



Rockwell

MANUFACTURING COMPANY

The Rockwell Building • Pittsburgh, Pa.

PM- 414-01-651-5002

DATED IM 3-15-68

ROCKWELL 11" METAL CUTTING LATHE

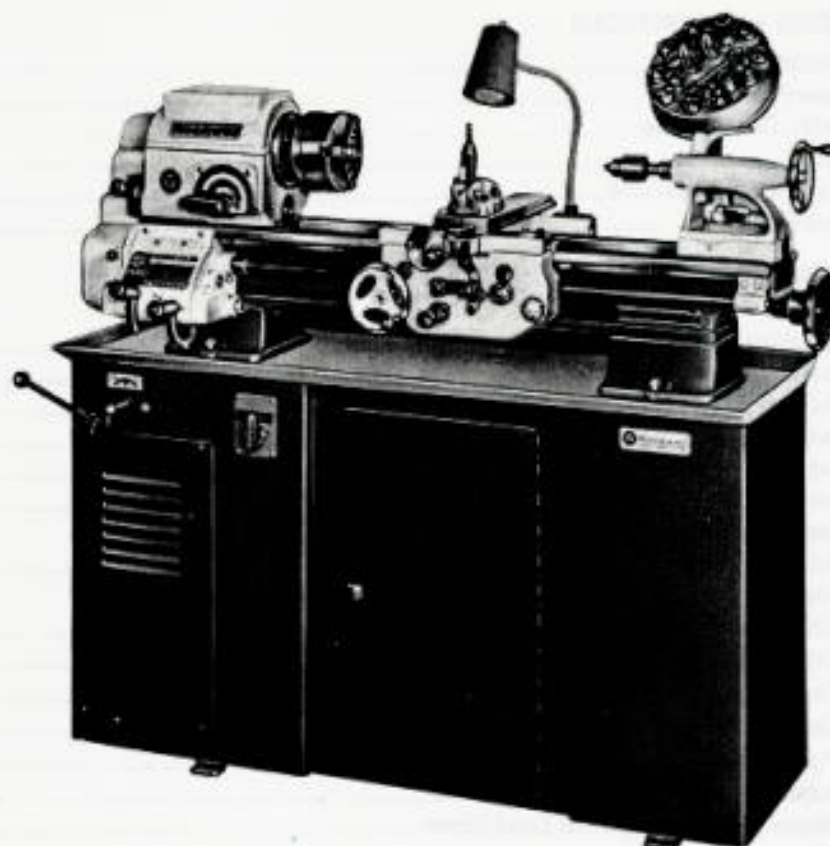


Fig. 1

INTRODUCTION

The Rockwell Metal Cutting Lathe you have just purchased is a **PRECISION MACHINE TOOL**, built to the same high standards that have made the name Rockwell the byword for quality built, industrial power tools for over a quarter of a century.

Treat it as such by taking the time and care to see that it is properly installed and conscientiously maintained. You will find such time to be well spent and gain the benefits derived from keeping your lathe in perfect working condition for its entire life.

Before leaving our factory, the complete machine was thoroughly aligned, tested and inspected and the results of the more important tests are shown on the **QUALITY CONTROL CERTIFICATE** packed with it. However, rough handling in shipment could throw the machine out of alignment and before being placed in operation it should be thoroughly checked and readjusted where necessary.

It is of the utmost importance therefore, that you review this entire manual before installing or operating your lathe so that you may become thoroughly familiar with the adjustments and functions of its various components.

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SELECTING FLOOR SPACE

Vibration transmitted through inadequately constructed floors by adjacent machinery or other sources can impair the accuracy of your lathe. Therefore, it is of utmost importance that the lathe be mounted to a solid, level foundation, preferably concrete.

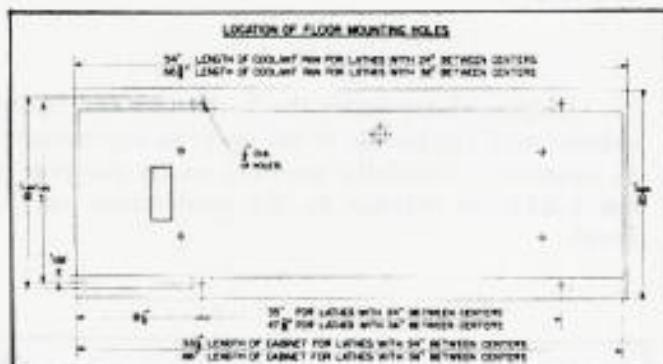


Fig. 2.

Unless substantially constructed, a wood floor should be braced against sagging and transmission of vibration. Refer to Fig. 2 for floor plan dimensions for 11" Metal Cutting Lathe.

CLEANING THE LATHE

The bed ways and all other machined and unpainted surfaces of the lathe are protected with a coating of rust preventive. This coating may be removed with a soft cloth moistened with kerosene (do not use acetone, gasoline or lacquer thinner for this purpose.) After cleaning, cover all unpainted surfaces with a light film of good machine oil.

INSTALLING THE MOTOR

If your lathe was purchased complete with a Rockwell motor you may disregard these instructions because the motor has been mounted and the motor pulley adjusted to give correct alignment of the lower variable speed belt.

For easier wiring, the motor junction box should be toward the front of the lathe.

1. Place the pulley on motor shaft with key in place. Do not tighten set screw at this time, as the motor pulley will be adjusted to give correct alignment of the lower variable speed belt.

2. Remove nut, washer, and rubber bumper from the motor mounting plate.

3. Place motor on motor plate, install motor mounting bolts, and tighten nuts finger tight. A block of wood placed under the hinged motor plate will facilitate insertion of the four bolts for mounting the motor.

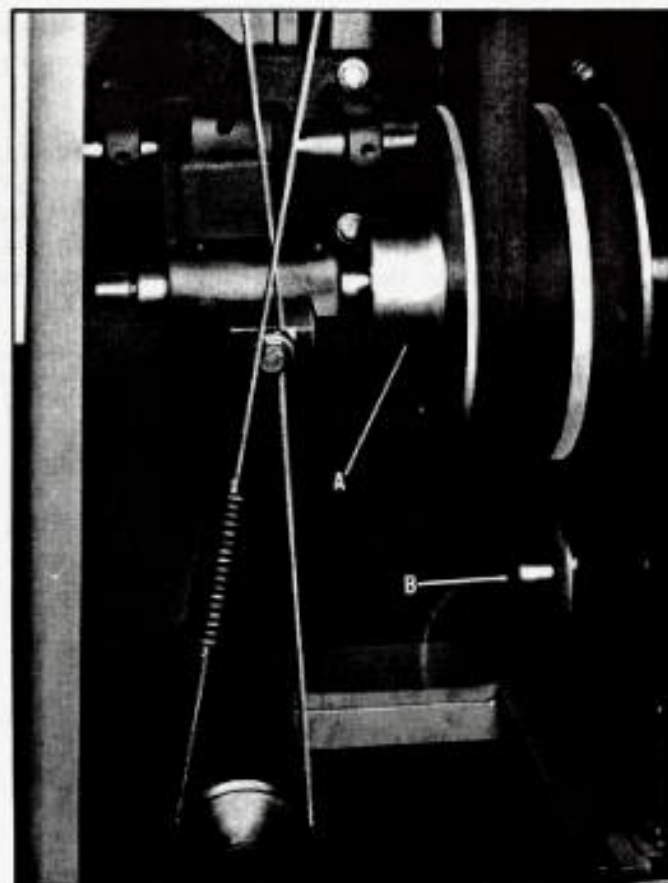


Fig. 3.

4. Turn the variable speed control lever counter-clockwise until the variable speed pulley (A) Fig. 3, is completely lowered.

5. Adjust motor shaft to be parallel with variable speed pulley shaft.

6. Tighten motor mounting nuts.

7. Fig. 3-A shows the correct position of the speed control regulating pulley and cable when the variable speed control lever is in the straight up position.

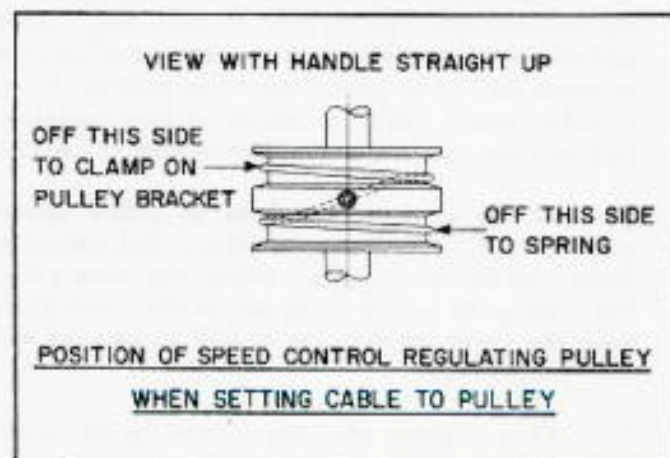


Fig. 3-A

INSTALLING VARIABLE SPEED BELTS

1. Turn the variable speed control lever clockwise and raise the variable speed pulley to maximum height.
2. Remove the two spindle V-belts (A) Fig. 4, from the jackshaft pulley (B). Place the upper variable speed belt (C) on jackshaft pulley (B) and variable speed pulley (D), as shown in Fig. 4. Then reassemble the two spindle V-belts to the jackshaft pulley as shown.

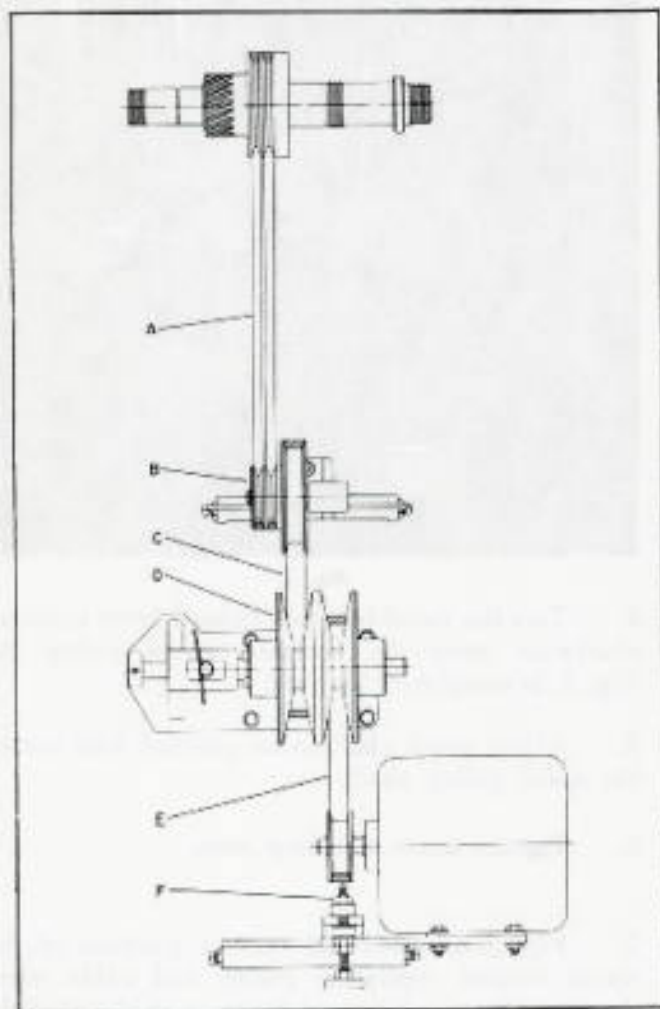


Fig. 4.

3. Place lower variable speed belt (E) Fig. 4, on the variable speed pulley (D). Remove nut, washer, and rubber bumper (F) from the motor mounting plate to allow belt to be placed on motor pulley. Lower variable speed pulley to assist in this operation. Replace nut, washer, and rubber bumper (F) Fig. 4.
4. With a straight edge held on either outside edge of the variable speed pulley and extending down past the motor pulley, adjust the motor pulley (by sliding the pulley in or out on the motor shaft) until the lower variable speed belt is parallel with the straight edge.
5. Then tighten the set screw in the motor pulley.

LEVELING THE LATHE

1. Place the cabinet on a level floor. If rocking occurs place metal shims between the bolt pads of the cabinet and floor.

2. Place a precision spirit level (A) Fig. 5, squarely across the V-ways at the headstock end of the bed.

3. Adjust shims under the headstock end of the cabinet until the bubble in the level is approximately centered. Carefully note the exact position of the bubble in relation to the graduations on the level.

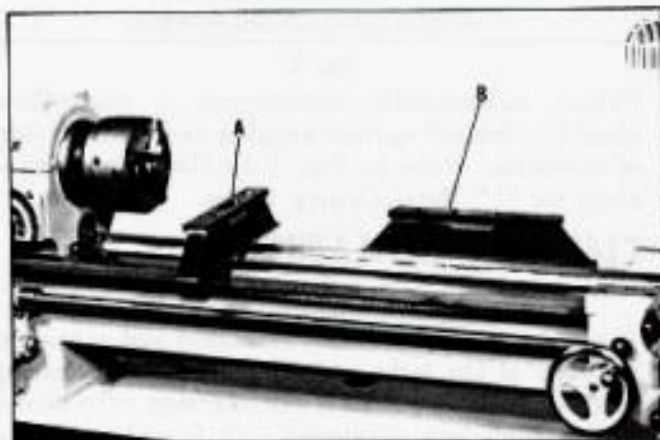


Fig. 5.

4. Without turning the level end for end, move it to the tailstock end of the bed, and place it squarely across the V-ways.

5. Adjust shims under the tailstock end of the cabinet until the bubble comes to rest at the same position as when the level was at the headstock end of the bed.

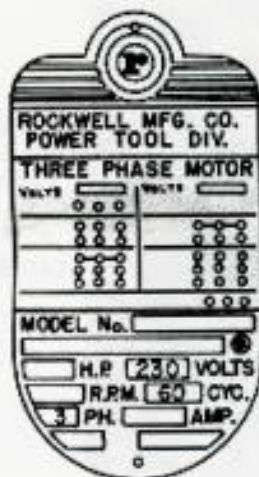
6. Place the level (B) Fig. 5, lengthwise on the center of the bed and shim until bubble is approximately centered.

7. Repeat Steps 3, 4, 5, and 6 until readings are approximately the same.

8. Fasten the cabinet to the floor.

ELECTRICAL RECOMMENDATIONS

A constant speed high starting torque, 1 hp, 1725 rpm motor is recommended. The motor pulley supplied with the lathe is designed to fit a motor shaft 3/4" in diameter. However, these motor pulleys are also available with 5/8", 7/8", 1" and 1 1/8" bore. The motor mounting plate of the lathe is designed to accommodate most motors made in Rockwell No. 8 1/2 and NEMA 143-143T-145-145T-182-182T frames. Wiring diagrams are included with the Rockwell Switch kits made available for use with this lathe.



Nameplate on motor.

Make sure electrical
characteristics
are the same.



To connect to power source
use heavy enough wire.

3 PHASE
230 VOLT
60 CYCLE
POWER
SOURCE

Your power source.

H. P.	1 Phase	3 Phase
1	#12	
1 & 1 1/2		#14

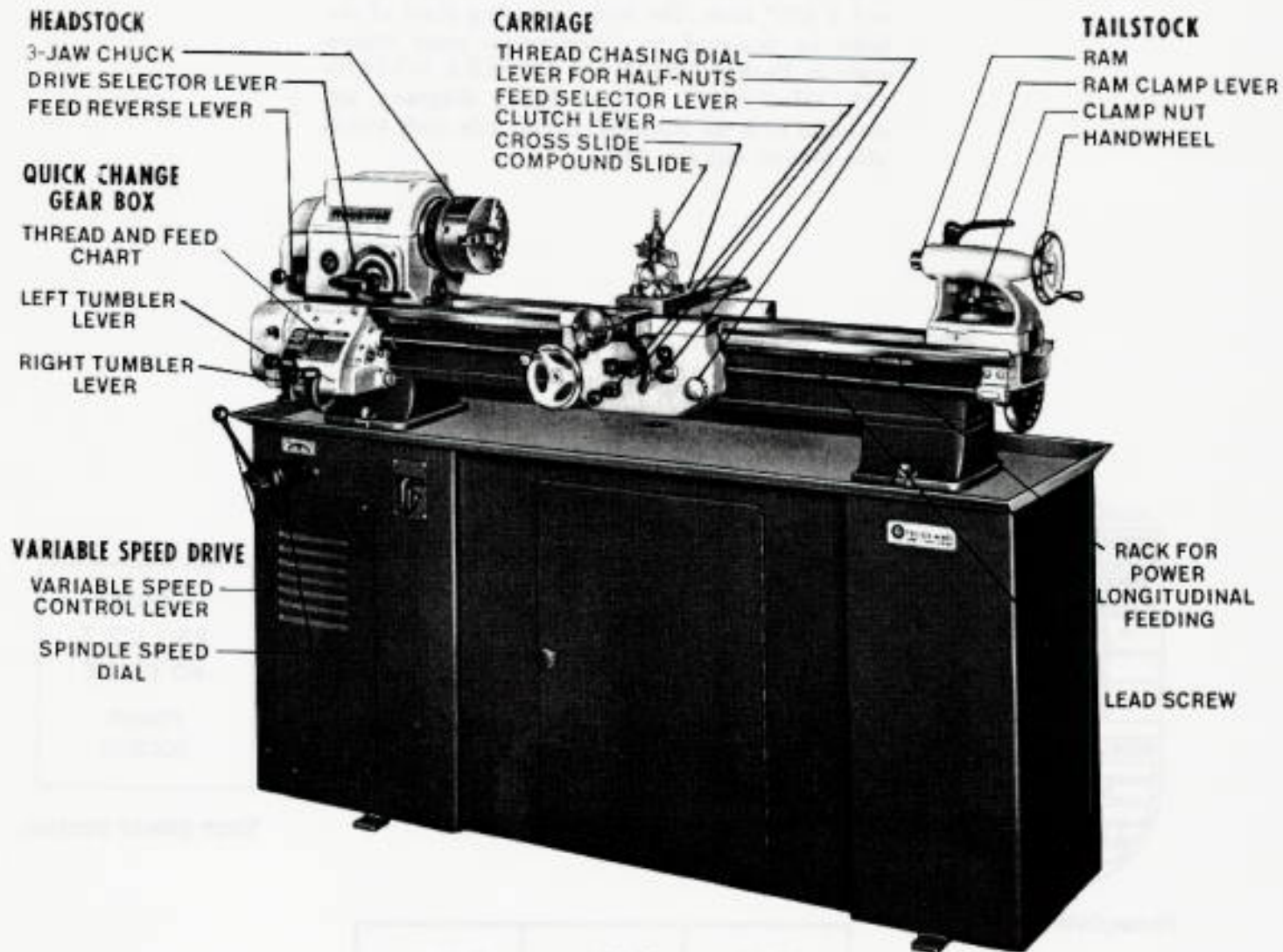


Fig. 6.

OPERATION AND CONTROLS

The following is an explanation of the operating controls of the Rockwell 11" Metal Lathe. An experienced lathe operator knows that there is always some difference between the location and type of control between different lathe models, even though the purpose of the controls is similar between one lathe and another. The novice should study these explanations carefully before turning on the power, to avoid damage to the lathe or injury to himself.

All operators will profit by a knowledge of how the controls operate and how they are to be set for standard lathe operations like turning, boring, facing, and thread cutting, or special lathe operations like milling, drilling, reaming, knurling, and others.

CAUTION: Before turning on the motor for the first time, be sure that the Feed Reverse Lever of the Outboard Gear Train is set in the neutral position. Do not turn the Control Lever for the Variable Speed Drive until the motor is running. Then immediately rotate this control lever in a counter-clockwise direction to cause the lathe to run in a slow range before other controls are manipulated. Until you are familiar with the controls, it is better to manipulate them with the lathe running slowly.

HEADSTOCK CONTROLS

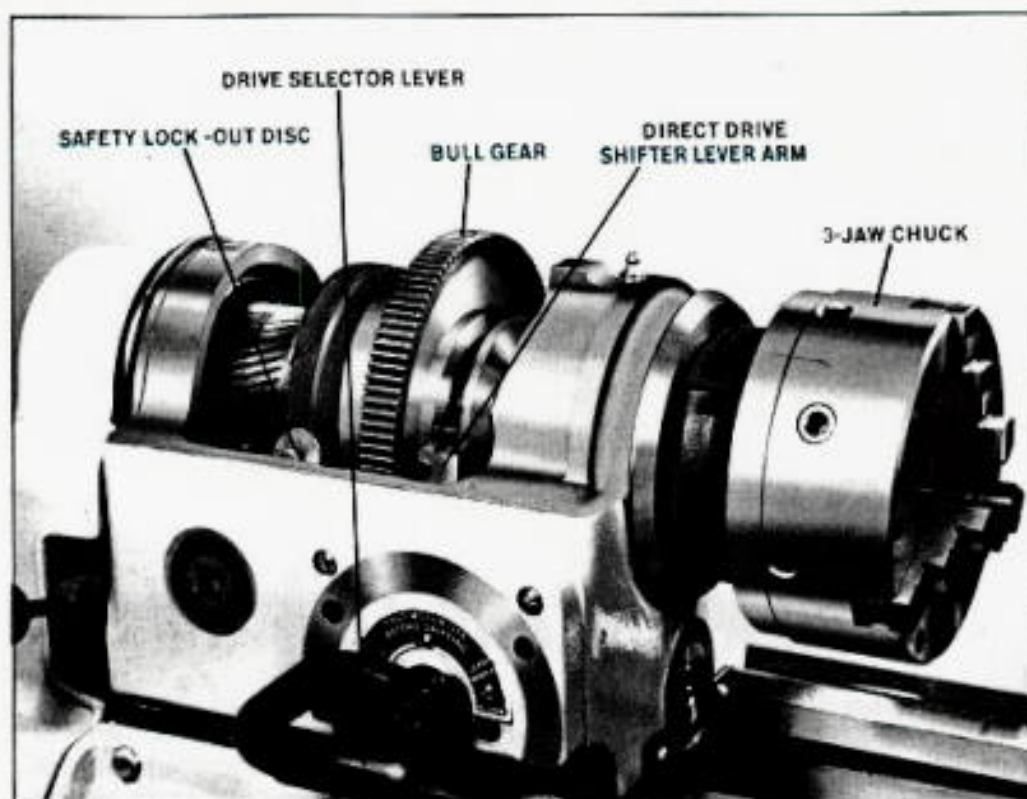


Fig. 7.

