VASA Hot Air NEWSLETTER
June 2012
The Automotive Air-conditioning, Electrical and Cooling Technicians of Australasia

Corporate affairs:secretary@vasa.org.au Phone: 0438 569 517 www.vasa.org.au
Administration and membership: admin@vasa.org.au 30 Dale Street, Brookvale NSW 2100 Ph: 02 9907 1354 Fax: 02 9907 1356

VASA's Registered Technicians Program (RTP) still doing a great job for young technicians

VASA's own Registered Technicians Program, referred to widely as the RTP, remains the organisation's greatest single technical asset.

Devised by the first technical committee of VASA, and written by Australia's foremost trainer in air conditioning repair and practice, Grant Hand of Automotive Training Solutions, the RTP was rolled out over a seven year period, finishing in 2002.

During that time, no fewer than 52 technical bulletins were written covering electrical, refrigeration, retrofitting and air conditioning diagnosis.

With many of the bulletins, Grant produced a questionnaire to encourage young technicians to respond to the courses and achieve certificates of completion. This process, which involved Grant interacting personally with many young technicians, was considered one of the best training platforms ever undertaken for air conditioning technicians in Australasia.

The RTP is still regarded as the only complete training program covering all aspects of retrofitting and maintenance of vehicle air conditioning systems ever written. It is often called the bible of air conditioning, and despite its age, the information contained in its bulletins is as relevant today as it ever was.

Many VASA members still use the bulletins to train young technicians because there is just nothing like it anywhere.

The latest to verify the value of the program is Benjamin Perry, of long time VASA member Mr Cool Automotive in Brisbane. Ben's father David is highly respected in the industry, and now Ben is helping to steer the business in new directions, with the help of his almost completed business management degree.

One of the growth areas of the business is in compressor remanufacturing, which David began some years ago.

The trading name he adopted, Australian Auto Compressor Company, is being given a new prominence as a diversified add-on to the retail workshop, Mr Cool.
Ben says Australian Auto Compressor Company is accredited by Denso as a company capable of remanufacturing compressors back to OEM standards.

Ben has trained at Denso, and is now using the RTP to upskill his technical staff.

Technicians Harry Singh and Josh Martin are working through the RTP at the rate of one bulletin per a week.

Ben expects to complete most of the training by late September. The technicians are simultaneously completing TAFE courses.

He says the technicians firmly believe that the VASA training program has given them deeper insight into principles of refrigeration than they could have gained anywhere else.

"So up-skilling outside the TAFE system is exactly the results we are achieving," said Ben.

The RTP training is supervised by Ben and when the program is finished VASA will issue certificates of completion.

Mr Cool technicians Harry Singh, Benjamin Perry and Josh Martin using an anemometer for testing condenser airflows.

Bob Reynolds hangs up his gauges after a lifetime in mobile air conditioning... well, not quite

A real pioneer who worked on the first farm machinery with air cooled cabins

Long time VASA member Bob Reynolds, well known for his diesel expertise around Henry Lawson country, Grenfell and Forbes, west of Sydney, has hung up his gauges – well not quite.

But at 77 years of age, he's trying to call it quits and enjoy what he calls his semi-retirement.

He has closed down Reynolds Tractor & Diesel Service in the heart of Grenfell after 21 years and relocated to a shed on his home acreage at the edge of town.

Bob's expertise in diesel repairs and farm machinery air conditioning has made him a popular figure in his district, and he could be said to be a true pioneer in cabin air conditioning in the big harvesters and tractors of this rich grain growing area.

He told VASA, "I enjoy the industry and its challenges. I was very involved with the agricultural machinery in the early stages of enclosed cabins and air conditioning and rest assured we were on our own.

"We had to sort out the manufacturers' shortcomings. It was all good learning. Current technology leaves some of us oldies lacking. However, we still have common sense."

Bob is an honorary life member of the Insitute of Automotive Mechanical Engineers, and has served as an examiner for the Institute for the past 40 years. He's still called on today to test trade qualifications.

He joined the Institute as a student member in 1953.

"Both the IAME and VASA I hold in high esteem. You have to belong to organisations like this to keep up your skills and stay connected.

"I am determined to participate in the trade for as long as possible.

