

CENTRAL MACHINERY



Model 38144

16-Speed Drill Press

Assembly and Operating Instructions



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For technical questions, please call 1-800-444-3353.

THANK YOU for choosing a Harbor Freights Tool product! For future reference, please complete the owner's record below:

Model: _____ Serial No: _____ Purchase Date: _____

SAVE THE RECEIPT, WARRANTY CARD AND THESE INSTRUCTIONS. It is important that you read the entire manual to become familiar with the unit **BEFORE** you begin assembly.

Technical Specifications

SKU: 38144



Model: 13 inch Drill Press-16 Speed, Floor Model

Power Source: 120V, 60HZ, Single-Phase,

Speeds: Sixteen (16) speeds ranging from 220 to 3600 RPMs

Drill Chuck Capacity: 7/64" to 5/8"

Spindle Stroke: 3-1/8"

Swing: 13-1/2"

Column Diameter: 2-57/64"

Table Type: 11-1/2" square-dry table that rotates 360 degrees and tilts 0-45 degrees in one-degree increments.

Table T-Slot Dimensions: 1/2"

Overall Height: 62-7/8"

Unpacking

Unpack and check contents. Make sure you have all parts described in the Parts Lists and **Figure 1** on page 3.

Remove all preservative lubricants from parts with a clean dry cloth.

Some of the parts are heavy and may require two people for lifting.

If any parts are missing or broken, please call Harbor Freight Tools at 1-800-444-3353. The shipping box should contain:

- | | | | |
|----|--------------------------------------|----|----------------------------|
| A. | Table Assembly | F. | Head Assembly |
| B. | Arm | G. | One (1) box of loose parts |
| C. | Instruction manual and warranty card | J. | Column Assembly |
| D. | One Bag of Parts | | |
| E. | Base | | |

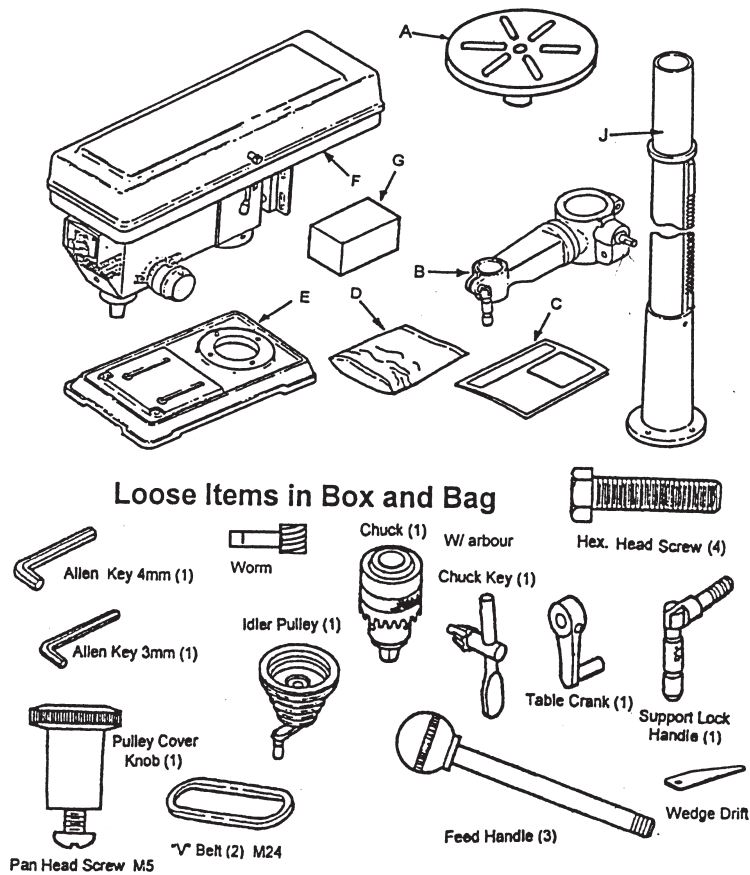
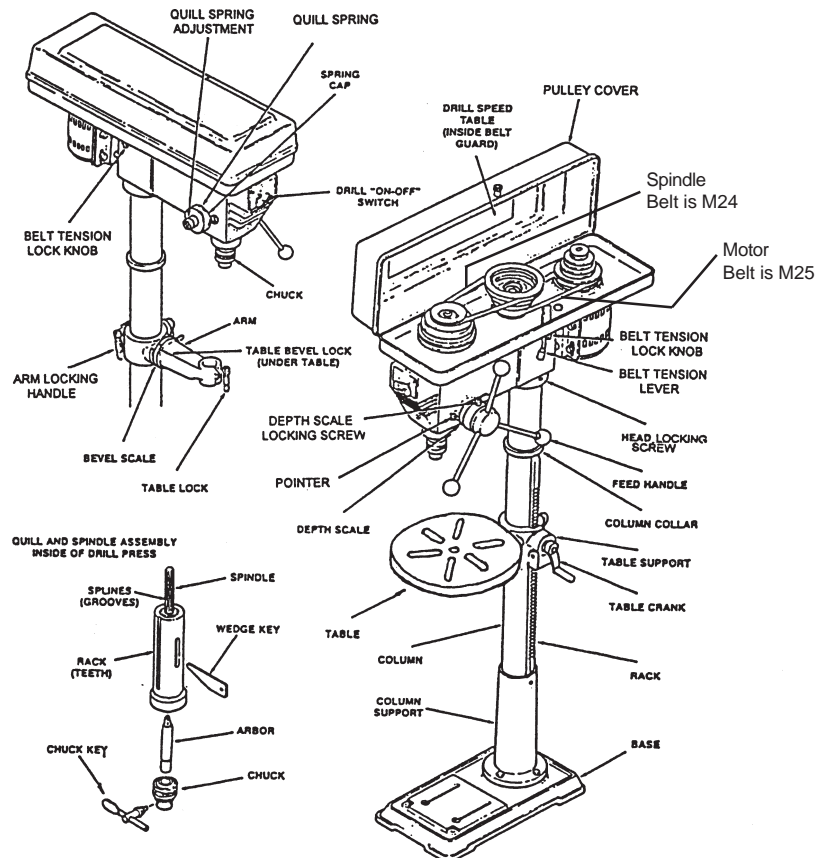


