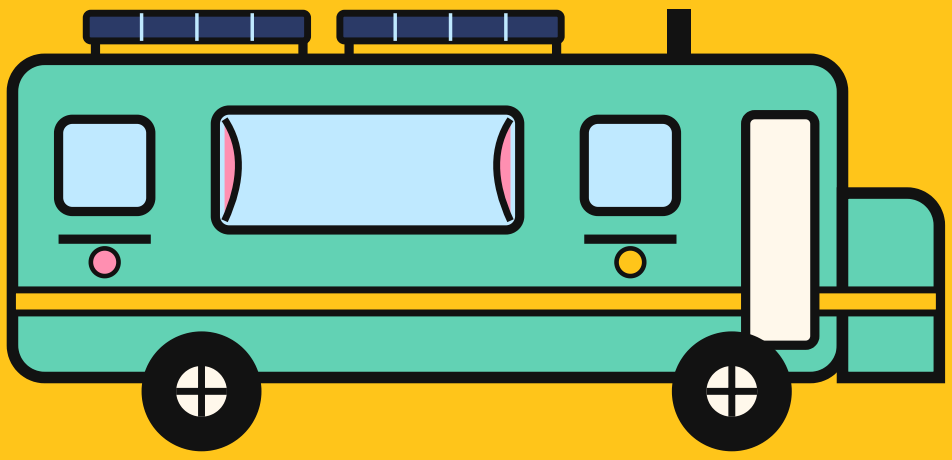
SKOOLIE FINDER · FREE GUIDE

The Skoolie Build Guide



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THE 7 MISTAKES THAT STALL FIRST BUILDS

1. Buying the bus before deciding how you will live in it (chapter 1).
2. Skipping a real inspection and buying a rusted floor (chapter 4).
3. Leaving registration and insurance until the build is done (chapter 5).
4. Covering rust instead of treating it (chapter 7).
5. Trapping moisture behind the walls (chapter 10).
6. Wiring without fuses or with undersized cable (chapter 11).
7. Never weighing the finished bus (chapter 15).

CHAPTER 01

Plan before you buy

The bus you buy should come out of your plan, not the other way round. Most stalled builds started with a cheap bus at auction and a plan worked out afterwards. Spend a weekend on these questions before you look at a single listing.

How will you use it?

- **Full-time home:** you need a real bathroom, enough water and power to go days without hookups, and heating and cooling for every season you will meet.
- **Weekends and holidays:** a simpler build. Campground hookups can cover water and power, and a smaller bus is easier to store between trips.
- **Parked most of the time:** a tiny home that rarely moves can carry more weight, but check your local rules on living in a vehicle on private land.

Who is coming?

Count beds first. One or two people fit in a short bus. A family needs bunks, more water, more storage and usually a full-size bus. Pets need floor space and somewhere cool when you leave them inside.

Where will it go?

Full-size buses are long. Some campgrounds limit site length, city streets are tight, and low bridges, parking garages and drive-throughs are out. If you plan to explore forest roads, a shorter bus goes more places.

Where will you build it?

You need flat ground, power for tools, room to walk all the way round the bus and permission to work there for months. Check zoning and any homeowners' association rules before the bus arrives, not after a neighbor complains. Paid RV

storage with work access, farm land and rented shop space are the common answers.

What can you do yourself?

Be honest about welding, electrical and plumbing skills. Every one of them can be learned, but the jobs where mistakes hurt (electrical, gas and structural steel) are worth paying a professional to do or to check.

Budget in categories, not one number

Prices change by region and year, so build your own budget from quotes. These are the lines it needs:

- [ ] The bus, plus auction fees, tax, transport or towing
- [ ] Title, registration, inspection and insurance
- [ ] Mechanical catch-up: fluids, filters, brakes, tires, belts, batteries
- [ ] Tools you do not already own
- [ ] Rust treatment, floor, insulation and walls
- [ ] Electrical: batteries, solar, inverter, charger, cable, fuses
- [ ] Water: tanks, pump, heater, plumbing, toilet
- [ ] Heating, ventilation and cooling
- [ ] Kitchen, bed, cabinets, finishes

- [ ] A contingency line for what you find under the floor

CHAPTER 02

Choose your bus

School buses come in a few body styles. The style decides your floor plan, how the bus drives and how easy it is to service. You can compare them on the Pick a Size section of the home page.

