OPERATING INSTRUCTIONS AND PARTS LIST FOR

LATHE

9 INCH SWING, 30" BETWEEN CENTERS

Model Number 103.23070

The model number of your Lathe will be found on a plate on the back of the bed below the headstock. Always mention this model number when communicating with us regarding your Lathe or when ordering parts.

Instructions for Ordering Parts

All parts listed herein must be ordered through a Sears retail store or mail order house. Parts are shipped prepaid. When ordering repair parts, always give the following information:

1. **The Part Number.**
2. **The Part Name and Price.**
3. **The Model Number 103.23070.**

This list is valuable. It will assure your being able to obtain proper parts service. We suggest you keep it with other valuable papers.

SEARS, ROEBUCK and CO.

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SOURCE FORM 24929

OPERATING INSTRUCTIONS AND PARTS LIST FOR LATHE

Model Number 103.23070

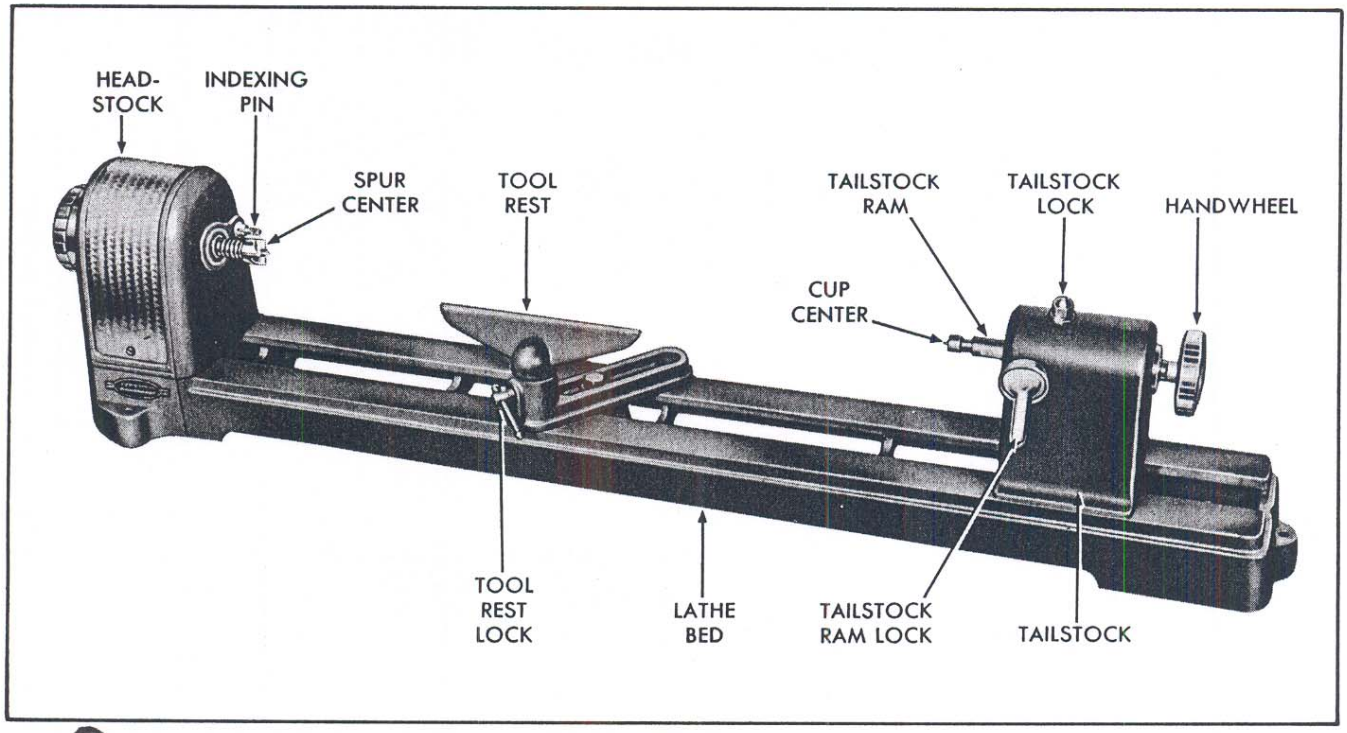


FIGURE 1

ASSEMBLING:

Your lathe has been completely inspected and tested at the factory. To prevent loss of parts during shipment, the headstock cover 24413, the spur center 24105, the cup center 24104 and the ¾ inch hex wrench 24715 have been packed separately in an enclosed carton.

