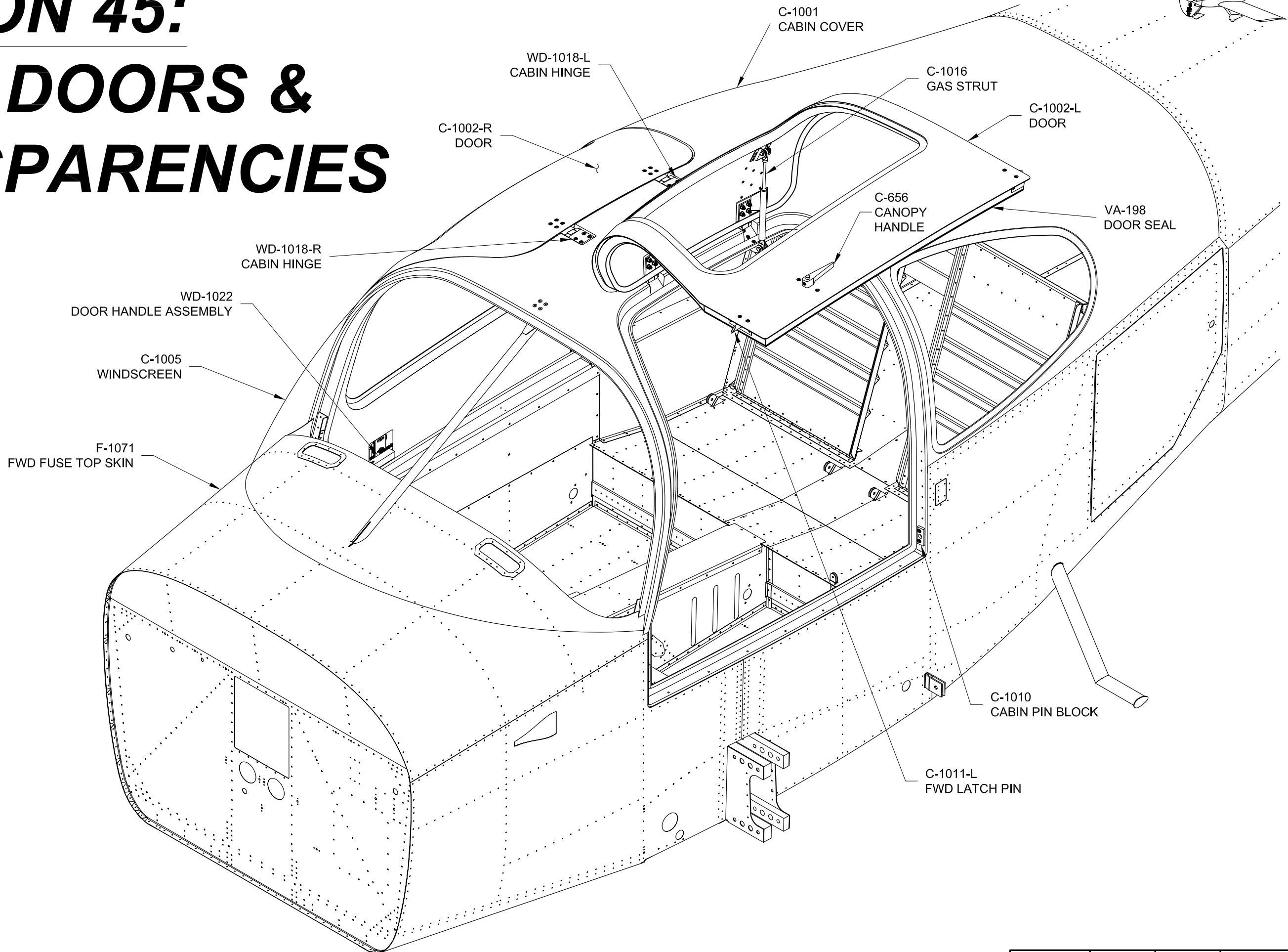
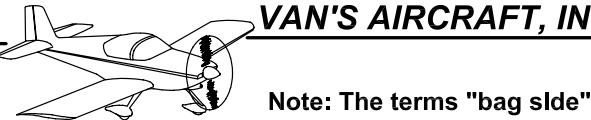


SECTION 45: CABIN DOORS & TRANSPARENCIES





Note: The terms "bag side" and "tool side" are used in this section. "Bag side" refers to the "rough" side of the part which shows the weave of the fabric and may have wrinkles and other surface irregularities. "Tool Side" refers to the "smooth" side of the part which is an exact mirror of the mold upon which the part was layed-up and cured.

Step 1: Trim the outside perimeter and window flange of the C-1002A-L and -R Cabin Door Outer Shells as shown in Figure 1.

There are six "dimples" molded into the tool side of each cabin door outer shell; one near the lower door forward edge, one near the lower door aft edge, and one in the window flange near each of the four corners of the window. Drill a #40 hole through the cabin door outer shell at the center of each of the six dimples. These holes are "index holes" used to locate the door shells to each other and to the fuselage.

Draw two lines on the window flange of each cabin door outer shell, one line $\frac{3}{4}$ inch offset from the window joggle and one line $1\frac{1}{4}$ inch offset from the window joggle. See Figure 1, Sect A-A.

On the $1\frac{1}{4}$ inch window joggle offset line, make a mark approximately every $1\frac{1}{2}$ inch around the window perimeter. Drill a #40 hole at each mark.

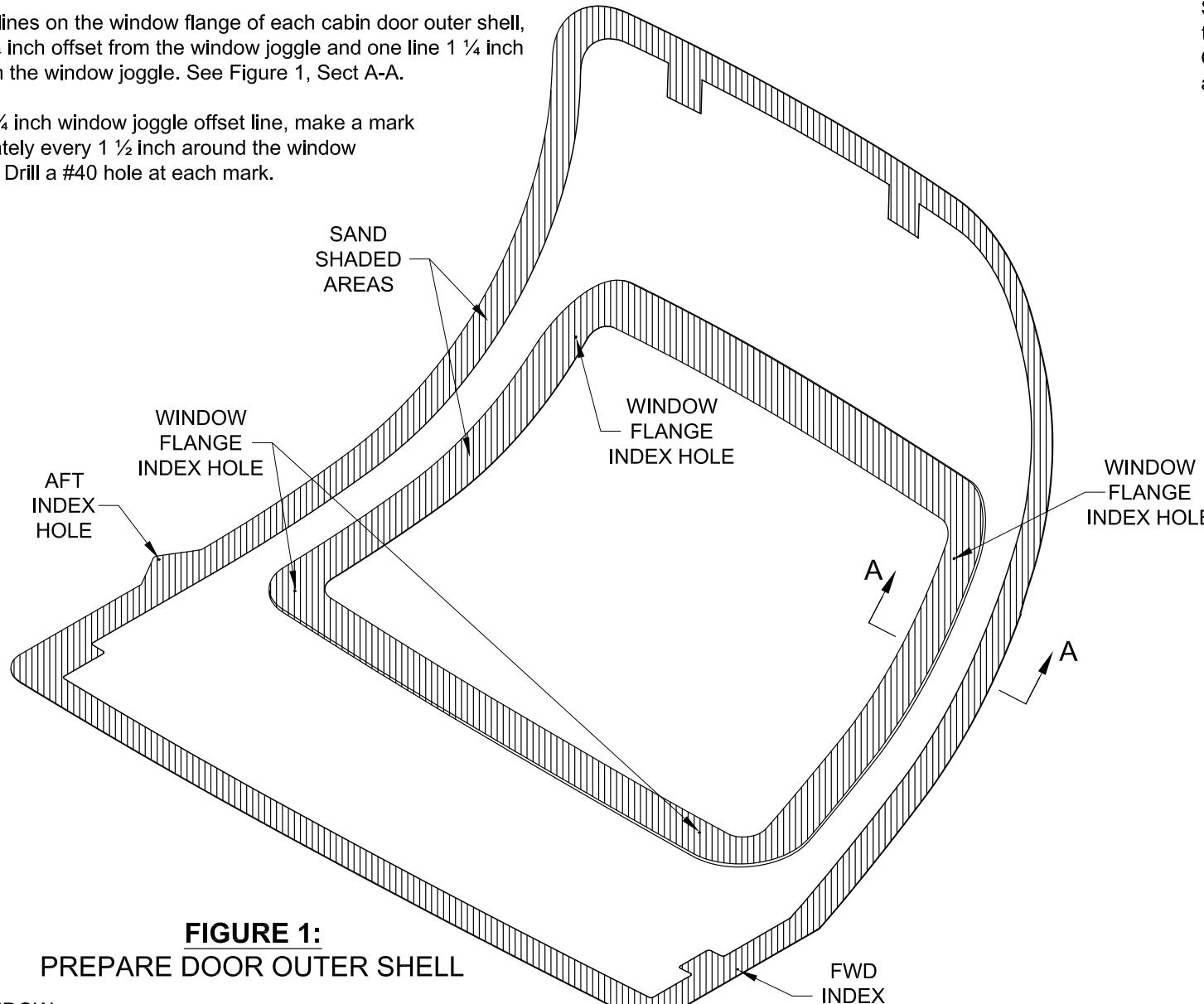
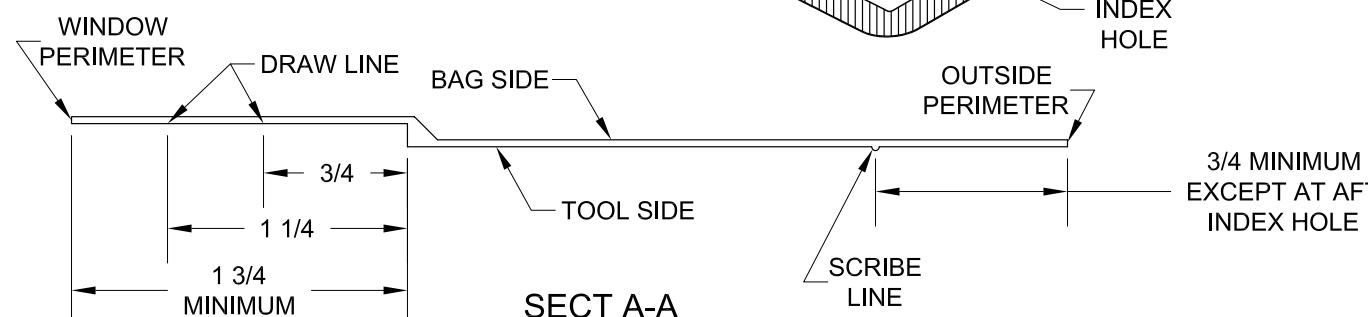


FIGURE 1:
PREPARE DOOR OUTER SHELL



Step 2: Trim the outside perimeter and window flange of the C-1002B-L and -R Cabin Door Inner Shells as shown in Figure 2.

The tool side of each cabin door inner shell has molded-in dimples that correspond to the dimples molded into the C-1002A-L and R Cabin Door Outer Shells. Drill a #40 hole through the cabin door inner shell at the center of each of the six dimples.

Step 3: Sand the bag side surface of the C-1002A-L and -R Cabin Door Outer Shells in the areas that will mate to the C-1002B-L and -R Cabin Door Inner Shells. The mating areas are shown shaded in Figure 1.

Step 4: Sand the bag side surface of the C-1002B-L and -R Cabin Door Inner Shells in the areas that will mate to the C-1002A-L and -R Cabin Door Outer Shells. The mating areas are shown shaded in Figure 2.

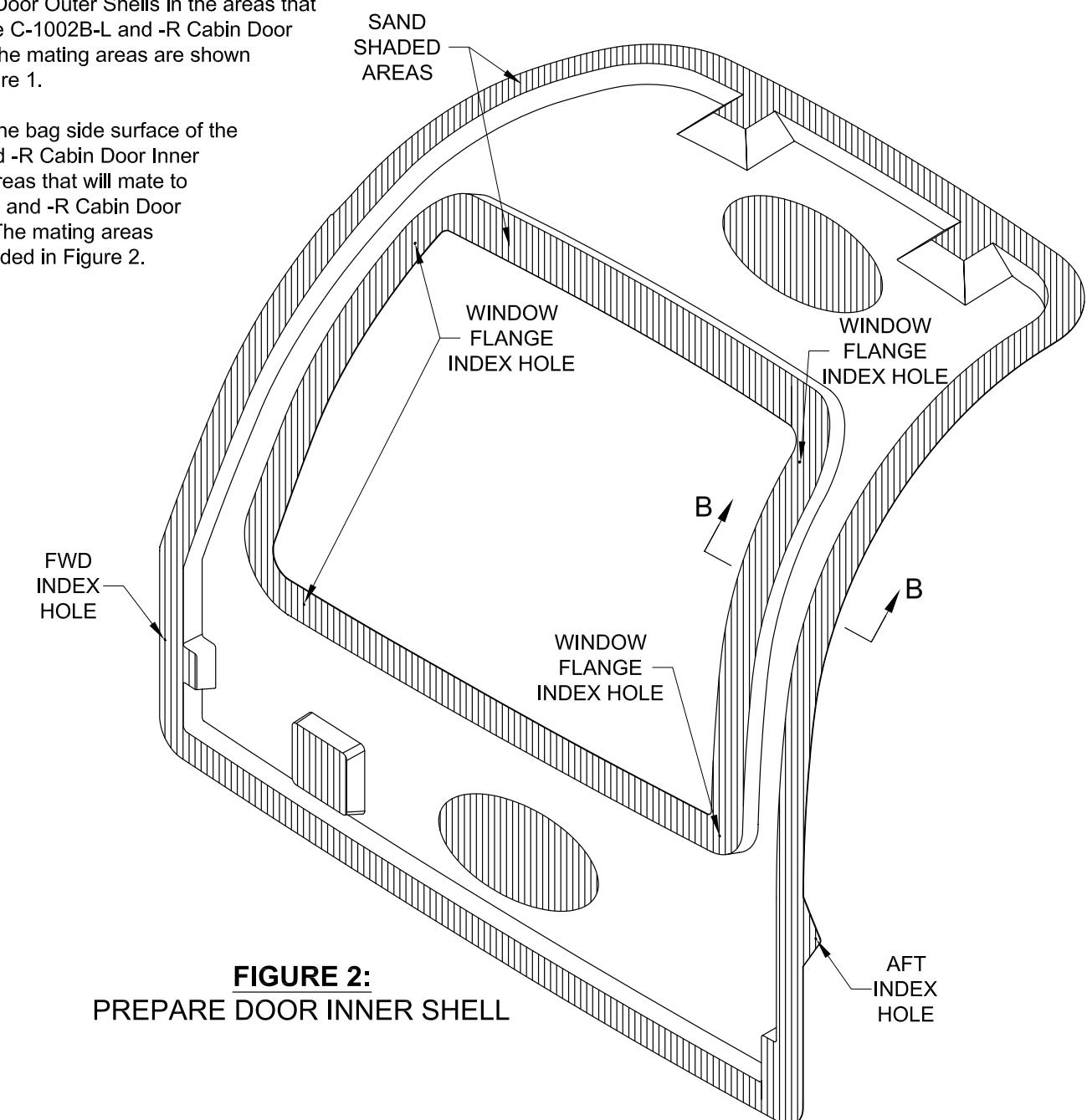
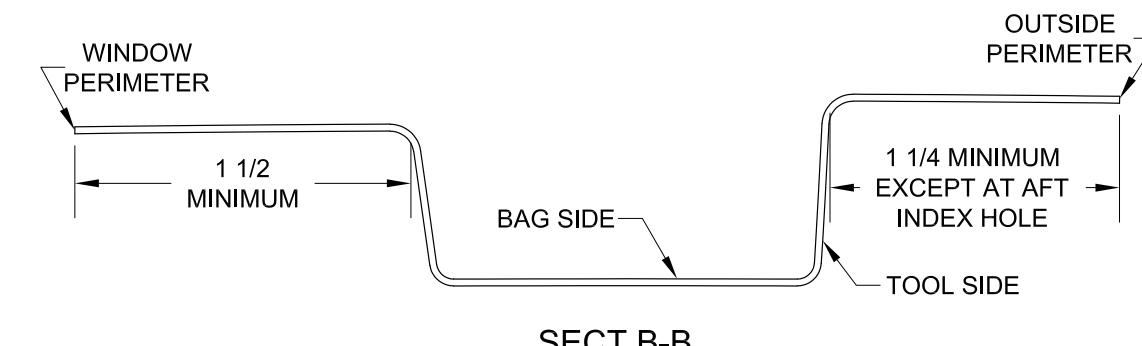
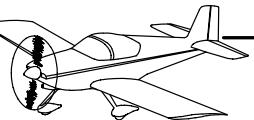


FIGURE 2:
PREPARE DOOR INNER SHELL





Step 1: There are several rivet holes in the fuselage that were deliberately left open to facilitate gluing the C-1002A Door Outer Shells to the C-1002B Door Inner Shells. See Page 29-17, Figures 1 & 2, and Page 29-18, Figure 1. At each of the open holes, draw reference lines on the fuselage side so that the hole centers can be located when covered. See Figure 1.

If you have a hole finder, you can skip this step.

Step 2: Cleco the C-1002A-L Door Outer Shell to the C-1002B-L Door Inner Shell using the four #40 holes in the window flange of the door inner shell. See Figure 2.

Step 3: Cleco the C-1002A-L Door Outer Shell/C-1002B-L Door Inner Shell to the fuselage using the forward and aft index holes. See Figure 2.

Verify that there is a constant 1/16 to 1/8 inch gap between the C-1002B-L Door Inner Shell and the return flange of the C-1001 Cabin Cover. Trim or sand the cabin cover return flange if/as required to achieve the required gap. See Page 45-04, Figure 1, "Stage 1: Initial Placement on Fuselage".

