



EAA[®] Technical Counselor News

ASSISTANT EDITOR:
Debra Michels

September/October/November 1990

EDITOR: Ben Owen
PRINTING: Times Printing

Bob Humbert's Pietenpol



This shows the Humbert Pietenpol instrument panel and the very meticulous work being done.



This shows Bob Humbert and his Pietenpol. He was visited by Technical Counselor Jim Stevenson of Marshall, Michigan (on right).



This shows the detail in the area of the firewall, gascolator and the box on the firewall.

BOB HUMBERT'S PIETENPOL

Every homebuilder and every homebuilt is unique in some way. Bob Humbert and his beautiful Pietenpol reinforce that statement. Bob started his Pietenpol in 1969 when he purchased the plans, but it wasn't until 1972 when he really got started. From 1972 to 1976, Bob was quite active working on the sheet metal and the fuselage, the ribs, the spars and the tip bows. During this time was when he decided his first ribs he ever built back in early 1969 were not acceptable, so he rejected them. Like most builders, Bob had a down period between 1976 to 1982, where the project remained basically dormant. However, from 1982 to 1986, Bob picked back up in earnest and completed much of the welding, including the gear and the engine mount, and purchased an engine on which he had the mags rebuilt. The engine was taken from an Er-coupe and is a C75-12 with electric start. In 1987, Bob did some of the light covering of tail feathers, but then demands of work and working on a new house, really interrupted things. Just recently, in 1990, Bob has restarted. As the project currently stands, Bob has the fuselage on its gear complete but not covered, the wings complete but not covered, the tail feathers complete and covered and with the first coat of sealing dope. While the project is already fairly old, it shows excellent workmanship throughout, with close fitting joints, good glue lines, and careful attention to detail.



For Bob, the hardest thing has been the long term "psyching up" for the project. As Bob says, "I had hair when I started this project". Bob has some of the pictures of his children holding up the finished side crutches of the fuselage when they were very young, now those children are 24 and 28. "My, how time goes on!" Bob said the easiest thing was the wood working, because it was such a pleasure to see the pieces come together and form up to make the fuselage and wings. The other easy part for Bob was the welding. He found a great guy who was very good about performing welding and very friendly to talk to and work with on the project.



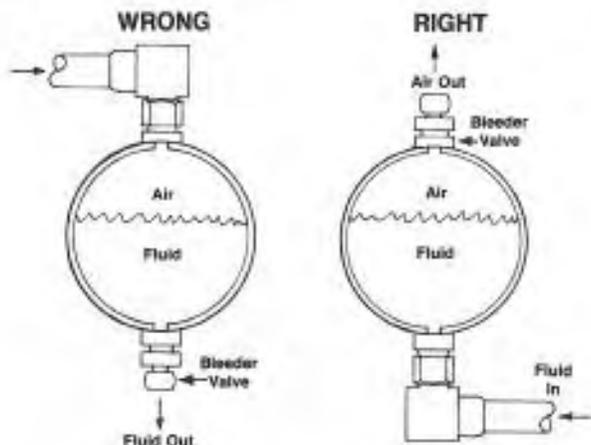
Recognizing it has been now 21 years since Bob purchased the plans, I would think that when his Pietyenpol is completed, Bob will have one of the longest term single builder projects I know of. Perhaps, one of the longest in recent history. I'd like to hear some input on the longest project from other members.

Keep'em flying!
Jim Stephenson

Notices

NEIL SIDERS COMMENTS ON THE ARTICLE "WHEELS & BRAKING" MARCH '89, CRAFTSMAN'S CORNER, PAGE 42

In looking over the article, I discovered a point that you may have overlooked. The drawing for the gravity method of brake bleeding is incorrect. When bleeding from the top down, it becomes necessary in some cases to remove the wheel cylinder and hold it with the bleeder valve at the top. If the bleeder valve is on the bottom, air is trapped in the wheel cylinder and all you do is pump fluid through the system. Just remember to put some sort of spacer between the pads to make up for the rotor.



'91 EAA SCHOLARSHIP PROGRAM

The goal of the EAA Aviation Scholarship Program is to encourage, recognize and support excellence in students pursuing knowledge of the technologies and skills of aviation. Annual scholarships provide assistance to outstanding individuals demonstrating a financial need to accomplish their aviation goals. Applicants should be well-rounded individuals involved in school and community activities as well as aviation. The academic record of applicants should verify their ability to successfully complete the educational activity for which the scholarship is requested.

For information and application materials for these scholarships ranging from \$200 to programs leading to an Engineering Degree, contact the EAA Education Office at EAA Headquarters at (414)426-4888.

CORRECTION TO JUNE/JULY/AUGUST 1990 ISSUE OF THE TECHNICAL COUNSELOR NEWSLETTER UNDER "OPERATIONS"

Please be advised that the Jim Batterman accident was due to structural failure of a Decathlon wing fitting, not a Citabria. I regret any confusion this may have caused. The only failures known so far on this particular fitting had been to Decathlons, there have been none to Citabrias. There seems to be something unique about the Decathlons which is causing the failures. Also, we should mention that the bolt that passes through the strut fitting, the spar and into the compression members on American Champion's new Decathlon strut fitting kit may be too short and AN6H-20A is called out and it is believed that an AN6H-22A is required.

Dear Tom,

As an aeronautical engineer with 40 years experience, I feel confident to comment on the referenced suggestion, which was to replace the reinforcing welded tube through another load carrying tube by putting a plug inside and eliminate the welding.

