EAA Chapter 648

Longmont, Colorado 80503

Our Next Meeting will be 7pm, June 8th, at the Colorado Classic Aircraft building of Carol & Bob Leyner, located on the north side of the Longmont airport.

June

2015

www.648.eaachapter.org

Contents

Editor

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May Meeting Photos:

There are no known photos of Chapter 648's May meeting, due to the absence of the Newsletter Editor, who had the camera. It is rumored that he will make every attempt to attend future 648 events and chronicle them accordingly.

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June Program: Haiko Eichler will present a June program on the Berlin Airlift. Some of you may remember the program by Sgt. Major Don Long who was stationed in England working on the fleet of planes used in the Airlift. Haiko will give us a first person accounting of what it was like, including some little known facts and experiences they shared with young friends at that time. BRING GUESTS! THIS IS A CHANCE TO EDUCATE YOUNG PEOPLE ON SOMETHING OUR GOVERNMENT AND MILITARY DID RIGHT.

Several months ago, members volunteered to organize meeting programs for 2015. Our June 2015 meeting program will be arranged by Haiko Eichler. As a reminder, the schedule for subsequent months is as follows:

July	Rick Hall--fiberglass construction techniques
August	Doug Sykes--Air Traffic Control services to pilots
September	Chapter Picnic
October	Bill and Mary Mitchell
November	(Need Volunteer)
December	Chapter Christmas Party

If you aren't on the list already, please step up and take one of the months needing a volunteer to arrange the program.

As always, everyone is invited to bring a guest to our meetings. There is almost always an interesting program and fun for all.

A Message from the President

Our program for June is about an interesting and import event in the Country's history following World War 2. When you mention "The Berlin Airlift" to most people under 60 and especially teenagers and young adults, you are often greeted with a blank stare or a disinterested and sometimes disrespectful comment. Many decision makers, politicians, and military personnel seem all too eager to resort to military action when a foreign policy problem

arises. The Marshall Plan and the Berlin Airlift seem to be forgotten by many and I'm guessing receive little attention in High School history programs. Here's a chance to spread the word. Haiko Eichler and Willi Jung, two of our Chapter members, experienced the airlift first hand. Here's a chance to introduce our own young people to a piece of history first hand. Please spread the word about our next meeting and invite guests. Bring your spouses, kids and neighbors to this program.

Also don't forget to write your Senators and Representative concerning the Pilot's Bill of Rights #2 currently working its way through Congress.

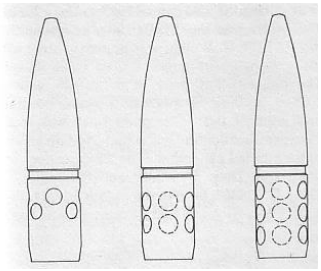
Dick Socash

President, EAA Chapter 648

NEWSLETTER QUIZ

Each month, we will ask a "question" in the newsletter. Answers are given at the meeting referenced in the newsletter. At the end of the year, there will be a prize to the person who has the most correct answers. Some will be easy and some difficult.

May Question: In discussions with my brother-in-law who was a waist gunner in a B-24 in the 446 Bomb Group in Europe during the latter stages of WW2, he talked about using "Headlight tracers." What are "Headlight tracers?"



May Answer: The M21 50 caliber round was specifically designed to provide a trace which was far more visible from the front than standard tracers. It was intended for bomber gunners, because it had been observed that attacking fighters were sometimes distracted by tracer rounds flying towards them.

This was achieved by drilling holes into the side of the jacket. They were below the cannelure, so not visible in a loaded round. Actually, only the test series had the holes drilled into the projectile jacket. A much simpler way was devised. Manufacturers just loaded an ordinary tracer jacket with 100% IGNITER compound, instead of the usual igniter/tracer compound mix. The igniter compound burned a bright white, so bright the target could see the incoming tracer even without side holes.

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June Question: Some WW2 fighter planes used water injection to increase power for short periods of time. How did this increase output power?

