INSTALLATION INSTRUCTIONS

700-0083 REV -

INSTALLATION OF 700-0080 SEAL KIT IN LANCAIR 4787 GEAR DOOR ACTUATORS

LOG OF REVISIONS

Revision	Pages	Description	Date
-	ALL	INITIAL RELEASE	03/25/2025

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LIMITS TO LIABILITY AND DISCLAIMER

This manual and 700-0080 seal kit are provided to assist owners and mechanics complete their own repairs to their actuator. This kit is made of industry standard seals taken directly from the original manufacture's (Lancair) kits which are no longer in production. O'Day Design LLC did not design the original actuator, nor size and specify the original seals used in it. As such, O'Day Design LLC makes no claim as to the airworthiness of the design or particular actuator being serviced. O'Day Design LLC assembles these kits as a convenience for owners who would otherwise need to procure these same seals in larger qualities.

By using these instructions, and/or the 700-0080 seal kit, the installer, owner, operator, and their representatives understand and assume all risks involved with completing the reseal and subsequently operating the aircraft with this actuator. To the extent permitted by law, they agree to indemnify, defend, and hold harmless O'Day Design LLC from any and all claims, actions, liabilities, suites, injuries, demands, obligations, losses, settlements, judgments, damages, fines, penalties, costs, and expenses, including attorney's fees and other expenses, (collectively a "Claim") arising out of, or relating to, the installation or use of these instructions or the 700-0080 seal kit.

O'Day Design LLC encourages feedback from owners and installers on the content of this kit and these instructions so that they may be improved for other future installations.

INTRODUCTION

This manual contains instructions for resealing the part number 4787 gear door actuators used on Lancair Legacy models. These are referred to as Reno-mod actuators by Lancair. The original Lancair seal kit was HC-4787.

PARTS AND TOOLS REQUIRED

PARTS:

- **700-0080 Seal Kit**
  - Obtained from www.odaydesign.com/product/700-0080

ITEM	DESCRIPTION	QTY USED
1	O-RING	1
2	U-CUP SEAL	1
3	T-SEAL	1
4	SEALING WASHER	1

- **Other New Hardware Needed (Not Included in Kit):**
  - Qty 1 – AN960-416 - Washer
  - Qty 1 – AN960-416L - Washer

TOOLS:

- **Wrenches**

- **Torque Wrench**
- **Small Snap Ring Pliers**
- **Plastic pics (optional)**
  - Do not use metal picks of any kind
- **Wet-or-Dry Sandpaper**
  - 400-800 grit

- **Polishing Wheel**
  - These can be mounted on a bench grinder or a drill press
- **Hone**
  - Only needed if the cylinder requires cleanup
  - Fine ball hones, made from Aluminum Oxide, in the 400-600 grit range, are acceptable.
  - A homemade “flapper” hone can also be fashioned using a piece of 400-600 grit sand paper on the end of a shaft or dowel. This is the most cost-effective solution.

- **Loctite 565**
- **O-Ring Lube**
  - Super Lube – 21030 or
  - Parker O-Lube - 884-2 or
  - You can also just use fresh hydraulic fluid
    - MIL-PRF-83282 (Royco 782)
    - MIL-PRF-5606 (Royco 756)

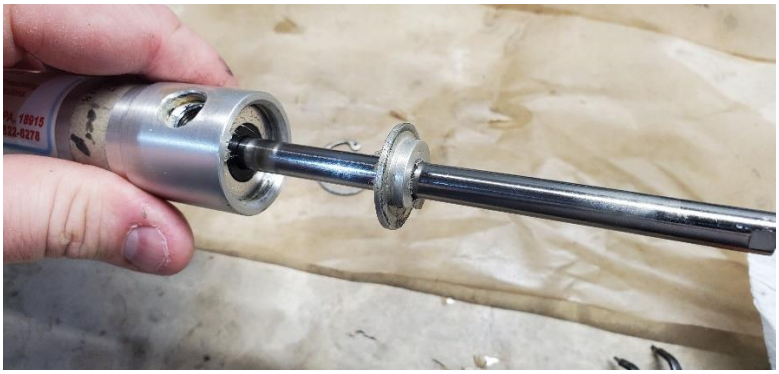
DISASSEMBLY

1. Remove the cylinder from the plane. Pump it a few times to remove the hydraulic fluid. Thoroughly clean the outside of it.

