



Hot Air

NEWSLETTER

APRIL 2008

the aftermarket airconditioning and auto electrical specialists of choice

National Secretariat: PO Box 1160 Paradise Point Qld 4216 ACN 063969782

VASA takes on a new look plus a growth plan

A new way of explaining the value of the benefits of VASA membership has been developed by the VASA Board of Directors.

In an intense all-day meeting in Sydney on 19 March, the Board put its 'reasons for being' under the microscope, and nipped out a whole new approach to membership benefits and also adopted a membership-drive strategy aimed at capturing the interest of a wider range of aftermarket specialists.

The new look VASA represents probably the biggest single change in its direction since it was founded in 1992.

Since VASA incorporated former members of the Australian Association of Automotive Electricians into the association in August 2007, there has been a growing pressure from the membership to consider a name change, to better reflect those sectors of the industry which VASA intends to represent, and also to present a clearer and less complex 'brand' to the aftermarket.

Here is a summary of the main decisions from 19 March meeting.

It was agreed that the name VASA was now accepted as a brand and should be retained as the organisation's name. However it will no longer be regarded as an acronym (Vehicle Air Conditioning Specialists of Australasia, incorporating the Australian Association of Automotive Electricians), but will in future be a brand name in its own right.

A new, modern logo will be developed, using the VASA brand and no other verbiage

On formal documents, advertising and submissions to Government, the following description would be applied: **The Mobile AC, Electrical and Cooling Technicians of Australasia**

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Hot contender for R134a replacement

A wildcard refrigerant with an incredibly low global warming potential, called HFO-1234yf, has emerged as the front-runner in the race to develop a replacement for R134a.

The refrigerant has come from the Honeywell/DuPont joint collaboration and, unlike other candidates, such as the much vaunted Fluid H, the new candidate has turned in promising toxicity and stability tests.

As DuPont's Australian Business Manager Mr John McCormack says, "There are still a couple of testing hurdles yet, but this is the closest any replacement refrigerant has come to being the new refrigerant which meets all the specifications.

"The car manufacturers and tier one suppliers have all confirmed our results, so HFO-1234yf could well be the one to go into production. As to the time-line for supply, it is too early to tell, so R134a will be around in this part of the world for quite a few years yet," Mr McCormack added. (continued next page)



Gold Coast Convention & Exhibition Centre
Broadbeach Queensland

Begins 6pm Friday
27 June 2008
Ends late Sunday 29 June 2008

Full Registrations:
\$410 VASA members
(early bird before 25 April)
\$445 standard rate

\$460 Non-members
(early bird before 25 April)
\$495 standard rate

Additional technicians from same workshop
\$230 (early bird before 25 April)
\$247.50 standard rate

Apprentices:
Complimentary when attending with a full paying VASA member.

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Hot contender for R134a replacement

The new refrigerant was announced in February at an Alternative Refrigerant meeting in Austria.

The meeting was told that the global alternative refrigerants presented to date had not met acceptance criteria and there were limitations to other options such as CO2 and the US contender, the 152a/secondary loop system.

HFO-1234yf has been identified as the preferred option on a number of fronts.

Its global warming potential (GWP), for example, is down to 4 (R134a is 1,410, and the European Union has put a GWP ceiling of 150 or less on any new refrigerant).

"Its big appeal," says John McCormack, "is that it is a near drop-in replacement for R134a and it is comparable for its refrigeration properties.

"It's mildly flammable, but significantly less so than HFC-152a. In fact, in extreme leak results testing, we couldn't get an ignition with an arc welder on the floor or at the vent outlet."

Next steps on the path to adoption of the new refrigerant include testing for OEM vehicle cooling performance, final toxicity testing and multiple risk assessments. All are expected to be finalised at the latest by August this year. The companies aim to obtain SNAP approval this year, and their application is already on the table.

DuPont and Honeywell are hoping that industry consensus on HFO-1234yf as the global industry solution will be achieved by the second quarter of this year and plans are in place to meet the 2011 European Union MAC directive.

Timing has now become critical, with several European car makers saying they are still looking seriously at CO2 as their new refrigerant.

