

**SECTION 2:**



Nose Rib  
8R1-7

Position the lower nose rib on the front of the spar at the predrilled holes just above rear rib #3 (615mm from the bottom of the spar) Check lateral alignment (rib is centered left and right on the spar) Drill with #30 drill bit and cleco (4 holes)



Flanges on the nose rib  
point down.

Grommets for rudder tail light.



If you plan to install optional navigation lights:

To install the white taillight, run the wire.

- 150 mm. from the end of the spar
- 250 mm. from the end of rib 8R1-2
- Use ¼" I.D. grommet.

Use a Step Drill (Uni Bit) to drill larger holes in the aluminum sheets.

Refer to drawing 8RU-1



Rudder skeleton with nose rib.

Building Sequence: The tip rib is installed after the rear skin is positioned.

Disassembly the rudder skeleton to install the Upper Hinge Angles to the front of the spar.

Refer to drawing 8RU-1 for the size and location of the hole for the grommets



Upper Hinge Angles  
**8R2-4**  
**Qty = 2**

**NOTE:** Only one of the Hinge Angles has a pre-drill pilot hole.

Lay the two rudder bearings (8R2-4) on a flat surface back to back and clamp them together. Check that the aft flange is perfectly in line with each other.



1/4" hole (UPPER HINGE) in top flange for AN4-7A bolt. Refer to the bottom right diagram on drawing 8RU-3 to see how the rudder will be bolted to the fuselage.

First drill through the #40 pilot hole through both pieces. Then open (enlarge) hole to 1/4", recommend to use a drill press.



Mark the rivet line on the back side of the spar flange.



TIP: locate the center line by measuring across the spar, set the ruler at even interval of 140mm 120, 100 etc to make dividing in half easier!

Mark the aircraft centerline on the Spar. Note: the pre-drilled holes may not be perfected centered on the centerline.



Position a 10mm thick shim block between the two brackets. Slide a piece of 1/4" diameter rod through the hole in each bracket. Use this rod to align the lower bracket to the spar centerline.

Clamp the two Upper Hinge Angles 8R2-4 together with the 10mm spacer block between them.



The 1/4" hole on the Hinge Angles is in line with the spar center line

Adjust the rod over the center line on the spar (above and below the Hinge Angles)  
 Clamp the Angles to the spar.  
 CHECK: The rivet line (marked on the spar flange of the Hinge Angles) are visible through the pre-drilled holes in the spar) Adjust the assembly up or down as required for equal edge distance on the two Hinge Angles.



Undersize pilot holes:  
 Drill #30 and cleco.

**5 RIVETS A5**  
 (in each bracket)

Enlarge the hinge angle holes with a #20 drill for A5 rivets.

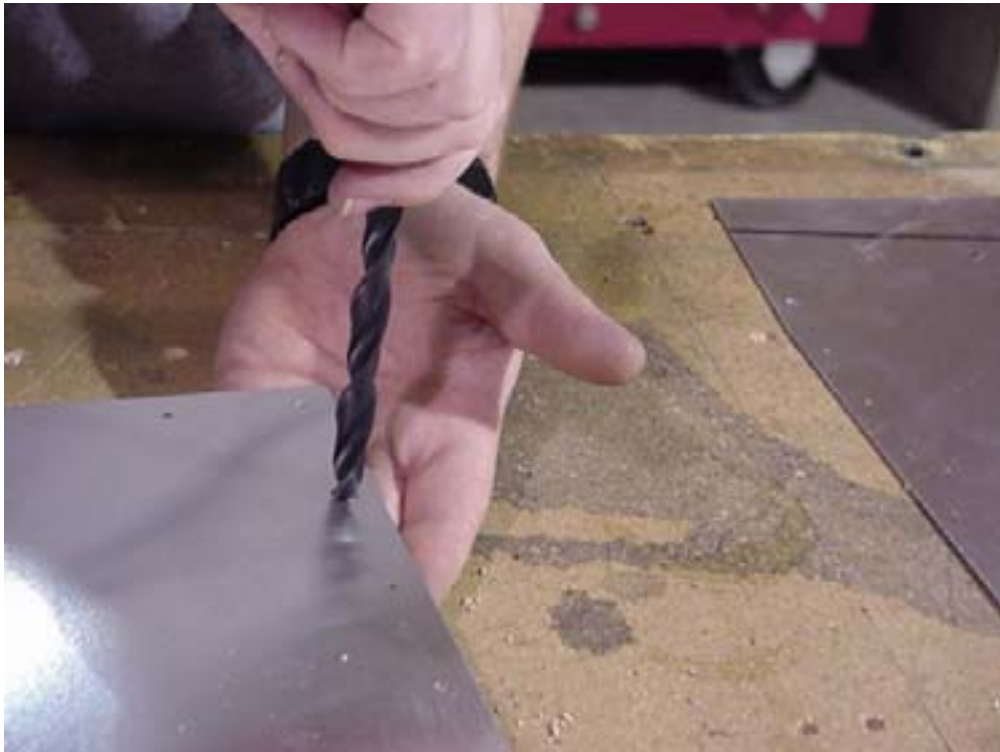


## DEBUR THE HOLE

Un-cleco all the parts.

