

SAE Interior Climate Control Standards Committee

The Interior Climate Control Standards Committee comprise of the following activities:

Interior Climate Control Steering Committee

Interior Climate Control Service Committee

Interior Climate Control MAC Supplier Committee

Interior Climate Control Vehicle OEM Committee

Interior Climate Control Fluids Committee

The members of each committee have expertise in that area and are responsible for the development of SAE Standard or Recommended Practice documents.

The list of documents for each committee are listed in appendix A.

The purpose of this document is to provide a summary of ICCSC published documents as listed by purpose, application and its scope.

Since the first SAE document J513 in January 1936, which conforms to ANSI B70-1974, SAE refrigeration flare fittings have been an industry standard. In April 1953, SAE J639 provided standards for system service access fittings currently used by the automotive and commercial industry.

To prevent mis-connections, SAE J639 was revised in the 70's to provide different size system service connections on CFC-12 mobile A/C systems. The use of different high and low refrigeration service access fittings is not a standard in the commercial refrigeration industry.

When the mobile industry changed refrigerants from CFC-12 to HFC-134a new unique quick couple service fittings were developed to reduce venting and possible mixing of refrigerants during service of mobile A/C systems. Unique quick couple service fittings have been developed for R-134a, R-1234yf, R744 (carbon dioxide) and HFC-152a mobile A/C systems as part of the J639.

The mobile air conditioning industry established replacement refrigerant criteria, resulting in new SAE documents.

The industry/EPA field study of mobile A/C systems identified what level of contamination could be expected from used CFC-12 refrigerant and established equipment requirements and the purity levels for recycled refrigerant. Refrigerant purity has been established for R-134a, R-1234yf and R-744 carbon dioxide.

Based on that study, SAE and industry have identified that only CFC-12, HFC-134a and R-1234yf refrigerant, removed from a mobile A/C, recycled on-site and directly used in a mobile A/C system can be accepted. All used refrigerant from other sources must be sent off-site for processing and must meet the specific ARI recycled purity specification. R-744 must be recovered from the system and lubricant and/or contamination removed prior to venting to the atmosphere.

Documents are available from SAE International at the following Web site.

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

SAE standards listed comply with the following statement:

"This report is published by SAE to advance the state of technical and engineering sciences. The use of this Technical 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."

SUMMARY OF SAE DOCUMENTS

At the request of the U.S. Environmental Protection Agency, SAE Interior Climate Control Standards Committee established working groups to address the needs of the auto industry regarding these environmental concerns. This summary includes SAE documents that have been developed to cover emission, contamination and handling of refrigerants used in the mobile air conditioning industry.

The information on current ICCSC SAE documents are separated into the following categories:

- Industry criteria and guidelines
- System design guidelines
- System components
- Technician service procedures
- Service equipment
- Recovery/recycle equipment
- Replacement refrigerant requirements
- Retrofit documents
- Heating and defrosting

The information contained in this document was accurate to the best of our knowledge in June 2016. Users should always check with the SAE Staff Standards Specialist or refer to the SAE website www.sae.org and search on the exact document number to obtain and verify the latest version, revision date and scope as these items are constantly being updated.

INDUSTRY CRITERIA AND GUIDELINES

SAE J2219 Mobile Air Conditioning Industry Criteria and Guidelines

Aug 12, 2011 Stabilized

Scope

The purpose of this SAE Information Report is to provide information on refrigerant issues of concern to the mobile air-conditioning industry.

System Design Guidelines

SAE J639 Safety Standards for Motor Vehicle Refrigerant Vapor Compressions Systems

Dec 19, 2011 Revised

Scope

This SAE Standard applies to refrigerant vapor compression systems that provide cooling and/or heating for passenger cars, light trucks and commercial vehicles (on and off road) that use automotive type mobile air conditioning [MAC] systems. Large trucks, buses and other vehicles that do not use typical automotive a/c systems or use refrigerants not listed in this document are not covered by this standard. This standard covers any vehicle with a MAC system using a belt or electric motor driven compressor. This document provides standards for design, assembly, test and service of MAC systems to minimize environmental, health and safety impacts. Also included are cautionary statements for the service industry to alert technicians to the inadvisability and possible health or safety effects associated with venting refrigerant during service. It is not intended to restrict the use, or further development, of other types of refrigeration systems for mobile air conditioning applications. This document may be amended or additional safety standards created should other systems become practical. This document addresses only HFC-134a (R-134a), carbon dioxide (R-744), and HFO-1234yf (R-1234yf) refrigerants. To prevent system contamination all refrigerants used in mobile air conditioning vapor compression systems require unique service fittings and service equipment. The unique service fittings are intended to eliminate the potential for system refrigerant cross-contamination during service activity. CFC-12 (R-12) is no longer in use in new MAC systems. The service fitting description is maintained as a reference for older vehicles still in use. When retrofitting an R-12 system to use R-134a or when removing R-12 (vehicle disposal) use service equipment designed for R-12 and certified to meet the requirements of SAE J1990 (R-12 recovery and recycle equipment). HFC-152a is an A2 flammable refrigerant as classified by ASHRAE 34 and should be used only with a secondary loop application. However, until MAC systems are developed to use R-152a (HFC-152a), no SAE Standards for system design, service equipment or service procedures have been established. The R-152a service fittings described within this Standard were established as part of the industries evaluation of replacement refrigerants and are maintained for future design guidance and to prevent potential refrigerant cross contamination.

SAE 1662 Compatibility of Retrofit Refrigerants with Air-Conditioning System Materials

Nov 21, 2011 Stabilized

Scope

The purpose of this SAE Recommended Practice is to provide criteria for determining the compatibility of air-conditioning (A/C) system materials/components with candidate retrofit refrigerants intended to replace CFC-12 (R12) in mobile A/C systems originally designed to use CFC-12 (R-12).

SAE J2727 Mobile Air Conditioning System Refrigerant Emission Charts for R-134a and R-1234yf

Apr 02, 2013 Revised

Scope

The “System Emissions Chart” contained herein is intended to serve as a means of estimating the annual refrigerant emission rate (grams per year) from new production A/C systems equipped with specified component technologies. It provides emission values for various component technologies that are currently available, and can be expanded as new technologies are commercialized. This document provides the information to develop an Excel file template “System Emissions Chart” for system emission analysis. The chart includes automotive compressor technologies for conventional mobile air conditioning systems as well as those using semi-hermetic compressors. This standard can be considered a companion document to SAE J2763 Test Procedure for Determining Refrigerant Emissions from Mobile Air Conditioning Systems. SAE J2727 estimates system emissions, taking into account production assembly variation and accounts for components that are 100% helium leak tested prior to vehicle final assembly. The results from SAE J2064 are used to better represent permeation emissions from different hose material and coupling configurations in this version. SAE J2763 may be used to quantify emissions from properly assembled systems.

