SAE The Engineering Society For Advancing Mobility Land Sea Air and Space®
INTERNATIONAL
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SURFACE VEHICLE STANDARD

SAE J1732

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Submitted for recognition as an American National Standard

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

Foreword—SAE J2210 established equipment specifications for on-site recovery and reuse of HFC-134a (R-134a) in mobile air-conditioning (A/C) systems. These specifications are for HFC-134a (R-134a) recovery (extraction) only equipment that are intended to be used in conjunction with the on-site recovery/recycling (R/R) equipment used at service facilities, or allow for off-site refrigerant reclamation.

1. 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.

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 Mechanical Vapor Compression Systems Used for Mobile Air-Conditioning Systems
SAE J1771—Criteria for Refrigerant Identification Equipment for Use with Mobile Air-Conditioning Systems
SAE J2210—HFC-134a (R-134a) Recovery/Recycling Equipment for Mobile Automotive Air-Conditioning Systems
SAE J2196—Service Hose for Automotive Air Conditioning
SAE J2296—Retest of Refrigerant Containers

2.1.2 ARI PUBLICATION—Available from Air Conditioning and Refrigeration Institute, 1501 Wilson Boulevard, Sixth Floor, Arlington, VA 22209.

ARI 700—Specifications for Fluorocarbon Refrigerants

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2.1.3 CGA PUBLICATION—Available from CGA, Crystal Gateway #1, Suite 501, 1235 Jefferson Davis Highway, Arlington, VA 22202.

CGA S-1.1—Pressure Relief Device Standard Part 1—Cylinders for Compressed Gases

2.1.4 DOT SPECIFICATION—Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

CFR 49, Section 173.304—Shippers—General Requirements for Shipments and Packagings

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

UL 1769—Cylinder Valves

3. Specifications and General Description

3.1 The equipment must be able to recover (extract) HFC-134a (R-134a) refrigerant from a mobile A/C system.

3.2 The equipment shall be suitable for use in an automotive service garage environment as defined in 6.8.

3.3 Equipment Certification—The equipment shall be certified by Underwriters Laboratories or an equivalent certifying EPA listed laboratory to meet SAE J1732.

3.4 Label Requirements—The equipment shall have a label "Design Certified by (Company Name) to meet SAE J1732 for use only with HFC-134a (R-134a). The refrigerant from this equipment must be processed to the appropriate ARI 700 specifications or to SAE J2210 specifications by using Design Certified equipment of the same ownership." The minimum letter size shall be bold type, 3 mm in height.

4. Safety Requirements

4.1 The equipment must comply with applicable federal, state, and local requirements on equipment related to the handling of HFC-134a (R-134a) material. Safety precautions or notices, labels, related to the safe operation of the equipment shall also be prominently displayed on the equipment and should state "CAUTION—SHOULD BE OPERATED BY CERTIFIED PERSONNEL." The safety identification shall be located on the front near the controls.

4.2 The equipment must comply with applicable safety standards for electrical and mechanical requirements.

5. Operating Instructions

5.1 The equipment manufacturer must provide operating instructions that include information required by SAE J639, necessary maintenance procedures, and source information for replacement parts and repair.

5.1.1 The instruction manual shall include the following information on the lubricant removed. Only new lubricant, as identified by the system manufacturer, should be replaced in the mobile A/C system. Removed lubricant from the system and/or the equipment shall be disposed of in accordance with the applicable federal, state, and local procedures and regulations.

5.2 The equipment must prominently display the manufacturer's name, address, the type of refrigerant it is designed to extract, a service telephone number, and any items that require maintenance or replacement that affect the proper operation of the equipment. Operation manuals must cover information for complete maintenance of the equipment to assure proper operation.

5.3 The equipment manufacturer shall provide a warning in the instruction manual regarding the possibility of refrigerant contamination in the mobile A/C system being serviced.

5.4 Recovery equipment having refrigerant identification equipment shall meet the requirements of SAE J1771.

5.5 Recovery equipment not having refrigerant identification capability shall have instructions covering possible contamination problems to both the equipment and the existing recycled refrigerant in the equipment.

6. Function Description

6.1 The equipment must be capable of ensuring recovery of the HFC-134a (R-134a) from the system serviced by reducing the system pressure to a minimum of 102 mm of mercury below atmospheric. To prevent system delayed outgassing, the unit must have a device that assures that the refrigerant has been recovered from the A/C system.

6.1.1 Testing laboratory certification of the equipment capability is required which shall process contaminated refrigerant samples at specific temperatures.

6.2 The equipment must be preconditioned with a minimum of 13.6 kg of the standard contaminated HFC-134a (R-134a) at an ambient of 21 °C before starting the test cycle. Sample amounts are not to exceed 1.13 kg with sample amounts to be repeated every 5 min. The test fixture shown in Figure 1, shall be operated at 21 °C. Contaminated HFC-134a (R-134a) samples shall be processed at ambient temperatures of 10 and 49 °C, without the equipment shutting down due to any safety devices employed in this equipment.

6.2.1 Contaminated HFC-134a (R-134a) sample.

6.2.2 Standard contaminated HFC-134a (R-134a) refrigerant, 13.6 kg sample size, shall consist of liquid HFC-134a (R-134a) with 1300 ppm (by weight) moisture at 21 °C and 45 000 ppm (by weight) of oil (polyalkylene glycol oil with 100 cs viscosity at 40 °C or equivalent) and 1000 ppm by weight of noncondensable gases (air).

