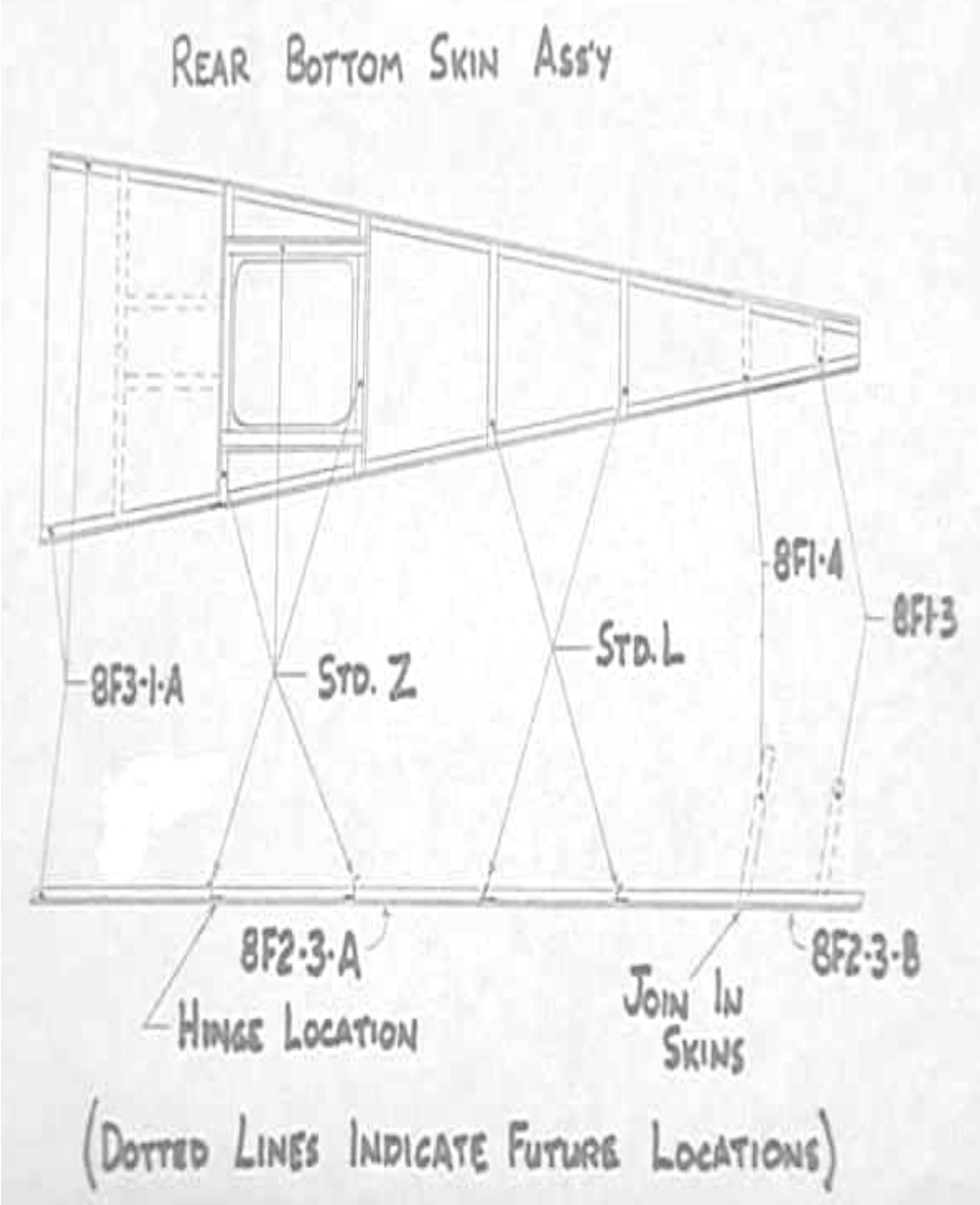
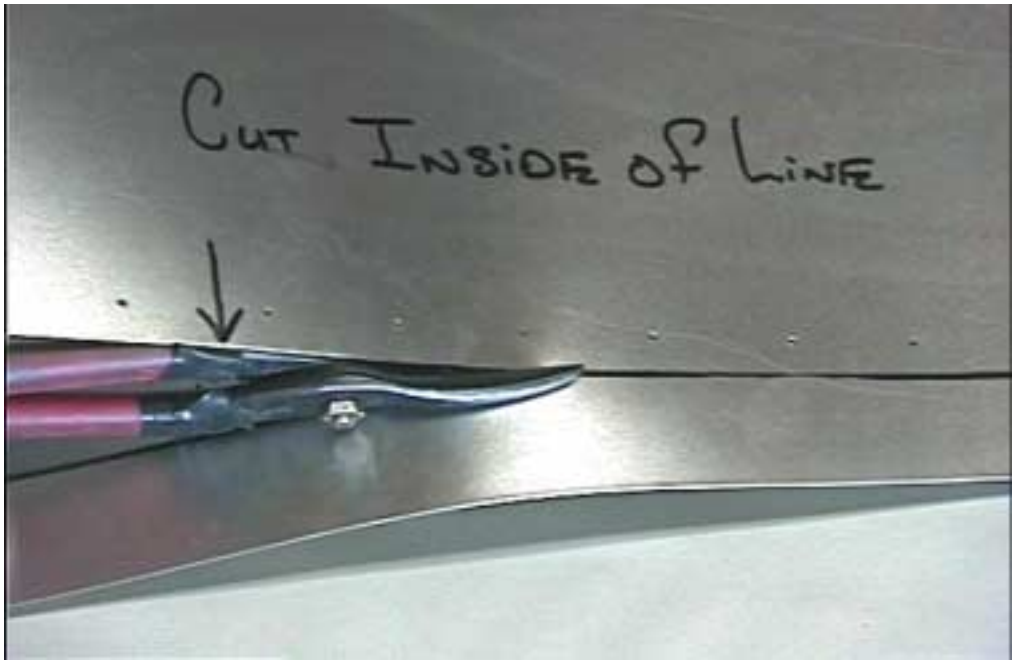
STOL CH 801
REAR FUSELAGE ASSEMBLY

