IFLYRV10.COM
BILLET FLUSH DOOR HANDLES
INSTALLATION MANUAL

Thanks for purchasing a set of Billet Aircraft door handles from IFLYRV10.COM.
They are constructed of 2024 aluminum and machined to our high standards.
If any part offered by IFLYRV10.COM fails to completely satisfy, just call and we will do whatever it takes to correct the problem. …… Steve

This Manual is set up with a few different sections, which will allow variations on the install. Please review all instructions before starting.

All builders will start with the basic handle install and linkage connection.

WE DO NOT RECOMMEND DISABLING THE ORIGINAL INTERIOR DOOR LOCK MECHANISM
Therefore there must be a way to release the interior lock from the outside after the door has been latched closed from the outside.

Parts for both install options are included. A flush key cylinder lock is under development. Standard key cylinders will fit, but are not supplied. (It'll be worth the wait)

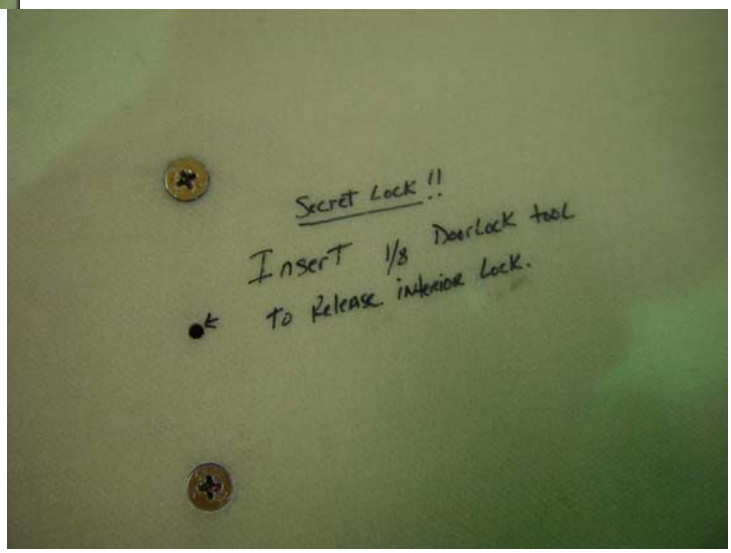
Two external latch release options, pictured below, can be used based on builder preference and aircraft status.

If you are retrofitting a flying aircraft or have already installed the Vans exterior handle, the pushbutton release will be the best choice.

The discreet 1/8” release requires the door skin has not been drilled for the exterior handles yet..

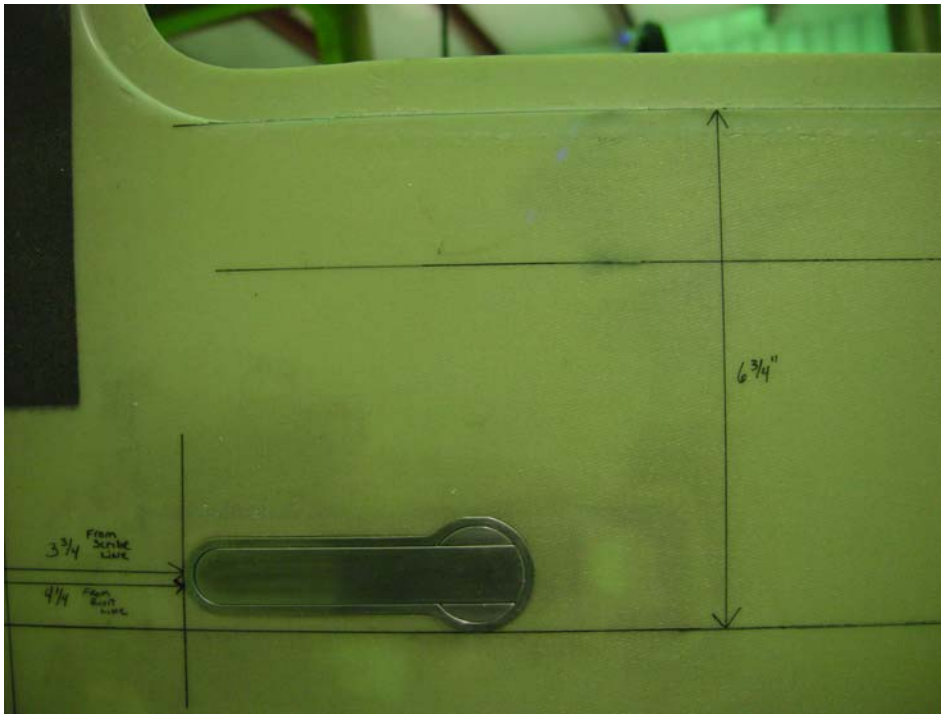
Set at 3/16” above the surface the button is flush when the latch releases.

