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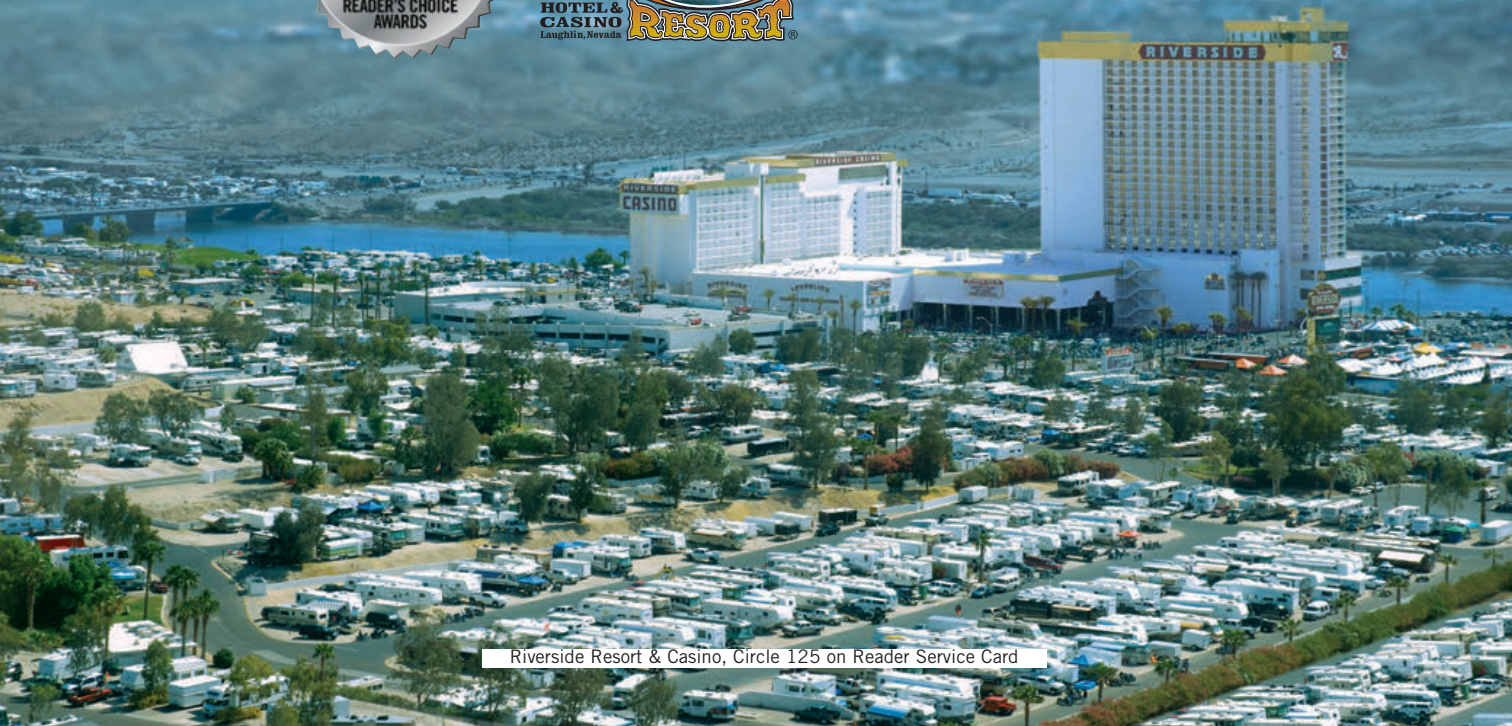
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On the cover: The Vanleigh Vilano 375FL at Outdoor Resort Palm Springs in Cathedral City, California. Photo by Scott Hirko

Spring into Summer

With the travel season in full swing, keeping your RV road-worthy can contribute to trouble-free trips



Lonely Planet named Canada its number-one choice for the best countries to visit in 2017. The *New York Times* listed Canada as its number-one destination in "52 Places to Go in 2017." Why? America's neighbor to the north is celebrating its sesquicentennial this year, the 150th anniversary of confederation. The world's second largest country by area, with the most coastline of any country, Canada is full of beautiful vistas, exciting cities and friendly people.

Canada has 46 national parks and reserves in its 13 provinces and territories, from the U.S. border to the Arctic Circle, many of which are RV-friendly. Entrance to them is free this year with the 2017 Parks Canada Discovery Pass, although campground fees are not included. The pass is available at regional visitor centers throughout the country and online at www.commandes-parcs-parksorders.ca.

In anticipation of the sesquicentennial, Alan Rider towed a trailer more than 4,000 miles on the Trans-Canada Highway, from British Columbia to Nova Scotia, camping at RV parks along the way and making memories that will last a lifetime. He recounts his epic journey starting on page 42, including a scenic detour to Banff and Jasper national parks and the Icefields Parkway.

Of course, there are plenty of memorable places to visit south of the Canadian border, and this issue takes you to several of them. Pamela Selbert tours the home of the world-famous Budweiser Clydesdales in Boonville, Missouri (page 9). Emily Fagan takes her fifth-wheel to Down East Maine (page 20), and Lisa Ballard goes underground to explore three subterranean destinations in Montana (page 32).

As spring turns to summer, we are fortunate to have extensive highways, amazing scenery and spectacular natural wonders to visit with our RVs. But before you hit the road this season, make sure your home-on-wheels is ready to roll.

This issue gets back to basics with articles on two important features in any RV: appliances and batteries. Starting on page 26, we look at appliances for air conditioning, cooking, heating, refrigeration and water heating, and how to keep these essential RV systems running smoothly. Then on page 38, Ed Bolduc goes to the heart of the 12-volt electrical system to review proper charging, care and storage of batteries to maximize their life and make the most of your RV adventures.

Summer brings with it the need for shade, and in the RV world, that is accomplished with awnings. There are lots of awning options out there, and in upcoming issues we'll install some new ones and repair some common components. On page 48, Larry Walton attaches a 12-foot patio awning on a classic travel trailer built back when awnings weren't standard equipment on RVs.

Get out there this summer and make some great RV-vacation memories! 🗣️

— Chris Dougherty, Technical Editor

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Publisher Ann Emerson

Editor Valerie Law

Managing Editor Donya Carlson

Technical Editor Chris Dougherty

Senior Art Director Rick Damien

Production Director Bob Dawson

Production Manager Brenda Hutchinson

Business Manager Katey Purgatorio

Publisher Emeritus Bob Livingston

Consulting Editors Chris Hemer, Jeff Johnston

Contributors Lisa Ballard, Ed Bolduc, Emily Fagan, Kevin Livingston, Alan Rider, Pamela Selbert, Bruce W. Smith, Larry Walton

Vice President National Sales Terry Thompson
847-229-6759

RV Marketplace/Classifieds Katey Purgatorio
847-229-6756, katey.purgatorio@goodsam.com

Advertising Sales/Southwest Sue Seidltz
847-229-6813, sue.seidltz@goodsam.com

Advertising Sales/Southeast Kim Whitaker
919-412-6325, kim.whitaker@goodsam.com

Advertising Sales/Northeast Lou Cicirelli
954-297-9234, lou.cicirelli@goodsam.com

Advertising Sales/Northwest Scott Oakes
847-229-6758, scott.oakes@goodsam.com

Customer Service

Subscriptions (print and digital)

800-825-6861

trailerlife@cdsfulfillment.com

Editorial

info-tl@goodsam.com

www.trailerlife.com



President Mark Boggess

Vice President/Publisher Ann Emerson

Vice President/Advertising Sales Terry Thompson



Trailer Life (ISSN 0041-0780) is published monthly by GS Media & Events (a division of Good Sam Enterprises, LLC), 2750 Park View Court, Suite 240, Oxnard, CA 93036. Periodicals postage paid at Oxnard, CA 93036, and additional mailing offices. The annual subscription rate is \$17.97 per year in the U.S. For Canadian and International subscriptions, add \$12 per year. U.S. funds only.

U.S. Postmaster Send address changes to *Trailer Life*, P.O. Box 5860, Harlan, IA 51593-1360.

Canadian Return Address GS Media & Events, 4960-2 Walker Road, Windsor, Ontario N9A 6J3. Publication Sales Agreement 40012332.

Printed in the United States

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LP-Gas Fundamentals

I just finished reading "The ABCs of LPG" by Ed Bolduc in the April issue. After 35 years of repairing swimming-pool gas heaters, I thought I knew quite a lot about liquefied petroleum gas, but Ed's article filled in my understanding. I applaud his skill at explaining LP-gas controls and pressure regulation better than a textbook.

Paul Wahler, Lusby, Maryland

Your April article on LP-gas contained a lot of good information. However, you got the density wrong in the "Let's Talk Safety" sidebar. LP-gas is heavier than air at standard atmospheric pressure.

Chuck Pohlhammer

Lake Forest, California

I saw a posting dated January 2017 stating that the life of a DOT cylinder is now 10 years from the date of manufacture. Your April article referenced the prior 12-year expiration date.

Dennis Richards

New Castle, Pennsylvania

Ed Bolduc replies: *The posting is correct, at least for now. On January 23, the expiration date of LP-gas cylinders used in RVs changed from 12 years to 10 in a rulemaking document from the U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA). However, the new rule is being challenged by the National Propane Gas Association (NPGA). The NPGA has filed a petition for rulemaking to begin the process of changing it back to 12 years. As with any governmental process, the PHMSA's rulemaking takes time, so we will have to wait for the final outcome.*

No Such Puck

I was pleased to read Emily Fagan's "Latch and Release" article in the April issue about the B&W Companion OEM fifth-wheel hitch. My wife and I just had a Companion hitch installed in our new truck, but, unlike the Fagans, we had to have the Turnoverball hitch installed

Going Shoeless in Georgia

We enjoyed "Catch of the Day," Lisa Ballard's Roads to Adventure column in the April issue, because it featured one of our favorite camping locations, Tybee Island, Georgia. We have eaten at the Crab Shack several times and love it. Note that the people in the bottom photo are not "fishing" for baby alligators, as the caption implies, but *feeding* them with specially prepared nuggets bought inside.

The article didn't mention River's End, the only campground on Tybee Island. Run by the City of Tybee, River's End is a beautiful campground with great amenities and gives discounts to members of the Good Sam Club, AAA, AARP and the military.

Marty and Martha Greene, Dalzell, South Carolina

We visited Tybee Island in April 2008. Like Lisa Ballard, we went to the Crab Shack and had lunch "Where the Elite Eat in Their Bare Feet," which I thought was the cleverest motto. I also thought it was such a great idea to provide a hole in the tables for discarding crab shells and trash at the end of the meal. Quite a place!

Sandy McHale, Copperopolis, California



because our truck didn't come with the puck platform in the bed.

We searched dealer lots for more than six months to find the right truck but found only two with the hitch-prep package, and both were stripped-down work trucks. I do not understand why so many dealers order well-equipped three-quarter- and one-ton diesel trucks that are built to tow but do not include the factory prep package.

Kevin Morris, Wampum, Pennsylvania

I have a B&W Companion OEM hitch in my 2014 F-350, which, as illustrated in April's "Latch and Release," utilizes the puck locations for mounting the hitch solidly to the bed and frame of the truck. I would encourage other owners to consider placing short-shank padlocks on the puck handles when the hitch is latched closed and putting long-shank padlocks on each side of the upper hitch mount where normally just mounting pins are inserted. Adding these locks goes a long way toward discouraging theft of the hitch when no trailer is attached.

Richard Blackwell, Indio, California

Turn of the Century

The April article about Charleston, South Carolina, "Charleston's Glory Days," said Hurricane Hugo devastated the city in 1889. It was actually 1989. I don't think they even named storms back then! That being said, I did enjoy the article.

Renee Montaudo, Rincon, Georgia

Quail or Condor?

Contrary to the April issue's article on Pinnacles National Park, "To the Brink and Back," the California valley quail is the official California state bird.

Gary Thompson, Pahrump, Nevada

You're right, Gary, although a movement is afoot to change that. To support the grassroots effort to make the once nearly extinct California Condor California's state bird, go to www.thepetitionsite.com. — Editors 🗣️

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Going Places



(Far left) A mare and foal graze at Warm Springs Ranch, where 20 to 25 foals per year are welcomed. (Left) A “full hitch” parades through the Anheuser-Busch brewery in St. Louis. (Bottom) The Clydesdales spend much of their time roaming in the pastures. The 25,000-square-foot breeding barn has a veterinary lab and foaling stalls with customized shelters.

Horsin’ Around in Missouri

Meet the iconic Budweiser Clydesdales at their home at Warm Springs Ranch in Boonville

article by Pamela Selbert

Once you’ve seen the Budweiser Clydesdales — whether at St. Louis’ Busch Stadium on Cardinals’ Opening Day or some other sporting event, or even if only in one of the brand’s more than two-dozen endearing Super Bowl commercials — you’re not likely to soon forget the magnificent equines.

Even so, seeing them from afar doesn’t begin to compare with getting up close and personal with these gentle giants, which you can do on a guided walking tour at 300-acre Warm Springs Ranch, a former cattle farm near Boonville, Missouri (about 150 miles west of St. Louis), where the big draft horses have been bred since 2008. The breeding facility was moved from California after Belgium-based InBev announced plans to purchase Anheuser-Busch.

Clydesdales, originally from Scotland, have been associated with Anheuser-Busch since 1933, when August Busch Jr. and Adolphus Busch

III gave their father, August Busch Sr., a six-horse Clydesdale hitch to celebrate the repeal of Prohibition. The elder Busch immediately recognized the advertising potential, and now Clydesdales have been associated with the brand for more than 80 years. Eight-horse hitches pulling a shiny 1900-style red, white and gold beer wagon emblazoned with “Budweiser” have appeared in thousands of parades and other events. The Budweiser Clydesdales have performed in TV commercials for more than half a century.

Not just any Clydesdale is eligible for the role. A horse must be male, a gelding and at least four years old. He must be 6 feet tall at the shoulder, weigh between 1,800 and 2,300 pounds, and have a bay (reddish-brown) coat, with a black mane and tail, a blaze of white on the face and four white-stocking, feathered feet.

More than 70 Clydesdales live at

Warm Springs Ranch. Of the baby Clydesdales that enter the world here every year, about 10 will qualify for a future spot on one of the traveling hitches and a chance to appear in one of the brand’s commercials.

Visitors on the tours, which require a reservation, learn some Clydesdale history and what goes into raising the beautiful animals. Visitors can interact with handlers, take photos with a Clydesdale, purchase souvenirs at the gift shop and sample beer (ages 21 and older, of course). The 90-minute tours, which cost \$14 (children two and under are free), are offered every day except Wednesday at 10 a.m. and 2 p.m. VIP tours, which cost \$500, include a visit to the 25,000-square-foot breeding barn and foaling area, and interaction with the Clydesdales. These 90-minute tours are offered the same days at 10:30 a.m.

Warm Springs Ranch is ADA-compliant.

Warm Springs Ranch

25270 Highway 98, Boonville, Missouri
888-972-5933, www.warmspringsranch.com
Open for tours through October this year, rain or shine.

Cottonwoods RV Park

Columbia, Missouri (about 25 miles away)
888-303-3313, www.cottonwoodsrvpark.com



Vintage Cruiser

Gulf Stream's Vintage Cruiser travel trailer offers a step back in time with modern conveniences and amenities. The family-owned company, manufacturer of travel trailers, fifth-wheels and Class C motorhomes, claims it has captured the spirit of the 1950s for campers to enjoy today with six 20-, 23- and 26-foot floorplans that include two bunk models. Gulf Stream's goal in building the Vintage Cruiser is for people to "recall a simpler era and relive days filled with swimmin' holes, fireside sing-alongs and camping in the great outdoors, where the stress and pressure of the 21st century don't exist."

The lightweight-fiberglass Vintage Cruisers may



look retro but are built with modern laminated, vacuum-bonded walls, a welded-aluminum frame and a one-piece roof, and start at 2,825 pounds (dry). Standard features include Roanoke Light Cherry Cabinetry, vinyl flooring and a full dry bath.

Styles, colors and designs of the upholstery, light fixtures, woodwork and graphics inspired by the '50s team up with a 6-cubic-foot refrigerator, a stainless microwave, a two-burner cooktop and LED lights. The trailers have nearly 7-foot ceiling heights and two 5-gallon LP-gas cylinders. The freshwater tank holds 28 gallons, and black and gray tanks have 30-gallon capacities.

The Gulf Stream Vintage Cruiser is available in two-tone Teal and Cream or Crimson and Cream. An upgraded Estate Wagon package simulates a 1940s or '50s woodie station wagon, inside and out.

Base MSRP ranges from \$19,593 to \$24,633.

Gulf Stream, 800-289-8787, www.gulfstreamcoach.com



Laughlin Chefs Food Fest

Get ready for delicious food and drinks and friendly competition at the June 8 30th Annual Chefs Food Fest in Laughlin, Nevada, a family-friendly gaming, entertainment and water-sports destination on the shores of the Colorado River. Laughlin and neighboring Bullhead City, Arizona, are popular destinations for RVers.

Laughlin hotels' finest chefs will cook up their best dishes, along with restaurants, distilleries, wineries and breweries vying for trophies and wowing the crowd with their creations. The event includes a live auction and is sponsored by the Laughlin Chamber of Commerce, with proceeds going to a local charity. All food and drinks are included in the \$75 admission.

On July 4, just after dark, Rockets Over the River, a spectacular display of pyrotechnics, can be viewed along the entire Laughlin River Walk, with patriotic music choreographed to the show.

The town's oldest gaming establishment, Don Laughlin's Riverside Resort Hotel and Casino, welcomes guests to its 740-site RV park and the casino's two swimming pools.

Chefs Food Fest, 702-298-2214, www.laughlinchamber.com

Riverside Resort, 800-227-3849, www.riversideresort.com



NEWSWIRE

TRUCK RECALL F-250 Damaged Park Rod

Ford has recalled approximately 52,608 F-250 pickups in the United States and Canada. In affected trucks, when the driver moves the shift lever to park, a damaged park-rod actuating plate might not achieve mechanical park, and if the parking brake is not applied, the truck could move. The recall targets certain 2017 gasoline-powered 6.2-liter trucks built at the Kentucky Assembly Plant from October 9, 2015, to March 30, 2017. Ford is not aware of any accidents or injuries associated with the issue. Dealers will inspect and replace the park-rod actuating plate as necessary at no cost to the customer. Reference number for the recall is 17C06. www.ford.com

ENGINE OIL New API Licensing

The American Petroleum Institute (API) has licensed approximately 400 CK-4 and 60 FA-4 engine oils and expects availability to grow as more oil marketers meet the new standards. API CK-4 oils are intended for diesel-powered engines previously using API CJ-4 oils, and API FA-4 oils are intended for 2017 and newer engines. The new oil products help diesel-engine manufacturers meet more stringent emissions requirements. API-listed oils are backward-compatible — designed to be used in engines where APT CJ-4 engine oils have been previously recommended — and provide a number of improvements. www.dieseloilmatters.com

Kansas, Oklahoma and Texas Celebrate the Chisholm Trail's Sesquicentennial

In August 1867, the first herd of Texas cattle arrived in Abilene, Kansas. Over the next several years, millions of cattle were driven up the Chisholm Trail to be loaded onto railroad cars. The trail changed the American West and gave birth to the cowboy as an icon of the cattle industry. In celebration of the trail's 150th anniversary, a traveling exhibit, "The Chisholm Trail: Driving the American West," will move through Kansas, as it traces

the trail from its 1860s beginnings to modern times.

During the anniversary, Kansas' historic cow towns are reviving their rowdy roots with special events that include festivals featuring Old West reenactors, cowboy poets, storytellers, longhorns being driven through the streets, walking tours, cow camps, campfire ghost stories and the ever-popular cow-chip-throwing contest.

