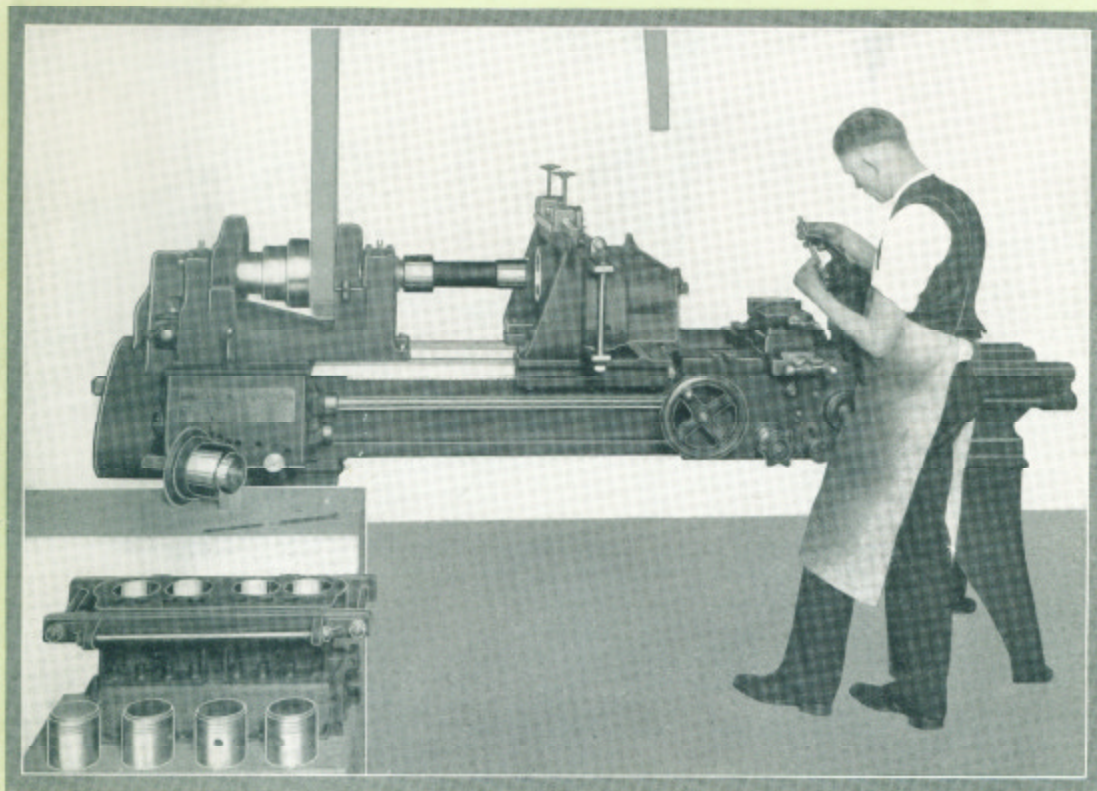


The South Bend Method for Reboring and Regrinding Cylinders in the Lathe



Reboring a Six Cylinder Block on an 18 inch x 8 foot South Bend Lathe

THE South Bend Lathe has the necessary power, the wide range of automatic feeds, and the spindle speeds necessary for reboring or regrinding cylinders. Unlike special Single Purpose Machines, it can also be used for hundreds of other profitable jobs in Auto Repair and Machine Shop work.

BULLETIN NO. 89

South Bend Lathe Works
725 East Madison St., South Bend, Indiana

Copyright, 1925
South Bend Lathe Works



The New
"South Bend"

--- the Lathe with Practical Attachments

The South Bend Method of Reboring Cylinders

Worn or scored cylinder blocks can be reconditioned quickly and accurately by boring on the South Bend Lathe. By using the fine automatic feed of the carriage, a smooth, accurate surface is obtained equal to the original finish of the cylinder. Many of the leading automobile manufacturers now finish their cylinders by boring in preference to grinding.

Reboring a Ford Cylinder Block

Figure 2 C

The illustration shows a Ford cylinder block mounted on a special fixture for reboring in the lathe. The fixture slides along the lathe bed and is connected to the carriage so that the automatic feeds can be used. The equipment is designed to take care of two, four, or six cylinder blocks of various types and sizes.

