

7+Years of great service from marine batteries? Here is how to get it!

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Get to talking with an boater for more than 10 minutes and you'll hear all about his battery problems.

Whether it is a \$50 battery or a \$120 so called "maintenance-free sealed" battery, getting more than 2-3 years of good reliable life seems to be a near Impossibility. This appears **more true the less you use your watercraft.** Why does this happen? Why should using a battery less not give it more life?

Batteries that are not kept fully charged or are over charged, develop a high resistance coating on their charge plates call "sulphation". It also forms during normal charging – discharging of the battery, although at much slower rates. This coating prevents the battery from accepting a full charge, no matter how long you keep it on charge. It also causes the battery to use water, a.k.a. "boil out". Lastly, the battery is no longer capable of delivering its rated capacity. **It is as if the battery has physically shrunk.**

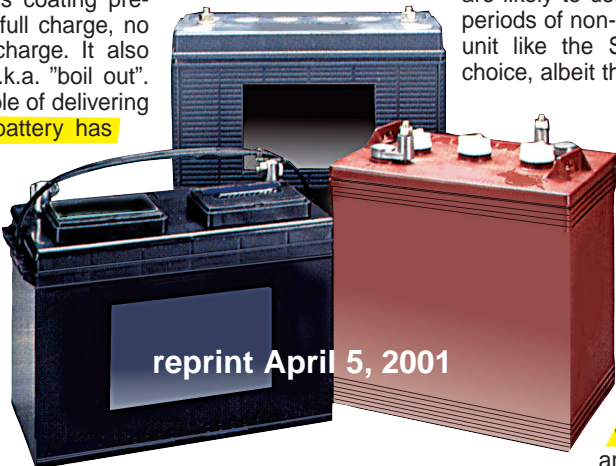
According to the BCI (Battery Council International) 85% of the nearly 75 million new lead acid batteries sold each year in the U.S., will die before the end of their design life, due to sulphation. It is by far the #1 cause of early battery failure Can anything be done to prevent this from happening? Can it be reversed, when it does occur? The answers are YES and YES.

Several U.S. and a Canadian manufacturer have introduced "de-sulphators", a.k.a. "conditioners", devices that are designed to reverse sulfate build-up. Some have combined them with charger-maintainer that provide a regulated "float" – maintenance charge, allowing batteries to be left on charge for months at a time, without the fear of overcharge.

Among the three (3) manufacturers we are aware of (SolarTech, Winnipeg Canada, PulseTech, Irving, TX and VDC Electronics, Inc., Englewood NJ), each has its own special features, the importance of which depends on your situation. All use high frequency electronically generated pulses to cause the sulphate crystals to resonate

(unbind) and return the sulfuric acid to the electrolyte, raising the electrolyte reading and cleaning the charge plates. **None of the sulphate or active charge plate material falls to the bottom of the cell as in the case of the long used "battery cell equalization" method.** They can all be used on all lead acid batteries, including deep cycle, starter, sealed, gelled, AGM, maintenance free types, as well as 6-v golf type in series. However, only VDC's BatteryMINDER combines charging, monitoring and conditioning all in one unit.

If your boat is normally docked in an area where electricity is readily available, your best and least expensive choice would be an AC plug-in type unit such as the Pulse Tech, or VDC Electronics units. If you are likely to use your boat year-round with only occasional periods of non-use (several weeks Max.), then an on-board unit like the SolarTech CAN-Pulse might be your best choice, albeit the most expensive.



Regardless of your choice, these devices do work, when used as directed by the manufacturer. They are truly capable of maximizing your battery's life and performance. For less than \$60 (in the case of the VDC's BatteryMINDER) you can extend the life of any type battery (12-v (or series connected 6-v) by over 40% with nearly all their original capacity.

Reducing charge time, saving wear and tear on your alternator and belt system, **while saving fuel by lowering alternator load** are additional benefits you can expect when your batteries are free of sulphate.

For more information visit these companies Web sites:

- www.vdcelectronics.com
VDC Electronics, Inc., Englewood, NJ
tel: 800 379-5579 (ET) Tech. support #206
- www.solartech.com.ca
SolarTech Co., Ltd., Winnipeg, Canada
tel: 204 885-4652
- www.pulsetech.com
Pulse Tech Corporation, Irving, TX
tel: 800 580-7554

Scientific basis for de-sulphation process / circuitry



Every element known to man has a magnetic moment at a resonant frequency ie, a point at which the chemical bonds that hold the molecules together to form a crystal can be broken. Sulphation, the number one cause of early battery failure, is simply crystals of lead sulphate (PbSO4) which have formed on the lead storage plates in a lead-acid type battery.

When a battery is improperly charged (over/under) or allowed to self discharge as occurs during storage/non-use, these crystals build up on the battery's storage plates preventing the battery from ever being fully charged and therefore able to deliver their full power/capacity.



Above: 588X enlargements of a battery's lead plate.
(L to R) 1. New battery-note absence of sulphate crystals.
2. After six months of misuse.
3. After three months of using BatteryMINDER.

VDC Electronics, Inc. has created a simple method of generating the required resonant frequency (3.26 megahertz pulse) to breakdown the lead sulphate crystals, allowing the molecules to return to the battery's electrolyte. By creating a wave form with the required 3.26 MHz frequency, coupled with a very fast rise time and a high amplitude pulse, more energy is developed to breakdown sulphation than by any other method believed to exist. This unique approach has now been granted a U.S. Patent on February 6, 2001.

Note: Not every battery is a candidate for re-conditioning due to mechanical damage, due to vibration or contamination, which has caused its cells to be "shorted". If however a 12 volt battery has a resting voltage of at least 10.5V and none of the 6 cells are shorted, de-sulphation of its plates can be accomplished.