

The Build Behind the Rig

Starlink, power, air conditioning — everything I need, no campground required. Why park eight feet from a stranger when the whole river's open?



One of the rare moments this thing is actually clean — right after a wash, before the next trip

Most of the campers on the road are built to get to a campground. Mine was built to skip campgrounds altogether.

The whole point of this rig is off-road capability — the ability to get down to the rivers and lakes where the truly good sites are, off the beaten path, and stay there without needing a hookup. No reservations, no neighbors, no generator noise. Just the rig, parked wherever I want to be.

That single goal — get anywhere, stay as long as I want — drove every decision after it, especially the power system.

Truck	Ram 5500
Camper	Lance 1172 truck camper
Built for	Off-road boondocking near rivers and lakes, no campgrounds



Out in the wilds of Utah

This didn't start with this truck. It started in 1985 with a Chevy Silverado and a Bigfoot camper, then moved to a 2013 Ram 2500 diesel with an Adventurer camper — which eventually rotted out. When we went truck camper shopping for a replacement, everything that met our needs was too heavy for the 2013 Ram 2500, even with airbags on it. So the truck had to change too.

There's a detour in there worth mentioning. This was during the post-COVID years when everything was still radically inflated — a truck camper actually cost more than a motorhome at the time. So we bought a motorhome instead and modified it to try it out. It worked, until it didn't: the nail in the coffin was that every time we wanted to go fishing or run the rapids in a jet boat, we had to put the dishes away, run the slides in, and button the whole thing up first. We're in and out of the water four or five times a day on a trip — a truck camper just gets dropped at the site, and the truck and boat stay hooked up and ready the whole time. The motorhome got sold at a steep discount to my son, who loves motorhomes but doesn't fish.

Same reasoning rules out most purpose-built expedition vehicles for me. A lot of them permanently attach the habitat to the frame, or run it on a non-torsion subframe — which defeats the whole advantage a truck camper has in the first place: the ability to separate the two and leave the camper behind. And once it's off the truck, it doesn't just sit there wobbling on its jacks either — a set of StableCamper stabilizer poles (made by Jared Sund's company out of Oregon) tuck out of the way until needed, then extend down to triangulate the jacks and keep the whole thing solid.

Rather than jump to a dually and outgrow that in another ten years, I went straight to commercial territory: a chassis with a 13,500 lb rear axle GAWR. I figure I'll wear out before I outgrow that capacity.



The old rigs: '85 Silverado/Bigfoot combo and the 2013 Ram 2500/Adventurer

What actually kicked this whole project off was the hitch on the original CM bed tearing apart somewhere in Arizona — it ended up sagging toward the ground and had to be field-fixed just to get home. The camper sitting too high was more of a nuisance by comparison, and solving the spare tire storage was another piece of it, but between the three, patching the old bed stopped making sense. Starting from scratch did.

I got twenty thousand miles of use out of the truck before I ever got around to wiring up the rear lights and putting a license plate on it, because with the camper on, nobody could see any of that back there anyway.



The original commercial bed — camper sitting higher than I wanted

The bare steel bed, mid-build — pressed into service for a fishing trip before it was even finished

This whole process was long and drawn-out, with a lot of decisions along the way — not all of it smooth. But most of those decisions worked out for the good, and choosing the Lance camper itself is one of the biggest ones.

We went to the RV show in Tacoma and compared it against the other truck campers on the market (I'd rather not call out competitors by name). Two things ruled most of them out. First, the black tank: one competitor used a cassette toilet with a very small black tank — a dealbreaker if you actually want to boondock. The Lance's 35-gallon black tank lasts weeks, and next to the power situation, that's one of the biggest factors in staying off-grid long-term. Fresh water isn't the bottleneck the same way — a pump and filtration setup lets me pull water straight from a river or lake and filter it for use, so a big fresh tank was never the deciding factor.

Second, height: several of the side-entry competitors are built to sit entirely above the pickup's bed rails, which stacks up fast. Mounted on my stock commercial bed, one of those would have put the rig well over 13 feet tall — which creates nothing but problems, from route planning to just clearing garages and drive-throughs.

Third, entry height: some of these side-entry campers and expedition vehicles have you climbing six feet of stairs to get into the habitat. I'm 62 — that's not something I want to be doing at every campsite. On this setup, the Lance's fold-down steps hit the ground in exactly the right spot, dead level. There are two more steps once you're inside the camper itself, but nothing like the multi-stair climbs some of these other rigs require.

