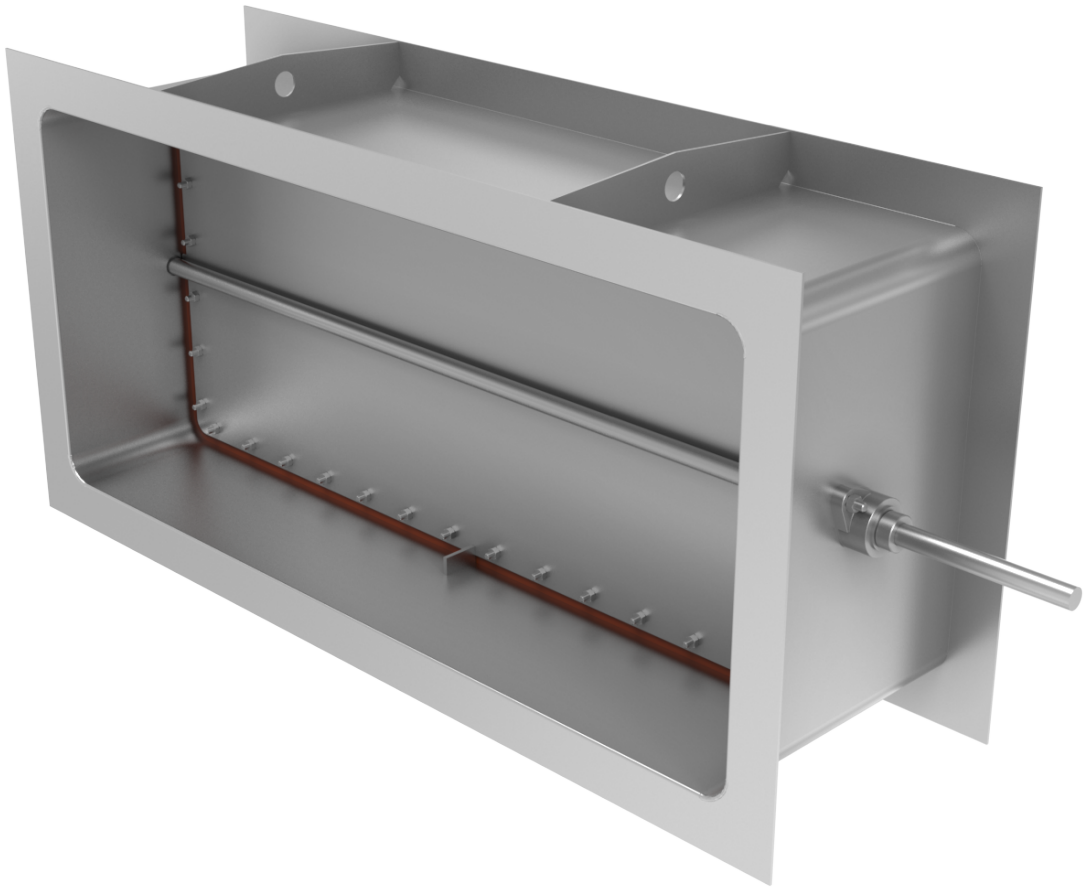
RUSKIN

Maintenance Manual



Model: BTD830

Bubble Tight Isolation Damper

SCOPE

Part 1 will provide general upkeep type maintenance to help in extending the life of the damper.

Part 2, Section 1 of this instruction will provide guidance for bearing and seal maintenance.

Part 2, Section 2 of this instruction will provide guidance for the replacement of the blade seal.

Parts may be purchased from your Ruskin Representative or by calling Ruskin @ 1(816)761-7476 and following the appropriate prompts.

PART 1
GENERAL MAINTENANCE

CLEANING

During installation and over the life of the ducted system, foreign debris may be introduced into the system. Debris in the system, can cause damage to seals. Inspecting and cleaning the interior of the system and damper, can prevent damage.

