~~#54C~~ ~~18~~
54D(2)

Torrington 6-SF-10 brg installation for Ailerons
OR SK~~F~~: GEZ 10 ESIMP ~~3F/01~~

BRG O.D. = 1.065

BRG O. All length = .545
BRG rot length = .465

BRG I.D. = ~~.0622 - .0~~
.622 - .623

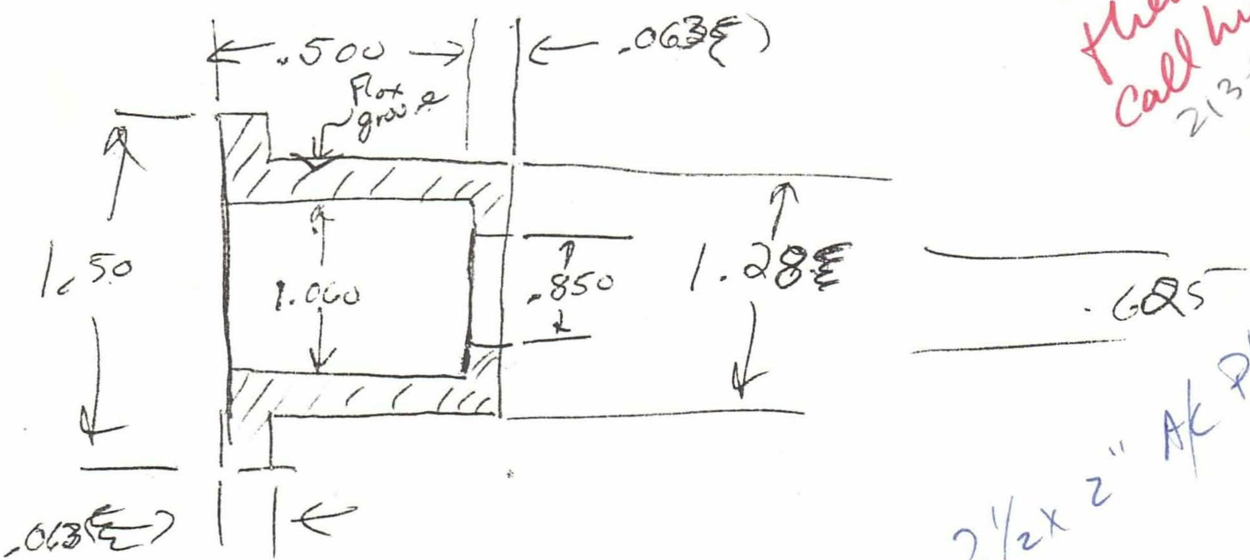
.095
× 2
.190

1.250
.190
1.060
.005 press. ok

Turn down 2" of CS 152 to slip fit Brg.

Tom Coughlin has fabricated these - Call him: 213-379-6089

ID of CS150 = 1.275
1.295



2½ x 2" AK Plywood

Over all lg = .5625

1 Cut & Face off
2 turn 1.28 dia, .500 long
3 drill ½" hole
4 bore to .850
5 part off & reverse
6. face off to .063
7. Bore 1.060 X.500

#8691

~~FREE~~

#110

LONG EZ
AILERON-TORQUE-TUBE-BEARING INSTALLATION

The following is shared information. You assume all responsibility for employing all or any part of the modification described herein on your airplane or any other airplane.

PLAN REFERENCE: Page 19-14, Sect. E-E

PART NUMBER REFERENCES: CS-132L
C-150
C-151
C-152

BILL OF MATERIAL:

2 ea. Torrington 6-SF-10 Self-aligning bearing – Similar See SKF, next page
2 ea. 4130N Tubing 1.25" dia X 0.095 X 0.467 long.

TOOL NEEDED: Blu-Mol hole saw, 1.25" dia with arbor for $\frac{1}{4}$" pilot (or equiv.)

