

**HARDINGE**

**HARDINGE**

# OPERATOR'S MANUAL



**MODEL DV59**  
**HIGH SPEED LATHE**

**READ INSTRUCTIONS CAREFULLY BEFORE  
OPERATING MACHINE**

When this instruction book was printed the information given was current. However, since we are constantly improving the design of our machine tools, it is possible that the illustrations and descriptions may vary somewhat from the machine you received. This means that the machine you received is the latest improved model to better fulfill your requirements.

**HARDINGE BROTHERS, INC.  
ELMIRA, NEW YORK**

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## INSTALLATION INSTRUCTIONS

Remove crating but do not remove machine from skid. Move machine to the location in your plant where it is to be used before removing from skid as per the following instructions.

**LIFTING MACHINE:** Remove the four bolts which hold the machine to the shipping skid. There are two bolts at the extreme left-hand end of the pedestal and two at right-hand end.

The machine may be removed from the skid by either a crane or fork lift truck. When lifting with a crane, the rope or cable sling should be arranged as shown, Figure 1. **NEVER LIFT MACHINE WITH ROPE OR CABLE AROUND SPINDLE, BED OR TAILSTOCK.** The rope or cable must be capable of withstanding a weight of 1500 pounds.

When using a lift truck, adjust forks to go in between top planks of skid and bottom of pedestal base. Lift machine slowly, checking to see that correct balance is maintained. **USE CAUTION** as machine has somewhat more weight at the front and it is more easily tipped using the lift truck method than the crane and sling method.

After skid has been removed, place machine directly on location where it is to be used.

**MACHINE FOUNDATION:** The Hardinge DV59 Precision Lathe is designed to operate without the need of special foundations. A substantial wood or concrete floor is satisfactory. However, it must be fairly flat and have sufficient strength to support machine properly. Do not locate machine near other equipment that causes vibration which will transmit to this machine as poor work finish may result.

**LEVELING MACHINE:** The Hardinge DV59 Precision Lathe is designed with a three-point bearing arrangement between bed and pedestal base. The three-point bearing arrangement makes accurate leveling unnecessary. Leveling should be such as to be reasonable and so that coolant will properly drain into sump from ends of pan.

There is an adjustable foot at back right-hand corner of the pedestal

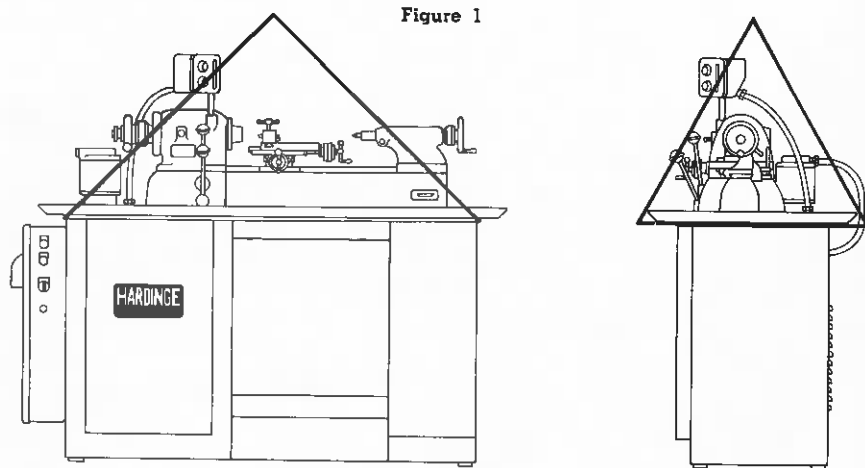


Figure 1

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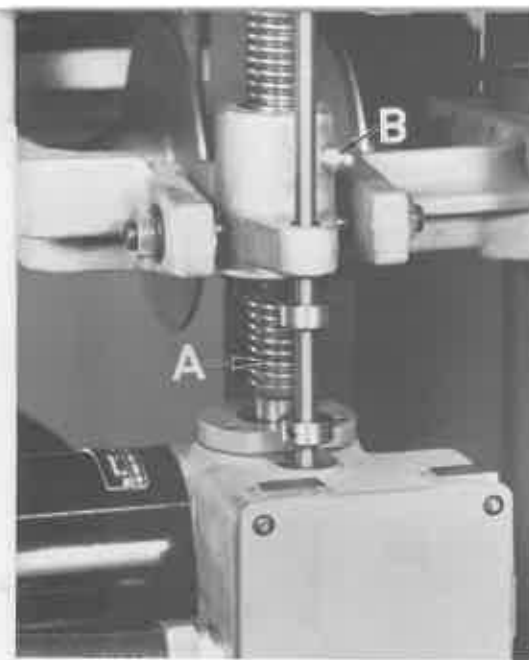


Figure 2

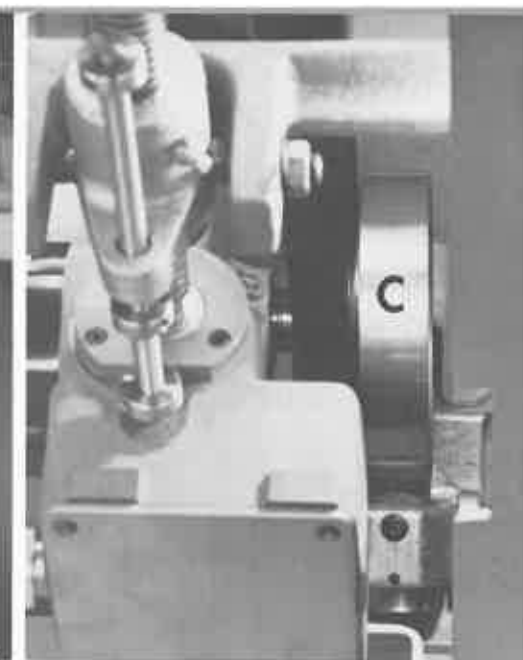


Figure 3

base to compensate for uneven floor conditions. To adjust, loosen the socket set screw and raise or lower the foot with a pin wrench so that all four feet rest firmly on the floor. Tighten socket set screw to retain setting. Should floor conditions be such that adjustable foot does not take care of leveling, use shims under feet of pedestal.

**CLEANING MACHINE:** Use a cloth or brush to clean this precision machine. **DO NOT CLEAN MACHINE WITH COMPRESSED AIR.** The use of compressed air for cleaning will reduce the precision life of this machine. Small particles of dirt and foreign matter can be forced past seals and wipers into the precision slides and bearings. **USE ONLY CLOTH OR BRUSH TO CLEAN MACHINE.** This also applies to daily cleaning of unit after it is in operation.

After machine has been properly located, leveled and bolted to floor, clean off all anti-rust shipping grease and dirt accumulated in transit with a good grade of grease solvent. Remove wood shipping retainer block and wire binding from variable speed countershaft pulley assembly. Using a  $\frac{3}{4}$ " socket wrench, remove and discard shipping hold down clamps located up inside motor compartment over the top of the pulley assembly.

Remove all shipping grease from variable speed vertical screw "A", Figure 2, pulleys and brake drum with cloth dampened with solvent. **DO NOT SATURATE BELTS WITH SOLVENT AND DO NOT REMOVE LUBRICANT FROM VARIABLE SPEED PULLEY SHAFT.** Lubricate nut at grease fitting "B" and oil vertical screw with light oil for first "Run-in" only. Keep vertical screw lubricated by greasing at fitting "B" with a good grade of grease such as Houghton cosmolube #2. **LUBRICATE ONCE A MONTH** or more often if necessary. Add a few drops of light oil to brake drum "C", Figure 3. Clean motor compartment and tool storage compartment. Put bottom tool shelf in place.

3

## ELECTRICAL CONNECTIONS

The DV59 is shipped completely wired and assembled. Access for the electric power line is made at any convenient place in switch case. Remove fibre board cover on disconnect switch "B", Figure 4, and make electrical connections on line side of disconnect switch. Ground connection is made at point "C".

### DO NOT OPERATE SPEED CHANGE MECHANISM UNTIL SPINDLE ROTATION HAS BEEN CHECKED.

To check rotation of spindle, apply a collet to the machine spindle to anchor collet closer. Exercising extreme care, turn disconnect switch to "On" using lever "D".

Push "Start" button "E", Figure 5, and pull out lock pin "F", Figure 6. Place lever "G", Figure 6, in "Forward" position and lever "H" in "Low" position. Spindle should rotate counterclockwise when viewed from tailstock end of machine.

If spindle does not turn in correct direction, disconnect electric power source and interchange any two leads at line side of disconnect switch. When spindle is rotating correctly, turn disconnect switch to "Off" position with lever "D". Close and secure switch case door.

Figure 4

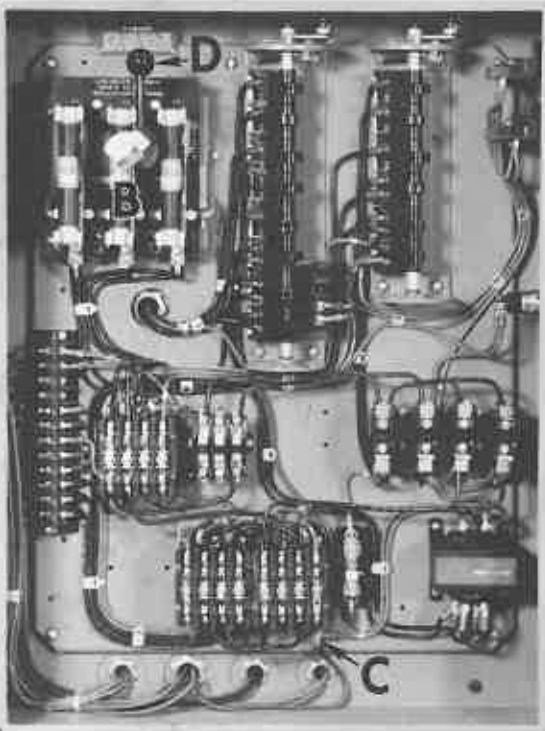


Figure 5



## OPERATING INSTRUCTIONS FOR MODEL DV59

### SPINDLE DRIVING UNIT

The driving unit provides infinitely variable spindle speeds from 230 to 3500 r.p.m. both forward and reverse.

Control lever "H", Figure 6, controls the spindle speed change from "High" to "Low" range which is accomplished through the 2:1 ratio motor.

