



A Successful Battery Program

- Cool** - Proper battery cooling temperature is below 120 degrees F.
- Clean** - Clean, dry batteries live longer & have fewer problems
- Water** - Plates should be kept covered without overflow)
- Charge** - One charge every 24-hr period with the appropriate sized charger. Equalize weekly. Boost charging may shorten battery life if not managed.
- Discharge** - Do not over discharge your battery! Daily depth of discharge is 80%.
- Rotate** - Failure to properly rotate batteries in multi-shift applications can dramatically shorten battery life!

DAILY

- After equalizing charge and allowing for proper cooling, the battery is most likely ready to be watered. Prior to installing the battery visually inspect battery for frayed cables, broken connectors or other physical defects.
- Battery (DOD) depth of discharge should not be lower than 80% (as indicated by the lift interrupt LED flashing light). Opportunity charging is an acceptable practice if the charger has been properly calibrated for opportunity charging programming. (Contact [Barclay](#) for proper charger setting-programming)
- Note battery temperatures. High temperatures indicate a battery and/or charger problem. (Normal operating range 77° – 88°)
- Note battery performance issues. If the battery fails to deliver less than normal run-times there could possibly be an issue with the battery, truck, or charger and it could be as simple as a loose connector. Minor problems such as connectors need to be isolated and repaired as quickly as possible. (Contact [Barclay](#) for further evaluation)
- To further optimize the effectiveness of your battery program establish a “Battery Log Book” to help identify potential problems quickly. This also serves as documentation to [Barclay](#) if there are any problems.

WEEKLY

- Follow the watering schedule provided by the Mfg. If you do not have a watering schedule, contact [Barclay](#) to provide one.
- Any battery that boils over may indicate a watering error. Summertime environments and multiple cycles per day may require twice weekly watering.
- DesertHog™ batteries may be watered every 2-4 months depending on operating temperature and charging variables. (See your [Barclay](#) Customer Service Rep for proper water schedule)
- Every battery should be equalized weekly.

MONTHLY

- Batteries should be cleaned and neutralized monthly. [Barclay](#) recommends using our PRO WASH™ neutralizing and cleaning solution for quick clean ups and neutralizing tops of your batteries. The following inspection should be performed monthly, Service Technician to record the following:
 - ✓ Record open circuit voltage readings of batteries after they have been equalized.
 - ✓ Record specific gravity of high and low voltage cells
 - ✓ Record battery temperature during equalizing periods (near the center of the battery)
 - ✓ Record battery, charger and handling equipment condition-comment or concerns

ANNUALLY REVIEW

- Verify Lift Interrupts are operating within the lift truck manufacturer’s specifications.
- Review watering procedures to ensure compliance with operation
- Review battery temperatures and charging sequence
- Review battery discharge data and battery change out procedure
- Review charging procedures and equalization periods
- Review battery rotation procedures
- OSHA requirements and proper safety , spills and recycling instructions as outlined in Enersys Section 28.00*
- An inspection should be performed by an Battery Technician to record the following:
 - ✓ All open circuit voltage readings
 - ✓ Specific gravity readings
 - ✓ Cell temperature (cell must be located near the center of the battery)
 - ✓ Overall battery, charger and handling equipment condition

29 CFR 1926.441- Battery Rooms and Battery Charging

(a) GENERAL REQUIREMENTS

- (1) Batteries of the non-seal type shall be located in enclosures with outside vents or in well-ventilated rooms, so arranged as to prevent the escape of fumes, gases, or electrolyte spray into other areas.
- (2) Ventilation shall be provided to ensure diffusion of the gases from the battery to prevent the accumulation of an explosive mixture.
- (3) Racks and trays shall be substantial and treated to be resistant to the electrolyte.
- (4) Floors shall be of acid-resistant construction or be protected from acid accumulations.
- (5) Face shields, aprons, and rubber gloves shall be provided for workmen handling acids or batteries. (OSHA 1926.441(a)(5)).
- (6) Facilities for quick drenching of the eyes and body shall be provided within 25 feet of the work area for emergency use.
- (7) Facilities shall be provided for flushing and neutralizing spilled electrolyte, for fire protection, for protecting charging apparatus from damage by trucks, and for adequate ventilation for dispersal of fumes from gassing batteries.

(b) CHARGING

- (1) Battery charging installations shall be located in areas designated for that purpose.
- (2) Charging apparatus shall be protected from damage by trucks.
- (3) When charging batteries, the vent caps shall be kept in place to avoid electrolyte spray. Care shall be taken to assure that vent caps are functioning.

29 CFR 1910.151- Medical Services and First Aid

- (1) The employer shall ensure the ready availability of medical personnel for advice and consultation on matters of plant health.
- (2) In the absence of an infirmary, clinic, or hospital in near proximity to the workplace which is used for the treatment of all injured employees, a person or persons shall be adequately trained to render first aid. First aid supplies approved by the consulting physician shall be readily available.
- (3) Where the eyes or body of any person may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use.

29 CFR 1910.178, subparagraph (g) - Changing and Charging Storage Batteries

(g) CHANGING AND CHARGING STORAGE BATTERIES

- (1) Battery charging installations shall be located in areas designated for that purpose.
- (2) Facilities shall be provided for flushing and neutralizing spilled electrolyte, for fire protection, for protecting charging apparatus from damage by trucks, and for adequate ventilation for dispersal of fumes from gassing batteries.
- (3) A conveyor, overhead hoist, or equivalent material handling equipment shall be provided for handling batteries.
- (4) Reinstalled batteries shall be properly positioned and secured in the truck.
- (5) A carboy tilter or siphon shall be provided for handling electrolyte.
- (6) When charging batteries, acid shall be poured into water; water shall not be poured into acid.
- (7) Trucks shall be properly positioned and brakes applied before attempting to change or charge batteries.
- (8) Care shall be taken to assure that vent caps are functioning. The battery (or compartment) cover(s) shall be open to dissipate heat.
- (9) Smoking shall be prohibited in the charging areas.
- (10) Precautions shall be taken to prevent open flames, sparks, or electric arcs in battery charging areas.
- (11) Tools and other metallic objects shall be kept away from the top of uncovered batteries.

1910.178 (g) (6) refers to diluting pure acid with water. A properly designed, manufactured, and maintained lead-acid battery already has diluted acid and is, therefore, safe to add water to the battery.