

# Ground Vehicle Standards Newsletter

Volume III, Issue 1  
February 2012

**SAE International**

Creating harmonized standards solutions. Moving the on- and off-road vehicle industry forward.

## Program sets conformance standards for mobile air conditioning manufacturers

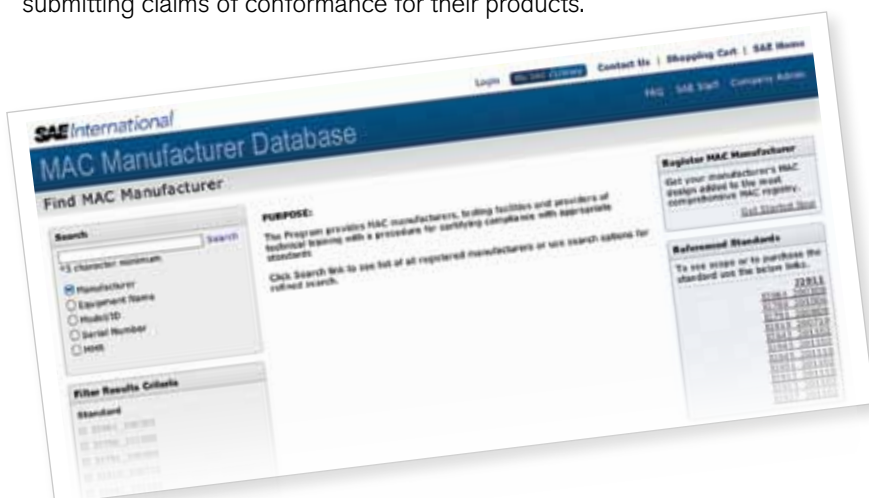
In response to industry and consumer requests, a new program developed by SAE International provides conformance measures for mobile air conditioning (MAC) industry.

The program, which is overseen by **SAE International's Interior Climate Control Standards Committee (ICCSC)**, offers a procedure for certifying compliance with appropriate SAE International technical standards, can be used by MAC manufacturers, along with testing facilities and providers of technical training.

While certification of any product is voluntary, suppliers who advertise their products as certified to an SAE International "J" standard are required to follow the procedure established by this program. Such certification is designed to raise the level of confidence and to assure consumers of MAC components, equipment and technician training programs that the providers are following and meeting the expected performance criteria set by SAE International standards.

The basis of the program is governed by "SAE J2911: Procedure for Certification that Requirements for Mobile Air Conditioning System Components, Service Equipment, and Service Technician Training Meet SAE J Standards," a revised version of which was issued in January. Use of the program assures end users that MAC parts, components and training products meet the strict performance set forth by SAE International.

MAC Industry suppliers are encouraged to visit the new SAE MAC Database Website: <http://macdb.sae.org>. Companies can register on the site which will act as a database of those manufacturers and technician training programs submitting claims of conformance for their products.



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**Editorial Directors:** Jack Pokrzywa, Keith Wilson

## NHTSA proposed rule on keyless ignition cites SAE Recommended Practice

In response to past cases of unintended acceleration, the U.S. National Highway Traffic Safety Administration (NHTSA) has issued a NPRM (Notice of Proposed Rulemaking) proposing to standardize the operation of controls that are used to stop a vehicle engine or other propulsion system, and that do not involve the use of a physical key.

NHTSA used SAE's Recommended Practice J2948 as a foundation for the NPRM, while noting that their proposed rule differs from the J2948 on several points.

Developed by the **Controls and Displays Standards Committee and its Keyless Ignition Subcommittee**, J2948, ("Keyless Ignition Control Design"), which establishes guidelines for the operation of automotive keyless ignition systems, was issued in January 2011. This Recommended Practice is designed to help minimize user-instigated errors by providing design recommendations pertaining to uniform labeling, indication of vehicle ignition/control status, and physical control characteristics of keyless ignition systems.

## Idea for Future H-Point project being assessed

Members of SAE's **Human Accommodations and Design Devices Standards Committee** are exploring whether there is interest in establishing a new Cooperative Research Development Project regarding the development of an H-Point Machine for straddle/saddle seating. This type of seating, used on motorcycles and other off road vehicles (such as snowmobiles and certain watercraft) cannot be measured with the present SAE H-Point Machines.

H-Point Machines are used to describe the seated occupant's posture and position in the seating package and provide reference locations (H-Points) to define space and comfort related measurements. A future H-Point Machine designed specifically for motorcycles and off-road vehicles could provide that industry with standardized tools and measurement procedures useful in the design and development of such vehicles.

If you or your company has an interest in this concept, please contact Gary Pollak at [gary@sae.org](mailto:gary@sae.org) or 724-772-7196.

