OPERATOR'S MANUAL

RADIAL DRILL

MODEL: RD-1000M

Baileigh Industrial, Inc.
P.O. Box 531
Manitowoc, WI 54221-0531
Phone: 920.684.4990
Fax: 920.684.3944
sales@baileigh.com

Rev. 08/2015

Table of Contents

THANK YOU & WARRANTY

Thank you for your purchase of a machine from Baileigh Industrial. We hope that you find it productive and useful to you for a long time to come.

Inspection & Acceptance. Buyer shall inspect all Goods within ten (10) days after receipt thereof. Buyer's payment shall constitute final acceptance of the Goods and shall act as a waiver of the Buyer's rights to inspect or reject the goods unless otherwise agreed. If Buyer rejects any merchandise, Buyer must first obtain a Returned Goods Authorization ("RGA") number before returning any goods to Seller. Goods returned without a RGA will be refused. Seller will not be responsible for any freight costs, damages to goods, or any other costs or liabilities pertaining to goods returned without a RGA. Seller shall have the right to substitute a conforming tender. Buyer will be responsible for all freight costs to and from Buyer and repackaging costs, if any, if Buyer refuses to accept shipment. If Goods are returned in unsalable condition, Buyer shall be responsible for full value of the Goods. Buyer may not return any special order Goods. Any Goods returned hereunder shall be subject to a restocking fee equal to 30% of the invoice price.

Specifications. Seller may, at its option, make changes in the designs, specifications or components of the Goods to improve the safety of such Goods, or if in Seller's judgment, such changes will be beneficial to their operation or use. Buyer may not make any changes in the specifications for the Goods unless Seller approves of such changes in writing, in which event Seller may impose additional charges to implement such changes.

Limited Warranty. Seller warrants to the original end-user that the Goods manufactured or provided by Seller under this Agreement shall be free of defects in material or workmanship for a period of twelve (12) months from the date of purchase, provided that the Goods are installed, used, and maintained in accordance with any instruction manual or technical guidelines provided by the Seller or supplied with the Goods, if applicable. The original end-user must give written notice to Seller of any suspected defect in the Goods prior to the expiration of the warranty period. The original end-user must also obtain a RGA from Seller prior to returning any Goods to Seller for warranty service under this paragraph. Seller will not accept any responsibility for Goods returned without a RGA. The original end-user shall be responsible for all costs and expenses associated with returning the Goods to Seller for warranty service. In the event of a defect, Seller, at its sole option, shall repair or replace the defective Goods or refund to the original end-user the purchase price for such defective Goods. Goods are not eligible for replacement or return after a period of 30 days from date of receipt. The foregoing warranty is Seller's sole obligation, and the original end-user's exclusive remedy, with regard to any defective Goods. This limited warranty does not apply to: (a) die sets, tooling, and saw blades; (b) periodic or routine maintenance and setup, (c) repair or replacement of the Goods due to normal wear and tear, (d) defects or damage to the Goods resulting from misuse, abuse, neglect, or accidents, (f) defects or damage to the Goods resulting from improper or unauthorized alterations, modifications, or changes; and (f) any Goods that has not been installed and/or maintained in accordance with the instruction manual or technical guidelines provided by Seller.

EXCLUSION OF OTHER WARRANTIES. THE FOREGOING LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED. ANY AND ALL OTHER EXPRESS, STATUTORY OR IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE ARE EXPRESSLY DISCLAIMED. NO WARRANTY IS MADE WHICH EXTENDS BEYOND THAT WHICH IS EXPRESSLY CONTAINED HEREIN.

Limitation of Liability. IN NO EVENT SHALL SELLER BE LIABLE TO BUYER OR ANY OTHER PARTY FOR ANY INCIDENTIAL, CONSEQUENTIAL OR SPECIAL DAMAGES (INCLUDING, WITHOUT LIMITATION, LOST PROFITS OR DOWN TIME) ARISING FROM OR IN MANNER CONNECTED WITH THE GOODS, ANY BREACH BY SELLER OR ITS AGENTS OF THIS AGREEMENT, OR ANY OTHER CAUSE WHATSOEVER, WHETHER BASED ON CONTRACT, TORT OR ANY OTHER THEORY OF LIABILITY. BUYER'S REMEDY WITH RESPECT TO ANY CLAIM ARISING UNDER THIS AGREEMENT IS STRICTLY LIMITED TO NO MORE THAN THE AMOUNT PAID BY THE BUYER FOR THE GOODS.

Force Majuere. Seller shall not be responsible for any delay in the delivery of, or failure to deliver, Goods due to causes beyond Seller's reasonable control including, without limitation, acts of God, acts of war or terrorism, enemy actions, hostilities, strikes, labor difficulties, embargoes, non-delivery or late delivery of materials, parts and equipment or transportation delays not caused by the fault of Seller, delays caused by civil authorities, governmental regulations or orders, fire, lightening, natural disasters or any other cause beyond Seller's reasonable control. In the event of any such delay, performance will be postponed by such length of time as may be reasonably necessary to compensate for the delay.

Installation. If Buyer purchases any Goods that require installation, Buyer shall, at its expense, make all arrangements and connections necessary to install and operate the Goods. Buyer shall install the Goods in accordance with any Seller instructions and shall indemnify Seller against any and all damages, demands, suits, causes of action, claims and expenses (including actual attorneys' fees and costs) arising directly or indirectly out of Buyer's failure to properly install the Goods.

Work By Others; Safety Devices. Unless agreed to in writing by Seller, Seller has no responsibility for labor or work performed by Buyer or others, of any nature, relating to design, manufacture, fabrication, use, installation or provision of Goods. Buyer is solely responsible for furnishing, and requiring its employees and customers to use all safety devices, guards and safe operating procedures required by law and/or as set forth in manuals and instruction sheets furnished by Seller. Buyer is responsible for consulting all operator's manuals, ANSI or comparable safety standards, OSHA regulations and other sources of safety standards and regulations applicable to the use and operation of the Goods.

Remedies. Each of the rights and remedies of Seller under this Agreement is cumulative and in addition to any other or further remedies provided under this Agreement or at law or equity.

Attorney's Fees. In the event legal action is necessary to recover monies due from Buyer or to enforce any provision of this Agreement, Buyer shall be liable to Seller for all costs and expenses associated therewith, including Seller's actual attorneys' fees and costs.

Governing Law/Venue. This Agreement shall be construed and governed under the laws of the State of Wisconsin, without application of conflict of law principles. Each party agrees that all actions or proceedings arising out of or in connection with this Agreement shall be commenced, tried, and litigated only in the state courts sitting in Manitowoc County, Wisconsin or the U.S. Federal Court for the Eastern District of Wisconsin. Each party waives any right it may have to assert the doctrine of "forum non conveniens" or to object to venue to the extent that any proceeding is brought in accordance with this section. Each party consents to and waives any objection to the exercise of personal jurisdiction over it by courts described in this section. Each party waives to the fullest extent permitted by applicable law the right to a trial by jury.

Summary of Return Policy.

- 10 Day acceptance period from date of delivery. Damage claims and order discrepancies will not be accepted after this time.
- You must obtain a Baileigh issued RGA number PRIOR to returning any materials.
- Returned materials must be received at Baileigh in new condition and in original packaging.
- Altered items are not eligible for return.
- Buyer is responsible for all shipping charges.
- A 30% re-stocking fee applies to all returns.

Baileigh Industrial makes every effort to ensure that our posted specifications, images, pricing and product availability are as correct and timely as possible. We apologize for any discrepancies that may occur. Baileigh Industrial reserves the right to make any and all changes deemed necessary in the course of business including but not limited to pricing, product specifications, quantities, and product availability.

For Customer Service & Technical Support:
Please contact one of our knowledgeable Sales and Service team members at:
(920) 684-4990 or e-mail us at sales@baileigh.com

INTRODUCTION

The quality and reliability of the components assembled on a Baileigh Industrial machine guarantee near perfect functioning, free from problems, even under the most demanding working conditions. However if a situation arises, refer to the manual first. If a solution cannot be found, contact the distributor where you purchased our product. Make sure you have the serial number and production year of the machine (stamped on the nameplate). For replacement parts refer to the assembly numbers on the parts list drawings.

Our technical staff will do their best to help you get your machine back in working order.

In this manual you will find: (when applicable)

- Safety procedures
- Correct installation guidelines
- Description of the functional parts of the machine
- Capacity charts
- Set-up and start-up instructions
- Machine operation
- Scheduled maintenance
- Parts lists

GENERAL NOTES

After receiving your equipment remove the protective container. Do a complete visual inspection, and if damage is noted, **photograph it for insurance claims** and contact your carrier at once, requesting inspection. Also contact Baileigh Industrial and inform them of the unexpected occurrence. Temporarily suspend installation.

Take necessary precautions while loading / unloading or moving the machine to avoid any injuries.

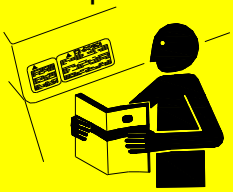
Your machine is designed and manufactured to work smoothly and efficiently. Following proper maintenance instructions will help ensure this. Try and use original spare parts, whenever possible, and most importantly; **DO NOT** overload the machine or make any unauthorized modifications.

Note: *This symbol refers to useful information throughout the manual.*

IMPORTANT

PLEASE READ THIS OPERATORS MANUAL CAREFULLY

It contains important safety information, instructions, and necessary operating procedures. The continual observance of these procedures will help increase your production and extend the life of the equipment.



SAFETY INSTRUCTIONS

LEARN TO RECOGNIZE SAFETY INFORMATION

This is the safety alert symbol. When you see this symbol on your machine or in this manual, **BE ALERT TO THE POTENTIAL FOR PERSONAL INJURY!**

Follow recommended precautions and safe operating practices.

UNDERSTAND SIGNAL WORDS

A signal word – **DANGER**, **WARNING**, or **CAUTION** is used with the safety alert symbol. **DANGER** identifies a hazard or unsafe practice that will result in severe **Injury or Death**.

