

Colchester Lathe 101



Safety

- Don't wear gloves
- Don't wear long sleeves or 'dangly' clothing
- Wear eye protection
- Wear closed shoes (no sandals, crocs, etc) Steel toe isn't a bad idea.

What to do WHEN something breaks

- Shut everything down as soon as possible
- Report the breakage
 - Use ticket system
 - Email helpdesk@dallasmakerspace.org
(Must have AD account linked to that email to work!)

Ticket System

The screenshot shows the Dallas Makerspace website in a Mozilla Firefox browser. The URL is <https://dallasmakerspace.org/#>. The page features a header with the Dallas Makerspace logo and a navigation menu. A dropdown menu is open under the 'Organization' link, with the 'Ticket System (HelpDesk)' option highlighted in yellow. The main content area has a background image of a workshop with the text 'Make Hack Learn' and a list of activities: 3D Design, Sewing, Photography, Woodworking, Blacksmithing, Arts, CNC Machining, Robots, Electronics, Pottery, and Welding. A red button labeled 'See Our Class Schedules' is positioned below the list. The footer contains four columns of text: 'Who We Are', 'What We Do', 'Why We Do It', and 'Why Should I Join', followed by a red button labeled 'Join Today >'.

Navigation Menu:

- Home
- Events
- Join
- Teach
- Contribute
- Organization
 - Member Portal
 - Forums
 - Billing
 - Voting
 - Password Reset
 - Ticket System (HelpDesk)**

Main Content:

Make Hack Learn

3D Design Sewing Photography
Woodworking Blacksmithing Arts
CNC Machining Robots Electronics
Pottery Welding

[See Our Class Schedules](#)

Who We Are

The Dallas Makerspace is a 501(c)(3) non-profit, shared community workshop and laboratory. We are an organized group of local artists, engineers, makers, and thinkers who work together to provide tools and learning resources to the public.

What We Do

We use these resources to collaborate on individual and community projects in order to promote science, technology and art; while working and experimenting on innovative ideas to encourage learning within our community.

Why We Do It

At the Dallas Makerspace we believe that collaboration is a truly effective form of learning. To that end, our members and volunteers teach classes, hold unique educational events and collaborate on cool projects.

Why Should I Join

- 24/7 Access to our tools & space
- A voice in how the organization is run
- Discounts on some classes and workshops
- Support our mission

The Dallas Makerspace needs your support. [Join Today >](#)

<https://accounts.dallasmakerspace.org/tkt/portal/>

Noise

- If it doesn't sound right, then STOP
- Metalworking when done properly is MUCH quieter than woodworking.

Basic Rules

- Clean up your mess!
- Put the tools back where they belong!
- If you don't know, ask!

For more information

- Slides and User manual from //Files/committees/machineshop/Training/Colchester
- Wiki Page