The Kansas activities are part of

a three-state Chisholm Trail celebration that includes events and historical attractions in Oklahoma and Texas. Check the websites below for more information, including the traveling exhibit's dates and towns visited in 2017 and into 2018.

CT-150 Kansas Coalition
www.chisholmtrail150.org

Chisolm Trail 150th
www.chisholmtrail150.org

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Package Deal

When shipping fees on a returned fifth-wheel cover weren't reimbursed by the seller, a North Carolina reader sought help from RV Resolutions:

▶ Last November, I ordered an RV cover from Car Cover Universe. The company guarantees that if the wrong size cover is sent, shipping charges to return the cover will be reimbursed.

When I called to place my order, the salesman I spoke with agreed I should get the 29- to 33-foot cover to fit my 32-foot fifth-wheel. However, the cover I received was about 2 feet too short. The company insists that the 33-foot cover was sent to me, but the size on the carton is 26 to 30. I have asked a few times what that means, and the only answer I have received was, and I quote, "Your cover is a 33-foot cover."

The company refuses to pay my \$66.20 shipping charge.
Donnie McAvoy, Jacksonville, North Carolina

A couple of weeks after RV Resolutions reached out to Car Cover Universe on Donnie McAvoy's behalf, he followed up with a thank-you note:

▶ Thank you for your service. Car Cover Universe sent me a check for shipping. If it had not been for RV Resolutions, I do not think I would have gotten the check.
D.M.

Take Your Seats

Frustrated when the manufacturer of their fifth-wheel's sofa and recliners denied their request to replace the marred vinyl upholstery, a Florida couple contacted RV Resolutions:

▶ We have a 2012 CrossRoads Rushmore fifth-wheel trailer purchased new in January 2013. The two vinyl-covered recliners and sofa in the living room are cracking and peeling.

I called Lippert Components, the furniture's manufacturer, and was told to email photos, which I did. We received an email from Kimberly Crane in the customer-service department stating that her supervisor had reviewed the photos and could not approve the claim because the furniture is out of warranty.

We use the RV three to four months a year. When not in use, it is stored in our garage with an electric hookup and a fan on a timer to circulate air daily. We are two retired adults and have no pets or children staying in the RV.

The vinyl upholstery on the recliners is in terrible condition. The only reason the sofa isn't in worse shape is because we have stopped using it. One of the cushions has a small peeled spot, and the arms are cracking.

We appreciate your assistance and are hopeful that there is a satisfactory resolution for both parties.

**Harry and Margaret Kuligofski
Nobleton, Florida**

THE COMPANY RESPONDS

In an effort to find a mutually acceptable solution, we contacted Lippert Components and heard from the company's customer-service department:

▶ Thank you for reaching out to share feedback from our customers. We will be in direct contact with them

to address the items discussed in the letter. Should there be anything further we can do to assist you or our customers, please do not hesitate to reach out.

**Kerri Guerrero, Supervisor
Interior Customer Service
Lippert Components
South Bend, Indiana**

Several months after we received Lippert's response, the Kuligofskis sent an update to let us know the outcome and express their thanks:

▶ We're happy to report that your intervention was successful. Lippert Components contacted us to address the issue, and the sofa and two recliners have now been replaced. We thank you very much for your assistance.

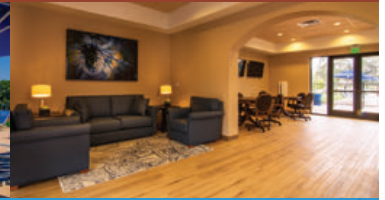
H. and M.K. 📧

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Viva Vilano!

Vanleigh RV's expertise building Tiffin motorhomes inspires a new line of amenity-rich fifth-wheels

It's no secret that the principals of Vanleigh RV, a relative newcomer in towable manufacturing, share their DNA with the founders and current operators of Tiffin Motorhomes, makers of Allegro-branded motorized RVs. While cutting their teeth on building Class A motorhomes in the family business has proven to be highly successful, the next venture into fifth-wheel trailers, surely a departure from their norm, capitalizes on the reputation that made Tiffin an icon in the RV industry.

The Vilano fifth-wheel line made its debut at the Louisville trade show in 2015 and has quickly found its niche in a market that caters to discriminating

owners who do not have an unlimited budget. At just shy of 100 grand, the latest model, the 375FL, is a 40-footer with a front-living-room configuration with enough strategically infused upgrades to raise the bar from commonplace to feature-rich, again, without pushing the price into the stratosphere.

A front-living-room floorplan offers a number of possibilities for full-timers or extended-stay occupants, but it's not for everyone. In this plan, the front living room is about as inviting as any room can be. The dark wood contrasts nicely against the lighter colored wallboard, wood-grain-look flooring and Ultraleather furniture. Those who



enjoy hosting guests will find that this living room will quickly become hangout central. The seating is superb, with enough places for eight people on the opposing sofa beds and theater recliners.

Two factors make this front living room more spacious: the flat roofline that provides 6 feet 6 inches of headroom and the opposing slides, two of

(Top) Outdoor Resort Palm Springs in Cathedral City, California, was a perfect backdrop for the Vilano. (Above left) The front living room is big enough for eight people to hang out in comfort. (Above right) A short stairway from the living room leads to the kitchen with a peninsula galley counter. The fully equipped galley also has a TV for the cook's viewing.

six in this model. A liberal placement of LED fixtures offsets any darkness from the woodwork, and even the cup holders have blue background lighting.

Uncommon in a fifth-wheel in this

price range is the level of woodwork found throughout the interior. All the cabinets and trim are solid wood, built by hand in the company's custom cabinet shop. The heavy dark woods exude

quality and long-term service, even under full-time living, which is a likely use for this fifth-wheel and a feature that the Tiffin family has hung its hats on for a very long time.

A generous assortment of windows brings in plenty of ambient lighting and offers a commanding view to the outside, except for the very front, where the wall is completely filled with a 55-inch smart TV and well-placed cabinets and drawers. Some of this space is designated for entertainment electronics that support the huge TV, but there's still plenty of room for pack rats. A large fireplace in the lower section of the entertainment center offers a perfect touch in this room and is within easy viewing from the opposing large and comfy reclining theater seating. As a matter of fact, don't plan on spending too many awake moments in front of the TV if the theater seats are reclined fully.

As you step down from the living room, the floor converges with the entry-door landing and beginning of the galley. What seems smallish at first glance is actually a very usable kitchen that's ready for just about any type of meal prep. Using a peninsula galley counter with the stainless-steel sinks, rather than an island approach, makes great sense here. Not only is floor space better utilized, the layout allows access to the refrigerator when the slides are retracted for travel, and there's deep storage below the sinks.

The residential refrigerator, three-burner cooktop with oven and stylish microwave occupy the left-side galley



Opposing slides, an optional king-size bed and storage space for large wardrobes take on the aura of the company's higher-line motorhomes.

slideout, along with an array of cabinets and drawers. The backsplash decor adds a big touch of class to the overall look in the galley. And to help control the foodstuffs and supplies needed for a fifth-wheel of this size, a hutch separating the galley from the front living room is chock-full of cabinets — and there's a small shelf to hold keys, phones and other small items.

Across from the galley, the dining table, chairs and large pantry are tucked into an opposing slideout. The chairs are very heavy, but once you sit down, you'll be all smiles, even though they take a little grunt to move around. Not only are the chairs extremely comfortable and upholstered smartly, but they work harmoniously with the glass-top table, which is also solid as a

rock. Four people can work through an elaborate meal without plate clunking.

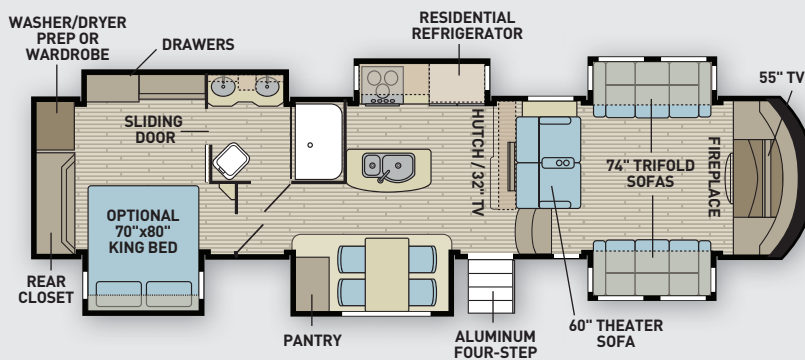
While the galley and living room are designed more along the lines of a fifth-wheel, the rear portion of the unit takes many of its cues from the motorhome operation. A wide hallway leads to the bathroom on the street side and the rear bedroom, both closed off by residential-style doors. These doors are 7 feet tall and solid, with the one leading to the bedroom fitted with a decorative window. Basically, you're looking at doors that can be compared to those in expensive homes.

Floor space in the bathroom is expansive with the focal point being the his-and-her sinks set in a solid-surface countertop. Full-timers will have no problem storing all the necessary bathroom items, and the counter is big enough for primping, but not oversize by any means.

The horizontally configured shower stall is huge, and is fitted with a nice showerhead and fixtures, and places for soap and shampoo. Water pressure was on the anemic side, whether hooked up or using the onboard demand pump. This is something that can likely be rectified at the dealer level and usually entails locating and fixing a tight bend or removing crud in the lines. For those who spend time off the grid, a more efficient water pump may be in order.

The toilet is mounted cubbyhole-

VANLEIGH VILANO 375FL



fashion adjacent to intersecting walls across from the sinks, which makes great sense for opening up the floor space in the bathroom, but it was placed in such a way that the toilet seat could not stand up unassisted. Also, providing a small porcelain toilet, rather than one with an elongated bowl, was not consistent with the rest of the interior amenities.

A sliding door in the bathroom opens to the rear bedroom, creating a very large area that has all the elements of a nicely furnished suite. Design elements taken from the motorhome side of the business give the area a look more similar to that inside a diesel pusher. The slideout on the street side expands the area in front of the double sinks in the bathroom and the cabinetry across from the foot of the optional king-size bed that's pulled out with the opposing slideout. Multiple drawers in dresser form, plus the cabinets, handle large wardrobes, and that doesn't take into consideration the rear closet. Mirrored sliding doors open to a huge area for hang-ups and items that can be placed on the floor. Next to the wardrobe is a closet prepped for an optional stacking washer and dryer.

Buyers will have to decide if the king-bed option makes the most sense, and that, of course, is usually dependent on personal taste. If the additional 10 inches of width is not crucial to a good night's sleep, then the standard queen bed is a better choice. The king bed is stuffed into the slide, leaving little room to walk around and maneuver for changing the sheets. Also, the nightstands are rather small for common bedside items, including those that can take advantage of the built-in double USB charging receptacles. In either case, the foam mattress is comfortable, and there is a good amount of storage space under the bed platform, which lifts easily.

We liked the headboard and overhead-cabinet treatment, and the multiple LED fixtures, along with the windows on each slideout wall, warded off any closeness due to the dark decor. A ceiling fan and multiplex lighting switches are welcome features.

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SPECIFICATIONS

VANLEIGH VILANO 375FL

Exterior Length	40' 6"
Exterior Width	8' 5"
Exterior Height	12' 11"
Interior Width	8' 1"
Interior Height	8' 6"/6' 6" living room
Construction	Tubular aluminum side walls and floor, aluminum roof joists, high-gloss fiberglass exterior, painted front cap, EPDM roof membrane
Freshwater Cap.	54 gal.
Black-/Gray-Water Cap.	45/90 gal.
LP-Gas Cap.	14 gal.
Water-Heater Cap.	10 gal.
Refrigerator	18 cu. ft. residential
Furnace	42,000 Btu
Air Conditioner (3)	15,000 Btu
Converter	70 amp
Inverter	1,000 watt
Battery	Dealer supplied
Tires	ST 235/85R16 LRG
Suspension	Leaf with Equa-Flex
Weight (freshwater, water heater, LP-gas full; no cargo)	15,640 lbs.
Hitch Weight	3,560 lbs.
Axle Weight	12,080 lbs.
GVWR	16,000 lbs.
GAWR	7,000 lbs.
Cargo Carrying Cap.	360 lbs.
Base MSRP	\$94,968
As-Tested MSRP	\$99,103
Basic Warranty	1 year

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Sharing a slideout with the neighboring bedroom, the bathroom's his-and-her sinks are a welcome touch for couples. A horizontally positioned shower offers plenty of room.

The bedroom and bathroom are not accessible with the slides retracted, so those who want to take a potty stop or quick nap on travel breaks will have to extend the slides enough to slip by.

Physical size, attributed to the six slideouts and overall length, made the Vilano pleasurable to live in, especially for full-timers who may want a little separation from each other and enjoy some quiet time. While most of the

amenities in this fifth-wheel meet its design purpose, the Vilano could use some support-system tweaking. Three air conditioners (one optional) perched on the roof suggest that the interior will stay cool, and it does, but heat distribution from the furnace could use some redirection. The nearest register to the bedroom was too far to keep the area warm, while the front of the unit was toasty. To



supplement, we used the heat pump in the rear air conditioner, which added needed warmth but was noisy and cycles way too frequently.

All the systems are controlled by a central touch pad mounted at the end of the galley hutch and easily accessed when entering the rig, which adds great versatility. From here the lighting can be controlled, HVAC set, slides deployed, and hot-water tank set to gas or electric. It was a great convenience that will take some time with the instructions to perfect but will certainly be appreciated. It would be nice to illuminate the icons in the surrounding bezel; we liked turning off all the lights with one button, but when it's dark, the icons on the bezel are hard to see. Acclimation with the panel should make this process more instinctive for most users.

To help with cleanup, a central vacuum-cleaner hose is built into a channel behind the theater seating. It pulls out of its dock for use, and cleaning attachments stored in a nearby compartment can be connected. Users should not be timid when extending the hose to reach the back portion of the trailer.

Outside, all stored items are relegated to the front compartments. A standard-fare pass-through offers a good amount of space for bulky items and is finished off handsomely. Additional items can be stashed in the front compartment where the battery boxes reside. Batteries are supplied by the dealer, and it's best to install two to support the trailer's power requirements. A 1,000-watt inverter is included to operate the residential refrigerator when on the road.

Adjacent to the pass-through compartment on the left is the utility center, which is well laid out and easy to use. Refreshingly, the controls are simple, and switches for the electric gate valves for dumping the holding tanks make it unnecessary to incorporate problematic cables. An electric reel for the 50-amp power cord facilitates hookup.

Plan on taking along extra sewer hoses, since the outlet pipes are separated by a long distance — the gray below the utility center and the black

out back. To hook up both at the same time, a wye fitting will be necessary.

Working in the pass-through storage compartment and utility center will take some care. Many owners will be too tall to stand under the front-living-room slideouts when extended and will likely have unexpected confrontations with the corners at first. We learned that the hard way and covered the lower edges with foam swim noodles. While most people will learn to duck, backing up from the storage compartment will also take some finesse to keep from bashing one's back. This is a compromise that results in exceptional headroom in the living room.

High-gloss fiberglass side walls with well-placed graphics and a painted front cap give the Vilano a stately look. Your eye will gravitate to the painted front cap, which is stylish and fitted with LED lighting, and gives the overall impression that the entire body is painted. The flat roofline pushed up the profile, but not to a point where you think you're towing an enormous fifth-wheel.

At first, the 16,000-pound gross vehicle weight rating (GVWR) seemed like the Vilano was going to be light for its size, but that rating gives a false impression. After filling it with water and LP-gas and adding one battery, the actual weight left only 360 pounds for loading, which is inconsistent with the intent of this model. Even though the 7,000-pound-rated axles are not loaded to maximum capacity, this fifth-wheel is a strong candidate for higher rated axles and chassis to make it feasible for heavier loading. The optional G-rated tires and wheels are capable of increasing the capacity to 7,500 pounds on each axle, so moving to heavier-rated axles and boosting the GVWR can be accomplished at the factory level without much redesign work.

Tiffin heritage is renowned for its wonderful customer service, and moving the family into the fifth-wheel segment will undoubtedly propagate that reputation. Considering the newness of the product line, the company gets high marks for bringing to market fifth-wheels that raise the bar without breaking the bank. 🚐



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DOWN EAST MAINE

OFF THE BEATEN PATH BETWEEN PENOBSCOT AND PASSAMAQUODDY BAYS
ON AN RV ROAD TRIP THROUGH QUINTESSENTIAL NEW ENGLAND TOWNS

Down East Maine is as far east as it gets on the U.S. mainland, although it is certainly not down. For sailors, however, a voyage to Maine's northern coast is downwind in an easterly direction from Boston, and the nautical name given to the area by old salts long ago has stuck. Recently, my husband, Mark, and I traveled to Down East Maine with our 36-foot HitchHiker, and we were bewitched by the many delights we found well off the beaten path.

BANGOR TO BUCKSPORT

The city of Bangor is the gateway to the region, and friends showed us some of the city's more unusual sights. Often overshadowed by Portland, its flashier neighbor to the south, Bangor is a

working town, and its prettiest side may be its backside.

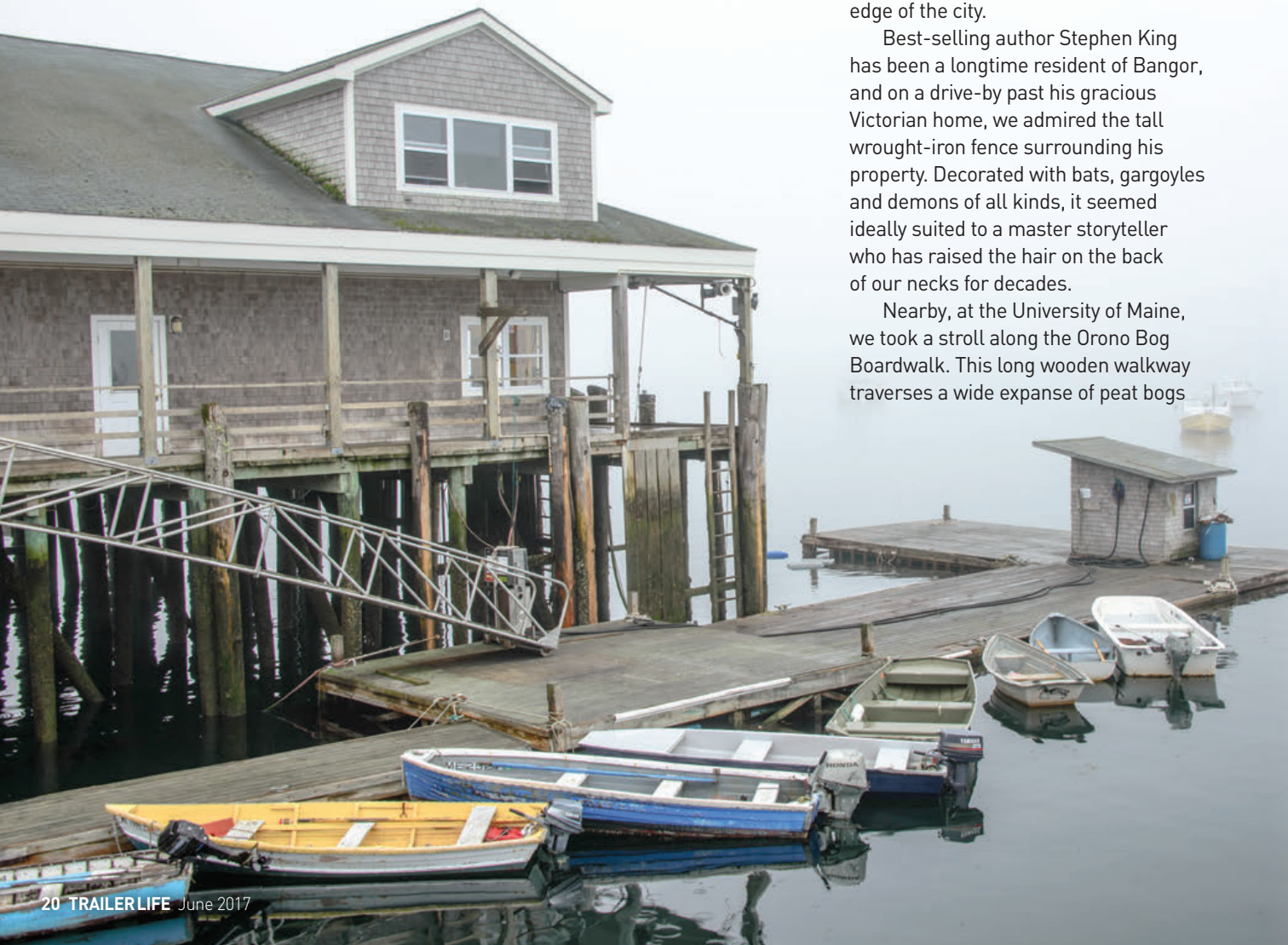
The Kenduskeag Stream Trail meanders behind the tall brick buildings downtown and created colorful reflections during our walk

one afternoon. As we ambled along the tree-shaded path, we were surprised when the trail suddenly shifted gears near the rural outskirts of town. In just a few strides, we passed from urban cityscape to pastoral landscape.