May Program: Our program was presented by Haiko Eichler. Haiko gave an excellent talk on using auto gas in an airplane engine. Major engine manufacturers, faced with the potential of frivolous lawsuits, are reluctant to discuss using anything other than FAA approved aviation fuels. According to Haiko, experience over a number of years has shown no adverse effects of using gas directly from the pump which can contain as much as ten-percent ethanol. For those reluctant to go this far, he demonstrated a simple technique for removing ethanol from pump gas. I tried it on 5 gallons of 91 octane pump gas and found the process to be easy and the cost savings worthwhile. The only modification I recommend to the procedure shown is to let the gasoline water mixture sit for several hours before siphoning off the purified gasoline. For reference, on the day I did this, 100LL was $4.63/gas, MoGas at LMO was $3.65/gal and 91 octane super premium was around $1.90/gal. Add 19 cents to the pump gas to account for the extracted ethanol volume. Well done Haiko!!!

Other Items of Interest

Do Piston Engine TBOs Make Sense?

March 13th, 2014 by Mike Busch

Last month, I discussed the pioneering work on Reliability-Centered Maintenance (RCM) done by United Airlines scientists Stan Nowlan and Howard Heap in the 1960s, and I bemoaned the fact that RCM has not trickled down the aviation food chain to piston GA. Even in the 21st century, maintenance of piston aircraft remains largely time-based rather than condition-based.

Most owners of piston GA aircraft dutifully overhaul their engines at TBO, overhaul their propellers every 5 to 7 years, and replace their alternators and vacuum pumps every 500 hours just as Continental, Lycoming, Hartzell, McCauley, HET and Parker Aerospace call for. Many Bonanza and Baron owners have their wing bolts pulled every five years, and most Cirrus owners have their batteries replaced every two years for no good reason (other than that it's in the manufacturer's maintenance manual).

Despite an overwhelming body of scientific research demonstrating that this sort of 1950s-vintage time-based preventive maintenance is counterproductive, worthless, unnecessary, wasteful, and incredibly costly, we're still doing it. Why?

Mostly, I think, because of fear of litigation. The manufacturers are afraid to change anything for fear of being sued (because if they change anything, that could be construed to mean that what they were doing before was wrong). Our shops and mechanics are afraid to deviate from what the manufacturers recommend for fear of being sued (because they deviated from manufacturers' guidance).

Let's face it: Neither the manufacturers nor the maintainers have any real incentive to change. The cost of doing all this counterproductive, worthless, unnecessary, and wasteful preventive maintenance (that actually doesn't prevent anything) is not coming out of their pockets. Actually, it's going into their pockets.

If we're going to drag piston GA maintenance kicking and screaming into the 21st century (or at least out of the 1950s and into the 1960s), it's going to have to be aircraft owners who force the change. Owners are the ones with the incentive to change the way things are being done. Owners are the ones who can exert power over the manufacturers and maintainers by voting with their feet and their credit cards.

For this to happen, owners of piston GA aircraft need to understand the right way to do maintenance—the RCM way. Then they need to direct their shops and mechanics to maintain their aircraft that way, or take their maintenance business to someone who will. This means that owners need both knowledge and courage. Providing aircraft owners both of these things is precisely why I'm contributing to this AOPA Opinion Leaders Blog.

When are piston aircraft engines most likely to hurt you?