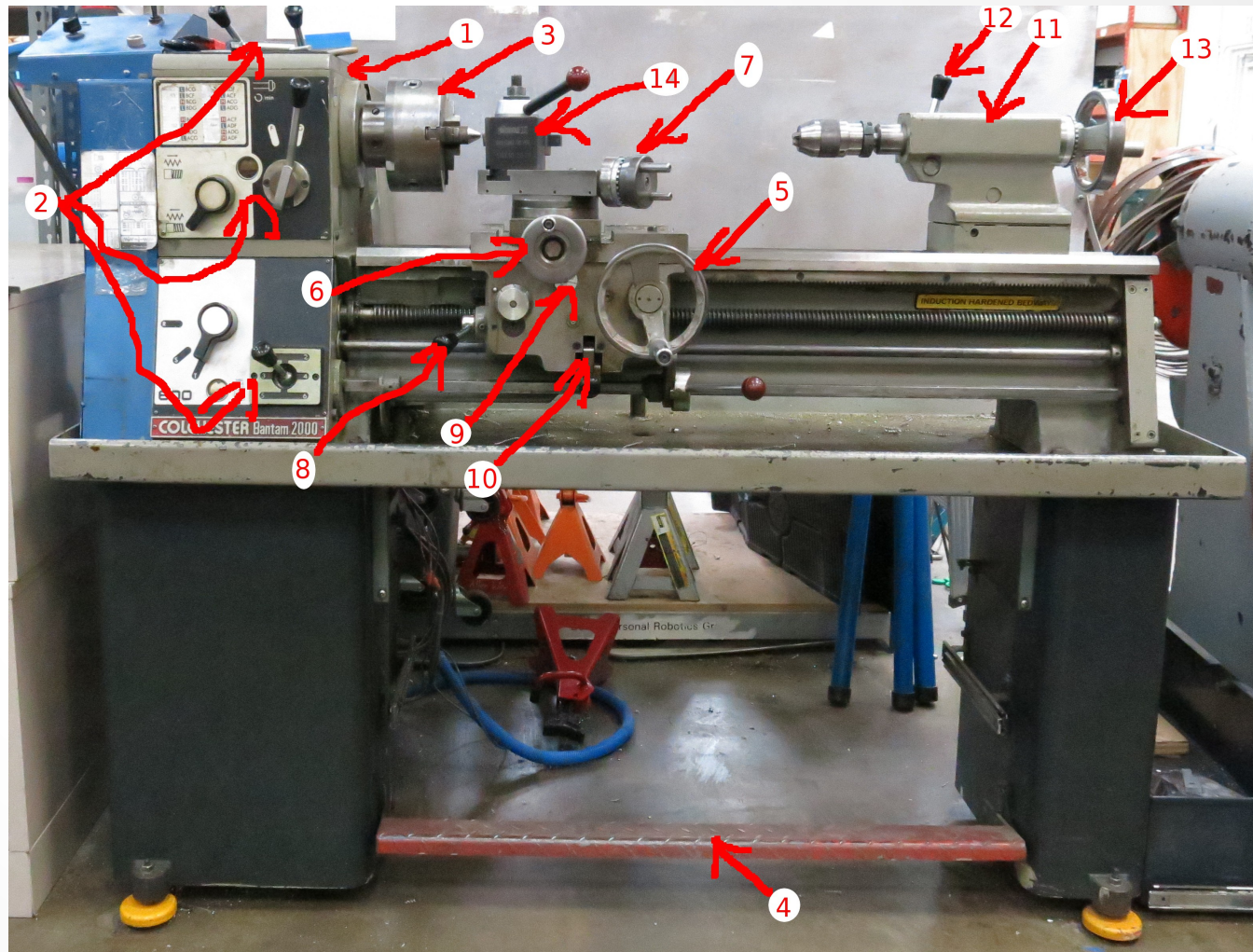
https://dallasmakerspace.org/w/images/e/e4/Bantam_2000_Manual.pdf

If your going to use the lathe, take the time to review this document!

- For cutting speed and feeds, refer to the space's copy of the machinery handbook.
 - Provides current speeds as surface feet per minute (SFM). To get RPM
$$\text{RPM} = \text{SFM} * 4 / \text{Diameter of Part (inches)}$$
 - Tables provide maximum, start at about 2/3 of provided value

Lathe Parts and Controls

1. Headstock
2. Gear Box
3. Chuck
4. Emergency Stop
5. Saddle traverse hand wheel
6. Cross traverse hand wheel
7. Top slide traverse hand wheel
8. Lead nut operating lever
9. Surfacing and sliding feed selector
10. Power feed lever
11. Tail stock
12. Quill Lock
13. Tail stock feed hand wheel
14. Tool post



