

	<b>SURFACE VEHICLE RECOMMENDED PRACTICE</b>	<b>SAE</b> <b>J1661 APR2011</b>
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Procedure Retrofitting 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.

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1. **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."

## 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 J1628—Technical Procedure for Using Electronic Refrigerant Leak Detectors 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 J1660—Fittings and Labels for Retrofit of CFC-12 (R-12) Mobile Air-Conditioning Systems to HFC-134a (R-134a)

SAE J1771—Criteria for Refrigerant Identification Equipment for Use With Mobile Air-Conditioning Systems  
SAE J1989—Recommended Service Procedure for the Containment of CFC-12 (R-12)  
SAE J1990—Extraction and Recycle Equipment for Mobile Air-Conditioning Systems CFC-12 (R-12)  
SAE J1991—Standard of Purity for Use in Mobile Air-Conditioning Systems CFC-12 (R-12)  
SAE J2084—Air-Conditioning Hose Requirements for HFC-134a (R-134a)  
SAE J2099—Standard of Purity for Recycled HFC-134a (R-134a) for Use in Mobile Air-Conditioning Systems  
SAE J2196—Service Hoses for Automotive Air Conditioning  
SAE J2197—HFC-134a (R-134a) Service Hose Fittings for Automotive Air-Conditioning Service Equipment  
SAE J2209—CFC-12 (R-12) Extraction Equipment for Mobile Air-Conditioning Systems  
SAE J2210—HFC-134a (R-134a) Recycling Equipment for Mobile Air-Conditioning Systems  
SAE J2211—Recommended Service Practice for the Containment of HFC-134a (R-134a)

### **3. *Air-Conditioning System Preparation Prior to Retrofit***

- 3.1** Determine that the vehicle A/C system has not been previously retrofitted. Talk to the customer and obtain the service history of the A/C system.
- 3.1.1 Since the A/C system may contain another refrigerant, a combination of refrigerants, or excess noncondensables (NCG's), the system's contents should be identified before removing the refrigerant. Not identifying the refrigerant type prior to removal can result in contamination of R/R equipment. Use of refrigerant identification equipment certified to SAE J1771 should be used to determine what refrigerant is in the mobile A/C system about to be recovered.
- 3.1.2 Check the engine compartment area for a system label to determine the existing system identification and/or if a retrofit label has been installed.
- 3.1.3 Determine that CFC-12 (R-12) service ports are on the A/C system. CFC-12 (R-12) high and low side ports. (SAE 3/8 in-24 and 7/16 in-20 refrigeration flares as defined in SAE J639).
- 3.1.4 Check all service ports and identify the usage (e.g., switches). Refer to 5.3 for retrofit fitting and label requirements.
- 3.2** Determine possible refrigerant leaks and system performance.
- 3.2.1 Connect the CFC-12 (R-12) manifold set including service hoses that meet SAE J2196 to the system. During initial inspection and service, use CFC-12 (R-12) refrigerant recovery/recycle (CFC-12 (R-12) R/R) equipment meeting SAE J1990 or SAE J2209.
- 3.2.2 With the engine off, check the A/C system pressure. If the system does not have pressure, inspect the system for possible leak points. Follow SAE J1628 Leak Check procedure by adding refrigerant CFC-12 (R-12) to determine if the system has any leaks. System components that are found to be leaking shall be repaired or replaced in a manner compatible with the retrofit.
- 3.2.3 With the refrigerant system properly charged, operate the A/C system and observe the high and low pressures, panel outlet discharge temperature, and other parameters recommended by the vehicle manufacturer.
- 3.2.4 Determine necessary repairs and component replacements in addition to those required for retrofitting the vehicle A/C system. Refer to 5.2.1 for repairs.