



# SightGlass News

Issue 1 • April 2015

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*Unbeatable R1234yf  
insights, training and  
more at W&G 2015*



## WIRE & GAS

## 2015

### GOLD COAST JUNE 5 - 7



# JOIN THE R1234yf ELITE

**THIS year's Wire & Gas convention and trade show (Gold Coast, June 5-7th) is guaranteed to put you ahead of the pack when it comes to knowledge of the new industry standard automotive air conditioning refrigerant, R1234yf.**

In addition to being among the first in Australasia to receive comprehensive on-vehicle training in R1234yf, Wire & Gas attendees will join an elite few to receive knowledge and understanding of R1234yf directly from an engineer who played a key role in the new refrigerant's development.

Barbara H. Minor is senior engineering fellow at Chemours (a subsidiary of DuPont) in the USA, and led the development of several low global warming refrigerants for refrigeration and air conditioning applications, including R1234yf for automotive.

She holds more than 130 US patents, has her name to numerous publications and is an active member of refrigeration societies



**Barbara H. Minor**

such as ASHRAE and AHRI, while chairing the AHRI Research and AHRTI Technology and Steering committees.

Barbara will deliver a presentation at Wire & Gas and be available to answer in-depth questions about R1234yf.

Detailed training in R1234yf will be presented by respected automotive climate control expert Grant Hand and VASA director Mark Mitchell, including on-vehicle sessions with a dedicated R1234yf system using the relevant gauges, evacuation unit, proprietary cylinder and fittings.

Also covered will be R1234yf operating characteristics, a comparison of its enthalpy properties with R134a and handling techniques for this A2L-rated 'mildly flammable' substance.

The value of gaining so much knowledge about a refrigerant that is expected to be used in the majority of cars sold in Australasia within two or three years is worth the delegate fee alone but there

is much, much more going on at Wire & Gas besides.

Other training sessions – also delivered by experts in their field – cover air conditioning basics, engine management systems, deep cycle batteries and solar, and the psychology of business. Training is fully catered, with morning tea, lunch and afternoon tea provided.

The experts forum on Saturday night will also provide the opportunity to learn from leaders in the automotive air conditioning and auto-electrical industry.

A trade show will operate throughout the event, providing exhibitors with 16 hours of contact time with Wire & Gas delegates, who will socialise and network during the Friday night happy hour, Saturday night cocktail party and Sunday night gala dinner.



**Grant Hand**

**Book now! [vasa.org.au/WG2015](http://vasa.org.au/WG2015)**

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# SightGlass News



## WELCOME TO VASA2015

A message from VASA VP Brett Meads



**IT IS with much pride that I welcome you to the first edition of VASA's SightGlass News. Your current board and executive team have collectively invested many thousands of hours to provide members with an association that is relevant, informative, helpful and cost effective.**

To be fair, VASA 2015 has really been 22 years in the making, and it would be appropriate for me to acknowledge the contribution made by all directors and executive staff during VASA's rich history. As volunteers from your industry, VASA directors have always worked hard to give of themselves such that the industry and your business may benefit.

Sometimes we get it wrong, sometimes we get it right. And sometimes we confront obstacles that just cannot be overcome by an association such as VASA, despite our best intentions.

Still, with the support and feedback of our members we continue to strive for an association of which you can be proud to be a member, an association that punches above its weight when it matters, and an association that holds high the values of training, networking and, importantly, taking pride in being a professional technician and businessperson.

VASA 2015 is the result of both member feedback and a board committed to growing your association for the benefit of all members.

We have streamlined operations such that we can now offer a long overdue reduction in membership fees. Coupled with this we have changed our membership structure so that all those who work in our industry can now benefit from an investment in VASA membership. Further, we have looked hard at the member benefits on offer and repackaged and enhanced the line-up of resources available exclusively to VASA members.

The SightGlass suite of products is only available from VASA and I encourage you to jump in feet first and make good use of all of the SightGlass products.



I thank you for your ongoing support of VASA and I invite your feedback, both positive and negative. I look forward to catching up with you at Wire&Gas 2015, or at one of VASA's Regional SightGlass Training sessions during August and September.

## SightGlass News

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## FROM THE EDITOR

Haitham Razagui  
editorial@vasa.org.au

**A PROUD welcome to the first edition of SightGlass News. I hope you like the new look and enjoy the content we've packed in.**

As usual there wasn't quite enough room for everything we wanted to publish but hopefully with a bit of sponsorship here and advertising there we can increase the page-count in future editions. Then I

won't have to be so merciless in slashing paragraphs or even whole articles!

My intention is to run those articles that get snipped, in their full glory, on the new members-only SightGlass Live website, where discussion around the topics covered is warmly encouraged.

But back to the subject of advertising – please get in touch if you want your organisation, products or services promoted within these pages.

VASA membership is set to grow exponentially for the benefit of all members, so increasing the reach of our publications with workshop owners,

technicians, wholesalers, manufacturers, government departments, educational institutions and industry bodies.

Valued readers don't fret – unlike some other trade publications I'm not about to fill these pages with advertorial and I will keep digging up original industry stories to keep you well-informed and ahead of the game.

I know readers can tell the difference between advertorial and original content. And I know you are more likely to pick up, read, value and respect publications full of original content.

So that is exactly what you will get.

## THE PRESIDENT WANTS A WORD

with Ian Stangroome



**WITH the receipt of this, the first edition of SightGlass News, I welcome you to a new membership year and a new era of evolution for our association.**

As our industry evolves, so too must we, and by 'we', I mean both collectively and individually, all of us who are involved in any way in our industry. To be representative of our industry, and remain relevant to our membership, your VASA board and secretariat accept the responsibility and undertake to ensure that our association evolves and changes with the times.

This new VASA year heralds many changes, which we feel are vast improvements and will add great value to your membership.

You may have noticed the revised logo, which has undergone a subtle change. The waveform signal which underscores 'VASA' transforms from that of an analogue waveform to digital. This seemingly simple change of our logo represents more than just a change in the shape of a wiggly line. For all the technicians out there, you will appreciate the many changes you

have experienced in the workshop as vehicles have entered the digital age. With our analogue brains we are now required to think

digitally: On/off, high/low, black/white, right/wrong. Well, maybe not the last two examples, but you get my drift, and whatever happened to grey? Just when you thought you had seen the last of the sight glass in our industry, apart from those still used in a few systems of course, VASA re-introduces the 'SightGlass' into your world.