SECTION 2
Rear Fuselage Bottom Assembly
Ref Dwg 8FR-2





FUSELAGE BOTTOM SKIN
8F2-3A

Note: The edges of skin 8F2-3A are <u>not</u> a straight line.

Check: edge distance from the center of the hole to the edge of the sheet = 9.5mm

Start by trimming the two skins to size.
The photo indicates to cut to the inside of the line, but it's a good idea to leave about 1/2mm of the black line as a witness. Trim carefully as this will affect the final size of the aircraft and how some other parts fit.

Work with the sheet flat on the workbench.

File the edge smooth to remove any slivers or sharp points. The body file is used to plane the edge for a smooth continuous curve.

FUSELAGE REAR BOTTOM SKIN 8F2-3B

IMPORTANT
Mark the aircraft center line in the middle of the sheets (both sides)
Check: The front and aft edges are square to the center line.

Decide which side will be inside and outside, clearly label the skin.

8F2-3A to 8F2-3B
A4 PITCH 40

End holes in the Longerons = A5

Drill #40 and cleco 8F2-3A & 8F2-3B together.
Line up center lines, 20mm overlap
Check: length = 3806mm (measured along the aircraft center line).

Lay the skin upside down on the workbench: inside faces the workbench.

A4 PITCH 40

Mark the stiffener for trimming both ends.

SUGGESTION:
Remove each L angle from the skin before installing the next one.

Check page 1 (of this section) to determine the placement of stiffener L's and Z's. The bend in the L angle is towards the front. The first Z, the bend is towards the front. The rear Zee, the bend is towards the back.
Back drill the two L angles and two Z angles through existing holes in skin: slide a piece of 1x2 board under the skin at the location of a stiffener rivet line.

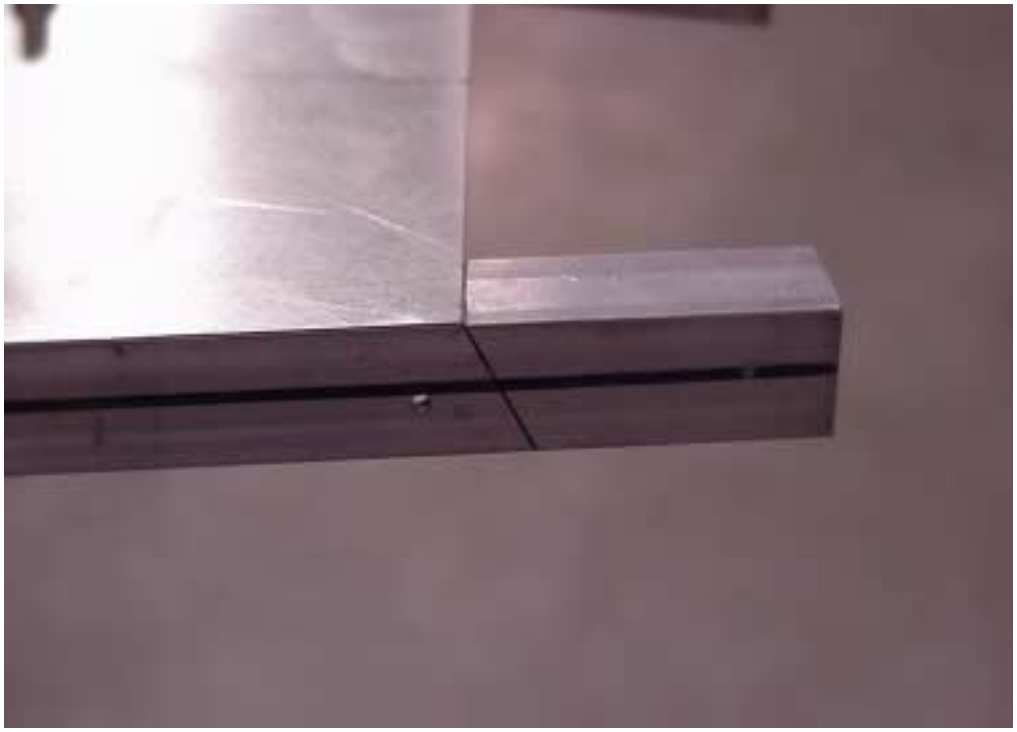
Rough cut: snip each flange, then flex to break off end.
Final cut: start at one flange, rotate the L angle to cut around the radius and continue through to the second flange.

RED Snips Shown.

Remove the ‘L’ and trim to size. This is not the final size so don’t spend time finishing the ends.

Also drill and label the diagonal L angles.
Trim the ends of the diagonal angles square 10mm past the last hole.