Drive Selector Lever – Direct drive, loose spindle, locked spindle, and back gear drive are obtained by simply shifting the single drive selector lever to the desired position. **SHIFTING FROM ONE POSITION TO ANOTHER MUST BE DONE ONLY WHEN THE MOTOR IS OFF AND THE SPINDLE IS AT REST. THE MOTOR SHOULD NEVER BE STARTED WITH THE LEVER IN LOCKED SPINDLE.** Always check the position of the lever before starting the motor.

Direct Drive – In direct drive the shifter lever arm rides in the groove ring of the bull gear and pushes the bull gear to the left engaging the dog clutch halves.

Loose Spindle – In loose spindle neither the dog clutch nor the back gears is engaged. The spindle is free to be rotated by hand. This facilitates the location of work in chucks, inspection of work, or the physical checking of work with indicators or micrometers.

Locked Spindle – When both the dog clutch and back gears are engaged the spindle is in locked position. In this position, the spindle cannot be rotated.

Back Gear Drive – In back gear the dog clutch halves are disengaged. The back gears drive the spindle at the lower spindle speeds because of the 6 to 1 reduction ratio of the gears.

Safety Lock-Out Disc – In addition to the convenience of the single drive selector lever for selecting any drive position, your lathe has a positive foolproof safety lock-out feature which makes damage to the drive impossible, even if a change in drive conditions is attempted with the motor running.

When the drive selector lever is engaged for back gear drive, loose spindle or direct drive, it is normally impossible for the operator to pull out of this drive position with the motor running. By a sudden jerk, the lever can sometimes be withdrawn from the locating hole while the motor is running, but no harm can be done, since this action automatically disengages the direct drive dog clutch in the headstock.

The spindle, of course, cannot rotate with the drive selector lever in the locked spindle position and the motor should not be turned on while in this position.

The drive selector lever can be disengaged from any position preliminary to selecting another position. If, however, the motor is turned on at this point, after pulling out from one position but before selecting the next position, the safety lock-out feature prevents the inexperienced operator from going into direct drive or locked spindle position by preventing the lever from entering the selected hole.

To restore the drive selector lever to normal operating condition after reaching the condition described in the above paragraph, the operator should first bring the spindle to a stop by shutting the motor off, and then drop into the back gear or the loose spindle position. The operator can then select whichever drive condition he desires in the normal way with the motor off and spindle stationary.

OUTBOARD GEAR TRAIN

Feed Reverse Lever – This Lever has three positions and shifts gears in the Outboard Gear Train which transmits power from the spindle of the lathe to the Quick Change Gear Box. When the lever is in the up position the lead screw rotates in a direction opposite to that of the spindle and when the lever is in the down position the lead screw and spindle rotate in the same direction. When the lever is in the center (neutral) position the Quick Change Gear Box is disconnected and the lead screw does not rotate.

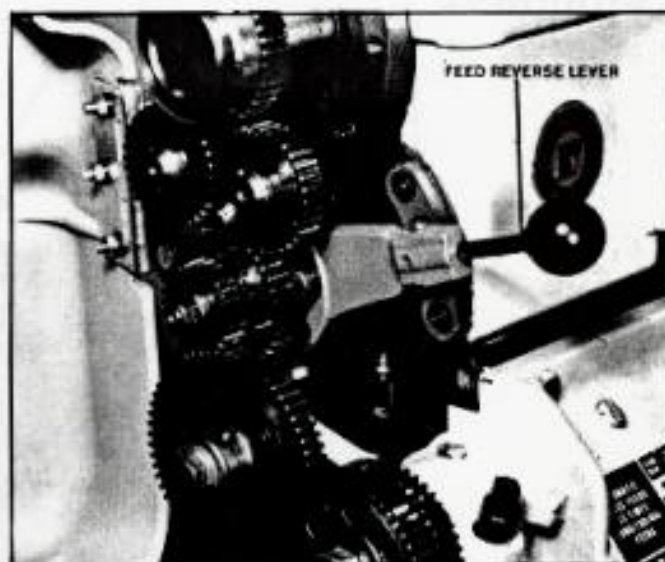


Fig. 8.

VARIABLE SPEED DRIVE

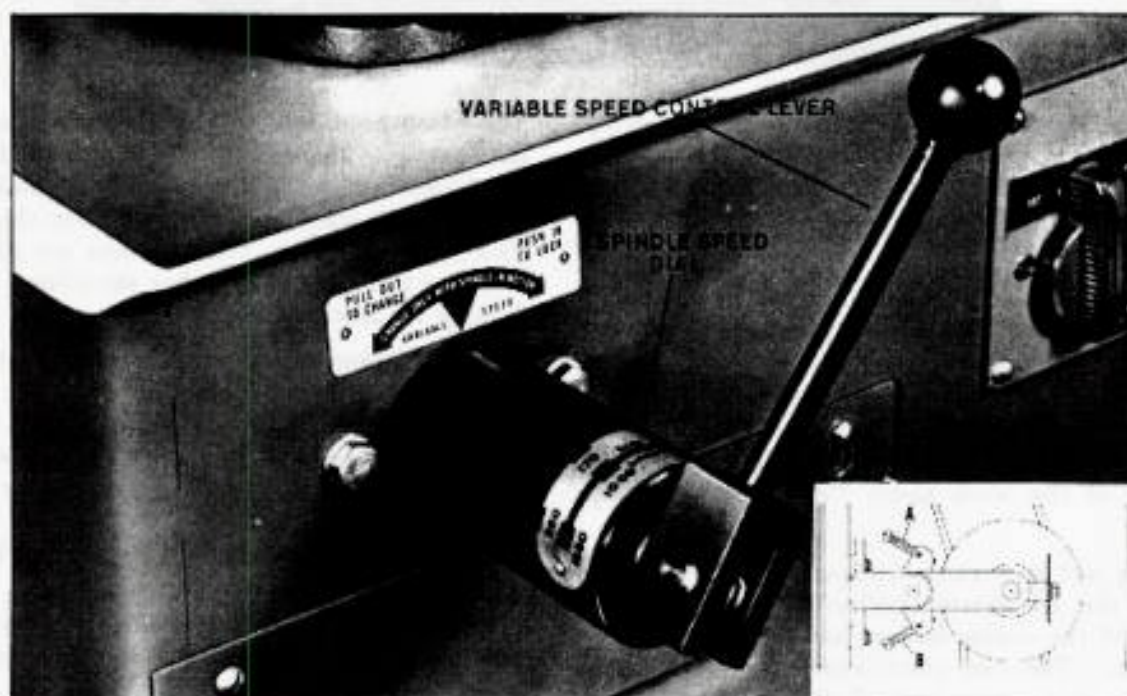


Fig. 9.

The variable speed control lever should not be moved except when the motor is running to avoid putting unnecessary strain on the variable speed drive pulley assembly. The control lever is turned clockwise to make the lathe run faster and counter-clockwise to slow it down.

The infinite number of speed ranges between 45 and 1550 spindle rpm obtainable by the use of the variable speed drive makes it one of the most versatile means of power transmission available. The lower portion of the speed range is accomplished by the 6 : 1 reduction through the back gears.

The spindle speeds in back gear are 45 to 250 rpm. The spindle speeds in direct drive are 220 to 1550 rpm.

Two square head screws (A and B) are provided on the variable speed pulley bracket. (See drawing in Fig. 9). These screws are set at the factory to allow the lathe to be operated through its full range.

For inexperienced student operators, for repetitive two diameter work, or for other reasons, it is sometimes desirable to adjust the lathe to other than factory-set maximum or minimum spindle speeds. This is done by adjusting the two square head screws.

Adjust screw (A) for high spindle speed and screw (B) for low spindle speed.

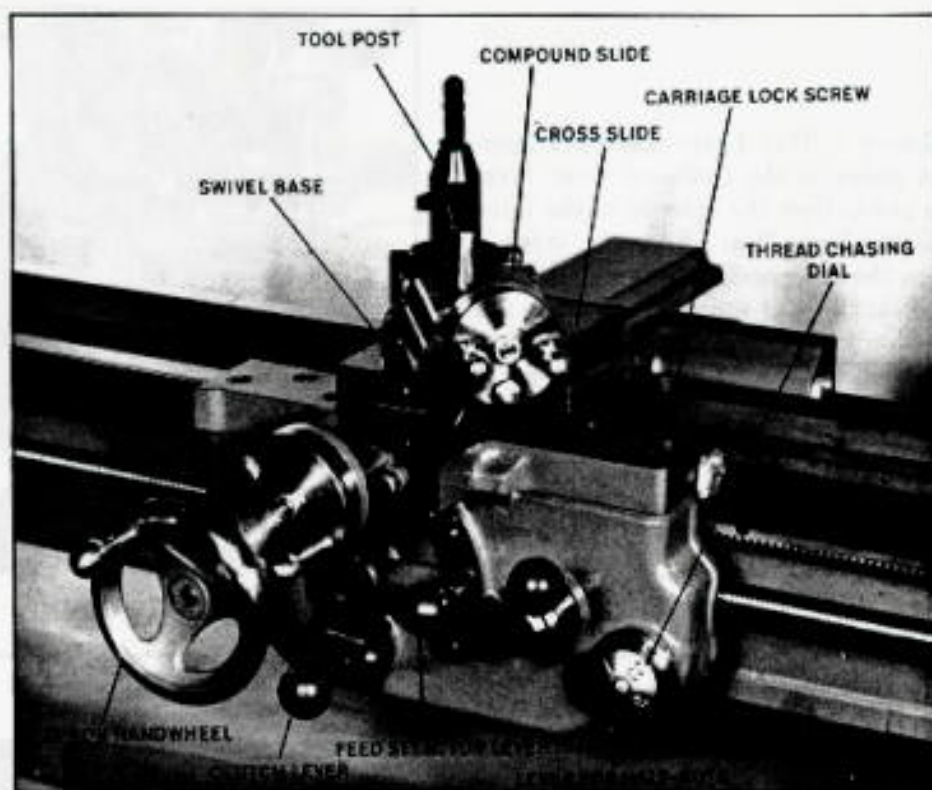


Fig. 10.

The lathe carriage includes the apron, saddle, cross slide, compound slide and tool post. The importance of the carriage cannot be overemphasized for it is the unit which supports and controls the motion of the tool.

The micrometer collars for the compound slide and cross slide are both of the "direct reading" type. For example if you advance the cross slide one mark on the collar, the diameter of the work piece will be reduced .002", although the tool will move in only .001". In other words, you "read" the diameter of the work piece "directly" from the collar.

One long and two short witness marks are found next to the micrometer collar for the compound slide, and the collar has a mark for each .001" movement. The two short witness marks form a vernier so that a movement of .0005" can be measured. When the compound slide is set at 90 degrees to the spindle, moving in one mark advances the tool .001", but takes .002" off the diameter. At all angle settings of the compound other than 90 degrees, the tool still moves .001" per mark, but the amount the diameter of the work is reduced is less than that "directly read" and it will be the product of the sine of the angle at which the compound is set.

The carriage lock screw must always be loosened before trying to feed the carriage along the bed. When firmly tightened, this screw will guard against possible movement of the carriage when facing, cutting off, and doing other operations where the cutting tool is moved only by feeding the cross slide or compound slide.

The apron handwheel is turned clockwise to move the carriage toward the tailstock, and counter-clockwise to move it toward the headstock. Before using this handwheel, be sure that the carriage lock screw is loose, the half-nuts are disengaged from the lead screw, and that the clutch for power feeding is disengaged.

The feed selector lever has three operating positions. The clutch lever and the lever for half-nuts must be set in the disengaged positions, and then the feed selector lever is shifted by pulling out on the handle ball to retract the plunger from any one of the three holes in the apron. A spring causes the plunger to enter the selected hole when the handle ball is released.

The upper hole is for longitudinal power feeding, the center hole for threading, and the lower hole for power cross feeding.

With the feed selector lever in the center hole and the half-nuts engaged for threading, the lever is locked, and cannot be shifted for power longitudinal or cross feeding until the half-nuts are disengaged.

The Thread Chasing dial speeds up the operation of cutting external or internal threads. The Carriage can be traveled back along the Bed rapidly by means of the Apron Handwheel with the half-nuts disengaged, instead of slowly by means of reversing the Lead Screw with the half-nuts engaged. The function of the Thread Chasing Dial is to tell you just when to drop the half-nuts onto the Lead Screw so that the tool will repeatedly follow the same groove as the thread is being formed.

The Thread Chasing Dial rotates whenever the Lead Screw is rotating (except with the half-nuts engaged) and is divided by the four numerals (1, 2, 3, and 4) one each quarter circle on the dial. Watching these numerals pass the single witness mark, tells you when to "drop" the half-nuts onto the Lead Screw according to the following system.

Pitch or Threads per Inch	Example	Position for Subsequent Passes
$\frac{1}{4}$ Pitch	$5\frac{3}{4}$ Threads per inch	Same position only
$\frac{1}{2}$ Pitch	$4\frac{1}{2}$, $5\frac{1}{2}$, $6\frac{1}{2}$, $11\frac{1}{2}$	Opposite positions only — 2 Positions
Odd Pitch	5, 7, 9, 11, 13, 23	Any of 4 Positions
Even Pitch	4, 6, 8, 10, 12, 14, 16, etc. through 224	Any of 4 Positions
Pitches in Multiples of 8	8, 16, 24, 32, 40, 48, 56, 64, 72, 80, 88, 96, etc.	Drop in any position. Thread cutting dial need not be used.

The thread dial is used and referred to when cutting threads. When $\frac{1}{4}$ threads are being cut, (for example $5\frac{3}{4}$ threads) drop the half-nuts in on any one of the four numbers of the thread cutting dial.

However, you must drop the half-nuts on the lead screw, for subsequent passes across the stock, on the same number you started with. If you start with the No. 1 position on the dial, you must keep dropping the half-nuts when the thread cutting dial indicates the No. 1 position. If you start with No. 2, you must use No. 2 position etc. As stated above, any one of the four numbers can be used when starting to cut $\frac{1}{4}$ threads.

When cutting $\frac{1}{2}$ threads (for example $4\frac{1}{2}$ threads), you can start on any one of the four numbers. After you have once started, you must make subsequent passes by dropping the half-nuts on either the same number you started with or the number opposite it on the dial. For example, if you start with No. 1, subsequent passes can be made by dropping the half-nuts in either the No. 1, or No. 3 position, and if No. 2 is used, half-nuts can be dropped in the No. 2 or 4 positions. If you start with No. 4, the No. 4 and No. 2 position can be used, etc.

If the thread being cut is an odd number per inch, that is 5, 7, 9, 11 etc., you can start with any number on the dial and on subsequent passes, you can drop the half-nuts on any one of the four numbers, that is 1, 2, 3, and 4.

If the number of threads being cut is 8, or any multiple of 8, that is 8, 16, 24, 32, 40, 48, 56, etc., it is not necessary to read the thread cutting dial. Just drop the half-nuts on the lead screw anytime, which also applies to subsequent passes that might be made.

This does not mean that the thread cutting dial cannot be used with cutting these threads, the dial can be used if the operator so desires.

Rockwell 11" Lathes are equipped with a built in thread stop, as shown in Fig. 10-A. This photograph shows the bottom side view of the stop for clarity.

This exclusive built in thread stop enables you to cut threads faster and the chance of error is minimized.

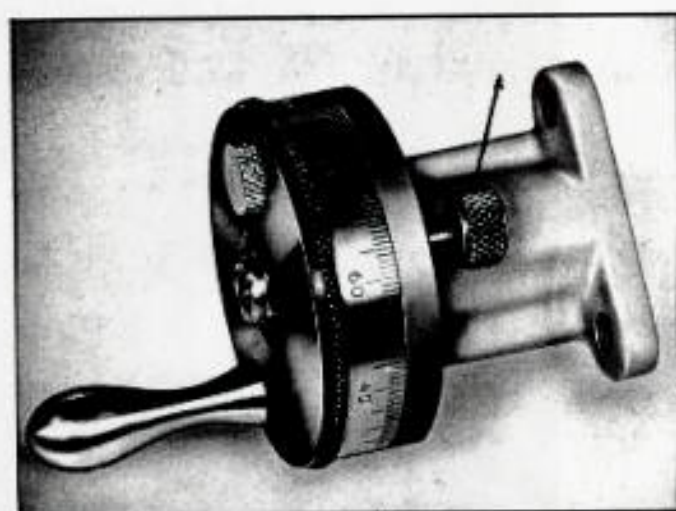


Fig. 10 A

When cutting threads the compound slide is usually set at 29° , and the proper tool holder and thread cutting tool is adjusted in relation to the stock. Push in the knurled knob (A) Fig. 10-A to engage the thread stop and turn the cross slide handwheel clockwise until it engages the stop. Move the compound slide in until the cutting tool just touches the work. Back out the cross slide and move the carriage until the tool is away from the work and clear of the end. Then move the cross slide in against the stop and proceed cutting by engaging the half-nuts.

When you are finished with the first cut, disengage the half-nuts, back out the cross slide, manually return the carriage to the starting position and move the cross slide in. The stop enables the cross slide to be in the same position for each successive cut and the tool is advanced by the compound slide for depth of cut.

To return the carriage to the starting position without this feature, you must reverse the rotation of the lead screw (which is a very slow procedure) or remember a mark on the micrometer collar of the cross slide when you originally position the cross slide. The latter method increases the possibility of error.

QUICK CHANGE GEAR BOX

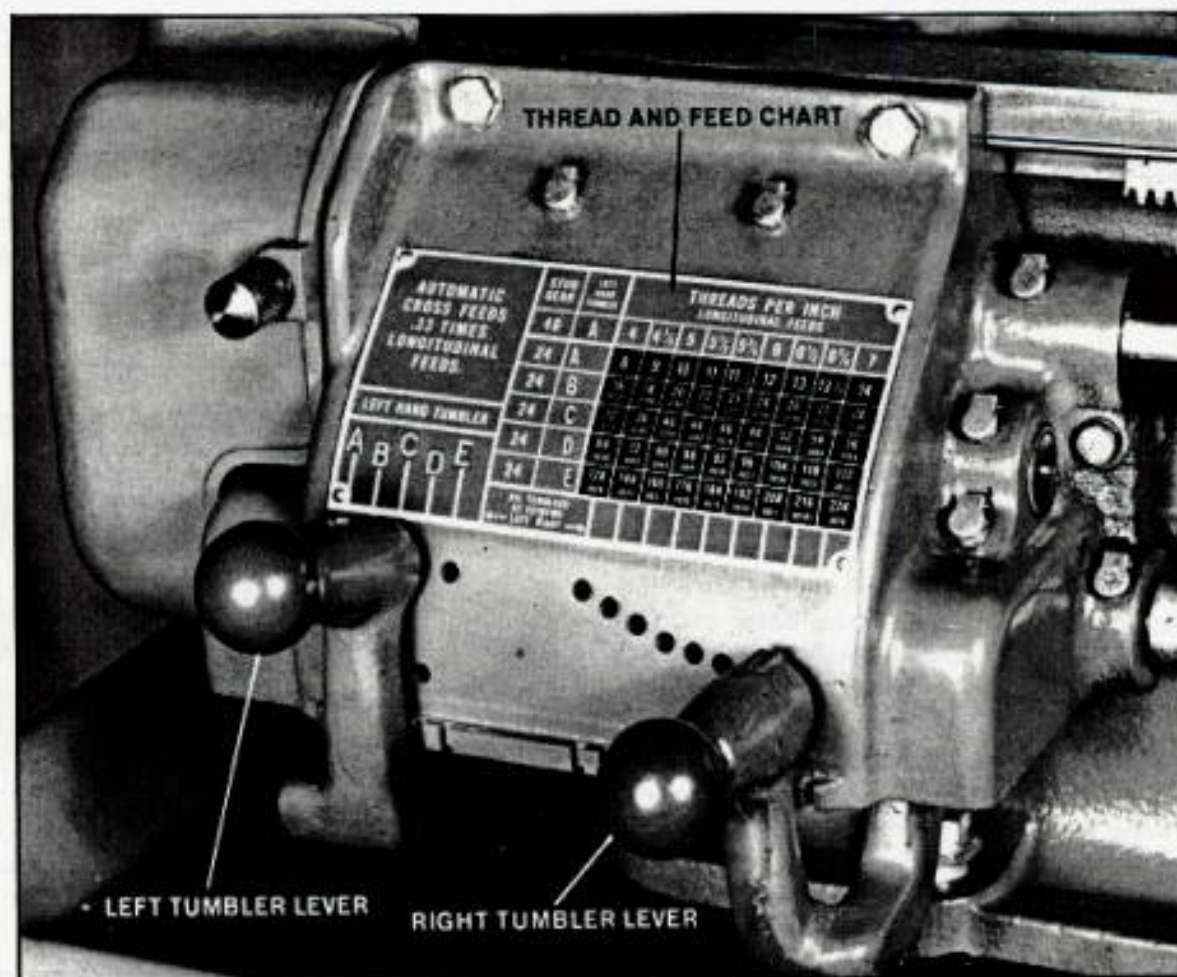


Fig. 11.

Fifty-four threads from 4 to 224 per inch can be cut by shifting the left and right tumbler levers and by changing one stud gear in the gear train. This is a gear type transmission which allows the operator to quickly select 54 different speeds of the Lead Screw. These speeds are really 54 different ratios relative to the speed of the spindle of the headstock.

There are two input speeds of the gear box, obtained by exchanging the 24 tooth and 48 tooth stud gears mentioned above. The 48 tooth stud gear should be used only for chasing threads 4 through 7 pitch. The 24 tooth stud gear should be used for all other threads and for all power feeding. If this rule is violated, the thread and feed chart on the Quick Change Gear Box will not give correct readings.

With the Quick Change Gear Box set for any of the eighteen (18) thread pitches from 4 through 14, the power feeds which could then theoretically be used, are too fast for all practical purposes.

Therefore, in practice, the 48 tooth stud gear should not be used for power feeding, and the power feeds are not shown on the top two rows of the chart where threads 4 through 14 are indicated.

