

# **WARCO**

## **2B5, 2B12 & 2F DRILLS**

### **INSTRUCTION MANUAL**

**WARREN MACHINE TOOLS (GUILDFORD) LTD**

**WARCO HOUSE, FISHER LANE**

**CHIDDINGFOLD, SURREY GU8 4TD**

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# Specifications

MODEL NO			RDM-1601F (B)	RDM-1602F (B)	RDM-2001F (B)
MOTOR	HP (kw)		3/4 (0.55)	3/4 (0.55)	1 (0.75)
	PHASE		1	1/3	1/3
	Hz		60/50		
CHUCK (mm)	JT3		0.8~16	0.8~16	0.8~16
	B16		3~16	3~16	3~16
	B18		3~16	3~16	3~16
	B22				5~20
SPINDLE SPEEDS RPM (r/min)	50Hz	12	180~2740	180~2740	
		16	220~3480	170~3020	160~3000
	60Hz	12	250~3100	250~3100	
		16	260~4220	210~3670	200~3630
SPINDLE	TAPER		MT2	MT2	MT2/MT3
	TRAVEL (mm)		80	80	80
TABLE SIZE (mm)	SQUARE		254 x 254	305 x 305	
	ROUND		320	320	320
	W/ROSEVOIR			305 x 305	356 x 350
SPINDLE TO TABLE (mm)		FLOOR	760~780	730~750	730
		BENCH	465	420~440	340
SPINDLE TO BASE (mm)		FLOOR	1280	1234	1220
		BENCH	710	680	655
OVERALL HIGHT (mm)		FLOOR	1610	1610	1630
		BENCH	1060	1060	1060
NW/GW ( kg )		FLOOR	60/65	67/72	85/90
		BENCH	55/59	61/66	79/84
PACKING SIZE ( mm )		FLOOR	1430x510x256	1430x510x256	1410 x 540 x 265
		BENCH	895x490x290	895x490x290	895 x 540 x 290



# FULL ONE YEAR WARRANTY ON DRILL PRESS

If within one year from the date of purchase, this Drill Press fails due to a defect in material or workmanship, we will repair it, free or charge. Day Master.

## General Safety Instructions For Power Tools

### 1. KNOW YOUR POWER TOOL

Read and understand the owner's manual and labels affixed to the tool. Learn its application and limitations as well as the specific potential hazards peculiar to this tool.

### 2. GROUND ALL TOOLS

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

In working order, and in proper adjustment and alignment.

### 4. REMOVE ADJUSTING KEYS AND WRENCHES

From a 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. Floor must not be slippery due to wax or sawdust.

### 6. AVOID DANGEROUS ENVIRONMENT

Don't use power tools in damp or wet locations or expose them to rain. Keep work area well lighted. 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, by removing starter keys, or storing tools where children can't get them.

### 9. DON'T FORCE TOOL

It will do the job better and safer at the rate for which it was designed.

### 10. USE RIGHT TOOL

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

### 11. WEAR PROPER APPAREL

Do not wear loose clothing, gloves, neckties, or jewelry (rings, wrist watches ) to get caught in moving parts. **NONSLIP** footwear is recommended. Wear protective hair covering to contain long hair. Roll long sleeves above the elbow.

### 12. USE SAFETY GOGGLES ( HEAD PROTECTION )

Wear safety goggles at all times. Everyday eyeglasses are not safety glasses. They only have impact resistant lenses. Also, use face or dust mask if cutting operation is dusty, and ear protectors ( plugs or muffs ) during extended periods of operation.

**13. SECURE WORK**

Use clamps or a vise to hold work when practical. It frees both hands to operate tool.

**14. DON'T OVERREACH**

Keep proper footing and balance at all times.

**15. MAINTAIN TOOLS WITH CARE**

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

**16. DISCONNECT TOOLS**

Before servicing; when changing accessories such as blades, bits, cutters, etc.

**17. AVOID ACCIDENTAL STARTING**

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

**18. USE RECOMMENDED ACCESSORIES**

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

**19. NEVER STAND ON TOOL OR ITS STAND**

Serious injury could occur if the tool is tipped or if the cutting tool is accidentally contacted. Do not store materials above or near the tool such that it is necessary to stand on the tool or its stand to reach them.

**20. CHECK DAMAGED PARTS**

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

**21. DIRECTION OF FEED**

Feed work into a blade or cutter against the direction of rotation of the blade or cutter only.

**22. NEVER LEAVE TOOL RUNNING UNATTENDED**

Turn power off. Don't leave tool until it comes to a complete stop.



# Additional Safety Instructions for Drill Presses

## SAFETY SIGNAL WORDS

**DANGER** : means if the safety information is not followed someone will be seriously injured or killed.

**WARNING** : means if the safety information is not followed someone could be seriously injured or killed.

**CAUTION** : means if the safety information is not followed someone might be injured.

**WARNING** : For your own safety, do not attempt to operate your drill press until it is completely assembled and installed according to the instructions... and until you have read and understand the following:

### 1. General Safety Instructions for Power Tools. 2

### 2. Getting to Know Your Drill Press ..... 17

### 3. Basic Drill Press Operation ..... 23

### 4. Adjustments ..... 25

### 5. Maintenance ..... 26

### 6. Stability of Drill Press

If there is any tendency of the drill press to tilt or move during any use, bolt it to the work bench. If the workpiece is too large to easily support with one hand, provide an auxiliary support.

### 7. Location

Use the drill press in a well lit area and on a level surface clean and smooth enough to reduce the risk of trips, slips, or falls. Use it where neither the operator nor a casual observer is forced to stand in line with a potential kickback.

### 8. Kickback

Kickback is the grabbing of the workpiece by the rotating tool. The workpiece can be thrown at very high speed in the direction of rotation. **THIS CAN CAUSE SERIOUS INJURY.** To reduce the possibility of injury from kickback :

Clamp the workpiece firmly to the table whenever possible.

Buffing or sanding wheels or drums should be contacted on the side moving away from you, not the side moving toward you.

Use only recommended accessories and follow the instructions supplied with the accessory.

### 9. Protection : Eyes, Hands, Face, Ears and Body

**WARNING : To avoid being pulled into the spinning tool--**

**1. Do Not wear :**

- gloves
- necktie
- loose clothing
- jewelry

**2. Do tie back long hair**

- a. If any part of your drill press in missing, malfunctioning, has been damaged or broken... such as the motor switch, or other operating control, a safety device or the power cord, turn the drill press off and unplug it until the particular part is properly repaired or replaced.
- b. Never place your fingers in a position where they could contact the drill or other cutting tool if the workpiece should unexpectedly shift or your hand should slip.
- c. To avoid injury from parts thrown by the spring, follow instructions exactly as given and shown in adjusting spring tension of quill.
- d. To prevent the workpiece from being torn from your hands, spinning of the tool, shattering the tool or being thrown, always properly support your work so it won't shift or bind on the tool:
  - Always position **BACKUP MATERIAL** (use beneath the workpiece) to contact the left side of the column.

- Whenever possible, position the **WORKPIECE** to contact the left side of the column- if it is too short or the table is tilted, clamp solidly to the table. Use table slots or clamping ledge around the outside edge of the table.
- When using a drill press **WISE**, always fasten it to a table.
- Never do any work "**FREE-HAND**" (handholding workpiece rather than supporting it on the table), except when polishing.
- Securely lock Head to Column, Table Support to Column, and Table to Table Support before operating drill press.
- Never move the Head or Table while the tool is running.
- Before starting the operation, jog the motor switch to make sure the drill or other cutting tool does not wobble or cause vibration.
- If a workpiece overhangs the table such that it will fall or tip if not held, clamp it to the table or provide auxiliary support.
- Use fixtures for unusual operations to adequately hold, guide and position workpiece.



- Use the **SPINDLE SPEED** recommended for the specific operation and workpiece material - check the inside of the Belt Guard for drilling information; for accessories, refer to the instructions provided with the accessories.

- e. Never climb on the drill press Table, it could break or pull the entire drill press down on you.
- f. Turn the motor Switch Off and put away the Switch Key when leaving the drill press.
- g. To avoid injury from thrown work or tool contact, do NOT perform layout, assembly, or setup work on the table while the cutting tool is rotating.