To assemble, place the cover over the two clips on the outboard face of the headstock. Install the two centers in their tapered seats as shown in Figure 1. The wrench, intended for use on the tool rest clamp bolt and the tailstock lock should be kept in a convenient location near the tool.

INSTALLATION:

Mount the lathe securely on a work bench or table with screws or bolts. Three 11/32 inch holes are provided in the projecting feet of the lathe bed for this purpose.

This lathe is so designed that the motor can be mounted either on the bench to the rear of the headstock, or below on a bench shelf with the belt traveling through a hole cut in the bench. In either position, the use of a hinged motor mount will make it easier to move the belt to different pulley steps for changing speeds.

In case it becomes necessary to replace the belt, proceed as follows:

1. Remove the headstock cover and spur center.
2. Loosen the two pulley set screws until they are free of the drill spots in the spindle. Check by rotating the spindle in the pulley.
3. Remove the two hexagon shaped lock nuts 24641 from the left hand threads on the outboard end of the spindle.
4. Using a piece of wooden dowel as a drift pin, tap the spindle from the outboard end, driving it in until there is sufficient clearance between the end of the spindle and the inside surface of the headstock to allow passage of the belt.
5. After replacing the belt, tap the spindle back in place from the inboard side. Be sure that the inboard and outboard ball bearings are seated squarely in the head casting. If either of the two bearings should become unseated as the spindle is driven through, they should be reseated in the casting by tapping gently around the outside race or ring with a piece of wood.
6. Relocate the two pulley set screws accurately in the two drill spots on the spindle, and tighten securely.
7. Thread the two hexagon lock nuts onto the left hand threads on the outboard end of the spindle. BE SURE THAT THE UPSET OR RAISED FACE IS INBOARD, AGAINST THE BEARING. Do not overtighten the lock nut against the bearing. It should be just tight enough to prevent shifting or end play in the spindle. After the position of the inside nut has been established, hold it in place and tighten the outside lock nut securely against it.

8. Reinstall the headstock cover and turn the spindle by hand to insure free spinning action before applying power.

LUBRICATION:

The precision ball bearings used in this lathe have been packed with grease at the factory. They should require no further attention for the life of the bearing. To maintain smooth efficient operation, a few drops of light oil should be applied occasionally to the tailstock screw and the tailstock ram. Wipe the lathe bed occasionally with an oily rag to prevent rust, and allow free movement of the tool rest holder and tailstock along the bed.

SPEED AND ROTATION:

Check the direction of rotation when installing the motor. The spur center must turn counter clockwise when viewed from the tailstock end of the lathe.

Under normal conditions, best results will be obtained by using a 1/3 horsepower 1750 R.P.M. motor. For continuous heavy duty work, a ½ horsepower motor of the same speed is recommended. By using a four step motor pulley the same size as the spindle pulley, the following recommended speeds may be obtained.

Work Diameter	R.P.M. Roughing	R.P.M. Finishing
Up to 2"	2325	3450
2" to 3"	1325	2250
3" to 5"	825	1350
5" to 9"	825	875

The following table shows the diameter of the pulley step in which the belt should be placed in order to obtain the desired speed in Revolutions Per Minute.

R.P.M.	Lathe Pulley Step Dia.	Motor Pulley Step Dia.
3450	2"	4"
2250	2 5/8"	3 3/8"
1350	3 3/8"	2 5/8"
875	4"	2"

The four step motor pulley mentioned may be obtained from your Sears retail store or mail order house. Be sure to specify the shaft diameter of your motor when ordering this pulley.

