Logan Lathe

200 Series 10" Lathes
Instructions

INSTRUCTIONS

LOGAN ENGINEERING COMPANY • Chicago, Ill.

200 - 201 - 210 - 211

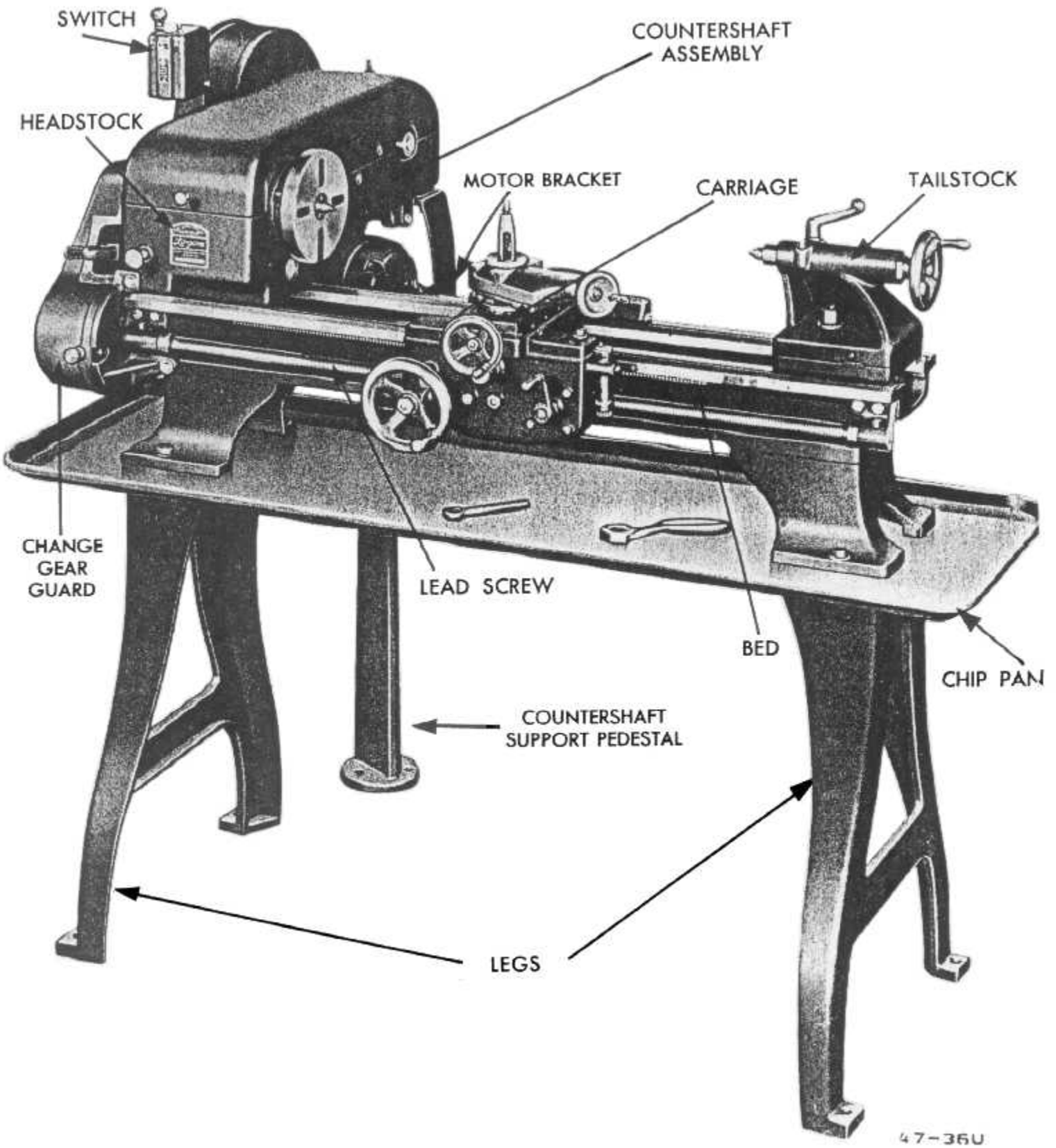


FIGURE 1—LOGAN FLOOR MODEL LATHE

LOGAN LATHES

The cases in which your Logan No. 200 Floor Model Lathe is delivered contain the following:

1 Logan Lathe with headstock, tailstock, and carriage mounted on the lathe bed.
1 Lot of 11 extra change gears bolted to base of lathe crate. (6 change gears are also attached to the lathe.)
1 2-Step V type motor pulley (screwed to base of lathe crate).
1 Bag (attached to countershaft assembly) containing:
  1 tool post
  1 tool post ring
  1 tool post screw
  1 tool post wedge
  1 tool post block
  1 tool post wrench
  1 tailstock wrench
  2 60° centers
  1 Morse Taper Adapter #3—#2
  1 Knob and quill (for lubrication well on tailstock).
1 Countershaft assembly
1 V Belt (attached to countershaft)
1 6 conductor cable (in bag attached to headstock)
1 Instruction Book (inside the change gear guard)
1 Parts List (inside the change gear guard)
1 Countershaft support pedestal
1 Chip pan
1 Set of Floor Legs

For the No. 210 Bench Model Lathe the countershaft support pedestal, chip pan and floor legs are omitted.

Unpack carefully and check to be certain that you have removed all the pieces. After removing the lathe from its shipping case clean it thoroughly with a stiff brush and kerosene. Then cover all the unpainted surfaces with a film of good machine oil to prevent rusting. These surfaces should be covered with a film of oil at all times, and the lathe should be covered with canvas when not in use.

Setting Up the Lathe

FLOOR MODEL. Mount the lathe on the chip pan and the floor legs using the bolts furnished and attach the countershaft assembly to the rear of the headstock as shown in Fig. 2. Locate the lathe on a **solid level floor,** preferably concrete, in a dry well lighted location, using lag screws or bolts to fasten the legs to the floor. If the lathe is set on a concrete floor, mark the location of the bolt holes and drill in the concrete with a star drill setting the lag screws or bolts in expansion shields or in melted lead.

It is of the greatest importance that the lathe be level; if it is not, its weight will cause the lathe bed to be twisted, throwing the lathe out of true. It is impossible to do accurate work on a lathe that is not level and the lathe will be damaged beyond repair.

When the lathe is in position, place a sensitive machinists level on top of the lathe bed and adjust any variation from level by placing thin shims under the feet. Be certain the lathe is level across the ways and parallel to them both at the headstock and tailstock ends. When the lathe is level bolt down tightly and check the leveling. It may be necessary to loosen the bolts and add more shims. Remember the lathe **must be level** if it is to perform accurately.

BENCH MODEL. Attach the countershaft assembly and place the lathe in position on the bench. The bench for the lathe should be 31 to 33 inches high heavily reinforced for steadiness and should have a top of seasoned wood at least two inches thick. We suggest that the top either be dowelled or that 4 or 5 steel rods with end nuts be run crosswise through the top and the nuts turned tight, pulling the boards together. Plane the bench top level and place the lathe upon it. Mark and drill four ⅜-inch holes under the corresponding holes in the legs at each end of the lathe. Through these holes place four machine bolts to fasten the lathe to the bench and to aid in leveling. Then proceed to level the lathe bed with shims as described for the floor model.

Mounting the Motor

The Logan Lathe is designed to be powered by a 1750 RPM motor of 1/3 or ½ H.P. When the lathe is in place mount the motor on the motor bracket beneath the countershaft. Do not tighten bolts until the motor position has been adjusted.

To adjust the motor position align motor pulley and the 10-inch pulley on the countershaft by moving the motor until the two are in line. Tighten the base bolts, but do not place the belt on the pulley until the motor wires have been connected and the motor pulley tested for direction of rotation.

Connect the drum reversing switch mounted on the countershaft with the motor, using rubber covered 6 conductor cable in accordance with the wiring diagram pasted on the inside of the switch cover. Motors furnished by Logan have a wiring diagram packed with the motor to assist in making the proper connections. Connect the motor to the current source. The motor pulley should then rotate clockwise, viewed from the motor pulley end, when the switch is in the forward position. Combined switch and motor wiring diagrams are shown on the last page of this booklet for use with the motors we furnish.

We recommend the use of a good three phase motor that is electrically balanced and will not transmit vibration through the belts to the headstock, causing chatter. Split phase motors are not recommended, especially where fine work is required.

Adjusting the Belts

The belt from the motor to the countershaft and the one from the countershaft to the lathe are easily adjusted for tension. Neither of these belts should be too tight, the tension depending on the load. Excessive belt pressure will shorten the life of the belt, place a strain on the bearings and cause a loss of power through excessive friction. When adjusted for normal work a moderate pressure on the middle of either belt should depress it about 1½ inchs.

The motor bracket is hinged at one side with a bolt and nut adjustment that raises or lowers it thereby decreasing or increasing the tension on the V belt. The V belt rides in a V groove of the two step motor pulley and on a flat face of the two step countershaft pulley.

When the cone pulley guard is raised, the countershaft

automatically moves toward the headstock thereby releasing the tension on the flat belt. With the tension released, the belt may be easily changed from one step to another. When the cone pulley guard is closed the belt is automatically brought into tension again, the amount of tension being regulated by a slotted head screw located at the rear of the cone pulley guard. Turning the screw to the right increases the belt tension; to the left decreases it.

The Countershaft

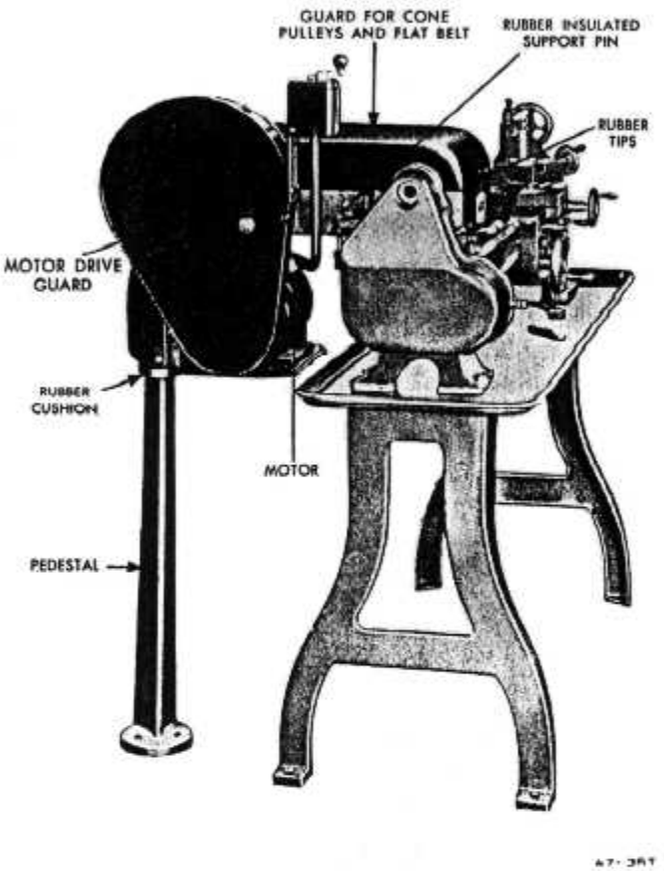


FIGURE 2—END VIEW OF COUNTERSHAFT ASSEMBLY

The countershaft assembly of the Logan Lathe is a patented development that is a distinct improvement over previous design. This special unit assembly is carried by two hinged pins attached to a bracket in the headstock and by a pedestal rod to the floor or the bench giving three point suspension. To prevent vibration being transmitted to the lathe, the entire assembly is insulated by rubber at all points of contact. The pedestal rod rests on a rubber foot, the two hinge pins are rubber cushioned and the cone pulley guard rests on rubber buttons. Provision is made to adjust belt tension easily. An adjustable motor mounting bracket is included in the assembly. All pulleys and belts are completely guarded, yet easily accessible. A patented tension release operates automatically when the cover for the cone pulleys is raised to permit quickly changing the flat belt from one step to another. And finally, the entire assembly is designed to appear as a streamlined part of the lathe.

Fig. 2 above illustrates the floor model lathe and countershaft assembly in position. The bench model uses the same countershaft design adapted for bench use.

The Headstock

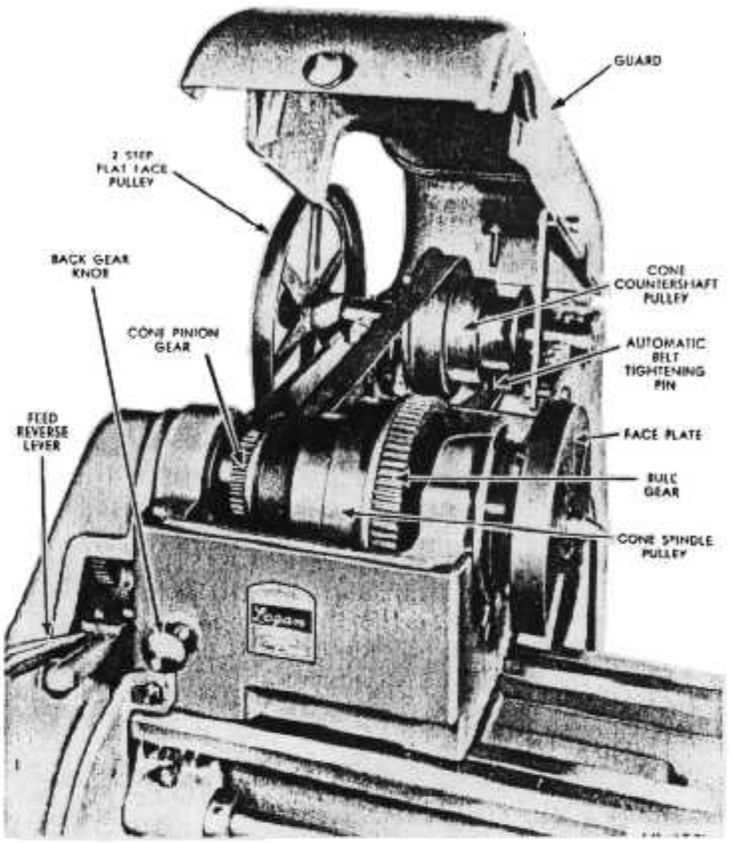


FIGURE 3—HEADSTOCK AND COUNTERSHAFT

The headstock of the Logan Lathe is made of high grade gray iron and is totally enclosed. It contains the headstock spindle and bearings, the bull gear, the cone pulley and the back gears. The cone pulley is turned by the belt from the countershaft and thereby turns the bull gear or transmits its power through the back gears to the bull gear if lower speed or greater power are desired.

Alloy steel has been used in making the spindle, which has been machined and ground to a fine finish. The nose is 1½-in. diam. with 8-pitch National Form threads and has been turned internally to a No. 3 Morse Taper. A reducing sleeve permits the use of a No. 2 Morse Taper Center. The 25/32-in. hole permits work as large as ¾-in. to be fed through the spindle. A draw-in collet attachment taking collets up to ½-inch capacity can be used through the hollow spindle. With push type collet attachment the capacity is ⅝-in.

The spindle is mounted on three rows of New Departure pre-loaded precision ball bearings which are sealed in grease. The use of ball bearings in the headstock to mount the spindle is advanced design that, although more expensive, gives finer results. Ball bearings are the ideal friction reducing bearings—"nothing rolls like a ball." Technical advances in ball bearing manufacture make it possible now to obtain special pre-loaded ball bearings of extreme precision that will carry the loads for which they are designed with less wear, greate accuracy and with no adjustment required.

The three-step cone pulley and the cone pinion gear are fastened together rigidly and revolve freely on the spindle. For direct drive the pulley is locked to the large

bull gear which is keyed to the spindle. This is accomplished by means of a plunger-type lock located on the side of the bull gear. When this lock is "in" the pulley turns the bull gear with it; when "out" the pulley and the cone pinion gear turn free of the bull gear.

Should it ever be necessary to remove the headstock spindle the following procedure should be followed.

First, remove the take-up nut, the spindle gear, Woodruff key, collar, and bearing grease seal in the order named from the left hand end of the spindle.

Second, remove the four fillester head screws from the bearing cap, then the bearing cap and next the grease seal from the right hand end of the spindle.

Third, loosen the set screws in the bull gear and carefully drive the spindle with a wooden mallet toward the tailstock end of the lathe being careful to hold the bull gear and cone pulley parts as the spindle is removed so they will not drop.

Important:

Ball bearings can be ruined by improper handling. When pressing a bearing into or out of the seat, pressure should be applied to the outer race only, but when pressed on to or off of shaft, pressure should be applied on the inner race only. Bearings should be carefully kept free of dirt and grit and except in extreme cases must not be tapped into place with a hammer.

The Back Gears

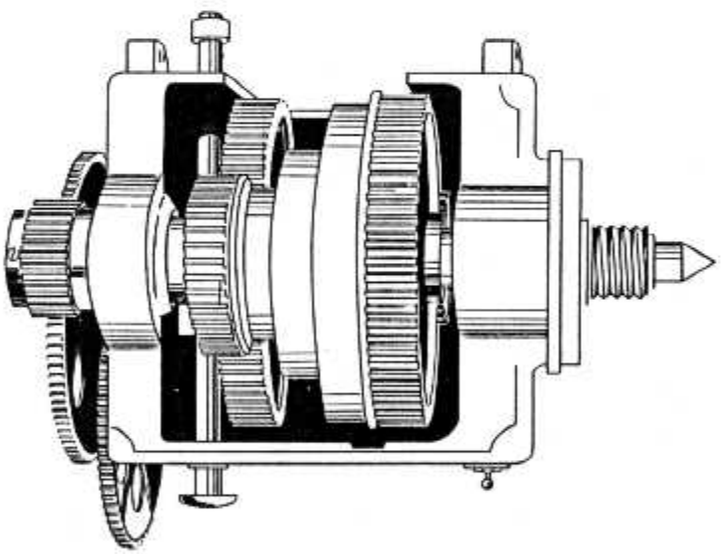


FIGURE 4—BACK GEAR DRIVE

The back gear mechanism on the Logan Lathe is enclosed in the headstock instead of being located in an exposed position as in the usual construction. Also, instead of having to reach over the top of the headstock to throw a back gear lever, the Logan design permits controlling the back gear by a knob on the front of the headstock. The back gear is mounted on a quill which turns on self-lubricating bronze bearings on an eccentric shaft. The knob operates a rack engaging a pinion which rotates the eccentric shaft, thereby swinging the back gears into mesh. When the knob is pulled out, the back gears are engaged and are locked in position by a pawl just back of the knob. The lock is released by pressing the pawl with the finger.

The cone pulley and small gear turn freely on the spindle and are locked to the bull gear for direct drive by a lock pin located in the side of the bull gear. When slower turning speed or greater power than could be obtained from a direct drive is required, the back gears are used. To engage the back gear drive first pull out the direct drive lock pin so that the cone pulley and small gear turn free of the bull gear. Then engage the back gears so that the power is transmitted through the cone pulley and small spindle gear to the large back gear, and from the small back gear to the bull gear. The bull gear, being keyed to the lathe spindle, turns the spindle.

Spindle Speeds

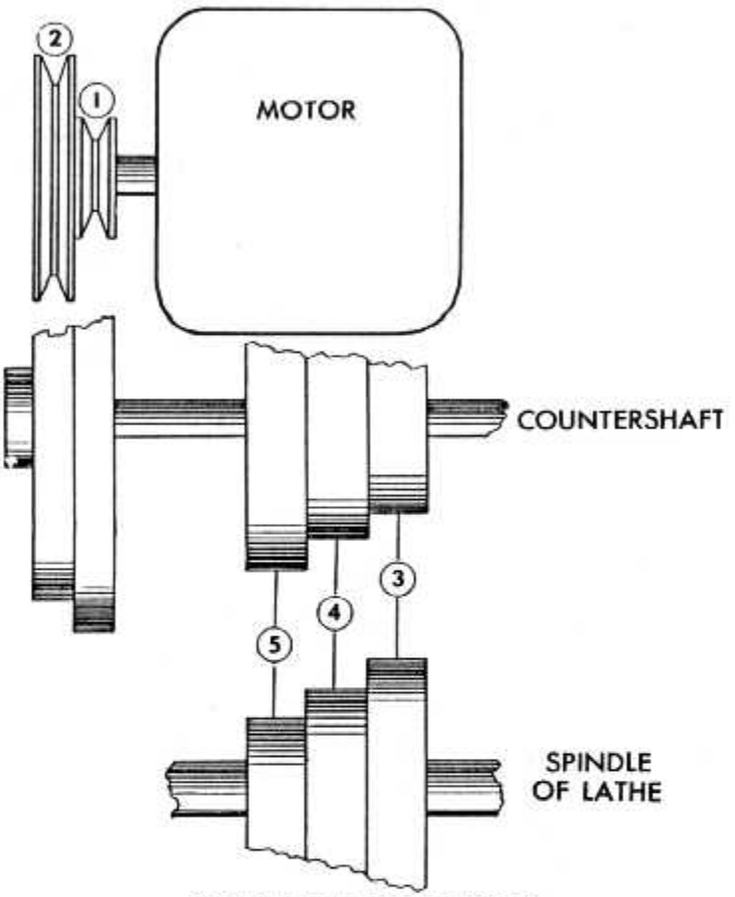


FIGURE 5—BELT DRIVE DIAGRAM

The following table shows the spindle speeds which can be obtained using the various belt position shown in Fig. 5 both with direct drive and with the back gear drive.

Motor Belt Position	Spindle Belt Position					
	Back Gear Drive			Direct Belt Drive		
	3	4	5	3	4	5
1	30	56	104	179	334	620
2	70	131	244	420	780	1450

Power Feeds

The tail end of the headstock spindle is fitted with a gear for transmission of spindle power through a gear train to the lead screw along the front of the lathe which is used in power feeding. The rate of feed is dependent upon the speed of the lead screw.

It is necessary in operations such as thread cutting to

Power Feeds

Threads Per Inch	Stud Gear	Diagram	Idler Gear	Screw Gears	Feeds Per Inch
4	64	Fig. I	72	32	
4½	64	Fig. I	72	36	
5	64	Fig. I	72	40	
5½	64	Fig. I	72	44	
6	64	Fig. I	72	48	
6½	64	Fig. I	72	52	
7	64	Fig. I	72	56	
7½	64	Fig. I	72	60	
8	32	Fig. I	72	32	
9	32	Fig. I	72	36	
10	32	Fig. I	72	40	
11	32	Fig. I	72	44	
11½	32	Fig. I	72	46	
12	32	Fig. I	72	48	
13	32	Fig. I	72	52	
14	32	Fig. I	72	56	
16	32	Fig. I	72	64	
18	16	Fig. I	72	36	
20	16	Fig. I	72	40	
22	16	Fig. I	72	44	
24	16	Fig. I	72	48	
26	16	Fig. I	72	52	
27	16	Fig. I	72	54	
28	16	Fig. I	72	56	
30	16	Fig. I	72	60	
32	16	Fig. I	72	64	
36	24	Fig. II	72	36	
40	24	Fig. II	72	40	
44	24	Fig. II	72	44	
48	24	Fig. II	72	48	
52	24	Fig. II	72	52	
54	16	Fig. II	72	36	
60	16	Fig. II	72	40	
64	24	Fig. II	60	64	0.0156
	16	Fig. II	60	44	0.0152
	16	Fig. II	60	46	0.0145
	16	Fig. II	60	48	0.0139
	16	Fig. II	60	52	0.0128
	16	Fig. II	60	56	0.0119
	16	Fig. II	64	60	0.0111
	32	Fig. III		64	0.0104
	32	Fig. III		72	0.0092
	24	Fig. III		64	0.0078
	24	Fig. III		72	0.0069
	16	Fig. III		64	0.0052
	16	Fig. III		72	0.0046

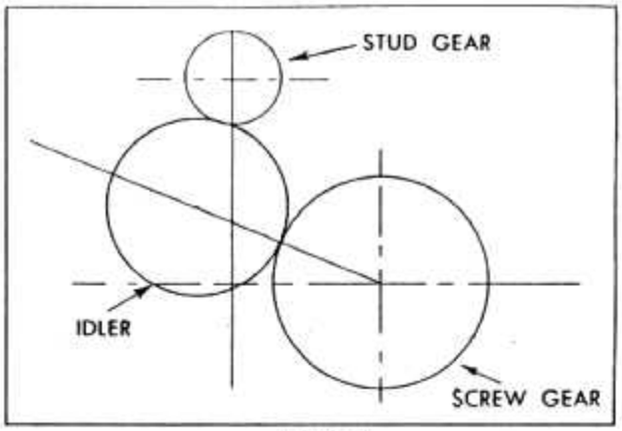


FIGURE I

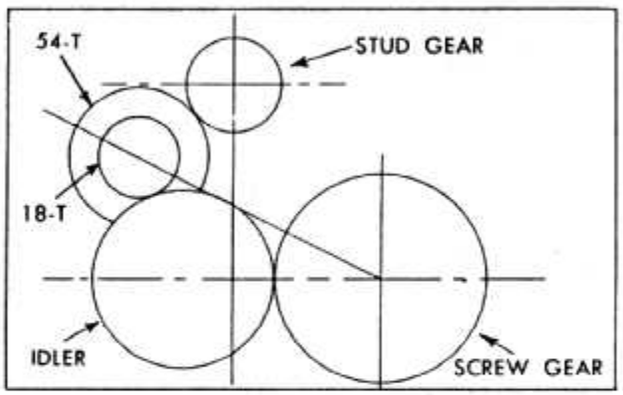


FIGURE II

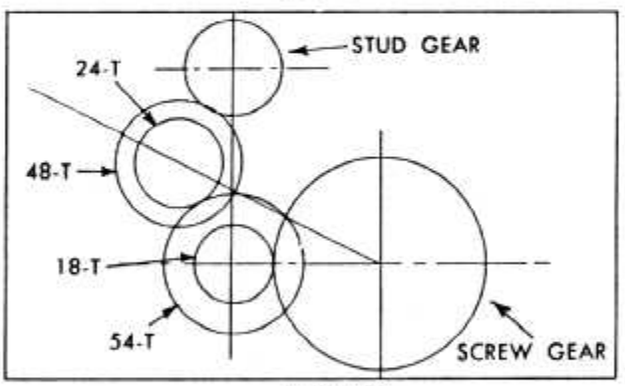


FIGURE III

FIGURE 6—CHART OF THREADS AND FEEDS

set the rate of feed in a definite relationship with the speed of the spindle; this is accomplished by arrangement of the gears and the gear sizes in the gear train. The gears may be arranged on the gear bracket to drive from three positions, the sizes of the gears in these three positions determining the ratio of spindle speed to lead screw speed. The three positions are shown on the threading chart in Fig. 6; by referring to the table for threads per inch or feeds per inch wanted and to the diagram, the correct gear sizes and their positions may be found.

