



HOT AIR

NEWSLETTER

3rd Issue 2002

of the Vehicle Airconditioning Specialists of Australasia December 2002

National Secretariat: VASA ABN 39 063 969 783 PO Box 2204 Southport Queensland 4215

FILE THIS ISSUE OF HOT AIR IN YOUR VASA FOLDER

Hot Air is produced with the generous assistance of Atofina and BOC



BOC Refrigerants

The big RTP catalogue is inside this issue. You're not getting your full membership benefit if you ignore it.

The RTP is the result of an enormous amount of input by the Board and the Technical committees of VASA over the past five or six years.

What began as a sort of crash course in the essential underpinning knowledge of electronics and refrigeration has now developed into a very specific training program aimed at keeping VASA members up to date with vehicle developments.

This of course requires a great deal of liaison and bargaining with OEMs, but VASA's credentials in the training area have gradually convinced some of the major car companies that sharing their technical data can have long lasting benefits for their brand name.

Hot Air prints the entire catalogue in the centre spread. See if there is something you have missed.

The next big VASA project is to arrange the catalogue by subject, for quick and easy reference.

The call goes out to wholesalers & manufacturers

As VASA matures, its true character emerges. Its educational and training focus is one thing, but where else can you find an organisation which contains such a diversified membership, from wholesaler to technician.

It's a critical mass which is its own strength, but too few wholesalers and OEMs really take full advantage of this relationship with the professional workshops of Australia and New Zealand.

The same faces emerge at the trade shows and the workshops and whenever there is work to be done, or sponsorship to be raised to benefit all.

Doesn't the fact that these same people stay in the game send out messages to others....there are opportunities going begging. **Read more P4...**



The Wire & Gas training formula, which had its debut in Brisbane last June, will be the pattern for the next 12 workshops around Australia and New Zealand as a result of the enthusiastic acceptance of the first regional workshop in

Tweed Heads on 2 November.

More than 80 technicians, mechanics and business managers responded to the first of the Wire & Gas regional workshops.

Full Story Page 9...

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Mechanics ain't all that bad..p2

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NEW INSIGHT INTO WHO'S GOT WHAT IN THEIR A/C SYSTEM

Some interesting comparisons with the Australian experience have emerged from a recent survey of refrigerant gas usage in the USA, carried out by the Mobile Air Conditioning Society (MACS) Worldwide.

In the last issue of Hot Air, VASA revealed some disturbing trends from its Australian survey, the main ones being that gas contamination, poor labelling and even worse work practices were major worries for the true professional of the industry. Our survey confirmed what many VASA officials have always thought, that only 36% of all vehicles contain the proper refrigerant R134a. The rest is a mixture of blends, air, hydrocarbons and R12.

As a result, Technical Coordinator Grant Hand is preparing a recommended guide to work practice for the management of refrigerant gas.

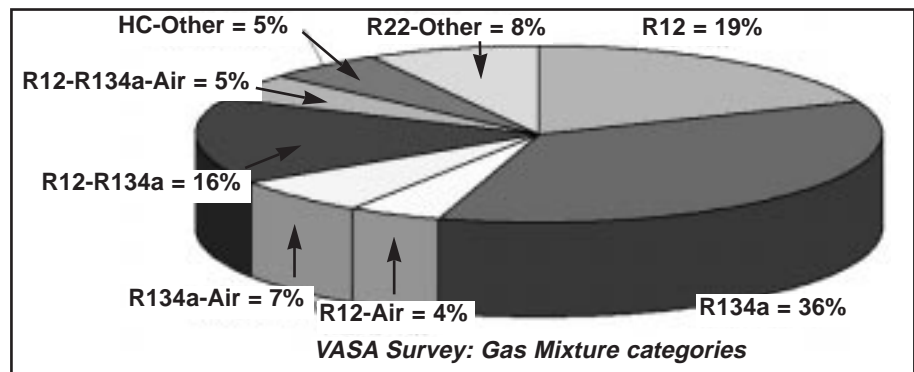
MACS asked roughly the same kind of questions as the VASA survey. Here are the comparisons, as close as we can get given the differences in the methodology.

For example, the MACS survey was conducted through more

than 100 individual workshops, so that a variety of work practices need to be factored in to the figures. In the VASA survey a small number of selected professional workshops were used to survey vehicles specifically. These workshops were all equipped with gas analysers. In the US survey, 86% of the respondents used gas analysers.

The Australian survey was much more brutal than the US approach. VASA's approach was that a trace of anything other than the gas specified for that vehicle was treated as a contaminant. This means that if only .2% of hydrocarbon was detected in a system which was labeled to contain R12 or R134a, then that vehicle was deemed to be contaminated.

What gasses were in the vehicles tested:



	USA	AUST
R12	26%	19%
R134a	74%	36%

How much contaminated gas was in the fleet on average:

	USA	AUST
	12.7%	45%

How many systems contained hydrocarbon refrigerant:

	USA	AUST
	6.4%	5%

How many systems had been properly retrofitted with service fittings, a label and high pressure compressor cut off switch? (Note: VASA's figures apply to incorrect ports and proper labelling only)

	USA	AUST
	31.6%	67.5%

Other interesting survey results:

In the MACS Survey 24% of the

respondents do not own a diagnostic scan tool. Only 68% of those with a diagnostic scan tool, said it was helpful in mobile A/C service.

The current US mobile A/C passenger car and light truck fleet is estimated to be 215 million vehicles.

