THE COZY NEWSLETTER #24 January, 1989

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It is mandatory for all Cozy builders to have Newsletters #4 thru 24, plus a current and continuing subscription to future editions. We are attempting to get this edition published a little early so we can wish all of you:

MERRY CHRISTMAS and HAPPY NEW YEAR!

Also, please note the re-availability of Cozy flight apparel, in case you have Some last minute Christmas shopping to do (They also make excellent birthday gifts). Co-Z Development provides

support directly to Cozy builders in the US and Canada; and all other countries indirectly through our good friends:

Co-Z Europe (Uli & Linda Wolter), Ahornstrasse 10, D-8901 Ried, West Germany

Uli writes:

"I envy Vance for his spare time to accomplish all these nifty mods and changes. It seems that we just do not have enough time to do all we want. In your newsletter you stated that we had a variable pitch Hoffmann propeller on our Cozy. This was not correct -Please note -It is a MT (Gerd Muehlbauer) electric variable and constant speed propeller, e.g. you may select any position you want and after selected, this pitch setting will stay regardless of power setting. In the automatic mode, however, the propeller will maintain the selected RPM like any C/S propeller. On take off, I select 2700 RPM and after take off I reduce to 2500 RPM or what ever propeller speed I desire. This gave us a take off roll of 440 m or 1340 ft. with a gross weight of 1710 lbs. at sea level and calm winds during the EURO CAFÉ 540 this summer. By the way, we won the race again this year by beating a Glasair.

.I also mentioned in our last newsletter what we have, done with our Roncz canard. Since we cannot afford to take the Cozy in the shop during the flying season, I did not continue testing at aft c.g. positions past 100.5. During this winter I will increase the canard incidence by 0.5 degree and hope to have 0 degree elevator at mid c.g. with 160 KIAS cruise speed. More thorough testing will then follow."

Uli sent me literature on MT propellers. In USD the propeller costs $4,300 and the control unit $820. It was not clear whether this was delivered cost, or shipping and duty extra.

Those of you who also subscribe to the "Canard Pusher" ($14.00Iyr.) will note that we sometimes cover the same subjects. This is particularly true in this issue; there were a number of good articles in CP #57.

ANOTHER COZY FLIES:

We heard indirectly that S. Morgan Dean, in Burbank CA has finished a beautiful Cozy and is now flying off his test hours. We tried to confirm this by phone, but he apparently has an unlisted number. How about a written report, Morgan: Also, if any more of you are flying, please let us know so we can keep other builders up to date.

INCIDENTS

Keith Spreuer writes:

Dear Nat,

We had an incident in our Cozy N84CZ of which I thought you should be aware. The incident

involved a nose-gear-first landing that, fortunately, resulted in very minor aircraft damage and no injuries.

We have a total of about 60 hours on the airplane so far and have been very happy with its handling and performance. We have been concerned with the relatively high takeoff speed at forward c.g.s, however. We took off at a gross of about 1400 lbs. and a c.g. of 98.2. We had a beautiful flight for about 2.7 hrs. which reduced our fuel down to about 6 gals. and put us at a c.g. of 97.6. We pulled the power to idle 10 miles from the airport at 5,000 ft. AGL and had an easy glide to the airport. I trimmed the airplane for a steady 700 fpm descent at 80 KIAS. Everything appeared perfect until I tried to flare. I pulled hard on the stick but got no noticeable change in pitch attitude. The airplane contacted the runway on all three wheels at the same time, or possibly a split second sooner on the nose. The landing was hard, but not as hard as I've seen in other aircraft. The nose gear collapsed immediately. The airplane lowered its nose to the ground and slid straight down the runway and stopped in about 200 ft. There was no discomfort to myself or my passenger.

Later, when we inspected the plane, we believe the following failure mode occurred. The first failure was the two lower screws that hold on the nose wheel assy. Before the other two screws failed, the rod ends on the shock strut buckled and the gear folded up until the wheel contacted the bottom of the fuselage just forward of the wheel well. The wheel assy. then came off entirely and contacted the prop. The NG-l strut never retracted entirely and acted as a skid, so that there was no damage to the fuselage. The retraction mechanism remained down and locked, there was no damage to the large spur gear. The tube through the center of that gear was bent, causing binding when near the full up end of travel. We replaced that tube, the shock strut and rod ends. The NG-l strut was ground down about 1/10 in. below original size, thru the BID plies and into the uni-S-glass. We laid up 2 plies of BID over the front of the strut and reinstalled the nose wheel assy. with AN hex head bolts. These repairs and a borrowed prop were adequate to ferry the plane back to home port. We are now replacing the NG-l strut and making cosmetic repairs. other than returning the configuration to 'per plans' we are using AN bolts at the top and bottom of NG-l and putting an 1/8" steel plate in place of aluminum on the NG-5 attachment. We also squeezed an extra 1/4" in length on NG-l to increase angle of attack during takeoff. We are considering a stiffer spring in the shock strut so that the gear compresses less at forward c.g.s, also improving angle of attack during takeoff. We understand that this spring is available but we have not ordered one yet. We sent the prop to Great American and to our surprise, it is repairable ($100).