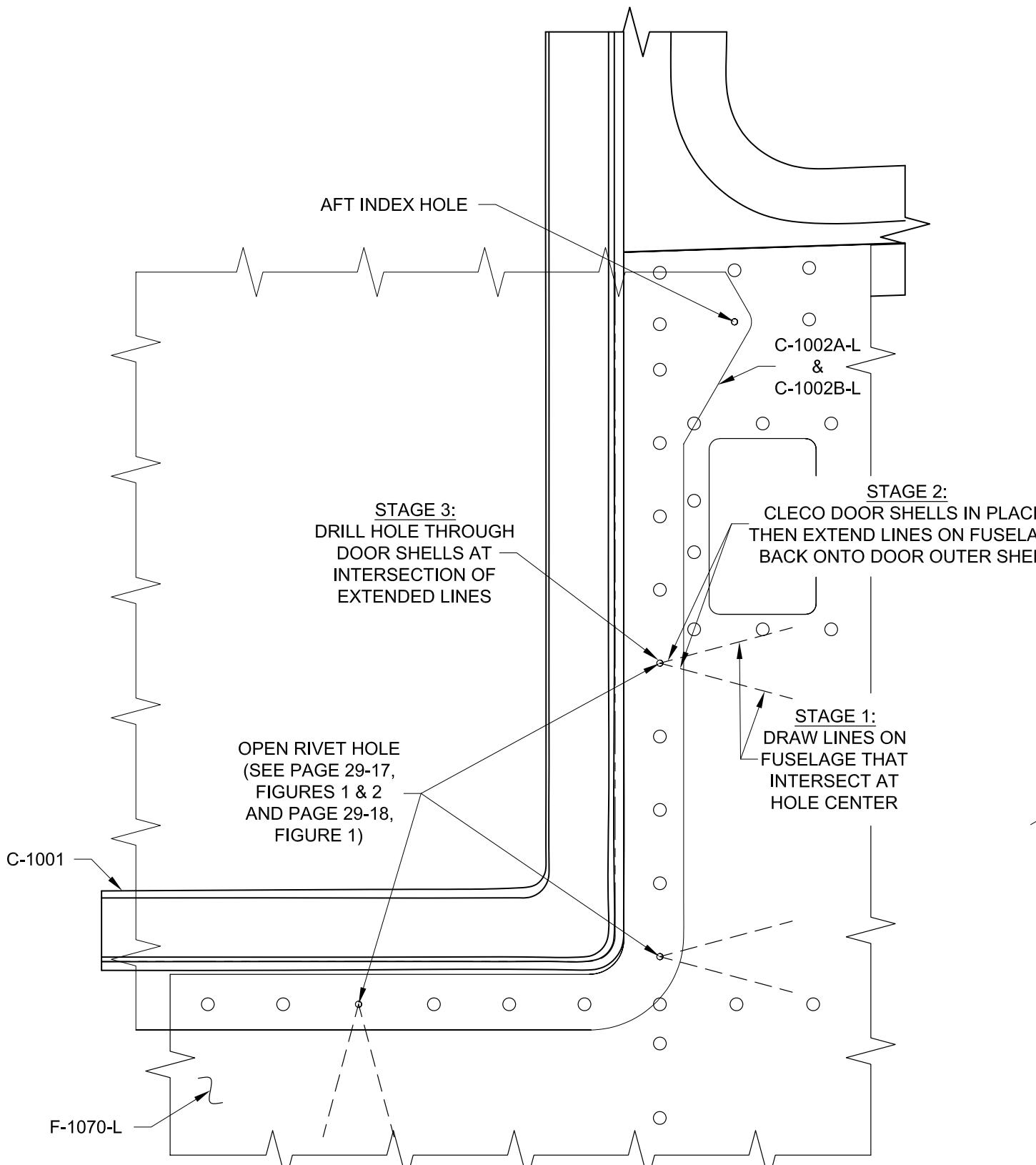


FIGURE 1:
LOCATING BLIND HOLES

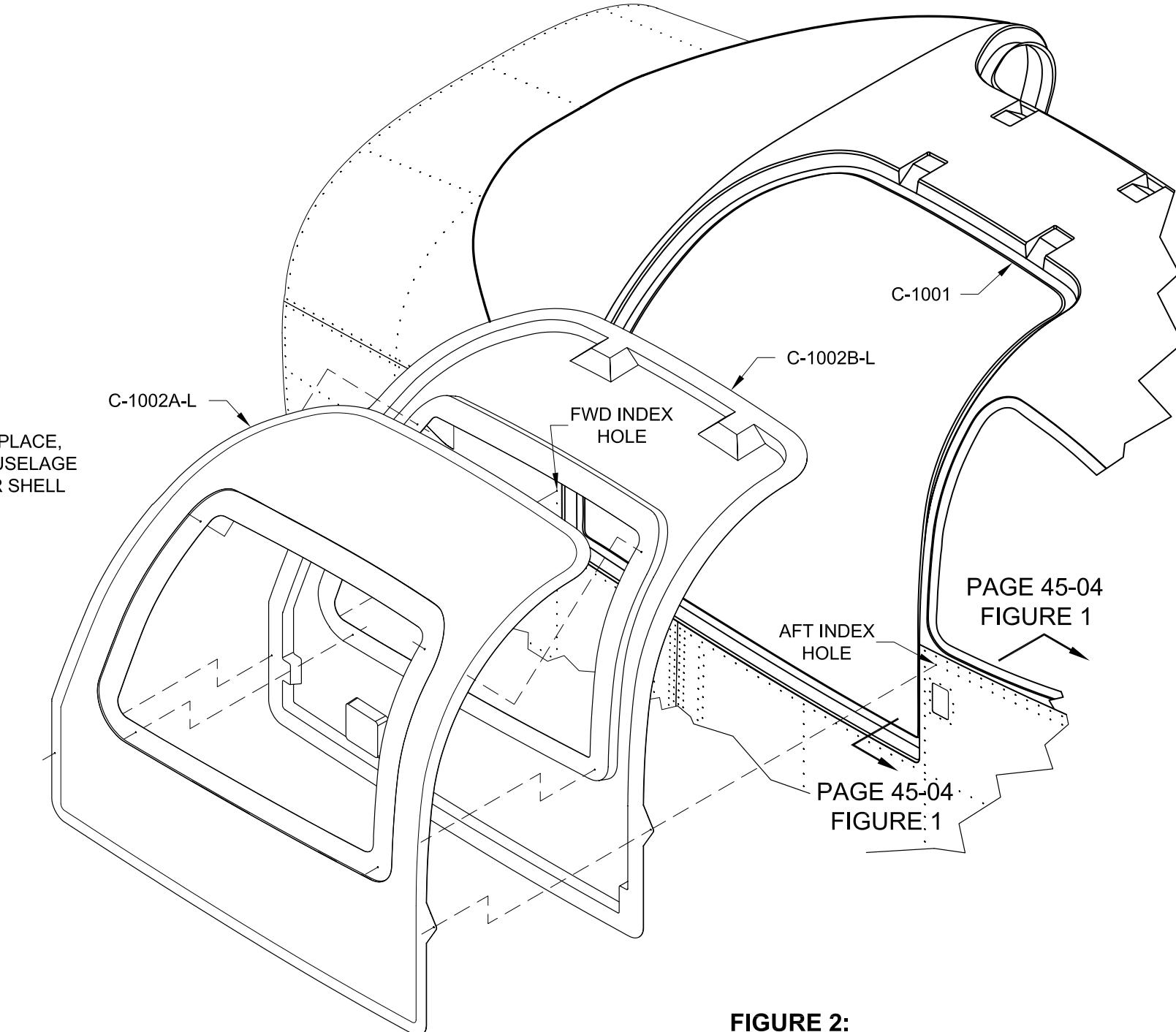


FIGURE 2:
CLECO DOOR SHELLS TO FUSELAGE

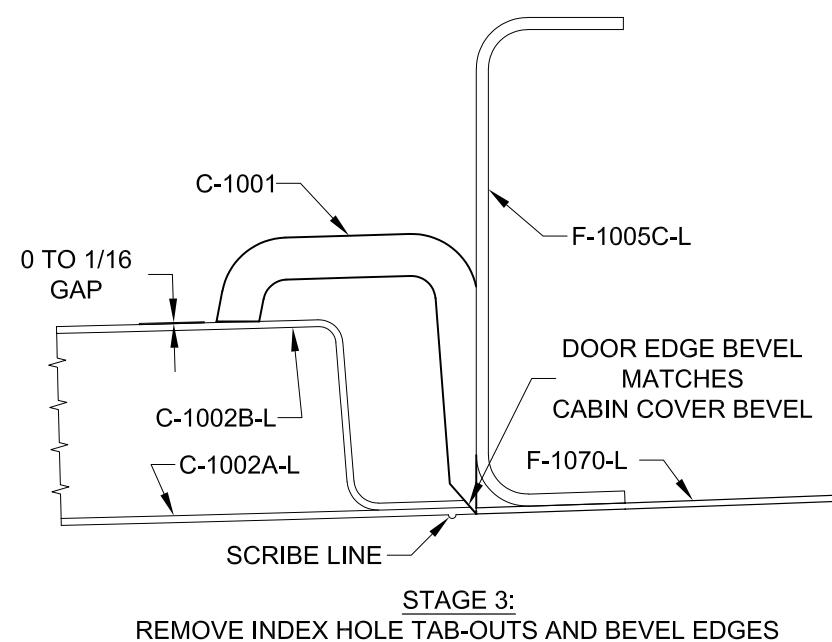
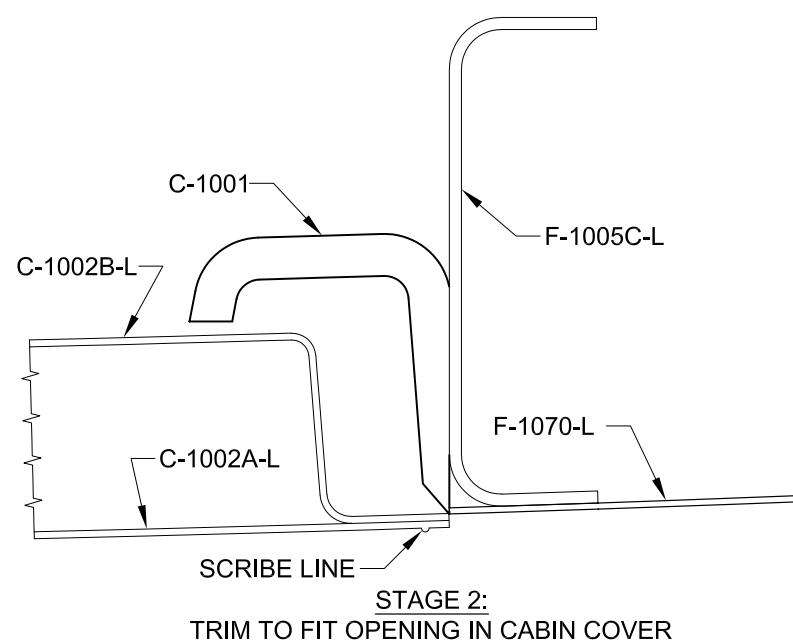
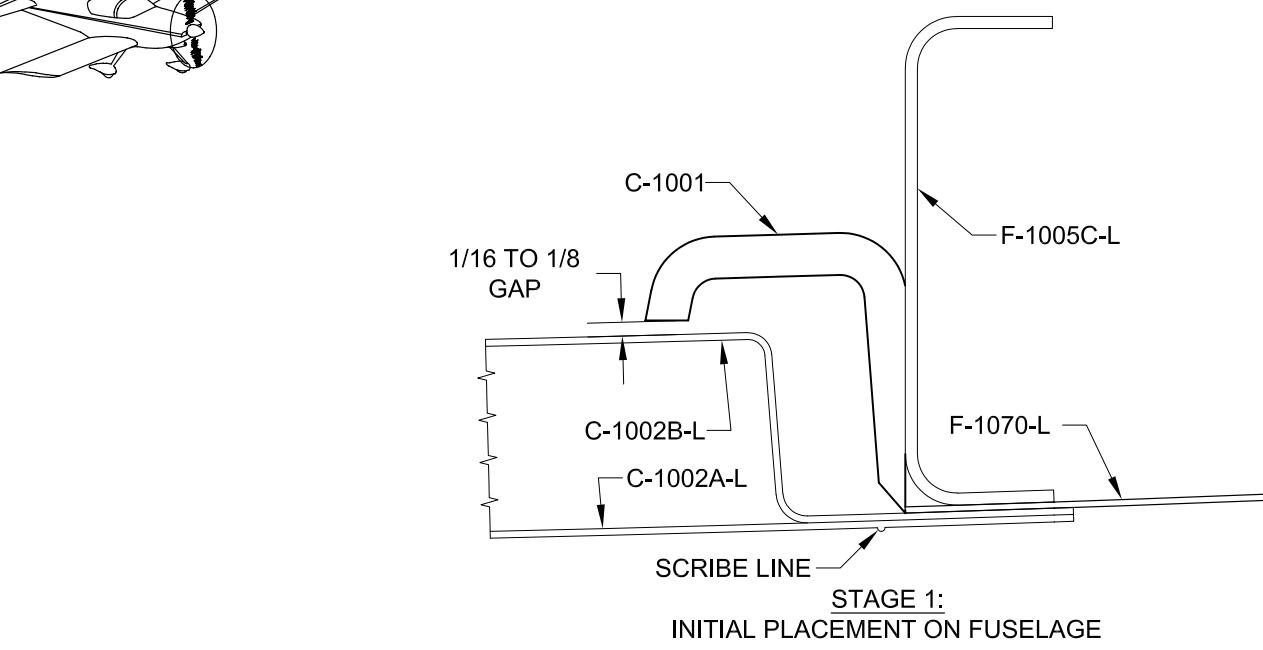
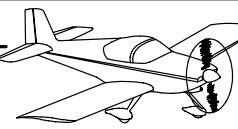


FIGURE 1: PROGRESSION OF DOOR TRIM AND FIT

Step 1: Using the open hole reference lines (or hole finder) drill #40 through the C-1002A-L Door Outer Shell/C-1002B-L Door Inner Shell into the open rivet holes in the fuselage. See Page 45-03, Figure 1. Install a cleco in each hole as it is drilled. If any mismatch occurs, the hole in the door inner/outer shells should be elongated rather than the hole in the fuselage. The clecos are used to hold the door inner/outer shells tightly to the side of the fuselage.

Step 2: Duct tape the upper part of the C-1002A-L Door Outer Shell/C-1002B-L Door Inner Shell to the C-1001 Cabin Cover. The duct tape should hold the door inner/outer shells to the upper cabin cover as tightly as possible.

Step 3: Match-Drill #40 the holes in the window flange of the C-1002A-L Door Outer Shell into the window flange of the C-1002B-L Door Inner Shell. Install a cleco in each hole as it is drilled.

Step 4: Remove the C-1002A-L Door Outer Shell/C-1002B-L Door Inner Shell from the fuselage and separate the door outer shell from the door inner shell.

Step 5: Repeat all preceding steps for the right side door.

Step 6: Position one of the C-1002C Gas Strut Attach Doublers on the bag side surface of the C-1002B-L Door Inner Shell as shown in Figure 2.

The gas strut attach doubler centers on the width of the aft hinge pocket molded into the door inner shell.

The shape of the gas strut attach doubler can be adjusted as required to achieve a good fit to the door inner shell. The fit need not be perfect because the glue used to attach the gas strut attach doubler to the door inner shell will easily fill any gaps of up to 1/16 inch.

Match-Drill #30 and cleco the gas strut attach doubler to the door inner shell. Remove the gas strut attach doubler and deburr holes.

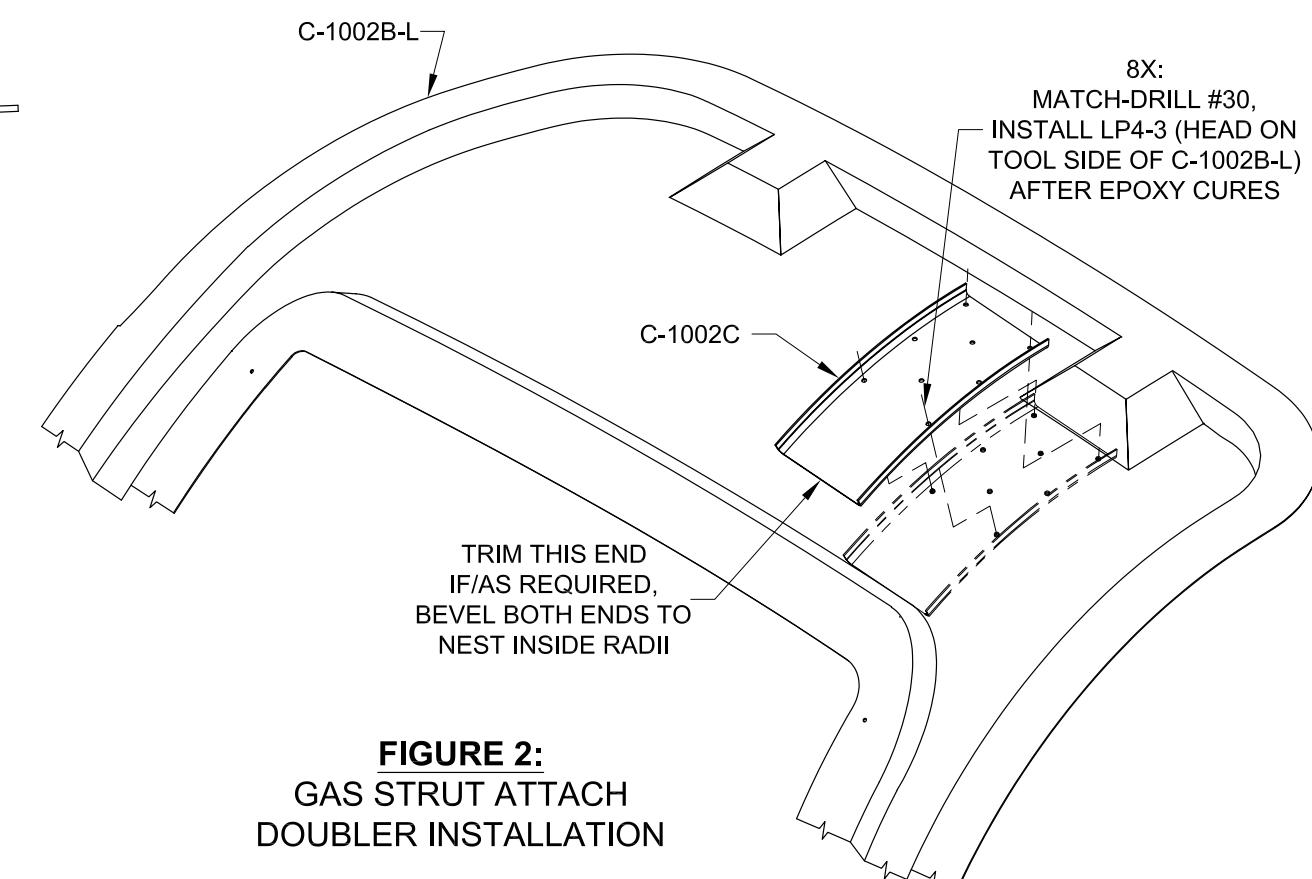
Repeat this step for the right side door.

Step 7: Mix some epoxy and thicken it with cab-o-sil to the point that it will not pour out of the mixing cup. A total mixture quantity of about 2 fluid ounces will be required.

Use 80 grit sandpaper to roughen the mating surfaces of the C-1002B-L & R Door Inner Shells and C-1002C gas strut attach doublers.

Apply a 1/16 inch thick layer of thickened epoxy to each gas strut attach doubler and cleco each one to the appropriate door inner shell. Use two clecos for each gas strut attach doubler inserted through the two holes on the part centerline. Install the clecos from the tool side of the door inner shells. Use hand pressure to seat the gas strut attach doublers to the door inner shells and to squeeze out any excess epoxy which should be removed.

After the epoxy has cured re-drill the holes to #30 and install rivets as shown in Figure 2.

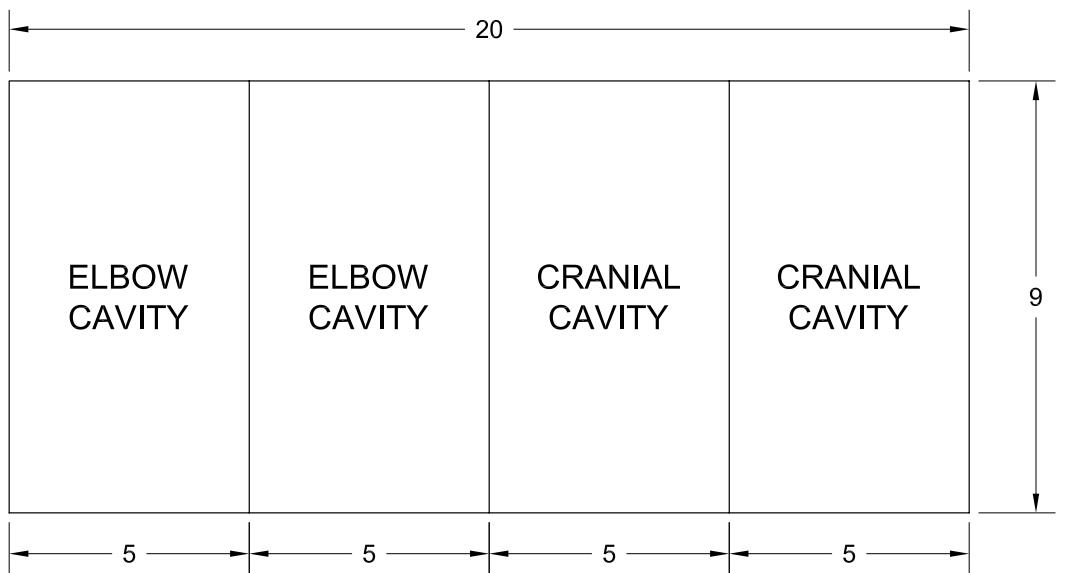




Step 1: There are three locations on each door where the bag sides of the C-1002A Door Outer Shell and C-1002B Door Inner Shell are locally bonded together. The three locations are as follows: The "cranial cavity" in the upper door above the window, the "latch pocket" in the lower door, and the "elbow cavity" in the lower door aft of the latch pocket. At the cranial cavity and elbow cavity the door shells require a "bridge" of structural filler material between them.

The material used for the structural filler is a 3 dimensional weave glass fiber fabric called ParaBeam.

Cut four pieces of parabeam (two for each door) to the dimensions shown in Figure 1.



Step 2: Mask-off the fuselage in anticipation of joining the C-1002A Door Outer Shell and C-1002B Door Inner Shell in place on the fuselage.

NOTE: Steps 3 through 8 must be done in a single work session. This will require use of an epoxy with a 30 minute (minimum) pot life.

Step 3: Brush a light coat of epoxy to the bag sides of the C-1002A-L Door Outer Shell and C-1002B-L Door Inner Shell at the three places where they are bonded together.

Step 4: Wet-out with epoxy each of the two pieces of parabeam for the left door then place it at the appropriate spot on the C-1002B-L Door Inner Shell.

Step 5: Mix some epoxy and thicken it with cab-o-sil to the point that it will not pour out of the mixing cup. A total mixture quantity of about 10 fluid ounces will be required.

Apply a 1/32 to 1/16 inch layer of thickened epoxy to all the mating surfaces around the door outside perimeter and window inside perimeter of the C-1002B-L Door Inner Shell. These areas are shown shaded on Page 45-02, Figure 2.

Step 6: Put one cleco at the lower forward corner and one cleco at the lower aft corner of the C-1002A-L Door Outer Shell.

Allowing contact only along the lower edge, use the two clecos to join the door outer shell to the C-1002B-L Door Inner Shell. Lay the remainder of the door outer shell in place on the door inner shell and cleco them together at only the upper forward and upper rear corners of the window.

Step 7: Place the C-1002A-L door inner shell/C-1002B-L door outer shell subassembly on the fuselage and cleco it to the fuselage at the two index holes.

Insert clecos through the door inner shell/door outer shell and into all the open holes in the fuselage

Insert clecos through all the holes around the perimeter of the window.

Use C-clamps, small weights, duct tape, or whatever works to hold the door inner shell and door outer shell tightly to each other AND to the fuselage while the epoxy cures. Apply hand pressure to push-out any excess thickened epoxy between the parts. Use only light pressure if you use C-clamps or other mechanical clamps so as not to locally distort the door shells. Any irregularities will be permanent after the epoxy has cured.

Step 8: After the door is fully cured remove all clecos, clamps, weights, duct tape then remove the door from the fuselage.

Step 9: Repeat Steps 3 through 8 for the right side door. The doors will subsequently be referred to as the C-1002-L Door and C-1002-R Door.

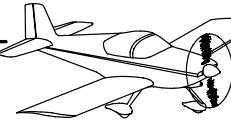
Step 10: Trim the window openings in the C-1002-L and R Doors such that a $\frac{3}{4}$ inch wide flange remains. This trim line was drawn per Page 45-02, Step 1.

Step 11: Trim the outside perimeter of the C-1002-L and R Doors to within 1/8 inch of the molded-in scribe line except leave a small tab-out at the front and rear indexing holes. See Page 45-04, Figure 1, "Stage 2: Trim to Fit Opening in Cabin Cover".

