



SURFACE VEHICLE STANDARD

J2030

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Superseding J2030 JUN2009

Heavy-Duty Electrical Connector Performance Standard

RATIONALE

Updated MIL specification reference with EIA specification.

FOREWORD

NOTICE: Some test procedures are potentially dangerous. SAE Technical Reports do not purport to address all of the safety problems, if any, associated with their use. It is the responsibility of the user of an SAE Technical Report to establish and employ appropriate safety practices. Tests should only be conducted by individuals who have been properly trained in the test procedure and who are aware of any hazards which might be present. Appropriate safety and health precautions must be employed when conducting any test.

1. SCOPE

This SAE Standard encompasses connectors between two cables or between a cable and an electrical component and focuses on the connectors external to the electrical component. This document provides environmental test requirements and acceptance criteria for the application of connectors for direct current electrical systems of 50 V or less in the majority of heavy-duty applications typically used in off-highway machinery. Severe applications can require higher test levels, or field-testing on the intended application.

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 J163 Low Tension Wiring and Cable Terminals and Splice Clips

SAE J726 Air Cleaner Test Code

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http://www.sae.org/technical/standards/J2030_201506**

SAE J1455 Recommended Environmental Practices for Electronic Equipment Design in Heavy-Duty Vehicle Applications

SAE J1614 Wiring Distribution Systems for Construction, Agricultural, and Off-Road Work Machines

2.1.2 ASABE Publication

Available from the American Society of Agricultural and Biological Engineers, 2950 Niles Road, St. Joseph, MI 49085-9659, Tel: 269-429-0030, www.asabe.org.

ASAE455 Environmental Considerations in Development of Mobile Agricultural Electrical/Electronic Components

2.1.3 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 D 471 Standard Test Method for Rubber Property - Effect of Liquids

ASTM G 153 Standard Practice for Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials

ASTM G 154 Standard Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials

2.1.4 EIA Standard

Available from the Global Documents, 15 Iverness Way East, Englewood, CO 80112-5704, USA, Tel: 303-397-7956, 800-854-7179, <http://global.ihs.com/>

EIA-364-23 Low-Signal Level Contact Resistance

2.2 Related Publications

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

2.2.1 API Publication

Available from API, 1220 L Street, NW, Washington, DC 20005-4070, Tel: 202-682-8000, www.api.org.

API 1560 Lubricant Service Designation for Automotive Manual Transmissions and Axles

2.2.2 ISO Publication

Available from American National Standards Institute, 25 West 43rd Street, 4th Floor, New York, NY 10036, Tel: 212-642-4900, www.ansi.org.

ISO 8092 Road Vehicles - Connections for On-Board Electrical Harnesses

3. DEFINITIONS

3.1 CONNECTOR

A coupling device, which provides an electrical junction, a mechanical junction, or both, between two cables or between one or more cables and an electrical component. Connectors can also provide for mechanical stability and geometric arrangement.

3.2 TERMINAL

An electrically conductive device attached to a cable to facilitate connection to an electrical component, cable, or termination.

3.3 SEALED

A system that creates a nonleaking union between mechanical elements when submerged in a water solution as defined in the tests within this document.

3.4 SIGNAL LEVEL CIRCUIT

A circuit in which open circuit voltage is typically less than 5 V and current is typically less than 0.05 A. Circuits of this energy level typically are not able to break through oxides, sulfides, or other contaminants, which can build up on the contact surfaces and prevent continuity.

3.5 POWER CIRCUIT

A system using two or more cables where current flows from the source to one or more electronic/electrical devices and back again to the source. The electrical energy is supplied at high levels of current and typical system voltage (system battery voltage).

3.6 CABLE

Insulated stranded electrical conductor used to establish a single current path.

3.7 WIRING

Collectively, the cables, harnesses, connectors, terminations, and supporting components used in the electrical wiring distribution system.

4. SAMPLE PREPARATION

Samples shall be made on the connector manufacturer's recommended tooling and checked for conformance to the connector manufacturer's standards.

4.1 Assembly

All connector cavities shall be wired with manufacturer's minimum approved cable outside diameter size except for test groups 'A' and 'D' which shall be be wired with manufacturer's maximum approved conductor size in lengths sufficient to accommodate testing. Cable diameter shall be checked and be within the connector's manufacturing specification. Crimp characteristics (i.e., height, width, etc.) shall be checked. To prevent capillary action on sealed connectors, all loose wire ends and test points (i.e., millivolt test connection) shall be sealed with alcohol-base RTV silicone or equivalent.