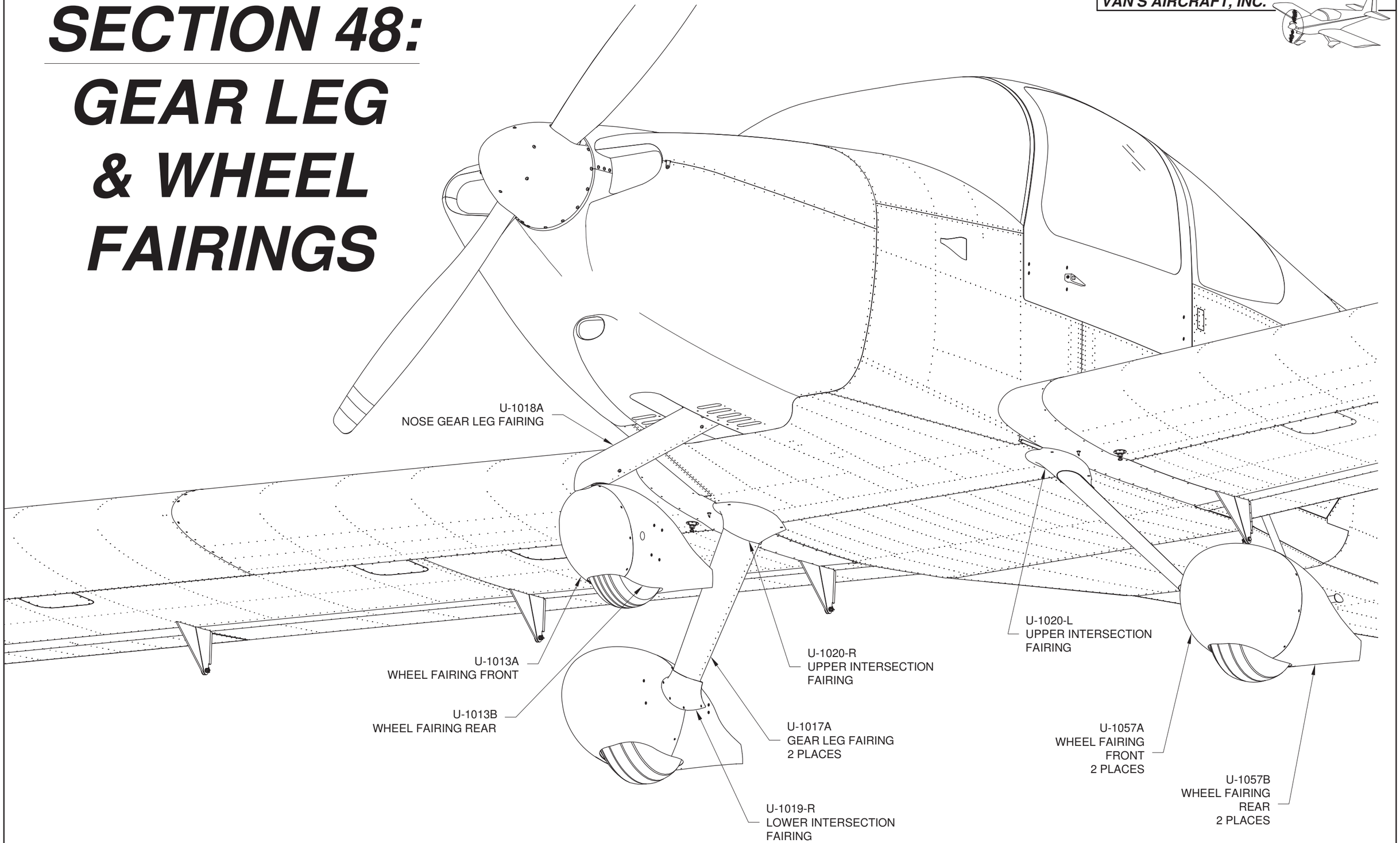
SECTION 48:
GEAR LEG & WHEEL FAIRINGS



NOTE: This section provides instruction for the installation of the left wheel only. The right side is a mirror of the left.

NOTE: If transparent, the fairings in this section must remain transparent to accomplish the installation. Do not sand or prime either side of the fairings until directed to do so or until installation is complete.

If the fairings are opaque, refer to Section 5.18 MATCH-DRILLING OPAQUE FIBERGLASS PARTS.

The U-1057-A Wheel Fairing Front and U-1057B Wheel Fairing Rear should mate as accurately as possible. Due to the variations in fiberglass molds it is necessary to first make the parts fit.

Step 1: The U-1057A Wheel Fairing Front has been laid up so that there are overlapping layers of cloth along its centerline. The area of overlap is thicker than the rest of the fairing. Sand down this thicker area so that the aft edge of the wheel fairing front is the same thickness all along its length.

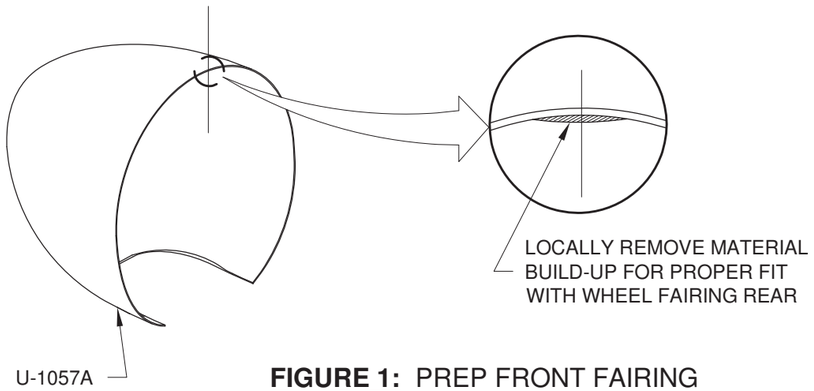


FIGURE 1: PREP FRONT FAIRING

Step 2: Square up the inside corner of molded step in the U-1057B Wheel Fairing Rear as required to allow for a good fit of the fairing halves as shown in Figure 2. A coarse file works well.

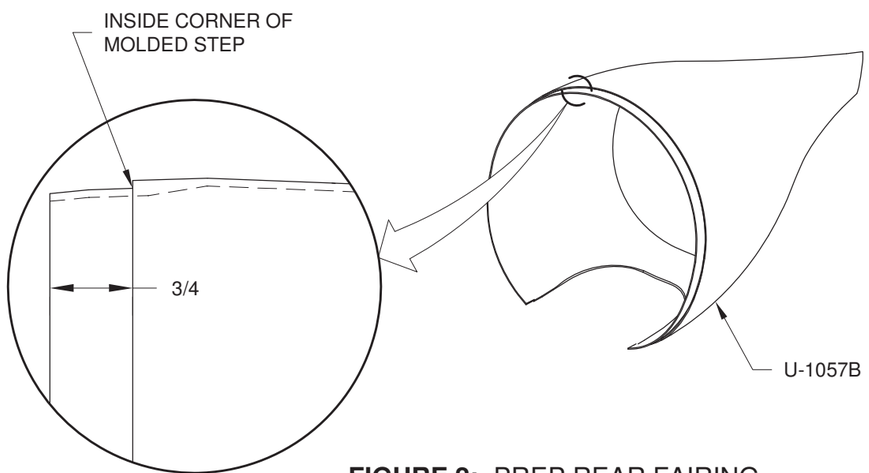


FIGURE 2: PREP REAR FAIRING

Step 3: Use coarse sandpaper glued to a straight stick as a disposable file to remove any material that prevents the halves from matching smoothly. Take the time required to precision fit the wheel fairing halves.

Assemble the U-1057A Wheel Fairing Front and U-1057B Wheel Fairing Rear. Tape them in this position and place a reference mark across the seam. Slit the tape on the seam with a razor blade and use this mark to realign the fairings during assembly.

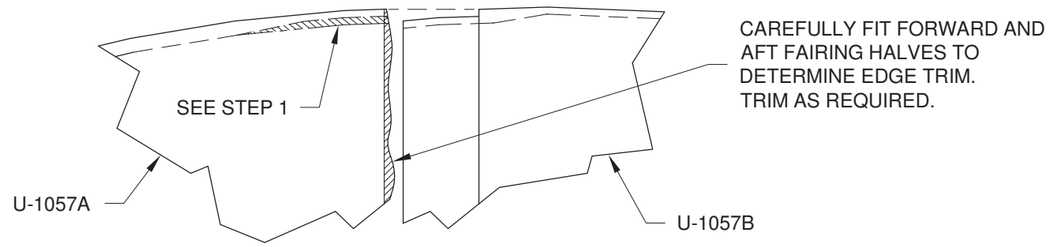


FIGURE 3: FIT AND TRIM FAIRING HALVES

Fairings greatly reduce the drag an otherwise unfaired wheel and gear leg would create. Just as important as the fairing itself is its alignment. Due to the gear leg design, once off the runway the gear leg and wheel position and orientation change. Therefore the fairings must be aligned to the aircraft while the aircraft is in a flight attitude. This is achieved by jacking and leveling the aircraft allowing the landing gear to assume their in flight position. The fairings are then aligned to the aircraft centerline, **not** the wheel.

To align the fairing several reference marks are needed. Some on the fairing and at least one on the floor representing the aircraft centerline.

Step 4: Draw a vertical centerline on the U-1057B Wheel Fairing Rear as shown in Figure 4. Place a mark at the midpoint of the vertical centerline as shown in Figure 4.

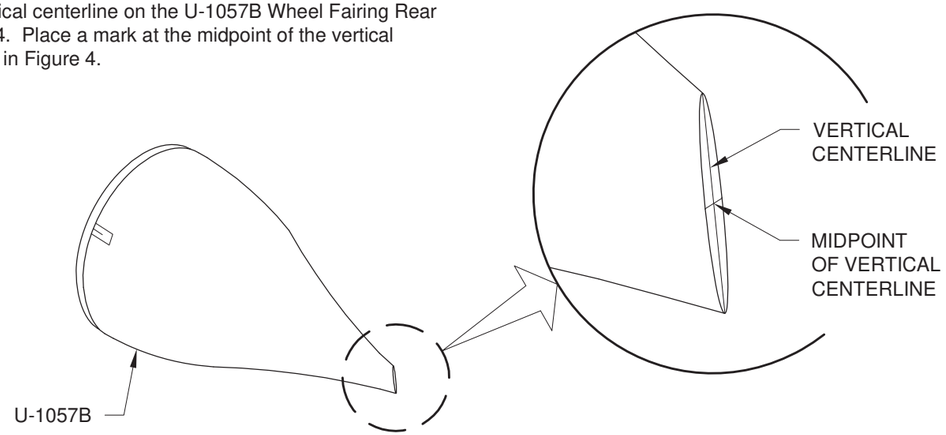


FIGURE 4: DRAW REFERENCE LINES

Step 1: Make a 'V' block or similar holding fixture from 1/4 inch thick or greater plywood as shown in Figure 1.

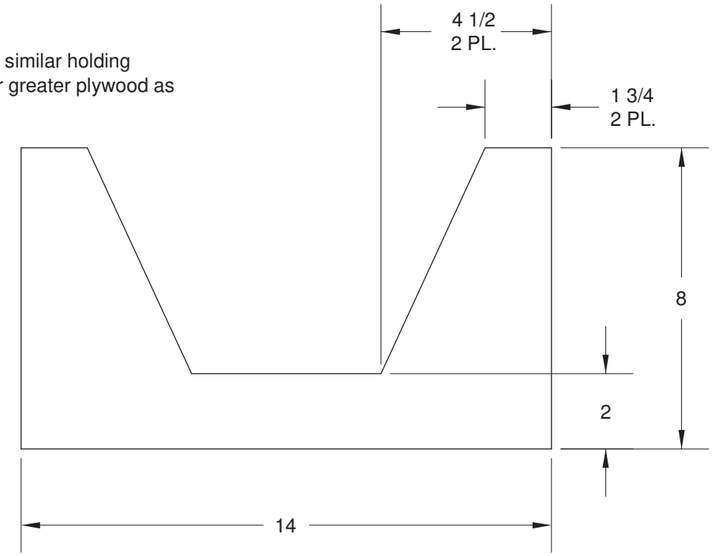


FIGURE 1: FABRICATE 'V' BLOCK

Step 2: Place the U-1057B Wheel Fairing Rear on the bench and make it plumb using a square so that the reference line on the fairing is vertical. Mark a centerline as shown by measuring horizontally across the forward opening of the fairing as shown in Figure 2. Position a square at the midpoint of this distance and mark the top of the wheel fairing rear. Extend the mark 1/2" aft of the molded step. This reference mark will serve to align the wheel fairing along its roll axis.

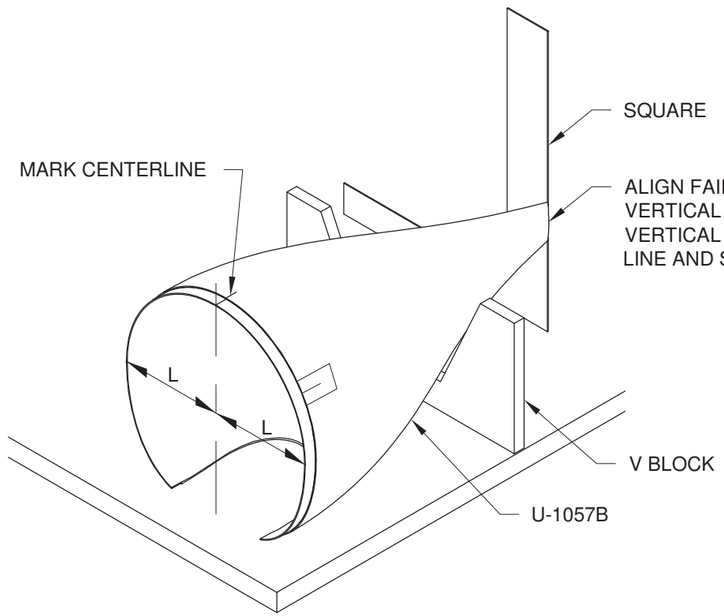


FIGURE 2: MARK FAIRING CENTERLINE

Step 3: Tape the U-1057A Wheel Fairing Front and U-1057B Wheel Fairing Rear halves together as per Figure 3.

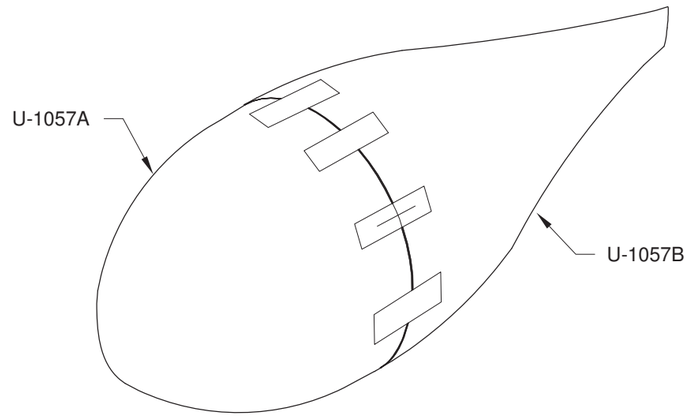


FIGURE 3: TAPE FAIRING HALVES TOGETHER

Step 4: Drill and cleco the U-1057A Wheel Fairing Front and U-1057B Wheel Fairing Rear halves together as per Figure 4. Measure down from the centerline marked earlier. Drill and cleco beginning at the top of the fairings. Center the holes in the middle of the flange fore and aft. Work down the sides to help minimize bulging and mismatch between the fairing halves. The fairings as supplied are symmetrical (no right or left hand fairing) but the asymmetrical fastener pattern will establish the left and right fairings. The 1/2 inch hole is a start for the U-1001-L Main Gear Leg entry point and will be trimmed more later.

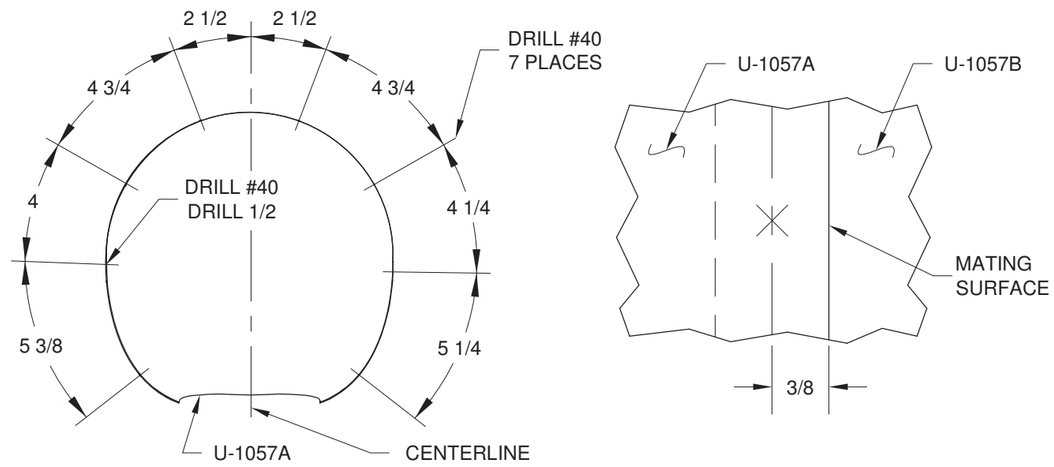


FIGURE 4: FASTENER SPACING (FRONT VIEW - LEFT FAIRING)

Step 1: Fabricate a 1" wide shim approximately 1/4" thick (not provided in kit) and position it temporarily between the brake disk and the U-01010A-1 Main Wheel Fairing Bracket to keep it from deflecting excessively when drilling through from the outside of the fairing as shown in Figure 1.

