

BRISBANE VALLEY FLYER

JULY - 2013



Watts Bridge Memorial Airfield, Cressbrook-Caboonbah Road, Toogoolawah, Q'ld 4313.



**Another scene from the past – a touch of nostalgia.
Two de Havillands in formation over Watts Bridge in 2012.**

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The Fridge in Your Plane (By Rob Knight)

Everywhere you go, unless you are operating a fuel injected or a turbine powered aircraft, you are flying around with a refrigerator in your aircraft. Yes, that's a fact. And your airborne fridge has all the trimmings and trappings of its ground-borne kitchen counterpart.

"So", I hear you ask. "What are you talking about?"

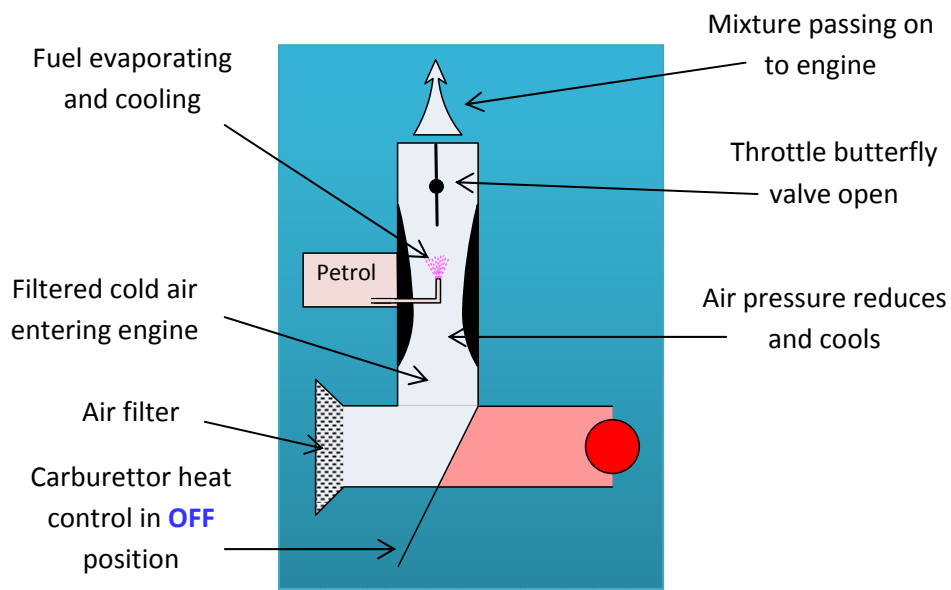
I am talking about the carburettor and how it is really a fridge in disguise.

While fridges cool things, and carburettors supply a gaseous mix of petrol and air to feed an internal combustion engine, you are excused for wondering what on earth they have in common. However, despite their obvious design outcome differences, fridges and carburettors rely on the same two fundamental processes to function - evaporating a liquid to change its state to a gas, and subjecting a gas to a decrease in pressure. Both these processes draw heat from their surroundings as they take place.

Your fridge compressor punches the gas in its tank into a smaller and smaller volume until it changes state and becomes a liquid, and then it squirts the pressurised liquid out through a jet. As the exiting liquid expands into the low pressure region outside the jet, the action draws heat from the immediate environment. At the same time as the expansion of liquid to gas is taking place, the liquid is evaporating to a gas and this too requires heat which it draws from its surroundings. So both processes extort heat from their surroundings.

In the carburettor it is the vaporisation of the petrol we want, the cooling is just an undesirable side effect. As the liquid petrol exits the carburettor jet and evaporates, just like the system in your fridge, it too absorbs heat from its surroundings, just as effectively as your dear old Kelvinator. Also, as existed in the fridge, the venturi in the carburettor throat is engineering a pressure drop to suck fuel through the carburettor jet and this, too, further lowers the temperature inside the carburettor where these processes are occurring. In both your fridge and your carburettor there exist two processes – a pressure drop in a gas pressure AND cooling due to evaporation. So why are you surprised to experience ice in your carburettor? It forms in your fridge!

Can you eat a hearty meal with a sore throat? Of course not and neither will your engine run properly when its throat is all choked up. This ice, formed by a process called deposition, does not pass through a liquid state – it short-circuits the normal process path and changes directly from a gas to a solid that sticks to the interior metal surfaces. This solid deposit can adhere to the venturi, roughening it and reducing the airflow so the engine is malnourished. It can form around the main jet and interrupt the flow of petrol, again reducing power. Or it can quickly block so much of the intake system the engine is strangled to death.



