

OPERATING INSTRUCTIONS AND PARTS LIST FOR

DRILL PRESS

MODEL NUMBER 103.0305

This is the Model Number of your Drill Press. It will be found on the plate on the base. Always mention this Model Number when communicating with us regarding your Drill Press or when ordering parts.

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

SEARS, ROEBUCK and CO.

OPERATING INSTRUCTIONS

INSTALLATION

The motor pulley and several small parts are packed in the carton fastened in the crate. To mount the motor remove the motor support base from the drill press. Bolt the motor to the casting using the four square head machine bolts provided. (Use only a ball bearing motor on this machine.) Place a plain washer between each bolt head and the support and between each nut and the motor base. Slip the motor pulley on the motor shaft with the smallest step toward the motor. Reassemble the motor support on to the drill press.

Check the direction of rotation of the motor under power. The pulley should turn to the right or clockwise. If the pulley revolves in the wrong direction turn the motor over—if the motor has a double drive shaft—or change the wiring as directed by the manufacturer.

Use a straightedge to line up the motor and machine pulleys. Raise the head frame to the top of the column and attach the belt guard. Level the drill press base by means of shims when bolting the machine securely to its stand or bench. Wipe off the spindle taper and the socket of the chuck. Assemble by seating the chuck on the spindle.

ADJUSTMENTS

The nut (A in Fig. 1) may be set at any point on the feed stop rod from 0" to 4". This allows the drilling of any number of holes to the same depth without individual measurement.

The tension on the belt is properly adjusted when the motor support rods are forced out until the lower end of the motor tilts out slightly past a vertical position. It is then held in a vertical position by means of the motor bracket handle (B). The nut (C) gives a close control over the tension. To change speeds release the handle and push lower end of motor away from the column.

The table leveling pin (D) locates the table in the horizontal position.

To check the spindle for end play, lock the quill with the handle (E) and push upward on the chuck. To correct excessive motion remove the spring housing knob and spring. Support the chuck to prevent the spindle from dropping out and force the pinion shaft in through the head frame up to the feed lever. Remove the spindle and

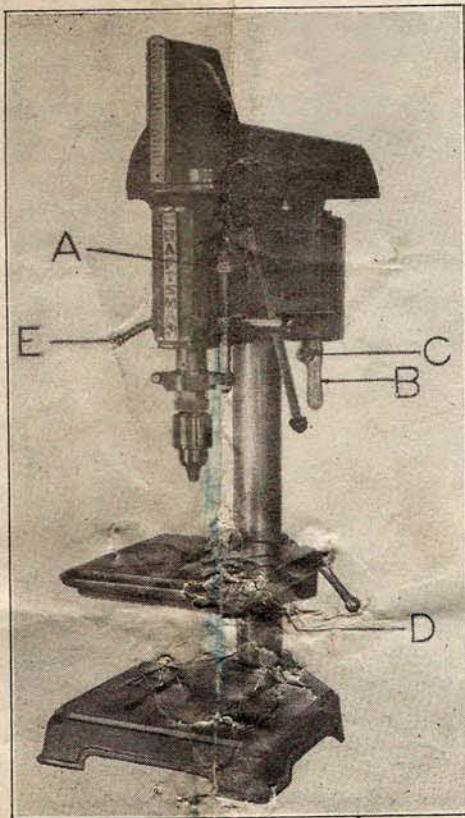


Fig. 1

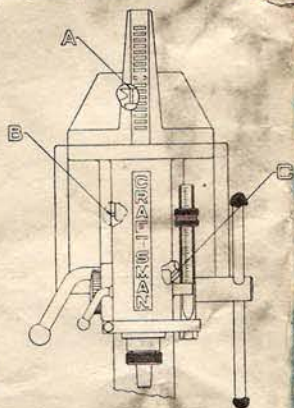


Fig. 2

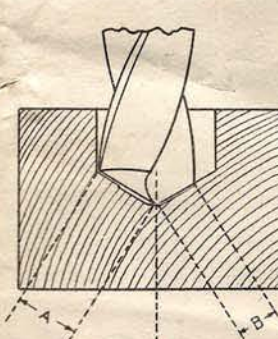


Fig. 8

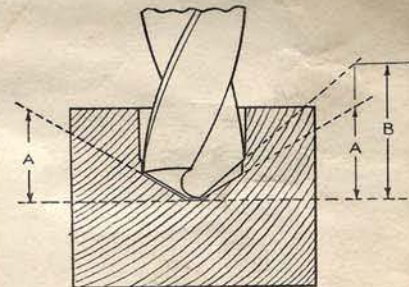


Fig. 7

LUBRICATION

The points A and B in Fig. 2 should be oiled frequently. The point C and the spline surface at the top of the spindle need only be oiled occasionally.