While not the most favoured because of cost and maintenance issues attached to such a high pressure system in a vehicle, the car companies had, until now, no other options, with the 2011 deadline looming.

"The industry is universally hoping that a drop-in replacement refrigerant can be developed in time," says Mr McCormack.

"The indications are that by the middle of this year, we will have wide industry approval, and the car makers' total focus

on a replacement refrigerant that is not going to require massive re-engineering."

The new refrigerant has received what amounts to a big thumbs up from the heavyweights of the Japanese car industry, comprising the Japan Automotive Manufacturers Association (JAMA) and the Japan Auto Parts Industries Association (JAPIA).

JAMA comprises 12 OEMs including Toyota, Honda, Nissan, Subaru, Suzuki, Mitsubishi and Daihatsu while seven Tier 1 suppliers including Calsonic, Denso, Sanden and Valeo are represented in JAPIA.

The research team delivered the results of its tests at the VDA Alternative Refrigerant Winter Meeting in Austria.

After examining a range of performance criteria, the team declared that 1234yf has the potential to be the alternative to R134a.

Under high load conditions, and with the same AC system specifications with a modified TXV, the tests showed that cooling performance was quite similar to R134a, compatibility was not considered an issue, and the flammability risk was virtually non-existent. Only long term toxicity remained to be evaluated.

VASA takes on a new look

VASA will concentrate its future membership drive on both workshop operators and individual technicians, with a new fee structure for technicians to encourage their participation.

VASA's membership fees from 2009 (effective April 2009) will increase from \$332.75 for business (workshop) operators to \$395 and a new membership level of individual technician will carry a fee of \$195.

Other membership categories will remain as at present (covers wholesalers both national and state, manufacturers and corporates).

The criteria for workshop membership will be:

- * Refrigerant Trading Authorisation in Australia OR
- * A full time employee with either Cert III Auto Electrical or Cert II Air Conditioning

The criteria for individual membership (an employee of any workshop or industry organisation) will be:

- * Cert III Auto Electrical
- * Cert II Air Conditioning (National Refrigerant Handling Licence in Australia)

In a major review of membership benefits, the Directors felt that there needed to be a value placed on VASA services, so that members could feel more comfortable that their annual subscriptions were returning tangible benefits.

WORKSHOP MEMBERSHIP BENEFITS:

- * Information
- * Training - attendance at a minimum of one workshop per year with a proposed entry fee of \$100 (full retail value \$300 - \$400) per year minimum covers membership subscription
- * Market credibility
- * Support
- * The Automotive Technician annual subscription (value \$115)
- * Representation in Government and Industry
- * Corporate citizenship
- * Purchasing Power
- * Group advertising – Yellow Pages
- * Lower Eftpos Rate
- * Wire & Gas Convention discounts
- * Website access to technical data on line (VASA and TaT)
- * TaT technical assist

Some of the benefits listed are new, and will take a little time to develop.

INDIVIDUAL TECHNICIAN MEMBERSHIP BENEFITS:

- * Information
- * Training – attendance at a minimum of one workshop per year, with a proposed entry fee of \$100 (full retail value \$300 - \$400) per year minimum covers membership subscription
- * Credibility
- * Support
- * The Automotive Technician annual subscription (value \$115)
- * TaT technical assist
- * Representation in Government and Industry
- * Wire & Gas Convention discounts
- * Website access to technical data on line (VASA and TaT)

The Directors debated at length whether VASA should revert to an individual technician membership instead of a workshop (business) membership.

While individual technicians, as employees, have never been denied a VASA membership, only a handful of individual members have ever joined.

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VASA takes on a new look

Also vigorously debated was the question of VASA's representation of the automotive electrical and AC industry.

Two distinct points of view were tabled – that despite the small numbers of members in relation to the estimated numbers of technicians in Australia and New Zealand, VASA remains the only properly constituted organisation representing the industry, and that it should be seen in this role, especially since the membership contained all significant wholesalers and leading OEMs as well as workshop memberships.

The contra argument was based on the perception that such a small number of members, less than 300, could be regarded as a representative group if there were an estimated 10,000 workshops which would qualify for membership.