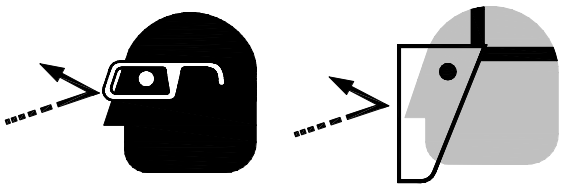
Safety signs with signal word **DANGER** or **WARNING** are typically near specific hazards.

General precautions are listed on **CAUTION** safety signs. **CAUTION** also calls attention to safety messages in this manual.

SAVE THESE INSTRUCTIONS.
Refer to them often and use them to instruct others.

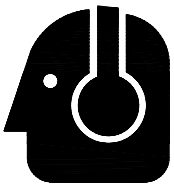
PROTECT EYES

Wear safety glasses or suitable eye protection when working on or around machinery.



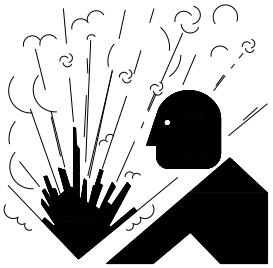
PROTECT AGAINST NOISE

Prolonged exposure to loud noise can cause impairment or loss of hearing. Wear suitable hearing protective devices such as ear muffs or earplugs to protect against objectionable or uncomfortable loud noises.



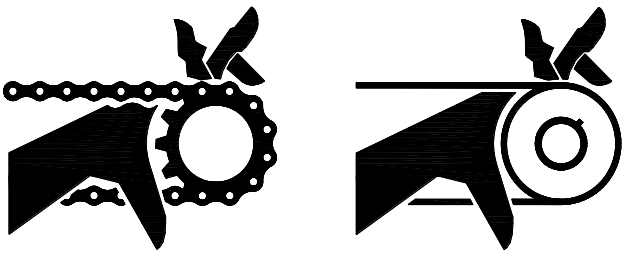
HYDRAULIC HOSE FAILURE

Exercise **CAUTION** around hydraulic hoses in case of a hose or fitting failure.

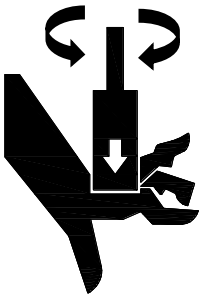


BEWARE OF PINCH POINTS

Keep hands and fingers clear of all potential pinch points. These include sprockets and chains along with belts and pulleys.

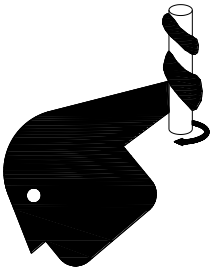


BEWARE OF PIERCING POINTS



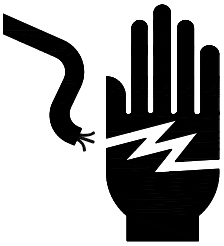
NEVER place Keep hands, fingers, or any part of your body away from rotating tooling bit.

ENTANGLEMENT HAZARD – ROTATING SPINDLE



Contain long hair, **DO NOT** wear jewelry or loose fitting clothing.

HIGH VOLTAGE



USE CAUTION IN HIGH VOLTAGE AREAS. DO NOT assume the power to be off.
FOLLOW PROPER LOCKOUT PROCEDURES.

EMERGENCY STOP BUTTON

In the event of incorrect operation or dangerous conditions, the machine can be stopped immediately by pressing the **E-STOP** button. Twist the emergency stop button clockwise (cw) to reset. Note: Resetting the E-Stop will not start the machine.

SAFETY PRECAUTIONS

Metal working can be dangerous if safe and proper operating procedures are not followed. As with all machinery, there are certain hazards involved with the operation of the product. Using the machine with respect and caution will considerably lessen the possibility of personal injury. However, if normal safety precautions are overlooked or ignored, personal injury to the operator may result.
Safety equipment such as guards, hold-downs, safety glasses, dust masks and hearing protection can reduce your potential for injury. But even the best guard won't make up for poor judgment, carelessness or inattention. **Always use common sense** and exercise **caution** in the workshop. If a procedure feels dangerous, don't try it.
REMEMBER: Your personal safety is your responsibility.

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

1. **Only trained and qualified personnel can operate this machine.**
2. **Make sure guards are in place and in proper working order before operating machinery.**
3. **Remove any adjusting tools.** Before operating the machine, make sure any adjusting tools have been removed.
4. **Keep work area clean.** Cluttered areas invite injuries.
5. **Overloading machine.** By overloading the machine you may cause injury from flying parts. **DO NOT** exceed the specified machine capacities.
6. **Dressing material edges.** Always chamfer and deburr all sharp edges.
7. **Do not force tool.** Your machine will do a better and safer job if used as intended. **DO NOT** use inappropriate attachments in an attempt to exceed the machines rated capacity.
8. **Use the right tool for the job. DO NOT** attempt to force a small tool or attachment to do the work of a large industrial tool. **DO NOT** use a tool for a purpose for which it was not intended.
9. **Dress appropriate. DO NOT** wear loose fitting clothing or jewelry as they can be caught in moving machine parts. Protective clothing and steel toe shoes are recommended when using machinery. Wear a restrictive hair covering to contain long hair.
10. **Use eye and ear protection**. Always wear ISO approved impact safety goggles. Wear a full-face shield if you are producing metal filings.

11. **Do not overreach**. Maintain proper footing and balance at all times. **DO NOT** reach over or across a running machine.
12. **Stay alert**. Watch what you are doing and use common sense. **DO NOT** operate any tool or machine when you are tired.
13. **Check for damaged parts**. Before using any tool or machine, carefully check any part that appears damaged. Check for alignment and binding of moving parts that may affect proper machine operation.
14. **Observe work area conditions**. **DO NOT** use machines or power tools in damp or wet locations. Do not expose to rain. Keep work area well lighted. **DO NOT** use electrically powered tools in the presence of flammable gases or liquids.
15. **Tooling adjustments and maintenance**. Always keep tooling and bits sharp and properly adjusted for optimum performance.
16. **Keep children away**. Children must never be allowed in the work area. **DO NOT** let them handle machines, tools, or extension cords.
17. **Store idle equipment**. When not in use, tools must be stored in a dry location to inhibit rust. Always lock up tools and keep them out of reach of children.
18. **DO NOT operate machine if under the influence of alcohol or drugs**. Read warning labels on prescriptions. If there is any doubt, **DO NOT** operate the machine.
19. **DO NOT** touch live electrical components or parts.
20. **Turn off** power before checking, cleaning, or replacing any parts.
21. Be sure **all** equipment is properly installed and grounded according to national, state, and local codes.
22. Inspect power and control cables periodically. Replace if damaged or bare wires are exposed. **Bare wiring can kill!**
23. **DO NOT** bypass or defeat any safety interlock systems.
24. Keep visitors a safe distance from the work area.

TECHNICAL SPECIFICATIONS

Drilling Capacity	1.57” (40mm)
Distance Column Surface To Spindle Center	7.8” ~ 39.3” (198 ~ 1000mm)
Maximum Travel Of Spindle	9.4” (239mm)
Distance Base To Spindle	10.3” ~ 41.8” (262 ~ 1062mm)
Spindle Travel	9.8” (250mm)
Spindle Taper	MT4
Number Of Spindle Speed	6
Range Of Spindle Speed	75-1220rpm
Number Of Feed	3
Range Of Feed	0.0039 ~ 0.0098 inch/r (0.10 ~ .25 mm/r)
Elevating Speed	47.25 inch/min (1200mm/min)
Angle Of Arm Rotation	360° (180° each way)
Max Torque Of Spindle	147.5lb/ft (200Nm)
Maximum Feed Load	1416lbf (6300N)
Power Supply	220V 3ph 60hz
Spindle Driving Motor	2hp (1.5kw) 220V, 3Ph, 60hz, 5.9A
Arm Elevation Motor	.75hp (.55kw) 220V, 3Ph, 60hz, 3.5A
Coolant Pump	1/8hp (0.09kw) 220V, 3Ph, 60hz, .54A
Weight	3740lbs (1700Kg)
Shipping Dimensions	74” x 39” x 93” (1880 x 991 x 2362mm)

TECHNICAL SUPPORT

Our technical support department can be reached at 920.684.4990, and asking for the support desk for purchased machines. Tech Support handles questions on machine setup, schematics, warranty issues, and individual parts needs: (other than die sets and blades).

For specific application needs or future machine purchases contact the Sales Department at: sales@baileigh.com, Phone: 920.684.4990, or Fax: 920.684.3944.

***Note**: The photos and illustrations used in this manual are representative only and may not depict the actual color, labeling or accessories and may be intended to illustrate technique only.*

***Note:** The specifications and dimensions presented here are subject to change without prior notice due to improvements of our products.*

UNPACKING AND CHECKING CONTENTS

Your Baileigh machine is shipped complete in one crate. Separate all parts from the packing material and check each item carefully. Make certain all items are accounted for before discarding any packing material.

WARNING: SUFFOCATION HAZARD! Immediately discard any plastic bags and packing materials to eliminate choking and suffocation hazards to children and animals.
If any parts are missing, do not plug in the power cable, or turn the power switch on until the missing parts are obtained and installed correctly.

Cleaning

WARNING: DO NOT USE gasoline or other petroleum products to clean the machine. They have low flash points and can explode or cause fire.

CAUTION: When using cleaning solvents work in a well-ventilated area. Many cleaning solvents are toxic if inhaled.

Your machine may be shipped with a rustproof waxy coating and/or grease on the exposed unpainted metal surfaces. Fully and completely remove this protective coating using a degreaser or solvent cleaner. Moving items will need to be moved along their travel path to allow for cleaning the entire surface. For a more thorough cleaning, some parts will occasionally have to be removed. **DO NOT USE** acetone or brake cleaner as they may damage painted surfaces.
Follow manufacturer's label instructions when using any type of cleaning product. After cleaning, wipe unpainted metal surfaces with a light coating of quality oil or grease for protection.