A good grade of oil of S.A.E. No. 20 viscosity should be used.

The ball bearings in the quill and pulley are packed with grease at the factory and require no additional lubrication for the life of the bearing.

DRILLING

Since there is no definite table of speeds and feeds for drilling which has universal acceptance, only general rules and recommendations can be given. The type and hardness of the material, the depth and size of the hole, the

collar above the quill and reset it tightly against the top of the quill bearing.

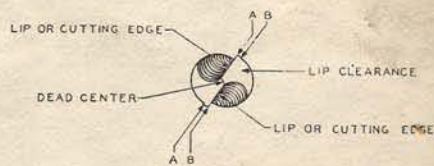


Fig. 4

SPEEDS

There are nine different spindle speeds available on this drill press. Using the recommended 1750 R.P.M. motor and with the motor and spindle pulleys in line, shifting the belt from top to bottom gives the following speeds: 5200, 2440, 1300 and 580 R.P.M. Lowering the motor on the motor support base until the largest groove on the motor pulley is in line with the second groove on the spindle pulley produces the following: 3300, 1750 and 1000 R.P.M. Raising the motor until the

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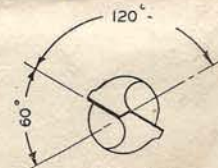


Fig. 5

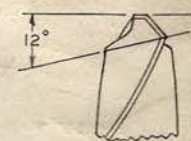


Fig. 6

motor pulley is one groove higher than the normal position drives the spindle at 3900, 1750 and 750 R.P.M.

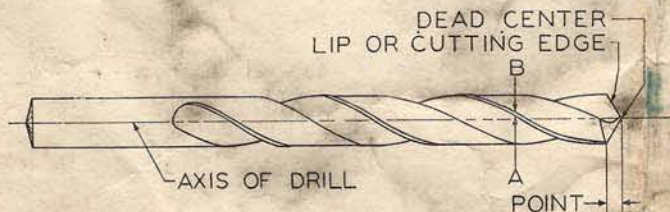


Fig. 3

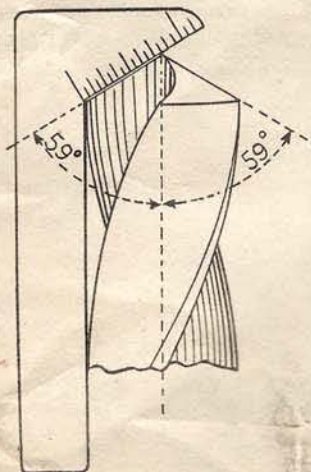


Fig. 9

quill assembly. Resting the chuck on the bench, force the spindle up tight against the bottom of the quill. Loosen the

OPERATING INSTRUCTIONS (CONT'D.)

grinding of the point on the drill, and the quality of hole required all enter into the determination of the correct speed and feed. Roughly the larger the hole and the harder the material, the slower the speed. An approved method is to start any drill with a medium feed and speed, increasing either or both after noting the effects on the drill. If the drill wears away at the extreme outer corners of the cutting edges, it has too much speed. If the drill chips on the cutting edge it is an indication of too heavy a feed. For very small drills it is better to have a high speed and a light feed since they are designed for high speed.

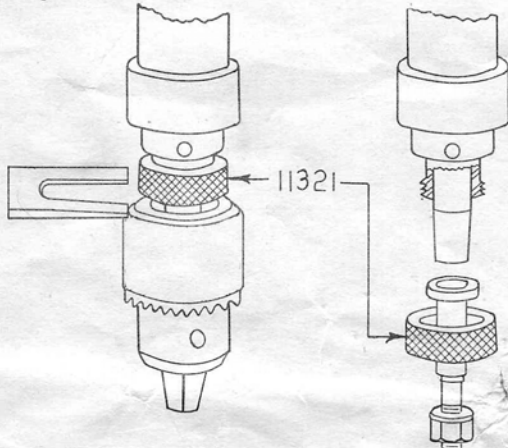


Fig. 10

Fig. 11

When making a setup for drilling, support the work carefully to prevent springing as this will cause drill breakage. The feed on small drills should be reduced at the point of breaking through otherwise the lips will bite too deeply and the drill will break. Never attempt to hold the work by the hand. Use a clamp or a drill vise.