Next - trim 3mm off each end to allow the angle to fit in between the Longerons

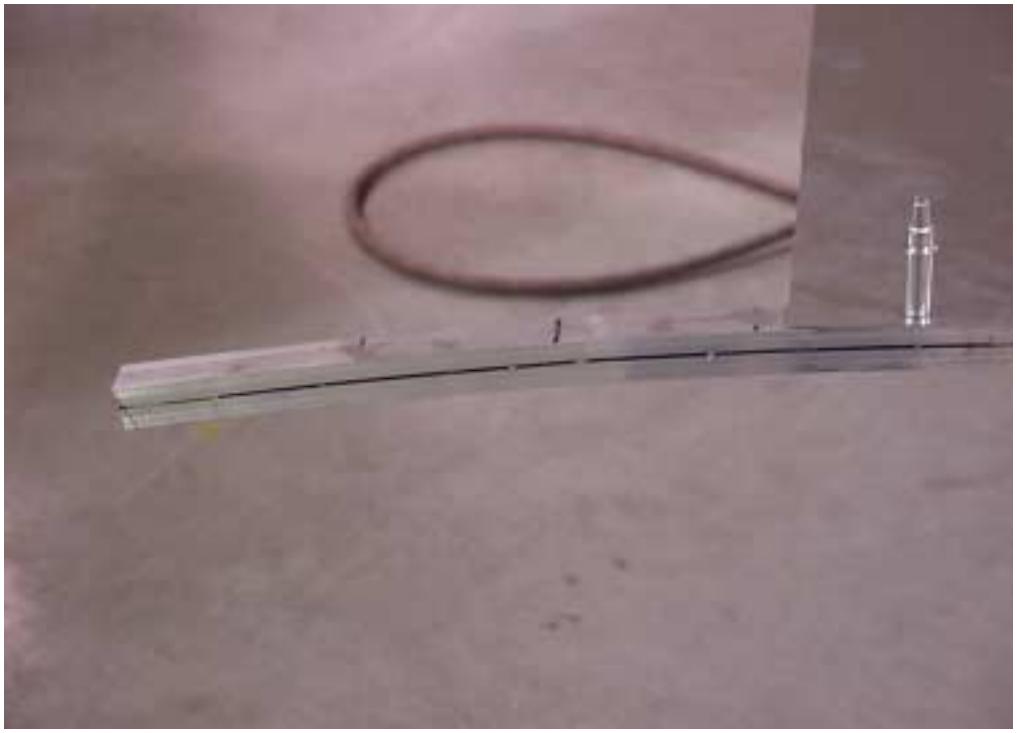


BOTTOM REAR LONGERON 8F3-1A

IMPORTANT
Before removing the Longerons from the side skins trace the aft edge of the Rear Side Skin 8F2-2B on the 8F3-1A.

Reference edge: line up the aft edge of the skin with the aft edge of the side skin (marked line on the side of the longerons).

Mark the rivet line along the bottom flange of the lower longeron.
Since the longeron will be reference along the edge of the skin, the flange center line is a check to confirm proper edge distance of 9.5mm



The front portion of the Longerons is longer than the bottom skin

CHECK the curvature of the Longerons at the front, when looking at the fuselage on the finished airplane, the front of the Longerons bend up and inboard (left and right).

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The aft edge of the Bottom skin is even with end of the side skins

The sides of the skin are <u>not</u> a straight line. Therefore continue to position the longeron as you drill. Cleco every second to third hole. Check your work then drill the rest of the holes in the longerons.

A5 PITCH 40

Drill with pilot holes #40 and Cleco one side at a time. Then reposition the skin with the other edge along the workbench.

Joggling Stiffeners

4mm step approximately 25mm long.

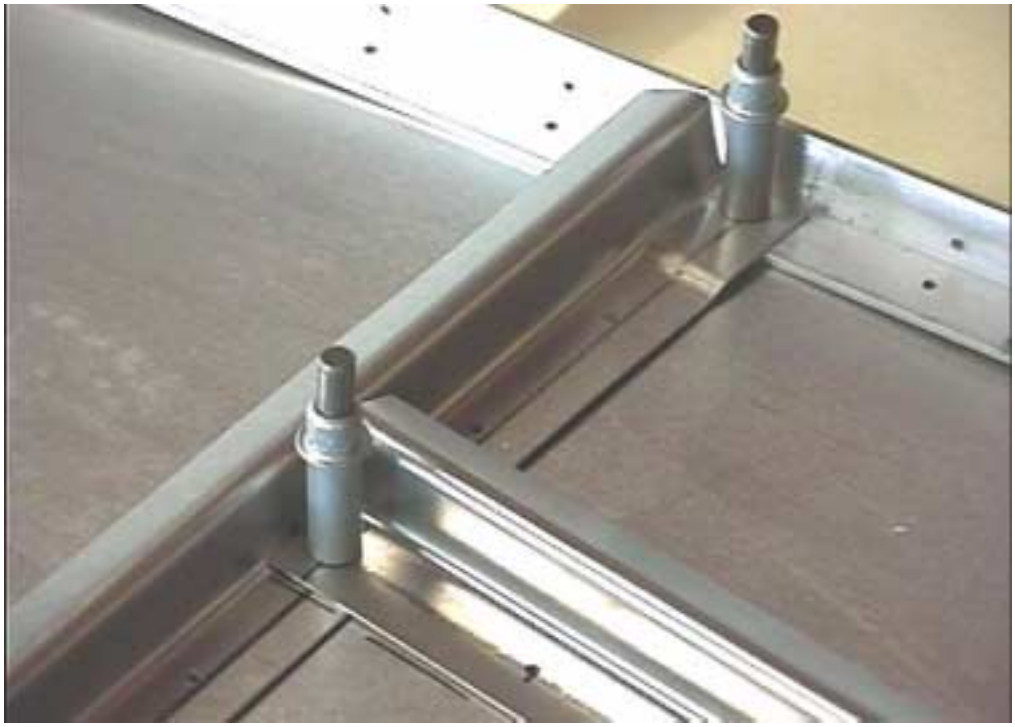
Hardwood is best but this one was made from spruce and worked well.