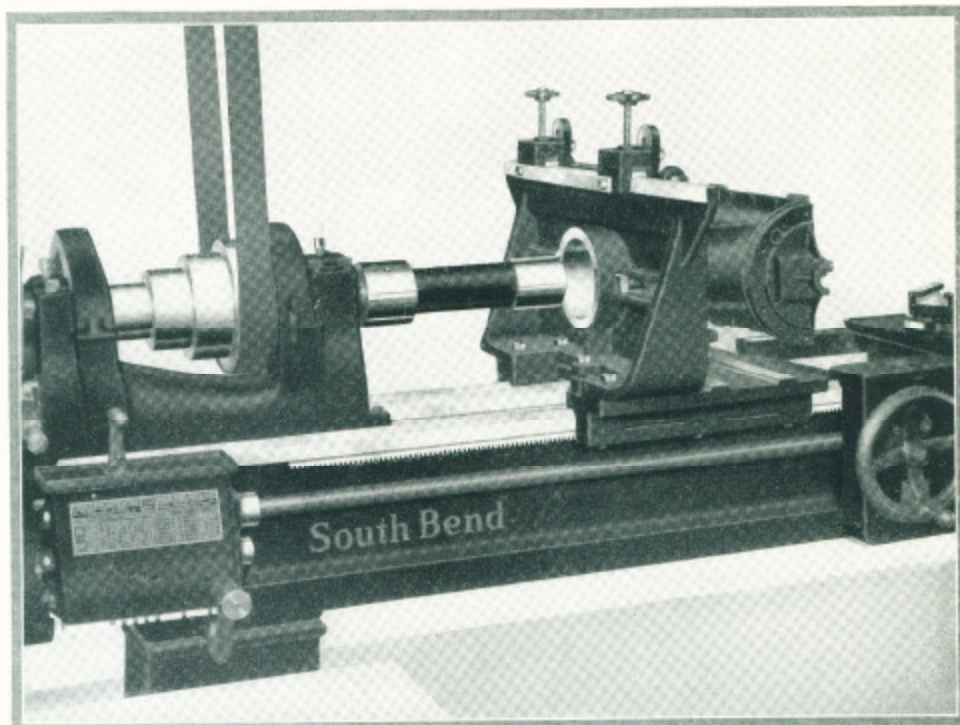


Figure 2 C—Reboring a Cylinder Block on the Lathe.

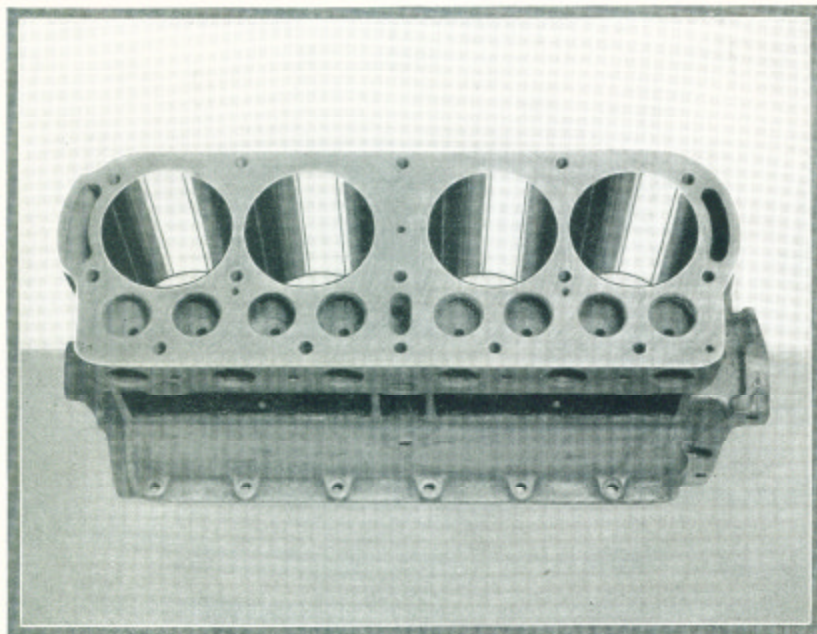


Figure 3 C—Cylinder Block That Has Been Rebored in the Lathe.

A Rebored Cylinder Block

Figure 3 C

The illustration at the left shows a cylinder block that has been rebored in the South Bend Lathe. The cylinders are smooth, straight, accurate and true their entire length, and at perfect right angles to the base. Cylinders can be rebored in about half the time required for grinding.



The New
"South Bend"

--- the Lathe with Practical Attachments

The Method of Mounting the Cylinder Block for Reboring or Regrinding

The South Bend Method of mounting cylinder blocks for reboring or regrinding is both practical and efficient. Heavy, awkward blocks can be handled with ease and precision. The weight of the cylinder block is entirely supported by an adjustable cradle to facilitate aligning, centering or shifting from one hole to another.

