

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 82

[FRL-5426-1]

RIN 2060-AF35

Protection of Stratospheric Ozone; Servicing of Motor Vehicle Air Conditioners

AGENCY: Environmental Protection Agency.

ACTION: Proposed rule.

SUMMARY: On July 14, 1992, EPA published a final rule in the Federal Register establishing standards and requirements regarding the servicing of motor vehicle air conditioners (MVACs) that use chlorofluorocarbon-12 (CFC-12), a class I refrigerant, and establishing restrictions on the sale of small containers of class I or class II refrigerants, pursuant to section 609 of the Clean Air Act, as amended (the Act).

Pursuant to section 609(b)(1), today's proposed rule would establish standards and requirements for the servicing of motor vehicle air conditioners that use class I or class II substances other than CFC-12 as a refrigerant, or use HFC-134a, a non-ozone-depleting substitute for CFC-12, or any other substitute for a class I or class II substance used in an MVAC.

Today's proposed rule also would require that at motor vehicle disposal facilities, either section 609 certified technicians, or employees, owners or operators of the facilities, be used to recover refrigerant (whether CFC-12 or a substitute) from motor vehicles located at the facilities and bound for disposal. The recovered refrigerant would have to be reclaimed or recycled using approved equipment prior to use in recharging an MVAC or MVAC-like appliance. The proposal would also establish standards for owners and operators of salvage yards, scrap recycling facilities, landfills or other facilities where such vehicles may be located, to sell refrigerant recovered from such vehicles to section 609 certified technicians. Finally, the proposal would establish standards for mobile recovery and recycling service.

Today's proposal increases industry flexibility in selecting and purchasing proper recovery and recycling equipment by establishing standards for equipment that recovers and/or recycles additional refrigerants, and approving independent testing organizations that certify such equipment.

By promoting the recycling or reclamation of all refrigerants from

MVACs, this proposed rule will help to lower the risk of depletion of the stratospheric ozone layer and the possibility of global warming, thus diminishing potentially harmful effects to human health and the environment, including increased incidence of certain skin cancers and cataracts.

DATES: Written comments on this proposed rule must be received by April 5, 1996, unless a hearing is requested by March 18, 1996. If a hearing is requested, written comments must be received 30 days after the hearing. Individuals wishing to request a hearing must contact the Stratospheric Ozone Information Hotline at 1-800-296-1996 between 10 a.m. and 4 p.m., Monday through Friday, Eastern time, by March 18, 1996. To find out whether a hearing will take place, contact the Stratospheric Ozone Information Hotline after March 19, 1996.

ADDRESSES: Written comments and data should be sent to Public Docket No. A-95-34. This docket is located in Room M-1500, Waterside Mall (Ground Floor), U.S. Environmental Protection Agency, 401 M Street, S.W. Washington, D.C. 20460. Dockets may be inspected from 8:30 a.m. to 5:30 p.m., Monday through Friday. A reasonable fee may be charged for copying docket materials.

FOR FURTHER INFORMATION CONTACT: Christine Dibble, Stratospheric Protection Division, Office of Atmospheric Programs, Office of Air and Radiation (6205-J), 401 M Street S.W., Washington, D.C. 20460. (202) 233-9147 or fax (202) 233-9577 or electronically at dibble.christine@epamail.epa.gov. Comments and data submitted electronically will not be accepted. The Ozone Information Hotline at 1-800-296-1996 can also be contacted for further information.

SUPPLEMENTARY INFORMATION: The contents of today's preamble are listed in the following outline:

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I. Background

A. Statutory Authority

Title VI of the Act is designed to protect the stratospheric ozone layer. Section 609 of the Act requires the Administrator to promulgate regulations establishing standards and requirements regarding the servicing of MVACs. Section 609 defines "refrigerants" to include, as of November 14, 1995, any substance that substitutes for a class I or class II substance used in an MVAC. The statute requires that as of that date: Persons servicing an MVAC system for consideration must use approved recover/recycling equipment. To be approved, equipment must be certified by the Administrator, or by an independent standards testing organization approved by the Administrator, or the equipment must be substantially identical to such equipment if it was purchased prior to the date EPA proposed standards applicable to the equipment. To be certified, the equipment must meet standards established by the Administrator, which shall be at least as stringent as Society of Automotive Engineers (SAE) standard J1990. In addition, any such servicing of an MVAC system for consideration must be performed by a technician trained and certified according to standards established by the Administrator. EPA also sets standards for certification and training, and approves organizations to conduct such training if they meet the Agency's standards. Finally, section 609 prohibits the sale of small containers of class I or class II substances used in MVACs, unless sold to section 609 certified technicians.

B. July 14, 1992 Final Rule and May 2, 1995 Supplemental Final Rule

On July 14, 1992, the Agency published a final rule initially implementing section 609. In that rule, the Agency prohibited the repair or servicing of any MVAC for consideration if such repair or servicing involved the air conditioner refrigerant, unless performed by a trained and certified technician who properly uses approved refrigerant recycling

equipment. The Agency also prohibited the sale or distribution of any class I or class II substance suitable for use in an MVAC that is in a container of less than 20 pounds to anyone other than a properly trained and certified section 609 technician.

The July 14, 1992 final rule defines "approved refrigerant recycling equipment" as equipment that recovers and recycles CFC-12 refrigerant and that is certified by the Administrator or by an independent standards testing organization approved by the Agency as meeting the standards set forth in appendix A in the rule. Refrigerant recycling equipment is also considered approved if it was purchased before September 4, 1991, and is substantially identical to the certified equipment. Only equipment certified as meeting the standards or meeting the criteria for substantially identical equipment is approved for use in the servicing of motor vehicle air conditioners under section 609 of the Act.

The July 14, 1992 rule also establishes standards by which (i) an independent standards testing organization may apply to the Agency for approval to test and approve refrigerant recycling equipment, and (ii) a training and certification program may apply to the Agency for approval to train and certify technicians in the proper use of refrigerant recycling equipment for MVACs. Finally, the rule establishes various recordkeeping and reporting requirements.

Underwriters Laboratories (UL) and ETL Testing Laboratories (ETL) are the approved independent standards testing organizations that currently certify equipment using the standards that appear in appendix A of the rule. These standards apply to recover/recycle equipment that extracts CFC-12 refrigerant from a motor vehicle air conditioner and cleans the refrigerant on-site. The regulatory standards are based on those developed by SAE and cover service procedures for recovering CFC-12 (SAE J1989, issued in October 1989), test procedures to evaluate recover/recycle equipment (SAE J1990 issued in October 1989 and revised in 1991) and a purity standard for recycled CFC-12 refrigerant (SAE J1991, issued in October 1989).

As stated above, section 609 prohibits the sale or distribution of any class I or class II substance suitable for use in an MVAC that is in a container of less than 20 pounds to anyone other than a properly trained and certified section 609 technician. It should be noted, however, that EPA expanded this prohibition in the regulations published on May 14, 1993 at 58 FR 28712 under

section 608 of the Act (40 CFR 82.154(n)), which prohibits the sale as of November 14, 1994 of any size container of a class I or class II substance, including refrigerant blends that include class I or class II substances, to other than a section 608 or section 609 certified technician.

The July 14, 1992 rule reserved standards for equipment that extracts but does not recycle CFC-12 refrigerant (recover-only equipment) in Appendix B to the rule. On May 2, 1995, EPA published a final rule establishing regulatory standards, again based on those developed by SAE, which apply to certification of recover-only equipment. Specifically, for recover-only equipment, the Agency adopted (i) the recommended service procedure for the containment of CFC-12 described in SAE J1989 and already set forth in appendix A, and (ii) a standard that describes test procedures to evaluate recover-only equipment that is based on SAE J2209 (issued in June, 1992).

II. Today's Proposed Rule

Today's proposed rule further implements section 609(b)(1) of the Act. This section of the preamble reviews the major elements of the proposal. Specifically, the proposed regulations would:

(i) explicitly permit and establish standards for (a) section 609 certified technicians to recover refrigerant (whether CFC-12 or a substitute) from motor vehicles bound for disposal (including vehicles that contain MVAC-like appliances) and recycle that refrigerant in their service facilities for use, and (b) owners or operators of salvage yards, scrap recyclers, landfills or other facilities where such vehicles may be located, to sell refrigerant recovered from such vehicles (whether CFC-12 or a substitute) to section 609 certified technicians without recycling the recovered refrigerant;

(ii) revise the definition of "properly using" to explicitly permit and establish standards for mobile recovery and recycling service;

(iii) establish a standard for approval of recover/recycle equipment that extracts and recycles HFC-134a from MVACs;

(iv) establish a standard for approval of recover-only equipment that extracts HFC-134a from MVACs;

(v) establish a standard for approval of recover-only equipment for FRIGC™, a class II-containing blend refrigerant that has been listed as acceptable for use in MVACs under the Agency's Significant New Alternatives Policy (SNAP) program, and for other class I or class

II refrigerants used in MVACs other than CFC-12;

(vi) establish a standard for approval of recover-recycle equipment that extracts and recycles both CFC-12 and HFC-134a using a common refrigerant circuit;

(vii) revise the requirements for Agency approval of independent standards testing organizations to include certification of recover/recycle and recover-only equipment designed to service HFC-134a and FRIGC™ MVAC systems; and

(viii) revise the criteria for approval of technician training and certification programs to reflect the use of recover/recycle and recover-only equipment designed to service HFC-134a, FRIGC™, and other class I or class II refrigerant MVAC systems.

In addition, in this notice EPA describes its intention to grandfather technicians currently certified under section 609, so that they will not need to be recertified to operate recover/recycle and recover-only equipment designed to service HFC-134a, FRIGC™, and other class I or class II refrigerant MVAC systems.

A. Service Practices

Today's proposed rule clarifies the Agency's position on two issues that have not previously been explicitly addressed in the section 609 regulations: (i) Under what conditions it is permissible for a section 609 certified technician to recover refrigerant from motor vehicles located at a motor vehicle disposal facility and bound for disposal, and under what conditions it is permissible for the owner or operator of a motor vehicle disposal facility to sell refrigerant recovered from such vehicles to certified technicians; and (ii) under what conditions it is permissible to conduct mobile recovery and recycling service, *i.e.*, service in which approved recover-only or recover/recycle equipment is transported to the location of an MVAC for servicing by a certified technician.

The Agency intends that the same service practice regulations being proposed today for MVACs will also be proposed for MVAC-like appliances (such as tractors and other farm equipment, construction equipment, and mining and quarry equipment, that meet the definition of MVAC-like appliances set forth in 40 CFR 82.152(l)). Because MVAC-like appliances are governed under section 608 of the Act rather than under section 609, service practice regulations similar to those being proposed today will be proposed for MVAC-like appliances in a separate proposal to amend section 608.

The proposed changes to the section 608 regulations are intended for publication on or about the date of publication of this section 609 proposed rule.

1. The Handling of Refrigerant From Automobiles Bound for Disposal and Located at Motor Vehicle Disposal Facilities

Since the publication of the July 14, 1992 rule, EPA has received an increasing number of questions concerning the handling of refrigerants from MVACs and MVAC-like appliances bound for disposal and located at motor vehicle disposal facilities. Many owners of motor vehicle disposal facilities have assumed that recovered refrigerant must be sent off-site for reclamation, while others have assumed that they may sell the refrigerant to any interested parties. In response to the increasing cost of CFC-12, some service technicians have begun to recover refrigerant from motor vehicle disposal facilities for use in their own service facilities. In addition, owners and operators of motor vehicle disposal facilities have been recovering refrigerant from automobiles and selling it to service technicians. The rule proposed today would clarify that the Agency permits these activities as long as certain requirements are met during the performance of the activities.

The regulations adopted by EPA at 40 CFR part 82, subparts B and F (*i.e.*, the section 609 and 608 regulations) currently address to some extent activities involving recovery and sale of refrigerant from MVACs and MVAC-like appliances at motor vehicle disposal facilities. Section 82.156(g) requires that all persons recovering refrigerant from MVACs and MVAC-like appliances for purposes of disposal must reduce the pressure of the system to or below 102 mm of mercury vacuum, using equipment that meets the requirements of § 82.158(l). Section 82.154(f) requires that persons who recover refrigerant from MVACs and MVAC-like appliances for purposes of disposal must certify to the Administrator that they have acquired equipment that meets such standards. In addition, persons who take the final step in the disposal process must recover any remaining refrigerant in accordance with applicable requirements. These provisions were adopted pursuant to section 608 of the Act. Within the section 609 regulations, § 82.34(b) requires that small containers of class I or II substances suitable for use in an MVAC may only be sold to certified technicians. This applies to sales of class I or II substances recovered from MVACs or MVAC-like appliances at motor vehicle disposal facilities. Finally, any servicing of an MVAC or

MVAC-like appliance with refrigerant recovered from a motor vehicle disposal facility would be subject to the various equipment and use restrictions in 40 CFR Part 82, subparts B and F.

The regulations proposed today would supplement this regulatory scheme with a set of requirements that provide an incentive for the recovery and re-use of refrigerants from MVACs located at motor vehicle disposal facilities, minimize the discharge of refrigerants, and provide for the proper recycling or reclamation of the refrigerants prior to their use in servicing MVACs or MVAC-like appliances. The Agency intends that the regulations to be proposed shortly amending section 608 of the Act will similarly provide an incentive for the recovery and re-use of refrigerants from MVAC-like appliances located at motor vehicle disposal facilities so that the refrigerants are properly recycled or reclaimed prior to their use in servicing MVACs or MVAC-like appliances.

The Agency believes that recovery and recycling of refrigerant from MVACs bound for disposal and located at motor vehicle disposal facilities will be more economically attractive to the MVAC technician and the motor vehicle disposal facility operator if the sale or reuse of unreclaimed refrigerant is explicitly permitted. The MVAC technician will derive higher profit by selling recycled refrigerant to an MVAC service customer than by selling it to a reclaimer. Because of this economic incentive, technicians will seek salvaged MVACs. In addition, motor vehicle disposal facility owners and operators may profit by selling refrigerant directly to technicians, or by charging technicians fees for the opportunity to recover refrigerant at the facility, creating other economic incentives in the refrigerant recycling chain. The Agency believes that encouraging these activities will, by increasing the value of refrigerant to the person recovering it, reduce the amount of refrigerant that either leaks out of MVACs while they await disposal, or is purposely vented during the process of disposal.