Make this block to produce the correct joggle in the ‘L’ stiffeners.

Joggling L angles:
Place the stiffener in position on the block and give it a sharp blow with a rubber mallet approaching from slightly behind the radius.

Joggle the top and bottom end of the vertical L angles.

Detail of joggled end.



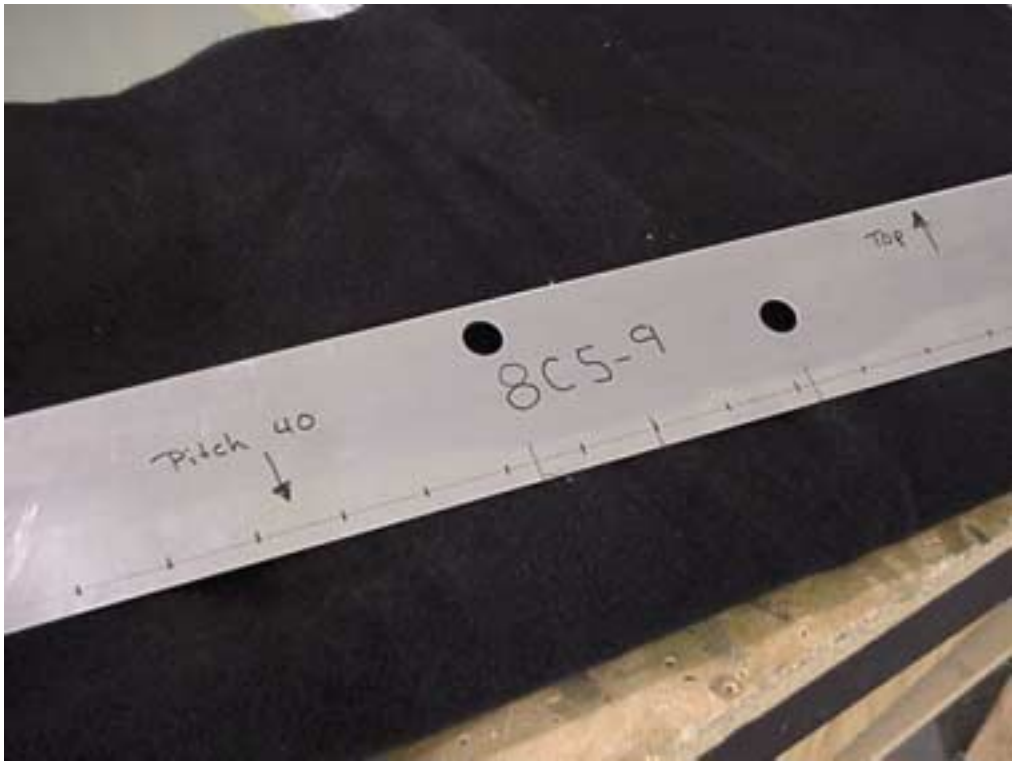
Detail of Z angles around the bottom access panel.

Cut two pieces of Z angles to fit along the sides of the opening, front and back overlap on top of the bottom flange.

A4 PITCH 40
In Z angles

In forming the joggle the hole at the extreme ends of the 'L' or 'Z' may move out of position. To correct cleco the 'L' or 'Z' in place on the skin, re-drill the holes at the longeron. However this is not much of a concern as these holes will be opened up to 1/8" diameter later.

<u>Open the pilot hole for the size of the rivets:</u>
Back drill & cleco the L angles with #30
Back drill and cleco Z angles with #30
Back drill and Cleco the left and right Longerons with #20



REAR CABLE FAIRLEAD SUPPORT CHANNEL 8C5-9

Bottom flange drilled to the L angle.

Layout the rivet line in the middle of the overlap, edge distance = 9.5mm

A4 PITCH 40

#30 Holes

Clamp 8C5-9 to the first L angle behind the access cover.
Overlap = 19mm.
Remove the L angle.

REAR SEAT FORWARD CHANNEL
8F11-7

Mark the center line square to the bottom flange.

A5 PITCH 40

Drill & Cleco with pilot holes #40

Photo to show the relative position of the Rear Seat Forward Channel 8F11-7 along the front edge of the bottom skin.