In 2001, it was estimated that the number of "on-road" HFC-134a vehicles exceeded the CFC-12 vehicles. However, with current new car warranties, many of these HFC-134a systems are not currently being serviced by independent repair facilities.



You can trust your mechanic - at least they are way ahead of politicians

It was reported recently that mechanics ranked 15th on a Readers' Digest survey of the most trusted.

They scored well, considering that Social Workers were 14th, although how plumbers made it to 10th position is a little sus. They were the only other trade, other than mechanics to make it into the top 20.

But mechanics were way ahead of polities, car salesmen and trade unionists and certainly above bankers and lawyers.

Ambulance officers were the most trusted of all, with firefighters next, then pilots and nurses. That's fair.

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RRA joins in with warnings on flammables risks

The mixing of flammable gases or hydrocarbons and non-flammable gases such as fluorocarbons during the refrigerant gas recovery process can put contractors and wholesalers at serious risk.

This is the warning issued by Australia's foremost refrigerant gas recovery experts, Refrigerant Reclaim Australia.

"At issue is not the use of flammable refrigerants in suitable equipment, but rather the safety implications of mixing flammable and non-flammable refrigerants in systems and their subsequent recovery at end of life," says RRA's Michael Bennett.

"One of the main problems is that equipment fittings don't have to be changed to indicate whether a flammable gas has been used, so there's no way for a technician to know what they are dealing with.

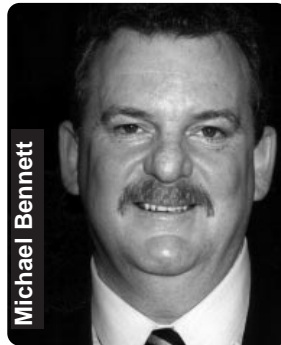
"Even the mixing of small quantities of flammable gas with non-flammable gas is all you need to turn the recovery of refrigerant into a hazardous operation," Mr. Bennett explains.

It is established procedure in the industrial gases industry that left hand thread fittings should be used on all equipment to indicate the use of flammable gas.

Additionally, while it is mandatory

for all refrigeration and air conditioning installations to have labels that state which gas has been used, there appears to be a low level of compliance across all sectors.

The result of the lack of a requirement to change fittings and low compliance or inaccurate labelling is that technicians cannot be certain of the type of refrigerant they are recovering.



Michael Bennett

This situation is of great concern to Refrigerant Reclaim Australia, the national not-for-profit industry body

that recovers and destroys contaminated and unwanted refrigerant.

The RRA program to take back refrigerant is not set up to handle flammable products as the decanting equipment used throughout the collection network is not built to handle and transfer this type of refrigerant.

Similarly, the recovery units widely used by tradespeople are not rated for flammable products, making the mixing of gases a potential danger for everyone involved in the recovery process.

Mr Bennett says that while flammable gas has on some occasions found its way into recovered refrigerant received by RRA, fortunately there have not been any incidents to date.

"While the chances of a serious incident appear to be remote, the consequences could be catastrophic; the most difficult safety issues to manage are usually the ones that are remote but potentially devastating."

In order to curb this problem, RRA believes safety measures should be strengthened to reflect the dangers of handling and recovering flammable refrigerant gases.

"It would seem that existing laws, regulations and standards fail to prevent or minimise the mixing of flammable and non-flammable refrigerants. This lack of appropriate safeguards may be putting people at risk; it's a situation that needs to change sooner rather than later."



Footnote: VASA's official position on the use of flammable gases in vehicle air conditioning systems which are not designed for them is unchanged? **Don't.**

...opportunities for wholesalers and OEMs

(from page 1)

A major push is on to enroll many more wholesalers and OEMs into VASA.

Wholesaler members have access to sponsorship opportunities should they have equipment or services that they wish to promulgate to the service centre community.

For example, for as low as \$75 per issue, a wholesaler can insert new product information into Hot Air, with corresponding exposure on the website.

At the current series of regional workshops wholesalers and manufacturers are urged to take a positive role for very little outlay to bring their technologies and training to the service centres. We have proved time and again that there is a dire need for training at all levels.

Wholesalers can no longer assume that the workplace knows everything there is to know about even the most common of products. As technologies change, the workshops are looking for more efficient and cost effective ways to achieve all of the time honoured procedures of vehicle maintenance.

While on the subject of opportunities, the following story raised a lot of comment last issue...we think the message is so powerful we intend to run it again.

What do I get for my money? This is the cry which occasionally keeps bobbing up from some members.

We think VASA is mature enough now to say to these people "if you don't realise what you get for your money, you really aren't dedicated enough to be part of it."

The secretariat now asks these questions when confronted with this statement...

Do you read Hot Air when it hits your desk?

Do you visit the website?

Have you seen all the technical and other information in its pages?

When you get your RTP, do you read it?

If so, do you fill in the questionnaires so that you can get a certificate to hang on your customer service wall to show how smart you are?

Do you ever phone the technical coordinator Grant Hand and get him to solve a tricky question for you?

IS THIS WORTH 250 BUCKS TO YOU?

Do you go to conventions and listen to the technical papers and see all the latest products on display?

Do you ever call one of your fellow members to resolve a sticky technical issue, including wholesalers or OEMs?

Have you considered the collective power of being in a professional network of service centres, all displaying a respected VASA logo on the window?

If the answer is **NO** to all of these, then, sorry pal, you are not in a position to ask us "What do I get out of VASA for my 250 bucks a year."

Being a member of an organisation of any kind is not a one-way street.