Raise or lower the bracket to accommodate the different sizes of gears by loosening the nut just behind the lead screw bearing. The gears are attached to the gear bracket so that when the bolt holding them is loosened they may be moved along the bracket slot. Each bolt holds two gears, both of which must be mounted, whether they mesh in the train or not. If one meshes with two others it is called an "idler" and the unused one a "spacer." If both mesh in the train they form a "compound gear."

The gears which are used in the gear train are of semi-steel, machined to insure perfect teeth which will mesh evenly and smoothly with the others in the

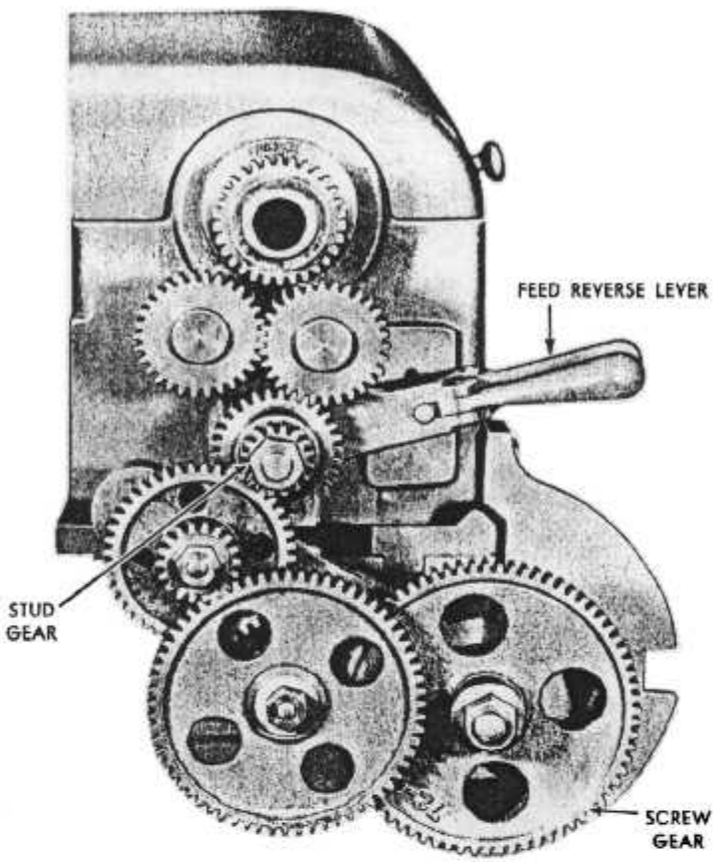


FIGURE 7—CHANGE GEAR TRAIN

train. Each gear fits over a steel sleeve which accommodates two gears and is keyed to fit the keyway of the gears. The sleeves fit over the bracket bolt, a washer serving as a spacer between the assembly and the nut.

When assembling a gear train care must be taken to allow sufficient clearance between two meshing gears in order to prevent binding. A small amount of graphite grease applied to the teeth will make them run quietly and smoothly.

The feed reversing lever, which protrudes from the gear train housing has three positions—Up, Down, and Center.

When in the center position the two gears on the end of the lever, which turn on bronze bearings, are free of the gear train and all power feeds are disconnected.

When "Up" the lead screw turns to move the longitudinal and cross feeds in one direction. When "Down" the longitudinal and cross feeds are in the opposite direction.

The alloy steel lead screw which runs along the front of the lathe bed has a Acme thread accurately cut with a pitch of ⅛-inch (8 threads to an inch) and is mounted at each end in a large cast iron bearing equipped with oil cups. Clean and oil the lead screw frequently to maintain its accuracy.

The Lathe Bed

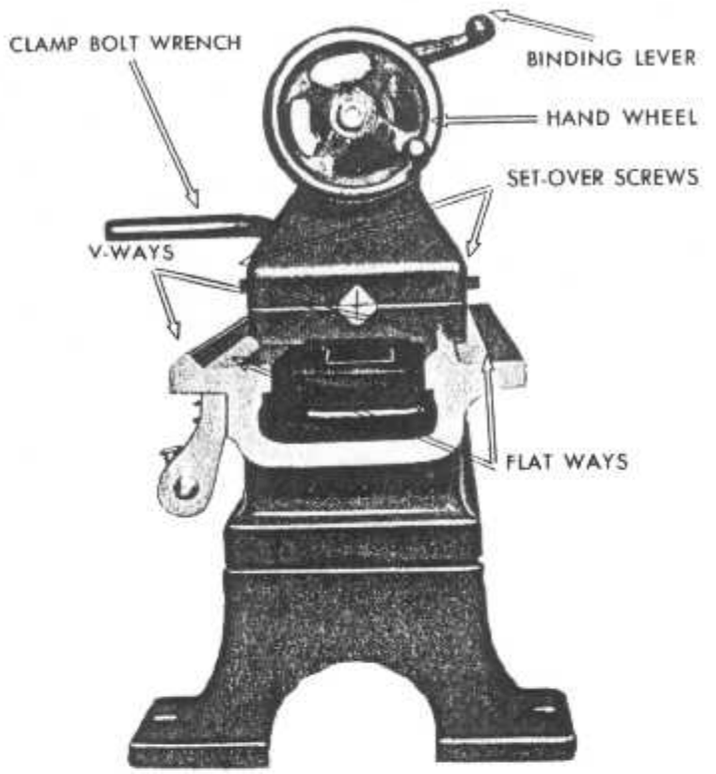


FIGURE 8—LATHE BED AND TAILSTOCK

The bed of the Logan Lathe is an extra heavy one-piece casting of hard iron containing the correct proportion of steel and alloys to give the maximum in wear and to withstand all strains. Extra width (6-15/16" across the ways) extra heavy walls, heavier and closer spaced box type cross ribs combine to give greater strength and a more solid foundation for the lathe mechanisms.

The accuracy of the lathe bed and the ways on which the carriage and the tailstock are mounted is of primary importance. To insure extreme accuracy in the bed two prismatic V-ways and two flat ways are employed. They have been planed, milled and precision ground, giving an accurate, heavy, well ribbed bed of the type found on large engine lathes. In order to retain this accuracy, the instructions for setting up the lathe emphasize the necessity for carefully levelling the bed both across and parallel to the ways.

With proper care and normal use there will be no appreciable wear on the bed or ways of a level lathe, but the surface may be damaged by a lack of oil or by abrasion. Be careful not to drop tools or work on the ways. Keep them well oiled when not in use, wiping them off and re-oiling before continuing work and, if possible, keeping them covered during filing or grinding operations.

The Carriage

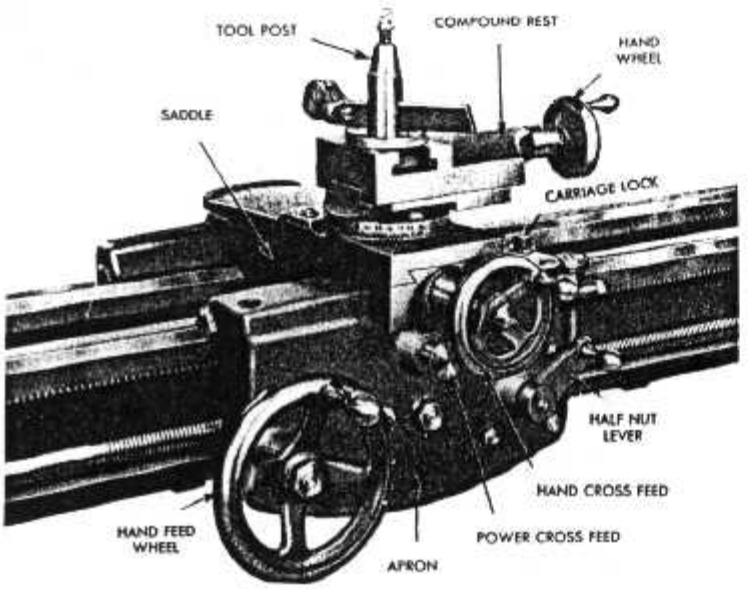


FIGURE 9—CARRIAGE

The carriage of the lathe is divided into four parts, the apron, the saddle, the compound rest and the tool post. Since the carriage supports the cutting tool and controls its action it is an important unit and care has been taken to make it both accurate and strong.

The apron which is suspended from the front of the saddle contains the power longitudinal and cross feed mechanism, the longitudinal hand feed and the threading dial.

The large hand feed wheel on the front of the apron moves the carriage along the ways by means of gears mounted in bronze bearings. The gears engage a rack on the underside of the forward way.

The carriage is moved along the ways for thread cutting and longitudinal power feeding by the action of the lead screw within the apron, the speed of movement depending upon the feed gear arrangement. The half-nut which is operated by the half-nut lever on the right end of the apron closes on the lead screw and provides the drive.

The threading dial on the right end of the apron indicates the proper position in which to engage the half-nut lever during threading operations so that the tool will enter the same groove for each cut, thereby eliminating the need for reversing the drive at the end of each cut. (Fig. 10 Threading Dial).

When cutting even numbered threads the half nuts may be engaged at any point on the threading dial.

When cutting odd-numbered threads (5, 7, 9, 11, etc. per inch) engage the half-nut lever when the outer mark is in line with either the mark numbered "1" or that numbered "2".

When cutting half-numbered threads (4½, 5½, 6½, 11½, etc.) engage the half-nut lever at the same point on the dial for each cut.

The power cross feed is driven by the spline in the lead screw shaft through a set of straight and mitre gears controlled by a plunger-type handle on the apron which when "Out" engages the cross feed screw and the lead screw.

The saddle which moves longitudinally on the front V-way and the back flat way, has been machined from a semi-steel casting and is held down on the bed by gibs which bear on the underside of the front and back ways. These gibs are adjustable and should be set just tight enough to give a firm sliding fit between the carriage and the bed.

The hand cross feed is operated by the ball crank handle at the end of the cross feed slide. This slide is equipped with a gib which may be tightened by adjustment of the set screws on the outside of the slide. The cross feed gib should fit snugly and should be adjusted whenever play develops. The cross slide is moved by an Acme threaded screw mounted in self lubricating bronze bearings. The ball and crank handle of the cross feed is of polished steel and is calibrated in thousandths of an inch for measurement of feed when a definite cut is to be taken.

The compound rest is mounted on top of the cross-slide on a base calibrated in degrees from 0° to 90° in both directions. Two bolts, one on each side of the rest hold

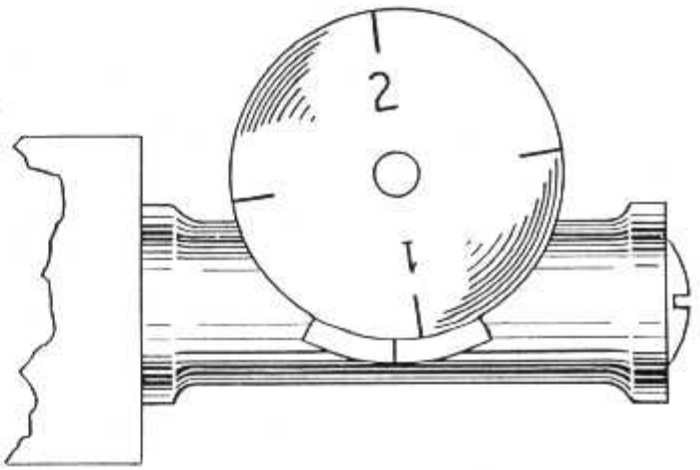


FIGURE 10—THREADING DIAL

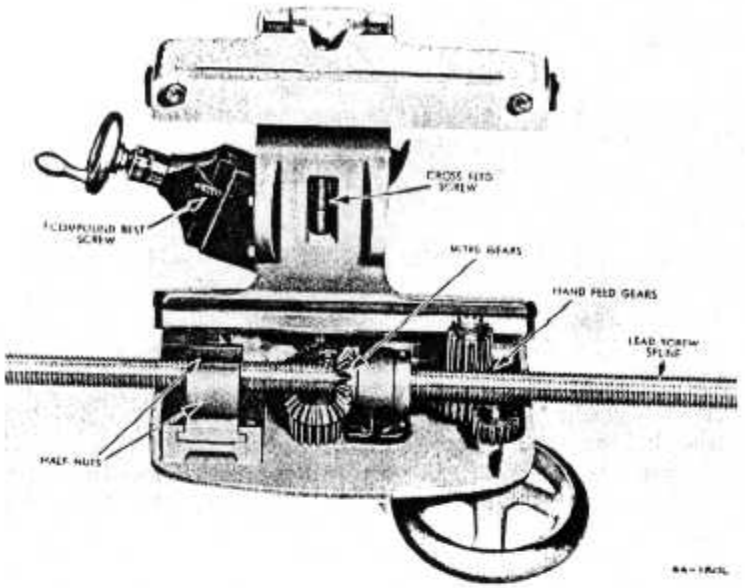


FIGURE 11—UNDERSIDE OF CARRIAGE

the base in position, and by loosening these bolts the rest may be swivelled to the desired angle. Two self-lubricating bronze bearings are mounted in the bushings of the rest which is moved over the slides by an Acme threaded screw. The slide is dovetailed with gib take-up for wear.

The compound rest motion is controlled from a ball and crank handle by which the tool may be moved into the work for short tapers. The compound rest handle is calibrated for measurement in thousandths of an inch.

The tool post fits into a T slot in the compound rest and holds the tool holder by means of a square head screw.

The Tailstock

The tailstock slides on a V and flat way of the bed as illustrated in Fig. 8. It is locked in position along the bed by tightening the clamp bolt with the clamp bolt wrench furnished with the lathe.

The tailstock spindle is controlled by the tailstock hand wheel. Turning the wheel in a clockwise direction brings the spindle out of the tailstock. The spindle is of special steel with a ground finish and has been reamed for a No. 2 Morse Taper Center, which may be ejected by turning the tailstock wheel in a counter clockwise direction until the spindle reaches the end of its travel.

The spindle is graduated up to 2½ inches in sixteenth inch graduations for accuracy in boring and drilling. Lock spindle in place by turning the binding lever to the right. A cup and quill are mounted on the top of the tailstock. Fill with a heavy grease or a mixture of white lead and machine oil to be used to lubricate the centers when work is mounted between them.

The tailstock may be set-over 11/16 inch for turning tapers by loosening the tailstock clamp nut and adjusting the headless set screws located on either side. To align the tailstock again the index line on the tail stock and tailstock base will indicate the approximate position. To obtain the exact position it is necessary to place a 12 or 15 inch check bar between centers. Take a light cut, then check the diameter at each end of the bar with a micrometer. If there is a variation adjust the set-over screws until the diameters at each end are the same after a cut.

Lathe Centers

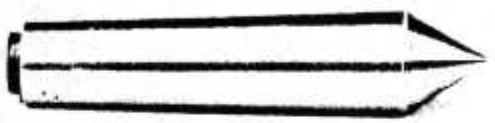


FIGURE 12—60 DEGREE CENTER

The headstock spindle is machined to take a No. 3 Morse Taper and is furnished with an adapter for a No. 2 Morse Taper Center. The tailstock is fitted for a No. 2 Morse Taper Center.

While the tailstock spindle should be kept oiled on the outside, the interior should be dry and clean. Before placing either of the centers in the lathe they and the tapers into which they fit should be wiped free of oil and dirt, for the presence of a bit of dirt or a slight film of oil will interfere with the accuracy.

Oiling the Lathe

The design of the Logan Lathe provides for correct lubrication with a minimum of attention. The ball bearings in the headstock are sealed in grease and require no further lubrication for the life of the bearing. At 22 separate points there are self-lubricating bronze bearings where in ordinary construction plain bearings with oil holes are used. The bronze in these bearings is of an absorbent texture and has been thoroughly impregnated with lubricant. The correct film of lubricant is constantly maintained at the bearing surface without the necessity of periodic renewal.

Those points in the lathe requiring regular lubrication should be gone over every time the lathe is used and in a definite order so that no parts will be missed. Use a good machine oil no heavier than SAE No. 10 wiping away excess oil that would cause dirt to adhere to the lathe. Do not attempt to oil the lathe while it is running.

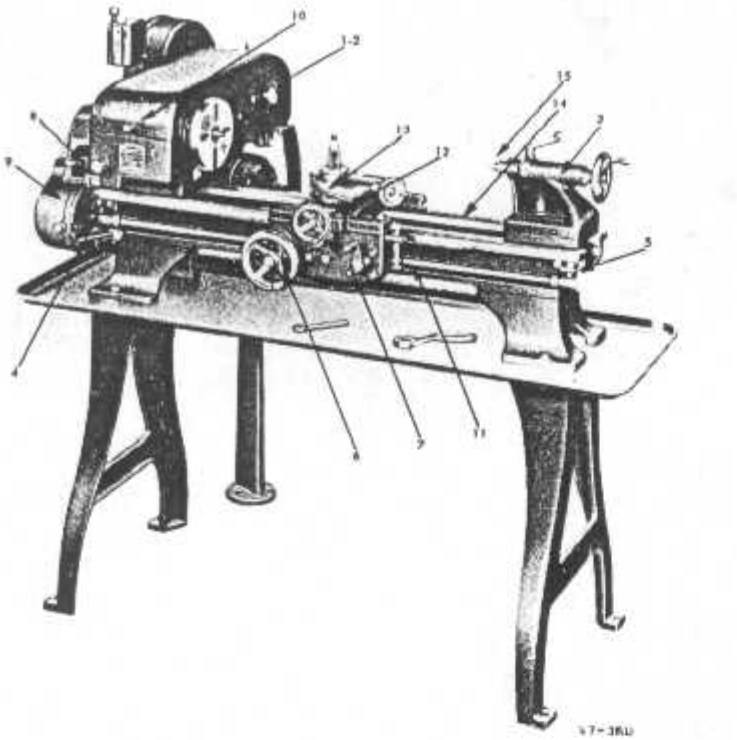


FIGURE 13—OILING DIAGRAM

Using a long-spouted can, oil the following points each time the lathe is used:

1.-2. Two oil cups on top of the countershaft bearings.

3. The spring well on top of the tailstock.

4.-5. Two oil cups on top of the bearings at either end of the lead screw.

6. The hand feed wheel. (A spring well is located in the apron behind the wheel to receive oil for the hand feed shaft bearings).

7. The half-nut lever. (A spring well in the apron behind the lever supplies oil to the half-nuts).

8. The feed reverse lever. (A hole has been drilled in the base of the lever to receive oil).

9. The bearings on each of the change gears.

10. The spindle pulley. (Remove the headless set screw on the second step of the pulley and oil freely before using the back gears).

Keep the following surfaces clean, free of chips and covered with a film of oil:

11. The lead screw.

12. The cross slide.

13. The compound slide.

14. The lathe bed ways, both V and flat.

15. The outside of the tailstock ram.

A small amount of graphite grease should be kept on the teeth of all gears in the headstock, the apron and on the teeth of the rack on the underside of the front way.

Lathe Belts

The Logan Lathe is delivered equipped with a flat belt of web and rubber composition connecting the cone pulley on the lathe with the countershaft. A V Belt is also furnished to connect the 2 step V groove motor pulley with the 2 step flat face pulley on the countershaft. The life and efficiency of both these belts will be increased by keeping them clean and free from oil and by slipping them off the pulleys to release the tension, if the lathe is to be unused for any considerable length of time.

The use of a flat belt makes removal of the spindle unnecessary when replacing or changing the belt providing an endless belt is not required. This arrangement has two distinct advantages. First, the belt may be changed quickly and easily with a minimum of effort, for it may be laced, glued or hooked on the spindle, a simple procedure when compared with the task of removing the spindle and slipping an endless belt over it. Second, there is no risk of losing the alignment that has been accurately achieved at the factory through the use of precision gauges. Because of the high grade materials used and the accurate workmanship in assembling the headstock, under ordinary circumstances it need not be taken apart during the life of the lathe. However, should you desire to remove the spindle, you may do so, as was explained in the spindle description.

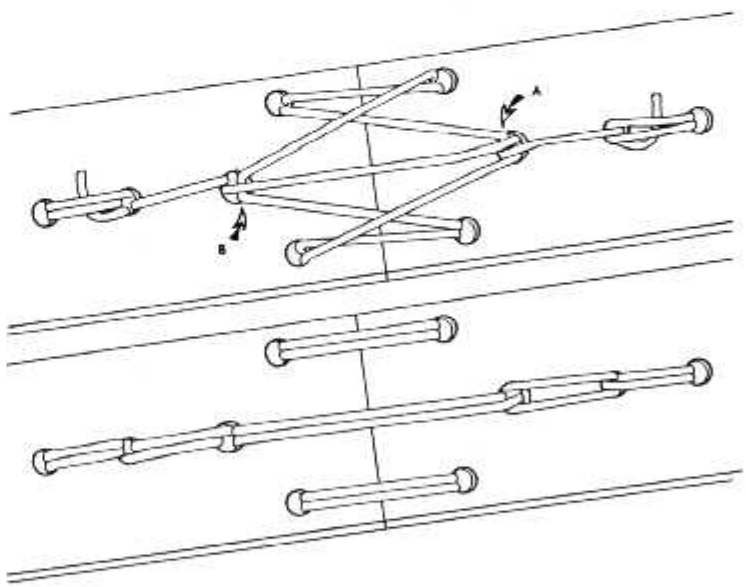


FIGURE 14—LACED BELT

Fastening the flat belt over the spindle pulley is a simple matter and may be done in any one of the following ways.

The belt, if laced, may be joined by either gut or rawhide throngs as follows. When the belting has been cut to the desired length, square the ends and punch ten holes as shown in Picture 14. Start the lace through holes A and B, pulling both ends through, working one to the right and one to the left, as shown. Do not cross one layer of lacing over another on the pulley side and do not allow it to kink or turn or the belt will not run smoothly. Fasten the ends as shown. If round gut is used cut shallow trenches between the holes on the pulley side and sink the gut in them.

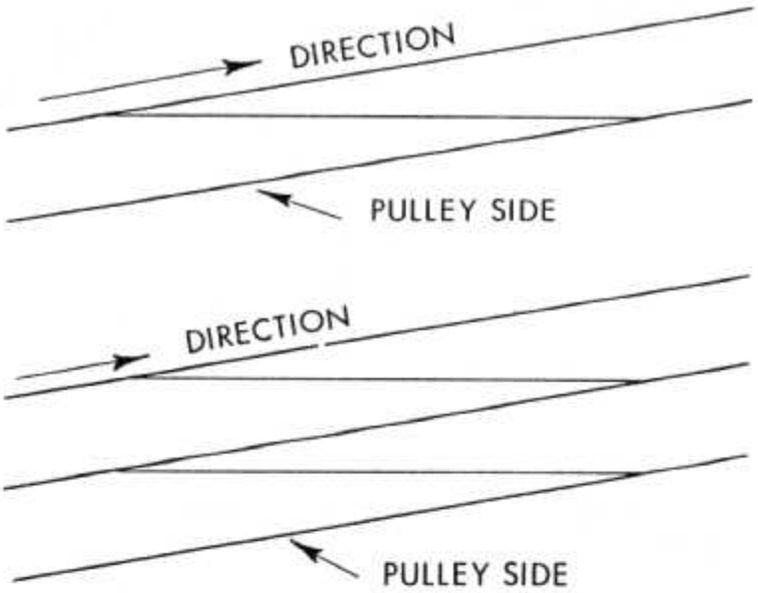


FIGURE 14A—GLUED BELT

If the belt is to be glued, make allowance for overlap and taper the overlap at each end so that ends will join as shown. See Figure 14A. Double belts should be split and each part tapered. Full directions are usually supplied with the glue; follow carefully.

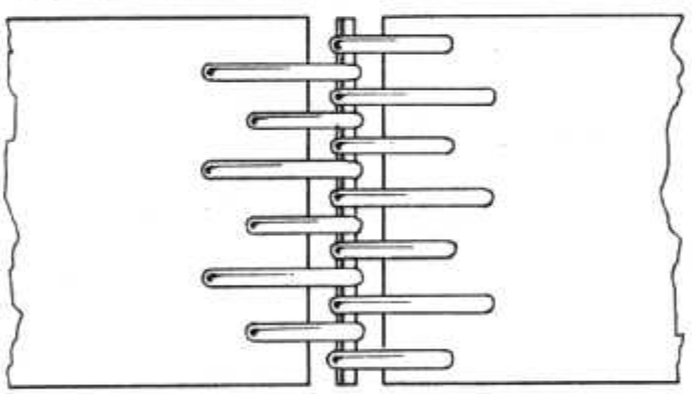


FIGURE 14B—BELT HOOK

The simplest and quickest method of fastening belt ends is by means of wire hooks, as shown in Figure 14B above. A number of different types are available which are easily attached by forcing the ends of the hooks through the belting and folding them over.

The V Belt supplied is a standard ½ inch endless belt which is easily slipped into place over both the two step V motor pulley and the 2 step flat face countershaft pulley.

Cutting Tools

There are a great variety of cutting tools used on a lathe, each shape being adapted to the work to be done and the finish to be left on the metal. Basically, however, all employ the same principle for all operate with a tearing action. The cutting edge of the tool tears a chip from the work and breaks it into separate sections as shown in Picture 15.

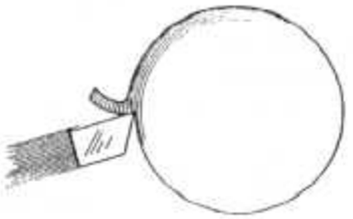


FIGURE 15—CUTTING ACTION OF TOOL BIT

Because of this the cutting edge of the tool must be sharp enough to separate the chip from the work with a minimum of power, but must also be large enough to support the cutting surface and to carry the heat of friction away from the point. These two opposing requirements can be accomplished by carefully working out the angle at which the tool will enter the work and the angles of clearance between the tool and the work.

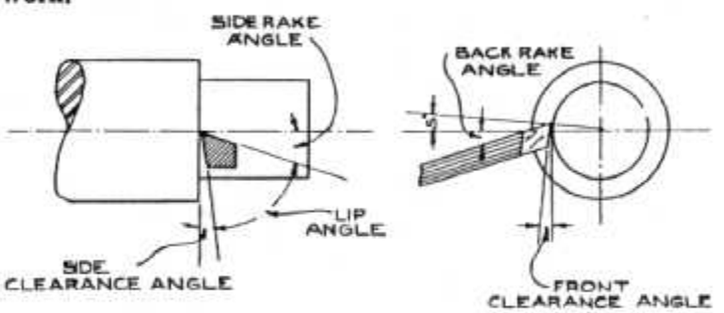


FIGURE 16—CUTTING ANGLES

Figure 16 above illustrates a cross-section and a side view of a tool bit in working position showing the names of the various angles for grinding and setting the bit.

