



# Blue Green

The necessity of saving our blue skies from the effects of ozone damage is about to start costing some additional green down here at ground zero. As we're all about to discover, saving the environment won't be cheap or easy.

But we're not here to discuss environmental issues. Unless you've been away from the planet for the past few years, you're already aware of the problems caused when we allow certain chemicals to damage the stratosphere.

We are here to discuss many of the hard business questions involved in the great chlorofluorocarbon debate. And believe us, it is a confusing and complicated matter at this point. Even tentative EPA standards for certification will not be finalized until later this year. EPA has until November 15, 1991 to finalize these standards. That would leave 45 days to certify all techs doing air conditioning before the January 1, 1992 deadline. We'll look at testing going on now to help us all avoid the last minute rush.

The equipment issue is also confusing, since so many units are available for you to look at before

making a decision to purchase. In this article, we will try to provide you with information about the changes coming in air conditioning service in the following three areas, and answer as many practical questions as possible:

- **Refrigerant**—Will traditional R-12 refrigerant be available—and if so—for how long? How much will it cost? Will it be taxed? Will supplies decrease?

- **The Law**—How will new clean air legislation affect the individual shop owner? Will certification be a "must" for anyone doing A/C service? What type of training will be needed for certification? How do I become a certified A/C technician?

- **Recycling Equipment**—What equipment is available? How much does it cost? Can you hope to have a good cash return on your investment? Is this equipment a "must" for certification? Are the systems expensive to maintain?



## The Law

If you're confused about the new law, the effects it will have on your business, and the steps you need to take to continue doing air conditioning repairs, you're not alone.

MACS (Mobile Air Conditioning Society), IMACA (International Mobile Air Conditioning Association) and ASE, are currently offering certification testing. Tentative standards have been set for certification, and while they're reasonably sure that the standards set by the tests will stand, final approval of these certification standards will not be made until some time in November.

There is one sure thing. After January 1, 1992, you will be required to use approved refrigerant recycling equipment, and also be properly trained and certified in its use. For those shops which serviced fewer than 100 systems in 1990, the deadline is January 1, 1993.

Basically, the new law states:

- **You must use approved refrigerant equipment in order to work on A/C systems.** The Clean Air Act defines approved refrigerant equipment as "equipment that meets standards at least as stringent as those set by SAE Section J1990." You don't need to read Section J1990. Simply remember that recovery and recycling equipment can be UL certified only if it meets the requirements of J1990.

UL listed equipment should be labeled "Design Certified by Underwriters Laboratories, Inc."

- **You must be certified and trained in the handling of air conditioning refrigerant, and in the proper use of refrigerant recovery and recycling equipment in order to perform A/C service.**

In some cases, state and local governments have already passed laws of their own regarding the use of automotive refrigerants. It's possible that local legislation already requires you to meet certain standards, and some of these requirements may be even more demanding than those set by the EPA.

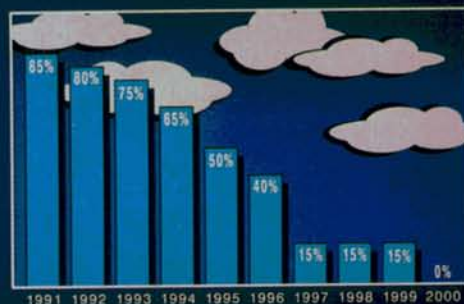
Wisconsin, for instance, is requiring "hands on" mastery of this equipment for certification. And in 1993, the state of Florida will require that in addition to preliminary certification, all techs performing A/C maintenance and repair must also have ASE certification in Heating and Air Conditioning.

Check with your local EPA or state government if you're not sure about current legislation in your area.

## Refrigerant Supplies

If you think you can go on with business as usual when it comes to A/C work, the marketplace is about to screw up your plans. Ozone depleting refrigerants are about to follow the Studebaker and the dodo bird into extinction. There won't be any more—none—after a gradual reduction in refrigerant production. By the year 2000, CFCs will no longer be produced.

CLEAN AIR ACT CFC PHASEOUT SCHEDULE  
(Based on percentage of 1986 levels)



While the maximum allowable production of these refrigerants will decrease, there's no guarantee that manufacturers will produce to maximum allowable levels in the meantime. In other words, there may be even less new refrigerant produced than the law allows. Unfortunately, new ozone-safe substitutes for R-12 will not work in the air conditioning systems now used in cars. New systems are being designed to use the new refrigerants.

The incompatibility problem goes even further. As of now, the new ozone safe R-134a is not only incompatible with conventional systems, it is incompatible with R-12. Apparently, the proposed lubricants for use in R-134a systems won't cohabitate with mineral based lubricants used in R-12 systems. Alternative solutions are being studied, but for now, forget R-134a for use in anything but the newly designed systems coming (hopefully) in 1993 new cars.