However, since VASA will actually represent all technician employees in a member business, and all employees share in VASA technical information, the organisation can claim it represents approximately 2000 industry personnel.

If wholesaler and manufacturer employee numbers are added, the number is considerably higher. For example, a national wholesaler, with 20 branches, is issued with 20 membership certificates and decals, and they also receive the Hot Air newsletter. Every branch is treated as a VASA member and is entitled to be represented by VASA.

It was pointed out that the reality was that VASA was indeed seen as representative of the aftermarket climate control sector by the Australian Government, other industry bodies, wholesalers and OEMs.

While the issue remained a personal point of view and unresolved, it was unanimously agreed that VASA would greatly benefit by a totally new approach to membership, and a more commercial approach to placing values on the benefits of membership to encourage new participants.

In reaching the conclusion that workshop operators would continue to be the hardcore membership of VASA, it was generally agreed that an exclusive individual technician-based membership would not work because employees, in general, were not inclined to join industry groups, considering this to be the responsibility of their employers.

The new-look VASA will be presented to the 2008 Wire & Gas Training Convention and Trade Show on the Gold Coast from 27 - 29 June.

The historic board meeting was attended by Mark Padwick (President), Mark Mitchell (Vice-President), and directors Barry Rogers (NZ), Jeff Smit, Deyan Barrie and CEO Ken Newton.

Tim Grimes (member CoolDrive Distribution) was invited by the Board to assist in preparing the new marketing strategy for VASA.

Directors John Blanchard and Dave Jackson were absent on business.

Obituary: *Prestige Auto Pioneer Ken Rudder*

Ken Rudder, a true pioneer of the vehicle air conditioning industry in Australia, has died in Sydney.



His business, Prestige Auto Air at Lakemba, became a major force in the industry with up to 60 employees at one stage.

His brother, Elton Rudder, credits Ken with

having taught him everything he knows, and Hot Air thanks Elton for making this eulogy available.

"Ken started in the auto air business in the late 1960s working for Auto Air at Camperdown.

In the early 1970s he started All Car Airconditioning at St Peters in Sydney where he fitted air to Jaguars, Mercedes Benz, BMW, Rovers and many others. He designed and built air conditioning units for just about any brand of car on the market.

With the emergence of the Japanese car in Australia, he soon began building and installing units in these cars.

With a move to larger premises in Marrickville and the formation of another company Mazdair, he began production of airconditioning kits for Mazdas, Datsuns and Hondas.

After a move from Marrickville to a new factory at Lakemba and the sale of All Car Airconditioning, he started Prestige Auto Air. Still producing car air units, he began building AC kits for the truck market.



The CCN 2008 Young Mobile Air Conditioning Technician of the Year, sponsored by VASA will be named on 21 April. The next issue of Hot Air will feature the two young finalists.

He also built and installed air for the bus and the earthmoving industry.

If somebody came to Ken wanting aircon in anything he could cool it! At one stage he exported refrigeration units to the Middle East.

Seeing the writing on the wall with the car air industry, he began to build refrigeration units which led him to build insulated truck bodies and insulated vans which he continued to do until his passing on 4 March 2008.

Over the many years he has employed many people in the auto air industry. At one stage he had around 60 employees working for Prestige Auto Air.

I, for one, would not be in this industry if it wasn't for my brother and I thank him for the knowledge he passed on to me over the years.

He will be missed by many within the Industry."

Elton Rudder

Brassed off

A VASA member in North Queensland phoned in with a plea for a source for brass low side fittings for R134a retrofits.

In NQ apparently, the fittings often fill with water and quickly rust out because, the member says, the quality of many Chinese made steel fittings is rubbish.

He was told nobody in Australia makes brass fittings. One of the VASA Brains Trust came up with the following:

Heldon Products
25 Tullamarine Park Rd
Tullamarine Vic 3043
Ph 03 9286 4222

When the Code arrives, it will set the standards which must be followed

By Grant Hand - Automotive Training Solutions



The long-awaited automotive Code of Practice is expected to be adopted by the Government in the near future.