Use scrap pieces of aluminum with strips of duct tape added to achieve a snug fit.

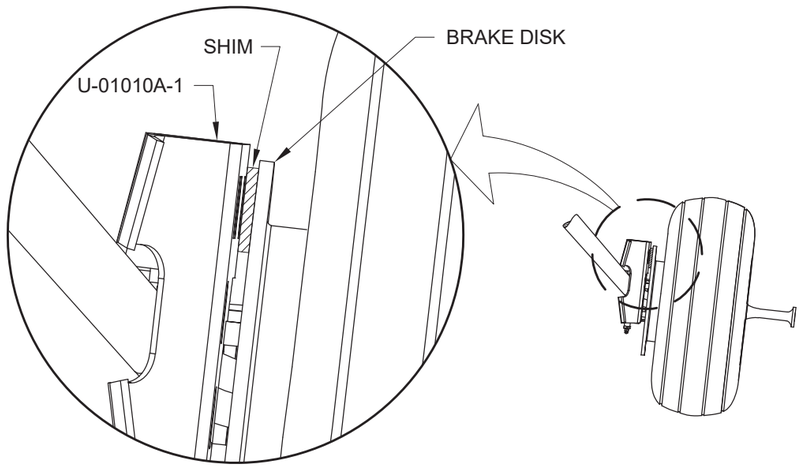


FIGURE 1: SHIM MAIN WHEEL FAIRING BRACKET

Step 2: Mark nutplate locations on the U-01010A-1 and U-01010B-1 Main Wheel Fairing Brackets using a "sharpie" pen as per the dimensions shown in Figure 2. Place the marks on the side facing the fairing.

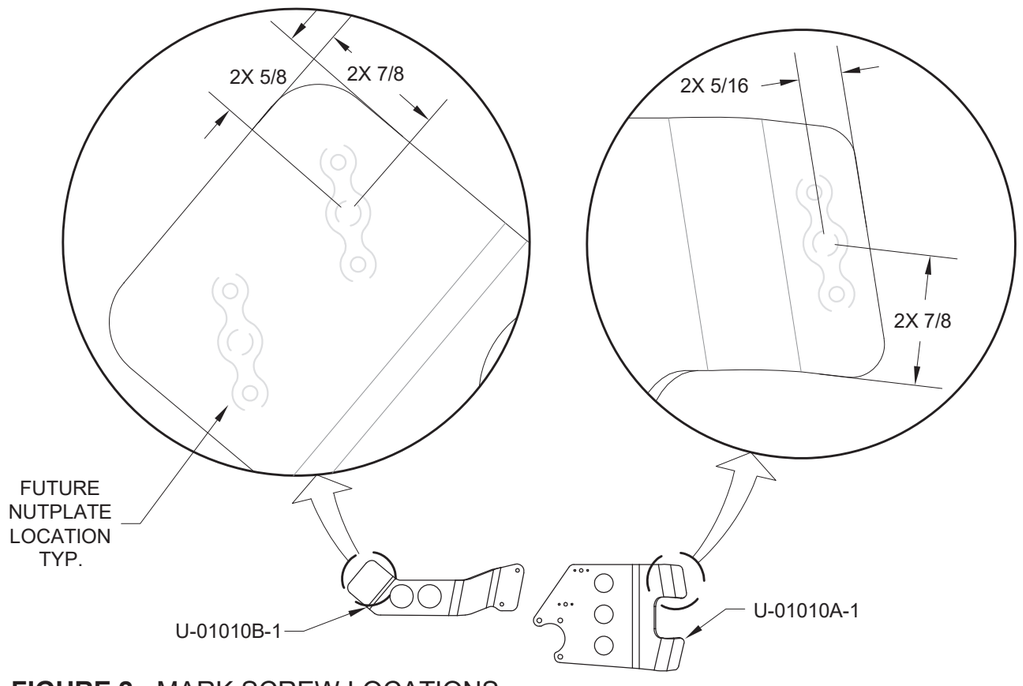


FIGURE 2: MARK SCREW LOCATIONS

Step 3: Place the assembled U-1057A Wheel Fairing Front and the U-1057B Wheel Fairing Rear into the 'V' block with the wheel opening facing upward as shown in the Iso View of Figure 3. Rotate the assembled fairing until the centerline drawn at the back of the wheel fairing rear is vertical. Measure up from the table as per the callouts to the midpoint of the vertical centerline at the aft end of the wheel fairing rear. This levels the assembled fairing. Measure up from the table the same amount at the forward end of the wheel fairing front and place a horizontal reference mark as shown in Figure 3. Disassemble the fairings.

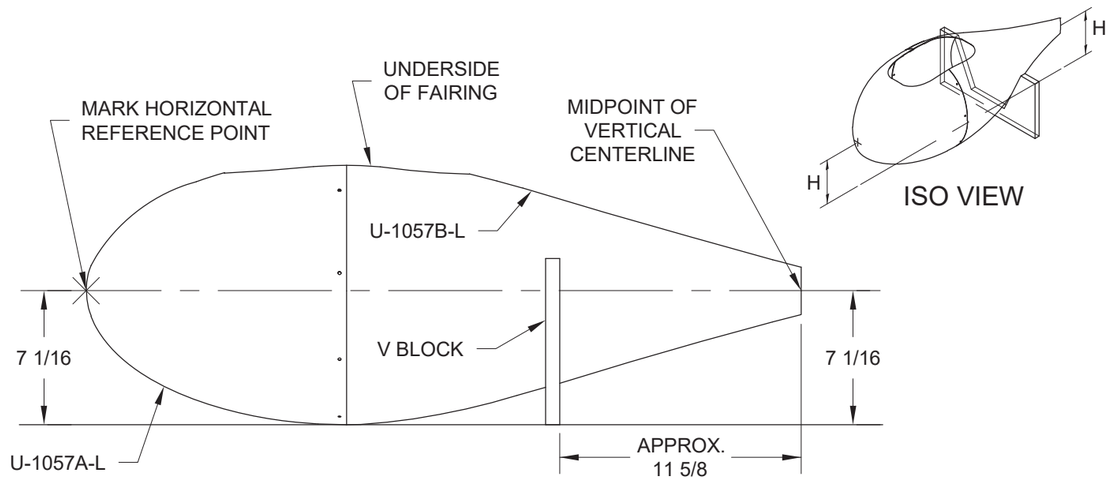


FIGURE 3:
MARK HORIZONTAL REFERENCE POINT ON WHEEL FAIRING FRONT

Step 4: Fabricate a spacer as per Figure 4. The dimension of the spacer is based on a 15X6.0-6 tire. If necessary adjust the height of the spacer to compensate for a different tire size, tire wear and/or inflation pressure by referring to the vertical dimension 8 7/8" on Page 48-5, Figure 1.

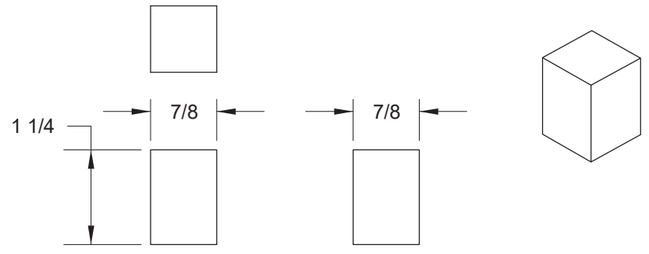


FIGURE 4: FABRICATE SPACER

Step 5: Raise the airplane on jacks so the tires are just off the ground (zero to 1/16" gap). Level the airplane longitudinally and laterally at the F-1015C Mid Cabin Deck. **NOTE: DO NOT FORGET TO LEVEL THE AIRCRAFT.**

It may be necessary to remove and reinstall the wheels several times while adjusting the fit of the U-01010A-1 and U-01010B-1 Main Wheel Fairing Brackets to the U-1057A/B Wheel Fairings. **WARNING: Use caution while the airplane is on jacks. Don't let it tip or it will fall off the jacks.**

Step 1: Install the spacer by taping it to the top of the tire as shown in Figure 1. Center the U-1057B-L Wheel Fairing Rear over the tire and spacer. Trim U-1057B-L Wheel Fairing Rear as shown in Figure 2. Mark the area of interference with the U-1001-L Main Gear Leg, remove the fairing, locally trim a small amount of the fairing, reposition the fairing over the wheel, mark and trim as required to achieve the correct final position. Trim until a 1/8-1/4 in. gap exists between the gear leg and the wheel fairing rear.

The wheel fairing rear is positioned correctly in the fore/aft direction when the center of the U-01004 Axle Nut Standoff lines up with the aft edge of the molded step as shown in Figure 1.

Block up the aft end of the wheel fairing rear to position the center of the aft edge of the fairing roughly 9 5/16" off the floor.

If necessary, adjust/bend the flanges of the U-01010A-1 and U-01010B-1 Main Wheel Fairing Brackets during the next few steps to achieve a reasonably good fit with the wheel fairing as the fairing is aligned to the wheel. This may even require removing the wheel and bracket several times. The fit need not be perfect as thickened epoxy will take up some of the space between the bracket and fairing.

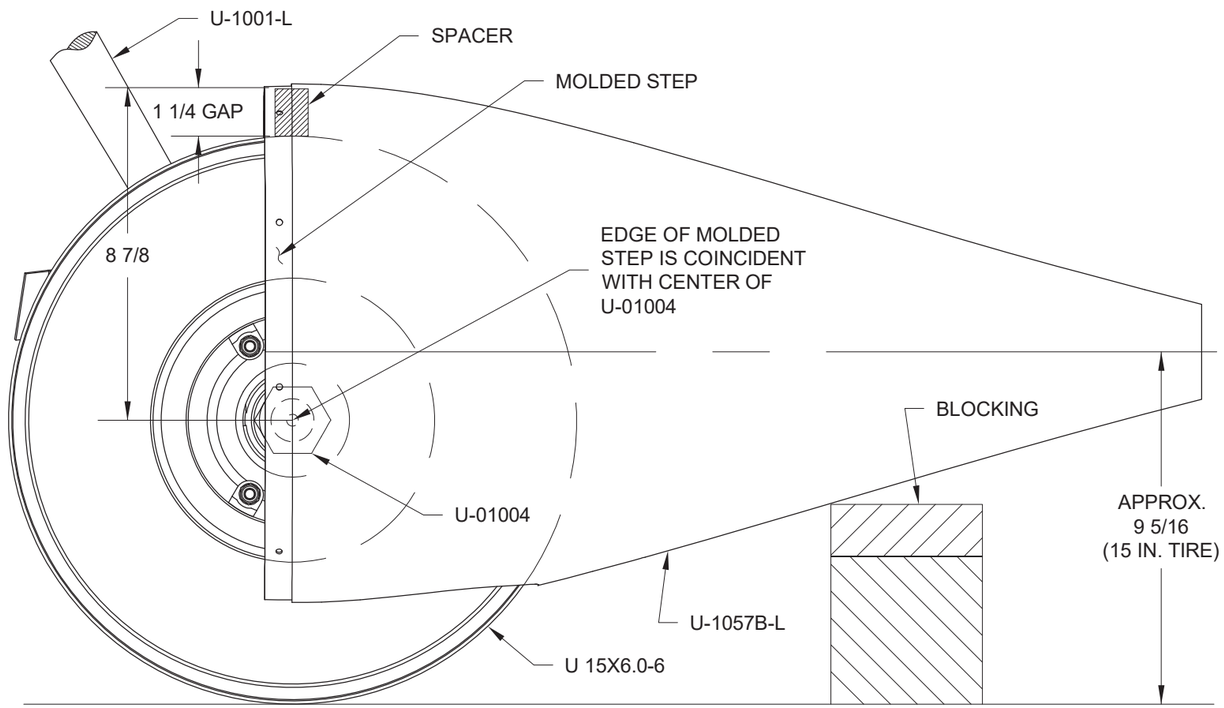


FIGURE 1: POSITIONING THE WHEEL FAIRING REAR

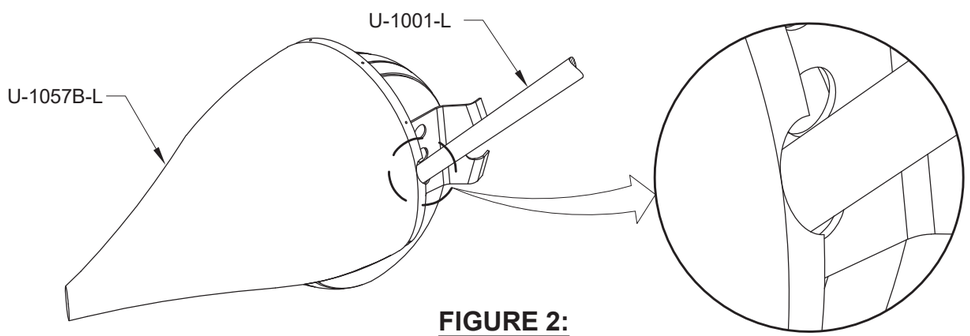


FIGURE 2:
TRIMMING WHEEL FAIRING REAR

Step 3: Align the U-1057B-L Wheel Fairing Rear in rotation to the tire by using the tire tread as an alignment guide as shown in Figure 3.

In this case the vertical axis of the fairing is intended to be parallel with the vertical axis of the wheel and tire tread ... not perpendicular to the floor.

Use blocks and/or shims to hold the fairing in place.

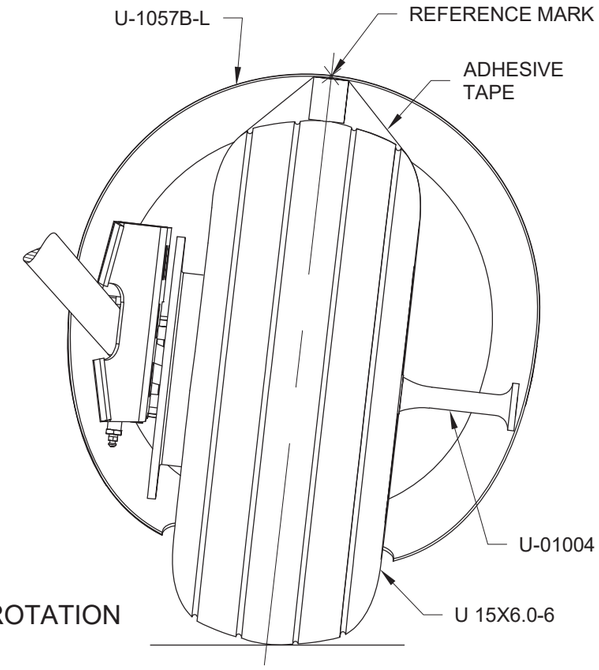


FIGURE 3:
ALIGNING FAIRING IN ROTATION

Step 4: Slide the U-1057A-L Wheel Fairing Front onto the U-1057B-L Wheel Fairing Rear. Trim the wheel fairing front where it interferes with the U-1001-L Main Gear Leg and brake line (not shown) until the wheel fairing front can be clecoed to the wheel fairing rear as shown in Figure 4.

Check that the fairing is parallel to the floor and Shim as needed to make the front and rear dimensions the same. Mark wheel fairing front and rear around the wheel opening to yield clearance called for in Figure 4.

Remove the wheel fairing front. Trim around wheel opening.

