

No. 11-120 HOMECRAFT 11" DRILL PRESS Operating and Maintenance Instructions

The Delta Homecraft 11" Drill Press meets the requirements of the hobby craftsman for the usual drilling operations in metal, wood and other materials. In addition, it will perform a variety of special operations by means of inexpensive interchangeable spindles and accessories. These convenient attachments make it one of the most versatile pieces of equipment for the home workshop.

Under the item No. 11-120 we furnish the drill press as shown in Fig. 1, but without the motor. Drive belt, 4-step pulleys and chuck are included with the machine. The motor must be purchased separately to suit available electric current and meet the customer's power requirements.

Accessories for the machine, available when ordered extra, are the mortising attachment, plywood shaping table, shaper fence, spring type holdowns, lamp attachment, and interchangeable spindles for shaper cutters, router bits, sanding drums and other tools. Consult your Delta dealer for prices.

Complete directions for adjusting and maintaining the machine and for performing the common drilling operations are contained in these instructions. The accessories and their uses in special operations are described briefly. More complete information, hints and suggestions are given in our illustrated handbook "Getting the Most out of Your Drill Press."

Refer to Fig. 9 and Table 1 to identify the parts mentioned in the following instructions.

CONSTRUCTION FEATURES

This drill press has all controls needed for convenience and for accurate work. Table and head are adjustable at any height on the column. Four spindle speeds are provided by the cone pulleys; the best speed for each operation is instantly available. Correct belt tension can be maintained by adjusting the movable motor bracket. The stop rod is easily set to control drilling depth. The chuck will take up to $\frac{1}{2}$ -inch drills.

The spindle pulley is of the floating type. It is carried on a sealed ball bearing mounted in the top of the head. A splined sleeve DP-264 transmits power to the spindle. The ball bearing carries the belt tension and there is no side pressure on the spindle, which will run true indefinitely in its bronze bushings. Pressure of the drill is taken by a thrust ball bearing at the lower end of the quill.

The spindle is easily removed and can be replaced in a few minutes. This feature is a great convenience in changing spindles for special operations.

SELECTING THE MOTOR

For light duty on this drill press we recommend the No. 60-013 $\frac{1}{3}$ hp 1725 rpm motor, which has been selected for use with the Delta Homecraft machines. This motor operates only on 115-volt single phase 60-cycle alternating current, and develops sufficient power for all operations at moderate rates of feed, but the operator must be careful not to force the work.

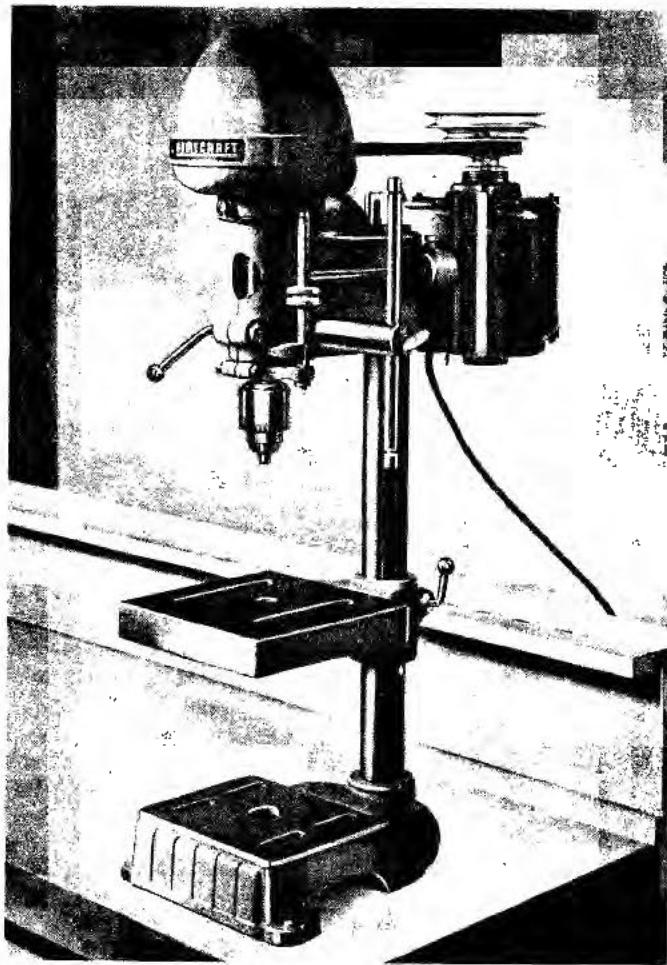


Fig. 1. Delta Homecraft 11" Drill Press.

For those who prefer greater power, and when 115-volt 60-cycle current is not available, we recommend the $\frac{1}{3}$ hp 6-inch frame Delta Motors which are available with various current characteristics. Consult your Delta dealer for the correct motor to meet your needs.

When selecting a motor from any other source, be sure that it is capable of taking the end thrust due to weight of the rotor and that it is protected against loss

of lubricant when operated in the vertical position. This is especially important in sleeve bearing motors.

