PALMGREN®

18″ Mill Drill with DRO and power feed

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

9646739.01-0221

DESCRIPTION

Palmgren 18" Mill Drill w/ DRO and Power Feed, Model 9680149 is for milling or drilling, widely used in different places. Fine exterior, wide range of speed and easy to use.

Designed for industrial usage milling, drilling, reaming, steps and mill plane with metal and other material.

- The highest speed range 5000 rpm; variable spindle speed;
- Spindle speed digital readout;
- Tapping function;
- Brush less DC motor;
- Chuck guard with safety switch;
- Feeding depth digital readout;
- Fine feeding;
- With two USB sockets, can supply power to lamp or iPad;
- Large size worktable 740 × 180mm;
- High grade aluminum hand wheel, anodic oxidation treatment of the whole Aluminim Rod Surface;
- High grade scale ring, Surface anodic oxidation treatment.
- Small tools adsorption zone.

UNPACKING

WARNING: Be careful not to touch overhead power lines, piping, lighting, etc., if lifting equipment is used. Mill Drill weighs up to 170 Kg lbs, proper tools, equipment and qualified personnel should be employed in all phases of unpacking and installation.

Crates should be handled with care to avoid damage from dropping, bumping, etc. Store and unpack crates with correct side up. After uncrating Mill Drill, inspect carefully for any damage that may have occurred during transit. Check for loose, missing or damaged parts. If any damage or loss has occurred, claim must be filed with carrier immediately. Check for completeness. Immediately report missing parts to dealer.

CAUTION: Never use highly volatile solvents. Avoid getting cleaning solution on paint as it may tend to deteriorate these finishes. Use soap and water on painted components.

SPECIFICATIONS

Palmgren 18" Mill Drill w/ DRO and Power Feed, Model 9680149	
Max drilling capacity	1.10"
End mill capacity	1"
Face mill capacity	0.50"
Throat	2.50"
Max distance spindle to table	9"
Spindle taper	13.40"
Spindle speed, low range	100-1800 RPM
Spindle speed, high range:	280-5000 RPM
Motor RPM	3600 RPM
Table size	30" x 7"
T-slot size	0.5"
Table longitudinal travel (X)	20"
Cross travel (Y)	8.25"
Headstock travel (Z)	9.85"
Voltage	115V
Amperage	8A
Power	1.33 HP
Overall dimension (LxWxH)	37.5" x 30.25" x 36.25"
Packing size (LxWxH)	43.25" x 36.25" x 39"
Weight (net/gross)	324 lbs / 375 lbs

KNOW YOUR TOOL

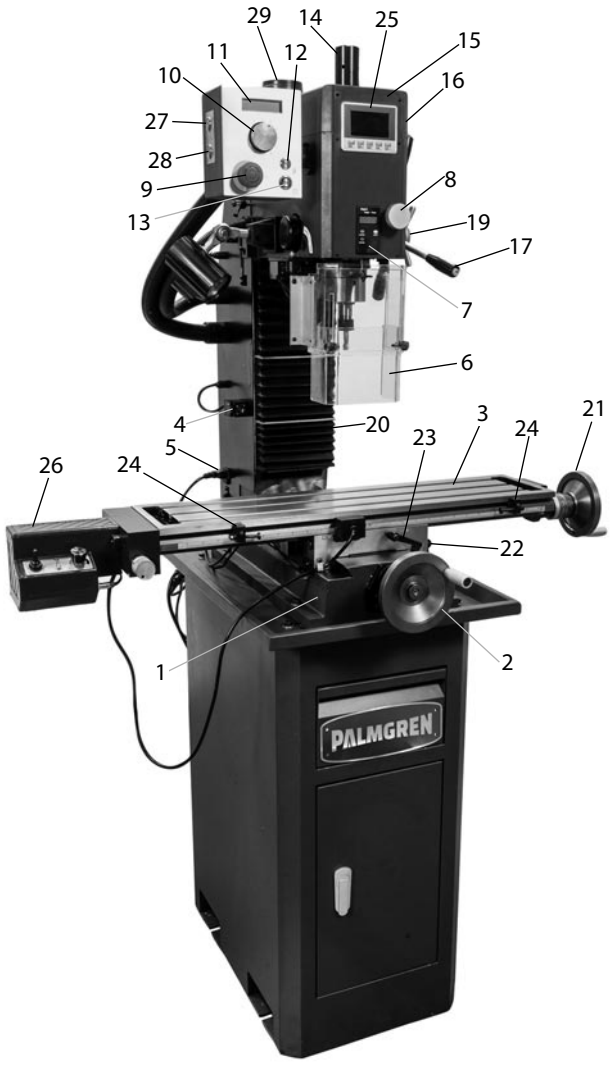

Figure 1 - Know your tool.

1 Base
2 Y-axis hand wheel
3 Large size worktable
4 Fuselage (with protect cover)
5 Power socket with fuse
6 Protective dust guard assembly
7 Depth display
8 Fine feeding handle
9 Emergency stop switch
10 Knob with potentiometer
11 Spindle speed display
12 Tapping function button
13 Start button
14 Spindle box top cover
15 Spindle box
16 Tapping button (change to F/R)
17 Spindle lifting lever
19 Fine feeding lock handle
20 Back mask
21 X-axis handle wheel
22 Saddle lock handle
23 Saddle
24 Worktable lock handle
25 DRO
26 Power feed
27 Up
28 Down
29 Z-feed motor

SAFETY RULES

WARNING: For your own safety, read operating instructions manual 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.

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.

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.)

CAUTION: Think safety! Safety is a combination of operator common sense and alertness at all times when tool is being used.

OPERATOR

Common sense and caution are factors which cannot be built into any product. these factors must be supplied by the operator. Please remember:

- When using electric tools, machines or equipment, basic safety precautions should always be followed to reduce the risk of fire, electric shock, and personal injury.
- Keep work area clean. Cluttered areas invite injuries.
- Consider work area conditions. Do not use machines or power tools in damp, wet, or poorly lit locations. Do not expose equipment to rain, keep work area well lit. Do not use tools in the presence of flame gases or liquids.
- Keep children away, all children should be kept away from the work area.
- Guard against electric shock. Prevent body contact with grounded surfaces such as pipes, radiators, ranges, and refrigerator enclosures.
- Stay alert. Never operate if you are tired.
- Do not operate the product if under the influence of alcohol or drugs. Read warning labels on prescriptions to determine if your judgment or reflexes might be impaired.
- Do not wear loose clothing or jewelry as they can be caught in moving parts.
- Wear restrictive hair covering to contain long hair.
- Use eye and ear protection. Always wear.
- Keep proper footing and balance at all times.
- Do not reach over or across running machines.

BEFORE OPERATIONS

- Be sure the switch is OFF when not in use and before plugging in.
- Do not attempt to use inappropriate attachments in an attempt to exceed the tool's capacity. Approved accessories are available from the dealer or machine maker.
- Check for damaged parts, before using any tool, any part that appears damaged should be carefully checked to determine that it will operate properly and perform its intended function.
- Check for alignment and binding of all moving parts, broken parts or mounting fixtures and any other condition that may affect proper operation. Any part that is damaged should be properly repaired or replaced by a qualified technician.
- Do not use the tool if any switch does not turn off and properly

OPERATION

- Never force the tool or attachment to do the work of a larger industrial tool. It is designed to do the job better and more safely at the rate for which it was intended.
- Do not carry the tool by its power cord.
- Always unplug the cord by the plug. Never yank the cord out of the wall.
- Always turn off the machine before unplugging.

WARNING: If there is any question about a condition being safe or unsafe, do not operate the tool!

SAFETY RULES (CONTINUED)

GROUNDING INSTRUCTIONS

This machine has a three-prong plug, the third prong is the ground. Plug this cord only into a three-prong receptacle. Do not attempt to defeat the protection the ground wire provides by cutting off the round prong. Cutting off the ground will result in a safety hazard and void the warranty.

WARNING: Do not modify the plug in any way. if you have any doubt, call a qualified electrician.

INSTALLATION

CAUTION: Do not attempt to use the machine until installation is complete, and all preliminary checks have been made in accordance with this manual.

MOUNTING THE MACHINE

The machine should be mounted on a strong, heavy workbench, of sufficient height so that you do not need to bend your back to perform normal operations. 9680149 comes with a stand, but can also be mounted to workbench.

Ensure the location is adequately lit and that you will not be working in your own shadow. We strongly recommend that the machine bolted firmly to strong workbench using the tapped holes used to secure the feet to the machine. This is to provide added stability and consequently, additional safety.

To do this, first drill four M12 clearance holes in a worktop, at the dimensions shown in the diagram opposite, and with appropriate length M10 bolts, or screws, with flat washers. (not supply, you need prepare these by yourself).

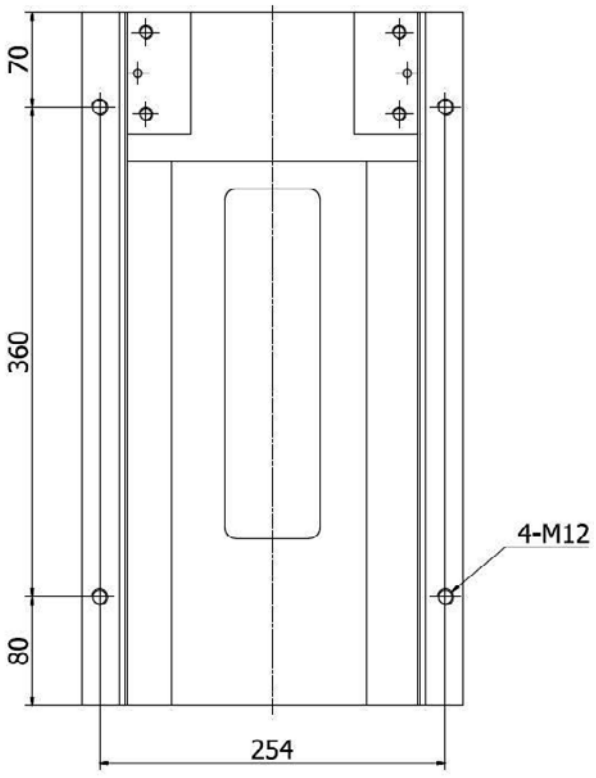

Figure 2 - Clearance holes in worktop diagram.