**10. Use only accessories designed for this drill press to avoid serious injury from thrown broken parts or work pieces.**

- a. When cutting large diameter holes :  
Clamp the workpiece firmly to the table.  
Otherwise the cutter may grab and spin it at high speed.  
Use only one piece , cup-type, hole cutters.  
**DO NOT** use fly cutters or multi-part hole cutters as they can come apart or become unbalanced in use.  
Keep speed below 1,500RPM.

- b. Drum sanders must **NEVER** be operated on this drill press at a speed greater than 1800 RPM.
- c. Do not install or use any drill that exceeds 7" in length or extends 6" below the chuck jaws. They can suddenly bend outward or break.
- d. Do not use wire wheels, router bits , shaper cutters, circle (fly) cutters or rotary planers on this drill press.

**11. Note and Follow the Safety Warnings and Instructions that Appear on the Panel on the Right Side or the Head.**

**12. This Drill Press has 12/16 speeds as listed below:  
See inside of belt guard for specific placement of belt on pulleys.**

**13. Think Safety.** Safety is a combination of operator common sense and alertness at all times when the drill press is being used.

**WARNING : Do not allow familiarity ( gained from frequent use of your drill press ) to become commonplace. Always remember that a careless fraction of a second is sufficient to inflict severe injury.**

The operations of any power tool can result in foreign objects being thrown into the eyes, which can result in severe eye damage. Always wear safety goggles before commencing power tool operation. Safety Goggles are available at retail stores.



# Motor Specifications and Electrical Requirements

## MOTOR SPECIFICATIONS

You can easily find specifications on the motor name-plate

**WARNING :** To avoid injury from unexpected startup, do not use blower or washing machine motors or any motor with an automatic reset overload protector.

## CONNECTING TO POWER SOURCE OUTLET

This machine must be grounded while in use to protect the operator from electric shock.

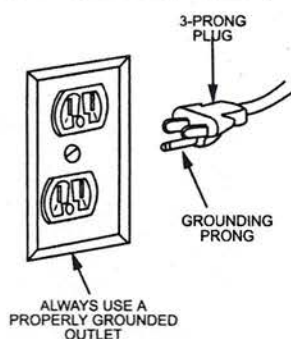
Plug power cord into a properly grounded type outlet protected by a dual element time delay or Circuit breaker.

Not all outlets are properly grounded. If you are not sure that your outlet, as pictured below, is properly grounded, have it checked by a qualified electrician.

**WARNING :** To avoid electric shock, do not touch the metal prongs on the plug, when installing or removing the plug to or from the outlet.

**WARNING :** Failure to properly ground this power tool can cause electrocution or serious shock, particularly when used in damp locations, or near metal plumbing. If shocked, your reaction could cause your hands to hit the cutting tool.

If power cord is worn or cut, or damaged in any way, have it replaced immediately to avoid shock or fire hazard.



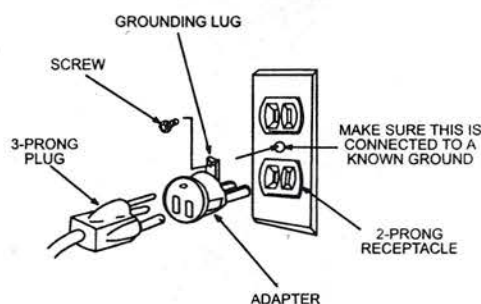
This power tool is equipped with a 3-conductor cord and grounding type plug, approved by Underwriters Laboratories and the Canadian Standards Association. The ground conductor has a green jacket and is attached to the tool housing at one end and to the ground prong in the attachment plug at the other end. This plug requires a mating 3-conductor grounded type outlet as shown.

If the outlet you are planning to use for this power tool is of the two prong type, **DO NOT REMOVE OR ALTER THE GROUNDING PRONG IN ANY MANNER.** Use an adapter as shown and always connect the grounding lug to known ground.

It is recommended that you have a qualified electrician replace the **TWO** prong outlet with a properly grounded **THREE** prong outlet.

An adapter as shown below is available for connecting plugs to 2-prong receptacles.

**WARNING :** The green grounding lug extending from the adapter must be connected to a permanent ground such as to a properly grounded outlet box.



**NOTE :** The adapter illustrated is for use only if you already have a properly grounded 2-prong receptacle. Adapter is not allowed in Canada by the Canadian Electrical Code.

The use of any extension cord will cause some loss of power. To keep this to a minimum and to prevent overheating and motor burn-out, use the table below to determine the minimum wire size (A.W.G.) extension cord. Use only 3 wire extension cords which have 3-prong grounding type plugs and 3-pole receptacles which accept the tools plug.

Extension Cord Length	Wire Size A. W. G.
0-25 Feet	16
26-50 Feet	14
51-100 Feet	12

# Preparation

On receipt, carefully unpack the components ensuring that no damage was suffered in transit, and that all parts are accounted for.

The following loose items are to be found in the packing case.

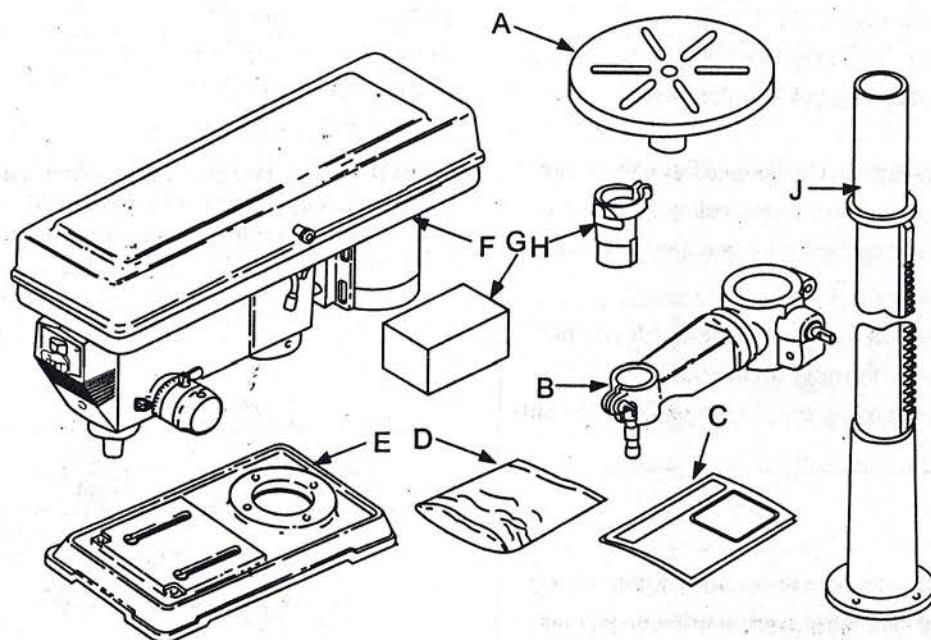
- A. Table Assy. (Square, Round or Wet-Slot . optional)
- B. Arm (optional)
- C. This manual
- D. 1 x Bag of loose parts.
- E. Base.
- F. Head Assy.
- G. 1 x Box of loose parts

H. Chuck Guard Assy. (Extra)

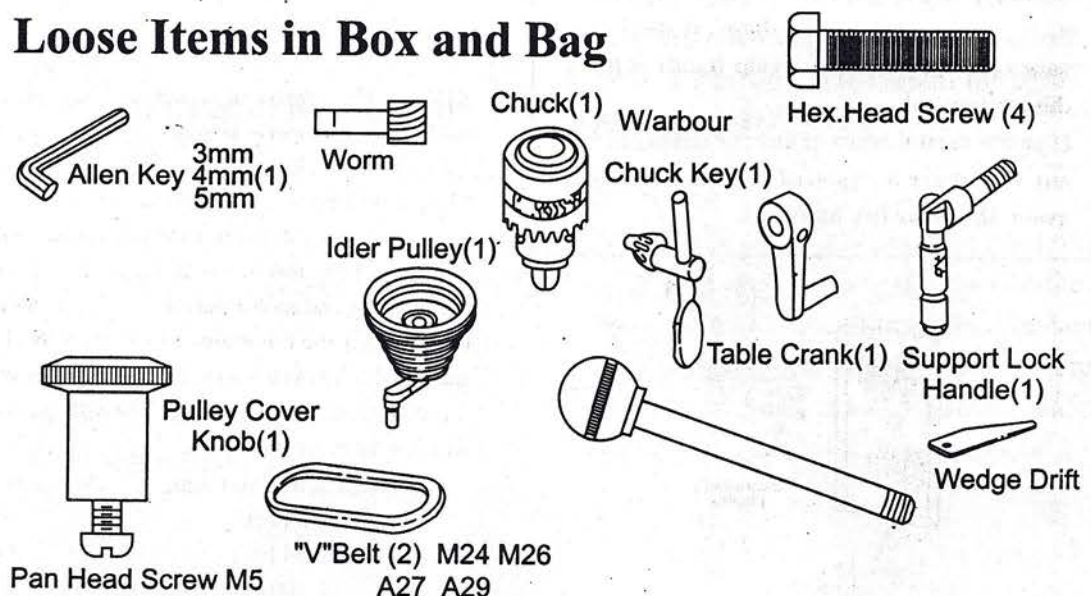
J. Column Assy. (Long or Short, optional)

Check the parts against the above list and refer to the following diagrams.