SAE J2762 Method for Removal of Refrigerant from Mobile Air Conditioning System to Quantify Charge Amount

Feb 04, 2011 Issued

Scope

This Standard provides an overview of results and requirements needed to remove refrigerant from a mobile air conditioning system for determining refrigerant emissions (leakage). This reclaim procedure for use on fleet vehicles in a field service environment should produce an accuracy and repeatability sufficient to determine refrigerant loss within 2 g.

SAE J2763 Test Procedure for Determining Refrigerant Emissions from Mobile Air Conditioning Systems

Feb 20, 2015 Reaffirmed

Scope

This SAE Standard covers the Mini-Shed testing methodology to measure the rate of refrigerant loss from an automotive air conditioning (A/C) system. This SAE procedure encompasses both front and rear air conditioning systems utilizing refrigerants operating under sub-critical conditions.

SAE J2765 Procedure for Measuring System COP [Coefficient of Performance] of a Mobile Air Conditioning System on a Test Bench

Oct 16, 2008 Issued

Scope

1.1 This Standard applies to motor driven mobile air conditioning systems consisting of one in-car air coil (evaporator), a compressor, an expansion device, and one under-hood air coil (condenser). 1.1.1 This standard can also be used for measuring systems that use electrically driven compressor if measurement of input power to compressor is carefully considered. 1.1.2 This standard can also be used for measuring systems that include the entire air handling system if air side pressure drop for the entire vehicle system is carefully considered. 1.1.3 This standard can also be used for measuring systems that include the entire front end cooling module if air side pressure drop for the entire vehicle system is carefully considered. 1.1.4 This standard can also be used for measuring systems that include a secondary cooling loop if the power to drive the pumps in this system is carefully considered. 1.2 This Standard specifies procedures, apparatus, and instrumentation that will produce accurate steady state capacity and efficiency data for refrigerant components. 1.3 This Standard does not: 1.3.1 Specify tests for dual evaporator systems, 1.3.2 Specify transient test methods, 1.3.3 Make recommendations for safety 1.3.4 Specify tests for production, specification compliance, or field testing of mobile air conditioning systems.

SAE J2766 Life Cycle Analysis to Estimate the CO₂-Equivalent Emissions from MAC Operation

Feb 16, 2009 Issued

Scope

This recommended best practice outlines a method for estimating CO₂-Equivalent emissions using the GREEN-MAC-LCCP© (Global Refrigerants Energy and Environmental - Mobile Air Conditioning - Life Cycle Climate Performance) model (also referred to as "the model" in this standard).

SAE J2772 Measurement of Passenger Compartment Refrigerant Concentrations Under System Refrigerant Leakage Conditions

Feb 04, 2011 Issued

Scope

This Standard is restricted to refrigeration circuits that provide air-conditioning for the passenger compartments of passenger and commercial vehicles. This Standard includes analytical and physical test procedures to evaluate concentration inside the passenger compartment. In the early phases of vehicle evaluation, usage of the analytical approach may be sufficient without performing physical tests. The physical test procedure involves releasing refrigerant from an external source to a location adjacent to the evaporator core (inside the HVAC-Module). An apparatus is used to provide a repeatable, calibrated leak rate. If the system has multiple evaporators, leakage could be simulated at any of the evaporator locations. This standard gives detail information on the techniques for measuring R-744 [CO₂]

and R-1234yf [HFO-1234yf], but the general techniques described here can be used for other refrigerants as well.

SAE J2773 Standard for Refrigerant Risk Analysis for Mobile Air Conditioning Systems
Feb 04, 2011 Issued

Scope

This Standard describes methods to understand the risks associated with vehicle mobile air conditioning [MAC] systems in all aspects of a vehicle's lifecycle including design, production, assembly, operation and end of life. Information for input to the risk assessment is provided in the Appendices of this document. This information should not be considered to be complete, but only a reference of some of the data needed for a complete analysis of the risk associated with the use of refrigerants in MAC systems.

SAE J2777 Recommended Best Practice for Climatic Wind Tunnel Correlation
Jan 14, 2016 Revised

Scope

With many corporations and suppliers conducting development and validation tests at different Climatic Wind Tunnel sites, there is an increasing need for a recommended best practice that defines a process by which climatic wind tunnels can be correlated. This document addresses the test methods and metrics used to obtain similar results, independent of location, for Heating Ventilation and Air Conditioning (HVAC) and Powertrain Cooling (PTC) development. This document should be used as a guideline to make sure key aspects of tunnel testing are covered when comparing various climatic wind tunnel facilities. The depth of the correlation program is ultimately influenced by program objectives. Therefore, a correlation program, for the intent and purposes of this document, can range from just a few tests to a full analysis that involves multiple vehicle tests identifying limitations and statistical boundaries. Using recommendations in this document will eliminate most of the items that effect facility mismatch in a correlation program.

SAE J2911 Procedure for Certification that Requirements for Mobile Air Conditioning System Components, Service Equipment, and Service Technician Training Meet SAE J Standards

Jan 14, 2013 Revised

Scope

This SAE Standard provides manufacturers, testing facilities and providers of technician training with a procedure for certifying compliance with the appropriate standards.

Manufacturers or seller who advertise their products as Certified to an SAE J standard shall follow this procedure. Certification of a product is voluntary; however, this certification process is mandatory for those advertising meeting SAE Standard(s) requirements. Only certifying to this standard allows those claiming compliance to advertise that their product (unit), component, or service meets all requirements of the specific SAE standard. Certification of compliance to this and the appropriate standard and use of the SAE label on the product shall only be permitted after all the required information has been submitted to SAE International and it has been posted on the SAE web site. This process is mandatory for those advertising as being “Certified to SAE JXXXX [appropriate SAE Standard] requirements or any advertising or labeling language that implies such certification. SAE International will post the results in the official SAE on-line database. SAE J2911 requires manufacturers, testing facilities, and technician training providers to comply with different requirements. (Therefore this document covers requirements for MAC system parts, service equipment and printed training manuals that are different in content so are identified in this standard for general reference as product with procedures for certifying compliance with the appropriate SAE standard. Regulatory agencies will also have access to the SAE International public posting of the results in the official SAE database.