Figure 1

Figure 2





IMPORTANT SAFETY INSTRUCTIONS!



READ ALL INSTRUCTIONS BEFORE USING THIS PRODUCT!

Work Area

TO AVOID RISK OF PERSONAL INJURY, EQUIPMENT DAMAGE, FIRE AND SHOCK, MAKE SURE YOUR WORK AREA IS:

Free of damp, wet or rainy conditions

Free of flammable gasses or liquids

Childproof - use padlocks, master switches and remove starter keys when not in use.

Well-lit

Clean and uncluttered

Well-ventilated

The Operator

COMMON SENSE AND CAUTION ARE FACTORS WHICH CANNOT BE BUILT INTO ANY PRODUCT. THESE FACTORS MUST BE SUPPLIED BY THE OPERATOR. PLEASE REMEMBER:

Prevent body contact with grounded surfaces such as pipes or radiators.

Stay alert. Never operate equipment if you are tired.

Do not operate the product if under the influence of alcohol or drugs. Read warning labels on prescriptions to determine if your judgment/reflexes might be impaired.

Do not wear loose clothing or jewelry as they can be caught in moving parts.

Non-skid footwear is recommended.

Wear restrictive hair covering to contain long hair.

Use eye and ear protection. Always wear:

ANSI-approved dust mask or respirator when working around metal, wood, and chemical dusts and mists.

A full face shield if you are producing metal or wood filings.

Ear protectors

Keep proper footing and balance at all times.

Do not reach over or across running machines.

Always check that adjusting keys and wrenches are removed from the tool or machine work surface before plugging it in.

Before Operating

- √ Know the machine. Learn its applications and limitations, as well as the specific potential hazards.
- √ Check for damage. If part of the machine is damaged, it should be carefully inspected to ensure that it can perform its intended function correctly. If in doubt, the part should be replaced.
- √ Be sure the switch is OFF before plugging in.
- √ Before starting machine check to ensure that all chuck keys, spanners and wrenches are removed from the machine.
- √ Make sure guards are in place and working order.
- √ Make sure tool has been cleaned and properly lubricated.
- √ Check for damaged parts. Before using any tool, any part that appears damaged should be carefully checked to determine that it will operate properly and perform its intended function.
- √ Check for alignment and binding of all moving parts, broken parts or mounting fixtures and any other condition that may affect proper operation. Any part that is damaged should be properly repaired or replaced by a qualified technician.
- √ Do not use the tool if any switch does not turn off and on properly.

