Rudder Hinging

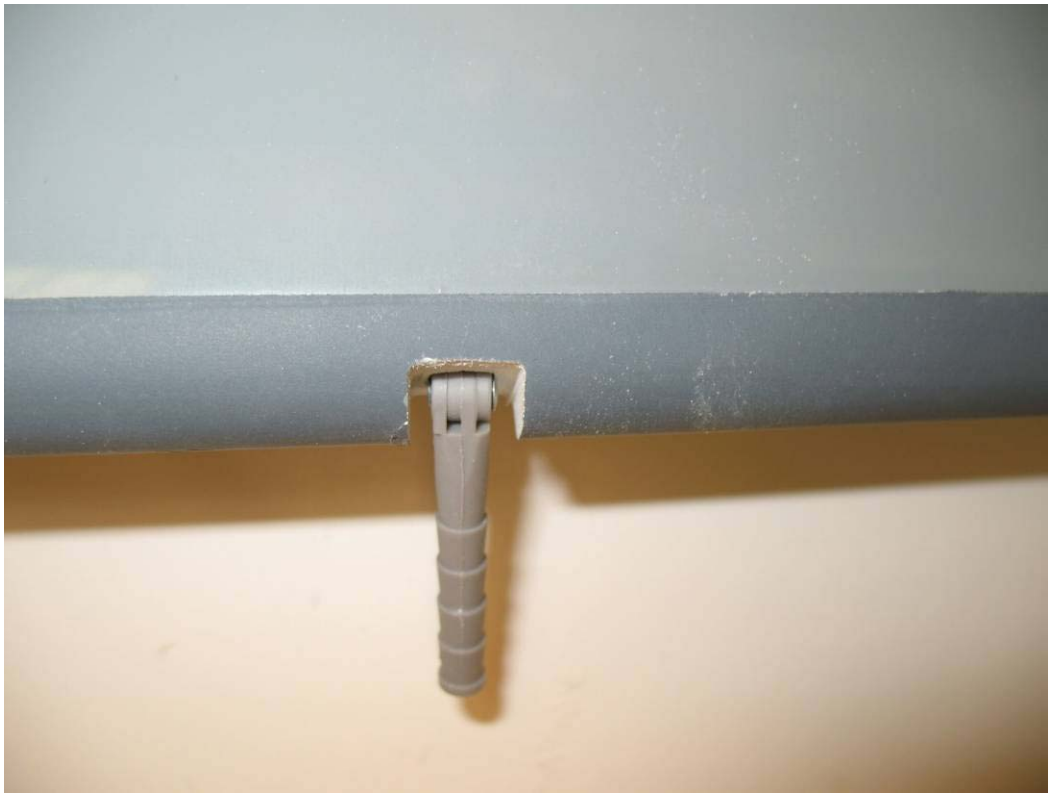
Note: This procedure is shown early in this manual because many of the tools and techniques can be applied on following assembly sequences.

Sufficient rudder travel is important to a good aviator. Slow rolls, point rolls and crosswind landings demand it.
To get sufficient rudder travel (1 1/8” L & R of center at the top) the hinge pivot axes must be recessed into the rudder by a distance equal to the radius of the rudder L.E. at that hinge position.

☐ Installation of the Robart H.D. hinge point begins by drilling out the pilot holes with a 3/16” drill bit. A Perma-Grit RF-6C tool may be necessary to keep the hole for the hinge body at 90° to the L.E.

Rudder Hinging (Continued)

☐ Use a Perma-Grit square file (large) to make notches in the L.E. and then to adjust the round hole to a square entry to accept the hinge body. Adjust the holes and slot as necessary to position the hinge pivot to be one radius of the L.E. deep.



☐ Apply Vaseline to the hinge pivot.

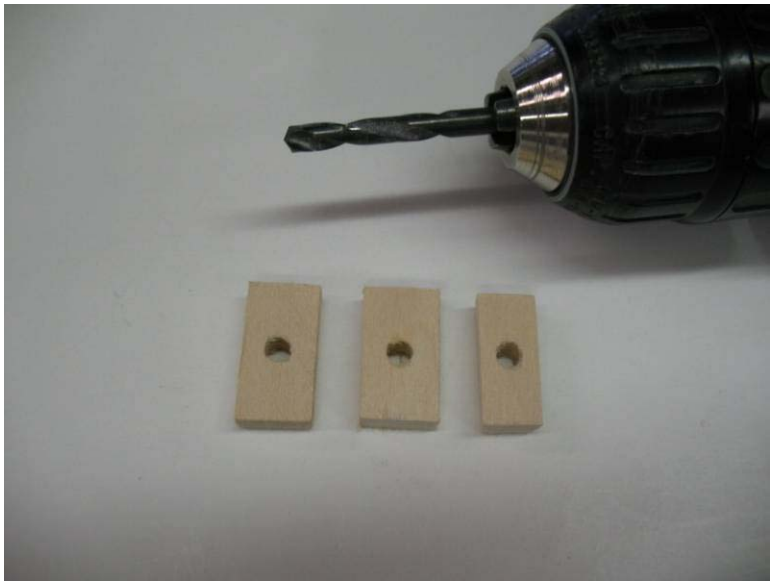
Rudder Hinging (continued)

