

Operator's Manual

Drill Press



CAUTION: Read and follow all Safety Rules and Operating Instructions before First Use of this Product. Keep this manual with tool.

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SAFETY

WARNING: Some dust created by power sanding, sawing, grinding, drilling and other construction activities contains chemicals known to cause cancer, birth defects or other reproductive harm. Some examples of these chemicals are:

- Lead from lead-based paints
- Crystalline silica from bricks, cement and other masonry products
- Arsenic and chromium from chemically treated lumber

Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals, work in a well-ventilated area and work with approved safety equipment such as dust masks that are specially designed to filter out microscopic particles.

WARNING: To avoid electrical hazards, fire hazards, or damage to the tool, use proper circuit protection.

Use a separate electrical circuit for your tools. To avoid shock or fire, replace power cord immediately if it is worn, cut or damaged in any way.

SAFETY

GENERAL SAFETY INSTRUCTIONS

BEFORE USING THE DRILL PRESS

Safety is a combination of common sense, staying alert and knowing how to use this Drill Press.

WARNING: To avoid mistakes that could cause serious injury, do not plug the Drill Press in until you have read and understood the following:

1. **READ** and become familiar with the entire Operator's Manual. **LEARN** the tool's application, limitations and possible hazards.
2. **KEEP GUARDS IN PLACE** and in working order.
3. **REMOVE ADJUSTING KEYS AND WRENCHES.** Form a habit of checking to see that keys and adjusting wrenches are removed from the tool before turning ON.
4. **KEEP WORK AREA CLEAN.** Cluttered areas and benches invite accidents.
5. **DON'T USE IN DANGEROUS ENVIRONMENT.** Don't use power tools in damp or wet locations, or expose them to rain. Keep work area well lighted.
6. **KEEP CHILDREN AWAY.** All visitors should be kept at a safe distance from work area.
7. **MAKE WORKSHOP CHILDPROOF** with padlocks.
8. **DON'T FORCE THE TOOL.** It will do the job better and safer at the rate for which it was designed.
9. **USE THE RIGHT TOOL.** Do not force tool or attachment to do a job for which it was not designed.
10. **USE PROPER EXTENSION CORD.** Make sure your extension cord is in good condition. When using an extension cord, be sure to use one heavy enough to carry the current your product will draw. An undersized cord will result in a drop in line voltage and in loss of power that will cause the tool to overheat.
11. **WEAR PROPER APPAREL.** Do not wear loose clothing, gloves, neckties, rings, bracelets, or other jewelry that may get caught in moving parts. Non-slip footwear is recommended. Wear protective hair covering to contain long hair.
12. **ALWAYS WEAR EYE PROTECTION.** Any Drill Press can throw foreign objects into the eyes that could cause permanent eye damage. ALWAYS wear Safety Goggles (not glasses). Everyday eyeglasses have only impact-resistance lenses. They ARE NOT safety glasses.
13. **SECURE WORK.** Use clamps or a vise to hold work when practical. It's safer than using your hand and it frees both hands to operate tool.
14. **DISCONNECT TOOLS** before servicing; when changing accessories such as blades, bits, cutters, and the like.
15. **REDUCE THE RISK OF UNINTENTIONAL STARTING.** Make sure switch is in OFF position before plugging in.
16. **USE RECOMMENDED ACCESSORIES.** Consult the Operator's Manual for recommended accessories. The use of improper accessories may cause serious injury.

17. **NEVER STAND ON TOOL.** Serious injury could occur if the tool is tipped or if the cutting tool is unintentionally contacted.
18. **CHECK FOR DAMAGED PARTS.** Before further use of the tool, a guard or other part that is damaged should be carefully checked to determine that it will operate properly and perform its intended function – check for alignment of moving parts, binding of 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.
19. **NEVER LEAVE TOOL RUNNING UNATTENDED. TURN POWER “OFF”.** Don't leave tool until it comes to a complete stop.
20. **DON'T OVERREACH.** Keep proper footing and balance at all times.
21. **MAINTAIN TOOLS WITH CARE.** Keep tools sharp and clean for best and safest performance. Follow instructions for lubricating and changing accessories.
22. **DO NOT** use power tools in the presence of flammable liquids or gases.
23. **DO NOT OPERATE** the tool if you are under the influence of any drugs, alcohol or medication that could affect your ability to use the tool properly.
24. **ALWAYS** operate the Drill Press in a well-ventilated area and provide for proper dust removal. Use dust collection systems whenever possible. Dust generated from certain materials can be hazardous to your health.

SPECIFIC SAFETY INSTRUCTIONS FOR THE DRILL PRESS

WARNING: For your own safety, do not try to use your drill press or plug it in until it is completely assembled and installed according to the instructions, and until you have read and understood this instruction manual.

