SAE standards stand ready to serve industry’s growing need for globally harmonized standards solutions. As a leading consensus standards developer and through consortia work developing and approving standards for and from the U.S. market, SAE standards:

- Reduce Costs
- Improve Quality
- Strengthen Your Competitive Advantage
- Improve Safety
- Facilitate Innovation
- Increase Speed-To-Market

Volume 2, 2009

Turn the page to explore the automotive electronics standards available today through SAE.
Accessories

J1239 Four-, Five-, and Eight-Conductor Electrical Connectors for Automotive Type Trailers
J563 Standards for 12 Volt Cigarette Lighters, Power Outlets, and Accessory Plugs

Architecture

J2356 A Graphical Model for Interactive Distributed Control
J2186 E/E Data Link Security
J2546 Model Specification Process Standard
J2056/3 Selection of Transmission Media
J2524 Vehicle Network Protocol Survey
J2748 VHDL-AMS Statistical Analysis Packages

Cables

J2183 60 V and 600 V Single Core Cables
J2863 Automotive Trailer Tow Connector
J156 Fusible Links
J163 Low Tension Wiring and Cable Terminals and Splice Clips
J1127 Low Voltage Battery Cable
J1128 Low Voltage Primary Cable
J1678 Low Voltage Ultra Thin Wall Primary Cable
J2031 High Tension Ignition Cable
J1654 High Voltage Primary Cable
J2840 High Voltage Shielded Primary Cable
J2032 Ignition Cable Assemblies
J2501 Round, Screened and Unscreened, 60 V and 600 V Multicore Sheathed Cables

Definitions/Terms/Naming Conventions

J831 Electrical Definitions
J1930 Electrical/Electronic Systems Diagnostic Terms, Definitions, Abbreviations, and Acronyms—Equivalent to ISO/TR 15031-2
J1416 Generator Terminal Labeling
J1213/1 Glossary of Vehicle Networks for Multiplexing and Data Communications
J139 Ignition System Nomenclature and Terminology
Electrical Systems

Battery

J1494 Battery Booster Cables
J2801 Comprehensive Life Test for 12V Automotive Storage Batteries
J2289 Electric Drive Battery Pack System: Functional Guidelines
J2464 Electric Vehicle Battery Abuse Testing
J2288 Life Cycle Testing of Electric Vehicle Battery Modules
J240 Life Test for Automotive Storage Batteries
J2185 Life Test for Heavy-Duty Storage Batteries
J1127 Low Voltage Battery Cable
J1797 Recommended Practice for Packaging of Electric Vehicle Battery Modules
J1798 Recommended Practice for Performance Rating of Electric Vehicle Battery Modules
J537 Storage Batteries
J1495 Test Procedure for Battery Flame Retardant Venting Systems
J2380 Vibration Testing of Electric Vehicle Batteries

Fuses

J2576 Blade Fuses – 42 V System
J1284 Blade Type Electric Fuses
J2736 Blade Type Electric Fuses
J554 Electric Fuses (Cartridge Type)
J2741 Fuses with Female Contacts – 32V System
J2778 Fuses With Bolt down Contacts – 32V Systems
J2781 Fuses with Bolt-In Contacts with Rated Voltage of 450V
J1888 High Current Time Lag Electric Fuses
J2077 Miniature Blade Type Electrical Fuses
J2294 Recommended Practices for Test and Performance of Auxiliary Fuses for High Voltage Road Vehicle Wiring Systems
Voltage
J541 Voltage Drop for Starting Motor Circuits
J539 Voltages for Diesel Electrical Systems
J2669 Voltage Regulators for Automotive-Type Generators
J2232 Vehicle System Voltage Initial Recommendations

42 Volt
J2622 Battery Connections for 42 Volt Electrical Systems Tests and General Performance Requirements
J2576 Blade Fuses - 42 V System
J2651 Jump Start Connections for 42 Volt Electrical Systems

Electrical Terminals
J858 Electrical Terminals Blade Type
J561 Electrical Terminals–Eyelet and Spade Type
J928 Electrical Terminals–Pin and Receptacle Type