Should there be any deficiencies or damage, you should contact your CLARKE dealer immediately.



## Loose Items in Box and Bag

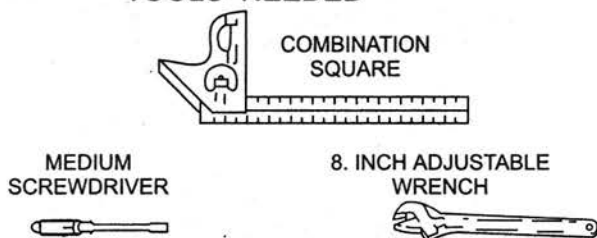




# Assembly

**WARNING :** For your own safety , never connect plug to power source outlet until all assembly steps are completed.

## TOOLS NEEDED

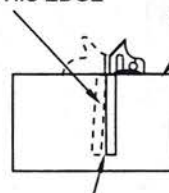


COMBINATION SQUARE MUST BE TRUE.

Check its accuracy as illustrated below.

DRAW LIGHT LINE ON BOARD ALONG THIS EDGE

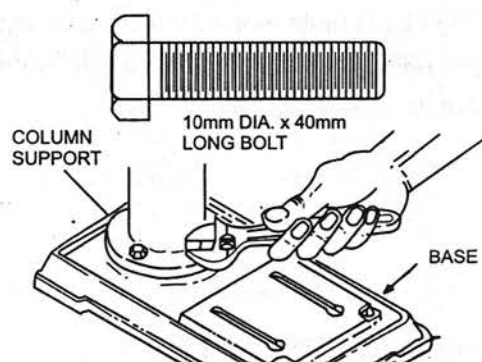
STRAIGHT EDGE OF BOARD 3/4" THICK- THIS EDGE MUST BE PERFECTLY STRAIGHT



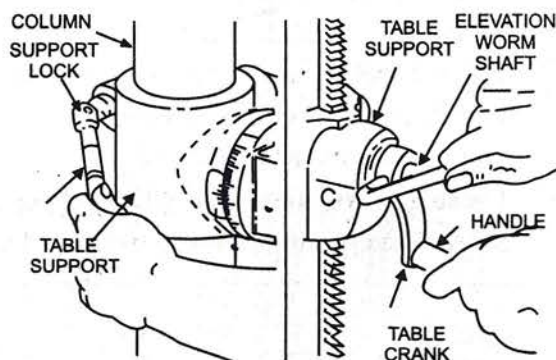
SHOULD BE NO GAP OR OVERLAP WHEN SQUARE IS FLIPPED OVER IN DOTTED POSITION

## ASSEMBLY OF COLUMN AND TABLE HARDWARE

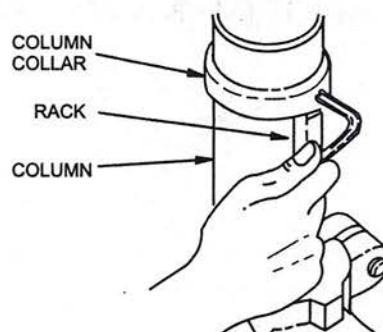
1. Position base on floor. Remove protective covering and discard.
2. Remove protective sleeve from column tube and discard. Place column assembly on base, and align holes in column support with holes in base.
3. Locate (4) four 10mm Dia. x 40mm long bolts(see illustration) in loose parts bag.
4. Install a bolt in each hole through column support and base and tighten with adjustable wrench.



5. Locate table crank and support lock in loose parts box.
  6. Install support lock from left side into table support and tighten by hand.
  7. Install table crank assembly and tighten set screw with a 3mm HEX "L" wrench . Do not overtighten . Set screw should be tightened against the flat section of the shaft.
- NOTE :** To minimize crank backlash , tighten support lock , rotate elevation worm shaft clockwise, then assemble crank tight against table support and tighten set screw.

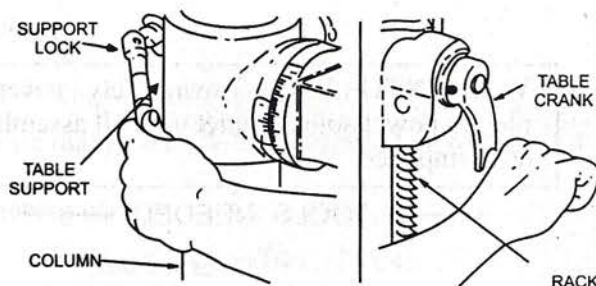


8. Check column collar for proper adjustment. Collar should not be angled on the column and it should be positioned so rack will slide freely in collar when table is rotated 360° around column table. If re - adjusted , only tighten set screw enough to keep collar in place.
- NOTE :** To avoid column or collar damage, do not overtighten set screw.



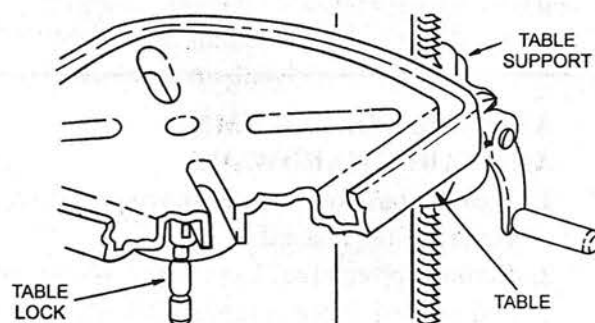
## INSTALLING THE TABLE

1. Loosen support lock and raise table support by turning table crank clockwise until support is at a working height level. Tighten support lock.



2. Remove protective covering from table and discard. Place table in table support and tighten table lock (located under table) by hand.

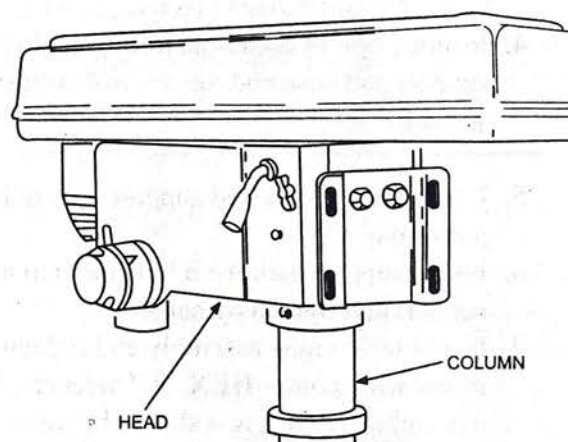
**NOTE:** If table won't fit into table support easily, pry open table support with a flat blade screw driver.



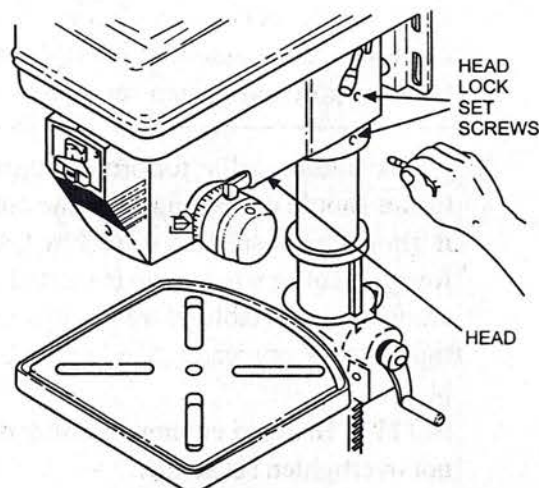
## INSTALLING THE HEAD

**CAUTION :** The head assembly weighs about 55 pounds. Carefully lift head.

1. Remove protective bag from head assembly and discard. Carefully lift head above column tube and slide it onto column making sure head slides down over column as far as possible. Align head with table and base.
2. Locate (2) two 10mm dia. x 12mm long set screws (see illustration) in loose parts bag.



