MANUAL of INSTRUCTIONS

for

INSTALLATION of FIBERGLASS FAIRINGS

for the

RV AIRCRAFT

As Prepared by

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FAIRINGS-ETC

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General Information

Trim to Fit. All of the fairings are designed to "trim to fit". This isn't always going to be the case but should give a very good start.

Guarantee. Your satisfaction is guaranteed so; if the initial fit isn't close enough return them for a complete refund. **The guarantee is void if the fairings have been modified, so make your decision before you cut.**

Fairing Composition. The fairings are made with vinyl ester resin so any ester resin or epoxy will bond. Dad always said, "there is more than one way to skin a cat", so keep in mind my instructions are to give you a little head start but are not the only way it can be done.

Two Absolutes. Now, the only two absolutes in "glass work."

#1. To make resin get hard you have to put catalyst in ester resin. You have to put hardener in epoxy.

#2. No matter how you do the job, somebody or everybody is/are going to come along and observe and tell you, you did it all wrong. (Just smile, nod your head and wait for them to leave.)

Fillers. There are many brands that work fine. Use your favorite, I use Evercoat.

Blue Spots. On occasion, your parts may come with blue spots. This is where I left a void (air pocket between the part and the mold) and repaired it with Evercoat.

Evercoat. A little trick with Evercoat. If you must bond vinyl ester to an epoxy part, wash the part with detergent, sand with 60 grit and put on a coat of Evercoat. Sand the Evercoat with 60 grit and apply the vinyl ester. It"s not a great joint, but it does stick.

Synatactic. A mixture of epoxy or „ester resin with fillers. The fillers: Air-O-Sil or Cab-OSil thickens the mixture. The more you add, the thicker it gets.

Mil fiber. Very short glass strands that add strength. You can go to 50/50 by volume. Its generally easier to put it in the resin before it thickens.

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Micro balloon. Micro balloons are used to make sanding easier, keep large volumes from getting hot, and expanding a small volume of resin to fill a large volume of space. It reduces the strength of the resin.

Other fillers. Anything you can get your hands on from dirt to gold dust. One substitute for micro-balloons is sawdust. It has draw backs, but it works. If you want to fill a strange shape with something heavy, use lead shot with mil-fiber and resin.

What To Do About The Pinholes

Why are their pinholes in my fiberglass parts? As we lay up the part, little bits of air get trapped in the resin causing all laminates to have pinholes. Little bits of air is even trapped in the weave of the fabric threads, particularly in laminates that are vacuum formed.

You will need Goo. The "Goo" I like is a product called Evercoat. There is a body putty that is for laminates and a thinner material that is for filling pinholes. These products cure fast, sanding time is about an hour, they sand easy [nothing sands easy] and are light. They are available at your local auto paint store.

Another trick. Use your primer. If it isn't thick let it stand open, not the whole gallon, just what you will need, and it will thicken in time. Then brush or squeegee it on. A sand able or high build primer is best.

How do I fix the pinholes?

The fix: two things are important.

- One, as you work the chosen "Goo" into the holes, be sure to work back and forth.
  As you sweep left to right, the "Goo" sticks on the right side of the hole. As you sweep right to left the "Goo" sticks on the left side of the hole. Wallah, a filled hole [we hope].

- Two, sand easy. If you sand into the laminate, you WILL uncover more holes because there are holes lurking in the resin just under the surface.

Questions: Contact Steve Barnes at 623-536-0951 or email him at RVStormer@Gmail.com.