Some practice is required to get on to moving the tumbler levers smoothly from left to right or vice versa. Many operators extend the index finger of their right hand down along the lever, and exert a clockwise twisting pressure with their wrist when moving from right to left. A counterclockwise twisting pressure using either the left or right hand, is used to move either lever from left to right. When the tumbler lever cannot be lowered easily into the new position, the spindle should be turned slightly by hand, or jogged with the motor, to get the gears to mesh.

The left and right tumbler levers should be shifted only with the motor off, to avoid clashing the gear which might damage them, especially at high speeds. Both are shifted in the same fashion.

TAILSTOCK



Fig. 12.

The box wrench which comes with the lathe is used to loosen or tighten the Clamp Nut that secures the Tailstock to the bed. With the Clamp Nut loose, the Tailstock can be moved by hand along the bed, or can be removed from the bed entirely by sliding it off the end.

The Tailstock can also be moved or "offset" for taper turning by means of the two Offset Adjusting Screws. First loosen either screw, and then tighten the other to "offset" the tailstock. The amount of movement is measured by the witness marks on the outboard end of the tailstock. The Clamp Nut must be loose before this adjustment is made. After the desired "offset" is obtained, tighten previously loosened Screw, and check again to be sure the setting has not shifted. For straight turning and most every job except taper turning, the witness marks must be in line with each other.

The Ram Clamp Lever is loosened to release the Ram for feeding in or out.

The Handwheel is rotated in a clockwise direction to cause the Ram to feed out, and counterclockwise to retract the Ram. Turning the Handwheel counterclockwise will also eject or free from the Morse taper hole of the Ram a center, a taper shank drill, etc., after the ram has been retracted to a certain point.

The top of the Ram is graduated in one sixteenth inch ($1/16''$) divisions, which can be used for reading the amount the Ram is fed out, for drilling, etc. It has a tang slot for positive drive of twist drills and other tools with a tang-type No. 3 M.T. shank. Complete retraction of ram automatically ejects center. CAUTION: A drift pin should never be used in the tang slot to remove twist drills and other tools. The Ram has a witness mark at center height for easy positioning of cutting tool.

SERVICE ADJUSTMENTS

HEADSTOCK

ALIGNING BED WAYS PARALLEL TO SPINDLE

1. Mount a 4 jaw chuck on the spindle and insert a ground and polished test bar, approximately 1 1/2" to 2" in diameter and about 16" long.
2. True up the test bar by indicating 1 1/2" and 13 1/2" from the chuck. Rotate the test bar against an indicator at these positions, see Fig. 13. The total indicator reading should not exceed .0005 at either spot.

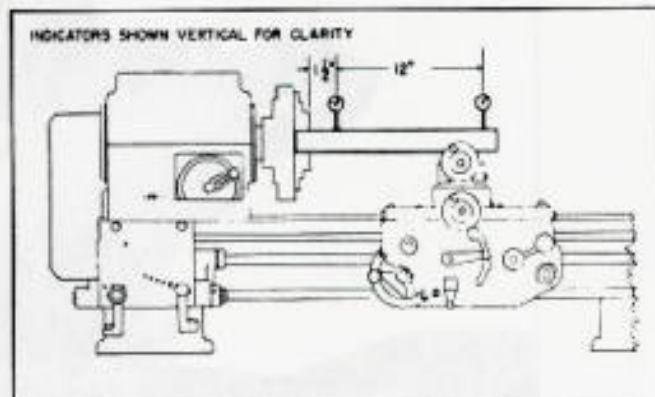


Fig. 13.

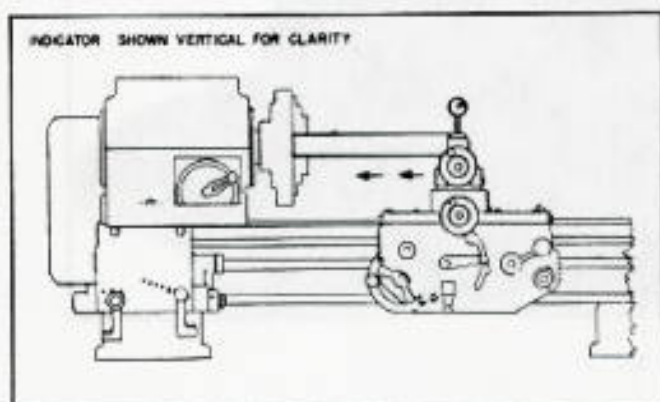


Fig. 14.

3. Mount the indicator on the tool post in a horizontal position, as shown in Fig. 14, and move the indicator 12" along the test bar by feeding the carriage. The total indicator reading should not exceed .0005.

4. If an adjustment is necessary, loosen two bolts (A) Fig. 15, located at the front and rear of the right hand riser block under the tailstock, adjust bushings (B) and retighten bolts (A). Repeat Step 3 and adjust further if necessary.

5. Occasionally the lathe should be rechecked and alignment adjustments made if necessary. If the lathe turns or bores a taper, it is an indication the machine is no longer in alignment.

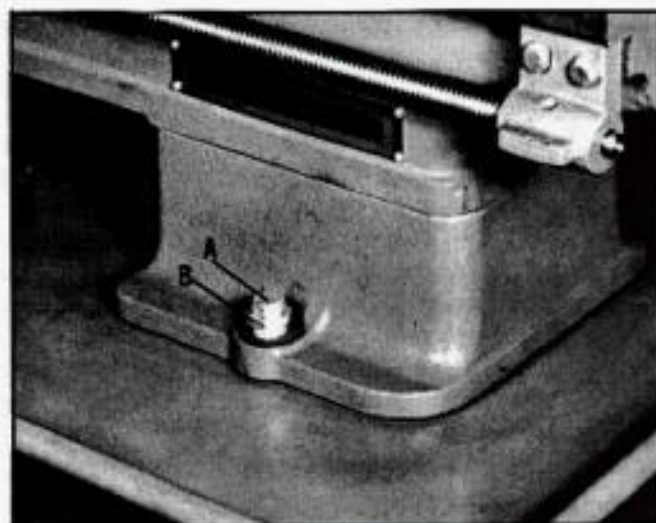


Fig. 15.

ADJUSTMENT OF SPINDLE BEARINGS

1. If the spindle should develop end play or spin too freely, loosen two set screws (A) Fig. 16, and tighten thrust nut (B) until the end play is removed and the spindle turns with a slight drag. THEN BACK OFF THRUST NUT (B) FIG. 16, 10 DEGREES TO PROVIDE PROPER PRELOAD OF THE BEARINGS. Retighten set screws (A).

2. Should you find the bearings running above 145 degrees farenheit the following procedure should be used to loosen the preload on the roller bearings of the lathe spindle. Loosen two set screws (A) Fig. 16, and loosen thrust nut (B) 180 degrees. Using a wooden mallet, strike the chuck end of the spindle, (be sure to protect the threads on the spindle). This impact will move the bearings apart. Now adjust bearings as described in Step 1.

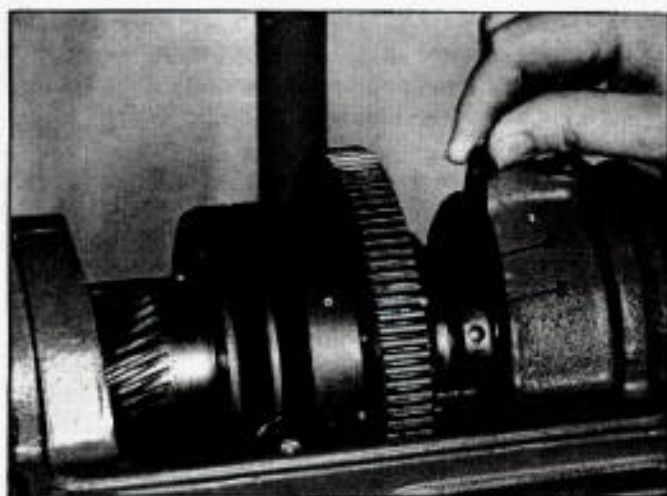


Fig. 16.



Fig. 17.

ADJUSTMENT OF BACK GEARS

1. No adjustment of the back gears is necessary, since all the parts are factory fitted and the teeth meshed with proper back lash and the whole assembly dowelled. If, however, the back gears have been disassembled, realign the witness marks (A and B) Fig. 17, as described in Step #6 on Page 25 under Removing and Replacing Outboard Spindle Bearing, Spindle V-Belts, and Back Gears.

ADJUSTMENT OF DIRECT DRIVE DOG CLUTCH

If the dog clutch will not entirely disengage for loose spindle, or back gear settings, make the following adjustments:

1. Place lever (A) Fig. 18, in a vertical position as shown.
2. Remove two screws (B) Fig. 18.

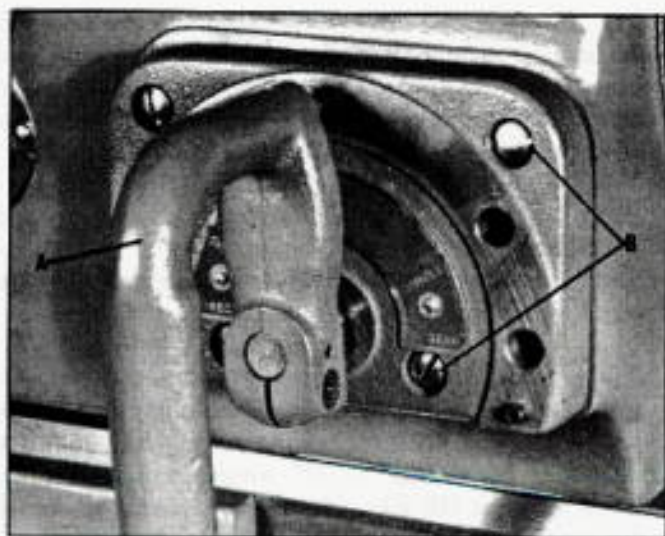


Fig. 18.

3. Place lever in loose spindle position as shown in Fig. 19, and remove screw (A) and pin (B). Then remove lever (C) from shaft.

4. Carefully remove cover (D) Fig. 19, after first removing remaining screws. Care should be taken to hold shaft (E) in place so that it will not withdraw with cover plate.

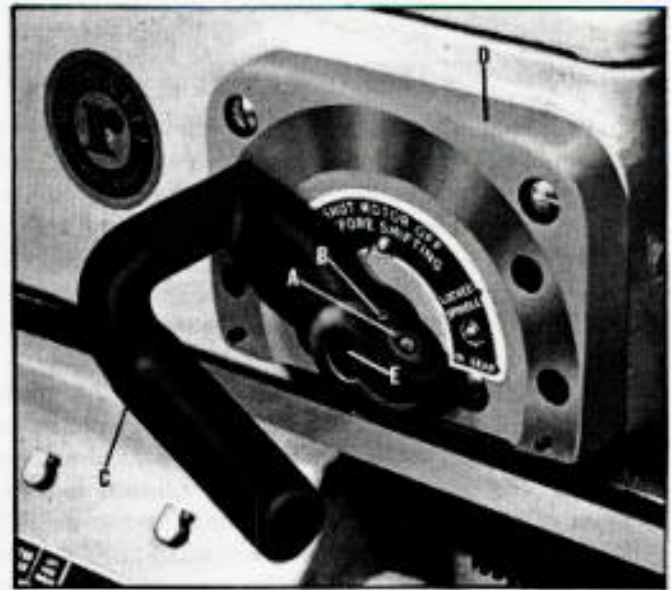


Fig. 19.

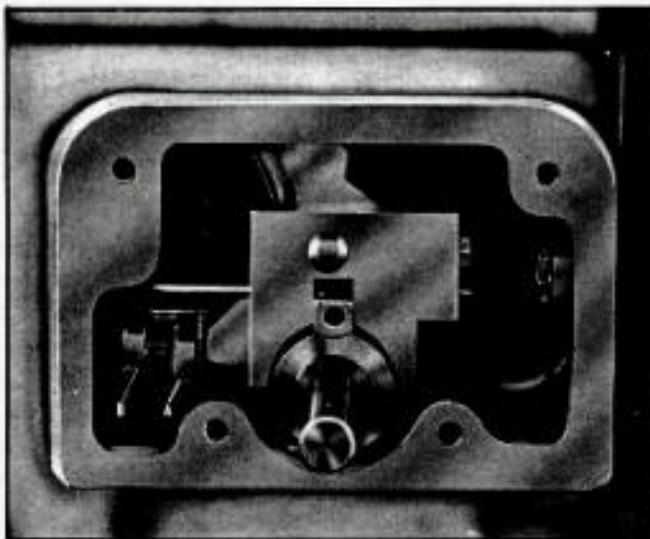


Fig. 20.

5. Make clutch adjustment by loosening lock nut (A) and turning screw (B) Fig. 20.

6. Check clearance by rotating spindle. Clutch should be completely disengaged when the lever is in the loose spindle position.

7. Tighten lock nut (A) Fig. 20, and reassemble handle and cover.

ADJUSTING SAFETY LOCK-OUT FEATURE

The safety lock-out disc (A) Fig. 21, must be adjusted so it is not in contact with the belts and not more than 1/16" away from the belts, when the motor is turned off and the drive selector lever engaged in any of the four positions.

This adjustment should be visually inspected periodically or checked immediately if it is possible to disengage the drive selector lever from the hole with the motor running.

To adjust, remove headstock cover, loosen nut (B) and turn safety lock-out disc (A) Fig. 21 in or out so that it is not in contact with the belts and not more than 1/16" away from the belts. Then lock nut (B) Fig. 21. This adjustment should be made with the drive selector engaged.

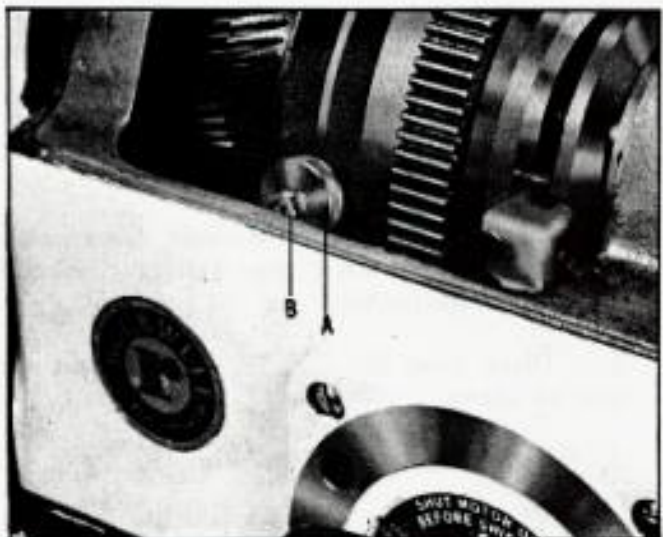


Fig. 21.

ADJUSTING DRIVE SELECTOR LEVER

If it ever becomes impossible to pull the drive selector lever out of whichever drive position in which it is being used, even with the spindle stationary, the following adjustment should be made:

1. Remove the drive selector lever and cover plate by following Steps 1, 2, 3, and 4 under ADJUSTMENT OF DIRECT DRIVE DOG CLUTCH.
2. Move the flat spring (A) Fig. 22, up or down until there is equal clearance between the dog plate (B) and the cam (D). The spring is moved up or down by loosening screw (C) which holds one end of the spring against the headstock body casting.

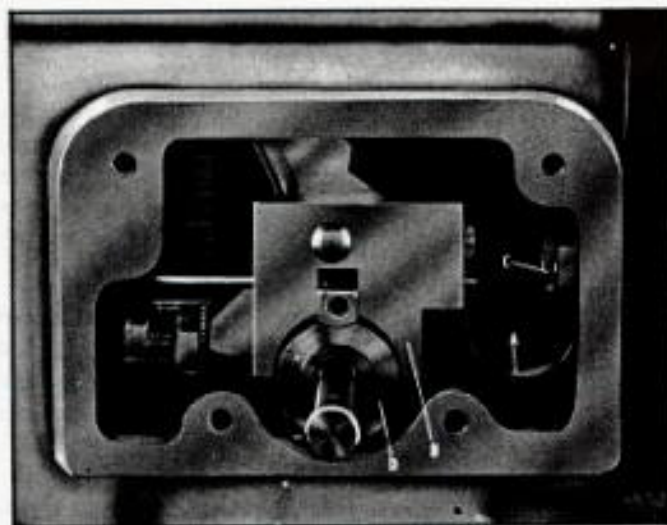


Fig. 22

OUTBOARD GEAR TRAIN

ADJUSTING BACK LASH

Proper back-lash of the gears of your lathe has been set at the factory, however, after considerable use, adjustments may be necessary.

To establish back-lash between gears (A) and (B) Fig. 23, when the feed reverse lever (C) is in the up position, and between gears (A) and (D) when the feed reverse lever is in the down position, proceed as follows:

1. Place a strip of wrapping paper between gears (A) and (B) Fig. 23, and place the feed reverse lever in the up position.
2. Rotate the gears expelling paper and continue through one full revolution of larger gear to make certain no binding occurs at any point. In other words there should be some back-lash between any given point of the gears' mating circumference.
3. If an adjustment is necessary, loosen two screws (E) Fig. 23, and move the bracket (F) until the desired back-lash is obtained. Then tighten two screws (E).
4. When proper back-lash between gears (A) and (B) Fig. 23 is obtained, proper back-lash will automatically be obtained between gears (A) and (D).



Fig. 23.

CARRIAGE

GIB ADJUSTMENT FOR COMPOUND SLIDE

1. A gib is provided to take up all play between the mating dove tailed ways of the compound slide and swivel base. Should the compound slide move too freely or bind, it is necessary to readjust the gib (A) Fig. 24.
2. To make this adjustment, first be sure that the mating surfaces are clean and coated with a thin film of light machine oil. Then adjust the three hexagon socket cone pointed set screws (A) Fig. 25.
3. Each set screw should be loosened or tightened approximately the same amount until a good, snug, sliding fit is obtained.

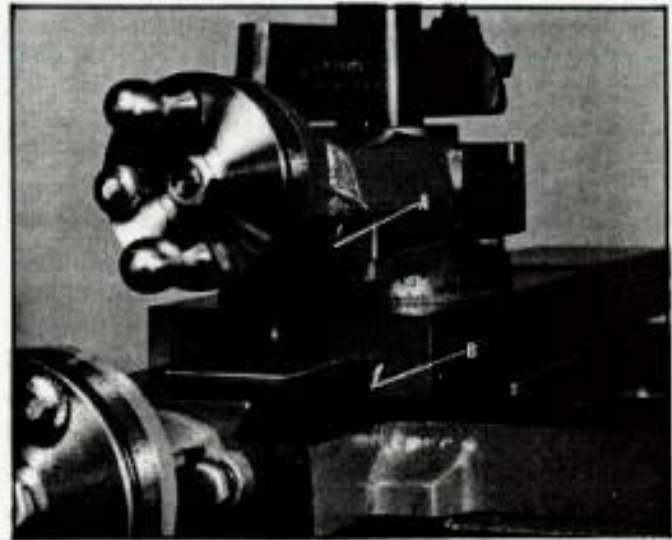


Fig. 24.



Fig. 25.

GIB ADJUSTMENT FOR CROSS SLIDE

1. Follow the same procedure for adjusting the cross slide gib (B) Fig. 24, as for gib adjustment for the compound slide.

COMPOUND SLIDE FEED SCREW END PLAY ADJUSTMENT

1. To remove end play of the compound slide feed screw, tighten nut (A) Fig. 26.

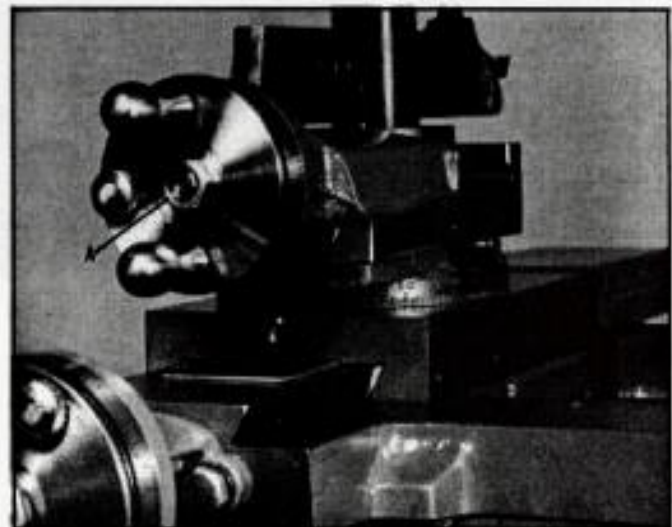


Fig. 26.

CROSS SLIDE FEED SCREW END PLAY ADJUSTMENT

1. To remove end play of the cross slide feed screw, loosen lock nut (A) Fig. 27, make the adjustment by tightening nut (B). When correct adjustment is obtained tighten lock-nut (A) Fig. 27.

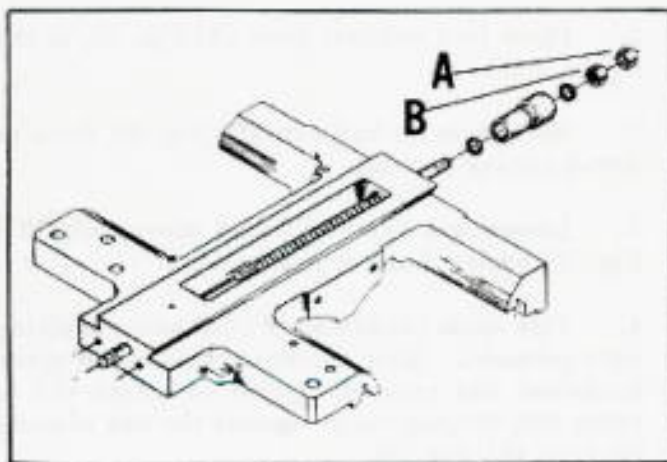


Fig. 27.