1. **THIS DRILL PRESS** is intended for use in dry conditions, indoor use only.
2. **WEAR EYE PROTECTION.** USE a face or dust mask along with safety goggles if drilling operation is dusty. USE ear protectors, especially during extended periods of operation.
3. **DO NOT** wear gloves, neckties, or loose clothing.
4. **DO NOT** try to drill material too small to be securely held.
5. **ALWAYS** keep hands out of the path of a drill bit. Avoid awkward hand positions where a sudden slip could cause your hand to move into the drill bit.
6. **DO NOT** install or use any drill bit that exceeds 175mm in length or extends 150mm below the chuck jaws. They can suddenly bend outward or break.
7. **DO NOT USE** wire wheels, router bits, shaper cutters, circle (fly) cutters, or rotary planers on this drill press.
8. **WHEN** cutting a large piece of material, make sure it is fully supported at the table height.
9. **DO NOT** perform any operation freehand. **ALWAYS** hold the workpiece firmly against the table so it will not rock or twist. Use clamps or a vise for unstable workpieces.
10. **MAKE SURE** there are no nails or foreign objects in the part of the workpiece to be drilled.
11. **CLAMP THE WORKPIECE OR BRACE IT** against the left side of the column to prevent rotation. If it is too short or the table is tilted, clamp it solidly to the table.
12. **IF THE WORKPIECE** overhangs the table such that it will fall or tip if not held, clamp it to the table or provide auxiliary support.
13. **SECURE THE WORK.** Use clamps or a vise to hold the work when practical. It's safer than using your hand and it frees both hands to operate tool.
14. **MAKE SURE** all clamps and locks are firmly tightened before drilling.
15. **SECURELY LOCK THE HEAD** and table support to the column, and the table to the table support before operating the drill press.
16. **NEVER** turn your drill press ON before clearing the table of all objects (tools, scraps of wood, etc.).
17. **BEFORE STARTING** the operation, jog the motor switch to make sure the drill bit does not wobble or vibrate.
18. **LET THE SPINDLE REACH FULL SPEED** before starting to drill. If your drill press makes an unfamiliar noise or if it

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vibrates excessively, stop immediately, turn the drill press OFF and unplug. Do not restart the unit until the problem is corrected.

19. **DO NOT** perform layout assembly or set up work on the table while the drill press is in operation.
20. **USE THE RECOMMENDED SPEED** for any drill press accessory and for different workpiece material.
21. **WHEN DRILLING** large diameter holes, clamp the workpiece firmly to the table. Otherwise, the bit may grab and spin the workpiece at high speeds. **DO NOT USE** fly cutters or multiple-part hold cutters, as they can come apart or become unbalanced in use.
22. **MAKE SURE** the spindle has come to a complete stop before touching the workpiece.
23. **TO AVOID INJURY** from accidental starting, always turn the switch OFF and unplug the drill press before installing or removing any accessory or attachment or making any adjustment.

ELECTRICAL REQUIREMENTS

POWER SUPPLY AND MOTOR SPECIFICATIONS

WARNING: To avoid electrical hazards, fire hazards, or damage to the tool, use proper circuit protection. Use a separate electrical circuit for your tools. To avoid shock or fire, if power cord is worn or cut, or damaged in any way, have it replaced immediately.

GROUNDING INSTRUCTIONS

WARNING: This tool must be grounded while in use to protect the operator from electrical shock.

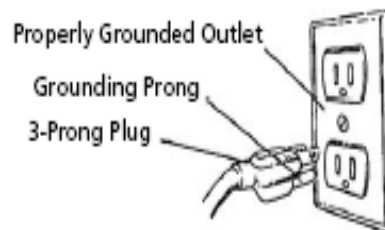
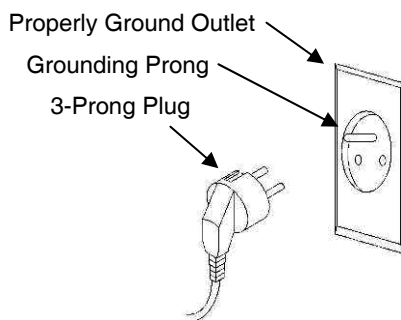
IN THE EVENT OF A MALFUNCTION OR BREAKDOWN, grounding provides a path of least resistance for electric current and reduces the risk of electric shock. This tool is equipped with an electric cord that has an equipment-grounding conductor and a grounding plug. The plug **MUST** be plugged into a matching receptacle that is properly installed and grounded in accordance with ALL local codes and ordinances.

DO NOT MODIFY THE PLUG PROVIDED. If it will not fit the receptacle, have the proper receptacle installed by a qualified electrician.

IMPROPER CONNECTION of the equipment-grounding conductor can result in risk of electric shock. The conductor with green insulation (with or without yellow stripes) is the equipment-grounding conductor. If repair or replacement of the electric cord or plug is necessary, **DO NOT** connect the equipment-grounding conductor to a live terminal.

CHECK with a qualified electrician or service person if you do not completely understand the grounding instructions, or if you are not sure the tool is properly grounded.

Refer to either picture:



WARNING: Improper connection of equipment grounding conductor can result in the risk of electrical shock. equipment should be grounded while in use to protect operator from electrical shock.

-Check with a qualified electrician if you do not understand grounding instructions or if you are in doubt as to whether the tool is properly grounded.

-This tool is equipped with an approved cord and a 3-prong grounding type plug for you protection against shock hazards.

