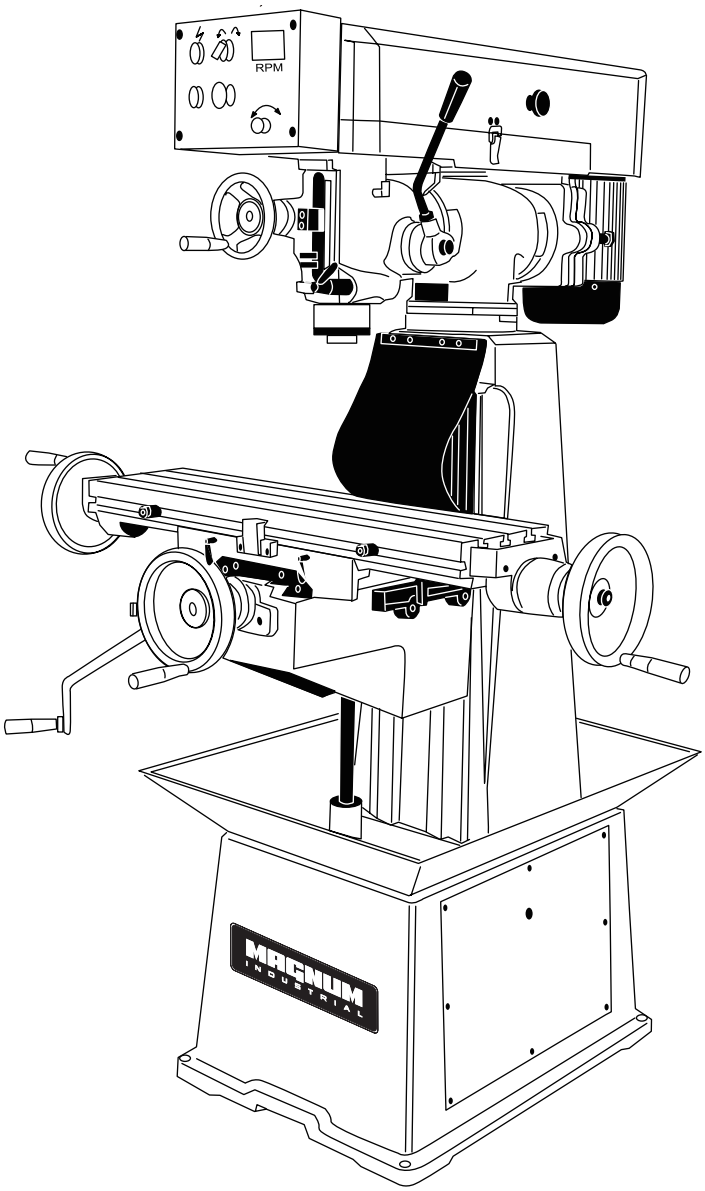
MAGNUM
INDUSTRIAL

MODEL NO.: MI-94500



OPERATING MANUAL

SAFETY RULES

WARNING: FAILURE TO FOLLOW THESE RULES MAY RESULT IN SERIOUS PERSONAL INJURY.

1. **FOR YOUR OWN SAFETY, READ INSTRUCTION MANUAL BEFORE OPERATING THE TOOL.** Learn the tool's application and limitations as well as the specific hazards peculiar to it.
2. **KEEP GUARDS IN PLACE** and in working order.
3. **ALWAYS WEAR EYE PROTECTION.** Wear safety glasses. Everyday eyeglasses only have impact resistant lenses; they are not safety glasses. Also use face or dust mask if cutting operation is dusty. These safety glasses must conform to ANSI Z87.1 requirements.
   Note: Approved glasses have Z87 printed or stamped on them.
4. **REMOVE ADJUSTING KEYS AND WRENCHES.** Form habit of checking to see that keys and adjusting wrenches are removed from tool before turning it on.
5. **KEEP WORK AREA CLEAN.** Cluttered areas and benches invite accidents.
6. **DON'T USE IN DANGEROUS ENVIRONMENT.** Don't use power tools in damp or wet locations, or expose them to rain. Keep work area well lighted.
7. **KEEP CHILDERN AWAY.** All visitors should be kept safe distance from work area.
8. **MAKE WORKSHOP KID PROOF** with padlocks, master switches, or by removing starter keys.
9. **DON'T FORCE TOOL** it will do the job better and safer at the rate for which it was not designed.
10. **USE RIGHT TOOL.** Don't force tool or attachment to do a job for which it was not designed.
11. **USE PROPER EXTENSION CORD**. Make sure your extension cord is in good condition. When using an extension cord, be sure to use one heavy enough to carry the current your product will draw. An undersized cord will cause a drop in line voltage resulting in loss of power and overheating. Table 1 shows the correct size to use depending on cord length and nameplate ampere rating. If in doubt, use the next heavier gage. The smaller the gage number, the heavier the cord.
12. **WEAR PROPER APPAREL** Do not wear loose clothing, gloves, neckties, rings, bracelets, or other jewelry which may get caught in moving parts. Nonslip footwear is recommended. Wear protective hair covering to contain long hair.
13. **ALWAYS USE SAFETY GLASSES.** Also use face or dust mask if cutting operation is dusty. Everyday eyeglasses only have impact resistant lenses, they are NOT safety glasses.
14. **SECURE WORK.** Use clamps or a vise to hold work when practical. It's safer than using your hand and it frees both hands to operate tool.
15. **DON'T OVERREACH.** Keep proper footing and balance at all times.
16. **MAINTAIN TOOLS WITH CARE.** Keep tools sharp and clean for best and safest performance. Follow instructions for lubricating and changing accessories.

17. **DISCONNECT TOOLS** before servicing; when changing accessories, such as blades, bits, cutters, and the like.
18. **REDUCE THE RISK OF UNINTENTIONAL STARTING.** Make sure switch is in off position before plugging in.
19. **USE RECONNENDED ACCESSORIES.** Consult the owner's manual for recommended accessories. The use of improper accessories may cause risk of injury or persons.
20. **NEVER STAND ON TOOL** Serious injury could occur if the tool is tipped or if the cutting tool is unintentionally contacted.
21. **CHECK DAMAGED PARTS.** Before further use of the tool, a guard or other part that is damaged should be carefully checked to determine that it will operate properly and perform its intended function-check for alignment of moving parts, binding of moving parts, breakage of parts, mounting, and any other conditions that may affect its operation. A guard or other part that is damaged should be properly repaired or replaced.
22. **DIRECTION OF FEED.** Feed work into a blade or cutter against the direction of rotation of the blade or cutter only.
23. **NEVER LEAVE TOOL RUNNING UNATTENDED. TURN POWER OFF.** Don't leave tool until it comes to a complete stop.
24. **MAME SURE TOOL IS DISCONNECTED** from power supply while motor is being mounted, connected or reconnected.