SYSTEM COMPONENTS

SAE J2064 Coupled Automotive Refrigerant Air-Conditioning Hose Assemblies

Aug 28, 2015 Revised

Scope

The Scope of SAE J2064 covers coupled hose assemblies intended for containing and circulating lubricant, liquid and gaseous R134a and/or R-1234yf refrigerant in automotive air-conditioning systems. Historically, requirements for the hose used in coupled automotive refrigerant air conditioning assemblies was included in SAE J2064. SAE J2064 has been changed to establish the requirements for factory and field coupled hose assemblies. SAE J3062 has been issued to define requirements for the hose used in these assemblies into its own standard. SAE J2064 also provides the necessary values used in SAE J2727 Mobile Air Conditioning System Refrigerant Emission charts for R-134a and R-1234yf. The certified coupling of MAC hose assemblies is required in meeting certain regulatory requirements. A hose which has met the requirements of SAE J3062 and certified in J2911 must be used as part of the coupled assembly. A hose which meets the requirements of SAE J3062 does not insure the assembly will meet the requirements of SAE J2064. It is the hose assembly manufacturer's responsibility to confirm that the assemblies meet the specified acceptance criteria for this specification. The hose assembly shall be designed to minimize permeation of the refrigerant, contamination of the system, and to be functional over a temperature range of -30 to 125 °C. Specific construction details are to be agreed upon between user and supplier. meet the requirements of SAE J3062.

SAE J2842 R-1234yf and R744 Design Criteria and Certification for OEM Mobile Air Conditioning Evaporator and Service Replacements

May 07, 2015 Revised

Scope

The intent of this standard is to establish a framework to assure that all evaporators for R-744, R-1234yf, and R-445A mobile air conditioning (MAC) systems meet appropriate testing and labeling requirements. SAE J639 requires vehicle manufacturers to perform assessments to minimize reasonable risks in production MAC systems. The evaporator (as designed and manufactured) shall be part of that risk assessment and it is the responsibility of the vehicle manufacturer to assure all relevant aspects of the evaporator are included. It is the responsibility of all vehicle or evaporator manufacturers to comply with the standards of this document at a minimum. (Substitution of specific test procedures by vehicle manufactures that correlate well to field return data is acceptable.) As appropriate, this standard can be used as a guide to support risk assessments.

With regard to certification, most vehicle manufacturers have established formal production part approval processes (PPAP) where compliance certification is established and formally documented. For an evaporator manufacturer of non-original equipment parts (or a vehicle manufacturer that does not have a formal part compliance certification process) then the certification described in this standard is the requirement to which those evaporators shall comply. In this case, the evaporator manufacturer or an independent institution shall complete the evaporator certification according to SAE J2911. An example of the latter would be the completion of witness testing by the evaporator manufacturer with the submission of certification documents by the witness organization.

Refrigerant R-152a was excluded from this standard because a secondary loop refrigerant system is required. This standard also does not apply to R-134a refrigerant evaporators because it is proven in use.

SAE J3062 Automotive Refrigerant Air-Conditioning Hose Requirements

Jun 30, 2015 Issued

Scope

The Scope of SAE J3062 covers hose intended for containing and circulating lubricant, liquid and gaseous R134a and/or R-1234yf refrigerant in automotive air-conditioning systems. The hose shall be designed to minimize permeation of the refrigerant, contamination of the system, and to be functional over a temperature range of -30 to 125 °C. Specific construction details are to be agreed upon between the user and supplier.

Requirements for the hose used in coupled automotive refrigerant air-conditioning assemblies had been included in SAE J2064. SAE J3062 separates requirements for the hose used in these assemblies into its own standard. SAE J2064 also provides the necessary values used in SAE J2727 Mobile Air-Conditioning System Refrigerant Emission charts for R-134a and R-1234yf. Mobile air-conditioning system refrigerant emissions rates are established in SAE

J2727 Emission charts and are important. The certified coupling of MAC hose assemblies is required in meeting certain regulatory requirements.

Therefore, the Scope of SAE J2064 has been changed to establish the assembly requirements for factory and field coupled hose assemblies. A hose which meets the requirements of SAE J3062 may not meet the requirements of SAE J2064. Bulk hose produced prior to the release of this standard could be labeled "SAE J2064" and may not meet the requirements of SAE J3062.

SAE J2196 Service Hose for Automotive Air Conditioning

Nov 21, 2011 Stabilized

Scope

This SAE Standard covers reinforced rubber, reinforced thermoplastic, or otherwise constructed hose, or hose assemblies, intended for conducting liquid and gaseous refrigerants for service connections from mobile air conditioning systems to service equipment such as a manifold gauge set and vacuum pumps or for use internally, in charging stations or service equipment intended for use in servicing mobile air-conditioning systems. The hose shall be designed to minimize permeation of refrigerants and contamination of refrigerant passing there through and to be serviceable over a temperature range of -30 to 95°C. Hose working pressure shall be at least 3.4 MPa and the minimum burst pressure be at least 5 times.

SAE J2197 HFC-134a (R-134a) Service Hose Fittings for Automotive Air-Conditioning Service Equipment

Aug 12, 2011 Stabilized

Scope

This SAE Standard covers fittings intended for connecting service hoses, per SAE J2196, from Mobile Air-Conditioning Systems to service equipment such as manifold gauges, vacuum pumps and air-conditioning charging, recovery and recycling equipment (Figure 1). Due to similarities between English and metric thread sizes a single, unique ACME thread fitting is specified. This fitting was recommended by the Compressed Gas Association (CGA), Connection Standards Committee Task Force as one which could be qualified to meet their requirements for use and safety in a time frame consistent with the introduction of R-134a. It was selected because its unique design would reduce the likelihood of cross-threading service hoses on R-12/R-134a refrigerant storage containers and service equipment. The high and low pressure hose in SAE J2196 requires the charge coupling (used to connect service hoses to vehicle access ports) to be an integral part of the hose assembly. To allow removal of the hose from the coupling for hose replacement only, a two-piece construction with a wrench tight connection is permitted. Specifications covering this fitting are provided.

TECHNICIAN SERVICE PROCEDURES

SAE J1628 Technician Procedures for Refrigerant Leak Detection in Service of Mobile Air Conditioning Systems

Jul 24, 2014 Revised

Scope

This SAE Recommended Practice applies to the use of generally available leak detection methods to service motor vehicle passenger compartment air conditioning systems.