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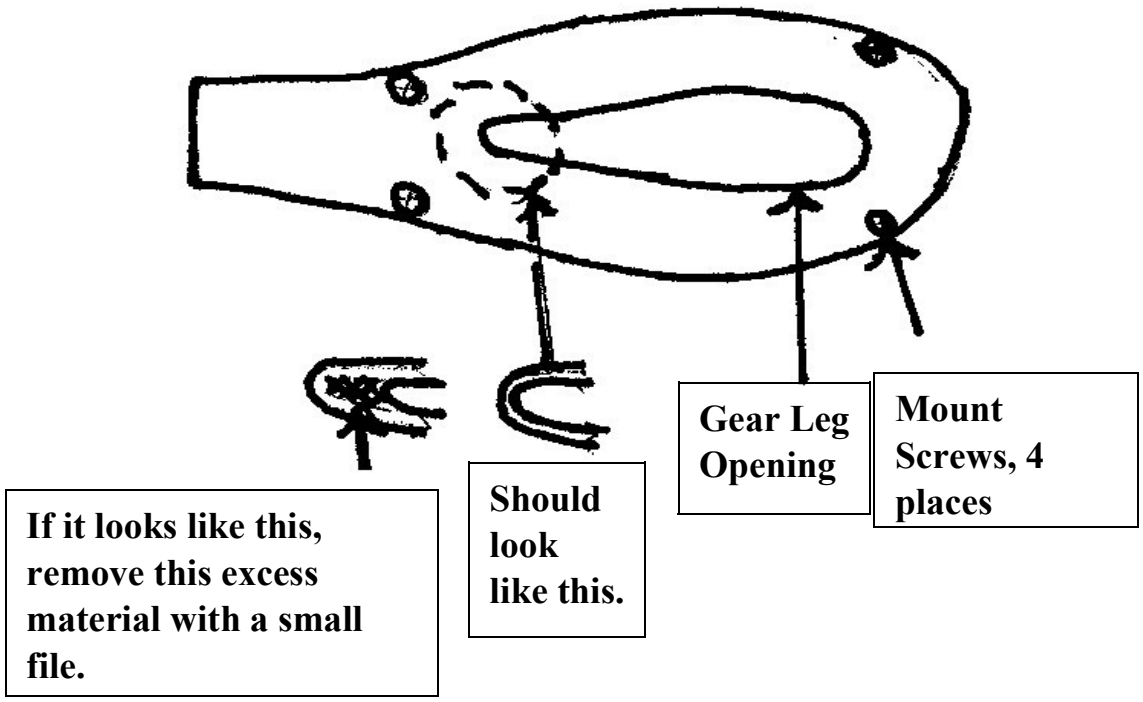
Installation of the Upper Main Intersection Fairing

This fairing is provided with an inboard closure and will slip on the gear leg at the bottom and then slide up the gear leg to the fuselage. If it won't go all the way up, there are three fixes.

The first is to see if the trailing edge has a buildup of material. (See Figure 1A). The front and rear of this opening are thicker than the rest of the fairing. These are high stress areas so don't remove too much material.

Figure 1 A
Bottom View



If this area is OK and the fairing still will not slide up all the way, proceed with Figure 2A.