☐ Inject BVM Aeropoxy into each hole in the rudder and work the hinge in and out to remove excess glue. A small artists' blade is handy to remove glue. Allow the glue to set 3 to 4 hours.

☐ Use tape and a sanding block to mark and trim 1/16" of material from the fin T.E. Use a smaller sanding block to bevel the T.E.'s back to a thin edge.

Rudder Hinging (continued)

☐ From the 1/4” x 1/2” x 4” basswood block supplied, cut (3) 1” long pieces and drill a 3/16” hole in the center of each. The block for the uppermost hinge will have to be trimmed in width to fit into the fin T.E. opening. Bevel the edges of the blocks as necessary to clear glue joints.



☐ Use a Perma-Grit large square file to make the 3/16” holes square to accept the hinge stem. Hand fit a basswood block to each hinge stem until it is snug, yet stands off the rudder L.E. about 1/16” as shown.

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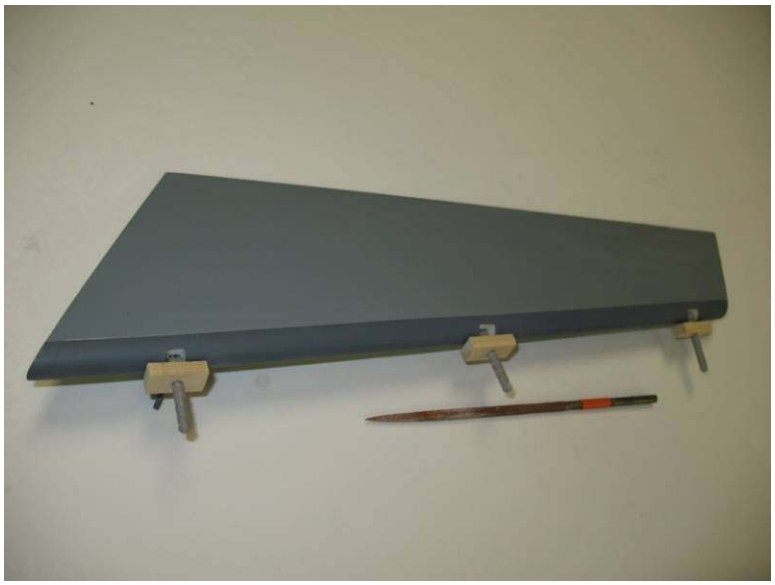


Rudder Hinging (continued)

☐ Hand fit the rudder basswood blocks to Adjust the holes in as necessary to rudder hinges to fit the fin T.E.

with the the fin T.E. the fin T.E. allow the a bit loose in

☐ After the rudder to fin fitting is complete, inject BVM Aeropoxy into the fin T.E. and coat the basswood hinge stems. Trial remove and apply Aeropoxy where Space the rudder card thicknesses Apply the rudder place. The gap side of the rudder should also have clearance. Allow to

blocks and fit to the fin, more BVM needed.

tip (3) business from the fin tip. and tape it in between the L.E. and fin T.E. a three card cure.