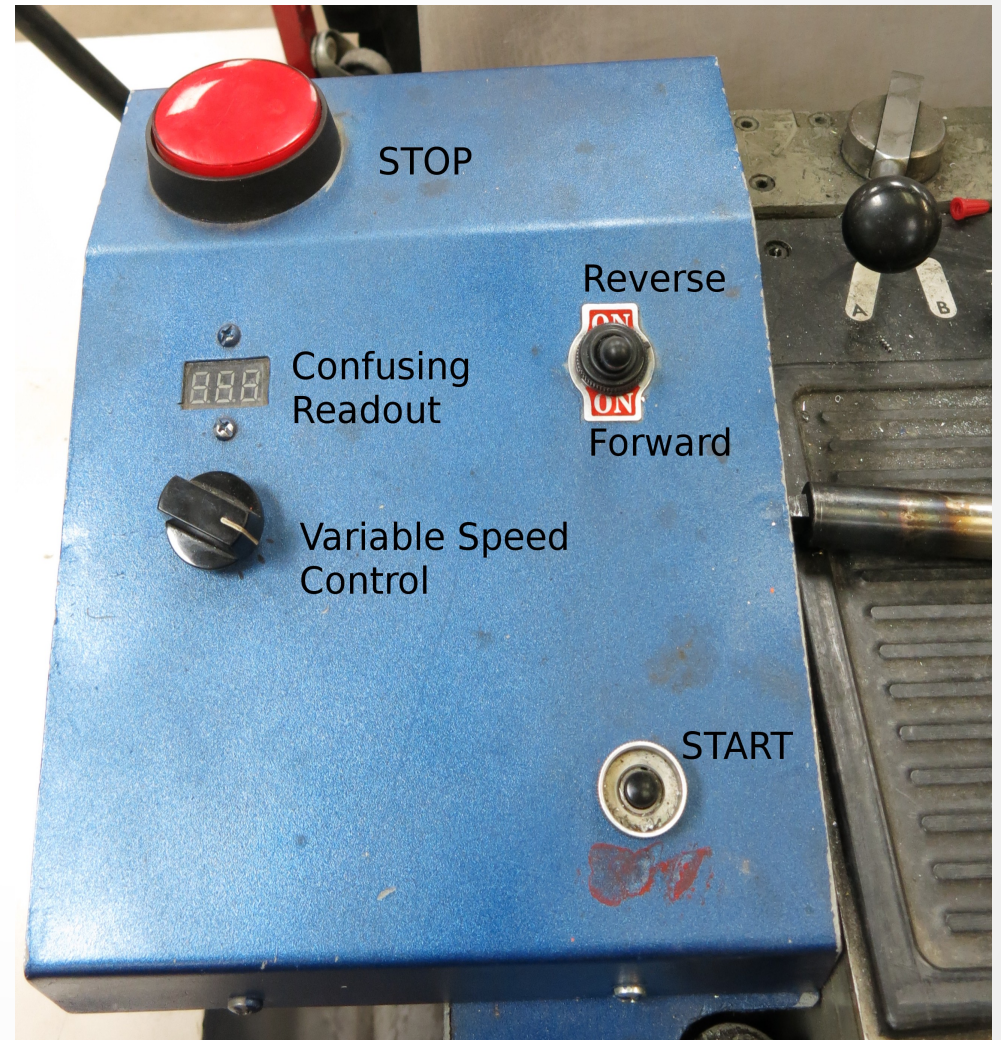
Starting Lathe

- While MOTOR IS OFF, set gear levers to desired speed
- Settings in manual are not correct for motor we have
- Use following:
 - BCG – 34 RPM
 - BCF – 56 RPM
 - BDG – 82 RPM
 - BDF – 133 RPM
 - ACG – 257 RPM
 - ACF – 327 RPM
 - ADG – 486 RPM
 - ADF – 773 RPM



