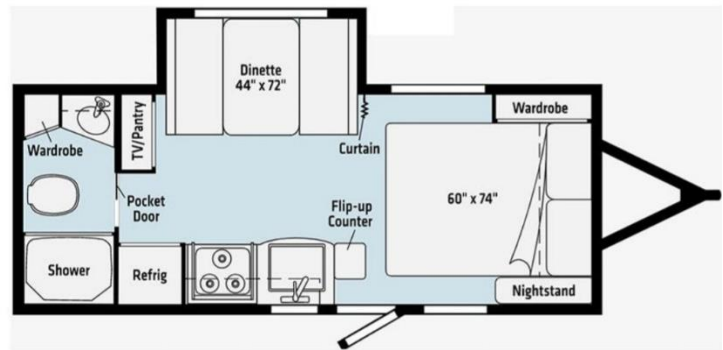


The ideas for the upgrades my wife and I have done primarily came from the two Winnebago Minnie Facebook forum sites as well as recommended U-Tube videos I watched or other camping lifestyle forums my wife checks out. I owe a tremendous amount to these sources and recommend everyone RVing to join any or all these groups. Obviously, I was on a mission to outfit everything that would enhance and simplify our life traveling in the Minnie and spared no expense or time to incorporate all these features. Many of them are low cost while others were quite expensive. Overall if I was to start over, I would likely re-buy the same model and do almost all the same upgrades. We pull with a 2020 Ram 1500 EcoDiesel that gets about 13 MPG towing and 26 MPG empty. We are very happy with this truck. I hope this list helps other travelers with ideas, upgrades, and equipment to consider.

We purchased a new 2022 2108 FBS in February of 2022 from Fretz RV in Souderton PA. The first week the slide out jammed while trying to extend it. Fortunately, Fretz was super accommodating and had it fixed in less than a week with parts they had in stock. Since that time there have been loose screws, one broken refrigerator door handle and some buckled backplash but other than that, our Mini has performed well. Any travel trailer is a home on wheels that gets bounced around and needs regular maintenance and consistent organization to keep it enjoyable. We chose this model because the queen size bed allows both of us to get up at night and is easy to make. We also prefer the dinette as I do a lot of computer work and it has a large storage space below both seats. One layout change based on our lifestyle was to remove the TV which we don't use and replace it with a storage shelf. The list of all upgrades is first. Pictures, Amazon screenshots and short explanations of each upgrade are provided next. Total of all necessities is about \$2400 plus \$700 for bike rack. Total of all upgrades is about \$8300.

47 Necessities & Considerations \$2500 + \$700 bike rack (pg 6-15)

- Assorted pliers, screwdrivers, sockets, level & screws
- Battery drill
- Tire Wedges & X-Chocks
- Leveling blocks & stabilizer pads
- Mouse deterrent
- Jack stand & extra blocks
- 5 ton hydraulic jack & tire lifter
- Step stool for camper stairs
- Outdoor table & small folding chairs
- Plastic outdoor rug
- RV Ceramic Wax Spray
- Surge protector and circuit tester
- Extra 30 amp cord & conversion plug
- Water filter, hose splitter & water jugs
- Storage bins & clothes storage bags
- Blue tooth tire pressure monitors
- Collapsing water hose & water pressure reducer
- Funnel for filling water tank
- Rhino dump hose, clear elbow & extension, holders
- Silverware & Dish soap holder
- Door clip & magnet hangers
- Small portable heater

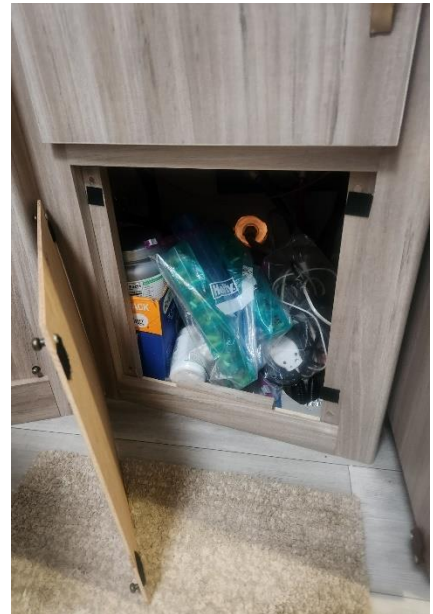


- Cover for electric jack
- 1.5 inch foam topper for the mattress
- Labels & markings
- Dish and bowl holder in upper cabinet
- Extra fuses
- Sink drain mat
- CRC Power lube PFT spray
- Velcro stick on strips
- Small step ladder
- Quick disconnect for water inlet
- Dump cap handle
- 5 gallon bucket and lid
- Refrigerator spring bars & refrigerator door stops
- Refrigerator temperature gauge
- Retracting clothes Line
- Outdoor grill & Induction stove
- Quick heating tea kettle
- Electric frothier
- Coffee maker & coffee grinder
- Two bike carrier
- Extra dump slide valve
- Black tank sprayer & soap
- Grey & black tank cleaners
- Entrance step carpets
- Brake adjusting tool
- 50 amp to 30 amp converter plug
- Tongue security key lock



27 Interior Upgrades \$1050 (pg 15-20)

- Bedside reading light
- Cabinet latches
- Caulked bath sink & counter top
- Shoe compartment
- Hooks & bungee to hold outdoor table
- Plastic chain to hold paper towels
- Pencil & pen removable cup holder
- Coat & hat hanging hooks
- Replaced interior sound system speakers
- Screen door support bar
- Indoor outdoor temperature gauge
- Flashlight & key rack near the door
- Added stop cord & larger box for flip down drawer



- Changed screwed cabinet panels to Velcro with metal pull handles
- Insulate AC intake cabinet
- Installed piano hinge and lift arm for dinette storage compartments
- Reverse counter top extender
- Electric blanket heating pad
- Shelf where TV was located
- USB plug to bed side table & dinette
- 12 volt fan hung in doorway
- Broom storage
- Dimmable dinette light
- Slide out drawers in dinette storage cabinet
- Access under the slide
- Added second shelf above the bed
- Cell phone booster



18 Exterior Upgrades \$860 (pg 20-24)

- Propane gauges on the tanks & Bluetooth gauges
- Bath fan roof rain cover
- Rotate electric jack motor
- Moved spare tire to underside of front
- Installed keyless entry lock
- Replaced outdoor shower key lock with thumb latch
- Installed drip edges for exterior hatches and windows
- Fresh water tank drain
- Weather coated and insulated wheel wells
- Zip ties to secure propane access door
- Welded rear bumper to 2" receiver hitch
- Outside paper towel holder
- Brake line protectors
- Propane connection to portable grill
- Exterior USB outlet
- Rear bumper broom holder
- Changed outdoor outlet to be powered by Inverter
- Added rear propane connection



7 Pass Through Storage Upgrades \$140 (pg 25-26)

- Carpet pass through floor
- Hanging hook for emergency crank arms
- Hung Chock-X with screws
- Second pass through light
- Installed wooden slides at pass through entrances



Hung service circuit protector

Custom bracket for shore power cords & propane hoses & stabilizer pads

13 Electrical Upgrades \$2650 (pg 26-32)

Converted to lithium battery compatible converter

12 volt front exposed fuse wiring

Installed two lithium batteries in pass through

4X4 electrical box above the battery

Voltage gauge in pass through

Second solar panel

Moved under carriage fuses

2500 watt inverter in pass through wired to sink and microwave 120 volt outlets

Truck alternator DC to DC camper battery charger

12 volt cigarette sockets on either side of pass through for tire inflator

Solar disconnect switch when temperature is below freezing

AC soft start

Wattage & charging meter

Grey and freshwater level sensors

22 Bathroom & Kitchen & Plumbing Upgrades \$1060 (pg 32-37)

Water pressure gauge & 90 degree shut off

Rhino dump hose stored in bumper

Dump hose elbow attached to frame

Replacement Vortex bath fan

Recessed toilet paper holder

Reset dinette table lower

Shower soap holder & hooks

Magnetic holds and lifts to allow access to water pump

Accumulator for water pump

Bungee to hold shower door open

Wedge cut yoga blocks under the shower pan

Two fans for refrigerator interior cooling fins

Caulked Bathroom sink and around bathroom flooring

Two fans for refrigerator roof vent

New 310 Porcelain toilet

Bidet on toilet

Cut slot in shower hose holder

Attach clear dump elbow to frame

Oxygenator shower head & single handle shower valve

Shower head shut off valve

Added insulation to hot water heater & other locations

Air compressor to water line adaptor



Water Filter and UV light

6 Slide Out Upgrades \$455 (pg 38-39)

Slide out topper

Velcro slide controller and entrance cover

Stainless plates under the slide rollers

Bottom & top corner slide supports when retracted

Aluminum support plate for each side of slide frame

Emergency slide blocking 2x4's in ceiling of pass through

12 Towing & Hitching Equipment \$2050 (pg 39-42)

Anderson weight distribution hitch (WDH)

Bubble gauges on camper

Bluetooth leveling gauge

Step up pads for rear corners of pickup

Bluetooth tire sensors on each camper tire

Hitch bar tightening clamp

Jack storage box

Sumo Springs for Ram 1500 pickup rear axle

White tape on ball hitch

Rear facing bluetooth camera

Tongue scale

volt tire air pump

14 Camper Repairs (pg 42-44)

Slide twisted sideways first week of ownership

Longer cabinet screws where occasionally needed

Adjusted bathroom door and raised the bottom slide

Trimmed paneling to allow kitchen faucet extender to move

Resized and repositioned dinette cushion end trim

Replaced refrigerator door handle

Trimmed 1/16" off bottom of backsplash Formica

Tightened sink holders, re-caulked sink & re-glued loose Formica

Added supports to the floor panels beside the slide

Added fresh water tank supports

Replaced lug nuts

Unkinked slide motor wires

Replace draw slides for one drawer

Water fill tube leak



12

38 Necessities & Considerations

Assorted pliers, screwdrivers, sockets, level & screws \$150

There is always some fix or adjustment necessary on any trip. Along with multiple sized crescent wrenches, pliers and screwdrivers be sure to include one or more square #2 screwdriver as almost all the screws in the camper use square head drivers. I like to include a set of socket wrenches plus extra sockets sized for all the hook up bolts and nuts.

Battery drill \$225

A battery drill along with speed bits often gets used on a trip. We have expensive bicycles that are secured with multi bike locks since any one can cut through them with a grinder. Unfortunately, I have in the past lost my bike lock keys and had to grind my own locks. In case it happens again I also carry a battery hand grinder.

Tire Wedges & X-Chocks \$120

I prefer the black rubber tire wedges. I place one on every tire around the camper first thing after maneuvering the camper to the optimal location. A white label saying “Wedges” on my electric jack reminds me to place and remove them but I’m sure I’m not the only one who has run over them after forgetting to pull them out. I purchased x-chocks which just fit between the dual tires but I rarely use them as I don’t mind the slight rocking reduction they provide. The X-Chocks do provide an additional wheel lock if needed for an inclined parking spot.

Visit the FloTool Store
Hopkins FloTool 11930MI Heavy Duty Wheel Chock, (Pack of 2)
#1 Best Seller in Powersports Loading Ramps



Brand: BAL
X-Chock Wheel Stabilizer - Pair - One Handle - 28012
★★★★★ 16,710



A battery right angle drill and socket can be used to install the X-Chocks. A tip for getting the rubber tire wedges tighter is to place the rear ones first and slightly back the camper on to them. While holding the camper with the truck now have your partner place the front ones. This will wedge them in tighter.

Leveling blocks & stabilizer pads \$80

Side to side leveling can be done with either Lego style block pads or angled wedges. I bought the less expensive Camco leveling wedges versus the Anderson ones. I use the angled ones occasionally if the ground is stiff enough to hold them. Mostly I use the Lego style for leveling and they are also handy if any of your stabilizing arms are too far off the ground to reach.

Visit the Camco Store
Camco Curved Leveler and Wheel Chock (44423)
★★★★★ 1,348



Visit the Camco Store
Camco Fasten RV Leveling Blocks | Features a Durable Resin Construction, a Convenient Carrying Handle, and is Compatible with Single Wheel, Stabilizer Jacks, and More | 8.5-Inches x 8.5-Inches (21022)
★★★★★ 3,352



Mouse deterrent

Keeping mice out of the camper is not easy. Sealing every entry hole on the underside of the camper is the first line of defense. Using one of the scented mouse deterrent packages is a second method especially when the camper is parked.