OPERATION

Before starts to use this machine, operator should go through the instructions carefully so as to acquaint with the construction of the machines, the functions of the various controls and also the driving systems.

Let me introduce the operator step to you:

1. Insert the power line insert the socket left of the fuselage, then power on.

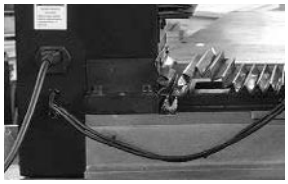

Figure 3 – Power plug socket locations.

2. Loosen the emergency stop switch (B), then the spindle speed display (D) bright and show "0000", press the start button (A) then clockwise rotation of the speed control button (C), can make the spindle speed raise to the highest position. Under these circumstances the mill only have forward direction. Under tapping circumstances have forward and reverse direction. Press the tapping function lock button (E), then is button will bright, then you can press a green button to choose the spindle run to forward or reverse. The green button total 3 pieces., they on the right of the spindle box in the lifting lever. You can see the word of forward or reverse on the right of the display (D), it easy to show the user the direction of the rotation of the spindle.

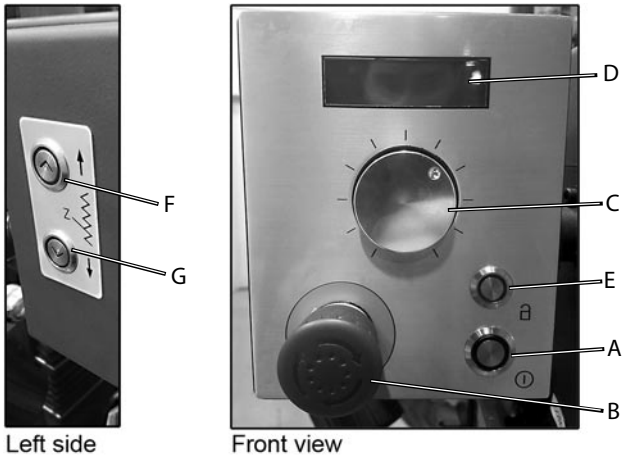

Figure 4 – Main control buttons.

A – Start	E – Tapping mode/drill mode
B – E-stop	F – Up button
C – Speed control dial	G – down button
D - Display	H – power indicator light

3. This mill has two spindle speed ranges. The low is 100-1800 rpm and the high range is 280-5000 rpm. To switch between the ranges, un plug the machine, open the cover, and switch the belt between the two gear sets.

OPERATION (CONTINUED)

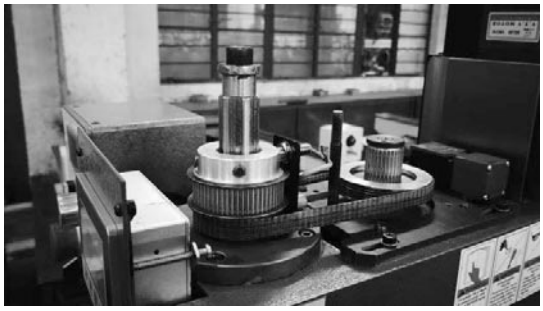

Figure 5 – Spindle belt and gearing.

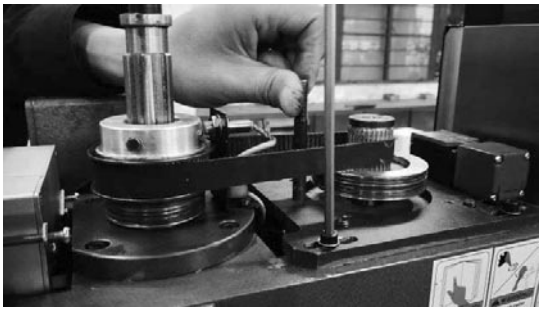

Figure 6 – Spindle belt and gearing.

4. If you want to stop the spindle you can counter-clockwise turn the speed control knob (C) to the "0" position, or press the start button (A) the spindle will stop running.
5. The machine can be quickly stopped when running, by pressing the large red emergency stop button. The mill will stop immediately.

NOTE: The emergency stop button (B) is for emergencies, and not general use. Using too often will wear out the main PC board.

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SEVERAL CHARACTERISTIC FUNCTIONS

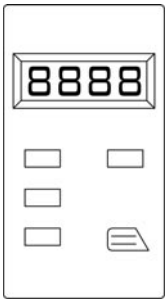


Figure 7 - Spindle depth display.

Figure 8 - Chuck guard with safety switch.

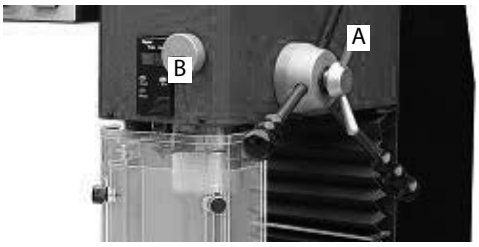


Figure 9 - Spindle fine feeding (tighten the lock knob "A" then turn the fine feeding knob "B".

Figure 10 - Small tools adsorption zone.

Figure 11 - With two USB sockets, can supply power.

OPERATION (CONTINUED)

INTRODUCTION OF HIGH AND LOW SPEED SHIFT

1. Loosen and remove the hand screws and gaskets on the top cover of the box;

Figure 12 – Hand screw location.

Figure 13 – Hand screw removed.

2. Pull the top cover of the box with the pull rod protector on the top of the hand. Note: do not remove the two screws above the front.

Figure 14 – Gear box cover removal.

Figure 15 – Spindle belt and gearing.

3. Use the inner six angle wrench to unlock the internal six angle screws M5 of the 4 locking motor connecting plates, and pull the motor connecting plate with the hand direction to the main axis, and the belt loosens easily. Usually the factory state is at this high speed position.

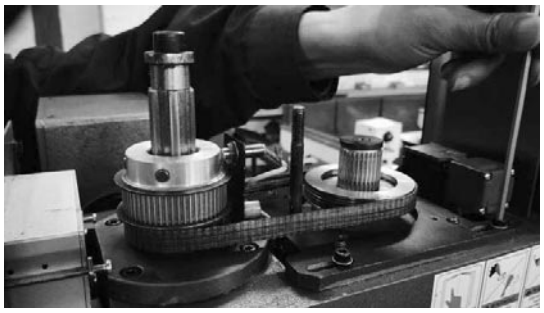


Figure 16 – Unlocking screw.

Figure 17 – Removing belt.

4. The synchronous gear belt for low-speed gear is removed from the attachment package and mounted on the upper low-speed gear;

Figure 18 – Shifting belt to upper low-speed gear.

Figure 19 – Shifting belt to upper low-speed gear.

5. Push the long bolt with hand to drive the motor to move to the column side, the belt is tight, then lock 4 inner hexagonal screws to fasten the motor connecting plate;

OPERATION (CONTINUED)

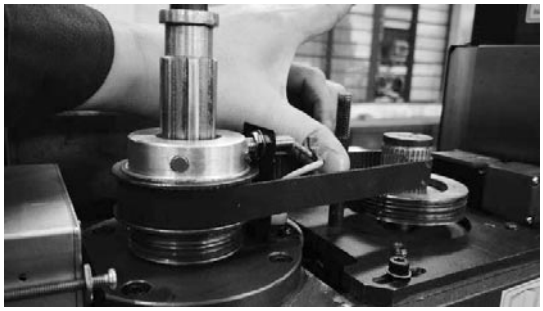


Figure 20 – Testing belt.

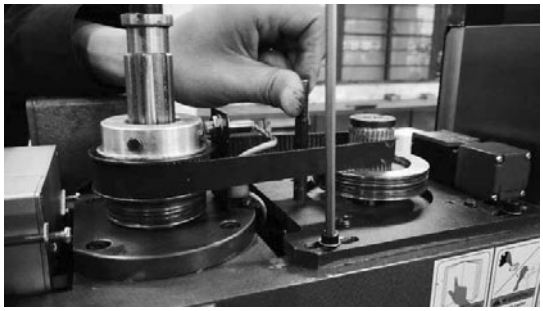


Figure 21 – Re-fastening the motor connection plate.

6. Check the looseness of the synchronous belt by hand pressing, after confirming ok, lock the fastening screw of the motor connection plate again, and install the top cover of the box with the gasket and nut to complete the belt replacement.

Figure 22 – Testing belt.

Figure 23 – Gear cover replaced.

7. change the range from high speed to low speed or from low speed to high speed in the same mode.

BRIEF INTRODUCTION OF CONVENTIONAL MECHANICAL OPERATION

1. The clamping tool and work piece must stop the machine first;
2. Clean the inner hole of the spindle and the conical surface of the tool rod, push the tool rod into the inner hole of the spindle, and put in the pull rod to hang the tool rod;
3. The parts to be processed are placed on the surface of the worktable. After pressing with the pressing plate or use vice clamped, the parts are moved to the desired position vertically and horizontally.

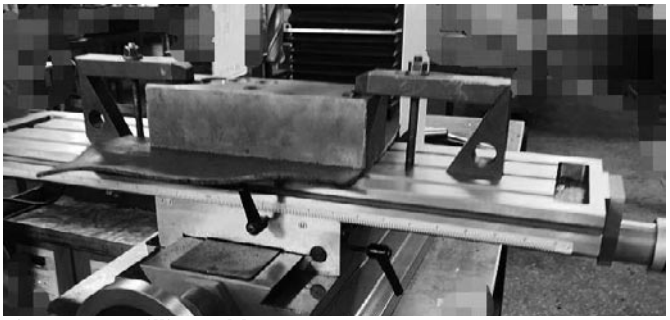


Figure 24 – Milling table.

4. Loosen the column lock handle, shake the lift handle and move the spindle box down;
5. Start the machine, select a good rotation speed, turn counterclockwise to turn the lifting handle, and drilling of milling can be done at this time;
6. When milling parts, we must lock the spindle box and spindle, at the same time lock the longitudinal transverse plug iron according to the need, so as not to change the machining size;

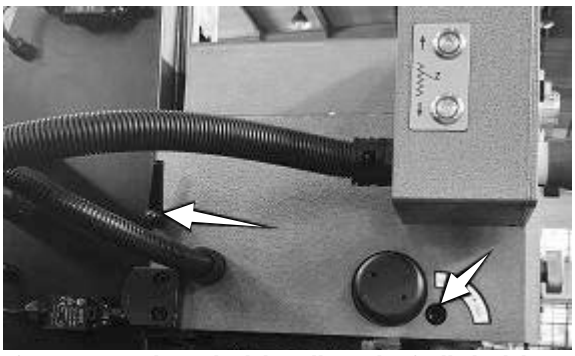


Figure 25 – Column lock handle and spindle lock location.

