



**3000, 4000,  
4100, 7500,  
7700**

**Drum & Disc  
Brake Lathes**



**Installation Instructions  
Operating Instructions  
Safety Instructions  
Maintenance Instructions**

READ these instructions before placing unit in service. KEEP these and other materials delivered with the unit in a binder near the machine for ease of reference by supervisors and operators.

***HENNESSY INDUSTRIES, INC.***

1601 J. P. Hennessy Drive, LaVergne, TN USA 37086-3565 615/641-7533 800/688-6359

HENNESSY INDUSTRIES INC. Manufacturer of AMMCO®, COATS® and BADA® Automotive Service Equipment and Tools.

Manual Part No.: 911005 47

Revision: 11/03

# Safety

## Table of Contents

<b>Definitions of Hazard Levels</b> .....	ii
<b>Owner's Responsibility</b> .....	ii
<b>Safety Notices and Decals</b> .....	iii
<b>Warning</b> .....	iii
Cautions and Dangers .....	iii
<b>Important Safety Instructions</b> .....	iv
<b>Before You Begin</b>	
Receiving .....	1
Electrical Requirements .....	1
Installation .....	1
Operating Specifications .....	2
Principle Operating Parts .....	3
Arbor Installation .....	4
Adapters .....	4
<b>Basic Operation</b>	
Spindle .....	4
Spindle Feed .....	4
Spindle Speed .....	4
Spindle Speed Adjustment .....	4
Crossfeed .....	4 - 5
V-belt Tension and Adjustments .....	5
Poly V-belt Tension .....	5
Basic Operation of Handwheels .....	5
<b>Reconditioning Brake Drums</b>	
Preparation .....	6
Mounting Drums .....	6 - 8
<b>Reconditioning Disc Brake Rotors</b>	
Preparation .....	8
Twin Cutters .....	8
Model 6950 Twin Cutter - 4000 & 7500 .....	8
Rotor Mounting .....	9
Set Up and Reconditioning Rotors .....	10 - 11
Model 7900 Twin Cutter - 4100 .....	12
Installation .....	12
Preparation .....	12
Rotor Mounting .....	12
Set Up and Reconditioning Rotors .....	13
<b>Maintenance and Service</b>	
Oiling .....	14
Cleaning .....	15
Care of Arbors and Adapters .....	15
Shear Gear Replacement .....	15

## Definitions of Hazard Levels

Identify the hazard levels used in this manual with the following definitions and signal words:

**DANGER** Watch for this symbol:



It Means: Immediate hazards, which will result in severe personal injury or death.

**WARNING** Watch for this symbol:




It Means: Hazards or unsafe practices, which could result in severe personal injury or death.

**CAUTION** Watch for this symbol:



It Means: Hazards or unsafe practices, which may result in minor personal injury or product or property damage.

 Watch for this symbol! It means BE ALERT! Your safety, or the safety of others, is involved!

## Owner's Responsibility

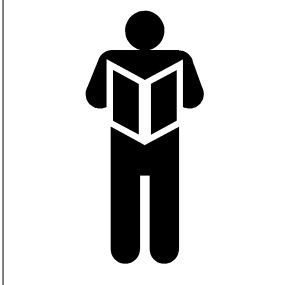
To maintain machine and user safety, the responsibility of the owner is to read and follow these instructions:

- Follow all installation instructions and make sure installation conforms to all applicable Local, State, and Federal OSHA Regulations and Electrical Codes.
- Carefully check the unit for correct initial function.
- Read and follow the safety instructions. Keep them readily available for machine operators.
- Make certain all operators are properly trained, know how to safely and correctly operate the unit, and are properly supervised.
- Allow unit operation only with all parts in place and operating safely.
- Carefully inspect the unit on a regular basis and perform all maintenance as required.
- Service and maintain the unit only with authorized or approved replacement parts.
- Keep all instructions permanently with the unit and all decals/labels/notices on the unit clean and visible.
- If ownership of the unit is transferred, provide new owner all information, manuals, and provide AMMCO new ownership information.

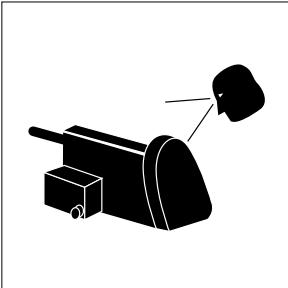
# Safety

## Safety Notices and Decals

For your safety, and the safety of others, read and understand all of the safety notices and decals included here and on the unit.



**Read entire manual before installing, operating, or servicing this equipment.**



**Proper maintenance and inspection is necessary for safe operation.**



**Do not operate a damaged lathe.**

<b>⚠ CAUTION ⚠</b> Prevent accidents and injury, read and follow instructions.		
<ol style="list-style-type: none"><li>1. Read and follow instructions.</li><li>2. Always wear eye protection, avoid loose clothing and jewelry.</li><li>3. Keep all guards, shields, and covers in place and in working order.</li><li>4. Keep bystanders out of work area.</li><li>5. Unplug unit from power source before servicing or adjusting.</li><li>6. Maintain unit properly, keep work surfaces and work area clean.</li></ol>		

## Warning

This equipment incorporates parts such as snap switches and power receptacles which tend to produce arcs or sparks. Therefore, when located in a service facility, the unit should be in a room or enclosure provided for the purpose, or should be at least 18" or more above floor to minimize the risk of igniting fuel vapors.

### Cautions and Dangers

1. Eye and face protection requirements:

"Protective eye and face equipment is required to be used where there is a reasonable probability of injury that can be prevented by use of such equipment." OSHA 1910.133 (a).

Protective goggles, safety glasses, or a face shield must be provided by the purchaser/user and worn by the operator of the equipment. Make sure all eye and face safety precautions are followed by the operator(s). Keep bystanders out of the area.

2. Do not remove any safety equipment, belt guards, or shortcut controls or operations.
3. Make sure drums and rotors are properly and squarely mounted before starting lathe, and that all parts are secure.
4. Do not wear loose clothing, jewelry, or gloves when operating or working around a lathe.
5. Do not overload the lathe. Read and understand the lathe specifications. Overloading is poor machine tool practice, shortens the life of the lathe, and could cause a failure resulting in personal injury.



**Failure to follow danger, warning, and caution instructions may lead to serious personal injury or death to operator or bystander or damage to property. Do not operate this machine until you read and understand all the dangers, warnings and cautions in this manual. For additional copies of either, or further information, contact:**

### **Hennessy Industries, Inc.**

1601 J.P. Hennessy Drive  
LaVergne, TN 37086-3565  
(615) 641-7533 or (800) 688-6359  
[www.ammcoats.com](http://www.ammcoats.com)

# IMPORTANT SAFETY INSTRUCTIONS

Before operating the lathe, review the warning information on the lathe and the cautions, warnings and dangers in this manual. Also review the following general safety instructions. Failure to follow safety instructions could result in personal injury to operator or bystanders and damage to the lathe or personal property.

## READ ALL INSTRUCTIONS

When using your garage equipment, basic safety precautions should always be followed, including the following:

- 1.** Keep guards in place and in working order.
- 2.** Remove adjusting keys and wrenches from the tool before turning it on. Make this a habit.
- 3.** Keep work area clean. Cluttered areas and benches invite accidents.
- 4.** Avoid dangerous operating environments. Do not use power tools in areas where explosive vapors are present or in damp or wet locations. Do not expose them to rain. Keep the work area clean and well lighted.
- 5.** Keep children away. All bystanders should be kept completely away from the work area.
- 6.** Make the workshop kid-proof. Use padlocks and master switches, and remove starter keys.
- 7.** Don't force a tool. It will do the job better and safer at the rate for which it was designed.
- 8.** Use the right tool. Don't force a tool or an attachment to do a job for which it was not designed.
- 9.** Dress properly. Keep loose clothing, gloves, neckties, shop rags or jewelry may get caught in moving parts. Non-slip footwear is recommended. Wear protective hair covering to contain long hair.
- 10.** Wear eye protection. Safety glasses, goggles, or a face shield will help protect the operator from injury. Use a face shield and dust mask during dusty operations.
- 11.** Secure the work properly to the unit for setup and tool bit positioning. Do not attempt to hold a drum or rotor steady on the arbor with your hands. Both hands must be free to operate unit.
- 12.** Don't overreach. Keep proper footing and balance at all times when lathe is in operation or when working around the unit.
- 13.** Maintain tools with care. Keep tools sharp and clean for best and safest performance. Follow instructions for lubricating and changing accessories.
- 14.** Remove power from the unit and disconnect tools before servicing and when changing accessories such as blades, bits, cutters, etc. Follow lock-out and tag-out procedures as required.
- 15.** Avoid unintentional starting. Make sure the switch is in the OFF (O) position before plugging the machine in or performing any maintenance or service work.
- 16.** Use recommended accessories. Consult the manufacturer's catalogs for recommended accessories. Use of improper accessories may cause risk of injury to operator or bystanders.
- 17.** Never stand or lean on a lathe. Serious injury could occur if the lathe is tipped or if the cutting tool is unintentionally contacted.
- 18.** Check damaged parts carefully. Before further use of the lathe, a guard or other part that is damaged should be carefully checked. Immediately replace all damaged, missing, or non-functional parts. Check for alignment of moving parts, binding of moving parts, breakage of parts, mounting, and any other conditions that may affect operation. Guards and other parts that are damaged should be properly repaired or replaced before lathe is used again.
- 19.** Always feed the work into a blade or cutter and against the direction of rotation. Cutters and tool bits are designed to cut from the inside of a drum or rotor to the outer edge. Do not attempt to cut from the outside edge in to the center.
- 20.** Never leave tools running unattended. Turn the power off. Don't leave the tool until it comes to a complete stop.
- 21.** Never use compressed air to blow the tool clean. Chips and dust may be driven between machined parts and into bearings, causing undue wear. They may also contact persons in the area causing personal injury.
- 22.** Operate the lathe in the proper environment. The lathe incorporates parts such as snap switches and power receptacles which tend to produce arcs or sparks. Therefore, when located in a garage, the unit should be in a room or enclosure provided for the purpose, or should be at least 18" or more above the floor to minimize the risk of igniting fuel vapors.