SUAVEC Pest Control Pouches, Rodent Repellent, Peppermint Mouse Repellent, Repel Rodents, Mouse, Mice... See more
#1 Best Seller in Indoor Ultrasonic Insect & Pest Repellers



Jack stand & extra blocks \$50

Some campers prefer to use a jack post extender which mostly eliminates the need to carry jack posts supports. The longer the electric jack is extended, however, the more stress is placed on it when the camper shifts. I purchased a plastic jack post stand and cut three 2-inch-thick blocks. I store these in a Craftsman's box behind the propane tanks where the original battery was located.



5 ton hydraulic jack or Tire lifter \$30

A hydraulic jack for emergency tire repairs is a good idea although the tow vehicle jack could also be used. I bought a 5-ton version from Harbor Freight and store it in the pass through. The Minnie's double axle also allows use of a single tire ramp that lifts the adjoining tire for easy tire removal repair or adding or replacing wheel bearing grease. I will be getting this and then have to find a way to strap it to the underside camper frame as I have no room in my pass through for it.



Stool for camper stairs \$30

The camper comes with a two-step folding stair even though it mostly needs a three step stair. A three-step stair can be installed but it is expensive. The easier choice for us is a portable first step. This four legged version has been very adequate and is tossed upside down in the camper when traveling.



Outdoor table & small folding chairs \$200

Although campsites often provide a picnic wooden bench, comfortable folding chairs and a separate outdoor table is a necessity for us. This plastic top folding table works great but does not fit in the pass through. I found a place to strap it in the camper. This portable small collapsing chair fits upright inside the pass through and can be bungie strapped to the front wall of the pass through.

Plastic outdoor rug \$45

A large foldable 9X12 plastic outdoor mat is a necessity to minimize dirt and sand dragged into the camper. The one we use folds up and is stored in the pass through. Thrown rugs on the camper interior floor are of course a good choice.

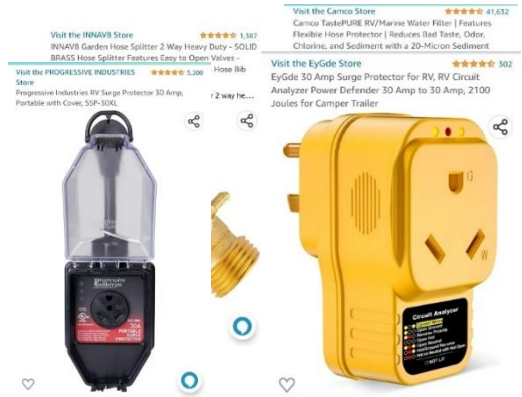
RV ceramic wax and cleaner

The recommended wax for RV's are the McGuire products. This spray on product has good reviews and is easy to install. =You of course must wash the camper first with either a specific RV was or dawn dish soap. The McGuire product is simply sprayed on and washed off with water so it is super simple to install and thus easy to re-apply.



Surge protector and circuit tester \$100

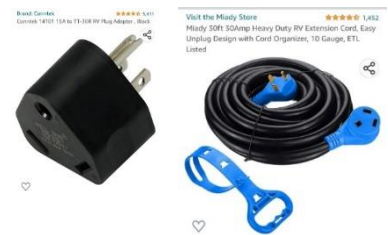
necessity is a surge protector as electricity at the RV park can be erratic. Surge protectors vary in quality and cost. This is the one we use. As an extra check, I will sometimes plug in an inexpensive 30-amp circuit tester to make sure the pedestal power is wired correctly. If this less expensive tester is blown out, the main surge protector will be ok.



A

30-amp extension cord & conversion plug \$80

Our camper came with one 30 foot, 30 amp plug in cable. A minimum of one extra 30-amp cable is very important. I care two extra 30-amp cables as well as the factory supplied cable. Often there is only a 20 amp or even 15 amp plug available. I carry two 30-amp to 20-amp conversion plugs in case I miss place one. I store one plug in the outdoor shower compartment for easy access. The back-up plug is with my assorted tools.



Water filter, hose splitter & water jugs \$60

We use the Camco blue water filter when hooked up to the water spigot or when filling our water tank. I will use a hose splitter at the spigot and attach a second filter to the extra outlet for filling water bottles unless. We use this filter to refill all our quart size and smaller drinking and cooking bottles. For extra water we carry two separate 2.5 gallon collapsible water jugs and four regular gallon jugs in the compartment under our bed inside a plastic bin in case they leak.



Storage bins & clothes storage bags \$45

We use net bags for clothes separated by item. Labeled storage bins that are critical. The cabinet under the TV location has six pull out bins that are sized 8X13X5. In the dinette storage compartments we use plastic baskets. The pass through has two Craftsman 10 gallon latching bins for holding wedges, tire lifts and stabilizing pads. A third larger 15 gallon clear plastic bin in the pass through holds miscellaneous parts.



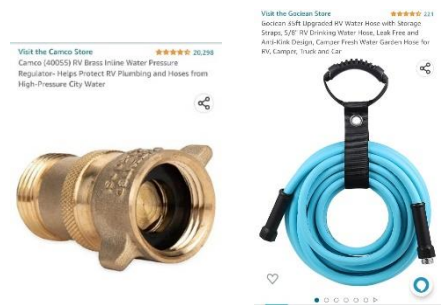
Blue tooth tire pressure monitors \$130

An absolute necessity is blue tooth to dashboard display tire pressure and temperature sensors. Low tire pressures or excessive heat causes tire blowouts. A solar cell powered display sits on the driver’s side dashboard. As soon as low tire pressure hits the set point or the same with high temperature, an alarm goes off. Otherwise, a blown or flat tire might never be known until a passing car starts giving hand signals you have a problem. Two tires blown and a major accident is about to happen.



Drinking water hose & water pressure reducer \$50

A safe for drinking water hose that collapses into a compact roll is a definite necessity. When unwrapping and wrapping up the hose it is best to always keep the hose strip in alignment to minimize tangles and allow full water drainage before the hose is re-coiled to be stored away. The water pressure at a campground can possibly be strong enough to blow out a water pipes in the camper. A pressure reducing fitting needs to be installed on one end of the hose.



Funnel for filling water tank \$10

Tractor Supply has inexpensive plastic funnels that fits inside my miscellaneous storage container. The funnel is used if needed to add water to the camper freshwater tank using water jugs when a hose is not available.



Rhino dump hose, clear elbow & extension, holders \$80

The Rhino hose collapses into a compact hose. It is also handy to purchase an accordion style hose support that maintains a slope from the camper to the in-ground dump drain. When connected to a campsite dump drain you never leave your grey and black water valves open. Wait until your tanks are at least partially filled to dump sewer line first and then grey water second. After draining both tanks I run hose water in the dump hose to further flush out waste. Thoroughly shake out water in hose before placing the hose in camper also includes a black tank flush hose inlet above the dump outlets.

the bumper. Our

To provide additional black tank cleaning, partially refill the black tank using this hose inlet while being careful not to over fill the tank and push water up and out of the toilet. Repeat as necessary until flush is clear water.

Silverware & dish soap holder \$25

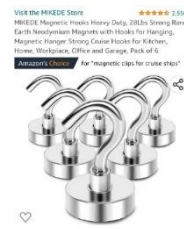
is too easy to mis-place silverware when you are camping. Sherry found this plastic container that holds the silverware for easy retrieval as well as a small spray bottle that holds diluted Dove detergent. I used Velcro stick-on pads to keep it place



It

Door clip & magnet hangers \$25

We use door hanging hooks all over the camper to hold hats, shirts, jackets and towels. We also mounted double hook hangers on either side of the slide using double sided sticky tape. The one mistake was using the double stick tape on the vinyl paneling as this very thin vinyl started to stretch and peel off. Over the sink we use magnet hooks attached to the side of the range vent hood for kitchen items.



Small portable heater \$40

Although the propane heater works well, it is loud and turns on and off at night. When plugged in, a small quieter electric heater with multiple settings is perfect for chilly or even cold nights. My heater on the different settings uses 600, 800 or 1300 watts. I turn it off if using micro-wave at the same time.



Cover for electric jack \$12

They make a weather cover to protect the electric jack. I purchased one but had the bad habit of forgetting to replace it since it was the exact same black color as the propane cover and eventually lost it. I replaced it with a more visible gray cover. I also attached a cord to the cover that was connected to the jack in case I once again forgot to flip it over the jack when we were getting ready to start towing.



1.5 inch foam topper for the mattress \$60

There is lots of discussion online about replacing the camper mattress. We like a firm mattress with a foam topper that can be replaced if it wears out. We used a 1.5-inch topper on top of the original mattress, and it is perfectly comfortable for us. We also got a fitted sheet that is sized for RV mattresses. We will eventually need to replace the mattress but for now it is fine.

Labels & Markings



I have a white label maker that prints black lettering. All the storage bins are labeled that fit in the cabinet shelves under the old TV location. On the electric jack I wrote re-minders about chocks, stabilizer, and plugs. I also labeled the black flush inlet and water fill just in case someone else is helping to hook up. I also found it helpful to put a small piece of white tape on the interior camper light switch at the front door and over the stove to identify the light switch more quickly when it's dark in the camper.

Dish and bowl holder in upper cabinet \$10

We found a three tier adjustable wire holder at Walmart that stores the plates and bowls perfectly in the cabinet above the sink. Unfortunately the inventory always changes so you will need to device your own storage containers.



Extra fuses \$30

I set of assorted automotive fuses and water heater thermal fuses are absolutely a definite item to have in the camper or tow vehicle.



Brand: Serenpy
Serenpy Roll Up Dish Drying Rack, Over The Sink Dish Drying Rack Kitchen Rolling Dish Drainer, Foldable Sink Rack Mat Stainless Steel Wire Dish Drying Rack for Kitchen Sink Counter (17.5"x11.8")
#1 Best Seller in Dish Racks



Dish drain mat \$10

Counter space is tight. This dish drain coil holds wet dishes and wraps up easily. I cut it down to fit inside the sink edges using a grinder. The sink plastic cutting boards get stored when parked behind the stove top cover that is folded up and this adds extra counter space and dish drying pad..

CRC Power lube PFT slide lubricant \$15

The bearings on the slide both top and bottom as well as the rollers underneath need spraying every month or two of camper use. This lubricant is recommended by the manufacturer. For other latches, locks, bike chains and moving parts we use WD40 PFT spray. Our dealer also recommended a spray for the slide rubber gasket.

CRC Power Lube Industrial High Performance Lubricant With PTFE, 11 Wt. Oz., High Performance Aerosol Lubricant Spray
Amazon's Choice in Automotive Assembly Lubricant...



Visit the Art3d Store
Art3d 16 Sets Hook and Loop Tape Sticky Back, 1 in x 4 in Double-Sided Command Adhesive Strip Heavy Duty
Amazon's Choice in Interlocking Tape Sewing Fabric...



Velcro stick on strips and double sided stick tape \$10

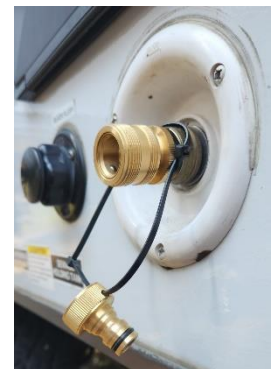
These velcro stick on tape strips I use for lots of items I need to hold in place but still be able to unstick. Double stick tape is great to have for items that need to be permanently stuck.

Small step ladder \$30

There are times when you need to reach the awning or add lubricant spray to the upper slide motor. A small step ladder just fits upright in the pass through and is totally necessary at times. ce or cups held to a table.

Quick disconnect for water inlet \$16

Connecting and unconnecting a hose into the driver rear side water inlet is often hard to tighten and loosen. A brass disconnect makes it easy to change. The extra nipple works as a plug when travelin by filling it with caulk and drilling it to attach azip tie lanyard.



Dump cap handle \$11

The grey and black pipe end cap can be difficult to twist on or off. This cap has a nice extended grip that keeps your hands farther away from a spill and includes a hose fitting you can use for back flushing or possibly grey water draining.



5 Gallon Bucket

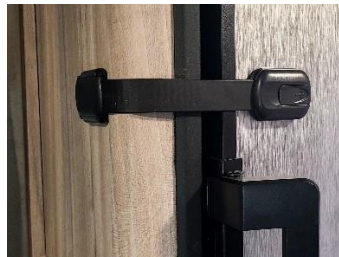
A Home Depot or Lowes Bucket with a lid is our clothes washer. During our tow days we 1/2 to 3/4 fill the bucket with water, laundry soap and dirty clothes and strap it in the back of the pick-up. Once at our next stop we rinse several times and ring out the clothes and fantasize about designing a portable clothes ringer.