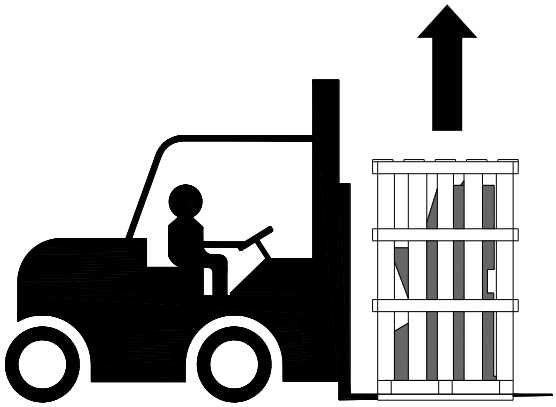
Important: *This waxy coating is **NOT** a lubricant and will cause the machine to stick and lose performance as the coating continues to dry.*

TRANSPORTING AND LIFTING

IMPORTANT: *Lifting and carrying operations should be carried out by skilled workers, such as a truck operator, crane operator, etc. If a crane is used to lift the machine, attach the lifting chain carefully, making sure the machine is well balanced.*

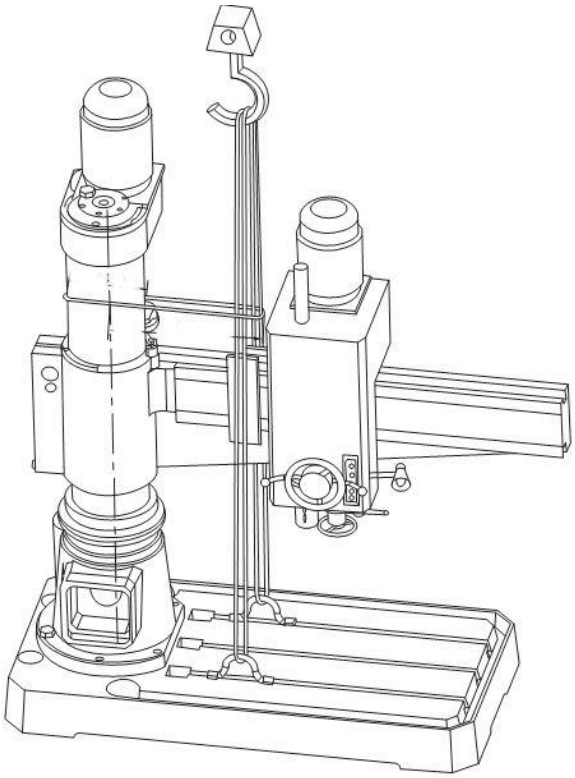
Follow these guidelines when lifting with truck or trolley:

- The lift truck must be able to lift at least 1.5 – 2 times the machines gross weight.
- Make sure the machine is balanced. While transporting, avoid rough or jerky motion, and maintain a safe clearance zone around the transport area.
- Use a fork lift with sufficient lifting capacity and forks that are long enough to reach the complete width of the machine.
- Remove the securing bolts that attach the machine to the pallet.
- Approaching the machine from the side, lift the machine on the frame taking care that there are no cables or pipes in the area of the forks.
- Move the machine to the required position and lower gently to the floor.
- Level the machine so that all the supporting feet are taking the weight of the machine and no rocking is taking place.



Follow these guidelines when lifting crane or hoist:

- Always lift and carry the machine with the lifting holes provided at the top of the machine.
- Use lift equipment such as straps, chains, capable of lifting 1.5 to 2 times the weight of the machine.
- Take proper precautions for handling and lifting.
- Check if the load is properly balanced by lifting it an inch or two.



- Lift the machine, avoiding sudden accelerations or quick changes of direction.
- Locate the machine where it is to be installed, and lower slowly until it touches the floor.

INSTALLATION

This machine requires a minimum of 23ft^2 (2.13m^2) and a solid floor such as concrete a minimum of 4” thick. 6” minimum is preferred.

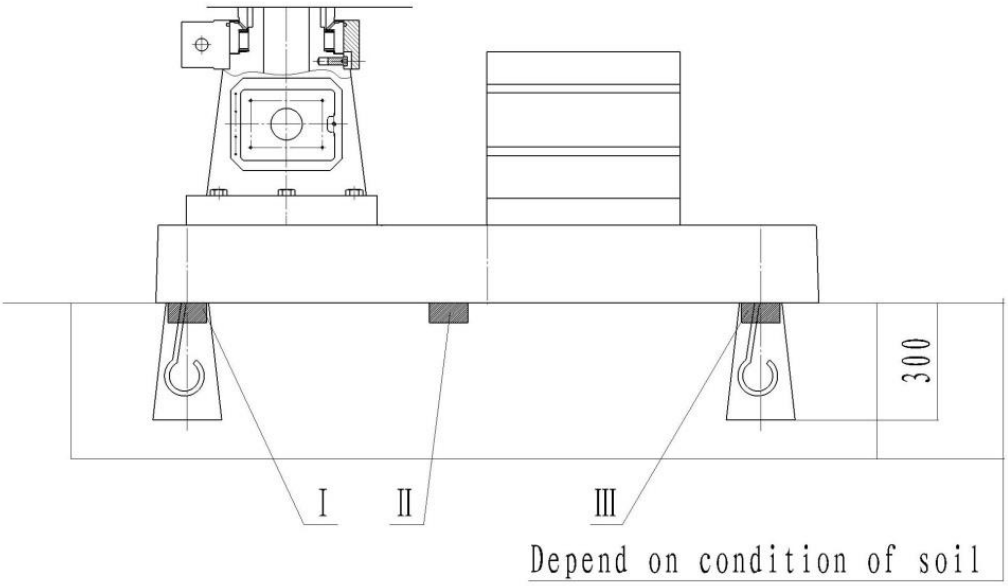
IMPORTANT:

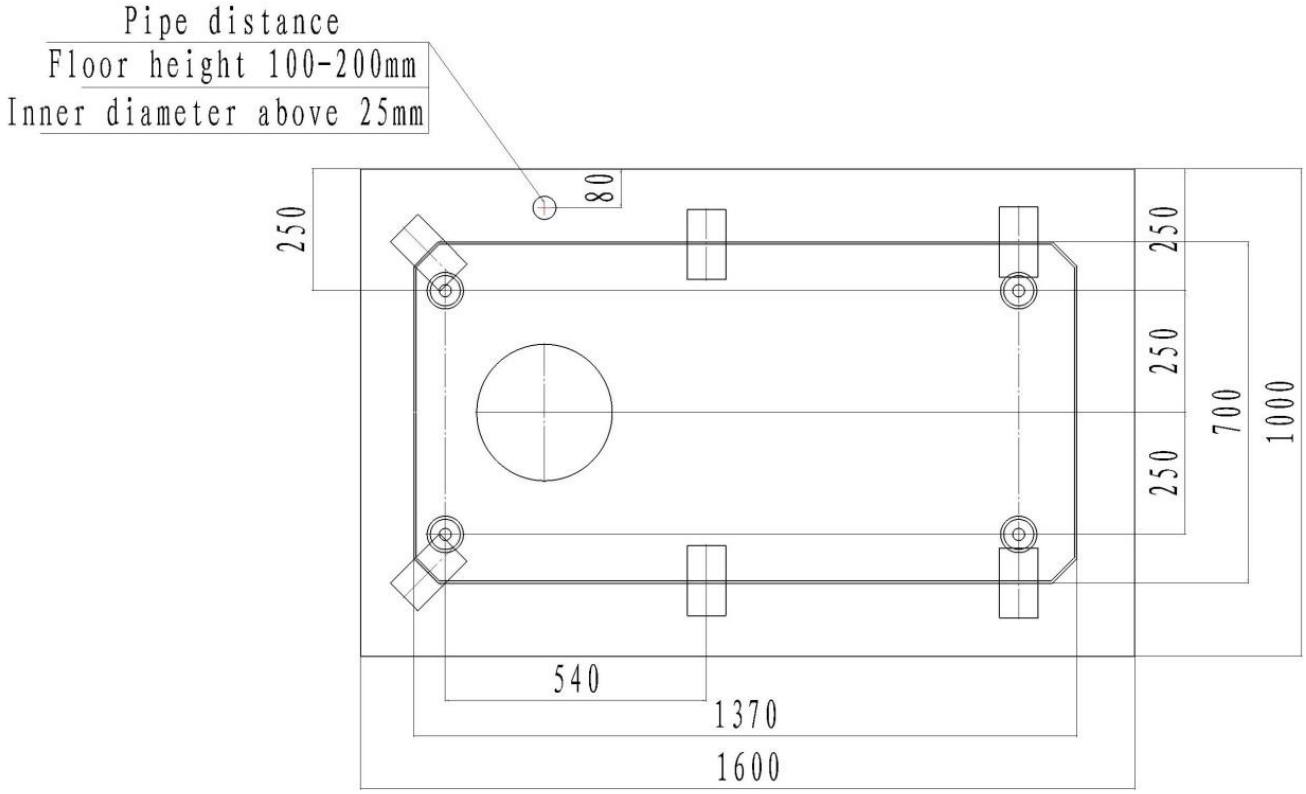
Consider the following when looking for a suitable location to place the machine:

- Overall weight of the machine.
- Weight of material being processed.
- Sizes of material to be processed through the machine.
- Space needed for auxiliary stands, work tables, or other machinery.
- Clearance from walls and other obstacles.
- Maintain an adequate working area around the machine for safety.
- Have the work area well illuminated with proper lighting.
- Keep the floor free of oil and make sure it is not slippery.
- Remove scrap and waste materials regularly, and make sure the work area is free from obstructing objects.
- If long lengths of material are to be fed into the machine, make sure that they will not extend into any aisles.
- **LEVELING:** The machine should be sited on a level, concrete floor. Provisions for securing it should be in position prior to placing the machine. The accuracy of any machine depends on the precise placement of it to the mounting surface.
- **FLOOR:** This tool distributes a large amount of weight over a small area. Make certain that the floor is capable of supporting the weight of the machine, work stock, and the operator. The floor should also be a level surface. If the unit wobbles or rocks once in place, be sure to eliminate by using shims.
- **WORKING CLEARANCES:** Take into consideration the size of the material to be processed. Make sure that you allow enough space for you to operate the machine freely.
- **POWER SUPPLY PLACEMENT:** The power supply should be located close enough to the machine so that the power cord is not in an area where it would cause a tripping hazard. Be sure to observe all electrical codes if installing new circuits and/or outlets.