CONTROLS: See Figure 1

Tailstock Lock;

Major adjustment of distance between centers may be made by loosening the tailstock lock allowing the operator to move the tailstock along the bed to the desired position. The tailstock lock must be securely tightened before the work is turned under power.

To remove the tailstock from the bed, loosen the **tailstock lock** two or three turns. Lift tailstock until it just clears the bed and turn it crossways. The tailstock can now be removed.

Handwheel;

Minor adjustment of distance between centers is made by turning the handwheel thus moving the cup center toward or away from the work piece as desired.

Tailstock Ram Lock;

As its name indicates, the ram lock holds the ram in a fixed position so that it will not move and loosen its grip on the work piece as a result of vibration. The tailstock ram must be locked securely in position during cutting operations on work between centers.

Tool Rest Clamp Bolt;

To change the angle of the tool rest holder, or to change its position on the bed, loosen the tool rest clamp bolt several turns. Be sure that the bolt is rigidly tightened before operation under power.

Tool Rest Lock;

The tool rest may be raised, lowered, and turned in its pivot after releasing the pressure of the tool rest lock. After the proper tool rest position has been selected, the lock nut must be tightened firmly to prevent a shift of the tool rest.

Indexing Pin;

The indexing pin is in line with a series of 36 equally spaced holes in the surface of the step pulley inside the headstock. This spring loaded pin when allowed to project through the casting and into a hole in the pulley, locks the entire turning assembly attached to the spindle.

Through the use of this pin, the spindle may be held stationary for various operations such as attaching face plates or laying out patterns and centerlines on face plate work. The index pin provides a means of spacing the various cuts in fluting and reeding operations.

With the index pin engaged, the lathe may be used as a fixture for holding long twist or spiral work for the hand finishing operations. It is always a good policy to double check all control units before apply-

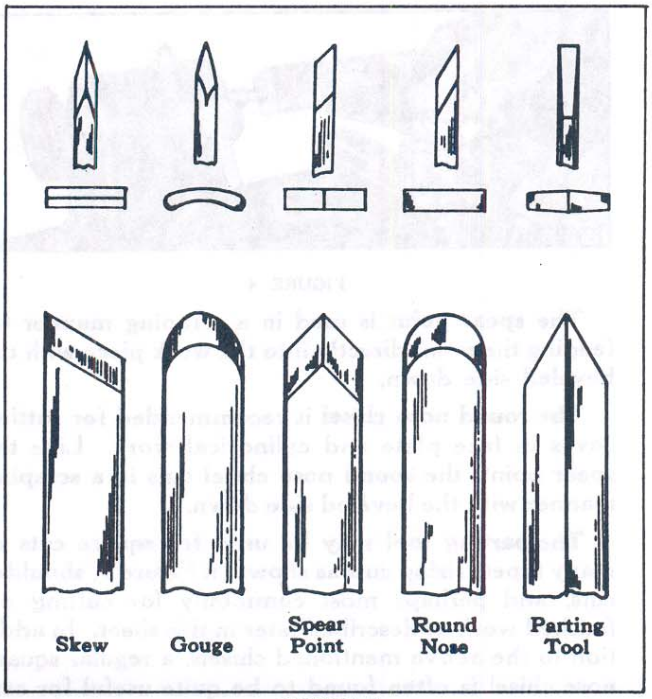


FIGURE 2

short cuts, the first starting several inches from the cup center and working toward the tailstock, the second cut starting several inches from the first cut, etc. When a point several inches from the spur center is reached, turn the chisel and make the final cut in the direction of the headstock. Do not make long continuous cuts, and do not start a cut at the end of a work piece during roughing work with the gouge chisel. The shorter cuts starting in the body of the piece prevent splintering and tearing.

