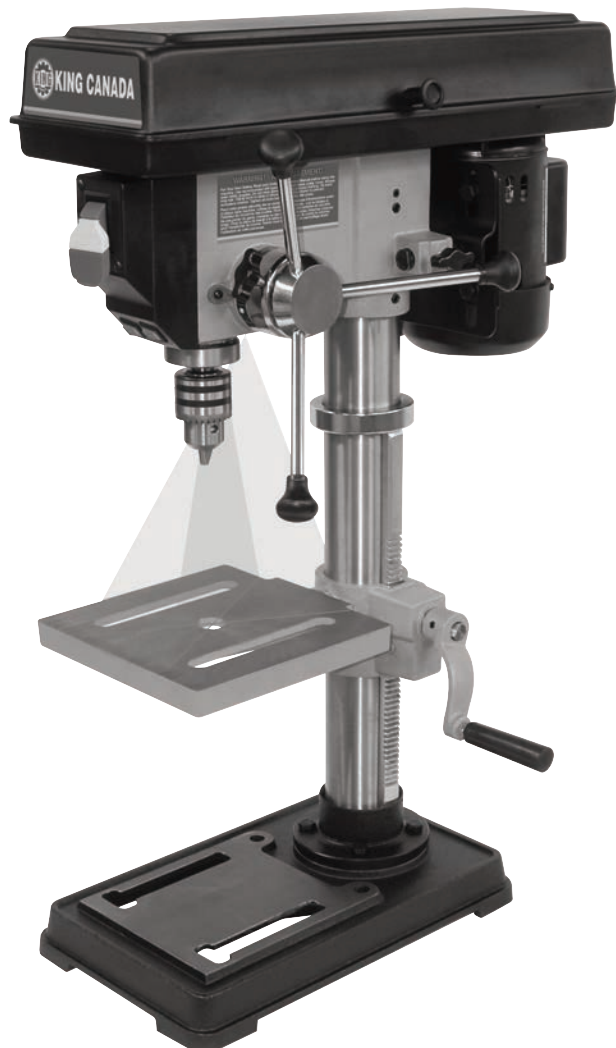




KING KING CANADA

10" BENCH DRILL PRESS

03/2016



MODEL: KC-110N

INSTRUCTION MANUAL

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WARRANTY INFORMATION



**2-YEAR
LIMITED WARRANTY
FOR THIS 10" DRILL PRESS**

**KING CANADA TOOLS
OFFERS A 2-YEAR LIMITED WARRANTY
FOR NON-COMMERCIAL USE.**

PROOF OF PURCHASE

Please keep your dated proof of purchase for warranty and servicing purposes.

REPLACEMENT PARTS

Replacement parts for this product are available at our authorized King Canada service centers across Canada.

LIMITED TOOL WARRANTY

King Canada makes every effort to ensure that this product meets high quality and durability standards. King Canada warrants to the original retail consumer a 2-year limited warranty as of the date the product was purchased at retail and that each product is free from defects in materials. Warranty does not apply to defects due directly or indirectly to misuse, abuse, normal wear and tear, negligence or accidents, repairs done by an unauthorized service center, alterations and lack of maintenance. King Canada shall in no event be liable for death, injuries to persons or property or for incidental, special or consequential damages arising from the use of our products.

To take advantage of this limited warranty, return the product at your expense together with your dated proof of purchase to an authorized King Canada service center. Contact your retailer or visit our web site at www.kingcanada.com for an updated listing of our authorized service centers. In cooperation with our authorized serviced center, King Canada will either repair or replace the product if any part or parts covered under this warranty which examination proves to be defective in workmanship or material during the warranty period.

NOTE TO USER

This instruction manual is meant to serve as a guide only. Specifications and references are subject to change without prior notice.

PARTS DIAGRAM & PARTS LISTS

Refer to the Parts section of the King Canada web site for the most updated parts diagram and parts list.

KING CANADA INC. DORVAL, QUÉBEC, CANADA H9P 2Y4

www.kingcanada.com



GENERAL SAFETY INSTRUCTIONS FOR POWER TOOLS

1. KNOW YOUR TOOL

Read and understand the owners manual and labels affixed to the tool. Learn its application and limitations as well as its specific potential hazards.

2. GROUND THE TOOL.

This tool is equipped with an approved 3-conductor cord and a 3-prong grounding type plug to fit the proper grounding type receptacle. The green conductor in the cord is the grounding wire. **NEVER** connect the green wire to a live terminal.

3. KEEP GUARDS IN PLACE.

Keep in good working order, properly adjusted and aligned.

4. REMOVE ADJUSTING KEYS AND WRENCHES.

Form habit of checking to see that keys and adjusting wrenches are removed from tool before turning it on.

5. KEEP WORK AREA CLEAN.

Cluttered areas and benches invite accidents. Make sure the floor is clean and not slippery due to wax and sawdust build-up.

6. AVOID DANGEROUS ENVIRONMENT.

Don't use power tools in damp or wet locations or expose them to rain. Keep work area well lit and provide adequate surrounding work space.

7. KEEP CHILDREN AWAY.

All visitors should be kept a safe distance from work area.

8. MAKE WORKSHOP CHILD-PROOF.

-with padlocks, master switches or by removing starter keys.

9. USE PROPER SPEED.

A tool will do a better and safer job when operated at the proper speed.