Embedded Software
J2632 Embedded Software C Coding Practices
J2516 Embedded Software Development Lifecycle
J2734 Embedded Software Verification and Validation
J2640 General Automotive Embedded Software Design Requirements
J2602/3 LDF/NCF Data Definition and Format Recommended Practice
J2780 Model Based Embedded Systems Engineering
J2746 Software Assessment Repository
J2720 Software Development for Calibration and Manufacturing

EMC
J1113/1 Electromagnetic Compatibility Measurement Procedures and Limits for Components of Vehicles, Boats (Up to 15 M), and Machines (Except Aircraft) (16.6 Hz to 18 GHz)
J1113/2 Electromagnetic Compatibility Measurement Procedures and Limits for Vehicle Components (Except Aircraft) – Conducted Immunity, 15 Hz to 250 kHz – All Leads
J1113/3 Conducted Immunity, 250 KHz to 400 MHz, Direct Injection of Radio Frequency (Rf) Power
J1113/4 Immunity to Radiated Electromagnetic Fields-Bulk Current Injection (BCI) Method
J1113/11 Immunity to Conducted Transients on Power Leads
J1113/12 Electrical Interference by Conduction and Coupling – Capacitive and Inductive Coupling via Lines Other than Supply Lines


J1113/24  Immunity to Radiated Electromagnetic Fields; 10 KHz to 200 MHz – Crawford Tem Cell and 10 KHz to 5 GHz–Wideband Tem Cell


J1113/42  Electromagnetic Compatibility – Component Test Procedure – Part 42: Conducted Transient Emissions

J551/1  Performance Levels and Methods of Measurements of Electromagnetic Compatibility of Vehicles, Boats (up to 15 m), and Machines (16.6 Hz to 18 GHz)

J551/5  Performance Levels and Methods of Measurement of Magnetic and Electric Field Strength from Electric Vehicles, Broadband, 9 kHz to 30 MHz

J551/11  Vehicle Electromagnetic Immunity – Off Vehicle Source

J551/12  Vehicle Electromagnetic Immunity – On Board Transmitter Simulation

J551/13  Vehicle Electromagnetic Immunity – Bulk Current Injection

J551/15  Vehicle Electromagnetic Immunity – Electrostatic Discharge (ESD)

J551/16  Electromagnetic Immunity – Off-Vehicle Source (Reverberation Chamber Method) – Part 16: Immunity to Radiated Electromagnetic Fields

J551/17  Vehicle Electromagnetic Immunity – Power line Magnetic Fields


J1752/2  Measurement of Radiated Emissions from Integrated Circuits – Surface Scan Method (Loop Probe Method) 10 MHz to 3 GHz
**Environmental**

J2456  Mercury Switch Removal Process

**Electric Vehicle, PHEV, HEV**

J2293/1  Energy Transfer System for Electric Vehicles – Part 1: Functional Requirements and System Architectures
J2293/2  Energy Transfer System for Electric Vehicles – Part 2: Communication Requirements and Network Architecture
J2841  Definition of the Utility Factor for Plug-in Hybrid Electric Vehicles Using NHTS Data
J2758  Determination of the Maximum Available Power from a Rechargeable Energy Storage System on a Hybrid Electric Vehicle
J1772  SAE Electric Vehicle Conductive Charge Coupler
J1773  SAE Electric Vehicle Inductively Coupled Charging

**Battery**

J2289  Electric-Drive Battery Pack System Functional Guidelines
J2464  Electric Vehicle Battery Abuse Testing
J2288  Life Cycle Testing of Electric Vehicle Battery Modules
J1797  Recommended Practice for Packaging of Electric Vehicle Battery Modules
J1798  Recommended Practice for Performance Rating of Electric Vehicle Battery Modules
J2380  Vibration Testing of Electric Vehicle Batteries

**Emissions**

J1711  Recommended Practice for Measuring the Exhaust Emissions and Fuel Economy of Hybrid-Electric Vehicles

