Recreational Aircraft Association of New Zealand (Inc)

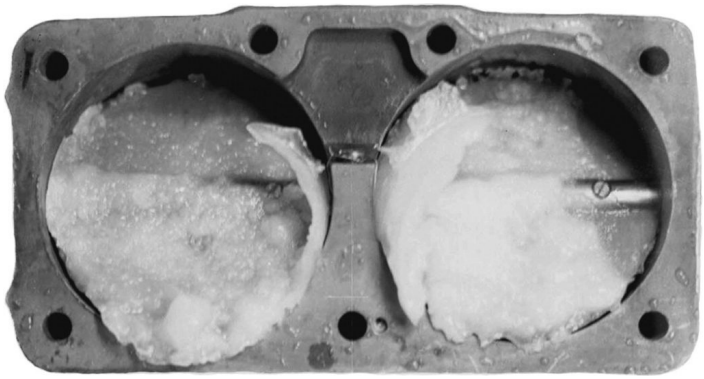
February 2022

RAANZ RECPILOT

WELCOME

Welcome to the February issue of RecPilot.

As well as the usual, In this issue, we have great information about carb icing. We hope you find it usefull and educational.



Source http://farmmachinerydigest.com/wp-content/uploads/2021/04/Carb-ice-2-1024x545.jpg

OVERVIEW

From The Operations Manager

Rodger Ward | 0274932943

We recently concluded our current series of Roadshows around the country with a trip to the West Coast.
Part of the Roadshow was a presentation on how we process information. This is how we grab bits of information from the environment in order to understand what is happening now, how it may affect us and how we use this information to make sensible decisions about what may happen next.
Some things we must consider especially in the Aviation world when making decisions are

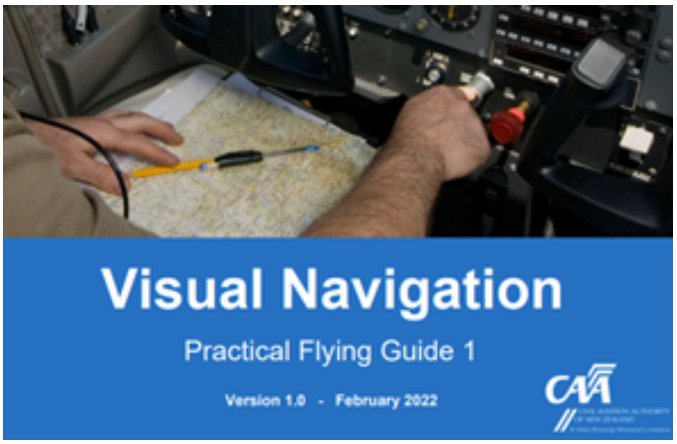
- The Risk of what we are proposing to do
- The Rules that apply to what we are proposing to do.

Risky behaviour is something we have all probably seen and quite probably spoken to someone about.

- The more we do something risky and get away with the more normal it seems.
- IT IS STILL RISKY !!!!
- If someone speaks to you about something you are doing that they perceive to be risky please LISTEN to them. They are not saying something just to annoy you.

CAA are currently doing a Nationwide e presentation regarding the Standard Overhead Join. I encourage all members to electronically attend these when in your area. (CAA OHead Join) It is not quite the same as face to face but that is the world we are in at the moment.

CAA have also recently published a Visual Navigation Guide (CAA Visual Nav Guide) and I encourage all to look through this document. It does contain some very useful information to make navigating your way around the countryside easier. I am well aware of the current use of the likes of OZ Runways etc., but a



thorough understanding of the basic Navigation principles involved allows us to very quickly confirm the electronics are not steering us the wrong way and the answers to fuel requirements etc. are in the ballpark.

My last trip to the States finished with a Taxi ride from downtown New Orleans to a hotel very near Louis Armstrong Airport. The Taxi driver did not know the hotel so got one of our group to enter the hotel on his phone. He just followed the blue line which went sailing past the Airport heading for the same hotel in the next city quite a few Interstate miles away that had been mistakenly entered. No one checked the data. Never happen here in a light aircraft, yeah right!
Our Nav exam is currently being reviewed and will include a lot more basic navigation principles and Dead Reckoning (DR) skills.