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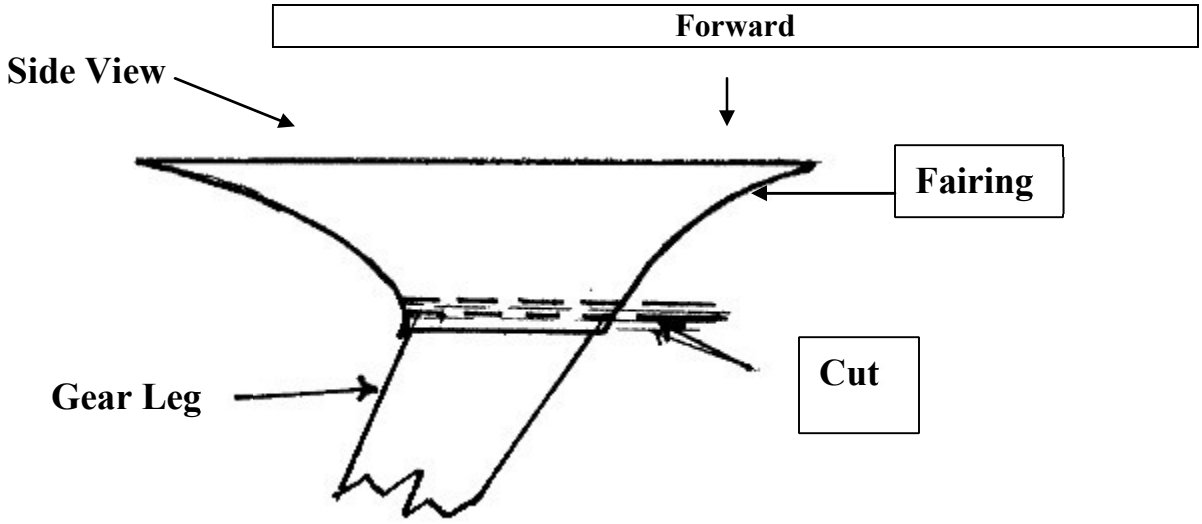
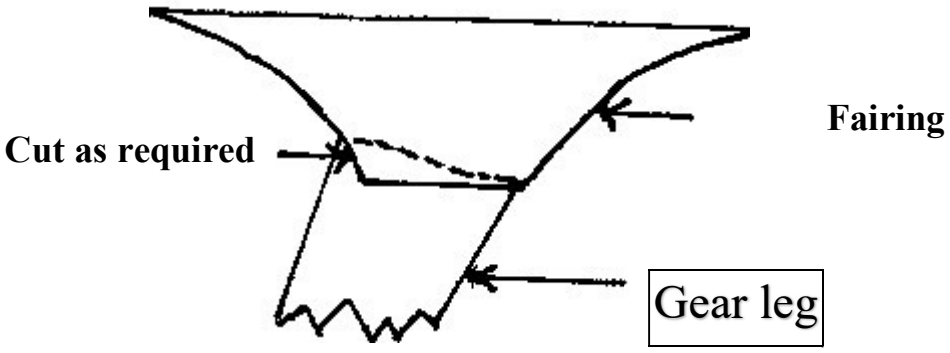
Figure 2A



To make the gear leg opening larger remove even bands of the fairing at the gear leg opening. Use ¼ or 1/8 cuts. As you trim the bottom of the fairing, the gear leg opening gets larger. Be patient, go slow.

trimming the fairing, the fairing should move to within a couple of inches of contacting the fuselage. If it is more than this, laminating may be required. If you want to proceed, trim up to 1/2 " per figure 2. If it still isn't all the way up see Figure 3A. **Figure 3A**



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Cut away or slot the trailing edge of the fairing until the fairing nests against the fuselage. Then slide the fairing down and use packaging tape to cover the exposed area of the gear leg. Sand the fairing forward of the slotted area. Put the fairing back in place

and wrap a lamination around the aft edge to enclose the gear leg. Use about 20 oz. of glass. That is: 5 layers of 4 oz/4layers of 6 oz, etc. When the lamination is set, finish with body filler.

If you don't want to do the laminating, a little artistic trimming would make the area look OK.

Mounting the fairing to the fuselage is your choice. There is going to be some stress on the fairing due to gear leg flex, so probably four screws would be a minimum. (See Figure 1A.)

Questions? Be sure to call Steve before you modify at 623-536-0951 or email him at RVStormer@Gmail.com

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Mounting the Lower Main Intersection Fairing

The upper intersection fairing should be installed first to set and maintain the alignment of the gear leg fairing while the lower intersection fairing is being installed.

The front and rear parts are built to extend beyond the joint in the wheel pant. The excess material will get trimmed off by you to give a good fit between the two sections.

The bottom of the gear leg fairing can move fore and aft.

- Center the gear leg fairing in this travel range.
- Hold the intersection fairings in place.

  Make sure they reach the joint in the wheel pant. Some readjustment of the gear leg fairing might be required.