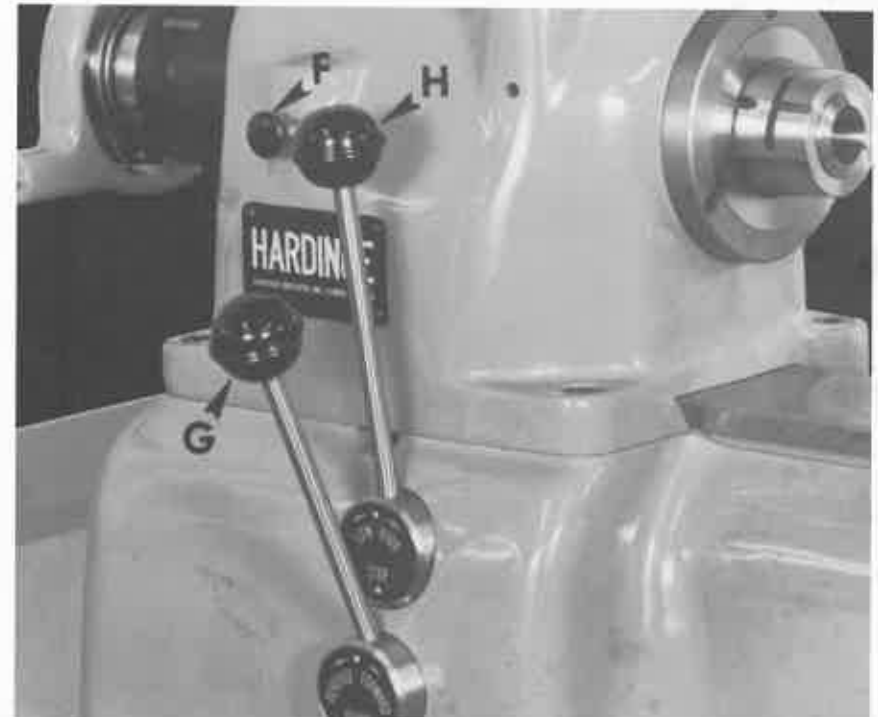
Control lever "G" controls direction of headstock spindle rotation. The solenoid-operated brake will be automatically applied when lever "G" is in center position.

The Hardinge DV59 Lathe is designed for rapid acceleration to high speeds. **BEFORE** mounting large fixture work or a heavy jaw chuck, set lever "H", Figure 6, in "Low" position. Unusually large or heavy work or work not properly balanced will cause excessive vibration at high speeds.

To start spindle, pull out lock pin "F", Figure 6, press "Start" button "E", Figure 5. Move control lever "H" to "Low" or "High" position and control lever "G" to "Forward" or "Reverse" position.

To stop spindle, move lever "G" to "Brake" position. Push button "J", Figure 5, to complete machine shut off.

Figure 6



**TO CHANGE SPINDLE SPEED,** start spindle and push button "K", Figure 7, to increase speed and button "L" to decrease speed. Hold button until desired speed is indicated in sight window. Speeds in left-hand column are obtained with lever "H" in "Low" position, and speeds in

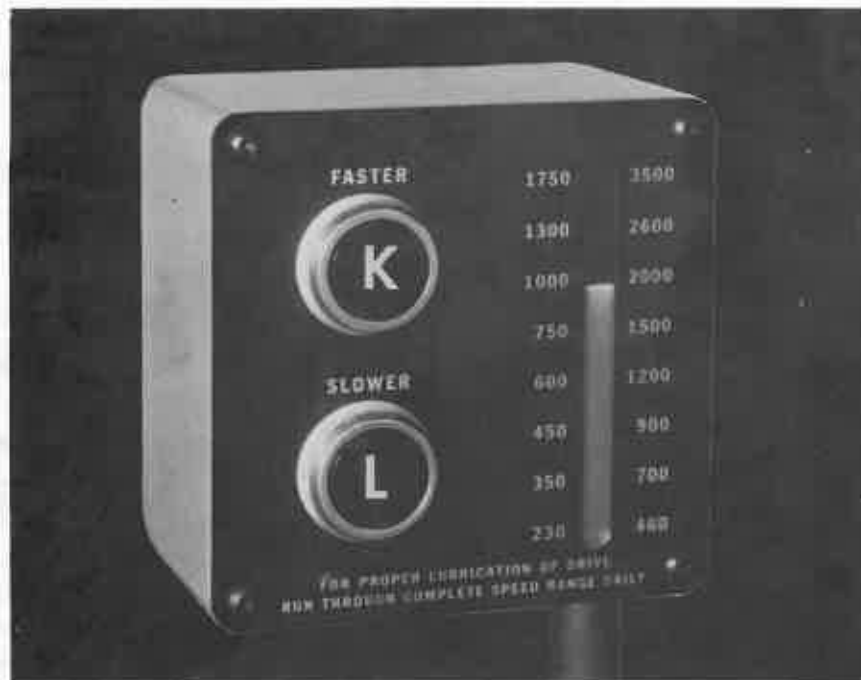


Figure 7

right-hand column are obtained with lever "H" in "High" position. The spindle speeds should be selected to suit each particular job, depending on material, diameter, type of cut and tool to be used.

**FOR PROPER LUBRICATION OF DRIVE RUN THROUGH COMPLETE SPEED RANGE DAILY.**

### FREE SPINDLE

To obtain a "Free Spindle" for turning of spindle by hand, pull out lock pin "F", Figure 6. Place lever "H" in "Stop" position, lever "G" in "Forward" or "Reverse" and push "Start" button "E", Figure 5. The spindle will rotate by hand more freely after machine has been run at any speed over 1100 r.p.m.

## LUBRICATION OF HEADSTOCK SPINDLE BEARINGS

The headstock spindle is mounted on precision preloaded ball bearings. The preloading and resulting load-carrying capacity is engineered to take radial thrust or end thrust, or a combination of both.

The precision preloaded ball bearings are grease-packed for life and require no further lubrication. The entire bearing assembly is housed as a unit and is properly sealed to exclude dirt and foreign matter. The spindle bearing seals are designed to operate at high speed without wear or friction.

There are occasions on a new machine when some of the excess grease in the spindle bearings will work its way out of the opening at the bottom of the front bearing cap. The appearance of this excess grease does not affect the spindle bearings nor the fact that they are grease-packed for life.

In the event that spindle bearings require attention, contact your local Hardinge representative or Hardinge Brothers, Inc.

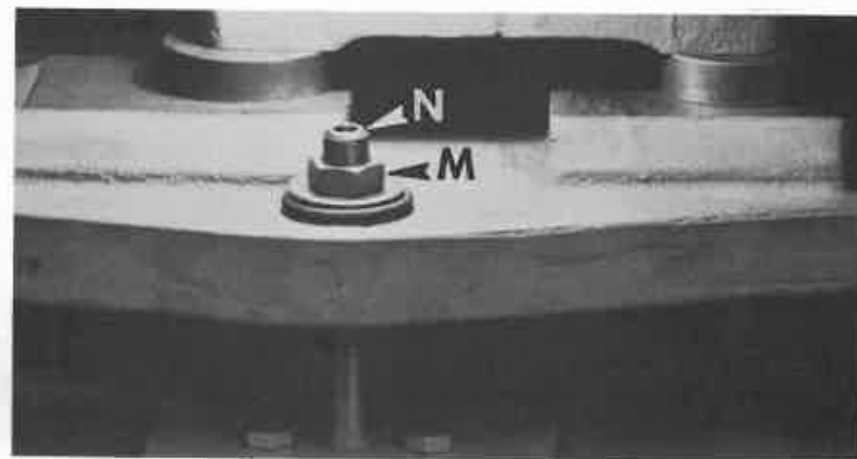
### BELT ADJUSTMENT

To check belt tension, run machine at approximately 1000 r.p.m. and allow spindle to coast to a stop by stopping machine with lever "H", Figure 6, only. There should be no "Looseness" in the belts and yet they should not be "Drum Tight." If belts slip when properly adjusted, machine is being overloaded.

To tighten belts, loosen nut "M", Figure 8, and turn set screw "N" clockwise to lower motor plate and tighten belts. Each time after adjusting, start machine spindle and allow to **COAST** to a stop to allow belts to equalize their tension.

For replacement of motor and headstock belts see Page 16.

Figure 8



## SPINDLE DRIVESHAFT BRAKE

The spindle brake is built for rapid but gradual stopping of the precision headstock spindle at all speeds. Brake is automatically applied when lever "G", Figure 6, is placed in center position.

The brake drum "O", Figure 9, is located directly on the main drive motor shaft. The brake is actuated by a solenoid located under cover "P", accessible from rear of machine by removing louvered cover.

The brake insert "C", Figure 10, is forced against the brake drum by spring action. The spring automatically compensates for brake wear. **DO NOT ALLOW CORK INSERT TO BECOME DRY.** Oil daily with spindle oil or as often as required. Allowing cork to become dry will reduce belt life excessively.

### TO ADJUST BRAKE

With brake "Off" (as explained for free spindle Page 6) loosen set screw "A", Figure 10, and turn adjusting collar "B" clockwise with a pin wrench until there is .003" to .005" clearance between insert "C" and brake drum "D". Relock set screw "A". **DO NOT ADJUST "E"** which is factory set to hold alignment key for the brake shoe housing.

### TO REPLACE BRAKE INSERT

Loosen set screw "A", Figure 10, unscrew collar "B" and remove housing "F". Knock out old insert. Trim off small end of new insert until it bottoms and is a snug fit in tapered hole of housing. When reassembling, line up keyway of housing with key before starting adjusting collar "B". Set clearance as explained under "Brake Adjustment" and relock set screw "A", Figure 10.



Figure 11

## TAILSTOCK

The tailstock is securely anchored to the dovetail bed with locking lever "B", Figure 11. To properly lock tailstock on center, lever "B" should be against stop pin "C".

The hardened and ground spindle is graduated in  $\frac{1}{8}$ " increments for the full  $3\frac{1}{2}$ " travel. The handwheel has a black and white friction adjustable dial reading in .001" increments. To adjust dial for zero reading, hold handwheel and turn dial with fingers.

The spindle takes standard No. 2 Morse taper shank centers and other tailstock tooling, see Page 34.

To lock spindle in position, move lever "A" clockwise as viewed from machine rear.

