

**SECTION/OPERATION**

**8**

**BODY DETAILS**

<u>COMPONENT</u>	<u>PROCEDURE</u>	<u>PRINT #</u>	<u>TEMPLATE</u>
MAIN ROTOR SHAFT (E49-2000)	Temporarily install	E49-2000	E49-1
BODY (E32-2000)	Tub Seats Floor pan Body panels Windscreen Doghouse Overhead switch panel Cabin comfort Fresh air collector	E32-2000	E30-2 E32-1 E32-2
DOORS (E41-2000)	Doors	E41-2000	E41-1 E41-2
SKID PANTS (E45-2000) (see section 23)	Skid pants		

**NOTES**

MAIN ROTOR SHAFT: The main shaft must be mounted 90 degrees to the square drive mount tubes both fore/aft and laterally. It may be necessary to file the holes in the hood bracket slightly fore and aft to achieve this. If it is necessary to file more than 1/8", contact RotorWay.  
The rotor system is installed at this point to help position the body and doghouse for assembly.

SKID PANTS: The skid pants should not be fitted until all the other components have been installed (see section 23), because the landing gear is designed to flex under the weight of the ship. However, the skid pants can be painted at the same time as the other body panels. Care must be used when fitting the skid pants in section 23 to avoid damaging the paint.

## ROTORWAY

### TOOLS REQUIRED FOR OPERATION 8:

Band saw	
Cleco	
Cleco pliers	
Countersink	
Drill bits of the following sizes:	1/16"
	1/8"
	3/16"
	1/4"
	5/16"
	3/8"
	#40
	#79
Uni-bit or Step drill	
Dzus tool	
File	
Framing square	
Grease pencil	
Hammer	
Hand drill (air or electric)	
Needlepoint pliers	
Nutdriver	
Pop rivet gun	
Protractor level	
Ratchet with sockets of the following sizes:	1/2"
	9/16"
Scissors	
Screwdriver	
Tape Measure	
Vise	
Wrenches of the following sizes:	1/2"
	9/16"

## ROTORWAY

### PREFACE

Use clecos to pre-assemble the entire body before attaching any nut plates or Dzus fasteners. This gives you the opportunity to shift or relocate components somewhat if there is any unacceptable mismatch. All unused cleco holes may be refilled with fiberglass.

To get better hole alignment in body panels, the following often helps: hold the body together with as few cleco fasteners as necessary to maintain alignment, then enlarge the holes in the fiberglass according to the type of fastener being used. Try using a uni-bit or step drill; these types of drills are less likely to wander.

Most of the fiberglass pieces will have cut out areas which will appear as a slightly raised line on the surface of the gel coat. These cut outs have been pre-scribed into the part for your convenience, though they serve only as an approximation. DO NOT cut out any of these pre-scribed areas until the part has been trial fitted and the exact cut out area has been determined. The correct areas will then be trimmed out before final installation.

**IT IS EXTREMELY IMPORTANT THAT YOU READ THE ENTIRE SECTION OF BODY CONSTRUCTION PROCEDURES BEFORE BEGINNING THE ACTUAL FITTING AND ASSEMBLY, SO THAT YOU HAVE A PROPER OVERVIEW OF THE ENTIRE PROCESS.**

**ROTORWAY**

Overview of how the body will look when clecoed in place:



Photo A

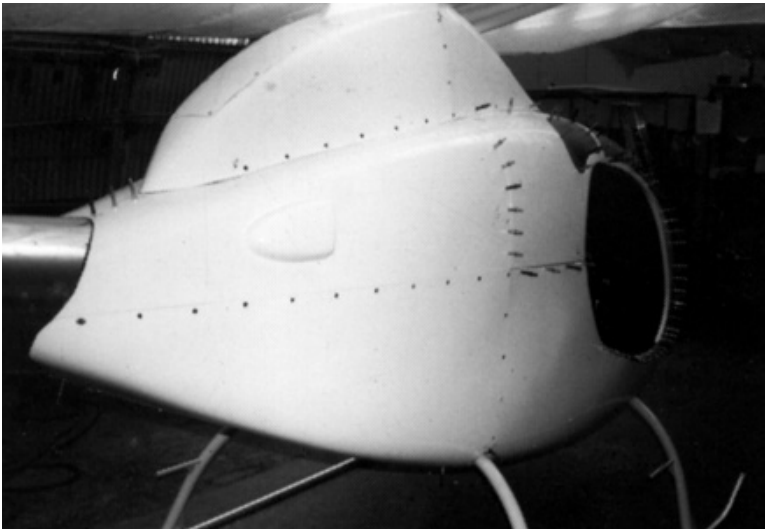


Photo B

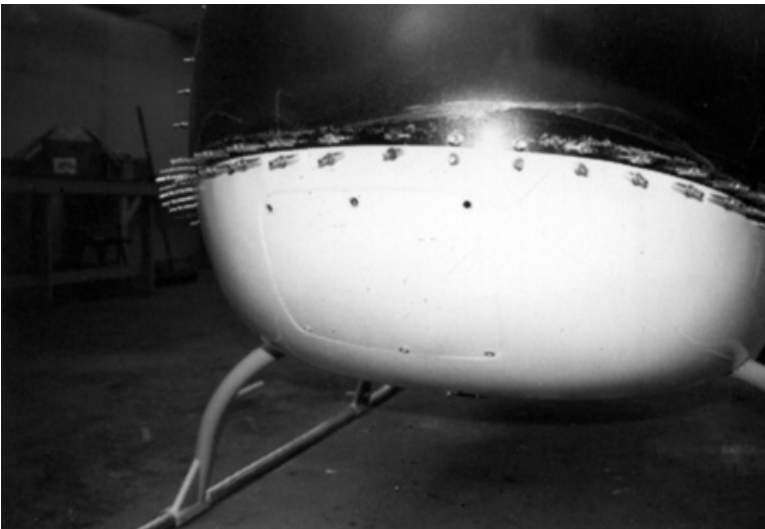


Photo C



Photo #1

Use prints E49-2000, E49-2001, E49-2002, E23-2000, and template E49-1 when constructing the main rotor shaft assembly. Parts as received from RotorWay International.

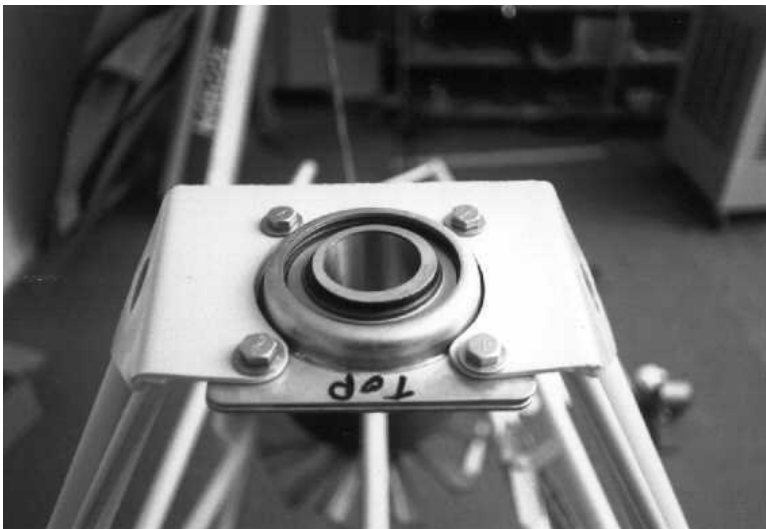


Photo #2

Install the main rotor thrust bearing and bearing flanges in the hood bracket on the airframe.



Photo #3

Clamp the upper frame clevis casting to the bottom of the square drive tubes. Place a piece of 1/8" scrap between the bottom of the square tube and the rear of the clevis casting. Then drill the bolt holes in the casting, using the bushings in the airframe tubes as a guide.