It's common on these heavy-duty trucks to do a super-single conversion at all four corners instead of keeping the dually setup I chose. Honestly, my answer might have been different if the commercial bed and camper hadn't already been sitting so high — 43-inch-tall super singles would've stacked that much more height on top. In the end I'm happier sticking with the dually: the truck stays easy to get into, and the camper steps work exactly the way they were designed to.

First thing I did once I had it: peeled off every Lance logo and decal. I don't mind a small badge — a Cummins emblem on the truck is one thing — but I'm not driving down the road as a foot-tall-lettering mobile billboard for a company unless they're cutting me a check for it. While I was at it, I sealed the roof seams with Eternabond right away, so I wouldn't repeat the Adventurer's rot problem.

"I'm not driving down the road as a foot-tall-lettering mobile billboard for a company unless they're cutting me a check for it."

AN EXPENSIVE LESSON: WHAT WE TOW

This one cost real money to learn. We originally ran a side-by-side on an open trailer, then upgraded to an enclosed cargo trailer — and put solar panels on top of that too, which doubled our total solar capacity. On paper, it was a great setup.

In practice, side-by-side usage rules are all over the map — different states, counties, and parks all have their own restrictions, and keeping track of where we could and couldn't actually ride it became more trouble than it was worth. We ended up scrapping all of it: the open trailer, the solar-equipped cargo trailer, and the side-by-side itself.

In its place, we switched to flat-towing a 2025 two-door Jeep Wrangler, which meant adding a supplemental braking system for towing. The Wrangler is small enough that it only carries about 200 watts of solar — a fraction of what the old cargo trailer's array provided — so the power system took a real hit from the switch. Worth it for simplicity, but it's a good example of how much a "better" setup on paper can cost you in practice.



The original setup: side-by-side on the open trailer, with winter tracks on it

I'd bet this is the only Ram 5500 in existence with a truck camper that actually fits properly — sitting at the right height, with the right cab-to-camper clearance, pulled all the way forward against a quarter-inch aluminum plate that acts as the stop.

That last part matters more than it sounds like. A truck camper is designed around an 8-foot bed, but the 4500/5500 chassis runs a 9'4" frame. Left alone, that extra length pushes the camper back and out of position. Ever since the 1985 Chevy, I'd gotten used to driving with the window down and being able to see — almost reach out and touch — the camper's overhang past the cab. That was true on the '85 Silverado, and it was still true on the 2013 Ram 2500. But with the stock commercial 5500 bed, the extra frame length put the camper completely out of sight, and it just felt wrong. The aluminum stop plate in the custom bed pulls the camper forward until that familiar overhang is back where it belongs.

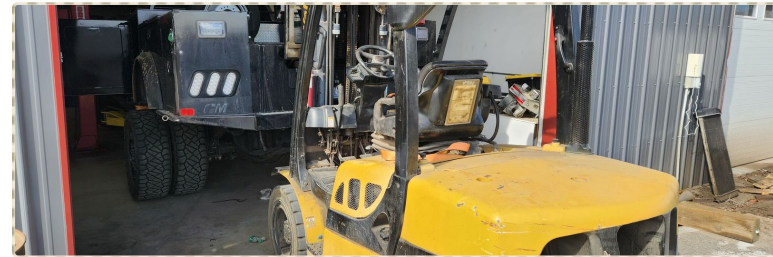
Even with the rear of the bed narrowed down to clear the airbags and frame rails, the Lance camper itself still needed a modification to slide up over that narrow section: the water bay had to lose about 3 inches of space, and then get glued back together, before the camper would fit.

No matter how many measurements I took — camper sitting in one corner of the shop, truck up on a lift in another — it didn't all add up. I went to load the camper for a trip and found out the bed steel still ran too far back; the camper wouldn't even go on. That turned into an hour with a cutting wheel, slicing and dicing steel, just to get it on the truck the first time. I'm not an engineer, so sometimes you learn things the hard way. If any of these dimensions help someone else trying to fit a truck camper on a Ram 4500/5500 or Ford 450/550-series truck, that alone will make this whole write-up worth it.

"Ever since 1985, I could reach out the window and touch that overhang. On the stock 5500 bed, it disappeared out of sight — and it just felt wrong."

The old commercial bed came off with a forklift. Underneath it, the CM bed itself had picked up surprising rust in under two years — turned out the underside had never been painted or powder coated. The truck's own frame was fine. That's also where the Kelderman dual-stage rear air suspension cross member went in, tied into the frame with grade 8 hardware.