Normal, Cold air selected. Cold filtered air enters carburettor

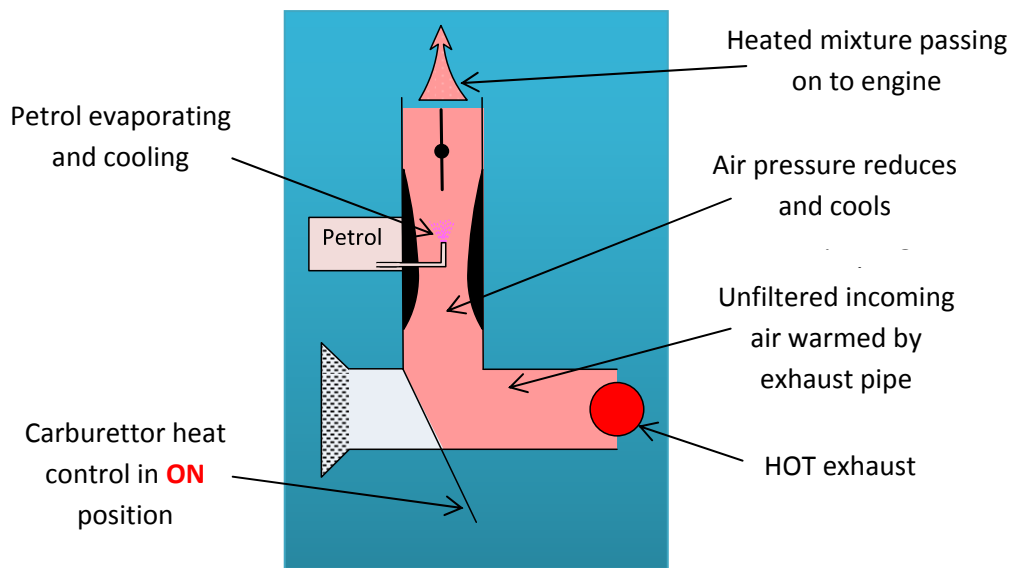
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But how do we know when we have carburettor ice? Obviously one answer is when the engine loses power, runs rough and stops! The sudden silence would be a good clue to most pilots that something was amiss. However, it doesn't have to get that bad; there are other symptoms that an alert pilot can identify and use to trigger remedial action to eliminate the problem.

To examine the symptoms, we need to be specific about the engine and propeller system powering the aircraft. Most 4 stroke ROTAX drivers can stop reading here because this manufacturer provides a collar around the carburettor area through which runs hot coolant fluid. This keeps the metal parts too warm for ice to adhere.

Inevitably, carburettor ice will cause a mixture change and the engine will run rich – there are not enough parts of air compared to parts of petrol being drawn into the engine. Any aircraft without a constant speed propeller unit (CSU) will suffer a power loss - the RPM will reduce without the pilot having moved the throttle. Also, the engine will run rough. An aircraft fitted with a CSU is likely to display the same rough running, but the propeller RPM will continue as set by the CSU governor, only the pressure shown on the manifold pressure gauge will fall as the restriction in the carburettor reduces the airflow.

So once we notice the symptoms of ice forming how can we stop it? We have already said that a temperature issue leads to the formation of carburettor ice. And yes, I know, I can hear you saying, "Then why don't we just heat the incoming air?" This is indeed a most elegant solution and that is exactly what we do. There is a control; in the cockpit, usually a knob to pull or a lever to slide, that changes the source of air entering the carburettor. The primary source allows normal outside air to be drawn through a filter and then into the carburettor. This alternative source when carburettor heat is selected ON takes hot air from around the exhaust pipe and ducts it into the carburettor so the heated air can deal to the malignant ice.



Carburettor heat applied. Warmed but unfiltered air enters carburettor

However – note well that air entering the engine from this source is not filtered and, if carburettor heat is applied in dusty conditions, grit and dust entering the engine could shorten its life markedly.

So where does that leave the pilot? It leaves them experiencing a short period of rougher running and a possible further drop in RPM before sweetness returns along with the RPM. At this point the pilot can smile smugly and push the carburettor heat back to cold, secure in the knowledge that they have averted yet another disaster for Aircraft Accident Investigations to probe for TV. But have they?