Debur both side of every hole. Expect to find the largest bur on the on the backside of the part. When using a sharp drill bit, there is practically no bur on the topside of the sheet.

The burs on thin aluminum sheets are very small, running a flat file over the holes can knock them off. Use a double cut fine cut fit, if necessary round off the front of the file and any other sharp corners so as not to scratch the aluminum surface.



Using a large drill bit is another method of deburring the holes.

Give each hole a quarter twist, run your finger over the hole to confirm that there is no burr; otherwise repeat the process.

When using a drill bit, be careful not to countersink the hole!

**After all the holes are deburred, cleco the skeleton assembly together for riveting. Refer to the left diagram on drawing 8RU-1 for the rivet size.**

Deburring with a drill bit take much longer!



TIP: Depending how close the middle hole is drilled to the flange, it may be necessary to file the side of the riveter to get the tool to set properly.



Photo to show the flat nosepiece to install the 2 middle rivets in the Hinge Angles 8R2-4.

Use the custom machined nosepiece on the riveter for all other rivets.

Disassemble and countersink the center rivet hole in each of the hinge brackets. The center hole is countersunk and riveted from the front to provide the required clearance for the bolt when the rudder is attached to the rear fuselage. Rivet the hinge brackets with A5 rivets.



Avex blind rivets  
Flush counter sunk rivets  
(Note: the rivets do not have a pre-formed domed head)

A4 = 1/8" diameter  
A5 = 5/32" diameter

Two different diameter rivets. Only one length.



**Custom machined nose piece on screwed in the riveter head.**

There are two size of riveter head: do not use A4 rivets with the custom nose piece for the A5 Rivets:

**CHECK:** The diameter of the machined nose piece is the same diameter of the rivet head.



Pneumatic riveter. The A4 and A5 rivets can be pulled with a hand riveter or with a power tool (pneumatic or hydraulic).

At high air pressure (above 30 PSI) some pneumatic riveter will have a tendency to pull the A4 rivets too fast; the gun will recoil and bounce off the skin, possibly marking the skin in the process.

**SUGGESTION:** Install an air regulator on the pneumatic riveter to reduce the air pressure. The riveter will be easier to handle if it does not pull too fast.





The special machined nose piece on the riveter will draw the edge of the rivet down on the sheet.

**CHECK:**

- A) The nose piece on the riveter is not leaving any marks on the skin
- B) There is not gap between the edge (around the circumference) of the rivet and the skin.
- C) When pulling the rivets hold the riveter square to the work-piece. If there is a gap between the edge of the rivet and the skin, chances are that the riveter was held on an angle to the skin. Simply drill out the rivet and replace it.



The rivet is pull tight from the front and from the back.

The grip range for the A4 rivets is from 0 to 1/4" (0 to 6mm) and for the A5 form 0 to 5/16 (0 to 8mm)



### Drilling out a rivet

Use the same size drill bit as the original hole.

For A4 use #30

For A5 use #20

Carefully drill off the rivet head. Stop as soon as the head is loose. Remove the head from the drill bit before proceeding to driving out the body of the rivet.



Rivet on the right has the head drilled off.

**CAUTION:** Once the head is removed, the drill bit will have a tendency to slip off the rivet and elongate the hole as soon as it makes contact with the steel mandrel in the middle of the rivet.

**TIP:** Hold the drill with two hands; angle the drill as necessary to keep the drill bit centered on the rivet. Use short power burst on the trigger, check for signs of progress before proceeding.

With the same size drill bit as the original hole, carefully push the rivet through, turn the drill very slowly and apply a reasonable amount of pressure to drive the remaining part of the rivet through the hole. Don't push too hard or the rib flange will bend. When drilling out end holes, try to support the rib flange by sliding the file under the bottom side of the flange to prevent the flange from bending away.

**Next size:** For elongated holes, use the next size rivets: use an A5 instead of an A4.