6.3 Portable refillable containers used in conjunction with this equipment must meet applicable DOT Standards.

6.3.1 The container color must be blue with a yellow top to identify that is contains used HFC-134a (R-134a) refrigerant. It must be permanently marked on the outside surface in black print at least 20 mm "DIRTY HFC-134a (R-134a)—DO NOT USE, MUST BE REPROCESSED."

6.3.2 The portable refillable container shall have a 1/2 in ACME thread.

6.3.3 During operation, the equipment shall provide overfill protection to assure that the storage container liquid fill does not exceed 80% of the tank's rated volume at 21 °C per DOT Standard, CFR Title 49, Section 173.304 and the American Society of Mechanical Engineers.

6.4 Additional Storage Tank Requirements

6.4.1 The cylinder valve shall comply with UL 1769.

6.4.2 The pressure relief device shall comply with CGA Pamphlet S-1.1.

6.4.3 The container assembly shall be marked to indicate the first retest date, which shall be 5 years after date of manufacture. The marking shall indicate that retest must be performed every subsequent 5 years. The marking shall be in letters at least 6 mm high. SAE J2296 provides an inspection procedure.

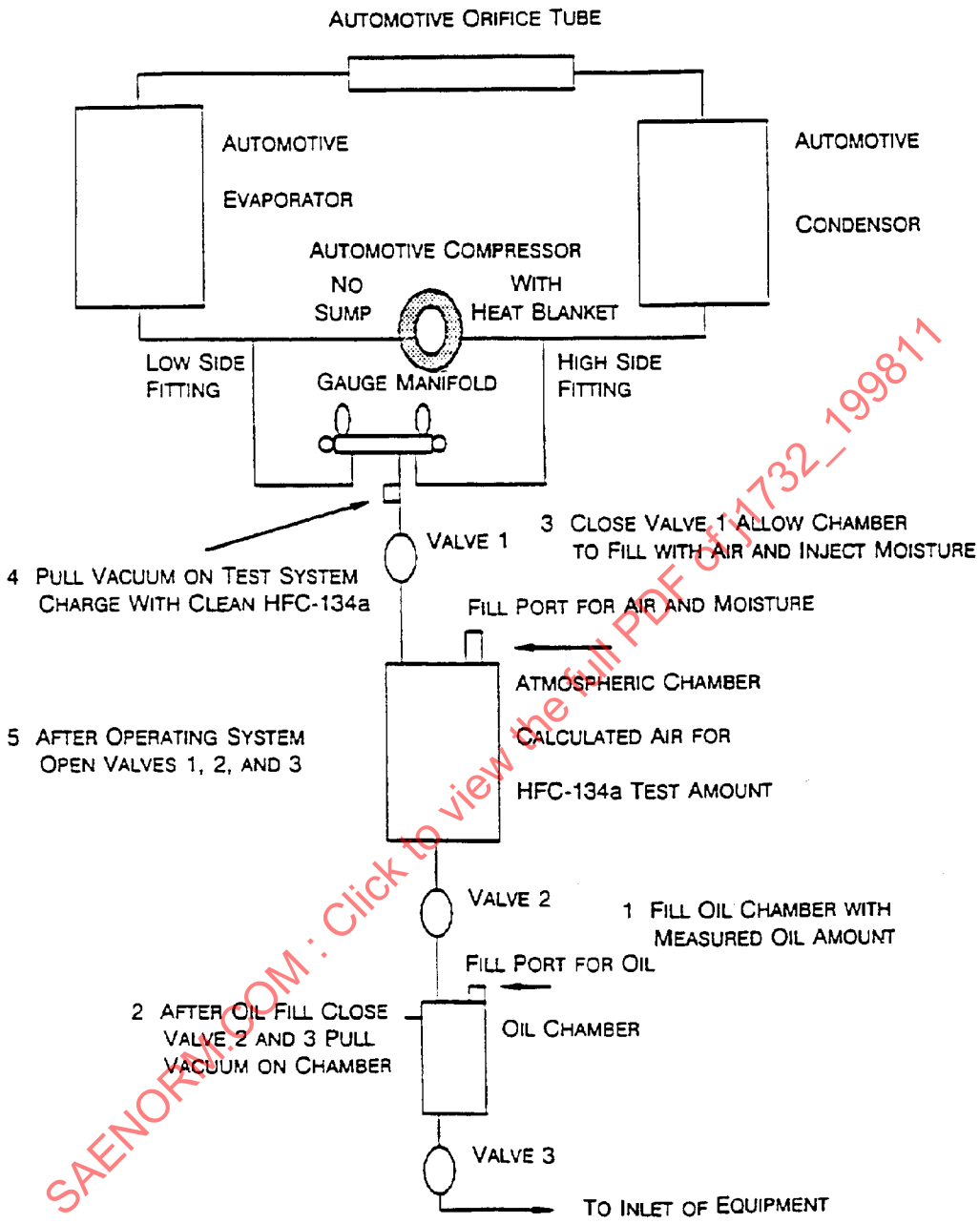

FIGURE 1—TEST FIXTURE

6.5 All flexible hoses must meet SAE J2196 for service hoses.

6.6 Service hoses must have shutoff devices located within 30 cm of the connection point to the system being serviced to minimize introduction of noncondensable gases into the recovery equipment during connection and the release of the refrigerant during disconnection.

6.7 The equipment must be able to separate the lubricant from recovered refrigerant and accurately indicate the amount removed from the simulated automotive system during processing in 30 mL units.