VASA provides the platforms, the contacts, the information base, the training programs, the technical information, the publications, the means of communicating. The member's role is pretty simple – just use it.

The June 2002 Wire & Gas convention boasted the lowest registration and exhibition fees ever. Its success proved that the decision to make it a budget convention was right.

But when the time came to book a keynote speaker, the budget just didn't run to the mega-bucks required these days.

VASA's wholesaler supporters came to the rescue, plotting among themselves to guarantee that VASA and its new partner at convention AAAE, could turn on a keynote speaker of the calibre of



basketball great and Olympic hero Andrew Gaze.

It helped of course that Graham Bonney of Ingram was a huge fan of Andrew's.

The identity of the benefactor who underwrote Andrew's appearance was kept under wraps during the convention, but now it can be told.

Yes, it was Ingram. Wire & Gas owes Graham and his team a big cheer for their their readiness to offer support. Thanks too, to Mark Padwick of Sanden, who brokered the deal.

One address - one value

VASA has revised its membership policy dealing with those situations where members may own, operate or franchise at more than one location.

The VASA Board is facing continuing questions from those who have national chains of outlets, or franchises, especially among the wholesalers.

On the other hand, with diversity at the service centre level, VASA is starting to find member workshops, under the same ownership, springing up in different parts of cities.

The overriding VASA Board view is that the cost of membership of VASA is so low, when measured against the services provided, that each location should carry individual membership.

VASA is also concerned that if it allowed multiple sites under a single membership, the distribution of the RTP and all other information would fall apart.

As one board member (a wholesaler himself) said, "You can't always count on head office sending all relevant material from VASA to all of its outlets. It is cheaper for them to have individual memberships and so ensure that all publications, including the RTP, get to the coalface of every business."

Here are the new guidelines for multiple location memberships.

Service Centres

1. Membership of VASA in this category applies to **one location only**. Where a member operates more than one Service Centre or Technical location, each Service Centre or Technical location must

carry independent Membership, with the Manager or Technician at each location nominated in the Registered Technicians Program.



Note: While members may choose not to insist on other company outlets joining VASA, it is recommended that membership by all outlets would provide a competitive advantage, and would also ensure that each outlet was kept informed of technical issues through the RTP and other VASA training and regulatory information.

Wholesalers operating service centres

5. Where a Wholesaler or a Manufacturer member **also operates a service centre**, a single membership applies for both, **only** if the businesses are located at the same location.

So that if a Wholesaler in central Sydney, operates a service centre in Hornsby, each business must be a full member of VASA in order to be badged as VASA centres.

2. Members may operate as many **mobile Service operations** as required within one membership, provided that the mobile operations are based at the Member's nominated business premises.

3. **Mobile Services**, operated by Members, are encouraged to use the VASA badge on such vehicles. These badges will be additional to those provided at the start of membership and can be purchased at any time from the VASA Secretariat or from Wire & Gas Regional Workshops and conventions.

Wholesalers

4. Membership of VASA in this category applies to **one location only**. Where a member operates more than one Wholesale outlet, each outlet must carry independent Membership, with the Manager or Technician at each location nominated in the Registered Technicians Program.

MACS / NARSA TO MERGE

The Mobile Air Conditioning Society (MACS) Worldwide and the National Automotive Radiator Service Association (NARSA) are planning to merge.

No timetable has yet been set for the merger which is subject to due diligence and ratification by both memberships.

"The marketplace has become intensely competitive," says MACS. "The merger provides opportunity to expand resources for increased industry and member challenges."

NARSA is a worldwide trade association with more than 1,500 member businesses. MACS represents 1,600 members in the United States, Canada and over 40 countries around the world.

VASA's greatest achievement

The Registered Technicians Program is directed and written by the Technical Committee of VASA and managed by Training Coordinator Grant Hand from the Douglas Mawson Institute of Technology in Adelaide.

VASA members at all levels (except Corporate), pay a component representing roughly 60% of their annual membership dues towards the RTP, which of course nowhere near covers the total cost of the program. This is why we depend so much on support from our sponsors, such as Dupont, who assist with the RTP costs and Atofina and BOC who support the Hot Air publication.

This means that the RTP is a compulsory component of membership, and thereby ensures that all members receive something of great value for their membership.

A minimum of four technical bulletins are produced for each year's series (six bulletins per year were released for the first three years) and these are accompanied by questionnaires which provide a twofold purpose.

Members are encouraged to send back the questionnaires after each bulletin, because it helps the members to articulate their approach to technical issues and often brings out trends or major issues which can then be worked on in future issues of the Bulletins. The questionnaires, as well as being a valuable training aid for the members, are a perfect feedback mechanism for VASA and its future training agendas.

At the end of year, certificates are issued by VASA to those who undertake the RTP questionnaires and send them back to the Training Coordinator for assessment and comment.

In addition, members have access to the Training Committee to help resolve technical issues which may arise from their reading of the RTP.

In many cases, members enrol more than one technical staff member in the RTP, with some workshops having up to four peo-



ple receiving the RTP at any one time.

The RTP (Issue 1) is also used to great advantage by VASA in its validation of new members. When technicians or workshops join VASA, they receive the current year's RTP as well as Year 1 RTP. It is a requirement of membership that the Year 1 RTP questionnaires are returned within the first year of membership, thus ensuring that members are elevated from "Provisional" to full member status. This process ensures that the professional level of membership is retained at a reasonably high level – a major stipulation of the VASA Board and essential if the VASA logo is to maintain its credibility with consumers.

