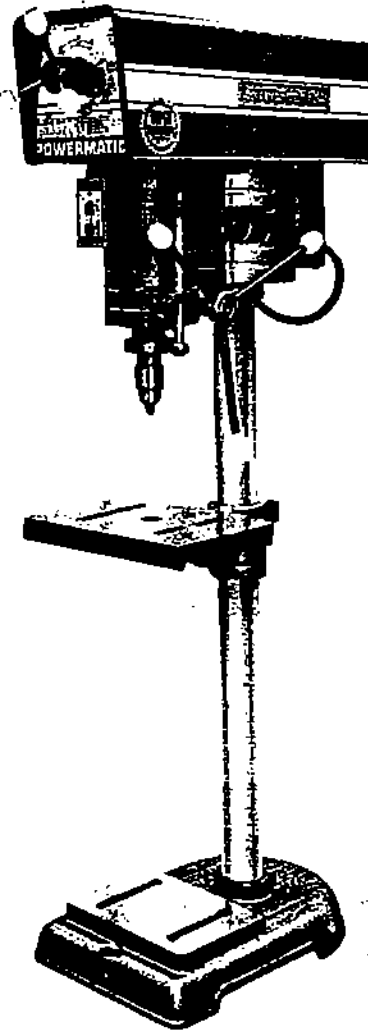


Model 1150
15" Drill Press

MAINTENANCE INSTRUCTIONS AND PARTS LIST

PRICE \$ 2.50



POWERMATIC®

POWERMATIC  HOUDAILLE

Mt. Airy, Pa. Phone 271-10

FOREWORD

This manual has been prepared for the owner and operators of a Powermatic Model 1150 Drill Press.

In order to obtain maximum life and efficiency from your Powermatic drill press and to aid in operating the press with safety, read the manual thoroughly and follow all instructions carefully.

The specifications listed were in effect when the manual was published. However, because of Powermatic's policy of continuous improvement, Powermatic reserves the right to change specifications at any time without incurring obligations.

WARRANTY

This machine and its component parts have been carefully inspected at various stages of production and each finished machine is subjected to a final inspection before shipment. We agree that for a period of eighteen (18) months from date of delivery from our authorized dealer to replace, at our option, any machine (or component part thereof) proving defective within the above period, F.O.B. our plant providing such machine (or component part) is returned pre-paid to our plant, or a designated service center of the undersigned, for our examination. **THIS WARRANTY DOES NOT INCLUDE REPAIR OR REPLACEMENT REQUIRED BECAUSE OF MISUSE, ABUSE, OR BECAUSE OF NORMAL WEAR AND TEAR; OR ELECTRICAL MOTORS WHICH ARE WARRANTED BY THEIR MANUFACTURER AND WHICH SHOULD BE TAKEN TO THEIR LOCAL AUTHORIZED REPAIR STATION FOR SERVICE. FURTHER, WE CANNOT BE RESPONSIBLE FOR THE COST OF REPAIRS MADE OR ATTEMPTED OUTSIDE OF OUR FACTORY OR DESIGNATED SERVICE CENTER WITHOUT OUR AUTHORIZATION. NO CLAIMS FOR DEFECTS WILL BE HONORED IF SERIAL NUMBER PLATE HAS BEEN REMOVED. THIS WARRANTY IS MADE EXPRESSLY IN PLACE OF ALL OTHER WARRANTIES OR GUARANTEES, EXPRESS OR IMPLIED, WITH RESPECT TO FITNESS, MERCHANTABILITY, QUALITY OR OPERATIVENESS. THIS WARRANTY BECOMES EFFECTIVE ONLY WHEN THE ACCOMPANYING CARD IS FULLY AND PROPERLY FILLED OUT AND RETURNED TO THE FACTORY WITHIN TEN (10) DAYS FROM DATE OF DELIVERY.**

MACHINE INSTALLATION ADJUSTMENTS AND MAINTENANCE**RECEIVING:**

Remove drill press from shipping container and check for damage. Report any damage to your distributor immediately. Attach accessories shipped with drill press, then clean protective coating from table, column, base and spindle with a good commercial solvent. Read instruction manual thoroughly for assembly alignment, maintenance and safety instructions.

INSTALLATION:

Mount machine on a solid foundation and lag to the floor through holes provided in base of drill press. The head and table of the machine have been lowered on the column for convenience in packaging. If a crane is not available to raise the head, proceed as follows:

1. Place a block of wood between spindle nose and top of table.
2. Loosen head locking handles, bumping them lightly to make certain they release.
3. Turn turret handle counter-clockwise (toward the operator). Head will move upward 6".
4. Lock head again with locking handles, raise table to a position just under spindle nose and repeat steps 2 through 4.
5. If the above procedure is too slow, use a minimum of three men to move head to its proper height; two to lift head and one to handle loosening and locking head control locks.
6. After head is at proper height—secure tightly, then make sure the safety collar is locked in place under the head. This will prevent head from falling if loosened for swing drilling operations.
7. Visually align spindle with table and base.

MULTIPLE SPINDLE MODELS:

In the case of multiple spindle models, the legs are not attached to the table, they are packed separately. To assemble the legs to multiple spindle models, carefully support machine on forklift tines or other temporary supports and bolt legs securely into position. The tables of multiple spindle models are at times shipped in more than one piece. In joining table halves, use alignment pins provided before securing bolts. These pins guarantee precision table surfaces. It is imperative that multiple spindle tables be carefully leveled. Use a precision level and level using the jackscrews provided in the legs. Lag machine to floor through holes provided in legs.

MOTOR INSTALLATION:**Step Pulley Models—**

If your machine was ordered less motor, or if the motor is being replaced, the following instructions will make installation easier.

- a. Place motor pulley on motor shaft and insert key.
- b. Raise drill press table as shown in Fig. 1. Place motor upright on table and install motor to motor mount, using (4) 5/16" x 5/8" long hex head cap screws. Align motor and spindle pulley and tighten motor pulley setscrews.
- c. Loosen belt clamp handle (Fig. 2) place belt over pulleys and into lowest speed grooves. Push belt clamp handle to rear for light belt tension and turn handle clockwise to lock. Too much tension will cause excessive vibration, shaft breakage, bearing noise and wear.

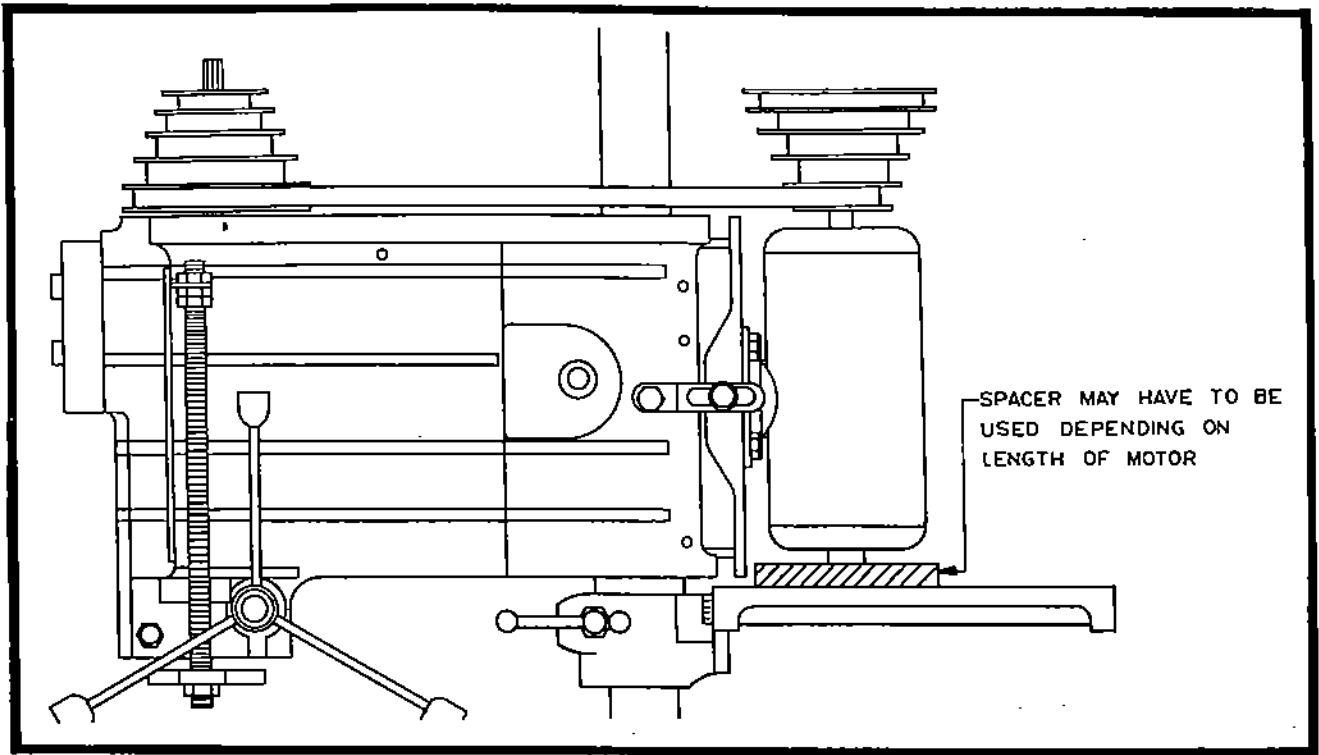


Figure 1

MOTOR INSTALLATION

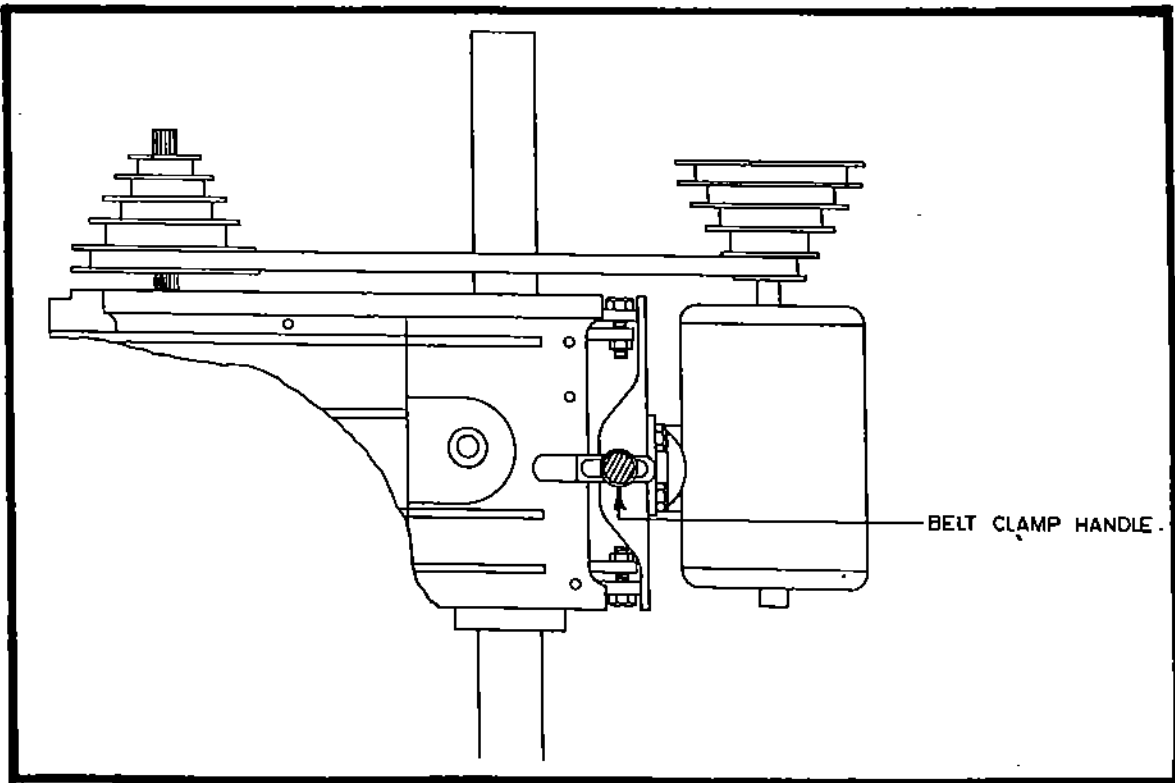


Figure 2

BELT TENSIONING

MACHINE INSTALLATION ADJUSTMENTS AND MAINTENANCE cont'dVariable Speed Models—

Powermatic prefers to ship all variable speed drill presses with motors installed; however, if the machine was ordered less motor, or a motor is being replaced, the following instructions apply.

