

RV-10 Low Profile Handle

Installation Guide



Thank You!

On behalf of Aerosport Products and myself thank you for purchasing the RV-10 Low Profile Handle.

Designed by: Justin Twilbeck

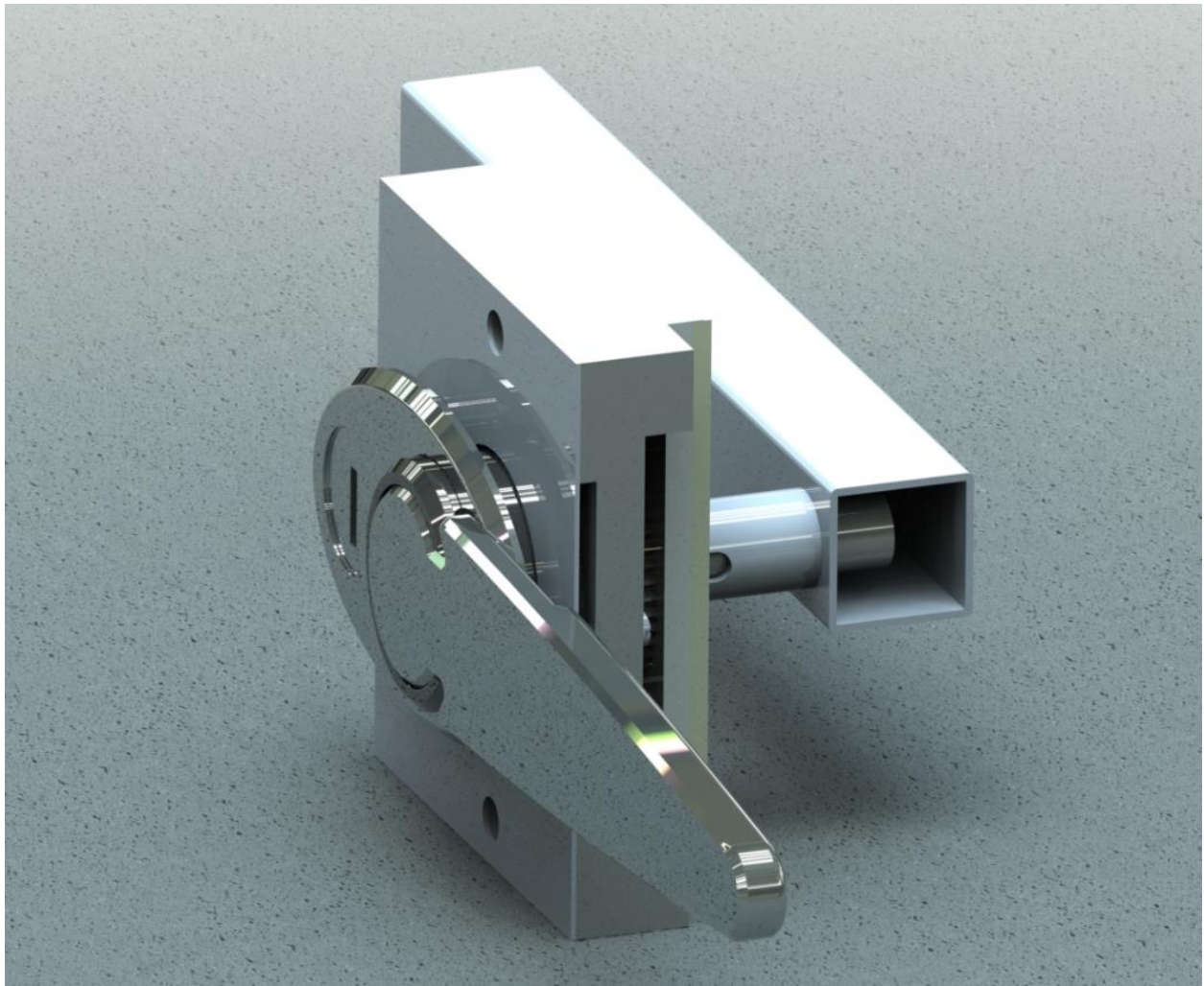
RV Builder and Engineer

Introduction

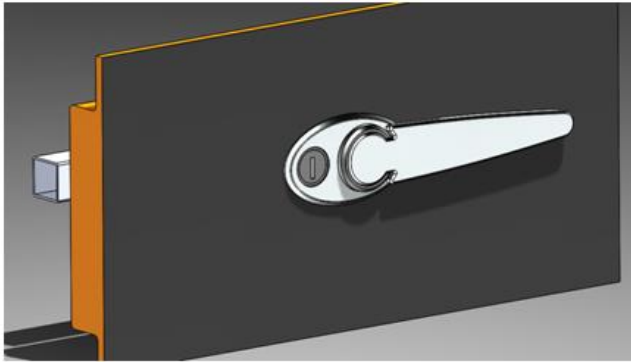
The Low Profile Handle is made from aluminum alloy and a high strength and corrosion resistant stainless steel inner ring. The handle replaces the standard RV-10 Van's aircraft exterior handle that is supplied in the finishing kit. The handle has an aerodynamic design while maintaining the safety lock feature of the original design. The design also includes a location to install a lock flush with the handle giving the door a finished and well crafted look. Existing, installs can be retrofitted with the new handle.

The handle operates in a similar manner as the original Van's handle; with the exception of the safety latch release button which is replaced with a lever action integrated into the handle design. The center of the circle is pushed lightly with the thumb releasing the safety latch mechanism and causing the back end to pull away from the door allowing access to grip the handle. The handle is then twisted to open the doors. NOTE: The degrees of rotation are not limited allowing use of the 180° Planearound Third Latch if desired.

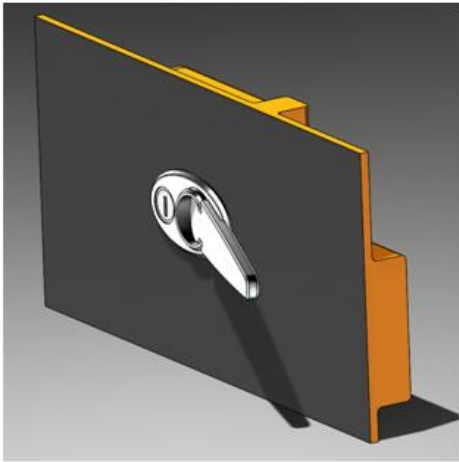
The handle is approximately 1/3rd the height of the stock Van's handle reducing drag and improving the aesthetic appearance of the aircraft. The professional fit and sleek design are right at home on the modern and aerodynamic RV-10.



