Sept. 1936- Aug. 1938

# PARTS LIST FOR

# CRAFTSMAN DRILL PRESS

## MODEL NUMBER 101.03580

This is the Model Number of your Drill Press. It will be found on the rear center of the Base Top. Always mention this Model Number when communicating with us regarding your Drill Press or when ordering Parts.

## ORDERING INFORMATION FOR RETAIL AND MAIL ORDER STORES

REFER TO THE PRICE LIST 101.00 FOR CURRENT SELLING PRICES AND ORDERING INFORMATION.

REFER TO MODEL #101.1 FOR PARTS ON HI-LO SPEED ATTACHMENTS.

## FILING INSTRUCTIONS

Remove and destroy the parts list 101.03580 from the Division 9 Standard Nomenclature Grey Binder, Volume 1, and file this list in its place.

SEARS, ROEBUCK AND CO.

Revised JULY, 1952

# OPERATING INSTRUCTIONS

When unpacking, be very careful to go through all papers thoroughly so as not to miss any parts.

This drill press is designed to be used for all ordinary work with a motor having a speed of approximately 1750 R.P.M. and with such a motor will have 9 different speeds as follows: 580, 1300, 2440 and 5200 R.P.M. with motor in normal position (pulleys in line); 1000, 1750 and 3300 R.P.M. with motor lowered on motor base so that top step of motor pulley lines up with the second step on the spindle pulley; 760 and 4000 R.P.M. with motor raised on motor base so that the top step on the spindle pulley lines up with the third step on the motor pulley.

If the direct motor drive set-up is used (Fig. 1) the motor should revolve in a clockwise direction when facing the pulley end. If it revolves in the opposite direction, reverse this according to the manufacturer's instructions. When you are sure the motor revolves properly, bolt it to the mounting bracket, locating it centrally on the provided slots. Attach the motor pulley to the shaft with the large step on top. Use a straight edge to line up the motor pulley with that on the spindle. Bolt the Drill Press to the bench, BEING SURE IT IS LEVEL. Locate the belt in the desired groove, and it is ready for operation.

If the countershaft and idler pulley are to be used (Fig. 2) the motor should revolve in a counter-clockwise direction when facing the pulley end. Bolt the Drill Press to the bench and attach the countershaft in position as shown. Locate the motor pulley on the shaft with the large end out and directly under the countershaft. Bolt the motor to the bench, put the belt in the desired groove, and the Drill Press is ready for operation. When using the belt in one of the smaller motor pulley grooves, pull out the countershaft to keep the belt tight.

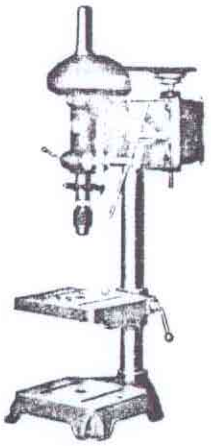

Fig. 1

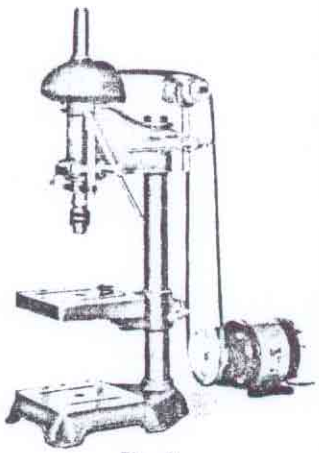

Fig. 2

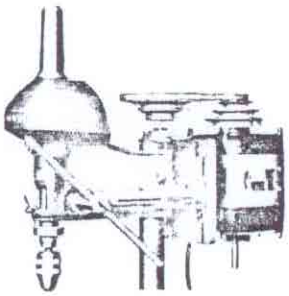

Fig. 3

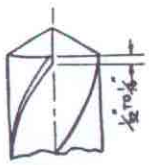

Fig. 4

## DRILLING

The proper speed for drilling depends upon: 1. The material to be drilled; 2. the size of the hole; 3. the kind of drill. Generally speaking, the harder the material and the larger the drill, the slower should be the speeds.