For efficient performance, each of the angles and settings shown should be specially determined for the particular kind of material being worked on, the material the tool bit is made from, the cutting speed, the kind of coolant being used, if any, and whether roughing, finishing, parting or forming work is being done. Figure 18 illustrates the seven bit shapes commonly used and the working position of each with the correct angles for an average cut in mild steel at a cutting speed of 80 feet per minute using high speed tool steel bits and machining without coolant.

In shaping the bits use a good medium grit grinding wheel being careful not to burn the edges. Cool the bit in water to prevent drawing the temper.

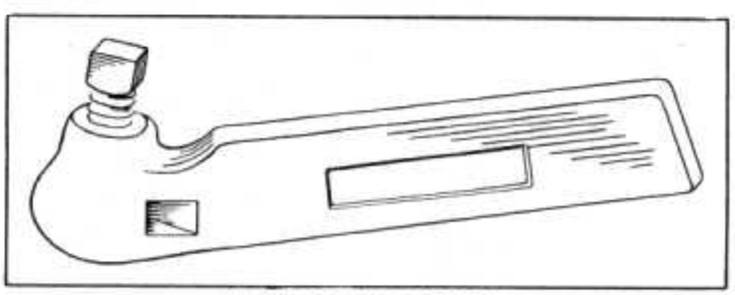


FIGURE 17—TOOL HOLDER

A tool bit holder for holding ¼- by ¼-inch tool bits eliminates the use of large and more expensive tools of high speed steel and also holds the bit at an angle. This angle directs a large portion of the cutting pressure directly toward the base of the tool post.

LATHE TOOL BIT SHAPES

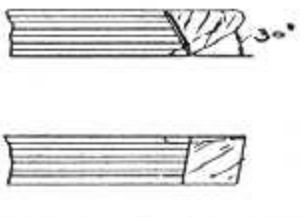
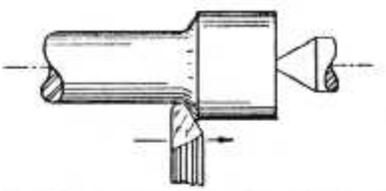
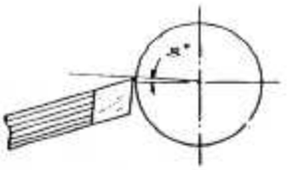
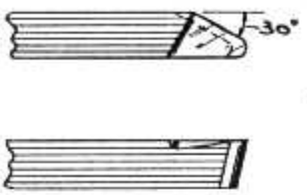
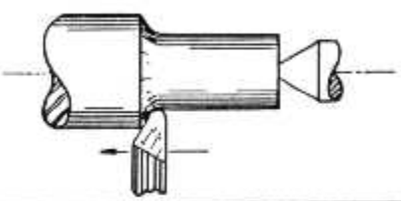
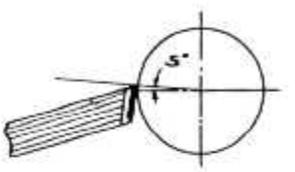
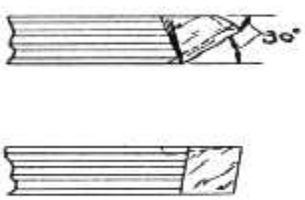
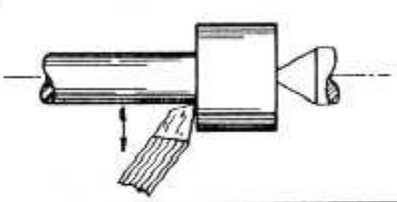
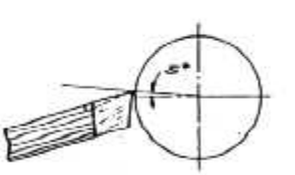
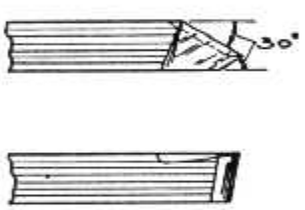
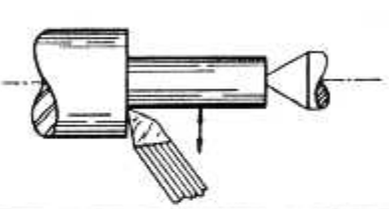
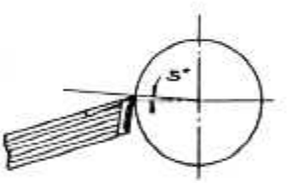
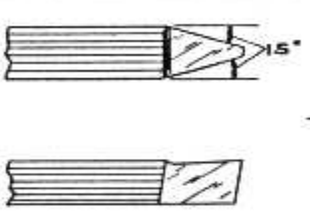
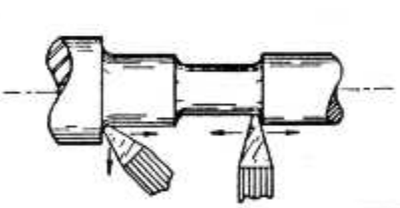
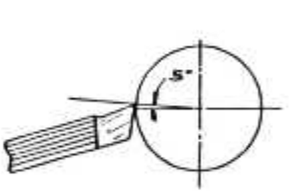
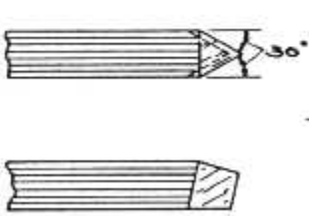
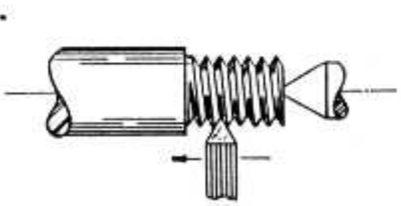
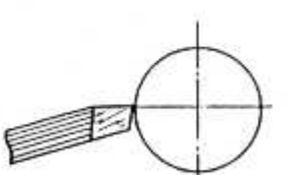
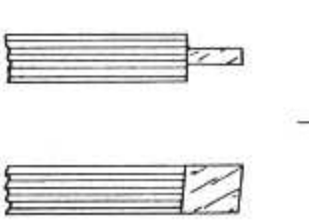
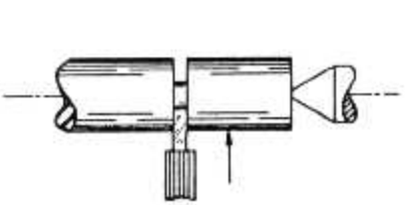
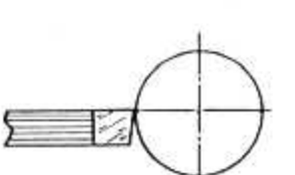
Top and Side View	Top View Working Position	Side View Working Position	Grinding Angles
Left Hand Turning Tool 			Back Rake Angle .....16½° Front Clearance Angle.. 7° Side Rake Angle .....18° Side Clearance Angle.... 8° Lip Angle .....64°
Right Hand Turning Tool 			Back Rake Angle .....16½° Front Clearance Angle.. 7° Side Rake Angle .....18° Side Clearance Angle.... 8° Lip Angle .....64°
Left Hand Facing Tool 			Back Rake Angle .....16½° Front Clearance Angle.. 7° Side Rake Angle .....18° Side Clearance Angle.... 8° Lip Angle .....64°
Right Hand Facing Tool 			Back Rake Angle .....16½° Front Clearance Angle.. 7° Side Rake Angle .....18° Side Clearance Angle.... 8° Lip Angle .....64°
Round Nose Turning Tool 			Back Rake Angle .....16½° Front Clearance Angle.. 7° Side Rake Angle ..... 0° Side Clearance Angle.... 8° Lipe Angle ..... 82°
Threading Tool 			Back Rake Angle..... 0° Front Clearance Angle.. 5° Side Rake Angle ..... 0° Side Clearance Angle... 10° Lip Angle ..... 80°
Cut-Off Tool 			Back Rake Angle ..... 0° Front Clearance Angle.. 5° Side Rake Angle ..... 0° Side Clearance Angle.... 3°

FIGURE 18

When using the tool holder, the cutting end of the bit should be clamped as close to the end of the holder as possible and the bit holding end of the holder should be as close to the tool post as possible. This will give the cutting edge rigid support so that the action of the work will not force it downward, causing chatter and possibly breaking off the bit.

Holding the Work

There are five common methods of holding work in a lathe; between centers, in a chuck, on the face plate, in a collet, and on a mandrel.

MOUNTING BETWEEN CENTERS

Whenever possible the work is turned between centers as this method is most accurate and permits removing the work from the lathe and replacing it without affecting the accuracy.

The first step in turning between centers is to find the center of the ends of the work and drill center holes. This operation is important and should be done with care.

If square, hexagonal, or any other regular sided stock is used lines may be scribed across the ends from corner to corner, the point of intersection being the center.

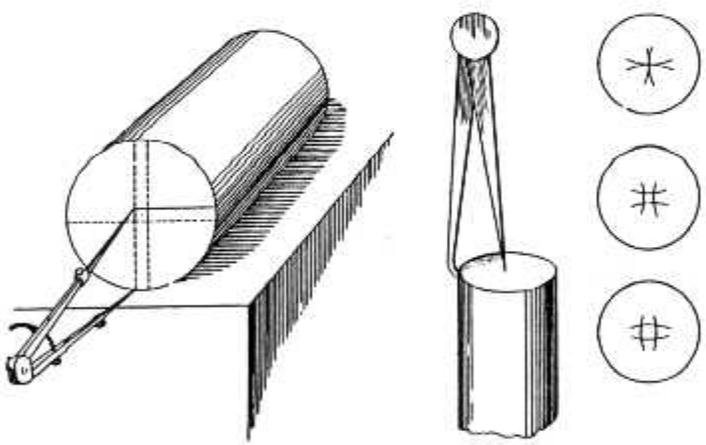


FIGURE 19—FINDING CENTERS

If round stock is used the center may be found either with dividers or with hermaphrodite calipers. When using dividers open them to approximately half the diameter, and laying the stock on a flat surface place one point on the work, the other on the flat surface, and scribe a line along the end as shown in Fig. 19. Turn the stock a quarter turn and scribe another line and so on until the four lines are drawn as shown. If the dividers are held at the same angle each time, the center of the small square formed will be the center of the stock.

If hermaphrodite calipers are used open them to approximately half the diameter of the stock and holding the bent leg on four quarter points of the circumference, scribe four arcs across the end, forming a four-sided central figure. The center of this figure will be the center of the stock. Rubbing chalk on the ends will make the scribing more easily seen.

When the center of the stock has been found, place a center punch vertically on the center mark and strike with a hammer, making an indentation sufficiently deep so that the work will revolve on the center points of the lathe.

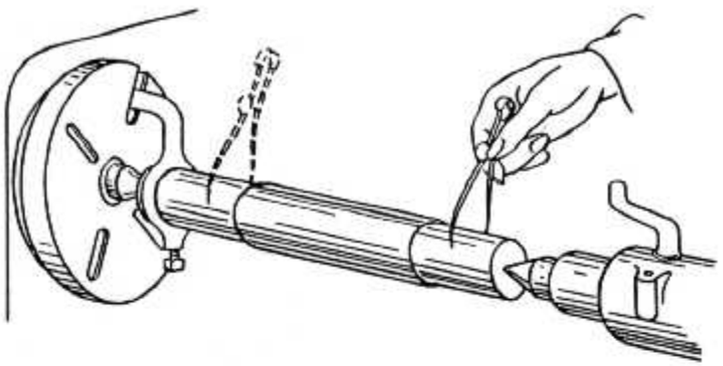


FIGURE 20—TESTING CENTERS

The stock, especially if close to finish size, should be placed in the lathe and the center tested before countersinking. This is done by revolving the stock by hand while it is held between the centers and holding a piece of chalk so that it will touch any high spots on the work as shown in Fig. 20.

If the chalk encounters high spots move the center holes toward these high spots by placing the work in a vise and driving the center punch toward them at an angle, then bringing it back to a vertical position.

The countersink drill is usually used in drilling center holes since it both drills the hole to the proper depth and countersinks at the proper angle.

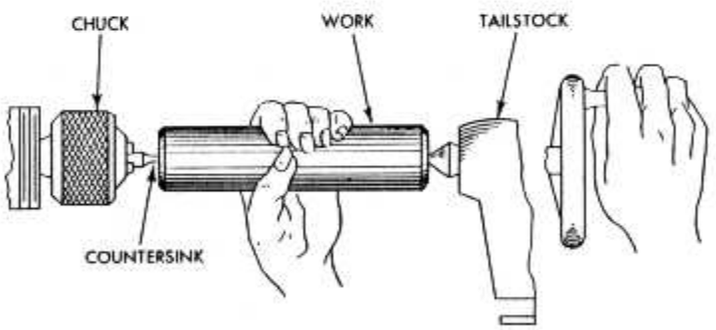


FIGURE 21—COUNTERSINKING CENTERS

The countersink drill is mounted in a chuck in the headstock spindle and the work held with the tailstock center in one center hole, the drill in the other. With the spindle turning at about 600 R.P.M. the tailstock ram is then advanced moving the work into the drill as shown in Figure 21.

If this method is not used the center holes may be drilled by placing the work in a drill press, or the work may be held in a universal three-jaw scroll chuck and the countersink drill held in the tailstock in a drill chuck. When this method is used the end of the shaft should be faced smooth before drilling the center hole.

When drilled and countersunk the holes should be deep

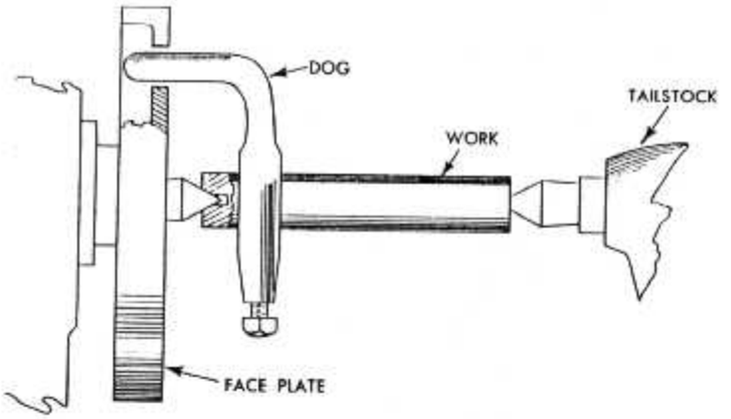


FIGURE 22—MOUNTING BETWEEN CENTERS

enough to prevent the points of the lathe center touching the bottom, and the tapered sides should exactly fit the 60° angle of the centers. If they do not the work will not turn evenly or smooth and will be inaccurate. A correctly drilled and countersunk hole is shown in Figure 22.

Lubricate the end centers by filling with heavy grease or with white lead thinned with machine oil or light cylinder oil.

Place the end of the work in a lathe dog so that the tail of the dog extends beyond the end of the work and into the slot of the face plate, without interfering with the headstock center. The work should now rest firmly on both centers but should not bind. To test the mounting, place a finger on the tail of the dog and move it back and forth within the face plate slot. You should be able to move it easily, but not too easily. When the pressure on the ends has been adjusted lock the tailpost ram by turning the binding lever to the right.

CHUCKS

Two types of chuck commonly used are the 3-JAW UNIVERSAL CHUCK and the 4-JAW INDEPENDENT CHUCK. These are used in turning the work that can not be readily turned between centers. See Figure 23.

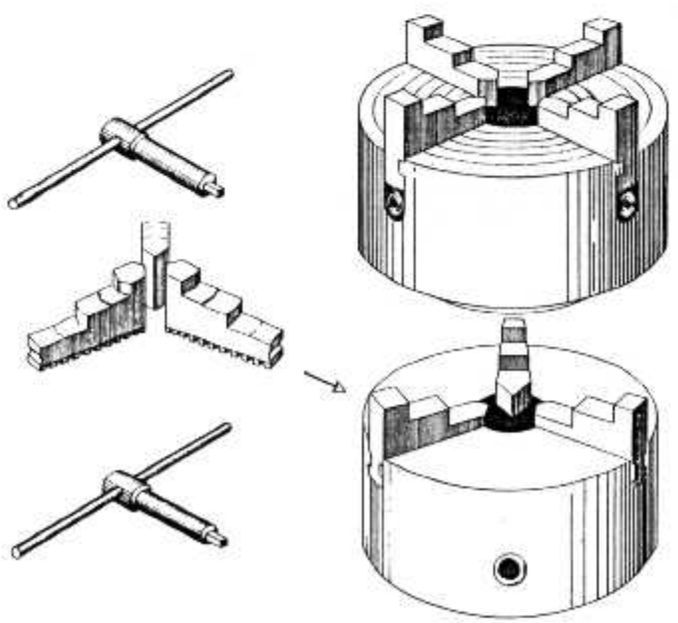


FIGURE 23—3 AND 4 JAW CHUCKS

Some chucks mount directly on to the spindle nose, while others are bolted to an adapter plate which fits on to the spindle.

Before mounting a chuck or face plate clean the spindle shoulder and chuck back and oil the threads of the spindle head and chuck thoroughly. Turn the chuck on by hand, being careful not to spin it up to the shoulder as it may jam. Never use lathe power to screw a chuck on or off of the spindle.

The chuck can be loosened for removal by (1) Engaging the back gears while the bull gear is connected to the spindle pulley, so that the spindle will not turn, and turning the chuck by placing the chuck wrench in its hole and pulling on it. (2) Placing a block of wood between the chuck jaw and the lathe bed, engaging the back gears, and turning the spindle by pulling by hand on the belt. Take care in removing the chuck. You may damage the spindle threads or you may damage the bed ways if the chuck falls on them.

The 4-jaw independent chuck is recommended if the lathe is to have only one chuck as it will hold square, round or irregular shaped work in either a concentric or eccentric position. Each jaw is controlled by a head screw, a number of concentric circles scribed on the face permitting the approximate centering of the work by moving all jaws to the same line or to the same distance from the same line.

The work is then revolved by hand and a piece of chalk held lightly against the work to mark the high spots. The jaw opposite the high point is loosened and that behind it tightened until the work is centered.

The 3-jaw universal chuck is self-centering, all jaws working from one screw which saves time and trouble in centering round or hexagonal work but it can not be used for square or irregular shapes.

The 4-jaw chuck can be adjusted to any degree of accuracy required. 3-jaw chucks are usually accurate to .003 when new. If greater accuracy than this is required, the jaws may be shimmed as needed.

The jaws of the 4-jaw chuck are reversible, while an additional set of jaws are supplied with the 3-jaw chuck for internal chucking in which case the jaws are placed inside the work and the outside turned.

THE HEADSTOCK SPINDLE CHUCK (Fig. 24A) is used for small diameter work that may be passed through the headstock spindle. It is similar to a drill chuck in operation except that it screws on to the spindle and is hollow. Since it holds much the same type of work as the collet chuck and is less expensive, it is advisable at times to use in place of the collet.

DRILL CHUCKS (Fig. 24B) are used both on the tailstock of a lathe with the work turning and on the headstoc of the lathe with the work held. Although for production drilling, a drill press is generally used, there are many small jobs of drilling, reaming, tapping, etc., that are conveniently handled by means of a lathe drill chuck.

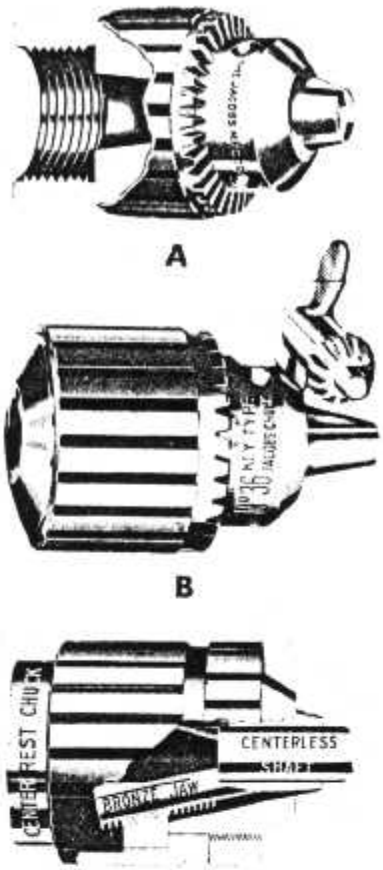


FIGURE 24—LATHE CHUCKS

THE CENTER REST CHUCK (Fig. 24C) is mounted in the tailstock by means of a solid tapered arbor which replaces the center. The stationary bronze jaws provide an accurate support for turning round work where a center cannot be used.

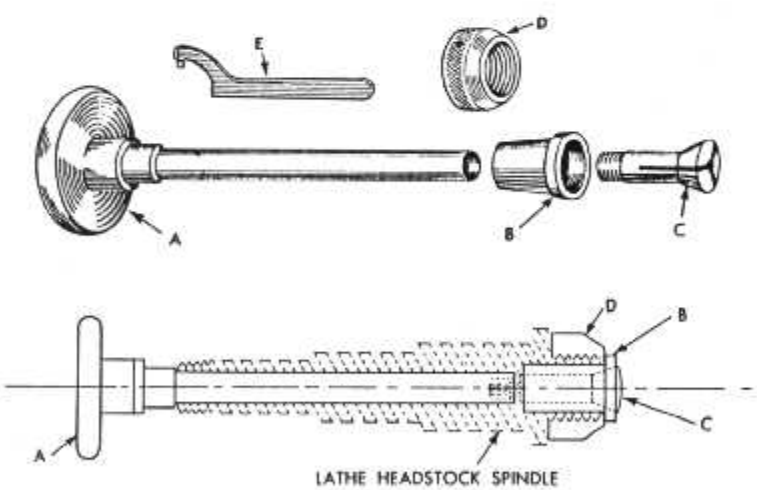


FIGURE 25—DRAW-IN COLLET ATTACHMENT

DRAW-IN COLLET CHUCK. Small work that must be very accurate is mounted in a draw-in collet placed within the headstock spindle.

The assembly consists of a draw-in spindle (A in Fig. 25) threaded at the right end to receive the collet; a tapered closing sleeve (B); a split holding collet (C); spindle nose cap (D); and spindle nose cap wrench (E). The tapered closing sleeve fits into the headstock spindle and adapts it to the collet. The work is placed in the split end of the collet and the collet closed by pressure as it is drawn into the taper by the draw-in spindle which enters the headstock spindle from the other end.

Never use a collet for work more than .005 inch larger or smaller than its rated diameter. Before mounting work in a collet, all parts—work, collet, spindle, and taper—must be wiped clean and dry.

When removing the collet assembly unscrew the draw-in spindle a couple of turns and press the collet loose. To remove the tapered closing sleeve, unscrew the spindle nose cap with spanner wrench which forces the sleeve out of the lathe spindle.

Draw-in collet chucks for production are also available that are lever operated instead of the hand wheel operated as described above. Lever operated draw-in collet chucks can be opened and closed while the lathe spindle is in motion.

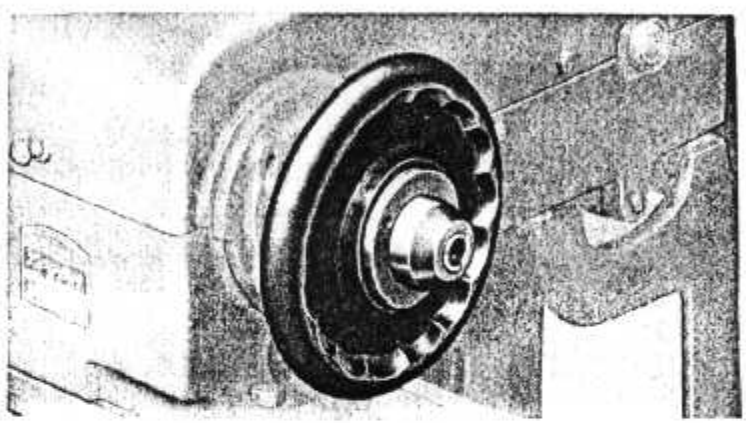


FIGURE 26—HAND WHEEL COLLET CHUCK

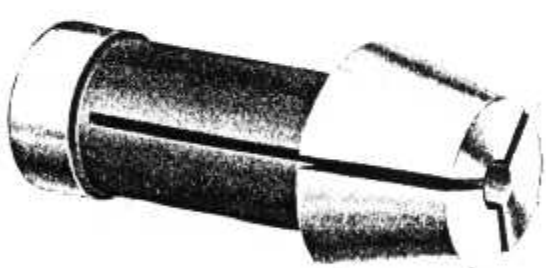


FIGURE 27—PUSH TYPE COLLET

THE HAND WHEEL COLLET CHUCK shown in Fig. 26, uses push type collets as shown in Fig. 27. This chuck is fitted to the spindle nose by means of a back plate and is opened and closed by turning the hand wheel while the spindle is held. The positive squeeze grip closes concentrically on the work without longitudinal movement of the collet.

A lever type collet attachment fitting on the spindle nose and using push type collets is also available. These production attachments can be opened or closed while the lathe spindle is in motion.

Push type collet chucks have greater capacity, have greater holding power and do not pull the work away from a stop in closing the collet. However, draw-in collets having very little over-hang are slightly more accurate.

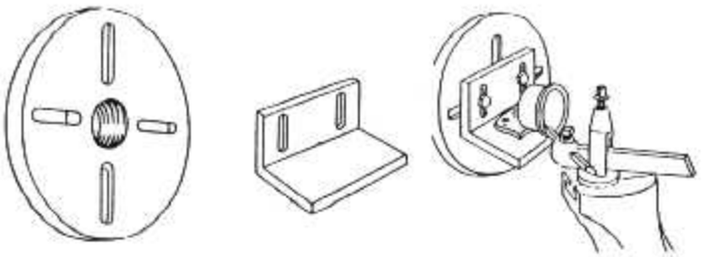


FIGURE 28—FACE PLATE

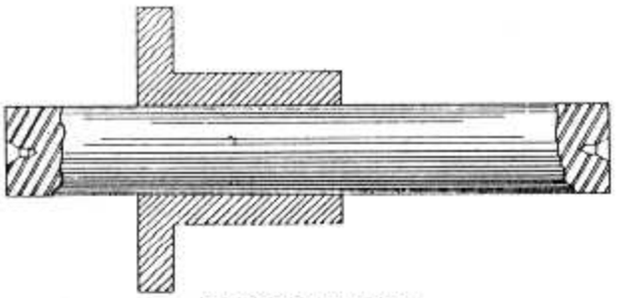


FIGURE 29—MANDREL

FACE PLATE MOUNTING

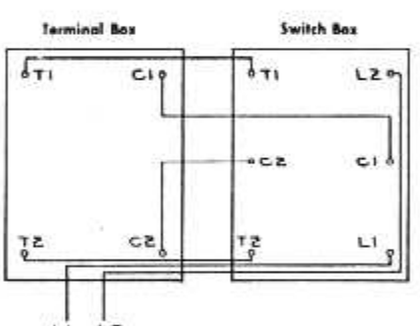
Many irregular shapes are best mounted for turning by clamping to the face plate directly or by fastening to an angle plate which in turn is mounted on the face plate. (Fig. 28) Be careful in bolting down not to spring the work on the plate and use the same care in screwing the face plate on the lathe spindle as described for mounting chucks. Heavy work mounted off center should be counterbalanced by attaching balancing weights to the opposite edge of the face plate. To locate the work accurately on the face plate use either a dial indicator or a center indicator.