INSPECTION

While the damper is idle, inspect the actuator, bearing assemblies and any attached linkage or devices. Inspect for loose or missing hardware and/or damage to the actuator or attached devices. Look for any water puddling on surface of damper (water beads may form due to temperature differences).

- If loose or missing hardware is identified:
  - Tighten any loose hardware.
  - Replace any missing hardware as required.
- If damage is found on Actuator.
  - Contact device manufacturer or Ruskin Field Repair, for repair or replacement procedures.
- If damage is found on other attached devices.
  - Contact device manufacturer for repair or replacement procedures.

PART 2
SECTION 1
BEARING & SEAL MAINTENANCE

2.1.1. ACTUATOR REMOVAL

NOTE: Drive blades to either open or closed position. Make note of position, prior to removal of actuator.

REMOVAL

1. Axle mounted actuator. (See figure 2.1.1.A).
   a. Disconnect and lockout power to actuator.
      i. Support actuator, loosen nuts evenly on axle clamp and remove actuator.

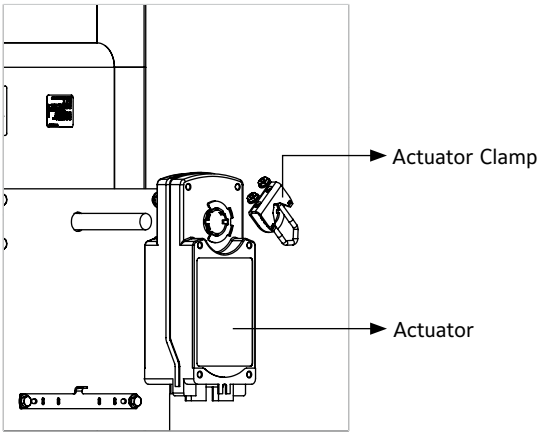


Figure 2.2.1.A

b. Remove nuts and bolts from actuator mounting plate. (See figure 2.1.1.B).

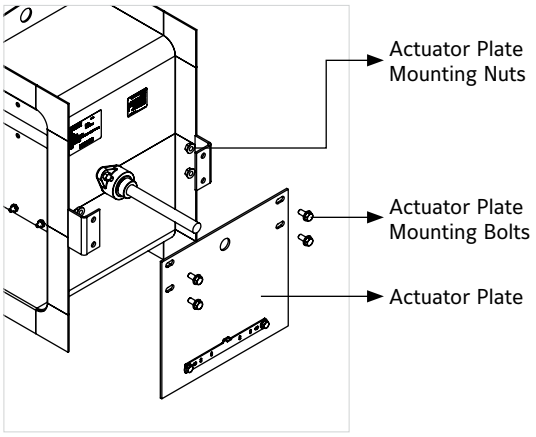


Figure 2.1.1.B

2. Coupling mounted actuator. (See figure 2.1.1.C).
   a. Disconnect and lockout power to actuator.
      i. Support actuator, loosen bolts evenly from back side of actuator mounting plate and remove actuator.

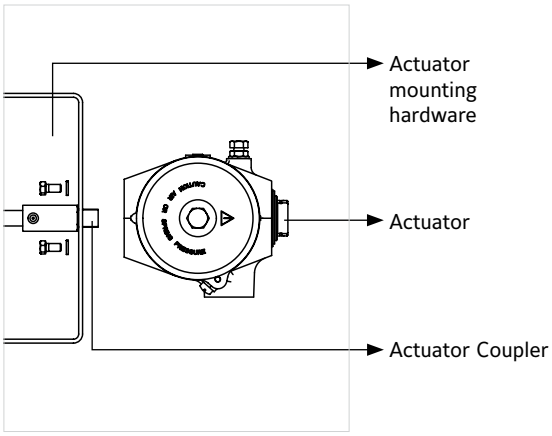


Figure 2.1.1.C

b. Using a drive punch and hammer, remove drive pin from coupling completely and remove coupler from axle. (See figure 2.1.1.D).