Refrigerator spring bars & refrigerator door stops \$30

Visit the Camco Store
★★★★★ 1,263
Camco 44053 28" RV Refrigerator Bar, Holds Food and Drinks in Place During Travel, Prevents Messy Spills, Spring Loaded and Extends Between 16" and 28" - White (3 Pack) (44074)



Visit the CLUTESAFETY Store
★★★★★ 7,857
CLUTESAFETY Child Proof Safety Locks - Baby Proofing Cabinet Lock with 6 Extra 3M Adhesives - Adjustable Strap Latches to Cabinets, Drawers, Cupboard, Oven, Fridge, Closet, Stair Door, Window (Black, 6)



The refrigerator door will spring open while traveling both from the camper rocking or items shifting around inside the refrigerator. Not a pretty site finding everything that was in the refrigerator now on the floor. Two things have made that a past issue,

spring rods on each shelf in the refrigerator and door straps. Obviously, the straps are an extra step but needed. When the

camper is in storage it is also important to keep the doors ajar to prevent mold growth inside. The credit card sized tabs that came with the refrigerator can be used for this.

Refrigerator temperature gauge \$15

Being able to check freezer and refrigerator temperature is important to know everything is working OK.



Brand: Marantz
★★★★★ 1
Marantz Portable Travel Cool with a Cool Shade
Adjustable Travel Retractable Camping Clothes Line
Travel Retractable Clothes Line Cool for Outdoor/Beach,
25 Ft Orange

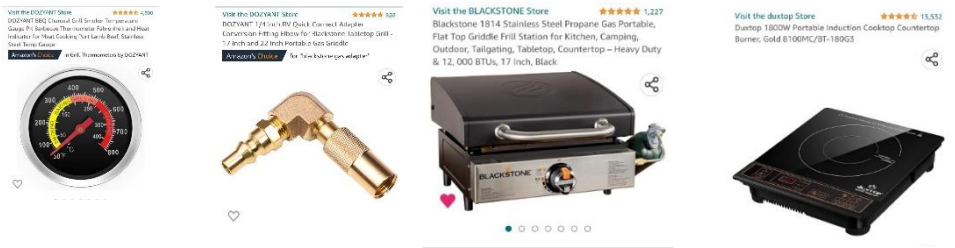


Retracting Clothes Line \$20

This is a compact clothes line that rolls up by hand and is very handy for drying laundry.

Outdoor grill & Induction stove \$325

Almost every camper prefers to cook outdoors. The choices are a gas grill and an induction stove. The key is finding either of these in, as compact a size as possible, and still be practical. I have the single burner Blackstone grill with the cast iron plate that is easy to scrap clean. You need the hose to grill converter plug to use the Minnie’s exterior gas outlet. The grill stores in the pass through upside down and sideways. We also have a single burner 1800 watt induction stove that heats up a cast iron or magnetic stainless very fast. I changed the outdoor outlet to run on battery inverter to be able to use induction outdoors with or without shore power.



Tongue Combination Lock



I prefer a combination lock for securing the tongue latch so that I don’t need to carry an extra key. After more than once leaving the lock on the rear bumper after I disconnected the tow vehicle, I got a thin steel cable, and drilled the edge of the lock so that I would not have to replace this lock.

Quick heating tea kettle \$25

Boiling water for tea or my Aeropress is a daily ritual. This tea pot is our favorite because it minimizes propane use and can be used on the induction stove.



Electric frothier \$20

We like our cappuccinos with lots of frothed milk or cream. This frothier heats and froths the milk perfectly and is easy to clean. It uses about 500 watts.



Coffee maker & coffee grinder \$75

Of course coffee is the reason to get out of bed. We both prefer organic food items including coffee which means grinding our own beans. Both of us like strong espresso style cappuccino in the morning. My wife likes a stove top espresso maker. I use an AeroPress. Because we might be boondocking, I installed a 2500 watt inverter to be able to use the grinder or frothier or micro-wave even if we had no electric hook-up.

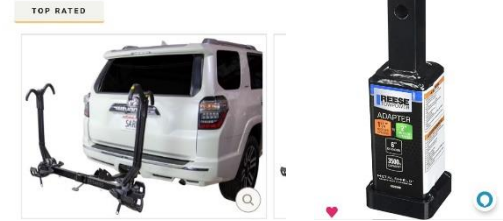


Two bike carrier \$700

We both love mountain biking and have expensive bikes. Together they weigh about 85 pounds. How to best transport the bikes is a serious decision. I moved the spare tire to the front hitch and my Minnie came with a 1 ¼ inch receiver rated for 150 pounds. I wanted a non-bike frame carrier that has the bar that grabs the front tire. My two-bike carrier is a RockyMounts Monorail that is not RV rated but is supposed to hold a total of 120 lbs of bikes. The bouncing actually caused the initial 1 ¼” carrier bar to bend. The manufacturer sent me a 2” replacement. Another brand, Saris, is rated for 2” hitch, RV use. I did re-enforce the camper hitch receiver by welded it to the bumper. Rockymounts sent me a 2” frame component. I purchased a 1.25” to 2” adapter and had it welded in place after cutting the 1 ¼” back to reduce extending it out farther. See description in Exterior Upgrades.

Saris SuperClamp HD 2-Bike Hitch Rack

4.7 | 11 Reviews Item #183678



Visit the BEST STATE Store
Brand: Saris
Saris SuperClamp HD 2-Bike Hitch Rack
4.7 | 11 Reviews



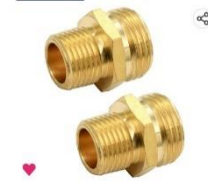
Extra dump slide valve \$20

The cable pulls for the grey and black water dump valves are notorious for getting stuck in the open position, refusing to close. Having an alternate temporary slide valve that uses the same attachment as the dump hose is a quick temporary fix to keep your trip on schedule. It is wise to have this spare part for yourself or another camper you are willing to help out with.

Black Tank Sprayer \$25

The sensors inside the black tank are notorious for showing partial full when the tank is empty. Using the black water spray inlet to flush the tank out after dumping will often help clean the sensors. Adding fresh water with some dawn detergent to the black tank after emptying it will help by sloshing around while towing. We always deposit toilet paper in a trash can. Last technique is to buy the Camco spray attachment and attach it to a hose or an adapter to connect it to the shower hose.

Visit the GESHATEN Store
Brand: GESHATEN
GESHATEN 3/4" GHT Male x 1/2" NPT Male Connector, Brass Garden Hose Fitting, Adapter, Industrial Metal Brass Garden Hose to Pipe Fittings Connect (2 Pack)
4.7 | 11 Reviews



Brand: Vittoria
Vittoria AD1-0184VP Master Blaster RV Tank Cleaning Wand with Power Nozzle - White
4.7 | 11 Reviews



Grey & black tank cleaners \$20

Sensors in the two tanks tend to misread they are partially full after emptying. Adding Dawn detergent to either tank with about 5 gallons of water while traveling is a common method to clear them up. Happy Camper powder added to black tank is commonly done. Some will also add Borax and a water softening additive to either tank to help clean them up while traveling.

Entrance step carpets \$45

Having an extra carpet to wipe your feet before entering the camper is a definite necessity. This package has an extra carpet step but is 23” wide.

Visit the LATCH IT Store
Brand: LATCH IT
LATCH IT RV Step Covers 3 Pack | 23" Wide Camper Step Covers | RV Stair Covers | RV Step Rug Best Fits 8-11" Deep RV Stairs | Keep Your RV Cleaner with Our RV Stair Covers!
4.7 | 11 Reviews



Brake adjusting tool

Minnie brakes are not self-adjusting. The brakes should be adjusted every 3000 miles. This tool is handy for spinning the brake star wheel up until the elevated tire does not spin and then click the star wheel down enough so there is only a small amount of drag. Repeat for all tires. Place floor jack just behind rear tire to lift both tires and securely brace camper before crawling under it.



50 amp to 30 amp converter plug

There may be an outdoor electrical box that has a 50 amp 220 outlet but no 30 amp or the 30 amp is broken. This is a converter plug that takes one side of the 220 and provides 120 at 50 amps for that case.



Tongue security key lock

It is difficult to decide what tongue lock is best from the many choices and size. I picked this lock because it appears to be robust and it allows you to key it to your tow vehicle key. This eliminates having to carry an extra key that could be lost or misplaced when you need it. I also dis-assembles into a small enough package to fit in my pass through cargo tool container.



24 Interior Upgrades

Bedside reading light \$23

My wife likes to read in bed. This bed side usb-c re-chargeable light works great and has dimmer settings .



Cabinet latches \$15

The cabinet doors and drawers have self-closing hinges, but they would still occasionally open while traveling. To remedy this I installed simple spring latches on every door and drawer. I aligned them by first installing the female piece on the cabinet or drawer frame. I then placed double stick tape on the male piece and snapped it into the already installed female piece on the cabinet



frame. I then closed the door or drawer and pressed hard until the male piece stuck to the door or drawer face and then opened it back up. With the piece stuck in place, I used the

smallest drill bit to create a pilot hole, removed the tape and screwed the male piece in place. We have not had any issues with drawers or doors swinging open while traveling.

Caulked bath sink & countertop \$15

The bathroom sink and kitchen countertop get a lot of water splashed on them. I bought the best clear silicone caulk and using a very small tip opening, carefully caulked all the edges that could get water intrusion. I also used silicone caulk around the edges of the bathroom floor and around the toilet.

Shoe compartment \$50

We have multiple pairs of shoes and try to not wear them in the camper. Our 2108FBS queen size bed has a nice sized storage space under the base of the bed that is accessed by lifting the mattress plywood panel. It does take effort to lift this hatch with all the bed coverings. I built a wooden box inside the compartment using pre-painted shelving boards to a depth of a pair of shoes. The shoe box has a plywood cover so the top still provides some storage inside the compartment. The remaining compartment space is used to store water jugs. The shoe compartment into the room required cutting the paneling and trimming the edges with white vinyl outside edge corner molding.



Insulate AC intake cabinet \$25

I took down the ceiling AC cover and sealed up all accessible surfaces inside with foil lined self-sticking insulation wrap I got from Home Depot to reduce leakage into the rafter spaces.

Plastic chain to hold paper towels \$20

The paper towel holder could be mounted on the side wall between the stove and the micro-wave. We decided we wanted it above the stove but on the back wall. We did not want to put screws in the wall, so we installed two hook hangers with double stick tape to the underside of the range vent hood and used a plastic chain to hold the paper towel roll in place.



Pencil & pen removable cup holder \$11

Having a cup to hold assorted pens, mechanical pencils and a black marking pen is an important organizer. The solution was using double stick Velcro tape to attach the cup to the back topside of the dinette table and also one in the kitchen and bathroom countertops. The Velcro has held up well. I keep small sponges soaked wet in the cups in the kitchen and bathroom for easy use and it reduces sponge mold growth when they are kept wet.



Coat & Hat hanging hooks \$12

Stick on Command hooks have held on to the wood trim so far without having to use any screws.

Replaced interior sound system speakers \$28

The interior speakers were marginal. I installed better speakers in the same openings although I did need to slightly enlarge the openings



Visit the Camco Store ★★★★★ 11,434
Camco 42183 Screen Door Cross Bar Handle [Allows for Easier Exit and Protection of RV Screen Doors with Sturdy and Secure Grip]

Screen door support bar \$20

The screen door has no handle to grab to close the door. I added a support bar to the inside of the screen door. This makes it super easy to grab the screen door to close it. Although it is a temptation to use the screen door grab bar to close the main door it is best to use the main door latch to ensure the screen door does not get damaged. I also added a wooden pull knob to the screen door access slide to make it easier to grab.



Indoor outdoor temperature gauge \$45

I like to know what the outside and inside temperature is and even the day of the week. I bought an indoor/outdoor thermometer combination clock, date, and humidity. The outdoor sensor I mounted between the propane tanks so that it is protected from the weather. I mounted the gauge to the right of the camper door as you walk out for easy viewing. The display lights up with a button that's awkward to find, so I indicate the button location with a small piece of white tape.

Visit the La Crosse Technology Store ★★★★★ 1,909
La Crosse Technology 582967 Wireless Digital Personal Weather Station



Flashlight & key rack near the door \$25

A flashlight in a convenient place that is always there, is a god send. Hanging a small LED flashlight using Velcro tape right below the indoor/outdoor temperature gauge near the exterior door works out to be a perfect location to grab and more important to notice it has not been returned to its home base. A key rack above it is also super convenient location as you are always needing to grab truck keys or just check if they have all been returned to the hanger.



