Cincinnati_No2_Workholding_and_Tooling_Guide.md

Workholding & Tooling Reference

Cincinnati No. 2 Tool & Cutter Grinder

Fixtures, T-Slot Hardware, and Part-Specific Solutions

Machine & Table Context

- **Machine:** Cincinnati No. 2 Tool & Cutter Grinder
- **Table size:** 6" × 44"
- **Longitudinal travel:** ~24"
- **Spindle speed:** 3800 RPM

T-Slot Geometry (Measured)

- **Throat (narrow opening):** ~0.557" (≈ 9/16")
- **Undercut width:** ~0.959"
- **Undercut height:** ~0.380"
- **Top of undercut below table surface:** ~0.516"

Practical Interpretation

These dimensions correspond closely to **ANSI-style 9/16" T-slots**, intended for **nominal 1/2" T-bolts**.

In shop terms:

- Buy hardware marketed as **9/16" T-slot** or **1/2" T-bolt system**
- Thread size typically **1/2-13**

T-Slot Hardware Buy List (Recommended)

Core Hardware

- (8–12) **1/2-13 T-slot nuts**, sized for 9/16" slots
- (8–12) **1/2-13 studs**, assorted lengths (2", 3", 4")
- (6–8) **Strap clamps** (1/2" system)
- (6–8) **Step blocks** (matched to strap clamps)
- (4–6) **Hardened parallels or setup blocks**

Optional but Very Useful

- Low-profile **toe clamps** (1/2" system)
- Assorted **socket-head cap screws** (1/2-13)
- Ground spacer blocks (shop-made or purchased)

Tooling Gaps & Budget-Friendly Solutions

1. Minimal Surface Grinding Capability

Best Value

Fine-pole permanent magnetic chuck, 6" wide

- Ideal size: **6" × 12"**
- Used premium often best value
- Import acceptable for light grinding

Interim / Complementary

Toolmaker’s vise (2"–2.5")

2. Holding Lathe Tool Bits for Sharpening

Toolmaker’s vise + simple angle blocks

- Repeatable rake and relief
- Safe, rigid presentation

3. Holding Short Shafts for End Finishing

See part-specific section below.

Specific Part Geometry

- **Eccentric shaft:** Ø 5/16", length 5/16"
- **Disc:** Ø 1-1/4", thickness 1/4"
- **Stem:** Ø 9/16", length 2-3/8" (coaxial)

Recommended Solution for This Part

Dedicated Grinder-Only 5C Spin Fixture

- Hold part by **9/16" stem** in 5C collet
- Establish fixed axial stop
- Face-grind eccentric shaft end
- Do **not** rotate during grinding

Alternate Solution

Toolmaker’s Vise + V-Block + Stop

- Immediate, inexpensive
- Less repeatable than collet holding

What You Do Not Need

- Cylindrical grinder
- Eccentric grinding fixtures
- Dividing heads with offsets

Recommended Purchase Priority

1. 1/2-13 T-slot hardware set
2. Toolmaker’s vise
3. Dedicated grinder-only 5C spin fixture
4. Fine-pole magnetic chuck

Final Notes

This approach maximizes capability while minimizing cost and avoids rare or proprietary tooling.