



An Extended Guide · No. 1673

Storing Batteries: Charge Level, Temperature, Off-Season

Putting a battery away
so it's ready later

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! Read this first — a few battery-safety basics

A battery stores a lot of energy in a small package, so a few plain habits keep everyone safe — no matter the chemistry. Charge with the charger made for that exact battery, on a hard, non-flammable surface, and never charge one that is swollen, cracked, leaking, hot, or wet. Keep batteries away from open flame, sparks, and high heat, and give a lead-acid battery plenty of fresh air while it charges, because it can give off explosive hydrogen gas. Never puncture, crush, short the two terminals together, or throw a battery in a fire. Around lead-acid batteries wear eye protection — the acid inside can burn skin and eyes. And when any battery finally wears out, it does not belong in the household trash: batteries are recycled at the right drop-off, never thrown away. The reassuring part is that the LiFePO₄ chemistry — also written LFP — inside most of today's power stations and backup batteries is one of the safest and most stable there is. This guide is about putting a battery away for a while — stored right, it will be ready when you need it, and safe the whole time it waits.

Storing a battery so it's ready later

A battery you put away for the off-season — or just for a stretch you won't use it — needs a little thought going in, or it can let you down when you finally reach for it.

I'm Bill, and I run Bill's Home Tech here in Portage County, Ohio. Every spring I hear the same disappointment: a mower, an RV, or a backup battery that sat all winter and won't wake up. Almost always, it comes down to how it was put away.

This guide is about that inactive, on-the-shelf kind of storage — not the everyday habits of a battery you use all the time, which our everyday-habits guide covers. Store it right and you'll be pleasantly surprised come next season.

★ No question is too basic

If you've ever pulled out a dead battery in the spring and wondered what went wrong, let's make sure it doesn't happen again. Call or text me at (330) 200-8042.

The whole guide, on one page

If you read nothing else before putting a battery away, read this.

- ❑ Store lead-acid fully charged — and keep it that way; a maintainer is ideal.
- ❑ Store lithium (LFP) at a partial charge — not bone-empty, not necessarily full.
- ❑ Keep any battery cool and dry, out of direct sun, away from heat and freezing extremes.
- ❑ All batteries slowly self-discharge while sitting — lead-acid faster — so check and recharge periodically.
- ❑ Keep terminals clean and covered, and away from loose metal that could short them.
- ❑ Store lead-acid off damp concrete, on a board or shelf, and out of reach of kids and pets.

✓ The two big ones

If you remember only two things: lead-acid goes away full, lithium goes away partial — and both like it cool.

What we mean by 'storing' a battery

There's a difference between a battery you use every week and one you're putting away, and it changes the advice.

Storage here means inactive — a battery that's going to sit unused for weeks or months. Think of a lawn tractor over winter, an RV or boat in the off-season, a spare backup battery, or a power station you won't touch for a while. A sitting battery has different needs than one in daily service.

If instead you're looking for the day-to-day habits of a battery you use regularly — how to charge it, how deep to drain it, keeping it cool — that's our everyday-habits and depth-of-discharge guides. This one is all about the shelf.

✓ Put-away care is its own skill

A battery that's resting wants to be set up once and checked now and then, not fussed with daily. Get the setup right and it mostly looks after itself.

The three things that matter most

Good storage really comes down to three simple decisions.

- **Charge level** — how full you leave it, which differs by chemistry.
- **Temperature** — cool and dry, out of the heat and away from freezing extremes.
- **Checking in** — a periodic look and top-up, because batteries fade while they sit.

Get those three right and you've done ninety percent of the job. The rest — clean terminals, a safe surface, keeping metal away — is easy housekeeping. The next few pages take each one in turn.

★ Three decisions, one happy spring

I've watched these three little choices decide whether a battery wakes up ready or goes in the recycling bin. They're worth the few minutes.

Charge level: store lead-acid full

For lead-acid — car, AGM, gel, deep-cycle, most UPS batteries — the rule is put it away full and keep it full.

