



SURFACE VEHICLE INFORMATION REPORT

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Automotive Air-Conditioning Service Ports Final Report, Recommendations

RATIONALE

SAE J3266 is intended to provide the findings and recommendations of the automotive air-conditioning service ports task force, a working group within the Interior Climate Control, Mobile Air-Conditioning (MAC) Supplier Standards Committee. The report is an evaluation of the access ports and tools used on automotive air-conditioning systems to evacuate and charge systems with approved refrigerants during vehicle service.

1. SCOPE

The scope of this SAE Information Report is an evaluation of the ports and tools used on automotive air-conditioning systems to evacuate and charge systems with approved refrigerants during vehicle service. A task force was formed in April 2021 to perform this evaluation and concluded its work in September 2021. The scope of the task force was to evaluate issues being reported from service repair shops with air-conditionings service ports and the tools being used to connect to these ports. The task force also evaluated published SAE J Standards and discovered many of these standards did not include the necessary requirements for service ports and tools. The task force published a final report of its findings and recommendations. The report includes recommendations to correct and publish new SAE Standards related to the scope of this project.

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 J639 Safety and Design Standards for Motor Vehicle Refrigerant Vapor Compression Systems

SAE J3267 Automotive Air-Conditioning Service Ports Task Force Field Survey Results

3. DEFINITIONS

There are no defined terms specified herein.

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4. MAC SUPPLIER STANDARDS COMMITTEE, A/C SERVICE PORTS TASK FORCE

The MAC Supplier Standards Committee formed the A/C Service Ports Task Force to address the findings of a 2018 field survey performed by the Mobile Air Climate Systems Association (MACS). The task force worked with MACS to conduct an additional field survey in June of 2021 specifically targeted at the service ports. These findings are provided in SAE J3267.

Many of the current SAE J Standards are missing design specifications for A/C service ports, its associated components, and the quick connect tools which attach during servicing of the vehicle. As a result, the aftermarket is filled with tools of varying degrees of quality, quite frankly unacceptable in some cases. The service port core valves are being damaged by these products creating A/C system refrigerant leaks.

The service ports are becoming contaminated with dirt and moisture due to missing caps, the primary seal of the service port. The older the vehicle, the more likely it is to be missing service port caps. This is a direct result of not requiring the use of a properly designed retention feature or tether.

Some of these design specifications for service ports and tools could be included in the current documents; others would need to be addressed by creating new SAE J Standards that require the use of certified components which meet these standards.

Section 5 identifies the areas which need immediate attention to correct these shortcomings and the SAE J Standards which “loosely define” specifications which need to become requirements and “shall meet” the SAE J Standard. In some cases, the existing standards are not being met.

The report concludes with a recommendation for the design of a new service port for future refrigerant launches and a call for making the new design a running change for current production. The task force is recommending that a workgroup be formed to implement these recommendations, similar to the SAE IMAC Cooperative Research Program which significantly reduced major areas of system refrigerant loss by implementing new designs. Industry experts from the OEM, supplier, service standards committees, and others should be invited to participate in this effort.

The following executive summary report summarizes the task force activity, findings, and recommendations.

5. EXECUTIVE SUMMARY

5.1 Interior Climate Control MAC Supplier Standards Committee A/C Service Ports Task Force, July, 2021

5.1.1 Background

The A/C Service Ports Task Force was formed in April of 2021 to address “service ports leaking” as the #2 issue service shops were repairing during a MACS 2018 “Reasons for Service” survey. The following chart illustrates the top ten reasons for vehicle air conditioning service:

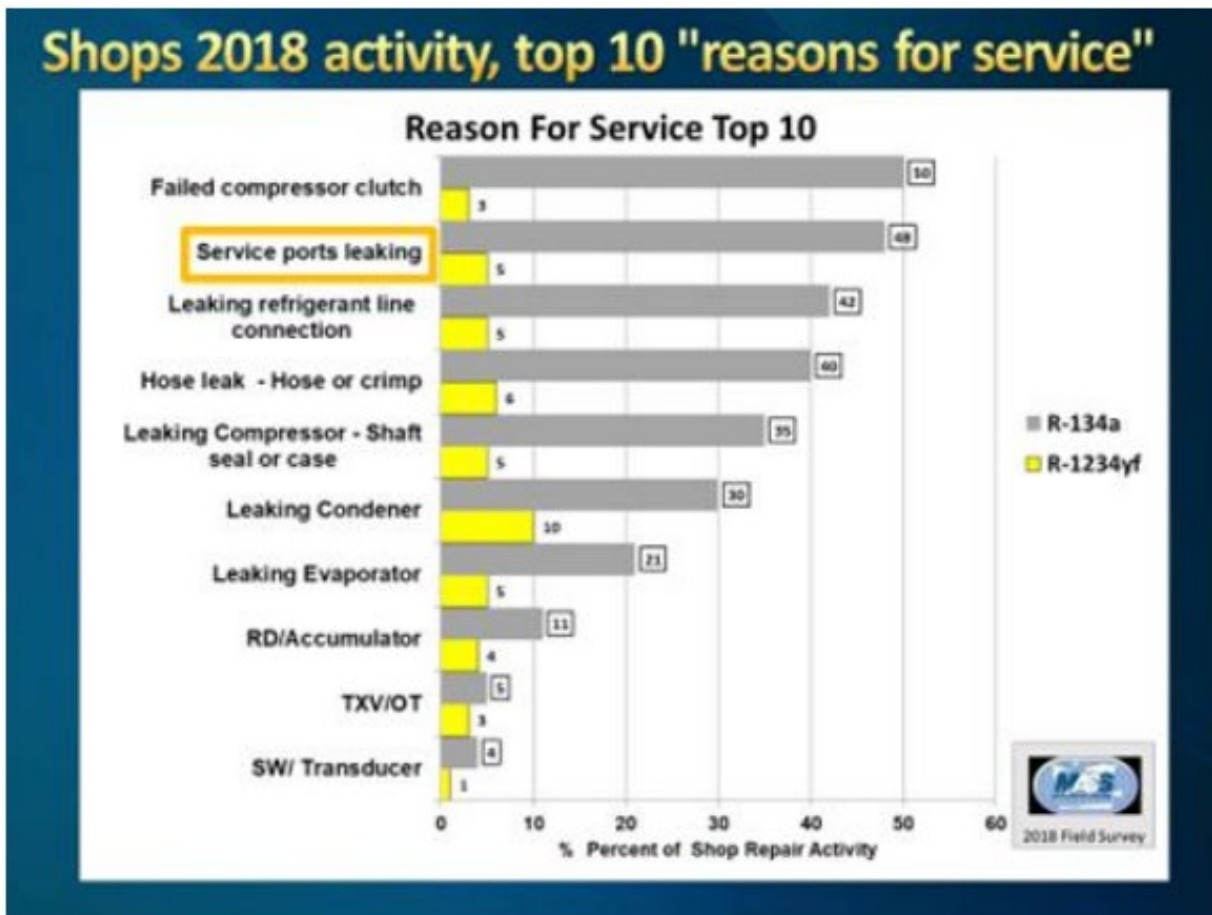


Figure 1 - MACS 2018 reason for service

5.1.2 Scope

Review the MACS 2018 field survey and recommend corrective actions to the Interior Climate Control Standards Committee. Conduct Webex meetings to identify the root causes associated with service port leaks.

5.1.3 June 2021 MACS Survey

In order to perform a deeper dive into the issues, the task force worked with MACS to perform an additional field survey with questions only related to service ports. The task force developed 17 questions and four relevant opportunities to provide comments for the survey. The team at MACS expedited the survey to over 12000 of its membership and provided the results to the task force in roughly 2 weeks. The task force is very appreciative of the effort made by the MACS team to perform this valuable survey.

6. SURVEY RESULTS

An executive summary of the field survey will be provided to the Interior Climate Control Standards Committee membership under separate cover.

Upon review of the responses, a small percentage of the vehicles were R1234yf systems with low mileage. The vast majority of the vehicles coming into the service shops were R134a systems. Of these systems, 76% of vehicles had been in service for >50000 miles. It was also reported that greater than 50% of these vehicles had a missing service port cap(s). The service port cap retention feature is essentially non-existent. 92% of the vehicles with the caps still attached to service ports had no retention feature (tether) included with the cap. The task force also identified an application with an inferior tether design. Tethered caps were used but the design was not robust as the straps were broken (SAE J639 has no material or durability requirements for tethered caps.) See Figure 2.