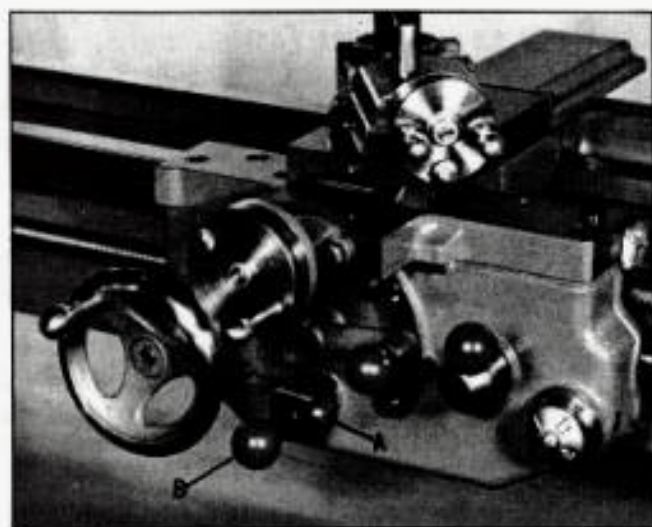


Fig. 28.

POWER FEED CLUTCH ADJUSTMENT

Loosen set screw located on left end of shaft (A) Fig. 28, and rotate lever (B) clockwise full turns, not half turns, until proper tension is obtained, and retighten set screw. If, however, this adjustment is too tight and one full turn counterclockwise proves to be too loose, a half turn is necessary. This means that the stop bracket (C) Fig. 28, must be rotated so as to have the stop part on top for proper operation of the clutch lever. To do this, loosen set screw, rotate lever (B) and stop (C) together until disengaged from clutch shaft. Do not lose the relative position of the stop to the lever when disengaged, but carefully rotate the stop (C) 1/2 turn and reassemble to clutch shaft.

ADJUSTING HALF-NUTS

The half-nuts can be adjusted for wear by closing them in further on the threads of the lead screw, as follows:

1. Close the half-nuts by turning lever (A) Fig. 29, clockwise as far as it will go.
2. Loosen two set screws (B) Fig. 29, allowing hub (C) to turn freely on shaft. CAUTION: To retain the stop parts of the hub in their proper place, always keep the hub (C) against the apron.
3. With the half-nuts closed, move lever (A) Fig. 29, counterclockwise a few degrees and retighten set screws (B).
4. Check to make sure lead screw does not bind when half-nuts are closed.

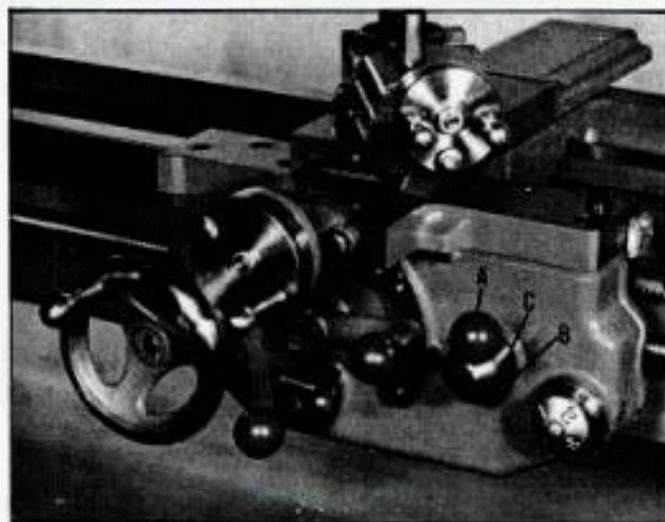


Fig. 29.

REMOVING END PLAY FROM LEAD SCREW

1. Place feed selector lever (A) Fig. 30, in the middle notch.
2. Move lever for half-nuts (B) Fig. 30, down to thread cutting position.
3. Loosen set screw (C) and move collar (D) Fig. 30, against boss of casting (E).
4. Turn apron handwheel (F) clockwise applying light pressure. After clockwise rotation of apron handwheel has stopped, tighten set screw (C) in collar (D), keeping collar against the end of casting boss (E), Fig. 30.



Fig. 30.

BELT TENSION

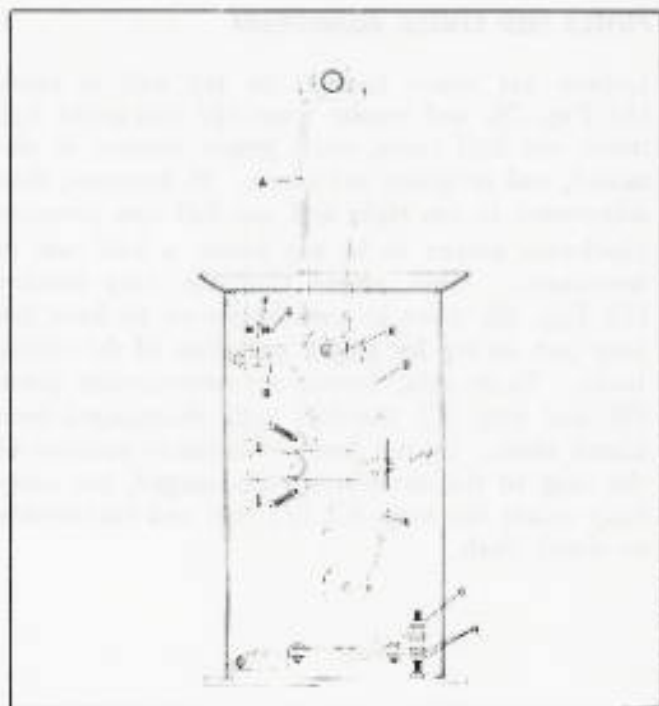


Fig. 31.

BELT TENSION FOR SPINDLE V-BELTS

To increase tension on the spindle V-Belts (A) the jackshaft mounting bracket (B) Fig. 31, must be shifted down. This may be done as follows:

1. Loosen nut (C) Fig. 31, on the motor mounting plate so the variable speed drive belts (D) and (E) have considerable play.
2. Loosen nut (F) Fig. 31, and tighten screw (G) until the spindle belts (A) have the desired tension. Then tighten nut (F).

BELT TENSION FOR VARIABLE SPEED BELTS

Tension adjustment for the variable speed belts (D) and (E) Fig. 31, is made by tightening or loosening the nuts (C) and (H) on the motor mounting plate.

REMOVING EXCESS PLAY IN TAILSTOCK HANDWHEEL

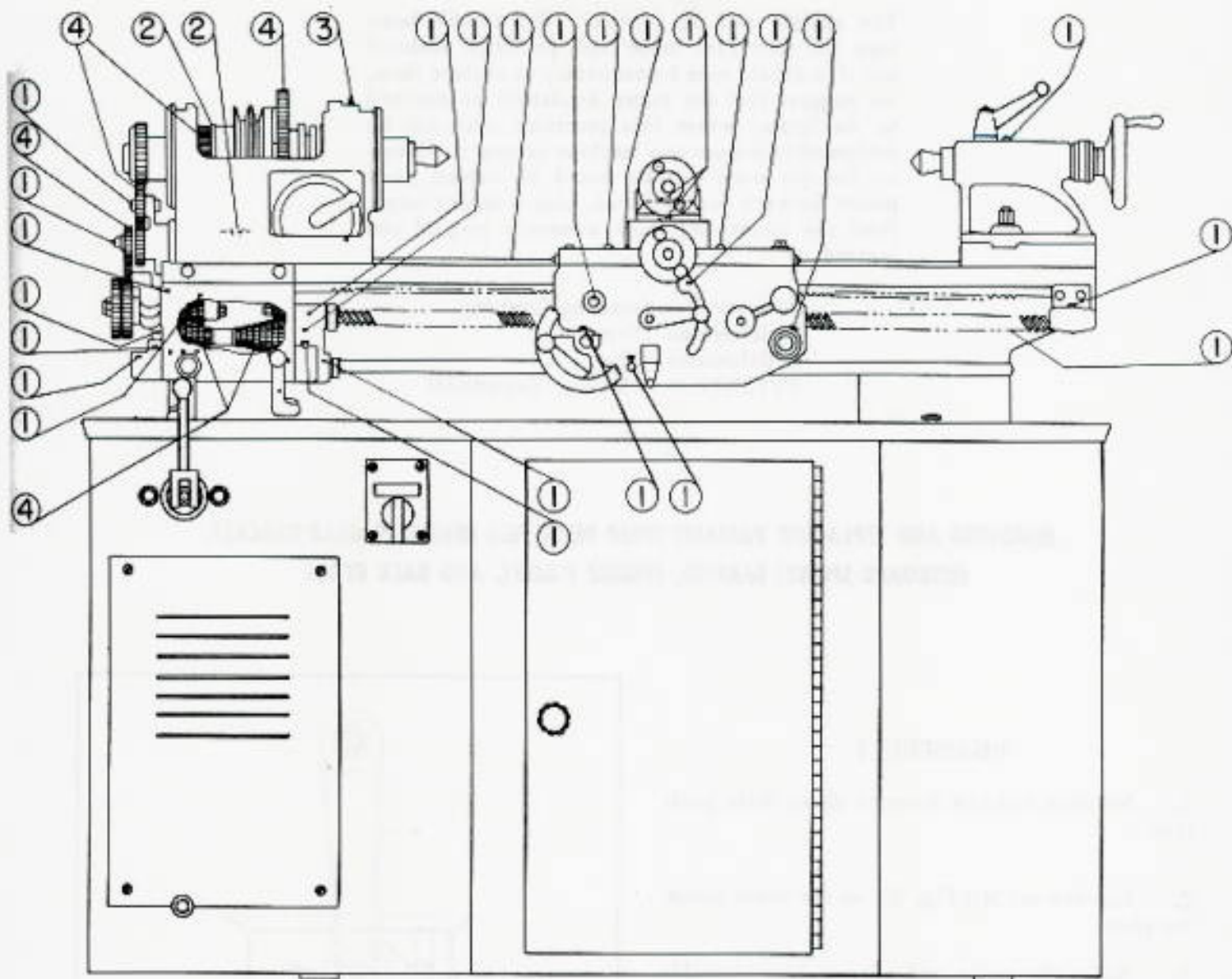
1. To remove excess play in the tailstock handwheel, tighten the self locking nut (A) Fig. 32.



Fig. 32.

LUBRICATION

LUBRICATION CHART FOR 11" METAL CUTTING LATHE



- ① OIL DAILY
- ② OIL EVERY 50 HOURS

- ③ GREASE EVERY 200 HOURS
- ④ GREASE AS REQUIRED

POINTS *1 & *2 REQUIRE TEXACO REGAL OIL - BR 8 0

POINTS *3 REQUIRE TEXACO REGAL STARFAK *2 GREASE OR EQUIVALENT

POINTS *4 REQUIRE TEXACO MARFAK *0 GREASE OR EQUIVALENT

MAINTENANCE AND REPAIRS

HEADSTOCK

REPLACEMENT OF SPINDLE AND TAPERED ROLLER SPINDLE BEARINGS

The spindle and the tapered roller spindle bearings are precision made and precision mounted and if it should ever be necessary to replace them, we suggest that the entire headstock be returned to the factory where this precision work can be performed to restore new machine accuracy. Charges for the work will be based on current parts prices for each part replaced, plus a labor charge. Send the entire headstock assembly prepaid and insured to:

Rockwell Manufacturing Company
Bellefontaine Division
Bellefontaine, Ohio
ATTENTION: Service Department

REMOVING AND REPLACING VARIABLE SPEED BELTS, FEED REVERSING GEAR BRACKET, OUTBOARD SPINDLE BEARING, SPINDLE V-BELTS, AND BACK GEARS

DISASSEMBLY

1. Set drive selector lever to direct drive position.
2. Unscrew nut (C) Fig. 33, on the motor mounting plate.
3. Raise the motor and remove lower variable speed belt (E) Fig. 33.
4. Raise the variable speed pulley (J) Fig. 33, by moving the variable speed control lever. Release tension on spindle belts (A) by loosening nut (F) and screw (G) Fig. 33. Remove spindle belts (A) from jackshaft pulley (K). Then remove the upper variable speed belt (D).

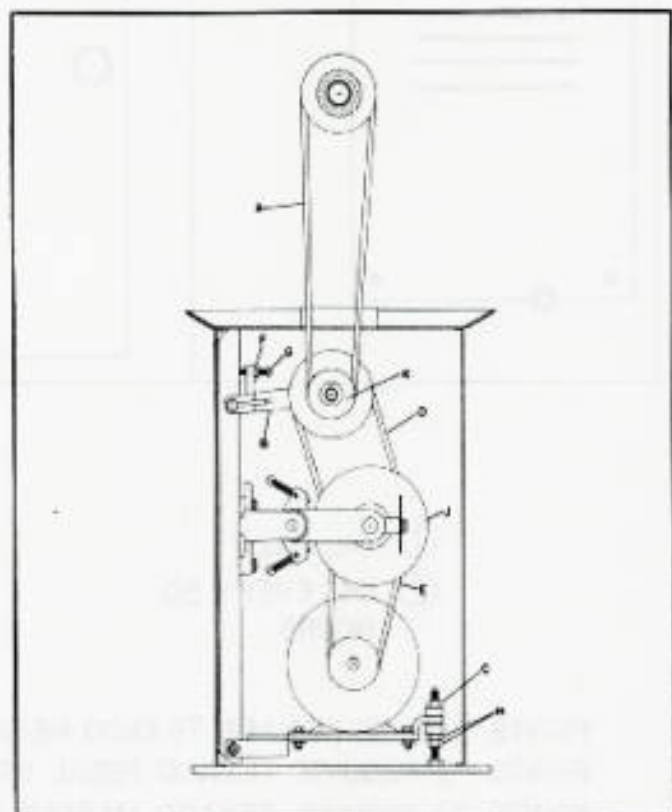


Fig. 33.

5. Remove outboard gear cover and headstock cover.

6. Loosen bolt (A) Fig. 34, of the gear train. Rotate the gear bracket (B) counterclockwise disengaging the gear train.

7. Remove nut (C) Fig. 34, washer (D), and reversing gear bracket (E).

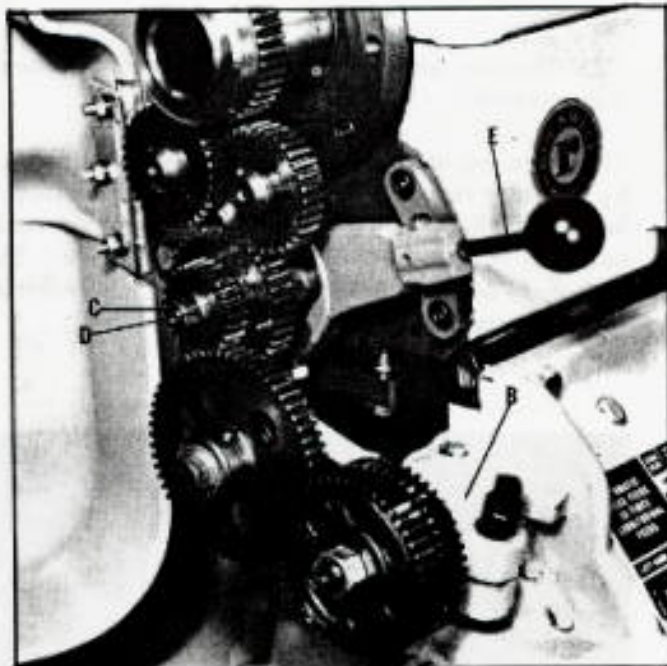


Fig. 34.

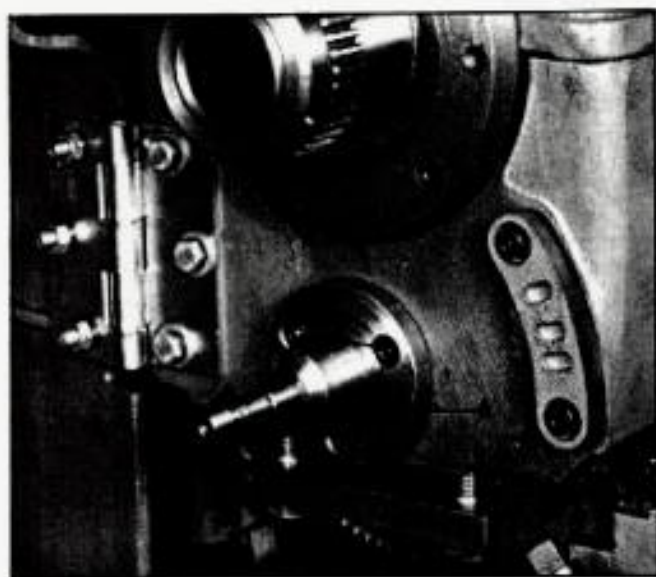


Fig. 35.

8. Remove shoulder bushing (A) Fig. 35, by removing three screws (B).

9. Loosen set screw (A) Fig. 36, and remove spindle nut (B). CAUTION: Care should be taken not to lose brass plug below set screw (A). Remove gear (C), key (D), and spacer (E) Fig. 36.

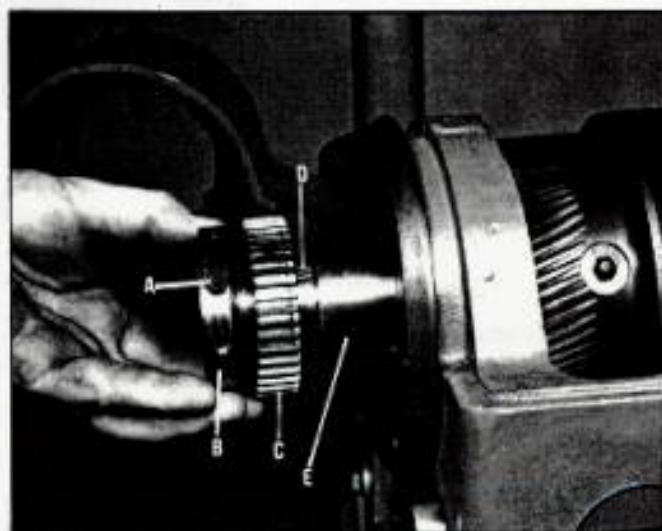


Fig. 36.

10. Remove four cap screws from outboard bearing retainer.

11. Remove outboard bearing retainer (A) Fig. 37, by screwing two 3/8-16 x 2" screws into the tapped holes as shown. Tighten the two screws evenly until the outboard bearing retainer pulls free. The outboard bearing is removed with the outboard bearing retainer.

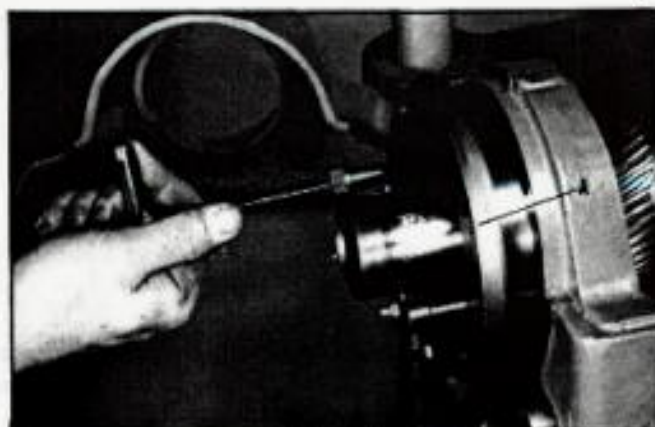


Fig. 37.

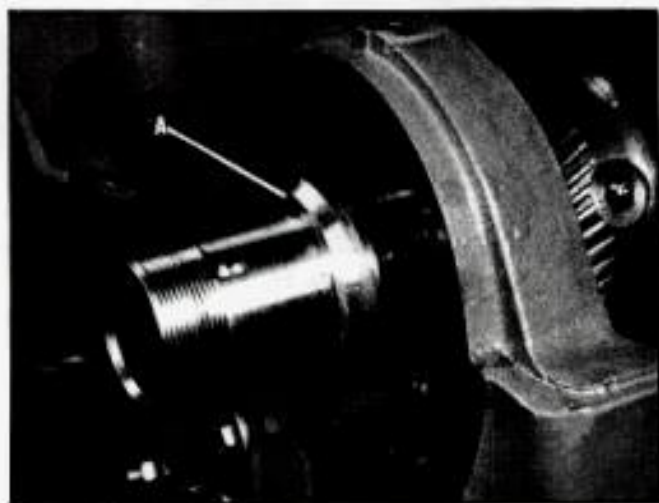


Fig. 38.

12. Remove spindle spacer (A) Fig. 38.

13. Remove the four mounting bolts and the two mounting plates that hold the headstock to the lathe bed.

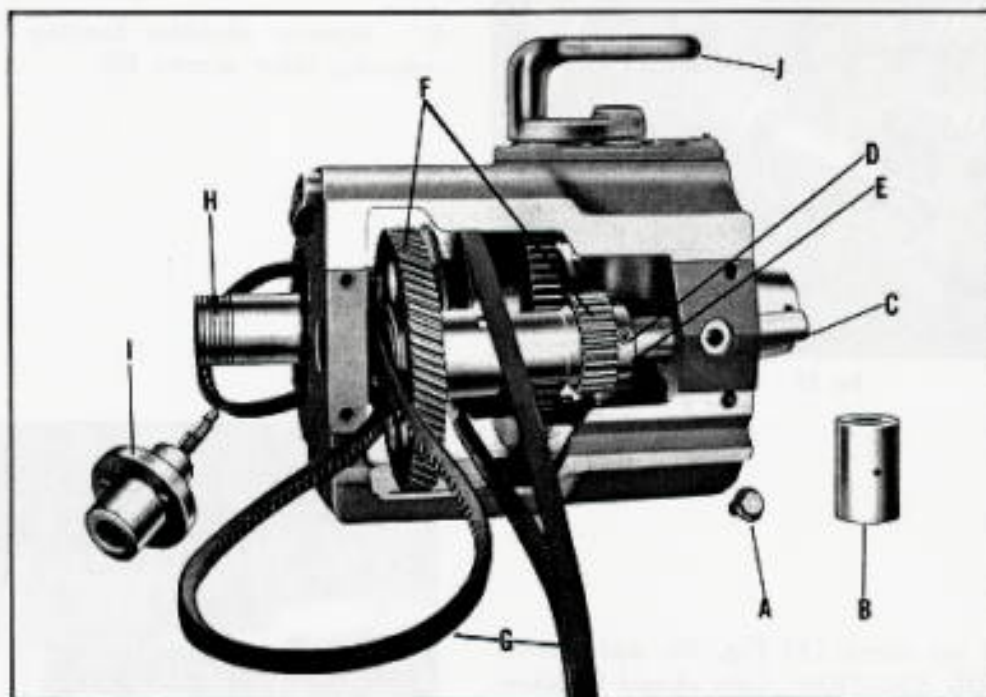


Fig. 39.