SAVE THESE INSTRUCTIONS

ADDITIONAL SAFETY RULES FOR BAND SAWS

1. If you are not thoroughly familiar with the operation of band saws, obtain advice from your supervisor, instructor or other qualified person.
2. Follow all wiring codes and recommended electrical connections. Make certain that the tool is properly grounded.
3. Make all adjustments with the power “OFF”
4. Always maintain proper adjustment of blade tension, blade guides, and blade support bearings.
5. Avoid awkward hand positions. A sudden slip could allow the hand to contact the blade.
6. Do not attempt to saw stock that does not have a flat surface, unless a suitable support is used.
7. Make sure blade is not contacting the workpiece before turning on the power switch.
8. Always keep hands and fingers away from the blade when the machine is running.
9. Hold workpiece firmly against table and feed into blade at a moderate speed.
10. Made sure that the saw blade teeth point downward toward the table.
11. Adjust upper guide to just clear work piece.
12. Disconnect machine from the power source when making repairs.
13. Replace all guards after servicing.
14. Turn off band saw if the material is to be backed out of an uncompleted cut.
15. Make relief cuts before cutting long curves.
16. Do not cut material that is too small to be safely supported.
17. Support long heavy work from the floor.
18. Before leaving the machine, make sure the work area is clean.
19. Important: When the tool is not in use , the switch should be in the “OFF” position and the power cord disconnected.
20. Do not remove jammed cutoff pieces until blade has stopped.

ON-OFF SWITCH PADLOCK – To safeguard the band saw from unauthorized operation and to avoid accidental starting by children or other not qualified to use, the use of padlock is required. To lock out the on – off switch, open the padlock, insert through the hole of the switch on button and close the padlock. Place the key in a location that is inaccessible to children and other not qualified to use the tool.

SWITCH WITH KEY – The switch key must be inserted into the switch before saw can operate. To lock the switch in the OFF position, remove the switch key from the switch. Place the key in a location that is inaccessible to children and others not qualified to use the tool.

GROUNDING INSTRUCTIONS

1. **All grounded, cord-connected tools:**
   In the event of a malfunction or breakdown, grounding provides a path of least resistance for electric current to reduce the risk of electric shock. This tool is equipped with an electric cord having an equipment-grounding conductor and a grounding plug.

   The plug must be plugged into a matching outlet that is properly installed and grounded in accordance with all local codes and ordinances.

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

   Improper connection of the equipment-grounding conductor can result In a risk of electric shock. The conductor with insulation having an outer surface that is green with or without yellow stripes is the equipment-grounding conductor. If repair or replacement of the electric cord or plug is necessary, do not connect the equipment-grounding conductor to a live terminal.

   Check with a qualified electrician or service personnel if the grounding instructions are not completely understood, or if in doubt as to whether the tool is properly grounded.

   Use only 3-wire extension cords that have 3-prong grounding plugs and 3-pole receptacles that accept the tool’s plug.

   Repair or replace damaged or worn cord immediately.

2. **Grounded, cord-connected tools intended for use on a supply circuit having a nominal rating less than 150 volts:**
   This tool is intended for use on a circuit that has an outlet that looks like the one illustrated in Sketch A in Figure 1. The tool has a grounding plug that looks like the plug illustrated in Sketch A in Figure 1. A temporary adapter, which looks like the adapter illustrated in Sketches B and C, may be used to

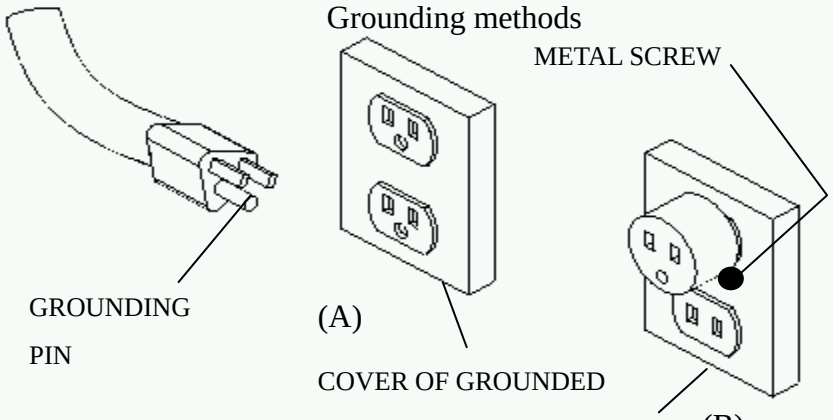
connect this plug to a 2-pole receptacle as shown in Sketch B if a properly grounded outlet is not available. The temporary adapter should be used only until a properly grounded outlet can be installed by a qualified electrician. The green-colored rigid ear, lug, and the like, extending from the adapter must be connected to a permanent ground such as a properly grounded outlet box.

3. **Grounded, cord-connected tools intended for use on a supply circuit having a nominal rating between 150-250 volts, inclusive:**

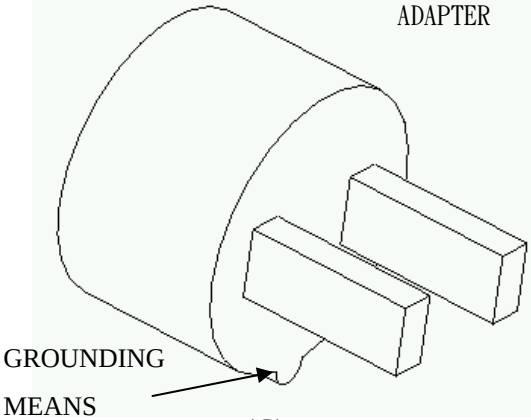
This tool is intended for use on a circuit that has an outlet that looks like the one illustrated in Sketch D in Figure 1. The tool has a grounding plug that looks like the plug illustrated in Sketch D in Figure 1. Make sure the tool is connected to an outlet having the same configuration as the plug. No adapter is available or should be used with this tool. If the tool must be reconnected for use on a different type of electric circuit, the reconnection should be made by qualified service personnel; and after reconnection, the tool should comply with all local codes and ordinances.

FIGURE 1

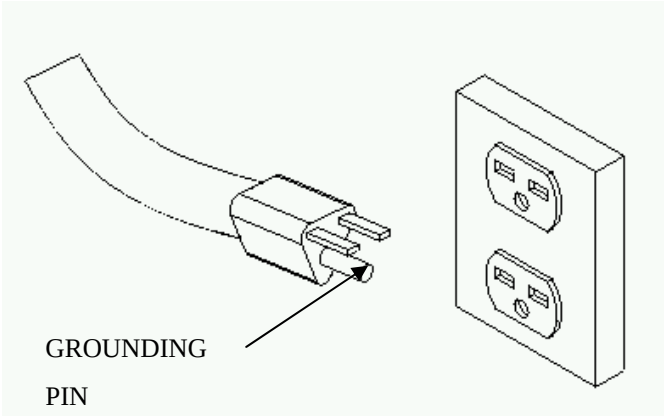
Grounding methods



Note : In Canada, the use of a temporary adaptor is not permitted by the Canadian Electrical Code.