Standard shank tooling is automatically ejected when spindle is returned beyond zero reading on spindle.



Figure 9

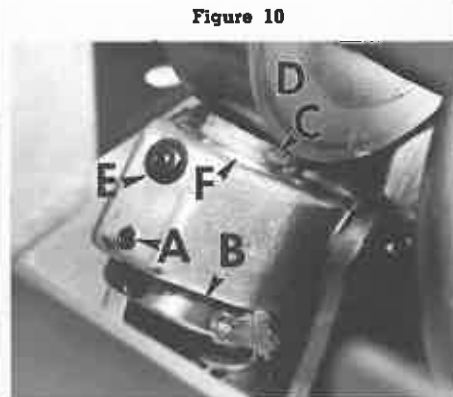


Figure 10

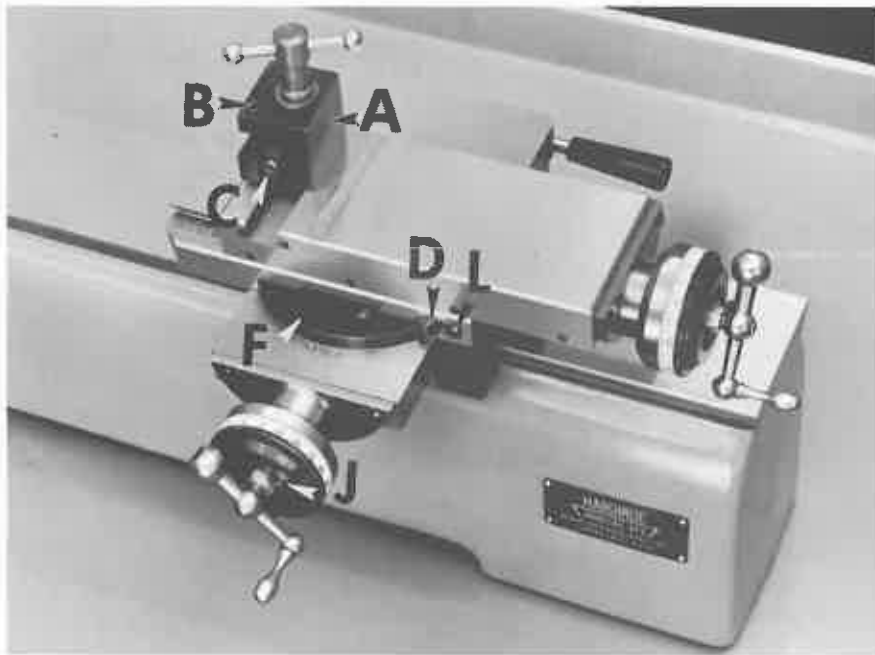
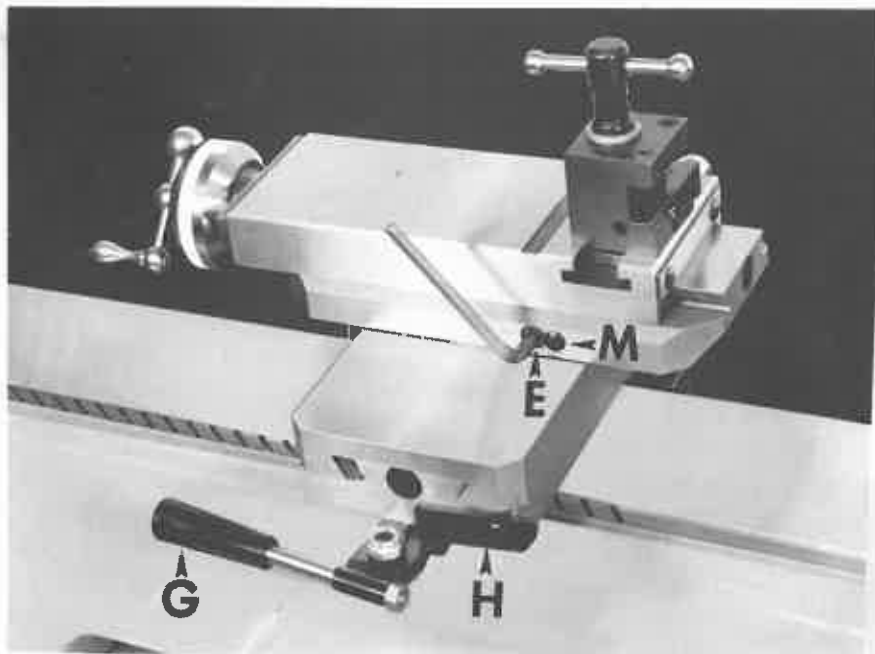


Figure 12

Figure 13



## COMPOUND SLIDE REST

(Optional)

The Hardinge compound slide rest features easy reading black and white dials and completely covered feed screws. The rigid tool holder "A", Figure 12, takes standard  $\frac{3}{8}$ " square tool bits. See bulletin DH for specifications and prices on Hardinge engineered carbide cutting tools.

The tool holder has a screw feed wedge arrangement for fast, accurate and rigid use. The wedge adjustment main-

tains proper cutting edge clearance by keeping the cutting tool in a horizontal plane at all points of adjustment when placing the tool cutting edge on center.

To raise or lower cutting tool, loosen lock screws "B", Figure 12, and turn feed screw "C" accordingly.

To make precision angular setting of the index slide, loosen lock "D", Figure 12, and lock "E", Figure 13, to permit top slide to be swiveled. Angular setting is visible through magnifier "F", Figure 14, providing greatest accuracy for setting the slide. Magnifier "F" is shown in Figure 12 with protective cover in place which is used to prevent damage to the lens.

To move slide rest along bed, move handle "G", Figure 13, toward back of machine. **IF SAFETY LOCK "H" IS NOT IN PLACE**, as shown Figure 13, **COMPOUND SLIDE WILL TIP OFF BED**. To remove slide rest from bed, lift safety latch as shown, Figure 15.

The black and white feed screw dials are direct reading and adjustable for zero setting with positive locks "J", Figure 12. Each dial graduation is equal to .001"; that is, for each graduation the top slide will move .001" along the bed and the bottom slide will cause a change of .001" on diameter.

See page 30 for compound slide rest tooling.

Figure 15



Figure 14



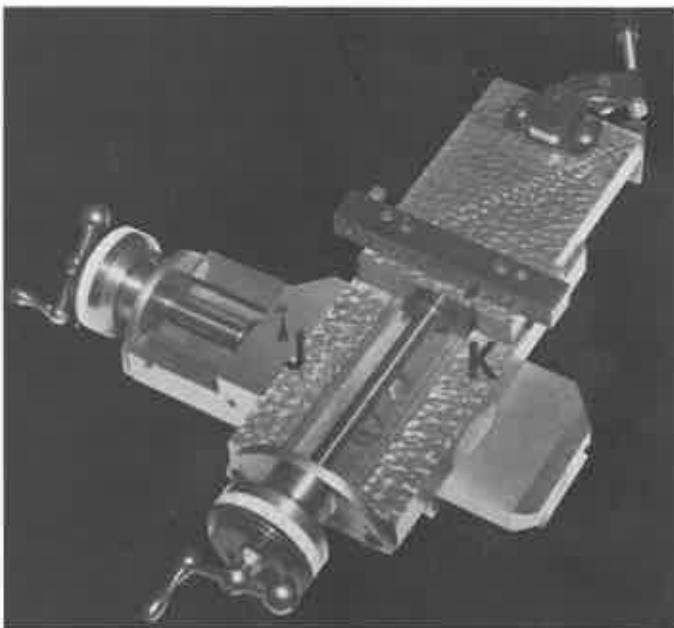


Figure 16

### TO CLEAN AND LUBRICATE COMPOUND SLIDE REST

Remove tool holder or other compound slide rest tooling. Remove slide rest assembly from machine bed as shown in Figure 15. With a  $\frac{1}{8}$ " hex pin wrench loosen stop screw "J", Figure 16, for top slide and stop screw "K" for bottom slide.

Using a  $\frac{3}{32}$ " hex pin wrench, remove button head screws "L", Figure 12, and "M", Figure 13. With a  $\frac{7}{32}$ " hex pin wrench loosen and remove eccentric lock "D", Figure 12, and eccentric lock "E", Figure 13. Eccentric locks are not threaded and will pull straight out after loosening. Lift top half of slide rest from bottom half.

Turn handwheels counterclockwise until feed screws clear feed screw nuts to permit removal of top and bottom slides from mating dovetail ways.

Clean dial and swivel area, feed screws, feed screw nuts and mating dovetails. Lubricate these same areas with a light oil. Wipe oil from dial. Reassemble all parts. When assembling, turn stop screws "J" and "K", Figure 16, until they bottom and back off one turn to eliminate drag.

It is recommended that the compound slide rest be cleaned and lubricated once a month.

### MACHINE SERIAL NUMBER

The serial number for the DV59 High Speed Lathe is located at the rear of the headstock frame. See Figure 17. Machine serial number should be included in all correspondence regarding this machine.

### TO REMOVE COLLET CLOSER

The collet closer should be removed from the DV59 when using jaw chucks, face plates, fixture plates or other nose type fixtures.

Running the machine with the collet closer in place **WITHOUT A COLLET** will cause damage to the collet closer. Also, the collet closer should be removed periodically for cleaning to prevent loading of chips between collet closer tube and inside of spindle at rear end.



Figure 17

To remove the collet closer, remove link pin "A", Figure 17, only. This pin is easily removed by pulling up and out with fingers.