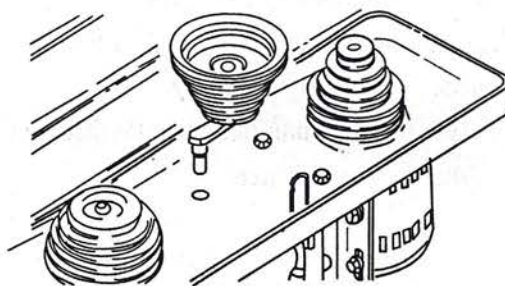
3. Install a set screw in each hole (as indicated) on the right side of the head, and using a 5mm hex "L" wrench, tighten the two head lock set screws.





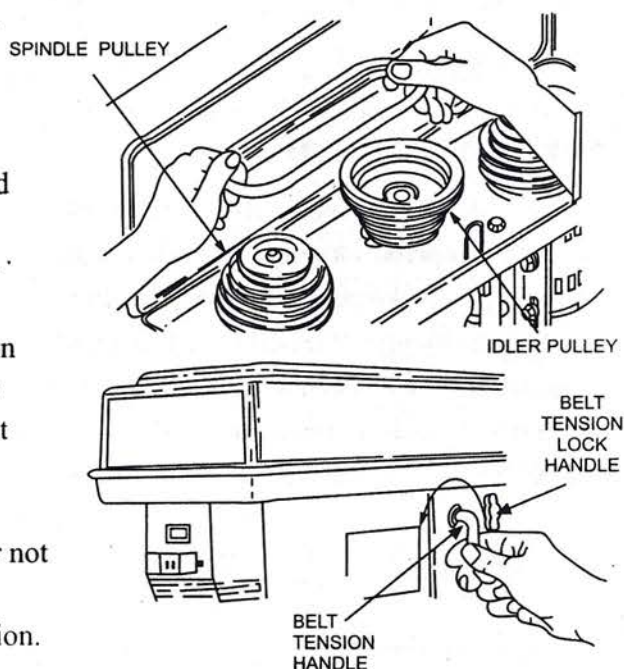
## INSTALLING THE PULLEY-CENTER

1. Locate center pulley assembly in loose parts bag and place in proper hole.



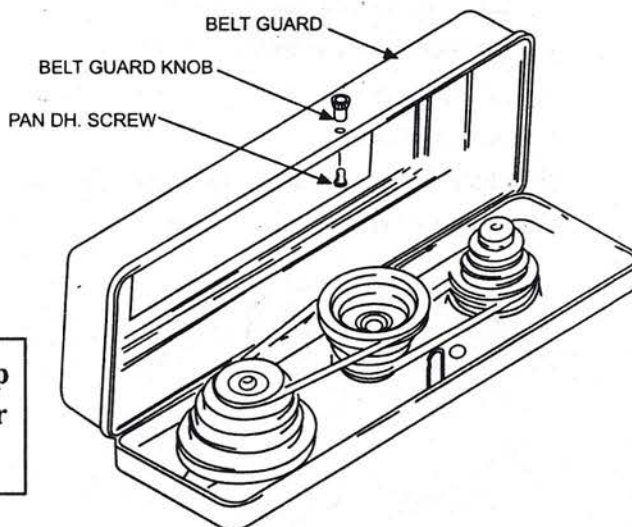
## INSTALLING BELT

1. Locate two(2) v-belts in the loose parts bag.
2. Use speed chart inside belt guard to choose speed for drilling operation. Install belts in correct position for desired speed. The **Longer** of the two belts is always positioned between the spindle pulley and idler pulley.  
**NOTE:** Refer to inside Belt guard for Recommended Drilling Speeds.
3. Apply tension to belt by turning Belt Tension Handle counter clockwise until belt deflects approximately 1/2 inch by thumb pressure at its center.
4. Tighten Belt Tension Lock Handles.  
**NOTE:** Over tensioning belt may cause motor not to start or damage bearings.
5. If belt slips while drilling, readjust belt tension.



## INSTALLING BELT GUARD KNOB

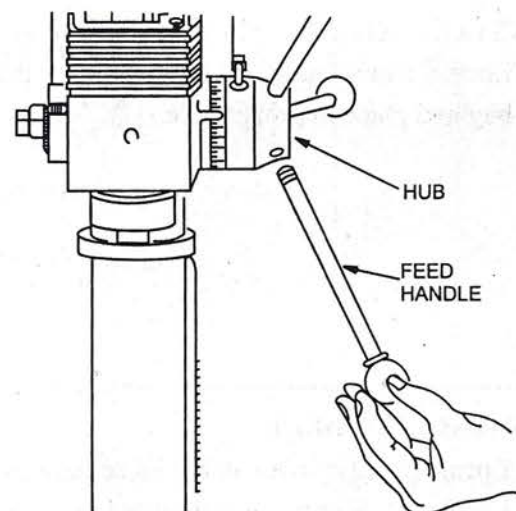
1. To attach belt guard knob, locate knob and 5mm Dia. x12mm long pan hd. screw in loose parts bag. Install screw in hole located in guard and attach knob turning until tight.



**WARNING:** To avoid possible injury keep guard in place and in proper working order while operating.

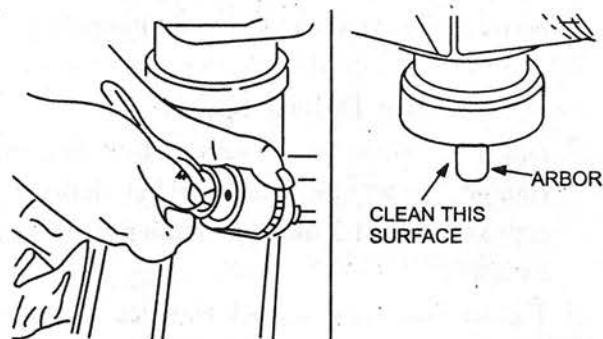
### INSTALLING FEED HANDLES

1. Locate three (3) feed handles among loose parts.
2. Screw the feed handles into the threaded holes in the hub and tighten.

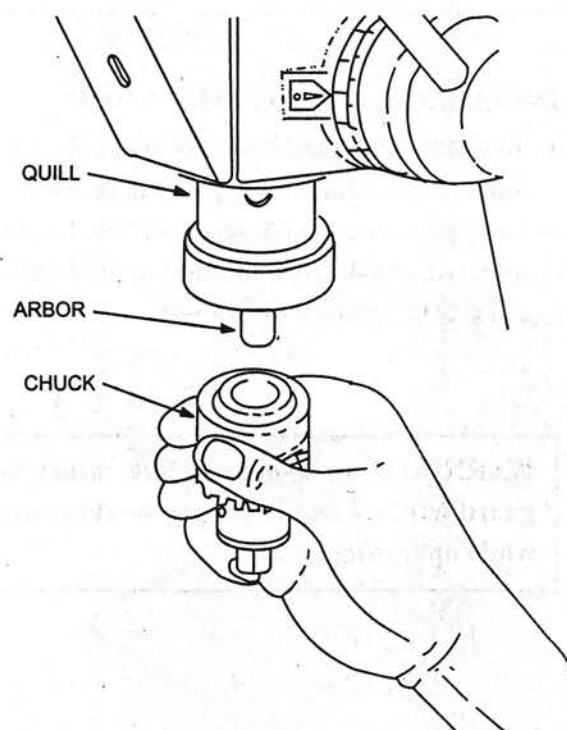


### INSTALLING THE CHUCK

1. Clean out the **TAPERED HOLE** in the chuck.  
Clean the tapered surface on the arbor with a clean cloth. Make sure there are no foreign particles sticking to the surfaces. The slightest piece of dirt on any of these surfaces will prevent the chuck from seating properly. This will cause the drill to "wobble."