Style	Looks like	Good for	Watch for
Short bus (Type A, cutaway)	A van cab with a bus body behind it	Solo or couples, city parking, first builds	Low ceiling, limited payload
Mid-size	A shorter classic school bus	A real bed, galley and bathroom without full-size length	Fewer for sale
Full-size dog nose (Type C, conventional)	The classic bus with a hood	Families, the most common donor bus	Length, turning circle
Flat nose (Type D, transit)	Flat front, driver ahead of the wheels	Most living space for the length	Engine access, engine in the cab or in the back

Engine and transmission

The drivetrain matters more than the body. Builders tend to look for engines with a long service record and good parts supply, such as the International DT466, the Cummins 5.9 and ISB, and the Caterpillar 3116 and C7, paired with an Allison automatic. Ask what is in the bus and look up the parts and service situation for that combination near where you live.

- **Gearing:** some older Allison automatics, such as the AT545, have no overdrive. The engine revs high at highway speed, which costs fuel and noise. A bus geared for stop-and-start school routes may be slow on the highway.
- **Emissions equipment:** diesel engines built for the 2007 emissions rules onward add a particulate filter, and later engines add DEF (diesel exhaust fluid). They are cleaner and can drive well, but there is more to maintain. Many builders prefer older engines for simplicity; decide which you would rather own.
- **Gas or diesel:** many short buses run gas engines, which any shop can work on. Most full-size buses are diesel.
- **Brakes:** many full-size buses have air brakes, and short buses usually have hydraulic brakes. Air brakes can affect which license you need in some states.

Height and headroom

Measure the inside height from the floor to the ceiling before you buy. Your floor and ceiling will each take some of it back after insulation. If you are tall and the bus is not, plan for a roof raise (chapter 8) or choose a different bus.

Special-needs buses

Buses built for students with disabilities often have a wheelchair lift and a wide side door. The lift can stay for an accessible build, or come out to free space and weight. They also tend to have fewer seats and sometimes air conditioning.

Rear-engine buses

A rear-engine (pusher) bus is quieter up front and gives you a flat floor near the driver, but the engine compartment takes the back of the bus. Your bedroom or storage sits over it, and you need an access hatch for service.

TIP

Shortlist two body styles, not one. You will find more buses, and you can let price, condition and location decide between them.

CHAPTER 03

Find a donor bus

Retired school buses come from a handful of places. Each one trades price against how much you know about the bus.

Government surplus auctions

School districts, cities and federal agencies sell retired buses through online auction sites. Prices can be low, and buses are sold as-is. You usually get a description, photos and sometimes maintenance notes. Read each auction's terms: buyer's premium, payment deadline, pickup window and what title paperwork comes with the bus.

The school district directly

Some districts sell retired buses themselves. Call the transportation department, ask when they retire buses and whether you can see the maintenance records. A mechanic who has worked on the bus for years is the best source of truth you will find.

Bus dealers

Used bus dealers charge more, but the bus is usually running, sometimes inspected, and you can see it before you pay. Some will deliver.

Private sellers and half-finished projects

Partly converted buses come up for sale when a build stalls. You may save on demolition, but you inherit someone else's work, good or bad. Inspect the wiring and anything hidden behind walls with extra suspicion.

USE THE FINDER

Skoolie Finder checks dealer listings and live federal surplus lots in one search, and builds GovDeals, Public Surplus and Municibid searches already filtered to your ZIP and budget.

CHAPTER 04

Inspect before you bid

An auction bus sells as-is. The cheapest bus becomes the most expensive one when the floor is rotten or the transmission slips. Inspect in person, or pay a diesel mechanic to inspect for you. Bring a flashlight, a screwdriver, a magnet, a creeper or a piece of cardboard, gloves and a friend.

