

## **Leisure Batteries**

### **Care and maintenance of Deep Cycle Batteries.**

Deep cycle batteries are designed to deliver energy over an extended period. They are not designed to deliver a lot of energy in a short time. Start batteries are not suited for use as a leisure battery, their plates are not designed to deliver low currents for an extended time.

### **Battery types**

There are 3 basic types of Lead/Acid battery. Wet or Flooded, AGM (Absorbed Glass Mat) and Gel Cell.

Wet cell batteries that are not maintenance free need to be checked every 3 months at a minimum if there is a solar system attached or they are connected to a mains charger that is left on. The cells lose water and when the plates become exposed to air the battery will Sulphate and degrade very fast. The battery is designed to lose water. Maintenance Free is what it says, there is nothing to check and is designed not to lose fluid or gas.

AGM battery construction enhances discharge and recharge efficiency. The electrolyte is suspended in the battery and is not in a liquid form. There is little chance of hydrogen gas being produced or external corrosion. They deliver their best performance if they are not allowed to discharge below 50% of their capacity before recharging

Gel batteries are similar to AGM batteries. They are sensitive to overcharging . They are suited to very deep discharge situations and can be left discharge longer than other lead batteries. However, they will still degrade if left discharged for too long.

### **AGM batteries**

We find AGM batteries to be a very good battery to use in most motorhomes and caravans. They are robust and good value for money.

AGM batteries are fully sealed and leak proof. The AGM separators sit between the internal plates to retain the electrolyte in the ideal position for discharge and recharge.

AGM batteries are Anti-Spill with no acid leakage even when the battery case is damaged.

AGM batteries have extremely low self-discharge rates when compared to conventional batteries.

AGM batteries have high levels of vibration resistance and durability compared to conventional batteries

AGM batteries have increased plate numbers per cell, larger plates, increased operating pressure and higher levels of pure lead when compared to conventional batteries giving a lower internal resistance resulting in reduced discharge and recharge times.

## Battery ratings.

The battery is rated at a number of amp hours over a number of hours. A battery rated at 100AH/C20 is expected to deliver 100 amps over a 20 hour period. The C20 rating is the most common one you will see. The amp Hour number will change for the same battery depending on the C rating. A battery rated at 95AH/C20 will also have a rating of 75AH/C10.

## Charging

It takes typically 6 – 8 hours to bring a deep cycle battery back to 80%, that means driving all day. The last 20% takes time up to 2 days to get to 100% capacity. This is quicker if the battery has not been discharged too much.

Solar systems are ideal for keeping your battery fully charged when no in use. If your motorhome or caravan is stored under cover then it is unlikely the solar panel will be any use. In this case it is advisable to connect to mains power and allow the on-board battery charged to maintain the battery. Most modern motorhomes and caravans will have a continuous small load on the leisure battery even when the main switch is turned off.

To charge effectively from mains power a 3-stage smart charger is the minimum needed to charge the batteries correctly. Not all smart chargers are suitable.

Modern engines now have smart alternators whose output voltage drops quickly to a level that will not charge your leisure battery. If your vehicle has a smart charger you will need a DC/DC charge booster that is designed to charge deep cycle batteries to charge them when the engine is running. And to prevent faults caused by a low charge voltage.

## Your Voltmeter

Your voltmeter can tell you a lot about your battery without going to the expense of installing a separate battery monitor.

To get an accurate idea of the state of charge of your leisure battery you need to read the voltage when the battery is rested. This means that the battery has not received a charge or discharge in the 6 – 8 hours prior to taking the reading. This means you are not plugged into mains power, the sun isn't on the solar panel and the engine hasn't been started and no 12V system is operating. The best time is first thing in the morning before the sun comes up.

When something is charging the batteries, the voltmeter will show a high reading. This is just the charging source voltage being applied. It is not an indication of the stored capacity of the battery. It is the same if you turn on some lights and the voltage drops significantly. This is a function of the voltage drop at the point where the battery voltage is being measured.

State of Charge	12V Flooded	12V AGM	12V Gel
100%	12.7	12.8	12.6
75%	12.4	12.6	12.3
50%	12.2	12.3	12.1
25%	12.0	12.0	11.8
0%	11.8	11.8	11.6

Your system will still work when the battery voltage is below 11.8 volts, but you will reduce the life expectancy of the battery.

### **General tips**

New deep cycle batteries need to be cycled several times before reaching full capacity.

For best battery life batteries should not be discharged below 80% of their rated capacity. Most will be Ok up to 50% discharge so long as they are recharged as soon as possible after the discharge. Proper battery sizing will help avoid excessive discharge.

Avoid charging at excessively high or low temperatures. Cold reduces battery capacity and retards charging. Heat can result in overcharging.

Where multiple batteries are connected, they should be of the same size (capacity), type and age.

If the motorhome or caravan is going to be parked up for an extended period and it doesn't have an active solar system:

1. The battery/s should be fully charged before storing.
2. All electrical connections should be removed from the battery/s
3. Store the battery/s in as cool a place as possible but not below 0°C. Batteries will discharge when stored, lower temperatures slow the rate of discharge.
4. When not in use, give the battery/s a charging boost at least every 2 months. Running the engine will not achieve this. You will need to plug into mains power or expose the solar panel to sunshine.