

SONERAI NEWSLETTER

OCT-NOV-DEC 2007

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JEFF LANGE'S SONERAI I AT OSHKOSH '07

Jeff's airplane is as fast as it looks! As you see it here, it is parked with the AirVenture Cup racers at this year's convention. This was Jeff's first attempt at racing, and his first long cross-country in the airplane. He averaged a little over 176 mph from Dayton, OH back to OSH. The airplane has a 2110 VW conversion with a very short Prince P-tip propeller. You can also see Jeff's new Hoerner-style wing tips which have added to the overall performance of the machine.

SONERAI'S AT OSHKOSH '07



Gary Klingma's Sonerai III

Gary had been threatening to bring the airplane to OSH for several years, and this year he made it. Gary has metallized the fuselage and installed a Continental engine.



Roger Godfrey's Sonerai III

Roger trailed the airplane to the convention last year, but flew it in this year. This airplane has a 2180 VW and a slightly longer, Riblett airfoil wing.

SONERAI NEWS

- Great Plains News: There's nothing new from Steve and Linda. Keep an eye out for their annual *Beetle Flyer* which usually has some good deals that you can use as an excuse for a Christmas present.
- First Flights: No new reports this time. Let me know when you fly for the first time, so we can all celebrate your success. (Photos are nice, too.)
- 2007 Fly-In Schedule:
There are just a few of the big ones left this year. Make plans now to go to the one nearest you, and show off your Sonerai:
 - Virginia, Petersburg, VA 10/6-7
 - SERFI, Evergreen, AL 10/12-14
 - Copperstate, Casa Grande, AZ 10/25-28
- Sonerai Wing Construction Manual: There are 18 pages of text, 85 photographs, and 12 drawings, as well as a complete materials and a tools list. If you have an older set of plans (The manual is now included with the plans, so you new plans holders already have it.) and would like your own personal copy, sent me cash, check, money order, or PayPal (at the email address on the front page) for \$25.00. Postage is included.
- Back Issues: **Sonerai Newsletter** back issues are now available in three forms. The first is a CD which contains all of the complete newsletters published by Ed Sterba from 1987 through 1995 in ".pdf" format. It costs \$40.00. The second is a CD which contains complete copies of all of the newsletters published from 1996 through 2006, also in ".pdf" format. The cost is \$50.00. If you buy both CD's, the package price is \$75.00. And finally, there are also hardcopy back issues. I have the last two issues from 1994, and all of the issues from 1995 thru 2006 (That's 50 issues!). Contact me for pricing, and I'll make you a deal. As usual, I accept cash, check, money order, or PayPal for the correct amount. Postage is included.

2180 TRANSPLANT, PART 3

At the end of my last report, the Sonerai was back at the airport, and ready for the final tweaking before the final airworthiness inspection and the second "first" flight.

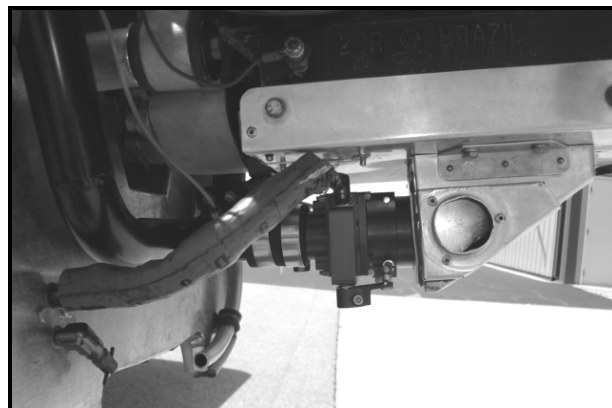
CARBURETORS

As I mentioned last time, I installed the HAPI UltraCarb from my original engine installation on my new engine. My logic for doing so was based

on the fact that it had the same throat diameter as the Ellison EFS-2 that I got with the 2180, and that I wanted to keep the fuel system as simple and straightforward as possible. I didn't want to install the electric fuel pumps necessary to provide the Ellison with stable fuel pressure. Besides, I figured I should be able to get the carb to flow the necessary fuel throughout its working range. And, the UltraCarb allowed the use of my original air box and air filter.

The initial problem with the UltraCarb was that, even though the engine started and ran great, it was running way too lean at wide-open-throttle. The carb installation instructions stated that it was necessary to have a 100°F to 150°F EGT rise when leaning from full rich to peak EGT at wide-open-throttle to provide enough fuel flow to help cool the engine. Mine was at peak EGT at the "full rich" position.