MANDREL MOUNTING

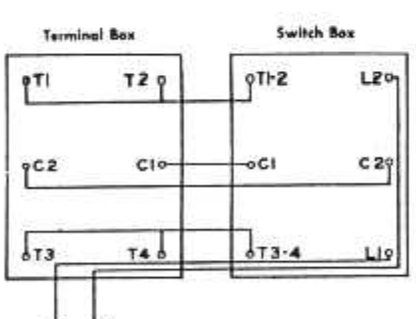
Hollow pieces may be mounted on a mandrel and the mandrel mounted between centers, allowing the entire outer surface to be turned instead of the limited surface that would be available if the piece were held in a chuck.

Although mandrels are available which may be expanded to fit the hole by forcing out grips on the sides, a mandrel is usually a piece of steel with a slight taper (.006 inches per foot) the ends flattened for the lathe dog and the piece held to the mandrel by friction. When mounting the work it is advisable to oil both the mandrel and the hole to prevent the work "freezing" on the mandrel. In driving the mandrel out of the work do not use a steel hammer without protecting the end of the mandrel from damage. Make sure that mandrel is driven off in the opposite direction than that from which it entered the work.

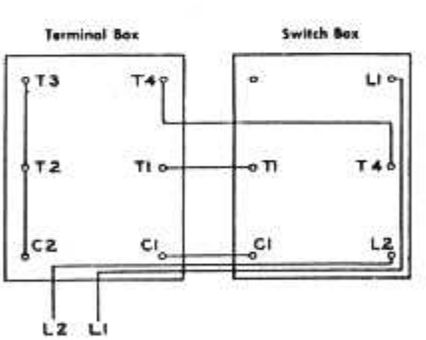
Fig. 30 Motor and Switch Wiring Diagram



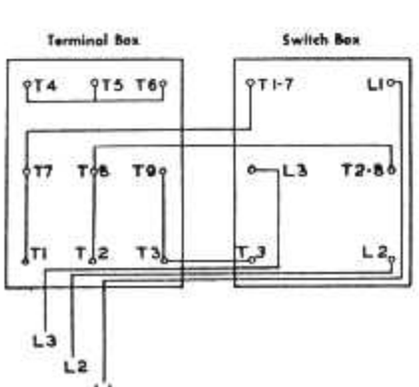
No. 1100 Motor
(Capacitor type)
1/3 H.P. 110 volt,
60 cycle, single
phase
No. 0639 Switch
(R-1144)



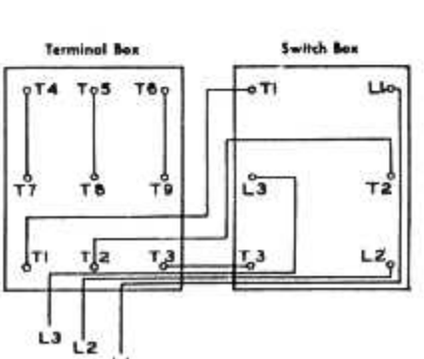
No. 1105 Motor
(Capacitor type)
½ H.P. 115 volt,
60 cycle, single
phase
No. 0639 Switch
(R-1144)



No. 1105 Motor
(Capacitor type)
½ H.P. 230 volt,
60 cycle, single
phase
No. 0639 Switch
(R-1144)



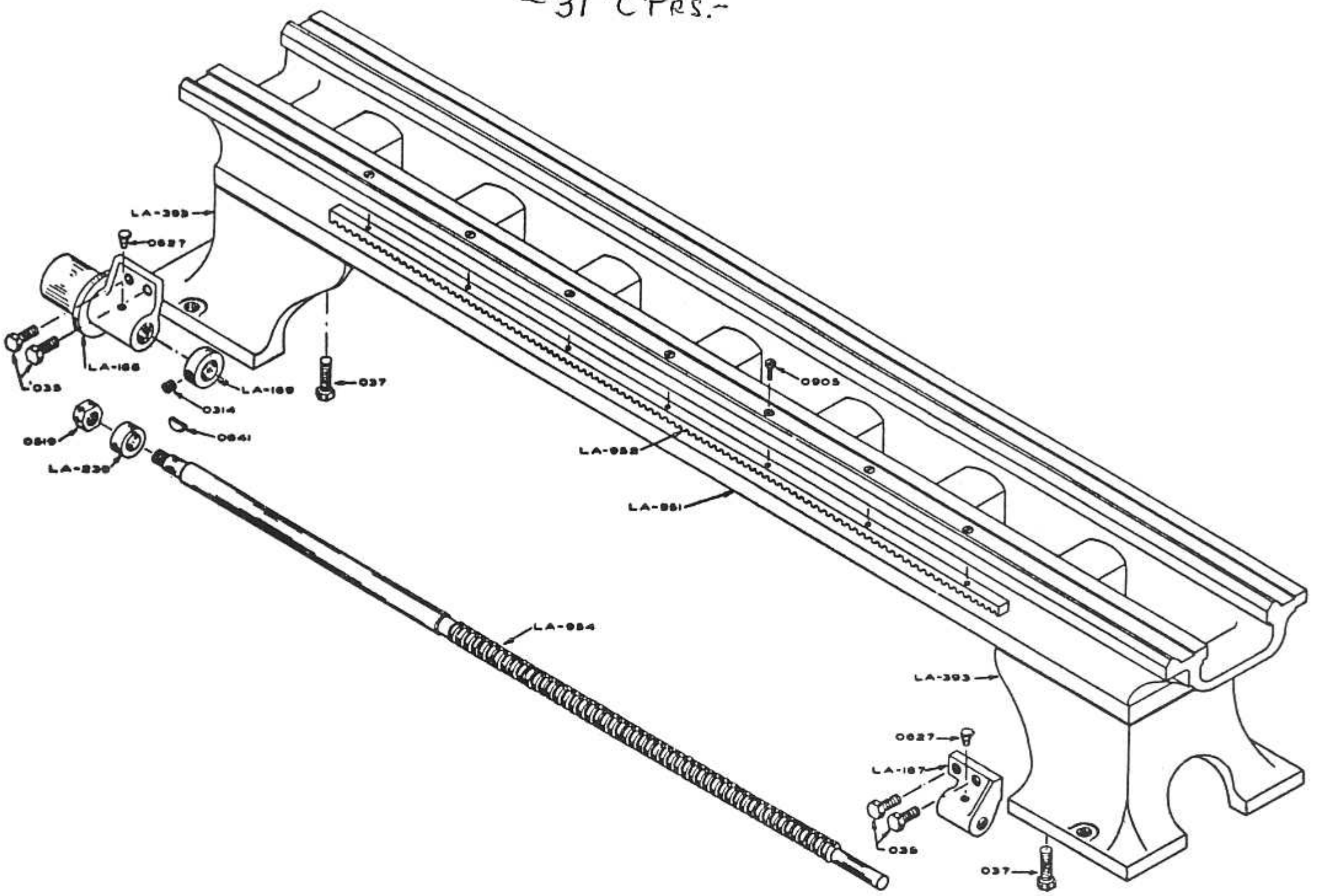
No. 1110 Motor
½ H.P. 220 volt,
60 cycle, three
phase
No. 0636 Switch
(R-1143)



No. 1110 Motor
½ H.P. 440 volt,
60 cycle, three
phase
No. 0636 Switch
(R-1143)

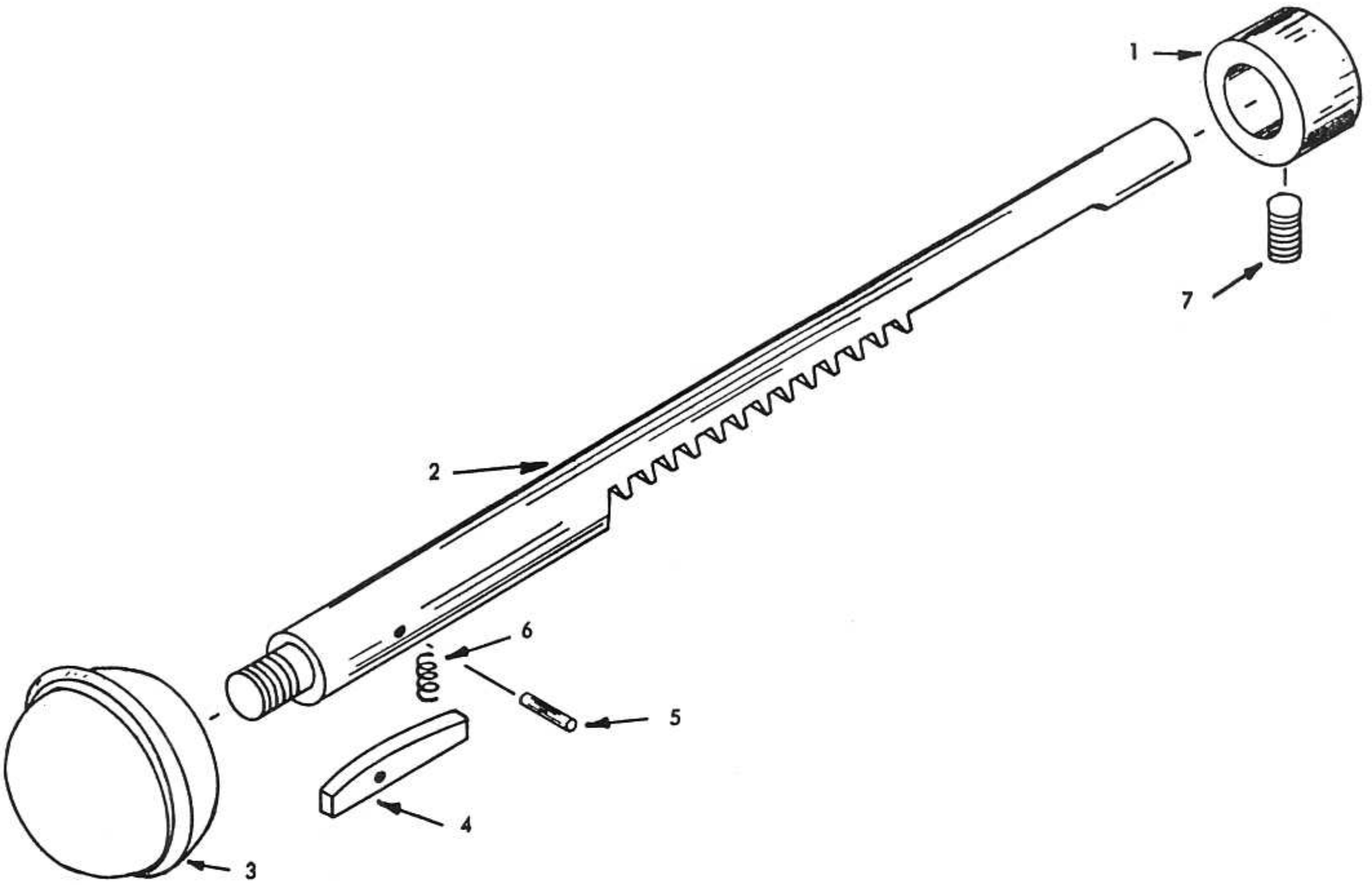
LA-960 BED ASSEMBLY

~31" Ctrs.~



PART NO.	REQ'D	NAME OF PART	SHIPPING WEIGHT LBS.	OZ.
LA-166	1	Bracket-Left with 0627	3	
LA-167	1	Bracket-Right with 0627.	1	
LA-169	1	Collar with 0314		6
LA-239	1	Collar		4
LA-393	2	Bed Support.	20	
LA-951	1	Bed	138	
LA-952	1	Rack	5	
LA-954	1	Lead Screw	9	15
035	4	Hex. Hd. Cap Screw 3/8-16 x 7/8. .		3
037	8	Hex. Hd. Cap Screw 3/8-16 x 1-1/4.		3
0314	1	Socket Set Screw 5/16-18 x 5/16. .		3
0519	1	Hex Nut 1/2-20		3
0627	2	Oil Cup.		3
0641	1	Woodruff Key		3
0905	7	Fil. Hd. Mach. Screw 10-32 x 9/16.		3

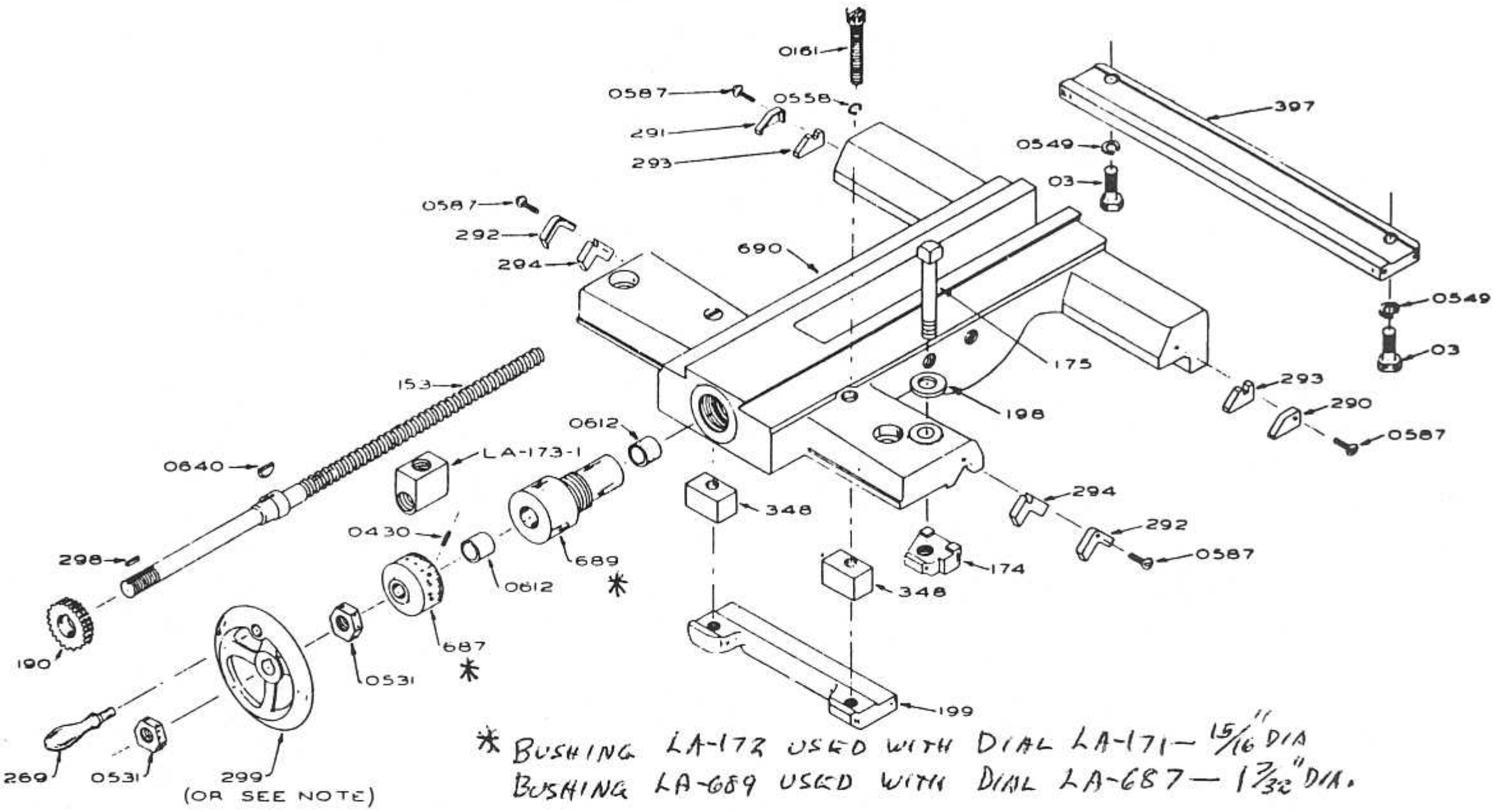
SHIFTER RACK ASSEMBLY
LA-56



Drwg. No. 1A-30056

ITEM	PART NUMBER	DESCRIPTION	I.B.M. NUMBER	QUANTITY	SHIPPING WEIGHT	
					LBS.	OZS.
1	LA-243	Collar w/0310	24A-30243	1		4
2	LA-241	Shifter Rack	18A-30241	1	1	
3	0922	Knob	Q21-00922	1		4
4	LA-264	Latch Key	15A-30264	1		3
5	LA-275	Pin	37A-30275	1		3
6	LA-238	Spring	36A-30238	1		3
7	0310	Socket Set Screw 1/4"-20x3/8"	Q06-00310	1		3

LA-50-2 SADDLE ASSEMBLY



* BUSHING LA-172 USED WITH DIAL LA-171 — 15/16" DIA
BUSHING LA-689 USED WITH DIAL LA-687 — 1 7/32" DIA.

PART NO.	NO. REQ'D	DESCRIPTION	SHIPPING WEIGHT LBS.	SHIPPING WEIGHT OZ.
LA-153	1	Cross Feed Screw with 0640.	1	
LA-173-1	1	Cross Feed Nut.		6
LA-174	1	Saddle Lock Nut		5
LA-175	1	Saddle Lock Screw		3
LA-190	1	Cross Feed Idler Gear		4
LA-198	1	Washer.		3
LA-199	1	Front Gib	1	4
LA-269	1	Handle.		4
LA-290	1	Wiper-Rear Right.		2
LA-291	1	Wiper-Rear Left		2
LA-292	2	Wiper-Front		2
LA-293	2	Felt-Rear		2
LA-294	2	Felt-Front.		2
LA-298	1	Key		3
LA-299	1	Handwheel with 269.	2	7
LA-348	2	Gib Spacer.		8
LA-397	1	Saddle Gib.	1	8
LA-687	1	Graduated Collar with 0430.		8
LA-689	1	Bushing with 2 of 0612.	1	
LA-690	1	Saddle.	19	
03	2	Hex. Hd. Cap Screw 1/4-20 x 3/4		3
0161	2	Fill. Hd. Cap Screw 1/4-20 x 1-3/4. . .		3
0430	1	Headless Set Screw 8-32 x 3/8		3
0531	2	Jam Nut 3/8-24.		3
0549	2	Lock Washer 1/4 x 7/16.		3
0558	2	Lock Washer 1/4		3
0587	4	Drive Screw 6-32 x 1/2.		3
0612	2	Oilless Bearing		3
0640	1	Woodruff Key 1/8 x 1/2.		3

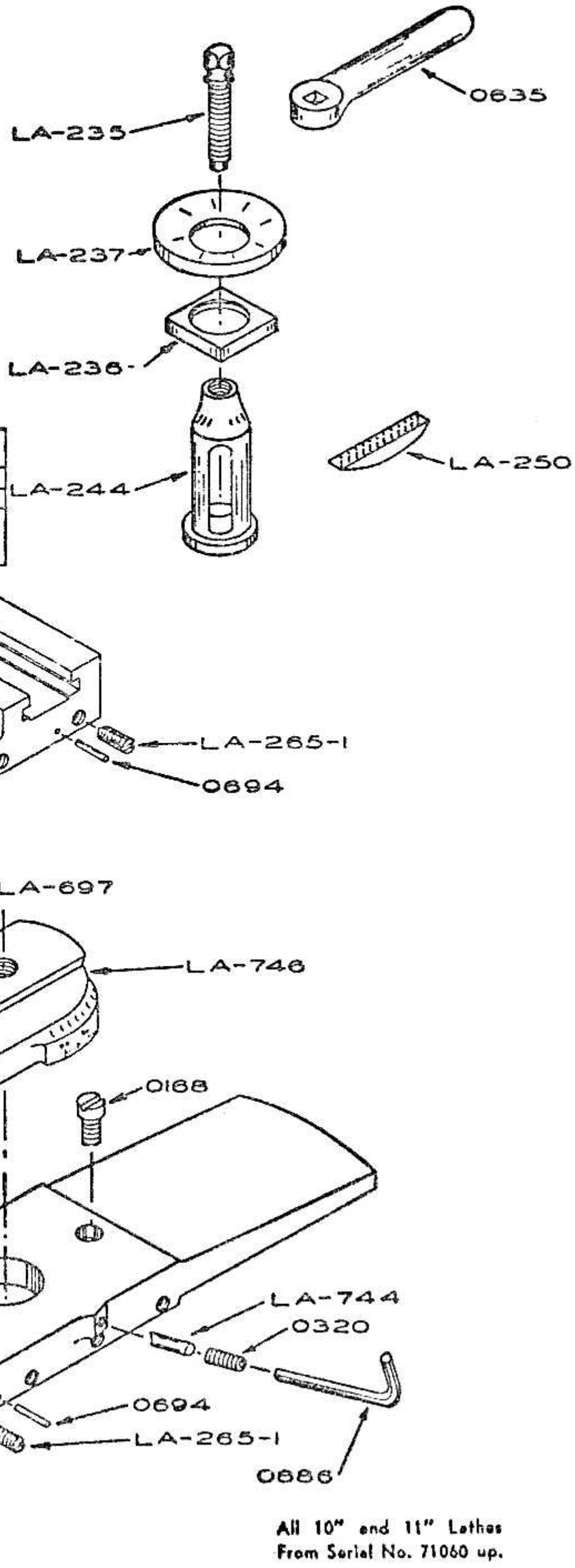
SUB-ASSEMBLY FOR ORDERING CONVENIENCE				
LA-290-A	1	Saddle Wiper Set consists of: LA-290, LA-291, (2) LA-292, (2) LA-293, (2) LA-294, & (4) 0587		4

NOTE: ON TURRET LATHE MODELS, SUBSTITUTE LA-297 HANDWHEEL WITH 0644 REVOLVING HANDLE.

