



B737 PTU Cracked Seal Retainer Investigation PN 56586

P/N:63169 – Rev. A (Mar-2026)



ENGINEERING **YOUR** SUCCESS.

B737 PTU Cracked Seal Retainer Investigation PN 56586

Problem Statement:

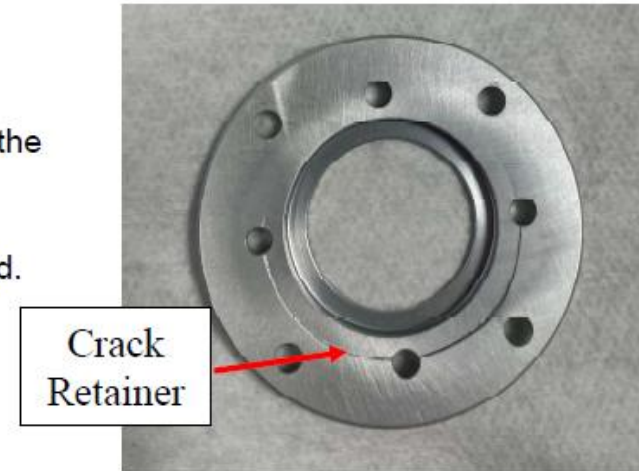
- Increase of PTU returns due to external leakage
- After teardown for investigation, units present cracked seal retainer on the motor side
- Oftentimes the screw heads are busted off and internal seal is damaged.

Investigation:

- Multi-discipline and multi-company RCCA conducted.
 - ✓ RCCA Fishbone Created
 - ✓ Evaluated many parts returned from the field.
 - ✓ Performed Metallurgical Analysis on failed samples.
 - ✓ Reviewed screw processing and application comparison.
 - ✓ Verified location of failure with FEA using case pressure supplied by Boeing.

Root Cause:

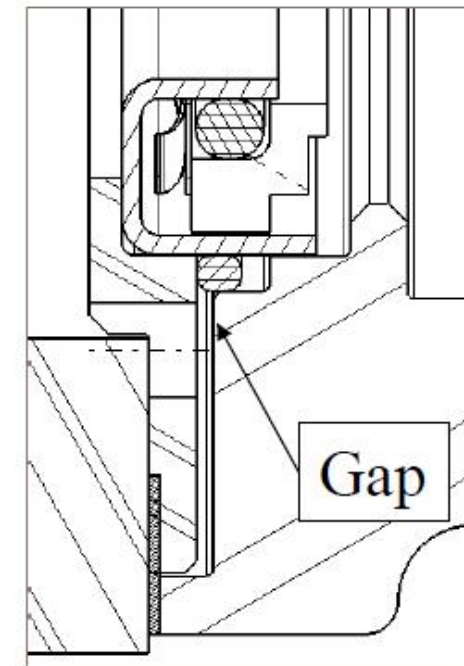
- Aircraft system exceeds existing system requirements, specifically case pressure.



B737 PTU Cracked Seal Retainer Investigation PN 56586

Failure Sequence:

1. Screw Heads Break
2. Retainer moves toward bracket and destroys the gasket.
3. With the gasket damaged, the internal seal has a 0.023" gap.
 - Seal extrudes out un-used hole.
 - Even without un-used hole, seal is expected to extrude.
4. Retainer cracks
 - Supported by FEA
 - Different predicted life depending on location
 - 0-600-0 psi, 300,000 cycles
 - 13,302 cycles predicted in exterior radius of retainer.