(C)

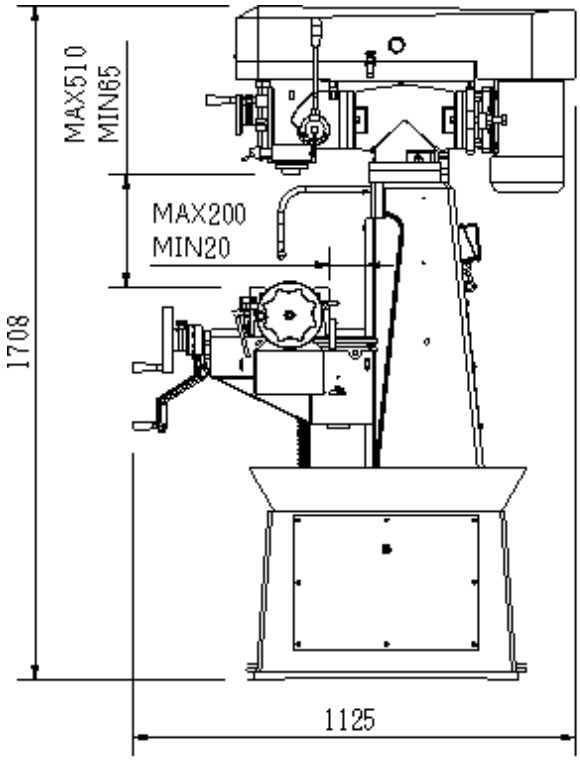


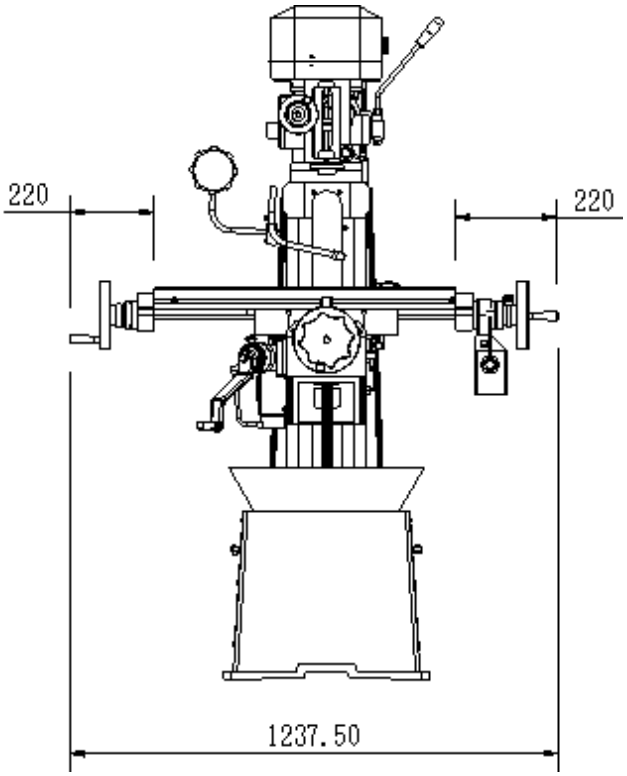
(D)

Table 1

Minimum gage for cord

Ampere Rating		Volta	Total length of cord in feet			
		120V	25ft.	50ft.	100ft.	150ft.
		240V	50ft.	100ft.	200ft.	300ft.
More Than	Not More Than		AWG			
0	6		18	16	16	14
6	10		18	16	14	12
10	12		16	16	14	12
12	16		14	12	Not	Recommended





Design Type…….....…Floor Model Knee Mill

Overall Dimensions:

- Height…….....…. 67”
- Width (With Handwheels on)…….....….40 1/2”
- Depth…….....…….....……..42 4/3”
- Table Size…….....……...8”x 30”
- Crate Size…….....…….....…..45”x45x76”
- Foot Print…….....… 19”x 26”
- Shipping Weight…….....……...1101 lbs.
- Net Weight…….....…… 991 lbs.

Capacity:

- Spindle Travel…….....……..3 1/2”
- Spindle Taper…….....……..R-8

- Max Distance, Spindle to Table…….....…….....20”
- Swing…….....……7 1/2”
- Table Travel, Longitudinal(X)…….....18”
- Table Travel, Cross(Y).....7 3/4”
- T-Slots(# and Size).....3@ 2 3/16” centers,3/8” Studs

- Range of Speeds…….....……..200-2250 R.P.M.
- Knee Travel(Z)…….....……...17 3/4”
- Vertical Head Tilt…….....……90° Right and Left
- Column Swivel.....90° Right and Left

Construction:

- Table…….....……Cast Iron
- Base…….....……Cast Iron
- Head.....Cast Iron

Motor:

- Type…….....ALUMINUM CAST Induction

Horsepower…….....…….....2 H.P.

- Phase/Voltage…….....…...3 Phase 220V
- Prewired…….....……220V
- Amps…….....….5
- Cycle and R.P.M…….....……60 Hertz/1720 R.P.M.
- Power Transfer…….....…….....Variable Frequency V-Belt Drive
- Bearings…….....Shielded and Lubricated Ball Bearings

FEATURES

1. Model is a compact vertical milling machine . It is easy to set up . The controls are designed for operator convenience with dual table hand wheels .
2. It is very practical for technical schools , small parts production , tool rooms , R&D work , maintenance shops and even hobby use.
3. The machine is ideally suited for many operations , including : conventional milling , compound angle milling , engraving , drilling and jig boring .
4. All “ways” are hand scraped for perfect bearing and alignment . The table is ground for perfect squareness .
5. Castings are high strength material . They are aged for several months , before normalizing and tempering , to minimize deformation .
6. Anti friction bearings are procured from famous manufacturers such as **SKF** , **FAC** , **NSK** , etc … completely interchangeable world wide .

----------NOTICE----------

1. Remove protective crating and skids carefully , in the event of damage in transit , contact our representative and the transportation company making delivery .
2. The machine is carefully inspected and tested in operation by Q.C. personnel before it leaves our factory . If any defects are found on delivery write us directly .
3. Read the catalogue and become familiar with the parts locations on the drawings as it will be easier to understand this operator's manual .