## Recommended Practice for classifying vehicle hazards

The **SAE Functional Safety Committee** is developing "J2980: Considerations for ISO 26262 ASIL Hazard Classification." Projected to be finalized later this year, this recommended practice is intended to provide guidance for classifying vehicle-level hazards utilizing the ISO 26262 ASIL classification method.

This document aims to "get everyone on the same page on how to apply ISO 26262," says **Committee Chairman Dave Hartfelder**, Senior Manager, General Motors. This ISO standard ("Road Vehicles – Functional Safety") addresses possible hazards caused by malfunctioning behavior of electrical and/or electronic (E/E) safety-related systems, including interaction of the systems.

J2980 will provide guidance to determine the exposure, severity, and controllability for vehicle level hazards. A template for documenting the pertinent hazard classification rationale will also be provided. The committee is in the process of forming three international work groups that will begin applying J2980 to obtain real-world experience to classifying hazards in propulsion and driveline, steering and suspension, and brakes, trailer brakes and park brakes. The workgroup experience and learning gained from applying the Draft J2980 will be fed back into making the document more understandable and comprehensive prior to approving and releasing it later this year.

ISO 26262 is also the focus of the new SAE webinar "Overview and Impact of the Automotive Functional Safety Standard ISO 26262," which debuts on March 21 and 23. Instructed by Joseph Miller, Chief Engineer of Systems Safety at TRW Automotive (and a member of the Functional Safety Committee), the webinar will discuss the scope of ISO 26262, its differences from the general safety standard IEC 61508, and how the scope changes with the introduction of new systems. For more information on this webinar, visit <http://www.sae.org/pdevent/WB1134>.

## Brake rotor standard in development

SAE's **Brake Dynamometer Standards Committee** is developing a new recommended practice which details dynamometer testing and performance criteria for assessing brake rotor crack generation and propagation during high-energy brake applications.

"J2928: Rotor/Drum Crack and Strength Dynamometer Test Procedure" is derived from common test sequences used within the industry. The significant increase in vehicle applications, in addition to the number of rotor and drum designs and configurations, create the need for a standardized single-ended inertia dynamometer procedure to verify the specific part design.

The recommended practice provides standard description and nomenclature for rotor types, designs, and main dimensions. The guidelines are designed to make the testing process more cost-effective by providing an industry-endorsed protocol to detect rotors with potential thermal issues during heavy braking. The standard has been developed in collaboration with OEMs, Tier 1 and Tier 2 suppliers, aftermarket suppliers, and testing facilities.

Affina Group Inc. has recently requested that the National Highway Traffic Safety Administration (NHTSA) adopt a federal vehicle safety standard for brake rotors based on J2928.

### Delivery options for SAE Technical Standards

- Handbook Supplements (HS) – Bound collections of technology related standards and reports offered at less than the collective price of the individual standards in the collection.
- JPaks - Online Standards Plans – A customizable subscription plan that lets you pay for just the documents you need and use, full text search capabilities and an alert page keep you aware of changes and updates.
- Standards on CD-ROM – An entire SAE standards library in a medium that is fast, easy to use and remains current throughout the year.
- Databases and customizable corporate solutions. Visit <http://standards.sae.org/>

**SAE International**

### For On- and Off-Road Harmonized Standards Solutions, All Roads Lead to SAE

Since 1905, SAE International has been providing the common engineering requirements for new mobility products, advanced technologies, and applications. It is uniquely positioned to provide innovative standards solutions to the global on- and off-road industries and their engineering challenges.

For automotive vehicles, SAE plays the central role in developing essential North American emissions and safety standards to meet some of the most stringent regulations in the world. Through ISO, it plays a key role in bringing standards for and from the United States market to the global table. As the center of expertise on Commercial Vehicle/ConAgg standards development, many of its standards are adopted by ANSI and ISO.

SAE offers a full suite of standards capabilities—committee management, consensus-based standards development, consortium administration, cooperative research, and database development—providing industry, companies, and individuals with extensive opportunities to participate, influence, grow, and prosper.

[www.sae.org](http://www.sae.org)

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## Spotlight on sustainability

*SAE's Fuel Cell Committee members participate in DOE workshop*

**Numerous members of SAE's Fuel Cell Standards Committee and its Fuel Cell Interface Work Group** attended the National Renewable Energy Laboratory (NREL) and U.S. Department of Energy (DOE) "Hazard Review for Retail Fueling of Hydrogen Fuel Cell Vehicles Workshop," which was held October 27, 2011 in Troy, Michigan.

The focus of the workshop derived from the Fuel Cell Interface Work Group's response to a request from DOE to identify issues related to fuel cell vehicles. A hazard review of the fueling process was among the issues identified by the Work Group.

During the workshop, participants were asked to identify the most important hazards associated with retail hydrogen fueling, prioritize the hazards, and identify potential actions required to reduce or eliminate these hazards.

