



Innovative Workflow Solutions

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## Goliath Carts, LLC Battery Safety Guide

**Battery Safety:** We must think *safety* when we are working around and with batteries. Remove all jewelry. After all you don't want to melt your watchband while you are wearing the watch. The hydrogen gas that batteries make when charging is very explosive. We have seen several instances of batteries blowing up and drenching everything in sulfuric acid. That is no fun, and would have been a good time to use those safety goggles that are hanging on the wall. Heck, just break out your disco outfit. Polyester is not affected by Sulfuric Acid, but anything with cotton will be eaten up. If you do not feel the need to make a fashion statement - just wear junk clothes, after all Polyester is still out of style. When doing electrical work on vehicles it is best to disconnect the ground cable. Just remember you are messing with corrosive acid, explosive gases and 100's amps of electrical current.

**Battery Maintenance** is an important issue. The battery should be cleaned using a baking soda and water solution; a couple of table spoons to a pint of water. Cable connections need to be cleaned and tightened as battery problems are often caused by dirty and loose connections. A serviceable battery needs to have the fluid level checked. Use only mineral free water, Distilled is best as all impurities have been removed, and there is nothing left that could contaminate your cells. Don't overfill battery cells especially in warmer weather because the natural fluid expansion in hot weather can push excess electrolytes from the battery. To **prevent corrosion** of cables on top post batteries use a small bead of silicone sealer at the base of the post and place a felt battery washer over it. Coat the washer with high temperature grease or petroleum jelly (Vaseline), then place cable on the post and tighten. Coat the exposed cable end with the grease. Most folks don't know that just the gases from the battery condensing on metal parts cause most corrosion.

**Battery Charging** - Remember you must put back the energy you use immediately. If you don't the battery sulfates and that affects performance and longevity. The alternator is a battery charger. It works well if the battery is not deeply discharged. The alternator tends to overcharge batteries that are very low and the overcharge can damage batteries. In fact an engine starting battery on average has only about 10 deep cycles available when recharged by an alternator. Batteries like to be charged in a certain way, especially when they have been deeply discharged. This type of charging is called 3 step regulated charging. Please note that only special **SMART CHARGERS** using computer technology can perform 3 step charging techniques. You don't find these types of chargers in parts stores and Wal-Marts. The first step is **bulk charging** where up to 80% of the battery energy capacity is replaced by the charger at the maximum voltage and current amp rating of the charger. When the battery voltage reaches 14.4 volts this begins the **absorption charge** step. This is where the voltage is held at a constant 14.4 volts and the current (amps) declines until the battery is 98% charged. Next comes the **Float Step**. This is a regulated voltage of not more than 13.4 volts and usually less than 1 amp of current. This in time will bring the battery to 100% charged or close to it. The float charge will not boil or heat batteries but will maintain the batteries at 100% readiness and prevent cycling during long term inactivity. Some Gel Cell and AGM batteries may require special settings or chargers.



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### ***Battery Do's***

- Think Safety First.
- Do read entire tutorial
- Do regular inspection and maintenance especially in hot weather.
- Do recharge batteries immediately after discharge.
- Do buy the highest RC reserve capacity or AH amp hour battery that will fit your configuration.

### ***Battery Don'ts***

- Don't forget safety first.
  - Don't add new electrolyte (acid).
  - Don't use unregulated high output battery chargers to charge batteries.
  - Don't place your equipment and toys into storage without some type of device to keep the battery charged.
  - Don't disconnect battery cables while the engine is running (your battery acts as a filter).
  - Don't put off recharging batteries.
  - Don't add tap water as it may contain minerals that will contaminate the electrolyte.
  - Don't discharge a battery any deeper than you possibly have to.
  - Don't let a battery get hot to the touch and boil violently when charging.
  - Don't mix size and types of batteries.
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