"Many thanks for what VASA has given to me and I wish the organisation a very healthy future," Bob added.

Bob did his apprenticeship as a diesel engineer with the old firm of Ferrier & Dickinson in Sydney, the home of Gardner diesel engines.

Many thanks for what VASA has given to me. I hold you in high esteem

He was later to work as a motor mechanic at the Australian Small Arms Factory at Lithgow, and then moved to underground mines around the district as a diesel engineer.

In 1965, he and his brother John started Reynolds Brothers Motors, a Ford tractor dealership and repairer at Forbes, which continued until 1982.

"The US tractors from John Deere were the earliest to put cabins with air conditioning on their tractors. Up till then the farmers drove their tractors all day in the open, covered in dust and dirt.

"Local manufacturers Ford and International went from tractors with no cabins at all in the early 70s to cabins with evaporative coolers by the late 70s," Bob recalls.

"This technology didn't suit all climatic conditions and when they moved into proper air conditioning, it was a lot of trial and error.

"Dust in a farming environment was the killer but even worse was how to get rid of the heat out of the condenser. Tractors don't travel at any speed through the air. The air conditioners could cool down the cabin, but the heat would cook the daylights out of the system.

"We did a little bit of aircon installation, but mostly, our role was to keep the air conditioning systems alive and the farmers happy," Bob said.

His proudest moment was being invited to be the plant mechanics judge in the New South Wales finals of the Work Skills Olympics in 1987.

VASA president Ian Stangroome said Bob was a real pioneer, and VASA would continue to send Bob his Hot Air newsletter and TaT magazine for as long as he wants them and his membership fees will be suspended.

Wire & Gas 2012 in Geelong, Victoria has attracted its full complement of delegates.

Over two days, 100 technicians, including a few of their business partners, will attend four of the best training sessions ever assembled under the VASA banner.

Top trainers Grand Hand and Jack Stepanian will deliver basic and advanced courses on air conditioning and engine management systems, while TaT Biz business trainer Geoff Mutton will help workshop owners improve their bottom lines, through better understanding of profit and loss statements and how to structure staff to make the most money from their labour.

Thanks to Ford Australia and in particular their product development manager Steve Pohlner, delegates will be shown the workings of the $20 million Advanced Centre for Automotive Research and Testing (ACART) environmental wind tunnel, the largest in the southern hemisphere. VASA is only the second organisation to be allowed access to the facility.

As well as the training, VASA will stage its annual general meeting and election of directors, and conduct a forum where all delegates get to speak their minds about issues which concern them. The main topic, without doubt, will be the imminent rise in the cost of R134a as a result of the carbon tax, and the effect this is likely to have on the industry.

While Wire & Gas has been scaled back from the big conventions and trade shows of the past, it still depends on the support of wholesaler and manufacturer members and friends. VASA sincerely thanks the following brands for their continuing support.

SCA SuperCool Asia Pacific

ashdown ingram

ADAIR Auto Air Products

CoolDrive DISTRIBUTION

HELLA

SANDEN

TaT The Automotive Technician

BG

www.OLCT.co

The president wants a word

Make good use of the network

The release of this edition of Hot Air coincides with Wire & Gas 2012 in Geelong over the June long weekend.

You may well be reading this newsletter at some point over the long weekend. If you are one of the fortunate attendees, congratulations, and I trust you have a rewarding and memorable weekend.

By attending, You have made a choice to work on yourself, improve your knowledge and skill base, and have an influence on the future of your industry organisation and your industry overall.

Remember, if we or our businesses are not growing, we must be dying. If we are standing still, we are really going backwards, as those who believe themselves to be our competitors pass us by.

We are either green and growing or ripe and rotting, and which one we are is our personal choice. By making the choice, whatever that may be, you are taking the wheel and driving your own bus. Who's driving your bus?

The Wire & Gas events provide an atmosphere and opportunity for you to keep hold of the wheel and maintain control of your bus. A mixture of technical and business training, an annual general meeting, an industry forum and socialising is the perfect opportunity for members of VASA and industry to come together and share points of view, exchange ideas and swap stories.

It is also an opportunity for us all to acknowledge those within our industry who have contributed above and beyond.

