

Setting Up Your Work Vehicle for Success



ARE YOU READY TO DRIVE TO THE JOB SITE?


Not so fast.

If your warehouse is your company's base camp, the work vehicle is a crew's backpack: all the equipment and supplies you know you'll need on the job, plus a survival kit for things that could go wrong. Because of that, your vehicle should be seen as a tool of the trade, as important as your equipment choices.

Your vehicle is also a reflection of your business. It's the first thing a customer sees when you arrive. A clean, organized, and well-maintained vehicle leaves a lasting impression, signaling professionalism and instilling trust.

This section will look at best practices to:

- 1 Have what you need, when you need it.
- 2 Organize for efficiency.
- 3 Maintain for smooth operations.



WHAT SHOULD I HAVE ON MY VEHICLE?

HERE IS THE SINGLE MOST IMPORTANT THING...

The most important item on every vehicle is not the solar modules. Not extra drill bits. Not a ladder.

The most important item is the checklist of tools and materials that need to be loaded in your vehicle to ensure a project will not stall.

There are three categories of items you need to carry:

- Tools and equipment for every job.
- Materials and supplies for every job.
- Spare supplies to handle the unexpected.

Truck or van?

Based on the observations of dozens of installers across three continents, Enphase Field Application Engineers say there is no big difference in efficiency between using a truck or a van. But either vehicle type should have plenty of well-labeled compartments to store supplies from the inventory checklist.



TOOLS AND EQUIPMENT

The basic tools and equipment needed for every job should live on the truck.

Tips to streamline:

- ✓ **Pick one brand** of power tools and stick to it. Milwaukee, Makita, DeWalt... the brand matters less than the consistency. It simplifies keeping a supply of charged batteries: you need one fast charger on the job, and charged back ups at the warehouse.
- ✓ **Invest in quality.** A cheap ladder not only needs to be replaced more often, but creates a safety risk.
- ✓ **Have multiples of the most used hand tools.** The crew should never need to share tools such as socket wrenches if it's faster to have one each.
- ✓ **Check everything's on board.** If equipment's easy to see, chances of leaving a hammer, screwdriver, or charger at the warehouse, or worse, at the site, are minimized.



SUPPLIES FOR THE DAY

The modules, racking, inverters and connection equipment should be spelled out in the Bill of Material and loaded anew for each job.

Tips to streamline:

- ✓ **Standardize your suppliers.** If your design team streamlines by using a few vendors for every job, loading the vehicle becomes faster too. Your crew will know a box has 12 microinverters without having to read the label.
- ✓ **Don't count the small stuff.** Instead of counting out every bolt and screw, just ensure there's a plentiful supply of the small stuff used on every job and replenish daily. **Aim for a standard kit of common small parts instead of developing a custom bill of materials down to the ground lug for each project.**
- ✓ **Pack for a slightly larger job.** Having one spare panel, microinverter, and piece of racking on board may ensure a workplace misstep does not drag a one-day job out to two days.



**WAIT.
WHERE ARE
YOU GOING?**

FAMOUS LAST WORDS: “I’LL BE RIGHT BACK”

Returning to the jobsite a second day is a top contributor to the cost of installation, and a quick run to the hardware store for a spare part can be the difference between a one-day and a two-day job.

Nothing good can come from sending crew members off on a detour. Labor costs and travel expenses go up. Productivity goes down. If crew members are leaving the jobsite with any degree of regularity, it’s time to review planning procedures, including site assessments and inventory management strategies, to figure out where—and why—things are running off course.

Some employers motivate crews with productivity incentives based on the number of solar modules installed. Others empower employees to pay careful attention to detail and provide high-quality service. Whatever the motivator, focus on installing as effectively as possible.

SPARE PARTS FOR ALL SCENARIOS

Synergy Solar, an Enphase installer in Northern California, packs a spare parts kit in all of its trucks and the electric car used for sales visits.

The kit contains:

- ➔ mounting hardware
- ➔ electrical grounding clips
- ➔ terminator caps for cables
- ➔ electrical tape
- ➔ 4-in-1 screwdriver

Crews can dip into the spare parts kits to replenish supplies during break time on the job site. Synergy co-owner Jeff Mathias makes a point of putting hardware in the spare parts kit for an older micro-inverter model, the M190, so the crew is always prepared for maintenance work.



“If you have to do a callback because you dropped a nut off the roof, it’s a demoralizing experience, especially if you’re an hour away.”

-Jeff Mathias, Synergy Co-Owner

VEHICLE PACKING CHECKLIST

SUPPLIES FOR THE DAY (load or replenish)

Paperwork

- Homeowner contact information
- System design
- Electrical review

Roof Penetration Supplies

- Soladeck or similar
- Flashing
- Caulk

Racking and Mounting Equipment

- Rails
- L-feet
- T-bolts, lag bolts or hex bolts
- Washers, nuts and self-tapping screws

Solar Equipment

- Modules
- Microinverters
- Envoy or AC Combiner Box
- Cable and clips or ties
- Bolts
- Washers, metal and rubber

SPARE SUPPLIES (keep on vehicle)

Structural Reinforcement

- Wood
- Air hammer
- Nails

Spare Parts

- Extra module, microinverter, railing
- Breakers, electrical box, wire
- Nuts, bolts, screws
- Conduit

Worker Health and Safety

- First aid kit
- Water
- Sunscreen

TOOLS AND EQUIPMENT (keep on vehicle)

Jobsite and Safety Equipment

- Harnesses and lines
- Hardhats and reflective vests
- Gloves and safety glasses
- Safety signage
- Ladders
- Flashlight or headlamp

Hand and Power Tools

- Tape measure
- Chalk line, crayons and chalk
- Impact driver
- Drill and drill bits
- Screwdrivers
- Ratchet and sockets
- Pry bar
- Power tool chargers and batteries
- Conduit bender
- Wire cutters

This is a starting list based on what we have seen used. Copy it, or make your own. But the important thing is to have every crew use a list before they head out for a job.