My feeling after restoring many antique planes and designing and building several of my own, (Red Wing Black Bird Biplane, June & July Issues, 1977), is that the suggestion is dangerous and should be retracted. The old method of welding a tube inside a hole through a load carrying beam was done for a purpose overlooked by whoever proposed this suggestion; fatigue at a stress concentration point.

The purpose of a wire or other brace attaching to the tube is to stabilize that point from moving. But the tube on the outboard side of the brace becomes a cantilevered beam with maximum bending moments applied at that point. A hole drilled at the top and bottom of the tube removes the critical material needed to resist the bending. True, a plug inside can take crushing loads and does not weaken the original steel by welding, but the tube can crack off at the holes. A welded transverse tube can reinforce the edges of the hole to prevent a fatigue crack.

I suggest you get a second opinion, and a third, etc., and then publish a retraction before someone applies this suggestion to a fatal crash. In many professional associations, all technical articles are reviewed by experts in the field before being accepted for publication. Do we?

Sincerely,
Stan Wallis
170 Clubview Drive
Ypsilanti, MI 48197

EDITOR'S NOTE: We would be interested in hearing any comments from any Technical Counselors or reader of the newsletter regarding the suggestion in Craftsman's Corner. As always, these suggestions are merely just suggestions. Some of the positive aspects of changing from a welded in bushing to a slide in and glued in place insert are that you eliminate the welding which normally reduces the strength of 4130N from 90-110,000 psi to approximately 70,000 psi: Reduce the size of the hole drilled in the tube and you eliminate drag. Providing washers for use that were shaped to the size of the tube under the bolt on that section and since the bolts hold primarily by friction (for example, propeller bolts) it would seem that the design suggestion made by a member was a possible solution — as yet untried. Let us hear from you! This is a common method on aluminum tube U.L. aircraft.

TIGHTENING DRILL SHANKS - REVISITED

I have a note from Technical Counselor, Joe W. Hillebrand of Sun Lakes, Arizona who is questioning the drill shank tightening article in the "Technical Tip" section of the last newsletter. He comments that "if you get any benefit from tightening the three holes, it is psychological. You will get the same benefit from tightening one hole three times. If you disassemble a chuck, this will be self-evident".

EDITOR'S NOTE — So far the discussion on this is Drill Salesman, Arthur Medwedeff of Livonia, Michigan and myself agreeing with tightening all three holes and Gordy White and Joe Hillebrand saying it is unnecessary. It still works for me!

Joe McKinstry's Kitfox



Kitfox by builder Joe McKinstry of Belleville, Illinois. The aircraft is complete with the exception of the counter balance weight on the flaperons. Photo by Technical Counselor Wil Krebel of Pierron.



McKinstry's Kitfox uncovered showing the engine and the 3 blade propeller.

Dick Logston's Starduster I



Starduster I, N35RL — Almost ready to go! The builder is Dick Logston of Aberdeen, Washington. Photo by Technical Counselor, Bob Hansen of Aberdeen.

Safety

GLASAIR ACCIDENT DUE TO BUILDER ERROR

There was an accident to a Glasair in April of 1986. The report we have from an independent engineer observer (not FAA) was that the abrupt aileron input at high speed, (down load) caused the failure of the wing's leading edge bond joint of the right wing from wing torsion aileron loads. Witnesses on the ground heard a "pop" sound.

As the wing opened up, the aircraft rotated to the right, flat to impact. The leading edge butt joint was open from tip to root on the right wing tip. Examination of the right wing showed five fiberglass laminations of the top shell and five fiberglass laminations of the bottom shell. The shells are butted together at the center of the leading edge. The top and bottom shells are joined together at the leading edge by strips of fiberglass applied to the leading edge on the outside. The fiberglass was not cleaned to obtain a bond and the fiberglass strips were only 1-3/4" wide providing only 3/4" bond area for the top and bottom. There were only three laminations, but the material did not fail. The bond failed from an inadequate bond area.

The leading edge bond joint should have been covered with five laminations. For example, their width should have been 1-3/4", 2-1/2", 3", 4", and 5". These five laminations would have provided a minimum of a 2-1/2" bond on each section. This would have given the leading edge the same integrity as the top and bottom shells.

The small bond area is considered responsible for the failure of wing leading edge torsion.

CORBEN BABY ACE HOMEBUILT ACCIDENT

The airline transport rated pilot survived the crash with no injury. The aircraft was substantially damaged.

On the flight in question, it was determined that about 4 gallons of fuel remained in the 12 gallon fuel tank at the time of takeoff. On climb, the aircraft was so nose high that the gravity fuel system was unable to support a normal engine operation. As a result the engine lost power with resultant loss of altitude causing the aircraft to strike a tall tree and hang inverted about 10 feet off the terrain. The engine in normal flight attitude functioned normally. The engine test run was normal.

RECOMMENDATION: It is recommended that with less than one half tank of fuel, nose high attitudes be avoided; that the EAA be informed of the circumstances involved in this accident for possible dissemination to owners for this type aircraft with a similar fuel system; and that a placard be installed in the cockpit of all Corben Baby Ace aircraft that would warn against excessive nose high pitch with less than half a tank of fuel remaining.

ACCIDENT HISTORY

LONG-EZ MISHAP

A Long-EZ had a mishap when it ran out of fuel. It was fueled in the nose wheel retracted or "kneeling" position and the tanks were not completely filled.

RECOMMENDATION: Check the fuel quantity before flight with the aircraft in a level position.

