

# CNC Router Automatic Lubrication System Check and Refill

## 1.0 Maintenance Objective & Frequency

The objective of this procedure is to inspect the automatic lubrication system reservoir level, verify proper pump operation, and refill the reservoir with the specified lubricant. This PM prevents premature wear of linear guides, ball screws, and spindle bearings by ensuring consistent lubrication delivery. Frequency: Weekly or every 40 hours of spindle runtime, whichever comes first.

## 2.0 Lockout/Tagout (LOTO) & Safety

- Electrical Isolation: Disconnect main power to the CNC router control cabinet and apply a personal lock and tag.
- Pneumatic Isolation: Close the main compressed air supply valve and bleed any residual pressure from the system.
- Mechanical Lockout: Ensure the gantry is parked in a safe, accessible position and cannot move. Apply a mechanical brake lock if available.
- PPE: Safety glasses, nitrile gloves (to avoid skin contact with lubricant), and steel-toed boots.

## 3.0 Required Tools, Parts & Lubricants

- Approved lubricant per OEM spec (e.g., Mobil Vactra No. 2, ISO 68 way oil, or equivalent)
- Clean lint-free wipes or rags
- Flashlight or inspection light
- Funnel (if reservoir opening is small)
- Disposable gloves
- Oil absorbent pads (for spill cleanup)
- Catch pan or container (for any drips)

## 4.0 Step-by-Step Maintenance Procedure

1. Perform full LOTO as per Section 2.0. Verify zero energy state by attempting a cycle start (machine should not respond).
2. Locate the automatic lubrication system reservoir. Typically mounted on the gantry or near the control cabinet. Remove the reservoir cap or dipstick.
3. Visually inspect the oil level. The level should be between the minimum and maximum marks. If the reservoir is translucent, use a flashlight to check for clarity and contamination (no water droplets, sludge, or metallic particles).
4. If the level is low, add the specified lubricant using a clean funnel. Fill to the maximum mark. Do not overfill.
5. Inspect the pump unit for any signs of leakage around fittings, hoses, or the pump body. Tighten any loose fittings gently (do not overtighten).
6. Check the condition of the lubrication lines. Look for cracks, kinks, or disconnections along the path to the linear guides, ball screws, and spindle. Replace any damaged lines.

7. Manually actuate the lubrication pump (if equipped with a manual test button) to prime the system and verify that oil is being delivered to all distribution points. Listen for the pump cycle and observe oil exiting at the farthest point.
8. Wipe down any excess oil from the reservoir, pump, and surrounding area using lint-free wipes. Dispose of wipes and gloves properly.
9. Replace the reservoir cap securely. Ensure the cap vent (if present) is not blocked.
10. Remove LOTO devices and restore power and compressed air to the machine.

## 5.0 Verification & Return to Service

1. Power up the CNC router and allow the control system to initialize. Navigate to the lubrication system status screen (if available) and confirm no alarms are present.
2. Manually trigger a lubrication cycle from the control pendant or HMI. Listen for the pump to cycle and visually confirm oil is being distributed to the linear guides and ball screws (look for a thin film of oil on the guide surfaces).
3. Run a dry cycle (no cutting) at 50% rapid speed for 2 minutes. Monitor for any unusual noises from the axes or spindle that could indicate a lubrication fault.
4. Inspect the lubrication lines again after the cycle for any new leaks or disconnections.
5. If all checks pass, sign off on the PM work order in ServiceGrid, noting the amount of oil added and any observations.

**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.