Use a constant speed motor, preferably 1725 rpm. Do not exceed this speed, as higher rates will shorten the life of the spindle bearings. The correct motor speed for 50-cycle current is 1425 rpm.

SPINDLE SPEEDS

The four pulley steps give spindle speeds of 700, 1250, 2400 and 4700 rpm when a 1725 rpm motor is used. When driven by a 1425 rpm motor, the corresponding speeds are 1/6 less. The range is sufficient, in either case, to provide speeds suitable for all operations.

PULLEY AND BELT

The No. 985 motor pulley furnished with this drill press has $\frac{1}{2}$ -inch bore. It will fit any of the motors recommended above. The No. 340 belt has the correct length for such conditions. Consult your Delta dealer if you need a pulley of different bore or a longer belt to fit some other motor.

MOUNTING AND ASSEMBLING

The drill press is assembled ready to mount on the work bench; it is bolted to a wooden skid and packed in a carton marked No. 11-120. Motor pulley, belt, wrenches and motor bolts are in small packages attached to the machine. The motor and other items of your order are supplied in separate packages.

Locate the machine in a convenient operating position, preferably flush with the front edge of the bench or table. Use $\frac{5}{16}$ -inch round head stove bolts of proper length through the three mounting holes of the base to fasten it permanently as shown in Fig. 1.

HEAD HEIGHT

The head is clamped in a low position to save packing space. Raise it to within $\frac{1}{2}$ inch of the top of the column. Clearance under the chuck will then be 10 inches to the lowest position of the table and $13\frac{1}{2}$ inches to the base, sufficient to permit easy removal of the spindle.

Use the table as a temporary support while shifting the head. This is a safety precaution; if the head should slip out of hand it might injure the operator, and in any case striking the table or base would seriously damage the chuck and spindle. Proceed as follows when raising the head to the top of the column:

Swing the table to one side, bring it up into contact with the head and clamp it securely by means of the lock bolt DP-11. Loosen the nut SP-1028 on the left side of the head. Move the table and head up together, releasing the lock bolt only while lifting. Clamp the table when the head is at the correct height. Line the spindle up directly over the center hole of the base, then tighten the hexagon nut SP-1028 to clamp the head permanently on the column. Return the table to its regular position.

Follow this safe procedure whenever you move the head on the column.

INSTALLING THE MOTOR

Attach the motor to the mounting bracket in the vertical position, with the shaft upward, using the carriage bolts SP-808 with washers and nuts. The bracket is slotted to receive the 6-inch frame motors which are recommended above; some other motors may

require special mounting arrangements. Do not tighten the bolts permanently until the belt has been lined up.

Slip the motor pulley, No. 985, with the smallest step downward, onto the motor shaft. Make sure that the set screws SP-201 engage the flat of the shaft, and tighten them firmly. Install the drive belt over corresponding steps of the motor and spindle pulleys.

The motor should run clockwise when viewed from above. If it runs the wrong way, reverse its rotation according to the manufacturer's directions furnished with the motor.

POWER CONNECTIONS

Before connecting the motor to the power line, be sure that the electric current is of the same characteristics as stamped on the motor name plate.

Do not connect the motor to a circuit which will be overloaded. If an extension cord is used, it must have adequate capacity. All line connections should make good contact. Running on low voltage will injure the motor.

BELT ALIGNMENT AND TENSION

Place a straight edge across the top of the motor pulley to check the elevation with respect to the spindle pulley. Raise or lower the motor in the slots of the mounting bracket to make the pulleys level. Keep the motor shaft vertical; there is some play in the slots, which might permit the motor to tilt slightly. Tighten the motor bolts permanently when the alignment is correct. Check with the straight edge. The belt will wear rapidly if the pulleys are out of line.

The belt should be just tight enough to prevent slipping. Excessive tension will reduce the life of belt, pulleys and bearings. The correct tension is such that the belt can be flexed about one inch out of line midway between pulleys, using finger pressure.

To adjust belt tension, loosen the two hexagon head cap screws SP-607 which hold the motor bracket studs in the head casting. Move the bracket in or out, as required, and tighten the cap screws.

The motor bracket can be shifted enough to accommodate the No. 340 V-belt when used in connection with any of the recommended motors. See your Delta dealer if a belt of different length is needed with your motor.

LUBRICATION

Apply a few drops of light machine oil to the spindle bearings once or twice a month. The oil holes in the front of the quill near its ends are accessible when it is run down and clamped. The lower hole feeds the thrust bearing #6000 in addition to the lower spindle bearing. The spindle pulley bearing is sealed and needs no lubrication.

Lubricate the surface of the quill occasionally, by applying a drop or two of oil inside the head casting. Also oil the quill rack, clock spring, pinion where it enters the head casting, upper end of the spindle above the pulley, flat surfaces of the stop rod and interior of the chuck.

Wipe the bright surfaces of the base, column and table with an oily cloth to keep them from rusting.

OPERATING ADJUSTMENTS

The controls and adjustments described below are important for accuracy and convenience in various operations. Follow these directions for best results:

Depth Control

Maximum quill travel of this drill press is $3\frac{1}{2}$ inches. The knurled nuts DP-274 on the stop rod HDP-113 may be set to stop the drill at any lesser depth. They can be locked against the washer when a number of holes are to be drilled to the same depth.

