

6) What are the steps to recover refrigerant?

Answer Key

Testname: AHAC8_SHORT14

1) Section 609 of the Act gives EPA the power to enforce the following requirements:

- Preventing the release or venting of CFC-12 or HFC-134a.
- Technicians are required to use approved equipment to recover and recycle CFC-12 and HFC 134a.
- Technicians who repair or service CFC-12 and HFC-134a systems must be trained and certified by an EPA-approved organization.
- Service shops must maintain records of refrigerant transfer and technician certification.
- Service shops must certify to EPA that they have and are properly using approved refrigerant recovery equipment.
- The sales of small cans of CFC-12 (R-12) can be made only to certified technicians.
- CFC-12 equipment can be permanently converted to HFC-134a, but must meet SAE standard J2210.
- CFC-12 systems can be retrofitted to use a SNAP refrigerant.
- EPA can assess civil penalties and fines for violations of these requirements.

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2) Recycled refrigerant must meet the same purity standards as new (virgin) refrigerant including:

- less than 15 ppm moisture
- less than 4000 ppm oil
- less than 330 ppm air

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3) To retrofit a system, perform the following steps:

Step 1- Visually inspect the system to ensure good condition, install a gauge set, and operate the system to bring it up to operating temperatures. Check for proper operation and note any needed repairs. record the high-side pressure for later comparison.

Step 2- Recover the R-12 from the system and remove as much oil-dissolved R-12 as possible.

Step 3- Make any repairs to the system to cure problems that were found in step 1.

Step 4- If the compressor failed, remove the failed compressor, flush the system and/or install a high-side filter, and install the replacement compressor along with a new accumulator or receiver– drier.

Step 5- Check the system to determine whether a high-pressure relief valve is used. if it has one, a high-pressure cutoff switch must be installed to stop the compressor before pressure relief valve release pressures occur. The switch is installed so it senses high-side pressure and is wired into the clutch wire or relay so it can interrupt clutch operation.

Step 6- If directed, replace the receiver–drier or accumulator.

Step 7- Replace any line-fitting O-rings on connections that were disturbed, or as directed.

Step 8- Replace any switches and valves as directed.

Step 9- Add the proper type and amount of oil—ester or PAG—into the compressor oil fill port or suction port. If the accumulator or receiver–driver is replaced, pour part of the oil into the inlet port.

Step 10- Install the R-134a service fittings. Any old Schrader valves that remain in service should be replaced with new R-134a valves.

Step 11- Fill out and install the identifying decal to properly identify the system. The old label must be rendered unreadable.

Step 12 -Connect a vacuum pump to the system and pull a minimum vacuum of 29 inch hg (500 microns) for at least 30 minutes to evacuate the system.

Step 13- Recharge the system using r-134a. Charge the system with 80% to 90% of the specified amount of R-12.

Step 14- Operate the system and check for proper operation, paying careful attention to the high-side pressure.

Step 15- Test for leaks.

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4) Noncondensable gas (NCG) is usually air.

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5) Many experts recommend using a vacuum gauge that measures the amount of air remaining in the system rather than just the vacuum.

- A micron is one millionth of a meter and there are about 760,000 microns of air at atmospheric pressure.
- The lower the pressure, the lower the number of microns of air.
- A vacuum reading of 29.72 inch hg. is about 5,000 microns.
- Many experts recommend that the micron level be 500 or less for best results.

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6) Step 1 - Identify the refrigerant in the system.

Step 2 - Make sure the hoses have the proper shutoff valves and are compatible with the refrigerant in the system.

Step 3 - Connect the recovery unit to the system or to the center hose of the manifold gauge set, following the directions of the manufacturer.

Step 4 - Open the required valves and turn the machine on to start the recovery process, following the directions of the machine's manufacturer.

Step 5 - Continue the recovery until the machine shuts off or the pressure reading has dropped into a vacuum.

Step 6 - Verify completion of recovery by shutting off all valves and watching the system pressure. If pressure rises above 0 PSI within 5 minutes, repeat steps 4 and 5 to recover the remaining refrigerant.

Step 7 - Drain, measure, and record the amount of oil removed from the system with the refrigerant and dispose of properly. this amount of new oil should be added during the recharging process.

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