The secret release will require a small pin to be carried on the keychain

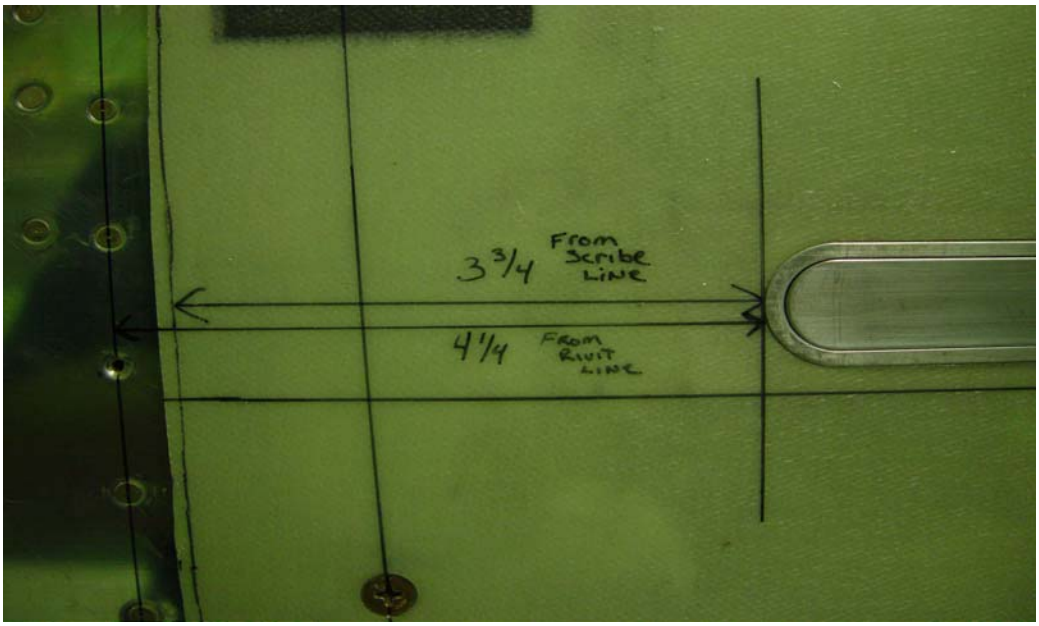


Copilot Door First—All Builders

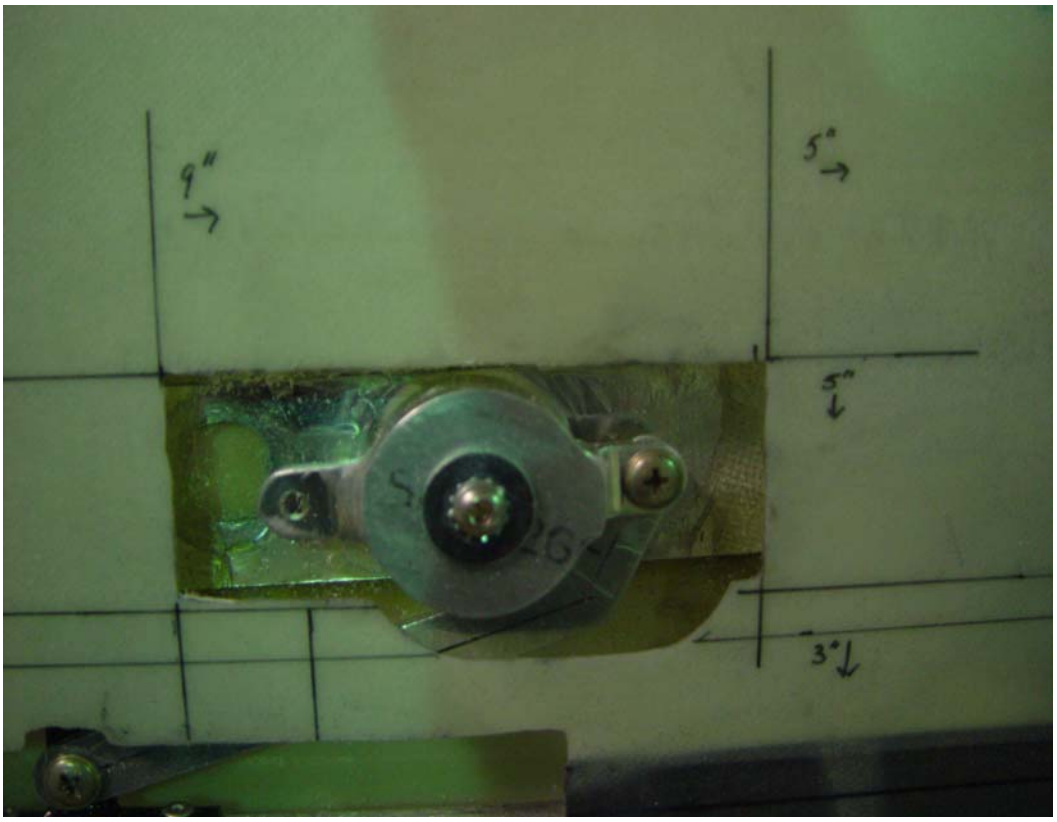
1) Draw a horizontal parallel line 6 3/4” down from bottom edge of window edge.
2) Draw a parallel vertical line 4 1/4” from rivet line.
3) Place Template on intersecting lines and duct tape in place. ***Read note below***
4) Using dremel or similar, cutout handle slightly undersize. File to final fit now or wait until access is made from backside for final fitment. Ideally the closer the fit the better.



Please take a moment to understand the measurements are for the cut out area of the template and not from the template outer perimeter. Due to the possible variance of the outer dimensions on the template, layout the handle as pictured.

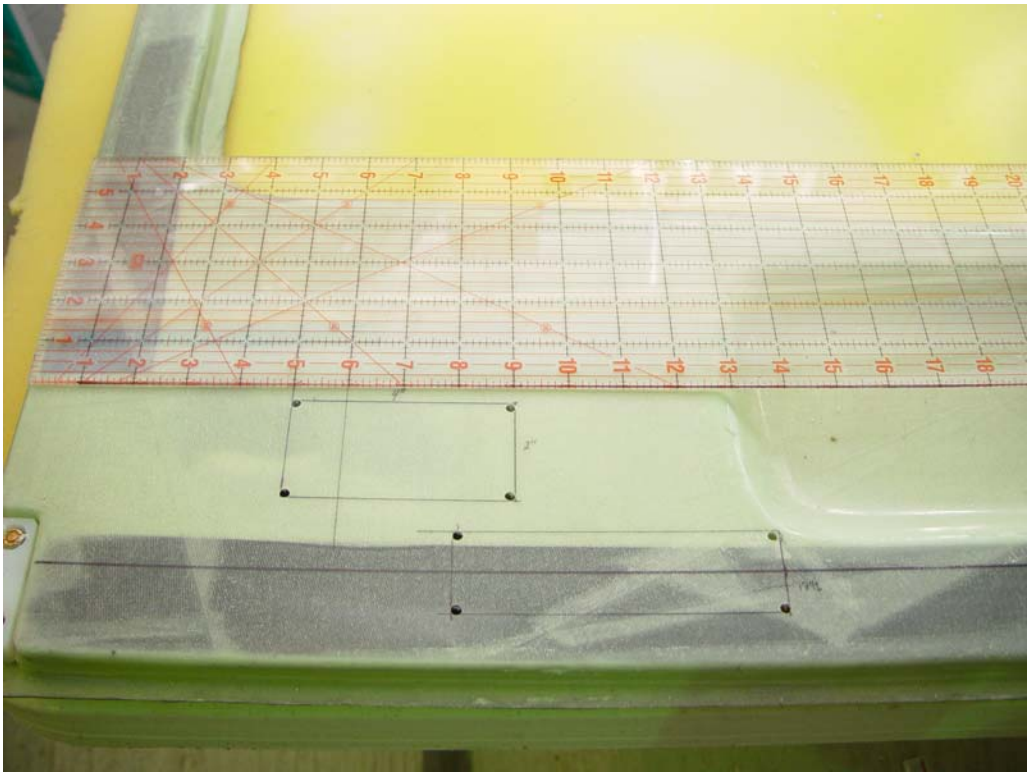


Inner door cutout for handle is approx. 2” x 4” (see pic)
Measured 5” from aft edge of door and 3” from bottom edge of door.
Cut interior access hole.
Final fit Billet Handle into cutout, trimming as required to get desired fit. Glue with epoxy after roughing exterior door skin and handle body to ensure adhesion. You may also add a small strip of 1/2” wide fiberglass tape along the perimeter of the handle to insure complete bonding.

