RChobby Lab

10 RC LiPo Battery Mistakes You Want to Avoid

By Ted Dulles Updated on March 15, 2024

Reviewed by Kristen Ward

R/C vehicles powered by lithium polymer (LiPo) batteries have taken the hobby by storm. Their unbeatable combination of high power, long run times, and light weight makes them perfect for everything from bashers to racers.

However, LiPo batteries require special care and handling compared to older battery types like NiMH. Make one wrong move, and your expensive battery could be permanently damaged or even start a fire!

In this epic guide, we'll cover the 10 LiPo battery mistakes made by beginners and veterans alike. We'll explain what goes wrong in each case and how you can avoid disaster through proper usage and storage methods.

Whether you're new to the hobby or have been racing and bashing for years, you're sure to pick up some useful LiPo knowledge here!

Mistake #1: Using Adapters with High-Powered Vehicles

Battery adapters serve an important purpose – they allow you to connect batteries with different connectors to your vehicle or charger. For low-power applications, these adapters work flawlessly. However, high-powered brushless vehicles place a lot of current demand on batteries which can cause issues:

- More resistance means more lost efficiency and slower speeds
- Heat buildup can melt plastic adapters and damage batteries
- Overheating leads to fire risk

The solution:

Avoid battery adapters whenever possible with high-powered RC vehicles. For example, if your truck requires an EC5 connector but your batteries have XT60, directly solder an EC5 connector onto your batteries. This eliminates any resistance and overheating danger from middle-man adapters.

Mistake #2: Mixing Old and New Batteries

Many RC models require running two battery packs simultaneously to provide enough power and capacity. When this is the case, both batteries MUST be well-matched for optimal safety and performance. Mixing batteries with different age, capacities, C-ratings, or charge levels stresses the electrical systems and is very risky.

The consequences of mismatching batteries include:

- Over-discharging the older battery leading to damage
- Overheating as the packs struggle to balance each other out
- Higher risk of crashing due to sudden loss of power

Here's how to properly match battery pairs:

- Charge both packs together consistently
- Retire both batteries together after the same usage

If one battery dies earlier than the other, replace them as a pair. Avoid the temptation to mix in newer and older batteries!

Mistake #3: Charging Hot Packs

After bashing your truck hard or screaming around the race track at full throttle, battery packs build up a lot of heat. You may be tempted to quickly recharge and get back to the action. However, this is incredibly hard on LIPO batteries!

Charging hot packs leads to faster capacity degradation. After fewer cycles, you'll notice the pack doesn't last nearly as long as it used to between charges. You're also at much higher risk for a dangerous battery fire by charging immediately after high current use.

Here is the proper way to handle hot LIPOs:

- Allow packs to fully cool off to ambient temps before charging
- Gently blow cooling air over the pack to speed up
- Have spare packs to rotate through without needing to quick charge

Get in the habit of carefully monitoring battery temperature, especially when charging multiple packs in succession. The few minutes of waiting is well worth it for dramatically extended lifespan!

Mistake #4: Forgetting to Storage Charge

So you finish an awesome day of bashing and head home excited to work on your truck and reminisce about the epic runs. After pulling the two hot LiPo packs from your rig, you set them aside to cool off and immediately start wrenching away on your truck with nary another thought about those batteries.

LiPo batteries should never be put into long term storage fully charged or fully depleted. When resting for longer than a few days, LiPos MUST be “storage charged” to around 3.85V per cell (50% charge). This drastically slows internal chemical reactions that degrade packs when left dormant.

Mistake #5: Leaving Batteries Plugged into Vehicles during Storage

Here’s a scenario that makes all RC enthusiasts cringe – you stash away your beloved RC car or helicopter for the winter months and forget that you left the LiPo packs plugged in! Come spring cleaning time, you pull out your gear hoping to bring it back to life just when fun weather hits.

However, you discover that your forgotten battery has been slowly draining to absolute zero volts over the past 6 months. Hopefully it hasn’t damaged your electronics due to over-discharge. But regardless, the battery pack itself is unsalvageable. All that expensive Lithium has chemically degraded to the point that no amount of charging will bring it back.

This is the worst case scenario of battery storage failure due to simple carelessness and it couldn’t be easier to avoid:

- Make storage mode charging part of your post-run routine so packs are always left 50% charged if sitting
- ALWAYS fully disconnect / unplug batteries when storing vehicles
- Check vehicles periodically if storing long term in case a rare bad connection is allowing discharge

Save yourself big headaches by being meticulous about unplugging all power sources in stored RC units!

Mistake #6: Improper LiPo Storage Conditions

Stashing LiPos in hot garages or cold basements invites damage over time as the cells get stressed by temperature swings. Leaving batteries sitting in humidity condenses moisture inside the pack which can cause shorts. Worst case, tossing Lipos loosely into messy overflowing bins could cause punctures to the thin wrapping around the soft pouch cells.

