

Jayco Eagle 355MBQS Fifth Wheel Upgrades

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The following are the modifications, repairs, and accessories I have done or added to our 2019 Jayco Eagle 355MBQS Fifth wheel. I have provided links for each item where possible.

Please note the Amazon links are through Amazon Smile, Amazon Smile is a program where they donate to a charity of your choice every time you shop. You get the same prices as on Amazon and the charity you designate gets a small donation at no charge to you.

All the information in this guide is believed to be correct but it is up to the person reading this to confirm the information in this guide. Consult your RV dealer or other qualified expert before attempting any modifications or repairs. RV system can be extremely dangerous or even lethal if improperly operated, maintained or modified, proceed at your own risk! Many of these modifications may void your warrantee.

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Battery Bank

AGM Batteries

We boondock a lot, the dealer we bought the camper from was going to put in an Interstate battery that was approximately 70Ah, that might be sufficient if all you do is drive from campground to campground and always have full hookups, but not for going off grid. I bought 2 - 125Ah sealed AGM batteries giving us 250Ah of capacity.

https://smile.amazon.com/VMAXSLR125-2-VMAX-batteries-Solar-Inverters/dp/B00NLQQE1E/ref=sxsts_sxwds-bia-wc-p13n1_0?cv_ct_cx=agm&dchild=1&keywords=agm&pd_rd_i=B00NLQQE1E&pd_rd_r=926bff4-0a11-40e5-b8be-136c9bfe4be1&pd_rd_w=KjHh7&pd_rd_wg=DojVF&pf_rd_p=1da5beeb-8f71-435c-b5c5-3279a6171294&pf_rd_r=7JZXGPNBNYGG6QBN2N3E&pvc=1&qid=1594049508&sr=1-1-70f7c15d-07d8-466a-b325-4be35d7258cc

Lithium Batteries

If you boondock a lot you will definitely need a big battery bank and I have actually upgraded from the AGM set up. When I bought the AGM batteries, I looked briefly at lithium, but I decided they were too expensive, but then as I lived with the AGM batteries, they have 3 draw backs.

1. You can only discharge them approximately halfway without degrading the batteries, so a 250Ah battery bank only provides 125Ah of useable power. One place we camp is shady, and we had to run generators every day.
2. They are heavy, the two batteries weigh 140 pounds.
3. They charge quickly in bulk mode but once they get to about 80%, they slow down to about one-fifth of the charge rate. Lithium batteries can be run down close to zero, weigh a lot less and charge at full speed until full meaning they require less generator time to charge and take better advantage of solar on sunny days.

I should note here that any battery degrades the farther you discharge them, even lithium's but there is a big "knee" for lead acid and lithium's are more linear and can be discharged further. I have also recently learned that most lead acid batteries do not reach their rated amp hours whereas Battle Born lithium's typically exceed theirs. If you go with lead acid batteries you need to buy them all at one time, with lithium's you can add more batteries later.

I eventually sold my 2 – 125Ah AGM batteries and replaced them with 3 – 100Ah Battle Born Lithium batteries. Total capacity went from 250Ah to 300Ah, but more importantly useable capacity went from 125Ah to 300Ah. Secondly the 3 – Lithium batteries weigh 90 pounds saving 50 pounds and finally they charge faster and make it feel like I have more solar panels. They did cost a lot more money but by calling Battle Born directly and buying multiple batteries I got a significant discount. I am considering adding one more lithium in the future to get to 400Ah.



Figure 1. Battle Born Batteries.

https://battlebornbatteries.com/?gclid=Cj0KCQjwy8f6BRC7ARIsAPIXOjhrcY5ubrFJXA6JF6doI8w3-yOmbpzUCwUTum-XRHks3cahCZz3tiwaAuKXEALw_wcB

Specification	AGM	Lithium
Batteries	2	3
Total capacity	250Ah	300Ah
Useable capacity	125Ah	300Ah
Weight	140lb	90lb
Charging	Fast then slow	Fast
Cost	Medium	High

Battery Bank Comparison

If you can afford it, I recommend the Battle Born lithium batteries.

Solar

Solar Panels

I bought 4 – 200 watts solar panels from eBay and mounted them on the roof of the camper. The back pair and front pair are each wired in series and then the two pairs are wired in parallel. This results in maximum power at 42.1 volts and 19 amps. The panels feed into the camper through the Jayco pre-wired for solar wiring that has a 30-amp maximum rating, so they are within the rated capacity for the wiring, if they were all wired in parallel, they would not be.

One thing to note is when you wire panels in series if either one is shaded the output of the pair goes to zero, this does not happen with panels in parallel.



Figure 2. 4-200-watt Solar Panels and Wiring.

The solar panels are held down with Renogy Z mounts:

https://smile.amazon.com/gp/product/B00W49ZPPK/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

I bolted the mounts to the panels, located the panels on the roof and drilled pilot holes, I then filled around the holes with Dicor self-leveling sealant and screwed the panels to the roof. I also covered the tops of the screws with more Dicor:

https://smile.amazon.com/gp/product/B00HJ6RUCE/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

I changed out the screws that come with the Z mounts for larger diameter stainless steel tech screws to get them to hold better.

I bought premade 10 awg solar MC4 cables and cut them to length and swapped out the ends. I got the cables and ends from Amazon but they are no longer available.

I used Y cables to hook the panels in parallel:

https://smile.amazon.com/gp/product/B0753X68PS/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

I use Eterna Bond tape to hold the wires down to the roof:

https://smile.amazon.com/gp/product/B00CELOSE6/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

Charge Controller

The Jayco solar wiring drops down through the wall in front of the bathroom behind a solar sticker on the wall. By removing the Jay Command panel from the wall, I could get to the wires. The red wire is cut behind the wall because it is set up to put a charge controller in the wall, but I wanted to use a different charge controller in the front compartment, so I spliced the wires together. The red wire terminates

behind the disconnect switch in the basement and the black wire runs into the front compartment. I routed both wires to the front compartment.

The solar wiring connects to a Victron Energy Blue Solar MPPT 150:60 controller. Even though the feed from the panels is 19 amps the charge controller converts the 42.10 volts maximum voltage to 14.4 volts and the maximum current then raises to 55.5 amps and therefore the 60-amp controller.

https://smile.amazon.com/gp/product/B01EW2ASIK/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

I also bought the Bluetooth dongle so I can monitor the charge controller from my iPhone and iPad.

https://smile.amazon.com/gp/product/B01CGFF8Q2/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1



Figure 3. Victron Solar Charge Controller.

Also in the picture with the charge controller is the blue tooth dongle (upper left) and input and output breaker/disconnects so I can isolate the controller from the solar panels or battery bank.

https://smile.amazon.com/gp/product/B07QMJFZSS/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

I highly recommend a solar system if you boondock plus even sitting in our driveway I don't have to plug in the camper to keep the batteries charged up. I really like the Victron Energy Charge controller and being able to monitor the solar output over Bluetooth with my smart phone or tablet. I often check on my camper battery status from in my house.

When we boondock we use the inverter a lot and 800 watts is a good amount of power, but I have considered adding 2 more panels to get to 1,200 watts. The panels are mounted flat on the roof and the most power I have seen them produce is just over 700 watts. If all you do boondocking is run the inside LED lights, the refrigerator and water heater on propane and the water pump a much smaller solar system of 100 to 200 watts will recharge your batteries each day.

I recommend this type of solar installation and the Victron charge controller.

Portable Panel

One place we camp is shady for much of the spot and I have a 120-watt Go Power portable panel with built in charge controller from when I had a travel trailer. I put a solar inlet in the nose of the rig connected to the battery bus bars and got an extension cord for the solar panel so I can put it out in front of the rig and move it around to find sun.



Figure 4. Solar Inlet

When we had a travel trailer the 120-watt panel is all we used and it would recharge the battery each day but we didn't have an inverter.

Transfer Switch, Inverter and Charger

With a large battery bank and solar power, I also wanted to be able to make AC power when boondocking.

Initial Set Up

I installed a Tripp Lite 2,000-watt pure sine wave inverter/charger in the front bay near the batteries with a short run of 2/0 battery cable to the batteries and a Technology Research 50-amp Surge Guard Transfer Switch in the kitchen near the shore power inlet. I am personally not a fan of the inverter/chargers with integrated transfer switches for fifth wheel use. The problem with integrated transfer switches is the shore power comes in around the middle of the rig, but the inverter/charger needs to be in the front compartment near the batteries. This means you must run the shore power 6/3 with ground wiring from the middle of the unit to the front and then back to the middle of the unit where the power distribution panel typically is. This can be hard to snake through with the existing

wiring in place. With my set-up the transfer switch is mounted in a kitchen cabinet between the shore power inlet and the power panel and only requires a short run of 6/3 and in my camper it runs behind a cabinet panel and under a drawer and was easy to put in. I then ran 10/2 with ground from the inverter in the front compartment to the transfer switch and 12/2 with ground from the power panel to the charger input on the inverter charger. These were relatively easy to snake through the underside of the unit. Note, I disconnected the converter in the power panel and used the breaker to feed the charger, this ensures the inverter does not power up the converter and try to charge the batteries it is drawing from.

I also installed a Trimetric battery monitor system that provides a percent full for the battery bank by measuring current flow through a shunt on the battery bank ground wire. The Trimetric readout and the remote for the Tripp Lite inverter/charger were both placed in the washer/dryer hookup cabinet in my master bedroom because it was easy to snake the wires up there along the washer/dryer prep lines. This set up is nice because you can switch on the inverter and have 120-volt power for anything you want in the coach and do not have to manually switch anything else. There did however prove to be issues with this set up.

1. The inverter/charger and remote didn't really behave the way they should and when I tried to get support from Tripp Lite they had discontinued the unit and wouldn't help me.
2. The inverter/charge was very heavy at around 50 pounds and drew a lot of power even when idling.
3. As I learned more about RV park power problems, I began to wish I had spent the money for the Surge Guard transfer switch with full power protection instead of just the surge protection.
4. The Tripp Lite charger did not have a lithium setting and would not take advantage of the ability to rapidly charge the Battle Born batteries all the way.

I do not recommend this Tripp-Lite unit.

Upgraded Transfer Switch

I eventually decided to upgrade the transfer switch to the Surge Guard Model 40350-RVC with full power protection. It checks for: open ground, open neutral, low, and high voltage, reverse polarity, miswired pedestal, high and low frequency and will not connect your rig if any of these problems are present, and it provides surge protection. There is also an available monitor panel that displays voltage and current on each leg of your 50-amp service and displays any faults.

<https://rvpower.southwire.com/products/transfer-switches/50a-hardwire-model-40350-rvc-automatic-transfer-switch/>

<https://rvpower.southwire.com/products/accessories/remote-power-monitor-lcd-display/>

In my fifth wheel the shore power comes in the side, runs through the back of a bottom cabinet on the front wall of the kitchen, under a bottom drawer and then into the power panel mounted on the right side of that wall, see figure 6. By putting the transfer switch in the bottom of the cabinet where the line already ran it was easy to hook up. Figure 5. shows the transfer switch in the bottom left cabinet against

the outer wall of the camper, then the wire runs under the drawer in the middle and the power panel can be seen on the right of figure 6.



Figure 5. Transfer Switch mounted in the bottom of a kitchen cabinet. Mounted upside down for ease of wiring.



Figure 6. Front kitchen wall.

I installed the transfer switch upside down because it was easier to hook up the wires, upside down has no effect on its operation.

I installed the remote monitor right under the existing Jayco control panel for my rig, see central control station, see figure 8.

I know you can buy standalone power protection systems to plug into the power pole at an RV park, but it is something else to hook up each time and can get stolen. I like the wire it in and forget about it solution plus having a power/voltage readout for each leg in the camper is very handy.

I recommend the Surge Guard Model 40350-RVC with the monitor panel.