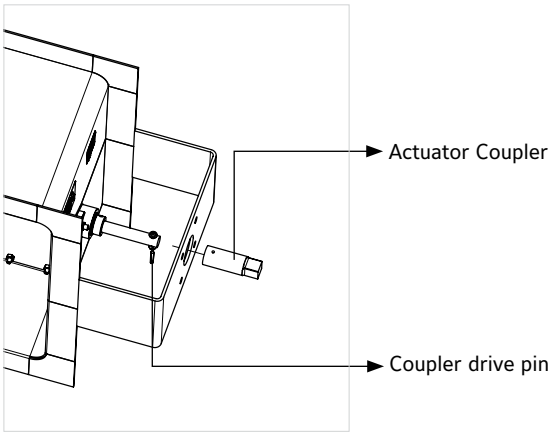


Figure 2.1.1.D

2.2.1 Set collar. (Typical for both sides) (See figure 2.2.1.A).

a. Loosen set screw in axle collar.

b. Remove collar and thrust washer.

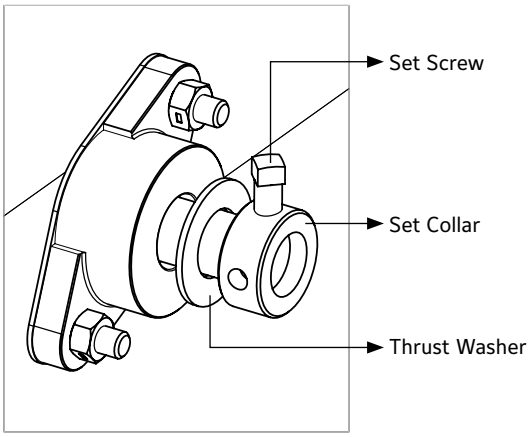


Figure 2.2.1.A

2.3.1 Bearing housing. (Typical for both sides) (See figure 2.2.1.B).

a. Remove nuts from bearing housing.

b. Lubricate axle using WD40, grease or equal.

c. Slide bearing housing off the axle.

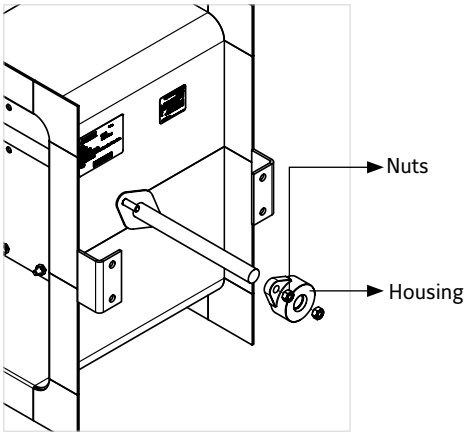


Figure 2.2.1.B

2.4.1 Bearing housing gasket (Typical both sides) (See figure 2.4.1.A).

a. Use WD-40 and spray gasket and edges of gasket. Allow to sit for 5 -20 minutes.

b. Using a plastic scraping tool (to keep from damaging frame metal) remove gasket and any sealant.

c. Repeat spraying with WD-40 to clean any extra sealant.

i. Clean surface with Isopropyl Alcohol afterward and allow to air dry.

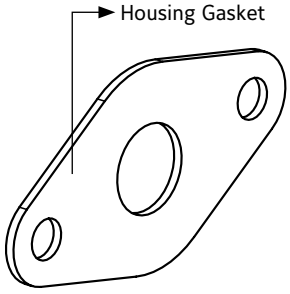


Figure 2.4.1.A

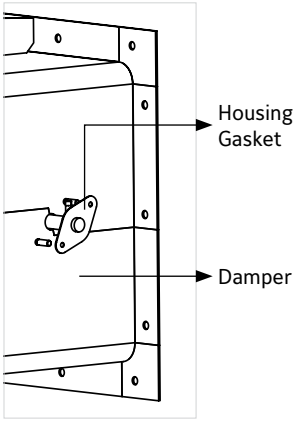


Figure 2.4.1.B

Actuator not shown for clarity.