Quill Clamp

To clamp the quill in any convenient position, tighten the lock bolt DP-11 on the front of the head. Avoid clamping too tightly, and be sure to release the quill fully before operating it, so that the accurately ground surfaces will not be damaged.

Clamping the quill is necessary in operations such as routing; it is also convenient when oiling and in measuring to set the stop nuts for depth control, and when changing spindles.

The clamp handle may be adjusted to stand in any convenient position when tight, by shifting the hexagon nut DP-223 in its socket. The handle should hang downward when loose.

Table Adjustment

The table HDP-101 may be clamped at any height on the column to accommodate length of drill, thickness of the work and depth to be drilled. It may be swung right or left for locating holes, or turned completely out of the way when work is to be supported directly on the base. The center hole of the table should be in line with the spindle for through drilling.

Spindle Return Spring Adjustment

The quill should operate freely and return instantly from any drilling position, but without slamming the stop collar too hard against the head casting. The return spring DP-232-S is adjusted at the factory for average conditions; it may need tightening when some of the heavier spindle accessories or tools are used.

Turn the clock spring case counter-clockwise to wind the spring tighter, clockwise to loosen it. Adjustment may be made $\frac{1}{4}$ turn at a time, by engaging successive notches of the case over the two anchor lugs on the left side of the drill press head. In adjusting the spindle return spring, proceed as follows:

Loosen the hexagon nuts SP-1227 on the left end of the pinion shaft and back them off about $\frac{1}{8}$ inch from the spring case, for clearance. Grip the case firmly, to hold the spring tension while pulling the case away from the lugs; rotate the case $\frac{1}{4}$ turn and slip the next pair of notches over the lugs. Keep the case against the head casting, so that the lugs hold the spring tension while you test the quill action and take a new grip. When the desired action has been obtained, push the case firmly against the head and make sure that both lugs are fully engaged. Turn the inner hexagon nut against the spring case lightly, not tight enough to cause binding. Lock it in this position by means of the outer nut, using two wrenches to jam them together.

To remove the clock spring, take off the hexagon nuts, release the spring tension entirely, and slip the case off of the pinion shaft. When installing the spring, be careful to engage the flat inner end into the slot of the shaft.

CHUCK

The chuck HDP-158 is furnished as standard equip-

ment in this drill press. It is a key chuck, and will take drills up to $\frac{1}{2}$ inch and down to $\frac{1}{8}$ inch.

There should be no occasion for removing the chuck from the spindle, as the standard spindle DP-255-S-A is designed only for use with this chuck.

Inserting Drills

Insert the drill between the chuck jaws, holding it in the left hand; at the same time engage the beveled key with the gear on the chuck and turn right to tighten.

Avoid jamming the chuck jaws too tight. Use only enough pressure to prevent the drill from turning in the jaws while drilling.

CHANGING SPINDLES

To remove the spindle, run the quill down until the set collar HDP-107-S above the quill is accessible through the opening in the head. Clamp the quill in this position. While holding the spindle to avoid dropping it, release the set screw SP-201 to loosen the set collar. Swing the table to one side and raise the quill to the top of its stroke; there will be plenty of clearance for lowering the spindle out of the bearings.

Reverse the above procedure when installing the spindle, observing these precautions: Be sure that the spindle is passed through the fiber washer DSS-77 and the set collar HDP-107-S as the upper end comes through the quill. Rotate the spindle to enter the splines into the pulley. Tighten the set screw against the solid surface of the spindle, not into a spline groove, to avoid damage.

To eliminate all end play in the spindle, clamp the table at suitable height and lower the spindle against it with moderate pressure while clamping the quill. Push the set collar down against the quill while tightening the set screw. This method removes slack between thrust collar, thrust bearing and quill.

QUILL

The spindle runs in porous bronze bushings HDP-130 which are press fitted into the quill and line reamed after assembly. The quill travels in the ground seat of the head casting. These parts will remain accurate indefinitely if kept clean and lubricated according to instructions.

Any play which might develop between head and quill after considerable use can be taken up by partially tightening the lock bolt DP-11. If the quill needs replacement, order the item HDP-102-A.

A hog ring HDP-105 holds the thrust bearing # 6000 into the lower end of the quill. When replacement is necessary, pry out the hog ring and install the new bearing with the narrow opening to the bottom.

When using the mortising attachment No. 976, remove the stop collar DP-270 and install the chisel holder in its place. Tighten the clamp nut enough to hold the attachment from slipping, but avoid excessive pressure which might deform the quill. Observe the same precaution when remounting the stop collar. In either case, align the stop rod in the groove on the right side of the head so that it operates without drag.

