BOOST CHARGING AGM AND GEL VRLA BATTERIES THAT HAVE BEEN IN STORAGE

BACKGROUND

Batteries are perishable items – they lose charge when stored. This phenomenon is called self-discharge and irreversible damage occurs if they are allowed to self-discharge too far. The key to prevent such damage is to charge them before this happens, via a process called boost charging. The warmer the storage temperature the faster the self-discharge while cooler temperatures slow down the rate of self-discharge. Ideally, batteries should be stored at temperatures at or below 77ºF (25ºC) to maximize the storage time before a boost charge becomes necessary. Absorbed glass mat (AGM) and gel batteries must be boost charged once every six months or when the open circuit voltage (OCV) drops to 2.07 volts per cell (VPC), whichever occurs first. However, for best performance the batteries should not be allowed to self-discharge below 2.09 VPC, corresponding to about a 75% state of charge (SOC).

BOOST CHARGING PARAMETERS

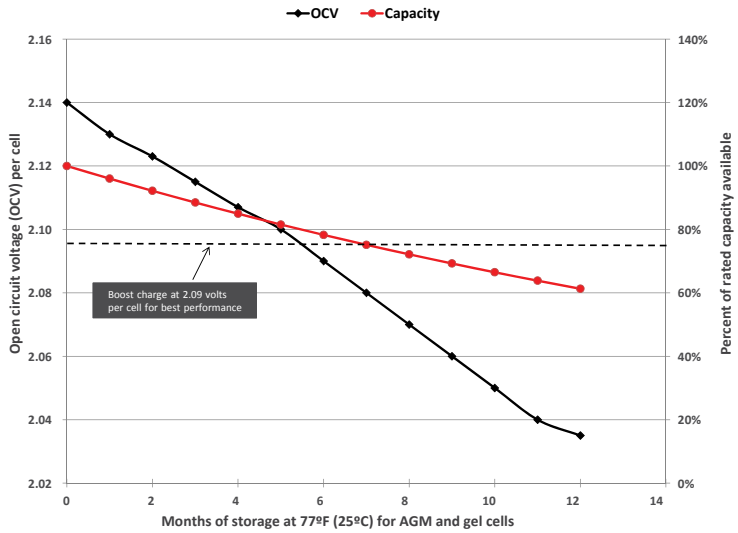
While the time needed for a boost charge will depend on the SOC the battery has dropped to, the boost charge voltage and maximum charge current allowed will be the same. The constant voltage charger's output voltage should be set at 2.40 volts per cell (VPC) or 14.4V for a 12V battery and the charge current must not be higher than 0.20 C_{20} amps where C_{20} is the capacity of the battery at the 20-hour rate of discharge, or a maximum charge current of 20A for a 100Ah battery at the C_{20} rate.

The graph shows the storage characteristics of lead calcium valve regulated lead acid (VRLA) cells. The optimum performance threshold OCV of 2.09 VPC is shown as a broken line on the graph.

The time needed to boost charge the cells is given by the equation below. For example, a 100Ah battery taken down to a 25% depth of discharge (DOD) or 75% SOC will need to be boost charged for 7½ hours with a 10A charger or for 6¼ hours if a 20A charger is used instead.

$$\text{Boost Charge Time in Hours} = \left(\frac{\text{DOD X Capacity at 20 - hr rate}}{\text{Maximum Charge Current}} + 5 \right)$$

STORAGE CHARACTERISTICS OF AGM AND GEL BATTERIES



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