New Converter

After I installed this system, I could not get my rig to connect to my shore power at home. I have a 50-amp RV power pole in my driveway, and it would not connect. Properly wired for 50-amps you should have a ground, a neutral and two hot wires (red and black) with each hot wire on its own 50-amp breaker. The ground and neutral should be bonded together in the power pole. Tested with a voltmeter you should see 120-volts red wire or black wire to neutral or to ground. 240-volts red wire to black wire and 0-volts neutral (white wire) to ground. I had all that and yet it would not turn on. It turned out the Tripp Lite charger was interfering with the system and when I shut off the breaker to the Tripp Lite charger everything worked. I decided at this point to go back to the converter in the power panel and not use the Tripp Lite charger anymore, but this did mean I had to shut off the converter breaker any time I turned on the inverter.

I will note here that Surge Guard support documents are very weak and when I talked to them, they basically said they do that on purpose because they want professionals installing their gear. They had also never heard of the interference problem I had with the Tripp-Lite.

The converter in the Progressive Dynamic power panel is a good option for battery charging but does not have a Lithium mode and while it will not damage the Battle Born batteries, what I saw was it never charged them all the way. It turns out however that Progressive Dynamics does make a Lithium Converter for the power panel I have, and it is an easy conversion, so I swapped out the converter and now the batteries charge up all the way on shore power.

My power panel is the Progressive Dynamics PD4560K and the Lithium Converter for it is the PD4560LICSV. You can buy the converter here: <https://ltdrvparts.com/PROGRESSIVE-DYNAMICS-60A-LITHIUM-CONVERTER-CHARGER-PD4560LICSV-PD4560LICSV.htm> They were great to work with and got it right out to me.

If you go to Lithium batteries and you do not have a lithium capable converter, I recommend this conversion.

New Inverter

Once I had done all this, I began to question why I still had the Tripp Lite inverter/charger that was heavy, flaky and drew a lot of power on idle. I decided to replace it.

The first replacement I got was a Renogy 2,000-watt pure sine wave new style unit. When I went to buy it - it was out of stock and then it came in and I ordered it, it took almost two weeks for them to ship it and they didn't answer any of my requests for when it would ship, then they showed it as shipped but the shipper didn't have it, this went on for two more weeks and they still didn't answer my emails. I tried calling them but got an automatic system that puts you on hold and after a few minutes the system disconnects you. When I finally got the unit, it would not work with my Surge Guard. When I measured the unit, I found 118 volts hot to neutral, 58 volts hot to ground and 58 volts ground the neutral, this is despite the Renogy literature saying the neutral and ground are bonded together in the unit. I requested

a return authorization and after almost two months and multiple emails and calls I just finally got a return authorization and eventually got my money back, but I will not buy anything from them again.

I finally bought a Go Power 2,000-watt inverter, it is much lighter than the Tripp Lite at around 12 pounds, much lower power draw at idle and works with my Surge Guard and has a nice remote. I did not consider it at first because it does not have hard wiring options for the output, only plugs but I finally just put a 20-amp plug on the end of my 10/2 Romex and plugged it in. Note that the inverters only have one 120-volt hot line so at the transfer switch I jumper the one hot wire to the red and black wires, so it powers both legs on my 50-amp service. So far, I am happy with the Go Power. I think 2,000-watts is a good size for an RV as it will run pretty much anything in the RV except maybe the air conditioning (it will run one air conditioner due to some modifications I discuss below but not for long before the batteries run down).

https://smile.amazon.com/gp/product/B01LX7FLD6/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

https://smile.amazon.com/gp/product/B01MTB9Y32/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

I recommend a pure sign wave inverter because it will run even sensitive electronics efficiently.



Figure 7. Go Power 2,000-watt pure sign wave inverter in the front electronics bay (left side).

I installed the remote next to the Surge Guard monitor and moved the Trimetric control to that location as well giving me a central control station. I did need a 50-foot cable for the Go Power. It comes with a 25-foot cable and I emailed them to ask if the cable was a standard cable or wired in some strange way and they made it sound like it is a special cable and they offered a 50-foot version that I ordered. While I was waiting for the 50-foot cable I examined the 25-foot cable and convinced myself it is a standard RJ12 cable and I bought one of those and it worked fine.

I recommend the Go Power 2000-watt pure sign wave inverter.



Figure 8. Central Control Station.

Just under the original Jayco control center I have mounted all the controls and monitors I have added. In the picture above (the controls look crooked because of the camera angle but look straight in person):

1. Top row - left – trimetric battery minder provides battery voltage, current flow into and out of the battery bank and percent full for the battery bank.
2. Top row - middle – existing ceiling fan switch.
3. Top row - right – Go Power remote and monitor provides bar graphs for battery voltage, percentage of inverter capacity being drawn, inverter status and on/off switch.
4. Middle row – left – existing dimmer switches.
5. Middle row – middle – lighted on/off switch for the converter. When the inverter is running it powers the entire power panel and converter, the converter would then be using battery output through the inverter and converter to try to charge the batteries. To prevent that loop, I switch off the converter when running the inverter.
6. Middle row – right – Microair replacement thermostat for the air conditioner/heating system. The Microair provides programable functions and remote control from a smart phone over WiFi.
7. Bottom row – left – transfer switch monitor as described previously, provides voltage and current of each of the 50-amp legs plus fault read outs for the protection system.
8. Bottom row – right – sea level systems tank monitors provide battery voltage and percent full for each of the four on-board tanks. It is much more precise than the Jayco, empty, 1/3, 2/3 and full lights.

Internet, Alarm System, and Cameras

Internet

I own my own business selling software over the internet, I can work from anywhere but must always have good reliable internet.

The Pepwave Max Transit Dual is two cellular modems plus Wifi and GPS in one unit. It can bond the cellular modems together using both at once plus WiFi to maximize throughput. I have a Verizon Sim card in slot one and an ATT Sim card in slot two so I can use both at once or whichever gets the best connection in remote areas.

The setup for Verizon was easy, I just popped in the Sim card and it worked. The AT&T setup was more difficult, it turned out the plan I bought was locked to the cellular modem the sim card came in, I had to change plans, go through a lot of configuration and get a full-size sim card to get it working (I tried an adapter but it didn't work).

I originally was going to buy the Pepwave along with a bundled antenna from Mobile Must Have. The bundle was back ordered but I ordered it hoping to have it in time for a two-week trip. At one point I contacted them to ask about getting the antenna early so I could run the wires while waiting for the modem, they said no problem, we just had to cancel the bundle and order the two separately. They said they had the antenna in stock, and it would go right out. After it did not show as shipped after two days, I contacted them only to find out they did not actually have the antenna (Mobile Mark), but then they told me they had the Poynting antenna in stock and it was cheaper. I said that is great but if I am spending over a thousand dollars on the antenna and modem, I want the best possible performance. They then told me the Poynting is just as good as the mobile mark which made me wonder why they did not suggest it in the first place. They said they would get it right out but shipped it ground so I did not get it for several days. They also said that unlike the Mobile Mark the Poynting antenna did not need a ground plane but when I got the Poynting the directions specified a larger ground plane than Mobile Mark. When I called and asked them about it, they said you can use it without the ground plane but it doesn't work as well. I fabricated my own ground plane with galvanized steel I bought at home depot with the edges rolled to protect the roof.



Figure 9. Poynting Antenna Install

The antenna needed to be located away from the air conditioners to prevent signal shadowing. I wanted to run the wire down into the mid bunk I use as an office and I decided to run the wires in the bathroom

ceiling down through a plumbing chase in the bathroom corner and then into the mid bunk room. I marked the roof with painters' tape for the ceiling joists and wall locations and then drilled the hole for the antenna, see figure 9. The antenna has a pipe that sticks off the bottom with a big nut on it. The antenna can be seen in the top of the figure 9., it has 4 cellular antennas covering 4 different bands, 2 WiFi antennas covering different bands and 1 GPS antenna. The braided wire bundle has all seven wires in it.

I put self-leveling Dicor on the roof to adhere the ground plane I fabricated and used bricks to hold the ground plane down while the Dicor dried, see figure 10. I then threaded the antenna wires and pipe down through a hole I had drilled in the middle of the ground plane and down through the roof hole. I opened the fan trim piece in the bathroom and was able to reach up above the ceiling and put the nut onto the antenna pipe to secure it in place (I do have exceptionally long arms). The antenna also has adhesive foam on the bottom to help secure it to the ground plane. I did ultimately find the edges of the ground plane lifted from the roof and I put Eterna bond tape over the edges.



Figure 10. Ground plane Dicor drying.

I threaded the antenna wires through the bathroom ceiling and into the plumbing chase. In the mid bunk room, there is a cabinet mounted up high over the desk and if you take the trim panel out of the end near the wall that is common with the bathroom, there is a big hole. I thought I could drop the antenna wires down through the plumbing chase and grab them through the hole, except the wire got stuck and while pulling on them a wire shorted out and blew out the lights in the mid bunk and master bedroom. I ended up opening the plumbing chase that was full of a rat's nest of crappy Jayco wiring practice. It turned out when Jayco fabricated the cabinet over the desk they put a staple through a wire and when I pulled on the antenna wires, that pulled on the wire just enough to short it out. I fixed that and with the chase open was able to get the wire threaded back through. I closed the chase back up with some wire brads.

This is the antenna I used although I would buy it somewhere else:

https://www.mobilemusthave.com/Poynting-7-in-1-4x-Cellular-WIFI-GPS-RV-and-Marine-Roof-Antenna-for-Dual-Modem-Applications_p_165.html



Figure 11. Antenna on ground plane (Eterna bond tape not added yet).

With the antenna now installed and unhappy with Mobile Must Have, I decided to see if I could get a Pepwave sooner from somewhere else and it turned out the 5G store had the Pepwave in stock and would overnight it to me.

This is the modem: https://5gstore.com/product/8988_pepwave_max_transit_duo_primecare.html

I mounted the router in the cabinet over the desk in the mid bunk room and hooked up the 7 antenna wires. I also ran 12-volt power to the cabinet as described in the other electrical section, see figure 12.

The Pepwave modem also has a WiFi router that allows any devices in the camper to connect to the internet connection. I use it with my notebook computer and iPad, plus for my wife and kids iPads and I get reliable – fast internet everywhere I have gone including out in the woods away from everything. We did video calls from the woods in a state park in Rhode Island last summer with no problems.

I recommend this antenna and always on router/modem set-up but with 5G rolling out would look at 5G options.

Ring Alarm System

With an always-on internet connection and WiFi I decided to put in a Ring Alarm system. I liked the idea of being able to put in a variety of wireless sensors and get alerts to my cell phone when we are away from camp.

I have smoke/CO alarms in the living room and bedroom, a listener for the propane alarm in the kitchen, a motion alarm by the entry door with more planned, contact sensors on the basement and front compartment doors, flood/freeze sensors under the kitchen sink and toilet with another planned for the basement. All of the ring sensors are wireless and run-on batteries, but the hub has to be plugged in and the key panel is also supposed to be plugged in periodically to charge. I did not want to have to run the inverter any time I wanted the alarm on because the inverter is a significant battery draw. After some investigation I found the ring power supply is 5-volts, so I bought a 12-volt to 5-volt converter (top of figure 12 with bus bars) and used it to power the ring alarm system (right side of figure 12) I also use the

converter to run a weather station display and will use it to run the Blink camera hub described below. The Ring hub, Weather Station and Blink Hub are all USB micro connectors, so I bought cheap power supplies with USB micro cords on them and cut the cords off and wired them into the converter (normal USB cords have more than two wires). Not shown in the picture but added later are in-line fuses for each connection. With this set up I can run the Pepwave, Ring Alarm and Blink Cameras continuously without drawing much power.

Ring alarm stater kit:

https://smile.amazon.com/gp/product/B07ZDTXJ93/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

Flood and freeze sensors:

https://smile.amazon.com/gp/product/B07M943G7L/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

Motion alarm:

https://smile.amazon.com/gp/product/B07ZB2QF2V/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

Smoke and CO listener:

https://smile.amazon.com/gp/product/B07M93Z1NT/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

Z-wave smoke and CO detectors that work with the Ring Alarm system:

https://smile.amazon.com/gp/product/B00KMHXFAI/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

12 volt to 5 volt converter:

https://smile.amazon.com/gp/product/B01M03288J/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

Power Adapters with USB micor outputs:

https://smile.amazon.com/gp/product/B01170020U/ref=ppx_yo_dt_b_asin_title_o00_s01?ie=UTF8&psc=1

I recommend the Ring Alarm system.

