

# GS Yuasa E-Learning Support Documentation

## Leisure Battery Maintenance & Care

### Overview:

This support documentation has been designed to work in conjunction with the GS Yuasa e-learning course “Leisure Battery Maintenance & Care” and covers of the following subjects:

- **Leisure battery applications**
- **Battery performance & service damage**
- **Service care & maintenance**

### Leisure battery applications

Leisure and marine batteries are known as deep cycle types. They provide long-term energy delivery and are capable of a much greater number of deeper discharge cycles when compared to automotive starter batteries. Leisure batteries are designed to support electrical consumers such as caravan and motorhome lighting and accessories, whilst marine types support engine starting, navigation, communication and other auxiliary equipment.

### Battery performance & service damage

#### Seasonal use

There is a misconception that a leisure and marine batteries are fit and forget products, however, this is not the case. Both leisure and marine batteries are predominantly in use during the warmer summer months and are left in storage throughout the winter.

If the battery is in regular use or long-term storage it must be checked and charged as required to prevent service or storage related damage. If not maintained its condition will permanently deteriorate until it can no longer supply the required performance. This failure is not because of any manufacturing or material defect but due to lack of care and maintenance.

#### Battery age performance losses

Batteries that have been in service for some time will have experienced some natural deterioration which means that when compared to a new battery more frequent recharging will be required.

#### Correct battery application

It is important to specify the correct battery technology and performance rating to ensure maximum possible service life. Many factors must be taken into consideration when selecting the best battery option, these include:

- Available installation space
- On or off grid usage
- Electrical power demands
- Frequency of use
- Holiday duration



The maximum physical size of the battery will usually be dictated by the tray size. When connected to an on-grid power supply at a camp site there is little or no load on the battery. However, when operating off-grid with no external power supply the battery supports all electrical loads. The more electrical consumers that are in use, the greater the demand on the battery and the faster it discharges. It is therefore advisable that the battery capacity required for an application is accurately calculated considering the appliances on board, their hourly power consumption, and how long each appliance is likely to be used.

## Watt hour calculations

An example of how Watt hours are calculated could be a TV rated at 80 Watts on for 2 hours takes  $80 \times 2 = 160$ -Watt hours, 4 lamps rated at 20 Watts for 4 hours takes  $4 \times 20 \times 4 = 320$ -Watt hours, a water pump rated at 50 Watts for  $\frac{1}{2}$  hour takes  $0.5 \times 50 = 25$ -Watt hours and a mobile device charging rated 25 Watts for 3 hours takes  $3 \times 25 = 75$ -Watt hours. This gives a total of 580-Watt hours.

It is then advisable to factor in a 20% safety margin as the figures used for the capacity calculation can go up or down. Total battery requirement is therefore 696-Watt hours. The required battery capacity will also be dramatically affected if using a motor mover or auto-levelling system as these consume large amounts of power over a very short time. All GS Yuasa leisure batteries feature a watt hour rating and guidance on usage type on their label.

## Cycles & frequency of use

A leisure battery has a finite number of available cycles, each time it is cycled its service life is reduced. Therefore, users who take frequent breaks will require a battery with more available cycles than a user that goes away infrequently. All GS Yuasa leisure batteries feature a cyclic rating which indicates how many charge and discharge cycles the battery is capable of to 50% depth of discharge.

## NCC verification

GS Yuasa batteries are part of the NCC verified battery scheme. The scheme ensures caravan and motorhome users can easily identify which batteries on the market are quoting accurate, verified specifications, and which are not. NCC verification provides consumers with confidence that their battery is fit for purpose and will perform as advertised. NCC verified batteries have undergone comprehensive testing conducted by suitably certified and audited test houses. Once verified they are categorised as A, B or C depending on capacity and intended purpose. All verified batteries carry clear NCC labelling.

## Battery technology

GS Yuasa's range is tiered with different levels of performance and cyclic life available therefore battery technology must be considered when selecting the battery, charging and maintenance. All batteries are maintenance free and do not require topping up when in normal service.

Conventional type batteries offer standard performance levels and are end vented and must be installed with a breather pipe in occupied spaces whereas EFB and AGM batteries are upgrade options as they provide greater endurance, more available cycles and faster charging. EFB batteries feature a roll-over proof sealed lid and must also be installed with a breather pipe.

AGM batteries offer the maximum number of cycles and feature a spill proof internal construction with no free acid and can be installed in occupied spaces with natural ventilation.

GS Yuasa deep cycle commercial vehicle batteries are also ideal for dual power applications where starting and overall energy supply power is required, such as large water craft, canal boats and horse boxes as they provide very high Watt-hour ratings and excellent resistance to vibration.



GS Yuasa marine start and dual battery types have the unique characteristics. They feature a marine cranking amps or MCA rating which unlike CCA which is tested at  $-18^{\circ}\text{C}$  is determined at  $0^{\circ}\text{C}$  as this is more relevant for marine applications. Marine batteries also benefit from a dual terminal design to allow simultaneous connection of auxiliary and starter cables.

Unlike vehicle batteries which generally travel on smooth roads, marine batteries must be able to resist repeated vibration from wave impact and trailer transport. To prevent damage, they are built to provide a higher level of vibration resistance

## Storage self-discharge overview

Once fully commissioned a battery continuously releases electrical energy and self-discharges. When disconnected and at  $10^{\circ}\text{C}$  this can be up to 0.1 Volts per month however this self-discharge rate doubles with every  $10^{\circ}\text{C}$  temperature rise. When in service or left connected to the vehicle, the demands of any permanent electrical consumers such as alarm systems increase this discharge rate significantly.

## Discharge damage

If the battery falls to and below 12.40 Volts for extended time periods, or it is deeply discharged irreversible damage will occur. Two common scenarios are, failure to maintain the battery when in storage and failure to check and charge the battery before and after each use.

Many newer caravans and motorhomes have an intelligent charging facility when in use. Users should consult their handbooks for more details. GS Yuasa advise a suitable charger compatible with the battery's technology is connected when the vehicle is not used for extended periods of time. GS Yuasa smart chargers operate on or off the vehicle and will maintain the battery in an optimum condition.

## Battery service care & maintenance

### Maintenance overview

Always ensure you use a charger compatible with AGM type batteries as failure to do so will result in permanent damage and premature failure.

### Periodic maintenance

If removing the battery, fully charge it prior to storage. Check its voltage is more than 12.40 every month and charge if required. Recharge every three months regardless of the voltage to refresh and mix the electrolyte solution.

### Constant maintenance

If leaving the battery on the vehicle, connect a smart charger compatible with the battery technology and featuring a pulse mode as this will maintain the battery at 95 to 100% capacity by monitoring voltage and applying a pulse charge when required.