## SAVE THESE INSTRUCTIONS

# Brake Lathes

## Before You Begin

### Receiving

The shipment should be thoroughly inspected as soon as it is received. The signed bill of lading is acknowledgement by the carrier of receipt in good condition of shipment covered by our invoice.

If any of the goods called for on this bill of lading are shorted or damaged, do not accept them until the carrier makes a notation on the freight bill of the shorted or damaged goods. Do this for your own protection.

NOTIFY THE CARRIER AT ONCE if any hidden loss or damage is discovered after receipt and request the carrier to make an inspection. If the carrier will not do so, prepare a signed statement to the effect that you have notified the carrier (on a specific date) and that the carrier has failed to comply with your request.

IT IS DIFFICULT TO COLLECT FOR LOSS OR DAMAGE AFTER YOU HAVE GIVEN THE CARRIER A CLEAR RECEIPT.

File your claim with the carrier promptly. Support your claim with copies of the bill of lading, freight bill, invoice, and photographs, if available.

Although AMMCO's responsibility ceases upon delivery of the shipment to the carrier, we will gladly assist in tracing lost shipments. Our willingness to assist in every possible manner does not make AMMCO responsible for collection of claims or replacement of lost or damaged materials. Shipping damage claims will not be handled under warranty.

### Electrical Requirements

The lathe must be properly grounded to protect the operator from shock. The lathe is equipped with an approved 3-conductor cord and a 3-prong grounding type plug to fit the proper grounding-type receptacle. Should an extension cord be required, use 3-conductor cords with 3-prong grounding plug and 3-prong grounding receptacle properly rated to handle this electrical power tool only. Do not modify a cord or plug to match a receptacle; have a qualified electrician install an appropriate outlet to match the lathe requirements. Repair or replace any worn or damaged power cords immediately.

Verify that the lathe plug and grounding-type receptacle match as shown in Figure 1.

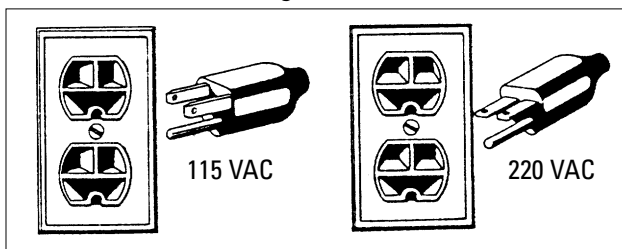


Figure 1 - Power Cord Plug and Receptacle Types

### Installation

1. Assemble bench according to the instructions provided. Tighten all fasteners securely.
2. After assembly, the bench should be leveled and may be bolted down with 3/8 or 7/16 inch bolts or lag screws.
3. Unbolt the lathe from the shipping pallet. Lift the lathe onto the bench.
4. Bolt the lathe to the bench with the hardware provided. Tighten fasteners securely.
5. Remove any packing materials and protective wrapping from the lathe and components.
6. Make sure lathe is turned off. Plug lathe into a properly installed and grounded outlet that matches the lathe plug.
7. Remove the shipping plug, insert the oil dipstick, and check oil level. The lathe is shipped with the correct amount and type of oil. Add oil as necessary to reach the correct mark on the dipstick. Use only EP-80-90 gear oil. Oil level should be checked often.

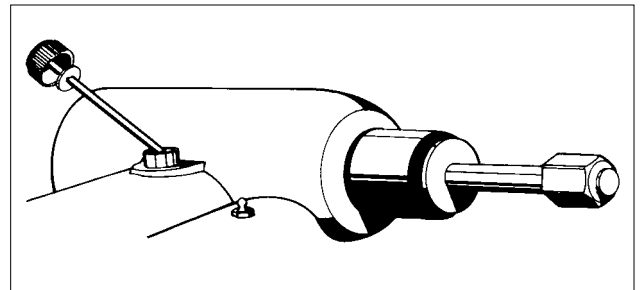


Figure 2 - Check oil level

8. Clear the area and turn lathe on. Check for proper operation (motor and spindle rotation).

### Preparation for Use

1. Inspect all adapters and accessories for burrs, nicks, or other damage.
2. Clean accessories with a vaporizing solvent.
3. Apply a light film of oil to all adapters to protect their machined surfaces from rust. Refer to the maintenance section for more information.



**There is a circuit breaker located on the electrical panel to prevent damage to the lathe in the event the motor is overloaded. Move the switch to the off position and correct overloading situation before re-setting circuit breaker. Serious personal injury could result if circuit breaker is re-set while lathe is still on.**

