



830VS Milling Machine

Operation Manual



Safety Rules

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Warning: Failure to follow these rules may result in serious injury.

1. For your own safety, carefully read this instruction manual before operating the machine, learn the machines application and limitations as well as the specific hazards associated with this type of machine.
2. Always keep the guards in place and in working order.
3. Always wear eye protection, normal glasses only have impact resistant lenses and are not suitable as safety glasses, also use a face or dust mask if the cutting operation is dusty.
4. Remove any adjusting keys and wrenches before operating the machine.
5. Keep the work area clean and clear of any obstacles.
6. Do not use the machine in a dangerous environment, do not expose the machine to rain or use the machine in damp or wet conditions. Keep the work area well lighted.
7. Keep children and other visitors away from the machine and the work area.
8. Make the workshop childproof by using padlocks, master switches or by removing any starter keys.
9. Do not force a machine to do a job for which it was not designed and only use the machine at a rate for which it was designed.
10. Only use an extension cord that is in good condition and that is suitable for the current that this machine will draw. An undersized cord will cause a drop in the line voltage which will result in a loss of power and overheating. If in doubt, use a larger than necessary cable for this machine.
11. Wear the appropriate safety clothing and do not wear loose clothing, gloves, neckties, rings, bracelets or other jewellery that can get caught in the moving parts of the machine. The use of non-slip footwear is recommended as is wearing a protective hat or a hairnet to contain long hair.
12. Make sure that the workpiece is secured in a vice or with the appropriate clamps, do not attempt to hold the workpiece by hand.
13. Do not overreach, maintain a proper footing at all times.
14. Keep the tooling sharp and clean for the best and safest performance, follow the instructions for lubricating and changing accessories.
15. When performing any maintenance or changing accessories such as cutting tools etc. make sure that the machine has been turned off.
16. Make sure that the switches are in the off position before starting the machine to reduce the risk of accidents due to unintentional starting.
17. Only ever use the recommended accessories, the use of improper accessories may cause injury or damage the machine.
18. Never stand on the machine, it could tip or the cutting tool could be unintentionally caught causing injury to the user.
19. Before starting the machine, check for any damaged parts such as guards or covers and that they can be safely operated and that they will perform their intended function. Check the alignment of the moving parts, for any binding of the moving parts, any broken parts and the mounting of any parts that may affect the machines operation. A guard or other part that is damaged should be repaired correctly or replaced.
20. Only feed work into the cutting tool against the direction of rotation of the spindle.
21. Never leave a machine running unattended, make sure that the machine is disconnected from the power supply and has come to a complete stop before leaving it.

22. Make sure that the machine is disconnected from the power supply while the motor is mounted, connected or disconnected.

Grounding Instructions

In the event of a malfunction or a breakdown, grounding provides a path of least resistance for the electrical current to reduce the risk of electric shock. This machine has been equipped with an electric cable with an equipment-grounding conductor and a grounding plug.

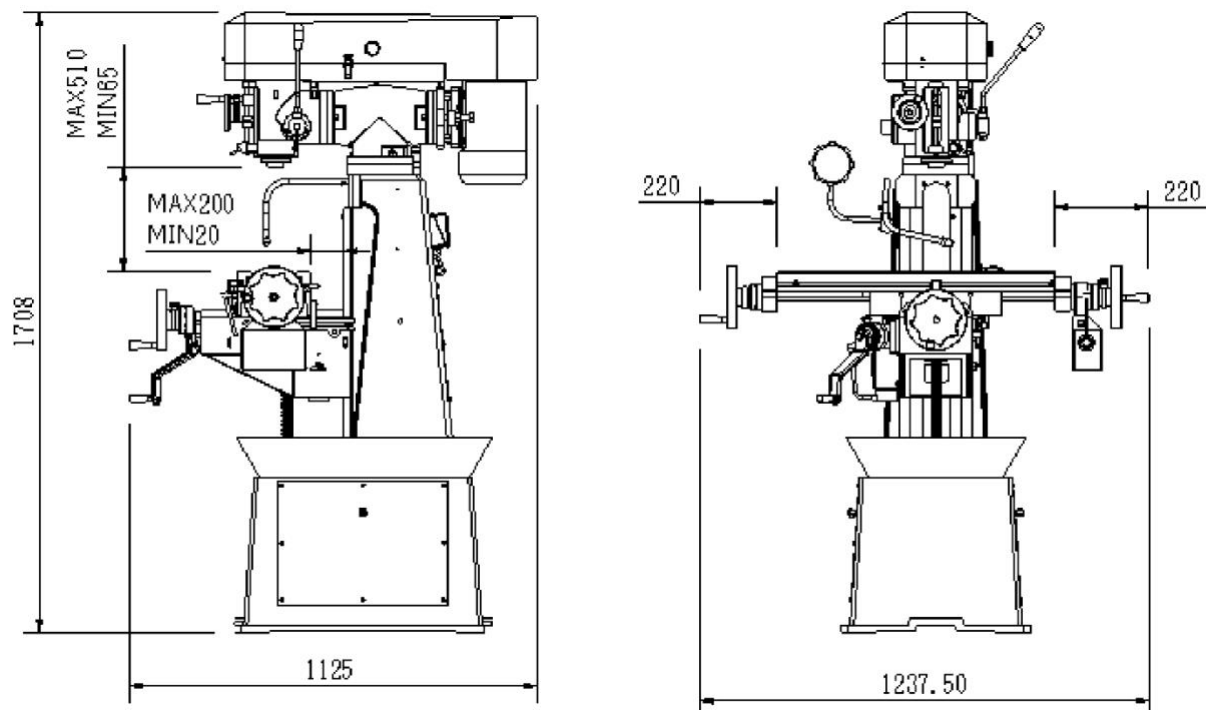
The plug must be plugged into a matching outlet that has been correctly installed and grounded in accordance with the local laws and regulations.

Do not modify the plug provided, if it will not fit the outlet, have the correct outlet installed by a qualified electrician.