**Plug-in Vehicles**

J2847/1  Communication between Plug-in Vehicles and the Utility Grid
J2847/2  Communication between Plug-in Vehicles and the Supply
Safety

J2344 Guidelines for Electric Vehicle Safety Equipment (EVSE)
J2847/3 Communication between Plug-in Vehicles and the Utility Grid for Reverse Power Flow

Ignition System

J259 Ignition Switch
J973 Ignition Switch Measurements Procedure
J139 Ignition System Nomenclature and Terminology

Manifold Absolute Pressure Transducer

J1346 Guide to Manifold Absolute Pressure Transducer Representative Test Method
J1347 Guide to Manifold Absolute Pressure Transducer Representative Specification

On-Board Diagnostics

J1962 Diagnostic Connector Equivalent to ISO/DIS 15031-3: December 14, 2001
J2012 Diagnostic Trouble Code Definitions
J1979 E/E Diagnostic Test Modes
J1930 Electrical/Electronic Systems Diagnostic Terms, Definitions, Abbreviations, and Acronyms – Equivalent to ISO/TR 15031-2
J1978 OBD II Scan Tool – Equivalent to ISO/DIS 15031-4: December 14, 2001
J2819 TP2.0 Vehicle Diagnostic Protocol
J1699/2 OBD II Related SAE Specification Verification Test Procedures
J1699/3 OBD II Compliance Test Cases
J2809 Honda Diagnostic Serial Data Link Protocol – ABS/VSA System
J2818 Keyword Protocol 1281

Programmable ECUs

J2534/1 Recommended Practice for Pass-Thru Vehicle Programming
J2534/2 Optional Pass-Thru Features
J2534/3 Conformance Test Cases
Relays

J1744  280 Relay Footprint
J771   Automotive Printed Circuits
J2716  SENT Single Edge Nibble Transmission for Automotive Applications

Reliability

J1850  Class B Data Communications Network Interface
J1938  Design/Process Checklist for Vehicle Electronic Systems
J2837  Environmental Conditions and Design Practices for Automotive Electrical/Electronic Equipment: Reference Data from J1211 Nov 1978
J1213/2 Glossary of Reliability Terminology Associated With Automotive Electronics
J1211  Handbook for Robustness Validation of Automotive Electrical/Electronic Modules
J1879  Handbook for Robustness Validation of Semiconductor Devices in Automotive Applications
J2820  Modeling and Simulation Methods for Automotive Electrical/Electronic Components and Systems
J1699/1 SAE J1850 Verification Test Procedures
J2450/1 SAE J2450 Supplemental Training Document
J2128  The Reliability Disciplines
J2450  Translation Quality Metric

Spark Plugs

J549   Pre-ignition Rating of Spark Plugs
J2203  SAE 17.6 Cubic Inch Spark Plug Rating Engine
J548/1 Spark Plugs
J548/2 Spark Plug Installation Sockets
J2162  Spark Plug Heat Rating Classifications

Starter Motor

J2437  Air Starter Motor Test Procedure
J544   Electric Starting Motor Test Procedure
J1375  Starter Motor Application Considerations
J542   Starter Motor Mountings
J543   Starter Motor Pinions
        and Ring Gears
Switches

J1076  Backup Lamp Switch
J2108  Door Courtesy Switch
J235   Electric Blower Motor Switch
J234   Electric Windshield Washer Switch
J112   Electric Windshield Wiper Switch
J910   Hazard Warning Signal Switch
J564   Headlamp Beam Switching
J253   Headlamp Switch
J249   Mechanical Stop Lamp Switch
J589   Turn Signal Switch

Test Methods

J823   Flasher Test
J1346  Guide to Manifold Absolute Pressure Transducer Representative Test Method
J1253  Low-Temperature Cranking Load Requirements of an Engine
J2438  Low-Temperature Cranking Load Requirements of an Engine-Air Starter Method
J2544  Plug-In Relay Test Methods
J56    Road Vehicles – Alternators with Regulators – Test Methods and General Requirements
J1495  Test Procedure for Battery Flame Retardant Venting Systems
J2748  VHDL-AMS Statistical Analysis Packages