Starting Lathe

- Electronics Box
- Variable Speed



Mount a Chuck

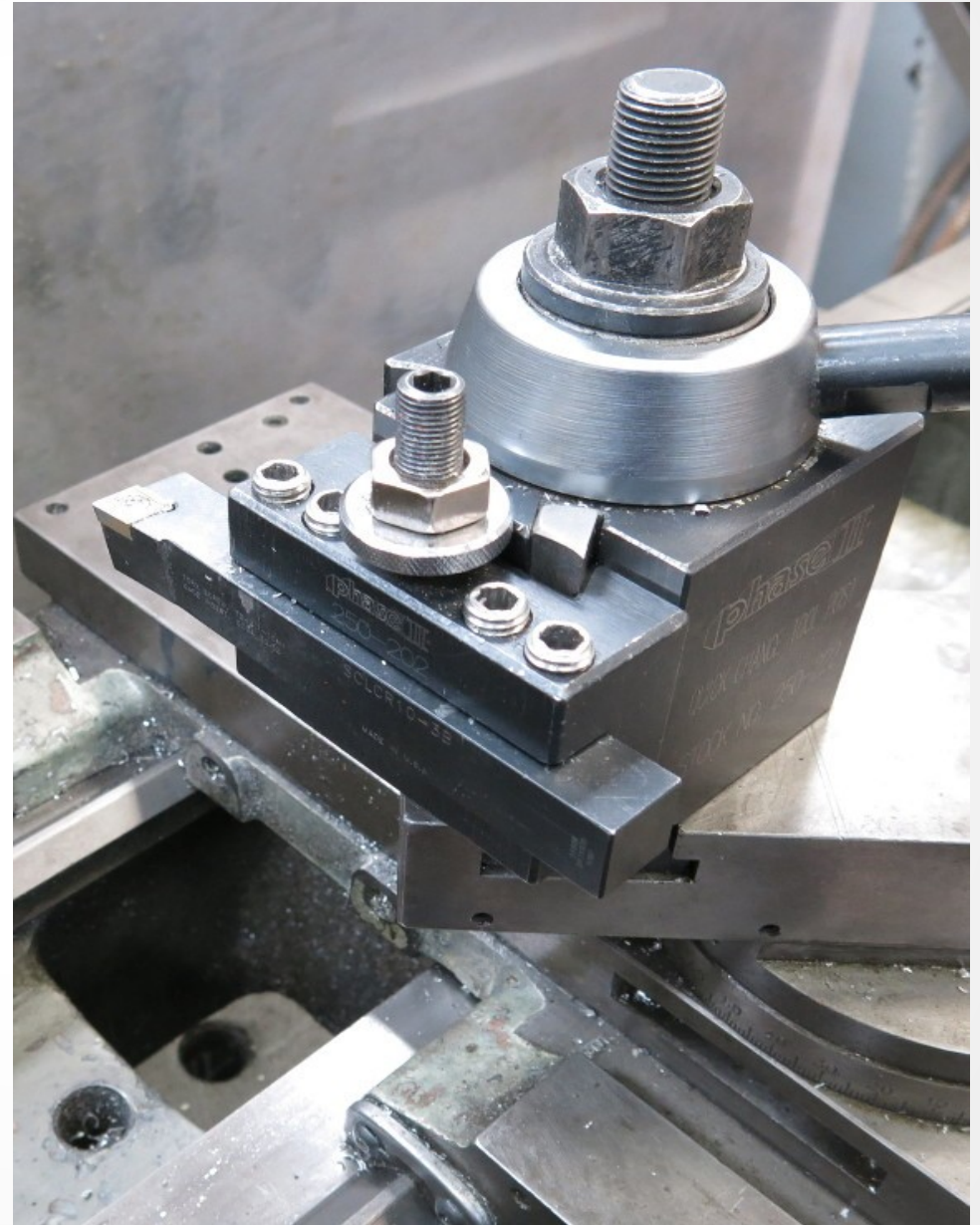


Chucks

- 3-jaw (Default) “6 inch”
 - Self-centering
 - Not overly accurate
 - Jaws are NOT reversible
- 4-jaw “5 inch and 8 inch”
 - Can be time consuming, but with practice can get +/- 0.001” within 2 minutes
 - As accurate as you want it to be

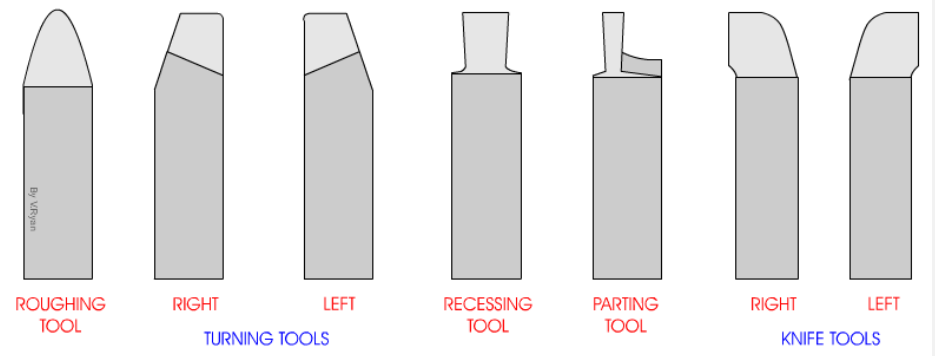
Toolpost

- Replaceable inserts
- Quick clamp
- Must be set to the center height



Traditional Tool Shapes

- Usually made from HSS
- Need to grind your own



Our tool holder

- Carbide inserts
- No need for grinding
- Used to cut toward headstock (left cutting) and to face part
- Can't cut to a right hand shoulder
- We have two, one setup for aluminum, cast iron, brass, and bronze and the other for steel



- Matching part to cut to a right hand shoulder
- DMS doesn't own.



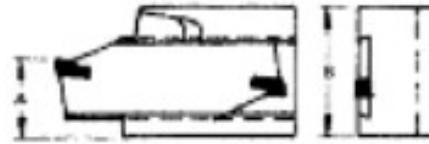
Cut Off Tool Insert Holder

#71



CUT-OFF AND GROOVING HOLDER

Designed for extremely high rigidity under heavy duty conditions, and cool chatter-free operation at higher speeds. Two different blades can be used with this holder: wedge grip throwaway insert blade, or reversible blade with brazed-in carbide tips. The chip-breaker is an integral part of the blade and cannot be lifted by broken chips. Simplicity is but one of the major advantages of the Series 71. Adjustment of the blade position is simple, the locking is accomplished by one screw instead of the usual number of adjusting and clamping screws. The versatility of this tool is further increased by the availability of a wide range of cutting edge widths. Holder supplied less blade. When ordering brazed carbide blades, specify grade A2 or A6. For carbide cut-off inserts see page 54.