When the piece has been roughed out to within approximately 1/8 inch of its finished diameter (check with calipers), stop the lathe, move the tool rest in to 1/8 inch of the work piece, and set the belt into the proper pulley steps to provide the next highest speed as shown in speed table for finishing cuts.

At the beginning of the finishing cuts the ends of the piece may be accurately squared by using the parting tool or skew chisel as desired. The finishing cut may be made with the gouge or skew chisel depending on the shape of the finished piece. Straight surfaces are generally finished best with the skew chisel, while concave or convex surfaces work best with the gouge chisel. Best finishing results are obtained by making a fine cut in a shaving manner, feeding the chisel parallel to the axis of the work piece in a slow continuous movement, applying even pressure to the chisel throughout the cut.

When cutting special shapes, sizing cuts shown in Figure 5 may be made with the parting tool. These cuts can be made to within 1/8 inch of the finished dimension. Diameters of these sizing cuts as well as any other cylinder work may be checked to the desired dimension by measuring with calipers as the cut is made.

Before sanding cylindrical work, feed the parting tool into the work at the points of cut-off until the diameter is reduced to about 1/4 inch. Stop the lathe and remove the tool rest before sanding. Hold the sandpaper strips at each end and apply the paper lightly to the turning cylinder. **DO NOT WRAP THE PAPER AROUND THE WORK PIECE. THIS PRACTICE CAN RESULT IN SERIOUS INJURY.**

When the surface finishing operations (sanding—polishing, etc.) have been completed, the work piece may be cut-off either by feeding the parting tool through, or by stopping the lathe and cutting through with a saw.

TURNING FLAT WORK:

Surface turning on flat work such as ash trays and lamp bases, may be accomplished by attaching the work piece directly to a face plate with short screws, or by gluing the piece to a wood backing plate which has first been fastened to the faceplate and trued by turning. If the wood backing plate is used, glue a piece of paper between it and the workpiece to facilitate separation after the turning is complete. Turn the tool rest parallel to the face of the work piece as shown in Figure 6, and adjust the height so that the cut is taken at the centerline of the piece. Facing is generally accomplished with the chisel at right angles to the work piece taking somewhat of a scraping cut.

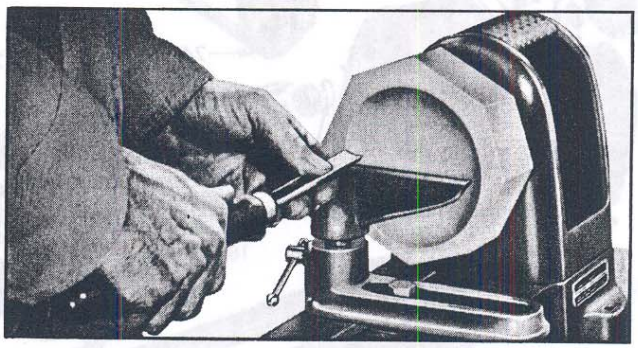


FIGURE 6

Face plate work over 9 inches in diameter may be turned on the outboard end of the lathe spindle by removing the headstock cover and attaching a left hand threaded face plate to the spindle. Do not attempt to cut at any time without a tool rest in proper position. For the outboard turning mentioned above, a floor stand or similar support should be provided for a tool rest.

For face plate turning, the chisel should be placed so that the work turns down into it. In other words, for turning inboard of the headstock, cut to the left of center as shown in Figure 6, while for outboard turning, the cut must be made to the right of center as you face the work.

SAFETY PRECAUTIONS:

Do not operate the lathe while wearing loose sleeves, dangling neckties, or any other type of loose clothing that might become entangled in the revolving work.

After setting the work up in the lathe, double check to be sure that it is mounted securely. Fast spinning pieces may cause serious damage if they break loose as a result of careless mounting. Always spin the work by hand before applying power.

Always use the tool rest when cutting with the chisels. Keep the tool rest close to the work, and keep the chisels sharp. Do not be afraid of high speeds on ordinary spindle work.

It is recommended that you install a motor switch at the left hand end of the lathe for quick power cut-off.