10. USE RIGHT TOOL.

Don't force the tool or the attachment to do a job for which it was not designed.

11. WEAR PROPER APPAREL.

Do not wear loose clothing, gloves, neckties or jewelry (rings, watch) because they could get caught in moving parts. Non-slip

footwear is recommended. Wear protective hair covering to contain long hair. Roll up long sleeves above the elbows.

12. ALWAYS WEAR SAFETY GLASSES.

Always wear safety glasses (ANSI Z87.1). Everyday eye-glasses only have impact resistant lenses, that are **NOT** safety glasses. Also use a face or dust mask if cutting operation is dusty.

13. DON'T OVERREACH.

Keep proper footing and balance at all times.

14. MAINTAIN TOOL WITH CARE.

Keep tools sharp and clean for best and safest performance. Follow instructions for lubricating and changing accessories.

15. DISCONNECT TOOLS.

Before servicing, when changing accessories or attachments.

16. AVOID ACCIDENTAL STARTING.

Make sure the switch is in the "OFF" position before plugging in.

17. USE RECOMMENDED ACCESSORIES.

Consult the manual for recommended accessories. Follow the instructions that accompany the accessories. The use of improper accessories may cause hazards.

18. NEVER STAND ON TOOL.

Serious injury could occur if the tool tips over. Do not store materials such that it is necessary to stand on the tool to reach them.

19. CHECK DAMAGED PARTS.

Before further use of the tool, a guard or other parts that are damaged should be carefully checked to ensure that they will operate properly and perform their intended function. Check for alignment of moving parts, breakage of parts, mounting, and any other conditions that may affect its operation. A guard or other parts that are damaged should be properly repaired or replaced.

20. NEVER LEAVE MACHINE RUNNING UNATTENDED.

Turn power "OFF". Don't leave any tool running until it comes to a complete stop.

SPECIFIC SAFETY INSTRUCTIONS FOR DRILL PRESS

1. TO AVOID INJURY FROM PARTS BEING THROWN BY THE SPRING

Follow the instructions exactly as given and shown in "Adjusting the quill return spring".

2. USING A DRILL PRESS VISE

When using a drill press vise, always fasten it to the table.

3. NEVER DO "FREEHAND WORK"

Never do any work "Freehand" (hand holding the workpiece rather than supporting it on the table) except when you have polishing to do.

4. SECURE the lock head to the column, table support to column and table to table support before operating the drill press.

5. NEVER move the head or table while the drill press is running.

6. USE THE RECOMMENDED SPINDLE SPEED for the specific operation and workpiece material. Check the panel inside the guard cover for drill information. For accessories, use the instructions provided with the accessories.

7. NEVER climb on the drill press table, it could break or pull the entire drill press down on you.

ELECTRICAL INFORMATION



WARNING

ALL ELECTRICAL CONNECTIONS MUST BE DONE BY A QUALIFIED ELECTRICIAN. FAILURE TO COMPLY MAY RESULT IN SERIOUS INJURY! ALL ADJUSTMENTS OR REPAIRS MUST BE DONE WITH THE MACHINE DISCONNECTED FROM THE POWER SOURCE. FAILURE TO COMPLY MAY RESULT IN SERIOUS INJURY!

POWER SUPPLY

WARNING: YOUR DRILL PRESS MUST BE CONNECTED TO A 120V WALL OUTLET, WITH A MINIMUM 15-AMP. BRANCH CIRCUIT AND USE A 15-AMP TIME DELAY FUSE OR CIRCUIT BREAKER. FAILURE TO CONNECT IN THIS WAY CAN RESULT IN INJURY FROM SHOCK OR FIRE.

GROUNDING

Your drill press must be properly grounded. Not all outlets are properly grounded. If you are not sure if your outlet is properly grounded, have it checked by a qualified electrician.

WARNING: IF NOT PROPERLY GROUNDED, THIS DRILL PRESS CAN CAUSE ELECTRICAL SHOCK, PARTICULARLY WHEN USED IN DAMP LOCATIONS. TO AVOID SHOCK OR FIRE, IF THE POWER CORD IS WORN OR DAMAGED IN ANY WAY, HAVE IT REPLACED IMMEDIATELY.

If this drill press should malfunction or breakdown, grounding provides a path of least resistance for electric current, to reduce the risk of electric shock. This drill press is equipped with a cord having an equipment-grounding conductor and grounding plug. The plug must be plugged into an appropriate outlet that is properly installed and grounded in accordance with all local codes and ordinances.

WARNING: TO MAINTAIN PROPER GROUNDING, DO NOT REMOVE OR ALTER THE GROUNDING PRONG IN ANY MANNER.

120V OPERATION

As received from the factory, your drill press is ready to run for 120V operation. This machine is intended for use on a circuit that has an outlet and a plug which looks like the one illustrated in Fig.1.

WARNING: DO NOT USE A TWO-PRONG ADAPTOR(S) FOR THEY ARE NOT IN ACCORDANCE WITH LOCAL CODES AND ORDINANCES. NEVER USE IN CANADA.

EXTENSION CORDS

The use of any extension cord will cause some loss of power. If you do not have a choice, use the table in Fig.2 to determine the minimum wire size (A.W.G-American Wire Gauge) extension cord needed. Use only 3-wire extension cords which have 3-prong grounding type plugs and 3-hole receptacles which accept the tool's plug.