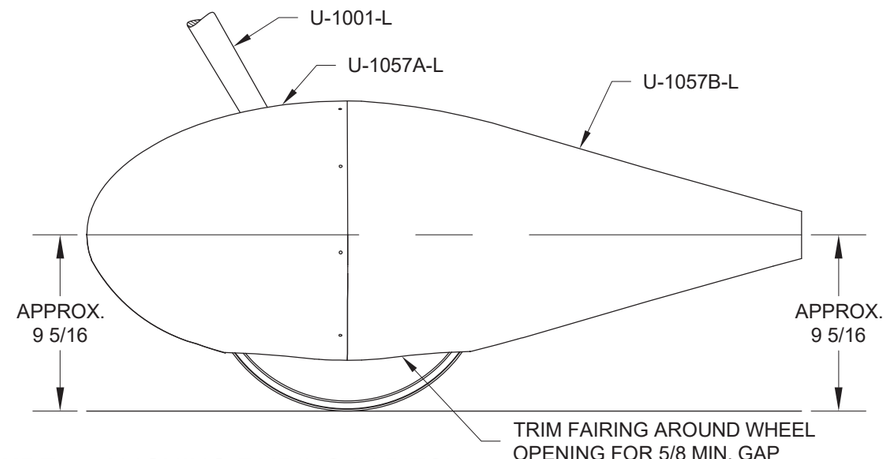


FIGURE 4: ALIGNING FAIRING IN PITCH

NOTE: Drill parallel to the axis of the U-01004 Axle Nut Standoff, not perpendicular to the surface of the fairing.

Step 1: Drill the U-1057B-L Wheel Fairing Rear as per the callout at the intersection of the U-01004 Axle Nut Standoff and the molded step as shown in Figure 1. Mark the hole location for drilling from the inside. Pull the fairing forward and drill with a right angle drill from the inside out, or translate the hole location to the outside surface and drill.

Recheck the location of the wheel fairing rear and make corrections if/as required.

Final-Drill as per the callout.

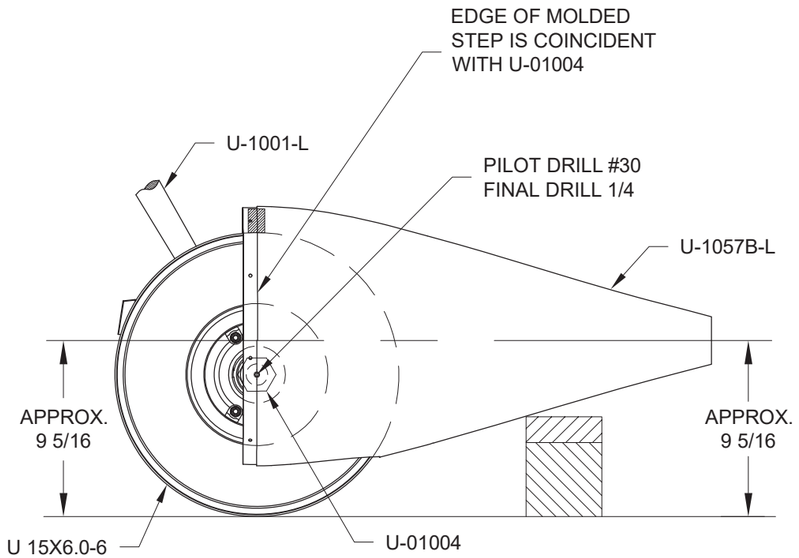


FIGURE 1: DRILL FAIRING

Step 3: Shim between the fairings and the tire to keep the fairing from moving while drilling. Working from the inboard side of the U-1057A Wheel Fairing Front and U-1057B Wheel Fairing Rear sight through the translucent fairing and locate the "sharpie" pen marks. Drill the fairings and brackets at the four nutplate locations as shown in Figure 3.

Remove the wheel fairings.

Roughen the inside of the wheel fairings aggressively at the #36 holes. Reinforce an area about 3" in diameter around each hole with one or two layers of fiberglass. When cured drill up to #27 the four #36 holes in the fairings.

This is also a good time to roughen the inside of the fairing at the 1/4 hole which will later prevent having to remove the rear fairing just to do so.

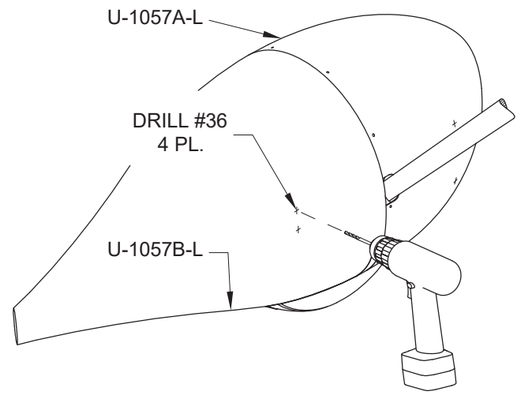


FIGURE 3:
DRILLING THE FAIRINGS AND BRACKETS

NOTE: The wheels are toed in. If the wheel fairing is made parallel to the wheel it will be misaligned.

Step 2: Cleco the U-1057A-L Wheel Fairing Front to the U-1057B-L Wheel Fairing Rear. Insert a 1/4 bolt through the fairing and screw it into the U-01004 Axle Nut Standoff without tightening it down. Carefully adjust the wheel fairing position until it is aligned with the aircraft centerline as shown in Figure 2.

To accomplish this drop plumb bobs from the fore and aft center of the fuselage and snap a chalk line through these marks, transferring the aircraft centerline to the floor. Measure from this centerline to the points depicted in Figure 2. When all the measurements are equal the fairings are parallel to the aircraft centerline.

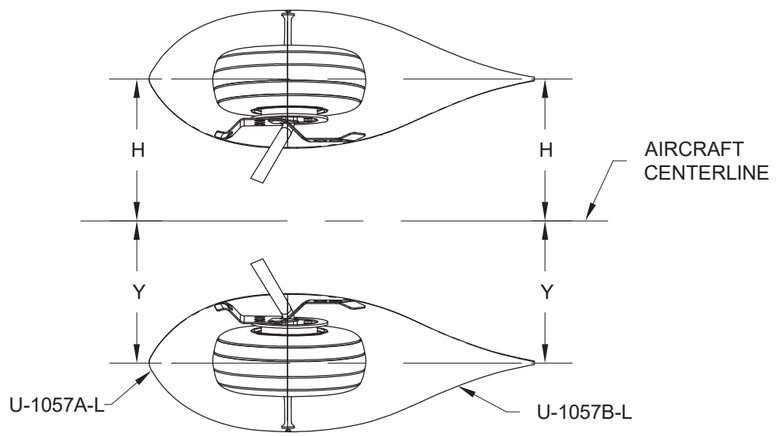


FIGURE 2: ALIGNING MAIN WHEEL FAIRINGS WITH THE AIRCRAFT CENTERLINE

Step 4: Tap the U-01010A-1 and U-01010B-1 Main Wheel Fairing Brackets for 6-32 screws. This will allow the temporary mounting of the fairings to the brackets (for final alignment) with 6-32 screws rather than clecoing to the bracket which tends to flatten the fairing at that location. Reattach the wheel fairings to the main wheel fairing brackets with 6-32 screws and check their alignment using Page 48-5, Steps 3 and 4, and Step 2 on this page.

Step 5: If misaligned remove the appropriate screw(s) and elongate the screw hole(s) with a small round file to correctly position the fairing. Replace the screws and recheck. Repeat until the fairings are properly aligned. Later, the epoxy/flox mixture will replace the material removed by elongating the screw holes.

Remove the fairings. Coat the 6-32 screw threads with candle wax to prevent epoxy from filling them up. Aggressively roughen the inside of the wheel fairings at the screw locations. Tape the main wheel fairing bracket tabs to prevent the epoxy/flox mixture from bonding to them. If the epoxy/flox is allowed to engulf the edges of the bracket the fairings will be difficult to remove. Prevent this by using clay or shims to add thickness to the outboard side of the bracket especially near the edges.

Mix epoxy and flox (cotton or glass) to the consistency of peanut butter and build up the areas around the two screws on both the forward and aft main wheel fairings. Attach the wheel fairings to the bracket and to each other while the mixture is wet. Use enough epoxy/flox so that when assembled a recessed area will be created that will help lock in the bracket and reduce the bearing loads on the fiberglass at the screw hole. Check the wheel fairing alignment.

Step 6: When cured remove the U-1057A-L Wheel Fairing Forward. **NOTE: The U-1057B-L Wheel Fairing Rear may remain in place for the following step.**

The U-01004 Axle Nut Standoff butts to the U-1057B-L Wheel Fairing Rear at a spot where the wheel fairing rear is sloped.

Step 1: Form in place a surface parallel to the outboard end of the axle nut standoff using more epoxy/flox mixture. Having already roughened the inner surface of the U-1057B-L Wheel Fairing Rear aggressively using coarse sandpaper at the 1/4" hole the epoxy mix may be applied to the fairing without having to remove it from the bracket. Apply mold release or tape to the axle nut standoff if you want to be able to remove it later.

Apply an epoxy/flox mixture to the inside of both wheel fairings in the area adjacent to the nut standoff as shown in Figure 1. Cleco the wheel fairing front to the wheel fairing rear. Ideally a pocket will also be formed in which the nut standoff may seat.

Allow the mixture to harden then remove the wheel fairings.

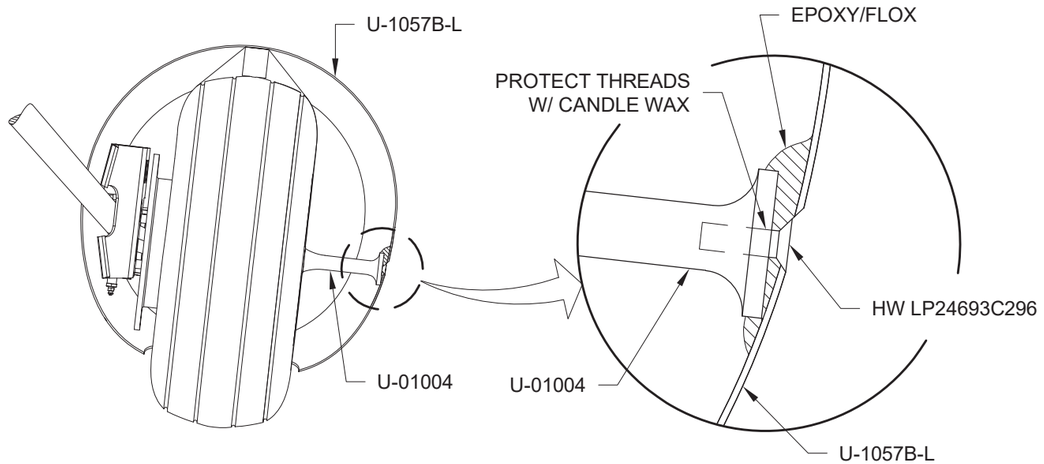


FIGURE 1:
BUILDING UP FAIRING AT AXLE NUT STANDOFF

Step 2: Final-Drill #10 the four nutplate screw holes in the U-01010A-1 and U-01010B-1 Main Wheel Fairing Brackets as shown in Figure 2. Final-Drill #40, countersink and deburr the nutplate attach holes as shown in Figure 2 and attach the hardware as per the callouts.

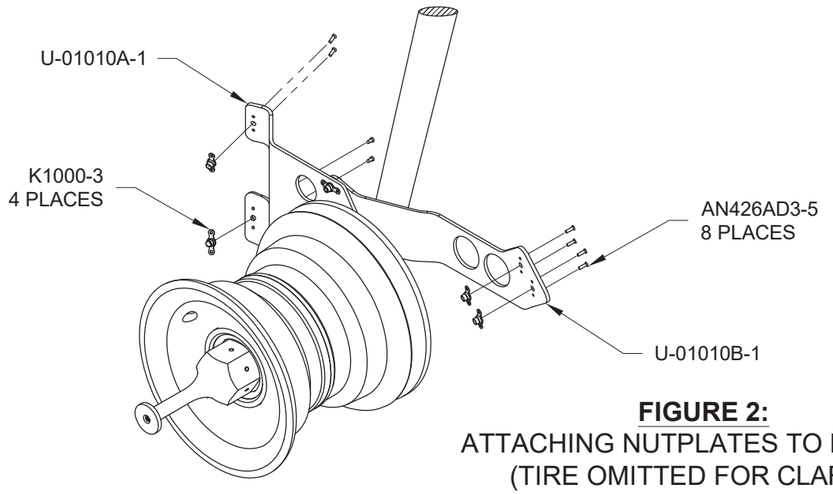


FIGURE 2:
ATTACHING NUTPLATES TO BRACKET
(TIRE OMITTED FOR CLARITY)

Step 3: Cleco together the U-1057A-L Wheel Fairing Front and U-1057B-L Wheel Fairing Rear. Final-Drill #10 the two fairing to bracket attach holes in the wheel fairing front and wheel fairing rear as shown in Figure 3. Countersink these holes to accept AN509-10R10.

Final-Drill #28 three (of the seven) evenly spaced #40 screw attach holes. Disassemble and deburr. Install three K1000-06 nutplates at these #28 holes (see Figure 4). Final-Drill #40 and countersink for nutplate rivets as shown in Figure 4. Deburr the holes. Rivet the nutplates to the wheel fairing rear as per the callouts.

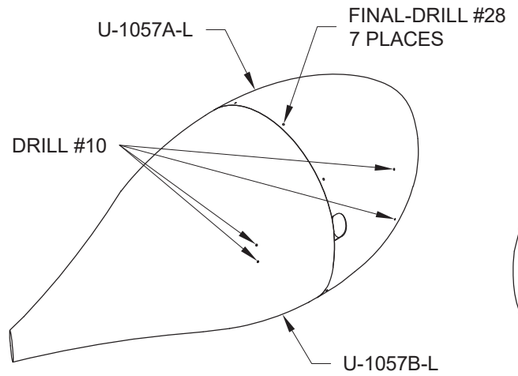


FIGURE 3:
FINAL DRILLING THE FAIRINGS

Step 4: Reassemble the fairing halves using three #6 screws and clecos at the rest of the holes. Final-Drill #28 the remainder of the #40 holes. Disassemble the fairing halves. Install the remaining nutplates. Reassemble using #6 screws.

Countersink the #28 holes in the U-1057A-L Wheel Fairing Front as per the callout in Figure 4.

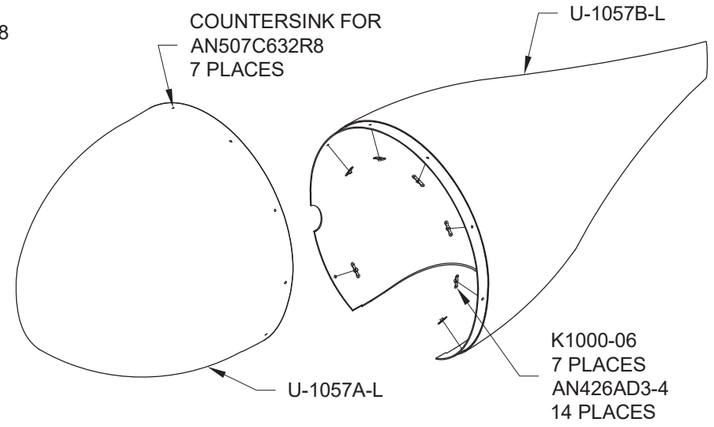


FIGURE 4:
RIVETING NUTPLATES TO FAIRING

Step 5: Attach the U-1057A-L Wheel Fairing Front and U-1057B-L Wheel Fairing Rear to the U-01010A-1 and U-01010B-1 Main Wheel Fairing Brackets, respectively, using the hardware specified in Figure 5.

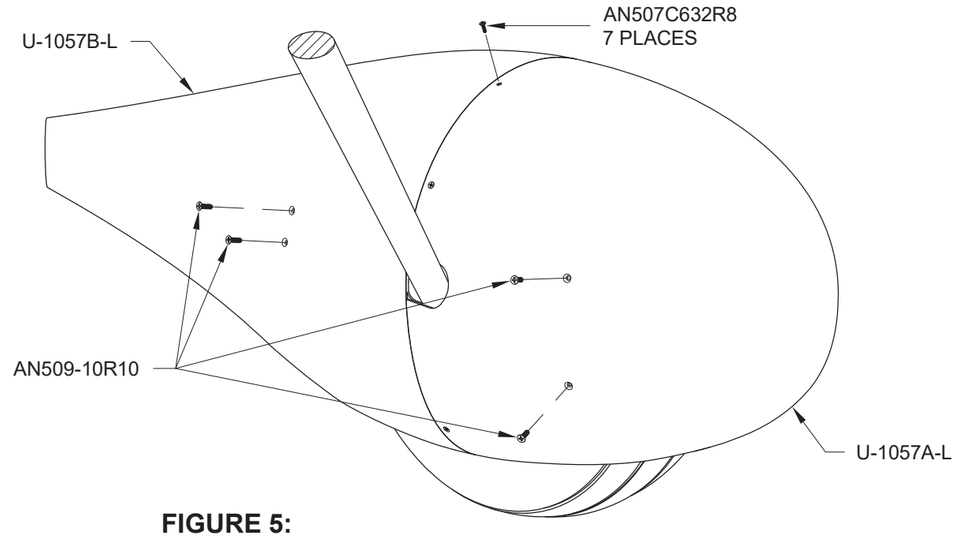


FIGURE 5:
ATTACHING MAIN WHEEL FAIRINGS

Gear leg fairings are very important for drag reduction. While it may seem that a fairing on the main wheel and tire would add more speed than one on a small round gear leg just the opposite is true. On our two place models wheel fairings add about 3-4 mph but the gear legs add at least 8 mph. The combined wheel and gear leg fairings add around 12 mph to the top speed. Looking at it another way - it would take an additional 27 horsepower to achieve the 12 mph contribute by the fairings. Obviously a good fairing installation is necessary if high speeds are to be had from an RV.