Retracing our steps back to town, we worked up enough of a thirst to warrant a stop at the Sea Dog Brewing Company. Quaffing Gollywobbler brown ale on the enormous deck out back, we had a great view of the boats on the tidal Penobscot River that runs along the edge of the city.

Best-selling author Stephen King has been a longtime resident of Bangor, and on a drive-by past his gracious Victorian home, we admired the tall wrought-iron fence surrounding his property. Decorated with bats, gargoyles and demons of all kinds, it seemed ideally suited to a master storyteller who has raised the hair on the back of our necks for decades.

Nearby, at the University of Maine, we took a stroll along the Orono Bog Boardwalk. This long wooden walkway traverses a wide expanse of peat bogs



created by receding glaciers 10,000 years ago. Deer, colorful birds and other animals live in this 616-acre nature preserve, and we were delighted to see a spotted fawn in the distance and a black-throated green warbler up close.

This part of Maine is made up of dozens of peninsulas, islands and saltwater rivers. Near the village of Bucksport, downstream from Bangor, the bridge across the Penobscot River is not only a popular landmark but has been an example of the latest suspension-bridge technology twice in its 85-year history. Replacing the old ferry system, the innovative Waldo-Hancock Bridge opened with fanfare in 1931. In 2006 the original span was retired when the radically different cable-stayed Penobscot Narrows Bridge took its place.

Savvy engineers built the Penobscot Narrows Bridge to incorporate the tallest public bridge observatory in the world. The look out is at the top of one of the two 420-foot bridge towers, and a quick elevator ride took us up to it. Peering through the glass walls at the 360-degree view surrounding us, we could see for miles up and down the Penobscot River, and the pretty village of Bucksport seemed to lie right at our feet.

THE CRANBERRY ISLANDS

Although tidal rivers make up much of the northern Maine coast, getting out onto the open ocean is a must for visitors to the area. Among the boating options are windjammer day sails, dinner cruises and whale-watching tours. After a bit of research, we decided to visit the Cranberry Islands on the mail-boat ferry.

The *Double B* runs year-round between Northeast Harbor on Mount Desert Island, home to Acadia National Park, and Great Cranberry and Little Cranberry islands. Our day aboard the boat and ashore on the islands turned



out to be one of the highlights of our visit. A round-trip ticket is good for unlimited ferry rides all day between the three ports.

We climbed aboard for the first trip of the morning, and the first mate, Ted, welcomed us and about 20 or so regulars. The mail boat is a lifeline for the 200 or so inhabitants of the two Cranberry Islands. Along with the mail, it carries most of the goods that supply the islands' tiny stores and restaurant, and also ferries the islanders themselves.



(Left) Mist and fog shroud the dinghy dock at Bass Harbor, a quaint fishing village on Mount Desert Island. **(Top)** The Kenduskeag Stream Trail reveals beautiful reflections on the backside of Bangor. **(Above)** A fifth-wheel trailer parks near a lighthouse on New Brunswick's Campobello Island, the second largest of the Fundy Islands. **(Right)** At the northern end of the Maine coast, a 12-foot-tall fisherman sculpture greets visitors to Eastport.

DOWN EAST MAINE

As the boat threaded its way through Northeast Harbor, we noticed that not only were we the only tourists on board, but we were surrounded by workmen carrying lunch pails. At our first stop, Great Cranberry Island, 10 minutes later, the commuters got off and climbed the gangway for a day of work.

No sooner had they gone ashore than a group of schoolchildren came down the gangway and joined us on the ferry. Like most other American kids on their way to school, they all carried backpacks, but unlike other students, they were also wearing life jackets.

"We've got the cell-phone numbers for every single parent," Ted told me, as he patted the backs of the kids coming aboard. Other passengers greeted them with hugs and welcomed them warmly, and we realized that many of the adults on board were schoolteachers.

We were enchanted by this unusual

aspect of island life and listened with rapt attention as Ted described what it's like aboard the *Double B* in wintertime when the ocean spray freezes hard on the windshield and the more fearsome blizzards stop the ferry from running all together. He went on to say that winters are so cold in this part of Maine, the politicians keep their hands in their own pockets.

A few minutes later, we disembarked in Islesford on Little Cranberry Island, along with an endless stream of packages, bags of potting soil, coolers full of meat and dairy products, and other goods destined for the stores, restaurants and homes on the island.

"We live and die by Amazon," one islander joked, as we watched Ted and the captain unload the boat into a waiting pickup truck.

We walked along a small road past a street sign that showed a huge mosquito carrying off an islander. We laughed, but we were grateful that the

mosquitoes weren't out yet. However, the wild lupines were in full bloom, and it seemed that every empty field and yard was filled to overflowing with these enormous and gorgeous blue and lavender flowers.

A small sign by the road led us to Islesford Artists, an art gallery owned by Katy Morse Fernald, a third-generation islander. Her husband, a sixth-generation lobsterman, used to store and repair his lobster pots in the building's loft, which is now filled with beautiful paintings.

We returned to the docks to catch the mail boat back to Great Cranberry Island, where we found a small general store and the popular lunch spot Hitty's Café. But it was the ferry rides that captivated us. Before long, we were back down at the docks waiting to board once again. Along with goods being loaded on and off the mail boat, a pair of French Canadians disembarked with their touring bicycles.

After we hopped on, the mail boat

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(Above, from left) The music teacher at Islesford School transports his bongo drums from Little Cranberry Island to Mount Desert Island on the *Double B* mail boat. The boat is a fun way to visit the Cranberry Islands. (Right) Down East Maine's tidal waterways are crystal clear.

made a quick stop at Islesford, and a group of people started loading bongo drums onto the boat. Before long, the bongos were stacked high in front of us, and a beaming young man, Beau Lisy, came aboard. He told us he was the once-a-week music teacher at Islesford School and had just finished a segment on West African music.

LUBEC, EASTPORT AND CAMOBBELLO ISLAND

We couldn't imagine topping our mail-boat experience, but Down East Maine is full of surprises. After a scenic drive along coastal Route 1 east from Mount Desert Island, we discovered the charming seaside village of Lubec, the easternmost municipality on the U.S.

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DOWN EAST MAINE



DOWN EAST ESSENTIALS

Down East Maine extends from the gateway city of Bangor south along the Penobscot River to Penobscot Bay and east up the coast to the Canadian border and Passamaquoddy Bay. Interstate 95 and U.S. Route 1 provide easy access to the region.

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www.eastportmaine.com

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mainland, and Campobello Island, just across the border in New Brunswick.

The border crossing, although formal and requiring a passport book or passport card, is a simple trip from Lubec across a small bridge. What a delight to drive onto the island and instantly see a sign with the French translation "Arrêt" underneath the English "Stop."

Both sides of the international border are marked with a stunning lighthouse. Candy-striped West Quoddy Head Light stands on the U.S. side, while its sister, the red-cross-embazoned East Quoddy Head Lighthouse, known locally as Head Harbour Lighthouse,

presides over the Canadian side.

While West Quoddy Head Light is easy to see up close because it is in a state park, East Quoddy Head Lighthouse stands on a rocky knoll at the far end of Campobello Island and is accessible by foot for just a few hours at low tide. The tides in this region are enormous, and the water rises 5 feet an hour, so intrepid trekkers who venture out to the lighthouse have to pay close attention to the tide tables or risk being stranded on the island for eight hours until the next low tide.

Since we arrived near high tide, we contented ourselves with admiring this stunning lighthouse from a distance.



East Quoddy Head Lighthouse on New Brunswick's Campobello Island is a beautiful and dramatic presence on a very rocky shore. Visitors can walk to the lighthouse for a few hours during low tide but must beware of getting stranded when the tide comes in.

Lobster boats pattered around the rocky shores, and the ocean was so clear we could see the sand and pebbles deep in its depths beneath the seaweed that waved in the swell.

Back on the U.S. side of the border, we ventured to another seaside village, Eastport, where we found the antique wooden *Friendship* sloop tied up at the town dock. Behind the boat was a row of gray clapboard buildings facing the ocean. To complete this quintessential New England scene, a towering sculpture of a fisherman greeted visitors at the pier. This sculpture was created as a prop for the TV show *Murder in Small Town X*, and the residents liked it so much they made sure it stayed on the dock long after the TV crews left town.

We were charmed by the small, distinctive homes as we wandered

through the streets. Many are oddly shaped, built according to the whims of the lobstermen and fishermen who settled the town long ago. Tall, skinny two-story houses and rows of homes with steeply pitched roofs were lovingly maintained and encircled by beds of colorful flowers.

One morning we enjoyed a delicious breakfast at the Moose Island Bakery, and one evening we caught a free lecture at the public library by a resident who had just come back from a trip to Cuba. Mingling with the townspeople over coffee at the café and again at the library after the lecture made us realize just how precious it is to travel to a place where the locals are welcoming and easy to get to know.

We had ventured far off the beaten path in Down East Maine, but what treasures we had found. 🗨️

On the other side of the bridge that leads to Campobello Island, the village of Lubec, Maine, charms visitors with its seaside ambience and local color.



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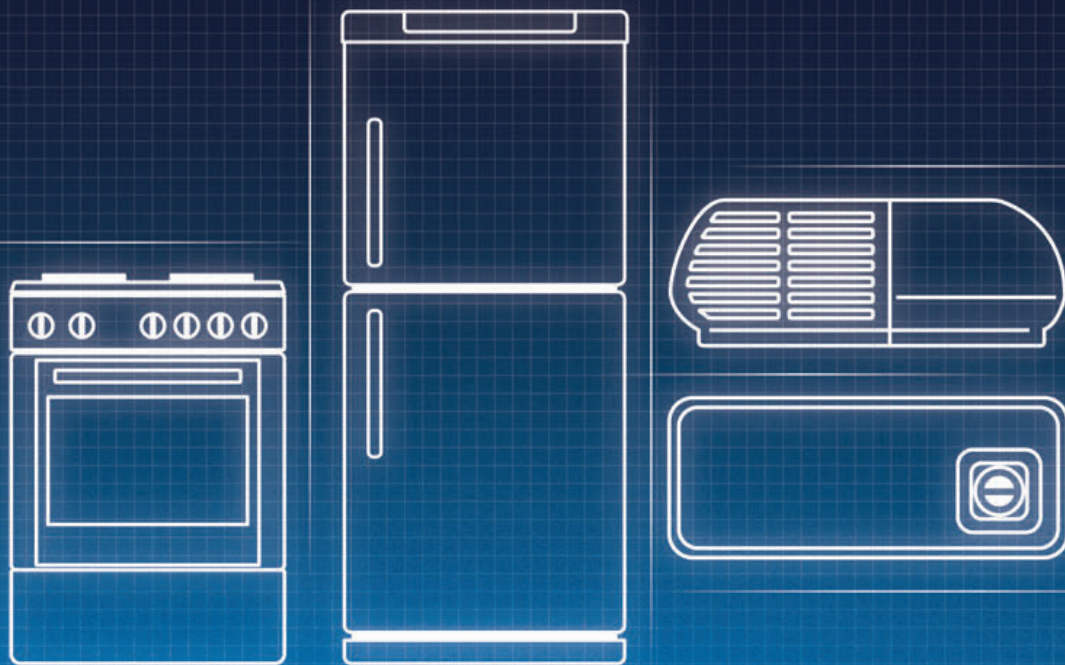
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While general maintenance procedures for air-conditioning, cooking, heating, refrigeration and water-heating appliances are included in this article, it's important to follow the instructions outlined in the specific owner's manuals. Manuals for many common RV appliances can be found on the websites listed in each section.

Some appliance maintenance requires significant disassembly, special tools and equipment, and opening the LP-gas system. If you are not comfortable with these operations or don't have the proper equipment, see a certified technician for the service of that appliance.

Air Conditioning

RV air conditioners come in a range of sizes and styles, but the most prevalent are roof-mounted 13,500- and 15,000-Btu units that are either ducted or direct-vented, meaning they have a plenum on the ceiling (usually fitted with the controls) that blows cool air directly from the unit. Some ducted systems have a direct vent as an added feature. Some smaller trailers come equipped with small-box air conditioners mounted

[1] All RV air conditioners with ceiling plenums have a provision for removing the return-air grille and the filter for cleaning. Check the owner's manual for specific procedures. Here, the grille in a Coleman-Mach unit is gently pried off. **[2]** Once the grille is removed, the filter is exposed. Dust on this unit is visible, and even this relatively small amount is worth cleaning to keep the air conditioner functioning properly.



in the side wall of the trailer.

Air-conditioner maintenance is remarkably simple, as RV units are sealed from the factory without recharging ports and solid-state control systems. The most frequent maintenance requirement is to keep the return-air grille and filter clean in the ceiling unit, and it is essential to do this at least monthly during heavy use and more often in dusty conditions. These filters are important, as they keep dirt and dust from getting into the evaporator fins, plugging them and preventing airflow, and causing freeze-up and frosting.

It's also important to keep an eye on the components under the air-conditioner shroud on the roof. The inside of the unit should be kept clean and free of leaves, pine needles, wasps' nests and other detritus. Mildew or dirt that accumulates under the shroud should be removed. Condenser fins should be clean and unbent. Carefully

flushing the fins with water should suffice for cleaning. Bent fins can be straightened with combs that are available from HVAC-supply stores.

Since the air conditioner is sealed from the outside rooftop, spraying water on the fins shouldn't create an issue with moisture penetration. If the air conditioner is excessively dirty, however, removing the unit from the RV before cleaning may be preferred. Many air conditioners have their electronics in the outside section, usually under a small metal cover, so when cleaning the unit, the power must be disconnected and the electronics protected from overspray.

Many new RVs have H-ducted roof systems with separate ducts for the registers and return air, and no central ceiling unit. In this case, the return-air grille has a small filter that needs to be removed and cleaned in the same fashion as the others.

A properly operating air conditioner

should produce about a 20-degree-Fahrenheit difference in temperature between the return air and cooled air from the register closest to the air conditioner. For example, if the air going into the unit is 100 degrees, 80-degree return air is appropriate.

🔧 **MAINTENANCE TIP:** Anytime you look up at the ceiling unit and see dust, it's time to clean the return-air grille and filter. Simply remove the grille (this procedure differs by brand and model, so check the owner's manual), remove the filter, thoroughly wash it in the sink and let it dry before reinstalling.

RESOURCES

Airxcel (Coleman-Mach)
www.airxcel.com/coleman-mach
ASA Electronics (Advent Air)
www.advent-air.com
Atwood Mobile Products (Air Command)
www.atwoodmobile.com
Dometic (Blizzard, Brisk, Penguin)
www.dometic.com

Cooking

Of all the cooking appliances found in RVs, LP-gas-powered ranges require the most maintenance, but the procedures are not difficult. These are pretty simple devices that, as long as they receive the proper LP-gas supply, should work as designed.

Cleanliness is the key to maintaining an RV range, as spilled and burnt food and liquids can block LP-gas ports on the cooktop. Debris left under the cooktop on unsealed models is an attractant for pests.

On most cooktops that can be opened, the grill can be removed by pulling it forward and lifting it straight up to unlock it (it has spring clips in the rear). Pins in the rear act as hinges, and the unit should be able to be lifted off the pins and set aside. Clean this whole area thoroughly.

Each burner secures to the bottom of the pan with a single screw and may have an igniter wire attached. There's seldom a need to remove these, unless a major spill results in plugging of the little holes, or ports, in the burner or some of the



[3] To clean the range, remove the top grate, then pull forward on the cooktop. The top will likely have spring clamps in the rear that pull it back. Some ranges have a hinged top that can be lifted up. Check the owner's manual for specifics. **[4]** With the range top removed, access to the pan is easy for cleaning spills and debris. If a burner is plugged, it can be freed by removing one screw and the ignitor wire, and sliding the tube and burner off the manifold.

"jets" fail to light. In this case, the burner can be cleaned after removal by pulling away from the valve manifold at the front, being careful not to lose the plastic grommet at the manifold, if it has one.

The burner can be submerged in hot, soapy water and scrubbed carefully. Persistently plugged ports can be cleaned with a needle or wire, being careful not to enlarge the ports; wire or bristle brushes should not be used. After cleaning, shake the burner and let it dry, then reinstall and test.

Continued problems could signify an LP-gas pressure issue, which should be checked by a professional.

The oven is controlled by a temperature-sensing valve that is mounted to the range-top gas manifold. Routed from the manifold is one tube for a pilot and one for the main burner, and a thermocouple wire running down into the upper rear of the oven box. This thermocouple should remain clean for proper operation, and if it becomes fouled, a light cleaning with

emery paper is all that is required. The thermocouple can be removed from the back wall by compressing the spring clips.

Temperature in an RV oven can fluctuate more than in larger residential or commercial models, so using an oven thermometer is recommended, rather than relying on the temperature setting. To avoid burning the bottom of food, get a small pizza stone that fits on the metal tray above the burner. It should be small enough not to block the holes in the sides of the tray. This will help even out the oven temperature, and the higher flame temperature won't be directed at the bottom of the food.

⊕ MAINTENANCE TIP: To keep the inside of the cooktop spick-and-span, line the bottom with aluminum foil, being careful not to block the ventilation or access holes in the sides and rear. If you have a boil-over or other spill, cleaning up is simply a matter of removing the foil and replacing it with a fresh layer.

RESOURCES

Airxcel (Suburban), www.airxcel.com/suburban
 Atwood Mobile Products (Atwood Ranges, Wedgewood Vision)
www.atwoodmobile.com
 Furrion (RV Chef), www.furrion.com/kitchen

Heating

Furnace maintenance is very important, with most procedures completed by a certified RV technician or appliance technician who is experienced with burner-assembly removal for cleaning and/or inspection. Return-air rates must be maintained to prevent overheating. Frequent cleaning may be required if the furnace is used often or exposed to excessive dust, carpet lint or pet hair. Depending on the make and model, the entire furnace may need to be removed for service.

When removed, the burner is inspected for heat damage and burn-through, the ignitor is inspected and cleaned or replaced, and gaskets are replaced as needed. Service includes a visual inspection of the inside of the burn chamber, and fans are checked for damage or evidence of rodents' nests, among other things.

The large air grate in front of the cabinet where the furnace is located does not have a filter. Contrary to popular belief, this is intentional. Use of a filter here would restrict the flow of air to the furnace, and when dirty, could restrict it enough to cause the furnace to overheat and cycle on and off repeatedly.