Figure 26 – Saddle lock and table locking locations.

7. When replacing the drill chuck or milling chuck, open the top shield loosely on the edge, loosen the screw thread of the pull rod 2-3 teeth, then use a hammer to knock the taper handle away from the main shaft, and finally loosen the handle with the hand to replace the rod.

OPERATION (CONTINUED)

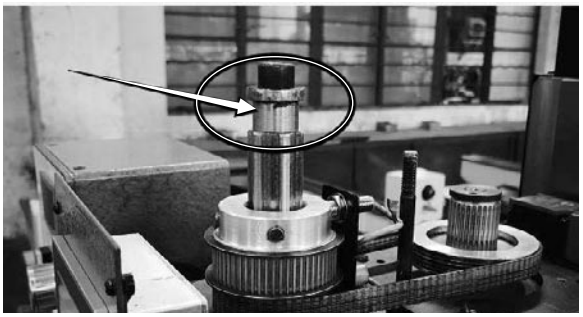


Figure 27 – Spindle screw.

Figure 28 – Spindle removal.

MAINTENANCE

AFTER USING

After the completion of the work, the power supply should be cut off, the machine tool and environment should be cleaned well, and mechanical oil should be added to the exposed surface of the machine to prevent the surface of the machine from rusting and affecting the use and beauty of the machine.

MACHINE TOOL LUBRICATION

In order to ensure the long service life of the machine and the effective operation of the machine tool, lubricating oil or lubricating oil is regularly added to each moving joint and joint.

Where lubricating oil is needed is mainly the dovetail surface in three directions of XYZ axis. Position as indicated by arrow

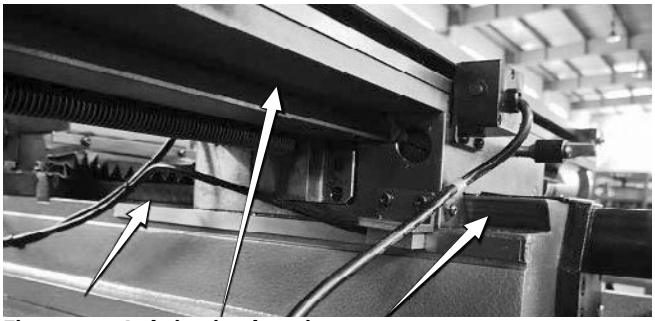


Figure 29 – Lubrication locations.

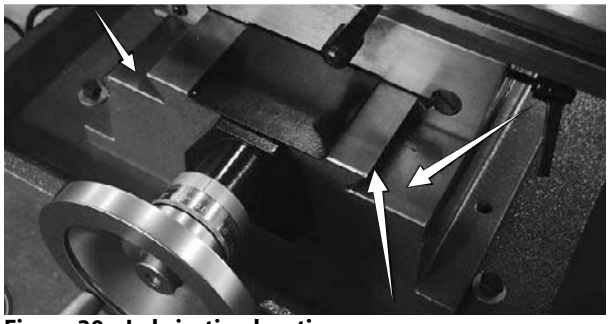


Figure 30 – Lubrication locations.

The main ones that need to be lubricated are XYZ's three axial thread rods and rod nuts.

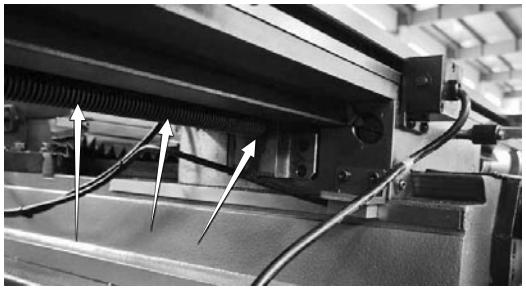


Figure 31 – Lubrication locations.

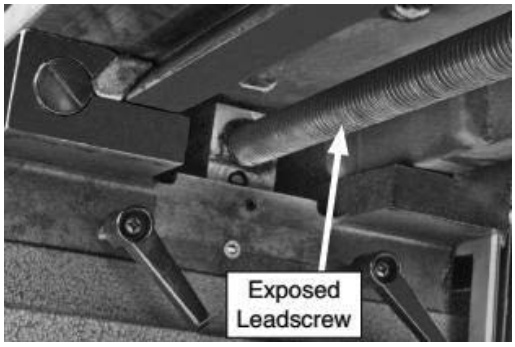
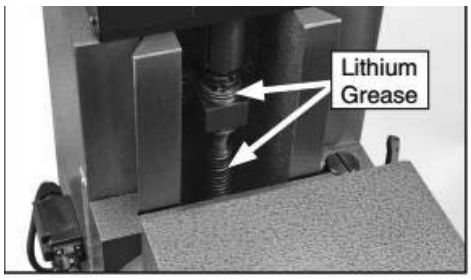


Figure 32 – Lubrication locations.



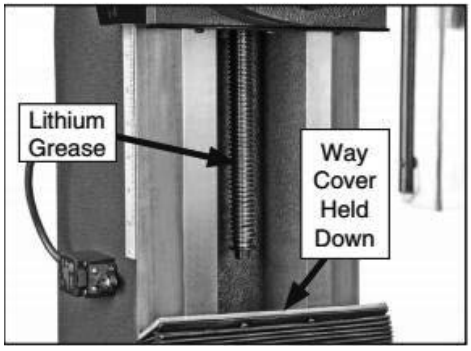


Figure 33 – Lubrication locations.

MAINTENANCE (CONTINUED)

OBLIQUE PLUG IRON ADJUSTMENT

This mill uses an oblique plug iron (angle degree is 1:100) between the base and saddle, saddle and work table, head stock and fuselage. Thie plug iron allows smooth high accuracy movement for each part.

After continued use, the oblique plug iron should be checked and adjusted, to eliminate any gap error that occurs. Check for errors every 3 months

To adjust use a phillips screwdriver and tighten slightly clockwise, as shown below.

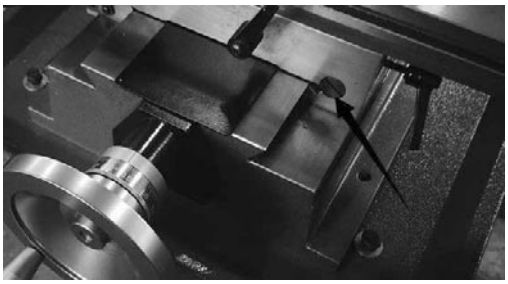


Figure 34 – Oblique plug iron location.

NOTES

ELECTRICAL SCHEMATIC

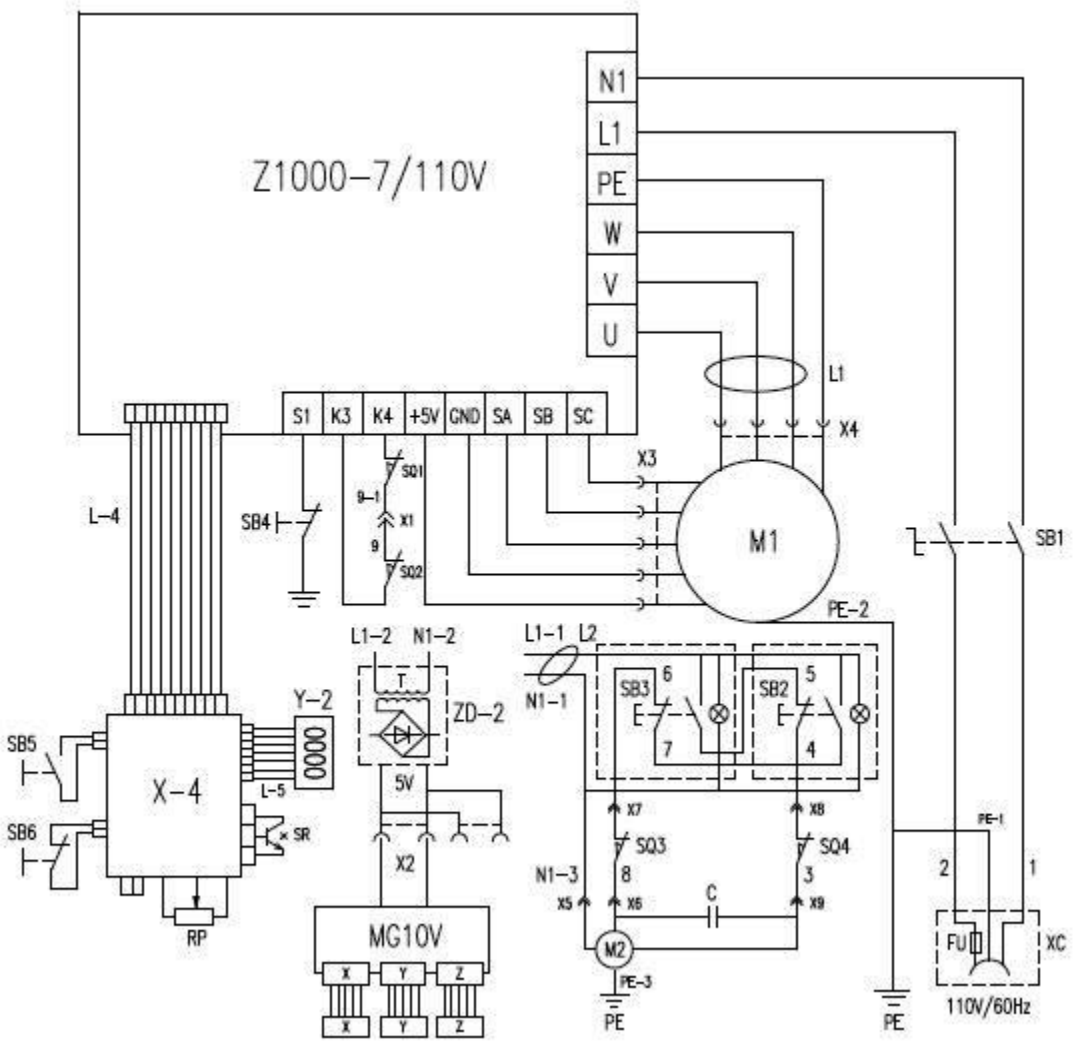


Figure 35 - Electrical Schematic

Z1000-7/110V: PC Board
SQ3: Limit switch for raising up
X-4: Knob plate
SQ4: Limit switch for raising down
SB1: Emergency stop button
SB2: Lifting button
L1: Magnet ring
SB3: Down button
SR: Velocity probe
M2: Lifting motor
MG10V: Digital readout display
SQ2: Limit switch for spindle box cover