14. Remove the headstock from the lathe bed and lay it on its side with the drive selector up, as shown in Fig. 39.

15. Remove bolt (A) Fig. 39, from the bottom of the headstock and remove bearing (B) which supports lower back gear shaft (C).

16. Loosen set screw (D) in collar (E) Fig. 39, slide back gears (F) to the right just far enough to remove belts. Do not remove shaft (C).

17. Remove belts (G) Fig. 39, by slipping them through the outboard spindle bearing hole, past the end of the spindle (H), back through the outboard spindle bearing hole, and down past the back gears (F).

1. Reverse Step 18 to assemble new spindle V-Belts around Spindle Pulleys.
2. Fasten shoulder bushing (I) Fig. 39, to headstock.
3. Put selector lever (J) Fig. 39, into direct drive position.
4. Push shaft (C) into shoulder bushing (I) Fig. 39.
5. Replace bearing (B) and bolt (A) Fig. 39. Care must be taken to see that witness mark on bearing (B) is toward the outside and pointing up toward the spindle.
6. Check to see if witness mark on shaft (C) Fig. 39 and bearing (B) coincide (with selector lever still in direct drive). If not, remove bolt (A) and bearing (B) and repeat Steps 4 and 5 rotating the shaft until gears mesh in the correct position so that the witness marks on bearing (B) and shaft (C) coincide. The gears referred to are the small gear on shaft (C) and the small gear on the inboard end of the shaft which is rotated by the drive selector. The proper engagement of these gears is necessary for the witness marks to coincide and for the proper backlash setting of the back gears.
7. Move back gears (F) to left side and fasten with collar (E) and set screw (D) Fig. 39.
8. Replace spacer (A) Fig. 38, with chamfered end toward the outside.
9. Insert extended loose ends of belts through bed and chip pan opening while placing headstock on lathe bed.
10. Reach through cabinet door and pull belts down.
11. Fasten the headstock to the lathe bed using the four mounting bolts and two mounting plates. End of headstock should be approximately flush with end of ways of bed before tightening bolts.
12. Reverse Steps 1 through 13 under REMOVING AND REPLACING VARIABLE SPEED BELTS, FEED REVERSING GEAR BRACKET, OUTBOARD SPINDLE BEARING, SPINDLE V-BELTS, AND BACK GEARS.

QUICK CHANGE GEAR BOX

REPLACING LEFT AND RIGHT HAND TUMBLERS

1. Disengage lead screw from gear box by loosening set screw (A) Fig. 40 and moving lead screw to the right a few inches.
2. Remove three screws (B) Fig. 40 and remove gear box from the lathe.

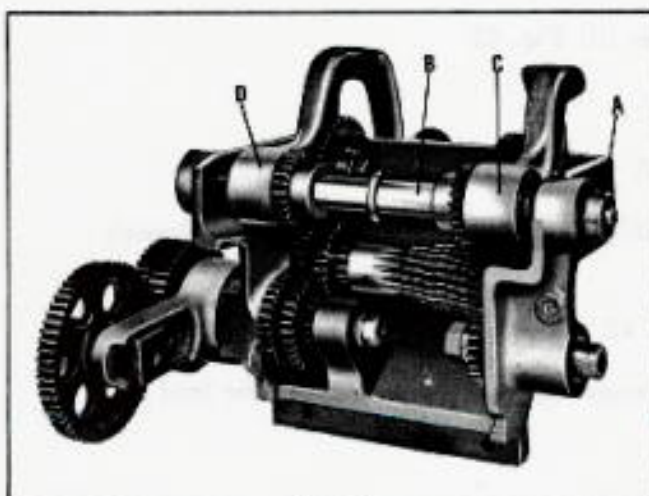


Fig. 41.

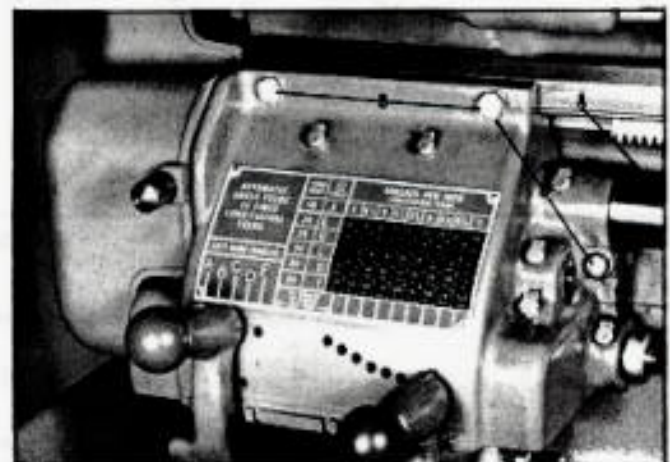


Fig. 40.

3. Loosen set screw in collar (A) Fig. 41, and remove the collar.
4. Slide the shaft (B) to the left as viewed in Fig. 41, and remove and replace the tumblers (C) and (D).
5. Reverse the above instructions when reassembling the gear box.

CARRIAGE

REPLACING CROSS SLIDE FEED SCREW AND NUT

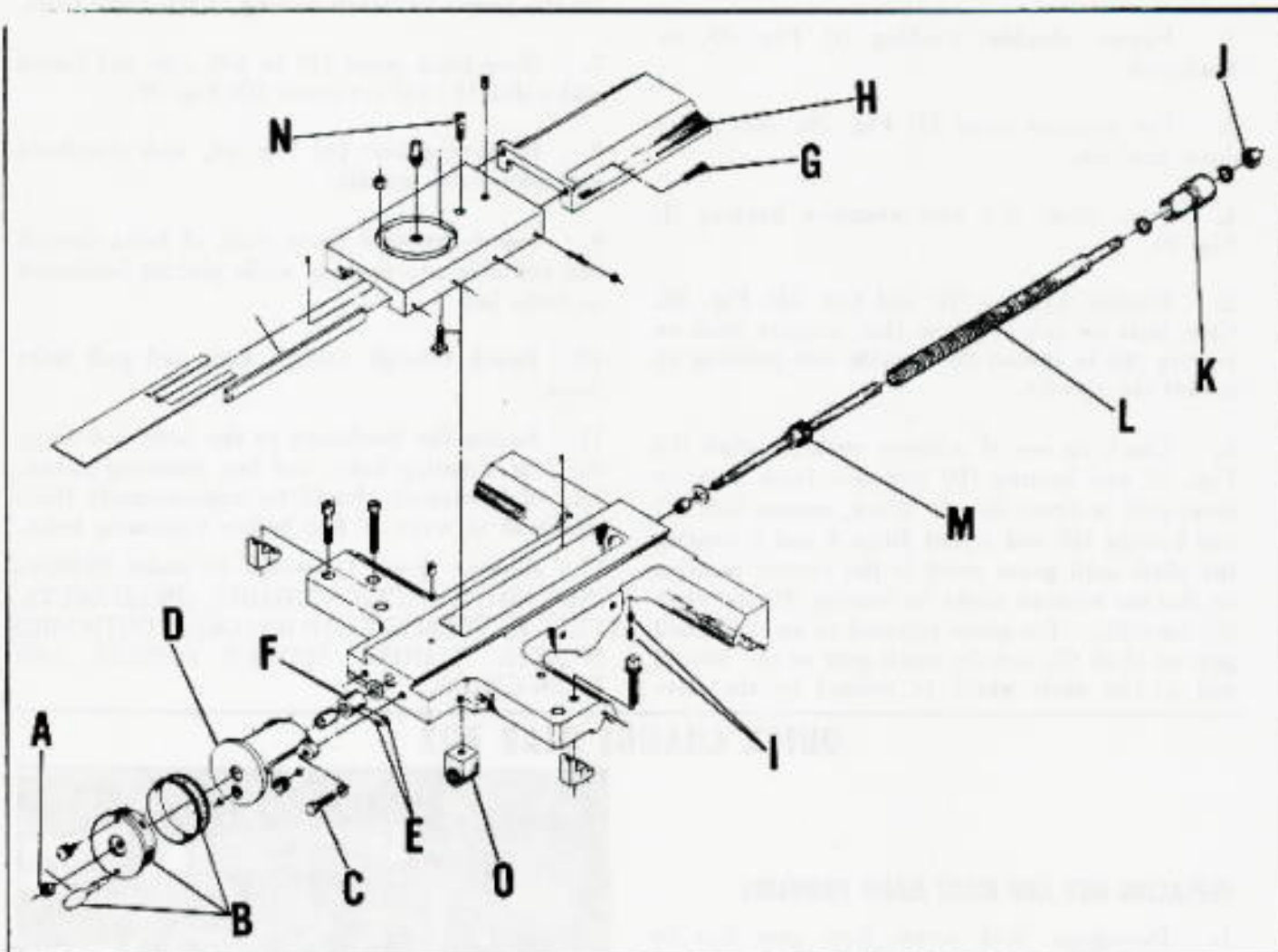


Fig. 42.

1. Remove nut (A) and handwheel assembly (B) Fig. 42.
2. Remove two screws (C) and flange (D) Fig. 42.
3. Loosen two set screws (E) and remove collar (F) Fig. 42.
4. Remove two screws (G) and remove cover (H) Fig. 42.
5. Remove two set screws (I) Fig. 42.
6. Remove nuts (J) and bushing (K) Fig. 42.
7. Remove the feed screw (L) and feed shaft (M) Fig. 42 by threading them out through the rear.
8. Remove screw (N) and feed nut (O) Fig. 42.
9. When reassembling make sure the feed screw (L) runs freely through the feed nut (O) before tightening screw (N) Fig. 42.

REPLACING COMPOUND SLIDE FEED SCREW AND NUT

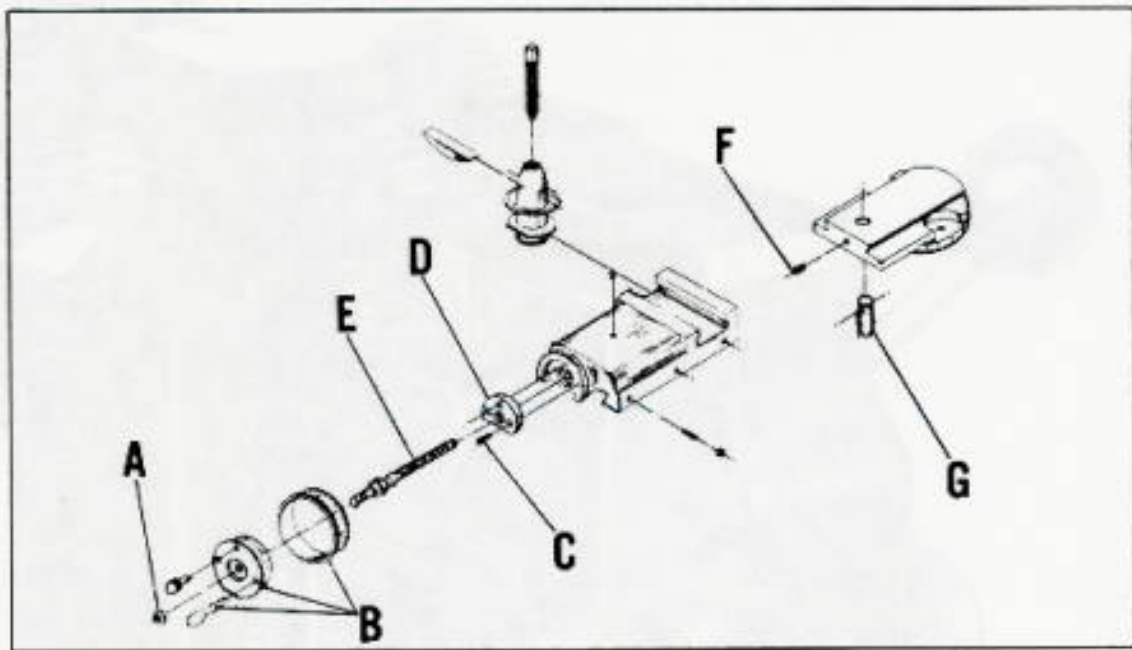


Fig. 43.

1. Remove nut (A) Fig. 43, and handwheel assembly (B).
2. Remove three screws (C) and thrust bushing (D) Fig. 43. Then remove the compound slide feed screw (E) by turning it counterclockwise.
3. Loosen set screw (F) and remove the feed nut (G) Fig. 43.
4. When reassembling make sure the compound feed screw (E) runs freely through the feed nut (G) before tightening set screw (F) Fig. 43.

REPLACING HALF-NUTS, POWER FEED CLUTCH, AND WORM

To make repairs to the apron it is first advisable to remove the carriage from the bed, as follows:

1. Remove the tailstock from the lathe.
2. Remove the two screws on the lead screw bracket and remove this bracket from the right hand side of the bed.
3. Loosen the three cap screws (A) Fig. 44, enough so that the apron will drop about a quarter of an inch.

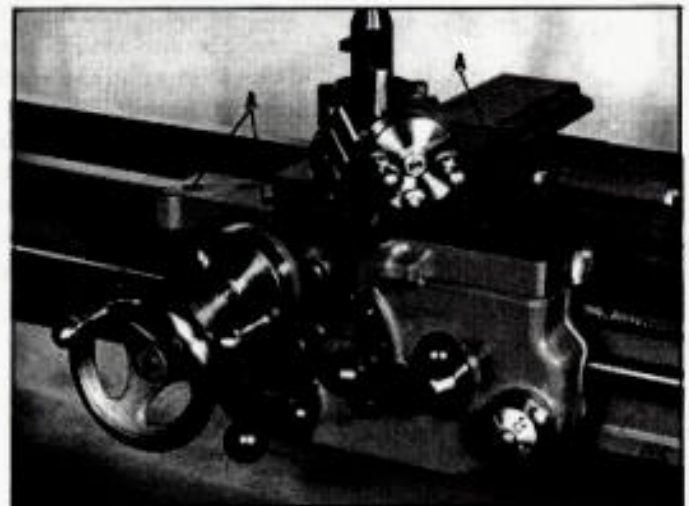


Fig. 44.

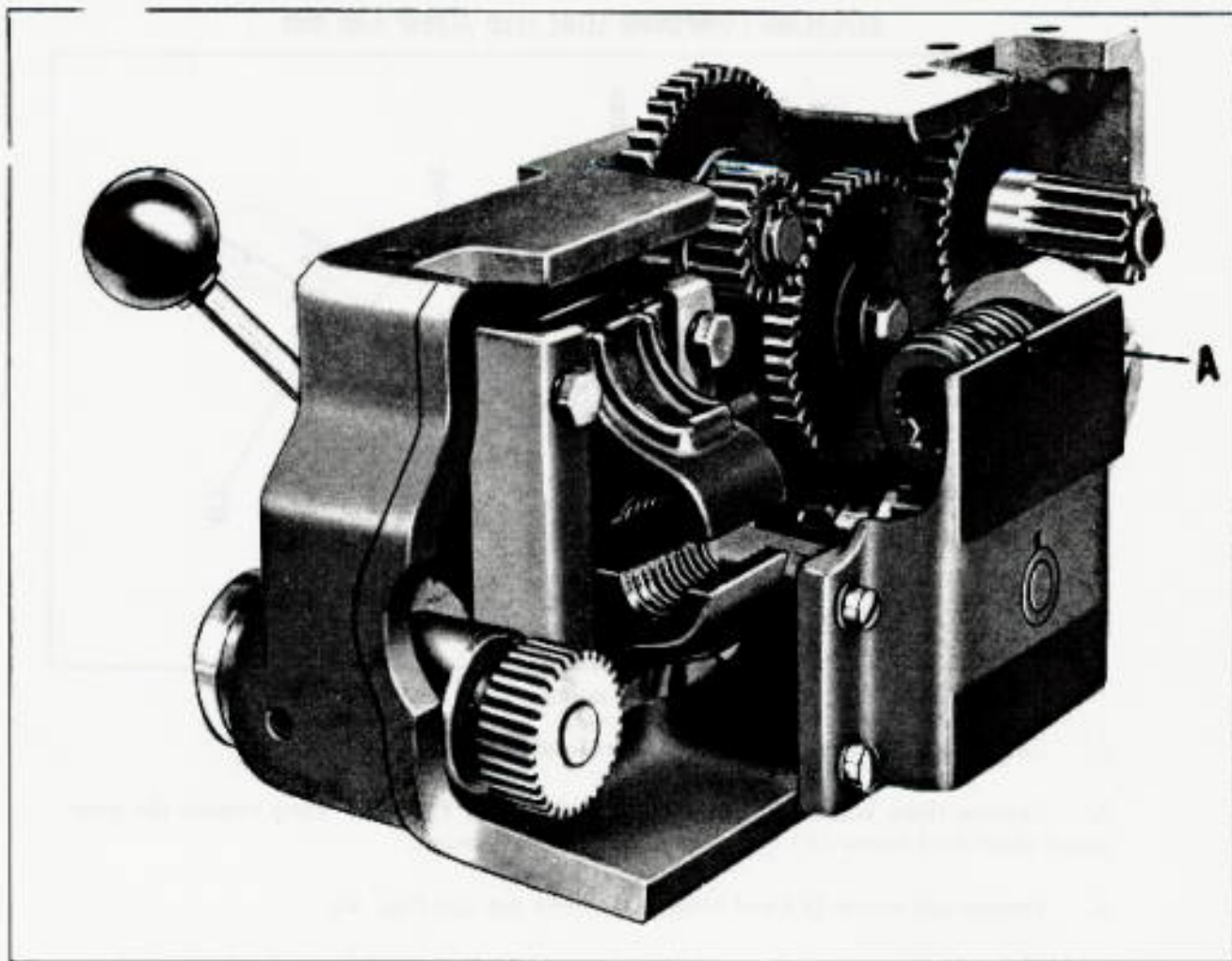


Fig. 45.

4. Move the carriage to the right and off the lathe bed.
5. The half-nuts, power feed clutch, and worm can now be replaced. Fig. 45 shows an interior view of the apron.
6. When reassembling the apron be sure to engage the key in the worm gear (A) Fig. 45, into the keyway in the lead screw and move the carriage onto the bed. When tightening the three screws (A) Fig. 44, move the apron handwheel back and forth to allow the lead screw and pinion in apron to mesh. Before tightening the two screws on the lead screw bracket, run the carriage the full length of the lathe to make sure no binding occurs.

**QUALITY
CONTROL
CERTIFICATE**

Rockwell MANUFACTURING COMPANY
POWER TOOL DIVISION



ROCKWELL 11" METAL CUTTING LATHE

CATALOG NUMBER INSPECTED BY
SERIAL NUMBER DATE

This Rockwell 11" Metal Lathe is a precision machine tool, modern in design and built to highest quality standards. Before it left our factory it had to pass more than 50 tests for dynamic balance, accuracy, and ease of operation. Some of these test results are reported here to show you the quality built into your particular lathe.

The Rockwell 11" Metal Lathe is built to give you many years of good service. PLEASE STUDY THE INSTRUCTION MANUAL CAREFULLY BEFORE OPERATING THE LATHE. Keep the lathe clean, well lubricated, and in proper adjustment. The accuracy of work it produces depends on you.

