



# CFC Update

The clock is ticking, and it's ticking a little bit faster every day. Time is running out on the production of chlorofluorocarbon (CFC) refrigerants. As we explained in our August CFC report, "Blue Green," the U.S. Government has signed an international agreement that calls for gradual reductions in CFC production and a complete end to all production by the year 2000. If that seems like a long way off, read on.

Recent scientific discoveries have shown that the ozone depletion caused by the release of CFCs into the atmosphere is even greater than was once believed. Rather than the year 2000, new international agreements may cause manufacturers to halt CFC production by 1997, or even as early as 1995. Now we're talking about three to five more years instead of eight. If I were an ozone molecule, I'd be thinking the sooner the better.

The clock is ticking on you, too. The United States is the world's largest consumer of CFCs, and the automotive manufacturing and repair industry has been identified as the largest single contributor to that consumption. A large percentage of that consumption has been caused by the previously routine practice of "venting" the R-12 contained in automotive A/C systems during routine maintenance and repair pro-

cedures. So you can see why it didn't take long before the government turned its attention to us.

It's going to take more than money if you want to keep buying and handling R-12. Government regulations now require a new certification if you want to continue to service and repair your customers' air conditioning systems. You will also be required to use specialized refrigerant recycling equipment to conserve the remaining supplies of R-12 and to limit the amount of ozone-damaging R-12 that escapes into the atmosphere.

## You And The Law

There's been a lot of confusion about the new regulations for refrigerant recycling equipment and technician certification. Congress passed the Clean Air Act Amendments of 1990, then turned the matter of technician certification over to the Environmental Protection Agency (EPA). The EPA went past the November 15, 1991 deadline without announcing their standards for technician certification, even though we were supposed to be certified by January 1, 1992. Leave it to our government to pass new regulations before figuring out how they were going to be administered and enforced.

The National Institute for Automotive Service Excellence (ASE), the Mobile Air Conditioning Society (MACS), and the International Mobile Air Conditioning Association (IMACA) have all worked with the EPA to develop the necessary standards for technician certification. Each of these organizations has also developed its own refrigerant recovery and recycling training and testing program. When our first report was written, MACS and IMACA were already administering their programs, pending EPA approval. ASE waited until November before proceeding without EPA approval of their mail-in training and testing program.

The EPA still hasn't officially recognized or approved any of the programs, although recognition for all three seems all but assured at this point. The January 1, 1992 certification deadline was never officially moved back, so if you haven't done anything about getting certified, it's time to get cracking. We'll briefly summarize the regulations and how they might apply to you and your shop:

**• If your shop serviced more than 100 A/C systems during 1990, you must now be certified and trained in the handling of air conditioning refrigerant, and in the proper use of refrigerant recovery and recycling equipment.**

At this point, the EPA has not begun enforcing the regulations. The latest information we have suggests that your jobber will require an identification number (indicating that you are certified) before he will be able to sell you R-12. After November 15, 1992, you will need this identification number to purchase R-12 in small one-pound containers.

Your jobber will also use the identification number system to track the amount of refrigerant he sells, when he sells it, and to whom. You should do the same. The EPA is preparing regulations that will require you to keep monthly records of R-12 usage in your shop. If R-12 is required during an A/C repair job, enter the customer's name, date, and amount of R-12 used in a ledger. Also note the amount of R-12 used on the repair order. Enforcement can begin at any time because the regulations are already on the books. I would hate to own the first shop the EPA decides to use as an example.

**• You must use approved refrigerant recycling equipment if you plan to continue working on automotive A/C systems. Approved refrigerant recycling equipment must meet or exceed standards established by the Society of Automotive Engineers (SAE).**

You don't have to read the SAE papers to determine whether the equipment you are considering meets the SAE standards. Equipment testing has been assigned to Underwriter's Laboratories (UL). All refrigerant equipment must meet the SAE standards to receive a UL seal of approval. Look for the words "UL Listed" or "Design Certified by Underwriters Laboratories" on the equipment. Equipment that is identified in this manner has met the SAE standards.