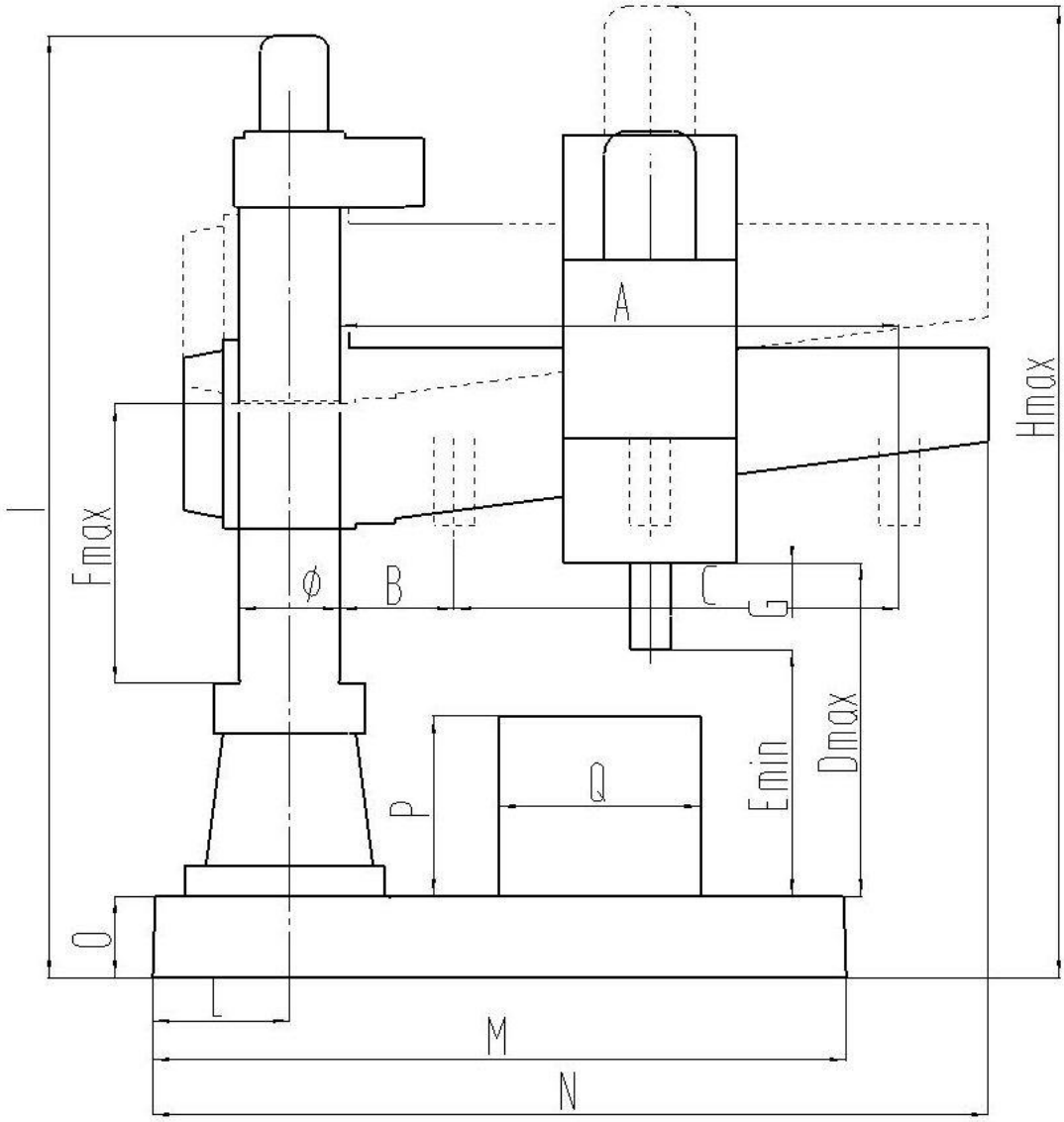
Anchoring the Machine

- Once positioned, anchor the machine to the floor, as shown in the diagram, using bolts and expansion plugs or sunken tie rods that connect through holes in the base of the stand.
- Level the machine to be within 0.0015”/40” (0.04/1000mm) in each direction across the base of the machine. Use steel shims as needed.