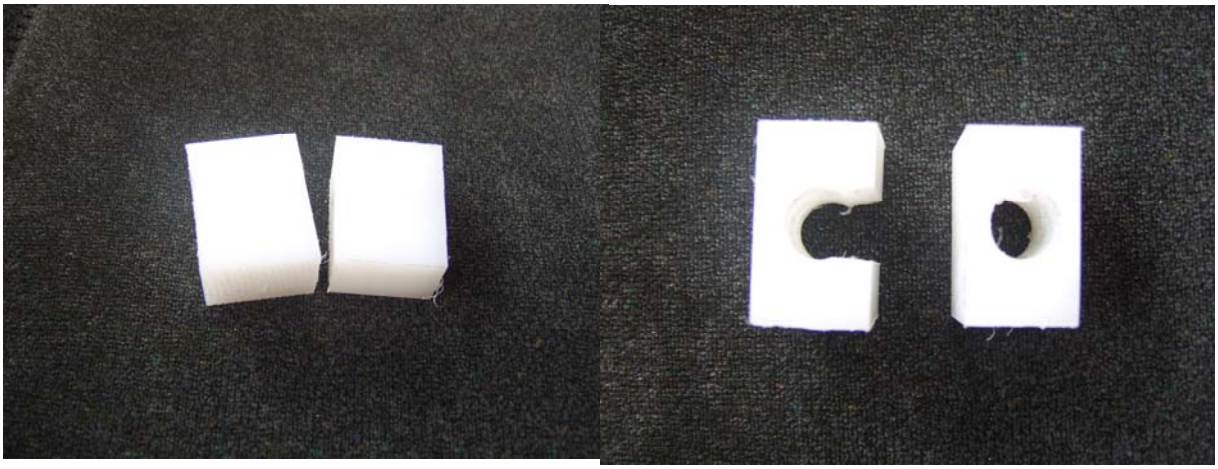


The back pages have copies of the original install instructions from Vans that pertain to the door structure.
They are for reference only.

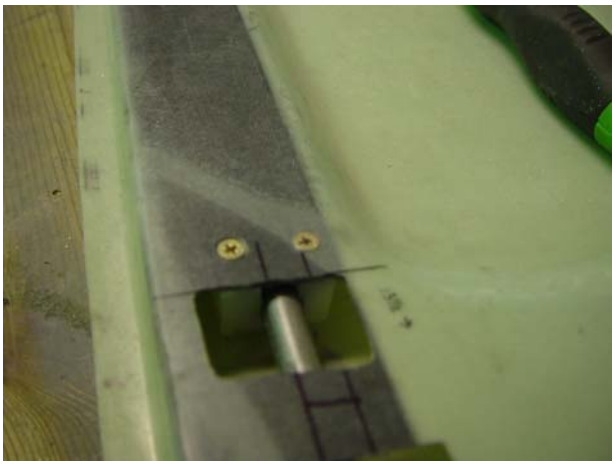
Draw a centerline from the aft edge of the door to the inside door latch directly above the aft pushrod to give a reference line.
Cut a hole 5 1/2” x 1 1/2” starting 8” from aft edge and centered over pushrod.

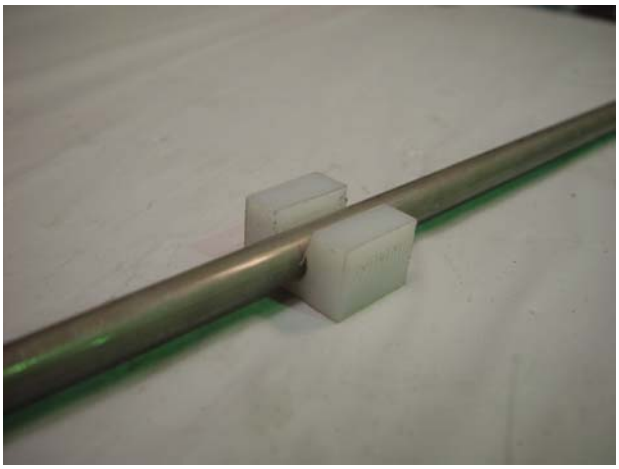


You should have two pieces of plastic 1 1/4” x 1” x 3/4”.
Drill 29/64” through both pieces on the 3/4” x 1 1/4” side.
Slot from the top of the block to the hole as pictured with a bandsaw or hacksaw.

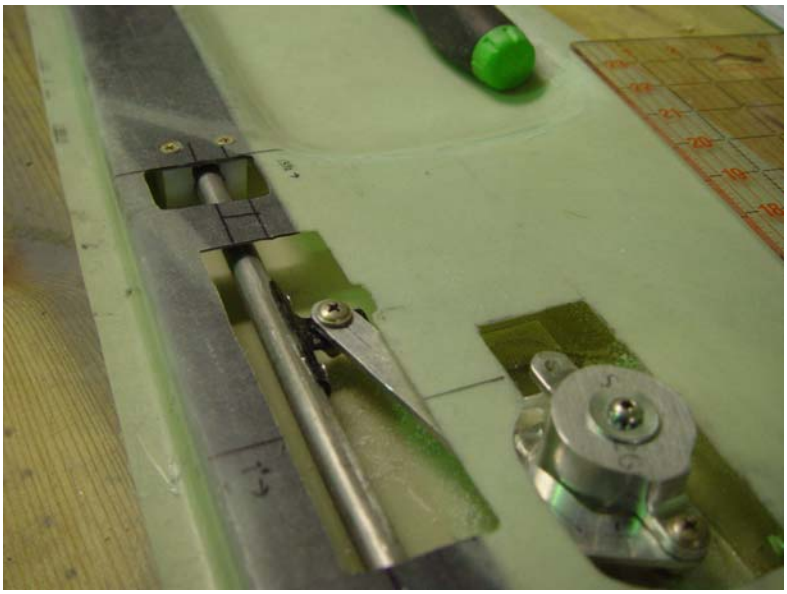


Place one plastic block onto pushrod, foreword in the lower access hole.
Drill 2 #29 holes into guide block through inner door skin.
Countersink and add (2) 509-8r8 screws. Verify smooth operation of Vans door latch system.
The guide block should not bind on the pushrod. Its purpose is to keep the pushrod straight.
The picture on left is for illustration only as your cutout will be slightly different.





Install linkage arm to aft ear of Billet Handle and attach pushrod saddle to other end of linkage.
Use fiber washers between moving parts.
With Vans a door latch fully closed and the Billet Handle closed with rotator parallel with the pushrod.
Temporarily place saddle on pushrod. Secure saddle with some 5 min epoxy or such and a couple nylon cable ties to test operation. Move saddle if necessary to insure full operation and mark position when satisfied.
Drill (2) #30 holes and secure saddle to pushrod with two lp4-3 pop rivets.