Make sure that the drill runs true when starting—it may be necessary to countersink the work. Small drills should be fed into the work carefully since they are designed to be run at very high speeds. Avoid too high a speed, especially with the larger drills—excessive speed wears off the drill corners, draws the temper of the drill, and may even burn or break the drill tip.

Note: When drilling brass, aluminum, lead and other soft materials which cause the drill to "hog-in", reduce the rake angle of the cutting edge by grinding the drill as shown in Fig. 4. This reduced rake angle is also desirable when drilling very hard materials because it lessens the strain on the drill. This change makes drilling easier and results in a more accurately drilled hole.

Lubrication: A cutting compound is essential when drilling practically any metal. The following compounds will give best results:

Hard, tough steels—turpentine or kerosene.

Softer steels—lard oil or equivalent.

Aluminum and other soft alloys—kerosene.

Brass—drill dry or use paraffin oil.

Die castings—drill dry or use kerosene.

Cast iron—drill dry.

Do not attempt to make large holes in a small piece or in thin material without first clamping the work securely to the table. For maximum accuracy, raise the table high enough so that the spindle does not run entirely out of the quill in going through the work. When drilling the larger holes, much better results are obtained by using our new slow-speed attachment shown in Fig. 3. This attachment provides a low speed of 200 R. P. M. It can be attached or detached in less than two minutes.

The spindle stop gauge is graduated from 0 to 3 inches in sixteenths of an inch for convenience and accuracy in gauging the depth of holes.

The two lock nuts on the feed stop gauge may be adjusted so that any number of holes may be drilled to the same depth.

DRILLS: After the drill point is dulled for the first time, its effectiveness depends entirely upon how it is reground. For clean, accurate drilling, the operator must resharpen the drill properly. The cone-shaped surface at the end of the drill is called the "point", and the edge at the extreme tip end is the "dead center".

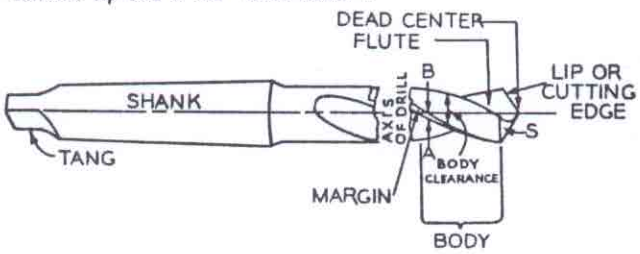


Fig. 5

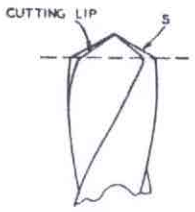


Fig. 6

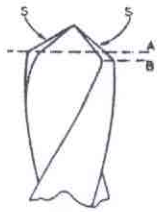


Fig. 7

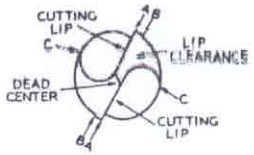


Fig. 8

In order to penetrate the work, the cutting edge must have the correct cutting angle and "lip clearance" at the center of the drill (Fig. 8). Fig. 6 shows a drill ground with no lip clearance. The portion of the drill behind the cutting lip is bearing on the metal being cut and prevents the cutting lip from biting in. The cutting lip and heel "S" are in the same plane. This drill will cut very poorly, if at all. Fig. 7 shows how the "heel", the part directly back of cutting angle, must be ground away.

THE PROPERLY GROUND DRILL: Two rules are especially important when grinding drill points. 1. The lip clearance angle (Fig. 9A) should be between 12 and 15 degrees. 2. The two cutting edges must be of equal length and angle. In Figs. 9A, 9B, 9C, the properly ground drill point is shown. Refer to these figures when grinding a drill—they will aid in grinding drills which will cut true-sized holes with a minimum of drill wear.

