



# TURBO DIESEL

## REGISTER





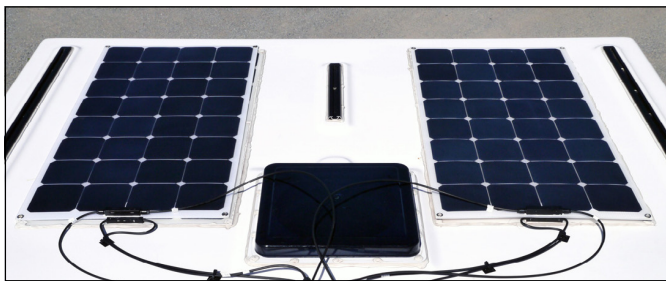
### ZAMP SOLAR

Solar panels can be an impressively effective way to maintain or charge your RV house batteries. As long as there is sun, free electricity flows. Of course there is an upfront cost, but for many the benefits far outweigh the initial expenditures. I've used a vintage Avion travel trailer and other camping outfits for decades, but I had never experienced the electrical gift from the sun until adding two Zamp 100-watt panels to the roof of my 2012 Four Wheel Camper. After this initial positive experience I never want to be without RV solar.

My current and beloved Hallmark Milner slide-in popup was ordered with two 100-watt panels. They were flat, ultra thin, and flexible cells from Renogy, Hallmark's supplier at the time. During the first few months of use all was well; the panels pumped appropriate amperage into two 6-volt batteries. However, after just eight months in-service, while camping in Southern Nevada (plenty of sun), I noticed very little and sometimes zero juice feeding the batteries. Initially the capacitors were suspect, but then I learned that Renogy had discovered a design problem in their product. The bad news was they didn't have a fix, or a similar replacement, not even on their drawing board. Ugh! Renogy offered to replace the defective products with traditional hard cells, but I preferred avoiding the mounting hassles and additional height of a thicker and heavier product.

#### Zamp Flexi Flat 100-Watt Panels

Renogy's failure was discovered in November 2015, and in December I learned that Zamp Solar was soon introducing their new, 100-watt *Flexi Flat* RV panels. Past positive experience with Zamp halted my search, and I placed an order for an early production pair to be shipped in early 2016. While not as thin as the inoperable cells from Renogy, they are plenty thin, measuring approximately 1/4" (Zamp says 1/2"), and they are flexible enough for most curved-roof applications. The length and width dimensions (41.5" by 21.5") are also very close to the removed panels.



Zamp's Flexi Flat panels connected and sitting atop the roof during a brief function test

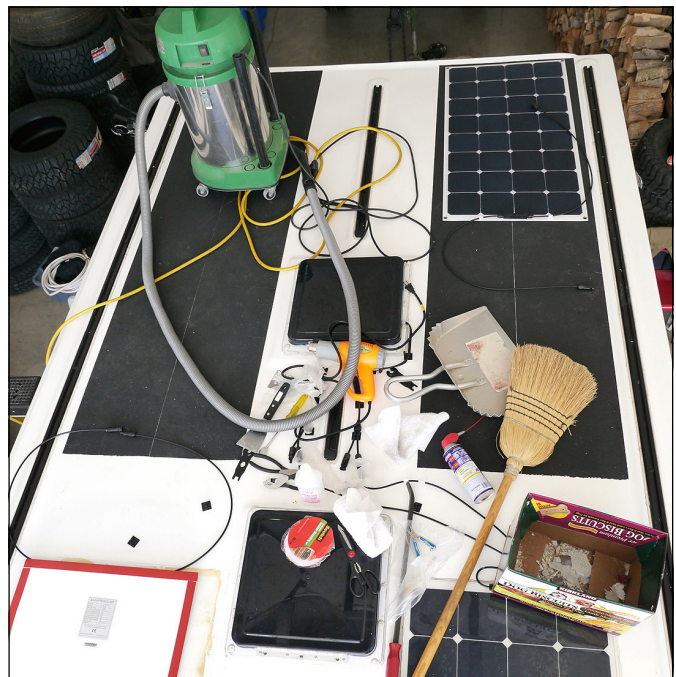
Before attacking the removal chore, I'd purchased special plastic spanners to disconnect the common MC4 solar fittings. These connectors appear intentionally impossible to separate with only two hands and screwdrivers. With the proper wrenches, it was quick and painless. After briefly testing the Zamp panels just sitting atop the roof, I dove into the project.



MC4 solar connectors are easily separated with the proper tool.