**• If your shop serviced fewer than 100 A/C systems during 1990 and you want to continue doing A/C repairs, you have until January 1, 1993 to certify and get your recycling equipment.** This one year deferral is not automatic. You must apply in writing to the EPA to receive it. Manufacturers of recycling equipment, regional EPA offices, MACS, or IMACA should be able to provide you with the necessary paperwork if you need to apply for a deferral.

**• State and local CFC regulations in some areas of the country may be even more stringent than those set down by the federal EPA.** If you have any questions about any special regulations in your area, check with your local government or EPA.

## Training and Testing

You're an A/C service technician and you want to keep servicing your customers' A/C systems. What do you do now? About 300,000 of your fellow technicians have asked the same question, so you aren't alone. MACS and IMACA continue to offer the training and testing options we discussed in our August report, and there are some new options we'll describe here.

As we mentioned, ASE began administering their testing program in November. If you are an ASE certified technician, you have probably received information from ASE on their mail-in program, "Refrigerant Recovery and Recycling Review and Quiz."

The ASE program includes a 10 page booklet and a 20 question quiz. It's an open book test that you can take at home. All of the information needed to correctly answer the quiz questions is contained in the booklet. A score of 17 or more correct answers is necessary to pass the quiz. The quiz must be returned to ASE for scoring, along with a \$12.00 fee. We mailed ours to ASE and received a special CFC Recovery and Recycling certificate within about a month.

The quiz includes several questions about CFCs and their effect on the environment, as well as questions regarding the correct handling of refrigerants and refrigerant recovery and recycling equipment. There are at least 12 different sets of test questions, so don't get any ideas about copying the answers from your buddy.

The structure of the quiz questions may remind you of an ASE certification test, which isn't surprising since ASE drew up the questions. The open book Refrigerant Recovery and Recycling quiz is not an additional ASE certification, however. And don't be surprised if some refrigerant recovery and recycling questions turn up on the next batch of ASE Heating and Air Conditioning certification tests.

Manufacturer sponsored training and pre-certification clinics are another option that is gaining in popularity. As we approach this year's A/C season, the thought of several hundred thousand technicians who need certification and recycling equipment must have set quite a few marketing men's minds in motion.

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We attended one such clinic sponsored by Everco Industries. The clinic was held at a local automotive parts jobber's warehouse and had over 60 attendees. The clinic fee included the cost of the ASE quiz. Other manufacturers of A/C parts and recycling equipment are also sponsoring CFC recycling pre-certification clinics and have aligned themselves with any of the three testing bodies.

Our Everco A/C training instructor took us through the material in the ASE test booklet and provided additional CFC-related information. About an hour into the clinic, we were ready to take the open book ASE quiz. Everco made sure the quizzes were mailed to ASE after we were finished.

Following the completion of the quiz, our instructor gave a more detailed demonstration of the recovery and recycling techniques we had just learned, using the equipment he had brought with him. The Everco equipment was available for sale or lease, but there was no "sign on the dotted line" pressure if you weren't ready to make up your mind on the spot.

Check with your local A/C parts jobber or A/C refrigerant recovery equipment supplier for information about sponsored clinics in your area.

## Your Choice

You will have to decide which training and testing option is right for you. If you already have recycling equipment and have a good understanding of the subject, a mail-in quiz may be the way to go. If you need more help with the material, try attending a clinic which provides instruction before the test. If you're in the market for recovery and recycling equipment, a manufacturer-sponsored clinic might be the way to go. You'll get your testing out of the way and have a chance to check out the recycling equipment, all at the same time.

For information about ASE's program, **Circle Number 211** on the reader service card. For information about MACS' program, **Circle Number 212**. For information about IMACA's program, **Circle Number 213**.