Remove collet closer as shown in Figure 18. To remove adjusting nut "C", Figure 18, pull nut straight off end of spindle. **DO NOT TURN ADJUSTING NUT — IT IS NOT THREADED TO SPINDLE.**

Figure 18





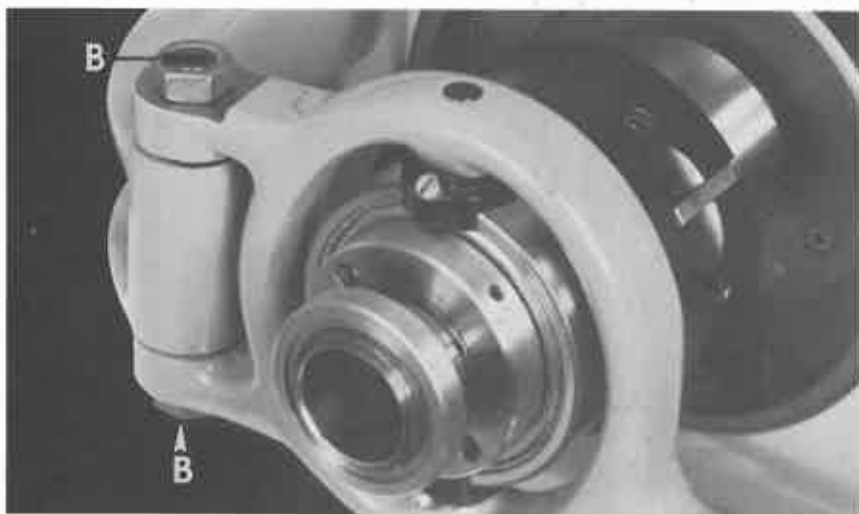


Figure 19

**DO NOT REMOVE COLLET CLOSER BY REMOVING SCREWS "B",** Figure 19. These screws are adjusted at the factory for proper operation of collet closer.

### TO REPLACE COLLET CLOSER

Clean the inside of the headstock spindle thoroughly before applying collet closer. Also, clean outside diameter at rear of spindle where adjusting nut locates. Clean collet closer tube inside and out.

Apply a film of light oil on rear of headstock spindle and replace adjusting nut "C", Figure 18. **DO NOT FORCE ADJUSTING NUT ON SPINDLE. IF ADJUSTING NUT GOES ON TIGHT, REMOVE AND EXAMINE FOR BURRS OR SCRATCHES.**

Apply a film of light oil on bearing section "D", Figure 18, of collet closer tube, replace closer and insert link pin "A", Figure 17.

### TO ADJUST COLLET CLOSER

1. Apply the desired size collet or step chuck to the machine spindle. **COLLET OR STEP CHUCK AND SPINDLE MUST BE CLEAN.**
2. Open collet closer latch "A", Figure 20, by pressing down at point "B".
3. Engage collet closer tube on collet or step chuck and thread about two turns only. To turn the collet closer tube, the operator turns the black shell guard "C" forward with his left hand while holding the collet or step chuck in place with his right hand.
4. Place a work piece in collet or step chuck.
5. Move lever "D", Figure 20, to the extreme left or closed

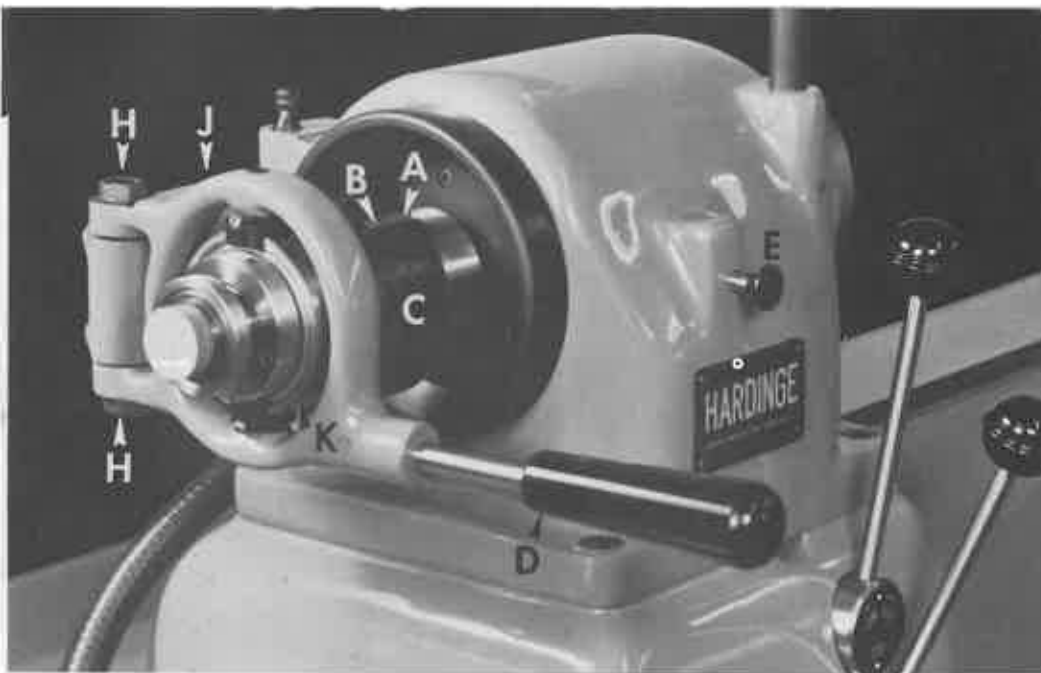


Figure 20

position. Push in lock pin "E", Figure 20. To engage lock pin, turn spindle by hand until pin enters notch to lock. Turn shell guard "C" toward operator until it is drawn up as far as it will go by hand.

6. Move lever "D" forward to the released position and turn shell guard "C" toward operator so that latch "A" advances two notches on the adjusting nut.
7. Close latch "A" and test collet closer for tension on work. Should additional gripping pressure be required, open latch "A" and turn shell guard "C" toward operator. For less gripping pressure, turn shell guard "C" away from operator.

The two adjusting screws and lock nuts "H", Figure 20, are factory adjusted to a point where there is no pressure on bearing "K".

If, after considerable wear, bearing becomes noisy or requires replacing, screws "H" should be adjusted to raise or lower lever yoke "J" so there is no pressure on bearing "K".

### SPINDLE LOCK PIN

Spindle lock pin "E", Figure 20, is used to hold the headstock spindle stationary when applying or removing spindle nose attachments, adjusting collet closer or when applying and removing work from fixtures or threaded arbors. To engage lock pin, turn spindle by hand (see instructions for obtaining free spindle Page 6) and hold pin in until it engages in one of the notches of the spindle assembly. **THE LOCK PIN is electrically interlocked with the main drive motor and MUST BE WITHDRAWN BEFORE MACHINE WILL START.**

## TO REPLACE DRIVE BELTS

1. Run carrier "A", Figure 21, to down position (slow spindle speed).
2. Remove pedestal rear louvered cover to prevent damage when motor mounting plate is raised.
3. Remove nut from motor mounting plate hold down stud, Figure 22.
4. Raise motor mounting plate approximately 2" at machine front and block, Figure 23.
5. Roll motor belt to right off countershaft pulley onto pulley hub.
6. Loosen screw "B", Figure 24, remove screw "C" and swing brake assembly away from brake drum.
7. Roll motor belt off motor pulley and over brake drum.
8. Run pulley carrier "A", Figure 25, to top position (high spindle speed).
9. Slide countershaft to extreme left, as viewed from machine front, and remove belts over end of countershaft, Figure 25.
10. Remove cotter key on switch pull rod for high-low lever which passes through spindle belt. Move spindle belt around end of pull rod.
11. Remove collet closer per instructions Page 13.
12. Remove three screws "D", Figure 26, and remove hand-wheel "E".
13. Lift spindle belt from spindle pulley and remove through opening in headstock, Figure 27.
14. Reassemble with new belts. See Page 7 for proper belt adjustment and Page 8 for brake adjustment.



