

Blade seal may deteriorate over time due to aging, wear or mechanical damage. Site conditions such as radiation, grit, or chemical agents may degrade the elastomer used.

Standard seal material is solid silicone rubber, 50 Shore A durometer.

- A. Operating torque increase with material thickness, as does the ability to withstand differential pressure across the damper blade.
- B. Stiffer material (higher durometer) increases operating torque and degrades material compliance to frame.
- C. Rubber materials vary greatly in their coefficient of friction and their “stickiness”. Materials with the same durometer may not perform with same torque and sealing capability.

The amount of seal overlap to the damper frame is critical. At axle penetration, seal should just contact frame so it does not fold. Seal blade perimeter at right angle to axle should overlap frame so as to increase the angular range of blade travel. That is, blade may not stop in exactly the same spot every time, depending on installed actuator.

Seal may cover the whole blade surface or have center cut out to conserve material.

Standard caulk is silicone rubber and is used to insure that air does not bypass around blade fasteners.

Seal Preparation

If seal is being cut in field, a fine sanding pad running PARALLEL to the seal edge can smooth rough places and blend uneven surfaces (see picture). It is important that seal edge have sharp right angle corners and have no nicks, cuts or roughness.

Procedure

- A. Decontaminate, sterilize or clean damper before replacing seal. This damper is often specified for uses that could be hazardous to one's health.
- B. Close damper. Remove nuts around blade perimeter and along axle.
- C. Use hammer and punch on axle bolt ends to loosen and remove blade cover plate with seal. Be careful not to scrape or gouge frame inside perimeter.
- D. Pull off seal. Remove any remaining silicone caulk.
- E. Caulk perimeter of blade cover with small ($\frac{1}{8}$ in.) bead. Be sure to caulk OUTSIDE of blade perimeter studs.
- F. Install seal onto perimeter studs, making sure to orient the shorter seal axis and axle bolt holes along the axle centerline.
- G. Lay damper horizontally with the axle on down side. Insert blade cover with seal. On larger dampers, it is sometimes easier to orient damper vertically, open blade and insert blade cover and seal. Rock blade cover to engage axle studs. Install several fasteners to hold blade cover in place.
- H. Position damper so blade studs are accessible and install nuts. If nuts are stainless steel, apply anti-sieze compound to studs to prevent galling fastener threads.
- I. DO NOT OVERTIGHTEN NUTS ON PERIMETER STUDS as seal can and will be squeezed out excessively. Seal should extend approximately $\frac{1}{2}$ inch at axle perimeter and $\frac{5}{8}$ - $\frac{3}{4}$ inch at right angles to axle. Tighten



nuts starting at axle, alternating side-to-side, and working out to blade tips.

J. Close damper. Blade tip-to-frame web distance at top & bottom should be the same, $\pm \frac{1}{2}$ in. Adjust blade stops as necessary.

K. Open and close damper blade several times so blade seal seats and aligns. Wipe off any excess caulk. Inspect for visual gaps. If possible, pressurize one side of damper and use Leak Detect Solution to inspect for leakage. Adjust per Trouble Shooting Guide.

Trouble Shooting Guide

Problem	Possible Cause	Remedy
Visual see through near axle	Insufficient tightening of perimeter nuts	Tighten nuts until seal gap closes
	Perimeter nuts too tight causing excessive squeeze	Loosen perimeter nuts so seal relaxes
Small leak at seal perimeter	Roughness or cut across seal perimeter	Sand seal perimeter edge smooth. If near axle, this will require disassembly of damper. See figure on page 1.
	Insufficient tightening of perimeter nuts	Tighten nuts until seal gap closes
	Dirt on seal or frame	Remove dirt
Damper not closing completely	Insufficient actuator torque	Replace actuator or increase air pressure supply if pneumatic
	Blade stops not correctly adjusted (HTBR-451 only)	Adjust blade stops
Damper will not open	Insufficient actuator torque	Replace actuator or increase air pressure supply if pneumatic
	Higher seal durometer used	Replace with correct material
	Stuffing boxes too tight	Loosen stuffing box clamps to reduce friction
Leakage around blade fasteners	Seal not caulked outside perimeter studs	Loosen, caulk and retighten seal
Blowing through seal perimeter	Excessive differential pressure across blade	Reduce applied pressure
	Insufficient seal overlap	Tighten perimeter nuts to squeeze out seal

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