So, what is the reason that the plane didn't flare? I think I would have to say, pilot error. Examination of the trim, after the accident, indicated it was not near full nose up. I believe that I was not out of elevator travel, but that due to the stiff trim spring we have, the forces were so high that I thought I was. We have a non-standard pitch trim system using a fiberglass cantilever spring and push rod on the torque tube instead of the double spring set up. our spring was too stiff to get full travel of the elevator when the trim is in the center position. The take-off and landing speeds were higher than we liked at a c.g. of 97.5, so we also moved the battery from the nose to the center spar so we are not on the forward c.g. limit with two people in the front seat. That means more ballast when I fly alone, but I think that is a better compromise. You should advise builders to keep the landing flare in mind when they evaluate forward c.g.s.

Sincerely, Keith Spreuer

Comments:

I talked to Bill Spreuer after this incident. He and his son had originally installed the battery in the nose to minimize ballast when flying solo. However, when flying dual, they were very close to the forward c.g. limit, which gave them a nose-down attitude during takeoff, extended their takeoff distance, and required more nose-up elevator during landing. They had checked forward c.g.s during the test period, and had been flying dual with forward c.g. since without problem.

On this flight, however, they were testing power-off gliding range from 5,000' to touch down, and had trimmed the airplane for 700 fpm descent at 80 knts, and did not slow down to 70 knts on final (Owners Manual p.17), so they contacted the runway at an excessive speed and rate of descent.

Bill said that afterwards they tested their leaf spring pitch trim and found the spring constant to be 5 lbs./in., which required a heavy stick force to override. They have since modified it to 2 lbs./in. They have also moved the battery aft so they will have a more favorable c.g. position when flying dual.

The use of a fiberglass leaf spring for pitch trim has not as yet been recommended as a design change. Although simple in concept, it obviously should not be too stiff, and the friction nut must be adjusted so the trim can be overridden, without excessive force, and elevator travel not restricted.

The best flying qualities are obtained in the mid c.g. range, and your airplane should be balanced to be at midrange when flying dual. You will need ballast in the nose then, when flying solo. Although you can safely fly at forward c.g.s, it will extend takeoff distance and will place additional loads on the nosegear, obviously. There should be no problem flaring, if full elevator travel is available.

ACCIDENTS

AVIATION CONSUMER magazine has reported that experimental home-built airplanes have a worse accident record than factory-built airplanes (even though a large percent of factory-built accidents are stall-spin related). This is due to a number of factors. In home-builts, there are more opportunities for non-conformity to occur (unintentional and intentional). Therefore, each home-built airplane should be considered a new, experimental, research, high-risk airplane. These aircraft are often tested (or even worse, not fully tested) by pilots who have very little time in type, and who often do not follow careful flight safety procedures in their testing. Also, because these airplanes have higher performance and are more fun to fly, many accidents are the result of high-risk flying and improper acrobatics. RAF reports that seven of eleven Long EZ accidents occurred during low altitude buzzing or acrobatic maneuvers.

Make sure you follow the instructions in the Owners Manual for weight & balance, preflight inspection, pilot qualifications and flight testing. Make sure you observe the limitations on gross weight, c.g., maximum speed and maneuvering speed. Acrobatics and low level buzzing are STRICTLY PROHIBITED:

In CP 57, RAF reported a fatal accident in a Varieze, which we mention here because it also relates to

the Cozy. The Varieze crashed in Central California because the canard failed structurally due to flutter. In their investigation, the FAA and RAF determined there was a combination of causes.