Cleco the doors back onto the fuselage. Mark any areas of the door outside perimeter which require further trimming in order to fit to the fuselage. Small amounts of material are best removed with 80 to 100 grit sandpaper on a long (approximately 12 inches) sanding block.

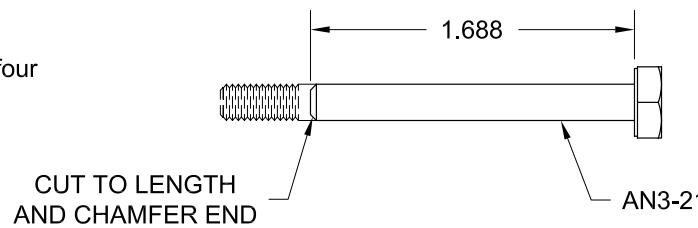
Step 12: Trim the indexing hole tab-outs from the C-1002 Doors. Sand a 45 degree bevel into the outside perimeter of the doors as shown on Page 45-04, Figure 1, "Stage 3: Remove Index Hole Tab-Outs and Bevel Edges". Trim/sand the door as required for it to just fit the opening in the fuselage.

FIGURE 1: PARABEAM CUT DIMENSIONS



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Step 1: Cut-off the threaded ends of four AN3-21A bolts as shown in Figure 1.



Step 2: Using the cut-off bolts as hinge pins, assemble the WD-1018-L Cabin Hinges to the WD-1019-L Door Hinges and assemble the WD-1018-R Cabin Hinges to the WD-1019-R Door Hinges as shown in Figure 2.

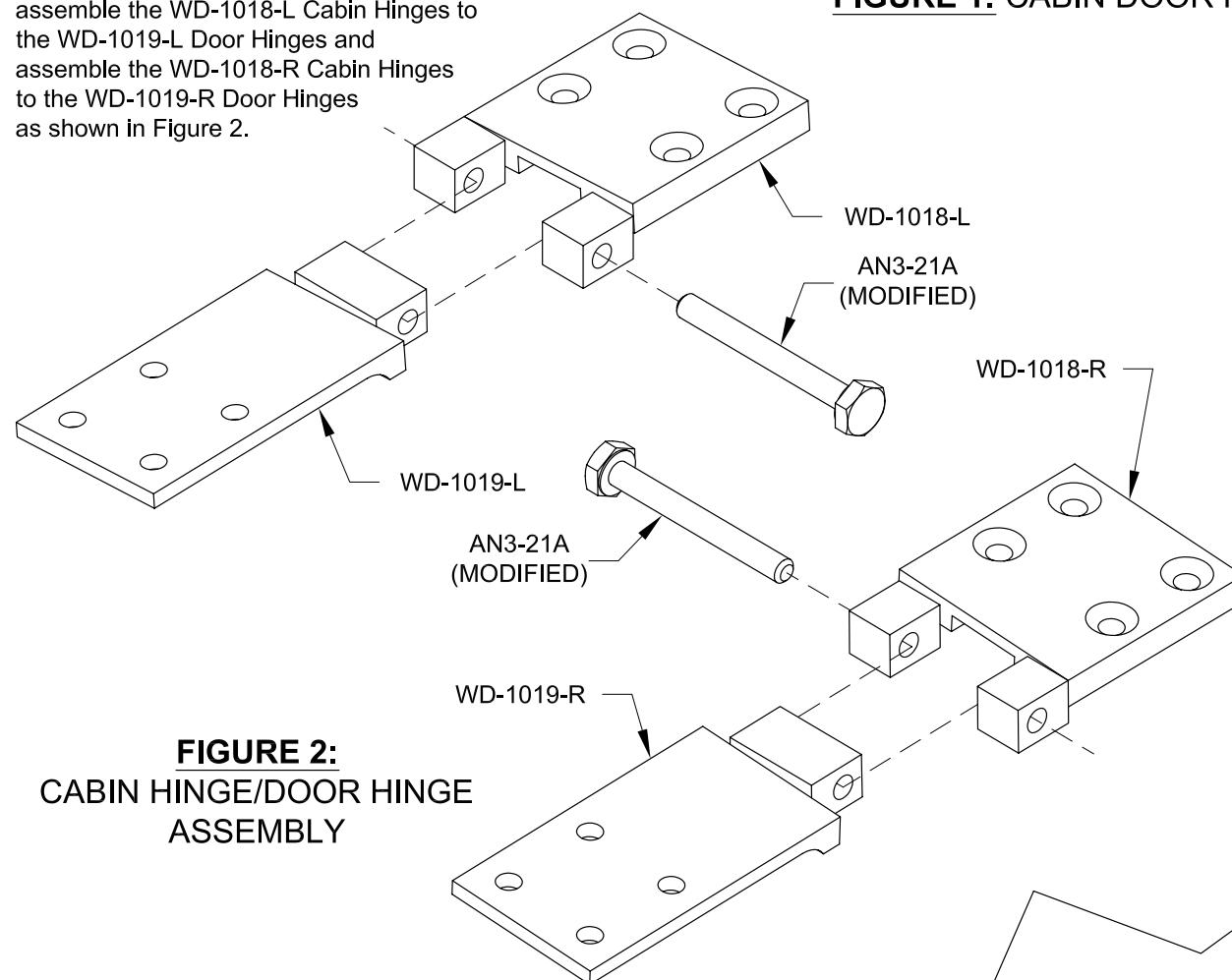
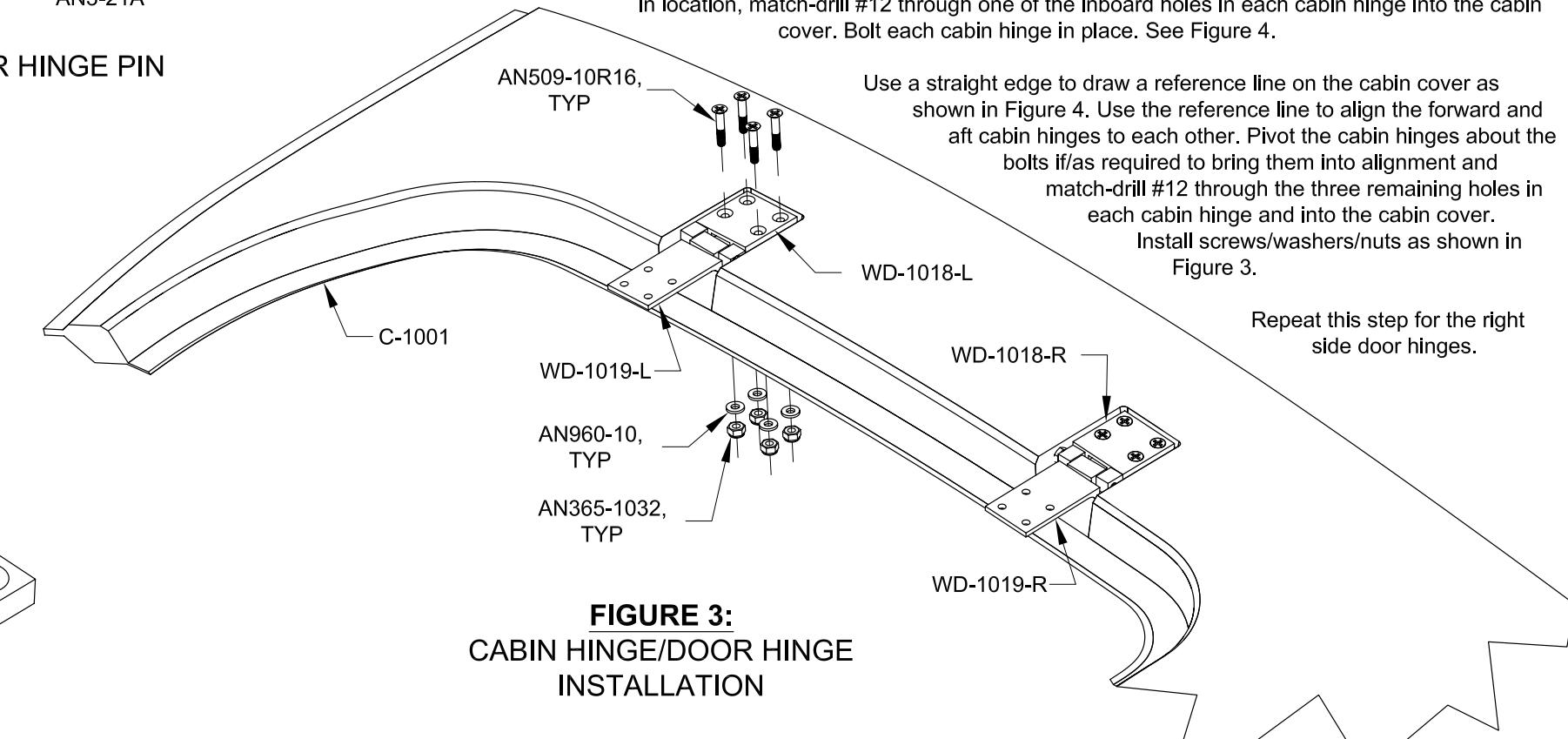


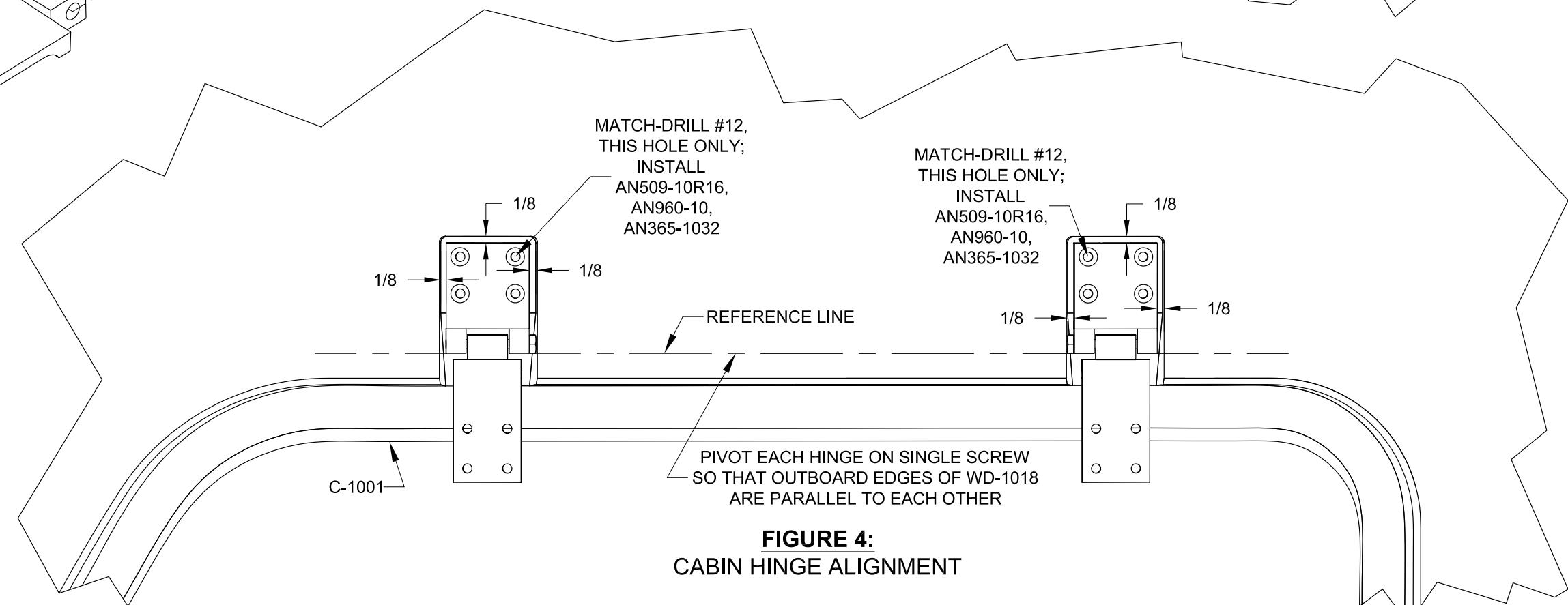
FIGURE 1: CABIN DOOR HINGE PIN

Step 3: Position the WD-1018-L Cabin Hinge/WD-1019-L Door Hinge subassembly in the forward pocket in the C-1001 Cabin Cover. Position the WD-1018-R Cabin Hinge/WD-1019-R Door Hinge subassembly in the aft pocket in the cabin cover. See Figure 3.

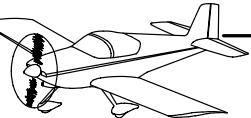
The WD-1018-L and -R Cabin Hinges are located on the cabin cover as shown in Figures 3 and 4. Use three .125 thick scrap aluminum spacers to locate each cabin hinge to the "walls" of the hinge pockets. With the cabin hinges held in location, match-drill #12 through one of the inboard holes in each cabin hinge into the cabin cover. Bolt each cabin hinge in place. See Figure 4.



**FIGURE 3:
CABIN HINGE/DOOR HINGE
INSTALLATION**



**FIGURE 4:
CABIN HINGE ALIGNMENT**



Step 1: Place the C-1002-L Door on the fuselage and hold it in place with duct tape.

Step 2: Working from inside the cabin, match-drill #12 one of the outboard holes in each of the WD-1019 Door Hinges. Temporarily install a screw/washer/nut through the door hinge and C-1002-L Door as shown in Figure 1. Match-Drill #12 the remaining outboard hole in each door hinge and install screw/washer/nut.

Step 3: Un-tape the C-1002-L Door, swing it open and match-drill #12 the remaining 2 holes in each WD-1019 Door Hinge as shown in Figure 2.

Machine countersink the outside surface of the door at the four open holes. Install screw/washer/nuts in countersunk holes. Remove screw/washer/nuts from the holes not yet countersunk and countersink the holes. Install screw/washer/nuts in the holes.

Close the door and see if it distorts. If the door wants to ride too low relative to the cabin cover shim between the inside surface of the door and WD-1019 Door Hinges.

Step 4: Repeat Steps 1 through 3 for the C-1002-R Door.

Step 5: Remove the C-1002-L and C-1002-R Doors from the WD-1019-L/R Door Hinges.

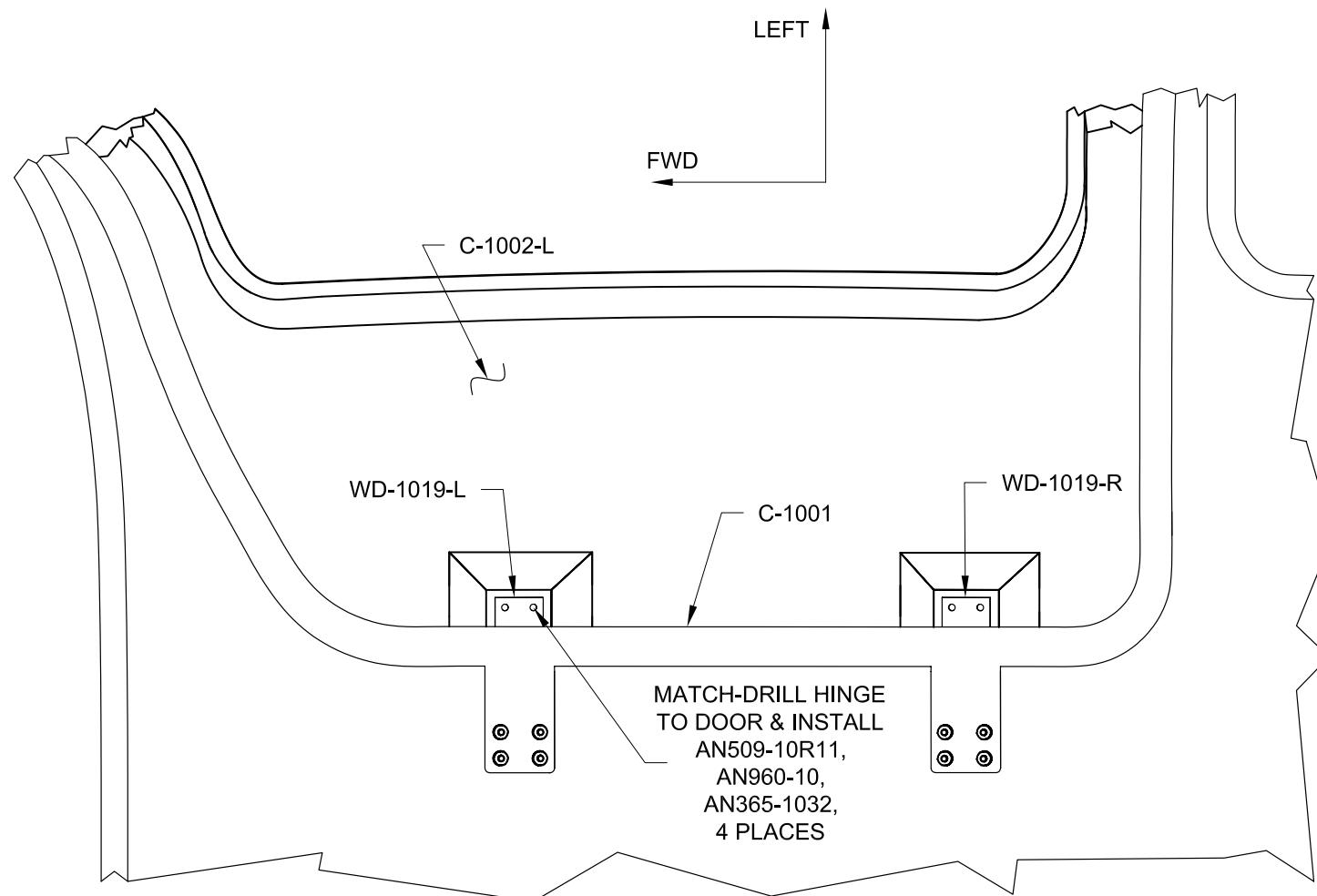


FIGURE 1: MATCH-DRILL DOOR HINGE OUTBOARD HOLES TO DOOR

(VIEW LOOKING UP AT INNER SURFACE OF CLOSED LEFT DOOR AND CABIN COVER)

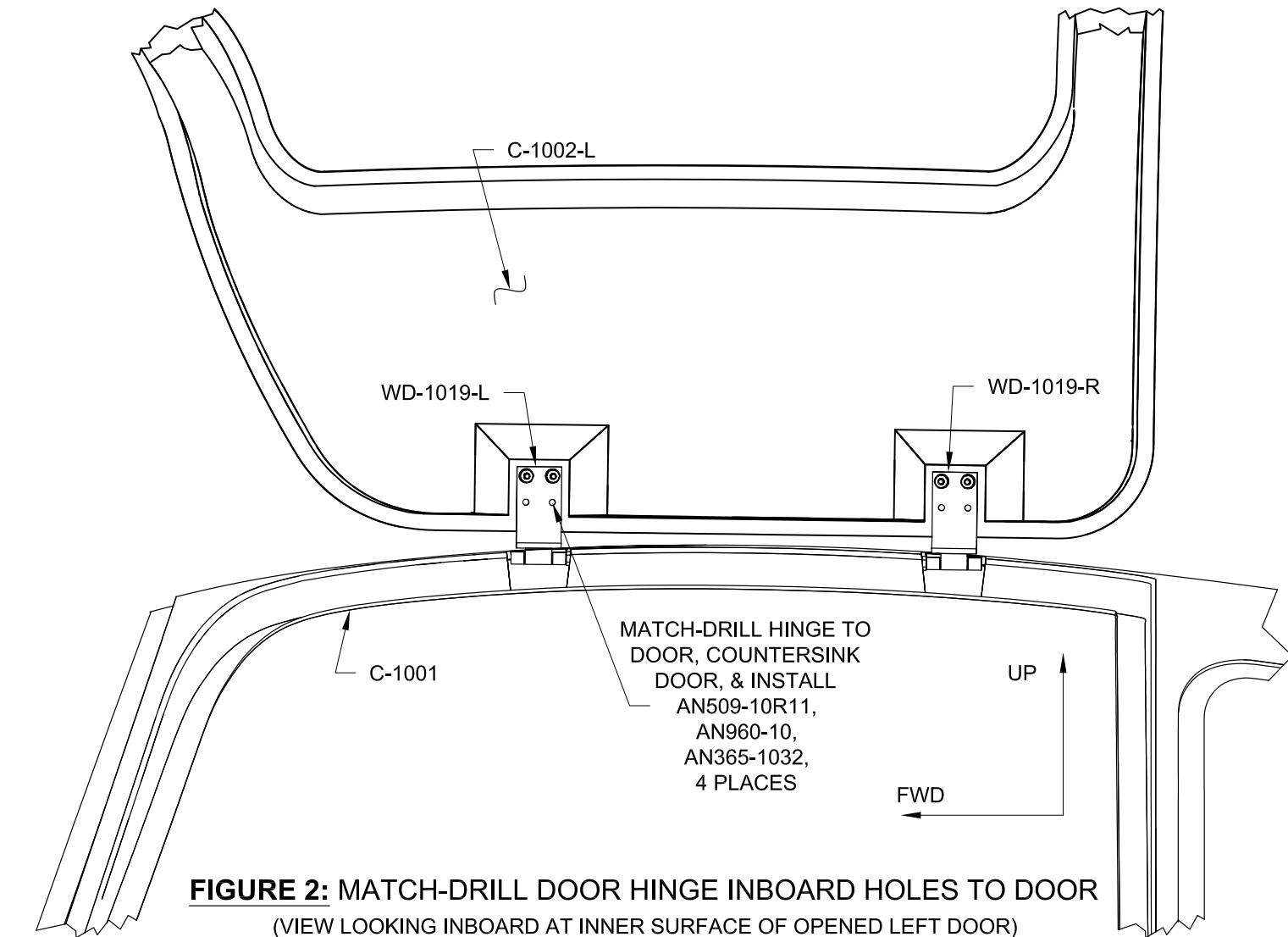
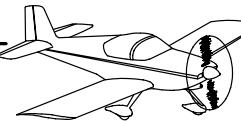


FIGURE 2: MATCH-DRILL DOOR HINGE INBOARD HOLES TO DOOR

(VIEW LOOKING INBOARD AT INNER SURFACE OF OPENED LEFT DOOR)



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Step 1: Initial trim the perimeter of the C-1003-L and C-1003-R Front Windows to the line marked on the windows. See Section 5U for guidelines on handling and trimming plexiglass.

