The Downs and Ups of the Aftermarket Airconditioning Industry

The size of the Australian and New Zealand aftermarket airconditioning industry is shrinking as more new cars are delivered to their owners already fitted with factory systems.

VASA president Mark Mitchell who has just completed an investigation into the future of aftermarket for his November appearance at IMACA, said that the one saving grace for VASA members was the trend by some motor dealers to fit non-genuine air in their own pre-delivery department so that they can maintain a price advantage against opposition cars.

"The thing that hit me in America was that factory air is now fitted to 98% of all cars sold in America", said Mark. "Based on Australian car sales statistics we have to be prepared for the fact that while the size of our aftermarket may indeed shrink to 2%, it will be difficult to assume we can hang on to 10% of the market forever."
extent have to be re-educated towards regular AC servicing, which particularly hits home when the first major AC breakdown occurs.

Customers are demanding longer warranties on new systems and AC repairs. Some major motor insurers are giving 'lifetime' warranty on smash repairs.

Longer warranties have hit every industry. Just about any consumer item you buy now has a three year warranty. This is not necessarily a bad thing, but it does affect the AC repairer. It's very difficult these days to explain to the customer that a repair on one section of the AC system does not mean the warranty on repairs will cover all the system components. For instance the increasing problems with 'thin wall' evaps and condensers is one area that is very hard to explain to the customer. You know what's involved in replacing a leaking condenser, then three months later a leak develops in the evaporator. Most AC specialists are finding this situation increasingly difficult to explain.

In metropolitan areas the older vehicles (1982-1995) which still provide the highest service and repair revenue are migrating to the suburbs.

Many traditional AC specialists have businesses established in central business districts or industrial areas where these older vehicles have literally left and have been replaced by new and late model vehicles usually still under warranty.

The older vehicles can be found in the suburbs and repairers are faced with the decision of implementing marketing strategies to entice these vehicles into the shop or alternatively relocate or add a mobile service vehicle to the operation.

Service shops have not been able to pass on to the customer the cost of equipment purchased for the transition out of R12. Our industry has borne the cost of equipment upgrade during this period and while the returns on servicing are a little better than they were with R12, they have not been sufficient to cover all the costs associated with this equipment purchase, not to mention the ongoing maintenance and upgrade of this equipment.

Any service shop undertaking insurance work has been forced to go mobile.

Higher service demands in the insurance and smash repair industry have resulted in nearly all AC smash repair work carried out on the smash repairer's premises. Any AC specialist workshop without a mobile service unit can virtually forget about doing insurance work.

Insurance company 'superstores' remain a threat in the future.

Long term, there remains a threat of insurance companies operating their own workshops. Some which are trialling this practice in Australia at the moment, are basing their sales philosophy on "everything under the one roof".

Time will tell whether the idea continues.

The incidence of refrigerant leakage has decreased.

Many in the industry are right in saying that 134a systems with barrier hose, bubble crimp fittings and better seals have contributed to a significant decrease in refrigerant leaking, but also R12 systems improved greatly in this area before the phase out.

**UPSIDES**

**The technology explosion is increasing opportunities for smart technicians and workshops.**

Technology has crept into every aspect of the modern AC system from the design of heat exchangers and compressors, materials used in hoses and seals, ATC units, electronics and engine management controls down to the simple processes of flushing and lubricant choices.

In the R12 days, this level of technology just did not exist but now the AC specialist is delivering a huge amount of technology to the customer even in a simple repair job.

The smart technicians are keeping abreast of all this, keeping themselves well trained and more importantly presenting themselves professionally in such a way that the customer knows all this technology is going on in the car and the customer has actually brought the vehicle to someone who really knows his trade.

We are finding customers enjoy being part of all this and at the workshop floor there is simply so much more to sell the customer than in the past. And of course the amateur service operators are very frightened by all this and are simply running away.

Healthy fusion has occurred between tradesmanship in auto electrical and airconditioning workshops.

The work cross-over in these two trades has created a healthy fusion in skills.

Airconditioning technicians have become better electricians and vice versa, resulting in more service and repair opportunities in each individual workshop. This will only expand in the future.

**Opportunities in retrofitting R12 fleet.**

This should provide a constant stream of service opportunity until 2001, maybe 4 to 4.5 million vehicles in Australia.

*Continued next page...*
Insurance companies have adopted mono-
refrigerant policy and are leaning towards
quality service and repairs.

This has occurred through the efforts of
VASA and others to
show to the industry the
complications from mul-
tiple refrigerants in the
market place. As a result
of this and fears of poor
workmanship, the insur-
ance companies have
also insisted this retro-
fitting work be carried
out by a specialist. This
has tended to break the
‘cheapest quote’ ethic
from these companies.
However we are still
concerned ‘cheap’
mobiles are still in the
market place doing 10
minute evacuations and
VASA has more work
and education to do in
this area.

Wider choice of com-
petitively priced parts
available to the after-
market.

