



A charge of 15.03 Volts would damage some types of battery

Time to take CHARGE

John Wickersham explains the positives and negatives of battery care

The Club's Technical Information Leaflet, *Lead Acid Batteries* (see the 'Expert Advice' section at caravanclub.co.uk), provides guidance about leisure batteries and their maintenance. This article describes chargers that run on the mains and highlights one or two problems.

BUILT-IN CHARGERS

There is a designated location for a leisure battery in all modern caravans and motorhomes, and in the majority of caravans you will find a built-in 230V charger in close proximity.

However, in a motorhome some manufacturers install the leisure battery a long way from its charger. For example, some charging devices

are housed within a fused control panel which is nowhere near the battery itself. This can result in a loss of power on account of the length of their connecting cables.

Most built-in chargers work in conjunction with the leisure battery and provide power to 12V accessories. Many remain in operation whenever a caravan is connected to a mains supply – some don't have an on/off switch. However, many chargers installed 20 or more years ago were intended to be switched off as soon as their leisure battery was fully recharged. Check the requirement in your owner's manual and refer to *Section 5 – Continuous Charging* in the Club's leaflet (details above).

Now a point of concern. If a charger/power unit is running 12V accessories while your caravan is

coupled to a mains supply, it is important it doesn't over-load them. Fortunately, 12V components such as interior lights can cope with slightly higher voltages – but within limits. Accordingly, the output from many built-in chargers was designed not to exceed 13.8V.

For reasons explained later, BCA Leisure then introduced its 'duo charger' which has been installed in several models from Hull-based Coachman Caravans. This combined charger/power supply unit (PSU) has a pair of cables supplying 13V to run appliances and another pair supplying 14.2V for battery re-charging. Similar recent charger/PSUs from Sargent Electrical automatically disconnect 12V accessories from a battery while it's undergoing a charge. They then provide: a) 13.5V to run



Power supply units often incorporate a charger although the battery might be fitted some distance away



The BCA Leisure duo voltage charger has a battery connection producing 14.2V and an appliance supply of 13V



Sterling chargers often include setting switches so they can be used with gel and other sealed batteries



This CTEK charger with maximum charging current of 25A is installed in a motorhome alongside a 180Ah battery



Only install a 'smart' stage charger if you are prepared to choose the appropriate mode settings yourself



This 'supply' mode setting limits output to 13.6V so you can use 12V accessories on site without risk of damage



This particular CTEK stage charger includes a 16V output 'boost' to revive badly discharged lead/acid batteries



When a control panel indicates that your battery is receiving 14.8V, don't switch on any 12V accessories

accessories and b) a 14.4V 'bulk' charge for the battery.

CHARGING REQUIREMENTS

LEAD/ACID LEISURE BATTERIES

According to battery manufacturers, a discharged lead/acid leisure battery seldom regains a full state of charge if it doesn't receive a voltage of around 14.8V or more. If a battery is only part-charged, not only does it discharge quicker than you'd expect but its lead plates often become coated with sulphate – as reported in Section 3 of the Club's technical leaflet. If this sulphate deposit increases, a battery fails and can't be revived.

However, Section 4 of the technical leaflet indicates that introducing voltages of 14.8V causes a battery to emit hydrogen which is flammable and potentially explosive. That's why lead/acid leisure batteries have a plastic tube to convey the gas outdoors for dispersal. This might raise concerns but 'gassing' helps prevent sulphate developing on a battery's lead plates and its operating life is thereby extended.

AGM AND GEL LEISURE BATTERIES

Recharging a sealed leisure battery is different. Some owners fit sealed 'absorbent glass mat' (AGM) batteries, while others install gel batteries. Neither type has a gas ventilation tube. That's because their required charging voltages don't cause gassing. Manufacturers usually state that an AGM charge must not exceed 14.4V whereas the limit for a gel battery is 14.2V. *Note: These issues concern Voltage, which, roughly speaking, is the 'pressure' of electricity.*