Blink Cameras

I wanted to add cameras on the exterior of the camper, and I have Blink cameras on my house and really like them. The cameras are wireless and run-on AA batteries for many months, but the hub must be plugged in. Once again it runs on 5 volts, I will wire it to the 5-volt converter I already put in. I have not mounted the hub and cameras yet, that will be a spring project, so I do not have pictures yet, see figure 13.

Picture to be added

Figure 13. Blink Camera.

With the Ring Alarm and Blink Cameras I can monitor my camper on my cell phone from anywhere in the world.

The ring cameras snap on to the mounting brackets and I will likely unsnap and stow them when travelling.

I recommend Blink cameras.

Other Electrical

Accessory panel

I have added several new 12 volts inlets and outlets and powered devices. I added a 6-fuse panel visible in the front of the Go Power picture (figure 7).

https://smile.amazon.com/gp/product/B000THQ0CQ/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

This fuse panel has its own disconnect and feeds:

1. Solar inlet for the stand-alone Go Power 120 watts solar panel – see the solar section.
2. Basement outlet to run the water barrel pump – see the plumbing section.
3. Light in the front compartment.
4. Mouse lights underneath – see the critter control section.
5. WiFi – powers the WiFi/cellular modem, Ring Alarm system, Bling Camera Hub and Weather station – see the internet, alarm and camera section.
6. Future.

If you need additional 12 volt feeds I recommend this fuse panel.

Compartment lights

In case I need to work on anything in the front electrical compartment I mounted LED lights on the compartment ceiling. The lights can be switched to turn on one or both sides and are very bright and light up the whole compartment making it easy to work in there.

https://smile.amazon.com/gp/product/B07CLH9SR7/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

I bought the four pack because I use the same light in one of my utility trailers.



Figure 14. Electrical Compartment Ceiling Light.

I recommend this front compartment light.

Generators

When we boondock I bring generators for two main reasons, one is to charge the batteries if we do not have enough sun for the solar and, two, to run the air conditioning if it gets too hot. Historically I brought two Honda EU2000i generators and ran them in parallel to run the air conditioning (they sell a parallel kit that allows a standard EU2000i and an EU2000i companion to be hooked together). The Honda EU series generators make perfect clean power, are incredibly quiet and efficient. They make bigger models than the EU2000i but I feel the EU2000i are the perfect size, easy to get in and out of my truck and easy to fit in the truck bed in front of the fifth wheel hitch. The EU2000i has now been replaced by the EU2200i that is even better with 2,200 watts instead of 2,000 watts. The i at the end stands for inverter, the inverter makes the power, and the generator can be throttled down to save fuel when the load is low while still making 120-volts.

<https://powerequipment.honda.com/generators/recreational-generators>

You can read about using the generators in parallel here:

<http://cdn.powerequipment.honda.com/pe/pdf/misc/EU2200i-EU2000i-Parallel-Operation.pdf>

One note about these generators, the small Honda generators like this do not have the ground and neutral bonded together and once again will not work with the Surge Guard power protection system unless you make an adapter. I simply took male and female 30-amp twist plugs, hooked them together with 10-gauge SOOW wire and used a quick splice connector to connect the ground and neutral together and then put shrink wrap tubing over it, see figure 15.



Figure 15. Adapter cable with neutral and ground connected together.

https://smile.amazon.com/gp/product/B083S6FVFM/ref=ppx_yo_dt_b_asin_title_o03_s00?ie=UTF8&psc=1

https://smile.amazon.com/gp/product/B0813T3R3D/ref=ppx_yo_dt_b_asin_title_o07_s00?ie=UTF8&psc=1

One thing that has always been inconvenient about this generator solution is running them on gasoline. First off you must bring the gasoline, and secondly, gasoline today has ethanol in it, and it is a disaster for small engines like this. Whenever you store the generator for long periods you must drain the carburetor bowl or flush it out with ethanol free gas.

There is a great solution to this available from Hutch Mountain where you can convert the Honda's to Tri-Fuel, that lets them run on gasoline, propane, or natural gas. The beauty of propane is it runs clean, never goes bad and you already have it on your RV. The conversion is easy to do and takes about an hour. At a half load an EU2000i/EU2200i will burn about a pound of propane an hour. The reason I replaced my EU2000i with the EU2200i is that the EU2000i was too old to be converted to propane, the 2000i companion I had was new enough to convert and the 2200i could be converted and they will work together in parallel.

<https://hutchmountain.com/>

They also offer quick disconnect hose to hook up the generators to the quick disconnect outlets on your camper.



Figure 16. Two generators running on a 40-pound propane tank.

As mentioned above the generator(s) can be run from the camper propane if they can be run from a propane tank with an additional regulator. In figure 16, I had two generators, an EU2000i and EU2200i hooked up in parallel. We used them intermittently over two weeks to charge the batteries on this relatively shady site and to run high draw appliances. We made it for the two weeks on the one 40-pound tank but did not run the air conditioning because the weather was mild.

I recommend the Honda EU2200/2200i generators and the propane conversion.

HVAC

Microair Easy Start

Hutch Mountain also offers a Microair Easy Start that limits the power draw for an air conditioner so that a 15,000 btu air conditioner can be run from a Honda EU2000i generator. The kit is easy to install and takes around 60 minutes, see figure 17. Figure 18. Illustrates a Honda EU2000i running off the RV propane and powering a 15,000BTU air conditioner.

I did find that the adhesive pads that come with the Microairs don't stick well enough and I used 3M heavy duty automotive mounting tape to stick it on:

https://smile.amazon.com/Double-Length-Mounting-Waterproof-Lights/dp/B082WW5NSM/ref=sr_1_1_sspa?crd=3QEIM0NIGU2EF&dchild=1&keywords=3m+double+side+tape+heavy+duty+automotive&qid=1603053952&sprefix=3M+double+%2Cautomotive%2C186&sr=8-1-spons&psc=1&spLa=ZW5jcnlwdGVkUXVhbGlmaWVyPUExVTIET00xUDdJVIZCJmVuY3J5cHRIZElkPUEwOTc2NzczMlpYVTVIKSTMyRFBXTClbmNyeXB0ZWRBZEIkPUEwNjU0NzQyM1YxV1JGWWpaWThFJndpZGldE5hbWU9c3BfYXRmJmFjdGlvbj1jbGlja1JIZGlyZWNOJmRvTm90TG9nQ2xpY2s9dHJ1ZQ==

One issue I have with Hutch Mountain is their delivery is slow and they are hard to get in touch with. They also recently updated their web site and I find it hard to navigate and I could not get an order to go through. It turns out you can order the Microairs directly from Microair and get them much faster plus the new thermostat I will discuss below.

<https://www.microair.net/collections/easystart-soft-starters>



Figure 17. Microair Easy Start installed on a Coleman Mach 15,000 btu air conditioner.



Figure 18. Honda EU2000i generator running on propane from the RV propane system and powering a Coleman 15,000 btu air conditioner.

I recommend the Microair easy start.

Air Conditioning Insulation and New Shrouds

As you can see in the Microair picture there is no insulation on the Coleman air conditioner lines. The larger line supplies the cold coolant to the evaporator box where the inside air is cooled and on a hot day will absorb a lot of heat from the outside air. I insulated the line with foam insulation (see figure 19):

https://smile.amazon.com/gp/product/B084WYBGMG/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

I also added Reflectix insulation to the outside of the evaporator box attached with spray adhesive (see figure 20):

https://smile.amazon.com/gp/product/B07QW4RF41/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

https://smile.amazon.com/gp/product/B0732SQRC7/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1



Figure 19. Insulated AC Coolant Line

I also replaced the original black air conditioner shrouds with white shrouds to reduce the thermal load, see figure 21).

https://smile.amazon.com/gp/product/B004RCP0IE/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

In all honesty I do not yet have a good answer for how much these changes improved the air conditioning performance. On a trip earlier this year the air conditioning did not work very well but since then we have not used the air conditioning enough to have a comparison.



Figure 20. Cold box insulated with Reflectix



Figure 21. White air conditioner shrouds.

I don't know yet whether the insulation and shroud made a difference.

Heat Vents With Shut Offs and Vent Cover

I read on the Jayco Owners Forum that when the air conditioner is running you can lose cold air down into the heating ducts and I replaced the duct outlets with ones with shut off louvers, see figure 22.

https://smile.amazon.com/gp/product/B000JASZ11/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

Note that when running the heat, you have to make sure all the vents are open or the furnace may shut off due to back pressure.



Figure 22. Replacement floor register.

I also made a cover for the return vent in the mid bunk room, see figure 23.

The mid bunk room return air vent lets air from the camper return into the underside for the furnace. During the summer heat from the underside can rise into the mid bunk room and this cover prevents that but must be removed in the winter when the furnace will be run.



Figure 23. Mid bunk room return vent cover.

I also put stainless steel screen behind the vent so that if any critters get into the underside or insects they cannot get up into the living space through the vent, I once found an acorn in that room before I put the screen on although it could have gotten in somewhere else and gotten under the door.

I would not recommend changing the vents to ones with shut offs, I do think the return vent cover was worth doing.

New Thermostat

I replaced the thermostat in the main living area with a Microair Easy Touch to provide programmability and iPhone control, see figure 8.

<https://www.microair.net/products/easytouch-rv-thermostat?variant=32199143555156>

To install it you have to remove the existing thermostat, see figure 24 and transfer the color-coded wires to the back of the new thermostat, see figure 25.

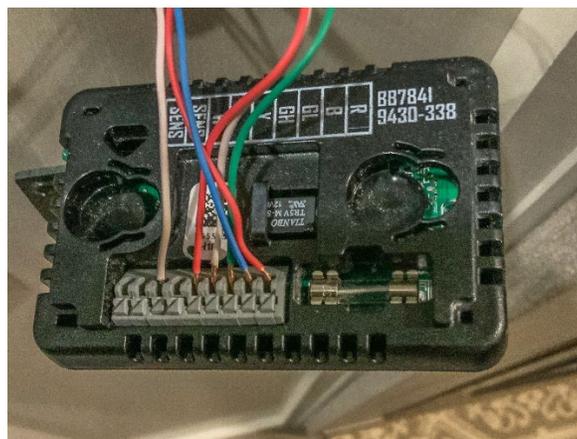


Figure 24. Back of the original thermostat.



Figure 25. Back of the new thermostat.

The old thermostat was mounted vertically so the mounting screws must come out and new horizontally oriented screws for the new thermostat have to be put in.

The new thermostat has a lot of nice features but honestly, I have not really made use of them yet and this may have been an upgrade I could have skipped.

I recommend the thermostat upgrade if programmability and remote control are important to you.

AC gasket repair

Over the first winter with our camper, I found a puddle of water behind the kitchen center island towards the back of the camper. I could not find any roof leaks to explain it but when I opened the rear air conditioner, I found signs that water was leaking under the gasket, see figure 26.



Figure 26. Roof area under the air conditioner.

When you take the air conditioner shroud off there are two long screws at the front and two near the back of the air conditioner that hold it to the roof. Remove all four screws and you can lift the air conditioner off, I then set it on the side on a moving blanket on the roof next to the opening. By only

moving it a short distance you do not have to disconnect the wires (make sure the power is off to the camper before doing this). Be careful not to cut the roof with the sharp edges of the air conditioner.

In figure 26. the left side is toward the front of the camper. All around the opening there is clean gray roofing except towards the front where discolored areas show where the water was getting in.

In the figure 27. the gasket at the front can be seen to be twisted. There are basically two problems, one is the air conditioner is mounted too far back and the gasket does not overlap flat roof enough. Secondly the gasket is mounted too far back on the air conditioner.



Figure 27. Air conditioner bottom and gasket.