I. INSTALLATION：

To set the machine on a solid concrete foundation , it's advisable to apply a little grout to touch up any unevenness in the concrete in order to get a solid foundation at all points . When setting machine on a floor that has any surface irregularities , shims should be used to correct this condition to the greatest extent possible .

II. PRE-LUBRICATION：

Thoroughly clean the machine with gasoline or kerosene , then lubricate all the slide ways with S.A.E. #10 and gears with S.A.E.#30 lubricant . Be sure the machine is lubricated properly before starting .

III. LEVELLING MACHINES：

Set machines by leveling the work table lengthwise and crosswise with a precision leveling instrument （refer to the test readings in the attached test records）.

IV. INSPECTION：

Inspect the machine with the attached original testing records for reference.

V. SWITCH BOX：

Switch box is located on the left side of the column , on – off only .

VI. ADJUSTMENT OF TABLE FEED TRAVEL：

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

VII. ADJUSTMENT OF TABLE GIB：

The table is provided with a full length tapered gib in the saddle with an adjusting screw on each end . To take up gib tighten the two screws until a slight drag is felt when moving the table by hand . If the table is not tight enough , loosen the adjusting screw on small end , and tighten up adjusting screw on big end . If feel is too tight , reverse the adjusting procedures .

VIII.ADJUSTMENT OF SADDLE AND KNEE GIBS：

To tighten gibs the same method as described above is used .

IX. CLAMPING TABLE , SADDLE AND KNEE：

When milling with 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 members and provide for heavier cuts with a minimum of vibration . The saddle locking lever is located on the left side of saddle to the operator , apply clamping pressure properly , as this will hold saddle sufficiently rigid .

The table clamping levers are located in front of saddle and should always be clamped when longitudinal movement is not required .

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

X. REMOVING TABLE：

Remove the table as follows ： hand wheel , dial holder , bearing bracket , turn the lead screw all the way , so that it can be removed . Complete all the steps then the table can be disassembled easily .

XI. REMOVING SADDLE：

Remove as follows ： hand wheel , dial holder , bearing bracket ,

Turn the lead screw all the way , loosen set screw on the middle of saddle , take off the lead screw nut , and draw saddle gib out .

The saddle can then be removed .

XII. MOUNTING MOTOR AND SHIFTING BELTS FOR SPEEDS：

Motor is mounted on a plate hinged to the pulley housing . Release the belt set unit by turning the handle at the side of motor , then shift belts to proper speed as desired , then tighten the belt set unit . A speed change chart is attached inside the pulley cover .

XIII. QUILL LOCK AND VERTICAL FEED:

The handle at the right lower corner of the head is the quill lock. When 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 pulley. Open the cup and drip oil in a couple times a day. This will lubricate all the vertical spindle system from top to bottom. The micrometer depth stop is graduated in inches. By utilizing these simple graduations, it is possible to work very accurately to different depths. A lock nut under the micrometer nut assures that the micrometer nut is secured properly.

XIV. QUILL CLUTCH OF VERTICAL MILLING HEAD:

The vertical feed is controlled by a hand wheel at the front of the head and a handle at the right

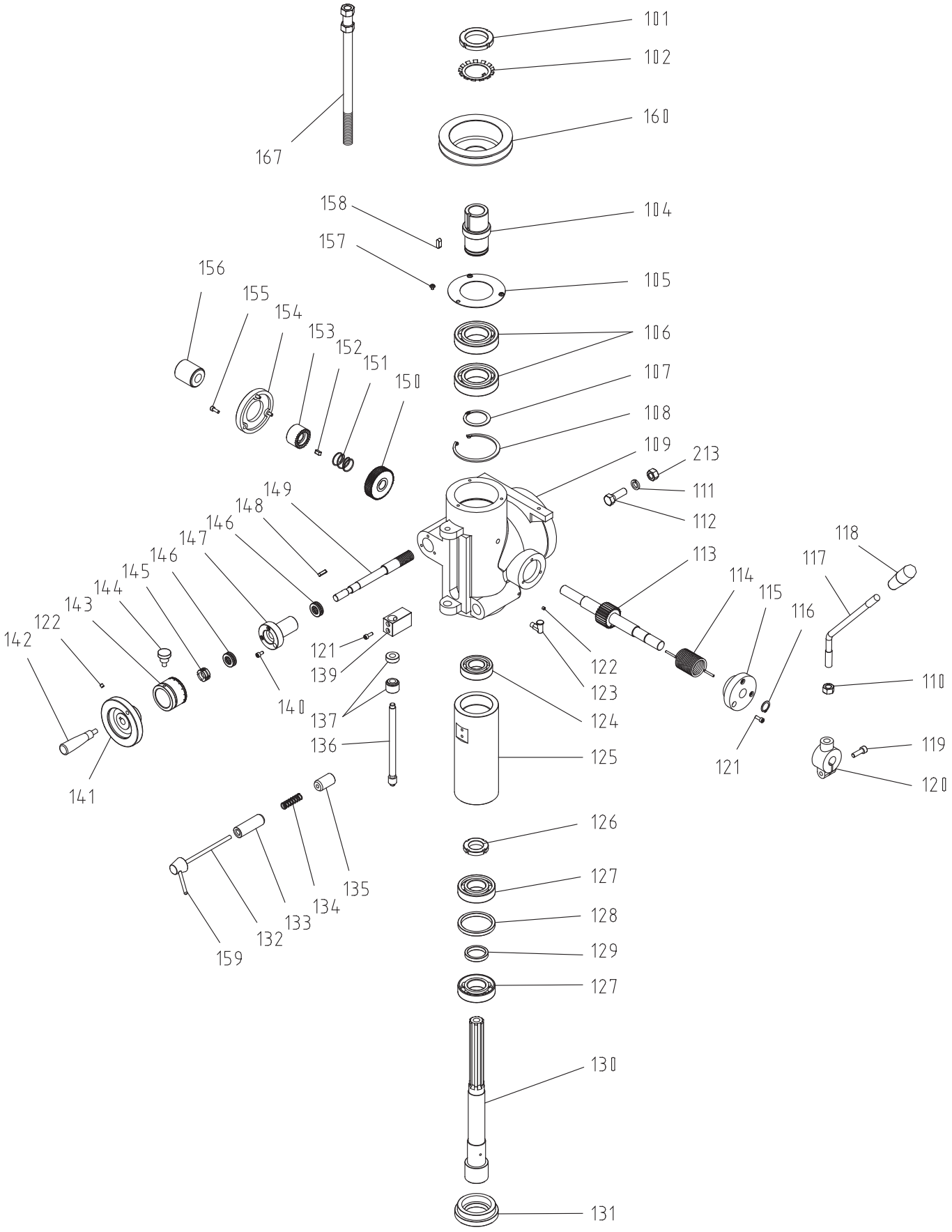
hand of the head. When hand wheel is in use tighten the clutch lock nut by hand, or loosen it for handle operation. Use hand wheel for fine feeds, handle for fast feeds.