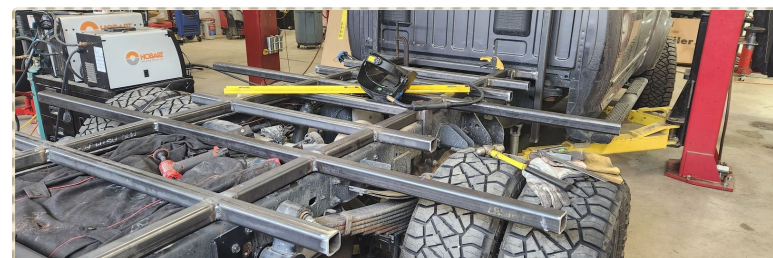
Two design requirements drove the whole layout: a 35x12.50R22 tire had to fit in one of the storage compartments, and the bottom of the camper had to clear the satellite radio antenna by 4 inches. Getting the tire to fit meant running the ladder frame as close to the tire as possible while still leaving room for snow chains and for the angle change the leaf springs go through — that angle had to be simulated after everything was tacked in place.



The old CM commercial bed, coming off



Prepping the frame rails, Kelderman cross member going in

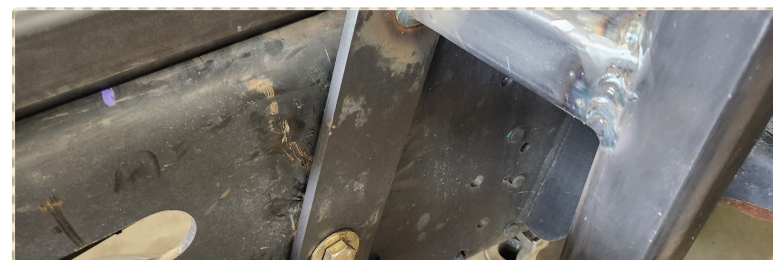


Ladder frame laid out around the tire clearance



Verifying the spare still goes in and out easily

The frame itself is steel for durability. The outer storage boxes are aluminum — partly for weight savings that don't really matter on a truck this size, and honestly, partly because I wanted to learn to weld aluminum. The two meet with a 6-inch overlap, panel bond adhesive, and carriage bolts — bulletproof. The whole bed bolts to the frame with eight 3/4" and two 10mm grade 8 fasteners, deliberately overbuilt after the old bed's hitch tore itself apart.



Bed-to-frame attachment, deliberately overbuilt



The Kelderman system: leaf spring hanger replaced with an airbag

The question I get asked most is about the construction of the bed itself — how the door jambs and details like that are actually made. The honest answer: I don't have a fabrication shop. This was all built with an existing MIG welder, with a spool gun added on for the aluminum work. All the aluminum cutting was done with a table saw, a router, and a regular wood chop saw — no fancy tooling, just what I already had.



The beginning of the aluminum cabinet structure



The finished cabinets, tools still out

"No fancy tooling, just what I already had — a MIG welder, a spool gun, a table saw, a router, and a wood chop saw."

Being a mechanic by trade, I wasn't going to build this without service access. There's a removable rear taillight panel — drilled, tapped, and bolted with stainless button head hardware — that comes off for servicing the airbags and trailer wiring. The bed floor keeps both fuel pump modules accessible, and there's room in the middle to add a gooseneck hitch down the road if I ever want one.



The three access panels: both fuel pump modules, and the open middle slot for a future gooseneck

The fuel filler was its own two-day project. The gap between the front doors only left room for 1x2 aluminum framing, so the fillers ended up mounted at an angle on the rear of the custom bed, fed by a run of plumbing through the inner cabinets so both tanks fill from one spot. It replaced the old routine of opening a compartment and fishing a rubber plug out of the OEM filler hose at every gas station.



Cardboard mockup for the fuel filler angles



The finished dual fuel filler setup

Storage-wise, the fuel fillers live on the driver's side, the toolbox is on the passenger side, and the left rear compartment holds a spare propane cylinder for the camper in a locking round holder — that compartment actually got shrunk 4 inches from its original size once I realized the doors wouldn't clear the camper's side skirting.



The mechanic's toolbox compartment



Locking spare propane cylinder holder

The hitch was the failure point on the old bed, so this one runs a dual-bar design — a 2.5" and a separate 4-foot 2" bar, tied into two different cross members — along with the Kelderman hitch, all fastened with grade 8 hardware. It tows the Jeep or the boat without a second thought.



The dual-bar hitch, both receiver tubes visible



The completed taillight panel, plate and all

Getting down to the river means the rig has to handle a lot more than pavement. That's the reason for the front bumper, the bigger off-road tires, and the air suspension underneath.

