

Early Battery Failures

The reason that aircraft batteries often only last two to three years is due to three big factors—and a few you can control

Both in our last two LPM battery tests as well as on-line surveys done by *Aviation Consumer* magazine, aircraft batteries commonly only last two to three years for reliable operation. The reasons for this short life are fairly straight forward, but there are things an owner can do to lengthen battery life.

The first problem with aviation batteries is the marginal size and capacity for the job in order to keep battery weight down. Aviation batteries are much smaller with less capacity than an auto battery, yet it is often starting an engine with twice the displacement of an auto engine with oil two to three times as thick to churn through.

As a result an aircraft battery has to discharge substantially more of its capacity to start an aviation engine than the typical starting chore for an auto. It's a given fact that the more frequently that you discharge a lead acid starting battery beyond a very minimal starting burst, the shorter its life, all other things being equal.

Next, being a chemical beast, a lead acid battery slowly self-destructs from disuse as it spontaneously self-discharges with the simple passage of time. Frequently it is not fully charged from the typical short flights of today's aircraft users so it sits between flights in an already partially discharged state. The more time a battery spends partially discharged the faster it becomes permanently damaged and loses capacity.

It commonly takes two hours to recharge a battery during flight with a properly adjusted charging system. And, charging system voltage that is either too high or too low will slowly and permanently damage a battery and shorten its useful life.

The third factor is improper care of the battery by the owner. The worst thing is to not use a battery charger when the plane is not flown at least once a week. But the next worse thing is to not use the proper battery charger. That's right, using the wrong charger in some cases can be more harmful than not using a charger at all.

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How can this be? First, high charge currents are bad—even the common 10 amp auto charger is too much current for a healthy charge cycle of an aviation battery. Also, any time prolonged (more than overnight) battery charging voltage stays over 13.1 (26.2) volts (in a trickle charge mode) the battery will slowly dry out. As long as you have a flooded battery and the electrolyte stays above the plates, you can add water. But if you have a sealed battery then the electrolyte loss is gone for good.

You will commonly find (if you dig deep enough into the literature) that even computer controlled (smart) auto chargers have voltage that cycles too high and have trickle charge voltages that are above the recommended levels for aviation batteries.

This is particularly an issue with aircraft sealed batteries and especially with Gill sealed batteries, which have shown themselves to be more prone to damage from slightly elevated charging voltages (in two separate tests we have done). You must absolutely stay within their published voltage and current limitations in their literature.

So if you want to maximize battery life make sure your aircraft charging system is properly adjusted to at least 13.8 volts and below 14.3 volts and use a bench charger designed for aircraft batteries or one with a trickle charger under 13.1 (26.2) volts.

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