The round, flexible furnace ducts



(5) Some RV furnaces have an exterior vent but are built into the RV and need to be removed for service. **(6)** Other furnaces have exterior access and can be serviced more easily. Removing the outside cover exposes the workings of the furnace, which is a big time-saver when doing maintenance or making repairs.

are like Habitrail tubes to mice, and they will nest in them, and sometimes even build nests inside the furnace. Any indication of mice in or around the furnace is a problem that should be investigated by a certified technician.

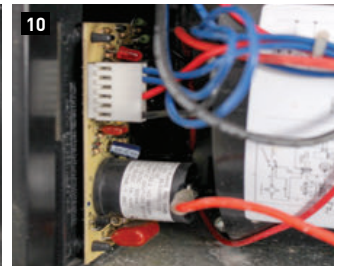
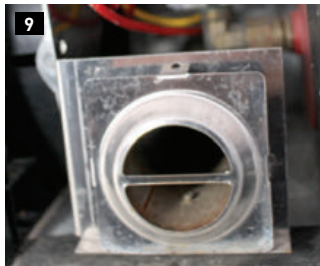
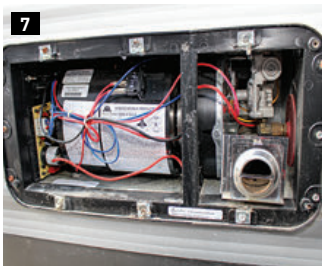
⊕ MAINTENANCE TIP: Never store anything in front of or in the return-air compartment or vent for the furnace. Keep the furnace ducts clear so air is freely discharged

from each register, and keep dirt and debris from falling into the floor registers inside the RV.

RESOURCES

Airxcel (Suburban)
www.airxcel.com/suburban
 Alde, www.alde.se/usa
 Aqua-Hot, www.aquahot.com
 Atwood Mobile Products (Hydro Flame)
www.atwoodmobile.com
 Truma (Combi)
www.truma.com/us/en/home

(7) From left to right, the furnace circuit board, fan cage, circuit-breaker reset switch, vent, gas valve and, behind that, the burner are all accessible when the outside cover is removed. **(8)** If the furnace fails to operate, the circuit-breaker switch is a good place to check for power. When working on the furnace, turn the power off first. It can be turned on and off as needed for advanced diagnostics. **(9)** The LP-gas furnace takes in fresh air and discharges exhaust through the tube shown here. The tube pulls out, and the entire burner assembly behind it can then be removed for service. Only a certified RV technician should remove the burner and valve assembly. **(10)** A circuit board controls the fan and ignition cycle for the furnace. It also detects the flame and cuts off the gas in a flame-out condition.



Refrigeration

Cleanliness is important in back of the refrigerator, as air space and ventilation are paramount for proper function. Remove the exterior-access panel and vacuum or sweep the area regularly, or blow it clean with a can of compressed air. Make sure there are no nests or other obstructions in the roof or upper-wall vent. An inspection mirror can be used for viewing up the ventilation space to make sure it is clear.

Rust will often form in the burn chamber and chimney of a refrigerator, just like on a barbecue grill, and will accumulate around the burner, which must be cleaned. Vacuuming, sweeping or blowing out this area with compressed air will often suffice. If there is a lot of foreign material, the ports on the burner appear plugged or burned through, or the flame is not clear blue when operating the refrigerator on LP-gas, removal of the burner and cleaning or replacement may be required.

The electrode-spark gap should be set according to the manufacturer's specifications when cleaning and reinstalling the electrode and burner. Manufacturers also recommend that LP-gas pressure and electrical voltage be checked.

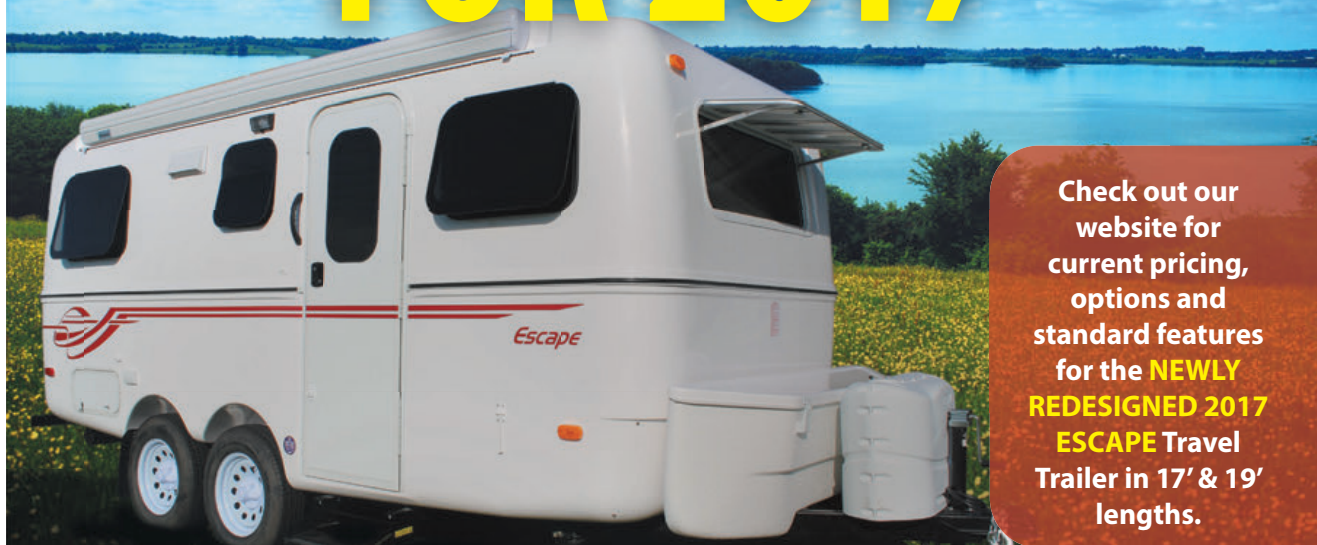
Cleanliness inside the refrigerator is equally important for proper function and to keep from attracting pests when the RV is in storage. Pay special attention to the door gaskets. Clean any mildew and make sure the gaskets are in one piece and not separated from the door.



(11) Leaving the inside of the refrigerator clean and free of crumbs and spilled food is an essential part of maintenance and helps keep pests away when the RV is in storage. **(12)** To prevent mildew growth and odor buildup, every RV refrigerator has a method of keeping the doors open during storage, such as this small latch on Norcold models. **(13)** Some Dometic refrigerators come with a blue plastic Airing Position Card that inserts between the lock and the detent on the door to keep it open during storage. **(14)** Accessible through an exterior panel, the back of the refrigerator should be inspected and cleaned periodically. In most refrigerators, the burner assembly (lower right) is covered by a shroud that is removed before servicing.

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Condensation will form inside the refrigerator when it warms after use, and any remaining moisture can encourage mildew growth and unpleasant odors. Refrigerator and freezer doors should be propped open during storage to allow ventilation and keep mold from growing.

For more information on RV refrigerator maintenance, see "Fridge Fix" in the March 2017 issue.

➤ **MAINTENANCE TIP:** All RV refrigerators have some type of latch or spacer card that holds the doors open while in storage to prevent mildew and odors. Aftermarket door holders are also available, and towels or crumpled newsprint can be used as an inexpensive alternative.

RESOURCES

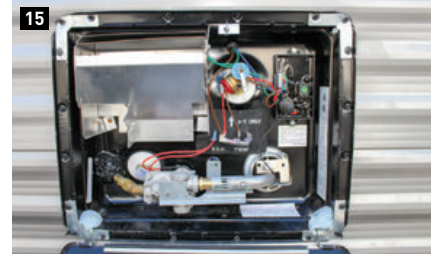
Atwood Mobile Products (Helium) www.atwoodmobile.com
 Dometic (Americana, Classic, Elite, NewGen), www.dometic.com
 Thetford (Norcold), www.thetford.com

Water Heating

RV water heaters range from pilot-ignition propane models to on-demand appliances. Also known as instant or tankless water heaters, on-demand units have specific maintenance requirements for each brand that are not covered here, and owners should follow the directions for their particular model.

Standard water heaters require maintenance that starts with keeping the tank as clean as possible. Hard-water deposits are common, so flushing the tank is recommended. Camco makes a water-heater tank rinser that works well, using a fine tip that inserts through the drain opening to help flush out deposits and debris.

Stagnant water in the tank can lead to microbiological growth, evident by the smell of rotten eggs. The best way to prevent this is to sanitize the water system with a chlorine solution or premixed water-system freshener at the beginning of each season and use an inline filter when filling the tank or



(15) The exterior compartment for this standard Atwood water heater provides access to the pressure-relief valve in the upper middle, the circuit board on the upper right, and the gas valve and burn tube across the bottom in front of the tank drain.

hooking up to a water source.

The water heater's burn tube and chamber are exposed and easy to maintain. Disassembling the burn tube will frequently reveal fine, silklike webs built by spiders attracted to the smell of propane. A flue brush can be used to clean the tube. Cleaning the thermocouple on pilot-light water heaters or the ignitor on electric-ignition versions by lightly sanding with emery paper will keep them in good condition.

The water heater's pressure-relief valve is a safety device to prevent rupture of the tank in the event of overheating. Exercising this valve on occasion by lifting the small tab will help keep it operational and prevent scale buildup. Do this only after the tank has cooled.

➤ **MAINTENANCE TIP:** If the pressure-relief valve weeps a lot, turning off the water supply and opening the valve until it stops releasing water and sucking in air should restore the air pocket. Another method is to empty the tank by using the water-heater drain, then refill it by running the pump or using hookup-water flow and opening the faucet farthest from the water tank. If neither fix works, the valve may need to be replaced.

RESOURCES

Airxcel (Suburban) www.airxcel.com/suburban
 Atwood Mobile Products www.atwoodmobile.com
 Camco, www.camco.net
 Girard Products, www.greenrvproducts.com
 Truma (AquaGo) www.truma.com/us/en/home

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GOING UNDERGROUND IN MONTANA

KNOWN FOR ITS BIG, BLUE SKIES, THE TREASURE STATE ALSO OFFERS THRILLS BENEATH THE SURFACE, FROM CAVERNS AND A SILVER MINE TO A SUBTERRANEAN CITY

Montana is often called Big Sky Country. The sky does indeed feel more expansive and somehow bluer in the Treasure State. There's much to experience under those enormous azure heavens, but recently I discovered several subterranean surprises — Lewis and Clark Caverns in Whitehall, the World Museum of Mining in Butte and an entire underground town below Havre. Each one is unique with a huge wow factor, but they also impart interesting historical perspectives, not only on the state of Montana but also the West in general.

LEWIS AND CLARK CAVERNS

My husband, Jack, is a native Montanan. He grew up near Lewis and Clark Caverns, where he once spent a summer giving tours of this limestone cave system, one of the largest in the northwestern United States. He wanted to show it to me, so we stopped by the caverns while camping and fly-fishing near Three Forks.

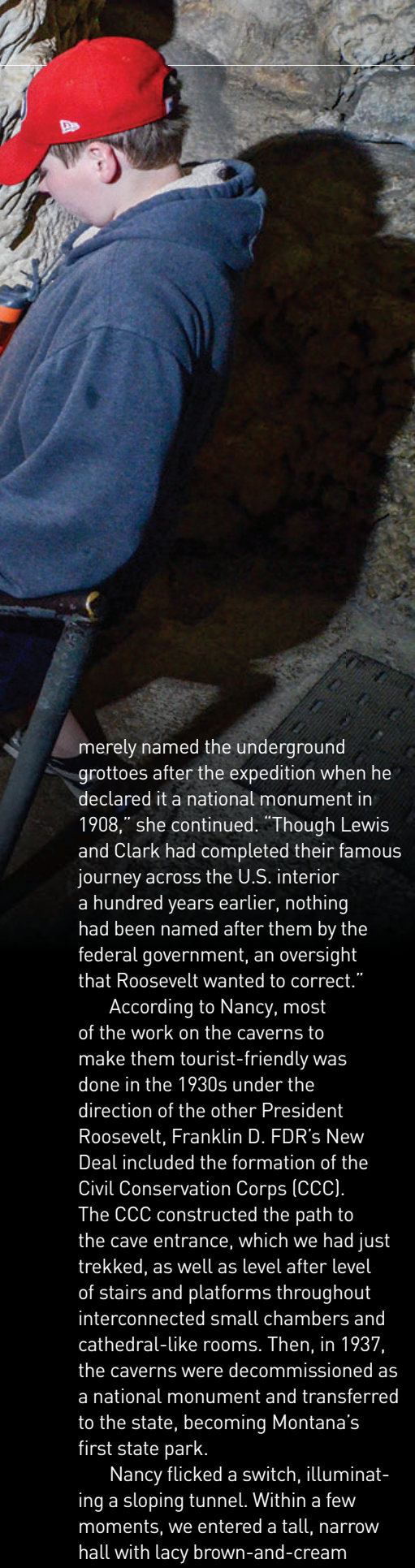
It was a 90-degree summer day when we pulled into the parking lot, which felt even hotter on the short hike up a gently graded, paved path to the entrance of the caverns. Jack distracted me from the heat by pointing to a number of small boulders alongside the trail. Embedded in the boulders were 350-million-year-old fossils from an era when the region was under an ancient

sea. (Today, the entrance to the caverns is at an elevation of 5,300 feet.) I had never seen such detailed fossils in the open where visitors could touch them.

The entrance to the caverns was about 20 feet tall, carved into the hillside we had just climbed. Jack and I joined a dozen other people and our guide, Nancy, who had worked at the caverns for more than a decade.

"The Lewis and Clark expedition never knew the caves were there, though they camped along Antelope Creek within sight of its entrance," Nancy explained, as we dug jackets from our backpacks. Cold air wafted up from the black hole beyond where we stood.

"President Theodore Roosevelt



merely named the underground grottoes after the expedition when he declared it a national monument in 1908," she continued. "Though Lewis and Clark had completed their famous journey across the U.S. interior a hundred years earlier, nothing had been named after them by the federal government, an oversight that Roosevelt wanted to correct."

According to Nancy, most of the work on the caverns to make them tourist-friendly was done in the 1930s under the direction of the other President Roosevelt, Franklin D. FDR's New Deal included the formation of the Civil Conservation Corps (CCC). The CCC constructed the path to the cave entrance, which we had just trekked, as well as level after level of stairs and platforms throughout interconnected small chambers and cathedral-like rooms. Then, in 1937, the caverns were decommissioned as a national monument and transferred to the state, becoming Montana's first state park.

Nancy flicked a switch, illuminating a sloping tunnel. Within a few moments, we entered a tall, narrow hall with lacy brown-and-cream

stalagmites spiraling upward toward a rough, angled ceiling.

"You can always tell a stalactite from a stalagmite," she explained, "Stalactites have to hold on *tight* to stay connected to the top of the cave, whereas stalagmites *might* grow tall enough one day."

We descended metal and rock stairs, marveling at the intricate designs in the limestone columns, all formed naturally by acidic groundwater. In one of the towering halls, the stalactites hung like row after uneven row of Goliath toothpicks. Another hall seemed wallpapered with a mosaic of colorful stripes, called "cave bacon."

In some of the larger rooms, purple, red and green lights added to the dramatic effect. In others, it seemed a troll king might emerge from the vast layers of regal rock formations and spectacular natural carvings. One room, bathed in white light, looked like a partially melted amalgam of bridal paraphernalia with a massive wedding cake in one corner and an enormous lacy veil draped haphazardly in another — all rock, of course.

After 2 miles of mesmerizing formations, we emerged from the caverns into the bright midday sun. "Wow!" I exclaimed, blinking in the brightness, "That was an incredible natural wonder!" And it was just my first underground adventure in Montana.



(Left) Visitors to Lewis and Clark Caverns in Whitehall descend past limestone formations. **(Above)** Relaxing at the state park campground near the caverns.

HAVRE BENEATH THE STREETS

Upon mentioning how much I enjoyed our visit to Lewis and Clark Caverns to a friend, also from Montana, he replied, "If you like underground labyrinths, you should check out Havre Beneath the Streets."

Intrigued, Jack and I decided to visit Havre, a prairie town located on the Hi-Line, the nickname for the Great Northern Railroad across northern Montana.

Tours of Havre Beneath the Streets meet at the Frank DeRosa Railroad Museum in downtown Havre. Our guide, Mary, a resident of Havre for more than 40 years, started our tour just outside the railroad museum.

"Notice anything special about these sidewalks?" she began.

We hadn't, but now that she pointed them out, the sidewalks did seem



Hell Roarin' Gulch, a re-created 1890s town at the World Museum of Mining.



- The largest town in north-central Montana’s Hill County, **Havre** is on U.S. Route 2 at the north end of U.S. Route 87.
- **Butte** is at the junction of interstates 15 and 90, about 270 miles southwest of Havre.
- Lewis and Clark Caverns State Park is in **Whitehall**, about 42 miles east of Butte and 19 miles west of Three Forks.

exceptionally wide.

“The sidewalks are hollow underneath,” continued Mary, leading us into an alley next to the museum. “In 1904, a couple of drunks got angry with a saloon owner. They set fire to the saloon, but it was windy. Sixty buildings burned! After the fire, the entire business district moved underground.”

We followed her down a stairwell, as if heading into the basement of

a building, and stepped through a time warp. Instead of a dank cellar, we found ourselves inside a perfectly preserved general store. Cans of vegetables, a vintage wood-framed radio and a feather duster were poised for purchase.

Mary led us through the mercantile into a passageway. Moments later, we emerged in the Sporting Eagle Saloon. The bar was little more than a thick

board lying across two large barrels. Playing cards and unbranded liquor bottles were scattered around the half-dozen tables.

“Do you know what the word ‘sporting’ in a saloon’s name means?” Mary quizzed. “It’s a place where men can find ‘sporting’ women. Prostitutes. At the time of the fire, Havre was almost entirely male. Women didn’t want to live on the prairie back then.”

We moved on, down another short tunnel into an oversize room filled with steel-framed beds, a bordello.



(Far left) Two tractors from the mines outside a former sauerkraut factory sit at the World Museum of Mining in Butte. (Left) Visitors check out the museum’s ore cars on the underground tour.

MONTANA DOWN UNDER

LEWIS AND CLARK CAVERNS STATE PARK, WHITEHALL

www.stateparks.mt.gov/lewis-and-clark-caverns

- The 3,015-acre state park is open year-round. The cave is open from May 1 to September 30 and for candlelight holiday tours in December.
- Access to the cave is by guided tour only.
- The cave tour takes two hours, and first-come, first-served tickets may be purchased at the park.
- The tour requires the ability to walk 2 miles and go up and down steep stairs.
- Wear layers, including a light rain jacket and sturdy footwear. The cave is chilly and damp.
- From June to August, the park also offers Wild Cave Tours, evening tours by headlamp for ages 12-plus. Reservations are required.
- If you have been to a cave or mine within the past two years, do not wear the same clothing or footwear to prevent the spread of white-nose syndrome, a fungal disease lethal to bats.
- The state park has hiking and biking trails, a visitor center, interpretive displays, a coffee shop and an amphitheater.
- Camping options in the park include 40 campsites, a tepee [855-922-6768, www.montanastateparks.reserveamerica.com] and a group-camping area (contact the park to reserve).

HAVRE BENEATH THE STREETS, HAVRE

www.havrechamber.com

- Access to Havre Beneath the Streets is by guided tour only.
- Havre Beneath the Streets is a separate museum but affiliated

with the Frank DeRosa Railroad Museum. Tour tickets may be purchased in the railroad museum, and tour groups meet there.

- Be sure to check out the railroad museum after the underground tour, including the impressive model trains on the lower level (open to the public on certain evenings and by special request).
- The tour requires the ability to go up and down stairs to get into and out of the underground museum.
- Camping options in Havre include Beaver Creek Park (406-395-4565, www.bcpark.org), 📍 Havre RV Park (800-278-8861, www.havremt.com/duckinn/emporium.htm) and 📍 Evergreen Campground (800-527-5348, www.centralmontana.com/listings/2775.htm).