LA-49-5 COMPOUND REST ASSEMBLY

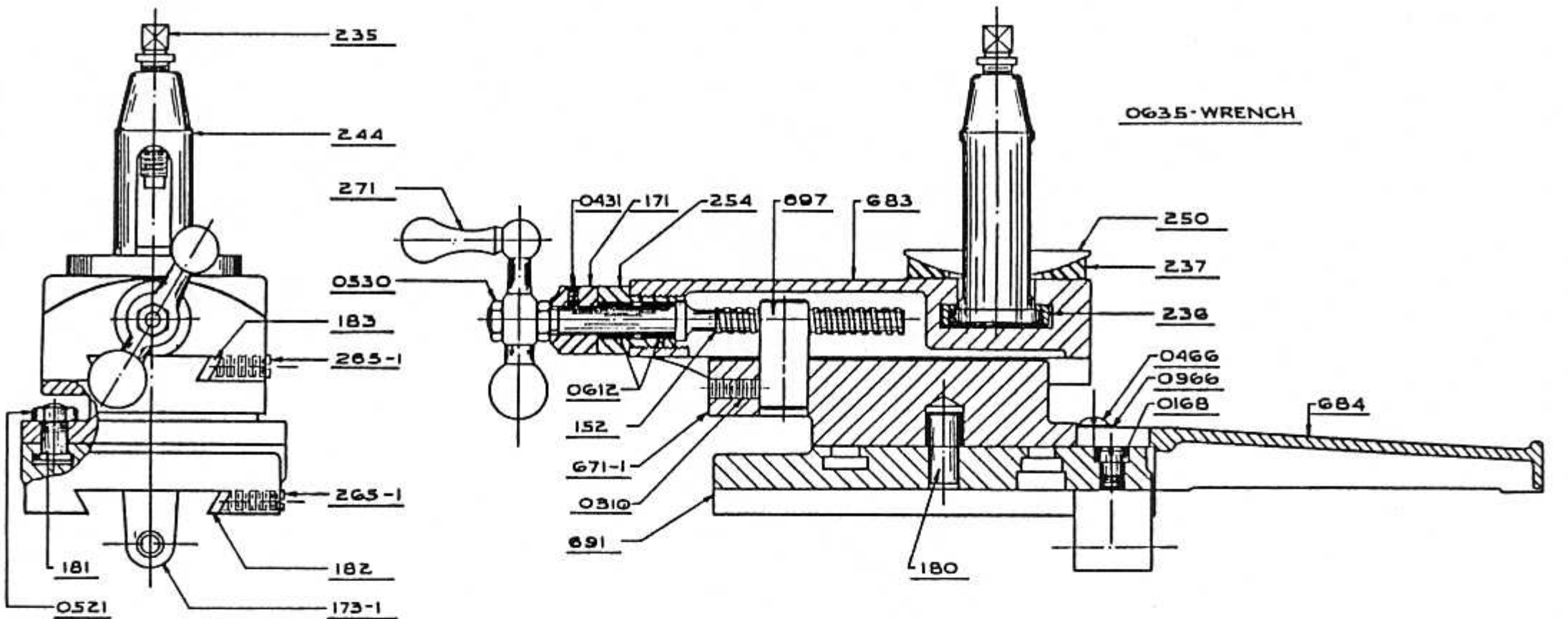
PART NUMBER	NO. REQ'D.	DESCRIPTION	SHIPPING WEIGHT LBS.	SHIPPING WEIGHT OZS.
LA-183	1	Top Compound Gib		4
LA-235	1	Tool Post Screw		4
LA-236	1	Tool Post Block		3
LA-237	1	Tool Post Ring		4
LA-244	1	Tool Post		12
LA-250	1	Wedge		4
LA-265-1	7	Gib Screw		4
LA-269	1	Handle		4
LA-298	1	Key		3
LA-335	1	Handwheel with 269	1	8
LA-697	1	Compound Rest Nut		8
LA-744	2	Locking Plug		3
LA-745	1	Compound Rest Top w/183 & 0694	5	
LA-746	1	Swivel with 0310	4	
LA-747	1	Compound Rest Base w/2 LA-744, LA-749, 2- #0320 & #0694	6	
LA-749	1	Compound Base Gib		8
LA-799	1	Compound Rest Screw		6
LA-1147	1	Screw		3
LA-1148	1	Slug		3
LB-136	1	Graduated Collar		8
LB-137	1	Bushing	1	
0168	1	Fillister Head Cap Screw 5/16"-18 x 5/8"		3
0310	1	Socket Set Screw 1/4"-20 x 3/8"		3
0320	2	Socket Set Screw 3/8"-16 x 5/8"		3
0530	2	Jam Nut 5/16"-24		3
0635	1	Tool Post Wrench		8
0694	2	Groove Pin 1/8" x 3/4"		3
0886	1	Socket Screw Wrench 3/16"		3

SUB-ASSEMBLY				
PART NUMBER	NO. REQ'D.	DESCRIPTION	SHIPPING WEIGHT LBS.	SHIPPING WEIGHT OZS.
LA-244-A		Tool Post Complete, consists of:- LA-235, 236, 237, 244, 250	1	6



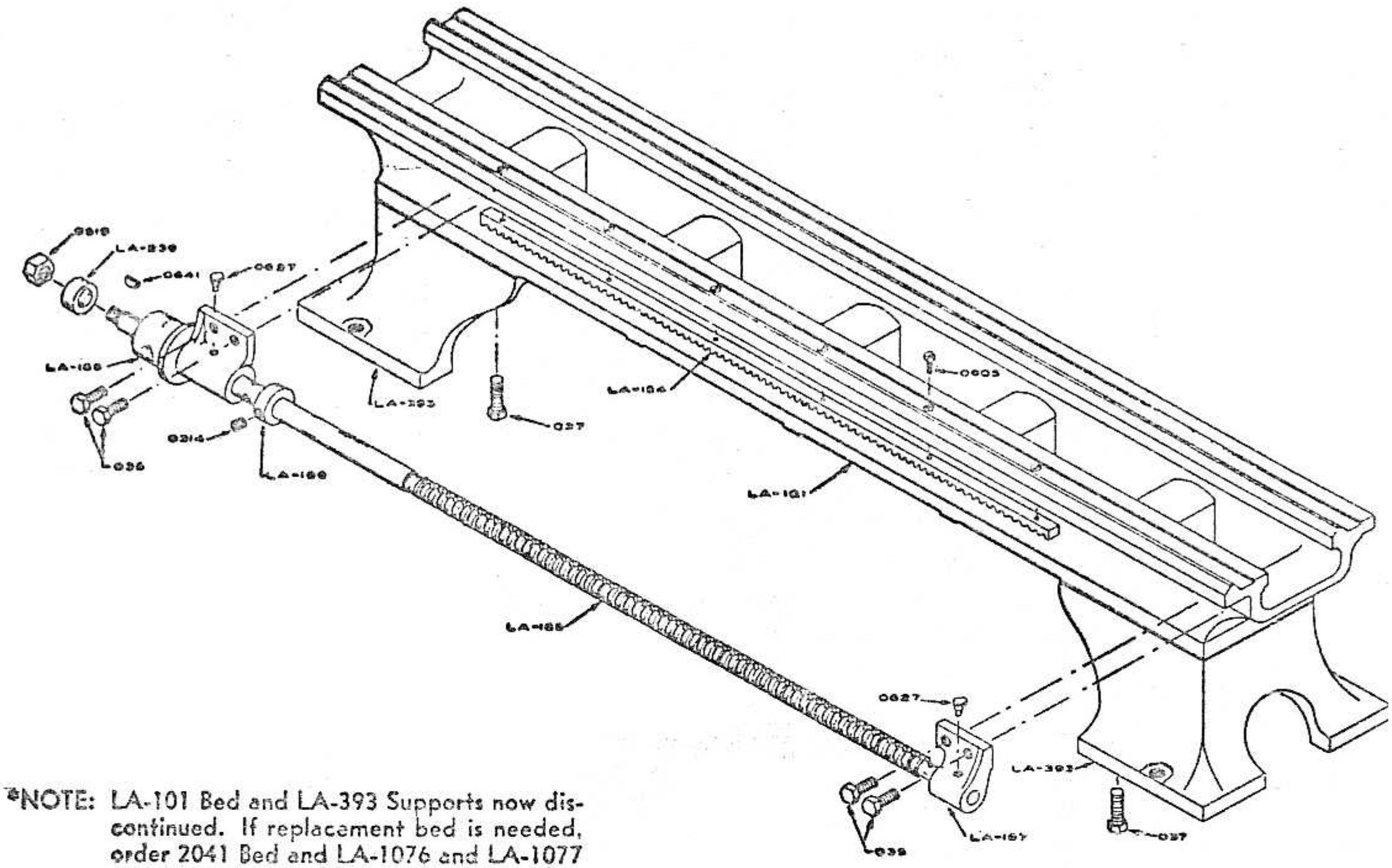
NoNote: 0635 and 0886 Wrenches included when LA-49-5 is ordered as replacement unit.

All 10" and 11" Lathes From Serial No. 71060 up.



PART NO.	NO. REQ'D	NAME OF PART	SHIPPING WEIGHT LBS.	SHIPPING WEIGHT OZ.	PRICE EACH
LA-152	1	Compound Rest Screw		6	$
LA-171	1	Graduated Collar with 0431		8	
LA-173-1	1	Cross Feed Nut		6	
LA-180	1	Swivel Pin		3	
LA-181	2	Swivel Lock Bolt		2	
LA-182	1	Compound Gib (Base)		4	
LA-183	1	Compound Gib (Top)		4	
LA-235	1	Tool Post Screw		4	
LA-236-1	1	Tool Post Block		3	
LA-237	1	Tool Post Ring		4	
LA-244	1	Tool Post		12	
LA-244-A	1	Tool Post Complete	1	6	
LA-250	1	Wedge		4	
LA-254	1	Bushing with 0612		10	
LA-265-1	7	Gib Screw		8	
LA-271	1	Ball Crank with 273		9	
LA-273	1	Pin		3	
LA-671-1	1	Swivel	4		
LA-683	1	Compound Rest Top with 254, 183 & 2 of 0694	4		
LA-684	1	Chip Guard	2		
LA-691	1	Compound Base with 180, 182 & 2 of 0694	4		
LA-697	1	Compound Rest Nut		8	
0168	1	Fillister Hd. Cap Screw 5/16-18x5/8		3	
0310	1	Socket Set Screw 1/4-20x3/8			
0431	1	Headless Set Screw 8-32x1/4		3	
0466	2	Rd. Hd. Screw 10-32x1/2		3	
0521	2	Jam Nut 5/16-18		3	
0530	2	Jam Nut 5/16-24		3	
0612	2	Oilless Bearing		3	
0635	1	Tool Post Wrench		8	
0694	4	Pin		2	
0966	2	Washer		3	

LA-42 BED ASSEMBLY



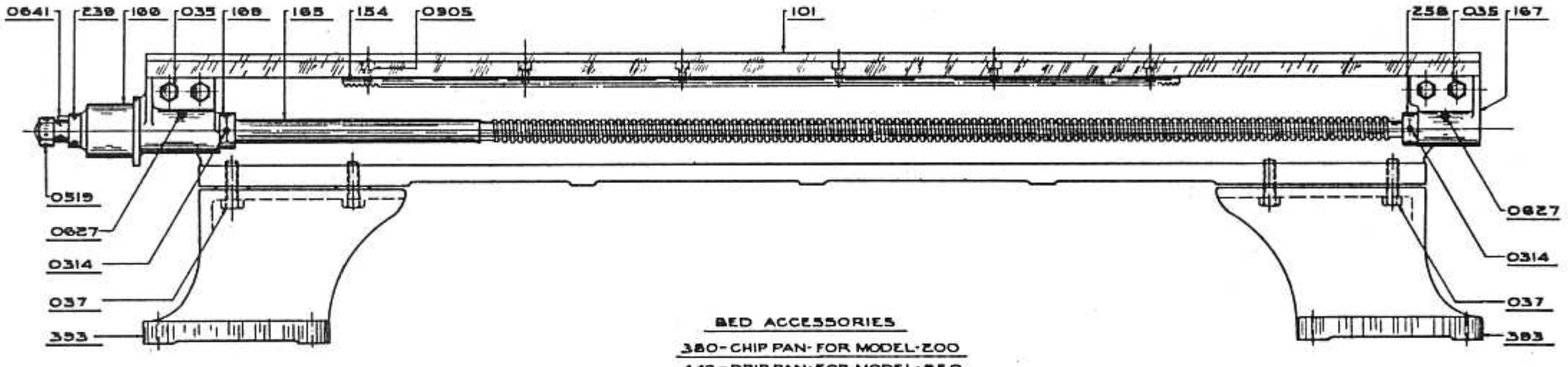
*NOTE: LA-101 Bed and LA-393 Supports now discontinued. If replacement bed is needed, order 2041 Bed and LA-1076 and LA-1077 supports.

For floor model lathes it will be necessary to drill additional holes in the chip pan to accomodate the new bed supports.

PART NUMBER	NO. REQ'D.	DESCRIPTION	SHIPPING WEIGHT LBS.	OZS.
*LA-101	1	Bed	115	
LA-154	1	Rack	3	
LA-165	1	Lead Screw 46-5/8"	8	
LA-166	1	Bracket-Left with 0627	3	
LA-167	1	Bracket-Right with 0627	1	
LA-169	1	Collar with 0314		6
LA-239	1	Collar		4
*LA-393	2	Bed Support	20	
035	4	Hex. Hd. Cap Screw 3/8-16 x 7/8		3
037	4	Hex. Hd. Cap Screw 3/8-16 x 1-1/4		3
0314	1	Socket Set Screw 5/16-18 x 5/16		3
0519	1	Hex. Nut 1/2-20		3
0627	2	Oil Cup		3
0641	1	Woodruff Key		3
0905	6	Fil. Hd. Mach. Screw 10-32 x 9/16		3

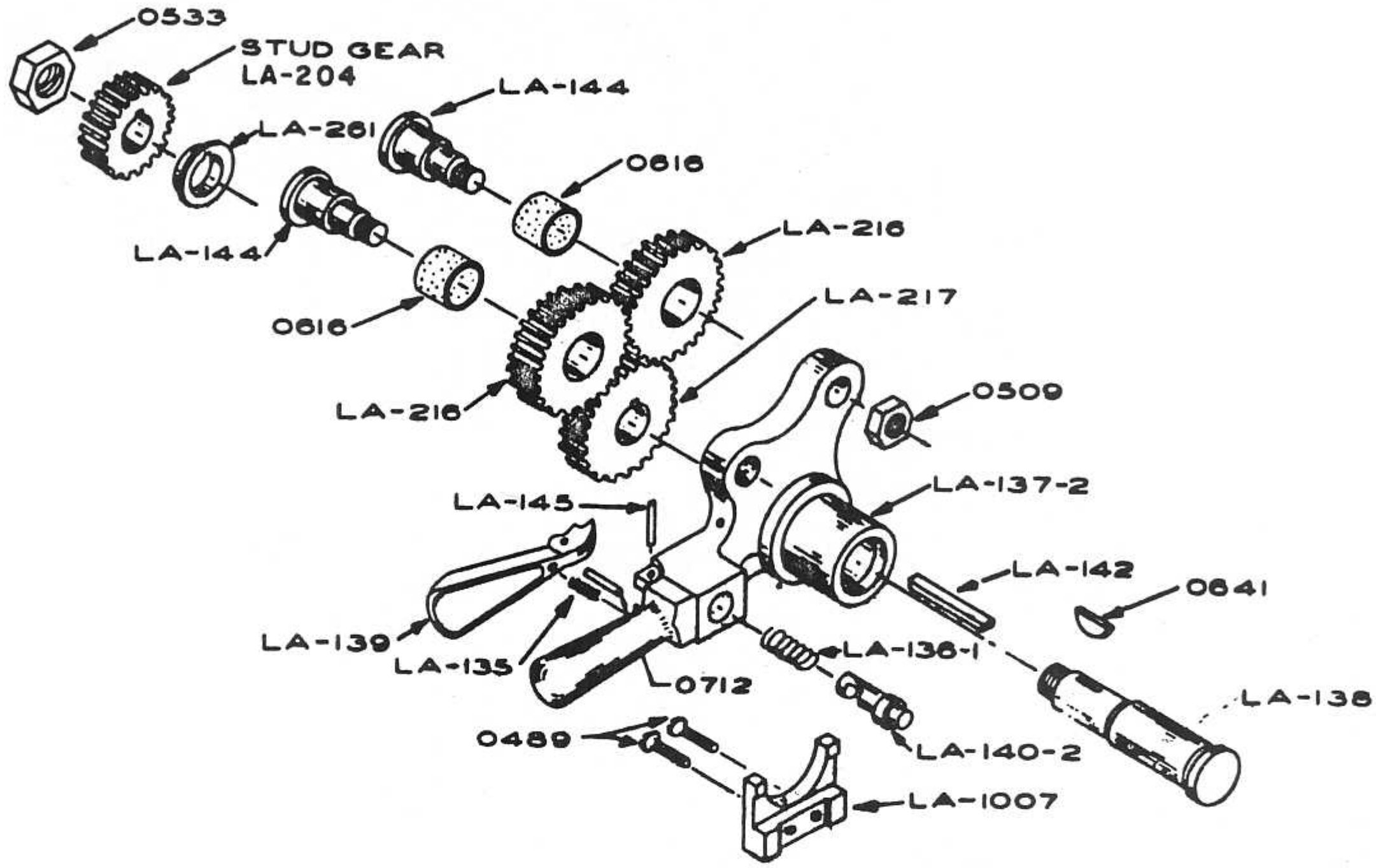
LA-42 BED ASSEMBLY

-24" CTRS-



PART NO.	NO. REQ'D	NAME OF PART	SHIPPING WEIGHT LBS.	SHIPPING WEIGHT OZ.	PRICE EACH
LA-101	1	Bed	115		
LA-154	1	Rack	3		
LA-165	1	Lead Screw	8		
LA-166	1	Bracket-Left with 0627	3		
LA-167	1	Bracket-Right with 0627	1		
LA-169	1	Collar with 0314		6	
LA-239	1	Collar		4	
LA-258	1	Collar with 0314		6	
LA-393	2	Bed Support	20		
035	4	Hex. Hd. Cap Screw 3/8-16 x 7/8		3	
037	8	Hex. Hd. Cap Screw 3/8-16 x 1-1/4		3	
0314	2	Socket Set Screw 5/16-18 x 5/16		3	
0519	1	Hex. Nut 1/2-20		3	
0627	2	Oil Cup		3	
0641	1	Woodruff Key		3	
0905	6	Fil. Hd. Mach. Screw 10-32 x 9/16		3	
		BED ACCESSORIES			
LA-373	2	Floor Legs	75		
LA-380	1	Chip Pan for #200	17		
LA-446	1	Drip Pan for #850	21		
055	4	Bolts for Floor Legs		3	
0511	4	Nuts for Floor Legs		3	

LA-4-2 REVERSE GEAR ASSEMBLY



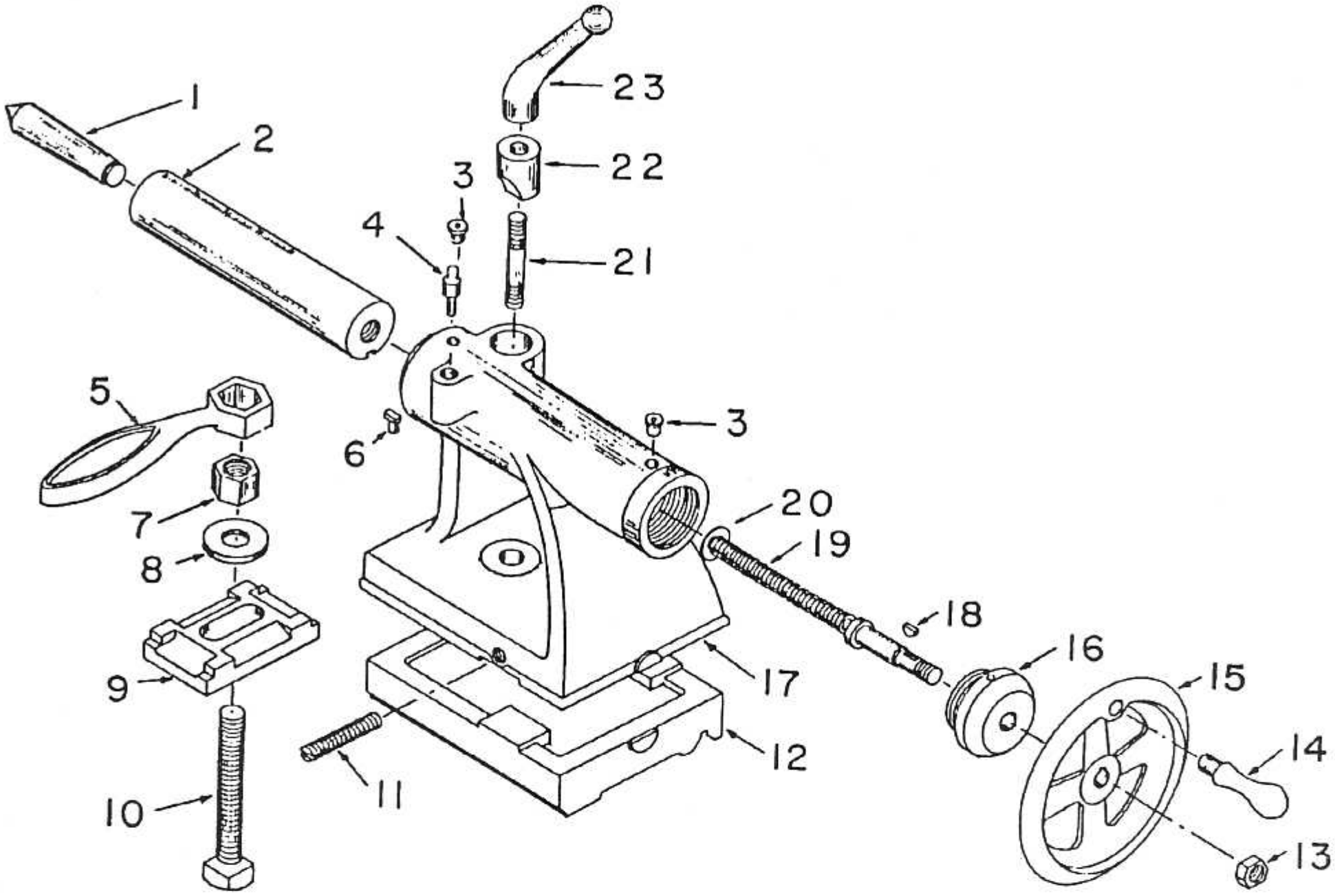
PART NUMBER	NO. REQ'D.	DESCRIPTION	SHIPPING WEIGHT LBS.	SHIPPING WEIGHT OZS.
LA-135	1	Handle Spring		3
LA-136	1	Plunger Spring.		4
LA-137-2	1	Reverse Gear Bracket.	1	
LA-138	1	Reverse Gear Shaft		14
LA-139	1	Plunger Lever		6
LA-140-2	1	Plunger		3
LA-142	1	Oiler		3
LA-144	2	Pinion Stud		8
LA-145	1	Handle Pin		3
LA-216	2	Idler Gear w/0616.		12
LA-217	1	Reverse Gear w/keyway.		12
LA-261	1	Spacer.	1	
* LA-1007	1	Lock.		4
* 0489	2	Rd. Hd. Screw 10-24 x 3/4"		3
0509	2	Hex. Nut 5/16"-18.		3
0533	1	Jam Nut 1/2"-20		3
0616	2	Oilless Bearing.		4
0641	1	Woodruff Key 5/32" x 7/8".		3
0712	1	Grooved Pin 1/8" x 3/8".		3

(*) NOT FURNISHED WITH REPLACEMENT REVERSE GEAR ASSEMBLY ORDER - MUST BE ORDERED SEPARATELY

NOT PART OF ABOVE ASSEMBLY - MUST BE ORDERED SEPARATELY				
LA-204	1	Change Gear 36T (Stud Gear)	1	

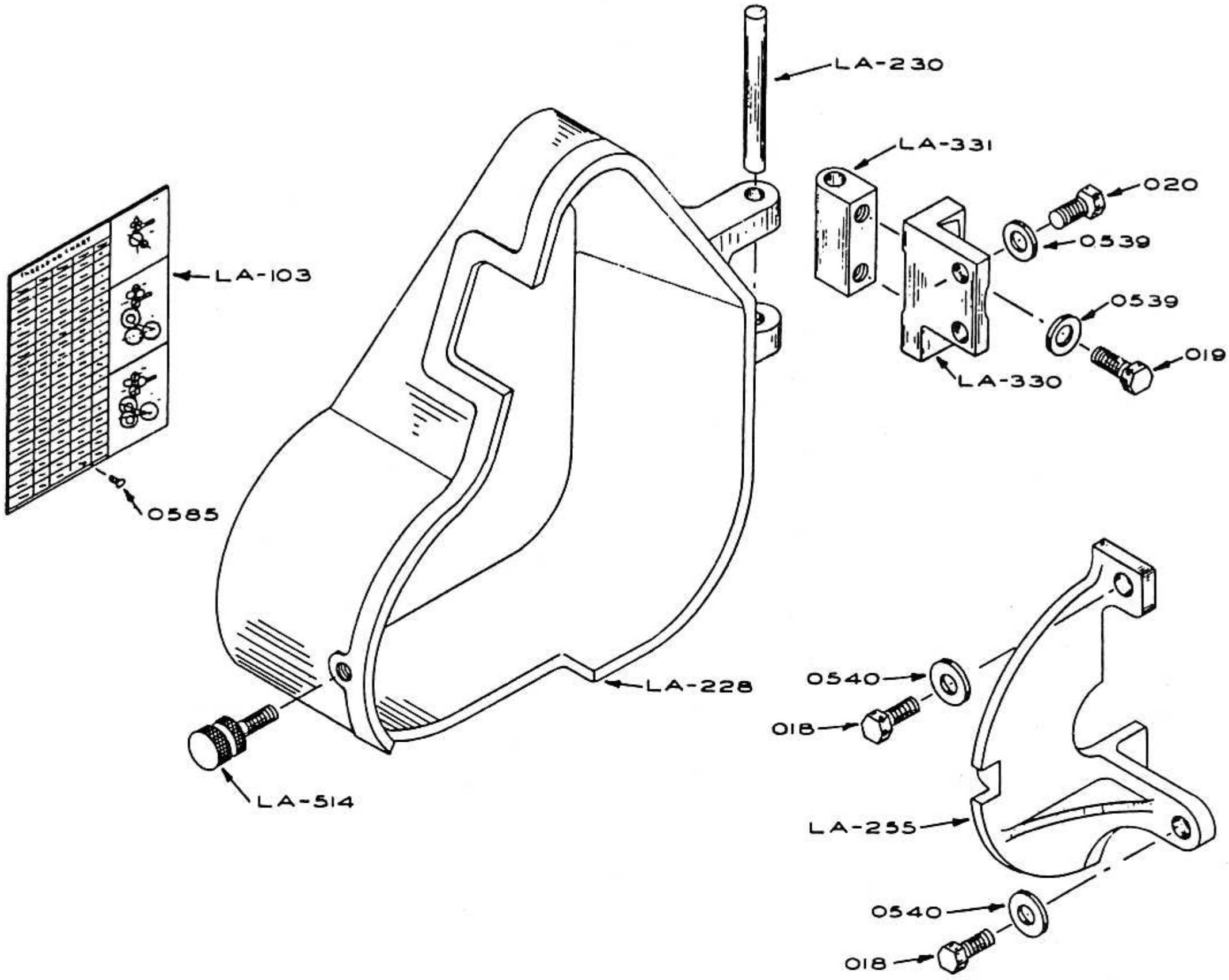
SUB-ASSEMBLY FOR ORDERING CONVENIENCE				
LA-137-2-A	1	Reverse Gear Bracket Assembly consists of: LA-135, LA-136, LA-137-2, LA-139, LA-140-2, LA-145	3	5

LA-3-1 TAILSTOCK ASSEMBLY



ILLUS. KEY	PART NUMBER	NO. REQ'D	DESCRIPTION	APPROX. SHIPPING WEIGHT LBS.	APPROX. SHIPPING WEIGHT OZS.
1	Q23-03307	1	Dead Center		8
2	LP-1239	1	Tailstock Spindle	1	8
3	Q19-00626	2	Ball Oiler, 1/4"		3
4	LP-1244	1	Dauber		3
5	Q23-03308	1	Tailstock Wrench	1	
6	LP-1321	1	Spindle Key		2
7	LP-1246	1	Hex Nut - Hardened		3
8	Q10-00543	1	Washer		3
9	LP-1311	1	Clamp	1	8
10	Q08-00147	1	Bolt, 1/2-13 x 4"		12
11	Q06-00461	2	Set Screw, 3/8-16 x 2"		4
12	LA-1066	1	Tailstock Base - Should be ordered with LA-105-1	5	
13	Q09-00531	1	Jam Nut, 3/8-24		3
14	Q21-03345	1	Handle		4
15	LP-1512	1	Handwheel w/ Handle	2	7
16	LP-1222	1	Screw Retainer		12
17	LA-105-1	1	Tailstock Top - Should be ordered with LA-1066	12	
18	Q12-00642	1	Woodruff Key		3
19	LP-1143	1	Tailstock Screw		8
20	LP-1336	1	Rubber Washer		3
21	LP-1278	1	Binding Stud		3
22	LP-1240	1	Binding Plug		6
23	LP-1217	1	Binding Lever		12