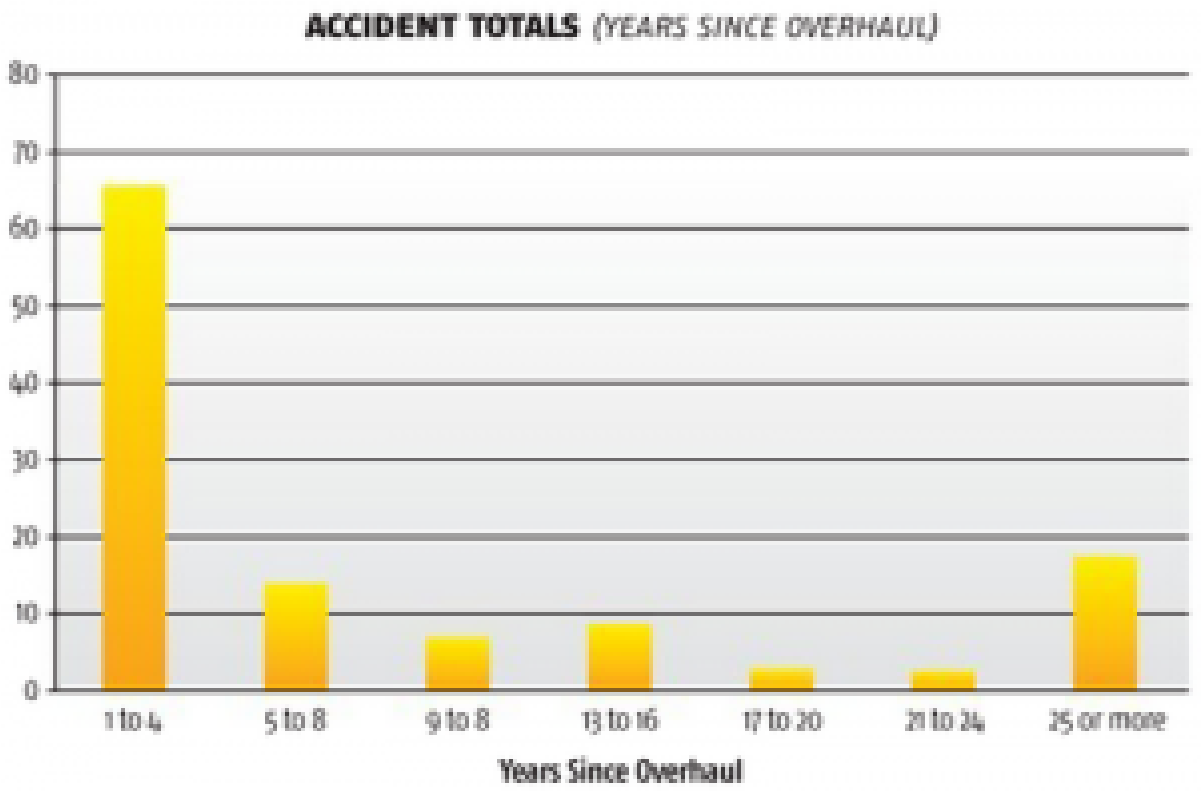
Fifty years ago, RCM researches proved conclusively that overhauling turbine engines at a fixed TBO is counterproductive, and that engine overhauls should be done strictly on-condition. But how can we be sure that his also applies to piston aircraft engines?

In a perfect world, Continental and Lycoming would study this issue and publish their findings. But for reasons mentioned earlier, this ain't gonna happen. Continental and Lycoming have consistently refused to release any data on engine failure history of their engines, and likewise have consistently refused to explain how they arrive at the TBOs that they publish. For years, one aggressive plaintiff lawyer after another have tried to compel Continental and Lycoming to answer these questions in court. All have failed miserably.

So if we're going to get answers to these critical questions, we're going to have to rely on engine failure data that we can get our hands on. The most obvious source of such data is the NTSB accident database. That's precisely what brilliant mechanical engineer Nathan T. Ulrich

Ph.D. of Lee NH did in 2007. (Dr. Ulrich also was a US Coast Guard Auxiliary pilot who was unhappy that USCGA policy forbade him from flying volunteer search-and-rescue missions if his Bonanza's engine was past TBO.)

Dr. Ulrich analyzed five years' worth of NTSB accident data for the period 2001-2005 inclusive, examining all accidents involving small piston-powered airplanes (under 12,500 lbs. gross weight) for which the NTSB identified "engine failure" as either the probable cause or a contributing factor. From this population of accidents, Dr. Ulrich eliminated those involving air-race and agricultural-application aircraft. Then he analyzed the relationship between the frequency of engine-failure accidents and the number of hours on the engine since it was last built, rebuilt or overhauled. He did a similar analysis based on the calendar age of the engine since it was last built, rebuilt or overhauled. The following histograms show the results of his study:



If these histograms have a vaguely familiar look, it might be because they look an awful lot like the histograms generated by British scientist C.H. Waddington in 1943.