# Brake Lathes

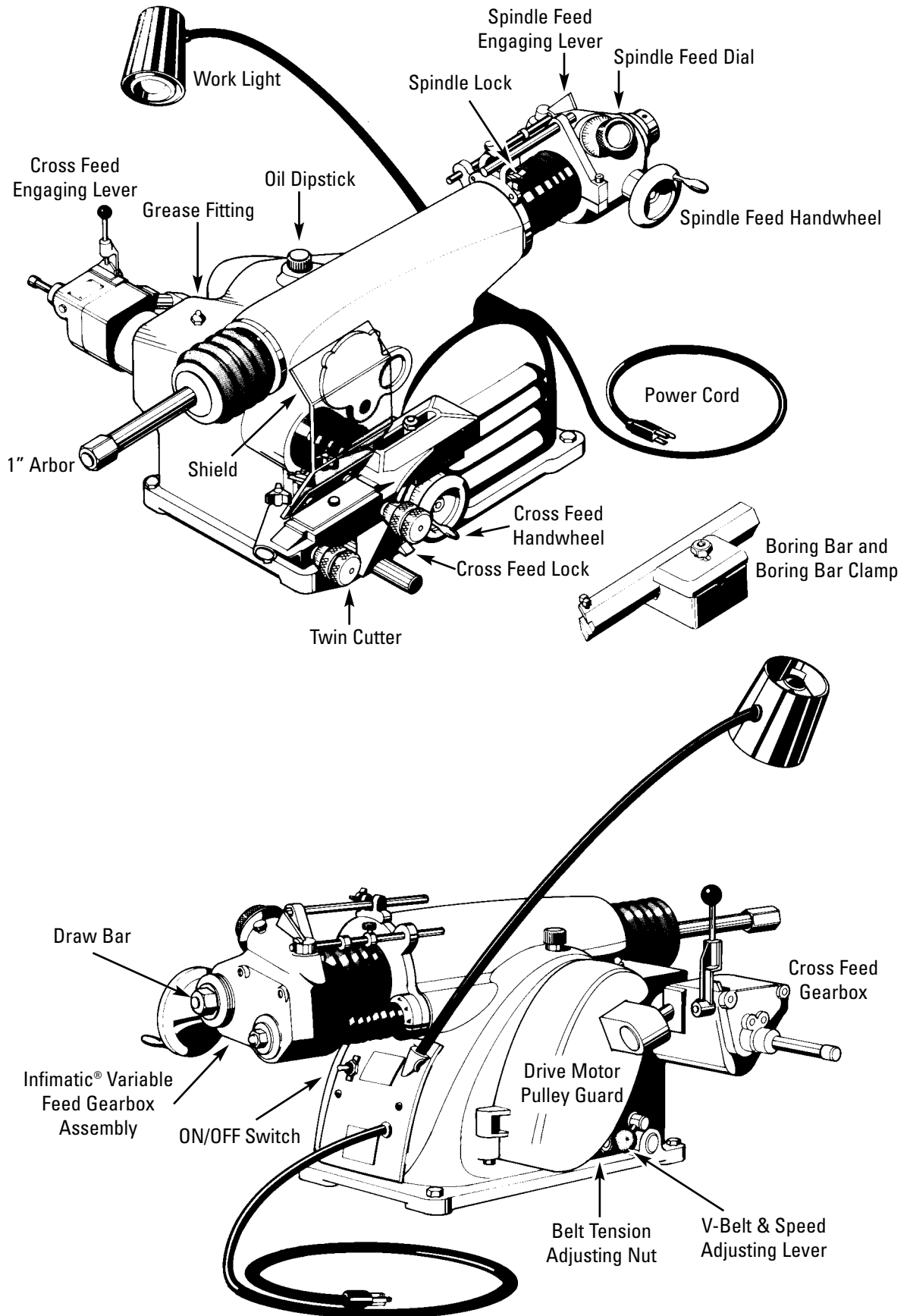
## Operating Specifications

	3000	4000	4100	7700	7500
Overall lathe height	17.25" (438 mm) all models				
Lathe shipping weight	325 lbs (147 kg)	385 lbs (175 kg)	410 lbs (186 kg)	398 lbs (180 kg)	367 lbs (167 kg)
Floor space requirements - width	48" (1219.20 mm) all models				
Floor space requirements - deep	34.5" (901.70 mm) all models				
Spindle to floor (mounted on optional bench)	39.375" (1000 mm) all models				
Electrical requirements (unless otherwise specified)	Standard: 115 VAC, 60 Hz, single-phase, fused at 20 amps (all models) Optional: 220 VAC, 60 Hz, single-phase, fused at 15 amps (all models)				
Spindle motor	1 HP, 60 Hz, 115/230 VAC (all models)				
Spindle travel	7" (178 mm)	6.875" (175 mm)	9.875" (251 mm)	10" (254 mm)	n/a
Spindle speed					
Inner Groove	100 RPM	100 RPM	60 RPM	100 RPM	100 RPM
Middle Groove	—	—	80 RPM	—	—
Outer Groove	200 RPM	200 RPM	115 RPM	200 RPM	200 RPM
Spindle feed speed	Infinitely variable				
Minimum	0.002 inch per revolution (0.05 mm/rev) except 7500				n/a
Maximum	0.020 inch per revolution (0.50 mm/rev) except 7500				n/a
Cross feed speed					
Fine	Manual	0.002	0.002	Manual	0.002
Course	Manual	0.010	0.010	Manual	0.010
Handwheel graduations	0.002 (0.050 mm) all models				
Maximum brake rotor diameter*	14.5" (368.3 mm) all models				
Maximum brake rotor thickness	1.875" (47.63 mm)		4" (102 mm)		1.875" (47.63 mm)
Brake drum diameter					
Minimum	6" (152 mm) (except 7500)				n/a
Maximum	28" (711 mm) (except 7500)				n/a
Maximum drum depth	6.875" (175 mm)	6.875" (175 mm)	9.875" (251 mm)	9.875" (251 mm)	n/a
Maximum load					
1" Arbor	100 lbs. (45.36 kg) all models				
1.875" Arbor	200 lbs. (90.72 kg) all models				

\* The no. 906936 Cross Feed Extension – for use with the 4000, 4100 and 7500 lathes only  
– increases the maximum rotor diameter to 19" (483 mm).

# Brake Lathes

## Principle Operating Parts



# Brake Lathes

## Arbor Installation

The 1" arbor shipped with the lathe has been carefully matched to the lathe during final assembly and testing. Witness marks have been etched onto the arbor and the spindle for precise, repeatable alignment.

The witness marks must be carefully aligned when installing the arbor (Figure 3). A true-running arbor is essential to professional quality brake drum and rotor reconditioning.

1. Locate the witness marks on the arbor and the spindle.

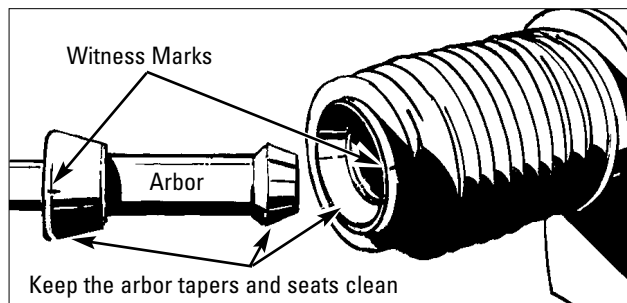


Figure 3 – Align witness marks during arbor installation

2. Insert the arbor into the spindle making sure the witness marks are aligned.
3. Tighten the drawbar (located at the rear of the spindle) to pull the hardened and ground tapers of the arbor into the matching seats in the spindle.

## Adapters

**Important:** Although the adapters, arbor, and spindle are made of top grade steel and are turned, hardened, and precision ground to close tolerances, great care should be taken in their use, handling, and storage. Even the smallest nick, scratch, or loose chip on the machined mating surfaces can cause incorrect rotor mounting alignment. This will cause inaccurate machining.

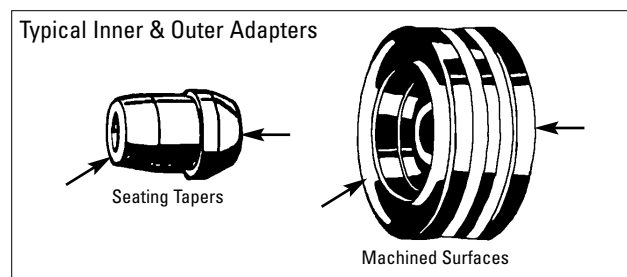


Figure 4 – Use care to avoid damaging mating surfaces

Always inspect the surface, face, and seating tapers of each part before use. Wipe each part clean before and after using it. Carefully correct any flaw with a fine stone. If damage cannot be corrected, replace the part.

## Basic Operation

To completely understand drum and rotor turning you must have a knowledge of the lathe itself.

### Spindle

The spindle is a motor driven shaft that turns the arbor upon which the brake drum or rotor is mounted. By turning the drum and holding a cutting tool against the inner braking surface, metal can be removed.



**Do not try to move any feed levers or dials without the drive motor running. Damage may occur to the gear trains.**

### Spindle Feed

By operating the spindle feed lever, the spindle will move the mounted brake drum to the left. This feeds the braking surface across the cutting tool as the drum moves away from the tool. Spindle feed may also be done manually using the spindle feed handwheel.

Spindle feed refers to the distance the spindle is pulled per revolution. This speed is adjustable on all models except the 7500:

**Important:** Spindle feed must be adjusted with the lathe running.

1. Rotate the spindle feed dial to the desired feed rate. The rate is adjustable to any point between 0.002" (0.05 mm) and 0.020" (0.50 mm).

### Spindle Speed

Spindle speed is measured in RPMs and is adjustable. Refer to the specifications listed on page 4 for the RPM rating of each groove on the V-belt pulley for each model.

### Spindle Speed Adjustment

This V-belt adjustment must be made with the lathe off.

1. Release the belt tension by moving the V-belt adjusting lever to the right (clockwise).
2. Move the belt to the pulley groove that will give the correct spindle speed for the cut to be taken.
3. Reapply tension to the V-belt by moving the adjusting lever back to the operating position.

### Cross Feed

The cross feed draws the tool bit across the face of a brake rotor or flywheel when the cross feed drive is engaged (models 4000, 4100, and 7500). The cross feed may also be operated manually using the cross feed handwheel (all models).

# Brake Lathes

Feed speed refers to the thousandths of an inch the cutting tools move per revolution of the spindle. The cross feed speed is adjustable on the 4000, 4100, and 7500:

**1.** Using the 3-position lever, select Fine (0.002" [0.05 mm]) or Coarse (0.010" [0.25 mm]). The Neutral position is the off position (no movement). The cross feed may also be operated manually.

## V-Belt Tension and Adjustment

A loose belt can cause slippage when taking heavy cuts. A belt that is too tight can cause vibration and possible sub-standard finishes on machined drums and rotors. Check and adjust belt monthly.

There should be between  $\frac{1}{4}$ " to  $\frac{1}{2}$ " of play in the belt.

**1.** Position the v-belt speed adjusting lever to the left (counterclockwise) to the fully engaged position.

**2.** Loosen the adjustment nut.

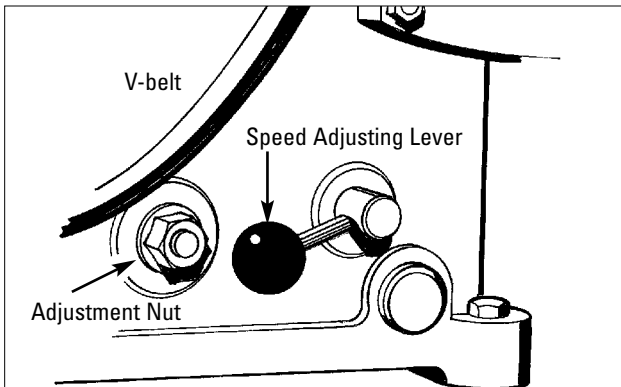


Figure 5 – Engage lever and loosen nut

**3.** Push in on the belt approximately  $\frac{1}{4}$ " to  $\frac{1}{2}$ " (0.64 to 12.7 mm) and hold.

**4.** Retighten the adjusting nut.

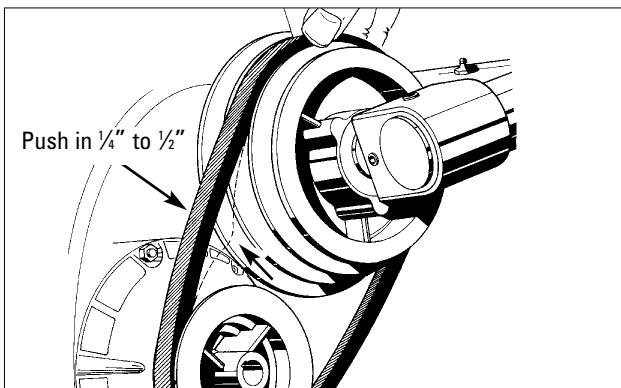


Figure 6 – Press the belt in and tighten adjusting nut

## Poly V-Belt Tension

For poly v-belt adjustment, use the same procedure as for the standard v-belt, with these exceptions:

**1.** The poly v-belt should be adjusted to deflect  $\frac{3}{32}$ " with a 5 pound push on the belt. The ideal tension is the lowest tension at which the belt will not slip under the highest load.

**2.** Check and adjust as required the tension during the first day of operation. Do not overtighten.

## Basic Operation of Handwheels

Clockwise rotation of the spindle feed handwheel retracts the spindle in towards the lathe.

Clockwise rotation of the cross feed handwheel moves the cutting tool in towards the lathe.