Figure 23

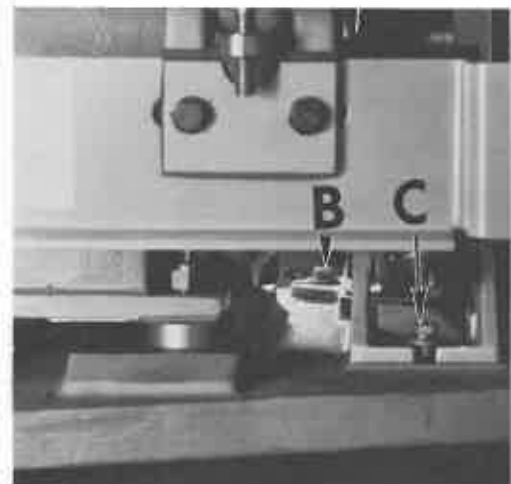


Figure 24

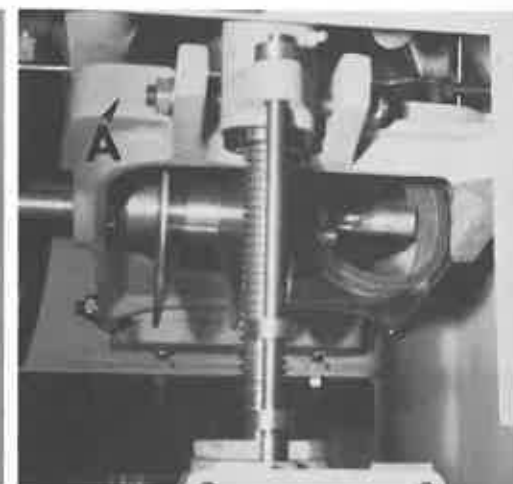


Figure 25

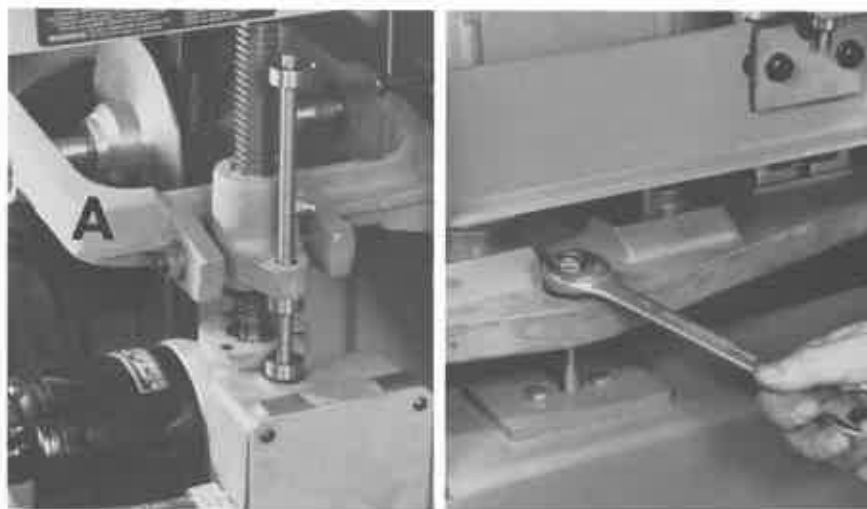


Figure 21

Figure 22

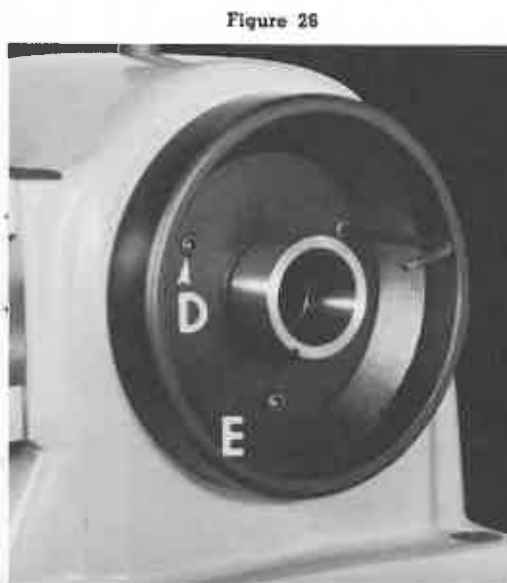


Figure 26

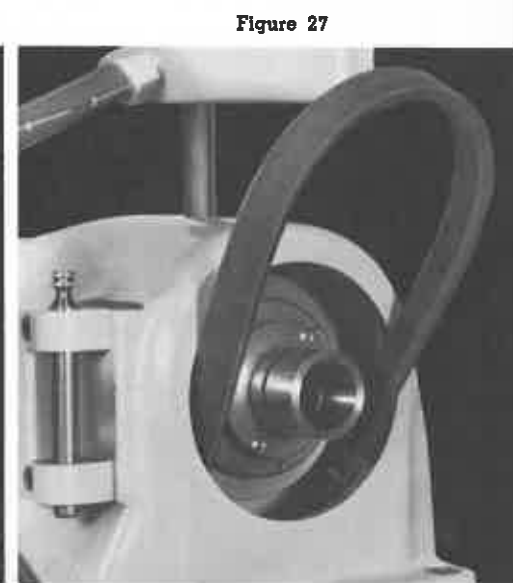


Figure 27

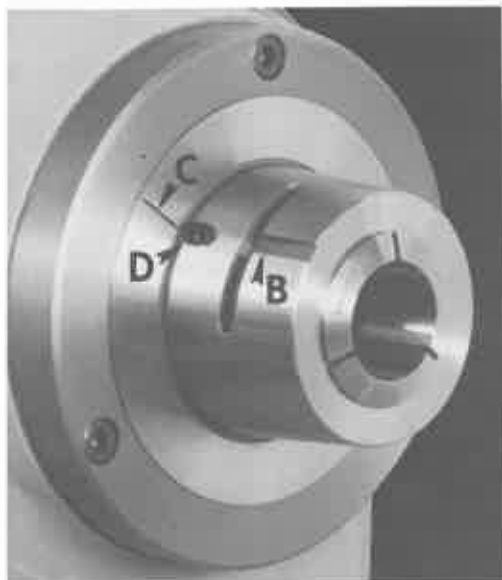


Figure 28

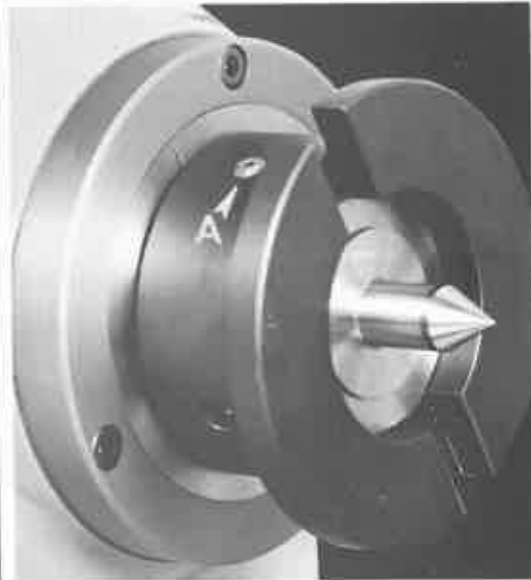


Figure 29

### TO APPLY AND REMOVE SPINDLE NOSE TOOLING

The Hardinge taper nose spindle construction is time-proven for accuracy, durability and for fast, easy application and removal of spindle nose tooling. The precision ground taper holds and aligns all tooling.

**TO APPLY** spindle nose tooling, engage lock pin "E", Figure 20. Align key "A", Figure 29, with bayonet slot "B", Figure 28, and slide tooling on spindle nose. Turn clockwise or counterclockwise to lock in place. Once securely drawn up, the spindle nose tooling is actually driven by the locking action of the tapered surfaces. Final tightening should be done with a standard pin type spanner wrench. (Use Williams or Armstrong spanner wrench No. 460.) **DO NOT USE HAMMER AND PUNCH.**

**TO REMOVE** spindle nose tooling, turn with spanner wrench until key "A", Figure 29, is in line with reference mark "C", Figure 28, on spindle. **DO NOT REMOVE KEY "A" TO REMOVE SPINDLE NOSE TOOLING.**

### SPINDLE COLLET KEY

The spindle collet key "D", Figure 28, is threaded into the spindle and can be replaced in the event of wear or damage. Remove lock screw and collet key screw with 3/32" hex pin wrench,



Figure 30

### COOLANT FACILITIES (Optional)

The Hardinge DV59 Lathe has an integral sump built into the sloping bottom of the chip and coolant pan. If not supplied with machine, coolant facilities can be ordered and installed by user.

The coolant pump "A", Figure 30, is operated by selector switch "B" with positions "On-Off-Auto". With switch in "On" position, coolant will run continuously. With switch in "Auto" position, coolant will run only when main motor is engaged.

Clean sump regularly, depending on type of material being run. When machining cast iron or other powdery material without coolant, close sump screen cover to prevent powdery material from mixing with coolant.

### OIL BASE CUTTING FLUIDS ARE RECOMMENDED FOR MAXIMUM MACHINE LIFE.

When coolant is used while machining a part having a through hole, apply a thermos bottle cork to the end of the collet closer tube as shown, Figure 20. This will prevent coolant from running out end of spindle.

To clean sump, remove the four screws, one in each corner of the screen cover for sump. Lift screen cover from sump. Rinse out and drain sump by removing pipe plug from bottom of sump. This plug is easily accessible from rear of machine.

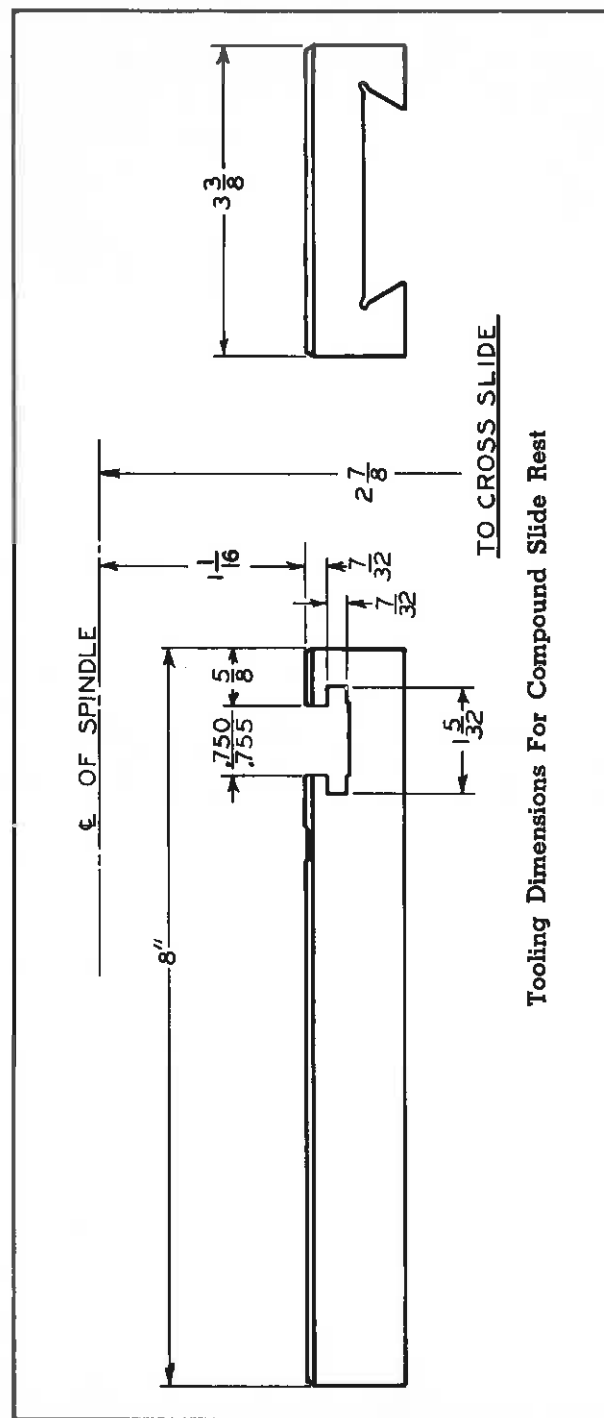
## MACHINE SPECIFICATIONS

Spindle Construction .....	Hardinge Preloaded Ball Bearing	
Spindle Capacity	With Round 5C HARDINGE Collets .....	1-1/16"
	With Hexagon 5C HARDINGE Collets .....	7/8"
	With Square 5C HARDINGE Collets .....	3/4"
	With 5C HARDINGE Step Chucks .....	1-1/16" to 6"
	With Jaw Chucks .....	5"
Length of Bed .....	36"	
Swing Over Bed .....	9"	
Distance Between Centers .....	17"	
Travel of Top Slide .....	4-1/4"	
Travel of Bottom Slide .....	5"	
Tool Post Capacity .....	3/8" x 3/8"	
Travel of Tailstock Spindle .....	3-1/2"	
Tailstock Spindle Taper .....	No. 2 Morse	
Variable Spindle Speeds .....	All speeds from 230 to 3500 r.p.m.	
Weight Complete (Approximate) .....	1150 pounds	