Step 2: Test fit the C-1003-L Front Window to the C-1002-L Door as shown in Figures 1 and 2. Mark any areas of the front window outside perimeter which require further trimming in order to fit to the recess in the door. Final-Trim the perimeter of the front window as required to allow it to fit into the recess in the door. Small amounts of material are best removed with 80 to 100 grit sandpaper on a long (approximately 12 inches) sanding block.

Use the same process to fit the C-1003-R Front Window to the C-1002-R Door.

Step 3: Smooth the edges of the C-1003-L and C-1003-R Front Windows with 220 grit sandpaper to remove any scratches that could cause a crack to begin.

Step 4: Mask the inner and outer surfaces of the C-1003-L/R Front Windows except for a 3/4 inch wide strip around the perimeter where they overlap the C-1002-L/R Door window recesses. Scuff the mating surface of the windows and door recesses with 220 grit sandpaper.

Step 5: Re-fit the C-1003-L/R Front Windows to the recesses in the C-1002-L/R Doors. The thickness of the plexiglass will vary around the perimeter of each window. Shims can be used between the window and the door recess where required to raise the outer surface of the window to more closely match the outer surface of the door.

See Figure 2.

AN960-6 washers make very convenient shims.

The distance between adjacent shims need not be less than approximately 4 inches.

Use epoxy to glue the shims to the surface of the door recess.

NOTE: Van's Aircraft recommends the use of Weld-On 10 to attach all transparencies to the C-1001 Cabin Cover. Weld-On 10 is available from Van's Aircraft in 4 oz. kits. One 4 oz kit is required for each transparency.

Step 6: Place the C-1002-L Door on a table or other flat surface with the window recess facing up.

Apply a thin layer of Weld-On 10 to the window recess portion of the door and remove any excess. Immediately place the C-1003-L Front Window in the window recess and seat it down onto the window recess and/or shims. Remove any excess glue that has squeezed-out and use a finger or popsickle stick to create a fillet of glue between the inside edge of the door recess and the inside surface of the front window. (Cured Weld-On 10 is very hard; any drips or sags will be difficult to remove later.) Use small weights or duct tape to hold the front window in place while the Weld-On 10 cures.

Repeat for the opposite side door and front window.

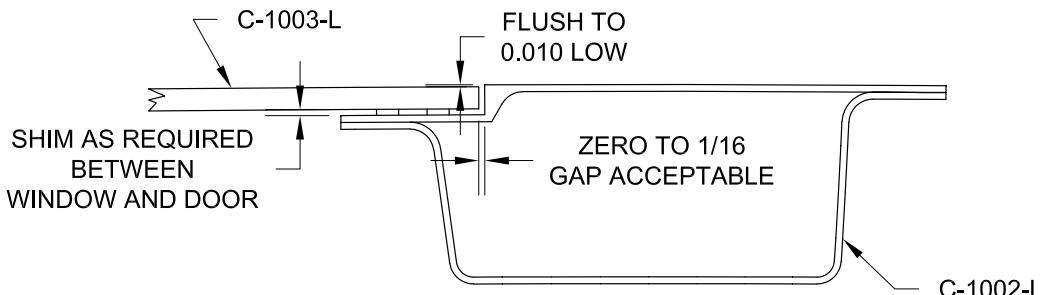
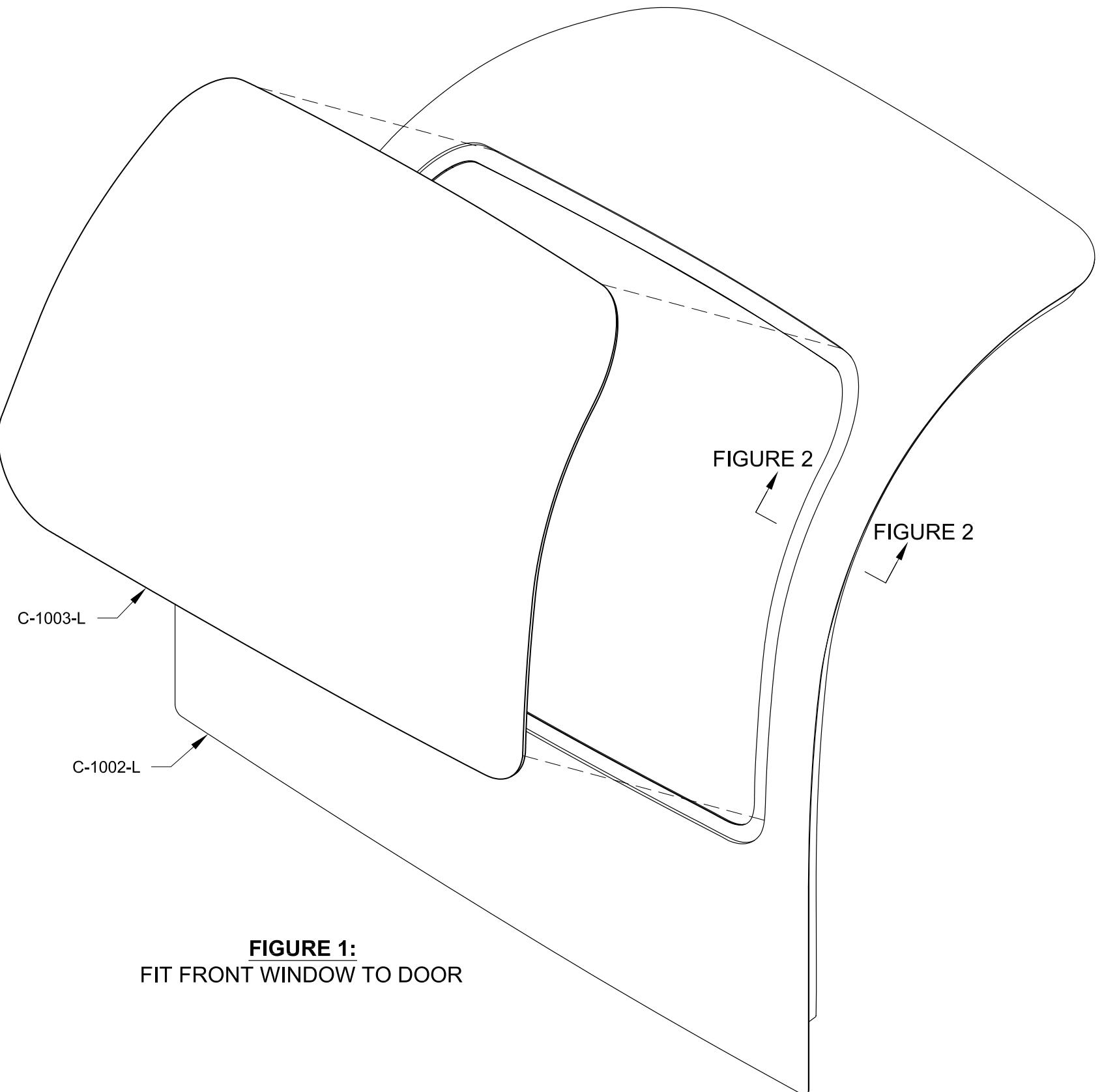
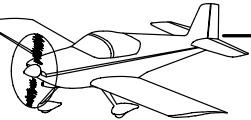


FIGURE 2: SHIM WINDOW TO FIT DOOR RECESS



**FIGURE 1:
FIT FRONT WINDOW TO DOOR**



Step 1: Use a 1/2 inch diameter drill to make a center mark at the bottom of the hole in the C-656 Canopy Handle.

Using the center mark to keep the bit that is called-out in Figure 1 concentric to the existing hole, drill through the canopy handle as shown in Figure 1.

Drill a pilot hole located as shown in Figure 1.

Round the corners of the canopy handle as shown in Figure 1.

Step 2: Insert the WD-1022 Door Handle Assembly all the way into the C-656 Canopy Handle as shown in Figure 2.

Check that the surfaces of the door handle assembly and canopy handle are aligned as shown in Figure 2, then match-drill #29 through the door handle assembly using the hole in the canopy handle as a drill guide. Drill 1 inch deep as measured from the outside surface of the canopy handle.

Step 3: Remove the C-656 Canopy Handle from the WD-1022 Door Handle Assembly.

Final-Drill #19 the #29 holes through the door handle assembly then deburr the holes.

Step 4: Final-Drill #19 the #29 hole through the near side only of the canopy handle.

Tap the far side #29 hole using an 8-32 tap.

Countersink the canopy handle to fit the head of an AN509-8 screw. See Figure 2.

Test fit the AN509-8 screw into the canopy handle as shown in Figure 2. Drill and tap deeper if/as required for the screw to fully thread into the canopy handle.

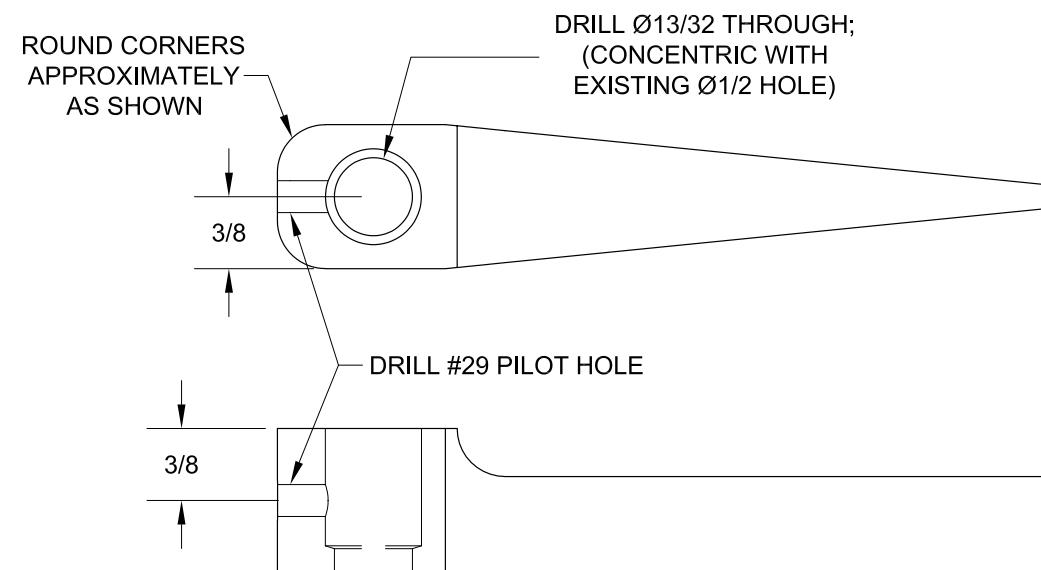


FIGURE 1: PREPARE CANOPY HANDLE

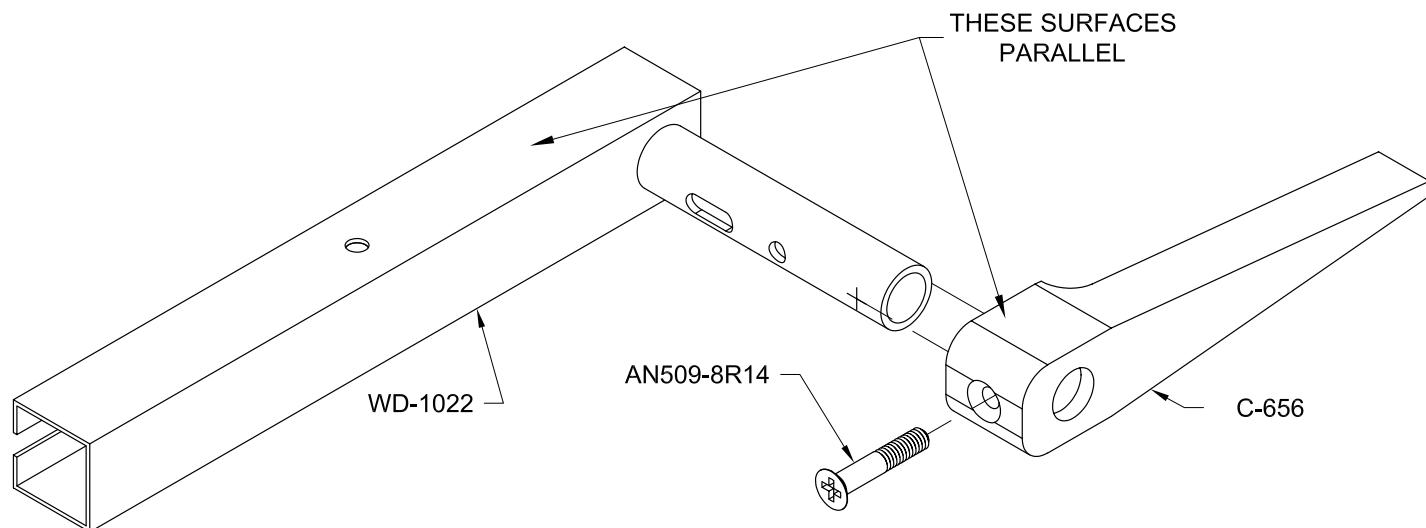
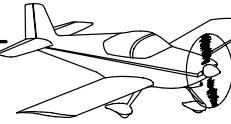


FIGURE 2:
MATCH-DRILL CANOPY HANDLE TO DOOR HANDLE ASSEMBLY



Step 1: Temporarily assemble the C-1006A Handle Plate, C-1006B & C-1006C Handle Pivots, C-1006D Handle Face Plate, C-1014 Handle Spur Gear, and WD-1022 Door Handle Assembly as shown in Figure 1. Align the edges of the handle plate, handle pivots, and handle face plate and match-drill #10 two places as shown in Figure 1. Remove the C-1006C Handle Pivot and the handle spur gear. Match-Drill #40 through the C-1006D Handle Face Plate, C-1006A Handle Plate, and C-1006B Handle Pivot four places as shown in Figure 1.

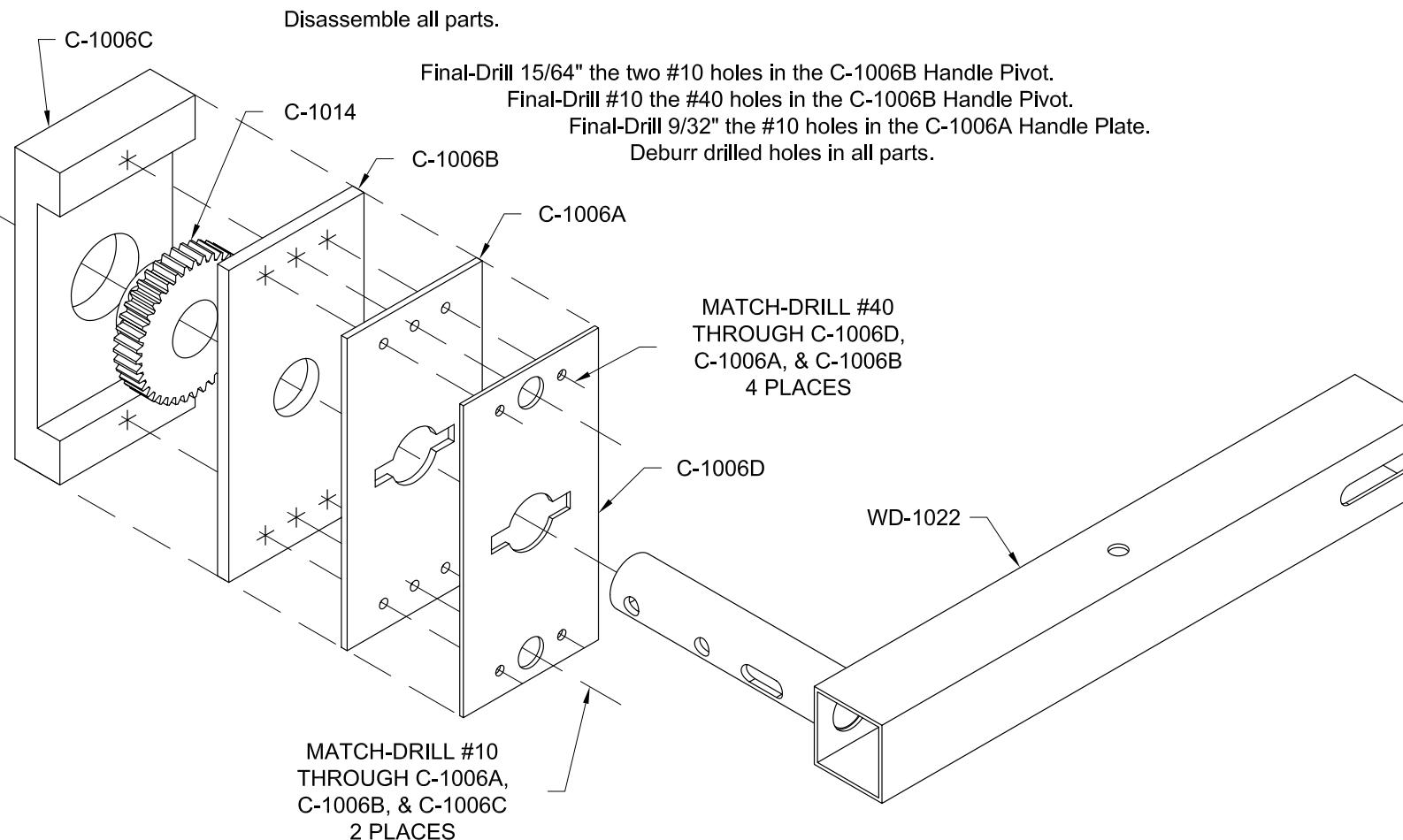
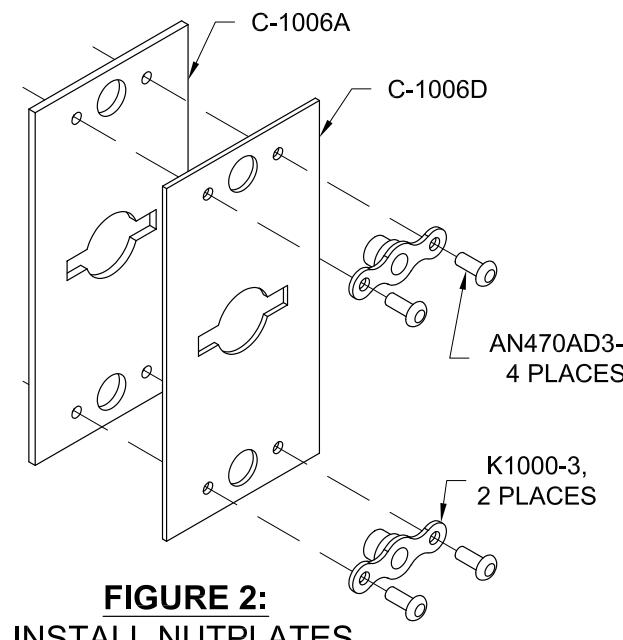


FIGURE 1: MATCH-DRILL HANDLE PLATES

Step 2: Rivet the C-1006A Handle Plate and C-1006D Handle Face Plate to each other and install nutplates as shown in Figure 2.

FIGURE 2:
INSTALL NUTPLATES

Step 3: Final-Drill and round the corners of the narrow end of each C-1008 Handle Lever as shown in Figure 3. Smooth all edges of the handle levers.