WORLD MUSEUM OF MINING, BUTTE

406-723-7211, www.miningmuseum.org

- Tour reservations should be made in advance.
- A guide takes visitors through the Orphan Girl Mine but is not required to view the rest of the museum’s exhibits.
- Wear sturdy walking shoes and a light jacket. The mine shaft is damp and chilly.
- The mine tour is not ADA-compliant, but visitors with disabilities can take most of the tour and turn around at any time.
- Camping options include Butte KOA in Butte (406-782-8080, www.koa.com/campgrounds/butte), and 📍 Fairmont RV Park and Campground in Anaconda, about 24 miles northwest of Butte (866-797-3505, www.fairmontvresort.com).



(Above, from left) At Havre Beneath the Streets, the mercantile displays vintage goods, and a mannequin of bootlegger "Shorty" Young, owner of the Sporting Eagle bordello, sits in his former office. The view of Havre from a hillside above the community reveals no hint of an underground town.

Numbers were painted on the walls around the room. I stopped by bed number 18. A woman's brush lay on a nearby bureau, as if its owner would use it later that evening.

"Twenty-seven women lived and worked here," explained Mary. "The number on the wall indicated who lived where. The ladies moved around and didn't want the men to recognize them.... When a prostitute got too old or too full of venereal disease, she was told to go to the local opium den and ask for an overdose."

The opium den was later in the tour, part of the underground laundry, which was also a bathhouse, typical of the era. For the Chinese who ran the laundry and worked on the railroads, subterranean living helped keep them safer during an era of rampant prejudice against immigrant workers.

We continued through a tack room containing the saddle of "Long George" Francis, a horse thief known as much for his tall, skinny physique (6 feet 6 inches, 190 pounds) as his illegal practices. Then we moved on to a blacksmith forge and a meat market, and into the office of Christopher "Shorty" Young, the owner of the bordello and a notorious bootlegger. Young was the boss of Havre during its underground heyday, but a shotgun leaning against his sizable desk and a secret passage behind a movable wall hinted at the tenuous nature of his far-



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reaching business interests.

The tour also included a barbershop, a drug store, a mortuary and a lawyer's office, where the Corpus Juris books contain such titles as *Mayhem to Money Laundering* and *Libel and Slander*.

"Havre was born bad," Mary said, as we climbed another stairwell and emerged into the sunlight a half-block from the railroad museum. "It stayed that way until 1944 when Shorty

Young died."

"Wow!" I exclaimed for a second time, marveling at yet another underground wonder in Montana.

WORLD MINING MUSEUM

My third adventure in Montana below the earth's surface was directly related to the state's nickname, the Treasure State, a moniker based on its bounteous mineral reserves. Some of the earliest explorers came



A furnace used for processing ore stands on the grounds of the World Museum of Mining, one of only a few museums located on a mine yard.

to Montana hoping to strike it rich prospecting for gold, silver and other precious metals. As mining has long been a cornerstone of the state's economy, touring a mine seemed an obvious complement to natural caverns and a subterranean town. The World Museum of Mining in Butte is one of the only places where visitors can go down into a real mine shaft, so I headed to Butte.

The World Museum of Mining is perched atop a hill by Montana Tech of the University of Montana. The modest one-story building beside the parking lot belies its 22-acre campus, which includes a collection of rocks from around the world, an antique dollhouse exhibit, and Hell Roarin' Gulch, a reconstructed mining town with buildings dating back to the 1890s. Each of the 35 buildings contained relics related to that business or home. Numerous old mining wagons and tools lay scattered around the town.

After poking around the gulch, I joined a small group on a tour of the Orphan Girl Mine, a real silver, lead and zinc mine that no longer operates. The tour began at the far end of the campus near a memorial to more than 2,500 men who lost their lives in

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various mining-related accidents or to lung diseases caused by working in the mines around Butte. Dating back to 1865, the names were etched into one of the several slabs of black, polished granite. It was a stark reminder of the risks of working in the mines, where cave-ins, accidents caused by the use of explosives and general health risks were part of everyday life.

The tour continued to the Hoist House, where machinery lifted ore out of the earth. Then our guide, Jim, a Butte native who spent nine years as an electrician in the mines, outfitted us with headlamps. He led us to an enormous metal door, an entrance to the mine. We descended into a tunnel, following a set of railroad tracks on which several ore cars rested.

"The cars were pulled by mules," our guide explained. "The mules never left the tunnels. They spent their lives down here and were often treated better than the men."

We continued down and down, eventually coming to two side-by-side elevator shafts, 65 feet under the ground. Along the way, we passed equipment used to excavate ore and

Walking among the subterranean stalactite and stalagmite formations at the Lewis and Clark Caverns.



create tunnels that continued 2,700 feet into the earth. Today, the tunnels are filled with water starting at the 100-foot level.

"As the mine got deeper, they found what would become the largest copper deposit in the world," Jim explained. "It was good timing with the invention of the electric light. That's why Butte is called the Richest Hill on Earth. The first electricity in Montana was in the mines, not the town."

I was grateful for my headlamp, as we gathered by the elevators. One at a time, we each stepped into the tiny elevator car and peered up the straight, narrow shaft.

"Wow!" I exclaimed, trying to imagine life as a miner.

When we reemerged from the tunnel, I was glad to see Montana's big blue sky again, yet our underground explorations had enlightened me in many memorable ways. 🚚

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CHARGED UP

Keep the good times rolling by understanding and maintaining your RV's batteries

RV batteries were once considered an option primarily for off-grid camping. With the increasing complexity of RV electrical systems, batteries have become a necessity. Understanding how batteries work and are charged, maintained and stored will ensure that they achieve their maximum longevity.

BATTERY TYPES

Lead-acid batteries are available in three types: flooded wet cell, absorbed gas mat (AGM) and gel cell. Lithium-ion (Li-ion) batteries are making their way into RVs, but mostly as expensive aftermarket upgrades. Li-ion batteries require a more precise charging regimen than lead-acid batteries, which requires replacing the original-equipment charger with one that can handle this requirement plus adding the voltage-regulation and temperature-monitoring hardware needed for Li-ion batteries. Although Li-ion technology offers many advantages over lead-acid batteries, its high cost makes lead-acid batteries a more viable choice for most trailer owners.

Lead-acid batteries comprise individual cells connected internally in series. Each cell contains lead plates

with a separator between them and is filled with an electrolyte made of sulfuric acid and water. Positive plates are made of lead dioxide, and negative plates are pure lead. A chemical reaction between the lead plates and the sulfuric acid causes the plates to become positively and negatively charged. When an electrical circuit is closed, such as turning on a light switch, electrons flow from the negative plate to the positive plate, powering the circuit.

When lead-acid batteries begin to discharge, the lead plates become coated in lead sulfate, and the electrolyte solution begins to dissolve, increasing its water content. When fully discharged, the electrolyte consists primarily of water. The increased water content makes a discharged battery more susceptible to freezing. A fully charged lead-acid battery freezes at

minus-92 degrees Fahrenheit, while a battery that is 80 percent discharged will freeze at 19 degrees Fahrenheit.

All batteries are storage mediums, because they do not create electricity; they store it. Once a lead-acid battery is discharged, it requires an electrical current to reverse the chemical process. During charging, the lead sulfate and water are converted back to lead, lead dioxide and sulfuric acid. An analogy would be to think of your RV's water tank. Like a discharged battery, when the tank is empty, it can't give you any water. But refill it, and it will provide water for your use. It's the same with batteries. When charged, they will provide power to your RV's appliances and accessories.

The most common type of battery used in trailers is the flooded lead-acid (FLA) wet-cell battery. Flooded batteries were invented more than 150 years ago, and they remain the battery of choice for most RVers, primarily because of their relatively low cost. Available in 6- or 12-volt configurations, flooded batteries vent small amounts of oxygen and hydrogen gas while charging; an explosion can occur if this gas is exposed to a spark or flame.

Wet-cell batteries must be stored either in a well-ventilated compartment or a sealed battery box with an external vent. The amount of gas generation increases when a flooded battery is overcharged. These gases are produced from the electrolysis of water from the electrolyte. Because water is lost during this process, flooded batteries require distilled water to be added periodically.

A variation of lead-acid battery technology is the AGM battery. AGM batteries have an ultrafine fiberglass mat embedded between the lead plates that absorbs the electrolyte. AGM batteries have several advantages over flooded batteries including a spill-proof design, lower internal resistance, faster charging times and a longer life cycle. They are less likely to self-discharge, are less prone to sulfation and can be mounted in any position. On the negative side, AGM batteries are more expensive and require an AGM-compatible battery charger.

Gel-cell batteries offer similar





advantages over flooded batteries. Gel cells contain no liquid. The sulfuric acid is mixed with a thickening agent to form a gel-like substance. Gel-cell batteries are expensive and require a charger that is designed for their charging profile. They offer a slight performance advantage over AGM batteries at high ambient temperatures and under slow-discharge conditions, but their higher price makes AGM batteries the more popular choice.

AGM and gel-cell batteries are valve-regulated lead-acid (VRLA) batteries. VRLA batteries do not vent hydrogen under normal conditions. Hydrogen and oxygen are recombined inside the battery to prevent outgassing and loss of water. However, if a VRLA battery is overcharged or overheated, a safety valve will open, allowing gases to be vented. For this reason, proper ventilation is still required. VRLA batteries are considered sealed, maintenance-free batteries that require no periodic adding of water.

Each cell in a lead-acid battery is capable of storing 2.1 volts. A 12-volt battery has six cells, while a 6-volt battery has three. The terminology is confusing because a fully charged 12-volt battery produces 12.6 volts and is more than 50 percent discharged at 12 volts.

There are two kinds of lead-acid batteries: starting and deep-cycle. Starting batteries have several thin lead plates designed to produce a short high-current burst of electricity, making them well-suited for starting engines. Their capacity is measured in cold cranking amps (CCA). CCA is the amount of current, measured in amperes, that a fully charged battery can deliver for 30 seconds while still maintaining 1.2 volts per cell. The higher the CCA rating, the more capable the battery for starting an engine.

Starting batteries are designed to be slightly discharged, usually by less than 5

Flooded lead-acid batteries (clockwise from rear): 6-volt, 12-volt group 27 and 12-volt group 24.

percent of their capacity, and immediately recharged. Repeatedly discharging a starting battery by more than 20 percent of its capacity will damage the lead plates and cause premature failure. Deep-cycle batteries are designed with thick plates and should not be discharged below 50 percent of their capacity per cycle for maximum longevity.

A cycle occurs when a battery is discharged then recharged. Depth of discharge is how low the battery was discharged. The less depth of discharge a deep-cycle battery is routinely subjected to, the longer that battery will last.

CAPACITY AND SIZE

The capacity of a deep-cycle battery is measured by its reserve capacity and ampere-hour capacity. Reserve capacity is the time, in minutes, a fully charged battery can deliver 25 amps of current before the battery is discharged to 10.5 volts at 80 degrees Fahrenheit. Although reserve capacity may not provide practical information, it is useful in comparing the capacity of different sizes and brands of batteries.

An ampere-hour (amp-hour or Ah) is the amount of energy charge in a battery that will allow one ampere of current to flow for one hour. To get an amp-hour rating, a battery must be fully discharged over a specific time. The standard time used for deep-cycle batteries is 20 hours, but manufacturers often list other time ratings. If a battery has an 80 amp-hour rating at 20 hours, the battery provides 4 amps for 20 hours. The higher the amp-hour rating, the greater the battery's storage capacity.

Lead-acid batteries come in standard physical sizes determined by the Battery Council International, a trade association of automotive-battery manufacturers. The most common size for trailers is group 24. Group 27 batteries are a popular upgrade. Although group 24 and 27 batteries are the same height and width, group 27 batteries are 1.8 inches longer and

BATTERY TESTING

At increased states of charge, the electrolyte in a battery becomes increasingly dense with higher concentrations of sulfuric acid. A voltmeter or multimeter can be used to test state of charge. On wet-cell batteries, exact state of charge can be determined by using a hydrometer to measure the specific gravity of each battery cell.

A standard hydrometer looks like a turkey baster or an oversize eyedropper and contains a glass tube partially filled with weights. Dial-type hydrometers are also available. When the hydrometer is dipped into a battery cell and electrolyte is drawn into it by squeezing the top, the indicator inside the hydrometer floats or sinks, according to the specific gravity of the electrolyte, indicated by hash marks.

In a fully charged battery, each cell has a specific gravity around 1.277 at 80 degrees Fahrenheit. High-end hydrometers may have a thermometer and conversion chart built in to read the temperature of the electrolyte and will adjust the reading based on the temperature.

Do not test a battery that is connected to any source. The battery should be at rest, or open circuit, for at least one hour prior to testing because of surface charge, according to Trojan Battery. After filling the battery with water, it must have a discharge/charge cycle before testing to ensure the electrolyte has properly mixed.

Battery cells should read equally. If the difference is greater than .15 volts for a 6-volt battery and .22 volts for a 12-volt battery, the battery is damaged and should be replaced.

Electrolyte is drawn out of the cell of a wet-cell battery and into a hydrometer so the specific gravity and cell voltage can be measured. This battery is in the red zone, indicating that it needs to be charged.



offer more storage capacity than similar group 24 batteries.

Physical size is not the only factor in determining a battery's storage capacity. Different models and brands within the same group can have different capacities that are determined by the construction and internal design of the battery. When comparing lead-acid batteries, the battery's capacity ratings should be considered to determine its performance level.

LONGEVITY, CARE AND MAINTENANCE

Temperature affects battery performance and life span. Higher temperatures increase a battery's storage capacity but decrease longevity. Lower temperatures prolong the battery's life but decrease its performance. A battery that delivers 100 percent capacity at 80 degrees Fahrenheit will provide only 60 percent capacity at 0 degrees Fahrenheit,

(Right) Gases released during wet-cell battery charging can corrode battery connectors and wiring. **(Far right)** A regular part of wet-cell battery maintenance is cleaning away the corrosion with a solution made from one cup of baking soda per gallon of water. To clean the battery terminals, use a discarded toothbrush or wire-bristle brush with the baking-soda solution, then rinse well. A terminal-cleaning tool can also be used.



PHOTOS BY EMILY FAGAN

and voltage will drop to 12.2 volts, reducing the battery's performance.

The most common cause of lead-acid battery failure is sulfation. Sulfation is the formation of sulfate crystals on a battery's lead plate that occurs slowly over time as the battery undergoes numerous charge and discharge cycles. The rate of sulfation greatly increases if a battery is overcharged, undercharged, stored in a discharged state, or the electrolyte level drops below the top of the lead plate, exposing the plates to air. Proper con-

ditioning of a battery immediately after discharge will help minimize sulfation.

The electrolyte level in a flooded battery should be maintained to prevent sulfation. How quickly a battery loses water depends on how many charge and discharge cycles it undergoes, charge rate and how deep the state of discharge. Generally, battery electrolyte levels should be checked once a month. Batteries should be completely charged before maintenance begins because the electrolyte level changes depending on the level of charge.

BATTERY CONNECTIONS

RVs are often equipped with one battery, but sometimes a second battery is added to increase capacity. Wiring a single battery is simply a matter of connecting the positive lead to the positive terminal and the negative lead to the negative terminal. Connecting two or more batteries is somewhat more complicated.

Multiple batteries can be connected three ways:

1. Wiring batteries in parallel does not increase the voltage of the battery bank, but it does increase the amperage. For instance, two 80-amp-hour 12-volt batteries wired in parallel will produce 12 volts with a 160-amp-hour capacity. The batteries are connected with the positive terminal of one battery wired to the positive terminal of the other, while the two negative terminals are also wired together.

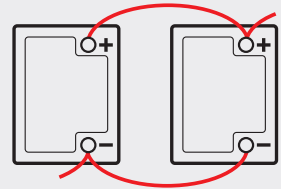
2. When batteries are wired in series, the voltage of the battery bank increases, but the amperage remains the same. Two 6-volt batteries with a rating of 200 amp-hours that are wired in series will result in a 12-volt battery bank with a 200-amp-hour capacity. Connecting two batteries in series requires wiring the positive terminal of one battery to the negative terminal of the other battery.

3. Wiring in series/parallel is for RVs that require a high reserve capacity and must have more than two batteries. Batteries wired in this way will increase their voltage and amperage. Connecting in series/parallel requires wiring two batteries in series and wiring each pair of batteries in parallel. If four 6-volt batteries, each with a capacity of 200 amp-hours, are wired in series/parallel, the result is a 12-volt battery bank with a capacity of 400 amp-hours.

PARALLEL

To increase capacity but not voltage, connect the **positive** terminal from one battery to the **positive** terminal of another battery, and the **negative** terminal to the **negative** terminal.

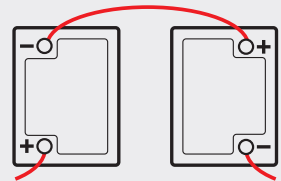
Batteries..... Two 12-volt/80 amp-hours
Total Voltage..... 12 volts
Total Capacity..... 160 amp-hours



SERIES

To increase voltage but not capacity, connect the **positive** terminal from one battery to the **negative** terminal of another battery.

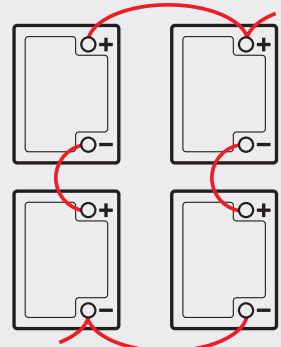
Batteries..... Two 6-volt/200 amp-hours
Total Voltage..... 12 volts
Total Capacity..... 200 amp-hours



SERIES/PARALLEL

To increase voltage and capacity, connect two batteries in series and two (or more) batteries in parallel.

Batteries..... Four 6-volt/200 amp-hours
Total Voltage..... 12 volts
Total Capacity..... 400 amp-hours



Remember This

Parallel combines amps, not voltage.
Series combines voltage, not amps.
Series/parallel combines voltage and amps.



Maintenance chargers keep stored batteries charged automatically. Deltran's high-efficiency Battery Tender Power Tender products are among those approved for use in states such as California and Oregon where battery chargers are required to be energy-efficient.

How a battery is charged plays a key role in maximizing its life. Trailer batteries are charged by the trailer's electrical converter/charger applying DC current. Some converter/chargers use single-stage charging, which provides a single constant voltage to the battery.

Single-stage charging is slow and may cause overcharging or undercharging, decreasing a battery's life. Multistage chargers, sometimes called smart chargers, use three or four stages with varying voltages or amperages to charge and maintain batteries. Multistage charging is faster than single-stage and is capable of charging batteries to their maximum capacity without overcharging.

Once batteries are charged, a maintenance charge keeps them topped off. Some multistage chargers have an equalizing cycle that applies high voltage at a low amperage to help remove sulfation from the battery plates and make sure all the batteries' cells are equally charged.

When performing wet-cell battery maintenance, make sure the area is well ventilated, and wear rubber gloves and goggles. Begin by removing the battery's vent caps. Each battery cell should be filled to $\frac{1}{8}$ inch below the plastic vent tubes. Avoid overfilling the batteries, which might cause the electrolyte to overflow. Only distilled water should be used. Tap water contains dissolved minerals and impurities that can coat the plates and inhibit the chemical reaction that normally occurs in a battery, resulting in decreased per-

formance and a shortened battery life.

Battery terminals should be cleaned to remove corrosion. Start by removing the negative cable, followed by the positive cable. A mixture of one cup of baking soda and one gallon of water or a commercial spray-on terminal cleaner can be used. An old toothbrush or a small, stiff wire brush is useful for scrubbing. If a spray cleaner is used, follow the instructions on the can. After cleaning, rinse the terminals with water and reconnect the positive terminal, followed by the negative terminal. Then seal with a battery-terminal sealant spray, available at auto-parts stores, to deter future corrosion.