ORDER # AXA-71

PRICE EA. \$207.00

A	B	USED WITH BLADE WIDTHS
$\frac{15}{16}$	$1\frac{13}{16}$	$\frac{1}{8}$, $\frac{3}{16}$ or $\frac{1}{4}$

REVERSIBLE BLADES WITH BRAZED-IN CARBIDE TIPS



ORDER NUMBER	71-125-1*	71-187-1*	71-250-1*
WIDTH x HEIGHT	.120 x 1.50	.187 x 1.50	.250 x 1.50
PRICE	\$71.50	\$81.00	\$85.50

WEDGE GRIP THROWAWAY INSERT BLADES



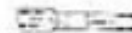
ORDER NUMBER	71-125-1BSL*	71-187-1BSL*	71-250-1BSL*
WIDTH x HEIGHT	.120 x 1.50	.187 x 1.50	.250 x 1.50
PRICE	\$75.00	\$83.00	\$91.00

EXTRACTOR (For self-locking carbide insert removal)

ORDER # ESG-1*

PRICE EA. \$4.40

WEDGE AND LOCK SCREW ASSEMBLY FOR HOLDERS #7



ORDER # WSA-6*

PRICE EA. \$49.50

HEIGHT ADJUSTMENT ASSEMBLY



ORDER # AXA-HA*

PRICE EA. \$12.60

Cut off tool inserts

- Hertel
 - C2 for Cast Iron, Aluminum, Brass
Enco 359-3062
 - C5 for steel
Enco 359-3065



MGTN HT10 Grade, 1/4 Inch Cutting Width, Carbide Cutoff Insert

Applications:	Cut-Off
Cutting Width (Decimal Inch):	.2500"
Material:	Carbide
Manufacturer's Grade:	HT10
Industry Grade:	C2
Lead Angle:	0
Style:	MGTN-6

Model #359-3062
Low Price:\$9.03 ea
Availability: In Stock

Quantity **ADD TO CART**

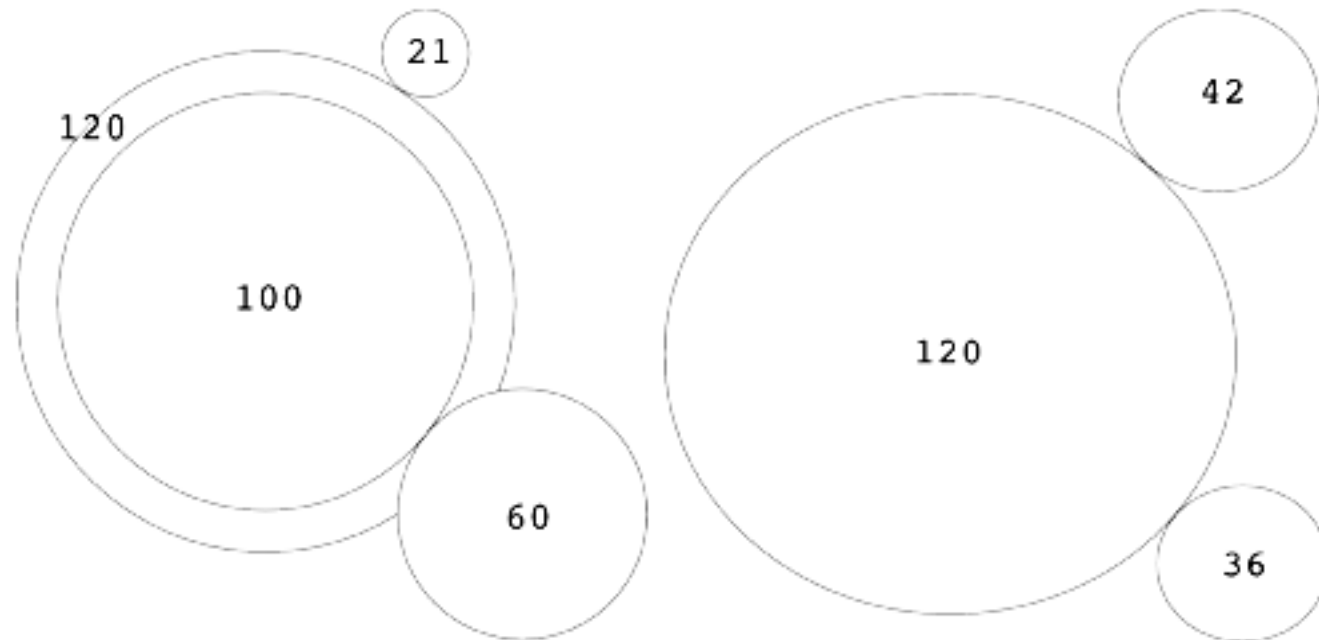
[Master Catalog Page 180](#)