## REGULAR EQUIPMENT

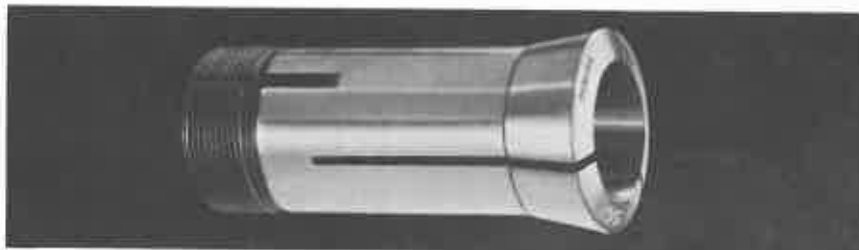
The Hardinge DV59 is furnished complete with:

- Fully Enclosed Headstock
- Preloaded Ball Bearing Spindle
- Hardened and Precision Ground Taper Nose Spindle with 1-1/16" collet capacity
- Ball Bearing Lever Collet Closer
- Large Finger Grip Handwheel
- HARDINGE Dovetail Bed with hardened and ground steel ways
- Three Point Bed Suspension
- Speed Levers for low—stop—high and forward—brake stop—reverse
- Constant Full Bearing Tailstock with male center — No. 2 Morse taper
- Hardened and Ground Tailstock Spindle with 1/8" graduations
- Tailstock Handwheel with ball bearing thrust and adjustable dial graduated in .001"
- Large Welded Steel Oil Type Chip Pan and Coolant Sump
- Welded Steel Pedestal with knee space
- Tool Storage Compartment with sliding ball bearing collet trays
- Foot Rest
- Automatic Spindle Driveshaft Brake
- Magnetic Electric Control Panel with transformer providing 110 volts for push button control circuit; time lag thermal overload relays provide overload protection; low voltage protection is also provided; cam operated, quick make and quick break forward and reverse switches; pilot light; fused disconnect switch interlocked with cover of panel — entire panel is one self-contained unit.
- Push Button Control for Variable Speed Drive. Direct Reading Spindle Speed Indicator. Infinitely Variable Speed Driving Unit complete with single voltage, 2 speed, reversing motor with a spindle speed range of 230 to 3500 r.p.m.
- Completely wired and assembled when delivered



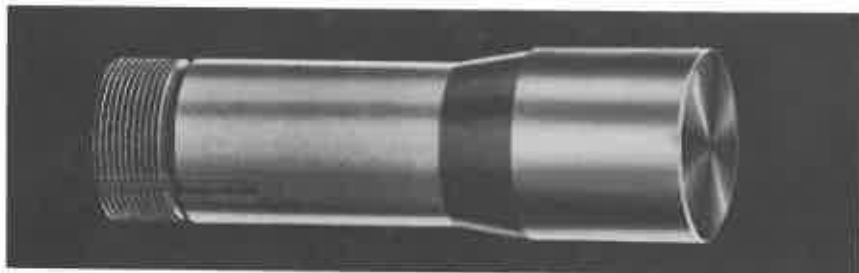
Tooling Dimensions For Compound Slide Rest

# HEADSTOCK SPINDLE TOOLING



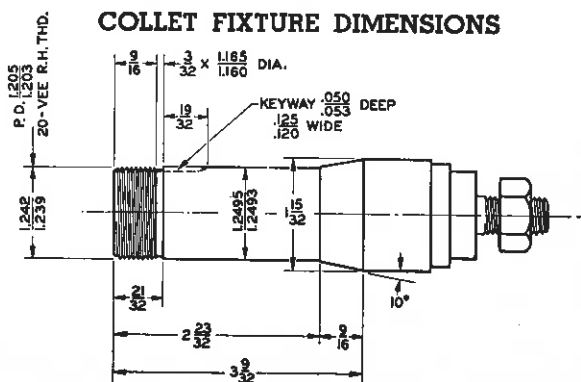
## 5C HARDINGE COLLETS

The Hardinge DV59 High Speed Lathe takes 5C Hardinge collets with capacity of 1-1/16" round, 7/8" hexagon and 3/4" square. The Hardinge 5C collet, which is manufactured to exact precision standards, is now supplied standard with 1/2" deep precision internal threads (at no additional charge) for threaded positive stops. See Page 24.

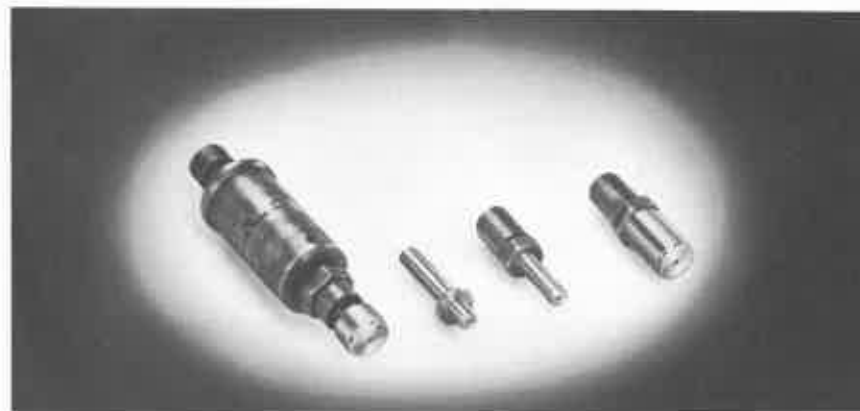


## 5C HARDINGE PLUG CHUCK

The collet shank section is finished for direct application to your machine spindle. The nose section is 1-15/32" in diameter and 1 3/4" long. It can be machined in place for the greatest degree of accuracy to suit your particular requirements for special arbors.



# HEADSTOCK SPINDLE TOOLING

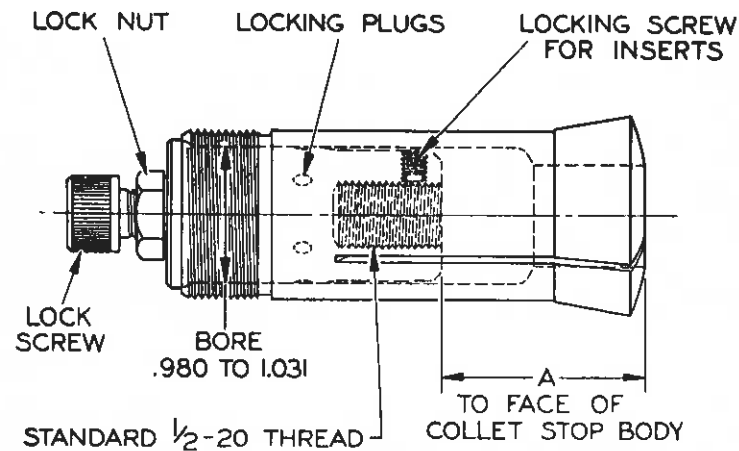


## UNIVERSAL COLLET STOP

This stop converts 5C Hardinge collets into solid stop or spring ejector stop collets, without alteration of the standard collets. The application of this stop to the collet requires no machining. In other words, all collets used with this machine can be used in the regular manner or as solid stop collet or as spring ejector stop collets. The universal collet stop can be used with either the new threaded or the unthreaded 5C collet.

Dimension "A" is equal to 1 3/8" and is the maximum depth a part may be chucked using a solid stop. The maximum depth for spring ejector stop is 13/16". This is due to space required for spring ejector construction.

### Tool No. G-10



## HEADSTOCK SPINDLE TOOLING

### THREADED POSITIVE STOPS

The Hardinge 5C solid, ejector and long stops are threaded into and positively shoulder locked in the new 5C Hardinge collet. (Hardinge 5C collets are now supplied standard with  $\frac{1}{2}$ " deep precision internal threads for threaded positive stops at no additional charge.)

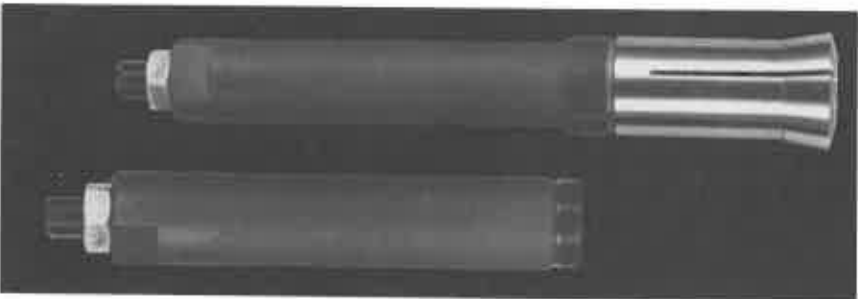
Once locked in place, the stops cannot move even under heavy drilling or other end working operations. The three stops permit a wide range of chucking work since all are adjustable for the desired part length to the maximum depths listed below.



**Solid Stop** — For chucking parts to a depth of  $3\frac{1}{4}$ " from the collet face.  
**Model SS-5C**



**Ejector Stop** — For chucking parts to a depth of  $2\frac{3}{4}$ " from the collet face.  
**Model ES-5C**



**Long Stop** — For chucking parts to a depth of  $7\frac{1}{2}$ " from the collet face.  
**Model LS-5C**  
For work to and including  $\frac{7}{8}$ " round,  $\frac{3}{4}$ " hex and  $19/32$ " square.

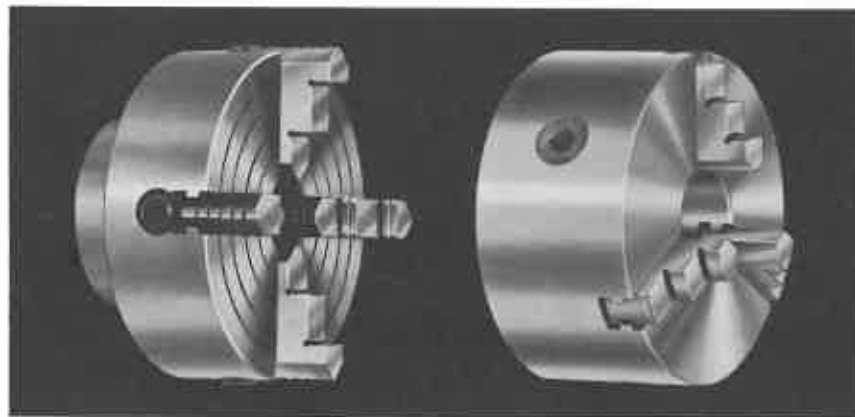
## HEADSTOCK SPINDLE TOOLING



### 5C-E EMERGENCY COLLETS

For emergencies requiring a step type, odd size or special shape collet the 5C-E with its soft face and pilot hole permits rapid drilling and boring to exact size.