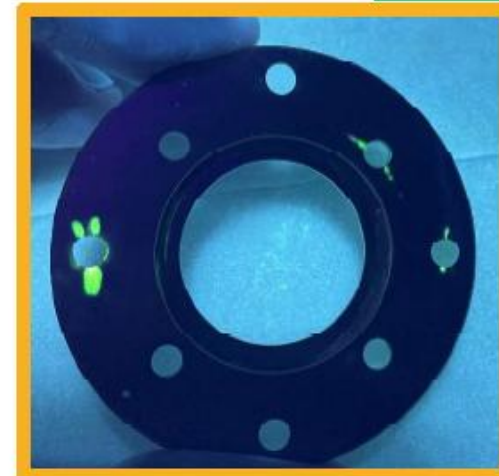
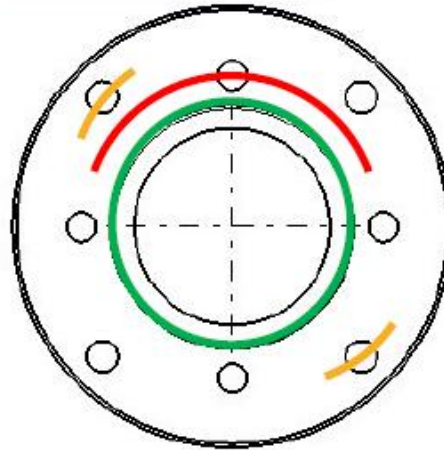
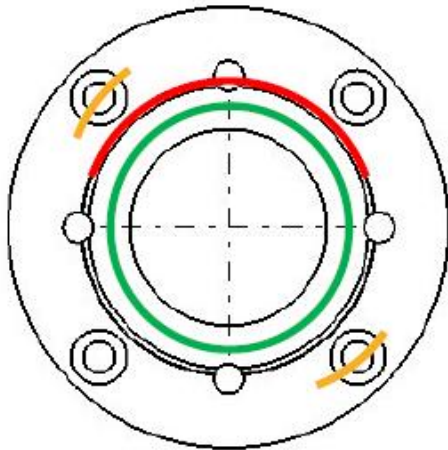
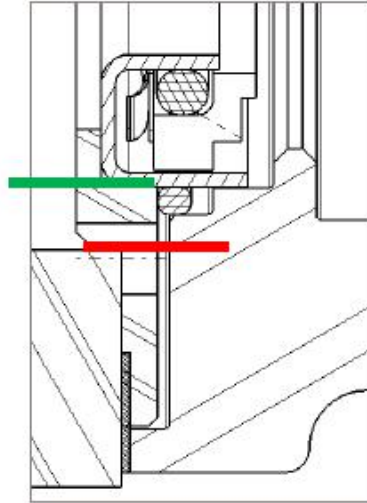


B737 PTU Cracked Seal Retainer Investigation PN 56586

Retainer Crack Locations:

- Screw Location
- Exterior Radius
- Internal Shaft Seal Shelf

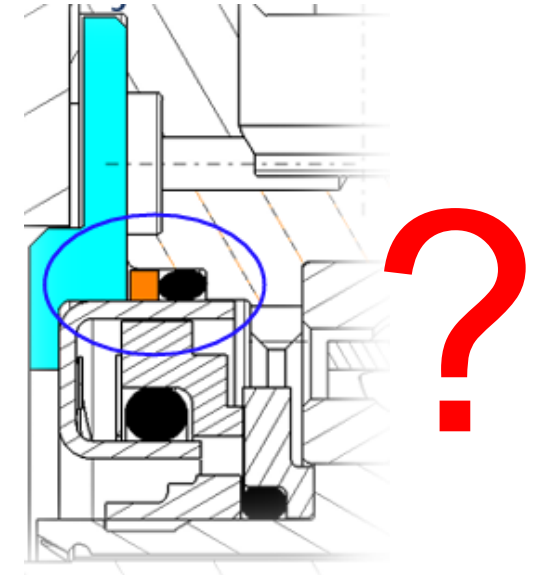
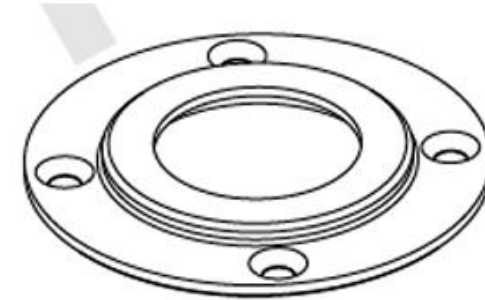
[No Title]