I tried straightening the gasket, moving the gasket forward on the air conditioner and mounting the air conditioner as far forward as the screws would allow, and initially, I thought that worked. I ran a hose on the roof and did not see any leaks but a few weeks later I got another leak during a long rainstorm.

I then bought a new one piece gasket:

https://smile.amazon.com/gp/product/B07TW7QY16/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

I mounted the new gasket as far forward on the air conditioner as possible and then mounted the air conditioner as far forward on the roof as the screws would allow. I then caulked the front of the gasket, you are not supposed to do that, the gasket is supposed to just be a press fit, but what really needs to happen is the air conditioner needs to be repositioned further forward but that is likely a major undertaking. Over several months I have had no leaks. I am thinking in the spring I may also put Eterna Bond tape along the front of the air conditioner.

If you have a leak at the rear of your unit, I recommend pulling your air conditioner and checking the gasket.

Plumbing

Water barrel and power outlet

In 2009 we were going to a music festival and we still tent camped and I wanted a way for my family to take showers in our camp site. I bought a shower tent, a portable on-demand water heater that ran off a 20# propane tank and mounted a 15-gallon water barrel on a hand truck with a pump, see figure 28. We only used the shower tent set-up for one year before moving on to better options, but the water barrel has proven invaluable ever since.



Figure 28. Portable Water Barrel

We still camp at the music festival and they have water trucks but no hook ups. We also camp every year at a state park with water faucets throughout the park but no hook ups in the sites. With the water barrel I can go to a water truck or water faucet, fill up the barrel and then go back to my site and pump the water into whatever trailer I am using.

The barrel has a long cord with a cigarette lighter plug on the end and for a long time I brought a deep cycle marine battery and an adapter to plug it in the water barrel in to, but now I have mounted a 12-volt outlet in the basement of my fifth wheel near the water bay, see figure 29. I have adapters so I can attach the pump outlet on the barrel to the water inlet on my fifth wheel.

I use a shure flow water pump:

https://smile.amazon.com/gp/product/B00G6SJ100/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

I don't remember where I got the water barrel but this is drinking water safe and similar:

https://smile.amazon.com/Gallon-Emergency-Water-Storage-Barrel/dp/B07RG84S27/ref=sr_1_5?crid=3EHJC52T262FA&dchild=1&keywords=15+gallon+water+barrel&qid=1600312178&srefix=15+gallon+water+b%2Ctools%2C150&sr=8-5

The hand truck is from Home Depot as is the tubing and fittings.



Figure 29. Basement Power Outlet

If you boondock I recommend a water barrel like this to transport water to your rig.

Disconnect washer/dryer water lines

We have washer/dryer hookups in our camper but do not have the washer/dryer and the lines are something else that can leak and must be flushed when sanitizing and winterized, I opened the back wall of the basement and disconnected the lines down there. I used PEX unions to reconnect the lines where the tee was and left the original lines in place with labels so they can be hooked back up in the future if we ever get a washer dryer (we probably will not due to weight), see figure 30.

I recommend this modification if you have hookups but don't plan to use them.

Water filter system

When I had a travel trailer, I bought one of the blue in-line water filters that goes on the hose but had problems with water flow and I have gone without a filter for some time now. We do not drink the camper water, so I was not too worried about it, but this summer we were camping with a new baby and using the water to wash her bottles. I bought an RV Filter Store Essential RV Water Filter System with Blue Cage and Hose Fittings. This filter has a lot more filter area than the hose filter and I have not had any flow issues. It is kind of heavy with filter housings and a stand that are a heavier build than they really need to be, but it shouldn't break.



Figure 30. Disconnected washer/dryer lines.

<https://www.rwaterfilterstore.com/water-filter-system-universal-mounting>

The filter removes sediment with the first element and then chlorine and giardia and cryptosporidium cysts with the second element. I just put it on the ground and hook it up to the faucet and RV with two short hoses. When we are at a park with faucets but no hookups, I use it to filter the water going into the water barrel. I also like that the larger filter elements have longer residence time for the water, residence time is important when removing impurities with carbon absorption.

If you are concerned with the water quality in your RV, I would recommend this although you may want to look for a lighter approach.

Replumb waste lines

One frustrating issue with my RV was the black water tank never emptied all the way, in fact I eventually discovered it was always over half-full!

I took down the Coroplast underneath to look at the plumbing, the first thing I noticed was all the excess wire Jayco stuffs up underneath that immediately fell out on the ground (see figure 31).



Figure 31. Wire loops that fell out of the bottom of the camper.

In my unit, under the basement there are 2 identical 50-gallon holding tanks, on the driver side is the bathroom grey water tank and, on the passenger side, is the black water tank. The tanks are about 6-feet long (running front to back), just over 2-feet wide and 7-inches tall at the back end and shorter at the front. They are supposed to slope down from front to back to the outlet but do not really slope much. The outlet at the back is connected to 3" ABS Drain Waste Vent (DWV) piping. DWV piping is designed for waste and vent applications where the lines are not pressurized.

The problem I found in my unit is the 3" waste line comes out of the tank and slopes up around 4" before reaching the pipe that drains out of the unit. Since the tank is only 7" tall there was no way it would drain even halfway, see figure 32.



Figure 32. Outlet pipe goes “uphill”.

I needed to get the outlet pipe lower at the black tank, still have slope to the grey tank and then slope down from the grey tank to the outlet and do all of that above the Coroplast. I cut the pipe between the black and grey tank and between the grey tank and the outlet. Once the hose clamp is undone the pipe can be rocked back and forth and pulled out of the tank (and yes it will be disgusting, I put down a big plastic masonry mixing tray underneath to catch the effluent). I did try draining the tank first by raising the front of my RV all the way and that helped reduce the amount that came out.

Jayco uses ABS and ABS should not be mixed with PVC. I originally thought I could just buy the pipe and fittings at Home Depot, but all they sell is PVC, I did find Lowes sells a selection of ABS DWV lines and fittings with some in-store and a lot more on-line. I needed 3" pipe and pipe couplings plus glue. The 3" ABS DWV pipe is inserted into a flange on the back of the tank, held in with a hose clamp and calked with white sticky caulk.

I reoriented the outlet pipes on both tanks, cut back the pipe and made a piece to connect them back together and got it all positioned so the outlet from the black tanks is now flat to down. I glued that piece together and inserted it back into both tanks. I contacted Jayco to find out what the caulk was, but they had to open a ticket. My dealer said they thought it was butyl tape and I used that and have not had any leaks, but I eventually Jayco got back to me and said it is Quad sealant available at Home Depot.

Once I had the section done between the two tanks, I needed to reconnect the outlet from the grey tank to the line that runs out of the camper and both are rigid and held in place. I used a rubber sleeve to

connect them so I had some flex and could push it up onto one pipe, butt the two pipes to each other and pull it over the gap.

https://smile.amazon.com/gp/product/B00HZSJ9T8/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

Tank supports

Unfortunately redoing the plumbing was not a complete solution. The tanks are held up by a top lip around the upper edges and have two metal cross braces underneath the tanks. The problem is the bottoms of the tanks are thin plastic and sag a lot including in front of, in between and behind the cross braces and this traps liquid, see figure 33.



Figure 33. Tanks as installed at the factory.

I also found a partial cut near the front of the tank that I put a patch on just in case.

I read on the Luxe RV web site that they put plywood under their tanks, and I decided I needed to do something like that to reinforce them. The problem is I did not want to put too thick a piece of plywood above the cross pieces under the tank and push it up too much transferring all the weight off the upper lip onto the cross pieces. I decided to use 3/8" plywood under the tanks with 1" x 2" oak bracing in between the cross braces glued and screwed to the plywood, see figure 34.



Figure 34. Plywood piece with oak bracing

The right side of the brace in the picture is 1 x 2 oak I planned to connect to the front frame of the RV with Tek Screws, the two channels running across the piece are where the two cross braces will sit.

I took down the two cross braces and then put the brace in place and reinstalled the cross braces (they just are attached to the underside of the two main I beams with Tek screws, see figure 35).



Figure 35. Braces in place

I attached the braces to the frame and cross braces with Tek Screws, I also put 1/4" spacers between the cross-brace mounts and the I beams to reduce how much upward pressure I put on the tanks so that weight will still be supported by the lip. I also tucked all the wiring back up and tie wrapped it. I thought about cutting it shorter but there are multiple wires in each wire loam, and I did not want to do that much splicing.

You may notice the black tank brace on the right is more complex than the grey tank brace on the left, that is because the black tank is more of a drainage issue. The black tank also tends to be full more often, on hookups we leave the grey valve open and black valve closed and when dry camping I take tote tanks of grey water to a dump station every few days but try to only dump the black tank at the end of the trip.

The back end of the tank brace is strapped to the frame to support it all the way to the end, see figure 36. I also used large tie wraps to hold the 3" DWV lines in the exact position I wanted them to stay in.

The black and grey tank now both completely drain.

If you have drainage issues with your tanks, I recommend opening the bottom and implementing whatever parts of this fix are required.

Tank monitors

I am not a fan of the Jayco tank level monitors, 1/3 full can be anywhere from just over 1/3 full to almost 2/3 full, I want more precision in the measurements.



Figure 36. Back end of the tank brace strapped to the frame.

I bought an enclosed utility trailer in 2010 and outfitted it with a lot of RV systems. I put in a 40-gallon water tank and Garnet Instruments Sea Level II tank monitor to monitor how full the tank is. The Sea Level II system worked well and read out how full the tank was in percent. While I had the bottom of my RV open, I bought a SeeLevel II 709-4 Tank Monitor to monitor all my tanks and I attached the sensors to the outside of my freshwater tank, both gray tanks and black tank. The whole system works over two wires and you cut out tabs to tell each sensor what tanks it is monitoring. I ran the wires up to my master control panel illustrated in figure 8.

It is a little hard deciding exactly how to cut and mount the sensors on the tanks in the RV because the sides are curved whereas the sides of the tank in my utility trailer are straight. I put the monitors on late in the summer and have not used them a lot yet, but my initial impression is they are not as accurate as I had hoped.

At this point I do not recommend these tank monitors but may change my mind once I have worked with them more.

Label tanks and capacities

This is a little thing but once you figure out which tanks is which, labeling them with what they are their capacity is a handy reminder. I find it particularly useful for the slides, see figure 37.

I have also labeled the tanks out in the wet bay, see figure 38.

Lippert Floe

The Lippert Floe is a low-pressure air compressor that can be permanently installed on your RV to blow the water out of your lines for winterizing or even between trips to keep your lines clean, see figure 39.



Figure 37. Control panel labels.



Figure 38. Wet bay labels.



Figure 39. Lippert Floe Install.

I mounted the flow behind the back wall of my basement against the wall for the outside kitchen. The black tube that comes out of the bottom runs over to the wet bay and is hooked into the line that runs up from the freshwater tank. The valve in the line is left closed when the Floe is not running. With the wall in place, I can reach the valve through the access panel for the low point drain.

I ran the power cord around and over my basement to the other side where I installed the power outlet for my water barrel seen in figure 29. I hung the Floe cord by the outlet and when I want to run the Floe I just plug it in, see figure 40.

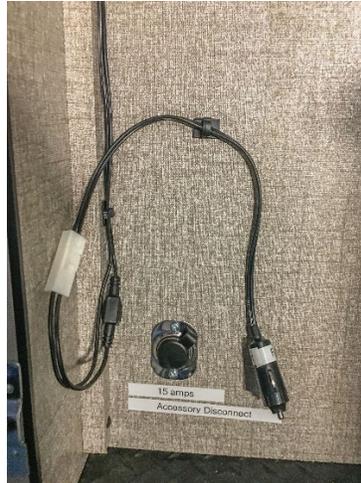


Figure 40. Power cord for Floe at power outlet in the basement.

It is convenient to have the Floe permanently installed and be able to blow out the lines quickly and easily, it is very loud but since it is only on when you are blowing out the lines it isn't a big deal. I have only used it once so far so I don't have a lot of experience with it, but I appreciate the convenience and I like not having to put in and flush out antifreeze.