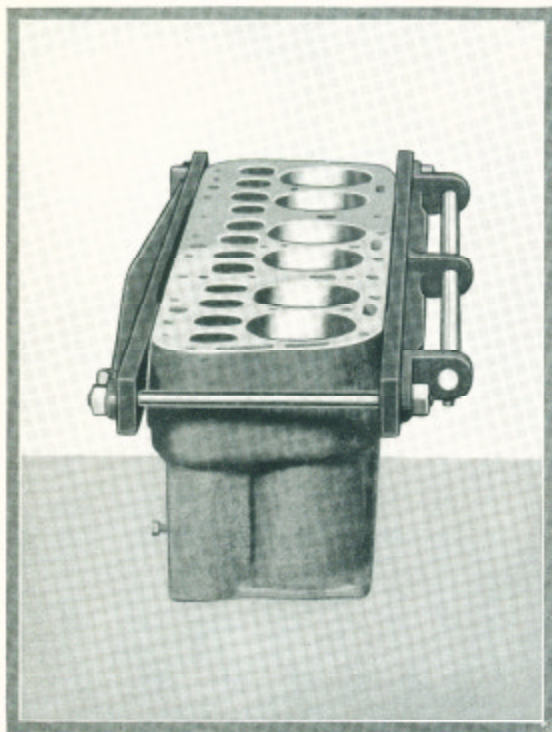


Figure 4 C — Cradle Clamps Bolted to Cylinder Block.

Cradle Support Clamps

Figure 4 C

In order to facilitate the handling of heavy or awkward cylinder blocks, cradle support clamps are used. The cradle simplifies the centering of the cylinder that is to be machined, and is clamped to the cylinder block as shown in the illustration.

Mounting the Cylinder Block

Figure 5 C

To mount the cylinder block on the special fixture, it is only necessary to hang the steel bar of the cradle on the support hooks at the top of the angle plate as is illustrated. The weight of the cylinder block is thus entirely supported by these adjustable brackets, which facilitates the operator in proceeding with the centering of the cylinder so that it will be concentric with the spindle of the lathe.

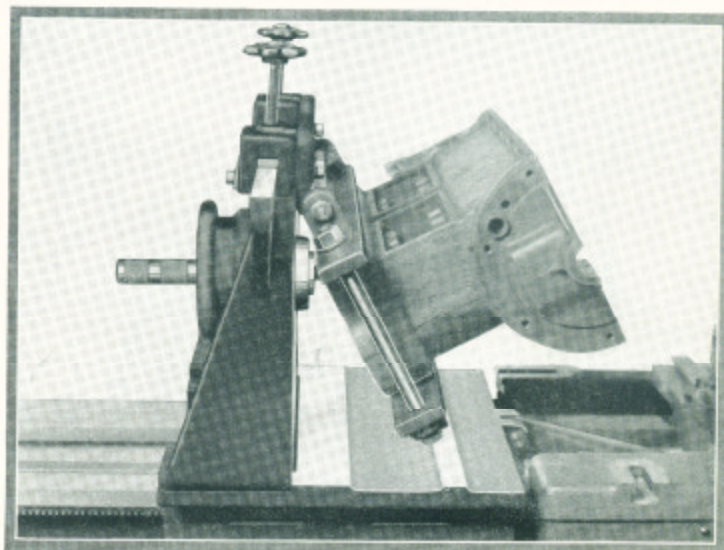


Figure 5 C—The Pilot Ring of the Centering Plug Facilitates Centering the Cylinder Concentric with Spindle of Lathe.



The New
"South Bend"

--- the Lathe with Practical Attachments

The Method of Mounting the Cylinder Block for Reboring or Regrinding

The illustrations below explain the South Bend Method of mounting and centering the cylinder block on the lathe for reboring or regrinding. The South Bend equipment is universal so that cylinder blocks of various sizes and kinds can be quickly and accurately mounted in the minimum amount of time. Heavy clamps are furnished for fastening the cylinder block securely in position after it has been centered.

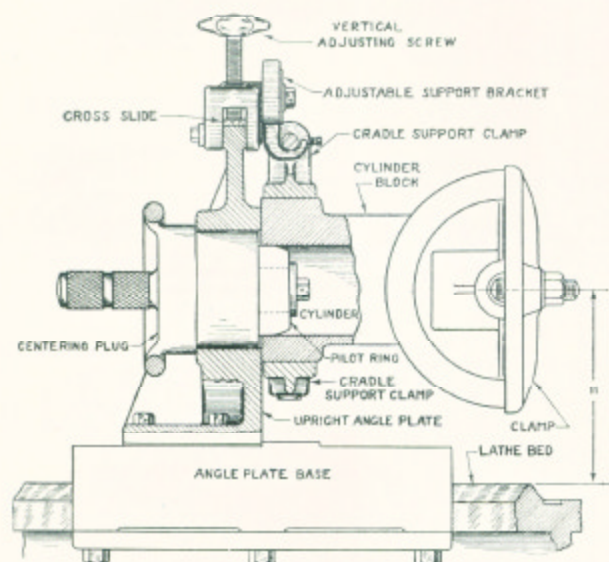


Figure 6 C—How Cylinder is Centered Concentric to Lathe Spindle.

