

PALMGREN[®]

20"

VARIABLE SPEED BELT DRIVE
DRILL PRESSES
SINGLE PHASE AND THREE PHASE



Read carefully and follow all safety rules and operating instructions before first use of this product.

TABLE OF CONTENTS

Specifications	2
Safety Rules	2-3
Description of Machine	3
Control Panel	4
The Machine Head	4
Installation	4
Positioning the Machine	4
Initial Cleaning	4
Assembly	4
Assembling Loose Parts	4
Electrical Connection of the Machine	4
Operation	5
Changing the Spindle Speed	5
Adjusting the Machine Head Height	5
Adjusting the Rack Height	5
The Operation Cycle	6
Setting the Depth Stop	6
Removing the Tools from Spindle Bore	6
The Spindle-Return Spring	6
Lubrication	6
Wiring Diagrams for Voltage Change	7
Explosion Drawings and Parts Lists	8-13

SPECIFICATIONS

	9680226	9680227
Voltage	115V / 230V	230V / 460V
Amperage	28 A / 14 A	6.1 A / 3.0A
Phase	1 PH	3 PH
Drilling Capacity; Steel	1-1/4"	
Tapping Capacity; Steel	3/4"	
Swing	21"	
Spindle Taper	MT3	
Spindle Travel	6"	
Quill Diameter	3"	
Column Diameter	4.5"	
Spindle Nose to Table	27.2"	
Spindle Nose to Base	47.2"	
Table Dimensions	22" x 18.5"	
Base Dimensions	27" x 19"	
RPM	300 – 2000 RPM	
Motor	2 HP; 1 PH	2 HP; 3 PH
Machine Dimensions	35.8" x 27" x 78"	
Net/Gross Weight	650 lbs / 750 lbs	
Package size	37.5" x 25.5" x 5"	

SAFETY RULES

WARNING: For your own safety, read all of the instructions and precautions before operating tool.



PROPOSITION 65 WARNING: Some dust created by using power tools contain chemicals known to the state of California to cause cancer, birth defects or other reproductive harm.

Some examples of these chemicals are:

- Lead from lead-based paints.
- Crystalline silica from bricks and 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. Always wear **OSHA/NIOSH** approved, properly fitting face mask or respirator when using such tools.

WARNING: Always follow proper operating procedures as defined in this manual even if you are familiar with the use of this or similar tools. Remember that being careless for even a fraction of a second can result in severe personal injury.

BE PREPARED FOR JOB

- Wear proper apparel. Do not wear loose clothing, gloves, neckties, rings, bracelets or other jewelry which may get caught in moving parts of machine.
- Wear protective hair covering to contain long hair.
- Wear safety shoes with non-slip soles.
- Wear safety glasses which comply with United States ANSI Z87.1. Everyday glasses have only impact resistant lenses. They are **NOT** safety glasses.
- Wear face mask or dust mask if cutting operation is dusty.
- Be alert and think clearly. Never operate power tools when tired, intoxicated or when taking medications that cause drowsiness.

WORK AREA SHOULD BE READY FOR JOB

- Keep work area clean. Cluttered work areas and work benches invite accidents.
- Do not use power tools in dangerous environments. Do not use power tools in damp or wet locations. Do not expose power tools to rain.
- Work area should be properly lighted.
- Proper electrical outlet should be available for tool. Three-prong plug should be plugged directly into properly grounded, three-prong receptacle.
- Extension cords should have a grounding prong, and the three wires of the extension cord should be of the correct gauge.
- Keep visitors at a safe distance from work area.
- Keep children out of workplace. Make workshop childproof. Use padlocks, master switches or remove switch keys to prevent any unintentional use of power tools.

SAFETY RULES (CONTINUED)**TOOL SHOULD BE MAINTAINED**

- Always unplug tool prior to inspection.
- Read operating instructions manual for specific maintaining and adjusting procedures.
- Keep tool lubricated.
- Use sharp cutters and keep the tool clean for safest operation.
- Remove adjusting tools. Form the habit of checking that adjusting tools are removed before turning on the machine.
- Keep all parts in working order. Check to determine that the guard or other parts will operate properly and perform their intended function.
- Check for damaged parts. Check for alignment of moving parts, binding, breakage, mounting and any other condition that may affect a tool's operation.
- Damaged parts should be properly repaired or replaced. Do not perform makeshift repairs. (Use the parts list provided to order replacement parts.)