The front bumper is a Buck Stop bumper out of Prineville, Oregon, with an integrated winch mount, so getting unstuck doesn't depend on someone else showing up. The fenders were trimmed to clear the larger off-road tires, and the whole rig rides on an air suspension system — onboard compressor, air tank, and shocks — so I can adjust ride height and handling for whatever the road throws at it. The truck stays fully steerable even completely aired down, and the whole system runs off a Bluetooth app — so at a campsite, I can level the truck and camper right from my phone instead of digging out a pile of blocks. Aired all the way down, it'll fit through a 12-foot garage door — almost unheard of for a truck camper, let alone one with this much off-road setup and tire size.

Worth being honest about: I bought this truck for load capacity, but the first trip out on the stock commercial tires and stock suspension was miserable on back roads — and I'm almost never on the interstate, it's back roads and highways all across the country. If you're thinking about a Ram 5500, don't judge it stock; it rides that rough for everyone at first. The first fix was ditching the commercial tires for 33x12.50s and running 45 psi front, 80 psi rear — that alone was a huge difference. The Kelderman suspension came a year or two later and changed everything else. Between the two, it went from something you just endured for the capacity to a truck that handles mountain twisties shockingly well for its size — not quite a Cadillac, but close, especially with the lower center of gravity.



The Buck Stop bumper, prepped with the winch mount



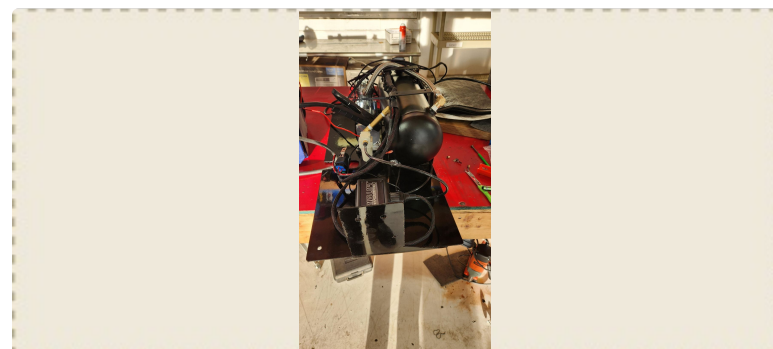
Installed and ready to work



Fenders trimmed to clear the larger off-road tires



Room to run the bigger off-road tread



Bench-testing the compressor and tank for leaks before installation



Air suspension and adjustable shocks



Installed on the truck, mounted between the transfer case and the fuel filter

This is the part everyone asks about first.

The roof of the camper isn't flat — there's an AC unit and other factory obstacles right where solar panels would normally go. Rather than settle for a smaller array, I designed and built my own mounting frame from scratch to route around the AC unit and everything else in the way, so I could fit ten 100W EcoFlow panels on top anyway.

Most of the frame bolts down to the existing mounting points on the factory Lance cargo rack, though two front mounts had to be added new to make the whole array work.

The result: a battery bank large enough that I can run the air conditioning directly off the battery pack. That's the detail that surprises people most — most off-grid setups can't touch AC power at all.



The custom frame, welded from scratch



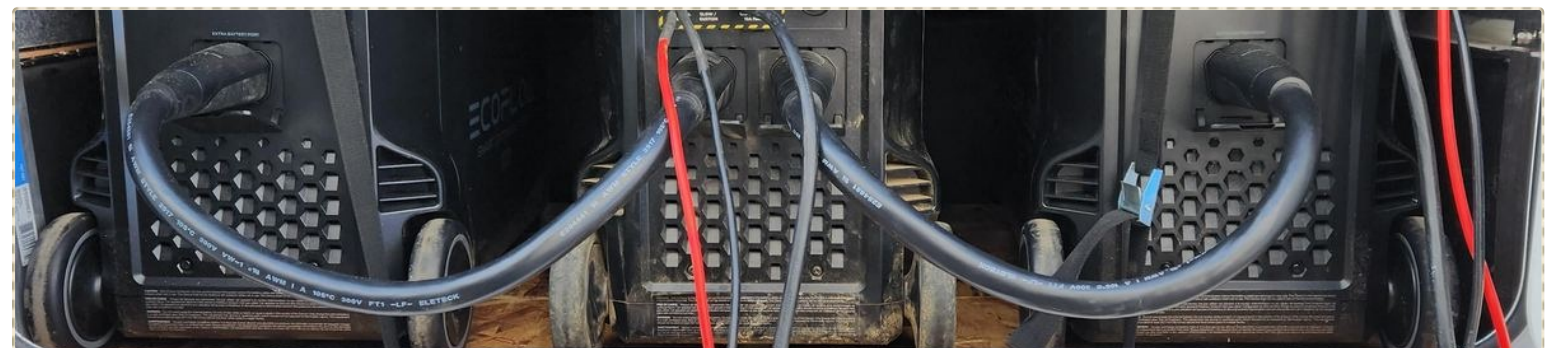
Panels laid out and wired



Test-fitting the panel array on a forklift before it went up on the roof



Installed and routed around the roof obstacles



The battery bank itself — three EcoFlow units wired together in the rear storage bay. This is what runs the AC.