Position the front fairing in place and make sure it is "settled in." ○ It should contact the wheel pant all the way around and just touch the gear leg fairing.

- ○ Install three clecos near the edge, into the wheel pant.
- ○ Mark the wheel pant at the edge of the fairing.

Mark the joint line between the front and rear halves of the wheel pant. This line is probably going to start out straight inboard then curve slightly forward to the thickest part of the gear leg. See Figure 1B on Page 3. Make sure the rear half and the forward half meet.

Then remove the forward half and trim to the joint line.

Remount the front half with the clecos.

○ Hold the rear half in position with tape and mark the joint line long, 1/8" at least.

- ○ Trim the joint line so the front and rear halves fit nicely together.
- ○ A slight clearance between the gear leg fairing and intersection fairing behind the gear leg fairing is desirable.

When this fit is complete, hold the rear half in place and install three clecos and mark the edge.

Remove the fairings and wheel pants.

- ○ Grind the wheel pants ½" to ¾" inside of the line where the fairings is going to make contact with the wheel pant.
- ○ Grind deep enough to remove all paint and/or gel coat.

Reinstall the wheel pants.

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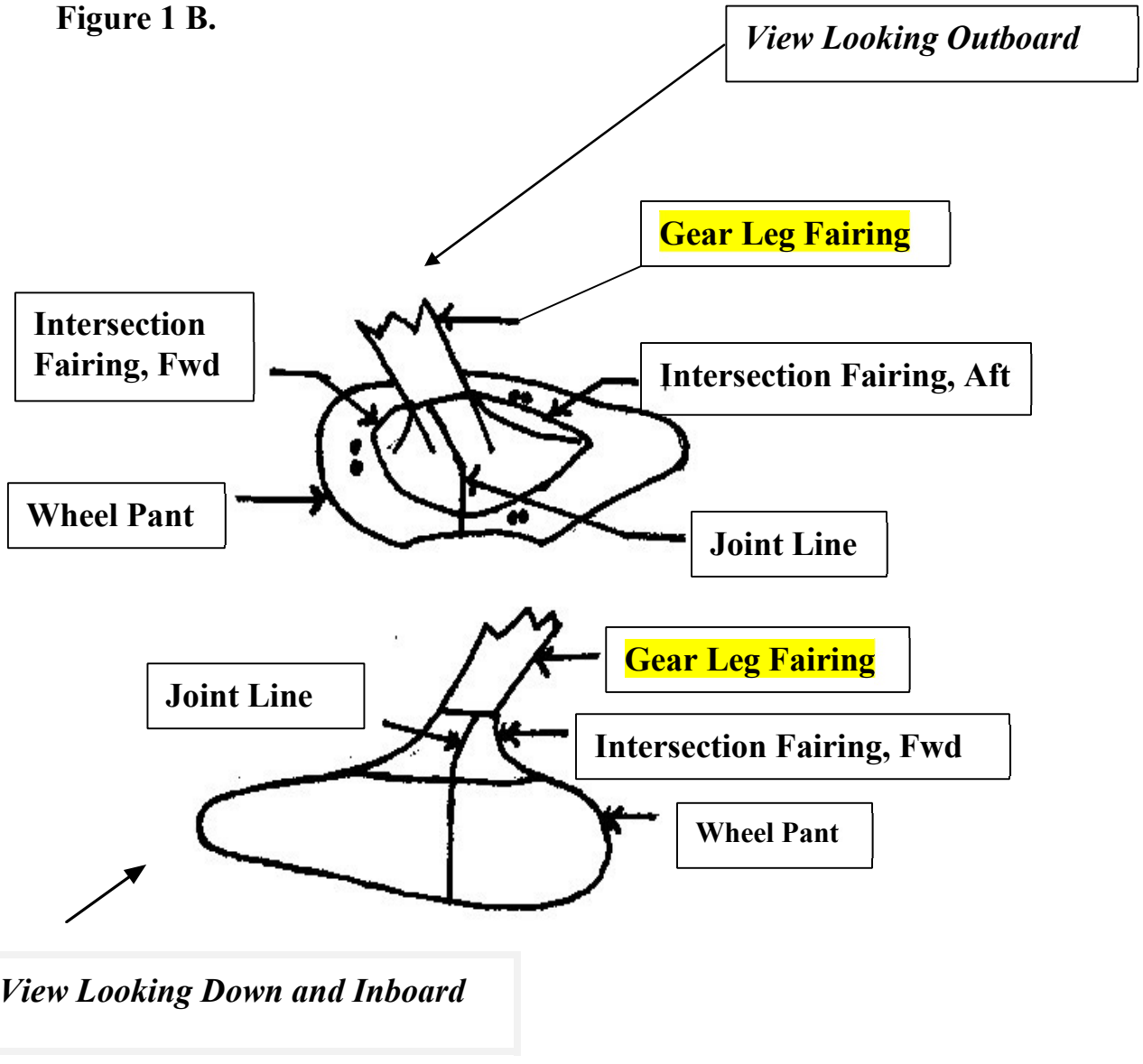
- Using a putty of your choice, Bondo or a syntactic mix, bond the fairing to the wheel pant. The clecos will locate the fairing but press down on the bonded area to squish the excess material out of the joint.
- Protect the front/rear half joint so they don't bond together.
- Remove the wheel pants from the plane and grind the seam about ½" on each side of the line.

