



HOT AIR

NEWSLETTER

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of the Vehicle Airconditioning Specialists of Australasia August 2001

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FILE THIS ISSUE OF HOT AIR IN YOUR VASA FOLDER

How a convention can change an industry's future!

The VASA convention, held in Sydney in mid-June, was a triumph for on-the-job training. It marks the beginning of a new era and expanded opportunities for the shrinking and competitive vehicle air conditioning aftermarket workshops and technicians.

It's a message that VASA has been delivering for the past nine years, but only now achievable through a joint effort with Australia's foremost auto training centre, the Douglas Mawson Institute of Technology in Adelaide.

Delegates at the Sydney convention rolled up in record numbers to the training workshops and special introduction session to the Certificate IV and Diploma developed for the national auto market by DMI. Candidates will do their courses at their own workshop and there's no need to sit in a classroom. Many who are already well equipped in the trade, will find them-

selves with highly marketable qualifications through the Current Competency program. The accent throughout is on all-round training in customer relations, marketing and business management, as well as the more practical technical requirements.



Above: VASA president Mark Mitchell becomes the first to sign up at convention for his Diploma.

STOP PRESS: He passed a month later!

Educational Manager of the automotive program at DMI, Judy Warrington, supported by VASA's training coordinator and advanced skills lecturer at DMI, Grant Hand and a team of five from the Institute, were the big winners from the VASA convention and were delighted with the launch of their innovative program.



Judy Warrington receiving VASA's thanks from convention chairman Tony Heat.

THE WARRANTY WASH-UP

VASA learns you can't insure your way out of poor work practices. We own up to the failure of the warranty program, but out of the ashes, a Phoenix rises. There will be a warranty, but it will be very different.

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NEW:
Less preaching - more technical detail in this issue



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The sartorial splendour of VASA's big Julie, alias convention chairman Tony Heat, who delivered the opening oration - Friends, Romans, Technicians...

The tone of the convention was established at the plenary session, devoted entirely to the richest line-up of quality speakers ever assembled for VASA.

Among them was Bob Hudson, Vehicle Evaluation Engineer for NRMA and Peter Roberts, Manager of HVAC and Powertrain Cooling for Holden Engineering Department. This pair alone were the highest profile Australian automotive industry people ever seen at VASA.

Brand marketing specialist Bruce Haddon of Sydney, as keynote speaker and moderator of the plenary session, provided a wealth of information and challenged every delegate to go home and re-invent themselves as true specialists and business leaders in their communities. VASA has had many motivational speakers over the years, but Bruce's entertaining perceptions of market trends caused a mass mood swing from doom and gloom to promising futures for many workshop owners.

Explaining the DMI - VASA relationship at the plenary session, Judy Warrington explained that the competitive nature of busi-

ness and the global impacts on every aspect of our lives – including the threat to our livelihoods - means that we need to reflect on how we do business, how we gain a market edge, what will the business need to do or look like to be still surviving in ten years time.

"We may think we are travelling along OK with steady turnover of business, regular customers, cornered market share, coping with the GST paper work, then suddenly a competitor comes along and builds a flashy new facility down the road, offers discounts and sells the latest fad items.

"Worse still, some jerk does the same deal over the Internet and the customer does not even have to leave home to purchase the product of choice," said Judy.

The convention, with its ever popular trade show, attracted more than a hundred specialists in vehicle air conditioning from Townsville to Perth, with a big contingent from New Zealand, where VASA's strength is rapidly growing.

President Mark Mitchell said the convention was a turning point for VASA. "Members need not fear about getting their value for money from VASA, now that the training initiatives have been clearly identified and the message has been received with enthusiasm.

"Combined with the unique VASA training program, the RTP (Registered Technicians Program), this now makes VASA the leading training motivator in the South Pacific in specialised automotive aftermarket work. Unlike many other organisations, VASA can see the future clearly from a national perspective and this is our real strength," added Mark.



Convention sponsor faces: John Blanchard CEO of Jayair, Mr Okura MD of Sanden International and Bob Pattison, MD of Calsonic Australia.



Andrew Kavanagh, National Marketing Manager of Jayair formally opened the VASA trade Show in Sydney.



Keynote speaker and mediator Bruce Haddon's interviewing style was an innovative introduction to the speakers at VASA convention. Here, he interviews Bob Hudson of NRMA.