KNOW HOW TO USE TOOL

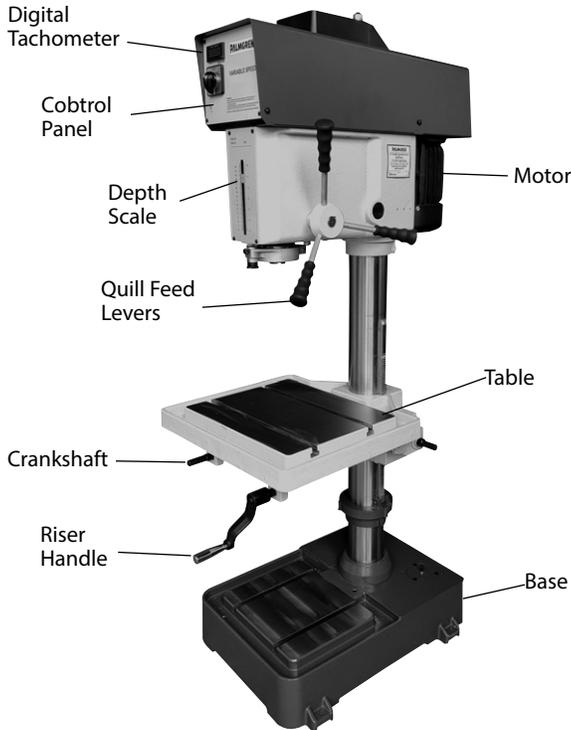
- Use the right tool for the job. Do not force tool or attachment to do a job for which it was not designed.
- Disconnect tool when changing accessories such as bits, cutters and the like.
- Avoid accidental start-up. Make sure switch is in OFF position before plugging in.
- Do not force tool. It will work most efficiently at the rate for which it was designed.
- Handle workpiece correctly. Secure work with clamps or vise. Leave hands free to operate machine, Protect hands from possible injury.
- Never leave a tool running unattended. Turn the power off and do not leave tool until it comes to a complete stop.
- Do not overreach. Keep proper footing and balance.
- Never stand on tool. Serious injury could occur if tool is tipped or if cutter is unintentionally contacted.
- Keep hands away from moving parts and cutting surfaces.
- Know your tool. Learn its operation, application and specific limitations.
- Feed work into a bit or cutter against the direction of rotation of bit or cutter.
- Turn the machine off if it jams. A cutter jams when it digs too deeply into the workpiece. (The motor force keeps it stuck in workpiece.)
- Use recommended accessories.
- Clamp workpiece or brace against column to prevent rotation.
- Use recommended speed for drill accessory and workpiece material.

WARNING: Think Safety! Safety is a combination of operator common sense and alertness at all times when drill press is being used.

SAFETY GUIDELINES

- Keep the work area clear. Remove foreign objects prior to operation so as to ensure safety.
- Use the safety guard. The safety guard prevents Chips from spraying out and causing cuts or burns.
- Remove adjusting keys and wrenches before turning machine on.
- Lock the machine head. Check if the machine head is safely locked prior to operation.
- Wear proper apparel. Do not use loose clothing or jewelry, which can get caught in moving parts. Rubber soled footwear is recommended for best footing.
- Always use safety glasses. Wear protective eye wear when operating, servicing, or adjusting machinery.
- Keep hands in sight. Do not put hands or fingers around, on, or below any rotating cutting tools.
- Keep children away. All visitors should be kept a safe distance from the work area.
- Never leave the machine running unattended. Turn the power off. Do not leave the machine until it comes to a complete stop.
- Secure work. Use clamps or a vise to hold work, when practical. It is safer than using your hands, and it frees both hands to operate the machine.
- Do not overreach. Failure to maintain proper working position can cause you to fall into the machine or cause your clothing to get caught, pulling you into the machine.
- Do not use in a dangerous environment. Don't use power tools in damp or wet locations, or expose them or rain. Keep work area well lighted.
- Do not repair or adjust the voltage inverter. Notify qualified personnel for repairs or adjustment to prevent damage or personal injury.
- Always disconnect the machine from the power source before servicing.

DESCRIPTION OF MACHINE



CONTROL PANEL

- A. Forward / Reverse / Off Switch - Starts, changes direction, and stops the motor.
- B. Tachometer – Displays the rate of spindle rotation in RPM.
- C. Spindle Speed Hand Wheel – Changes the speed of spindle rotation and should only be used while the machine is running.

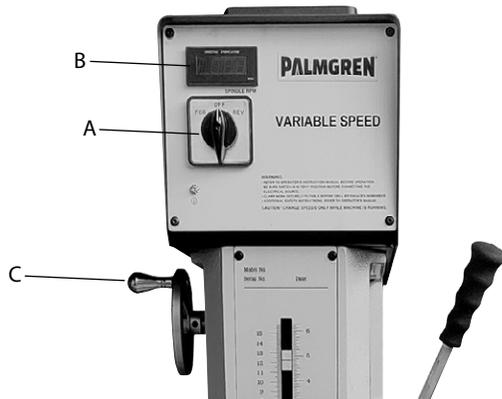


Figure 1 - Control Panels.

THE MACHINE HEAD



The machine head can move up, down, and be rotated 360°. It allows more flexibility in work piece sizes. The drilling machine head is lowered on the column for crating and transportation. Before operating the drill press, raise the head to the optimum operational height.

INSTALLATION

POSITIONING THE MACHINE

1. Check to see if the head is secure to the column with 10mm hex wrench (B, fig. 2).
- WARNING:** Failure to lock the machine head may result in machine damage or personal injury.
2. Position a belt, with a load capacity about 300kgs at point J (J, fig. 2) to lift the machine.
 3. The head and the worktable of the machine can be rotated 360°, so choose a location with enough space and solid foundation.

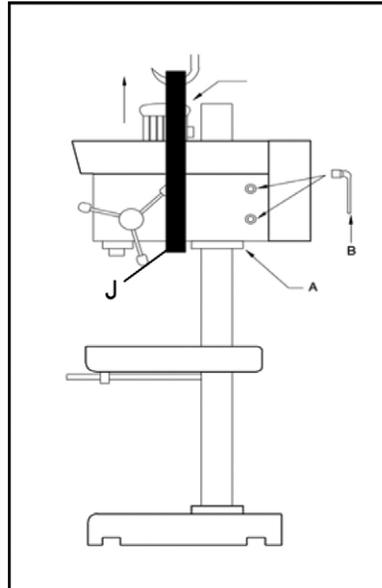


Figure 2 - Positioning the machine.