This has only occurred
in Australia and NZ in the
last four years. Up until
then the aftermarket in
particular tended to pay
a lot more for parts both
genuine and non-gen-
uine.

Market forces and better
accessibility to a wider
range of non-genuine
parts has improved the
competitiveness of these
parts for independent
specialists.

Five to 15-year-old
vehicles are relying on
AC specialists and
other independents for
service and repairs.
(these vehicles have
received minimal
maintenance and ‘no
sympathy’ out of war-
ranty)

The customer is coming
out of the warranty peri-
od and moving to an
independent specialist
for major service and
repairs. This is particu-
larly evident if a repeat
of a previous warranty
fault has occurred. Also
minimum to no AC main-
tenance is carried out
during the warranty
and the early post warranty
period. The result of
course is a repair to the
AC system.

Stronger business
opportunities now
exist for ‘quality’
mobile service opera-
tors.

Mobile servicing is now
an accepted practice in
our industry. Many of
the larger and established
workshops have put on
mobile units to retain
insurance work and to
recapture some of the
older vehicle business.
These vehicles have
migrated to suburbs and
have owners who are
convenience conscious.
Mobile servicing is a
preference for them.
Also this has demanded
an improvement in ser-
vie quality and in our
industry the operators
have really lifted their
game.

Higher incidence of
multiple repair to vehi-
cles five to eight years
old. i.e. more than one
major component
requires replacing.

This trend has continued
over the last five years
and showing no signs of
decreasing. The busi-
ness opportunities are
obvious in that the repair
bills are higher in line
with higher profit on
these repairs. Typically,
these repairs are com-
pressor replacements
with an evaporator or
condenser replacement
or followed by hoses and
control valves.

Multiple component
replacement repairs
will promote ‘pull out’
or ‘service kits’.

With a vehicle requiring
multiple repairs, it is
often more economical
to replace all the major
components. Many AC
specialists are now
keeping ‘pull out’ kits on
the shelf. That is virtually
a complete system with-
out all the expensive
minor items such as
wiring harness, AC
switch, saddles and
grommets. This way an
economical job can be
done for the customer
and the repairer can
deliver a much better
warranty. This type of
repair is a definite
growth area.

<table>
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<th>IMACA VISIT</th>
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<td>VASA president Mark Mitchell addressed an audience of more than 500 of the top echelon of the world’s automobile airconditioning industry at the IMACA convention at Fort Worth, Texas in November. Not counting appearances at previous IMACA and MACS conventions by individual VASA members, this represented the first presidential paper delivered outside Australia by VASA.</td>
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The convention theme was the first 50 years of aftermarket airconditioning in the USA. With more than 116 exhibitors from seven countries the trade show was the largest event of its kind.

Mark Mitchell’s visit was hosted by IMACA director Frank Allison who was international guest speaker at VASA’s Gold Coast convention in 1997.

“...Continued from Page 2
The VASA convention in 1999 is likely to begin with what Mark Twain once called, "a good walk spoiled" — golf to the uninitiated.

Convention chairman John Blanchard reminded Hot Air that the only other convention in VASA’s history which included golf was the 1995 convention held at St Kilda beach.

On that occasion the golf tournament was the finale to the convention and it was held on Sunday morning after the annual dinner.

In August 1999 the convention committee are looking at starting the program on the Friday with a golf tournament at which the trophies which may become perpetual will be presented as part of the annual dinner on the Saturday night.

The golf course has not yet been selected but John Blanchard would like any feedback from golfing members on this idea.

The Melbourne convention will be held from August 27 - 29 next year at the Hilton on the Park.

This hotel has one of the most unique positions in Melbourne next to beautiful Fitzroy Gardens.

## RTP Update
### Refrigerants Keep Coming Back To Haunt Us

_JUST when you thought it was safe to stop promoting the "mono-refrigerant" policy, a new wave of problems emerge._

In the last few months training coordinator Grant Hand has been swamped with questions regarding alternative refrigerants and oils.

The Registered Technicians Program Bulletin # 4, the last to be distributed, was dedicated to refrigerants and refrigerant oils.

"It is not until technicians start having warranty claims rejected that it starts to hit home that perhaps products are not all that they seem," says Grant.

Normally the RTP will include a bulletin from each main section of the folder – Refrigeration and Electrical, but for the period of October 98 to January 99 the bias will be specifically to retrofitting.

A number of new issues are impacting on the content of the bulletins. For example there is a push for several new refrigerants onto the market and a renewed campaign for some old ones. As has previously been the case they are marketed with "selective information" both technical and environmental.

VASA strongly recommends that if you do not normally sight the RTP Bulletins (ie you have one or more technicians enrolled but not yourself) that you obtain and read this Bulletin. A majority of the ‘run of the mill’ issues regarding alternatives (ie legislation, safety concern etc) have not been addressed – hopefully we are all aware of them by now. The bias of the article is specifically technical with a long hard look at the real issues at hand in this area.

There are several real problems that have not been given enough thought in the whole retrofit scene.