I conditionally recommend the Floe based on my limited experience with it so far.

Propane

Propane Monitor

I added an AP Mopeka Tank Check propane monitor to monitor the level of propane in the two propane tanks. The Mopeka has two sensors that attach magnetically to the bottom of the tanks and then a small wireless controller that shows the tank status. I keep the controller in the drawer in my bedroom and you just press the buttons on it and it shows you how full each tank is in $\frac{1}{4}$ tank increments, see figure 41.



Figure 41. AP Mopeka Propane Monitor Readout

https://smile.amazon.com/gp/product/B019QGLVJ2/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

Recently I tried to use it and it does not seem to be reading tank levels anymore.

Currently I would not recommend the Mopeka due to unreliability.

Grill Conversion to Camper Propane

In the miscellaneous section I will discuss how I removed the cook top from the outdoor kitchen and converted that space to a drawer. The outdoor kitchen has a grill on a drawer and even pulled out all the way any grease flair ups cooking hamburgers or steaks sends flames up near the side of the RV, I used it on one trip and vowed never to use it again. Once I removed it and converted it to a drawer, I wanted a way to grill.

I bought a small portable Weber Grill, the Q Grill that I can easily carry in the basement, see figure 42.



Figure 42. Weber Q Grill.

The Q Grill is a nice portable grill with a cast iron grate that cooks well. The grill comes with its own regulator and is designed to hook directly to a propane bottle. I wanted to be able to hook it into the quick disconnect on the side of the RV that was already there for the pull-out grill or the quick disconnect on the rear bumper.

Propane gear sells a conversion kit that replaces the regulator with a quick disconnect that plugs into the RV quick disconnect (propane on the RV goes through a regulator before being distributed throughout the rig).

Figure 43 shows the grill after the regulator has been removed and the quick disconnect has been put in place. Please keep in mind that if you ever want to hook the grill directly to a propane bottle you need to reinstall the regulator.



Figure 43. Q Grill After Regulator Removal and Quick Connect Install.

If you would prefer a griddle, propane gear has similar options to convert a Blackstone griddle.

I recommend the Weber Q Grill and propane gear conversion.

Gas Stops on Propane Tanks

Propane is highly combustible and if a gas line is severed at any time, stopping the flow of propane as quickly as possible is critical to prevent potential fires or explosions.

GasStops installed on the outlets of your propane tanks will sense excess propane flow and shut off the flow at the bottle:

https://smile.amazon.com/gp/product/B07N4D4SMD/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

Figure 44. illustrates a GasStop install on a propane bottle, there is also a handy gauge for monitoring how full the tank is.



Figure 44. GasStops on the Outlet of A Propane Bottle.

Each time you reconnect your propane bottle, for example after filling it you will need to press down on the gauge a couple of times to “prime” the GasStop for propane to flow.

You can also use the GasStop gage to leak test your lines. You hook it up, charge the line with propane and then close the valve on the cylinder, if the gage on the GasStop goes down over a few minutes you have propane leaking somewhere.

I haven't had a propane line sever and trigger a GasStop but I recommend them as a prudent safety precaution.

Master Bedroom

New Mattress

When we walked through the camper at the dealer the mattress it came with was hard as a rock. Before we even took delivery of the camper, we bought a Sleepy's Hush Pillowtop mattress at Mattress Firm.

<https://www.mattressfirm.com/search?q=sleepys+hush+pillow+top&lang=default>

The funny thing is while we were buying the camper mattress my wife started talking about how she always wanted a power base bed and we ended up buying a king size power base and an expensive mattress to go on it for our bedroom. A year later my wife and I both agree the camper mattress is more comfortable.

One other comment on the bed, we sleep on a king size mattress at home but have a queen size mattress in the camper. I find the queen has plenty of room and I like being able to easily walk around it. A lot of times king size beds are crammed into an RV and I personally think having a queen with room to walk around it is a good trade-off. Others may want a king bed, but I wanted to point out that when you get a king bed you may be giving up walk around room.

I recommend an upgraded mattress and really like the Sleepy's Hush Pillowtop.

Remove TV

We rarely watch TV while camping and our unit came with a TV in the bedroom. The TV was mounted over the dresser blocking the top of the dresser and we never used the TV. I removed the TV and put it in storage in case we ever sell the unit, and the new owner wants the TV back. It is easy to take in and out, held in place by 8 screws. Removing the TV really opens up the top of the dresser, see figure 45.



Figure 45. Master Bedroom Dresser After the TV Was Removed.

If you don't use the master bedroom TV, removing it really opens up the dresser top area.

Closet lights

There are no lights in the closet in the master bedroom. When the overhead lights are on in the bedroom it is easy to see in the front of the closet but if you need something out of the shelves in the back or at night when someone is sleeping, and you don't want to turn the lights on it is hard to see. I installed motion sensor battery powered LED lights that attach to magnetic strips held on with double sided tape. We have one light on each side of the closet, and they turn on whenever you open the closet doors. Also, because they are magnetically attached you can pull them off and use them to see in the back of the closet.

The light I used is available here:

https://smile.amazon.com/gp/product/B07C6596ZC/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

See figure 46.

This is an easy to install, inexpensive modification that really improves the user experience with the closets, I recommend it.



Figure 46. Master Bedroom Closet Lights.

Door stop/holder

When open I found the door to our master bedroom would often sit partially open/partially shut. I bought a magnetic door stop that is spring loaded to the door does not bang against a hard stop and it magnetically holds the door fully open. When you want to close the door you just pull and the magnet releases.

The door stop I bought is available here:

https://smile.amazon.com/gp/product/B01J7M9X68/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1



Figure 47. Master Bedroom Door Stop

This is another easy to install upgrade that I recommend.

Fire extinguisher

Our camper came with a single small fire extinguisher located near the entry door. The existing fire extinguisher is rated for B (flammable liquids) and C (electrical) but not A (wood, paper, cloth, plastic, etc.) which seems strange to me in an RV made largely out of wood and fiberglass, see figure 48.



Figure 48. Jayco Fire Extinguisher.

In case of fire, I wanted a bigger fire extinguisher rated ABC, plus I wanted one in the bedroom in case we needed to fight our way out through a fire. I mounted a bigger fire extinguisher in the bedroom closet, see figure 49.

The extinguisher shown in figure 49 is standard extinguisher and there are several draw backs to these types of extinguisher, they are big and heavy, they make a huge mess when discharged and the discharge does not last very long, they also expire over time.

I am in the process of replacing them with Element E100's:

https://smile.amazon.com/gp/product/B08K99LPQX/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

The Element E100 has several advantages, they are smaller and lighter, the E100 has a 100 second discharge time, they work on all types of fires and leave no mess, they never expire, they are also unaffected by temperature over a wider range than they will ever experience in an RV. The only draw backs are cost and the need to train people in how to use them. Pretty much everyone knows to pull the pin and squeeze the trigger for a regular extinguisher, for the Element you must remove the top cap, remove the bottom cap and use the striker in the bottom cap to “strike” the top starting the flow of fire

suppression chemical. For a key safety item, I am willing to pay the cost and I will train everyone who stays in my RV how to use them.



Figure 49. Master Bedroom Fire Extinguisher.

I will take a picture of the element fire extinguishers in place once I have them installed.

I recommend the Element fire extinguishers.

Wall hooks

I ordered some hooks that match the hooks in our bathroom and mounted them on the bedroom wall.

https://smile.amazon.com/gp/product/B07MM9K63Z/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

I mounted two hooks on the wall between the master bedroom and bathroom. Feeling the wall, it was easy to identify where the studs are and I screwed the hooks into the studs. I hang various clothing items on them I am going to use the next day or pajamas and they are a nice addition to the camper, see figure 50. Note, I will get a better picture in the spring when I can run the slides out.

I recommend this modification.

Safe

I don't carry a lot of valuables in our camper but when we are on vacation, I do carry some cash. I bought a small combination safe:

https://smile.amazon.com/gp/product/B00FARLXRW/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1



Figure 50. Hooks on Master Bedroom Wall.

At just over 11 pounds it is not too heavy and fits into the shelves in the back of the closet in the master bedroom, see figure 51.



Figure 51. Safe.

One comment on this type of safe is that the combination relies on batteries inside the safe, so they provide a key in case the batteries die, this means you must figure out somewhere to keep the key.

I recommend this modification.

Day/Night Roller Shades

The existing shades are hard to pull down, do not completely block outside light and don't completely block people outside the camper from seeing in. I ordered day/night roller shades for the bedroom here:

https://www.recpro.com/?gclid=CjwKCAiAsaOBBhA4EiwAo0_AnChS5Z95izi3tol0Cb5uvPuoXCHQS_3cxV1WCEWbVq3e66_bdmEunxoCGBcQAvD_BwE

Picture to be added.

Figure 52. Day/Night Roller Shades.

Recommendation to be determined after I install and test them.

Dimmer

I wanted to be able to dim the bedroom lights, so I bought a touch dimmer switch like what is used in the living and dining room area of the camper.

Dimmer:

https://smile.amazon.com/gp/product/B072349JZN/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

The hole for the original switch was too big for the dimmer switch to cover so I made a cover out of an ABS sheet and then mounted the dimmer switch to the cover, see figure 53.

ABS sheet:

https://smile.amazon.com/gp/product/B0007WTF02/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

The dimmer does have a small light in the middle, it does not bother me because I sleep with a pillow covering my eyes, but some people have complained in the Jayco Owner Forum about light from the dimmer in their bedroom.

This type of dimmer switch requires DC plus and minus in and DC plus and minus out. In my case the original switch just interrupted the plus line, and the minus line was not even visible in the opening, however the thermostat for the bedroom was mounted to the wall right above the switch and when I took it off the minus line was there, I just had to identify which line fed the lights.

If you want to be able to dim the bedroom lights, I recommend this modification.

Bathroom

Vent fan

The original fan in the bathroom made a lot of noise, did not move much air and the on/off button was on the ceiling where my wife couldn't reach it.



Figure 53. Dimmer switch on mounting plate (bottom)

I bought a Maxxair 7500K – 10 speed vent fan with remote control:

https://smile.amazon.com/gp/product/B003YJIDW6/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

This fan is amazing, on 10% fan speed it is silent and will keep the bathroom mirror from fogging up during a shower although the bathroom still feels humid, at 20% it is still really quiet, and the humid feeling is gone. At 100% fan speed it still is not very loud, and it will pull the heat out of the whole camper, you can actually feel the air coming in the windows and door screen if the fan is set to pull out. The cover for the fan allows you to run the fan even in the rain and I mounted the remote cradle on the wall next to the sink where it is easy to reach.

The hardest part of the installation is cleaning up all the old sealant when you take out the old fan, the new fan drops right into the same opening. The trim piece for inside that comes with the fan is too short, but the original trim piece fits fine after you cut it shorter and notch the corners.



Figure 54. Maxxair Vent Fan.



Figure 55. Remote Mounted to the Wall Above the Light Switches.

Glass wipers

Opening and closing my shower glass doors made this terrible metal on metal screeching sound. I posted on the forum asking people about lubricating the metal channels the doors glide on and someone said the problem is the clear plastic/rubber wiper strips they put on the ends of the doors to seal between the glass. At first, I did not believe the wipers could make a noise like that but when I removed them the noise went away. I have now gone for several months without them and the noise is gone, and I have not had any trouble with water getting out of the shower. The glass door panels have plenty of overlap to prevent water getting out.

I recommend removing the wiper strips.

Shower head

The shower head in the camper doesn't develop much pressure. I bought an Oxygenics shower head: https://smile.amazon.com/gp/product/B00F5MUB66/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

Its not really clear to me the new shower head made that much difference, but it was an easy change over.

I could go either way on this upgrade.

Shampoo dispenser

Whenever we get ready to move the camper, I always had to go check the shower to make sure there weren't any loose shampoo bottles in there that could fly around and break. I mounted a shampoo dispenser on the wall and now I never have to worry about, see figure 56.