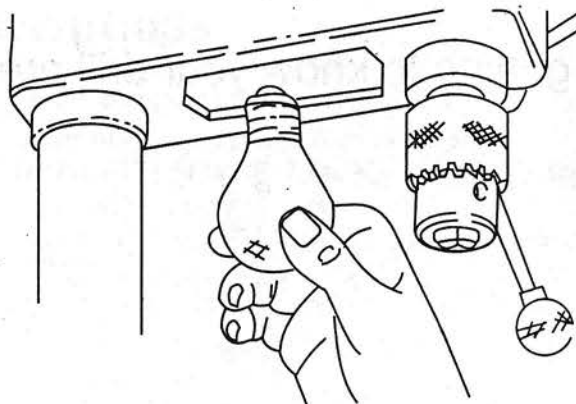
2. Slide the chuck up over the arbor as illustrated.
3. Unlock support lock and raise table so its about two(2) inches below tip of chuck.
4. Turn chuck sleeve clockwise and open jaws in chuck completely.
5. Turn feed handles counterclockwise and force chuck against table until chuck is secure.





## INSTALLING LIGHT BULB

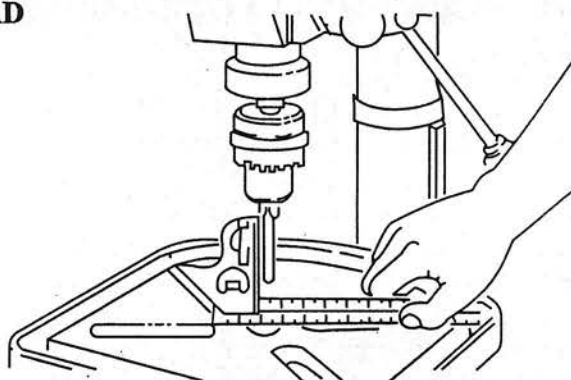
1. Install a light bulb (not larger than 60 watt) into the socket inside the head.



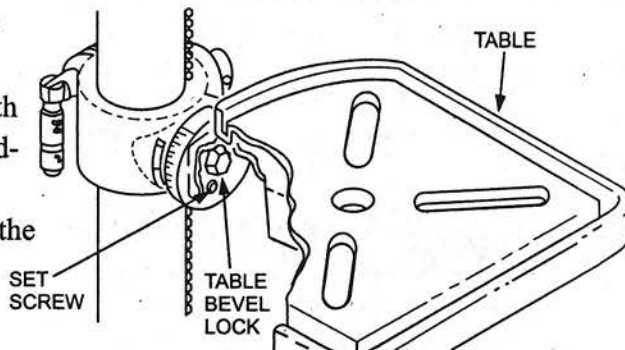
## ADJUSTING THE TABLE SQUARE TO HEAD

**NOTE:** The combination square must be "true." See "Unpacking and Checking Contents" section for method.

1. Insert a straight ground steel rod or a straight drill bit (not included) approximately 3" long into chuck and tighten.
2. With table raised to working height and locked on column, place combination square flat on table beside rod.



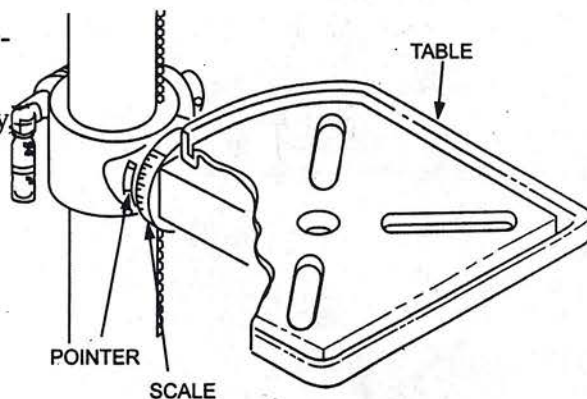
3. If an adjustment is necessary, loosen the set screw under bevel lock with 3mm Hex "L" wrench, then loosen the table bevel lock with the 24 mm flat wrench (included). (These adjustments are located under the table).
4. Align the table square to the bit by rotating the table until the square and bit are in line.
5. Retighten table bevel lock.
6. Retighten set screw.



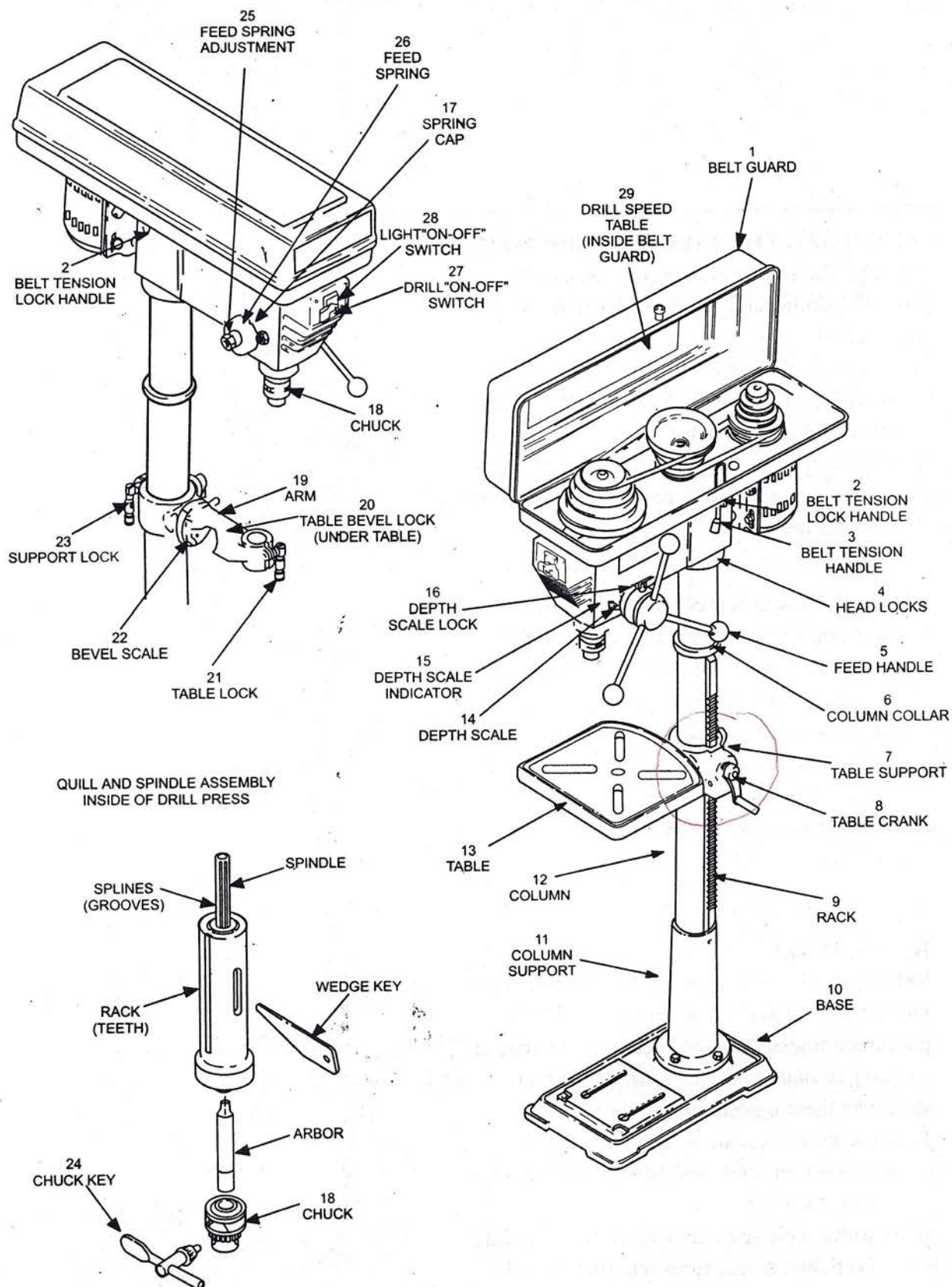
## BEVEL SCALE

**NOTE:** The bevel scale has been included to provide a quick method for beveling the table to approximate angles. If precise accuracy is necessary, a square, or other precision measuring tool should be used to position the table.

