

HOT Air



Newsletter of the Vehicle Airconditioning Specialists of Australasia
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THE DOWNS AND UPS OF THE AFTERMARKET AIRCONDITIONING INDUSTRY

The New Systems Aftermarket is Shrinking

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. *Continued page 3...*

IN AN industry as benign as car air-conditioning, the market forces and trends affecting the professional workshop in Australia and New Zealand seem grossly out of proportion.

One of the main reasons for VASA's formation in 1993 was to try to plot these forces and prepare the industry for the inevitable changes which may have to be made in work practices.

VASA has been preoccupied in recent years with the biggest single issue to hit auto airconditioning since it was invented – the change over from R12 to R134a.

The industry is now starting down the barrel of new threats, not the least being the saturation of the market with factory installed airconditioning and changing consumer attitudes towards warranties.

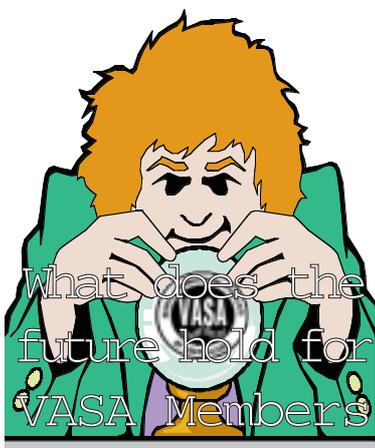
In a survey of the market for the IMACA convention, president Mark Mitchell summarised the down sides and up sides for the aftermarket industry.

DOWNSIDES

Factory (genuine) air is now saturating the market.

In 1995/94 major manufacturers went to a three year warranty. This has contributed to a "no maintenance" ethic among motorists.

The independent AC specialists are missing out on maintenance during the longer vehicle warranty periods and the customers are coming out of these warranties with a 'no maintenance' attitude and to a large



Understand the Downsides and work on the Upsides

THE DOWNS AND UPS OF THE

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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



Mark Mitchell – look for the opportunities

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 deliver-

ing 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 ...

THE **DOWNs** AND **UPs** OF THE **AFTERMARKET AIRCONDITIONING INDUSTRY**

... Continued from Page 2

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 multiple refrigerants in the market place. As a result of this and fears of poor workmanship, the insurance companies have also insisted this retrofitting work be carried out by a specialist. This has tended to break the 'cheapest quote' ethic from these companies. However we are still concerned 'cheapy' 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 competitively priced parts available to the aftermarket.

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-genuine.

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 independants for service and repairs. (these vehicles have received minimal maintenance and 'no sympathy' out of warranty)

The customer is coming out of the warranty period and moving to an independent specialist for major service and repairs. This is particularly evident if a repeat of a previous warranty fault has occurred. Also minimum to no AC maintenance 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 operators.

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 service quality and in our industry the operators have really lifted their game.

Higher incidence of multiple repair to vehicles 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 compressor 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 without 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.

IMACA VISIT

VASA president Mark Mitchell addressed an audience of more than 500 of the top echalon 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.

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.

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THE NEW SYSTEMS AFTERMARKET IS SHRINKING



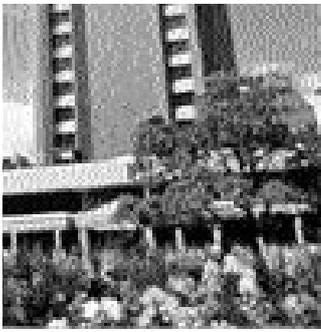
"I believe the best the aftermarket can expect for the medium to long term is perhaps 5% to 7% of the total new system market," added Mark.

The average age of the Australian fleet is 10.9 years.

In 1995, 65% of all new cars were airconditioned, in 1998, 90%

were airconditioned. Of the 1998 figures the market is shared 75% by the vehicle manufacturers, 15% are dealer fitted and 10% fitted by the aftermarket specialists.