2. Remove the two fittings and the hardware from the end of the shaft.

3. Using a socket push the retaining plate inwards slightly to make removal of the snap ring easier. Rotate the snap ring to align with the relived area of the retainer and remove it.

4. Remove the retaining plate. Check the snap ring groove for any burrs that could cause damage to the end cap or piston when removed.



5. Using a firm grip, grab the end of the shaft and pull the shaft assembly out of the housing.

6. Using 9/32 and 5/16 wrenches, remove the nut retaining the piston from the end of the shaft. Remove the piston and hardware from the shaft. Discard the old sealing washer and AN960-416 washer.

7. Slide the end cap off the back of the shaft.

8. Carefully remove the U-Cup seal and O-ring from the aluminum end cap. Remove the T-seal from the piston. Discard these components. Do not use metal picks of any kind to remove these seals.

Note: Some 4787 actuators were provided with a square cross section O-Ring instead of the U-cup seal. It is unclear why this was done, possibly due to shortages or cost of the proper U-cup design. While these may work, they are not ideal under the high pressures these actuators are subject to. The kit replaces these with U-cup seals intentionally to improve sealing and reduce wear.

INSPECTION

Clean all the metal components using a parts washer and brake clean, they should be completely clean and grease free.

The following items should be inspected in addition to a general look over the components for wear, damage, and bending. This is particularly important on actuators involved in a gear collapse or jammed door failure. **It is important that every surface that interfaces with the seals be inspected and polished if necessary.**

- Shaft
  - Bending or Cracking – Reject
  - End Thread Condition
  - Burrs on shaft edges near piston – Polish as required (burrs can damage seals during assembly and may prevent sealing of sealing washer)

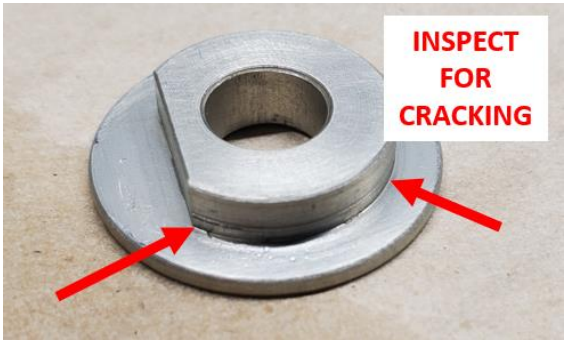
  - Scratches on Shaft – Polish out by first wet sanding and then polishing. Deep scratches require replacement. Thoughly clean the residuals from these processes.

- Cylinder Housing
  - Bending or Cracking – Reject
    - Pay particular attention to cracking at the snap ring groove.
  - Mounting Hole – Excessive wear.
  - Inside – Check the surface for scratches and burrs, if light scratches exist, they may be polished out using the hone and WD-40. Remove as little material as possible, breaking through the anodized surface will accelerate future wear. Thoroughly clean to remove any residuals from the honing process.

- Piston
  - T-Seal groove – Inspect for scratches
  - Outside Diameter – Inspect for wear
  - Counterbore – Inspect for scratches and dents. Take note of smooth vs. marred side. The smoothest side will be the side facing the sealing washer when reassembled, this side needs to have no scratches, galling, or dents. Galling pointed out on one side below for example.

- Aluminum End Cap
  - Inside U-Cup seal surface – Check for scratches
  - O-Ring groove – Inspect
  - Shaft hole – Inspect for wear

- Retaining Plate & Snap Ring
  - Inspect for Flatness, cracking, wear, and corrosion.