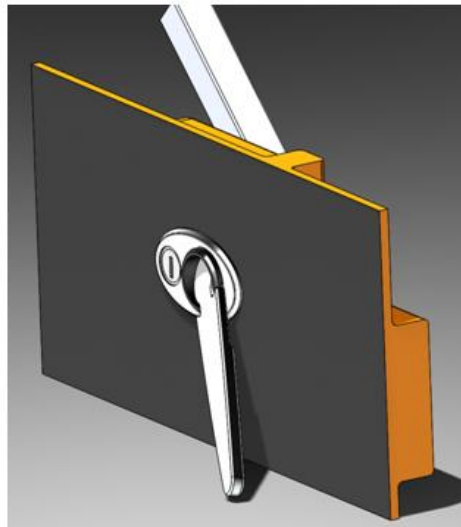
Handle Operation



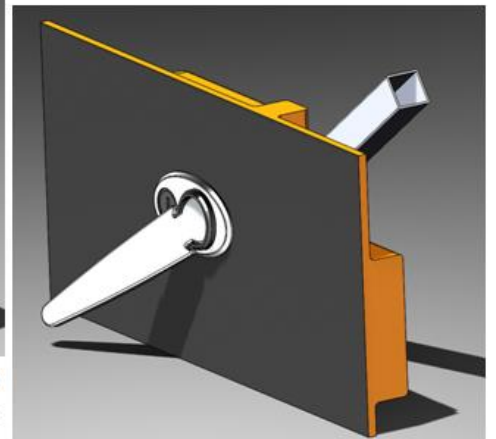
Stowed and
Locked



Push in Center Ring to
Disengage Safety Latch
and Handle Pulls Away
From Door

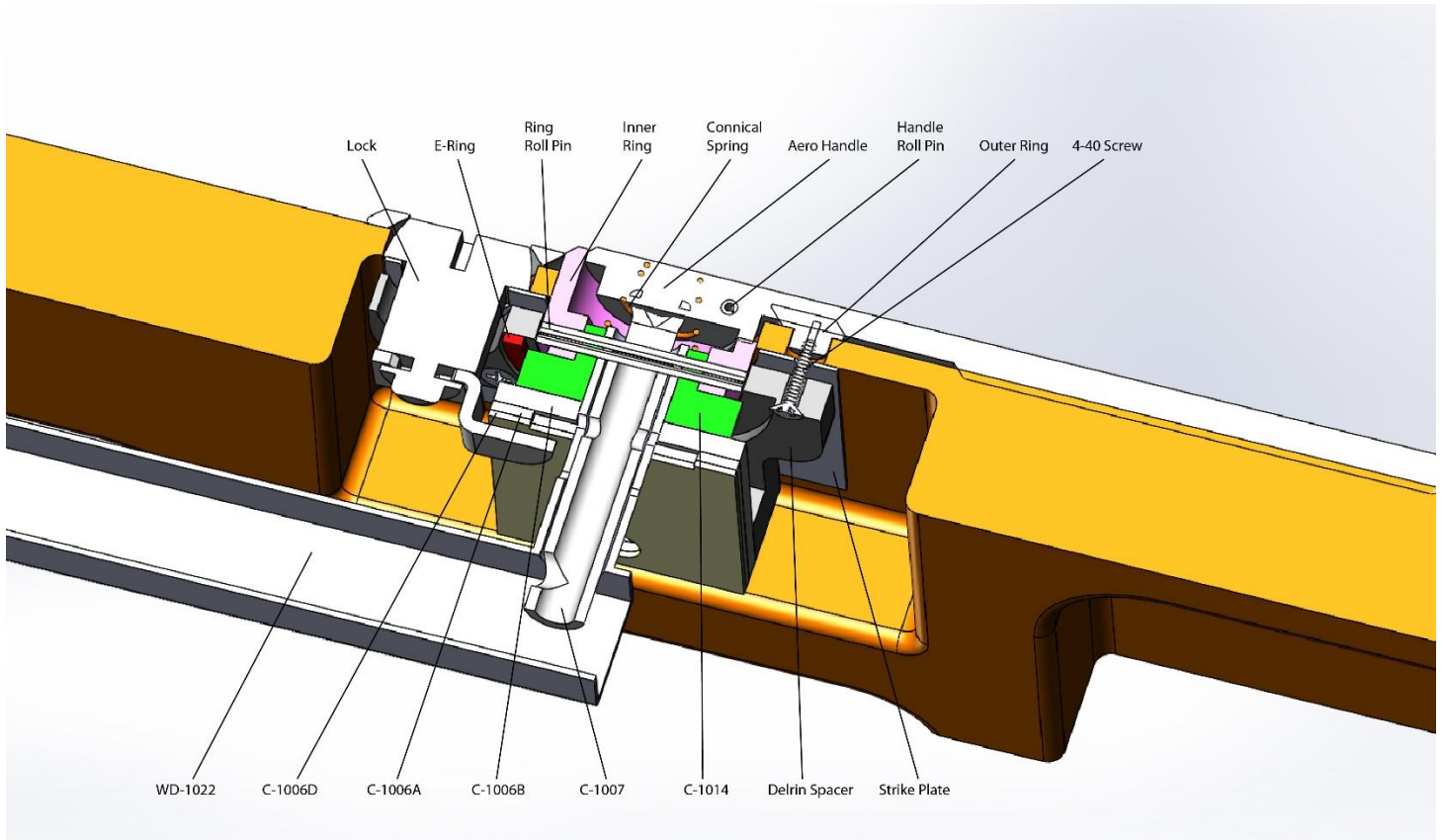


Rotate Handle To
Open Door



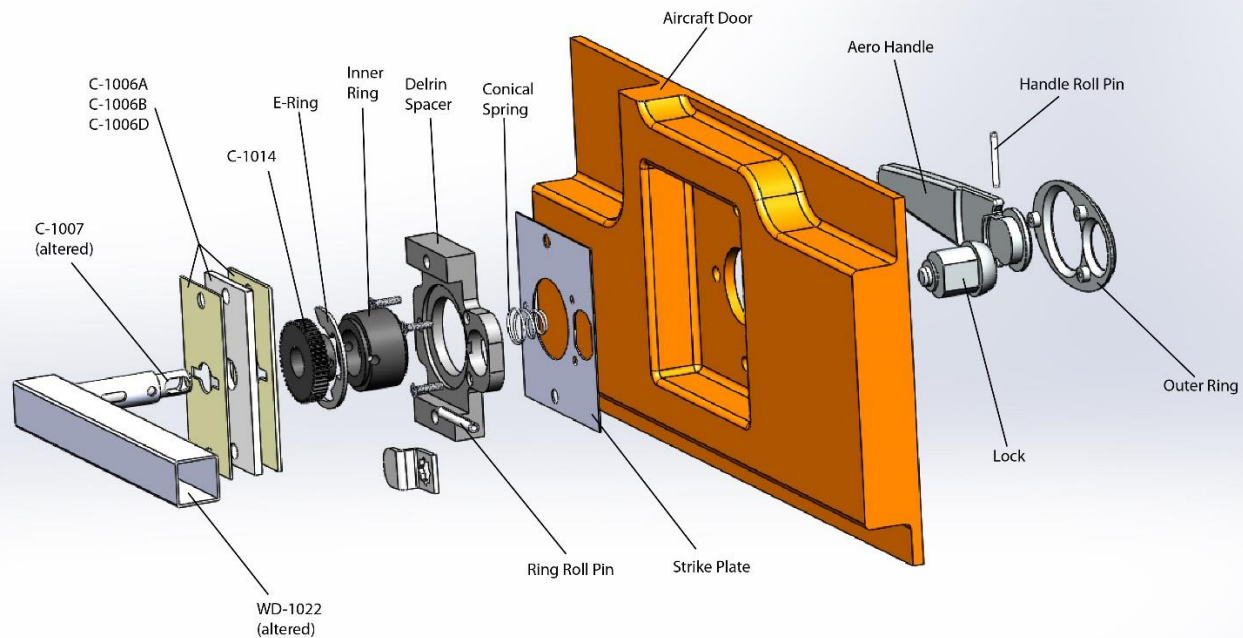
How it Works

Van's interior components are left in operation with the new handle. The racks and gear operate in the same manner as the OEM intended them to. The change is on the exterior of the aircraft. The pictures below show the internal components of the handle. The center safety release pin (C-1007) and its operation remains as designed. The release pin is now engaged by the Low Profile Handle. The handle rotates outward on the handle roll pin pushing the release pin inboard, when the pin (not shown) disengages from C-1006A and D plates the handle can then rotate. The inner ring allows rotation about the handles axis and is connected to C-1014 gear, thus pulling the racks (not shown) as designed. The new assembly is held in place by the Delrin spacer providing a rotation point and a pocket for the E-Ring to operate and restricting any inboard or outboard movement.



Cutaway View of Handle in Closed Position

Handle Installation



RV-10 Low Profile Handle Install Exploded View

Kit List

Item	Description	Qty Per Set
Handle	Aluminum	2
Inner Ring	Stainless Steel	2
