RV9A Builder's Journal

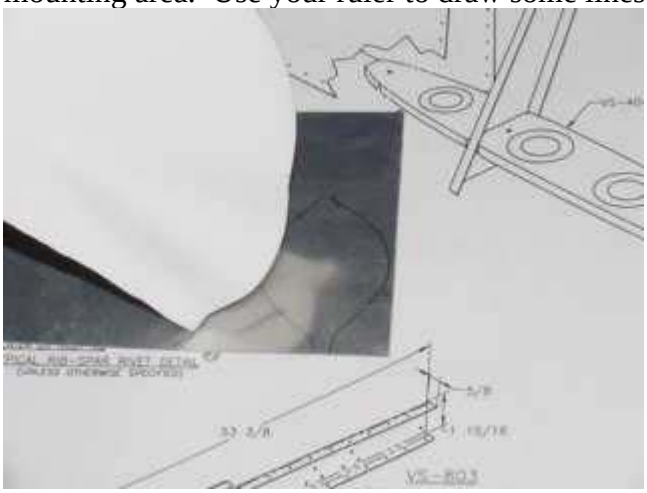
Rudder Bottom Light Installation

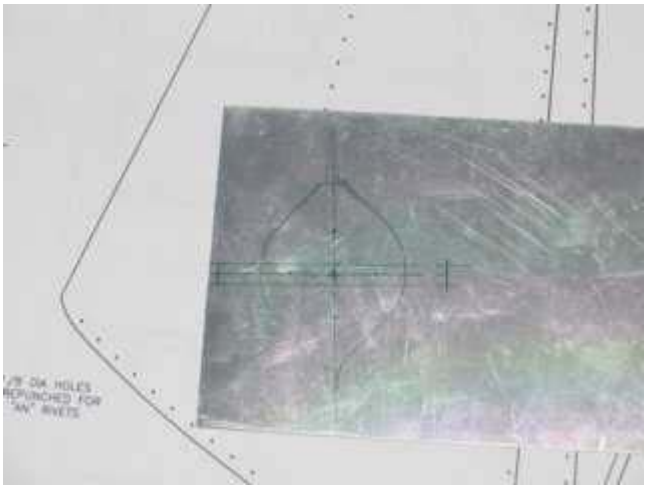
For three years now I blew off fitting the fiberglass rudder bottom. Now, I have no choice since it is on the short list of things to do. So the problem is, "how the heck do I bolt this light on"? Seems like I was not the only one wondering. Searching the archives of the usual places turns up a variety of solutions, some of them good, some overly complex.

My goal with this particular piece of fiberglass is to permanently attach it to the rudder bottom. This means that the light must be easily removable from the outside in order to be serviced. The obvious answer is to slap a couple of nutplates on and be done with it. However as you look closer, that is more easily said than done.

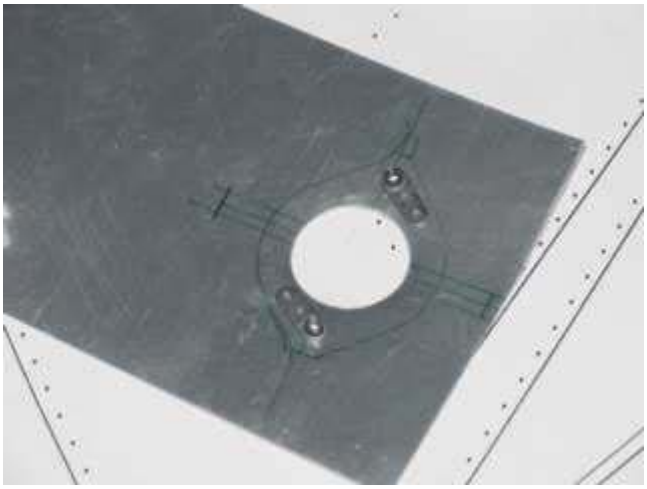
The little pod that Van's molds in to this piece is scarcely big enough to hold the Whelen combo strobe/position light. It is just about physically impossible to cut a hole for the light and for nutplates, then actually rivet nutplates directly to the fiberglass. What I did instead, was to create a plate out of some scrap aluminum sheet in the same shape as the mounting surface of the fiberglass, attach nutplates to that plate, then attach the plate to the fiberglass. Simple, fast and works great! It also allowed me to use a decent sized #6 nutplate and screws.

Step 1. Get some aluminum sheet from your trim bundle and trace the outline of the rudder bottom light mounting area. Use your ruler to draw some lines and mark the center.





Step 2. Using a fly cutter, big unibit, or a large firearm, make a hole large enough to accomodate the light. Mine was 1 1/16" in diameter, and I used a fly cutter in my drill press to knock out the hole. Once you punch the hole, use the light assembly itself to mark the locations of the mounting holes on the plate. Find a good position to place the nutplates. Note the picture - I found that only the "one legged" nut plate (MK2000-06) would fit. I suspect a "corner" style would fit also, but I didn't have one available.



Step 3. Drill holes for the nutplates and cut the plate out of the sheet. Debur and polish it up.

Step 4. Knock out the hole in the fiberglass. This is easily done by first placing the plate onto the mounting area and tracing the hole. Next, drill a series of 1/8" holes around inside the trace. Finally, take a Dremel tool and connect all the holes.

Step 5. Next, you will need to cut some space for the nutplates to allow them to recess into the glass.

After riveting the nutplates onto the plate, lay the plate on the fiberglass and draw an outline of the nutplates. Use the Dremel tool to carve out these areas.

Step 6. To attach the plate to the fiberglass, use some epoxy. I drilled some extra holes in the plate to allow the epoxy to come through and create a better mechanical grip. Be sure to sand off the white gelcoat and rough up the surfaces with sandpaper. Allow to dry overnight.
Update: I found later that the epoxy did not bond well to the metal plate and it snapped off quite easily. Not wanting to do any more glass work on the already painted rudder, I drilled two additional holes on each side of the plate through the fairing. I then took a couple of "U" shaped pieces of stiff wire and put them through, bending the legs flat on the inside of the fairing (much like a large staple). If I had to do it over, I would glass over the edges and feather them into the fairing. That would insure the metal plate would not escape, and it would provide a nicer transition to the light housing.

Step 7. You may need to finish up the edges a bit by sanding and using some filler or even a layer of glass to create a nice transition. That is up to you. Except for waiting for the epoxy to dry, doing this only took a couple of hours with minimum hassle.

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