The UltraCarb is a float-bowl, slide valve unit that has the mixture control needle attached to the slide like the old POSA. It is actually a modified Lectron carb, and after searching the Internet, I found a source for richer needles, and ordered a couple from a Lectron distributor in New York state. Once they arrived, it turned out that they were too long for my carb. So, I cut one of them down, and went to testing. No change. I went back to the old needle and filed the taper so that it was thinner to flow more fuel. Still, no change. I filed it some more, and again, NO CHANGE. It was at this point I realized that this carb was just not capable of flowing any more fuel. Now what?



AeroCarb – RH side

A really good friend of mine, Ken Flaglor, also bases his current airplane, a Fisher Dakota Hawk, at our airport. Ken has built a bunch of airplanes in his 80-plus years, including a Sonerai II. His current project is a Sonex with an AeroVee 2180. When I described to him my little problem, he said "Why don't you try an AeroCarb? I just happen to

have one.” So, he loaned me his brand new 32mm AeroCarb with the proviso that I get him another one if this one worked.

Well, it worked. The AeroCarb was an easy retrofit. The installation instructions were first rate. I had to trim the intake manifold back about ¼” to have enough room to install the air box, and I had to acquire a new mixture vernier control because my original was about an inch too short. I replaced the music wire in my throttle push-pull, and made a slight modification to the air box, and it was good to go.



AeroCarb – LH side

The engine started right up, and initially ran rich. After turning the needle in a full turn, she ran fine, taking the throttle well, and having enough extra fuel flow at the top end to give good cooling. The one thing I had to change, though, was my engine shutdown procedure. Because there is no float bowl, if you shut the engine off with the mag switch (as I've done for years), it'll leak all of the fuel on the ground if you don't turn off the fuel. This is just like the old POSA, but the difference is that the AeroCarb has a fuel shutoff feature built into its mixture control function. So, now I kill the engine by pulling the mixture control all the way out. Just like back in my Cessna 150 days.

All of this was accomplished just prior to Oshkosh. That gave me the opportunity to discuss my installation with John Monnett and some of the Sonex/Waix guys. They pretty much gave me a thumbs-up. So, the airplane was ready to fly. All it needed was the paperwork.

AIRWORTHINESS INSPECTION AND BFR

I worked with Joe Norris, who is on the Information Services staff at EAA and is an AB-DAR, to get the airworthiness certificate reissued for my airplane. I've known Joe for a long time, since the days when he built a Sonerai II, and he was really helpful and accommodating. The only issue we had was timing. The airplane was ready just

before the EAA convention, and he couldn't do the inspection until after. It just meant that she wouldn't be at Oshkosh this year, and I could live with that. (Although, it was kind of weird not having an airplane on the flight line, and just being a "civilian" again.)

After the convention was over, and everyone at EAA had time to breath again, I got a call from Joe, and we arranged to meet at my hangar on Saturday morning, August 11. I told Joe if he timed it right, we could get the inspection done, and I'd buy him lunch. And that's what we did. Joe signed the airplane off, and gave me the latest version of the operating limitations (which is why I wanted a new airworthiness certificate) along with a five hour test period. We then had a great lunch at the Charcoal Grill in Burlington, and he left to inspect another airplane before he returned to OSH.

Now the airplane was ready, but I wasn't. I'd let my biennial flight review (BFR) lapse during the rebuild, so I had to make arrangements to get that done. It happened the following Saturday, with my BFR go-to guy, Bob Washburn and his Piper Cherokee 140 at Eat Troy. The BFR is always interesting because the only time I fly a Cherokee is for my BFR. I apparently did OK, because Bob signed me off. So, now I was ready. But there was only one problem. As we were flying the last downwind leg of the day, it started to rain. And it rained every day for the next week. We got 8 inches of rain, and, of course, I didn't get to fly. This drove me crazy because I don't wait very well.

Finally, it looked like the weather would break on Friday, so I hustled out to the airport after work. But, about two miles from the field, it started to rain again. Saturday would have to be the day.

FLIGHT TESTING

Saturday dawned foggy. By the time I got to the airport, the fog had lifted, but the cloud bases were still lower than pattern altitude. To kill some time, I did a thorough preflight, and waited for Keith, my hangar partner. I wanted him there just in case something went awry. He got there a short time later, and we watched the clouds slowly break up and lift a little. Finally, I couldn't wait anymore, and decided to go.

My second "first" flight turned out to be pretty much of a none-event. The engine ran great, and the temperatures and pressures were all in the green. The airplane flew the same. It was great to be flying again. The only problem was that the cloud bases weren't really high enough to fly under them comfortably at pattern altitude, so after 15 minutes

of bombing around, I decided to come back and land. I would wait for the ceiling to go up before flying again.