Step 1: Place the U-1017A Gear Leg Fairing leading edge down on a table or other flat surface and use a square at one end to position the trailing edge exactly above the leading edge. Make sure that the other end of the fairing also has the trailing edge exactly above the leading edge. This will verify that the fairing was molded without twist.

If/as required straighten the trailing edge of the gear leg fairing by sanding it with a long (12 in.) sanding block.

To avoid building in a twist add reference marks to the trailing edge by beginning with the fairing in the "no-twist" position. Place two or three spring clamps on the trailing edge. Wrap a short piece of tape around the trailing edge at each end then use a razor blade to split it along the trailing edge. If the fairing becomes twisted the edges of the tape will not line up. Check the alignment frequently during installation.

Step 2: Remove Page 48-13 and cut along the U-1017A Upper Trim Template cut line. Smooth the template over the outside of the fairing aligning it to the leading edge parting line. Use spring clamps to hold it in place. Mark the upper cut line on the fairing blank. Make two tick marks, one on each end of the fairing as per the callout in Figure 1. Remove the template and repeat for the other blank.

Cut the template along the U-1017A Lower Trim Template cut line. Use the dimension given in Figure 1 for positioning the lower template and then outline the lower end. **NOTE: When the text of the template is visible a U-1017A-L will be formed.** Make the tick marks here as well. Reverse the template so the text will not be visible and wrap it around the bottom of the other fairing blank and mark the lower cut line to form a U-1017A-R.

Extend the gear leg centerline marks about 1/4" toward the center of the part. The marks will be helpful later when positioning the fairings to the gear legs.

Trim off the top and bottom ends of the fairing. After trimming, file or saw notches approximately 1/16" deep in the ends of the fairing at the gear leg centerline marks.

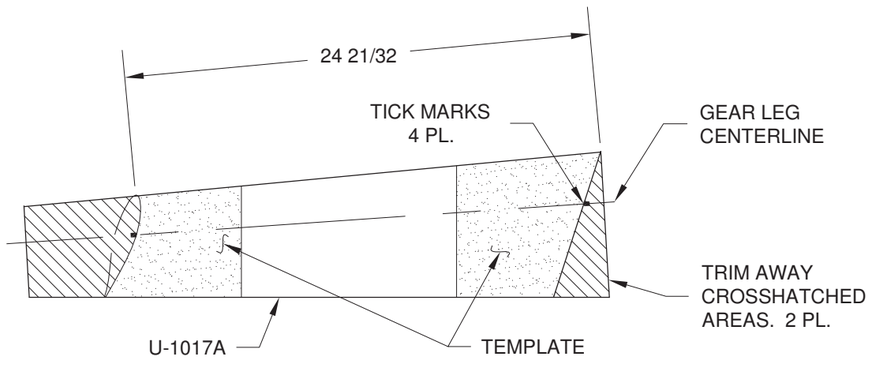


FIGURE 1: TRIMMING THE FAIRING (LEFT SHOWN)

Step 3: Place the trimmed U-1017A-L Gear Leg Fairing on the gear leg as shown in Figure 2. Clamp the trailing edge closed with two or three spring clamps.

Check the reference tape to be sure the gear leg fairing is not twisted. Adjust the position of the fairing to align the gear leg centerline marks with the gear leg centerline.

The lower end of the gear leg fairing should sit nearly flush on the U-1057-L Wheel Fairing. Some variation may occur depending on how accurately the wheel fairing was aligned and the gear leg fairing was trimmed.

In subsequent steps the gear leg fairing will be more accurately aligned but for now trim only as needed to generally seat the gear leg fairing onto the wheel fairing.

Remove the gear leg fairing from the gear leg.

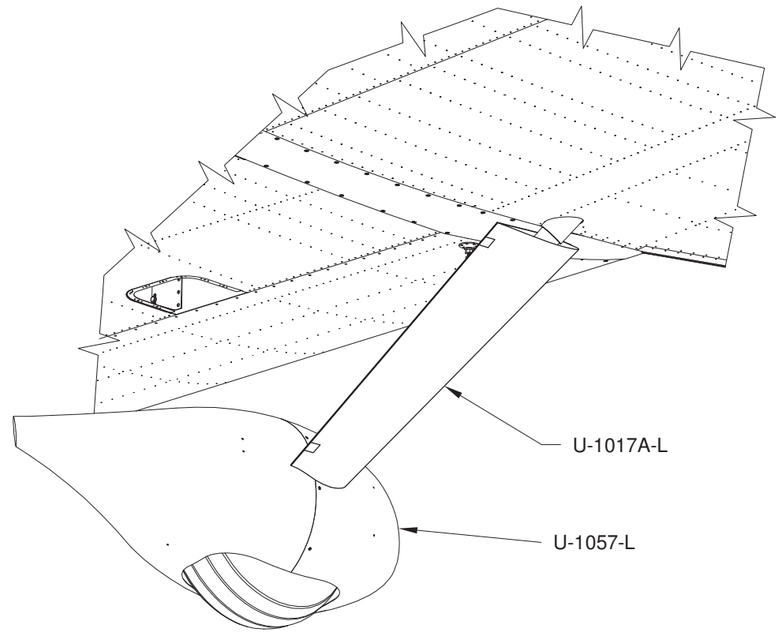


FIGURE 2: INSTALLING GEAR LEG FAIRINGS

Step 4: Remove the hinge pin from the U-1017B Gear Leg Fairing Hinge. Trim the hinge material to the length shown in Figure 3. The hinge will initially overhang each end by about 1" to help clamp the hinge to the fairing. Reinsert the hinge pin.

Mark but do not drill the rivet locations on each of the hinge segments as shown in Figure 3. Offset the rivet locations on the opposite hinge by 1/8" to prevent the clecos from interfering with one-another. When drilling the hinge to the fairing the fastener location marks will be visible through the translucent fairing.

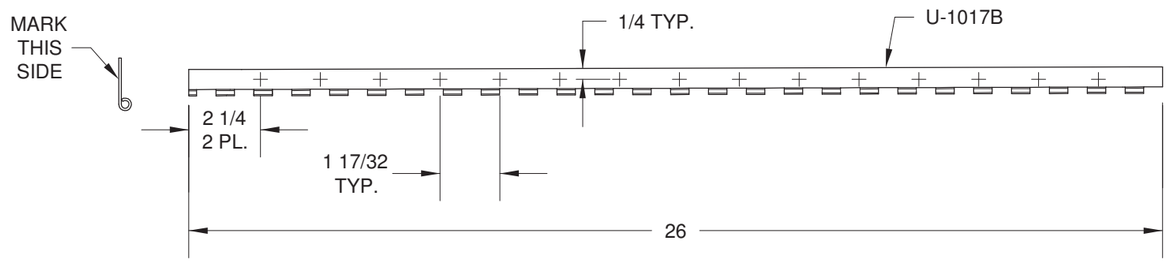


FIGURE 3: CUTTING HINGE HALVES

Step 1: Position the U-1017B Gear Leg Fairing Hinge and hinge pin inside the U-1017A Gear Leg Fairing as shown in Figure 1. With the trailing edge of the fairing taped closed turn the fairing trailing edge down to allow the hinge to locate itself.

Do not force the hinge farther aft (down) into the fairing. When assembled the hinge should be holding the trailing edge closed with a slight amount of pressure. Mark the fairing as shown in Figure 1 so that the hinge can be put back in the same place later.

Remove the hinge from the fairing and remove the hinge pin from the hinge.

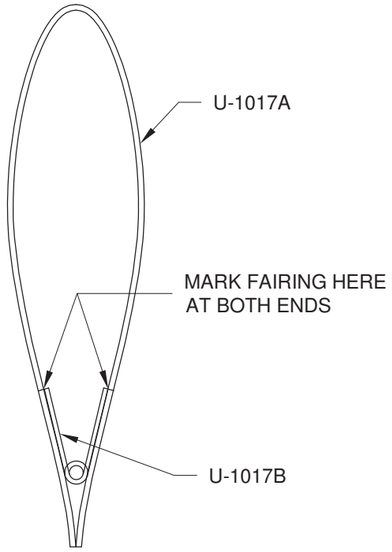


FIGURE 1:
POSITIONING HINGE IN FAIRING

Step 2: Position the marked hinge inside the trailing edge of the fairing and clamp the ends of one hinge half in place. With the hinge ends clamped in position, begin at one end and drill #40 through the fairing and hinge using the fastener locations marked on the hinge to position the holes. Use light pressure and high drill speed allowing the bit to cut through without distorting the hinge. Work from one end of the fairing to the other, clecoing each hole before drilling the next. Mark the final trim locations on the hinge before removing it from the fairing.

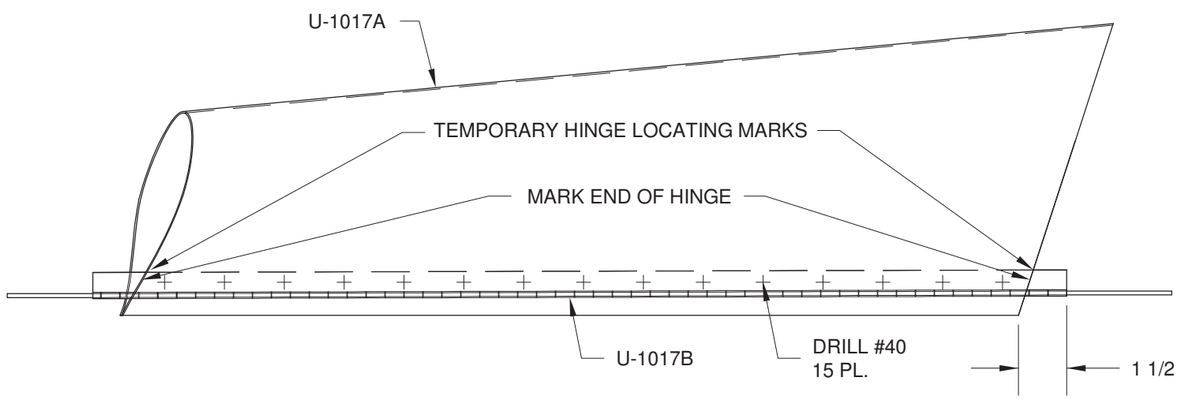


FIGURE 2: DRILLING FAIRING AND HINGE HALVES

Step 3: Un-cleco the hinge from the fairing and clean out any metal chips. Deburr holes and trim the 1" excess hinge from each end. Because the fairing is quite thin we recommend you keep the hinge clecoed to the fairing while countersinking. The holes in the hinge will guide the countersink cutter and keep it from elongating the holes in the fairing. Cleco the hinge to the fairing and countersink the fairing for AN426AD3 rivets. Rivet the hinge to the fairing using a hand squeezer. Do not fully set the rivets as in a metal structure. This would cause the thin composite fairing to crack around the holes. Repeat for the other hinge half.

Insert the hinge pin joining the trailing edge. Use a long sanding block to remove any excess "tail" on the fairing and even up the sides of the trailing edge.

Remove the hinge pin and bend the lower 1" to 90°. Grind the other end to an offset point (see Page 47-7). Drill a #40 hole through the upper surface of the lower end of the fairing so that the hinge can be safety wired at final assembly as shown in Figure 3.

Hereafter the U-1017A Gear Leg Fairing will be referred to as U-1017.

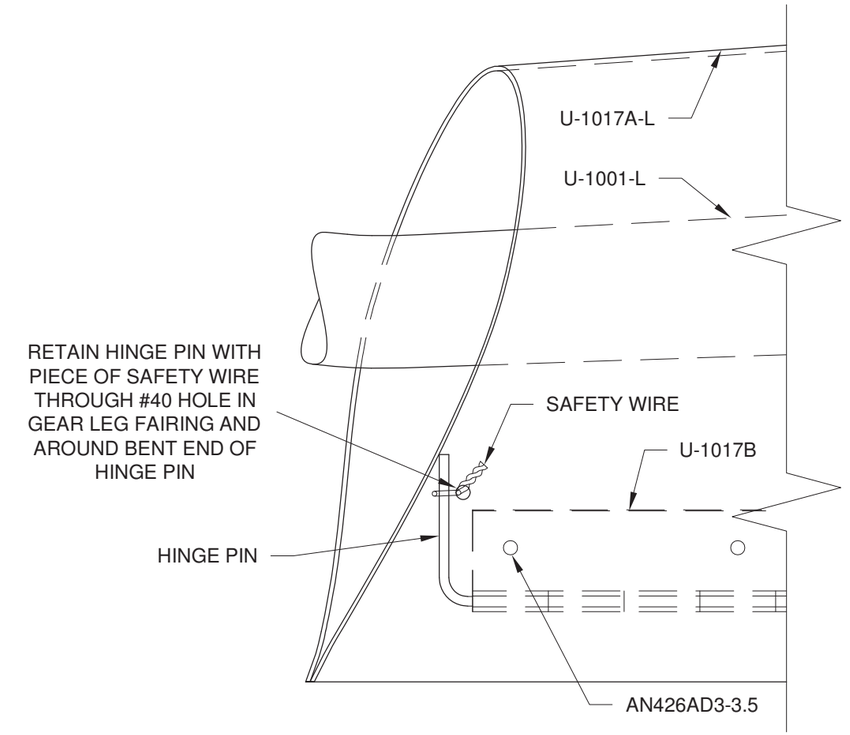


FIGURE 3: HINGE PIN RETENTION DETAIL

The gear leg fairing must be aligned with no load on the wheels simulating the in-flight condition of the gear legs. The following steps require the aircraft to be supported by jacks far enough off the ground that the wheels no longer touch. Level the aircraft at the F-1015C-L/R Mid Cabin Decks as shown in Figure 1. **WARNING: Use caution while the airplane is on jacks. Don't let it tip or it will fall off the jacks!**

Step 1: Slip the U-1017-L Gear Leg Fairing over the gear legs and brake lines and insert the hinge pin from the bottom. The hinge pin is thin enough to curve during insertion without taking excessive permanent bend.

Roughly align the gear leg fairing to the airflow and the notched centerline marks with the gear leg centerline. Clamp the gear leg fairing to the gear leg to temporarily hold it in place.

The alignment of the fairings is important and can significantly affect the way the airplane flies. While a very careful "eyeball" alignment job might come close this is made difficult because of the sweep back of the gear legs.

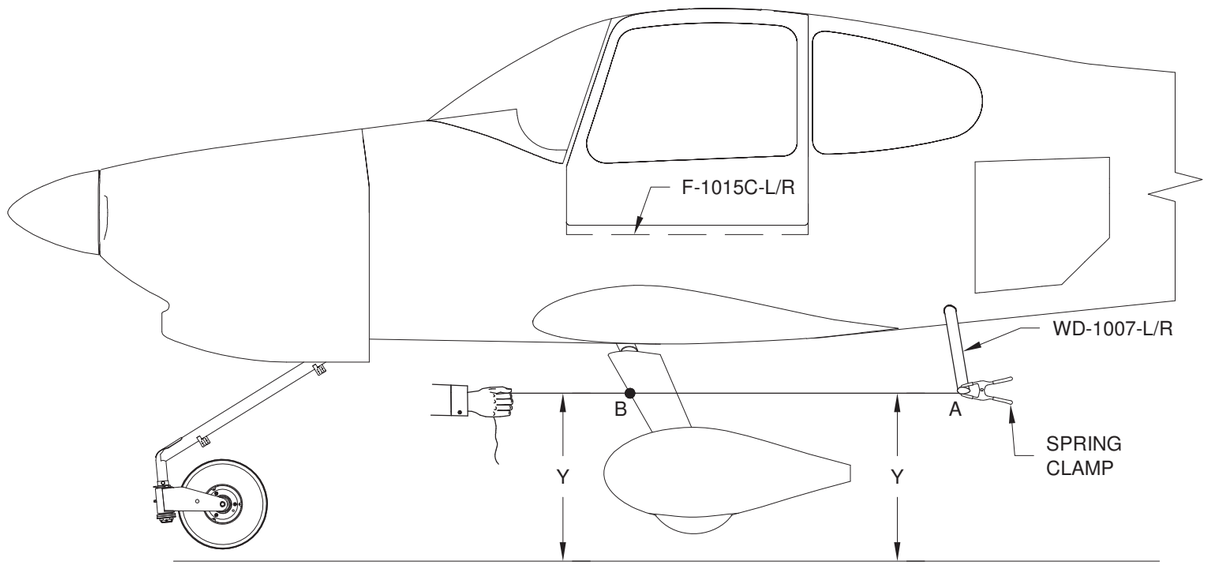


FIGURE 1: LEVELING AIRCRAFT AND ALIGNING GEAR LEG FAIRINGS

Step 2: Drop plumb bobs from the aircraft centerline to the floor and snap a line on the floor between theses two points. Create a displaced centerline (parallel to the real centerline) on the floor beneath an arbitrary point "A" on the horizontal part of the WD-1007-L Step. It could be established elsewhere but the step is very convenient spot. Drop a plumb bob from point "A" to the floor and measure the span wise distance "X" from below point "A" to the center of the fuselage. Snap a line from below the step forward past the gear leg fairing the distance "X" from and parallel to the aircraft centerline. This is the displaced centerline. Drop a plumb bob from the leading edge of the U-1017-L Gear Leg Fairing to the displaced centerline as shown in Figure 2. This locates point "B" on the leading edge of the fairing.