The RTP is an ongoing program, now in its fifth year.

As a service to members only, every issue of the RTP can be downloaded from the restricted "Members Lounge" of the VASA website, free of charge.

The list which follows reveals the awesome range of technical areas and problems covered by the RTP. Our next step is to categorise it by subject for quick ref-

erence on the workshop computer.

Year 1

REFRIGERATION

Refrigeration Bulletin 1

- Principles of refrigeration
- Refrigerants
- Pressure/temperature relationships of refrigerants
- Change of state characteristics
- Refrigeration circuit

Refrigeration Bulletin 2

- Principles of refrigeration
- Pressure/temperature relationships
- Enthalpy
- Enthalpy in the air conditioning system
- Enthalpy in the evaporator
- Enthalpy in the compressor
- Enthalpy in the condenser
- Through the TX Valve/orifice tube
- Summary of the basic operation
- Superheating and subcooling
- Checking evaporator superheat levels
- Discharge line superheat vs evaporator superheat

Refrigeration Bulletin 3

- Refrigeration
- The condensing phase
- Subcooling
- Critical points checklist

Refrigeration Bulletin 4

- Airflow measurement
- Condenser checks
- Using the results/correcting the problems
- Evaporator airflows

RETROFITTING

Retrofitting Bulletin 1

- System charging in retrofit
- The 90% charge rule
- R134a - Sight glass charging
- Charging options
- Determining charge rates by pressures

Retrofitting Bulletin 2

- Refrigerants in retrofit a technical perspective
- Clarification of refrigerants
- Technical considerations - refrigerants
- Seal compatibility
- Fractionation
- Glide
- Pressure control devices
- Receiver driers/accumulators

Retrofitting Bulletin 3

- Oils in retrofit - a technical perspective
- The OEM perspective
- Compressor oil return - the key factor
- Conclusions and concerns
- Oil selection in retrofit
- Oil selection criteria

Retrofitting Bulletin 4

- Professional service procedures in retrofit
- Baseline service procedures
- Evacuation performance
- Changing the drier/accumulator

Continued next page...

ELECTRICAL

Electrical Bulletin 1

Principles of electricity
Glossary of terms
Composition of matter
Conductors and insulators
What is electricity?
Flow in a conductor
OHMS law
Circuit types

Electrical Bulletin 2

Principles of electronics
Semiconductor devices
Thermistors
Meter fundamentals
Choice of multimeter
Ammeters
Ohmmeters

Electrical Bulletin 3

Radiator/condenser fan speed control
Basic control principles
Series/parallel switching
Principle of operation
Switching
Fan operation - for dual speed series/parallel switched circuits - radiator and condenser fans

Electrical Bulletin 4

EF/EL Falcon fan wiring
EF/EL switching
EF fan operation
Summary - EF Falcon
EL Falcon switching

TECHNICAL DATA SHEETS

Technical Data 1

Abbreviations

Technical Data 2

Conversion - imperial and metric units

Technical Data 3

R - 134A and R - 12
Refrigerant characteristics

Technical Data 4

Pressure temperature chart (common refrigerants)

Technical Data 5

Pressure temperature chart (common refrigerants)

Technical Data 6

Liquid line subcooling chart (kPa)

Technical Data 7

Liquid line subcooling chart (PSI)

Technical Data 8

Air conditioning oil charge capacities

Technical Data 9

Refrigerant formulation - automotive

Technical Data 10

Automotive air conditioning lubricants

Technical Data 11

Flushing procedures using R141b

Technical Data 12

Psychometric performance testing

Technical Data 13

Boiling point of water under a

vacuum

Year 2 - 1999-2000

Bulletin 1 - Advanced

Analysis

TX Valve control
Including limitations in retrofit
Detailed pressure analysis
Full evaporator coils
Partially filled coils
Valve equalisation
Pressure drops versus equalisation

Bulletin 1 - Refrigeration

Thermostatic expansion valves
TX Valves
Heat loads - the variable Superheat
TX Valve operation (Contd)
Starved coil condition
Flooded coil condition
Summary TX valve operation
TX valve sizing

Bulletin 2 - Advanced

Analysis
TX valve control - Part 2
Frost lines/ liquid floodback evaluation
Summary - frost line evaluation
Poor cooling performance

Bulletin 2 - Electrical

Electronic control principles
Principles of electronics
Diodes
Reverse biased
Forward biased
Diode applications
Transistors
PNP transistors
Thermistors

Bulletin 2 - Retrofitting

TX Valves in retrofit
When is a valve replacement necessary?
Cross charged bulbs
Retrofitting and cross charged bulbs

Bulletin 3 -

Electrical/Electronics

Amplifier systems
analogue amplifier inputs
Analogue logic circuits
The amplifier system in operation
Basic clutch switching
ECU control
Slip sensors

Bulletin 3 - Refrigeration

Orifice - expansion tube system
Operating principles
Fully flooded evaporator systems
Pressure control/freeze control systems
Low pressure thermostat controlled systems
Orifice tube application

Bulletin 3 - Retrofitting

Retrofitting orifice tube sys-

tems

R134a characteristics/physical properties

Orifice tube systems are different

Fully flooded systems

The solution

Pressure control / temperature control

Low pressure / thermostatic cycling systems

Noises in retrofit

Bulletin 4 - Advanced

analysis

Fault diagnosis - incorrect

gauge reading - incorrect

pipe temperatures

Is the evaporator "full"?

Is the coil "flooded"?