INITIAL CLEANING

Machine is shipped with a rustproof oil coating. Clean the rustproof oil coating from all exposed metal surface. Then apply oil/grease.

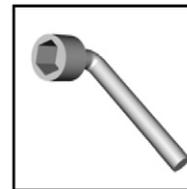
ASSEMBLY

ASSEMBLING LOOSE PARTS

1. Attach Riser handle to the necessary crankshaft.
2. Use socket L-wrench to tighten/loosen the machine head lock nuts.



Riser handle



L-wrench

ELECTRICAL CONNECTION OF THE MACHINE

Make sure whether the voltage of the acquired machine is 220V / 1-phase or (220V, 380V, 400V, 440V) / 3-phase prior to connection. If the machine cannot be operated after wires have been connected, please check the following items:

1. The Emergency switch is released.
2. The door of the electrical cabinet (CE version) is properly closed and switched to ON (locked) position.
3. The safety guard is in the proper position (closed).

OPERATION

CHANGING THE SPINDLE SPEED

Change speeds only while the machine is running. Then spindle speed can be adjusted to the proper cutting RPM by using the spindle speed handle (F, fig.1). The spindle speed range is from 300 RPM to 2000 RPM.

ADJUSTING THE MACHINE HEAD HEIGHT

The machine head is lowered for shipping and it must be raised before operating. The head must be raised to a height so that the top of the column does not interfere with the pulleys or belt.

1. Unlock the table. Use crankshaft (A, fig. 3), counterclockwise.

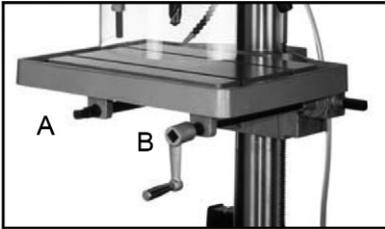


Figure 3

2. Use a suitable block of wood to support the machine
3. Position the support block between the machine head and table.
4. Raise the table and support block to the machine head. Use crankshaft (B, fig. 3), clockwise. Do not place the block under the lock collar (A, fig. 4).
5. Secure the collar. Check the two set screws (A, fig. 4).

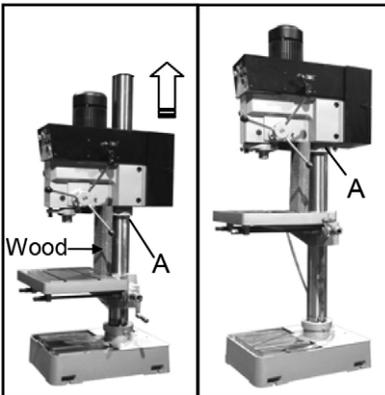


Figure 4

6. Unlock the machine head. Loosen head locking bolts (fig. 5)

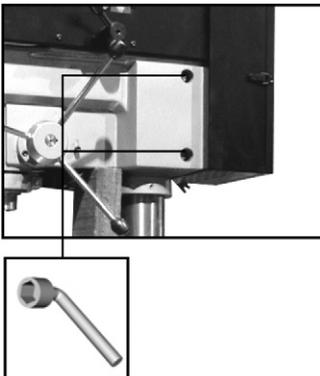


Figure 5

7. Raise the head to the highest position. Use crankshaft (B, fig.3), clockwise.

CAUTION: When the head bore and the column cap are flush, the head cannot be raised further. Use a ladder to observe the column through the top of the belt cover.

8. Lock the machine head. Tighten the two head locking bolts (fig. 5).
9. After the head is set and locked, unlock the collar. Loosen two set screws (A, fig. 4).
10. Slide the lock collar up to the machine head.
11. Lock the collar. Firmly tighten two set screws (A, fig. 4).

WARNING: Failure to lock collar can result in damage of the machine and personal injury.

12. Once the machine head is safely secured, remove the support block

13. To lower the head, reverse the steps above.

NOTE: Do not loosen the head lock bolts without supporting the head.

WARNING: Failure to lock the head handles can result in damage of the machine and personal injury.

ADJUSTING THE RACK HEIGHT

To raise the table to a working height requires the raising the column rack.

1. Lock the table. Use crankshaft (A, fig. 3), clockwise.
2. Unlock column bearing collar (B, fig. 6). Loosen the two set screws (A, fig. 6).

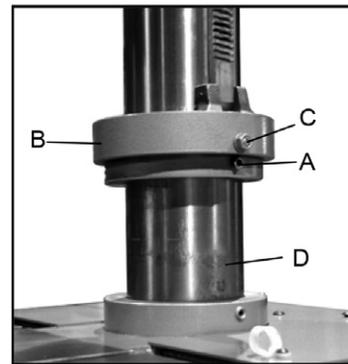


Figure 6

CAUTION: Do not loosen lock nuts (C, fig. 6).

3. Raise the rack (D, fig. 6). Use crankshaft (B, fig. 3), clockwise.
4. Lock column bearing collar (B, fig. 6). Tighten the two set screws (A, fig. 6).

WARNING: Failure to bearing collar can result in damage of the machine and personal injury.

5. Now the table is free to be raised or lowered for normal operation.



The position is set. The table and head are raised.

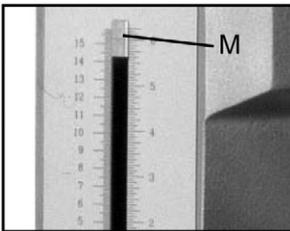
OPERATION (CONTINUED)**THE OPERATION CYCLE**

Refer to figures 1 and 3 on pages 4 and 5.