Also, a reminder that as a result of the RAANZ / SAC blending, the SAC Exposition has been retired. I encourage all, especially the new RAANZ members to make themselves familiar with the RAANZ Exposition. There are some minor differences. This document is always in a state of change, but all changes do take time and need to go through the CAA approval process. If you do have any concerns about the Exposition or constructive changes you think need to be made, please do not hesitate to let us know.

From The Technical Officer

Stan Hyde

Carrying on from last month's letter about some of the things new owners or about to be owners should look out for, this month I will chat about the often-overlooked items on microlight aircraft.

A pre-flight isn't just a quick walk around and off you go, it's a thorough look over the whole aircraft in and out where possible. One of our members once said to me, ''I don't really know what's right or wrong because I'm not every hands on, so I look more for things that look wrong rather than right, nuts loose, cracks, leaks etc'' This is a very good way of approaching a pre-flight but the bits we don't get to check often get overlooked or not looked at from one annual to another.

Good examples of these are, wheel bearings, brake pads or brake shoes, tires perished and cracked, wheel covers full of mud etc from the strips you regularly use.

All these are in one area, at the end of the undercarriage leg and all can have a dramatic effect on how your day ends if not checked more regularly than just at annual time. Remove the wheel covers more than once a year, jack the wheel off the ground and check everything.

If your tires have been on for a few years, look hard to see if there is any split or cracks appearing. The pictures above are of a tire that was on an aircraft with an up to date annual, but the tire was shot. It looked ok from a distance apart from a bit bald but was about to go bang.

Some microlights also use bungy cords as the suspension. These are often covered and forgotten about. Having one of these break at the wrong moment while landing or taking off can also wreck your day. If regularly looked at, you will notice change in the bungy, worn, torn, or bulging through the outer covering. It's much cheaper to replace these if you have doubts rather than have the front-end drop causing a prop strike. That then can be a costly exercise to repair.

Exhaust springs are also overlooked, not so much at pre-flight to see if in one piece but what you don't see is the issue. They rust and wear losing their tension and when the eyelet is worn enough where it clips onto the exhaust, it breaks and falls off. Not a good look for pusher engine aircraft.

You will see in the picture below that the broken one has a tie wire thorough it and hi temp silicone over the wire and spring.

This simple job ensures in most cases that when the spring breaks at one end, it will remain in position and not head out through your prop. It will then be picked up at the next pre-flight. You will also note in the picture, the spring hook (eyelet) wear (that is very hard to see at pre-flight) is about to fail under spring tension.

If the springs break and the muffler falls away from the engine manifold on a two-stroke for example, this will change its tune dramatically and a lot of power will be lost. Take time and have a harder look.

To sum up,

- Take time with your pre-flights. No ''she will be right; it was good when the last person flew it.''
- Take time regularly to look check the areas that are not easily accessible at pre-flights.
- Don't leave these areas unchecked from one annual to another.
- Remember, part 103 allows you to do your own maintenance but in doing so, you must ensure you keep your aircraft airworthy.
- Don't forget the paperwork, log all checks, and work you have done on your machine. This is part of maintenance and must be done. (Record Keeping)

The good news is you now have something to do on those wet, windy days. Get to know your aircraft better and you won't have too many unwanted surprises from your I/A at your next annual inspection.

FROM THE ADMINISTRATOR

Stuart Parker | 021 076 3483

- **ex-SAC Instructors and IAs-** just reminding you that we will continue to accept SAC BFR and Inspection forms and stickers. Let me know as you near run-out and I will send replacements from our stock of SAC forms and move you across to the RAANZ equivalents once used up.
- **ex-SAC pilots-** you may continue to fly on your SAC certificate (assuming currency requirements are met). We will issue you a RAANZ certificate on your next BFR or upgrade- or earlier if you ask. No charge.
- **Instructors using the online CMV forms-** on submission these are held pending until they are checked for validity (exams, membership, etc), same as for paper forms. So there can be a delay of a few days before everything is processed and the database is updated. But still quicker than snail mail.
- **Instructors and IAs-** NZPost is abysmally slow at present, so there can be turnaround delays of up to 2 weeks there and back. Scanning and emailing forms helps cut down the wait time.
- **CURRENCY-** pilot certificate and flight permit validations issued under the RAANZ system are valid only if the Instructor or IA is a current member at the time of issuing, and the pilot or owner remains a current member while flying under those certificates/permits. These are checked at processing time- if there is an issue, we will hold the forms pending, email a reminder, and only process the forms once membership is sorted.