Outer Ring	Aluminum	2
Spacer Block	Delrin	2
Strike Plate	Stainless Steel	2
4-40 Screw	MS24693-C6	6
Ring Roll Pin	SS 5/32 x 1.125	2
E-Ring	SS 1.626 Dia	2
Conical Spring	0.5in Tall Spring	2
Handle Roll Pin	SS 3/32 x 0.875	2
Interior Handle Roll Pin	SS 5/32 x 1.0	2

The locks shown in the diagrams below are not included in the kit. A set of ACS locks are recommended although many $\frac{3}{4}$ " locks with a head diameter of approximately $\frac{7}{8}$ " may still work.

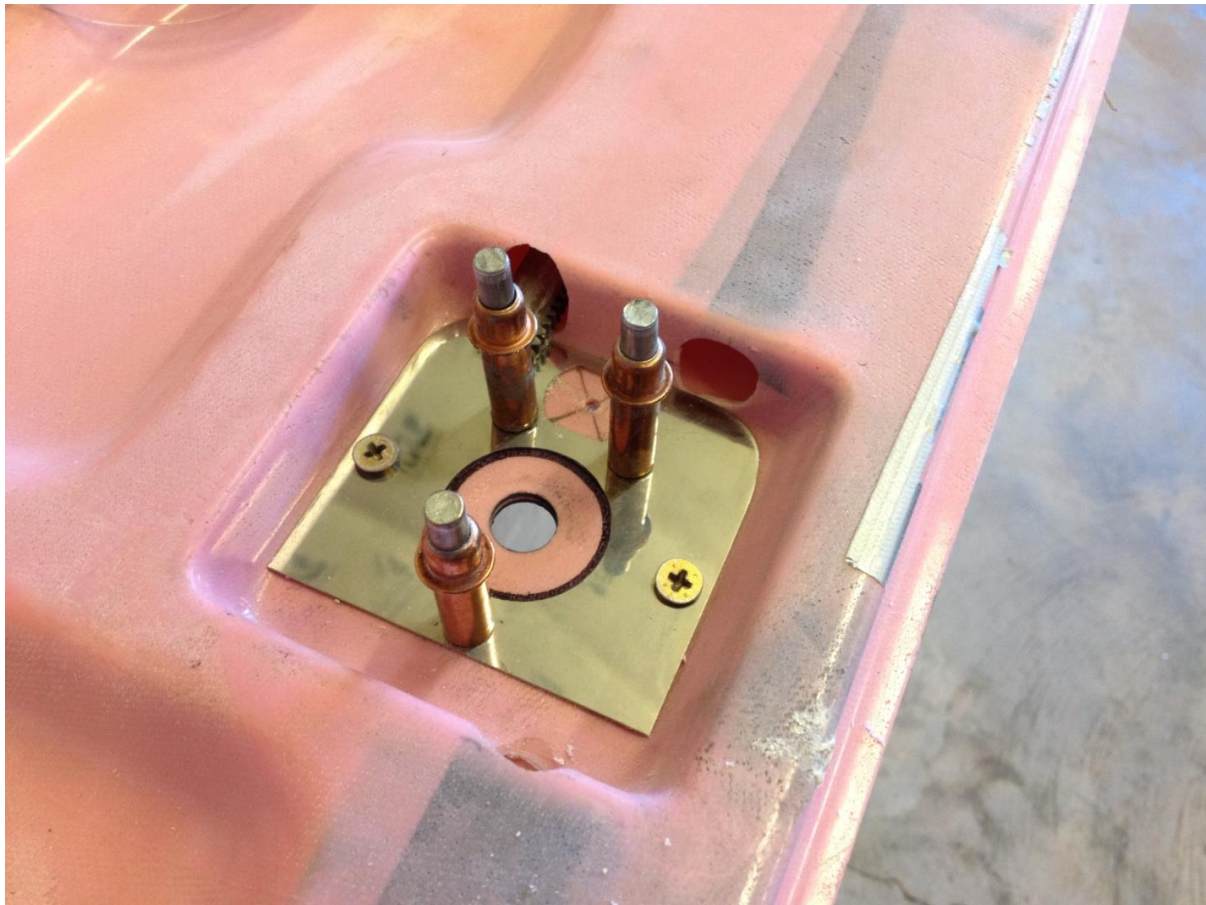
Note: It is highly recommended that you read this entire manual before starting. You may find many points along the process that a quick test fit of the components will aid in a simpler install or a change in order of the steps may be beneficial for your particular situation.

Door Prep

1. **New Install:** Using the Strike Plate from the kit as a template center the upper and lower screw holes in the door pocket. Round the forward corners of the plate as needed to clear the door pockets fillets and ensure the strike plate is sitting flush with the door skin. Be sure the lock cut out is facing forward. Drill the two holes out using a #12 bit.

Existing Install: Round the forward corners of the plate as needed to clear the door pockets fillets and ensure the strike plate is sitting flush with the door skin. Line up the existing screw holes with the template and proceed.

