

As Seen In...

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Battery sulfation: prevention and repair

It's long been known that aviation, as well as non-aviation lead-acid batteries, sealed AGM or flooded (wet cell-filler caps) types, lose power and have shorter lives than batteries used on a regular-daily basis. Why should this be? It is counter intuitive. Something else must be going on that is not seen or readily understood. The major unseen is sulfation.

Sulfation is a build-up of lead sulfate crystals causing bad things to begin happening, i.e. loss of cranking power, longer charging times, excessive heat build-up (leading to "boil out"), shorter running times between charges and lastly, dramatically shorter battery life.

Although sulfation is by far the number one cause, it is not the only reason a battery fails. Vibration, contamination, damaged charging plates (due to overheating) and under-over

charging are the other major causes.

Testing your battery for sulfation

The following, if done correctly, will tell you more about the condition of your battery than any anecdotal history would ever. Use of a digital volt meter (\$19.95 at Radio Shack) is mandatory.

Step 1

Charge battery to as full a level as possible with an aviation specific charger or after a flight of no less than several hours. Allow battery to rest; don't charge or discharge for a minimum of 12 hours.

Step 2

Measure and record the battery's voltage using a digital meter. If your battery is a wet cell type (has filler caps), you can also test the Specific Gravity (SG) of the liquid electrolyte in each cell. Record the

SG readings in each cell. Note: Any cell-to-cell variation in SG will diminish as the battery becomes less sulfated as a result of desulfating it with a BatteryMINDER*.

For 12-Volt minimum voltage for effective desulfation = 12.5. (wet cell SG reading 1265 [2 balls, if a 4 ball type hydrometer]). Note: 12.5-V = a battery with only 50% of original capacity. For 24-Volt batteries – minimum voltage = 25.0. (wet cell SG = 1265 [2 balls in a 4 ball type hydrometer]) Note: 25V = only 50% of its original capacity.

Step 3

If your battery qualifies as a candidate, continue to leave battery connected to your BatteryMINDER for a minimum of 72 hours.

Step 4

Disconnect and retest battery voltage and SG. You

(OVER)

should measure an increase in the voltage and SG, indicating desulfation is taking place, i.e. The sulfuric acid that was in the sulfate crystals has now returned to the electrolyte where it came from originally.

Leave your battery connected to BatteryMINDer for an additional 72 hours minimum and test again. Continue this testing until you no longer measure any improvement (increase) in the battery's voltage (and SG, if wet cell).

Note: increases in battery voltage and a wet battery's electrolyte specific gravity, will be very small and depends on how sulfated the battery was, and how long has the sulfate been deposited on the storage plates.

Conclusion: De-sulfation, via variable high frequency pulses, works at removing sulfate from any type sealed or wet cell lead-acid battery*. By doing so, otherwise healthy batteries, those who have lost no more than 25% of their power**, can be Battery sulfation: prevention and repair expected to improve to an 85% or greater level of performance. As with our own bodies, prevention beats rehab, every time. With BatteryMINDER's ability to fully charge, without ever overcharging, no matter how long left connected, there is no reason sulfation should ever become an issue. Further, without sulfation ever reaching damaging levels, life and performance can be expected to be several folds better than any battery left to self-discharge, as is typical of so many GA

batteries. The proper use of the BatteryMINDER ensures the longest performance life of any GA battery (sealed or wet cell lead-acid). Our unconditional guarantee and five year full parts and labor warranty should tell most that we "walk the walk".

* Includes AGM and PLT (pure lead tin) such as those made by Odyssey and Gill Teledyne.

** As determined by electrolyte specific gravity (wet -flooded types) and/or no load battery voltage (sealed AGM or PLT) after "resting" battery for 10-12 hours.

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