SAFETY

-Grounding plug should be plugged directly into a properly installed and grounded 3-prong grounding-type receptacle, as shown.

-Do not remove or alter grounding prong in any manner. In the event of a malfunction or breakdown, grounding provides a path of least resistance for electrical shock.

WARNING: This Drill Press is for indoor use only. Do not expose to rain or use in damp locations.

GUIDELINES FOR EXTENSION CORDS

USE PROPER EXTENSION CORD. Make sure your extension cord is in good condition. When using an extension cord, be sure to use one heavy enough to carry the current your product will draw. An undersized cord will cause a drop in line voltage, resulting in loss of power and cause overheating.

Be sure your extension cord is properly wired and in good condition. Always replace a damaged extension cord or have it repaired by a qualified person before using it. Protect your extension cords from sharp objects, excessive heat and damp or wet areas.

ACCESSORIES AND ATTACHMENTS

RECOMMENDED ACCESSORIES

WARNING: To avoid injury:

- Use only accessories recommended for this Drill Press.
- Follow instructions that accompany accessories. Use of improper accessories may cause hazards.
- Use only accessories designed for this Drill Press to avoid injury from thrown broken parts or workpieces.
- Do not use any accessory unless you have completely read the instruction or operator's manual for that accessory.

CARTON CONTENTS

UNPACKING AND CHECKING CONTENTS

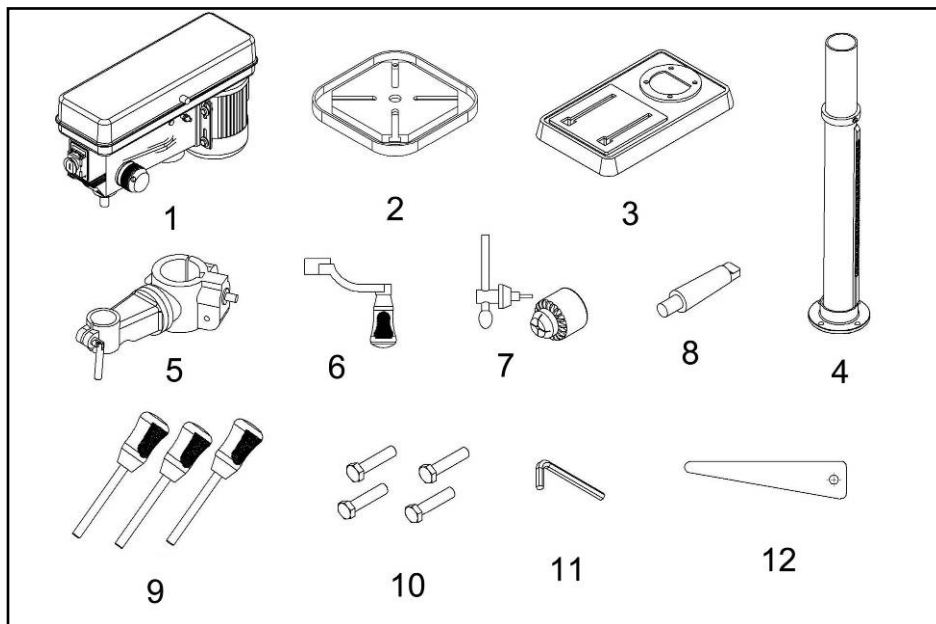
Carefully unpack the Drill Press and all its parts, and compare against the illustration following.

WARNING:

- To avoid injury from unexpected starting, do not plug the power cord into a power source receptacle during unpacking and assembly. This cord must remain unplugged whenever you are assembling or adjusting the drill press.
- If any part is missing or damaged, do not plug the drill press in until the missing or damaged part is replaced, and assembly is complete.
- To protect the drill press from moisture, a protective coating has been applied to the machined surfaces. Remove this coating with a soft cloth moistened with kerosene .

TABLE OF LOOSE PARTS

Unpack carton, check you machine to see parts listed below:



- | | |
|---------------------------|------------------|
| 1. Head assembly | 7. Chuck and key |
| 2. Table | 8. Arbor |
| 3. Base | 9. Feed handle |
| 4. Column assembly | 10. Bolt |
| 5. Table support assembly | 11. Hex wrench |
| 6. Crank handle | 12. Wedge |

ASSEMBLY

1. Column support to base

- 1.1 Position the base on floor or bench.
- 1.2 Place the column on the base, aligning the holes in the column support with the holes in the base.
- 1.3 Locate the four long hex bolts from the loose parts bag.
- 1.4 Place a bolt in each hole through the column support and the base.
Tighten with an adjustable wrench.

See Fig. 1

2. Install the table and rack

- 2.1 Take off ring and rack.
- 2.2 Install table support together with rack.

See Fig. 2

- 2.3 Install the ring and fix it firmly.

See Fig. 3

3. Install the crank handle and table

See Fig. 4 and Fig. 5

Fix the crank handle with attached screw

Tighten clamp bolt to lock the table bracket.

Place the table onto table support.

