SURFACE VEHICLE RECOMMENDED PRACTICE

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Alternate Refrigerant Consistency Criteria for Use in Mobile Air-Conditioning Systems

RATIONALE

The original proposal to stabilize this document was balloted in March of 2013. Five voters recommended that instead the document be removed from circulation. The document applies to R12 refrigerant which was phased out of automotive use in 1995. The document should be cancelled to make it clear that future replacement refrigerants are not a replacement for R12, but replacements for R134a which is the current refrigerant used in most automotive applications today.

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1. Scope

1.1 This SAE Recommended Practice applies to refrigerant blends (multicomponent refrigerants) intended for use as retrofit refrigerants to replace CFC-12 (R-12) in mobile air-conditioning (A/C) systems. Since the composition of non-azeotropic refrigerant mixtures changes as refrigerant is lost, either through the vapor phase or the liquid phase, the method of charging A/C systems is important. The purpose of this document is to determine the proper refrigerant phase, liquid or vapor, for system charging by relating system performance changes to the charging method.

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 1657—Selection Criteria for Retrofit Refrigerants to Replace CFC-12 (R-12) in Mobile Air-Conditioning Systems

SAE J1659—Vehicle Testing Requirements for Replacement Refrigerants for CFC-12 (R-12) Mobile Air-Conditioning Systems

3. Sample Testing

3.1 Two 13.5 kg containers which meet the appropriate safety requirements (e.g., DOT and/or UL requirements), identified as "A1 and A2," shall be filled, to 80% maximum capacity, containing the specified refrigerant mixture and shall be maintained at a 24 °C ambient ± 1 °C for 24 h.

3.2 Container A1 shall be used to transfer and sample refrigerant in the liquid state. Container A2 shall be used to transfer and sample refrigerant in the vapor state.

3.2.1 Prior to start of testing, a small amount of refrigerant from both containers "A1" and "A2" shall be taken in the liquid and vapor phase, respectively, and analyzed using a gas chromatograph to determine original composition of liquid and vapor.

3.3 The containers shall be connected, with the appropriate valves and hoses, so that the contents of containers A1 and A2 can be transferred to empty containers, identified as "B1" and "B2," respectively, and also with the ability to withdraw a 1 kg sample at various container weights into a third set of containers generally identified as "S" (Figure 1).

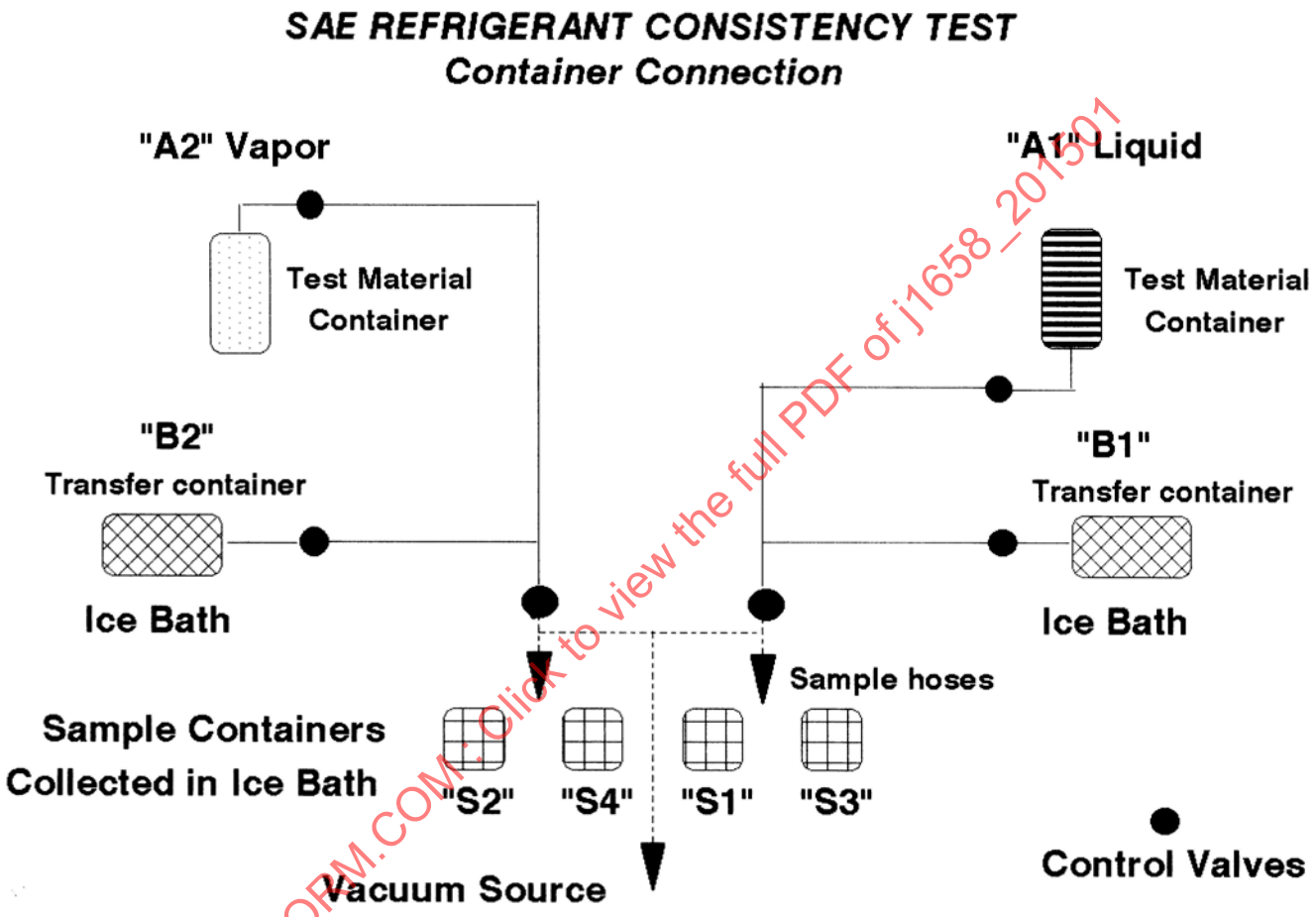

FIGURE 1—SAE REFRIGERANT CONSISTENCY TEST

3.3.1 The "B1" and "B2" containers, at least 13.5 kg (meeting appropriate DOT or UL requirements), shall be initially evacuated to a minimum of 2.7 kPa below atmospheric adjusted for altitude (29.2 mm of mercury), and placed in a container and covered with dry ice.

3.3.2 The sample container "S," shall not be less than a capacity of 2.5 kg mass in size (total of 4), and will contain the 1 kg test samples. The container and connection hoses shall be initially evacuated to a minimum of 2.7 kPa below atmospheric adjusted for altitude (29.2 mm of mercury), and placed in a container and covered with dry ice prior to collecting the sample.

3.3.3 The total test system including hoses and connections shall be reduced to 2.7 kPa below atmospheric adjusted for altitude (29.2 mm of mercury), prior to transfer of the refrigerant from valved off containers "A1" and "A2."