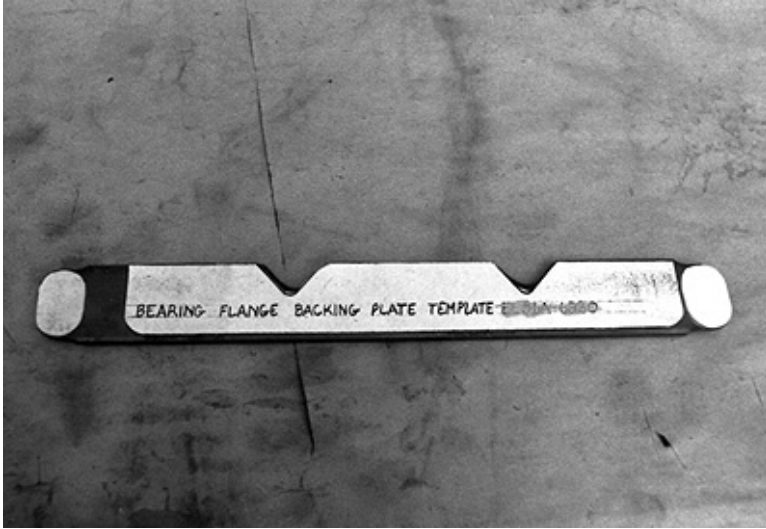


Photo #4

Using template E49-1, cut out the lower bearing backing plate and flange hole plugs.

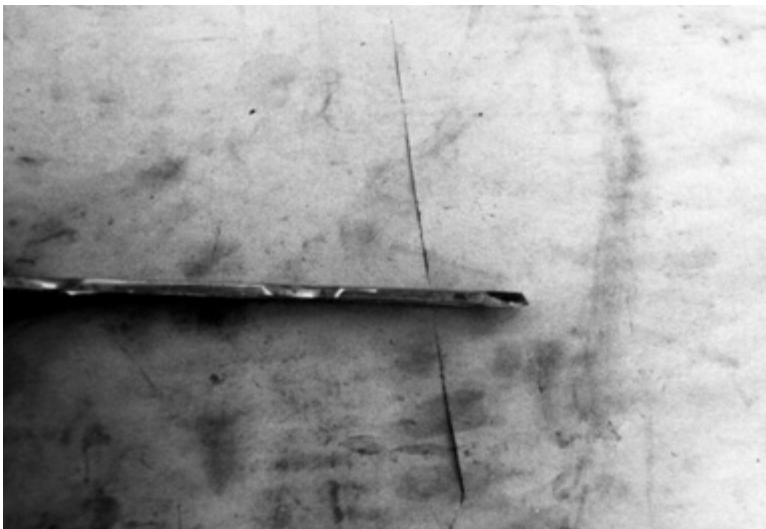


Photo #5

Chamfer the top edge of the backing plate.

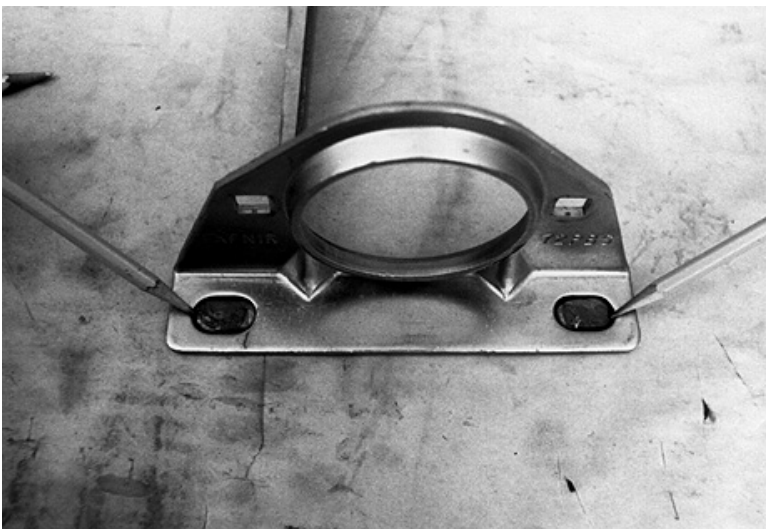


Photo #6

Chamfer the plugs for better welding penetration.