A lead-acid battery wants to be stored fully charged. Left sitting at a low charge, it slowly sulfates inside, and a sulfated battery can be ruined for good. So charge it up completely before it goes on the shelf, and don't let it drift down while it waits.

Because lead-acid also self-discharges fairly quickly on its own, keeping it full over a long storage usually means either recharging it every so often or, far easier, leaving a maintainer connected to do it automatically. More on maintainers in a couple of pages.

! A discharged lead-acid battery is a battery at risk

Never store lead-acid empty or low. Full is the safe storage state — and keeping it full is the single most important thing for a lead-acid battery on the shelf.

Charge level: store lithium at a partial charge

Lithium plays by different rules — and interestingly, full isn't the goal for long storage.

A lithium (LFP) battery or power station is happiest stored at a partial charge — somewhere in the middle range, not bone-empty and not necessarily brimming full for months on end. The exact level is the maker's call, so check the manual; many suggest a comfortable partial charge for storage.

The good news is that lithium self-discharges slowly and holds its charge well while sitting, so it needs less babysitting than lead-acid. Set it to a partial charge, store it cool, and check it now and then to make sure it hasn't drifted too low over a long rest.

✓ Partial, not empty — and not always full

For lithium, aim for a middle-ground charge for storage. Follow the maker's guidance on the exact level; they know that pack best.

Why the two chemistries differ

It seems odd that one goes away full and the other partial, so here's the plain reason.

Lead-acid is chemically unstable when it sits at a low charge — that low, resting state is exactly when sulfation sets in and does its damage. Keeping it full holds that trouble at bay. So for lead-acid, full is the safe resting place.

Lithium doesn't sulfate, and it's under no strain sitting at a middle charge — in fact a moderate level is easiest on it over a long rest. Its BMS also guards the bottom so it won't quietly drain itself to harm. Different chemistry, different comfort zone — and now you know why.

✓ Two chemistries, two comfort zones

Lead-acid rests easy when full; lithium rests easy in the middle. Match the battery to its own comfort zone and it stores beautifully.

Temperature: cool, dry, and out of extremes

Where you set a battery down matters as much as how full it is.

Batteries store best somewhere cool, dry, and out of direct sun — a steady basement or an interior closet is far better than a hot attic, a sun-baked shed, or a car. Heat is the long-term enemy of every chemistry; it ages a battery faster even while it's just sitting there.

At the other extreme, avoid deep freezing too. A garage that swings from baking summers to bitter winters is a hard place on a battery. If your only spot is an outbuilding, favor the most temperature-steady corner you can find. Our cold-weather guide goes deeper on heat and cold.

! Heat is the silent battery-killer

A battery cooking in a hot attic or car ages fast, even in storage, and extreme heat is a safety risk. Cool and steady is what you're after — and never store a battery where it could freeze solid.

Self-discharge: batteries fade while they sit

Even doing nothing, a battery slowly loses charge — and that's the reason storage takes any attention at all.

Every battery leaks a little charge just sitting on the shelf. Lead-acid fades noticeably faster; lithium holds on much longer. Warmth speeds it up for both, which is one more reason cool storage helps. Left long enough with no attention, a battery can drift down to where it's harmed — especially lead-acid, which mustn't sit low.

This is exactly why a maintainer is such a friend to a stored lead-acid battery, and why even a slow-fading lithium pack deserves an occasional check. The battery isn't broken — it's just quietly doing what all batteries do.

✓ **Sitting still isn't the same as staying put**

A stored battery is always slowly drifting down. Plan for it with a maintainer or a calendar reminder, and it never catches you out.

Checking in while it's stored

A stored battery doesn't need daily fuss — just an occasional look so it doesn't drift too far.

Every so often over a long storage, check the battery's charge and top it up as needed. How often depends on the chemistry and the temperature — lead-acid without a maintainer needs checking more often than a lithium pack. When you check, glance the battery over too: any swelling, leaking, corrosion, or a warm spot is worth catching early.