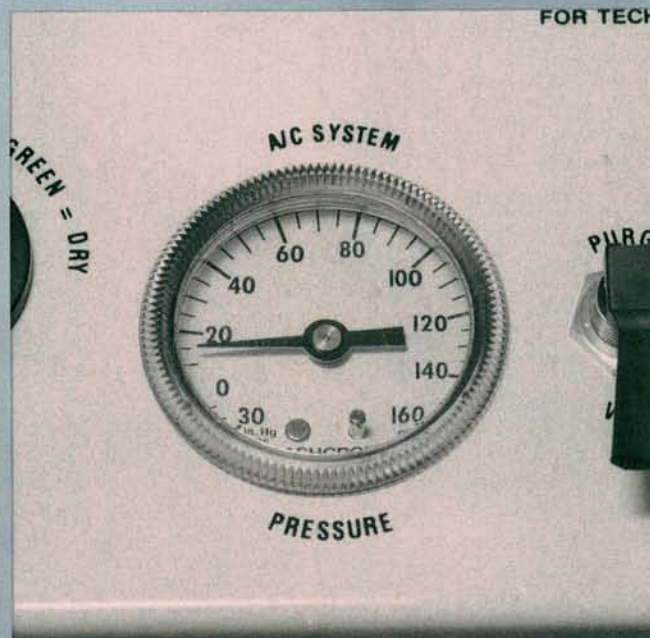
The photos on the last two pages of this article will take you through basic techniques needed when working with recovery and recycling equipment. Equipment from different manufacturers will require slightly different operating procedures, but the same basic safety procedures apply to all equipment. We thank Envirotech Systems for the loan of their refrigerant recycling system.

— By Karl Seyfert

## Refrigerant Handling Techniques

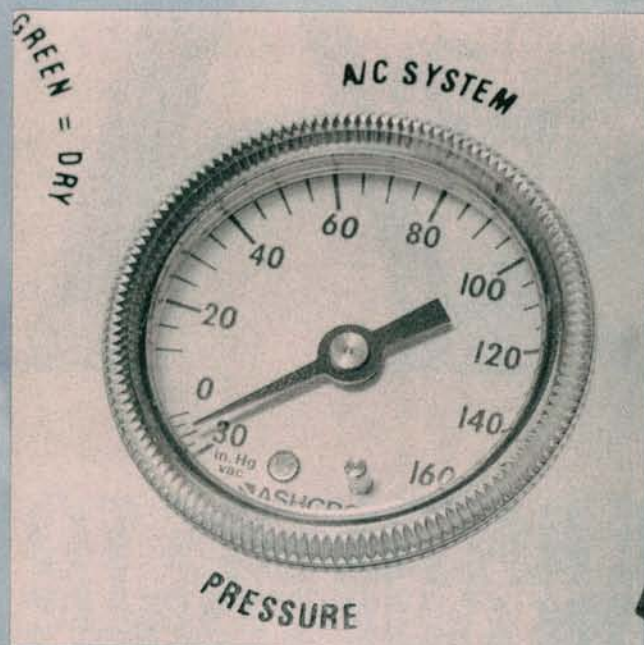


**1** Refrigerant recycling equipment must have shutoff valves within 12 inches of the ends of all service hoses. This cuts down on R-12 loss when connecting and disconnecting the equipment. These automatic hose shutoff valves close as soon as the hose is disconnected from the service fitting.

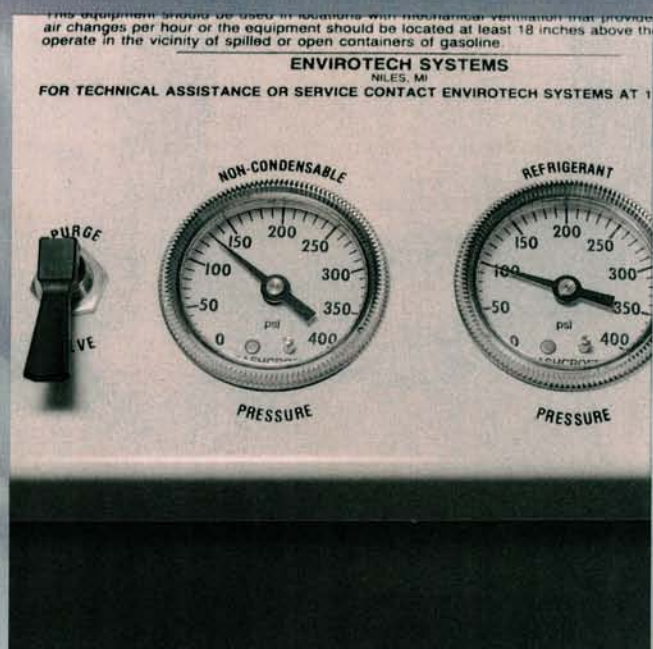


**2** Any refrigerant recovery/recycling equipment you consider should meet UL standards, so equipment from different manufacturers will work in pretty much the same manner. Wait at least five minutes after the machine finishes recycling. If there is still pressure in the system, run the machine through another cycle.