Is the EPR set correctly?

Bulletin 4 -

Electrical/Electronics

Amplifiers and pressure control units

ECM/PCM signalling

ECM/PCM control

Clutch lock-out strategies

ECM/PCM thermistor circuits

Limitations of thermostats

The circuit

Testing the circuit

ECM/PCM control

Multiplexed systems

Bulletin 4 - Refrigeration

Evaporator pressure regulator systems

Operating principles

TX valve control

Clutch cycling

The EPR/STV system

explained

Options of freeze control

How does the EPR valve

work?

Gauge analysis of EPR/STV

systems

Evaluation using the 3 gauge

method

Gauge readings - high heat

load

Gauge readings - low heat

load

Suction line frosting

Evaluation using the 2 gauge

method

Summary of operation

Bulletin 5 - Electrical

Types of electronic climate control systems

Electronic climate control

(ECC) system outline

Strategies of the ECC system

System overview

Basic areas of control

Inputs

Temperature detection

Thermistor (temperature

input) circuits

Circuit operation

Sunload sensors

Variations to input sensor

circuits

Circuit testing precautions

Bulletin 5- Refrigeration

Variable displacement compressors

Basics of EPR/STV systems and variable displacement

compressors

TX valve control

Basic system operation

Low heat loads

Regulating/reduced capacity mode

Compressor/control valve operation

Control valve operating modes

Under high heat loads (high system demand)

Under low heat loads - (low system demand)

Interpreting the gauges

System evaluation

Modification to variable pump systems

Contaminated and non-recommended refrigerants

Bulletin 6 - Advanced

Analysis

Variable pump diagnosis

A review of the basics of VP

The basics of diagnosis

System operational tests

Variable pumps in dual evaporator systems

Bulletin 6 - Electrical

Part 2 - Electronic climate control processing and outputs

Digital and analogue

Micro computer basic layout

Signal processing - the

basics

Processing

The basics of diagnosis

Outputs

Actuator (output) operation

Total system operation - basic

principles

Basic principles - output control

summary

Year 3 - 2000-2001

Bulletin 1 - Refrigeration

Sub-Cool cycle systems

The subcool cycle - what is

it?

Subcooling

Subcooling checks

Efficiency of subcooled systems

Subcooling (conventional

style)

Subcooling (subcool cycle

system)

Charge levels -subcool cycle

systems

Sight glass indication

Bulletin 1 - Electrical

Electronic climate control

Detailed output control

Review of basic system operation

System control strategies

After the initial stabilising

phase

Continued next page...

Cycling ranges
Start of system operation
Heat cycle - ECC systems
Enhanced control strategies

Bulletin 2 - Refrigeration

Performance testing by gauges
Review of gauge analysis
Analyse the low side gauge and flow rates
Sling psychrometer
Humidity probe

Bulletin 2 - Electrical

Electronic climate control
Monitoring of outputs
Blower motor control
Detailed blower speed control
Amplifier operation
Checking the circuit
Testing the base
Monitoring blower speed
High speed control

Bulletin 3 - Refrigeration

System switches and protection devices
Basic types of protection / control devices
Switches in detail
Pressure relief devices
Combination of switches and PRV's
Pressure transducers

Bulletin 4 - Refrigeration

System design and calibration
TX Valve - sizing and super-heat calibration
System calibration
Cooling capacity (ratings)
TX Valve ratings

Bulletin 4 - Electrical

Electronic climate control
Monitoring of outputs - blend door control
Heater bleed
Refrigerating capacity
Engine cooling system
Feedback circuit
Dual zone climate control
Diagnosis - blend door motors
Blend door referencing

Bulletin 5 - Refrigeration

System capacities
Definitions
Units of capacity
Basics of system capacity
Heat load calculation
Evaporator selection
TX Valves selection
Compressor selection
Flow rating evaluation
Condensing capacities

Bulletin 6 - Refrigeration

System capacities - Part 2
Humidity loading and system performance evaluation
A quick review
Humidity - why does it lower efficiency?
Testing systems
Determining humidity

Psychometric test data
Manufacturers graph
Manufacturers table
Understanding performance
Limitations of air conditioning systems
Humidity loading and efficiency
Limitations of thin walled /close tube evaporators
Humidity drains

Year 4 - 2001-2002

Bulletin 1 - Refrigeration

System flushing
Protecting the customer base
Principle causes of compressor failure
Compressor replacement scenarios
Filter screen blockages
Filter/drier (FDR) blockage
TX Valve inlet filter blockage
Orifice tubes/filters
Suction line filters
Component cleanliness in a compressor replacement repair
The condenser
The evaporator
TX Valve, orifice tube, receiver drier, accumulators
Evaporator pressure
Regulations, suction throttling valves and valve in receiver assemblies
Pipes, hoses, couplings and expansion mufflers.