Firstly technicians and business operators perceived that if at the completion of a retrofit the air gets cold and the compressor does not fail in the first 10 minutes, then it has been a ‘successful retrofit’ with no further concerns. Unfortunately, somehow, long term reliability (and in some cases short term reliability) has been forgotten about in the chase for the cheap retrofit. We are not saying every retrofit has to cost $900 but there remains real concerns in ultra cheap retrofits especially when alternatives are used.

Secondly we, as the professionals of the industry, are going to be ‘landed’ with problem jobs as a result of the ultra cheap retrofit and the use of alternatives and we need to be fully armed with technical knowledge regarding the various aspects of oils and alternatives.

Thirdly, and probably most importantly, we need to sell professional retrofits and be able to speak with confidence to convince customers of the need for professional services even though from a dollar perspective it may be slightly dearer, having said that a ‘baseline retrofit’ that does not require flushing and minimal component change is often cheaper on R134a with no reliability concerns. In many cases it is nothing short of bewilderment as to why an alternative would be used in the first place.

As mentioned in the RTP addressing oils there is mention of some new silicon and hydrocarbon based oils on the market. Unfortunately until further test data on reliability is available we are not able to report from a technical perspective on their place in the automotive airconditioning industry. In fairness however it must be mentioned that test data from the commercial/industrial airconditioning industry testing bodies is encouraging as is the performance in some automotive compressors that are notoriously prone to failure.

*Continued next page...*
At least from reading RTP 4 you will be fully aware of the issues at hand in both oil and refrigerant selection. Bulletin 5 will address the remaining technical issues centering around retrofitting namely that of flushing (procedures, necessity, or lack of necessity, and flushing agents). Many of us would be horrified to know what flushing agents are being used. We will also briefly look at correct servicing procedures and from the electrical front, plan to present you with the switching and wiring circuits for the EF/EL Falcons for which we have had numerous requests.

"Once again, sincere thanks to those who participate in this program particularly those who return questionnaires and strive to be truly the professionals of the industry," added Grant.

With the increase of VASA publications during 1998 here's a timely reminder to members on how to make the most of your membership and how to determine "who does what".

There are three main centres of operation for VASA.

1. VASA Secretariat
This office operates out of Melbourne Auto Air and it is where you find the VASA secretary/treasurer John Blanchard. All official communications to VASA regarding your membership must go to the Secretariat. This office handles your annual membership renewal, all of VASA's money, all legal matters and anything to do with VASA company returns. This office also handles member complaints, disputes and any questions arising from breaches of VASA's policies.

2. VASA Corporate Affairs and President
In Southport, Queensland, VASA president Mark Mitchell manages the national affairs of VASA from his SuperCool office. In the same complex of buildings is the office of Newton's, the consultancy where VASA's corporate affairs are managed. Newton's publish Hot Air and they are also responsible for VASA's publications as well as all submissions to government, OEMs and media. This alliance between president and the corporate affairs consultant saves VASA considerable time, money and energy, especially when crisis issues emerge.

All VASA publications emanate from this office so members who are looking for copies of the service centre directory, repair manual, flushing procedures, or "Which Gas" brochure should make contact with this office. Contacts are on the back page of Hot Air.

3. VASA Training
All VASA training programs are managed out of the Adelaide headquarters of training coordinator Grant Hand. This is where the registered technician program bulletins are posted from and all questionnaires for the RTP must be returned to this address. (Please note that for convenience, Grant has offered to circulate to all members who were not able to attend the Adelaide convention, 100 copies of the new "Which Gas" brochure. This allocation to each member will be sent out in two lots of 50 over the next two training bulletins. If you want more of these brochures, they are readily available from stock for a small charge of $50 per 100. Stocks of brochures are held at corporate affairs, the secretariat and the training coordinator, so simply approach the office closest to you.)
Evidence Mounts For 134a As Gas Of Choice

Evidence continues to pour in supporting R134a as the safest refrigerant gas for automotive airconditioning.

Because the alternative refrigerant industry continues to try to destabilise the gas market with blends and hydrocarbons, VASA believes all members need to be well versed on the safety aspects of the recommended refrigerant gas so that they can satisfy any fears their customers may still have.

International bodies which were responsible for the many years of study which culminated in the R134a selection have recently completed a new series of clinical safety studies on HFC-134a and HFC-227ea, under carefully controlled conditions at the TNO Food and Nutrition Institute in the Netherlands.

The studies involved exposure of healthy volunteers to HFC concentrations from 1000 to 8000 ppm, each for one hour.

The clinical phase of the studies was completed in June 1998 and the results were entirely consistent with the body of safety data on the two HFCs. The studies were commissioned in response to the now famous 1997 human inhalation study at the Wright-Patterson air force base in Ohio.

The methodology used in the Wright-Patterson study which challenged the safety of R134a has since been taken to task by the US Environmental Agency (Hot Air April 1998).