M1: Brushless motor
FU: Fuse (20A)
SB4: Tapping button
XC: Socket with fuse
Y-2: Liquid crystal display panel
SB5: Start/stop button
L2: Magnet ring
SB6: Mill/tapping change button
ZD-2: DC power supply board
SQ1: Limit switch for chuck guard
C: Electric capacity

TROUBLESHOOTING

SYMPTOM	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Motor cannot start	1. The power supply is not on.	1. Turn on the emergency stop button
	2. Low voltage	2. Check that the voltage of the power supply is correct.
	3. Motor open circuit or loose connection.	3. Check that all the connections of the motor are loosened or disconnected.
	4. The external input socket is broken.	4. Check and confirm the input socket is ok.
	5. May which switch is bad or connect line loosen;	5. Check switches and the connect lines is tighten.
Fuse or circuit breaker disconnected	1. wire or plug short circuit	1. Check wires and plugs for damaged or missing insulation and replace them with extension wires.
	2. circuit board short circuit 3.power supply fuse or circuit breaker incorrect.	2. Check the voltage of the power supply is correct
		3. Check that all connections of the motor are loose or welded or insulated, and replace the correct fuse or circuit breaker in time
Motor overheating	1. Motor overload	1. Reduce the load of motor
	2. Air circulation of motor is restricted	2. Clean the motor and ensure smooth circulation of air
The hand wheel of a transverse or feed trawl is too loose	1. The adjusting screw is not in place.	1. Tighten the adjusting screw and lubricate the bed
	2. Hand wheel loosened	2. Tighten the hand wheel knob
	3. Wire rod assembly old or not in place	3. Tighten all loose knobs on the thread rod assembly.
The machine makes constant noise	1. The gear or bearing is out of order.	1. Replace damaged gear or bearing
	2. The motor is out of order.	2. Replace motor
During operation, the machine stops	1. Drilling and milling too deep	1. Reduce drilling depth
	2. The wrong speed or feed speed was used in the drilling and milling operation.	2. Choose the right speed
	3. Milling cutter damage	3. Replacement milling cutter
	4. Motor or motor carbon brush damaged	4. Replacement of carbon brush or motor
	5. Gear damaged	5. Replacement gear
Finish surface difference	1. Speed or feed speed error	1. Change the milling cutter by adjusting the correct speed or feed speed
	2. Milling cutter broken or wrong selected	2. Change the cutter
Difficult to move the end part on the guide rail	1. Drying of guideway	1. Lubricating oil
	2. Z shaft hand wheel to tighten	2. Adjusting screw
	3. Over compacted with debris on guide rail	3. Cleaning guide
T - type nut is difficult to fix	1. T type nut defect or damaged	1. Replacement of type t nut
	2. T-groove on the wrong working table	2. Replacement of table or well-used T slot

REPLACEMENT PARTS ILLUSTRATION 1D

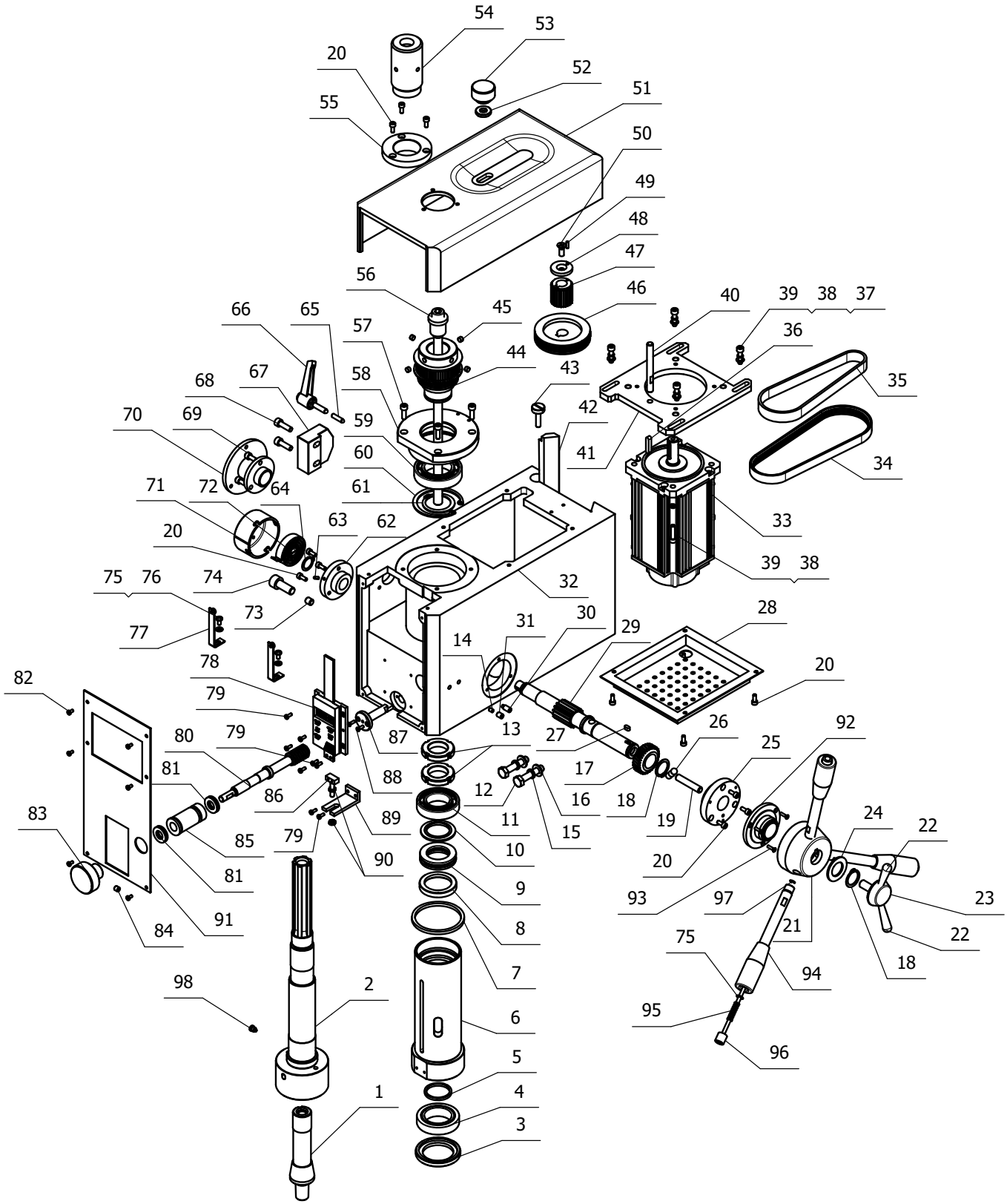


Figure 36 – Replacement Parts Illustration for Headstock with DRO

REPLACEMENT PARTS ILLUSTRATION 2B

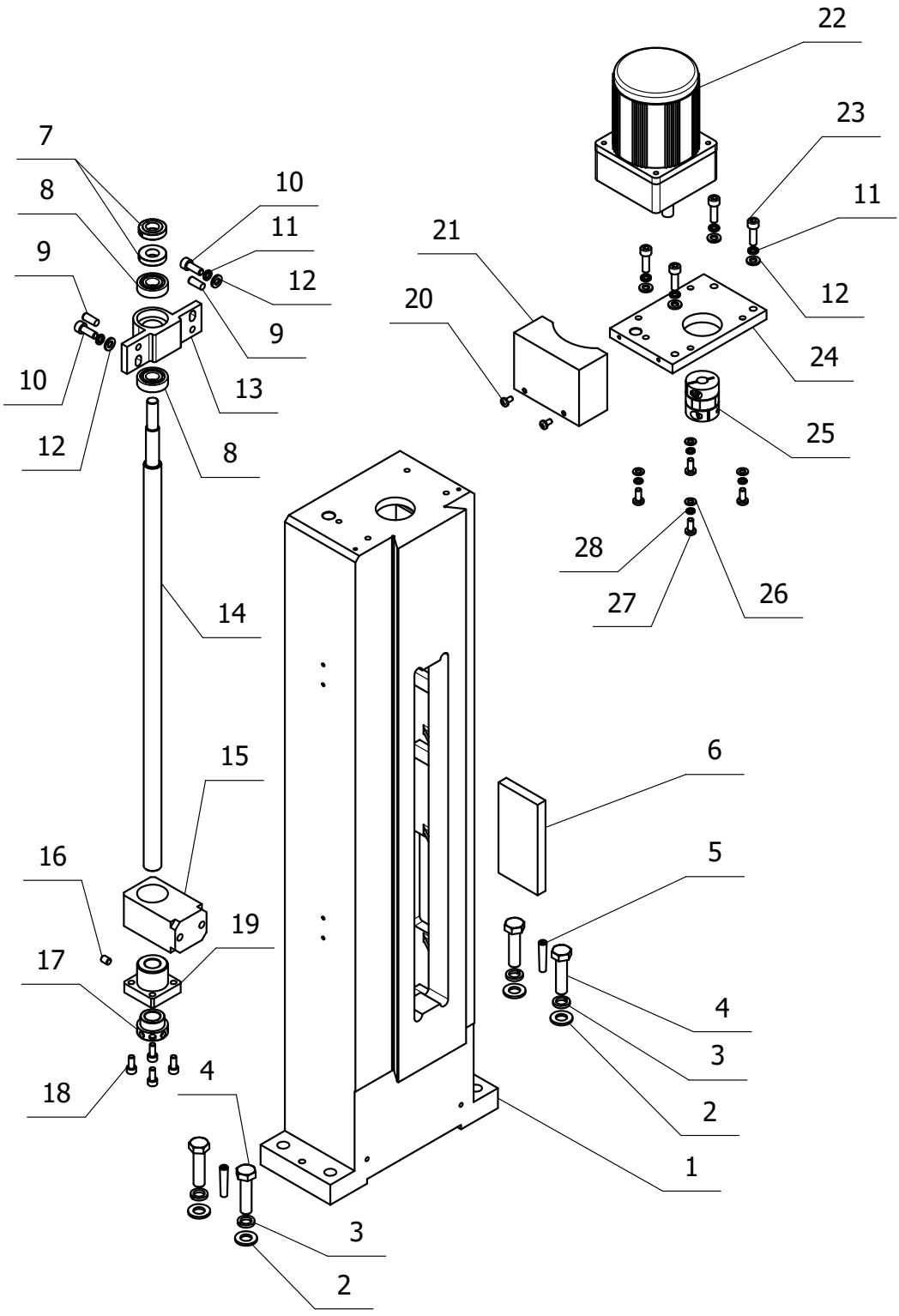


Figure 37 – Replacement Parts Illustration for Column with Z Axis Motor Auto Lift