Bulletin 2 - Refrigeration

Partial blockages and system efficiency
Compressor flushing
What do we flush with?
Flushing agent removal
Suction line filters - do they work?
The dangers of suction line filters
Fitting suction line filters - Reducing the risk
Testing procedures
Summary - flushing and suction line filters

Bulletin 3 - Refrigeration

Dual evaporator circuits
Factory designed/engineered systems
Hybrid and on site designed systems
Evaporator selection
Compressor selection
Flow rates and heat absorption
TX Valve control
Superheat
Oil return
Quoting dual evaporator jobs scenario
Condensing
Condensing efficiencies
Airflow considerations
Exceptions
Additional condenser fitment
Series or parallel?
Testing pressure drops in

condenser sets
Receiver/filter driers

Bulletin 4 - Electrical

Electronic management systems
Electronic control unit
Switching
Generation 1 - ECU/ECM
Signalling systems
Testing procedures
Generation 2 - ECU/ECM
Switching
Generation 3 - Thermistor ECM/PCM systems
The "Japanese" system - a derivative of the Generation 3 systems.
Electronic climate control systems
Generation 4 systems - the present day
Multiplexing and serial data communication
Multiplexed systems
The basics of multiplexing
Diagnostic tools
The complete system

Bulletin 5 - Electrical

Electronic management systems
Electronic control unit
Switching
Additional revision notes (Multiplexed Systems)
Displaying fault codes
Safety precautions for vehicles fitted with systems using electronic components
VT Commodore
Electrical/electronics
Blower motor control
Condenser fan circuit
Operating strategy

Bulletin 6 - Electrical

AU & AU II Falcon electronic control system
Some key points...
The AU Falcon system
Compressor clutch control
System monitoring
When do we generate super-heat?
Evaporator superheating
Excessive suction line superheating
Superheat of compression & recompression
Evaporator thermistor control
Summary inputs & testing
Substitution testing
Testing using a potentiometer
Outputs
Recirculate switching

Year 5 - 2002-2003 (CURRENT YEAR)

Bulletin 1 - Refrigeration
Variable pumps vs conventional systems
Variable pump systems low side analysis
Conclusions - principles of diagnosis - variable pumps
Bulletin 2 -

Full diagnostic charts for both conventional and variable pump systems, including pressure drop evaluation

Further bulletin content not yet finalised.

HOW THE RTP IS MANAGED

It works in this sequence after a person joins VASA.

1. They receive a membership hard cover folder, with section dividers, service standards and Year 1 RTP with questionnaires as well as the Bulletins for the current membership year.
2. In order to satisfy the VASA technical committee of the member's basic knowledge of vehicle air conditioning procedures and standards, they are regarded as a "Provisional" member pending completion of the Questionnaires for Year 1 RTP.
3. They have 12 months to complete the Year 1 Questionnaires.
4. They receive each RTP bulletin as they are published, together with questionnaires.
5. All Questionnaires are evaluated, marked and comments made.
6. At the end of each year, those who have completed the questionnaires receive a personal certificate of completion.
7. As a member, they are entitled to download free of charge all RTPs, which are available on the VASA website in a Members Only section.

VASA achieves the following:

1. Provides members with a value for money continuing course of technical information, product and equipment knowledge and skills.
2. Encourages members to share experiences and engage in continuing knowledge gathering to improve their competitive edge.
3. Retains a healthy interest in VASA and the many opportunities it presents .
4. Continues to lift the overall standards of membership to a level which justifies VASA's claim to be the professional "network of choice".
5. Provides the means of building the credibility of the VASA network of repairers.



Continued from Page 1

They came from as far afield as Rockhampton, about 800 kms to the north, and Grafton in NSW.

Keynote speaker was Adelaide-based trainer Grant Hand, who is also training coordinator for one of the partners in the venture, VASA (Vehicle Air Conditioning Specialists of Australasia).

Introductions to VASA and the AAAE were carried out by VASA President Mark Mitchell and AAAE secretary Jeff Smit.

Grant Hand held the floor for the rest of the morning and following lunch, exhibitor speakers introduced new technologies and products. This was followed by an open forum featuring all the speakers and the trade show, where six exhibitors had set up mini displays of essential equipment.

Exhibitors were Lovelocks, JAYAIR, SCA Australia, Petro-Ject, Ashdown and Sanden.

The day was voted a huge success. Of the 47 survey forms filled in after the event, all but one answered YES to the question, "Was the workshop useful for you?".

The respondents were glowing in their praise for Grant Hand's presentation and for the depth of information provided.

Grant's topic was based on selection of the right capacity components to suit mobile air conditioning applications.

The training workshops will all feature a keynote speaker, who will deliver an in-depth technical presentation. Support speakers will concentrate on new products and technical tips covering air conditioning and auto electrical.

At all workshops, both AAAE and VASA will present their credentials and try to encourage membership applications from the audiences.

There was universal agreement that a/c and auto electrical technicians who did not attend additional training at workshops such as these, could not expect to retain their market positions as vehicles become more complex.

Issues identified which will impact on the technicians of tomorrow will be the possible introduction of CO2 into climate control systems in vehicles.

Of major interest to all a/c workshops is the licensing of all technicians who handle FC refrigerants, which will become mandatory in Australia over the next couple of years. It actually begins next year on a voluntary basis and then is expected to become law. Technicians without the license, will not be able to buy refrigerant gas.

Other issues include a range of new incentives put in place by Refrigerant Reclaim Australia to step up the rate of nationwide recovery of refrigerant gas from vehicles.

The next Wire & Gas regional workshop will be held in Albury on Saturday 29 March 2003, followed by Perth on Saturday 12 April 2003 and Sydney on 3 May 2003.