A number of key agencies including the EPA, US Department of Defence and the US Food and Drug Administration assessed the Wright-Patterson findings and agreed that the events were not consistent with the extensive body of safety data on HFC-R134a and HFC-227ea. In the meantime, the TNO study will be finalised by the end of 1998 and will be made available to the public. The US EPA plans to post the reports on the internet, probably via the National Technical Information Service website.

Unanswered Questions on Alternatives says Phoenix Forum

The latest series of international trials reveal there are still too many unanswered questions on alternative vehicle airconditioning refrigerants.

"Don't look for an early replacement of R134a on production vehicles," said the study which culminated in the Phoenix Forum where vehicle manufacturers and AC system component suppliers as well as the US EPA met to evaluate the tests on R134a systems and experimental alternate refrigerant systems.

Hydrocarbons were dismissed by concerns of the vehicle manufacturers on the questions of occupant safety and product reliability when a flammable refrigerant is used. They said that system designs must consider safety features such as isolation shutoff valves and secondary coolant circuits.

Data from accidents around the world indicate a concern for secondary fires being caused by a damaged AC component that has leaked a flammable refrigerant and is ignited. This can result in a torch effect igniting other flammable materials in the engine and passenger compartments.

However, one of the questions is their safety, such as flammability or effects on the vehicle's occupants should a refrigerant leak occur into the passenger compartment.

All this activity is over the global warming issue of R134a as compared to the so called natural refrigerants, hydrocarbons and carbon dioxide.

HFC's Are The Viable Solution

The Alliance for Responsible Atmospheric Policy based in Arlington Virginia recently published a paper in which it hails HFCs as the most energy efficient solution to global climate change problems.

The report in part says: Hydrofluorocarbons (HFCs) are viable and proven solutions to the problems addressed by the Montreal Protocol and Kyoto Protocol processes. They are energy efficient, low-toxicity, cost effective and can be used safely.

Governments and industry support their global use in applications which meet important environmental and societal needs, including metered dose inhalers, insulation, refrigeration, airconditioning, technical aerosols and fire extinguishers.

Use of HFCs reduces total greenhouse gas contributions compared to CFCs. HFCs will represent less than 2% of all greenhouse gas emissions in 2000. Realistic projections show that emissions will be less than 3% in 2050.

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The Wright Brothers are an institution in the northern NSW inland city of Armidale.

The diversified workshop of Cliff Wright Motors includes an auto electrical/auto airconditioning section headed by Craig Wright who was a foundation member of VASA.

Cliff Wright established his mechanical workshop more than 40 years ago on the New England Highway in the middle of Armidale. As the business grew and Cliff diversified into wrecking, auto electrical and panel shop he had to build larger premises to cope.

He bought 20 acres of land in west Armidale near the railway freight centre in 1971, and subdivided it. This formed the current industrial area of the city.

Cliff Wright Motors now occupies about 6 acres on the Miller Street site, and is a multi faceted business involving new and used spare parts, used car sales, paint and panel, full mechanical workshop, along with the auto electrical/airconditioning section.

The company now employs 20 people and is an integral part of Armidale’s automotive industry. The airconditioning workshop has three full time staff.

“When we started into airconditioning 20 years ago our equipment consisted of a bottle of R12 and a manifold gauge,” recalls Craig.

"Modern technology then took over and a bunsen burner style leak detector was purchased. This of course is a far cry from today with the most modern flushing and charging systems being used, and the most comprehensive range of spare parts in the New England area." In 1995 Cliff retired and the business is now owned and operated by the four Wright brothers, Gary (general manager), Philip (car sales), Craig (airconditioning/auto electrical) and Chris (mechanical).

Craig recalls that as technology and the laws involved in airconditioning became tougher, many workshops decided to drop out of this business. "We made a move the other way and went about finding out as much as we could and expand to currently being regarded as the No. 1 airconditioning workshop in the area," he says proudly.

"When VASA was formed we were in the first intake of 40-50 companies. We have since found it to be very helpful. Not only on the technical side of things, but on a business level, in sourcing parts as well as service for our customers encountering trouble away from Armidale. The social side of VASA (ie annual conventions) has also been a lot of fun.

"One of the major stumbling blocks to airconditioning in our region is the variation in temperature. It isn't uncommon during December/January to have days in the high 30s to the opposite of trying to get a system to operate with a wind chill of minus 10ºC in July/August," Craig adds.

Subjects for this regular series are chosen at random but the editors will try to find a balance between states, capital cities and provincial areas.

For our first in the series we visit Armidale, the university city in the New England tablelands of northern New South Wales.
A keynote speaker at VASA’s Perfect Vintage Convention in Adelaide in 1998 was Steve Colmery from Orica in the US. Steve is Market Development Manager for the Synthetic Lubricants Business of ICI.

In the last issue we ran a brief summary of Steve’s paper and in this issue we cover the balance of his US report on the major problems facing the industry.