The Centering Plug

Figure 7 C

The centering plug is used to locate the cylinder concentric with the axis of the lathe spindle. The large diameter is machined to fit the hole bored in the center of the angle plate, and the small pilot at the end of the plug fits into the cylinder that is to be rebored.

How the Cylinder is Centered with the Lathe Spindle

Figure 6 C

The illustration at the left shows the method of adjusting the cylinder so it is concentric with the spindle of the lathe. Vertical adjustment is provided by the knob adjusting screws, and horizontal adjustment is provided by sliding the cylinder block along the cross slide. The centering plug hole in the vertical plate is bored concentric with the axis of the lathe spindle after the fixture has been hand scraped to the V-ways of the lathe bed. After the cylinder is properly centered and the block securely clamped to the angle plate, the centering plug is removed.

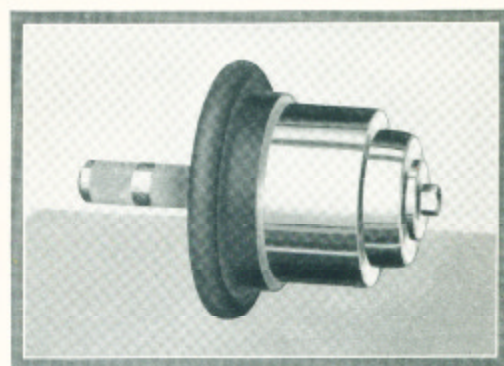


Figure 7 C—Centering Plug with Pilot Ring Attached.

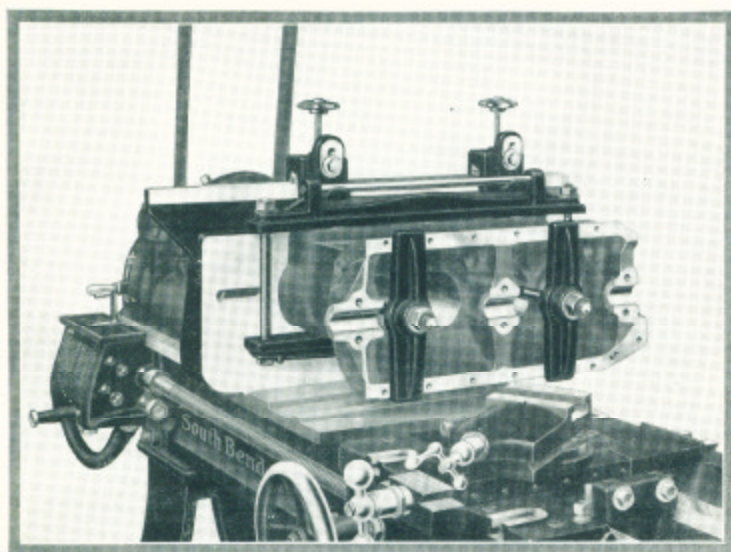


Figure 8 C—Method of Clamping Cylinder Block to Angle Plate.

How the Cylinder Block Is Clamped to the Vertical Surface

Figure 8 C

After the cylinder has been accurately centered it is clamped to the vertical surface of the fixture by two large strap clamps. These clamps hold the cylinder block securely while it is being machined. The vertical surface of the angle plate is true with the axis of the lathe spindle so that the cylinder is machined square with the surface of the block and a round, true hole produced.



The New "South Bend" --- the Lathe with Practical Attachments

Cylinder Reboring Equipment for South Bend Lathes

The equipment illustrated and described on this page has been especially designed for reboring cylinder blocks on the South Bend Lathe. The construction is thoroughly practical throughout and the equipment will be found very convenient to use.

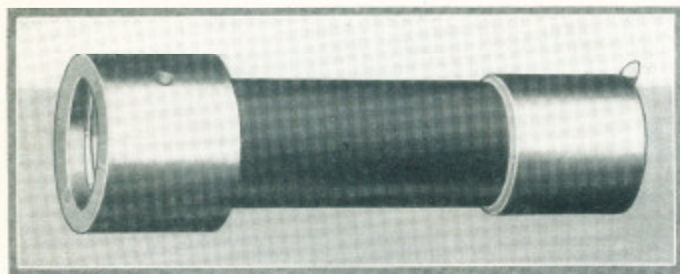


Figure 9 C—Boring Bar.

The Boring Bar

Figure 9 C

The boring bar, which is of heavy, rigid construction, screws onto the spindle nose of the lathe. The fine screw adjustment of the high speed steel cutting tool enables the operator to machine the cylinders to the most accurate requirements. See Job Sheets for further details.