For further inquiries: www.wireandgas.com or phone 07 5526 3044

DIARY DATES FOR NEXT TWO YEARS

2003

Saturday 29 March
Wire & Gas Regional Workshop
Albury / Wodonga
Coverage: Northern VIC and Southern NSW

Saturday 12 April
Wire & Gas Regional Workshop
Perth
Coverage: All of WA

Saturday 3 May
Wire & Gas Regional Workshop
Sydney
AAAE Annual General Meeting
Coverage: Metro area

Saturday 7 June
Sunday 8 June
(June long weekend)
Wire & Gas Regional Workshop
Adelaide
VASA Annual General Meeting
VASA 10 years since first meeting
Coverage: All of SA and Australasia

Saturday 9 August
Wire & Gas Regional Workshop
Townsville
Coverage: Far North QLD

Saturday 6 September
Wire & Gas Regional Workshop
Melbourne
Coverage: Metro Area

2004

Saturday 27 March
Wire & Gas Regional Workshop
Orange
Coverage: Western NSW

Saturday 17 April
Wire & Gas Regional Workshop
Rockhampton
Coverage: Central QLD

Saturday 8 May
Wire & Gas Regional Workshop
Wollongong
Coverage: South Coastal NSW

Saturday 12 June
Sunday 13 June
Monday 14 June (June long weekend)
Wire and Gas Training
Convention and Trade Show
Gold Coast
VASA: Annual General Meeting
CELEBRATION : 10 years of incorporation

Saturday 14 August

Wire & Gas Regional Workshop
Brisbane
Coverage: Metro / Gold Coast / Sunshine Coast

Saturday 11 September
Wire & Gas Regional Workshop
Ballarat
Coverage: Western Vic

The Mobile Air Conditioning Society (MACS) Worldwide will hold its 23rd annual convention and trade show, Reality Check 2003 at the Marriott New Orleans from 30 January to 1 February 2003.

MACS trade show, long recognised as the largest and most prestigious in the international mobile A/C and engine cooling system industry has sold out early.

There will be 122 vendors in 199 booths featuring the best in mobile A/C tools, equipment and services.

A current list of MACS worldwide exhibitors may be found on the MACSWorldwide website at: www.macsw.org.

Founded in 1981, the Mobile Air Conditioning Society (MACS) Worldwide is the leading forum for its specialised segment of the automotive aftermarket. MACS Worldwide' goal is to fill the industry's need for comprehensive technical information, training, and communication.



Airport location pays dividends for NZ VASA member

Hot Air always tries to give credit where it's due. While this story is a little belated coming through, it still deserves a run because it highlights what a bit of lateral thinking can do to improve business prospects.



Auckland member Stuart Montford, was recently awarded the Mariner 7 Best Emerging Business Award for his company Auckland Vehicle Refrigeration (AVR). AVR specialises in automotive air conditioning, small to medium truck chiller units and small business air conditioning systems.

The company was launched as a one man band in August 1999 by Stuart and his wife Tina. A contract with Europe's largest auto air conditioning company, based at London's Heathrow Airport, gave Stuart the idea to set up AVR at Auckland International Airport. The site was chosen strategically for the large number of rental car and mobile campervan companies located there. There is also a high growth zone for businesses and warehouses.

In just 18 months, the staff grew to five. "To see the growth over such a short time has been tremendously rewarding," says Stuart. "I honestly believe that employing quality staff and maintaining a strict policy of money made by the company goes back into the company has led directly to our growth. This growth will continue as we move to reinvesting into research and development of truck refrigeration."

You can help keep the website honest

With the new VASA website, there are bound to be broken links and all sorts of problems until we get the bugs ironed out. We are talking about computers, remember.

Let's face it, as professionals in the motor vehicle industry, if you turned out equipment and operating systems for your cars like the computer companies turn out for their computers, you would all be

out of business.

So if you see something which looks odd on the website as you browse around, please send a quick email to secretary@vasa.org.au and we will fix it.



New VASA website is lean and clean

Don't ask how we did it, but the new VASA website is up and running, with quite a few changes.

When the website was first developed about four or five years ago, without realising it we created a monster.

We soon realised that the time and cost of maintaining a massive site which worked on manual systems just couldn't be sustained.

So with the help of our "boy genius", Nick Fritzkowski, we streamlined the site and did the impossible, put the entire membership database on the internet. With this move comes a host of new possibilities.

Members will edit and look after their own information on line. So if you have not updated your phone number, the member of the public who goes looking for you in your suburb will not be able to reach you and you lose the business.

The database will automatically generate letters, invoices etc to meet certain deadlines. This means no more long delays in the processing of member requests and new member applications.

We got rid of the buy and sell page – wasted too much time and not enough people made use of it. The special pages for executive members and the Board have gone too. We've returned to direct emails for the executive for all communication.

Member benefits will improve rapidly now that we have more time to devote to simply putting plenty of technical information in the members' pages. This is what you pay for.

So our recommendation is. As soon as you get a minute go on line and at least check out your own personal information and make sure it is correct.

Unicla UC45 Compressor



The UC45 is a new release from Unicla for very small applications, like small cabins on ride on mowers, sleeper cabs in trucks and small chiller boxes using R134a.

It's A mount style, has pad hose fittings on top and No 8 hose size both sides. Comes in 12 and 24 volt 4pg and M section clutch pulleys.

Main feature is that the compressor is such a low power consumer it can be driven by a 12 or 24 volt DC motor.



SCA Australia Pty Ltd
Parts Sales:
07 5571 1936
Email:
sca@sca.com.au

www.sca-australia.com.au



AUTOMOTIVE TECHNOLOGIES

Spal fan assemblies include high efficiency, low noise and either middle or long life types. Long life motors are considered to last between 5 and 7,000 hours.

Centrifugal blower decks include single scroll type with the motor enclosed into the actual housing within the blower wheel for confined spaces.

