Lithium Batteries

– How do I love you, let me count the ways

(Skip to end for bullet points)

It's time for a battery upgrade. You would consider lithium as a replacement, but it seems so expensive compared to traditional GC2 (Golf Cart) batteries. "I'd rather save my money".

No doubt lithium batteries have a higher up-front cost and replacing those two (or four) GC2 batteries with lithium – thousands of dollars! Right? Expensive, right?

Well…..maybe…maybe not.

In another life as apprentice mechanic, I had a long and familiar relationship with Flooded Lead/Acid (FLA) batteries – and I'll be frank – I "dislike" them! Why? Acid-burned clothes, explosions, burned skin and countless battery replacements over the years in car, trucks, etc. The cost, over time, has been dramatic, to both clothing and wallet. But they are a dependable and predictable battery chemistry – passingly familiar to most everyone. In the RV world, they are a bit of a nightmare though, and here is why.

Flooded Lead Acid – Dependable

FLA batteries CAN be very dependable – when properly maintained, and when charged/discharged to specific ranges. However, in the life of a casual, weekend RV'r, those factors seldom play in. You get back from your trip, you are exhausted and likely so is your battery. Then you forget to plug it in for a day or two or forget to check the water levels. More often, in just a year or two – you need to replace that battery…it's become almost a springtime ritual. Or worse, you get to your favourite camp spot, and, after a couple of days, don't have enough juice to lift the hitch because the capacity has depleted so badly on that 2-year-old battery. Warranty aside – it's a hassle.

Getting the best life out of an FLA means keeping it as close to full-charge as possible. Then, when you use it, don't discharge it more than 50% of its rated capacity – any more degrades it – particularly if you leave it discharged for any length of time.

Lithium – Forgive me

Lithium is much more forgiving. They are happy at just about any range of charge – and, in fact, prefer to be left a little discharged. (Anywhere from 25% to 75% is their sweet spot). On top of that – there IS no maintenance. No water levels to check. (Yay!). Plus, if you forget to plug your trailer/RV in to charge it for a week or two – your lithium won't even care.

Those factors already make lithium a more 'trouble-free' battery for the casual weekender and even more attractive if you are a boon-docker (dry-camper) or full-timer.

Speedy

If you have solar on your rig those 2 or 3 hours of sun peeking from behind the clouds or trees will barely touch the re-charge on an FLA battery – but with lithium, that's likely enough to top your battery right back up. That's because lithium charges very fast – typically in ¾ to ½ the time it takes for a FLA battery to charge. That's important when the battery is the last thing you think of before you leave home too.

Who's Cold?

In cold weather (3C/38F) our four (4) 6-volt FLA, failed us at only one year old. Their slower chemistry couldn't produce enough power to keep our furnace blower running. Since we switched to lithium, that has never been a problem. Lead/Acid batteries are simply a more sluggish chemistry, and react slowly when power demand is higher. You likely noticed that when starting your car in cold weather.

Longevity

And last: You are probably going to leave that lithium battery in your will – they just last that long. Most are good for a minimum of 3,000 cycles (From fully charged to fully depleted and back – partial discharges don't even count). At 3,000 cycles, that's about 10 years of life. I've had mine almost 4 years – and I've only put 200 full cycles on them.

Finally - Back to Price

So – If you spent $500.00 on a pair of 6-volt golf cart batteries, and they last two years. That's about $250.00/year - $100/year in the unlikely event you can make them last 5 years.

Spending $900.00 on a single lithium battery seems more expensive – but it will perform better than those two batteries (more like four), and likely last 10 plus years. That's only $90.00/year. Minus all the inconvenience.

Pro's & Cons – Revisited

FLA (Lead Acid)

Pro's

- Cheap cost per battery
- Most RV shops are familiar with FLA
- Can be purchased from many locations
- Old and new charging equipment will likely work

Con's

- More batteries required for capacity
- Weight – very heavy (65+ pounds per battery)
- Consistent & regular maintenance required for longevity
- Lifespan measured in 2-5 years (more with perfect maintenance)
- Potentially explosive
- Cannot be safely installed inside your RV (explosion hazard)
- Generally, must be installed upgright
- Can only deliver high current loads for short duration and is temperature sensitive

Lithium (LiFePO4)

Pros

- Virtually zero maintenance
- Very quick to recharge
- Much lighter per battery (30 pounds or less per battery)
- Higher energy density per pound (per battery)
- Can deliver high current loads - works well with high capacity inverters
- Can be stored almost anywhere, in almost any position
- Voltage very consistent across discharge cycle – easier on electronics
- Likely last RV battery(s) you will ever buy

Cons

- Higher sticker price
- Unfamiliar to some RV shops
- Older charging equipment might not perform optimally[1]
- Cold weather charging (below 3C) can be a concern
- Accurately measuring capacity requires a shunt

[1] Older equipment such as converters may not charge to 100%. (Solar helps with this).