POLLIWAGEN

There was an accident to a Polliwagen in June of 1990. The aircraft was involved in an incident on its initial flight. The pilot stated while performing a steep turnout after an aborted landing, he experienced an engine malfunction. He landed the aircraft in a field adjacent to the runway, which resulted in the aircraft sustaining minor damage.

During the investigation of the incident, it was determined the aircraft had approximately 10 gallons of fuel on board. Further investigation revealed the builder had installed a three position fuel selector. Given the circumstances, minimum fuel, a steep turn and the three position fuel selector, it appears that the malfunction was due to fuel starvation.

The inspector recommended that either a two position or four position fuel selector be installed to ensure constant supply of fuel through all maneuvers for a safer operation.

His reasoning was that a three position selector has left, right and both. A two or four position selector on the "both" position would be the logical way to position the selector when on minimum fuel. As there was 10 gallons, five on each side, and a pilot not intending to fly, he felt that this would be safer. The aircraft also had a bogus hardware store bolt in the rudder which sheared and the rudder fell back causing partial loss of rudder control. This was a fast taxi practice and the pilot stated he actually did not intend to fly.

SPECIAL NOTICE ON CONTAMINATED GREASE

This report on contaminated grease was received from the U.S. Army National Guard. During routine spectrometric analysis of swashplate and support assembly grease samples on AH-1S (Bell Model 209) helicopters, there was a sudden rash of components that were showing excessive cutting wear, rubbing wear, and corrosion.

The samples of the bulk grease submitted for analysis indicated that the grease itself was contaminated. The two lot numbers they had on hand were both found to be contaminated according to the submitter. These lot numbers were 2810078 and 1471039. This was from a shipment of Aeroshell 22 grease.

They contacted the submitter of this report to assure themselves concerning this problem. The submitter said the grease samples sent in were from containers just opened and there was no way the grease could be contaminated while in their custody. Prior to this occurrence, the grease had been very satisfactory.

SAFETY NOTE

One of our Technical Counselors called and suggested that fuel vents be vented elsewhere other than the areas of the brakes at the landing gear due to possibility that hot brakes may ignite vapors coming from the fuel vent.

The second suggestion from the same counselor is that C-clamps with rubber mounts be taken off from time to time due to corrosion and sanded lightly and reprimed so that the rust does not deteriorate the strength of the engine mount.

MAGNETO SWITCH SUGGESTION

Technical Counselor, Gene Darst reports his new KR-1 has a new prop from Sterba a 52-46, has been flown up to 195 miles per hour indicated air speed. It flies hands off. On landing it was below 45 indicated, he must get to altitude and stall, etc. yet, it is a dream to fly. The mag switch is a miniature toggle switch. Gene accidentally hit it off at 1800 feet — got awful quiet — checked fuel throttle — then realized it was the mag. Gene flipped it on and away he went. A switch guard is on it now and he made it out of .025 20-24-T3 aluminum built out of two pieces. He suggests everyone make one so that they do not have a problem in the air. He was about to pick a spot to land — deciding — gear up or down when he spotted the problem.

PAINTS & PERSONAL HAZARDS

Our Technical Counselor, Richard Finch of Goleta, California has been working quite hard on his Buick V-6 automotive conversion for aircraft use. However, he has been sidelined most recently with a problem and it was diagnosed as "chemical bronchitis" from breathing two-part epoxy paint while spray painting airplane parts with P.P.&G. "Deltron" paint. He wore a standard paint mask, but a painter should wear a maximum filtration mask, or even an oxygen mask when spraying the new 50/50 epoxy paints. He recently learned of a doctor in Florida who died of lung congestion about 30 days after spraying his homebuilt aircraft with epoxy paint. For about six weeks Dick felt like he was in serious trouble because he could hardly breathe without coughing and his normal energy level was the bottom 2% of normal. He feels that he has now recovered as of July 1st and is back at work on the airplane. He will miss all of this year's air shows since the airplane will not be in flying condition in time to make Oshkosh 1990.

LETTER FROM ED YUNG OF LAPORTE, TEXAS, STATES SOME OPERATIONAL COMMENTS (Letter Edited For Brevity)

In '52 on a bitterly, cold and windy day in Missouri, I used the still commonly taught (but erroneous) carb heat application technique. It melted ice crystals which froze in my venturi. There was no additional carb heat to remove the ice, of course, so I crash landed with minor damage. Since then I use a carb air temp gauge, if possible, and never indiscriminately use carb heat, even when flying without the temp gauge.

Keeping the 172 in the desert and flying out of fields to 9,000 ft. elev. there and in Mexico, we experienced trim mechanism and fuel selector corrosion twice, and believe it or not, never in Houston (22 years).