Added stop cord & larger box for flip down drawer \$10

The top drawer below the sink is a tiny compartment and the door tends to flip all the way open, spilling its contents. I found a larger plastic box at Target that just fit inside the small space and used corded rope to keep the door from flipping totally open. New kitchen pads and sponges can be safely stored there.

Changed screwed cabinet panels to Velcro with metal pull handles \$25

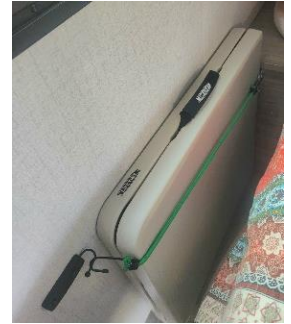
The compartment below the bathroom sink should be occasionally inspected for water leaks or access drain valves. The panel was fixed with screws. I replaced the screws with small metal pulls and added Velcro to the four corners of the paneling. Now we can easily access these extra storage areas by simply pulling the metal pull handles. I did the same under the refrigerator to keep some spare parts in the small space.

Brand: Ripeng ★★★★★ 144
35 Pieces Mini Round Head Knobs Vintage Antique Drawer Metal Round Head Pull Handle Knobs with Screws for Wood Case Drawer Cabinets (Bronze)
Amazon's Choice in Cabinet & Furniture Knobs by Ri...



Hooks & bungee to hold outdoor table \$15

The outdoor table is too large to fit inside the pass through. The 2108FBS has generous space on either side of the bed. On the far side from the door, I installed a hook in the pass through adjoining wall and on the wall of the camper that allows the table to be flush with the exterior wall and bungee strapped in place. This is the location I tried to use double stick tape that tore the vinyl wall covering loose. I ended up screwing the hook to the wall.



Installed piano hinge and lift arm for dinette storage compartments \$50



Visit the Apexstone Store ★★★★★ 2,004
Apexstone 200N/45LB Gas Struts, Gas Shocks, Gas Springs, Gas Strut Lift Support 200N Hinge, Lid Stay, Set of 4



The dinette benches have large storage compartments and small access doors facing the sink and stove. You can access the space by finding another location for both cushions and lifting the plywood base out, but this is awkward. I cut the plywood tops the long length in the exact location that allowed both cushions to be stored up right. I supported the cushion side of the plywood with a 2x2 wood support and permanently secured the cushion side plywood. The long piece of plywood facing the table was attached to the secured plywood with a piano hinge. I covered the hinge with wide vinyl tape. I installed a mechanical lift arm at the far side of the cabinet. Now only the bottom cushion needs to be flipped to an up position and the exposed plywood easily opens exposing the entire storage bin for access. This upgrade is a must as it makes easy access to these two large storage containers.

Reverse countertop extender \$0

For some unknown reason the countertop extender was installed with the long edge projecting into the room, blocking use of the exterior door. I removed it and re-installed it, so the long edge runs parallel with the kitchen sink.



Electric blanket heating pad

I purchased a 6 amp, 12 volt electric blanket that only had the cigarette lighter plug and no adjuster. I cut the wire and connected it to a disconnect two piece plug and then wired to a 10 amp 12 volt dimmer switch that I wired to a 10 amp fuse holder and to a battery circuit. The electric blanket is placed under the bed sheet and the dimmer controller is on the shelf by the bed to adjust lower or turn off or on at night.

Visit the SUPERNIGHT Store 4.2 ★★★★★ 482
SUPERNIGHT LED Light Strip Dimmer, DC12V-24V 30A PWM Dimming Controller for Dimmer Knob Adjust Bright... See more

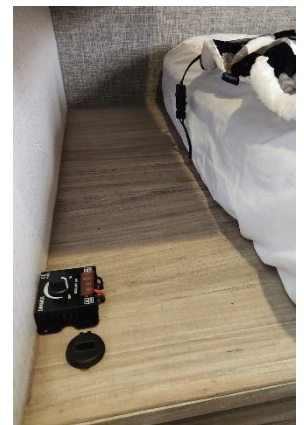


Muzzys 12-14-16-18 AWG Gauge 2 Pin Position Terminal Weather Pack WeatherPack Connector Male Female Set Weather Proof Gauge Gauge Wire Quick Disconnect QD Splice Kit



Westinghouse Heated Car Blanket, 12-Volt Electric Blanket for Car, Truck, SUV, RV, Portable Heated T... See more

Climate Pledge Friendly



Visit the acegoo Store ★★★★★ 250
acegoo 12V LED Ceiling Dome Light, RV Boat Dimmable Puck Light, 12 Volt Overhead Down Light for Camper Van Truck Travel Trailer Cabinet Kitchen Interior Lighting, DC12-24V, 2-Pack (Warm White)



Dimmable dinette light \$20

The light over the dinette can be too bright when sitting at the table. I purchased a dimmable puck light that looks identical to the ceiling lights that came with the camper. It even changes to a warm or bright color.

Shelf where TV was located \$30

We do not watch TV when at home or when camping except to watch movies. Since we watch movies on our laptop or tablet, the TV was un-used and therefore removed. In its place I built a shelf that is hung from the upper cabinet on the exposed corner and held in place with double stick tape on two sides touching a wall and one screw into the wall. This shelf has become a great space to store books, charging cables, wallet, and an extra USB powered fan



USB plug to bed side table & dinette \$60

Visit the Qidoo Store ★★★★★ 917
USB C Car Charger Socket, Qidoo 12V/24V Dual USB Outlet PD3.0 & QC3.0 Car USB Port with LED Voltmeter and ON/OFF Switch DIY Car Socket for Car Boat Marine Bus Truck Golf RV Motorcycle



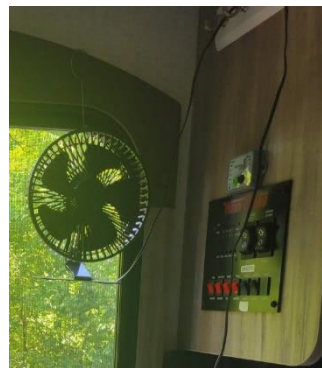
Brand: Tyumen ★★★★★ 89
TYUMEN 50FT 14/2 Gauge Red Black Cable Hookup Electrical Wire LED Strips Extension Wire 12V/24V DC Cable, 14AWG Flexible Wire Extension Cord for LED Ribbon Lamp Tape Lighting



A combination USB C & A that provides faster charging speeds was installed under the dinette table near the exterior wall and beside the right-side bed. The quicker charging speed and convenience of a charger cable on the dinette table has been great. A 1 1/8" core drill made the correct hole size. I used 14 gauge silicone wiring from 4x4 box to the USB plugs. I routed the dinette table cable between the camper frame and coroplast under the camper to the wheel well. From there I drilled up in the bottom edge of the wheel well to get into the dinette storage cabinet. I routed the wire from the back of the storage cabinet to the back of the underside of the dinette table.

12 volt fan hung in doorway \$25

I bought two USB three speed reversible 6.5 inch fans. One we use in different locations in the camper. The other I was able to hang in the right top corner of the entrance door and plug into a USB outlet installed above the sink. This fan moves air from outside into or out of the camper even with the screen door closed.



Visit the xaxia Store ★★★★★ 1,188
xaxia 6" USB Desk Fan, 4 Speeds Small Desk Fan, Ultra Quiet Electric Plug In, 90° Adjustment, Strong Wind, USB Powered, Portable Desktop Table Fan for Home Office



Visit the Camco Store ★★★★★ 7,586
Camco Broom and Dustpan for RVs, Adjustable from 24 to 52 Inches (43623-A)



Broom & broom storage \$25

A combination foldable, collapsible broom and dustpan are a necessity to sweep up sand and other dirt that gets tracked inside the camper. The very bottom cabinet compartment under the original TV location has the back half blocked off to protect wiring to an AC outlet. I removed the backing, pushed the wires further back and installed a plywood shelf inside the compartment that would just fit the broom with a stop to prevent it from going too far into

the shelf. There is space below it to store odds and ends.

Slide out drawers in dinette storage cabinet \$100

I found a sliding shelf assembly that would allow two shelves to just fit inside the door to the left side dinette storage compartment. The lower shelf was raised so it cleared the lip of the doorway opening. I built a plywood box inside the storage compartment to install the sliding shelves. The lower shelf is now a convenient tool storage drawer. Now when a tape measure or tool is needed, it is easily obtained by opening the cabinet door and pulling out the bottom shelf.



Visit the DINDON Store ★★★★☆ 16
DINDON 1 Tier Pull Out Cabinet Organizer (11" W x 18" D) Heavy-Duty Metal Sliding Drawer Shelf, Slide Out Wire Basket for Kitchen Cabinets, Pantry, Bathroom, Chrome Finish...



Added second shelf above bed \$80

We have found the shelf above our bed is perfect for storing our clean clothes in separate mesh bags. I added a second shelf below it to increase the area as we start camping in cooler weather and need more clothes storage. I tried mixing and matching different grey stains to match the wood and bolted the shelf to the side walls using a wooden block on the inside.



Cell phone booster

The camper booster reduces the cell phone service which is often very weak. I installed the SolidRF exterior antenna on the top of the ladder which allows it to be laid down while towing. The cord was routed through the bumper corner guard and then into the camper from underside. Inside I had power supply under the dinette storage compartment and even added an on and off switch as it does draw power off the battery. The interior antenna is left loose on the dinette table. Your cell phone needs to be within a few feet of the interior antenna to provide boost.

Visit the SolidRF Store ★★★★☆ (3.8) 81
SolidRF-Cell Phone Booster for RV Truck-Vehicle Cell Phone Booster Compatible with All Carriers Networks- Boosts 3G 4G LTE Signal-5G Ready for Bands 12/13/17/19/21/25/4-FCC Approved



13 Exterior Upgrades

Propane gauges on the tanks & Bluetooth gauges \$125

The camper came with no propane gauges. Short propane connection extenders can be purchased that include a gauge. They do not display the actual amount of propane left in the tank but do provide an indicator that the tank is full or empty. They are not that accurate, and temperature can affect them. Bluetooth propane gauges are expensive but well worth it because they offer an accurate way to see the propane level of each tank with the push of a button. Sensors are placed under each propane tank that Bluetooth to an indicator gauge inside the camper. The sensor CR2032 battery for each tank sensor needs to be replaced every season so best to order extra batteries. The indoor display unit battery lasts for years. Occasionally I have had to use my cell phone app and the green re-sync button on the sensors to re-connect them with the display. One issue is forgetting they are magnetically stuck to the bottom of the tanks when changing or re-filling the tanks and then losing one of them.



Camco Vent Cover, White

Bath fan roof rain cover \$45

In order to be able to keep the rear bathroom vent window open I installed a fan roof cover. The one I purchased was able to be bolted to the existing operable skylight roof frame without needing to drill through the roof coating. The skylight still opens about 75% of its maximum.

Rotate Tongue Jack

When hooking or unhooking the camper to the tow vehicle, rotating the electric jack motor sideways makes it easier to high step over the tongue to work both sides. The motor is held in place on top of the stem with two threaded bolts. Once the bolts are removed the jack motor can be lifted up and set to the side. The jack shaft needs to be carefully drilled in perpendicular location to the existing holes. The holes are then taped with the correct tape size of the existing bolts. The motor head is then replaced in the new rotated position and the bolts tightened into the new taped holes.



Moved spare tire to underside of front \$25

wanted to use the rear hitch receiver for a two-bike carrier so the spare tire needed another home. Another camper had bolted tire to the front hitch frame. My battery had already been exchanged for a Life4Po and moved into the pass through, so the old battery location gave me room to work. I



a Unistrut to fit across the old battery holding frame. I was able to use a Unistrut 1/2" threaded rod holder and two nuts to suspend the rod below the frame. Using only one of the spare tire bolt holes I was able to clamp the tire tight to the bottom of the frame. Two nuts and large washer were used to keep the tire secure. I had to position the tire as far back as possible to clear the propane hoses. This did reduce the ground clearance a few inches but fortunately these Minnies have lots of clearance to start with.

Installed keyless entry lock \$215

I replaced the camper entrance lock with a keypad keyless unit. We love not having to carry a key and so far, the battery has lasted a year and a half. I always keep a spare key in the glove box of the truck in case the battery dies.