SAE J1989 Recommended Service Procedure for the Containment of CFC-12 (R-12)

May 26, 2011 Stabilized

Scope

During service of mobile air-conditioning (A/C) systems, containment of the refrigerant is important. This procedure provides service guidelines for technicians when repairing vehicles and operating equipment defined in SAE J1990.

SAE J2211 Recommended Service Procedure for the Containment of HFC-134a (R-134a)

Nov 21, 2011 Stabilized

Scope

Refrigerant containment is an important part of servicing mobile air-conditioning (A/C) systems. This procedure provides guidelines for technicians for servicing mobile A/C systems and operating refrigerant recycling equipment designed for HFC-134a (R-134a) (described in SAE J2210).

SAE J2298 Ultraviolet Leak Detection: Procedure for Use of Refrigerant Leak Detection Dyes for Service of Mobile Air-Conditioning Systems

Aug 12, 2011 Stabilized

Scope

This SAE Standard applies to the application of ultraviolet leak detection to service mobile air-conditioning systems.

SAE J2845 R-1234yf [HFO-1234yf] and R-744 Technician Training for Service and Containment of Refrigerants Used in Mobile A/C Systems

Jan 14, 2013 Revised

Scope

Technician training is required to ensure that recommended procedures are used for service and repair of Mobile Air Conditioning (MAC) systems using R-744 and/or R-1234yf. Unique requirements for each refrigerant are detailed within this standard. Technicians may be trained in either or both refrigerants. The technician shall be trained to recognize which refrigerant is being handled, how to handle it safely and be equipped with the essential information, proper equipment and tools, which are unique to these refrigerants. This standard outlines minimum content requirements for such training programs. Training programs designed in accordance with this standard are not intended to ensure or assess the technical skills of technicians regarding the diagnosis and repair of motor vehicle air conditioners. Rather, the goal of such programs is to provide information to technicians about safely handling refrigerants.

SERVICE EQUIPMENT

SAE J1627 Performance Criteria for Electronic Refrigerant Leak Detectors

Apr 01, 2011 Stabilized

Scope

This SAE Standard applies to electronic probe-type leak detectors used to service motor vehicle passenger compartment air-conditioning systems. This document does not address any safety issues concerning their design or use.

SAE J1771 Criteria for Refrigerant Identification Equipment for Use with Mobile Air-Conditioning Systems

May 26, 2011 Stabilized

Scope

This SAE Standard applies to refrigerant identification equipment to be used for identifying refrigerant CFC-12 (R-12) and HFC-134a (R-134a) refrigerant when servicing a mobile A/C system or for identifying refrigerant in a container to be used to charge a mobile A/C system. Identification of other refrigerants is the option of the equipment manufacturer.

SAE J2296 Retest of Refrigerant Container

Jun 04, 2012 Revised

Scope

To provide a procedure to inspect a refrigerant cylinder used in equipment servicing mobile air-conditioning (A/C) systems. This includes the pressure cylinder used for refrigerant recovery/recycling and charging equipment.

SAE J2297 Ultraviolet Leak Detection: Stability and Compatibility Criteria of Fluorescent Refrigerant Leak Detection Dyes for Mobile R-134a and R-1234yf (HFO-1234yf) Air-Conditioning Systems

Jan 14, 2013 Revised

Scope

This SAE Standard applies to dyes intended to be introduced into a mobile air-conditioning system refrigerant circuit for the purpose of allowing the application of ultraviolet leak detection. In order to label any product(s) they shall meet SAE J2297, and the certification process as described in SAE J2911 must be followed and the documentation described in the appendix shall be submitted to SAE.

SAE J2299 Ultraviolet Leak Detection: Performance Requirements for Fluorescent Refrigerant Leak Detection Dye Injection Equipment for Aftermarket Service of Mobile Air-Conditioning Systems

Jan 11, 2012 Stabilized

Scope

This SAE Standard applies to fluorescent refrigerant leak detection dye injection equipment for use in ultraviolet leak detection when servicing mobile air-conditioning systems.

SAE J2670 Stability and Compatibility Criteria for Additives and Flushing Materials Intended for Aftermarket Use in R-134a (HFC-134a) and R-1234yf (HFO-1234yf) Vehicle Air-Conditioning Systems

Feb 07, 2011 Revised

Scope

This SAE standard applies to any and all additives and chemical solutions intended for aftermarket use in the refrigerant circuit of vehicle air-conditioning systems with belt-driven compressors, except as noted below. This standard provides testing and acceptance criteria for determining the stability and compatibility of additives and flushing materials (solutions) with A/C system materials and components, that may be intended for use in servicing or operation of vehicle air conditioning systems. This standard does not provide test criteria for additive, compressor lubricant, or flushing solution effectiveness; such testing is the responsibility of the additive and/or solution manufacturer/supplier. This standard does not cover additives or flushing materials for electrically driven compressors. The use of additives with electrically driven compressors might cause electrical shorting and compressor failure. It is not the intent of this document to identify the requirements for ultraviolet leak detection dyes. Such dyes must meet the requirements of SAE J2297 for the intended refrigerant. Additives for mobile air conditioning

systems are not tested under this standard for system enhancement or performance. This standard only indicates if the additive is chemically compatible with materials used in the system components. Flushing solvents, when used, completely fill the component/system being flushed and, hence, should not harm system components at 100% concentration. They are not intended to remain in the system, either as a solvent or as an additive, but, because it is not possible to remove all of the flushing solvent, an indeterminate amount remains. The residual remaining in the system depends on many factors, including system/component configuration, component blind spots where liquid cannot be removed, the volatility of the solvent, the procedure(s) used to remove the solvent, and evacuation capability and procedure. No means exists to identify and/or specify the amount of residual solvent that either can, or will, remain in any given system after the procedure(s) have been followed. This standard does not address the flushing solvent procedure or its effectiveness at removing residual flushing agent.

SAE J2791 HFC-134a Refrigerant Electronic Leak Detectors, Minimum Performance Criteria

Jan 14, 2013 Revised

Scope

This SAE Standard provides testing and functional requirements to meet specified minimum performance criteria for electronic probe-type leak detectors. So they will identify smaller refrigerant leaks when servicing all motor vehicle air conditioning systems, including those engineered with improved sealing and smaller refrigerant charges to address environmental concerns and increase system efficiency. This document does not address any safety issues concerning their design or use.