HOW DO I ORGANIZE FOR EFFICIENCY?

HAVE WHAT YOU NEED, WHEN AND WHERE YOU NEED IT

For backcountry hikers, packing efficiently is a matter of survival. For solar installers, everyday inefficiencies may not seem like a big deal, but eventually they add up to the company's life or death.

As competition intensifies, installers will have added incentive to organize and pack the vehicle so they can arrive and leave a jobsite as efficiently as possible.

Here are two ideas that can help transform an ordinary work vehicle into a lean and effective supply house on wheels:

- 1 Organize supplies by stages.
- 2 Choose one way to load your vehicle.

1

ORGANIZE SUPPLIES BY STAGES

Crate personal protective equipment (PPE) like hardhats and rope harnesses together.

These supplies belong with the rest of the safety equipment, as they're among the first objects the crew should be handling at the start of the job.

Bundle tools and components according to steps in the installation process.

How about all the little nuts, bolts and smaller pieces that get clipped, drilled, or pressed into place? Resist the temptation to organize supplies by category as you did with PPE equipment. Instead, organize by step and ultimate location.

Separate junction boxes from enclosures for monitoring and communications devices, for example. Both belong with electrical equipment, but junction boxes go to the rooftop while enclosures for monitoring stay on the ground.

2

CHOOSE ONE WAY TO LOAD YOUR VEHICLE

In the introduction to the Solar Survival Guide, we talked about how Southwest Airlines built its business into a lean, mean flying machine by committing to a single aircraft, the Boeing 737, so a crew member or maintenance worker assigned to any airplane knows where to go and what to do.

Think of the work vehicle as your 737.

When your staff are placing inventory on board, they should know which items to load in first and where to put all the items in the work order.

Label and color-code compartments so they correspond with space in the warehouse.

For example, mark warehouse shelves and vehicle compartments that hold rooftop mounting components with one color tape, and those with supplies for interconnection with another.



BONUS POINTS

If crew members go out with a different team leader, they shouldn't have to learn their way around a new vehicle's storage areas.



DO YOU NEED ANY UPGRADES FOR THE VEHICLE?

PURPOSE-BUILT TO SMOOTH OUT UNPACKING

Rocky Mountain Institute and Georgia Tech Research Institute found that installer trucks in Germany are configured so well that crews spent virtually no time unloading, unpacking, and preparing solar modules for rooftop installation.

In the US, the researchers found these tasks took long enough that they increased installation costs by \$0.01/W, or \$50 for a typical 5 kW system. Not much for a single job, but it adds up over time.

Consider retrofitting storage spaces on board so materials are secure while the vehicle is in motion and then can be easily unpacked, or even accessed with no unpacking needed. Eliminate these costs, and your work vehicle upgrades will pay for themselves in no time.



HOW DO I MAINTAIN FOR SMOOTH OPERATIONS?

A POORLY MAINTAINED WORK VEHICLE UNDERMINES SUCCESS

Here are five tips to make sure your vehicles keep your organization moving in the right direction.

- 1 Organize charging and navigation systems.
- 2 Remember safety and security.
- 3 Start each day with a clean vehicle.
- 4 Follow vehicle maintenance protocol.
- 5 Safeguard documentation.



ORGANIZE CHARGING AND NAVIGATION SYSTEMS

A dedicated GPS device can help your installers get to the jobsite more efficiently than a smartphone that might receive a call or run out of batteries. Ensure you have infrastructure on board for charging devices you need to use in the vehicle and on the jobsite.



REMEMBER: SAFETY AND SECURITY

Always put away GPS devices and other valuables, and secure cables in a glove box when parking vehicles overnight. Ensure all vehicle doors and external boxes lock properly.



START EACH DAY WITH A CLEAN VEHICLE

You cannot leave packaging or other forms of waste at the jobsite, or allow waste to accumulate within the work vehicle where it will get in the way. Transport pre-sorted waste and recyclables back to the warehouse and dispose of them on return. Try to minimize the creation of waste at the jobsite. If you can safely load and transport solar modules with minimal packaging, you'll spare yourself the trouble of handling and hauling additional construction waste.



FOLLOW VEHICLE MAINTENANCE PROTOCOL

Limousine and taxi companies routinely perform walk-around inspections to check for auto body damage, low tire pressure and other problems. Business comes to a standstill if something goes wrong with the vehicle, so they care for their fleet. Solar installers have to view their trucks and vans the same way.



SAFEGUARD DOCUMENTATION

Stay up to date with insurance and vehicle registrations. Make sure current documentation is always available. Include copies in the vehicle and originals at the office.



**SO, ARE YOU
READY TO HIT
THE ROAD?**

You're well on your way to streamlining, but there's always more you can do.

If you get your work vehicles organized effectively and efficiently, you are setting up your whole system for success. Want to dig deeper? Here are some resources to check out:

Solar Survival Guide

Sign up to receive the entire Solar Survival Guide for streamlining the warehouse, the jobsite and more.

enphase.com/solarsurvival

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