
Dust Collector Rotary Valve Chain Tension & Alignment PM

1.0 Maintenance Objective & Frequency

The objective of this procedure is to inspect, adjust, and verify the chain tension and sprocket alignment on the dust collector rotary valve drive system. Proper chain tension prevents excessive wear, reduces the risk of chain jump or breakage, and ensures consistent rotary valve operation for material discharge. This PM also includes lubrication of the chain and inspection of sprocket teeth for wear.

Frequency: Every 500 operating hours or quarterly, whichever comes first. Perform more frequently if the rotary valve operates in a high-dust or high-temperature environment.

2.0 Lockout/Tagout (LOTO) & Safety

- **Electrical Isolation:** Lock out and tag out the main disconnect switch for the dust collector rotary valve motor. Verify zero energy state with a voltmeter.
- **Mechanical Isolation:** Ensure the rotary valve is not under load. If the system is tied to a pneumatic conveying line, isolate and depressurize the line upstream.
- **Personal Protective Equipment (PPE):** Safety glasses, cut-resistant gloves, hearing protection, and dust mask (if residual dust is present).
- **Lockout/Tagout Device:** Personal padlock and hasp, LOTO tag, and group lockout box if multiple energy sources exist.

3.0 Required Tools, Parts & Lubricants

- Adjustable wrench (10 inch) or combination wrench set (metric/imperial as per sprocket bolts)
- Chain tension gauge (or ruler/caliper for sag measurement)
- Straightedge (600 mm / 24 inch) or laser alignment tool
- Torque wrench (range 10-50 Nm)
- Chain breaker tool (if chain replacement is needed)
- Replacement chain (if worn beyond limits, same pitch and width as OEM)
- Chain lubricant (ISO VG 150 or OEM-recommended chain oil)
- Clean rags and solvent (for degreasing)
- Flashlight or inspection mirror

4.0 Step-by-Step Maintenance Procedure

1. Perform Lockout/Tagout as per Section 2.0. Confirm zero energy state before proceeding.
2. Remove the chain guard or access cover. Inspect the guard for damage or missing fasteners. Set aside hardware in a clean container.
3. Visually inspect the entire length of the chain for signs of wear: stretched links, cracked side plates, seized pins, or uneven wear. If any link is damaged, replace the entire chain.

4. Inspect both drive and driven sprockets for tooth wear. Look for hooked or worn teeth, pitting, or galling. If sprocket wear exceeds 10% of tooth thickness, replace sprockets.
5. Measure chain sag (tension) at the midpoint of the longest span. For a typical rotary valve, the recommended sag is 1-2% of the center distance between sprockets (e.g., for a 600 mm center distance, sag should be 6-12 mm). Use a straightedge and ruler or a chain tension gauge.
6. If chain tension is too loose (sag > 2%), loosen the motor mounting bolts and slide the motor away from the rotary valve to increase tension. If too tight (sag < 1%), loosen and slide the motor toward the valve. Re-tighten motor bolts to OEM torque specification (typically 20-30 Nm for M8 bolts).
7. Check sprocket alignment using a straightedge placed across the faces of both sprockets. The straightedge should contact both sprocket faces evenly. If misaligned, shim the motor base or adjust the rotary valve sprocket position as needed. Maximum allowable offset is 0.5 mm per 100 mm of center distance.
8. Lubricate the chain with a high-quality chain lubricant. Apply oil to the inside of the chain (between the side plates) while rotating the chain by hand. Wipe off excess lubricant to prevent dust accumulation.
9. Reinstall the chain guard and secure all fasteners. Torque guard bolts to OEM specification (typically 10-15 Nm).
10. Remove all tools and debris from the work area. Verify that no loose items remain near the drive system.

5.0 Verification & Return to Service

1. Remove LOTO devices in reverse order. Re-energize the system per plant LOTO policy.
2. Start the rotary valve motor and let it run for 2-3 minutes. Listen for unusual noises (chattering, grinding, or slapping) which indicate misalignment or improper tension.
3. Observe the chain for smooth, vibration-free operation. The chain should not jump or skip on the sprockets.
4. Check the rotary valve rotation direction and confirm it matches the arrow on the housing. Verify that material is discharging properly.
5. Stop the motor and perform a final visual inspection of the chain and sprockets. Ensure no abnormal wear patterns have developed during the test run.
6. Complete the PM work order in ServiceGrid. Record chain sag measurement, sprocket condition, and any adjustments made. Note the date and technician name.

Regulatory Disclaimer: This document is a generic maintenance template provided for educational and informational purposes only. It does not constitute professional engineering or reliability advice. The end-user assumes all liability for validating all step sequences, torque specs, and LOTO protocols against specific machinery OEM manuals before deployment to a live production floor.