1. Check that the head is secure.

WARNING: Failure to lock the head handles can result in damage of the machine and personal injury.

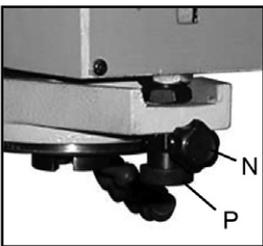
2. Secure the work piece to the table.
3. Adjust the table to the desired height. Use crankshaft (B or C, fig. 3).
4. Use crankshaft (A, fig. 3) to lock the table lock. Attach and rotate the riser handle clockwise.
5. Start the machine and select rotation direction using knob (A, fig. 1).
6. Set spindle speed using speed control handwheel (C, fig. 1).
7. Use the depth handle to bring the tip of the drill bit to the surface of the work piece hold.
8. Set the drilling depth stop (M) to required depth.
9. Begin drilling by using the quill feed levers.



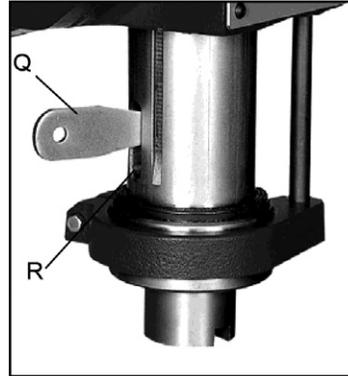
Set depth stop.

SETTING THE DEPTH STOP

1. Set the depth to zero by lowering and holding the cutting tools to the surface of the work piece.
2. Unlock the depth scale by turning the lock knob (N).
3. Set the depth stop by rotating the depth stop knob (P) to the desired depth.
4. Lock the depth scale by turning the lock knob (N).

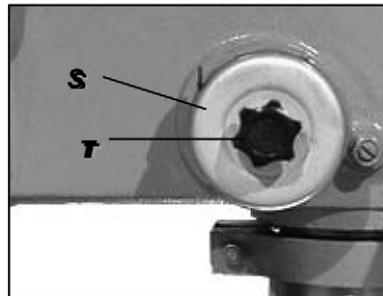
**REMOVING THE TOOLS FROM SPINDLE BORE**

1. Disconnect machine from power supply.
2. Place a thin wood plank on the worktable to protect the surface of the worktable.
3. Raise the worktable to about 250mm under the bit.
4. Lower the spindle about 150mm.
5. Place the drift key (Q) into the aperture (R) of the quill and tap the end of the drift key (Q) with a hammer until the bit or chuck arbor falls down.

**THE SPINDLE-RETURN SPRING**

The spindle-return spring is the retraction mechanism for the spindle. The spindle cap has slots along the side. Over time, the spindle return may be slow or lethargic. Adjust the spindle return mechanism so that the spindle retracts properly.

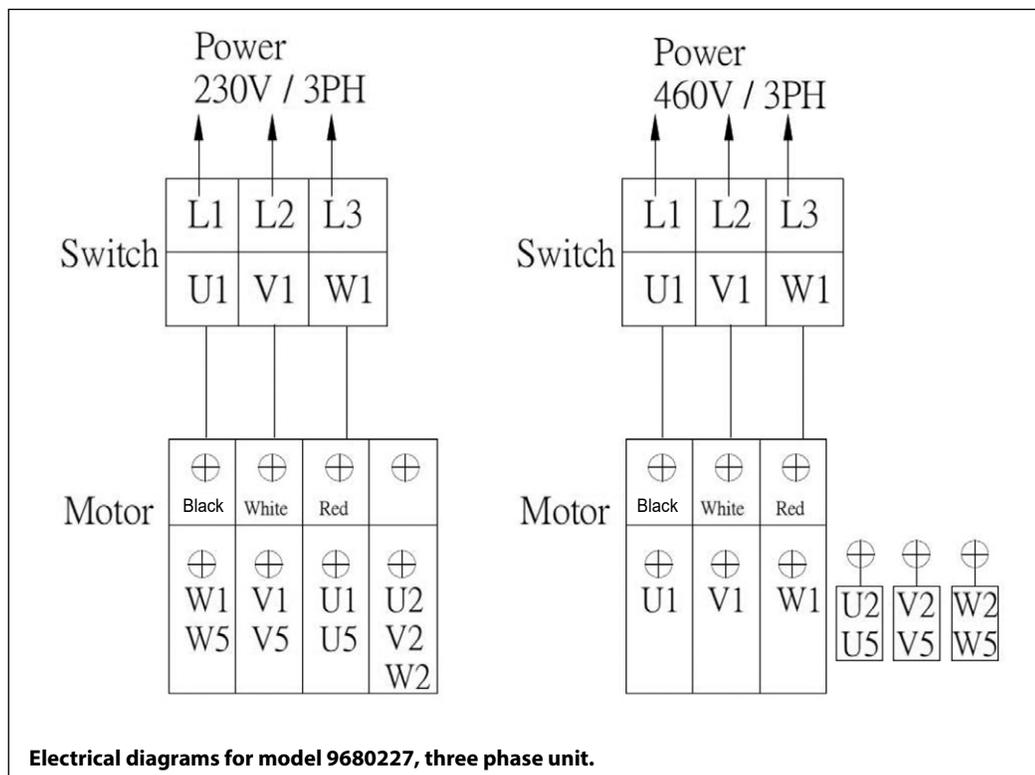
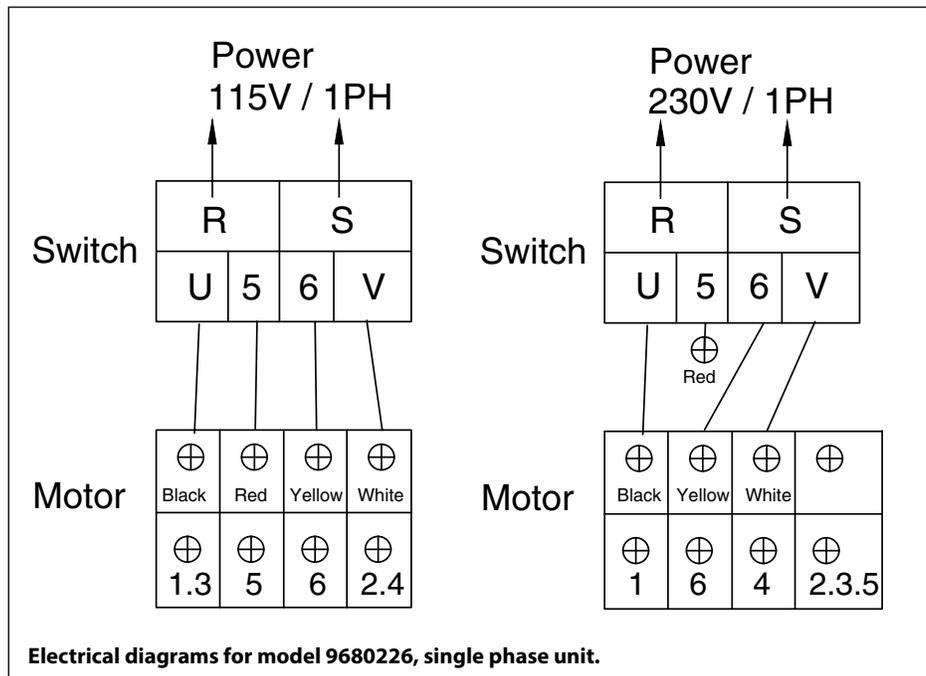
1. Loosen the star knob (T) by turning it counterclockwise.
2. Rotate the spring casing (S) one slot to retention the spring.
3. Tighten the star knob (T) by turning it clockwise.
4. The spindle return spring adjustment is complete.