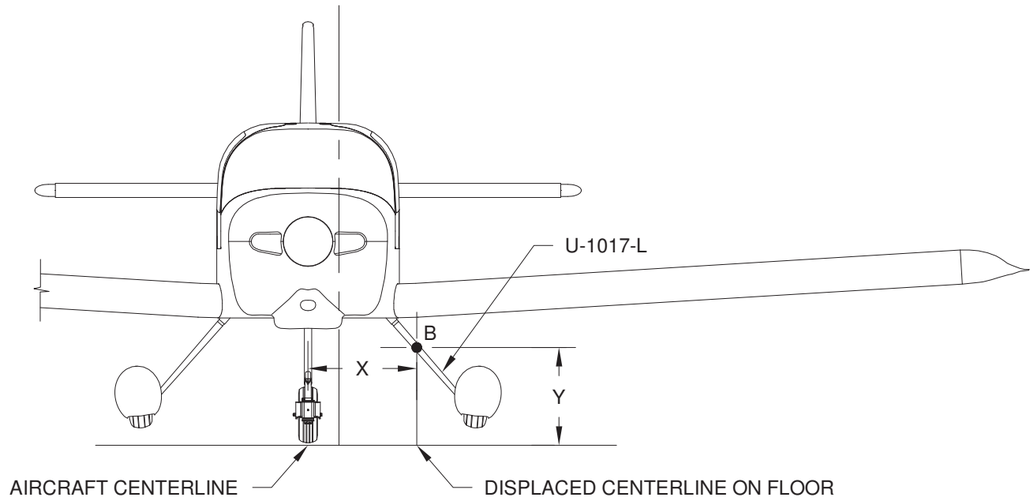


FIGURE 2: MEASURING FROM AIRCRAFT CENTERLINE AND FLOOR

Step 3: Wrap a string around the leading edge of the U-1017-L Gear Leg Fairing as shown in Figure 3 at point "B" (see Figure 1) and pull both ends tight to the spring clamp at "A". Be sure the string is level and parallel to the F-1015C-L Mid Cabin Deck. Measuring from the floor will be adequate here. When the leading and trailing edges of the gear leg fairing are centered between the strings as shown in Figure 3 the gear leg fairing is properly aligned.

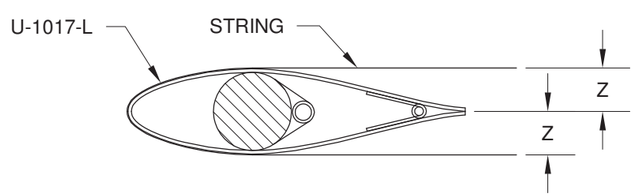


FIGURE 3: ALIGNING GEAR LEG FAIRINGS

Step 1: Clamp the U-1017-L Gear Leg Fairing to the U-1001-L Gear Leg (not shown). The U-1019-L Lower and U-1020-L Upper Intersection Fairings must be aligned to the gear leg fairing and the gear leg fairing alignment must be maintained while the intersection fairings are being installed. Once permanently installed the intersection fairings will hold the gear leg fairing in place.

Apply a parting agent such as automotive wax, PVA (a special liquid parting agent) or brown mylar packaging tape on the gear leg fairing and U-1057-L Wheel Fairing surfaces to prevent adhesion since the intersection fairings must part from all adjoining surfaces.

Slip the lower intersection fairing around the gear leg fairing and fit it to the U-1057-L Wheel Fairing as shown in Figure 1. The intersection fairings are fabricated with only two layers of fiberglass so they should be flexible enough for making adjustments.

Clamp the lower intersection fairing together at its aft edge. Excess material has been added to the intersection fairings to secure them to the wheel and gear leg fairings. Do not trim them until after additional layers of fiberglass have been added.

Align the lower intersection fairing to the gear leg fairing and fit it to the wheel fairing. Secure it with spring clamps and duct tape.

Add two more layers of fiberglass to reinforce and constrain the intersection fairing to its final shape. Epoxy resin **must** be used when adding layers to the epoxy intersection fairings. Two layers of 9 oz. fiberglass cloth over top of the original intersection fairings should be sufficient.

Drill and cleco the intersection fairing to the wheel fairing when cured as per Figure 2. Remove the part and trim to final size.

OPTIONAL: For a smoother transition from the lower intersection fairing to the wheel fairing see Page 48-12.

Step 2: Repeat Step 1 for the U-1020-L Upper Intersection Fairing. See Page 48-12, Figure 1.

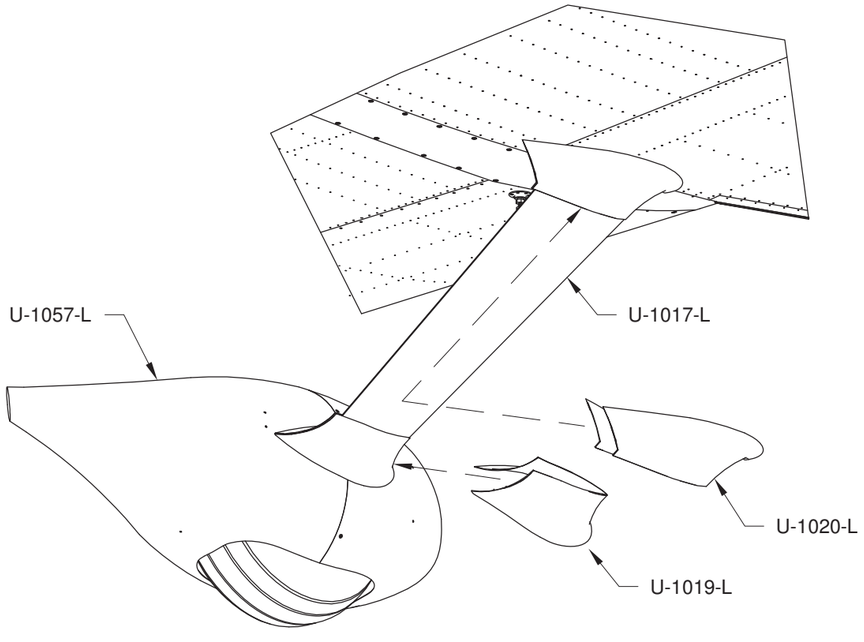


FIGURE 1: INSTALLING INTERSECTION FAIRINGS

Step 3: Drill #40 and cleco the U-1019-L Lower Intersection Fairing at approximately the locations shown.

Step 4: Remove the U-1019-L AND U-1020-L Intersection Fairings and U-1057-L Wheel Fairings. Install nuplates on the inside surface of the wheel fairings as shown in Section A-A.

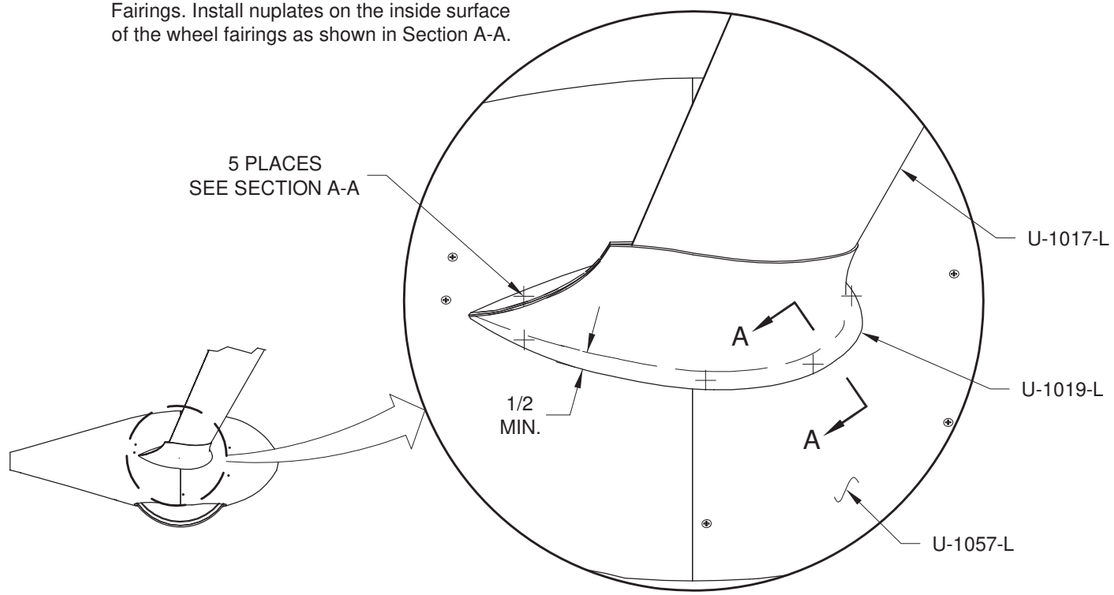
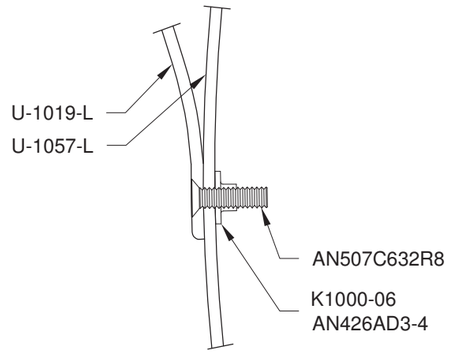


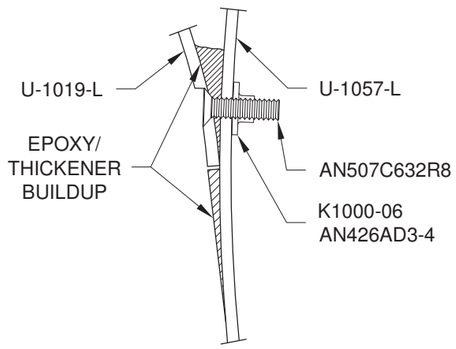
FIGURE 2: ATTACHING LOWER INTERSECTION FAIRING



SECTION A-A

Optional: Trim away most of the flange (mating surface) of the U-1019 Lower Intersection Fairing as shown in the Optional Section A-A. Drill the screw attach holes. Remove the int. fairing. Reinforce the intersection fairing by building up its inner surface around the screw holes with a small amount of epoxy/thickener mixture. When cured countersink the screw holes.

Cover the intersection fairing in release solution. Attach it to the wheel fairing and apply a slurry of epoxy resin and thickener to the sanded surface of the wheel pant. Once the slurry is hardened, sand it to a smooth surface.



OPTIONAL SECTION A-A
(SEE FIG. 2 PAGE 48-11)

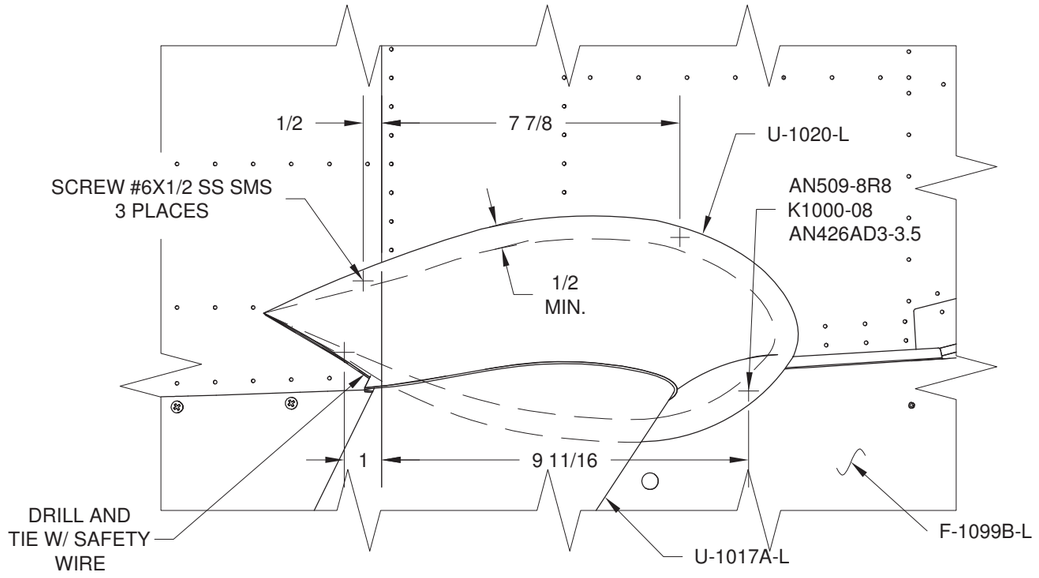


FIGURE 1:
ATTACHING UPPER INTERSECTION FAIRING
BOTTOM VIEW

GEAR LEG CENTERLINE - TOP TEMPLATE

GEAR LEG CENTERLINE - BOTTOM TEMPLATE

ALIGN WITH THE TOP
EDGE OF THE U-1017A
GEAR LEG FAIRING

U-1017A TRIM TEMPLATE

LOWER TRIM LINE

UPPER TRIM LINE

U-1017A LOWER TRIM TEMPLATE CUT LINE

U-1017A UPPER TRIM TEMPLATE CUT LINE

NOTE: CHECK PRINTED SCALE 1:1 PER SECTION 3 BEFORE USING THE TEMPLATE!

16
[406.4 mm]

10 9/16
[268.3 mm]

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NOTE: The nose wheel fairing is a two piece fiberglass assembly. It attaches to the nose wheel fork with brackets riveted to the wheel fairing.

NOTE: If transparent, the nose wheel fairings must remain transparent to accomplish the installation. Do not sand or prime their interior or exterior surfaces until directed to or upon the completion of the installation.

If the fairings are opaque, refer to Section 5.18 MATCH-DRILLING OPAQUE FIBERGLASS FAIRINGS.

Step 1: Fit the U-1013A Wheel Fairing Front and U-1013B Wheel Fairing Rear together. The wheel fairing rear has a recessed lip on the front so the smaller wheel fairing front will fit flush. This lip may be uneven. Trim it to a constant width as shown in Figure 1.

Step 2: Fit the U-1013A Wheel Fairing Front over the lip of the U-1013B Wheel Fairing Rear and trim, grind or file either of them as needed to achieve a good fit. Do not worry about a mismatch at the top center of the fairing halves since this area will be trimmed away later to clear the WD-1017 Nose Gear Leg Assembly. Tape them into a best fit position and place a reference mark across the seam. Use this mark to realign the fairings during assembly.

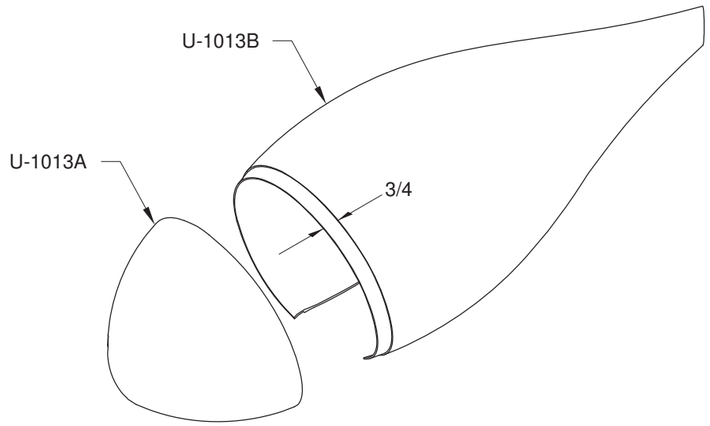


FIGURE 1: FITTING FAIRING HALVES

Step 3: Mark the screw locations that will join the U-1013A Wheel Fairing Front and the U-1013B Wheel Fairing Rear as per the dimensions shown in Figure 2 and Section A-A.