What the Cylinder Reboring Equipment Consists Of

Figure 10 C

The equipment included in the price of the Cylinder Reboring Attachment consists of boring bar, angle plate fitted to lathe bed, cradle clamps for holding cylinder block to angle plate, centering plug, and complete set of Job Sheets giving full information on cylinder reboring.

Net Factory Prices Reboring Attachment Complete

Catalog No.	Size Lathe	Shipping Weight	Price of Reboring Attachment
161	16 in.	430 lbs.	\$125.00
181	18 in.	460 lbs.	135.00
211	21 in.	500 lbs.	150.00
241	24 in.	550 lbs.	175.00

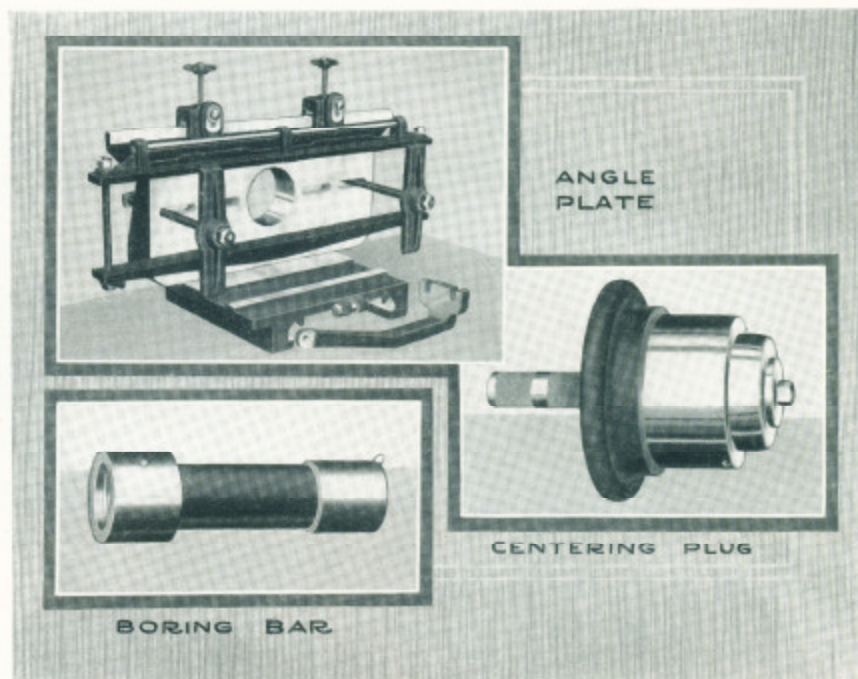


Figure 10 C—The Different Parts Which Make Up the Reboring Equipment.

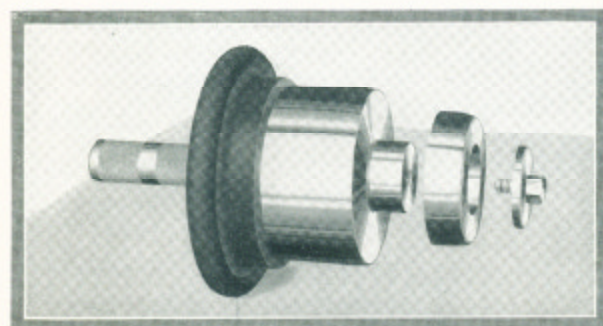


Figure 11 C—Pilot Rings are Interchangeable on Centering Plug.

Extra Pilot Rings for Centering Plug

Figure 11 C

The construction of the centering plug is clearly illustrated at the left. The pilot ring is bored and reamed to fit the centering plug but is left rough on the outside diameter for finishing to the required size. One pilot ring is included with the centering plug.

No. 11 Extra Pilot Rings for Centering Plug, Shipping Weight 2 lbs.
Net Factory Price each\$1.50