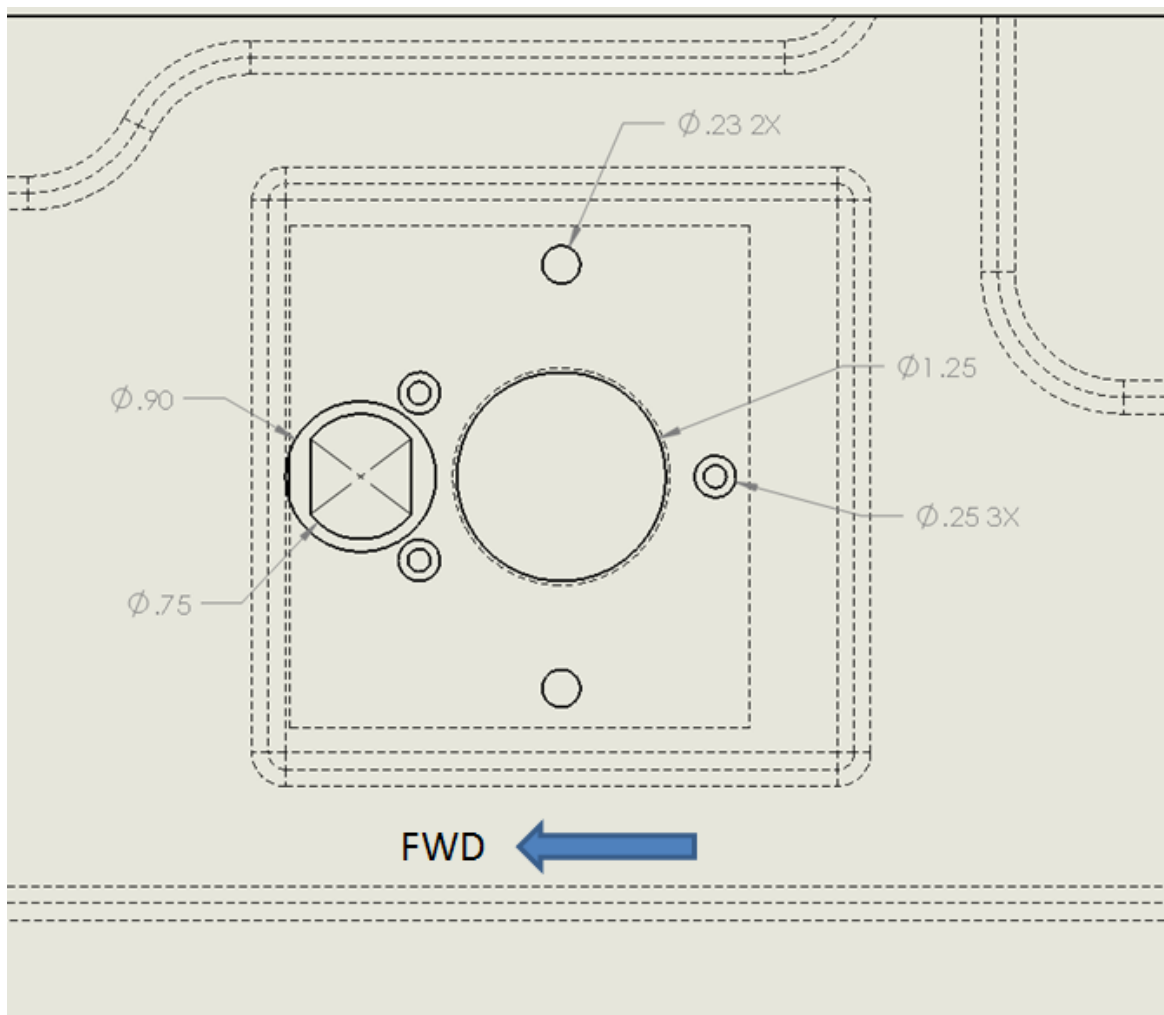
New and Existing Install: Slide some #10 screws through the holes to align the strike plate and secure it in place. Drill the #4 screw holes with a #30 drill bit and secure with clecos as you drill. Mark an X on the door skin using a fine point pencil and the flats of the lock cutout as a guide (see image). Drill a pilot hole in the center of the X using a #30 drill bit. Leave the hole as is you will return to this later. With the plate still held in position use it as a guide to cut out the large center hole. Trace the inside perimeter of the plate's hole onto the door skin using a sharpie marker to space the inner hole off the template. Cut a hole slightly smaller than the marking and then finish shaping with sandpaper up to the mark. Ensure the internal handle assembly, with the steel inner ring, fits through the hole for smooth operation. Increase the diameter as needed up to the diameter of the strike plate hole.



Door Interior Pocket Looking Outboard

2. **New and Existing Install:** Remove all of the parts including the strike plate. Using the pilot holes in the previous step, drill the three #30 holes up to a ¼" hole, stepping the drill bits up in size before the final drill. Next, using a step drill bit, drill the lock pilot hole up to ¾".

3. **New and Existing Install:** With the strike plate held back in place by two #10 screws. Slide the lock body in the $\frac{3}{4}$ " hole until the lock head rests on the outer skin of the door. The flats of the lock should line up and slide into the flats of the strike plate. If it does not just open the hole in the door skin until the lock head rests on the outer door skin and between the strike plate flats without force. Then, trace a circle around the lock head onto the outer door skin using the lock head as a template. This tracing should be around 0.90" in diameter. Remove the lock and strike plate and cut a hole through the door skin up to the marking. See the images below and on the following page for clarity. Use caution, the material between the 0.25" holes and the new 0.90" hole will be very thin. Try your best to not damage it. (If the layer of material does become broken just clip the thin material to a clean edge).
4. **New and Existing Install:** Reinstall the strike plate. The outer skin should look like the image below. Ensure the lock head slides into the hole and between the flats without great force. The lock will now sit recessed inside the door skin and rest on the strike plate.



Door Exterior Looking Inboard

5. **New and Existing Install:** This is a good time to test fit the outer ring. The bosses on the bottom of the outer ring should slide into the 0.25" holes and the lock should align with the center of the forward hole. Adjust as necessary.

6. **New and Existing Install:** This is also a good time to ensure the door skins are properly bonded. Check for any gaps or unfilled voids in the door (note the separation of the door skins inside the large hole) and fill with epoxy resin. Flexing in the door when tightening the screws may cause the door thickness to adjust during final fitment of the handle. Also, opening the clearance holes of the racks will make installation easier. It is suggested to maximize the size of the holes for best clearance.