Today's proposed rule would revise the definition of "properly using" located at § 82.32(e), add a definition of "motor vehicle disposal facility" at § 82.32(i), and add a new § 82.34(d). The effect of these changes is that upon the recovery of refrigerant from MVACs bound for disposal and located at motor vehicle disposal facilities, a person recovering the refrigerant, whether a certified technician or motor vehicle disposal facility owner, operator, or employee, would be able to transfer the

refrigerant off-site for recycling or reclamation in accordance with the conditions described below.

The conditions described below in section (a) propose who may recover refrigerant from a motor vehicle disposal facility, and what kind of equipment should be used to recover refrigerant. Section (b) proposes who may purchase refrigerant recovered from a motor vehicle disposal facility, and section (c) proposes how refrigerant recovered by the persons described in (a) or (b) should be processed prior to reuse. Section (d) discusses recordkeeping and reporting requirements. Section (e) provides a general discussion of minimizing contamination of refrigerant from motor vehicle disposal facilities and requests comment on certain issues relating to the proposals described herein.

a. Recovery of refrigerant from MVACs at motor vehicle disposal facilities. The proposed restriction set forth in § 82.32(e)(3) states that equipment capable of reducing system pressure to or below 102 mm of mercury vacuum must be used to recover the refrigerant. This proposal simply references a provision previously adopted under section 608. It is repeated here for purposes of clarification only.

The proposal would also require in § 82.34(d) that any person recovering refrigerant from MVACs at a motor vehicle disposal facility who is not employed at or by the facility, or who is not the owner or operator of the facility, be a section 608 or section 609 certified technician. With respect to class I and class II substances, sections 608(a) and (b) authorize the restriction on who may recover refrigerant. Under section 608, the Administrator may prescribe standards and equipment regarding the use and disposal of class I or II substances, in order to reduce the use and emissions of these substances to the lowest achievable level, and to maximize the recapture and recycling of these substances. The Administrator also may establish standards and requirements regarding the safe disposal of these substances.

Although sections 608(a) and (b) authorize the restriction on who may recover refrigerant from a motor vehicle disposal facility with respect to class I or II substances, these sections do not directly require regulation of the use of substitute refrigerants that are not class I or class II substances. Section 608(c)(2), however, does prohibit the

knowing¹ venting or release of such substitutes during the maintenance, repair, service or disposal of an appliance where the refrigerant may enter the environment, unless the Administrator has determined that such venting, release, or disposal does not pose a threat to the environment. *De minimis* releases associated with good faith efforts to recapture and recycle or safely dispose of the refrigerant are not subject to this prohibition. Releases associated with recovery that does not comply with the regulations would not be considered *de minimis*. This venting prohibition is self-effectuating, and went into effect on November 15, 1995 with respect to substitutes for class I or class II substances. In today's rulemaking, EPA is proposing to define the kind of recovery and recycling practices that must be followed in order to avoid violating the prohibition on venting substitutes for class I or class II refrigerants. The requirement that only a section 608 or section 609 certified technician or an owner, operator, or employee of a motor vehicle disposal facility extract the substitute refrigerant from an MVAC at a motor vehicle disposal facility is a reasonable exercise of this authority, because extraction is an intentional activity, and any release associated with it would be considered a knowing release. In addition, it is reasonable to presume there will be a release associated with extraction, unless the person can show that in fact there was no such release. EPA is therefore proposing that it be a prohibited act to extract substitute refrigerant from MVACs at motor vehicle disposal facilities without meeting the requirements described in this proposal. A showing that there was no release would serve as an affirmative defense to this prohibition.

The proposed restriction on who may recover refrigerant serves to prohibit from recovering refrigerant at motor vehicle disposal facilities persons who are not certified under the Act to handle refrigerants, unless they are owners, operators or employees of the facilities. Because these persons have not been trained in the proper methods of recovering refrigerant from an MVAC system, they are more likely to vent refrigerant in the process of extracting it, and are less likely to know how to protect the purity of the refrigerant. Allowing these persons to recover class I and class II refrigerants at motor vehicle disposal facilities would not be consistent with the Agency's mandate to

establish requirements that would maximize the recapture and recycling of class I and class II refrigerants. Allowing them to recover substitute refrigerants would not be consistent with the section 608(c) venting prohibition.

The Act currently permits owners, operators and employees of motor vehicle disposal facilities to recover refrigerants from MVACs located at the facilities even though they may not be certified and therefore trained in the proper handling of these refrigerants. The Agency intends to continue to permit this activity. Under this proposed rulemaking, refrigerant handled by these persons must be transferred either to a reclaimer, or to a 608 technician, who in turn sells it to a reclaimer, or to a 609 technician, who recycles the refrigerant. In all of these instances, because the refrigerant is either recycled or reclaimed, the purity of that refrigerant should be protected. In addition, many owners, operators and employees of these facilities may have already invested in equipment that they use to recover refrigerant, and may currently have in place contracts to sell the refrigerant extracted from MVACs at the facilities. If the Agency had decided instead to begin to prohibit owners, operators and employees of motor vehicle disposal facilities from recovering refrigerant (so that only certified technicians could recover refrigerant), these persons might be unable to use any equipment they had already purchased, and in violation of contracts previously entered into. In order to assure that motor vehicle disposal facility owners and operators maximize the recapture of class I and class II refrigerants as required by section 608(a) of the Act, and refrain from venting substitute refrigerants as required by section 608(c) of the Act, the Agency has traditionally relied on a combination of providing the industry with informational guidance and requiring the industry to meet regulatory mandates. Rather than requiring that owners and operators of motor vehicle disposal facilities become certified technicians, the Agency proposes to continue to publish guidance alerting the industry of the environmental consequences of releasing refrigerant, refrigerant salvage techniques, and the importance of not mixing different refrigerants.

b. Restriction on sale of recovered refrigerant. The proposal includes a restriction set forth at § 82.34(d) on who may purchase refrigerant recovered from a motor vehicle disposal facility. For class I and II substances recovered from MVACs, sections 608 and 609 authorize the proposed sales restriction. While

section 609 is limited to restricting the sale of class I or II substances in small containers for use in MVACs, section 608 authorizes a broader sales restriction. The sales restriction provision proposed today for inclusion in § 82.34(d) basically repeats the sales restrictions previously promulgated at §§ 82.34(b) and 82.154(n). This proposal makes clear that the restriction applies with respect to class I or II substances recovered from MVACs during the disposal process.

The current sales restriction in section 609(e) does not extend to substitute refrigerants that are neither class I nor class II substances. EPA is currently developing a proposal addressing the use of substitutes under section 608, and is considering extending the sales restriction to such substitutes. EPA will address the sale of substitutes recovered from MVACs during the disposal process in that rulemaking. Section F of this preamble provides additional discussion with respect to restrictions on the sales of motor vehicle refrigerants.

c. Subsequent use of recovered refrigerant. Section 82.32(e) of the regulatory text proposed today would require that certified technicians process refrigerant recovered from a motor vehicle disposal facility through section 609 approved recycling equipment before it could be used to charge or recharge an MVAC. (In the concomitant proposed amendments to section 608 of the Act, EPA intends to propose similar requirements for refrigerant that is used to charge an MVAC-like appliance.) The only exception to this recycling requirement would be where the recovered refrigerant has been reclaimed to the appropriate level of purity. Section 609 authorizes this restriction with respect to MVACs, both for class I and class II substances as well as substitutes. A certified technician purchasing or accepting refrigerant from MVACs bound for disposal and located at a motor vehicle disposal facility is responsible to assure that the refrigerant is recycled properly prior to being charged into another MVAC or MVAC-like appliance and should not rely on assurances from the disposal facility that the refrigerant has been recycled.

Further, if refrigerant recovered from a motor vehicle disposal facility is to be recycled in section 609 approved refrigerant recycling equipment prior to reuse, the refrigerant may subsequently be charged only into an MVAC or an MVAC-like appliance. This proposal essentially references the requirement previously adopted in 40 CFR 82.154(g) and (h) that refrigerant recovered from

¹ EPA interprets the term "knowing" as used in section 608(c)(1) to mean a general intent, and not a specific intent to release or vent the refrigerant.

a 608 appliance that is to be charged into any type of appliance other than an MVAC or MVAC-like appliance must first be reclaimed. It is repeated here for purposes of clarification only.

d. Recordkeeping and reporting.

Today's proposed rule does not require any additional recordkeeping relating to refrigerant recovered from MVACs prior to disposal. Requiring disposal facilities to track refrigerant, and to demonstrate how the refrigerant in each MVAC was handled prior to the disposal of the vehicle, would inhibit the activity EPA is encouraging in today's rule. Further, a recordkeeping requirement would add an undue administrative burden to industry because of the large number of vehicles disposed of annually, and would provide no additional benefit to the environment.

e. Minimizing contamination/requests for comment. The Agency is concerned that the purity of the supply of each automotive refrigerant be maintained. Although motor vehicle air conditioning has long been dominated by CFC-12, automotive manufacturers now install HFC-134a in new car systems, while some refrigerant manufacturers are attempting to establish large markets for other CFC-12 substitutes in vehicles. This proliferation of refrigerants in the section 609 sector increases the chances of contamination in individual systems. Contaminated refrigerant supplies may create MVAC system failures as well as failures of refrigerant recover/recycle equipment, leading to emissions of refrigerants and to increased costs for both service facilities and motor vehicle owners. In addition, contaminated refrigerant may be extremely difficult to recycle, reclaim, or dispose of, so that it is likely to be vented into the atmosphere.

i. Contaminated MVAC systems entering the disposal facility. Refrigerant recovered from MVACs bound for disposal at motor vehicle disposal facilities may of course be contaminated by refrigerants not approved for motor vehicle use, such as HCFC-22 or blends containing hydrocarbons. The Agency believes that permitting the recovery and recycling/reclamation of refrigerant from these MVACs will not significantly increase the possibility of contamination of the automotive refrigerant supply, for two reasons. First, nearly all MVACs currently being disposed of use only CFC-12. Second, MVACs using any other refrigerants are required by EPA to have unique fittings and a label stating the type of refrigerant used in the air-conditioning system. EPA strongly recommends, but is not requiring, that the person recovering the refrigerant at

the facility identify the type of refrigerant prior to recovery, using refrigerant identifier equipment. EPA believes that the proper recovery and recycling/reclamation of refrigerant from vehicles located at disposal facilities, as described in this proposal, should serve to minimize the possibility of contaminated refrigerant supplies from disposal facilities.

ii. Improper practices at disposal facilities which would result in mixing or contamination of refrigerants. In order to minimize the chances of mixed refrigerants coming from motor vehicle disposal facilities, it may be necessary to require that persons recovering refrigerant at the facilities change the type of equipment that they now use. Current regulations in 82.158(l) provide that any person recovering refrigerant from an MVAC at a disposal facility must use equipment capable of reducing the system pressure to 102 mm (about 4 inches) of mercury vacuum. Although the Agency is today proposing to continue to permit persons recovering refrigerant from MVACs at disposal facilities to do so, the Agency is concerned that these persons may not properly purge or clear the recovery equipment prior to extracting another type of refrigerant with that equipment, or that they may not otherwise take the correct precautions to ensure that only one type of refrigerant is recovered into a container. Depending on the design of the equipment, significant quantities of refrigerant may be left behind in the condenser of the equipment after the recovery or recycling process is complete. This issue was discussed at length in the proposal and final rule for the original section 608 regulations. Parties interested in this issue should review the discussion of it in the final 608 regulations at 58 FR 28681-682.

EPA is consequently interested in receiving comments from the public as to whether the current requirement should be changed to satisfy this concern. Specifically, EPA would like to receive comments addressing whether EPA should require that persons recovering refrigerant must instead use (i) only equipment that meets the definition of "approved refrigerant recycling equipment" set forth in § 82.32(b) (*i.e.*, equipment approved under section 609), (ii) only equipment that meets the definition of "certified refrigerant recovery or recycling equipment" set forth in § 82.152(c) (*i.e.*, equipment approved under section 608), or (iii) equipment that meets either the definition set forth in § 82.32(b) or the definition set forth in § 82.152(c). Equipment approved under section 609 is generally dedicated to recovering

and/or recycling a single refrigerant, with the exception of certain equipment designed for recycling both CFC-12 and HFC-134a which uses either two separate circuits or common circuitry. The Agency is not aware of any equipment approved under section 609 that recovers but does not recycle multiple refrigerants. Equipment approved under section 608 is generally designed for use with multiple refrigerants but uses a common circuit. Refrigerant from section 608 appliances must either be returned to the same system or reclaimed. For both section 608 and section 609 approved equipment that handles multiple refrigerants using common circuitry, certain equipment features are designed to prevent cross contamination. In addition, technicians are instructed on how to clear the equipment of residual refrigerant between jobs.

In order to minimize the chances of contaminated refrigerants coming from motor vehicle disposal facilities, it may be necessary to limit sales of refrigerant by owners, operators and employees of these facilities to section 608 certified technicians only. Section 609 certified technicians, rather than purchasing refrigerant from the facility owners, would have to recover the refrigerant themselves. Although the Agency does not wish to impose requirements on the disposal industry that would discourage recovery of refrigerants to such an extent that the requirements defeat the goals of Title VI of the Act, the Agency is particularly concerned that facilities that dismantle both refrigerators, residential air conditioners and other section 608 appliances, and motor vehicles, may engage in the practice of recovering from section 608 appliances refrigerant that is high in acid levels due to compressor burn-out, and then selling that refrigerant to a section 609 certified technician for use in an MVAC or MVAC-like appliance. Efforts to identify the refrigerant would not show that the refrigerant was contaminated by these acids. Sources such as residential air conditioners and refrigerators are much more likely to have ceased operation because of compressor burn-out, a condition which may be remedied through reclamation to the ARI 700 standard achieved in reclamation but not through recycling in section 609 approved refrigerant recycling equipment. The Agency is interested in receiving comments on this issue.

2. Mobile Recovery and Recycling

EPA has in the past not permitted a technician to transport his approved refrigerant recycling equipment off-site to perform air conditioning service for

an automobile body shop, service station, dealership or other facility that services MVACs or MVAC-like appliances, although the technician has been permitted to take the approved equipment to a facility where such servicing is generally not performed for consideration, such as a farm or personal residence. While this off-site, or mobile, service policy was directly addressed in an Applicability Determination dated July 22, 1994, and later addressed in a September 22, 1994 clarification of that Applicability Determination, the policy was not directly addressed in the original rule.