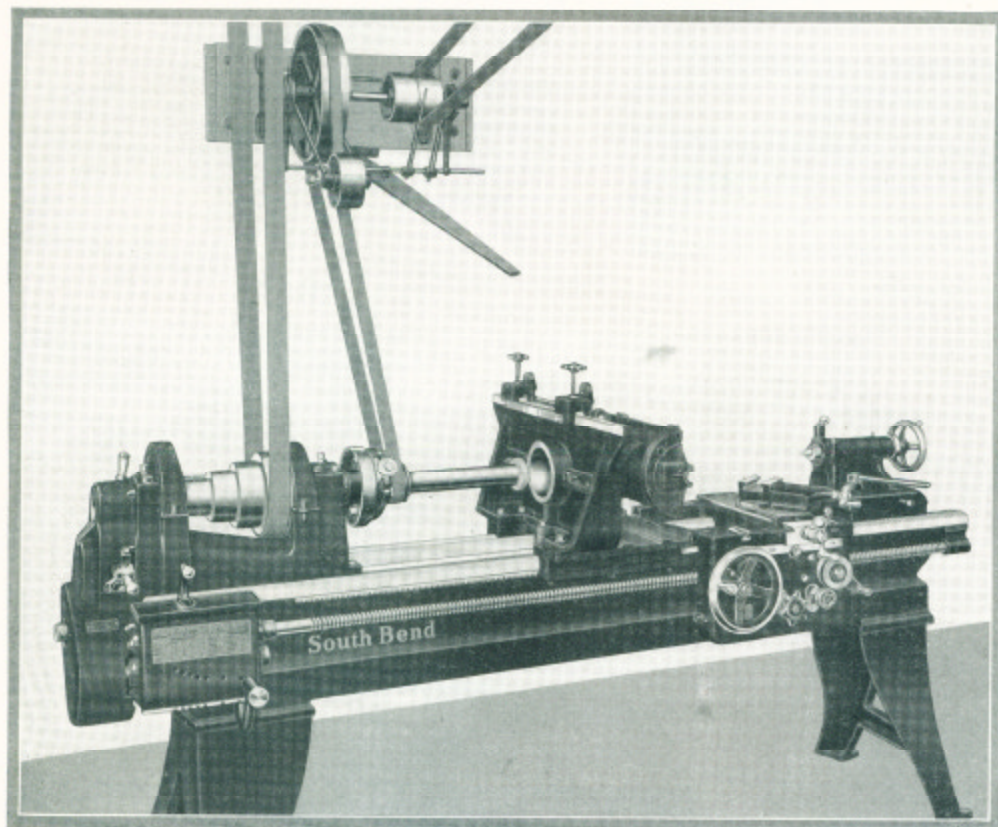


The New
"South Bend"

--- the Lathe with Practical Attachments

The South Bend Method of Regrinding Cylinders

Some mechanics prefer to recondition cylinders by regrinding on account of the highly polished surface produced. Cylinders can be reground with accuracy and precision on the South Bend Lathe and the method outlined below is both economical and practical. The equipment required is the same as is used for reboring, excepting the grinding spindle and countershaft.



Regrinding a Cylinder Block in the Lathe

Figure 12 C

The illustration shows an 18 inch swing x 8 foot bed, South Bend Lathe with complete cylinder regrinding equipment. The cylinder block is supported by a special fixture in the same manner as for reboring. The grinding spindle, which screws onto the spindle nose of the lathe, is driven from a wall countershaft. If the cylinder is badly scored, and the customer demands regrinding, it is best to remove most of the metal by reboring and then to finish by regrinding.

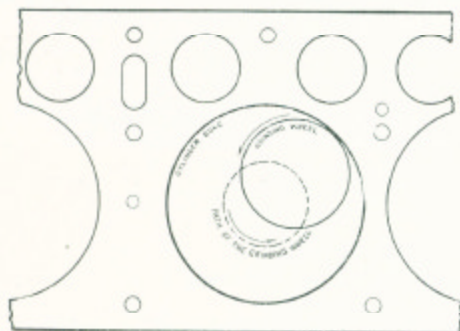


Figure 13 C—Eccentric Action of Grinding Spindle.

How the Grinding Spindle Operates

The eccentrically mounted grinding wheel revolves at a high speed on its own axis and at the same time is carried slowly around in a true circle inside of the cylinder by the rotation of the lathe spindle. A highly polished, true surface is produced perfectly straight and round from one end to the other. A graduated collar, reading in thousandths of an inch, provides for a fine adjustment of the grinding spindle so that cylinders can be reground within extremely close standards of accuracy.

Figure 12 C—Cylinder Grinding Attachment Mounted on Lathe.

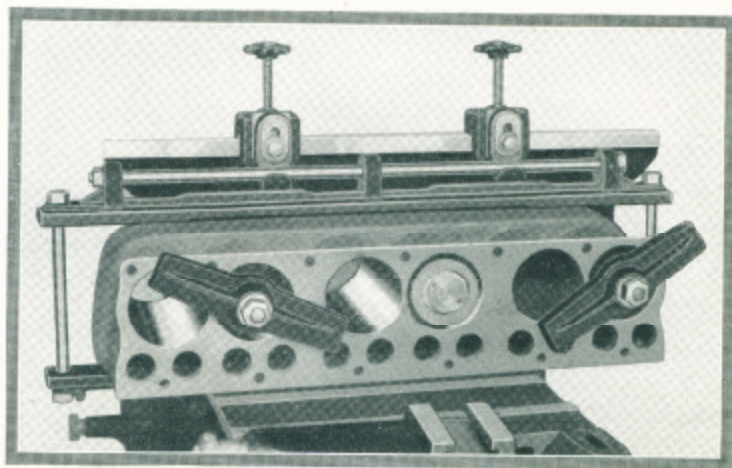


Figure 14 C—Rear View of Cylinder Block to Show Grinding Wheel in Action.