PASSWORDS- we have updated the database password/login system security. Previously we were issuing fairly simple passwords which were easy to guess and reminded members to log in to their myRAANZ page to change to something more secret to them. We have now gone a step further, with default passwords being randomly generated. Once a member logs in to myRAANZ and updates their password it is hashed and saved- no longer knowable by anyone but the member. If you forget your password you can click on the 'forgotten password' to be issued with a new random temporary password.

In general things are ticking along fine this end, we appear to be over the main hump of the SAC/RAANZ merge, and over the next year or so all will have transitioned to the RAANZ certificates/forms/docs. But if you have an issue, phone or email me so we can get things sorted.

CARBURETTER ICING

(with acknowledgement to EASA) compiled by Ken McKee

1. CAUSES

a. Carburettor (carb) icing is caused by a sudden temperature drop when the fuel vaporises as it mixes with the inlet air, and another drop when the pressure reduces as the mixture passes through the carburettor venturi and the throttle valve/butterfly.
b. If the temperature drop cools the air below its dew point, water condenses. If the mixture temperature falls below freezing, the condensed water will form ice on the inner surfaces of the carburettor and the throttle valve.
c. This ice gradually blocks the venturi, changing the fuel/air ratio and causing a progressive, smooth loss of power.

2. ENGINE FACTORS

a. Carburettor icing is more likely when MOGAS is used, because of its volatility and water content.
b. Reduced power settings make engines more prone to icing. Induction temperatures are lower, and the partly closed butterfly can be restricted more easily by the ice build up.
c. Liquid-cooled engines/heads tend to cool less quickly when power is reduced, which reduces the severity of carburettor icing.
d. Some engines have electric heaters which directly increase the temperature of the carburettor body, encouraging ice to clear. A similar effect may be obtained in a liquid cooled engine by directing a flow of hot coolant around the carburettor body.
e. On other engines (specially air cooled), carb icing is normally cleared by the pilot selecting an alternative air source (carb heat) which supplies air which has been heated in a heat exchanger to melt the ice obstruction. This alternative air source by-passes the normal air intake filter.
f. Fuel injected and Turbocharged engines and engines with constant velocity carburettors are less prone to icing.
g. Not all engines have carb heating systems fitted, particularly in the case of Microlights. In these cases pilots need to be even more conscious of carb icing and how to avoid the problem. A good practice before the first flight of the day or if the engine compartment is cold is to carry out a high power run up before taking off, for a sufficient period to ensure that the engine compartment is thoroughly heat soaked.

3. ATMOSPHERIC CONDITIONS

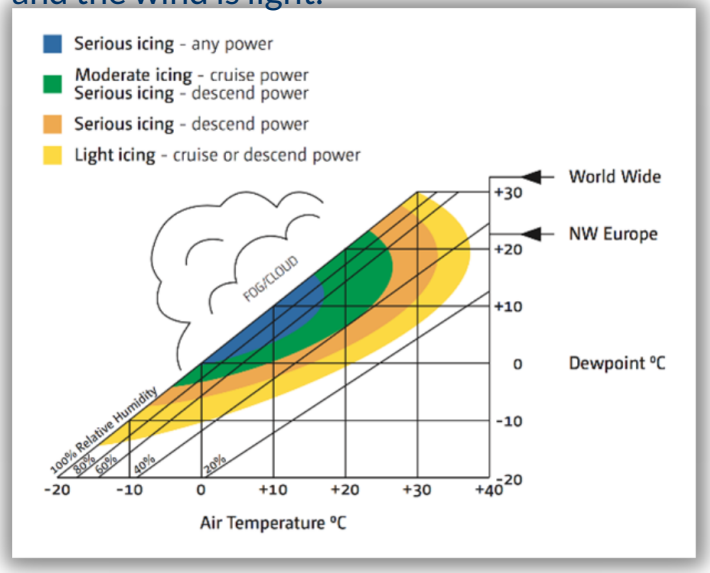
a. Carb icing is not restricted to cold weather. It will occur on warm days if humidity is high, especially at low power settings. Flight tests have produced serious icing at descent power when the air temperature was above 25°C, even with relative humidity as low as 30%. At cruise power, icing occurred at 20°C when relative humidity was 60% or more. (Cold, clear winter days are less of a hazard than humid summer days because cold air holds less moisture than warm air.) In areas where high humidity is common, pilots must be constantly on the alert for carb icing and take corrective action before the situation becomes irretrievable. If the engine fails due to carb icing, it may not re-start and even if it does, the delay could be critical.

b. Carb icing can occur in clear air without any visual warning. The icing risk may be higher in and near cloud, but the pilot should be less likely to be surprised.

c. Aviation weather forecasts do not normally include special warnings of induction system icing. Pilots must therefore use knowledge and experience. Dew point readings close to the temperature mean the relative humidity is high. However, the humidity reported at an aerodrome may bear little relation to the humidity at flying altitudes.