XV. VERTICAL HEAD AND TEE ADAPTER:

Vertical milling head can be tilted 90° on each side by loosening the four locking bolts on tee adapter.

Lossen two set bolts on the adapter, the vertical milling head can then be swiveled 120° ; tighter the set bolts after swiveling. The motor and milling head must tilt together for the motor and head are suspended on the same pulley housing.

PARTS LIST FOR MI-94500



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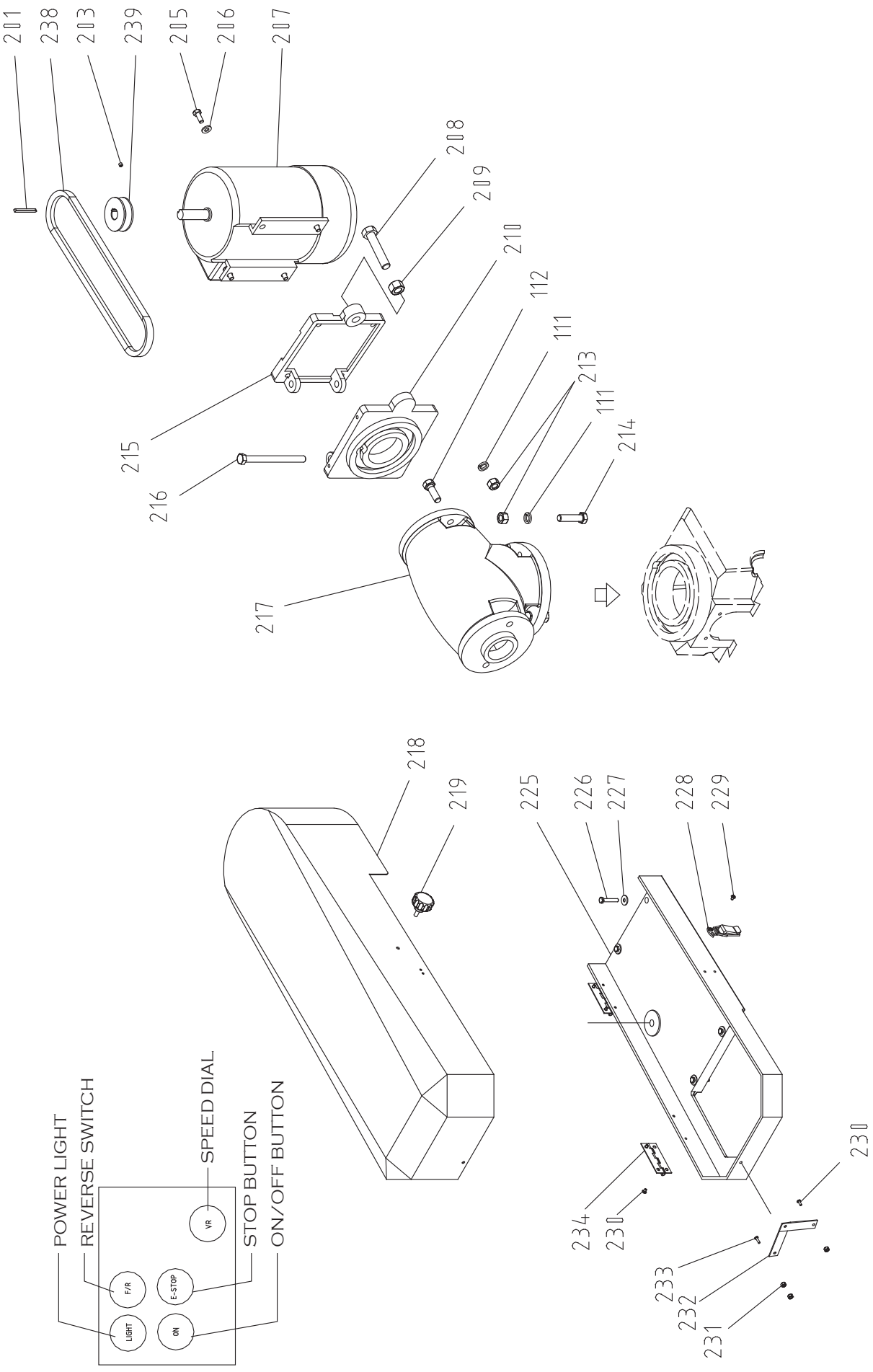

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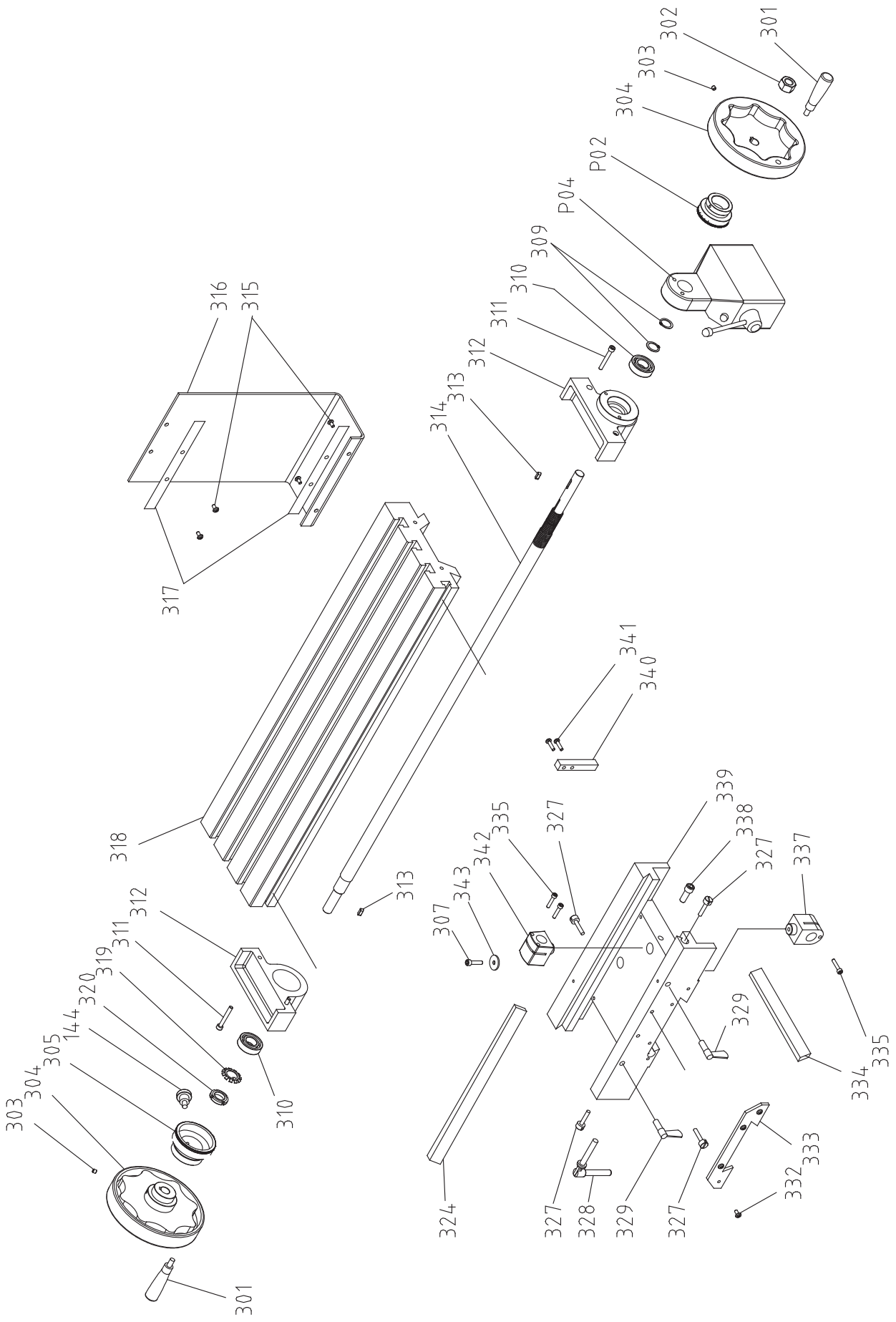