Like the commercial Code (stationary air conditioning and refrigeration) it has been a complex and drawn out process largely due to the size and diverse range of views about what should be included and the acceptable industry standard.

The important point to consider when you refer to the Code of Practice when it is released is that it is a minimum standard document.

In simple terms all work must meet or exceed the standards laid down in the document. The overall aim of the automotive air conditioning Code of Practice is to minimise the emissions of harmful synthetic greenhouse gases and ozone depleting gases.

Minimise is the key word.

When working on air conditioning systems it is sometimes difficult to completely eliminate emissions. As an example, if you connect a hose that has air in it and you determine that air may be pulled into the system, it will be necessary to lightly purge the hose of air. This is preferable to allowing air to enter a system, where it may cause acid formation and thus cause the emission of the full system charge.

The second important point is that it is the responsibility of the service technician to establish or determine the integrity of the system and the system must not be recharged/regassed with refrigerant if there are doubts about the integrity of the system.

Appropriate repairs must be undertaken before recharging the system with refrigerant.

Directly connected with this is the third point, the question of 'topping up' of air conditioning systems. Is it allowable? **THE ANSWER IS NO.**

All air conditioning systems presented for servicing or repair must be completely serviced, including a determination of the integrity of the system (in other words, is it likely to leak?) irrespective of cost,

proposed sale of the vehicle, scrapping of the vehicle or any other excuse NOT to complete the service.

We have all heard these excuses from customers hundreds of times. The full servicing of air conditioning systems is a **LEGAL REQUIREMENT** (as opposed to topping up). Severe penalties will result.

The fourth aspect of the Code is one that will be open to the most discussion - leak testing.

Everyone has a different opinion on leak detection. What is the best method? The answer is there is no single answer.

Nitrogen pressure testing is the most complete solution, but it has its limitations. Much of a modern system is inaccessible. So even if you are losing nitrogen pressure, how do you actually locate the leak?

You cannot use a soap solution because you cannot access a large portion of the system. This is where dye leak detection, electronic sniffers and visual inspections come into play. Despite the opinion of many industry professionals there is no single formula or one size fits all, for leak detection.

PROBLEM CORNER

2001 Holden Ts Astra, engine type Z18XE dealer fitted AC, Delphi compressor. Would not turn on.

Pressure switch fault code P1540. Pressure switch replaced - fault code would not clear. Compressor clutch OK.

The scanner would not get a pressure reading from the pressure switch.

The VASA 'Brains Trust' asked, "I know this sounds crazy, but has he changed the dryer as they can be blocked with comp debris and not allow the pressure switch to work. If this is the case he will need a new comp as well as the dryer."

Neither compressor nor filter were replaced.

The comp can start to overheat, shorting out a thermal diode in the coil. Check the continuity of the coil first. As this is happening, the comp pumps out into the system a fine copper like powder, which gets into the orifice of the pressure switch and worse case scenario blocks the drier. If the comp engages but no performance it is probably the control valve in the comp. These can be replaced, but the recommendation was that the comp be replaced, as replacing the valve is only a short term repair. Always change the receiver drier no matter what.

Biggest convention incentives ever

When a VASA member buys ONE full registration for the 2008 Wire & Gas Convention in late June, apprentices from the same workshop are FREE and there's no limit.

Technical staff from the same workshop are **HALF PRICE** and again there's no limit.

Every delegate receives full convention benefits including training, entertainment and trade show entry.

This is the biggest incentive yet to encourage VASA workshop owners to introduce their staff and apprentices to the best collection of speakers, trade exhibits and training ever assembled in one place for the vehicle air conditioning and auto electrical technicians of Australia and New Zealand.

FOR THE BEST DEAL - REGISTER BEFORE 25 APRIL

REGISTRATION FORMS ARE NOW AVAILABLE

If you haven't received one, go to

www.wireandgas.com.au

OR send an email to

wireandgas2008@ozacomm.com.au

OR Phone 07 3854 1611



Wayne Gardner, World 500cc motorcycle racing champion and Australian V8 Supercar Champion is a keynote speaker.