- a. Remove variable speed control cam by removing shoulder bolt (Fig. 3), then remove (4) 5/16 guard retaining screws and lift guard from machine.
- b. Raise drill press table and lock in position (Fig. 1). Place motor on table in upright position and attach motor to motor mount, using (4) 5/16 hex nuts.
- c. Place variable speed motor pulley on motor shaft (spring up); open pulley by placing variable speed belt between halves and pulling outward on belt. Rotate pulley until setscrew in the lower cone is visible. Insert key in keyways, then tighten screws.
- d. Before replacing guard—temporarily replace variable speed cam (Fig. 4). Turn machine on and set variable speed rate at 2500. The belt should be in a horizontal plane at this point. If belt is cocked at an angle, loosen motor pulley and move on shaft until belt is level. Secure setscrew. (See section on changing speeds for setting speed range.)
- e. Remove cam—replace guard, then cam. Machine is now ready for operation.

NOTE: The above operations are easier to perform with head raised to its maximum height (flush with top of the column) since it is easier to remove the belt guard with this position.

CHANGING SPEEDS:

Speed changes on step pulley models are to be made with the machine not running—loosen clamp handle (Fig. 2) and pull toward operator. Belt is now free to move to any of the 5 speeds available. When speed choice is made, move clamp handle to rear for proper tension and lock by rotating clockwise.

Speed changes on variable speed models are to be made **ONLY WHILE MACHINE IS RUNNING**. Damage to variable drive mechanism will result if speed is adjusted while machine is not running.

If spindle speed does not appear to match the dial speed on variable speed unit—check speed with a tachometer and adjust by turning bolt on control arm (see Fig. 4) clockwise to increase speed and counter-clockwise to decrease.

To set speeds, adjust cam to minimum RPM, adjust by means of screw in control arm to flush belt with outside diameter of spindle sheave. Move motor back until belt has minimum of play. Pull out on one side of the belt. If there is a minimum of slack, the motor and belt system are properly adjusted in this position.

INSTALLING CHUCK:

- a. Wipe off the No. 33 spindle taper and tapered socket in chuck body (Fig. 5) with a clean cloth. Make sure no foreign particles are left on these surfaces which could prevent proper seating of the two parts.
- b. Apply a light film of oil on the spindle taper and place chuck on end of spindle (Fig. 5). Screw chuck collar on to the threads at end of spindle. Hold spindle pulley with one hand to keep spindle from rotating and tighten the chuck collar with drill chuck key.
- c. When removal of the chuck is required—disconnect power source. Hold top spindle pulley with one hand and using chuck key handle, loosen chuck collar by turning counter-clockwise (Fig. 5). Continued rotation of the collar will force the chuck off tapered spindle. **NEVER** attempt to drive or wedge chuck off as damage could result to chuck, spindle nose, and spindle bearings.

QUILL ADJUSTMENT:

Lateral play or bellmouthing can develop between the quill and head casting bands due to wear. To compensate for wear between the quill and head, proceed as follows:

- a. Be sure quill lock handle (Fig. 6) is loose.
- b. Loosen acorn nut.
- c. Squeeze slotted head casting together slightly by tightening bolt (A). Apply just enough pressure to compensate for wear but do not restrict free motion down or return.
- d. Tighten acorn locknut.

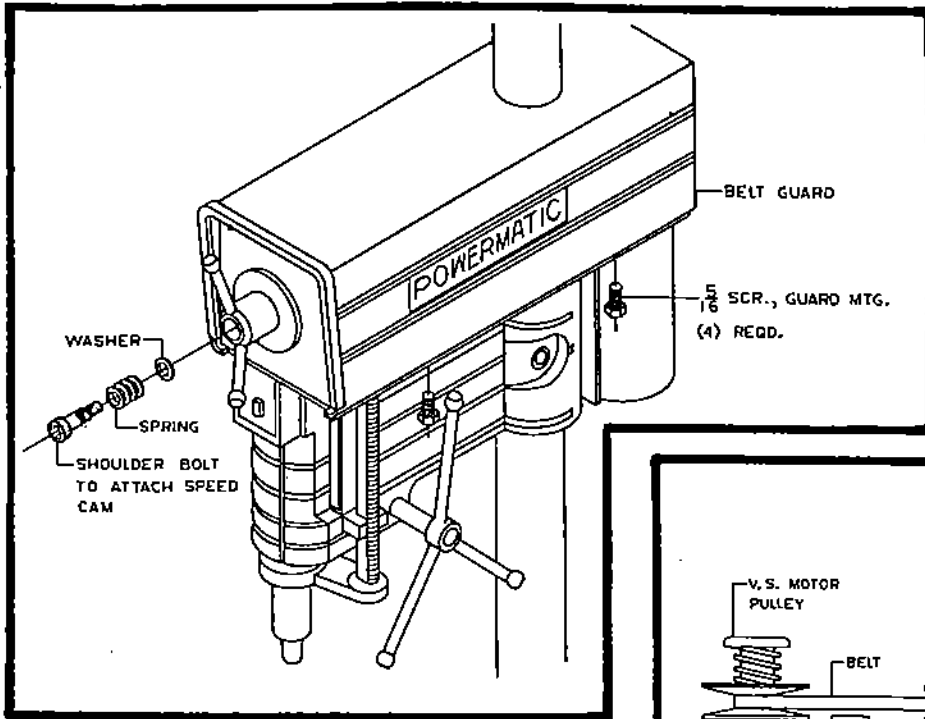


Figure 3
V. S. GUARD REMOVAL

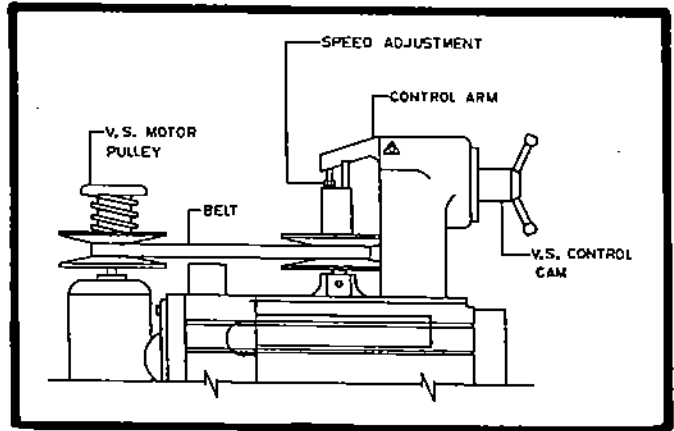


Figure 4
V. S. SPEED ADJUSTMENT

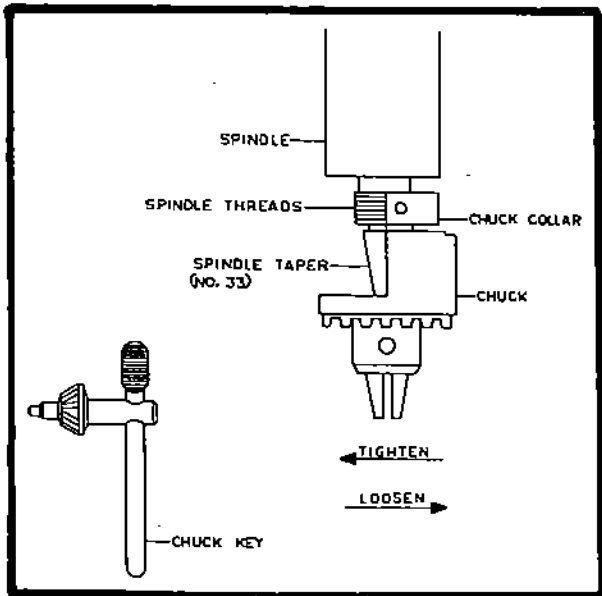


Figure 5
KEY CHUCK INSTALLATION

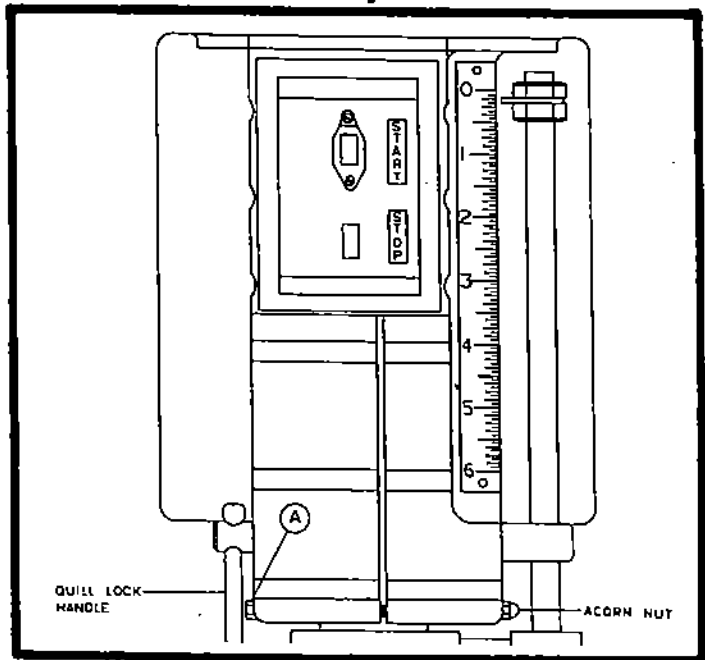


Figure 6
QUILL FIT UP ADJUSTMENT

MACHINE INSTALLATION ADJUSTMENTS AND MAINTENANCE cont'dQUILL RETURN SPRING ADJUSTMENT:

Spring tension for return of spindle, after hole drilling, has been pre-set at the factory. No further adjustment should be attempted unless absolutely necessary. Adjustment will probably be required if a multiple spindle drilling or tapping head is used. If adjustment is necessary, loosen lock screw (A) (Fig. 7) while holding quill spring housing (B). Do not allow the housing to turn in your hand, or spring will unwind. Turn entire housing assembly clockwise the number of turns necessary to cause the quill to return to its up position. (NOTE: The flat of the spring housing pilot is lined up with the spring loading hole on the body of the spring housing.) Reset lock screw (A), make sure point of screw mates to flat on the housing journal.

REPLACING SPINDLES ON QUILL ASSEMBLY:

To change the quill assembly for any reason, proceed as follows:

1. Hold quill return spring housing (B) in left hand (see Fig. 7) and loosen lock screw (A). Let spring unwind slowly, by allowing can to turn in hand.
2. Loosen setscrew (C) (Fig. 6) and remove nut (D) on bottom of depth stop rod. Unscrew and remove depth stop.
3. Hold quill assembly and remove the turret pinion shaft (E). Entire quill assembly will slide out of head.

To change spindles, follow the above steps, then (Fig. 8):

1. Loosen setscrew in collar (A) to reach this screw, insert a 5/32" Allen wrench through hole (B) in top of quill.
2. With a hard rubber mallet or block of wood, tap spline end of spindle. The spindle, with bearing (C) will come out of quill.
3. Use an arbor press to remove bearing (C).
4. To replace spindle, reverse above procedure.
5. When replacing collar (A), remove all end play from spindle.
6. When replacing quill in head casting, rotate spindle, if necessary, to engage spline in pulley driver.
7. Remove lock ring (F) and cover plate (G) (Fig. 7) from spring housing and make certain tongue on return spring is properly inserted in slotted end of pinion shaft. Replace cover and adjust spring tension as instructed under heading "QUILL RETURN SPRING ADJUSTMENT".

LUBRICATION:

All ball bearings in your Powermatic drill press are sealed for life, requiring no lubrication. Points requiring lubrication are:

1. Internal spline drive assembly. Keep this area well lubricated with a good grade non-hardening grease, such as Fiske Company "Lubriplate". Insert grease in the hole at the top of spindle-pulley spline driver. Lube twice yearly.
2. A light film of oil applied to the quill and column will reduce wear, prevent rust, and assure ease of operation.
3. Quill return spring should receive oil (SAE 20) once yearly. Remove cover plate and apply oil with squirt can or small brush.
4. **IMPORTANT:** The hub area of variable speed pulleys should be oiled with a light lubricant such as SAE 10W or automatic transmission oil every 90 days.
5. Apply Lubriplate to quill pinion every 90 days.
6. Occasional dressing of belt with spray can type belt dressing or parafin wax will promote longer belt life and quieter operation.

NOTE: Use extreme care when performing this operation and keep hands clear of pinch points. When using parafin bar, do this only by turning the sheaves by hand. Do not apply with motor running.