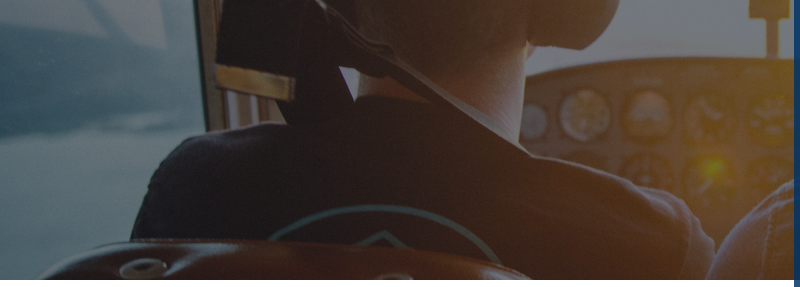
When dew point information is not available, assume high humidity particularly when:

- in cloud and fog; these are water droplets and the relative humidity should be assumed to be 100%.
- in clear air where cloud or fog may have just dispersed, or just below the top of a haze layer.
- just below cloud base or between cloud layers (the greatest liquid water content is at cloud tops).
- in precipitation, especially if persistent.
- if the surface and low level visibility is poor, especially in early morning and late evening, and particularly near a large area of water.
- when the ground is wet (even with dew) and the wind is light.



However, the lack of such indications does not mean low humidity.

The chart shows the wide range of ambient conditions in which carb icing is most likely. It shows the much greater risk of serious icing with descend power.



4. RECOGNITION

a. Paragraphs 1, 2 and 3 should help pilots to avoid icing, but they must refer to the relevant sections of the Pilot's Operating Handbook or Flight Manual for specific procedures related to the particular a**irframe/engine combinations.**

b. If the aircraft has a fixed pitch propeller, the most likely indications of carb icing are a slight drop in rpm and performance (airspeed and/or altitude). The pilot may automatically open the throttle slightly to compensate for a smooth and gradual loss of rpm, and not notice the performance loss. But as ice increases, rough running, vibration, further loss of performance occurs and ultimately the engine will stop. Pilots should routinely compare the rpm gauge with the ASI and altimeter.

c. With a constant speed propeller a reduction in rpm would only occur after a large power loss, however the performance reduction will be shown as a drop in manifold pressure.

d. In steady level flight an exhaust gas temperature gauge, if fitted, may show a decrease in temperature before any significant decrease in engine and aircraft performance.

5. ACTIONS

a. Whenever carb heat is applied, always select full heat. Partial carb heat should only be used if specifically recommended in the Flight Manual or Pilot's Operating Handbook.

b. Turn on carb heat whenever carb icing is likely. Carb heat should be turned on:

- as a routine, check at regular intervals to prevent ice build up,
- whenever a drop in rpm or manifold pressure, or rough engine running, is experienced,
- when carb icing conditions are suspected, and
- when flying within the high probability ranges indicated in the chart.

However while carb heat is turned on, it reduces engine power. This power loss may be critical in certain flight phases, for example during a go-around.

c. In cruise flight, apply carb heat at regular intervals to prevent ice forming. Apply it for at the very least 15 seconds (but considerably more in certain aircraft) to prevent the loss of engine power, or to restore it.

d. If carb heat (the hot air) has dispersed ice which has caused a loss of power, turning carb heat off (selecting cold air) should produce a higher rpm or manifold pressure than the reading before turning carb heat on. This will show that ice has been forming, but does not prove that all the ice has melted! Carry out further checks until there is no resultant increase. Then monitor the engine instruments, and carry out the routine checks more often. If there is no carb icing, there should be no increase in rpm or manifold pressure above the figure noted before turning carb heat on.

e. If carb heat is turned on when ice is present, the situation may at first appear worse, because the engine will run roughly

as the ice melts and passes through it. Allow the hot air time to clear the ice. This time may be more than 15 seconds.
f. Unless it is necessary, avoid using carb heat continuously at high power settings. However carb heat should be applied early enough before descent to warm the intake, and should remain fully applied during that descent, as the engine is more susceptible to carb icing at low power settings.