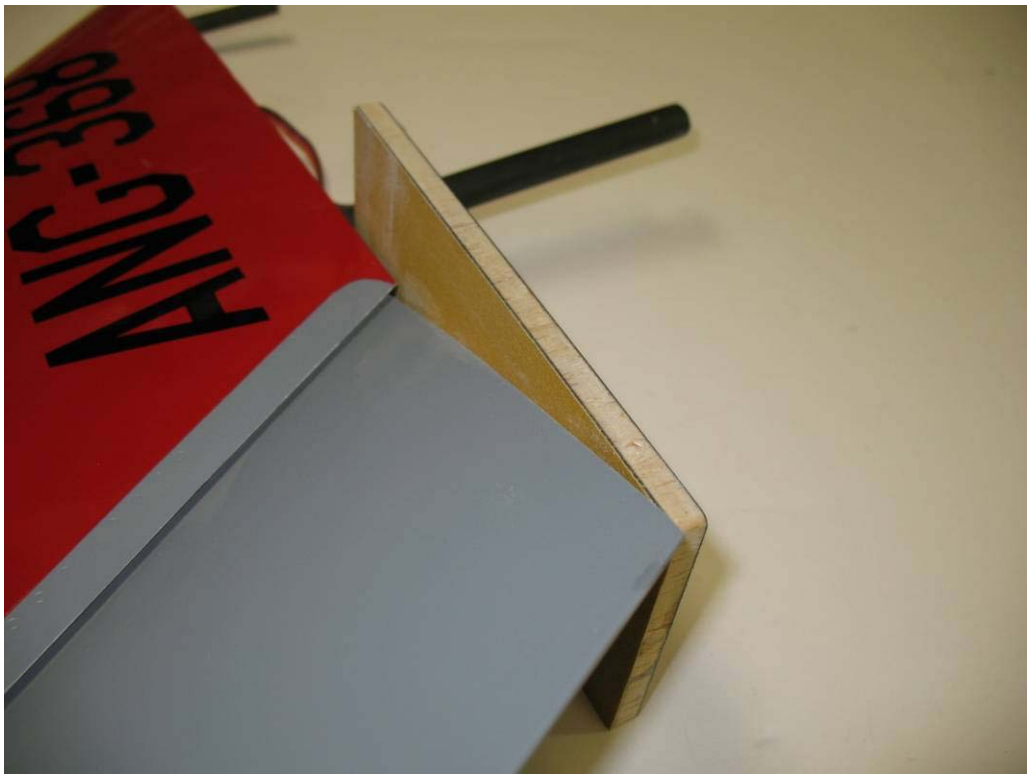
Rudder Hinging (Continued)

- ☐ To get full travel of 1” from neutral at tip it may be necessary to remove material from the fin tip extension. the

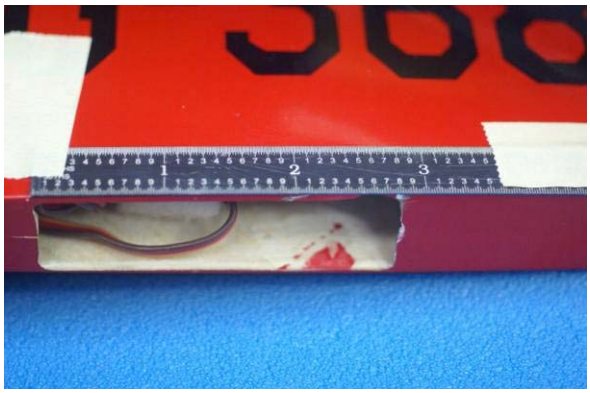
We used a piece of Perma-Grit #103 Flex Strip to accomplish this.
Use an appropriate paint such as Model Master available at your local hobby shop for touch up.

☐ If the fin T.E. is still interfering with rudder travel, protect the rudder L.E. with tape and use the piece of Flex Strip to trim the edge of the fin.

Rudder Hinging (Continued)



☐ Deflect the rudder and use a sanding block to trim away that which protrudes below the fin base



Rudder Servo Installation (Preferred Alternate)

The rudder servo installation must be very rigid and slop free to offer positive rudder control and be flutter free. This alternate method moves all of the rudder control components into the vertical fin, providing many benefits which include inspection simplification, and direct rigid rudder operation and control. This method is “Speed Proven”. The Skymaster factory installed rudder servo box located below and aft of the fin is not used, and may be removed if desired. This BVM demo model uses a JR 8611a rudder servo.

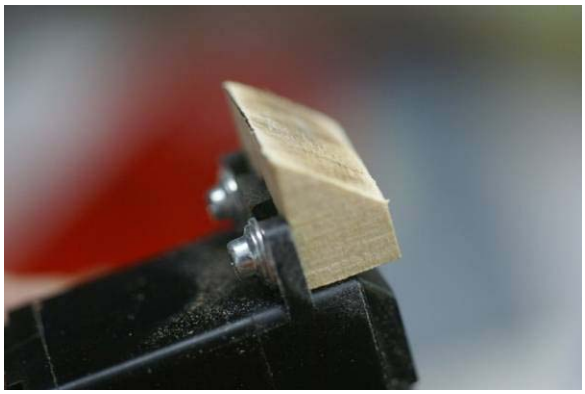
Rudder Servo Installation (Preferred Alternate Continued)

☐ Layout and cut a servo pocket in the vertical fin base located 7/8” forward of the aft C/F fin post. Extend the cutout forward 2 7/8”, and radius the corners to avoid future cracking.