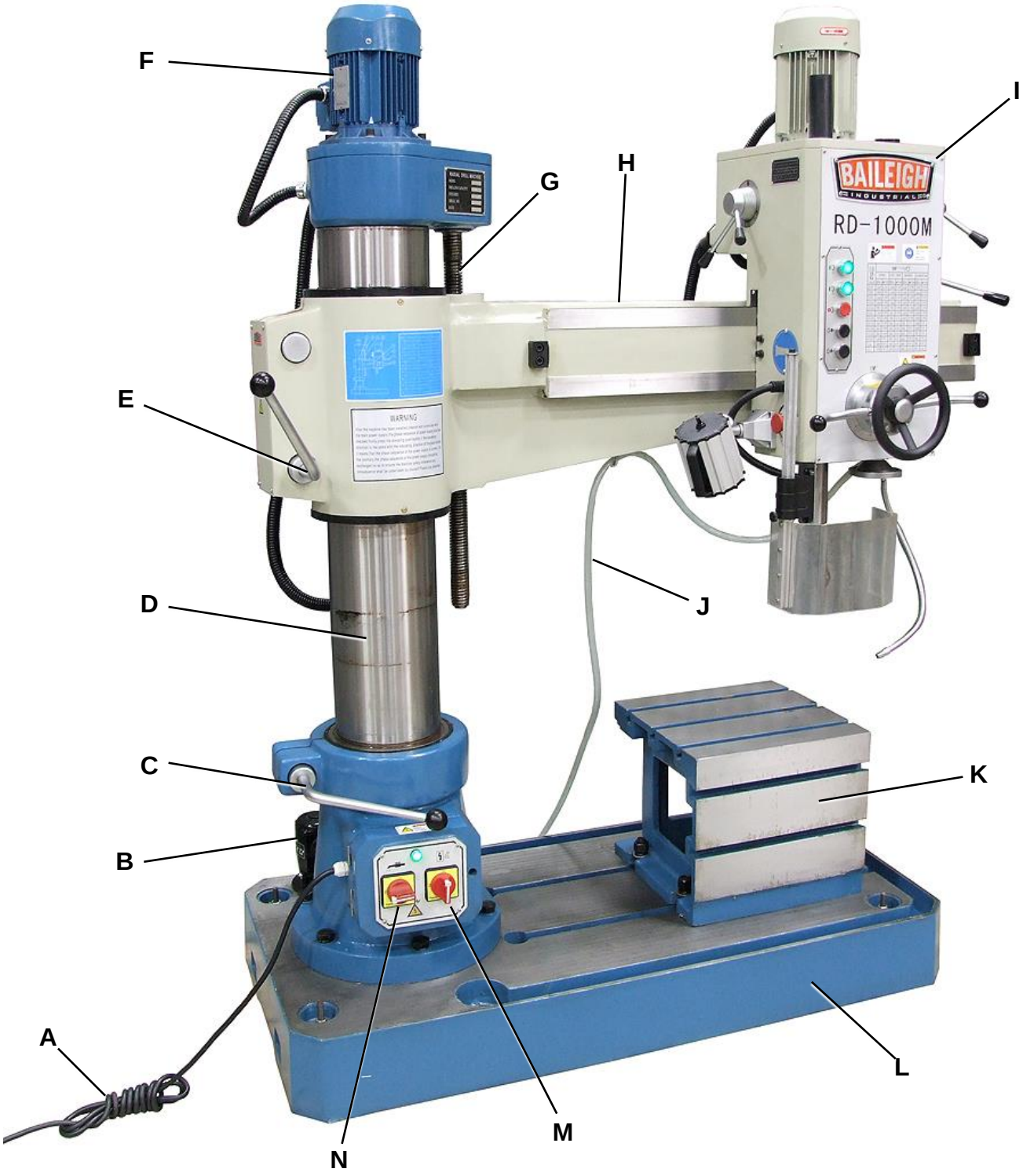


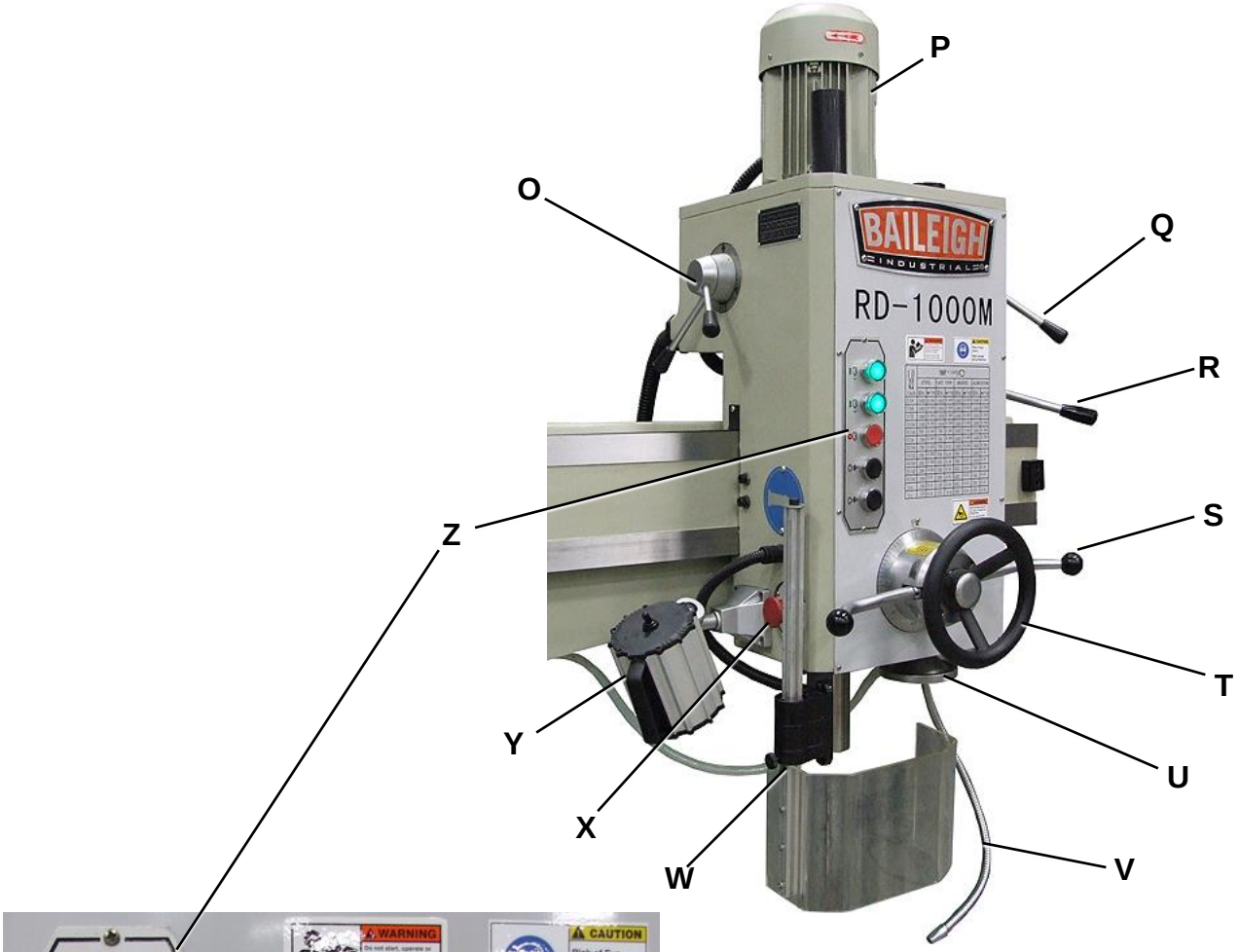
OVERALL DIMENSIONS

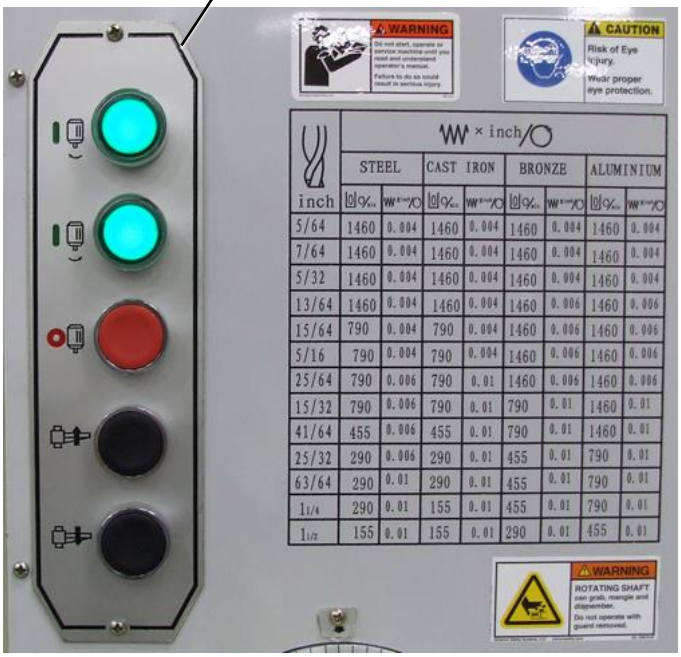


Item	Dimension	Item	Dimension
A	40.15” (1020mm)	I	74.21” (1885mm)
B	12.60” (320mm)	L	10.43” (265mm)
C	19.68” (500mm)	M	53.94” (1370mm)
D	35.43” (900mm)	N	55.79” (1417mm)
E	9.45” (240mm)	O	6.30” (160mm)
F	20.08” (510mm)	P	13.78” (350mm)
G	5.90” (150mm)	Q	15.75” (400mm)
H	81.10” (2060mm)	φ	7.87” (200mm)

GETTING TO KNOW YOUR MACHINE







inch	STEEL		CAST IRON		BRONZE		ALUMINIUM	
5/64	1460	0.004	1460	0.004	1460	0.004	1460	0.004
7/64	1460	0.004	1460	0.004	1460	0.004	1460	0.004
5/32	1460	0.004	1460	0.004	1460	0.004	1460	0.004
13/64	1460	0.004	1460	0.004	1460	0.006	1460	0.006
15/64	790	0.004	790	0.004	1460	0.006	1460	0.006
5/16	790	0.004	790	0.004	1460	0.006	1460	0.006
25/64	790	0.006	790	0.01	1460	0.006	1460	0.006
15/32	790	0.006	790	0.01	790	0.01	1460	0.01
41/64	455	0.006	455	0.01	790	0.01	1460	0.01
25/32	290	0.006	290	0.01	455	0.01	790	0.01
63/64	290	0.01	290	0.01	455	0.01	790	0.01
1 1/4	290	0.01	155	0.01	455	0.01	790	0.01
1 1/2	155	0.01	155	0.01	290	0.01	455	0.01

Item	Description	Function
A	Power Cord	Connects to power source to disconnect switches.
B	Coolant Pump	Pumps coolant to the coolant nozzle to supply coolant to the drill site.
C	Column Lock Lever	Locks and unlocks the column to from rotation.
D	Column	Supports the radial arm and rotates to allow the arm to swing around the column.
E	Arm Lock Lever	Locks and unlocks the radial arm for raising and lowering. Engages a limit switch to disable the up down switches when locked.
F	Elevation Motor	Powers the raising and lowering of the radial arm.
G	Elevation Lead Screw	Driven screw which raises and lowers the radial arm.
H	Radial Arm	Supports the Drill Head. Moves up and down on the column and rotates around the column.
I	Drill Head	Houses the drilling controls, motor, and gear for the drilling operation.
J	Coolant Hose	Connects from the pump to the valve and then the nozzle.
K	Work Table	Box shaped multi surface table used to mount and secure the material during the drilling operation. Proper securing of the material and the fasteners to do so are the owners / operators responsibility.
L	Base	Provides supports the drill and drill column by weight and being anchored to the floor. Coolant tank is cast into, and is part of the base.
M	Main Disconnect	Main On/Off switch for Drill Head operation.
N	Coolant On/Off Switch	Turns On and Off the coolant pump.
O	Gear Shift Levers	2 levers used in combination to shift gears into the six available spindle rpm speeds.
P	Drill Motor	Provides the power to the spindle through the gear set.
Q	Spindle Feed Rate Selector	Lever used to shift gears into the three available spindle feed rates.
R	Drill Head Lock Lever	Locks and unlocks the Drill Head in position along the length of the radial arm.
S	Spindle Feed Handle	Rotating the handle will lower and raise the spindle. Pulling the handle arms outward will engage the feed gears for auto-feeding of the spindle. The spindle will shut off at full extension.
T	Travel Hand Wheel	When the drill head lock lever is unlocked, this hand wheel will move the drill head along the length of the radial arm.

U	Micro Feed Wheel	Is engaged and rotates when the auto feed gear selector is engaged in a set of gears.
V	Flexible Coolant Nozzle	May be positioned to direct coolant to the drill site.
W	Drill Guard w/Safety Switch	Plexiglas cover used to guard the drill during operation. Includes and safety limit switch inside the pivot hinge. Used to endure the guard is closed during operation. May be positioned up and down as needed to fit the drill being used.
X	Emergency Stop Button	A push button with twist rest to remove power from the drill motor and controls immediately when pressed. Requires a twist to restore power to the control switches.
Y	Work Lamp	Provide a light source to be directed to the drill site.
Z	Operating Control Panel	Includes the drill motor clockwise rotation, counterclockwise rotation, motor stop, arm raise and arm lower push buttons.
	Spindle Motor Clockwise Rotation	When the main disconnect is ON, this button will be illuminated. Press this button to start and run the motor to turn the spindle clockwise. Typically called forward.
	Spindle Motor Clockwise Rotation	When the main disconnect is ON, this button will be illuminated. Press this button to start and run the motor to turn the spindle counter-clockwise. Typically called reverse.
	Spindle Motor Stop	Press this button to stop the spindle motor.
	Radial Arm Up	Press and hold this button to raise the radial arm. Release this button when the arm is at the desired height. The up limit switch will stop the up function when the arm is at the top of the stroke.
	Radial Arm Down	Press and hold this button to lower the radial arm. Release this button when the arm is at the desired height. The down limit switch will stop the down function when the arm is at the bottom of the stroke.

ASSEMBLY AND SET UP

⚠ WARNING: For your own safety, DO NOT connect the machine to the power source until the machine is completely assembled and you read and understand the entire instruction manual.

This drill is fully assembled and requires little setup.

- Once the drill is properly installed and anchored, remove the 2 shipping braces.
- One is mounted at the end of the radial arm to the work table to prevent the arm from bouncing.
- The second brace is located on the column side of the drill head and is used to secure the drill head in position on the radial arm to maintain a balance point. These braces will only be used again if the drill is again transported over the road.
- Check and verify the machine is ready for operation with all fasteners tight and fluid levels correct.
- Add coolant based upon coolant directions.

