

PUBLICATION:

***Electrical Arcs and Sparks: A Literature Review of Definitions and Their Implications in the Analysis of 12 Volt Direct Current Electrical System Fires***

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SYNOPSIS:

Electrical failures commonly cause fires in vehicles and equipment. Surveys have been conducted regarding electrical fire events in the trucking industry to develop corrective maintenance practices. Survey responses determined that electrical failures accounted for approximately 17% of all reported truck fires. If the trucks were parked, with or without the engine running, 43% of all fires were caused by electrical failures. When considering all vehicle types, NFPA reports that an average of 267,600 reported U.S. vehicle fires occurred per year from 2003-2007. Of these, 23% were reportedly caused by electrical failure or malfunction.

This paper has three main purposes; (1) to research and aggregate the definitions of these terms and phenomena from published information, (2) to apply and compare the definitions and descriptions in terms of how they apply and vary in alternating current (AC) and direct current (DC) electrical systems of different voltage levels, and (3) to discuss how these definitions and descriptions can be more appropriately used and applied to fire origin cause and determinations in the 12 volt DC electrical systems typically found in vehicles and vehicle equipment.