

# Aircon-Conned: The saga continues!

The following article is an AECS technical help desk situation. We discuss, review and resolve.



## Vehicle

All Automotive and Commercial Air-Conditioning service machines and vehicle A/C systems.

## Problem Reported

You may remember that in December 2016 ([see here](#)) we released an article in various automotive publications warning everyone about the dangers of AC Stop-Leak and AC top-up products. Our motive, to warn the industry to be vigilant and try and avoid the damage it can cause to your AC service machines and vehicle systems.

Sadly, it has reared its very ugly head once again and we feel compelled to bring this one to your attention. If you are in any doubt about what we have said in the past or your mind has since been "put at rest" by slick sales talk please take a look at this very expensive report and photographs.

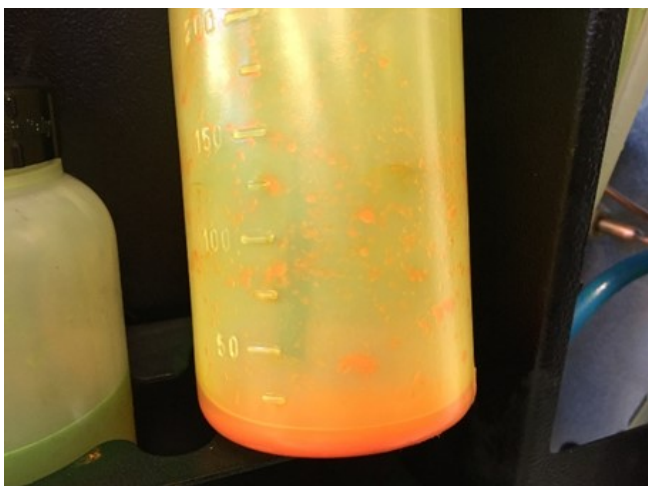
## AECS Service Visit

We recently visited a customer's workshop to carry out their annual onsite machine service and calibration of their A/C service machine which we supplied brand new barely 18 months ago. During our visit, we asked the workshop if there were perhaps any issues with the machine we might need to look at while we were onsite.

In this instance, our customer casually mentioned that UV dye had been leaking inside the machine's frame and for that reason they had stopped using the UV dye injection function!?! The alarm bells went off in our minds!

We have come across similar situations like this before and the outcome is nearly always the same and it's normally not a happy ending.

We carried out a simple stop leak check using our detection kit along with a refrigerant purity test which we do now do as part of every annual A/C machine service and sure enough we got 3 straight positive tests for the dreaded stop leak.



**UV Dye Bottle**

Aside from the positive stop leak test results there were obvious indications that all was not right in the UV dye bottle itself which could be seen just by looking at it. UV dye is normally yellow NOT orange.

We explained our concerns to the customer and at this point that the decision was made to return the machine to our workshop for a thorough investigation.

Back at our lab we stripped the machine apart to investigate the extent of the contamination so we could generate a report for the workshop owner.

## Damage Report

The following pictures were taken from the actual machine and formed part of a report we generated which was sent to the workshop owner to inform them of the bad news.

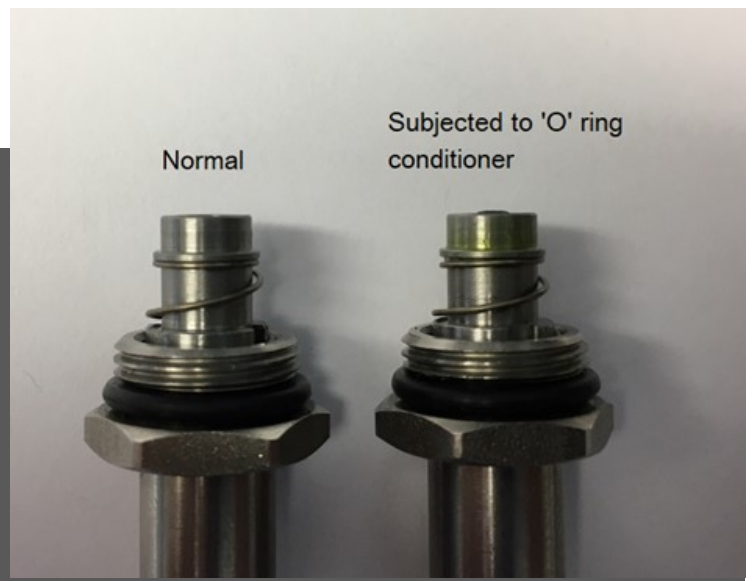
**Has anyone seen UV dye looking like this?**



**Here we can see an internal fitting which we examined within the machine. This is typical of the damage Stop-Leak causes and this machine was literally full of this contamination.**



**The UV dye solenoid housing and valve also showing evidence of Stop-Leak.**



Most manufacturers of stop leak and A/C top-up add a chemical which is often referred to as 'O' ring conditioner designed to soften old and hardened seals. In reality, this causes nothing more than the seals to swell permanently out of shape. Look closely at the seal in the end of the solenoid on the right in the picture above compared to the solenoid from an identical uncontaminated machine on the left.