After Power is Connected

- Lubricant the main column with 30W oil.
- Start the machine and lower the radial arm 2” (50.8mm) and clean and lubricant the exposed surface.
- Raise the radial arm 3-4” (76-102mm) and clean and lubricate the exposed surface. This will prevent any dirt or grit that may have accumulated during shipping from damaging and scratching the column.
- Lubricate the machine as shown in the lubrication diagram.
- Run the machine in each function. If the machine runs smoothly and properly, it may be placed into service.

ELECTRICAL

WARNING: Baileigh Industrial is not responsible for any damage caused by wiring up to an alternative 3-phase power source other than direct 3-phase. If you are using an alternate power source, consult a certified electrician or contact Baileigh Industrial prior to energizing the machine.

CAUTION: HAVE ELECTRICAL UTILITIES CONNECTED TO MACHINE BY A CERTIFIED ELECTRICIAN!
Check if the available power supply is the same as listed on the machine nameplate.

WARNING: Make sure the grounding wire (green) is properly connected to avoid electric shock. DO NOT switch the position of the green grounding wire if any electrical plug wires are switched during hookup.

Motor Specifications

Your tool is wired for 220 volt, 60Hz alternating current. Before connecting the tool to the power source, make sure the machine is cut off from power source.

Considerations

- Observe local electrical codes when connecting the machine.
- The circuit should be protected with a time delay fuse or circuit breaker with a amperage rating slightly higher than the full load current of machine.
- A separate electrical circuit should be used for your tools. Before connecting the motor to the power line, make sure the switch is in the “OFF” position and be sure that the electric current is of the same characteristics as indicated on the tool.
- All line connections should make good contact. Running on low voltage will damage the motor.
- 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.

⚠ WARNING: In all cases, make certain the receptacle in question is properly grounded. If you are not sure, have a qualified electrician check the receptacle.

- Improper connection of the equipment-grounding conductor can result in 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.
- Repair or replace damaged or worn cord immediately.

Extension Cord Safety

Extension cord should be in good condition and meet the minimum wire gauge requirements listed below:

	LENGTH		
AMP RATING	25ft	50ft	100ft
0-6	16	16	16
7-10	16	16	14
11-12	16	16	14
13-16	14	12	12
17-20	12	12	10
21-30	10	10	No
	WIRE GAUGE		

An undersized cord decreases line voltage, causing loss of power and overheating. All cords should use a ground wire and plug pin. Replace any damaged cords immediately.

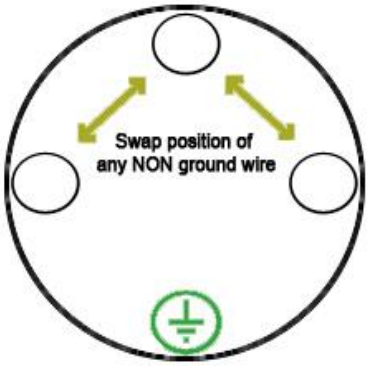
Power cord connection:

1. Turn the main disconnect switch on the control panel to the OFF position.
2. Unwrap the power cord and route the cord away from the machine toward the power supply.
    a. Route the power cord so that it will NOT become entangled in the machine in any way.
    b. Route the cord to the power supply in a way that does NOT create a trip hazard.
3. Connect the power cord to the power supply and check that the power cord has not been damaged during installation.

Check for correct rotation of the motor

⚠ **IMPORTANT: DO NOT** run the machine until all the packaging materials have been removed and fluid levels have been filled as needed.

4. Verify that all tools and materials have been removed from any area around the machines moving parts.
5. With power connected and the main disconnect turned ON, the motor rotation power buttons on the control panel will be lit.
6. Push the radial arm up and down buttons. The arm should raise when the up button is pushed and lower when the down button is pushed.
7. If not, disconnect power to the machine, and switch the L1 and L3 wires. DO NOT move the ground wire.
8. Turn the main disconnect to off when not in use.



Electrical Theory of Operation

This machine use 220V, 60HZ 3 three phase alternating current. Control circuit and light circuit are controlled by the control transformer which reduces the voltage. The voltage is 110V, 24V fitted for all kinds of electric component, are all listed on the detailed electric component list.

The machine is equipped with three motors:
M1 — Main Motor
M2 — Elevating Motor
M3 — Coolant Pump
The coolant pump is connected with through the lower electrical enclosure while the other motors and controls are connected through the upper arm mounted electrical enclosure.

⚠ **IMPORTANT: DO NOT** always rotate the radial arm in the same direction around the column. This will damage wires, cables and hoses that are routed between the column and the arm.

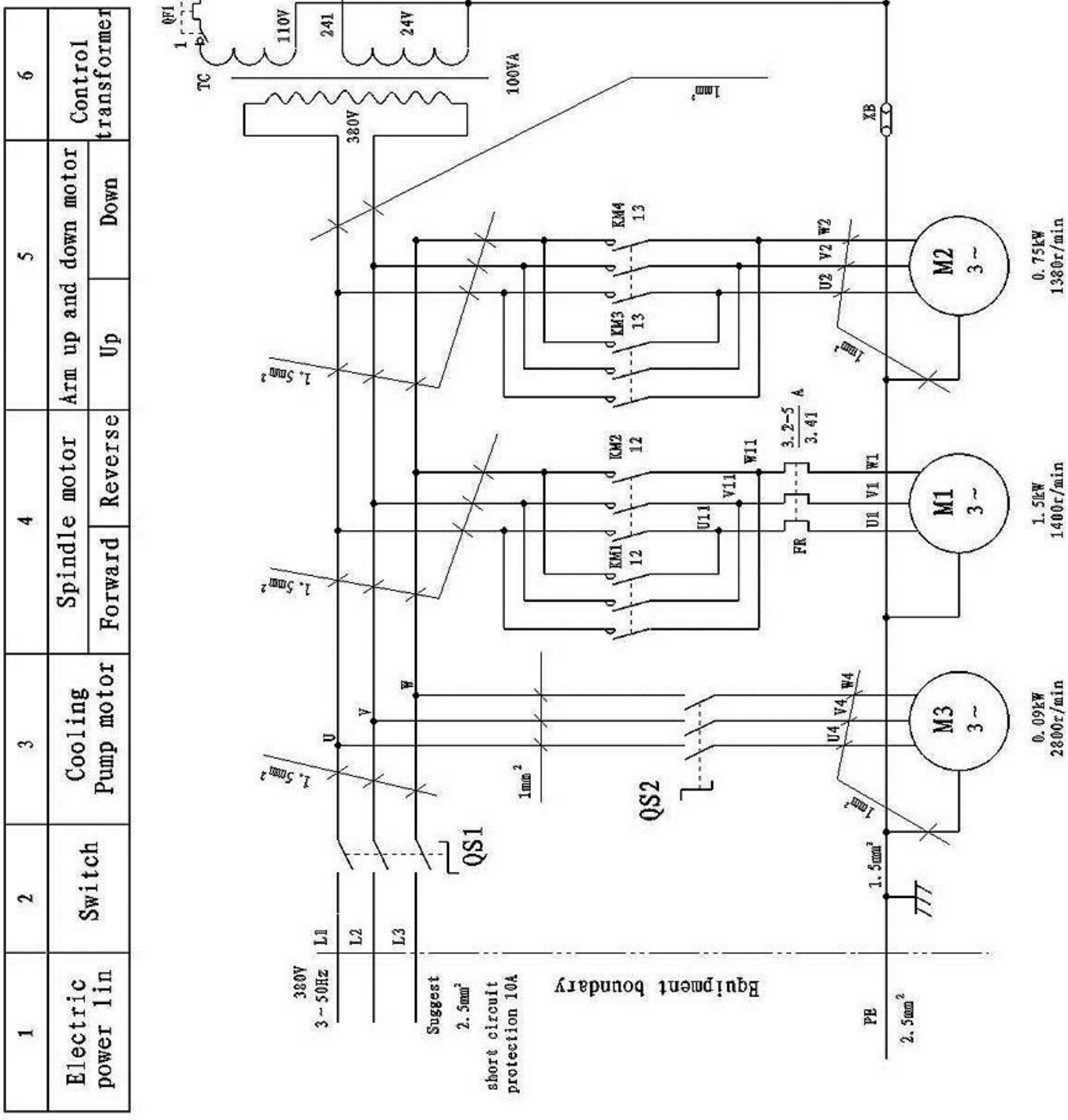
Power ON
Turn on the electricity switch QF (SA1), indicator light HL1 and button indicator light HL2, HL3 connected.