Improper connection of the grounding conductor can result in a risk of electric shock. The conductor has been insulated with a green and yellow stripe jacket, if repair or replacement of the cable is required, do not connect the earthing cable to a live terminal.

Only ever use 3 core cables and three prong grounding plugs when using this machine and repair or replace the plug or cable if they are damaged immediately.

Machine Dimensions



Specifications

| | |
|--------------------------------------|------------------|
| Spindle Taper | R8 |
| Spindle Travel | 88.9mm |
| Spindle Speed | 200-2250rpm |
| Distance Spindle to Table Surface | 57-510mm |
| Size of Worktable | 205x760mm |
| Size of T-Slots | 14mm |
| Number of T-Slots | 3 |
| Maximum Longitudinal Travel of Table | 470mm |
| Maximum Cross Travel of Table | 200mm |
| Vertical Travel of Table | 455mm |
| Leadscrew for Drill Chuck | 3mm Pitch |
| Vertical Head Tilt Angle | ±90° |
| Head Swivelling Angle | 360° |
| Motor | 1.13kW (1.5Hp) |
| Net Weight | 450Kg |
| Size | 1100x1100x1900mm |

Features

1. This machine is a vertical milling machine and has been designed to be easy to use and to provide convenient operation with dual table handwheels.
2. This machine is practical for technical schools, small parts production, tool rooms, R&D work and maintenance shops.
3. This machine is suitable for many operations including conventional milling, compound angle milling, engraving, drilling and jig boring.
4. The castings are a high strength material that have been aged for several months before normalizing and tempering to minimize deformation.

Note:

1. Remove the case carefully to prevent damaging the machines paintwork, in the event that the machine is damaged in transit, contact the dealer immediately.
2. The machine has been carefully inspected and tested before it leaves our factory, contact the dealer if any defects are found on delivery.
3. Read the manual carefully and become familiar with the location of all of the parts to ensure the continued safe operation of this machine, it is important that the location of the emergency stop button is noted before use in the event of an emergency.

Installation

Install this machine on a solid, level foundation, ensure that space is provided around the machine to allow for the movement of the head in the horizontal axis and to allow for maintenance to the electrical system.

Cleaning and Lubricating the Machine

Once the machine is in position, thoroughly clean the machine with kerosene or other non-flammable cleaning solutions. Once all of the anti-rust grease has been removed, apply a thin layer of lubricating oil on the surface of the guideways, make sure that the machine is correctly lubricated prior to operating.

Levelling the Machine

Set the machines level prior to operating by placing an engineers level on the worktable in both the longitudinal and cross directions.

Isolation Switch

The isolation switch is located on the left side of the column and turns the machine on and off.

Adjustment of the Table Feed Travel

The longitudinal and cross feed can be set for any travel distance by adjusting the stop set screws that are located in front of the table and at the right side of the knee.

Adjustment of the Gibs

The table is provided with a full length tapered gib in the saddle which has been fitted with an adjustment screw on each end. To adjust the gib, tighten the two screws until a slight drag is felt when moving the table. If the table is not tight enough, loosen the adjusting screw on the small end and tighten the adjusting screw on the big end, if the gib is too tight, reverse the procedure. The procedure is the same on the saddle and knee gibs.

Clamping Table, Saddle and Knee

When milling with the longitudinal table feed only, it is advisable to clamp the knee with the column and the saddle with the knee to add rigidity to these parts and be able to make heavier cuts with the minimum amount of vibration. The saddle locking lever is located on the left-hand side of the saddle, ensure that the clamping pressure is adequate to hold the saddle securely.

The table clamping levers are located in front of the saddle and should always be clamped when longitudinal movement is required.

The knee clamping lever is located on the left side of the knee, leave the knee clamped at all times unless the knee is in operation.

Motor Mounting and Shifting Belts for Speed

The motor is mounted on a plate that is secured on the pulley housing. Release the belt set unit by turning the handle at the side of the motor then shift the belts to the desired speed before tightening the belt set unit. A speed chart is attached inside the pulley cover.

Quill Lock and Vertical Feed

The handle at the right lower corner of the head is the quill lock, when the vertical feed is not in use, set the handle to lock the quill and make the head more stable.

Open the pulley cover to locate a vertical oil cup in front of the pulley, open the cup and fill with oil a couple of times a day, this will lubricate the whole vertical spindle system from the top to the bottom.

The micrometer depth stop is graduated in millimeters, by using these graduations it is possible to accurately work to different depths. A lock nut can be found under the micrometer nut to ensure that the micrometer nut is secure.