1. To use the bevel scale do the following:
  - a. Loosen set screw and table bevel lock (see step 3 above).
  - b. Move table so desired angle or bevel scale is straight across from zero line on table support.
  - c. Retighten table bevel lock and set screw.



# getting to know your drill press

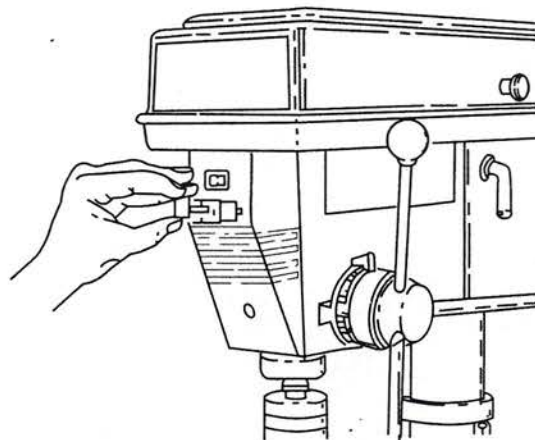
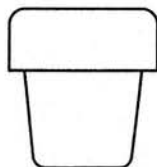




## Feature Descriptions

1. **BELT GUARD ASSEMBLY**... Covers pulley and belt during operation of drill press.
2. **BELT TENSION LOCK HANDLES**... Tightening handles locks motor bracket support and **BELT TENSION HANDLE** to maintain correct belt distance and tension.
3. **BELT TENSION HANDLE**... Turn handle counter clockwise to apply tension to belt, turn handle clockwise to release belt tension
4. **HEAD LOCKS**... Lock the head to the column. ALWAYS have them locked in place while operating the drill press.
5. **FEED HANDLE**... For moving the chuck up or down. One or two of the handles may be removed if necessary whenever the workpiece is of such unusual shape that it interferes with the handles.
6. **COLUMN COLLAR**... Holds the rack to the column. Rack remains movable in collar to permit table support movements.
7. **TABLE SUPPORT**... Rides on column to support arm and table.
8. **TABLE CRANK**... Turn clockwise to elevate table. Support lock must be released before operating crank.
9. **RACK**... Combines with gear mechanism to provide easy elevation of table by hand operated table crank.
10. **BASE**... Supports Drill Press. For additional stability, holes are provided in base to bolt Drill Press to floor. (See "Additional Safety Instructions for Drill Presses.")
11. **COLUMN SUPPORT**... Supports column, guides rack, and provides mounting holes for column to base.
12. **COLUMN**... Connects head, table, and base on a one - piece tube for easy alignment and movement.
13. **TABLE**... Provides working surface to support workpiece.
14. **DEPTH SCALE**... Shows depth of hole being drilled.
15. **DEPTH SCALE INDICATOR**... Indicates drilling depth selected on depth scale.
16. **DEPTH SCALE LOCK** ... Locks the depth scale to selected depth.
17. **SPRING CAP**... Provides means to adjust quill spring tension.
18. **CHUCK**... Holds drill bit or other recommended accessory to perform desired operations.
19. **ARM**... Extends beyond table support for mounting and aligning the table.
20. **TABLE BEVEL LOCK**... Locks the table in any position from 0° - 45°.
21. **TABLE LOCK**... Table can be rotated in various positions and locked.
22. **BEVEL SCALE**... Shows degree table is tilted for bevel operations. Scale is mounted on side of arm.
23. **SUPPORT LOCK**... Tightening locks table support to column. Always have it locked in place while operating the Drill Press.
24. **CHUCK KEY** ... It is a self - ejecting chuck key which will "pop" out of the chuck when you let go of it. This action is designed to help prevent throwing of the chuck key from the chuck when power is turned "ON". Do not use any other key as a substitute, order a new one if damaged or lost.
25. **FEED SPRING ADJUSTMENT**... Refer to section "Assembly - Installing and Tensioning Belt".
26. **DRILLING SPEED** ... Can be changed by placing the belt in any of the STEPS (grooves) in the pulleys. Spindel Speed label inside belt guard.
27. **DRILL "ON-OFF" SWITCH**... Has locking feature. **THIS FEATURE IS INTENDED TO HELP PREVENT UNAUTHORIZED AND POSSIBLE HAZARDOUS USE BY CHILDREN AND OTHERS.**

Insert KEY into switch  
NOTE: Key is made of yellow plastic



## Trouble Shooting

**WARNING :** For your own safety, turn switch "OFF" and always remove plug from power source outlet before trouble shooting.

● CONSULT YOUR LOCAL SERVICE CENTER IF FOR ANY REASON MOTOR WILL NOT RUN.

TROUBLE	PROBABLE CAUSE	REMEDY
Noisy Operation	<ol style="list-style-type: none"> <li>1. Incorrect belt tension.</li> <li>2. Dry Spindle.</li> <li>3. Loose spindle pulley.</li> <li>4. Loose motor pulley.</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust tension, See section "ASSEMBLY- TENSIONING BELT."</li> <li>2. Lubricate spindle. See "Lubrication" section.</li> <li>3. Checking tightness of retaining nut on pulley, and tighten if necessary.</li> <li>4. Tighten setscrews in pulleys.</li> </ol>
Drill bit burns	<ol style="list-style-type: none"> <li>1. Incorrect speed.</li> <li>2. Chips not coming out of hole.</li> <li>3. Dull Drill bit.</li> <li>4. Feeding too slow.</li> </ol>	<ol style="list-style-type: none"> <li>1. Change speed. See section "Getting To Know Your Drill Press"---DRILLING SPEED.</li> <li>2. Retract drill bit frequently to clear chips.</li> <li>3. Resharpen drill bit.</li> <li>4. Feed fast enough---allow drill bit to cut.</li> </ol>
	<ol style="list-style-type: none"> <li>5. Not lubricated.</li> </ol>	<ol style="list-style-type: none"> <li>5. Lubricate drill bit with cutting or motor oil (See "Basic Drill Press Operation" section.)</li> </ol>
Drill bit leads off--- hole not round.	<ol style="list-style-type: none"> <li>1. Hard grain in wood or lengths of drill bit cutting lips and/or angles not equal.</li> <li>2. Bent drill bit.</li> </ol>	<ol style="list-style-type: none"> <li>1. Resharpen drill bit correctly.</li> <li>2. Replace drill bit.</li> </ol>
Wood splinters on underside.	<ol style="list-style-type: none"> <li>1. No "back - up material" under workpiece.</li> </ol>	<ol style="list-style-type: none"> <li>1. Support workpiece or clamp it---See "Basic Drill Press Operation" section.</li> </ol>
Workpiece torn loose from hand.	<ol style="list-style-type: none"> <li>1. Not supported or clamped properly.</li> </ol>	<ol style="list-style-type: none"> <li>1. Support workpiece or clamp it---See "Basic Drill Press Operation" section.</li> </ol>
Drill bit binds in workpiece.	<ol style="list-style-type: none"> <li>1. Workpiece pinching drill bit or excessive feed pressure.</li> <li>2. Improper belt tension.</li> </ol>	<ol style="list-style-type: none"> <li>1. Support workpiece or clamp it---See "Basic Drill Press Operation" section.</li> <li>2. Adjust tension---See section "ASSEMBLY-TENSIONING BELT."</li> </ol>
Excessive drill bit runout or wobble.	<ol style="list-style-type: none"> <li>1. Bent drill bit.</li> <li>2. Worn spindle bearings.</li> <li>3. Drill bit not properly installed in chuck.</li> <li>4. Chuck not properly installed.</li> </ol>	<ol style="list-style-type: none"> <li>1. Use a straight drill bit.</li> <li>2. Replace bearings.</li> <li>3. Install drill bit properly---See "Basic Drill Press Operation" section.</li> <li>4. Install chuck properly---refer to "Unpacking and Assembly Instructions---INSTALLING THE CHUCK."</li> </ol>
Quill Returns too slow too fast	<ol style="list-style-type: none"> <li>1. Spring has improper tension.</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust spring tension---See section "Adjustments-Quill Return Spring."</li> </ol>
Chuck will not stay attached to spindle. It falls off when trying to install it.	<ol style="list-style-type: none"> <li>1. Dirty, grease, or oil on the tapered inside surface of chuck or on the spindles tapered surface.</li> </ol>	<ol style="list-style-type: none"> <li>1. Using a household detergent-clean the tapered surfaces of the chuck and spindle to remove all dirt, grease and oil.</li> </ol>



## Maintenance

**WARNING:**For your own safety, turn switch "off" and remove plug from power source outlet before maintaining or lubricating your drill press.