SAE J2888 R-1234yf Service Hose, Fittings and Couplers for Mobile Refrigerant Systems Service Equipment

Jan 14, 2013 Revised

Scope

This SAE Standard covers fittings, couplers, and hoses intended for connecting service hoses from mobile air-conditioning Systems to service equipment such as charging, recovery and recycling equipment. (Figure 1) This specification covers service hose fittings and couplers for MAC service equipment service hoses, per SAE J2843 and SAE J2851, from mobile air-conditioning systems to service equipment such as manifold gauges, vacuum pumps, and air-conditioning charging, recovery and recycling equipment.

SAE J2912 Performance Requirements for R-134a and R-1234yf Refrigerant Diagnostic Identifiers (RDI) for Use with Mobile Air Conditioning Systems

Dec 11, 2014 Revised

Scope

This SAE Standard applies to refrigerant identification equipment to be used for identifying refrigerant HFC-134a (R-134a) and HFO-1234yf (R-1234yf) refrigerant when servicing a mobile A/C system or for identifying refrigerant in a container to be used to charge a mobile A/C system. Identification of other refrigerants is the option of the equipment manufacturer, although it shall not misidentify refrigerants, per 3.2.

SAE J2913 R-1234yf [HFO-1234yf] Refrigerant Electronic Leak Detectors, Minimum Performance Criteria

Feb 04, 2011 Issued

Scope

This SAE Standard provides testing and functional requirements to meet specified minimum performance criteria for electronic probe-type leak detectors. The equipment specified here will identify smaller refrigerant leaks when servicing motor vehicle air conditioning systems, including those engineered with improved sealing and smaller refrigerant charges to address environmental concerns and increase system efficiency. This document does not address any safety issues concerning the equipment design or use beyond that of sampling a flammable refrigerant save those described in 3.1 and 3.2 of this document. All requirements of this standard shall be verified in SAE J2911.

SAE J2927 R-1234yf Refrigerant Identifier Installed in Recovery and Recycling Equipment for Use with Mobile A/C Systems

Jun 21, 2012 Revised

Scope

This SAE standard applies to refrigerant identification equipment to be used for identifying an acceptable level of R-1234yf purity in a refrigerant tank or vehicle MAC system labeled as containing R-1234yf, and not misidentify other refrigerants, per 5.7.

SAE J2970 Minimum Performance Requirements for Non-Refrigerant Tracer Gasses and Electronic Tracer Gas Leak Detectors

Mar 17, 2015 Revised

Scope

This standard provides the testing and functional requirements guidance necessary for a leak detection device that uses any non-A/C refrigerant tracer gas, such as helium or a nitrogen-hydrogen blend, to provide functional performance equivalent to a refrigerant electronic leak detector. It explains how a non-refrigerant leak detector's calibration can be established to provide levels of detection equal to electronic leak detectors that meet SAE J2791 for R-134a and SAE J2913 for R-1234yf.

RECOVERY/RECYCLE EQUIPMENT

The mobile Air Conditioning industry has established SAE performance certification requirements for recovery/recycle equipment and purity requirements for CFC-12 HFC-134a and HFC-1234yf. Use of certified ARI-740 equipment, which does not have a purity standard requirement, cannot be used in the mobile air conditioning industry since it does not comply with SAE or Section 609 of The Clean Air Act requirements.

SAE J1732 HFC-134a (R-134a) Refrigerant Recovery Equipment for Mobile Automotive Air-Conditioning Systems

Nov 21, 2011 Stabilized

Scope

The purpose of this SAE Standard is to provide equipment specifications for the recovery of HFC-134a (R-134a) refrigerant to be returned to a refrigerant reclamation facility that will process it to the appropriate ARI 700 Standard or allow for recycling of the recovered refrigerant to SAE J2210 specifications by using Design Certified equipment of the same ownership. It is not acceptable that the refrigerant removed from a mobile air-conditioning (A/C) system, with this equipment be directly returned to a mobile A/C system. This information applies to equipment used to service automobiles, light trucks, and other vehicles with similar HFC-134a (R-134a) A/C systems.

SAE J1770 Automotive Refrigerant Recovery/Recycling Equipment Intended for Use with Both R12 and R134a

Nov 05, 2010 Canceled

Scope

The purpose of this SAE Standard is to establish the specific minimum equipment requirements for recovery/recycling equipment intended for use with both R12 and R134a in a common refrigerant circuit that has been directly removed from, and is intended for reuse in, mobile air-conditioning (A/C) systems. This document does not apply to equipment used for R12 and R134a having a common enclosure with separate circuits for each refrigerant.

SAE J1990 Recovery and Recycle Equipment for Mobile Automotive Air-Conditioning Systems

May 26, 2011 Stabilized

Scope

The purpose of this SAE Standard is to provide equipment specifications for CFC-12 (R-12) recycling equipment. This information applies to equipment used to service automobiles, light trucks, and other vehicles with similar CFC-12 (R-12) air-conditioning (A/C) systems. Systems used on mobile vehicles for refrigerating cargo that have hermetically sealed systems are not

covered in this document. The equipment in this document is intended for use with refrigerant that has been directly removed from, and intended to be returned to, a mobile A/C system. Should other revisions due to operational or technical requirements occur, this document may be amended.

SAE J2209 CFC-12 (R-12) Refrigerant Recovery Equipment for Mobile Automotive Air-Conditioning Systems

Aug 12, 2011 Stabilized

Scope

The purpose of this SAE Standard is to provide equipment specifications for CFC-12 (R-12) recovery for return to a refrigerant reclamation facility that will process it to the appropriate ARI Standard (Air Conditioning and Refrigerant Institute) or allow for recycling of the recovered refrigerant in equipment that is certified to meet the requirements of SAE J1991. Under the existing rule, the U.S. EPA requires refrigerant removed from a mobile air-conditioning (A/C) system using recovery equipment certified to meet SAE J2209 can only be recycled using equipment meeting SAE J1991 that is owned by the same company or individual. It is not acceptable that the refrigerant removed from a mobile A/C system, with this equipment, be directly returned to a mobile A/C system. This information applies to equipment used to service automobiles, light trucks, and other vehicles with similar CFC-12 (R-12) systems.

SAE J2210 HFC-134a (R-134a) Recovery/Recycling Equipment for Mobile Air-Conditioning Systems

Nov 05, 2010 Canceled

Scope

The purpose of this SAE Standard is to establish the specific minimum equipment requirements for recycling HFC-134a (R-134a) that has been directly removed from, and is intended for reuse in, mobile air-conditioning (A/C) systems.