ACCESSORIES:

Face plates of various sizes, sanding discs, auxiliary centers, drill chucks, sanding drums, extra long tool rests, and jack shafts for greater speed range and variation may be purchased from your retail store or mail order house.

ing power with a job set up in the lathe. The operator should be sure that the tailstock and the tailstock ram are securely locked, that the tool rest and tool rest holder are held rigidly in position, that the belt is in the right pulley groove for the speed desired, and finally that the index pin is retracted and clear of the pulley.

TURNING CHISELS:

The five basic types of turning chisels are shown in Figure 2. They are available in various sizes individually, or in matched sets.

The gouge chisel is used for the slower speed rough cutting operations as well as for finishing cuts on irregular shapes. The gouge should be used with the beveled edge down. The chisel should be rolled slightly in the direction in which it is advancing as shown in Figure 3.

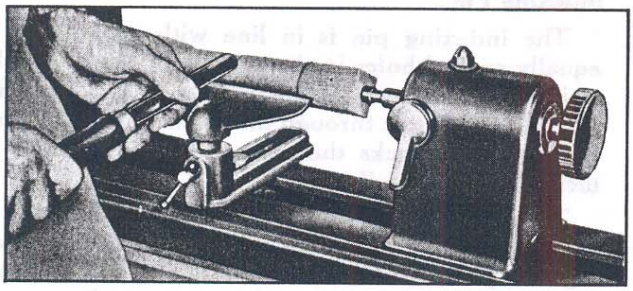


FIGURE 3

The skew chisel is used for finishing cuts on cylinder work with its edge at an angle to the axis of the work piece as shown in Figure 4. The skew is also often used to cut clearance behind a shoulder cut where cutting rather than scraping action is desired.

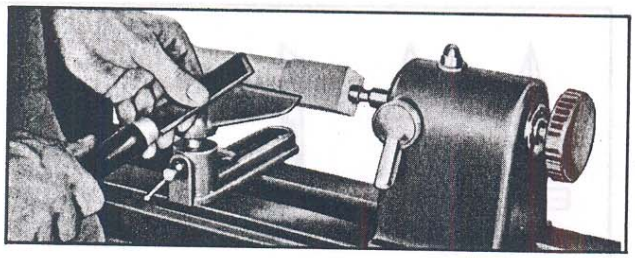


FIGURE 4

The spear point is used in a scraping manner by feeding the point directly into the work piece with the beveled side down.

The round nose chisel is recommended for cutting coves in face plate and cylindrical work. Like the spear point, the round nose chisel cuts in a scraping manner with the beveled side down.

The parting tool may be used for square cuts of many types: sizing cuts as shown in Figure 5, shoulder cuts, and perhaps most commonly for cutting off finished work as described later in this sheet. In addition to the above mentioned chisels, a regular square nose chisel is often found to be quite useful for certain wood turning operations.

Best quality work is obtained only when a sharp edge is maintained on the cutting tools. When sharpening the chisels, grinding and honing should be done

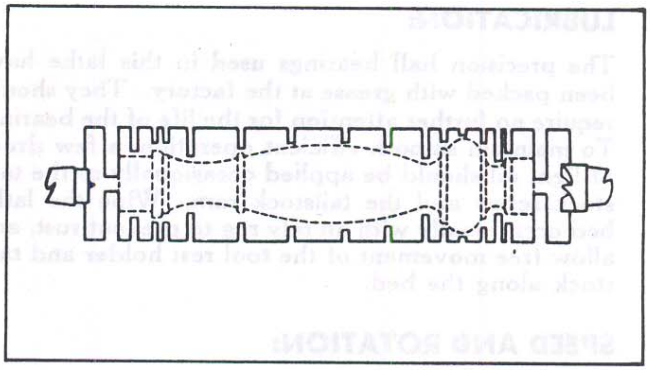


FIGURE 5

only on the bevels so as to preserve the original shape of the chisel. Skew chisels must be flat ground, not hollow ground.

