SURFACE VEHICLE STANDARD

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Superseding J2549 MAR2016

Single Conductor Cable for Heavy-Duty Applications - Truck and Bus

RATIONALE

SAE J2549 has been revised with the following changes:

Table 1 relocated to Section 5 where referenced in the document.

Table 1 added “All” “Types” to include all temperature classes.

Table 1 simplified SAE Wire Size description.

FOREWORD

This document is intended as a supplement to the SAE J1127 and SAE J1128 standards as a means of assuring the dimensional and performance needs associated with the unique demands of heavy-duty truck, trailer, and converter dolly electrical systems.

1. SCOPE

This SAE Standard establishes the minimum construction and performance requirements for single conductor cable for use on trucks, trailers, and converter dollies.

2. REFERENCES

2.1 Applicable Documents

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

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

SAE J1127 Low Voltage Battery Cable

SAE J1128 Low Voltage Primary Cable

SAE J2394 Seven Conductor Cable for ABS Power - Truck and Bus

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
Tel: +1 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
SAE WEB ADDRESS: **http://www.sae.org**

For more information on this standard, visit
https://www.sae.org/standards/content/J2549_202012

2.1.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org

ASTM B3 Specification for Soft or Annealed Copper Wire

3. DEFINITIONS

Refer to the definitions contained in SAE J1127 and SAE J1128.

4. GENERAL

4.1 Cable Types

Due to the variation in the performance demands of cables used in different applications within the truck-trailer system, this document addresses various types of cables, determined by their mode of installation and working environment. These are summarized in SAE J1127 and SAE J1128.

4.2 Identification

Packaging containing cable conforming to this document shall be identified with the manufacturer's identification, and shall be identified with SAE J2549 along with the cable type as described in SAE J1127 and SAE J1128. The cable itself is not to be marked, as this may conflict with circuit identification marking.

5. GENERAL SPECIFICATIONS

5.1 Conductors

5.1.1 Material

All conductors shall be of stranded, soft-annealed copper, complying with ASTM B3, SAE J1127, and SAE J1128. The surface finish shall be sufficiently free of imperfections to enable effective terminal crimping and splicing.

5.1.2 Cross-Sectional Area

The cross-sectional area of stranded conductors shall conform to the values specified in SAE J1127 and SAE J1128. Where a higher current-carrying capacity is required, the user may specify the larger cross-sectional area such as that outlined in SAE J2394 (which covers three popular conductor sizes) after consideration of the effect on terminal crimp dimensions and connectors.

5.1.3 Stranding

The individual strands contained within a conductor shall be of the same nominal diameter. The number of strands is dependent on the flexibility and flex-life requirements for specific applications with a greater number of strands used in applications involving repeated flexing.

5.1.4 Conductor Splicing

If required, conductor splicing shall meet the requirements outlined in SAE J1127 and SAE J1128, as well as those noted below.

5.1.4.1 Single strand splices are not to be closer together than 20 times the conductor diameter in a bunched or concentric stranded conductor and 200 times the conductor diameter in a rope-lay construction and there shall be no more than three single strand splices per 3 m of conductor.

5.1.4.2 Whole conductor splices shall not exceed a frequency of one splice per 30000 m of cable.

5.2 Insulation

5.2.1 Material Physical Properties

The physical properties of the insulation for each cable type shall comply with the requirements as outlined in the "Mechanical Properties" section of SAE J1127 and SAE J1128.

5.2.2 Application

Insulation shall be applied in compliance with SAE J1127 and SAE J1128. The surface finish shall be free of imperfections such as indentations, voids, nicks, cuts, and roughness, and the eccentricity and perimeter of the cable shall be sufficiently uniform to enable the effective sealing of standard connectors.

5.2.3 Insulated Conductor Outside Diameter

The outside diameter of each insulated conductor shall be measured in accordance with the methods outlined in SAE J1127 and SAE J1128. The mean of the diameter readings shall determine the finished insulated conductor diameter and shall be in accordance with SAE J1127 and SAE J1128, except where identified in Table 1.

5.2.4 Wall Thickness

The minimum wall thickness at any point shall be measured in accordance with the method outlined in SAE J1127 and SAE J1128. All individual wall thickness values must be in accordance with SAE J1127 and SAE J1128, except where identified in Table 1.

Table 1 - Outside diameter and minimum wall thickness
(see 5.2.3 and 5.2.4)

SAE Wire Size	All TWP TXL Types				All GPT GXL Types				All SXL Types			
	Min. Wall mm	Max OD mm	Min. Wall in	Max OD in	Min. Wall mm	Max OD mm	Min. Wall in	Max OD in	Min. Wall mm	Max OD mm	Min. Wall in	Max OD in
24	0.29	1.50	0.012	0.061	- per SAE J1128 -				- per SAE J1128 -			
22	0.29	1.70	0.012	0.068	- per SAE J1128 -				- per SAE J1128 -			
20	0.29	1.90	0.012	0.075	0.47	2.29	0.019	0.090	0.62	2.57	0.025	0.101
18	0.29	2.11	0.012	0.083	0.47	2.41	0.019	0.095	0.65	2.82	0.026	0.111
16	- per SAE J1128 -				0.46	2.82	0.018	0.111	0.69	3.18	0.027	0.125
14	- per SAE J1128 -				0.46	3.07	0.018	0.121	0.76	3.68	0.030	0.145
12	- per SAE J1128 -				0.53	3.66	0.021	0.144	0.81	4.27	0.032	0.168
10	0.37	4.06	0.015	0.160	0.65	4.52	0.026	0.178	0.90	5.00	0.036	0.197
8	0.42	4.90	0.017	0.193	0.80	5.69	0.032	0.224	0.95	5.84	0.038	0.230

SAE Wire Size	All STT STX STR Types				All SGT SGX SGR Types			
	Min. Wall mm	Max OD mm	Min. Wall in	Max OD in	Min. Wall mm	Max OD mm	Min. Wall in	Max OD in
6	0.86	7.54	0.034	0.297	1.14	8.48	0.045	0.334