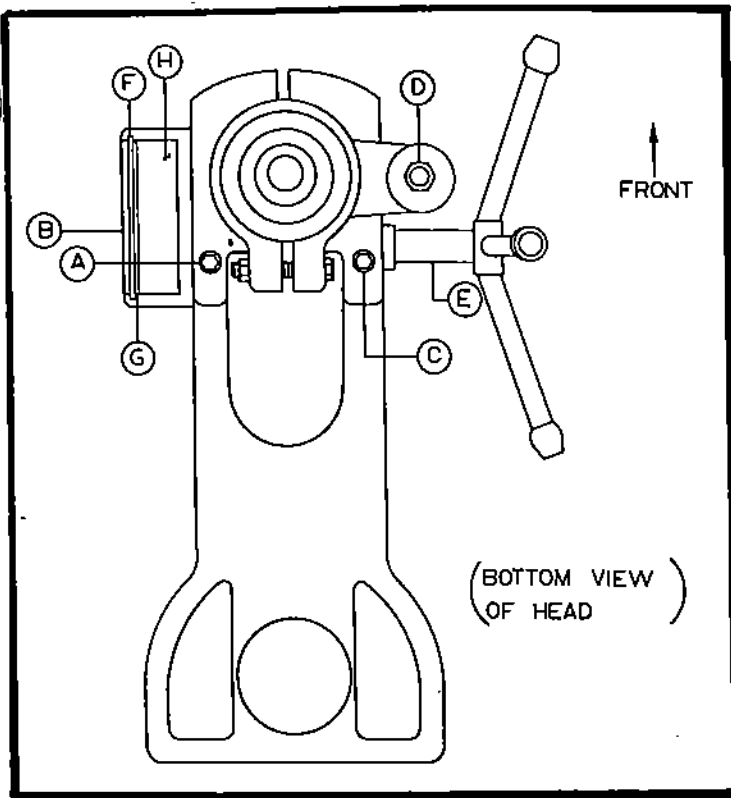


Figure 7
QUILL REMOVAL

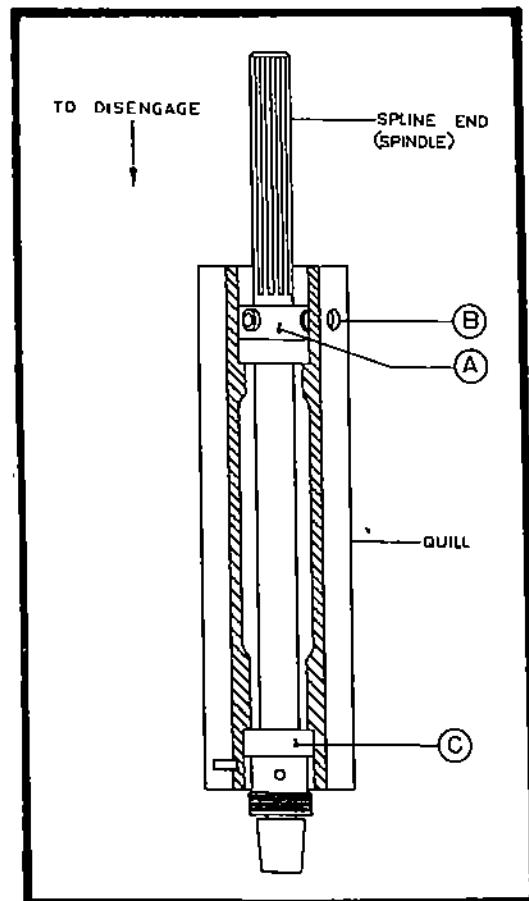


Figure 8
SPINDLE ASSEMBLY

MORTISE ATTACHMENT INSTALLATION

IMPORTANT NOTE: Mortise attachments cannot be installed on Morse Taper Spindle Models.

To Mount mortise attachment, remove quill yoke (Fig. 9) by removing locknut (B) and loosening yoke clamp bolt at rear of quill. Replace yoke with chisel housing (C). Insert depth stop rod into housing and replace locknut (B).

Insert proper size hollow chisel (with discharge hole to left if possible) into chisel housing. Insert a dime between shoulder on top of chisel and bottom of chisel housing. Lock chisel in place temporarily with round head bolt (D). Insert drill bit into chisel allowing shank to extend as far as possible into chuck jaws. Apply pressure against bit end with a wood block, and while holding, pressure tighten chuck jaws securely. Remove dime and move chisel up against chisel housing. Set lockscrew (D) tightly. Affix fence assembly to tilting tables as pictured in Fig. 9. The mortise attachment is now ready to use. Use short pecking strokes on all mortise operations.

If chisel end begins to turn blue, check chisel for sharpness and clearance between end of drill bit and chisel. Pressures exerted during mortise operation will sometimes force drill bit deeper into chuck jaws, reducing clearance gap. A loud squeal is usually an indication of insufficient clearance.

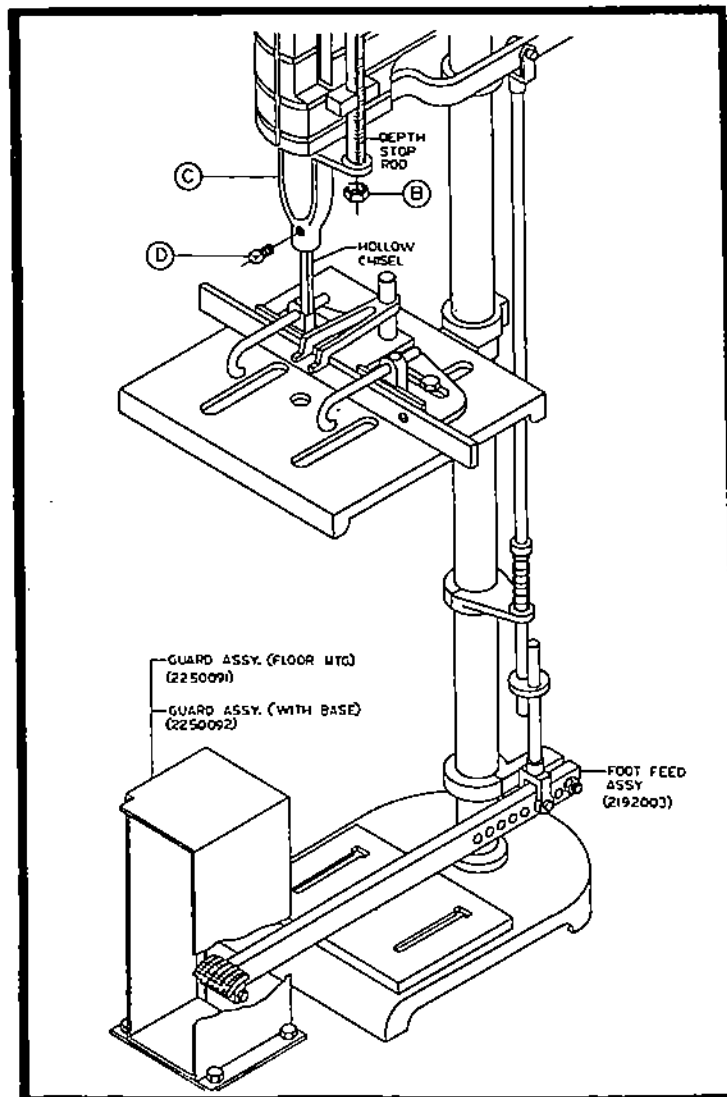


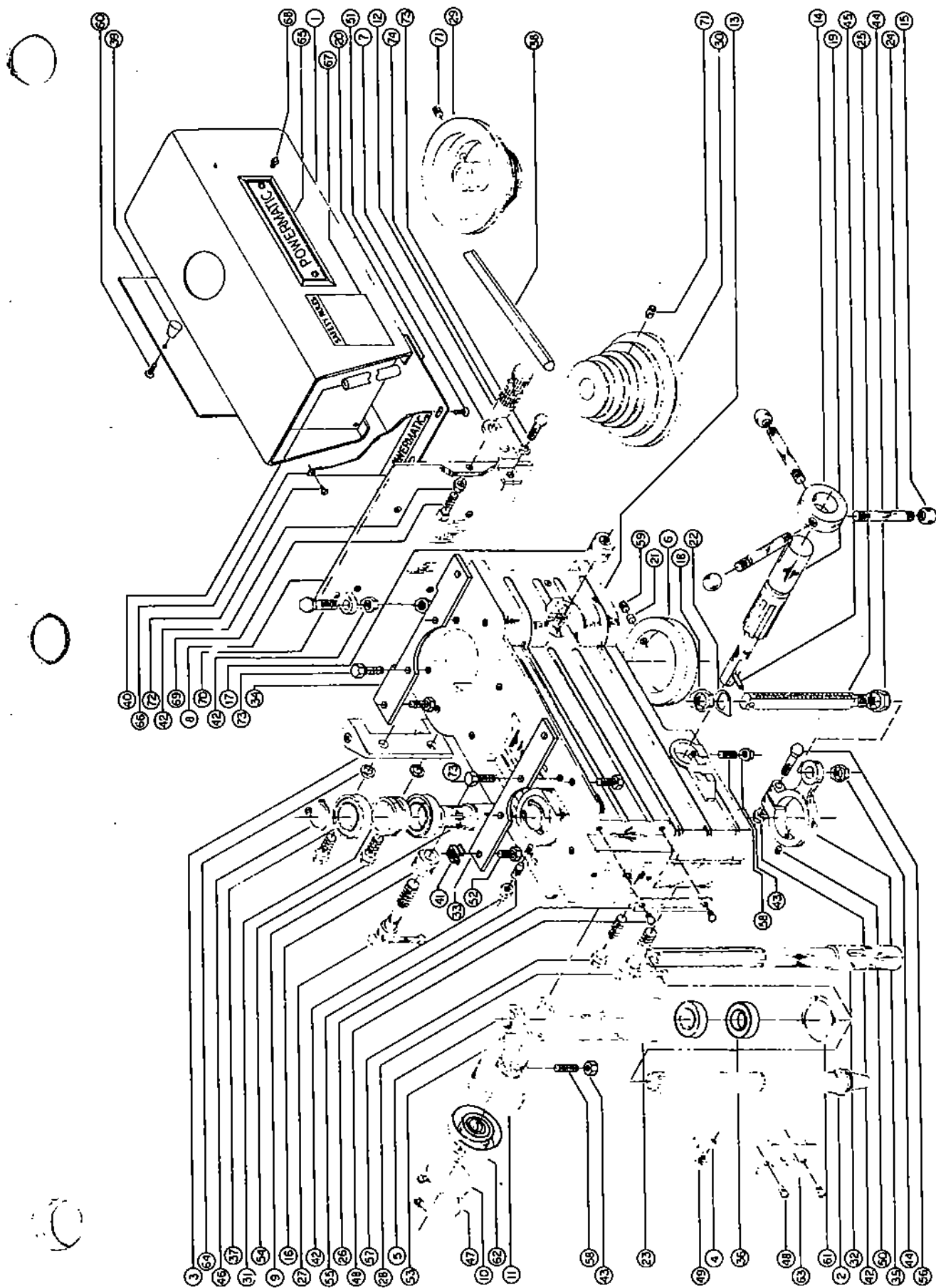
Figure 9
MORTISE ATTACHMENT INSTALLATION

TROUBLE SHOOTING HINTS

TROUBLE	PROBABLE CAUSE	REMEDY
<u>Excessive Vibration</u>	<ol style="list-style-type: none"> 1. Improper belt tension. 2. Uneven belt wear (hard spots). 3. Motor or spindle pulley out-of-balance. 4. Bad motor. 	<ol style="list-style-type: none"> 1. Adjust belt tension. 2. Replace belt. 3. Balance or replace problem pulley. 4. Replace motor.
<u>Motor Stalls</u>	<ol style="list-style-type: none"> 1. Over feeding. 2. Dull drill. 3. V/S belt riding on inner cone. 4. Motor not building up to running speed. 5. Bad motor. 	<ol style="list-style-type: none"> 1. Reduce feed rate. 2. Sharpen drill and keep sharp. 3. Re-adjust V/S belt. 4. Replace or repair motor. Check fuses in all three legs on three phase motors and replace if necessary. 5. Replace motor.
<u>Noisy Operation</u>	<ol style="list-style-type: none"> 1. Excessive vibration. 2. Improper quill adjustment. 3. Noisy spline. 4. Noisy motor. 	<ol style="list-style-type: none"> 1. Check remedy under excessive vibration. 2. Adjust quill (refer to paragraph on quill adjustment.) 3. Lubricate spline. 4. Check motor bearings or for loose motor fan.
<u>Drill or Tool heats up or burns work.</u>	<ol style="list-style-type: none"> 1. Excessive speed. 2. Chips not clearing. 3. Dull tool. 4. Feed reate too slow. 5. Rotation of drill incorrect. 6. Failure to use cutting oil or coolant (on steel). 	<ol style="list-style-type: none"> 1. Reduce speed. 2. Use pecking operation to clear chips. 3. Sharpen tool or replace. 4. Increase feed enough to clear chips. 5. Reverse motor rotation (refer to motor wiring diagram.) 6. Use cutting oil or coolant on steel.
<u>Drill leads off</u>	<ol style="list-style-type: none"> 1. No drill spot. 2. Cutting lips on drill off center. 3. Quill loose in head. 4. Bearing play. 	<ol style="list-style-type: none"> 1. Center punch or center drill workpiece. 2. Regrind drill. 3. Tighten quill (refer to quill adjustment). 4. Check bearings and reseal or replace if necessary.
<u>Excessive drill runout or wobble.</u>	<ol style="list-style-type: none"> 1. Bent drill. 2. Bearing play. 3. Drill not seated properly in chucks. 	<ol style="list-style-type: none"> 1. Replace drill. Do not attempt to straighten. 2. Replace or reseal bearings. 3. Loosen, reseal and tighten chuck.
<u>Work or fixture comes loose or spins.</u>	<ol style="list-style-type: none"> 1. Failure to clamp workpiece or work holding device to table. 	<ol style="list-style-type: none"> 1. Clamp workpiece or work holding device to table surface.