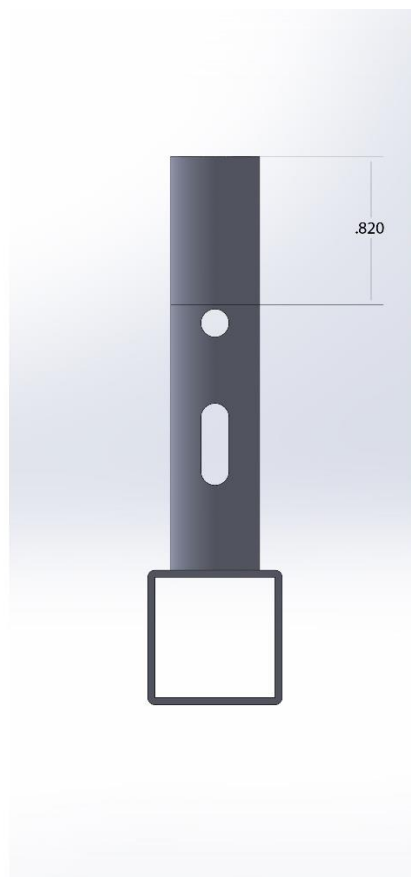


Door Skin Voids and Final Cut Pattern

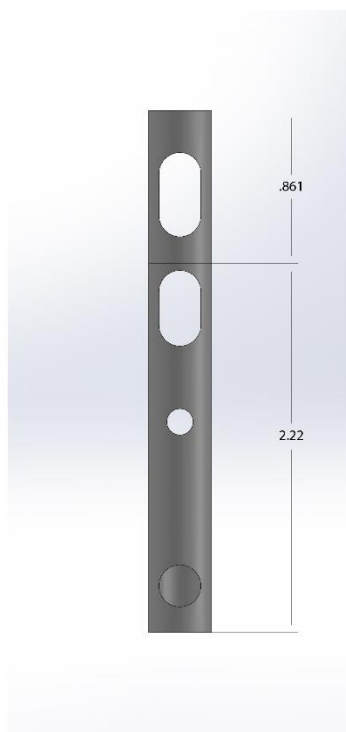
Interior Handle Alteration and Assembly

7. **New and Existing Install:** Modify existing interior handle parts by cutting away the tops of the C-1007 Pin and WD-1022 Handle as shown. Deburr and polish the ends of the parts after cutting.

Creating a slight dome shape while polishing on the top of the C-1007 Pin is recommended for smoother operation.

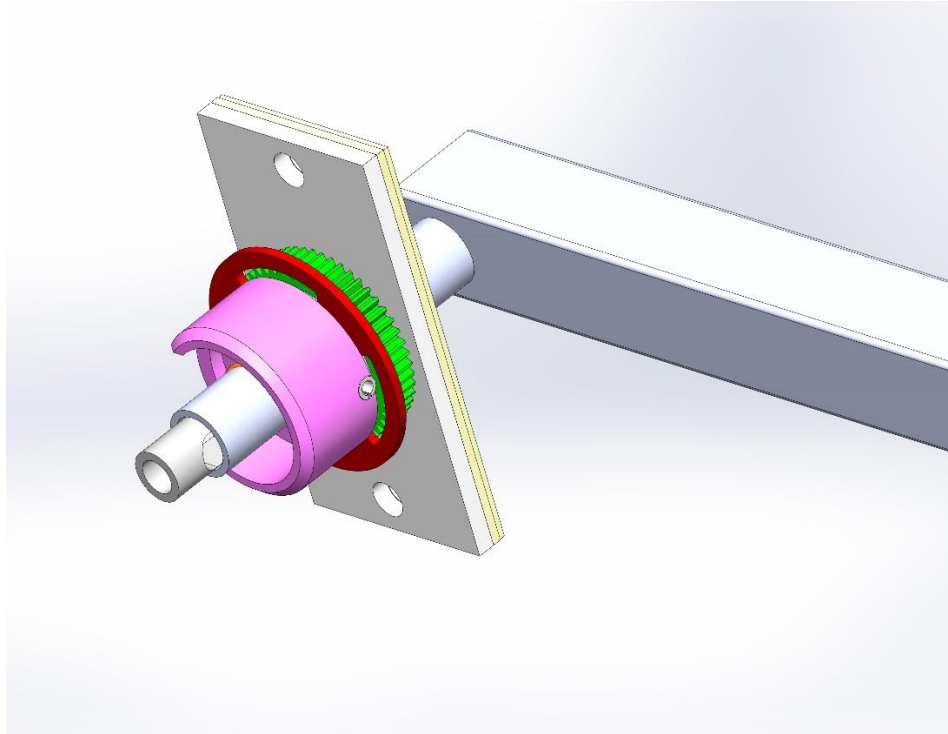


Remove $26/32''$ (0.820'') from top of WD-1022 Handle as shown.

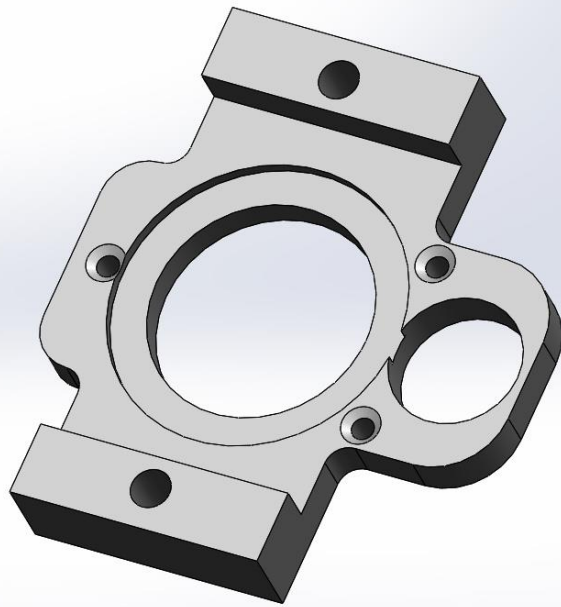


Remove $57/64''$ (0.861'') from top of C-1007 Pin as shown.

8. **New Install:** Assemble handles and C-1006 A, B, C, and D plates as shown in Van's instructions page 45-10 Rev 0.
9. **New and Existing Install:** Assemble the handle lever and latch mechanism as shown in Van's instructions page 45.13 Rev 1. With the exception of adding the inner ring and the large roll pin. The large roll pin replaces the original pin that holds the C-1014 gear in place. The new pin is installed in the same hole of the gear but also holds the inner ring to the gear. Ensure the outer edges of the pin do not protrude and polish as necessary. Polish the inside of the ring as needed to create a snug fit over the gear.