Alan Woodhouse of Actrol Parts, in light mood at the trade show with Carl Heslop (centre) Manager Forane Div. of Atofina and Ray Knight, Business Manager of Atofina (right).

Are Conventions Really Worth it - here's what two service centre operators think



Delegate Les Bennell of Queensland

"Saturdays plenary session was a most entertaining and informative day. Some of the more serious subjects were:

An introduction to Delphi Aftermarket products including the V5 and V7 variable compressors now fitted to a lot of the newer cars by Dr Peter Lin of Delphi.

An informative outline of the procedures required by GM for the development and testing of an effective climate control system for our diverse range of climatic conditions both in this country and the rest of the world, by Peter Roberts of Holden.

A talk on workshop computer programs by ICS.

An introduction to the on the job training program developed and offered by the Douglas Mawson Institute.

The Trade Show is the highlight of the convention for me. Where else in one day, at one location can you see and discuss all of the latest products and services available to our industry. I have already picked up a \$30,000 job using a new product that I saw at the Trade Show. If that doesn't make attending a must then I don't know what does.

It was a most enjoyable and informative weekend as have been all of the previous conventions. I urge all of you to make an attempt to participate in the next

Singapore is OFF October meeting to decide next year's convention/trade show

VASA directors meeting in Melbourne in October will finalise plans for a low budget convention and trade show in Australia around the middle of 2002.

At the same time, the lid will be closed on the planned Singapore excursion in mid 2002, due to poor response despite initial enthusiasm at the Sydney convention.

To those who responded to the Singapore idea, director Glen Watkinson and his wife Christine thank you. The Watkinsons had put in a great deal of personal effort on Singapore, but they acknowledge that times are tough and the business climate is not the most encouraging for reasonably expensive off-shore tours, no matter how interesting.

President Mark Mitchell said the Directors were considering a low budget - no frills approach to future conventions and trade shows, at least until better times returned.

one as it is great to meet and socialise with and learn from our peers in this industry. No one else knows the particular problems and circumstances that we conduct our businesses under as well as others in the same industry."



Delegate David Reckin of Queensland

"I didn't expect so much professionalism from a bunch of air conditioning blokes" - was the summing up from one of the newer VASA members, David Reckin.

"The number of people interested in vehicle air conditioning is really too small to accommodate today's capital city convention costs.

"Sydney was a great convention, but I suspect it will be the last in a line of highly successful conventions for VASA. We need to bend with the times and we've got the message loud and clear that it's becoming too expensive to spend too much time away at a convention in another part of the country," said Mark.

"We are looking at a convention packed into a weekend, at a venue outside the CBD. It will incorporate a trade show, perhaps in conjunction with the Auto Electricians Association, technical sessions, workshops and a couple of quality speakers. The VASA AGM would be held at the same time.

"Among the venues being considered are Brisbane and Gold Coast (it's about their turn), or Melbourne."

"I appreciated the fact that I was in the company of the big and the small of the A/C business. I think that's a real plus for VASA. It allowed me to keep abreast of the industry at large and helped me with the BIG PICTURE".

"I got to appreciate the network abilities we all possess, but probably don't use enough.

"Some people just sign up, hang the certificate on the wall and do nothing else.

"But if we took a little time over it, we can learn from each other and share ideas. Isn't that what belonging to an organisation like VASA is all about?"

VASA learns you can't insure your way out of poor work practices

VASA's ill fated journey into a formal warranty program has ended in tatters, buried in a minefield of gobbledegook and technical requirements which will make claims difficult to manage.

The real problem is that any program needs support to be viable and the support (with a few exceptions) was virtually non-existent.

VASA now finds itself in a position where to be competitive and to offer services above those of competitors, it needs to offer warranty in one form or another. For this to occur there needs to be a radical culture change among some members of VASA. Unless warranty issues can be resolved within a culture where the customer's needs are the most important consideration, you might as well give the game away.

Due to the lack of member response, the agreement between VASA and FD&W Warranty is finished, but to their credit, FD&W have set up a bank account and a low key system headed by a clerk, to see all warranty claims through to the end. However, because there is now no FD&W handling claims, no VASA warranty department headed by expert problem solvers and arbitrators, no-one to negotiate with manufacturers or wholesalers, the requirements for a claim have been made so onerous that it is very unlikely

that any claim would ever get past first base.