STEP PULLEY HEAD ASSEMBLY

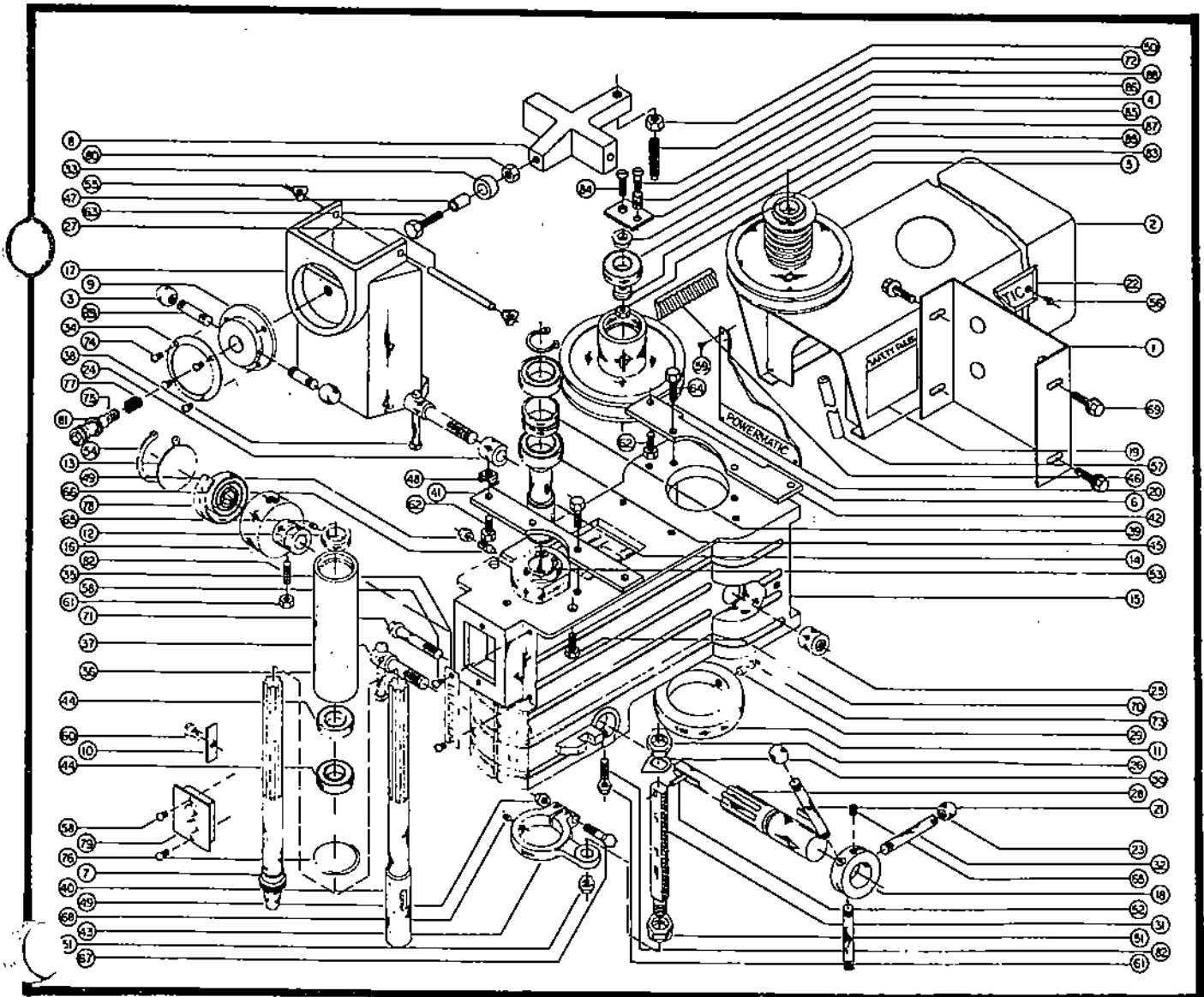
NO.	PART NO.	DESCRIPTION	QUANTITY
1	2250062	S/P Guard Assembly (Complete)	1
2	2749013	Screw Chuck Spindle	1
3	3063004	Mtg. Motor Base Bracket	1
4	3092012	Switch Wire Clamp	1
5	3096244	Spindle Collar	1
6	3096008	Column Collar	1
7	3064051	Motor Base Lock Bracket	1
8	3042019	S/P Motor Base	1
9	3144003	Internal Drive Spline	1
10	3104010	Quill Pinion Spring Cover	1
11	3298280	Spring Housing	1
12	3268009	S/P Motor Base Lock Handle	1
13	3277014	Casting Head	1
14	3301003	Turret Hub	1
15	3406206	Turret Knob	3
16	3448014	Plain Column (Sleeve) Lock	1
17	3448015	Threaded Column (Sleeve) Lock	1
18	3528005	Depth Adj. Nut	3
19	3586009	Quill Operation Pinion	1
20	3595271	Safety Plate	1
21	3598023	Brass Protector Plug, 7/16" x 3/16"	1
22	3604002	Depth Adj. Pointer	1
23	3640005	Sliding Quill	1
24	3670025	Turret Rod	3
25	3670016	Depth Adj. Rod	1
26	3684248	Plate Depth Adj. Scale	1
27	2695015	Lock Screw, 1/2"-13 x 6-1/4"	1
28	2695009	Quill Lock Screw	1
29	3718003	S/P Motor Pulley	1
30	3718004	S/P Spline Drive Sheave	1
31	3737001	Bearing Spacer	1
32	3749014	No. 2 Morse Taper Spindle	1
33	3767211	Guard Mtg. Strap (Front)	1
34	3767212	Guard Mtg. Strap (Rear)	1
35	3936002	Quill Yoke	1
36	6060007	Ball Bearing, Z99R12	2
37	6060013	Bearing, Tefnir 9106 PP	2
38	6077018	"V" Belt, Browning No. 4L 450	1
39	6430017	Knob, Davies No. 3702 SD	1
40	6458001	Rubber Molding, Atlantic India No. 1274	1
41	6514014	Self-retaining Nut (Mtg. Guard)	4
42	6515001	Hex Nut, 5/16"-18	4
43	6518001	Plain Hex Nut, 1/2"-13	2
44	6566002	Plain Hex Nut, 3/8"-24	2
45	6626035	Spring Pin, 3/16" x 5/8"	1
46	6670006	Lock Ring, No. 5100-118	2
47	6670071	Retaining External Ring, RS-275	1
48	6706038	Rd. Hd. Mach. Screw, 6-32 x 1/2"	2
49	6714035	Fill. Hd. Mach. Screw, 1/4"-20 x 3/4"	1
50	6714090	Half Dog Soc. Hd. Setscrew, 1/4"-20 x 1/2"	1
51	6714066	Rd. Hd. Screw, 1/4"-20 x 1/4"	2
52	6714127	Hex Hd. Cap Screw, 1/4"-20 x 1/2"	4
53	6715016	Soc. Setscrew, 5/16"-18 x 5/16"	2
54	6715032	Hex Hd. Screw, 5/16"-18 x 1"	2
55	6715118	Soc. Hd. Setscrew (Dog Pt.), 5/16"-18 x 3/4"	1
56	6715039	Hex Hd. Screw, 5/16"-18 x 3/4"	1
57	6716114	Hex Hd. Screw, 3/8"-16 x 2-3/4"	1
58	6718038	Soc. Hd. Setscrew (Dog Pt.), 1/2"-13 x 1-1/4"	2
59	6718055	Soc. Setscrew, 1/2"-13 x 1/2"	1
60	6760046	Rd. Hd. Screw (Mtg. Knob), 10"-13 x 3/8"	1
61	6804004	"O" Ring Seal, No. 330-7507	1
62	6813026	Torsion Spring, .035" x 1"	1
63	6821155	Push Button Switch, Furnas No. 12 BA 106606	1
64	6861200	Lock Washer, 5/16"	2
65	3312251	I.D. Powermatic Plate	1
66	3330278	I.D. Serial Plate	1
67	3330284	Safety Plate	1
68	6680020	Flat Alum. Drive Rivet, 5/32" x 1/4"	4
69	6715097	Sq. Hd. Screw, 5/16"-18 x 1-1/4"	1
70	6715034	Hex Hd. Screw, 5/16"-18 x 1-1/4"	2
71	6715016	Soc. Cap Setscrew, 5/16"-18 x 5/16"	2
72	6706035	Rd. Hd. Screw, NO. 6-32 x 1/4"	4
73	6715033	Hex Hd. Cap Screw, 5/16"-18 x 1/2"	5
74	6861200	Plain Helical Lock Washer, 5/16"	1



