HARDINGE

HIGH SPEED PRECISION LATHE

FOR

ACCURACY - FINE FINISH - HIGH SPEEDS - LOW COST

HARDINGE BROTHERS, INC., ELMIRA, N. Y.

"Performance has established leadership for Hardinge"

www.OzarkToolManuals.com
THE Hardinge Precision Lathe provides accuracy and speed to give the perfect combination for producing parts to exacting close limits. The simplicity of operation enables relatively unskilled operators to produce parts to the necessary close limits without expensive tooling. The above illustration clearly shows the rugged construction which assures fine to heavy cuts with a desired finish at high speeds and lasting precision.

The driving belts to the headstock spindle can be readily changed without removing the headstock spindle.

Super-precision Preloaded Duplex Ball Bearings provide extreme accuracy and high spindle speeds with the bearings requiring no adjustment. The desirable results are so surprising that actual use is the best medium to determine the advantages over your present machines.

**HEADSTOCK:** The headstock frame is of the finest grade, seasoned and heat-treated alloy iron and has a hand scraped bearing surface to fit the ways of our amply proportioned lathe bed.

The outstanding feature is the **enclosed headstock.** The design has been successfully used with our sleeve bearing machines over a number of years. Reflection will indicate that machine tool builders are offering enclosed headstock units for: First, greater accuracy; Second, to allow heavier cuts; Third, to completely enclose driving belts. The enclosed headstock is the logical design for a ball bearing precision lathe, as it meets accuracy and speed requisites.

The spindle is hardened and ground, both internally and externally, and is made of the best grade ball bearing steel. With the ball bearing construction, the spindle is mounted in rotating members to eliminate wear on the spindle — an unusual feature for a lathe. The spindle pulley is provided with six positions for locking by means of a substantial pin at the rear of the headstock. The spindle has the Hardinge patent taper nose — threaded nose spindle furnished upon request.

All headstocks are provided with an integral boss for the rapid application of the Automatic Collet Closer as illustrated and described in our Lathe Attachment Bulletin LA.

**BALL BEARINGS:** Work load on a sleeve bearing is supported by a film of oil, the functioning of which is dependent upon such variable factors as film thickness, temperature and difference in the grades of oil used. With a preloaded ball bearing, the pressure between balls and races is such as to prevent formation of an oil film and the contact of load carrying members is positively metal-to-metal. In other words, the load is carried on perfect spheres of hardened steel instead of globules of oil whose load-carrying ability varies with the operating temperature. Naturally, accuracy with speed and long life is attained.

Proper steel, vast improvement in manufacturing methods and the use of modern gages have achieved a uniform standard of accuracy, considered commercially impossible a few years ago.

**LUBRICATION:** Both the front and rear bearing sections of all headstocks are properly sealed to exclude dirt and other foreign matter.

Headstocks having oil cups at the rear of the unit are provided with oil holes filled with felt to assure constant filtered lubrication. On machines where there are no oil cups located at the rear of the headstock, the headstock is equipped with front and rear bearings which are grease packed for life — requiring no further lubrication.
COMPOUND SLIDE REST: In keeping with the high precision qualities of Hardinge Lathes, the compound slide rest reflects the best in design and workmanship.

All slides are properly proportioned, hand scraped and accurately fitted. The slides are provided with gibbs for adjustment to assure a correct sliding fit at all times. The base for the bottom slide is in direct contact with the lathe bed. The alignment of the compound slide rest with the lathe bed is maintained by a long adjustable bed stop. The index slide has a positioning lock and a positive lock.

The construction of the tool post allows the use of standard tool holders or two 3/8" square tool bits may be employed to give the proper center height. It is heavily constructed and hardened and revolves in an oblong block which fits the T-slot of the top slide.

The top and bottom screws have accurate 10 pitch threads revolving in long bearings. The adjustable dials are large and plainly marked, being graduated in thousandths.

ATTACHMENTS: Attachments increase the utility of a precision lathe—the wide variety of attachments and their interchangeability are characteristic of Hardinge High Speed Precision Lathes. Additional information is given in our Lathe Attachment Bulletin LA.

TAILSTOCK: The correct design and substantial construction of this tailstock are clearly apparent. The base casting is hand scraped to a full bearing on the lathe bed, and to perfect alignment with the headstock spindle.

The spindle is hardened, ground and is graduated to eightths of an inch. It has a ball bearing to absorb the thrust which may be placed upon the spindle. A constant full bearing for the spindle is provided regardless of its position in the tailstock body thus assuring extreme rigidity and accurate travel. The adjustable dial at the hand wheel end of the spindle, graduated in thousandths, is provided for fine depth control when drilling, reaming or boring with the tailstock.

A split nut lock arrangement securely holds the spindle in any particular position in the frame while an eccentric bolt and binder hold the tailstock in position on the lathe bed.

The spindle has a No. 1 Morse taper and the tailstock is furnished with a male center. The male center is automatically discharged at the end of the right hand travel of the spindle.