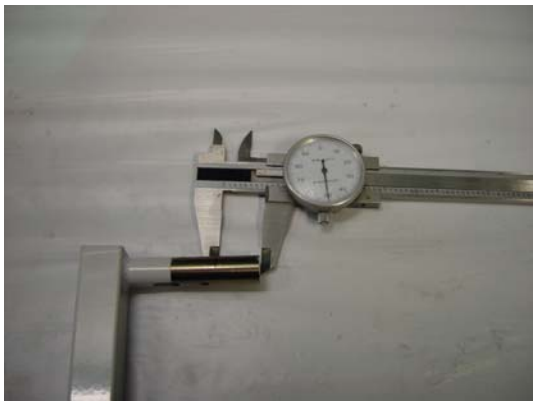
Remember that Vans inside latch will lock in the closed position. Do not force it to open from the Billet Handle. Use a wire tie to keep it from locking while testing. Do not defeat the safety of Vans locking handle.

HINT:
If the Billet Handle is rotated 60 deg the pushrods in the door will engage without locking in the inside latch. Rotating the Billet Handle 90 deg will close and lock the door on the inside.

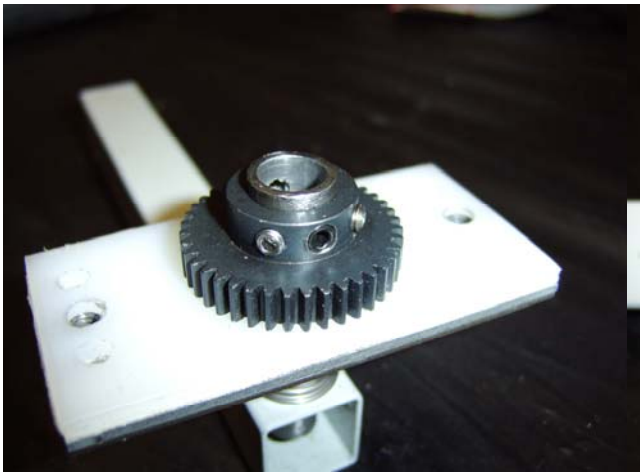
The screw shown holding the linkage arm to the rotator cup has to be installed from the bottom with the nut on top for clearance on the latest (thinnest) handles.

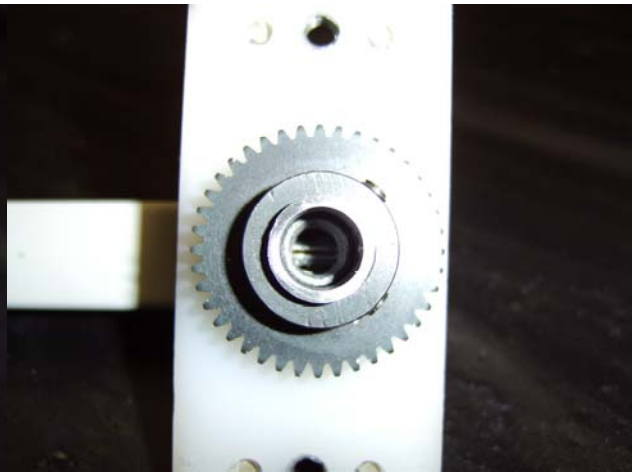
Vans Handle Modification

Mark and remove 3/4” from wd1022 round section.
Cut C-1007 steel tube at the start of the oval holes, removing both oval holes leaving a flush edge. It should be about 2” long after cut.
Drill the center of C-1007 using an “F” drill or equivalent to allow tapping to 5/16”-18. Tap down as far a you can to the roll pin.
Reassemble the handle with gear, roll pin and spring. Test fit the push button to ensure smooth operation.

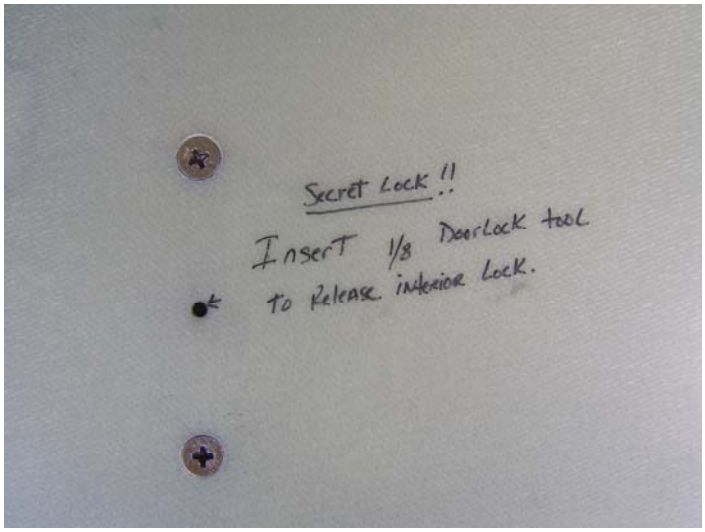


Drill #21 into roll pin holes in door handle gear. Tap for 10-32. Place gear onto handle assembly and align roll pin holes. Run tap into gear and handle assembly together. Insert 2 10/32 setscrews into gear until flush with the outside of the gear. The upper roll pin is replaced with this pair of setscrews and provides anti rotation protection. Also tighten two other setscrews for added security. When satisfied with fit, grind the tube of handle flush with gear top surface.

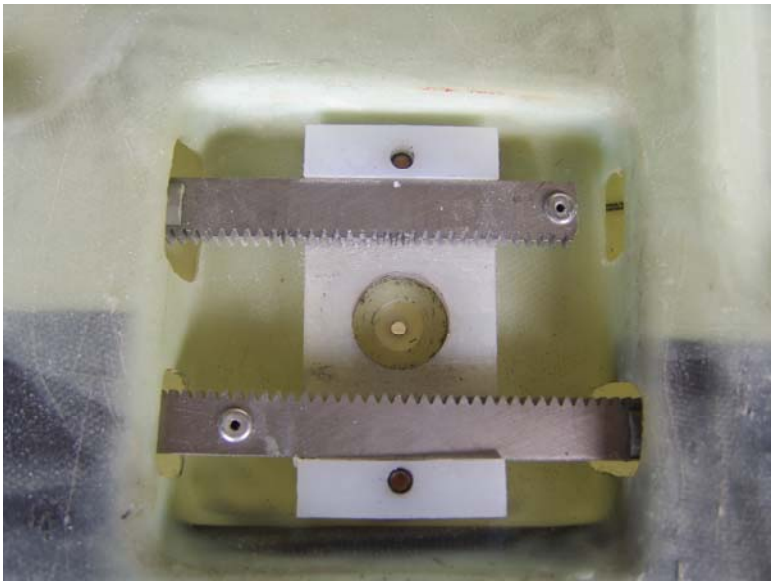




Install Vans latch into door and adjust pushbutton to approx 3/16” above the surface of the door skin.
Glue stainless washer with epoxy to exterior door skin to trim off release button.
If the hidden release is desired and the door skin has not been drilled for Vans Latch already then dill an 1/8” hole for a release pin. Also there has to be a piece of 5/16” allthread screwed into the C-1007 for the pin to contact.