**Blend Composition Changes during Use**

Mobile airconditioning systems may not be suitable to handle blended refrigerants that fractionate in the evaporator. For example, when working with such refrigerants it is important to consider the additional system modifications required to handle these blends that are zeotropic. Also airconditioning controls (ie clutch cycling switch, low pressure cut-offs) may not work properly with the zeotropic blends. Problems that may result include condensation freezing on the evaporator which may in turn result in a loss of cooling. In addition, performance may decline with changing blend compositions, an example being during the recovery and recycle process.

**Recycle and Recovery**

Using refrigerant blends for automotive retrofit would require all service engineers to carry specific recovery equipment dedicated or adapted for use with each specific refrigerant blend. Such a proliferation of blends would make it virtually impossible to standardise retrofit procedures and retrofit equipment. Even if it is practical to convert CFC-12 recovery equipment, there is considerable industry concern that the refrigerant blend composition (which may have already changed in the car airconditioning system) can be routinely maintained within the specified tolerance. This is particularly so if non-condensable gases are vented from the recovered refrigerant blend, either through automatic or manual purge systems on the recovery units.

The introduction of a number of refrigerant blends into an automotive aftermarket that already contains R134a and CFC-12 may add significant complexity for the service industry and greatly increase the chances of cross contamination of service industry supplies of refrigerant during topping up and recovery processes. This is potentially a major concern for the automotive retrofit industry.

**System Changes**

On the evaporator side of an automotive airconditioning system, the suction pressure of blends containing 134a (such as FR-12) is generally lower than R134a or CFC-12. For a CCOT system (Clutch Cycling Orifice Tube), it has been recommended that a clutch cycling switch change is made when using these blends. [2] If the switch is not changed when using these blends the system will shut down for a period when the suction pressure is lower than preset for CFC-12 use. In the case of FR12 there is a specific, further issue in that the pressure in the winter months would not allow the airconditioning system to operate in defrost mode and there may be concern that use during this time of year could result in liquid feedback to the compressor causing wear and other subsequent damage to the automotive airconditioning system.

Cars with thermal expansion valves (TXV) could require a change over of the valves to achieve equivalent performance. The inaccessibility of the components in some models make this a labour intensive and therefore a high cost option.

**Oil Changes**

The benefits of not changing the mineral oil for some of the refrigeration blends has been highlighted as a major advantage by some organisations but “not changing” the oil can in some cases be misleading. For example, with FR-12 Intermagnetics (the company that developed FR-12) state... “the mineral oil in existing systems should not be removed. We strongly recommend that, rather than adding the usual one or two ounces of mineral oil during the changing procedure, you add sufficient polyol ester synthetic oil to make 70% mineral oil, 30% POE blends in the airconditioning system. “The lubricant will enhance system durability”.

**Materials Compatibility**

For these blends compatibility data and materials recommendations available for pure R134a should be applied, paying close attention to any specific issues which may arise from the additional blend components.

There are generally two types of blends offered for retrofit, those that contain R-22 and those that contact R134a. The R-22 containing blends generally have extremely high permeation rates through rubber hoses these are greater than for R134a through nylon lined hoses. The blends containing R134a, such as FR-12 or Freeze-12, all have over 50% by wt R134a in the blend and all will have at least the same materials compatibility as pure R134a.
Coping with Blends, Recycling and Incompatibilities

**R134a: The Right Choice for Retrofit**

**OEMs**
Most OEMs offer retrofit kits and have guidelines for many car makes and models for retrofitting to R134a based on extensive field trials and fleet tests over a period of years and many millions of miles.

**System Changes**
R134a can be used to retrofit automotive air-conditioning systems with minimal system changes. Blends offering identical performance are not "drop ins" as changes have to be made to the systems when retrofitting, which may include addition of a new lubricant, specific to the refrigerant being used along with new fittings.

The discharge pressures of R134a are higher than that of CFC-12 and this has resulted in extensive testing to ensure that MAC systems are in most cases suitable for retrofit to R134a. In the USA, which covers a very broad climatic range, 95% of car air-conditioning designs may be retrofitted using R134a, in the case of 95% of car designs. For the remaining 5%, a small fan may be required for the condenser and this can be fitted at relatively low cost. For R134a, almost all of the major OEMs have recommended no orifice tube or TXV changes to the system when retrofitting. Pressure cut out switches or pressure relief valves are already installed on CFC-12 systems and can be used with R134a.

**Oil Changes**
Retrofit Experience in the USA suggests that it is not necessary to remove mineral oil from the system, unless the system is contaminated [3]. In fact, several major OEMs are indicating that mineral oil removal is not necessary when retrofitting automotive airconditioning systems [4]. These respected groups have determined, through their own field trial experience, that in many R134a retrofits the POE or PAG oil can just be added to mineral oil already in the system, making the retrofit even simpler.

In Australia, the hot, humid conditions, have resulted in much greater attention in condenser performance, and at least one local expert has recommended oil flushing to remove mineral oil when retrofitting. In this context, it should be noted, however, that if a car airconditioning system is faulty, then in many cases there will be significant refrigerant and oil loss and the garage would normally replace the oil in the system during repair anyway. Given this, in such circumstances it is just as easy and a much preferred solution to retrofit 134a with POE or PAG oil.