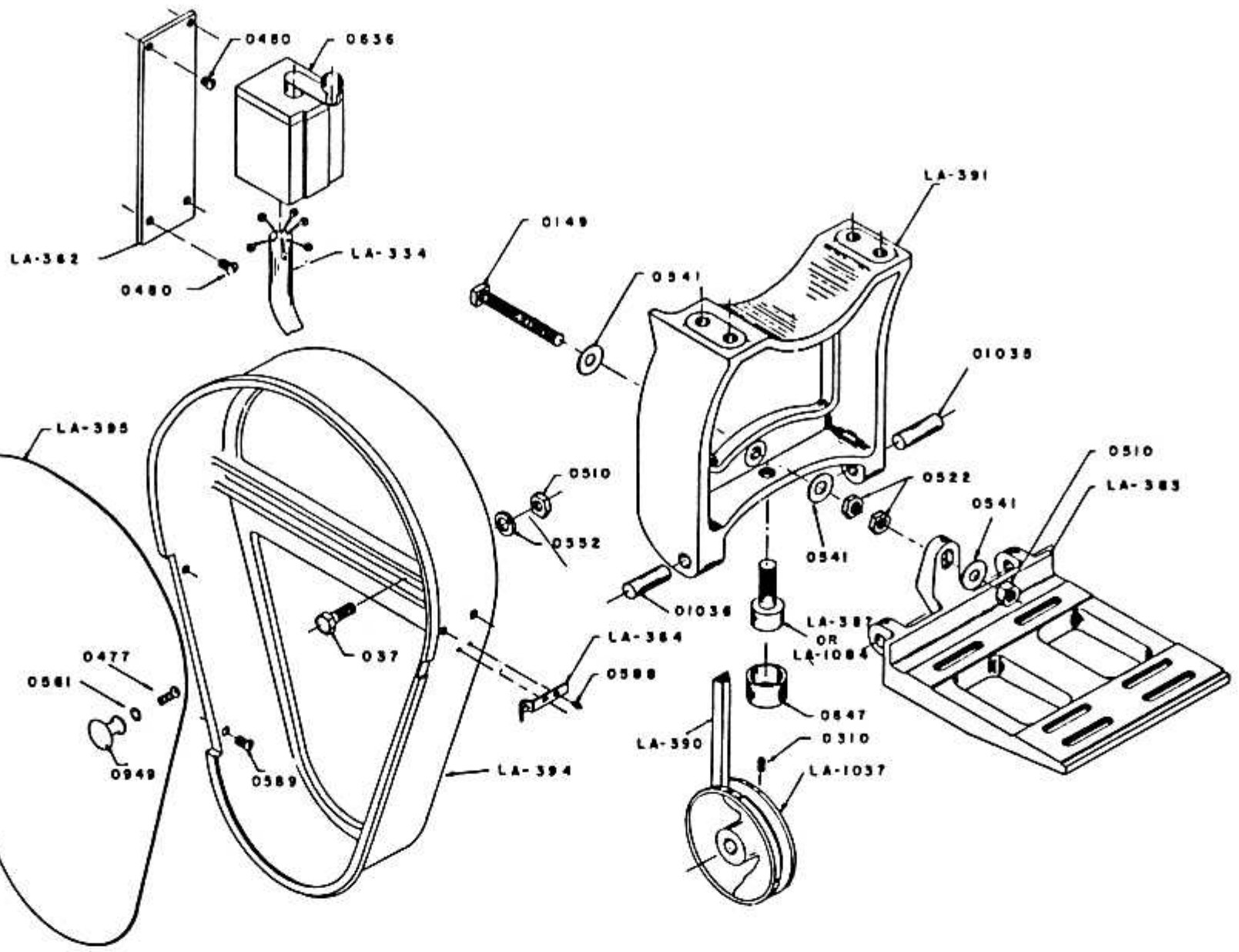
LA-23-1 GUARD ASSEMBLY



PART NUMBER	NO. REQ'D.	DESCRIPTION	SHIPPING WEIGHT LBS.	OZS.
LA-103	1	Threading Chart		6
LA-228	1	Change Gear Guard	15	4
LA-230	1	Hinge Pin		6
LA-255	1	End Guard	4	
LA-330	1	Hinge Bracket (See LA-330-A) . . .	1	
LA-331	1	Hinge Block	1	
LA-514	1	Knob		3
018	2	Hex. Hd. Cap Screw 5/16-18 x 3/4 .		3
019	2	Hex. Hd. Cap Screw 5/16-18 x 7/8 .		3
020	2	Hex. Hd. Cap Screw 5/16-18 x 1 . .		3
0539	4	Washer 11/32 x 3/4		3
0540	2	Washer 3/8 x 7/8 x 1/16		3
0585	2	Drive Screw #0 x 3/16		3

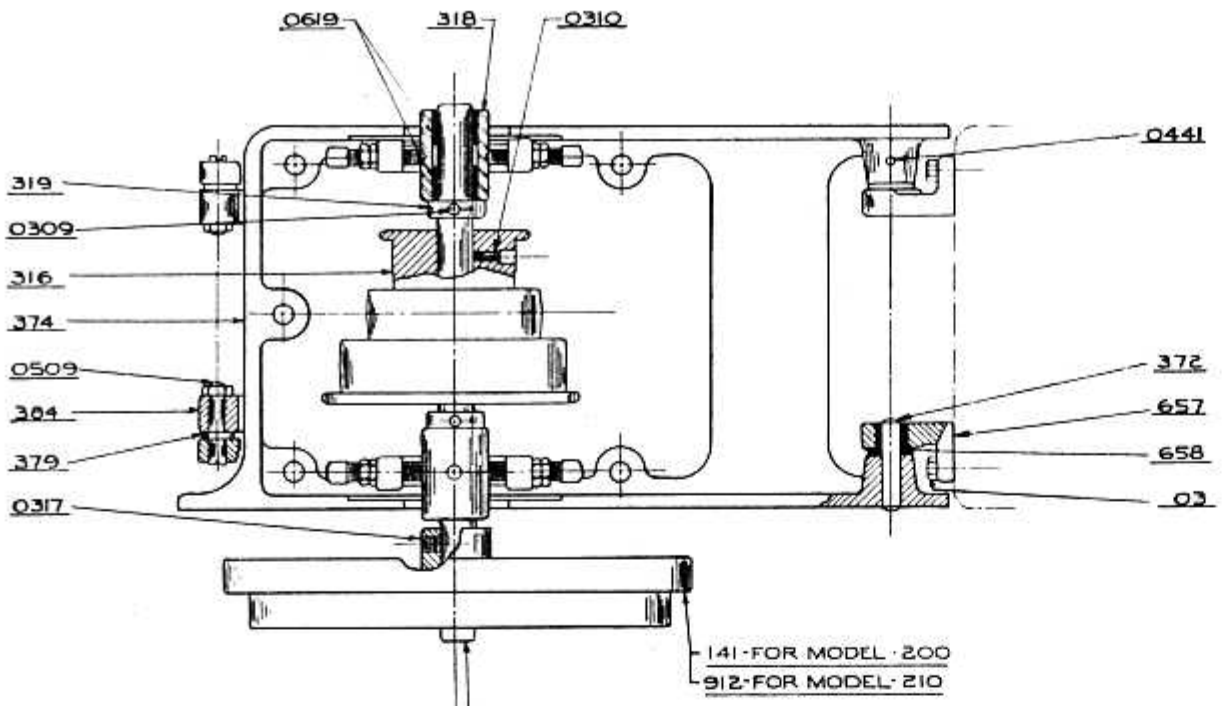
SUB-ASSEMBLY				
LA-330-A	1	Hinge Bracket Assembly Consists of LA-330, LA-331, (2) 019 & (2) 0539	2	

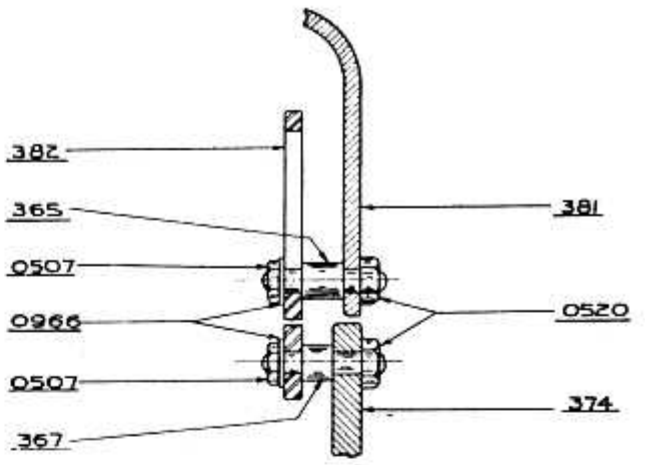
LA-17 BENCH STAND ASSEMBLY

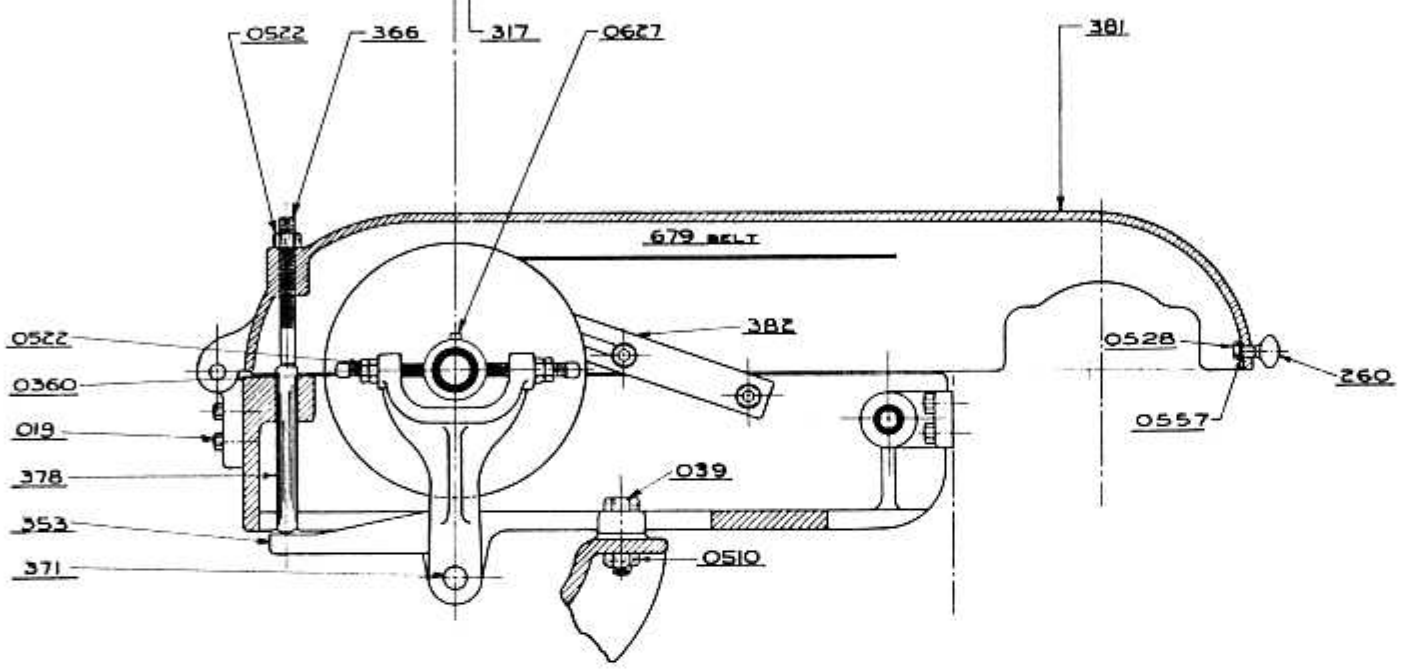


PART NUMBER	NO. REQ'D.	DESCRIPTION	SHIPPING WEIGHT LBS.	SHIPPING WEIGHT OZS.
LA-334	1	Cable w/6 of 0411 Terminals (30" - 6 Wire)	1	
LA-362	1	Switch Bracket.....	2	
LA-364	1	Spring.....		3
LA-383	1	Motor Bracket	10	
LA-387	1	Adjusting Screw (10" Lathes)		4
LA-390	1	V-Belt (40" x 1/2" x 17/32")		6
LA-391	1	Bench Stand	17	
LA-394	1	Guard Frame	20	8
LA-395	1	Guard Door w/LA-375 Hinge	5	
LA-1037	1	Motor Pulley w/0310 (Specify bore 1/2, 5/8 or 3/4"	3	
LA-1084	1	Adjusting Screw (11" lathes)		4
037	2	Hex. Hd. Cap Screw 3/8"-16 x 1 1/4".		3
0149	1	Sq. Hd. Machine Bolt 3/8"-16 x 3 1/2".....		3
0310	1	Soc. Set Screw 1/4"-20 x 3/8"		3
0477	1	Round Hd. Screw 8/32" x 1/2"		3
0480	4	Round Hd. Screw 1/4"-20 x 3/8".....		3
0510	3	Hex. Nut 3/8"-16		3
0522	2	Jam Nut 3/8"-16		3
0541	4	Washer 7/16" x 1" x 5/64".....		3
0552	2	Lockwasher 7/16" x 3/4"		3
0561	1	Lockwasher 11/64" x 11/32" (Internal Tooth).....		3
0588	2	Self-Tapping Screw, 6/32" x 1/4".....		3
0589	2	Self-Tapping Screw, 10/32" x 5/16".....		3
0636	1	Drum Reversing Switch.....	3	
0647	1	Rubber Foot.....		6
0949	1	Plastic Knob		3
01035	1	Split Pin 1/2" x 1-3/4".....		3
01036	1	Split Pin 1/2" x 2".....		3

LA-16 DRIVE BOX ASSEMBLY

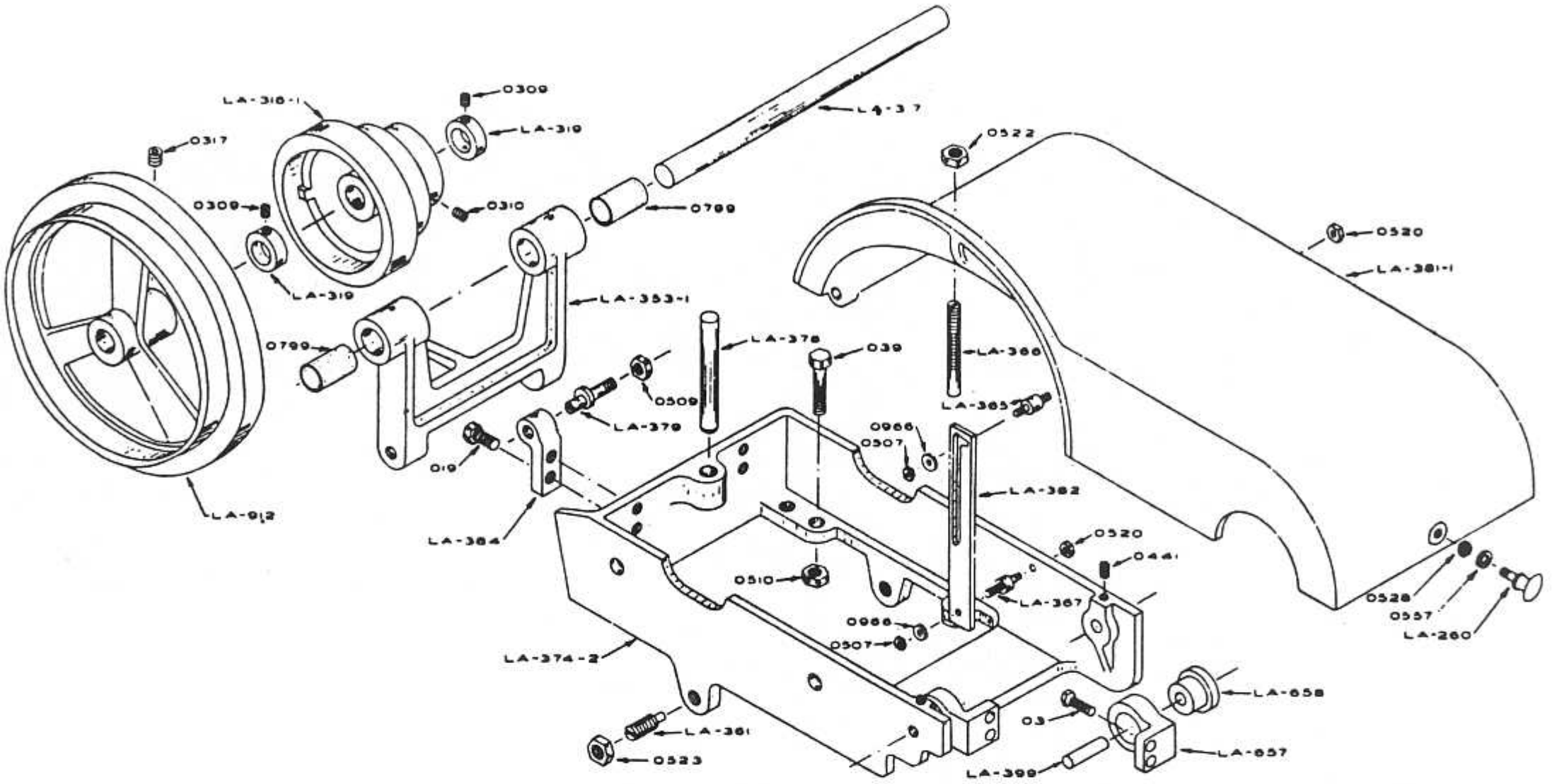






PART NO.	NO. REQ'D.	NAME OF PART	SHIP. WT. LBS.	SHIP. WT. OZ.	PRICE EACH
LA-260	1	Knob with 0528 and 0557.		2	
LA-316	1	Cone Pulley with 2 of 0310	7		
LA-317	1	Shaft.	2	3	
LA-318-A	2	Bearing with 0627 and 2 of 0619. . .	1	4	
LA-319	2	Collar		5	
LA-353	1	Countershaft Bracket	5		
LA-365	1	Shoulder Pin		3	
LA-366	1	Adjusting Screw.		3	
LA-367	1	Shoulder Pin		2	
LA-371	1	Shaft.	1		
LA-372	2	Pin.		6	
LA-374	1	Drive-Box.	19	8	
LA-378	1	Plunger.		5	
LA-379	2	Hinge Pin.		4	
LA-381	1	Drive Box Cover.	26		
LA-382	1	Stay Bar		6	
LA-384	2	Hinge Bracket.		6	
LA-657	2	Hinge Bracket.	1	3	
LA-658	2	Bushing 1"x1-3/8"x1"		3	
LA-679	1	Flat Belt (see Headstock Assembly).			
LA-912	1	Pulley with 0317	7	2	
03	4	Hex. Hd. Cap Screw 1/4-20x3/4. . . .		3	
019	4	Hex. Hd. Cap Screw 5/16-18x7/8 . . .		3	
039	4	Hex. Hd. Cap Screw 3/8-16x1-3/4. . .		3	
0309	2	Socket Set Screw 1/4-20x1/4.		3	
0310	2	Socket Set Screw 1/4-20x3/8.		3	
0317	1	Socket Set Screw 3/8-16x3/8.		3	
0360	4	Sq. Hd. Set Screw 3/8-16x1½.		4	
0441	2	Headless Set Screw 1/4-20x3/8. . . .		3	
0507	2	Hex. Nut 10-32		1	
0509	2	Hex. Nut 5/16-18		3	
0510	4	Hex. Nut 3/8-16.		3	
0520	3	Jam Nut 1/4-20		3	
0522	5	Jam Nut 3/8-16		3	
0528	1	Jam Nut 12-24-7/16x5/32.		3	
0557	1	Washer 7/32x13/32.		3	
0619	4	Oilless Bearing.		6	
0627	2	Oil Cup.		3	
0966	2	Washer 13/64x1/2x.049.		3	

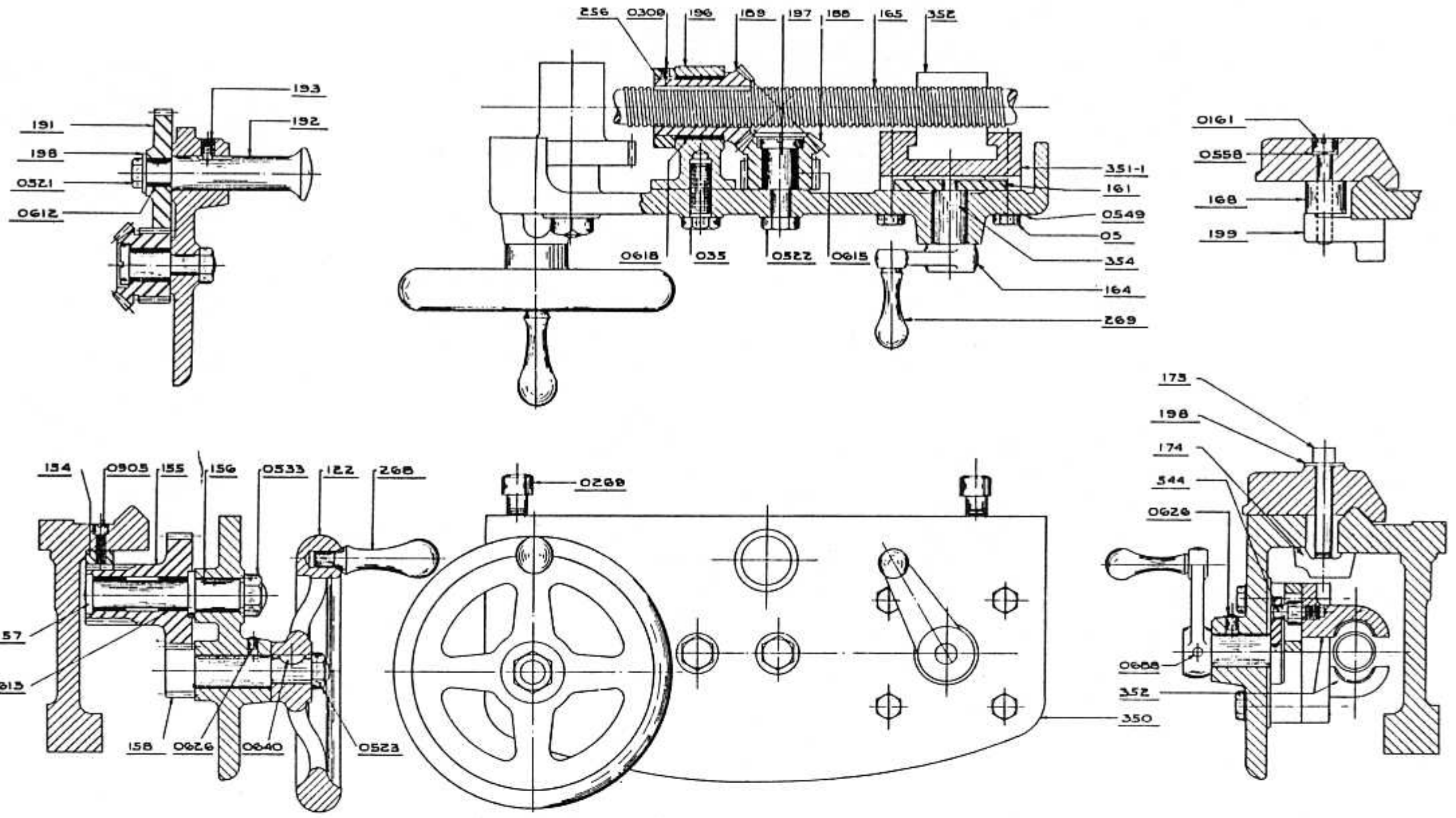
LA-16-2 DRIVE BOX ASSEMBLY



PART NO.	NO. REQ'D	NAME OF PART	SHIP.WT. LBS.	SHIP.WT. OZ.
LA-260-A	1	Knob with 0528 & 0557		2
LA-316-1 -A	1	Cone Pulley with 2 of 0310. . . .	7	
LA-317	1	Shaft	2	3
LA-319-A	2	Collar with 0309.		5
LA-353-1 -A	1	Counter-shaft Bracket w/2 of 0799	5	
LA-361	2	Pivot Screw . . .		3
LA-365	1	Shoulder Pin. . .		3
LA-366	1	Adjusting Screw .		3
LA-367	1	Shoulder Pin. . .		2
LA-374-2	1	Drive Box	19	8
LA-338	1	Plunger		5
LA-379	2	Hinge Pin		4
LA-381-1	1	Drive Box Cover .	26	
LA-382	1	Stay Bar.		6
LA-384	2	Hinge Bracket . .		6
LA-399	2	Pin		5
LA-657	2	Bracket	1	3
LA-658	2	Rubber Bushing. .		3
LA-912-A	1	Pulley w/0317 . .	7	2
03	4	Hex. Hd. Cap Scr. 1/4-20 x 3/4 . .		3

PART NO.	NO. REQ'D	NAME OF PART	SHIP.WT. LBS.	SHIP.WT. OZ.
019	4	Hex. Hd. Cap Scr. 5/16-18 x 7/8. .		3
039	4	Hex. Hd. Cap Scr. 3/8-16 x 1-3/4 .		3
0309	2	Socket Set Scr. 1/4-20 x 1/4 . .		3
0310	2	Socket Set Scr. 1/4-20 x 3/8 . .		3
0317	1	Socket Set Scr. 3/8-16 x 3/8 . .		3
0441	2	Headless Set Scr. 1/4-20 x 3/8 . .		3
0507	2	Hex Nut 10-32 . .		3
0509	2	Hex. Nut 5/16-18.		3
0510	4	Hex. Nut 3/8-16 .		3
0520	2	Jam Nut 1/4-20. .		3
0522	1	Jam Nut 3/8-16. .		3
0523	2	Jam Nut 7/16-14 .		3
0528	1	Jam Nut 12-24 . .		3
0557	1	Washer 7/32 hole 13/32 Dia. . . .		3
0799	2	Oilless Bushing .		4
0966	2	Washer 13/64 hole 1/2 Dia.		3