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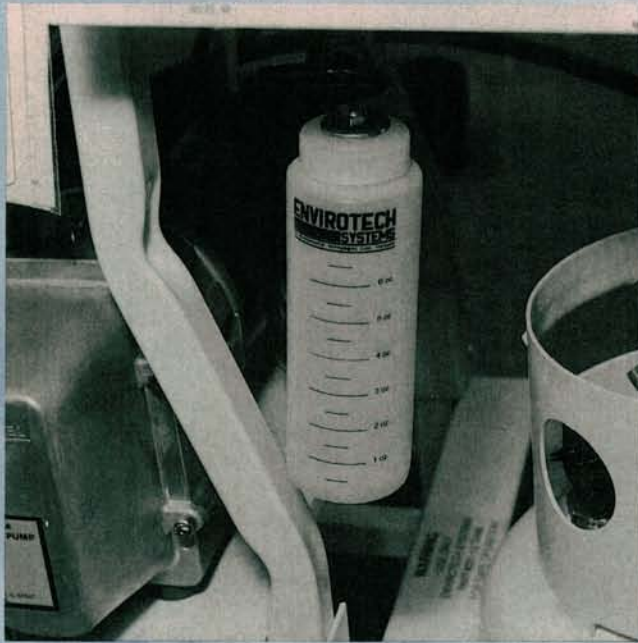


**3** We wait five minutes to detect any last gasps of refrigerant that might be hiding in the system. The recycling equipment's vacuum pump should draw the A/C system down to a vacuum. The system must hold a stable vacuum for at least two minutes. If it won't hold a vacuum, we know there's a leak somewhere.



**4** One of the byproducts of recycled refrigerant is noncondensable gas (air). A separate gauge on our equipment measures the pressure of this byproduct. After recycling, we follow the manufacturer's instructions and vent the noncondensable gas to lower its pressure to within 20 PSI of the stored refrigerant pressure.

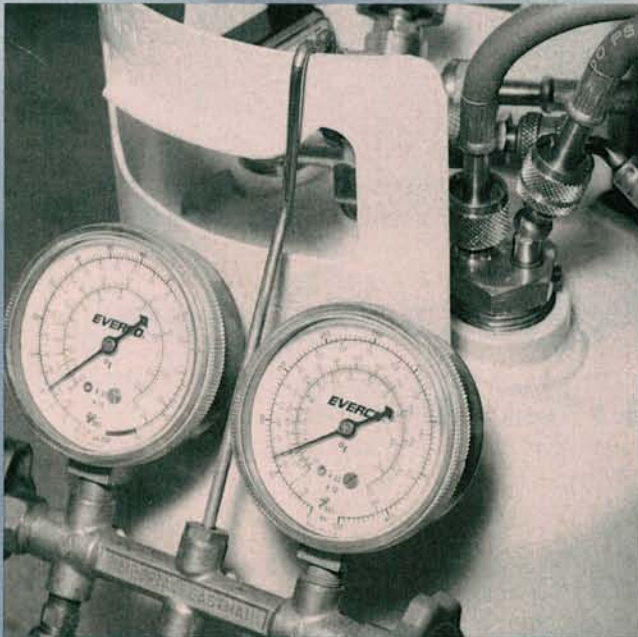
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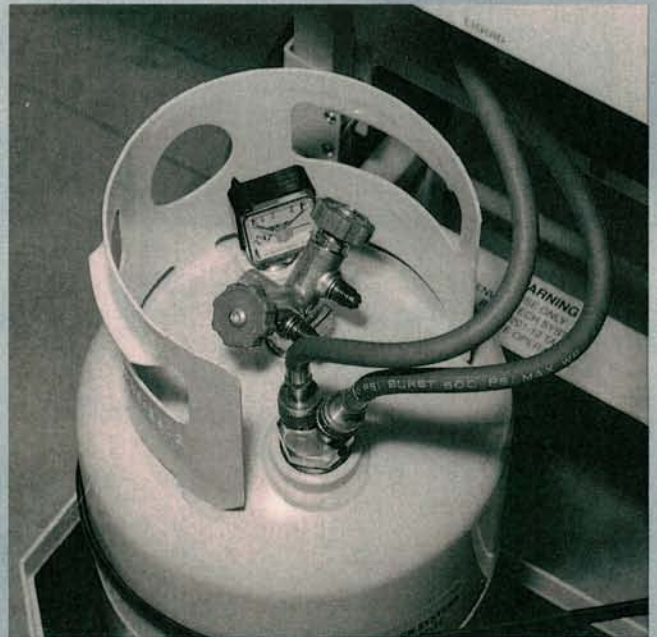
**5** A small amount of oil is pulled out of the car's A/C system during the refrigerant recycling process. Contaminants are also removed with the oil. A bottle on the side of the recycling equipment collects and measures the amount of oil removed so we know how much to add when the system is recharged.