Below shows the 1/2” relief that is drilled out for the original Vans install, the 1/8” hole in center indicates this install will have a discreet release.



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.

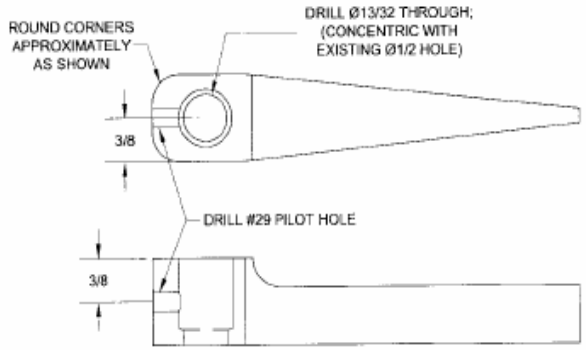


FIGURE 1: PREPARE CANOPY HANDLE

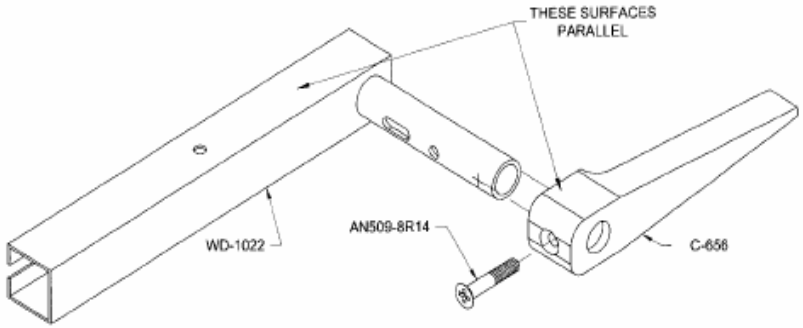


FIGURE 2:
MATCH-DRILL CANOPY HANDLE TO DOOR HANDLE ASSEMBLY

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.

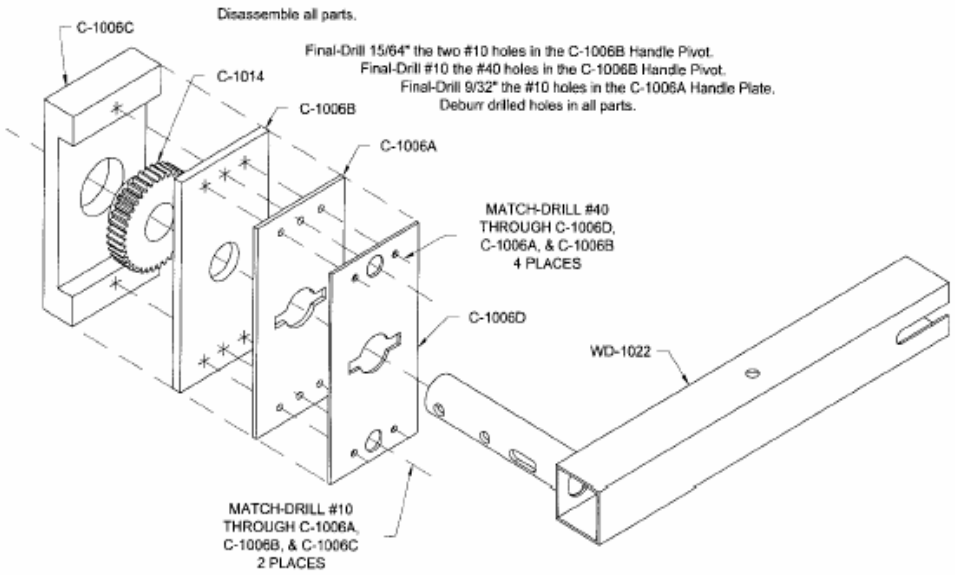


FIGURE 1: MATCH-DRILL HANDLE PLATES

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.

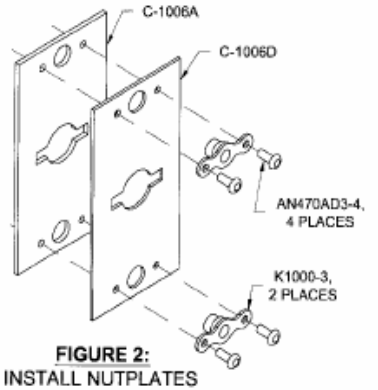


FIGURE 2: INSTALL NUTPLATES

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.

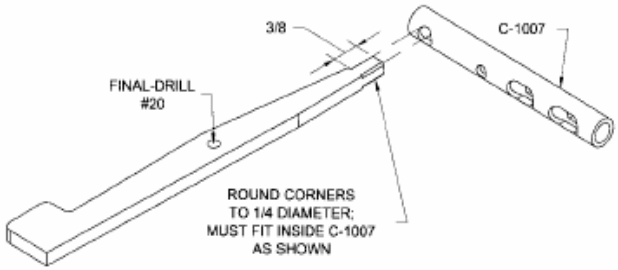


FIGURE 3: PREPARE HANDLE LEVER

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.

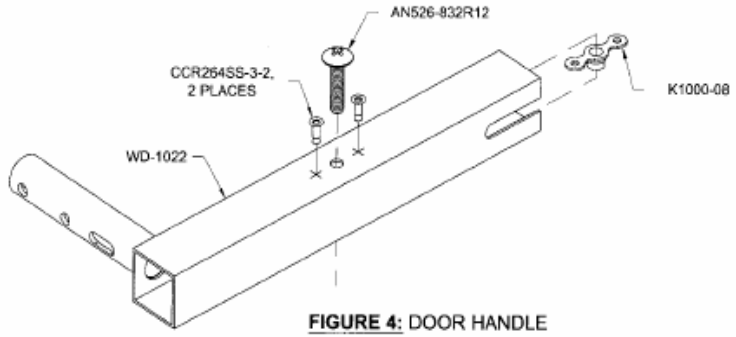


FIGURE 4: DOOR HANDLE NUTPLATE INSTALLATION

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.

