

LIBERTY FIELD FLYERS

JULY 2014 NEWSLETTER

(Note: if you can't see graphics, open the PFD attachment)



EAA Chapter #1534

Officers:

President: Les Goldner
Vice Pres.: Mark Johnson
Secretary: Chris Rampoldt
Treasurer: Vic Bologna

JUNE 12TH MEETING ANNOUNCEMENT

Our meeting this month, as usual, will start at 1-PM this Saturday in our Club hanger (11C) with no-charge pizza or Burgers (Vic's choice) and soft drinks before the meeting at 12:30-PM.

At this meeting we need to finalize the July 19th Lake Pillsbury fly/camp-out and discuss other matters. We do not have a speaker at this meeting.

JUNE 14TH 2014 MEETING MINUTES

(By Chris Rampoldt)

Fourteen members attended the 1: PM meeting and our President Les Goldner brought the meeting together. He announced that the trike people were invited to attend and speak but that didn't happen, however, a pilot by the name of Andy Lim was there and not only is he a trike pilot, and aspiring to build a Mosquito light weight Helicopter, he is currently flying as a commercial pilot for Asiana Airlines. After he introduced himself, we realized he didn't have time for a lot of stories or chit chat so suffice to say I believe he wants to become a new member of our club. Our Treasurer, Victor Bologna announced our club holdings at \$4,452.71 exactly and also, the minutes of our last meeting in May were accepted.

Chuck Endecott, a past member of the Liberty Field Flyers signed up again to be a member and gave us a little of his flying history. He has owned an MX, a Challenger, and a Flight Star and had an X-Air with a BMW motorcycle engine on it. Currently he has no airplane and had agreed to drive out to Lake Pillsbury to supply our campout next week.

A discussion of old business included the flight of six club airplanes that flew to Healdsburg before the meeting. It was a great flight and everyone appeared to have a good safe time. The three points that were discussed were radio communication, (two pilots talking at the same time,)...and the need for short, clear statements, diversions around or over airspace, and also how helpful it is for pilots who have landed, to quickly clear the runway for airplanes behind them (e.g., Mark's plane with limited brakes).

Everyone was advised of the Overnight Flyout to Lake Pillsbury which has been rescheduled to July 19 which is a Saturday and is one week after our July 12 meeting. Volunteers needed.

An around the room comment time was started by Les. Les will have his Motor Glider test flying in about two months. Victor's engine is now operating like he wants it too. Wayne is still looking for an instructor for his MXL II or anyone to fly with him. Good Luck Wayne. Darren is waiting for instruments for his 701 and expects to start the engine soon for the first time. And Gordon is full of enthusiasm...in a good way.

The meeting was adjourned until the next one, July 11.

Respectfully submitted, Chris.

NOT SO HAPPY LANDING!

(Pics and info sent by Bim)

This happened near Pemberton AP in New Jersey and brings back memories.

“The pilot was on launch in his 2 place Challenger when his 503 lost full power to idle. Jorge had a passenger and it was a hot last Saturday so his climb rate was not what he would have liked. Jorge had used 2/3 of the runway when his engine gave up with less than 200 ft. of altitude and the tree line and swamp directly in front of him. To his right was Greenberg's farm and a corn field. The corn was only 3 ft. of growth so it was fortunate. He turned hard right with nose down and went for the corn. Not a bad landing considering.. they walked away and the engine started and ran when we got it back in the hangar.” Go figure. (From Bob Brasher)



The summer months have many interesting events to fly to in addition to Chris's list. Here are just two of them:

- The 3rd Annual International Wings and Wieners Fly-In at Ukiah airport, this Sunday, July 13th, from 11AM to 3 PM hosted by EAA Chapter 1027. They will provide Ball Park all-beef hot dogs, potato salad, dessert, and cold beverages, all for free.
It includes a Historic Aircraft display. Families with kids welcome; unattended children will be given a double espresso and a puppy!
- Wings Over Wing Country, at Santa Rosa is coming Sept 20-21. We have not participated in this airshow and exhibit event for a few years and may want to join in as a group this year. See www.wingsoverwinecountry.org/ for details.

WE NEED ARTICLES FOR THIS NEWSLETTER

if you don't want very short Newsletters, pls send anything of interest to Chris Rampoldt

WHAT MAKES AN ENGINE AIRWORTHY?

(A good AOPA article, July 2nd, 2014, by Mike Busch. Mark, we will test your knowledge at the meeting)

If we're going to disregard manufacturer's TBO (as I have advocated [in earlier blog posts](#)), how do we assess whether a piston aircraft engine continues to be airworthy and when it's time to do an on-condition top or major overhaul? Compression tests and oil consumption are part of the story, but a much smaller part than most owners and mechanics think.