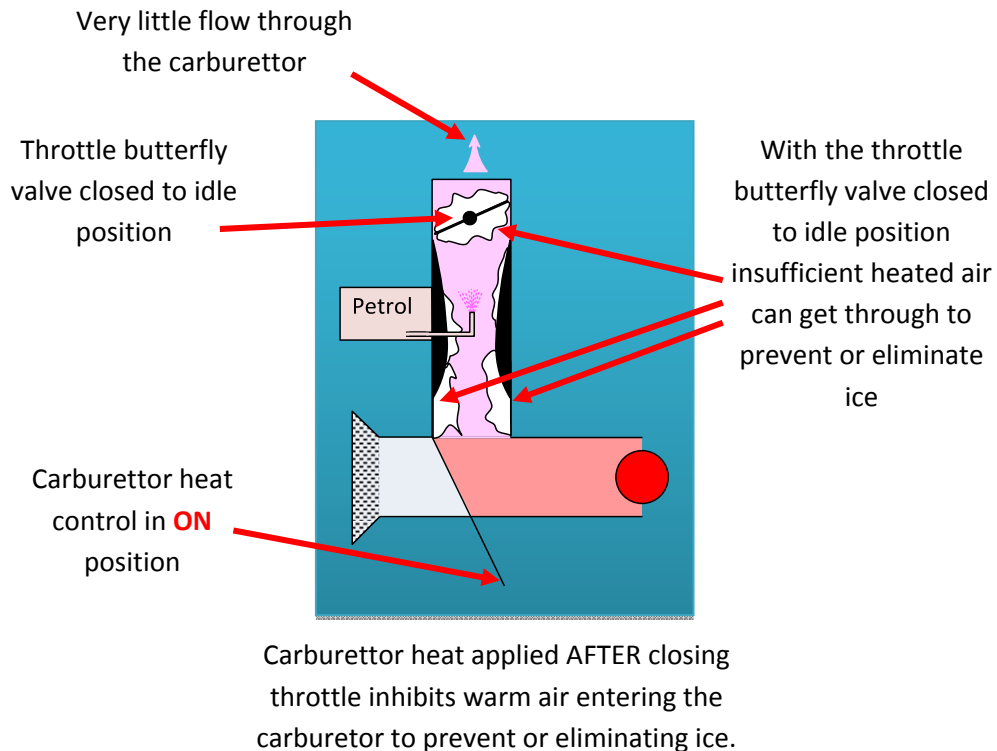
Ice can come back, any time it likes. So why don't we leave the carburettor heat on? The answer is simple – the engine loses power when the carburettor heat is on. This is because it runs over-rich which also affects the fuel burn rate. In some sophisticated aircraft, carburettor throat temperature gauges are fitted that have a

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coloured range to indicate the critical temperature for carburettor ice in the prevailing conditions. The carburettor heat control is used to keep the instrument needle out of that range.

Carburettor ice is most likely to form when the pressure in the carburettor is low, such as when running at low power settings. This means that simply closing the throttle can precipitate ice when none existed when the throttle was more open. Also, if you think about it, how will you get hot air into the carburettor throat if the throttle is closed? This means that pilot timing in applying the carburettor heat can be critical.

Carburettor heat should be applied BEFORE closing the throttle. A few seconds of lead time before pulling the noise knob back will allow the hot air from around the exhaust to warm the metal throat and manifold, and greatly reduce the chance of ice. It will also tend to eliminate any minor ice that might be present but going un-noticed.



In the event of a go-around, the carburettor heat should be moved to the OFF position as soon as possible after power is applied. Remember, in most engines you won't get the full amount of available power when the carburettor heat is on because the mixture is too rich.

On approach it is normal practice to change the carburettor heat to full cold on short final. There are two reasons – a go-around after a failed landing might well occupy so much of the pilot's attention they forget to remove heat and suffer the reduced power. Another reason is that the aeroplane will soon have landed and it is wise not to run unfiltered air through the carburettor. It is worth noting, though, that some Jabiru engines do have a filter system that provides protection when carburettor heat is applied. However, check it out with your tame engineer so you know exactly what is in your aeroplane.