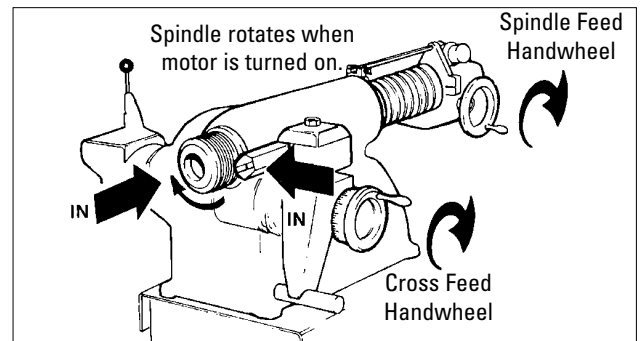


Figure 7 – Clockwise rotation of handwheels

Counterclockwise rotation of the spindle feed handwheel extends the spindle out away from the lathe.

Counterclockwise rotation of the cross feed handwheel moves the cutting tool out away from the lathe.

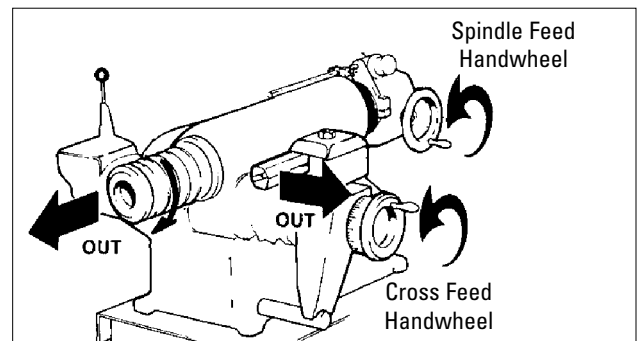


Figure 8 – Counterclockwise rotation of handwheels

# Brake Lathes

## Reconditioning Brake Drums

### Preparation

**1.** Measure the diameter of the brake drum with a brake drum micrometer.

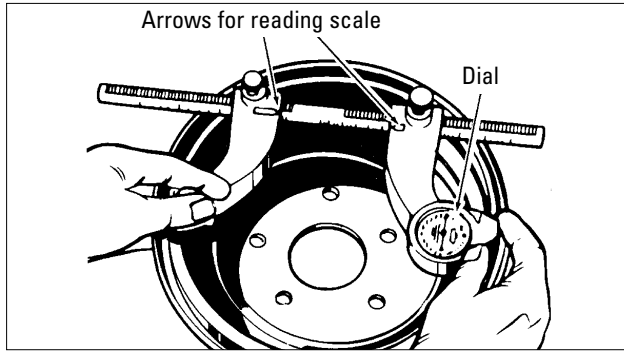


Figure 9 – Measure drum diameter

**2.** Determine if the drum will be within maximum rebore limits after reconditioning.

**Note:** Most often, the DISCARD diameter is cast into the brake drum, not the maximum machining diameter.

**3.** Inspect brake drum. Do not attempt to machine a drum that is damaged or in poor condition.

### Mounting Drums

**1.** Loosen the boring bar clamp nut and push the boring bar all the way into the clamp.

**2.** Mount the drum on the arbor using the proper adapters, cones, and spacers. Use examples in Figure 10 for guidance.

**3.** Wrap the drum silencer band snugly around the drum. Be sure it covers up to the right-hand edge.

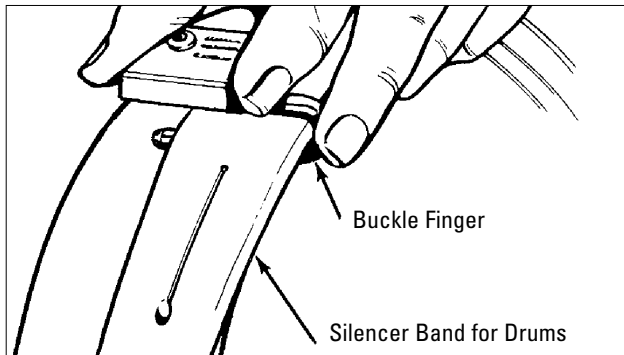
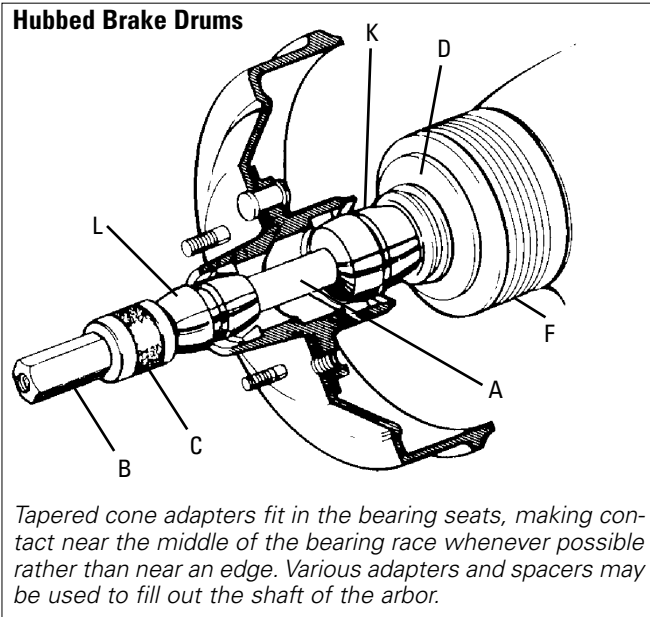


Figure 11 – Attach silencer band

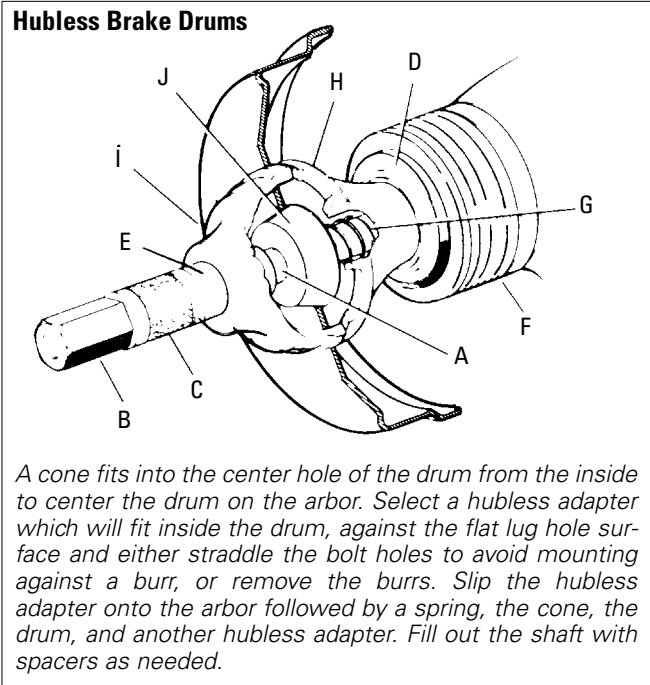
**Important:** The spindle feed handwheel will not operate unless the spindle feed engagement lever is in the OFF position. Feed should only be adjusted when the spindle is turning.

**4.** Position the cross slide and spindle by turning their respective handwheels to their maximum clockwise (in) position. Then back off the cross feed handwheel 2 complete turns and the spindle handwheel 4 complete turns.

Figure 10 – Typical drum mounting configurations



Tapered cone adapters fit in the bearing seats, making contact near the middle of the bearing race whenever possible rather than near an edge. Various adapters and spacers may be used to fill out the shaft of the arbor.



A cone fits into the center hole of the drum from the inside to center the drum on the arbor. Select a hubless adapter which will fit inside the drum, against the flat lug hole surface and either straddle the bolt holes to avoid mounting against a burr, or remove the burrs. Slip the hubless adapter onto the arbor followed by a spring, the cone, the drum, and another hubless adapter. Fill out the shaft with spacers as needed.

Key to Mounting Adapters, Cones, and Related Parts	
A. 1" Arbor	G. Spring
B. Arbor Nut	H. Inside Floating Adapter (sm.)
C. Self-Aligning Spacer	I. Outside Floating Adapter (lg.)
D. Lathe Spindle Nose	J. Centering Cone
E. Spacer	K. Large Double Taper Adapter
F. Protective Boot	L. Small Double Taper Adapter

**Note:** The self-aligning spacer should always be used next to the arbor nut when tightening. To avoid overtightening, wrench tighten the arbor nut counterclockwise until the drum and adapters begin to turn on the arbor, then continue to advance the wrench  $\frac{1}{16}$  of a turn. DO NOT overtighten the arbor nut.

# Brake Lathes

**5.** Position the boring bar by loosening the boring bar clamp nut and sliding the boring bar inward toward the drum until the tool bit is close to the drum.

The boring bar position is changed whenever a drum of different diameter is machined.

The entire boring bar clamp may also be swiveled to achieve the best cutting position.

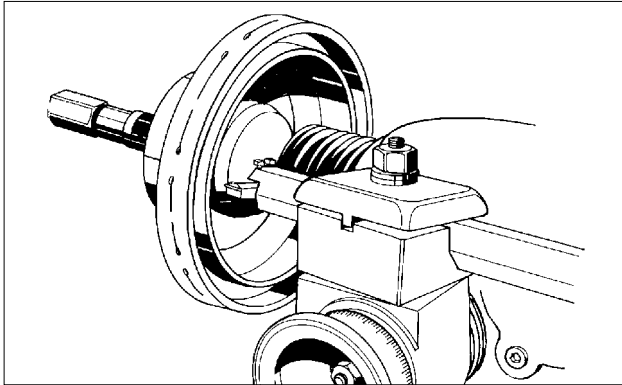


Figure 12 – Positioning the boring bar

**6.** Turn the drum by hand to make sure that everything is clear.

**7.** Turn the lathe ON.

**8.** Advance the tool bit manually until it just contacts the drum surface momentarily and makes a scratch cut.

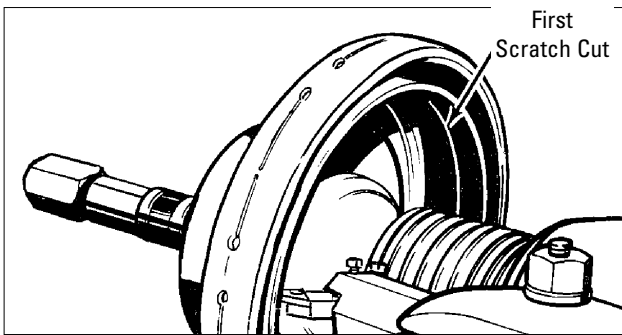


Figure 13 – First scratch cut

**9.** Loosen the dial lock screw on the cross feed handwheel and set the dial to the diameter of the drum as measured with the micrometer. Tighten the lock screw.