Keep the quill as high as the work will permit, so that any side thrust will be transmitted directly to the head casting. This is especially important when rout-

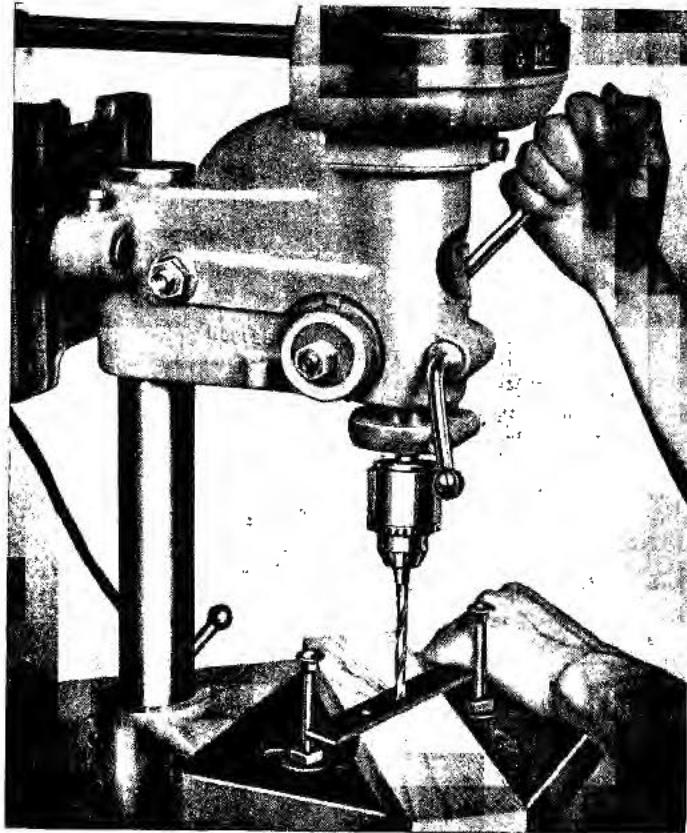


Fig. 2. Drilling Holes in Thin Steel Stock.

ing, sanding, shaping, and for other operations in which the edge of the tool does the work. Do not run the quill down to reach the work; rather raise the table to bring the work as close as possible to the head.

SPINDLE PULLEY BEARING

Replacement of the spindle pulley bearing will not be necessary until the machine has had a long period of heavy use. To check the bearing, remove the spindle so that the pulley will run idle; if it turns smoothly and runs with no noise beyond the whirring due to the belt, the bearing is still in good condition.

To replace the bearing, take off the spindle pulley guard HDP-126-S, withdraw the hexagon head cap screw DP-279 from the front of the head, and push the pulley upward out of the head casting. Remove the retainer plate DP-278 from the inside of the pulley and press the old bearing out of the pulley. Install a new bearing HDP-129 and re-assemble the parts according to Fig. 9. In mounting the pulley, enter the inner race of the bearing so that the threaded hole meets the hole in the head casting, and tighten it into position by means of the screw DP-279.

DRILL PRESS OPERATIONS

The following directions will give the inexperienced operator a start on the common drill press operations. More detailed information is given in the handbook mentioned on Page 1. Use scrap material for practice, to get the feel of the machine before attempting regular work.

Correct Drilling Speeds

Factors which determine the best speed to use in any drill press operation are: Kind of material being

worked, size of hole, type of drill or other cutter, and quality of cut desired. The smaller the drill, the greater the required rpm. In soft materials the speed should be higher than for hard metals.

A table of recommended speeds for high speed steel drills is printed in the handbook. The values for ordinary carbon steel drills are one-half of those shown. The correct speeds when these drills are used in wood are the same as for soft metals. Best speeds for spur bits, as well as for routing, mortising, and other operations, are given under corresponding headings in the handbook.

Since four spindle speeds are available on this drill press, it is necessary to select the speed which comes nearest to the recommended value, and shift the belt on the pulleys accordingly. After some experience the operator will know which pulley step is best in each case.

Drilling Holes to Depth

In using the stop rod to limit quill travel for drilling a number of holes to the same depth, determine the end of the stroke by direct measurement or by drilling the first hole to the required depth. In either case, clamp the quill in the limiting position, run the stop nuts DP-274 down against the guide lug, and lock the upper nut against the washer. Release the quill clamp and proceed with the work.

Use of the stop nuts is convenient in many operations. In through drilling, for example, they may be set to stop the quill immediately after the drill has cut through the work, preventing excessive wear and damage.

Boring in Wood

Twist drills, although intended for metal drilling, may also be used for boring holes in wood. However, machine spur bits are generally preferred for working in wood; they cut a square-bottom hole and are designed for removal of wood chips. Do not use hand bits which have a screw tip; at drill press speeds they turn into the wood so rapidly as to lift the work off the table and whirl it.

For through boring, line up the table so that the bit will enter the center hole, to avoid damage. Scribe a vertical line on the front of the column and a match mark on the table bracket, so that the table can be clamped in center position at any height.

Feed slowly when the bit is about to cut through the wood, to prevent splintering the bottom face. Use a scrap piece of wood for a base block under the work; this helps to reduce splintering and protects the point of the bit.

Drilling in Metal

Use stop bolts as shown in Fig. 2 when drilling in metal. The work should never be held in the hand alone; the lips of the drill may seize the work at any time, especially when breaking through the stock. If the piece is whirled out of the operator's hand, he may be injured. In any case, the drill will be broken when the work strikes the column.