6. SUMMARY

Icing forms stealthily. Some aircraft/engine combinations are more susceptible to icing than others.
Icing may occur in warm humid conditions and at any time of the year.
MOGAS makes carb icing more likely.
Low power settings, such as in a descent, are more likely to produce carb icing.
Warming up the engine thoroughly before take-off improves the effectiveness of any carb body heat.
Use full carb heat frequently when flying in conditions where carb icing is likely. Remember the RPM gauge is the primary indication for a fixed pitch propeller and manifold pressure for variable pitch propellers.
Treat carb heat as an ON/OFF control – either full hot or full cold.
It takes time for the heat to work and the engine may run roughly while ice is clearing.
Using appropriate procedures can PREVENT THIS PROBLEM

OUT AND ABOUT

Some photos from the recent Stratford Fly-in

IF YOU HAVE PHOTOS OR STORIES YOU WOULD LIKE TO SHARE, CONTACT EDITOR@RAANZ.ORG.NZ

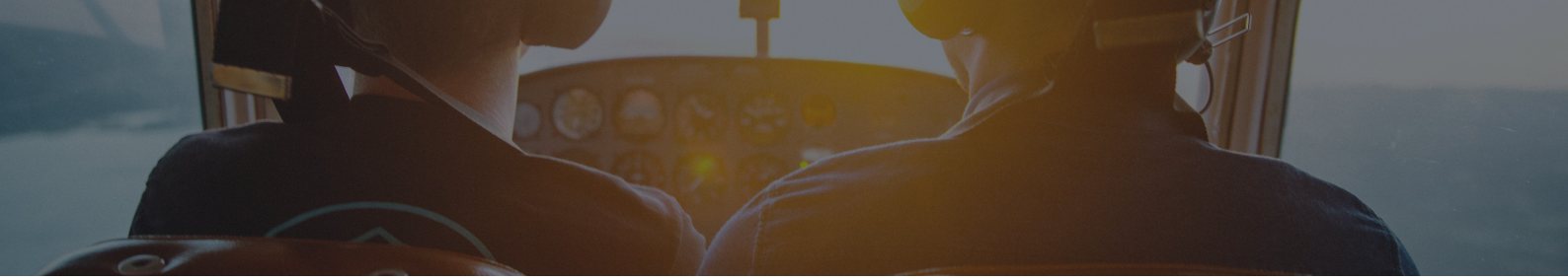
Thanks to John Issott!

I attended the Stratford flyin last Saturday & Sunday and what a stunning day we had. One out of the box! Greg Sheehan-Dawson and I flew down, from North Shore, in Greg's Aeroprakt A32 Vixxen. Taking advantage of the blue conditions to go on a VFR flightplan. 2.2 hours chock to chock.Stratford were excellent hosts, including the availability of a hot shower and breakfast on the Sunday morning!

Incidents

The purpose of including incidents here is for education.

14th January 2022. Following a normal pre flight inspection, I departed NZFE and tracked east to the coast then turned north for Motunau Island. At 900ft overhead Ashley River mouth, I observed the cylinder head temperature gauge in the red, noting the engine sounded normal, I had power and the oil temp and pressure were normal, I reduced power and descended to 500ft for cooling. This had no effect and by now there was a faint "hot" smell in the cabin, so I broadcast a Pan-Pan and opted for a precautionary landing. The beach abeam Liethfield settlement was quite busy, so I tracked slightly further north and finding an empty stretch landed just above the waterline. It was a "positive" landing, probably due to a sense of urgency and the undulating sand, but there was no apparent damage to the aircraft or injuries to myself and my passenger. I contacted the 0800 ACCIDENT and reported landing. I also contacted my IA, who instructed me not to attempt a takeoff until the engine had been inspected. A crowd quickly gathered and we were able to move the aircraft above the high tide mark. The police attended, took statements and checked paperwork. An initial inspection was undertaken and it was noted that a temperature sender had failed and a radiator hose was slightly lose, allowing coolant to obviously drip, but only when the water cap was removed. Later that day and on the outgoing tide, the aircraft was relocated south to Ashworth Beach where the redundant temperature sender was connected and the coolant topped up. Following a normal run-up, with all temperatures and pressures showing normal, the aircraft was flown back to NZFE. A follow-up inspection at Alpi HQ confirmed that the engine had not sustained any damage. A massive thank you goes to the many people who turned up and helped turn a drama into a picnic. In particular a mention for my wife for being a brilliant passenger in difficult circumstances. Then (in order of appearance) Logan, Errol, Stu, Kevin and Hamish, not forgetting the good people of Liethfield Beach who prevented my Alpi from becoming a boat. The lesson for me here is, piloting is a solitary occupation but aviation is a team sport. Without the support of the CAA, our fellow pilots, clubs and organisations and even the general public, my drama would have been a disaster not a picnic.