Dial Indicator Inspection

	TEST	Limit Allowed	This Lathe
1.	Spindle Nose Runout (Indicator on Face and Pilot of Threaded Nose Models)	.0005 T.I.R.	
2.	Spindle Taper Hole Runout—Test Bar in Spindle Hole—Indicate 1½" from Spindle Nose	.0005 T.I.R.	
3.	Spindle Taper Runout—Test Bar in Spindle Hole—Indicate 12" from Spindle Nose	.001 T.I.R.	
4.	Spindle Alignment with Bed ways—Vertical—along 12" of test bar	.001	
5.	Spindle Alignment with Bed ways—Horizontal—along 12" of test bar	.0005	
6.	Tailstock Ram Alignment with Bed ways—Vertical—along 3" Test Bar mounted in extended Ram—high at Headstock end	0 to .0015	
7.	Tailstock Ram Alignment with Bed Ways—Horizontal—along 3" Test Bar mounted in extended Ram	.001	
8.	Vertical Alignment of Head and Tail Centers (High at Tailstock)	0 to .003	
9.	Cross Slide Alignment—To Face Hollow or Concave only on 10" Diameter	.001 (5" Rad)	
10.	Lead Screw Cam Action	.0005	
11.	Cross Feed Screw Backlash (8 marks on micrometer collar)	.004	
12.	Compound Feed Screw Backlash	.006	
13.	Tailstock Feed Screw Backlash	.010	

Additional Inspection

	TEST	Check If O.K.
1.	Bed Level—using spirit level in transverse and longitudinal directions	
2.	Travel of Carriage full length of bed, using handwheel	
3.	Lead Screw Alignment with Bed Ways—Vertical and Horizontal—end to end	
4.	Lead Screw—Lead per foot + or - .002; and Lead in any 4" + or - .00075	
5.	Lead Screw Control Lever (forward, neutral, reverse)	
6.	Functioning of Half Nuts (lathe running)	
7.	Lock out Device for Half Nuts	
8.	Quick Change Gear Box—Check for noise or vibration with lathe running	
9.	Graduations on three Micrometer Collars and Compound Swivel Saddle. Witness Marks for Tailstock Set-over, Swivel Saddle (2), Eccentric Shaft for Back Gears, Shear Pin and three Micrometer Collar	
10.	Check Maximum and Minimum Spindle Speeds in Direct Drive (1550 and 220 rpm) using Stroboscopic Tachometer	
11.	Vibration at 1220 rpm not to exceed .0005" amplitude on Bed and .0003" at the Spindle using Electronic Vibration Analyzer	
12.	Vibration from 220 to 1550 rpm not to exceed .005" amplitude on Variable Speed Drive Bracket, using Electronic Vibration Analyzer	
13.	Turn and Face Drive Plate and pack with same lathe	
14.	Make light and heavy cuts 6" long, and check for taper—not to exceed .0005"	
15.	Cut a coarse and a fine thread	
16.	Tailstock ejects center	

ROCKWELL 11" METAL CUTTING LATHE

QUALITY
CONTROL
CENTRAL

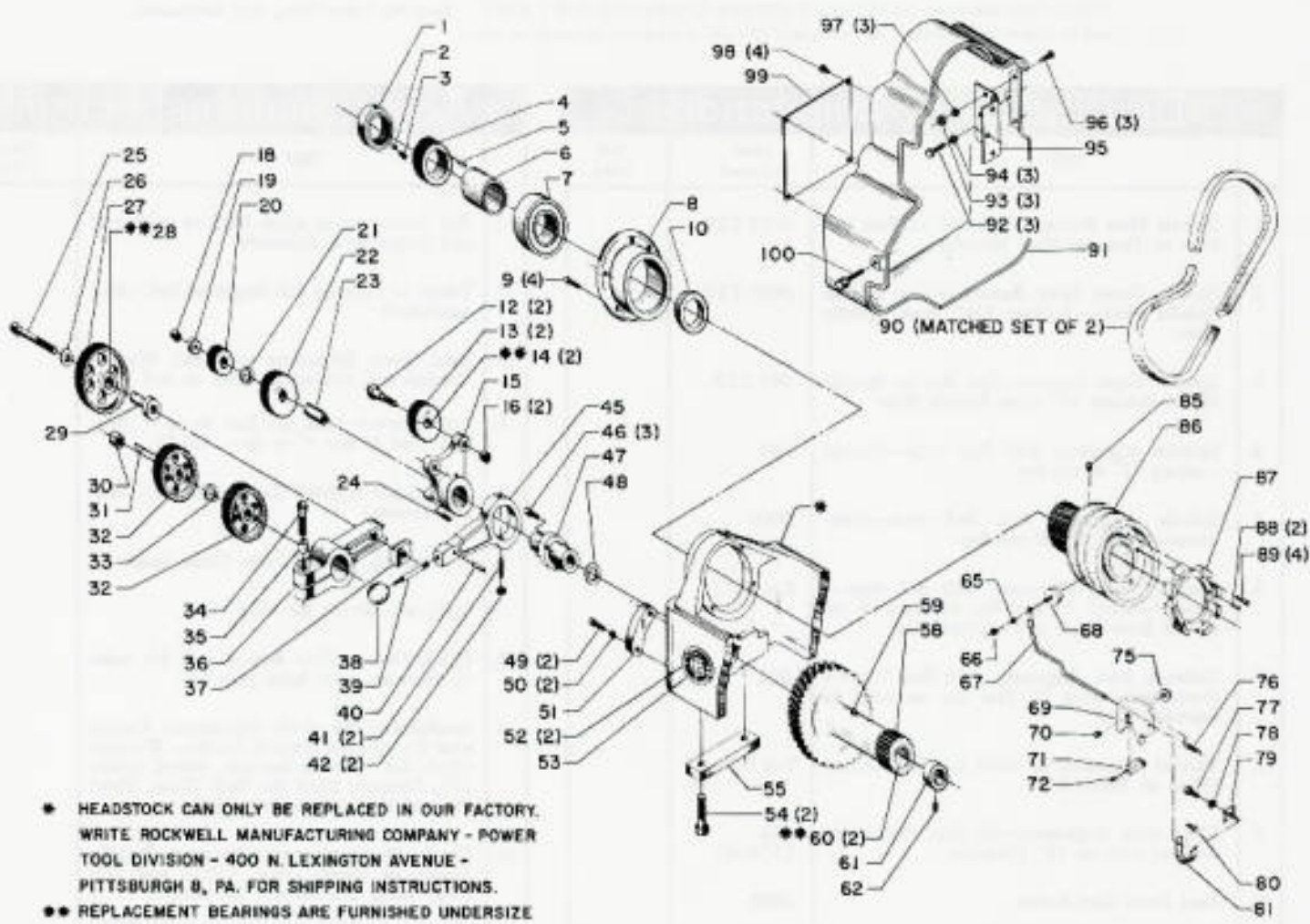
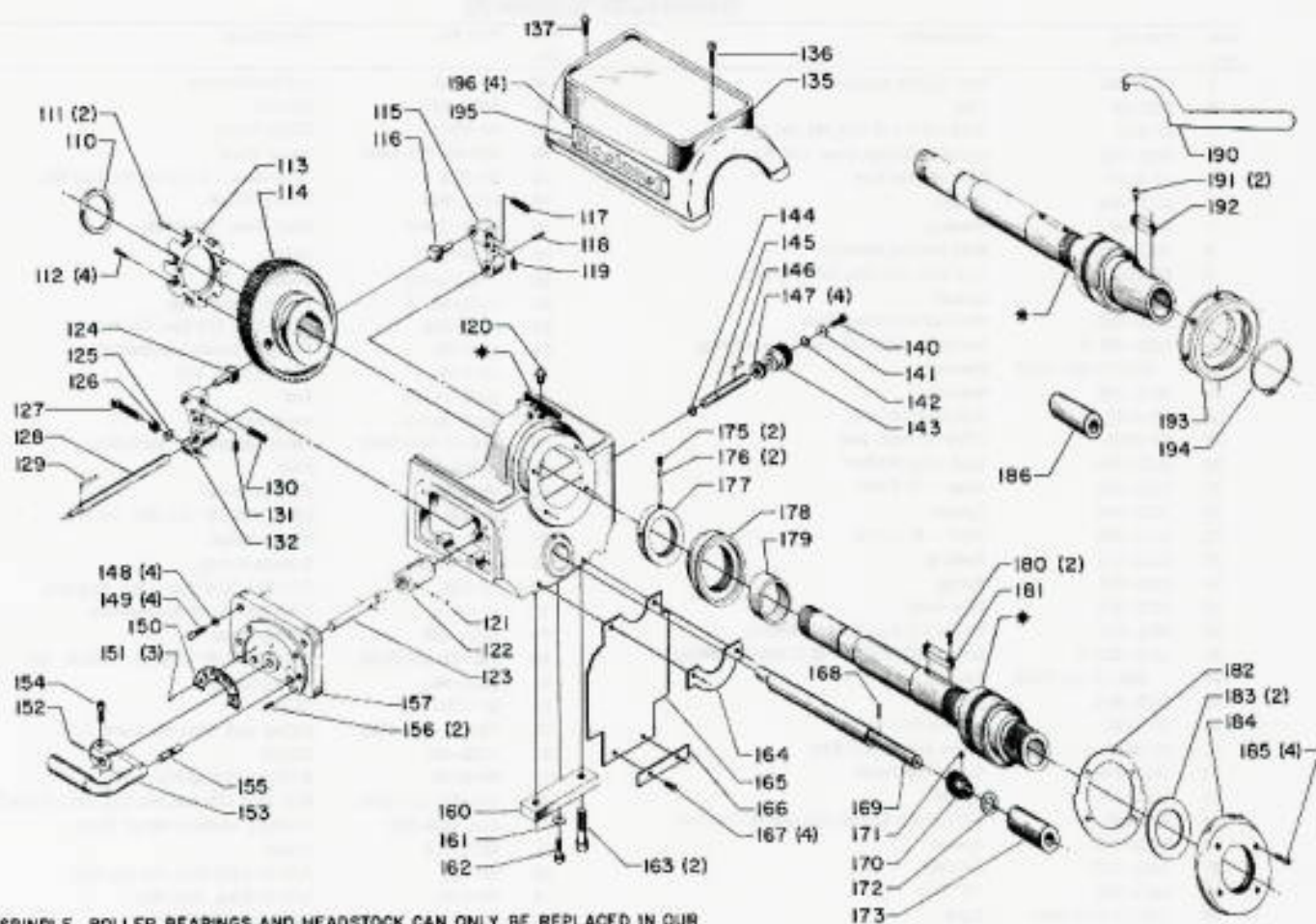


Figure A

HEADSTOCK (Figure A)

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	MCL-223	Rear Collar Retainer	50	SP-1702	1/4 Lockwasher
2	SCG-88	Plug	51	MCL-250	Bracket
3	SP-225	5/16-18 x 1/4 Soc. Hd. Set Scr.	52	SP-2250	Drive Screw
4	MCL-228	Spindle Change Gear - 40 Teeth	53	960-02-012-0028	Name Plate
5	SP-2619	#404 Hi-Pro Key	54	SP-615	7/16-14 x 1 3/4 Hex. Hd. Cap Scr.
6	MCL-234	Spacer	55	MCL-249	Clamp Block
7	SP-5349	Bearing	58	MCL-224-5	Back Gear, Including:
8	MCL-240	Rear Bearing Retainer	59	SP-7107	Oiler
9	SP-8309	1/4-20 x 5/8 Soc. Hd. Cap Scr.	60	MCL-536	Bearing
10	MCL-235	Spacer	61	MCL-241-5	Collar, Including:
12	MCL-256	Stud for Reversing Gear	62	SP-225	5/16-18 x 1/4 Soc. Hd. Set Scr.
13	MCL-231-5	Reversing Gear-34 Teeth, Including:	65	SP-1775	#10 Int. Tooth Lockwasher
14	920-75-031-8097	Bearing	66	SP-1203	#10-32 Hex. Nut
15	MCL-206	Bracket	67	MCL-549-5	End
16	SP-1207	3/8-24 Hex. Nut	68	MCL-553-5	Retainer Pad
18	SP-1206	5/16-24 Hex. Nut	69	414-01-390-5000	Swivel Assembly, Including:
19	MCL-248	Stud Gear Washer	70	MCL-551	Stud
20	MCL-230	Gear - 24 Teeth	71	MCL-568	Cam Follower
21	MCL-254	Spacer	72	SP-258	#8-32 x 5/16" Soc Hd. Set Scr.
22	MCL-229	Gear - 40 Teeth	73	MCL-378	Shim Washer
23	MCL-255	Bushing	76	MCL-543	Torsion Spring
24	DDL-123	Spring	77	SP-626	1/4-20 x 3/4" Hex. Hd. Cap Scr.
25	MCL-310	Idler Bolt	78	SP-1764	1/4" Int. Tooth Lockwasher
26	DDL-174	29/64 x 1 x 1/8 Steel Washer	79	MCL-553	Clamp Plate
27	MCL-227-5	Intermediate Gear-60 Teeth, Including:	80	901-02-181-6103	#10-32 x 3/8" Hex. Hd. Mach. Scr.
28	920-75-011-7190	Bearing	81	MCL-544	Return Spring
29	MCL-265	Bearing	85	SP-7107	Oiler
30	SP-1382	1/2-18 Hex. Nut	86	414-01-351-5032	Pulley with Gear-44 Teeth L. H.
31	SP-2606	1/8 x 5/8 Hi-Pro Key	87	MCL-430	Clutch
32	MCL-176	Gear - 48 Teeth	88	SP-2729	3/16 x 1/2 Roll Pin
33	MCL-254	Spacer	89	901-03-111-9880	#10-24 x 1/2 Soc. Hd. Cap Scr. - Nylon Insert
34	SP-6053	3/8-16 x 2 1/4 Sq. Hd. Collar Cap Scr.	90	Cal. #25-502	V-Belt (Matched set of Two)
35	MCL-314	Spacer	91	MCL-216	Guard
36	MCL-210	Bracket	92	SP-612	1/4-20 x 5/8 Hex. Hd. Cap Scr.
37	MCL-253	"T" Nut	93	SP-1634	1/4-20 Hex. Jam Nut
38	951-01-022-0490	Knob	94	SP-1702	1/4 Lockwasher
39	MCL-151	Handle Rod	95	MCL-289	Hinge
40	SP-5075	1/4 x 3/4 Roll Pin	96	SP-7510	1/4-20 x 3/4 Truss Hd. Screw
41	SP-139	1/4-20 x 1 Headless Set Screw	97	SP-1702	1/4 Lockwasher
42	SP-1034	1/4-20 Hex. Jam Nut	98	SP-2232	#2 x 3/16 Drive Screw
45	MCL-209	Lever	99	414-01-072-0009	Lubrication Chart
46	SP-3309	1/4-20 x 5/8 Soc. Hd. Cap Screw	100	MCL-252	Knurled Knob
47	MCL-743	Shaft for Stud Gear			
48	LTA-462	3/4 Fiber Washer			
49	SP-3309	1/4-20 x 5/8 Soc. Hd. Cap Screw			



* SPINDLE, ROLLER BEARINGS AND HEADSTOCK CAN ONLY BE REPLACED IN OUR FACTORY. WRITE ROCKWELL MANUFACTURING COMPANY - POWER TOOL DIVISION - 400 N. LEXINGTON AVENUE - PITTSBURGH 8, PA. FOR SHIPPING INSTRUCTIONS.

HEAD STOCK

Figure B

HEADSTOCK (Figure B)

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
110	MCL-236	Spacer	160	MCL-249	Clamp Block
111	SP-2729	3/16 x 1/2 Roll Pin	161	SP-1605	3/8 x 7/8 x 1/16 Washer
112	901-03-111-9980	#10-24 x 1/2 Soc. Hd. Cap Scr. - Nylon Insert	162	SP-807	5/16-18 x 3/4 Hex. Hd. Cap Scr.
113	MCL-430	Clutch	163	SP-615	7/16-14 x 1 3/4 Hex. Hd. Cap Scr.
114	MCL-223	Spindle Gear - 104 Teeth	164	MCL-296	Retainer Plate
115	MCL-232	Sliding Gear Arm	165	MCL-297	Splash Guard
116	414-03-047-5001	Shifter Arm Shoe	166	MCL-277	Lower Plate
117	MCL-438	Clutch Spring	167	SP-561	#10-32 x 3/8 Rd. Hd. Mach. Scr.
118	SP-2665	1/8 x 1/8 x 5/8 Key	168	SP-2706	3/16 x 1 Roll Pin
119	SP-202	1/4-20 x 1/2 Soc. Hd. Set Scr.	169	MCL-251	Back Gear Shaft
120	SP-7114	Grease Fitting	170	MCL-250-R	Lower Shifter Gear-20 Teeth, R. H., Including:
*	414-01-406-5010	Shaft Assembly, consisting of:	171	DOL-253	1/4-28 x 3/16 Soc. Hd. Set Scr.
121	SP-2733	5/32 x 1" Roll Pin	172	LTA-482	3/4 Fiber Washer
122	414-01-019-5010	Cam	173	MCL-240	Bushing
123	414-01-106-5041	Shaft	175	SP-201	5/16-18 x 5/16 Soc. Hd. Set Scr.
124	414-03-047-5001	Shifter Arm Shoe	176	SCG-88	Plug
125	SP-1756	3/8 Ext. Tooth Lockwasher	177	MCL-247	Collar Nut
126	SP-1005	3/8-16 Hex. Jam Nut	178	MCL-244	Rear Bearing Seal
127	MCL-373	3/8-16 Spec. Sq. Hd. Set Screw	179	MCL-237	Spacer
128	MCL-263	Shaft	180	SP-3306	#8-32 x 3/8 Soc. Hd. Cap Scr.
129	MCL-317	Key	181	MCL-267	Key
130	MCL-406	Clutch Spring	182	MCL-202	Front Bearing Gasket
131	SP-202	1/4-20 x 1/2 Soc. Hd. Set Screw	183	MCL-208	Grease Seal Washer
132	MCL-214	Sliding Gear Arm	184	MCL-245	Front Bearing Seal
133	MCL-77	Headstock Cover	185	SP-3309	1/4-20 x 5/8 Soc. Hd. Cap Scr.
136	SP-725	1/4-20 x 1 Pil. Hd. Screw	186	MCL-424	#2 M. T. Adapter
137	SP-701	1/4-20 x 3/4 Pil. Hd. Screw	186	MCL-428	#3 M. T. Adapter
140	SP-612	1/4-20 x 5/8 Hex. Hd. Cap Scr.	190	414-01-101-5003	Wrench (For L-00 Tapered Spindle Nose)
141	DDL-266	17/64 x 11/16 x 5/84 Steel Washer	191	SP-3306	#8-32 x 3/8 Soc. Hd. Cap Scr.
142	SP-7011	Retaining Ring	192	MCL-434	Key (For L-00 Tapered Spindle Nose)
143	MCL-261	Upper Shifter Gear - 20 Teeth, R. H.	193	414-01-079-5001	Nut (For L-00 Tapered Spindle Nose)
144	SP-7018	Retaining Ring	194	SP-7417	Retaining Ring (For L-00 Tapered Spindle Nose)
145	MCL-539	Shaft	195	960-02-012-0050	Nameplate
146	SP-2665	1/8 x 1/8 x 5/8 Key	196	SP-2250	Drive Screw
147	DDL-161	1/2 x 7/8 x 1/32 Fiber Washer	*	Cat. #25-542	60° Soft Center (#2 M. T.)
148	SP-1784	1/4 Int. Tooth Lockwasher	*	Cat. #25-640	7" Drive Plate (For 2 1/4-8 Threaded Spindle Nose)
149	SP-701	1/4-20 x 3/4 Pil. Hd. Screw	*	Cat. #25-642	7" Drive Plate (For L-00 Tapered Spindle Nose)
150	414-01-037-5005	Instruction Plate	*	Not Shown	
151	SP-2252	#2 x 3/16 Drive Screw			
152	SP-2719	1/8 x 1 Roll Pin			
153	MCL-545-S	Handle, Including:			
154	SP-755	1/4-20 x 3/4 Soc. Hd. Screw			
155	MCL-547	Pin			
156	SP-2729	3/16 x 1/2 Roll Pin			
157	MCL-546	Plate			

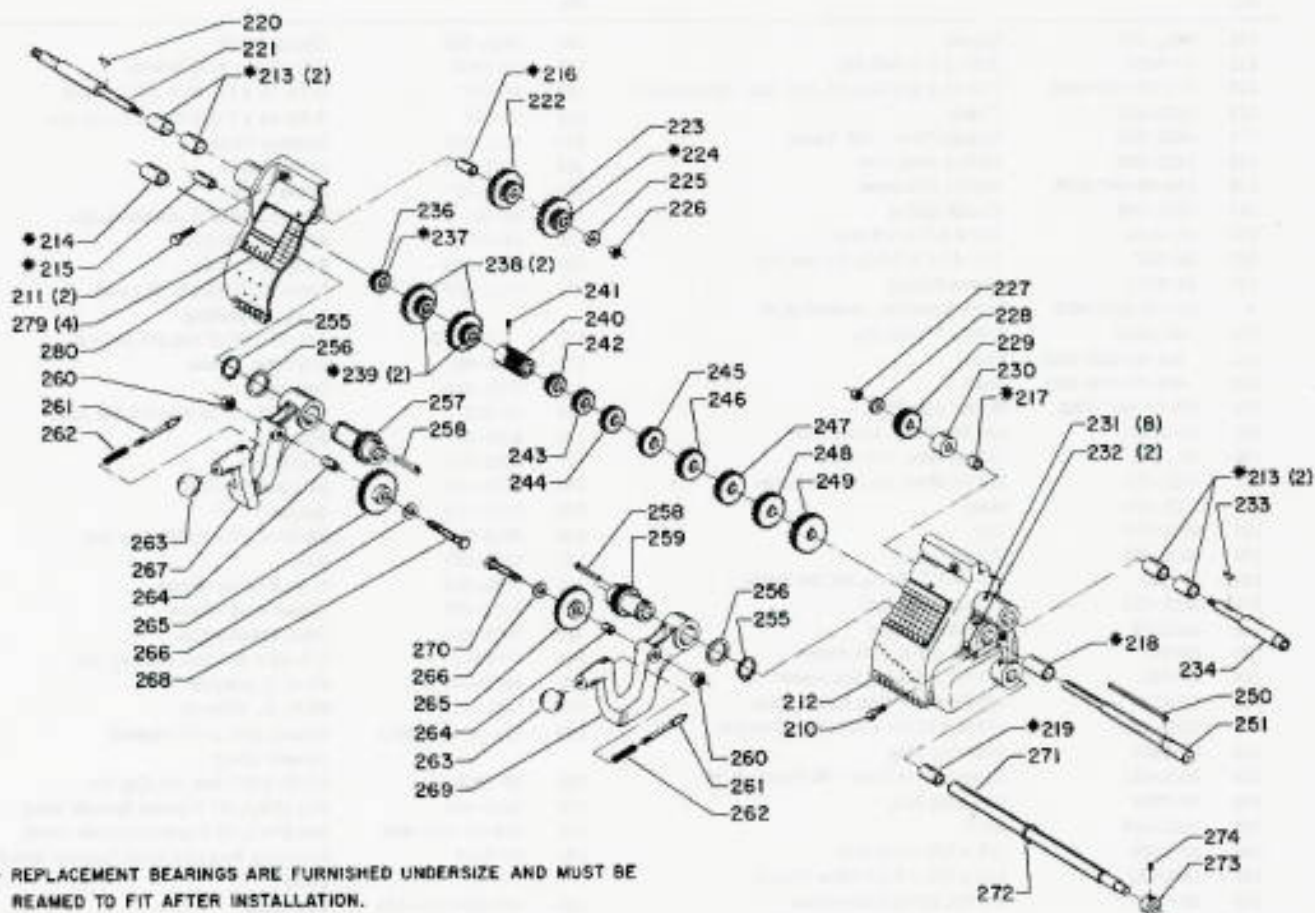
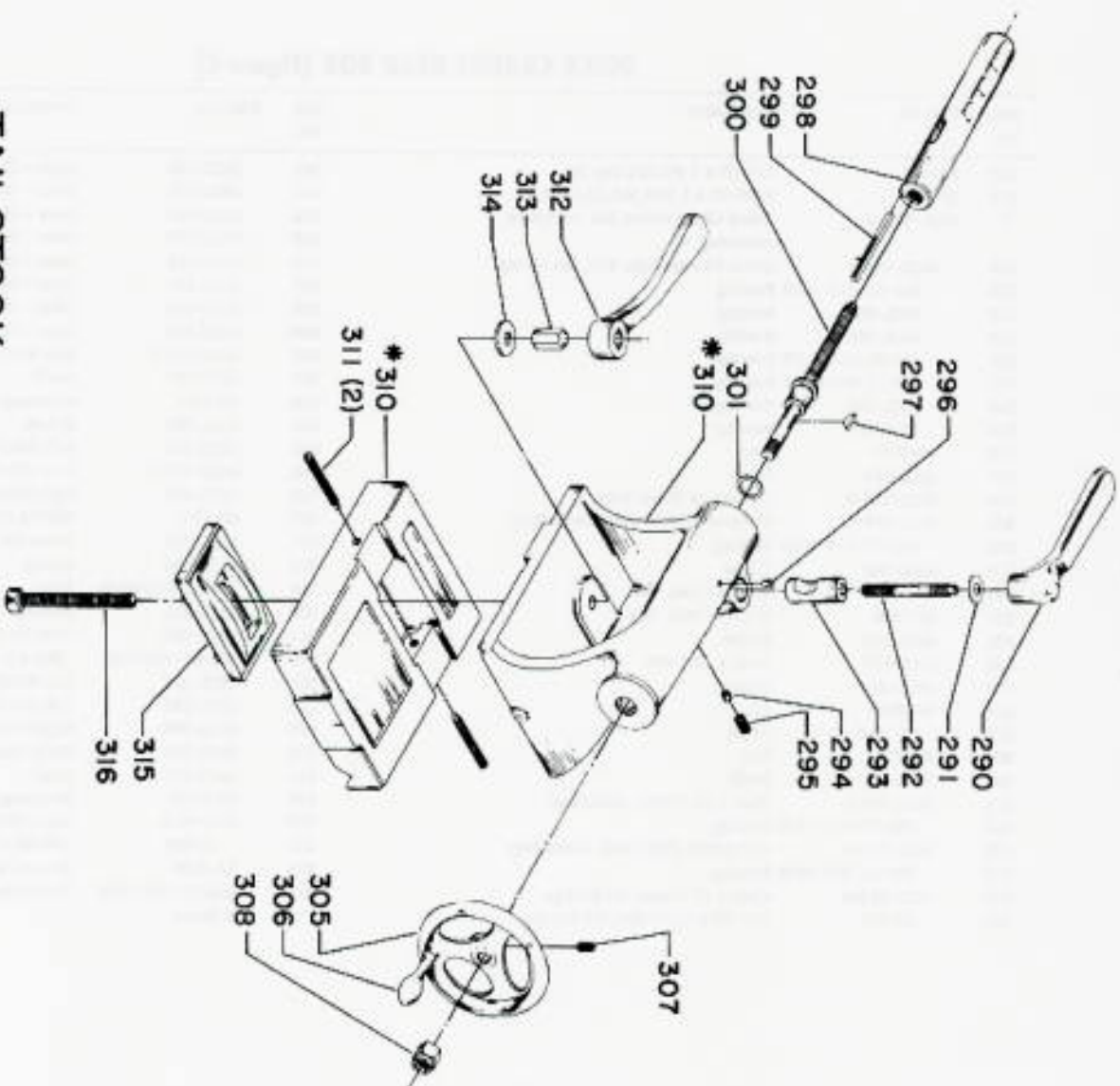