**LUBRICATION**

Apply oils to the driving parts of the machine prior to operation and supply coolant during operation to ensure stability of cutters and the object being processed.

- Lubricate – Column, Quill.
- Grease – Rack on the column so that the worktable can move up/down smoothly.

WIRING DIAGRAM FOR VOLTAGE CHANGE



REPLACEMENT PARTS LIST FOR MOTOR-PULLEY ASSEMBLY

Ref. No.	Description	Part No.	Qty.	Ref. No.	Description	Part No.	Qty.
1	Hand Grip	N/A	1	41-1	Washer 5/16"	*	4
2	Hand Wheel (Includes #1)	965152201	1	42	9680226 1 PH Motor	965154901	1
3	Bushing	965152301	1	42	9680227 3 PH Motor	965154903	1
4	Key 4×4×15	*	1	43	Key 5×5×45	*	1
5	Worm Shaft	965152401	1	44	Key 5×5×20	*	1
6	Thrust Bearing	965152501	1	45	Washer 5/16"	*	4
7	Bearing Housing	965152601	1	46	Hex Screw M8×25	*	4
8	Spindle Mid Shaft	965152701	1	47	C-Ring (Shaft)	965155001	1
9	C-Ring (Shaft) S-25	*	1	48	Spring Cover	965155101	1
10	Key 5×5×25	*	1	49	Spring	965155201	1
11	Key 5×5×40	*	1	50	Lower Motor Pulley	965155301	1
12	Shaft	965152801	1	51	Belt	965155401	1
13	Thrust Bearing	965152901	1	52	Round Head Screw M4×10	*	4
14	Worm Shaft	965153001	1	53	Key 8×8×30-special	965167901	2
15	Control Rod	965153101	1	54	Set Screw M5×8	*	1
16	Pin	965153201	1	55	Set Screw M8×8	*	2
17	Housing	965153301	1	56	Bushing	965155501	1
18	Hex Socket Cap Screw M6×20	*	1	57	Hex Socker Cap Screw M6×20	*	2
19	Bracket	965153401	1	58	Upper Motor Pulley	965155601	1
20	Control Rod Sleeve	965153501	1	59	Washer 1/4"	*	4
21	Shaft	965153601	1	59-1	Round Head Screw M5×10	*	4
22	Plate	965153701	1	60	Plate Bracket	965155701	1
23	Spring Washer 5/8"	*	1	61	Washer 5/16"	*	2
24	Hex Nut 5/8"-18UNF	*	1	62	Hex Socket Cap Screw M8×20	*	2
25	Hex Socket Cap Screw M8×20	*	2	63	Cross Head Screw 1/4"×1/2"	*	2
26	Washer 5/16"	*	2	64	Washer 1/4"	*	2
27	Hex Nut 7/16"-20UNF2	*	2	65	Pulley Cover	965155801	1
28	Ball Bearing 6302zz	*	2	66	Hex Socker Cap Screw M8×30	*	2
29	C-Ring (Hole)	*	2	67	Washer 5/16"	*	2
30	Speed Change Bracket	965153801	1	68	Plate Bracket	965155901	1
30-1	Shaft	965153901	1	69	Forward / Reverse / Off Switch	965156001	1
30-2	C-clip S-12	*	2	70	Cap Screw- special	965168001	2
31	Speed Change Lever	965154001	1	71	Face Plate	965156101	1
32	Bearing Cover	965154101	1	72	Round Head Screw M5×10	*	4
33	Ball Bearing 6207zz	965154201	1	73	LED Display	965156201	1
34	Upper Spindle Pulley	965154301	1	74	Switch Plate	965156301	1
35	Lower Spindle Pulley	965154401	1	75	Screw	965156401	2
36	Belt	965154501	1	76	Label	965156501	1
37	Ball Bearing 6205zz	965154601	2	77	Label Cover	965156601	1
38	Bushing	965154701	1	78	Knob	965156701	1
39	Bushing	965154801	1	79	Connection Cord	965156801	1
40	Hex Nut 1/2"-20UNF	*	1	80	Power Cord	965156901	1
41	Hex Socket Cap Screw M8×35	*	4				

