Forklift Battery Maintenance Guide

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Forklift batteries can be costly and properly maintaining your forklift battery can save you thousands. Educating operators on some of the basics of electric forklift battery maintenance will help extend battery life, improve performance, and increase the lifespan of your forklift.

Forklift Battery Charging

Stick to a protocol for charging your forklift truck battery. Since batteries have a finite number of cycles, charging based on convenience instead of sticking to a schedule can potentially shorten the battery's life. The general rule of thumb is to recharge the battery after an eight-hour shift or when it is more than 30% discharged. If you charge too frequently when it is not more than 30% discharged, you will shorten the battery life.

Follow these best practices for charging batteries:
If possible, let the forklift battery charge completely once you've started to charge it. Cutting a charging cycle short can also be harmful to the battery's longevity. Be sure to recharge the battery once every day fully.

Don't let a discharged battery sit for too long–not more than a few hours to one day. By doing so, you increase the likelihood that hard sulfation will develop, which will reduce the run time and life of the battery.

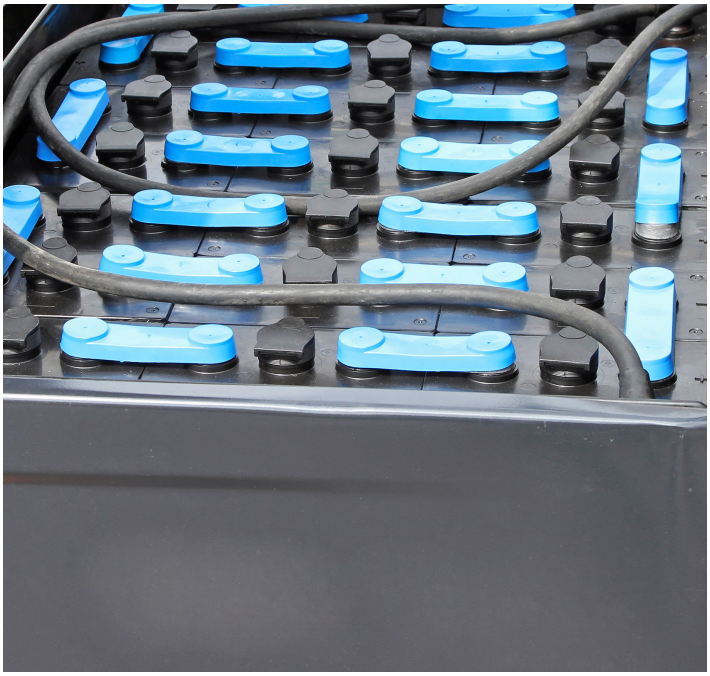
Don't over discharge your forklift battery. If you discharge beyond 80%, you'll be doing long-term, irreparable damage to the battery and significantly shorten the battery life.

Be aware of battery temperature when charging. Excessive heat will shorten battery life by half. Keep the forklift battery as close to 25°C as is practical. Charging a cold battery around 15°C or less requires extra time, as well as temperature compensation on the battery charger to achieve proper charge voltages.

Forklift Charging Stations

In addition to these electric forklift battery maintenance tips, for safety purposes, it's also highly recommended that a facility has a designated battery charging area. This area should have clear signage, available water supply for eye washing, ventilation, a fire extinguisher, and a phone in case of emergencies. Here are a few other safety precautions to be aware of:

- Prohibit smoking near the designated battery changing area.
- Avoid wearing metallic jewelry while recharging batteries.
- Use appropriate handling equipment for lifting and moving heavy batteries.
- Wear appropriate protective equipment (safety goggles, gloves, apron, and/or face shield).
- Position forklifts appropriately and apply brakes before charging or changing batteries.
- For batteries with sealed vents, do not recharge with a current greater than 25 amperes.
- If the battery becomes hot or electrolyte fluid begins leaking from the vents, turn off the charger. When the battery has cooled, restart at a lower charging rate.
- Keep accurate records of battery watering, cleaning, inspections, and other maintenance.
- Recycle or follow specified local procedures for battery disposal as they contain hazardous waste.



Check and Maintain Battery Fluid Levels

Having the right amount of water in your battery is critical for it to function to its full capacity. Have a schedule to check the fluid level of your forklift batteries–approximately every five charging cycles is ideal. Check several cells to see if there's enough water to cover the separator plates. If it's not obvious from inspecting two or three, proceed to check all the cells. If necessary, top off the fluid.

Typically, forklift batteries will need to be topped off every ten charges if they're brand new. The battery should be filled to cover the separator plates. Batteries should only be topped off when they are fully charged. It's also important not to overfill the battery as there needs to be some additional space to account for expansion when the forklift battery is in use.

Water used in batteries should fall between 5 and 7 on the pH scale and within the battery's recommended levels for impurities. Check the documentation on your forklift battery for specifics on the allowed limits of water impurities. Distilled water is preferred.

Each month you should take a gravity reading of all of the battery's cells with a hydrometer after a charge. Fully charged, standard forklift batteries typically have an ideal specific gravity of 1.285. Check your battery's specifications for the exact number for your model.

Temperature Changes Effect Your Battery

Often forklifts are used in extreme environments, and temperature has a direct effect on the life of a battery. The design life of the battery is based on an average annual temperature of 25°C (77°F). As the temperature increases above 25°C (77°F), the life of the battery decreases. The chart below shows the effects of temperature.

Maximum Annual Average Battery Temperature	Maximum Battery Temperature	Percent Reduction In Battery Life
25°C (77°F)	50°C (122°F)	0%
30°C (86°F)	50°C (122°F)	30%
35°C (95°F)	50°C (122°F)	50%
40°C (104°F)	50°C (122°F)	66%
45°C (113°F)	50°C (122°F)	75%
50°C (122°F)	50°C (122°F)	83%

For example: If a battery has a design life of 10 years at 25°C (77°F), but the actual annual average battery temperature is 35°C (95°F), the projected life of the battery is calculated to be only 5 years [10 years - (10 years x 0.50) = 5 years]. It is important to maintain the battery temperature as close to 25°C (77°C) to achieve the optimum service life from your battery.

Exide Technologies. Section 95.10 2012-07 Relay Gel I&O Manual: Page 10.

Equalizing

Some batteries require equalizing, and if so, they will often have an equalizing setting on their charger. What is equalizing a battery? At its core, equalizing a battery means that you are overcharging it to remove sulfate crystals that have built up on the plates. Sulfation, as mentioned in the charging section of this article, can shorten the battery's life. Equalizing a battery also reverses acid stratification, which occurs when the acid concentration at the bottom of the battery is greater than that at the top. Not every forklift battery requires equalizing, so check the specifications on your battery before adding this to your forklift battery maintenance routine. For wet cell batteries, these should be equalized about once per week. Do not equalize more than the recommended frequency per operating procedures. More is not necessarily better!

Cleaning Your Forklift Battery

Cleaning the top of the forklift batteries with battery cleaner or warm water is not only a good maintenance practice, it is also required on some batteries to maintain the warranty. Check your warranty documentation just to be sure. We suggest a monthly cleaning even if it's not required by your warranty to help avoid build-up, which can cause tray corrosion, faster self-discharge and possibly even impact the forklift's electronics. Review the safety procedures listed above when preparing to clean a battery.