LUBRICANTS

In drilling metals—with the exception of cast iron—a cutting compound is recommended both to cool the cutting edges and to improve the finish of the hole. In addition to those supplied by the cutting oil manufacturers the following are suggested:

- Very hard steel or material—Turpentine or kerosene.
- Ordinary steel—Soluble oil or lard oil.
- Brass—Kerosene, lard oil or dry.
- Copper—Soluble oil.
- Aluminum or white metal—Kerosene.
- Stainless steel—Turpentine.
- Monel Metal—Lard oil.
- Cast Iron—Dry.

DRILLS

The grinding of the drill point when sharpening is of the utmost importance as this operation determines drilling efficiency.

The various parts of the drill are shown in the drawings, Figs. 3 and 4. When grinding a drill three factors must be checked: 1. The Lip Clearance, 2. Both the Length and Angle of the Lips, and 3. The location of the Dead Center. To grind lip clearance begin at the cutting lip and gradually grind back until the angle at the circumference is between 12 and 15 degrees, Fig. 5. As the center of the drill is approached the angle should increase until it is approximately 120 degrees across the dead center, Fig. 6. Too much clearance will cause the outer corners to break away. If the lengths (A and B, Fig. 7) or angles (A and B, Fig. 8) of the lips are unequal, one lip will do all the work. Either condition will make a hole actually larger than the drill. The recommended angle for most purposes is 59° (Fig. 9). The dead center will be on the axis line of the drill only if the lips are of equal length and make equal angles with the axis.

For accurate finishing of drilled holes an additional operation of reaming is necessary. To meet a finish dimension the hole is first drilled undersize—about $\frac{1}{4}$ for holes below 1 inch in diameter—after which a finish size reamer is clamped in the chuck. Slow speeds and even feeds are essential for reaming.

IMPORTANT

The CHUCK SUPPLIED on this drill press CANNOT be used for any other purpose than drilling or reaming. For routing, mortising shaping, etc., use the adapters and chucks designed for taper spindles.

To convert the drill press remove the chuck with the wedge and install the shaper adapter or collet chuck as shown in Figs. 10 and 11.

SHAPING

Use the extension table and hold down clips shown in the catalog. Drill the two holes at the location given in Fig. 12 and mount the table with the head in normal position as shown in the catalog. The cutters must be mounted on an adapter which is assembled as shown in Fig. 11. Make sure the lock nut at the bottom of the adapter is tightened securely. Avoid heavy cuts by using two or more passes when removing an excessive amount of stock.

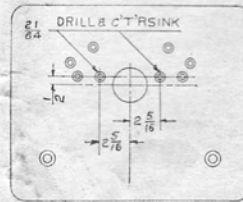


Fig. 12

Feed the work from the left, AGAINST THE DIRECTION OF ROTATION of the cutter (Fig. 13), and use the highest spindle speed. Fasten the cutter on the spindle with the cutting lip on the side toward the work (Fig. 13). Bring the sides of the fence as close to the cutter as possible. Adjust the table to approximately the correct height first, and then locate the cutter exactly by means of the drill press feed. Avoid feeding out more of the quill than is necessary.

A set of depth collars are always used to shape work having an irregular contour. The extension table is used without the fence and the collar bears on either the work itself or a pattern fastened to the work. To start an irregular cut a starting pin or clamped support should be used on the feed side.

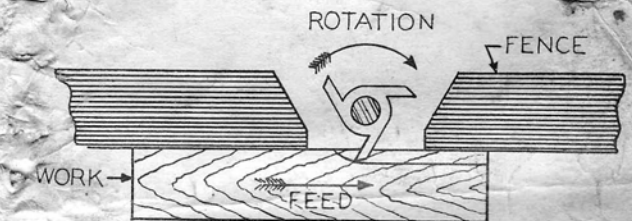


Fig. 13

DOVETAILING

A comb guide attachment and dovetail router bits for this work are listed in the catalog.

CARVING AND ROUTING

A collet chuck mounted as shown in Fig. 11 is used to hold these cutters. A board may be clamped to the table as a fence for a straight cut. For irregular work place a mark on the fence to be used as a pivot point. When grooving an irregular shape with the routing cutter complete the work in one pass.

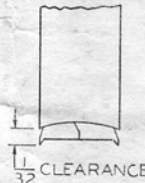


Fig. 14

In carving both hands are used to guide the work freehand. Since this work consists mainly in rounding off edges little stock is removed.