The original rule does require, however, that refrigerant may only be recycled off-site if the refrigerant is first extracted from an MVAC using recover-only equipment, and is then recycled off-site using equipment owned by the person who owns both the recover-only equipment and the establishment at which the refrigerant is extracted. In all other instances, refrigerant removed from the location where it is extracted has to be reclaimed to ARI 700 standards to assure purity. EPA believes that this requirement minimizes prospects of contamination of MVACs.

This on-site/off-site distinction discussed in the original rule, however, may be distinguished from the mobile service discussed in today's proposal. EPA required the on-site/off-site distinction because of its concern that refrigerant from non-MVAC air conditioning or refrigeration systems might contaminate MVAC systems and recycling equipment, particularly since MVAC recycling equipment is not designed to remove contaminants from non-MVAC systems. In contrast, the mobile service discussed in today's proposal would not increase the risk of contamination from non-MVAC sources, because EPA is limiting the mobile service to MVACs where the refrigerant must still be recycled on-site to the appropriate section 609 standard prior to reuse in another MVAC or in an MVAC-like appliance.

The goal of EPA's past prohibition on transportation of equipment off-site to perform air-conditioning service was to enhance compliance by encouraging MVAC service facilities to obtain their own approved equipment and to have their employees certified under section 609. EPA has based its interpretation that the 609 regulations preclude such mobile recovery and recycling for MVACs on the certification provision at § 82.42(a)(1). In the Applicability Determination dated July 22, 1994, EPA stated that since the certification form specifies the address of the establishment where the equipment will

be located, the equipment may therefore not be moved from the address where the service is performed. The Agency also stated in the Determination that while current regulations allow MVACs to be transported to a facility where approved equipment is located and serviced there, that facility may not transport the equipment to a second facility where such equipment is not located, and service the MVAC at the second facility.

EPA is proposing to change these provisions and allow an expanded use of mobile recovery and recycle units. EPA intends to publish an amendment to section 608 of the Act proposing that the same activity be explicitly permitted with respect to the mobile servicing of MVAC-like appliances. EPA believes that the mobile service policy has failed to encourage MVAC service facilities to obtain their own approved equipment or to have their employees certified under section 609. Consequently, today's rulemaking proposes to explicitly permit mobile servicing of MVACs. In its reconsideration, EPA determined that allowing mobile service performed by certified technicians using approved equipment encourages proper use of the equipment and discourages venting of refrigerant. This policy also increases the flexibility of industry to choose the mode of compliance by allowing businesses that do not specialize in MVAC service to contract their MVAC services that involve refrigerant to a section 609 certified technician. The definition of "properly using" set forth in § 82.32(e) would consequently be amended to explicitly permit this activity. This proposed provision would apply to servicing both CFC-12 and any substitutes for CFC-12 in MVACs. An MVAC service facility engaging a mobile technician would be responsible to ensure that the technician is properly certified. The technician's showing the facility his section 609 certification card should provide a sufficient demonstration to the facility that he is properly certified. The Agency is interested in receiving comments with respect to whether the MVAC service facility engaging the technician should be responsible to ensure that the technician is using section 609 approved recycling equipment.

The definition of "properly using" in section 609(b) provides the Administrator discretion to include the use of mobile recovery and recycling. The certification provision in section 609(d) requires that persons who perform service on MVACs for consideration must acquire and properly use approved equipment for servicing involving refrigerant. Where

mobile recovery is involved, the person with the service facility has not acquired approved equipment, but the person who actually performs the service under the proposed provision would be a certified technician using approved equipment acquired by that technician or their employer. EPA believes it is a reasonable interpretation of section 609(d) to allow the use of mobile recovery and recycling under these circumstances, as the text of section 609(d) can be interpreted to include this and it will further the purposes of this section by promoting the proper use of approved equipment and reducing the amount of improper servicing or discharge.

B. Standards for Recover/Recycle Equipment

Section 609 of the Act authorizes the Agency to establish standards for the equipment used in recovering and recycling MVAC refrigerant. Section 82.36(a) of the regulations specifies that equipment that recovers and recycles CFC-12 refrigerant must meet the standards set forth in appendix A. Equipment that only recovers CFC-12 to be reclaimed or recycled by separate equipment must meet the standards set forth in appendix B. Today's rulemaking adds standards for HFC-134a recover/recycle equipment, HFC-134a recover-only equipment, service procedures for HFC-134a containment, purity of recycled HFC-134a, equipment intended for use with both CFC-12 and HFC-134a, and recover-only equipment designed to be used with FRIGC™ or other class I and/or class II refrigerants other than CFC-12.

These standards, proposed today as appendix C, D, E and F to the regulations promulgated under section 609, represent a consensus of the Interior Climate Control Committee of SAE. This committee is made up of automotive industry experts, equipment and supply manufacturers, and chemical producers. SAE issued the standards (SAE J1990, J1991, J1989) later adopted by EPA in appendix A and the Agency believes that the standards set forth in today's rulemaking as appendices C, D, E, and F are consistent with the specifications required in those standards for recovery, recycling, refrigerant purity, and service procedures.

The Agency believes that the standards are appropriate for recovery and recycling because they achieve environmental protection through recycling and containment of refrigerant, and protect automobile equipment through minimum refrigerant purity standards and service

procedure standards. The standards being proposed are based on SAE J2099 (Standard of Purity for Recycled HFC-134a), SAE J2211 (Recommended Service Procedure for the Containment of HFC-134a), SAE J2210 (Standard for HFC-134a Recycling Equipment), SAE J1732 (HFC-134a Extraction Equipment for Mobile Air Conditioning Systems) and SAE J1770 (Standard for Recycling Equipment Intended for Use with Both CFC-12 and HFC-134a).

Appendix F, Standard for Recover-only Equipment that Extracts Class I or Class II Refrigerants Other Than CFC-12, is based on SAE J2209 (CFC-12 Extraction Equipment for Mobile Air Conditioning Systems). Since SAE is not at this time developing a standard specifically for FRIGC™ or any other class I or class II refrigerant other than CFC-12, the Agency developed a standard in cooperation with SAE and other industry representatives. Equipment that is certified by an approved testing organization to meet these SAE standards prior to the proposed standards in this rule becoming final will be considered EPA-approved equipment.

Under section 609 of the Act, standards developed by the Administrator for approved refrigerant recycling equipment shall, at a minimum, be as stringent as SAE J1990 in effect as of November 15, 1990. The standards proposed today as appendices C, D, E and F are as stringent as SAE J1990 regarding the equipment standards for refrigerant purification, equipment testing, and equipment operation and performance. The proposed standards are nearly identical to the SAE J1990 standard, with the exception that the standards proposed today are more stringent than J1990, in that they specify a higher minimum vacuum requirement of 102 mm of mercury, compared to the general requirement in J1990 that refrigerant extraction be performed "to a vacuum." This will help prevent any refrigerant from being vented by ensuring that all refrigerant has been removed from an MVAC system prior to opening it to the atmosphere. Among the provisions contained in the appendices proposed today that are as stringent as those in J1990 are the following: The moisture, acid and particulate removal and non-condensable gas purging requirements of the proposed standards; the requirements for operating instructions and safety requirements; the requirements for overfill, pressure relief, portable tanks and containers, hoses, and lubricant separation; and the testing requirements that verify that the equipment operates properly.

The Act also requires that standards establishing proper service procedures shall, at a minimum, be as stringent as SAE J1989 in effect as of November 15, 1990. The standards proposed today are equally as stringent as the SAE J1989 regarding the recovery, recycling and other handling of refrigerant associated with the servicing of MVACs. The proposed standards are nearly identical to the SAE J1989 standards. SAE J1989 required that the recovery equipment be operated until the pressure be reduced "to a vacuum". The proposed standard specifies a vacuum of 102 mm of mercury. The standards provide pressure and temperature tables to provide for safe handling of refrigerant storage containers. The tables are as a stringent as the requirements of J1990.

1. Standards for HFC-134a Recover/Recycle Equipment

Today's proposed rule adopts a standard for HFC-134a recycling equipment for mobile air-conditioning. This standard establishes specific minimum equipment requirements for the recycling of HFC-134a that has been directly removed from, and is intended for reuse in, mobile air-conditioning systems.

Today's proposed rule requires that the recycling equipment meet the standards set forth in appendix C to this rule. The standard contains specifications for labeling the recovery equipment once it is certified, safety requirements, operating instruction and a functional description of the equipment, including hose and fitting specification, overfill protection requirements and storage tank requirements. The standard provides a procedure to test the equipment to verify that it meets the specifications of the standard.

Today's rule adds a standard for purity for recycled HFC-134a that establishes the minimum level of purity required for recycled HFC-134a removed from, and intended for reuse in, mobile air-conditioning systems. The standard sets purity specifications for levels of moisture, lubricant and noncondensable gases, and is set forth in appendix C to this rule.

Today's rule also proposes a standard recommended service procedure for containment of HFC-134a, set forth in appendix C, that provides guidelines for the technicians that service MVACs and operate refrigerant recycling equipment designed for HFC-134a. The proposed standard provides specific procedures to recover the refrigerant by reducing system pressure to at least 102 mm of mercury vacuum. The standard contains requirements for stored refrigerant

containers and disposal of empty containers.

The standard set forth in appendix C is nearly identical to the SAE J2210 standard issued by SAE December 1992. The differences between SAE J2210 and appendix C are incidental, such as grammatical corrections and spelling, and do not affect the requirements of the standard.

2. Standard for HFC-134a Recover-Only Equipment

Today's proposed rule adds standards for equipment that recovers refrigerant but does not recycle the refrigerant by removing impurities. Refrigerant recovered by this type of equipment must be properly recycled on-site or reclaimed off-site before it can be reused in an MVAC. The proposed rule requires that equipment meets the standards set forth in appendix D to this rule. The standard requires that the container for used refrigerant be marked in black print "Dirty Refrigerant—Do Not Use Without Recycling." The standard states that the recovery equipment be able to separate the refrigerant from the recovered refrigerant and indicate the amount of lubricant removed so that the technician can return the proper amount of lubricant to the system.

The standard set forth in appendix D is nearly identical to the SAE J1732 standard issued by SAE in December 1994. The differences between SAE J1732 and appendix D are incidental, such as grammatical and spelling, corrections and do not affect the requirements of the standard.

3. Standard for Automotive Refrigerant Recycling Equipment Intended for Use With Both CFC-12 and HFC-134a

Today's proposed rule adds a standard that establishes specific minimum equipment requirements for automotive refrigerant recycling equipment intended for use with both CFC-12 and HFC-134a in a common refrigerant circuit. The proposed rule requires that equipment meets the standards set forth in appendix E to this rule. The proposed standard in appendix E requires labeling of the equipment after certification, and includes requirements to prevent cross contamination before operations involving a different refrigerant can begin. These requirements include interlocks and indications to prevent cross contamination. The standard contains requirements to purify the refrigerant, safety requirements and functional description of the equipment, requirements for labeling of the storage tanks to identify CFC-12 and HFC-

134a, and hose and connection requirements. Today's proposed standard also provides guidelines for testing the equipment to verify that it meets the requirements of the standard.

The standard set forth in appendix E is nearly identical to the SAE J1770 standard issued by SAE in December, 1995. The differences between SAE J1770 and appendix E are incidental, such as grammatical and spelling corrections, and do not affect the requirements of the standard.

4. Standard for Recover-Only Equipment That Extracts Class I or Class II Refrigerants Other Than CFC-12

Today's proposed rule adds standards for equipment that recovers but does not recycle refrigerants other than CFC-12 and HFC-134a. The refrigerant that is recovered by this type of equipment must be properly reclaimed before it can be reused in an MVAC. The proposed rule requires that equipment meets the standards set forth in appendix F. Appendix F is based on the recover-only standard for CFC-12. The standard states that the recovery equipment be able to separate the lubricant from the recovered refrigerant and indicate the amount of lubricant removed so that the technician can return the proper amount of lubricant to the system.

C. Substantially Identical Equipment

Section 609 of the Act provides that equipment purchased before the proposal of standards shall be considered certified if it is substantially identical to equipment certified by the EPA or by an independent standards testing organization approved by EPA. Section 82.36(b) of the regulations states that recover/recycle equipment designed for use with CFC-12 and purchased before the proposal of the standards for refrigerant recycling equipment in appendix A (*i.e.*, before September 4, 1991) shall be considered certified if it is "substantially identical" to equipment approved under § 82.36(a).

Today's proposal would apply the Act's "substantially identical" provision to recover/recycle and recover-only equipment that services HFC-134a MVACs, recover/recycle equipment intended for use with both CFC-12 and HFC-134a MVACs, and equipment that recovers but does not recycle class I and class II refrigerants other than CFC-12. These types of equipment will be considered approved if they are substantially identical to equipment approved under § 82.36(a) and if they were purchased prior to the date of today's proposal. A manufacturer or owner may request a determination from EPA on the point of whether a

particular model is substantially identical.

The Agency's views on implementation of the "substantially identical" provision are discussed in some detail in the September 4, 1991 Notice. EPA considers equipment to be substantially identical if it performs equivalently to the equipment that is certified to meet all the approved equipment standards but was purchased prior to the date of publication of the appropriate EPA proposed standard. In general, EPA proposes to follow the same strict approach in implementing the substantially identical provision for the equipment subject to the standards proposed today as for recover/recycle and recover-only equipment that services CFC-12 MVACs. EPA is aware of some cases in which equipment purchased before the publication of the proposal to today's rule was produced by manufacturers that have not yet received a certification on any model or by manufacturers that no longer make equipment. In situations where equipment was purchased without certification and no model by that manufacturer achieves certification, EPA will evaluate the equipment on a model-by-model basis before making a substantially identical determination. Owners of the equipment, if they cannot contact manufacturers to determine the status of equipment, may submit process flowsheets and lists of components to EPA. EPA reserves the right to inspect the equipment and request samples of refrigerant if necessary. The address for submittal of information is: MVACs Recycling Program Manager, Stratospheric Protection Division, (6205J), U.S. Environmental Protection Agency, 401 M Street, S.W., Washington, D.C. 20460, Attention: Substantially Identical Equipment Review. EPA will maintain a strict interpretation of the substantially identical clause in order to protect the air-conditioning units and the integrity of the recycling program. As a result, the Agency does not anticipate that many types of equipment subject to the standards proposed today will qualify as substantially identical through this evaluation procedure.