Visit the RVLock Store
RVLock V4 Key Fob and Keyless Entry Keypad, RV/Motor Home Door Lock Accessories



Visit the Camco Store
Camco Offset Cam Lock | Features an Easy Turn Thumb-Operated Style Lock Twist, a Durable Plated Steel Construction, and Includes (1) 7/8-Inch Offset and (1) Straight CAM (#4523)
Amazon's Choice in RV Locks by Camco

Replaced outdoor shower key lock with thumb latch \$15

For some dumb reason the camper outdoor shower cabinet came with a key lock. I replaced the keylock with a thumb latch. Although we don't use this shower hose much, the cabinet has become my convenient storage space for my 30 amp to 20 amp converter plug.



Installed drip edges for exterior hatches and windows \$45

Water leakage is the enemy of any camper or home. I added stick on, drip edge, water diverters above all the windows and operable doors to minimize rain getting in. They come in white and black. I chose black. So far, the stick-on tape has held.

Visit the TRIM-LOK Store
Trim-Lok Drip Rail, Black - 1/2" Height, 25' Length - PVC Plastic Rain Gutter for Cars, Vans, and RVs, Easy to Install! Flexible Drip Rail Molding to Control Water Runoff, Durable 3M Tape Included



Fresh water tank drain \$60



The fresh water tank drain valve requires climbing under the camper and draining directly on the ground. I cut off the drain and used PEX brass elbow and clamp to route the piping to the frame of the camper for easier access and to be able to attach a hose to divert draining water further away. The hose bib also provides an easy access if I need to transfer water to another container. To minimize freeze-up I added a valve close to the tank and insulated it with expanding foam. The hose bib bracket was a Unistrut that I cut with a grinder to provide support for the hose bib.

Weather coated and insulated wheel wells \$100

The wheel wells are galvanized sheet metal exposed on the inside and outside. I spray coated the outside with undercoating to minimize future corrosion. The heat loss this bare metal is right next to the water pump and sink water lines. Insulating the metal from the inside is difficult because of all the obstacles but is what others have done. The slide side is very difficult to get to. I used one inch and two-inch Thermax rigid insulation board on the outside and then a layer of 1/8 inch vinyl board to protect it. There was plenty of clearance from the tires. I used some fastening glue to adhere the layers but needed to use large washers and tap screws that grabbed the sheet metal. Fortunately, the screws did not damage any inside wiring.



of

Zip ties to secure propane access door \$2

The propane access lid has been known to fly off, if it becomes un-attached during transport. A few drill holes and two zip ties allow the door to be opened but prevents it from disappearing.



Welded rear bumper to receiver hitch \$45 + Neighbor's welder

We ride full suspension e-mountain bikes that are the lightest I could find. The two e-bikes are 43 pounds each. The bike rack weighs another 45 pounds. Total weight is about 132 pounds. The 1 1/4 hitch is rated at 150 pound maximum. **To increase the strength of the hitch and reduce twisting, I bought angle iron and had two pieces welded from the side of the hitch to the bumper.** The receiver worked good but my RockyMounts 1 1/4" bike rack bent. The company graciously sent me the 2" frame component. I purchased a 1/1/4" to 2" adapter and welded it to the 1 1/4' receiver after cutting off a few inches to reduce the added length. The tongue weight is reduced half a pound for every pound on the rear hitch. My tongue weight with a fully loaded camper is a around 550 pounds or 11%.



Visit the Reese Store
Reese Towpower 7020500 1-1/4" to 2" Receiver Adapter - 6" Long - Black
Amazon's Choice in Towing Hitch Receivers by Reese



Outside paper towel holder \$15

Having access to paper towels after completing a dump station emptying is appreciated. I used electrical conduit clamps and 12" and minnie bungies to make paper towel holders on either side of the front camper frame. It is tucked far enough under the frame to stay dry even when traveling in the rain.

Visit the Alex Tech Store
Alex Tech 2581 - 3/4 inch Cord Protector Wire Loom
Tubing Cable Sleeve Split Slicing For USB Cable Power Cord Audio Video Cable - Protect Cat From Chewing Cords - Black
Amazon's Choice in Cable Sleeves by Alex Tech



Brake line protectors \$30

The hydraulic brake lines are exposed to road salt and other exposure. I installed plastic wiring protectors that are open on the long edge and easy to install.

Propane connection to grill + extra propane hose \$25

The outdoor portable grill was set up to only use propane cartridges. I bought a fitting to allow a standard propane hose to be connected from the Minnie outdoor propane fitting to the grill regulator. I also bought a second propane hose to allow the grill to be installed on the picnic table included at most RV sites.

Visit the Camco Store
Camco Propane Quick-Connect Fitting Allows You to Add a Convenient Connect/Disconnect Method to Your Low Pressure Appliances, 1/4" NPT x Full Flow Male Plug (59905)



Exterior USB outlet \$35

I installed a fast charge combination USB A & C outlet outside in the fender skirting. Often while sitting outside at the portable table, I need to charge my cell phone or tablet. Although the outdoor 120 volt outlet could be used with shore power, the new USB outlet works off the battery while boondocking. I used 14 gauge silicone wiring to power it.

Visit the Linkstyle Store
12V USB Outlet, Dual Quick Charge 3.0 12V Socket USB Charger and PD Type-C (USB C), 12V 24V USB Charger, Waterproof Power Socket Adapter, Car Charger Adapter for RV Marine Motorcycle Truck Golf Cart RV



Rear bumper broom holder \$5

normal size broom is handy to sweep off the roof or the outdoor carpet or knock leaves and water off the awning when you are retracting it. But there is no place to store it in the Minnie. I rigged up two bungies by drilling some strategic holes to hold an outdoor broom on top of the rear bumper.

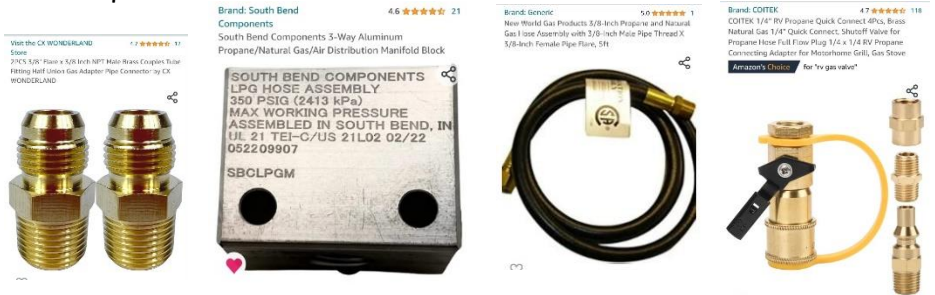


Changed outdoor outlet to be powered by Inverter \$0

We often need to charge our E-Bikes using the outdoor outlet or run the portable electric stove when we have no shore power. Changing this outlet to the inverter allows us to use the outdoor outlet whether we have shore power or not by simply activating the inverter.

Added outside rear propane connection outlet \$70

Using the outdoor propane grill sometimes works best towards the rear of the camper rather than the front. There was a rear 3/8 NPT plug in the 4 way propane connector. I installed a four foot propane hose to route it to the rear of the camper into a three way block that I attached to the frame. I bought a 1/4 NPT propane valve quick disconnect to set up the connection for my gas grill hose.



7 Pass Through Storage Upgrades

Carpet pass through floor \$0

I stabled some extra carpeting I had to the entire floor of the pass though to keep things from sliding around while traveling. It is appreciated when half crawling into the pass through to get something in the middle or just sliding storage boxes in and out.



Hanging hook for emergency crank arms \$7

Plastic hanging hooks with double stick tape are easy to install on the front facing wall to hold the emergency backup cranking arm which I have never needed to use. It will work on the jack and the stabilizer arm cranks.



Hung Chock-X with screws \$90

I bought Chock-X tire wedges. On flat ground they are not needed but on sloped ground when I need to double secure the camper they really help and reduce the slight camper rocking. I installed two screws to hang them from, on the front side pass through framing to keep them out of the way.



Second pass through light \$15

The Minnie came with one light on the passenger side of the pass through. I wired a 2nd identical style light on the driver's side for lighting near the battery disconnect switch. My electrical junction box makes extra 12 volt wiring easy.



Installed wooden slides at pass through entrances \$4

Sliding plastic containers in and out of the pass through will sooner than later destroy the pass through door weatherstripping. I cut a 2x4 down to a height just higher than the weatherstripping and with some additional notching attached it to the pass through plywood floor. This is a very important upgrade, and it makes getting the containers in and out of the pass through easier as you slide them on the wood rather than the door metal framing.

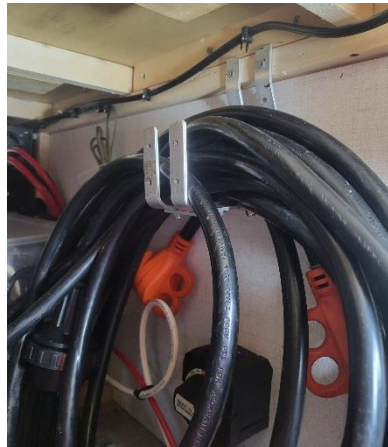


Hung service circuit protector \$8

Anything you can hang provides easy access and more important, is always in the same location when you need it. The bracket for this came from either Home Depot or Lowes.

Custom bracket for shore power cords & propane hoses & stabilizer pads \$15

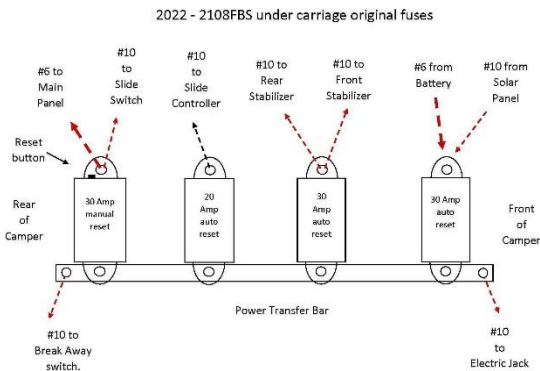
I tried locating hangers for the items stored in the pass through, but nothing worked well. Instead, I bought 1/8" by 1.5" aluminum bars and using a bench press to shape them for all the different things I wanted to hang on the walls of the pass through. I used these custom hangers for two 30 amp cords, two propane hoses, and stabilizer pads.



9 Electrical Upgrades

Converted to Life4Po battery compatible converter \$150

The Minie converter is only setup for lead acid and AGM batteries. In order to use a lithium Life4Po battery, a component of the converter needs to be replaced. The main electrical control box remains in place. I called the manufacturer to make sure I was ordering the right replacement part. The new component has a flip switch to use Life4Po batteries. The change out requires careful removal and re-connection of wires in the identical sockets in the new component.



Front under-carriage 12 volt fuse block wiring

This is a wiring diagram of the 4 fuses that are exposed to the weather by being bolted to the camper drivers side front frame. There is one reset button on the rear fuse block. The other three fuse blocks have auto time delayed reset function. I ended up rewiring all these fuses.

Installed two LiFePO4 lithium batteries in pass through \$700

Visit the LiTime Store ★★★★★ 867
 LiTime 12V 100Ah MINI LiFePO4 Lithium Battery,
 Upgraded 100A BMS, 10-Year Lifespan with Up to
 15000 Cycles, Max. 1280Wh Energy LiFePO4 Battery in
 Small Size, Perfect for RV, Solar, Trolling Motor



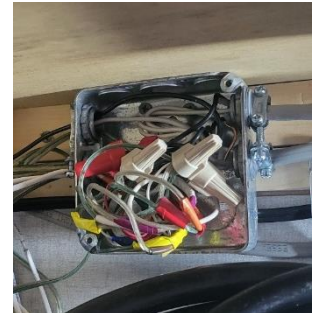
Lithium batteries will discharge when the temperature is below freezing but charging them when the battery is below freezing can reduce the battery performance. Moving the batteries into the pass through allows the battery to be exposed to the cabin heat when occupied. Fortunately, the original cable routed to the lead acid battery was able to be re-routed into the pass through so the existing wiring could be used. I first installed the 100 amp hour lithium battery towards the center of the rear facing wall in the pass through and then later purchased a 2nd 100 amp hour battery. The LiTimes Life4Po batteries have worked fine so far. I did need to use #2 awg wire to connect the two batteries in parallel because my 2500 watt inverter can draw as much as 200 amps out of the batteries. A 1/0 cable may have been a better choice. If I started over I would have bought one 200 AH battery. You need to balance the voltage of the two batteries before using them. Contact battery company about this procedure.