Remember – rough running and an RPM drop is likely to be that fridge in your engine again, and should have you reaching for the carburettor heat control pronto. But don't leave it on for landings.

Happy flying

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The Scene over the Ditch

Last Easter Peter Freeman and several friends got all adventurous and flew to New Zealand for the airshow at Blenheim at the top of the South Island. Peter made great use of his camera and brought back the priceless shots you can enjoy below.



Fokker D1



Sopwith Pup



Sopwith Tri-plane



Auster (model unknown)



Sopwith Camel



Curtis P40 Warhawk

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Messerschmidt B108 Taifun



YAK 3



Harvards (synchronized aerial swimming)



Chance-Vought F4 Corsair



Bristol F2b fighter.



Messerschmidt B108 Taifun



Avro Anson



Curtis P40 Warhawk in flight

Many thanks, Peter, for sharing these with us.

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Another type of "Bloke's Shed - CORRECTION

CORRECTION to a statement made in last month's issue.

Bruce Clarke has two replica kits being built in his hanger at Watts Bridge. Bruce, who is already flying the Sopwith Pup that he has built (see front cover of last issue), is now building, not a Sopwith Camel as stated in the last issue, but the Nieuport kit. It is Ron Dunn who is the Camel constructor. (Apologies Ed.)

FLY-INS Looming

Saturday July 6th	The BVSAC Fun Fly Poker Run ending at Watts Bridge
	The Australian Aerobatic Club (AAC) Christmas in July at Watts Bridge.
Saturday July 13th	Angelfield Burnett Flyers Breakfast Fly-in
Saturday July 20 th	Dunwich Straddie Breakfast Fly-in

Photo Competition

This month's winner is.....

Sorry - no images sent in

I need your images - I really have run out. (Rob K.)

Wanted to Buy: Lea Kestrel or similar 95.10 untralight.

Contact Rob Knight Editor (kni.rob@bigpond.com,
0400 89 3632, or 07 5467 3149).

For Sale: \$5000.00

Evans VP-1 Volksplane. Was once owned by Dick Smith (the Dick Smith). In great condition. Powered by VDub 1832cc engine. Has spare prop, windshield, u/c and more. Currently at Camden Haven airfield in NSW.

**PH: 02 6584 4004 or
0407 537 537.**



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Mystery Aircraft (July Issue)

Clue: An American aircraft.

This is a particularly rare aeroplane designed for private and commuter use.

Email your answer to me at kni.rob@bigpond.com



Mystery Aircraft (June Issue)

This is AAK's Hornet AG/Utility #A001, manufactured by Australian Aircraft Kits in Taree, NSW.

Check out these Clips

<http://www.youtube.com/watch?feature=endscreen&v=jdUKLvT6u5o&NR=1>

and

<http://www.youtube.com/watch?v=663OR1JXW2o>

Joke for the Month

After an aircraft accident.

Insurer: It was pilot error.

Pilot: It was design error.

Insurer: I disagree. The pilot is at fault for trusting the designer.

Quotes (or, "There's wisdom in the air):

1. When flying an aeroplane, it's usually best to keep the pointed end going forward as much as possible. (Unknown.)
2. It's absolutely bizarre that the people who can't tell us what the f***** weather is going to be next Tuesday can predict with absolute precision what the f***** temperatures will be in 100 year' time! It's absolute horse sh**. (Michael O'leary, CEO Ryanair, carefully and articulately weighing the evidence on global warning.)

BirdsiPhotography

Want an air-to-air shot of you flying your dream machine? It's easy to arrange and will cost less than you might think. Grab the phone and contact Peter Davies or Rob Knight on 0400 89 3632, or email kni.rob@bigpond.com



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Keeping up with the Play (Test yourself – how good are you, really?)

1. What is the standard validity period for a METAR?
 A. 1 hour.
 B. 6 hours.
 C. 12 hours.
 D. METARS don't have validity periods.

2. If lowering flaps increases lift, why then is the best rate of climb achieved when the flaps are raised?
 A. Lowering flaps causes a trim change which increases drag.
 B. The drag increase with flaps lowered reduces surplus HP.
 C. With flaps down the aircraft has a lower nose attitude so the rate of climb reduces.
 D. Because lowered flaps blanket the slipstream so impede the thrust resulting in a reduced rate of climb.