VASA has learnt a lot from this experience and as a result, top priority is being given to the writing of a set of guidelines for an internal warranty procedure in which work rates and times are uniformly adopted by the membership and a clean and simple method of handling claims is put down on paper.

The mindset which needs to change is that warranty is no longer a "problem" or a liability

It is a marketing opportunity which can reap handsome rewards in the hands of a professional network of workshops and technicians and do absolute wonders for VASA's marketing image. NETWORKING IS THE KEY!

So what happens to the 250 warranty books already sold? **VASA's advice is simple.** Those with books left on the shelf - throw them away, write it off your tax (talk to your accountant first) and put it down to experience.

Those who have handed out books with warranty on components, just hope your repair work was good enough to ensure they don't come back, and if they do, bend over backwards to fix the problem, at your own expense. If you get a claim from another repairer, talk with each other to

resolve the problem to satisfy the customer. If a customer returns a warranted system with a fault after 18 months, that's when the cover kicks in - the workshop guarantees their own workmanship for the first 18 months of the cover.

Despite FD&W former CEO Glen Conrad's assurances that the warranty program will meet its responsibilities and obligations, any attempt at interpreting the requirements of the scaled down warranty is a minefield in itself, made worse by the fact that there is no-one with any great authority running the show. CEO Glen Conrad has resigned from the company, but, again to his credit, is volunteering his services to assist to ensure that "fairness is done."

However, the stipulation that in every warranty claim, the offending part needs to be declared a "manufacturing fault" or "not a manufacturing fault" by BOTH VASA's technical director and the manufacturer, virtually means that a claim will be so hard to prove, it will not be worth the wait or the effort.

It also would put VASA's Technical Director Grant Hand in an untenable position with the manufacturers in having to make decisions on the real cause of failure - which in a majority of cases is extremely hard to ascertain.

Parts, particularly compressors, rarely fail through manufacturing fault. **(Continued next page...)**

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This is reinforced by manufacturer's bench testing and the results seen in disassembly of failed compressors. In the vast majority of cases components fail because of poor work practices.

For VASA's Technical Department to prove a manufacturing fault, it would need a full range of answers and technical readouts from the service centre before it could determine that the part was properly installed. Even with this information, it would find that most warranty issues are service centre fault related and therefore there would never be a claim in these cases.

There's only one way a warranty will work in VASA. Every member is going to have to assume responsibility for his or her own workmanship, and we need to network a lot better than we are doing now, to gain a reputation as the professional technical network.

All VASA members need to adopt the philosophy that their competition exists OUTSIDE the VASA network....that fellow VASA members are your associates in a business picture which is much bigger than your own workshop.

VASA is also going to have to adopt stringent rules which will ensure that workshops with a history of non-cooperation in warranty matters will be forced to leave the VASA network.

The membership will not be able to afford to carry workshops which will not work towards providing a reputation of professionalism within the whole association.

The warranty issue highlights yet again the relationship between

technical training and the satisfied customer.

There will always be those who try to take the shortcut and save money by not improving their technical skills. These will be the people who will be unsupported in a truly professional VASA network in which the public can trust.

Why should professional workshops have to fix other people's problems which are patently caused by lack of knowledge, faulty diagnosis, or poor work practices.

President Mark Mitchell, while disappointed that the warranty program didn't work, says the breakdown of the program will force VASA to emerge as a stronger and even more professional network of service centres.

"There will be no more protection of people who believe they can't be taught or learn new skills," he said. "You just won't be able to insure your way out of poor diagnosis or part installation."

"The good news is that warranty issues are being resolved almost daily among the VASA membership, with no angst and no problems. It's been going on for years, with or without a warranty program."

The words of committeeman and manufacturer, Bevan Carrick of Cooltemp are still ringing in the executive's ears.



At the board meeting in Sydney, Bevan made the observation that his company saw all warranty issues as great marketing opportunities - never a liability.

"We go out of our way to fix the problem, at our expense, and we do it with a smile. The customer is never exposed to the negative side of warranty - and why should they?"

VASA couldn't agree more.