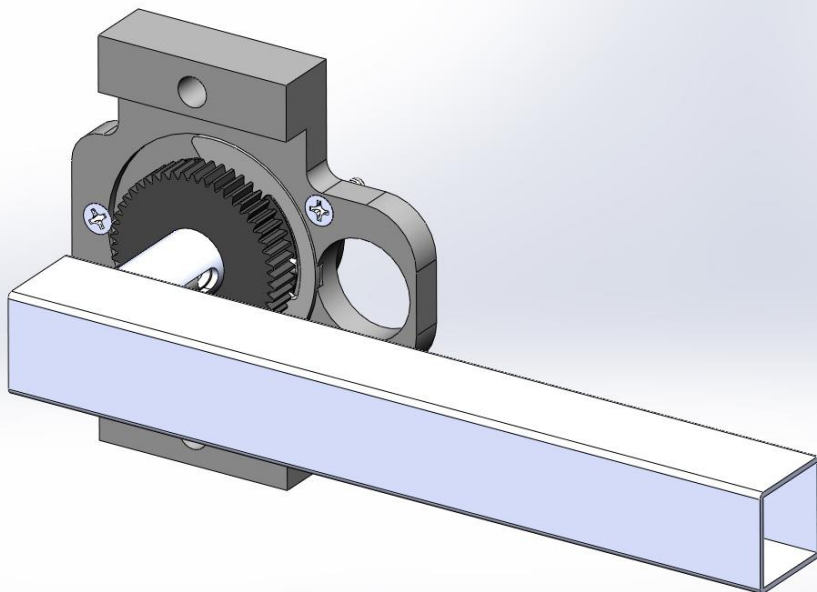


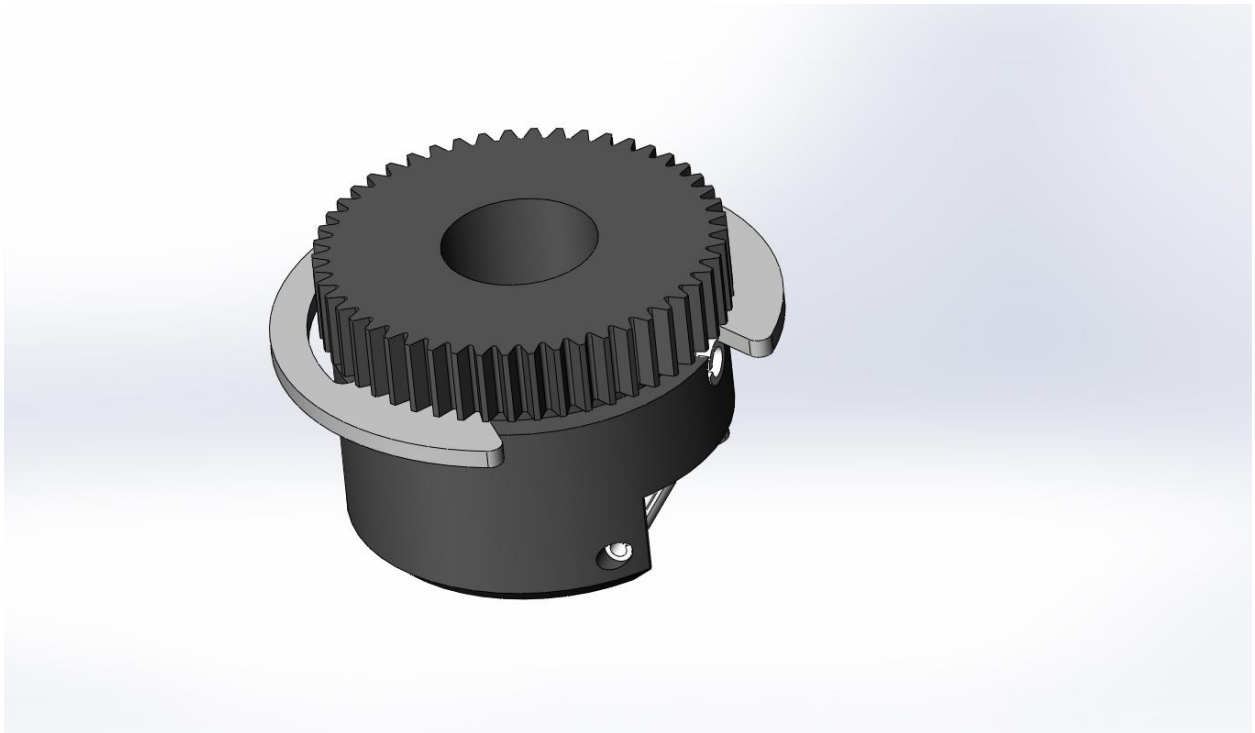
10. **New and Existing Install:** Countersink the three #4 holes by using a #30 countersink on the inboard face of the Delrin block as shown in the image below.



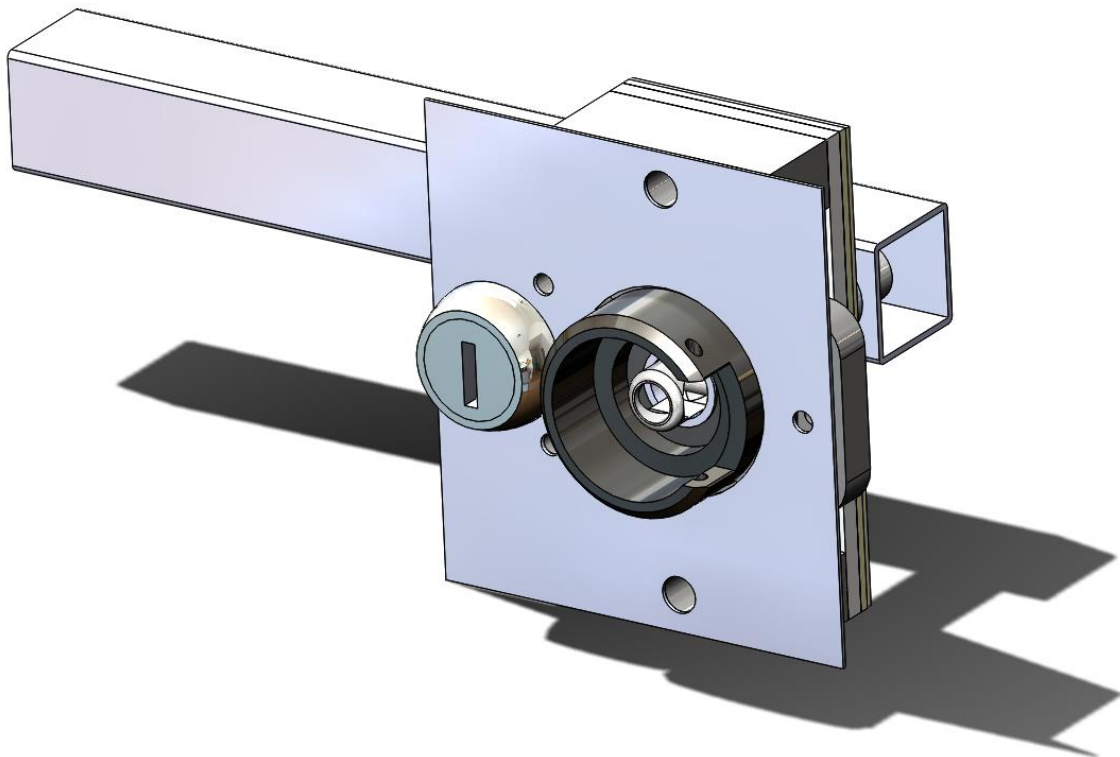
NOTE: The image shown above is an updated design to the Delrin block. This update occurred after the writing of these instructions therefore some images do not have the updated design incorporated, although the blocks install in the same manner.

- 11. New and Existing Install:** Slide the handle assembly into the delrin spacer and push the e-ring into the groove.