1. One of the canard lift tabs was not bolted tightly to F-22. The hole through the lift tab was elongated with impressions of the bolt threads in the upper and lower sides of the hole. Since the smooth grip length of the bolt should have extended through the hole, it was concluded that the bolt had been inserted through the hole but not tightened. It is not known whether the builder was distracted when he was installing the canard, or why the bolt was not tightened.
2. It was reported that the elevators were considerably overweight, but had been balanced by adding more weight to the inboard balance arm. After taking a section through the elevator, it was found that the chord had been extended by gluing balsa wood along the trailing edge and then covering it with 2 layers of BID. This was the main cause of it being overweight. It was concluded that with one lift tab loose, overweight elevators, and improper balancing, the resonant frequency of oscillation of the canard was reduced, as compared with design, and the possibility of flutter was increased. This fatal accident has resulted in RAF making certain recommendations, to which we subscribe:

   1) NEVER allow yourself to be distracted while working on your airp1ane, such that you might not complete a task, and then forget to finish it later. We all have had the experience of visitors dropping in while we are working. Even if you have to be rude, finish the job before laying down your tools.

   2) Your elevators should balance with the weights shown in the plans. If they do not, do not try to balance them by adding weight inboard. Instead, discard them and make new ones more carefully to make them lighter (you can probably re-use the torque tubes and other hardware). The mass balance called out for the elevator and the specification for balancing them applies only to an elevator fabricated with the same weight and stiffness as that which has successfully passed all the flutter testing. It is extremely important, and life-critical that the manufacturer or owner of each Cozy, or any plane for that matter, assure himself without a doubt, that the control surfaces are conformal to those which have passed flight tests and been shown to be flutter-free.

LANDING GEAR MELT DOWN

You have heard of nuclear melt-downs. Well, it is also possible to have landing gear melt-downs. The cause is the same in both cases, i.e., inadequate dissipation of heat. With the advent of heavy duty brakes, and brake cylinders up front, braking power has been greatly increased. When you brake hard, the discs absorb a tremendous amount of energy, which is converted to heat, and they can get red-hot. This energy can only be dissipated by radiation and/or convection. The gear leg is directly in the path of radiation, and if you install wheel pants without outlets in the top for hot air to escape, all of the heat will be contained inside the wheel pant. The result could be a disastrous melt-down of the landing gear legs. This has happened to a Cozy and at least one Long EZ. There are some simple rules which, if followed, will keep you out of trouble. They are:

1. Protect the gear leg from radiant heat: An unprotected gear leg will absorb about 90% of all

the radiation it "sees" .On the other hand, shiny aluminum (like foil or aluminum tape) will absorb only about 4% of the radiation it "sees". If you wrap the gear leg first with 1/8" fiberfrax, and then with shiny aluminum, you will greatly reduce the heating by radiation.

2. Make sure the discs aren't too close: If you install heavy duty brakes without moving the bearings 3/16" farther out on the axle (spacers are available from Brock), you will increase heating of the gear leg by 78% due to reduced spacing, disc to gear leg alone, to say nothing about the additional heat you can generate with more powerful brakes.
3. Provide a vent for hot air to escape from your wheel pants. Hot air rises and will be trapped inside the wheel pants unless you provide a vent, on the top, on the disc side, for it to escape.
4. Be easy on the brakes. The brakes on the Cozy (and Long EZ) are designed so that they will come into play only after full rudder is deployed. Rely on rudder as much as possible during taxiing, take off roll, and landing roll. Use all of the runway for landing roll-out. DO NOT get into the habit of braking hard to turn off at the first taxiway.
5. During high-speed taxi tests, remove wheel pants and allow brakes to cool between runs.
6. Make sure your nose gear swivel is not too tight so you don't have to ride the brakes during taxiing.
7. RAF suggests installing " 1/8" aluminum plate between the axle and gear leg, which extends upward above the brake disc, to act as a heat shield. we don't like this, because dull aluminum absorbs 2~ times as much radiation as shiny aluminum, and this plate would conduct the heat directly to the gear leg.

SEPARATE TOE BRAKES

Some people think it would be nifty to have separate toe brakes, independent of rudders. We do not recommend this for several reasons. The most important is that you should ALWAYS have full rudder deployed before actuating brakes. There is no situation we can imagine where this is not true. Separating these functions would therefore require additional pilot skill and coordination, to apply rudder first, and then brakes. It is an unnecessary complication (more things to go wrong), it adds weight, and it obviously adds expense. In an airplane, you should ALWAYS use the simplest system which works. Complicating any system increases the likelihood of failure.