Operation

- √ This drill press is designed for use with DRILL BITS and MORTISING ATTACHMENTS only. The use of other cutting tools or accessories could be hazardous.
- √ Always use clamps, or a drill vise bolted to the table, to hold the work. It should never be held in place by just your hand.
- √ Never force the tool or attachment to do the work of a larger industrial tool. It is designed to do the job better and more safely at the rate for which it was intended.
- √ Always unplug the cord by the plug. Never yank the cord out of the wall.
- √ Always turn off the machine before unplugging.
- √ With normal use, the motor housing may get hot.
- √ Make all adjustments to the machine with the power OFF.
- √ Never stand on the machine. Serious injury could occur if the machine is tipped over.
- √ Always use the correct drilling speeds for the drill size and the type of material being drilled
- √ Never leave the drill unattended while it is running.
- √ When turning off the machine, never leave unit it has come to a complete stop.
- √ Never hold material to be drilled with your bare hands. Damage to the machine may also occur if the flung material strikes the column.

Assembly (Please refer to Figure 2 and Parts Lists/Diagrams)

CAUTION! Consider the weight of the components and take necessary precautions when lifting components. Assistance will be required when assembling.

Before adjustments are made, ensure that the machine is SWITCHED OFF AND UNPLUGGED. Also make sure all locking handles and securing screws are FULLY TIGHTENED when adjustments are completed.

Before assembling, remove all traces of preservative from the components and wipe all parts thoroughly with a clean dry cloth. Apply a thin coating of light machine oil to the table, column and base to prevent rust.

Column Assembly to Base

MOUNTING SURFACE: Ideally, the base should be firmly bolted to the floor or workbench prior to assembly of other components. The mounting surface must be flat, level and capable of supporting the drill press'weight combined with materials to be drilled. Mount the drill at a sufficient height so you need not bend your back to operate.

1. With the Base on a flat level surface, bolt on the Column Support (#4B) using the five 10 x 40mm hex head screws provided.
2. Tighten firmly.

Table and Support Arm to Column

1. Remove the rack (#2B) from the column by slackening off the collar grub screw (#11B) and removing the collar (#19B). The rack is stowed in this position for transit purposes.
2. Lubricate the worm gear (#18B) with light grease, and insert its shaft first fully into its housing in the arm until it is flush with the helical gear (#17B). Hold it in this position. The worm gear shaft will extend through the housing ready for the crank to be attached later.
3. Gently slide the arm assembly over the column and hold it steady while inserting the rack down through the worm gear housing until it is flush with the helical gear, ensuring the long smooth end of the rack faces up. Place the bottom end of the rack in the groove formed by the column support and the column.
4. Hold in this position while replacing the collar on the column. Ensure that the end of the rack is firmly engaged in the groove formed between the collar and the column. However, there must be a working clearance between the rack and collar — make sure the rack is not pinched. Firmly secure the collar with the grub screw.
5. Thread the Arm Locking Handle (#16B) in from the left, and tighten to secure the arm to the column.
6. Attach the table crank (#8B) to its spigot and tighten the securing screw.
7. Slacken off the arm locking handle and turn the crank, testing to ensure the arm will move the full length of the rack easily, without binding, and will also rotate about the column evenly and without tight spots. **Note:** If too tight, nip up the arm locking handle and slacken off the collar grub screw. Adjust to give a greater working clearance between the rack and collar, tighten the grub screw and test again.
8. Insert the table into its housing on the arm and secure with the table clamp (#13B).

Head to Column

1. It may be necessary to unscrew the Head Lock Set Screws (#21A) slightly to ensure they do not protrude internally, as this will prevent the head from sliding fully into position.
2. With assistance, raise the Head and place it on top of the Column, ensuring it slides home fully.
3. Align the head with the base and firmly secure with the Set Screws (#21A) provided.
4. Screw the three Feed Handles (#24A) and screw them firmly into the hub of the spindle feed shaft (#25A).

Installing the Chuck

1. With the Chuck Guard lifted clear of the spindle nose, slide the work table up the column to within 6" of the spindle.
2. Open the jaws of the chuck to their maximum width, using the Chuck Key supplied.
3. Put a piece of scrap wood on the table to protect the Chuck Nose.
4. Ensuring all parts are thoroughly clean and dry and burr free, insert the arbor (#14) firmly into the end of the chuck. The other end of the arbor, with the chuck now attached, is then inserted into the end of the spindle shaft (#13) turning, where necessary, to ensure the tang on the end of the arbor is aligned correctly with the drive slot in the spindle shaft. Pull the spindle down using the feed handles, pressing the chuck jaws hard against the piece of scrap wood until the chuck is forced home.