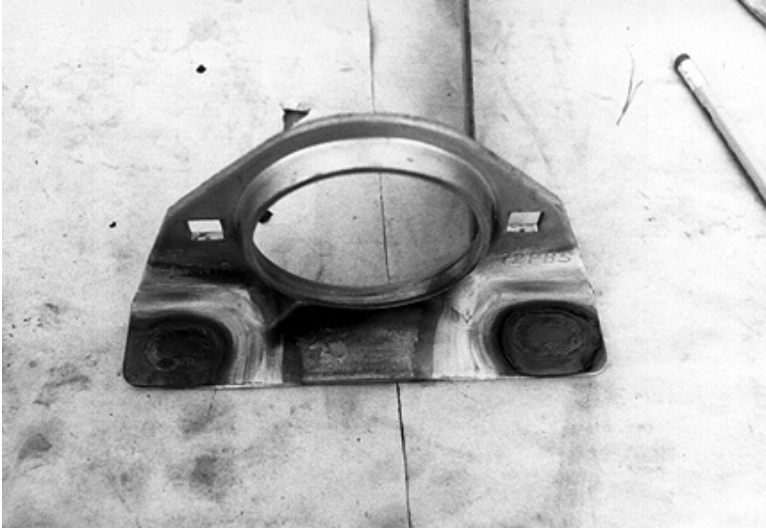


Photo #7

Weld the plugs in the holes. After welding, use a file or grinder as necessary to remove excess weld or plug material, so that the mounting surface is flat.



Photo #8

Clamp the flangette to the front of the square drive tube on the airframe.

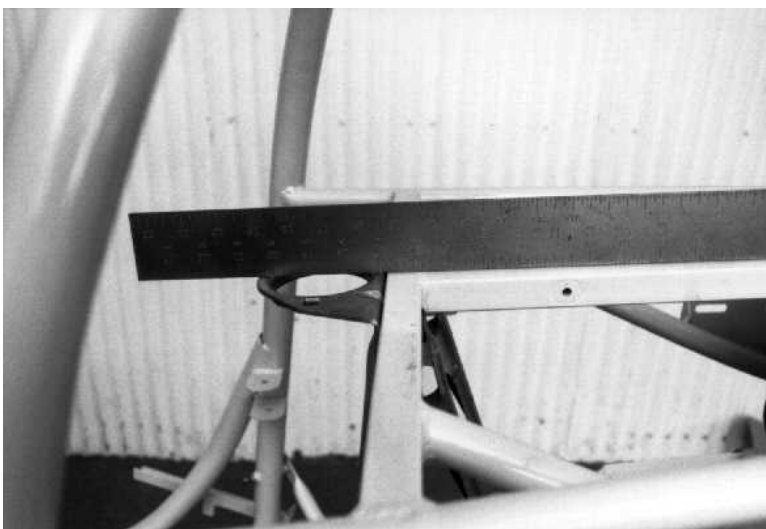


Photo #9

The top of the flangette must be even with the top of the square drive tubes.



Photo #10

If the angle of the flangette is not 90 degrees, clamp it in a vise and use a hammer to bend the flat part until it is at the correct angle.



Photo #11

Clamp the flangette to the front of the square drive tube so that the tops are even. Using a felt marker, draw a line where the flangette will be cut to be flush with the bottom of the square drive tube.

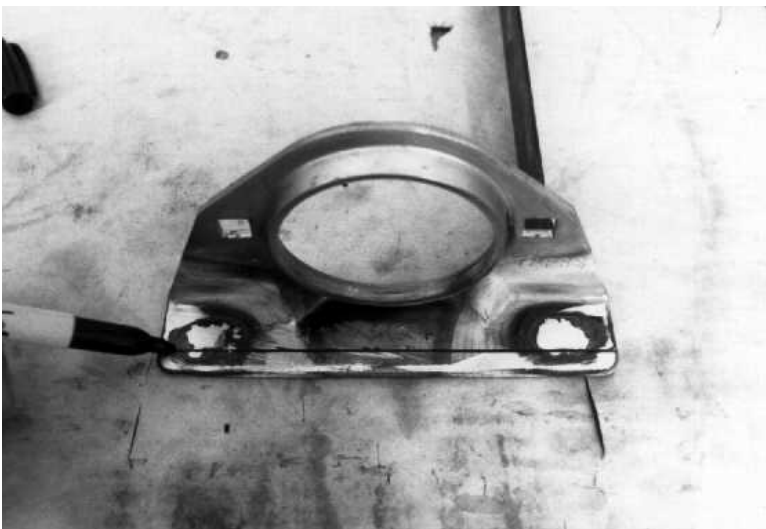


Photo #12

Transfer the mark to the other side of the flangette and cut off the excess with a band saw. It is necessary to remove this excess material so the bottom of the flange will not interfere with the upper frame clevis casting.





