

	SURFACE VEHICLE STANDARD	SAE J1654 OCT2012
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		Superseding J1654 SEP2004
Unshielded High Voltage Primary Cable		

RATIONALE

Added, “unshielded” to the title and scope for clarification of the specification.

Allowed voltages up to 1000 V DC or AC rms

Updated definition of plastic and referenced ASTM D-833 versus ASTM F-1251

Removed non-applicable definitions

Removes SAE J1292 from related or referenced specifications

Updated definition of thermoset

Updated format and spelling in Figure 1

Clarified text in Clauses 5.4 and 5.5 and Figure 2

Added values for 1000 V Cable to Figure 1

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1. SCOPE

This SAE Standard covers unshielded cable intended for use at a nominal system voltage up to 600 V or 1000 V (AC rms or DC). It is intended for use in surface vehicle electrical systems.

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 724-776-4970 (outside USA), www.sae.org.

SAE J1127 Low Voltage Battery Cable

SAE J1128 Low Voltage Primary Cable

SAE J1678 Low Voltage Ultra Thin Wall Primary Cable

SAE Dictionary of Materials and Testing

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 B 354 Standard Terminology Relating to Uninsulated Metallic Electrical Conductors

ASTM F 1251 Standard Terminology Relating to Polymeric Biomaterials in Medical and Surgical Device

2.1.3 IEC Publication

Available from ANSI, 25 West 43rd Street, New York, NY 10036-8002, Tel: 212-642-4900, www.ansi.org.

IEC, Electricity, Electronics and Telecommunications, Multilingual Dictionary

2.2 Related Publications

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 International, 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 J156 Fusible Links

SAE J1673 High Voltage Automotive Wiring Assembly Design

SAE J2501 Round, Screened and Unscreened, 60 V and 600 V Multi-Core Sheathed Cables

2.2.2 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 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 174 Standard Specification for Bunch-Stranded Copper Conductors for Electrical Conductors

ASTM B 787 19 Wire Combination Unilay-Stranded Copper Conductors for Subsequent Insulation

2.2.3 ISO Publications

Available from ANSI, 25 West 43rd Street, New York, NY 10036-8002, Tel: 212-642-4900, www.ansi.org.

ISO 6722 Road vehicles - 60 V and 600 V single core cables - Test methods, dimensions and requirements

ISO 14572 Road vehicles - Round, screened and unscreened, 60 V and 600 V multicore sheathed cables - Basic and high performance test methods and requirements

3. DEFINITIONS

3.1 ADDITIONAL MASS (ref. "Resistance to Sandpaper Abrasion" test)

The mass which is applied to the support rod. The combination of the forces exerted by the additional mass and the 0.63 N exerted by the remaining apparatus (bracket, support rod, and pivoting arm) is applied to the cable.

3.2 COATED WIRE

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

3.3 CABLE

See primary cable.

3.4 CABLE FAMILY

A group with multiple conductor sizes having the same conductor strand coating, insulation formulation, and wall thickness type.

3.5 CONDUCTOR

A wire or combination of wires not insulated from one another, suitable for carrying an electrical current. (ASTM B 354)

3.6 CONDUCTOR SIZE

See "SAE Conductor Size".

3.7 CORE

One of the components in an assembly. A component may be an uninsulated conductor, an insulated conductor, a twisted pair, a shielded assembly, a coaxial cable, or any finished cable.

3.8 FLUID COMPATIBILITY

The ability of a cable to resist the effects of various fluids found in surface vehicles.

3.9 HOT PLATE

An electrically heated device used to test thermoset cables.

3.10 LOW VOLTAGE (Low Tension)

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

3.11 MINIMUM WALL (Thickness)

The lowest allowable insulation thickness at any point.

3.12 NOMINAL

Name or identifying value of a measurable property by which a conductor or component or property identified, and to which tolerances may be applied.

3.13 PLASTICS

A material that contains as an essential ingredient one or more organic polymeric substances of large molecular weight, is solid in its finished state, and, at some stage in its manufacture or processing into finished articles, can be shaped by flow.

3.14 PRIMARY CABLE

The single or multi-stranded, single conductor, insulated cable used to carry electric current, by attachment to the low voltage side of an ignition coil in surface vehicles.

3.15 RESISTANCE TO OZONE

The ability of a material to withstand the deteriorating effect of ozone (surface cracking). (Dictionary of Materials and Testing)

3.16 SAE CONDUCTOR SIZE

A system that indicates the cross sectional area of the conductor. The "SAE Conductor Size" is the approximate area of the conductor.

3.17 SEPARATOR

A thin layer used as a barrier to prevent mutually detrimental effects between different components of a cable such as between the conductor and insulation or between the insulation and the sheath. (IEC, Electricity, Electronics and Telecommunications, Multilingual Dictionary)

3.18 STRIP FORCE

The peak axial force required to overcome the adhesion between the conductor and the insulation.

3.19 STRAND

See "Wire".

3.20 TCR, Temperature Class Rating

A class designation based on the retention of "Mechanical Properties" (tensile and elongation) after 168 h of heat aging at 30 °C above the temperature class rating.

3.21 Thermoplastic

A plastic capable of being softened by heating and hardened by cooling through a temperature range characteristic of the plastic and, in the softened state, capable of being repeatedly shaped by flow into articles by molding, extrusion or forming. (IEC, Electricity, Electronics and Telecommunications, Multilingual Dictionary)