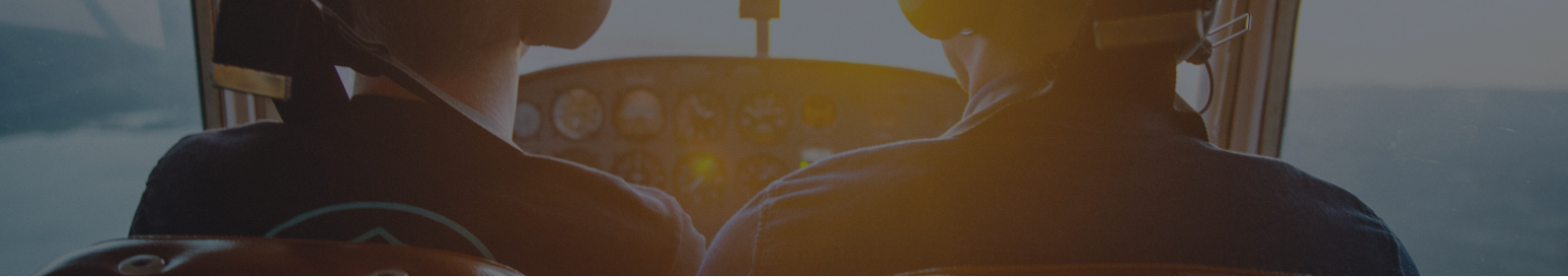


Incidents

The purpose of including incidents here is for education.

Incident Details

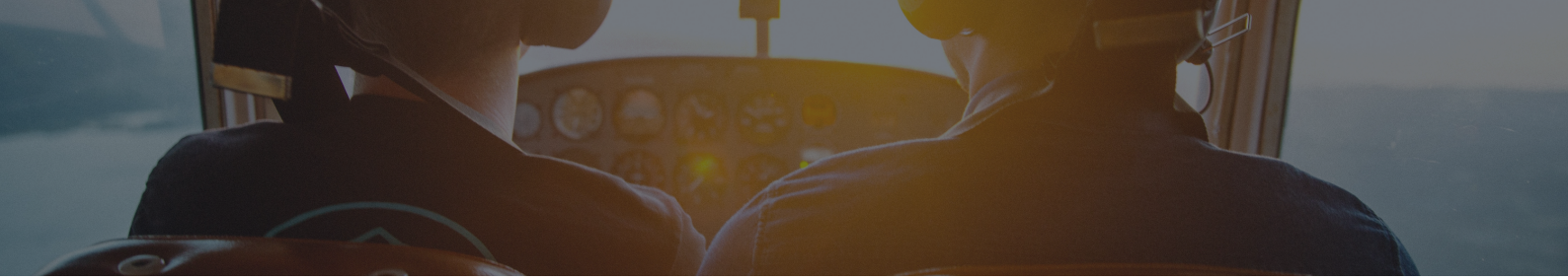
Microlight type/model	Ultravia Pelican Club GS
Place of incident	10 South Wanganui
Other aircraft involved	Nil
Describe the incident	On climb out of Wanganui for Kapiti Island the engine lost 300RPM but within 20 seconds had recovered normal RPM. I made an immediate left turn for the nearby coast as soon as the RPM drop occurred but when it recovered I resumed the original track. I had not observed any water in the fuel drains for sometime so felt it was not water in the fuel but could not determine the reason for the RPM drop. I decided to continue to Paraparaumu on the basis that the engine had returned to normal smooth running. Along the way I observed the #4 EGT was only reading 81 and not at the 157 that it normally runs at. I also detected a slightly uneasy beat occasionally so decided to divert to Paraparaumu instead of my planned crossing of Cook Strait to Omaka. Upon landing straight in on runway 16 I removed my headset and detected a very disturbing noise that suggested the aircraft would be grounded when I shut down. Removing the top cowling at the Kapiti Aero Club hangar I discovered the #4 exhaust pipe snapped in two on the 90 degree bend. These pipes had been worked on at 850 hours but this pipe had not had the 90 degree bend renewed so was now at 1365 hrs. The engineer reported that the pipe was paper thin where it broke.
Describe the affect on safety	The EGT drop is now the indicator of a problem like this that I had not seen in my extensive flying experience. Definitely a reason to not cross Cook Strait.
Remedial action taken	Pipe repaired by a welder for return to service.
Corrective or preventive action recommendations	All pipes will be checked and replaced where necessary. I have heard of other Rotax aircraft having similar issues with exhausts at around 1000 hrs.