BACKGROUND:

LONG EZ plans call for drilling a 5/8" dia hole in CS-150 phenolic block to act as a bearing for CS-152. Experience has shown this to be a sloppy bearing. Worse, experience has also provided proof that vibration has caused damage to CS-152 where it interacts with CS-150. This situation was remedied on N 81KP during its 100-hr. inspection as described below.

INSTRUCTIONS:

Step 1. Hole saw CS-150 up to $1\frac{1}{4}$" dia. Maintain concentricity by using a 5/8" dia wood plug with $\frac{1}{4}$" pilot hole. File or Dremel diagonal grooves (inside herringbone) into the $1\frac{1}{4}$" hole in CS-150 for flox preparation.

Step 2. Grind herringbone grooves on outside surface of the $1\frac{1}{4}$" dia steel sleeve. Rough up this surface to be sure it is clean for floxing. Press Torrington bearing into sleeve carefully (this is a mild press fit). Stake in place eight places both sides.

Step 3. Chuck CS-152 into a lathe or drill press. Using #320/400 grit paper reduce CS-152 dia carefully until CS-152 achieves a firm slide fit through the bearing. This is the heart of the modification. Too tight and it won't install, too loose and you have defeated the whole idea.

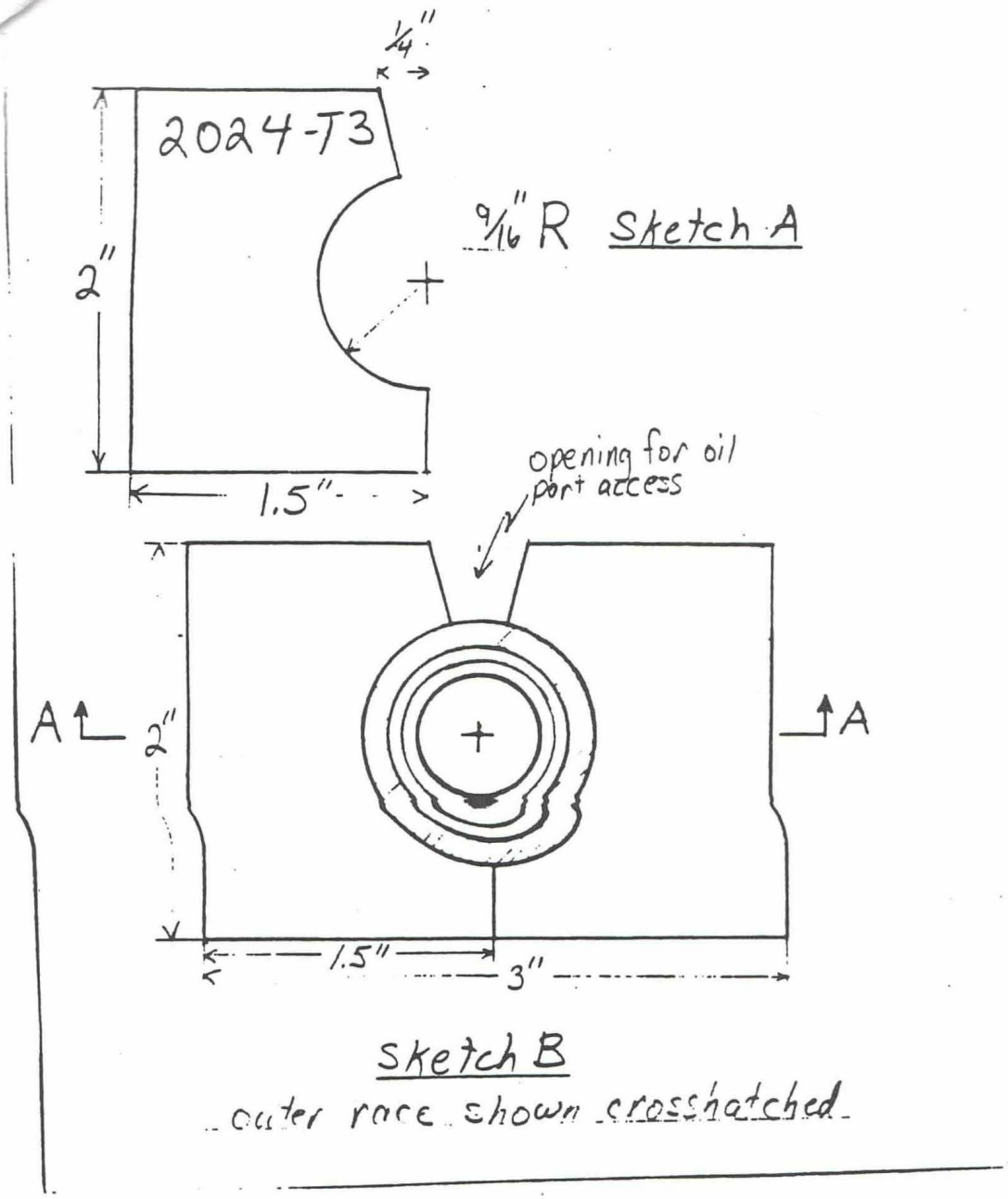
Step 4. Grey tape the bearing face to protect it from flox. Trial fit bearing assembly into CS-150 for axial clearance of CS-132L and CS-151. If clearance is needed on CS-132L (be certain there IS clearance over ± 20 deg.) move bearing assembly outboard and reduce length of CS-151 if necessary. When you have determined the correct axial position of the bearing assembly in CS-150, flox in place. Cure 48 hrs. Lube bearing wirh Molykote or equiv. Back up bearing while installing aileron.