BATTERY CAPACITIES

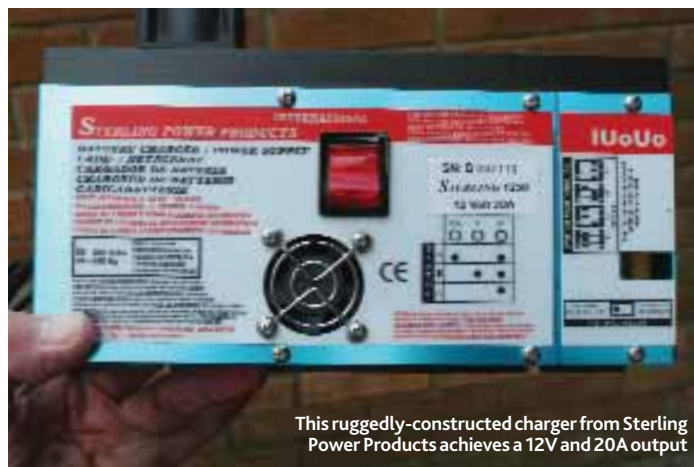
The 'capacity' of a battery is measured in ampere hours (Ah) as explained in Section 2 of the technical leaflet. This places a further requirement on the type of charger best-suited. In effect, a charger's amp output must be sufficient for a battery's Ah capacity. *Note: 'amps' are a measure of the 'amount' of electricity.*

Traditional advice is to use a charger whose output is about 10% of a battery's Ah capacity. For example – an 8A output charger is recommended for an 80Ah battery. Many chargers state their output on a label.

CHARGING REGIMES

Older battery chargers provide a fixed output and caravan built-in chargers usually give a maximum of 13.8V.

Recently, however, 'stage chargers' have been developed which provide a controlled 'charging regime'. This can achieve good results and the stage



This ruggedly-constructed charger from Sterling Power Products achieves a 12V and 20A output

“ A good charging regime provides a long service life ”

cycle usually begins with a brief, but high voltage. Thereafter, the number of phases differs. Some products have three stages in their charging regime; costlier chargers have eight stages including desulphation and reconditioning phases.

These 'smart' or 'intelligent' stage chargers are available as portable models but some fixed caravan chargers incorporate stage charging, too. For instance, some Sargent built-in chargers have three stage outputs although they never exceed 14.4V (see sargentshop.co.uk for further information).

Some smart chargers interact by monitoring a battery's condition and then responding as needed. Later, when a battery has fully recovered, they move into a low maintenance mode to keep it topped-up. Many can be left connected, too, because they automatically switch on or off as required. Hence, they perform a maintenance function just like a 'trickle charger'. A good charging regime helps a battery achieve its maximum Ah capacity and provides a long service life.

REMOVING A LEISURE BATTERY

If your caravan/motorhome is left unused for more than a month, the Club advises that its leisure battery is removed, left in a cool, dry place, charged to maximum, checked bi-monthly and re-charged if needed. That's when highly-efficient portable 'smart' chargers are ideal.

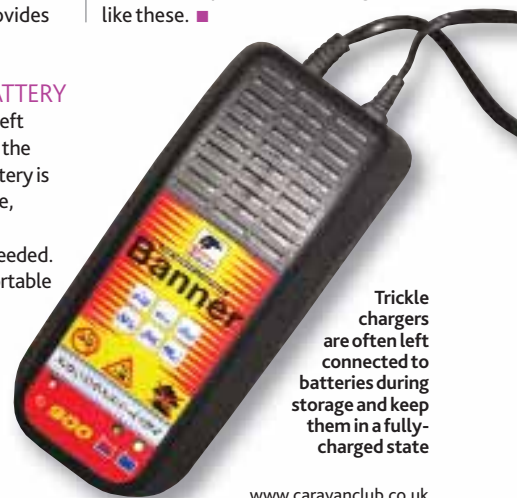
INSTALLING A HIGH-OUTPUT CHARGER

Some technically-minded owners install smart chargers



High-output chargers can get hot and are fitted with cooling fans. When operating, these might be noisy

that include a mode selection switch to keep their battery appropriately treated. That's fine as long as different operating modes are understood and selected as necessary by the owner. For instance, smart chargers usually include a 'supply mode' which you select when running 12V accessories. However, should a badly-discharged battery need a recovery boost, that mode's available, too, but don't choose this when 12V appliances are running. High-performance chargers also get warm and cooling fans are sometimes distracting. Good ventilation is important, too, but batteries respond well to chargers like these. ■



Trickle chargers are often left connected to batteries during storage and keep them in a fully-charged state