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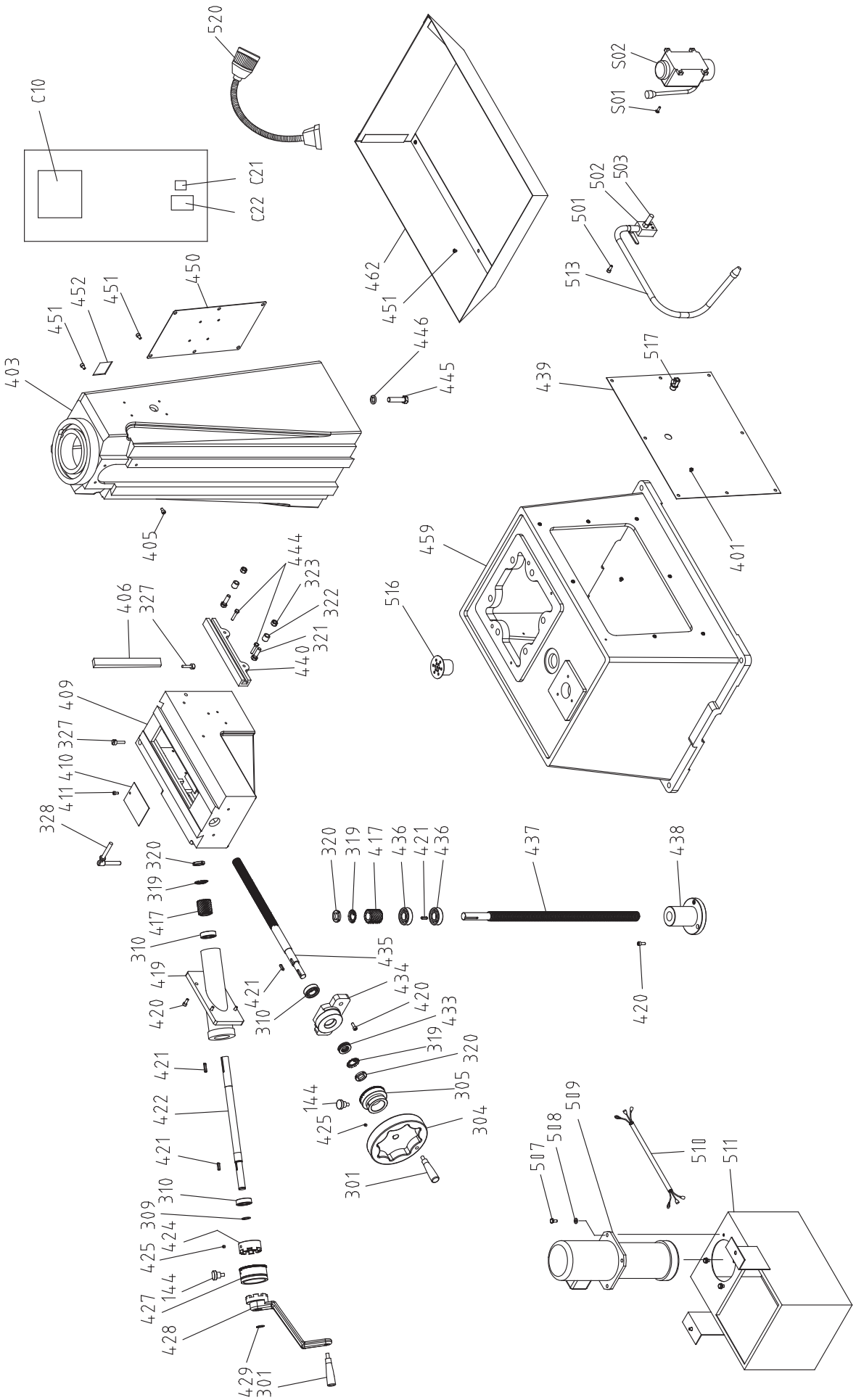