Underneath

- [ ] Frame rails: surface rust is normal; flaking, holes or soft spots are not
- [ ] Floor from below, around the wheel wells, the rear step and the battery box
- [ ] Body mounts and crossmembers
- [ ] Leaks: engine oil, transmission fluid, coolant, power steering, differential
- [ ] Exhaust: holes, broken hangers, soot trails
- [ ] Suspension: cracked or shifted leaf springs, worn shocks

Engine and drivetrain

- [ ] Start it cold. Note hard starting, knocking and heavy smoke
- [ ] Oil level and color; milky oil can mean coolant in the oil
- [ ] Coolant level, color and any oil film in it
- [ ] Transmission fluid level and smell; a burnt smell is a warning

- [ ] Belts and hoses: cracks, bulges, soft spots
- [ ] Drive it if you can: shifts, brakes, steering play, warning lights
- [ ] Ask for maintenance records and the engine and transmission model

Body and inside

- [ ] Lift the rubber mat in a few places; push a screwdriver into soft plywood
- [ ] Look for water stains on the ceiling and around windows
- [ ] Roof seams and the emergency hatches: signs of leaks
- [ ] Windows and the entry door: open, close and seal
- [ ] Tires: tread, cracks and the date code (last four digits of the DOT number are week and year)
- [ ] Lights, wipers, horn, gauges
- [ ] Air brakes: the system should build pressure and hold it

Paperwork

- [ ] Is there a title, and is it clean? "Bill of sale only" can make registration hard
- [ ] VIN on the title matches the VIN on the bus
- [ ] Odometer reading and whether it is believed accurate

- [ ] Pickup deadline, and whether the seller helps with loading

WALK-AWAY SIGNS

Rust holes in the frame, a floor you can push a screwdriver through in several places, a transmission that slips or will not shift, coolant in the oil, or no title. Any one of these can cost more than the bus.

CHAPTER 05

Title, registration and insurance

Sort out paperwork first. A finished bus that you cannot register or insure is a very expensive shed.

Title

Transfer the title into your name as soon as you buy. Government sellers often supply a certificate or form that your DMV uses to issue the title; ask the seller what they provide and ask your DMV what it accepts.

Registering as a motorhome

Most builders register the finished bus as an RV or motorhome. That can lower registration costs, change license requirements and make RV insurance possible. Each state sets its own rules. Many look for some combination of sleeping space, cooking, water, a toilet and power, and may want photos, a weight slip or an inspection. Get your state's requirements in writing before you design the interior, so the build meets them.

License

In most states you can drive a privately owned motorhome without a commercial license. Some states require a non-commercial upgraded license for heavy vehicles or for air brakes. Check your state's DMV rules for your bus's weight and brake type.

Looking like a school bus

Once it is not a school bus, it must stop looking like one. Remove or cover the "School Bus" lettering, take off or disable the stop arm and the red and amber warning lights, and check whether your state requires the bus to be repainted from school bus yellow. Several do.

Insurance

Not every insurer covers a converted bus, and some will not cover one under construction. Call specialist RV insurers before you buy, and ask what they need: photos, registration as a motorhome, a minimum level of completion. Ask about liability while the bus is being driven home from the auction, too.

TIP

Some builders register through an out-of-state company or service. It is legal in some situations and not in others, and it can affect taxes and insurance. Talk to a professional in your own state before choosing it.

CHAPTER 06

Demolition

Demolition is fast, loud and satisfying. It also shows you what the bus is really like. Wear eye and ear protection, gloves and a good dust mask.

Seats

Seats are usually bolted through the floor, with nuts underneath and brackets on the wall side. Rusted nuts are the norm. An impact driver with a helper underneath works on good bolts; an angle grinder with cutting discs handles the rest. Many seats sell or give away to other builders and farms.

Floor

Under the rubber matting is usually plywood, then the steel floor. Pull it all up. This is the only way to see rust and to treat it properly. Mark every bolt hole you leave in the steel for sealing later.

Ceiling and walls

Interior panels are held with screws or rivets. Behind them is often fiberglass insulation that may be wet, compressed or full of mouse nests. Most builders strip it all and start again. Drilling rivets is slow; a sharp bit, a center punch and patience help.

What to keep

- The driver's area, gauges and controls you need on the road
- Emergency exits that your state requires (check before you remove any)
- Heater cores and fans you might reuse, and wiring you can label and trace

SAFETY

Older buses can contain materials you should not breathe as dust, such as old insulation or coatings. If you are unsure what something is, test it or have it tested before you cut or sand it.