ASSEMBLY

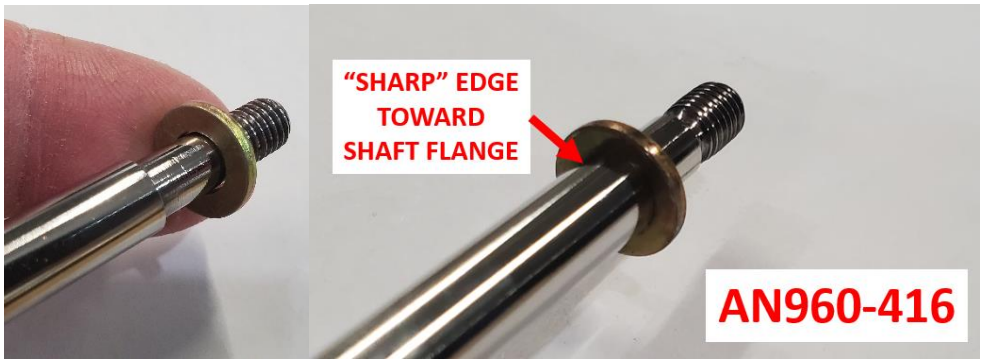
1. Lubricate the O-Ring and install it onto the cap.

2. Lubricate and install the U-Cup into the front of the end cap. The U-Cup should be oriented as shown, with the lip facing inside of the cylinder assembly and the flat part on the outside.

3. Lubricate and install the end cap onto the shaft by sliding it on from the piston end.

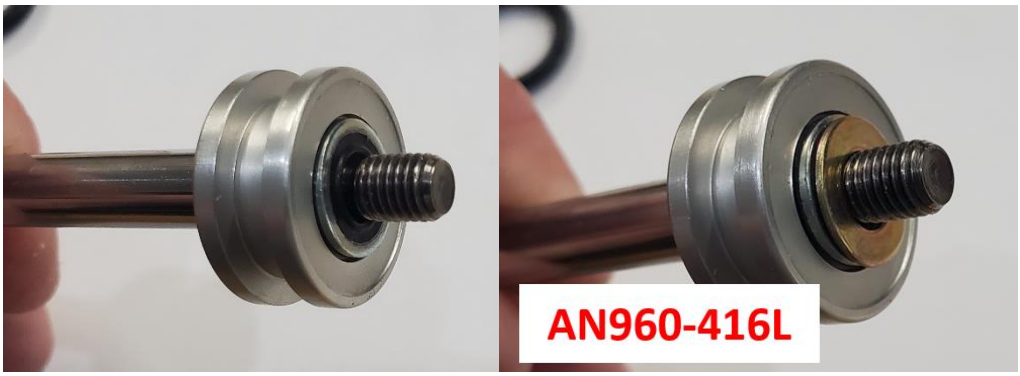
4. Obtain an AN960-416 washer and ensure it does not have any burrs on the “sharp” side (the sharp side should not actually be sharp). If this sharp side is not flat grab another washer or lap it flat on a sharpening

stone. Install the washer onto the piston end of the shaft with this “sharp” edge against the flange of the shaft. This provides the maximum support possible to the washer. Make sure that it seats fully against the flange on the shaft.



5. Next, install the piston onto the washer. Be sure to orient the piston with the least perfect counterbore against the washer previously installed, this leaves the better surface to interface with the sealing washer.

6. After lubricating, install the sealing washer onto the end of the shaft. Inspect the AN960-416L washer for burrs and place the more “sharp” side toward the sealing washer. Again, this washer should be lapped flat if required to remove any burrs.