Frequently blow out any dust that may accumulate inside the motor.

A coat of furniture-type paste wax applied to the table and column will help to keep the surfaces clean.

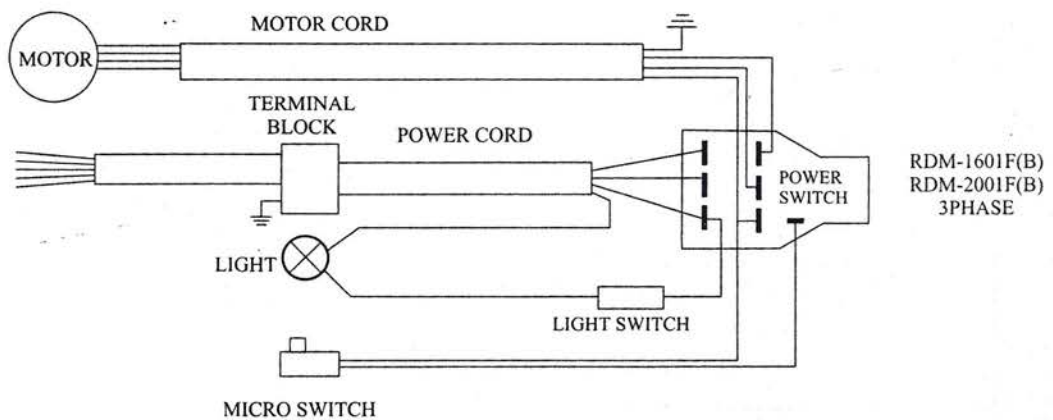
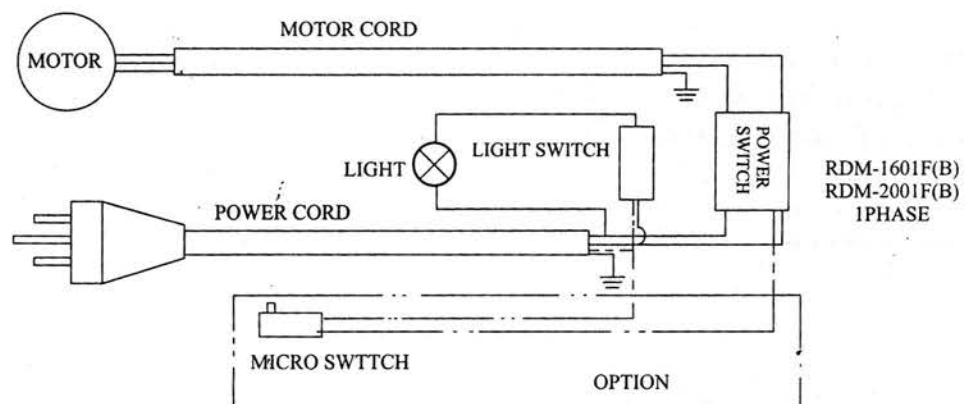
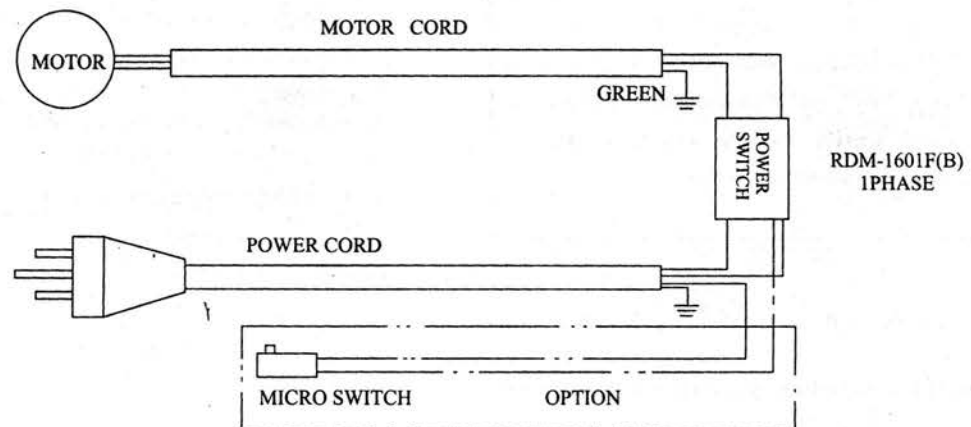
**WARNING:**To avoid shock or fire hazard, if the power cord is worn or cut, or damaged in any way, have it replaced

## Lubrication

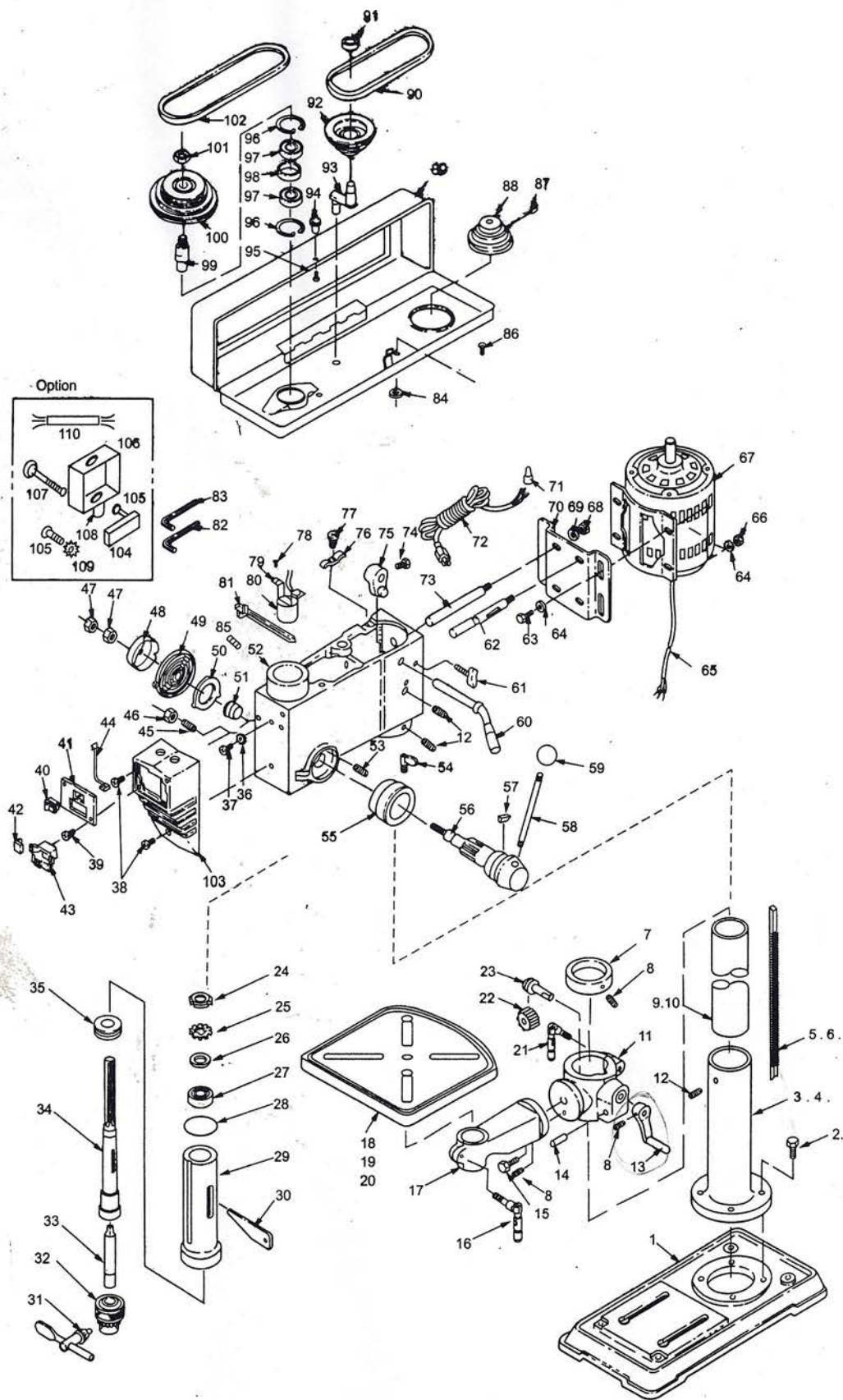
All of the BALL BEARINGS are packed with grease at the factory. They require no further lubrication.