A sight glass may be defined as 'a viewing window used to observe the contents of a sealed or enclosed system'. VASA has expanded its product offering under the SightGlass brand to enable you to gain a broader, interactive insight into the industry. The newsletter, 'Hot Air' has become a rejuvenated, glossy *SightGlass News*, and 'eNews' has become *SightGlass eNews*.

In 2015 VASA has introduced *SightGlass Tech*, a growing library of quality printed, vehicle specific HVAC technical bulletins, produced by the VASA Technical Team, providing exclusive test data, information, known issues and Autodata wiring diagrams.

Another new product on offer is the

member exclusive interactive online information exchange SightGlass Live, which allows members to network with real experts to learn, share tips, tricks and advice on all things technical, business and industry related.

Like the sight glass installed in air conditioning and refrigeration, which allows you to look into a sealed system, SightGlass Live is also sealed from non-members. We encourage you to make use and take advantage of this fantastic, exclusive new resource.

Of course it only works if you contribute, so don't rely on others to make all the posts, but actively work at regularly logging in, making contributions and answering posts yourself. You never know who you might help with that snippet of knowledge you may be sitting on.

Remember, to continue to have access to the suite of VASA resources, your membership subscription must be maintained, so I would urge you to renew your 2015 membership as soon as you are able, if you have not already done so.

Lastly, as you may be aware VASA has a booth at this year's AAA Expo in Melbourne, held from the 16th-18th of April.

We look forward to hearing from you or catching up with you either at the Expo, Wire & Gas or the Regional SightGlass Training events. Wherever you are, may all your interactions be mutually worthwhile.



1. Much of the global automotive industry has adopted R1234yf as the standard refrigerant in new cars, primarily due to tightening overseas legislation over the global warming effect of refrigerants released into the atmosphere.
2. R1234yf has a far lower global warming potential than R134a, which has been the sole industry standard refrigerant in automotive air conditioning since it replaced ozone-depleting R12 in the 1990s.
3. Unlike the switch from R12 to R134a there will be no need to change existing air conditioning systems over to R1234yf, because R134a will continue to be available for servicing older equipment.
4. R1234yf carries an ASHRAE rating of A2L (mildly flammable) and is subject to Dangerous Goods class 2.1 handling and transportation requirements.

5. However R1234yf is not easily ignited and struggles to sustain and propagate a flame compared with A3 (highly flammable) rated hydrocarbon refrigerants available to the aftermarket but never used or approved by OEMs.
6. Flammability concerns about R1234yf are held by some car manufacturers – most notably Mercedes-Benz, which has contravened European law by refusing to adopt it – meaning it is inevitable that additional new refrigerants will start to enter the market in the near future, making the job of the automotive air conditioning technician more complex.

### Introducing a new Autodata



[autodata.com.au](http://autodata.com.au)



# INSIDE AUTODATA



Behind the scenes: a painstaking wiring diagram process

**TALENT, dedication, patience and time. A lot of time. This is just a fraction of what goes into creating the Autodata wiring diagrams used daily in thousands of workshops across Australia and New Zealand, plus countless more around the world.**

*SightGlass News* discovered just how much work goes into the Autodata product during a behind-the-scenes tour of the British company's Australian headquarters in Brisbane, where almost 2600 wiring diagrams have been created in the past three years alone.

As part of VASA's partnership with Autodata, some of these diagrams are included in the new member-exclusive *SightGlass Tech* bulletins.

Adam Maynard, a young ex-Holden technician, sits at his desk in a comfortable office that bears no resemblance to the warehouse racks that once occupied this space in the days before everything went online, and Autodata was still shipping books and CDs.

Attached to one of Adam's two computer screens are family photos, beside him a huge lever-arch file containing an official factory Ford FG Series II Falcon workshop manual.

Adam shows me the wiring diagram in the Ford manual he is using as an information source. As Ford had combined the starting and charging circuits onto a single one-page diagram, Adam has used a highlighter pen to isolate the two circuits so he can create separate diagrams.

To demonstrate how different the source materials are for each manufacturer, Adam reaches for a Nissan D22 Navara workshop manual in which the wiring diagrams are broken down to show only the sections affected by specific diagnostic trouble codes.

My mind starts to melt as I try to understand how Adam accurately translates innumerable separate sections of circuit into Autodata's easy-to-use schematic style, which was established around 25 years ago. The Nissan and Ford diagrams are as different as night and day – and there are dozens more manufacturers, all with their own formats for Adam to get his head around.

To ensure consistency and ease of use for technicians flipping from one vehicle to the next, Autodata sets strict rules on the layout of wiring diagrams. For example, fuel pumps are on the left, ECUs are central – regardless of the many ways source information might be laid out.

It is the same story for wiring colours. Each has a standard Autodata code – for example yellow is 'ge'. Similarly, if you have ever wondered why some of the wording used in Autodata seems a bit odd, it is to ensure it accurately translates into all 17 languages in which it is published around the world.

**'A set of wiring diagrams for one car takes 160 man hours but on complex vehicles the power distribution diagram alone can take a month. But that's not the end of it.'**

The rules mean Adam's diagrams match the format of those produced at Autodata's global headquarters in the UK, where the wiring diagram team alone outnumbers him ten-to-one. Similar-sized or even larger teams work on other information categories.

Adam says that on average, a set of wiring diagrams for one car takes 160 man hours but on highly complex vehicles the power distribution diagram alone can take a month. But that's not the end of it.

Once Adam has finished drawing each

## MANUAL MAYHEM

**AUTODATA Australia technical liaison and content manager Wayne Mander allowed *SightGlass News* into a cornucopia of workshop manuals that would turn an enthusiastic home mechanic – and probably a few professional technicians – green with envy.**

**Not only is there an archive of Autodata manuals – among them a six-volume archive of wiring diagrams including one in the old pre-schematic style – but official factory manuals and glovebox guides for all sorts of Australian-made and imported vehicles.**

**An indication of modern vehicle complexity was the 19-volume Toyota Tarago manual, each book the size of a major city's telephone directory. Imagine the freight on that – and then multiply it by the number of Toyota models out there.**

diagram, he must identify and list all the electrical components featured.