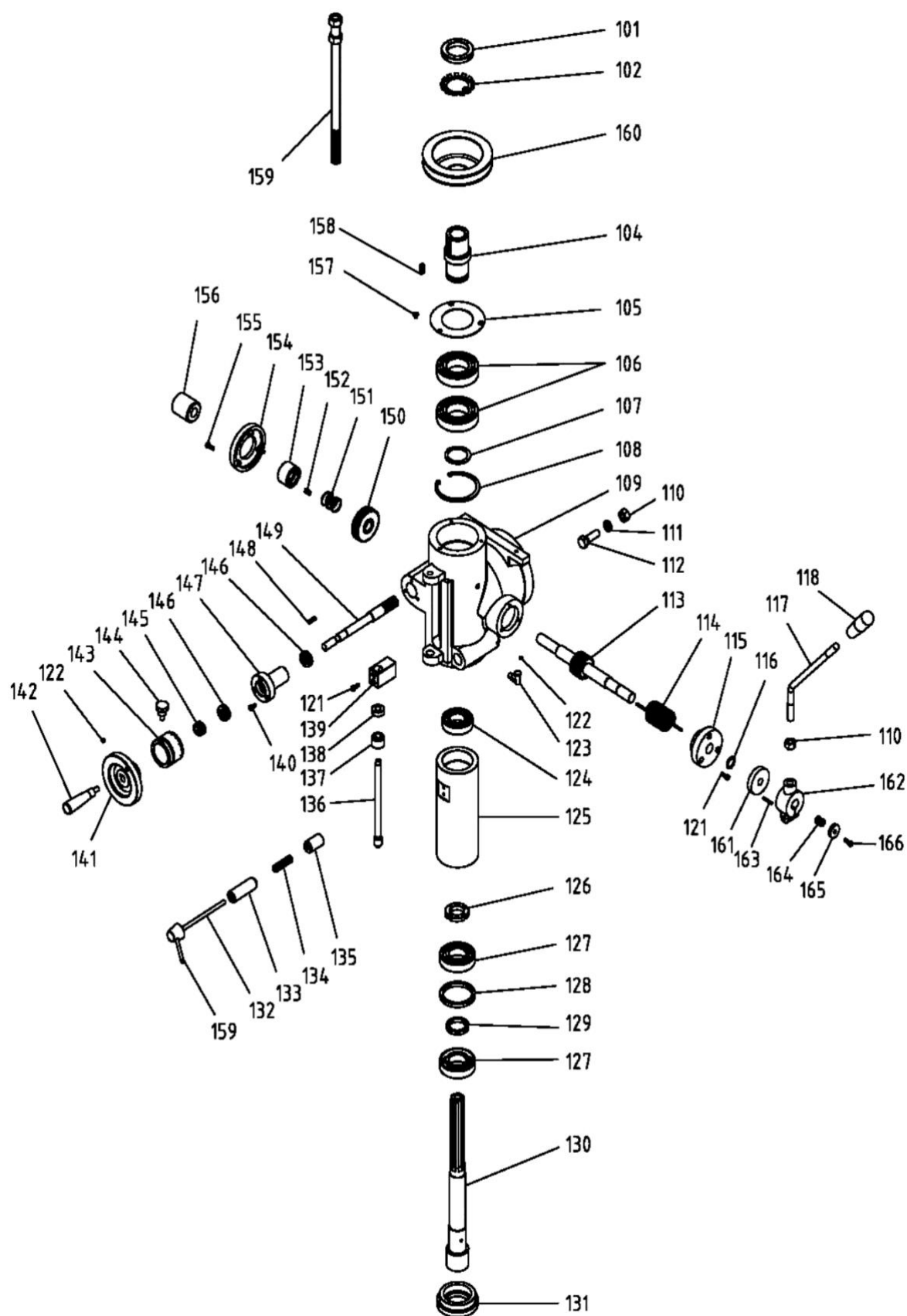
Quill Clutch

The vertical feed is controlled by a handwheel at the front of the head and a handle at the right-hand side of the head. When the handwheel is in use, tighten the clutch lock nut by hand or loosen it for hand operation. Use the handwheel for fine feed and the handle for higher feed rates.

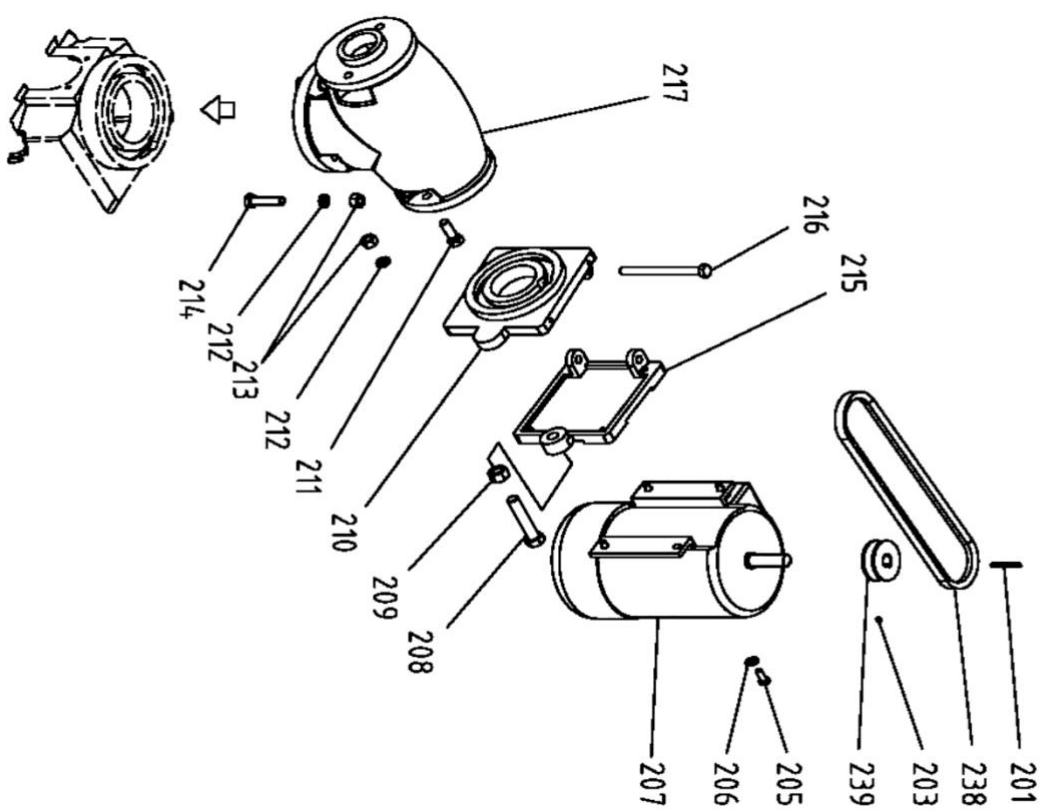
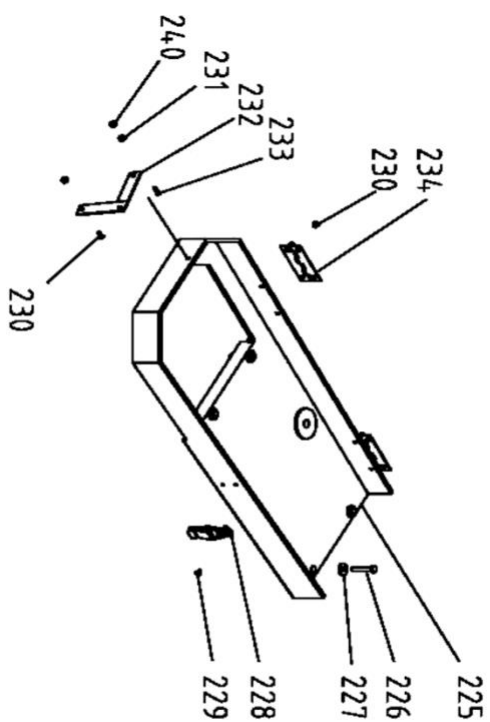
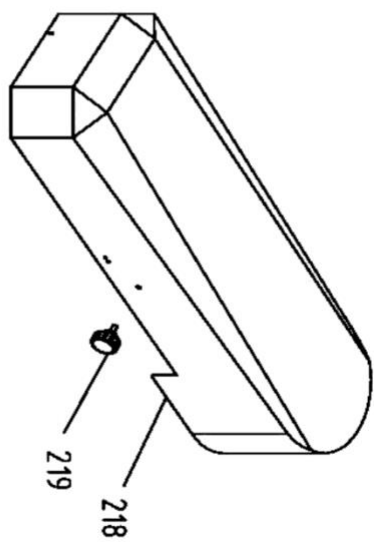
Vertical Head and Tee Adaptor