The work must be held steady while drilling; any tilting, twisting or shifting results not only in a rough hole, but also increases drill breakage. For flat work, lay the piece on a wooden base as shown in the photo-

graph and hold it firmly down against the table, allowing the bolts to prevent it from turning. If the piece is of irregular shape and cannot be laid flat on the table, it should be securely blocked and clamped.

Routing

For routing, grooving, carving, and cutting round-end mortises, use the spindle with $\frac{1}{2}$ -inch hole, No. 974, shown in Fig. 3. Insert the bit into the spindle to full depth, and clamp it by tightening the two hexagon socket set screws against the shank. Router bits with $\frac{1}{2}$ -inch shank are available in five sizes, from $\frac{1}{4}$ to $\frac{1}{2}$ -inch diameter.

Use the highest spindle speed of this drill press for routing operations. Support the work against a fence whenever possible, so that it is not twisted out of the hands when caught by the deep flutes of the bit. When starting a cut, feed down slowly to the desired depth in the work, then clamp the quill to maintain the same depth over the entire area to be routed.

The work should be advanced so that the push caused by the cutting action of the bit is against the direction of feed. With the fence in the usual position behind the work, this means that the feed should be from left to right.

Routing to a pattern or template is illustrated in Fig. 3 and 4. This is the proper method when the shape of the work makes the use of a fence impossible. Cut a full size pattern from thin stock, using the scroll saw. Such pattern is shown in Fig. 3. Tack the pattern to the under side of the work. Mount the plywood shaper table No. 11-806, or a planed board, on the drill press table. Drill a hole in the wooden table, using the router bit, and drive a dowel of the same diameter into

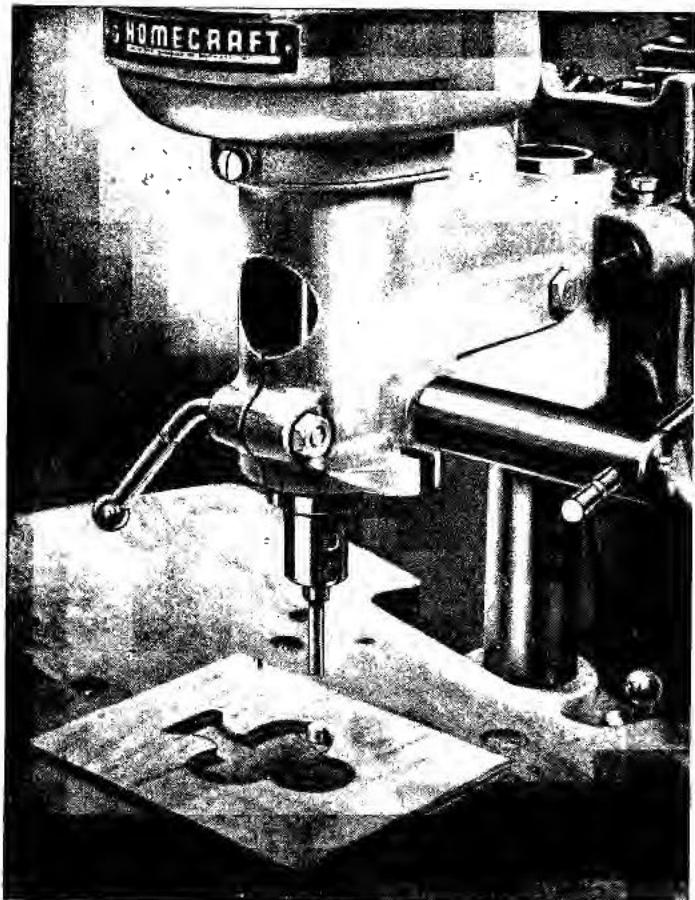


Fig. 3. Router Bit, Plywood Table, Dowel and Pattern for Routing.