Ready for "First" Flight

An hour or so later, we went up again and flew for another 45 minutes. Everything continued to work just as I had hoped. The rate-of-climb seemed to be better and the cruise speed was faster than with the old engine, and the new engine ran like a Swiss watch. It looked like getting the five hours flown off would not be much of a problem, and I'd be able to make it to all of those September fly-ins. On Sunday, we flew 0.8 of an hour, leaving 3.2 hours left in the test time.

The following weekend was the three-day Labor Day weekend, and the weather was everything I could ask for. It provided the perfect opportunity to get the three-plus hours in. I used all of the test time to explore the entire speed range, and record the operating temps and pressures at various power settings. The numbers came out like this:

CHTs: 365 to 375°F

Oil Temp: 170 to 180°F

Oil Pressure: 42 psi at cruise, 10 to 15 psi at idle with the oil hot.

Cruise: 135 mph IAS at 25" MP and 3100 rpm

Stall: Just under 60 mph IAS at 880 lbs operating weight

Max Speed: 138 mph IAS at 28" MP and 3300 rpm at 2500' msl

Fuel Burn: approx 4.5 gph at cruise

At the end of the testing, I decided that, for my airplane, my prop was not a perfect match for my engine. This was obvious from the engine speed numbers at cruise and wide open. I expected to see the engine turn up a little more. 3200 to 3300 rpm at 25" MP at cruise, and 3400 to 3600 rpm wide open are the numbers I'm used to seeing.

PROPELLORS

The prop that came with the engine, and the one that was used during the five hours of flight testing, is a 54" long, 48" pitch "wide blade" Ed Sterba

prop. I had refinished and balanced it, so it runs very smoothly.

When I mentioned my performance numbers to Steve Bennett, and my thoughts about my prop, he offered to send me a test prop to try. That prop was a 52 x47 "tapered tip" Sterba. I mounted it on the airplane and flew it for an hour, repeating the speed runs performed with the other prop. The top speed increased by about 4 mph with the engine turning at about 3400 rpm, and the cruise numbers were about the same. It was not as big a change as I had hoped, but the change was in the right direction.

The next experiment was to shorten my prop by two inches. The consensus was that I would pick up 100 to 200 rpm. And that has proven to be true. Again, the cruise speed has not changed, but the cruise rpm is now at 3200 rpm, and the top speed is a bit over 140 mph IAS with the engine approaching 3400 rpm.

And that's the way the airplane is going to be configured for a while. I'm thinking that I will ask Ed to build me a 52x46 "Race" profile prop, but in the meantime, I'm just going to fly. By the way, the electric start is "wonderful".

THE \$5.00 AUTO PILOT by Ivan Martinez

The last time I was flying, I had trouble with my Icom radio. When I called the tower, my radio did not work properly. The tower could be heard, but they could barely hear me. Communications were enough to get me out of the airport. So, after the airport area was vacated, the radio problem was addressed. A corroded connection it was.

Have you tried taking your radio apart while flying your Sonerai? It's not easy. Well, it just so happened that this was my first flight with my "\$5.00 auto pilot". Well, actually it's just 2 springs and a ball chain that hold the wings level. I was able to work on the radio with both hands. Minor directional adjustments could be made with rudder, and the plane did not wonder everywhere.

I am not going to tell you how to make the wing holder. Just look at the picture, and it should be self explanatory. The spring and clips came from Home Depot, and here are the part numbers. Springs (2) in a package SQ# 168-965. Clips (2) in a package SQ# 507-938. The ball chain my wife gave me. It came from a "table lamp fixing kit" she put together. The ball chain I used is bigger than standard and I don't know where you can find one. Try a light bulb or lamp shop. The second clip is

just so the springs have tension and the chain stays put (optional.) You have to bend the clips. You have to modify both ends of the springs and drill little holes on the ball chain cuffs for the spring to go through.

Well, I said I was not going to tell you how to make it and I did. My plane also has an elevator trim tab. With trim tab and wing hold folding and unfolding charts is now a snap. Good luck.

Ivan Martinez
Sugarland, TX



Ivan's \$5.00 Autopilot

A BOOK REVIEW

Just before this year's EAA convention, it was announced that a new book about Sonerai designer, John Monnett, had just been finished, and would be available during the convention at the Sonex booth. The book, entitled **John Monnett – From Sonerai to Sonex** was written by Jim Cunningham. Now, I don't consider myself to be a fan of many people, but I guess I'd consider myself a fan of John and his work. I suppose owning and flying my Sonerai for more than 20 years would affirm that.

