Moulder Outboard Bearing Stand Alignment Procedure

1.0 Maintenance Objective & Frequency

The objective of this procedure is to align the outboard bearing stand to the spindle centerline on a moulder. Proper alignment prevents excessive bearing wear, reduces spindle runout, minimizes vibration, and ensures consistent workpiece finish quality. This PM is critical for maintaining spindle accuracy and preventing unplanned downtime due to bearing failure.

Frequency: Every 500 operating hours or quarterly, whichever comes first. Also perform after any spindle or bearing replacement, or if vibration analysis indicates misalignment.

2.0 Lockout/Tagout (LOTO) & Safety

- Electrical Isolation: Lock out the main disconnect switch for the moulder. Verify zero energy state with a voltmeter.
- Pneumatic Isolation: Close the compressed air supply valve and bleed any residual pressure from the system.
- Mechanical Lockout: Ensure the spindle is fully stopped and cannot rotate. Use a spindle lock if available.
- PPE: Wear safety glasses, steel-toed boots, and cut-resistant gloves. Hearing protection is required if operating near other machinery.

3.0 Required Tools, Parts & Lubricants

- 0.0001-inch resolution dial indicator with magnetic base
- Precision straight edge (at least 12 inches long)
- Feeler gauge set (0.0015 to 0.030 inch)
- Torque wrench (range 20-100 Nm) with appropriate socket for bearing stand bolts
- Brass drift punch and dead-blow hammer
- Clean lint-free rags and degreaser
- Replacement bearing stand shims (various thicknesses: 0.002, 0.005, 0.010 inch)
- Anti-seize compound (nickel-based)
- ISO VG 68 bearing grease (if bearing requires re-lubrication)

4.0 Step-by-Step Maintenance Procedure

1. Perform LOTO as per Section 2.0. Confirm spindle is at a complete stop and all energy sources are isolated.
2. Remove the outboard bearing stand access cover and any guarding. Clean the bearing stand mounting surface and spindle shaft with degreaser and a lint-free rag.
3. Inspect the bearing stand for visible damage, cracks, or wear. Check the bearing for roughness by rotating it by hand. If any defects are found, replace the bearing stand assembly before proceeding.
4. Loosen the bearing stand mounting bolts by 1-2 turns using the appropriate socket. Do not remove them completely. This allows the stand to be adjusted.

5. Mount the dial indicator on the spindle housing or a rigid fixture. Position the indicator plunger against the outer diameter of the spindle shaft, near the bearing stand location. Zero the dial indicator.

6. Rotate the spindle by hand (or use a spindle wrench) and record the total indicated runout (TIR). Acceptable TIR is less than 0.002 inch. If TIR exceeds this, proceed with alignment adjustment.

7. Using the brass drift and dead-blow hammer, gently tap the bearing stand in the direction needed to reduce the runout. Tap in small increments (0.001-0.002 inch movement). Re-check runout after each tap. Repeat until TIR is within 0.002 inch.

8. If tapping does not achieve alignment, loosen the mounting bolts further and insert shims between the bearing stand and the machine base as needed. Use feeler gauges to determine the required shim thickness. Re-tighten bolts to 10 Nm and re-check runout. Adjust shim stack until TIR is acceptable.

9. Once alignment is achieved, torque the bearing stand mounting bolts to the OEM specification (typically 45-55 Nm) in a crisscross pattern. Apply anti-seize to the bolt threads before final torque.

10. Re-check the TIR after final torque. If runout has changed, repeat steps 7-9 until TIR remains below 0.002 inch.

11. If the bearing is grease-lubricated, apply 2-3 pumps of ISO VG 68 grease to the bearing fitting. Do not over-grease.

12. Reinstall the access cover and guarding. Remove all tools and debris from the work area.

5.0 Verification & Return to Service

1. Remove LOTO devices and restore power to the moulder.

2. Perform a dry run (no material) at low spindle speed (e.g., 2000 RPM) for 2 minutes. Listen for unusual noise or vibration. If abnormal, stop immediately and re-check alignment.

3. Run a test piece of material at normal feed rate and spindle speed. Inspect the workpiece finish for chatter marks or uneven surface. Acceptable finish is smooth and consistent.

4. Measure the spindle temperature with an infrared thermometer after 10 minutes of operation. Temperature should not exceed 60°C (140°F). If hotter, investigate bearing condition.

5. Complete the PM work order in ServiceGrid, documenting the final TIR reading, shim thickness used, and any observations. Sign off and return the machine to production.

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.