See Fig. 4

Fig. 1

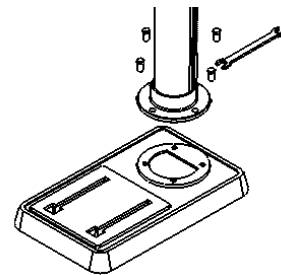


Fig.2

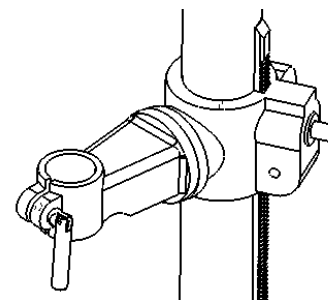


Fig.3

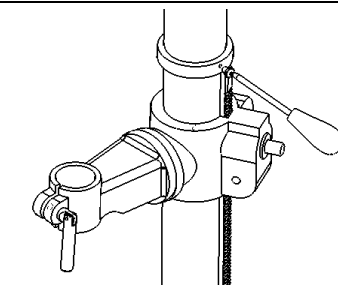


Fig4

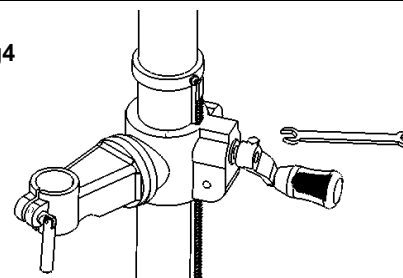


Fig.5

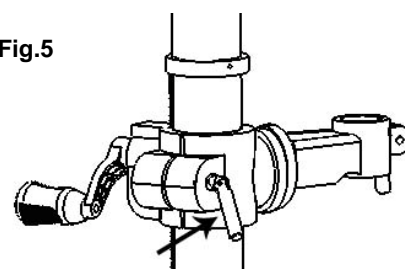
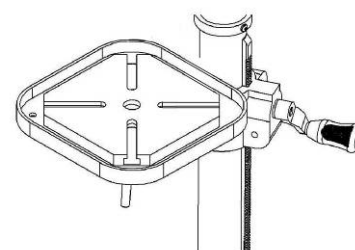


Fig.6



ASSEMBLY

5. Installing the head assembly

5.1. Carefully lift the head assembly above the column and slide it onto the column.

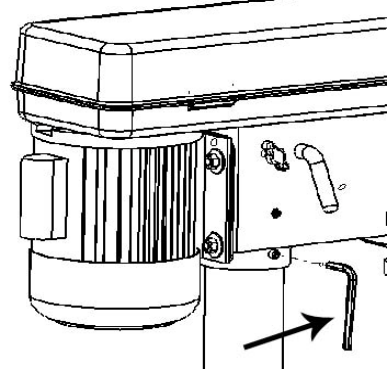
Make sure the head slides down over the column as far as possible.

Align the head with the base.

5.2. Using the hex wrench, tighten the head lock set screws.

See Fig. 7

Fig.7



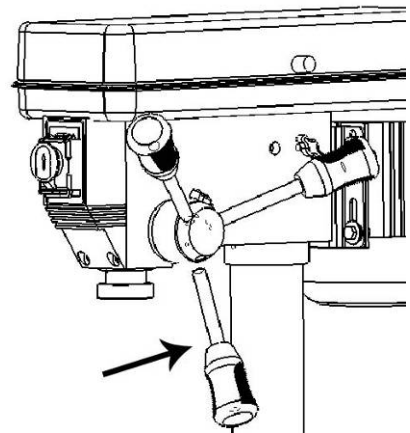
6. Installing feed handles

6.1. Locate the three feed handles in the loose parts bag.

6.2. Screw the feed handles into the threaded holes in the hub. Tighten.

See Fig. 8

Fig. 8



7. Installing the chuck

WARNING: Before any assembly of the chuck and arbor to the drill press head, clean all mating surfaces with a non-petroleum based product; such as alcohol or lacquer thinner. Any oil or grease used in the packing of these parts must be removed; otherwise the chuck may come loose during operation.

7.1 Open the jaws of the chuck by rotating the chuck sleeve clockwise. To prevent damage, make sure the jaws are completely retracted into the chuck.

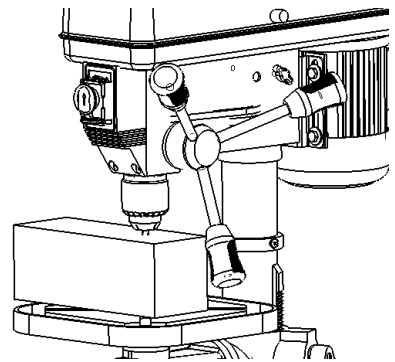
7.2 Push the chuck onto the spindle.

NOTE: Clean the spindle taper with a non-alcohol based cleaner before inserting it into the chuck.