PARTS LIST FOR MI-94500

No.	Description	No.	Description
MI-94500-101	PULLEY LOCKING NUT	MI-94500-145	SPANNER NUT
MI-94500-102	WASHER	MI-94500-146	THRUST BEARING
MI-94500-104	SPINDLE SLEEVE	MI-94500-147	WORM SHAFT SLEEVE
MI-94500-105	BEARING COVER	MI-94500-148	WOODRUFF KEY
MI-94500-106	BEARING	MI-94500-149	WORM SHAFT
MI-94500-107	EXT RETAINING RING	MI-94500-150	COUPLING WORM GEAR
MI-94500-108	INT RETAINING RING	MI-94500-151	SPRING
MI-94500-109	HEAD CASTING	MI-94500-152	WOODRUFF KEY
MI-94500-110	HEX NUT	MI-94500-153	BUSHING
MI-94500-111	SPRING WASHER	MI-94500-154	END CAP
MI-94500-112	SQUARE HEAD BOLT	MI-94500-155	CAP SCREW
MI-94500-113	GEAR SHAFT	MI-94500-156	KNURLED KNOB
MI-94500-114	TORSION SPRING	MI-94500-157	CAP SCREW
MI-94500-115	END CAP	MI-94500-158	KEY
MI-94500-116	EXT RETAINING RING	MI-94500-159	LOCK HANDLE
MI-94500-117	HANDLE LEVER	MI-94500-160	PULLEY
MI-94500-118	KNOB	MI-94500-167	DRAWBAR
MI-94500-119	CAP SCREW	MI-94500-201	WOODRUFF
MI-94500-120	HANDLE BASE	MI-94500-203	SET SCREW
MI-94500-121	CAP SCREW	MI-94500-205	CAP SCREW
MI-94500-122	SET SCREW	MI-94500-206	WASHER
MI-94500-123	OIL CUP	MI-94500-207	MOTOR
MI-94500-124	BEARING	MI-94500-208	HEX BOLT
MI-94500-125	QUILL	MI-94500-209	HEX NUT
MI-94500-126	SPANNER NUT	MI-94500-210	MOTOR BRACKET
MI-94500-127	ANG CONTACT BEARING	MI-94500-213	HEX NUT
MI-94500-128	BEARING SPACER LARGE	MI-94500-214	SQUARE HEAD BOLT
MI-94500-129	BEARING SPACER SMALL	MI-94500-215	MOTOR MOUNTING
MI-94500-130	VERTICAL SPINDLE	MI-94500-216	SCREW
MI-94500-131	SPINDLE COLLAR	MI-94500-217	TURRET
MI-94500-132	QUILL LOCK BOLT	MI-94500-218	UPPER BELT COVER
MI-94500-133	QUILL LOCKING BLOCK	MI-94500-219	KNOB
MI-94500-134	SPRING	MI-94500-225	LOWER BELT COVER
MI-94500-135	LOCK PLUNGER SMALL	MI-94500-226	HEX BOLT
MI-94500-136	QUILL STOP MICRO SCREW	MI-94500-227	FLAT WASHER
MI-94500-137	QUILL MICRO STOP	MI-94500-228	LATCH
MI-94500-139	QUILL STOPPER	MI-94500-229	CAP SCREW
MI-94500-140	CAP SCREW	MI-94500-230	PHLP HD SCR
MI-94500-141	HANDLEWHEEL	MI-94500-231	HEX NUT
MI-94500-142	HANDLE	MI-94500-232	COVER SUPPORTING ARM
MI-94500-143	GRADUATED DIAL	MI-94500-233	PHLP HD SCR
MI-94500-144	LOCKING THUMB SCREW	MI-94500-234	COVER HINGE