As an alternative to manually removing vent caps and filling each cell, watering systems are available from companies such as Trojan and Flow-Rite. These systems allow remote filling of all batteries from a single hose without overfilling. This can be a real time-saver, especially if reaching the battery caps is difficult.

Trailer owners often overlook proper off-season storage of batteries. If the trailer's shorepower cord is plugged into an electrical outlet and is equipped with a multistage charger, the batteries will be kept properly charged and require only periodic fluid-level checks. Most OEM converter-chargers will provide only a float charge, which will not condition batteries properly. If it is not possible to keep the trailer plugged in, the batteries should be kept fully charged, removed from the trailer and stored in a cool, dry place. This is particularly important in cold climates where a discharged battery is likely to freeze.

Batteries in storage must still be

maintained. Lead-acid batteries will discharge over time, even if they are not being used. The rate of self-discharge depends on the batteries' design and the temperature. Flooded batteries have higher self-discharge rates than VRLA batteries. Higher temperatures increase self-discharge, which is why batteries should be stored in a cool place.

The Battery Council International recommends that batteries in storage be given a freshening charge if voltage drops below 12.4 volts for a 12-volt battery or 6.2 volts for a 6-volt battery. Battery voltage can be checked with a multimeter set to DC volts or with a hydrometer (see "Battery Testing" on page 39). Batteries should be given a full charge immediately after they are reinstalled on a trailer.

Maintenance chargers keep batteries charged while in storage and are simple to use. Just plug the charger into a household outlet and connect the charge cables to the battery terminals. Like the charger in your RV, maintenance chargers are available as either a constant-voltage charger or a multistage charger. Multistage charging ensures that batteries are fully charged without overcharging.

Lead-acid batteries are the heart of an RV's 12-volt DC electrical system, and with proper care and maintenance should provide years of service. 🚗

RESOURCES

East Penn Manufacturing

www.eastpennmanufacturing.com

Exide Technologies

www.exide.com

Fullriver Battery

www.fullriverbattery.com

Interstate Batteries

www.interstatebatteries.com

Lifeline Batteries

www.lifelinebatteries.com

Odyssey Battery

www.odysseybattery.com

Optima Batteries

www.optimabatteries.com

Trojan Battery Company

www.trojanbattery.com

Battery state-of-charge charts for voltage and specific gravity can be found online by doing a key-word search in the web browser.

Single-point watering systems such as Trojan's HydroLink (left) and Flow-Rite's On-Board RV Edition and Qwik-Fill simplify the maintenance task of keeping proper levels of water in multiple battery cells.



CANADA'S LONG AN

WHAT BETTER WAY TO CELEBRATE THE 150TH ANNIVERSARY OF AMERICA'S NEIGHBOR TO

Paul McCartney sang about “the long and winding road,” but I’m here to tell you, he didn’t know the half of it. I’ve just returned from a coast-to-coast trip on the Trans-Canada Highway, the longest uninterrupted route in North America. While I’ll get into specifics in a moment, for now let’s just say our trip from Vancouver, British Columbia, to Halifax, Nova Scotia, was an RV adventure of epic proportions. Whether you choose to hitch up your trailer and drive the highway from coast to coast, as my friend Mike and I did, or just follow along a short segment, one thing is for certain. The trip will leave you with lifelong memories and a new appreciation for America’s neighbor to the north.

THE ROAD AHEAD

Every road trip needs a road, and at nearly 5,000 miles, the Trans-Canada Highway is a great road indeed. Its sections of modern divided highway are broken up by many segments of two-lane blacktop that seem to have changed little since the transcontinental route officially opened in 1962. For two guys looking for an out-of-the-ordinary RV journey, the Trans-Canada Highway proved to be ideal, with every passing mile creating lasting memories in terms of both stunning scenery and remarkably friendly locals — not to mention the camaraderie that can only come from good friends embarking on a grand adventure together.

As much as I love everything about being on the road, Mike and I fully expected that there would be problems. What neither of us imagined, however, was that the challenges would start so soon. Just trying to get across the Canadian border north of Seattle turned out to be problematic when an overzealous border guard grilled us relentlessly.

We were eventually ordered to pull over and report to the counter inside where they deal with such scofflaws. When we finally reached the head of the line, we had what turned out to be a very pleasant chat with the officer’s supervisor, who admitted he was envious of our trip. He soon cut us loose, and Mike and I set off in high spirits.

HIGHWAY TO HELLS GATE

From a navigational standpoint, the part of the trip through British Columbia was the easiest. We found the Trans-Canada Highway — Highway 1 in these parts — thanks to its distinctive green route signs emblazoned with a white maple leaf. From there, it was simply a matter of pointing our rig east.

This section of the highway is also hands-down one of the most scenic. From the outskirts of Vancouver, the road

winds through the farm belt around Chilliwack (an odd name for one of Canada’s warmest cities) before heading up into the densely forested mountains east of Hope.

Putting in regular appearances throughout this stretch was the Fraser River. As we drove upstream and entered the depths of Fraser Canyon, we encountered the rapids flowing through the 110-foot-wide rocky gap known as Hells Gate, an obstacle that proved to be the vexation of thousands of prospectors during the area’s 1857 gold rush. For a closer look at this tumultuous stretch of river, we recommend taking a trip in the enclosed gondolas of the Swiss-built aerial tramway.

A MUST-DO DETOUR

Our next destination required a detour off the Trans-Canada Highway. Having long heard about how spectacular Banff and Jasper national parks are, we couldn’t come this close without seeing for ourselves. Unfortunately, you couldn’t prove how utterly breathtaking the Canadian Rockies are by our experience. Although we stayed in the area for several days, low clouds obscured our views of the dramatic peaks the whole time.

Not that this side trip was a complete washout, however. We drove the 144-mile Icefields Parkway several times, stopping to ogle landmarks like the 80-foot drop of Athabasca Falls, where the water’s pale blue hue created a scene not unlike a watercolor painting.

To get a look at the glaciers that give the Icefields Parkway its name, we also stopped at the Columbia Icefield Discovery Centre. From the deck we had sweeping views of the massive icefield, the largest of its kind south of Alaska. To get a closer look, sign up for one of the sightseeing tours aboard the humongous Ice Explorer buses that trek onto the surface of the glacier itself.

PRAIRIES AND PRONGHORN

The sun that had eluded us in the national parks returned as we passed through the outskirts of Edmonton and Calgary on our way to rejoin the Trans-Canada Highway, where we once again turned east toward the Great Plains.

This was farm and ranch country, with fields full of corn and cattle ambling over gently rolling hills. A Canadian marketing pamphlet, hoping to lure European settlers in the early 1900s, called this “the last, best West.” One look at the pronghorn we saw bounding across this wide-open landscape was all it took to convince us that description still rings true.

ND WINDING ROAD

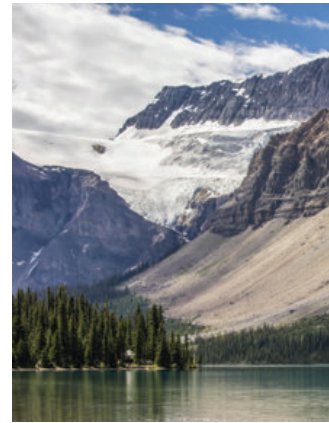
DO THE NORTH THAN A GRAND ADVENTURE ON THE CONTINENT'S LONGEST HIGHWAY?



Starting in British Columbia, the Trans-Canada Highway journeys east through the country's 10 provinces. The author and his travel companion made their way through seven of them.

PHOTO COURTESY OF MICHAEL BERNARD/CARIBBOO CHILCOTTIN COAST TOURISM

(Right to far right) Carved by the Red Deer River, Horse Thief Canyon is a dramatic example of the badlands that blanket south-eastern Alberta. On the province's western side, the Bow River flows into turquoise-blue Bow Lake, presenting stunning photo opportunities just off the Icefields Parkway. The parkway itself, Highway 93, cuts a 145-mile swath through the Rockies between the mountain towns of Lake Louise and Jasper.



To learn more about the lives of the native Canadians that have long called this prairie home, consider stopping off at Blackfoot Crossing Historical Park just south of the Trans-Canada Highway about 60 miles east of Calgary. Overlooking the Bow River, you'll find a modern architectural masterpiece of a building, filled with exhibits designed to introduce the history of the Blackfoot people.

GOOD TIMES IN THE BADLANDS

In the more distant past, this area was home to giant lizards, and paleontologists regularly find their bones protruding from eroded hillsides of the nearby Canadian Badlands.

To see some of their discoveries, take the detour north to the Royal Tyrell Museum of Paleontology, 4 miles outside the town of Drumheller. This is also a good place to stretch your legs on one of several nearby hiking trails through the badlands that border the Red Deer River valley.

If you'd like to get a hands-on

feel for the paleontologist's life, visit Dinosaur Provincial Park, just north of the highway at Brooks. Here you can participate in an actual dinosaur dig, helping to locate and recover buried fossils that haven't seen the light of day for 75 million years.

Mike and I continued toward the city of Medicine Hat, a great name for a town that refers to the majestic eagle-feather headdresses worn by Blackfoot medicine men. Because we'd made better time than expected, we abandoned our plan to stop here for the night and pushed on into the province of Saskatchewan.

MEANDERING TOWARD MOOSE JAW

Leaving the world's tallest tepee in our rearview mirror (at 214 feet, you can't miss it), we soon crossed the Alberta-Saskatchewan line. Since most of Sas-

katchewan doesn't observe Daylight Saving Time, we picked up an extra hour to see waving wheat and lots of it. As with America's farm country, many of the once-thriving communities here had been reduced to a mere cluster of dilapidated houses and shuttered storefronts.

The town of Swift Current, 135 miles east of Medicine Hat, was much more of a going concern. Along with the expected trappings of modern life, like a Tim Hortons (a coffee shop that's a Canadian institution), we saw a long line of dealerships with rows of shiny new tractors and combines for sale. As I said, this is farm country, but the extensive inventory these dealers had on hand made me wonder how many of these pricey machines they could possibly sell in any given year.

In another two hours, we were approaching the outskirts of Moose Jaw (another great name for a town), as the sun was sinking below the western horizon.

LIFE IN THE SLOW LANE

Mike and I were up early the next morning, eager to get to our next destination, Winnipeg, Manitoba. Like Texas, Saskatchewan seems to go on

PHOTO COURTESY OF NOEL HENDRICKSON/BANFF LAKE LOUISE TOURISM

IF YOU GO

The Trans-Canada Highway is North America's longest highway, and from British Columbia to Nova Scotia, we traveled most of it, with a detour in the Rockies. While there are stretches where campgrounds and gas stations are few and far between, driving the highway gives the feeling of being on a true middle-of-nowhere adventure without having to sacrifice comfort and amenities.

RV accommodations range from national and provincial campgrounds to privately owned parks. To find them, go to www.goodsamcamping.com and search by city and province.





forever, and we hit some traffic in the capital city of Regina. When Mike used his phone to Google "Regina," he discovered the outpost was once called Pile of Bones, a name we both agreed had a much more colorful ring to it.

We crossed the Saskatchewan-Manitoba line and pressed on past fields of sunflowers to Winnipeg, where we soon discovered the campground had lost our reservation. All that was quickly rectified, however, and we settled in to enjoy a day off the road.

The next morning we headed to the Royal Canadian Mint. All of the country's coinage is struck here, including unique versions of the loonie and toonie (one- and two-dollar coins, respectively) designed to celebrate Canada's sesquicentennial. The tour of the plant turned out to be fascinating and included the chance to heft an actual gold ingot under the watchful gaze of an exceptionally friendly but well-armed guard. My only complaint was that they didn't give out samples!

ELUSIVE ANTLERS

After an enjoyable day off, we were ready to hit the pavement bright and

early the next morning. Next stop: Thunder Bay, Ontario.

As we crossed the Manitoba-Ontario line, the Trans-Canada Highway's route number changed from 1 to 17. Here the road began to rise through increasingly rolling countryside and past the once-important gold-mining town of Kenora (originally named Rat Portage) on the northern shore of Lake of the Woods.

Speaking of bodies of water, the country we were traveling through was full of them, from small ponds to large lakes. This is where I began my borderline-obsessive search for the noble moose the yellow highway signs were warning us about mile after mile. Both Mike and I studied the shoreline of every waterhole. With nothing to show for our eagle-eyed efforts, we began to wonder if perhaps it was the local moose's day off.

We rolled into Thunder Bay late that afternoon, as bruise-colored clouds were building up over the shores of Lake Superior. Our three-day stay here just happened to coincide with the RV park's Canada Day celebration (think Fourth of July, and



Icons of the Canadian prairie, pronghorn can outrun any creature in North America.

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BEARS AND BARBECUE

With those festivities over, it was time to ease on down the road once again. Our route took us along the north shore of Lake Superior toward the border town of Sault Sainte Marie (say "soo-saint-marie").

We passed through the small town of White River where Royal Canadian Army Lieutenant Harry Colebourn, on his way to fight in World War I, purchased a black bear cub he named Winnie in honor of his Winnipeg home town. After the cub was smuggled across the Atlantic, Winnie became a mascot for the troops before Colebourn donated him to the London Zoo. It was there that this Canadian bear fueled the fertile imagination of author A.A. Milne, the man who created everybody's favorite bear cub, Winnie-the-Pooh.

We continued on to the town of Marathon and the turnoff for the 725-square-mile preserve known as Pukaskwa National Park. The park protects the longest stretch of undeveloped shoreline in the Great Lakes, and if you've a mind to see just how cold the waters of Lake Superior really are, the sandy beach here at Hattie Cove will give you your chance.

This part of the trip also offered a unique learning experience, when a young black bear (whom we naturally named Pooh) decided to saunter across the highway in front of us. It was a moment that taught me just how quickly I could bring 23,000 pounds of truck and trailer to a halt.

As we rolled into Sault Sainte Marie that afternoon, we were greeted by what

was perhaps the most idyllic weather of the whole trip. Having arrived too late to visit the Canadian Bushplane Heritage Centre, we had to make do with a couple of steaks on the built-in gas grill that came with our campsite. As we dined al fresco, Mike and I agreed that, yes, indeed, we were really roughing it.

WATER, WATER EVERYWHERE

We were up early again the next morning, as we continued east on the Trans-Canada Highway along the north shore of Lake Huron. Of all the Great Lakes, Huron is the second largest in terms of surface area, a fact that at first doesn't seem possible when you look across the narrow North Channel to Manitoulin Island, the world's largest island in a freshwater lake.

To make things just that much more interesting, Manitoulin Island is so big it has its own series of more than 100 lakes, many of which have their own islands, some of which have their own lakes. The thought of having a freshwater lake on an island in a freshwater lake was enough to make our heads spin.

Pondering such geographical oddities, we rolled through small towns like Blind River and past old farms now reverting to forests. We reentered civilization again at Sudbury, a former mining town built to take advantage of the area's large deposits of nickel ore, one of which was discovered by none other than Thomas Edison.

From there we ran along the Quebec border on our way to Renfrew, an hour west of Ottawa, Canada's capital city, where we stopped for the night.

PHOTOS COURTESY OF NOEL HENDRICKSON/BANIFF LAKE LOUISE TOURISM AND WALLY HAYES/NOVA SCOTIA TOURISM



(Left to right) Visitors come face to face with dinosaur skeletons at Drumheller, Alberta's Royal Tyrrell Museum, Canada's only museum dedicated exclusively to paleontology. Viewed from one of the three Vermilion Lakes, Mount Rundle is one of the most-photographed peaks in the Canadian Rockies. Across the continent in Nova Scotia, on the shores of the Bay of Fundy, low tide strands fishing vessels in the picturesque community of Hall's Harbour.

A FUNNY, SAINTLY TOWN

With fewer than 1,000 miles to go to our final destination of Halifax, Nova Scotia, we hit the road to Montreal. The Trans-Canada Highway — here known as Route 20 or the Route Transcanadienne — goes smack-dab through the heart of the city, and between the heavy traffic and difficult-to-decipher French road signs, my nerves were fraying. We somehow emerged on the other side of the city unscathed, thanks to Mike's cool head and crackerjack navigational skills.

We skirted downtown Quebec two hours later, and continued past peaceful farm fields and orchards along the southern shores of the wide St. Lawrence River. We made a sharp turn southeast at Rivière-du-Loup ("River of the Wolf") to follow the Trans-Canada, now known as Highway 2, past one small town after another, most of which seemed to have the word "Saint" in their names.

While we commented on this profusion of heavenly monikers, we didn't think too much about it until we came to the exit sign for the village of Saint-Louis-du-Ha!-Ha! (yes, the excla-

mation points are actually part of the name). If the town council's goal was to elicit outright laughter from passersby, I can tell you, they succeeded.

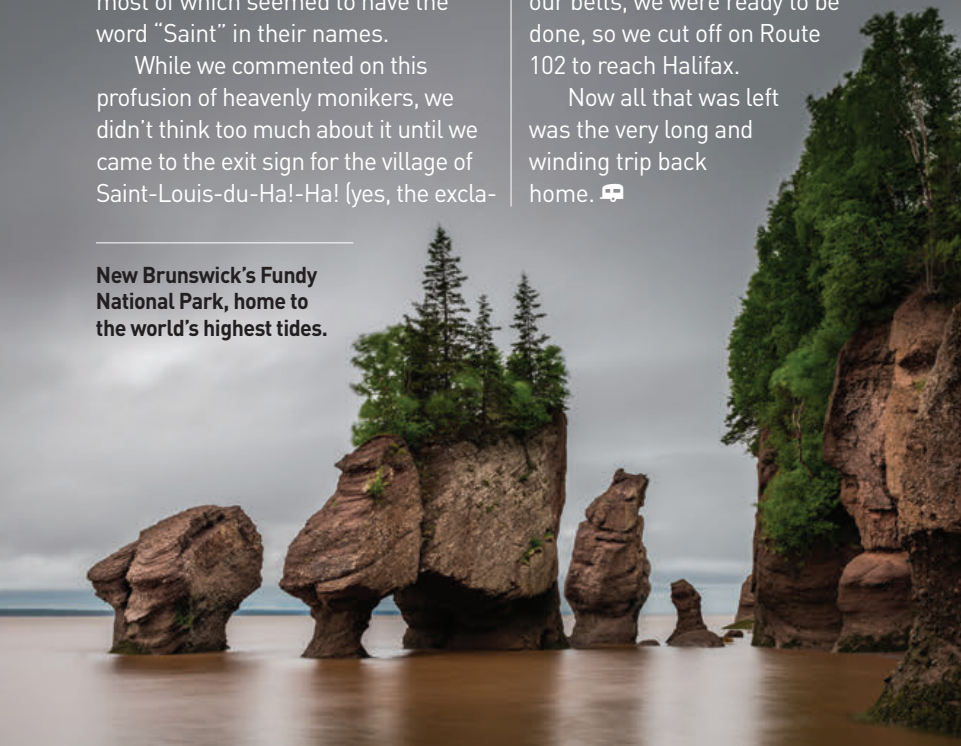
HALIFAX OR BUST

Crossing the border into New Brunswick, the gray, rainy skies returned. This part of the Trans-Canada Highway parallels the St. John River, brushing the northern tip of Maine near Caribou and Presque Isle in the process. It also comes close to Fundy National Park, named for the Bay of Fundy, a world-famous inlet known for its 50-foot tides. Getting to the park requires a 45-minute detour, but it's a must-see if you have the time.

Somewhere around Amherst, the Trans-Canada Highway takes on yet another new identity as Route 104. With more than 4,000 miles and seven of Canada's 10 provinces under our belts, we were ready to be done, so we cut off on Route 102 to reach Halifax.

