# Weeke CNC Tool Changer Arm Calibration

## 1.0 Maintenance Objective & Frequency

The objective of this procedure is to calibrate the tool changer arm on a Weeke CNC machining center to ensure precise tool pickup and drop-off at the spindle and tool magazine. Proper calibration prevents tool crashes, reduces spindle wear, and minimizes machine downtime. This PM is required every 2000 operating hours or semi-annually, whichever comes first, or immediately after any collision or tool change error.

## 2.0 Lockout/Tagout (LOTO) & Safety

- Electrical Isolation: Disconnect main power at the machine disconnect switch and apply a personal lock and tag.
- Pneumatic Isolation: Close the main compressed air supply valve to the machine and bleed residual air from the tool changer pneumatic system.
- Hydraulic Isolation: If equipped with hydraulic tool clamping, isolate the hydraulic power unit and relieve system pressure per OEM instructions.
- PPE: Wear safety glasses, steel-toed boots, and cut-resistant gloves. Use a lifting device for heavy tool changer components if required.

## 3.0 Required Tools, Parts & Lubricants

- 0-1 inch Digital Micrometer (0.0001 inch resolution)
- Dial Indicator with magnetic base (0.001 inch resolution)
- 10mm Allen Key (hex wrench)
- 8mm Allen Key (hex wrench)
- Torque Wrench (range 10-50 Nm)
- Feeler Gauge Set (0.001-0.020 inch)
- Calibration Tool (simulated tool holder or master tool, per Weeke spec)
- ISO 68 Hydraulic Oil (for lubrication points if specified)
- Clean lint-free rags
- ServiceGrid mobile device or tablet for digital PM sign-off

## 4.0 Step-by-Step Maintenance Procedure

1. Perform LOTO as per Section 2.0. Verify zero energy state by attempting to jog the tool changer arm manually (it should not move).
2. Remove the tool changer arm access covers using a 10mm Allen key. Set covers aside in a clean area.
3. Visually inspect the tool changer arm for cracks, wear, or damage. Check all bolts for tightness. Report any anomalies before proceeding.

4. Mount the dial indicator with magnetic base on the spindle housing. Position the indicator tip on the tool changer arm gripper surface (at the tool clamping point). Zero the indicator.

5. Manually rotate the tool changer arm through its full 180-degree arc (using the manual rotation tool if available). Record the maximum runout on the dial indicator. Acceptable runout is less than 0.005 inches (0.127 mm). If runout exceeds this, proceed to adjustment step.

6. If adjustment is needed, loosen the four M8 bolts securing the tool changer arm to the drive shaft using an 8mm Allen key. Do not remove bolts completely.

7. Using a soft mallet, gently tap the tool changer arm to align it. Re-check runout with the dial indicator. Repeat until runout is within 0.005 inches. Tighten the M8 bolts to 25 Nm using a torque wrench.

8. Install the calibration tool (master tool holder) into the tool changer arm gripper. Manually cycle the arm to the spindle position. Use a feeler gauge to check the gap between the tool holder taper and the spindle taper. The gap must be 0.002-0.005 inches (0.05-0.127 mm). Adjust the arm height using the eccentric adjustment screw (if equipped) per OEM manual.

9. Lubricate all pivot points and gripper mechanisms with ISO 68 hydraulic oil as specified in the Weeke lubrication chart. Wipe off excess oil with a clean rag.

10. Reinstall all access covers and tighten fasteners to 10 Nm. Remove all tools and debris from the work area.

## 5.0 Verification & Return to Service

1. Remove LOTO devices. Restore main power and compressed air. Verify the machine is in manual mode.

2. Jog the tool changer arm through a full cycle (pick tool from magazine, place at spindle, return) using the manual control panel. Listen for unusual noises and watch for smooth motion.

3. Run an automatic tool change cycle with a test tool (non-production). Verify the tool is securely clamped at the spindle and released properly at the magazine.

4. Run three consecutive automatic tool changes using different tool positions in the magazine. Confirm no errors or collisions occur.

5. Sign off on the PM work order in ServiceGrid, documenting the runout measurements and any adjustments made. Attach a photo of the dial indicator reading if possible.