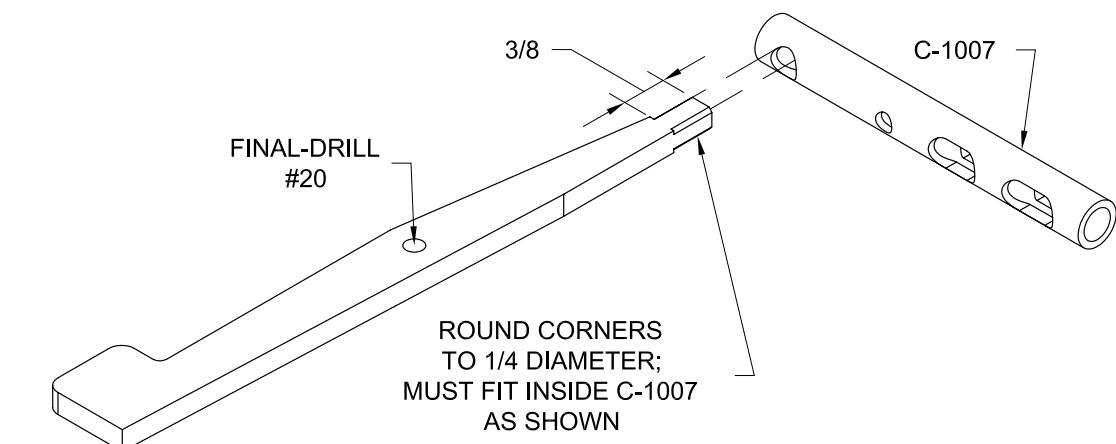
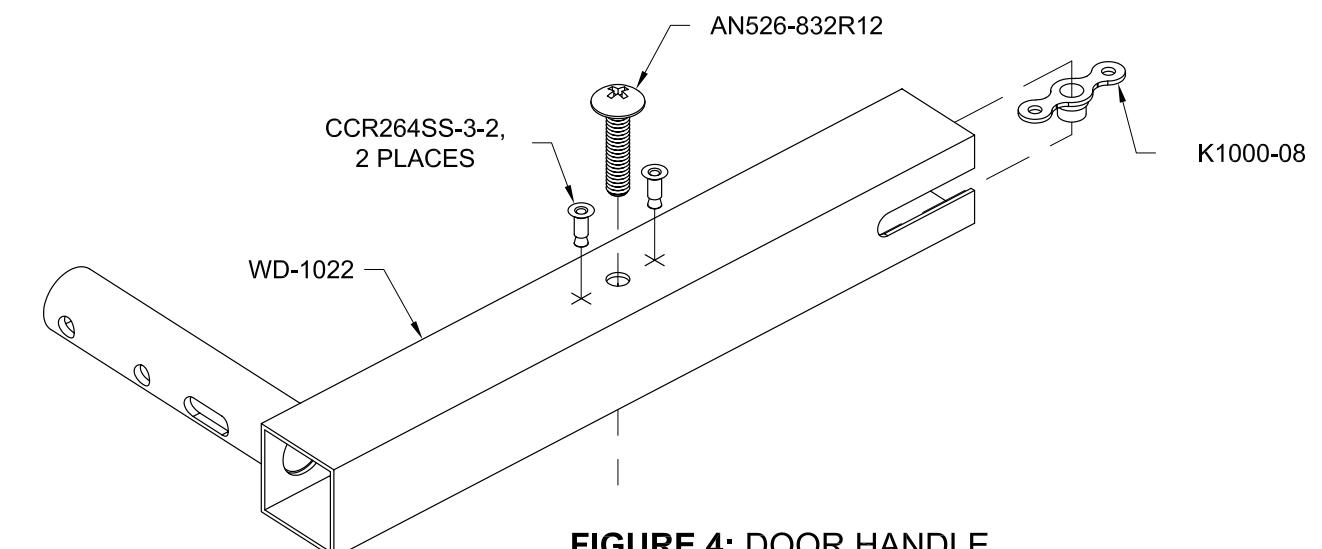
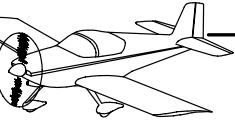


FIGURE 3: PREPARE HANDLE LEVER

Step 4: Install a nutplate on the WD-1022 Door Handle Assembly as shown in Figure 4. Install a nutplate on the remaining door handle assembly on the side opposite that shown in Figure 4.

FIGURE 4: DOOR HANDLE
NUTPLATE INSTALLATION



Step 1: Cut each C-RACK 10" Handle Rack into two pieces as shown in Figure 1.

Install a blind rivet into one end of each handle rack piece.

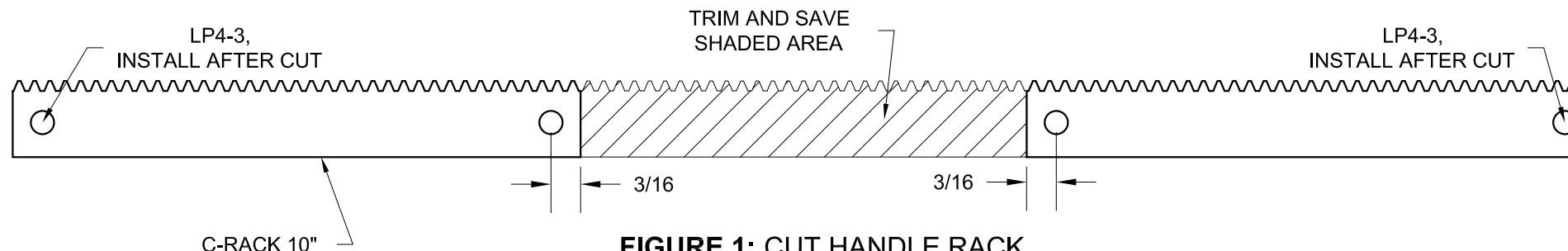


FIGURE 1: CUT HANDLE RACK

Step 2: Insert the C-1014 Handle Spur Gear into the C-1006C Handle pivot. Position the handle pivot/spur gear in the latch pocket of the C-1002-L Door as shown in Figure 2. Center the handle pivot in the latch pocket both vertically and fore/aft as shown in Figure 3. With the handle pivot held in position, match-drill a $\frac{1}{2}$ inch diameter hole through the door using the handle spur gear as a drill guide. See Figure 3.

Step 3: Insert the WD-1022 Door Handle Assembly through the C-1014 Handle Spur Gear and through the hole just drilled through the C-1002-L Door. See Figure 2. This will hold the C-1006C Handle Pivot centered on the hole in the door. Re-check that the edges of the handle pivot are aligned with the edges of the latch pocket and match-drill #12 through the door using the holes in the handle pivot as drill guides. See Figure 3.

Step 4: Repeat Steps 2 and 3 for the C-1002-R Door.

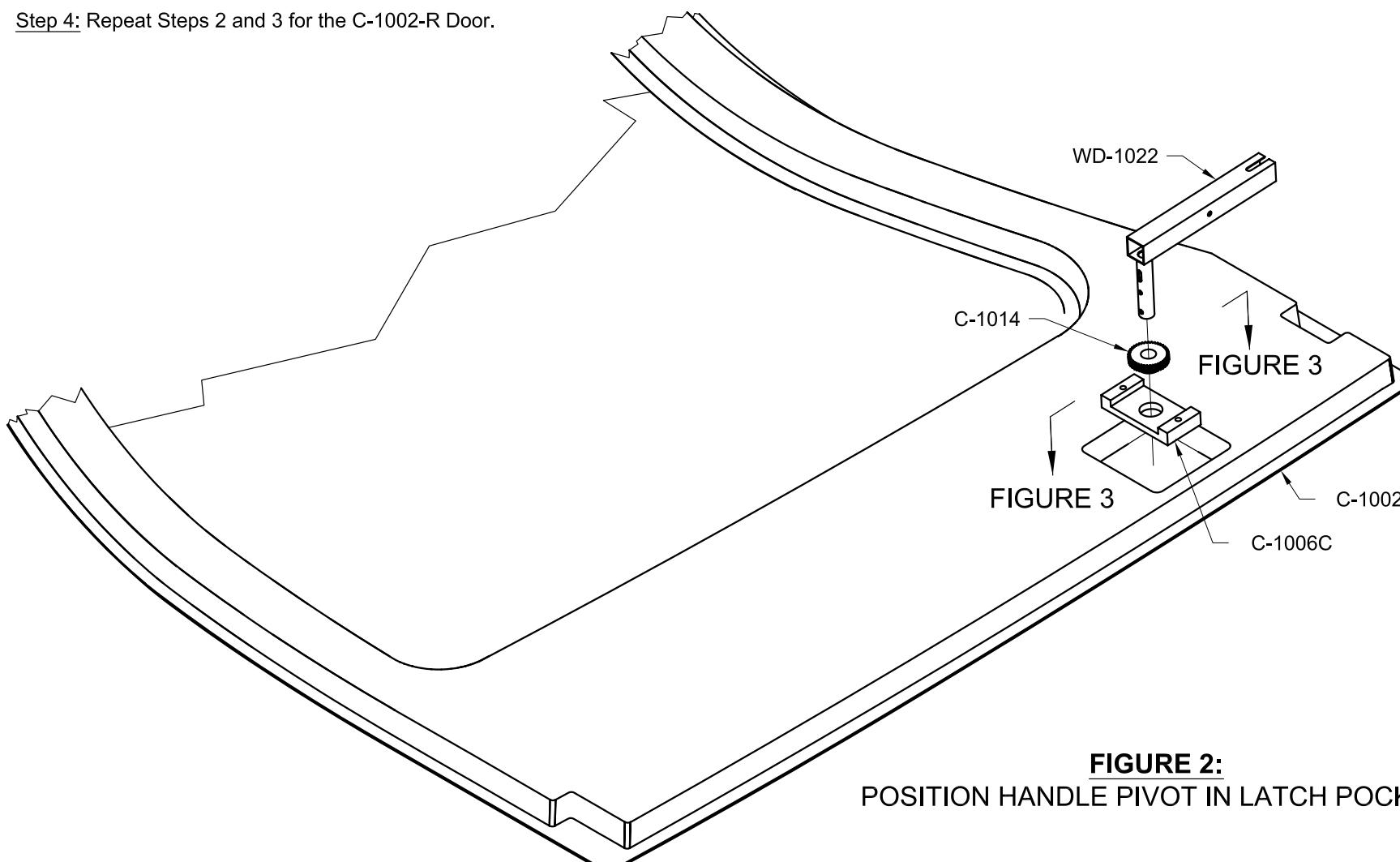


FIGURE 2:
POSITION HANDLE PIVOT IN LATCH POCKET

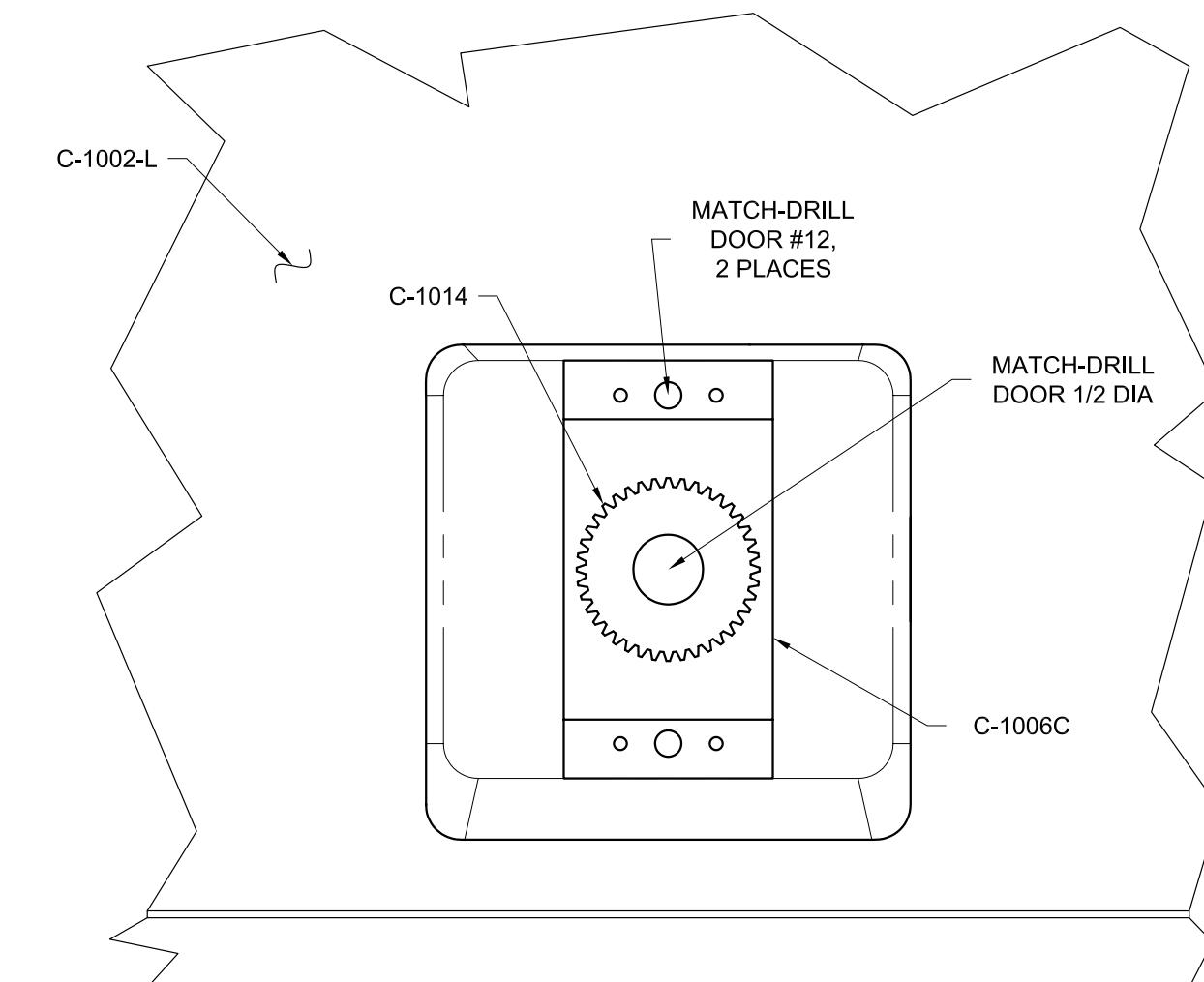
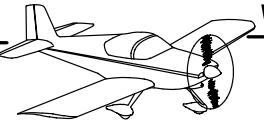


FIGURE 3:
MATCH-DRILL HANDLE PIVOT TO DOOR



Step 1: Position the C-1009 Door Fwd Pin Block in the pocket in the C-1002-L Door as shown in Figures 1 and 3. Round the upper, aft, and lower outboard edges as required for the door fwd pin block to nest tightly against the door. The door forward pin block must not protrude beyond the forward "wall" of the door.

With the door fwd pin block held in place, match-drill #12 through the door using the holes in the door fwd pin block as drill guides.

Remove the door fwd pin block and mark "left" or "right" as appropriate.

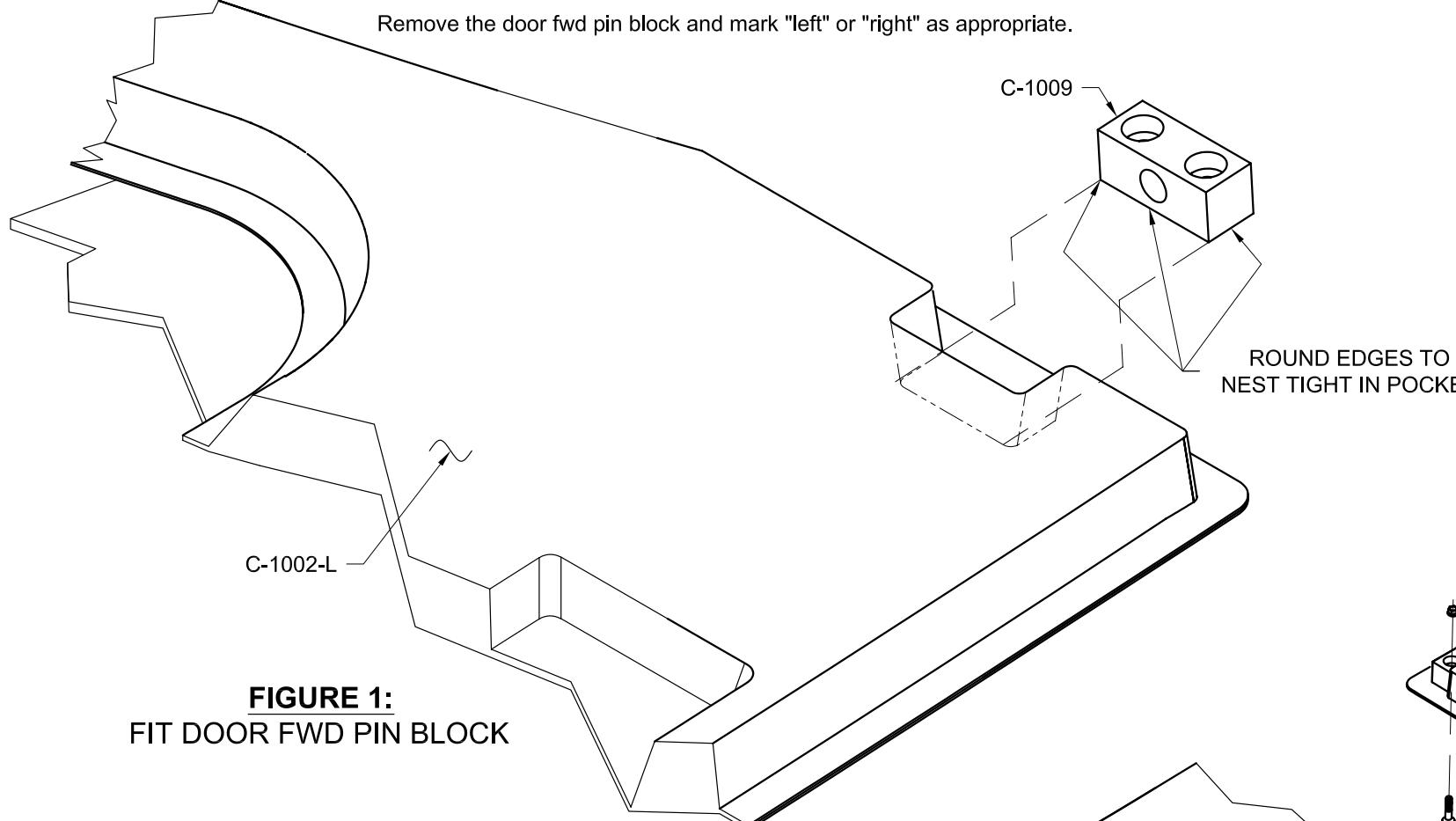


FIGURE 1:
FIT DOOR FWD PIN BLOCK

Step 2: Position the C-1017 Door Aft Pin Block in the pocket in the C-1002-L Door as shown in Figures 2 and 3. Round the upper and fwd outboard edges as required for the door aft pin block to nest tightly against the door. The aft pin block must not protrude beyond the aft "wall" of the door.

With the door aft pin block held in place, match-drill #12 through the door using the holes in the door aft pin block as drill guides.

Remove the door aft pin block and mark "left" or "right" as appropriate.

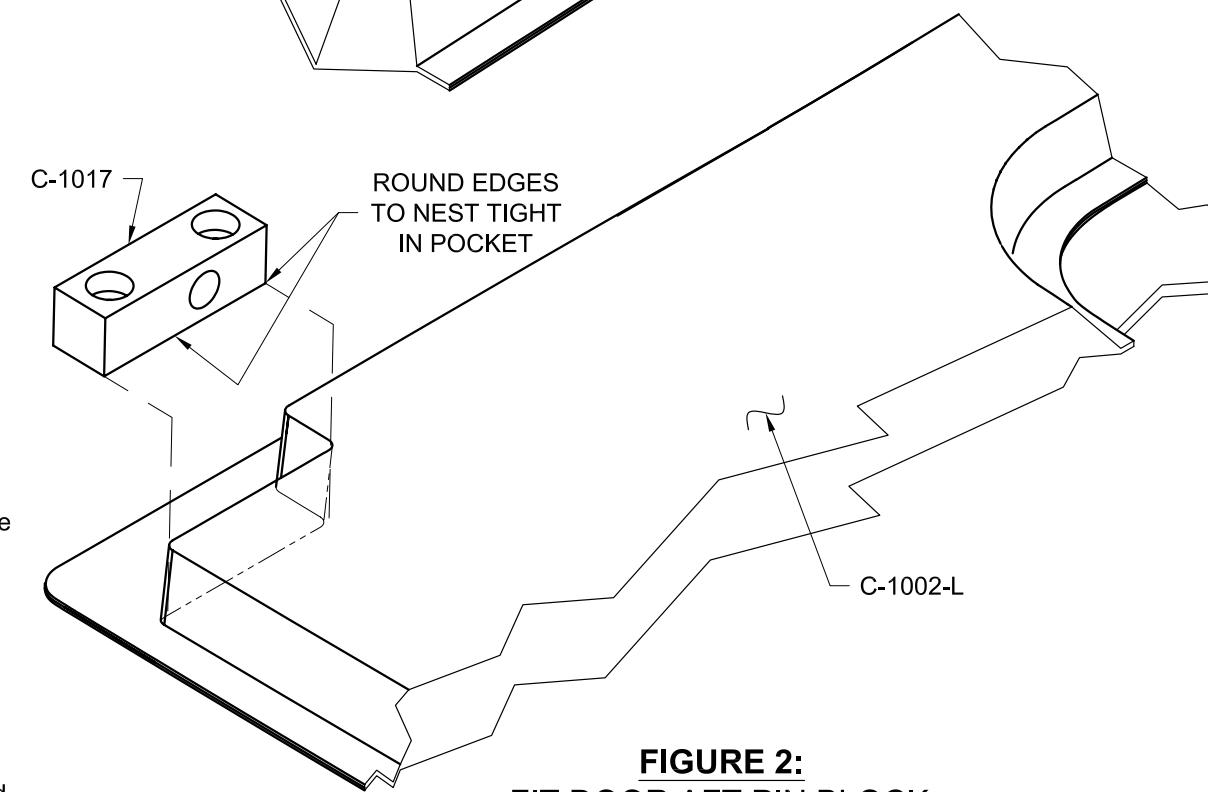


FIGURE 2:
FIT DOOR AFT PIN BLOCK

Step 3: Machine countersink the outer surfaces of the C-1002-L Door at all #12 holes (six places per door) to fit the head of an AN509-10 screw. It is better to under-countersink by .010 to .015 depth at this point in construction.

Step 4: Attach the C-1009 Door Fwd Pin Block and C-1017 Door Aft Pin Block to the C-1002-L Door as shown in Figure 3.

Match-Drill 7/16 into the "walls" of the door using the holes in the pin blocks as drill guides. Remove the fwd and aft pin blocks. Enlarge the 7/16 holes to 15/32 or 1/2.

Re-install the fwd and aft pin blocks.

Step 5: Repeat Steps 1 through 4 for the right side door.