B737 PTU Cracked Seal Retainer Investigation PN 56586

Proposed Interim Fix Improvement

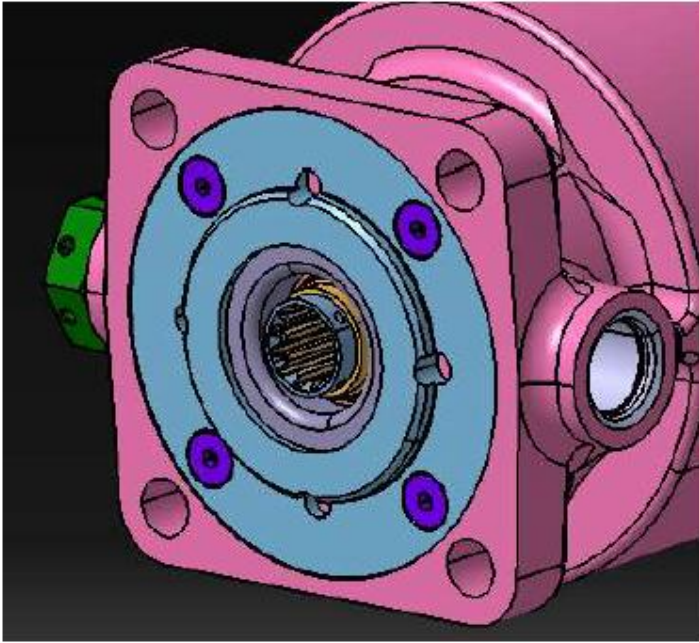
- Option A: Strengthen seal retainer via material change to steel, remove non-used holes, and increase lip radii.
- Option B: Install backup-ring to existing O-ring seal between housing and cup seal to further prevent seal extrusion if screws break.
- ECD: Middle of 2026



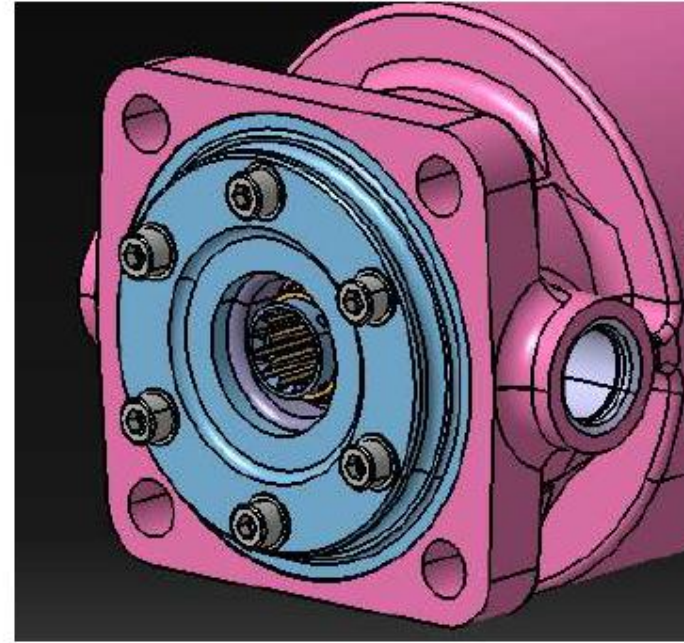
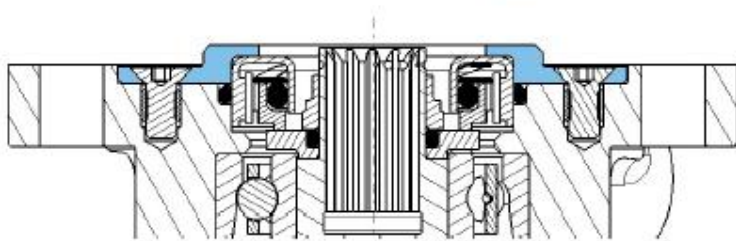
B737 PTU Cracked Seal Retainer Investigation PN 56586

Known Issues – Potential Redesign:

- Seal Retainer Cracking – Replace 4 counter-sunk holes with 6 through holes. Incorporate outer o-ring gland. Increase flange thickness. Evaluate integration of shaft seal Cup with Seal Retainer.



Present Design



Potential Re-Design