LONG EZ AILERON TORQUE-TUBE BEARING MODIFICATION

I decided to install a spherical bearing instead of the plans suggested phenolic bearing for two reasons. All of the Long Ez's I have seen have had more friction in the roll control systems than I thought was necessary. I also thought that the chrome moly tube/ phenolic bearing would probably develop some play with time.

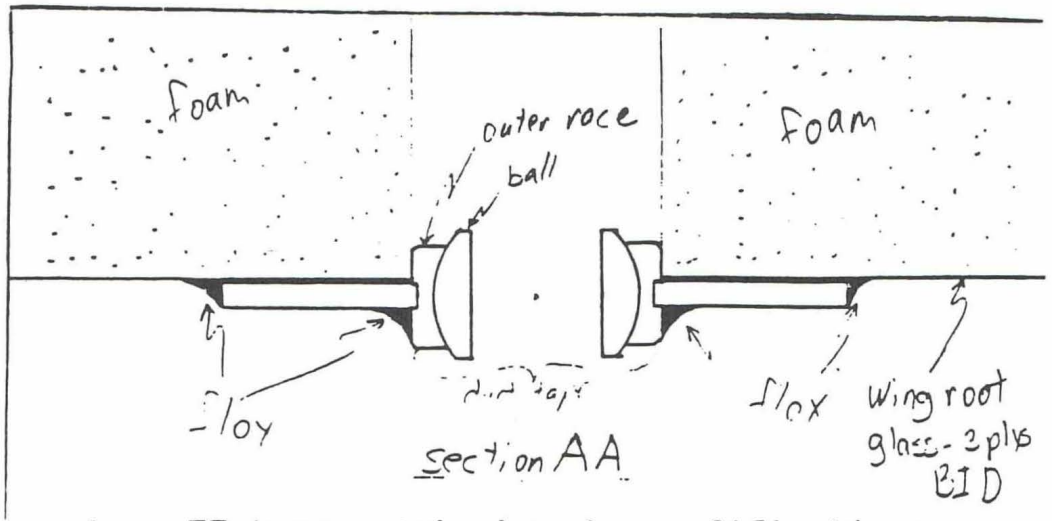
A ball bearing was suggested in the Canard Pusher newsletter, but it weighs 1.3 pounds and is designed for a conveyor belt roller application. A good friend found an aircraft spherical bearing (Part Number COM-10) carried by B&F Aircraft Supply. It only weighs .11 pounds and allows as much as 8.5° misalignment. The latter criteria is necessary due to the arc that the other end of the torque tube goes through as the aileron rotates.