The Agency is aware that some HFC-134a recover-only equipment has been sold prior to SAE's issuance of the J1732 standard for HFC-134a recover-only equipment in December, 1994 and that some dual refrigerant recycling equipment has been sold prior to SAE's issuance of the J1770 standard for equipment that recovers both CFC-12 and HFC-134a in December, 1995. Because no SAE standard was in place at the time of sale, the equipment could

not be certified for EPA approval by UL or ETL. In such an event, *i.e.*, where units are sold prior to the publication of the appropriate SAE standard, so that there is no sticker or plate on the unit showing that the model has been tested by UL or ETL to meet the appropriate SAE standard, and later, after publication of the standard, units of the same model are certified by UL or ETL, the Agency is considering treating the units sold prior to the publication of the standard to be substantially identical. The Agency reserves the right, however, to terminate such treatment of earlier units in the event the Agency receives evidence that some earlier units of that model (e.g., prior to serial number xxxxx) were not able to achieve one or more of the provisions of the appropriate SAE standard. In that instance, the manufacturer will have to demonstrate to EPA that the units in question are substantially identical before EPA would make a determination to that effect. The Agency recognizes that manufacturers of units sold prior to the publication of the appropriate SAE standard may consider developing retrofit kits to bring pre-certification units up to the performance standard of certified units.

It should be noted that some dual refrigerant recycling equipment sold prior to SAE's issuance of the J1770 standard for equipment that recovers both CFC-12 and HFC-134a in December, 1995, may be labeled with a UL or ETL sticker that indicates that the unit meets SAE J-1990 and J-2210. The Agency does not consider that these units necessarily meet the J1770 standard. In the event that later versions of the same model of equipment become certified by UL or ETL to meet the J1770 standard, then, as discussed above, the Agency is considering treating the units sold prior to the publication of the standard to be substantially identical, although EPA reserves the right to terminate this determination as noted above.

The Agency is aware of several models of automotive refrigerant recycling equipment intended for use with both CFC-12 and HFC-134a where units have been sold prior to the publication of SAE standard J1770. These models are the SPX/Robinair model numbers 12134A and 17800A, the White Industries model number 01234a, and the American Thermoflo model number 18000. After reviewing the equipment specifications and performance for each of these models, the Agency proposes to determine that they are substantially identical to equipment EPA would approve

according to the standards set forth in this proposal.

D. Approved Independent Testing Organizations

Section 82.38 establishes the criteria for approval of testing laboratories or organizations to certify whether equipment governed by the regulations meets the standards set forth in the regulations. Under the July 14, 1992 final rule and the May 2, 1995 supplemental final rule, approved organizations would determine whether recover/recycle and recover-only equipment meets the standards set forth in the appendices to the rule, which were based on SAE standards. Today's rulemaking will expand that provision so that these approved organizations will be able to determine whether the equipment subject to today's proposal meets the standards set forth in the appropriate appendices.

Because the application materials received by the Agency from UL on October 21, 1991, and from ETL on November 27, 1991 demonstrate that both organizations have met the criteria set forth in § 82.38(b) with respect to all equipment subject to today's proposal, and because the Agency has received written requests from both UL and ETL stating that all the application criteria are still being met and requesting that they be approved to certify the equipment subject to today's proposal, the Agency intends to approve UL and ETL to certify this equipment, effective as of the effective date of this final rulemaking.

EPA encourages applications from other facilities that are capable of testing equipment to the necessary standards. Organizations must demonstrate that they have the experience and the appropriate equipment to perform testing. The EPA will maintain a list of approved independent standards testing organizations available upon request at the address set forth in § 82.38. The Agency reserves the right to revoke approval if the testing organization violates any of the requirements contained in § 82.38.

E. Technician Training and Certification

Section 82.40 established the standards for programs approved to train and certify technicians. The standards cover training, the subject material that must be covered by each program, and minimum test administration procedures. Summaries of reviews of programs must be submitted every two years and programs must offer technicians proof of certification upon successful completion of the test.

At this time, over twenty organizations have been approved by EPA to train and certify technicians in the use of recover-recycle and recover-only equipment that services CFC-12 MVACs. Ten of these organizations train and certify their employees, while the remaining train members of the general public. While EPA's approval of these organizations has been limited to equipment that services CFC-12 MVACs, the Agency believes that for purposes of training and certification conducted prior to 30 days after the publication of the final rule following this proposal, these organizations should also be considered as approved for purposes of the equipment and refrigerants subject to today's proposal. As discussed below, the design features of recover/recycle and recover-only equipment subject to today's proposal are very similar to the design features of CFC-12 equipment, and the procedures for extracting refrigerant are very similar for all types of equipment. The organizations have previously shown their compliance with the provisions regarding test administration and proof of certification. Retraining and recertifying of technicians already certified to use CFC-12 equipment would produce only a limited environmental benefit. In addition, such retraining and recertification would impose a large burden on the technicians and the organizations that certify them. For these reasons, EPA intends to approve the 25 organizations noted above for any training and certification of technicians they conducted prior to 30 days after publication of the final rule in the use of the equipment and refrigerants subject to today's proposal.

EPA also intends to approve the above-noted currently approved organizations for future training and certification of technicians for the use of the equipment and refrigerants subject to today's proposal on the condition that the organization certify in writing to the Agency that its training materials discuss the standards set forth in appendices C, D, E, and F, as finally adopted, and that its testing materials include questions concerning those standards. Each of the above organizations that submits such a certification shall be approved upon the date which is the later of (i) the effective date of the final rule, or (ii) the receipt by the Agency of such a certification. Organizations that do not submit such a certification will not be approved to train and certify future technicians for the use of the equipment and refrigerants subject to today's proposal.

As noted above, the prior training and testing of previously approved technicians for CFC-12 equipment adequately and sufficiently covers the standards set forth in appendices C, D, E, and F because of the large overlap between the text of the standard based on SAE J1990 contained in appendix A and the standards based on the SAE standards contained in appendices C, D, E and F. In all of these appendices, the following provisions are identical or nearly identical: safety requirements; requirement that the manufacturer must provide operating instructions; requirement that the equipment must ensure the refrigerant recovery by reducing system pressure below atmospheric to a minimum of 102 mm of mercury; the preconditioning of the equipment with a contaminated sample; the composition of that contaminated sample; the requirement that the equipment must be certified by UL or an equivalent certifying laboratory; the requirement that the label on the equipment must state that it has been design certified to meet applicable SAE standards; and the additional storage tank requirements.

Where the SAE J1990-based standards in appendix A differ from the SAE J1732-based standards in appendices D and F, they differ largely because appendix A contains many provisions that relate to the recycle portion of the equipment operation and which are thus not applicable to appendices D and F. For example, appendix A describes requirements for the recycling test cycle and for the quantitative determination of moisture, lubricant, and noncondensable gas in that cycle.

A review of SAE J1732 indicates that it contains two provisions that relate to the recovery of refrigerant for which there are no equivalent provisions in SAE J1990. First, section 6.3.2 of SAE J1732 requires that the equipment discharge or transfer fitting shall be 1/2" ACME thread. SAE did not consider this requirement until after the publication of the final version of J1990. This requirement guards against mixing of different refrigerants by using unique fittings. Second, section 6.1 of SAE J1732 requires that the unit must have a device that assures that refrigerant has been recovered so that outgassing is prevented. Although there is no equivalent to this provision in SAE J1990, J1989 requires safeguards to prevent outgassing.

EPA encourages applications from other organizations that are capable of training and testing technicians. Organizations must demonstrate that they have the appropriate experience to perform the training and testing and

meet the other requirements of § 82.40. The materials must cover the subjects described in 40 CFR 82.40. Approved organizations must demonstrate that the tests they offer will be graded by a computer scanner or disinterested, independent party. The EPA will maintain a list of approved testing and training organizations available upon request at the address set forth in § 82.38. The Agency reserves the right to revoke approval of the organization pursuant to provisions set forth in § 82.40.

F. Sales Restrictions

Section 609 made it unlawful, effective November 15, 1992, for any person to sell or distribute, or offer for sale or distribution, except to section 609 certified technicians, any class I or class II substance suitable for use as refrigerant in a motor vehicle air-conditioning system and that is in a container with less than 20 pounds of refrigerant. Consequently, sales of small cans of CFC-12, as well as small cans of FRIGC and any other HCFC blend which EPA's Significant New Alternatives Policy (SNAP) program may determine to be acceptable as a substitute for CFC-12 in MVACs, are limited to section 609 certified technicians. In addition, section 608 regulations that became effective November 14, 1994 (58 FR 28714) restrict the sales of all containers (regardless of size) of any class I or II refrigerant to technicians certified under either section 608 or section 609 of the Act.

In conjunction with the publication of this proposal for changes to the regulations promulgated under section 609 of the Act, the Agency is proposing in a separate rule several changes to the regulations promulgated under section 608 of the Act. The proposed changes to the section 608 regulations are intended for publication on or about the date of publication of this section 609 proposed rule. The proposed changes to the section 608 regulations, pursuant to the mandate of section 608(c)(2), establish standards and requirements for the servicing of appliances and industrial process refrigeration that use refrigerants that substitute for the currently-regulated class I or class II substances. In addition, in that proposal, the Agency may include a provision proposing to restrict the sale of substitute refrigerants, including HFC-134a, to technicians certified under either section 608 or section 609 of the Act. Should the Agency determine to propose such a sales restriction, the proposed changes to the regulatory text and explanatory

discussion in the preamble would be entirely contained in the section 608 proposed rule, even though the changes would also affect industries governed under section 609—automotive refrigerant distributors, automobile manufacturers, and the automotive service industry. All parties interested whether EPA decides to institute a sales restriction are therefore urged to review the language contained in the section 608 proposal.

III. Summary of Supporting Analyses

A. Executive Order 12866

Under Executive Order 12866 (58 FR 51735, October 4, 1993), the Agency must determine whether this regulatory action is "significant" and therefore subject to OMB review and the requirements of the Executive Order. The Order defines "significant" regulatory action as one that is likely to lead to a rule that may:

- (1) Have an annual effect on the economy of \$100 million or more, or adversely and materially affect a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;
- (2) Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
- (3) Materially alter the budgetary impact of entitlement, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or
- (4) Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

It has been determined by OMB and EPA that this proposed rule is not a "significant regulatory action" under the terms of Executive Order 12866 and is therefore not subject to OMB review under the Executive Order. The Agency prepared an analysis to assess the impact of the proposed regulation (see Regulatory Assessment for EPA's Proposed Rule on Standards and Requirements for Servicing of Motor Vehicle Air Conditioners that use Refrigerants other than Class I or Class II Substances, U.S. EPA Stratospheric Protection Division, November, 1995), which covers both recover/recycle equipment and recover-only equipment, and is available for review in the public docket for this rulemaking.

B. Regulatory Flexibility Analysis

1. Purpose

The Regulatory Flexibility Act, 5 U.S.C. 601-612, requires that Federal agencies examine the impacts of their regulations on small entities. Under 5

U.S.C. 604(a), whenever an agency is required to publish a general notice of proposed rulemaking, it must prepare and make available for public comment an initial regulatory flexibility analysis (RFA). Such an analysis is not required if the head of an agency certifies that a rule will not have a significant economic impact on a substantial number of small entities, pursuant to 5 U.S.C. 605(b).

The Agency has performed an initial regulatory flexibility analysis and determined that this regulation does not affect a substantial number of small businesses. The analysis is found in Appendix A in the Regulatory Assessment for EPA's Proposed Rule on Standards and Requirements for Servicing of Motor Vehicle Air Conditioners that use Refrigerants other than Class I or Class II Substances (U.S. EPA Stratospheric Protection Division, October, 1995) (Regulatory Assessment) and is available for review in the docket. The methodology and results of the analysis are presented below.

2. Methodology and Results

To examine the impacts on small businesses, EPA first characterized the regulated community by identifying the SIC codes that would be involved in the servicing and repair of motor vehicle air conditioners. After determining the number of these entities that are classified as small by the Small Business Act (SBA), the Agency performed impact tests using sales, profits and cash flow measures. The analysis included least expensive and most expensive private cost scenarios for compliance that were developed for the Regulatory Assessment. The least expensive cost scenario assumed recover/recycle equipment is purchased while the more expensive option assumes dual refrigerant recover/recycle equipment is acquired. The analysis also takes the cost of sending refrigerant out for reclamation, labor, and cost savings from using recycled refrigerant into account.

The analysis indicates that the number of small establishments significantly affected by the regulation ranges from 3.4% if the least expensive compliance option is chosen, to 7.4% if the most expensive compliance option is chosen. The Agency frequently defines a "substantial number" of small entities as approximately 20% or more of small establishments. As a result, the Agency certifies that this regulation will not significantly affect a substantial number of small entities, pursuant to 5 U.S.C. 605(b).

C. Paperwork Reduction Act

This proposed rule has no new information requirements subject to the Paperwork Reduction Act.

D. Unfunded Mandates Reform Act

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), P.L. 104-4, establishes requirements for Federal agencies to assess the effects of their regulatory actions on State, local and tribal governments and the private sector. Under section 202 of the UMRA, EPA generally must prepare a written statement, including a cost-benefit analysis, for proposed and final rules with "Federal mandates" that may result in expenditures to State, local and tribal governments, in the aggregate, or to the private sector, of \$100 million or more in any one year. Before promulgating an EPA rule for which a written statement is needed, section 205 of the UMRA generally requires EPA to identify and consider a reasonable number of regulatory alternatives and adopt the least costly, most cost-effective or least burdensome alternative that achieves the objectives of the rule.

Today's proposed rule contains no Federal mandates under the regulatory provisions of Title II of the UMRA for State, local or tribal governments or the private sector. As the draft Regulatory Assessment demonstrates, EPA believes that this rule does not contain a Federal mandate that may result in expenditures of \$100 million or more for State, local and tribal governments, in the aggregate, or the private sector, in any one year. Thus, today's proposed rule is not subject to the requirements of sections 202 and 205 of the UMRA. EPA has also determined that this rule contains no regulatory requirements that might significantly or uniquely affect small governments.

List of Subjects in 40 CFR Part 82

Environmental protection, Chlorofluorocarbons, Motor vehicle air-conditioning, Reporting and recordkeeping requirements, Recover/recycle equipment, Recover-only equipment, Reporting and certification requirements, Stratospheric ozone layer.

Dated: February 12, 1996.

Carol M. Browner, Administrator.

For the reasons set out in the preamble, 40 CFR part 82 is proposed to be amended as follows:

PART 82—PROTECTION OF STRATOSPHERIC OZONE

1. The authority citation for part 82 continues to read as follows:

Authority: 42 U.S.C. 7414, 7601, 7671-7671q.

2. Section 82.30 is amended by revising paragraph (a) to read as follows:

§ 82.30 Purpose and scope.