The quality of the trainers, the calibre of business owners and technicians and industry representatives and, of course their attending partners guarantees a weekend of high level energy, enthusiasm and renewed vigour for what often seems to be a difficult and challenging industry.

These challenges include the ever changing and increasing level of technology in the motor vehicle, the introduction of the carbon tax to take effect on 1 July, and the introduction of another refrigerant into our vehicle pool.

The last two issues will certainly lead to greater use of unapproved, unregulated and less than ideal alternative refrigerants.

The technology changes we face are increasing at a rapid rate. We may not be able to change that but we can keep pace.

How we deal with these challenges will be dependent upon how we educate and inform ourselves of the options open to us.

Networking with quality members of our industry is not only motivational and inspirational, but will often provide solutions to the everyday problems we face.

There will always be challenges and there will always be someone wanting to take control of your bus. Seriously, it could even be a government fixated on a carbon tax.

By continuing to be educated and informed you can maintain control and steer your way to success as a technician, a business owner and a valued member of your industry.

I look forward to catching up with everyone in Geelong.

VASA and MACS agree - lead by example

Too many aftermarket automotive workshops seem to suffer from inferiority complexes which can impact on their bottom line.

How workshops present themselves can have a direct relationship to their charge-out rates.

As trainers often say, "If you look good and can confidently demonstrate your knowledge and professionalism, you can justify a price increase."

In today's market, where dealerships are putting a lot more into retaining their customers long term rather than just through the early warranty period, aftermarket workshops are often struggling to get a greater return for the hours and the work they do.


Andy Fiffick, MACS Chairman

It's not that workshops are not busy, it seems that the reward is falling short of what it should be.

There are many reasons why this is happening, and for many workshop owners, seeking expert advice or attending training events may be the only way they can discover how they can turn their business around for the better.

However, VASA was interested to read the views of MACS Worldwide chairman Andy Fiffick, who recently called on his members throughout America to put some effort into improving what he called the lacklustre image of the industry, as well as the lacklustre profit margins.

"We need to overcome our negative image if we are to win the trust of the public, raise our prices and attract young talent to our workshops," Andy said.

Andy then went into detail about all the things a workshop owner and staff could do to win public condence and improve the public's perception of aftermarket workshops.

It was a strong plea for people to drag themselves away from their after-hours computer or mobile phone and do what previous generations did so well – join clubs and special interest groups, help schools and charities, use local media to tell the world about the great work being done by the aftermarket workshops.

In other words, lead by example.

"Make sure your shop is clearn, neat and your staff looks professional. Make your reception area user-friendly, and offer free WiFi. Believe in yourself, your staff and your shop's abilities.

"You will gain the respect of the public, grow your business and attract new talent into your shop.

"We are the good guys and most of our regular clients already know it. Let's let the publc in on the secret and give them a positive, long lasting impression," Andy added.

VASA can only agree.

Does this person represent us?

Prime Minister Gillard is treating parliament and those industries which have much to lose under the carbon tax regime with utter contempt which befits a third world dictatorship rather than an Australian democracy.

In recent weeks, in the House of Reps, Warren Truss, the leader of the Nationals asked this question:

"Is the Prime Minister aware that her $23 a tonne carbon tax will result in a tax of $75,000 a tonne on refrigerant gas, and that this will cost a large meatworks an extra $55,000 a year, and a supermarket $17,000 a year; and that the cost of servicing a home refrigerator will be an extra $300? Does the Prime Minister expect those extra costs to be passed on to consumers?

Ms GILLARD (Lalor—Prime Minister): I would say that, as usual, what we are seeing is an attempt by the Opposition to make wild claims and cause fear in the Australian community. We have seen it consistently with the claims about astronomical increases in the cost of living. We have seen it consistently with the Leader of the Opposition saying the coal industry would close.

Then she raved on and on accusing the Opposition of misleading the public until Mr Truss reminded the deputy speaker that Gillard had not addressed the question.

The deputy speaker agreed, saying "I will ask the Prime Minister to be relevant to the question.

Ms GILLARD: The point I was making was, like with the many other wild claims by the opposition, we will see the truth on 1 July.

One of VASA's directors summed it up for all of us: "God help us all. These people could not formulate a sound business plan for a lemonade stall at a school fete.