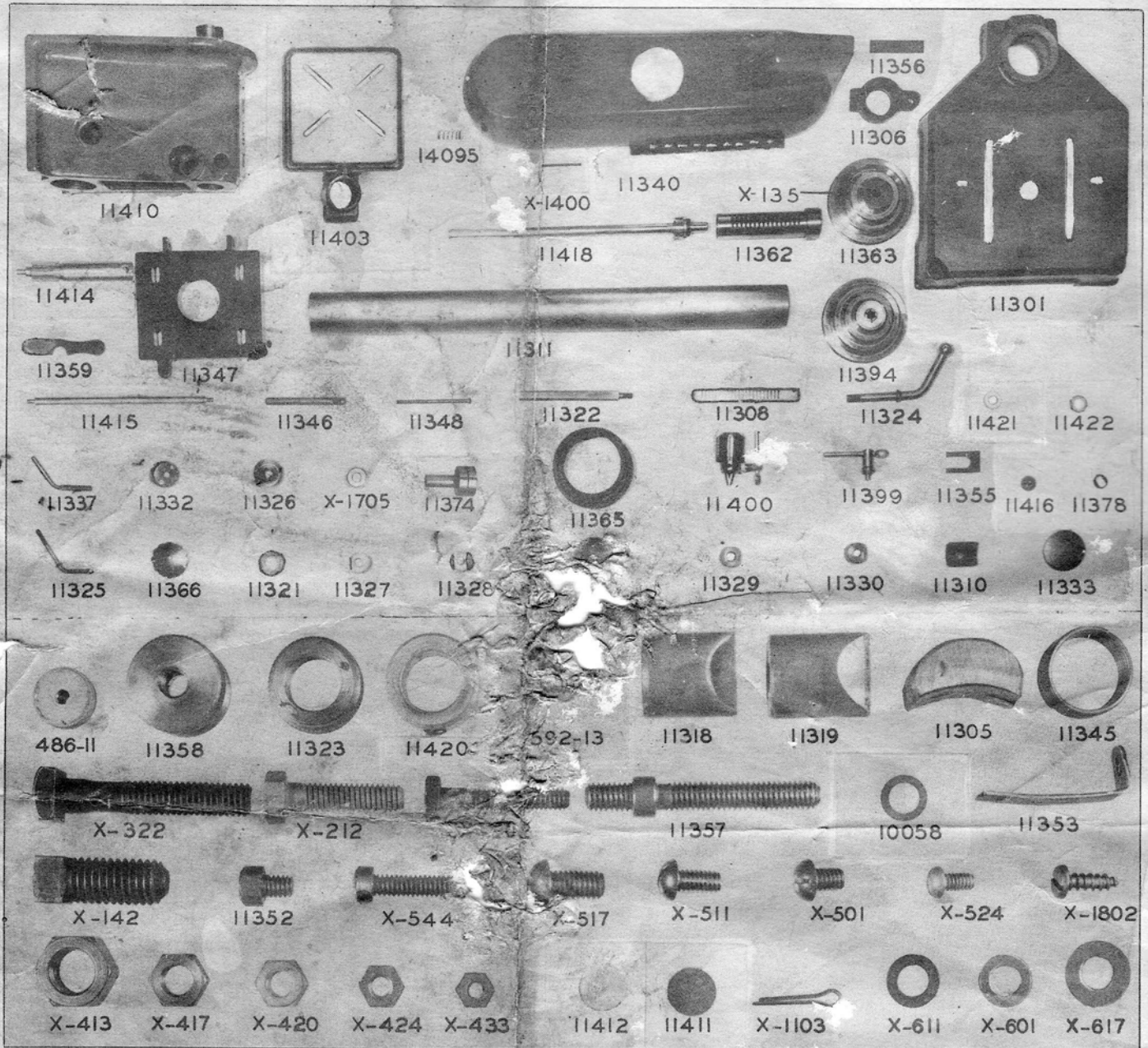
Use the quill lock to hold the cutter at the correct depth. Use the higher spindle speeds for these cutters.

MORTISING

To set up the mortising attachment shown in the catalog remove the feed stop bracket and clamp the chisel holder in its place. Use the feed stop rod in the chisel holder. Insert the chisel of the size desired in the holder and slip the proper bit up through the chisel. Use a collet chuck to hold the bit. To avoid overheating and damaging the end of the chisel check the clearance (Fig. 14) between bit and chisel. This must be a MINIMUM of $\frac{1}{32}$ inch.

Mark the outline of the mortise on the work and mark the depth on the end or the side. Feed the chisel down to the mark and set the feed stop nuts. Adjust the fence guide to bring one edge of the mortise under the chisel and clamp the hold-down lightly against the top. Starting at one end of the outline feed the chisel SLOWLY into the work. On a deep mortise it will be necessary to raise the chisel several times to discharge chips. Move the work along so that the chisel covers about one third of the first cut. The balance of the cuts may be taken somewhat faster.

Mortising must be done at the slower spindle speeds. To cut a mortise in a wide piece, swing the head to one side so that the work may be supported on the bench rather than on the drill press table or base.