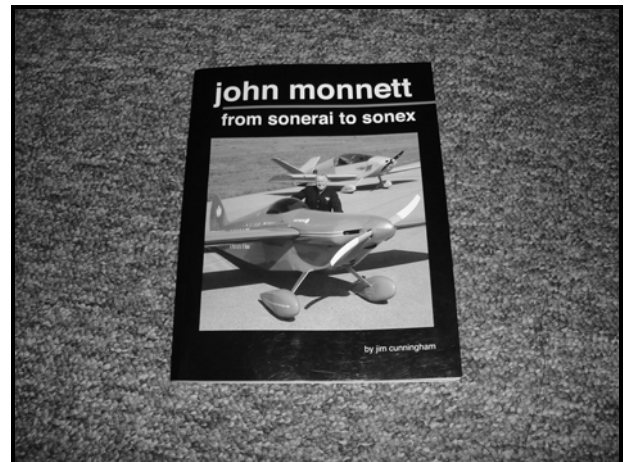
So, on one of my visits to the Sonex booth during Oshkosh week, I bought a copy and, of course, asked John to sign it, which he graciously did.

For those of you who might be interested in the history of John's involvement in aviation, and in particular the development of his many designs,

the book is fun read. It covers his aviation exploits from his first flying model named "Sonerai" thru the Sonex, Waix, and Xenos. There is great insight in his design philosophy, and how his many designs came to be.

I'd strongly recommend that every Sonerai builder/flyer get a copy and spend a couple of cold winter evenings reading and enjoying the story, along with the many photos (particularly the one of the red airplane on the bottom of page 37).

The book is available from Sonex Ltd. (www.sonexaircraft.com). Get one for Christmas.



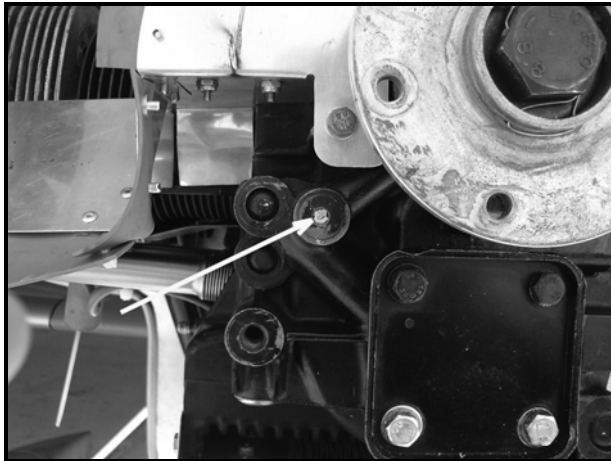
VW ENGINE SERVICE BULLETIN

Almost from the beginning of my engine exchange project, Steve Bennett was after me to comply with his Service Bulletin #1 found on the Great Plains website. Basically it involves the removal and replacement of a plug mounted in one of the oil passages on the front of the engine to guarantee maximum oil flow to the #3 and #4 crankshaft bearings. These are the two bearings immediately behind the prop hub on a front-drive engine.

Apparently, since around 1998, VW engine cases have been built with pressed-in plugs that partially block off the flow to the #4 bearing, and can also block off some of the flow to the #3 bearing, depending on the length of the plug. Since 1999, Steve has been removing this plug, and replacing it with a threaded plug which is only deep enough to plug the end of the passage without affecting the flow of oil to the bearings.

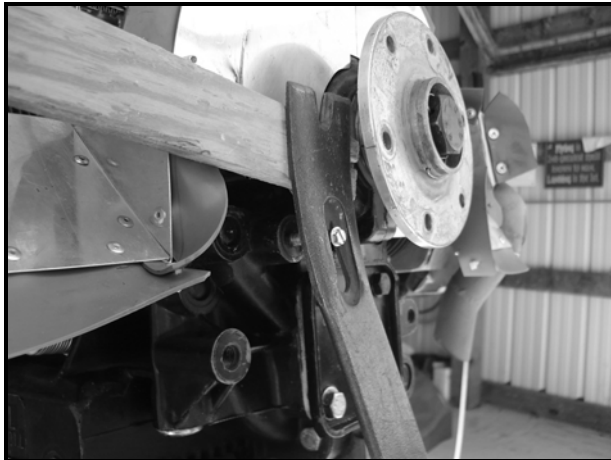
To further encourage me to make the change, Steve mailed me a 1/16 NPT tap, and a short allen plug to do the job. So, during my last prop change,

I got the job done. It probably took, at most, 15 minutes. See the following photos to see how it was done.