Figure C

QUICK CHANGE GEAR BOX

QUICK CHANGE GEAR BOX (Figure C)

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
210	SP-725	1/4-20 x 1 Fil Hd, Cap Scr.	242	MCL-190	Gear - 18 Teeth
211	SP-649	5/16-18 x 1 Hex Hd, Cap Scr.	243	MCL-191	Gear - 20 Teeth
*	MCL-704-S	Quick Change Gear Box Complete, consisting of:	244	MCL-192	Gear - 22 Teeth
212	MCL-704-A	Quick Change Gear Box, including:	245	MCL-193	Gear - 24 Teeth
213	414-01-017-5012	Bearing	246	MCL-194	Gear - 26 Teeth
214	MCL-383	Bearing	247	MCL-195	Gear - 27 Teeth
215	MCL-384	Bearing	248	MCL-403	Gear - 28 Teeth
216	414-01-017-5013	Bearing	249	MCL-196	Gear - 28 Teeth
217	414-01-017-5011	Bearing	250	MCL-187-S	Key with Pin
218	MCL-385	Bearing	251	MCL-186	Shaft
219	MCL-382	Bearing	252	SP-7017	Retaining Ring
220	SP-2617	Key	256	MCL-201	Spacer
221	MCL-186	Shaft	257	MCL-271	Left Hand Shifter Gear - 26 Teeth
222	MCL-179-S	Compound Drive Gear	258	MCL-217-S	Key with Pin
223	MCL-178-S	Compound Idler Gear, including:	259	MCL-404	Right Hand Shifter Gear - 26 Teeth
224	920-75-511-8053	Bearing	260	SP-1505	3/8-16 Hex, Jam Nut
225	MCL-248	Collar	261	MCL-204	Index Pin
226	SP-1300	5/16-18 Hex, Nut	262	MCL-205	Spring
227	SP-1300	5/16-18 Hex, Nut	263	931-01-022-0450	Knob
228	MCL-248	Collar	264	MCL-311	Bearing
229	MCL-197	Gear - 26 Teeth	265	MCL-200	Idler Gear - 40 Teeth
230	MCL-414	Spacer	266	904-01-331-7706	.380 x 1 x .0098 Steel Washer
231	SP-5099	Oilier	267	MCL-207	Left Hand Shifter Lever
232	SCG-74-S	Oilier	268	MCL-199	Left Hand Idler Screw
233	SP-2617	Key	269	MCL-205	Right Hand Shifter Lever
234	MCL-401	Shaft	270	MCL-188	Right Hand Idler Screw
236	MCL-184-S	Gear - 16 Teeth, including:	271	MCL-270	Shaft
237	920-75-511-7108	Bearing	272	SP-7008	Retaining Ring
238	MCL-178-S	Compound Idler Gear, including:	273	SDP-94-S	Set Collar, including:
239	920-75-511-8053	Bearing	274	SP-208	1/4-20 x 1/4 Soc. Hd. Set Screw
240	MCL-189-S	Gear - 16 Teeth, including:	279	SP-2252	#2 x 3/16 Drive Screw
241	SP-208	1/4-20 x 1 1/4 Soc. Hd. Set Scr.	280	414-01-072-5094	Instruction Plate
			*	Not Shown	



TAILSTOCK

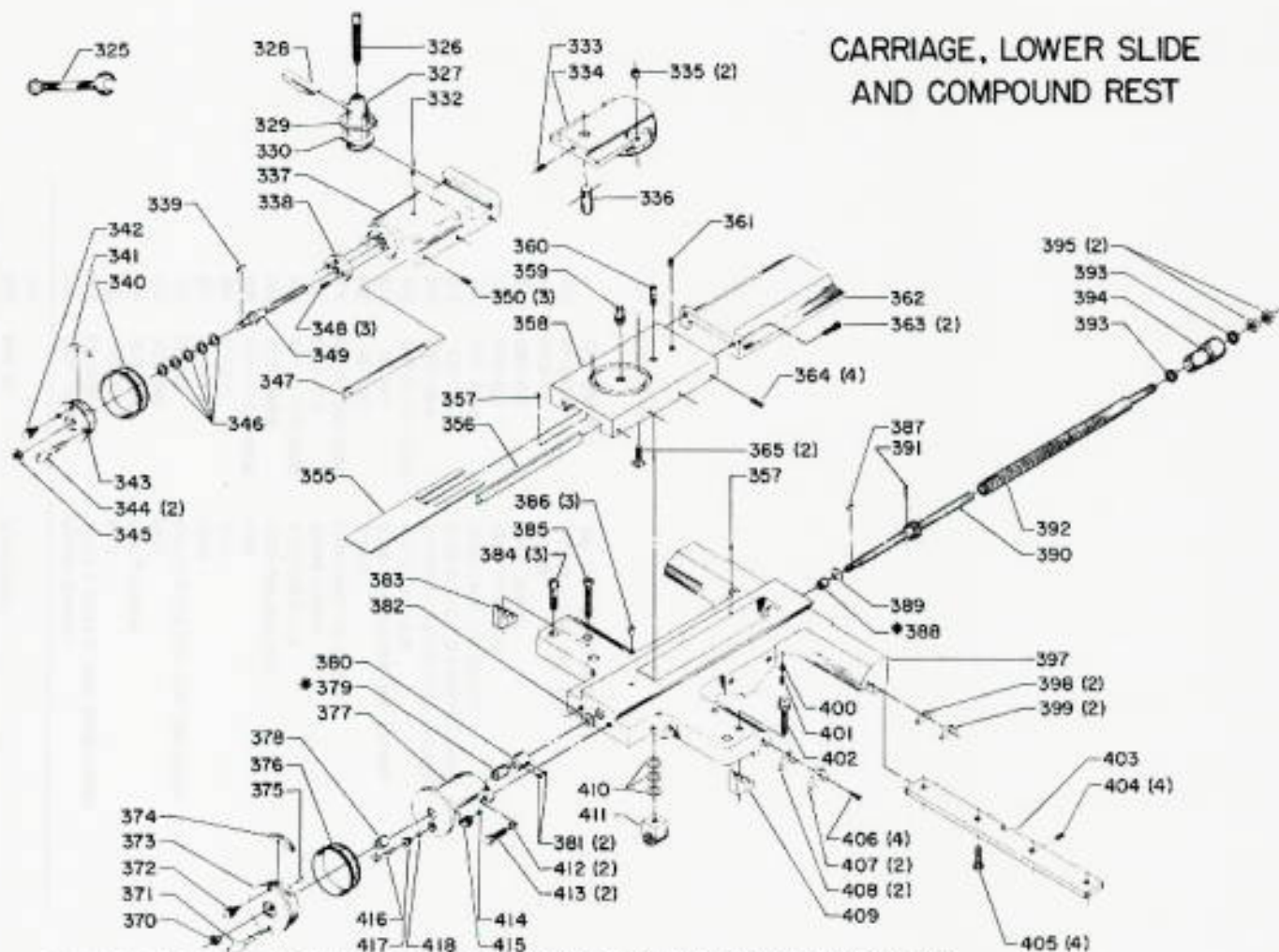
* TAILSTOCK AND SUB-BASE MUST BE PURCHASED UNDER MCL-68-B AS A UNIT. WHEN REPLACING, ALIGN HEADSTOCK AND TAILSTOCK AND SCRIBE WITNESS MARKS.

Figure D

TAILSTOCK (Figure D)

Ref. No.	Part No.	Description
290	MCL-108	Handle Wrench
291	SP-1688	1 5/8" x 6 1/4" x .065" Steel Washer
292	MCL-116	Stud
293	MCL-117	Clamp Sleeve
294	SCG-246	Plug
295	SP-242	3/8-16 x 1 1/2 Hex. Soc. Set Screw
296	SP-2406	Chisel
297	SP-2617	Key
298	414-01-073-5005	Ram
299	MCL-473-5	Tailstock Ram Key
300	414-01-113-50735	Adjusting Screw
301	MCL-113	Thrust Washer
305	900-01-891-6988	Handwheel, including:
306	SP-9601	Handle
307	SP-281	3/16-18 x 3/8 Soc. Hd. Set Soc.
308	902-01-211-7282	1/2-20 Stop Nut
310	MCL-58-8	Tailstock and Sub-Base, including:
311	CHL-438	5/16-18 x 2 1/2 Adjusting Screw
312	Cal. #342	25/32 Inset Box Wrench
313	CHL-422	Spec. Acorn Nut
314	CHL-426	Spec. Washer
315	MCL-70	Clamp
316	SP-2374	1/2-13 x 4 Sq. Hd. Bolt
•	Cal. #25-641	60° Hand Center (3M, T.)
•	Not Shown	

CARRIAGE, LOWER SLIDE AND COMPOUND REST

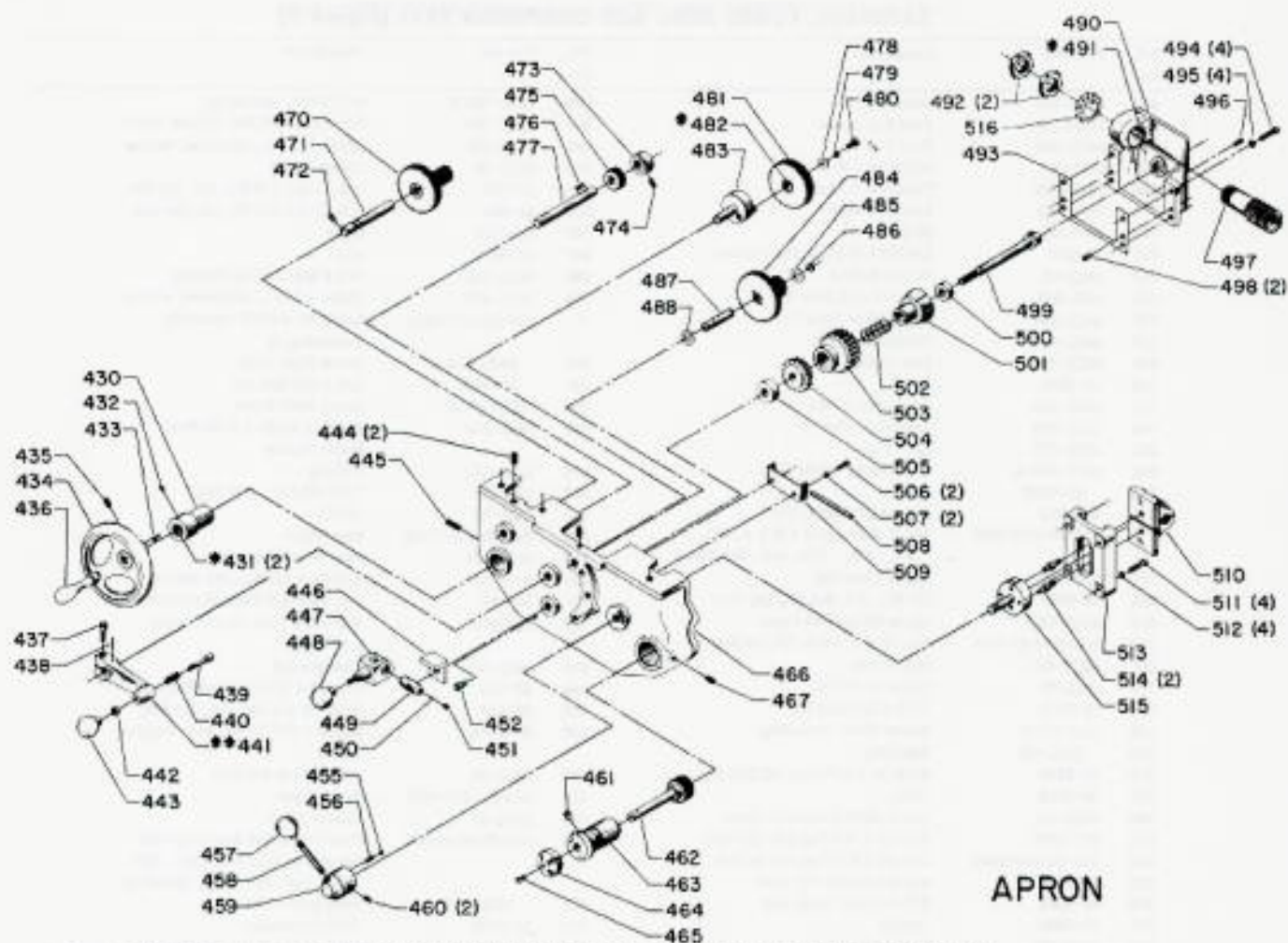


• REPLACEMENT BEARINGS ARE FURNISHED UNDERSIZE AND MUST BE REAMED TO FIT AFTER INSTALLATION.

Figure E

CARRIAGE, LOWER SLIDE AND COMPOUND REST (Figure E)

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
325	MCL-309	Wrench	380	MCL-532-S	Set Collar, Including:
326	DDL-236	Tool Post Screw	381	SP-246	#10-32 x 3/16 Soc. Hd. Set Screw
327	MCL-521	Tool Post	382	MCL-533	33/64 x 7/8 x .002 Steel Washer
328	DDL-238	Adjusting Gib	383	MCL-98	Clamp Block
329	MCL-522	Tool Post Washer	384	SP-734	3/8-16 x 1 1/4 Soc. Hd. Cap Scr.
330	DDL-235	Swivel Washer	385	SP-739	3/8-16 x 1 3/4 Pil. Hd. Cap Scr.
332	SP-7193	Oil	386	SP-5118	Oil
333	SP-203	1/4-20 x 5/8 Soc. Hd. Set Scr.	387	SP-2610	Key
334	MCL-83	Swivel Saddle	388	MCL-528	1/2 x 5/8 x 33/64 Bushing
335	DDL-255	5/16-18 Hex. Jam Nut	389	MCL-523	33/64 x 7/8 x .002 Steel Washer
336	MCL-535	Upper Slide Feed Nut	*	414-01-412-5014	Lower Feed Shaft Assembly, Consisting of:
337	MCL-594	Compound Slide	390	MCL-446-S	Lower Feed Shaft
338	MCL-585	Stop Collar	391	SP-2704	1/8 x 3/4 Roll Pin
339	SP-2610	Key	392	MCL-794-S	Lower Feed Screw
340	MCL-594	Graduated Collar	393	MCL-828	25/64 x 47/64 x 3/32 Feed Screw Washer
341	MCL-582	Locking Wedge	394	MCL-583	Bushing
342	MCL-576	Lock Screw	395	SP-1233	7/16-20 Hex. Jam Nut
343	MCL-523-A	Handwheel, Including:	397	MCL-60	Saddle
344	SP-3602	Handle	398	414-03-113-5002	Rear Wiper
345	SP-1081	3/8-24 Hex. Lock Nut	399	MCL-101	Rear Wiper Retainer
346	414-01-032-5008	Set of Shims (1/2 x 3/4 x .001, .002, .003, .004, and .005 Thk.)	400	SP-1148	1/4-20 x 3/8 Soc. Hd. Set Scr.
347	MCL-94	Upper Slide Gib	401	SP-268	1/4-20 x 3/8 Soc. Hd. Set Scr.
348	SP-3300	#8-32 x 3/8 Soc. Hd. Cap Scr.	402	SP-6035	3/8-16 x 2 1/4 Sq. Hd. Collar Cap Screw
349	MCL-596	Upper Slide Feed Screw	403	MCL-90	Clamp Flange
350	901-04-140-9445	1/4-20 x 1/2 Soc. Hd. Set Scr.	404	SP-154	#10-32 x 3/8 Headless Set Scr.
355	MCL-308	Way Cover	405	SP-649	5/16-18 x 1 Hex. Hd. Cap Scr.
356	MCL-98	Lower Slide Gib	406	SP-3010	#8-32 x 1/2 Rd. Hd. Self-Tapping Screw
357	SP-2722	1/16 x 1/4 Roll Pin	407	MCL-99	Front Wiper Retainer
358	MCL-61-S	Lower Slide, Including:	408	414-03-113-5001	Front Wiper
359	DDL-248	Steel Pin	409	MCL-98	Clamp Block
360	SP-3350	5/16-18 x 1/2 Soc. Hd. Cap Scr.	410	414-01-335-5001	Feed Screw Nut Assembly with Set of Shims (5/16 x 7/8 x .002, .003, and .004 thk.), Including:
361	SP-5118	Oil	411	MCL-720	Feed Screw Nut
362	MCL-62	Lower Slide Extension Cover	412	SP-1700	5/16 Lockwasher
363	SP-3309	1/4-20 x 5/8 Soc. Hd. Cap Scr.	413	SP-608	5/16-18 x 1/8 Hex. Hd. Cap Scr.
364	901-04-140-9446	1/4-20 x 3/4 Soc. Hd. Set Scr.	414	SP-7043	Retaining Ring
365	MCL-561	Swivel Saddle "T" Bolt	415	MCL-465	Thumb Knob
370	SP-1081	3/8-24 Hex. Lock Nut	416	MCL-461-S	Index Cam
371	SP-3603	Handle	417	MCL-464	Nut for Index Cam
372	MCL-575	Lock Screw	418	SP-3051	"O" Ring
373	MCL-575	Handwheel	*	Not Shown	
374	MCL-577	Locking Wedge			
375	SP-6711	1/8 x 3/8 Roll Pin			
376	MCL-80	Micrometer Collar			
377	MCL-55-A	Lower Feed Screw Flange, Including:			
378	MCL-106	Bushing			
379	MCL-83	Bearing			

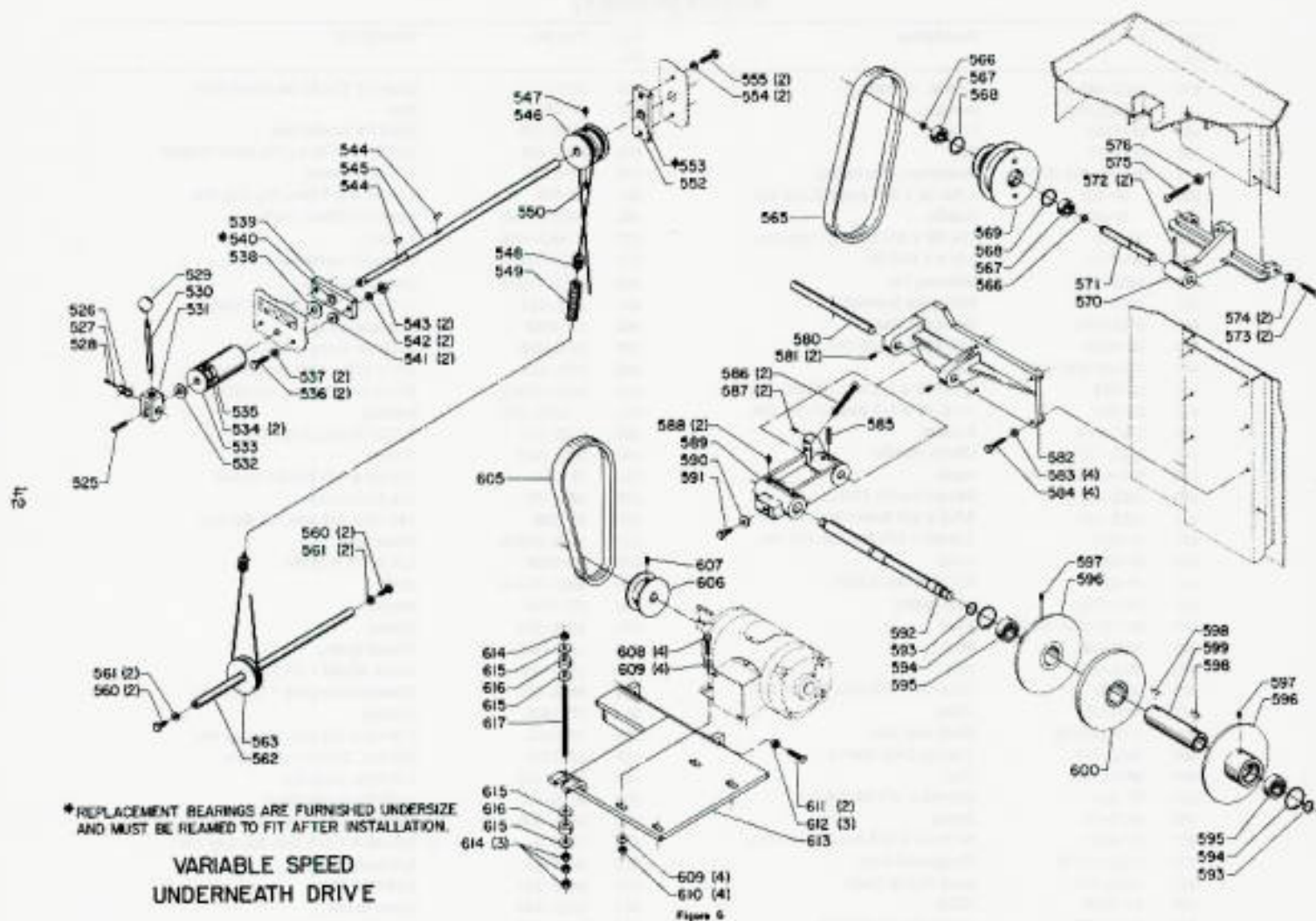


- ◆ REPLACEMENT BEARINGS ARE FURNISHED UNDERSIZE AND MUST BE REAMED TO FIT AFTER INSTALLATION.
- ◆◆ HOLE FOR ROLL PIN IS PARTIALLY DRILLED IN HANDLE. FINISH DRILL WHEN REPLACING.