✓ YOU MUST LAMINATE THE JOINT WITH 3 or 4 LAYERS of CLOTH. Finish as needed.

Figure 1 B.



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Empennage Fairing Installation Instructions

The empennage fairing is designed to 'trim to fit'. Due to variation in the skin contours, it may require 'fill' in some areas where there are gaps.

A note about fasteners and fiberglass. Fiberglass does not like screws and rivets. Aluminum expands and contracts more than fiberglass so some 'squirm room' is desirable. Be a bit generous with the clearance holes. Tighten screws 'lightly snug'. If at all possible, use tinnerman washers. See Figure 3 for the desirable fit.

The upper fairing is installed by dropping the rear of the fairing in place. Slide the fairing forward. The front of the fairing goes down past the horizontal stabilizer, then the fairing slides aft. At this point it should not quite fit. The idea is that the vertical stabilizer stops the fairing before the horizontal stabilizer fits into the contour of the fairing. The fairing may also want to set a bit high in the front. This is corrected by trimming the fairing a bit at a time at Figure 1, Point A. I would trim no more than a quarter inch at a time.

The screw locations are suggested minimums. You may need more screws to pull the edges in against the horizontal and vertical stabilizers.

Some gaps might be closed with a screw. See Figure 4. You probably already have nut plates in the ribs of the horizontal and vertical stabilizers. You may be able to close the gap by pulling the screw down until the gap closes. Don't tighten the screw tight. Slip a piece of paper through the gap and when you feel drag, as you pull it out, you are tight enough. The nut plate should keep the screw from working out.

The lower fairings may be notched at the forward end where the upper fairing is tight against the skin. If you trim about a quarter inch aft it will leave a tab that will slide in above the radius of the upper fairing. A little filler will smooth the step aft of the edge of the upper fairing. The lower fairings have less curve than the lower surface of the horizontal stabilizer. As you install screws working aft it should conform to the bottom of the stabilizer. You will probably want three or four pairs of screws. I would use a #6 round head sheet metal screw using Loc-Tight or clear fingernail polish. These screws can be installed so they go in the fuselage longer on and horizontal inboard rib.