An oil quill is provided for center lubricant.
PEDESTAL DRIVING UNIT: The welded steel pedestal is a modern support for the modern Hardinge Precision Lathe. The pedestal fully encloses a standard two-speed reversing motor, controls, driving unit and provides cabinet space for storage of tools, collets and other attachments. The levers at the headstock operate two electrical motor controls—one for LOW - STOP - HIGH, and the other for FORWARD - BRAKE STOP - REVERSE spindle speeds. Both levers are provided with stops for immediate location of speed positions. The driving unit comes as a proven unit through years of use with our precision lathes and milling machines. There are no gears, clutches or loose pulleys to cause noise, chatter and vibration.

The pedestal driving unit can be furnished, at extra cost, with built-in coolant facilities—including pump, sump, piping and strainer—if so desired.

(For Wood Bench Mounting—see Bulletin LM)

REGULAR EQUIPMENT AND SPECIFICATIONS

Enclosed Headstock, Hand Wheel, Draw Spindle, Spanner Wrench for Draw Spindle; Tailstock with Male Center; 36” Plain Bed with Bed Bolt and Speed Control Levers; (Compound Slide Rest extra); Pedestal Driving Unit with Motor and Controls for either 220 volt or 440 volt or 550 volt, 60 cycle, 3 phase current—completely assembled and wired when shipped. Driving units for other currents—specifications and prices upon application.

<table>
<thead>
<tr>
<th>Specifications</th>
<th>TB 59</th>
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<tbody>
<tr>
<td>Collet Round Capacity through Spindle</td>
<td>1”</td>
</tr>
<tr>
<td>Collet used—Dimensions—see Collet Bulletin</td>
<td>5C Hardinge</td>
</tr>
<tr>
<td>Capacity through Spindle with Jaw Chuck</td>
<td>1 5/8”</td>
</tr>
<tr>
<td>Swing over Bed</td>
<td>17”</td>
</tr>
<tr>
<td>Distance between Centers</td>
<td>30”</td>
</tr>
<tr>
<td>Length of Bed</td>
<td>4½”</td>
</tr>
<tr>
<td>Travel of Top Slide</td>
<td>5½”</td>
</tr>
<tr>
<td>Tool Post Capacity</td>
<td>¾” x 1”</td>
</tr>
<tr>
<td>Travel of Tailstock Spindle</td>
<td>3½”</td>
</tr>
<tr>
<td>Tailstock Spindle Taper No.</td>
<td>1 Morse</td>
</tr>
<tr>
<td>Eight Speeds*</td>
<td>230 R.P.M.</td>
</tr>
<tr>
<td>½ Low</td>
<td>3500 R.P.M.</td>
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<tr>
<td>⅜ High</td>
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* Unless otherwise specified, units are furnished with the standard speed range of 230, 460, 790, 1200, 1590, 1800, 2370, 3500 R.P.M. forward and reverse. The following three spindle speed ranges are optional—prices will be quoted upon application:

- 250, 510, 880, 1350, 1780, 2000, 2690, 4000 R.P.M.
- 160, 320, 550, 835, 1140, 1300, 1680, 2600 R.P.M.
- 100, 300, 570, 850, 1120, 1680, 2600 R.P.M.
BRACED BENCH MOUNTING
FOR
HARDINGE HIGH SPEED PRECISION LATHE

DESCRIPTION OF BRACED BENCH

The bench top is manufactured from clear hard northern maple, being made of narrow strip laminations which are glued up with edge grain working surface. It is reinforced with three 3/8" tie bolts running entire width of top to prevent warping or distortion. The bench top dimensions are 60" x 30" x 2-1/4" thick.

The top is supported by 1-5/8" diameter steel legs which are held extremely rigid by 1/2" diameter angular tension rods. Each tension rod has a right hand and a left hand thread, to increase or decrease tension as desired—there is no chance for movement of the bench top since the tension rods are at an angle. (This feature eliminates vibration.) The steel legs are provided with a height adjustment to overcome floor irregularities. A swinging collet board, furnished as standard equipment, and the 14" x 20" x 5" steel drawer provide storage space for machine attachments.

The enclosed head precision lathe, braced bench and drive are shipped completely assembled and wired, ready for operation by connection of the motor to the power line.

DESCRIPTION OF DRIVING UNIT

The enclosed headstock covers two vee belts which connect the lathe with the drive. The driveshaft pulley is overhung to facilitate the replacement of the headstock vee belts. A standard two-speed reversing motor is vee belt connected to a four step pulley to give eight forward and eight reverse spindle speeds. The motor is mounted on a motor shelf provided with a lever for ease of changing motor vee belt. (The motor is not attached to the bench top and, being felt mounted on a hinged shelf, the possibility of vibration is eliminated.) The hinged motor shelf is supported by a felt cushion and is lowered or raised by a screw for fine adjustment of belt tension. A dash pot neutralizer holds the motor shelf in the desired position.

The drive shaft is supported by self-aligning ball bearings. Individual adjustment is provided to maintain proper tension for the vee belts. The levers at the headstock operate two electrical motor controls—one for LOW-STOP-HIGH, and the other for FORWARD-BRAKE-STOP-REVERSE spindle speeds. Both levers are provided with stops for immediate location of speed positions. The units provide eight speeds forward and eight speeds reverse ranging from 230 to 3500 r.p.m.