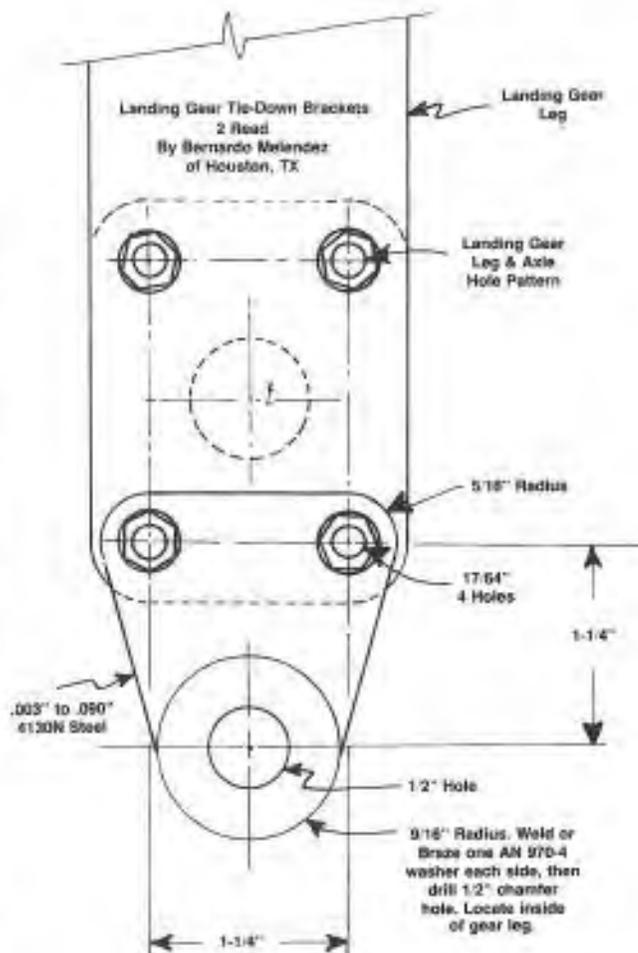
We recently discovered in flight on a winter day that our glove box with its "flare set" was almost hot enough to burn our hands. A heater hose had rotted at just the wrong place and vented air directly at it.

Two years ago after a very thorough inspection by a top notch mechanic who had spotted some horizontal stabilizer corrosion, I spotted an infinitesimal swelling of the spar cap directly behind the windshield and over the main spar cap through. Three months, 300 man hours by my wife and I and \$8,000 worth of parts and labor by two mechanics, later we put the 172 back in the air.

LANDING GEAR TIE DOWN BRACKET

Suggestion from the Soneral Newsletter submitted by Gordon Timmins. Our very first newsletter back in April 1982, included a building tip describing a wing tip tie down bracket installed outboard of STA 107. This necessitated that the spar be left an inch or so longer, to allow the bracket to be attached. If you cut the spar off at STA 107, as per the plans, you couldn't install this bracket.

Here is a drawing of another bracket that can be installed regardless of the spar length.



A CASE FOR THE VISIBLE VOLTMETER

By Al Ross (edited for brevity). While reinstalling the starter on my KR-2, I inadvertently allowed the battery cable to contact the exhaust pipe. The insulation on the battery cable prevented an immediate short, but after two or three minutes of running the engine, just enough time to taxi about halfway to the takeoff end of the runway, the heated exhaust pipe melted the insulation and allowed the cable to contact the pipe, connecting the battery to ground through perhaps 15 inches of battery cable. My first indication of a problem was the voltmeter reading very close to zero, and the ammeter indicating about 20 amps (max. for my alternator). The only logical reasons for zero voltage were a dead short or a bad meter circuit, so I got the plane off the runway ASAP and quickly(!) removed the cowl and disconnected the positive cable from the battery. (I always carry tools since an incident with my Revmaster engine caused a forced landing!) A boiling battery coupled with a warm cable disclosed the problem, and I rerouted the cable away from the exhaust pipe.

Technical Tips

TIP FROM LEE TAYLOR ROSEVILLE, CALIFORNIA

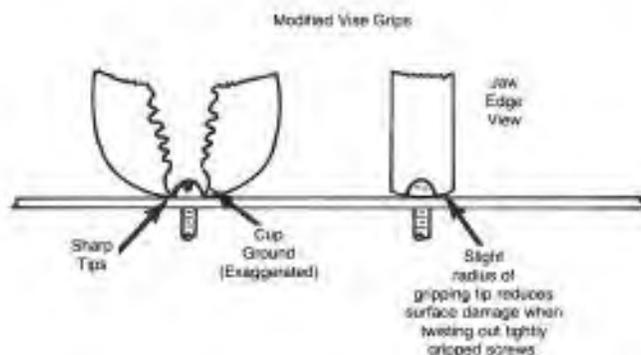
Sirs:

It seems like one of the more frustrating tasks of aircraft restoration/maintenance is removing a dome-head screw that is worn out or frozen.

I have for many years been using a specially-ground pair of Vise Grip pliers for this job, and have been quite often amazed by the number of highly-experienced mechanics that aren't aware of the technique. Thought maybe you might like to publicize the method.

Simply, a very small cup is ground in the tip of the jaws of the Vise-Grips, which allows the jaws to easily and tightly grip the screw to provide a superior grab in removing the screw. By grinding the jaw tips so they have a sharp edge and slight concave bevel, they will actually "bite into" the edge of the screw, and under its edge.

Cautions are to make the grinding just barely enough to give the jaw edge a wedging action that will bite into the screw, rather than sliding off it the way a flat surface jaw will do, and to radius the outside edge of the sharp jaw slightly so that material damage does not occur as the screw is loosened. If the cup grind is too radical, then the jaws will dig deeply under the screw, with resultant sheet metal surface damage. Likewise, if the tip is not radius-ground, then the edges of the jaws will tend to severely scratch the surface metal as the screw is twisted out.



We want to just barely grip the screw tightly, without the jaw tips wedging themselves under the screw edge and damaging the sheet metal surface beneath the screw as it is loosened.

Properly ground and used, these pliers are capable of applying enough torque to a frozen screw to break it off, without damaging the underlying surface. Improperly ground and used, like any powerful tool, they are capable of causing severe surface sheet metal damage. Use them and all tools skillfully and carefully.