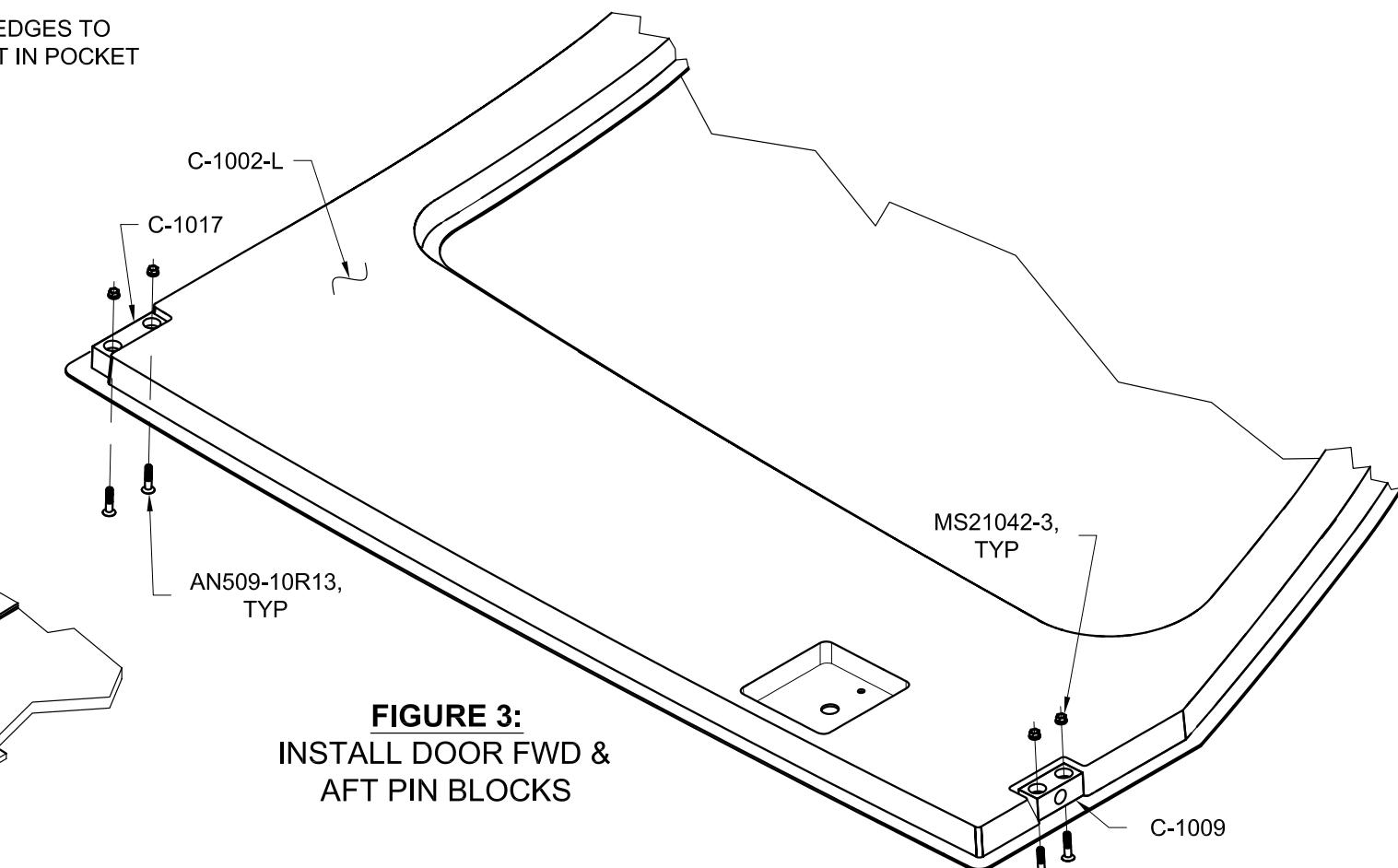
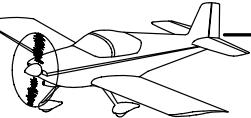


FIGURE 3:
INSTALL DOOR FWD &
AFT PIN BLOCKS



Step 1: Secure the VA-197 Spring and C-1007 Handle Slide to the WD-1022 Door Handle Assembly with a roll pin as shown in Figure 1.

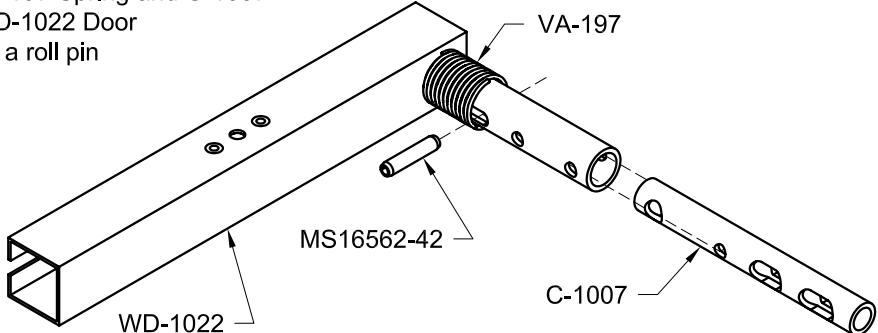


FIGURE 1: BEGIN LATCH MECHANISM ASSEMBLY

Step 2: Secure the C-1008 Handle Lever to the WD-1022 Door Handle Assembly with a screw as shown in Figure 2. When the handle lever is secured in place, the narrow end must engage the opening in the C-1007 Handle Slide as shown in Page 45-10, Figure 3.

Slide the C-1006D Handle Face Plate/C-1006A Handle Plate assembly and the C-1006B Handle Pivot onto the door handle assembly as shown in Figure 2.

Attach the C-1014 Handle Spur Gear to the door handle assembly using a roll pin as shown in Figure 2. The ends of the roll pin must be flush with the outside diameter of the handle spur gear.

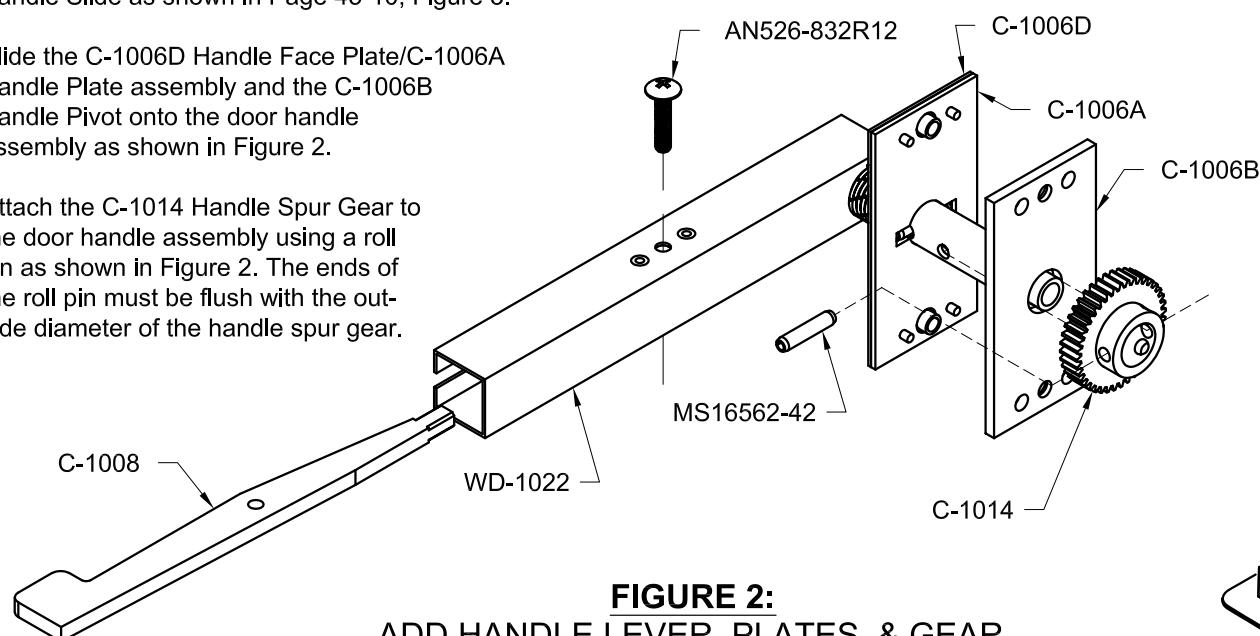


FIGURE 2:
ADD HANDLE LEVER, PLATES, & GEAR

NOTE: For the Initial assembly of the Latch Mechanism shown in Figure 3 temporarily install the Rack Trimmings (see Page 45-11, Figure 1) rather than the handle racks.

Step 3: Place two Handle Racks on the C-1014 Handle Spur Gear as shown in Figure 3.

Slide the C-1006C Handle Pivot over the handle spur gear and handle racks as shown in Figure 3.

The assembly just created will subsequently be referred to as the Latch Mechanism.

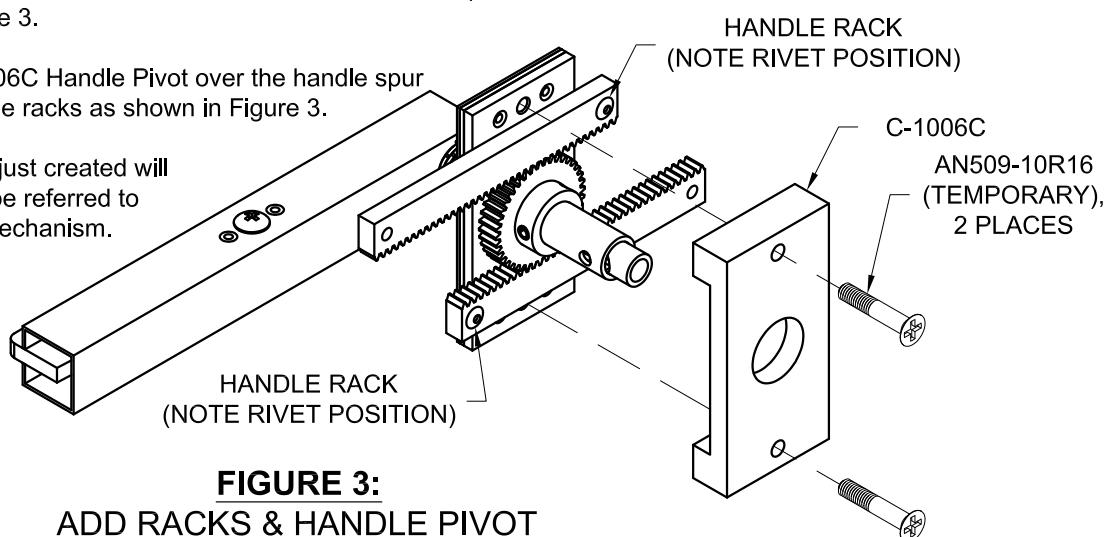


FIGURE 3:
ADD RACKS & HANDLE PIVOT

Step 4: Attach the Latch Mechanism to the C-1002-L Door as shown in Figure 4.

Operate the latch mechanism so as to cause the Rack Trimmings to extend fore and aft from the latch mechanism and lightly contact the walls of the latch pocket.

Mark the walls of the latch pocket around the ends of the rack trimmings. Retract the rack trimmings and remove the latch mechanism from the door.

Drill 1/2 inch diameter (minimum) holes in the walls of the latch pocket. Temporarily re-attach the latch mechanism to the door and operate the latch mechanism. Check that the holes in the walls of the latch pocket will clear the ends of the rack trimmings. Enlarge the holes in the walls of the latch pocket if/as required to allow the ends of the rack trimmings to pass through with clearance of 1/16 to 1/8.

Remove the latch mechanism and replace the rack trimmings with the Handle Racks (created per Page 45-11, Step 1) as shown in Figure 3. Because of the size of the latch pocket in the door and the length of the handle racks, the latch mechanism must be assembled "in-position" in the latch pocket.

Step 5: Repeat the Latch Mechanism assembly (Steps 1 through 3) and installation (Step 4) for the right side door.

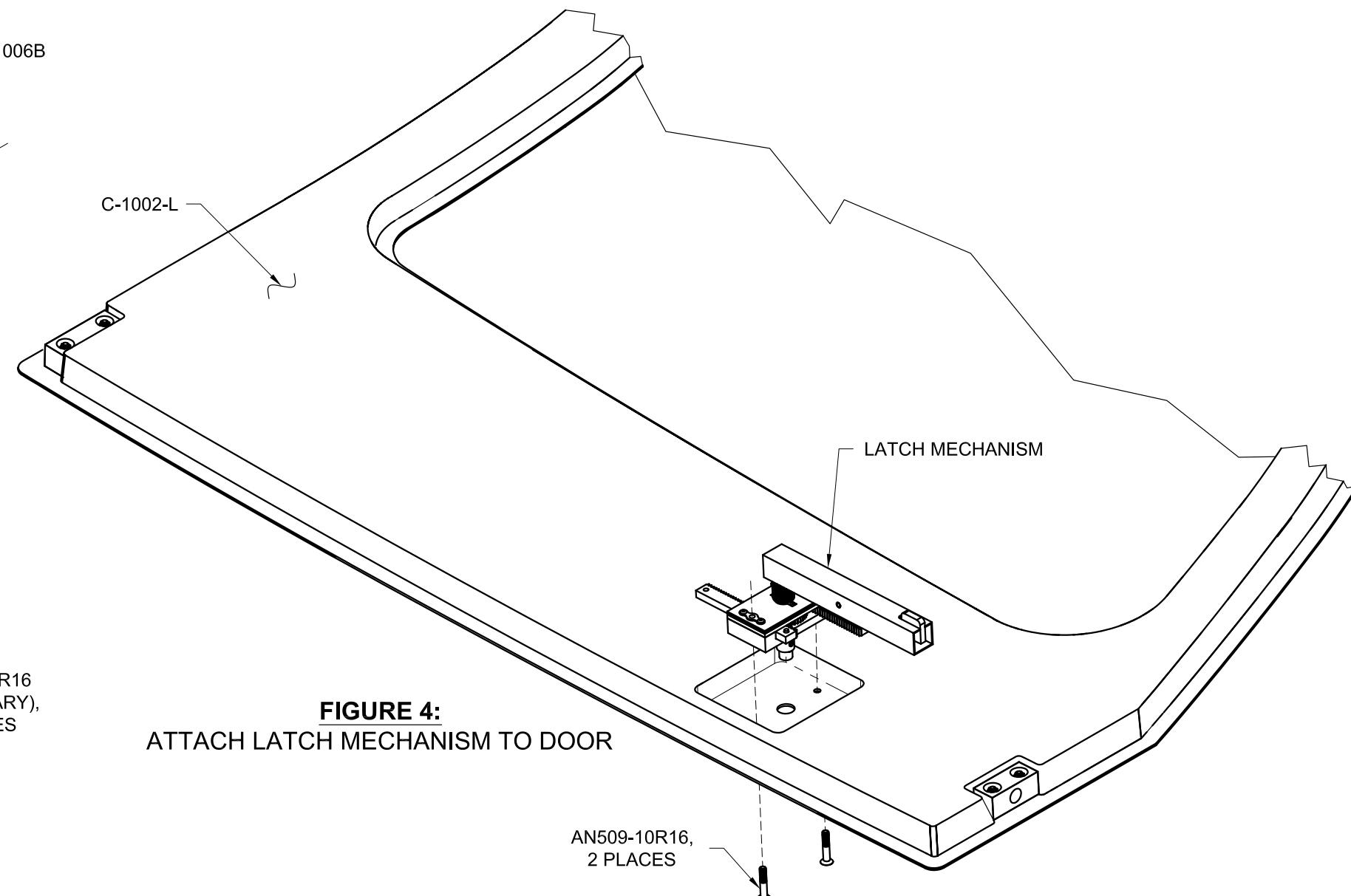


FIGURE 4:
ATTACH LATCH MECHANISM TO DOOR



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Step 1: Tap the inside diameter of the beveled end of the C-1011-L/R Forward Latch Pins and C-1012-L/R Aft Latch Pins as shown in Figure 1. Radius the full perimeter of the outside edge of the beveled end of the forward and aft latch pins as shown in Figure 1.

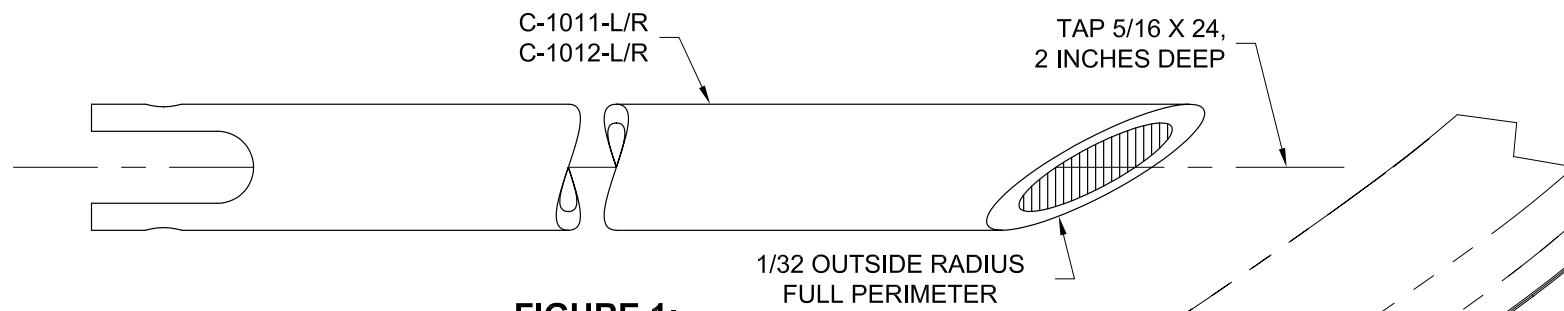
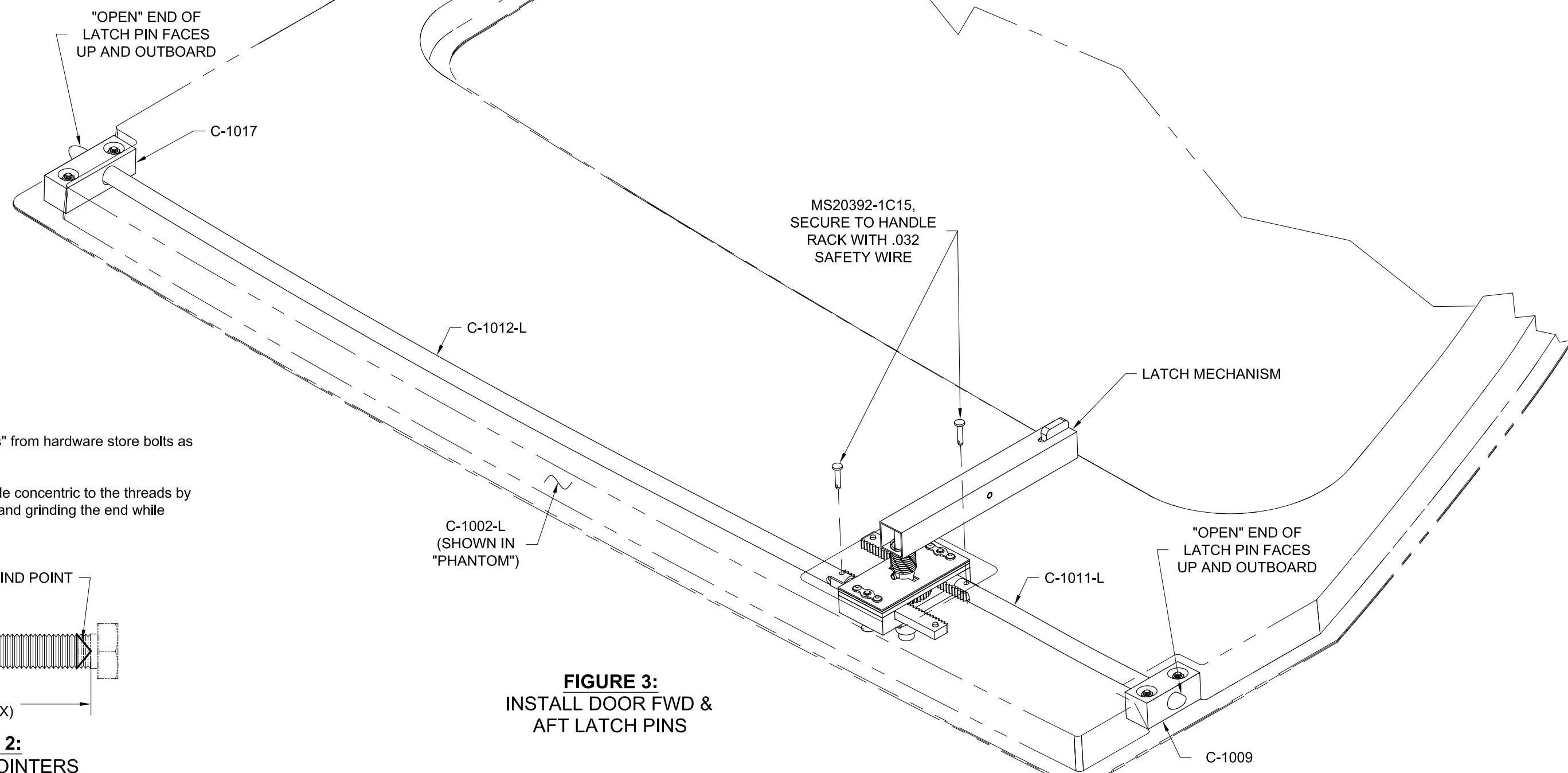


FIGURE 1:
TAP LATCH PINS



Step 2: Create two "pointers" from hardware store bolts as shown in Figure 2.

The point can easily be made concentric to the threads by using an electric drill motor and grinding the end while turning the bolt in the drill.