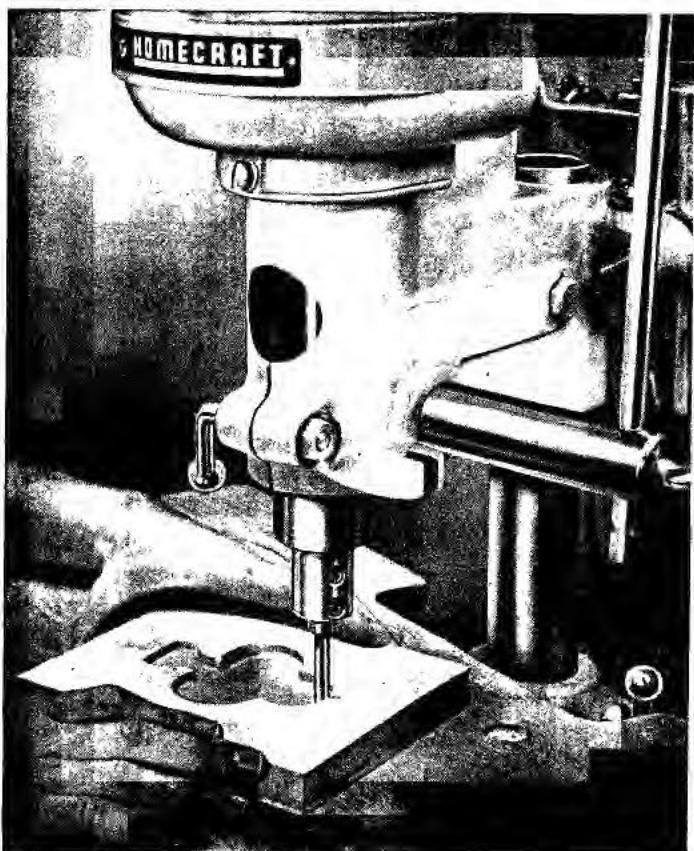


Fig. 4. Routing from a Pattern.

the hole to project slightly less than the thickness of the pattern. Lay the work over the dowel and rout the face of the work to the desired depth, using the dowel to limit travel of the work. The result will be an exact copy of the pattern, as shown in Fig. 4.

Although router bits can be mounted in the chuck, we strongly advise using the special spindle No. 11-801 which is designed to take the side thrust produced during the routing operation. Bits with a shank diameter other than $\frac{1}{2}$ -inch can be held in the router spindle by inserting a sleeve to make up the difference. Such sleeve must fit closely and have side holes to permit tightening the set screws against the shank of the bit.

Sanding

One of the special uses of this drill press is in sanding the surfaces of wooden or metal parts as illustrated in Fig. 5. Sanding drums of various sizes from $1\frac{1}{16}$ -inch diameter by $2\frac{1}{2}$ inches long to 3 by 3 inches are available. These drums have a patented rubber cushioned core feature which permits the use of interchangeable abrasive sleeves of various grades. We offer garnet sleeves for sanding wood and aluminum oxide for metals.

Use the No. 974 spindle for these sanding drums. The smallest has a $\frac{1}{2}$ -inch shank to fit directly into the spindle; the larger drums have a $\frac{1}{2}$ -inch hole and set screws for attaching them by means of a short piece of $\frac{1}{2}$ -inch steel rod.

Three-inch sanding drums should be run at 1250 rpm, smaller drums at higher speeds. To utilize the full face of the drum, mount a board on the drill press table and cut a hole in the board, slightly larger than the drum. Run the drum down into the hole as shown in the

photograph, and clamp the quill. The abrasive sleeve will then extend below the work to cut equally across the entire face.

The fence may be used as a guide when sanding flat surfaces. Bolts, pivot pins or templates fastened to the table are useful for curved work. Such fixtures help to produce accurate results and protect the operator. Always feed the work against the rotation of the drum, to prevent jamming.

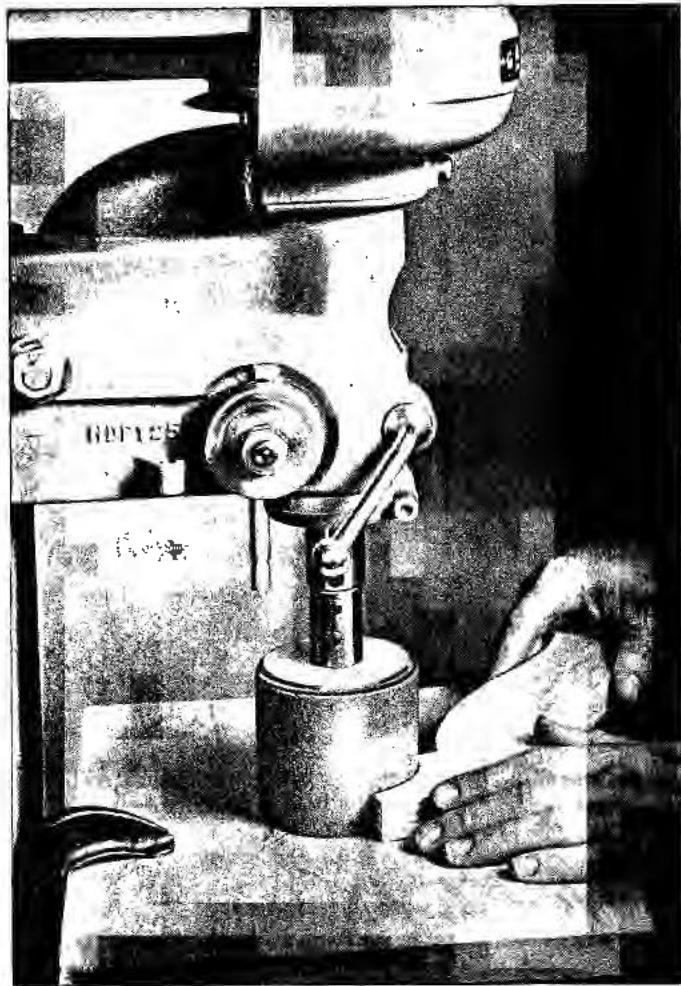


Fig. 5. Sanding a Wooden Bracket.