**Cost**
According to Arctic Auto Air Inc. (a major service organisation in the USA) when there is a loss of CFC-12 or if the system needs to be opened for repair, 95% of the vehicles can be retrofitted to R134a at no additional cost [3].

Addition of a synthetic lubricant is required for R134a but as mentioned earlier, it should be noted that this has also been the recommendation from some manufacturers of blends containing R134a. Furthermore it should be remembered that the interim blends can be much more expensive than R134a.

A less obvious cost of using blends, but a significant one nonetheless, could be the requirement to dispose of large quantities of contaminated refrigerant, recovered from systems and inadvertently mixed due to the presence of several blends as well as CFC-12 and R134a. Fittings and adapter kits for refrigerant blends to allow use with recovery and recycle machines could greatly add to the possibility of error when retrofitting systems.

Removal of CFC-12 and addition of a blend via the same machine could lead to contaminated refrigerant being used to charge the system. In order to avoid this possibility new service equipment may be desirable at significant cost. In practice, the additional costs for retrofit using R134a should be much lower as most garages should have dedicated equipment for handling R134a.

**Retrofit Procedure for CFC-12 to R134a**
The following procedure forms the basis of retrofitting to R134a and is currently being used worldwide:

1. Check vehicle service history
2. Pre-retrofit check record pressures, temp, air flow, clutch cycling etc.
3. Leak check the system
4. Recover the CFC-12
5. Flush if there are contaminants (due to compressor failure). Otherwise no flush or mineral oil removal may be necessary.
6. Add the synthetic lubricant (POE or PAG)
7. Reassemble the airconditioning system after making repairs - also add the required HFC-134a service ports.
8. Evacuate for at least 30 min (preferably 45 min.)
9. Charge the system with R134a (usually 80-85% or CFC-12 charge)
10. Leak check the system
11. Post retrofit check

**Summary**
R134a remains the only refrigerant specified for retrofit by the automotive OEMs and many after-market organisations, with millions of fleets test documented since 1993. R134a was chosen as the retrofit refrigerant by the OEMs and many mainstream after-market organisations because R134a works for retrofits.

It is important to address the aspects of using blends, such as system performance, potential fractionation, required system changes, recovery and recycle and overall cost when deciding on which refrigerant to use when retrofitting.
It is apparent that the manufacturers and importers of CFCs have made a successful transition to alternatives. It is equally clear that the transition has created some difficult issues for other elements of the industry and consumers. These need to be resolved if our ozone protection program is to be a success.

From Environment Australia’s perspective, key issues appear to be:

- the increased number of refrigerants that industry now have to deal with; and
- the lack of regulatory controls on the alternative refrigerant preferred by the motor vehicle industry, namely HFCs.

HFCs are a greenhouse gas which are covered by the Framework Convention on Climate Change and its Kyoto Protocol. This means that the current regulatory-based management regime established for the control of ozone-depleting substances, under the Montreal Protocol, can not simply be extended to HFCs. This includes:

- Commonwealth legislative controls on the manufacture, import and export of ozone depleting substances; and
- Complementary legislation enacted by State and Territory governments to control the sale, purchase and use of ozone depleting substances through accreditation, licensing and mandatory codes of practice.

This means that the only form of controls that currently apply to HFCs are those practices voluntarily agreed and implemented by industry.

This lack of formal control on HFC refrigerant handling and use combined with the multiplicity of refrigerants could lead to loss of consumer and environment protection, and increased costs to industry, through:

- allowing non-accredited personnel to service equipment using HFCs;
- increased venting of refrigerants to the atmosphere;
- cross-contamination of repairers stock and equipment when recovering unknown refrigerants; and
- the removal of any imperative to reclaim, recycle or safely dispose of used HFC refrigerants.

Environment Australia is concerned that the exclusion of HFCs from current legislative controls could undermine the momentum and behavioural change achieved by this management regime. The fact that emissions of HFCs within Australia are increasing in conjunction with their greater use in refrigeration systems adds greater weight to these concerns.

HFCs are potent greenhouse gases - the global warming effect of 1 kilogram of HFCs is 1,300 times greater than 1 kilogram of CO2. It is therefore important that policies and practices are put in place to minimise HFC emissions to the atmosphere.

From Environment Australia’s perspective, the main objective is to devise the simplest and most straightforward management regime to meet our environmental needs. While we are only just beginning this process, I can give you an indication of our initial thinking on the future management of HFCs.

The environmental management of HFCs (and all other synthetic gases, including PFCs and SF6) are to be considered as part of the implementation of the national greenhouse strategy. The NGS is Australia’s primary mechanism for responding to our international commitments under the Kyoto Protocol on climate change.

- The NGS specifies that environmental management strategies be developed for each of the three synthetic gases included in the Kyoto Protocol.

- The strategies will provide a national framework for action to pursue improvements in design and handling practices to minimise emissions of greenhouse gases to the atmosphere.