7.3. Using a wood mallet, firmly tap the chuck upward into position on the spindle shaft.

See Fig. 9

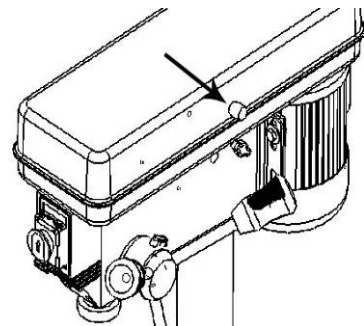
Fig. 9



8. Install knob and screw of upper pulley cover.

See Fig.10

Fig. 10



ADJUSTMENT

1. Table adjustment

A. Height adjustment

To adjust up or down.

Loosen the clamp bolt then adjust the table to your desired position by swing the table bracket crank handle.

See Fig. 11

B. Tilting adjustment:

Loosen lock bolt then swing table to appropriate position and retighten lock bolt.

See Fig. 12

C. Swing 360°

Loosen clamp bolt then swing table to appropriate position and retighten clamp bolt.

See Fig. 13

2. Feed Depth Adjustment

2.1 Loosen the locking screw, rotate scale so desired depth is indicated on scale next to the pointer. Tighten locking screw. Use this feature to drill more than one hole to same depth.

2.2 Spindle can be locked in either fully or partially down position.

Loosen locking screw. Lower chuck to desired depth, rotate scale fully clockwise and tighten locking screw. Use this feature to set up and align work.

3. SPEED ADJUSTING

The spindle speeds shown in the speed label.

To change the speed, loose the belt tension lock knob , pull the motor mounting plate to the front end then change the belt location.

To tighten the belt, push the motor mounting plate to the rear end and lock the belt tension lock knob.

See Fig.15

Fig. 11 Table bracket crank handle

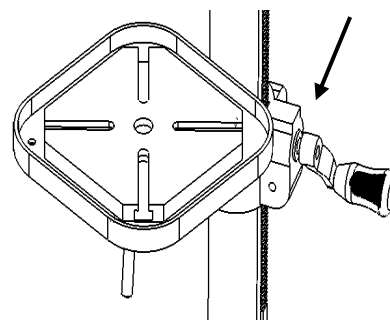


Fig. 12

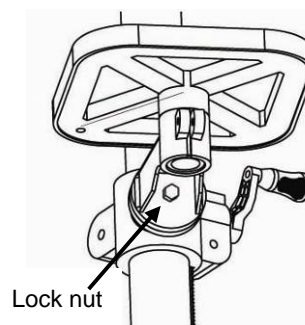


Fig. 13

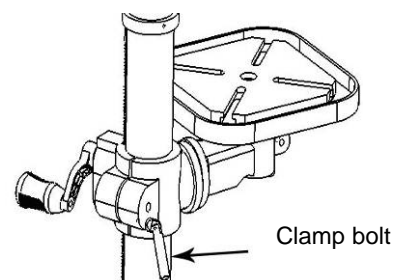
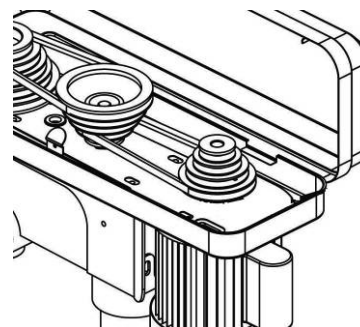


Fig. 14



Fig. 15



ADJUSTMENT

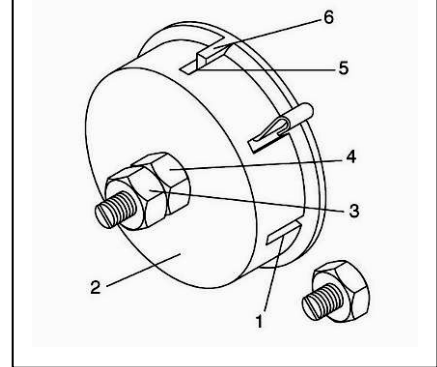
4. Quill Spring Adjustment

The quill return spring may need adjustment if the tension causes the quill to return too rapidly or too slowly.

See Fig. 16

- 4.1 Lower the table for additional clearance.
- 4.2 Place a screwdriver in the lower front notch (1) of the spring cap (2). Hold it in place while loosening and removing only the outer jam nut (3).
- 4.3 With the screwdriver still engaged in the notch loosen the inner nut (4) just until the notch (5) disengages from the boss (6) on the drill press head.

Fig. 16



CAUTION: DO NOT REMOVE THIS INNER NUT, because the spring will forcibly unwind.

- 4.4 Carefully turn the spring cap (2) counterclockwise with the screwdriver, engaging the next notch.
- 4.5 Lower the quill to the lowest position by rotating the feed handle in a counterclockwise direction while holding the spring cap (2) in position.
- 4.6 If the quill moves up and down as easily as you desire, tighten the inner nut (4) with the adjustable wrench. If too loose, repeat steps 2 through 4 to tighten. If too tight, reverse steps 3 and 4. **DO NOT OVERTIGHTEN** and restrict quill movement.
- 4.7 Replace the jam nut (3) and tighten against the inner nut (4) to prevent the inner nut from reversing.