He will inspire you with his story of how he built a successful business after retiring from racing.



Anyone can be a conventioneer - all you need is a desire to learn and have fun at the same time

Conventions are powerful adrenalin rushes.

Until you've been to one, you just can't imagine the atmosphere. It's the best way to discover new things and have fun at the same time (ask any of the people in the pic below).

Where else can you see the biggest trade show in your industry, hear the most qualified and informative trainers and speakers, see the best entertainment, AND be in one of the best environments in the land AND write it off as a very legitimate tax deduction?



Those technicians who were bitten by the convention bug in previous years, keep coming back.

DIY air - wonderful for the environment!

Letter from America - Julian Hentze

I bet there were times when you looked at your ARC licence and wondered if it was a waste of time.

Spare a thought for your counterparts in the USA.

It's finally starting to get warm here, and for a person whose last address was Brisbane, I have been having issues with the minus symbol in front of the daily temperature.

So when it started to heat up, I celebrated by pushing the AC button on the dash of my trusty Oldsmobile. She only cost \$500 so I should not have been surprised at the lack of action.

Looking under the bonnet really didn't help. I was in the Walmart Auto section



and found on the shelf a selection of pressurised R134a cans, with connector tubes. Did I need a licence to purchase this product? No. Did I need a recovery machine to ensure that I complied with the environmental regulations? No. Did I need a weekend with Grant Hand?

So I asked a bush mechanic friend how he fixes his AC.

"Easy," he said, "you buy a can of R134a and drop it in." How much do you put in, I ask? "Till the can is empty." How much refrigerant does your car take, I ask? He didn't know. When do you take it to a workshop?

"Don't have to. It usually stays cool for a few weeks and it's only \$9 a can."

Hi and welcome aboard

VASA (inc AAAE) extends a hearty welcome to the auto electricians listed below who have climbed aboard our band-wagon of technician and workshop members.

If existing VASA members know any of these workshops in your locality, do the right thing and drop around with a six-pack and shake them by the hand - then promise to work together to keep all customers in the VASA network. This neighbourly gesture will do you both good.

Frank's Auto-Electrics, GEELONG NORTH NSW
Williams Auto Electrician, CAIRNS QLD
Lockton Auto Electrics, NAROOMA NSW

AND...a big welcome to the following new members:

DiesElectrics, DALBY QLD
Suncoast Mobile Air, KALANGUR QLD
JAS Oceania, National Wholesaler, MELBOURNE VIC

When you get a lot of people together from the one industry, there's a great camaraderie and what appears to be a fun time is actually a very intensive learning time.

You find technicians standing around coffee machines and bars, solving everyday problems that they encounter in their workshops. They meet their suppliers face to face, they make valuable contacts in technical areas that would never be possible during a normal working day.

Those who attend our conventions are able to go back to their workshops and immediately put into practice what they have learnt.

Bring an open mind to the Wire & Gas Convention this June. You will surely approach your business with a whole new outlook when you return.

The back office moves to Melbourne

In order to do its work more efficiently, with the financial resources available, VASA has moved its back office to a kindred association, AIRAH, in Melbourne.

AIRAH is a bigger organisation covering the stationary refrigeration sector, but has in-house facilities to manage the administrative paper work of smaller associations.

In the current annual renewals, members will notice some changes, including a different bank account for on line payments.

For day to day member activity, little will change. The CEO still works out of Southport in Queensland and the Board of Directors still oversees all activity.

Over time, big improvements are planned in the delivery of technical services through the independent magazine, The Automotive Technician, which was devised by VASA and AAAE senior members.

In the next issue of Hot Air, we will devote a lot of space to this new way of gathering technical information, and problem solving.

In the meantime, it would be helpful for members to pay their dues on time.

A 10% discount applies to fees paid promptly, so take advantage of this.

For all inquiries about your membership status, please now call 03 8623 3019 or fax 03 9614 8949 and a very efficient Sandra will help you out. Email address is still secretary@vasa.org.au

Refrigerant charge rates charts can only ever be a guide. In fact, you don't need them at all.

