Battery Basics and Proper Battery Storage

A battery is an electrical power storage device.

If you have a battery that won't be used for a while, it is important to take care of the battery when it is not being used. Here are some basics of getting the most out of your battery……..
We will use a 12 volt battery as an example.

A battery measuring voltage at 12.6 volts and a hydrometer -specific gravity sg-reading of 1.265 at 80 degrees F. in each cell, is fully charged. The reading in each cell, if battery caps are removable, should be consistent with each other. If there is a difference of over 50 points in any one or more cells (1.75 sg down to 1.25 sg), this indicates a bad cell. All cells need to work together equally for best battery performance. If the specific gravity reading is low in all cells, charge the battery before faulting it. The best charge rate for any battery is 10% of its Ampre Hour rating. Since ratings are not often listed in ampre hours, in general, most car batteries are about 80 to 100 ampre hours. Therefore, charge a discharged 100 ampre hour battery at 10 amps for 10 hours. Just a couple of hours on a charge does not penetrate the depth of each plate and won't provide longer cranking when needed.

Fast rate charging (over 20 amps) to a battery, destroys plating paste grid material, and will shorten its life. Charging a battery at a very low rate, say at 2 amps, will take five times longer than at the preferred 10 amp rate.

Temperature affects a battery. A fully charged battery at 70 degrees F, will lose 25 % of its charge in three months. At 90 degrees F, it will lose 25% of its charge in one month. At 32 degrees F, it will lose 25 % of its charge in six months. Hence, a battery has a shelf life of about one year before it is termed “dead”. As a battery sits, it also “sulfates”. Sulfation is a shellack coating which seals the needed porous plate grids and creates the internal destruction of the plates so there won't be the power when you need it.

Hydrometer readings and charge rates are also affected by temperature. It takes longer time to charge a cold battery than a warm battery. It may add hours to the time you need to fully charge the battery. Checking the cells with a hydrometer when the acid is cold must also be adjusted to get an accurate reading.

As a battery discharges, the battery acid, H_2SO_4, becomes water, H_2O. As the battery is charged, the water is forced through the plates and picks up the sulfides left behind, and becomes battery acid again, which holds the charge to provide the power when you need it. Battery acid has a freezing point of about 60 degrees F BELOW zero. Therefore, it is important to keep any battery fully charged during the winter months, as freezing temperatures can affect a discharged battery (with water in it, not acid) and freezing can damage the plates or even crack the case.

If you store your vehicle longer than three months, most car manufactures recommend disconnecting the negative cable to prevent faster discharge than normal, considering the electronics that continually draw down a battery on today's cars. It is recommended to charge a stored battery about once a month, for about 10 hours at a rate between 6 and 10 amps. Starting a stored car during the winter does more harm than good in keeping the battery up---the starter draws more than the alternator can put back into the battery in that short time, plus, in cold weather, the battery may not even accept a charge in that short time, and you are only aiding in the further discharge of the battery.

Once a battery is known to be fully charged, a battery tender can be used to maintain the battery. A tender will turn on and turn off as needed. Attempting to charge a discharge battery using a battery tender will harm the transformer in the tender.