2.5.1. Bearing housing, axle seal (See figure 2.5.1.A).

a. Using shaft seal removal tool, remove shaft seal from housing.
   i. Inspect pressed in bearing for damage or wear replace as required.
b. Clean shaft seal race of the housing.
c. Inspect shaft seal race of bearing housing. No allowable nick, burrs, or gouges.
d. Nicks and burrs may be removed using emery cloth.
e. Gouges may be filled with metal filler and smoothed with emery cloth once cured.

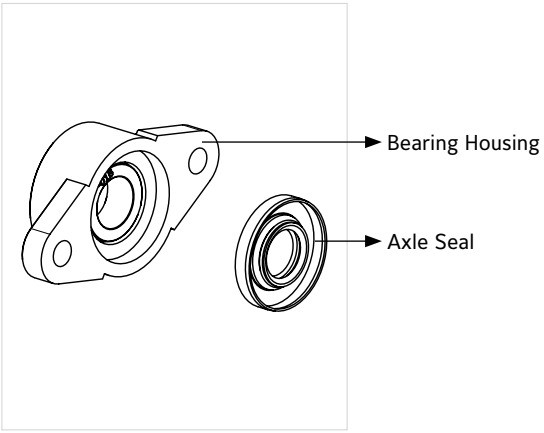


Figure 2.5.1.A

2.6.1. Bearing housing axle bearing (See figure 2.6.1.A).

a. Follow steps in procedures 2.1.1. and 2.1.2.
b. Use a press with appropriate size arbor and press bearing out.
c. Inspect bearing race of bearing housing. No allowable nick, burrs, or gouges.
   i. Inspect pressed in bearing for damage or wear replace as required. (See 2.1.3.).
d. Nicks and burrs may be removed using emery cloth.
e. Gouges may be filled with metal filler and smoothed with emery cloth once cured.

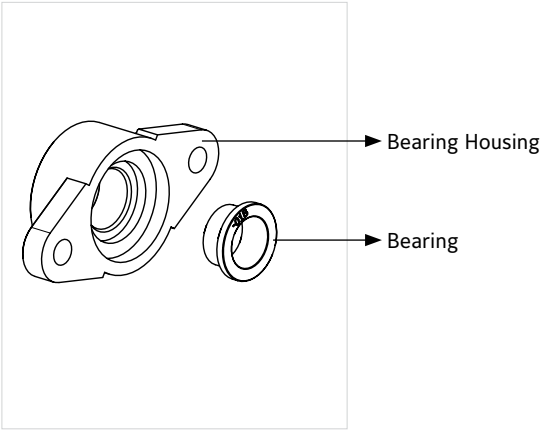


Figure 2.6.1.A

Axle Seal not shown for clarity.

INSTALLATION

2.7.1. Press-in bearing (See figure 2.7.1.A).

a. Align bearing to the inner most race of the bearing housing.
b. Using a press with appropriately sized arbor, slowly press bearing into housing until fully seated.

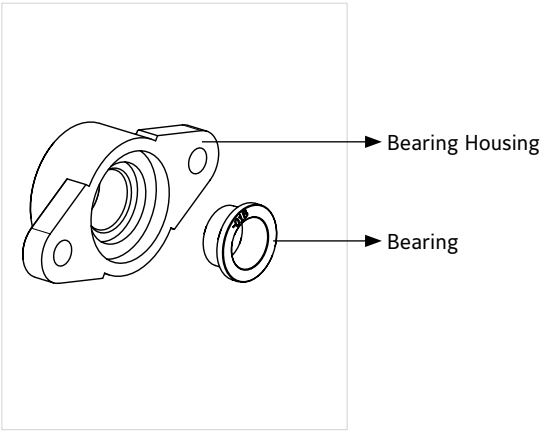


Figure 2.7.1.A

2.8.1. Press-in shaft seal. (See figure 2.8.1.A).

a. Align shaft seal to the outer most race of the bearing housing.

NOTE: Ensure bearing seal is installed as shown.

b. Using a press and seal driving tool, slowly press seal into housing until fully seated.