- Lead-acid without a maintainer: check and recharge fairly often.
- Lead-acid with a maintainer: it handles the topping up for you.
- Lithium (LFP): check occasionally; it holds charge well but shouldn't drift too low.
- Any battery: look for swelling, leaks, corrosion, or heat while you're at it.

✓ A reminder on the calendar

You don't have to remember on your own. A recurring note on the calendar or phone is all it takes to keep a stored battery from slipping too low.

Maintainers: the off-season's best friend

For a lead-acid battery that's going to sit, a maintainer turns storage from a chore into a set-and-forget.

A maintainer — also called a tender — is a smart charger built for the long haul. Left connected to a stored battery, it keeps it topped up only as needed and floats gently, so the battery stays full all season without overcharging. For a mower, an RV, a boat, or a backup battery, it's the easiest way to guarantee a happy spring.

Make sure the maintainer matches the battery's chemistry, set it up on a safe surface with fresh air, and you can leave it be. Lithium packs generally don't need a maintainer the way lead-acid does, since they hold charge so well — but always follow the maker's advice for your pack. Our charging guide covers chargers and maintainers in more detail.

★ A maintainer is small money, big peace of mind

For a lead-acid battery that sleeps through the winter, a good maintainer is one of the best little buys there is. Happy to help you pick and set one up — just call (330) 200-8042.

Two kinds of homes, two sets of needs

Where you store a battery — and the swings in temperature it faces — depends a lot on whether you're in town or out in the country.

If you live in town or the suburbs

In town or the suburbs, you usually have a temperature-steady spot indoors and a store close by, which makes storage easy.

- A basement or interior closet stays cool and steady — ideal for a stored battery.
- Shorter outages mean smaller batteries, which are easy to bring indoors for the off-season.
- A maintainer and a recycling drop-off are both a short trip away when you need them.
- Less need for long storage, since you're recharging from the wall between outages.

If you are out in the country on a well

Out in the country on a private well, batteries are often bigger and live in barns, garages, or outbuildings that swing hot and cold — and when the power's out, the well pump and running water go with it.

- Outbuildings swing from baking to freezing, so pick the most temperature-steady corner you can.
- Bigger deep-cycle and backup banks are heavy — store them where you won't have to move them far.
- Keep a maintainer on hand, since a store run is longer and lead-acid mustn't sit low.
- If batteries pair with solar, store the whole setup cool and dry — see our sizing and well-pump guides.

★ Not sure where to store yours over the winter?

Tell me what you've got and where you'd keep it, and I'll help you find the safest, steadiest spot and set up a maintainer if it needs one. Call (330) 200-8042.

Terminals, loose metal, and shorts

A stored battery still holds real energy, so a little care around the terminals keeps it safe on the shelf.

The danger with a resting battery is a short — something metal bridging the two terminals. A dropped wrench, a handful of screws, steel wool, even a stray nail across the terminals can spark, get very hot, and start a fire. So keep stored batteries clear of loose metal, and cover or cap the terminals if you can.

For loose lithium batteries, taping over the terminals before they go into storage is a smart habit — it keeps anything from bridging them. Store batteries where they won't get knocked around, and keep them out of reach of children and pets. Our terminals-and-cables guide covers safe connections in more depth.

! Never let metal bridge the terminals

Keep loose tools, screws, nails, and steel wool away from stored battery terminals. Cover or tape the terminals, and store the battery where nothing metal can fall across it.

Store lead-acid off damp concrete

Here's an old piece of advice that's half myth, half good sense — let's sort out which is which.

You may have heard that setting a battery on a concrete floor drains it. For a modern battery on a clean, dry surface, that's a myth — the concrete itself won't pull the charge out. So don't lose sleep over it.

The real, sensible part is moisture. A battery sitting on damp concrete can collect condensation, which invites corrosion on the terminals and case over a long storage. So the smart move is still to set a stored battery on a board, a shelf, or a mat — not because concrete drains it, but to keep it up out of the damp.