EDITOR'S NOTE: Try some valve grinding compound on the screwdriver slot(s) first — helps the screwdriver bite and hold.

MECHANICAL TIPS FROM THE AERONCA AVIATION CLUB NEWSLETTER, ISSUE NO. 23

The Vintage Aircraft Census has been produced by Tom Harnish, Flightline, P.O. Box 19047, Baltimore, MD 21284, telephone number 800-842-1716. Over 15,000 entries provide lists by N-number, date built, model, owner & address, etc. Contact Tom for latest prices and details.

The Smithsonian has over 40,000 technical manuals! Send a letter to: National Air & Space Museum, Archival Support Center (Bldg.12), 3904 Old Silver Hill Road, Suitland, MD 20746-3190.

The Soundcoat Company, 1 MD Burt Drive, Deer Park, NY 11729, telephone number 516-242-2200, makes a wide variety of sound absorption barrier and damper materials, including lightweight, fire resistant types. Write or call for catalog.

Lauren Manufacturing, 2228 Reiser Avenue SE, New Philadelphia, OH 44663, telephone number 216-339-3373 or 1-800-882-6907 or 1-800-882-6908, makes extruded seals, gaskets and weatherstrip in many materials and shapes. Many are available with a self adhesive strip. Useful for door, window and fairing seals, especially on rapid Aeroncas.

Airworthiness Directives (AD's) are sent free to the registered owners of aircraft, but the "owner" may be your bank. If your airplane is financed you may not be getting information you need. Talk to the financing agency about forwarding such notices. If you have other questions about AD's which might pertain to your airplane, contact: The FAA Aeronautical Center, AVN-113, P.O. Box 26460, Oklahoma City, OK 73125, telephone number (405)6821-4374.

Your radio may sound better with cheaper headphones, according to a clipping from the Canadian General Aviation News sent by Jack Boschulte of Sundridge, Ontario, Canada. The author tells of getting better performance from a \$20 "cheapie" stereo headset with a \$20 adapter than he did from a \$300 set of David Clark's. The manufacturer makes all sorts of adapters to provide the proper impedance match and isolation to permit home stereo equipment to be used with aircraft radios. For details, contact: Gregoire and Associates, 1400 Carpentier Street, Suite 341, San Leandro, CA 94577, telephone 1-800-634-0094 or 415-483-8077.

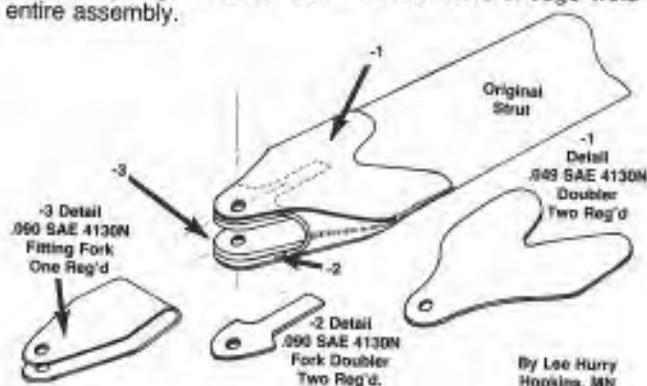
AIR FILTER

The induction air filter is a very important element in the life of an aircraft engine. It is more important than ever that the operator keep dirt and abrasives out of his engine if he is to get the expected engine and trouble-free hours out of it. Good maintenance and tight fit of the air filter is a very important factor in preserving the life of a plane's engine.

Currently there are over 700 Technical Counselors. If you know of someone who is interested in becoming one, please contact EAA.

ALTERNATE FOR PIPER STRUT FORK BOLTS

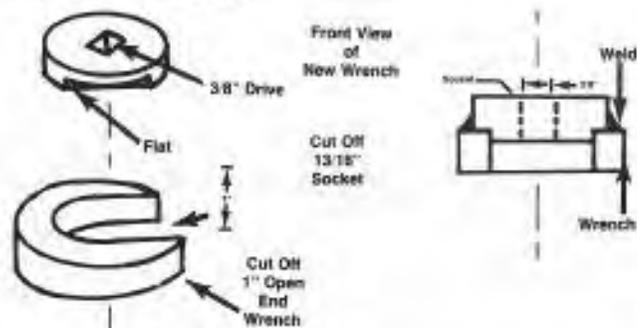
Remove original barrel & clevis end. slot strut in plane of major diameter to receive -3 fork. Weld -2 fork doubler to strut along original barrel slot. Fit -1 doublers & edge weld entire assembly.



OIL SCREENS

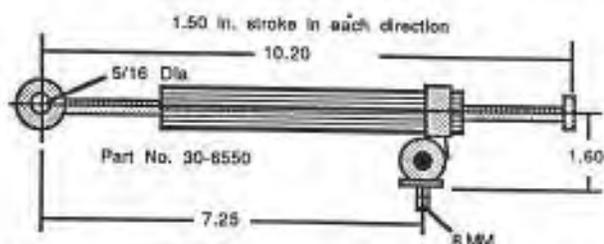
Quoted from the Cassutt Communicator Newsletter of April 1990.