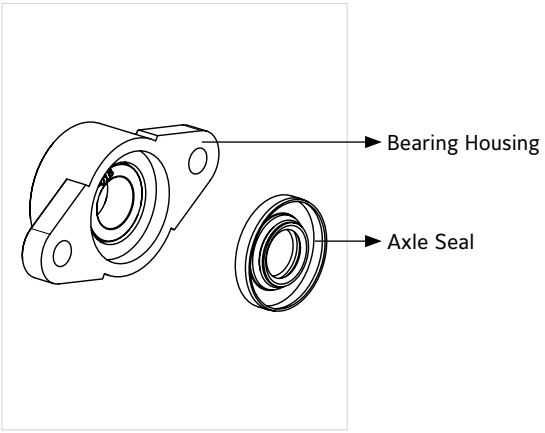


Figure 2.8.1.A

2.9.1 Bearing housing gasket. (Typical both sides). (See figure 2.9.1.A & B).

a. Inspect axle for damage prior to installing bearing housing assembly.
   i. Remove any material that protrudes from the axle surface using Emory cloth.
b. Apply a thin continuous bead of RTV sealant to one side of gasket.
c. Slide gasket over axle with RTV facing damper.
d. Align bolt holes in gasket with studs on damper frame.
e. Slide gasket over studs and axle until it contacts frame.

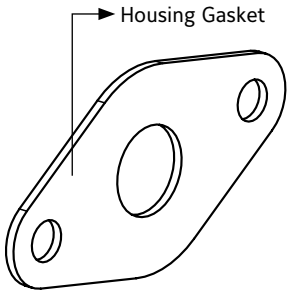


Figure 2.9.1.A

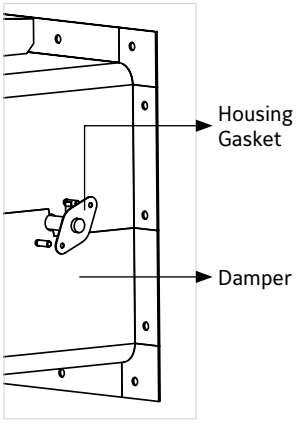


Figure 2.9.1.B

2.10.1 Bearing housing (Typical both sides). (See figure 2.10.1.A).

a. Inspect axle for damage prior to installing bearing housing assembly.
   i. Remove any material that protrudes from the axle surface using Emory cloth.
b. Apply a thin continuous bead of RTV sealant to the back side of the bearing housing.

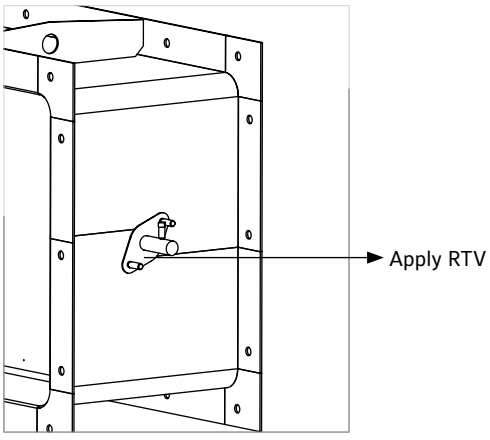


Figure 2.10.1.A

c. Apply a thin coat of grease to the shaft seal and bearing.

NOTE: Use caution when placing seal over end of axle, so not to damage seal.

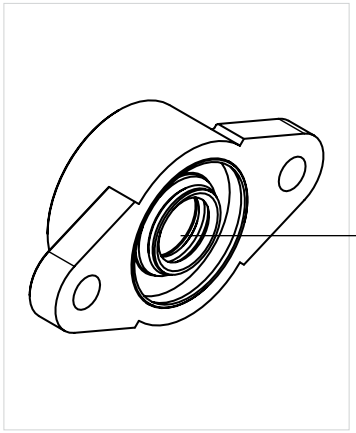


Figure 2.10.1.B

d. Slowly slide bearing housing assembly over axle.
   i. Align bolt holes in housing with studs on damper frame.
e. Slide housing over st uds and axle until it contacts gasket.
f. Install nuts and torque to 90 to 100 in. lbs.