Now, we have to be careful about how we interpret Dr. Ulrich's findings. Ulrich would be the first to agree that NTSB accident data can't tell us much about the risk of engine failures beyond TBO, simply because most piston aircraft engines are voluntarily euthanized at or near TBO. So it shouldn't be surprising that we don't see very many engine failure accidents involving engines significantly past TBO, since there are so few of them flying. (The engines on my Cessna 310 are at more than 205% of TBO, but there just aren't a lot of RCM true believers like me in the piston GA community…yet.)

What Dr. Ulrich's research demonstrates unequivocally is striking and disturbing frequency of "infant-mortality" engine-failure accidents during the first few years and first few hundred hours after an engine is built, rebuilt or overhauled. Ulrich's findings makes it indisputably clear that **by far the most likely time for you to fall out of the sky due to a catastrophic engine failure is when the engine is young, not when it's old.**

(The next most likely time for you to fall out of the sky is shortly after invasive engine maintenance in the field, particularly cylinder replacement, but that's a subject for a future blog post…stay tuned!)

So…Is there a good reason to overhaul your engine at TBO?

It doesn't take a rocket scientist (or a Ph.D. in mechanical engineering) to figure out what all this means. **If your engine reaches TBO and still gives every indication of being healthy** (good performance, not making metal, healthy-looking oil analysis and borescope results, etc.), **overhauling it will clearly degrade safety, not improve it. That's simply because it will convert your low-risk old engine into a high-risk young engine.** I don't know about you, but that certainly strikes me as a remarkably dumb thing to do.

So why is overhauling on-condition such a tough sell to our mechanics and the engine manufacturers? The counter-argument goes something like this: "Since we have so little data about the reliability of past-TBO engines (because most engines are arbitrarily euthanized at TBO), how can we be sure that it's safe to operate them beyond TBO?" RCM researchers refer to this as "the Resnikoff Conundrum" (after mathematician H.L. Resnikoff).

To me, it looks an awful lot like the same circular argument that was used for decades to justify arbitrarily euthanizing airline pilots at age 60, despite the fact that aeromedical experts were unanimous that this policy made no sense whatsoever. Think about it…

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Mike Busch is arguably the best-known A&P/IA in general aviation, honored by the FAA in 2008 as National Aviation Maintenance Technician of the Year. Mike is a 7,500-plus hour pilot and CFI, an aircraft owner for 45 years, a prolific aviation author, co-founder of AVweb, and presently heads a team of world-class GA maintenance experts at Savvy Aviator

AIRPLANE PICTURE(s) OF THE MONTH (#19)

(Holding at 19)

Send in those pictures

A beautiful airplane hangared at the Longmont airport.

Dan Murray's TravelAire

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The following article regarding VFR flight following is submitted by your Newsletter Editor and will be referenced in detail during a the upcoming August Chapter meeting.

VFR Flight Following

Several items for your consideration, when dealing with Air Traffic Controllers during Radar Flight Following. Flight Following is an advisory service provided by controllers working in Radar Approach Controls (TRACONS) and Air Route Traffic Control Centers (ARTCC) to point out airborne traffic and other safety issues.