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4X4 Electrical box above the batteries \$5

Wiring up gauges and accessories directly off the battery can cause a mess of different wires. To keep it organized I installed a stacked 4x4 electrical box above the battery. 12 gauge wire was routed from the negative shunt and the positive terminal up into the 4X4 box. A fuse holder and fuse was installed on the positive wire. All accessory and gauge wires could then be routed into the 4X4 box rather than crowding up the top of the battery. I labeled the fuse holder.



Voltage gauge in pass through \$12

Visit the Linkstyle Store ★★★★★ 2,654
 DC 12V 24V Car Voltmeter with LED Digital Display and
 Mounting Plate, Waterproof Voltage Gauge Meter with
 Terminals for Boat Marine Vehicle Motorcycle Truck,
 Round Voltage Gauge Meter with Red Light



I installed a small battery voltage display to provide a visual indicator of the battery status in a convenient location.

Inside the passenger side pass through in the Minnie is a triangular box that covers wires routed through the floor. The side face of this box was a perfect place to mount this gauge which is wired to the positive and negative terminals of the battery in the 4x4 electrical box. Every time I flip up the pass through door I can see my battery voltage. Next to the gauge on the wall is a printout of battery capacity based on voltage. I generally run about 13.1 to 13.3 volts at night if I am not plugged in. During the day or when plugged in, the battery will show higher voltage from the solar charging going to the battery. If my lithium battery goes to 12.9 volts, I know it is getting depleted and will need some extra charging.



Second solar panel \$300



If you like to stay at state or national parks or boondock you will often be without an electric hook up. The Renogy 200 watt panel was about \$250. You also need a tube of décor caulk and the Renogy mounting hardware as well as double splitter cables. I used #12 stainless 1" pan head screws to attach the panel brackets to the roof with caulk under the panel brackets to the roof with caulk under the bracket and on top of the screws. I also added an aluminum air foil in front of the panel.



Moved under carriage fuses \$50

There are four box fuses mounted on the inside of the driver's side frame that are directly exposed to rain and water splash while being towed. The rear most fuse has a tiny reset button on the top of it. This 30 amp fuse powers the 12 volt fuses in the camper main disconnect panel and the power for the slide switch. The other three fuse boxes are auto reset fuses after a delay. The second from the rear is a 20 amp yellow fuse box that powers the slide controller. The second from the front green 30 amp fuse box powers the front and rear stabilizers. The front 30 amp green fuse box accepts power from the battery and the solar panel and it powers all the other fuses with the lower copper transfer bar. On front end of the transfer bar is the connections to the electric jack and on the rear end of the bar is the connection to the breakaway switch for the trailer brakes. In decide to replace these box fuses with a six gang fuse holder that included individual LED lights to indicate a blown fuse. Unfortunately I did not pre test the lights and only two out of 6 worked. I will need to buy fuses that light up when blown to compensate or replace this block. The solar and electric jack wires were two short so I solder connected additional #10 gauge wire to extend them. I installed a new flip fuse breaker to accept the power from the battery and solar panel and the six circuit fuse block under the pass-through against the side to side frame. This location is very dry and protected and easy to see the fuses. I routed a #10 wire from flip breaker into the nearby 4x4 connection box and wired nut connected it to the electric jack source and the break-away switch for the trailer brakes.



2500 watt inverter in pass through wired to sink and microwave 120 volt outlets \$450



There are five important appliances I want to run if we are not plugged in, microwave, coffee grinder, milk frother, magnetic stove & UV water light. The biggest draw is the microwave at 1400 watts. I researched the minimum inverter size to

convert the 13 volt DC battery to 120 volt AC and was told at least 2000 watts because of startup wattage but better 2500 watts. I did wire a transfer switch to also run the AC but I can only run it for an hour with my 200 AH battery. The inverter requires large but rather short wiring supplied with the unit. I ended up mounting a Pure Sine Wave 2500 watt inverter above the battery with the on off inverter switch wired inside the camper to the panel beside the bed. This makes it easy to turn the inverter on or off. I decided not to wire the inverter into my shore power inlet of the converter as I was

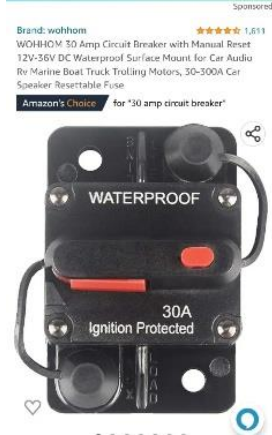
cautiously not wanting the inverter to also power all the 12 volt appliances and lights as the converter. I decided to instead install four new 120 volt outlets solely powered by the inverter when it was turned on. I ran 12 gauge wire from the inverter in the pass through to a junction box under the sink and then routed 14 gauge wiring to a new outlet installed on the side wall of the sink and a new outlet installed in the cabinet above the sink and an outlet under dinette table in the front storage cabinet wall. I was able to fish a wire up the refrigerator wall and behind the microwave to the upper cabinet outlet. There are now two outlets on the sink side wall and two outlets in the cabinet above the sink. Each is labeled inverter or shore power. Third outlet is for UV light under the sink. The dinette outlet is to charge the laptop when boondocking.



When the inverter is being used, the plug for the microwave needs to be changed to the inverter outlet. In testing the battery capacity using the inverter, it took 40 minutes of micro-wave run time with it being used on and off to deplete 100 AH battery. I re-wired outside outlet to run off the inverter to be able to use the portable induction stove outside when on battery. If on shore power I can still run the inverter to power this outlet. If I was to start over, I would instead install an automatic by-pass transfer switch that automatically switches back and forth between shore power and inverter power so all the camper 110 outlets would work off the battery rather than having duplicate outlets.

Visit the [VOLTWORKS Store](#) ★★★★★ 238
Pure Sine Wave 2500 Watt Car Power Inverter 2500w
Converter DC 12V to 110V-120V AC with LCD Display 2
AC Outlets 2x2.4A USB Ports 1 AC Terminal Block
Remote Control[3 Years Warranty] by VOLTWORKS





Truck alternator DC to DC 30 amp camper battery charger \$525

If you are without shore power and sunlight for three days or more you will eventually run out of battery capacity. There are two solutions for this, have a generator or use the alternator on your truck.



The generator solution allows you to run AC if your generator

or is large enough and you install a soft start option on the AC. This however requires having a place to store a generator along with one or more gas cans. I have inflatable kayaks and mountain bike gear in the back of my pickup with no easy place for a generator. I instead wired up my Ram 1500 Eco-diesel alternator to charge the camper battery. The installation requires heavy gauge #4 all copper wire routed from the truck battery all the way to the terminals of the camper battery. A Victron smart DC to DC controller needs to be installed. After reading numerous reviews I went with Victron rather than the cheaper Renogy. I installed a combination 30 amp fuse and disconnect on top of the truck battery. I have to open the engine hood to turn it on or off. Heavy duty Anderson style disconnect plug needs to be installed between the truck and the camper to disconnect the wiring when unhooking. When my camper battery was depleted, it took about two hours of truck idling at a non-electric site to bring the battery back up to 70%. It took all day to install the wiring and required special crimping pliers for the connections but the peace of mind knowing I can charge the battery any time day or night is worth it. Another advantage is being able to fully charge the battery while towing. One downside is I forgot to turn the charger off when my truck sat idle for a few weeks and the Victron unit ran my truck battery down to a few volts and I had to replace the truck battery.

Brand: Polarlander
Polarlander 12/24V Outlet Marine Boat Caravan Car
Cigarette Lighter Splitter Power Socket Adapter
Connector

12 volt cigarette sockets on either side of pass through for tire inflator \$25



My tire pressure monitors for the truck and camper let you know if any or all the tires need extra air pressure. Using a gas station tire fill is certainly the cheapest solution. Having your own inflator however is peace of mind. The inflator I bought is small and easy to pack. The inflator runs on 12 volts using a cigarette adaptor which is not included in the Minnie. Of course, I could maneuver the truck to provide the outlet power but that is not always convenient either. I bought two cigarette outlets and installed them in the ceiling of either side of the pass through. The 12 volt cord is just long enough so the inflator hose reaches the camper tires.

Solar disconnect switch when temperature is below freezing \$15

The solar panels should not be charging the battery when the lithium battery is below freezing. The Minnie battery disconnect does not disconnect the solar panels from providing a charge to the battery. The Minnie solar controller does have a 30 amp fuse holder directly below the controller. The fuse can be removed. I decided to replace the fuse holder with a 30 amp fuse on off disconnect. This allows easy shut off if the temperature is going below freezing and the camper is not heated to protect the LiFePo batteries.



AC Soft Start

The AC has a large amperage spike when it starts up. This can pop breakers if you are plugged into a 20 or 15 amp service. It also increases the required size of a generator. A soft start kit has a controller and capacitor inside it that starts the AC slowly so there is no spike. The soft start must be matched to your AC model and you must carefully follow the installation instructions because it requires re-wiring the controls inside the compressor unit on the roof. I watched a video and carefully followed all the instructions. I then tested the AC start up and the wattage slowly increased up to its running wattage of about 1300 watts.



Wattage & charging meter \$100

I initially bought a \$15 wattage meter but it did not display charging input current. A 2nd unit I installed to display charging never seemed to work correctly and eventually stopped working. I tore out all the wiring for these two units and after review of Renogy and Victron power displays I decided I did not want cell phone feature. I ordered a 500 amp version display from my battery company LiTime. It requires installing a new shunt which did not include the cable from the shunt to the battery negative terminal. I ordered that separately. The unit came with 20 foot multi wire to remote locate the display. I installed it on the lower kitchen cabinet wall as you enter the camper. This display gives me true battery capacity and what amount of amperage is going into or out of the battery.



Grey and freshwater level sensors

The tank level sensors that come with the camper are notorious for displaying the wrong levels. The fresh water tank is usually close but not very specific. The grey tank has no flush option so it goes bad. The black tank at least has a flush option that will often clear the sensors and the black tank level can be checked using a flashlight shined into the open toilet valve. Mopeka now offers grey and fresh

water sensors that display through an app on your smart phone. They are pricey but I decided to try them out. To allow access to the sensors I also bought 8" round access panels. You need to 1st locate the center of the tanks using shop floor plan drawings for your model camper. Circular holes need to be carefully cut in the bottom center of each tank location in the coroplast. The coroplast is only 1/4" thick so be very careful you don't cut wires or the plastic tanks. I cut circular 1/2" plywood rings to place above the coroplast to attach the access panels to. The sensors have self stick retaining rings to hold them in place. The fresh water tank sensor should be set to 7" tank height and the grey water to 6" tank height to get the best readings.

Visit the SEAFLO Store 4.6 ★★★★★ 1,363
SEAFLO 4" - 8" Black Circular Non Slip Inspection Hatch w/Detachable Cover



Visit the Mopeka Store 4.0 ★★★★★ 54
Mopeka Pro Check Water Sensor with Mounting Collar - Wireless Sonar Tank Monitor for Gray and Potable RV Holding Tanks



22 Bathroom & Kitchen & Plumbing Upgrades

Water Pressure gauge & 90 degree shut off \$40

Along with the pressure reducing fitting, I use a water pressure gauge as an additional safety check. I also found a brass elbow with a shut off that is very handy when filling the camper with water or disconnecting the hose or using the hose to do some cleaning after disconnecting from the camper.

Visit the Kinr Tool Store ★★★★★ 763
30° Tied 90 Degree Garden Hose Adapter with Bleed Off Valve, 1/4" Solid Brass Garden Hose Elbow Connector with 2 Extra Pressure Washers (1)



Visit the RVGuard Store ★★★★★ 6,740
RVGuard RV Water Pressure Regulator Valve, Brass Lead-Free Adjustable Water Pressure Reducer with Gauge and Inlet Screen Filter for RV Camper Travel Trailer



Visit the Camco Store ★★★★★ 9,885
Camco Magnetic Bumper Cap with Lug Fitting End | Fits Standard RV 4" Square Bumpers | Features Small Holes to Increase Airflow and Block Insects (40311), Black



Rhino dump hose stored in bumper \$28

The Rhino hose will fit into the rear square bumper if the knobs of the end caps are ground down a small amount. Magnetic hose caps are used to hold the hose in place. Be sure to shake out excess water from the hose before placing the hose in the bumper.

Dump hose elbows attached to frame \$40

Instead of putting wet dump hose elbows in a pass through container, I purchased several hose end caps and attached them with self-tapping screws to the frame of the camper near the dump valves. To make sure it does not fall off while traveling, I added a hook and short small black bungee cable that is attached through the cap to secure it.