Now all that was left was the very long and winding trip back home. 🚗

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SOMETHING NEW UNDER THE SUN

INSTALLING A PATIO AWNING ON AN OLDER TRAVEL TRAILER PROVIDES WELCOME SHADE, RAIN PROTECTION AND OUTDOOR LIVING SPACE

We bought a 1970s Fleetwood Terry travel trailer with the idea of upgrading it with some modern touches. One of the conveniences it lacked was an awning. Beyond offering protection from the sun and rain and keeping morning dew off the entry rugs and other items stored outside, a patio awning practically shouts, "This is our spot for the next few days," particularly when camp chairs and other homey touches are set up beneath it.

As with most renovation projects, design decisions are a big part of an awning install. Aside from personal preferences on size and mechanism types, practical considerations that involve the trailer come into play. When this Fleetwood was built, RV awnings were not standard equipment, so we had to figure out awning length and where the mounting points should go.

The entry door of the trailer was situated close to the back end. For the awning to function as a porch over the door, it would need to be positioned as far back as possible. Potential mounting points behind the door were a bit crowded with clearance lights and a corner clip on the wall shape.

Windows were another consideration. Ideally, when it comes to the location of the upright arms, it's best not to cross a window and obstruct the view, especially if you spend much time in your trailer without deploying the awning. We wouldn't be extending the awning in small campsites, heavy wind or cooler weather when more sun was wanted on that side of the trailer.

Because our trailer had never been fitted with an awning rail, we bought one at a local RV dealership. An awning rail attaches one end of the canopy fabric to the RV. Some rails have built-in gutters, and others also function as the transition between the roofing and siding. The one used for this trailer was

dedicated to attaching the awning.

After much deliberation, we decided a 12-foot patio awning would provide a nice front porch without dominating the trailer. We ordered the manually operated Pioneer Lite from Carefree of Colorado and chose Camel from the list of fabric colors. Prices range from about \$700 to \$1,500, depending on components, fabric type and length.

The Pioneer Lite awning is available in 1-foot increments from 8 to 21 feet, and arm lengths range from 68 to 81 inches. Turning the hand crank extends the arms and canopy, and pitch can be adjusted by raising or lowering the roller tube. Closing the awning is accomplished by turning the crank the opposite direction until the roller is snug against the trailer.

If your trailer already has an awning, you may want to change the size or the type of mounting hardware when it comes time to replace it. Perhaps a longer awning would serve better to provide shade for



more people. Or a smaller awning, like the one we put on our vintage Terry, would allow more light inside the RV.

If you choose to obstruct the view and mount an awning so a vertical support crosses a window, make sure there's adequate clearance past the window drip covers and moving parts, and that the window is not an emergency egress. For some power units, spacers can be ordered to position the mounts away from the wall to provide clearance.

Here's how we installed the first awning to grace the side of this 40-something-year-old Fleetwood.

Carefree of Colorado

303-469-3324, www.carefreeofcolorado.com

[1] The awning rail usually extends beyond the mounting brackets, but we needed to mount this one as high as possible, so we marked it to fit between the brackets after mocking up the arm assembly spacing on the floor. **[2]** The aluminum rail is cut with a carbide-blade-equipped miter saw. A cutoff tool would also suffice. **[3]** We deferred assembling the awning so we could use the left arm assembly to determine a good starting point. The upper-brace mounting bracket is positioned as far back and as high on the trailer as possible. The center of the bracket location is marked with masking tape. **[4]** Using the door frame as a reference, the corresponding location for the bottom-left bracket is checked to make sure the area is clear.



[5] The center location of the upper-right mounting bracket is measured and marked, and the corresponding bottom bracket location is checked to make sure both have anchoring points that are free of obstructions.

[6] Butyl tape is used on the back of the awning rail to seal it to the siding. The tape is like caulk or window glazing that comes in a roll. **[7]** After predrilling the awning rail about every 8 inches, it is attached with stainless-steel sheet-metal screws long enough to penetrate the siding and reach the framing. **[8]** End plugs are slid into the roller tube, and the caps are attached.



SOMETHING NEW UNDER THE SUN

[9] Siding at the bottom mounting bracket holes is predrilled, and the lag bolts are inserted into the framing. [10] Silicone caulk is placed on the lag shanks before tightening them to secure the bottom brackets. [11] The distance from the upper bracket to the lower bracket is measured. [12] Arm length is adjusted to match the distance between the brackets.

➔ INSTALLATION TIPS

- Keep the mounting points parallel and square.
- Anchor the arms solidly into the trailer framing, or use appropriate anchors and through bolts.
- Seal everything that penetrates the skin of the trailer to avoid leaks.



[13] The ends of the awning rail are bent open and the sharp edges are filed off, then the fabric poly rod is guided into the rail. This requires a step ladder and two helpers to walk with the arm assemblies. To make the fabric slide more easily, it helps to spray the rail with silicone lubricant. [14] The helpers walk the awning down the rail until the upper brackets align with the layout marks, then the arm assemblies are inserted into the bottom brackets. [15] The upper brackets are attached through the siding and into the framing using the supplied lag bolts. The bolts are sealed with silicone. [16] Using the crank handle, the awning is extended and retracted several times to make sure it tracks squarely. [17] Self-tapping sheet-metal screws are inserted through the awning rail and into the poly rod to keep the canopy from sliding forward and aft on the trailer. [18] The provided stop bolts are inserted into the arms so the roller can easily be returned to the correct elevation (level with the awning rail) for transport. 🗨️

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SHOCK OPTION

AN EASY FRONT-SUSPENSION UPGRADE LEVELS NEWER RAM HD 4X4S WHILE IMPROVING RIDE AND HANDLING, UNLOADED OR TOWING

Ram heavy-duty pickups took a big leap forward in ride and handling in 2014 when the three-link tapered-coil front suspension was rolled out in the 2500. A year later the 3500 shared the same setup, greatly improving overall ride. But both HD trucks still retained the tail-high attitude — which some owners like and others don't.

If you are of the latter persuasion, Epiq Suspension has an easy fix that moves the front coils down 2 inches by the addition of spring spacers, which places the truck at a level stance and gives a more eye-pleasing symmetry to the tires in the wheel arches.

Such a change, however, requires longer shocks, as the stock units don't have enough extra stroke to compensate for the longer suspension travel afforded by the coil spacers. Epiq Suspension takes that into consideration with the Ram HD 2-Inch Leveling Kit. For those who tow a trailer or carry a slide-in camper with a late-model Ram HD 4x4, the result is a marked improvement in handling and a noticeably smoother ride, whether the truck is loaded or running empty.

Epiq's basic leveling kit (\$99) comes as a pair of CNC-machined, triple-baked, powder-coated steel spacers that carry a lifetime guarantee. The spacers are offset to accommodate the coil-suspension geometry of the 2014-and-newer Ram HD's coil suspension.



Longer replacement shocks can be sourced by the customer, or Epiq offers the option of Bilstein 5100 shocks (\$175) or Fox 2.0 Performance Series IFP shocks (\$260) that are already matched for the application. We chose the Fox upgrade because the premium mono-tube truck shocks are built with robust components for longer life and tuned for heavy-duty towing.

The installation is straightforward and takes a DIYer about three hours to complete. A floor jack and jack stands are needed when doing this project outside of a shop, but special hand tools are not required. The kit was installed on a 2016 Ram 2500 Crew Cab 4x4 at Dunks Performance in Springfield, Oregon, in about an hour and a half.



Epiq Suspension's premium version of the Ram HD 2-inch Leveling Kit includes Fox 2.0 Performance Series IFP truck shocks along with USA-made Epiq spacers.

After the installation, the difference in handling and ride is quite apparent compared to the Ram's stock suspension. Overall ride is softer yet more controlled, and there's less shudder when hitting ruts, potholes and railroad crossings. The truck also feels more controlled going around corners, and there's less oscillation in the front suspension when towing a loaded trailer.

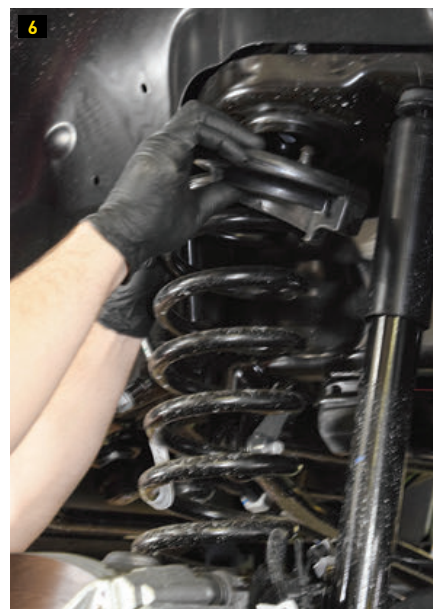
That's to be expected because the front suspension plays

a huge role in the stability and feel of a pickup. Shocks play a big part in that regard, controlling the rate at which the springs load and unload. The better the shocks are designed, the better the ride and handling.

It's prudent to have the front end realigned after installing the Epiq Suspension kit to make sure it's within factory specs. The test truck's front suspension was found to be within specs following the upgrade.



1) Ram went to the three-link coil front suspension in the 2014 2500 4x4s. The following year Ram 3500s received the same suspension upgrade. Epiq's leveling kit fits 2014 Ram 2500 4x4s and 2015 and newer 2500/3500 4x4s. **2)** The first step is to remove the lower bolts from the front shocks with jack stands supporting the front axle. **3)** The front sway bar is disconnected from the drop links using a 10mm wrench to hold the pin and a 21mm socket to remove the nut. Disconnecting the track bar isn't necessary, but doing so will make the upgrade easier if you are working without the benefit of a hoist.



4) Before the axle housing is lowered, the brake-line bracket on each side is disconnected at the base of the coils, so the hoses don't get stretched or damaged. **5)** The differential breather tube is disconnected from its retainer clip on the upper rear of the driver's-side coil tower. **6)** After the brake line and breather hose are free, the axle housing is slowly lowered until the top of the front coil on each side can be easily pulled out from the upper bracket. **7)** The Epiq spacer (same for both sides) is placed on top of the coil's rubber isolator and rotated so it aligns with the top bucket mount. The spacer is offset toward the rear of the truck.

SHOCK OPTION

8) A little downforce on the axle housing will help slide the spacer/coil spring back into position if the track bar is still attached.

9) Epiq includes a $\frac{5}{8}$ -inch keeper bolt to attach the spacer to the top of the coil tower just in case the suspension goes to full droop.

10) The original hydraulic shock is removed. It is too short to accommodate the added travel provided by the 2-inch leveling kit.

(Below) The Epiq/Fox front-suspension upgrade looks sweet and provided added suspension travel and tire clearance, and better ride and handling over the original Ram 2500 setup. A nearly level unloaded stance doesn't degrade the Ram HD 4x4's towing or load-carrying capacity.



11) The factory shock (left) measures 22.5 inches eye to eye. The Fox 2.0 shock (right) measures 25 inches. Shock valving and construction between the two shocks are considerably different, with the Fox being a heavy-duty shock that is valved specifically for HD pickups.

12) Upgrading to the Fox shocks is a straight bolt-in process using the stock Ram hardware. **13)** A Crescent wrench is used to pry the thick factory shock bracket open a fraction of an inch to slide in the slightly wider bottom mount of the Fox. **14)** After the coils and shocks are back in place, the axle housing is raised until the sway bar end-links can be bolted back on. The entire job should take the average DIYer less than three hours to complete and about half that time for someone using a hoist. 🛠️

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When it comes to gaining easy entry and exit into and out of an RV, stable steps, at the right height, are always welcome. Folding steps most commonly used on trailers and fifth-wheels can be challenging for people who need a wider platform for stability and, for some, the spacing between the rungs can be too tall for comfort. And these steps can also be difficult to deploy, depending on age and the amount of crud and rust that has built up on the mechanism over the years.

When Torklift International designed its GlowStep Revolution step system, it was earmarked for use on truck campers with steps below rear doors that traditionally have been difficult, and often awkward, to use. Torklift's product was later modified to retrofit the stock folding steps used on trailers and fifth-wheels, offering increased stability and a big lift in convenience when it comes to opening the steps for use in campgrounds, even on undulating terrain. The latest GlowStep Revolution, which employs the same scissor-type mechanism and offers 7 inches of vertical adjustment, has undergone refinements that make it better and safer.

Although the new GlowStep Revolution may appear identical to the previous model, a number of differences improve its functionality. The step system is still constructed of aircraft-grade aluminum, aside from the stainless rivets and a selection of mounting

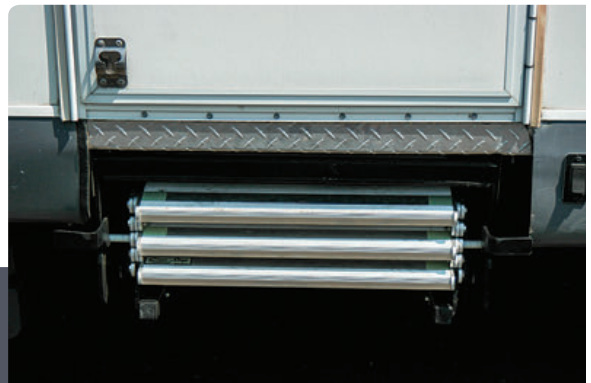


The near-effortless scissor-type mechanism allows the steps to be adjusted to accommodate various heights from the ground. A three-step model was installed on the test trailer; systems are also available with two, four, five or six steps.

hardware. It continues to provide several levels of adjustability and five positions for each leg of the company's All Terrain Landing Gear. And, as the name implies, it still glows in the dark for enhanced visibility at night.

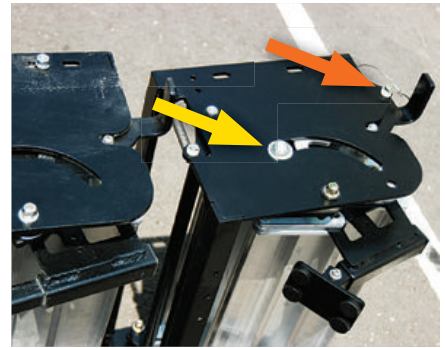
Improvements include revised landing gear that incorporates a new foot design and a far superior deployment guide and slide system. In upgrading the step system, Torklift utilized a larger nylon-encapsulated bushing for the pivots, which provides ad-

ditional support and much smoother operation. The bushing/bearing surface is capable of taking a significant amount of tension without over-stiffening the mechanism. Designers of the GlowStep also incorporated a hole on either side of the mechanism to engage the supplied bail pin in a locked



STEP IT UP » Torklift's GlowStep Revolution can be installed in the factory openings of most travel trailers and fifth-wheels. When retracted, the rungs fold nicely into the allocated space.

(Right) Upgraded proprietary All Terrain Landing Gear can be adjusted individually in five possible positions. (Far right) A larger nylon bushing (yellow arrow) increases stability and allows for smoother operation. A supplied bail pin (orange arrow) can now be used to secure the mechanism.



position, either folded or extended.

Installation of the GlowStep Revolution is straightforward, requiring a simple replacement of the existing standard-issue RV step and its four associated bolts and nuts. To make the process easier, the steps should be removed from the frame before installing on the trailer, which will lessen the assembly weight. After the frame is secured to the trailer chassis, the steps are easily reattached. At this point, the step system is completely ready for use anywhere, including the aforementioned uneven terrain.

Rated for 375 pounds, the GlowStep Revolution system is available in two- to six-rung configurations

and designed to fit standard industry openings below the entry door. Fitment assistance is offered on the company's website. Prices for the various U.S.-made step systems range from \$535 to \$650, and the product is protected by a lifetime warranty.

Beyond ease of use, the GlowStep's scissor action makes it possible to forgo a booster step to reduce the distance from the ground to the first rung, which many times can be too high due to ground terrain; the entry-door step riser height is 7½ inches. SureGrip

step tread provides a solid, nonslip surface, and a SafeStep pet barrier can be added to protect paws from getting caught in the openings. A GlowGuide handrail can also be installed for additional stability. Owners will certainly enjoy the solid feel without compromising balance from diving-step syndrome, narrow rungs and uncomfortable heights commonly experienced with factory counterparts. 🐾

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Waxing Eloquent

It's difficult to reach the top of my fifth-wheel's front cap when waxing it due to the slope, so I have to use an extension ladder. For an easy fix that won't scratch the fifth-wheel's surface, I cut a foam swim noodle to length, sliced the pieces lengthwise and installed them on my extension ladder. The foam stays in place when moving the ladder and can easily be repositioned where needed.

Rex Church, Alamo, Texas

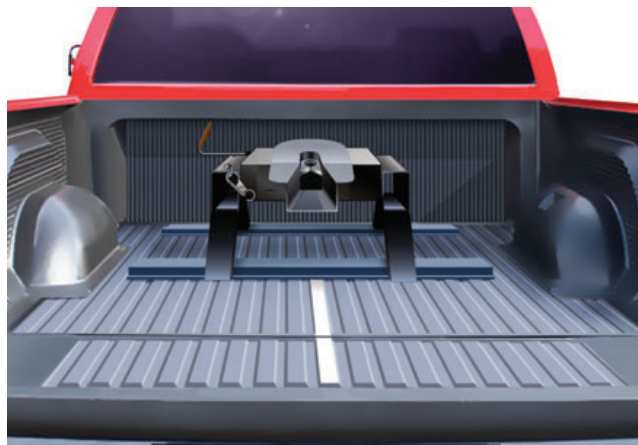
Editors' note: Use care to set the ladder at the correct angle and place the foam noodles securely. Duct tape may help to attach the noodles, but be sure the tape doesn't get in the way of extending the ladder's fly section.

Help for Hitching Up

I have a 2011 Cougar fifth-wheel with Keystone's proprietary Hitch Vision, which is basically a mirror on the front of the RV that greatly helps with aligning the hitch in the truck bed with the kingpin on the fifth-wheel. There is one problem, however, and that is I can't see the hitch in the mirror until I am just a foot or two away. This makes it difficult to adjust the truck to cleanly line up the fifth-wheel.

To fix this, I installed a strip of duct tape in the truck bed that runs from the tailgate to the middle of the hitch. This guide strip is visible early in the hitching process and makes it much easier to adjust the truck for a perfect alignment every time. You can even use reflective tape, which may help with in-the-dark hitching, and add an additional tape strip to the top of the pin box.

Steve Pankratz, Sioux Falls, South Dakota



No-Spatter Spouts

As an avid RVer of seven years, I'm always eager to learn new things about the lifestyle. While camping with a friend, we got on the discussion of air in the water line when the water is first turned on and bleeding out the air. If you bleed it at the kitchen faucet, it tends to make the fixture jump and spurt until the air is gone.

But if you fill the freshwater hose with water before hooking up, there is almost no air at all in the lines, and if a shut-off valve is installed at the end of the hose closest to the RV, there's even less air when hooking up. Not that air in the line is the end of the world, but minimizing it seems to make it easier on the faucet and fittings and, of course,

prevent water from spraying on the counter.

I even put a Y-fitting with shut-off levers at the hookup faucet, which adds the benefit of getting water from the outside or connecting a second hose. Plus, when it's time to leave, I can open the unused outlet to release excess pressure. This way, I can skip the free shower inside when disconnecting!

Bob Stanley, North East, Pennsylvania

Editor's note: This is a good idea, not only for minimizing pressure on the faucets but for flushing the water spigot before hooking up the hose. We've seen rust come out of spigots at campgrounds and RV parks. 🚰

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HaulMaster **SCISSOR SUPER COUPON**

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- Weighs 105 lbs.

19659128

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Customer Rating **★★★★★**

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Cycle Safeguard

Bicycling is a favorite mode of campground transportation and a means of exercise for RVers, and there's often considerable investment in the pedals being pushed. USA Roadbag's bicycle covers provide in-transit protection and security for these treasured two-wheelers. The new Front Load (FL) models have an easy-access zipper that simplifies covering bikes mounted on the rear of the vehicle. Featuring reflective strips for visibility, the 600-denier canvas covers are weather-resistant with tiny holes in the bottom to drain any water that enters around the hitch opening. Bags in the FL configuration are available in eight colors to fit from two to four bikes and are compatible with most receiver-hitch racks.