Feed Rates

- Upper black knob controls feed direction
- Lower two controls control feed rates (RST, 1-6)



Feed Rates

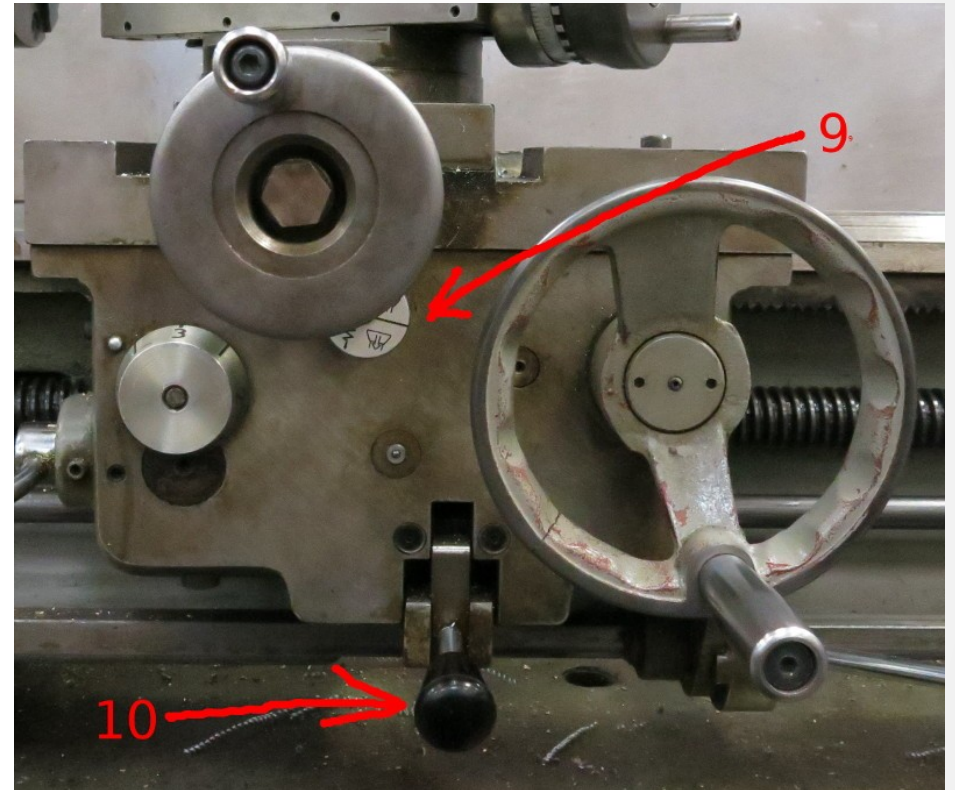


Gear Setting	Feed Rate (inches per rev)	Gear Setting	Feed Rate (inches per rev)
R5	0.001	R5	0.005
R2	0.002	R4	0.006
S3	0.003	R2	0.008
S2	0.004	S6	0.010
T5	0.005	S4	0.012
T3	0.006	S2	0.016
T2	0.008	T6	0.020
		T4	0.025
		T3	0.032