#### Remove and Replace

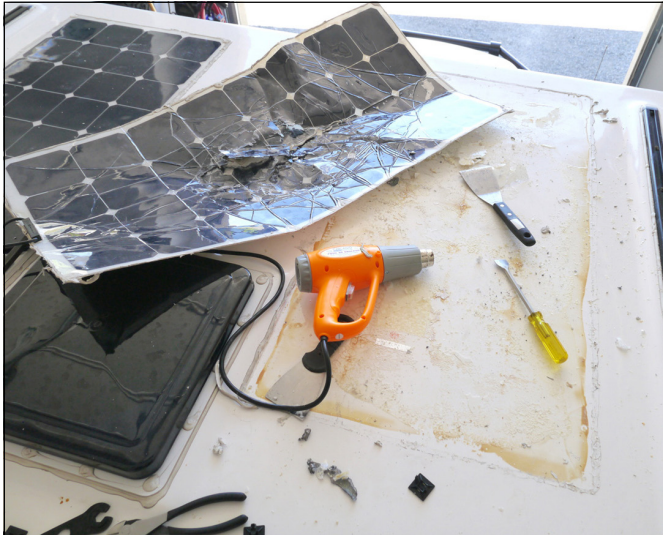
The term *R&R* is casually thrown around by professional and DIY folks all the time, though some things are easier said than done. Sometimes it's the removal, sometimes it's the replacement, but many times there is real work involved for the solo shadetree mechanic. In this instance it was the removal.



Rooftop workstation.

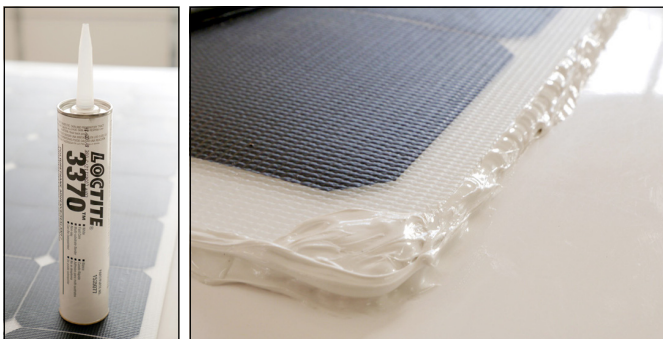


The edges of the old panels were secured with a modern goop that remained pliable and was easy to get under and lift with a putty knife. Unfortunately, the rest of the area under the cells was effectively *welded* to the roof with a hard-drying and brittle glue that was not easily removed. Using a heat gun, pry-bar, screwdriver, gasket scraper, and putty knife, it took *several* hours on my knees, over two days, and much elbow grease to remove both panels, the glue, and clean and prep the roof for the new Zamp *Flexi Flat* replacements. Though already worthless, the Renogys were utterly destroyed in the process. Hallmark's one-piece, molded-fiberglass roof is stout, but I still needed to use care to avoid serious gouges or divots while prying the cells from the roof.



Mangled, yes, and this was the easy panel to remove.

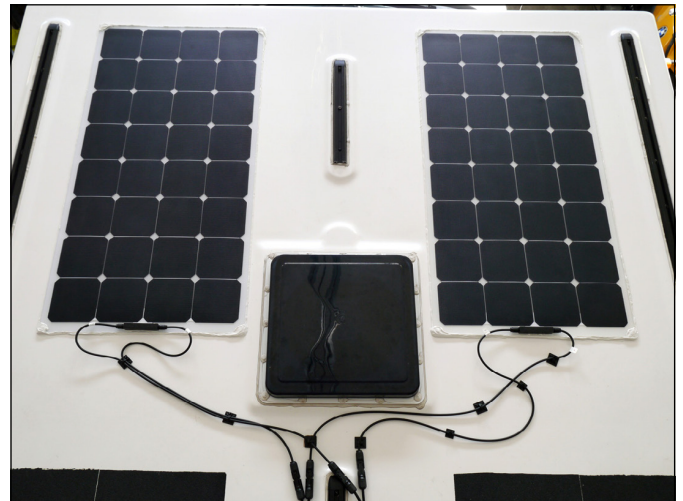
My initial placement of the *Flexi Flat* panels was accomplished with the double-sided mounting tape I love and use often. Once in-place, the perimeter was glued down with Loctite 3370 one-part polyurethane, which remains soft and pliable. It's unlikely I'll have to replace the Milner's solar, but it will be easier if I do.



Special goop suggested by Hallmark RV. Perimeter completely sealed with a little extra filling on the corner eyelets.

## In Use — We Have Amps!

Zamp's *Flexi Flat* cells have been maintenance free atop the Hallmark camper for one year. With optimal sun I've seen as much as 11.0 amps from the two 100-watt panels, and they have a 25-year output warranty. One *Flexi Flat* panel is \$553, or Zamp sells a Deluxe Kit with panel, controller, harness and other bits for \$821. Based in Bend, Oregon, Zamp proudly makes their products in the USA. Like a select few other companies, Zamp has impressed me with a real person answering the phone when I call with a question. What's not to like? Zamp Solar is another company whose products I don't like to go camping without.



Dry and connected and ready for adventures.



Plenty of volts and amps, the Zamp Solar *Flexi Flat* panels have been flawless.