The vertical milling head can be tilted 90° in either direction by loosening the four locking bolts on the tee adaptor.

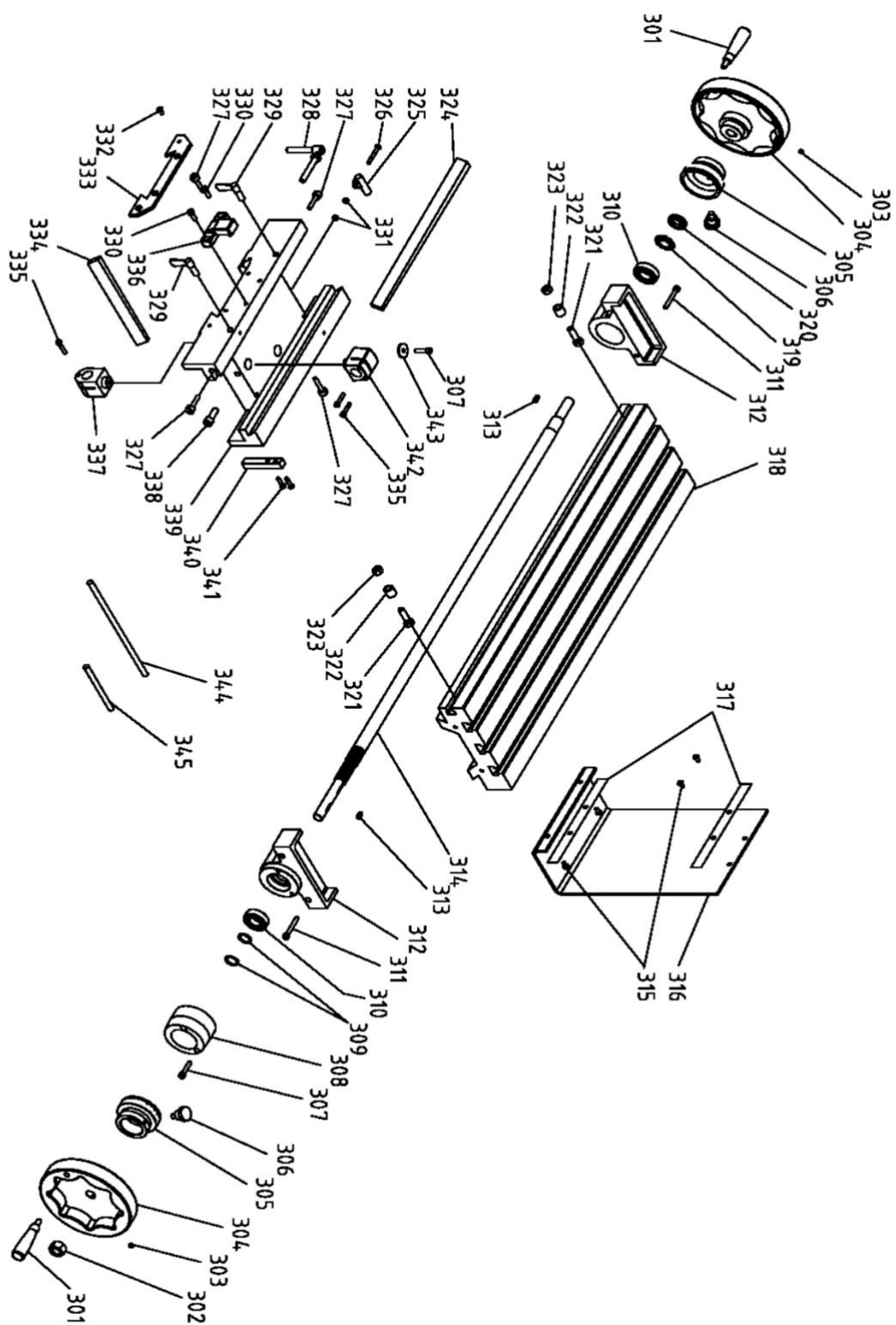
Loosen the two sets of bolts on the adaptor, the vertical milling head can then be swiveled 120°, tighten the bolts after the movement is complete. The motor and milling head must tilt together for the motor and head are suspended on the same pulley housing.