"We are fighting with both hands tied behind our backs when a query raised in question time can be dealt with in such a contemptuous manner by the leader of our country. What right has she to be so flippant with regard to a matter that is so important to so many?"

VASA Technical Bulletin
Category: REFRIGERATION
Volume 1 Bulletin 1

Hot Air is revisiting the RTP in the order in which it was first delivered to members a decade ago. The original technical bulletins can be downloaded by VASA members at www.vasa.org.au

This bulletin deals with the basics of refrigeration and for the purpose of understanding the concepts some broad generalisations have been made.

Future bulletins will significantly expand on the concepts presented here, and the generalisations will be clarified.

For technicians who have extensive trade experience or solid theoretical refrigeration backgrounds, please accept the generalisations contained within this text.

To interpret the advanced facets of mobile air conditioning systems it is imperative that the operational concepts of refrigeration or air conditioning systems are fully understood.

This covers the properties of refrigerants (including pressure and temperature relationships) and the dynamics of how that refrigerant behaves in the air conditioning system.

Historically, the mobile air conditioning industry has been built on R12 with simplistic control of the systems.

There have been changes on a number of fronts, namely the change from R12 to R134a, the unfortunate introduction of various azeotropic blends adding complexity to interpretation and diagnosis of systems, and an increased complexity in the management of the air conditioning system. This last point, for example, includes its interface into the engine management control and/or full climate control.

Other changes include:

- various flushing agents being used which in some cases are not entirely removed, thereby changing the physical and operational characteristics of the refrigerant
- increased complexity in vehicle design and the addition of extra heat loads on the system.

These changes cause us to rethink the way we approach the servicing, diagnosing and repair of air conditioning systems.

Let's face facts. R12 was easy – clear sight glasses, simply designed system and a refrigerant extremely tolerant to limitations in system design and servicing procedures.

We need now to go back and grasp the principles of refrigeration in order to be a professional in this industry.

Refrigerants

Many people view air conditioning from one angle only – that it absorbs heat from inside the cabin, and dehumidifies the air in the cabin.

It is the refrigerant in the system that actually absorbs and releases heat.

However, heat is a form of energy and energy cannot be created or destroyed – it can only be changed from one form to another or shifted from one place to another. This is a basic law of physics.

If this is applied, the energy or heat that is absorbed in the cabin has to be dissipated outside the cabin. This is the role of the two principal heat exchangers of the air conditioning system. The evaporator absorbs heat from inside the vehicle and the condenser dissipates that heat outside the vehicle.

It is vital to identify that it is not the heat exchangers that do the actual work – it is the refrigerant that is travelling through them that actually absorbs and releases heat.

For a refrigerant to be efficient, it must:

- readily vaporise at low pressures
- readily liquefy at high pressures
- be a substance that has an appropriate vaporisation/ condensation pressure range that is effective and usable
- be a substance that has a large latent heat of vaporisation
- have a critical temperature far higher than the condensation temperature.

Refrigerants must not only have certain operational qualities, they must also have environmental and safety qualities as well.

In addition to these operational qualities these additional features are required of any refrigerant:

- non-toxic
- non-flammable or explosive
- stable throughout the entire operating range (no change in its properties and must not decompose)
- soluble in oil
- safe to the ozone layer.

A number of refrigerants have suitable operational qualities but fail in one or more of the above areas. It is for this reason the car makers have chosen R134a.

It possesses all of the operational qualities of R12, with slightly more sensitivity due to its pressure/temperature relationship, with no limitations from a safety, or material compatibility perspective.

➔

REFRIGERATION LAW No. 1

Heat will always move from a warm object to a cooler one whether it be in solid, liquid or vapour form.

The key point to understanding and diagnosing refrigeration systems is that heat will always travel from hot to cold.

REFRIGERATION LAW No. 2

To Refrigerate is to Remove Heat

Pressure/temperature relationships of refrigerants

How does a refrigerant absorb heat from inside the cabin and dissipate it to outside the vehicle via the two heat exchangers?

First we must understand the dynamics of heat transfer.