The New
"South Bend"

--- the Lathe with Practical Attachments

Cylinder Regrinding Equipment for South Bend Lathes

The equipment illustrated on this page has been especially designed for regrinding cylinders on South Bend Lathes. The construction and design is thoroughly practical throughout and the equipment will be found convenient and durable.

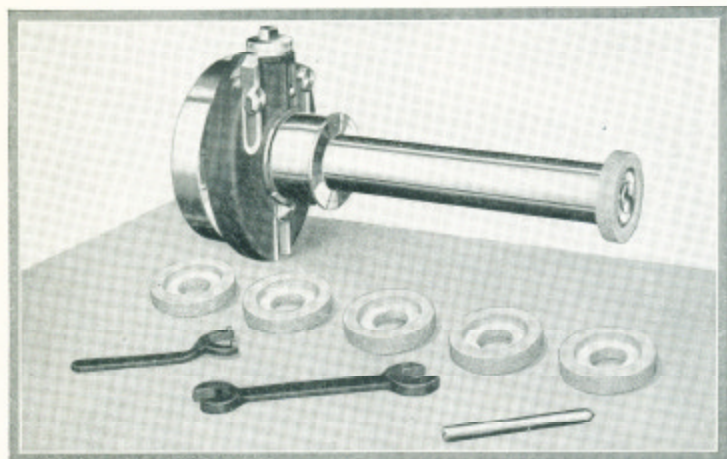


Figure 15 C—Grinding Spindle, Wheels and Wrenches.

Countershaft for Acme Grinding Spindle

Figure 16 C

The grinder countershaft, illustrated at the right, is provided with a tight and loose pulley, a large drive pulley, and an idler pulley for maintaining proper belt tension. The entire countershaft is balanced and the self-aligning bearings are lined with a high quality special bearing metal.

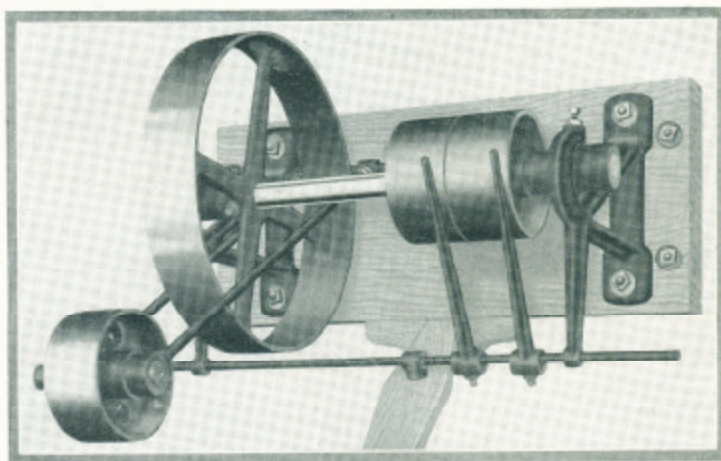


Figure 16 C—Wall Countershaft for Grinding Spindle.

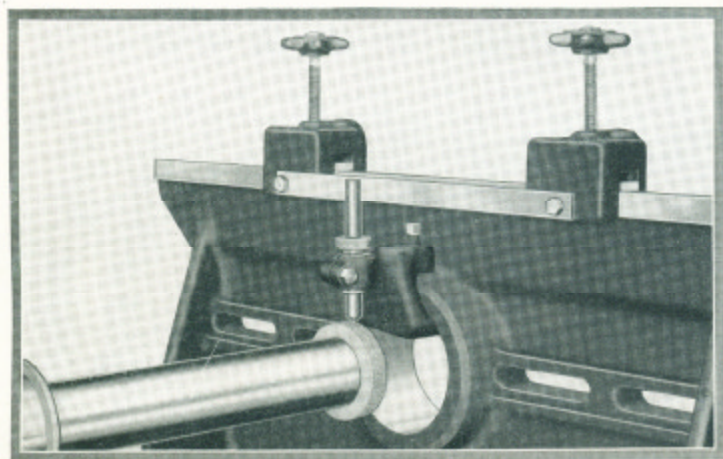


Figure 17 C—Truing a Wheel with a Diamond.