James Robert "Bob" Moseley (1948-2011)

My late friend Bob Moseley was far too humble to call himself a guru, but he knew as much about piston aircraft engines as anyone I've ever met. That's not surprising because he overhauled Continental and Lycoming engines for four decades; there's not much about these engines that he hadn't seen, done, and learned.

From 1993 and 1998, "Mose" (as his friends called him) worked for Continental Motors as a field technical representative. He was an airframe and powerplant mechanic (A&P) with inspection authorization (IA) and a FAA-designated airworthiness representative (DAR). He was generous to a fault when it came to sharing his expertise. In that vein, he was a frequent presenter at annual IA renewal seminars.

Which Engine Is Airworthy?

During these seminars, Mose would often challenge a roomful of hundreds of A&P/IA mechanics with a hypothetical scenario that went something like this:

Four good-looking fellows, coincidentally all named Bob, are hanging out at the local Starbucks near the airport one morning, enjoying their usual cappuccinos and biscotti. Remarkably enough, all four

Bobs own identical Bonanzas, all with Continental IO-550 engines. Even more remarkable, all four engines have identical calendar times and operating hours.

While sipping their overpriced coffees, the four Bobs start comparing notes. Bob One brags that his engine only uses one quart of oil between 50-hour oil changes, and his compressions are all 75/80 or better. Bob Two says his engine uses a quart every 18 hours, and his compressions are in the low 60s. Bob Three says his engine uses a quart every 8 hours and his compressions are in the high 50s. Bob Four says his compressions are in the low 50s and he adds a quart every 4 hours.

Who has the most airworthy engine? And why?



Don't place too much emphasis on compression test readings as a measure of engine airworthiness. An engine can have low compression readings while continuing to run smoothly and reliably and make full power to TBO and beyond. Oil consumption is an even less important factor. As long as you don't run out of oil before you run out of fuel, you're fine.

This invariably provoked a vigorous discussion among the IAs. One faction typically thought that Bob One's engine was best. Another usually opined that Bobs Two and Three had the best engines, and that the ultra-low oil consumption of Bob One's engine was indicative of insufficient upper cylinder lubrication and a likely precursor to premature cylinder wear. All the IAs agreed Bob Four's was worst.

Mose took the position that with nothing more than the given information about compression readings and oil consumption, he considered all four engines equally airworthy. While many people think that ultra-low oil consumption may correlate with accelerated cylinder wear, Continental's research doesn't bear this out, and Mose knew of some engines that went to TBO with very low oil consumption all the way to the end.

While the low compressions and high oil consumption of Bob Four's engine might suggest impending cylinder problems, Mose said that in his experience engines that exhibit a drop in compression and increase in oil consumption after several hundred hours may still make TBO without cylinder replacement. "There's a Twin Bonanza that I take care of, one of whose engines lost compression within the first 300 hours after overhaul," Mose once told me. "The engine is now at 900 hours and the best cylinder measures around 48/80. But the powerplant is running smooth, making full rated power, no leaks, and showing all indications of being a happy engine. It has never had a cylinder off, and I see no reason it shouldn't make TBO."

Lesson of a Lawn Mower

To put these issues of compression and oil consumption in perspective, Mose liked to tell the story of an engine that was not from Continental or Lycoming but from Briggs & Stratton:



If this one-cylinder engine can perform well while using a quart of oil an hour, surely an aircraft engine with 50 times the displacement can, too.

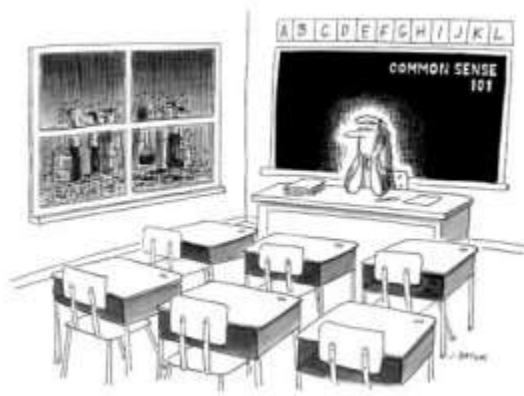
Years ago, I had a Snapper lawn mower with an 8 horsepower Briggs on it. I purchased it used, so I don't know anything about its prior history. But it ran good, and I used and abused it for about four years, mowing three acres of very hilly, rough ground every summer.

The fifth year I owned this mower, the engine started using oil. By the end of the summer, it was using about 1/2 quart in two hours of mowing. If I wasn't careful, I could run out of oil before I ran out of gas, because the sump only held about a quart when full. The engine still ran great, mowed like new, although it did smoke a little each time I started it.