For circuits that are further away from the electrical circuit box, the wire size must be increased proportionately in order to deliver ample voltage to the drill press motor. Refer to Fig.2 for wire length and size.

USING ON/OFF SWITCH WITH REMOVABLE SAFETY KEY

The On/Off switch (A) Fig.3 is used to turn the drill press on and off. To turn the drill press "On", move the switch upwards (On position), to turn the drill press "Off", move the switch downwards (Off position).

This switch comes with a removable safety key (B). When the safety key is removed from the switch and placed in a safe location, unauthorized persons or children can't turn the switch to the On position. It is recommended to always remove the safety key from the switch whenever the drill press is not in use. To remove the safety switch, make sure the switch is in the Off position and simply pull out the safety key.

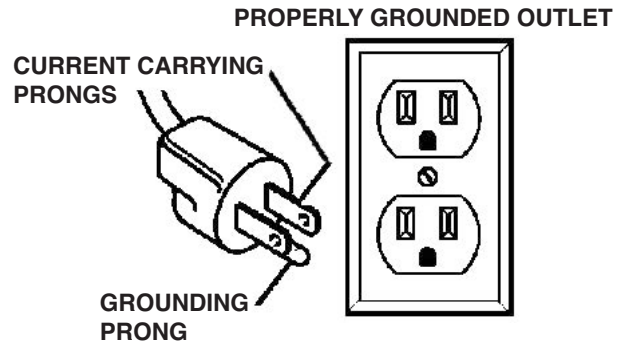
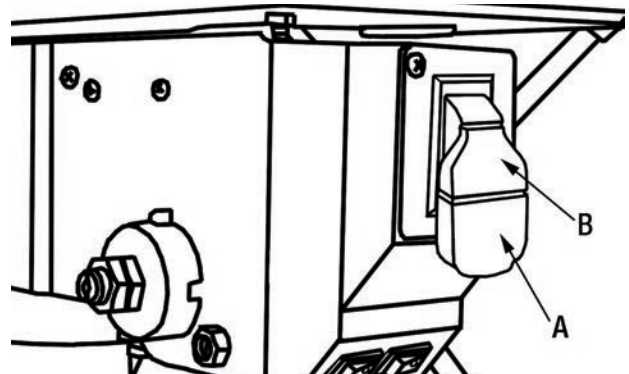


Figure 1

<u>LENGTH OF CONDUCTOR</u>	<u>WIRE SIZES REQUIRED (AMERICAN WIRE GAUGE)</u>
0-25 FEET	<u>110V LINES</u> NO.14
26-50 FEET	NO.12
51-100 FEET	Not recommended