I wish to emphasise that climate change agreements are aimed at managing emissions. They do not control supply or consumption of gases. This means that the use of HFCs will not be phased out.

Preliminary discussions have been held with industry and some States and Territory Governments. It is intended that separate strategies be developed for individual sectors of industry - the initial focus is to be on HFC use in the fluorocarbon industry. Given the relative importance of vehicle air conditioners in terms of overall use and emissions of HFCs, your industry is likely to receive early attention.

At this early stage, we expect to advance action on two main fronts:

- compilation of information on HFC use and emissions
- the initial focus will be on establishing a general national profile from existing information to inform the development of action plans and specific measures
- the revision of detailed inventory methodology and gathering of industry data will occur over a longer time frame
- the evaluation of issues and development of action plans

As part of the action plans, Environment Australia would like to see the sound practices developed in industry for handling CFCs extended to alternative refrigerants, through continuing requirements to meet standards set out in codes of practice and continuing emphasis on ‘no venting’ of refrigerants to the atmosphere. The states and territories can play an important and ongoing role here.
As part of its insurance industry campaign VASA sought the position of the major insurers on questions such as pricing, airconditioning repairs and refrigerants.

The general reaction from the insurers was supportive of VASA’s initiatives and the executive got a great deal of heart from the encouraging responses on the mono-refrigerant policy. The main reactions were:

NRMA Queensland recommends retrofitting to R134a as the only alternative to replacing R12, and will not authorise the use of blend or alternative gases.

Bill Blackhall
Manager Repair Industry Liaison – NRMA

The relationship between the insurance industry and VASA has strengthened considerably as a result of a priority initiative by VASA directors to convince insurers of the value of professional and consistent repairs to airconditioning systems in damaged vehicles.

The insurance majors have in general responded with enthusiasm but while the insurance head offices have indicated support for the VASA initiatives the hard part is getting this message through to the thousands of insurance assessors in the field.

VASA’s new directory of member service centres is out and in time all members will receive a complimentary copy.

It’s a 40 page booklet with a listing by state of every member which operates a service centre for the public.

Prime target for the first edition of the book was the insurance industry.

As president Mark Mitchell says, the intent of the directory for VASA members is to encourage a national network mentality among the VASA workshops so that motorists are assured of consistent service and pricing for their airconditioning repairs as well as being able to transfer warranty provisions on new installations from one town to the next.

It’s anticipated that with new members coming on stream all of the time it may be necessary to reprint the book at least annually but maybe half yearly.
**New Members**

New members since the Service Directory was published are:

<table>
<thead>
<tr>
<th>Name</th>
<th>Phone Numbers</th>
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<tbody>
<tr>
<td>Mr. Brett Meads</td>
<td>07 5483 8444</td>
</tr>
<tr>
<td>Gympie Auto Air</td>
<td></td>
</tr>
<tr>
<td>4 Tozer Lane</td>
<td></td>
</tr>
<tr>
<td>Gympie Qld 4570</td>
<td></td>
</tr>
<tr>
<td>Phone: 07 5483 8444</td>
<td></td>
</tr>
<tr>
<td>Mr. Phillip Cawthorn</td>
<td>0418 737 317</td>
</tr>
<tr>
<td>Icy Cool Car</td>
<td></td>
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<tr>
<td>Airconditioning</td>
<td></td>
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<tr>
<td>7 Hazeltine Place</td>
<td></td>
</tr>
<tr>
<td>Parkwood Qld 4214</td>
<td></td>
</tr>
<tr>
<td>Phone: 0418 737 317</td>
<td></td>
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<tr>
<td>Mr. Steven Grosser</td>
<td>014 092 854</td>
</tr>
<tr>
<td>Mobile Airconditioning</td>
<td></td>
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<tr>
<td>&amp; Mechanical Services</td>
<td></td>
</tr>
<tr>
<td>Box 538</td>
<td></td>
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<tr>
<td>Naracoorte SA 5271</td>
<td></td>
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<tr>
<td>Phone: 014 092 854</td>
<td></td>
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<tr>
<td>Ms. Kath Rohan</td>
<td></td>
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<tr>
<td>Bri-Jon Pty Ltd</td>
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<tr>
<td>13 Fraser Street</td>
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<tr>
<td>Airport West Vic 3042</td>
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<tr>
<td>David William &amp;</td>
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<td>Christine Hughes</td>
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<td>Davis Auto Air</td>
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<td>59-61 Ingham Road</td>
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<td>Townsville West</td>
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<td>Qld 4810</td>
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<tr>
<td>Phone: 07 4772 2511</td>
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<tr>
<td>Mr. Wayne Batson</td>
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<tr>
<td>Tuncurry Auto</td>
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<tr>
<td>Electricians</td>
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<tr>
<td>86 Manning Street</td>
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<tr>
<td>Tuncurry NSW 2428</td>
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<tr>
<td>Phone: 02 6554 5591</td>
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<tr>
<td>Mr. Gavin Lyons</td>
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<td>Lyons Airconditioning</td>
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<td>(Services (WA))</td>
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<tr>
<td>157 Chisholm Crescent</td>
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<tr>
<td>Kewdale WA 6105</td>
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<tr>
<td>Phone: 08 9453 2811</td>
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**VASA READY REFERENCE DIRECTORY 1998/99**