This setting will be the reference used to help determine the drum recondition diameter.

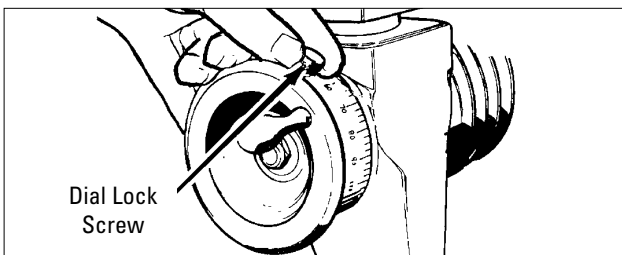


Figure 14 – Set drum diameter measurement

**10.** Back the tool bit off and turn the lathe OFF.

**11.** Loosen the arbor nut, rotate the drum 1/2 turn (180°) on the arbor and inner adapter, and retighten the nut.

**12.** Turn the lathe ON.

**13.** Turn the spindle feed handwheel 1/2 turn in either direction and make a second scratch cut.

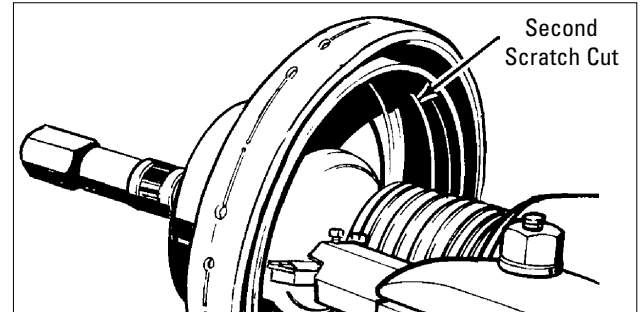


Figure 15 – Second scratch cut

**14.** Turn the lathe OFF.

**15.** Examine the scratch cuts.

If the first and second cuts are opposite one another (180° apart), remove the drum from the arbor, check the mounting adapters and arbor for nicks, burrs, or chips, remount the drum, and repeat scratch cut process.

If the scratches are side by side, proceed to step 16.

**16.** Turn the spindle feed handwheel until the deepest worn groove of the drum lines up with the point of the tool bit.

**17.** Advance the tool bit into the bottom of the groove by rotating the cross feed handwheel counterclockwise.

**Note:** These operations may be done with the lathe running.

The depth of cut dial will show the approximate reconditioned diameter of the drum. This measurement must be compared with:

- A.** The maximum rebore limits cast into the drum.
- B.** The measured diameter to determine the best amount of material to be removed in one pass.

**18.** Determine the depth-of-cut by these general guidelines:

- Roughing cuts should be no deeper than 0.020"
- Finish cuts should be no shallower than 0.004" deep.

**19.** With the lathe running, set the depth-of-cut dial to the depth desired and lock the cross feed by tightening the lock knob.

# Brake Lathes

Figure 16 – Lock cross feed

**20.** Set the spindle feed speed while the lathe is running by unlocking the feed dial lock screw and turning the dial. Tighten the lock screw when speed is set.

The rough cut feed range is between 0.006" (0.15 mm) (6 on the dial) to 0.020" (0.50 mm) (20 on the dial).

The finish cut feed range is between 0.002" (0.05 mm) (2 on the dial) and 0.006" (0.15 mm) (6 on the dial).

**21.** Set the feed shut-off by sliding it on the shaft to a point that approximately equals the depth of the drum and tightening it in place. The feed will stop when it reaches this point.

Figure 17 – Set spindle feed shut-off

**22.** Engage the feed lever to begin drum reconditioning.

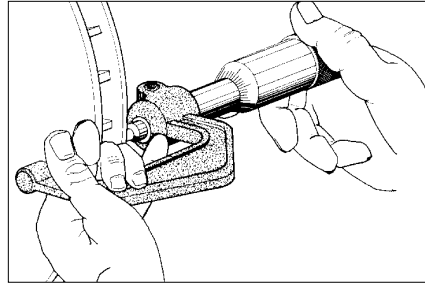
## Reconditioning Disc Brake Rotors

### Preparation

**1.** Inspect the rotor carefully for scoring, rust ridges (at the inner and outer circumference of the rotor), and hard spots. Any excessive wear or deformity should be noted and, if not within acceptable limits, the rotor should be replaced.

**2.** Use a micrometer to check the thickness of the rotor at no less than 3 points around the circumference about 1" (2.54 mm) in from the outer diameter.

If the rotor thickness varies between readings, it should be reconditioned. However, if the thickness is less than the minimum established by the manufacturer, or if it will be less after reconditioning, the rotor should be replaced.



**Note:** Most often the DISCARD thickness dimension is cast or stamped into the rotor, not the minimum machine-to thickness.

Figure 18 – Measure rotor thickness

### Twin Cutters

A twin cutter tool is used on the 4000, 4100, and 7500 to recondition both surfaces of a brake rotor at the same time. The twin cutter replaces the boring bar on top of the cross feed after removing the upper and lower tool bar clamps.

#### Model 6950 Twin Cutter—4000 & 7500

**1.** Mount the twin cutter on the cross feed with the stud bolt extending through the cast slot. The slot helps center the twin cutter to the rotor.

**2.** Secure the twin cutter to the cross feed with self-aligning nut and washer assembly. Tighten the nut firmly.

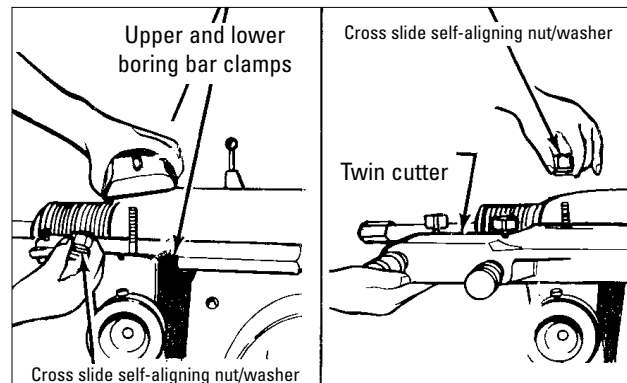


Figure 19 – Install the twin cutter

# Brake Lathes

## Rotor Mounting

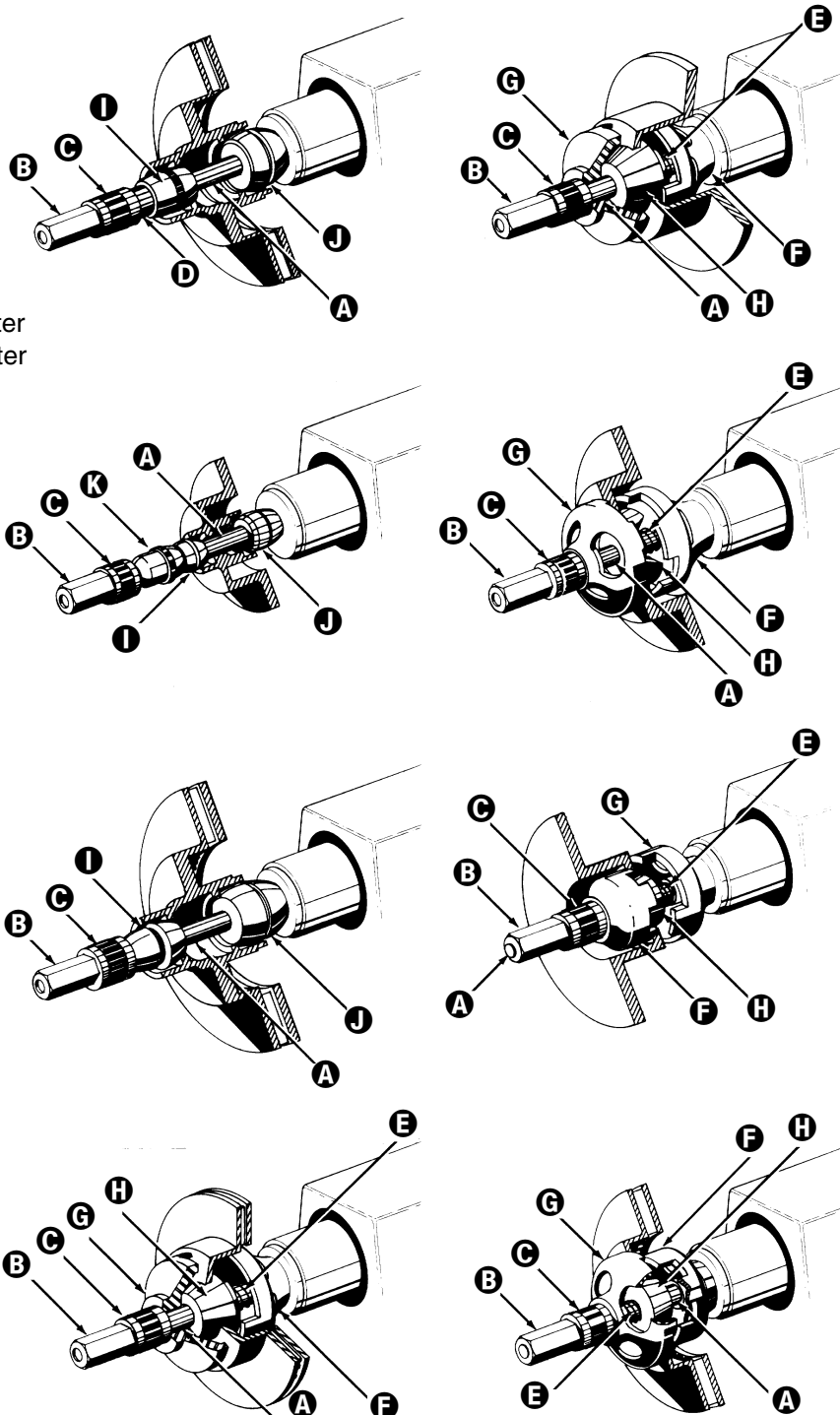
Review the descriptions of mounting a brake drum on page 6. The same directions apply when mounting a brake rotor. Hubbed rotors are mounted on adapters that fit into the bearing races. Hubless rotors use a cone in the center hole and a hubless adapter on each side of the rotor. Spacers are used to fill out the arbor shaft so that the arbor nut can be tightened. The setups illustrated in Figure 20 are typical of the many mounting configurations necessary to meet the requirements of brake rotor reconditioning. The adapters, cones, and

