SAE International

SURFACE VEHICLE RECOMMENDED PRACTICE

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

RATIONALE

The technical report covers technology, products, or processes which are mature and not likely to change in the foreseeable future.

STABILIZED NOTICE

This document has been declared "Stabilized" by the SAE Interior Climate Control Committee and will no longer be subjected to periodic reviews for currency. Users are responsible for verifying references and continued suitability of technical requirements. Newer technology may exist.

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1. ***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.

2. ***References***

2.1 **Applicable Publications—**The following publications form a part of the specification to the extent specified herein. Unless otherwise indicated, the latest revision of SAE publications shall apply.

2.1.1 SAE PUBLICATIONS—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J639—Safety and Containment of Refrigerant for Vapor Compression Systems for Mobile Air-Conditioning Systems
SAE J1627—Rating Criteria for Electronic Refrigerant Leak Detectors
SAE J1628— Technician Procedure for Using Electronic Refrigerant Leak Detector for Service of Mobile Air-Conditioning Systems
SAE J1657—Selection Criteria for Retrofit Refrigerants to Replace CFC-12 (R-12) in Mobile Air-Conditioning Systems
SAE J1661—Procedure for Retrofitting CFC-12 (R-12) Mobile Air-Conditioning Systems to HFC-134a (R-134a)
SAE J2064—HFC-134a (R-134a) Refrigerant Automotive Air-Conditioning Hose

2.1.2 UL PUBLICATION—Available from Underwriters Laboratories, Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

ANSI/UL 969-1991—Marking and Labeling Systems

3. ***Fittings***

3.1 There shall be at least one system service port which complies with SAE J639 for HFC-134a (R-134a). If both a high side and low side service port exist, there shall be at least one high side and at least one low side system service port which complies with SAE J639 for HFC-134a (R-134a) after the retrofit is completed.

3.2 When existing CFC-12 (R-12) service ports are to be retrofit, HFC-134a (R-134a) conversion assemblies shall be fitted. The conversion assembly shall attach to the CFC-12 (R-12) fitting with a thread lock adhesive and/or a separate mechanical latching mechanism (e.g., snap-ring, drive-wire, roll pin, etc.) in a manner that prevents the assembly from being removed inadvertently.

3.2.1 A conversion assembly that consists of flexible portion(s) as well as nonflexible couplings and/or fittings shall comply with SAE J639. Such a conversion assembly, up to and including the appropriate CFC-12 (R-12) interface, shall be considered a hose assembly and shall meet all requirements of SAE J2064. Such a conversion assembly shall also meet the following vibration test requirements. Following successful completion of the SAE J2064 Coupling Integrity Test, subject these same test specimen assemblies, still charged with the appropriate amount of refrigerant (5.3.2.1), to the following vibration testing sequence:

a. Install each test specimen assembly on a vibration table with the conversion adaptor positioned downward.
b. Expose the assembly to 77 °C + 5 °C and vibrate at 30 Hz + 5 Hz and 1.57 mm total displacement in a vertical direction for 200 h followed by 200 h in a horizontal direction.

At the end of test, verify gravimetrically that the test assembly still has a refrigerant charge. Refrigerant leakage at the end of test shall not exceed 0.45 kg per 40 years. Leak detection equipment and methodology shall conform to SAE J1627 and J1628.

3.2.2 A conversion assembly that consists solely of nonflexible couplings and/or fittings shall comply with SAE J639. Such a conversion assembly, up to and including the appropriate CFC-12 (R-12) interface, shall be tested in accordance with SAE J2064 Coupling Integrity Testing sections covering coupling integrity, test specimens, charging and exposure, after which refrigerant leakage shall not exceed 0.45 kg per 40 years. Leak detection equipment and methodology shall conform to SAE J1627 and J1628. Following successful completion of this "modified" SAE J2064 Coupling Integrity Test, subject these same test specimen assemblies, still charged with the appropriate amount of refrigerant, to the following vibration testing sequence.

a. Install each test specimen assembly on a vibration table with the conversion adaptor position downward.
b. Expose the assembly to 77 °C + 5 °C and vibrate at 30 Hz + 5 Hz and 1.57 mm total displacement in a vertical direction for 200 h followed by 200 h in a horizontal direction.

Refrigerant leakage at the end of test shall not exceed 0.45 kg per 40 years. Leak detection equipment and methodology shall conform to SAE J1627 and J1628.

3.2.3 Only a conversion assembly meeting the requirements of 3.2.1 and 3.2.2 may be labeled with "SAE J1660" or "Complies with SAE J1660."

3.3 When new HFC-134a (R-134a) service ports are added, they shall conform to SAE J639. Such added retrofit service ports shall comply with SAE J2064 Coupling Integrity Test 5.3.2 and 5.3.3.

3.4 All CFC-12 (R-12) service ports shall either be retrofitted with conversion assemblies as in 3.2, or be rendered incompatible with CFC-12 (R-12) related service equipment by fitting with a device such as a plug or cap. This device shall attach to the CFC-12 (R-12) fitting with a thread locking adhesive and/or a separate latching mechanism (e.g., snap-ring, drive-wire, roll pin, nonremovable plug) that prevents the device from being removed inadvertently.

4. ***Labels—***When a retrofit procedure is performed, a label(s) documenting the change shall be affixed to the vehicle as described as follows.

4.1 The retrofit label shall have a header with the words "NOTICE: RETROFITTED TO R134a."