(a) The purpose of the regulations in this subpart B is to implement section 609 of the Clean Air Act, as amended (Act) regarding the servicing of motor vehicle air conditioners, and to implement section 608 of the Act regarding certain servicing, maintenance, repair and disposal of air conditioners in motor vehicle-like appliances.

* * * * *

3. Section 82.32 is amended by adding a heading to paragraph (e), by revising paragraph (e)(1), and by adding paragraphs (e)(3), (e)(4), and (i) to read as follows:

§ 82.32 Definitions.

* * * * *

(e) Properly using. (1) Properly using means using equipment in conformity with the recommended service procedures and practices for the containment of refrigerant set forth in appendices A, B, C, D, E, and F of this subpart, as applicable.

* * * * *

(3) Refrigerant that is extracted from an MVAC located at a motor vehicle disposal facility must be properly processed through approved refrigerant recycling equipment prior to using it to charge or recharge an MVAC or MVAC-like appliance (as that term is defined in § 82.152(e)), unless the refrigerant has been reclaimed in accordance with this subpart B.

(4) Notwithstanding any other terms of this paragraph (e), approved refrigerant recycling equipment may be transported off-site and used to perform air-conditioning service involving refrigerant at other locations where servicing of MVACs occurs. Any such servicing of MVACs or involving refrigerant must meet all of the requirements of this subpart B that would apply if the servicing occurred on-site.

* * * * *

(i) Motor vehicle disposal facility means any commercial facility that engages in motor vehicle disposal, dismantling or recycling, including but not limited to scrap yards, landfills and salvage yards engaged in such operations. Motor vehicle repair facilities, including collision repair facilities, are not considered motor vehicle disposal facilities.

4. Section 82.34 is amended by revising the reference "\$ 82.42(b)(4)" to

read "\$ 82.42(b)(3)" in paragraph (b); and by adding paragraph (d) to read as follows:

§ 82.34 Prohibitions.

* * * * *

(d) Any person who recovers refrigerant from an MVAC located at a motor vehicle disposal facility must be a certified technician under this subpart B or under subpart F of this part, except for employees, owners, or operators of the disposal facility. Any sale of a class I or class II substance extracted from an MVAC located at such facility must be to a technician certified under this subpart B or under subpart F of this part.

5. Section 82.36 is amended by revising paragraphs (a)(2) and (b) to read as follows:

§ 82.36 Approved refrigerant recycling equipment.

(a) * * *

(2) Equipment that recovers and recycles refrigerant must meet the standards set forth in appendix A of this subpart (Recommended Service Procedure for the Containment of CFC-12, Extraction and Recycle Equipment for Mobile Automotive Air-Conditioning Systems, and Standard of Purity for Use in Mobile Air Conditioning Systems), appendix C of this subpart (Recommended Service Procedure for the Containment of HFC-134a and Standards for Recover/Recycle Equipment that Extracts and Recycles HFC-134a and Standard of Purity for Recycled HFC-134a for Use in MVACs) and appendix E of this subpart (Automotive Refrigerant Recycling Equipment Intended for Use with both CFC-12 and HFC-134a), as applicable. Equipment that recovers refrigerant for recycling on-site or for reclamation off-site must meet the standards set forth in appendix B of this subpart (Recommended Service Procedure for the Containment of CFC-12, Extraction Equipment for Mobile Automotive Air-Conditioning Systems), appendix D of this subpart (HFC-134a Recover-Only Equipment, Recommended Service Procedure for the Containment of HFC-134a) and appendix F of this subpart (Recover only Equipment that Extracts Class I or Class II Refrigerants Other Than CFC-12), as applicable.

(b)(1) Refrigerant recycling equipment that has not been certified under paragraph (a) of this section shall be considered approved if it is substantially identical to the applicable equipment certified under paragraph (a) of this section, and:

(i) For equipment that recovers and recycles CFC-12 refrigerant, it was purchased before September 4, 1991;

(ii) For equipment that recovers CFC-12 refrigerant for recycling on-site or reclamation off-site, it was purchased before April 22, 1992;

(iii) For equipment that recovers and recycles HFC-134a refrigerant, it was purchased before March 6, 1996;

(iv) For equipment that recovers HFC-134a refrigerant for recycling on-site or reclamation off-site, it was purchased before March 6, 1996.

(v) For equipment that recovers any class I or class II refrigerant other than CFC-12 for recycling on-site or reclamation off-site, it was purchased before March 6, 1996; and

(vi) For equipment that recovers and recycles HFC-134a and CFC-12 refrigerant, it was purchased before March 6, 1996.

(2) Equipment manufacturers or owners may request a determination by the Administrator by submitting an application and supporting documents that indicate that the equipment is substantially identical to approved equipment to: MVACs Recycling Program Manager, Stratospheric Protection Division (6205J), U.S. Environmental Protection Agency, 401 M Street, S.W., Washington, D.C. 20460, Attn: Substantially Identical Equipment Review. Supporting documents must include process flow sheets, lists of components and any other information that would indicate that the equipment is capable of processing the refrigerant to the standards in appendix A, B, C, D, E or F of this subpart, as applicable. Authorized representatives of the Administrator may inspect equipment for which approval is being sought and request samples of refrigerant that has been extracted and/or recycled using the equipment. Equipment that fails to meet appropriate standards will not be considered approved.

* * * * *

6. Section 82.38 is amended by revising paragraphs (a) and (b)(1)(iii) to read as follows:

§ 82.38 Approved independent standards testing organizations.

(a) Any independent standards testing organization may apply for approval by the Administrator to certify equipment as meeting the standards in appendix A, B, C, D, E, or F of this subpart, as applicable. The application shall be sent to: MVACs Recycling Program Manager, Stratospheric Protection Division (6205J), U.S. Environmental Protection Agency, 401 M Street, S.W., Washington, DC 20460.

(b) * * *

(1) * * *

(iii) Thorough knowledge of the standards as they appear in the applicable appendices of this subpart; and

* * * * *

7. Section 82.40 is amended by revising paragraph (a)(2)(i) to read as follows:

§ 82.40 Technician training and certification.

(a) * * *

(2) * * *

(i) The standards established for the service and repair of motor vehicle air conditioners as set forth in appendices A, B, C, D, E, and F of this subpart. These standards relate to the recommended service procedures for the containment of refrigerant, extraction equipment, extraction and recycle equipment, and the standard of purity for refrigerant in motor vehicle air conditioners.

* * * * *

8. Appendix C is added to Subpart B to read as follows:

Appendix C to Part 82, Subpart B—Standard for Recover/Recycle Equipment for HFC-134a Refrigerant

I. SAE J2210, issued December, 1991.

HFC-134a Recycling Equipment for Mobile Air Conditioning Systems

Foreword

The purpose of this standard is to establish the specific minimum equipment specification required for the recycling of HFC-134a that has been directly removed from, and is intended for reuse in, mobile air-conditioning systems. Establishing such specifications will assure that system operation with recycled HFC-134a will provide the same level of performance and durability as new refrigerant.

1. Scope

The purpose of this standard is to establish specific minimum equipment requirements for recycling HFC-134a that has been directly removed from, and is intended for reuse in, mobile air-conditioning (A/C) systems.

2. References

Applicable Documents—The following publications form a part of this specification to the extent specified.

2.1.1 SAE Publications—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J2099—Standard of Purity for Recycled HFC-134a for Use in Mobile Air-Conditioning Systems.

SAE J2196—Service Hoses for Automotive Air-Conditioning.

SAE J2197—Service Hose Fittings for Automotive Air-Conditioning.

2.1.2 CGA Publications—Available from CGA, 1235 Jefferson Davis Highway, Arlington, VA 22202.

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

2.1.3 DOT Publications—Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

DOT Standard, 49 CFR 173.304—Shippers—General Requirements for Shippers and Packagings.

2.1.4 UL Publications—Available from Underwriters Laboratories, 333 Pfingsten Road, Northbrook, IL 60062-2096.

UL 1769—Cylinder Valves.

UL 1963—Refrigerant Recovery/Recycling Equipment.

3. Specification and General Description

3.1 The equipment must be able to remove and process HFC-134a from mobile A/C systems to the purity level specified in SAE J2099.

3.2 The equipment shall be suitable for use in an automotive service garage environment and be capable of continuous operation in ambients from 10 to 49 °C (50 to 120 °F).

3.3 The equipment must be certified that it meets this specification by Underwriters Laboratories (UL) or an equivalent certifying laboratory.

3.4 The equipment shall have a label which states "Design Certified by (Certifying Agent) to meet SAE J2210" in bold-type letters a minimum of 3 mm in height.

4. Refrigerant Recycling Equipment Requirements

4.1 Moisture and Acid—The equipment shall incorporate a desiccant package that must be replaced before saturation with moisture, and whose mineral acid capacity is at least 5% by weight of the dry desiccant.

4.1.1 The equipment shall be provided with a moisture detection means that will reliably indicate when moisture in the HFC-134a reaches the allowable limit and desiccant replacement is required.

4.2 Filter—The equipment shall incorporate an in-line filter that will trap particulates of 15 micron spherical diameter or greater.

4.3 Noncondensable Gases.

4.3.1 The equipment shall either automatically purge noncondensables (NCGs) if the acceptable level is exceeded or incorporate a device that indicates to the operator that the NCG level has been exceeded. NCG removal must be part of the normal operation of the equipment and instructions must be provided to enable the task to be accomplished within 30 minutes.

4.3.2 Refrigerant loss from noncondensable gas purging during the testing described in Section 8 shall not exceed 5% by weight of the total contaminated refrigerant removed from the test system.

4.4 Recharging and Transfer of Recycled Refrigerant—Recycled refrigerant for recharging and transfer shall be taken from the liquid phase only.

5. Safety Requirements

5.1 The equipment must comply with applicable federal, state, and local requirements on equipment related to

handling HFC-134a material. Safety precautions or notices related to safe operation of the equipment shall be prominently displayed on the equipment and should also state "CAUTION—SHOULD BE OPERATED BY QUALIFIED PERSONNEL".

5.2 HFC-134a has been shown to be nonflammable at ambient temperature and atmospheric pressure. However, tests under controlled conditions have indicated that, at pressures above atmospheric and with air concentrations greater than 60% by volume, HFC-134a can form combustible mixtures. While it is recognized that an ignition source is also required for combustion to occur, the presence of combustible mixtures is a potentially dangerous situation and should be avoided.

5.3 Under NO CIRCUMSTANCES should any equipment be pressure tested or leak tested with air/HFC-134a mixtures. Do not use compressed air (shop air) for leak detection in HFC-134a systems.

6. Operating Instructions

6.1 The equipment manufacturer must provide operating instructions, including proper attainment of vehicle system vacuum (*i.e.*, when to stop the extraction process), filter/desiccant replacement, and purging of noncondensable gases (air). Also to be included are any other necessary maintenance procedures, source information for replacement parts and repair, and safety precautions.

6.2 The equipment must prominently display the manufacturer's name, address, the type of refrigerant it is designed to recycle, a service telephone number, and the part number for the replacement filter/drier.

7. Functional Description

7.1 The equipment must be capable of ensuring removal of refrigerant from the system being serviced by reducing the system pressure to a minimum of 102 mm (4 in) of mercury below atmospheric pressure (*i.e.*, vacuum).

7.2 During operation, the equipment shall provide overfill protection to assure that the liquid fill of the storage container (which may be integral or external) does not exceed 80% of the tank's rated volume at 21.1 °C (70 °F) per Department of Transportation (DOT) Standard, 49 CFR 173.304 and the American Society of Mechanical Engineers.

7.3 Portable refillable tanks or containers used in conjunction with this equipment must be labeled "HFC-134a", meet applicable DOT or Underwriters Laboratories (UL) Standards, and shall incorporate fittings per SAE J2197.

7.3.1 The cylinder valve shall comply with the standard for cylinder valves, UL 1769.

7.3.2 The pressure relief device shall comply with the Pressure Relief Device Standard Part 1—Cylinders for Compressed Gases, CGA Pamphlet S-1.1.

7.3.3 The tank assembly shall be marked to indicate the first retest date which shall be 5 years after the date of manufacture. The marking shall indicate that retest must be performed every subsequent 5 years. The marking shall be in letter at least 6 mm (¼ in) high.

7.4 All flexible hoses must comply with SAE J2196.

7.5 Service hoses must have shutoff devices located within 30 cm (12 in) of the connection point to the system being serviced as identified in J2196. All service fittings must comply with SAE J2197.

7.6 The equipment must be able to separate the lubricant from the removed refrigerant and accurately indicate the amount of lubricant removed during the process, in 30 mL (1 fl oz) units. Refrigerant dissolves in lubricants and, as a result, increases the volume of the recovered lubricant sample. This creates the illusion that more lubricant has been recovered than actually has been. The equipment lubricant measuring system must take into account such dissolved refrigerant to prevent overcharging the vehicle system with lubricant. (Note: Use only new lubricant to replace the amount removed during the recycling process. Used lubricant should be discarded per applicable federal, state, and local requirements.)

8. Testing

This test procedure and its requirements are to be used to determine the ability of the recycling equipment to adequately recycle contaminated refrigerant.

8.1 The equipment shall be able to clean the contaminated refrigerant in section 8.3 to the purity level defined in SAE J2099.

8.2 The equipment shall be operated in accordance with the manufacturer's operating instructions.

8.3 Contaminated HFC-134a Sample.

8.3.1 The standard contaminated refrigerant shall consist of liquid HFC-134a with 1300 ppm (by weight) moisture (equivalent to saturation at 38 °C [100 °F]), 45,000 ppm (by weight) HFC-134a compatible lubricant, and 1000 ppm (by weight) of noncondensable gases (air).

8.3.1.1 The HFC-134a compatible lubricant referred to in section 8.3.1 shall be ICI DGLF 118, or equivalent, which shall contain no more than 1000 ppm by weight of moisture.

8.4 Test Cycle.

8.4.1 The equipment must be preconditioned by processing 13.6 kg (30 lb) of the standard contaminated HFC-134a at an ambient of 21 °C (70 °F) before starting the test cycle. 1.13 kg (2.5 lb) samples are to be processed at 5 min intervals. The test fixture, depicted in Figure 1 to Appendix A of this subpart, shall be operated at 21 °C (70 °F).

8.4.2 Following the preconditioning procedure per section 8.4.1, 18.2 kg (40 lb) of standard contaminated HFC-134a are to be processed by the equipment.