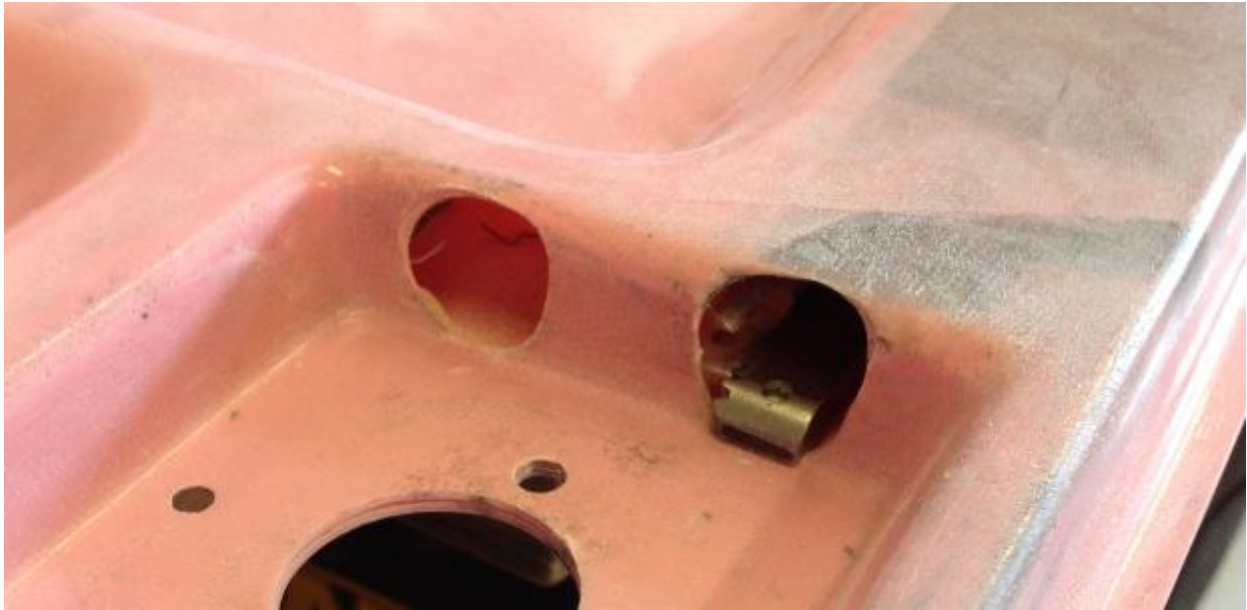


12. New and Existing Install: Align the strike plate in position. Place the lock into position and secure with nut supplied with the lock.



Exterior Handle with Racks

- 13. New and Existing Install:** Ensure the rack ends are free from the pop rivets or large burrs that would stop them from being inserted into the slot of the Delrin spacer and catch the gear. Once the final “timing” of the pin extension is perfected a pop rivet or other “stop” method can be installed if required/desired. Ensure the forward pin is installed in the door and that it’s rack clears the door pocket.
- 14. New and Existing Install:** Slide the aft rack into its clearance hole (Note: the rack is removed from its pushrod). This will allow clearance to drop the handle into place and ease in its installation.



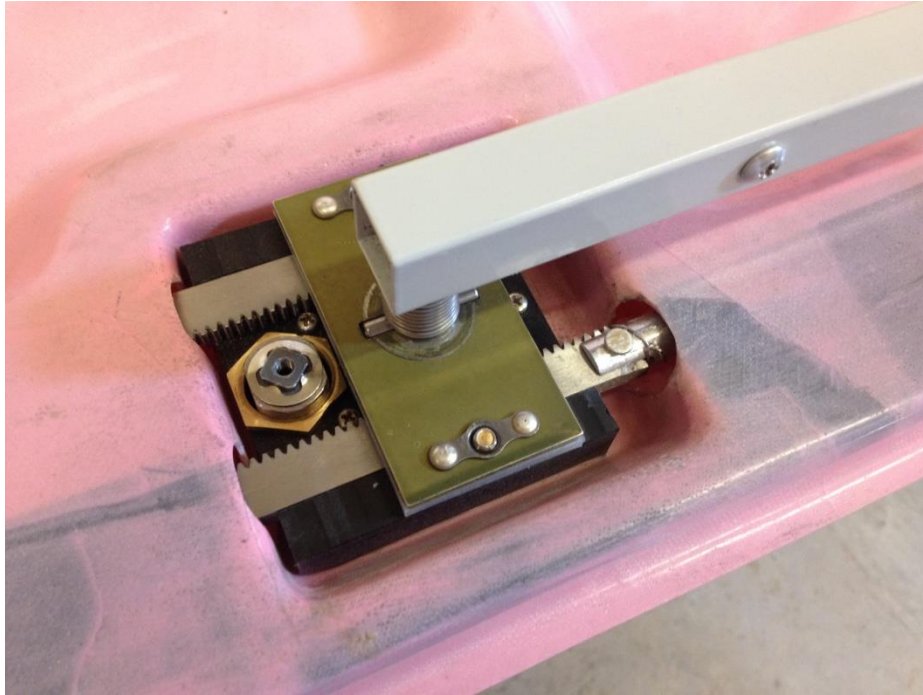
- 15. New and Existing Install:** Place the handle in the pocket. Screw the handle into place using the #10 screws as shown in Van's instructions. Before fully tightening the handle installation screws install the outer ring with all three 4-40 screws to ensure proper alignment of the handle and then lightly tighten the screws until the installation is complete. Lift the forward rack out of the clearance hole and leave it resting on the Delrin block as shown. Pull the aft rack out of it's clearance hole, and with the handle placed in the angle shown below, push the rack into the handle while turning the handle clockwise engaging the lower rack.



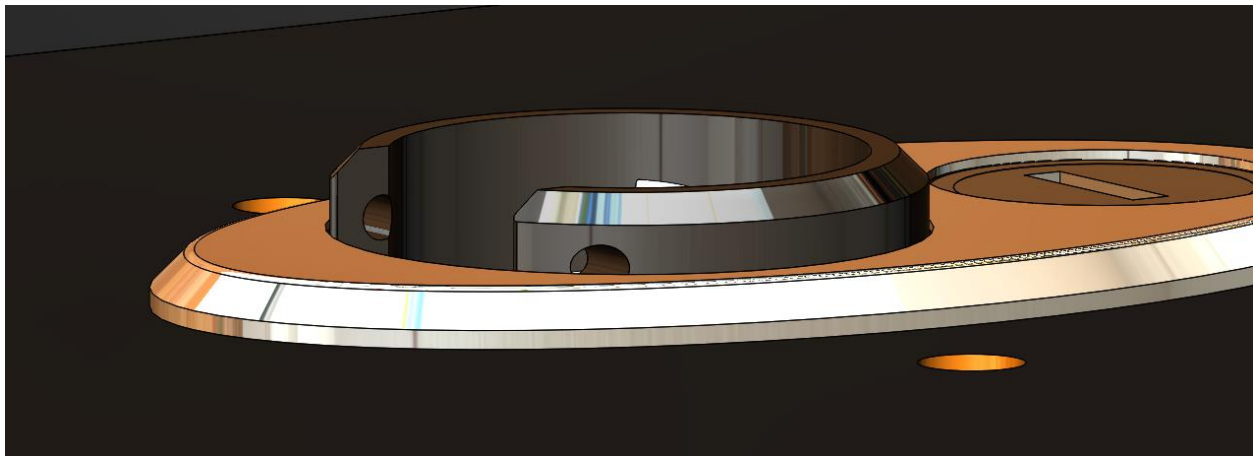
- 16. New and Existing Install:** Rotate the handle to the position shown and engage the forward rack. Continue rotating pulling the rack through.