The cornerstone of VASA's new warranty policy will be:

- 1. Treat the customer, whether yours or another VASA member's, as the most important person in the equation.*
- 2. Go overboard to get the customer back on the road as soon as possible and give them something extra to remember you by.*
- 3. When that's done, go back to the training manuals or go back to training itself to ensure that such problems never re-occur in your workshop.*
- 4. If it's another VASA member's customer, discuss it with them, professional to professional, to reach an amicable and friendly conclusion.*
- 5. Be prepared to admit that you might have miscalculated or missed a vital sign of failure in a component. Adopt the philosophy that if you did everything right, there would be no warranty claims.*

Forget the insurance!

**VASA is
your
warranty**

Hot Air makes no apologies for harping on this issue...it's important.

In the next page or two, Technical Director Grant Hand looks in more detail at the issues which must be considered in a component failure. It may help service centres develop a check list which will be useful in all future warranty issues.

The ACCC View on Warranty

The Trade Practices Act gives warranty and refund rights to consumers whether or not retail-

Some VASA members have been crying for years about "What is VASA doing to provide our workshops with a competitive edge? What are you doing to promote us? How can we guarantee that all a/c repair work comes to a VASA workshop?"

There's a simple answer - **ACT AND RUN YOUR BUSINESS LIKE YOU BELONG TO A NETWORK OF PROFESSIONAL WORKSHOPS.**

Solving customer's problems has become the biggest single marketing advantage

A global survey has reported, "92% of customers in the automotive area who have a complaint rectified to their satisfaction, become lifelong customers of the business or association with whom they dealt." Does this sound like VASA?.

So from now on, a customer problem is a welcome marketing opportunity. If it costs you, take it out of your promotional/market-ing budget. It's the best thing that

ers, service providers and manufacturers choose to give their own warranty or guarantee.

In the case of air conditioning systems in vehicles, the traditional 12-month warranty is absolutely worthless. It is clear that a consumer can bring back a

can happen in your workshop today.

If the time has not arrived already, customer problem solving will very soon become a key reason why motorists will choose a VASA service centre.

Here's the right way to manage warranty issues.

Treat the customer as if he/she were your own long established customer.

Make it clear to the customer that VASA networking will ensure the vehicle/system can be fixed at everybody's earliest convenience.

Do not, under any circumstances, lay blame on other VASA members to the customer. The customer's trust is in the VASA name. If you begin to break down that trust, you are destroying the marketing edge of your own association. Those who do it in future will be expelled from VASA.

Talk to the original repairer and negotiate an outcome. The VASA board is currently seeking input from members on recommended inter-member claim fees (labour rate at \$45 per hour has been suggested). Email the secretariat or VASA technical on your thoughts or suggestions.

Do not rip off another VASA member. We have had feedback on a replacement 1.5 metre discharge hose with 2 X No8 fittings costing \$290 to replace. This practice is like-

faulty system for probably up to three years and expect replacement or repair under their statutory warranty.

Go to www.accc.gov.au or go to your nearest ACCC office and pick up the booklet, "Warranties & Refunds" and read it.

wise grounds for expulsion. Negotiate a cost and the logistics and dynamics of a customer problem between yourselves. This is critical to the future of the association. With our professional status and small membership we cannot afford any bad publicity as a result of poor internal practices.

Where does the fault really lie??

An issue that constantly raises its head with regard to system faults is how do you really decide what caused the fault.

This is a real problem that compressor manufacturers and suppliers have been facing for years and is increasing as system complexity increases. It is now an area that needs to be addressed by all VASA members who may be in a position to pass judgement on why a component fails, particularly if it has come from another VASA member.

Let's use a compressor and clutch as an example.

Compressor failure causes can be any one of these:

Excessive speed / incorrect rating of compressor
Normal wear and tear (age)
Excessive pressure loadings
Excessive thermal loadings
Oil starvation (internal of pump)
Oil starvation (return to pump)
Oil slugging (return to pump)
Poor oil quality, grade or type
Refrigerant (liquid) slugging (return to pump)

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Excessive lubricant (yes, it is a problem in modern pumps)

Excessive belt tension

Intermittent supply (voltage) to clutch

Excessive vibration

Faulty manufacture

Contamination (solid particulant and refrigerant cocktail mixes) - Was the system originally flushed with the correct flushing agent

Clutch failure

If a clutch fails, it is often considered as "normal faulty manufacture". Think about this carefully. Clutches are manufactured with a certain torque rating, based on the magnetic field produced in an electro magnetic coil acting across clutch cross-sectional areas (the clutch faces).