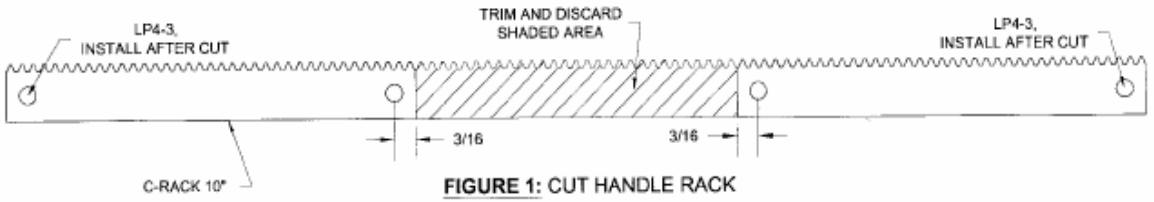


FIGURE 1: CUT HANDLE RACK

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 ½ inch diameter hole through the door using the handle spur gear as a drill guide.

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.

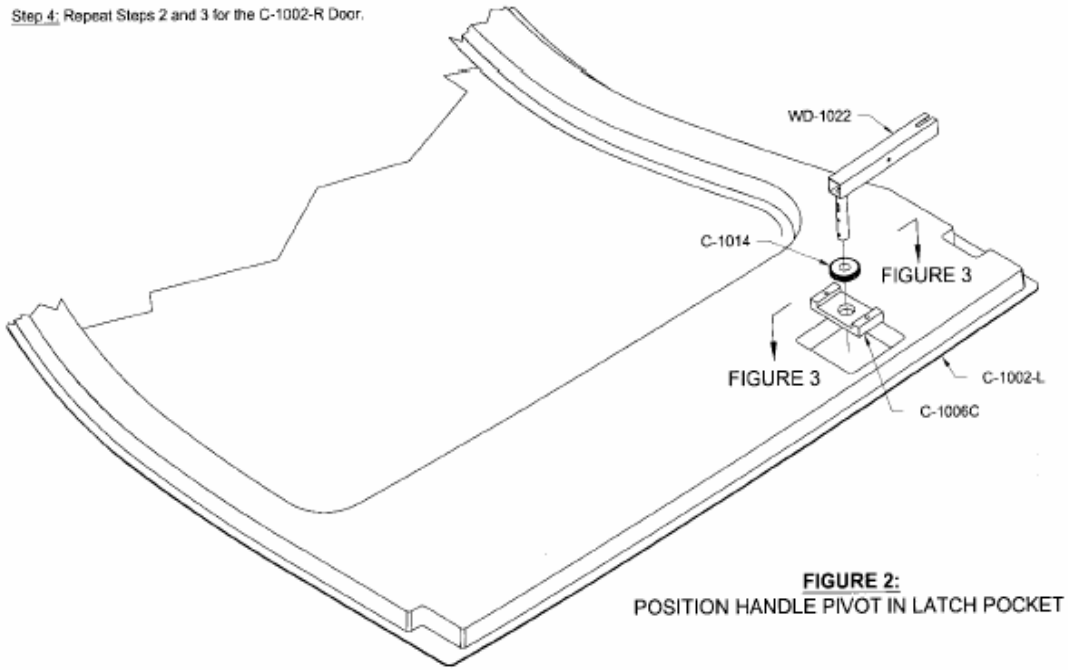


FIGURE 2:
POSITION HANDLE PIVOT IN LATCH POCKET

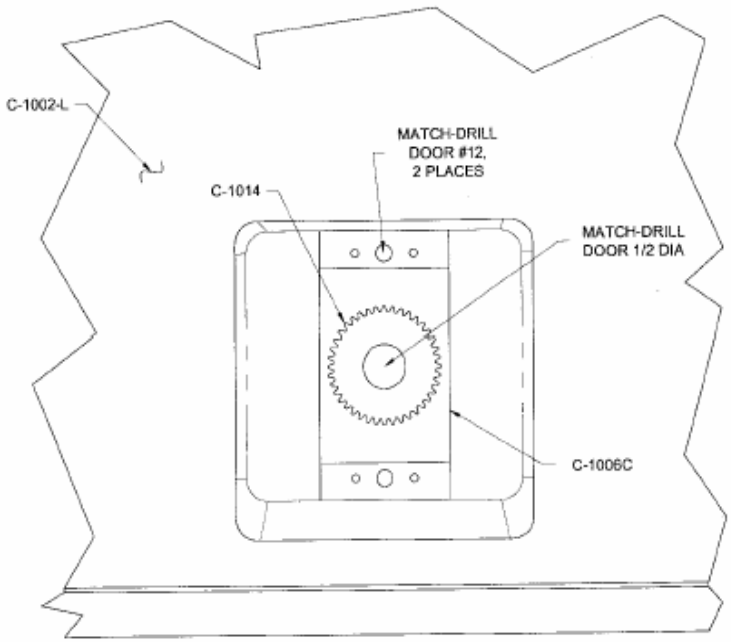


FIGURE 3:
MATCH-DRILL HANDLE PIVOT TO DOOR

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.

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.

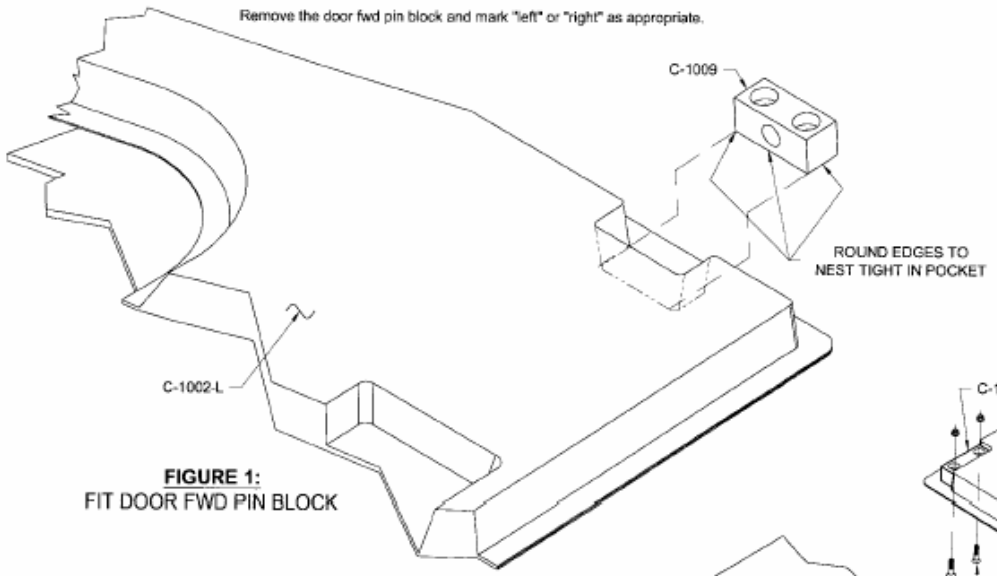


FIGURE 1:
FIT DOOR FWD PIN BLOCK

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.

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.