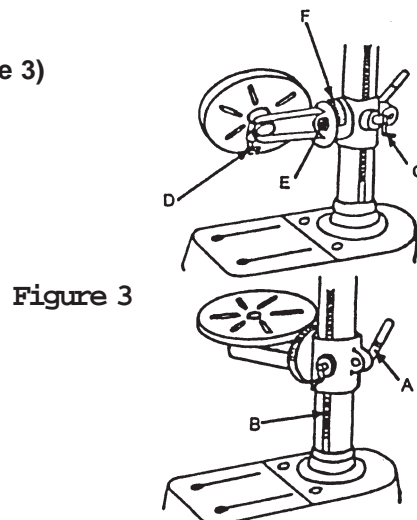
Pulley Cover Knob

1. Locate the knob with pan head screw and attach to the cover.
2. Screw on tightly.

Installing the Drive Belt

1. Undo the Belt Tension Locking Knobs (one either side of the head #18A) and turn the Belt Tension Lever (#19A) clockwise to bring the motor pulley (#11A) closer to the spindle pulley (#3) which will allow the belts to be slipped on with ease.
2. Lubricate the Idler Pulley Pivot shaft (#20) and Idler Pulley with light grease and install in its mounting between the motor and Spindle Pulleys.
3. Consult the chart inside the pulley cover (and duplicated in this manual) and install the belts in the positions corresponding to spindle/drill speed required.
4. Turn the belt counterclockwise so that tension is applied to the belts. Tension is correct when the belt deflects by approximately 1/2" at their centers of run when using reasonable thumb pressure. Lock the motor in this position using the locking screw. **Note:** If the belt slips during operation, adjust the belt tension.

Settings and Adjustments (Please refer to Figure 3)



Before adjustments are made, ensure that the machine is SWITCHED OFF AND UNPLUGGED. Also make sure all locking handles and securing screws are FULLY TIGHTENED when adjustments are completed.

TO ADJUST THE TABLE

The table is capable of moving in four directions (see Figure 3).

1. Raise or lower the table by slackening off the arm locking handle (A) and turning the crank (C) CLOCKWISE TO RAISE and COUNTER CLOCKWISE TO LOWER.
2. Swivel the table about the column by slackening off the arm locking handle. The table assembly, arm and rack (B) move in unison around the column.

SETTING THE REQUIRED ANGLE (see Figure 3)

1. Tilt the table by slackening the Bevel Table Locking Screw (E) and tilting to the required angle. A scale (F) is provided on the arm measured in degrees, to assist in setting the required angle. For all normal operations, the table should be set to 0 degrees.
2. To ensure the drill is entirely perpendicular to the table, insert a piece of straight round bar in the chuck, place a square on the table and bring it up to the round bar. Adjust the table tilt if necessary so that the table is correctly aligned.
3. Turn the table about its axis by slackening off the clamp (D).

TO SET DRILLING DEPTH (See Figure 4)

Located around the Spindle Feed Shaft is a Depth Stop Collar (A) with a graduated scale. The collar is capable of turning about the shaft and can be locked in place by a Locking Screw (B).

To set a drilling depth:

1. Lower the Chuck until the drill contacts the surface of the workpiece and hold it in that position.
2. Loosen the Locking Screw and turn the collar so that the measurement for the depth of the hole required is in line with the pointer (C). Lock the collar in this position using the locking screw.

The drill is now set to drill holes to your predetermined depth from that particular start point (i.e., providing the surface of your workplace is flat and level, you may drill a series of holes, each to the same depth).

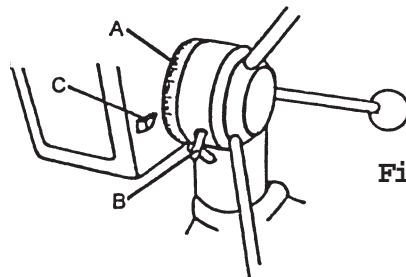


Figure 4

CHANGING DRILL (SPINDLE) SPEED

Before changing the speeds, make sure the machine is switched OFF and UNPLUGGED.

1. Open the pulley cover (#23).
2. Slacken off the Belt Tension Locking Knobs (on either side of the head #18A) and turn the Belt Tension Lever (#19A) clockwise to bring the Motor Pulley (#11A) closer to the Spindle Pulley (#3) in order to remove all tension from the drive belts.