- 17. New and Existing Install:** Fully rotate the handle and insert the pin through the lower rack into the pushrod. Secure with safety wire as desired. Test the timing of the handle and when it extends and retracts the pins. Slight adjustments may be necessary and can be accomplished by changing the angle of the handle when the racks are engaged.



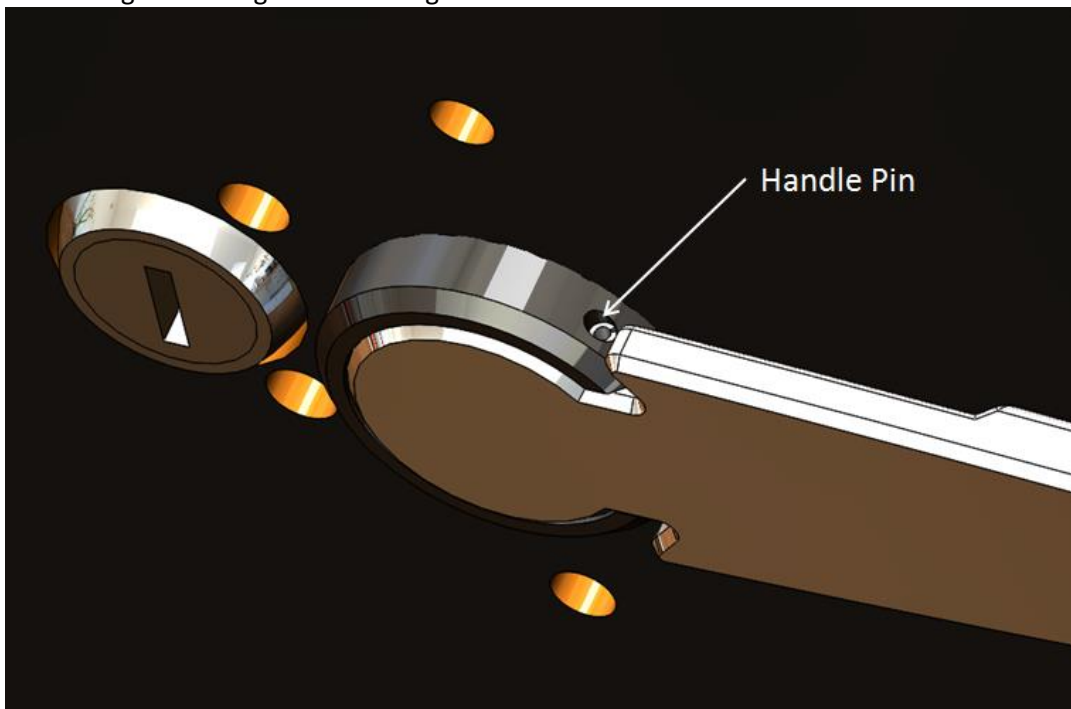
- 18. New and Existing Install:** Flip the door over and check to see if the handle attach pin hole in the inner ring clears the outer ring. Tighten the outer ring screws to compress the door skin for maximum clearance. For thick doors, as shown in the image below, the hole will not sit above the outer ring and therefore does not clear it. You must remove the outer ring at this point. For thin doors the hole will clear (sit above the outer ring) and you can proceed without removing the ring.



- 19. New and Existing Install:** Place the conical spring into position on the outside of the door. **NOTE:** For thick doors the ring will be removed at this point.



- 20. New and Existing Install:** Place the handle into position and carefully tap the pin into place. **Note:** Extra pins are included in the kit for fitting purposes. It is recommended to polish the “fitting” pins down until they slide into the holes with a gentle tap. You can polish them down by chucking them into a drill and spinning the pin while running it along a deburr wheel. **Note:** For thin doors the outer ring would still be installed and you must carefully install the pin without scratching or marring the outer ring.



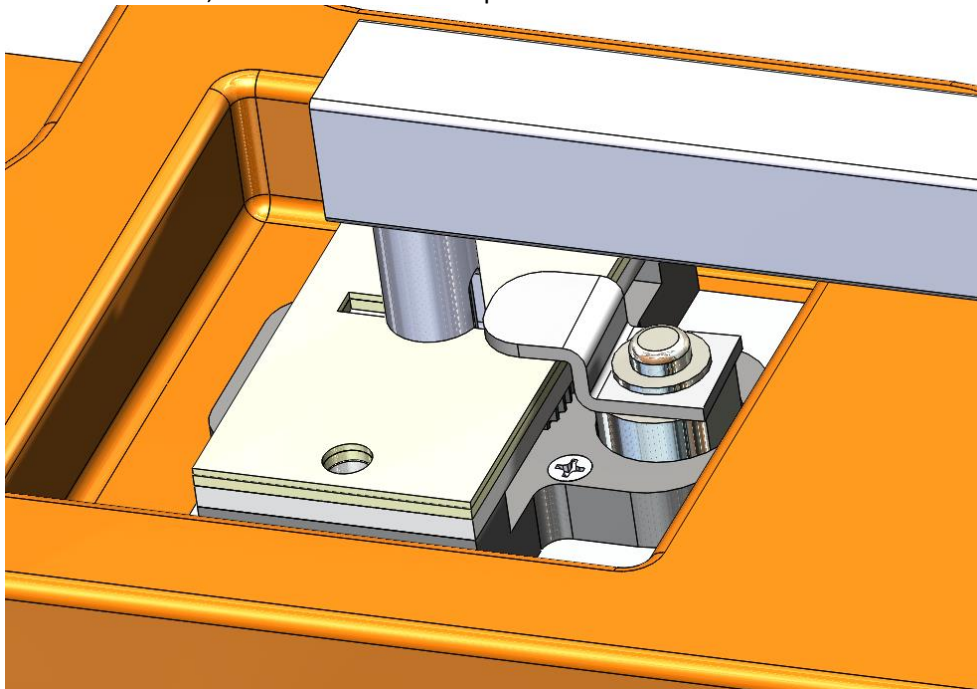
- 21. New and Existing Install:** Check that the handle rests parallel to the door. If it is sticking out away from the door the boss on the bottom of the handle may need to be lightly sanded to reduce its height and therefore the angle of the handle. Use caution as a very small amount of removed material will dramatically change the angle of the handle.



- 22. New and Existing Install:** Push the head of the handle to cause it to pull away from the door skin. Then carefully slide the outer ring into position. The chamfers on the back of the ring will allow extra clearance to aid in aligning the ring into position. Note: Sliding the ring into position along the thin edge and then turning into position at the end will aid in the installation as well. Reinstall the 4-40 screws into the outer ring. This step can be skipped for thin doors that the outer ring is already in place.



23. New and Existing Install: Once the handle is installed, and in its final position, install the cam on the lock and ensure proper operation of the lock. Adjust the angle of the cam tab as needed. The intent of the lock cam is to restrain the pin from disengaging from its slot. If the pin can't come out of the slot, the doors cannot be opened.



This completes the installation.
I hope you enjoy your handles and the security and beauty they bring to your airplane!