Because Autodata diagrams are interactive, they must all be accompanied by a document full of XML computer language that among other things, lists every electrical component in the circuit. Each component has its own designation, drawn from Autodata's constantly growing master list – which currently contains around 2000 entries.

Adam must carefully select each component from the master list for inclusion in the XML file. To my eyes the repetitive, robotic-looking XML document looks easy to get lost in but Adam is unfazed.

And if a type of component in a circuit is duplicated (such as multiple cooling fan relays) the component codes must be suffixed by a number and this replicated in new lines of the XML document.

To make sure he has covered all the diagrams for each vehicle, Adam has a standardised list of 'chapters' he must complete (unless they relate to systems not included on that model). Adam seems to use this as much as a work plan as a way of making sure he's covered everything on the vehicle.

Some diagrams must also be created to be print-friendly, spanning several pages. Viewed online the whole diagram is visible, but for printing they might be

Adam Maynard



divided into several A4 pages. For this Adam has to create new versions of diagrams that can spill across more than one page, complete with icons to help users match the points where each part of the circuit has been split.

The biggest diagram created in Australia spills across three pages but circuits for some of the European luxury cars can span up to six pages.

We're still not finished. Once all the diagrams and their associated XML documents are complete, they must be sent to Adam's UK counterparts for double- and triple-checking and any problems fixed before the diagrams can

be included in the Autodata software.

It can take up to six months from Adam picking up a factory workshop manual to the diagrams appearing online, but with streamlined processes and Autodata's recently released new online system the aim is to reduce that significantly.

Every diagram has a serial number so it can be traced back to the person who created it and the source material from which they were working.

Adam said there had been a number of cases in which Autodata customers found problems with diagrams subsequently traced back to the official factory manuals.

In one example the diagram was so wrong that when Autodata notified the vehicle manufacturer, it had to withdraw the factory manual and republish it with the diagram fixed. In another, it turned out a manufacturer had changed the colour of a wire because the factory ran

out of the old colour and never reflected the change in official manuals.

Wiring diagrams are just one of 25 information types available through the Autodata system. The effort required to compile so much data from disparate and often expensive sources is just mind-boggling.

It's incredibly labour-intensive work, carried out by skilled and knowledgeable people (Autodata has a policy of recruiting people with a trade background). Then there's the investment in sourcing official workshop manuals and data from manufacturers (who aren't always cooperative) plus the infrastructure required to provide a reliable world-wide online service.

Having seen what goes into just one part of Autodata's product, it starts to look like staggering value for money.

So when you're next looking at an Autodata wiring diagram, perhaps on the back of your *SightGlass Tech* bulletin, you can now appreciate the hours of painstaking work Adam and his colleagues put into it.



**IT IS hard to remember your lines when it is 40°C, even when you wrote them yourself.**

I learned this during filming for a short promotional video about VASA's new member-exclusive *SightGlass Tech* bulletin series.

Another thing I learned from the experience is just how much work – and teamwork – goes into producing each bulletin, which provides an overview of the HVAC system of the vehicle covered, air conditioning performance data to help technicians with diagnosis and HVAC wiring diagrams from our friends at Autodata.

When I arrived at the SuperTest facility on the Gold Coast just after 8am, a Toyota Yaris in the huge test chamber was already rigged up to all sorts of sophisticated monitoring equipment with wires, pipes and probes everywhere like a patient in the intensive care unit of a hospital.

In the adjoining monitoring office,

accessed through a half-foot thick metal door and with vault-like walls to match, it was possible to peer at the Yaris through what looked like bullet-proof glass.

Beneath the window were two large computer screens providing real-time data from probes measuring the temperature and airflow at the car's air vents and return air duct, the temperature of the car's refrigerant pipes, its low- and high-side refrigerant pressures and the ambient temperature and humidity of the test chamber itself.

There was probably even more going on that I either didn't notice or have forgotten. And this was a simplified version of pilot tests conducted previously, which simulated ram-air conditions, measured condenser fan airflow – you name it – and were dropped to focus on what tests can be most accurately replicated in a workshop environment.

It was time for the test to begin, with the test chamber set to 25 degrees. Once it (and the Yaris) had reached this temperature, the engine started and the air conditioning system activated, I watched the computer screens in fascination as a graph was plotted showing temperatures and pressures changing.

The tests at each ambient temperature were repeated with various combinations

of blower speed and engine RPM until finally the test chamber was cranked up to 40°C.

Which, as I found, was not a good time to try making part of the video inside the test chamber.

During and after all the test chamber activity, which takes hours and hours, photos were being taken of various components and connectors deemed useful for each vehicle's *SightGlass Tech* bulletin.

In addition, information like belt routing, known issues, thermistor values and overviews of the vehicle platform and HVAC system layout are compiled and relevant Autodata wiring diagrams sourced.

After each vehicle is tested, all the data recorded is sifted through to create a snapshot of what its air conditioning system was doing at a set stage in the process, and if the compressor was cycling at that point, two figures are recorded to cover both compressor on and compressor off states.

Creating each *SightGlass Tech* bulletin requires a mammoth effort and I think you'll agree it is well worth it to provide VASA members with such a valuable resource. Our aim is to provide you with six bulletins every year.

Watch the video: [vasa.org.au](http://vasa.org.au)

# MEET THE MEMBERS



**Tracey Dann of Hot Wired Auto Electrical in Toowoomba**

**TRACEY is not your stereotypical automotive workshop owner. With no trade background but a Bachelor of Business in economic and human resource management and an MBA to her name, Tracey comes from the HSE (health, safety and environment) and management consultancy industries, with experience in large organisations and corporate Australia.**

She employs four tradesmen and three apprentices plus purchasing and administration staff

Many of Hot Wired's clients come from the resources and civil construction industries.

### About Tracey

#### What encouraged you to begin working in the motor trade?

This business was purchased in 2000 as an investment at a time when I also owned a business in the HSE area. For a long time I ran both businesses but saw the potential for growth in the auto-electrical area so stopped consulting and focussed on this business.

I work in it full-time and don't pretend to be a tradesperson. I hire and surround myself with very good people and that allows me to run the business.