5C-E Emergency Collets are available with  $\frac{1}{4}$ ",  $\frac{1}{8}$ " or  $1/16$ " pilot hole or less pilot hole and, in addition, are available with  $\frac{1}{2}$ " or 1" extended nose to permit use where deeper counterbores or tool clearance for extended work is required.



### JAW CHUCKS\*

Hardinge DV59 Lathe is supplied with a taper nose headstock spindle for rapid accurate mounting of jaw chucks and other spindle nose attachments.

The 5" capacity four jaw and 5" capacity three jaw chucks, shown above, are available for use with the DV59 Lathe.

These chucks are integrally mounted for direct application to the taper nose spindle, thus eliminating a separate mounting plate.

\* When ordering, specify for taper or threaded nose spindle.

# HEADSTOCK SPINDLE TOOLING

## FIXTURE PLATES\*

The fixture plate is machined all over for direct application to the headstock spindle. Three sizes are available; 3", 5" and 8 $\frac{1}{8}$ " diameter. The flange section is  $\frac{3}{4}$ " thick with a  $\frac{7}{16}$ " center hole.

This plate can be machined to become a fixture or for mounting fixtures to hold work or for mounting special purpose chucks.

**Tool No. C-23** 3" Plate

**Tool No. C-24** 5" Plate

**Tool No. C-25** 8 $\frac{1}{8}$ " Plate

## 7" and 9" SLOTTED

and

## TAPPED FACE PLATES\*

Are used for holding irregular shaped pieces. Holes are drilled and tapped to permit the use of standard 5/16" x 18 bolts.

**Tool No. C-26** 7" Plate

**Tool No. C-27** 9" Plate

## ANGLE PLATE FOR FACE PLATE

The angle plate fastens directly to the T-slot of the face plate and is used to support work at right angle to the face plate. Work clamping surface is 1 $\frac{1}{2}$ " x 3".

**Tool No. G-11**

## DRIVE PLATE\*

The drive plate mounts on the spindle nose of the DV59 Lathe and is used in conjunction with the driving dog to drive work between centers.

**Tool No. G-12**

\* When ordering, specify for taper or threaded nose spindle.

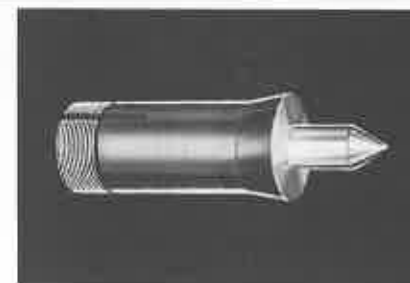
# HEADSTOCK SPINDLE TOOLING



**DRIVING DOG**

The driving dog is used in conjunction with the drive plate to drive work between centers.

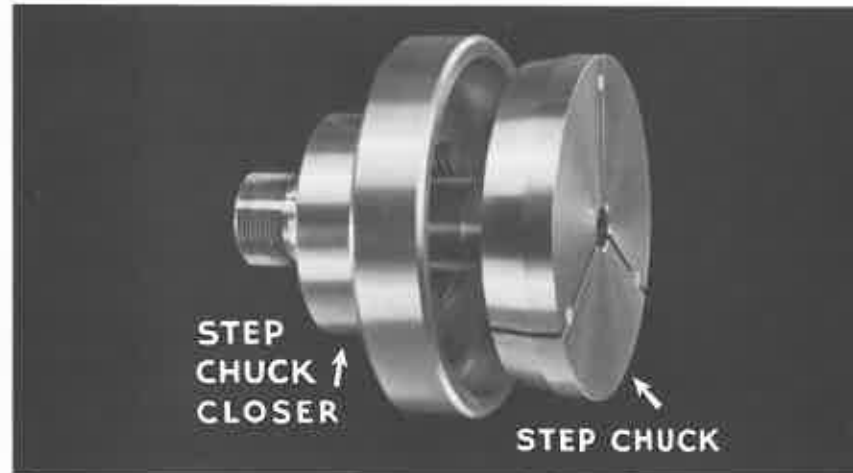
**Tool No. G-1**



**MALE CENTER**

The headstock center is required when work is to be held between centers.

**Tool No. G-9**



**5C HARDINGE STEP CHUCKS**

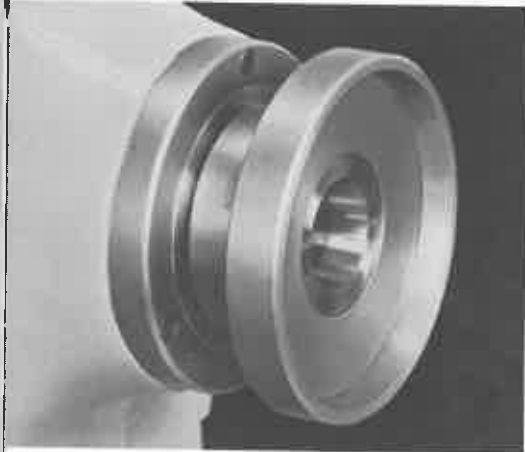
**REGULAR DEPTH CAPACITY** step chucks and closers are carried in stock in 2", 3", 4", 5" and 6" sizes for immediate delivery. They are  $\frac{3}{8}$ " larger in diameter than the rated size, so the full capacity may be readily applied. Steps may be applied to a depth of  $\frac{5}{8}$ " in these regular step chucks.

**EXTRA DEPTH CAPACITY** step chucks and closers are carried in stock in 2", 3", 4" and 5" rated sizes and 6" sizes are made to order. These step chucks are made so the full rated capacity step may be applied to the maximum depth of 1 $\frac{1}{4}$ ". A large step chuck closer is required for each size extra capacity step chuck.

When ordering, specify for taper or threaded nose spindle. Regular depth capacity step chucks and closers will be supplied unless extra depth capacity is specified.

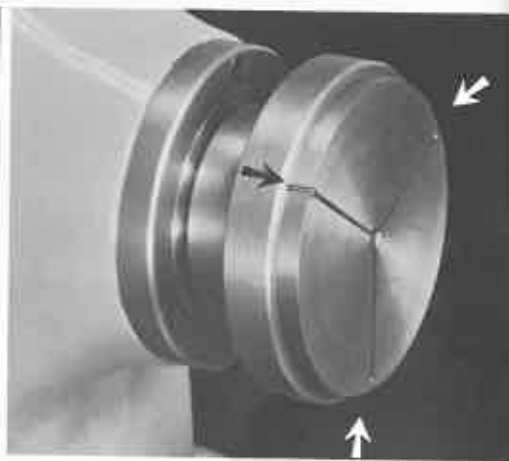


# INSTRUCTIONS FOR "STEPPING OUT" STEP CHUCKS



1. Clean nose of spindle. Apply a few drops of oil to outside of spindle. Clean spindle bore of step chuck closer. Apply closer to headstock spindle and tighten closer with spanner wrench. (Use Williams or Armstrong spanner wrench No. 460).

**Do not use punch and hammer.**



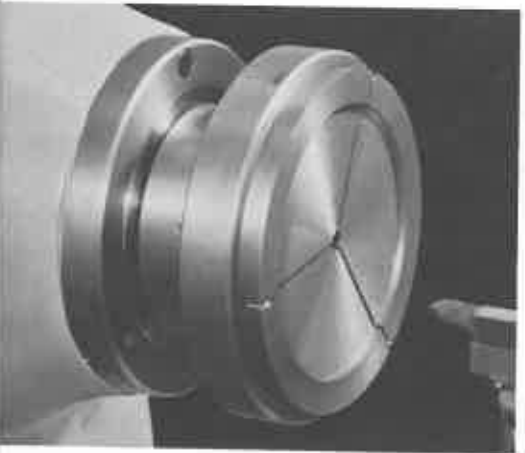
2. Clean inside of headstock spindle and outside of step chuck. Apply step chuck to spindle and collet closer. Be sure pins are in place. Adjust collet closer to same tension as used to chuck work piece and close step chuck.



3. With sharp carbide boring tool, rough bore step chuck to approximate size. The step chuck may be rapidly bored by using the plunge cut stepping method.



4. "Stepping out" of a step chuck requires care that bore is not oversize. When "roughing-out" use calipers, set slightly smaller than required size, to check bore diameter.



5. Finish bore to exact size of part to be held. Face bottom of bore in step chuck. If section of part to be held has a sharp corner, undercut corner of bore in step chuck.



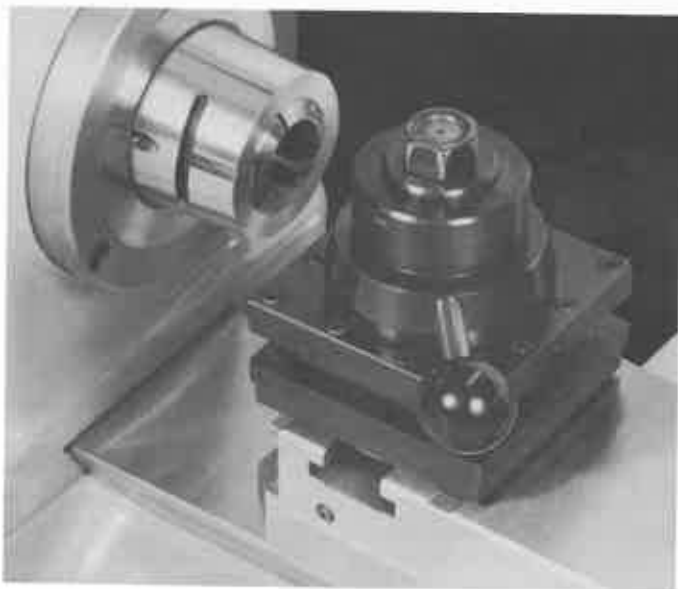
6. Clean bore of step chuck and use part as gage. Part should fit into step chuck like a good precision plug gage fit.



7. Remove step chuck. Clean step chuck closer and spindle. Wipe a few drops of oil on angle of step chuck closer and inside spindle. Perform this operation occasionally during a production run to assure accuracy of step chucks.



8. Remove pins from slots of step chuck. Clean each slot of step chuck of all chips and apply step chuck to machine spindle. Adjust collet closer for tension and you are ready to run production.



