



SURFACE VEHICLE STANDARD

J2762™**MAY2025**

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Superseding J2762 MAR2017

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

RATIONALE

SAE J2762 is the result of a Five-Year Review and update of the specification.

Edits have been made to the document to reflect the “refrigerant agnostic” direction of the Interior Climate Control Standards Committees.

1. 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.

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 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

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

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

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

Clodic, D., Yu, Y., Trémoulet, A., and Lionel, P., “Elaboration of a Correlation Factor Based On Fleet Tests and Mobile Air Conditioning (MAC) System Laboratory Tests,” SAE Technical Paper 2007-01-1187, 2007, <https://doi.org/10.4271/2007-01-1187>.

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2.1.2 Other Publications

Dianetti, E. and I-MAC Report Team. (2007). *Refrigerant leakage reduction: Final report to sponsors.*

3. BACKGROUND

3.1 The Effect of System Design on the Refrigerant Recovery Process

3.1.1 When refrigerant is removed from the system, the lowering of pressure results in some of the system components becoming cooler. This component cooling effect makes complete refrigerant removal in a short period of time more difficult. To remove as much of the refrigerant as possible during the recovery process, systems equipped with orifice tubes and accumulators require more time than systems equipped with expansion valves and receiver driers. This is mainly because of the design differences between accumulators and receiver driers (being larger than receiver driers, accumulators, located in the low-pressure side of the system [where the refrigerant is cold and more refrigerant can be held by the oil], hold more refrigerant and oil than do receiver driers).

3.2 The amount of refrigerant recovered from a system depends on how much is in the system and the temperature of the work area. When the refrigerant is recovered, the vacuum lowers the temperature of the various components in the system; the oil chills and forms a virtual barrier to reduce refrigerant evaporation.

3.3 I-MAC CRP (Improved Mobile Air Conditioning Cooperative Research Project) Results

3.3.1 Refrigerant Recovery Standard for System Charge Level Determination Final Assessment

3.3.1.1 The procedure was tested on selected vehicles with a variety of A/C system configurations (CCOT [cycling clutch orifice tube]), TXV [thermal expansion valve], dual systems). Different types of oil-less recovery pumps were investigated in an attempt to reduce variation of refrigerant recovery quantities.

3.3.1.2 The use of dry ice or liquid nitrogen was rejected as a viable option for field testing due to availability and safety concerns. Refrigerant recovery quantities achieved by following the published procedure did not produce the desired accuracy and repeatability for all A/C system types. All testing was conducted at room temperature. Consistent evacuation levels and times were maintained.

3.3.1.3 Recovery variation is largely dependent on the refrigerant vaporization rate and the amount of refrigerant remaining in solution with the oil within the A/C system at evacuation terminus. It is believed that the amount of refrigerant recovered, and the associated repeatability, would be improved significantly by elevating the vehicle temperature to 30 °C during reclaim. This was also rejected as being impractical in a field environment.

3.3.1.4 It is difficult and unreliable to remove refrigerant from mobile A/C systems and quantify system emissions.

3.3.1.4.1 Tests performed for the SAE I-MAC research program indicate that the surrounding temperature greatly affects the recovery process. Refer to Dianetti et al. (2007). Equipment used is shown in Figure 1.



Figure 1 - Recovery vacuum pump and cylinder used in laboratory refrigerant recovery procedure

- 3.3.1.4.2 If the system is opened, the remaining refrigerant will be vented to the atmosphere.
- 3.3.1.4.3 If the system recharges to specification, it will overcharge.
- 3.3.1.4.4 The development of SAE J2788 (December 2006 replacing SAE J2210) recovery/recharging equipment has improved refrigerant recovery capability during service. However, the equipment is not capable of recovering the entire amount of refrigerant in a system.
- 3.3.1.5 Recovery at 21 °C with SAE J2210 recovery equipment left over 18% of the refrigerant in the system. At a work area ambient of 10 °C, nearly 30% of the refrigerant remained in the system. See Figure 2.

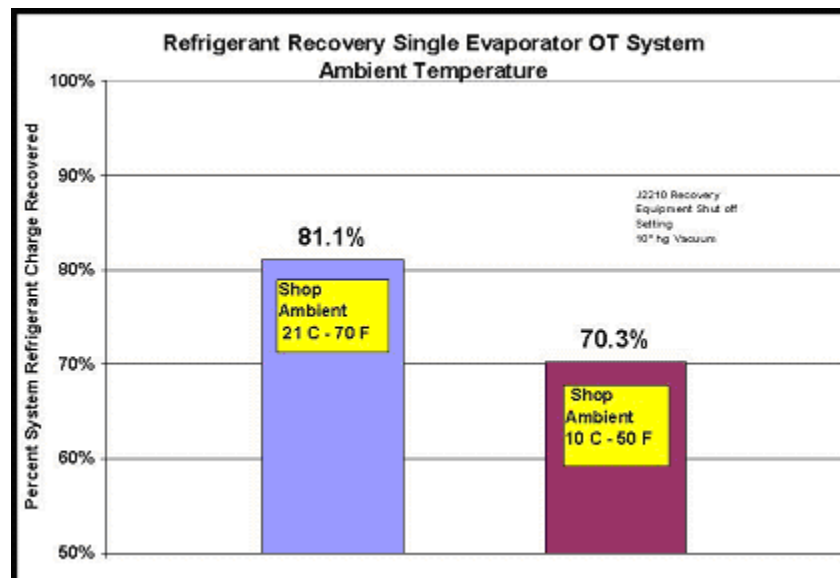


Figure 2 - Recovered refrigerant when using SAE J2210 recover/recycle equipment at 10 °C and 21 °C work area temperature

3.4 École des Mines Study Results (refer to SAE Technical Paper 2007-01-1187)

For each type of vehicle, in order to demonstrate that the refrigerant is recovered with a precision of less than 1 g, the refrigerant has been recovered just after the initial charge and after a half an hour of running the A/C system.