A spate of requests for charge rate charts means that the air conditioning technician needs to be reminded once again that these charts are really not the answer and that if used, they can only ever be a rough guide. First preference is to use the recommended rates as specified by the car manufacturer.

VASA's technical coordinator Grant Hand, of Automotive Training Solutions, stopped producing these charts in the mid 1990s, preferring to direct the technician to the more reliable means of ensuring any vehicle is correctly charged.

As VASA vice-president Mark Mitchell constantly explains, "While ever we still have R134a, the Registered Technicians Program is relevant." The RTP was developed over a period of seven years, and today remains the only true AC bible.

So, from Volume 1, Bulletin 1 (Retrofitting), we offer this refresher course.

The 90% Charge Rule.

When a system is charged with refrigerant we have characteristically used the "weight charging" method. This has led us to the belief that it is the weight of refrigerant that enters the system that is important. In fact it is the LIQUID VOLUME that is the critical factor.

When comparing R134a and R12 there is approximately a 10% weight differential to liquid volume (density differential) .

In simple terms 1kg of R134a will occupy a 10% larger volume than did 1kg of R12. Now ask yourself the question - where is the 10% extra liquid going to fit in the system? The answer is nowhere - you will be in the overcharge

band with excessive head pressures and liquid flood back a distinct possibility.

The answer is to reduce the WEIGHT charge by 10%. This will ensure the liquid volume in the system is equal to what it was designed for.

The system should operate correctly if component compatibility is acceptable. If, however, problems start to arise before the 90% charge ratio is achieved then there is either a limitation in a component design/size with respect to its ability to handle R134a or there is a component malfunction which is limiting its ability. These limitations are usually related to condensing capability.

R134a - Sight Glass Charging

Most technicians by now realise the limitations of sight glass observation of R134a systems. It must be identified however that the sight glass (if fitted) may still, in many systems, be an indicator of charge rates.

It is just that it cannot be used as an absolute indicator - because in many cases it will bubble or even foam severely. Our role is to identify charge rates by all of the indicators that the system under test show.

Why does the sight glass foam/bubble on R134a where it didn't on R12?

Basically there are four reasons for a bubbling/foaming sight glass:

- 1 Oil foaming
- 2 Turbidity of R134a
- 3 Lack of Condensing
- 4 Undercharge

Oil Foaming

Basically a problem of retrofitting.

If mineral oil is left in the system excessive foaming and agitation with the R134a compatible synthetic oils may occur. This renders the sight glass useless.

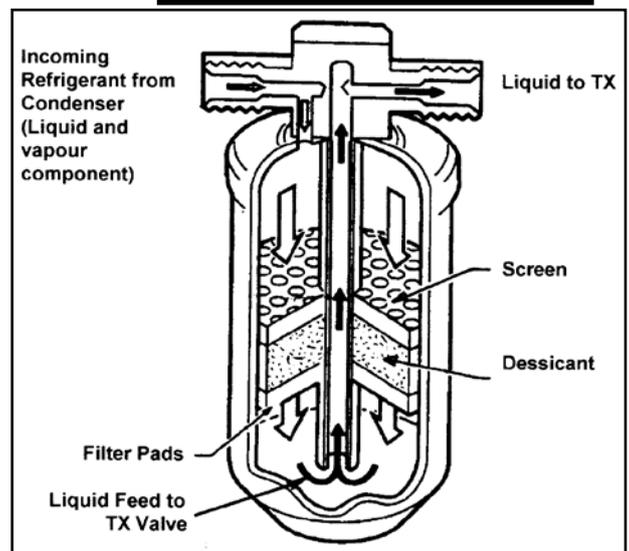
Low charge rates are undesirable in retrofit for 4 reasons

1. Inadequate performance under high heat loads
2. Excessive superheating under high heat loads
3. Reduced oil circulation
4. No safety margin when minor leakage occurs

It is imperative for the technician to identify the cause of a foaming sight glass.

It must be proved it is not an undercharge or lack of condensing in retrofitted systems.

Lack of performance under high heat loads will result from both conditions.