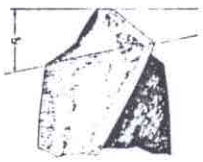

Fig. 9A

Fig. 9B

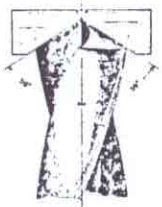

Fig. 9C

Fig. 9

REAMING: When a hole must be accurate to within .002 inch or less, it is first drilled a few thousandths of an inch undersize and then hand-reamed or reamed with the drill press to the finish-diameter. For best results, follow the same rules in reaming as for drilling. Use slow speeds, feed in evenly and be sure there are no burrs on the reamer teeth.

A reaming allowance between .010 and 1/64 inch is usually sufficient for machine-reaming holes with diameters of 1 inch or less—an allowance of 1/64 or 1/32 inch is recommended for machine-reaming holes between 1 and 2 inches in diameter. .003 to .005 inch is usually allowed for hand reaming operations.

CAUTION! In using the drill press for any purpose other than drilling, it is necessary to make use of special chucks and adapters.

In using the various types of mortising bits, router bits, dovetailing bits, etc., the operator MUST use a collet chuck rather than the Jacobs chuck. On those drills equipped with a tapered spindle, it is necessary to remove the Jacobs chuck and the threaded collar immediately above it. To remove Jacobs chuck from spindle, place the steel wedge between the chuck and the knurled collar and strike the wedge a sharp blow with a hammer. The chuck should be caught with the left hand in performing this operation. The collet chuck is placed on the taper, and the threaded collar is then replaced. There is a small flange on the inner side of this collar which will hold the collet chuck securely in position on the taper.

If the Jacobs chuck is used with any type of cutter where there is a thrust coming on from the side, the chuck will be pulled off the taper. This can be quite dangerous. Then, too, most of these operations are done at a high speed, and a collet chuck is much lighter and is preferable for the higher speed. The collet chuck grips the cutter shank all the way around instead of at just three points.

Exactly the same procedure is followed in installing the shaping adapter which is used on the tapered spindle drills to carry the shaping cutters.

## WOOD CARVING AND INLAYING

For this work, use the special router or woodcarving bits shown in our catalog. The drill press should run at a speed of about 5,000 R.P.M. or higher. Hold the piece to be worked firmly in one hand and run the bit into the work the proper depth. Clamp the spindle securely at this point. Now holding the work with both hands, guide it through the desired design. Frequently in carving the work is guided by a jig saw pattern cut out of plywood. This pattern is fastened to the underside of the work itself. A prong pin projecting up from the table runs in the pattern and guides the work.

## MORTISING

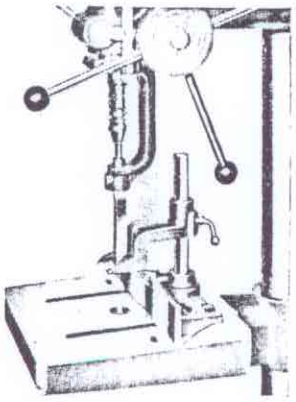

Fig. 10

Use the hollow chisel mortising attachment and accessories as shown in our catalog.

To set up the mortising attachment, first remove feed stop bracket and put chisel socket in its place. See Fig. 10. Remove the feed stop gauge, and insert in the chisel holder. This feed stop, in addition to serving as a depth gauge, prevents rotational play in the quill.

Select a mortising chisel and bit of desired size. Insert chisel in socket. Slide the bit up through the chisel and fasten in collet chuck, leaving 1/16" clearance between the spur of the bit and the lower edge of the chisel. This adjustment must be carefully made or a damaged bit and chisel will result. Turn the spindle by hand to make sure that the bit runs freely.

Set the guide fence in position and clamp the holder down lightly against the top surface of the work. Adjust the lock nuts on the feed stop gauge and take the first cut slowly. Raise the chisel frequently to discharge the chips. Move the work along the guide fence about two-thirds the width of the mortising chisel and take a second cut. This and succeeding cuts may be taken more rapidly. Repeat the above operation until the desired hole is completed. DO NOT FORCE THE CHISEL THROUGH THE WORK TOO RAPIDLY. Too rapid feed will cause burned chisels and bits.