There are three ways in which this heat transfer can take place:

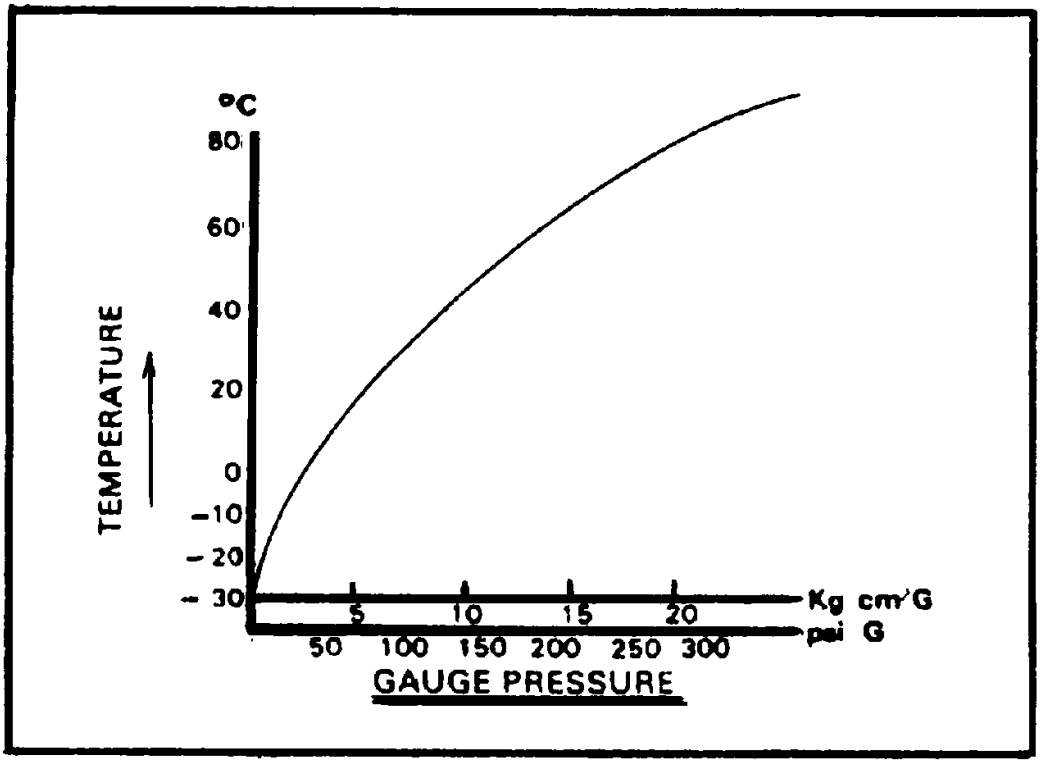
1. *Conduction*
2. *Convection*
3. *Radiation*

Given Refrigeration Law No.1, how do the heat exchangers absorb or radiate heat? The answer lies in the property of a refrigerant to have a direct pressure/temperature relationship.

The graph below shows that as we raise the pressure of the refrigerant we raise its temperature.

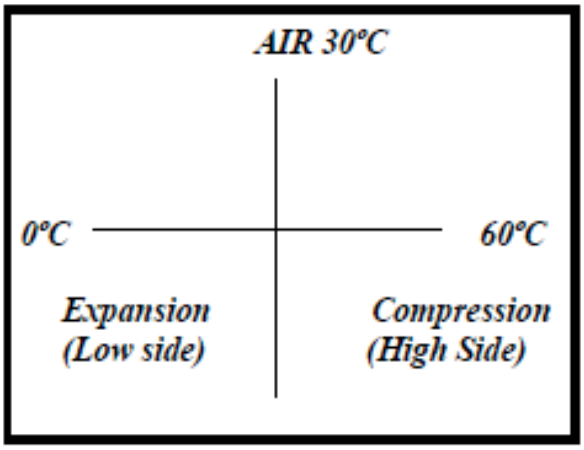
According to the graph:

- At 200 kPa (30 psi) the temperature of the refrigerant is approximately 0ºC.
- At 1500 kPa (220 psi) the temperature of the refrigerant is approximately 60ºC.



This characteristic curve represents the pressure/temperature relationship of R134a

What does this achieve? How do we use this principle? This is where the compressor and TX valve/orifice tube come into play. These are the components responsible for basic pressure generation in the system.



The compressor, acting in conjunction with the TX valve/orifice tube generates the basic high side and low side pressures.