Photo #13

Check the fit of the backing plate and the bearing flange.

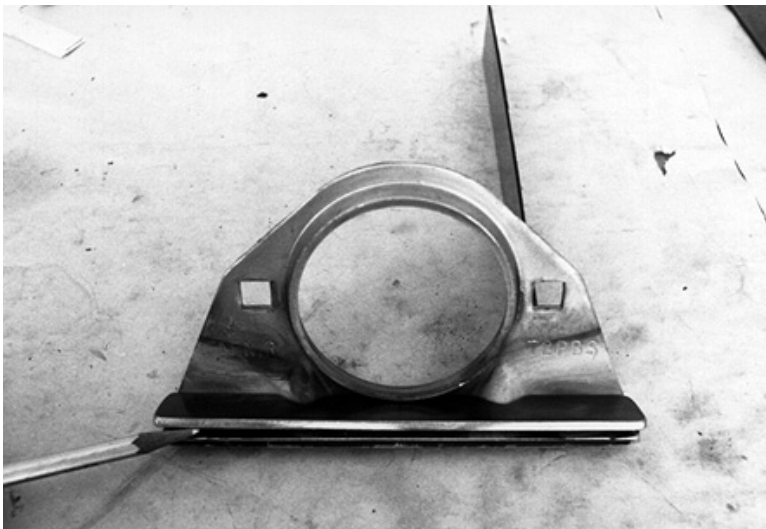


Photo #14

Another view of the backing plate and flange.

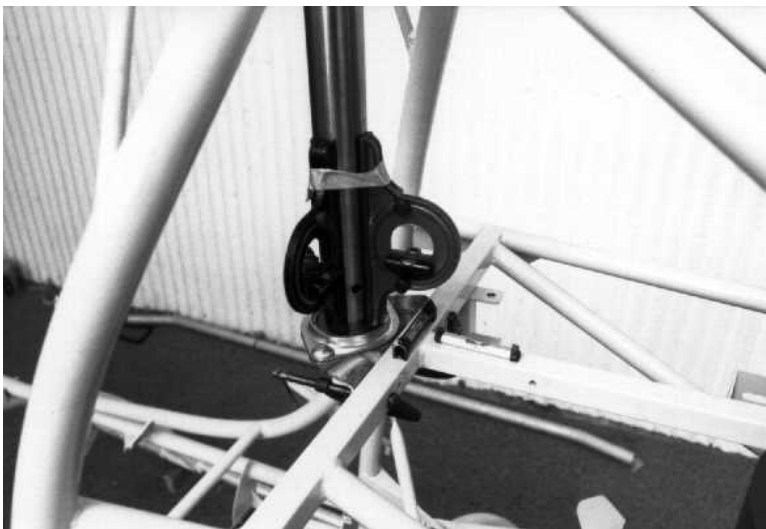


Photo #15

Assemble the lower main shaft bearing and clamp it to the square drive tubes. Install the main shaft in the bearings. Place a level on the square drive tubes to check the level in the fore/aft and lateral planes. Shim under the skids if necessary to level the drive tubes. Set the protractor level for 90 degrees and fasten it to the main shaft. Move the lower bearing laterally until the shaft is 90 degrees to the square drive tubes. The holes in the hood bracket may be elongated if necessary to make the shaft 90 degrees to the square drive tubes fore/aft.

## MAIN ROTOR SHAFT INSTALLATION

When the shaft is installed, it **MUST** be 90 degrees to the square drive tubes, both laterally and fore/aft. The previous page states that the holes in the hood bracket may be elongated if necessary to achieve fore-aft alignment. Occasionally this may not provide enough movement because the main bearing flanges might come into contact with the airframe tube under the hood bracket. If this happens, the bearing flanges can be ground off slightly to allow them to be moved back.

We recommend the use of a large builder's square for checking squareness here. This will be more accurate than using a protractor level.

It is also important that the main sprocket has the proper clearance (7/16" to 1/2") above the square drive tube to ensure correct alignment of the drive chain. If alignment cannot be achieved, one or two spacers may be added to the bottom of the main shaft.

The bolts and bolt heads that attach the sprocket to the hub must be safety wired on final installation, as shown on print E49-2001. Note that these bolts use the 1/4" all metal thin locknuts. Drill small holes in the main sprocket (no larger than 1/16") for the safety wire. (Refer to Section 11 page 5 and 6 for the details on installing these bolts.)