✓ A board or shelf, for the right reason

Keep a stored battery off damp concrete — but for the moisture, not the myth. A scrap of wood or a shelf is all it takes.

Clean and cover it before it rests

A few minutes of tidying before storage pays off when you come back to it.

Before a battery goes away, wipe the top clean and dry, and clean any corrosion off the terminals. For lead-acid, a paste of baking soda and water lifts crusty corrosion — rinse, dry, and then protect the terminals with a light dielectric grease or felt washers. Make sure connections are clean, and keep the whole battery dry.

A clean, dry, protected battery resists the corrosion that quietly eats away at a neglected one over a long rest. Wear eye protection and gloves around lead-acid, since the acid can burn. Our lead-acid maintenance and terminals guides cover the cleanup step by step.

✓ Clean now saves scrubbing later

Corrosion is far easier to prevent than to remove. A quick clean and a dab of protectant before storage keeps the terminals bright for next season.

Where to store it, and where not to

A quick side-by-side of the good spots and the ones to avoid.

Good storage spot	Poor storage spot
A cool, dry basement	A hot attic or a parked car
An interior closet or shelf	A damp corner or wet floor
A board or shelf, off concrete	Bare, damp concrete
Out of sun, clear of clutter	A sunny window or a metal-strewn bench

The pattern is easy to remember: cool, dry, steady, and clear of loose metal. Wherever you land, keep it out of reach of children and pets, and somewhere you'll remember to check on it now and then.

Waking a battery up after storage

When the season comes around again, a few minutes of care gets a stored battery back in service safely.

Before you rely on it, give a stored battery a full charge with the right charger and let it come to room temperature if it's been somewhere cold. Look it over first — check for swelling, leaks, corrosion, or a cracked case — and clean the terminals if they've dulled. Then test that it holds a charge before the day you actually need it.

Waking a battery up ahead of time, not the morning you need it, is the whole trick. If it's slow to take a charge, reads low even after charging, or shows any damage, it may have reached the end of its life — our failing-battery and testing guides help you tell.

★ Test before the season, not during it

Wake your batteries up a couple of weeks early. Finding a tired battery on a calm afternoon beats discovering it during the first storm — I've seen both, and early is far better.

Storing the different types

The core rules hold across the board, with a few type-by-type notes.

- **Power station (lithium)** — store at a partial charge, cool and dry, and check it every so often over a long rest.
- **Car or starting battery (lead-acid)** — store full, ideally on a maintainer; don't let it sit low.
- **Deep-cycle (RV, marine, backup)** — lead-acid types go away full on a maintainer; lithium types store partial.
- **UPS battery (usually AGM)** — keep the unit cool; these wear out in a few years and get replaced, then recycled.

When in doubt, the chemistry decides: lead-acid full, lithium partial, both cool and dry. Our car-and-deep-cycle, UPS, and power-station guides go further on each type.

Common Questions

The questions I hear most about putting batteries away.

Q: Should I store my battery full or partly charged?

It depends on the chemistry. Store lead-acid fully charged and keep it that way; store lithium (LFP) at a partial charge — not empty, not necessarily full. Follow your battery's manual for the exact level.

Q: Does storing a battery on concrete really drain it?

No — that's a myth for modern batteries on a clean, dry surface. The real concern is damp concrete causing corrosion, so a board or shelf is still smart, just for the moisture, not the myth.

Q: How often should I check a stored battery?

Lead-acid without a maintainer needs checking fairly often, since it self-discharges quickly. Lithium holds charge well and needs only an occasional look. A calendar reminder makes it effortless.

Q: Do I need a maintainer?

For a lead-acid battery in long storage, it's the easiest way to keep it full and healthy — well worth it. Lithium packs usually don't need one, since they hold charge so well; follow the maker's advice.

Q: Can I store a battery in an unheated garage or shed?

You can, but it's not ideal — outbuildings swing hot and cold, and both extremes are hard on a battery. Pick the most temperature-steady spot you can, and avoid places that bake in summer or freeze solid in winter.