Refrigerant charging

Charging Options

There are four options of charging:

1. Weight charging
2. Sight glass charging
3. Pressure charging
4. Monitoring of condenser subcooling

None of the above methods of charging should be used in isolation.

In all cases pressures must be analysed and in retrofitted systems subcooling checks are recommended to verify correct charge rates and/or satisfactory condenser performance.

WEIGHT CHARGING

The simplest of all methods of charging is to weigh in a specified quantity of refrigerant as specified by the manufacturer.

Before weight charging a system ensure the following factors are taken into account.

A thorough inspection must be carried out to ensure the system is unaltered from manufacture.

To accurately weight charge a system the hoses must be 'pulled dry' or an allowance made for the quantity of the refrigerant that is retained in the hoses at the completion of charging.

Note: A 2 metre set of service hoses will contain approximately 100 grams of refrigerant unless they are pulled dry.

When weight charging retrofitted systems DO NOT pull the hoses dry or balance off the gauges unless some pre-testing has been done on an identical system to ensure that the extra quantity pulled into the system will not drive head pressures up to an unacceptable level.

When pulling hoses dry once the high side valve depressor is backed off the high side pressure can no longer be assessed.

The extra quantity (up to 100 grams) can be a massive overcharge to a retrofitted or small capacity system. It is for this reason it is strongly recommended the hoses are left full on completion of charging UNLESS prior verification testing is performed.

SIGHT GLASS CHARGING

Contrary to popular opinion the sight glass may still clear at correct charge rates in a correctly operating system.

While weight charging or pressure/subcooling charging keep an eye on the sight glass. If it happens to clear then it still remains a valid indicator.

The important thing to realise is it may not clear and this is where the other indicators are critical.

PRESSURE CHARGING

In reality pressure charging should never be done in isolation. It should be "married" with weight charging, sight glass indication and liquid line subcooling as required.

Pressure dynamics will vary significantly dependent on the heat loads placed on the system. However there are some rules that can be used for basic pressure analysis of both genuine and retrofitted R134a systems.

In a correctly operating, correctly charged system the evaporator and the condenser will "Balance Off".

In simple terms this means the condenser will dissipate the heat that the evaporator absorbs - in fact it has to also dissipate suction line superheat and compressor superheat.

For this reason the condenser's heat radiation capacity is above that of an evaporator.

Critically an evaporator will absorb approximately 25 to 30°C out of the cabin

air. On humid days this temperature absorption factor will drop because it has the dehumidification heat loads to contend with.

If the evaporator is absorbing 30°C out of the cabin then it stands to reason the condenser will need to 'dump off' heat at a differential of 30°C.

Due to the frontal surface area of a condenser being considerably larger than an evaporator, its efficiency as a heat exchanger is higher. Given this, well designed systems will 'balance off' when the refrigerant in the condenser is approximately 25°C hotter than the air surrounding the condenser.

Using this +25°C rule will arm the

technician with a basic guideline of establishing what the condensing pressure should be for normal heat loads of 20 to 35°C (moderate to low humidities).

Most technicians are familiar with monitoring high side pressures - but in both retrofit and genuine 134a systems there are significant advantages in using condensing temperatures as the benchmark for system analysis.

Example:

Sample the air temperature the condenser is working with - ie the temperature of the air 50mm in front of the condenser with no air flow.

Let's use the example of 28°C.

Condenser air on = 28°C
Air to Refrigerant Differential required for adequate condensing = 25°C
= Ideal condensing temperature 53° C

= (Refer to P/T chart)
Approximately 1320kPa (190PSI)

Therefore this system operating and charged correctly will operate with a head pressure of 1320 kPa (190 PSI) to give a condensing temperature of 53°C. Of course this is in an ideal world with everything working perfectly - but the reality is we must make an allowance to the condensing temperature of + 10% for low humidities and + 20% for high humidities (above 60% Relative Humidity)

In the real world a condensing temperature of 60°C (1580 kPa) (230PSI) would be acceptable for low humidities and up to 66° C (1800 kPa) (265PSI) for high humidity conditions.

Using these guidelines establishes a basic pressure/temperature rule for ascertaining head pressures but there are limitations to this clinical approach.