SAE J2788 HFC-134a (R-134a) Recovery/Recycle/Recharging Equipment for Mobile Air-Conditioning Systems

Jan 14, 2013 Revised

Scope

The purpose of this SAE Standard is to establish the specific minimum equipment performance requirements for recovery and recycling of HFC-134a that has been directly removed from, and is intended for reuse in, mobile air-conditioning (A/C) systems. It also is intended to establish requirements for equipment used to recharge HFC-134a to an accuracy level that meets Section 9 of this document and SAE J2099. The requirements apply to the following

types of service equipment and their specific applications. a. Recovery/Recycling Equipment, b. Recovery/Recycling-Refrigerant Charging, c. Refrigerant Recharging Equipment Only.

SAE J2810 HFC-134a (R-134a) Refrigerant Recovery Equipment for Mobile Automotive Air-Conditioning Systems

Mar 11, 2016 Revised

Scope

The purpose of this SAE Standard is to provide minimum performance and operating feature requirements for the recovery of HFC-134a (R-134a) refrigerant to be returned to a refrigerant reclamation facility that will process it to the appropriate AHRI 700 Standard or allow for on-site recycling of the recovered refrigerant to SAE J2788 specifications by using SAE J2788 or SAE J3030 -certified equipment. It is not acceptable that the refrigerant removed from a mobile air-conditioning (A/C) system with this equipment be directly returned to a mobile A/C system. An identifier certified to SAE J2912 is to be used to identify the contents of the system prior to recovery of the refrigerant.

SAE J2843 R-1234yf [HFO-1234yf] Recovery/Recycling/Recharging Equipment for Flammable Refrigerants for Mobile Air-Conditioning Systems

Jan 14, 2013 Revised

Scope

This SAE Standard applies to equipment to be used with R-1234yf refrigerant only. It establishes requirements for equipment used to recharge R-1234yf to an accuracy level that meets Section 9 of this document and purity levels defined in SAE J2099. Refrigerant service equipment is required to ensure adequate refrigerant recovery to reduce emissions and provide for accurate recharging of mobile air conditioning systems. Equipment shall be certified to meet all performance requirements outlined in this document and international/regional construction and safety requirements as outlined in this document.

SAE J2851 Recovery Equipment for Contaminated R-134a or R-1234yf Refrigerant from Mobile Automotive Air Conditioning Systems

Feb 12, 2015 Revised

Scope

This standard covers equipment used to remove contaminated R-134a and/or R-1234yf refrigerant from Mobile Air Conditioning (MAC) systems.

SAE J3030 Automotive Refrigerant Recovery/Recycling/Recharging Equipment Intended for use with Both R-1234yf and R-134a

Jul 08, 2015 Issued

Scope

The purpose of this SAE Standard is to establish the specific minimum equipment requirements for recovery/recycling/recharge equipment intended for use with both R-1234yf and R-134a in a common refrigerant circuit that has been directly removed from, and is intended for reuse in, mobile air-conditioning (A/C) systems. This document does not apply to equipment used for R-1234yf and R-134a having a common enclosure with separate circuits for each refrigerant, although some amount of separate circuitry for each refrigerant could be used.

REPLACEMENT REFRIGERANT REQUIREMENTS

Documents were developed at the request of EPA to provide engineering guidelines for alternate refrigerants being considered for mobile A/C systems.

SAE J1991 Standard of Purity for Use in Mobile Air-Conditioning Systems Aug 12, 2011 Stabilized

Scope

This information applies to refrigerant used to service automobiles, light trucks, and other vehicles with similar CFC-12 (R-12) systems. Systems used on mobile vehicles for refrigerated cargo that have hermetically sealed, rigid pipe, are not covered in this document.

SAE J2099 Standard of Purity for Recycled R-134a (HFC-134a) and R-1234yf (HFO-1234yf) for Use in Mobile Air-conditioning Systems

Apr 10, 2012 Revised

Scope

This SAE Standard applies to: • recycled R-134a refrigerant, used in servicing of motor vehicle air conditioning (A/C) systems that were designed for use with R-12 and have been retrofitted for use with R-134a; • recycled R-134a refrigerant, used in servicing of motor vehicle air conditioning (A/C) systems that were designed for use with R-134a; • recycled R-1234yf refrigerant, used in servicing of motor vehicle air conditioning (A/C) systems that were designed for use with R-1234yf. Hermetically sealed, refrigerated cargo systems are not covered by this document.

SAE J1657 Selection Criteria for Retrofit Refrigerants to Replace CFC-12 (R-12) in Mobile Air-Conditioning Systems

Apr 01, 2011 Stabilized

Scope

The purpose of this SAE Recommended Practice is to provide criteria for determining the acceptability of candidate retrofit refrigerants to replace CFC-12 (R-12) in mobile A/C systems originally designed to use CFC-12 (R-12).

SAE J1658 Alternate Refrigerant Consistency Criteria for Use in Mobile Air-Conditioning Systems

Jan 08, 2015 Canceled

Scope

This SAE Recommended Practice applies to refrigerant blends (multicomponent refrigerants) intended for use as retrofit refrigerants to replace CFC-12 (R-12) in mobile air-conditioning (A/C) systems. Since the composition of non-azeotropic refrigerant mixtures changes as refrigerant is lost, either through the vapor phase or the liquid phase, the method of charging A/C systems is important. The purpose of this document is to determine the proper refrigerant phase, liquid or vapor, for system charging by relating system performance changes to the charging method. This document is complete only when combined with the requirements of SAE J1657.

SAE J1659 Vehicle Testing Requirements for Replacement Refrigerants for CFC-12 (R-12) Mobile Air-Conditioning Systems

Nov 21, 2011 Stabilized

Scope

The purpose of this SAE Recommended Practice is to establish the specific criteria for the selection of a replacement refrigerant for mobile CFC-12 (R-12) air-conditioning (A/C) systems. This document provides guidelines for qualifying candidate refrigerant. The requirements include laboratory and field testing. The alternate refrigerant shall provide comparable system performance as CFC-12 (R-12) as defined herein. The vehicle testing shall be conducted on representative vehicle manufacturer's product line, in which the refrigerant is intended to be used, such as cycling clutch orifice tube, constant run orifice tube, cycling clutch expansion valve, or continuous run expansion valve refrigerant system. This document is complete only when combined with the requirements of SAE J1657.