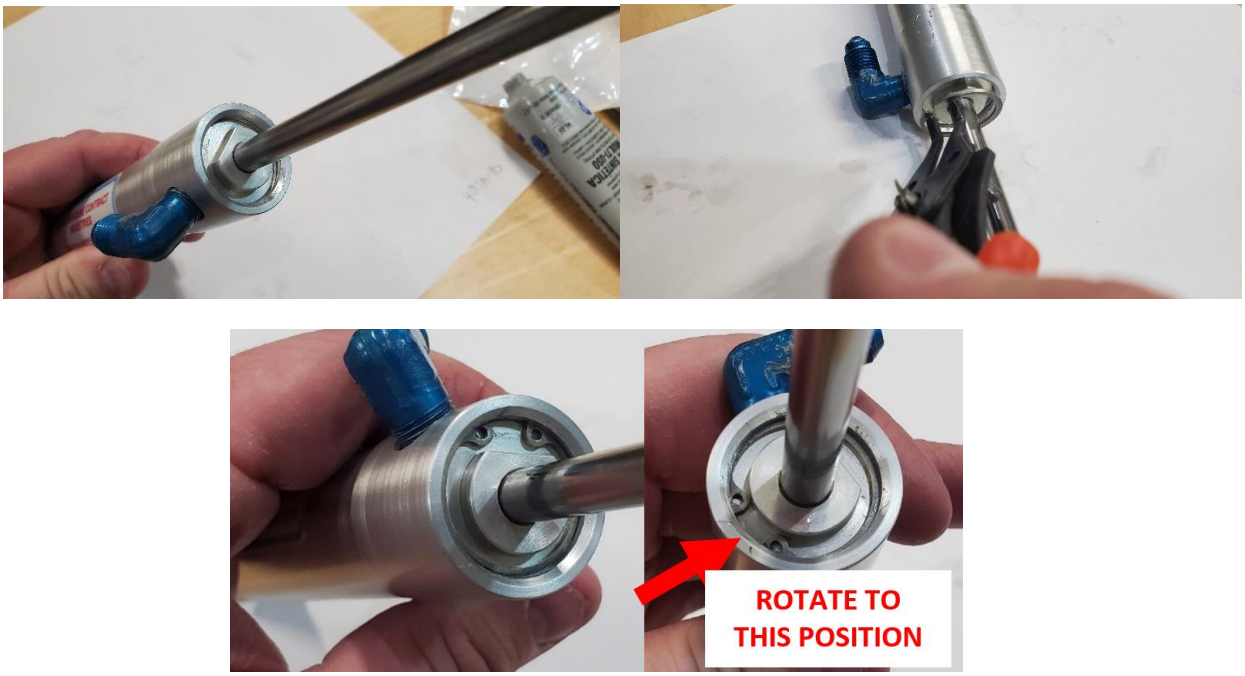
Note: The AN960-416L washer was not originally used by Lancair and is not needed, however it does reduce the opportunity for the sealing washer to become damaged during assembly due to the friction between the nut and rubber.

7. Install the nut on the end and torque to 40in-lb. Be sure to keep the AN960-416L washer centered with the nut during this to create the best seal possible. When torquing, it can help to hold the shaft by the flats in a non-marring vice.

8. Lubricate and install the T-seal onto the piston by first installing the rubber section, followed by the two plastic backup rings on either side as shown.

9. Lubricate the O-Ring on the end cap and T-Seal on the piston then carefully install the assembly into the main housing being sure not to cut the seals during this. Once the piston is inserted it becomes important to align the end cap with the hole in the housing before pushing it in. Once installed it will be difficult to rotate the cap into position if it is far off. Temporarily install one of the end fittings to ensure the cap doesn't move out of position.

10. Reinstall the end cap retainer. Reinstall the snap ring with the "sharp" edge facing away from the retainer plate. Be sure to orient the snap ring so that the legs are 180deg away from the clearance section of the retainer, this provides extra security that the ring will not come out. This is done by rotating it with the snap ring pliers after it is installed as shown below.



11. Reinstall the fittings into the housing using Loctite 565

12. Reinstall the hardware onto the end of the cylinder, reinstall the cylinder into the plane. Leak and function test prior to flight.