NOSE GEAR SHIMMY DAMPER

The shimmy damper in the plans requires religious attention to insure it is tight enough to prevent shimmy, and yet not so tight it overtaxes brakes when taxiing. If not tight enough, a vicious shimmy can occur at high speeds which can fail the fork, and likely also destroy the prop. Bob Davenport has designed, and offers for sale what RAF says is the best solution they have seen (we intend to order one for each of our airplanes). Contact:, Bob Davenport, PO Box 650581, Vero Beach, FL 32965-0581

CS-2 ELEVATOR HINGE BRACKETS

Several builders have reported receiving CS-2s from Brock Mfg. which were out of spec in regard to the perpendicularity of the surfaces, and the bushings located identically in all of the brackets. This is a heat-treated part, and sometimes distortion can occur during heat treatment. Both of these defects

can cause difficulties in installing elevators which move freely without binding. We have contacted Brock Mfg. and they were not aware of any problem. If you discover any quality problems, contact them. They depend upon feed-back from their customers. They will also appreciate compliments.

HINGE PIN KITS

Aileron hinges take quite a beating over time from engine/prop vibration and will loosen in time due to wear. Gary Hall sells a Teflon/stainless steel hinge pin kit which solve this problem. The kit consists of stainless steel hinge pin material together with Teflon tubing sized to fit over the hinge pin and inside worn aluminum hinge knuckles. This is said to virtually eliminate further hinge wear. We haven't needed to install this kit yet, but are keeping the information for future reference. Contact: Gary Hall, 4784 NW 43rd St., Lauderdale Lakes, FL 33319, (305) 484-4949

MAGNETO WIRING CHECK

A propeller, mounted to an aircraft engine, is potentially a lethal instrument. It can strike a person hard enough to maim or kill. Propellers frequently must be turned for removal of cowlings, and many other reasons. The ignition should always be off, and the prop should always be turned backwards, against the normal direction of rotation.

The ignition (magnetos) are turned off by grounding the P-leads. This is done with a switch in the cockpit. However, if there is a poor connection, or a break in the p-lead wire due to engine vibration, a magneto can be live even though the ignition switch is off. Then, if the prop is moved in the direction of normal rotation, the engine could fire with tragic results.

It is therefore good practice to conduct a magneto check before shutting down the engine after a flight. To do this, while the engine is still running, turn the master avionics switch off (you have one, don't you?), and then momentarily flip both mag switches off, for only a second or two. If everything is OK, the engine will stop firing, but will start again when you flip the switches back on. Then you can shut down normally, pulling mixture to idle cut off and then switching ignition off. If the engine doesn't stop firing during this check, you have a wiring problem, and your engine is always "live"--a very dangerous situation. Make this mag check mandatory after every flight.

AEROQUIP 601 HOSE ALERT

We recently received a recall notice on Aeroquip 601 hose. Apparently there was a problem curing the rubber, and some of these hoses have been springing leaks with potentially serious consequences.

If you used 601 hose, and made up the lengths yourself between April 1984 and May 1988, you may have defective hose and should replace it. If your hoses were made up by a distributor, they should have a metal identification band. On this band there will be a cure date and an assembly date.

lQ87 = cure date 1st qtr. 1987

A2Q87 = assembly date 2nd qtr. 1987

Look for cure dates between 1st qtr 84 and 3rd qtr 87, which are bad and should be replaced. An authorized Aeroquip distributor will supply you with new hoses, and will give you full credit upon receiving the old suspect hoses.

We have been using Aeroquip 701 hose, which we were told has superior rubber, with no mandatory replacement, period. We evaluated the corrugated, all-stainless steel hoses, and decided they were not flexible enough. RAF is now using and recommends the Teflon "Stratoflex" hose.

Fuel leaks can cause an engine fire, with potentially tragic results. Compliance with this recall notice is MANDATORY:

FUEL VALVE ALERT

The Cozy plans call for the same fuel valve which was specified for the Long EZ; i.e., the 3-way Imperial 108HD-04. This was a metal valve with an unlubricated metal plug. When it was subsequently learned that this valve was susceptible to sticking, when used in fuel systems (which could cause a forced landing), it was recommended in a past newsletter that the 3-way Weatherhead 6749, or better yet, the 4-way 6747, be substituted. The Weatherhead valves have a Delrin (nylon) plug, and, to the best of our knowledge, have solved this problem. RAF reported in CP 57 that there is another satisfactory substitute. It is a Whitey SS-44xF4 valve. This valve has a stainless body, a stainless ball, and uses Teflon seals. It has a .281" orifice thru the ball, and female ¼" NTP threads which accept AN fittings. Flow rate is more than adequate. This is not a recommendation that you replace the Weatherhead, just a piece of information. If you are interested, contact: Whitey Co., 318 Bishop Rd., Highland Heights OH 44143