RIISING CFC TAXES PER POUND



Now throw in the escalating tax rates for refrigerants. As supplies of virgin material decrease, taxes on supplies will increase. Effective January 1, 1990, the U.S. government imposed a tax of \$1.37 per pound through 1991. In 1992 the tax goes up again to \$1.62 per pound, and in 1993, there will be a \$2.65 tax figured into the cost of every pound of refrigerant. After that the per pound tax will go up an additional 45 cents per year.



# Blue Green

It seems safe to say that restricted supply and added taxes will make R-12 tough to get and increasingly expensive as time passes. This brings us to recycling equipment.

## Clean It and Reuse It

For the moment, forget about the fact that the law forces you to purchase approved equipment to do A/C repair and maintenance. Forget about feeling trapped into buying expensive equipment by the new law. Instead, let's look at the economics involved. After all, you're still a businessman looking for a profit.

Let's answer a few simple questions.

### Will recycled refrigerant perform like new?

Based on data collected by an EPA/MACS field study, SAE created a series of specifications for containment of refrigerant, proper service procedures, and purity of the recycled refrigerant.

These specifications limit the amount of moisture, refrigerant oil, and noncompressible gases allowed in recycled refrigerant.

Larry Turay of Everco has done extensive work in the field and he hasn't found any problems with performance or compatibility when recycled material is used—either alone, or with new material. Currently, about 60 percent of all refrigerant used at Everco's training facility is recycled.

Many car makers are endorsing the use of recycled refrigerant for warranty repairs.

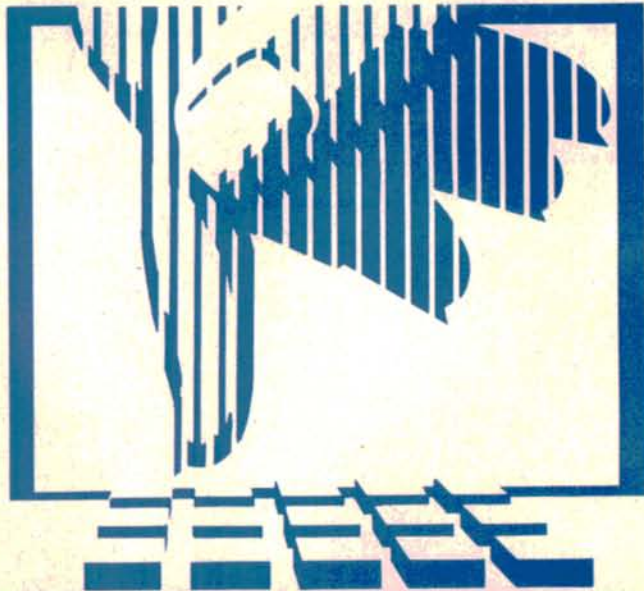
### How much will used refrigerant be worth?



No one knows for sure where the price of refrigerant will end up. But there are some general clues. We've already pointed out the decreasing supply and increased taxes on every pound. And once supplies of virgin refrigerant are gone—they're gone forever.

Some estimate that the supply of refrigerant will fall behind demand as early as 1996, even with everyone doing their best to save and recycle as much used refrigerant as possible. Another indication that refrigerant prices could very well skyrocket.

This makes recycled refrigerant very appealing, since there is no tax on recycled material. Each system recharge using recycled material will save you about five bucks a pound in taxes alone by the year 1999.



## CALCULATING REFRIGERANT COST PER WEEK FOR AIR CONDITIONING SERVICE

A. Average # of vehicles serviced per week:	20	30	40
B. Average lbs. of refrigerant per vehicle:	3	3	3
C. Average total refrigerant used per week: (A x B)	60	90	120
D. Average cost of refrigerant per pound:	5.00/lb	5.00/lb	5.00/lb
E. Total cost of new refrigerant per week: (C x D)	\$300	\$450	\$600

## CALCULATING COST SAVINGS WHEN RECOVERING/RECYCLING REFRIGERANT

F. Average amount of refrigerant recoverable: (Studies estimate that approximately 50% of a vehicle's charge is recoverable)	30	45	60
G. Average cost of refrigerant per pound:	5.00/lb	5.00/lb	5.00/lb
H. Savings on new refrigerant per week: (F x G)	\$150	\$225	\$300
I. Savings for 13 week a/c season: (H x 13)	\$1950	\$2925	\$3900
J. Savings for year round a/c service: (H x 52)	\$7800	\$11,700	\$15,600