Periodically lubricate the gear and rack table elevation mechanism, the SPLINES (grooves) in the spindle and the RACK (teeth of the quill). See "Getting to Know Your Drill Press."

# Wiring diagram







ITEM	DESCRIPTION	PART No RDM-1601F(B)	PART No RDM-1602F(B)	PART No RDM-2001F(B)
1	BASE	13301001	16101001	16101001
2	SCREW-HEX.HD GB5782-86	M10-40	M10-40	M10-40
3	SUPPORT COLUMN(F)	16101002	16101002	16201002
4	SUPPORT COLUMN(B)	16101002B	16101002B	16201002A
5	RACK(F)	16101010	16101010	16101010
6	RACK(B)	16101010A	16101010A	16101010A
7	COLLOR-RACK	16101011	16101011	16201011
8	SCREW-HEX.SOC GB80-85	M6-10	M6-10	M6-10
9	TUBE-COLUMN(F)	16101003	16101003	16201003
10	TUBE-COLUMN(B)	16101003B	16101003B	16201003A
11	SUPPORT-TABLE	16101004	16101004	16201004
12	SCREW-HEX SOC GB80-85	M10-12	M10-12	M10-12
13	CRANK	13201009	13201009	13201009
14	PIN-GEAR	16101007	16101007	16101007
15	SCREW-HEX HD GB5782-86	M16-35	M16-35	M16-35
16	CLAMP-TABLE	16101013	16101013	16101013
17	ARM-TABLE(OPTION)	13301005	16101005	16201005
18	TABLE SQUARE(OPTION)	13301014	16101014	
19	TABLE ROUND(OPTION)	16101014A	16101014A	
20	WET TABLE(OPTION)		16101014B	16201014
21	CLAMP COLUMN	16101012	16101012	16101012
22	GEAR HELICAL	16101006	16101006	16101006
23	WORM	16101008	16101008	16101008
24	LOCK NUT		16103005	16103005
25	RING-LOCKING	11GB894. 1-86	16103004	16103004
26	WASHER		16103003	16103003
27	BEARING-BALL	60201	60203	60203
28	GASKET-QUILL	13303006	16103006	16203006
29	TUBE-QUILL	13303002A	16103002	16203002
30	KEY-DRIFT	16103008	16103008	16103008
31	KEY-CHUCK	16103010	16103010	16103010
32	CHUCK (OPTION)	JT3/B16/B18	JT3/B16/B18	JT3/B16/B18/B22
33	ARBOR	16103007	16103007	16103007
34	SPINDLE	13303001	16103001	16203001
35	BEARING-BALL	60204	60204	60205
36	LOCK WASHER GB862.1-87	5	5	5
37	SCREW GB818-85	M5-6	M5-6	M5-6
38	SCREW GB818-85	M5-16	M5-16	M5-16
39	SCREW-PAN CR GB845-85	ST4.2-9.5	ST4.2-9.5	ST4.2-9.5



ITEM	DESCRIPTION	PART No RDM-1601F(B)	PART No RDM-1602F(B)	PART No RDM-2001F(B)
40	SWITCH-ROCKER	13302009	16102012	16102012
41	COVER-SWITCH PLATE	16102011	16102009	16202009
42	KEY-SWITCH	J-9301A	16102011	16102011
43	SWITCH-LOCKING(OPTION)	KJD6	J-9301A	J-9301A
		KJD12	KJD6	KJD6
			KJD12	KJD12
			KJD18	KJD18
44	LEAD		16102018	16102018
45	SCR.SC.SET.FL	13302021	16102021	16102021
46	NUT-HEX GB6170-85	M8	M10	M10
47	NUT-HEX GB6172-85	M12	M12	M12
48	CAP SPRING	16104008	16104008	16104008
49	SPRING	16104009	16104009	16104009
50	RETAINING-SPRING	16104007	16104007	16104007
51	SEAT-SPRING	16104006	16104006	16104006
52	HEAD	13302001	16102001	16202001
53	PIN-STOP	13304010	16104010	16104010
54	LOCK-DEPTH SCREW	16104012	16104012	16104012
55	RING-DEPTH STOP	13304003	16104003	16104003
56	SHAFT-PINION	13304000	16104000	16104000
57	GUDIE-SCALE		16104004	16104004
58	ROD	13304005	16104005	16104005
59	KNOB	13304011	16104011	16104011
60	HANDLE-BELT TENSION	16102004	16102004	16202004
61	KNOB-MOTOR ADJUST	16102005	16102005	16102005
62	SUPPORT-MOTOR BRA(R)	16102002	16102002	16202003
63	SC-HEX.HD.GB5782-86	M8-20	M8-20	M8-20
64	WASHER GB97.2-85	8	8	8
65	CORD-MOTOR.(OPTION)	13302016	16102016	16202016
66	NUT-HEX GB6170-86	M8	M8	M8
67	MOTOR (OPTION)	16102020	16102020	16202020
68	NUT-HEX GB6170-86	M12	M12	M12
69	LOCK WASHER GB93-87	12	12	12
70	MOUNT-MOTOR (OPTION)	16102007	16102007	16102007
71	CONNECTOR-WIRE	13302019	16102019	16102019
72	CORD-POWER (OPTION)	13302015	16102015	16202015
73	SUPPORT-MOTOR BRA(L)	16102003	16102003	16202002
74	SC.HEX HD GB5781-86	M8-16	M8-16	M8-16

ITEM	DESCRIPTION	PART No RDM-1601F(B)	PART No RDM-1602F(B)	PART No RDM-2001F(B)
75	LEVER-ADJUSTING	16102006	16102006	16102006
76	CLAMP-CORD	16102014	16102014	16102014
77	SCREW GB818-85	M5-12	M5-12	M5-12
78	SCREW GB818-85		M6-12	M6-12
79	BRACKET-BULB SOCKET		16102013	16102013
80	SOCKET-BULB		E-27	E-27
81	TIE-WIRE	16102017	16102017	16102017
82	WRENCH HEX GB5356-86	3	3	3
83	WRENCH HEX GB5356-86	4	5	5
84	WASHER FOAM	13105009	13105009	13105009
85	SCR-HEX. SOC. SET GB80-85	M8 x 8		
86	SCR-WASHER GB9074. 1-88	M6-12	M6-12	M6-12
87	SCR-HEX. SOC. SET GB80-85	M8-16	M8-16	M10-12
88	PULLER-MOTOR	16105005	16105005	16205005
89	GUARD	13305000	16105000	16205000
90	BELT"V"	16105010M24	16105010M24	16205010A27
91	BEARING BALL	60202	60202	60202
92	PULLEY-CENTER 12SP	16105006	16105006	
	PULLEY-CENTER 16SP	13305006	16105006A	16205006
93	PIVOT-IDLER 12SP	16105007	16105007	
	PIVOT-IDLER 16SP	16205007	16205007	16205007
94	KNOB	16105008	16105008	16105008
95	SCREW GB818-85	M5-12	M5-12	M5-12
96	RING-RETAINING	17 GB894.1-86	16102024	16202024
97	BEARING BALL	60203	60204	60205
98	SPACER	13302023	16102023	16202023
99	INSERT-PULLEY	13302022	16102022	16202022
100	PULLEY-SPINDLE (12SP)	13305009	16105009	
	PULLEY-SPINDLE (16SP)	13305009A	16105009A	16205009
101	NUT-PULLEY	13302025	16102025	16102025
102	BELT"V"	16105010M24	16105011M26	16205011A29
103	BOX-SWITCH	13102008	16102008	16202008
104	TERMINATION BLOCK	20102031	20102031	20102031
105	SCREW GB818-85	M4 x 6	M4 x 6	M4 x 6
106	TERMINAL BLOCK	20102030	20102030	20102030
107	SCREW GB818-85	M5 x 35	M5 x 35	M5 x 35
108	RELIEF-STRAIN	16102020-1	16102020-1	16102020-1
109	LOCK WASHER GB862.1-87	4	4	4
110	CORD	13302015J	16102015H	16202015H