ELECTRIC FUEL BOOST PUMP ALERT

A Long EZ pilot had a forced landing due to fuel stoppage, even though fuel remained in his tanks. Upon examination of his fuel system, he found the Facet boost pump to be completely blocked. One of the two valves in the Facet had deteriorated, worked its way out of the metal cage designed to contain it, and sucked into a position where it completely blocked fuel flow. The part number on the mounting flange of the pump was 480615. The valve which deteriorated was made of VITON. This pump is no longer being manufactured.

Before your next flight, check the part number of your boost pump. If you have a #40023, 480615, or 480616, remove the pump and replace it.

The most desirable Facet solid state pump for a replacement is #40108 (12 volt) or #40154 or #480610 (24 volt). Both pump fuel at a regulated maximum of 6 psi, and the valves are made of nylon, which may swell slightly in avgas, but are otherwise unaffected and will not deteriorate. These pumps have valves designed so they cannot obstruct fuel flow. The have AN-style 37° flare fittings which fit 3/8" tube, AN 816-6 nuts. Facet manufactures over 100 variations of their solid-state fuel pumps, many of which have VITON or Buna N valves which will deteriorate in avgas. Only nylon is satisfactory for use with avgas (or auto fuel, heaven forbid).

If, after checking part numbers, you are still uncertain, look into the inlet and outlet with a flashlight. Verify that the inlet valve (foot valve) is a round white dome or ball (nylon), NOT a flat, black rubber disc. Verify that in the outlet there is a white nylon valve under a steel pin which crosses the port to retain the valve. If this valve is gray or black (Viton), remove the pump and discard it before your next flight. If you have to have a pump with female pipe threads due to firewall layout, choose one with ¼" or 3/8" NPT threads, rather than 1/8", and examine it closely as described above to be sure it has NYLON valves.

If your Facet pump is more than a year old, you probably have one which could go bad. At a cost of about $30, it is not worth risking a forced landing. This is a MANDATORY change!

BUILDER HINTS

1. The canopies supplied by "the Airplane Factory (now named Fox Lite) is no longer trimmed as described in the plans. The recommended procedure for trimming is as follows: First trim the instrument panel using the template on A-22. Then install the turtleback per plans (you can raise the forward end up ½" for more headroom is you wish). Next, notch the canopy where it passes over the instrument panel to lower the forward end into position. Check the position with template BL 0 on A-22. Then, without further trimming, proceed with building the canopy frame. After the frame is contoured and glassed on the top, and removed for contouring and glassing the bottom, trim the excess Plexiglas from around the bottom, leaving ¾" to 1" overlapping the frame. A narrow abrasive wheel in your dremel works well for this trimming.
2. Cozy builder C.F. Cutcher reports that Long EZ builders in his area are using "Great Stuff" Insta- foam sealant for gluing styrafoam blocks together before hot wire cutting. He says a hot wire cuts through it easily. "Great Stuff" is carried by most hardware stores.
3. Cozy builder Wm. Beecham, 1399 NW 16th St., Boca Raton FL 33486 is compiling an index for the Cozy newsletter which cross references design changes, builder hints, etc. from NL #4 to present. He will supply copies of the index for $5.00.
4. Cozy builder Al Yarmey reports that the blower Vance Atkinson used for cabin heat is no longer available, but that a 3" dia axial blower is available for VW Beetles at $69.95 from one of the after-market suppliers of VW parts. The only information he supplied was that it was advertised by Barneys Import Service in the November 88 "Hot VW" magazine.
5. Cozy builder John Ash advises that the carb heat valve hookup (Chap 23, p.2) is not clear. The carb heat valve should be hooked up so that the filter is by-passed and heat is on when the control lever in the cockpit is pushed forward.
6. There may be places in the plans where we did not specifically say to tape a joint, as for example, where the instrument panel joins the fuselage sides and bottom. Whether or not the plans specifically call for it, joints between all permanently installed parts should be taped. This comes under the category of "good technique".
7. When paints are mixed by formula (such as Chrysler Spinacer White), the color additives tend to separate upon standing. Each time paint is withdrawn, the paint should be thoroughly mixed. Otherwise, you may find that the color shade will vary between parts painted at different times.
8. Pop rivets were inadvertently omitted from the bill of materials. It is suggested that you order

100 ea. Avex 1601-0410 dome head and Avex 1604-0412 countersunk pop rivets (and a gun) to use as required.