This is engineered against the force on engagement (the clutch engagement "spike") and the constant torque of driving the compressor.

So if a clutch fails, think about the following points:

Is the electromagnetic field strong enough?

Is current flow correct?

Is voltage supply correct?

Is voltage supply reliable and constant (intermittent shorts and opens)?

Is the air gap correct?

Are the clutch faces clean and in good condition (check front seal leaks, dust cap fitment etc)?

These factors will effect the clamping force of the clutch, thereby determining the maximum load (torque) the clutch will take.

But even if the clutch clamping force is correct what about the load it is placed under?

Consider these possibilities:

Pressure loadings on the compressor

Thermal loadings on the compressor

Or

Lack of lubrication that can cause binding of the pump

Intermittent slugging of the pump with liquid refrigerant (overcharge, incorrect TX valve, capillary tube sensing poor, TX jammed open)

Incorrect TX valve setting

If you are in a position to have to evaluate why a compressor or clutch has failed, it is not an easy decision to make, particularly if it is a repeat failure or if it is a VASA internal claim from another member. Compressor and clutches fail for a reason - and more often than not, it is **NOT** faulty manufacture.



Queensland Allstate Committee members, Raynor Ruf (Representative), Les Bennell and Richard Lewis.

Queensland is off to a flying start with its new Allstates Committee.

A VASA executive move to give more power and say to the states and territories - and New Zealand, the Allstates Committee will comprise a representative in each state or territory.

Assisted by an informal state committee, this representative will then report to a national Allstates chairperson, yet to be elected.

It will be up to the members to seek out their committee representatives and let them know what they want and how they feel about a whole range of issues.

At the first Queensland meeting, ably chaired by Gaynor Ruf and attended by President Mark Mitchell, training coordinator Grant Hand and Secretary/Corporate Affairs consultant Ken Newton, 52 members and non-members showed up.

Of that number, more than 20 responded in a very positive way to the Certificate IV and Diploma program which Grant introduced to the meeting through a workshop presentation.

Gaynor is seeking feedback from all Queensland members and plans to have at least three meetings a year, outside of workshops and training sessions.

New South Wales, under John Wallace's guidance, is also responding, with their first event being an informal swap, sell or buy day on 22 September at 1pm at Autofrost, Unit 1, 9 Works Place, Milperra. **More of this on the website.**

At this stage, the other state reps are Damien Petrie in Victoria, Dave Jackson in SA, Rod Lyons in WA and Richard Cooper in NZ.

Refer to the Directory on the back page of this issue for contact details.

Since the latest European Automotive Airconditioning Convention in September 2000, it has become clear that European vehicle and a/c manufacturers are seriously studying the possibility of heating and cooling the vehicle interior by means of a heatpump unit based on the environment friendly refrigerant CO₂.

The basic principle of the heatpump unit is that it can cool or heat by reversing the flow direction of the refrigerant.

This also applies for the heatpump unit that has been jointly developed by Audi and Austrian Obrist Engineering that has been first tested in Autumn 1999.

This is an interview with Frank Obrist - Obrist Engineering.

In the field of CO₂ applications for mobile cooling and heating Obrist Engineering cooperates with Audi, BMW, Daimler/Chrysler and others. Obrist is also a member of the VDA project group dealing with this subject and is since the start of its independence in a very close relationship to LuK regarding compressor developments.

CO₂ Compressors

The first years of Obrist's CO₂ activities were mainly dedicated to developing and engineering automotive CO₂ compressors. The first two prototypes H94 and C95 were developed by TES Wankel on behalf of DaimlerChrysler to fulfil the objectives of the European Race Project, before Obrist Engineering took over. While the

A European update on the CO₂ heatpump unit for vehicles With acknowledgement and thanks to Automotive Airconditioning Reporter and Editor Ron Henselmans

H94 was mainly developed for laboratory purposes, the C95 already met most of the standards as set by the VDA and can be found in Denso's 7SB16 compressor. A special feature has been the controllability of this early stage CO₂ compressor.