VARIABLE SPEED HEAD ASSEMBLY

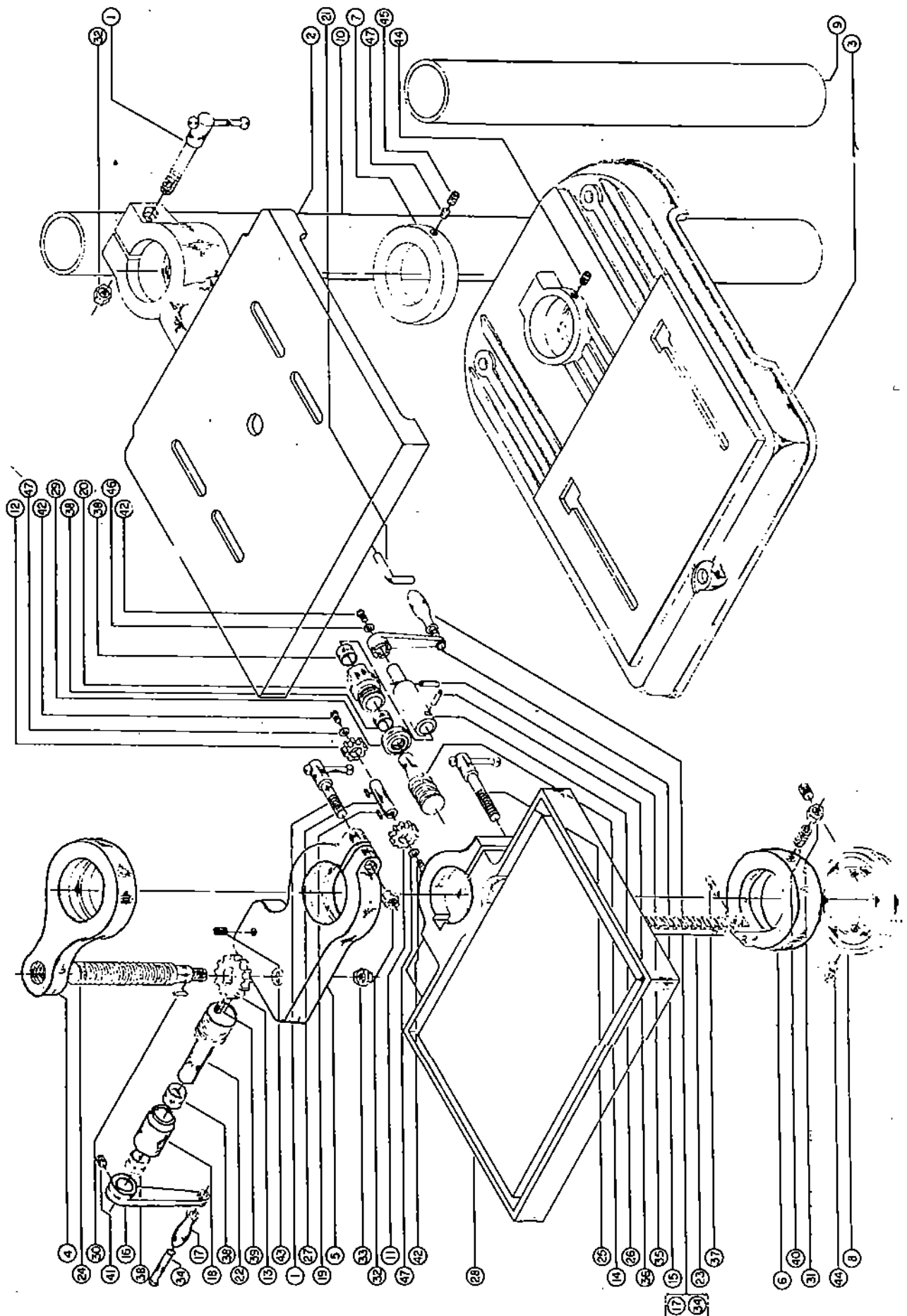
NO.	PART NO.	DESCRIPTION	QUANTITY
1	2042122	V/S Motor Base Assembly	1
2	2250063	V/S Guard Assembly	1
3	3406201	Teardrop Knob	2
4	2595004	V/S Bearing Plate Assembly	1
5	2719019	V/S Motor Sheave Assembly	1
6	2719025	V/S Driven (Spindle) Sheave Assembly	1
7	2749013	Screw Chuck Spindle	1
8	3025061	V/S Arm	1
9	3076033	V/S Cam	1
10	3092012	Switch Wire Clamp	1
11	3096008	Column Collar	1
12	3096244	Spindle Collar	1
13	3104010	Quill Pinion Spring Cover	1
14	3144003	Internal Drive Spline	1
15	3277014	Casting Head	1
16	3298280	Spring Housing	1
17	3298215	Cam Housing	1
18	3301003	Turret Hub	1
19	3330284	Safety Plate	1
20	3330278	I.D. Serial Plate	1
21	3388004	Key, 3/16" x 3/16" x 1"	1
22	3312251	Powermatic I.D. Plate	1
23	3406206	Turret Knob	3
24	3448014	Plain Column (Sleeve) Lock	1
25	3448015	Threaded Column (Sleeve) Lock	1
26	3528005	Depth Adj. Nut	3
27	3584032	Pivot Pin	1
28	3586009	Quill Operation Pinion	1
29	2598023	Brass Protector Plug, 7/16" x 3/16"	1
30	3604002	Depth Adj. Pointer	1
31	3670016	Depth Adj. Rod	1
32	3670025	Turret Rod	3
33	3673032	V/S Cam Roller	1
34	3684246	Dial Speed Plate	1
35	3684248	Depth Adj. Scale Plate	1
36	3640005	Sliding Quill	1
37	2695008	Quill Lock Screw	1
38	2695015	Lock Screw, 1/2"-13 x 6-1/4"	1
39	3737001	Bearing Spacer	1
40	3749014	No. 2 Morse Taper Spindle	1
41	3767211	Guard Mounting Strap	1
42	3767212	Rear Guard Mounting Strap	1
43	3936002	Quill Yoke	1
44	6060007	Ball Bearing, No. Z99R12	2
45	6060013	Bearing, Tafnir No. 9106PP	2
46	6077053	V/S Belt, No. 1922 V 443	1
47	6095043	Bushing, PS-R 306 x 3/8"	1
48	6514014	Self Retaining Nut	4
49	6515001	Hex Lock Setscrew Nut, 5/16"-18	1
50	6516009	Hex Jam Nut, 3/8"-16	1
51	6566002	Plain Hex Nut, 3/8"-24	2
52	6626035	Spring Pin, 3/16" x 5/8"	1
53	6670006	Lock Rings, No. 5100-118	2
54	6670071	External Retaining Ring, No. RS-275	1
55	6670082	Retaining Ring, No. 5305-31	2
56	6680020	Flat Alum. Drive Rivet, 5/32" x 1/4"	4
57	6458001	Rubber Molding	2
58	6706038	Rd. Hd. Mach. Screw, 6"-32 x 1/2"	2
59	6706035	Rd. Hd. Screw, No. 6-32 x 1/4"	4
60	6714035	Fill. Hd. Mach. Screw, 1/4"-20 x 3/4"	1
61	6518001	Plain Hex Nut, 1/2"-13	2
62	6714127	Hex Hd. Cap Screw, 1/4"-20 x 1/2"	4
63	6715032	Hex Hd. Cap Screw, 5/16"-18 x 1"	4
64	6715033	Hex Hd. Cap Screw, 5/16"-18 x 1/2"	4
65	6715016	Soc. Setscrew, 5/16"-18 x 5/16"	3
66	6715118	Soc. Hd. Setscrew, 5/16"-18 x 3/4"	1
67	6715039	Hex Hd. Screw, 5/16"-18 x 3/4"	1
68	6714090	Soc. Hd. Setscrew, 1/4"-20 x 1/2"	1
69	6715180	Hex Washer Hd. Screw, 5/16"-18 x 5/8"	4
70	6716034	Hex Hd. Screw, 3/8"-16 x 7/8"	2

NO.	PART NO.	DESCRIPTION	QUANTITY
71	6716114	Hex Hd. Screw, 3/8"-16 x 2-3/4"	1
72	6716102	Half Dog Soc. Setscrew, 3/8"-16 x 1-1/4"	1
73	6718055	Soc. Setscrew, 1/2"-13 x 1/2"	1
74	6747000	Screw, No. 4 x 3/16"	8
75	6718029	Shoulder Cam Mtg. Screw	1
76	6804004	"O" Ring Seal, No. 330-7507	1
77	6813006	Compression Spring	1
78	6813026	Torsion Spring, .035" x 1"	1
79	---	Switch (See Electrical Diagram)	1
80	6515007	Hex. Nut, 5/16"-18	1
81	6861702	Nylon Cam Washer	1
82	6718038	Soc. Setscrew, 1/2"-13 x 1-1/4"	2
83	6514012	Hex Nut, 1/4"-20	1
84	6714131	Flat Hd. Screw, 1/4"-20 x 7/8"	1
85	3598204	V/S Bearing Plug	2
86	3070201	Black Rubber Bumpar Bushing	1
87	6060009	Ball Bearing, MRC 204522	1
88	6714040	Fill. Hd. Screw, 1/4"-20 x 1-1/2"	1
89	3670039	Handle Rod	2



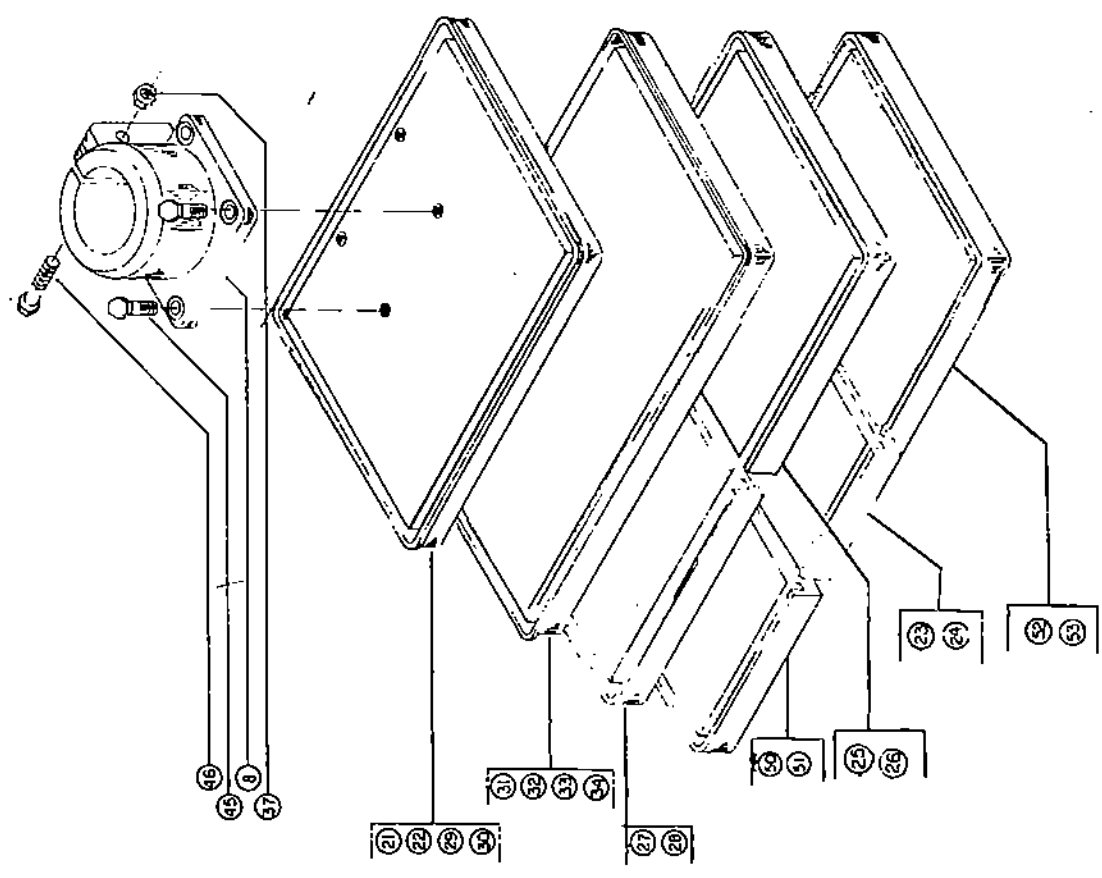
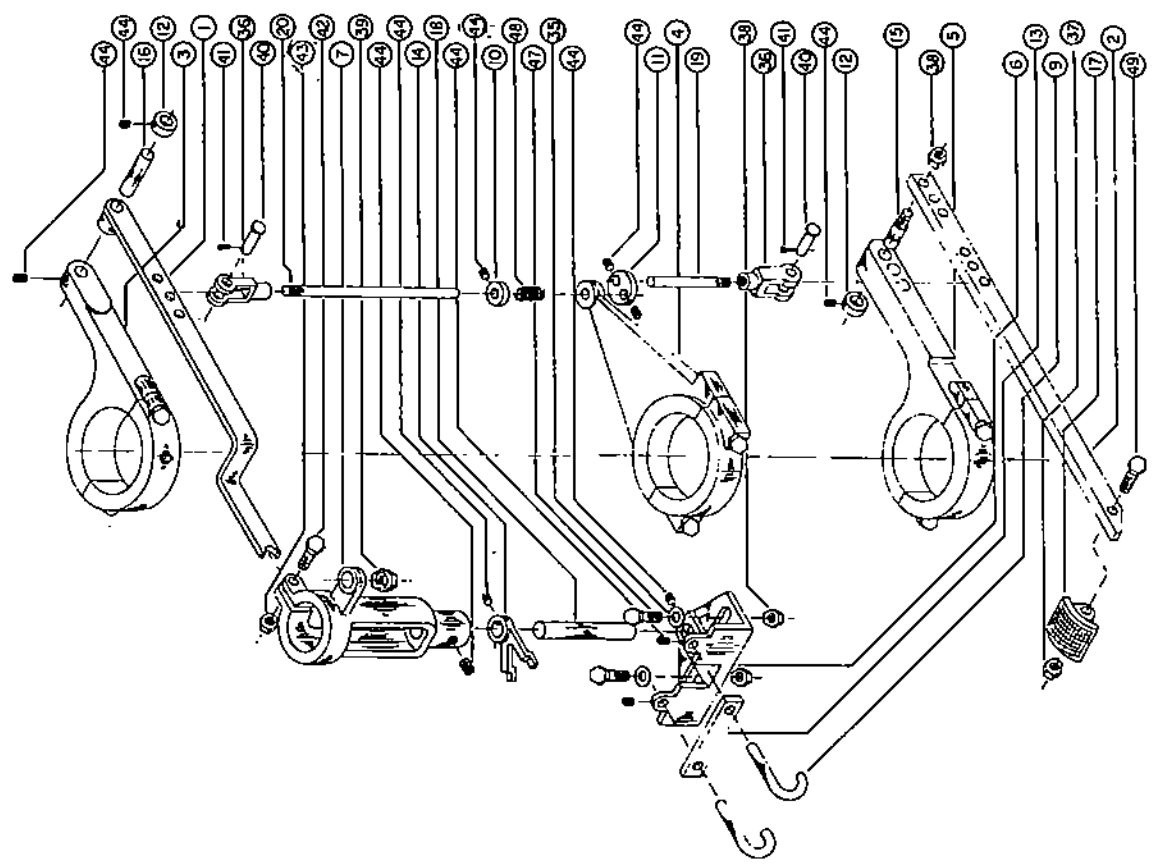
PRODUCTION TABLE AND COLUMN ASSEMBLY