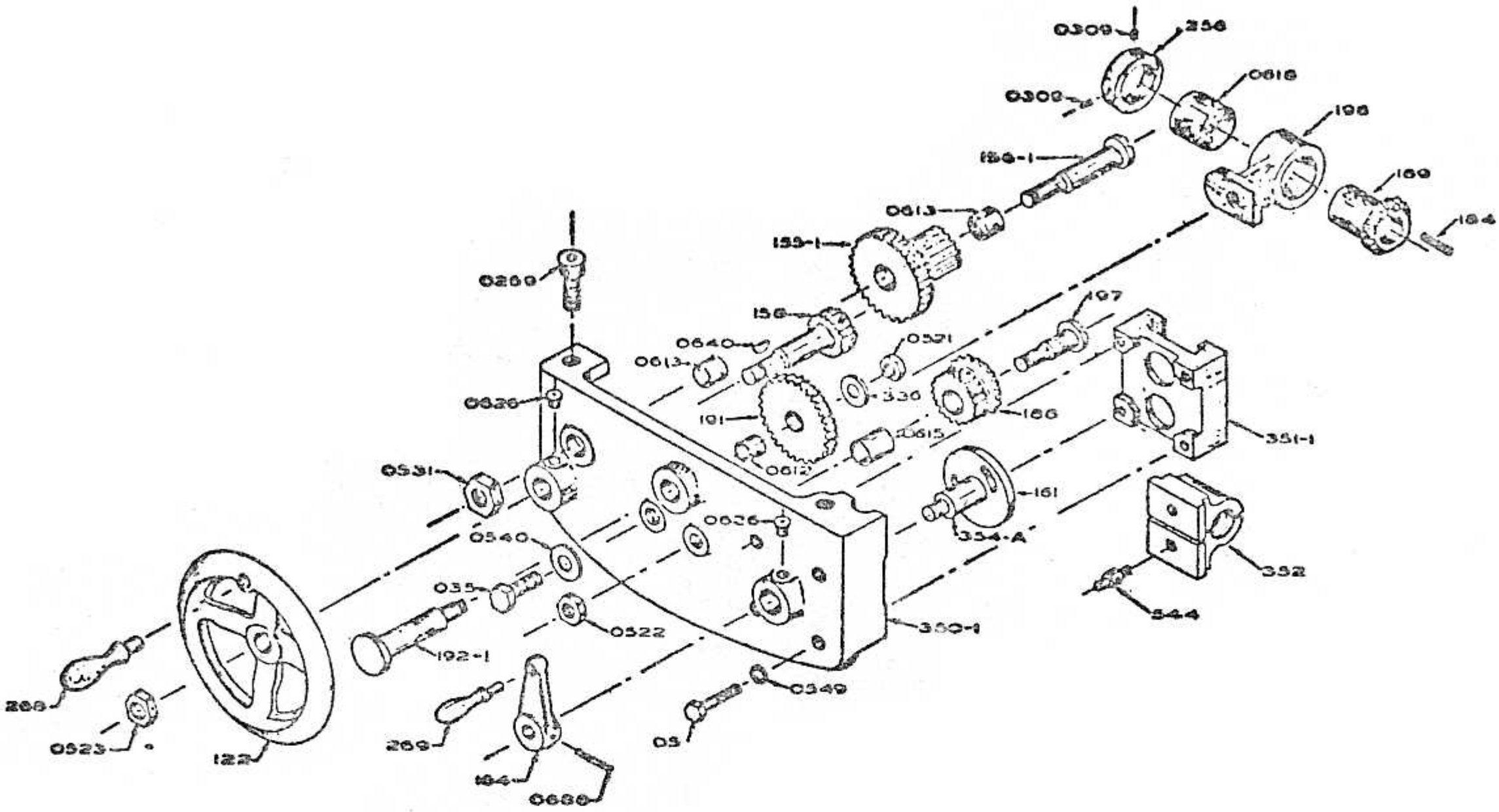
LA-15 APRON ASSEMBLY



PART NO.	NO. REQ'D	NAME OF PART	SHIP.WT. LBS.	SHIP.WT. OZ.	PRICE EACH
LA-122-A	1	Apron Handwheel with 268	3		
LA-154	1	Rack (See Lathe Bed)....			
LA-155-A	1	Rack Pinion Gear Assembly Consists of: LA-155, LA-156, LA-157	1	11	
LA-156	1	Rack Pinion Stud (See 155-A).....			
LA-157	1	Washer (See 155-A).....			
LA-158	1	Handwheel Pinion.....	1		
LA-161	1	Cam (See 354-A).....			
LA-164	1	Cam Shaft Lever.....		8	
LA-165	1	Lead Screw (See Lathe Bed).....			
LA-168	1	Gib Spacer.....		8	
LA-174	1	Saddle Lock Nut (See Saddle).....			
LA-175	1	Saddle Lock Screw (See Saddle).....			
LA-188-A	1	Miter Gear with 0615....		14	
LA-189	1	Miter Gear with Key.....		8	
LA-191-A	1	Idler Shift Gear with 0612.....	1		
LA-192	1	Idler Shifter Shaft.....		8	
LA-193	1	Lock Screw.....		3	
LA-196-A	1	Bearing with 0618.....	1		
LA-197	1	Stud.....		6	
LA-198	2	Washer (See Saddle).....			
LA-199	1	Front Gib.....	1	4	
LA-256	1	Collar with 2 of 0309...		5	
LA-268	1	Handle.....		6	
LA-269	1	Handle.....		4	

PART NO.	NO. REQ'D	NAME OF PART	SHIP.WT. LBS.	SHIP.WT. OZ.	PRICE EACH
LA-350	1	Apron.....	8		
LA-351-1	1	Half Nut Plate.....	1		
LA-352	1	Half Nut with 2 of 544..	1	8	
LA-354-A	1	Cam Shaft & Cam 161.....	1		
LA-544	2	Half Nut Pin.....		3	
05	4	Hex. Hd. Cap Screw 1/4-20 x 1.....		3	
035	1	Hex. Hd. Cap Screw 3/8-16 x 7/8.....		3	
0161	2	Fil. Hd. Cap Screw 1/4-20 x 1-3/4.....		3	
0269	2	Socket Hd. Cap Screw 3/8-16 x 1.....		3	
0309	1	Socket Set Screw 1/4-20 x 1/4.....		3	
0521	1	Jam Nut 5/16-18.....		3	
0522	1	Jam Nut 3/8-16.....		3	
0523	1	Jam Nut 7/16-14.....		3	
0533	1	Jam Nut 1/2-20.....		3	
0549	4	Lock Washer 1/4 x 7/16..		3	
0558	2	Lock Washer 1/4.....		3	
0612	1	Oilless Bearing.....		3	
0613	2	Oilless Bearing.....		3	
0615	1	Oilless Bearing.....		4	
0618	1	Oilless Bearing.....		6	
0626	2	Oil Cup.....		3	
0640	1	Woodruff Key 1/8 x 1/2..		3	
0688	1	Pin 1/8 x 1.....		3	
0905	1	Fil. Hd. Screw (See Lathe Bed).....			

LA-15-1 APRON ASSEMBLY

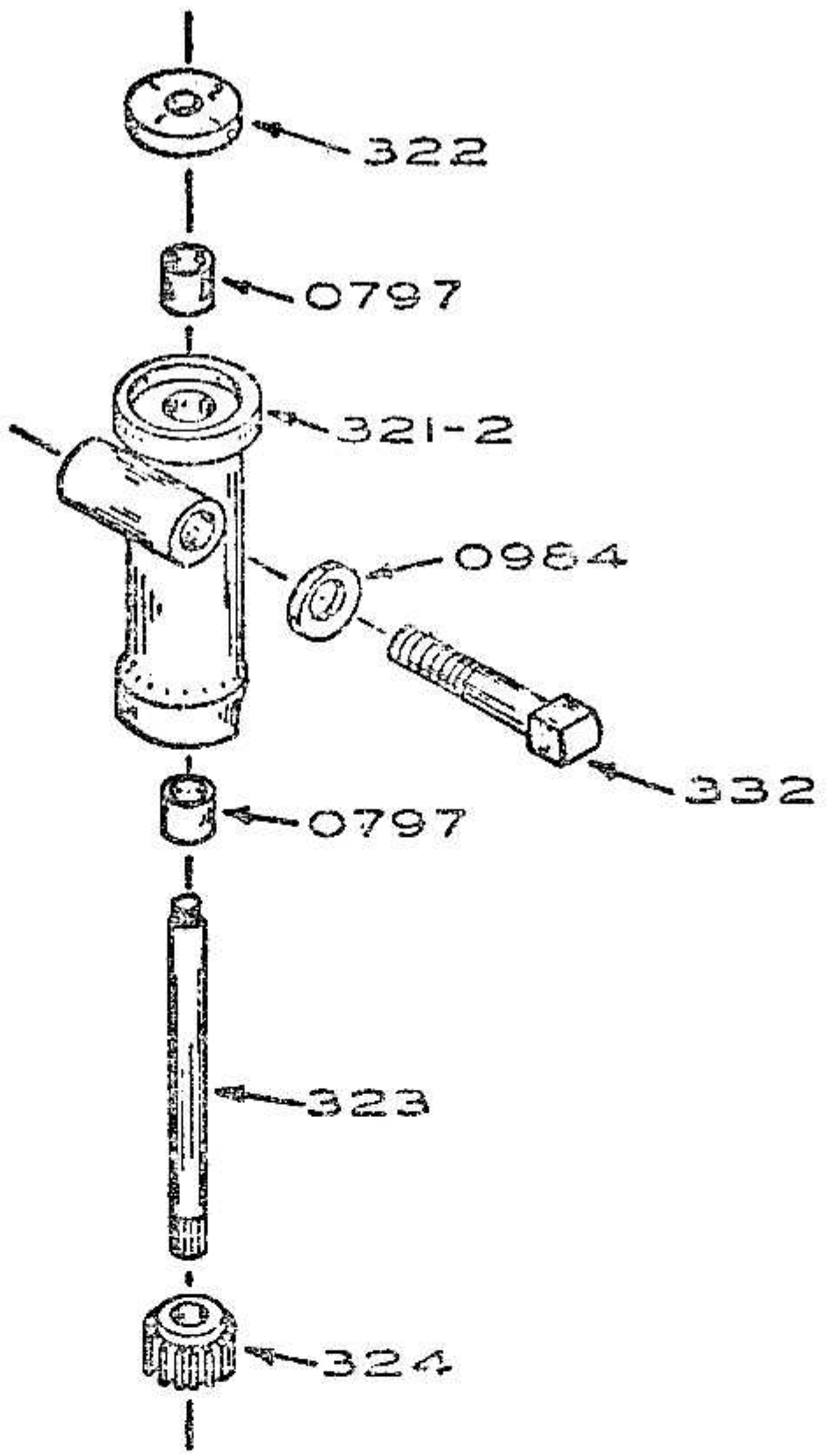


PART NO.	NO. REQ'D		SHIP WT. LBS.	SHIP WT. OZ.
LA-122	1	Handwheel w/268.....	3	
LA-154	1	Rack (See Lathe Bed)..		
LA-155-1	1	Rack Pinion Gear w/2 of 0613.....	1	11
LA-156-1	1	Rack Pinion Stud.....		8
LA-158	1	Handwheel Pinion.....	1	
LA-161	1	Cam (See 354-A).....		
LA-164	1	Cam Shaft Lever.....		8
LA-188	1	Miter Gear w/0615.....		14
LA-189	1	Miter Gear w/LA-184...		8
LA-191	1	Idler Shift Gear w/0612.....	1	
LA-192-1	1	Idler Shifter Shaft...		8
LA-196	1	Bearing w/0618.....	1	
LA-197	1	Stud.....		6
LA-256	1	Collar w/2 of 0309....		5
LA-268	1	Handle.....		6
LA-269	1	Handle.....		4
LA-336	1	Washer.....		3
LA-350-1	1	Apron.....	8	
LA-351-1	1	Half Nut Plate.....	1	8
LA-352-A	1	Half Nut w/2 of 544...	1	8
LA-354-A	1	Cam Shaft & Cam.....		
LA-544	2	Half Nut Pin (Also see LA-352-A).....		3

PART NO.	NO. REQ'D		SHIP WT. LBS.	SHIP WT. OZ.
05	4	Hex. Hd. Cap Screw 1/4-20 x 1.....		3
035	1	Hex. Hd. Cap Screw 3/8-16 x 7/8.....		3
0269	2	Socket Hd. Cap Screw 3/8-16 x 1.....		3
0309	2	Socket Set Screw 1/4-20 x 1/4.....		3
0521	1	Jam Nut 5/16-18.....		3
0522	1	Jam Nut 3/8-16.....		3
0523	1	Jam Nut 7/16-14.....		3
0531	1	Jam Nut 3/8-24.....		3
0540	1	Washer.....		3
0549	4	Lockwasher 1/4 x 7/16.....		3
0612	1	Oilless Bearing.....		3
0613	2	Oilless Bearing.....		3
0615	1	Oilless Bearing.....		4
0618	1	Oilless Bearing.....		6
0626	2	Oil Cups.....		3
0640	1	Woodruff Key 1/8 x 1/2.....		3
0688	1	Pin 1/8 x 1.....		3
0905	1	Fill. Hd. Screw (See Lathe Bed)...		

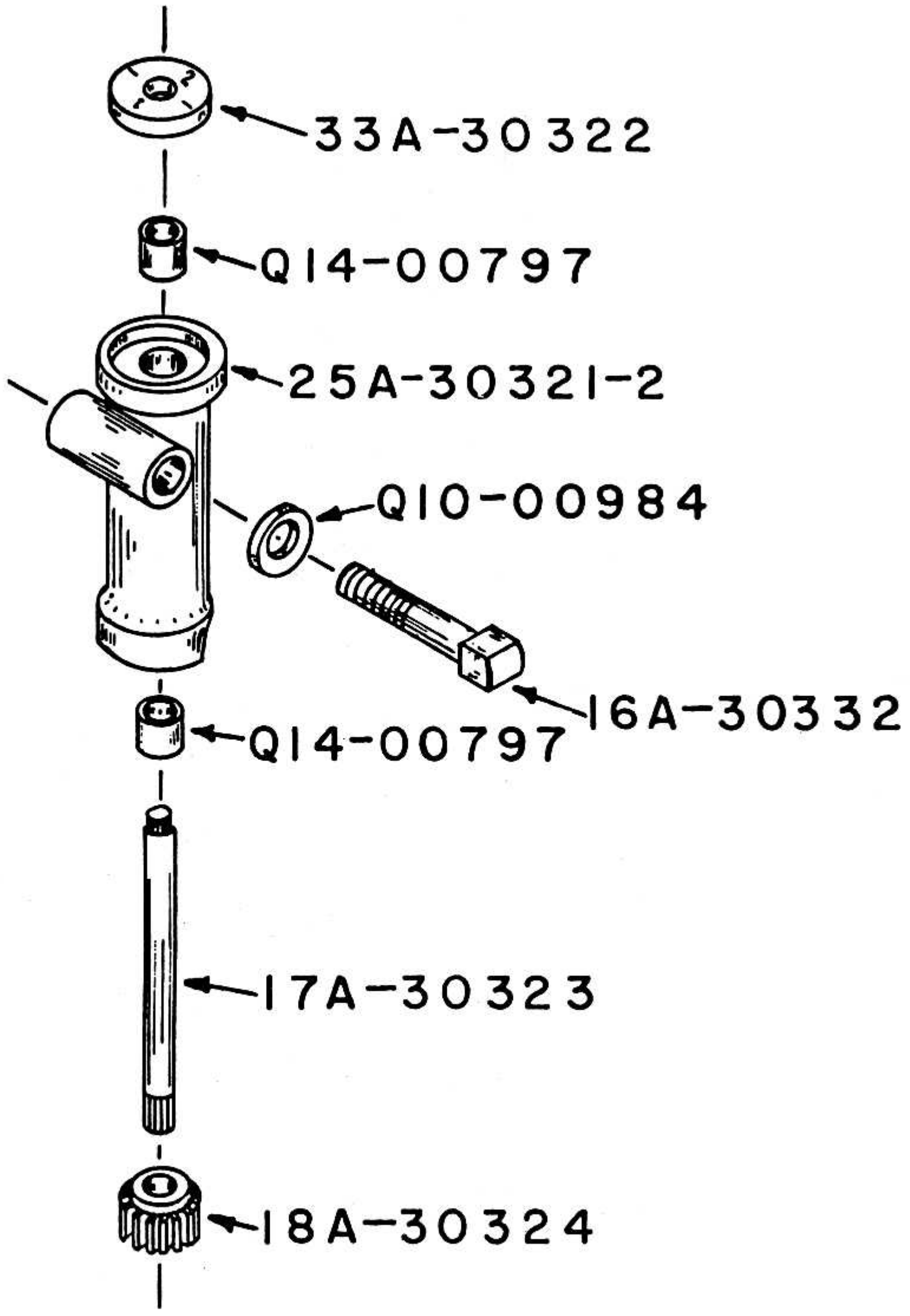
LA-12-2 THREADING DIAL ASSEMBLY

MODELS
200 –210
201 –211



PART NO.	NO. REQ'D	DESCRIPTION	SHIP LBS.	WT. OZ.
LA-321-2	1	Housing with 2-#0797		14
LA-322	1	Dial		3
LA-323	1	Shaft		6
LA-324	1	Gear		3
LA-332	1	Screw		4
0797	2	Oilless Bearing		3
0984	1	Washer		2

LA 12-2 DIAL INDICATOR ASSEMBLY



B. M. 2-1325			DRWG. NO. 1A-30012-2	
PART NUMBER	QUANTITY	DESCRIPTION	SHIPPING WEIGHT LBS.	SHIPPING WEIGHT OZS.
16A-30332	1	Screw		4
17A-30323	1	Shaft		6
18A-30324	1	Gear		3
25A-30321-2	1	Housing with 2 - Q14-00797		14
33A-30322	1	Dial		3
Q10-00984	1	Washer		2
Q14-00797	2	Oilless Bearing		3

LA 1083 BENCH STAND & GUARD ASSEMBLY

B.M.K-1320
B.M.K-1331

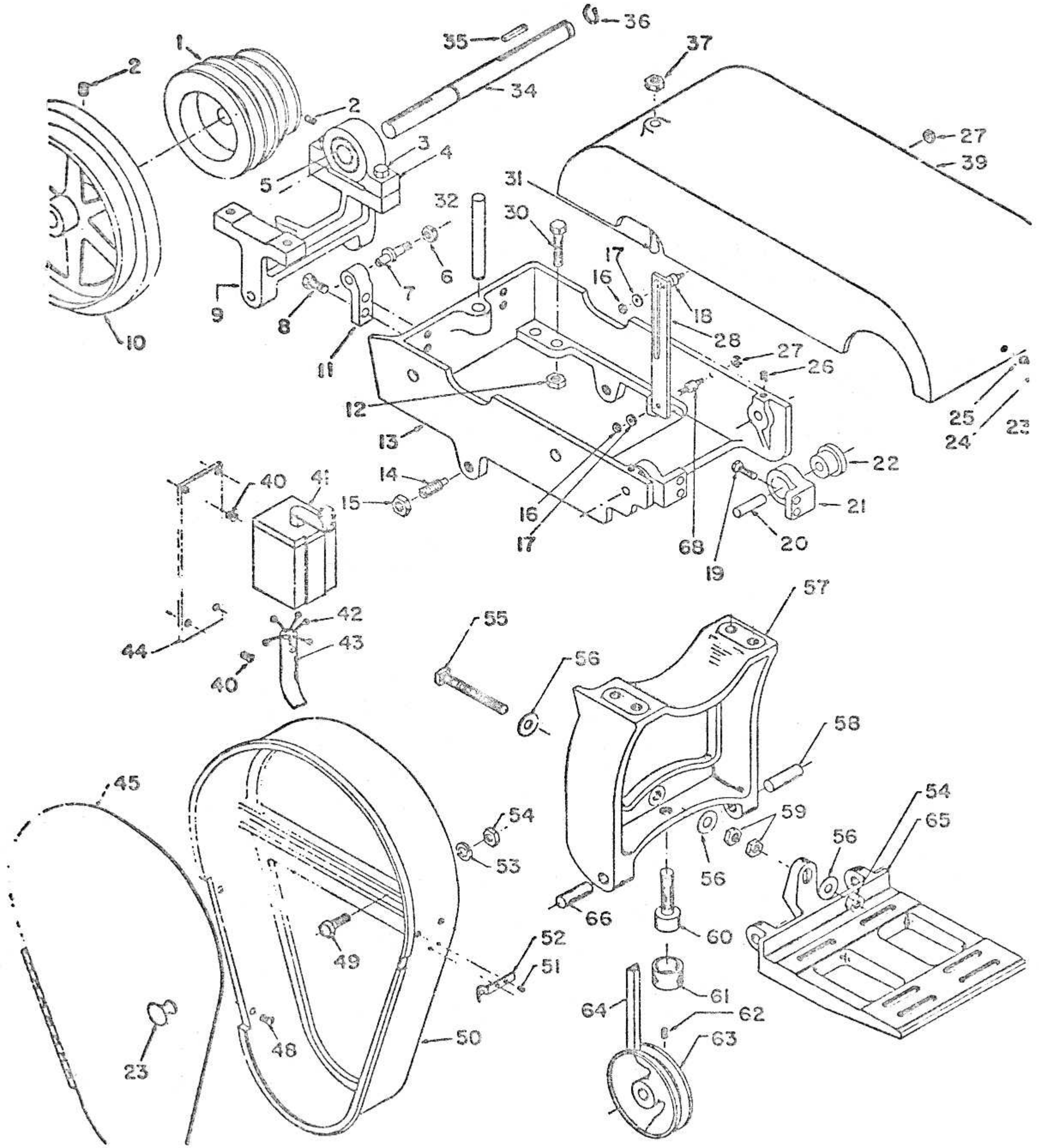
DRWG. 1D-31083

No.	Part Number	Description	Stock Number	Qty.	Weight Lbs.	Weight Ozs.
* 1	LA603	Countershaft Pulley .	20A-30603	1	8	4
2	0310	Soc. Set Screw	Q06-00310	1		3
3	021	Hex. Hd. Screw	Q01-00021	4		3
4	2122	Pillow Block	31A-32122	2	1	4
5	0676	Bearing	Q13-00676	2		8
6	0509	Hex Nut	Q09-00509	2		3
7	LA379	Hinge Pin	37A-30379	2		4
8	019	Hex. Hd. Screw	Q01-00019	4		3
9	LA340	Countershaft Brkt. . .	23C-30340	1	4	11
10	LA1036	Countershaft Pulley. .	20C-31036	1	4	
11	LA384	Hinge Bracket	23A-30384	2		6
12	0510	Hex Nut	Q09-00510	4		3
13	LA374-2	Drive Box	10D-31318	1	19	8
14	LA361	Pivot Screw	17A-30361	2		4
15	0523	Jam Nut	Q09-00523	2		3
16	0507	Hex Nut	Q09-00507	2		3
17	0966	Washer	Q10-00966	2		3
18	LA367	Shoulder Pin	37A-30367	1		3
** 19	03	Hex Hd Cap Screw . .	Q01-00003	4		3
20	LA399	Pin	37A-30399	2		3
** 21	LA1023	Hinge Bracket	23A-31023	2		6
22	LA658	Bushing	19A-30658	2		3
23	0949	Knob	Q21-00949	2		3
24	0561	Lockwasher	Q10-00561	2		3
25	0478	Rd. Hd. Screw	Q04-00478	1		3
26	0441	Set Screw	Q06-00441	2		3
27	0520	Jam Nut	Q09-00520	2		3
28	LA382	Stay Bar	22A-30382	1		6
30	039	Hex Hd Cap Screw . .	Q01-00039	4		3
31	LA366	Screw	16A-30366	1		3
32	LA338	Plunger	36A-30338	1		4
34	LA339	Shaft	17A-30339	1	1	4
35	2137	Key	15A-32137	2		3
36	0932	Tru Arc Ring	Q15-00932	2		3
37	0522	Jam Nut	Q09-00522	1		3
*39	LA651-2	Drive Box Cover . . .	08D-31332	1	37	
40	0480	Rd. Hd. Screw	Q04-00480	2		3
41	0636	Drum Switch	Q16-00636	1	3	
42	0411	Terminal Lug	Q16-00411	6		3
43	LA334	Cable Wire	41A-30334	1	1	
44	LA362	Switch Bracket	23A-30362	1	2	
45	LA395	Guard Door	08C-30395	1	5	
48	0589	Self Tapping Screw . .	Q07-00589	2		3
49	037	Hex. Hd. Cap Screw .	Q01-00037	2		3
50	LA394	Guard Frame	08C-30394	1	20	
51	0588	Screw	Q07-00588	2		3
52	LA364	Spring	36A-30364	1		3
53	0552	Lockwasher	Q10-00552	2		3
54	0510	Hex Nut	Q09-00510	3		3
55	0149	Sq. Hd. Bolt	Q08-00149	1		3
56	0541	Washer	Q10-00541	4		3
57	LA391	Bench Stand	04D-30391	1		17
58	01035	Pin	Q11-01035	1		3
59	0522	Jam Nut	Q09-00522	2		3
*60	LA387	Adjusting Screw	16A-30387	1		4
61	0647	Rubber Foot	Q22-00647	1		6
62	0311	Soc. Set Screw	Q06-00311	2		3
**63	LA1037	Motor Pulley . . . . . Specify Bore Size	20A-31037	1	3	
64	LA390	V Belt	20A-30390	1	1	
65	LA383	Hinge Bracket	23D-30383	1	10	
66	01036	Pin	Q11-01036	1		3
68	LA365	Shoulder Pin	37A-30365	1		4
		NOTE:				
*		For 11" Lathes Order				
1	LA1145	Countershaft Pulley .	20C-31145	1	8	4
39	LA1035-1	Drive Box Cover . . .	08D-31343	1	37	
60	LA1084	Adjusting Screw	16A-31084	1		4