9. Most builders are finding that the hole through the instrument panel for the elevator push rods must be enlarged to avoid interference. If these holes must be widened inboard, removing most of the material alongside the leg hole, add a ½" strip of foam along the leg hole and glass all around with 2 layers of UND for additional reinforcement.
10. Aerographics in Denver CO (800) 336-9633 is reported to custom make excellent aircraft markings such as N-numbers, "Experimental", fuel grade, capacity, no-step, no-push, etc. They offer a choice of letter style, size, and color. They are made of thin, self adhesive vinyl (like our Cozy decals) on release paper. You simply remove the backing, stick them down, squeegee them in place, and remove the facing paper. They are guaranteed for 7 years. They also sell masks, if you wish to paint on your own numbers.
11. Wiring an airplane is relatively easy for some, and very difficult "for others, depending upon background. Even the former can have difficulty getting good answers to highly technical questions. At last there is a good source of information: Bob Nuckolls at the "Medicine River Press", PO Box 12703, Wichita KS 67277-2703 has started a newsletter, "The Aero Electric Connection" just for people like us. Subscription is $20/yr, with $2 off for EAA members and another $2 off for AOPA members. He has further agreed to answer individual letters by subscribers. Bob works with Bill Bainbridge of B & C Specialties and designed the linear regulator Bill sells.
12. Brock Mfg sent us a Cozy 0-320 engine mount to check out for clearance with the new AC fuel pump and approve. We can report that there was no clearance problem, the mounting points were spread ¼" in both directions, as we had requested, to accommodate the ¼" thick extrusions with 10 plies of BID, the engine height was correct, distance from firewall was correct, and the thrust line was correct. The dynafocal ring was configured on the left side to eliminate interference with the oil filler tube (not true of other mounts). Their mounts are oven (not torch) normalized to eliminate welding stresses and pre-drilled for corrosion proofing inside with linseed oil. We don't know of any other manufacturer who does this good a job. Engine mounts are a vital part of your structure, and you shouldn't accept anything less than the best, which, as far as we are concerned, is Brock. Brock still has two 0-235 mounts in stock designed to clear the old fuel pump. When ordering, please specify which fuel pump you have, old or new style.
13. If you have an 0-235-L2C and it is getting tired or fouls its spark plugs in spite of using REM37BY Champions, this may be something to consider. "Light Plane Maintenance", Oct.1988 suggests an interesting compromise. You can get rid of the L2Cs tendency to lead foul spark plugs by having Engine Components, Inc., 9503 Middlesex, San Antonio TX 78217, (512) 828-3131, convert your engine. ECI has STC's to convert present 7/16" exhaust valves to 0-320 ½" valves and to machine an anti-lead-fouling valve pocket into the cylinder heads. This pocket increases the cylinder volume by approx. 5% which enables you to install the -F high compression pistons without ending up with too high a compression ratio. Your standard -L2C has 8.5:1 compression, the -F has 9.7:1, but the above conversion would give approx. 9.2:1. This might offer the best of several worlds. A little higher horsepower (approx. 122 hp), reduced lead fouling problems, and better knock resistance than the 125 hp -F engine. You should get more power and longer life out of your 0-235-L2C. This mod is not recommended for the low compression 0-235-C2C which does not suffer from lead-fouling and is generally extremely reliable. Also, these older 0-235s do not have crankcase through-

bolts. High compression pistons would certainly result in a lower TBO, or worse. Contact ECI for prices, and keep in mind, with the extra horsepower, you will need one to two inches more pitch in your prop. A subscription to "Light Plane Maintenance" costs $72 or l2 issues. PO Box 359135, Palm Coast, FL 32035.

14. It is quite common to see blistered paint on cowlings just above and below the exhaust pipes. The reason is that when the engine is leaned, the pipes can get cherry red, and heat is radiated to the cowlings. The best solution we have found is to put a radiant heat shield around the pipes where they face the cowling. An easy way to do this is to wrap two springs around the pipe and then wrap thin-gage shiny aluminum over the springs, fastening them in place with safety wire.

DESIGN CORRECTIONS/CHANGES

Chap.2, p.l & p.5, Chap.21: Change EFP Electric Fuel Pump to Facet #40108 or equivalent with nylon valve parts.