★ Have a storage question I didn't cover?

That's what I'm here for. Call or text (330) 200-8042 and ask away — no question about your batteries is too small.

An off-season storage checklist

Run through this before a battery goes on the shelf, and again when you bring it back.

- ☐ Wipe it clean and dry, and clean any corrosion off the terminals.
- ☐ Set the charge: lead-acid full, lithium at a partial charge.
- ☐ For stored lead-acid, connect a maintainer if you have one.
- ☐ Choose a cool, dry spot out of sun — off damp concrete, on a board or shelf.
- ☐ Cover or tape the terminals and keep loose metal well away.
- ☐ Put a reminder on the calendar to check and top it up midway.

✓ Tape this inside the storage cabinet

A printed copy where you keep your batteries is worth a dozen memorized facts. Glance at it going in and coming out, and you're set.

Where to go next

Storing connects to a few other habits, so here's where to look next.

- Using a battery day to day? Our everyday-habits guide covers the in-service routine.
- Setting up a maintainer? The charging guide walks through chargers and tenders.
- Have a flooded or AGM battery? The lead-acid maintenance guide covers watering and cleanup.
- Worried about heat and cold? Our cold-weather guide explains how temperature affects batteries.

You don't have to read them in order or read them all — just follow whatever question is on your mind today. Each guide stands on its own, and good storage sets up everything else.

You don't have to do this alone

You just have to remember that a friendly, patient person is one call away.

I hope this guide made storing your batteries for the off-season feel a little less daunting and a lot more doable. Keep it in a drawer with your other home papers, come back to a page whenever you need it, and don't worry about memorizing anything.

When you'd rather have a hand, that's exactly what I do. I come to your home, work at your pace, and never make you feel rushed or silly for asking. A first visit is a flat \$99, and for the parts that don't need me on-site I can often help right on your screen for \$49. Every visit comes with a 30-day, come-back-free guarantee. I don't do licensed electrical work or open up sealed battery packs myself — for anything hardwired, or for panel work, I'll help you line up a trustworthy local pro.

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Storage Charge Level

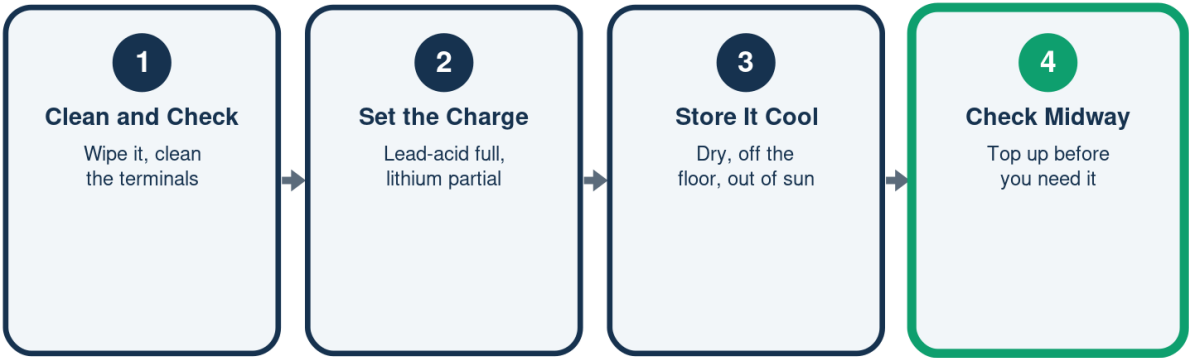
Put it away at the right charge

	Lead-Acid	Lithium (LFP)
Store it at	Full charge	Partial charge
Never	Store empty	Store bone-dry
Best helper	A maintainer	A simple top-up
If left low	Can be ruined	Avoid it too
Check it	Now and then	Now and then

Exact levels vary by maker — follow the label and manual.