The upcoming LVT36 compressor was jointly developed with LuK in 1997 and was designed to the performance requirements for upper end applications. This variable compressor with wobble plate has a maximum displacement of 36cm³, the same mounting hole pattern as the 7SB16 and a diameter of 123mm.

A significant step has been the development of the C99 compressor. Again on behalf and with the support of Daimler-Chrysler. First designed as a fixed displacement compressor with 42.5cm³ displacement, after that as



a variable displacement compressor with a 33cm³ displacement. According to Frank Obrist this model comprises a totally new concept.

One of the new features is the swash ring instead of the state of the art swash plate. "This has advantages on compactness and stability issues and improves the controllability behaviour," said Frank.

The capacity of the compressor can be brought back to a minimum of about 2-3%. Due to other internal innovations the swash ring is able to react extremely fast to extreme changes in rpm. This has a substantial impact on the issue of comfort and fuel consumption. Unpleasant discharge temperature changes that can occur because the wobble or swash plate in most variable compressors reacts with a time lag, can thus be avoided."

The heat pump idea in combination with CO₂ refrigerant

The meaning of the heat pump function in combination with CO₂ was primarily studied by DaimlerChrysler. Their investigations have seen basically three different approaches to this subject:

- . air side source
- . water side source
- . exhaust side source

Due to their calculations the exhaust side source offers the best efficiency.

Obrist has been fascinated by the idea to have a combined system for cooling and heating. After the experiences of the '99 Phoenix meeting with the Audi A4 testcar (built up by Obrist) with an excellent cooling performance and a quick reaction of the compressor to extreme changes in rpm the next steps could be done.

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"It became clear to us that the typical high pressure pattern in the CO₂ unit offers excellent opportunities to attack the interior heating problems in directly injected diesel engines. Even at ambient temperatures of about -20 degrees C, the CO₂ unit still has a low side pressure of 20 bar.

A R134a unit would not have enough pressure (=density) to perform at such temperatures."

This conclusion eventually led to the joint development of a CO₂ heat pump unit for the Audi A4. The first tests were performed last year.

Composition and results of the Obrist-Audi heatpump unit

The composition of the Obrist/Audi unit is comparable to other CO₂ prototype units except that it uses the water side (coolant) as the energy source. This decision was influenced by finding a way to realise reasonable costs or advantages in comparison to the state of the art supplementary heat systems. Main components are compressor, evaporator, gas cooler (=like a condenser in the R134a unit), filter, expansion valve, internal heat exchanger and 3-way valve to control the refrigerant flow direction.

Additionally the Audi-Obrist unit also contains an additional heat exchanger. Big difference with the R134a unit is that the walls of most components are thicker to withstand the higher pressures. For this reason also the internal design of the gas cooler tubes have been designed differently.

The Obrist accumulator in the prototype has been designed such that the refrigerant and lubricant can only leave the tank in the correct direction.

According to Frank Obrist especially the heating capacity of the unit brings forward big advantages. Obrist: "These advantages to not only affect aspects of comfort but also enhance driving safety."

Heating Tests

The heating tests were performed at an ambient temperature of -20 degrees C. During the first test with only the standard water/glycol heater operational, it took 50 minutes to reach the comfortable interior temperature of 22 degrees C. During the second test with the standard heater and an auxiliary fuel-driven heater it took 35 minutes to reach this interior temperature. The third test was performed by only operating the heat pump unit in heating mode. Already after 13 minutes the comfort temperature of 22 degrees C had been reached.

Obrist says "A test at -20 degrees C ambient temperature may not be very representative for an average European winter night. However, at higher temperatures the heat pump unit turned out to perform even better. Another test at -7 degrees C ambient temperature showed that the interior temperature after three minutes of operating the heat pump unit was already on a higher level than after using a parking heater during 45 minutes."

Obrist estimates the heating capacity of the Obrist-Audi unit at approximately 8kW. An average PTC auxiliary heater has a 1-2kW capacity.

Using the coolant for energy

The fact that the Obrist-Audi CO₂ unit not only has good cooling performance but also an excellent heating capacity can not only be explained by the use of CO₂. According to Obrist other mobile CO₂ prototypes have a heating capacity of 4-5 kw.