OPERATION:

Pieces to be turned between centers such as table legs, lamp standards, etc. are usually turned from pieces of square cross section. The rough work piece should be cut at least ¾ inch longer than the finished piece to allow material for cut-off after turning is complete. To support the work properly between the centers, the ends must be cut square.

To locate the center on the ends of the work piece, draw diagonal lines from corner to corner on each end. Mark the center on each end with a punch or awl. In the case of hard wood it might be necessary to drill a small hole about ⅛ inch deep at the center points and to make saw cuts ⅛ inch deep along the diagonal lines on one end to allow proper seating of the spur center. In softer wood, the spur center as well as the cup center may be seated by tapping with a mallet. When the spur center has been set in the wood, mark a reference point on both the wood and the spur center so that the piece may be accurately recentered if removed from the lathe before completion.

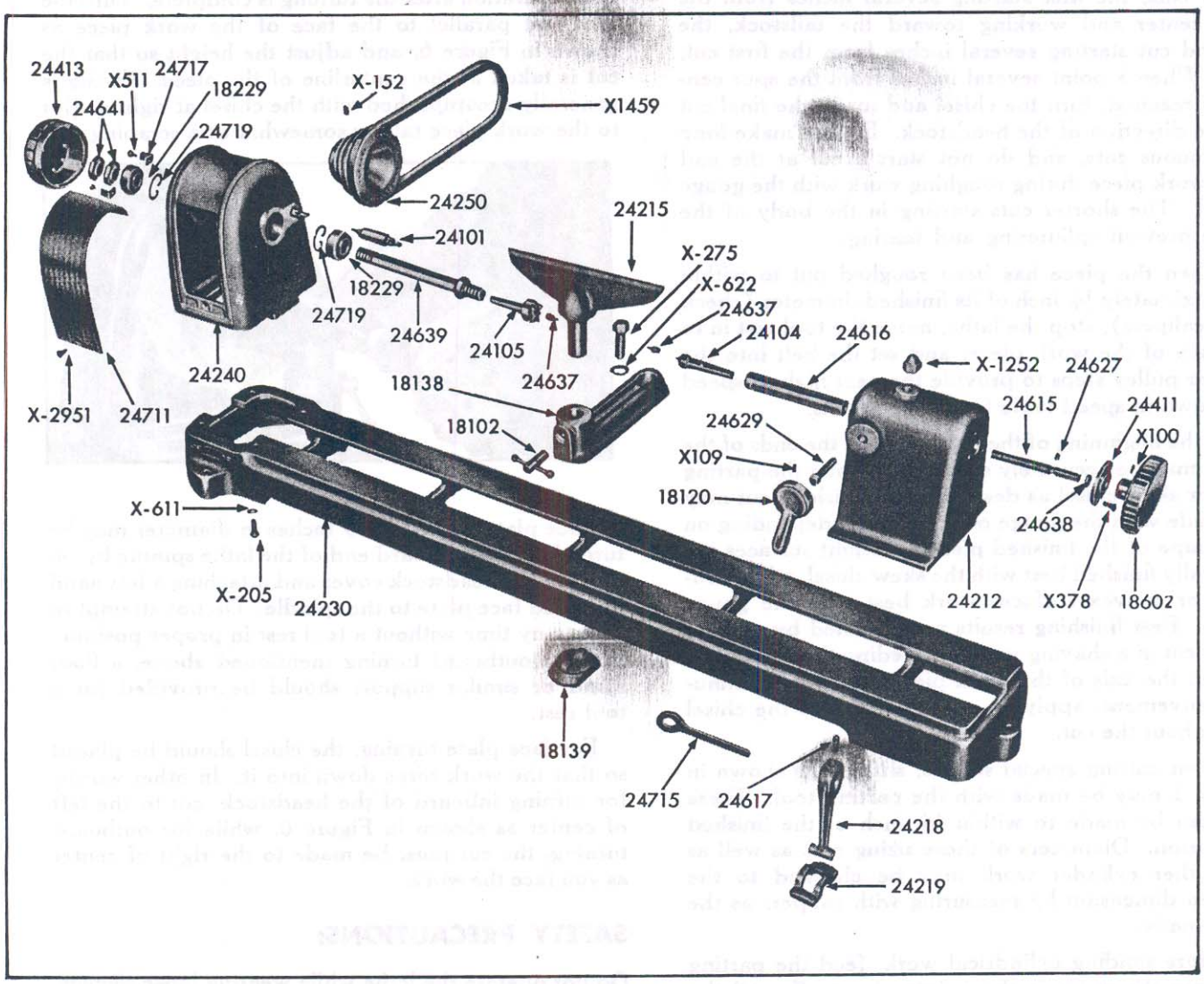
Mount the work in the lathe between the two centers adding a small amount of lubricant to the cup center to minimize burning of the wood.