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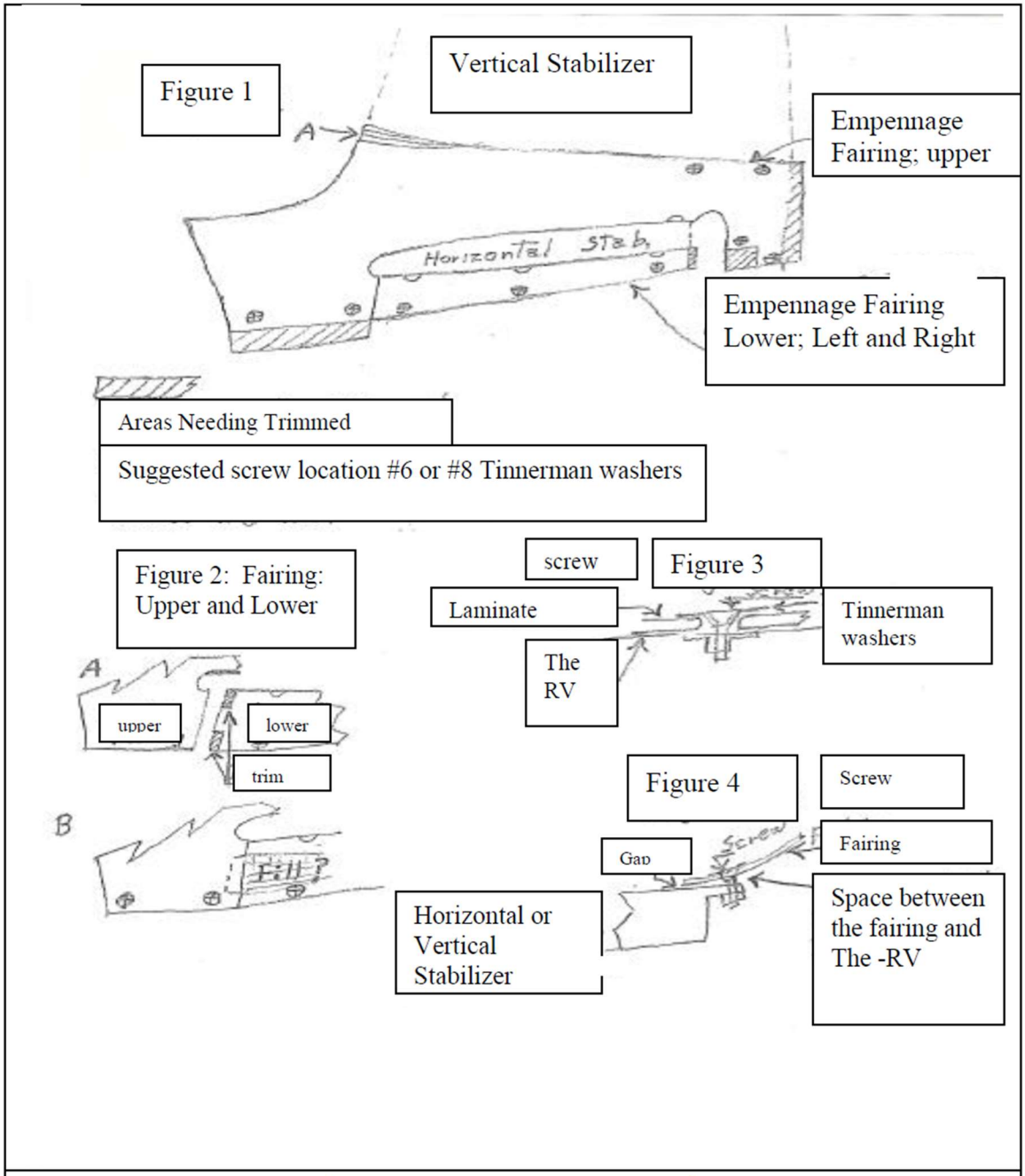

Empennage Fairing Details
Obviously not to scale, square or straight.

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Wing Root Fairing Instructions

The fairings for the -6A/-7A are going to be the same as the -6/-7 but will require cut outs for the step mount plate and the strut. A cut out will also be required for the main gear leg.

