



SURFACE VEHICLE STANDARD

J2912™**APR2026**Issued 2011-02
Revised 2026-04

Superseding J2912 SEP2020

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

RATIONALE

SAE Five-Year Review. Changes in SNAP refrigerants require update to performance testing. Additional editorial updates.

1. SCOPE

This SAE Standard applies to refrigerant diagnostic 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.

1.1 Purpose

Establishing such specifications will ensure equipment that meets this standard can identify relatively pure refrigerant HFC-134a (R-134a) and HFO-1234yf (R-1234yf) from mixtures of refrigerants (HFC, HCFC, CFC, hydrocarbons, etc.) in a refrigerant supply tank or mobile system prior to recovering/recycling (R/R) the refrigerant or prior to charging an A/C system from a refrigerant container to meet SAE J2099 requirements. The identifier also shall identify and display weight of non-condensable gases, such as air. The displays shall be in percentages, per 3.1.3, and to the specified accuracies.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue of SAE publications shall apply.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (U.S. and Canada only) or +1 724-776-4970 (outside U.S. and Canada), www.sae.org.

SAE J639 Safety and Design Standards for Motor Vehicle Refrigerant Vapor Compression Systems

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

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Documents



Standard, visit Sharing Hub

SAE J2197	Hfc-134a (R-134a) Service Hose Fittings for Automotive Air-Conditioning Service Equipment
SAE J2843	R-1234yf (HFO-1234yf) Recovery/Recycling/Recharging Equipment for Mobile Air-Conditioning Systems
SAE J2888	R-1234yf Service Hose, Fittings, and Couplers for Mobile Refrigerant Systems Service Equipment
SAE J2911	Procedure for Certification that Requirements for Mobile Air Conditioning System Components, Service Equipment, and Service Technician Training Meet SAE J Standards
SAE J3030	Automotive Refrigerant Recovery/Recycling/Recharging Equipment Intended for Use with Both R-1234yf and R-134a

2.1.2 UL Publications

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

UL 121201	Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations
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2.2 Related Publications

2.2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (U.S. and Canada only) or +1 724-776-4970 (outside U.S. and Canada), www.sae.org.

SAE J1739	Potential Failure Mode and Effects Analysis (FMEA), Including Design FMEA, Supplemental FMEA-MSR, and Process FMEA
SAE J2845	R-12 (CFC-12), R-134a (HFC-134a), R-1234yf (HFO-1234yf), R-744, and R-152a (HFC-152a) Technician Training for Service and Containment of Refrigerants Used in Mobile A/C Systems
SAE J2927	Integrated R-1234yf Refrigerant Identifier for Recovery and Recycling Equipment Used in Mobile A/C System Servicing

2.2.2 UL Publications

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

UL 1963	Refrigerant Recovery/Recycling Equipment
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3. TECHNICAL REQUIREMENTS

- 3.1 The identifier shall be suitable for use in safely identifying HFO-1234yf (R-1234yf), an A2L classified flammable refrigerant.
 - 3.1.1 The identifier shall be suitable for use in an automotive service garage environment and be capable of continuous operation in ambient temperatures from 10 to 49 °C.
 - 3.1.2 The identifier shall be design certified as an “R-134a/R-1234yf Refrigerant Diagnostic Identifier” and shall carry this labeling and also the following: “Certified to meet SAE J2912.” Tools that do not meet this standard shall not be referred to by this name or carry this labeling. Within this standard, the term RDI shall be used to mean R-134a/R-1234yf refrigerant diagnostic identifier.

3.1.3 Refrigerant Diagnostic Identifier

The R-134a/R-1234yf refrigerant diagnostic identifier shall have a panel or an output to another external display (R/R/R, etc.) that displays the percentages of R-134a and R-1234yf in the refrigerant sample, with the following levels of accuracy, based on a percentage of non-condensable gases that is 20% or less:

- a. If the refrigerant in the sample contains 90% or more of either refrigerant, the displayed percentage shall be accurate to $\pm 1\%$ points or better.
- b. If the refrigerant in the sample contains 70% to less than 90% of either refrigerant, the displayed percentage shall not display as greater than 92% pure.
- c. If the refrigerant in the sample contains less than 70% of either refrigerant, but the percentage makes it the primary refrigerant, the displayed percentage shall not display as greater than 85% pure.
- d. The percentages listed shall be for the refrigerants listed in 3.2 and pursuant to the testing in 5.7.

3.1.4 Non-condensable gases including air shall be displayed if in weight of 3% or greater of the sample, provided the refrigerant sample is identified as 95% or greater of R-134a or R-1234yf. The display then shall be accurate to $\pm 2\%$ points if NCG is in the range of 3 to 10% of the sample. The display shall be accurate to within $\pm 3\%$ points if NCG is in the range of 11 to 20%. If NCG content is in excess of 20%, up to 50%, the display shall be accurate to within $\pm 10\%$ points. If NCG content is in excess of 50%, the display shall indicate a numerical value that is greater than 50% or a message indicating the same as defined by the operating manual.

3.1.5 Hydrocarbons (abbreviated HC) and R-152a shall be identified if either or both are in the refrigerant sample at a percentage of 3 to 10%, accurate to $\pm 2\%$ points. For hydrocarbons (HC) or R-152a quantities greater than 10%, the RDI shall display the percentage as greater than 10% so as to not impinge upon the prior stated accuracy. The display shall read Hydrocarbons or abbreviated HC, R-152a, or an equivalent listed in the instruction manual.

3.2 This document provides the tests the equipment must pass and the feature content it is required to have, to certify the equipment to this standard, for identification of HFC-134a (R-134a), HFO-1234yf (R-1234yf), and hydrocarbons and/or R-152a. However, the equipment may identify as many refrigerants or substances as are in accordance with the manufacturer's design.

3.2.1 If the equipment displays a percentage beyond the design certified percent purity level (i.e., to one or more decimal places) or identifies refrigerants other than R-1234yf, R-134a, and hydrocarbons and/or R-152a, the additional display is understood to be informational and may not be accurate. See 4.5.

3.2.2 To prevent possible refrigerant contamination, the equipment shall comply with SAE J2888 and SAE J2197 requiring that a separate hose assembly be used with a unique service port fitting for each primary refrigerant it will test/identify. The RDI shall be furnished with fittings for R-134a and R-1234yf unless said device is designed for integration into an R/R/R machine.

3.2.3 The equipment shall be certified that it meets this specification by SAE J2911.

3.3 As an example, for an RDI that meets this specification to identify R-134a and R-1234yf by ABC Company to 98% purity, and to detect weight of non-condensable gases 3% or greater, the label (with lettering at least 3 mm high) would read "Refrigerant Diagnostic Identifier Design Certified by (name, such as ABC Company or ABC Laboratories) to Meet SAE J2912 to Identify HFC-134a (R-134a) and HFO-1234yf (R-1234yf), to 98% purity." Also, "This equipment will detect 3% or greater by weight of non-condensable gases in HFC-134a (R-134a) and HFO-1234yf (R-1234yf)."

3.4 The supplier of an RDI that meets this standard also is permitted to list separately in the operating manual and/or on a separate label any other refrigerants for which the RDI has similarly been tested and its performance verified to identify to accuracy levels equal to R-134a, R-1234yf, and hydrocarbons/R-152a. However, such listings shall be referred to as informational, as no specific testing is required by this standard. The label shall include the words "Informational only; not certified to SAE J2912."