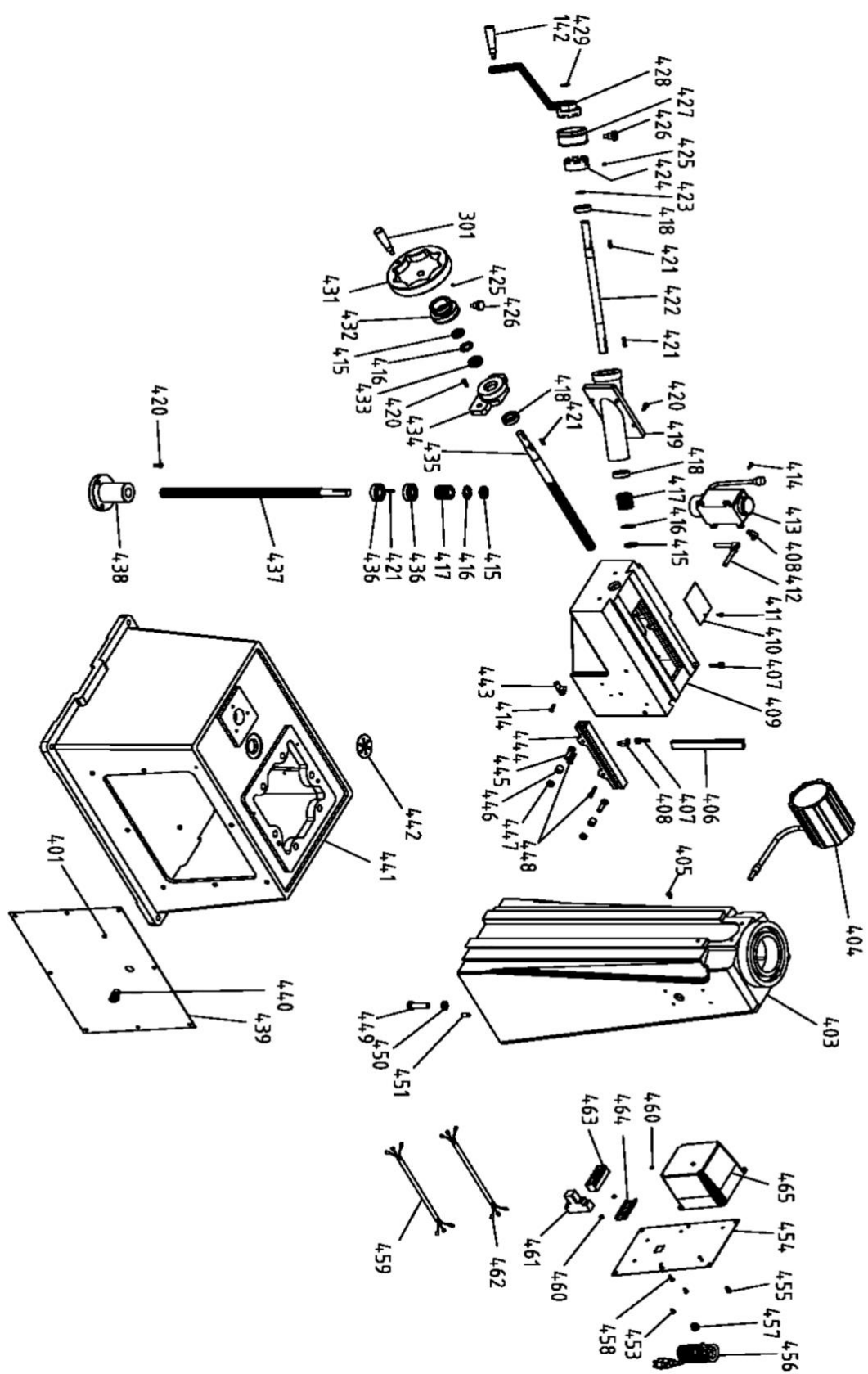
| Part | Description | Part | Description |
|------|--------------------|------|------------------------|
| 101 | Nut | 132 | Lock Knob Shaft |
| 102 | Washer | 133 | Lock Block (L) |
| 103 | **** | 134 | Spring |
| 104 | Spline Shaft | 135 | Lock Blocks (S) |
| 105 | Bearing Cover | 136 | Screw |
| 106 | Bearing 6209ZZ | 137 | Lock Nut |
| 107 | S-Ring 45 | 138 | Height Nut |
| 108 | C-Ring 85 | 139 | Block |
| 109 | Head Casting | 140 | M5-15 Pan Head Screw |
| 110 | 1/2" Nut | 141 | Handwheel |
| 111 | 1/2" Lock Washer | 142 | Handle |
| 112 | 1/2" - 1½" Screw | 143 | Stepped Sleeve |
| 113 | Gear Shaft | 144 | Dial Positioning Screw |
| 114 | Spring | 145 | 9/16" Nut |
| 115 | Flange Cover | 146 | Bearing 51102 |
| 116 | S-Ring 19 | 147 | Sleeve |
| 117 | Handle Lever | 148 | 5x5x20 Key |
| 118 | Knob | 149 | Worm Shaft |
| 119 | M8-25 Cap Screw | 150 | Coupling Worm Gear |
| 120 | Handle Base | 151 | Spring |
| 121 | M5-16 Cap Screw | 152 | 6x6x15 Key |
| 122 | M6-8 Set Screw | 153 | Coupling |
| 123 | Oil Cup | 154 | Plate |
| 124 | Bearing 6206ZZ | 155 | M5-10 Pan Head Screw |
| 125 | Spindle Quill | 156 | Knob |
| 126 | Nut | 157 | M5-8 Pan Head Screw |
| 127 | Bearing 7207 | 158 | Key |
| 128 | Bearing Washer (B) | 159 | Lock Handle |
| 129 | Bearing Washer (S) | 160 | Spindle Pulley |
| 130 | Spindle | 161 | Space |
| 131 | Spindle Nut | | |