Centrifugal blower decks with 3 speed resistor cast into the motor housing include substantial airflows up to and including 1000 m₃/h.

Axial fan assemblies are slim in design, very light weight for weight conscious systems, airflows up to and including 2750 m₃/h and full performance curves can be supplied.

Australian Distributor:
Custom Air Transport Air
Conditioning & Refrigeration
1800 600 440



A/C DIAGNOSTIC TOOL



The A/C Investigator's sophisticated computer "brain" takes just 2 minutes to run its diagnostics routine and evaluate system information.

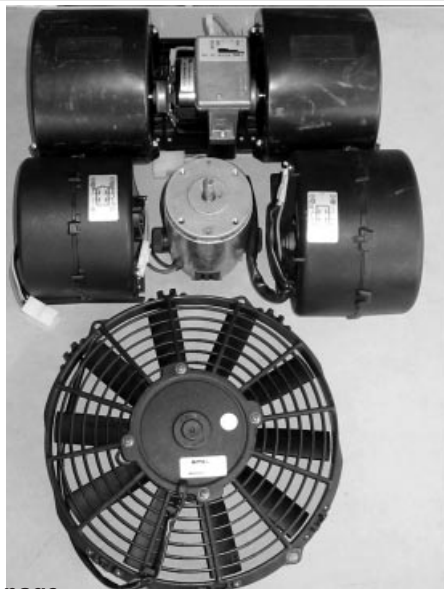
Years of service expertise, fieldwork, development and testing have been programmed into the A/C Investigator so it can provide accurate analysis.

It then prints out a list of possible problems and suggested repair solutions. PT # 9500



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www.jayair.com.au



More next page...

Any VASA member with a new product or service is invited to use this forum - only \$75 inc GST per insertion ...and it goes on the website as well for three months.

Send submissions to the Editor, Hot Air
info@vasa.org.au Phone 0755263044 or
 Fax 0755263404

SDV V5 REPLACEMENT

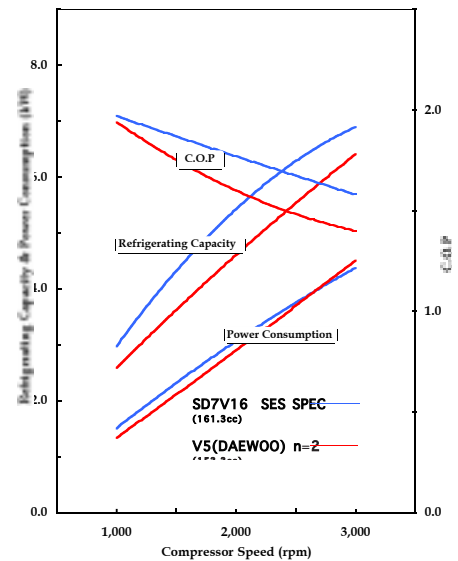


Sanden has developed a replacement for the VT V5 based on our SD7V16 compressor, (Part No DI-A932).

The performance graphs prove that the SDV will provide equal if not better performance.

The drop in has been designed to fit straight into the vehicle with the simple modification to the wiring terminal. No need to change hoses or fittings. .

Pressure Dis/Suc : 1.67(MPa) / 196(kPa)[gauge]
 Sub Cool / Super Heat : 0 / 10(K)



For further information contact your nearest Sanden Stockist

The above product information is a service to members and paid for by sponsors. While every attempt is made to ensure that only quality and proven products are selected, publication should not be construed as an endorsement of products by VASA.

Manuli hose and fittings offer exceptional seals to high pressure systems.

The dual o-ring type seal of the shaft ensures efficient sealing relying on rubber to rubber rather than compression seals with traditional crimping.

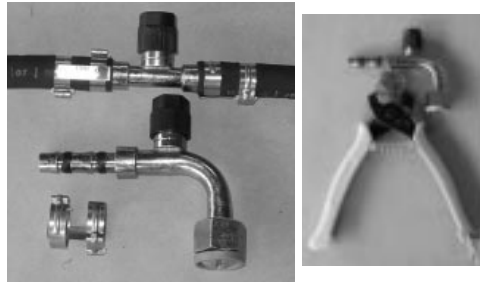
The Manuli crimp is re-useable and if the fitting orientation is wrong, undo the crimp with the same tool adjust the orientation and re crimp.

The crimping tool allows on the job crimping and eliminates wastage.

In the event the wrong fitting is crimped, the fitting can be very carefully removed and the correct fitting installed with no wastage of hose.



The Manuli hose and fittings are essential in high pressure, low temperature applications.



Australian Distributor: Custom Air Transport Air Conditioning & Refrigeration 1800 600 440

www.vasa.org.au

...Your one-stop resource centre on the web...

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

Is this the training you want?

Delegates surveyed at the Tweed Workshop on 2 November last, provided this list of training they wanted most. Do you agree?

Dual Systems
Transport refrigeration

Variable pumps
Continuing A/C diagnosis

Practical use of diagnostic scan tool
More info on electronics of later model vehicles and any wiring diagrams

Variable pumps
More from specific vehicle trainers like

Toyota, Ford and Holden for current cars
Some VT and AU A/C trouble shooting guides

All A/c updates of management system and include climate control

Electronics used in trucks
Climate control and more on variable compressor systems

Model specific training

Electronic Climate controls

EFI; diagnostics (advanced); engine management

VASA READY REFERENCE DIRECTORY 2002-2003

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64 9 277 9855
64 7 578 5626
03 9305 4055
03 9926 1800

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07 3286 1836
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