Acme Grinding Spindle

Figure 15 C

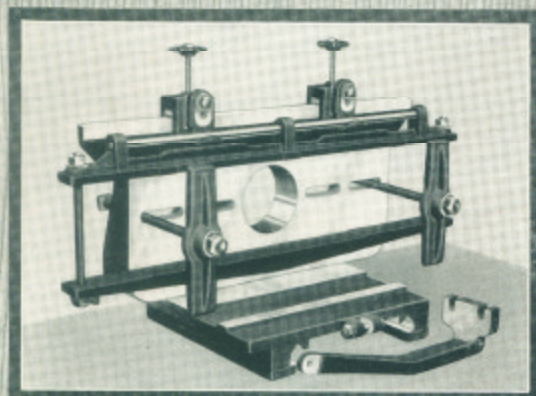
The Acme grinding spindle is mounted on the spindle nose of the lathe and is driven from a wall countershaft. The steel spindle is provided with ball bearings and is accurately balanced to eliminate vibration. A micrometer graduated collar reading in thousandths of an inch provides a fine adjustment of the grinding wheel. Six grinding wheels and the necessary wrenches are included with the grinding spindle.

Diamond Dresser for Truing Grinding Wheel

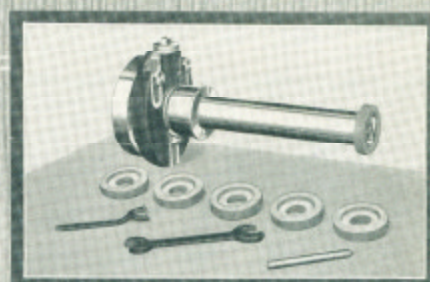
Figure 17 C

The holder for the diamond dresser is mounted on the vertical plate as illustrated for truing the grinding wheel. A fine screw adjustment of the diamond is provided. The supporting clamp and dresser can be removed instantly after the wheel has been made true. See Job Instruction Sheets on Cylinder Regrinding.

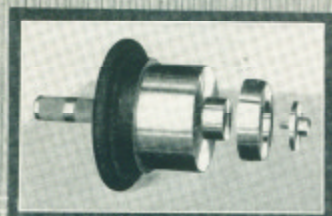
Parts Which Make Up the Complete Cylinder Regrinding Attachment for South Bend Lathes



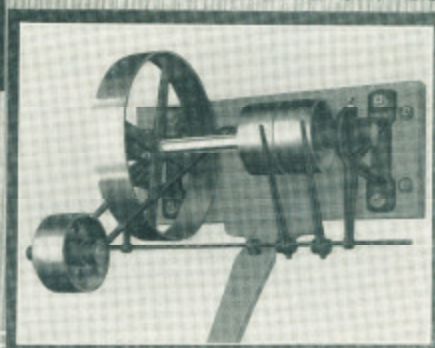
ANGLE PLATE



GRINDING SPINDLE



CENTERING PLUG



WALL COUNTERSHAFT

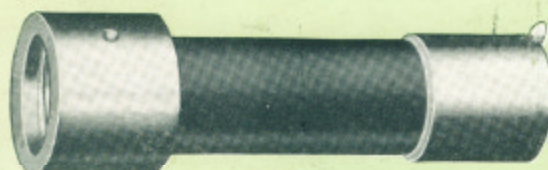
Equipment Included in Price of Cylinder Regrinding Attachment

The equipment included in the price of the Cylinder Regrinding Attachment consists of Grinding Spindle, six Grinding Wheels, Angle Plate fitted to lathe bed complete with clamps for holding Cylinder Block, Centering Plug with rough turned Pilot Ring, Diamond Dresser for truing grinding wheels, Countershaft with Idler Pulley, necessary Wrenches, and a complete set of Job Instruction Sheets giving full and complete information on cylinder regrinding.

Net Factory Prices Regrinding Attachment

Catalog No.	Size Lathe	Shipping Weight	Price of Regrinding Attachment
162	16 in.	530 lbs.	\$300.00
182	18 in.	560 lbs.	310.00
212	21 in.	600 lbs.	325.00
242	24 in.	650 lbs.	350.00

Equipment Required for Both Reboring and Regrinding Cylinders



Boring Bar

The Boring Bar illustrated above is the same as used with the South Bend Reboring Attachment. It is shown here in the event the operator wishes to have the necessary equipment for both reboring and regrinding cylinders on the lathe.

Some customers who purchase Regrinding Equipment find that quite often they are asked to rebores cylinders. All that is necessary in addition to the Regrinding Equipment is the Boring Bar illustrated at the left.

No. 1097 South Bend Boring Bar complete with Cutting Tool, Shipping Weight 50 lbs. Net Factory Price each.....\$15.00

Hone for Polishing Cylinders After Reboring

Honing Cylinders after they have been rebored is sometimes desired by the customer. Any of the standard makes of Hones can be used with the South Bend Reboring Attachment to follow the reboring operation.

South Bend Lathe Works
725 East Madison St., South Bend, Indiana

PRINTED IN U. S. A.