Chap.2, p.2 & p.4, Misc.: Change 108 HD-04 fuel valve to Weatherhead #6749 (3-way) or #6747 (4-way).

Chap. 2, p.4, Chap. 4 Foam: Change (12) to (16) sq.ft. 0.2" thick 18 lb. Clark.

Chap. 21, p.5, Step 11: Delete "and the gascolator & fuel pump in Chap. 15".

Chap. 21, p.5, Fig.16: Change 108 HD to Weatherhead #6749 (3-way) or #6747 (4-way) .

Chap. 23, p.2: Change EFP Electric Boost Pump to Facet #40108 or equivalent with nylon valve parts.

IVHC (INTERNATIONAL VARIEZE HOSPITALITY CLUB)

This club was originally organized for Varieze builders and pilots to visit one another, or to call upon when traveling around the country, and has been extremely successful. It has since been opened up to all composite builders. They publish a newsletter, with the names, addresses, and phone numbers of all members, and organize a number of flying activities for example, flying trips to the Bahamas. They have a dinner-get together every year at Oshkosh. We are charter members, and encourage Cozy builders to join. Membership is $17/yr. If interested, contact: D & B Shupe, 2531 College Lane, La Verne CA 91750.

The IVHC banquet at Oshkosh is getting pretty large and we were wondering whether there would be enough interest to start a banquet just for Cozy builders on either Sat., Sun., or Monday? We would recommend our favorite restaurant, Robbins (excellent food at very reasonable prices). Any interest? Who would like to organize it?

FLIGHT APPAREL AND JEWELRY

1. Our previous supplier of hats and shirts moved and we were out of touch for quite awhile. We have again located them: Custom Tops, 13520 N. 151 E. Ave, Collinsville, OK 74021, (918) 371-5789
2. In the last newsletter, we reported finding the Ebachs, who have very attractive Cozy lapel pins. They have also ordered a number of Cozy patches (just the airplane) which can be sewn on caps and jackets. Pins are $4.00 and patches $2.75 prepaid. Winter: The Ebachs #178 201 S. Greenfield, Mesa, AZ 85206, (602) 830-9626; Summer: VM Enterprises, 41910 Savage Rd., Belleville, MI 48111
3. Because they were not able to locate any supplier for Cozy apparel, Cozy builders Jeanie Irwin and Tom Troost decided to fill the gap. They had silk screen artwork (very nice) prepared and acquired a line of quality apparel. They can supply Cozy hats, T-shirts, sweat shirts, windbreakers, and warm jackets as follows:

   Hats: (red, black, lt blue, dk blue, min. order 2)…. .$ 6

   T-shirts: (same colors as above, S, M, L, XL)….. .$10

   Sweat shirts: (same colors, S, M, L, XL)……$15

   Jackets, flannel lining: (Navy, red, royal, black, maroon, Sizes S, M, L, XL) ……..$42

   Jackets, heavier quilted lining:(colors & sizes as above) ……..$47

   Jackets, Warm, Sherpa-type lining: (Navy, red, royal, black, kelly, Sizes as above) ….$47

   Send money order & $2.00 postage & 4% tax MI residents: Cozy Wear, 7982 N. Masters Rd., Howard City, MI 49529

4. Cozy builder Dennis Ninmer arranged with an air-brush artist to supply white T-shirts with a Cozy painted on the front against a background of sky, clouds, and ocean. Cost is $22 ea. incl. shipping. Each is painted individually. Children 10-12, 14-16, adult S, M, L, XL, 2X. Dennis W Ninmer, 1703 McKinley St., New Holstein, WI 53061, (414) 898-5520

INSTALLATION OF MASTER BRAKE CYLINDERS IN THE NOSE

Installing the master brake cylinders in the nose eliminates cable stretch and results in much more positive braking. We have also discovered that we don't have to add fluid as often, with cylinders in the nose.

On this page is shown two different schematics. The upper drawing shows how normal Rosenhan, Cleveland, or Gerdes master cylinders can be installed upright. The lower drawing is a simpler installation, but requires acrobatic master cylinders and reservoirs. Both require tabs to be welded on the rudder pedals. Both require rod extensions. The bolt through the rod extension rides in a slot which allows the rudder to be deployed before the brakes are actuated, and the brakes still provide a stop for the rudders.

