Ample Power Company

Frequently Asked Questions

Bulk Charge:

My alternator regulator no longer goes through the bulk charge cycle and goes right to the absorption setpoint. Does it need to be serviced?

Bill, all Ample Power Regulators are run with microcomputers. If the microcomputer is operating at all, it will almost certainly be going through all of the charge cycles. A memory failure that would skip one of the cycles and still allow the microcomputer to operate is a very unlikely, if not impossible circumstance.

You probably don't see the bulk charge indicator because the battery voltage is rising very quickly to the absorption voltage. This will happen if the batteries are already full, or don't accept a charge because of sulfation or other failure. The bulk charge cycle is that period of time between the onset of charge and reaching the absorption voltage. How long that takes depends on the size of the alternator, and the acceptance rate of the batteries.

Other than full-fielding the regulator during the bulk time period, the regulator has nothing else to do but sit and watch for battery voltage to reach the absorption setpoint. At that time, current will start to decline through the batteries because the regulator controls the field to maintain the absorption voltage.

Battery Replacement:

I bought 12 Prevailer 8 D Gel Cel batteries from you in 1991 (as well as inverters and your Power Management System as they existed at that time) and the batteries were installed on my boat. At times, I think that they do not have the full power that they once had, but at other times I think it's because I have gradually added equipment to the boat over the years which creates greater drain. –Carl–

Carl, we're hearing from many customers from the past who are wondering just how long their batteries will last. You probably are down on capacity, but it may not be due to age. Gel batteries need to be deep cycled a few times a year, so unless you purposefully don't charge them while you're away from the dock, then you should do the break–in procedure that is described in the Ample Power Primer.

See this page for more information.

Fusing:

Why do your drawings show a main battery fuse on the negative lead? I thought you were supposed to fuse on the positive wire.

Fred, a great amount of thought has gone into the proper location for a main battery fuse. We wish to achieve safety with a minimum cost, which fusing on the negative side of a battery permits. If someone were to give you a sealed box with a battery and a fuse inside it, you would not be able to determine which side of the battery was fused by any kind of electrical measurement. That being a fact, why not put the fuse where it will be most economical? If you put the fuse on the negative side, it will not need to be insulated. Even if you do drop a wrench on the fuse, shorting it to your metal hull, no electrical damage will result.

A fuse on the positive side must be enclosed inside an insulator of some sort, which adds unnecessary cost to the system. Should you fuse on the positive side? If you need Coast Guard certification, then you will have to put the fuse in the positive lead of the battery.

Please don't ask us to explain Coast Guard regulations.

Your wiring diagrams show fuses to instruments and regulators in the positive leads. Isn't this contrary to fusing the battery in the negative lead?

Fuses are always used to protect wiring from excessive current flow which may cause fire or other damage. As such, fuses should always be placed as close to the energy source as possible. Since most loads share a common negative distribution connection, fuses are not practical in the negative leads of loads.

Any wire leaving the positve battery terminal, which is not of sufficient gauge to be protected by the main battery fuse, should be separately fused as appropriate for the current capacity of the wire being protected.

Where there are several fused wires indicated in a drawing, each with a fuse, it is usually permissable to share a common fuse of adequate size to carry the expected load curerent and still protect wiring. Shared fuses are not a good idea for wires which serve as voltage sensing for instruments. The voltage drop through the fuse may cause erroneous readings.

Energy Monitor Controllers, H1 versus H1A:

What is the difference between the H1 and H1A models?

Both have an auxiliary channel, however, the signal range of the channel is differeent. The H1 accepts a 0-50mV signal from a shunt that must be placed in the negative lead of the charge source, such as solar panels, wind generators, or alternators with an isolated negative lead. The H1 displays the 0-50 mV as 0-200 Amps.

The H1A accepts an auxiliary input signal of 0-2V, which is displayed as 0-200 Amps. The Alternator Current Sensor is designed to provide a 0-2V signal from a shunt that is placed in the positive lead of a charge source. Obviously, it is most economical to measure current in the negative lead, so even if you want to measure alterntor current it may be best to purchase an alternator with insultated negative outputs. All of Ample Power large frame units have insulated negative outputs, while all small frame alternators can be ordered with insulated grounds.

Nickel-XX Battery Banks:

Would nickel-iron or nickel-cadmium batteries be a good choice?

Nickel-XX batteries have a reputation for being indestructable, and assuming that initial cost isn't a major consideration, why wouldn't we want to use them for the house bank? And why aren't there more manufacturers providing chargers and inverters that run off the typical voltages of nickel-XX batteries?

In space limited applications, energy density is lower than lead–acid batteries, although higher rates or charge/discharge are tolerated so if you are willing to charge more frequently, then a nickel-XX battery could be used in the same space/weight that a lead-acid bank.

Even if you have plenty of room for a nickel-XX battery bank, you'll still probably have to charge more frequently because charge retention after charging is less - - in the case of nickel-iron, much less.

Perhaps the most significant reason that a nickel–XX bank is not suitable for small energy systems, is the re-charge watt-hour efficiency. If you're charging from an engine/alternator, you may not be as concerned about watt-hour efficiency, but if your prime power is from solar or wind, then you probably don't want to sacrifice charge efficiency.

Watt-hour efficiency should not be confised with Amp-hour efficiency. Watt-hour for a lead-acid battery is in the range of 75-80% versus 55-60% for a nickel-XX battery. That means you'll be able to discharge 75-80% of the energy that has gone into the lead-acid battery as a recharge, but only 55-60% from a nickel-XX battery. If you factor in loss of charge for the nickel–XX battery, then you'll probably decide that the long range cost of energy isn't worth the initial cost, even with the greater expected cycle life.

While we've lumped all nickel based batteries together because they are similiar, be advised that there are some differences. The vented pocket plate nickel-cadmium is the lowest cost variety, has good charge retention and is rugged. Watt-hour charge efficiency, however, is in the 55-60% range.