Those three EcoFlow units weigh well over the 200 lb rating the bay's base was designed for, so I ran 2-inch aluminum strapping from one frame rail, down under the box, across, and back up to the other rail, topped with OSB to spread the load into the side frame rails. Otherwise those batteries would've ended up somewhere on the highway between here and their next destination.

The ten-panel array is wired in a 5x2 parallel-series configuration running around 90 volts, with the panels arranged in a checkerboard pattern across the two strings — that way, partial shading from a tree or the AC unit hits both strings evenly instead of killing one string's output entirely.

With zero sun, the battery bank runs the air conditioning for about four hours on stored charge alone. At full sun during the brightest part of the day, the system runs net zero or better — solar output keeps pace with the AC load and can even add charge back to the batteries.

Array config	10x 100W EcoFlow panels, 5x2 parallel-series, checkerboard wiring, ~90V
AC runtime, no sun	~4 hours on battery alone
Full-sun performance	Net zero or better — solar keeps up with AC load

There are actually two separate electrical systems on this rig. Alongside the roof array and EcoFlow bank that runs the AC, the camper still has its own 12-volt house system — upgraded with two more solar panels flat-mounted to the front of the camper, feeding a pair of 200 amp-hour Bluetooth-monitoring lithium batteries.

I went with Bluetooth-monitoring batteries instead of installing a separate shunt: LiFePO4 batteries sit in a flat 13.0-13.4 volt range for most of their discharge curve, then fall off fast once they drop below about 20% charge, before the BMS cuts them off entirely around 10 volts. A plain voltmeter can't tell you where you are on that curve until it's almost too late — you need real state-of-charge monitoring. The Bluetooth batteries handle that without extra wiring. Same logic behind choosing EcoFlow for the main system in the first place: no separate charge controller, inverter, and charger to wire up and manage individually.

One lesson that shaped all of this: the old Adventurer camper rotted out because I didn't know you have to walk the roof every year checking for cracks in the Dicor sealant at the seams. This Lance camper also has an aluminum framework instead of wood, and I sealed every seam with Eternabond tape the day I got it.

"At full sun, the array keeps pace with the AC load and can even add charge back to the batteries — on a system that's still running everything four hours after the sun's gone."

Any honest off-grid setup has to plan for days without sun. There's an 800-watt vehicle charging system wired with 1/0 cable straight to the battery bank through a continuous-duty relay off the Ram 5500's alternator. It can also run in reverse — if the truck's starting battery is ever dead, the same system can jump it.

The truck actually runs two alternators — I specced it that way on purpose, so one could be dedicated to the camper's electrical system. Alongside the 800W charge line, there's a second charge path through a Victron 30-amp charger, which at 12 volts works out to 360 watts feeding the 12V batteries directly. That's not something you can do through a standard RV 7-pin connector — a 7-pin will trickle charge at best, nowhere close to 360 watts. This second line runs through an 80-amp trolling-motor-style connector mounted under the fuel filter, so the whole thing stays fully removable. The only downside: instead of pulling one RV plug to disconnect the camper, you now pull two. Worth it — a charge line riding on the RV plug alone just isn't capable of doing real work.

The RV's factory generator is still part of the plan too, but I rewired the transfer switch so that once the generator times out and kicks on, it feeds 1,750 watts straight into the battery bank only — it doesn't power anything else in the RV. That keeps the generator running at a steady, efficient continuous duty cycle instead of surging up and down every time the AC or microwave kicks on, and it just runs until the 10.8 kWh battery pack is fully topped off.

Vehicle charging	800W, 1/0 cable, continuous-duty relay off the alternator; reversible for jump-starts
12V charge line	Victron 30A charger, 360W at 12V, via an 80A connector under the fuel filter
Generator charging	Rewired to feed 1,750W straight to the battery bank only, continuous duty
Battery pack	10.8 kWh total



When the sun isn't shining — a double rainbow off the back of the camper



The same storm, from the window