Figure F

APRON (Figure F)

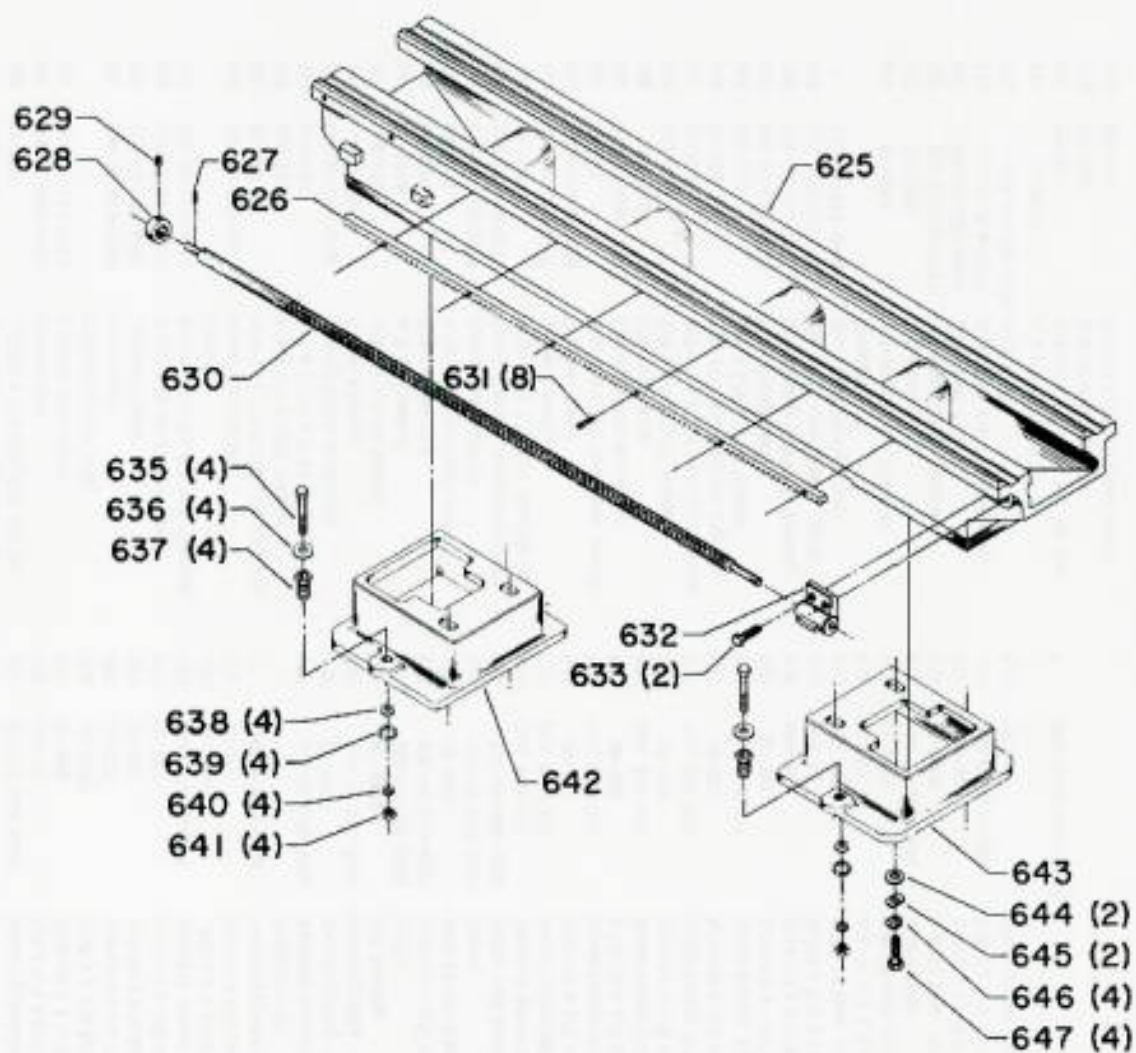
Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
430	MCL-131-S	Sleeve, including	475	MCL-132	Gear (18 Teeth) for Handwheel
431	MCL-386	Bearing	476	SP-2617	Key
432	SP-7103	Oiler	477	MCL-130	Shaft for Handwheel
433	SP-2617	Key	478	DDL-266	17/64 x 11/16 x .078 Steel Washer
434	931-01-991-6353	Handwheel, including:	479	SP-1702	1/4 Lockwasher
435	SP-251	5/16-18 x 3/8 Soc. Hd. Set Scr.	480	SP-601	1/4-20 x 3/8 Hex. Hd. Cap Scr.
436	SP-2601	Handle	481	MCL-139-S	Eccentric Gear, including:
437	SP-789	1/4-28 x 3/4 Soc. Hd. Cap Scr.	482	MCL-405	Bearing
438	SP-2719	1/8 x 1 Roll Pin	483	MCL-140-S	Eccentric Assembly
439	MCL-148	Indexing Pin	484	MCL-144-S	Compound Gear
440	MCL-406	Spring for Eccentric	485	DDL-161	1/2 x 7/8 x 1/32 Fiber Washer
441	MCL-146	Eccentric Handle	486	SP-7013	Retaining Ring
442	SP-9182	1/4-20 Hex. Jam Nut	487	MCL-142	Shaft for Compound Gear
443	931-01-022-0490	Knob	488	DDL-161	1/2 x 7/8 x 1/32 Fiber Washer
444	SP-217	5/16-18 x 1/2 Soc. Hd. Set Scr.	490	MCL-167-A	Worm Gear Cover, including:
445	SP-225	5/16-18 x 1/4 Soc. Hd. Set Scr.	491	MCL-407	Bushing
446	MCL-535	Bracket	492	TCS-217	1 1/8-20 Hex. Lock Nut
447	MCL-159	Clutch Handle	493	MCL-747	Gasket
448	931-01-022-0490	Knob	494	SP-710	1/4-20 x 7/8 Fil. Hd. Screw
449	MCL-160	Swivel Pin for Clutch	495	SP-1702	1/4 Lockwasher
450	MCL-161	3/16 x 1/8 Brass Plug	496	SP-230	1/4-20 x 5/8 Soc. Hd. Set Scr.
451	SP-208	1/4-20 x 1/4 Soc. Hd. Set Scr.	497	MCL-168-S	Worm Gear
452	SP-5214	Oiler	498	SP-2702	1/4 x 5/8 Roll Pin
453	SP-28	1/4 Dia. Steel Ball	499	MCL-163-S	Shaft
454	DDL-123	Coil Spring	500	SP-5323	Bearing
457	931-01-022-0490	Knob	501	MCL-165	Clutch
458	MCL-151	Stud	502	MCL-158	Clutch Spring
459	MCL-152	Hub	503	MCL-166	Worm Wheel - 36 Teeth
460	SP-254	5/16-24 x 3/8 Soc. Hd. Set Scr.	504	MCL-164	Transmission Gear - 28 Teeth
461	SP-7103	Oiler	505	SP-5322	Bearing
462	MCL-171-S	Shaft and Gear	506	SP-3322	#10-24 x 1/4 Soc. Hd. Cap Scr.
463	MCL-173	Timing Gear Sleeve	507	SP-1775	#10 Int. Tooth Lockwasher
464	MCL-170	Dial	508	MCL-150	1/4 Dia. Lock Pin
465	SP-661	#10-32 x 3/8 Rd. Hd. Scr.	509	MCL-149	Lock Pin Guide Plate
466	MCL-72	Apron	510	MCL-156	Half-Nut (Furnished in Pairs)
467	SP-251	5/16-18 x 3/8 Soc. Hd. Set Scr.	511	SP-614	1/4-20 x 1 1/4 Hex. Hd. Cap Scr.
470	MCL-137-S	Compound Gear	512	SP-1702	1/4 Lockwasher
471	MCL-135	Rack Pinion Shaft	513	MCL-155	Half-Nut Shoe
472	SP-7103	Oiler	514	MCL-154	Spec. Screw
473	MCL-133	Collar for Handwheel	515	MCL-153	Cam for Half-Nut
474	901-04-150-6215	1/4-20 x 3/8 Soc. Hd. Set Scr.	516	247-6	Lockwasher



VARIABLE SPEED DRIVE (Figure G)

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
626	901-01-020-0803	5/16-18 x 1 P.H. Hd. Set.	678	SP-6433	3/8-16 Hex. Jam Nut
628	414-02-071-5018	Setcrew Pin for Cam Block	680	414-02-106-0023	Pivot Shaft
627	M/CJ-161	3/16 dia. x 1/8 lg. Brass Plug	681	SP-217	5/16-18 x 1/2 Hex. Soc. Set Scr.
628	SP-502	1/4-20 x 1/2 Hex. Soc. Set Scr.	682	414-01-014-5019	Mounting Bracket
629	501-01-022-0490	Handle Ball	683	240-64	3/8 x 3/4 x 3/32 Washer
630	434-04-111-5001	Stud for Cam Lever	684	SP-809	5/16-18 x 1 1/2 Hex. Hd. Cap Scr.
631	434-04-019-5001	(T-threaded both ends)	685	SP-5077	3/16 x 1 1/4 Roll Pin
632	414-02-068-5001	Cam Block	686	SP-216	3/8-16 x 3 Sq. Hd. Set Scr.
633	414-01-107-5003	Special Washer	687	SP-208	1/4-20 x 1/4 Hex. Soc. Set Scr.
634	901-06-110-8031	Hub for Speed Control Shaft	688	SP-217	5/16-18 x 1/2 Hex. Soc. Set Scr.
		4-40 x 1/4 Rd. Hd. Set-Tapping Screw	689	414-01-014-5021	Variable Speed Pulley Bracket
636	414-01-637-5010	Speed Control Dial	690	240-104	.375 x 1 x 3/16 Washer
636	SP-648	3/8-16 x 1 1/4 Hex. Hd. Cap Scr.	691	SP-040	3/8-16 x 3/4 Hex. Hd. Cap Scr.
637	240-117	3/8 x 3/4 x 1/32 Washer	*	926-05-991-1869	Variable Speed Pulley Complex.
638	SP-1608	3/8 x 1 1/2 x 3/32 Washer			
639	414-02-304-5001	Bearing Block, Includings:	692	414-01-126-6006	Controlling of:
640	MH-3023	Sleeve Bearing	693	SP-7023	Variable Speed Pulley Shaft
641	240-104	3/8 x 1 x 3/16 Washer	694	904-15-190-7021	Retaining Ring - External
642	SP-1704	3/8 Lockwasher	695	SP-5300	Retaining Ring - Internal
643	SP-5900	3/8-16 Hex. Nut	696	926-05-051-8038	Ball Bearing
644	SP-2601	3/16 x 3/4 Woodruff Key	697	901-04-190-6202	Pulley
645	414-01-106-5037	Speed Control Shaft	698	414-01-105-5015	Sleeve
646	414-02-100-5001	Speed Control Regulating Pulley	699	926-05-991-1860	Pulley with Bearing
647	SP-213	5/16-18 x 1/2 Hex. Soc. Set Scr.	700	CAL #25-501	Variable Speed Bolt - Lower
648	414-01-381-5001	Cable Assembly	701	CAL #41-913	Motor Pulley (6/8" Bore), Includings:
649	923-02-081-8876	Tension Spring	702	SP-213	Motor Pulley (7/8" Bore), Includings:
650	SP-321	5/16-18 x 3/8 Hex. Soc. Set Scr.	703	CAL #41-914	Motor Pulley (3/4" Bore), Includings:
652	414-01-304-5003	Bearing Block, Includings:	704	SP-219	Motor Pulley (1" Bore), Includings:
653	MH-3023	Sleeve Bearing	705	CAL #41-915	Motor Pulley (1 1/8" Bore), Includings:
654	240-117	3/8 x 3/4 x 1/32 Washer	706	SP-219	Motor Pulley (1 1/2" Bore), Includings:
655	SP-648	3/8-16 x 1 1/4 Hex. Hd. Cap Scr.	707	CAL #41-916	Motor Pulley (1 3/4" Bore), Includings:
656	SP-640	3/8 x 3/4 x 1/32 Washer	708	SP-213	Motor Pulley (1 7/8" Bore), Includings:
657	414-02-106-5022	Idler Pulley Shaft	709	CAL #41-917	Motor Pulley (2" Bore), Includings:
658	414-01-382-5002	Idler Pulley W/Sleeve Bearing	710	SP-207	Motor Pulley (2 1/8" Bore), Includings:
659	CAL #25-500	Variable Speed Bolt - Upper	711	SP-327	Motor Pulley (2 3/8" Bore), Includings:
*	414-01-314-5006	Jack Shaft Bracket Assy.	712	SP-5433	Motor Pulley (3" Bore), Includings:
660	SP-7411	Controlling of:	713	414-01-572-5004	Motor Pulley (3 1/2" Bore), Includings:
667	SP-0385	Retaining Ring - External	714	SP-5300	Motor Pulley (3 3/4" Bore), Includings:
668	904-15-101-7147	Ball Bearing	715	745-82	Motor Pulley (3 1/2" Bore), Includings:
669	926-05-131-0033	Jack Shaft Pulley	716	903-01-011-5006	Motor Pulley (3 3/4" Bore), Includings:
670	414-01-024-0007	Jack Shaft Bracket, Includings:	717	M/CJ-7	Motor Pulley (3 3/4" Bore), Includings:
671	414-01-106-5039	Jack Shaft			
672	SP-5070	1/4 x 1 1/2 Roll Pin			
673	SP-327	3/8-16 x 1 1/2 Sq. Hd. Set Scr.			
674	SP-5433	3/8-16 Hex. Jam Nut			
675	SP-324	3/8-16 x 2 Sq. Hd. Set Screw			

* Not shown assembled.

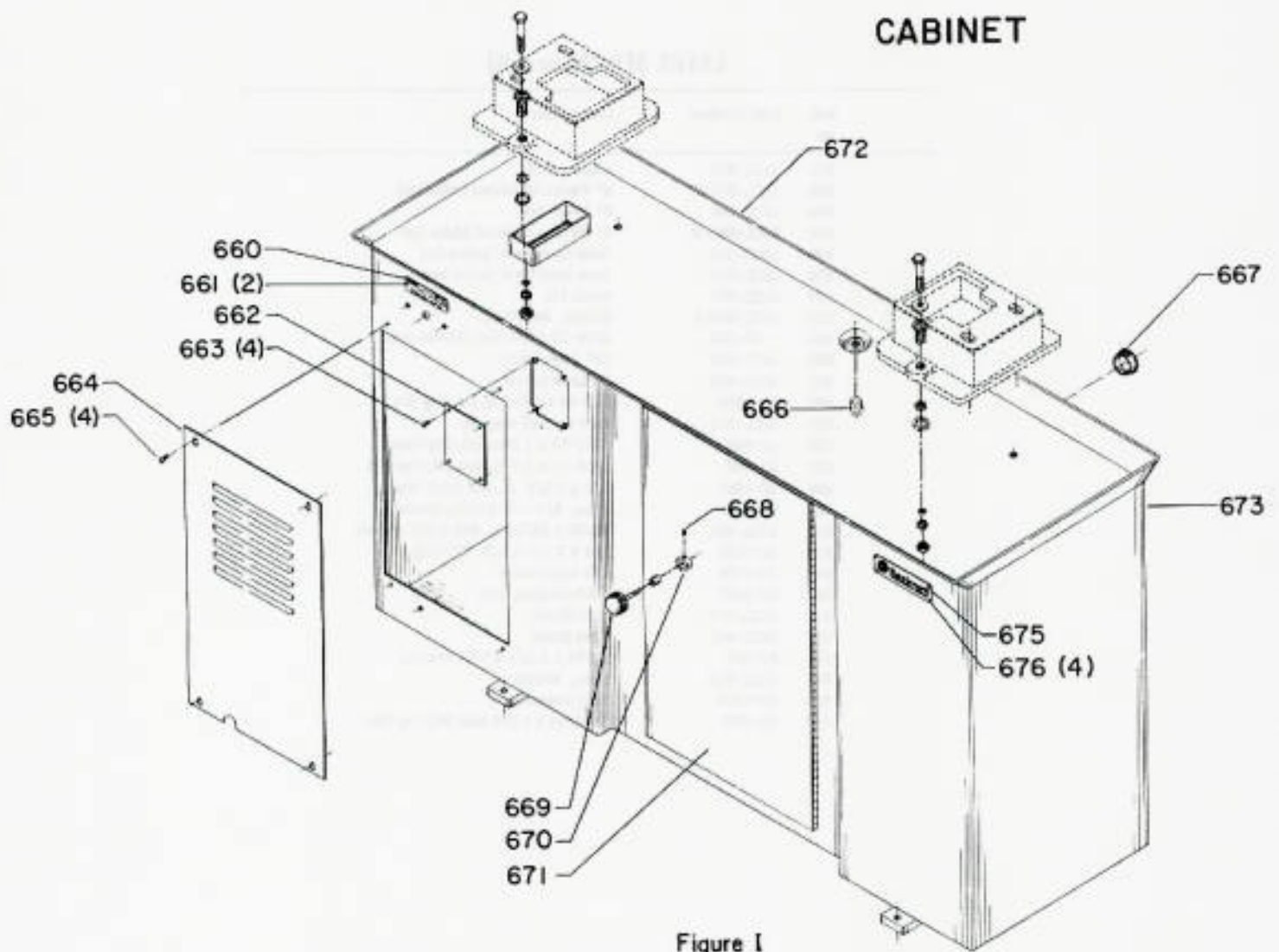


LATHE BED AND RISER BLOCKS

Figure H

LATHE BED (Figure H)

Ref. No.	Part Number	Description
625	MCL-905	4' Lathe Bed
626	MCL-905-H	4' Flame Hardened Lathe Bed
625	MCL-906	5' Lathe Bed
626	MCL-906-H	5' Flame Hardened Lathe Bed
626	MCL-390	Gear Rack for 4' Lathe Bed
626	MCL-394	Gear Rack for 5' Lathe Bed
627	MCL-511	Shear Pin
628	MCL-626-S	Collar, Including:
629	SP-225	5/16-18 x 1/4 Soc. Hd. Set Scr.
630	MCL-410	24" Lead Screw
630	MCL-412	36" Lead Screw
631	SP-3300	#10-24 x 5/8 Soc. Hd. Cap Scr.
632	MCL-216	Rear Bearing Support
633	SP-649	5/16-18 x 1 Hex. Hd. Cap Screw
635	SP-625	7/16-14 x 2 1/4 Hex. Hd. Cap Scr.
636	SP-1607	1/2 x 1 1/2 x .083 Steel Washer
637	CHS-84	Spec. 3/4 - 16 Raising Screw
638	MCL-488	15/32 x 55/64 x .080 Steel Washer
639	SP-9040	7/8 x 1 1/8 x 1/8 "O" Ring
640	SP-1705	1/2 Lockwasher
641	SP-6407	7/16-14 Hex. Nut
642	MCL-218	Riser Block
643	MCL-487	Riser Block
644	BS-267	23/64 x 1 1/4 x 7/32 Washer
645	MCL-312	Spec. Washer
646	SP-1716	7/16 Lockwasher
647	SP-815	7/16-14 x 1 3/4 Hex. Hd. Cap Scr.



CABINET (Figure 1)

Ref. No.	Part No.	Description
660	414-02-072-5008	Instruction Plate
661	SP-2252	#2 x 3/16 Drive Screw
662	414-03-031-5013	Switch Opening Cover
663	SP-561	#10-32 x 3/8 Rd. Hd. Mach. Scr.
664	414-01-031-5027	Cover
665	901-05-131-7951	#12 x 1/2 Rd. Hd. Self-Tapping Screw
666	SP-3624	1/2"-Sq. Hd. Pipe Plug
667	438-01-011-0020	Insulator
668	SP-208	1/4-20 x 1/4 Hex. Soc. Set Scr.
669	MCL-540-S	Door Knob
670	CBS-80	Cam
*	414-01-318-5009	Cabinet Assembly (24" between centers), Consisting of:
671	414-02-331-5003	Cabinet Door
672	414-01-369-5001	Coolant Pan
673	414-01-318-5019	Cabinet Base
*	414-01-318-5012	Cabinet Assembly (36" between centers), Consisting of:
671	414-02-331-5004	Cabinet Door
672	414-01-369-5002	Coolant Pan
673	414-01-318-5013	Cabinet Base
675	960-02-012-1401	Nameplate
676	SP-2252	#2 x 3/16 Drive Screw
*	Shown Assembled	