#### What do you enjoy about your job?

The challenge of making it work. I like working and surrounding myself with excellent people and that doesn't just include my staff who are a great team but extends to some relationships with customers and suppliers.

#### What are your core skills?

The boys will still say I struggle to identify an alternator from a starter motor, which is not entirely true! My core skills are in businesses management and the skills of managing a business, whether it's

a multinational or a small regional city workshop, are the same.

Because I don't have a trade background I don't have to believe that rebuilding an alternator is the holy grail of skill-sets so I'm more prepared to look outside that box. To help diversify we do work with vehicle management systems that are increasingly used by fleets these days.

As a business we're very customer-focussed and differentiate ourselves by the depth of skills our very qualified tradesmen have. Because our apprentices are working with those people they tend to develop a very broad range of skills very quickly.

We look at new technology, the accessory market, what we need to be aware of and we invest a lot in specialist equipment. For example we do harness braiding, and have a number of scan tools – it's just as common to see our tradesmen on computers researching diagnostics as on the tools.

#### What are your hobbies and interests?

I love travel and gardening – and have a 12 year-old, so I am officially his taxi driver.

#### Where do you want to be in 10 years?

In Tuscany drinking wine! Work-wise I'd like to see the business grow in providing very high-quality responses to auto-electrical requirements and growth in not only staffing numbers but also our product offering and the degree to which that is hi-tech, current and leading-edge.

### About the Industry

#### How do you feel the automotive AC industry is faring at the moment?

Like many VASA members we've seen a

decline in air conditioning work over the past couple of summers, largely due to dramatic increases in the price of R134a which caused people to seek alternatives.

Despite hydrocarbon refrigerants being controlled in Queensland, the reality is, you can buy them easily.

We are encountering increased hydrocarbon use and a couple of local mechanical workshops have started offering a \$77 re-gas. Suppliers to our industry are wholesaling it happily and it is advertised front-and-centre in some publications. You just can't compete with unlicensed people doing air conditioning work themselves.

#### Will it get better or worse?

That is so much in the hands of the regulators and legislators and until there are changes at that level I think we're going to continue to see erosion of our market share and the downgrading of the quality of work carried out by some in our industry who are unqualified and really shouldn't be doing this kind of work.

#### What is your view on the use of the new R1234yf refrigerant?

I read VASA articles every time they're published and some others online so we have background awareness but it's not something driving our decision-making at this stage. We purchased new recovery equipment about 12 months ago and looked at whether we needed to make provision for R1234yf but at that point my assessment was that those machines (which last around four years) will be nearing the end of their

useful life by the time R1234yf becomes something we need to deal with.

#### Do you attend industry seminars?

I always send some of my staff to Wire & Gas and this year I will be attending for a day, while I'll have a couple of my tradesmen at the technical sessions and probably a couple of apprentices as well. It'll be great for the apprentices to get that exposure.

We get TaT and go to their seminars and regular Repco workshops so we draw from a lot of areas in terms of ongoing staff development and keeping a handle on what's happening.

Locally I am very involved with the Chamber of Commerce and business networking organisations.



**Tracey Dann**

#### Are you a member of an automotive body other than VASA?

VASA tends to be the only one. We're a Capricorn member so through that we have an involvement with TaT but nothing other than that. I haven't seen a lot of promotion of what else is available.

#### Are there things you would like the industry to do that it is not yet doing?

Support trade training and opportunities for that, to maintain skill levels. Continue to keep tradesmen in the industry and show there is a career path where you don't end up being a certain age and stagnating career-wise, which is a huge challenge.

Having a voice with some of our suppliers as well. Some wholesalers don't always support the trade as much as they should, which cuts our margins and is damaging to the industry. It's something there needs to be an awareness of and the wholesalers need to know where they're positioning themselves – are they a retailer or a wholesaler?

#### About your VASA membership

##### How long have you been a member?

A long time, maybe 10 years.

##### Why did you join VASA?

Because I think VASA has a very important role in providing a voice for businesses like mine. As a small business you don't often have that voice so as a trade we need to have that lobbying power. That's so important because small businesses find it hard to be heard or make a difference. With VASA you get that critical mass that can bring about change.

##### How do you use VASA?

I always read the magazine and it goes in our lunch room where I know it's read widely by my staff. If there's an article that has particular resonance for something that's happening to us we will discuss it during our staff meetings. We use it as a prompt for staff discussion, whether it's a technical thing or more business-related.

##### Do you think VASA has a strong voice in the industry?

I do think it has a recognised voice. I think it's difficult sometimes to see how that voice is perceived because from a membership perspective we don't see all the things that are happening behind the scenes.

##### What more could VASA do for members?

More social media for people to see what VASA's doing as an industry voice. And remember that not everybody in the automotive business is a bloke! There is this perception of a very stereotypical workshop hierarchy which is the tradesman who brings in his wife as the admin person and they have a couple of other staff – but I don't fit any of those categories!

## HYDROCARBON HOSE-DOWN

**THIS warning label attached to a cylinder of hydrocarbon refrigerant could be the manufacturer's admission that its product is no longer considered a direct 'drop-in' replacement for R134a.**

The warning criticises major hose brands and hose types used by major motor vehicle manufacturers and recommends the retrofit to a 'full barrier hose' in order to reduce the chance of highly flammable refrigerant leaking.

Also, since the manufacturer's website was updated last year, the term 'drop-in' previously used in its marketing materials has all but disappeared.

Could it be that even the makers of HC refrigerants are now wavering over claims their products are suitable as direct R134a replacements in modern motor vehicles?

In a move unlikely to be warmly welcomed by hose manufacturers, the warning names the products of some brands as 'known suspect' including Goodyear, Nichirin, Parker, Manuli and Aeroquip.

The label recommends hoses complying with standard SAE J2064 Type C and to avoid hoses complying with SAE J2064 Type A and B.

However SAE J2064 relates only to hoses rated for R134a and R1234yf, making no mention of suitability for hydrocarbon refrigerants:

'This SAE Standard covers hose and hose assemblies intended for conducting liquid and gaseous R134a and/or R1234yf refrigerant in automotive air conditioning systems.