NO.	PART NO.	DESCRIPTION	QUANTITY
1	2695020	Lock Ass'y Screw (Utility and Tilting Table)	1
2	2797008	Tilting Table Ass'y	1
3	3042018	Drill Press Base	1
4	3064059	Upper Head Raising Bracket	1
5	3064060	Lower Head Raising Bracket	1
6	3078026	Thrust Bearing Collar Cap	1
7	3096008	Column Collar	1
8	3096042	Thrust Bearing Collar	1
9	3098208	Bench Model Column	1
10	3098209	Floor Model Column	1
11	3237001	Table Raising Large Gear	1
12	3237002	Table Raising Gear	2
13	3237003	Head Raising Spiral Gear	1
14	3237013	Table Raising Worm Gear	1
15	3268005	Table Elevating Handle	1
16	3268006	Head Raising Handle	1
17	3268201	Head Raising Handle Knob	2
18	3298010	Head Raising Pinion Housing	1
19	3388010	Sq. Key, 3/16" x 3/16" x 2-5/8"	1
20	3530003	Worm Gear Pinion Nut	1
21	3583060	Locating Tilting Table Pin	1
22	3586001	Head Raising Pinion	1
23	3650005	Rack Table Elevating Gear	1
24	3691007	Head Raising Screw	1
25	2695019	Lock Ass'y Screw	1
26	3701001	Elevating Handle Shaft	1
27	3701018	Gear Table Raising Shaft	1
28	3797031	Production Table	1
29	6064001	Bearing, NICE 605	1
30	6420001	Key, Woodruff No. 606	1
31	6515001	Hex Lock Nut, 5/16"-18	2
32	6518008	Lock Handle Hex Nut, 1/2"-13	1
33	6568010	Flex-Lock Thin Hd. Hex Nut, 1/2"-20	1
34	6624006	Flat Hd. Pin, 3"	2
35	6626040	Pinion Shaft Handle Lock Split Pin, 1/4" x 1/4"	1
36	6626038	Pinion Shaft Lock Split Pin, 1/4" x 1"	1
37	6626033	Split Pin, 3/16" x 2"	1
38	6095022	Bushing, Johnson 284 GP	4
39	6714004	Soc. Hd. Setscrew, 1/4"-20 x 1/4"	1
40	6715012	Soc. Cap Setscrew, 5/16"-18 x 3/4"	2
41	6715015	Soc. Hd. Setscrew, 5/16"-18 x 1/4"	1
42	6715055	Butt. Hd. Screw, 5/16"-18 x 1/2"	3
43	6716003	Pinion Housing Setscrew, 3/8"-16 x 3/8"	1
44	6718055	Soc. Cap. Setscrew, 1/2"-13 x 1/2"	3
45	6718056	Soc. Cap. Setscrew, 1/2"-13 x 3/4"	1
46	6861201	Plain Flat Washer, 5/16"	3
47	3598023	Brass Column Collar Plug, 7/16" x 3/16"	1

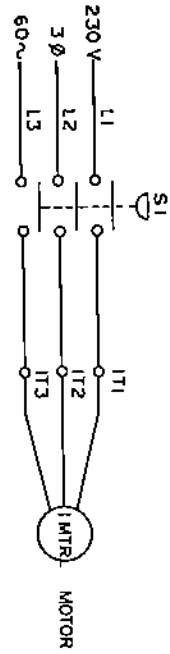


MULTI TABLE & MORTISER ATTACHMENT (OPTIONAL)

NO.	PART NO.	DESCRIPTION	QUANTITY
1	3025029	Upper Arm Feed	1
2	3025030	Arm Pedal	1
3	3063051	Upper Mtg. Ass'y Bracket	1
4	3063053	Spring Mtg. Ass'y Bracket	1
5	3063054	Lower Mtg. Ass'y Bracket	1
6	3063055	Holddown Base Bracket	1
7	3063072	Chisel Mtg. Bracket	1
8	3063075	Column Mtg. Bracket	1
9	3092015	Clamp	2
10	3096011	Spring Collar	1
11	3096014	Coupling Collar	1
12	3096244	Collar	2
13	3195001	Back-up Fence Board	1
14	3212005	Holddown Finger	1
15	3584002	Foot Pin Lever	1
16	3584004	Upper Feed Arm Pin	1
17	3587002	Pedel Operating Pedel Foot	1
18	3670050	Holddown Finger Mtg. Rod	1
19	3670052	Feed Operating Lower Rod	1
20	3670053	Feed Operating Upper Rod	1
21	3797016	One Spindle W/O T-slots Table	1
22	3797017	One Spindle W/ T-slots Table	1
23	3797018	Center Eight Spindle W/O T-slots Table	1
24	3797019	Center Eight Spindle W/ T-slots Table	1
25	3797024	Right 5-Spindle W/O T-slots Table	1
26	3797025	Right 5-Spindle W/ T-slots Table	1
27	3797026	Left 5-Spindle W/O T-slots Table	1
28	3797027	Left 5-Spindle W/ T-slots Table	1
29	3797039	Two Spindle W/O T-slots Table	1
30	3797068	Two Spindle W/ T-slots Table	1
31	3797038	Three Spindle W/O T-slots Table	1
32	3797067	Three Spindle W/ T-slots Table	1
33	3797037	Four Spindle W/O T-slots Table	1
34	3797066	Four Spindle W/ T-slots Table	1
35	3837007	Washer, 1/2" (Mortiser Attachment)	2
36	6126000	L.H. Feed Roll Clevis, R.H. Threads	2
37	6517001	Hex Nut, 7/16"-14	2
38	6518001	Hex Nut, 1/2"-13	3
39	6566002	Hex Nut, 3/8"-24	1
40	6621002	Clevis Attaching Pin	2
41	6622002	Cotter Key, 1/8" x 1" x 1/4"	2
42	6715039	Hex Hd. Screw, 5/16"-18 x 1 3/4"	1
43	6515001	Hex Nut, 5/16"-18	1
44	6715016	Soc. Hd. Setscrew, 5/16"-18 x 5/16"	8
45	6717018	Hex Hd. Screw, 7/16"-14 x 1 1/2"	4
46	6717020	Hex Hd. Screw, 7/16"-14 x 2 1/2"	1
47	6718063	Holddown Base Mtg. Brkt. Bolt, 1/2"-13 x 1 1/2"	2
48	6813056	10" Spring, I.D. 5/8", O.D. 7/8"	1
49	6717016	Hex Hd. Screw, 7/16"-14 x 2"	1
50	3797022	Left 6 or 8 Spindle W/O T-slots Table	1
51	3797023	Left 6 or 8 Spindle W/ T-slots Table	1
52	3797020	Right 6 or 8 Spindle W/O T-slots Table	1
53	3797021	Right 6 or 8 Spindle W/ T-slots Table	1

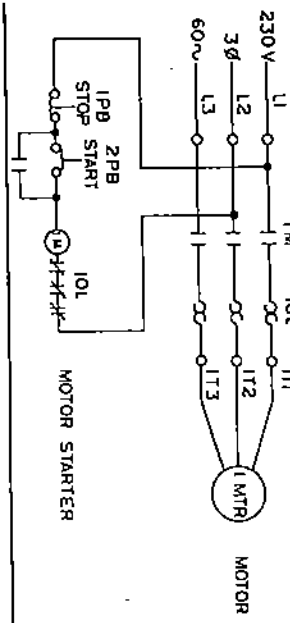


MANUAL



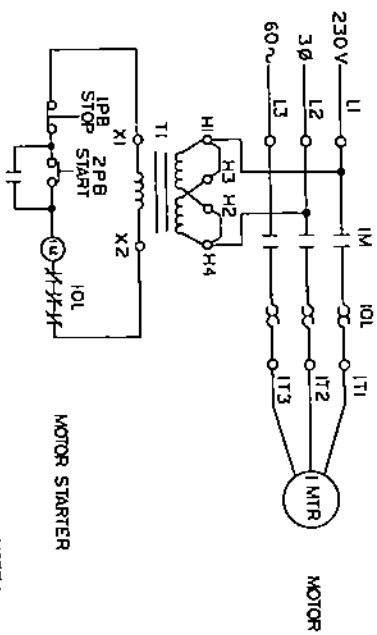
REF.	QTY.	POWERMATIC NO.	MFG. DESCRIPTION
S 1	1	(3Ø) 6821155	SWITCH, FURNAS 12BA106606
		(1Ø) 6821154	SWITCH FURNAS 12 BA106605

MAGNETIC



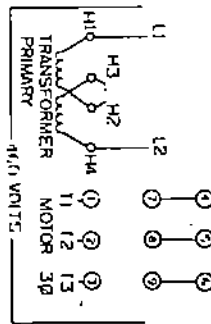
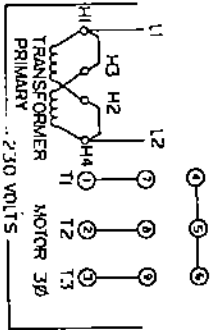
REF.	QTY.	POWERMATIC NO.	MFG. DESCRIPTION
M 1	1	(3Ø) 6816111	STARTER MAGNETIC, FURNAS, 14BF32BC71
		(1Ø) 6816105	STARTER MAGNETIC, FURNAS, 14CF12BAT
		6821014	SWITCH, FURNAS, MOMENTARY, PB, 628731B

MAGNETIC WITH LOW VOLTAGE CONTROL



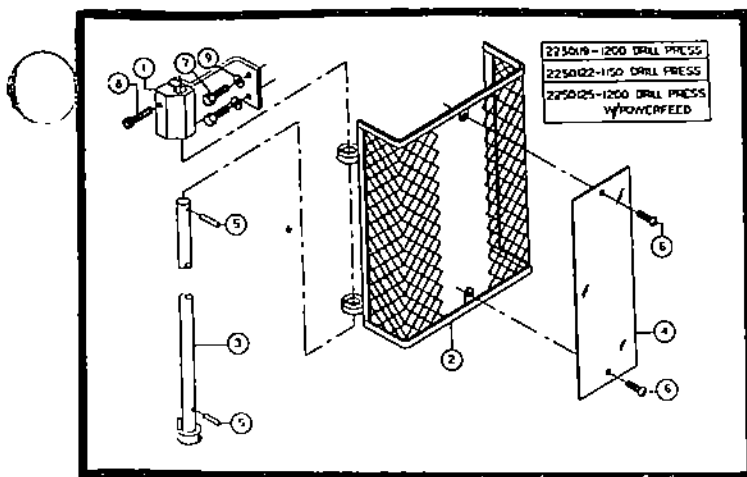
NOTE:
FOR SINGLE PHASE UNITS, OMIT LINE L3

REF.	QTY.	POWERMATIC NO.	MFG. DESCRIPTION
(P.B.) 1	1	6821014	SWITCH, FURNAS, MOMENTARY PUSHBUTTON, 628731B
		6831068	TRANSFORMER 115/230-24V, 50 VA
		6831069	" 230/460-24V, 75 VA
T 1	1	6831070	" 230 460-115V, 50 VA
		6816119	STARTER, MAG. VVXMR, 1Ø, 24V, FURNAS 14CF107013
		6816138	" " " 1Ø, 115V, " 14CF10707
		6816122	" " " 3Ø, 24V, " 14BF32BUT760
		6816126	" " " 3Ø, 115V, " 14BF32BUT76A
		6470600	MOTOR, ELEC, 1/4 HP 1Ø, 1200 RPM, 115/230V, 56 FR
		6470607	" " " 3Ø, 1200 RPM, 200 V, "
		6470608	" " " 3Ø, 1200 RPM, 230/460V, "
		6470700	" " " 1Ø, 1800 RPM, 115/230V, "
		6470702	" " " 3Ø, 1800 RPM, 575 V, "
		6470707	" " " 3Ø, 1800 RPM, 230/460V, "
		6470712	" " " 3Ø, 1800 RPM, 200 V, "



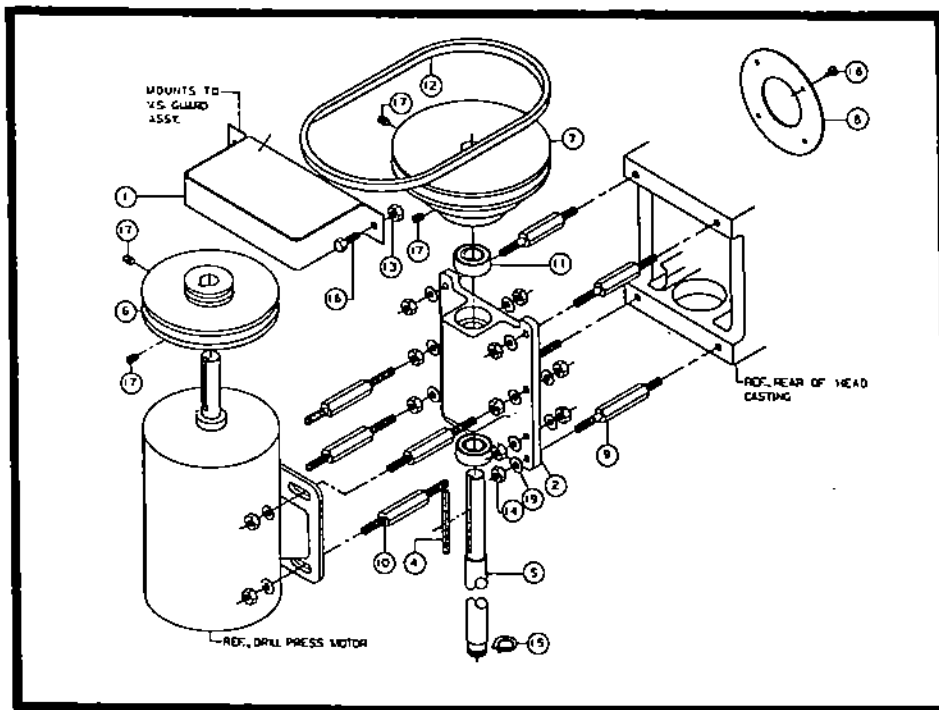
SCHEMATIC, COMPOSITE ELEC.

