

## **Understanding Batteries and the BLS**

The Battery Life Saver electronic device will extend the life of any lead-acid battery and can rejuvenate old “dead” batteries to a like new condition. But how does it work? To understand the technology behind the BLS, we must first understand how a battery works.

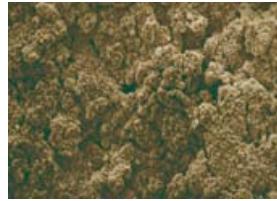
### **How a Battery Works**

In a normal battery we have three basic elements: one plate made of lead, an electrolyte of sulfuric acid and another plate made of lead oxide. When the battery is discharged, the sulfuric acid in the electrolyte reacts with the lead and lead oxide releasing electricity, forming lead sulfate. This leaves a watery electrolyte solution. When a battery is completely discharged, what is left is lead sulfate and water. When you recharge the battery, the electrical current causes the lead sulfate to break apart, returning the system to the original elements of lead and lead oxide on the plates and sulfuric acid in the electrolyte, *for the most part*.

### **What's the problem? Why do batteries fail?**

When the battery is recharged, a small amount of lead sulfate maintains its sulfate configuration (sulfate crystal).

**Lead Plate with No Sulfate Build Up**



**Lead Plate with Sulfate Build Up**



These sulfates crystals cannot be reconverted using a regular electric current. Every time the battery is discharged then charged, more of these crystals are produced and the electrolyte solution becomes more watery. Like layers of snow on a garden, the crystals will continue to accumulate until you can no longer see the garden. These crystals interfere with the flow of electricity in and out of the battery. The battery will take longer to charge and a charge will last less time. A perfectly good battery will seem dead because lead sulfate has built up on the plates.

### **The BLS is the Solution**

The BLS solves this problem by dissolving the buildup of lead sulfate crystals. The BLS sends a wave<sup>2</sup> through the battery or battery bank, targeting the lead sulfate crystals (even those that could not be dissolved by recharging), converting them back into lead and sulfuric acid. Each crystal is like a tiny radio receiver. In fact, when the radio was invented, a lead sulfate crystal was used for the receiver. The BLS action gradually restores the battery back to its original condition and allows the electrical charge to be drawn from the battery.

### **Other Desulfators**

Electronic and chemical desulfators have been on the market for years. How is the BLS different? The biggest difference is the BLS’s ability to target the whole range of sulfates that accumulate on the lead plates. As discussed above, regular electric current does not have the ability to do this. Electronic desulfators (commonly known as pulsers) send a high amount of voltage for a short period of time throughout the battery to knock down the crystals (similar to overcharging). They are unable to dissolve all the different types of sulfates. You can get some initial improvement but the continued use of the other desulfators that knock down crystals cause two negative effects on the battery:

- 1.) If you continue to use the pulser, the crystals will continue to accumulate at the bottom of the battery which can eventually cause a short cell.
- 2.) The plates will become thinner and the sulfuric acid will become weaker because any lead sulfate that falls to the bottom of the battery cannot be recovered.

The Battery Life Saver electronic device dissolves the lead sulfate crystals that are covering the plates, converting them back into the original elements. It rejuvenates the sulfuric acid solution as well as the lead plates.