8.5 Sample Requirements.

8.5.1 Samples of the standard contaminated refrigerant from section 8.3.1 shall be processed as required in section 8.6 and shall be analyzed after said processing as defined in sections 8.7, 8.8, and section 8.9. Note exception for non-condensable gas determination in section 8.9.4.

8.6 Equipment Operating Ambient.

8.6.1 The HFC-134a is to be cleaned to the purity level, as defined in SAE J2099, with the equipment operating in a stable ambient of 10, 21, and 49 °C (50, 70, 120 °F) while processing the samples as defined in section 8.4.

8.7 Quantitative Determination of Moisture.

8.7.1 The recycled liquid phase sample of HFC-134a shall be analyzed for moisture content via Karl Fischer coulometric titration, or an equivalent method. The Karl Fischer apparatus is an instrument for precise determination of small amounts of water dissolved in liquid and/or gas samples.

8.7.2 In conducting this test, a weighed sample of 30 to 130 g is vaporized directly into the Karl Fischer analyte. A coulometric titration is conducted and the results are reported as parts per million moisture (weight).

8.8 Determination of Percent Lubricant.

8.8.1 The amount of lubricant in the recycled HFC-134a sample shall be determined via gravimetric analysis. The methodology must account for the hygroscopicity of the lubricant.

8.8.2 Following venting of noncondensable gases in accordance with the manufacturer's operating instructions, the refrigerant container shall be shaken 5 min prior to extracting samples for testing.

8.8.3 A weighed sample of 175 to 225 g of liquid HFC-134a is allowed to evaporate at room temperature. The percent lubricant is calculated from weights of the original sample and the residue remaining after evaporation.

8.9 Noncondensable Gases.

8.9.1 The amount of noncondensable gases shall be determined by gas chromatography. A sample of vaporized refrigerant liquid shall be separated and analyzed by gas chromatography. A Porapak Q column at 130 °C (266 °F) and a hot wire detector may be used for the analysis.

8.9.2 This test shall be conducted on liquid phase samples of recycled refrigerant taken from a full container as defined in section 7.2 within 30 minutes following the proper venting of noncondensable gases.

8.9.3 The liquid phase samples in section 8.9.2 shall be vaporized completely prior to gas chromatographic analysis.

8.9.4 This test shall be conducted at 21 and 49 °C (50 and 120 °F) and may be performed in conjunction with the testing defined in section 8.6. The equipment shall process at least 13.6 kg (30 lb) of standard contaminated refrigerant for this test.

Rationale

Not applicable.

Relationship of Standard to ISO Standard

Not applicable.

Application

The purpose of this standard is to establish the specific minimum equipment requirements for recycling HFC-134a that has been directly removed from, and is intended for reuse in, mobile air-conditioning (A/C) systems.

Reference Section

SAE J2099—Standard of Purity for Recycled HFC-134a for Use in Mobile Air-Conditioning Systems.

SAE J2196—Service Hoses for Automotive Air-Conditioning.

SAE J2197—Service Hose Fittings for Automotive Air-Conditioning.

CGA Pamphlet S-1.1—Pressure Relief Device Standard Part 1—Cylinders for Compressed Gases.
 UL 1769—Cylinder Valves.
 UL 1963—Refrigerant Recovery/Recycling Equipment.
 DOT Standard, 49 CFR 173.304—Shippers—General Requirements for Shipment and Packagings.
 II. SAE J2211, issued December, 1991.

Recommended Service Procedure for the Containment of HFC-134a

1. Scope

Refrigerant containment is an important part of servicing mobile air-conditioning systems. This procedure provides guidelines for technicians for servicing mobile air-conditioning systems and operating refrigerant recycling equipment designed for HFC-134a (described in SAE J2210).

2. References

2.1 Applicable Documents—The following publications form a part of this specification to the extent specified. The latest issue of SAE publications shall apply.
 2.1.1 SAE Publications—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.
 SAE J2196—Service Hoses for Automotive Air-Conditioning.
 SAE J2197—Service Hose Fittings for Automotive Air-Conditioning.
 SAE J2210—Refrigerant Recycling Equipment for HFC-134a Mobile Air-Conditioning Systems.
 SAE J2219—Concerns to the Mobile Air-Conditioning Industry.

2.2 Definitions.

2.2.1 Recovery/Recycling (R/R) Unit—Refers to a single piece of equipment that performs both functions of recovery and recycling of refrigerants per SAE J2210.
 2.2.2 Recovery—Refers to that portion of the R/R unit operation that removes the refrigerant from the mobile air-conditioning system and places it in the R/R unit storage container.
 2.2.3 Recycling—Refers to that portion of the R/R unit operation that processes the refrigerant for reuse on the same job site to the purity specifications of SAE J2099.

2.2.1 Recovery/Recycling (R/R) Unit—Refers to a single piece of equipment that performs both functions of recovery and recycling of refrigerants per SAE J2210.

2.2.2 Recovery—Refers to that portion of the R/R unit operation that removes the refrigerant from the mobile air-conditioning system and places it in the R/R unit storage container.

2.2.3 Recycling—Refers to that portion of the R/R unit operation that processes the refrigerant for reuse on the same job site to the purity specifications of SAE J2099.

2.2.1 Recovery/Recycling (R/R) Unit—Refers to a single piece of equipment that performs both functions of recovery and recycling of refrigerants per SAE J2210.

2.2.2 Recovery—Refers to that portion of the R/R unit operation that removes the refrigerant from the mobile air-conditioning system and places it in the R/R unit storage container.

2.2.3 Recycling—Refers to that portion of the R/R unit operation that processes the refrigerant for reuse on the same job site to the purity specifications of SAE J2099.

3. Service Procedure

3.1 Connect the recycling unit service hoses, which shall have shutoff devices (e.g., valves) within 30 cm (12 in) of the service ends, to the vehicle air-conditioning (A/C) service ports. Hoses shall conform to SAE J2196 and fittings shall conform to SAE J2197.

3.2 Operate the recycling equipment per the equipment manufacturer's recommended procedure.
 3.2.1 Verify that the vehicle A/C system has refrigerant pressure. Do not attempt to recycle refrigerant from a discharged system as this will introduce air (noncondensable gas) into the recycling equipment which must later be removed by purging.
 3.2.2 Begin the recycling process by removing the refrigerant from the vehicle A/C system. Continue the process until the system pressure has been reduced to a minimum of 102mm (4 in) of mercury below atmospheric pressure (i.e., vacuum). If A/C

components show evidence of icing, the component can be gently heated to facilitate refrigerant removal. With the recycling unit shut off for at least 5 minutes, check A/C system pressure. If this pressure has risen above vacuum (0 psig), additional recycler operation is required to remove the remaining refrigerant. Repeat the operation until the system pressure remains stable at vacuum for 2 minutes.

3.3 Close the valves in the service lines and then remove the service lines from the vehicle system. If the recovery equipment has automatic closing valves, be sure they are operating properly. Proceed with the repair/service.

3.4 Upon completion of refrigerant removal from the A/C system, determine the amount of lubricant removed during the process and replenish the system with new lubricant, which is identified on the A/C system label. Used lubricant should be discarded per applicable federal, state, and local requirements.

4. Service with a Manifold Gauge Set

4.1 High-side, low-side, and center service hoses must have shutoff devices (e.g., valves) within 30 cm (12 in) of the service ends. Valves must be closed prior to hose removal from the A/C system to prevent refrigerant loss to the atmosphere.
 4.2 During all service operations, service hose valves should be closed until connected to the vehicle A/C system or to the charging source to exclude air and/or contain the refrigerant.
 4.3 When the manifold gauge set is disconnected from the A/C system, or when the center hose is moved to another device that cannot accept refrigerant pressure, the gauge set hoses should be attached to the recycling equipment to recover the refrigerant from the hoses.

4.2 During all service operations, service hose valves should be closed until connected to the vehicle A/C system or to the charging source to exclude air and/or contain the refrigerant.

4.3 When the manifold gauge set is disconnected from the A/C system, or when the center hose is moved to another device that cannot accept refrigerant pressure, the gauge set hoses should be attached to the recycling equipment to recover the refrigerant from the hoses.

5. Supplemental Refrigerant Checking Procedure for Stored Portable Containers

5.1 Certified recycling equipment and the accompanying recycling procedure, when properly followed, will deliver use-ready refrigerant. In the event that the full recycling procedure was not followed or the technician is unsure about the noncondensable gas content of a given tank of refrigerant, this procedure can be used to determine whether the recycled refrigerant container meets the specification for noncondensable gases (air). (Note: The use of refrigerant with excess air will result in higher system operating pressures and may cause A/C system damage.)
 5.2 The container must be stored at a temperature of 18.3°C (65°F) or above for at least 12 hours, protected from direct sunlight.
 5.3 Install a calibrated pressure gauge, with 6.9 kPa (1 psig) divisions, on the container and read container pressure.
 5.4 With a calibrated thermometer, measure the air temperature within 10 cm (4 in) of the container surface.
 5.5 Compare the observed container pressure and air temperature to the values given in Tables 1 and 2 to determine whether the container pressure is below the pressure limit given in the appropriate table. For example, at an air temperature of 21 °C (-70 °F) the container pressure must not exceed 524 kPa (76 psig).

5.6 If the refrigerant in the container has been recycled and the container pressure is less than the limit in Tables 1 and 2, the refrigerant may be used.

5.7 If the refrigerant in the container has been recycled and the container pressure exceeds the limit in Tables 1 and 2, slowly vent, from the top of the container, a small amount of vapor into the recycle equipment until the pressure is less than the pressure shown in Tables 1 and 2.

5.8 If, after shaking the container and letting it stand for a few minutes, the container pressure still exceeds the pressure limit shown in Tables 1 and 2, the entire contents of the container shall be recycled.

TABLE 1.—MAXIMUM ALLOWABLE CONTAINER PRESSURE (METRIC)

Temp, C(F)	kPa
18 (65)	476
19 (66)	483
20 (68)	503
21 (70)	524
22 (72)	545
23 (73)	552
24 (75)	572
25 (77)	593
26 (79)	621
27 (81)	642
28 (82)	655
29 (84)	676
30 (86)	703
31 (88)	724
32 (90)	752
33 (91)	765
34 (93)	793
35 (95)	814
36 (97)	841
37 (99)	876
38 (100)	889
39 (102)	917
40 (104)	945
41 (106)	979
42 (108)	1007
43 (109)	1027
44 (111)	1055
45 (113)	1089
46 (115)	1124
47 (117)	1158
489 (118)	1179
49 (120)	1214

TABLE 2.—MAXIMUM ALLOWABLE CONTAINER PRESSURE (ENGLISH)

Temp, F	Psig
65	69
66	70
67	71
68	73
69	74
70	76
71	77
72	79
73	80
74	82
75	83
76	85
77	86
78	88
79	90

TABLE 2.—MAXIMUM ALLOWABLE CONTAINER PRESSURE (ENGLISH)—Continued

Temp, F	Psig
80	91
81	93
82	95
83	96
84	98
85	100
86	102
87	103
88	105
89	107
90	109
91	111
92	113
93	115
94	117
95	118
96	120
97	122
98	125
99	127
100	129
101	131
102	133
103	135
104	137
105	139
106	142
107	144
108	146
109	149
110	151
111	153
112	156
113	158
114	160
115	163
116	165
117	168
118	171
119	173
120	176

6. Containers for Storage of Recycled Refrigerant

6.1 Recycled refrigerant should not be salvaged or stored in disposable containers (this is one common type of container in which new refrigerant is sold). Use only DOT 49 CFR or UL approved storage containers, specifically marked for HFC-134a, for recycled refrigerant.

6.2 Any container of recycled refrigerant that has been stored or transferred must be checked prior to use as defined in Section 5.

6.3 Evacuate the tanks to at least 635 mm Hg (25 in Hg) below atmospheric pressure (vacuum) prior to first use.

7. Transfer of Recycled Refrigerant

7.1 When external portable containers are used for transfer, the container must be evacuated to at least 635 mm (25 in Hg) below atmospheric pressure (vacuum) prior to transfer of the recycled refrigerant to the container. External portable containers must meet DOT and UL standards.

7.2 To prevent on-site overfilling when transferring to external containers, the safe filling level must be controlled by weight and

must not exceed 60% of the container gross weight rating.

8. Safety Note for HFC-134a

8.1 HFC-134a has been shown to be nonflammable at ambient temperature and atmospheric pressure. However, recent tests under controlled conditions have indicated that, at pressures above atmospheric and with air concentrations greater than 60% by volume, HFC-134a can form combustible mixtures. While it is recognized that an ignition source is also required for combustion to occur, the presence of combustible mixtures is a potentially dangerous situation and should be avoided.

8.2 Under NO CIRCUMSTANCE should any equipment be pressure tested or leak tested with air/HFC-134a mixtures. Do not use compressed air (shop air) for leak detection in HFC-134a systems.

9. Disposal of Empty/Near Empty Containers

9.1 Since all refrigerant may not have been removed from disposable refrigerant containers during normal system charging procedures, empty/near empty container contents should be recycled prior to disposal of the container.

9.2 Attach the container to the recycling unit and remove the remaining refrigerant. When the container has been reduced from a pressure to vacuum, the container valve can be closed and the container can be removed from the unit. The container should be marked "Empty", after which it is ready for disposal.

III. SAE J2099, issued December, 1991.

Standard of Purity for Recycled HFC-134a for Use in Mobile Air Conditioning Systems

Foreword

The purpose of this standard is to establish the minimum level of purity required for recycled HFC-134a removed from, and intended for reuse in, mobile air-conditioning systems.

1. Scope

This standard applies to HFC-134a refrigerant used to service motor vehicle passenger compartment air-conditioning systems designed or retrofitted to use HFC-134a. Hermetically sealed, refrigerated cargo systems are not covered by this standard.

2. References

2.1 Applicable Documents—The following publications form a part of this specification to the extent specified. The latest issue of SAE publications shall apply.

2.1.1 SAE publications—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J2210—HFC-134a Recycling Equipment for Mobile Air-Conditioning Systems.

SAE J2211—Recommended Service Procedure for the Containment of HFC-134a.

