

# GET THE INSIDE STORY

Look inside your lift equipment. Chances are, you'll see Trojan. Top AWP manufacturers and rental yards power their equipment with Trojan deep cycle batteries. After all, reliability is everything in the lift business, and Trojan batteries keep equipment running so there's no unexpected downtime. Want greater efficiency, higher profits and less worry? Trust our brand to power your brand.



*Trojan deep cycle batteries feature the propriety Maxguard® Advanced Design Separator and exclusive Alpha Plus® Paste Formulation for increased run time and less maintenance.*



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# Batteries included

**Batteries represent a tiny percentage of a machine's purchase cost, but are often the highest single item of a machine's annual cost and the biggest contributor to lost income! Leigh Sparrow reports.**

**THE STARTER** battery for a crane or diesel-powered lift represents just a fraction of a per cent of the total cost of a piece of equipment or plant, yet a cheap or poorly maintained battery can easily put a machine out of action and cause a loss of income.

The price differential between a cheap battery and a really good one is modest to say the least, especially when compared to the potential cost of a single failure. Yet in spite of this fact, many owners will insist on cutting corners with this critical component! Why?

Certainly one battery looks similar to another, causing many machine owners to fail to understand why they should pay more for a similar looking product. A good battery costing 10 to 15 per cent more than a cheap battery can easily last twice as long under average usage and maintenance regimes, longer if looked after properly.

## SO WHAT ARE THE DIFFERENCES?

**FIRSTLY, BATTERIES** are designed to suit different applications. A starter battery needs to be able to deliver high bursts of power for short periods of time, while a deep-cycle battery should deliver a steady stream of power over a long period and then be able to handle a heavy daily discharge and recharging cycle. A third category is the dual purpose battery, which is designed to handle a little bit of both, and is most often used where a machine has a heavy ancillary demand in addition to its starting role.

Look at batteries in detail and you enter another world. For cranes and access equipment, most problems and costs are associated with the deep-cycle applications for powering electric machines such as scissor lifts, which will be the focus of the remaining article. The principles, however, apply to all batteries.

So, you need to replace the deep-cycle batteries on your scissor lift. What choice do you have? Firstly, starting with the least expensive, there are three main types; the regular lead acid deep cycle battery, the spiral wound lead acid battery and the deep cycle gel battery.

The regular lead acid batteries are far and away the most popular in the UK and Ireland, but there is significant price and quality spread.

At one extreme, you will find totally unsuitable products, described by one manufacturer as "car batteries with a deep-cycle label slapped on the side." This product will be totally unsuitable to the application and will rapidly deteriorate.

Moving up to batteries that have been designed for the job, the price differential between a poor battery and a really good one seems to be in the region of 10 per cent or, £5 to £7 (€7 to €10) each. In other words, £20 to £30 (€28 to €40) per machine.

So, what do you get for the extra cost? Well, the first tangible difference is the design of the battery casing. You need a strong robust case, ideally with lifting eyes or lugs. Vibration from your equipment will can cause a cheap, lightweight casing to crack or rub through. The best ones are made from high impact ABS or polypropylene.

Secondly, a battery's "plates" are where the greatest differences occur. A "plate" is made up of a rigid metal grid onto which a lead oxide "paste" is applied. This is then cured to form the lead "plates" that make up the core of the

battery. A good battery will have robust heavy-duty, full-frame grids made from an alloy that is well suited to the application. The paste type and composition also varies widely. The best batteries use a high density paste, often strengthened with glass fibres. A cheap battery will use a standard low-cost paste, which will start to flake and shed

from the start, forming a sludge at the bottom of the battery, which will eventually cause it to short out. Plates made with superior and more resilient pastes, will last much longer, although eventually they will transform to a similar consistency to the cheap plates and then go through the same degradation process.

Thirdly, each battery plate is covered with a "separator", which in the case of cheap batteries will be a basic plastic version. A quality battery, on the other hand, will have plates wrapped in a glass fibre matting and use a specifically designed multi-ribbed separator made from polythene or other durable material. The design of the separator varies, with the best giving good flow-through characteristics and being rugged enough to outlast the battery itself.

Finally, a good battery is filled with a quality de-mineralised electrolyte for longer life.