For mortising wide pieces which cannot be accommodated over the base, swing the Drill Press head to one side so as to swing over the bench. In this manner very wide pieces such as doors, etc., may readily be mortised. USE THE SLOWER DRILL SPEEDS FOR MORTISING.

DOVETAILING: Use dovetailing attachment as shown in our catalog. (See instructions furnished with attachment.)

## SHAPING

The head may be used in the normal position or inverted as shown in Fig. 12. Use the special extension table and spring clips listed in our catalog. When the drill is equipped with a tapered spindle, a special shaping adapter is mounted on the spindle and held by the collar above the chuck. Be sure to use the collar to hold the shaping adapter in place. See "Caution" above.

Select the proper cutters and lock securely on the arbor. IMPORTANT: The direction of rotation should be TOWARD the work to be cut. Always set the wood facings as close to the cutter as possible to secure maximum safety. To feed work from the opposite side: 1. Turn cutter or cutters over. 2. Reverse direction of rotation of spindle. 3. Place hold-downs on opposite side. (A reversing switch will be found to be convenient.)

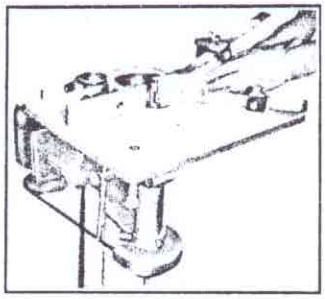

Fig. 12

In shaping circular or irregular work this shaping fence and hold downs are dispensed with. For this work we recommend and sell a set of nested depth collars. In these sets there is one thin inner collar slightly higher than the other collars. Outside of this is a bronze bearing collar, and outside of the bearing collar are a series of steel collars. In operation the work rests against the outer steel collar which remains practically stationary while the spindle revolves. These collars may be mounted above or below the cutter. The collars serve as a depth stop for the work preventing the cutter from "hogging-in". They should always be used on irregular work.

In commencing the cut on irregular work use the starting pin as a fulcrum to prevent the work from getting caught. Bring the work gradually in contact with the cutter. Hold the work firmly and keep it in contact with the depth collar. The shape of the piece will be governed by its contour; hence the work must be sawed to the desired shape before shaping. USE ONLY THE HIGHER SPEEDS FOR SHAPING.

## STATIC ELECTRICITY

Small static electrical discharges from power tools may be caused by friction between any two unlike surfaces, such as belt and pulleys, etc. This may be eliminated by grounding the tool to a water pipe.

## SPINDLE ADJUSTMENT

If longitudinal play develops in the spindle, it may be eliminated as follows: 1. Remove spindle guard and the two lock nuts on the feed stop bracket. 2. Remove spring housing cap by turning it 1/4" counter-clockwise and pulling out. 3. Remove feed lever and pinion shaft. 4. Pull spindle and quill downward and remove from the drill head. 5. Loosen set screw in collar directly above the quill and while forcing the spindle up against the bottom of the quill, tighten the collar against the top of the quill. Do not make the adjustment too tight. 6. Put spindle back into the drill head and reassemble.

## IMPORTANT—LUBRICATION

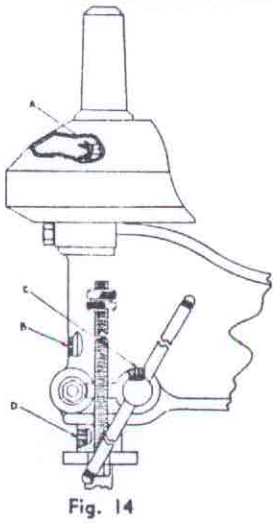


Fig. 14

USE S.A.E. NO. 20 MACHINE OIL

A. Spindle Pulley Bearing—Oil frequently.

B. Quill Bearings—Oil frequently. (Note: Spindle must be in lowest position to uncover oil hole).

C. Pinion Shaft Hub—Oil occasionally.

D. Lower Quill Bearing—Oil frequently.

Quill Surface—Oil should frequently be applied to the outside surface of quill. The spindle cap should be removed frequently and oil applied to the splined spindle also.

The grease cups on the countershaft of the countershaft drive model should be filled with Lubrico M-6 Grease every 3 months.