The seal has swollen and is bulging out of its housing. It's this "conditioning" of rubber seals which causes many of the initial machine symptoms and in this machine prevented the seal from doing its job correctly. Refrigerant, oil and the stop leak it contained were able to leak back from the internal manifold into the UV dye bottle where the refrigerant boiling off forced the dye out of the bottle and all over the inside of the machine.

Please bear in mind that R134a refrigerant begins to boil at normal atmospheric pressure of 1000mbar at around -27degrees Celsius.



**A/C Stop Leak detect kit.**

### **Stop leak detection**

The dangers of the A/C Stop-Leak have become such an issue that a few years ago an overseas manufacturer developed a Stop-Leak detection kit as it is clearly a growing problem not just here but internationally.

We have been supplying these detection kits to the Automotive trade for a few years now and they continue to be in high demand. A simple kit with purely mechanical components. The test takes not more than a few minutes and could be a vehicle and A/C machine saver.

### **Conclusion**

The cost of cleaning, flushing and rebuilding the machine in the pictures on top of replacing the sealed unit compressor made the job prohibitively expensive, the machine was a write off.

Even if would have gotten into the job, there is no 100% guarantee that we were going to get all the stop leak out (no warranty on the job). It only takes one small pocket of Stop-Leak to remain and the same problem would have arisen again.

Can you imagine the costs involved as a result of this man made problem! This has cost the workshop dearly in lost Aircon service work and the purchase of a new machine which they could not afford to be without.

“ We do not want this to happen to anyone, so what can you do, and what have we done? ”

AECS has as part of the Aircon training (ECAC1-1) a practical part where you get to use a Stop-Leak detection kit. Yes it looks from the outside like we are pushing product during our training, which is a big NO in any of our AECS seminars! Before we start the Stop-Leak detection section we clearly identify this and give people the opportunity to leave the training. No one has walked out yet.

What can you do? Enrol into one of our nationwide Aircon training seminars, we promise that you will like it! We have in almost all Aircon seminars inexperienced and very experienced (30+ industry years) Aircon technicians. They all gave very positive reviews.

Check on our web calendar <http://www.aecs.net> for dates, or call our training coordinator Mark at 06 8749 077.



### Latest A/C News

In October 2016, New Zealand was among the 197 parties to sign the Montreal Protocol on substances that deplete the ozone layer and this will lead to an eventual phase down in HFC production and use worldwide.

With climate change being a key worldwide issue, measures have already been put in place by governments and businesses around the world to move away from high GWP (Global Warming Potential) HFCs such as R134a.

Hydrofluorocarbons (HFCs) are man-made greenhouse gases with high GWP, up to 14,800 times that of carbon dioxide (CO<sub>2</sub>).

To put this into some perspective the GWP of CO<sub>2</sub> is just 1. The most commonly used HFCs in New Zealand have a GWP of between 675 and 4470. R134a most commonly used in Automotive has a GWP of 1430 with the new R1234yf gas having a GWP of only 4.



**R1234yf Swap-a-bottle**

As a small country in the HFC market, New Zealand is heavily influenced by changes made internationally. As such, we need to ensure we are appropriately prepared for the inevitable changes this will bring.

To stay in line with the Montreal Protocol most countries are looking to freeze the consumption levels of these gases by 2024 and some by 2028 and the New Zealand government is also looking to move away from HFCs over the coming years through a process of gradual "phase down".

Australia's HFC phase down has already been passed into law and will begin in January 2018 a whole year earlier than they originally planned. This will be managed through a permitted quota system. Gradually reducing in the maximum amount that is allowed to be imported into the country.

New Zealand's Government has been seeking industry feedback (submissions for this closed in June 2017) but, it has yet to ratify the changes required to pass this into law but at least it is now on the table being discussed.

In the EU they have already begun to reduce the availability of fluorinated gases and they are aiming for a reduction of 79% between 2015 & 2030. Industry changes will inevitably follow once things have passed into law here.

To accommodate the changes in the worldwide market, substitutes are being developed to replace high GWP HFCs. As some of you will be aware the newer R1234yf gas is already arriving in vehicles delivered to New Zealand. As I write this article R1234yf is still not freely available to purchase here in NZ. What we do know is that it is very expensive.

