

Technical Report Executive Summary:

“Canadus Power Systems HD-1224 and Desulfation Explained”

In a June 19, 2018 technical report, Canadus Power Systems explains how sulfation occurs and how it can be removed in vehicular lead-acid batteries. Prepared by Dan Biggs, Canadus VP of Technology, this report includes original laboratory and commercial field test work conducted by Canadus and is further supported by test work done by others as reported in technical publications.

Part of the report discusses the phenomena of lead-acid battery “application capacity™”, whereby the actual battery capacity is based on the vehicular application (affected by the charging voltage and duty cycle), and which can differ greatly from the rated capacity. The report explains how the gap between the application capacity™ and the rated capacity of a battery leads to the formation of large, stable lead-sulfate crystals (sulfation).

Other report topics include:

- The practice of constant current charging recommended by battery manufacturers
- Charging on commercial vehicles which leads to the application capacity™
- Formation of sulfation and how to reverse sulfation
- How the Canadus HD-1224 works and its effects on new and used batteries

With regards to sulfation, dozens of batteries at Canadus have been cycled through a variety of charge and discharge tests to study the difference between the behavior of the initially formed small crystals of reactive lead sulfate (PbSO_4) and the larger, more stable and less reactive lead sulfate crystals which form over time. The report explains why sulfation occurs and how it can be reversed by increased voltage in bench tests, and in actual practice by using the Canadus HD-1224 battery reconditioner in combination with the application voltage. The following conclusions are drawn from this report:

- A commercial vehicle’s application capacity™ is significantly lower than rated capacity
- Sulfation can be reversed by intense charging at higher voltages, but this is not practical on vehicles
- The Canadus HD-1224 battery reconditioner works in combination with application charging to prevent and/or reverse sulfation

The report is intended for commercial vehicle OEM technical personnel. Because of the proprietary nature of the information contained, Canadus requires a Non-Disclosure Agreement to be executed to prior to reviewing the report.

Dr. Jack A. Scott
CEO, Canadus Power Systems