

A Very Expensive Lesson In Batteries 101

A Lament in Three Chapters originally published in the *Western Road Runner*, October 2005 and updated December 2006.

The person that coined the phrase, "Lack of experience leads to bad judgment - bad judgment leads to experience," must have been looking over my shoulder during my all too many encounters with the batteries in my Chinook! After having spent nearly a thousand dollars prematurely replacing *all* of the batteries in my coach, I feel compelled to write of my experience so that, hopefully, others will not have to "experience" what we have gone through.

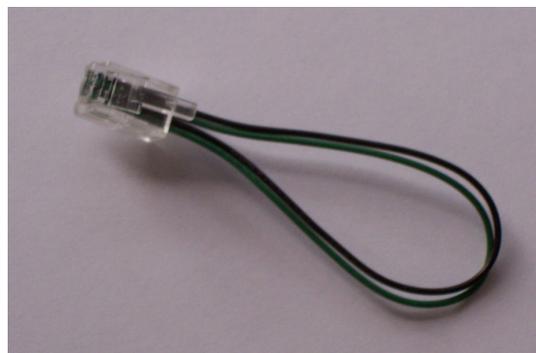
There are two important rules that all RV owners should understand and obey at all times, lest they unnecessarily contribute to the profits of the battery suppliers. The first rule is, "**Do not ever overheat (let alone boil) your batteries – a sure sign that you are overcharging them.**" The second rule is **never repeatedly discharge your chassis (engine) battery (as in running it down to the point where you have to "jump start" your engine.)**

Chapter One

In "Chapter One", I would like to share how we learned the lesson of Rule One the hard way. Our soap opera goes back to a day when our coach was only two months old, and I pulled the coach ("house") battery racks out to check on the level of electrolyte in our four, six-volt Interstate U2400 "house batteries". The "experience" that followed included making two separate trips to the grocery store to purchase distilled water, then between the four batteries pouring in two gallons to bring the levels of electrolyte in each cell up to the proper level! Anyone with even the skimpiest knowledge of batteries will tell you that under proper conditions, we should never have had to add this much water. As time went by and I periodically checked on our house batteries, I noticed that whenever we were plugged into shore power one battery in particular would be hot – way too hot to touch. In fact I remember listening to that battery actually boil on several occasions, when we were plugged into shore power. But wow, I thought, those house batteries sure would recharge in a hurry when we did plug in!

As our coach passed its second birthday, the endurance (ability to maintain voltage - charge) of the house batteries diminished noticeably. During this period I had been asking everyone whom I thought should be an "expert" on batteries, whether it was all right to boil them. Well, you guessed it, by the time I found out that **it is very bad to boil batteries** (it is probably the single best way to permanently and irretrievably damage them) I had ruined one of ours for sure, and another was on its way to total destruction. Another thing I learned that makes all of this experience even more painful is that when one or more batteries in a battery bank go bad, it is best to replace *all* of the batteries in the bank. When you only replace the one or two that are bad, the remaining weak battery(ies) just serve to bring down the new replacements that much faster.

Finally, this summer, as I was trying to figure out why our batteries were boiling, my diagnosis took me to the charger, which, in our particular coach is an Iota brand unit mounted on the driver's side wall behind the back of the tall wardrobe closet. To reach it, you have to remove the bottom panel (floor) of this closet followed by the back panel. When I finally "uncovered" the charger I discovered the short jumper wire on a modular jack shown in this picture, plugged into the charger.



The label on the front of the charger, immediately below the socket for this jumper, reads as follows, "Insert Plug to Quick Charge @ 14.2 V. To avoid battery damage remove plug after Quick Charge is complete." You can clearly see it in the photo below.



Needless to say, because of its inaccessible location and the fact that there was no information about it in our Owner's Manual, no one had ever removed it! No wonder we had boiled our batteries! I immediately removed the jumper plug, and we are happy to report that we have not boiled a battery since, and the water levels in the world's oceans has stopped going down since we are no longer consuming so much distilled water.

Of course, it was too late to save our original coach batteries, so on our way south to the Annual Rally just before Labor Day 2005, we stopped in at the Interstate Battery dealer in Portland and "ponyed up" for four new house batteries.

The most important item(s) that I picked up at the Interstate Battery dealer, however, were twenty-five copies of the very informative Interstate Battery publication, "*Marine/RV Battery Maintenance*". This well written eighteen page pamphlet contains a wealth of information about the various batteries commonly used in Marine and RV applications. **I strongly recommend that you go by your local Interstate Battery dealer and pick up a copy.** If you can't find a copy nearby, you can call "800-Crank-it" and request a copy be sent to you in the mail, or you can e-mail their Customer Service department, CustomerService@InterstateBatteries.com and I know they'll be more than happy to mail you one. Just tell them I sent you. I should have bought their stock before I had to replace my house batteries.