Also in figure 56 is the Oxygenics Shower Head and a bar soap holder I installed because we like Dove bar soap.

https://smile.amazon.com/gp/product/B000FGCW0K/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

https://smile.amazon.com/gp/product/B016P4OZ82/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1



Figure 56. Shampoo Dispenser, Soap Bar Holder and Oxygenics Shower Head.

One way valve

We boondock a lot and when showering I will run the water to get wet, turn it off, soap up, and then turn it back on to rinse off. When you turn the water back on there is a big slug of cold water that comes out before the water gets hot again. I saw in a YouTube video that the problem is the cold water is at higher pressure than the hot water and flows into the hot water line. The video claimed that if you put in a check valve it would fix the problem.

The hot and cold-water lines for my shower are both exposed behind the shower in the linen closet in the bathroom. I cut the Pex hot water line and put in a Shark Bite one way valve I bought at Home Depot, see figure 57. I think it does help some, but it does not fix the problem.

This modification is so easy to do I recommend it because I think it helps but it isn't a fix.

Medicine cabinet acrylic

The medicine cabinet in these units is relatively shallow and I found that every time I open it after moving the camper everything falls out.

I bought a sheet of clear acrylic and cut it into two-inch-wide strips on my table saw. I cut strips to length to match the inside width of my medicine cabinet and then cut side pieces to go in on the cabinet sides. I attached the strip together with acrylic solvent. Any glue overage or scratches can be easily buffed out

of the acrylic with automotive rubbing compound followed by polishing compound. I inserted the pieces into the cabinet and secured the ends with screws, I also bought a couple of clear plastic organizers.



Figure 57. One Way Valve on the Shower Hot Water Line.

Figure 58 illustrates the cabinet with the inserts and organizers.



Figure 58. Medicine Cabinet with Acrylic Inserts and Organizers.

This was an easy modification that really made the bathroom so much easier to use. I can pile a bunch of stuff in the cabinet and nothing falls out and everything is organized.

The acrylic sheets are:

https://smile.amazon.com/gp/product/B0755PPM1F/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

The acrylic solvent is:

https://smile.amazon.com/gp/product/B0096TWKCW/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

The organizers are:

https://smile.amazon.com/gp/product/B003E1O1E8/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

I recommend this modification.

Mid Bunk Room/Office

I work for myself selling computer models I create over the internet, I can work from anywhere with a computer and an internet connection but I need un-interrupted quiet to do it. One of the reasons we picked the floor plan we did was with the idea that I would convert the mid bunk to an office.

Remove Fold Down Bunk

The fold down bunk in the mid bunk room is too short for anyone in my family and is heavy so I removed it. I have it in storage and could easily put it back in if I ever needed it.



Figure 59. Mid bunk room with fold down bunk removed.

If you don't need the bunk removing it saves weight and makes the love seat easier to use.

Remove TV

Just like in the master bedroom I removed the TV because it made the desk harder to use and we do not use it.

If you do not use the TV removing it saves weight and makes the desk more usable.

Desk drawer and extension

The desk is not deep enough to use a computer on it, also on the right side there are three drawers, a shallow drawer and two deep drawers, but the deep drawers aren't deep enough for file folder. I do not know why Jayco does not make a file drawer and two shallower drawers. I hired a local cabinet shop to rebuild the desk and create a file drawer plus build a removable extension, see figure 60.



Figure 60. Mid Bunk/Office Desk with Extension.

The extension press fits to an extension at the edge of the desk and has fold-up legs so it can be easily stowed for travel. I wrap it in a moving blanket and put a moving blanket over the chair. The entire desktop is now solid cherry. You can also see in the picture that the TV has been removed.

I keep all of the documentation for the trailer and all of the modifications in the folders in this drawer for easy reference.

The brackets I bought for the legs are here:

https://smile.amazon.com/gp/product/B01N4F7BNH/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

If you want to use the mid bunk as an office I recommend this modification.

Wall hooks

My wife and I are raising our grand daughter and she sometimes shares my office with me (or in other words she takes it over). When she is in there having some hooks to hang towels and clothes on is helpful and just like the hooks I put up in the master bedroom I put some hooks up on the back wall that is common with the kitchen, see figure 62.



Figure 61. Desk File Drawer.

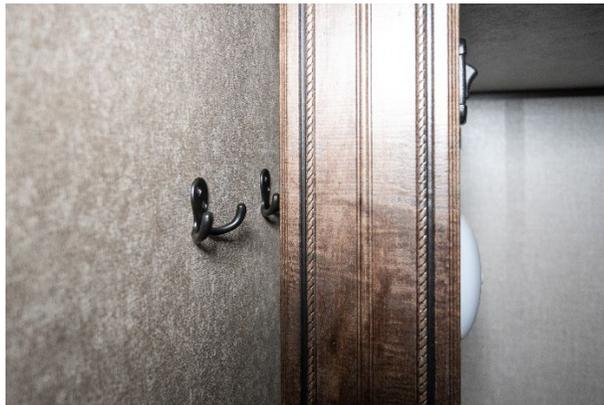


Figure 62. Wall Hooks.

This is another picture I will retake when I can run the slides out in the spring.

If you want hooks to hang things on this is an easy addition.

Extra plug

If you look carefully at figure 60 you can see that I added an extra plug next to the existing plug in the corner. I wanted additional outlets for when I have multiple items running on the desk.

The plugs used in my unit are self-contained black plugs and I bought it here:

<https://bendtrailers.com/rv-designer-self-contained-dual-outlet-with-cover-plate-black-s817/>

Then I simply cut a hole next to the existing plug and wired them in parallel.

I haven't actually made use of this, not sure I would do it again.

Desk switch

When you walk into the mid bunk the wall switch on the left turn on a blue night light at the floor and there is a switch on the side of the cabinet on the right that turns on a ceiling up-light, neither light lets you do any work. I installed a switch in the wall on the right under the cabinet that turns on the under-cabinet light – lighting up the desk and providing enough light to get right to work. The switch isn't that far from the under-cabinet light that has a switch on it, but it is much easier to reach entering and exiting the rooms.

This is the switch I used:

https://smile.amazon.com/gp/product/B002UC8MW4/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

To install this, I cut a hole in the wall for the switch and then opened up the bottom of the cabinet up above. I cut into the wire for the under-cabinet light, drilled a hole in the back wall and dropped the wires down to the switch hole.



Figure 63. Mid Bunk/Office Light Switch.

This took a little work, but it is a lot more convenient way to turn a usable light on and off entering and exiting the room.

Weather station

When I am camping, I like to be able to monitor the local weather. I bought a weather station:

https://smile.amazon.com/gp/product/B07GRBY9NP/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

This weather station can measure wind speed and direction, rain fall, humidity, temperature, barometric pressure and more.

I used hose clamps to mount a section of this aluminum flagpole on the top of my ladder:

https://smile.amazon.com/gp/product/B083QSDCW7/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

The pole holds the instrument package above the trailer roof but is still lower than the forward air conditioner. I leave the pole up all the time but take the weather instrument package off the pole when moving the trailer. Figure 64 shows the instrument package mounted on the pole.



Figure 64. Weather Instrument Package on the Mounting Pole.

The instrument package runs on batteries and communicates with the monitoring screen wirelessly. The monitor sits on the desk in the office and is powered by the DC converter discussed in the Internet, Alarm System, and Cameras section.

If you like to monitor the weather while camping I recommend this modification.



Figure 65. Weather Station Monitor.

Office door curtain

When my grand daughter is camping with us, she sometimes sleeps in her portable crib in my office. My wife made a curtain for the door so that light does not come in, see figure 66.



Figure 66. Mid Bunk/Office Door Curtain.

If you have a baby sleeping in the mid bunk room I recommend this modification.

Kitchen/Living Space

Light for entertainment system

I find the buttons for the entertainment system hard to read/shadowed. I added a switched battery powered LED light above the entertainment center, see figure 67.



Figure 67. Entertainment Center Light.

This light is like the closet lights described in the master bedroom section in that it is held in place by a magnetic strip and the strip is held in place by double sided tape. You must be careful placing the light so that closing the door over the entertainment center does not knock the light loose.

The light I used is:

https://smile.amazon.com/gp/product/B07C5TSH43/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

The light even has a remote control.

This is an easy and inexpensive modification that makes the entertainment center easier to use and I recommend it.

Towel bar

We wanted a place to hang dish towels in the kitchen. I bought a nickel towel rack at Home Depot and mounted it to the end of the center island. The rack sticks out enough that it is easy to put towels on and off the rack even with the counter overhang, see figure 68.

This is an easy and inexpensive modification that makes the kitchen more usable, I recommend it.

Pantry organization

One time when we moved our trailer a box of oatmeal fell in the pantry and sprayed oatmeal everywhere. I bought some retaining bars on Amazon here:

https://smile.amazon.com/gp/product/B07DNP2RC5/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

And here:

https://smile.amazon.com/gp/product/B0006IX7WY/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1



Figure 68. Kitchen Towel Rack.

And bought some baskets at the container store and some Rubbermaid cereal holders.

Our pantry with the retaining bars and baskets is shown in figure 69.



Figure 69. Pantry Organization.

I recommend these accessories.

Refrigerator monitoring system and fan

Early on we had some problems with our refrigerator not closing correctly and not holding temperature. I have added two accessories, one is a fan to circulate air in the refrigerator making it more efficient and the second is a wireless temperature monitor.

The fan is available here:

https://smile.amazon.com/gp/product/B01E5SNB5I/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

The refrigerator wireless thermometer is available here:

https://smile.amazon.com/gp/product/B07XD68GX6/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

And illustrated in figure 70.



Figure 70. Refrigerator Temperature Monitor.

The monitor not only provides wireless monitoring of the refrigerator and freezer, it can be set to alarm for over temperature.

I recommend these accessories.

Magnetic knife holder

We carry Victorinox chef, bread and carving knives in our trailer. They are nice, reasonably priced knives, that are a lot less expensive than the knives we have at home and work just as well. I put up a magnetic knife holder for them to make them easier to access when cooking, see figure 71.

The knife holder is available here:

https://smile.amazon.com/gp/product/B07L8JC5RF/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

I do take the knives down and put them in a drawer when travelling.



Figure 71. Magnetic Knife Holder.

I recommend this accessory.

Drawer Organization

The drawers in the kitchen in my unit are small and most organizers will not fit in them. For the cutlery I bought these:

https://smile.amazon.com/gp/product/B07PNLTRH8/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

And they have worked well, see figure 72.

I recommend this accessory.

Picture to be added.

Figure 72. Cutlery Drawer.

Paper towel holder

To hold a roll of paper towels I added this holder to the front of the kitchen:

https://smile.amazon.com/gp/product/B01M2YFY5G/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1



Figure 73. Paper Towel Holder.

Once again I will get a better picture in the spring when I can run the slides out.

I recommend this accessory.

Stair Lights

Someone in the Jayco Owners forum was commenting about almost falling down the stairs inside the unit and I thought adding lights would be a good idea. I wanted to match the Jayco blue theme for night lights so I bought these LED strips:

https://smile.amazon.com/gp/product/B078PH5C3F/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

I stuck them up just under the lip of each step.

I mounted a wall switch at the top of the stairs using this switch, see also figure 74:

https://smile.amazon.com/gp/product/B002UC8MW4/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

The cabinet over the desk in the mid bunk room is behind this wall and I thread wires from there to the switch for power. I then dropped the wires down through the wall into my outdoor kitchen enclosure. I took the refrigerator out of the outdoor enclosure, drilled a large hole in the wall and to get access to under the stairs to run power to the light strips. I then put a cover over the hole and put the refrigerator back in the outdoor kitchen hiding the cover.



Figure 74. Stair Light Switch.

Figure 75 illustrates the resulting stair light lit up at night.



Figure 75. Stair Lights.

I recommend this modification although it is a lot of work to get the wires snaked through everything.

Entry door

I ended up making a surprising number of improvements to the entry door.

Fix hole

The door stop Jayco installs is a hard plastic tube and it punched a hole in the door, see figure 76.