Currently in Australia where it is now available it costs around AU\$1800+gst for a 4.5kg bottle! Consider how this will affect you're future A/C service costs! That's going to make a typical 750gm charge of gas costs around AU\$300. Can you now still service a vehicle's A/C system for around \$150 if you are not recycling the gas? I think not.

### **Its not ALL bad news**

In response to the global decrease in ozone depleting substances, the Arctic and the wider global ozone layer should return to their original 1980 levels by around 2050, and a while later for the Antarctic ozone hole. So, the changes we have already made are working but the planet is still warming up and this is apparently not a good thing.

### **Conclusion**

We can all help in this reduction of emissions, you can too by recycling the refrigerant that you recover from vehicles. The refrigerant needs to be filtered, dried, separated by the machine before re-using it. This process is all automatic, think about quality and profitability!

The price of a bottle of R134a has already soared past the \$450 mark for many and this has reduced the profitability of A/C work, or scared customers off with the high costs.



At AECS we have seen a huge increase in demand for our A/C recovery/recycling machines as workshops look to massively reduce costs and to want to back up their projected clean green image.

The days of the "bottle on the shoulder fridgy guy" from down the road are surely numbered as this is now widely considered an outdated, highly inaccurate and inefficient method of working which needs assigning to the automotive history books.

At AECS we believe equipment technical support and training should always go hand in hand, we begin our annual program of A/C courses the coming month.

**The fourth R1234yf  
(new type refrigerant)  
machine imported by  
AECS into NZ.**

Talk to us about what's best for your workshop, let's make a plan to get you into A/C servicing. We can make sure you go away fully trained and correctly informed no matter what evolutions come our way. Keep an eye out for our training dates (see below), online, on our Facebook, and via the mail.

for **AECS** Ltd:  
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## Did you know....?

The new Nissan Leaf 2018 has the accelerator and brake integrated into a single pedal, Nissan have named it the e-Pedal. The e-Pedal handles starting, accelerating, decelerating and stopping. They have also increased the driving range (40kWh battery) to 240km compared to the previous model which had 170km.



(Photo Credit: The Verge)

AECS will be delivering specialised EV training in 2018. With constant research and development over previous years, we continue that AECS culture now, and to future tech. As always we have you in mind so that you are skilled and kept up to date.

## Electronic Air-Conditioning Training

Get full "hands-on" training with modern A/C systems in this exciting and informative seminar. The world of automotive A/C is changing and you need to stay up to date with the latest developments.

Highlights of what's in this training and much more:

- System identification. TX Valve or Orifice tube. Clutched compressor or constantly engaged. Detailed component explanations.
- How a simple pressure check can cause an A/C system to literally stop working.
- What are the real dangers posed by A/C "Top-ups".
- We show you how to safely service & maintain a system.
- How to diagnose modern A/C using UV dye, sniffer and Nitrogen.
- Protecting the environment, what are your responsibilities.
- Marketing the service to your customers.

**AUCKLAND:**  
2-3 October 2017

**CHRISTCHURCH:**  
7-8 November 2017

**DUNEDIN:**  
1-2 November 2017

### SEMINARS BY LOCATION: SEPTEMBER TO NOVEMBER 2017

#### Tauranga:

Modern Truck Diagnostics (TRUCKSCAN11): 21-22 September

#### Hamilton:

CAN Data (CAN1-1): 21 September (1pm-5pm)

Automotive Electronic Diagnostics (AED): 27-28 September

#### Auckland:

Engine Management Systems (EMS1-3): 25-26 September

Engine Management Systems (EMS1-6): 27-29 September

Electronic Air-Conditioning (ECAC1-1): 2-3 October

Scan Tool Diagnostics (SCAN1-1): 4-5 October

#### Christchurch

Hybrid and EV Diagnostics (EMS1-4): 24-25 October

Scan Tool - Level 2 (SCAN1-2): 26-27 October

Air Conditioning Systems (ECAC1-1): 7-8 November

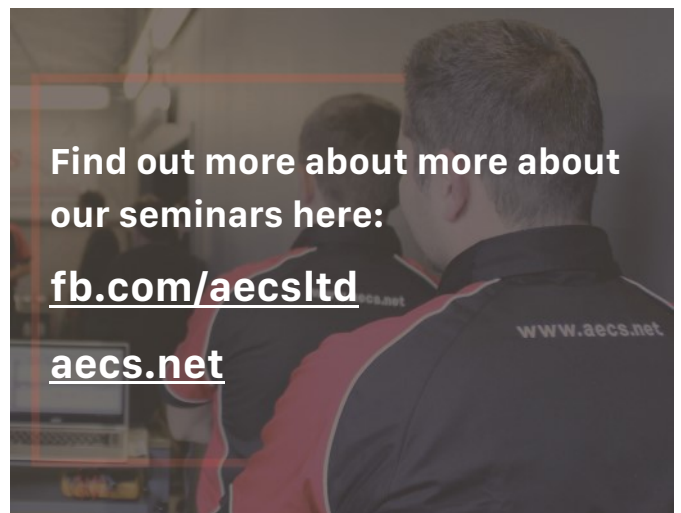
Modern Truck Diagnostics (TRUCKSCAN1-1): 9-10 November