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.

Part No.	Part Name	Price	Part No.	Part Name	Price	Part No.	Part Name	Price
486-11	Guard Lock Knob	\$.15	11336	Protractor Scale	.15	11418	Spindle Assembly	2.50
592-13	Pinion Shaft Guide Screw	.25	11337	Table Leveling Pin	.25	11420	Spindle Collar Assembly	.20
10058	Pinion Guide Screw Washer	.25	11340	Guard Assembly	3.00	11421	Spindle Collar Washer	.15
11301	Base	5.00	11345	Spindle Pulley Spacer	.15	11422	Spindle Collar Thrust Washer	.25
11305	Base Lock Shoe	.25	11346	Motor Support Rod	.25	14095	Handle Thrust Spring	.15
11306	Feed Stop Bracket	.75	11347	Motor Support Base	1.20	X-1705	Quill Ball Bearing	1.00
11308	Spindle Cover Plate	.40	11348	Motor Hinge Pin	.15	THE FOLLOWING PARTS ARE STANDARD AND CAN BE PURCHASED LOCALLY		
11310	Table Tilt Shoe	.25	11352	Spring Housing Screw	.15			
11311	Column	3.70	11353	Guard Lock Bracket	.15	X-142	Table Lock Screw	.10
11318	Quill Lock	.20	11355	Chuck Release Wedge	.15	X-202	Feed Stop Bracket Screw	.10
11319	Quill Lock Sleeve	.20	11356	Reinforcing Plate	.15	X-212	Lock Handle Pivot Screw	.10
11321	Thrust Collar Nut	.20	11357	Motor Support Stud	.15	X-322	Motor Mounting Bolt	.10
11322	Feed Stop Rod	.70	11358	Motor Bracket Nut	.15	X-413	Feed Stop Rod Nut	.10
11323	Feed Stop Nut	.15	11359	Motor Bracket Handle	.25	X-417	Motor Mounting Nut	.10
11324	Lock Handle	.45	11362	Quill Assembly	2.25	X-420	Feed Stop Bracket Nut	.10
11325	Quill Lock Handle	.25	11363	Motor Pulley Assembly	1.30	X-424	Guard Lock Screw Nut	.10
11326	Pinion Shaft Spring	.20	11365	Belt	1.00	X-433	Guard Bracket Nut	.10
11327	Head Lock Sleeve	.30	11366	Spring Housing Knob	.50	X-501	Bearing Retainer Screw	.10
11328	Head Lock	.30	11374	Bearing and Sleeve Assembly	3.50	X-502	Guard Lock Screw (Not Illus.)	.10
11329	Table Lock	.30	11378	Feed Stop Rod Nut Washer	.15	X-511	Cover Hinge Screw	.10
11330	Table Lock Sledge	.30	11389	Feed Stop Rod Lock Nut (Not Illus.)	.15	X-517	Protractor Scale Screw	.10
11332	Spring Retainer Housing	.20	11394	Spindle Pulley	1.75	X-524	Guard Bracket Screw	.10
11333	Column Plug	.15	11399	Drill Chuck Key	.50	X-544	Motor Support Lock Screw	.10
			11400	Drill Chuck Assembly	6.50	X-601	Motor Mounting Washer	.10
			11403	Table Assembly	7.50	X-608	Guard Lock Washer (Not Illus.)	.10
			11410	Head Frame Assembly	10.00	X-611	Pivot Lock Washer	.10
			11411	Pinion Shaft Handle Disc	.15	X-617	Pivot Washer	.10
			11412	Handle Spring Thrust Washer	.15	X-1103	Motor Hinge Cotter Pin	.10
			11414	Pinion Shaft	2.50	X-1400	Pulley Set Screw Washer	.10
			11415	Feed Lever	.50	X-1802	Cover Plate Screw	.10
			11416	Feed Lever Knob	.20			

HOW TO ORDER PARTS FOR MODEL NUMBER 103.0305

All parts listed here may be ordered through any Sears Retail or Mail Order Store. Parts are shipped prepaid. When ordering repair parts always give:

1. The Part Number in this List.
2. The Part Name and Price in this List.
3. The Model Number which is 103.0305 and will be found on a plate on the Base of the Drill Press.

We suggest you write your orders for repair parts like this sample:

Sears, Roebuck & Company
 Enclosed please find my check for \$3.45 for which please send me by Parcel Post the following parts for my Drill Press Model No. 103.0305.
 1 each No. 11340 Guard Assembly \$3.00
 1 each No. 11324 Lock Handle .45
 \$3.45

Yours truly, John Martin, Box 128, Richmond, Indiana