Ever since I began changing oil in C85-0200 powered Casstuts, I've wished for a better oil screen wrench. I always used a 1" open end Craftsman and wrestled with the various angles and wrench turnovers to get the screen out. It seemed that I was forever maneuvering to avoid the motor mounts, oil tank (I have used an aluminum tank mounted to the firewall), or instrumentation (CHT leads, tach cable, etc.). It finally occurred to me that if I could find a 1", 4-sided socket with a 3/8" drive that this task would be much easier. Since none were commercially available (to my knowledge) I cannibalized a socket and wrench and welded them together. I cut off the cheapest 3/8" drive socket I could find so that only the drive portion remained, ground 2 flats 1" apart halfway up this piece, then welded this stub drive centered on the end of the 1" wrench (and of course cut off the wrench handle). This worked great!



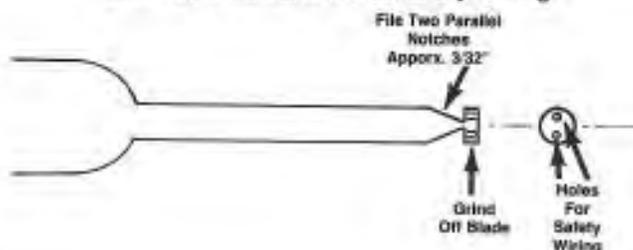
STEERING OIL DAMPER RECOMMENDATION

From Martin Hollmann's newsletter, Aircraft Designs, Aug./Sept. 1990. Found a nose wheel shimmy damper for his NOVA amateur built, available at \$45 from K & L Supply Company in Santa Clara, California. Telephone number 1-800-727-6767. Below are the damper dimensions in inches.



Steering Oil Damper Part No. 30-6550.

Modified Screwdriver For Safety Wiring



WHAT TO SEND TO THE FAA TO ASK THEM FOR AN INSPECTION

21.193 Experimental Certificates: General.

An applicant for an experimental certificate must submit the following information:

- (a) A statement, in a form and manner prescribed by the Administrator setting forth the purpose for which the aircraft is to be used.
- (b) Enough data (such as photographs) to identify the aircraft.
- (c) Upon inspection of the aircraft, any pertinent information found necessary by the Administrator to safeguard the general public.
- (d) In the case of an aircraft to be used for experimental purposes.
 - (1) The purpose of the experiment;
 - (2) The estimated time or number of flights required for the experiment;
 - (3) The areas over which the experiment will be conducted; and
 - (4) Except for aircraft converted from a previously certificated type without appreciable change in the external configuration, three-view drawings or three-view dimensioned photographs of the aircraft.

When Will It Fly?

Technical Counselor Joe Hillebrand reports on the inevitable question, "When are you going to fly it?" During the course of the many years that it normally takes to build a homebuilt aircraft, you may be subjected to many visitors and social inquiry regarding your airplane project. Most will be welcome, some will be harassing. At a cocktail party one "lady" badgered me incessantly for the date of the first flight which I told her several times I did not know. When she wouldn't be put off I finally told her the fourth of July. She said "The next fourth of July?". I told her "No, I didn't say that". Then she really went into orbit. In self defense to that question, which seemed to be the sole preoccupation of most visitors (including some EAAers who should know better), I made up a sign for my garage and a small 3 x 5 card to carry in my pocket to social gatherings which is reproduced below. You may find it handy.

I'm not going to fly it until it's finished. Since I'm not on a schedule, I don't know when it will be finished. If I decide to fly it before it's finished, you will be the first to know.

New Products

GLASAIR FLAPS ARTICLE:

NEW PRODUCT! SLOTTED FLAPS AVAILABLE FOR ALL GLASAIR MODELS!

Stoddard-Hamilton Aircraft, Inc., has once again expanded the flight envelope for their popular Glasair aircraft; this time on the low end.

Under development for the past year, a very simple but effective slotted flap design is now available for all Glasair models including a retrofit kit for all 1,125 previously delivered Glasairs.

To meet orders, Stoddard-Hamilton has geared the production rate to eight slotted flap kits per week. "Recognizing the safety value of a 6 mph decrease in landing and stall speeds is the primary reason for the popularity of this option", reports company president, Ted Setzer. "Together with the wing tip extensions, a Glasair owner can realize a net reduction of 13 mph in stall speed yet see a 7 mph increase in cruise speed at 8,000 feet. The best of both worlds!"

As a tangible way to measure the effectiveness of the slotted flaps alone, factory pilots demonstrated a minimum landing distance of only 327 feet during flight tests with a Glasair RG model.

Jerry Gruber of Elkhart, IN, the first Glasair III owner to install the slotted flaps, commented: "I never thought that slotted flaps were any different than regular flaps. I soon learned that they can make a fast airplane, like the Glasair III, very docile and slow in the pattern, and especially so during landing. It was the best investment in time and money that I could have done to improve an already great airplane."

For more information regarding the Glasair products contact: Stoddard-Hamilton Aircraft, Inc., 18701-58th Ave. N.E., Arlington, WA 98223, telephone (206)435-8533, fax (206)435-9525.



NEW PRODUCT AVAILABLE

There is an item called Clear Coat 900 which is a clear, protective finish that is non-yellowing. It is a solvent based acrylic modified polyester coating that has been used on some show aircraft. For further details you can contact: XIM Products, Inc., 1169 Bassett Road, Westlake, OH 44145, telephone (216) 871-4737.



Pratt-Martin RV-4.

Technical Counselor, Jack Blackwell took this nice picture of builder Robert Pratt. His partner is Ted Martin from St. Louis, Missouri. Both men are experienced aircraft company employees (retired) and expect to have the aircraft completed very shortly. The photo below shows some detail in the way of the Firewall.