(Δ) Not shown. (N/A) Not available as repair part. (*) Standard hardware item, available locally.

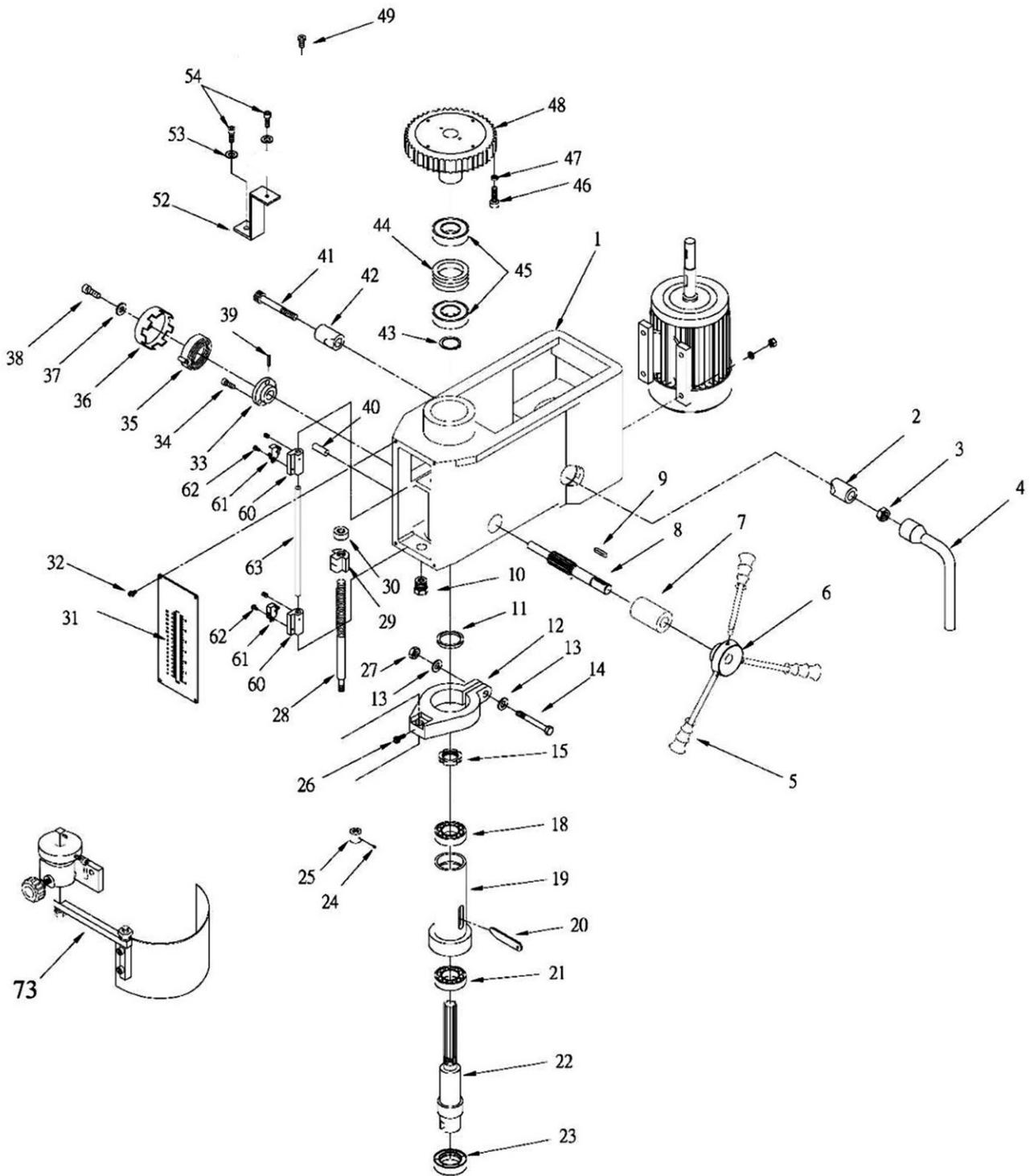


Figure 8 – Replacement Parts Illustration for Head and Spindle Assembly

REPLACEMENT PARTS LIST FOR HEAD AND SPINDLE ASSEMBLY

Ref. No.	Description	Part No.	Qty.	Ref. No.	Description	Part No.	Qty.
1	Head Body	965158901	1	31	Depth Scale	965160701	1
2	Cam Lock Rod	965159001	2	32	Screw 3/16" x 5/16"	*	4
3	Hex Nut M16	*	1	33	Spring Seat	965160801	1
4	Hex Head Wrench	965159101	1	34	Screw 3/16" x 5/16"	*	3
5	Spoke	965159201	3	36	Return Spring + Cover Assy. (Contains #35)	965160901	1
6	Hub	965159301	1	37	Washer 1/4"	*	1
7	Feed Shaft Seat	965159401	1	38	Set Knob 1/4"	965161001	1
8	Feed Shaft	965159501	1	40	Roll Pin	965161101	1
9	Key 6 x 6 x 20	*	1	41	Hex Shoulder Bolt	965161201	1
10	Set Screw - Special	965168101	1	42	Bushing	965161301	1
11	Rubber Washer	965159601	1	43	C-Ring S45	*	1
12	Quill Band	965159701	1	44	Spacer	965161401	1
13	Spring Washer 1/4"	*	2	45	Ball Bearing 6009zz	*	2
14	Hex Screw 1/4" x 2-1/2"	*	1	46	Hex Socket Cap Screw 3/16 x 1"	*	1
15	Lock Nut	965159801	1	47	Nut 3/16"	*	1
18	Ball Bearing 30206	*	1	48	Spindle Pulley 8M x 62T	965161501	1
19	Quill	965159901	1	49	Screw M4 x 20	*	1
20	Drift Pin	965160001	1	52	Sensor Bracket	965161801	1
21	Ball Bearing 30207	*	1	53	Washer 5/16"	*	2
22	Spindle MT3 / MT4	965160101	1	54	Hex Socket Cap Screw M8 x 20	*	2
23	Oil Seal 45 x 72 x 8	965160201	1	60	Micro Switch Bracket	965161901	2
24	Set Screw M6	*	2	61	Micro Switch	965162001	2
25	Retainer	965160301	1	62	Screw M3 x 16	*	4
26	Set Screw 1/4"	*	1	63	Micro Switch Support Rod	965162101	1
27	Hex Nut 1/4"	*	1	73	CE Option Safety Guard Assy. Standard	9615035	1
28	Depth Rod	965160401	1				
29	Depth Scale Bracket	965160501	1				
30	Nut	965160601	1				

(Δ) Not shown. (N/A) Not available as repair part. (*) Standard hardware item, available locally.