Figure 2





GETTING TO KNOW YOUR DRILL PRESS

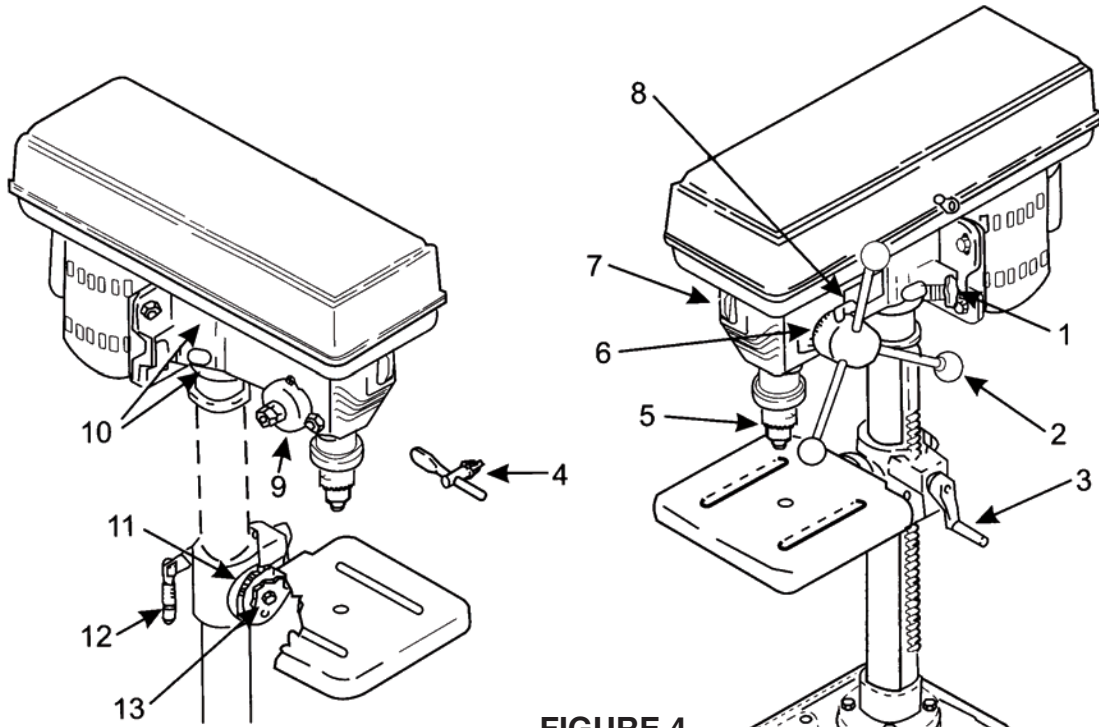


FIGURE 4

LOCATION AND FUNCTION OF CONTROLS

1. BELT TENSION LOCK HANDLE...Tightening handles locks the motor bracket support to maintain the correct belt distance and tension.
2. FEED HANDLE...moves the chuck up or down. One or two of the feed handle can be removed if it is necessary (If the workpiece interferes with the handles).
3. TABLE CRANK HANDLE...Turn clockwise to elevate table. Support lock must be released before operating crank handle.
4. CHUCK KEY... Used to tighten drill in the chuck and also to loosen the chuck for drill removal.
5. CHUCK...Holds drill bit or other recommended accessory to perform desired operations.
6. DEPTH SCALE...shows the depth of the hole being drilled in inches and millimeters.
7. ON-OFF SWITCH...has a locking feature to prevent unauthorized and possible hazardous use by children and others. Just below it you will find the light and laser switches.
8. DEPTH SCALE LOCK... Locks the depth scale at a desired position.
9. SPRING CAP...Provides means to adjust the quill spring tension.
10. HEAD LOCKING SET SCREWS... Lock the head to the column. ALWAYS have them locked in place while you operate the drill press.
11. BEVEL SCALE...shows the degree in which the table is tilted for bevel operations. The scale is mounted on the table support.
12. SUPPORT LOCK HANDLE...Tightening locks the table support to the column. Always have it locked in place while operating the drill press.
13. TABLE BEVEL LOCK...locks the table in any position from 0°-45°.

MODEL	KC-110N
VOLTAGE	120V
AMPS	2.5A
MOTOR R.P.M.	1720
Hz/PHASE.....	60 Hz / 1 PHASE
CHUCK CAPACITY	1/2"
SWING	10"
MAX. SPINDLE TRAVEL	2-3/8"
MAX. DISTANCE FROM CHUCK TO THE TABLE	9-1/2"
MAX. DISTANCE FROM CHUCK TO THE BASE.....	14"
NUMBER OF SPEEDS/RANGE OF SPEEDS	5 (620, 1100, 1720, 2340, 3100 RPM)
SPINDLE TAPER	JT#33
WEIGHT55 LBS

FIGURE 5

ASSEMBLY



BASE, COLUMN & TABLE ASSEMBLY

1. Position the base (A) Fig.6 on the floor. Remove the protective covering and discard.
2. Remove protective sleeve from the column (B) and discard. Place the column assembly on the base, align the holes in the column support (C) with the holes in the base.
3. Locate three long bolts from the parts bag.
4. Install a bolt in each hole through the column support (C) and the base and tighten with the adjustable wrench.
5. Loosen set screw (A) Fig.7 in column collar (B) with 3mm hex. key (C) and remove collar and rack (D) from the column.

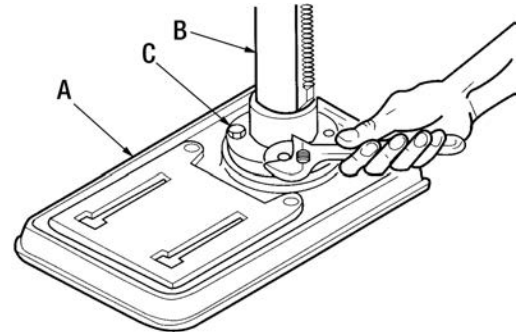


FIGURE 6

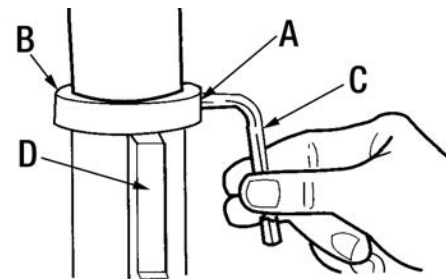


FIGURE 7

6. Find the elevation worm gear shaft (A) Fig.8 in the loose parts bag. Insert the elevation shaft into the table support (B) and extend the shaft through the opening as far as possible. The crank handle (C) is to be installed on the elevation shaft, the set screw (D) is to be aligned with the flat portion of the shaft. The crank is to be positioned as close to the arm support as possible, then tighten the set screw.

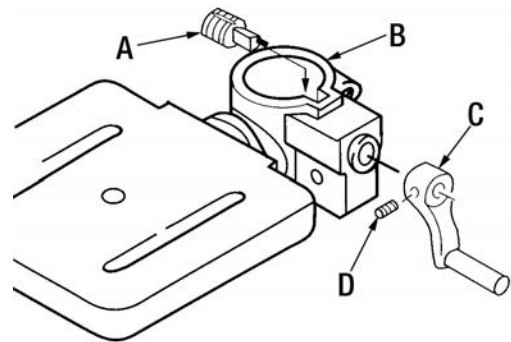


FIGURE 8

7. With the long smooth end of the rack (A) Fig.9 pointing upwards, slide rack down through the large round opening in the table support (B). Engage rack in gear mechanism found inside the opening of the table support.

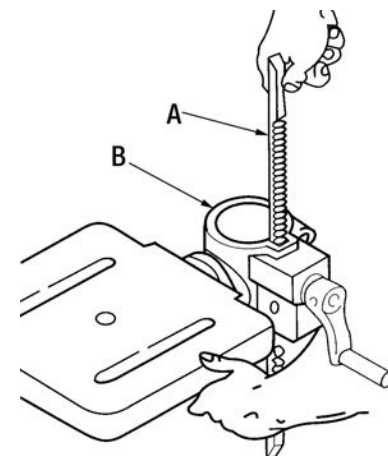


FIGURE 9



ASSEMBLY

8. While holding the rack (A) Fig.10 and table support (B) in an engaged position, slide both down over the column (C). Slide rack down the column until the rack is positioned against the lower column support (D).