AIRCRAFT INSTRUMENT VENTURI — NEW SYSTEM

This report from Raymond Ives, President of A & J Products, Inc., 31 Charlotte Street, Plattsburgh, NY 12901. The system is the use of two (old time) methods of deriving vacuum and updated to use with the present day single engine airplane. It is composed of an intake manifold air adapter and a modified AN-5807 venturi equipped with an electric heating device to eliminate the possibility of venturi icing. He has a STC for all Piper PA-28 and is working on STC's for the Cessna 172 through 210 models.

Shop Tips

Neil Sidders Shop



Neil Sidders — a tire makes a great bending tool.



Photo 5 shows the secondary or final form die located under Neil's right elbow. This is commonly called a knee. The tubes are compared on a suitable die table then tweaked until they match. That's Bruce Owens with the beard.



Photo 6 shows the restyled tail section which is more in line with the shape of the vertical fin and rudder. Neil feels home-building gives a person the opportunity to display his or her styling ideas in a way no other hobby or sport can. He loves it!

Bob Calais Shop



A floor mounted drill press is not a necessity but is very convenient if you decide to drill the spars after putting the wing together. If you have a table mounted model, don't rush out and buy a floor model but it does work well on the wings.



An almost essential item for safety is a hold down for the drill table to keep the parts from moving around, particularly when working with metal.

Engines

ENGINE REBUILDING TIPS BY RICHARD VON BERG

I agree with everything reported by Jack Hakes, except:

My local GM motor expert, Fred, who has 16 patents to his credit, states that initial RPM should be at least 1200 to 1400 RPM. This is to reduce the load on the crankshaft, rods and lifters. The oil film can hold better with higher velocity, also.

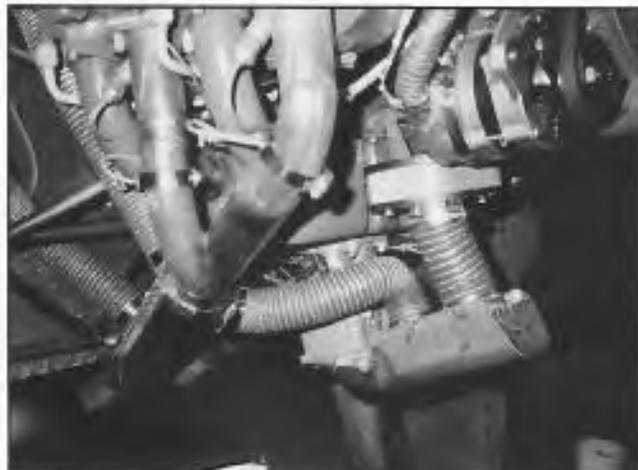
After the ground runs when flying, use the high RPMs as much as possible, 2500 RPMs would be a minimum, depending on the engine. Temperature, of course, should be watched. The higher RPMs insure not wearing ring travel short, which could cause ring breakage later.

Some engineers disagree on using straight mineral oil which is a poor lubricant. If the cylinders were sandblasted, the oil should be drained after 1 hour, and again at 5 hours, and again at 10 hours. At GMC, Saginaw Div. they never sandblast (or beadblast) a steering pump. They never had a failure on the ones not blasted, but many failures on the ones blasted.

When assembling rings, I lube with Marvel Mystery Oil prior to assembly and also use this on valve stems. For breaking, I prefer a good detergent oil as it is a better lubricant, and it will not gum up rings, and holds dirt in suspension. No matter how clean you think the engine was, honing debris, is likely still somewhere. Short oil changes are very important.

Jerry Malone's RV-6

This shows the box, hose attach and air filter. You can use either direct ram air, filtered air or carburetor heat. Also note the nice heat muff in the attached cabin heat tubes. You can also see the probes he made for the EGT. Also note the cooling duct to the alternator.



Shows the front view of the air box and control cables for flaps controlling the air flow. The filter is from a John Deere garden tractor.



Shows the ducting for cabin air.



Shows the cooling ducts going to the gascolator and fuel pump. He is well aware of the vapor lock I suffered and is trying to avoid it. He has 180 hp Lycoming with a constant speed propeller, yet to be installed is the duct safety pipe to the oil cooler. Photographs by Alex Sloan, Technical Counselor of Florence, Alabama.

FUEL INJECTION CHARACTERISTICS

The fuel injector cannot ingest dirty fuel as easily as a carburetor. For this reason, it is necessary to put more screens or filters in the fuel system, and they must be of a finer mesh than carburetors require. This calls for careful cleaning of these screens during maintenance checks. Furthermore, if an engine operates erratically (high or low flow), the fuel screens may be dirty.

The fuel injector seems to be more sensitive to vapor in gasolines, particularly in hot weather or when attempting a hot engine start. With vapor in the system, the turning period with starter will be longer until the vapor is sucked out of the lines and cooler fuel fills the lines out of the aircraft tank. Starters, batteries, magnetos and spark plugs must be maintained in good condition with any fuel-injected engine, but particularly in one which is difficult to start when hot. Consult your operator's handbook for the particular aircraft or engine.

CONCLUSION: Knowledgeable operation and better maintenance are more important with modern light weight flat opposed power plants, because taking more horsepower from them without increasing the size of the engine, and then tightly cowling them for more speed. As a result, the modern flat opposed piston engine is a compromise that cannot ingest dust or dirt or take neglect.