The sixth year, things got progressively worse, just as you might expect. By the end of the summer, it was obvious that this engine was getting really tired. It still ran okay, would pull the hills, and would mow at the same speed if the grass wasn't too tall. But it got to the point that it was using a quart of oil every hour, and was becoming quite difficult to start. The compression during start was so low (essentially nil) that sometimes I had to spray ether into the carb to get the engine to start. It also started leaking combustion gases around the head bolts, and would blow bubbles if I sprayed soapy water on the head while it was running. In fact, the mower became somewhat useful as a fogger for controlling mosquitoes. But it still made power and would only foul its spark plug a couple of times during the season when things got really bad.

Now keep in mind that this engine was rated at just 8 horsepower and had just one cylinder with displacement roughly the size of a coffee cup, was using one quart of oil per hour, and had zilch compression. Compare that to an IO-550 with six cylinders, each with a 5.25-inch bore. Do you suppose that oil consumption of one quart per hour or compression of 40/80 would have any measurable effect on an IO-550's power output or reliability—in other words, its airworthiness? Not likely.

In fact, Continental Motors actually ran a dynamometer test on an IO-550 whose compression ring gaps had been filed oversize to intentionally reduce compression on all cylinders to 40/80, and it made full rated power.



Let's Use Common Sense

I really like Mose's commonsense approach to aircraft engines. Whether we're owners or mechanics (or both), we would do well to avoid getting preoccupied with arbitrary measurements like compression readings and oil consumption that have relatively little correlation with true airworthiness.

Instead, we should focus on the stuff that's really important: Is the engine "making metal"? Are there any cracks in the cylinder heads or crankcase? Any exhaust leaks, fuel leaks, or serious oil leaks? Most importantly, does the engine seem to be running rough or falling short of making full rated power?

If the answer to all of those questions is no, then we can be reasonably sure that our engine is airworthy and we can fly behind it with well-deserved confidence.

On-Condition Maintenance

The smart way to deal with engine maintenance—including deciding when to overhaul—is to do it "on-condition" rather than on a fixed timetable. This means that we use all available condition-monitoring tools to monitor the engine's health, and let the engine itself tell us when maintenance is required. This is how the airlines and military have been doing it for decades.



Digital borescopes and digital engine monitors have revolutionized piston aircraft engine condition monitoring.

For our piston aircraft engines, we have a marvelous multiplicity of condition-monitoring tools at our disposal. They include:

- Oil filter visual inspection
- Oil filter scanning electron microscopy (SEM)
- Spectrographic oil analysis programs (SOAP)
- Digital engine monitor data analysis
- Borescope inspection

- Differential compression test
- Visual crankcase inspection
- Visual cylinder head inspection
- Oil consumption trend analysis
- Oil pressure trend analysis

If we use all these tools on an appropriately frequent basis and understand how to interpret the results, we can be confident that we know whether the engine is healthy or not—and if not, what kind of maintenance action is necessary to restore it to health.

The moment you abandon the TBO concept and decide to make your maintenance decisions on-condition, you take on an obligation to use these tools—all of them—and pay close attention to what they're telling you. Unfortunately, many owners and mechanics don't understand how to use these tools appropriately or to interpret the results properly.

When Is It Time to Overhaul?

It takes something pretty serious before it's time to send the engine off to an engine shop for teardown—or to replace it with an exchange engine. Here's a list of the sort of findings that would prompt me to recommend that "the time has come":



Badly damaged cam lobe found during cylinder removal. "It's time!"

- An unacceptably large quantity of **visible metal in the oil filter**; unless the quantity is very large, we'll often wait until we've seen metal in the filter for several shortened oil-change intervals.
- **A crankcase crack** that exceeds acceptable limits, particularly if it's leaking oil.
- **A serious oil leak** (e.g., at the crankcase parting seam) that cannot be corrected without splitting the case.
- **An obviously unairworthy condition observed via direct visual inspection** (e.g., a bad cam lobe observed during cylinder or lifter removal).
- **A prop strike, serious overspeed, or other similar event** that clearly requires a teardown inspection in accordance with engine manufacturer's guidance.

Avoid getting preoccupied with compression readings and oil consumption that have relatively little correlation with true airworthiness. Ignore published TBO (a thoroughly discredited concept), maintain your engine on-condition, make sure you use all the available condition-monitoring tools, make sure you know how to interpret the results (or consult with someone who does), and don't overreact to a single bad oil report or a little metal in the filter.

Using this reliability-centered approach to engine maintenance, my Savvy team and I have helped hundreds of aircraft owners obtain the maximum useful life from their engines, saving them a great deal of money, downtime and hassle. And we haven't had one fall out of the sky yet.



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](#)

PICTURES OF THE MONTH

Keep the pics coming!



(Above) Bim's great shot over Firestone Ca (Where? Free lunch if you know!)
The following 4 Pics also came from Bim





The following pics come mostly from Bill Sherlock on flights to Heldsburg and Ukiah













That's all folks!