REPLACEMENT PARTS ILLUSTRATION 3A

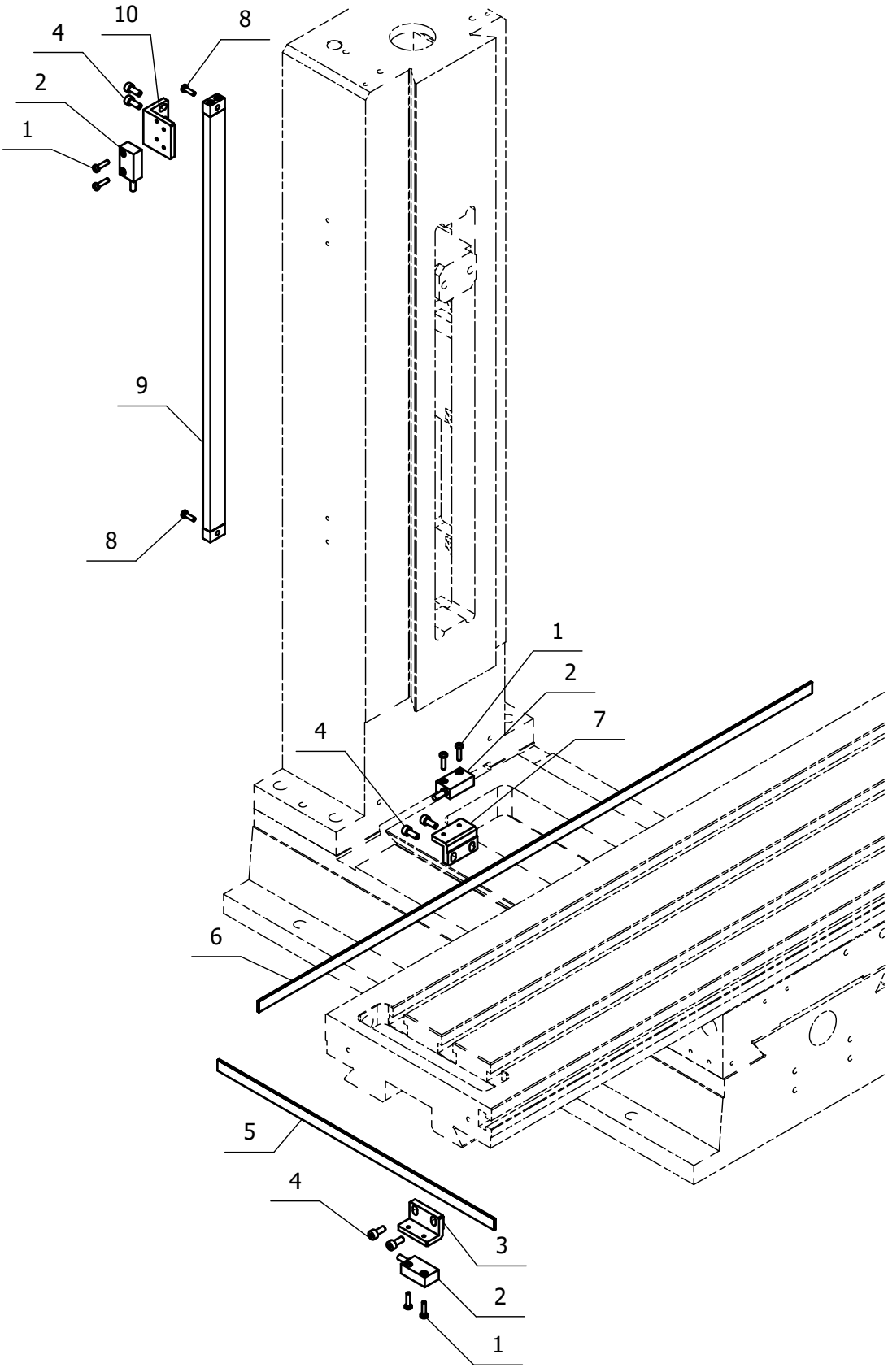


Figure 38 – Replacement Parts Illustration for Magnetic Scales and Readers

REPLACEMENT PARTS ILLUSTRATION 4A

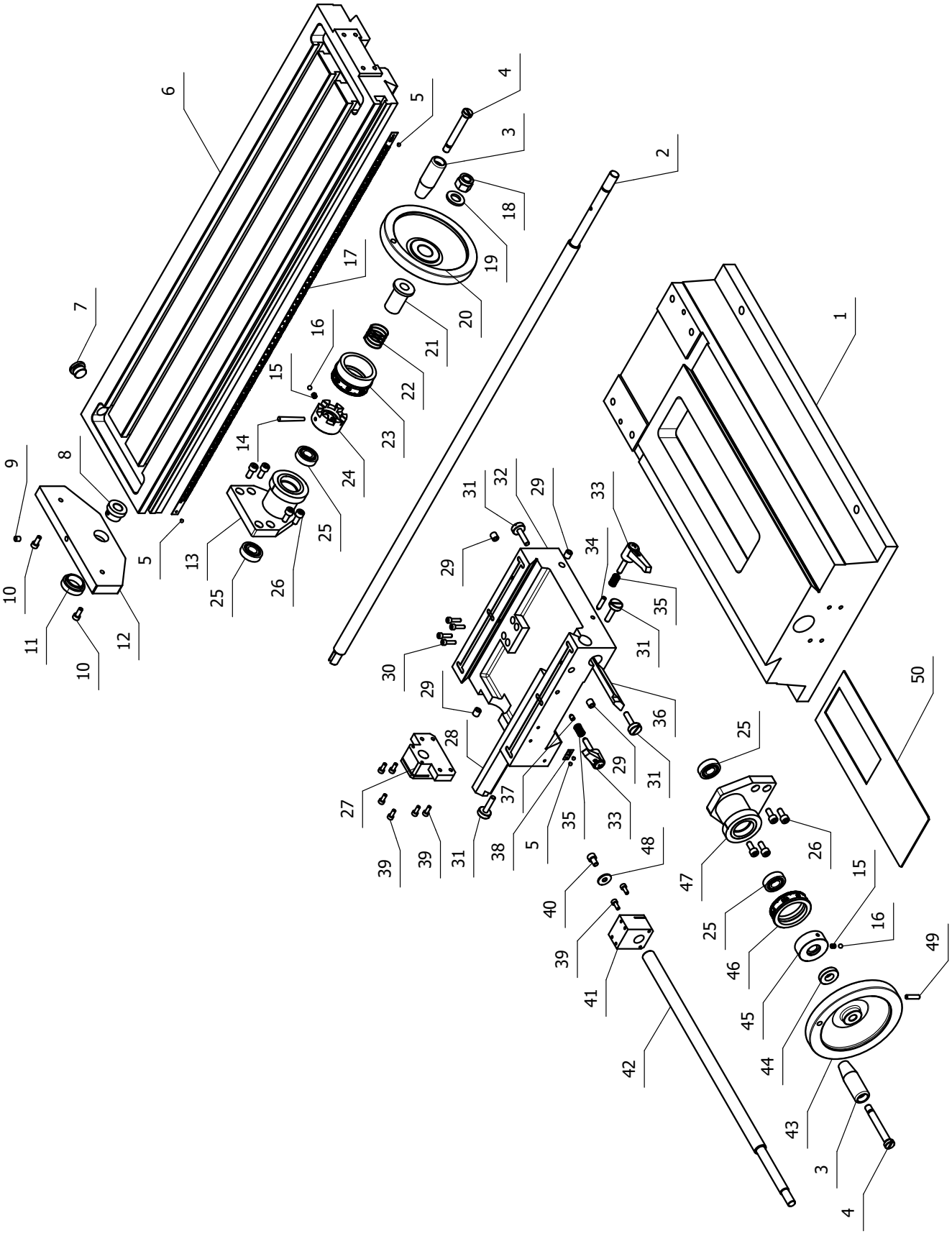


Figure 39 – Replacement Parts Illustration for Worktable and Base

REPLACEMENT PARTS ILLUSTRATION 5B

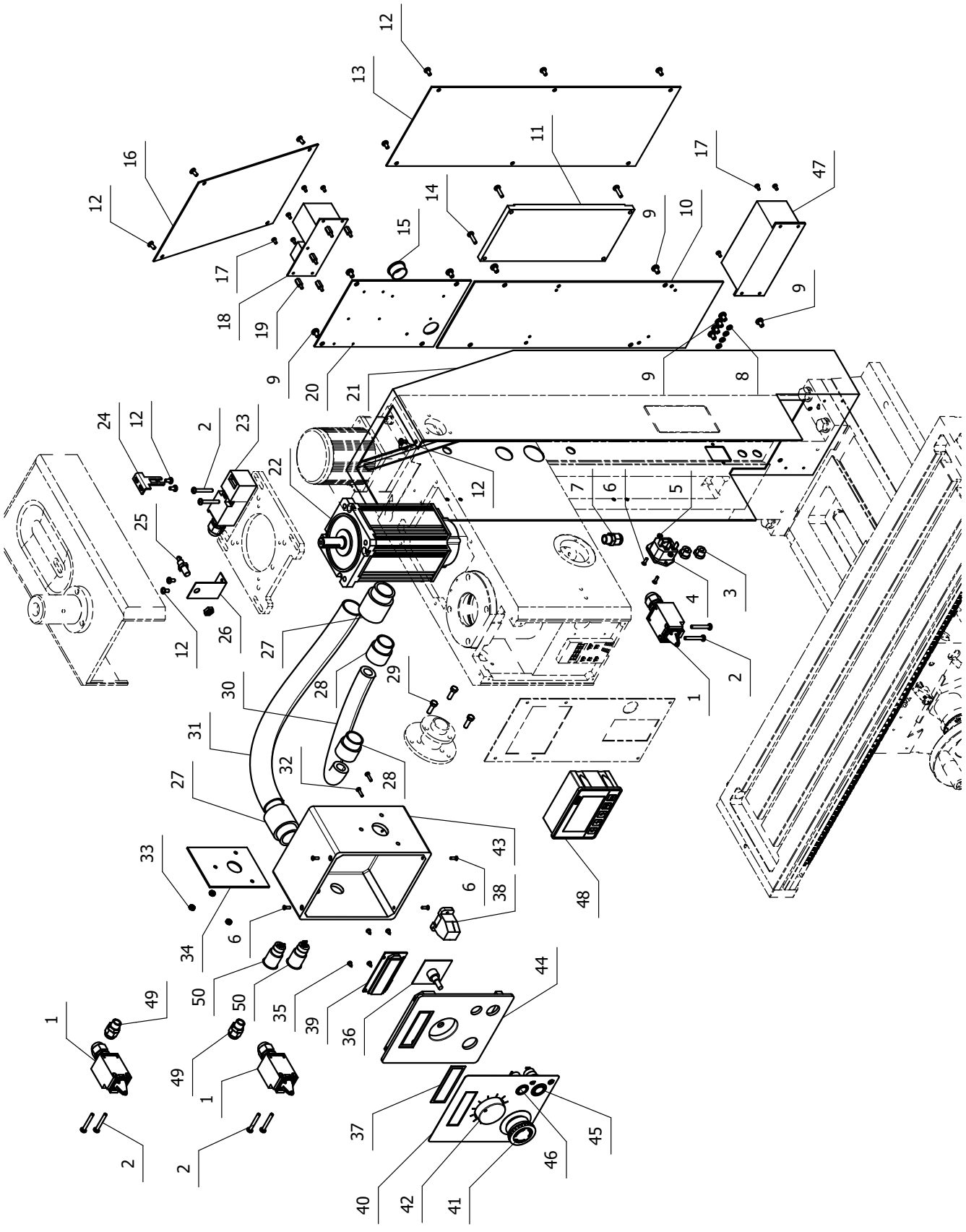