The fairing utilizes the existing mount holes for the flat fairing and requires new holes and nut plates in the fuselage.

First Step: To begin the installation, remove the flat wing root fairings. Install the fairing retainer aft of the front spar. See figure 1. The aft end of the retainer is l ¼ inches forward of the aft edge of the wing skin and extends forward. They joggle up of the retainer points toward the wing tip. Center the flange of the retainer that contacts the wing skin over the existing nut plates in the wing rib and mark and drill the holes in the retainer. Mount the retainer with round head screws and washers.

Next Step for -6A/-7A Builders. The -6A/-7A builders should set the rear half of the fairing on top of the retainer and the rear corner of the fairing aligned with the trailing edge of the flap. Mark the cutouts for the step plate and strut and then carefully cut as needed for a loose fit.

Next Step for Everyone. Now everybody test install the rear half of the fairing. You may want to protect the paint by putting masking tape just outboard of the retainer. Slip the bottom plate of the fairing under the retainer. This is a tight fit and may cause some mental anguish. Probably, starting the front corner of the plate under the retainer one half to two thirds of the way forward then sliding the fairing forward and inboard until the upper flange contacts the fuselage. This should work. The corner of the fairing should align with the trailing edge of the flap.

Next Step. Next is the front half of the fairing. Set it in place. The -6A/-7A aircraft will require a cut out for the gear leg. Make sure the leading edge is in place, mark and cut out for the gear leg.

At this point the front section of the fairing must be trimmed where it joins with the rear section. Hold the front section tight against the wing's leading edge and carefully mark the line at the front edge of the rear half of the fairing. This should remove about 3/8 of an inch of the aft edge of the front half. Leave it just a bit long.

Now slide the front plate under the retainer and move the front half of the fairing into place. It should fit the leading edge of the wing and the front end of the rear section. You may need to re-trim the aft end or force the aft section to move a bit aft. It's your call.

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Under the wing check the forward edge of the fairing where it contacts the fuselage. This should be a very good fit.

It shouldn't need fasteners or rubber, just a good fit. Make sure on the -6A/-7A the clearance hole for the gear legs are adequate. Holding the front half in place, mark all the screw holes top and bottom. Remove the front half of the fairing and drill and counter sink all the holes. Install the fairing with enough screws to hold it in place.

Check the fit of the joint line between the front and rear. Install a cleco through the front fairing into the tab on the rear half. This will get a nut plate and a flat head screw.

Because the aft half of the fairing is going to see aerodynamic loading and people standing on it, an angle is going to be installed on the fuselage to screw the fairing lower plate to in the flap area.

Begin by removing the aft half of the fairing and raise the flap. At the inboard end of the flap mark the fuselage just above the upper surface of the flap. One eighth of an inch should be enough.

The angle should extend from the flap's trailing edge to within about an inch of the aft edge of the wing skin. Install the angle with the flange up. Use three # 8 screws through the fuselage with large washers and nylocks, a doubler installed on the inside would be good!

Install the nut plates in the rear fairing half tab and counter sink the front half. Reinstall the rear half and put in the joint screw.

Lower the flaps and drill two # 8 clearance holes through the angle and fairing bottom plate. Remove the fairing and install two # 8 nut plates on the fairing bottom plate. The screws can be either round head or flat head depending on the amount of clearance between the flap and the angle. If in doubt, use flathead. Reinstall the rear half and install all the screws front and rear.

It's time to install the screws in the fuselage. At the aft end, behind the flap there should be two screws through the fairing bottom plate, and two through the fairing upper flange behind the flap. The -6A/-7A builders may want one of each side of the step plate and one aft toward the end of the fairing.

Moving forward, there should be a screw in the rear section just aft of the joint and one in the forward section just forward of the joint. There should also be a minimum of 4 or 5 around the leading edge.

It might be desirable to put a couple of screws in each panel between the fuselage formers to pull the aluminum out straight against the fairing.

