Airlock Maintenance
Western District IAOM

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Rotary Airlock Valves
Topics:

- Inboard/outboard bearings
- Performance
- Troubleshooting
- Maintenance recommendations
Importance of Airlocks

- Tightly machined internal clearances create air seal
- Used to separate two different pressure/vacuum environments
- Allow for proper performance of pneumatic system
  - Often found on the front end and termination point of conveying system
- Offer consistent and even product feed
Inboard Bearing Airlock

- Most common style of airlock
- Standard roller bearing with double lip seal installed in the inside of the endplate
- Easy to disassemble and reassemble
- Packed bearings for minimal maintenance
VJ Series Airlock Valve

- Inboard Bearings
- Most common option for many applications
- NOT considered a NFPA isolation device
VJ Series Exploded View

SHAFT SEAL VOID IS PACKED w/ "KEYSTONE" NEVASTANE (FOOD GRADE) LUBRICANT.
VJH Series Airlock Valve

- Considered an “Inboard Bearing Airlock”
- Suitable for most common applications
- Apply to higher pressures
- NOT considered a NFPA isolation device
Outboard Bearing Airlock

- Generally used for high heat applications or where material could migrate through an inboard lip seal
- Uses 3 layers of Teflon packing in the endplate
- Timken Bearing is located on the bearing rack which is removed from the endplate
  - is considered an NFPA isolation device.
VJX Series Airlock Valve

- Outboard Bearings
- Common for high pressure and abrasion applications
- IS considered a NFPA isolation device
Airlock Performance

- Clearances must be properly machined to offer an effective seal
- Typical rotor clearances of .004” (+/- .001”)
- Static and dynamic leakage always present
  - Worn clearances will greatly increase leakage
- Typically rated to 15psi or 15”Hg
- Typically operates from 10-30rpm
  - Rotation speed can be critical

**Generally a low maintenance item**
## Airlock Issues

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Airlock Will Not Turn

Airlock Problem or Motor Issue?
SAFTEY FIRST

• Do NOT attempt to work on, clean, service valve, open, or remove any protective cover, guard, grate or maintenance panel until the POWER and/or AIR has been turned off and LOCKED OUT.

• Never place any part of your body under or near rotating or moving parts of valve.
Troubleshooting

Remove Guard & Detach Chain

Can the Rotor Spin Freely?
Troubleshooting

Yes:
Airlock is Good

Motor heater settings?
Enough HP?
Gear Reducer?

No?
Time to work on your Airlock!
Troubleshooting

- Product build-up, wrench, bolts, sticks, etc.
- Rotor shifted
- Product binding
- Check for correct application, T.E.R., chrome body & end plates
Airlock Maintenance

- Remove the airlock from system to obtain unobstructed access to rotor.
- Place a block in the airlock to prevent the rotor from turning unexpectedly

DANGER: Never place hands or fingers in an airlock, unless it has been disconnected and locked out and a wooden block has been placed in the airlock to prevent the rotor from turning.
Airlock Maintenance

- Remove rotor blockage
  a. Using a probe, dislodge the obstruction from the rotor and discard.
  b. Remove safety block.
  c. Turn the rotor using the probe to inspect for additional foreign material.
- Check for rotor damage.
- If rotor does not turn freely:
  a. Locate rotor damage such as burrs or dents on rotor blades.
  b. Remove any burrs using a file or emery cloth.
VJ Airlock Maintenance

Burrs or dents must be removed from the rotor shaft before attempting bearing removal to prevent scoring of inner race.

**CAUTION:** Only insert punch in the unthreaded lock collar hole which is intended for this purpose to prevent irreparable lock collar damage.

**Figure 9.2**
VJ Airlock Maintenance

1. Remove the end plate
   **If both end plates are removed, they should be marked so that each end plate can be reinstalled on the same end of the airlock body**

2. Place the end plate on wooden blocks with the machined surface down.

3. Tap the bearing and shaft seal through the end plate using a brass rod and discard both the bearing and the shaft seal.
VJ Airlock Maintenance

- Turn the end plate over and install a new bearing using a brass driver
- Pack the bearing void and shaft seal using Keystone Nevastane HT/AW-2 grease
VJ Airlock Maintenance

• Seat the seal by slightly tapping with soft hammer
• Reinstall the endplate
• Check rotor clearance before tightening Locking Collars
NEW! Kice Maintenance videos

www.kice.com/products/airlocks/vjx/
Loosen bearing lock collar set screw by turning counter clockwise.

Disengage bearing lock collar from bearing by turning it using a punch and hammer.
Noisy Airlock Valve
Noisy Airlock Valve

• Is something stuck inside?

• Is your Motor/Airlock turning in correct direction?

• Has there been a major temperature change?
Don’t forget what is around your Airlock
Long Term Storage

If the airlock must be stored outdoors, the following precautions should be followed.

- Protect from environment as well as possible by covering to keep out dirt and moisture.
- Store on a skid with a fully covered deck to keep the airlock from resting directly on the ground ensuring the outlet is covered and protected.
- Securely cover inlet using the steps below.
- Remove shipping cover plate.
- Transfer the position of the airlock flange’s corner holes to the shipping cover plate and drill through holes.
- Place a gasket on the airlock inlet.
- Bolt shipping cover plate in place.
- Cover motor and drives to prevent ingress of water, dirt and pests.

NOTICE: Turn the rotor a minimum of five revolutions monthly to maintain grease distribution within the bearings.
Types of Kice Airlock Valves

- VJ Series
- VJH Series
- VJX Series
- VBS Series
- VD Series
- VL Series
In Closing……

- Understand the equipment that you have in operation
  - *Understand system behavior in both optimal and upset conditions*
- If in doubt or confused, rely on the manufacturer for advice
- Learn to identify and resolve issues before failures
- Regular and effective maintenance pays off
- BE SMART / BE SAFE

*Always work smartly and practice safety!!*
Thank you for the opportunity to speak today