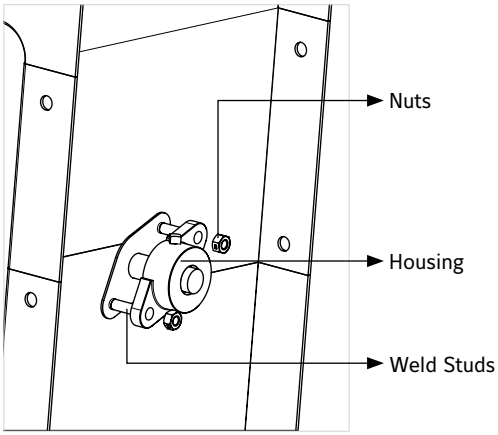


Figure 2.10.1.C

2.11.1 Thrust washer and set collar (Typical both sides). (See figure 2.11.1.A).
   a. Slide thrust washer and set collar onto axle until they meet the housing.
   b. Ensure blade is centered in damper frame.
   c. While grasping the axle firmly press the collar against the bearing housing and tighten the set screw.
   d. Cycle blade by hand to ensure smooth operation.

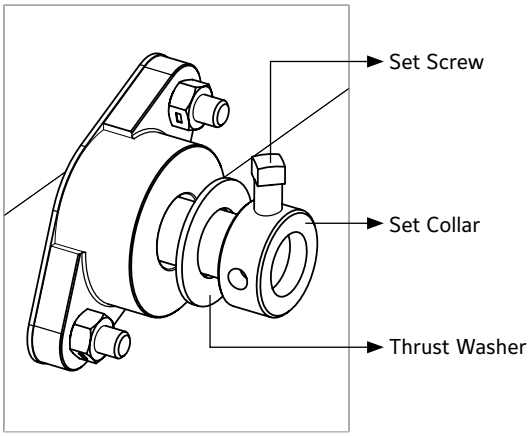


Figure 2.11.1.A

2.12.1. Mounted actuator.

a. Axle mounted actuator. (See figure 2.12.1.A).

i. Install actuator mounting plate and using existing hardware (if hardware has damaged threads or hexes replace hardware) Tighten hardware to wrench tight.

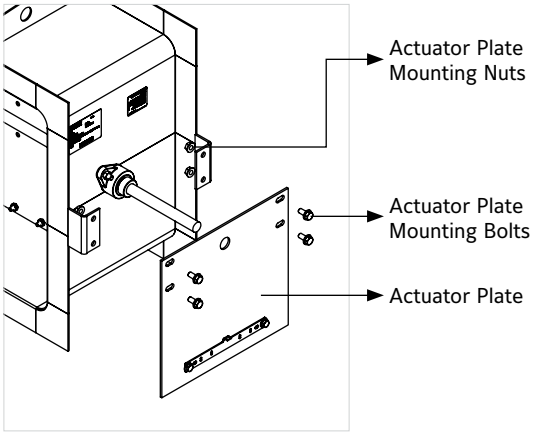


Figure 2.12.1.A

b. Slide actuator over axle and bottom of ensure actuator engages with anti-rotation strap.

c. Reconnect actuator and remove lock-out.

i. Fully open damper blade with actuator clamp loose.

ii. Energize actuator.

iii. Tighten nuts on actuator clamp to actuator manufacturers specified torque.

iv. Spring return actuator: de-energize actuator to ensure damper blade reaches fully closed position.

v. Fail in place actuator, drive actuator to fully closed position to ensure damper blade is closed.