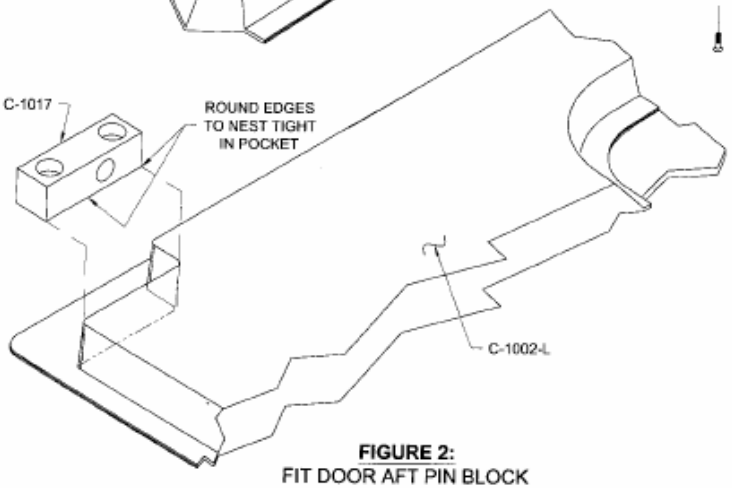


FIGURE 2:
FIT DOOR AFT PIN BLOCK

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.

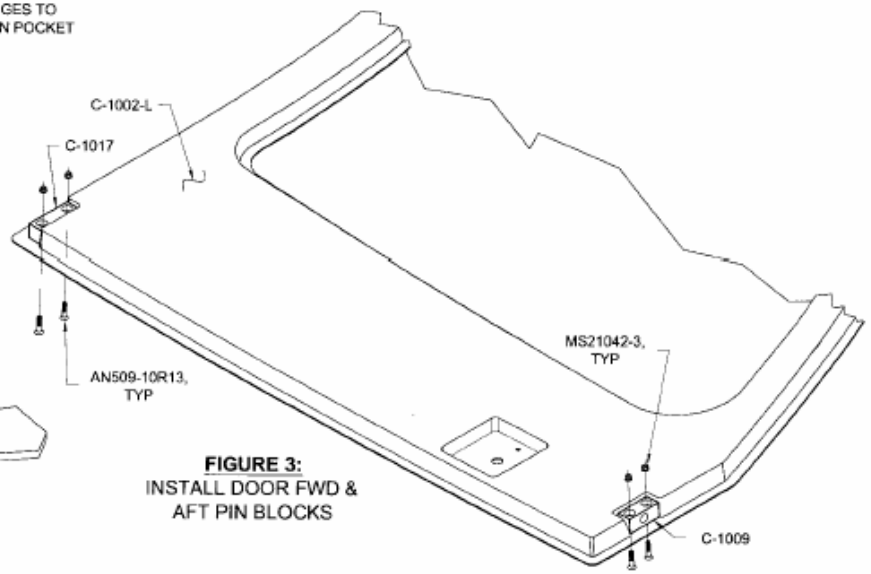


FIGURE 3:
INSTALL DOOR FWD & AFT PIN BLOCKS

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.

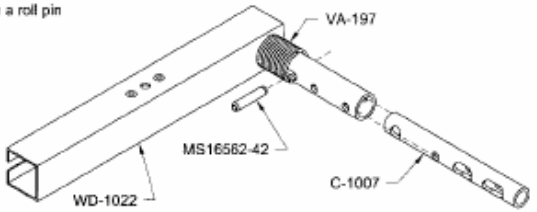


FIGURE 1: BEGIN LATCH MECHANISM ASSEMBLY

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.

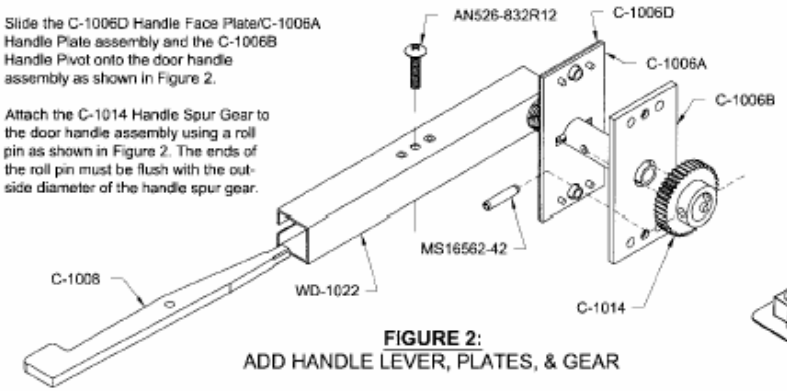


FIGURE 2:
ADD HANDLE LEVER, PLATES, & GEAR

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.

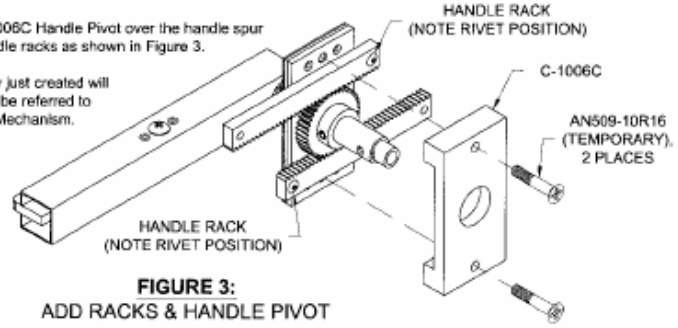


FIGURE 3:
ADD RACKS & HANDLE PIVOT

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 Handle Racks 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 handle racks. Retract the handle racks 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 handle racks. Enlarge the holes in the walls of the latch pocket if/as required to allow the ends of the handle racks to pass through with clearance of 1/16 to 1/8.

Re-attach the latch mechanism to the door.