FIGURE 3:
INSTALL DOOR FWD &
AFT LATCH PINS

Step 3: Establish proper orientation of the C-1012-L Aft Latch Pin. See Figure 3.

Bend the aft latch pin to match the contour of the door lower edge. The goal of the bending is to have the forward end of the aft latch pin parallel to the lower Handle Rack while the aft end of the aft latch pin is parallel to the hole in the C-1017 Door Aft Pin Block.

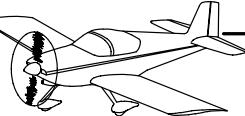
Insert the aft latch pin into the door through the door aft pin block and attach it to the lower handle rack using the hardware shown in Figure 3.

Step 4: Establish proper orientation of the C-1011-L Fwd Latch Pin. See Figure 3.

Bend the fwd latch pin to match the contour of the door lower edge. The goal of the bending is to have the aft end of the fwd latch pin parallel to the upper Handle Rack while the forward end of the fwd latch pin is parallel to the hole in the C-1009 Door Fwd Pin Block.

Insert the fwd latch pin into the door through the door fwd pin block and attach it to the upper handle rack using the hardware shown in Figure 3.

Step 5: Attach the door to the fuselage.



Step 1: Attach each C-656 Canopy Handle to its Latch Mechanism. See Page 45-09, Figure 2.

Step 2: Thread the pointers into the ends of the C-1011-L and C-1012-L latch pins.

Close the C-1002-L Door and hold closed such that the surface of the door is flush with the surface of the fuselage. With the door held closed, operate the latch mechanism to run the pointers into the door jambs with sufficient force to make definite marks in the composite door jambs of the C-1001 Cabin Cover.

Open the door and hold open.

Drill 7/16 holes through the fuselage structure using the pointer marks as a drill guide. The axis of each hole should be parallel to the outer surface of the fuselage. A straight edge held against the fuselage skin adjacent to the pointer mark in the door jamb can provide a parallelism reference when drilling.

Deburr the holes in the fuselage structure.

Repeat this step for the right side door.

Step 3: Drill holes in and center punch all four C-1010 Cabin Pin Blocks as shown in Figure 1.

Hold each cabin pin block in the door jamb by using a 3 to 6 inch long piece of 7/16 tubing inserted through the cabin pin block and into the hole in the fuselage structure. Align the long edges of the cabin pin blocks to be parallel to the door jamb. See Figure 2. Each cabin pin block is oriented properly when the center punch marks are INBOARD of the 7/16 diameter hole.

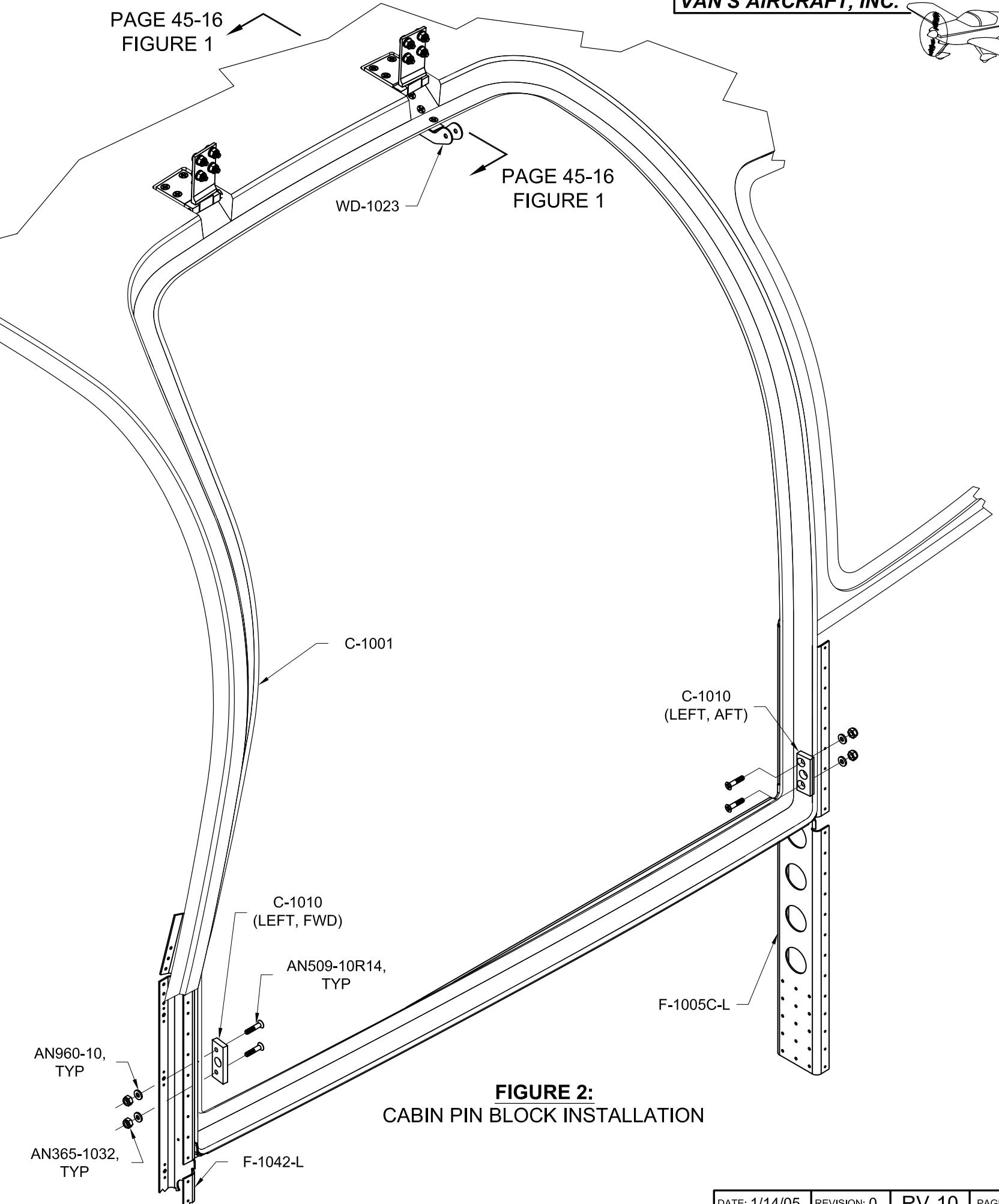
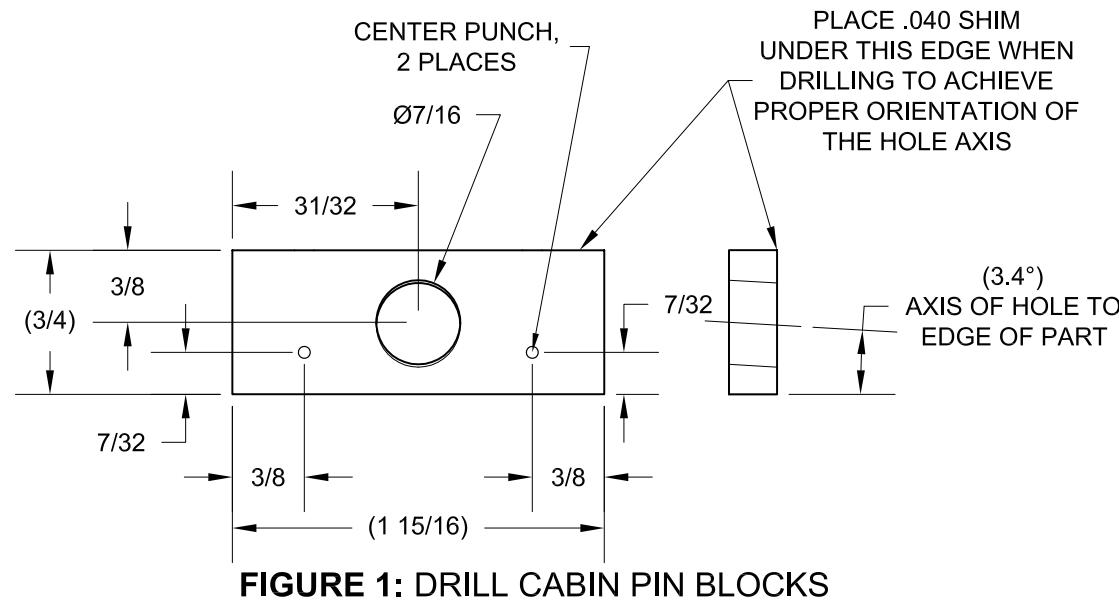
With each cabin pin block held in position, drill #12 two places through the cabin pin block and fuselage structure. The holes are located at the center punch marks in the cabin pin block. The axis of the holes must be parallel to the fore/aft axis of the airplane, not perpendicular to the door jamb surface. Mark each cabin pin block "right" or "left", and "fwd" or "aft" so that they are installed in the same location and orientation as when they were drilled. Set each cabin pin block aside after drilling.

Deburr the holes in the fuselage structure.

Run a #10 drill through the holes in the cabin pin blocks. Machine countersink each cabin pin block for the head of a #10 flush screw.

Attach the cabin pin blocks to the fuselage structure as shown in Figure 2.

Check for proper operation of each door latching mechanism.





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Step 1: Position the WD-1023 Gas Strut Attach Bracket on the C-1001 Cabin Cover as shown on Page 45-15, Figure 2, and as shown in Figures 1 and 2. The gas strut attach bracket inboard/outboard position is determined by the point of "best-fit" to the cabin cover. The gas strut attach bracket is centered fwd/aft on the door hinge.

With the gas strut attach bracket held in place, match-drill #12 through the cabin cover using the holes in the gas strut attach bracket as drill guides. Install a temporary screw/washer/nut in each hole as it is drilled to hold the gas strut attach bracket in position while the remaining holes are match-drilled.

Remove the gas strut attach bracket and deburr the holes that were just match-drilled.

Machine countersink the holes in the cabin cover to fit the head of an AN509-10 screw as shown in Figure 1.

Final install the gas strut attach bracket using the hardware called-out in Figure 1.

Step 2: Fabricate a Bracket Locating Bar out of 1/8 to 1/2 inch thick metal/plastic/wood as shown in Figure 3. Material is not provided in the kit. The bar simulates the compressed C-1016 Gas Strut and is used instead of the gas strut to locate the C-1013 Gas Strut Attach Brackets on the inner surface of the C-1002-L/R Door.

Step 3: Fabricate four C-1016B Bushings from AT6-058 x 5/16 as shown in Figure 4.

Step 4: Break apart the C-1013 Gas Strut Attach Bracket into its two halves and smooth the edges.

Insert a C-1016B Bushing in each end of the Bracket Locating Bar and attach the gas strut attach brackets to the bar using the AN3 bolt/washer/nut called-out in Figure 2.

Attach the bracket locating bar to the WD-1023 Gas Strut Attach Bracket using the AN3 bolt/washer/nut called-out in Figure 2.

Close the C-1002-L/R Door and latch it closed. Rotate the bracket locating bar up until the gas strut attach brackets rest against the inner surface of the door. With the gas strut attach brackets held in place as shown in Figures 1 and 2, match-drill #30 and cleco to the door using the holes in the gas strut attach brackets as drill guides.

Remove the bracket locating bar and remove the gas strut attach brackets and bushings

Deburr the holes of the C-1013 Gas Strut Attach Brackets. Prime if/as desired.

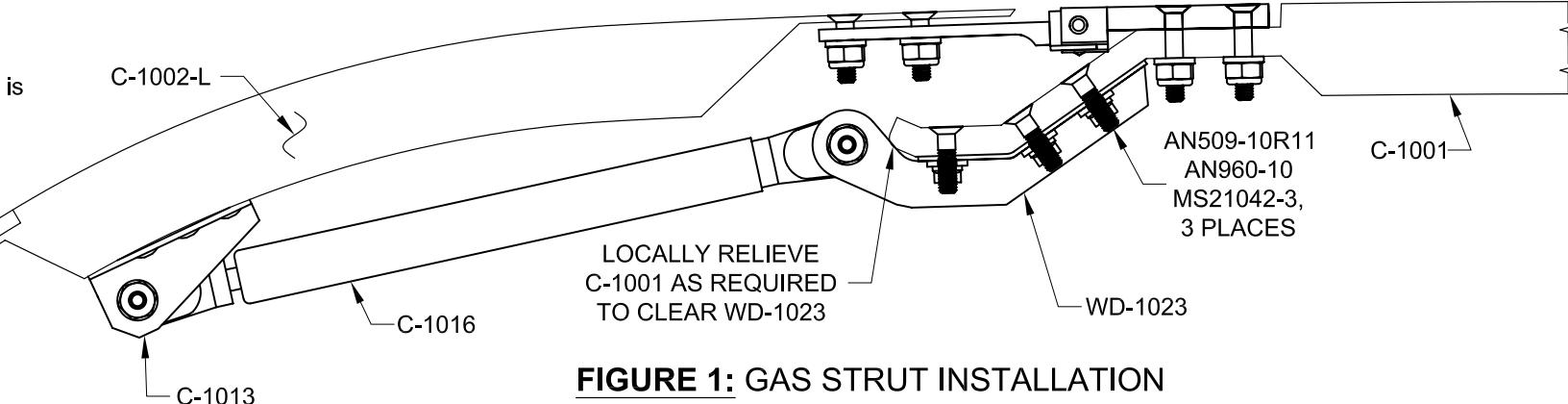


FIGURE 1: GAS STRUT INSTALLATION

(SECTION THROUGH CLOSED LEFT DOOR AND CABIN COVER AT CENTER OF AFT DOOR HINGE)

Close the C-1002-L/R Door and latch it closed. Rotate the bracket locating bar up until the gas strut attach brackets rest against the inner surface of the door. With the gas strut attach brackets held in place as shown in Figures 1 and 2, match-drill #30 and cleco to the door using the holes in the gas strut attach brackets as drill guides.

Remove the bracket locating bar and remove the gas strut attach brackets and bushings

Deburr the holes of the C-1013 Gas Strut Attach Brackets. Prime if/as desired.

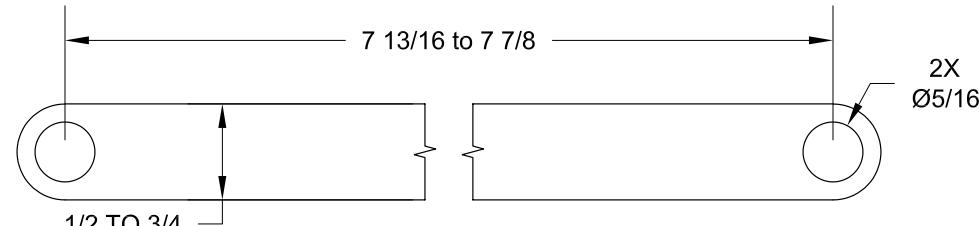


FIGURE 3:
BRACKET LOCATING BAR

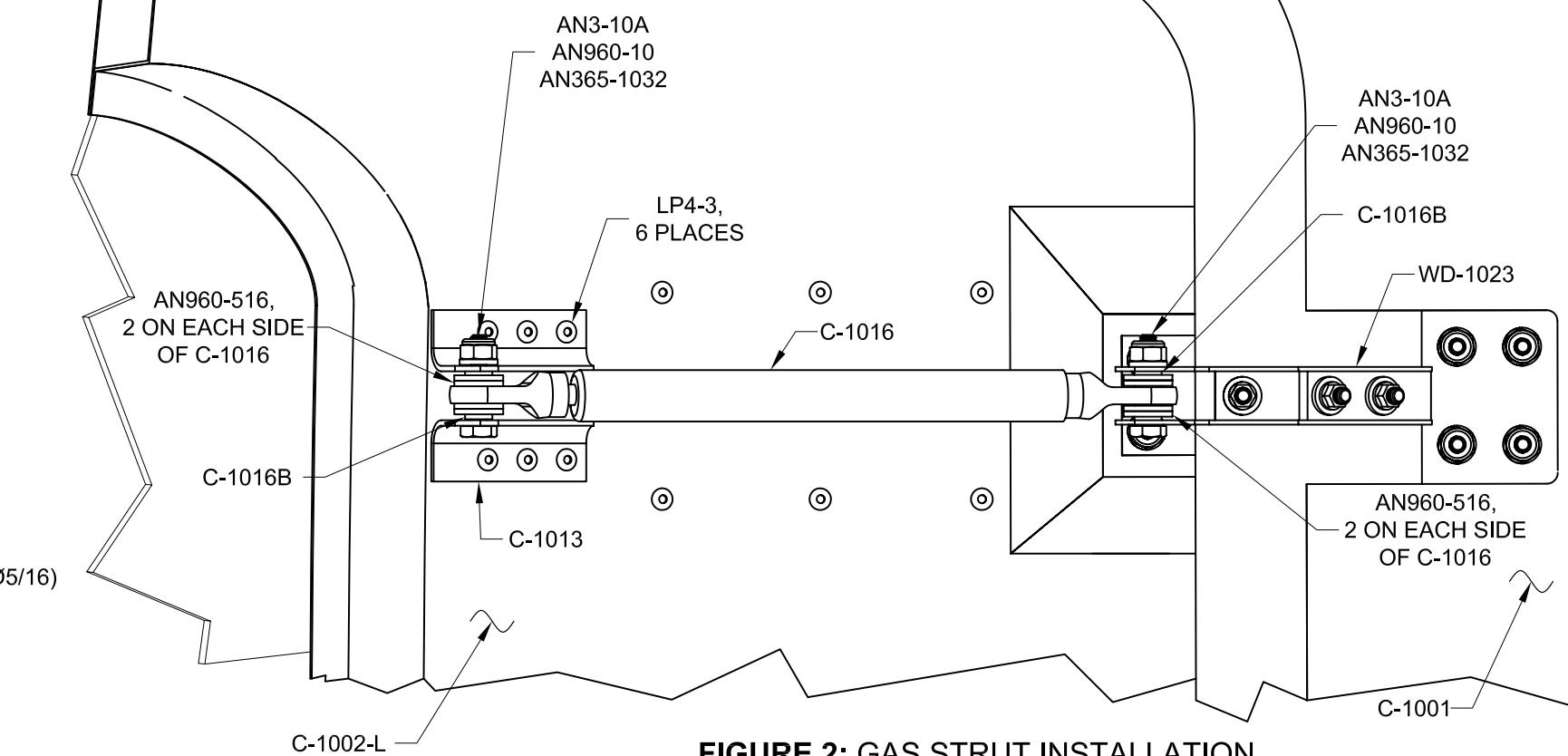


FIGURE 4: BUSHING

FIGURE 2: GAS STRUT INSTALLATION

(VIEW LOOKING UP AT INNER SURFACE OF CLOSED LEFT DOOR AND CABIN COVER)



Step 1: Remove the C-1002-L/R Doors from the fuselage. Complete the tasks described on Page 45A-02, Step 1 through Page 45A-07, Step 5.

Step 2: Remove all latch mechanism parts from the doors.

Finish-out the fiberglass surfaces of the doors that are on the interior of the cabin. See Section 5T, Fiberglass.

Blind rivet the C-1013 Gas Strut Attach Brackets to the C-1002-L/R Door as shown on Page 45-16, Figure 2.

Final paint the inner surface of the door.

Re-install all latch mechanism parts to the doors.

Step 3: The VA-198 Door Seal is installed as one continuous length of extruded rubber that begins/ends anywhere on the bottom edge of the C-1002-L/R Door, but not closer than 6 inches to either the forward or aft corner. The door seal is attached to the door as shown in Figures 1 and 2.

The door seal is glued to the door with a clear silicone sealant. (Van's aircraft used 3M "Super Silicone Sealant, Clear" supplied in semi-rigid tube form for use with a caulking gun.) Clecos are used every two to three inches to hold the door seal in place while the glue cures. Strips of scrap .025 or .032 aluminum 1 inch wide by 2 1/2 to 3 1/2 inches long are used to spread the cleco clamping pressure more evenly over the door seal.

Step 4: Fabricate the Fwd Latch Pin Plate and Aft Latch Pin Plate from pieces of scrap .032 aluminum as shown in Figures 3, and 4.

Attach both latch pin plates with blind rivets as shown in Figure 1.

Step 5: Attach the C-1002-L/R Doors to the fuselage.

Step 6: Install the C-1016 Gas Struts as shown on Page 45-16, Figures 1 and 2.

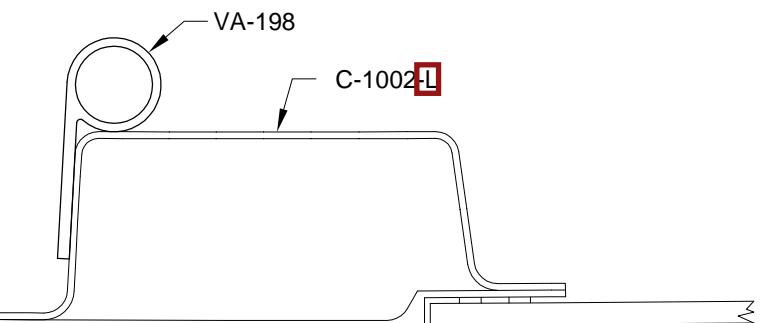


FIGURE 2: DOOR SEAL INSTALLATION

Step 7: Complete the tasks described on Page 45A-07, Step 7 through the end of Section 45A.