Putting a Battery Away

A simple off-season routine



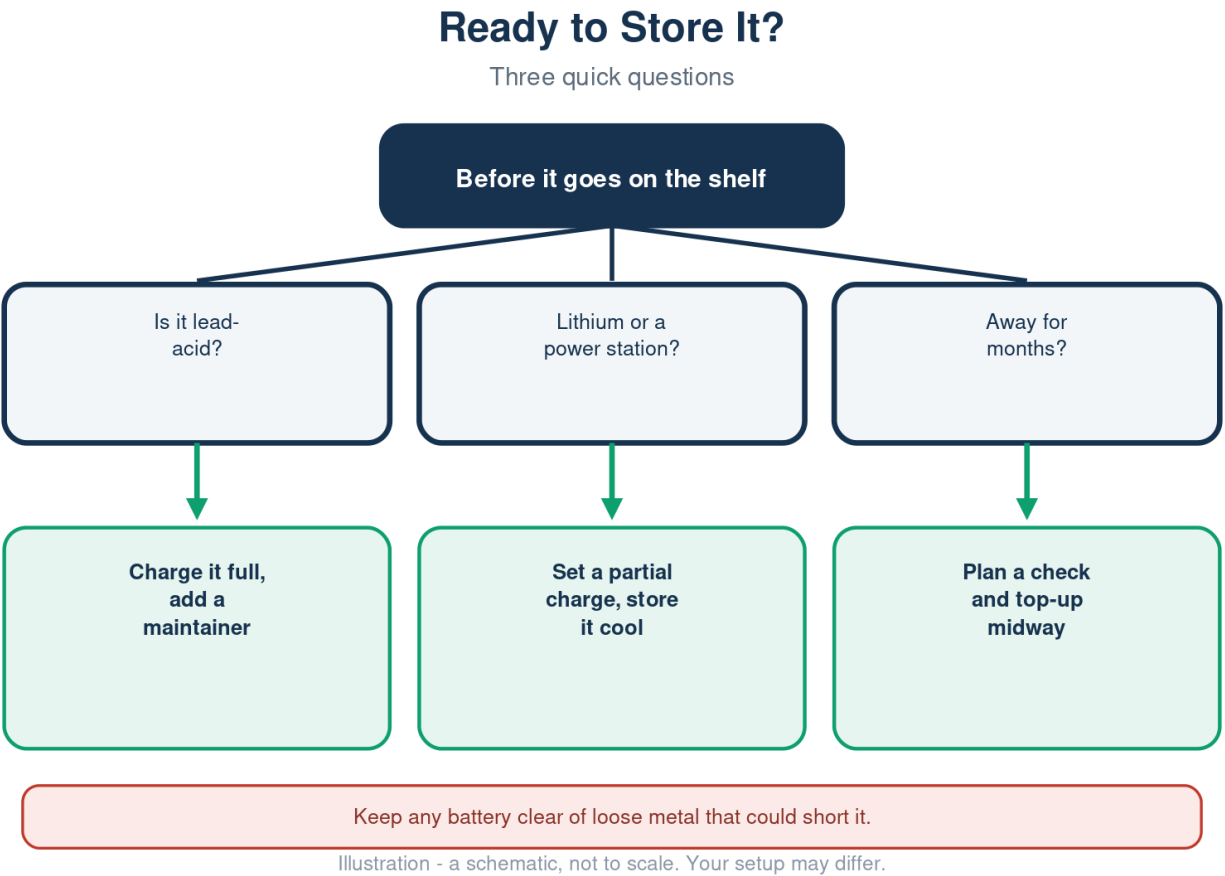
A few minutes now saves a dead battery later.

Where to Store a Battery

Good spots and poor ones

	Good	Poor
Temperature	Cool and steady	Hot attic or car
Moisture	Dry	Damp basement
Surface	A board or shelf	Damp concrete
Sunlight	Out of the sun	A sunny window
Around it	No loose metal	Tools and nails

A board or shelf keeps a battery up off damp concrete.





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A Note From Bill

A quick note from Bill.

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