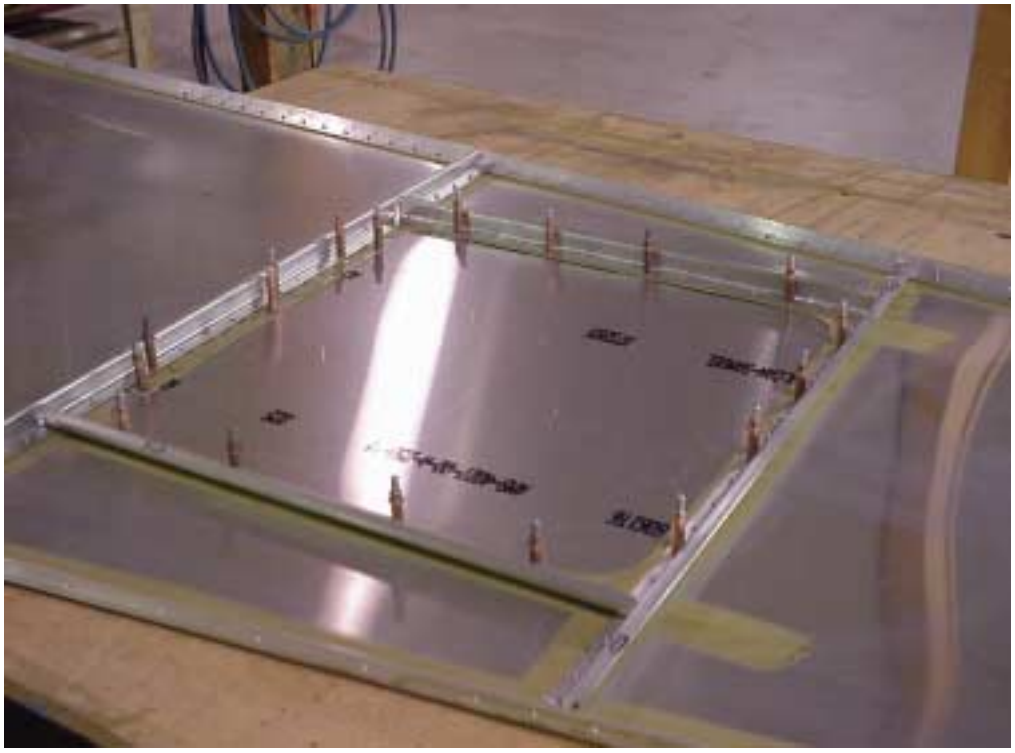
The Channel is positioned along the front edge of the bottom skin (bends toward the front).
Wait to drill with #30 until after the Cabin Floor 8F8-7 is positioned.

Line up center lines

Check edge distance. Clearly label the top side of the bottom skin.

COMMENT: it may be easier to work with the skin upside down on the workbench and to “hook” the flange of 8F11-7 over the end of the workbench, drill down into a solid surface instead of drilling up!

Drill the rear seat forward channel 8F11-7. It is located with the centerline of the 79^{o} flange located on the predrilled holes at the forward edge of the bottom skin.
REMOVE THE CHANNEL AFTER IT IS DRILLED.



The location and size of the access hole is marked on the skin between the Z angles.

Install the std ‘Z’ around the access door opening location. The edge of flat flange on the ‘Z’ is set on the access opening line drawn on the skin.

Use a hole-finder to locate and drill the holes or carefully slide the assembly off the bench and drill from the underside. Take care to properly support the assembly. Cleco as drilling proceeds.

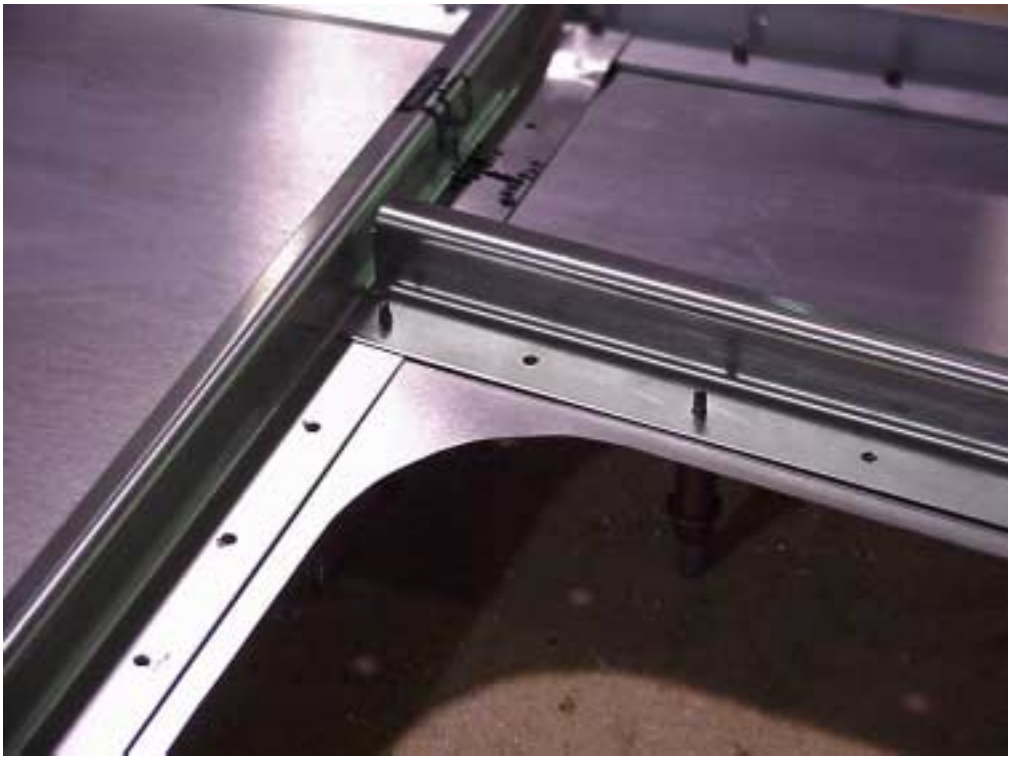
Remove all longerons and stiffeners.
Cut out the access door hole.
Deburr all parts, re-assembly by placing the Clecos on the outside.