3. Consult the chart inside the pulley cover (or **Figure 5**) and position the belts on the pulleys according to the spindle/drill speed required
4. When the belts have been correctly positioned, tighten them by turning the Belt Tension Lever counter clockwise until the belt deflects by approximately 1/2" at its center when using reasonable thumb pressure. Lock the lever in this position with the two Locking Knobs.

Operation

1. Insert the drill into the jaws of the chuck approximately 1", ensuring that the jaws do not touch the flutes of the drill. Before tightening the chuck, ensure that the drill is centered within the jaws. Tighten.
2. Make sure the table height and position is set so that the drill travel range is sufficient for the material to be drilled.
3. Make sure the work is securely clamped. That is, held in a drill vise, or bolted to the table. Never hold the material with your bare hands while drilling. Severe personal injury may be caused if the material is flung out of the operator's hand.
4. IF THE MATERIAL IS IRREGULARLY SHAPED and cannot be laid flat on the table, it should be securely blocked and clamped. Any tilting, twisting or shifting will result not only in a roughly drilled hole but also increases the chances of damage to the drill.
5. FOR FLAT WORK, lay the piece on a wooden base and clamp it down firmly against the table to prevent it from turning.
6. FOR SMALL MATERIALS that cannot be clamped to the table, use a drill press vise. Make sure the vise is clamped or bolted to the table.
7. WHEN DRILLING COMPLETELY THROUGH WOOD, always position a piece of scrap wood between the material and the table to prevent splintering on the underside of the material as the drill breaks through. The scrap piece of wood must make contact with the left side of the column as shown in **Figure 6**. Also, set the depth of the drill so that the drill will not come in contact with the table - or align the table so that the hole in its center is in line with the drill bit.

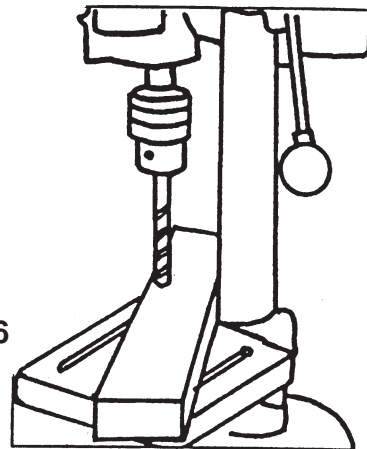


Figure 6

8. Once the instructions above have been followed, lower the drill bit into place and switch the machine ON .

Note: A micro switch is provided inside the Pulley Cover that prevents the machine from operating unless the Pulley Cover is firmly closed.

Cutting Speeds












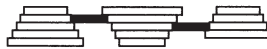
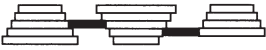



Factors which determine the best speed to use in the drill press operation are:

1. Type of material to be drilled
2. Size of hole
3. Type of drill bit
4. Quality of the hole/cut desired.

Generally, the SMALLER THE DRILL BIT the GREATER THE REQUIRED RPM. In soft material, the speed should be higher than for hard metals.

Drill Speed Table Note: Spindle Belt M24, Motor Belt M25

The table below shows the belt arrangements for given drill speeds (a full chart is also located on the inside of the pulley cover).

220 	300 	430 	480 
590 	650 	720 	850 
900 	950 	1600 	1900 
2000 	2500 	2900 	3600 

After Operation

1. Remove all residue from the machine and thoroughly clean all surfaces.
2. Make sure all components are dry and machined surfaces lightly oiled.
3. Remove drill bits and store in a safe place.
4. Child-proof the machine and work area. Make sure to use padlocks, master switches and remove starter keys.

Grounding/Voltage Warning

Common household current is 110-120 volts. As long as your tool is rated from 110-120V there will be no complications using this tool with household receptacles. Plug the press into a 110-120V properly grounded outlet protected by a 15-amp, dual element time delay or circuit breaker.

NEVER try to plug a 110-120V tool into a 220-240V circuit (or vice-versa) or serious complications and possible injury to the operator may occur. The plugs have different shapes to prevent this.

This piece of equipment has a three-prong plug. The third (round) prong is the ground to protect the operator from electric shock. Cutting off the ground will result in a safety hazard and void the warranty.

Extension Cords

Your tool has a three-prong plug, therefore you must use a three-prong extension cord. Only use rounded jacket extension cords listed by the Underwriters Laboratories (UL).