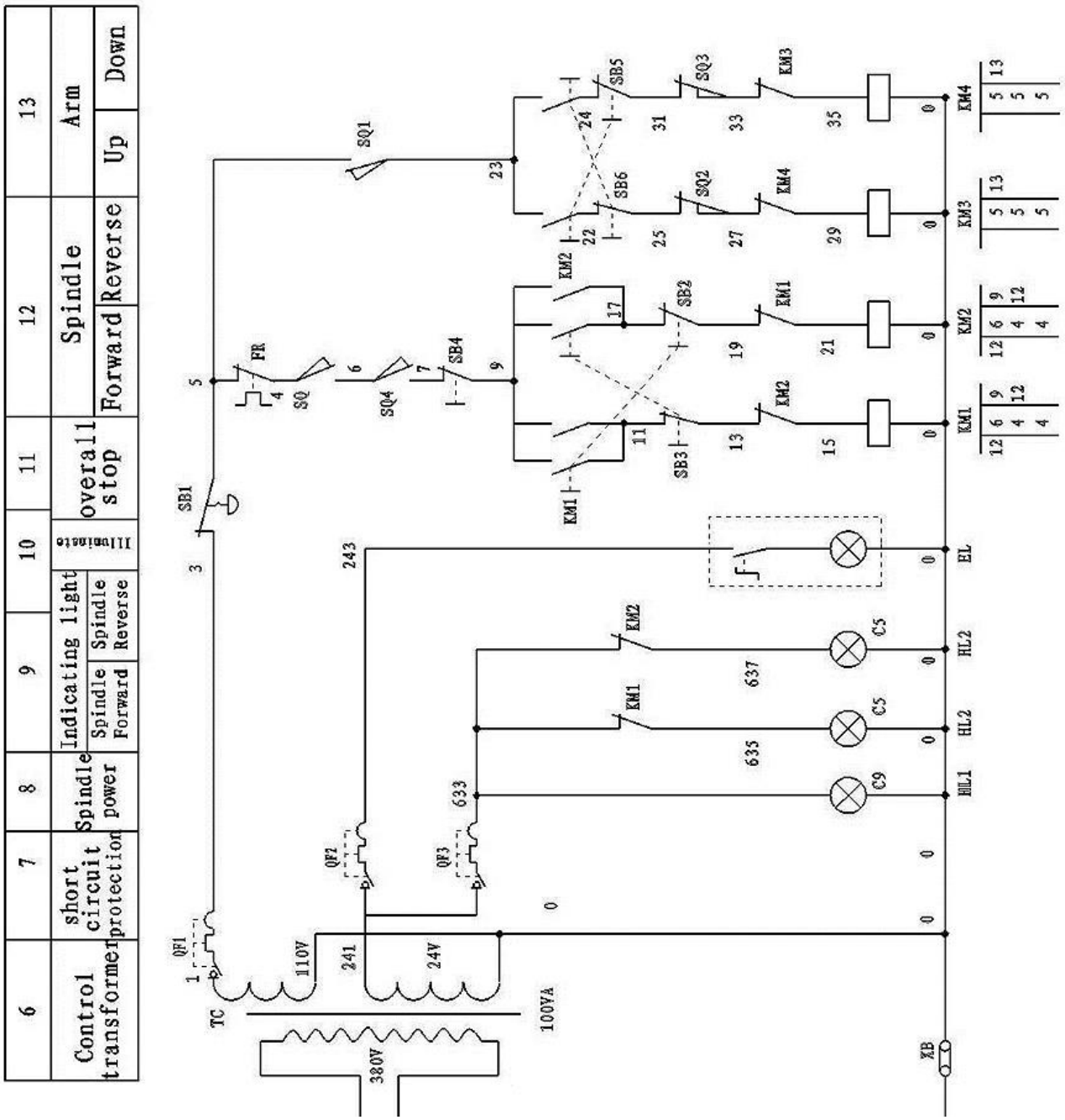
General Motor Operation
Press start button SB2, turn on the contactor KM1, then spindle rotates clockwise, indicator light HL2 off; press button SB3, contactor KM2 connected, spindle rotates counter-clockwise, indicator light HL3 off. Spindle stopped rotating when press button SB4.
In prevent of long time operation about general motor, there is a relay FR, its fixed value should adjust by the rating current of general motor M1.

Arm Raise and Lower
First release the arm clamping handle 3, micro-switch SQ1 closed, press up (or down) button SB5 (or SB6). Contactor KM2 (or KM3) energized, and the up and down motor M2 rotates to drive the arm up. When the arm is raised (or lowered) to the places you needed, release the button SB5 (or SB6) contactor KM3 (or KM4) released, up and down motor M2 stops. Arm movement stops.
Up and down limitation switch SQ2, SQ3 use to control the arm up and down travel limits. Arm stops when the arm is raised to the limit and contacts SQ2 (or SQ3), contactor KM3 (or KM4) is de-energized, up and down motor M2 stops. Arm movement stops.

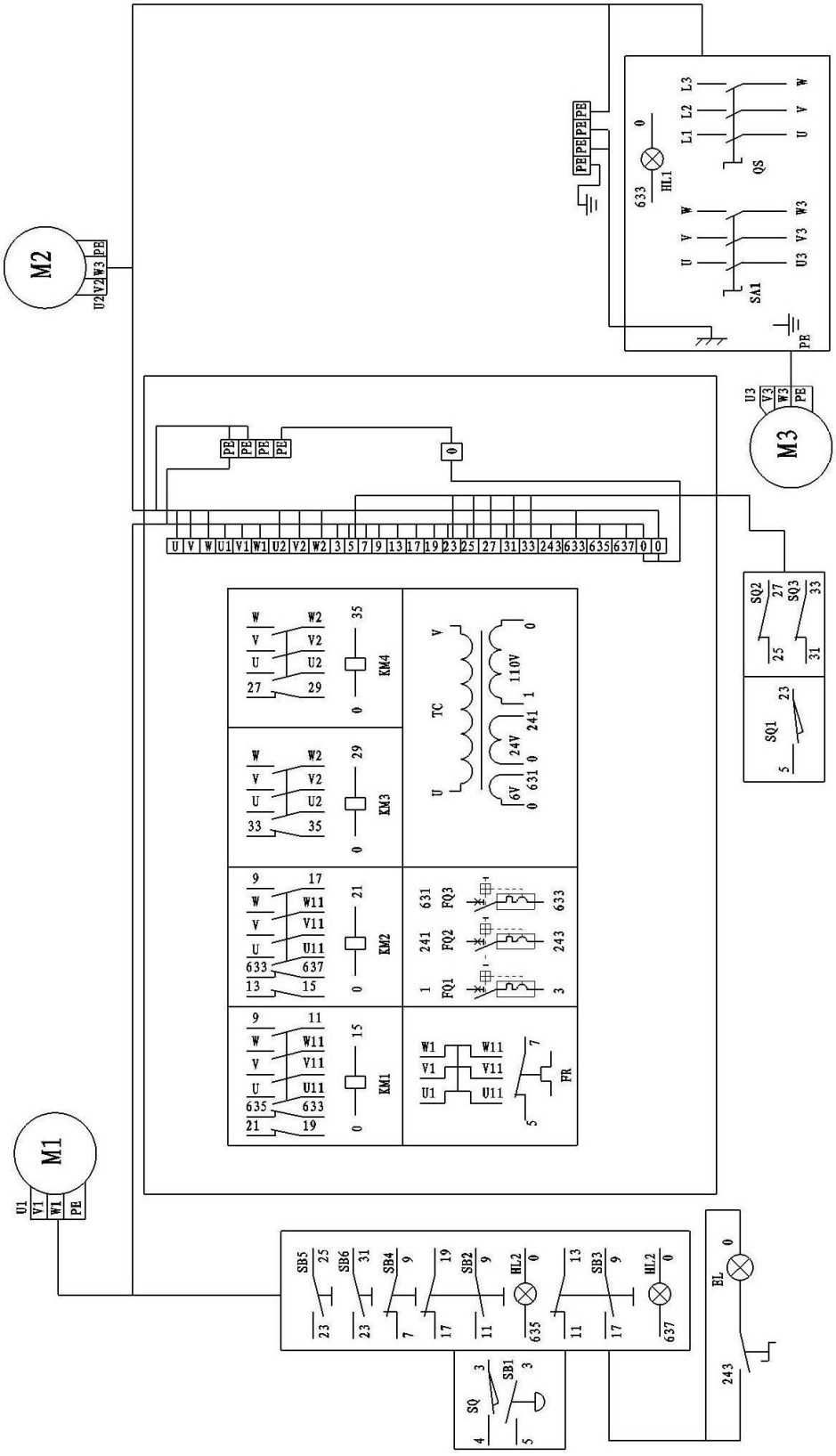
Start and stop of the cooling pump
The coolant pump is turned on and off directly using a disconnect type On/Off switch QS2. Turning the switch on starts and runs the coolant pump. Turning the switch off stops the pump.

ELECTRICAL SCHEMATIC




6
7
8
9
10
11
12
13
Control transformer
short circuit protection
Spindle power
Indicating light
Spindle Forward
Spindle Reverse
Illuminate
overall stop
Spindle
Forward
Reverse
Arm
Up
Down
QF1
TC
110V
24V
380V
100VA
SB1
FR
SQ
SQ1
SQ4
SB4
SB5
SB6
SQ3
SQ2
SB2
SB3
KM1
KM2
KM3
KM4
EL
HL1
HL2
C9
C5
XB

Wiring Layout



Electrical Item List

No.	Symbol	Qty.	Specification and model	Name
1	M1	1	1.5kw, Y90L-4	220V, 3Ph, 60hz, 5.9A Induction
2	M2	1	.75kw, Y2-802-4	220V, 3Ph, 60hz, 3.5A Asynchro
3	M3	1	1/8hp, 220/440, 3ph, 60hz, L125, 4bolt, 3-9/16" AB25TH	220V, 3Ph, 60hz, .54A (coolant)
4	QF1	1	GV2-ME10C/4-6.3A	Breaker, Thermal Magnetic
4A	QF2	1	GV2-ME08C/2.5-4A	Breaker, Thermal Magnetic
4B	QF3	1	GV2-ME04C/0.25-0.63A	Breaker, Thermal Magnetic
	QF4	1	C65N-2P-C2 (2A)	Breaker
	QF5	1	C65N-1P-C2 (2A)	Breaker
	QF6	1	C65N-1P-C4 (4A)	Breaker
5	TC	1	JBK5-100 220V/415V - A24V/60VA – B24V/40VA	Control Transformer
6	KM1-KM5	5	3TB4022, 110V, 50-60Hz	Contactor
7	FR	1	JRS1-09/F, 2.5-4A, 3.75A	Heat Relay
8	SQ2, SQ3	2	LX5-11N	Micro-Switch
9	SQ1	1	JWL1-11	Micro-Switch
10	SQ	1	DZ5-20/330FH	Air Automatic Switch (Proximity)
11	SA	1	HZ5-10/1, 7LO2	Combination Switch
12	SB1	1	LAY3-01ZS/1 red	Control Button
13	SB2,SB3	2	LAY3-11D/2 green	Control Button
14	SB5,SB6	2	LAY3-11P/6 black	Indicator Light
15	SB4	1	LAY3-01P/1 red	Indicator Light
16	HL	1	XD, faucet 6V	Switch of Door
17	EL	1	40W, 24V	Bulb
18		1	JC-25 head of light	Light

OPERATION

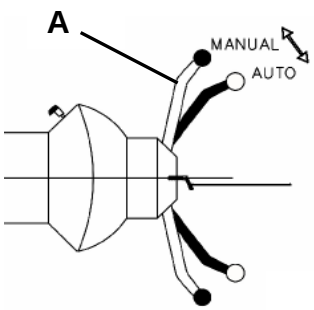
⚠ CAUTION: Always wear proper eye protection with side shields, safety footwear, and leather gloves to protect from burrs and sharp edges.
When handling large heavy material make sure they are properly supported.