RIVET SIZE

- **Longerons A5**
- **L angles A4**
- **Z angles A4**

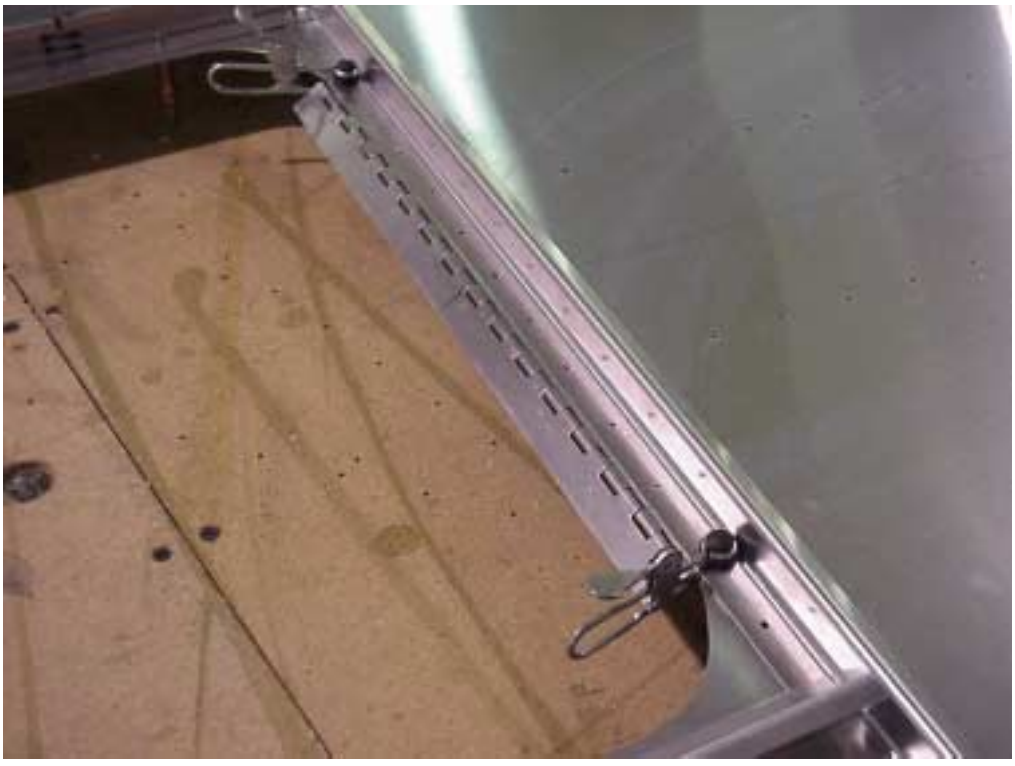
The Z angles are riveted after the Piano hinge is installed and the holes for the nut plates are drilled.

Place the rivet head on the bottom side against the skin.



Note that the flat flange on the Z's are placed next to the door opening of all four sides.

Photo of left aft corner



REAR ACCESS COVER HINGE
8F2-5

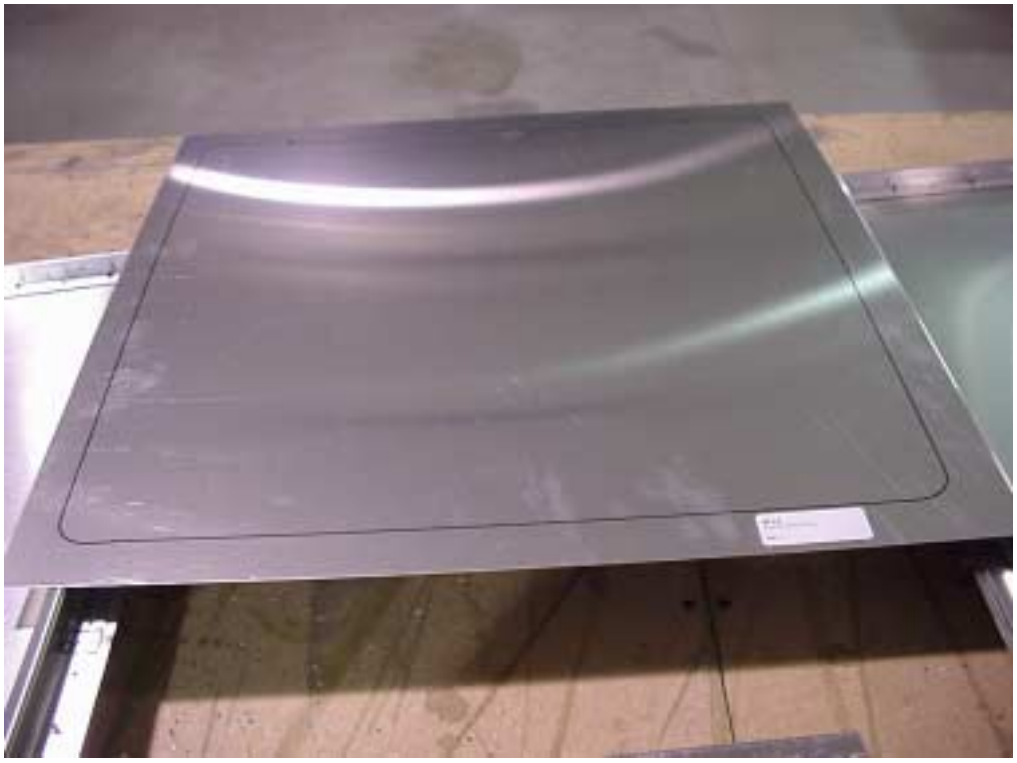
The front edge of the access hole is cut flush with the aft edge of the Z angle.