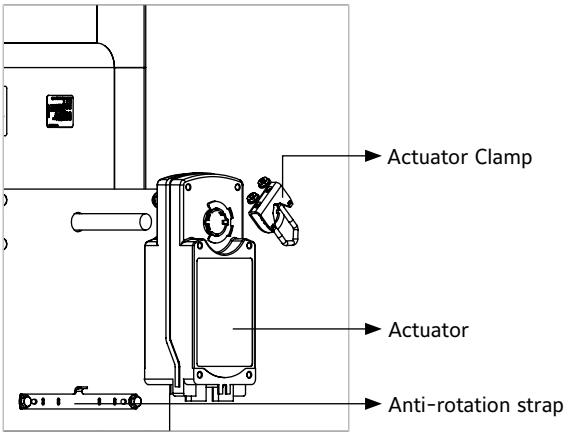


Figure 2.12.1.B

2.13.1 Coupler mounted actuator. (See figure 2.12.1.A).

d. Slide actuator coupler onto end of axle ensuring the drive pin holes in the axle and the coupler are aligned.

e. Install a NEW stainless steel shoulder bolt thru the coupler and axle. Install bolt, flat washers, Lock-nut, and tighten.

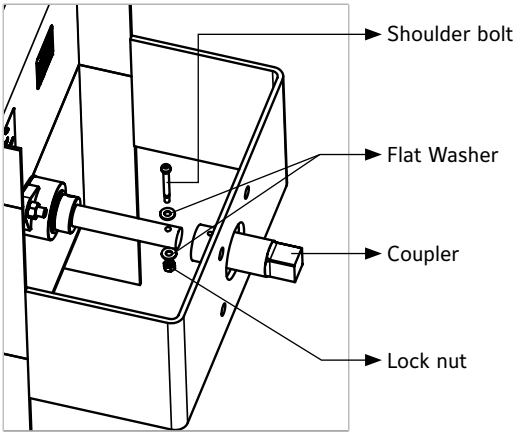


Figure 2.13.1.A

f. Align actuator with coupler and install actuator mounting bolts. Support actuator, tighten nuts evenly from back side of actuator mounting plate until tight.

g. Reconnect actuator and remove lock-out.
   i. Fully open damper blade with actuator clamp loose.
   ii. Energize actuator.
   iii. Tighten nuts on actuator clamp to actuator manufacturers specified torque.
   iv. Spring return actuator: de-energize actuator to ensure damper blade reaches fully closed position.
   v. Fail in place actuator, drive actuator to fully closed position to ensure damper blade is closed.

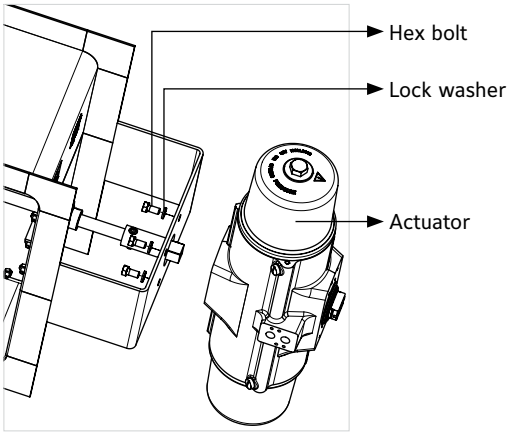


Figure 2.13.1.A

PART 2
SECTION 2
BLADE SEAL REPLACEMENT

2.2.1.1 BLADE SEAL REPLACEMENT

REMOVAL

1. Disconnect and lockout power to actuator. (See figure2.2.1.1.A).
   a. Gain access to the Front side of the damper.
   b. Remove lock nuts from blade.