Replacement Vortex bath fan \$50

The small bath fan blades that came with the Minnie is only partially covering the opening. I purchased the less expensive Heng's Vortex II fan that does not require any roof modifications. This fan has three forward speeds and two reverse. It is a louder fan than the higher quality Maxx Air fan but that fan requires the entire roof mounted assemble to be removed. In the future I might upgrade to that fan.



Recessed toilet paper holder \$25

There was no toilet paper holder included with the Minnie. I installed a recessed toilet paper in the panel covering the water heater. It required wood bracing to be installed inside the water heater cabinet to secure the metal holder.



Reset dinette table lower \$0

The dinette table sits higher than is comfortable for me to work. I removed the screws from the supports under the table and reset them to allow the table to be set lower.

Shower soap holder & washcloth hangers \$20

This soap holder we found at a campsite store is easily stuck to the shower wall and allows the soap to dry out between usage. Plastic self-stick hangers are easy to install to hold wash cloths.



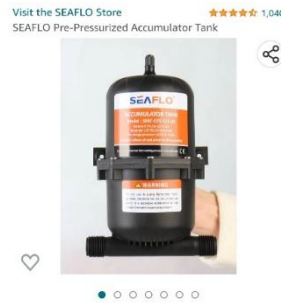
Magnetic holds and lifts to allow access to water pump \$10

The floor panel covering the water pump compartment was screwed in place. There are cold nights when you want to expose this area to camper heat. I replaced the screw holes with small pull handles and used small magnets inserted into the wood frame to keep the floor flat. Velcro strips will also work for this. This also makes it easy to check for any leaks if the water pump is cycling when no water is being used. I used these small pull handles for all the other access panels that originally had screws and used stick on Velcro strips to hold the panels in place. This includes the panel next to the space heater and the panel under the bathroom sink. Both of these spaces are now used for extra storage compartments.



Accumulator for water pump \$45

The water pump cycles a lot when using the water at either sink. To reduce this and provide steady water pressure I installed an accumulator tank in line with the pressure side of the pump. It just fit in the pump compartment after I trimmed some excess water hose which was vibrating against the side paneling.



Bungee to hold shower door open \$2



A simple fix for the shower door moving while traveling is wrapping a short bungee around the towel bar and having the two bungee hooks grabbing the shower sliding door.

Wedged cut yoga blocks under the shower pan \$15

The shower stall floor flexes more than I am comfortable with. I cut pieces of yoga block and was able to wedge them under the shower pan through the small access panel. The shower pan still flexes but is certainly better.



Two fans for refrigerator interior cooling fins \$45

We have the combination propane electric refrigerator. So far it has functioned flawlessly and uses very little propane when we are off grid or traveling. The fins in the back of this unit provide the cooling and can frost up. To increase the refrigerator performance and reduce freeze up, I installed two low wattage IP67 waterproof five inch fans directly in front of the fins. The fans came from Cooler Guys online store. The power for them comes from the refrigerator interior light. Trickiest part was getting the refrigerator light cover off. The fans are held to the fins using zip ties and alligator clips.



Caulked Bathroom sink and around bathroom flooring \$10

Water is always spilling around the bathroom sink and occasionally the toilet Bidet has been left on and flooded the floor or the toilet has spilled out. Using high grade silicone caulk, I sealed around the bathroom sink and countertop wall edges as well as around the edges of the bathroom floor and toilet to minimize water intrusion where it would not dry.

Two fans for refrigerator roof vent \$50

While installing the refrigerator interior fans I ordered two 6 inch IP67 waterproof fans also from Cooler Guys. I installed these up on the roof under the refrigerator cooling cover. I wired them from the DC circuit that powers the refrigerator light. Between the power source and the roof fans I installed a thermostat gauge that allows adjustable temperature settings. I set the temperature for 100 degrees. If the vent cavity gets to 100 degrees the roof fans will operate.



Visit the Dometic Store
Dometic 310 RV Toilet, White, Standard Height

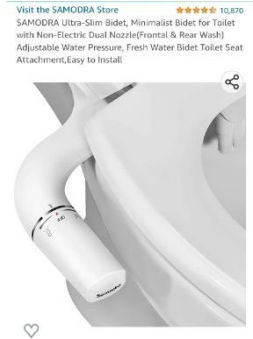


New 310 Porcelain toilet \$250

The Dometic 300 all plastic toilet that comes with the Minnie has been known to trap waste material where it cannot be flushed out. The 310 upgrade is porcelain instead of plastic and has a replaceable seat. I didn't want to take a chance on the 300 model going bad plus I wanted to install a bidet. The Dometic 310 was an easy change out.

Bidet on toilet \$35

We do the sailboat duty of not flushing toilet paper down the john to avoid clogs and messing up the tank sensors. The bidet reduces toilet paper usage and is an easy inexpensive install. I did included a shut off valve in the piping. Only issue has been twice I have left the bidet valve slightly on and the un-noticed trickle of water eventually overflowed and spilled onto the floor.

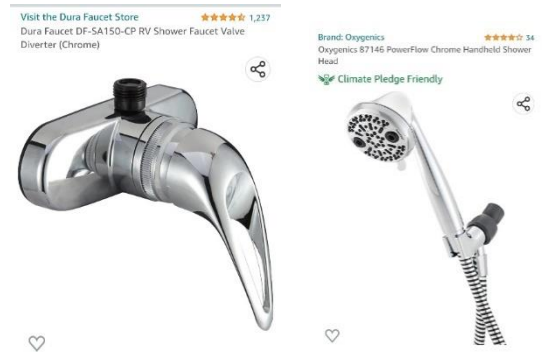


Cut slot in shower hose holder \$0

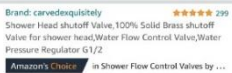
A simple upgrade is to use a jig saw to notch the shower hose plastic holder so you can move the shower head to any position. We leave the shower head in a plastic rinse bucket on the shower base to avoid it crashing down while traveling.

Oxygenator shower head with Single handle shower valve \$65

The shower head and double handle shower valve are about the cheapest you can get. Adjusting water temperature with a double handle tends to waste water. I replaced the shower head with an oxygenator shower head and the double valve with a single handle controller. The valve controller was an easy switch and I used clear silicone caulk to make sure it was watertight.



Shower shut off valve \$10



A simple shut off valve attached just above the shower control valve allows reducing or shutting off the water while soaping in the shower without changing the water temperature. Water saving is mandatory to minimize filling your tanks and having to make an extra trip to dump your tanks. Many State and National Park campgrounds have no onsite electric and water and rarely have sewer hookups. At these sites we prefill our fresh water tank and always minimize water usage. We keep a plastic sink dishwashing bucket in the kitchen sink and shower to catch some of our water usage and add it to the black tank or dump outside since if appropriate. The grey tank always fills before the black tank.

Added insulation to hot water heater and other locations \$5

The water heater tank has a thin aluminum faced bubble insulation wrap. I had some extra 23" wide 3.5" fiber glass insulation from a house project. I cut a 38" length out of the fiberglass roll and wrapped it around the water heater tank for additional insulation. I left the front of the tank with the by-pass valves exposed. I also used some of the fiberglass to insulate the hole through the floorboards under the shower and an open hole in the exterior rear wall next to the water heater. I used expanding foam insulation to insulate around the exposed three fill pipes that penetrate the exterior shell.

Air compressor to water line adapter \$20



The typical way to winterize a camper is to alter the water pump intake to draw in anti-freeze from a gallon container and flush this through your system. An alternate method is to use an air compressor set to 30 or maximum of 40 psi and blow air through the shore water inlet until all the lines have been cleared of water. The standard method of draining the water heater, water tank, grey tank and black tank and any other drain valves still needs to be done first. When it is time to refill the camper with water there is no anti-freeze that needs to be flushed out.

Brand: Vibrant Yard Co. LLC ★★★★★ 518
Water Blowout Quick Connect Plug Fittings for Air Compressor, Winterize Kit for RV, Camper, Outdoor Plumbing, Garden Hose, and Sprinkler Systems (One Pair)
Amazon's Choice for "air hose adapter"



Care must be taken to ensure the water pump and all lines have been blown clear of any water. A compressor hose barb to hose male fitting needs to be purchased to make the connection from the compressor to the camper water lines.

Water Filter and UV light \$300

To be sure the water is OK to drink, we always use the standard Camco blue water filter when filling up the fresh water tank or hooking up to an available faucet. For added water filtering I installed a FizzLife single 0.5 micron cartridge filter and then installed an iSpring 1 GPM UV filter. I bought a 1/2 inch pex Tee to 1/4" inch compression fitting that included a valve. I used automotive fuel injector hose clamps to secure the pex to the rubber pipe Winnebago installs. The UV light offsets from the wall with a 2X3 to allow replacement of the UV light. The UV filter requires a 110 volt electric outlet that I installed on the back wall of the under sink cabinet. My Inverter powers this duplex outlet so whether I have shore power or on battery only, I turn the inverter on to activate the UV light. Having an easy water bottle filling and cooking water source is a great feature that I highly recommend.

Visit the FRIZZLIFE Store ★★★★★ 87
Frizzlife SW10F Under Sink Water Filter System with Brushed Nickel Faucet, NSF/ANSI 53&42 Certified, Reduces 99.99% Lead, Chlorine, Bad Taste & Odor, 8K Gallons High Capacity, 0.5 Micron, USA Tech



Visit the iSpring Store ★★★★★ 298
iSpring UVF11A UV Ultraviolet Light Water Filter with Smart Flow Control Switch 11W, 110V, 10-INCH
Amazon's Choice in Under-Sink & Countertop Filtra...



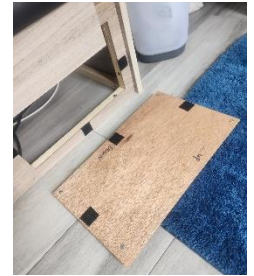
6 Slide Out Upgrades

Slide out topper \$350

For me, anything to keep the slide working smoothly is worth the extra effort and money. Slide out jamming is the nightmare of any camper. I ordered a topper when I purchased the camper and had the RV shop install it. It is the only thing extra the RV shop has installed on my camper.

Velcro slide controller and entrance cover

The slide controller is set way back under the right side dinette cushion and only accessible from a small panel opening. I added small pull handles in place of the screws and stick on Velcro to attach the panel to the frame. I removed the screws from the slide controller and also used Velcro to hold it to the exterior wall so it can be moved into the cabin if I need to more carefully check out the codes it displays. When the slide is in you have to pull the controller from the wall so you can see it.



Stainless plates under the slide rollers



I saw a video of a camper with rotted plywood on the underside of his slide. His repair was adding 3/4" steel plates and he said the slide operated better with them. I wanted to use thinner plates to minimize lifting the slide higher and was able to get three 1/8" stainless steel plates cut to the exact size to fit between the outer trim and the slide rollers. The plates were wide enough to have screw holes on their outer edges, to allow me to fasten them in place. Now the three slide nylon rollers, roll on the smooth steel plates instead on the vinyl coated plywood.

Bottom & top corner slide supports when retracted \$50

I am convinced that the most intense stress to the slide gears is when the slide is retracted and the camper is rolling over a speed bump or pot hole. The bouncing up and down puts immense stress on the gears holding the slide in place. To minimize the slide movement while traveling, 6X9X3 yoga blocks fit perfectly on top of the slide to wedge the slide against the ceiling. Some people also use yoga



Visit the Camco Store ★★★★★ 6,400
Camco RV Save-A-Step Brace | Stabilizes RV Steps and
Helps Stop RV Movement | Protects RV Steps from Sag
and Wear | Adjusts from 4-5/8"-8", (43681)



blocks turned on the 9 inch side of the yoga blocks for the bottom of the slide by adding additional wood to the underside of the slide to make a tight fit. I purchased two screw jacks and attached wooden blocks to the top and bottom of the metal threaded jack. I added a 2x6 block to the underside bottom corner of the slide. After pulling the slide in, we wedge the top yoga blocks in place and then spin the screw jack until it is tight with a throw rug under it. The throw rug helps keep the wedges in place while towing. I have pre-dilled the wooden block on the top of the screw jack to install four dowels to make it easier to spin tight. Although this is an extra step, every time we take the slide in or out, the peace of mind that I'm protecting the slide gears while traveling is worth the extra time it takes me.