Spine is installed on the outside (pointing down)

Drill and Cleco with #40

Orientation: On the front side of the access hole, the cover is hinged along the front.

Clamp the piano hinge between the bottom skin and the Z angle.



REAR ACCESS COVER 8F2-4

Trace of access hole on the door. Cut the door to size.

The Door is approximately 20mm bigger all round than the opening to install the screw fasteners.

Center piano hinge on the door.

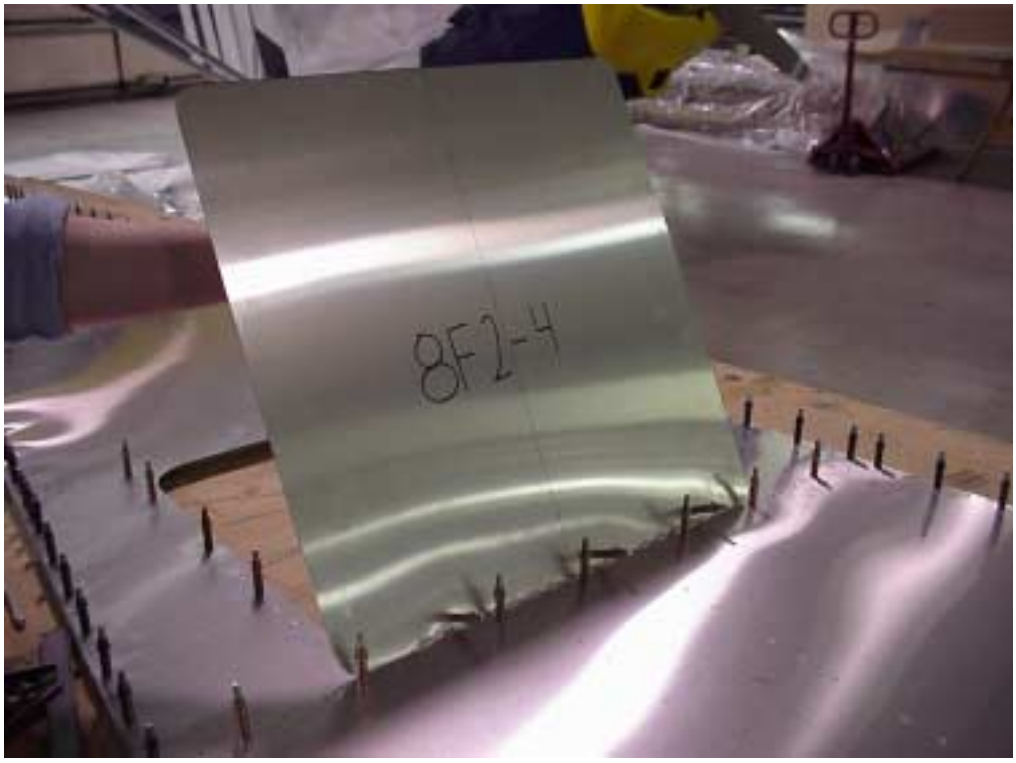
The Piano hinge is installed on the front side of the door.

Make a cutout in the door to make room for the hinge spinner: this will allow some overlap of the front of the door with the fuselage at each end of the hinge.

Disassemble the piano hinge.

Crimp one end of the hinge.
Shorten the hinge rod by 5mm and reinstall it.
Crimp the other end of the hinge.

The crimp on either end is a simple and effective method of keeping the pin in place.