Figure 40 – Replacement Parts Illustration for Left Control Box with Z Axis Auto Lift Switches

REPLACEMENT PARTS ILLUSTRATION 6A

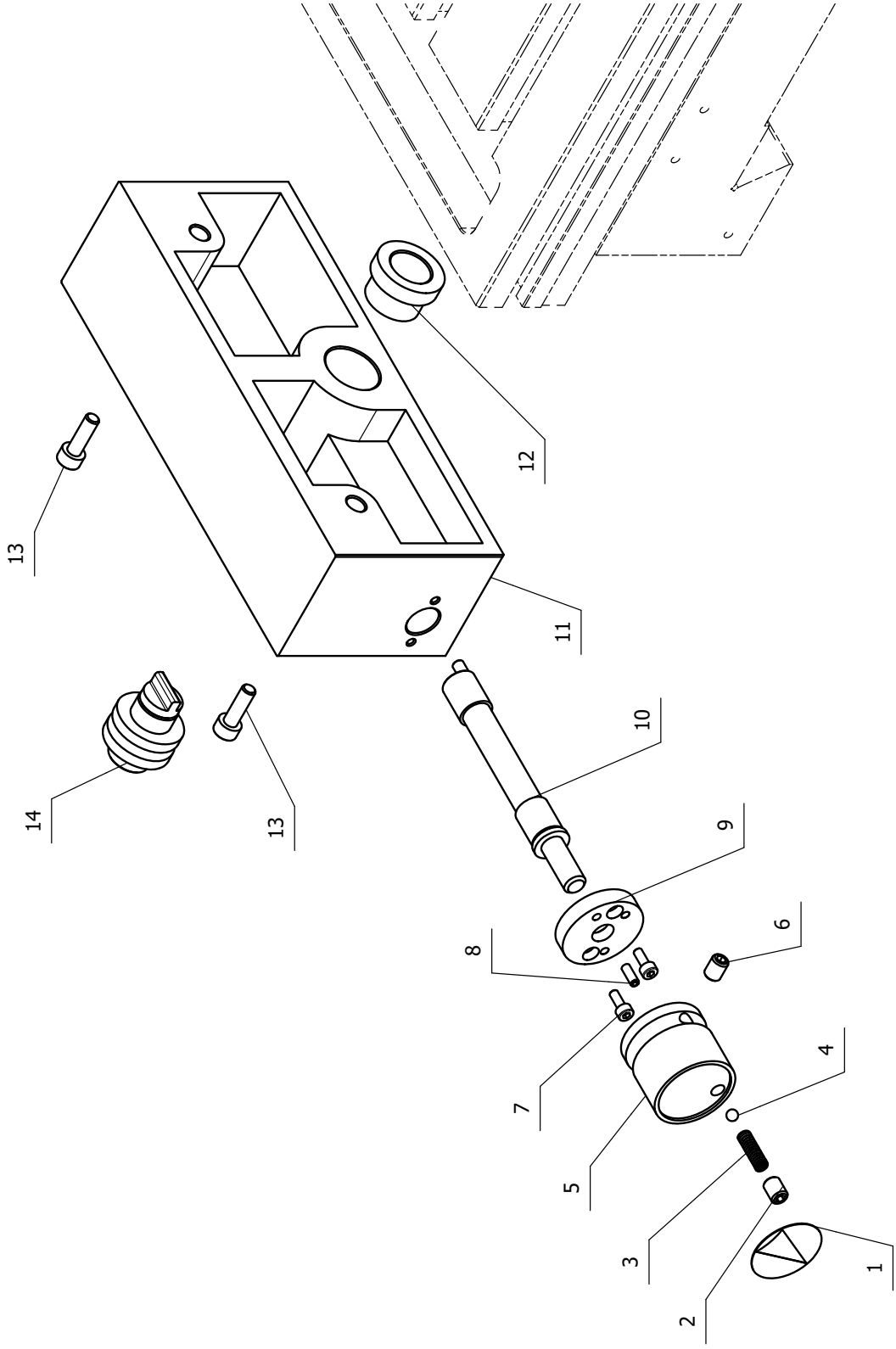


Figure 41 – Replacement Parts Illustration for Power Feeder Clutch Assembly

REPLACEMENT PARTS ILLUSTRATION 6B

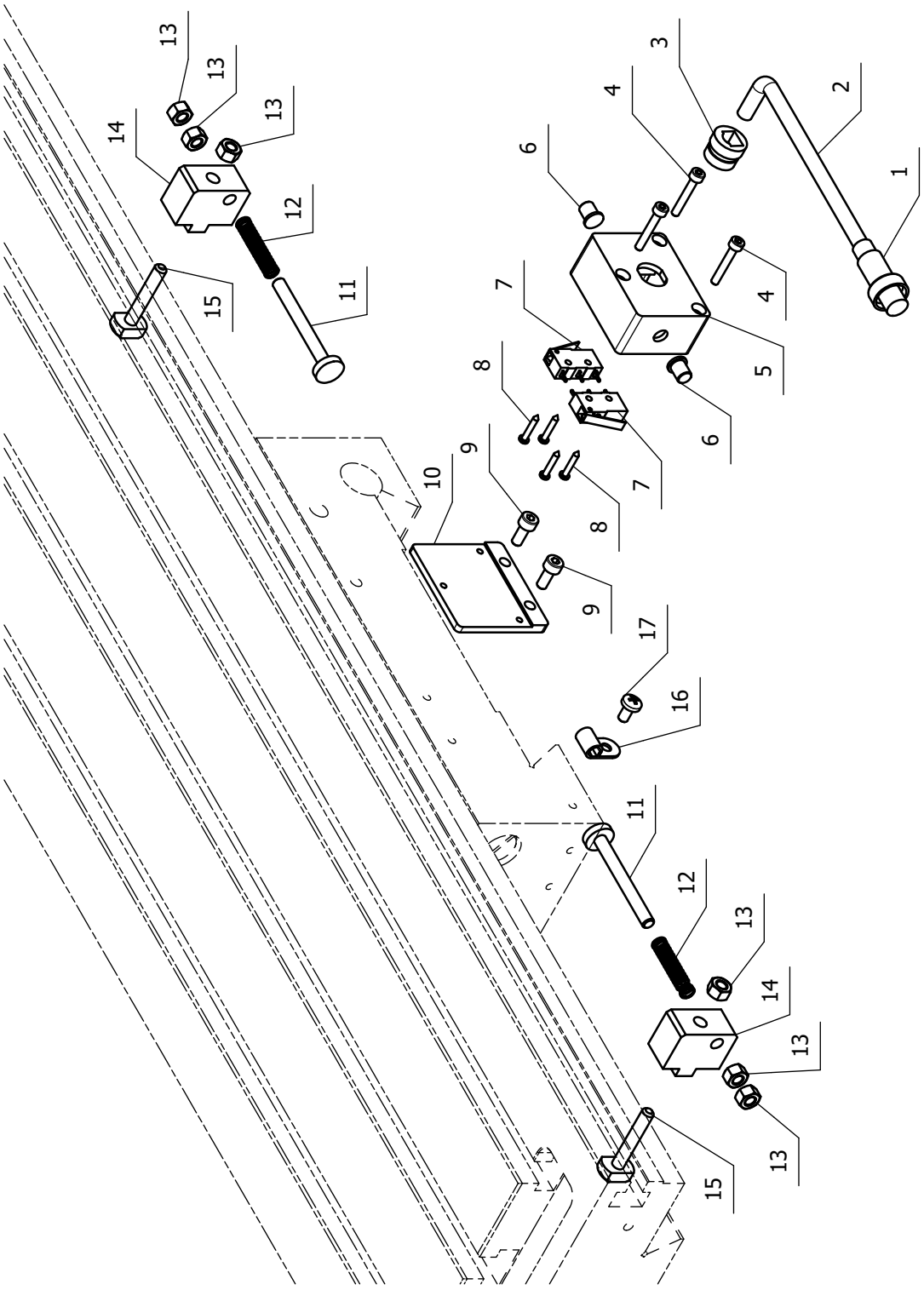


Figure 42 – Replacement Parts Illustration for Power Feeder Limit Devices Assembly