If the pressure in the evaporator is controlled to 200 kPa (30 psi) then the temperature of the refrigerant will be about 0° C.

If the pressure in the condenser is controlled to 1580 kPa (220 psi) then the temperature of the refrigerant will be about 60° C.

If the temperature of the day (ambient temperature) is say 30ºC and the system has created a low side of 0° C (refrigerant temperature) and a high side of 60° C (refrigerant temperature) then the refrigerant in both heat exchangers is at a temperature that will facilitate heat transfer (in opposite ways) to and from the air.

By applying Refrigeration Law No. 1:

- the refrigerant inside the evaporator will absorb heat from the relatively warm cabin air
- the refrigerant inside the condenser will dissipate heat to the relatively cooler air.

This leads us to Refrigeration Law No. 2.

Inside the vehicle, the heat is absorbed into the relatively cold refrigerant (30° C cabin air to 0° C refrigerant).

By 'sucking the heat out of the air' we refrigerate the cabin air.

Conversely, outside the vehicle, the refrigerant is much hotter than the air, thereby allowing for heat dissipation at the condenser (providing airflow is adequate).

Change of state characteristics

Sensible heat can be felt and can be measured with a thermometer.

The first of the four Refrigeration bulletins in Volume 1 will be continued in the next issue of Hot Air.

All RTP bulletins can be accessed by members online at www.vasa.org.au

When a refrigerant (or any substance) changes state, heat must be either absorbed or released. When dealing with air conditioning systems there are two forms of heat to consider.

Sensible heat

Sensible heat is the heat that will change the temperature of a substance. Sensible heat can be felt and can be measured with a thermometer.

Latent heat

Latent heat is the principal heat form needed in an automotive air conditioning system. Latent heat is the heat that is transferred in a change of state of a substance. The refrigerant changes state in both the condenser and the evaporator by absorbing and releasing heat. The absorbed or released heat is known as ***latent heat of vaporisation*** and ***latent heat of condensation.***

Latent heat is otherwise known as hidden heat because it cannot be felt or measured, it can only be observed by causing a change of state.

The first carbon tax shock waves have hit that section of the aftermarket vehicle repair industry that handles refrigerants and air conditioning repairs and maintenance.

After months of speculation about massive price increases to the standard vehicle refrigerant R134a, wholesalers have done their sums and are now giving the bad news to their workshop customers. But more bad news is yet to come.

One workshop owner described his shock when a letter arrived recently from one of his suppliers, advising of a $30 per kilogram increase in the price of R134a from 1 July.

'Wow – that will make a difference to the cost of any air conditioning work,' he said.

'I had been wondering what effect, if any, the carbon tax would have on my business. To be truthful, I thought it would have little effect other than on my utility bills.

'Let's face it, my business is a very small operation. Well, I may have underestimated the consequences of the carbon tax on my business.'

The workshop owner, based in Victoria, told how he is already losing air conditioning jobs to backyard workshops on price.

“It just got me thinking, what kind of job do these blokes do and what refrigerant do they use. I'll bet they don't put R134a in the system. What hope do we have – competing with prices like that.

“I have a feeling this will be a regular thing in the future. Guys like me who do the right thing, use the correct refrigerant, have the correct and current qualifications and do the job properly, will lose out to the cheaper, crappy job, probably because of the carbon tax,” he added.

Professional workshop owners have MP Rob Oakeshott and fellow Independents to thank for this grossly unfair tax that Gillard said we were never going to have.

When a VASA delegation met with Oakeshott around the time of the government vote on the carbon tax legislation, it became all too obvious that he had no idea of the detail of the legislation he voted for, to the point of saying 'that can't be right', when details of the tax burden on automotive workshops were pointed out to him. It was obvious that he was just another number in the government's plan to force a tax on the people.

More than one industry expert has forecast an upheaval in Australian workshop practices, and not for the better.

As many less-than-professional technicians turn to cheaper alternatives, in the process side stepping the current national refrigerant handling licensing scheme, more greenhouse gases than our PM and her crew could ever measure will be belched into the atmosphere. And that was precisely what the great carbon tax was supposed to prevent. It's the pink bats scheme all over again.

