



SURFACE VEHICLE RECOMMENDED PRACTICE

J2698™

JUN2022

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Superseding J2698 OCT2018

Primary Single Phase Nominal 120 VAC
Wiring Distribution Assembly Design - Truck and Bus

RATIONALE

SAE J2698 has been reaffirmed to comply with the SAE Five-Year Review policy.

1. SCOPE

- 1.1 This SAE Recommended Practice covers the design and application of primary on-board wiring distribution system harnessing for surface vehicles. This document is intended for single phase nominal 120 VAC circuits that provide power to truck sleeper cab hotel loads so that they may operate with the main propulsion engine turned off. The power supply comes from alternative sources such as land-based grid power, DC-AC inverters and auxiliary power generators. The circuits may also provide power to improve vehicle performance through charging batteries or operating cold-weather starting aids.
- 1.2 This document is not intended to provide guidance for electric or hybrid electric vehicle wiring circuits. Refer to SAE J1673 for high voltage automotive wiring assembly design.
- 1.3 Engine block heaters are 120 VAC devices that are used on a multitude of vehicle platforms in addition to trucks with sleeper cabs. Generally, the engine block heater circuit is wired independent of hotel loads. SAE J2698 does not apply to independently wired engine block heater circuits. Engine block heaters that are integrated with hotel loads are subject to the guidelines in this recommended practice.
- 1.4 It is understood that drivers may choose to operate 120 VAC devices with the truck moving or at rest. For example, a passenger may operate the microwave or watch television and need to operate an inverter. The environment that these devices are operated in can also vary with exterior ambient temperature extremes. Exposure to oil and vibration are other elements that typical household 120 VAC wiring would not normally be exposed to; therefore, the construction of this power distribution is made more robust for a mobile trucking environment. Driver interaction with the 120 VAC power through use of appliances or connection of cord sets requires special attention to safety aspects dictated in regulatory standards from Nationally Recognized Testing Laboratories (NRTLs) approved labs like Underwriter's Laboratories (UL), Canadian Standards Association (CSA) or from the National Electric Code (NEC) that are not common practice with typical 12 VDC vehicle wiring. This recommended practice supports that all electrical materials, devices, components, appliances, fittings and equipment shall be Listed, Labeled or Certified to UL and CSA standards and shall be connected in an approved manner when installed. Detailed requirements are listed hereafter.

2. REFERENCES

2.1 Applicable Publications

The following publications form a part of this specification to the extent specified herein. Any undated reference to a code or standard appearing in the requirements of this document shall be interpreted as referring to the latest edition of that code or standard.

SAE Executive Standards Committee Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

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Full document details: SAE J2698_202206

For more information on this standard, visit
https://www.sae.org/standards/content/J2698_202206/

Documents

Document Sharing Hub

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 J447	Prevention of Corrosion of Motor Vehicle Body and Chassis Components
SAE J560	Primary and Auxiliary Seven Conductor Electrical Connector for Truck-Trailer Jumper Cable
SAE J1128	Low Voltage Primary Cable
SAE J1455	Recommended Environmental Practices for Electronic Equipment Design in Heavy-Duty Vehicle Applications
SAE J1654	High Voltage Primary Cable
SAE J1673	High Voltage Automotive Wiring Assembly Design
SAE J1742	Connections for High Voltage On-Board Road Vehicle Electrical Wiring Harnesses—Test Methods and General Performance Requirements
SAE J1908	Electrical Grounding Practice
SAE J2223-2	Connections for On-Board Road Vehicle Electrical Wiring Harnesses—Part 2: Tests and General Performance Requirements

2.1.2 Underwriters Laboratories, Inc. Publications

Available from Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096, Tel: 847-272-8800, www.ul.com.

UL 20	Standard for General-Use Snap Switches
UL 50	Standard for Enclosures for Electrical Equipment
UL 62	Standard for Flexible Cord and Fixture Wire
UL 83	Standard for Thermoplastic-Insulated Wires and Cables
UL 310	Standard for Electrical Quick-Connect Terminals
UL 467	Electrical Grounding and Bonding of Equipment
UL 489	Standard for Molded-Case Circuit Breakers and Circuit-Breaker Enclosures
UL 498	Standard for Attachment Plugs and Receptacles
UL 514A	Standard for Outlet Boxes
UL 514B	Standard for Fittings for Conduit and Outlet Boxes
UL 514C	Standard for Outlet Boxes, Flush-Device Boxes and Covers, Nonmetallic
UL 817	Standard for Cord Sets and Power-Supply Cords
UL 943	Standard for Ground Fault Circuit Interrupters
UL 1077	Supplementary Protectors for use in Electrical Equipment

2.1.3 National Fire Protection Association Publication

Available from the National Fire Protection Agency, 1 Batterymarch Park, Quincy, MA 02169-7471, Tel: 617-770-3000, www.nfpa.org.

ANSI/NFPA 70-2008 National Electrical Code (NEC)

2.1.4 Canadian Standards Association Publications

Available from Canadian Standards Association, 170 Rexdale Boulevard, Toronto, Ontario, Canada M9W 1R3, www.csa.ca.

- C22.1 Canadian Electrical Code—Part 1, Electrical installations (CEC)
- C22.2 No. 0 General Requirements—CEC Part II
- C22.2 No. 0.4 Bonding and Grounding of Electrical Equipment
- C22.2 No. 5 Molded-Case Circuit Breakers, Molded-Case Switches and Circuit Breaker Enclosures
- C22.2 No. 18 Outlet Boxes, Conduit Boxes, Fittings and Associated Hardware
- C22.2 No. 21 Cord Sets and Power Supply Cords
- C22.2 No. 42 General Use Receptacles, Attachment Plugs and Similar Wiring Devices
- C22.2 No. 49 Flexible Cords and Cables
- C22.2 No. 65 Wire Connectors
- C22.2 No. 75 Thermo-Plastic Insulated Wires and Cables
- C22.2 No. 94 Special Purpose Enclosures
- C22.2 No. 111 General-Use Snap Switches
- C22.2 No. 144 Ground Fault Circuit Interrupters
- C22.2 No. 152 Quick Connect Terminals
- C22.2 No. 235 Supplementary Protectors

2.1.5 National Electrical Manufacturers Association

Available from the National Electrical Manufacturers Association, 1300 North 17th Street, Suite 1847, Rosslyn, VA 22209, Tel: 703-841-3200, www.nema.org.

NEMA WD6 2000 Wiring Devices—Dimensional Specifications

3. DEFINITIONS

3.1 Arc Fault

Discharges of current from one conductor to another in varying amounts of energy that result in some form of circuit damage or hazard.