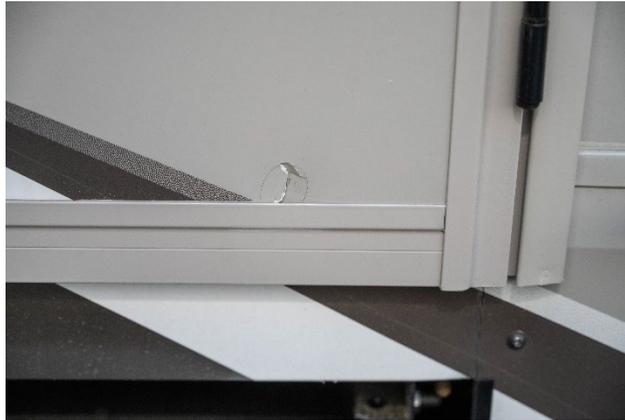


Figure 76. Hole in the Door from the Door Stop.

Obviously this isn't a good situation and was only going to get worse.

I bought a piece of aluminum angle stock at Home Depot, cut a short piece, put Dicor sealant around the hole and the top edge of the aluminum and screwed it to the door. The hole is sealed by the Dicor and aluminum, the door stop hits the aluminum and the aluminum top edge keeps the door stop from popping over the top, see figure 77.



Figure 77. Aluminum Stock Mounted to the Entry Door.

If you have a problem with the door stop puncturing the door I recommend this solution.

Keyless entry

A lot of people have positive things to say about keyless entry and I really liked the idea. We camp at a music festival every year and my kids are always asking for the camper keys, then I go back to the camper and cannot get in because they are off somewhere with the keys plus I worry about them losing

them. The Jayco keys are also reported to have a limited number of different configurations and I worry about someone else's keys fitting my unit, RV lock claims a million different configurations to their keys.

I bought the RV lock:

https://smile.amazon.com/gp/product/B00N58KQMQ/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

The installation was easy, it only took about ten minutes fitting into the original lock opening, see figure 78.

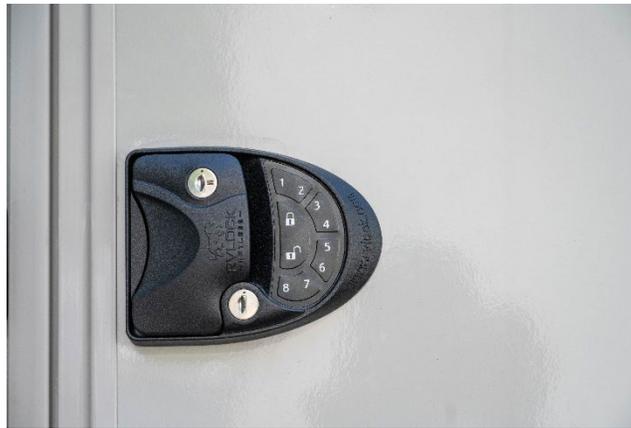


Figure 78. Keyless Entry

Once I installed it, I ran into one annoyance and one issue.

First off is the annoyance, out of the box when the Keyless entry unlocks it beeps so loud everyone in the campground will know you unlocked your door. Since you can hear it unlock it is not clear to me why it is designed to be this loud. I did eventually find out you can turn it off but then it does not even make the little beeps when you hit the keys. I would like the little hit the key beeps and no lock open beep.

The second thing was a real issue, the lock did not reliably unlock so if you didn't bring your keys you would be locked out. I eventually replaced the battery that came with the unit with a lithium battery and so far, I have not had any more issues but if you can't count on the lock working as a keyless entry it isn't very useful.

Assuming the issue was a bad battery shipped with the unit, then this is a useful addition but for me I am not currently prepared to recommend this.

Solar motion light

I got this idea from the Big Truck Big RV YouTube channel and it really is a great addition, it is a solar powered motion sensor light that I mounted near the steps. At night when you walk near the camper the light turns on automatically and you can see the steps. The built-in solar panel keeps it always charged and it works great.

This is the light:

https://smile.amazon.com/gp/product/B07DTQSTYM/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1



Figure 79. Solar Motion Sensor Light.

New steps

People on the Jayco Owners Forum often refer to the steps that come on the Eagles as the “Diving Board” apparently because they think they bounce around like a diving board. Yes, the factory steps are suspended in midair and yes, they move a little but not very much, at least mine don’t and I am a big guy. What I do not like about the factory steps is they end too far above the ground and I always brought a step stool to put under the last step. As much as possible I like everything on my RV to just work and not to have to bring extra things to put in place, so I decided to investigate alternate steps.

A lot of people appear to like the Morryde Step Above Steps, but my camper is stored at home next to a utility trailer and I don’t have enough room for the steps to swing down.

I ended up buying the Torklift Glow Step Revolution 4 ST because they go all the way to the ground and can be set at different angles for tight spaces or stretched out when you have room:

https://smile.amazon.com/gp/product/B07BNVZKQC/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

The installation was relatively easy, I did have to drill holes to get them positioned correctly but they fit in the existing stair well. I did decide they were too short, but I was able to buy and easily install an additional step. I had measured the height of my camper for the steps but my driveway slopes away from the camper and I needed a little more length.

I have limited experience with the steps, but my preliminary observations are:

1. The steps are supposed to glow to help you walk up and down them in the dark, in my opinion this “feature” is not functional, the steps have a bunch of glows in the dark plastic pieces stuck

to them. I have only used my steps a few times and the pieces are already falling off and they did not really work even when I first put the steps on.

2. The steps have a pin on one side that goes through two holes to ensure the steps do not open going down the road. The pin does not fit snugly and can easily fall out. I mentioned that to the company and they assured me it was unnecessary anyway, but it seems to me if they have it – it should fit right, there are also holes on both sides of the steps and if you put it on one side why not both.
3. The steps have adjustable feet at the bottom that sets the height of the bottom step, then the next four steps (I added one) are spaced based on the structure of the steps and finally the distance from the top step into the camper is adjustable. The net result of this is you can have three different step heights. Careful set-up can minimize this, but your body really expects all the steps to be the same.
4. Currently I cannot get the steps to properly latch in the up position. I have not worked on this yet because it is twenty degrees outside right now with two feet of snow on the ground, but it is disappointing in new steps.



Figure 80. Torklift Glow Step Revolution 4 ST Steps.

With more experience I may change my mind, but right now I would not recommend these steps.

Pull bar

I added a pull bar to the door to protect the screen and make the door easier to close. The bar is available here:

https://smile.amazon.com/gp/product/B0012GTVVA/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

The bar was easy to install and makes the door easier to use, see figure 81.

I would recommend the door bar, it is inexpensive and easy to install and makes the entry door easier to use.



Figure 81. Entry Door Bar.

Safety

To me the safety of myself and my family is paramount, and I want to do everything I can to insure we are safe.

Fire extinguishers

As mentioned in the Master Bedroom section I added a fire extinguisher to the closet, I added another one to the basement on the entry door side of the unit. It is my plan now to replace the Jayco factory extinguisher, the master bedroom, and the basement extinguishers with Element E100 extinguishers.

Alarms

As mentioned, in the Internet, Alarm System, and Cameras section I have added a Ring Alarm System and Blink Cameras. The Ring system provides a burglar alarm and monitors for smoke, CO, propane, water and freezing and provides not only an on the camper alarm but also alerts to my cell phone and iPad.

Disc Brakes

From the time I bought my unit, I never thought it stopped very well. After reading a lot of people talk about how much better disk brakes are, I decided to order them from Performance Trailer Braking. Interestingly the last trip I took before the brake install, I blew a fuse on my tow vehicle brake controller making a panic stop when someone cut me off. A few weeks after that I was working under the camper and I noticed a wire and spring sticking out of one of my brake drums, see figure 82.

My brake install was done at my house by John Alinger of A&A Mobile Services (405) 550-4702 and he was great to work with. When he removed the front driver side brake drum on my camper the brake looked fine, however when he removed the rear one all the parts just fell out on the ground (this was the brake where I had seen the spring and wire sticking out). On the passenger side of my camper both brakes had grease on the shoes, so basically, I had one of four brakes working. I want to note here that at this time my camper had less than 2,000 miles on it and I had never serviced the brakes or greased anything on the unit. I believe Jayco shipped the unit from the factory with only one functioning brake. I think what saved me is my tow vehicle is a dually with big brakes.



Figure 82. Spring and Wire Sticking Out of the Brake Drum.



Figure 83. Disc Brakes.

My camper has dual Dexter 7,000-pound axles, my understanding is the difference between the Dexter 7,000-pound and 8,000-pound axles is basically the outer bearings and brakes. I ordered the 8,000-pound axle brakes from Performance Trailer Breaking and they replaced the outer bearings, so I now have effectively 8,000-pound axles and brakes on my camper and it stops on a dime even with my brake controller turned down (I used to run it turned up all the way).

Having experienced disc brakes now, I really think they are an essential item for a heavy fifth wheel. They are expensive but I highly recommend them.

Shackles and wet bolts

John Alinger asked me if I wanted him to put upgraded shackles and wet bolts on while he was doing the brakes. I kind of went back and forth on this thinking that a unit with only 2,000 miles on it and a

CRE3000 suspension probably did not need it, but ultimately, I decided while he was here, I should have him do it. I am glad I did, he showed me the original shackles after he removed them, and I really wish I had taken a picture of them. The shackles are basically steel ovals with round holes in the ends except my holes were ovals after only 2,000 miles and were on the way to failing. A failed shackle would let the suspension collapse, the new shackles are about a half inch thick and I think they will basically last the life of the trailer.

I would recommend this upgrade.

Gas Stops

As described under propane, gas stops shut down gas flow if a gas line is cut.

Tire Pressure Monitoring System

I had a TireTech On Wireless Tire Pressure Monitoring System (TPMS) from a travel trailer we owned previously; I am not providing a link because the system is no longer available. I do highly recommend a TPMS, tires are a weak-spot on trailers and knowing the pressure and temperature are correct while traveling can prevent dangerous tire failures. Having had a tire blowout on the highway in a trailer I can say it is an experience I do not want to repeat.



Figure 84. Tire Pressure Measurement System Sensors

I recommend a tire pressure measurement system.

Critter Control

Seal The Underside

We had a travel trailer prior to our Fifth Wheel and we had a lot of problems with rodents getting inside and damaging the trailer. When I started looking around for where they were getting in, I was extremely disappointed with all the unsealed openings. I have 2006 and 2010 utility trailers that I have added a lot of camper systems too, I have never had a rodent in either one because I sealed every penetration when I made it. Thankfully my Fifth Wheel has a better underside than the travel trailer but there are still lots of seams and small gaps. I spent an entire day under the camper filling every gap with spray foam. As

discussed below I also later realized there are openings in the main I beams that need to be sealed as well plus where the spare tire hoist comes down through the Coroplast.

I recommend sealing the underside.

Mouse Lights

I saw a YouTube video where some people with a camper said that mice are very shy and by putting a string of Christmas lights under their camper, they kept them away. I bought some LED truck bed lights and stuck them up over each leveling jack and tire for my camper and then wired them to a timer switch to run them at night.



Figure 85. Mouse Lights Under the Camper

https://smile.amazon.com/gp/product/B017XFF9IM/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

It isn't clear to me whether this really helps and I would not recommend the timer. When the timer is on, the positive output measures 12 volts to ground and the negative output measures 0 volts to ground. When it is off both the positive and negative outputs measure 12 volts to ground. It does shut the lights off but while doing some wiring work, I accidentally shorted a light to ground and it lit up even though the timer was switched off.

I am up in the air on this modification, I do turn the lights on at night when I am camping but don't really know how much they help.

At home I put a string of LED rope lights around the entire camper to keep rodent away.



Figure 86. Timer/Switch for Mouse Lights

https://smile.amazon.com/gp/product/B07PD9QXQG/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

Stabilizer Jack Rewire

We took delivery of our camper in May of 2019, in the spring of 2020 after sitting over the winter three of the stabilizer jacks would not work because something had eaten the wires. I fixed the chewed through wires and then covered them all with wire loam all the way up to the stabilizer motor and filled the entry points through the I beams with spray foam, see figure 87.