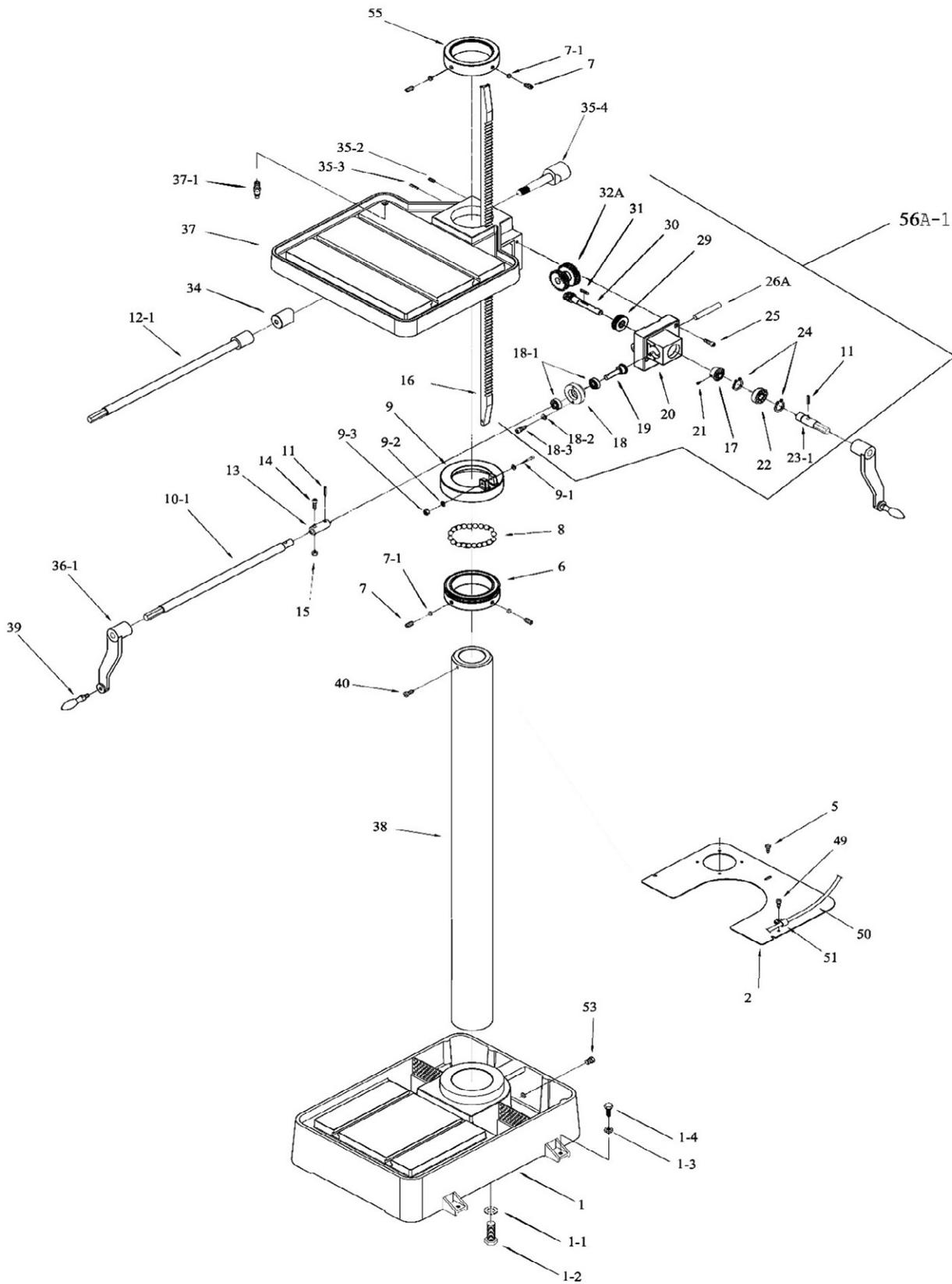


Figure 9 – Replacement Parts Illustration for Column, Table and Base

REPLACEMENT PARTS LIST FOR COLUMN, TABLE AND BASE

Ref. No.	Description	Part No.	Qty.	Ref. No.	Description	Part No.	Qty.
1	Base	965163401	1	23-1	Crank Shaft (Hex Head)	965165301	1
1-1	Lock Washer, 1/2"	*	6	24	C-Ring S-25	*	2
1-2	Hex Cap Screw, 1/2" x 1/2"	*	6	25	Socket Head Screw M8 x 35	*	3
1-3	Lock Washer, M10	*	4	26A	Shaft	965165401	1
1-4	Hex Cap Screw, M10 x 40	*	4	27	Set Screw	*	1
2	Plate, Coolant Cover	965163501	1	29	Bearing 51102	965165501	1
4	Hex Head Bolt BH M10 x 40	*	4	30	Worm, Table Raiser	965165601	1
5	Pan Head Screw 1/4" x 1/2"	*	3	31	Key 4 x 4 x 20	*	1
6	Ball Seat	965163801	1	32	Worm Gear Assembly (27, 32, 33)	965165701	1
7	Set Screw 1/2" x 3/4"	*	4	33	Gear	N/A	1
7-1	Block, Brass	965163901	2	34	Lock, Cam, Front	965165901	1
8	Ball Bearing	965164001	40	35-4	Locking Table Bolt Assembly (35-4, 35-1)	965166001	1
9	Ring, Lock	965164101	1	35-1	Spring	N/A	1
9-1	Hex Socket Cap Screw, M4 x 55	*	1	35-2	Hex Socket Cap Screw, M6 x 25	*	1
9-2	Washer, M4	*	1	35-3	Spring Pin, 5 x 20	*	2
9-3	Nut, M4	*	1	36-1	Lift Handle Crank	965166201	2
10-1	Crank Shaft (Hex Head)	965164301	1	37	Table	965166301	1
11	Spring Pin 4 x 25	965164401	1	37-1	Barb, Hose, 1/2" (Return)	965166401	1
12-1	Connection Rod (Sleeve w/Thread)	965164501	1	38	Column	965166501	1
13	Coupling, Table Raiser	965164601	1	39	Handle, Table Raise	965166601	1
14	Screw, Socket Head 1/4" x 1-1/2"	*	1	40	Pan Hex Socket Screw M5 x 10	*	1
15	Nut 1/4"	*	1	49	Screw, Pan Head	*	1
16	Rack	965164701	1	50	Hose, Vinyl, Clear, 1/2"	965167301	1
17	Large Beveled Gear	965164801	1	51	Clamp, Hose	965167401	1
18	Bearing Housing	965164901	1	52	Screw, Set, 1/2 x 1	*	2
18-1	Ball Bearing, 6202ZZ	*	2	53	Plug, Drain, 3/8 NPT	965167501	1
18-2	Washer 1/4"	*	2	54	Pin, Spring, 4 x 50	965167601	1
18-3	Cap Screw	*	2	55	Collar, Rack	965167701	1
19	Small Beveled Gear	965165001	2	56A-1	Table Raiser Assembly	965167801	1
20	Bracket, Cover	965165101	1				
21	Set Screw 1/4" x 3/8"	*	1				
22	Bearing, Ball	965165201	1				