'A hose marked 'J2064 – R134a', 'J2064 – R-1234yf' or 'J2064 – R134a/R-1234yf' signifies it has been coupled, tested, and has met the requirements of SAE J2064 for the marked refrigerant(s). A hose marked 'J2064' without reference to refrigerant signifies that it has been coupled, tested, and has met the requirements of SAE J2064 for R134 only.'

According to SAE J2064, the Type C

hoses recommended by the warning label have a 'suitable thermoplastic barrier between elastomeric layers' not present in Type A or Type B hoses.

But specifying a reinforced hose does not change the fact that no hoses are specifically rated for the use of hydrocarbon refrigerants in automotive applications.

After being alerted to the HC hose warning, VASA conducted some research with wholesale distributors and a number of workshop owners.

None reported any problems when using the 'suspect' hose types mentioned in the warning label, when using industry standard R134a refrigerant.

One major nationwide wholesaler said that 'with the introduction of the reduced barrier [Goodyear Galaxy 4860] hose and fittings we have had no problems or issues with leakage'.

'Providing you use the correct fittings and the crimping is done properly there should be no leakage issues. As we have been selling the Goodyear Galaxy hose for a long time now we can confidently say we have not experienced any issues with it.'

Ironically, the wholesaler said there had been leakage problems associated with the Goodyear G4826 hose and fittings recommended by the hydrocarbon refrigerant manufacturer's label.

'In the early days of 4826 (standard size) hose there was a lot of discussion in regards to leakage from fittings with this hose,' they said.

Making a connection with R134a on the warning label appears to be an attempt by the hydrocarbon refrigerant manufacturer to deflect the hose issue from being linked to their product.

Given hydrocarbon refrigerant is frequently used as a cheap 're-gas' it seems unlikely that many of its users would entertain the idea of replacing non-leaking hoses to avoid the problems caused by using hydrocarbon refrigerant in systems that were never designed for it.





# BACK TO BASE

## So who owns vehicle telematics data?

**WHO owns the data generated by modern 'connected' vehicles in their day-to-day running and who should have access to it?**

What are the anti-competitive, privacy and civil rights implications of vehicles that can store and transmit data on location, usage and countless other factors as well as technical and diagnostic information?

These questions represent a twist in the tale of Australia's journey toward the information sharing agreement, signed at the end of last year, and is hoped to grant independent workshops access to official repair information and tools that will enable them to compete on a level playing field with franchised dealers.

At the moment, anyone with a scan tool or even an OBD II port adapter and a smartphone app can access and download diagnostic, usage and other data from a vehicle.

But in this age of the telematics-enabled, internet-connected vehicle, a constant stream of data can be exchanged between a vehicle and its manufacturer or the dealership that sold it.

There is a concern that manufacturers and dealerships could be automatically alerted of faults, provided with a free opportunity to contact the vehicle owner and potentially make a service-related sale that might have otherwise gone to the customer's preferred independent workshop.

What if car manufacturers all decided the OBD II port was obsolete and all contact with a vehicle's diagnostic system could be done online? Where would that leave independent workshops?

This isn't as far-fetched as it sounds. Did you know that in Europe, all vehicles must now come with a built-in SIM card and mobile connection so emergency services can be automatically summoned in the event of a serious crash?

It's an initiative that will doubtless save lives, and telematics generally has many convenience benefits such as providing drivers with useful internet services on the move, such as real-time traffic congestion, road closure, weather or fuel price information.

But – and it's a big but – you have probably been followed around the internet by creepy adverts for products you thought about buying and researched online several weeks ago.

If your car is constantly transmitting your location and driving style to someone, that information could also be used to create a profile of you for marketing purposes. Everyone knows this is how Facebook makes its money and how valuable such data is to marketing agencies.

The good news is that Australia has a world-leading position

on the matter because a commitment to consider these issues is written into the *Agreement on Access to Service and Repair Information for Motor Vehicles* signed on December 15 2014.

Action from motoring and aftermarket organisations in North America and Europe – plus the Australian Automotive Aftermarket Association and Australian Automobile Association – is also forcing vehicle manufacturers to acknowledge and look into concerns about the implications of 'connected cars' becoming the norm, which is expected to happen in the next decade or so.

Ideas about international data usage protocols and legal frameworks are also being discussed, but something needs to happen quickly as technology is rapidly filtering down from luxury and premium vehicles to the volume sector.

The good news is, as AAAA executive director Stuart Charity put it to *SightGlass News*, 'governments will be keen to prevent a monopolistic situation and consumers will not want to be locked into something with no choice'.

But consumers will require education about data sharing and their rights to ensure they delve into vehicle data sharing option screens, especially as few go beyond choosing their favourite radio station presets or pairing their smartphone.

With the amount of in-depth electronic personalisation options available on modern vehicles – from suspension settings to interior lighting colour and everything in between – it is not beyond the realms of possibility that consumers could program in their preferred workshop to receive data from their vehicle, or opt-out of data sharing features completely.

An ideal outcome would also be that no default settings are installed, preventing the manufacturer or selling dealership automatically receiving data, and that the sharing of data could be deactivated completely by the consumer.

**YOUR COMPUTER ON WHEELS**  
Here are some things connected cars can do now—or will be able to do in a few years.

- Diagnostics:** Cars can generate precise data in real time about all aspects of their condition. For example, the car's computer can determine which parts are wearing out before a problem occurs by evaluating data from sensors throughout the vehicle.
- Rear-Seat Entertainment:** Built-in mobile hot spots allow backseat passengers to access Internet radio and social media, browse the Internet, and watch movies and TV shows.
- Automotive Apps:** You'll be able to download apps to your smartphone that can let you locate the nearest or cheapest parking, surf the Internet, shop online, make restaurant reservations, purchase movie tickets, buy and download songs, and much more.
- Geofencing Capabilities:** If you're a parent, you can choose to monitor your teen's driving habits and vehicle location and receive alerts if he or she has exceeded the speed limit, driven into off-limits areas, or driven at inappropriate times.
- Convenience:** Using your car's connection to the outside world, you'll be able to start your car remotely or adjust your home thermostat to change the temperature before you arrive. Your car can monitor your driving habits and alert you to ways you can save gas.
- Active Safety Systems:** Features like adaptive cruise control, head-up displays, intelligent brake assist, and forward-collision warning systems can help drivers better avoid crashes or significantly reduce their severity.
- Personal Data:** Cars can collect data on where, when, and how you drive. And if you connect your mobile device to your car, you'll be able to track your driving habits and receive alerts.
- Vehicle-to-Vehicle/Infrastructure Connections:** Connected vehicles will be able to communicate with each other and the infrastructure you'll be able to predict collisions and receive alerts.
- Security Systems:** Wireless connections can also use vehicle data to locate your vehicle in a parking lot and unlock its doors.