MSRP: From \$169.95
208-660-6351, www.usaroadbag.com
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Big Wheels for Big Rigs

Specializing in commercial-grade wheels for heavy-duty towing, Boar Wheel Company offers a lineup of wheels and wheel-and-tire packages that includes 19.5-inch aluminum-alloy wheels with 225/70R19.5 load range G tires. Commercial 19.5-inch wheels and tires not only have higher load and speed ratings than conventional RV-trailer offerings, they improve stability, have longer tread life and deliver 1- to 2-MPG better towing fuel economy, according to the manufacturer, without any trailer modifications. The 19.5-inch Muret 67 replacement wheels fit the eight-lug, 6.5-inch bolt pattern but may not fit all wheel wells; be sure to check before purchasing.

MSRP: \$359.95/wheel only
\$559/wheel and tire
888-619-5622, www.boarwheel.com
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Heavy-Duty WD Hitch

With the new breed of trucks capable of pulling trailers well beyond 12,000 pounds, hitch manufacturers are expanding their offerings to match. Curt Manufacturing's new 15K TruTrack system features a 15,000-pound gross trailer weight capacity and combines the functions of weight distribution and sway control in one product. The integrated sway control uses a spring-and-cam system and adjustable support brackets to keep the trailer better aligned with the tow vehicle. The hitch comes with a pair of trunnion-style, forged-steel extended spring bars for larger trailers, a pretorqued 2 $\frac{5}{16}$ -inch trailer ball, a durable carbide powder-coat finish and a 10-year limited warranty.

MSRP: \$793.25/model 17501
877-287-8634, www.curtmfg.com
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Royal Reception

Two new multidirectional over-the-air antennas from King help RVers connect with TV programming. Both HDTV antennas automatically receive free VHF, UHF and FM broadcast signals from all directions and amplify signal strength for the best available reception, according to King. The portable OmniGo (bottom left) requires no installation and no rotation. At the campsite, it can be mounted magnetically on the tow vehicle or the supplied tripod. The compact antenna stows in its carrying case along with the collapsible tripod, 12-volt DC power supply and 25-foot coax cable. The new OmniPro (top left) offers the same reception benefits as the OmniGo but is permanently mounted on the RV. Multidirectional signal reception means there's no need to crank it up or down like older antennas.

MSRP: \$129.95/OmniGo. \$99.99/OmniPro
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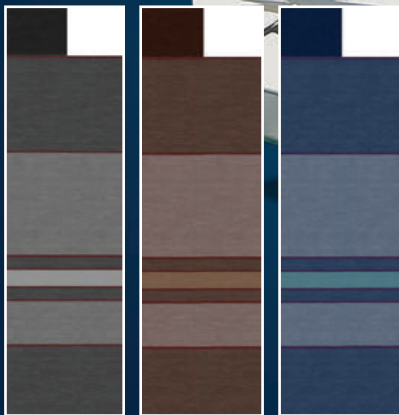
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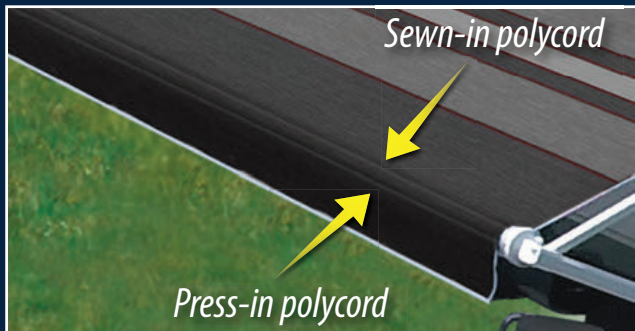
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EXTRA FUEL PAYLOAD

Q I had a Class A motorhome with a 75-gallon gas tank. Now I tow a trailer with a truck that has a 25-gallon gas tank. I want to know if it is safe to have a couple of full 5-gallon gas cans in the back of the truck.

John Clinton, Sacramento, California

A Any time you carry extra gasoline storage you incur a degree of risk, John, but you can reduce that risk when you need to haul along extra fuel. Be sure to use certified gasoline-storage containers. Install some type of container mounts or clamps that secure the storage containers tightly in place — and that doesn't just mean a bungee cord looped through the handle.



The last thing you want is loose cans of gasoline rattling around in the back of your truck or, in the event of an accident, having those containers thrown free of the truck, which greatly increases the chances for fire. Some common sense when planning your extra fuel storage can help keep you and others safe.

EXHAUST-BRAKE EXPERIENCES

Q I first installed a performance-chip package on my 2002 GMC diesel to up the power and torque from the factory values. I ran the truck with a setting that added about 40 horsepower and 60 lb-ft of torque. A few years later, I also installed an exhaust brake to help with the braking when pulling my 33-foot fifth-wheel.

Last summer, when we were coming out from the Grand Canyon, the temperature gauge started going up. All along the trip from Virginia, I had to replace water in the radiator, as the warning light kept coming on. I had noticed a low-water situation before even starting the trip but could find no leaks. This time the addition of water did not help cool the engine.

To make a long story short, the engine blew a head gasket, and the truck and trailer had to be towed to the Flagstaff GMC dealership. Due to the cost of the repair (estimated at \$6,000 to \$12,000), I ended up buying a new truck to get us back home. Although I have no proof (other than a blown head gasket), I am almost certain that with the large back pressure put on the engine with

the performance package and the exhaust brake, it was just too much for the head gasket to hold.

I would caution anyone about putting an exhaust brake on without any upgrade of the head gasket. I will say that I observed some water loss before I installed the exhaust brake, so the performance package may have accelerated the failure of the head gasket.

Sherman Frye, Mineral, Virginia

Q I have a 2007 Chevy HD with a Duramax diesel. Would an aftermarket exhaust brake cause any additional stress or damage to the engine? Is installing one a good idea?

Jeff Darling, Kirkman, Iowa

A There are several exhaust-brake systems available for your engine, Jeff, including those from Banks and BD Power. These aftermarket exhaust brakes are designed to work with your vehicle's engine and powertrain components. Properly used and set up, they won't damage the engine. This applies to an engine that's in good condition, of course, and the manufacturers of these products specify that on their websites.

Sherman's experience reflects what can happen to an engine that's showing its age with some miles on it, as well as another modification, which was the performance package, and the extra load it induced on the engine. That extra performance load, combined with the exhaust brake, likely aggravated the eventual head-gasket failure.

For a newer engine, the exhaust brake should be fine — in fact, they've been offered as an option or as standard equipment on full-size diesel pickups from the factory for several years now.

POWER-CENTER PROBLEM

Q I have a 2007 Pilgrim International 28-foot travel trailer. When I run the interior trailer lights and the slide-out using the battery, all is fine. When I plug into shorepower at home or at the campground, all is fine — until I unplug and want to use battery power. It doesn't work. I then have to replace the 12-volt DC 30-amp breaker in the converter panel, which gives me battery power until I plug into shorepower the next time. I then repeat the replacement of the relay to get to battery power. I go through about eight breakers a season — they cost about \$5 each, not all that expensive.

I don't want to do anything to cause a fire or put my family in harm's way.

TECH EXPERT



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.

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EQUAL HOUSING LENDER

Can converters be repaired, or do I have to replace the entire unit? The converter is part of a WFCO power center and is one of the following: WF-8935AN-P, WF-8945AN-P or WF-8955AN-P.

Bill Cole, Franconia, New Hampshire

A We're a bit puzzled by the "breaker" you describe as being replaced every now and then. The part number you sent in a subsequent email explaining exactly what you're buying is a 15-amp fuse. If the power center indicates a 30-amp fuse is needed for that position and you replace it with a 15-amp, it's going to blow as soon as you place a load on it, per the energy draw of a circuit that requires a 30-amp breaker.

If all the parts are correctly specified and matched, there's likely something else wrong. There could be a partially miswired power center, or based on the age of your RV, there could be some corrosion in the wiring connections, and that could be increasing the amp draw when a load is placed on that circuit.

Inspecting all of the connections for corrosion or frayed or damaged contacts may reveal the problem. The power center could also be faulty and might need to be replaced, as a repair might cost as much as a new unit. A call to the manufacturer would help answer that concern. If you need to replace the converter and power center, this would be a good opportunity to upgrade to a converter with a multistage smart charger. This would help keep the batteries in good shape and avoid overcharging them.

JERKING SLIDEOUT

Q I recently bought a 2016 Cross-Roads Sunset Trail Grand Reserve trailer. During the new-trailer demo, when the cable-driven slideouts came in or out, the whole trailer would shake from the jerking motion of the slide. I was told this is a normal condition. Now that it's home and I've had it in and out several times, I'm not so sure that's true. The slide goes out 42 inches, and it's about 16 feet long. The other slide does it, too, and it's about 3 feet shorter. The bedroom slide, which is a lot smaller, doesn't jerk. I'm hoping you

can explain this and let me know if it is normal or not.

Ed Regan, Point Pleasant, New Jersey

A A slideout room should not jerk, much less cause the entire trailer to shake when it's in use, Ed. This indicates some type of problem with the sliding support rails, the cable-drive components or some other part of the system. I would take the trailer back to the dealer and have the technicians give it another go. While you're there, look at some other similar trailers of the same make as yours, preferably one of the same model as yours, and have the dealer demonstrate the slideouts in those other models. That demonstration would reveal if it was indeed a "normal" condition across the product line.

If the dealership has its heels dug in with the claim that the jerking is normal, tell the salesperson you are not satisfied with the operation of the slides, and tell management you want the cable and track system inspected for proper operation and/or adjustment. If this doesn't work, take it to the next level and contact the manufacturer directly.

RUBBER MASTER TIRES?

Q On the way to Bryce Canyon in Utah last summer, we had a flat tire. Not wanting to travel without a spare tire, I bought one in the next town. The brand is Rubber Master, and the label says "equipped with Korean technology." The retailer said the tire had a lifetime guarantee and would be replaced if anything happened to it. Do you know anything about Rubber Master?

Dennis E. Bruvold, Glendale, Arizona

A That brand is a new one on us, Dennis, but that's not surprising, as new private-label tire brands enter the U.S. market all the time. We haven't heard any reader input about this tire, so we have no in-the-field reports to pass along.

Considering the continuing problems with imported trailer tires, the best we can suggest in your case (which is generally good advice regarding any trailer tire) is to keep a close eye on tire

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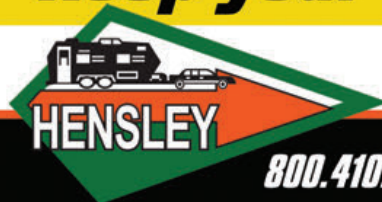
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pressure and perform regular inspections to watch for any kind of unusual sidewall or tread-area wear or damage such as tread separations or bubbles.

Please follow up and let us know your results with the new tire, as we'd like to let readers know of any real-world experiences you care to pass along.

TP FOR RVs

Q We're new to RVing and have been asking several RV locations about the use of toilet paper in RVs. None of the people we asked could be very specific. Can "septic-tank acceptable" paper be used in RVs in general?

Check Foley, Cheyenne, Wyoming

A In general, the best toilet paper to use in an RV waste system is the type sold as "septic-tank approved" or RV/marine toilet paper. That type of TP is designed to break down easily once immersed in water. That feature helps it flush somewhat more easily from the black tank when dumped, and because it also breaks down structurally, there's less chance the paper will build up in the tank or foul the level sensors. It also means the TP will be more effectively dissolved when in an RV park's septic system.

BATTERY-CHARGING OPTIONS

Q My RV charger/converter will not charge the brand-new RV batteries. Rather than replacing it, could I not just buy a battery charger and use this instead of paying to have my RV charger replaced?

Craig Turner, via email

Q I have a Honda EU1000i generator that I use to recharge my RV batteries while dry camping. Normally I plug the fifth-wheel directly into the generator and run it for several hours to top off the battery charge. Would it be more efficient or quicker to bring along a battery charger and run it off the generator, and have the charger hooked directly to the batteries? Would it be necessary to engage the battery disconnect while charging the batteries

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directly, or is there any chance of damaging the RV's electrical system while charging directly to the batteries?

Matt Butorac, Pueblo West, Colorado

A You can use a separate external battery charger for your RV batteries, Craig.

Matt, don't worry about having two charging sources attached at the same time. The more powerful of the two sources is the one that takes over, so to speak, and if the built-in converter isn't supplying enough power, the portable charger will do the job. A secondary external battery charger could charge the batteries faster than the built-in converter.

While this system works, we would strongly suggest you consider one of the newer converters with multistage smart-charging technology. Not only would that eliminate the hassle of constantly attaching and removing the external charger, it would also help the batteries last longer by keeping them properly charged and not overcharging them when in "float" mode when the batteries are topped up.

FUSE-PANEL LEGEND

Q I recently purchased a 2013 Keystone Fuzion toy hauler. I noticed the fuse block did not have a legend, so I decided to contact Keystone customer service. To my amazement, they told me they could not provide a legend, and I would have to pull each fuse out of the block to see what appliance it was associated with. I do not understand how a company can build a trailer and not keep track of where the fuses go. Are my expectations too high?

Joshua Nelson

Mount Pleasant, South Carolina

A As a rule, the RV manufacturers supply a legend that explains which circuit each fuse or circuit breaker supports, Joshua, and it's curious that none was included in your trailer. The owner's manual may include this information, but there are so many different RVs that use the same manual, it may not be possible to

cover every model. That being said, it seems there should be a means for an RV manufacturer to keep closer track of this type of product information, but apparently, it's not happening.

Many RVs have handwritten — “hand-scrawled” is a better description, based on what I’ve seen — information that’s added while the RV is being built. As each circuit’s power line is added to the fuse panel, someone writes in what each one does. Apparently, someone at the factory forgot to do this, and then an inspector later failed to notice it was missing. Unless you can find an identical model trailer and copy the information on its fuse panel, you are probably stuck with the trial-and-error process the customer-service contact described.

TRAILER STABILIZING

Q I don’t know where to turn. My husband and I have a 2014 Coachmen Freedom Express Liberty Edition travel trailer with bunk beds, and we love it — except for one thing. Even though we tighten and check the jacks, the trailer shakes every time we move at night, disturbing the other person and waking them up. I’m afraid to get up during the night to use the wash-room, as it disturbs my husband. What do we do?

Holly Hefferman, Calgary, Alberta

A First off, Holly, do an internet search for “RV trailer jack stabilizer.” There are several different models of trailer-stabilizer jack braces available. BAL, JT’s Strong Arm and SteadyFast are three brands that come to mind. These devices fasten between the trailer frame and the crank-down stabilizer jacks. Once the crank-down jacks are in place, you tighten the fasteners on the stabilizers, and they provide solid front-to-back and side-to-side stability for the trailer.

It’s not going to be perfect, keeping in mind that your trailer is mainly supported by springs and rubber tires, but adding one of these devices will be better than nothing. BAL X-Chocks, when applied to each side, also help with some of the movement.

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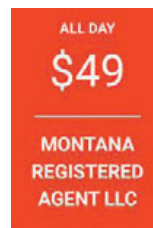
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TOWING CHANGES

Q We have upgraded from a small travel trailer to a fifth-wheel. In talking with other fifth-wheel owners, there seems to be no standard height distance from the top of the bed rail to the bottom of the trailer. Most seem to be set at about 6 to 8 inches. However, I have talked to two campers who use 4 inches of clearance, which seems to me to be too close and could end up damaging something.

Can you tell me what the industry recommends for safe towing? Also, should the trailer be level when being towed and why? I am using a PullRite SuperGlide hitch and have a shortbed Ford F-150 with a factory tow package and added springs.

Thank you for any information that you can provide. I will then be able to talk with other campers around the fire with some sense of knowledge.

Maurice Harrison, Staunton, Virginia

A Generally, we recommend at least 6 inches of clearance between the bed rail and the underside of the fifth-wheel. This is not an industry standard, as such, but just a common-sense figure we recommend. That 4-inch clearance standard used by some people allows very little movement between the truck and trailer. Any minor vertical variation in the road surface will eat up that 4 inches in a hurry, as the truck and trailer move independently, and that can result in trailer or pickup damage.

A nearly level trailer provides better weight distribution between the axles, it helps keep the trailer's aft end from dragging by being too low, and, in general, it looks better, although that's not a technical consideration. 🚚

HAVE A QUESTION? » Email rvclinic@trailerlife.com or write to RV Clinic, 2750 Park View Court, Suite 240, Oxnard, California 93036. Include your full name and hometown. Selected letters will be answered in the magazine, but time does not permit individual replies. No phone calls, please.

Wyoming Ghost Town

Getting into the spirit of history in South Pass City

South Pass, Wyoming (elevation: 7,411 feet), is the lowest point on the Continental Divide for hundreds of miles north and south. Homesteaders, prospectors, businessmen and military parties traveling along the Oregon, California and Mormon trails crossed the divide here during the 1800s. After gold was discovered in 1868, more than 2,000 people moved to the area, but the strike went bust after only two years.

Today, South Pass City is a ghost town maintained by the state of Wyoming as a historic site. I've never seen a ghost and never wanted to put myself purposely in a situation where one might float by, but I thought South

Pass City would make a good pit stop while traveling with my teenage son, Parker. He was all for it.

"Do you believe in ghosts, Mom?" he asked, as we approached the ghost town.

"No," I replied. But after a lifetime of Casper, Scooby-Doo, Ghostbusters and other apparition-laden entertainment, I didn't totally rule it out.

"Maybe we'll see one today!" he quipped.

We parked at the old dance hall, which now serves as a visitor center and the first stop of a walking tour. From there, we strolled down the main street, past the hotel, butcher shop, blacksmith forge, school,

jail, church and several homes. We wandered inside each building at our whim, but it was the Exchange Saloon that truly made us pause.

Built as a bank during the boom, it was the place where miners traded gold dust for dollars, hence the word "exchange" in its name. After the bust, miners used those dollars to buy home-brewed whiskey and spin the roulette wheel. Poker hands were dealt on the tables. Glasses on the bar were poised for pouring. It looked as if the saloon's patrons had simply stepped outside for moment.

"What happened to everyone?" asked Parker.

"Maybe they're the ghosts that make this a ghost town," I chuckled.

"Really?" pushed Parker.

"They probably continued west when South Pass dried up," I speculated more seriously. But to Parker and me, a part of those pioneers still remains in South Pass, as it always does, though people move on. 🚗



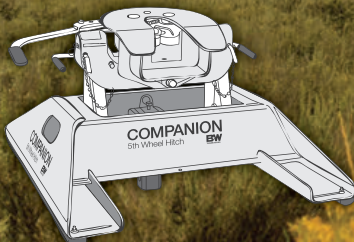
South Pass City

(Above left) The broad main street, with numerous historic sites, may have more grass than dirt nowadays, but it's largely unchanged from the town's heyday in the mid-1800s. (Top right) The town jail served as a holding place for disorderly boom-towners. (Bottom right) The Exchange Saloon, a bank turned bar.

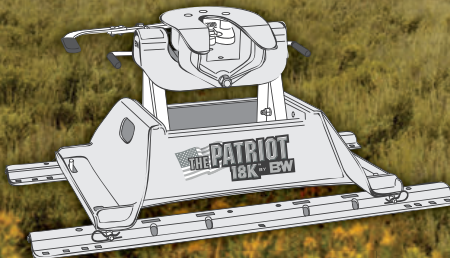
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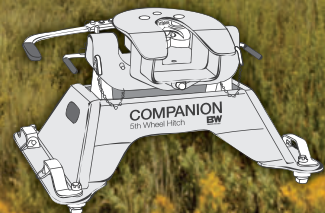
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