## AUTOMATIC INDEXING SQUARE TURRET

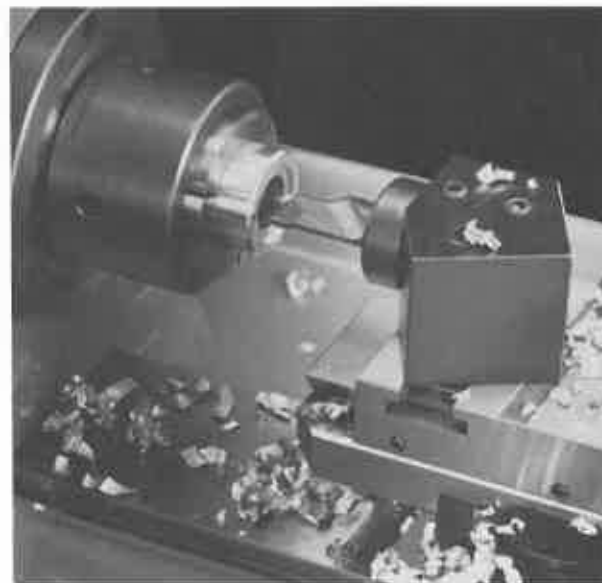
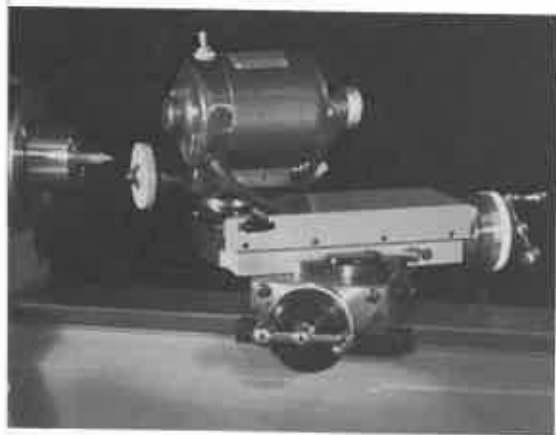
The square turret is applied directly to the tool post tee slot of the compound slide rest. The turret takes standard  $\frac{3}{8}$ " square tool bits. Simple movement of the lever automatically unlocks, indexes turret to the next tool position and relocks turret.

Accurate indexing is accomplished through tapered mating surfaces.

**Tool No. HTD**

## MOTOR GRINDER

The motor grinder unit mounts directly to the compound slide T-slot. It can be used for both external and internal grinding. Motor operates on 110 volt, single phase current.



## BORING TOOL HOLDER

The boring tool holder mounts directly to the T-slot of the compound slide and adapts standard  $\frac{5}{8}$ " diameter boring bars. An eccentric bushing permits height adjustment of the tool. Holder is supplied less boring tool.

**Tool No. L-5**

## CUT-OFF TOOL HOLDER

This patented cut-off tool holder fits directly to the compound slide. The blade and serrated blade holder are adjustable. The holder is furnished with a wrench — less blade. Blades are available in  $\frac{1}{16}$ ",  $\frac{3}{32}$ " or  $\frac{1}{8}$ " sizes. When ordering, specify desired blade thickness.

**Tool No. L-10**



## TOOLING

### PRECISION INDICATOR STOP FOR COMPOUND SLIDE REST

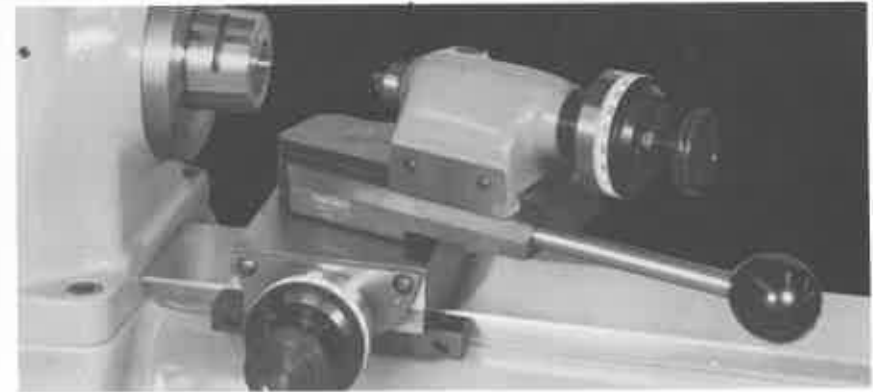
A precision indicator stop is used for turning and boring of parts to exceedingly close tolerances. The base of the indicator holder fastens directly to the dovetail bed ways. The base has a T-slot for positioning the indicator for small and large diameter work.

The standard precision indicator stop is furnished with a .0001" dial indicator and base. The base may be furnished less the dial indicator, if so desired.

Tool No. D-12



## BED TOOLING



### RADIUS TURNING ATTACHMENT

This precision attachment is used for turning concave or convex surfaces up to 1½" radius and for turning punches, dies, ball shaped valve seats and special spherical cutting tools.

The swivel slide is mounted on precision preloaded ball bearings for accuracy and rigidity. The swivel slide moves through 360°. Hardened feed screws are mounted on preloaded ball bearings and have adjustable black and white dials graduated in thousandths of an inch.



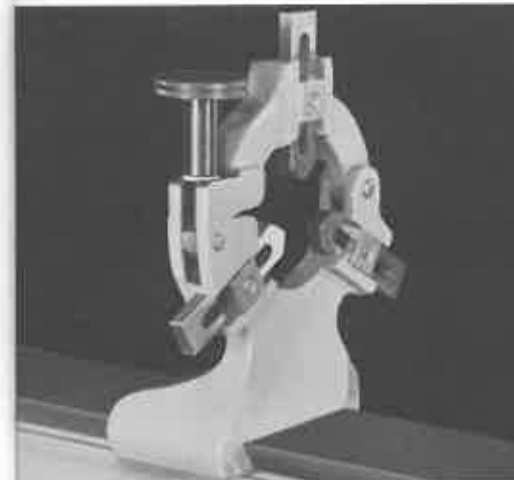
### ADJUSTABLE HEIGHT CHAIR

The seat of the chair has infinite adjustment to suit the operator and can be adjusted without the use of tools. The back rest is also adjustable.



### MACHINE LAMP

This lamp is available for use with the Hardinge DV59 lathe. The lamp fastens to the back of the lathe bed and operates from the regular 110 volt light line.



### CENTER REST

The three jaws are adjustable and have an accurate fit in the milled guides of the body. The top section is hinged to provide ease in loading. The center rest has a maximum capacity of 3".



### END-WORKING SLIDE

The slide is for deep hole drilling, lapping or any other operation requiring a tool travel up to 5½".

## TAILSTOCK TOOLING\*



**MALE CENTER**

This male center has a 11/16" head diameter and is furnished with all Hardinge tailstocks. All centers are hardened and ground.

**Tool No. G-5**



**FEMALE CENTER**

A female center is used for work that cannot have the usual center hole. The 11/16" head has a 60° conical hole 1/8" in diameter at the large end.

**Tool No. G-6**



**HALF CENTER**

A half center is used if tool clearance is desired when turning the full length of a part supported by the tailstock. The head diameter is 11/16".

**Tool No. G-7**



**LARGE CENTER**

This center has a head diameter of 1". It is indispensable for supporting tubing or recessed work too large for the standard male center.

**Tool No. G-8**

\* When ordering, specify No. 2 Morse Taper Shank

## TAILSTOCK TOOLING\*



**V CENTER**

The swivel V center is constructed so the V block rotates on the shank.

**Tool No. G-4**



**SUPER-PRECISION  
BALL BEARING CENTER**

This heavy duty anti-friction center has a No. 2 Morse taper shank for direct application to the tailstock spindle. Work can be done between centers at high spindle speed when the anti-friction center is used.

**Tool No. HDC**



**DRILL CHUCK**

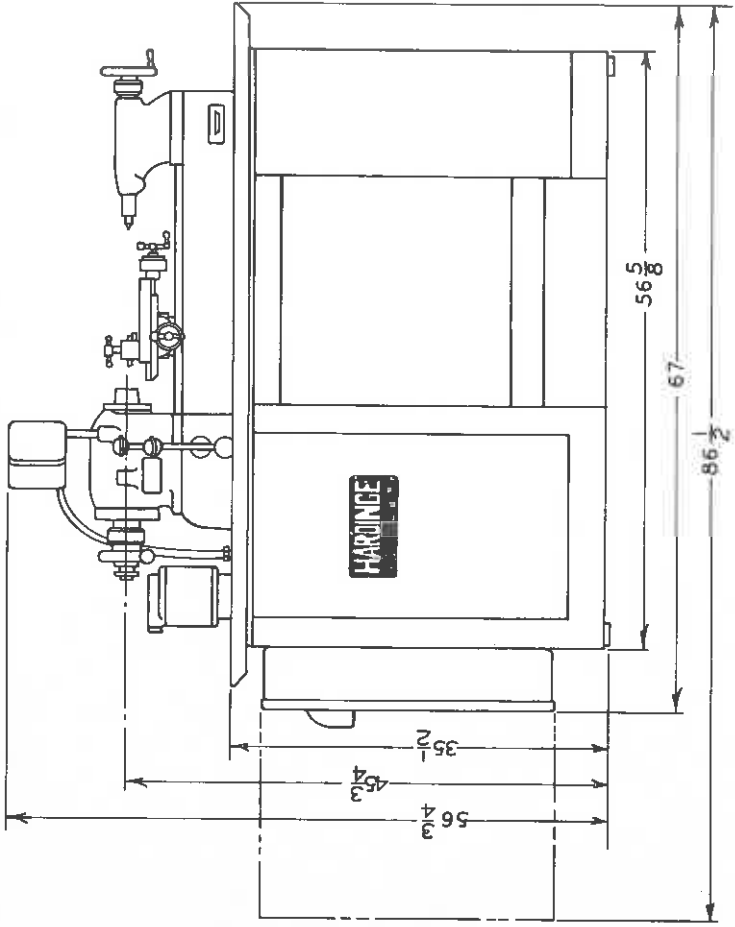
We recommend the improved type drill chucks with our tailstocks. We carry 0 - 1/8", 0 - 3/8" and 0 - 1/2" sizes in stock mounted ready for use.

**Tool No. G3-1** 1/8" Capacity

**Tool No. G3-3** 3/8" Capacity

**Tool No. G3-4** 1/2" Capacity

\* When ordering, specify No. 2 Morse Taper Shank



MACHINE FLOOR PLAN