CHAPTER 07

Rust and the floor

With the floor bare, you can deal with rust once and properly. Everything you build sits on top of this work.

1. **Find it:** sweep, vacuum and look closely, especially at wheel wells, the rear step, under the old heater and around the seat rails.
2. **Remove it:** wire wheels and flap discs on a grinder take surface rust off. Cut out and weld in new steel where the metal is thin or holed.
3. **Treat it:** a rust converter chemically changes remaining rust into a stable layer. Follow the product's directions on surface prep and drying time.
4. **Seal it:** a rust encapsulating paint or coating goes over the treated steel.
5. **Close the holes:** fill seat bolt holes with bolts, washers and sealant, or weld them. Every open hole lets in water and exhaust.

The new subfloor

A typical floor stack is: sealed steel, rigid foam insulation fitted between or over thin wood sleepers, then plywood, then your finished floor. Fasten through to the steel and seal every penetration. Keep the stack as thin as your climate allows, because every layer comes out of headroom.

TIP

Treat the underside too. Wheel wells and the floor from below take the most water and road salt.

CHAPTER 08

Roof raise and windows

Should you raise the roof?

A roof raise cuts the roof free at the pillars, lifts it and welds in new steel. It adds headroom, room for insulation and space for upper cabinets. It also adds height, weight, cost and a long welding job. Raise the roof if tall people will live in the bus or if you need storage up high; skip it if the stock height works for you.

- Doing it yourself needs real welding skill, steel, a way to lift the roof evenly and a lot of sealing.
- Fabrication shops that specialize in buses do raises; get quotes and look at their finished work.
- After a raise, measure the total height and write it on a label by the driver's seat. You will check it at every low bridge and fuel station canopy.

Windows

School buses have a lot of windows, which means a lot of heat loss and little wall space. Most builders keep some for light and views and delete the rest.

- **Deleting windows:** remove the window, cover the opening with sheet metal, fasten it with rivets or structural adhesive, and seal the edges.
- **Skinning:** covering the whole window band with one sheet of metal gives a smooth look but is a bigger job.
- **Keeping windows:** reseal them, add insulated covers for night and winter, and plan your layout so beds and cabinets sit where windows are deleted.

Roof hatches and openings

The roof is where you will add fans, vents and solar mounts. Plan every hole before you insulate, seal each one with a sealant made for roofs, and check the roof every

season.

CHAPTER 09

Layout and weight

Plan the layout before you insulate and wire, because the layout decides where every wire, pipe and vent goes.

Plan it full size

Draw it on paper, then mark it on the floor with tape. Sit where the couch will be, stand at the counter, lie where the bed will go. Cardboard boxes stand in for cabinets well.

The common order, front to back

1. Driver's area and entry door
2. Living area and dinette near the door, where light is best
3. Kitchen
4. Bathroom, often across from or next to the kitchen to share plumbing
5. Bedroom at the back, with storage underneath

Weight and balance

- Find the GVWR and the front and rear axle ratings (GAWR) on the label near the driver's door or in the paperwork. Stay under all three.
- Water is heavy. Put tanks low and between the axles where you can.
- Balance side to side: do not put the kitchen, water and batteries all on one side.
- Weigh the bare bus before you build, so you know your budget for everything you add.

Things that are easy to forget

- [ ] A clear path to every emergency exit
- [ ] Somewhere for wet coats and muddy boots
- [ ] A place for the battery bank with ventilation and access
- [ ] Access to the engine, transmission and any rear engine hatch
- [ ] Where the tanks fill, drain and get checked
- [ ] Seat belts for every passenger seat used while driving

CHAPTER 10

Insulation and ventilation

A steel bus is cold in winter, hot in summer and wet inside if you get this wrong. Insulation keeps temperature steady; ventilation removes the moisture you make by breathing, cooking and showering.