INTRO 2 SCOPE (ATS-1): 11 November

Find out more about more about  
our seminars here:

[fb.com/aecsltd](https://fb.com/aecsltd)

[aecs.net](http://aecs.net)





## BRAINBEE 8500



\$8,750+gst

- Fully automatic operation, with colour touch screen.
- Vehicle A/C database: The most comprehensive available.
- Eco Lock® zero-loss quick couplers.
- Precise old oil out weighing with automatic new oil in.
- UV dye injection and built-in printer as standard.
- Guided temperature linked pre/post service pressure check.

### TECH SPECS:

- 20lt refrigerant capacity.
- Non-condensing vent (automatic).
- 4.5m hose length.
- Class 1 gauges.
- 14cc Compressor.
- Upgradable to R1234YF.
- Hybrid vehicle kit (option)

## BRAINBEE 6000



\$5,850+gst

- Semi-Automatic operation, super easy to use.
- Eco Lock® zero-loss quick couplers.
- Monochrome graphic display.
- Nitrogen Leak Test built in (with optional kit).
- Agricultural Database (optional).

BRAINBEE IS:

• COOL • CALM • COLLECTED •

### TECH SPECS

- 12lt refrigerant capacity.
- Non-condensing vent (manual).
- 3m hose length.
- Class 1 gauges.
- 8cc Compressor.
- Air purge system.

**AECS** ☎ 06 874 9077 ✉ info@aece.net 📍 aece.net

OPTION

### Hybrid Pro Kit

PAG-POE oil flushing adaptor kit, essential for Hybrid/EV AC work.

### Flushing Kit

Easy connect universal adaptors. Particulate filter included. Software guided flushing.

### Nitrogen Leak Test Kit

Machine integrated N2 testing up to 15 bar. Prevents the waste of R134A gas.

### Stopleak Detection

Protect your investment. Simple & quick to use. Reusable stop leak detect adaptors.

Neutronics

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## HYBRID PRO KIT



Brainbee has developed a special Hybrid function available on its A/C service machines to be used in conjunction with the Hybrid Pro Kit to enable thorough cleaning of the internal pneumatic circuit and the machines connection hoses.

Essential for switching from PAG to POE refrigerant oils. As little as 1% contamination can cause potential hazards and A/C system components may require replacement.

Easy to connect flushing kit, insurance if your compressor fails to prevent debris continuing to circulate around your vehicle's A/C system.

Universal pipe adaptors, a low pressure coupler and a particulate filter are supplied making this a complete and essential kit for anyone undertaking A/C repairs and service.

## FLUSHING KIT





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## NITROGEN LEAK TEST KIT



Using the Nitrogen Leak test kit to test a vehicles' A/C system under a typical operating pressure of 10-15bar (normal high side operating pressure) without the worry that you may be leaking the valuable refrigerant into the atmosphere. Using a pressure sensor integrated into the Brainbee A/C service station (6000 or 8500) this test will take just a few minutes.

(Note: Nitrogen Cylinder and Adjustable N2 Pressure reducer also required).

## STOP LEAK DETECTION KIT



The Stop Leak Detection kit is made up of high quality automotive vehicle couplers, a refrigerant flow meter, flexi pipe, syringe and the all-important reuseable stop leak detecting cartridges. (Testing takes less than 5mins).

### KIT CONTENTS

- A/C coupler
- Flow meter
- (10) Test cartridges\*
- R134A and R12 couplers
- Test hose
- Syringe
- Molded carrying case
- Detailed instructions

\$524.73+gst



# BRAINBEE

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- Brainbee are at the forefront of the Automotive A/C service industry. Their latest range of service & recycling machines are perfectly adapted to the rigours of workshop life here in NZ.
- The technician interface is easy to understand and coupled with its built in Euro/Australasian vehicle database possibly the best package available on the market today.
- Highly accurate scales and pressure monitoring make sure you are working to the strictest of standards while the zero loss Eco Lock® anti-puff couplers ensure you are doing your part to protect the environment.
- Coupled with AECS technical support, onsite annual service and A/C training available throughout the country it's a package that hard to beat.

### AECS Technical Support

Our Industry leading technical support will be your partner that you can trust for expert diagnostics and complex automotive electronic problems.

Get the right advice and insights for all your automotive equipment and technical support. Start the conversation today.

06 874 9077

