

## **BATTERY TROUBLESHOOTING AND MAINTENANCE**

Harp's RV Service, harpsrv.com

183 Flocchini Circle, Lincoln, CA 95648 916.434.9151 / harpsrv@hotmail.com

### **Specific Gravity**

Measuring the specific gravity of the electrolyte generally checks the state of charge for a lead-acid cell. Specific gravity is a ratio comparing the weight of a substance with the weight of water. For instance, concentrated sulfuric acid is 1.835 times as heavy as water for the same volume. Therefore, its specific gravity is 1.835. The specific gravity of water is one, and therefore serves as a reference. In a fully charged cell, the mixture of sulfuric acid and water results in a specific gravity of 1.265 at room temperatures of 80°F (27°C). As the cell discharges, less acid is present and more water is formed, lowering the specific gravity. When the specific gravity is down to about 1.120, the cell is completely discharged.

### **Specific Gravity Readings**

Specific gravity readings are taken with a battery hydrometer, such as the one shown. When checking the specific gravity, hold the hydrometer vertically so the float is not rubbing against the side of the barrel. Draw an amount of electrolyte into the barrel so that with the bulb fully expanded, the float will be lifted free, not touching the side, top or bottom stopper of the barrel. Your eye should be on a level with the surface of the liquid in the hydrometer barrel. Disregard the curvature of the liquid where the surface rises against the float stem and the barrel due to surface tension. A hydrometer reading of 1.265 indicates a fully charged battery. A 75% charge is 1.225. Approximately 1.190 is half-charged, 25% is 1.155 and 1.120 indicates complete discharge. Each cell of the battery should be checked. The readings for each cell should be approximately the same. If a reading of one or more cells is substantially different, it would be an indication that the cell(s) is bad. Make sure the hydrometer is clean and does not have any cracks. Never take a hydrometer reading right after you have added water or immediately after a charge. You will get a false indication. You must let the electrolyte stabilize for about 20 minutes. Never add electrolyte to a battery after the initial service. The chemical balance will be off and the battery won't perform correctly. When adding water, distilled water should be used. Any mineral content could affect the chemical reaction and add to sulfation. The specific gravity will change as the temperature changes. You need to use a temperature compensated hydrometer to ensure accuracy.

## **DEEP CYCLE BATTERY MAINTENANCE**

### **SAFETY**

- Keep flames, sparks or metal objects away from batteries
- Always wear protective clothing, gloves and goggles when handling batteries
- Check that terminals are properly tightened; terminals that are too tight or too loose could result in post breakage, meltdown or fire

### **WATERING**

Add water, never acid, to cells (Distilled water recommended)

**DO NOT OVERWATER!**

If the batteries are fully charged add water to a level of 1/8" below bottom of fill well

If the batteries are discharged add water to a level just above the plates

## **INSPECTION & CLEANING**

Keep batteries clean and dry from residue

Check that all vent caps are tight

Use a solution of baking soda and water to clean if there is acid residue on batteries or corrosion on the terminals

Terminal protectors or protective spray should be applied to terminals to reduce corrosion

## **STORAGE**

Batteries should be fully charged prior to and during storage

Never store discharged batteries

Store batteries in a cool, dry place

Recharge batteries before putting them back into service