Insulation types

Type	Strengths	Weaknesses
Rigid foam board	Cheap, easy to cut, DIY friendly, good for floors and walls	Gaps at the edges and around ribs need sealing
Closed-cell spray foam	Fills every gap, sticks to steel, blocks air and moisture	Usually a professional job, messy, hard to undo
Mineral or natural wool	Fits irregular spaces, handles sound	Must be kept dry, needs a careful vapor plan

Condensation is the real enemy

Warm, moist air that reaches cold steel turns to water. Behind a wall, that water rots wood and rusts the bus from the inside. Two things prevent it:

- **Block the air:** seal insulation to the steel and close every gap, so moist air cannot reach the cold metal. Closed-cell foam does this by itself; foam board needs its seams and edges sealed.
- **Cut the thermal bridges:** the steel ribs conduct cold right into the bus. Cover them with a thin layer of foam before the wall goes on.

Ventilation

Plan at least one powered roof fan, ideally one at each end so air moves through the whole bus. Run a fan when you cook and shower, crack a window at night in cold weather, and use a moisture meter or hygrometer to see what is happening.

TIP

Insulate before you run wires and pipes only if you have planned every route. Most builders run wiring through the walls and ceiling first, then insulate around it.

CHAPTER 11

Electrical and solar

Your electrical system is the part of the build most likely to cause a fire. Plan it on paper, fuse everything and get it checked by someone qualified before you live in the bus.

Start with an energy audit

List every device, its power in watts and how many hours a day you will run it. Multiply and add them up to get watt-hours per day. That number sizes your battery bank, your solar and your charger. Fridges, heaters, air conditioners, induction cooktops and hair dryers are the big ones.

The parts

- **Battery bank:** most new builds use lithium iron phosphate (LiFePO4) batteries for their weight, lifespan and usable capacity. Most cannot be charged below freezing unless they are heated, so keep them inside the warm part of the bus or buy heated batteries.
- **Charging sources:** solar panels and a solar charge controller; a DC-to-DC charger from the bus alternator while you drive; and a shore power charger for campgrounds.
- **Inverter:** turns battery power into household AC for outlets. An inverter-charger combines the inverter and the shore power charger.
- **System voltage:** 12V is simple and common; 24V or 48V uses thinner cable for big loads. Pick it early and buy parts to match.

Safety rules

- [ ] A fuse or breaker on every positive cable, close to the battery

- [ ] A main battery disconnect you can reach quickly
- [ ] Cable sized for the current and the length of the run
- [ ] Crimped and heat-shrunk connections, not twisted wires
- [ ] Cable protected where it passes through metal
- [ ] Ground-fault protection on AC outlets near water
- [ ] A smoke alarm and a fire extinguisher you can reach

GET IT CHECKED

High-current DC wiring can start a fire in seconds if a cable is undersized or unfused. Have an electrician or experienced RV technician check your system before you rely on it.

CHAPTER 12

Water and the toilet

Tanks

- **Fresh water:** sized by how many days you want between refills. Inside the insulated part of the bus, it will not freeze as easily.
- **Grey water:** from sinks and the shower. Dumping it on the ground is illegal in many places; plan to empty it at dump stations.
- **Black water:** only if you install a flush toilet that needs one.

The system

A 12V water pump, an accumulator tank to smooth the flow, a filter, then cold lines to the taps and a water heater for hot. PEX tubing is popular because it is flexible and copes better with freezing than rigid pipe. Add drain points at the low spots so you can winterize.

Hot water

Propane tankless heaters, electric tank heaters run from shore power or a large battery bank, and heat exchangers that use engine or diesel heater heat are the common options. Follow the maker's venting rules exactly for anything that burns fuel.

The toilet

Type	How it works	Trade-off
Composting	Separates liquids; solids compost with a dry medium	No black tank, but needs emptying and a vent fan
Cassette	A small removable tank you empty at a toilet or dump station	Simple and compact, frequent emptying
Flush with black tank	Like a house toilet, into a holding tank	Most familiar, needs a black tank and dump stations

Freezing weather

Keep tanks and pipes inside the heated envelope, insulate anything that runs outside it, and know how to drain the whole system fast if you lose heat.

CHAPTER 13

Heating, cooling and gas safety

Heating

- **Diesel air heater:** burns fuel from the bus tank or its own small tank, with the combustion sealed from the living space and the exhaust outside. Popular for low power use.
- **Wood stove:** dry heat and a lot of charm. It needs proper clearances to anything that burns, heat shields, a well-sealed flue through the roof and a fresh air supply. Follow the stove maker's clearances.
- **Propane heaters:** use only heaters vented to the outside. Unvented heaters put moisture and combustion gases into a small space.
- **Electric:** easy on shore power, hard on batteries.