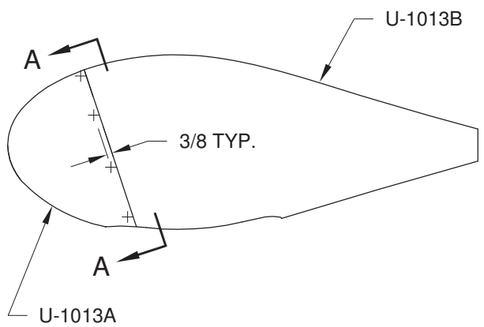
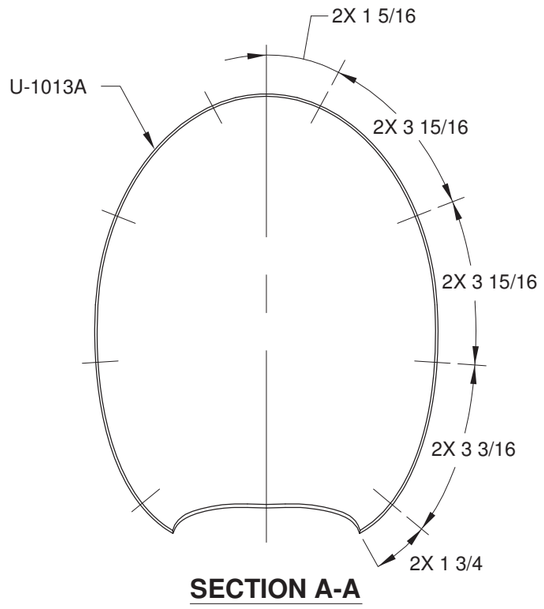


FIGURE 2: DRILLING ATTACH HOLES



SECTION A-A

Step 4: Drill the U-1013A Wheel Fairing Front and the U-1013B Wheel Fairing Rear screw locations as per the callout in Figure 3 installing clecos along the way. Begin at the top and progress toward the bottom of the fairing.

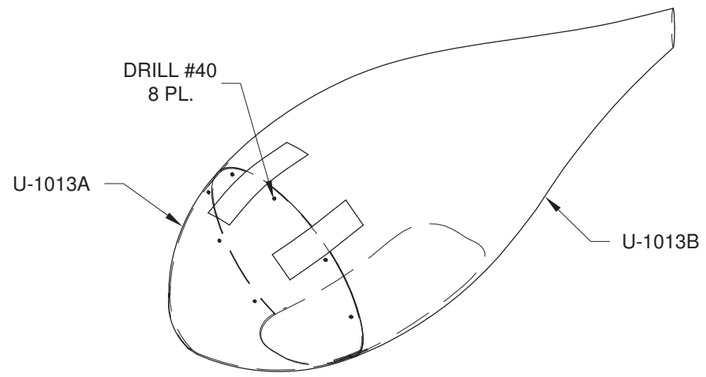


FIGURE 3: DRILLING FAIRINGS

Step 5: Draw a vertical centerline on the U-1013B Wheel Fairing Rear as shown in Figure 4. Place a mark at the midpoint of the vertical centerline as shown in Figure 4.

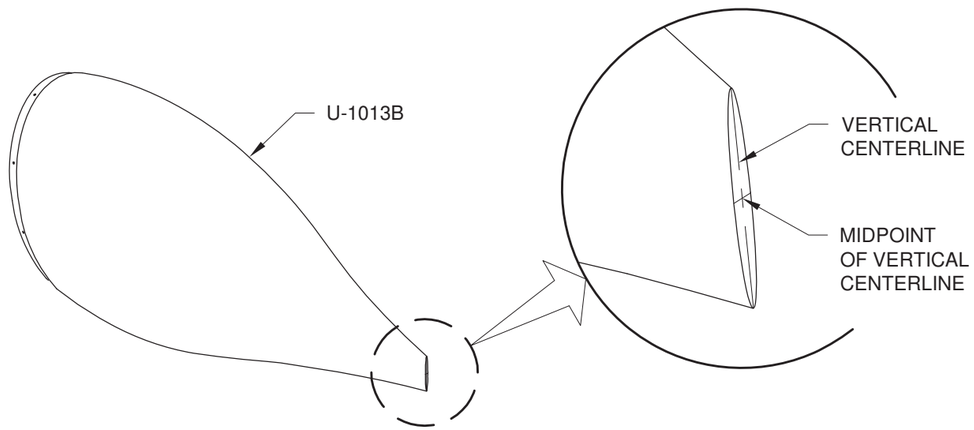


FIGURE 4: DRAW REFERENCE LINES AT AFT END OF FAIRING

Step 1: Place the U-1013B Wheel Fairing Rear on the bench and make it plumb using a square so that the reference line on the fairing is vertical.

Mark a centerline as shown by measuring horizontally across the forward opening of the fairing as shown in Figure 1.

Position a square at the midpoint of this distance and mark the top of the wheel fairing rear.

Extend the mark 1/2" aft of the molded step. This reference mark will serve to align the wheel fairing along its roll axis.

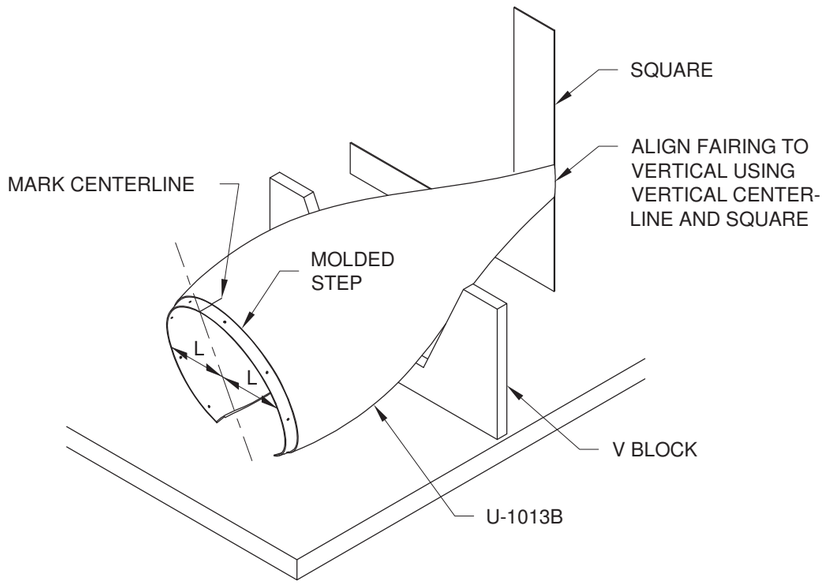
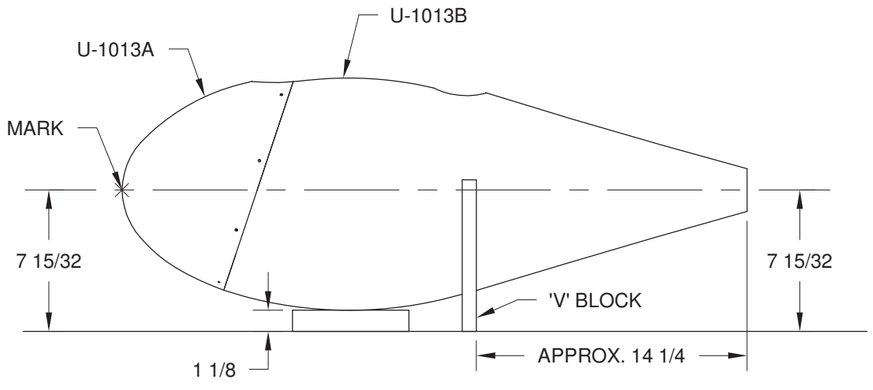
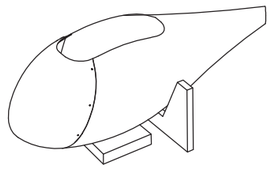


FIGURE 1: MARK FAIRING CENTERLINE

Step 2: Tape the U-1013A and B Wheel Fairing halves together and place them into the 'V' block with the wheel opening facing upward as shown in the Iso View of Figure 2. Rotate the assembled fairing about its long axis until the vertical centerline drawn at the back of the wheel fairing rear is vertical and check it with a square.

Level the wheel fairing by measuring from the bench to the midpoint of the vertical centerline at the aft end the distance shown. Mark the forward end of the fairing as shown.





ISO VIEW

FIGURE 2: MARK FAIRING CENTERLINE AT ITS NOSE

Step 3: Fabricate two U-1024 Standoffs from 3/4 x 1 1/2 x 1 3/16 2024-T351 aluminum block as provided. Hacksaw to the shape depicted and drill as shown in Figure 3.

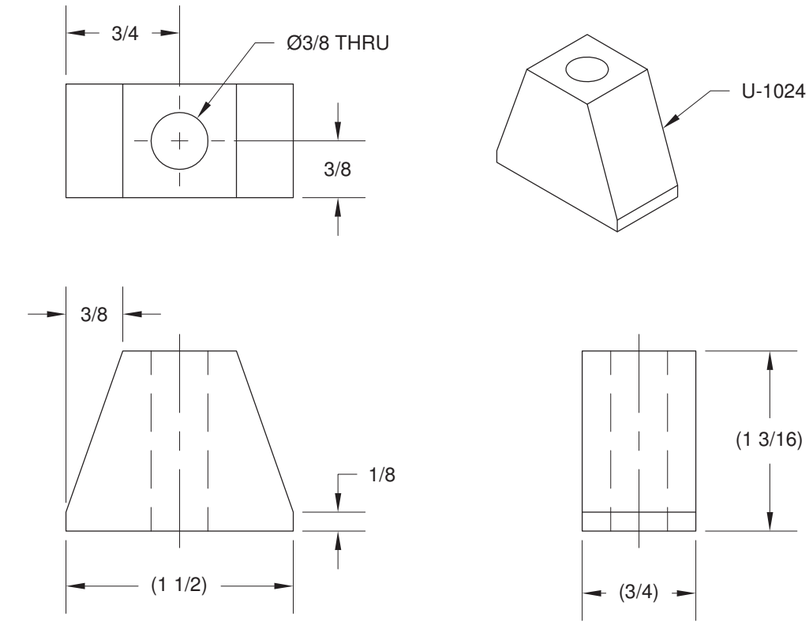


FIGURE 3: FABRICATE STANDOFF

Step 1: Mark screw locations on the U-1013C-L and -R Nose Wheel - Fairing Bracket flanges as per Figure 1. The marks will be visible through the wheel fairing. Drill and deburr the forward attach hole as per the callout.

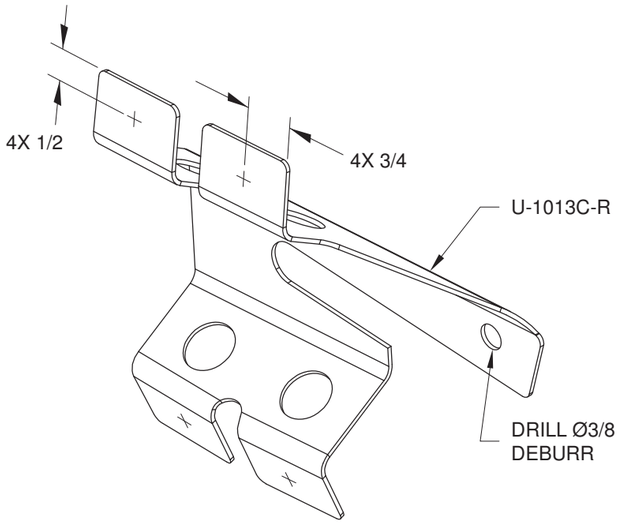


FIGURE 1: MARKING SCREW LOCATIONS

Step 2: Tape the spacer to the top of the tire as shown in Figure 2. Slide the U-1013C-R Nose Wheel - Fairing Bracket onto the axle at the gap in the washer stack-up and then bolt it to the WD-1030 Nose Fork using the hardware shown. **NOTE: Omit the two washers until the access hole is drilled.** Slide the U-1013B Wheel Fairing Rear into place. Slide the U-1013C-L Nose Wheel - Fairing Bracket into place between the wheel fairing rear and the nose fork bolting it to the nose fork as per the callouts.

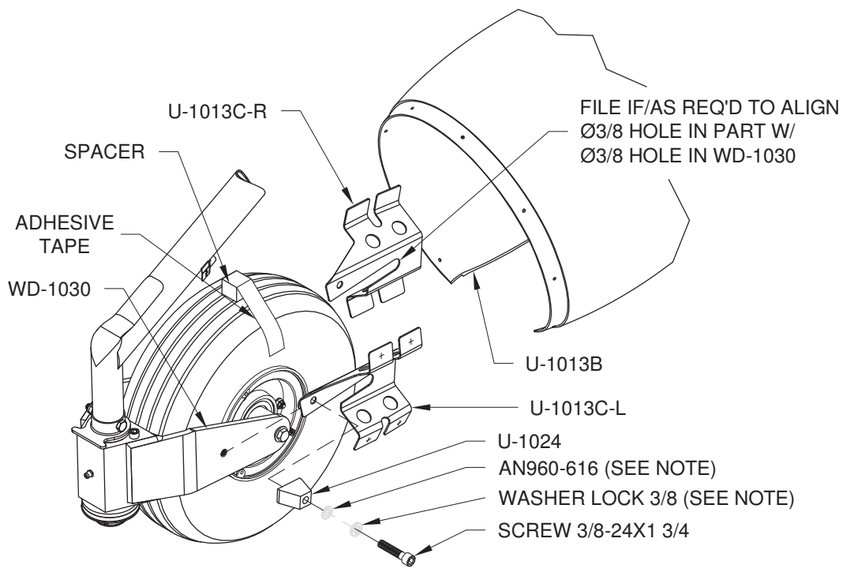


FIGURE 2: ATTACHING THE BRACKETS AND THE WHEEL FAIRING

Step 3: Support the aft end of the U-1013B Wheel Fairing Rear using blocks as shown in Figure 3. Position the wheel fairing rear on the U-1013C-L/R Nose Wheel - Fairing Brackets using the dimensions given. Bend the nose wheel - fairing brackets as required to fit to the inside surface of the wheel fairing rear.

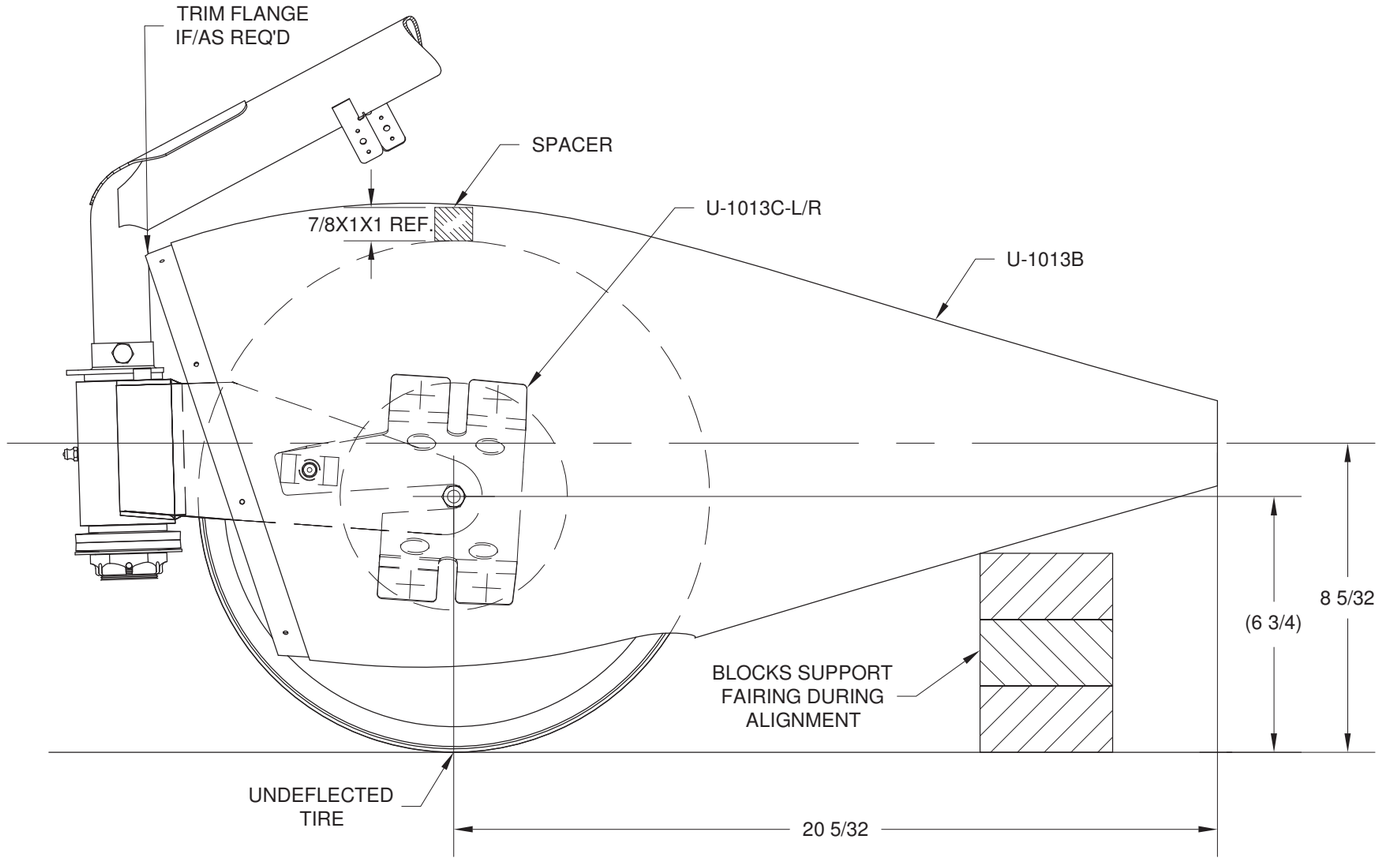


FIGURE 3: ALIGNING THE WHEEL FAIRING REAR

Step 1: Measure forward from the aft edge of the U-1013A Wheel Fairing Front the distance shown in Figure 1. Cut the hole with a 1 1/2 Dia. hole saw aligning the hole with the center of the wheel fairing front. Saw forward from the aft edge of the wheel fairing front to meet the tangent points of the hole. Careful work will allow reuse of the piece to fill in the gap over the flange of the wheel fairing rear. Trial fit the wheel fairing front and sand to fit allowing 1/16-3/32 clearance between the cutout edges and the WD-1017-1 Nose Gear Leg Assembly. This slot will be visible so take the time required to do a good job. Cleco the wheel fairing front to the wheel fairing rear.