1150 DRILL PRESS



GUARD ASSEMBLY

NO.	PART NO.	DESCRIPTION	QUANTITY
1	2092008	Guard Clamp Assembly	1
2	2250121	Drill Press Guard Assembly	1
3	2709026	Shaft Assembly	1
4	3720020	Plastic Guard	1
5	6626032	Spring Pin, 3/16" x 1 1/2..	2
6	6710063	Soc. Button Hd. Screw, 10-24 x 1/2	2
7	6715035	Hex Hd. Screw, 5/16-18 x 3/4	2
8	6716016	Soc. Hd. Cap Screw, 3/8-16 x 7/8	1
9	6861200	Lock Washer, 5/16"	2



VARI-SLO SPEED ATTACHMENT

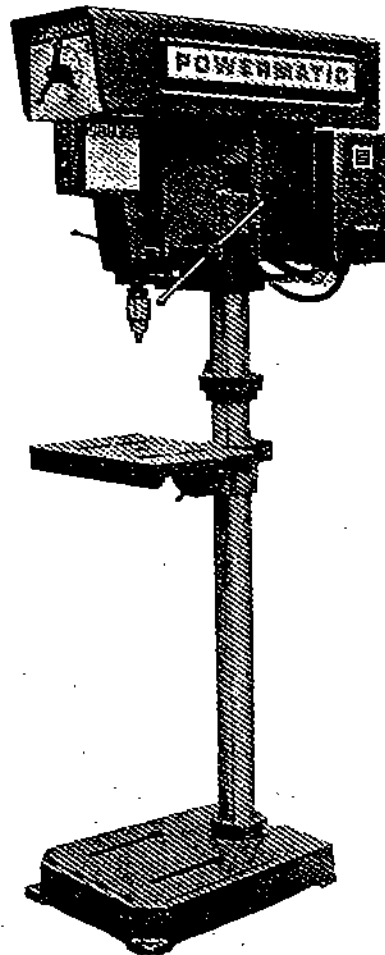
NO.	PART NO.	DESCRIPTION	QUANTITY	NO.	PART NO.	DESCRIPTION	QUANTITY
1	2250068	Guard Assembly	1	11	6060004	Bearing, New Departure Z99R10	2
2	3063268	Mounting Bracket	1	12	6077100	Polyflex Belt, Gates No. 7M600	1
3	3080082	Carton (Not Shown)	1	13	6514001	Hex Nut, 1/2"-20	2
4	3388043	Key, 3/16" x 3/16" 3/4"	1	14	6515001	Hex Nut, 5/16"-18	16
5	3705015	Shaft	1	15	6670008	Ret. Ring, TRU-ARC 5100-62	1
6	3717051	Motor Sheave	1	16	6714154	Hex Hd. Scr., 1/4"-20 x 3/8"	2
7	3717052	Countershaft Sheave	1	17	6715016	Soc. Set Scr., 5/16"-18 x 5/16"	4
8	3747017	Speed Plate	1	18	6746020	Pan Hd. Scr., No. 4 x 1/4"	4
9	3773036	Standoff Stud, (2 1/2" Body)	4	19	6861201	Flat Washer, 5/16"	16
10	3773037	Standoff Stud, (2" Body)	4				

The information and recommendations contained in this publication come from sources believed to be reliable and to represent the best current practice. Powermatic does not intend this manual as a complete course of instruction on how to use this machine with safety and does not guarantee or represent that the information is absolutely correct or sufficient. In addition, it can not be assumed that all acceptable safety measures are listed or that other additional measures are not needed under particular or exceptional circumstances or conditions.

PRICE \$ 2.50

Model 1150-A
15" (381mm) Drill Press

OPERATING INSTRUCTIONS



POWERMATIC®

Strength and performance right down the line.

POWERMATIC  OUDAILLE, INC.
McMinnville, Tennessee 37110 AC 615-473-5551

FOREWORD

SAFETY FIRST!

This manual has been prepared for the owner and operators of a Powermatic 15" Drill-Press. Its purpose, aside from machine operation, is to promote safety through the use of accepted operating practices. Read the safety and operating instructions thoroughly before operating the machine.

In order to obtain maximum life and efficiency from your Powermatic Drill Press, follow all the instructions in the operating instructions and maintenance manuals carefully.

The specifications put forth in this manual were in effect at the time of publication. However, owing to Powermatic's policy of continuous improvement, changes to these specifications may be made at any time without obligation on the part of Powermatic Houdaille, Inc.

WARRANTY

This machine and its component parts have been carefully inspected at various stages of production and each finished machine is subjected to a final inspection before shipment. We agree that for a period of eighteen (18) months from date of delivery from our authorized dealer to replace, at our option, any machine (or component part thereof) proving defective within the above period, F.O.B. our plant providing such machine (or component part) is returned prepaid to our plant, or a designated service center of the undersigned, for our examination. **THIS WARRANTY DOES NOT INCLUDE REPAIR OR REPLACEMENT REQUIRED BECAUSE OF MISUSE, ABUSE, OR BECAUSE OF NORMAL WEAR AND TEAR; OR ELECTRICAL MOTORS WHICH ARE WARRANTED BY THEIR MANUFACTURER AND WHICH SHOULD BE TAKEN TO THEIR LOCAL AUTHORIZED REPAIR STATION FOR SERVICE. FURTHER, WE CANNOT BE RESPONSIBLE FOR THE COST OF REPAIRS MADE OR ATTEMPTED OUTSIDE OF OUR FACTORY OR DESIGNATED SERVICE CENTER WITHOUT OUR AUTHORIZATION. NO CLAIMS FOR DEFECTS WILL BE HONORED IF SERIAL NUMBER PLATE HAS BEEN REMOVED. THIS WARRANTY IS MADE EXPRESSLY IN PLACE OF ALL OTHER WARRANTIES OR GUARANTEES, EXPRESS OR IMPLIED, WITH RESPECT TO FITNESS, MERCHANTABILITY, QUALITY OR OPERATIVENESS. THIS WARRANTY BECOMES EFFECTIVE ONLY WHEN THE ACCOMPANYING CARD IS FULLY AND PROPERLY FILLED OUT AND RETURNED TO THE FACTORY WITHIN TEN (10) DAYS FROM DATE OF DELIVERY.**

POWERMATIC  **HOUDAILLE, INC.**
McMinnville, Tennessee 37110

DRILL PRESS SAFETY INSTRUCTIONS

1. **Read, understand, and follow the safety and operating instructions found in this manual.** Know the limitations and hazards associated with this drill press. A safety rules decal is installed on each machine to serve as a reminder of basic safety practice.
2. **Grounding of the drill press:** Make certain that the machine frame is electrically grounded and that a grounding lead is included in the incoming electrical service. In cases where a cord and plug are used, make certain that the grounding plug connects to suitable ground. Follow the grounding procedure indicated by the National Electric Code:
3. **Eye safety:** Wear an approved safety shield, goggles, or glasses to protect eyes when operating the drill press.
4. **Personal protection:** Before operating the machine, remove tie, rings, watch and other jewelry and roll up sleeves above the elbows. Remove all loose clothing and confine long hair. Protective type footwear should be worn and hearing protectors should be used where noise exceeds the level of exposure allowed in section 1910.95 of the OSHA regulations. **Do not wear gloves.**
5. **Work area:** Keep the floor around the machine clean and free of scrap material, sawdust, oil or grease to minimize the danger of tripping or slipping. Be sure the table is free of all scrap, foreign material and tools before starting a cut. Powermatic recommends the use of anti-skid floor strips on the floor area where the operator normally stands and that each machine's work area be marked off. Make certain the work area is well lighted and that a proper exhaust system is used to minimize dust when required. Provide for adequate work space around the machine.
6. **Guards:** Keep the machine guards in place at all times when the machine is in use. If removed for maintenance purposes, use extreme caution and replace the guards on completion of the maintenance task before using the drill press. **Do not operate the machine with the guards off.**
7. **Do not overreach:** Maintain a balanced stance and keep your body under control at all times. Do not over reach.
8. **Maintain tools in top condition:** Keep tools sharp and clean for safe and best performance. Dull tools increase noise levels and the possibility of pulling the part free of its holding device. Check the condition of the tools before making any cuts.
9. **Hand Safety:** Keep hands away from the spindle area. Never reach under or around the guard when supplied to try to clear chips. Do not clear chips with hands; use a brush or chip rake.
10. **Spindle Rotation:** Be sure spindle rotates under power in a clockwise direction when viewed from the top of the drill press using right hand tools.
11. **Machine adjustments:** Make all machine adjustments with power off except spindle speed on variable speed models.
12. **Machine capacity:** Do not make any cuts requiring more power than is available on the machine.
13. **Chuck key:** On key chuck models, make certain chuck key has been removed and returned to its station before starting the spindle.
14. **Clamp or block work securely:** Never drill freehand, because a drill bit, tap or other tools can seize up causing the workpiece, jig, or fixture to rotate with the spindle resulting in serious injury.
15. **Avoid accidental starting:** Make certain the motor switch is in the "off" position before connecting power to the drill press.
16. **Careless acts:** Give the work you are doing your undivided attention. Looking around, carrying on a conversation, and "horseplay" are careless acts that can result in serious injury.
17. **Job completion:** If the operator leaves the machine area for any reason, the drill press should be turned "off" and the spindle should come to a complete stop before his departure. In addition, if the operation is complete, he should clean the drill press and the work area. **Never clean the drill press with power "on" and never use the hands to clear sawdust or chips; use a brush or chip rake.**

18. **Disconnect machine:** Before performing any service or maintenance and when changing tools.
19. **Replacement parts:** Use only Powermatic or factory authorized replacement parts and accessories; otherwise the drill press warranty and guarantee will be null and void.
20. **Misuse:** Do not use this Powermatic drill press for other than its intended use. If used for other purposes, Powermatic disclaims any real or implied warranty and holds itself harmless for any injury which may result from that use.

Do not equip your drill press with motor of higher than 3/4 horsepower nor run the spindle in excess of 4800 r.p.m. without the express written consent of Powermatic Houdaille, Inc. Doing so voids the warranty and Powermatic holds itself harmless from any injury that may result.

