SAE International

# SURFACE VEHICLE STANDARD

SAE J156

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## Fusible Links

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## *1. Scope*

This standard covers supplemental requirements for low tension primary cable intended for use as Fusible Links (Fuse Links) at a nominal system voltage of 60 V DC (25 V AC) or less in surface vehicle electrical systems. These supplemental requirements are intended to qualify cables for an extreme current overload.

### 1.1 Rationale

This document is being revised to include the following:

- Update format

## *2. References*

### 2.1 Applicable Publications

The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply.



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2.1.1 SAE PUBLICATIONS

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

SAE J537—Storage Batteries
SAE J1128—Low Voltage Primary Cable
SAE J1678—Low Voltage, Ultra Thin Wall Primary Cable

**2.2 Related Specifications**

The following publications are provided for information purposes only and are not a required part of this specification.

2.2.1 SAE PUBLICATIONS

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

SAE J1127—Low Voltage Battery Cable
SAE J1292—Automobile, Truck, Truck-Tractor, Trailer, and Motor Coach Wiring

2.2.2 ASTM DOCUMENTS

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM B 1—Standard Specification for Hard-Drawn Copper Wire
ASTM B 3—Standard Specification for Soft or Annealed Copper Wire
ASTM B 8—Concentric-Lay-Stranded Copper conductors, Hard, Medium-Hard, or Soft
ASTM B 33—Standard Specification for Tinned Soft or Annealed Copper Wire
ASTM B 174—Standard Specification for Bunch-Stranded Copper Conductors for Electrical Conductors
ASTM B 263—Method for Determination of Cross-Sectional Area of Standard Conductors
ASTM B 298—Standard Specification for Silver-Coated Soft or Annealed Copper Wire
ASTM B 354—Definitions of Terms Relating to Uninsulated metallic Electrical Conductors
ASTM B 355—Standard Specification for Nickel-Coated Soft or Annealed Copper Wire
ASTM B 452—Standard Specification for Copper-Clad Steel Wire for Electronic Application
ASTM B 787—19 Wire Combination Unilay-Stranded Copper Conductors for Subsequent Insulation
ASTM D 412—Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers—Tension
ASTM D 471—Standard Test Method for Rubber Property—Effect of Liquids
ASTM D 573—Standard Test Method for Rubber—Deterioration in an Air Oven
ASTM E 145—Standard Specification for Gravity-Convection and Forced-Ventilation Ovens
ASTM F 1251—Standard Terminology Relating to Polymeric Biomaterials in Medical and Surgical Device

## *3. Definitions*

### 3.1 Coated Wire

Wire comprised of a given metal covered with a relatively thin application of a different metal. (ASTM B 354)

### 3.2 Fusible Link (Fuse Link)

A section of low tension cable designed to open the circuit when subjected to an extreme current overload. Its purpose is to minimize wiring system damage when such an overload occurs.

### 3.3 Low Voltage

Usually considered to be ≤ 60 V DC (25 V AC).

### 3.4 Short Circuit

An accidental electrical connection between a feed circuit and a return circuit resulting in an extreme current overload.

## *4. General Requirements*

The cable should meet the applicable requirements of SAE J1128, or J1678. Cables other than those defined in SAE J1128, or J1678 may be used if they meet the functional requirements described in Sections 5.1 and 5.2.

### 4.1 Conductor

When bare or coated copper conductor is used, the conductor shall meet the requirements of SAE J1128 or J1678. When conductors other than copper or coated copper are used, the conductors must meet the functional requirements described in Section 5.

### 4.2 Insulation

Regardless of the type of insulating material used, the fusible link shall meet the performance requirements of SAE J1128, Type TWP for dielectric (withstand voltage), cold bend, flame, fluid compatibility, pinch and abrasion. When the conductor size of the fusible link does not match one found in SAE J1128 or J1678, the next larger size shall be used.

## *5. Additional Requirements*

Applications of fusible links are to be verified through mathematical modeling or experimentally in the vehicle or with an equivalent laboratory set up. The procedure for the laboratory set ups are described below. The fusible link cable must meet the requirements of the laboratory set up.