☐ The servo mounting blocks are 3/8” thick x 3/4” wide x 3/4” rock maple, and are found in the BVM Supplemental Parts Kit. Groove both blocks to accept the servo case top web. A small cutter in a Dremel Moto Tool works well.

☐ Cut a 45° bevel on the forward mount block as shown, and attach it to the servo lugs opposite the output shaft. Use (4) # 2 x 7/16” SHSMS to attach both mount blocks to the servo. No rubber cushions or eyelets are required.

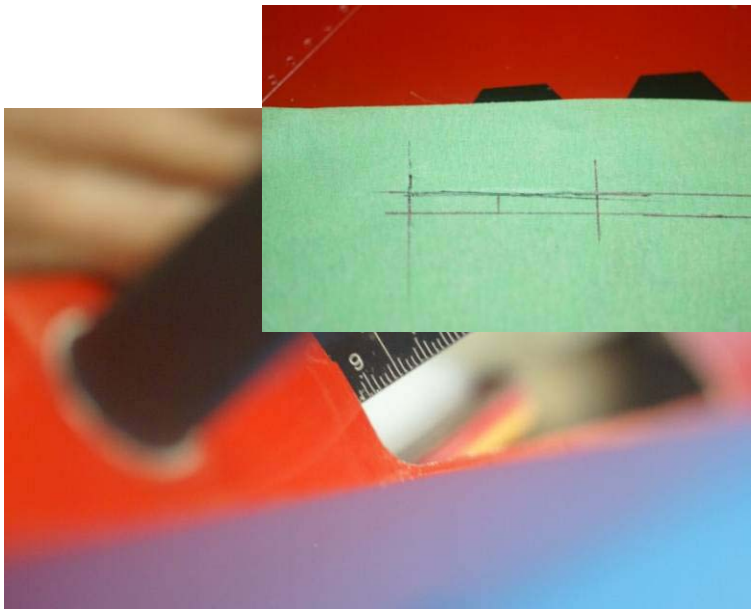
Rudder Servo Installation (Preferred Alternate Continued)

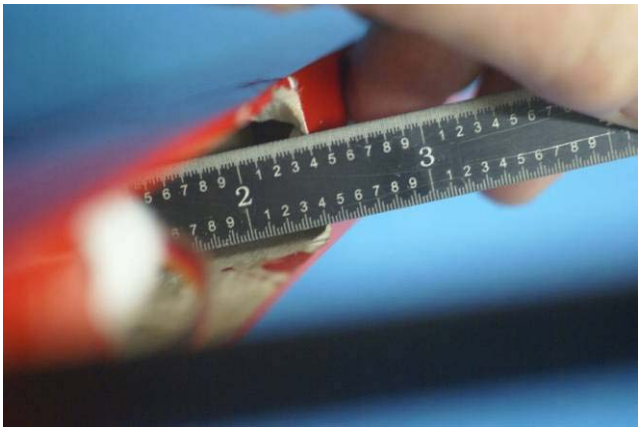


☐ With both mount blocks mounted on the rudder servo, insert the servo in the pocket and adjust the aft block length as required. If the servo opening is located per the dimensions called out in step #1the aft mount block should be 1.85” above the fin base, and the forward block 2.40” above the fin base. When satisfied with the fit, remove the servo assembly and apply BVM Aeropoxy or BVM Vio-Poxy to the blocks, and install. Clean up any excess adhesive with a “Q” Tip and isopropyl alcohol. When the adhesive has cured, remove the servo and make a small glue fillet around the edges of the mount blocks.

Aft mount block location 1.85” above fin base

Forward block location 2.40” above fin base.





Rudder Servo Installation (Preferred Alternate)

☐ Using masking tape, protect the vertical fin and rudder surface. Cut off one end of a JRPA 215 heavy duty servo arm. Electrically center the rudder servo and install it on the JR 8611a rudder servo with the servo arm closest to the aft fin post. Carefully measure the servo position. Transfer the servo arm location to the masking tape protective patch on the rudder surface above the servo location. Lay out the servo arm location on the masking tape protector. The slot should be 1.25” long.

Cut the servo arm slot with a Dremel #409 disc or equivalent. Adjust the slot with Perma-Grit tools to allow full surface deflection in both directions.

- ☐ Use a straight edge to extend the servo arm cutout location top and bottom edges to the rudder surface.
- ☐ Mark the position of the rudder horn so the clevis hole is positioned directly above the hinge pivot line. Use a Dremel #409 disk to cut the opening for the horn.
- ☐ Adjust the slot with Perma-Grit tools for a snug fit.
- ☐ Scuff the horn mounting foot with a small burr to ensure a good bond. Insert the rudder horn in the slot, but do not bond at this time. The rudder horn will be bonded in position later in this manual.