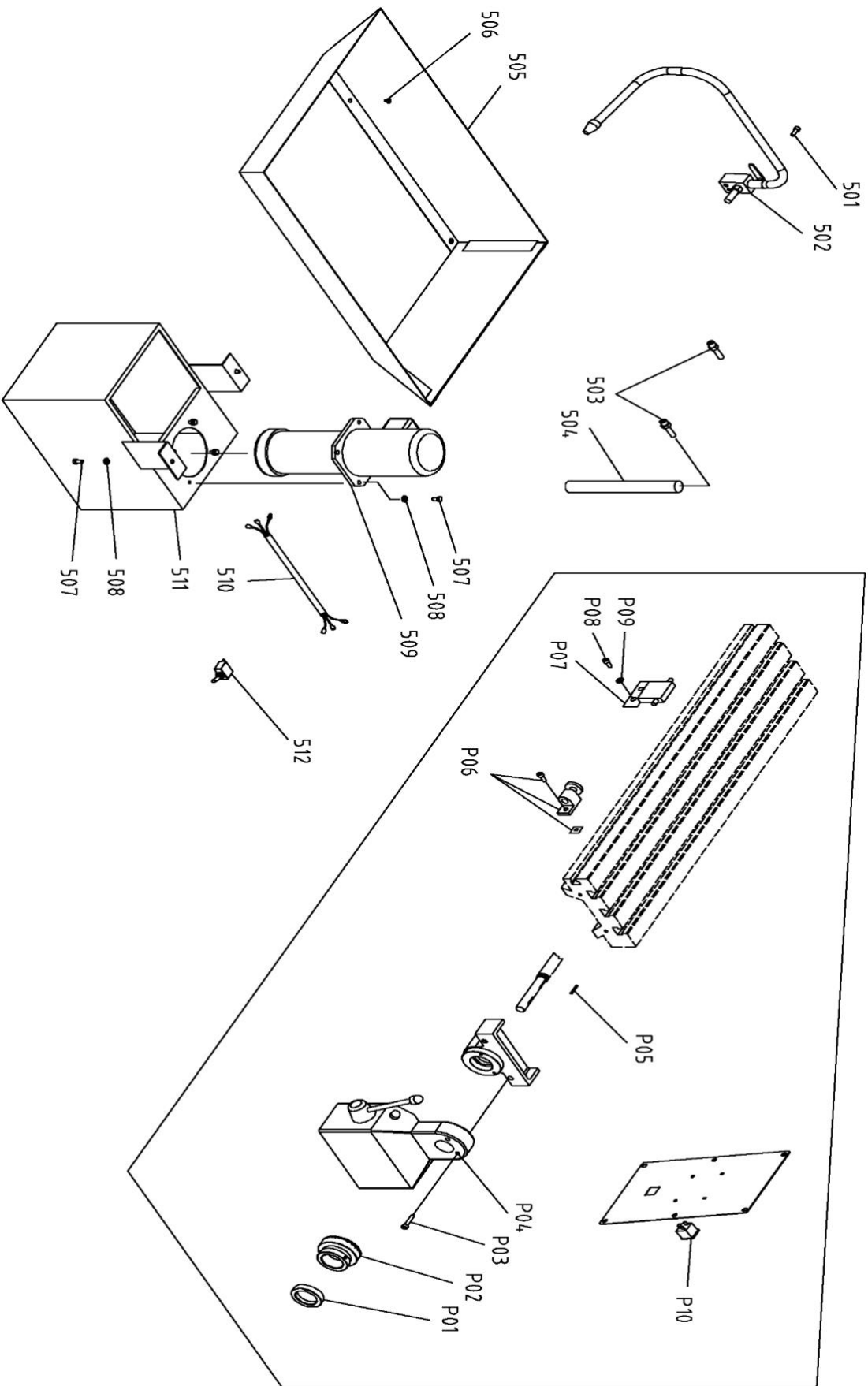
| Part | Description | Part | Description |
|------|-----------------------|------|----------------------|
| 201 | 5x5x40 Key | 221 | **** |
| 202 | **** | 222 | **** |
| 203 | M6-8 Set Screw | 223 | **** |
| 204 | **** | 224 | **** |
| 205 | M8x-20 Cap Screw | 225 | Lower Belt Cover |
| 206 | M8 Washer | 226 | M6-35 Screw |
| 207 | Motor | 227 | M6 Washer |
| 208 | M16-75 Screw | 228 | Latch |
| 209 | M16 Nut | 229 | M3-8 Pan Head Screw |
| 210 | Bracket | 230 | M5-8 Pan Head Screw |
| 211 | 1/2" - 1½" Screw | 231 | M5 Nut |
| 212 | 1/2" Lock Washer | 232 | Cover Supporting Arm |
| 213 | 1/2" Nut | 233 | M5-10 Pan Head Screw |
| 214 | 1/2"- 1¾" Screw | 234 | Cover Hinge |
| 215 | Mounting Plate | 235 | **** |
| 216 | Pivot | 236 | **** |
| 217 | Vertical Head Adaptor | 237 | **** |
| 218 | Upper Belt Cover | 238 | Belt B-59 |
| 219 | Knob | 239 | Motor Pulley |
| 220 | **** | 240 | M5 Washer |



| Part | Description | Part | Description |
|------|------------------------|------|-----------------------|
| 301 | Handle | 326 | M5-30 Pan Head Screw |
| 302 | 5/8" Nut | 327 | Adjsuting Screw |
| 303 | M6-8 Set Screw | 328 | Handle Bar |
| 304 | Handle | 329 | Table Locking Screw |
| 305 | Dial | 330 | M6-16 Cap Screw |
| 306 | Dial Positioning Screw | 331 | M5 Nut |
| 307 | M6-25 Cap Screw | 332 | M5-10 Ppan Head Screw |
| 308 | Spacer | 333 | Rubber Sheet |
| 309 | S-Ring 20 | 334 | Gib |
| 310 | Bearing 6004ZZ | 335 | M5-25 Cap Screw |
| 311 | M6-45 Cap Screw | 336 | Limit Seat |
| 312 | Lead Screw Bracket (R) | 337 | Cross Nut |
| 313 | 5x5x20 Key | 338 | M8-25 Cap Screw |
| 314 | Long Leadscrew | 339 | Saddle |
| 315 | M6-8 Pan Head Screw | 340 | Stop Block |
| 316 | Rubber Sheet | 341 | M5-20 Pan Head Screw |
| 317 | Rubber Sheet Holder | 342 | Longitudinal Nut |
| 318 | Table | 343 | M6 Washer |
| 319 | Star Washer | | |
| 320 | Bearing 6004ZZ | | |
| 321 | M10-30 Screw | | |
| 322 | Adjsuting Screw Sleeve | | |
| 323 | M10 Nut | | |
| 324 | Gib | | |
| 325 | Limit Block | | |