Aluminum support plate for each side of slide frame \$50



Some of the other Minnie owners who had their slide repaired were convinced the camper body on either side of the slide was not strong enough or anchored enough. One suggestion to address this was to add another metal plate attached to the slide frame and the camper body. I purchased two 1/8" by 1.5" by 60" aluminum bars from Home Depot. I pre-drilled them on each edge of the bar every 6 inches. I then screwed this plate into the side frame of the camper and the side frame of the slide to add additional strength. Ideally angle bar would provide better support but the flat bars are easier to install. As previously mentioned, anything to ensure the slide always works smoothly is worth it for me. I also added a stainless 1/4"



through bolt at the bottom to provide additional support where the most stress is happening.

Emergency slide blocking 2x4's in ceiling of pass through \$5

If the slide motor or mechanism was to fail while traveling, and the slide was retracted and the motors disconnected, a support 2x4 wedged inside on the top of the slide would prevent it from moving out. I cut two 2x4's to the length needed to provide this slide movement preventer. I stored this wood in the pass through by screwing them to the ceiling joists for out an out of the way location. I hopefully will never have to use these.

13 Towing & Hitching Equipment



Anderson weight distribution hitch (WDH) \$625

Weight distribution hitch (WDH) is considered a safety necessity to minimize trailer excessive sway and to transfer some trailer tongue weight to the tow vehicle. There are many manufacturers and varying alliances to one brand or another. After owning a blue ox bar spring type system on my previous camper, I switched to an Anderson unit. The primary reason is the ease of connecting and disconnecting it, no issues backing up with it, light weight, and adjustable tension. There are other WDH that provide stiffer sway control but the light weight



of this unit and the simplicity of connecting or disconnecting makes it my choice. All WDH do require careful initial set-ups that include adjusting the ball hitch height so your camper travels level to the ground and the tow vehicle is also close to level when towing. I contacted the manufacturer about my blue cups riding up and they sent me a whole new upgraded hitch ball and swivel plate for \$110.

Bubble gauges \$20 on camper versus Bluetooth Leveling gauge \$130

I purchased two small level gauges that I mounted on the front frame near the electric jack and behind the ladder on the camper body in the rear. Getting these gauges perfectly set is touchy as the smallest adjustment is significant amount of angle. You can also get a horizontal level gauge that sits on top of the camper frame. I also purchased the Level Mate Pro bluetooth gauge. I prefer the Bluetooth gauge because while I am moving the camper into its new location, the app on my cell phone is giving me instant read out of how level or out of level the camper is. I can actually move the camper back and forth until a spot is found that is closer to side to side level or even doesn't require the Lego blocks. Only issue I have had with the Bluetooth level is the CR2032 battery runs down if you leave it turned on for months at a time when not using it. I soldered the battery terminals of the level gauge to a 12 volt to 3 volt converter so it no longer needs a battery. Both types of gauges need to be installed with the camper pre-leveled to properly set them up. I decided the most important place to get the camper level is the stove for cooking. I use a level on the frame of the stove and adjust the camper with wedge lifts and the electric jack to get the stove level in both directions. After the camper is level, the Level Mate Pro can be calibrated to this level and the outdoor attachment levels installed. Sometimes you have to turn the sensor on and off if your app is not making a connection or change the battery so place it in a convenient to get to location.



Visit the LogicBlue Technology Store ★★★★★ 6,256
LogicBlue Technology LevelMatePRO Wireless Vehicle RV Leveling System - Patented Quick and Easy Smartphone Leveling Tool - Travel Trailer Accessories for RV Camping
Amazon's Choice for 'rv leveling system'



12V to 3V 3A Step-Down Waterproof Miniature DC-DC Converter Power Supply Module

Brand: Eonista

Amazon's Choice ★★★★★ 115 ratings, 13 answered questions

FREE Returns

With Amazon Business, you would have saved \$191.20 in the last year. Create a free account to

15% today

Brand: Eonista

Color: White

Input Voltage: 12 Volts

Output Voltage: 12 Volts



Step up pads for rear corners of pickup \$400

Fold up step pads for each rear corner of the pickup are mandatory upgrades as you always find yourself climbing in and out of the rear truck bed. They make them for every model pickup and they bolt directly on the frame. It is a mandatory item for me.



Brand: WEILETE ★★★★★ 67

WEILETE Rear Bedstep Retractable Bumper Truck Tailgate Step Compatible with Dodge Ram 1500 DT

(New Body Style) 2019-2020 2021 2022 Replaces 82215288MG 82215289AH

Production Application



Bluetooth tire sensors on each camper tire \$75

The Minnie has double axles but even with that, the last thing you want is a blown tire on the highway. It would be easy to not realize it has happened. A single blown camper tire means the remaining tire on that side is taking twice the load and it could blow to. Bluetooth tire sensors on each camper tire displays not only the tire pressure but the temperature. The dashboard display uses a solar cell so it does not need to be plugged in. The display will turn on an alarm if temperature exceeds a set point or tire pressure drops below a set point. Even a slow tire leak becomes visible before it can cause a problem.

Visit the Tymate Store ★★★★★ 2,669
Tymate Tire Pressure Monitoring System M12-3 - Solar Charge, 5 Alarm Modes, Auto Sleep Mode, Tire Position Exchange, 4 TPMS Sensors (0-87 PSI)



Hitch bar tightening clamp \$20

The ball hitch that attaches to the truck receiver is never tight. This simple clamp tightens the ball hitch to minimize hitch ball movement.



Jack storage box \$25

The tongue jack support blocks are stored in a watertight craftsman bin behind the propane tanks. There is no need to hunt for them in the pass through. I also keep my long 1/2" socket wrench that is used to tighten or loosen the Anderson weight distribution hitch in the box and a 3/8" socket wrench used to tighten the hitch bar clamp with a 3/4" socket. Everything needed to hitch and unhitch is all within reach.

Sumo Springs for Ram 1500 pickup rear axle \$325 + Installation \$150

Camper sway while driving is partially due to the lack of stiffness in the suspension of the tow vehicle. My Ram 1500 has coil springs and light duty axle bumpers mounted to the body of the truck directly above the axle. I replaced these lightweight bumpers with heavier duty Sumo Springs that compress when the camper is hooked up to the truck. This reduced the Ram rear sag and reduced the camper sway when the camper was being towed. The change out was easy for any car mechanic to do.



White tape on ball hitch \$0

It is difficult to see the ball hitch when using the rear camera in the truck during hook up. A simple strip of white tape makes it more visible and easier to line up when using the pickup rear facing camera.



Rear facing bluetooth camera \$120

When you are towing down the highway you cannot typically see vehicles directly behind the camper. This rear camera provides this view with a wide angle lens. This wide angle view is especially helpful when changing lanes as you can easily determine you have fully passed another vehicle or truck before moving into that lane. The camera also lets you know the truck is plugged into the camper and the running lights are working. I powered my camera by jumping a lead off the upper rear center running light. Pick up parking lights need to be turned on to power it.

Tongue scale \$150

You need to weigh your camper tongue at least once when you are fully loaded to determine if the tongue weight is too little or too much. Too little weight and the camper will tend to sway more when being towed. Too much and your truck front tires will be too light. I use a 6X6 timber I cut to a length that elevates the scale to keep the trailer level when using this scale. I always weigh the tongue before leaving home when the trailer is loaded and ready to be towed.



12 volt tire air pump \$35

This is more of a “feel better knowing I have it” piece of equipment. It is a tire air pump that runs on a 12-volt car cigarette lighter plug. There are also stand alone battery version tire pumps. With the 12 volt version, a vehicle would need to park close to the tire requiring air. I installed two 12-volt cigarette lighter type sockets in the pass through so I don’t need another vehicle. The other cheaper choice is to stop at a gas station air fill station.



8 Camper Repairs

Slide twisted sideways first week of ownership

The slide out twisted the third day we had the camper home when the camper was not level. Fortunately, the dealer had extra parts to do all the repairs and had it fixed in one week. Since that scare I have made every effort to add any improvements or procedures to keep the slide operating perfectly. One maintenance is to regularly oil the bearing gibbons with the recommended lubricate as well as the underside rollers. The other maintenance is to hand check that every screw is snug but not over tightened.

Longer cabinet screws where occasionally needed

The cabinet screws sometimes strip loose. I replaced a few with longer screws. Before or after any extended trip I lightly hand tighten every screw I can find inside and outside the camper.

Adjusted bathroom door and raised the bottom slide

The bathroom door came out of the lower track so I raised the track and re-adjusted the door to close square to the wall.

Trimmed paneling to allow kitchen faucet extender to move

The sink faucet head would not extend because the faucet weight under the sink would get hung up on the wood cabinet divider. I cut away the divider to give the faucet weight clearance as it went up and down.

Re-sized and adjusted the cushion stop trim

We are constantly pulling up the dinette cushion to access the storage space. The end trim piece to keep the cushion in place was set too high. I un-wound the vinyl, trimmed the size and re-wrapped the vinyl and re-attached the trim end piece. The refrigerator door tends to jam into the trim when the slide is retracted in. I moved all the left side cushion trim pieces towards the front of the camper 3/8” and now the door fully swings open.



Replaced refrigerator door handle

I pulled too hard on the refrigerator door and broke the handle. I received a new part under warranty and replaced the door handle and trim piece. It took a while to get the parts and they were shipped to the dealer so I bought a handle online so now I have an extra one.

Trimmed 1/16" off the bottom of backsplash Formica

A common defect is the backsplash behind the stove and sink on the wall buckles in the middle. This is due to not leaving an expansion space along the bottom edge. Using a framing square laid flat on the countertop for a 1/8" guide, I cut a 1/8" strip off the bottom edge of the backsplash with a utility knife. It was difficult cutting the Formica this way. Afterwards I pressed the backsplash back flat to the wall and re-caulked the bottom with silicone clear caulk.



Tightened sink holders, recaulked sink & re-glued loose Formica



The sink dropped and exposed the wood edge of the countertop. I placed a wood support on the cabinet floor below the sink and using a floor jack, pushed the sink up. I then tightened the screws holding the sink to the countertop. I then super glued some loose Formica paneling around the sink edge and used clear silicone caulking around the sink countertop edge. A few months later I had to recaulk it.

Added supports to floor panels beside the slide

The floor panels beside the slide were only attached to the exterior on one corner which allowed them to droop down towards the slide. The rear side of the slide has a cabinet and shelf. Occasionally things left on the shelf would fall and get trapped under the slide. By re-supporting the floor and adding a trim board the opening was reduced. An access door panel with small pull knobs was installed using extra paneling removed from the bottom of the adjoining cabinet and held in place with Velcro. The slide controller was attached to the exterior wall with Velcro so it could be moved to allow easier viewing if necessary.



Fresh water tank supports

Other campers have reported their freshwater tank collapsed down. To be pro-active I added two extra 1 1/2" steel angle bars by using large self-tapping screws to attach them to the frame.



Replaced the lug nuts

One of the lug nuts was un-useable because the outer sheath became distorted. I replaced all the lug nuts with one piece hardened lug nuts to avoid this happening again.

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Unkinked slide motor wires

The slide did not activate after we arrived on a Saturday at a friend's house in Kansas for an overnight stay. After the panic attack, I pulled the slide controller out from under the slide so I could better read it. The blinking lights indicated the rear motor had a neutral short. After trying the procedures for a manual override I could still not get the slide to activate and did not want to risk having the slide go out but then not coming in. Looking through all the slide repair posts on the Facebook group and getting some comments I decided to trace the entire wire. Fortunately, I had an access panel already cut under the left side of the slide and could loosen the slide wire. The slide power wire can also be removed from under the rubber gasket as it travels up to the motor. I found two locations where the wire was kinked and carefully massaged them straight. The slide now activated! I then carefully replaced the wire behind the weatherstripping and made the loop to the underside of the slide more gentle. The slide has performed perfectly since but I'm still considering buying a new wire harness in case that is needed in the future.

Replace drawer slides for one drawer

The draw slide for the top drawer under the sink came apart. I could not find a replacement so I ordered this self closing slide guide. It was difficult to get the slide guide to be perfectly lined up so the drawer was properly situated. I also needed to add a support block to the hanging plywood strip that supports the guide in the back.

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Water fill tube leak

While filling the fresh water tank with water I noticed a water drip at the fender. Inside there was moisture under the fill tubing where the exterior body meets the metal wheel cover. I tried tightening the hose clamp and drained and re-filled the fresh water tank but it was still leaking. I re-routed the drain tubing under the black PVC sink drain and purchased a smooth ring radiator clamp from the automotive store. To be extra protective I silicone the exposed inside of the wall under the plastic drain funnel and placed a small piece of flashing sloping down on the caulk to catch any future leaks. There were no leaks when I re-filled the water tank.