(Δ) Not shown. (N/A) Not available as repair part. (*) Standard hardware item, available locally.

PALMGREN WARRANTY

C.H. Hanson / Palmgren warrants their products to be free of defects in material or workmanship. This warranty does not cover defects due directly or indirectly to misuse, abuse, normal wear and tear, failure to properly maintain the product, heated, ground or otherwise altered, or used for a purpose other than that for which it was intended.

The warranty does not cover expendable and/or wear part (i.e. v-belts, screws, abrasives, jaws), damage to tools arising from alteration, abuse or use other than their intended purpose, packing and freight. The duration of this warranty is expressly limited to the terms noted below beginning from the date of delivery to the original user.

The Palmgren branded items carry the following warranties on parts:

All arbor presses, vises, clamps, positioning tables, tombstones, jack screws and vise accessories - LIFETIME.

All bench grinders, drill presses, tapping machines, band saws, lathes, milling machines, abrasive finishing machines and work stands - 3 YEARS.

The obligation of C.H. Hanson / Palmgren is limited solely to the repair or replacement, at our option, at its factory or authorized repair agent of any part that should prove inoperable. Purchaser must lubricate and maintain the product under normal operating conditions at all times. Prior to operation become familiar with product and the included materials, i.e. warnings, cautions and manuals.

Failure to follow these instructions will void the warranty.

This warranty is the purchaser's exclusive remedy against C.H. Hanson for any inoperable parts in its product. Under no circumstances is C.H. Hanson liable for any direct, indirect, incidental, special or consequential damages including loss of profits in any way related to the use or inability to use our products. This warranty gives you specific legal rights which may vary from state to state.

PALMGREN®

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