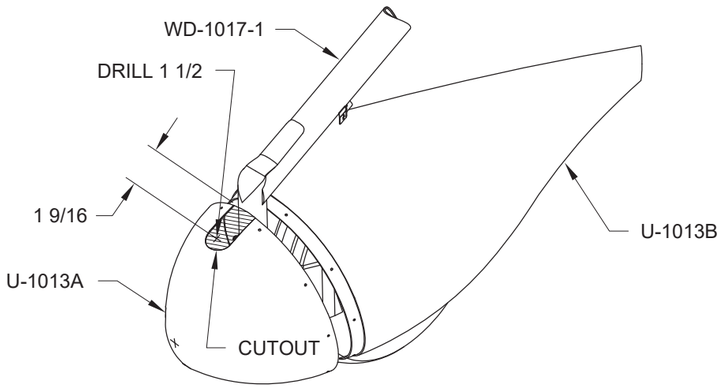


FIGURE 1: CUTTING THE SLOT IN THE WHEEL FAIRING FRONT

Step 2: Recheck the alignment of the U-1013 Wheel Fairing with the floor as shown in Figure 2. Sight through the U-1013B Wheel Fairing Rear and drill through the wheel fairing rear and the U-1013C-L/R Nose Wheel - Fairing Brackets. Drill the 1 in. Dia. access holes as per the callouts in Figure 2. Shim between the tire and the fairing if/as required to hold the fairing in place while drilling. Mark the wheel opening clearance as shown. Remove the fairings and trim the opening.

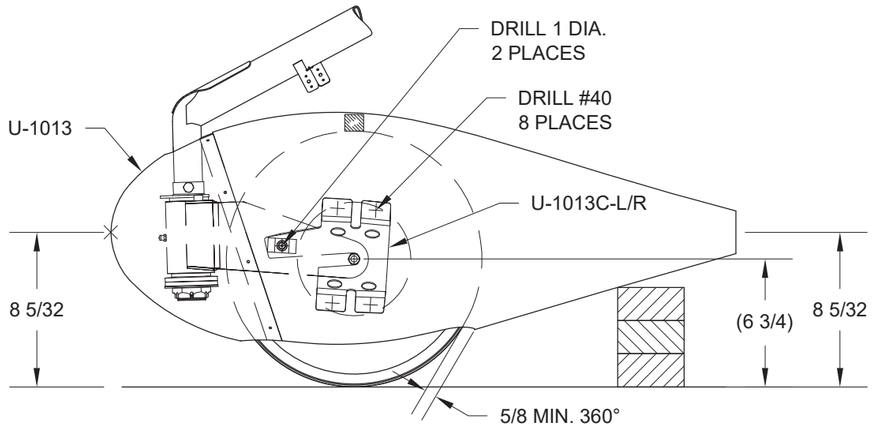


FIGURE 2: ALIGNING FAIRING IN PITCH

Step 3: Tap the U-1013C-L/R Nose Wheel - Fairing Brackets for 6-32 screws as shown in Figure 3. Reattach the wheel fairings to the main wheel fairing bracket with 6-32 screws and check their alignment.

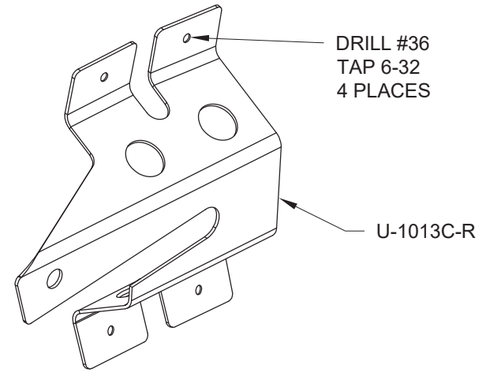


FIGURE 3: DRILLING AND TAPPING NOSE WHEEL - FAIRING BRACKETS

Step 4: Follow the procedures on Page 48-6 Step 5 for applying epoxy to the inside of the fairings.

Step 5: When cured remove the U-1013A Wheel Fairing Front and U-1013B Wheel Fairing Rear. Remove the U-1013C-L/R Nose Wheel - Fairing Brackets.

Step 6: Final-Drill the U-1013C-L/R Nose Wheel - Fairing Brackets for nutplate rivets and screws as shown in Figure 4. Deburr and countersink the nutplate attach rivet holes for flush rivets. Prime the nose wheel - fairing brackets and attach the nutplates shown.

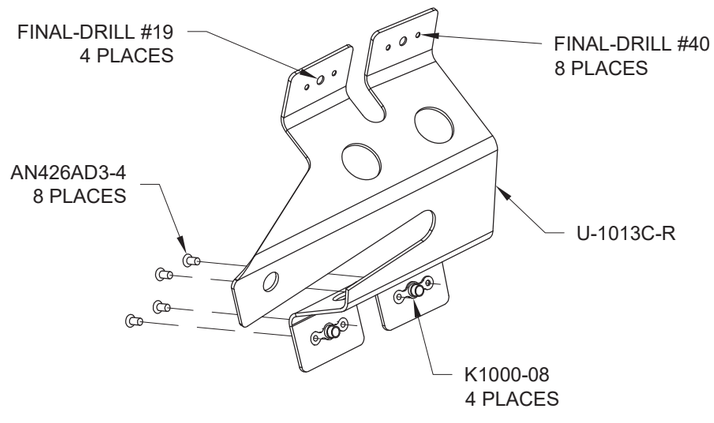


FIGURE 4: ATTACHING NUTPLATES TO BRACKETS

Step 1: Cleco the U-1013A Wheel Fairing Front and the U-1013B Wheel Fairing Rear together as shown in Figure 1. Refer to the callouts in Figures 1 & 2 and to the main wheel fairing instructions on Page 48-7, Steps 3 & 4 for the proper sequences.

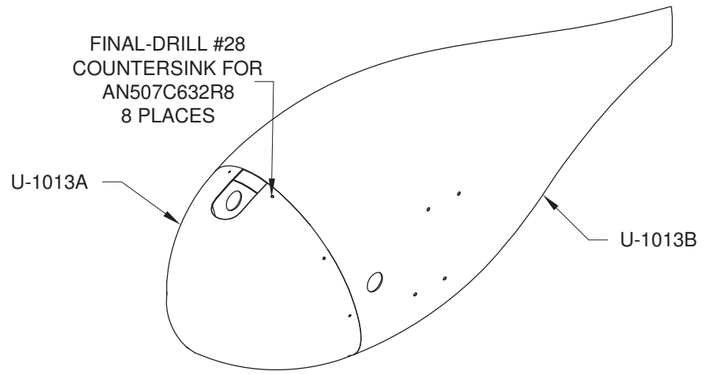


FIGURE 1: FINAL DRILLING THE FAIRING AND COUNTERSINKING

Step 2: Cut to fit the piece of fiberglass scrap created earlier to serve as a filler and position it on the wheel fairing rear directly behind the WD-1017 Nose Gear Leg. Final-Drill as shown in Figure 2, countersink and rivet it to the wheel fairing rear as shown in the Detail.

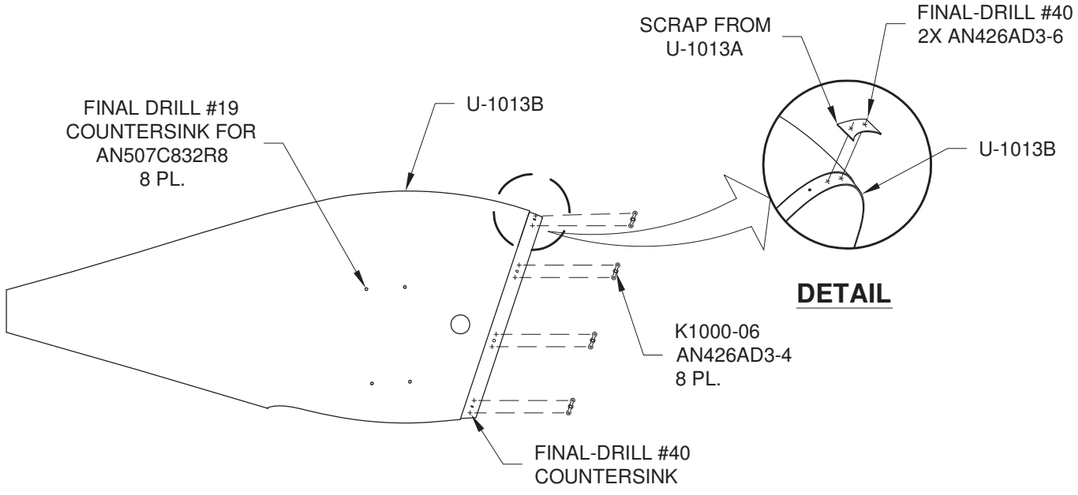


FIGURE 2: RIVETING NUTPLATES TO THE WHEEL FAIRING REAR

Step 3: Attach the U-1013C-L/R Nose Wheel - Fairing Brackets to the U-1013B Wheel Fairing Rear as per the hardware called out in Figure 3.

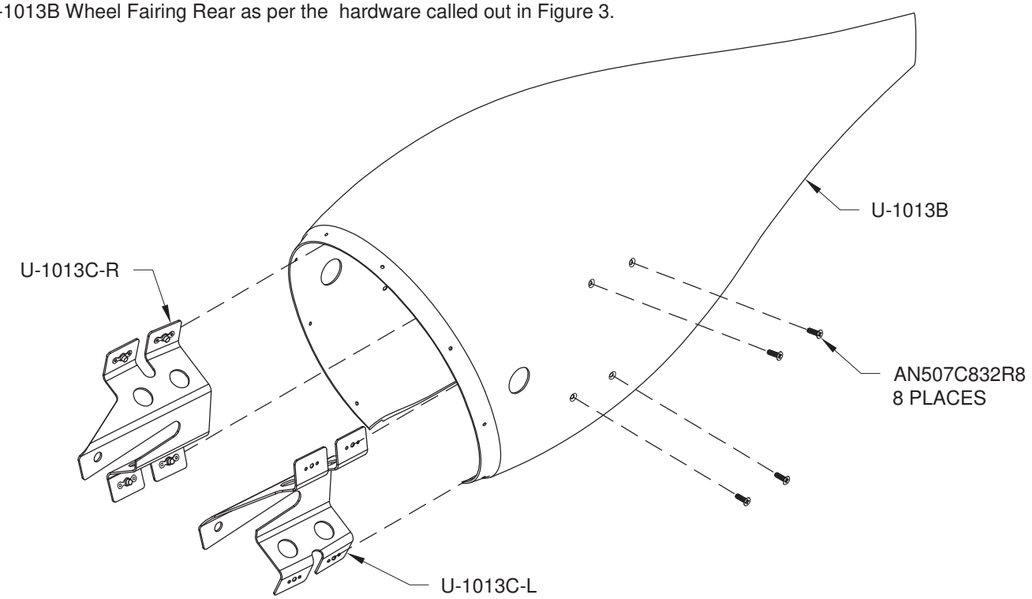


FIGURE 3: ATTACHING NOSE WHEEL - FAIRING BRACKETS

Step 4: Slide the U-1013B Wheel Fairing Rear onto the axle at the gap in the washer stack-up. Bolt it to the WD-1030 Nose Fork at the U-1013C-L/R Nose Wheel - Fairing Brackets as shown in Figure 4 using the hardware called out on Page 48-17 Figure 2. Attach the U-1013A Wheel Fairing Front to the wheel fairing rear as shown.

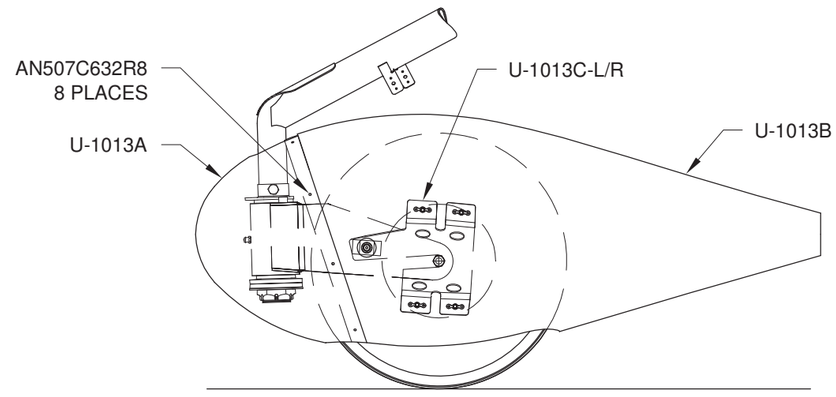


FIGURE 4: FINAL FAIRING ATTACHMENT

NOTE: The nose gear leg fairing is a simple fiberglass wraparound fairing much like the main gear leg fairings and is installed in almost exactly the same way.

NOTE: If transparent, the nose gear leg fairing must remain transparent to accomplish the installation. Do not sand or prime its exterior until installation is complete.

If the fairing is opaque, refer to Section 5.18 MATCH-DRILLING OPAQUE FIBERGLASS PARTS.

Step 1: Cut out the templates for the U-1018A Nose Gear Leg Fairing found at the end of this section.

Step 2: Drape the Aft Template over the U-1018A Nose Gear Leg Fairing and position it as per Figure 1. Double check that the measurement was taken to the cutout (shaded area) and **not** to the forward edge of the template. Transfer the outline to the part and trim as shown in Figure 1.

Step 3: Glue the Forward Template to a piece of stiff paper and position it onto the U-1018A Nose Gear Leg Fairing as per Figure 1. Transfer the outline to the part and trim accordingly. The template defines a conservative 'zero clearance' fit with the nose wheel fairing so the gear leg fairing should require additional trimming.

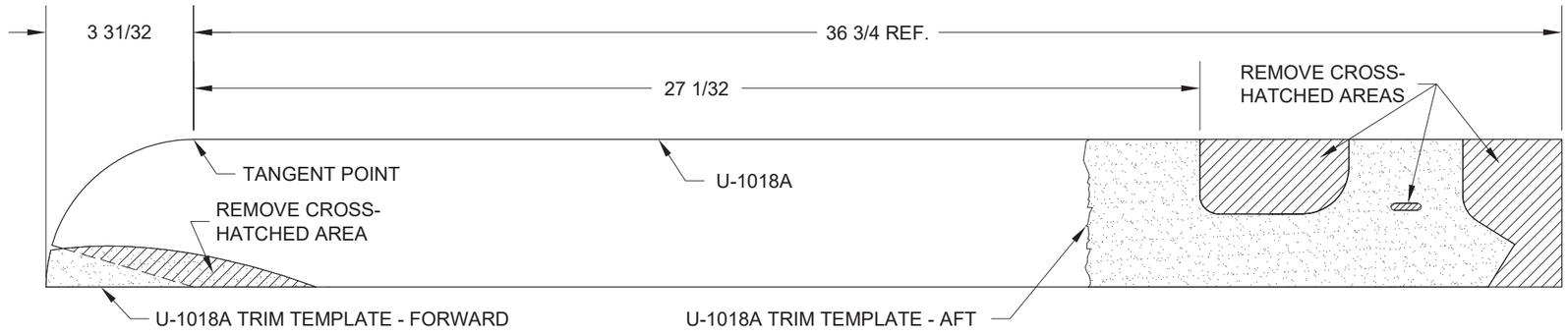


FIGURE 1: TRIMMING THE NOSE GEAR LEG FAIRING

Step 4: Remove a 1 in. wide strip of fiberglass from the top center of the U-1018A Nose Gear Leg Fairing as shown in Figure 2. This will allow the aft part of the fairing to slip over and later attach to the WD-1017-1 Nose Gear Leg Assembly.

