C&D TECHNOLOGIES

VRLA Batteries
Engine Starting Applications

Please Note: The information in this technical bulletin was developed for C&D Dynasty 12 Volt VRLA products. While much of the information herein is general, larger 2 Volt VRLA products are not within the intended scope.

The typical starting, lighting and ignition (SLI) battery used in automotive engine starting applications is designed with the maximum possible number of thin plates per cell. As a result, more cranking current can be supplied by the battery however it may have a short life expectancy when subjected to continuous charging as in stand-by power float service. Further, as a result of having a liquid electrolyte, on continuous float charge there will be a water loss from the electrolyte due to gassing and a resulting requirement to periodically add make up water to the battery cells. These SLI batteries are sometimes used in continuous float applications for starting standby generators and usually with poor results.

The valve regulated lead acid (VRLA) batteries are intended to provide long service life while on a continuous float charge as a result of having much thicker plates. However, this also results in lower cranking amp's than the typical SLI battery. Further, these VRLA batteries have an immobilized electrolyte and implement an oxygen recombination cycle to minimize gassing and eliminate electrolyte maintenance.

There are times when a user wishes to replace a liquid electrolyte SLI lead acid battery with a VRLA battery in hopes of achieving longer life and eliminating the battery electrolyte maintenance. However, when specifying a VRLA battery for standby power engine starting applications, four important aspects of application must be considered:

1. The charging system must be of the constant voltage - current limited type for VRLA batteries.

2. The charging system must be set to the recommended float voltage value 13.5 to 13.8 volts DC average per 12 volt series connected VRLA battery.

3. The installation should be in a ventilated area such that the VRLA battery is not exposed to excessive heat, such as next to the engine block or radiator, and that emitted gasses can not accumulate.

4. The VRLA battery will have different terminations than the SLI battery being replaced. If the wet SLI battery being replaced required frequent watering it may have been due to the type of charger utilized or that the environment of the battery was excessively warm. In these situations the cause of the SLI battery premature failures must be corrected prior to installation of the VRLA battery.

The SLI battery being replaced is typically identified by BCI group size, cold cranking amperes, marine cranking amperes or minutes reserve capacity.

The BCI (Battery Council International) group size simply defines a standard set of physical dimensions for the container. The group size does not define the performance of the battery. A particular group size could contain any of a variety of plate designs and number of plates per cell, which would result in significantly different performance.

The cold cranking rating (CCA) is the amperes a battery can produce for 30 seconds at 0° F (-17.8°C) to a final voltage of 1.2 volts per cell (7.2 volts for a 12 volt battery).

The marine cranking rating (MCA) is the amperes a battery can produce for 30 seconds at 32° F (0°C) to a final voltage of 1.2 volts per cell.

The reserve capacity is the number of minutes the battery can supply 25 amperes at 80°F (26°C) until the voltage declines to 1.75 volts per cell (10.5 volts for a 12 volt battery). This provides a general idea of how long the battery could supply the automobile electrical system in the event of an alternator failure.

Engine starting SLI batteries are not typically rated in ampere-hours capacity.

Model	Amp Hour capacity @ 20 hours rate to 1.75 V/C	Approximate Cold Crank Amperes	Approximate Marine Cranking Amperes	BCI Group Size	Reserve Minutes at 25 amperes to 1.75 V/C
BBG-165 RT	86	430	516	27	165
BBG-180 RT	92	460	552	31	180

With the AGM (UPS series) products, the CCA is approximately 7.5 times the 20 hour rated ampere-hour capacity while the MCA is approximately 122% of the CCA ampere rating. Again the actual CCA performance of the battery is a function of the design of the specific batteries plates and "top lead".

Model	Amp Hour capacity @ 20 hours rate to 1.75 V/C	Approximate Cold Crank Amperes	Approximate Marine Cranking Amperes	BCI Group Size	Reserve Minutes at 25 amperes to 1.75 V/C
UPS 12-100MR	26	190	230	U-2	38
UPS 12-150MR	34	220	265	U-1	58
UPS 12-210MR	53	430	515	22NF	100
UPS 12-300MR	78	650	780	24	140
UPS 12-350MR	93	825	990	27	160
UPS 12-400MR	103	1000	1200	29	180
UPS 12-490MRLP	115	1000	1200	29	220
UPS 12-490MR	141	920	1104	99	280
UPS 12-540MR	149	1050	1260	99	300
UPS 6-620MR	200	1300	1560	4	425

While the UPS series batteries were not designed with engine starting as the intended application, certainly they can be used for this purpose when longer float service life and freedom from electrolyte maintenance are the criterion.

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