The SAE Standard "J2601: Fueling Protocols for Light Duty Gaseous Hydrogen Surface Vehicles," developed by the Fuel Cell Standards Committee and released in 2010, describes the fueling process between the station and the vehicle.

"The workshop highlighted areas that will be looked into in the future," said **Mike Steele, Fuel Cell Standards Committee Chair**. "We can take J2601 and assess what hazards there could be at the interface between the station and the vehicle."

Potential actions to follow up to the workshop will be discussed at the committee's March meeting. "We need the committee membership's feedback on how want to move forward with this," Steele said.

## Dave Baxter recognized for service to Motor Vehicle Council

**Dave Baxter**, who chaired the SAE Motor Vehicle Council since January 2010, completed his term at the council's December 2011 meeting.

During the meeting, he was recognized by the Council for his contributions, and presented with a commemorative plaque by Jim Keller, incoming 2012-2013 Council chair, and Ragiemra Amato, incoming chair of the SAE Technical Standards Board.



Outgoing Motor Vehicle Council Chair Dave Baxter (right) with incoming SAE Technical Standards Board Chair Ragiemra Amato

Dave Baxter (right), who completed his term as Motor Vehicle Council Chair in December, with incoming chair Jim Keller

## Volunteer recognition: document sponsors

(Dec 2011 - Feb 1, 2012)

The SAE Standards Development Program thanks its Document Sponsors. These individuals have served not only as active committee members but have dedicated their time and talent in guiding the development of standards documents from the preparation of all drafts through balloting and publication.

*Thank you.*

**Richard Batzer**, Lockheed Martin  
**Pete Chisholm**, Mercury Marine  
**Jeff Dix**, Nissan North America, Inc.  
**Jeremy Harms**, Bobcat, Co.  
**William Hill**  
**Joseph Kay**, Meritor, Inc.  
**Frederick Kelley**, Prestolite Wire, LLC

**Joseph Kelly**, CVG  
**Hiralal Patel**  
**Jeffery Smith**, Vee Engineering  
**Jerry Steffy**, Harley-Davidson Motor Co.  
**Kevin Wolford**, Ameca, Inc.  
**Scott Ziolek**, Dymos of America

## SAE standards development committees seeking volunteers

Vehicle Engineering Systems Group/Exterior & Performance  
Light Vehicle Exterior Sound  
Road Vehicle Aerodynamics  
Speedometer & Odometer

IC Powertrain Group/ IC Powertrain Steering Committee  
Belt Drive  
Emissions  
Filter Test Methods

Vehicle Safety Systems  
Active Safety Systems

Materials, Processes & Parts Council  
Automotive Adhesives & Sealants  
Carbon & Alloy Steels (Metals Technical Executive Steering Committee)  
Non-Hydraulic Hose (Fluid Conductors Connectors Steering Committee)  
Plastics  
Textiles & Flexible Plastics

Electrical Systems Group  
Automotive Electronic Systems Reliability  
Electromagnetic Compatibility (EMR/EMI)

If you would like to influence the direction of standards and the future of the global ground vehicle industry—while benefiting from the professional development, networking, and peer recognition opportunities volunteering brings—you may express your interest online at the

SAE International website at this link: <http://www.sae.org/standardsdev/participationReq.htm>

## Upcoming Standards Technical Committee Meetings

A current schedule can be found on the SAE website. <http://www.sae.org/standards/>