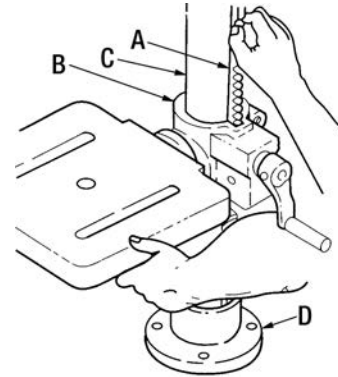


FIGURE 10

9. Replace column collar (A) Fig.11 and position it bevel side down over the rack (B). Tighten set screw (C) in collar with 3mm hex. key (D). To let the rack slide when the table is swung to the left or right around the column, the collar must sit loosely over the rack and should not be angled on the column. Only tighten set screw enough to keep the collar in place, otherwise the collar may break due to excessive pressure.

NOTE: To avoid column or collar damage, do not overtighten set screw.

10. Locate the support lock handle (A) Fig.12 in loose parts bag and tighten by hand.

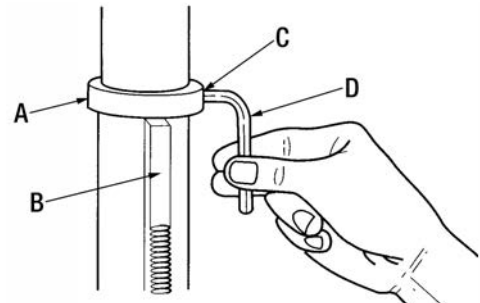


FIGURE 11

11. To minimize crank backlash; tighten the support lock handle and rotate the elevation worm shaft clockwise with the crank handle. Loosen the set screw in the crank and reposition it as close to the table support as possible. Tighten set screw in the crank handle.

INSTALLING THE HEAD

1. Remove the protective covering from the head assembly (A) Fig.13.
2. Carefully lift the head above the column and slide it down on the column as far as it will go. Align the head with the table and the base.
3. Using a 4mm hex. key, tighten both head set screws (B) on the right side of the head.

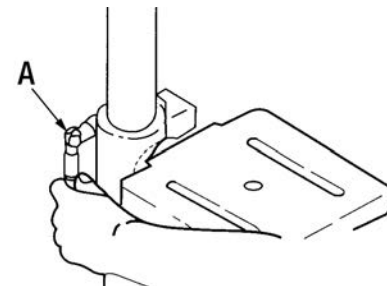


FIGURE 12

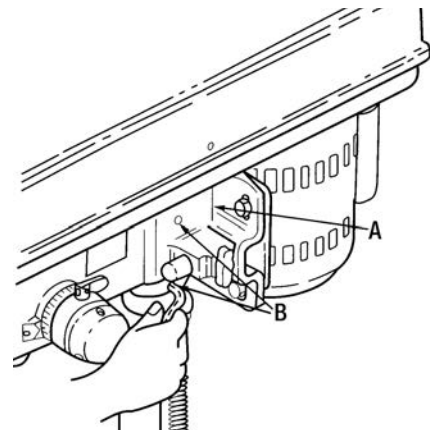


FIGURE 13

ASSEMBLY & ADJUSTMENTS



INSTALLING THE CHUCK

1. Locate the chuck (A) Fig.14 in the box of parts.
2. Clean out the tapered hole in the chuck, also clean the spindle nose (B) with a clean cloth. Make sure there are no foreign particles sticking to the surfaces. The slightest piece of dirt on the spindle nose or the chuck will prevent the chuck from seating properly. This will cause the drill to “wobble”.
NOTE: If the tapered hole in the chuck is extremely dirty, use a cleaning solvent on a clean cloth.
3. Push the chuck up on the spindle nose as far as it will go.
4. Turn the chuck sleeve clockwise and open the chuck jaws completely.
5. Lightly tap the nose of the chuck with a piece of wood to insure the proper seating of the chuck on the spindle.

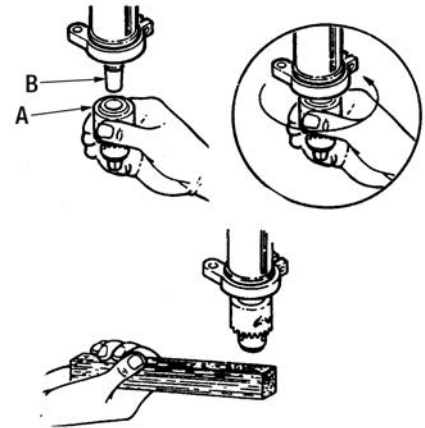


FIGURE 14

REMOVING THE CHUCK

1. Open the jaws of the chuck as wide as they will go by turning the chuck sleeve.
2. Carefully tap the chuck (A) Fig.15 with a mallet (B) in one hand while holding the chuck in the other hand to prevent the chuck from dropping when it is released from the spindle nose.