But there’s more bad news to come, as mentioned earlier. VASA checked with one of its national wholesaler members only to find that the final price of refrigerant is yet to be determined. It would appear that the $30 increase being quoted is merely the cost per kilo of the carbon tax. But there are going to be additional costs on refrigerant because the companies that import refrigerant are going to have to stump up millions of dollars before they can move their refrigerant off the wharves.

So it’s more than likely that on top of the carbon tax of $30, there will be increases in the price the importers will charge the wholesalers, and because of the dollars involved, it’s also likely that there will be some additional charges factored in to cope with interest on the finance which is going to have to be raised to pay carbon tax on tonnes of refrigerant coming into the country.

Workshops may not know the real price hike until a lot closer to 1 July, when the tax begins.

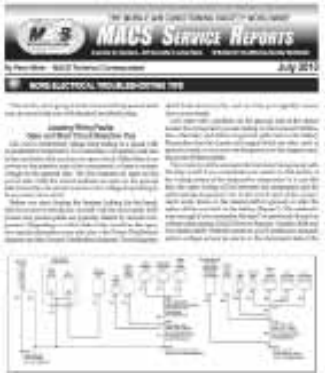
Many workshops are stockpiling R134a as fast as they can to try to stave off the impact of the tax for a year or more, but even that move, say wholesalers, will push up the price of R134a again.

VASA SERVICES

See Automotove Training Solutions chief trainer Grant Hand at his best on this air conditioning servicing DVD that comes with a 24-page workbook. VASA member price is $40.

To order your copy, email secretary@vasa.org.au with your name, membership number, address and phone number and we will post it to you immediately along with your invoice.

The Annual General Meeting of VASA will be held at the Four Points by Sheraton Hotel, Geelong, Victoria at 5pm on Saturday, 9 June 2012. All members are invited.



MACS
MOBILE AIR CONDITIONING SOCIETY
WORLDWIDE

VASA is proud to be affiliated with MACS Worldwide

Members web access

Follow this simple procedure to log in to www.vasa.org.au

1. On the front page of the site, there are two links, one in the top navigation bar and the other on the left hand navigation links. Click on one of the links.

2. Type your member number in the first box. In the password box, type in lower case the first four letters of the suburb in which your membership has been listed.

If that doesn't work, please check your membership number and suburb and try again. Accuracy is essential. ***After five password attempts the site will lock you out, and you will need to wait 10 minutes before trying again.***

TaT assist technical support

One of the big benefits of being a VASA member is that you receive a free copy of the TaT magazine, and with it free access to the *TaT assist* service.

This is a web-only service, so to access technical help, members must go to www.tat.net.au and log in, using the form that is generated when you click this link on the left of your screen.

If this is your first sign-in Click Here and enter the same email you gave with your subscription to generate your login details.

In your case, as a VASA member, your email is already installed in the TaT system, so if it matches, you will be provided with your own password for all future visits.

When you access the *TaT assist* form, you must fill in as much detail as possible to give the experts enough information to consider your problem.

VASA members can also access a growing database of vehicle faults and solutions in the members pages of the TaT website.

New Code of Service for your workshop

The VASA Code of Service, circulated to all members during April and May 2011, is a valuable marketing tool for workshops.

The codes, one covering the interaction with the customer, and the other covering workshop staff ethics, can be displayed individually, or as a set.

VASA recommends that members frame the codes and display them prominently in their customer waiting areas.

Hot Air is published every two months, and is posted to financial members of VASA, along with the current issue of the TaT magazine.

This newsletter contains information which will help you become a more productive technician. You are encouraged to leave past issues in your waiting room, so that your customers can see that you are a member of a professional repair network.

RTP

The RTP (Registered Technicians Program) was a big hit when first written by VASA, and is still considered the bible of air conditioning practice.

Members are encouraged to use this valuable resource for staff refresher courses, and for ready reference on a range of air conditioning issues.

The entire set of RTP bulletins can be found in the members area of the VASA website www.vasa.org.au

Hot Air is reproducing the RTP in its entirety and in a new, dressed-up format.

So far, we have covered the whole of Electrical Volume 1, Bulletins 1 – 4.

In the next issue of Hot Air, we will continue with the first of the four Refrigeration bulletins in Volume 1.