**COMING SOON**

**Your Car, Your Data campaign**

# ON THE CAMPAIGN TRAIL

**CONSUMERS have to be aware they own the data generated by their vehicle: a message encapsulated in the title of a North American campaign launched by a coalition of aftermarket associations and motoring clubs called 'Your Car, Your Data' and an Australian equivalent from the AAA called 'My Car My Data'.**



My Car My Data campaign

The AAA says 'consumers should have the right to own and control the use of data relating to the performance, operation and security of their vehicle'.

It is estimated that one in five new cars sold in the US last year was connected and that by 2025 all new cars sold will be connected.

'Developments in vehicle technology, such as telematics, should not negatively impact on a motorist's choice of repairer, or their ability to manage their personal information and data that is generated by a vehicle,' says the AAA.

In the US a 'Telematics Task Force' has been established and is working with the Society of Automotive Engineering (SAE) and the International Standards

Organisation (ISO) to create guiding standards for the application of telematics technology by both vehicle manufacturers and the aftermarket.

'Right now, automakers can collect your personal information including your exact location, car speed, braking and acceleration information, radio usage, phone use, and even how many people are in the car,' reads the Your Car, Your Data website.

'Improper access to certain vehicle systems can create serious public safety issues as well as jeopardise the privacy of the car owner. For these and many other reasons, the governance of telematics application development is a serious issue that requires a clear set of standards.'

### VEHICLE DATA AND TELEMATICS: OWNERSHIP AND ACCESS

- m) The Signatory Parties note that the progressive uptake of emerging vehicle telematics technologies are enabling increased transmission and use of data relating to vehicle use, performance and diagnostics.
  - n) The Signatory Parties acknowledge that access to and ownership of telematics data from individual vehicles presents a number of emerging issues for consumers; vehicle manufacturers; and motor vehicle repairers and service providers.
  - o) The Signatory Parties agree to implement a process to develop protocols relating to vehicle data access and ownership. The Signatory Parties agree that progress should be reported within 12 months of commencement.
- Information sharing agreement**

**ARC REACHES 60K MILESTONE**  
THE Australian Refrigeration Council (ARC) now has more than 60,000 individual ARCTick license holders on its books, plus at least 17,000 licensed businesses.

Almost a decade on from the introduction of licensing requirements for the handling and trade of ozone depleting and synthetic greenhouse gases in Australia, the increase in the number of license holders contrasts with the emergence of refrigerants with low global warming potential ratings that are not currently covered by the scheme.

ARC points out that each license holder is 'doing their bit for the environment – by limiting the emissions of fluorocarbon

refrigerant and synthetic greenhouse gases into the atmosphere'.

This is also acknowledged by Federal Environment Minister Greg Hunt, who recently said the refrigeration and air conditioning industry 'has delivered more emissions savings than any other sector in the Australian economy'.

ARC says our industry 'should rightly be proud of this achievement as it cements our place as environmental leaders'.

VASA believes the success of Australia's licensing scheme should be extended to cover all refrigerants to ensure standards of professionalism and safety are maintained for the benefit of our industry's reputation and its service to society.

# ANOTHER TWIST



**WHILE some organisations are telling vehicle manufacturers to keep their hands off consumers' vehicle data, vehicle manufacturers including Mercedes-Benz parent company Daimler and Volkswagen Group are telling third-party telematics providers like Google to keep their hands off too.**

Google's Android Auto system, unveiled last June and now being integrated to new cars, enables drivers to replicate their smartphone's functionality through a vehicle's dashboard touch-screen.

This and the similar CarPlay system from Apple have been welcomed by vehicle manufacturers as they save the trouble and expense of integrating expensive technology and software into their products, only for long development lead-times to render it obsolete by the time of launch.

But at the Handelsblatt Automotive Summit in Munich last November, Daimler chairman Dieter Zetsche voiced concerns about the potential for companies like Google to gather vehicle data for commercial gain.

"It's at that point where a conflict with Google seems pre-programmed," he said. "That's where we need to negotiate."

Dr Zetsche added that there was the potential for vehicle manufacturers to become "third parties" and that vehicle data should be stored and processed on a separate and secure system.

Volkswagen CEO Martin Winterkorn agreed there was a conflict and wanted to prevent Google from accessing a vehicle's data.

"We seek connection to Google's data systems but we still want to be the masters of our own cars," he said.

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## NEW OZONE THREAT

**A RAPID increase in atmospheric concentrations of dichloromethane – an ozone-depleting substance not controlled by the Montreal Protocol – has been discovered by scientists from the University of Leeds in Britain.**

While the current rate of ozone-depletion by dichloromethane is small, because it attacks ozone at the lowest altitudes of the stratosphere it has a significantly greater impact on climate than CFCs that destroy ozone at higher altitudes.

Where man-made dichloromethane originates is not fully understood, but scientists involved in the study did make a link to the fact it is used in the process of manufacturing some HFCs – an ironic twist given the ozone-depleting CFCs banned under the Montreal Protocol were replaced in many cases by HFCs.

Study lead author Dr Ryan Hossaini, from the School of Earth and Environment at the University of Leeds, said the industrial production of substances like dichloromethane swerved regulation under the Montreal Protocol because 'historically these chemicals have contributed little to ozone depletion'.

He added that if the increase in atmospheric dichloromethane is allowed to continue, 'it could offset some of the benefits to the Ozone Layer provided by the Montreal Protocol'.

Measurements taken by the National Oceanic and Atmospheric Administration (NOAA) in the United States were analysed and revealed a

rapid increase in dichloromethane. Study co-author Professor Martyn Chipperfield said monitoring of atmospheric concentrations of substances like dichloromethane must continue and their sources identified.

'At present, the long-term recovery of the Ozone Layer from the effects of CFCs is still on track, but the presence of increasing dichloromethane will lead to uncertainty in our future predictions of ozone and climate.'