Vehicle Architecture for Data Communications

J2814  Firewire for Vehicle Applications
J2813  Flexray for Vehicle Applications
J2824  Goldilocks Serial Communication Protocol Design
J2561  Bluetooth Wireless Protocol for Automotive Applications

Vehicle Displays

J1757/1 Standard Metrology for Vehicle Displays
J1757/2 Standard Metrology for Vehicle Displays – Electrical Performance
J1758  Vehicular Flat Panel Display Module
Vehicle Event Data

J1698/1  Vehicle Event Data Interface-Output Data Definition
J1698/2  Vehicle Event Data Interface-Vehicular Data Extraction

Vehicle Networks

J2740  General Motors UART Serial Data Communications
J1213  Glossary of Vehicle Networks for Multiplexing and Data Communications
J2610  Serial Data Communication Interface

CAN

J2284/1  High Speed CAN (HSC) for Vehicle Applications at 125 Kbps
J2284/2  High Speed CAN (HSC) for Vehicle Applications at 250 Kbps
J2284/3  High-Speed CAN (HSC) for Vehicle Applications at 500 Kbps
J2866  SafeCAN: Using CAN in Real-time Deterministic and Safety-Critical Applications
J2411  Single Wire CAN Network for Vehicle Applications

Class A Multiplexing

J2057/1  Class A Application/Definition
J2057/2  Class A Multiplexing Actuators
J2057/3  Class A Multiplexing Sensors
J2057/4  Class A Multiplexing Architecture Strategies
Class B Data Communication Network Messages

J1850  Class B Data Communications Network Interface
J2178/1 Class B Data Communication Network Messages – Detailed Header Formats and Physical Address Assignments
J2178/2 Class B Data Communication Network Messages – Part 2: Data Parameter Definitions
J2178/3 Class B Data Communication Network Messages – Part 3: Frame IDs for Single-Byte Forms of Headers
J2178/4 Class B Data Communication Network Messages – Message Definitions for Three Byte Headers

LIN

J2602/1 LIN Network for Vehicle Applications
J2602/2 LIN Network for Vehicle Applications Conformance Test

Warning Lamps/Flashers

J1690 Flashers
J823 Flasher Test
J589 Turn signal switch

Wiring/Wiring Harnesses

J1292 Automobile, Truck, Truck-Tractor, Trailer, and Motor Coach Wiring
J1742 Connections for High Voltage On-Board Road Vehicle Electrical Wiring Harnesses – Test Methods and General Performance Requirements
J2223/1 Connections for On-Board Road Vehicle Electrical Wiring Harnesses – Part 1: Single-Pole Connectors – Flat Blade Terminals – Dimensional Characteristics and Specific Requirements
J2223/2 Connections for On-Board Road Vehicle Electrical Wiring Harnesses – Part 2: Tests and General Performance Requirements
J2223/3 Connections for On-Board Road Vehicle Electrical Wiring Harnesses – Part 3: Multi-pole Connectors – Flat Blade Terminals – Dimensional Characteristics and Specific Requirements
J1673 High Voltage Automotive Wiring Assembly Design
J2618 Performance Specification for Physical Protection of Wiring Harnesses
J2192 Recommended Testing Methods for Physical Protection of Wiring Harnesses
Join the Technical Committees of SAE — over 10,000 volunteers; the top minds in the industry, serve on more than 700 committees, subcommittees and working groups to create and maintain thousands of technical standards and supporting documents.

Use SAE Standards to Improve Your Business

Join an SAE Standards Committee and help write global mobility history

Influence the future of your business and the industry through participation with SAE Standards

Put the power of SAE’s globally harmonized standards solutions Standards to work for you.
Call 1-877-606-7323 (U.S. and Canada) or 1-724-776-4970,
e-mail customerservice@sae.org
or visit www.sae.org/standards