## CALCULATING EQUIPMENT PAYBACK PERIOD

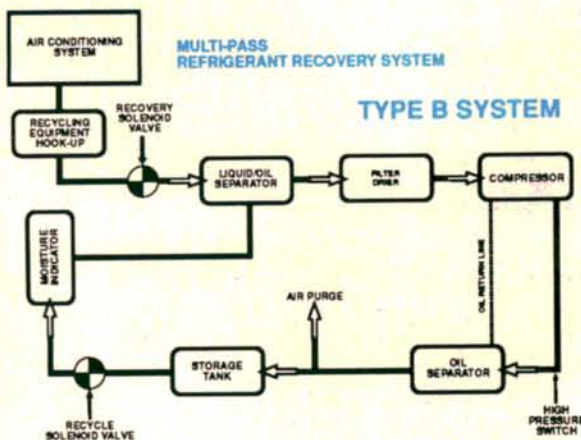
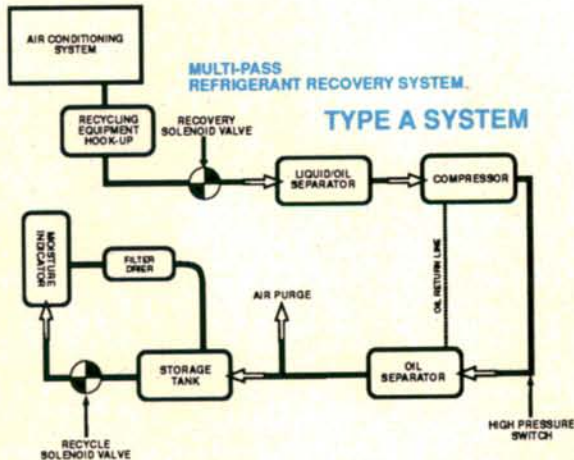
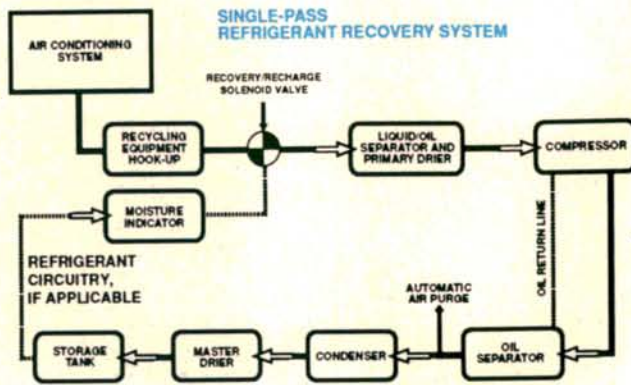
K. Average cost of system:	\$3000	\$3000	\$3000
L. Savings on new refrigerant per week: (Refer to H above)	\$150	\$225	\$300
M. Payback period in weeks: (K÷L)	20	13.33	10



## Types of Recovery and Recycling Systems

While each manufacturer will have his own specific approach to recycling equipment design, let's simplify things by saying that there will be two basic designs for these machines:

- Single Pass
- Continuous Loop



Charts provided courtesy of MACS.

The basic concept behind a single pass system is as follows:

- Refrigerant is removed from the vehicle.
- The used refrigerant passes through a separation chamber and filters which remove oil and particles.
- Then the refrigerant goes through a drier to remove moisture.
- Cleaned refrigerant is stored in a tank until it's needed for a recharge.
- A moisture indicator light tells you whether or not the refrigerant is moisture free. (Some single pass units allow you to add virgin material to the system if there isn't enough recycled refrigerant in the storage tank.)

Multi-pass systems work a little differently:

- Refrigerant is drawn from the vehicle.
- The used refrigerant passes through an oil separator and a drier to remove oil and moisture.
- This refrigerant is then stored in a tank.
- Unlike the single pass units, the multi-pass (or continuous pass if you prefer) system runs the refrigerant through the filtering process several times. Once again, an indicator informs you that the recycled refrigerant is ready for use in the vehicle's A/C system.

## Choosing a Machine

Be picky about the quality of the machine you select, and the features included. Some equipment may come complete with a charging station. If you already have a quality charging station, then all you need is the recycling machine. Then you can use recycled refrigerant or virgin material as needed in your old charging station.

Ask for information about efficiency ratings of recycling machines. These may vary. Since captured air must be removed from the recycler by venting, the efficiency of the vent mechanism is important.

Look at the internal construction of the equipment. Systems plumbed with rubber hose will lose more refrigerant than systems plumbed with solid pipe.

Some equipment will clean refrigerant using filters only, while others will offer a distiller to separate out particulates and moisture, extending filter life.

A caution here: If you run into a situation where you are recovering more refrigerant than you're using for repairs, DO NOT use old refrigerant tanks as storage tanks, or any other non-approved tanks for that matter. DOT approved storage tanks are available from several manufacturers.

It's also important to have accurate weighing equipment for storage tanks. Even approved tanks cannot be filled completely. Without room for expansion, the refrigerant can expand at higher temperatures. When the expanding refrigerant runs out of room, it can blow the tank to shreds. Ask questions about weighing equipment, how it works, and how to have it checked for calibration on a regular basis.

— By Marla Schleider and Becky Bilinovich