spacers supplied with the lathe will allow reconditioning of the majority of the rotors found on current production vehicles. Optional adapters, cones, and spacers are available to meet special needs.

**Note:** Adapters may also be used as spacers to fill out the arbor shaft if care is taken to prevent damage to their machined surfaces.

The patented self-aligning spacer prevents diagonal thrust on the adapters. The self-aligning spacer should always be used adjacent to the arbor nut.

- A** - 1" Arbor
- B** - Arbor Nut
- C** - Self-Aligning Spacer
- D** - Spacer
- E** - Spring
- F** - Small Hubless Adapter
- G** - Large Hubless Adapter
- H** - Centering Cone
- I** - Small Double Taper Adapter
- J** - Large Double Taper Adapter
- K** - Adapter, Used as Spacer



# Brake Lathes

## Set Up and Reconditioning Rotors

**1.** Install a silencer band on the mounted rotor. Stretch the band around the rotor and hook the metal loop over a lead weight.

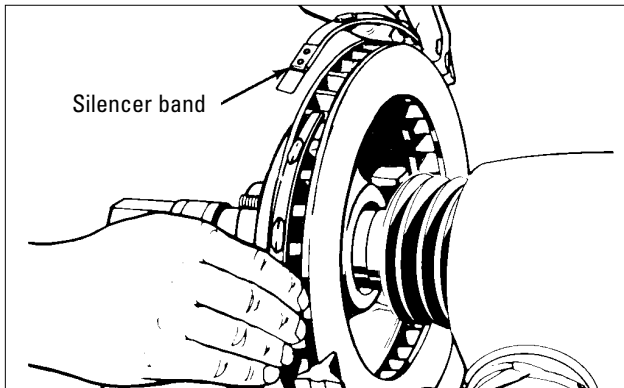


Figure 21 – Attach silencer band

**2.** Center the twin cutter to the rotor. Loosen the stud nut and adjust the twin cutter so that the rotor is centered between the tool bits. The slot of the twin cutter should be approximately parallel to the lathe spindle. Tighten the stud nut firmly.

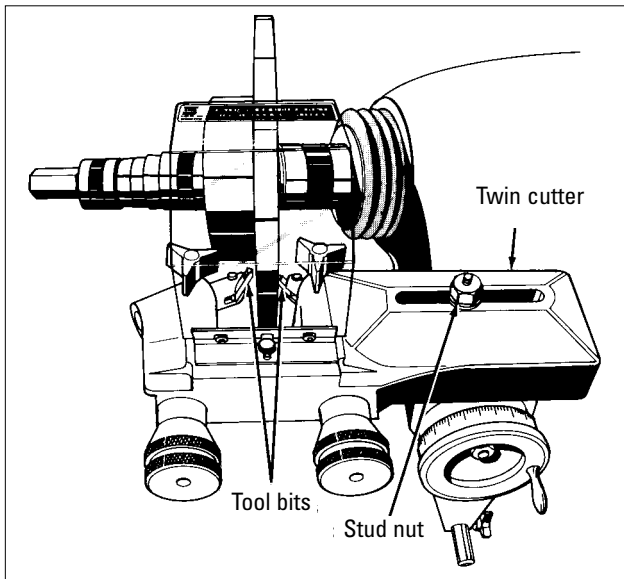


Figure 22 – Center the twin cutter

**3.** Install the safety shield. Review the cautions and dangers section and the general safety information at the beginning of this manual. The safety shield is easily screwed onto the twin cutter in the threaded mounting hole provided.



**Always wear safety glasses or a face shield. Cutting or grinding on an exposed surface such as a rotor will produce flying chips and debris.**

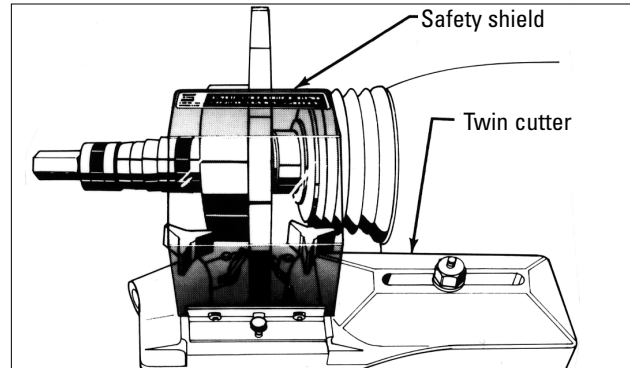


Figure 23 – Attach the safety shield

**4.** Adjust the drive belt to match the rotor size. Use the outer pulley groove for passenger car and most light duty truck rotors. Choose one of the inner pulley grooves when machining medium duty and larger truck rotors and some solid rotors.

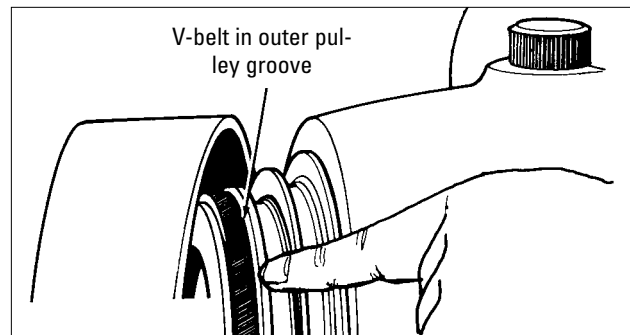


Figure 24 – Adjust drive belt location

**5.** Make sure that the tool bits clear the rotor surfaces and the silencer band. Give the rotor a full turn by hand and watch for clearance all the way around.

**6.** Turn the lathe ON.

**7.** Turn each tool bit control (the outer knurled knobs) clockwise until the tool bits just contact the rotor surfaces.

**8.** When the tool bits make contact, rotate each of the inner depth-of-cut collars to zero and back the tool bits away from the rotor.

From this point on, all tool adjustments will be made with the tool bit controls. Then inner depth-of-cut collars will be the reference and should not be moved.

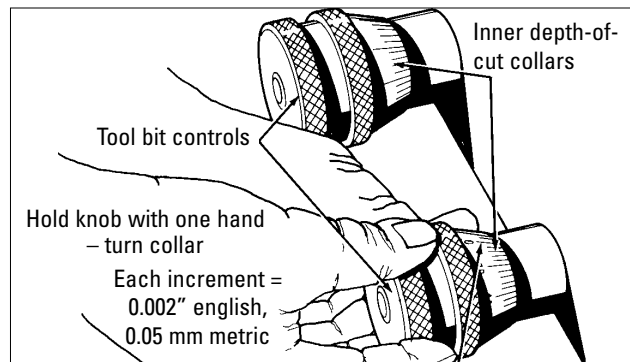


Figure 25 – Tool bit controls

# Brake Lathes

**9.** Turn the cross feed handwheel until the tool bits are at mid-point of the rotor face.

**10.** Turn the left hand tool bit control until the tool bit contacts the rotor surface and makes a scratch cut. After the cut is made, back the tool bits off and turn the lathe OFF.

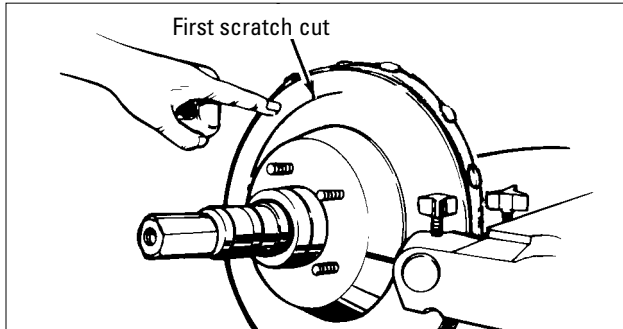


Figure 26 – First scratch cut

The scratch will usually appear as an incomplete circle. This is caused by runout or wobble due to rotor condition, or by the way the rotor is mounted on the arbor.