**6** To check for excess noncondensable gas in recycled refrigerant that's stored in a portable container, place the container out of direct sunlight at a temperature of 65 degrees F or greater for at least 12 hours. Measure the temperature within four inches of the container using an accurate thermometer.



**7** Now measure the storage container pressure with an accurate pressure gauge (1 PSI divisions). Compare the pressure and temperature readings using the chart in the ASE booklet. If the pressure is below the allowed reading for the ambient temperature, the refrigerant is ready to use as is.

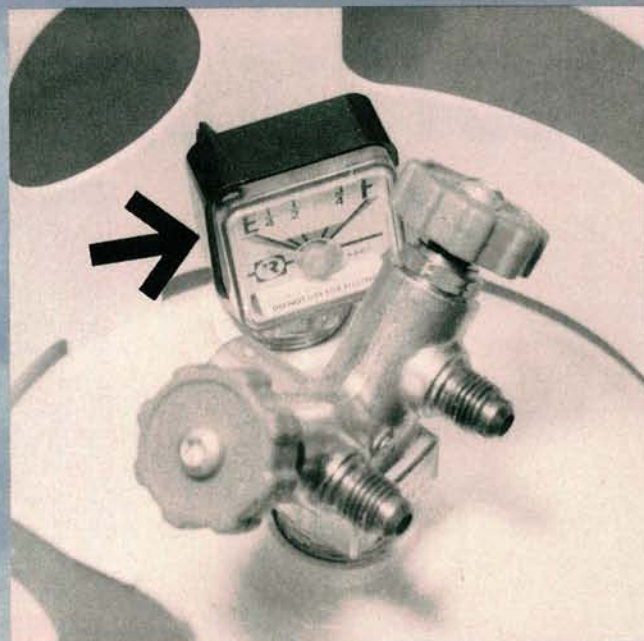


**8** If the refrigerant container pressure is over the allowable limit, slowly vent the vapor from the top of the container into the recycling equipment. Vent until the pressure falls below the limit. If the pressure can't be lowered within limits by venting, the entire contents of the container must be recycled.