3. Purity Specification

The refrigerant referred to in this standard shall have been directly removed from, and intended to be returned to, a mobile air-conditioning system. Contaminants in this recycled refrigerant shall be limited to moisture, refrigerant system lubricant, and

noncondensable gases, which, when measured in the refrigerant liquid phase, shall not exceed the following levels:

3.1 Moisture—50 ppm by weight.

3.2 Lubricant—500 ppm by weight.

3.3 Noncondensable Gases (Air)—150 ppm by weight.

4. Requirements for Recycle Equipment Used in Direct Mobile Air-Conditioning Service Operations

4.1 Such equipment shall meet J2210, which covers additional moisture, acid, and filter requirements.

5. Purity of HFC-134a Supplied from Other Sources

The purity of HFC-134a refrigerant supplied in containers from other sources shall, for servicing mobile air-conditioning systems, meet the refrigerant manufacturer's specification for new HFC-134a intended for mobile air-conditioning system use.

6. Operation of the Recycle Equipment

Recycle equipment operation shall be in accord with SAE J2211.

Application

This Standard applies to HFC-134a refrigerant used to service motor vehicle passenger compartment air-conditioning systems designed or retrofitted to use HFC-134a. Hermetically sealed, refrigerated cargo systems are not covered by this standard.

Reference Section

SAE J2210—HFC-134a Recycling Equipment for Mobile Air-Conditioning Systems.

SAE J2211—Recommended Service Procedure for the Containment of HFC-134a.

9. Appendix D is added to Subpart B to read as follows:

Appendix D to Part 82, Subpart B—Standard for HFC-134a Recover-Only Equipment

SAE J2211, Recommended Service Procedure for Containment of HFC-134a, as set forth under Appendix C of this subpart, also applies to this Appendix D.

SAE J1732, issued December, 1994.

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

Foreword

Appendix C of this part established equipment specifications for on-site recovery and reuse of HFC-134a in air-conditioning systems. These specifications are for HFC-134a extraction only equipment that are intended to be used in conjunction with the on-site recycling equipment currently used at service facilities, or allow for off-site refrigerant reclamation.

1. Scope

a. The purpose of this standard is to provide equipment specification for only the recovery of HFC-134a refrigerant to be returned to a refrigerant reclamation facility that will process it to ARI Standard 700-93 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 refrigerant removed from a mobile air conditioning system with this equipment be directly returned to a mobile air-conditioning system.

b. This information applies to equipment used to service automobiles, light trucks, and other vehicles with similar HFC-134a air conditioning systems.

2. References

2.1 Applicable Documents—The following publications form a part of this specification to the extent specified.

2.1.1 SAE Publications—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J639—Vehicle Service Coupling.
SAE J2210—HFC-134a Recycling Equipment for Mobile Automotive Air Conditioning Systems.

SAE J2196—Service Hoses for Automotive Air-Conditioning.

SAE J2197—Service Hose Fittings for Automotive Air-Conditioning.

2.1.2 ARI Publication—Available from Air Conditioning and Refrigerant Institute, 1501 Wilson Blvd. Sixth Floor, Arlington, VA 22209.

ARI 700-93—Specifications for Fluorocarbon Refrigerants.

2.1.3 CGA Publications—Available from CGA, 1235 Jefferson Davis Highway, Arlington, VA 22202.

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

2.1.4 DOT Publications—Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

DOT Standard, 49 CFR 49 173.304 Shippers—General Requirements for Shipments and Packagings.

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

UL 1769—Cylinder Valves.

3. Specification and General Description

3.1 The equipment must be able to extract HFC-134a from a mobile air-conditioning system.

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

3.3 Equipment Certification—The equipment shall be certified by Underwriters Laboratories or an equivalent certifying laboratory to meet this standard.

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. The refrigerant from this equipment must be processed to ARI 700-93 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 material. Safety precautions or notices or 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 J1629, 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 air conditioning 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.

6. Functional Description

6.1 The equipment must be capable of ensuring removal of refrigerant from the system being serviced by reducing the system pressure to a minimum of 102 mm (4 in) of mercury below atmospheric pressure (*i.e.*, vacuum). To prevent system delayed outgassing, the unit must have a device that assures the refrigerant has been recovered from the air-conditioning 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 by processing 13.6 kg (30 lb) of the standard contaminated HFC-134a at an ambient of 21 °C (70 °F) before starting the test cycle. Sample amounts are not to exceed 1.13 kg (2.5 lb) with sample amounts to be repeated every 5 minutes. The test fixture shown in Figure 1 to Appendix A of this subpart shall be operated at 21 °C.

Contaminated HFC-134a samples shall be processed at ambient temperatures of 10 and 49 °C, without equipment shutting due to any safety devices employed in this equipment.

6.2.1 Contaminated HFC-134a sample
6.2.2 Standard contaminated HFC-134a refrigerant, 13.6 kg sample size, shall consist of liquid HFC-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 it contains

used HFC-134a refrigerant. It must be permanently marked on the outside surface in black print at least 20 mm high "DIRTY HFC-134a—DO NOT USE, MUST BE REPROCESSED".

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

6.3.3 During operation, the equipment shall provide overflow 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, 49 CFR 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 markings shall be in letters at least 6 mm high.

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

6.6 Service hoses must have shutoff devices located within 30 cm (12 in) 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.

6.7.1 The purpose of indicating the amount of lubricant removed is to ensure that a proper amount of new lubricant is returned to the mobile air conditioning system for compressor lubrication.

6.7.2 Refrigerant dissolved in this lubricant must be accounted for to prevent system lubricant overcharge of the mobile air-conditioning system.

6.8 The equipment must be capable of continuous operation in ambient temperatures of 10 °C to 49 °C and comply with sections 6.1 and 6.2.

7. For test validation, the equipment is to be operated according to the manufacturer's instructions.

Application

a. The purpose of this standard is to provide equipment specification for only the recovery of HFC-134a refrigerant to be returned to a refrigerant reclamation facility that will process it to ARI Standard 700-93 or allow for the 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 system with this equipment be directly returned to a mobile air-conditioning system.

b. This information applies to equipment used to service automobiles, light trucks, and other vehicles with similar HFC-134a air-conditioning systems.

Reference Section

SAE J639—Vehicle Service Coupling.
SAE J2210—HFC-134a Recycling Equipment for Mobile Automotive Air Conditioning Systems.
SAE J2196—Service Hoses for Automotive Air-Conditioning.
ARI 700-93—Specifications for Fluorocarbon Refrigerants.
CGA Pamphlet S-1.1—Pressure Relief Device Standard Part 1—Cylinders for Compressed Gases.
UL 1769—Cylinder Valves.
49 CFR 173.304—Shippers—General Requirements for Shipment and Packagings.

10. Appendix E is added to Subpart B to read as follows:

Appendix E to Part 82, Subpart B—The Standard for Automotive Refrigerant Recycling Equipment Intended for Use with both CFC-12 and HFC-134a

SAE J2211, Recommended Service Procedure for the Containment of HFC-134a, as set forth under Appendix C of this subpart, and SAE J1989, Recommended Service Procedure for the Containment of CFC-12, as set forth under Appendix A of this subpart, also apply to this Appendix E.
SAE J1770, issued December, 1995.

Automotive Refrigerant Recycle Equipment Intended for Use with Both CFC-12 and HFC-134a

Foreword

The purpose of this standard is to establish specific minimum equipment requirements for automotive refrigerant recycling equipment intended for use with both CFC-12 and HFC-134a in a common refrigerant circuit. Establishing such specifications will assure that this equipment does not cross contaminate refrigerant above specified limits when used under normal operating conditions.

1. Scope

The purpose of this standard is to establish the specific minimum equipment intended for use with both CFC-12 and HFC-134a in a common refrigerant circuit that has been directly removed from, and is intended for reuse in, mobile air-conditioning (A/C) systems. This standard does not apply to equipment used for CFC-12 and HFC-134a having a common enclosure with separate circuits for each refrigerant.

2. References

2.1 Applicable Documents—The following publications form a part of this specification to the extent specified. The latest issue of SAE publications shall apply.
2.1.1 SAE Publications—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.
SAE J2099—Standard of Purity for Recycled HFC-134a for Use in Mobile Air-Conditioning Systems.
SAE 1991—Standard of Purity for Use in Mobile Air-Conditioning Systems.
SAE J2196—Service Hoses for Automotive Air-Conditioning.
SAE J2197—Service Hose Fittings for Automotive Air-Conditioning.

SAE J2210—HFC-134a (R-134a) Recycling Equipment for Mobile A/C Systems.

SAE J1990—Extraction and Recycling Equipment for Mobile A/C Systems.
2.1.2 Compressed Gas Association (CGA) Publications—Available from CGA, 1235 Jefferson Davis Highway, Arlington, VA 22202.

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

2.1.3 DOT Publications—Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

2.1.4 UL Publications—Available from Underwriters Laboratories, 333 Pfingsten Road, Northbrook, IL 60062-2096.

UL 1769—Cylinder Valves.
UL 1963—Refrigerant Recovery/Recycling Equipment.

3. Specification and General Description

3.1 The equipment shall be suitable for use in an automotive service garage environment and be capable of continuous operation in ambients from 10 to 49 °C.

3.2 The equipment must be certified that it meets this specification by Underwriters Laboratories Inc. (UL), or by an equivalent Nationally Recognized Testing Laboratory (NRTL).

3.3 The equipment shall have a label which states "Design Certified by (Certifying Agent) to meet SAE J1770 for recycling CFC-12 and HFC-134a using common refrigerant circuits", in bold-type letters a minimum of 3 mm in height.

4. Equipment Requirements

4.1 General.

4.1.1 The equipment shall be capable of preventing cross contamination to the level required by Section 9.2.1.G before an operation involving a different refrigerant can begin. The equipment must prevent initiation of the recovery operation if the equipment is not set up properly.

4.1.2 If an operator action is required to clear the unit prior to reconnecting for a different refrigerant, the equipment shall be provided with a means which indicates which refrigerant was last processed.

4.1.3 Means shall be provided to prevent recovery from both an CFC-12 and HFC-134a mobile air conditioning system concurrently.

4.1.4 Transfer of recycled refrigerant—Recycled refrigerant for recharging and transfer shall be taken from the liquid phase only.

4.2 Seat Leakage Test.

4.2.1 Valves, including electrically operated solenoid valves, that are used to isolate CFC-12 and HFC-134a refrigerant circuits, shall have a seat leakage rate not exceeding 15 g/yr (½ oz/yr) before and after 100,000 cycles of operation. This Endurance Test shall be conducted with HFC-134a at maximum operating pressure as determined by sections 8.1 and 8.2. The Seat Leakage Test shall be performed at 1.5 times this pressure at an ambient of 24 °C.

4.3 Interlocks.

4.3.1 Electrical interlock devices used to prevent cross contamination of refrigerant shall be operated for 100,000 cycles and there

shall be no failure that would permit cross contamination of refrigerant. Solid state interlock devices shall comply with the Transient Overvoltage Test and the Fast Transient (Electric Noise) Test contained in the Standard for Tests for Safety Related Controls Employing Solid-State Devices, UL 991.

4.4 Noncondensable Gases

4.4.1 The equipment shall either automatically purge noncondensables (NCGs) if the acceptable level is exceeded or incorporate a device that indicates to the operator the NCG level has been exceeded. A pressure gauge used to indicate an NCG level shall be readable in 1 psig increments. NCG removal must be part of the normal operation of the equipment and instructions must be provided to enable the task to be accomplished within 30 minutes.

4.4.2 Refrigerant loss from noncondensable gas purging, oil removal, and refrigerant clearing shall not exceed more than 5 percent by weight of the total amount of refrigerant through the equipment as detailed in Sections 8.1, 8.2, and 9.2.

4.5 Filter.

4.5.1 A 15 micron filter, or other equivalent means, to remove particulates of 15 micrometers spherical diameter or greater shall be located before any manual electrically operated valves that may cause cross contamination.

4.6 Moisture and Acid.

4.6.1 The equipment shall incorporate a desiccant package that must be replaced before saturated with moisture, and whose acid capacity is at least 5% by weight of the dry desiccant.

4.6.2 The equipment shall be provided with a moisture detection means that will reliably indicate when moisture in the HFC-134a exceeds 50 ppm, or in the CFC-12 exceeds 15 ppm, and requires the filter/dryer replacement.

5. Operating Instructions

5.1 The equipment manufacturer must provide operating instructions, including proper attainment of vehicle system vacuum (i.e., when to stop the extraction process, and also to stop the extraction process if it is noticed that the A/C system being serviced has a leak), filter/desiccant replacement, and purging of noncondensable gases (air). The instructions shall indicate that the correct sequence of operation be followed so that the equipment can properly remove contaminants to the acceptable level. Also to be included are any other necessary maintenance procedures, source information for replacement parts and repair, and safety precautions.

5.2 The equipment must prominently display the manufacturer's name, address, the type of refrigerant (CFC-12 and HFC-134a), a service telephone number, and the part number for the replacement filter/dryer. Operation manuals must cover information for complete maintenance of the equipment to assure proper operation.

6. Safety Requirements

6.1 The equipment must comply with applicable federal, state, and local requirements on equipment related to handling CFC-12 and HFC-134a material.

Safety precautions or notices related to the safe operation of the equipment shall be prominently displayed on the equipment and should also state "CAUTION—SHOULD BE OPERATED BY QUALIFIED PERSONNEL".

6.2 HFC-134a has been shown to be nonflammable at ambient temperature and atmospheric pressure. The following statement shall be in the operating manual: "Caution: HFC-134a service equipment or vehicle A/C systems should not be pressure tested or leak tested with compressed air. Some mixtures of air and HFC-134a have been shown to be combustible at elevated pressures (when contained in a pipe or tank). These mixtures may potentially be dangerous, causing injury or property damage. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers."

7. Functional Description

7.1 General.

7.1.1 The equipment must be capable of ensuring recovery of the CFC-12 and HFC-134a from the system being serviced, by reducing the system to minimum of 102 mm of mercury below atmospheric pressure (*i.e.*, vacuum).

7.1.2 The equipment must be compatible with leak detection material that may be present in the mobile A/C system.

7.2 Shut Off Device.

7.2.1 To prevent overcharge, the equipment must be equipped to protect the tank used to store the recycled refrigerant with a shutoff device and a mechanical pressure relief valve.

7.3 Storage Tanks.

7.3.1 Portable refillable tanks or containers shall be supplied with this equipment and must be labeled "HFC-134a" or "CFC-12" as appropriate, meet applicable Department of Transportation (DOT) or NRTL's Standards and be adaptable to existing refrigerant service and charging equipment.

7.3.2 The cylinder valve shall comply with the Standard for Cylinder Valves, UL 1769.

7.3.3 The pressure relief device shall comply with the Pressure Relief Device Standard Part 1—Cylinders for Compressed Gases, CGA Pamphlet S-1.1.

