

The following information will help prevent the majority of issues that are known to cause premature failure. Follow these instructions frequently to get the most out of your investment!

For a quick list of important topics visit our [care and maintenance webpage](#).

3.1 INSPECTION

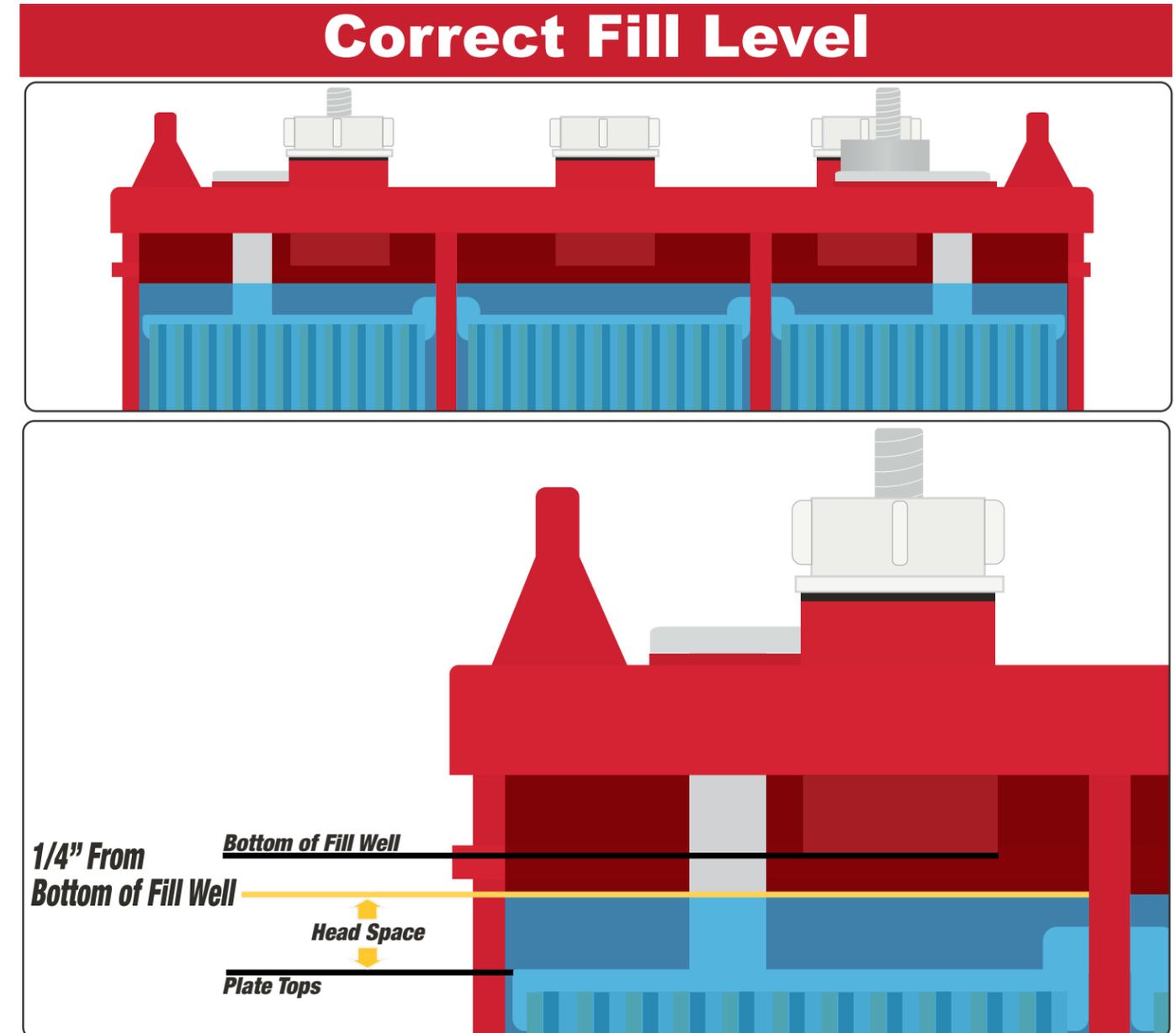
- **Check the outside of the battery.** The tops of the batteries and terminal connections should be clean, free of dirt and corrosion, and dry. Refer to Cleaning section 3.3.
- **If you notice any fluid** on the top of a deep-cycle flooded/wet battery, it may mean that the battery is being overfilled with water or overcharged. Refer to Watering section 3.2 for the proper watering procedure.
- **If fluid is on the top of a deep-cycle AGM battery** this means that the battery is being overcharged and the performance and life will be reduced.
- **Check battery cables and connections.** Replace any damaged cables. Tighten any loose connections. Refer to Torque Values section [2.1 Cable Size and Bolt Nut Specification](#) on page 6.