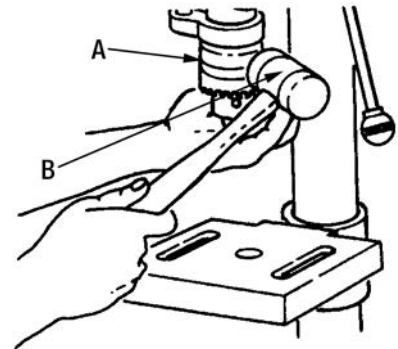


FIGURE 15

INSTALLING THE FEED HANDLES

1. Locate the three feed handles (A) Fig.16 among the loose parts.
2. Screw the feed handle tightly into the threaded holes in the hub (B).

TENSIONING THE BELT / SETTING DESIRED DRILLING SPEED

NOTE: The drill press is shipped with the belt installed, but it should be properly tensioned before use.

1. Lift the guard (A) Fig.17 from the right side and keep it opened.
2. Release the belt tension lock knob (B) located on the right side of the drill press head. Pull the right side of the motor towards the front to relieve the spring tension of the belt. Tighten the belt tension lock handle.
3. Choose the desired speed for your drilling operation, and move the belt to the indicated position on the pulleys. Refer to the chart on the inside of the belt guard.
4. Loosen the belt tension lock knob and move the right side of the motor backwards to apply tension to the belt.
5. Tighten the belt tension lock knob.

NOTE: The belt should deflect approximately 1/2” by applying finger pressure at the mid-point of the belt between the pulleys.

6. Close the belt guard.
7. If the belt slips while drilling, reajust the belt tension.

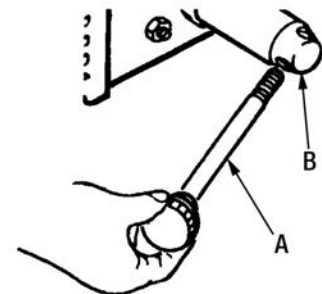
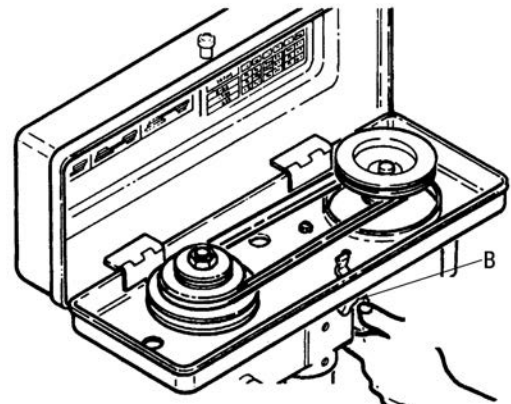
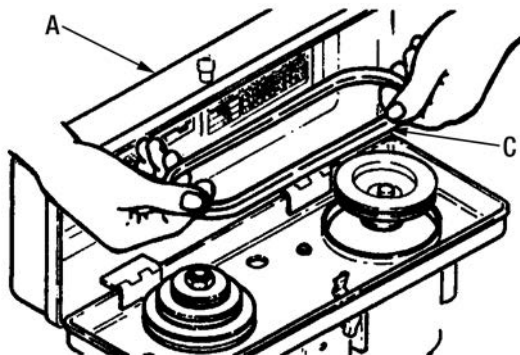


FIGURE 16



FIGURES 17



OPERATION & ADJUSTMENTS

WARNING! For your own safety, turn the switch OFF and remove the plug from the power source before making any adjustments. To avoid injury from thrown parts due to the spring release, follow instructions carefully and wear safety glasses.

INSTALLING DRILL BITS

Insert the drill bit (A) Fig.18 into the chuck (B) far enough to obtain the maximum gripping of the chuck jaws. When using a small drill bit, do not insert it so far that the jaws touch the flutes (spiral grooves) of the bit.

Make sure the drill bit is centered in the chuck before tightening the chuck with the chuck key (C). Tighten the drill bit well, so that it doesn't slip while drilling. Turn the chuck key clockwise to tighten, counterclockwise to loosen.

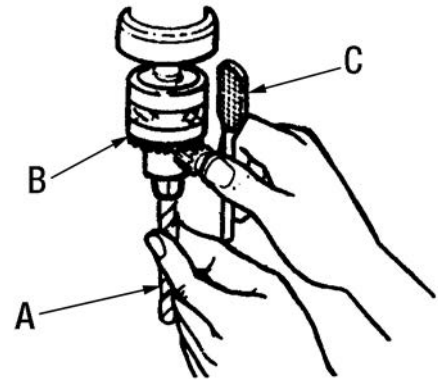


FIGURE 18

DRILLING TO A SPECIFIC DEPTH

To drill a blind hole (not all the way through) to a given depth, proceed as follows.

1. Mark the depth of the hole on the workpiece.
2. Loosen the depth scale lock knob (A) Fig.19.
3. With the switch OFF, bring the drill bit down until the tip of the lips of the drill bit are even with the mark (B).
4. Turn the depth scale (C) counterclockwise until it stops moving.
5. Tighten the depth scale lock knob.
6. The drill bit will stop at this depth until the depth scale is readjusted.