**11.** Check rotor mounting by loosening the arbor nut and turning the rotor 180° by hand on the arbor. Make sure the inside adapter does not rotate along with the rotor. Then retighten the arbor nut, turn the cross feed handwheel back 1/2 turn, turn the lathe ON, and repeat step 10 to make a second scratch cut.

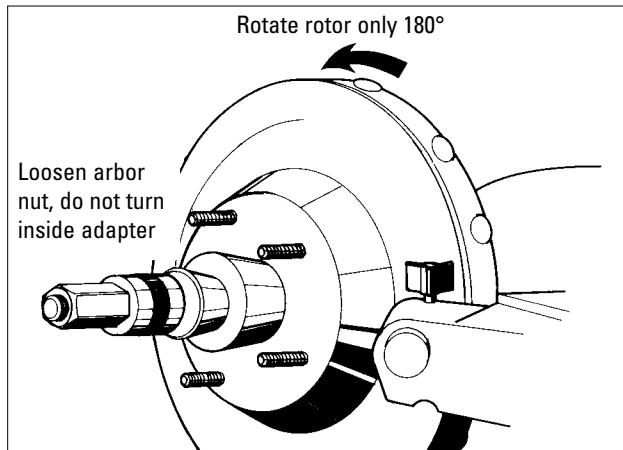


Figure 27 – Rotate rotor 180°

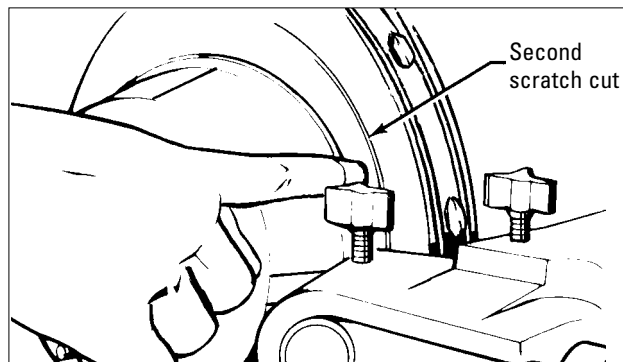


Figure 28 – Second scratch cut

**12.** If the scratch cuts are side-by-side, the runout or wobble is caused by rotor condition. A dial indicator may be used to compare rotor runout with manufacturer's specifications.

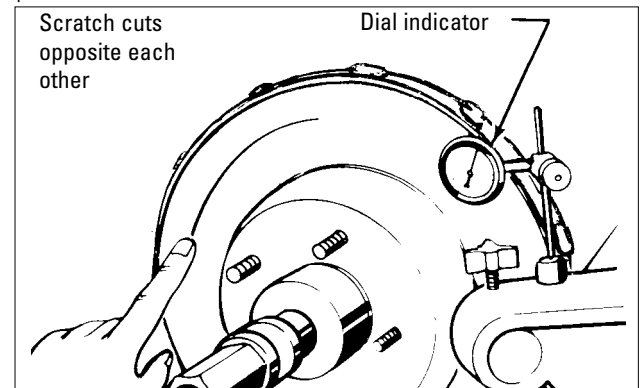


Figure 29 – Using a dial indicator

**13.** If the scratch cuts are opposite one another (180°), the rotor may not be properly mounted on the arbor. Remove the rotor and examine the arbor and all adapters for nicks, burrs, chips, dirt, or rust. Inspect the rotor hub for loose or damaged bearing cups. Clean, repair, remount, or replace as necessary.

**14.** Recheck the setting of the depth-of-cut collars which were set to zero earlier by moving the tool bits inward until they just contact the surfaces of the rotor. The collars should be at zero. Reset the collars if necessary.

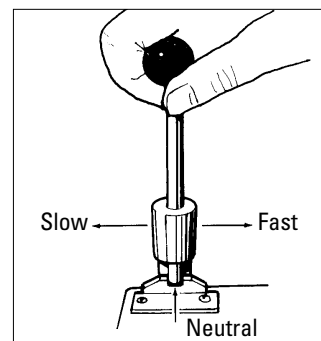
**15.** Turn the cross feed handwheel clockwise until the tool bits are near the rotor hub.

**16.** Turn the lathe ON.

**17.** Turn both tool bit controls to the desired depth-of-cut and lock them in position by tightening the red lock knobs above the tool bits.

**Note:** Either rough or finish cuts may be taken to resurface a rotor. Generally, finish cuts should be 0.004" (0.10 mm) to 0.006" (0.15 mm) per side. Very shallow cuts of less than 0.004" (10 mm) per side tend to reduce tool bit life because the heat generated during reconditioning isn't transferred to the rotor efficiently. Rough cuts may be taken from 0.006" to 0.010" per side.

**18.** Engage the automatic cross feed by moving the lever to the desired speed. The cross feed will stop automatically when the cutting tools have moved all the way across the face of the rotor.



**Note:** For roughing cuts, move the cross feed lever to the FAST position.

**Note:** For roughing cuts, move the cross feed lever to the FAST position.

Figure 30 – Engage automatic cross feed

# Brake Lathes

## Model 7900 Twin Cutter – 4100

The 7900 twin cutter mounts on the cross feed tool post to resurface both rotor surfaces simultaneously. Each tool bar is individually adjustable (in thousandths of an inch or millimeters) to permit precise depth-of-cut settings.

The tool bars mount on top of the tool bar support, carbide tips up, and are used to recondition both brake surfaces of a rotor at the same time.

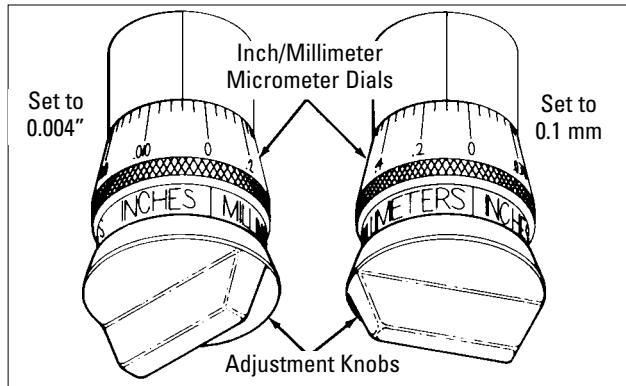


Figure 31 – 7900 twin cutter controls

## Installation

**1.** Remove the self-aligning nut/washer assembly retaining the boring bar clamp.

**2.** Remove the clamp and boring bar.

**Note:** Older lathes have a tool post pivot screw which must be loosened before the lower clamp can be removed.

**3.** Place the tool bar support over the cross feed tool post stud and replace self-aligning nut/washer assembly.

**4.** Align the tool bar support parallel with the arbor and wrench tighten the nut.

## Preparation

**1.** Inspect the rotor carefully for scoring, rust ridges (at the inner and outer circumference of the rotor), and hard spots. Any excessive wear or deformity should be noted and, if not within acceptable limits, the rotor should be replaced.

**2.** Use a micrometer to check the thickness of the rotor at no less than 3 points around the circumference about 1" (2.54 mm) in from the outer diameter.

If the rotor thickness varies between readings, it should be reconditioned. However, if the thickness is less than the minimum established by the manufacturer, or if it will be less after reconditioning, the rotor should be replaced.

**Note:** Most often the DISCARD thickness dimension is cast or stamped into the rotor, not the minimum machine-to thickness.

## Rotor Mounting

Follow the rotor mounting guidelines and examples provided on pages 10 and 11 and mount the rotor on the arbor.

## Set Up and Reconditioning Rotors

**1.** Install a weighted silencer band on vented rotors, a non-weighted silencer band on non-vented rotors, or an optional friction rotor silencer to dampen vibrations during machining.

**2.** Use the cross feed handwheel to position the tool bar support about 1/2" from the rotor or silencer band.

**3.** Loosen the tool post nut and center the tool bar support to the rotor. Wrench tighten the nut.

If the tool bar support cannot be centered with the rotor by moving the tool bar support, it may be necessary to move the rotor in or out by using the spindle feed handwheel to make the adjustment.

**4.** Install the tool bar, carbide tip up, on the right side of the rotor slide with the T-bolt and clamp. Slide the tool bar into the clamp.

**5.** Repeat step 4 for the left side tool bar.

**6.** Turn the end knob of each tool bar micrometer counterclockwise to fully withdraw the tool bit holders.

**7.** Position the left tool bar approximately parallel to the outer brake surface so that the tool bit is 1/8" away from the brake surface and reaches to the groove at the base of the brake surface. Tighten the T-bolt nut.

**8.** Repeat step 7 for the right tool bar.

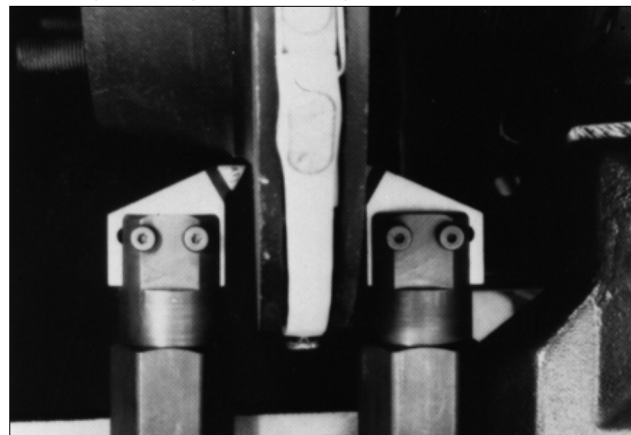


Figure 32 – Positioning the tool bars

**9.** Turn the cross feed handwheel counterclockwise until the tool bits are about 1/2" in from the outer edge of the brake surface.