- In the control room, controllers have both headsets and overhead speakers. This allows the controller to sometimes hear transmissions that come in over the speaker, if they are on the landline coordinating with other controllers. When you call, give the controller several seconds to respond, as they may have heard your call, but have yet to get to it.
- Many times, the radar sectors (scopes) are being run by one person, due to manageable workload, though there is room for as many as four to work at one time. This may also be a factor in how soon the controller responds to your request.
- Be advised that ***terminating flight following*** with a radar facility (center or approach) does not cancel your ***VFR flight plan***. VFR flight plans are completely separate from 'flight following' and are administered by the FSS (Flight Service Station) system, not through center or approach. Please do cancel your VFR flight plan through FSS.
- Regarding VFR flight plans, FSS is the place to file one, whether airborne or on the ground. The radar facilities simply don't usually have the time to take all of the info by radio. They will enter an abbreviated plan for you, which only takes a few seconds and is not the same as a bona fide VFR flight plan.
- VFR flight following is provided by the controller on a workload permitting basis. It is up to the controller to determine if higher priority duties allow him/her to provide this service.
- The controller may not sound busy, but there may are many tasks that may be in progress that aren't apparent to the pilot on frequency. Conversely, the controller may sound busy, but may still have time to provide flight following. Each controller has their own saturation threshold and is given reasonable latitude to determine if they can take on more duties. Though VFR flight following is technically an 'additional duty', it is also mandatory for the controller to provide this service if workload allows.
- Sometimes radar sectors, when not too busy, are combined together. This results in the controller using two or more frequencies, only one of which is heard by the pilot. This is why sometimes you hear a controller transmit, but don't hear a reply. Also, in large sectors (one of Denver Center's sectors is bigger than the entire New York Center) there may be multiple transmitters on the same frequency, making it possible for the pilot to think he is getting out of range because only the responding aircraft are heard, only to

find out the controller is using a transmitter farther away to talk to another aircraft. If there is any question in the pilot's mind that the aircraft and ATC are no longer in communication, do call the controller to confirm; it's much better than to fly out of radio coverage and have to be 'found' by the controller.

- Since ATC radar has only 'line of sight' capability, VFR flight following depends on the aircraft's altitude and transponder capability. In most cases, altitude in excess of 3000' agl is high enough to be seen on radar, but many exceptions exist to that guideline, especially in mountainous terrain.
- Speaking of transponders, Denver Center does not have very good primary radar (for a "skin paint", assuming no operable transponder). Most radar approach controls have much better primary radar and can provide advisories more consistently. In most cases, no transponder means no flight following from Denver Center.
- While receiving flight following, it is ATC's responsibility to coordinate your flight through any Class D (control tower) airspace you may fly through. The controller will usually advise you of any restricted, prohibited, or other special use airspace you will be transiting, though it is **YOUR** responsibility to remain clear of any special use airspace as required by FAR's. (The controllers don't, unless they are also pilots, know anything about where and when an aircraft can legally go!) Know your airspace locations and requirements!
- A simultaneous unexplained loss of radar and radio contact will, in most cases, result in search and rescue operations being initiated by ATC. The Center is required to follow up on any unaccounted-for aircraft. Do make sure your flight following is positively canceled with the radar facility! If you aren't able to reach ATC by radio, relay through another aircraft, if necessary, or by phone.
- **DO NOT** suspend your see and avoid vigilance while on flight following. The controller will advise you of traffic that they can see and have time for, not necessarily all traffic that might be there. **See and avoid** is still the key!
- Radio phraseology for VFR flight following request—this varies with individual controllers as to what they like to hear. Best bet is to listen before transmitting, then make it short, i.e.…"Denver Center, N4CD, Scottsbluff, VFR request"…..the controller will get your type aircraft, destination, and any other desired info as time allows.
- It is not necessary, when establishing radio contact with the controller to tell them what frequency you are on. That practice has its main value when contacting FSS.
- Listen for the words "(your call sign) **Radar Contact**"; this is the point that you will begin to receive radar advisories (flight following).
- A controller is required to provide **Safety Alerts** to pilots as a first priority duty. This is given when, in the controller's judgment, your aircraft is in unsafe proximity to terrain or another aircraft. When would a controller believe a VFR aircraft is in an unsafe condition? You'll find the answer to this question interesting.
- Finally, controllers are just plain people. Do not feel intimidated by them; they just have a complex job to do, and sometimes come across as a bit hurried or gruff, but they are

in the business to serve you in your airspace. Each controller may interpret the rules a bit differently, but the name of the game is **AVIATION SAFETY!**

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To members, friends and aspiring authors. *Get published!* Send in Your Newsletter Items! DON'T FORGET!!! We need to get submissions from the members to include in future newsletters. I'm starting to run out of ***ideas and lies***!! Let's hear from you!! Need "Plane of the Month", trip reports, technical tips, hangar tales, "beautiful planes," and aviation slanted "fish stories".

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