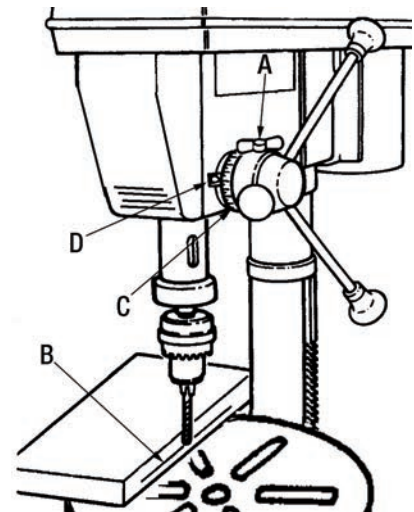


FIGURE 19

ANOTHER WAY- DEPTH SCALE

1. With the power OFF, loosen the depth scale lock knob (A) Fig.19.
2. Place workpiece on table. Adjust table until the tip of the drill is just a little above the top of the workpiece.
3. Turn the depth scale (C) clockwise until the depth scale indicator (D) points to the desired drilling depth on the scale.
4. Tighten the depth scale lock knob.
5. The chuck or drill will now be stopped after traveling downward the distance selected on the depth scale.

ADJUSTING THE QUILL RETURN SPRING

NOTE: The return spring tension is set at the factory and should not require further adjustment.

1. With the chuck at its highest possible position, turn the depth scale (C) Fig.19 clockwise until it stops and tighten the depth scale lock knob (A) Fig.19. This will prevent the quill from dropping while tensioning the spring.
2. Lower the table for additional clearance.
3. Work from the left side of the drill press.
4. Place screwdriver in the lower front notch (A) Fig.20 of the spring cap (B), and hold it in place while loosening and removing the outer nut (C) (only).
5. With screwdriver remaining in the notch, loosen inner nut (D) (approx. 1/8") until the notch disengages from the boss on the head. Do not remove this nut.
6. Carefully turn screwdriver counterclockwise and engage the next notch (E) in the boss. Do not remove screwdriver.
7. Tighten nut with wrench only enough to engage boss. Do not over tighten as this will restrict quill movement.
8. Check tension while turning feed handles.
9. If there is not enough tension on the spring, repeat steps 4-8 moving only one notch each time and checking tension after each repetition.

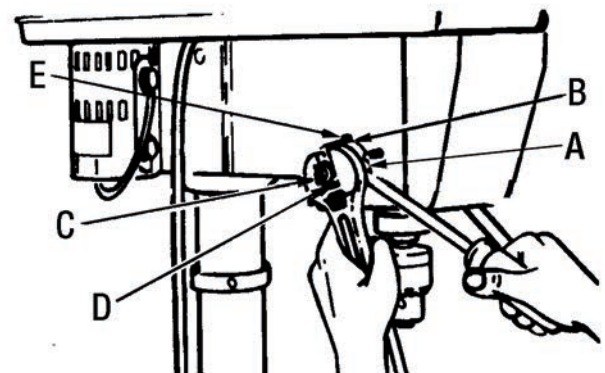


FIGURE 20

OPERATION



ADJUSTING THE TABLE SQUARE TO THE HEAD

1. Insert a precision round steel rod (A) Fig.21 approximately 3" long into the chuck and tighten.
2. With the table (B) raised to working height and locked into position, place a combination square (C) flat on the table beside the rod.
3. If an adjustment is necessary, loosen the table bevel lock bolt (D) with an adjustable wrench. This adjustment is located under the table.
4. Align the table square to the rod by tilting the table.
5. Retighten the table bevel lock bolt.

TILTING THE TABLE

To use the table in a bevel position, loosen the bevel lock bolt (D) Fig.21 with an adjustable wrench. Tilt the table to the desired angle by reading the bevel scale on the table support. Retighten the bevel lock bolt.

FEEDING

Pull down the feed handles (A) Fig.22 with only enough effort to allow the drill to cut. Feeding too slowly might cause the drill to burn...feeding too rapidly might stop the motor...cause the belt or drill to slip... tear the workpiece loose or break the drill bit.

HOLE LOCATION

Make an indentation in the workpiece where you want the to drill a hole using a centre punch or a sharp nail. Before turning the switch ON, bring the drill bit down to the workpiece, lining it up with the hole location.

POSITIONING THE TABLE AND WORKPIECE

Lock the table to the column in a position so that the tip of the drill is just a little above the top of the workpiece. Always place a piece of back-up material (wood, plywood) on the table underneath the workpiece. This will prevent splintering or making a heavy burr on the underside of the workpiece as the drill breaks through. To keep the back-up material from spinning out of control, it must come in contact with the left side of the column, as illustrated in Fig.22.

WARNING! To prevent the workpiece or the back-up material from being torn from your hand while drilling, position them against the left side of the column. If the workpiece or the back-up material are not long enough to reach the column, clamp them to the table. Failure to do this could result in personal injury.

LIGHT & DUAL LASER GUIDE SYSTEM

WARNING! Do not look directly at the laser beams. Do not aim the laser beams at any person or any object other than your workpiece.

If you desire using the dual laser guides, use the laser switch (A) Fig.23 to turn them On or Off. If an adjustment to the laser guides are necessary, proceed as follows;

- 1) Loosen set screw (B) (one set screw for each laser) and then slightly turn laser guide (C) in either direction, this will reposition the laser beams trajectory, adjust the position of the laser guides this way until both beams intersect at the point where the drill bit touches the workpiece. Retighten set screw after each adjustment.

The light On-Off Switch (D) turns On and Off a halogen light bulb which is found inside the head casting.