SAE J2683 Refrigerant Purity and Container Requirements for Carbon Dioxide (CO₂ R-744) Used in Mobile Air-Conditioning Systems

Mar 03, 2016 Revised

Scope

This SAE Standard applies to Carbon Dioxide R-744 refrigerant used to service motor vehicle passenger air-conditioning (A/C) systems designed to use CO₂ (R-744). Hermetically sealed, refrigerated cargo systems are not covered by this document.

SAE J2776 Refrigerant Purity and Container Requirements for New HFC-134a 1,1,1,2 - Tetrafluoroethane Refrigerant Used in Mobile Air-Conditioning Systems

Jan 14, 2013 Revised

Scope

This SAE Standard applies to new refrigerant used in motor vehicle passenger air-conditioning (A/C) systems designed to use HFC-134a. Hermetically sealed, refrigerated cargo systems are not covered by this document.

SAE J2844 R-1234yf (HFO-1234yf) New Refrigerant Purity and Container Requirements for Use in Mobile Air-Conditioning Systems

Jan 14, 2013 Revised

Scope

This SAE Standard applies to new refrigerant used in motor vehicle passenger air-conditioning (A/C) systems designed to use R-1234yf, including belt and electrically driven compressors. Refrigerant for use in hermetically sealed, refrigerated cargo systems is not covered by this document.

RETROFIT DOCUMENTS

Two documents cover the retrofit procedures for conversion of CFC-12 mobile air conditioning systems to HFC-134a.

SAE J1660 Fittings and Labels for Retrofit of CFC-12 (R-12) Mobile Air-Conditioning Systems to HFC-134a (R-134a)

Apr 01, 2011 Stabilized

Scope

This SAE Recommended Practice describes the specific measures required to meet SAE established criteria when retrofitting CFC-12 (R-12) mobile air-conditioning (A/C) systems to HFC-134a (R-134a), with regards to fittings and labeling. This document is complete only when combined with the requirements of SAE J1657.

SAE J1661 Procedure Retrofitting CFC-12 (R-12) Mobile Air-Conditioning Systems to HFC-134a (R-134a)

Apr 01, 2011 Stabilized

Scope

The purpose of this SAE Recommended Practice is to provide a service procedure for retrofitting a CFC-12 (R-12) system to HFC-134a (R-134a) while preserving performance and

integrity of the air-conditioning (A/C) system. The steps outlined in this procedure are complete when combined with good service practices and the vehicle manufacturer's recommendations (if available) for retrofitting their models.

Separate service equipment, for CFC-12 (R-12) and HFC-134a (R-134a), including refrigerant recovery/recycle (R/R), service manifolds, vacuum pumps, and charging equipment shall be used to preserve the purity of the refrigerants and the mobile A/C systems. This procedure will minimize release of refrigerant to the atmosphere, and will preserve the integrity of the recycled CFC-12 (R-12) and HFC-134a (R-134a) supplies.

This document applies to A/C systems used to cool the passenger compartment of automobiles, light trucks, and other vehicles with similar CFC-12 (R-12) systems. Due to technical advancements in recent years, this procedure is recommended for common vehicle platforms produced in the mid-1980s and later. Vehicles produced before this time period may require additional retrofit requirements. A/C systems used on mobile vehicles for refrigerated cargo that have hermetically sealed systems are not covered by this document.

This document is only complete when combined with the requirements of SAE J1657 "Selection Criteria for Retrofit Refrigerants to Replace CFC-12 (R-12) in Mobile Air-conditioning Systems."

SAE J1662 Compatibility of Retrofit Refrigerants with Air-Conditioning System Materials Nov 21, 2011 Stabilized

Scope

The purpose of this SAE Recommended Practice is to provide criteria for determining the compatibility of air-conditioning (A/C) system materials/components with candidate retrofit refrigerants intended to replace CFC-12 (R12) in mobile A/C systems originally designed to use CFC-12 (R-12).

Heating and Defrosting

SAE J638 Motor Vehicle Heater Test Procedure May 26, 2011 Stabilized

Scope

This SAE Recommended Practice, limited to liquid coolant systems, establishes uniform vehicle heater test procedures. Both laboratory and complete vehicle tests are specified in this document. Required test equipment, facilities, and definitions are included. NOTE - Defrosting and defogging procedures and requirements can be found in SAE J902, J381, J382, and J953.

SAE J902 Passenger Car Windshield Demisting and Defrosting Systems Aug 04, 2011 Revised

Scope

This SAE Recommend Practice establishes for passenger cars, light trucks, and multipurpose vehicles with GVW of 4500 kg (10 000 lb.) or less, as defined by EPA, and M1 category vehicles as defined by the European Commission:

a. Minimum performance standards for defrosting and demisting systems. b. Test procedures that can be conducted on uniform test equipment by commercially available laboratory facilities.

SAE J953 Passenger Car Backlight Defogging System

May 26, 2011 Stabilized

Scope

The scope of this SAE Recommended Practice is to establish uniform test procedures for passenger cars, to determine whether the system is defined as a defroster or defogger, and to establish minimum performance requirements for each system. A defroster for purposes of this practice is a system which will remove moisture and/or frost from the interior surface of the backlight at -18 °C. A defogger is a system which will remove moisture and/or fog from the interior surface of the backlight at 4 °C. The test procedure is intended to simulate actual conditions by utilizing either a cold room with an appropriate device to introduce air flow over the backlight or a sufficiently large wind tunnel with ambient temperature control. The test procedure and the minimum performance requirements are based on currently available engineering data.