Membership Changes

Apologies for missing this in the January issue.Below are the changes from January and February.

Name	Club	Certificate	Update
Adriaan Nortje	Auckland Recreational Microlight Aircraft Club	Advanced National	Upgrade
Alex Changchreonkul	Parakai Aviation Club	Novice	Joined
Brent Hempel	Associate	Advanced National	Joined
Brian Shaw	Associate	Advanced National	Joined
Cara Bosman	Mercury Bay Aero Club	Advanced National	Upgrade
Christopher Dela Cruz	Associate	Novice	Joined
Christopher Ewing	Associate	Advanced National	Upgrade
Christopher Ewing	Associate	Advanced Local	Upgrade
Colin Ashby	Associate	Advanced National	Joined
Craig Powell	Whangarei Flying Club	Novice	Joined
Darcie Neill	Associate	Novice	Joined
David Cameron	Manawatu Aviation Club	Senior Flight Instructor	Upgrade
David Erdman	Associate	Novice	Joined
David Sands	Associate	Novice	Joined
Denis Chernyshov	Canterbury Recreational Aircraft Club	Advanced National	Upgrade
Eugene DeMarco	Associate	Advanced National	Joined
Fred Courtney	Bay of Islands Aero Club	Advanced National	Upgrade
Glenn McIntosh	Gyrate Flying Club	Advanced Local	Upgrade
Gregory Francis Allen	Whangarei Flying Club	Novice	Joined
Gregory Stott	Southern Recreational Aircraft Club	Advanced National	Upgrade
Harry Offer	Associate	not issued	Joined
Hayden Robinson	Wairarapa Aero Club	Intermediate	Upgrade
Herman Johan Cruywagen	Associate	Novice	Joined
Ian Hill	Canterbury Recreational Aircraft Club	Advanced Local	Upgrade
Ian Walls	Canterbury Recreational Aircraft Club	Advanced National	Joined
Jess Collins	Canterbury Recreational Aircraft Club	Advanced National	Joined
Jonno McKay	Wairarapa Aero Club	Novice	Joined



Membership Changes

Name	Club	Certificate	Update
Josh Ruddenklau	Fiordland Aero Club	Novice	Joined
Jovana Mrkailo	Associate	Novice	Joined
Kevin Potter	Associate	Advanced National	Joined
Kiri Rogers	Whangarei Flying Club	Novice	Joined
Liam Wedlake	Canterbury Recreational Aircraft Club	Advanced Local	Upgrade
Lucy Gilroy	Canterbury Recreational Aircraft Club	Novice	Joined
Mark Thorns	Associate	Intermediate	Upgrade
Matthew Clark	Canterbury Recreational Aircraft Club	Intermediate	Upgrade
Matthew Walker	Associate	Novice	Joined
Michael Bach	Associate	Senior Flight Instructor	Upgrade
Mikhail Krasnykh	Associate	Novice	Joined
Neil Hintz	Associate	Intermediate	Upgrade
Neil Wright	Bay of Islands Aero Club	Advanced National	Upgrade
Oliver Plowright	Whangarei Flying Club	Novice	Joined
Robert Bradnock	Feilding Flying Club	Advanced National	Upgrade
Ryan Humphreys	Associate	Advanced National	Upgrade
Ryley Fleming	Golden Bay Flying Club	Flight Instructor	Upgrade
Sandra Ashby	Whangarei Flying Club	Novice	Joined
Shaun ONeill	NZ Autogyro Association	Intermediate	Upgrade
Sophie Burling	Manawatu Aviation Club	Advanced National	Upgrade
Wayne Drinnan	Associate	Advanced National	Joined