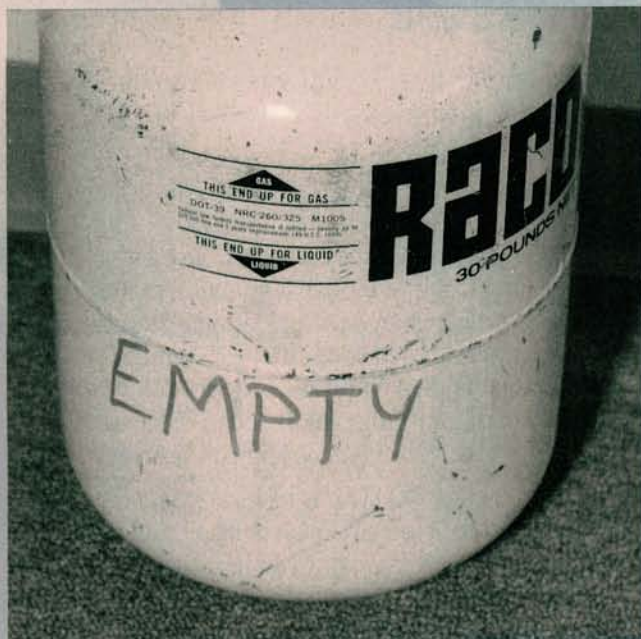
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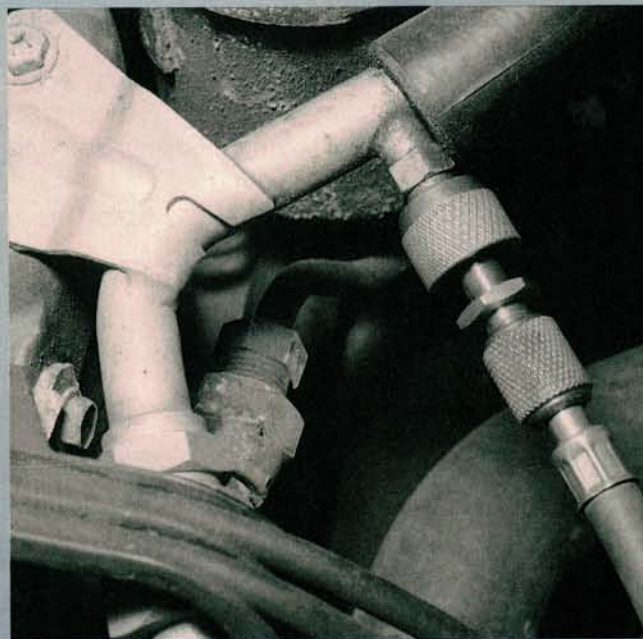
**9** Never store recycled refrigerant in a disposable container. The container must be marked DOT-4BA or DOT-4BW on the handle. These containers safely handle normal refrigerant expansion. Before adding refrigerant to the container, check it for noncondensable gases using the procedure we've described.



**10** Never fill a refrigerant container to more than 60 percent of its gross weight rating. This allows for normal expansion of the liquid refrigerant caused by heat. Some storage containers have an automatic valve (arrow) to prevent overfilling. If not, measure the container weight using a portable scale.



**11** Several pounds of refrigerant can cling inside a large disposable R-12 container, even though it seems to be empty. Evacuate this trapped refrigerant using your recycling equipment. Close the valve after the container reaches a vacuum. Label the container "EMPTY" and dispose of it properly.



**12** Disconnect the recycling equipment before charging the system, unless it's a recycling and recharging station. All your equipment must have shutoff valves within 12 inches of the hose ends. Use the recycling equipment to draw the trapped R-12 out of the manifold gauge set when you're finished.

## Blender Blues

Even if we recycle all the R-12 we can, mandatory reductions in the production of new R-12 would seem to make future shortages of R-12 inevitable. After all, the automakers are still producing new cars that use R-12 and there are still millions of used cars out there that use R-12. New cars using HFC-134a based A/C systems are now in production, but it will be many years before these cars represent a majority of the vehicle population.

Some enterprising manufacturers are attempting to capitalize on rising R-12 prices and anticipated shortages by offering "drop in" substitutes for R-12. These substitutes are typically blends of R-12 with other refrigerants. Adapters are also being marketed to allow the introduction of HFC-134a into systems originally designed for R-12. At this time, an acceptable substitute for R-12 has not been developed. No original equipment or aftermarket A/C system manufacturer has approved the use of substitute refrigerants in their systems.

Until a recommended and approved substitute for R-12 is found, stay clear of substitute refrigerants or refrigerant blends. Different refrigerants, as well as their lubricants and desiccants, are not compatible. Mixing refrigerants can cause A/C system performance problems or failures, and the mixture may also become flammable or combustible. If it's an R-12 system, recharge it with straight R-12.

Blended refrigerants can also damage recycling equipment which was designed to handle only R-12. If you aren't sure whether an A/C system may already contain a blend, don't hook up your recycling equipment. At this time, there are no field tests available to determine whether blended refrigerant has been added to the system.

Even if the refrigerant blend doesn't damage your recycling equipment, you'll still run the risk of damaging the A/C systems on other cars if the contaminated refrigerant is passed on to them through your recycling equipment. Servicing one system containing a blend could damage many others.