The extension cord must have a minimum wire size depending on the amperage of the tool and the length of the extension cord. This size is determined by its AWG (American Wire Gauge) rating. The smaller the gauge, the greater the cable's capacity. The amount of cords used does not matter: Total length determines the minimum AWG rating. Every cord must meet the AWG rating. Use the chart below to determine what AWG rating is required for your situation. Cord length is rated in feet. **Harbor Freight Tools can supply UL listed and outdoor rated cords in multiple AWG ratings if needed.**

AWG RATING CHART

CORD LENGTH		25'	50'	75'	100'	125'	150'	175'	200'
AMPS	AWG	AWG	AWG	AWG	AWG	AWG	AWG	AWG	
0-10.0	18	18	16	16	14	14	12	12	
10.1-13.0	16	16	14	14	14	12	12	12	
13.1-15	14	14	12	12	12	12	12	—	
15-18	14	12	12	12	12	12	—	—	

Maintenance

CLEANING: Regularly clean the work surface with dry brush or clean cloth. Keep machined parts of the press lightly greased. Always keep the motor and chuck clean. Prevent metal, wood, dust and debris from accumulating in this area. If jaws do not operate smoothly, have the chuck serviced by a qualified technician.

LUBRICATION: For average use, lubricate twice a year with #20-30 weight household oil. Lubricate more frequently with increased usage.

POWER CORD: Inspect the power cord periodically and, if damaged, have it repaired by an authorized technician.

REPLACEMENT PARTS: Replace belts at the first sign of slippage or fraying. When servicing, use only identical replacement parts. Use of any other parts will void the warranty.

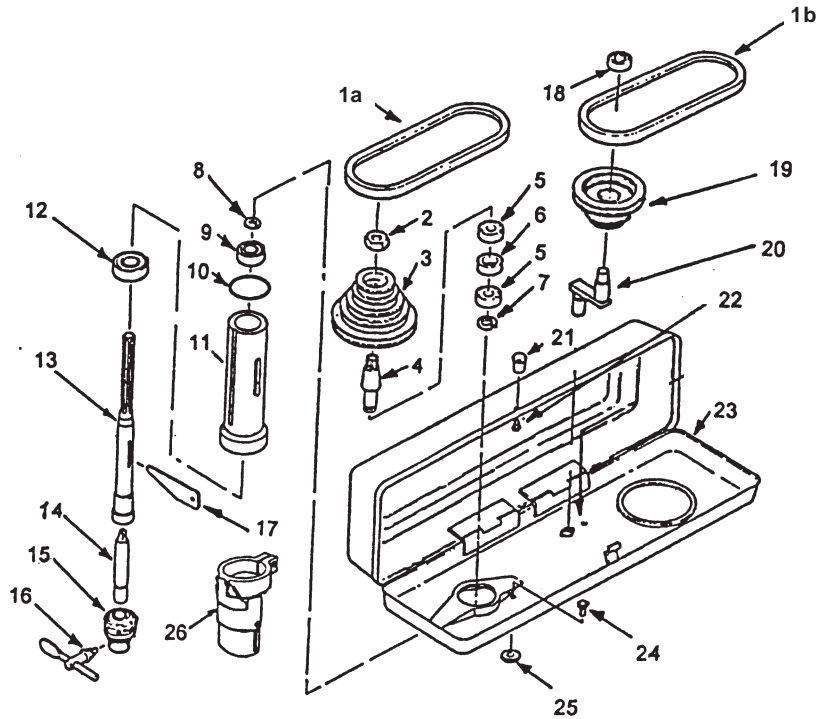
STORAGE: Always remove and store drill bits.

KEEP OUT OF REACH OF CHILDREN

Troubleshooting

PROBLEM	PROBABLE CAUSE	REMEDY
Noisy operation (under load)	<ul style="list-style-type: none"> • Incorrect belt tension • Dry spindle • Loose pulley • Loose belt • Worn bearing 	<ul style="list-style-type: none"> • Adjust tension • Lubricate spindle • Tighten pulley • Adjust belt tension • Replace bearing
Excessive drill wobble	<ul style="list-style-type: none"> • Loose chuck • Worn spindle, or bearing • Worn chuck • Bent drill bit 	<ul style="list-style-type: none"> • Tighten by pressing chuck down on to a block of wood against the table. • Replace spindle or bearing • Replace chuck • Replace drill bit
Motor won't start	<ul style="list-style-type: none"> • Power supply • Motor connection • Faulty switch • Motor windings burn 	<ul style="list-style-type: none"> • Check power cord • Check motor connections • Replace switch • Replace motor
Drill binds in material	<ul style="list-style-type: none"> • Excessive pressure on feed handle • Loose belt • Loose drill bit • Incorrect drill speed • Drill angles incorrect for type of material 	<ul style="list-style-type: none"> • Apply less pressure • Check belt tension • Tighten drill with key • Refer to Cutting Speed chart • Consult an appropriate source (e.g., manual, instruction book, professional) and adjust drill accordingly.
Drill burns or smokes	<ul style="list-style-type: none"> • Incorrect speed • Chips are not discharging • Dull drill or not the proper clearance allowed for material • Needs coolant • Feed pressure is wrong 	<ul style="list-style-type: none"> • Refer to Cutting Speed chart • Clean drill • Use coolant while drilling • Apply less pressure
Table difficult to raise	<ul style="list-style-type: none"> • Needs lubrication • Table lock tightened 	<ul style="list-style-type: none"> • Lubricate with light oil • Loosen clamp