## New committee chairs and vice chairs

**Donovan Hetteen**, Polaris Industries, Inc. – Chair, Snowmobile Technical Committee

**John Lenkeit**, Dynamic Research Inc. – Chair, Specialized Vehicle and Equipment Council

**Walter Ross** – Vice-Chairman, Specialized Vehicle and Equipment Council

**Jimmy Eavenson**, MTD Products – Chair, Special Purpose Vehicle Committee

**Brian Buchholz**, John Deere & Co – Chair, Small Engine and Powered Equipment Committee

**Edward Haberstroh**, Briggs & Stratton Corp – Vice-Chair, Small Engine and Powered Equipment Committee

**Daniel Ostrosky**, Yamaha Motor Corp USA – Chair, Personal Watercraft Committee

**Robert Newsome**, National Marine Manufacturers Association – Vice-Chair, Personal Watercraft Committee

**Paul Casperson**, Caterpillar Inc – Chair, CTTC C2, Electrical Components and Systems

**Edward Heck**, HED (Hydro Electronic Devices Inc) – Vice-Chair, CTTC C2, Electrical Components and Systems

**Paul Tuckner**, Grace Technologies – Chairman, Committee on Automotive Rubber Specs

**Steven Monthey**, Rhein Chemie Corporation – Chair, Non-Hydraulic Hose Committee

**Dr. Bart Terburg**, Osram Sylvania – Chair, SAE Lighting Coordinating Advisory Group

**Joseph D. Jaklic**, Osram Sylvania Products – Vice-chair, SAE Lighting Coordinating Advisory Group

**James E Johnson**, Valeo Sylvania LLC – Vice-chair, SAE Lighting Materials Standards Committee

**Zachary Doerzaph**, Virginia Tech – Chair, SAE Crash Data Collection and Analysis Steering Committee

**John C. Steiner**, KEVA Engineering – Co-chair, SAE Crash Data Collection and Analysis Steering Committee

## SAE: A Global Partner in Standards Development

In addition to the maintenance and development of its family of technical standards, SAE International is also an active partner with other standards development organizations, government agencies, and regulatory bodies to support the newest, most robust, and comprehensive standards products for a changing global marketplace.

- US Department of Transportation
- Society of Automotive Engineers of Japan (JSAE)
- German Electrical and Electronic Manufacturers Association (ZVEI)
- US Federal Highway Administration
- China Automotive Technology & Research Center (CATARC)
- National Highway Traffic Safety Administration
- Korean Agency for Technology and Standards (KATS)
- US Department of Energy
- Japan Automobile Research Institute (JARI)
- US Environmental Protection Agency
- Brazilian National Standards Organization (ABNT)
- American National Standards Institute (ANSI)
- Automotive Electronics Council (AEC)
- International Organization for Standardization (ISO); US representative



## SAE Ground Vehicle Standards “On The Road”

*A re-cap of recent and upcoming events at which SAE will participate*

- SAE International CEO Dr. David Schutt, and Keith Wilson, Technical Project Manager, SAE Global Ground Vehicle Standards, presented an overview of SAE Ground Vehicle Standards activities related to electric vehicles (EV) and plug-in hybrid electric vehicles (PHEV) at the **World Smart Grid Conference** in Beijing, China on November 8-10, 2011. They discussed conductive charging, wireless charging, communications to the grid system, lithium-ion batteries, and hydrogen fuel cell filling, and provided an overview of SAE Cooperative Research Projects.
- Keith Wilson attended the **SAE EV/PHEV Batteries and E-Motor Conference** in Shanghai, China on November 14 – 18, 2011. He displayed SAE EV/PHEV conductive charge connectors developed by the SAE Hybrid Vehicle Committees and provided technical information on Ground Vehicle Standards activities.
- Jack Pokrzywa, SAE Ground Vehicle Standards Manager, held meetings with management of **European Telecommunication Standards Institute (ETSI)** regarding collaborative agreement between the ETSI ITS Technical Committee Work Group 1 and the SAE DSRC Committee. The agreement is expected to be signed during ETSI General Assembly Meeting in March.
- Gary Pollak, Program Manager- Ground Vehicle Standards Technical Projects, participated in the **ANSI EVSP (Electric Vehicle Standards Panel) Steering Committee Meetings** on November 17-18, 2011 in Washington, DC. The SAE Technical Standards Committee industry members requested that SAE Staff represent them and act as the focal point for SAE in this ANSI initiative that has been ongoing since spring of 2011. The workshops that took place during the meeting coordinated all input to finalize the first draft of the ANSI report to be published and released early in 2012.
- Peter Byk, Technical Project Manager - Global Ground Vehicle Standards, attended the **World Forum for Harmonization of Vehicle Regulations** (Working Party –“WP.29”) Meetings, from November 15-18, 2011 in Geneva, Switzerland. The Working Party, a permanent body of the United Nations Economic Commission for Europe, serves as a global forum for discussions of current and new motor vehicle regulations. SAE International has been granted Special Consultative status by the United Nations and is recognized as a Non Government Organization (NGO).
- Peter Byk and Keith Wilson attended the **SAE Government Industry Conference**, January 25 - 27, in Washington DC. Meetings were held with both industry and government executives to discuss Ground Vehicle Standards development activities in areas such as EV / PHEV's, advanced safety, cyber security, ITS, fuel cell vehicles and SAE Cooperative Research Projects.

*Look for SAE-I at these upcoming events...*

- **Jorn Tinnemeyer, Chair of the Battery Standards Electronic Fuel Gauge Committee**, will speak at the **EV Battery Technology Conference** in London on February 28-29, 2012. He will provide an overview of SAE Ground Vehicle Standard development activities in each of the 16 SAE battery committees.
- Keith Wilson will present an overview of SAE Ground Vehicle Standards activities related to EVs and PHEVs at the **SAE 2012 Hybrid Vehicle and Electric Vehicle Technologies Symposium**, February 21-24 in San Diego, California. He will provide an overview of SAE Cooperative Research Projects and display SAE EV/PHEV conductive charge connectors developed by the SAE Hybrid Vehicle Committees.
- SAE Standards activities will be featured in a table-top exhibition at the 2012 **IEEE International Electric Vehicle Conference**, March 4-8 in Greenville, South Carolina. Keith Wilson will present an overview of SAE Ground Vehicle Standards activities related to EVs and PHEVs and participate in a panel discussion on EV standards.