REPLACEMENT PARTS ILLUSTRATION 7A

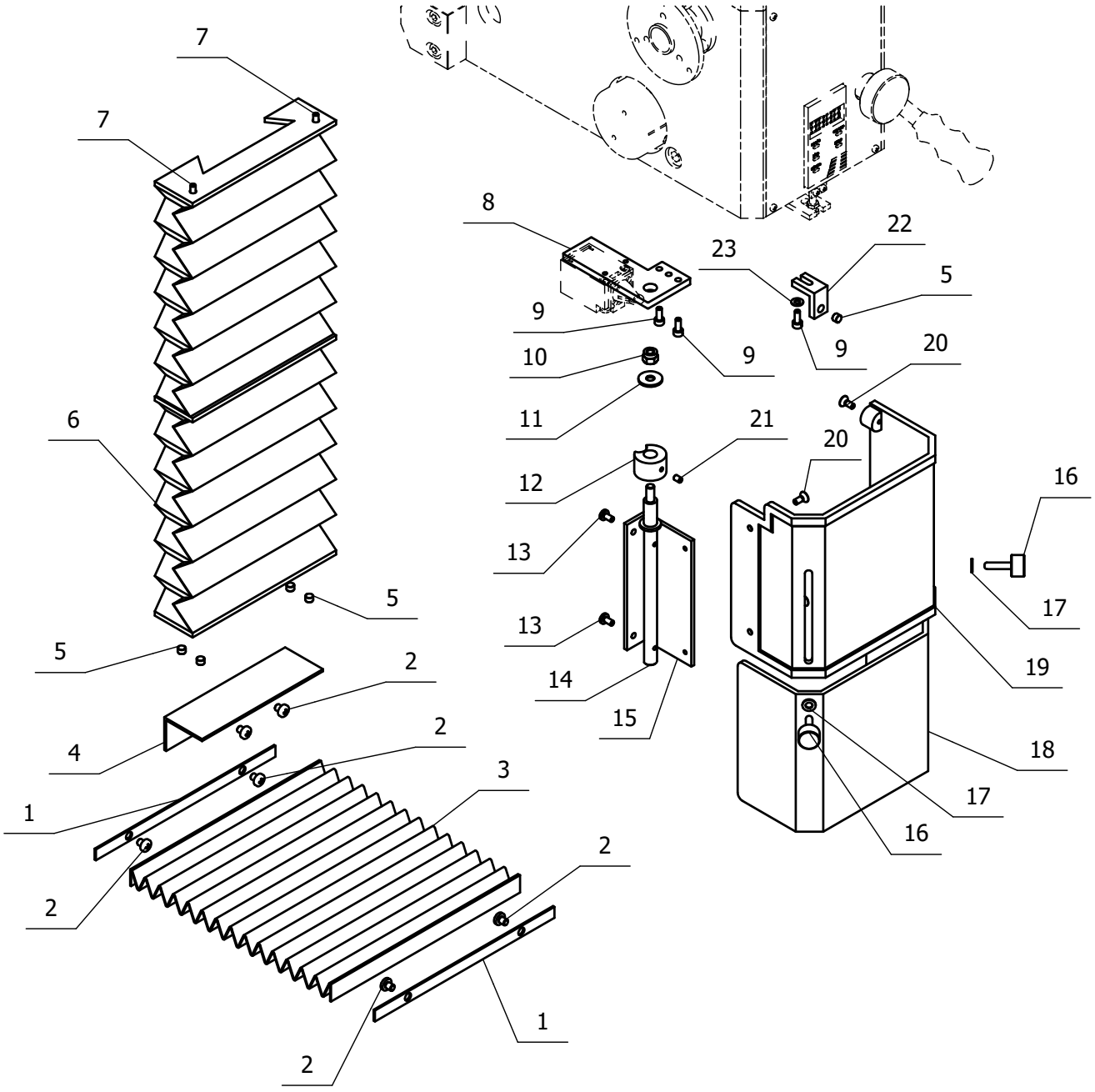


Figure 43 – Replacement Parts Illustration for Dustproof and Chuck Guard Assembly

REPLACEMENT PARTS LIST FOR 18″ MILL DRILL W/ DRO & POWER FEED

Ref. No.	Description	Part No.	Qty.
1D-1	JT6 taper shank	9646740.01	1
1D-2	R8 spindle	9646741.01	1
1D-3	Spindle under oil seal I	9646742.01	1
1D-4	Taper roller bearing 32907	9646743.01	1
1D-5	Up washer	9646744.01	1
1D-6	Spindle sleeve	9646745.01	1
1D-7	Sleeve limit washer	9646746.01	1
1D-8	Spindle under oil seal II	9646747.01	1
1D-9	Thrust ball bearing 8106	9646748.01	1
1D-10	Up washer II	9646749.01	1
1D-11	Deep groove ball bearing 80106	9646750.01	1
1D-12	Hexagon headed bolt M8*40	*	2
1D-13	Slotted round nut M27*1.5	*	2
1D-14	Press cake	9646751.01	1
1D-15	Spring washer 8	*	2
1D-16	Washer 8	*	2
1D-17	bevel wheel	9646752.01	1
1D-18	Check ring 20	9646753.01	2
1D-19	Locking small shaft	9646754.01	1
1D-20	Socket head cap screw M4*10	*	13
1D-21	Handle seat	9646755.01	1
1D-22	Small handle	9646756.01	2
1D-23	Locking lever	9646757.01	1
1D-24	Adjust washer	9646758.01	1
1D-25	Shaft right support flange	9646759.01	1
1D-26	Ball 8	9646760.01	3
1D-27	Flat key 4*8	*	1
1D-28	Down cover	9646761.01	1
1D-29	Gear shaft	9646762.01	1
1D-30	Slotted cylindrical end fastening screw M6*14	*	1
1D-31	Internal hexagonal flat end fastening screw M6*8	*	1
1D-32	Spindle box	9646763.01	1
1D-33	Brushless motor	9646764.01	1
1D-34	poly V-belt J*456*13 (5 slot)	9646765.01	1
1D-35	Timing belt 3m*396*15	9646766.01	1
1D-36	Flat key 5*25	*	1
1D-37	Washer 5	*	4
1D-38	Spring washer 5	*	8
1D-39	Socket head cap screw M5*20	*	8
1D-40	Double end stud	9646767.01	1
1D-41	Motor fixed plate	9646768.01	1
1D-42	Oblique plug iron	9646769.01	1
1D-43	Iron stopper screw	9646770.01	2
1D-44	Spindle synchronous belt wheel	9646771.01	1
1D-45	Magnet steel Φ6	9646772.01	4
1D-46	Motor synchronous belt wheel	9646773.01	1
1D-47	Motor synchronous belt wheel	9646774.01	1
1D-48	Washer	*	1
1D-49	Round pin A3*10	*	1
1D-50	Cross recessed countersunk head screw H M6*16	9646775.01	1
1D-51	Box top cover	9646776.01	1
1D-52	Washer	*	1
1D-53	Handle	9646777.01	1
1D-54	Dust cover on spindle II	9646778.01	1
1D-55	Dust cover on spindle I	9646779.01	1
1D-56	Lifting rod (R8)	9646780.01	1
1D-57	Socket head cap screw M5*16	*	4
1D-58	Bearing seat	9646781.01	1
1D-59	Deep groove ball bearing 80107	9646782.01	1
1D-60	Check ring 62	9646783.01	1
1D-61	Check ring 35	9646784.01	1
1D-62	Shaft tooth left support flange	9646785.01	1
1D-63	Spring round pin 3*8	*	1
1D-64	Check ring 16	9646786.01	1
1D-65	Longitudinal stopper locking rod	9646787.01	1
1D-66	Small handle assembly	9646788.01	1
1D-67	Fixed limit block	9646789.01	1
1D-68	Socket head cap screw M6*20	*	2
1D-69	Socket head cap screw M5*12	*	3
1D-70	Connect bracket	9646790.01	1
1D-71	Disc spring housing	9646791.01	1
1D-72	Disc spring	9646792.01	1
1D-73	Spindle sleeve locking shaft	9646793.01	1
1D-74	Socket head cap screw M10*25	*	1
1D-75	Washer 4	*	5
1D-76	Cross recessed head screw H M4*8	*	2
1D-77	Fixed mount	9646794.01	2
1D-78	Digital display module GD300-165	9646795.01	1
1D-79	Cross recessed head screw H M3*8	*	8
1D-80	worm shaft	9646796.01	1
1D-81	Thrust ball bearing 12*22*5	9646797.01	2
1D-82	Cross recessed head screw H M3*6	*	6
1D-83	Fine feeding hand wheel	9646798.01	1
1D-84	Internal hexagonal flat end fastening screw M6*6	9646799.01	1
1D-85	Worm eccentric sleeve	9646800.01	1
1D-86	Square screw of display ruler	9646801.01	1
1D-87	Register pin	9646802.01	1
1D-88	Cross recessed countersunk head screw H M3*10	*	2
1D-89	Display fixing bracket	9646803.01	1
1D-90	Hex nut M5	*	2
1D-91	Panel (use for fix display)	9646804.01	1
1D-92	Conductive ring assembly	9646805.01	1
1D-93	Cross recessed countersunk head screw H M3*12	*	3
1D-94	Operating handle assembly	9646806.01	3
1D-95	Compress spring 0.8*6*25	9646807.01	3
1D-96	Forward/reverse joystick assembly	9646808.01	3
1D-97	Check ring 3	9646809.01	3
1D-98	Shoulder cylinder key	9646810.01	1
2B-1	Fuselage	9646811.01	1
2B-2	Washer 10	*	4
2B-3	Spring washer 10	*	4
2B-4	Hexagon headed bolt M10*40	*	4