In our case, the pamphlet clearly explained that we had been overcharging our batteries; the reason that lead to their costly, premature demise. As you can see, removing the jumper plug from our Iota charger dropped the charging voltage from 14.2 volts to 13.4 volts, enough to bring it within the proper range to charge the batteries completely in 8 to 12 hours as the pamphlet recommends.

Chapter Two is sub-titled “Cool Tools for your Coach”.

In the photo to the right we have shown what we believe to be a most clever invention, especially for those installations where the batteries are not conveniently accessible for checking and refilling the electrolyte.

It is called a “ProFill” system, and we got ours at Camping World (this should not be construed as a specific endorsement of Camping World, but they are a handy source for this equipment and every RV’er knows the location of their closest store). They aren’t cheap, but they really do save a lot of aggravation, and if they enable you to maintain your own batteries without having to pay a mechanic to do it for you, then they will pay for themselves in short order.

Squeezing the rubber bulb pumps distilled water from the jug into the molded plastic distribution “bars” on the tops of the cells. Each hollow plastic bar connects to three screw-in cell caps. Each cell cap is equipped with an internal float valve that stops the flow of water into its cell when the level of electrolyte reaches the proper height. And all of this is accomplished without the need for a flashlight, mirror, back brace or kneepads!



In asking around, we have found that many savvy owners, not only of motor coaches, but of all sorts of other equipment that depends upon wet cell batteries for power, use this clever system to maintain the proper level of electrolyte in their batteries.

Chapter Three – The “Other” Battery Under The Hood; The Chassis Battery

Finally, in Chapter Three we want to discuss care of your coach chassis battery (the one that starts your engine and lights your headlights and dash lights, among other things). We have been operating on a second chassis battery for almost a year now, again a premature replacement caused by mistreatment of the original battery.

If you consult the “*Marine/RV Battery Maintenance*” pamphlet that we referred to earlier in this article, in the back pages they talk about Engine Starting Batteries, as differentiated from Deep Cycle Batteries such as those used for house batteries. The main difference between the two is that the Starting Battery is designed to provide the high current (lots of power) necessary for starting an engine for a very short time while a Deep Cycle Battery is designed (as the name implies) to provide a much smaller amount of current over a much longer period of time while it is also capable of being discharged to a much lower percent of its capacity. This is where we refer you back to the second paragraph of this article and Rule Two, **never repeatedly discharge your chassis battery (as in running it down to the point where you have to “jump start” your engine.)** This is often referred to as a deep discharge, and starting batteries are not made to withstand very many of these “cycles” before they just give out, never to be revived again.

When our coach was about a year old, we began to have intermittent trouble starting our engine. Fortunately, each time the chassis battery appeared to be discharged, we were able to use the “Jump Switch” in our Coach to “hook up” the house batteries to the engine starter and get it started that way. It wasn’t until after many of these incidents that we finally discovered why the chassis battery wasn’t getting charged by the alternator on the engine.

The reason that the chassis battery wasn’t getting a charge was because the cable clamp on the positive terminal of the chassis battery was slightly (but definitely not noticeably) loose, and enough corrosion had built up between the clamp and the positive terminal post to “insulate” the connection and prevent current flow into the battery. The clamps on the chassis battery terminals in our coach are Ford OEM clamps. They are stamped out of sheet metal, and as such they distort easily. When Chinook built our coach, they loosened the setscrew on the positive cable clamp and inserted a secondary lead that goes to the Battery Isolator (the “Smart Switch”). In tightening the clamp when they reinstalled it, it distorted and failed to make a solid connection. The photo below shows this clamp with the secondary positive cable attached.



Because we were totally unaware that this connection was not tight, the chassis battery was discharged completely and repeatedly, quickly leading to its expensive demise.

Finale

In conclusion, we offer this advice so that you might avoid errors in judgment that lead to expensive “experience:”

- Get a copy of the *Marine/RV Battery Maintenance* pamphlet from your nearest Interstate Battery dealer, if you don't already have one. Then read it and take its advice to heart.
- Know your batteries, their different characteristics and their different needs.
- Check their (all of them) condition often, both while *on* shore power and *off*.
- Check and maintain the electrolyte levels in those batteries which are not “maintenance free” (what a misnomer, anyway).
- Check the integrity of all cable connections, especially those that utilize clamps and setscrews. Included in these periodic checks should be all of your chassis grounds. Often these are located in exposed areas of the vehicle chassis where mud, snow and road salt can corrode parts and fasteners can shake loose.
- And, finally, we hope that this information will help you to enjoy your Chinook experience.