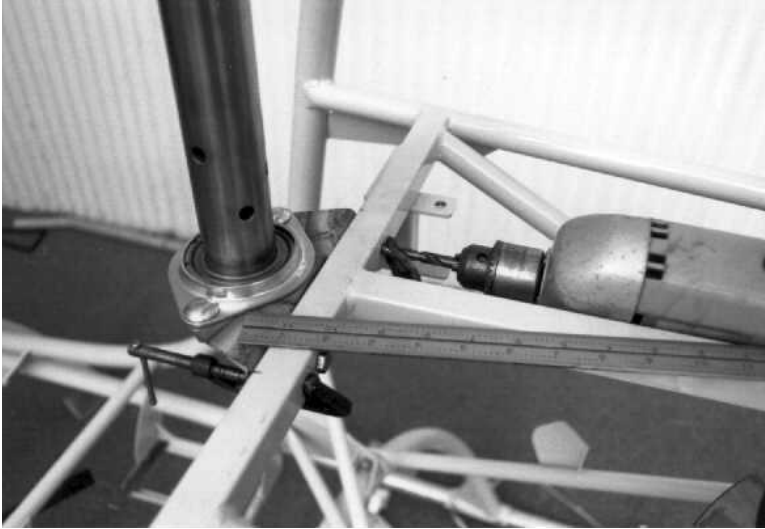


Photo #16

Check to make sure that the top of the square drive tubes and the bearing flangette are even. Then drill the holes in the bearing flangette.

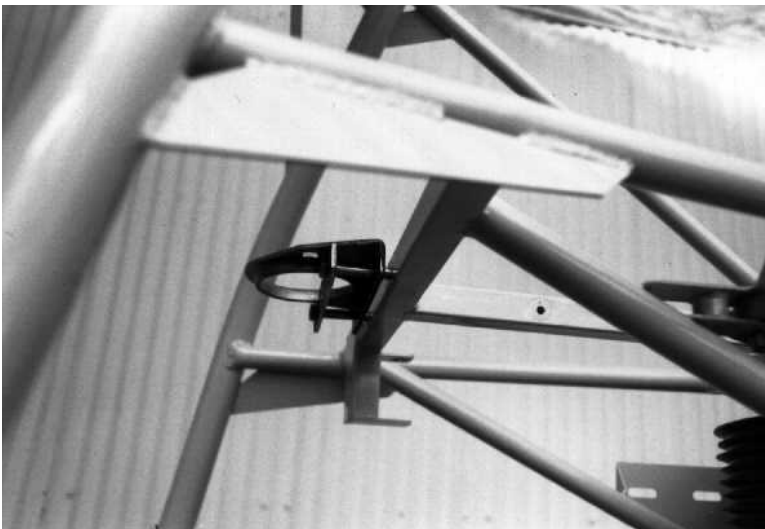


Photo #17

Clamp the backing plate to the flangette and drill the holes in the backing plate.



Photo #18

Check the hole alignment of the backing plate, flangette, and square drive tube.



Photo #19

Bolt the lower bearing, backing plate, and upper frame clevis casting to the square drive tubes.

Install the complete main shaft assembly and proceed with the body installation.



Photo #20

Parts as received from RotorWay International for the body.

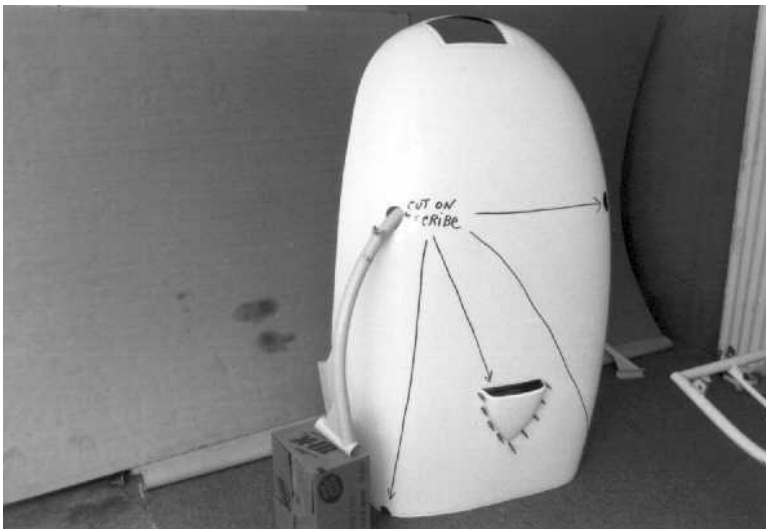


Photo #21

Cut out areas scribed for holes in the tub.