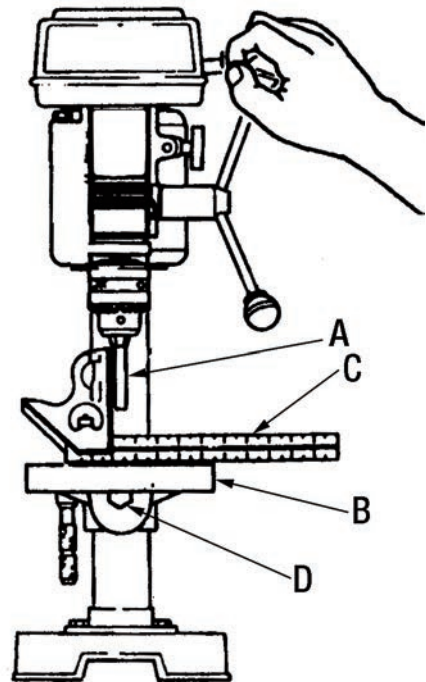


FIGURE 21

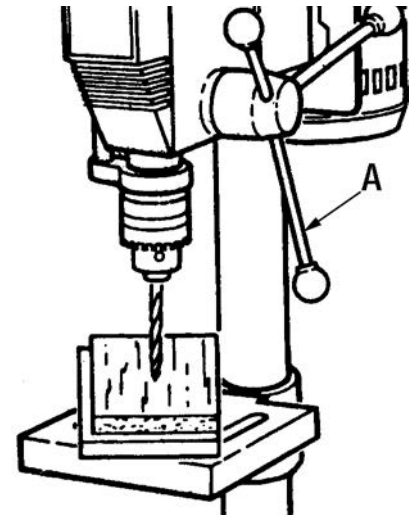


FIGURE 22

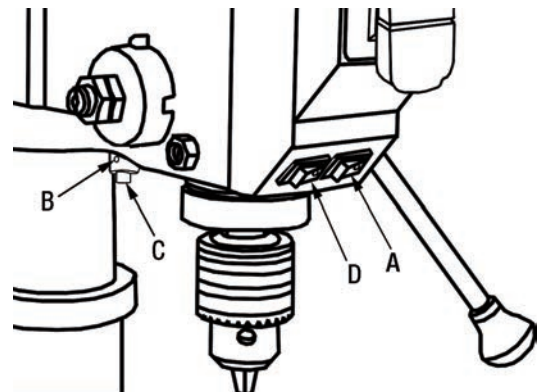


FIGURE 23



MAINTENANCE / TROUBLESHOOTING

LUBRICATION

All of the ball bearings are packed with grease at the factory. They require no further lubrication. Periodically lubricate the splines (Grooves) in the spindle and the rack (Teeth of the quill).

WARNING! For your own safety, turn the switch “OFF” and remove the plug from the power source before maintaining or lubricating your drill press.

Frequently blow out any dust that may accumulate inside the motor. After operation, remove chips or dirt on the machine and apply a coat of furniture-type paste wax to the table and the column, this will help keep the surfaces clean and free of rust.

PROBLEM	PROBABLE CAUSE	SOLUTION
Noisy operation.	<ol style="list-style-type: none"> 1. Incorrect belt tension. 2. Dry spindle. 3. Loose spindle pulley. 4. Loose motor pulley. 	<ol style="list-style-type: none"> 1. Adjust the tension. 2. Lubricate the spindle. 3. Tighten the retaining nut on the pulley as needed. 4. Tighten the set screws which hold the pulleys in place.
Drill bit burns.	<ol style="list-style-type: none"> 1. Incorrect speed. 2. Chips not coming out of hole. 3. Dull drill bit. 4. Feeding too slow. 5. Not lubricated. 	<ol style="list-style-type: none"> 1. Change the speed. 2. Retract the drill bit frequently to clear the chips. 3. Resharpen the drill bit. 4. Feeding too fast...allow the drill bit to cut. 5. Lubricate the drill bit with cutting or motor oil.
Wood splinters on underside of workpiece.	<ol style="list-style-type: none"> 1. No “Back-up material” under the workpiece. 	<ol style="list-style-type: none"> 1. Support the workpiece or clamp it.
Workpiece torn loose from hand.	<ol style="list-style-type: none"> 1. Not supported or clamped properly. 	<ol style="list-style-type: none"> 1. Support the workpiece or clamp it.
Drill bit binds in workpiece.	<ol style="list-style-type: none"> 1. Workpiece is pinching the drill bit or there is an excessive feeding pressure. 2. Improper belt tension. 	<ol style="list-style-type: none"> 1. Support the workpiece or clamp it. 2. Adjust the tension of the belt.
Excessive drill bit wobbling.	<ol style="list-style-type: none"> 1. Bent drill bit. 2. Worn spindle bearings. 3. Drill bit is not properly installed in the chuck. 4. Chuck not properly installed. 	<ol style="list-style-type: none"> 1. Use a straight drill bit. 2. Replace the bearings. 3. Install drill bit properly. 4. Install chuck properly.
Quill returns too fast or too slow.	<ol style="list-style-type: none"> 1. Spring has improper tension. 	<ol style="list-style-type: none"> 1. Adjust the spring tension.
Chuck will not stay attached to the spindle. It falls off when trying to install it.	<ol style="list-style-type: none"> 1. Dirt, grease or oil on the tapered inside surface of the chuck or on the spindle tapered surface. 	<ol style="list-style-type: none"> 1. Using a household detergent, clean the tapered surfaces of the chuck and the spindle to remove the dirt, grease and oil.