Please see diagrams on the following page. Questions??? Call Steve at 623-536-0951.

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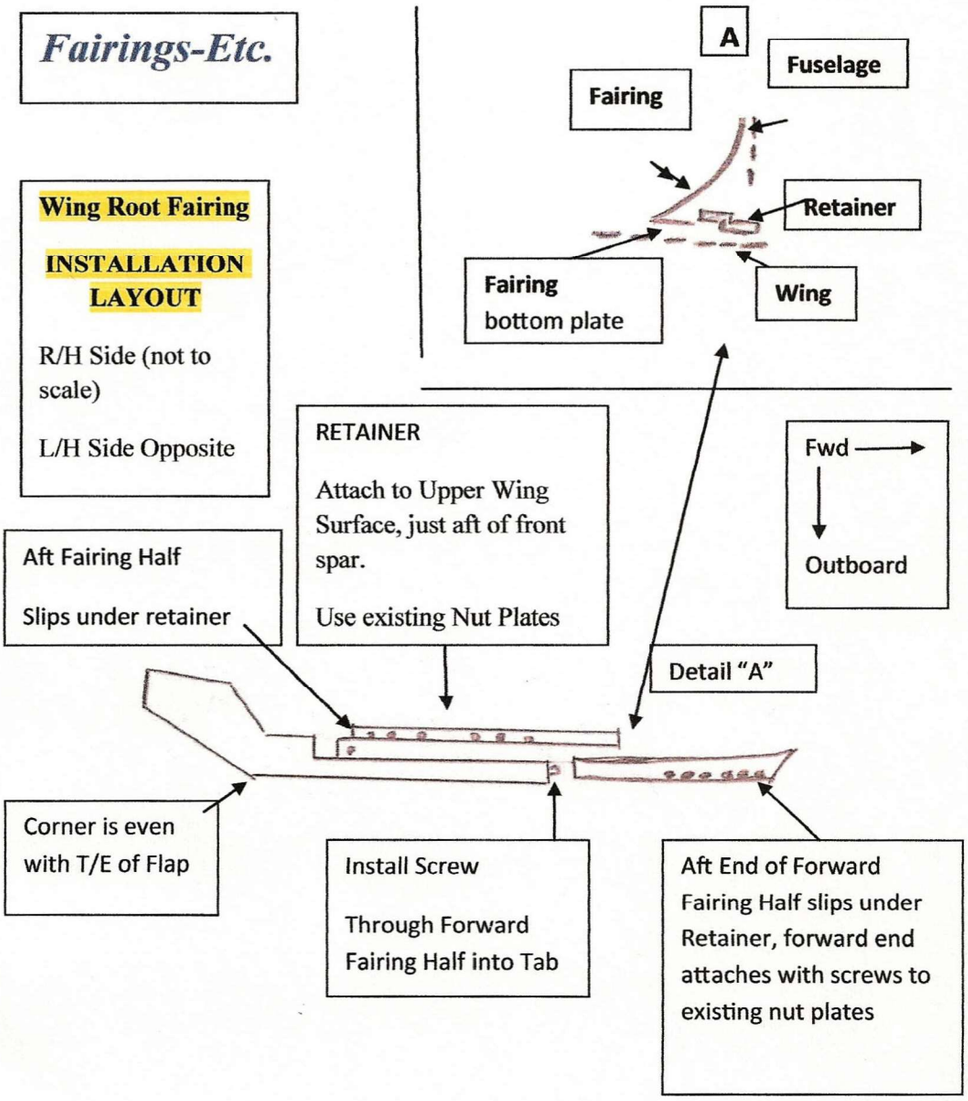
Wing Root Fairings Installation



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STAINLESS STEEL WHEEL PANT BRACKET INSTALLATION

Use the instructions that came with your wheel pants provided by Van's for the RV aircraft. We do recommend you drill the holes in the wheel pant brackets first and use those holes as a guide to drill the holes in the wheel pants.

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