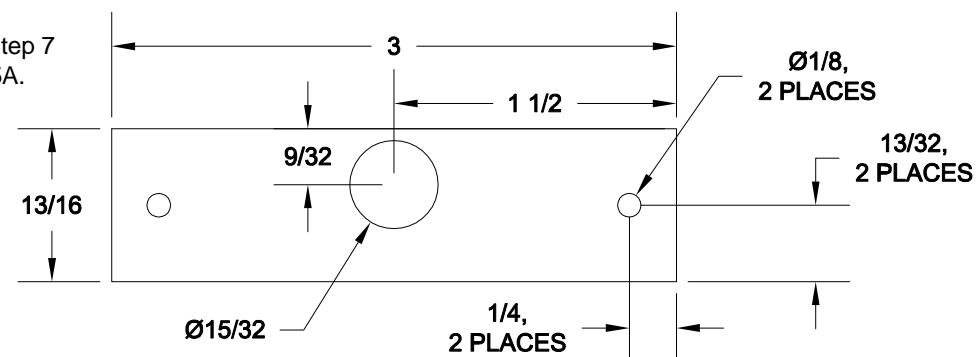
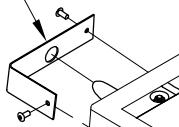


FIGURE 3: FWD LATCH PIN PLATE

AFT LATCH PIN PLATE



**FIGURE 1:
DOOR SEAL &
LATCH PIN PLATE
INSTALLATION**

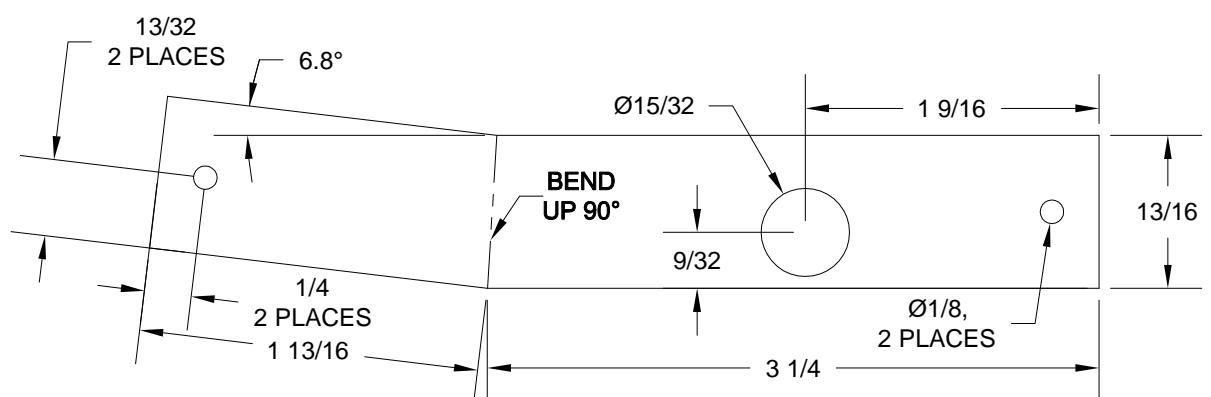
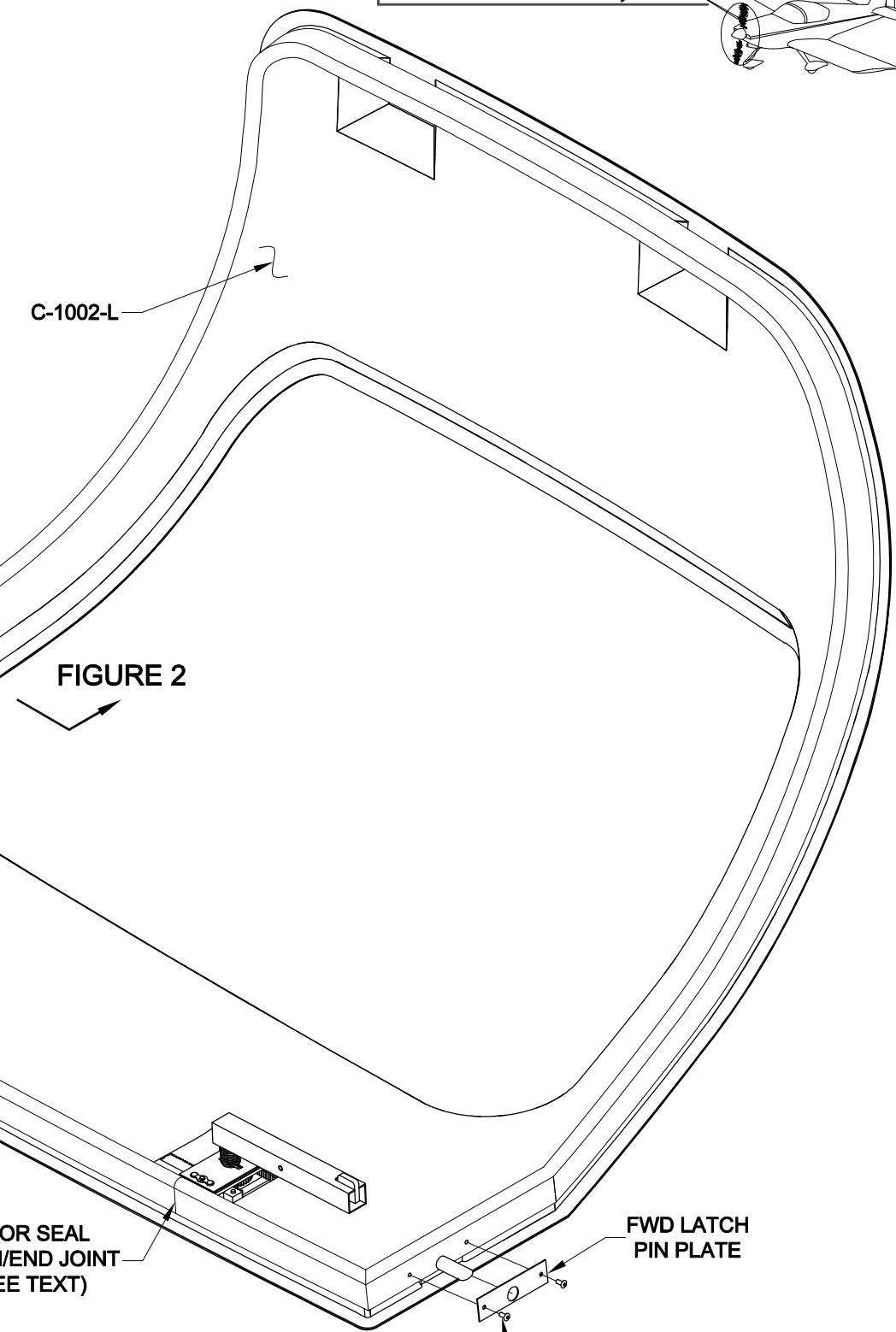
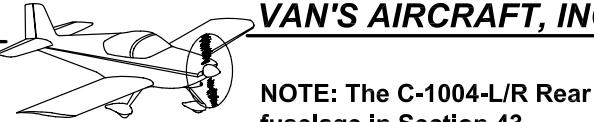


FIGURE 4: AFT LATCH PIN PLATE





NOTE: The C-1004-L/R Rear Windows and C-1005 Windscreen have already been fitted to the fuselage in Section 43.

Step 1: Place the C-1004-L Rear Window in place on the C-1001 Cabin Cover. Because the thickness of the plexiglass will vary around the perimeter, it may be necessary to use shims to locally raise the outer surface of each rear window to more closely match that of the cabin cover. See Page 45-08, Step 5 and Figure 2 for details of shim installation.

Step 2: Install the C-1004-L Rear Window using the same procedure described for installation of the C-1003-L/R Front Windows on Page 45-08, Step 6.

Repeat the shimming and installation process for the C-1004-R Rear Window.

Step 3: Place the C-1005 Windscreen in place on the fuselage. Determine the need for and (if necessary) install shims using the same procedure as for all the other transparencies.

Step 4: Install the C-1005 Windscreen using the same procedure as that of the other windows (see Page 45-08, Step 6) but with the following caveats:

- One 4 oz. kit of Weld-On 10 provides an adequate quantity of glue, but leaves no extra.
- The large size of the windscreen bonding area requires that installation be well planned and rehearsed so that work can be done quickly so as to keep the "skinning-over" of the glue to a minimum.

Step 5: Fabricate five clips from pieces of scrap .032 aluminum as shown in Figure 3.

The clips are blind riveted to the F-1071 Fwd Fuse Top Skin as shown in Figure 2 to hold the base of the C-1005 Windscreen against the fwd fuse top skin. The clips are installed every 12 inches along the lower edge of the windscreen.

Step 6: Fabricate a Windscreen Base Fairing as shown in Figure 1. The windscreen base fairing provides a smooth transition between the base of the C-1005 Windscreen and the F-1071 Fwd Fuse Top Skin. The windscreen base fairing is fabricated directly on the fuselage and consists of a lay-up of E-glass fabric and epoxy resin as subsequently described. Polyester or vinyl ester resins are not compatible with the plexiglass transparencies and must not be used.

Use a 7 inch radius circle gauge to determine where the edges of your finished windscreen base fairing will be on the plexi. Find the contact points at the front of the windscreen and bring it around the sides as shown in Figure 1.

Define the extent of the fairing on the windscreen by placing two layers of good quality electrical tape on the windscreen. Mask-off the entire windscreen EXCEPT for the perimeter areas that will be covered by the windscreen base fairing or paint.

Step 7: Sand the exposed windscreen with 60 to 80 grit sandpaper.

Step 8: Sand an area on the F-1071 Fwd Fuse Top Skin extending from the base of the C-1005 Windscreen forward approximately 4 inches. Do this along the entire base of the windscreen.

Step 9: Phosphoric acid etch the sanded areas of the F-1071 Fwd Fuse Top Skin.

SEE FIGURE 2 FOR
WINDSCREEN CLIP INSTALLATION;
SEE PAGE 45-19, FIGURE 1 FOR
WINDSCREEN BASE FAIRING
LAY-UP DETAIL

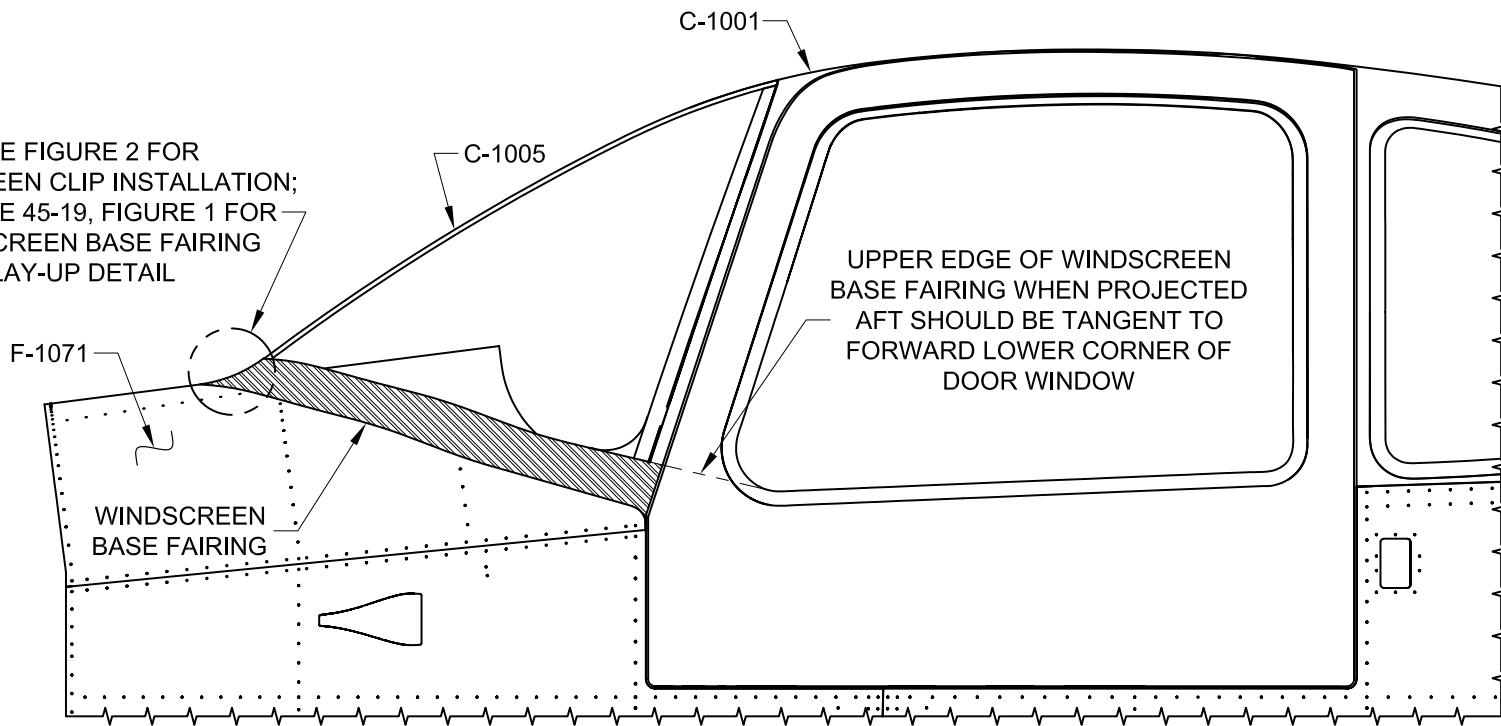


FIGURE 1: WINDSCREEN BASE FAIRING

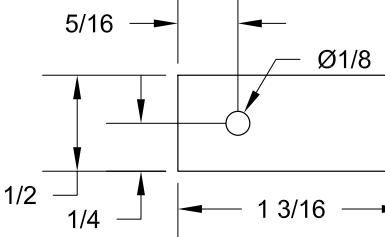


FIGURE 3: CLIP FABRICATION DETAIL

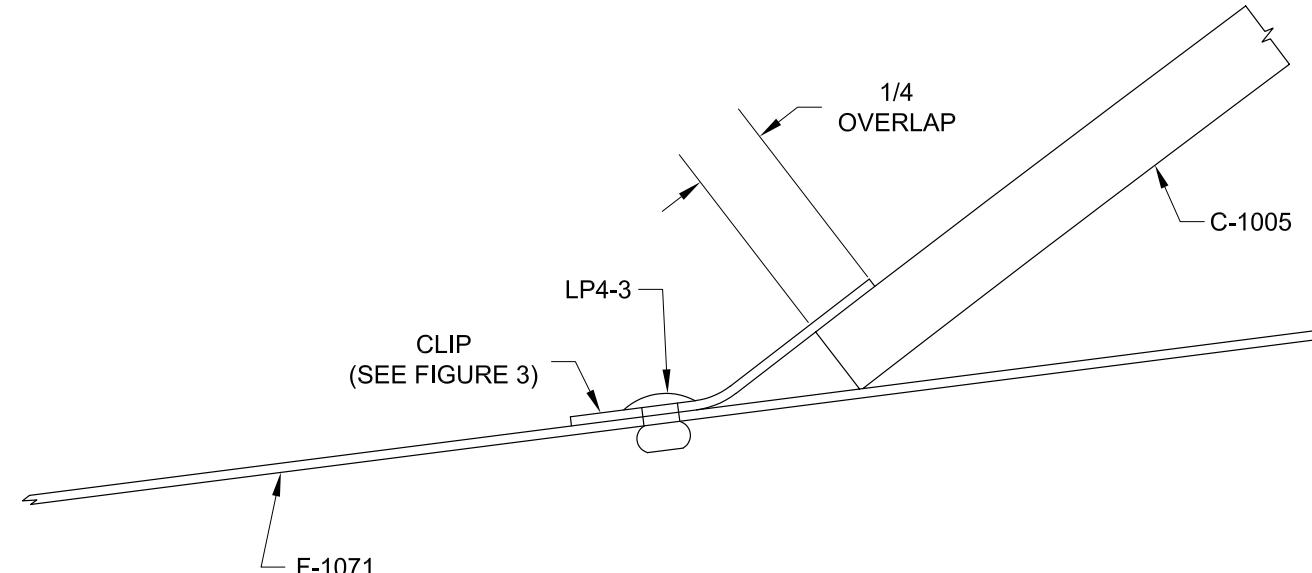
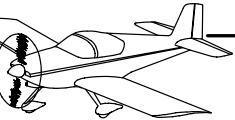


FIGURE 2: CLIP INSTALLATION DETAIL



Step 1: Apply a fillet of microballoons and epoxy to fill the gap between the edge of the C-1005 Windscreen and the F-1071 Fwd Fuse Top Skin. See Figure 1. This is the foundation upon which strips of glass cloth will be built-up to form the windscreens base fairing.

Step 2: Cut strips of 9 oz/sq-yd E-glass fabric 3 to 3 1/2 ft long. Cut TWO strips to each of the widths called-out in Figure 1. Cut parallel to the weave.

Step 3: Lay-Up the strips of E-glass fabric beginning with the narrowest strips and progressing to the widest. The first layer is centered on the base of the windscreens and each successive layer is centered on the layer beneath it as shown in Figure 1. The final layer should butt to, but not overlap, the edge of the electrical tape on the C-1005 Windscreen.

Each layer will consist of two strips to reach the full length of the lower edge of the windscreens. The strips should be butted to each other with the butt joint of each layer located one to two inches away from the butt joint of the previous layer.

Step 4: When the lay-up has fully cured, the surface may be shaped and sanded smooth.

Use a sanding block with the same 7 inch radius as the final lay-up. Begin with 40 to 50 grit sandpaper to get the general shape. Use caution so as to not sand the electrical tape on the C-1005 Windscreen.

When the shape is nearly correct and the thickness of the edge of the lay-up on the windscreens is nearing the thickness of the electrical tape, switch to 80 to 100 grit sandpaper and work very carefully until you are just contacting the tape on the windscreens and the aluminum skin at the edges.

Remove the second layer of electrical tape (leaving just one layer) and sand very carefully using 150 grit sandpaper until just beginning to see sanding marks in the electrical tape.

Remove all sanding dust and brush on a heavy coat of epoxy overlapping onto the electrical tape and metal at the edges. After the brush coat of epoxy cures, sand with 100 grit sandpaper initially, finishing with 150 grit sandpaper.

If there are any areas that need to be filled, scuff these areas with 40 to 50 grit sandpaper then fill with epoxy thickened with microballoons.

The goal is to have a layup with the outer surface being a buildup of 2 or 3 coats of epoxy that has been finish sanded to final shape with the epoxy on the windscreens blending out to the thickness of the electrical tape (or less) and the epoxy on the metal skin blending out to nothing.

Step 5: Use a mixture of epoxy thickened with microballoons to fill the gaps between the edges of all the transparencies and the C-1001 Cabin Cover.

Sand the cured epoxy/microballoon mixture smooth and flush with the cabin cover.

Step 6: Finish the pre-preg outer surfaces of the C-1001 Cabin Cover and C-1002 Doors. See Section 5T, Fiberglass.

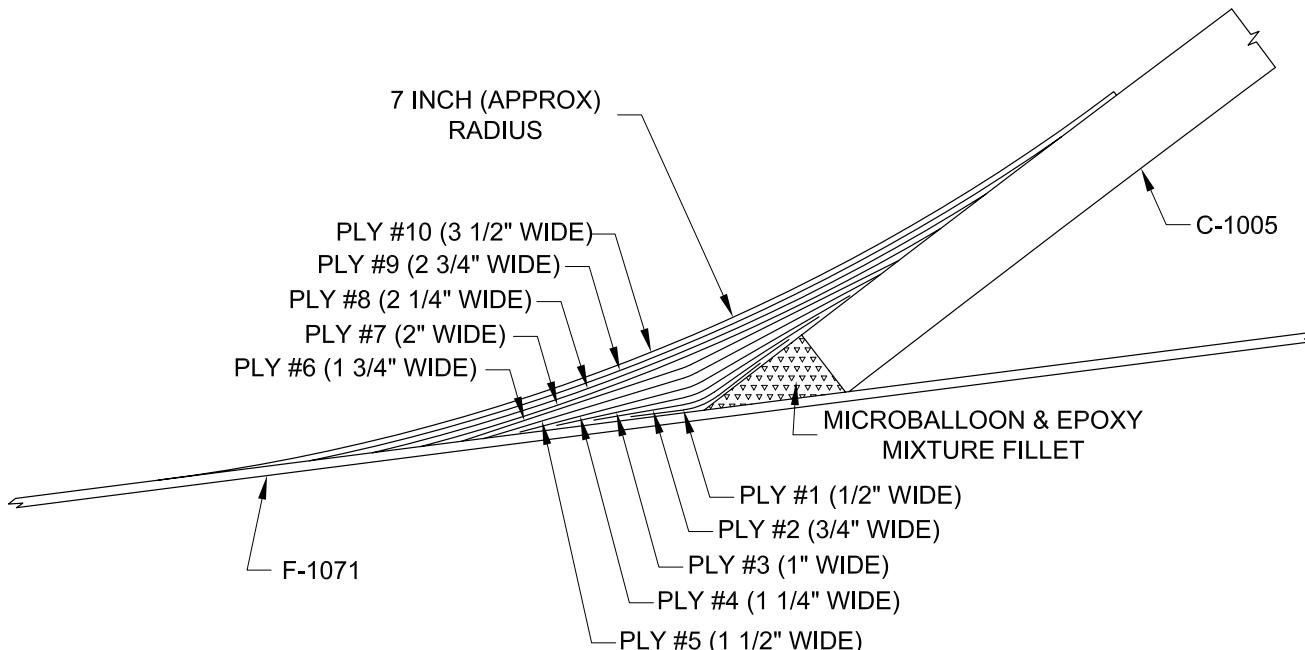
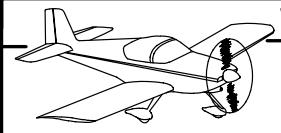


FIGURE 1: WINDSCREEN BASE FAIRING LAY-UP DETAIL



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