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

REPLACEMENT PARTS LIST FOR 18″ MILL DRILL W/ DRO & POWER FEED

Ref. No.	Description	Part No.	Qty.
2B-5	Internal thread taper pin 6*32	9646812.01	2
2B-6	Magnetic block	9646813.01	1
2B-7	Locking nut	9646814.01	2
2B-8	Deep Groove Ball Bearing 6001	9646815.01	2
2B-9	Taper pin inside screw 6*16	9646816.01	2
2B-10	Hexagon head screw M6*16	*	2
2B-11	Spring washer 6	*	6
2B-12	Washer 6	*	6
2B-13	Leadscrew support	9646817.01	1
2B-14	Lifting leadscrew	9646818.01	1
2B-15	Nut support	9646819.01	1
2B-16	Internal hexagonal fastening screw-flat end M6*8	9646820.01	1
2B-17	Metric lifting lock nut	9646821.01	1
2B-18	Hexagon head screw M5*12	*	4
2B-19	Metric lifting leadscrew nut	9646822.01	1
2B-20	Cross recessed head screw H M4*8	*	2
2B-21	Lifting motor hood	9646823.01	1
2B-22	Induction-motor with gearbox	9646824.01	1
2B-23	Hexagon head screw M6*20	*	4
2B-24	Z motor connection plate	9646825.01	1
2B-25	Clutch	9646826.01	1
2B-26	Washer 5	*	4
2B-27	Cross recessed head screw H M5*12	*	4
2B-28	Spring washer 5	*	4
3A-1	Cross recessed head screw type H M3*12	*	6
3A-2	Digital display head	9646827.01	3
3A-3	Longitudinal head bracket	9646828.01	1
3A-4	Hexagon head screw M4*10	*	6
3A-5	Longitudinal magnetic ruler	9646829.01	1
3A-6	Transverse magnetic ruler	9646830.01	1
3A-7	Transverse magnetic head bracket	9646831.01	1
3A-8	Cross recessed head screw type H M3*10	*	2
3A-9	X direction magnetic grating ruler assembly	9646832.01	1
3A-10	Vertical head bracket	9646833.01	1
4A-1	Base	9646834.01	1
4A-2	X-Axis leadscrew	9646835.01	1
4A-3	Handle sleeve	9646836.01	2
4A-4	Handle sleeve screw	9646837.01	2
4A-5	Label rivet 2*4	*	4
4A-6	Worktable	9646838.01	1
4A-7	End cap	9646839.01	1
4A-8	Longitudinal leadscrew support left sleeve	9646840.01	1
4A-9	Oil cup 6	9646841.01	1
4A-10	Hexagon head screw M5*12	*	2
4A-11	Left bracket cover	9646842.01	1
4A-12	Left bracket cover	9646843.01	1
4A-13	Bearing seat	9646844.01	2
4A-14	Round taper pin A4*40	9646845.01	1
4A-15	Compress spring 0.5*4.65*9	9646846.01	2
4A-16	Steel ball 5	9646847.01	2
4A-17	Graduated scale	9646848.01	1
4A-18	Hexagonal locking nut M12	*	1
4A-19	Washer 12	*	1
4A-20	Handwheel	9646849.01	1
4A-21	Tight sleeve	9646850.01	1
4A-22	Compress spring	9646851.01	1
4A-23	Graduated scale	9646852.01	1
4A-24	Leadscrew clutch	9646853.01	1
4A-25	Deep groove ball bearing 6001	9646854.01	4
4A-26	Hexagon head screw M6*14	*	8
4A-27	X-axis leadscrew nut	9646855.01	1
4A-28	Crossrange oblique plug iron	9646856.01	1
4A-29	Oil cup 8	9646857.01	4
4A-30	Hexagon head screw M4*16	*	4
4A-31	Wedge screw	9646858.01	4
4A-32	Saddle	9646859.01	1
4A-33	Small handle assembly	9646860.01	2
4A-34	Longitudinal wedge locking crown bar	9646861.01	1
4A-35	Compress spring 1*9.2*14	9646862.01	2
4A-36	Longitudinal oblique plug iron	9646863.01	1
4A-37	Longitudinal wedge locking crown bar	9646864.01	1
4A-38	Zero sign	9646865.01	1
4A-39	Hexagon head screw M4*10	*	8
4A-40	Hexagon head screw M6*10	*	1
4A-41	Y-axis leadscrew nut	9646866.01	1
4A-42	Y-axis leadscrew	9646867.01	1
4A-43	Aluminim handwheel	9646868.01	1
4A-44	Locking nut	*	1
4A-45	Scale ring sleeve	9646869.01	1
4A-46	Scale ring	9646870.01	1
4A-47	Positioning ring	9646871.01	2
4A-48	Washer 6	*	1
4A-49	Internal hexagonal fastening screw-flat end M5*20	*	1
4A-50	Chip breaker plate	9646872.01	1
5B-1	Safety limit switch QKS7	9646873.01	3
5B-2	Cross groove small disc screw type Z M4*30	9646874.01	8
5B-3	Thread buckle	9646875.01	2
5B-4	Socket with fuse DB-14F	9646876.01	1
5B-5	Hex. nut M3	*	2
5B-6	Cross recessed countersunk head screw H M3*10	*	6
5B-7	Pull not off M12	9646877.01	1
5B-8	Spring washer M5	*	4
5B-9	Cross recessed head screw type H M5*8	*	14
5B-10	Lower liner	9646878.01	1
5B-11	PC Board	9646879.01	1
5B-12	Cross recessed head screw type H M4*8	*	16
5B-13	Lower cover plate	9646880.01	1
5B-14	Cross recessed head screw type H M4*16	*	4
5B-15	Buttoned guard ring SB-22	9646881.01	1
5B-16	Upper cover plate	9646882.01	1
5B-17	Cross recessed head screw type H M3*6	*	9
5B-18	DC power supply board ZD-1	9646883.01	1

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

REPLACEMENT PARTS LIST FOR 18″ MILL DRILL W/ DRO & POWER FEED

Ref. No.	Description	Part No.	Qty.
5B-19	Hexagonal isolation column HTS-310	9646884.01	5
5B-20	Upper liner	9646885.01	1
5B-21	Post back cover	9646886.01	1
5B-22	Brushless motor	9646887.01	1
5B-23	Safety switch QKS8	9646888.01	1
5B-24	Safety limit switch insert QKS8-1	9646889.01	1
5B-25	Probe head M8	9646890.01	1
5B-26	Probe head support	9646891.01	1
5B-27	Quick hose connector	9646892.01	2
5B-28	Quick hose connector	9646893.01	2
5B-29	Hexagon headed bolt M5*16	*	3
5B-30	Flexible pipe	9646894.01	1
5B-31	Flexible pipe	9646895.01	1
5B-32	Cross recessed head screw type H M3*12	*	2
5B-33	Hex nut M4	*	3
5B-34	Electric box liner	9646896.01	1
5B-35	Self tapping screw ST2.9*6.5	*	4
5B-36	Knob plate	9646897.01	1
5B-37	back plate	9646898.01	1
5B-38	One male, two mother extension line w/ fixed seat	9646899.01	1
5B-39	liquid crystal board	9646900.01	1
5B-40	Switch sign	9646901.01	1
5B-41	Emergency stop button HY57B	9646902.01	1
5B-42	Knob	9646903.01	1
5B-43	Electric box	9646904.01	1
5B-44	Electric box cover	9646905.01	1
5B-45	Start stop button M19	9646906.01	1
5B-46	Tapping button M16	9646907.01	1
5B-47	filter	9646908.01	1
5B-48	MG10V digital display	9646909.01	1
5B-49	Pull not off M12	9646910.01	2
5B-50	19 button	9646911.01	2
6A-1	Shift indicator label	9646912.01	1
6A-2	Internal hexagonal fastening screw-flat end M6*8	*	1
6A-3	Compress spring 0.7*4*25	9646913.01	1
6A-4	Steel ball 4	9646914.01	1
6A-5	Handle	9646915.01	1
6A-6	Internal hexagonal fixed screw-taper end M6*8	*	1
6A-7	Hexagon head screw M3*8	*	2
6A-8	Spring round pin 3*8	*	1
6A-9	Flange	9646916.01	1
6A-10	Eccentric shaft	9646917.01	1
6A-11	Support seat	9646918.01	1
6A-12	Shaft sleeve	9646919.01	1
6A-13	Hexagon head screw M5*16	*	2
6A-14	Connector assembly	9646920.01	1
6B-1	Three-core connector head	9646921.01	1
6B-2	Black cable	9646922.01	1
6B-3	Thread buckle	9646923.01	1
6B-4	Hexagon head screw M3*20	*	3
6B-5	Micro switch box	9646924.01	1
6B-6	Impact nail	9646925.01	2
6B-7	Micro switch	9646926.01	2
6B-8	Self tapping screw ST2.2-13	*	4
6B-9	Hexagon head screw M4*10	*	2
6B-10	Micro switch bottom plate	9646927.01	1
6B-11	Pin roll	*	2
6B-12	Compress spring 0.5*4.5*28	*	2
6B-13	Hex nut M5	*	6
6B-14	Limit block	9646928.01	2
6B-15	T type bolt	9646929.01	2
6B-16	wiring fixing button	9646930.01	1
6B-17	Cross recessed head screw type H M4*8	*	1
7A-1	Filler strip	9646931.01	2
7A-2	Cross recessed head screw type H M5*6	*	6
7A-3	Dust guard	9646932.01	1
7A-4	Column shield baffle	9646933.01	1
7A-5	Φ6 magnet steel	9646934.01	5
7A-6	Lifting guide rail shield	9646935.01	1
7A-7	Cross recessed head screw type H M4*10	*	2
7A-8	Tie strap	9646936.01	1
7A-9	Hexagon head screw M4*10	*	3
7A-10	Hexagonal locking nut M6	*	1
7A-11	Washer 6	*	1
7A-12	Spacer sleeve	9646937.01	1
7A-13	Cross recessed head screw type H M4*8	*	2
7A-14	Rotation shaft	9646938.01	1
7A-15	Support	9646939.01	1
7A-16	Knurled flat head screw M5*20	9646940.01	2
7A-17	Washer 5	*	2
7A-18	Inner shield	9646941.01	1
7A-19	Outer shield	9646942.01	1
7A-20	Cross recessed countersunk head screw H M4*10	*	3
7A-21	Internal hexagonal fixed screw-taper end M4*6	*	1
7A-22	Link stopper	9646943.01	1
7A-23	Washer 4	*	1

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

NOTES

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 is 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 elated to the use or inability to use our products. This warranty gives you specific legal rights which may vary from state to state.

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