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- At the SAE BRASIL New Automotive Technology Symposium on March 26 in Sao Paulo, Brazil, SAE Technical Project Manager Keith Wilson will present a comprehensive overview of the latest SAE standards development and research efforts in the area of PHEV (Plug-in Hybrid Electric Vehicles) and BEV (Battery Electric Vehicles) including charging solutions, battery safety, interoperability and communication between EV and the electric grid.
- Keith Wilson will participate in a panel discussion at the **National Alliance for Advanced Technology Batteries** in Chicago, Illinois on April 2. He will provide an overview of the SAE Cooperative research Project for Rechargeable Energy Storage Systems (RESS) Safety, and provide an overview of standards development activities by SAE's battery committees.
- Robert Galyen, Chair of the SAE Battery Standards Steering Committee**, will speak at the **Advanced Lithium Ion Battery International Symposium** in Charlotte, North Carolina on April 18-20. He will provide an overview of standard development activities by each of the 16 SAE battery committees, and discuss the development of two new SAE battery standards committees.

Ground Vehicle Standards staff members will attend the **SAE 2012 World Congress** on April 22-24 in Detroit, Michigan to meet with both industry and government executives to discuss Ground Vehicle Standards development activities in areas such as EV / PHEV's, advanced safety, ITS, fuel cell vehicles and SAE Cooperative Research Projects. In addition, SAE Ground Vehicle Standards Committee meetings will be held during the SAE 2012 World Congress event at both Cobo Hall and SAE Automotive Headquarters.

## Nominate a deserving individual for an SAE award

### Arch T. Colwell Cooperative Engineering Medal

#### Nomination Deadline: July 1

This award recognizes a unique and outstanding contribution over a period of time to the work of the technical committees under the SAE Technical Standards Board in developing standards, specifications, technical reports, and data through cooperative research.

The medal was named in honor of Arch T. Colwell, its first recipient and 1941 SAE President. Dr. Colwell symbolized the dedication and devotion of SAE members who work to further the objectives of the SAE Technical Standards Program. The award is intended to stimulate technical committee members to greater accomplishments and the realization of satisfaction that comes from sharing their expertise.

It is administered by the SAE Technical Standards Board. It consists of a medal and a framed certificate and is presented at the Awards Ceremony during the SAE World Congress or at another appropriate venue.

Submit nominations at [www.sae.org/awards](http://www.sae.org/awards)

### An economical pathway for joint venture research: the Cooperative Research Program of SAE

Cooperative research ventures serve to bring more minds to the challenges and issues faced by industry. The result is a more robust project than each participating organization could complete independently. The pooling of financial resources also affords each participant more efficient use of their research budgets and eliminates duplication of efforts. Whether moving forward on the development of fuel cell standards...researching alternative refrigerants to HFC 134a...or developing a database of human body measurements to foster ergonomic designs, SAE's Cooperative Research Program can assist your company in its collaborative research needs.

To learn more contact Gary Pollak, Program Manager +1-724-772-7196; [gary@sae.org](mailto:gary@sae.org)



