February 2016

WAYPOINTS

PRESIDENT'S REPORT

Our regular chapter meeting will be held at the High River Air Cadet hangar on February 4, 2016, business meeting starting at 7:30. As usual, grub and libation guys, Bryan, John and René, will be providing excellent meals and libations starting shortly after 6 pm.

CHAPTER BUSINESS

Another reminder to everyone to remember to bring your cash or cheque book, as 2016 Chapter membership fees are due.

There will be a short business meeting, covering the usual subjects. Soren will provide an update on the Pot-Luck dinner plans. Dinner date is now firmed up for April 12, so please reserved that date on your calendars.

John will also update provide an update on the B-17 visit this summer.

PRESIDENTS NOTE

Hello everyone I am glad the last meeting went well and am looking forward to Johns discussion as described below. I have some good news: ***Bob Thirsk is able to give us a talk on April 12***. That is a Tuesday and I hope all can accommodate that. It should be very interesting, and I expect, well attended so let's have a discussion about that at the meeting. I would like to have EAA members come and if we can get some feel for the number of interested Cadets and parents we can discuss the total number that can be fed and entertained that evening.

I would like to discuss with all flights or interesting trips we could fly to as a group.

CHAPTER PRESENTATION/DISCUSSION – CHECKING OUT ON A NEW AIRCRAFT TYPE

When starting to fly a new-to-you aircraft type, or even a different model of a type already in your logbook, have you ever been uncertain about exactly what you need to look at, learn or consider as you transition to flying the new aircraft? For this month's meeting, we will have an interactive presentation looking at many of the aspects of checking out on a new type, with the expectation of generating lots of discussion within the group.

Don't miss this meeting discussion, and bring any friends who might be interested.

Fly Safe! John Mader EAA Chapter 1410 Vice-President 2014-16

Buying and Maintaining a Used Homebuilt

Garry Wright

In Canada it is legal for a licensed pilot to purchase a used amateur built aircraft and, although he has no obligation to do so, he can choose to maintain it himself. This is not true in the USA and this difference in regulation has had some significant impact on me personally.

Back in 2004, I was contemplating purchase of a homebuilt. I wanted to be able to fly before burning any more of my remaining lifetime in the build process. I did a lot of due diligence and decided to buy an airplane from one of the gurus of homebuilding on the theory that I could count on his judgment to supplement my own and help ensure I was buying wisely if not cheaply. In doing so, I was close to breaking one of the rules Budd Davison expressed in the Oct 2015 issue of Sport Aviation. This is a bit twisted because Budd was talking in the American context and his comments are not really directly applicable. I was buying to fly, and planning on doing my own maintenance.

This is a somewhat taboo subject to be bringing forth but worthy of consideration anyway. Was I really qualified to do this? Looking at my own experience and background I will confess that I thought I was quite well qualified, while also knowing I had a lot to learn. I am a good learner, open minded about what I know, what I don't know and willing to fill in the gaps. It is now my opinion that my estimate of the gaps was extremely low compared to the reality. Building an airplane myself would have filled many of those gaps, but not all by any means.

The burden of these errors rests entirely on my shoulders. No criticism of the regulatory process, or any person, most especially the involved guru, is implied here.

I will list only some of the examples that lead me to these conclusions. This buck stops here. And it will for you to if you follow my example.

One of the many things done to modify this airplane over its 23 years of life was replacement of a clapped out 115 HP engine with a 150 HP O320. This engine was out of an ancient 172 and was originally badged O320 and rebadged O320A1A by Lycoming when newer variations started to proliferate. Since this endeavor was undertaken as a commercial effort, by an experienced commercial operator (my guru), economics played its usual part and encouraged keeping the cost down. Mike Busch would not criticize the engine rebuild as far as I can tell. It ran well and was installed well. The engine instrumentation installed was used and in 2004 was probably on the threshold of becoming less than optimum for the purpose. It worked in its way, but as a scanning instrument demanded way too much 'head in the cockpit' time to be very useful. As a result of that, and having alarm thresholds set too high, there were several operating limitations exceeded for some years that should have been noted.

Some time after I purchased my plane, one of the owners of these aircraft was able to demonstrate the 'best' propeller for the engine/airframe combo and I decided to acquire one of these. I was not having any trouble with the propeller I had, but it did have over-speed issues being limited to 2600 rpm and of fairly fine pitch. When installed, I found the engine unable to make satisfactory static rpm (fell short about 100 rpm) with the new prop. Hmmmm. For two years hmmmmm.

This long and unsatisfactory search for the cause of this inconsistency led to much seesawing between props, head scratching, and questioning what was actually going on. I came to mistrust my engine, but with little evidence other than the inability to swing static rpm. Questions about the effect of density altitude, prop bite change with elevation and so on rolled and twisted and led to much reading, study and filling of those aforementioned gaps in my knowledge base.

A full ten years after acquiring this aircraft and maintaining it myself all this time, I decided that I could no longer justify flying this floatplane into wilderness areas without knowing why this was happening. I knew of nothing that had changed since the engine had been overhauled and it now had 400 hours since overhaul. I no longer believed it was safe but did not know of a real problem other than static rpm.