**Directors, Chairmen (in bold) and Committee Members**

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<thead>
<tr>
<th>Directors</th>
<th>Phone</th>
<th>Fax</th>
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<tr>
<td>Mark Mitchell</td>
<td>07 5532 8133</td>
<td>07 5532 8602</td>
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<tr>
<td>(President)</td>
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<tr>
<td>Glen Watkinson</td>
<td>08 8347 1155</td>
<td>08 8268 8048</td>
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<tr>
<td>(Vice Pres)</td>
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<tr>
<td>John Blanchard</td>
<td>03 9890 7082</td>
<td>03 9890 0061</td>
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<td>(Secy/Treas)</td>
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<tr>
<td>Tony Heat</td>
<td>02 9949 5188</td>
<td>02 9949 4243</td>
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<tr>
<td><strong>CORPORATE AFFAIRS</strong></td>
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<tr>
<td>Mark Mitchell</td>
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<td>(Chairman)</td>
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<tr>
<td>Chris Lindeman</td>
<td>02 9484 3949</td>
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<tr>
<td>Mark Padwick</td>
<td>02 9791 0999</td>
<td>02 9791 9029</td>
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<td>018 266 132</td>
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<tr>
<td>Grantley Hand</td>
<td>08 8251 3894</td>
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<tr>
<td>Greg Thomas</td>
<td>02 9774 4133</td>
<td>02 9772 3272</td>
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<td>02 9462 1511</td>
<td>02 9477 7360</td>
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<td>John Bish</td>
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<tr>
<td>John Blanchard</td>
<td>03 9890 7082</td>
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**Queensland Committee**

| Bevan Carrick     | 07 3375 5566 | 07 3375 1404 |
| Terry Gatley – Insurance | 018 722 947 | 07 3801 3096 |
| David Pude – Training | 07 3369 3133 | 07 3368 3745 |

**New South Wales Committee**

| Tony Heat         | 02 9949 5188 | 02 9949 4243 |
| Mark Padwick      | 02 9791 0999 | 02 9791 9029 |
| Roger Boa         | 018 428 898  | 02 9792 7069 |
| Steve King        | 02 4625 8216 | 02 4627 0374 |

**New South Wales Insurance Committee**

| Peter Dodds       | 02 9720 2258 | 02 9720 2355 |
| Phil Wilson       | 02 9601 2400 | 02 9601 6580 |
| Chris Lindeman    | 02 9484 3949 | 02 9484 8608 |
| John Wallace      | 0419 276 627 | 02 9634 7086 |

**Victoria Committee**

| Mark Lynch        | 03 9532 0785 | 03 9532 1010 |
| Brian Wilkinson   | 03 9544 7799 | 03 9544 7888 |
| Keith Murray      | 03 9544 7799 | 03 9544 7888 |

**South Australia Committee**

| Glen Watkinson    | 08 8347 1155 | 08 8268 8048 |
| Wayne Holttham    | 08 8224 2816 | 08 8224 2850 |
| David Jackson     | 08 8376 0899 | 08 8376 0451 |
| Allen Morris      | 08 8362 7671 | 08 8362 8337 |

**Western Australia Committee**

| Kevin Matthews    | 08 9275 3344 | 08 9275 5630 |
| Paul Robinson     | 08 9279 3336 | 08 9279 3156 |

**New Zealand Committee**

| Barry Rogers      | 64 9 573 3392 | 64 9 573 3395 |
| Richard Cooper    | 64 9 262 6524 | 64 9 262 0547 |
| Stuart Helm       | 64 7 846 6668 | 64 7 846 6667 |
| James Ritchie     | 64 9 520 2741 | 64 9 522 3318 |

**Editorial Consultants**

| Ken Newton        | 07 5526 3044 | 07 5526 3404 |
| Joy Davies        | 07 5526 3044 | 07 5526 3404 |

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**It’s official, it is now the Vehicle Airconditioning Specialists of Australasia.**

The extension of VASA membership to incorporate New Zealand, adopted by the 1998 AGM has now been sanctioned by the official registration by the company changing the title from "Australia" to "Australasia". The New Zealand members are now incorporated in all of the VASA mailouts and local issues will be handled by a New Zealand committee headed by Barry Rogers.

In the recently published service centre directory, New Zealand is represented by 19 workshops in 15 centres.

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The information in this newsletter is supplied by the executive, members and affiliate bodies in USA and Europe. VASA maintains a high standard of editorial and technical content, but can accept no responsibility for the accuracy of the statements made nor the technical information provided. If in doubt about any issue, contact an appropriate committee chairman or a member of the National Executive.