

YOUR FREE READER'S COMPANION

The Van Build Pack

A companion to The Camper Van Conversion Bible · by Mason Reeves

Thanks for picking up the book. This is the companion you keep on the bench while you build: a power-budget worksheet so you size the electrical on paper before you spend a dollar, layout starting points for the three common vans, an insulation and moisture map, and the full nine-phase checklist so you do the steps in the right order.

Two things sink more first builds than anything else: an electrical system sized by guesswork, and condensation nobody planned for. Get the power budget right and keep the metal warm and ventilated, and you're most of the way to a van you can actually live in. These pages are those two things, plus the order to do the rest in. — Mason

The Power Budget Worksheet

Size the system on paper first. Add up what you run in a day, then build the battery, solar, and charging to match. Do this before you buy a single component — it is the difference between a system that carries you and one you fight every cloudy day.

Step 1 — daily load (watt-hours per day)

List every load, its watts, and hours per day. Watts x hours = watt-hours. Add them up.

Load	Typical watts	Hours/day	Wh/day
12V fridge	45 (running ~1/3 of the time)	24	~360
LED lights	12	4	48
Roof fan	18	6	108
Water pump	50	0.3	15
Phone + laptop charging	60	3	180
Diesel heater (electrical draw)	25	5	125
Daily total			~840 Wh

That ~840 Wh/day is a realistic two-person build. Yours will differ — run your own numbers.

Step 2 — size the battery bank

- Lithium (LiFePO₄): usable to ~90-100%. For one cloudy day of reserve at 840 Wh, you want roughly 2x daily use = ~1700 Wh, so a 100Ah (1280 Wh) battery is tight, 200Ah (2560 Wh) is comfortable.
- AGM: usable to ~50% only — double the rated capacity for the same usable power. This is why lithium wins in a van despite the price.

Step 3 — size solar

Rule of thumb: 1 watt of panel returns ~4 Wh/day in good conditions, less in winter or shade.

Daily use	Minimum solar (summer)	Comfortable (3-season)
500 Wh	150 W	200-300 W
840 Wh	250 W	400 W
1200 Wh	350 W	500-600 W

Solar alone rarely covers winter. Plan a DC-DC charger (20-40A) so the engine tops the bank up as you drive, and a shore-power charger for hookups.

Step 4 — wire and protect

- Size the main wires for the inverter's surge, not just its rating. Undersized cable is the most common fire risk in a van.
- Fuse everything, close to the battery. Fit a main disconnect.
- Install a shunt-based battery monitor — voltage alone lies about state of charge.

Layout Starting Points

Every layout is a fight with the wheel wells and the sliding door. Start from one of these and adjust to your van and your body.

Van	Usable interior length	Standing height (high roof)	Best-fit layout
Ford Transit (high roof, 148" WB ext)	~144 in	~76 in	Fixed bed across the back, galley + bench mid
Ram ProMaster (159" WB ext)	~146 in	~76 in	Widest body — bed sideways fits sleepers up to ~5'10", huge garage
Mercedes Sprinter (170" WB)	~165 in	~76 in	Longest — fixed bed lengthwise + full galley + wet bath

Three layouts that work:

1. Fixed bed + garage (most popular). Bed across or along the back, big storage "garage" underneath for gear and the electrical. Galley and seating up front of the bed. Simple, durable, no nightly setup.
2. Convertible dinette/bed. A dinette that drops into a bed. Buys daytime space in a shorter van; costs you a nightly conversion.
3. Side bench + sideways bed (ProMaster). Only the wide ProMaster lets most people sleep sideways, which frees a huge amount of floor.

Sketch it to scale on grid paper before you cut anything. Mark the wheel wells, the slider, and every window first — then fit the furniture around them, not the other way round.

The Insulation & Moisture Map

Condensation is the silent killer of vans — it hides behind panels and rusts the shell from the inside. The goal is not the biggest R-value; it is keeping warm moist air away from cold metal and giving it a way out.

Where moisture hides

- Behind the walls, on bare ribs you didn't insulate (thermal bridges).
- Under the mattress, where your body's moisture has nowhere to go — use a slatted base or a breathable mat.
- At the windows and roof fan seams, the coldest surfaces in the van.

Insulation quick reference

Material	Where it shines	Watch out for
Thinsulate (3M SM600L)	Walls, ceiling, curves — doesn't hold water	Cost
Sheep wool	Walls, manages moisture well	Bulk, cost
Polyiso foam board	Floor and flat panels, high R per inch	Hard to fit curves; don't trap moisture behind it
Closed-cell spray foam	Total seal	Permanent, messy, can hide rust — many builders avoid

Rules that matter more than R-value:

- A roof fan is your best moisture tool — run it whenever you cook or sleep.
- Break thermal bridges: insulate the ribs, not just the cavities.
- Don't seal moisture in. Ventilate. In a van, airflow beats a vapor barrier almost every time.

The Nine-Phase Build Checklist

Do it in this order. Wiring before insulation means tearing walls back open; flooring before the roof fan drops metal shavings on your nice new vinyl. Top to bottom, rough-in before finish.

1. Plan & buy — pick the van, record GVWR and payload, sketch the layout to scale, size the electrical on paper, order long-lead items.
2. Strip & prep — pull the cargo floor and liners, vacuum, treat any rust to bare metal, mark every penetration before you drill.
3. Holes & ventilation — cut and seal the roof fan, windows, and heater penetration early, while a mistake is still cheap to fix.
4. Insulation & moisture — insulate ribs and cavities, break thermal bridges, insulate the floor, commit to a vapor strategy.
5. Electrical rough-in — mount battery, bus bars, fuses, disconnect; run and label all 12V wiring; fit DC-DC

and solar MPPT; test every circuit live before you cover a wire.

6. Plumbing rough-in — set fresh and gray tanks, run lines, mount the pump, pressure-test for drips.

7. Framing & finish surfaces — furring strips on the ribs, frame walls and ceiling, subfloor then finish floor, hang paneling.

8. Furniture & systems — bed frame, galley, fridge, cooktop, toilet, heater ducting, secured storage.

9. Shake down — load real weight and reweigh under GVWR, run the electrical overnight watching state of charge, drive a rough road and chase every rattle, sleep in it near home before you trust it far.

Build it in that order, check your state of charge before you trust the battery, and keep the metal warm and ventilated. Then go find a quiet place to park.

— Mason Reeves