Cooling

Insulation, shade, reflective window covers and moving air come first. A roof or mini-split air conditioner works well on shore power or a generator; running one from batteries alone takes a very large battery bank and solar array.

Propane safety

- [ ] Tanks in a locker sealed from the inside of the bus and vented to the outside at the bottom (propane is heavier than air)
- [ ] Certified fittings, a regulator and a leak test with soapy water on every joint
- [ ] A propane detector mounted low
- [ ] A carbon monoxide alarm

- [ ] A shut-off valve you can reach

CARBON MONOXIDE

Every bus with a fuel-burning appliance or a nearby generator needs a working carbon monoxide alarm. Test it regularly.

CHAPTER 14

Build out the interior

Walls and ceiling

Tongue-and-groove boards, thin plywood and sheet panels are all common. Lighter is better: every pound you add stays with the bus for its whole life. Fasten into the steel ribs or into wood furring strips fixed to them.

Cabinets and furniture

- Build lighter than a house kitchen: plywood frames, thin panels and fewer solid-wood pieces.
- Fix every cabinet to the floor, the wall ribs or both. In a hard stop, anything loose becomes a missile.
- Use latches that stay shut on bumpy roads, and lips or rails on shelves.
- Build storage into the bed platform, the dinette benches and under the floor where you can.

The kitchen

Decide on the fuel first: propane, induction on a large battery bank or both. A 12V compressor fridge is the common choice because it runs efficiently from the batteries. Plan ventilation over the stove.

Finishing touches that matter

- [ ] Insulated window covers for night and winter
- [ ] Hooks and a spot for everything you use daily

- [ ] Light switches by the door and by the bed
- [ ] A fire extinguisher by the door and one by the kitchen
- [ ] Labels on breakers, valves and shut-offs

CHAPTER 15

Before your first trip

Weigh it

Take the loaded bus, with full water and your gear, to a certified truck scale (most large truck stops have one). Weigh each axle and compare with the GVWR and axle ratings on the label. Overweight axles wear tires, brakes and suspension and can be unsafe.

Mechanical check

- [ ] Fresh oil, filters, coolant and transmission service if the records are unclear
- [ ] Brakes inspected and adjusted; air system checked for leaks
- [ ] Tires: rated for the load, correct pressure for your axle weights, date codes checked
- [ ] Belts, hoses and the battery for the engine
- [ ] All lights, mirrors and wipers
- [ ] A spare tire or a roadside plan for a tire this size

Safety gear

- [ ] Smoke, carbon monoxide and propane alarms tested
- [ ] Fire extinguishers charged and mounted

- [ ] Warning triangles and a reflective vest
- [ ] First aid kit and basic tools
- [ ] The total height written by the driver's seat

Shake-down trip

Go somewhere close for a night or two. Listen for rattles, check every latch after the drive, look for leaks and see how long your water and power last. Fix what you find before the big trip.

CHAPTER 16

Living in it

Where to park

- **Campgrounds and RV parks:** hookups and showers; check the site length limit before you book.
- **Public land:** many areas allow dispersed camping for a limited number of days. Learn the rules for each area and leave no trace.
- **Private land:** friends, farms and host programs. Check local rules on living in a vehicle.
- **Overnight stops:** some businesses allow overnight parking for travelers. Always ask, and respect the answer.

Routine maintenance

- [ ] Engine and transmission service on the maker's schedule
- [ ] Roof sealant inspected each season
- [ ] Battery state and connections checked monthly
- [ ] Tire pressure before every drive day
- [ ] Alarms tested and extinguishers checked
- [ ] Tanks sanitised and filters changed

Join the community

Skoolie builders share a great deal: forums, subreddits, Facebook groups, YouTube channels and in-person gatherings. When you get stuck, someone has usually solved the same problem on the same bus.

SHOW US YOUR BUS

Finished, half done or still gutted, we would like to feature your build on the Build Board, with credit and a link to your channel.

This guide is general information, not legal, mechanical or electrical advice. Rules differ by state; check with your DMV, insurer and qualified professionals for your build.