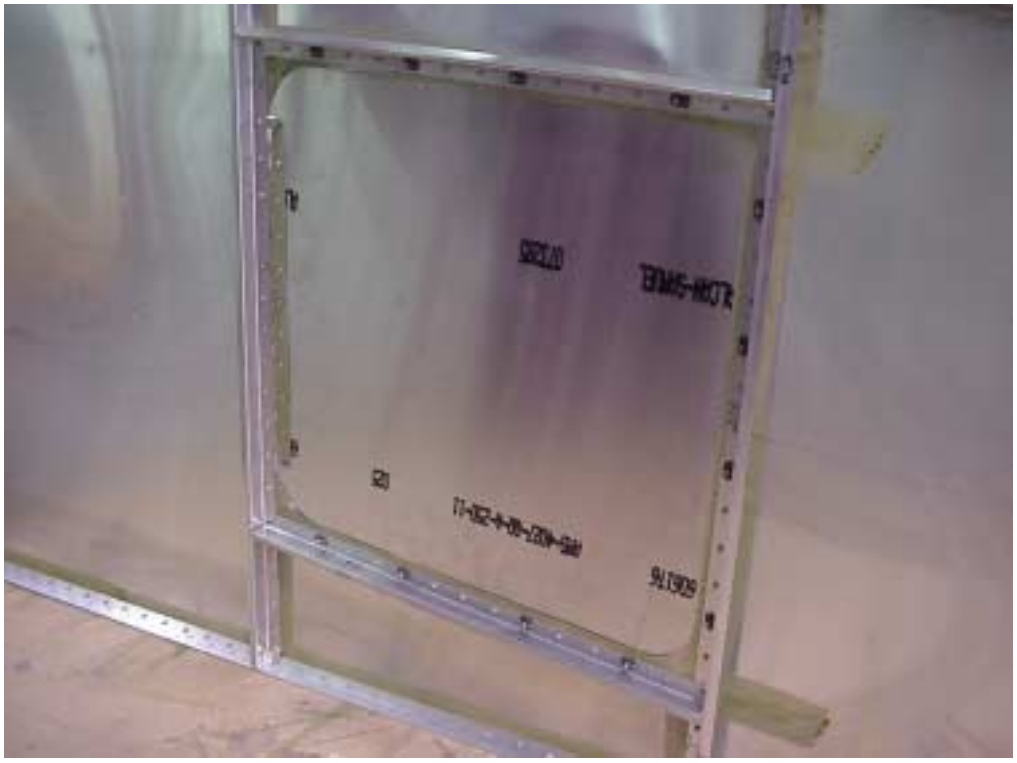
Test fit: the spin is installed on the outside.

The access door is secured with twelve screws and nut plates. These are located as follows.

Four down both sides and four across the rear edge. They are placed in the same rivet line used to secure the Z's surrounding the access door in the place where a rivet seems to be missing.

NUT PLATES
MS21075L3

Layout those positions and drill a 3/32" pilot hole through the 'Z', the skin and the closed access door.
Center a nut plate over the 3/32" pilot hole; drill the two mounting holes for the nut plate. Remove nut plate to open the middle hole to 7/32"
Rivet the nut plates in position with A3



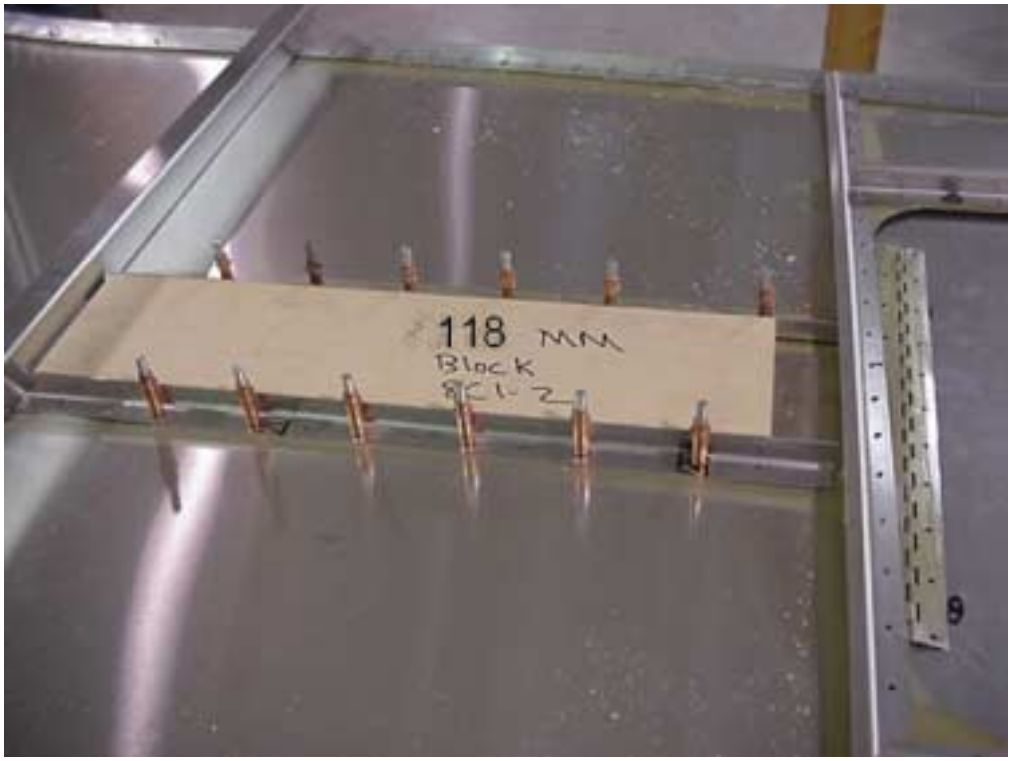
Reference bottom left diagram on CAD drawing 8FR-2

Use the domed head A3 rivets (3/32”) to install the nut plates MS21075l3L3 – use a flat nose piece on the riveter head.

RIVETING

- **Z angles A4**
- **Hinge to door and Z angle A4**
- **Nut plates A3**

3/16” machine screws AN525-10R7



L angles, #30 holes

A5 PITCH 40

Wait to rivet the L angles, remove later to drill to H.T. Bellcrank Bearing Support Channel 8C1-2

Make a plywood template 118mm wide to accurately space the L angles over the pre-drilled holes in the bottom skin.

NOTE:
Channel 8F11-8 is installed and drilled later when it can be clamped to the Side Channel 8F5-9

Viewed from the front looking back, the flanges of Channel 8F11-8 face forward.