Car sales in Australia in 1997 were 730,000 and sales in 1998 were expected to top 800,000.



Hilton On The Park

Convention

99

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-



Grant Hand — products are not all that they seem

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 bewildering 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.

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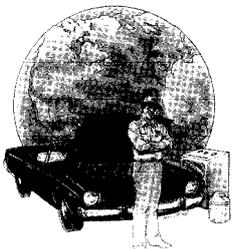
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At least from reading RTP 4 you will be fully aware of the issues at hand in both oil and refrigerant selection.

Bulletin 5 will address the remaining technical issues centering around retrofiting 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.

VASA is proudly affiliated with: -



IMACA
International Mobile Air Conditioning Association



FINDING YOUR WAY AROUND VASA



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 alternative 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-in-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.

THE WRIGHT BROTHERS ARE REALLY FLYING

Member Profile No. 1

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 con-

sisted of a bottle of R12 and a manifold gauge," recalls Craig.



The Wright Brothers: from left, Gary, Phillip, Craig and Chris

"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 10°C in July/August," Craig adds.

Craig Wright
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This is the first in what will be a never ending series of profiles of VASA members. This is in response to changes suggested by members in a recent Hot Air survey and will become vital in fostering a more intimate understanding of each others needs. These stories aim to share experiences and provide a little background on how each member found their way into auto airconditioning.

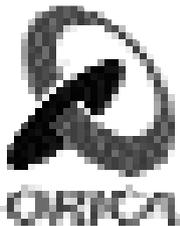
Subjects for this regular series are chosen at random but the editors will try to find a balance between states, capital cities and provincial areas.

For our first in the series we visit Armidale, the university city in the New England tablelands of northern New South Wales.

Coping with Blends, Recycling and Incompatibilities

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 then 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 to R134a 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 air-conditioning 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.



*Paul Kesby
Assistant Director
Ozone Protection
Environment
Australia*

Life Without CFC's – managing the alternatives

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 sub-

stances 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.

Insurers

Agree

... It's R134a

As part of its insurance industry campaign VASA sought the position of the major insurers on questions such as pricing, airconditioning repair policy 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.

David Reckin
Assistant Manager
NRMA Insurance Queensland

Authorised gas for retro-fit 134a only to be used.

Myles O'Mahoney
Claims Assessor RACQ

The gas we recommend be used is R134a.

W Johnson
Assessing Manager NSW
Action Assessing

GIO NSW will not accept blended gases to be used on any system at this point in time.

David Stephens
Northern Assessing
Manager NSW GIO General Ltd

In relation to retrofit gas, we only authorise R134a.

Tom Turner
National Manager Motor
NZI Insurance

At all times, NRMA has maintained a policy of retrofitting to R134a gas only.

Blend gases are not a viable option for NRMA due to the implications of recovery and identification of airconditioning gas in a system.

Bill Blackhall
Manager Repair Industry
Liaison -NRMA

Nostalgia . . .

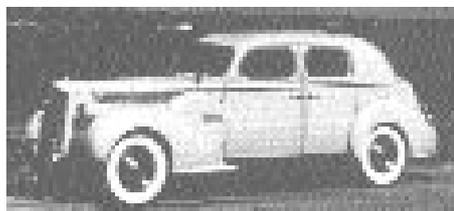
Pride of place at the IMACA convention were two classic cars in honour of the historic theme.

Automotive history was made on August 8, 1939, when the Packard motor car company introduced the first factory installed airconditioning system as a "standard extra-cost accessory" on selected 1940 models. Fewer than 200 of these "weather conditioned" cars were produced.

The car was a custom super-eight one-eighty club sedan owned by a Texan. In addition to airconditioning, the car had sealed-beam headlights

and a straight-eight 160 HP engine - both introduced on 1940 Packard models.