3.2 WATERING (FLOODED BATTERIES ONLY)

Never attempt to remove the caps on an AGM battery. Deep-cycle flooded/wet batteries need to be watered periodically. The frequency depends upon battery usage and operating temperatures. Check new batteries every few weeks to determine the watering frequency for your application. It is normal for batteries to need more watering as they age.

- **Fully charge the batteries** prior to adding water. **Water should be added if the plates are exposed regardless of the charge state.** If discharged batteries show exposed plates, add just enough water to cover the plates and then charge the batteries and continue with the watering after the full charge as indicated below.
- **Remove the vent caps and place them upside down** to prevent contamination on the underside of the caps and to prevent the acid on the caps from getting elsewhere. Check the electrolyte level.
- **If the electrolyte level is more than 1/4" below the bottom edge of the fill well tube** then add distilled or the approved water to a 1/4" (6 mm) below the bottom edge of the fill well tube as shown in the illustration below:

DIAGRAM 4



- **After adding water**, firmly install vent caps back on batteries. (See section [2.2 SpeedCaps™ and vent caps](#))
- **Tap water** may be used if the levels of impurities are within acceptable limits.

3.3 CLEANING

Observe the battery for cleanliness at regular intervals and keep terminals and connectors free of corrosion by using a wire brush as necessary. Terminal corrosion may adversely affect the performance of the battery, and could be a safety hazard.

- **Make sure that all vent caps are properly installed** on the battery. (Flooded Batteries only)
- **Clean the top of the battery, terminals and connections** with a cloth or brush and a solution of baking soda and water (1 cup of baking soda to 1 gallon of water/60ml of baking soda per liter of water). **Do not allow cleaning solution to get inside the battery.**
- **Rinse with water and dry** with a clean microfiber cloth.
- **Apply a thin coat** of terminal protector spray or terminal protection grease that can be purchased through your local battery dealer. Apply after installation of cables, not before. A coating between the terminal and the cable can cause resistance.
- **Keep the area around batteries clean and dry.**



4.1 BEFORE CHARGING

Proper charging is critical to maximize battery capacity and life. Both under- or over-charging batteries can significantly reduce the life of the battery. For proper charging, refer to the instructions that came with your equipment. Most chargers are automatic and pre-programmed. Some chargers allow the user to set the voltage and current values. Refer to [Table 4:](#) for charging guidelines and to US Battery's recommended deep-cycle flooded/wet charging guidelines ([Section 4.2.1](#)). Refer to the deep-cycle AGM charging guidelines ([Section 4.2.2](#)) and to [Diagram 6](#) for US Battery's recommended deep-cycle AGM charging guidelines.

- **Deep-cycle lead acid batteries should be charged** before their first use due to self-discharging.
- **Make sure the charger is set** to the appropriate program for deep-cycle flooded/wet or AGM depending on the type of battery you are charging.
- **Fully charge the batteries** at the first available opportunity after each use.
- Lead-acid batteries (deep-cycle flooded/wet, AGM or gel) do not have a memory effect and therefore do not need to be fully discharged before recharging.
- **Charge only in well-ventilated areas.**
- **Check electrolyte level** to make sure plates are covered with water before charging (deep-cycle flooded/wet batteries only). Refer to [3.2 Watering \(flooded batteries only\)](#).
- **Check that all vent caps are secured properly on the battery before charging.** It is dangerous and an explosion hazard to remove caps for (or while) charging.
- **Deep-cycle flooded/wet batteries will gas (bubble)** towards the end of charge to ensure the electrolyte is properly mixed.
- **Never charge a frozen battery.**
- **Avoid charging at temperatures above 120°F (49°C).**

4.2 CHARGING RECOMMENDATIONS

U.S. Battery Manufacturing Company, Inc. recommends the use of 'opportunity charging' or charging batteries and battery packs at every opportunity while in storage or service. Following this recommendation will assure that batteries are always at the highest possible State of Charge (SOC) to maximize performance and range and to minimize the battery's Depth of Discharge (DOD) to optimize performance and life. The charging process is intended to fulfill several objectives. First, the charging process should replace the capacity (in amp-hours) removed from the battery during previous discharges. Second, the charging process should return additional capacity (in amp-