5. ADJUSTING THE LASER LINES

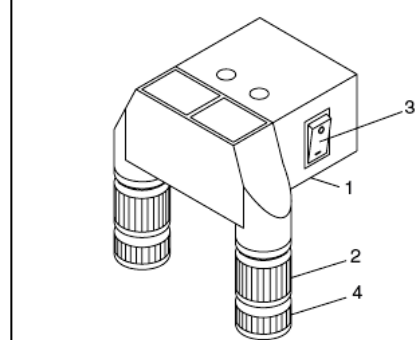
△Caution: Laser pointer is an alternative part . Your machine may not have this laser pointer.

How to check and adjust the Laser Beam Alignment:

Check the laser beam alignment to ensure the intersection of the laser lines precisely at the spot where the drill bit meets the workpiece. If it is not, the laser lines should be adjusted using the laser adjustment knobs located on the opposite sides of the head assembly.

1. Mark an "X" on a piece of scrap wood.
2. Insert a small drill bit into the chuck and align its tip to the intersection of the lines of the "X".
3. Secure the board to the table.
4. Turn on the laser(3) and verify the laser lines align with the "X" on the workpiece.
5. If the laser lines do not align, loosen knobs(2) on each side of the laser module and rotate the lasers(4) until the lines meet in the center of the "X". Retighten the knobs to secure.

Fig. 17



NOTE: Check and adjust the laser beam alignment every time the drill press table is raised or lowered to a new position.

LASER RADIATION: AVOID DIRECT EYE CONTACT

A Laser light is radiated when the laser guide is turned on. Avoid direct eye contact. Always turn off the laser and unplug the drill press from the power source before making any adjustments.

- A laser pointer is not a toy and should not come into hands of children. Misuse of this appliance can lead to irreparable eye injuries.
- Any adjustments to increase the laser power is forbidden.

ADJUSTMENT/OPEARTION

- When using the laser pointer, do not point the laser beam towards people and / or reflecting surfaces. Even a laser beam of lower intensity may cause eye damage. Therefore, do not look directly into the laser beam.
- If the laser pointer is stored for more than three months without use, please remove the batteries to avoid damage from possibly leaking batteries.
- The laser pointer includes no user serviceable components. Never open the housing for repair or adjustments.
- On units equipped with the Laser-Guide attachment, repairs shall only be carried out by the laser manufacturer or authorized agent.

OPEARTION

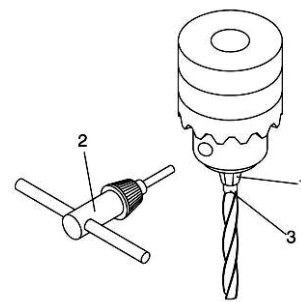
1. Installing A Drill Bit

See Fig. 18

- 1.1. With the switch "OFF", open the chuck jaws (1) using the chuck key (2). Turn the chuck key counterclockwise to open the chuck jaws (1).
- 1.2. Insert the drill bit (3) into the chuck far enough to obtain maximum gripping by the jaws, but not far enough to touch the spiral grooves (flutes) of the drill bit when the jaws are tightened.
- 1.3. Make sure that the drill is centered in the chuck.
- 1.4. Turn the chuck key clockwise to tighten the jaws.

Warning: To avoid injury or accident by the chuck key ejecting forcibly from the chuck when the power is turned ON, always recheck and remove the chuck key before turning the power ON.

Fig. 18

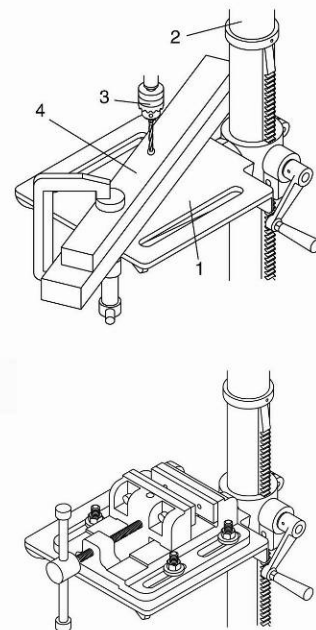


2. Positioning Workpiece

To prevent the workpiece or back-up material from being torn from your hands while drilling, you **MUST** position it against the **LEFT** side of the column. Failure to do this could result in personal injury.

See Fig.19

Fig. 19



3. Using Vise

For small workpiece that cannot be clamped to the table, use a drill press vise. The vise must be clamped or bolted to the table.

Warning: The drill press vise **MUST** be clamped or bolted to the table to avoid injury from a spinning workpiece, or damaged vise or bit parts.

See Fig.19

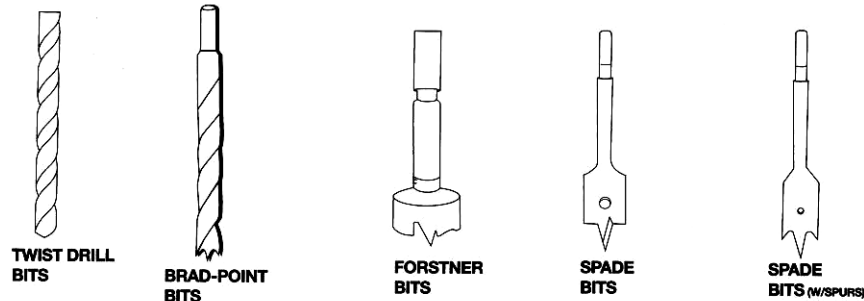
OPEARTION

4. Correct Drilling Speeds

Warning: Be sure drill press is turned off and is disconnected from power sours before adjusting speeds.