## SPIRAL BOUND AND GEL BATTERIES

**STEP UP** from the high-quality regular batteries, and you come to the exalted special batteries, which can offer an even longer life, minimum maintenance and no chance of electrolyte spills.

Spiral technology was firstly developed by Optima batteries, now part of Varta, and is similar to the very best of the regular lead acid batteries, except that it uses two thin plates wrapped into a spiral cell. The overall appearance of the battery is quite different. Optima claims that the benefits include less sensitivity to temperature, a greater resistance to vibration, longer life, reduced degradation from storage and maintenance-free characteristics.

Available at a higher cost, gel batteries offer similar advantages to Optima's spiral batteries and do not gas, so are ideal in hostile environments. Also, they will not suffer from stratification or ever require equalising.

## WHERE TO BUY YOUR BATTERIES

**ONCE THE** facts are known, no one in their right mind will elect to buy a cheap battery. "Only the rich can afford cheap batteries" is a quote often heard. Savings can be made without compromising quality, however, depending on where you buy your batteries. So shop around!

It is still possible to call an official dealer for your machine and buy your battery with the manufacturer's name and part number on it, and pay more than double than you would for the same battery elsewhere! Most manufacturers though do now offer competitive alternatives.

The key points to watch out for are the rating, performance, and vitally important for batteries going into aerial work platforms, is that the weight



**Above: Trojan claims that its heavy-duty, deep-cycle lead acid battery gives a longer productive life.**

is the same as the previous battery. AWP batteries form part of the counterweight and will void your CE approval, so care is needed.

A price check and comparison can be made with a specialist spare parts supplier. With a focus on parts and parts sourcing, they might offer you a better deal, but once again, you need to make sure that the quality is the same. A good battery that has passed through fewer hands or mark-ups will be a genuinely good bargain, while a cheaply produced battery will always be a costly mistake.

A third price check point is a battery specialist, which will often be an official distributor for battery manufacturers. If you are sourcing for an aerial lift however, difficulties may be had confirming the right match in terms of size, weight and power.

Also, do not assume that an original battery manufacturer distributor will automatically have the best price for that make of battery. Batteries arrive in this country from numerous sources.

Equipment manufacturers' local outlets (particularly in the US) will at times buy batteries direct from the producer at production line prices, which can lead to very competitive local prices, sometimes seriously undercutting the official battery maker's distributor.

## VOLUME PURCHASE

A PALLET load purchase will yield a better price and save unit delivery cost over buying batteries one at a time. However, if a pallet load represents more than a few months demand, forget it! Most "wet" or "flooded" batteries do

not store well. Also a volume supplier's batteries should be fresher. You can store "dry" batteries for much longer without degradation, but then you will need to get them filled and it is simply not worth the hassle these days.

As a fleet user, the best thing to do is to calculate your annual battery usage and negotiate a fixed price based on your annual battery needs with one good competitive supplier who can deliver quickly and inexpensively.

## BATTERY CHARGERS AND CHARGING

**BATTERY CHARGERS** for electric powered machines are generally automatic, with the latest ones capable of sensing the level of charge the batteries require before fully charging. The best battery chargers include a fourth "equalizing" stage.

Lead acid batteries should have this "equalizing" charge, which is essentially a controlled over charge. After every ten cycles or so, the effective battery life and capacity will be significantly extended.

Before putting a new battery pack in for service, the batteries should receive an equalizing charge to balance the voltage variation between cells and between batteries. Some fleet owners have developed battery equalizing bays to do this

before fitting them.

Lead acid batteries do not develop "memory". Batteries perform the best and last longest when the daily discharge is between 20 and 50 per cent, followed by a full recharge. Thus, spending two or three extra pounds on a 250 AH in place of a 220 could pay for itself in terms of longer life and fewer problems.

The worst thing for a battery is repetitive under-charging or extensive periods of inaction. This will result in stratification, where the electrolyte becomes stronger at the bottom of the battery than at the top, literally corroding the battery from the inside as well as a build-up of sulphate crystals on the plates, which also erodes battery performance.

C&A



Optima's spiral cell batteries cope with extremes of temperature and are maintenance free.

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