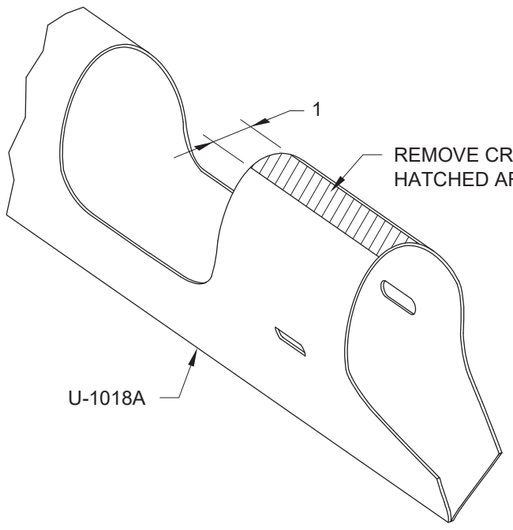


FIGURE 2: MODIFYING THE NOSE GEAR LEG FAIRING

Step 5: With the U-1013 Wheel Fairing in place fit the U-1018A Nose Gear Leg Fairing to the WD-1017-1 Nose Gear Leg Assembly as shown in Figure 3. Align the gear leg fairing by sliding it fore and aft along the nose gear to find the best fit and by using the dimension given in Figure 3. Section A-A depicts the fairing nested onto the nose gear leg assembly. Trim the nose gear leg fairing where it interferes with the nose wheel fairing. Rotate the nose wheel from side to side to check for clearance.

Step 6: Mark the outline of the small WD-1017-1 Nose Gear Leg Assembly fairing brackets onto the U-1018A Nose Gear Leg Fairing by sighting through the fairing.

Remove the nose gear leg fairing.

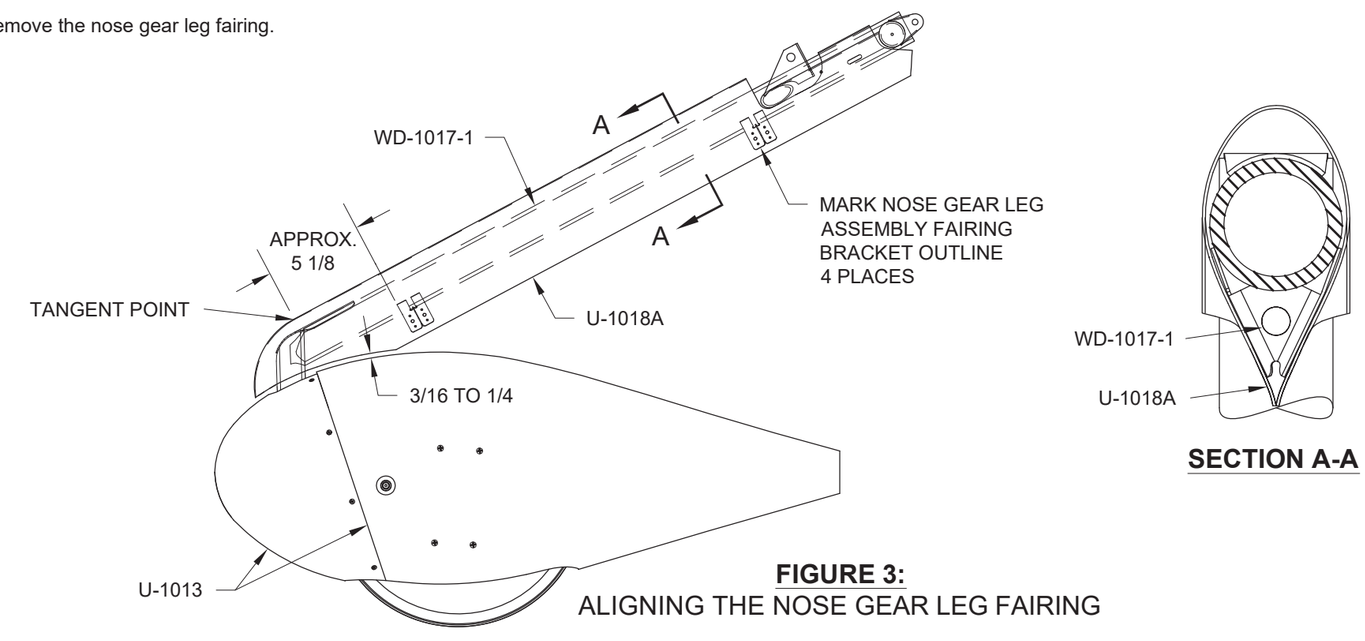


FIGURE 3:
ALIGNING THE NOSE GEAR LEG FAIRING

Step 1: Make the U-1018C Nose Gear Leg Hinge from "piano hinge .063." Draw a rivet centerline the full length of the outside of both halves of the nose gear leg hinge as per the dimension shown in Figure 1. Nest the hinge into the U-1018A Nose Gear Leg Fairing (referred to hereafter as "fairing") as shown allowing it to extend beyond both ends of the fairing. Transfer the centerline mark from the hinge to the fairing at the fairing ends where the hinge hangs out.

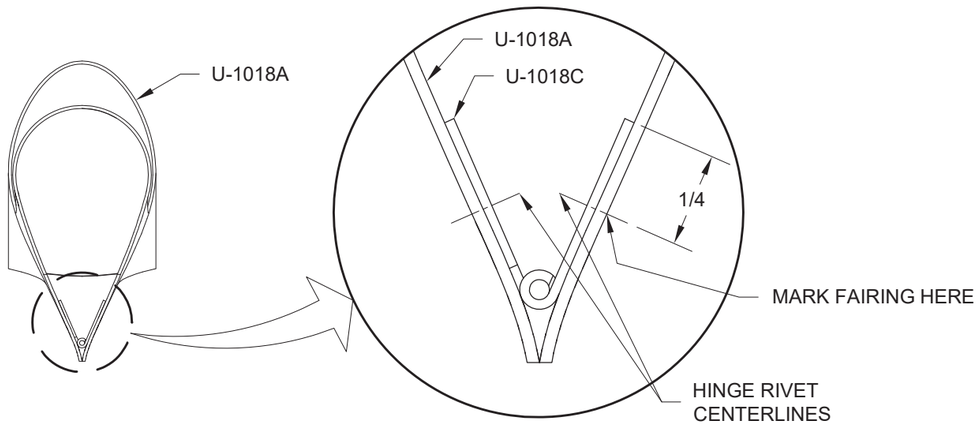


FIGURE 1:
ALIGNING PIANO HINGE

Step 2: Remove the U-1018C Nose Gear Leg Hinge from inside the U-1018A Nose Gear Leg Fairing. Lay the fairing on its side and draw a rivet centerline the length of the fairing by connecting the two marks made in the previous step. Lay out the rivet pattern as depicted in Figure 2. Flip the fairing over and lay out the rivet pattern for the other side.

Drill #40 the fairing at the hinge attach rivet locations.

Step 3: Insert the U-1018C Nose Gear Leg Hinge into the U-1018A Nose Gear Leg Fairing aligning the rivet centerline of the hinge with the holes in the fairing. Clamp it at each end. Use a new drill bit and high speed putting as little force on the hinge as possible to avoid pushing it away from the fairing while drilling. Match-Drill #40 the hinge using the #40 holes in the fairing as guides inserting clecos after drilling each hole.

Countersink the fairing to accept the rivets called out in Figure 2. Remove the hinge and deburr.

Cleco the hinge to the outside of the fairing and transfer the outline of the WD-1017-1 Nose Gear Leg assembly fairing brackets to the hinge. Remove and notch the hinge as shown in Figure 2. It is acceptable to omit the hinge altogether where it interferes with the nose gear leg assembly fairing brackets.

Remove the hinge pin from the hinge and cut the hinge halves to length. **Do not cut the hinge pin yet.**

Reinstall the hinge and rivet it to the fairing as per Figure 2. Use the same riveting technique as for the main gear leg fairings, see Page 48-9 Step 3.

Step 4: Hereafter the part number "U-1018 Nose Gear Leg Fairing" shall include the U-1018A Nose Gear Leg Fairing and U-1018C Nose Gear Fairing Hinge.

To keep the hinge pin from sliding down the fairing bend a 1/4 in. by 90° leg at the top. Cut the opposite end to length and grind to an offset point (see Page 47-7).

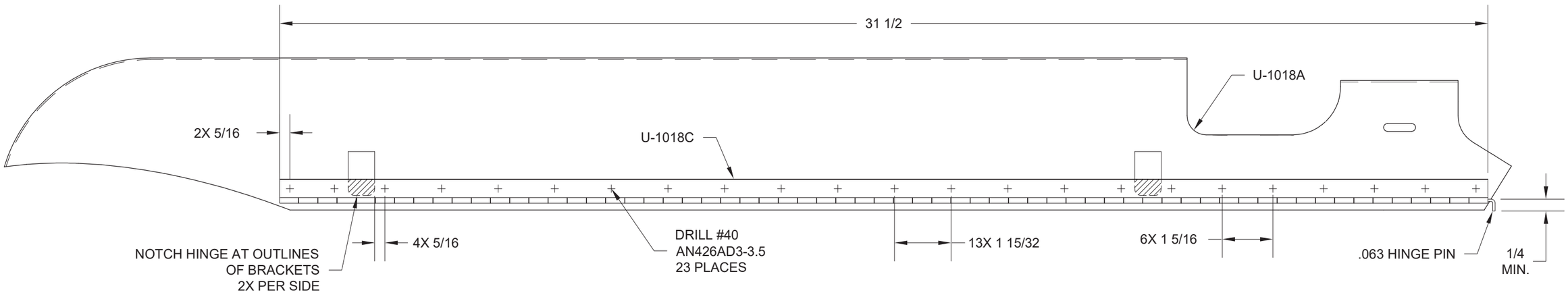


FIGURE 2: NOTCHING, DRILLING AND RIVETING THE PIANO HINGE
(SOME PARTS OMITTED FOR CLARITY)

Step 1: Reinstall the U-1018A Nose Gear Leg Fairing on the WD-1017-1 Nose Gear Leg Assembly and install the hinge pin.

Drill #19 the four attach holes in the fairing by sighting through the fairing at the holes in the WD-1017-1 Nose Gear Leg Assembly fairing brackets as shown in Figure 1 and Detail A.

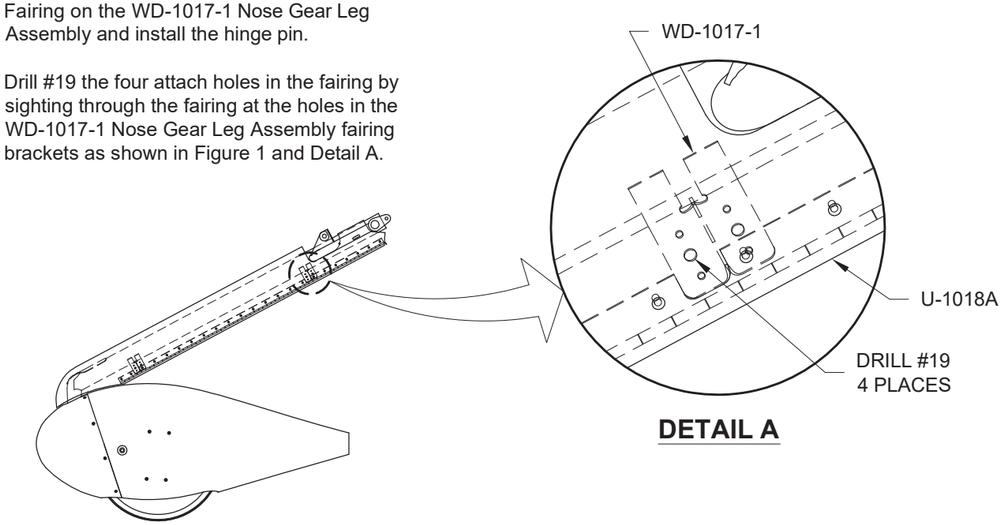


FIGURE 1: DRILLING THE NOSE GEAR LEG FAIRING

Step 3: Reinstall the U-1018A Nose Gear Leg Fairing on the WD-1017-1 Nose Gear Leg Assembly using the hardware shown in Figure 3.

Install and tighten the hose clamp at the aft end of the nose gear leg. If necessary soften the fiberglass tab with a heat gun in order to prevent it from cracking as the hose clamp is tightened.

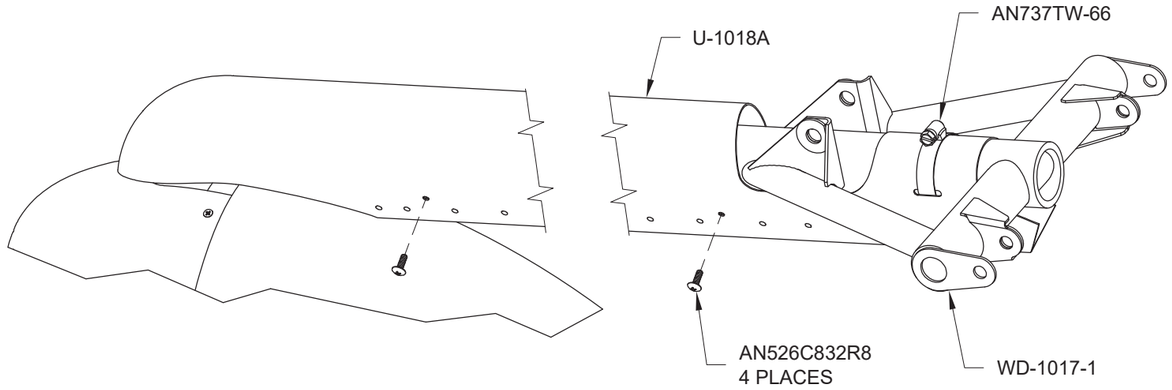


FIGURE 3: ATTACHING NOSE GEAR LEG FAIRING TO NOSE GEAR LEG ASSEMBLY

Step 2: Remove the U-1018A Nose Gear Leg Fairing. Final-Drill #40 the rivet holes and countersink them for the rivets called out in Figure 2. Rivet nutplates to the WD-1017-1 Nose Gear Leg Assembly as per Figure 2.

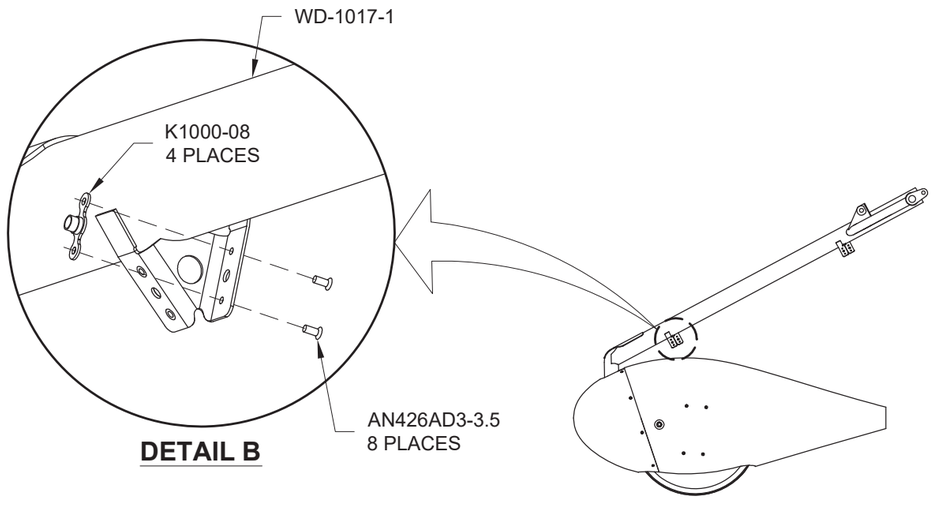
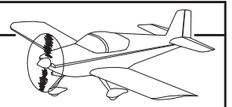


FIGURE 2: RIVETING NUTPLATES TO THE NOSE GEAR LEG ASSEMBLY



10 9/16

[268.29 mm]

OUTLINE REPRESENTS NET FIT WITH U-1013C.
PASTE TO FILE FOLDER OR CARD STOCK.

U-1018A TRIM TEMPLATE - FORWARD

DIMENSION REFERENCES THIS EDGE

REMOVE SHADED AREA

REMOVE SHADED AREA
2 PLACES

TRIM HERE
FOR IO-540.
LEFT SIDE ONLY.

U-1018A TRIM TEMPLATE - AFT

16

[406.40 mm]

NOTE: CHECK PRINTED SCALE 1:1 PER SECTION 3 BEFORE USING THE TEMPLATE!

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