Low Ambient Conditions

Under low ambient conditions (below 25°C) especially when humidities are also low the +25°C rule is limited.

Going back to the basic system operation, why would the condenser establish a 25° differential when the evaporator is only absorbing 18° of heat (18° day)?

The answer is it wouldn't.

It would only establish a differential to balance off the system which will only be 18°C (possibly only 15° to 16° given the efficiency ratio condenser to evaporator).

For low ambient conditions it is therefore recommended the "doubling rule" be used. The doubling rule is simply - sample the ambient temperature and double it.

For example: 18°C day + 18°C differential = 36° condensing temperature = 810 kPa (118 PSI)

Once again an allowance of 10% must be made for low to moderate humidities and 20% for high humidities (above 60%).

High Ambient Conditions

At above 35°C, especially with high humidities, the evaporator is working at peak capability. The TX valve will be open for a considerable percentage of time causing high flow rates and dense suction vapours to the compressor and the flow rate through the condenser to be higher.

These factors "load" the condenser to a point where it will need to operate at approximately 30°C higher above its sourcing air (air on) in order for it to dump heat effectively.

NEXT ISSUE OF HOT AIR:

DETERMINING CHARGE RATES BY PRESSURES

Members can read the entire technical bulletin now by logging on to www.vasa.org.au then click on the members library and follow the links to RTP Bulletins. Choose Year 1, Retrofitting Bulletin 1

get free subscription and full use of TaT services. HOWEVER, the subscription to TaT is for individual technicians. So what we recommended to VASA members was that the workshop retain the FREE subscription, but individual technicians within the workshop should join up as subscribers, either the workshop pays, or the technician pays.

The way TaT will work, especially with its problem solving system, will rely on personal contact with the technician whose head is under the bonnet of the problem car. This is the key to the success of the training and skills development program which TaT has developed.

So the workshop may well get a lot of information out of its FREE subscription, but when the time comes to get a problem solved on a particular vehicle, TaT experts will want to talk to the technician on the job, and if that technician is not a signed up TaT subscriber, they will not get this special service.

It's really all about empowering your technicians to improve your workshop efficiency and train your people at the same time,

So any VASA member with a query about TaT, should call the technical director, Jeff Smit, at 02 9966 8600.

The last word...



Official VASA website is: www.vasa.org.au

Official convention website is: www.wireandgas.com.au

Convention registrations can be arranged through: wireandgas2008@ozacom.com.au

Official TaT website is: www.tat.net.au



For all inquiries about your membership status, please now call 03 8623 3019 or fax 03 9614 8949 and a very efficient Sandra will help you out.

Email address is still secretary@vasa.org.au



Hot Air is the only official journal of VASA inc AAAE and is published every two months and mailed to members.

All inquiries about Hot Air should be directed to the CEO, Ken Newton at secretary@vasa.org.au, or ph 07 5591 6274 or fax 07 5591 8172.



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Organisations like VASA do their very best through volunteer efforts of their directors and others to provide services and generally look after their members.

But it's a two way street. An involvement by members is essential to our survival. If the directors don't know what you are thinking or worried about, how can they help you?

So please, spend a few minutes to send a few lines to VASA, any time you feel you have something to say:

secretary@vasa.org.au



The Automotive Technician

With each issue of Hot Air members receive their complimentary copy of the bright new technical magazine devoted to helping the technicians of Australia and New Zealand to 'problem solve'.

There is a little confusion in some minds about the relationship. The magazine was spawned from the corridors of VASA and AAAE, and its directors are all leading lights within these organisations. It is an independent publication serving not just AC and electrics, but all technical aftermarket skills.

The Automotive Technician has vowed to support any industry association, but because of its origins, TaT has an obligation to support VASA (inc AAAE) and its ideals.

There are huge bonuses for VASA (inc AAAE) members, making membership of the association not only desirable, but very cost effective.

Here's where the confusion comes in. A couple of members sent in subscriptions to TaT, and then found out their workshop was getting TaT and its services FREE anyway. So why do they need to subscribe.

The workshop - the VASA member - does