## New, revised & stabilized SAE standards (Dec 2011 – Feb 1, 2012)

Committee	Doc	Title	Status	Pub Date
<b>CONSTRUCTION, AGRICULTURAL &amp; OFF-ROAD MACHINERY COUNCIL</b>				
Excavators	J1309_201201	Travel Performance and Rating Procedure, Crawler Mounted Hydraulic Excavators, Material Handlers, Knuckle Boom Log Loaders, and Certain Forestry Equipment	STABILIZED	01/06/12
<b>MATERIALS, PROCESSES &amp; PARTS COUNCIL</b>				
Hydraulic Tube Fittings Committee	J514_201201	Hydraulic Tube Fittings	Revised	01/06/12
Hydraulic Hose and Hose Fittings Committee	J343_201201	Test and Test Procedures for SAE 100R Series Hydraulic Hose and Hose Assemblies	Revised	01/06/12
<b>MOTOR VEHICLE COUNCIL</b>				
Brake Linings Standards Committee	J866_201201	Friction Coefficient Identification and Environmental Marking System for Brake Linings	Revised	01/16/12
Interior Climate Control Committee	J2299_201201	Ultraviolet Leak Detection: Performance Requirements for Fluorescent Refrigerant Leak Detection Dye Injection Equipment for Aftermarket Service of Mobile Air-Conditioning Systems	STABILIZED	01/11/12
	J2911_201201	Procedure for Certification that Requirements for Mobile Air Conditioning System Components, Service Equipment, and Service Technician Training Meet SAE J Standards	Revised	01/12/12
Inflatable Restraints Committee	J2961_201201	Linear Impact Test for Passenger Airbag Modules Component Evaluation	Issued	01/11/12
Cooling Systems Standards Committee	J1390_201201	Engine Cooling Fan Structural Analysis	Revised	01/09/12
Human Accom and Design Devices Stds Comm	J2896_201201	Motor Vehicle Seat Comfort Performance Measures	Issued	01/06/12
Hybrid - EV Committee	J2931/1_201201	Power Line Carrier Communications for Plug-in Electric Vehicles	Issued	01/24/12
<b>SPECIALIZED VEHICLE &amp; EQUIPMENT COUNCIL</b>				
Motorcycle Technical Steering Committee	J331_201201	Sound Levels for Motorcycles	Revised	01/06/12
Marine Technical Steering Committee	J1928_201201	Devices Providing Backfire Flame Control for Gasoline Engines in Marine Applications	Revised	01/06/12
<b>TRUCK &amp; BUS COUNCIL</b>				
Truck and Bus Hydraulic Brake Committee	J2690_201201	Driveline Parking Brake Test Procedure for Medium Duty Vehicles	Issued	1/18/12
Truck and Bus Windshield Wipers and Climate Control Comm	J1944_201201	Truck and Bus Multipurpose Vehicle Windshield Washer System	Revised	01/11/12
Truck and Bus Electrical Systems Committee	J2549_201201	Single Conductor Cable for Heavy-Duty Applications - Truck and Bus	Revised	01/13/12

### Standards Consortium Administration

With over a century of experience providing the common engineering requirements for new mobility vehicles, SAE can be a key component in developing any consortium-based activity, providing the expertise and worldwide technological and human resources to help you turn your vision into a successful operating reality.

Each client maintains its desired degree of autonomy, flexibility, and control. Client/project-tailored services include:

- A legal framework
- Fiscal oversight
- Policy and procedure development
- Publishing and distribution services
- Marketing and public relations activities

# Improve interior package design, increase vehicle safety, and ensure international compliance with the SAE H-Point Machine

A three-dimensional manikin that provides the physical representation of driver H-points, the **H-Point Machine (HPM)** is used to define and measure vehicle seating accommodations. Offering a deflected seat rather than a free seat contour as a reference for defining seat space, it is a vital tool in the design of interior packages.

Available through SAE International, the *HPM* is used in conjunction with SAE Standard J826 and is currently referenced in various federal and international regulations including NHTSA's FMVSS in the US and ISO standards. Utilized in testing for compliance to such regulations involving impact/crash, head restraint, or vision, it is the required safety certification tool for vehicle production in many countries around the world. Additionally, those who need to locate seating reference points and torso angles as reported by manufactures employ the *SAE H-Point Machine*.

And for advance design and research applications, the **HPM-II** is available, which includes reformed shells for a consistent and reliable fit in bucket seats, an articulating back for lumbar support measurement, and the ability to measure the H-point without using legs resulting in simpler installation.

**Is one SAE HPM enough?**  
If your company tests and certifies to FMVSS 202a, it might not be.

NHTSA's head restraint regulation is now fully in effect. That means, in the US and Canada, front—and now rear seats—must meet FMVSS 202a. NHTSA is also encouraging the EU and UN ECE to adopt similar regulations.

To meet FMVSS 202a, a head restraint measuring device is attached to the SAE HPM. It is recommended in revised SAE Standard J826 Nov 2008 that a separate and unique HPM and HMPD for head assessment be used to eliminate any measurement variability that the HRMD may introduce.

Ensure North American compliance and be prepared for changes in EU/UN ECE regulations. Consider a second, dedicated SAE HPM—one for conventional HPM measurements and one for head restraint assessments.



View video at  
[store.sae.org/ea/hpoint.htm](http://store.sae.org/ea/hpoint.htm)

#### Contact:

SAE International Customer Service Phone:  
1-877-606-7323 (U.S. and Canada only);  
1-724-776-4970 (outside U.S. and Canada)  
Email: [CustomerService@sae.org](mailto:CustomerService@sae.org)

**SAE**International

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## Gain a competitive advantage. Impact your bottom line. Invest in standards.

Standards. The workhorse documents that commonize practices, processes, and products throughout the ground vehicle industry are also paramount to the advancement of technology. Standards documents are more than the practices of today. They account for history and anticipate the future of technology, regulation, and business. The direct benefits of standards are simple in concept but extraordinary in their global impact toward ever-safer, cleaner, more efficient worldwide transportation.