Feed Controls

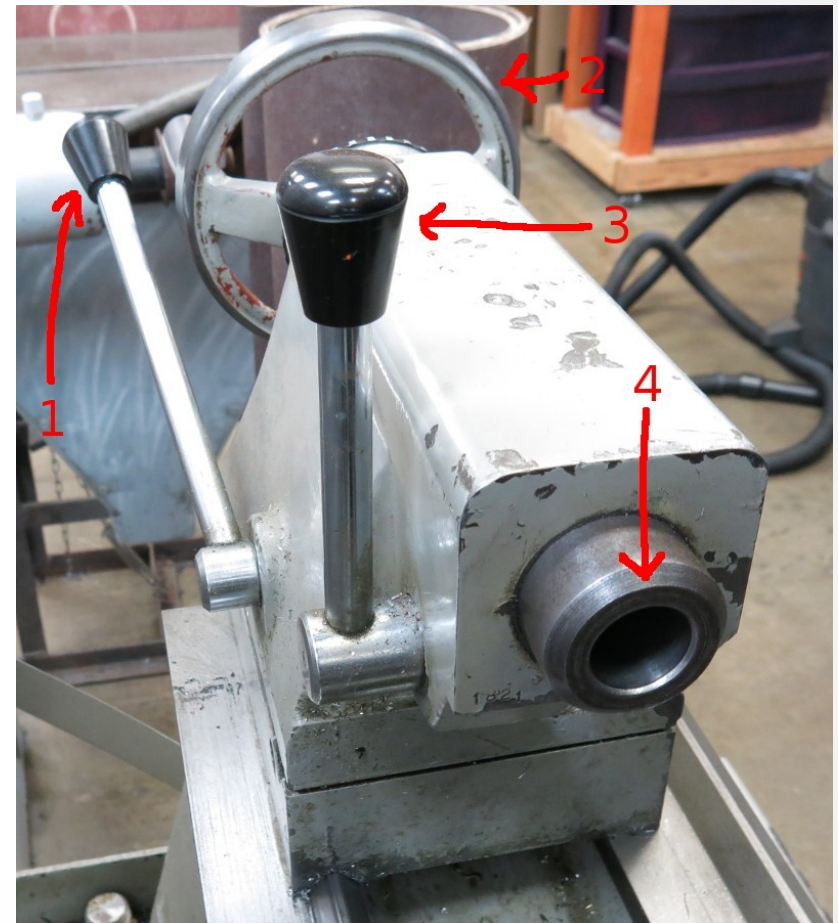
While machine is running!

- 9 - Surfacing and sliding feed selector
 - Push in for cross slide
 - Pull Out for traverse
- 10 - Power feed lever
 - Lift to engage power feed



Tail stock

- 1 – Tail stock bed lock
- 2 – Tail stock feed wheel
- 3 – Tail stock quill feed lock
- 4 – Tail stock quill



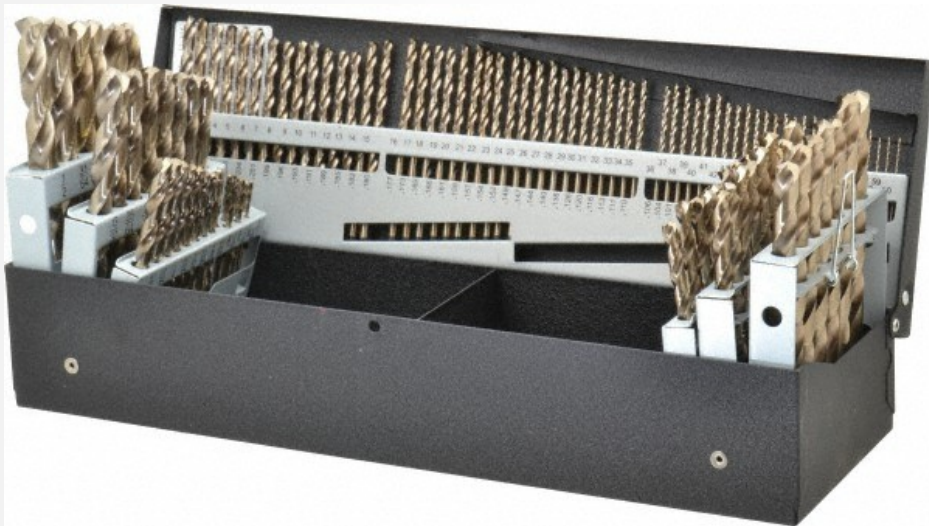
Tail Stock

- Quill – Morse Taper 3
- Drill Chuck
- Drill Bit
- Live Center

Drill Chuck



Drill Bits



Live Center

- Used to support piece
- Decreases deflection



Center Bits

- Use appropriate size for stock
- Drill to about $\frac{2}{3}$ of the way up the cone