Photo #22

Disassemble the front landing gear and install the halves through the holes in the tub. Then re-assemble. Prop up the tub or have someone help you during this process.



Photo #23

Install the front landing gear on the skids and airframe. At this time it is not necessary to final tighten the landing gear bolts; merely insert them and install the nuts finger tight.



Photo #24

Perform the following task with the help of an assistant. (This is one of the more critical steps in the construction, so take your time.) Hold the seat panel down firmly in the manner shown and force it to the rear as far as possible against the airframe tube to which it will be bolted.

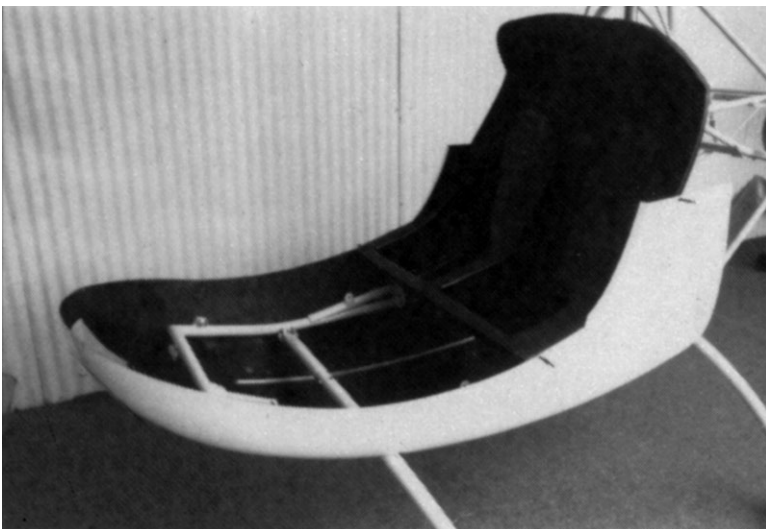


Photo #25

The seat should be a snug fit in the airframe.



Photo #26

Attach the fuselage tub to the seat bulkhead with two clecos in the pre-drilled master holes as shown. (Note: if landing gear cut outs do not match the gear, trim only the amount necessary to achieve a fit.)



Photo #27

The seat should sit on the curved frame tubes. However, later you may need to put shim in this area for alignment of the body.

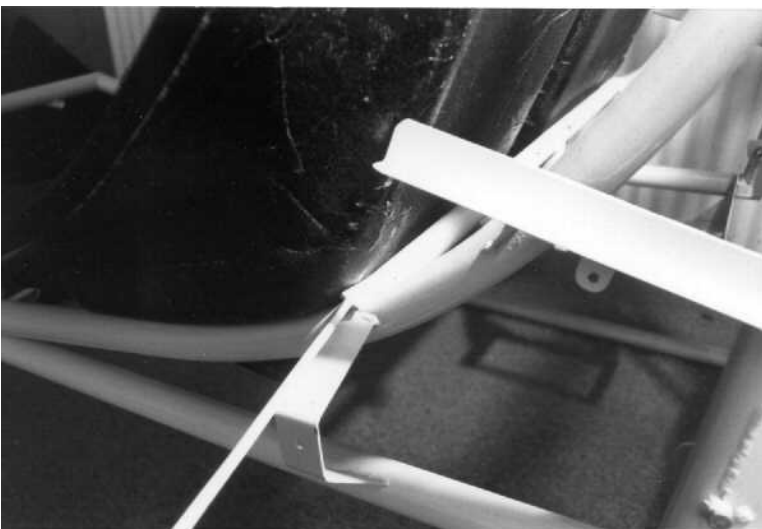


Photo #28

The back of the seat should be pushed tight against the cross tube of the airframe. This can be achieved by rotating the seat backwards and forwards to get a good fit.