To install the bearing, I cut a hole in the wing root glass, large enough for a press fit of the outer race of the bearing. The groove in the outside of the outer race was widened and deepened enough for 1/8" 2024T3 aluminum to fit into. Two pieces of the aluminum were cut as shown in Sketch A. The wing root glass was sanded in the area that the aluminum pieces go, plus one inch all around. The aluminum was cleaned with alcohol and sanded all over with 100 grit sandpaper. I put duct tape in the area shown in section AA to keep epoxy from between the ball and the outer race. The aluminum pieces and bearing were installed with wet flox on the aluminum pieces next to the glass and in the outer race groove. To hold the aluminum pieces in place I put some "super glue" on the outside corners to hold them against the glass. Wet flox fillets were used where shown. One ply of BID was layed up over the assembly plus one inch all around. When cured I trimmed the glass away in the area where I put the duct tape. The 4130 tube that goes through the bearing was a snug fit. The fit had to be opened up, because there is some axial movement of the torque tube as it rotates. I used a sanding drum in my moto-tool to open up the bore of the bearing just enough for it to slide freely over the 4130 tube. LPS-3 lubricant has been recommended to me to keep the bearing from rusting.



Sketch B

outer race shown crosshatched



Long EZ torque-tube bearing modification:

(Variance from the designers original plans should be considered a high risk endeavor and it is strongly suggested discussing comtemplated design alterations with the appropriate member of RAF prior to implementation.)

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OR SKF: GEZ 10 ESIMP ~~35/01~~

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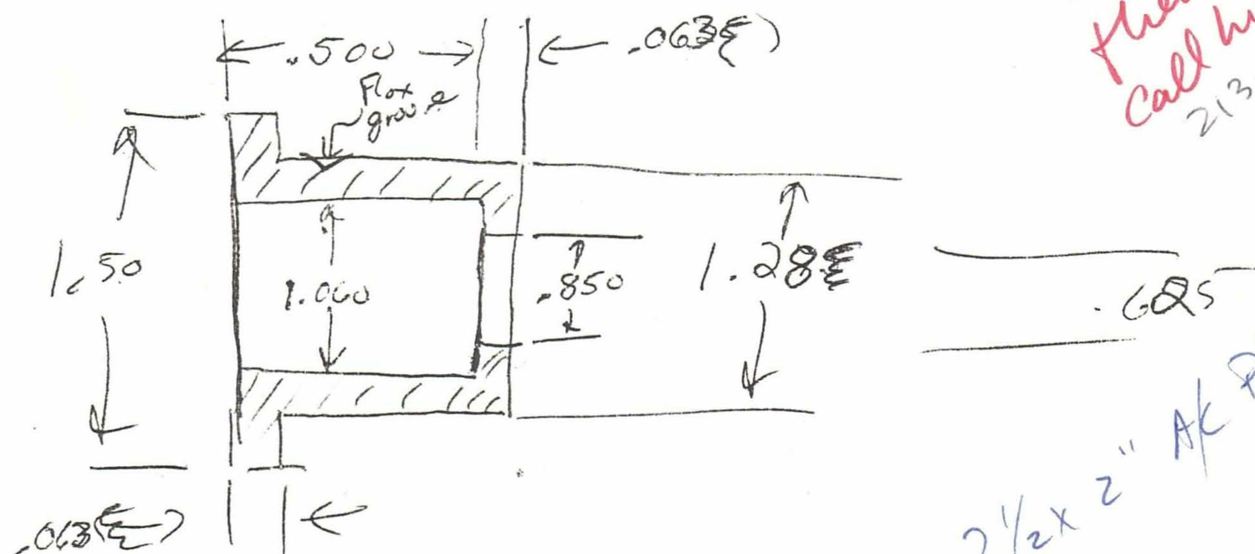

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