7.3.4 The tank assembly shall be marked to indicate the first retest date, which shall be 5 years after the 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.

7.4 Overfill Protection.

7.4.1 During operation, the equipment must provide overfill protection to assure that during filling or transfer, the tank or storage container cannot exceed 80% of volume at 21.1 °C of its maximum rating as defined by DOT standards, 49 CFR 173.304 and American Society of Mechanical Engineers.

7.5 Hoses and Connections.

7.5.1 Separate inlet and outlet hoses with fittings and separate connections shall be provided for each refrigerant circuit.

7.5.2 All flexible hoses and fittings must meet SAE J2196 (for CFC-12) and SAE J2197 (for HFC-134a).

7.5.3 Service hoses must have shutoff devices located within 30 cm of the connection point to the system being serviced.

7.6 Lubricant Separation.

7.6.1 The equipment must be able to separate the lubricant from the removed refrigerant and accurately indicate the amount of lubricant removed during the process, in 30 ml (1 fl oz) units. Refrigerant dissolves in lubricant and, as a result, increases the volume of the recovered lubricant sample. This creates the illusion that more lubricant has been recovered than actually has been. The equipment lubricant measuring system must take into account such dissolved refrigerant removed from the A/C system being serviced to prevent overcharging the vehicle system with lubricant. (Note: Use only new lubricant to replace the amount removed during the recycling process. Used lubricant should be discarded per applicable federal, state and local requirements.)

7.6.2 The equipment must be provided with some means, such as a lockout device, which will prevent initiation of the recovery operation after switching to the other refrigerant, if the lubricant has not been drained from the oil separator.

8. Testing

8.0 Equipment shall be tested in sequence as noted in sections 8.1, 8.2 and 9.2. The filter/dryer may be replaced only as noted by section 4.6.2.

8.1 CFC-12 Recycling Cycle.

8.1.1 The maximum operating pressure of the equipment shall be determined when recycling CFC-12 while conducting the following tests. This pressure is needed for the Seat Leakage Test, Section 4.2.

8.1.2 The equipment must be preconditioned with 13.6 kg of the standard contaminated CFC-12 (see section 8.1.2a) at an ambient of 21 °C before starting the test cycle. Sample amounts shall be 1.13 kg with sample amounts to be repeated every 5 minutes. The sample method fixture, defined in Figure 1 to Appendix A of this subpart, shall be operated at 21 °C.

8.1.2a Standard contaminated CFC-12 refrigerant shall consist of liquid CFC-12 with 100 ppm (by weight) moisture at 21 °C and 45,000 ppm (by weight) mineral oil 525 suspension viscosity nominal and 770 ppm by weight of noncondensable gases (air).

8.1.3 The high moisture contaminated sample shall consist of CFC-12 vapor with 1000 ppm (by weight) moisture.

8.1.4 The high oil contaminated sample shall consist of CFC-12 with 200,000 ppm (by weight) mineral oil 525 suspension viscosity nominal.

8.1.5 After preconditioning as stated in section 8.1.2, the test cycle is started, processing the following contaminated samples through the equipment.

A. 13.6 kg (1.13 kg per batch) of standard contaminated CFC-12.

B. 1 kg of high oil contaminated CFC-12.

C. 4.5 kg (1.13 kg per batch) of standard contaminated CFC-12.

D. 1 kg of high moisture contaminated CFC-12.

8.1.6 The CFC-12 is to be cleaned to the minimum purity level, as defined in SAE

J1991, with the equipment operating in a stable ambient of 10, 21, and 49 °C and processing the samples as defined in section 8.1.5.

8.2 HFC-134a Recycling Cycle.

8.2.1 The maximum operating pressure of the equipment shall be determined when recycling HFC-134a while conducting the following tests. This pressure is needed for the Seat Leakage Test, Section 4.2.

8.2.2 The equipment must be preconditioned by processing 13.6 kg of the standard contaminated HFC-134a (see section 8.2.2a) at an ambient of 21 °C before starting the test cycle. 1.13 kg samples are to be processed at 5 minute intervals. The test fixture shown in Figure 1 to Appendix A of this subpart shall be operated at 21 °C.

8.2.2a The standard contaminated refrigerant shall consist of liquid HFC-134a with 1300 ppm (by weight) moisture (equivalent to saturation at 38 °[100 °F]), 45,000 ppm (by weight) HFC-134a compatible lubricant, and 1000 ppm (by weight) of noncondensable gases (air).

8.2.2b The HFC-134a compatible lubricant referred to in section 8.2.2a shall be a polyalkylene glycol based synthetic lubricant or equivalent, which shall contain no more than 1000 ppm by weight of moisture.

8.2.3 Following the preconditioning procedure per section 8.2.2, 18.2 kg of standard contaminated HFC-134a are to be processed by the equipment at each stable ambient temperature of 10, 21, and 49 °C.

8.2.4 The HFC-134a is to be cleaned to the purity level, as defined in SAE J2099.

9. Refrigerant Cross Contamination Test

9.1 General.

9.1.1 For test validation, the equipment is to be operated according to the manufacturer's instruction.

9.1.2 The equipment shall clean the contaminated CFC-12 refrigerant to the minimum purity level as defined in Appendix A of this subpart, when tested in accordance with the requirements in section 8.1.

9.1.3 The equipment shall clean the contaminated HFC-134a refrigerant to the purity level defined in Appendix C of this subpart, when tested in accordance with the requirements in section 8.2.

9.2 Test Cycle.

9.2.1 The following method shall be used after the tests and requirements in Sections 8.1 and 8.2, respectively, are completed. Following the manufacturer's instructions, the equipment shall be cleared of HFC-134a, prior to beginning step A. The only refrigerant used for this is noted in steps A, C, and E of this section 9.2.1. The test fixture shown in Figure 1 to Appendix A of this subpart shall be used and the test shall be conducted at 10, 21, and 49 °C ambients.

A. A 1.13 kg standard contaminated sample of CFC-12 (see section 8.1.2a) shall be processed by the equipment.

B. Follow manufacturer's instructions to clear the equipment of CFC-12 before processing HFC-134a.

C. Process a 1.13 kg, standard contaminated sample of HFC-134a (see section 8.2.2a) through the equipment.

D. Follow manufacturer's instructions to clear the equipment of HFC-134a before processing CFC-12.

E. Process a 1.13 kg standard contaminated sample of CFC-12 (see section 8.1.2a) through the equipment.

F. Follow manufacturer's instructions to clear the equipment of CFC-12.

G. The amount of cross contaminated refrigerant, as determined by gas chromatography, in samples processed during steps C and E, shall not exceed 0.5 percent by weight.

10. Sample Analysis

10.1 General.

10.1.1 The processed contaminated samples shall be analyzed according to the following procedure.

10.2 Quantitative Determination of Moisture.

10.2.1 The recycled liquid phase sample of refrigerant shall be analyzed for moisture content via Karl Fischer coulometer titration or an equivalent method. The Karl Fischer apparatus is an instrument for precise determination of small amounts of water dissolved in liquid and/or gas samples.

10.2.2 In conducting the test, a weighed sample of 30 to 130 g is vaporized directly into the Karl Fischer anolyte. A coulometer titration is conducted and the results are calculated and displayed as parts per million moisture (weight).

10.3 Determination of Percent Lubricant.

10.3.1 The amount of lubricant in the recycled sample of refrigerant/lubricant is to be determined by gravimetric analysis.

10.3.2 Following venting of noncondensable, in accordance with the manufacturer's operating instructions, the refrigerant container shall be shaken for 5 minutes prior to extracting samples for test.

10.3.3 A weighed sample of 175 to 225 g of liquid refrigerant/lubricant is allowed to evaporate at room temperature. The percent lubricant is to be calculated from the weight of the original sample and the residue remaining after the evaporation.

10.4 Noncondensable Gas.

10.4.1 The amount of noncondensable gas is to be determined by gas chromatography. A sample of vaporized refrigerant liquid shall be separated and analyzed by gas chromatography. A Propak Q column at 130°C and a hot wire detector may be used for analysis.

10.4.2 This test shall be conducted on liquid phase samples of recycled refrigerant taken from a full container as defined in section 7.4 within 30 minutes following the proper venting of noncondensable gases.

10.4.3 The samples shall be shaken for at least 15 minutes prior to testing while at a temperature of 24°C ± 2.8°C.

10.5 Refrigerant Cross Contamination.

10.5.1 The amount of cross contamination of CFC-12 in HFC-134a or HFC-134a in CFC-12 shall not exceed 0.5 percent by weight as determined by gas chromatography. A sample of vaporized refrigerant liquid shall be separated and analyzed by gas chromatography. A 1% SP-1000 on Carbo-pack B (60/80 mesh) column may be used for the analysis.

11. Appendix F is added to Subpart B to read as follows:

Appendix F to Part 82, Subpart B—Standard for Recover-only Equipment That Extracts Class I or Class II Refrigerants Other Than CFC-12

Foreword

These specifications are for extraction only equipment used to service FRIGC™ FR-12 or other class I or class II refrigerants other than CFC-12.

1. Scope

The purpose of this standard is to provide equipment specifications for the recovery of FRGC™ FR-12 or other class I or class II refrigerants other than CFC-12 which are either (1) to be returned to a refrigerant reclamation facility that will process the refrigerant to ARI Standard 700-93 or equivalent new product specifications at a minimum, or (2) to be recycled in other EPA approved recycling equipment (in the event that EPA in the future designates a standard for equipment capable of recycling FRGC™ FR-12 or other class I or class II refrigerant, as appropriate). It is not acceptable that the refrigerant removed from a mobile air conditioning system, with this equipment be directly returned to mobile air conditioning system. This standard applies to equipment used to service automobiles, light trucks, and other vehicles with similar air conditioning systems.

2. References

2.1 Applicable Documents—The following publications form a part of this specification to the extent specified. The latest issue of SAE publications shall apply.

2.1.1 SAE Publications—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J639—Vehicle Service Coupling.
SAE J2196—Service Hoses for Automotive Air-Conditioning (fittings modified).

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

ARI 700-93—Specifications for Fluorocarbon Refrigerants.

2.1.3 Compressed Gas Association (CGA) Publications—Available from CGA, 1235 Jefferson Davis Highway, Arlington, VA 22202.

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

2.1.4 DOT Publications—Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

DOT Standard, 49 CFR 173.304—Shippers—General Requirements for Shipments and Packagings.

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

UL 1769—Cylinder Valves.

UL 1963—Refrigerant Recovery Recycling Equipment.

3. Specifications and General Description

3.1 The equipment must be able to extract from a mobile air conditioning system FRIGC™ FR-12 or another class I or class II refrigerant other than CFC-12 to which the equipment is dedicated.

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

3.3 The equipment discharge or transfer fitting shall be unique to prevent the unintentional use of the extracted refrigerant for recharging auto air conditioners.

3.4 Equipment Certification—The equipment shall be certified by Underwriters Laboratories or and equivalent certifying laboratory to meet this standard.

3.5 Label Requirements—The equipment shall have a label "Designed Certified by (Company Name) to meet EPA requirements for use only with (the applicable refrigerant). The refrigerant from this equipment must be processed to ARI 700-93 specifications or equivalent new product specifications before reuse in a mobile air-conditioning system." 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 the applicable refrigerant material. Safety precautions or notices or 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 equivalent to that required by SAE J1629, 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 air conditioning 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.

6. Functional Description

6.1 The equipment must be capable of ensuring removal of refrigerant from the system being serviced by reducing the system pressure to a minimum of 102 mm (4 in) of mercury below atmospheric pressure (*i.e.*, to a vacuum). To prevent system delayed outgassing, the unit must have a device that assures that the refrigerant has been recovered from the air-conditioning 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 by processing 13.6 kg (30 lb) of the standard contaminated refrigerant at an ambient of 21 °C (70 °F) before starting the test cycle. Sample amounts are not to exceed 1.13 kg (2.5 lb) with sample amounts to be processed at 5 min intervals. The test method fixture, depicted in Figure 1 to Appendix A of this subpart, shall be operated at 21 °C (70 °F). Contaminated refrigerant samples shall be processed at ambient temperatures of 10 and 49 °C, without equipment shutting due to any safety devices employed in this equipment.

6.2.1 Standard contaminated refrigerant, 13.6 kg (30 lb) sample size, shall consist of liquid refrigerant with 1300 ppm (by weight) moisture at 21 °C and 45,000 ppm (by weight) of oil (mineral oil and POE) 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 colored (with the applicable ARI color code for the specific refrigerant) with a yellow top to identify that it contains used refrigerant. It must be permanently marked on the outside surface in black print at least 20 mm high "DIRTY [NAME OF REFRIGERANT]—DO NOT USE, MUST BE PROCESSED".

6.3.2 The portable refillable container shall have a unique thread connection for the specific refrigerant.

6.3.3 During operation, the equipment shall provide overflow 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, 49 CFR 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.

6.5 All flexible hoses must meet SAE J2196 for service hoses except that fittings shall be unique to the applicable refrigerant.

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 the recovered refrigerant and accurately indicate the amount removed from the simulated automotive system during processing in 30 ml units.

6.7.1 The purpose of indicating the amount of lubricant is to ensure that a proper amount of new lubricant is returned to the mobile air conditioning system for compressor lubrication.

6.7.2 Refrigerant dissolved in this lubricant must be accounted for to prevent system lubricant overcharge of the mobile air-conditioning system.

6.8 The equipment must be capable of continuous operation in temperatures of 10 to 49 °C and must comply with sections 6.1 and 6.2.

7. For test validation, the equipment is to be operated according to the manufacturer's instructions.

Application

The purpose of this standard is to provide equipment specifications for the recovery of any class I or class II refrigerant other than CFC-12 for return to a refrigerant reclamation facility that will process it to ARI Standard 700-93 (or for recycling in other EPA approved recycling equipment, in the event that EPA in the future designates a standard for equipment capable of recycling FRIGC™ FR-12 or other class I or class II refrigerant, as appropriate). It is not acceptable that the refrigerant removed from a mobile air-conditioning system with this equipment be directly returned to mobile air-conditioning system.

Reference Section

SAE J639—Vehicle Service Coupling.
SAE J2196—Service Hoses for Automotive Air-Conditioning.
ARI 700-93—Specifications for Fluorocarbon Refrigerants.
CGA Pamphlet S-1.1—Pressure Relief Device Standard Part 1—Cylinders for Compressed Gases.
UL 1769—Cylinder Valves.
49 CFR 173.304—Shippers—General Requirements for Shipment and Packagings.

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