Avoid the use of excessive pressure which increases side thrust on the spindle and bearings. Abrasive sleeves remove material by the cutting action of the grit. Effective operation depends upon the correct type and size of grit for the material and the proper drum speed. When the sleeve becomes worn or loaded, discard it and install a new one.

Mortising

The mortising attachment No. 976 is a handy accessory for accurately cutting mortises of various widths and lengths. It consists of a base which is arranged to mount on the drill press table, a fence, holdowns and chisel holder. The spindle with $\frac{1}{2}$ -inch hole, No. 974, is used to hold the mortising bits. The attachment is adjustable for size of stock and location of cut.

Hollow chisels and bits are available in four sizes, from $\frac{1}{4}$ to $\frac{1}{2}$ inch. Any desired width and length of mortise can be made by overlapping cuts.

Conversion of the drill press for mortising is made by installing the No. 974 spindle and attaching the

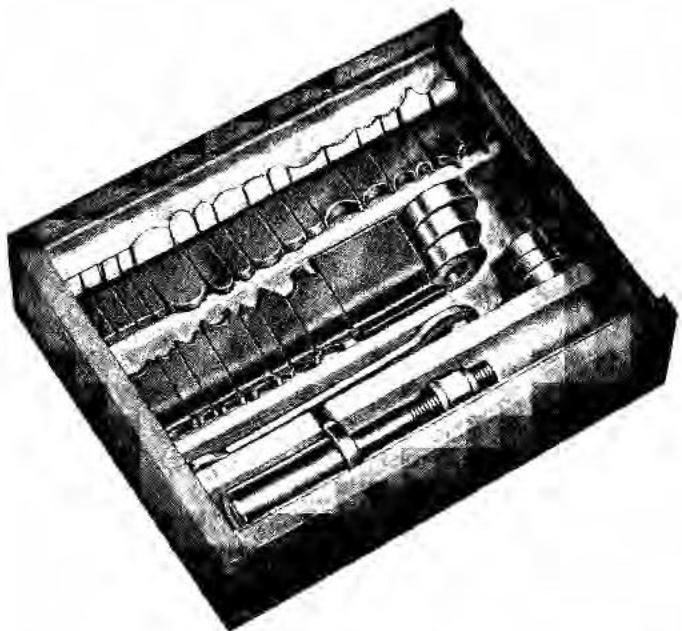


Fig. 6. Set of 3-Lip Shaper Cutters, Collars and Adapter.

chisel holder on the quill in place of the regular stop collar DP-270. Bushings are used to hold the mortising bits in the spindle. Complete instructions for mortising operations are given in the handbook, and are also included in the instruction sheet PM-1704 which is furnished with the attachment.

~~Shaping~~

~~This drill press is easily arranged to operate as a shaper. The maximum spindle speed of 4700 rpm is sufficient for smooth cuts. A wide selection of 3-lip~~



Fig. 7. Drill Press with Shaping Attachments.

shaper cutters, such as shown in Fig. 6, are available. These cutters have a 5/16-inch hole to mount on the special spindle No. 977. They may also be carried by the No. 974 spindle when the adapter No. 978 is used.

Do not attempt to use larger shaper cutters on this drill press; only the small 3-in. edge cutters with 5/16-inch hole may be run safely on this machine.

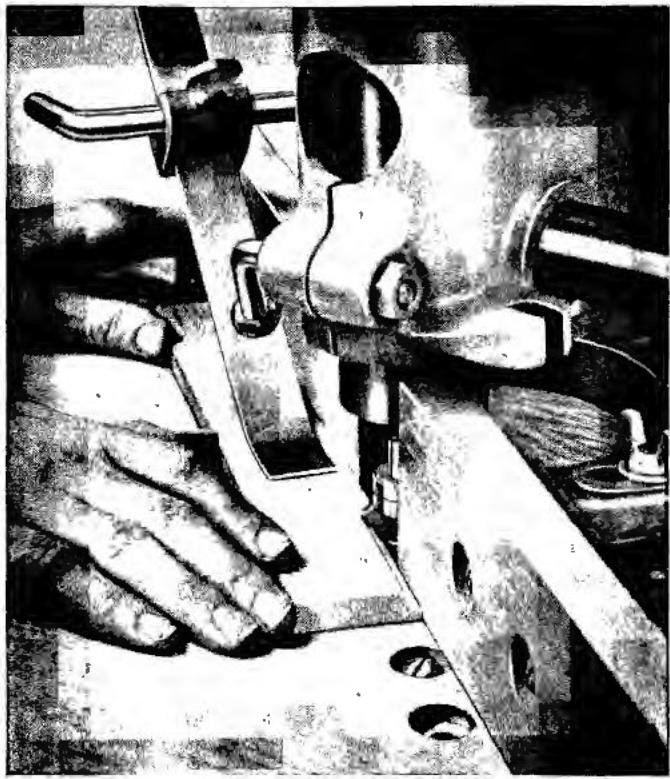


Fig. 8. Shaping on the Drill Press.