Appendix A

Interior Climate Control Standards Committees

List of currently published SAE documents by committee:

Interior Climate Control Service Committee

<u>Document</u>	<u>Title</u>
J1627	Performance Criteria for Electronic Refrigerant Leak Detectors

SAE J DOCUMENTS FOR MOBILE HEATING AND A/C SYSTEMS

J1628	Technician Procedures for Refrigerant Leak Detection in Service of Mobile Air Conditioning Systems
J1657	Selection Criteria for Retrofit Refrigerants to Replace CFC-12 (R-12) in Mobile Air-Conditioning Systems
J1660	Fittings and Labels for Retrofit of CFC-12 (R-12) Mobile Air-Conditioning Systems to HFC-134a (R-134a)
J1661	Procedure Retrofitting CFC-12 (R-12) Mobile Air-Conditioning Systems to HFC-134a (R-134a)
J1732	HFC-134a (R-134a) Refrigerant Recovery Equipment for Mobile Automotive Air-Conditioning Systems
J1770	Automotive Refrigerant Recovery/Recycling Equipment Intended for Use with Both R-12 and R-134a
J1771	Criteria for Refrigerant Identification Equipment for Use with Mobile Air-Conditioning Systems
J1989	Recommended Service Procedure for the Containment of CFC-12 (R-12)
J1990	Recovery and Recycle Equipment for Mobile Automotive Air-Conditioning Systems
J2196	Service Hose for Automotive Air Conditioning
J2197	HFC-134a (R-134a) Service Hose Fittings for Automotive Air-Conditioning Service Equipment
J2209	CFC-12 (R-12) Refrigerant Recovery Equipment for Mobile Automotive Air-Conditioning Systems
J2210	HFC-134a (R-134a) Recovery/Recycling Equipment for Mobile Air-Conditioning Systems
J2211	Recommended Service Procedure for the Containment of HFC-134a (R-134a)
J2298	Ultraviolet Leak Detection: Procedure for Use of Refrigerant Leak Detection Dyes for Service of Mobile Air-Conditioning Systems
J2762	Method for Removal of Refrigerant from Mobile Air Conditioning System to Quantify Charge Amount
J2788	HFC-134a (R-134a) Recovery/Recycle/Recharging Equipment for Mobile Air-Conditioning Systems
J2791	HFC-134a Refrigerant Electronic Leak Detectors, Minimum Performance Criteria
J2810	HFC-134a (R-134a) Refrigerant Recovery Equipment for Mobile Automotive Air-Conditioning Systems
J2843	R-1234yf [HFO-1234yf] Recovery/Recycling/Recharging Equipment for Flammable Refrigerants for Mobile Air-Conditioning Systems
J2845	R-1234yf [HFO-1234yf] and R-744 Technician Training for Service and Containment of Refrigerants Used in Mobile A/C Systems
J2851	Recovery Equipment for Contaminated R-134a or R-1234yf Refrigerant from Mobile Automotive Air Conditioning Systems
J2888	R-1234yf Service Hose, Fittings and Couplers for Mobile Refrigerant Systems Service Equipment
J2912	Performance Requirements for R-134a and R-1234yf Refrigerant Diagnostic Identifiers (RDI) for Use with Mobile Air Conditioning Systems
J2913	R-1234yf [HFO-1234yf] Refrigerant Electronic Leak Detectors, Minimum Performance Criteria
J2927	R-1234yf Refrigerant Identifier Installed in Recovery and Recycling Equipment for Use with Mobile A/C Systems
J2970	Minimum Performance Requirements for Non-Refrigerant Tracer Gasses and Electronic Tracer Gas Leak Detectors
J3030	Automotive Refrigerant Recovery/Recycling/Recharging Equipment Intended for use with Both R-1234yf and R-134a

Interior Climate Control MAC Supplier Committee

<u>Document</u>	<u>Title</u>
J2064	Coupled Automotive Refrigerant Air-Conditioning Hose Assemblies
J2763	Test Procedure for Determining Refrigerant Emissions from Mobile Air Conditioning Systems
J2765	Procedure for Measuring System COP [Coefficient of Performance] of a Mobile Air Conditioning System on a Test Bench
J2842	R-1234yf and R744 Design Criteria and Certification for OEM Mobile Air Conditioning Evaporator and Service Replacements
J3062	Automotive Refrigerant Air-Conditioning Hose Requirements

Interior Climate Control Vehicle OEM Committee

<u>Document</u>	<u>Title</u>
J1659	Vehicle Testing Requirements for Replacement Refrigerants for CFC-12 (R-12) Mobile Air-Conditioning Systems
J2727	Mobile Air Conditioning System Refrigerant Emission Charts for R-134a and R-1234yf
J2766	Life Cycle Analysis to Estimate the CO ₂ -Equivalent Emissions from MAC Operation
J2772	Measurement of Passenger Compartment Refrigerant Concentrations Under System Refrigerant Leakage Conditions
J2773	Standard for Refrigerant Risk Analysis for Mobile Air Conditioning Systems
J2777	Recommended Best Practice for Climatic Wind Tunnel Correlation
J638	Motor Vehicle Heater Test Procedure
J639	Safety Standards for Motor Vehicle Refrigerant Vapor Compressions Systems
J902	Passenger Car Windshield Demisting and Defrosting Systems

Interior Climate Control Fluids Committee

<u>Document</u>	<u>Title</u>
J1658	Alternate Refrigerant Consistency Criteria for Use in Mobile Air-Conditioning Systems
J1662	Compatibility of Retrofit Refrigerants with Air-Conditioning System Materials
J1991	Standard of Purity for Use in Mobile Air-Conditioning Systems
J2099	Standard of Purity for Recycled R-134a (HFC-134a) and R-1234yf (HFO-1234yf) for Use in Mobile Air-conditioning Systems
J2296	Retest of Refrigerant Container
J2297	Ultraviolet Leak Detection: Stability and Compatibility Criteria of Fluorescent Refrigerant Leak Detection Dyes for Mobile R-134a and R-1234yf (HFO-1234yf) Air-Conditioning Systems

SAE J DOCUMENTS FOR MOBILE HEATING AND A/C SYSTEMS

J2299	Ultraviolet Leak Detection: Performance Requirements for Fluorescent Refrigerant Leak Detection Dye Injection Equipment for Aftermarket Service of Mobile Air-Conditioning Systems
J2670	Stability and Compatibility Criteria for Additives and Flushing Materials Intended for Aftermarket Use in R-134a (HFC-134a) and R-1234yf (HFO-1234yf) Vehicle Air-Conditioning Systems
J2663	Refrigerant Purity and Container Requirements for Carbon Dioxide (CO2 R-744) Used in Mobile Air-Conditioning Systems
J2776	Refrigerant Purity and Container Requirements for New HFC-134a 1,1,1,2 - Tetrafluoroethane Refrigerant Used in Mobile Air-Conditioning Systems
J2844	R-1234yf (HFO-1234yf) New Refrigerant Purity and Container Requirements for Use in Mobile Air-Conditioning Systems

The information contained in this document was accurate to the best of our knowledge in June 2016. Users should always check with the SAE Staff Standards Specialist or refer to the SAE website www.sae.org and search on the exact document number to obtain and verify the latest version, revision date and scope as these items are constantly being updated.