In the fall of 2014 I bit the bullet and went to the Copperstate fly in south of Phoenix and purchased JPI's EDM740-4C uncertified EMI which has all the capability I had decided I needed to examine this problem. I also purchased a Snapon borescope so that I could verify the visible internals of the engine. Returning home in mid-April 2015 I started work installing the new instrument and examining the internals of the engine.

First flight with the new EMI indicated engine temperatures that were acceptable by Lycoming's standards (450°F), but way too high by Mike Busch's current and conservative criteria. I was also getting much higher temperatures on the rear cylinders than the front ones. In addition, the instrument indicated several parameters that I was a bit surprised by. The MAP (Manifold Absolute Pressure) at WOT (Wide Open Throttle) was never lower than 0.8 below ambient, indicating surprisingly good intake air flow to the carb even

though the air filter is a bit undersized and was originally a concern of mine associated with the static rpm issue. I was also getting somewhat weirdly erratic temperature curves though understanding the variations was pretty difficult.

Various other issues raised their heads and got the whack-a-mole treatment without really resolving the temperature or rpm issues. This took a lot of time and much research. I think my hair is grayer and thinner now.

Next up was the exhaust system which I had been reluctant to remove. Dumb move to delay this. I could have borescoped this problem but didn't and found on removing the exhaust that one of the mufflers (cyl 3 & 4) had a baffle broken loose and said baffle was partially obstructing the outlet of the muffler. These were stainless steel and made up by an apparently extinct outfit called Forsling as Cessna knockoffs. Unfortunately it appears that they were not made of 321 stainless but rather some other version and did not last very long. This explained the erratic nature of the CHT/EGT curves as the baffle moved around with respect to the outlet causing varying amounts of backpressure. It also explained the lack of power. Now we were getting somewhere. A new cross-over exhaust from Vettermann happened.

During the exhaust replacement phase I re-did the borescoping and found to my surprise that I had a bad exhaust valve on cylinder 4. For a bit I thought that this was newly developed but on review I saw the same problem on the earlier pictures, but had not previously spotted. A new valve happened thanks to Glenn Coffey skillfully examining and seating a new valve. I also got to borescope most of the cam surfaces ensuring there was no problem there while the cylinder was off. The bad valve would have failed in a fairly short period of time and almost certainly killed the engine and led to an off airport forced landing.

More test flights indicated some improvement to well below Lycoming's limits, but not enough to please Mike Busch and by now a fussier Garry Wright.

Much gnashing of teeth leading to the conclusion that the cowling for the 115 HP engine was not changed when the engine was upgraded and the instrumentation did not indica~~te an unacceptable situation at tha~~t time. Comparison of the cooling air exhaust size compared with the intakes showed the outlet to be woefully inadequate. Other marginal improvements to the cooling over the next few weeks led to acceptable temperatures with some remaining improvements quite feasible but fairly work intensive.

I now trust my engine again – with good reason. My skepticism about its reliability earlier was vindicated, and I have a trophy (the bad valve) to show for my findings.

So back to the beginning where I obliquely posed the question of was I really qualified to do all my own maintenance? I am forced by logic to say I've been lucky here, not smart. I have come to the conclusion that my choice to do my own maintenance (largely to the exclusion of professionals) was risky and probably inappropriate at the time.

While there are issues with hiring AME's to work on your experimental airplane, there are things they are especially suited to. Traditional engines are one of those areas. While they may have little experience with your particular airframe, they really are at an advantage in the firewall forward domain until you are well advanced and even then, they have the tools.

December 2015 issue of Sport Aviation

Many of you throw out your Sport Aviation magazines. I would like to get a few extra copies of the December 2015 issue of Sport Aviation to give to a few non EAA buddies who have helped me on my Gipsy project. Please bring your unwanted copy to the next meeting.

-------- Clark Seaborn

WAYPOINTS

Newsletter of the EAA Chapter 1410
High River, Alberta, Canada

www.eaahighriver.org

Who We Are

We are an enthusiastic group of like-minded individuals from various backgrounds who share a passion for recreational aviation in Southern Alberta and we offer the chance to meet others who combine fun with learning.

FOR SALE

Aviation items for sale call Ted Burgoin 403 852-6424 or email <burgted@gmail.com>

Lycoming 0-320 150 hp first time run out removed from C172 in 1995, 1 mag, no starter $2500 obo

Piper Tri Pacer fuselage and tail sections offers?

Pitts S1c 180 hp Lycoming wings removed TTSN 500 hrs, engine TTSN 700 hrs, symmetrical wing kit partially completed nicely built $30,000 obo

Cassutt racer wing structure less ply covering c/w Cassutt plans $300 obo

How to Join Our Chapter

Attend our next chapter meeting. Ask for anyone and they will be pleased to help. All the required forms will be made available for you to fill out. You must be a current member of EAA International, so please have your EAA membership number. If you are not a member, you can join EAA at the meeting.

Contact us by post at
EAA Chapter 1410
Box 5280, High River, Alberta T1V 1M4
Or by email at
president@eaahighriver.org

For registration forms contact the treasurer (see the list of the executive below).

Please update your web member profiles

On our web site, in the member's section, there are many pictures and profiles that are quite dated (aluminum parts which are now beautiful flying machines). The updates should be sent to the webmaster (webmaster@eaahighriver.org) Please supply: Name, project or aircraft, facts about your project and area of aviation interest.

EAA1410 2013 Executive		
President	Soren Christiansen	president@eaahighriver.org
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