This is the plug in question.

I center punched this plug (it's aluminum), and drilled it with a 1/8" drill bit about 1/2" deep. Next, I threaded a standard hardware store hex-head sheet metal screw into the hole. The pry bar was hooked over the screw as shown below, and with a few taps on the back of the bar with a ball peen hammer, the plug slid right out.

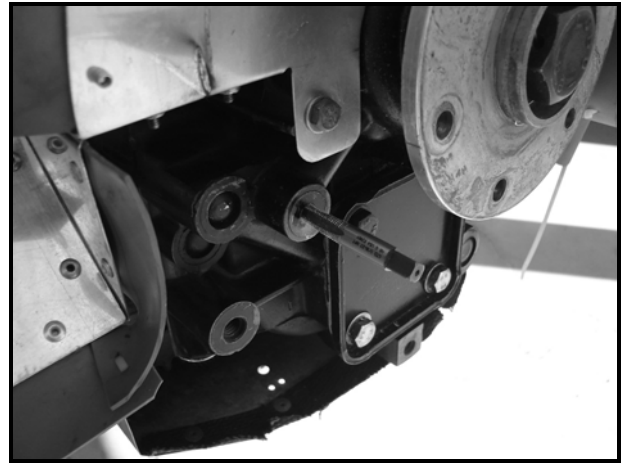


The pry bar set up.



Here's the plug.

The next step is to tap the hole. It turns out that the hole is almost the perfect size for the tap. Use a lot of grease on the tap to catch the chips, and clean the tap often. Once tapped to the correct depth, be sure to make absolutely certain the all of the chips have been removed from the hole.

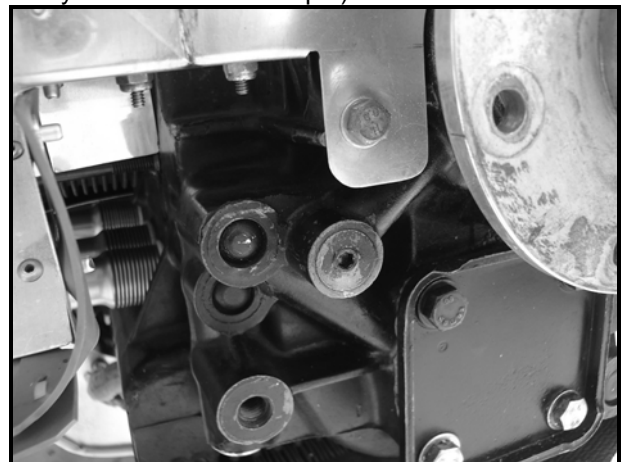


Tapping the hole.



The plug on the allen wrench.

Lastly, the plug was installed. I used a drop of red Loctite, and turned it in snug (be careful since it's being turned into an aluminum-magnesium casting, and you don't want to strip it).



The installed plug.

WANT ADS

These Ads are provided as a service to you, the subscriber, and are free of charge. I only ask to be informed when the Ad is no longer valid, and needs to be removed. Thanks.

SPECIALTY WELDING CAN
SUPPLY YOUR COMPLETELY
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Neshkoro, WI 54960, (920)293-8089 or
(920)293-8007 (Fax)

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Fisher, (863)655-0361,
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welding, and sheet metal. Numerous

awards including 1991 and 2004
Oshkosh Grand Champion Ultralight.
No job is too big or small. Need a
fuselage welded? Give Ed a try!!

WANTED: Sonerai II mid wing with
Revmaster 2100, 5/8" landing gear, 12
gal fuel tank, \$6000; Also, 1/2" landing
gear with mechanical brakes, axles,
Azusa wheels, and tires. \$150; And
Sonerai II fuel tank, \$50 Robert
Jorgenson, 435-678-3436,
robertjorgenson@yahoo.com (2/07)

FOR SALE: Sonerai IIL wings and
matching carry through box, Have spar

modification, Flown 50 hours. Right
aileron trailing edge bent in hanger
accident. \$ 500. Roger Godfrey
rvgodfrey@earthlink.net (3/07)

FOR SALE: Monnett Electro-X engine
mount with 10 amp Syncro alternator,
and magneto drive, \$100; Ellison EFS-
2 throttle body carb with 2 facet electric
fuel pumps, and misc. hoses and
fittings, \$450. Both prices include
shipping in the US and Canada
Fred Keip, 262-835-7714,
fredkeip@aol.com (4/07)



A View of N99FK's Engine Installation