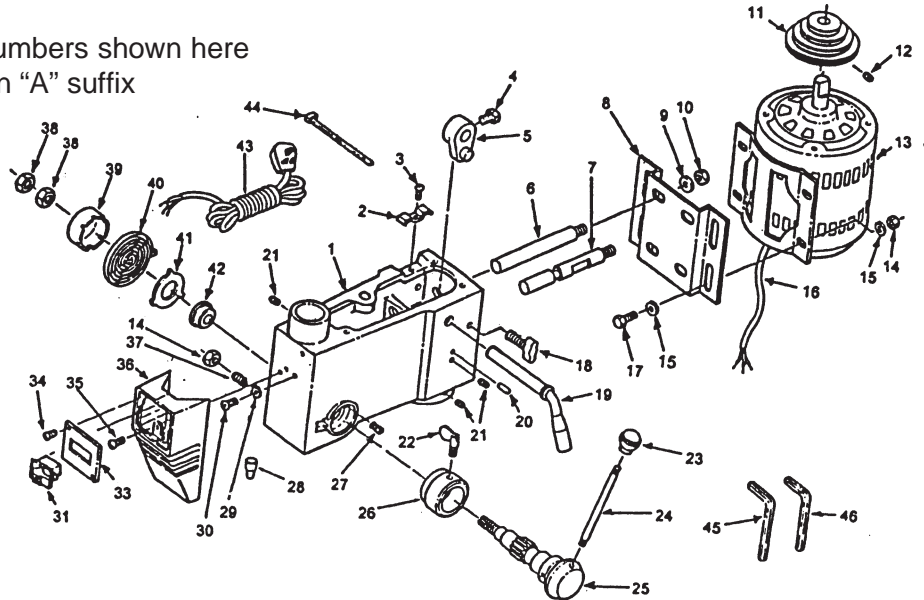
Figure 7 - Parts List - Pulley and Spindle Assembly



<u>Item</u>	<u>Description</u>	<u>No.</u>	<u>Item</u>	<u>Description</u>	<u>No.</u>
1a	"V" Belt M24	1505010	15	Chuck	1502009A
1b	"V" Belt M25		16	Chuck Key	1503010A
2	Pulley Nut	1302025	17	Wedge Drift	150300B
3	Spindle Pulley	1305009A	18	Ball Bearing 60202	GB278-89B
4	Pulley Insert	1302022	19	Idler Pulley	1505006
5	Ball Bearing 17mm 60203	GB2778-89C	20	Idler Pivot	1505007
6	Spacer	1302023	21	Knob	1505008
7	Retaining Ring 17mm	GB894.1-86B	22	Pan Head Screw M5	GB818-85B
8	Retaining Ring 11mm	GB894.1-86A	23	Pulley Cover w/labels	1305000C
9	Ball Bearing 60201	GB278-89A	24	Washer HD Screw	GB9074.1-88
10	Quill Gasket	1303003	25	Foam Washer	0805009
11	Quill	1303002B	26	Chuck Guard	1508002A
12	Ball Bearing 80202	GB278-89D			
13	Spindle Shaft	13003001A			
14	Arbor	1503007			