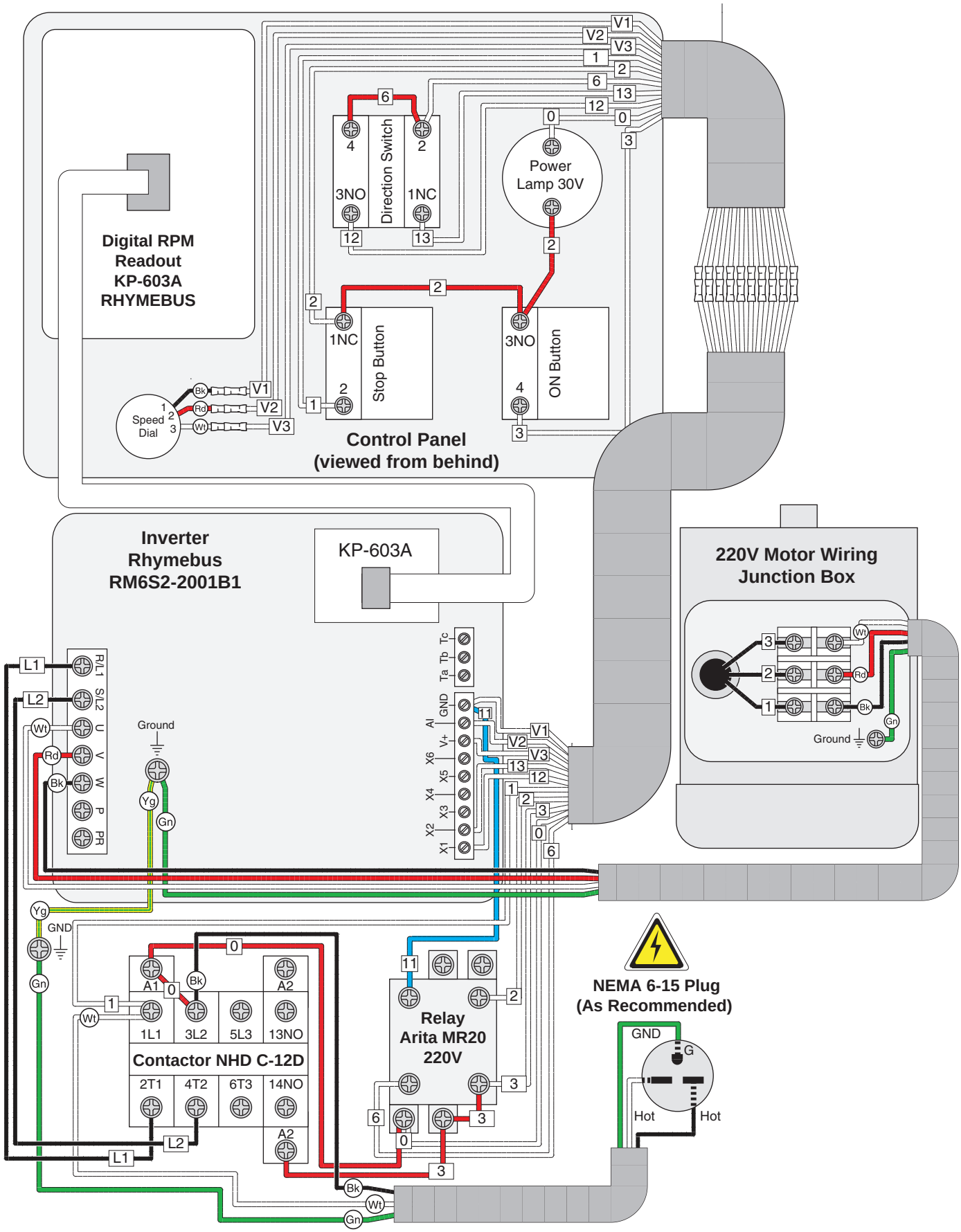
PARTS LIST FOR MI-94500

No.	Description	No.	Description
MI-94500-238	V-BELT B60	MI-94500-409	KNEE
MI-94500-239	MOTOR PULLEY	MI-94500-410	CHIP GUARD
MI-94500-301	HANDLE	MI-94500-411	SCREW
MI-94500-302	HEX NUT	MI-94500-417	BEVEL GEAR
MI-94500-303	SET SCREW	MI-94500-419	VERTICAL CRANK HOUSING
MI-94500-304	HANDWHEEL	MI-94500-420	CAP SCREW
MI-94500-305	GRADUATED DIAL	MI-94500-421	WOODRUFF
MI-94500-307	CAP SCREW	MI-94500-422	VERTICAL CRANK SHAFT
MI-94500-309	EXT RETAINING RING	MI-94500-424	CLUTCH
MI-94500-310	BEARING	MI-94500-425	SET SCREW
MI-94500-311	CAP SCREW	MI-94500-427	DIAL
MI-94500-312	LEADSCREW BRACKET	MI-94500-428	CRANK HANDLE ARM
MI-94500-313	WOODRUFF KEY	MI-94500-429	C-RING
MI-94500-314	LONGGITUDINAL LEAD SCREW	MI-94500-433	THRUST BEARING
MI-94500-315	PHLP HD SCR	MI-94500-434	BEARING HOUSING
MI-94500-316	WAY COVER	MI-94500-435	CROSS FEED LEADSCREW
MI-94500-317	WAY COVER HOLDER	MI-94500-436	BEARING
MI-94500-318	TABLE	MI-94500-437	ELEVATION LEADSCREW
MI-94500-319	SPRING WASHER	MI-94500-438	PEDESTAL
MI-94500-320	SPANNER NUT	MI-94500-439	BASE SIDE COVER
MI-94500-321	HEX BOLT	MI-94500-440	STOP BLOCK FIXTURE
MI-94500-322	ADJUSTING SCREW SLEEVE	MI-94500-444	HEX BOLT
MI-94500-323	HEX NUT	MI-94500-445	SCREW
MI-94500-324	TABLE GIB	MI-94500-446	SPRING WASHER
MI-94500-327	GIB ADJUSTMENT SCREW	MI-94500-450	COLUMN ACCESS PANEL
MI-94500-328	SADDLE LOCKING SCREW	MI-94500-451	CAP SCREW
MI-94500-329	TABLE LOCKING SCREW	MI-94500-452	PANEL
MI-94500-332	PHLP HD SCR	MI-94500-459	BASE
MI-94500-333	RUBBER SHEET	MI-94500-462	CHIP PAN
MI-94500-334	SADDLE GIB	MI-94500-501	CAP SCREW
MI-94500-335	CAP SCREW	MI-94500-502	CASTING
MI-94500-337	CROSS LEADSCREW NUT	MI-94500-503	PIPE CONNECTOR
MI-94500-338	CAP SCREW	MI-94500-507	HEX NUT
MI-94500-339	SADDLE	MI-94500-508	FLAT WASHER
MI-94500-340	STOP BLOCK	MI-94500-509	COOLANT PUMP
MI-94500-341	PHLP HD SCR	MI-94500-510	CORD
MI-94500-342	LONGITUDINAL FEED NUT	MI-94500-511	KETTLE
MI-94500-343	FLAT WASHER	MI-94500-513	NOZZLE ASSEMBLY
MI-94500-401	PHLP HD SCR	MI-94500-516	COVER
MI-94500-403	COLUMN	MI-94500-517	HOLDER
MI-94500-405	CAP SCREW	MI-94500-520	LED LIGHT
MI-94500-406	KNEE GIB	MI-94500-C10	AC MOTOR CONTROLLER

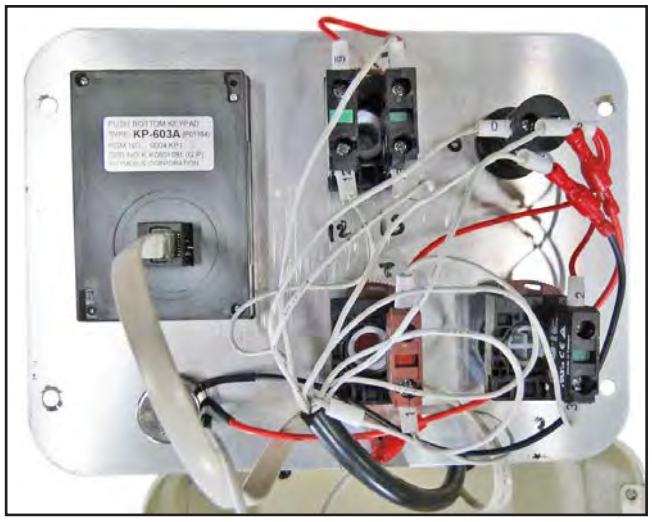
PARTS LIST FOR MI-94500

No.	Description	No.	Description
MI-94500-C21	RELAY		
MI-94500-C22	CONTACTOR		
MI-94500-P02	GRADUATED DIAL		
MI-94500-P04	POWER FEED		
MI-94500-S01	CAP SCREW		
MI-94500-S02	ONE-SHOT OILER		

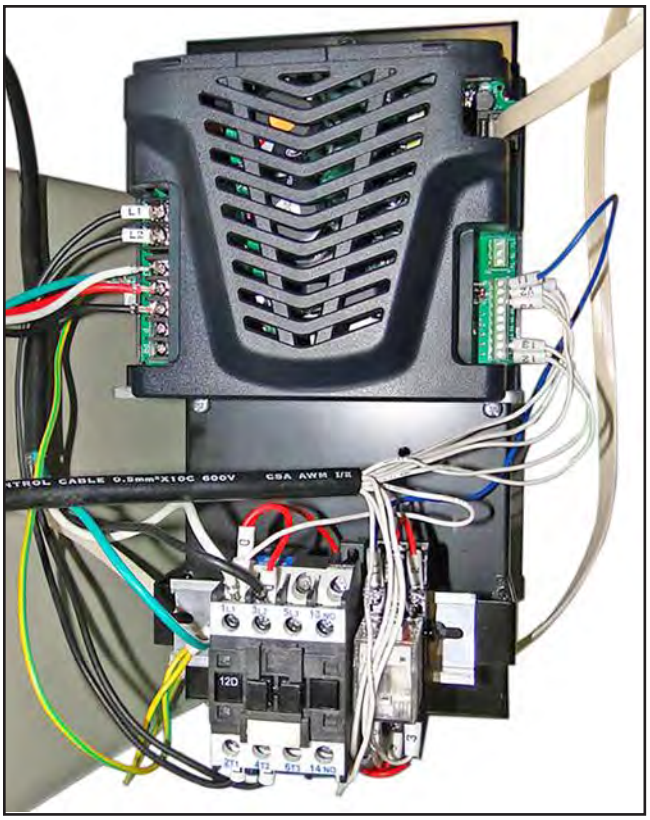
Wiring Diagram



Electrical Component Wiring



Control panel wiring.



Inverter, contactor, and relay wiring.

Motor junction box.