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

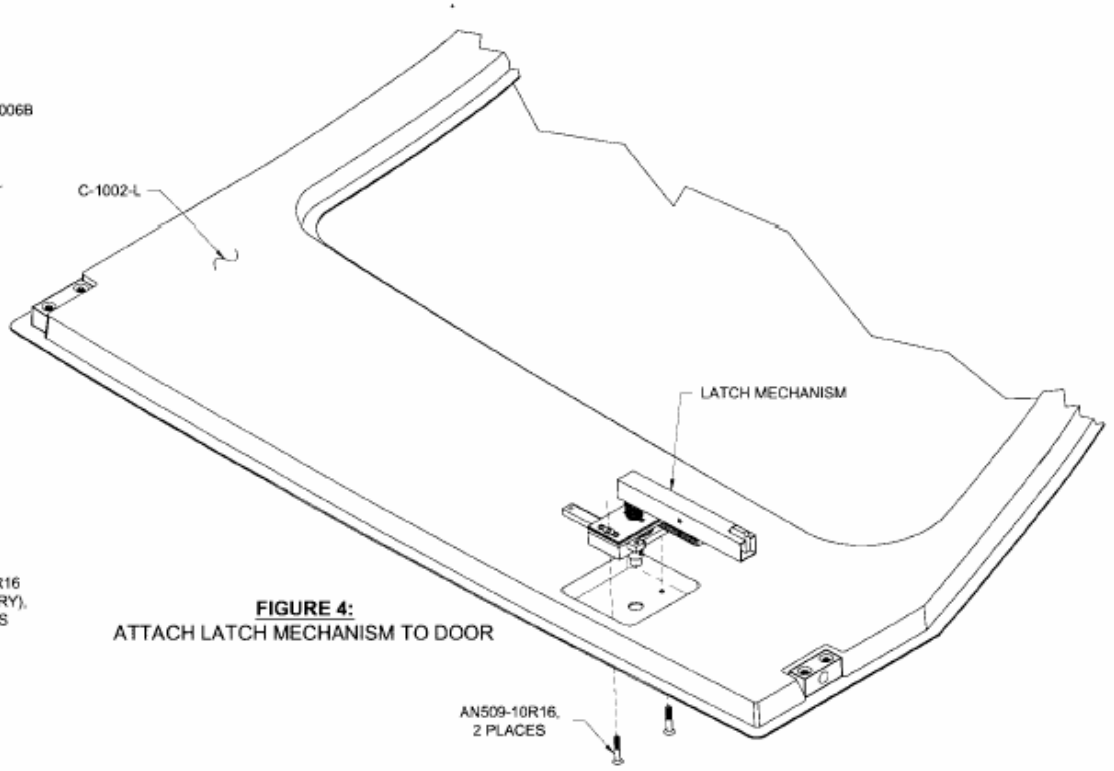


FIGURE 4:
ATTACH LATCH MECHANISM TO DOOR

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.

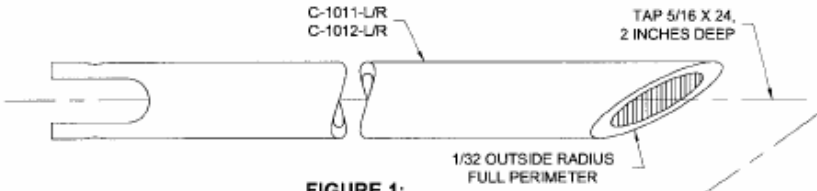


FIGURE 1:
TAP LATCH PINS

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.

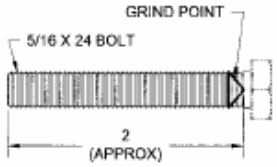


FIGURE 2:
FABRICATE POINTERS

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.

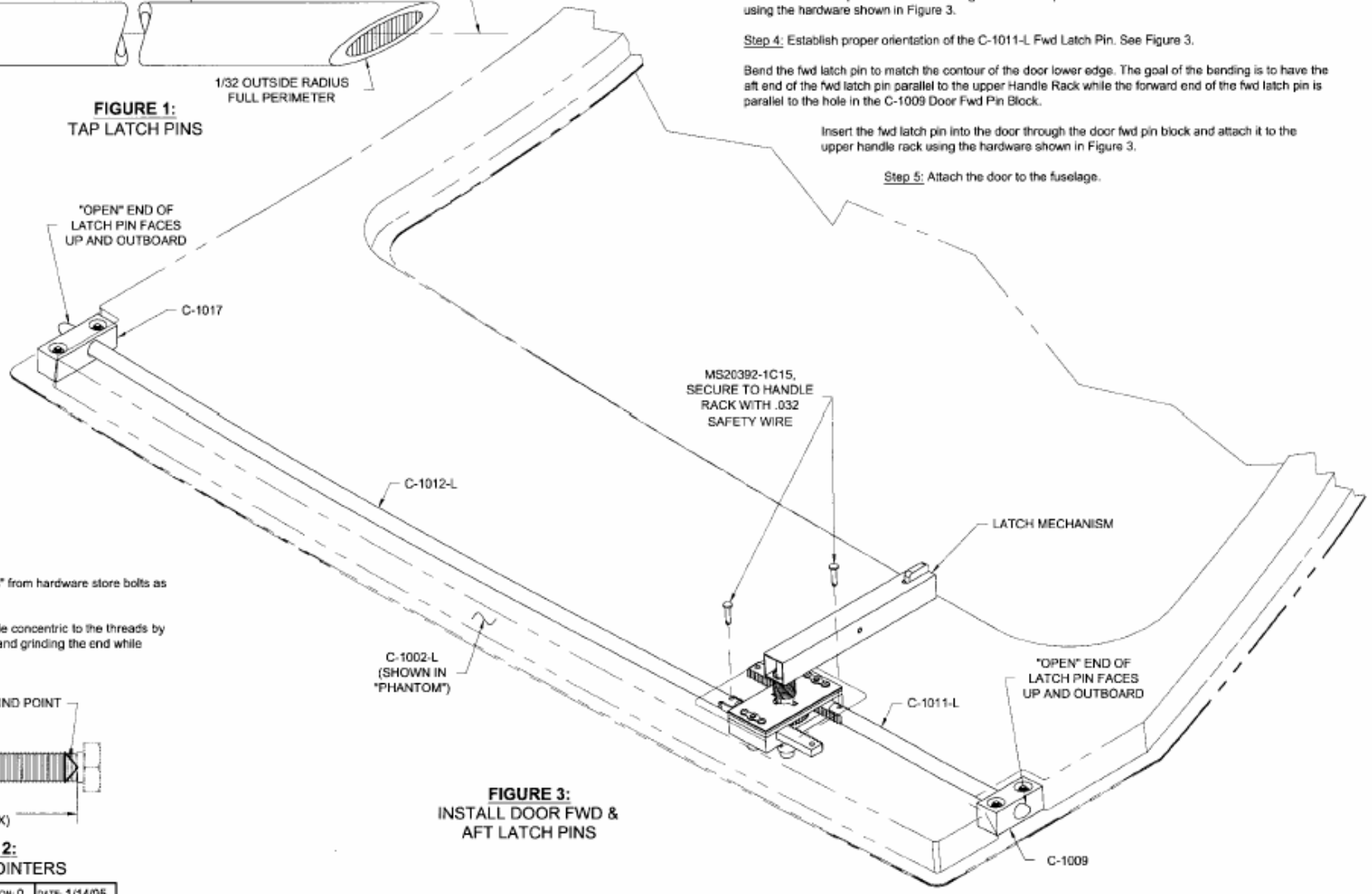


FIGURE 3:
INSTALL DOOR FWD &
AFT LATCH PINS