Figure 87. Stabilizer Jack Wiring.

I recommend putting wire loam around the wires to your stabilizer jacks and filling the I beam openings.

Rodent zapper

If a rodent gets into your camper, they can do a lot of damage. I have had good luck with these rodent zappers:

https://smile.amazon.com/gp/product/B01FE89RGU/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

I bait them with peanut butter, the rodent goes in and gets zapped with 8,500 volts killing them and then you take it outside and dump it out. I have only taken one mouse out of my fifth wheel but multiple mice and even a chipmunk out of my former travel trailer.

Ground Control

Snap Pads

When I first got my camper, I would put 12" long 2 x 12 pressure treated lumber pieces under each stabilizer jack. Every time I leveled the camper, I had to put the pieces down and every time I moved the camper I had to take them back up plus bring them with me. Snap pads are heavy rubber feet that press fit on over the existing bases of the stabilizer jacks. It takes over a thousand pounds of force to press fit them on and they are not going to fall off. You basically put them under the stabilizer jack and lower the jack down into the snap pad to snap them on. I no longer put anything down under the stabilizer jacks and it makes setting up and tearing down quicker and easier.



Figure 88. Snap Pad.

Also visible in figure 88 is the LED rope light I use around the bottom of the camper to scare away mice.

I recommend snap pads.

The Rock Stabilizers

When I am in bed at night and can feel the camper moving, I find it very annoying. After reading several glowing reviews I decided to buy The Rock Stabilizers. Basically, they are two pairs of screw jacks connected by chain, see figure 89. One set goes at the front of the camper and one at the rear. They pressure fit against the main I beam at an angle: <https://www.therockrvstabilizer.com/about>

The owner was good to work with, he got them right out to me and followed up to make sure I got them, however, the set I got had bad threads on one stabilizer and the cross piece for turning the jack fell out and when I told him that in an email, I got no response. I was able to fix both issues myself so it was not a big deal, but I would have liked a response.



Figure 89. The Rock Stabilizer.

It is one more thing to put in place when you set up, but they are easy to set up. They don't eliminate all movement only addressing side to side, but they do really stiffen up the camper.

I recommend these accessories.

Miscellaneous

Remove Cook Top and Covert to Drawer

As I mentioned in the propane section the first time, I used the pull out cook top grease flames were shooting up the side of my camper and I vowed to never use it again. I removed the cook top and what you have is basically a steel drawer with no bottom or front. I made an insert that slides in and is held in place by the screws that hold the bearing slides in place (I put in longer screws), see figure 90.

With some toolbox rubber liner in place it creates a nice drawer for holding my grill tools, see figure 91.

The beauty of this conversion is I kept the cook top in storage and if I ever sell the unit a future owner can easily remove this insert and put the cook top back.

I recommend this modification.



Figure 90. Cook Top Drawer Insert.



Figure 91. Pull Out Cook Top Drawer Conversion.

Emergency Window Hair Pins

Campers are required to have emergency exits and the standard approach is to have certain windows with a lever latch that you unlatch and push the lever through the opening to be able to crawl out the window (the end of the levers is red plastic). One problem with these windows is if you have them open and it is windy the latches often pull all the way through and you must go outside the camper and push the level back through the opening. I drilled small holes in the end of the red handles on the levers and put hair pins through the hole so the levers cannot pull through unless you pull the hair pin, see figure 92.



Figure 92. Emergency Exit Window Hair Pins.

I recommend this modification.

Slide Out Padded Corners

I added padded corners to the bedroom slide-out on my unit so that if I hit my head it won't be on a sharp corner. The padded corners come with an adhesive back and are easy to apply, see figure 91.

https://smile.amazon.com/gp/product/B000PD70KU/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

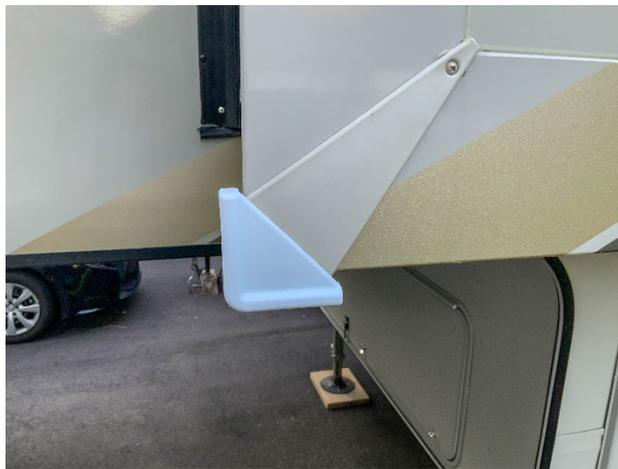


Figure 93. Padded Slide-Out Corner.

I recommend this modification.

Portable Washer/Dryer

We went camping this summer for two weeks with our baby grand daughter. She was spitting up a lot and going through a lot of clothes. We don't have the washer/dryer option, so we wanted some way to wash clothes without going to a laundromat during the Pandemic.

We bought a portable washer/dryer:

https://smile.amazon.com/gp/product/B01ALBMIEI/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

It is light, easy to move around and use and does a good job cleaning the clothes. It only handles small batches and only spin dries the clothes, but they then dry quickly on a clothes line in the sun.



Figure 94. Clothes in the Washer Side.



Figure 95. Portable Washer/Dryer.

It comes with a short hose to hook up a water supply, but we just put in the cloths and used the outside spray hose on the camper to spray water into the washer tub. The unit gravity drains, and I ran it into a tote tank (sort of). In the future I will either use a small pump to pump up into a tote tank or just run it

inside in the shower and drain it into the shower drain. The left side is the washer tub and the right side is a spinner to dry the clothes.

The washer/dryer is simple to use and self-explanatory, but I will note the directions that come with it are printed so small I couldn't read them. I tried to get a digital copy of the instructions from the manufacturer and they wanted me to prove I had bought the washer/dryer before they would send them. Even after I provided proof, they never sent them, it seems like something that should just be posted on their web site.

If you want to wash your own clothes, I recommend this accessory.

Power Tools

I used to own a 2005 Yukon with aluminum wheels and removing the lugs nuts was almost impossible. I bought a Dewalt battery impact wrench, and it wouldn't budge them, I then bought the most powerful battery impact wrench DeWalt made and it wouldn't budge them and burned out. I had another DeWalt tool also burn out with light use, so I decided it was time to do something different.

After a bunch of research, I found this Milwaukee battery impact wrench:
https://smile.amazon.com/gp/product/B0754MTTCL/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

One reviewer discussed going to a junk yard and this taking off every nut he tried included rusted-on lug nuts on dump trucks. The installer for my disc brakes also uses this tool and said he never found a nut it would not undo. I carry this in my tow vehicle with a spare battery.

I then decided I would standardize on Milwaukee tools that use the same battery for my camper so I can interchange batteries and only carry one charger.

I know some people carry a battery leaf blower for cleaning off the top of the camper and the slides. For a long time, I did not carry one but then we camped last fall when the leaves were falling off the trees. After that trip I added a Milwaukee leaf blower:

https://smile.amazon.com/gp/product/B078ZQX746/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

It works very well, and I carry it in my basement with one battery on it.

I also carry a battery drill/driver for repairs and it is also a Milwaukee and I carry it with one battery:
https://smile.amazon.com/gp/product/B07HMFXXH5/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

I also carry a small Milwaukee battery powered shop vac. I used to carry a small Hoover battery vacuum but noticed that whenever I was cleaning up after a project in the camper I went and got my battery DeWalt shop vac. Now I carry the Milwaukee shop vac in my kitchen closet:

https://smile.amazon.com/gp/product/B01N0C7NGC/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

Between the three tools in my camper and fourth in my tow vehicle, I have a total of five batteries that fit any of the tools and I carry a charger in the camper. I am happy with all four tools.

I recommend the Milwaukee tools.

Things I Wish My Unit Had

The following are some options/features I wish my unit had:

More Cargo Capacity

The single biggest thing I wish I had was more cargo capacity. The gross weight rating for our unit is 14,995 and the factory yellow sticker says the unit weighed 12,887 at the factory. The catalog weight is 12,155 so options added 772 pounds. The remaining cargo capacity is 2,108 pounds and while that sounds like a lot, after all the modification I discuss in this guide, the weight on a scale is 13,540. An interesting thing about this is I weighed everything as I added it and I only expected the weight to go up by 341 pounds, but it went up by 653 pounds, a large discrepancy. I wish I had weighed the unit as soon as I got it to ensure the factory weight was accurate. Of the next four things I wish my unit had, I could add three of them if I had the weight capacity available, but when we load the unit up for long trips, we are typically within about 300 pounds of the gross weight rating and that is with dry tanks. I would really like another 1,000 pounds of carrying capacity.

Dual Pane Windows

Our unit was custom ordered by someone else and we got a big discount because they had registered it and the given it back to the dealer to sell, so even though it had not been used it was considered used. The one thing they did not order I wish they had ordered is dual pane windows, in cold weather you can really feel the cold around the windows.

Slide Toppers

Slide toppers keep the tops of the slides clean helping to preserve the seals and keep the sun off the slide keeping them cooler in the summer. Some people complain about slide toppers rattling in the wind, but I would like them. I could add them but do not want the extra weight.

Washer/dryer

If you had asked me before we bought this unit whether I wanted a washer/dryer I would have said no. But now that we are camping for longer periods, staying closer to the camper due to COVID and camping with a baby, I would like a washer/dryer. I could add it but once again I am concerned about weight. We do have a small portable one as I discussed above but it is not the same particularly when it comes to drying the clothes.

Generator

As I discussed in the generator section, I bring 2 – Honda EU2200/2000i generators with me but I would prefer a built-in generator. Once again, I could add this, but it is a heavy option. The Honda's I bring, and the 40-pound propane tank are in the bed of my truck, not adding to the camper weight.

Jayco Quality

Fifth wheel campers are basically houses on wheels with all the complexity of a house plus added systems for portability. Everything must be light and relatively inexpensive to build to attract customers and every time you move your camper it is like a house going through an earthquake. Every camper is going to have some issues.

My first camper was a Starcraft Autumn Ridge and the first six months I owned it – it was at the dealer for four months having over 30 initial build defects corrected. With my Jayco Eagle, our first trip with it everything worked and I didn't find any issues.

Prior to our second trip the display board on the refrigerator failed, during our second trip we realized the passenger side taillight didn't blink and one of the slide motors failed. I would characterize this as normal initial quality issues and think it is typical of any camper.

The things I do take issue with are the following:

Brakes

As I discussed earlier in this document, I had one out of four brakes working correctly, this is a serious safety issue and should never have left the factory this way.

Black Tank Plumbing

Plumbing the black tank so the outlet line went four inches up-hill was just bad workmanship and should not have happened. The whole tank mounting design for the two – fifty-gallon tanks under the basement also needs to be redesigned with proper supports. I believe those two tanks retaining at least some liquid is common in fifth wheels (including other brands).

Air Conditioning Mounting Issue

My air conditioner was mounted too far forward, this is just carelessness and creates a difficult to fix problem for the customer.

Because my unit was registered by a previous owner and then sold to me, it was considered used even though he never used it. Jayco's warranty are not transferable, but because of Massachusetts laws (where I live) and a reasonable dealer owner the refrigerator, taillight and slide motor fixes were done under "warranty", I fixed the air conditioner and holding tanks and the brake issue was fixed during my disc brake upgrade (although I might not have done the expensive upgrade if the brakes worked better).

Electrical

While doing all the modifications described in this document, I have also found and fixed a lot of sloppy wiring by Jayco including some wires in the underside that were hanging in midair and likely to fail in the future.

I think all mid-priced brands of fifth wheels and maybe even the high-end ones will have some problems, but the brakes are unacceptable, and the holding tank design really should be redesigned as well.

If you have any questions or comments about these modifications, please feel free to contact me at scotten@scottenjones.com