Obrist: "In contrast with the other systems I know, our gascooler does not only use the ambient air for thermal exchange (cooling it in a/c mode, heating it in heating mode) but also the engine coolant. By means of a special heat exchanger, no bigger than the size of a fist, heat from the engine coolant is exchanged to the refrigerant. After a short engine operating time the coolant temperature had increased significantly more than the constant low ambient temperature. This in contrast with the ambient air that can be substantially colder in wintertime. In this way the refrigerant can already be slightly pre-heated before it is being compressed in heating mode. This avoids any capacity problems at low ambient temperatures."



Using the engine coolant as heating medium for the refrigerant in heating mode met some sceptic reactions at first. After all, taking heat from the engine coolant means loss of energy or heat for the engine itself.

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TECHNICAL UPDATE PAGES

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Obrist: "This is true, however, because the compressor operation means an additional load for the engine, additional energy is created again from this side. This conclusion resulted from a test that we have conducted. In a vehicle with a directly injected diesel engine the coolant temperature after 50 minutes was 63 degrees C. With our heating pump system in operation this was 73 degrees C. Of course this depends on the size of the heat exchanger and the acceptance of the engine engineers with which temperatures they are satisfied.

The use of the engine coolant as heat provider has another advantage. A problem with the heatpump unit with air cooled gascooler is that the gascooler freezes after operating a while at low ambient temperatures. This seriously hampers the heating capacity. "When the refrigerant is heated by the coolant under such circumstances this problem does not exist."

Advantages vs. disadvantages, perspective

Obrist has great confidence in the perspective of the CO2 heatpump unit for vehicles. "The advantages are not only related to environmental aspects. The unit cools and heats better. This not only affects the level of comfort. Because the unit is able to heat up the interior so quickly also safety aspects are involved. For instance, when the windscreen has to be cleared in the morning after a night of frost.

Also, measured at the same capacity demands as for R134a, the unit also operated more efficiently.

this means less fuel consumption. Finally components can be built more compactly when R134a capacity demands are accepted as the standard. The unit does not weigh more than a R134a unit and auxiliary heater together."

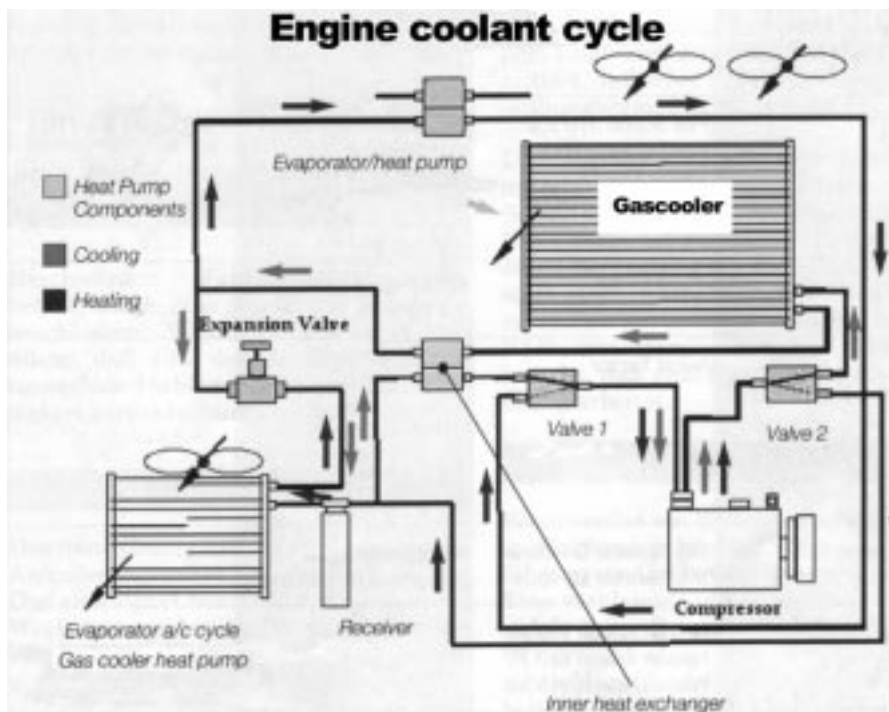
For Obrist there are no unsolvable technical problems remaining. Due to the nature of the system (it cannot cool and heat at the same time) it will remain necessary to have a water/glycol interior heater available for reheating purposes to reduce the humidity in the passenger compartment. In cases of humidity problem with lots of water in the evaporator during reheat mode of the AC-system, we have to get this out before we can run in heat pump mode.

diesel vehicles.