DISC
For occasional edge cutting it is satisfactory to run the drill press in its regular position as shown in the photographs. The head may also be inverted on the column so that the spindle projects upward through the table to duplicate the conditions of the standard shaper. The additional trouble of reversing the head is justified for safety and convenience if a large amount of shaping is to be done. Oil the thrust bearing at the end of the quill frequently when operating in the inverted position.

The plywood table No. 114806 is furnished with all fittings for attaching it to the drill press table. It provides all facilities for accurate shaper work when equipped with the regular shaper fence No. 982 and the spring type holddown attachment No. 983, as shown in Fig. 7.

Cutters must be mounted on the spindle with the lips facing to the left when the regular drilling position is used, as in Fig. 8. Feed of the work must be from left to right in this case, as shown.

~~Consult the handbook for more detailed shaping directions. The instruction sheet PM-1705, furnished with the plywood table, gives full details for mounting it on the drill press.~~

OTHER OPERATIONS

Dowel cutting, grinding, buffing, tapping, milling and other operations that depend upon a rotating

spindle can be done on this drill press by means of suitable tools and adapters. Many of these operations are explained in the handbook.

LAMP ATTACHMENT

A bracket on the left side of the head casting is arranged to receive the No. 882 lamp attachment. This accessory is adjustable to the best position for illuminating the work and will be useful for fine operations. It includes a lamp shade and 8-foot cord with plug.

ACCESSORIES AND TOOLS

Consult your Delta dealer for additional information about the drill press accessories and the tools, such as bits, chisels, cutters, abrasive sleeves, and grinding wheels which will make this machine most useful to you.

Remember that the cutting tool does the work; the drill press merely drives the tool. Good results can be obtained only with sharp tools of the right kind.

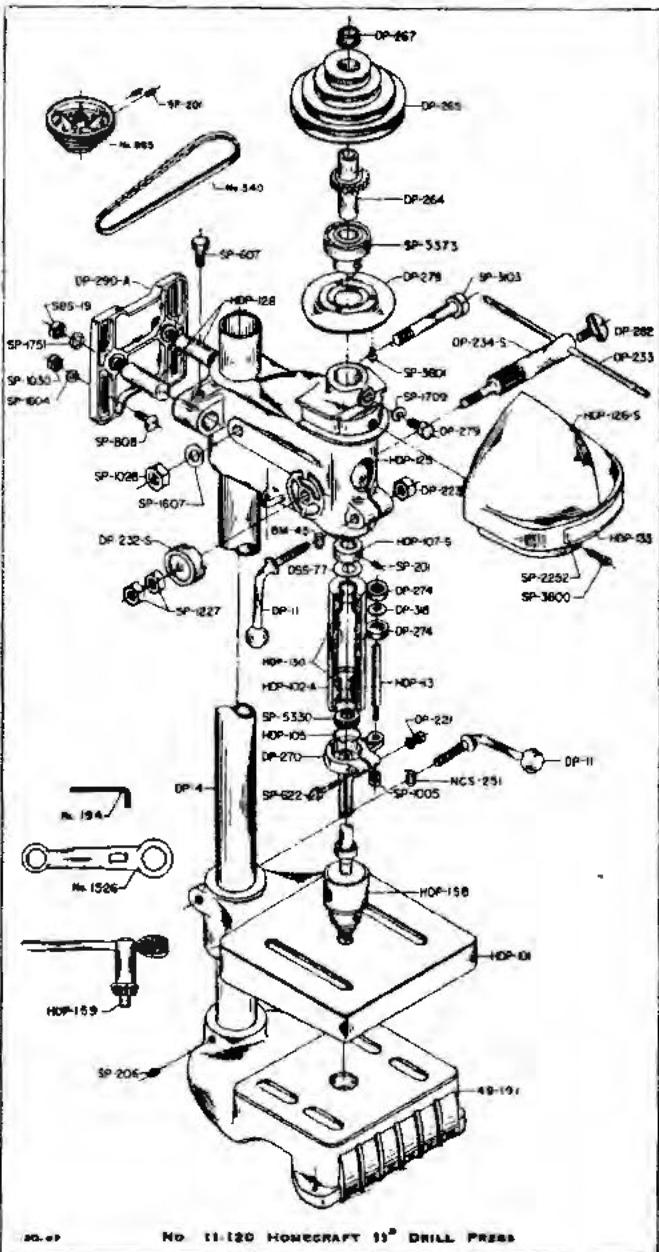


Fig. 9.

Table 1. REPLACEMENT PARTS

IMPORTANT: Give both the Part Number and the Description of each item when ordering from this list; also the Serial Number of the machine on which the parts are to be used.

CONSULT YOUR DELTA DEALER FOR PRICES OF REPLACEMENT PARTS, ACCESSORIES AND TOOLS TO FACILITATE HANDLING WE SUGGEST ORDERING ALL PARTS THROUGH YOUR DELTA DEALER

The right is reserved to make changes in design or equipment at any time without incurring any obligation to install these on machines previously sold, and to discontinue models of machines, motors or accessories at any time without notice.

Foreign distribution is through TAUCO EXPORT CORPORATION, 38 Pearl St., New York 4, New York, to Puerto Rico and the Canal Zone and to all foreign countries except Canada and the Philippine Islands.

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