Dichloromethane is classed as a 'very short-lived substance' or VSLs. Other sources of VSLs include seaweed, with around 90 per cent of total ozone loss in the lower stratosphere caused by naturally emitted VSLs.

However, the contribution from industrial VSLs compounds is increasing and appears set to increase further in coming years.

Study co-author Dr Stephen Montzka from NOAA explained: 'The increases observed for dichloromethane are striking and unexpected; concentrations had been decreasing slowly in the late 1990s, but since then have increased by about a factor of two at sites throughout the globe.'

The study into this new ozone threat was published in the *Nature Geoscience* journal under the title *Efficiency of Short-Lived Halogens at Influencing Climate Through Depletion of Stratospheric Ozone* and funded by the Natural Environment Research Council.

**SMUGGLERS CAUGHT**  
**MORE than 1300 tonnes of banned ozone-depleting substances (ODS) were seized worldwide between September 2012 and April 2014 according to figures from the United Nations Environment Programme.**

Confiscations included 7370 items of equipment and 9513 cylinders of

refrigerant, with most seizures being of R22 refrigerant, an HCFC, while others captured CFCs like R12 and illegally shipped HFCs like R134a. HCFC smuggling is expected to be a growing menace, with a current world market of around a million tonnes per year. In the 2000s ODS smuggling was in the region of 7000-14,000 tonnes annually.

## NOT ALL BAD NEWS

**UNEP's latest Scientific Assessment of Ozone Depletion report, which is updated every four years, has revealed the ozone layer is on track to recover to 1980 benchmark levels by 2050 in mid-latitudes and the Arctic.**

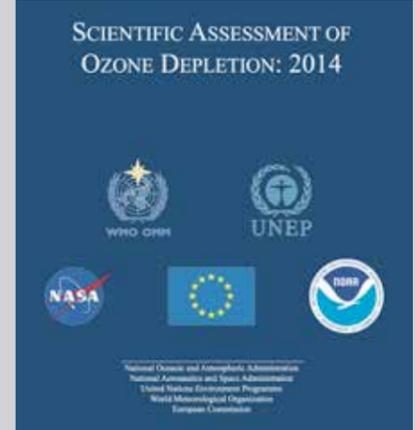
However the Antarctic ozone hole is expected to persist until much later this century due to the ozone-depleting substances still circulating in the upper atmosphere. Ozone levels have remained fairly stable since the year 2000.

The report, comprising findings from 300 scientists, provides a strong indicator of the Montreal Protocol's success in bringing ODS under control, which UNEP says will have prevented two million cases of skin cancer annually by 2030.

Reducing ODS emissions under the Montreal Protocol has also helped slow the amount of global warming gases entering the atmosphere, with a 90 per cent reduction of CO2-equivalent emissions from ODS compared with 1987 levels of 10 gigatonnes per year.

On the other hand, HFCs currently account for about half a gigatonne of CO2-equivalent emissions per year, and growing at a rate of about 7 per cent annually.

A global phase-down of HFCs under the Montreal Protocol is looking increasingly likely.



## EV BATTERIES



### Charging ahead

**WITHIN five years the batteries used to power electric cars will hold twice as much energy, at half the cost compared with today, according to Bosch chairman Volkmar Denner.**

Exponential advances in battery technology will make electric cars more affordable and viable for everyday use, accelerating their uptake, while hybrids and plug-in hybrids will become ever more fuel-efficient and cheaper to buy.

By 2025 Bosch expects around 15 per cent of all new cars built worldwide to have a hybrid powertrain at the very least, with much of this driven by tightening CO2 emissions targets around the world.

The German company also expects hybrid powertrains to become the standard for SUVs.

This is not surprising given the European Union's recent change of heart regarding diesel engines – it has flipped from incentivising them through lower registration fees and fuel taxes to talking about banning them from city centres – so the future now seems to lie firmly in the hands of petrol-based hybrids.

'Electrification will take combustion engines to new heights,' said Dr Denner. Early signs of the improvements to battery technology include an upgrade kit for the Tesla Roadster that boosts range from

394km on a single charge to 640km, and reports from the recent Geneva motor show that Nissan is aiming to double the range of its Leaf electric hatchback to more than 400km.

Bosch is also working on making it simpler and more convenient to charge electric cars.

It has developed a smartphone app that enables drivers to reserve charging spots and pay for electricity with any of the various charging point providers operating in Germany, ending the need for multiple membership cards.

It is reasonable to expect this technology – which demonstrates how Bosch no longer sees itself as just an automotive component supplier – to be rolled out worldwide.

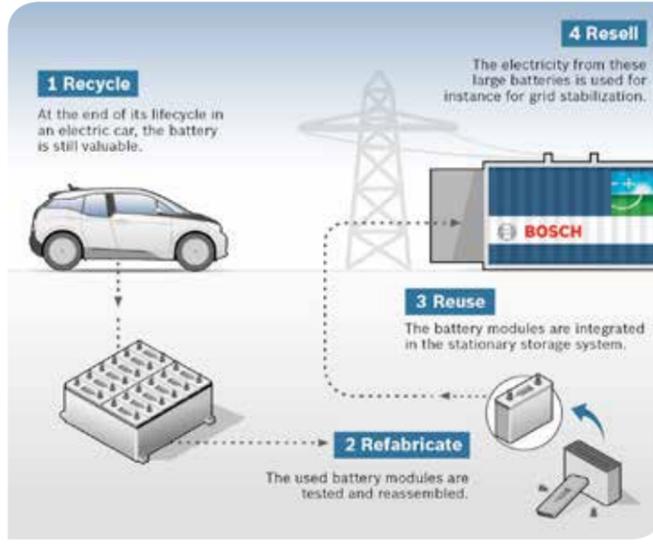
While Tesla already offers customers the option of converting old battery packs to store energy from domestic solar panels for use when the sun is not shining, Bosch has teamed up with BMW and European energy company Vattenfall to think even bigger.

Under the Second Life Batteries alliance, BMW is supplying used electric vehicle batteries that are interconnected to extend an existing large-scale energy storage system operated by Vattenfall in the German city of Hamburg, while Bosch's role is to integrate the batteries and maintain a management system intended to maximise

their service life and performance. Schemes like this can help overcome the shortfalls of renewable energy such as a lack of sunshine or wind and stabilise the power grid at times of peak demand or during fluctuations in power generation.