Use the recommended speed for the drill bit and workpiece.

The drill bits that can be used is shown in following figure:



Recommended Operating Speeds (in RPMS)

	Material					
	SOFTWOOD	HARDWOOD	ACRYLIC	BRASS	ALUMINUM	STEEL
TWIST DRILL BITS						
1/16-3/16" (3-5mm)	3000	3000	2500	3000	3000	3000
1/4-3/8" (6-10mm)	3000	1500	2000	1200	2500	1000
7/16-5/8" (11-16mm)	1500	750	1500	750	1500	600
11/16-1" (11-25mm)	750	500	NR	400	1000	250
BRAD-POINT BITS						
1/8"	1800	1200	1500	NR	NR	NR
1/4"	1800	1000	1500	NR	NR	NR
3/8"	1800	750	1500	NR	NR	NR
1/2"	1800	750	1000	NR	NR	NR
5/8"	1800	500	750	NR	NR	NR
3/4"	1400	250	750	NR	NR	NR
7/8"	1200	250	500	NR	NR	NR
1"	1000	250	200	NR	NR	NR
FORSTNER BITS						
1/4-3/8"	2400	700	250	NR	NR	NR
1/2-5/8"	2400	500	250	NR	NR	NR
3/4-1"	1500	500	250	NR	NR	NR
1 1/8-1 1/4"	1000	250	250	NR	NR	NR
1 3/8-2"	500	250	NR	NR	NR	NR
SPADE BITS						
1/4-1/2"	2000	1500	NR	NR	NR	NR
5/8-1 1/2"	1750	1500	NR	NR	NR	NR
1 1/8-1 1/2"	1500	1000	NR	NR	NR	NR
SPADE BITS WITH SPURS						
3/8-1 NR	2000	1800	500	NR	NR	NR

NR-Not Recommended

MAINTENANCE

MAINTAINING YOUR DRILL PRESS

WARNING: For our own safety, turn the switch OFF and remove the plug from the power source outlet before maintaining or lubricating your drill press.

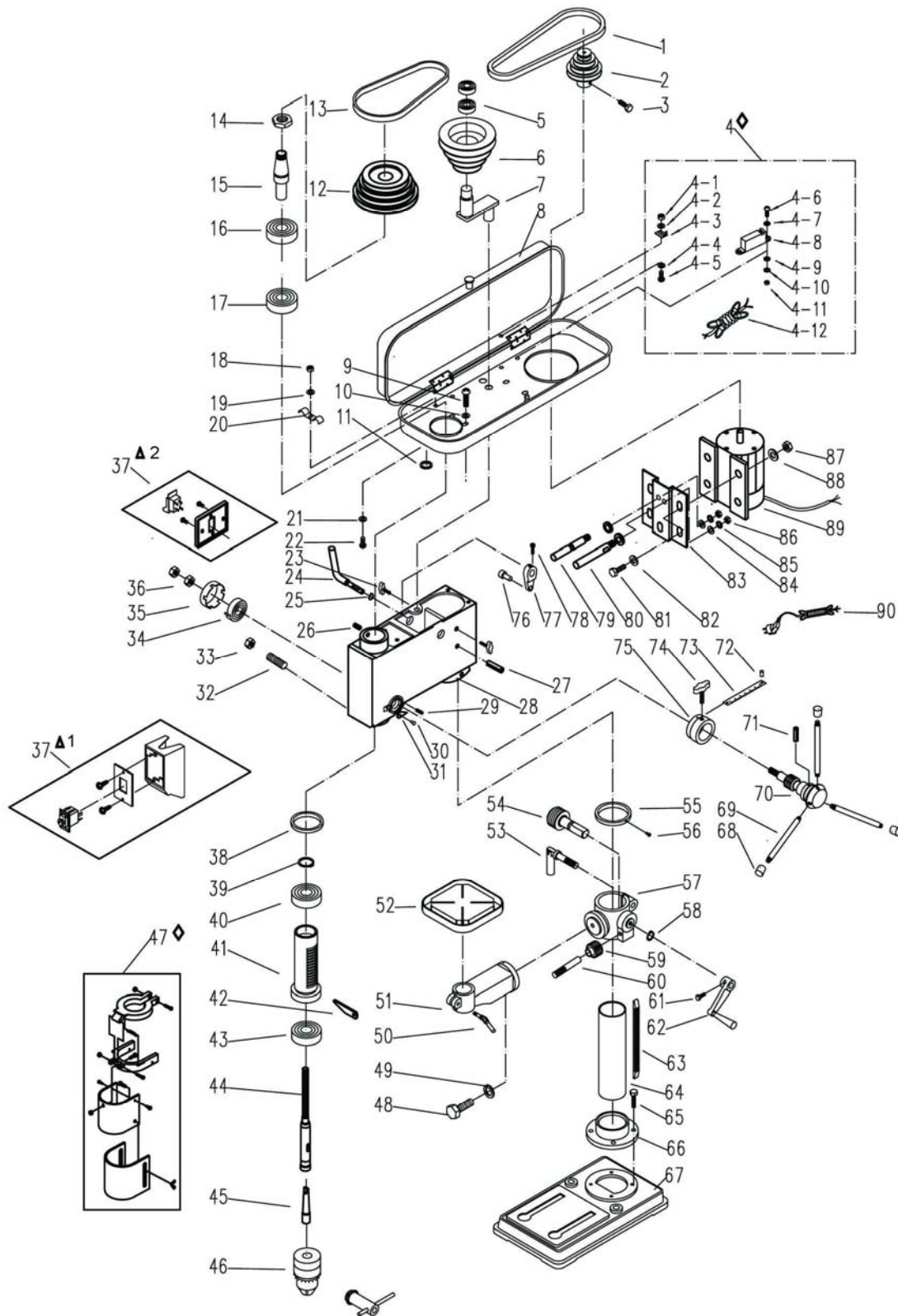
Frequently blow out, using an air compressor or dust vacuum, any dust that accumulates inside the motor. A coat of paste wax applied to the table and column will help to keep the surface clean & help avoid rust.

