Batteries for Commercial Vehicle Systems Selecting and Understanding

When selecting a battery for your application it is easy to get confused by the many acronyms and terms that are associated with battery specifications. The goal of this article is to familiarize yourself with these terms, and to better understand the true function of a battery, and what type best fits your needs.

Many factors affect what type of battery you will need for your specific application. There are two ways that batteries can be divided, how they are constructed and the application they are used for. Applications include automotive, marine, and deep cycle. Construction types include flooded (wet), Gelled, and AGM (Absorbic Glass Mat).

Starting batteries are usually labeled or called an SLI battery (Starting, Lighting, Ignition). These are usually constructed in the normal flooded (wet) style, sometimes called “Maintenance Free” These types of batteries are used to start the engine, because they require a lot of current for a short period of time. Starting batteries use a large number of thin plates for more surface area. The plates are made of a lead “sponge”, because there are so many of these tiny lead spongy plates it creates a huge amount of surface area, but when deeply discharged these smaller thin plates will become exhausted and will fail. As few as 30 deep cycles will cause a SLI battery to fail, but if used properly to start the engine they can last for thousands and thousands of cycles.

Deep cycle batteries are designed differently than starting batteries. They use a much thicker lead plate and these lead plates are solid rather than sponge. They can be discharges repeatedly up to 80%.

Marine batteries are categorized between a SLI type and a deep cycle type, they are not a true deep cycle battery because they are designed only to discharge to 50% capacity continually compared to a ‘true’ deep cycle which can go to 80% discharge and still remain viable. Golf cart batteries also fall between a deep cycle and a marine type battery. They are not a deep cycle battery but they can cycle deeper than a marine battery, but not as deep as a “true” deep cycle.

Flooded Batteries are the most common battery on the market. They contain usually 6 cells (at 2 volts per cell) with the lead plates suspended in wet acid, these batteries will sometimes need water added to keep the electrolyte level up. If you leave a flooded battery in a discharged condition it will cause permanent damage.

Gel Batteries are simply designed with instead of having the lead plates suspended in a wet solution they add a gel mixture that will jelly the electrolyte solution. This will enable a gel cell battery to not leak even if broken. It is crucial when using gel cell batteries that you closely monitor any charge you give it, you cannot charge a gel cell at a rapid rate or it will create ‘bubbles’ or ‘gaps’ in the gel that will never heal up again therefore decreasing the batteries effectiveness.

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AGM (Absorbic Glass Mat) batteries contain acid suspended in a unique glass mat separator. The advantages of this are they have a higher charge acceptance rate, and they do not leak even if broken, because of the very fine fiber Boron-Silicate glass mat plates being only 95% saturated compared to fully soaked. The electrolyte acid is contained in the glass mats themselves, and it holds another advantage in extreme cold weather because they cannot freeze. Another additional feature of AGM batteries is that they can be stored or sit on a shelf. With a standard flooded battery it is best to use the battery when you buy it, otherwise you will have to keep it on a trickle charge or risk it slowly losing its optimum capacity. With an AGM style battery you can let it sit for long periods of time and when you need it simply charge it to full capacity and it's ready to be used.

The reason plate thickness is so crucial in why a battery fails is that the positive plate slowly gets eaten away and deposited as sediment at the bottom of the cell. When finally the plates have all been exhausted the battery will fail. This is the difference between a standard SLI battery and a "true" deep cycle battery, which is why your starting battery is not designed to be drained over and over again.

It is important to remember when testing the voltage on your battery that you first remove the surface charge from the battery, in order to get the true voltage of the battery. If you do not do this you will get false readings and more than likely your tester will be seeing a battery that is 'ok'. In order to do this simply turn on your headlights for 2-3 minutes per battery, then shut off the lights, and then take the voltage reading. The reason you get a false reading when you have surface charge is, the battery plates are damaged, sulfated and are missing and they will give the appearance of being fully charged, but in reality they are just acting like a smaller battery and giving your voltmeter a incorrect reading due to the surface area being fully covered.

It is very important when buying a battery to know what the commonly used acronyms mean. Some acronyms are designed to make a battery look better or comparable to a standard labeled battery, therefore it is crucial to familiarize yourself with the terminology.

AH (Ampere-Hours) tells how much power a battery will store. The current multiplied by time in hours (Current x Hours) gives you the Ampere-Hours (AH). So a current of 1 (one) amp for 1 (one) hour would be 1 (one) AH.

Batteries that are utilized for starting engines like SLI (Starting Lighting and Ignition) batteries are not rated in AH but rather in the CCA (cold-cranking amps) due to the fact that they are designed only for use in starting the engine, once the engine has started they should not be used. Having a rating in CCA in colder temperatures is the standardized labeling; the reasoning is that CCA is how many amps a battery will put out for 30 seconds at 0 (zero) degrees F. before the voltage drops below 1.2 volts per cell. Also these batteries might contain statements such as 5 hour rate or 15 hour rate, this means that the battery will discharge perpetually over 5 or 15 hours, and the AH

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capacity is a measurement of how much it puts out before reaching 100% DOD (depth of discharge). The DOD is how much of the available charge is used compared to 100% (or 1.75 volts per cell, or 7.2 volts for 12 volt batteries).

The RC (reserve-capacity) is generally used on deep cycle batteries. The RC is the number of minutes a battery can manage a useful voltage (1.75 volts per cell). When using a system with heavy load requirements the Reserve Capacity (RC) is a more useful measurement. AH equals RCx.60 (minutes vs. hours).

MCA (marine cranking amps) and CA (cranking amps) are basically the same things. It is also a measurement similar to CCA (cold cranking amps) except it is the measurement of how many amps a battery will put out for 30 seconds at 32 degrees F, before the voltage drops below 1.2 volts per cell. If you are in an area that has some cold weather or you drive truck in an area with cold weather it is much more important to look for the CCA rating instead of the CA or MCA rating.

This information is intended to help you understand how a battery works and some of the different types of batteries on the market, so as to help you better understand your vehicle’s electrical system, it is not intended to “support” one manufacturer over another.

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