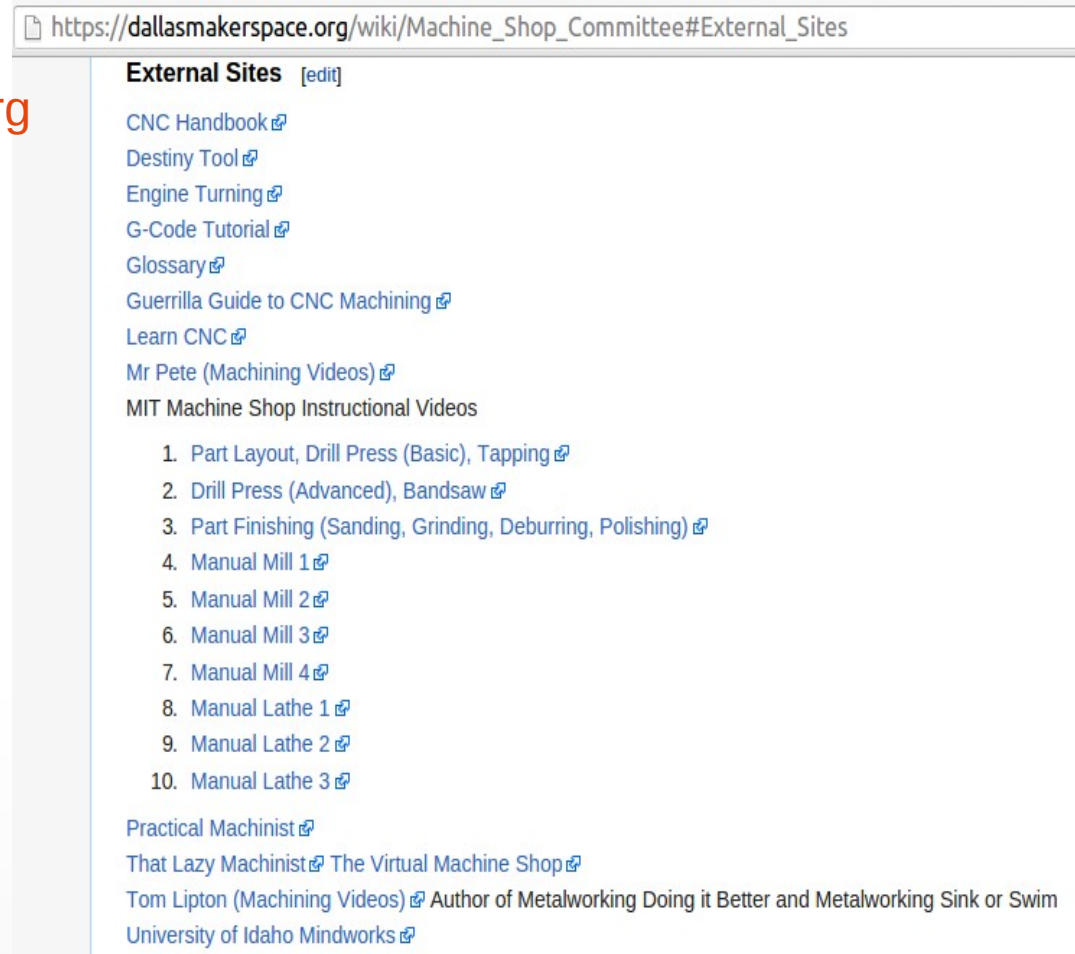


Final Information

- Use cutting fluid, liberally, when cutting anything other than brass or cast iron.
- If you use a file or sand paper on lathe, place some protective cloth/cover over the ways

For more information

- https://dallasmakerspace.org/wiki/Machine_Shop_Committee#External_Sites
- machineshop@dallasmakerspace.org
- Wiki contains links to MIT machine shop videos. Take the time to watch the lathe videos for details on actual machining technique if you haven't used a lathe before.



https://dallasmakerspace.org/wiki/Machine_Shop_Committee#External_Sites

External Sites [edit]

- [CNC Handbook](#)
- [Destiny Tool](#)
- [Engine Turning](#)
- [G-Code Tutorial](#)
- [Glossary](#)
- [Guerrilla Guide to CNC Machining](#)
- [Learn CNC](#)
- [Mr Pete \(Machining Videos\)](#)
- MIT Machine Shop Instructional Videos
 - [1. Part Layout, Drill Press \(Basic\), Tapping](#)
 - [2. Drill Press \(Advanced\), Bandsaw](#)
 - [3. Part Finishing \(Sanding, Grinding, Deburring, Polishing\)](#)
 - [4. Manual Mill 1](#)
 - [5. Manual Mill 2](#)
 - [6. Manual Mill 3](#)
 - [7. Manual Mill 4](#)
 - [8. Manual Lathe 1](#)
 - [9. Manual Lathe 2](#)
 - [10. Manual Lathe 3](#)
- [Practical Machinist](#)
- [That Lazy Machinist](#) [The Virtual Machine Shop](#)
- [Tom Lipton \(Machining Videos\)](#) [Author of Metalworking Doing it Better and Metalworking Sink or Swim](#)
- [University of Idaho Mindworks](#)