It is recommended that both right and left brakes be installed on the same side, preferably the pilot's side. Both drawings show installation of the right brake on the left NG 30. If the left brake is installed on the same side, the mechanism will have to parallel the fuselage side. This will require bending the tabs welded to the rudder pedals inboard about 20 degrees. It will also require building a pivot point on the fuselage side. We made a cone ½" high from two layers of birch plywood, sawed on a 45 degree angle, embedded a nutplate in the bottom, (after drilling a 3/16" hole through the center), floxed it to the fuselage side, and covered it with 2 plies of BID, lapping the fuselage side 1 inch in all directions.

The extra slots shown in the brake arm (above) and the tab (below) are optional. They allow you to adjust braking power, if you are not pleased with the normal setting.

LETTERS

Dear Nat, 10/18/88

Just a note to renew my newsletter and to let you know that I am still at it. I have finished the tub, the main spar and one wing. Hopefully, I will have more time in the coming year. I hope the suppliers keep supporting the slow Cozy builders. I really do enjoy building the plane. I wonder if you realize how much pleasure you have brought to your builders. My only regret is that I never had a chance to build the Mark IV, but I sure understand your position in this avaricious society.

Thanks again, Ken Brimmer

Dear Nat,

Enclosed is $7.50 for another year of the newsletter. I'm still making steady progress; slow, but steady. I believe I have just about finished all the glass work now. I still have fairings and minor additions to make, but most of the remaining work will be finishing and systems installation. There is a growing group of Long EZ and Cozy builders in Chapter 186. The mutual support of a large group of builders is beneficial to all of us. I still find the newsletter to be one of the best sources of information. Keep up the good work!

Sincerely, Dewey L. Davis

Dear Nat,

Due to recent changed circumstances, I am forced to give up my ambition to build a Cozy. I learned from the newsletter about another Cozy builder, and with heavy heart I sold him the materials I had bought. I would like to sell the plans. Could I ask your help in contacting interested parties? The plans, A drawings, Owner's Manual, and newsletters are all in good condition. My home phone number is (315) 633-9388. I can be reached there except during normal working hours. Between 9-4 I can be reached at (315) 255-3461.

I can't tell you how disappointed I am. May I wish you and Shirley a Merry Christmas and a Happy New Year!

Sincerely, Sakthi Vadivel

Dear Nat, 11/8/88

Just a few lines to let you know how Cozy #300 is coming along. Boy, I didn't expect the finishing process to be as much work as it was. It sure was good for my biceps. The entire airplane is now in primer, except for bottom which is painted with white Deltron. I really like the way the Ditzler K-200 primer with flex went on. It's quite a bit harder to wet sand (more like paint) than normal primer, but really sands to a very smooth finish. I located an engine 0-235-L2C and hope to have it mounted and running in a month or so.

I mounted my master cylinders on the firewall like the plans call for but noted a very mushy feeling when the brakes would be pumped. I called MATCO about this problem and they said a spring added in the lower part of the cylinder would solve this problem. I sent them the parts, they added springs and you can't believe the difference. The brakes are very firm now. I am looking forward to Sun & Fun in the spring. The people to contact about the brakes are: Al Burgander, MATCO Mfg. Co., 65 E. Kensington Ave, Salt Lake City UT 84115.

Thanks, Dave Mendenhall

APPROVED SUPPLIERS

The following are the ONLY approved suppliers for Cozy parts and materials. The only change since last published is a name change. The Airplane Factory consolidated with its parent company, Fox Lite. There is also a new address and phone number, which is that of its parent company.

1. **Construction materials:**

   Wicks Aircraft, 410 Pine St., Highland, IL 62249, (800) 221-9425

   Aircraft Spruce, Box 424, Fullerton, CA 92632, (800) 824-1930

   Alpha Plastics, 8734 Daffodil, Houston, TX 77063, (713) 780-0023

2. **Metal Parts**

   Brock Mfg., 11852 Western Ave., Stanton, CA 90680, (714) 898-4366

3. **Canopy and Windows**

   Fox Light Inc. (formerly Airplane Factory), 8300 Dayton Rd., Fairborn OH 45324, (513) 864-

5607)

4. **Cowling, Turtleback, Main & Nose Gears:**

   Feather Lite, PO Box 781, Boonville, CA 95415, (707) 895-2718

5. **Propellers**

   Great American, 1180 Pike Ln. #5, Oceano, CA 93445, (805) 481-9054

   B & T Props, 3850 Sherrod Rd ., Marriposa, CA 95338, (209) 742-6743

6. **Exhaust system**

Sport Flight, 22267 Powell Rd., Brooksville, FL 33512, (904) 796-1874

GALLERY