**10.** Turn the lathe ON.

**11.** Turn the end knob on the left boring bar micrometer clockwise to advance the tool bit until it lightly contacts the outer brake surface and makes a scratch cut.

# Brake Lathes

**12.** Turn the lathe OFF.

**13.** If the tool bit did not scratch the brake surface all the way around, there is runout in the rotor and/or runout cause by improper rotor mounting. To determine if the runout is caused by improper mounting:

A. Turn the end knob on the left tool bar micrometer counterclockwise 1 full turn to back the tool bit away from the brake surface.

B. Turn the rotor slide handwheel clockwise to move the tool bit 1/4" toward the arbor.

C. Loosen the arbor nut and rotate the rotor 180° on the arbor. Do not allow the adapters to turn. Retighten the arbor nut.

D. Turn the lathe ON.

E. Turn the end knob on the left tool bar micrometer clockwise until the tool bit makes light contact with the brake surface. Turn the end knob of the left tool bar micrometer counterclockwise to withdraw the tool bit from the brake surface.

F. Turn the lathe OFF.

If the 2 scratch cuts are side-by-side, the runout is in the rotor and not the mounting. Continue with step 14.

If the 2 scratch cuts are 180° apart, the runout is caused by improper mounting. Remove the rotor and adapters from the arbor, inspect the arbor and adapters for nicks, burrs, chips, or rust, inspect the rotor bearing races for looseness, clean all items, and remount the rotor. Check for runout again. If runout is corrected, continue to step 14.

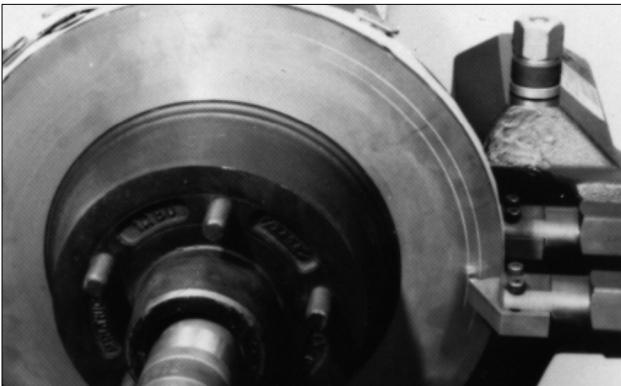


Figure 33 – Scratch cuts

**14.** Turn the lathe ON.

**15.** Turn the end knob on the left tool bar micrometer clockwise until the tool bit lightly contacts the brake surface.

**16.** Hold the end knob of the micrometer in place and rotate the depth-of-cut dial to zero.

**17.** Turn the end knob on the right tool bar micrometer clockwise until the tool bit lightly contacts the brake surface.

**18.** Hold the end knob of the micrometer in place and rotate the depth-of-cut dial to zero.

**Note:** Once both depth-of-cut collars are set to zero, use only the end knob to advance or withdraw the tool bit. The collar will rotate with the knob to show the depth-of-cut. Any other disturbance of the collar will lose the zero position.

**19.** Turn the cross feed handwheel clockwise until the outer tool bit reaches the groove at the rotor hub. The right tool will automatically be positioned beyond the inner brake surface.

**20.** Turn the end knob of each tool bar micrometer individually to set each tool bit to the desired depth-of-cut. Remove only enough material to clean up each side.

**21.** Engage the automatic cross feed to begin the cut.

**22.** When the tool bits have cleared the rotor, disengage the cross feed and turn the lathe OFF.

**23.** Inspect the brake surfaces. If part of the surface was not cut, leave the tool bars locked in position, turn the lathe ON, slowly turn the cross feed handwheel clockwise until the outer tool reaches the groove at the rotor hub, and repeat steps 20, 21, and 22.

# Brake Lathes

## Maintenance and Service

### Oiling

The lathe is shipped from the factory with the correct amount and type of oil. Check oil level frequently, and refill as necessary with EP-80-90 gear oil.

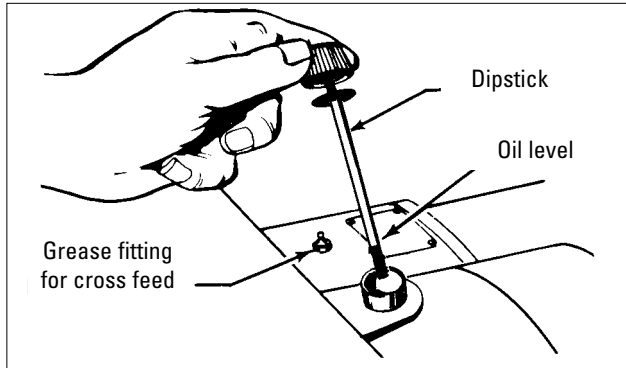


Figure 34 – Oiling

After every 500 hours of use, drain the oil and refill to the appropriate level on the dipstick with clean EP-80-90 gear oil. Use the oil drain plug on the front of the lathe to drain the old oil.

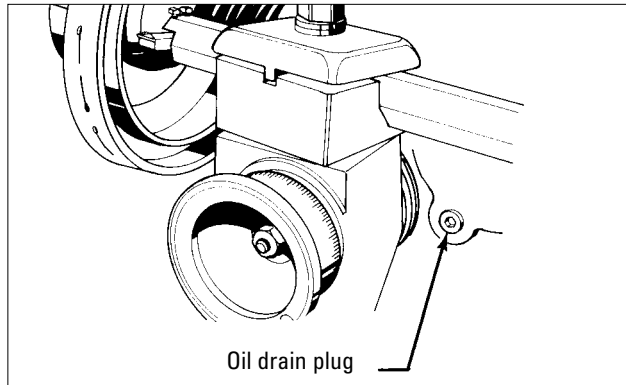


Figure 35 – Drain plug location

The Infimatic® Variable Feed Gearbox and the disc brake feed mechanism assemblies are filled with a special lubricant and need no further internal lubrication.

Lubricate the cross feed once each month with an automotive chassis grease. Pump the grease into the fitting until clean grease comes out the relief slot at the base of the fitting.

Use a hand pump grease gun only. A high pressure gun can burst the lathe casting.

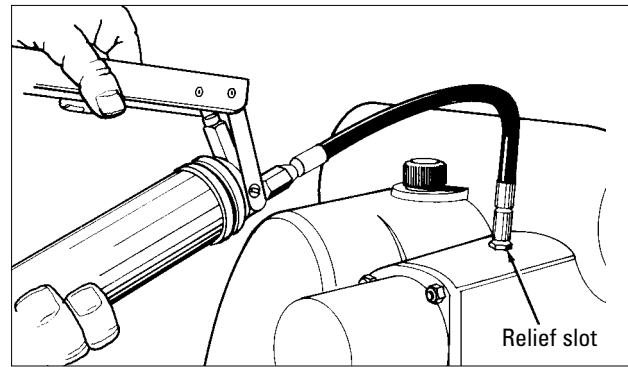


Figure 36 – Cross feed grease fitting

Grease the lead screw drive monthly. Locate the lead screw drive by pulling the protective boot back.

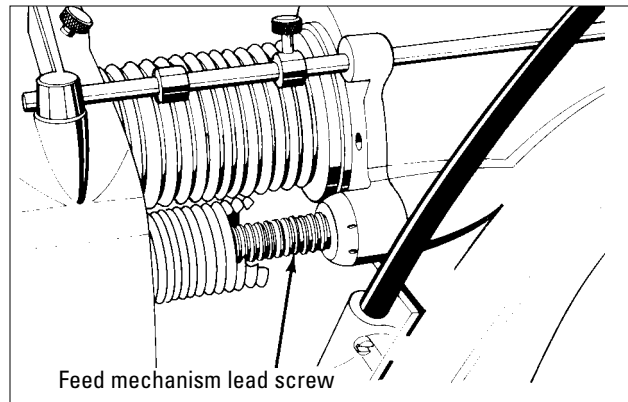


Figure 37 – Lead screw drive

Oil exposed metal parts periodically to prevent rust.

# Brake Lathes

## **Cleaning**

Keep the lathe as clean as possible for trouble-free operation, as well as safety and longer lathe life. Use a brush to sweep metal chips and dust off the lathe.

Do not use compressed air to blow the lathe clean. Chips and dust may be driven between machined parts and into bearings, causing undue wear.

## **Care of Arbors and Adapters**

Although the adapters, arbors, and spindle are made of top grade steel and are turned, hardened, and precision ground to close tolerances, great care should be taken in their use, handling, and storage. Even the smallest nick, scratch, or loose chip can cause incorrect rotor or drum alignment, resulting in inaccurate reconditioning.

Remove all adapters from the arbor after reconditioning a drum or rotor and wipe them clean – especially the inboard adapter. When a finished drum or rotor is removed from the arbor, the inboard adapter may move slightly away from the face of the arbor and allow metal chips to fall into the opening, causing a poor mounting for the next drum or rotor.

Regularly inspect the faces and seating tapers of the adapters for nicks and scratches, correct any flaw with a fine stone. If the damage cannot be corrected, replace the adapter. Handle the adapters and arbors with care and store them on individual hooks. Do not throw them into a box. The adapters are designed for mounting drums and rotors only. Do not misuse the adapters.

## **Shear Gear Replacement**

The shear gear is located in the drive housing under the dot plug cover. It is designed to “strip out” and prevent gearbox damage should a tool accidentally jam.

Remove the dot plug button. Remove the C-clip. Remove the shear gear. Remove any stripped teeth from the drive housing. Install the new gear. The concave side of the C-clip faces the gear to maintain pressure. Replace the dot plug button.