"Taking all the advantages into account, this sounds very reasonable. Purchase managers do not seem to care for product advantages however. Therefore the CO2 decision needs to be taken on higher levels within the vehicle manufacturers organisations," he says.

Biggest remaining problem according to Obrist is the issue of the industry to change to such new systems and all the costs that are involved. He expects that a decision in favour of the CO2 heatpump can only be taken on a broad level with at least a few leading players involved. "I do not believe that any vehicle manufacturer will dare to go on his own in this. The investments that are involved are

A/C and heat pump system



Obrist estimates that the production version of the unit will be approximately 50,- to 100,- Euro less expensive than the present R134a unit with auxiliary heater as already mounted on certain

still big. In case such decision is taken it will still take a while before it will be implemented in a majority of the new cars."

How to keep up with the RTP

Now that the RTP is in its 4th year, VASA has written a new policy on its management. For example, what happens if you hire a new employee or you have an employee who you believe needs some unpinning knowledge; where does he or she start with RTP? What happens if a new member joins VASA and wants all the RTP for every year of publication?

It's important to remember that the RTP is a PROGRESSIVE training program. This means that it would be an absolute advantage for every participant to have the complete set of RTP, from Year 1 onwards.

VASA is making it easy for members to have all RTPs, regardless of when they became a member of VASA, by introducing a back issue purchase scheme at barely the cost of printing OR members will be soon be able to download and print the RTPs from the member's lounge on the VASA website.

Each year's RTP will be available on the website within the first three months of the year following.

New policy for Existing Members

Every VASA member in these categories:

*Service Centre / Technician
Wholesaler
Manufacturer*

receives the current year's RTP as a compulsory component of membership.

Every member nominates the person who will undertake the RTP. In some cases, it's the owner of the business, otherwise, it's a partner or an employee. If the member does not nominate a person, the RTP defaults to the member.

If a member nominates an additional person in their business to receive the RTP, that person will also receive the full RTP folder and all Bulletins and Questionnaires.

Ownership of the RTP is simple - whomever pays for the RTP owns the program BUT the nominated person who completes the questionnaire earns the RTP Certificate which is issued each year to everyone who successfully completes the questionnaires and sends them in to the Technical Coordinator.

Adding a new staff member

Any member can add another person from their business to the RTP at any time during the year.

To do this, the member must pay the full \$100 plus GST for the current year's RTP and regardless of when the new person was joined up, they will receive the FULL YEAR's RTP for that year, plus all questionnaires and technical data sheets.

The full set of RTPs will be available free from the website (to members only) OR hard copies can be supplied for the prices listed below.

New VASA members

When a technician or service centre joins VASA for the first time, they are automatically considered a "provisional" member until they complete Year 1 of the RTP, which is supplied to them as part of their membership kit. The member does not become a full member until the questionnaires for Year 1 are filled in and sent back for assessment.

New members also receive the current year's RTP when they join.

SUMMARY OF COSTS

Existing Members:

Yearly \$100 + GST (Australia)
\$100 (New Zealand) -

You receive the current year's RTP.

Additional nominees at the time of membership renewal - \$100 + GST (Australia) \$100 (New Zealand)

They receive the current year's RTP.

Additional nominees during the year

\$100 + GST (Australia) \$110 (New Zealand)

They receive the current year's RTP in total.

New Members (from April 1 2001)

Yearly \$100 + GST (Australia)
\$100 (New Zealand) -

You receive the current year's RTP in total, PLUS Year 1 RTP.

Additional nominees at the time of joining - \$100 + GST (Australia) \$100 (New Zealand)

They receive the current year's RTP in total, plus Year 1 RTP.

Back issues of all RTP

Current and all new members

\$50 + GST (Australia) \$55 (New Zealand) for EACH YEAR

or

Download them (very soon) from the members lounge on the VASA website

Currently available

Year 1 RTP

Year 2 RTP

Year 3 RTP

Training open to all

Any VASA member or non-member who wishes to find out more about the unique training opportunities "on the job" offered by Douglas Mawson Institute, please write, fax or email to VASA and we will send you the information kit.

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Thanks again to our convention sponsors for 2001 - visit their pages on the VASA website.