Figure 8 - Parts List - Head Assembly

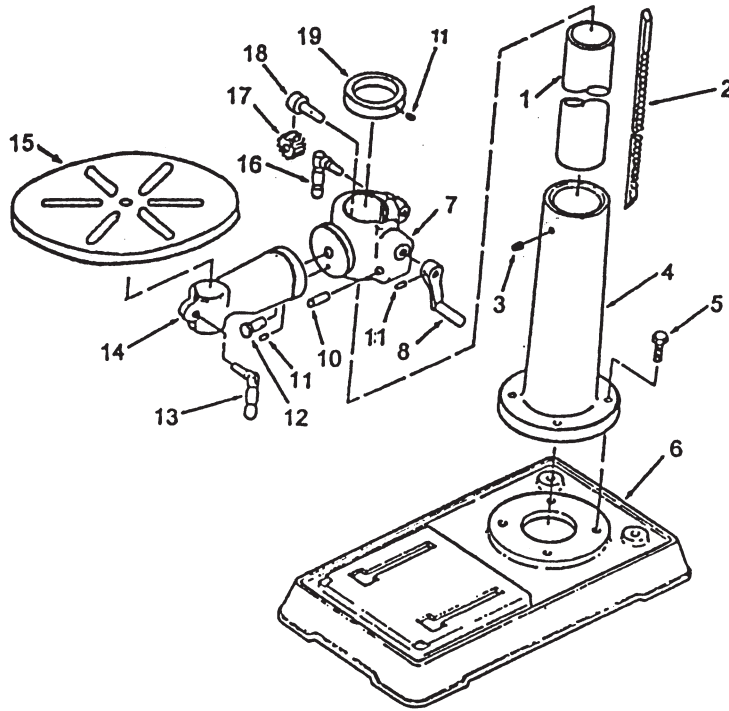
Part Numbers shown here
have an "A" suffix



<u>Item</u>	<u>Description</u>	<u>No.</u>	<u>Item</u>	<u>Description</u>	<u>No.</u>
1A	Head w/pointer and trim	1302001A	24A	Feed Handle	1304005
2A	Cable Clamp	15020114A	25A	Spindle Feed Shaft	1304002
3A	Pan Head Screw M5	GB818-85B	26A	Collar Depth Stop (w/scale)	1304003
4A	Hex. Screw M8	GB5781-86B	27A	Stop Pin	1304010
5A	Adjusting Lever	1502006	28A	Connector Wire	1302019
6A	Motor Support Bracket	1502002	29A	Lockwasher Ext. 5mm	GB862.1-87
7A	Motor Support Bracket	1502003	30A	Pan Head Screw M5	GB818-85B
8A	Motor Mount	1502007A	31A	No Volt Switch	1502010E
9A	Lockwasher 12mm	GB93-87	33A	Switch Plate Cover	1302009A
10A	Nut Hex. M12x1.75	GB6170-86E	34A	Pan Head Screw	GB845-85
11A	Motor Pulley	1505005	35A	Pan Head Screw M5	GB818-85B
12A	Skt. Screw Set M6	GB80-85A	36A	Switch Box	1302008B
13A	Motor	1302020B	37A	Screw-Special Set M8	1302021
14A	Hex. Nut M8	GB6170-86C	38A	Hex. Nut M12	GB6171-86E
15A	Washer M8	GB97.2-85	39A	Quill Spring Cap	1504008
16A	Motor Cable	1502016B	40A	Quill Spring	1504009
17A	Hex. Screw M8	GB5782-86A	41A	Spring Retainer	1504007
18A	Belt Tension Lock Knob	1502005	42A	Spring Seat	1504006
19A	Belt Tension Lever	1502004	43A	Power Cable	1302015B
20A	Roll Pin	GB879-86	44A	Cable Tie	1502017
21A	Head Lock Set Screw M8	GB80-85B	45A	Allen Key 4mm	GB5356-86B
22A	Depth Lock Screw	1504012	46A	Allen Key 3mm	GB5356-86A
23A	Knob	1304011			

Figure 9 - Parts List - Base and Table

Part Numbers shown here
include a "B" suffix



<u>Item</u>	<u>Description</u>	<u>No. CDP350F</u>
1B	Column	1301003
2B	Rack	1301010
3B	Hex. Socket Screw Set M10	GB80-85C
4B	Column Support	1301002
5B	Hex. Head Screw	GB5781-86
6B	Base	1301001
7B	Table Support w/indicator	1501004
8B	Crank	1001009
10B	Gear Pin	1501007
11B	Skt. Screw Set M6	GB80-85A
12B	Bevel Table Lock Screw M16	GB5781-86C
13B	Table Clamp	1501013
14B	Arm w/scale	1301005
15B	Table	1601014
16B	Arm Locking Handle	1501012
17B	Helical Gear	1501006
18B	Worm	1501008
19B	Collar	1501011