By the end of this year the Second Life Batteries alliance aims to be operating a two-megawatt facility, small enough to fit in a small building but providing enough output to theoretically supply 30 four-person households with power for a week. The rate of technological change is thrilling but also daunting. Before long VASA member workshops could be powered by the sun, wind and a battery from a wrecked hybrid or electric car while the vehicles they work on are powered by tiny internal combustion engines, electricity, hydrogen or even a combination.

Keeping up with it is going to be a challenge. Staying ahead of the curve is going to be highly rewarding.



## COOLDRIVE'S V8 SUPERCAR TILT

**COOLDRIVE Distribution's dedication to motorsport is writ large – literally – on the grid of this year's V8 Supercar Championship.**

Team CoolDrive has secured a naming rights partnership with Lucas Dumbrell Motorsport for the 2015 season and 27 year-old Tim Blanchard is the man behind the wheel of the CoolDrive Commodore.

CoolDrive also supports the Phillip Island Classic and other Victorian Historic Racing Register events, the Island Magic Formula Ford race, and sponsors Simon Fallon as he contests the Victorian Karting series.

'I am looking forward to taking the CoolDrive brand to the sharp end of the field,' said Blanchard.



## NEW JAYLEC CABLE TIES

**While Tim Blanchard engages in gripping track battles for the V8 Supercars race series, CoolDrive's new JayLec cable ties promise to take a firm hold of proceedings in the workshop.**

UV treated, self-extinguishing, made from Underwriters Laboratories approved nylon and rated for temperatures between -40°C and 85°C, they should be tougher than the Bathurst 1000.

CoolDrive sells them in sizes ranging from 100mm standard duty to 530mm heavy duty and with options comprising push-mount, mounting-head or adhesive mounting bases.

A reusable plastic grab case containing 1000 cable ties in the 10 most commonly used sizes is also available.



## US EPA APPROVES HC REFRIGERANTS

Strict controls, automotive still a no-go area

**THE United States Environmental Protection Agency (EPA) has approved hydrocarbon refrigerants R170(ethane), R600a (isobutane), R290 (propane) and R441A (a blend of all four) for use in certain stationary refrigeration and air conditioning applications.**

The EPA has not changed its position on the use of hydrocarbon refrigerants in motor vehicle air conditioning (MVAC) systems, with the only low Global Warming Potential (GWP) alternatives to R134a permitted being R-152a, R-1234yf and R-744.

'Two of these refrigerants are flammable, although less flammable than hydrocarbons ... all other flammable substitutes remain unacceptable for use in MVAC because EPA has not taken action to specifically list them as acceptable, subject to use conditions,' it says.

Behind this stance on hydrocarbons in automotive are 'flammability risks and the lack of sufficient risk assessment and other relevant information to demonstrate safe use ... some of these risks are unique to motor vehicles'.

In approving the four hydrocarbons for certain stationary equipment, the EPA also makes it clear that 'refrigerants may be used only in new equipment designed specifically and clearly identified for the refrigerant – i.e., none of these substitutes

may be used as a conversion or 'retrofit' refrigerant for existing equipment'.

For all cases in which hydrocarbons are allowed, the charge sizes are limited, for example 150g in retail food refrigeration and vending machines, or 57g for domestic fridges, freezers and fridge-freezers.



Only window-mounted, packaged terminal and portable air conditioning and heat pump equipment is approved for use with hydrocarbons, with charge amounts calculated on the size of the room for which it will be used and restrictions on how far the evaporator can be above floor level.

The EPA restricted hydrocarbons to these equipment types because 'self-contained air conditioners and heat pumps using a flammable refrigerant ... split system AC systems present different technical challenges than self-contained room AC equipment and are not part of this decision.'

Under EPA rules all equipment using hydrocarbons must have all parts through which refrigerant passes marked red.

'This colour must be present at all service ports and other parts of the system where service puncturing or other actions creating an opening from the refrigerant circuit to the atmosphere

might be expected and must extend a minimum of one inch in both directions from such locations,' it says.

Equipment must also carry five permanent warning labels, each with lettering at least 6.4 mm high:

- DANGER—Risk of Fire or Explosion. Flammable Refrigerant Used. Do Not Use Mechanical Devices To Defrost Refrigerator. Do Not Puncture Refrigerant Tubing. (On or near any evaporators that can be contacted by the consumer.)
- DANGER—Risk of Fire or Explosion. Flammable Refrigerant Used. To Be Repaired Only By Trained Service Personnel. Do Not Puncture Refrigerant Tubing. (Located near the machine compartment.)
- DANGER—Risk of Fire or Explosion. Flammable Refrigerant Used. Consult Repair Manual/Owner's Guide Before Attempting To Service This Product. All Safety Precautions Must be Followed. (Located near the machine compartment.)
- DANGER—Risk of Fire or Explosion. Dispose of Properly In Accordance With Federal Or Local Regulations. Flammable Refrigerant Used. (On the exterior of the refrigeration equipment.)
- CAUTION—Risk of Fire or Explosion Due To Puncture Of Refrigerant Tubing. Follow Handling Instructions Carefully. Flammable Refrigerant Used. (Near all exposed refrigerant tubing.)

A prohibition on the venting, release, or disposal of all four hydrocarbon refrigerants has been lifted as they are not considered a threat to the environment.

- training
- trade show
- networking
- experts forum
- happy hour
- cocktails
- gala dinner
- VASA AGM

### W&G 2015 program preview

#### Friday June 5

- ☀ Arrive at Marriott Surfers Paradise Resort & Spa
- 🌙 Happy hour • trade show opens

#### Saturday June 6

- ☀ Plenary breakfast with special R1234yf guest speaker
- ☀ Training at Marriott and SuperCool (with transfers)
- 🌙 Trade show • AGM • experts forum • cocktails

#### Sunday June 7

- ☀ Training at Marriott and SuperCool (with transfers)
- 🌙 Gala dinner and entertainment

**Secure your spot now!**

Go to [vasa.org.au/WG2015](http://vasa.org.au/WG2015) to download your booking form.