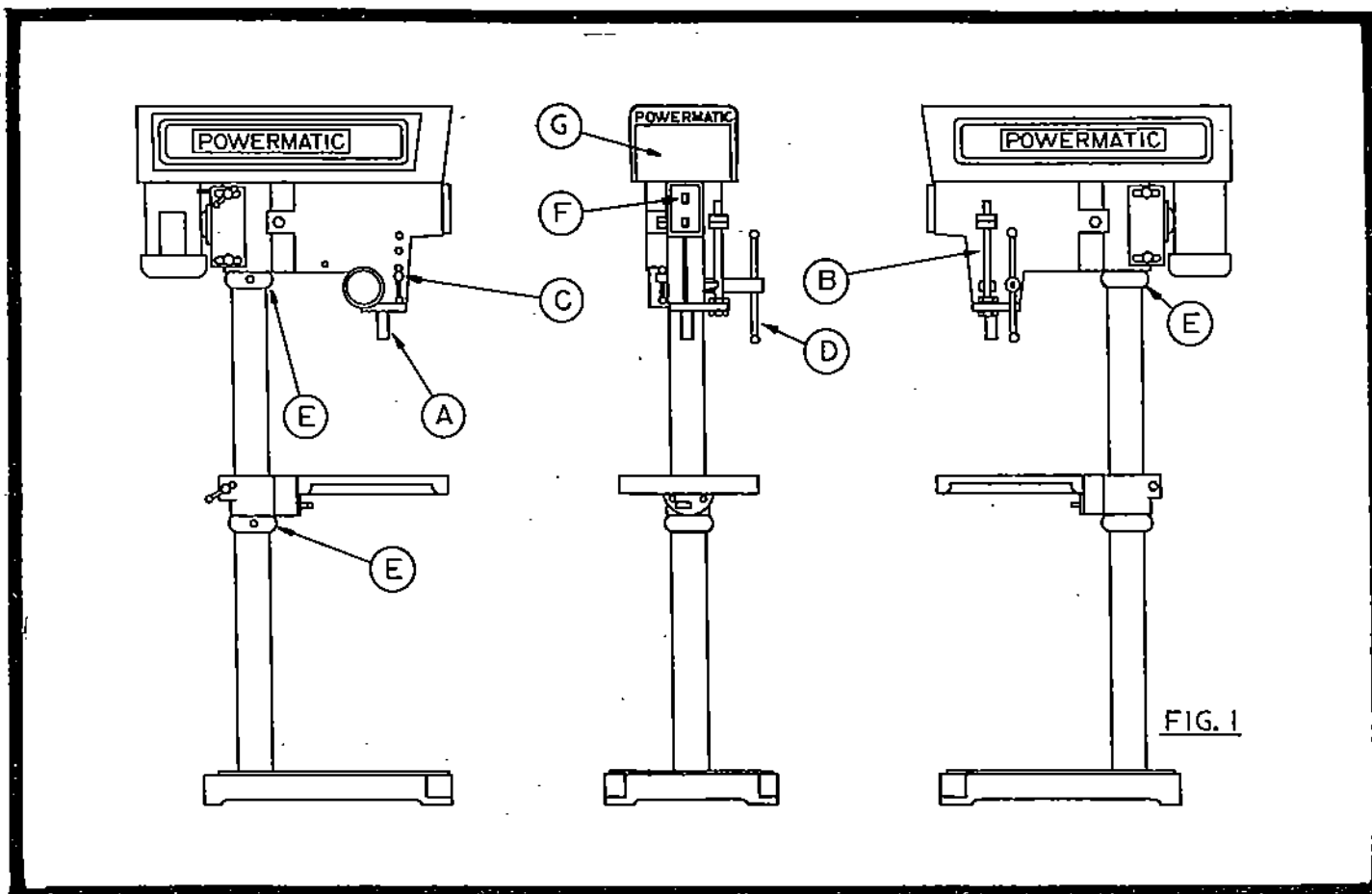


FIGURE 1

SPECIFICATIONS

Spindle; steel	10-spline, #2 Morse Taper or #33 Jacobs Taper with 0"-3/2" capacity chuck	Capacity in cast iron	5/8"
Spindle travel	6"	Capacity in steel	1/2"
Quill diameter	2 3/16"	Throat depth	Drills to center of 15" dia.
Column diameter	3" O.D.	Spindle Speeds:	
Column length, floor model	66"	Variable Speed Models	
Column length, bench model	42"	1800 RPM motor (Std.)	475 to 4800 RPM
Column, Wall thickness	3/16"	1200 RPM motor (Special)	317 to 3200 RPM
Table working surface:		Step Pulley Models	
Utility table	10" x 11"	1800 RPM motor (Std.)	400, 840, 1580, 2800, 5300
Tilting table	10" x 14"	1200 RPM motor (Special)	255, 535, 1005, 1785, 3380
Production table	12" x 18"	Height, floor model	66"
Base working surface	8 1/2" x 12"	Height, bench model	42"
		Weight, Net, bench model	245 lbs.

DRILL PRESS OPERATIONS

Familiarize yourself with all operating controls before attempting use of this machine.

CONTROLS : (See Fig. 1)

1. The spindle (A) in this machine is either a No. 2 Morse Taper or a No. 33 taper type equipped with a chuck. The key type chuck is 1/2" capacity, held to the spindle by the taper and a threaded lock collar.
2. A depth stop rod (B) is provided to control hole depth and to prevent drilling through material into table surfaces.
3. A quill lock (C) is located on the left side of the head and is used to hold quill at any position.
4. The handle (D) is used to lower the spindle and quill a total depth of 6".
5. Safety collars (E) are provided to prevent head and/or table from falling when locks are released. Be sure collars are in place and securely locked; one under the head and one under the utility or tilting table. No safety collar is required for the production table as it is rack and pinion controlled.
6. Starting switch (F) is mounted on the front of drill press head within easy reach of the operator.
7. A speed selection chart (G) is located on the front of the head. This chart is to provide assistance in determining proper drill press.

OPERATING HINTS:

1. Determine drill size, inspect for sharpness, insert and lock securely in chuck or morse taper.
2. Arrange at this point, to protect table surface from drill break-through. A piece of scrap material under the work space will prevent marring table surface and eliminate splintering a breakthrough point. Lock table securely to prevent movement.
3. To prevent work from being torn from operators hand, always secure workpiece, jig fixture, or holding device to table by clamping or blocking on the table. Do NOT use the column as a stop and clamp all light work pieces, jigs, fixtures or holding devices to the table to prevent them from being picked up as the quill returns.
4. Select the proper RPM for the tool being used, the material being machined, the operation to be performed and other conditions as indicated. (See tables, I, II, III pages 6, 7, and 8 for recommendations.) If drill press is the step pulley type, raise door and set drive belt in proper ratio position. If the machine is a variable speed model, turn machine on and turn control cam to proper speed. NEVER, attempt speed adjustment of variable speed machines unless machine is running. Turn machine off.
5. On tilting table models be sure to block the part or holding fixture from sliding of the table when it is used tilted at an angle. In addition be sure the table is clamped.
6. Set depth stop for desired hole depth. Fine adjustment is made by turning the fine adjustment collar. Use upper collar to lock stop setting position.
7. If coolant is being used, start flow.
8. Turn machine on and begin drilling operation. As the break-through point is reached, always slow feed rate down slightly to assist in elimination of burring underside of work piece and to help prevent a sudden break thru which can cause the drill to grab and pull the work piece free of its clamping device.
9. Perform all operations with a minimum extension of the quill. Adjust table or head position rather than using excessive quill travel.

TABLE 1
DRILLING FEEDS - SPEED - HORSE POWER REQUIRED

SIZE OF DRILL	FEED PER REVOLUTION	BRONZE BRASS	COPPER	ALUMINUM	MALLEABLE I. JN	CAST IRON			STEEL CASTING
						MACHINED SURFACE	SCALE SURFACE	DEEP HOLES	
FT. PER MIN.		250 FT	150 FT	300 FT	80 FT	100 FT	80 FT	80 FT	40 FT
INCHES	INCHES	R P M	R P M	R P M	R P M	R P M	R P M	R P M	R P M
1/16	.003	15279	9167	18320	4889	6111	4889	4889	2445
3/32	.0035	10186	6111	12212	3262	4077	3262	3262	1628
1/8	.004	7639	4583	9160	2445	3056	2445	2445	1222
5/32	.0045	6111	3667	7328	1956	2445	1956	1956	976
3/16	.005	5093	3056	6106	1630	2037	1630	1630	815
7/32	.0055	4365	2619	5234	1398	1747	1398	1398	698
1/4	.006	3820	2292	4575	1222	1528	1222	1222	611
9/32	.0065	3395	2037	4071	1087	1359	1087	1087	542
5/16	.007	3056	1833	3660	978	1222	978	978	489
11/32	.0075	2778	1667	3330	889	1111	889	889	444
3/8	.008	2546	1528	3050	815	1019	815	815	407
13/32	.0085	2350	1410	2818	752	940	752	752	376
7/16	.009	2183	1310	2614	698	873	698	698	349
15/32	.0095	2037	1222	2442	652	815	652	652	326
1/2	.010	1910	1146	2287	611	764	611	611	306
17/32	.0102	1798	1079	2157	575	719	575	575	288
9/16	.0105	1698	1019	2035	543	679	543	543	271
19/32	.0107	1608	965	1930	515	643	515	515	257
5/8	.011	1528	917	1830	489	611	489	489	244

SIZE OF DRILL	FEED PER REVOLUTION	STEEL					CAST IRON		STEEL	
		VERY HARD BRINELL 402-444	HARD BRINELL 302-387	MEDIUM BRINELL 202-293	SOFT BRINELL 101-196	DEAD SOFT BRINELL UNDER 100	CUTTING HP	FEED HP	CUTTING HP	FEED HP
FT. PER MIN.		40 FT	50 FT	60 FT	70 FT	80 FT				
INCHES	INCHES	R P M	R P M	R P M	R P M	R P M	HP	HP	HP	HP
1/16	.003	2445	3056	3667	4278	4889	.07	.0043	.18	.0076
3/32	.0035	1628	2039	2446	2852	3262	.11	.0044	.27	.0079
1/8	.004	1222	1528	1833	2139	2445	.14	.0045	.36	.0081
5/32	.0045	976	1223	1467	1711	1956	.18	.0046	.45	.0084
3/16	.005	815	1019	1222	1426	1630	.22	.0047	.54	.0087
7/32	.0055	698	874	1048	1222	1398	.25	.0049	.63	.0089
1/4	.006	611	764	917	1070	1222	.29	.0050	.72	.0092
9/32	.0065	542	680	815	950	1087	.33	.0051	.81	.0095
5/16	.007	489	611	733	856	978	.37	.0053	.89	.0097
11/32	.0075	444	555	667	778	889	.40	.0054	.98	.0100
3/8	.008	407	509	611	713	815	.44	.0055	1.07	.0102
13/32	.0085	376	470	564	658	752	.47	.0056	1.16	.0104
7/16	.009	349	437	524	611	698	.50	.0057	1.25	.0106
15/32	.0095	326	408	489	570	652	.54	.0058	1.34	.0107
1/2	.010	306	382	458	535	611	.57	.0059	1.43	.0109
17/32	.0102	288	360	431	503	575	.60	.0060	1.51	.0111
9/16	.0105	271	340	407	475	543	.64	.0061	1.60	.0112
19/32	.0107	257	322	382	450	515	.68	.0062	1.69	.0114
5/8	.011	244	306	367	428	489	.72	.00624	1.78	.0115

**TABLE II
TAPPING AND THREADING FORMULA
FOR CALCULATING HORSEPOWER REQUIREMENTS**

$$HP = RPV \times SFM \times M \times TD$$

PPV = Power Pitch Value See Chart
 SFM = Surface Feet Per Minute "
 M = Material Factor "
 TD = Tool Dullness Factor "
 HP = Horsepower
 RPM = Revolutions Per Minute

TAPPING AND THREADING FACTORS CHART	
Threads Per Inch	Power Pitch Value* PPV
32	0.002
27	0.0034
24	0.004
20	0.006
18	0.007
16	0.009
14	0.011
13	0.012
12	0.014
11½	0.015
11	0.016
10	0.020
9	0.025
8	0.030
7	0.035
6	0.040

*Multiply PPV by 2.2 for Double or Taper Pipe Threads

TD - Use (1.5 Factor) for Tool Dullness

MATERIAL AND SPEED FACTORS CHART		
MATERIAL	FACTOR - M	SPEED - S. F. M.
Aluminum	0.5	100
Bakelite	0.6	75
Brass	0.6	90
Bronze	0.6	50
Bronze Mang.	1.0	40
Copper	0.5	80
Alum. Die Cast	0.6	80
Fiber	0.5	75
Zinc Die Cast	0.6	80
Cast Iron	0.6	70
Malleable Iron	0.6	45
Magnesium	0.5	100
Steel Cast	1.4	35
Steel Fr. Mach.	1.0	50
Steel Chromium	1.7	30
Steel Alloy	1.7	25
Steel Stainless	1.7	20

REVOLUTIONS PER MINUTE CALCULATION

$$R, P, M = 3.82 \times S. F. M. \div \text{Dia.}$$

**TABLE III
REAMING SPEEDS - HIGH SPEED STEEL TOOLS
MATERIALS - RPM**

	Brass	Bronze	Malleable Iron	Cast Iron Class 30	Steel Casting	STEEL				
						Very Hard Br 400 - 425	Hard Br 300 - 375	Medium Br 225 - 300	Soft Br 100 - 200	Dead Soft Br Under 100
1/8	3500	1600	2200	2100	1700	640	800	1200	1900	2080
1/4	1700	800	1100	1050	850	320	400	600	950	1040
3/8	1200	530	730	700	600	210	270	430	640	700
1/2	880	400	550	520	440	160	190	320	480	520
5/8	700	320	440	410	350	130	150	250	380	410
NOTE: For Carbide Reamers Use 3 Times Chart Speeds										
Counterboring & Spotfacing -- High Speed Steel Tools - Surface Ft./Min.										
	325	100	50	50	40	30	45	55	65	110
NOTE: For Carbide Spotfacers Use 4 Times Chart Values										

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