3. A pilot, with the altimeter correctly set to the QNH 1005 hPa, flies to an area where the QNH is 1010 hPa. After failing to re-set the QNH on the altimeter subscale he lands at an airfield with an elevation of 340 feet AMSL. Assuming no instrument errors, what altitude will his altimeter read when the aircraft is parked and shut down?
 A. 490 ft
 B. 340 ft.
 C. 190 ft C
 D. Sea level.

4. A pilot arrives at an airfield and begins her flight planning. If the QNH at the field is 1010, her pressure altitude will be?
 A. Higher than the airfield elevation.
 B. Lower than the airfield elevation.
 C. The same as the airfield elevation.
 D. Sea level.

5. When flying at 3000 ft AMSL and 1000 ft AGL, how far from cloud should the pilot be for VFR?
 A. 5000 metres.
 B. Clear of cloud and in sight of ground or water.
 C. 1500 ft vertically/1000 ft horizontally.
 D. 1000 ft vertically/1500 ft horizontally.

ANSWERS: 1. D, 2. B, 3. C, 4. A, 5. B.

If you have any problems with these questions, call me (in the evenings) and let's discuss it! Ed.

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BRISBANE VALLEY SPORT AVIATION CLUB Inc

MINUTES OF THE 1st June 2013 GENERAL MEETING

- MEETING LOCATION:** Watts Bridge Memorial Airfield – BVSAC Clubrooms
MEETING DATE: 1st June 2013
MEETING OPENED: 10:15 AM
MEMBERS PRESENT: 17
- APOLOGIES:** Ian Ratcliffe, Mary Clarke, Mal McKenzie, Scott Meredith
VISITORS: Nil
NEW MEMBERS: Nil
MINUTES: May meeting of the BVSAC Inc.
Proposed: John Innes Seconded: Peter Ratcliffe Acceptance motion carried.
- PRESIDENT'S REPORT:** Neil reported on the success of the All-In Fly-In and noted that BVSAC sold in excess of \$500 worth of drinks. Neil thanked those who worked on the drink stand and helped out in other ways.
- SECRETARY'S REPORT:** Richard advised that membership invoices for 2013/2014 will be sent in the next few days.
- TREASURER'S REPORT:** Priscilla provided a financial statement advising the BVSAC Bank Account Balance is \$13,670.41 and provided a summary of the major income and expenditure items.
- WBMA REPORT:** Liz Cooke asked members to bring shovel and help with the completion of the vetiver grass area in the sewerage treatment areas. Date to be advised.
Peter Freeman, Liz Cooke and Richard Faint provided a combined report on the All-In Fly-In 2013. The weather overview was quite poor with predicted winds aloft being up to 55 Knots. Nonetheless over 80 aircraft arrived with many electing to drive in. It was noted that the aircraft attending was more GA oriented this year, no doubt due to the weather.
Fun Flight which was organized by Peter Biddle was a great success giving disadvantaged children and their carers the opportunity of an aviation themed day out and the chance of a flight in a light aircraft.
- BUSINESS ARISING:** Richard advised he had bought 2x 9 Kg gas bottles for the hot water system and the BBQ.
- GENERAL BUSINESS:**
- Glenda Faint suggested the club contact businesses such as Curtain Wonderland & Spotlight to obtain quotations for curtains or vertical blinds. Membership was of the opinion that vertical blinds were the best choice. Peter Ratcliffe advised that he and Ian could organize quotations and supply. After the meeting the windows & doors were measured up.
 - Neil encouraged everyone to attend and support the Fun Fly Poker Run and the Aerobatic Club's Christmas in July which replaces the July meeting.
 - Richard Faint mentioned the photography course being run by Rob Knight and encouraged anyone with an interest in photography, cameras and computer imaging to attend.
 - Glenda Faint suggested "bombing" the clubrooms for spiders and other insects.
 - Richard Faint was asked to send a message to the Email List explaining garbage removal from the clubrooms.
- NEXT MEETING:** The July meeting is being replaced by the BVSAC Fun Fly Poker Run. Members are encouraged to participate in the Poker Run in any way they are able. The next meeting will be 3rd August 2013 in the BVSAC Clubrooms Watts Bridge at 10:00AM
A BBQ lunch will follow the meeting.
- MEETING CLOSED:** There being no further business, the meeting was declared closed at 10:45AM
A BBQ lunch was held after the meeting.

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