

Battery Storage

Date: April 22, 2014

Affected models: All Lead Acid & AGM battery operated machines.

Classification Level: 5

Topic: Battery failure due to extended storage.

Recommendation: If a battery operated machine that contains Lead Acid or AGM batteries sits idle for longer than 1 month, it is recommended to charge the battery pack monthly. Also be sure to check the fluid level on Lead Acid batteries prior to the monthly charge.

- Lead Acid & AGM batteries must always be stored with a full charge!
- Storage will always cause batteries to age but low temperature & a full “State of Charge” (SoC) will slow the aging effects.
- The chart below shows the estimated recoverable capacity of a battery after 6 months of storage without a full SoC depending on room temperature.
 - Example: if a battery is stored without a full charge for 6 months at a temperature of **104° F**, 38% of the batteries charge capacity could be permanently lost which will greatly affect the overall run time of the battery and its life span.

Temperature

Recoverable Capacity

32° F / 0° C	97 %
77° F / 25° C	90 %
104° F / 40° C	62 %
140° F / 60° C	38 %

- Recommended storage Temperature is 59° F (15° C).
- Keep cells above 2.10 volts which equates to 12.6 volts per battery or 37.8 volts for a 36 volt battery pack (3 – 12 volt batteries).
- Applying a top charge monthly while batteries are in storage prevents sulfation.
 - Sulfation is the formation of large crystals that occur if batteries are stored in a discharged state or with low state of charge. These crystals form at the electrodes and are very difficult to convert back into lead & sulphuric acid. Sulfation causes a permanent loss of capacity of the battery.

Level 5 classification is defined as a recommendation or for informational purposes only. This is not a manufacturing defect. Windsor will not share the repair costs under warranty accommodation.