Advertised as the first



completely weather conditioned car, the 1940 Packard set a new standard of motoring comfort which General Motors and Chrysler would imitate on their top-of-the-line 1941 models. "Imitate" is the correct word, since the components on their systems

were virtually identical to those used on the Packard. American automobile production ceased with the advent of World War II, and the

OEM's would not offer airconditioning again until 1953 - more than five years behind the MVAC aftermarket.

Also on display was a 1955 Packard Patrician. This classic example of post-war American automotive design styling featured a Clardy truck mounted airconditioning system with a Lehigh V-93 compressor. The four-door sedan was powered by a 352 V8 engine and had an automatic transmission.

Thank You

Dear Mr Blanchard

What a delight it was for me to receive your special donation of \$4687.50 which was 50% of the proceeds from your charity auction. (Convention 98)

Your organisation has made it possible for The Salvation Army to help so many disadvantaged people and on their behalf I say thank you.

Could you please pass on to your executive members of VASA my personal thank you and if we can help in the future please do not hesitate to contact me.

God bless you.

*Merv Lincoln (Major)
State Appeals Director
Salvation Army*

New Member Directory for Insurers and Members

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.

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 has offered all assessors the service centre directory to encourage the assessors to choose VASA members.

The directory also lists VASA's warranty guidelines, refrigerant policy and service commitment.

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:

Mr Brett Meads
Gympie Auto Air
4 Tozer Lane
Gympie Qld 4570
Phone: 07 5483 8444

Mr Phillip Cawthorn
Icy Cool Car
Airconditioning
7 Hazeltine Place
Parkwood Qld 4214
Phone: 0418 737 317

Mr Steven Grosser
Mobile Airconditioning
& Mechanical Services
Box 538
Naracoorte SA 5271
Phone: 014 092 854

Ms Kath Rohan
Bri-Jon Pty Ltd
13 Fraser Street
Airport West Vic 3042

David William &
Christine Hughes
Davis Auto Air
59-61 Ingham Road
Townsville West
Qld 4810
Phone: 07 4772 2511

Mr Wayne Batson
Tuncurry Auto
Electricians
86 Manning Street
Tuncurry NSW 2428
Phone: 02 6554 5591

Mr Gavin Lyons
Lyons Airconditioning
Services (WA)
157 Chisholm Crescent
Kewdale WA 6105
Phone: 08 9453 2811

VASA READY REFERENCE DIRECTORY 1998/99

Directors, Chairmen (in bold) and Committee Members

<i>Directors</i>	<i>Phone</i>	<i>Fax</i>
Mark Mitchell (President)	07 5532 8133	07 5532 8602
Glen Watkinson (Vice Pres)	08 8347 1155	08 8268 8048
John Blanchard (Secy/Treas)	03 9890 7082	03 9890 0061
Tony Heat	02 9949 5188	02 9949 4243

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Chris Lindeman	02 9484 3949	02 9484 8608

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	018 266 132	
Grantley Hand	08 8251 3894	08 8289 4260

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John Bish	02 9482 1511	02 9477 7360

CONVENTION 1999

John Blanchard	03 9890 7082	03 9890 0061
Mark Mitchell	07 5532 8133	07 5532 8602

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

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Tony Heat	02 9949 5188	02 9949 4243
Mark Padwick	02 9791 0999	02 9791 9029
	018 266 132	
Roger Boa	018 428 898	02 9792 7069
Steve King	02 4625 8216	02 4627 0374

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Chris Lindeman	02 9484 3949	02 9484 8608
John Wallace	0419 276 627	02 9634 7086

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Brian Wilkinson	03 9544 7799	03 9544 7888
Keith Murray	03 9544 7799	03 9544 7888

SOUTH AUSTRALIA COMMITTEE

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Wayne Holtham	08 8234 2616	08 8234 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

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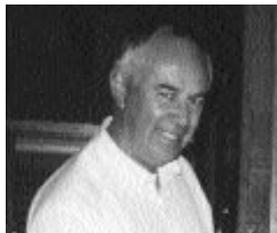
Welcome Aboard New Zealand

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.



Barry Rogers

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.