To avoid shock or fire hazard, if the power cord is worn or cut on any way, have it replaced immediately.

LUBRICATION

All of the drill press ball bearings are packed with grease at the factory. They require no further lubrication. Lower spindle to maximum depth and oil moderately once every three months.

Assembly diagram



△1, △2 Alternative assembly parts. Your machine has been equipped by △1 or △2 assembly part.

◇ Alternative assembly parts . Your machine may not have this assembly part.

PART LIST

Part No.	Description
1	Belt
2	Motor pulley
3	Bolt
4◇	Micro switch assembly
5	Ball bearing
6	Idler pulley
7	Idler pulley shaft
8	Belt cover
9	Screw
10	Washer
11	Grommet
12	Spindle pulley
13	Belt
14	Nut
15	Upper spindle sleeve
16	Ball bearing
17	Ball bearing
18	Nut
19	Washer
20	Cord line clamp
21	Washer
22	Screw
23	Locking screw
24	Belt tension adjusting handle
25	Retaining ring
26	Set screw
27	Pin
28	Drill press head
29	Pin
30	Rivet
31	Pointer
32	Set screw
33	Nut
34	Spring
35	Cap cover
36	Nut
37	Switch assembly
38	Rubber bumper
39	Retaining ring
40	Ball bearing
41	Quill
42	Wedge
43	Ball bearing
44	Spindle
45	Arbor

Part No.	Description
46	Chuck and key
47	Chuck guard assembly
48	Bolt
49	Washer
50	Locking handle
51	Table support
52	Table
53	Locking handle
54	Worm gear
55	Rack retaining ring
56	Set screw
57	Bracket
58	Retaining ring
59	Pinion gear
60	Shaft
61	Bolt
62	Crank handle
63	Rack
64	Column
65	Bolt
66	Collar
67	Base
68	Grip
69	Feed handle
70	Shaft pinion assembly
71	Pin
72	Rivet
73	Depth scale
74	Locking screw
75	Depth guage
76	Shaft
77	Tension block
78	Screw
79	Motor support shaft A
80	Motor support shaft B
81	Bolt
82	Washer
83	Motor support plate
84	Flat washer
85	Lock washer
86	Nut
87	Washer
88	Nut
89	Motor
90	Cord

Troubleshooting Chart

Symptom	Possible Cause(s)	Corrective Action
Noisy operation	<ol style="list-style-type: none"> 1. Incorrect belt tension 2. Dry spindle 3. Loose spindle 4. Loose motor pulley 	<ol style="list-style-type: none"> 1. Adjust tension 2. Lubricate spindle 3. Tighten pulley nut 4. Tighten set screw in pulley
Bit burns or smokes	<ol style="list-style-type: none"> 1. Incorrect speed 2. Chips not coming out of hole 3. Dull bit 	<ol style="list-style-type: none"> 1. Change speed 2. Retract bit frequently to clear chips 3. Sharpen or replace bit
Excessive drill bit run out or wobble	<ol style="list-style-type: none"> 1. Bent bit 2. Bit not properly installed in chuck 3. Chuck not properly installed 4. Worn spindle bearings 	<ol style="list-style-type: none"> 1. Replace bit 2. Install bit properly 3. Install chuck properly 4. Replace bearings
Drill bit binds in workpiece	<ol style="list-style-type: none"> 1. Workpiece pinching bit or excessive feed pressure 2. Improper belt tension 	<ol style="list-style-type: none"> 1. Support or clamp workpiece, decrease feed pressure 2. Adjust tension
Workpiece torn loose from hand	<ol style="list-style-type: none"> 1. No supported or clamped properly 	<ol style="list-style-type: none"> 1. Support or clamp workpiece properly