#### Technical standards enable and enhance:

- consistent and clear expectations for product performance and reliability
- regulatory compliance
- consistent product quality
- compatibility and interoperability
- more efficient procurement

#### Standardization also:

- lowers trade barriers
- lowers purchasing costs
- decreases design time
- promotes innovation
- increases new technology speed to market

Because industry can rely on standards for globally harmonized solutions to common issues, individual companies can devote more time and resources to advance their proprietary technology. In this way, standards help foster competition, which advances the collective technology of industry and in turn, creates the need for new and revised standards. This has been the cycle for ground vehicle standards solutions.

And, at the heart of those solutions is SAE International, the recognized leader in mobility engineering for over 100 years. It plays the central role in developing North American automotive standards and a key role in bringing US documents to the global standards table, working hand-in-hand with the global community to advance industry.

While participation in the standards development process helps the advancement of the industry it can also contribute to the advancement of your company and personal career.

#### Corporate Benefits

- Input into the direction of the standards
- Competitive intelligence through advance knowledge of standard direction
- Advance warning of pending regulations and influence over the technical basis of the regulation
- Insight into the competitive environment
- Product liability protections
- Strong relationships with customers and suppliers
- Association with the leading society for advancing mobility technology

#### Individual Benefits

- Professional development from continuous working contact with peers
- Peer recognition for advancing your industry's sectors technologies
- Excellent networking and learning opportunities from product developers/users around the world
- Discover emerging technologies
- Contribute to the industry's body of technical knowledge

To learn more about SAE Technical Standards Development—and for a schedule of Technical Committee meetings—visit us on the web at

<http://www.sae.org/standards/>

**Become a better you. Volunteer for an SAE Standards Development Committee.**

Match your expertise with one of the many SAE Technical Standards Development Committees that are writing the common engineering requirements for the advancement of the ground vehicle industry.