| Part | Description | Part | Description |
|------|------------------------|------|-----------------------------|
| 401 | **** | 434 | Bearing Housing |
| 402 | **** | 435 | Cross Leadscrew |
| 403 | Column | 436 | Bearing 6204zz |
| 404 | Lamp Assembly | 437 | Leadscrew |
| 405 | M6-8 Cap Screw | 438 | Pedestal |
| 406 | Gib | 439 | Cover |
| 407 | Lock Screw | 440 | Holder |
| 408 | Oil Joint | 441 | Machine Base |
| 409 | Knee | 442 | Cover |
| 410 | Knee Cover | 443 | Limit Block |
| 411 | M3-6 Pan Head Screw | 444 | Limit Track |
| 412 | Handle Bar | 445 | M10-30 Screw |
| 413 | Oil Pump | 446 | Sleeve |
| 414 | M5-15 Pan Head Screw | 447 | M10 Nut |
| 415 | Nut | 448 | M6-30 Screw |
| 416 | Tab Washer | 449 | 1/2" - 2" Screw |
| 417 | Bevel Gear | 450 | 1/2" Lock Washer |
| 418 | Bearing 6004ZZ | 451 | 10x20 Pin |
| 419 | Gear Shaft Sleeve | 452 | **** |
| 420 | M6-16 Cap Screw | 453 | 3/16" - 1/2" Pan Head Screw |
| 421 | 5x5x20 Key | 454 | Column Cover |
| 422 | Gear Shaft | 455 | M6-8 Pan Head Screw |
| 423 | S-Ring 20 | 456 | Cable |
| 424 | Coupling | 457 | Strain Relief |
| 425 | M6-8 Set Screw | 458 | 3/16" - 3/4" Pan Head Screw |
| 426 | Dial Positioning Screw | 459 | Cable (3) |
| 427 | Dial | 460 | 3/16" Nut |
| 428 | Crank Arm | 461 | Contactor |
| 429 | S-Ring 18 | 462 | Cable (4) |
| 430 | Handle Bar | 463 | Bus Bar |
| 431 | Handwheel | 464 | Mounting Track |
| 432 | Dial | 465 | AC Motor Controller |
| 433 | Bearing 51104 | | |