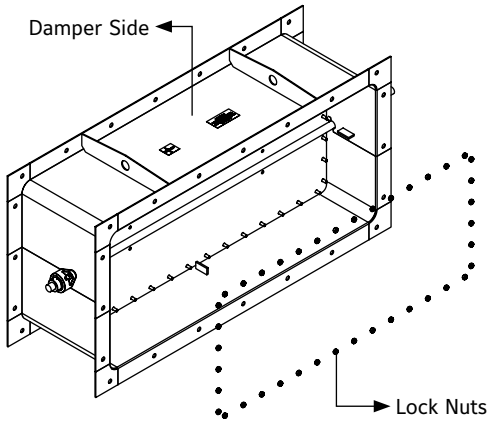


Figure 2.2.1.1.A

2. Gain access to the Back side of the damper.
   a. Remove blade seal retaining plate from blade assembly.
   b. Remove blade seal.
      i. Use WD-40 and spray RVT remaining on blade and blade seal retainer. Allow to sit for 5 -20 minutes.
      ii. Using a plastic scraping tool (to keep from damaging mating surfaces) remove any sealant.
      iii. Repeat spraying with WD-40 to clean any extra sealant.
      iv. Clean surface with Isopropyl Alcohol afterward and allow to air dry.

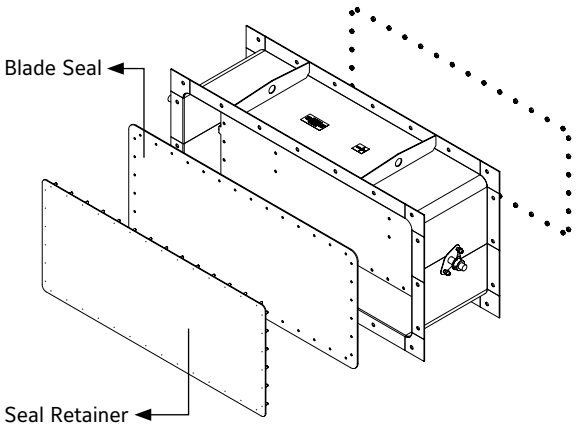


Figure 2.2.1.1.B

INSTALLATION

NOTE: Ensure blade seal hole pattern matches weld stud pattern if it does not consult Ruskin.

1. Apply a thin 1/8" bead of silicone caulk to blade seal retainer approximately 1" to the inside of weld studs.
   a. Lay blade seal in place over retainer plate and smooth.
2. Apply a thin 1/8" bead of silicone caulk to blade seal approximately 1" inside of weld studs.
3. Apply a thin 1/8" bead of silicone caulk around blade centering fixture holes on blade.
4. Align weld studs on blade seal retainer with holes in blade and attach seal & seal retainer using existing hardware. (If hardware has damaged threads or hexes replace hardware).

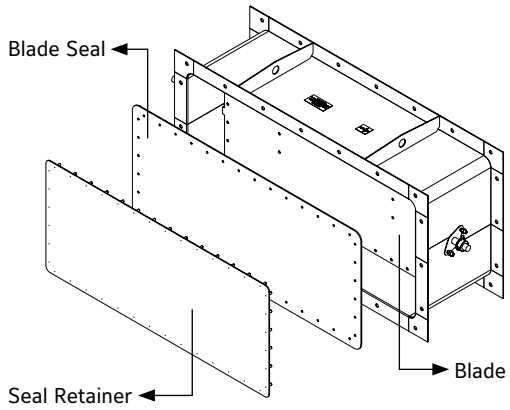


Figure 2.2.1.C

   a. Run lock nuts down until they contact blade skin.
   b. Torque nuts to 100 in. lbs., using a random pattern
5. Re-install damper.
6. Re-connect actuator power to actuator.

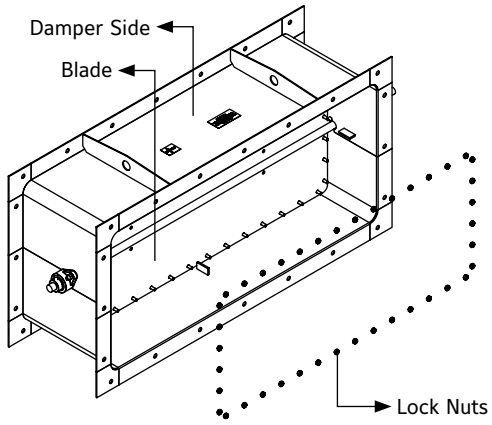


Figure2.2.1.D

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