Motor Vehicle Council		Truck & Bus Council		Materials, Processes & Parts Council		Construction, Agricultural & Off-Road Machinery Council	
<b>Chassis Systems Group</b> Brake Forum Steering Cmte Brake Linings Standards Brake NVH Standards Brake Dynamometer Standards <b>Highway Tire Forum Steering Cmte</b> Vehicle Dynamics Standards Wheel Standards <b>Hydraulic Brake Actuating Forum AG</b> Brake Fluids Standards Automotive Brake & Steering Hose Standards Hydraulic Brake Components Standards	<b>Vehicle Engineering Systems</b> Comfort & Convenience Adaptive Devices Controls & Displays Cooling Systems Dedicated Short Range Communications Advanced Traveler Information Systems Human Accommodations and Design Devices Interior Climate Control Volatile Organic Compounds <b>Exterior and Performance</b> Dynamical Modeling and Simulation Glazing Materials Light Duty Vehicle Performance & Economy Measurements Light Vehicle Exterior Sound On-Road Autonomous Vehicle Standards Road Vehicle Aerodynamics Speedometer & Odometer Tow Vehicle Trailer Rating WIN/WMI Wiper Standards	<b>Electrified Powertrain Groups</b> EV/HEV Steering Committee Hybrid/EV Technical Committee J1772 Task Force J2836fm-12847 Task Force J2344 Task Force J2894 Task Force J2954 Task Force Fuel Cell Standards Committee Emissions Performance Interface Safety <b>Battery Standards Steering Committee</b> Labeling Battery Transportation Testing Battery Recycling Safety Starter Battery E-Fuel Gauge Battery Terminology Secondary Battery Use Truck and Bus Battery Battery Test Equipment Battery Materials Testing Battery Size Standardization Advanced Battery Concepts	<b>Common Tests Technical SC</b> Hydraulics Electrical Components Cold Weather Operations <b>Human Factors Technical Adv. Grp</b> Machine Controls – Operator Machine Displays and Symbols Operator Seating and Ride Operator Accommodation <b>Machine Technical Steering Cmte</b> Loaders, Crawlers, Scrapers & Attachments Sweeper, Cleaner & Machinery Industrial Equipment Forestry & Logging Equipment Excavators Rebuilding Machinery Tire & Rim Trenching & Boring <b>Operator Protection Tech Adv. Grp</b> Personal Protection (General) Braking Lighting and Marking Protective Structures <b>Sound Level Technical Steering Cmte</b> Earth Moving Machinery Sound Level Back-up and Forward Warning Alarms	Work Truck Safety Committee <b>Advanced &amp; Hybrid Powertrain SC</b> Alternative Fuels Clutch, Transmission & Power Take-Off Hybrid Safety Hydraulic Hybrids <b>Body &amp; Occupant Environment SC</b> Truck Crashworthiness Windshield Wipers & Climate Control Human Factors <b>Electrical/Electronic Steering Cmte</b> Low Speed Communications Network Control and Communications Network Event Data Recorder Electrical Systems <b>Brake and Stability Control SC</b> Active Safety Systems Foundation Brake Brake Actuator Brake Systems Hydraulic Brake Wheel Stability Control Systems Air Brake Tubing & Tube Fittings <b>Total Vehicle Steering Cmte</b> Tire Pressure Management Systems Corrosion Aerodynamics/Fuel Economy Tire	Automotive Corrosion & Prevention Acoustical Materials Fasteners <b>Metals Technical Executive Steering Cmte</b> Carbon & Alloy Steels Metals Test Procedures Automotive Iron & Steel Castings Sheet & Strip Steel Elev Temp Prop. of Ferrous Metals Automotive Adhesives & Sealants Plastics Spline B92 <b>Spring Steering Cmte</b> Coil Spring Leaf Spring Pneumatic Spring Torsion Bar Spring & Stabilizer Bars Textile & Flexible Plastics Vibration Control <b>Fluid Conductors Connectors SC</b> C1 Hydraulic Tube Fittings C2 Hydraulic Hose & Hose Fittings C5 Metallic Tubing Cmte on Automotive Rubber Specs Non-Hydraulic Hose Hose/Clamp Performance & Compatibility <b>Fatigue Design &amp; Eval. Advisory Group</b> Surface Enhancement Material Properties Structural Analysis Fatigue Lifetime Predictions Road Load Data Acquisition Component Testing & Simulation Squeak and Iteq Compatibility Task Force Ground Vehicle Reliability Terrain Modeling Task Force Software System Reliability SC Unmanned Ground Vehicle Reliability TF CBM (Condition Based Management) SC	<b>Specialized Vehicle &amp; Equipment Council</b> Personal Watercraft Small Engine & Powered Equip Snowmobile Special Purpose Vehicle <b>Motorcycle Technical Steering Cmte</b> Motorcycle Sound Level Electric Motorcycle <b>Marine Technical Steering Cmte</b> Marine Engine Fuel Systems Marine Electrical Systems Trailer Gooseneck & Fifth Wheel Trailer Dynamics Conventional Towing to 20,000 lbs Trailer Terminology <b>Ship Systems Technical Steering Cmte</b> Ship Fluid Systems Fasteners	<b>Cooperative Research Projects</b> MAC Refrigerant Blends (MRB CRP) IMAC Alternative Refrigerants CRP1234yf Alt Refrigerant Assessment CRP150 Low GWP Alt Refrigerants Assessment High Temperature Battery Study Emergency Vehicle Lighting Truck Cab Anthropometric Study Vehicle Sound Level for Pedestrians H <sub>2</sub> Fuel Cell Station Breakaways, Hoses, Fittings, and Nozzles High Strain Rate Plastics IMAC ITS Projects CAESAR Ergonomics Gage R&R of HPM Oologic Trauma Plastics Suitable for use with H <sub>2</sub>
<b>Brake Forum Steering Cmte</b> Brake Linings Standards Brake NVH Standards Brake Dynamometer Standards <b>Highway Tire Forum Steering Cmte</b> Vehicle Dynamics Standards Wheel Standards <b>Hydraulic Brake Actuating Forum AG</b> Brake Fluids Standards Automotive Brake & Steering Hose Standards Hydraulic Brake Components Standards	<b>Electrical Systems Group</b> Vehicle E/E Systems Diagnostic Electronic Design Automation Vehicle Arch. for Data Communications Vehicle Electric Power Supply Embedded Software Automotive Electronic Systems Reliability Vehicular Flat Panel Display Electromagnetic Compatibility (EMC) Electrical Distribution Systems Srg. Cmte Connector Systems Cable Standards Harness Covering Circuit Protection & Switch Devices Functional Safety Automotive OEM EMC Event Data Recorder	<b>IC Powertrain Steering Committee</b> Automatic Trans Transaxle Automatic Trans Friction Driveline Standards All Wheel Drive Emissions Engine Power Test Code Belt Drive Air Cleaner Test Code Piston and Ring Standards Filter Test Methods Gasoline Fuel Injection Ignition Fuel System Standards Spark Arrestor	<b>Automotive Quality &amp; Process Improvement Committee</b> Jana Wright – jwright@sae.org Nikki Ameredes – nameredes@sae.org Patricia Ebejer – pebejer@sae.org Jill Kojraj – gjysta@sae.org Micheline Brussow - mbrussow@sae.org Lorie Featherstone – lfeather@sae.org	<b>Green Technology Groups</b> Green Technology Steering Committee Green Bio-Materials Task Force Green Terminology Task Force	<b>Green Technology Steering Committee</b> Jack Pokrzywa – jackp@sae.org Peter Byk – peterbyk@sae.org Keith Wilson – kwilson@sae.org Roxanne Loeffler – rloeffler@sae.org	<b>Service Development Steering Committee</b> Collision Repair Graphics Based Service Info	<b>Service Development Steering Committee</b> Collision Repair Graphics Based Service Info
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