ENGINE OVERHAUL TIP — ANOTHER ROPE TRICK

The tip by Richard M. Von Berg, "Rope Trick For Valves" in the October/November/December issue of the EAA Technical Counselor News suggests Another Rope Trick. The cylinder heads and barrels of a Gypsy Major engine are separate units. When disassembling an engine the accumulated carbon and varnish deposits can cause the heads to stick on the long cylinder studs so that they can't be removed. I have seen a 220 lb. man hang by his finger nails from a head with the cylinder nuts loosened, the Gypsy Major engine being inverted.

A length of rope inserted through the spark plug hole will fill the cylinder allowing you to gently force the head straight down with the piston by pulling on the propeller, or better, a club propeller. The push from the piston aided by some solvent on the cylinder studs will eventually move the head without hammering or prying.

Needless to say, care must be taken of the pistons and rods of the cylinders that are already removed. You can't use much more than clothesline rope, especially on the earlier engines as the spark plug holes are only 12 mm.

AIRCRAFT FUELS

During refueling stops at strange airports, it is very wise to supervise the refueling operation on your aircraft to prevent addition of the wrong fuel or oil. Each pilot should be able to identify fuels by color. Aviation fuel octanes do not mix in an aircraft fuel tank but can be properly mixed only at the refinery. The number of malfunctioning or failed engines resulting from attempting fuel mixing has been proven.

OIL SQUIRTERS RECOMMENDED ON CONTINENTAL O-470R

(Taken from the Cessna Pilots Association Magazine)

Dear CPA:

The Continental O-470R tended to run hot in a number of installations, particularly in Cessna 182s built in the early 1970s. The problem was corrected when Continental came out with the O-479S engine, employing oil squirters that throw oil on the back sides of the oil pistons.

Continental offers the oil squirters as an approved modification to the O-470R engines. I highly recommend that the modification be performed on any owner's O-470R at overhaul time.

Lynn Quackenbush (6601 Perimeter Road, Boeing Field, Seattle, WA 98108, phone 206-763-1912) has the special equipment and talent to make the change. Lynn is one of the very top engine experts in the northwest. He can perform the complete overhaul or just the oil squirter installation.

Ben Prince
Richland, WA
CPA #777

MISCELLANEOUS ENGINE COMMENTS BY TECHNICAL COUNSELOR, GIL HAUSLER OF PHOENIX, ARIZONA

THE COMPRESSION CHECK AS A MAINTENANCE AID

In general aviation, the compression check is used quite universally as a maintenance aid.

(a) A compression test can be made any time faulty compression is suspected, and should be made if the pilot notices a loss of power in flight, finds high oil consumption or observes soft spots when hand-pulling the prop. It is also considered part of the 100 hour engine inspection and the annual inspection. But most experienced maintenance men feel that the compression check is best used to chart a trend over a period of flight hours.

(b) A gradual deterioration of charted compression taken during routine maintenance checks would be a sound basis for further investigation and possible cylinder removal. This attempt to reduce the possibility of engine failure is called preventive maintenance.

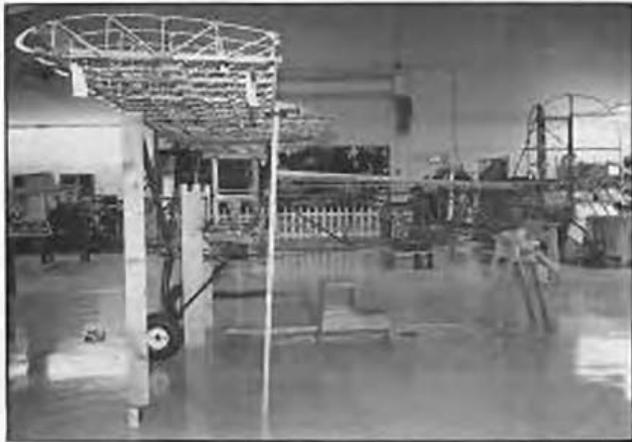
(c) There are two basic equipments in use: (1) The direct compression (old automatic type) and (2) The differential, using an input of 80 pounds of air.

(d) Of these two, the differential is considered best in that it is a more precise method of locating specific areas of trouble, it is simple to use, and it is better than the direct method in locating combustion chamber problems in an early stage of development.

AERONCA 7AC FUEL VALVE PROBLEM

A member with an Aeronca 7AC reports a problem with the universal that connects the actuating selector at the pilot's station with the forward mounted tank valve. The universal has a tendency to bend and when the selector is turned to the "on" position from the pilot's position, occasionally it will only go to half open. This can cause a problem on full power application. The obvious solution would be replacement of the worn actuating rod universal joint at approximately midpoint between the pilot's station and the tank.

Rigging



The aircraft is set up with the top longerons perfectly level, using sawhorses, lumber and clamps as shown.



The side is kept from deflecting by being clamped to the floor to keep the front level so the tires will not deflect.

DISCLAIMER

The EAA presents the materials and ideas herein only as a clearing house of information and as a forum for the exchange of ideas and opinions. No responsibility or liability is assumed, expressed or implied as to the suitability, accuracy, safety or approval thereof. Any party using the suggestions, ideas or examples expressed herein does so at his own risk and discretion and without recourse against anyone. Any materials published herein may be reprinted without permission. Please credit the original source of the materials, and the TECHNICAL COUNSELOR NEWSLETTER.

EAA[®] TECHNICAL COUNSELOR NEWS

WITTMAN AIRFIELD

OSHKOSH, WISCONSIN 54903-3086



BULK RATE
U.S. POSTAGE
PAID
PERMIT NO. 1
RANDOM LAKE, WIS.
53076