Here is proper LiPo storage best practices:

- Moderate room temps around 70*F
- Dry sealed plastic storage bins, ammo cans, or Lipo sacks
- Warning labels if storing large quantities
- No loose sharp objects mixed in that could puncture
- Avoid direct sunlight which can get very hot inside containers
- Inspect batteries whenever removing from storage
- If cells feel puffy from gassing, damaged and unusable

A little planning and effort upfront will prevent storage ruining hundreds of dollars worth of batteries later on!

Mistake #7: Buying Used LiPo Packs

Used LiPos for sale may seem like a great way to save money, but the risks often outweigh potential cost savings. There is no telling what abuses that battery endured before ending up on

Common used LiPo issues include:

- Unknown cycles on cells, falsely advertised as “lightly used”
- Internal damage from improper charging
- Puffing or gassing inside the cells
- Mechanical damage weakening the robustness
- Connector damage from rough handling

Having a LiPo let out the “magic smoke” and erupt into flames is scary enough when it’s your own fault! Getting burned by someone else’s negligent or abusive battery practices borders on unacceptable. Pay full price for that peace of mind that your new LiPos have a spotless record!

Mistake #8: Fully Charging Before Long Term Storage

It sure is tempting to fully juice up a pack before shelving it away for many months. “It will have plenty of electrons to last that whole time!” … Wrong way of thinking about battery chemistry! Even with no usage drain occurring, charged lithium battery packs slowly lose capacity just sitting idle for long enough.

A fully charged LiPo immediately begins aging as soon as that charger displays “FINISHED”:

- Long term full charge invites faster chemical breakdown
- The higher voltage also stresses components
- You may discover the pack damaged or unusable next time you need it!

This seems counterintuitive, but the proper way to store LiPos is at roughly 50% charge. This storage mode (as discussed earlier) drastically extends the shelf life by minimizing damaging reactions inside resting cells. Those lost electrons are a small price to pay for battery longevity!

Mistake #9: No Fire Safety Plan or Gear

R/C LiPo batterires absolutely live up to their name in terms of raw power and performance! But

Yet many hobbyists neglect reasonable fire precautions when charging and discharging their LiPo obsessions! Is having an urgent fire response plan even on the radar when you plug in to charge 10 packs at once in your garage as the kiddos bike around behind you?

Basic safety steps are easy:

- Dedicated fireproof LiPo charging container (Bat-Safe, ammo can, ceramic pot, etc.)
- Giant LiPo safety bag for discharging packs
- Fire extinguisher mounted nearby
- Spare bucket of coarse sand to contain runaway battery fires
- Avoid charging while away from home or sleeping

Additionally smart specialty devices exist for enhanced protection while charging:

- Fire suppression canisters (Fire Sense) mount above chargers
- Thermal probes with automatic halting of charge at unsafe temps

Is being slightly inconvenienced worth avoiding catastrophic damage? We sure think so! Just remember the Boy Scouts' motto: "Be Prepared"

Mistake #10: No Battery Maintenance & Inspections

It's all too easy to treat LiPo packs as "set it and forget it" sealed units. Pop em' in, fry em' up nice, yank em' out, repeat each bash session. But in reality, LiPos require reasonable upkeep and monitoring for optimal lifespan and safety. Ignore that periodic maintenance at your own peril!

Issues to keep an eye out for include:

- Each run, double check pack health – no puffiness, leaks, damage? Still balances to full charge capacity?
- When removing from storage, inspect cells and wiring for cracks or breakdown
- Replace battery connectors eventually as they wear out

5 minute inspection routines extend battery life, performance, and spots problems before they can ruin entire rigs or start electrical fires!

Conclusion

Whew, quite the list of potential pitfalls! Lithium polymer battery packs undeniably contributed to the immense popularity growth in cutting edge R/C vehicles over the past decade. However their sensitivity does demand proper usage and storage habits from enthusiasts.

Ignore those habits at your own risk – it only takes one improperly handled LiPo fire to make national news and draw the scrutiny of local regulators!

We encourage all devoted hobbyists to bookmark this article, share it in your club forums, and keep spreading the safety message to beginners. Let's keep this amazing hobby thriving responsibly for decades to come!

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Written By Ted Dulles

I'm Ted Dulles, an avid RC hobbyist extraordinaire! My passion for the world of remote-controlled (RC) models ignited in 2018. Just a year later, fueled by this passion, I took a bold step and opened my own RC shop in California. I have a deep fascination with all kinds of RC models – be it cars, planes, or boats. I'm always eager to take on new challenges and absolutely love the thrill and excitement that come with this hobby.

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Ted Dulles

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1508 S Pine St, Hope, AR 71801, US

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+1 301-337-7319

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