With the tailstock clamped firmly to the bed, advance the tailstock ram until the work piece is held firmly. Retract the ram slightly until the piece turns freely between the centers. Lock the tailstock ram lock securely to maintain the position of the cup center.

Lock the tool rest in position within ⅛ inch of the workpiece and slightly above its center. Never cut with the rest below the center of the work.

ALWAYS TURN THE WORK PIECE BY HAND BEFORE APPLYING POWER.

The rough cut should be made with the gouge chisel. Remove the square edges with a series of



PARTS LIST

Part No.	PART NAME	Prepaid Selling Price Each
18102	Tool Rest Lock	$ .50
18120	Tailstock Ram Lock Handle and Set Screw.	.70
18138	Tool Rest Holder	1.00
18139	Tool Rest Clamp	1.20
18229	Ball Bearing	2.15
18602	Hand Wheel Assembly with Set Screws	3.25
24101	Index Pin Assembly	1.00
24104	Cup Center with Point	1.25
24105	Spur Center with Point	1.50
24230	Lathe Bed	20.00
24240	Headstock with snap rings and index pin assy	9.50
24250	Pulley and Set Screws	2.00
24212	Tailstock	7.00
24215	Tool Rest	1.75
24218	Tailstock Lock	1.30
24219	Tailstock Lock Clamp	.35
24411	Tailstock Ram Collar	.40
24413	Headstock Cover	1.70
24615	Tailstock Ram Screw	.40
24616	Tailstock Ram	.80
24617	Tailstock Lock Stud	.20
24627	Tailstock Ram Screw Snap Ring	.15

Part No.	PART NAME	Prepaid Selling Price Each
24629	Tailstock Ram Lock Bolt	$ .20
24637	Center Point	.30
24638	Tailstock Ram Screw Washer	.15
24639	Headstock Spindle	2.75
24641	Spindle Lock Nut	.35
24711	Headstock Shield	1.00
24715	Wrench	.15
24717	Headstock Cover Clip	.15
24719	Headstock Snap Ring	.15
*X-100	Set screw ¼-20x¼	.10
*X-152	Set Screw 5/16-18x½	.10
*X-205	Hex Head Cap Screw 5/16-18x¾	.10
*X-275	Hex Head Cap Screw ½-13x1¼	.10
*X-378	Oval Hd. Machine Screw No. 10-24x⅜	.10
*X-511	Round Hd. Mach. Screw No. 10-24x⅜	.10
*X-611	Lock Washer 5/16 Std.	.10
*X-622	Plain Washer ½ Std.	.10
*X-1252	Acorn Nut ½-13	.15
X-1459	V-Belt ½x44 inches long. Purchase from nearest Sears retail store or mail order house. Ask for Catalog No. 9-1644	—
*X-2951	Binding Head Screw No. 6-32x¼	.10

***Parts marked in this manner may be purchased locally.**

This sheet is intended for instruction and repair parts only and is not a packing slip. The parts shown and listed may include accessories not necessarily part of this tool. All prices are subject to change without notice. All parts are shipped Prepaid.

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