

BATTERY TIPS & ALTERNATE CHARGE METHODS EXPLAINED

BATTERY TIPS

- 1) Recharge vehicle after each use.
- 2) Check water level monthly (applies to 'Flooded' water-based batteries only, NOT GEL-type). Check water levels more frequent in warmer climates. Do not fill higher than bottom of neck opening of battery cell.
- 3) Charge batteries before adding water unless plates are exposed and then add only enough water to cover plates. Once batteries are charged, add distilled water to bottom of neck opening.
- 4) Battery posts must be clean and cable connections tight. Clean posts with baking soda and water. Verify torque to cable connections (follow procedures in Service Manual).
- 5) When storing or parking vehicle for extended periods of time, two weeks or longer, it is strongly recommended that you first charge vehicle to 100%, then turn the "Master Disconnect Switch" (MDS), located under the bench seat for 2004-older Model vehicles and inside Access Panel of lower dash for 2005-current Model vehicles, to the "OFF" position. Vehicles equipped with Delta-Q brand charger may leave the MDS "ON" as it will turn on automatically and recharge batteries, once every 7 days for flooded batteries and once every 14 days for GEL batteries, for 26 consecutive cycles as long as the AC line power is not interrupted.
- 6) "Self" discharge rate of a battery is about 1% per day, anywhere from 40-100mA, depending on model year vehicle. Battery charge should be refreshed about every 2-3 weeks.
- 7) The MDS must be in the "ON" position for charger to operate and charge batteries.
- 8) Do not charge a frozen battery. Charged batteries do not freeze.

GEM ON-BOARD CHARGER

The GEM on-board charger is a 12-amp, 72-volt charger. There is a safety feature built into the charger that will not allow it to come on if the batteries are overly discharged. This safety feature is activated when the charger detects that the combined voltage of all batteries is 68 volts or less.

ON-BOARD CHARGER WON'T COME ON

If the string voltage is below the 68-volt threshold and the on-board charger will not activate, it then becomes necessary to employ an alternate charging method.

ALTERNATE CHARGE METHOD

WARNING!

Always wear safety glasses or approved eye protection when servicing batteries. Battery gas is flammable and explosive. Charge batteries in well ventilated area. Keep flame or sparks away from the battery or any other booster source with an output greater than 12 volts. Do not allow battery fluid to contact eyes, skin or clothing. If acid splashes in eyes or on the skin, flush the area immediately with large amounts of water.

CAUTION!

Batteries can be permanently damaged (and the warranty voided) if they are allowed to sit for an extended period of time at very low charge. A fully charged GEM with the Master Disconnect Switch (MDS) on, and not in operation for two weeks or longer will self discharge to a point that the on-board charger will not operate. If the GEM is not going to be used within a two-week period it is recommended that you fully charge the vehicle and turn off the MDS. It is also recommended that after this period the vehicle be recharged again before use to optimize battery capacity for best vehicle performance. The information listed below will explain how to get the correct amount of voltage into the batteries so that the on-board charger will activate. There may be damage to the batteries due to the fact they had sat for extended periods of time at low voltage. Resulting in poor performance and loss of desired range. Patience and extensive charging may help to recover and recycle some batteries as long as the cells were not dry or have any internal shorted cells.

To ensure the alternate charging method is done correctly follow these steps:

1. Locate the Master Disconnect Switch, under the bench seat (2004-older) or inside the fuse access panel (2005-current), depending on model year GEM, and turn it to the off position.
2. You will need to obtain a standard 12-volt automotive type battery charger. Set the amps to medium (10 to 30-amp).
3. Hook the cable clamps from the off-board charger directly to the battery posts, black to black (negative) and red to red (positive), one battery at a time. It is **NOT** necessary to remove or unhook battery post/cable connections as long as the MDS is off.
4. Charge each battery 10 - 20 minutes each. This is only a residual charge that is being put into the battery and will dissipate in a short period of time. It may be necessary to charge upwards of 1-2 hours per battery if they are significantly discharged. One concern to keep in mind is that, as you get to and finish charging the last battery, the first couple of batteries charged will have had time to dissipate their residual charge. You may need to give the first two batteries a quick refresher charge. It may be necessary to repeat this step.

5. After charging the last battery, remove the 12-volt charger cables from the battery, and turn on the MDS. The batteries should be above the 68-volt minimum level and the built-in on-board charger should operate flawlessly.
6. Plug the extension cord into the vehicle and let the on-board charger engage and finish the charging cycle.
7. Depending on the state of charge of the batteries in the vehicle you may need to repeat Steps 1-6.

INTERNAL RESISTANCE & SULFATION

Lead acid batteries have changed very little in 70 years. From the initial application of the electrolyte, sulfation begins coating the lead plates causing internal resistance. Aging batteries lose overall performance and require increased maintenance (more water) and charging time. Sulfation will eventually choke out any electrical activity. Stored and inactive batteries accelerate the problem of sulfation, leading to REDUCED BATTERY LIFE.