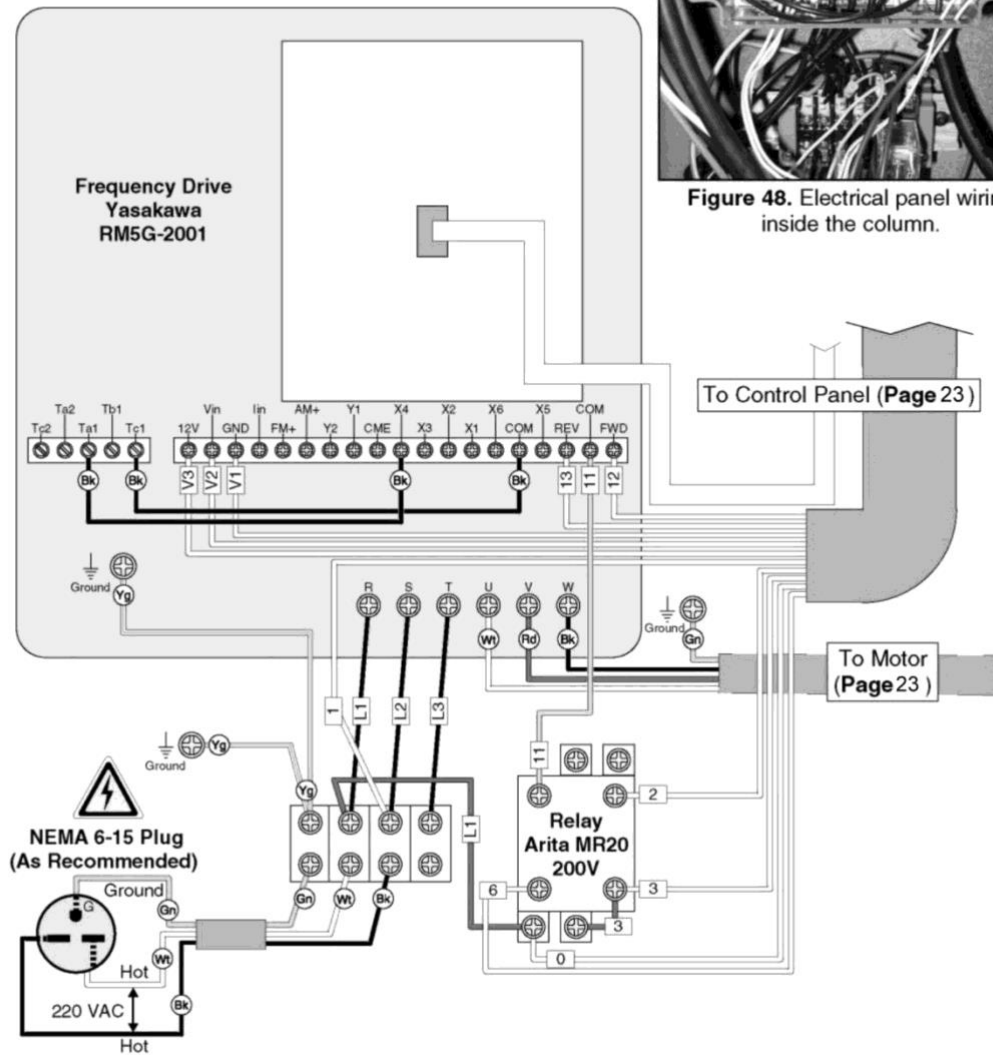


| Part | Description | Part | Description |
|------|-------------------------|------|----------------------|
| P01 | Set Nut | 501 | M5-15 Pan Head Screw |
| P02 | Dial | 502 | Nozzle Hose |
| P03 | M6-25 Cap Screw | 503 | Pipe Union |
| P04 | Power Feed | 504 | Hose |
| P05 | 3x3x30 Key | 505 | Splash pan |
| P06 | Stop W/Plunger Assembly | 506 | M6-8 Pan Head Screw |
| P07 | Auto Stop Switch | 507 | M6-15 Pan Head Screw |
| P08 | M6-16 Pan Head Screw | 508 | M6 Washer |
| P09 | M6 Washer | 509 | Pump Motor |
| P10 | Transformer | 510 | Pump Cord |
| | | 511 | Kettle |
| | | 512 | Switch |

Electrical Panel Wiring



Figure 48. Electrical panel wiring inside the column.



Control Panel & Motor Wiring

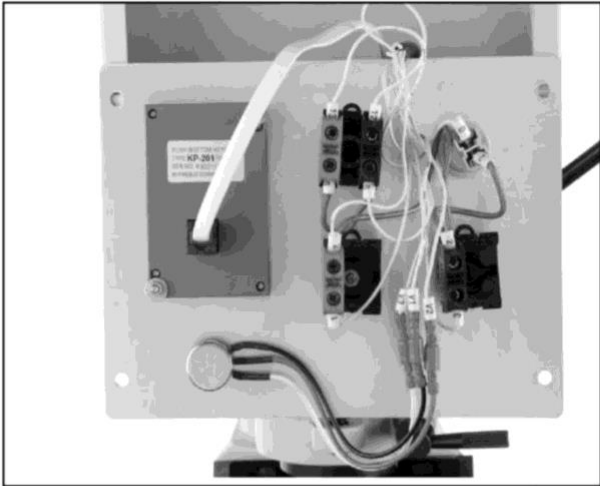


Figure 49. Control panel wiring (viewed from behind).

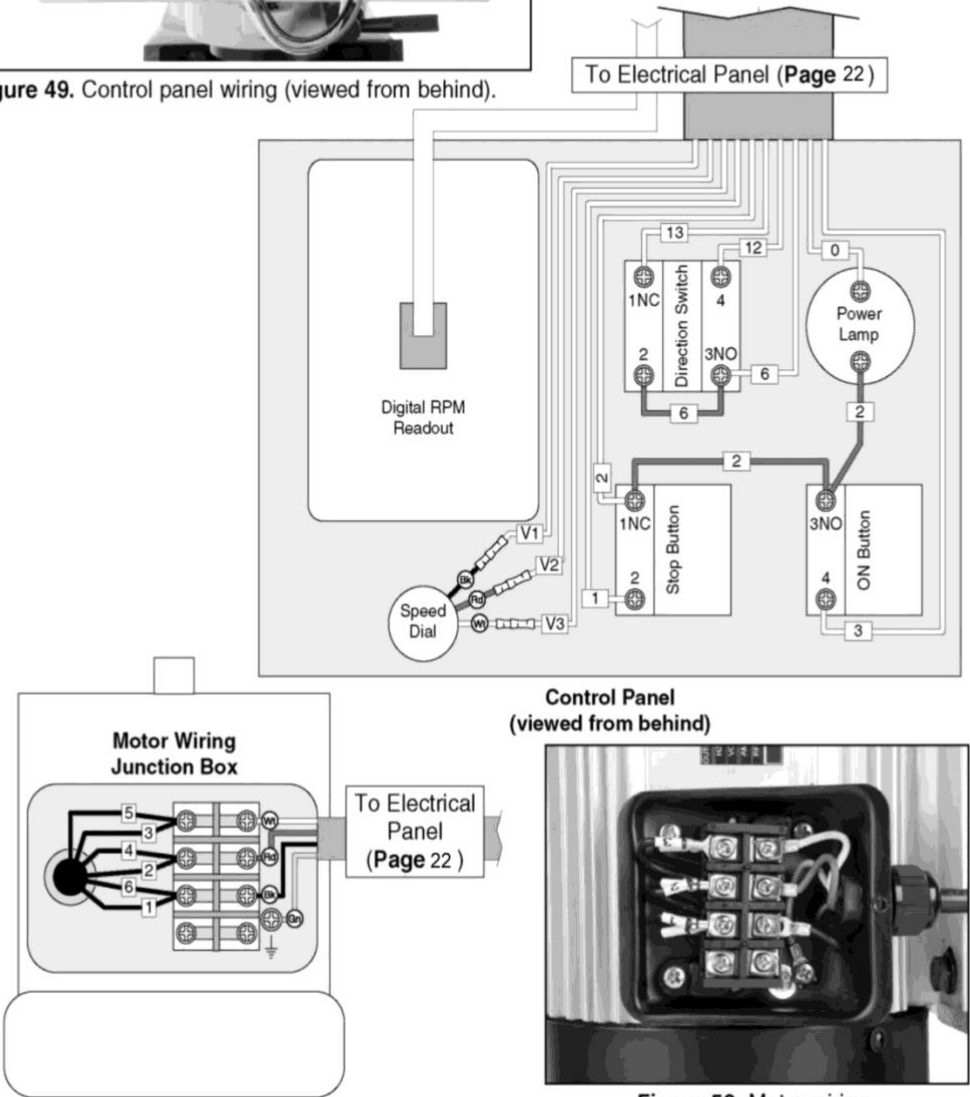


Figure 50. Motor wiring.