** Not included when ordering complete assembly.

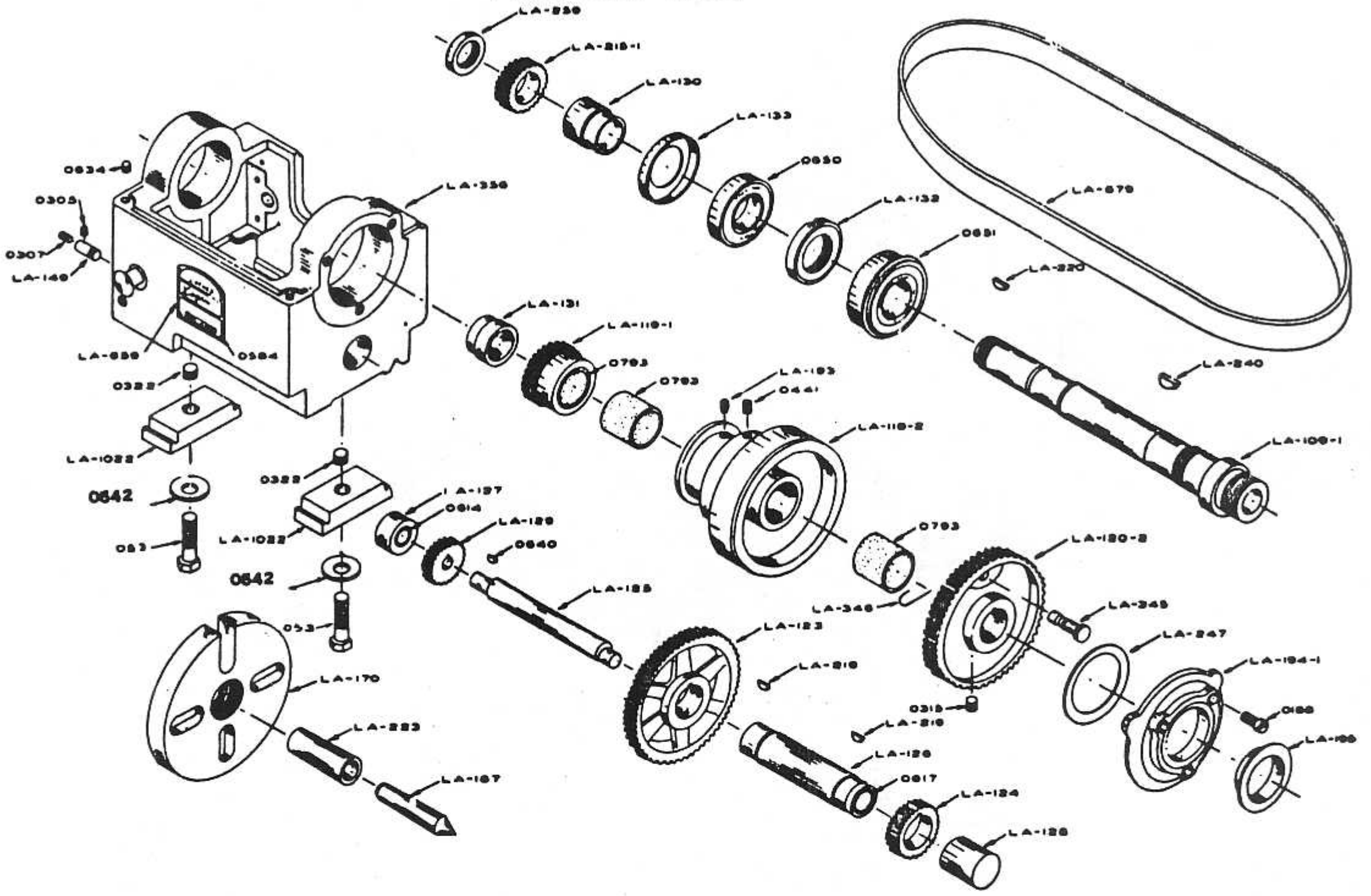
10" & 11" Bench and Floor models

LA 1083 BENCH STAND & GUARD ASSEMBLY



LA-108-2 HEADSTOCK ASSEMBLY

FROM SER.#48577

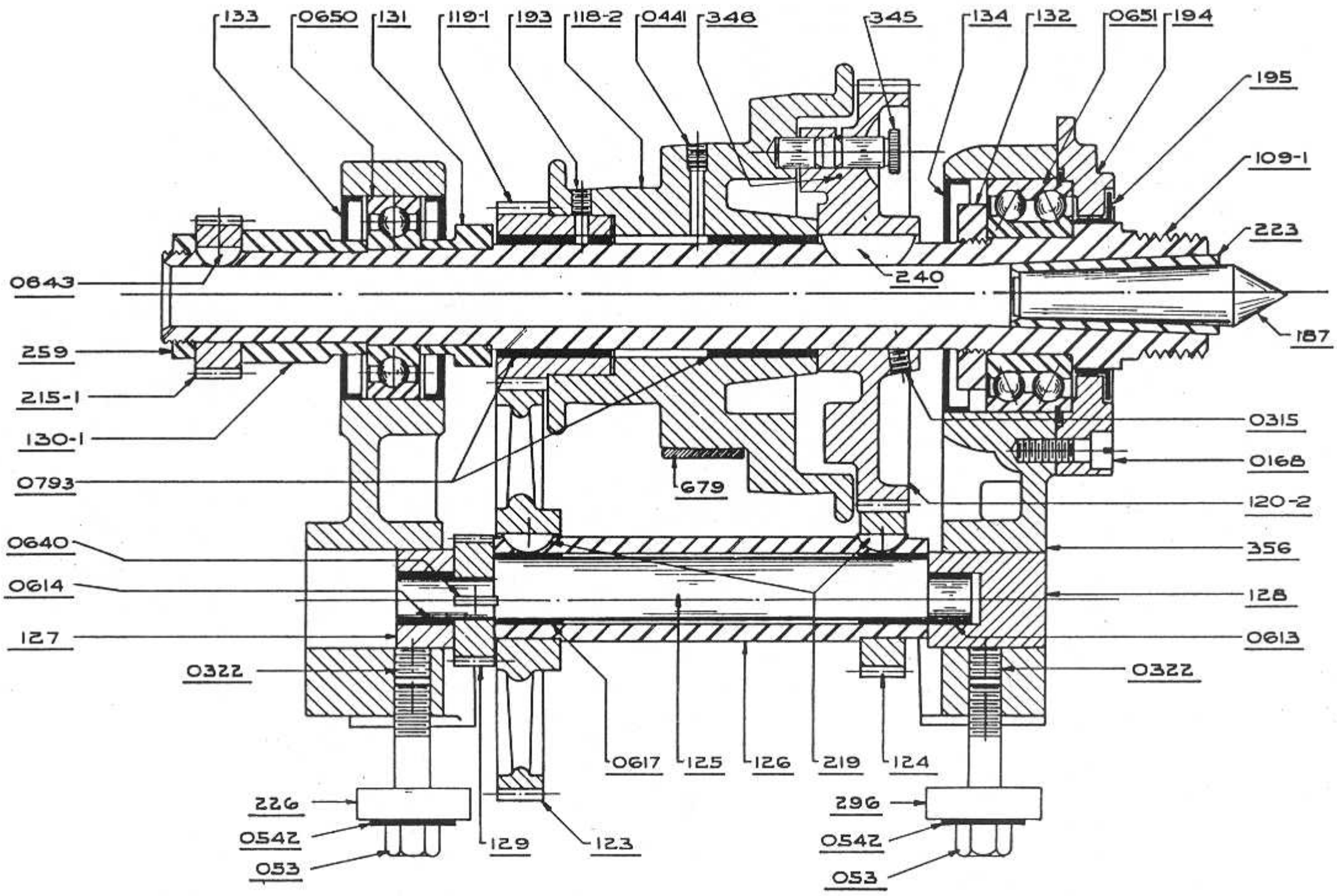


PART NO.	NO, REQ'D.	NAME OF PART	SHIP. WT. LBS.	OZ.
LA-109-1	1	Spindle.....	3	12
LA-118-2	1	Cone Pulley & Cone Pinion Assembly, Consists of: LA-118-2, 119-1, 193, 0441, & 2 of 0793.....	9	
LA-119-1	1	Cone Pinion Gear w/0793....		8
LA-120-2	1	Bull Gear Assembly, Consists of LA-120-2, LA-346, 345, & 0315.....	3	8
LA-123	1	70T, Back Gear.....	3	8
LA-124	1	28T, Back Gear.....		8
LA-125	1	Eccentric Shaft.....	1	12
LA-126	1	Quill Sleeve with 2 of 0617.....	1	14
LA-127	1	Bushing with 0614.....		8
LA-128	1	Bushing with 0613.....		12
LA-129	1	Shifter Gear.....		10
LA-130	1	Retaining Collar.....		12
LA-131	1	Retaining Collar.....		8
LA-132	1	Take-Up Nut.....		14
LA-133	2	Bearing Cover.....		4
LA-149	2	Stop Pin w/0305 & 0307....		3
LA-170	1	6" Face Plate.....	4	4
LA-187	1	Center.....		10
LA-193	1	Lock Screw.....		3
LA-194-1	1	End Bearing Cap.....	2	4
LA-195	1	Grease Seal Cap.....		4
LA-215-1	1	Spindle Gear.....		8
LA-219	2	Key.....		3
LA-220	1	Key.....		3
LA-223	1	Sleeve.....		12
LA-240	1	Key.....		3
LA-247	1	Spring Washer.....		

PART NO.	No. REQ'D.	NAME OF PART	SHIP. WT. LBS.	OZ.
LA-259	1	Take-up Nut.....		4
LA-345	1	Plunger.....		6
LA-346	1	Spring.....		4
LA-356-1	1	Headstock.....	25	
LA-659	1	Name Plate.....		4
LA-679	1	Flat Belt.....		8
LA-1022	2	Clamp.....		8
053	2	Hex. Hd. Cap Screw 7/16-14x1½.....		3
0168	3	Fil. Hd. Cap Screw 5/16-18x5/8.....		3
0305	2	Socket Set Screw 10-32x 3/16.....		3
0307	2	Socket Set Screw 10-32x3/8.....		3
0315	1	Socket Set Screw 5/16-18x3/8.....		3
0322	2	Socket Set Screw 7/16-14x5/16.....		3
0441	1	Headless Set Screw ¼-20x3/8.....		3
0542	2	Washer.....		3
0584	4	Drive Screw.....		3
0613	1	Oiless Bearing.....		3
0614	1	Oiless Bearing.....		3
0617	2	Oiless Bearing.....		4
0634	2	Rubber Bumper.....		3
0640	1	Woodruff Key 1/8x1/2....		3
0643	1	Key.....		3
0650	1	Ball Bearing #77506.....		14
0651	1	Ball Bearing #45507.....	1	12
0793	3	Oiless Bearing.....		5

LA-108-1 HEADSTOCK ASSEMBLY

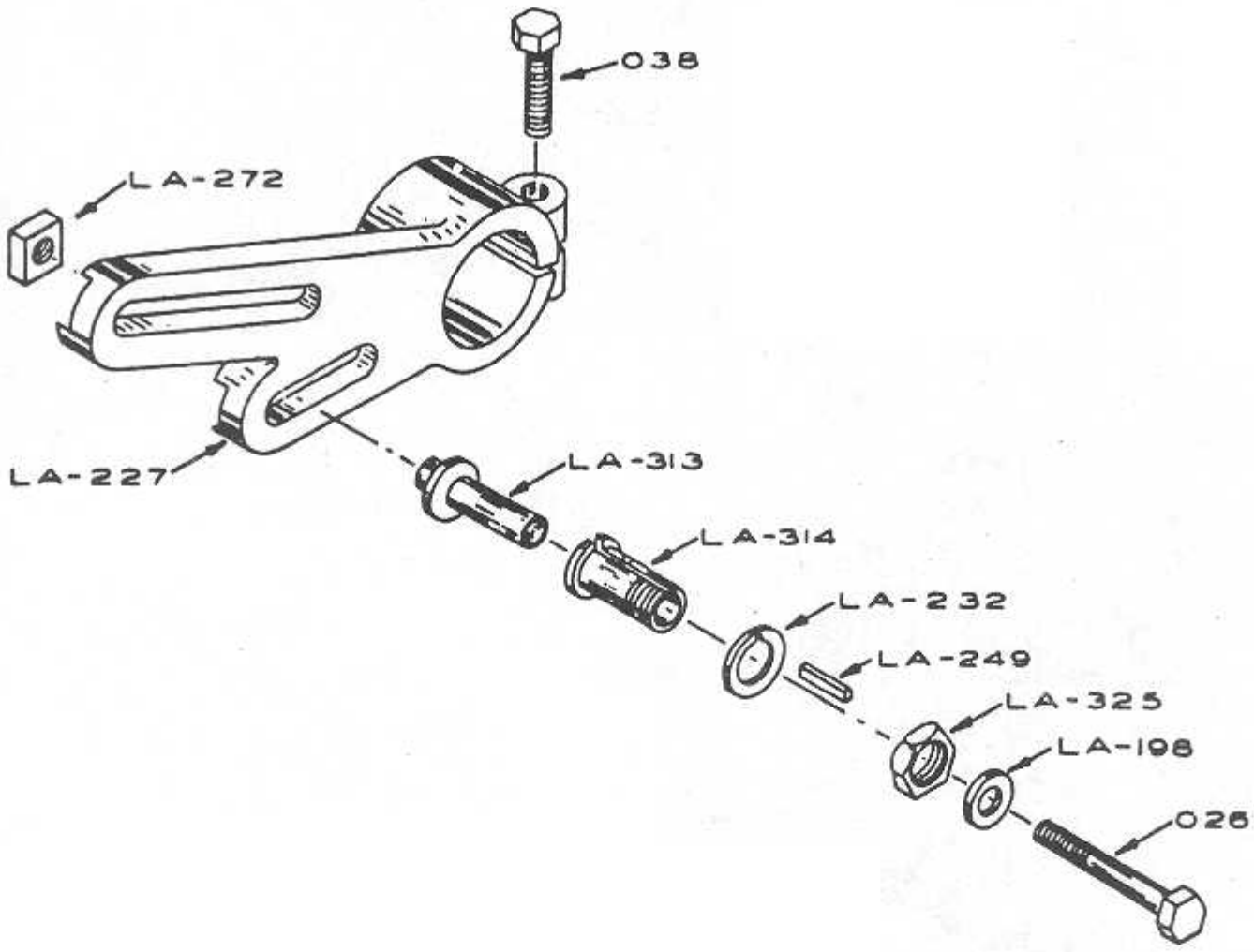
TO SER.#48577



PART NO.	NO. REQ'D	NAME OF PART	SHIP.WT. LBS.	SHIP.WT. OZ.	PRICE EACH
LA-109-1	1	Spindle.....	3	12	
LA-118-2-A	1	Cone Pulley & Cone Pinion Assembly, Consists of: LA-118-1, 119-1, 193, 0441, & 2 of 0793.....	9		
LA-119-1	1	Cone Pinion Gear w/0793..	1		
LA-120-2-A	1	Bull Gear Assembly, Consists of: LA-120-2, 345, 346, & 0315.....	3	8	
LA-123	1	70T. Back Gear.....	3	8	
LA-124	1	28T. Back Gear.....		8	
LA-125	1	Eccentric Shaft.....	1	12	
LA-126	1	Quill Sleeve with 2 of 0617.....	1	14	
LA-127	1	Bushing with 0614.....		8	
LA-128	1	Bushing with 0613.....		12	
LA-129	1	Shifter Gear.....		10	
LA-130-1	1	Retaining Collar.....		12	
LA-131	1	Retaining Collar.....		8	
LA-132	1	Take-Up Nut.....		14	
LA-133	2	Bearing Cover.....		4	
LA-134	1	Bearing Cover.....		3	
LA-170	1	6" Face Plate (Not Shown)	4	4	
LA-187	1	Center.....		10	
LA-193	1	Lock Screw.....		3	
LA-194	1	End Bearing Cap.....	2	4	
LA-195	1	Grease Seal Cap.....		4	
LA-215-1	1	Spindle Gear.....		8	
LA-219	2	Key.....		3	

PART NO.	NO. REQ'D	NAME OF PART	SHIP.WT. LBS.	SHIP.WT. OZ.	PRICE EACH
LA-223	1	Sleeve.....		12	
LA-226	1	Rear Clamp.....	1	14	
LA-240	1	Key.....		3	
LA-259	1	Take-up Nut.....		4	
LA-296	1	Front Clamp.....	1		
LA-345	1	Plunger.....		2	
LA-346	1	Spring.....		2	
LA-356	1	Headstock.....	25		
LA-659	1	Name Plate (Not Shown)...		4	
LA-679	1	Flat Belt.....		8	
053	2	Hex. Hd. Cap Screw 7/16-14x1½		3	
0168	3	Fil. Hd. Cap Screw 5/16-18x5/8.....		3	
0315	1	Socket Set Screw 5/16-18x3/8.....		3	
0322	2	Socket Set Screw 7/16-14x5/16.....		3	
0441	1	Headless Set Screw ¼-20x3/8		3	
0542	2	Washer ½x1¼x5/64		3	
0584	4	Drive Screw (Not Shown)..		3	
0613	1	Oilless Bearing.....		3	
0614	1	Oilless Bearing.....		3	
0617	2	Oilless Bearing.....		4	
0640	1	Woodruff Key 1/8x1/2.....		3	
0643	1	Key.....		3	
0650	1	Ball Bearing #77506.....		14	
0651	1	Ball Bearing #45507.....	1	12	
0793	2	Oilless Bearing.....		5	

LA-10 CHANGE GEAR ASSEMBLY



PART NO	NO. REQ'D	NAME OF PART	SHIP.WT. LBS.	SHIP.WT. OZ.
LA-227	1	Change Gear Bracket . . .	3	12
LA-232	2	Washer.		3
LA-249	2	Key		2
LA-300	2	Nut		6
LA-313	2	Sleeve.		8
LA-314	2	Bushing		8
LA-325	2	Nut		3
026	2	Hex. Head Cap Screw 5/16"-18 x 2-1/2" . . .		3
038	1	Hex. Head Cap Screw 3/8"-16 x 1-1/2". . . .		3
0539	2	Washer 5/16" x 3/4" x 1/16". .		3

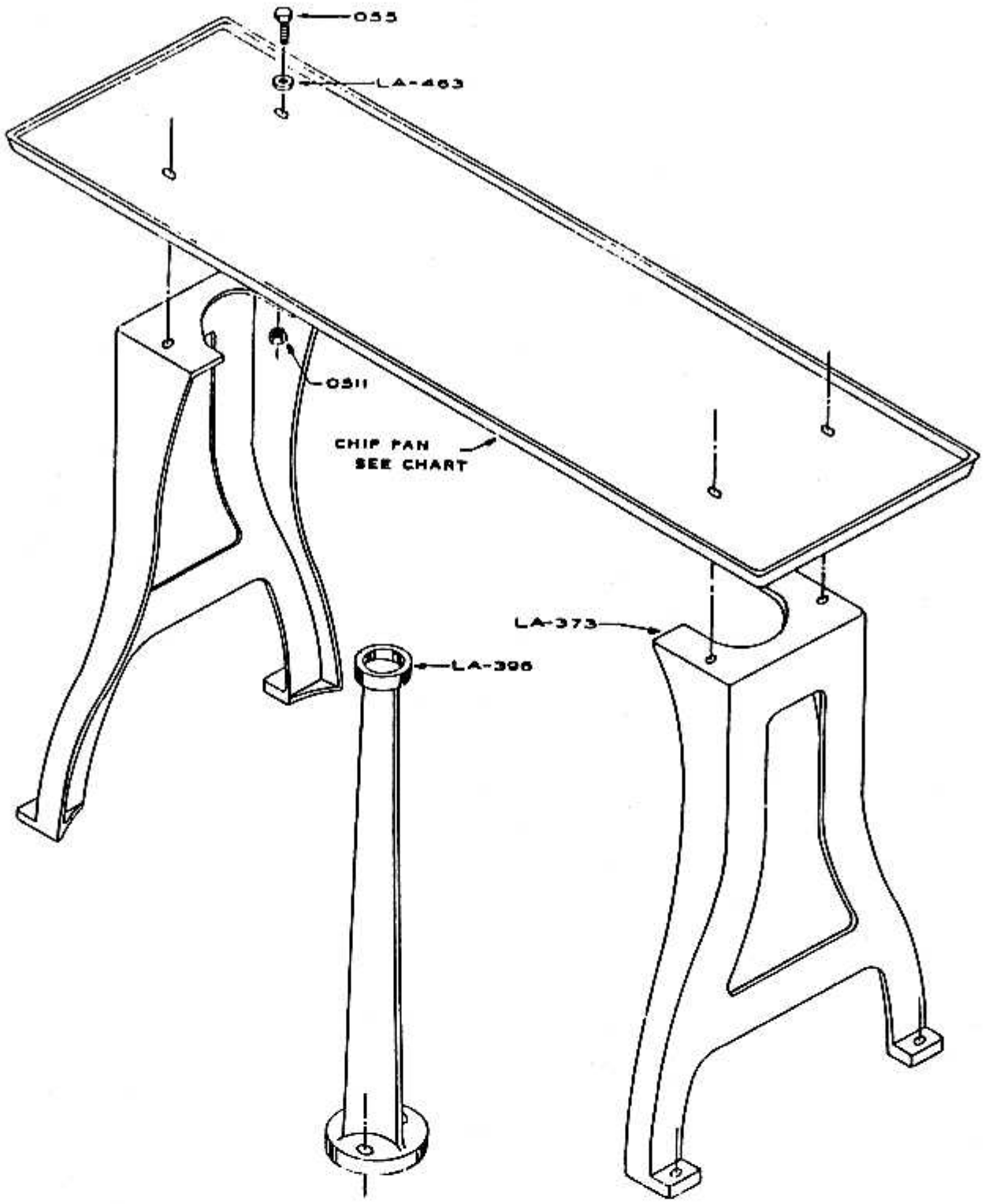
SUB-ASSEMBLY				
PART NO	NO. REQ'D	NAME OF PART	SHIP.WT. LBS.	SHIP.WT. OZ.
LA-313-A	1	Change Gear Stud Assembly Consists of: 232, 249, 312, 313, 314, 325, 026, 0539	2	

CHANGE GEARS (Not shown)

PART NO	NO. REQ'D	NAME OF PART	SHIP. WT. LBS.	SHIP. WT. OZ.
LA-200	1	16T. Change Gear.		4
LA-201	1	18T. Change Gear.		4
LA-202	2	24T. Change Gear.		4
LA-203	2	32T. Change Gear.	1	
LA-204	1	36T. Change Gear.	1	
LA-205	1	40T. Change Gear.	1	
LA-206	1	44T. Change Gear.	1	
LA-207	1	46T. Change Gear.	1	

PART NO.	NO. REQ'D	NAME OF PART	SHIP.WT. LBS.	SHIP.WT. OZ.
LA-208	1	48T. Change Gear.	1	
LA-209	1	52T. Change Gear.	1	
LA-210	1	54T. Change Gear.	1	2
LA-211	1	56T. Change Gear.	1	4
LA-212	1	60T. Change Gear.	1	6
LA-213	1	64T. Change Gear.	1	8
LA-214	1	72T. Change Gear.	1	12

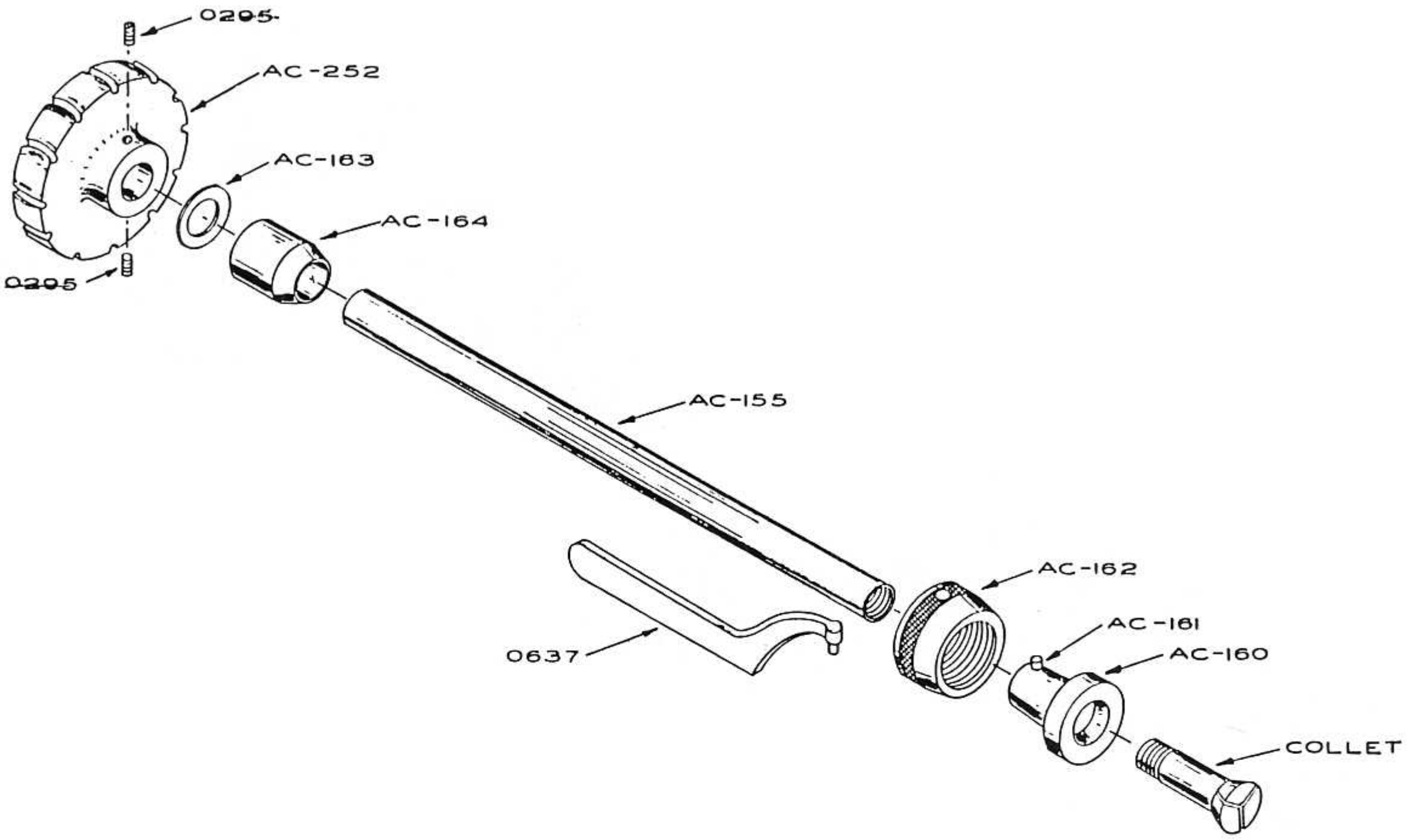
FLOOR STAND SETS



PART NUMBER	NO. REQ'D.	NAME OF PART	SHIP. WT. LB.	SHIP. WT. OZ.
LA-373	2	Floor Legs	75	
LA-396	1	Pedestal Leg	25	
LA-449	4	Rubber Washers (Mount between the Bed Supports & Pan for oiltight seal)		3
LA-463	4	Washers		3
055	4	Bolts for Mounting to Lathe		3
0511	4	Nuts		3
	1	Chip Pan (see below)		

Set No.	Chip Pan No.	Included in Price of Floor Models Lathes:	Accessory For:	Ship. Wt. Lbs.
LA-1072	LA-1073	1920, 1940, 1940-2	11" x 24" Lathes	20
LA-1078	LA-1079	1922, 1942, 1942-2	11" x 36" Lathes	26

AC-152 HANDWHEEL DRAW-IN COLLET ATTACHMENT



PART NO.	NO. REQ'D.	NAME OF PART	SHIP. WT. LBS.	OZ.
AC-155	1	Draw Bar Tube.	1	
AC-160	1	Adapter Sleeve w/161	1	
AC-161	1	Pin.		
AC-162	1	Spindle Nose Cap		8
AC-163	1	Fiber Washer		3
AC-164	1	Draw Bar Sleeve.		8
AC-252	1	Handwheel w/2 of 0307.	1	8
#0295	2	Socket Set Screw 10-32 x 3/8".		3
#0637	1	Spanner Wrench		12