Refer to “Getting To Know Your Machine” and your actual machine as needed to become familiar with the operational control referenced below.

IMPORTANT: *This Operation instruction is not in any specific order. Because it may be necessary to operate the drill to use functions to create the clearance needed to load and secure the material to be drilled.*
ALWAYS *verify that the work area including the spindle and radial arm are clear before starting the machine.*
ALWAYS *turn the main disconnect OFF before working on the drill or loading material.*

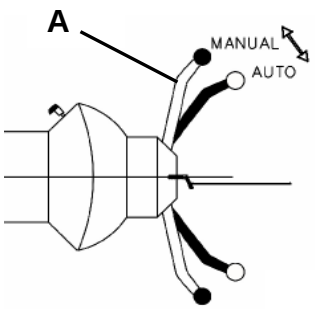
Manual Feed

1. Load and secure the material as needed to the work table or base. The mounting hardware to secure the material is supplied by the owner/operator. Do not allow the material to be unsecured as this will allow the material to swing with the spindle causing damage and injury.
2. Install the tapered adaptor and chuck into the spindle. Install a drill bit.
3. Align the drill over the material at the drill location.
    a. Use the travel hand wheel to move the head along the length of the radial arm. Lock the head at the desired location.
    b. Raise or lower the radial arm to desired height.
    c. Swing the arm on the column axis if desired to position. Verify the column is locked to prevent rotation during operation.
4. Set the speed selector to the desired using the gear levers.
5. Set to manual mode making sure the down-feed handles (A) are pushed in.
6. Start the machine by pushing the start button.
7. Turn the feed handle to lower the drill bit into the material.
8. When the desired depth is reached, turn the feed handle to raise the drill bit to clear the material.
9. Stop the motor.



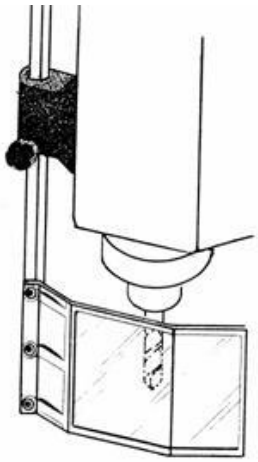
Auto Feed

1. Load and secure the material as needed to the work table or base. The mounting hardware to secure the material is supplied by the owner/operator. Do not allow the material to be unsecured as this will allow the material to swing with the spindle causing damage and injury.
2. Install the tapered adaptor and chuck into the spindle. Install a drill bit.
3. Align the drill over the material at the drill location.
    a. Use the travel hand wheel to move the head along the length of the radial arm. Lock the head at the desired location.
    b. Raise or lower the radial arm to desired height.
    c. Swing the arm on the column axis if desired to position. Verify the column is locked to prevent rotation during operation.
4. Set the speed selector to the desired using the gear levers.
5. Shift the down feed lever into the desired feed rate.
6. Set to auto mode making sure the down-feed handles (A) are pulled out.
7. Start the machine by pushing the start button.
8. The feed hand le will rotate slowly as the spindle feeds downward into the material.
9. When the desired depth is reached, push in on the feed handle to release the auto feed gears.
10. Turn the feed handle to raise the drill bit to clear the material.
11. Stop the motor.



Drill Protection Guard

- The machine is provided with a security micro drill guard.
- Before pressing the starting push button, set the drill guard in the working position, otherwise the machine controls will not start.



***Important**: If the guard is opened when operating the machine, the machine will stop. **DO NOT** REMOVE THE GUARD UNDER ANY CIRCUMSTANCES.*

Speed Selector

- Shift the levers in combination to obtain the desired spindle speed. In various combinations, a total of 6 different spindle speeds (rpm) may be selected.
- Follow the chart on the front of the control panel to select and set the desired speed.
- Rotate the spindle by hand as needed to align the gears.

***Important**:* **DO NOT** change spindle RPM until the spindle has stopped completely.

Feed Selector

- Shift the feed selector lever into the desired setting. The settings are set in inches of depth per revolution of the spindle.
- Follow the chart on the front of the control panel to select and set the desired speed.

***Important**:* **DO NOT** change spindle direction until the spindle has stopped completely.

Arm Elevating

1. Unclamp the arm lock handle to release the arm and release the limit switch.
2. Press and hold the arm raise (A) or lower (B) button to raise or lower the radial arm.
3. When the arm is at the desired height, release the button and the arm will stop
4. Use the arm lock lever to lock the arm at this height.

Spindle Rotation.

- Press the top green lamp button (C) to start the spindle motor in the clockwise rotation.
- Press the lower green lamp button (D) to start the spindle motor in the counter-clockwise rotation.
- Press the red button (E) to stop motor rotation.

Clamping/Unclamping the Column and Spindle Head

- Use the clamping handle to release the tension locking the arm to the column. This will allow arm to rotate on the column or raise and lower on the column.

⚠ **IMPORTANT: DO NOT** always rotate the radial arm in the same direction around the column. This will damage wires, cables and hoses that are routed between the column and the arm.

Coolant

- Locate the coolant pump On/Off switch (F) located at the base of the column.
- Turn the switch to the On position to turn the pump on.
- Use the flexible tube to direct the coolant flow toward the cutting point.
- Use the valve at the base of the flexible tube to control the coolant flow.

MATERIAL SELECTION

CAUTION: It must be determined by the customer that materials being processed through the machine are NOT potentially hazardous to operator or personnel working nearby.

When selecting materials keep these instructions in mind:

- Material must be clean and dry. (without oil)
- Material should have a smooth surface so it processes easily.
- Dimensional properties of material must be consistent and not exceed the machine capacity values.
- Chemical structure of material must be consistent.
- Buy certificated steel from the same vendor when possible.

ADJUSTMENTS AND MAINTENANCE

WARNING: Make sure the electrical disconnect is OFF before working on the machine.
Maintenance should be performed on a regular basis by qualified personnel.
Always follow proper safety precautions when working on or around any machinery.

- Check daily for any unsafe conditions and fix immediately.
- Check that all nuts and bolts are properly tightened.
- On a weekly basis clean the machine and the area around it.
- Lubricate threaded components and sliding devices.
- Apply rust inhibitive lubricant to all non-painted surfaces.

***Note**: Proper maintenance can increase the life expectancy of your machine.*

Adjustment of clamping strength of spindle head

- When clamping strength of spindle head is not strong enough, release the spindle box and the bolts under clamping cylinder. Move the bolt to the right position along the slot, clamp the bolts and spindle head firmly again. Twist the hand wheel along circle with 40kg strength. If the head don't move, the adjustment of clamping strength of spindle head has been workable.
- After adjustment of clamping strength, inspect releasing condition.
- Release the spindle head. Twist the hand wheel along circle with strength 3-4kg. The spindle head should move. Under the condition that the spindle head is clamped firmly. Insert a thickness 0.04mm insert ruler between the head and 55 arm slide face and front face. Depth should be not exceeding 20mm.

Adjustment of clamping strength of arm

- When clamping strength of arm is not strong enough, shut off the power while the arm is elevating make the arm released. Fasten the screw 6 along clockwise, and then turn on the power. If a thickness 0.04mm insert ruler can`t be inserted into the mounting place of the arm sleeve and outer sleeve. (It is better to fasten the screw until the rhombic can stand up vertically.

Adjustment of clamping strength of column

- When clamping strength of column is not strong enough, release the column. Unload the cover on the top. Twist firmly the lock nut. Clamp the column firmly. Load 160kg thrust strength to the end of the arm. If there is no movement of outer column against inner column, the adjustment of clamping column has been workable.
- If the lock nut have been at the limited position, clamping strength still not enough. Release the column. Release the inner hex head screw above the spring plate 12, adjust again.
- After adjustment of clamping strength. Inspect releasing condition. Release the column. Load 160kg thrust strength to the end of the arm. The column can be turn.

Adjustment of balance strength of spindle

- Balance strength of spindle have been adjusted well by manufacturer. When the spindle lost its balance because of the change of the cutter. Adjustment by turning the screw14.

Adjustment of resistance of feeding-load

- Resistance of feeding load have been adjusted well by manufacturer, usually do not adjust it in the operation. Under some special conditions, the user can turn the lock nut above the gear 8 to strengthen or loosen the strength of the spring. The resistance of feeding-load will be strengthened or loosened. When the resistance of feeding-load is 1600-1760kg, the overload safety protection device is in the normal work condition. If load over 1760-2000kg, the device will make the feed drive not work. The resistance strength should be measured by resistance strength testing instrument.

Maintenance

- The maintenance of the machine must be done according to the requirements in this manual. Lubricate the machine on time by stipulated lubricant oil. Oil screen should be washed regularly and keep the oil pure.
- Arm slide and column should be wiped by precision emery paper regularly to prevent the surface scratched.
- The cutting work must obey the technical data stipulated in this manual and not beyond the machine capacity. Loading strength should not exceed the spindle torque capacity 40KG/M and feeding-resistance strength 1600kg.
- When cutting, the spindle head, column should be clamped firmly under common situation, otherwise it will be easy to bring the bad consequence and harm the machine precision and durability.
- Prohibition to move the arm always along a same direction.

Accessing and Cleaning the Coolant System

- Clean the drain screens on the machine base and the drains channels around the base.
- Using a slug vacuum, empty and clean the dirt and debris from the reservoir.
- Thoroughly clean the pump and pump inlet
- Re-fill tank with coolant solution.

Oils for Lubricating Coolant

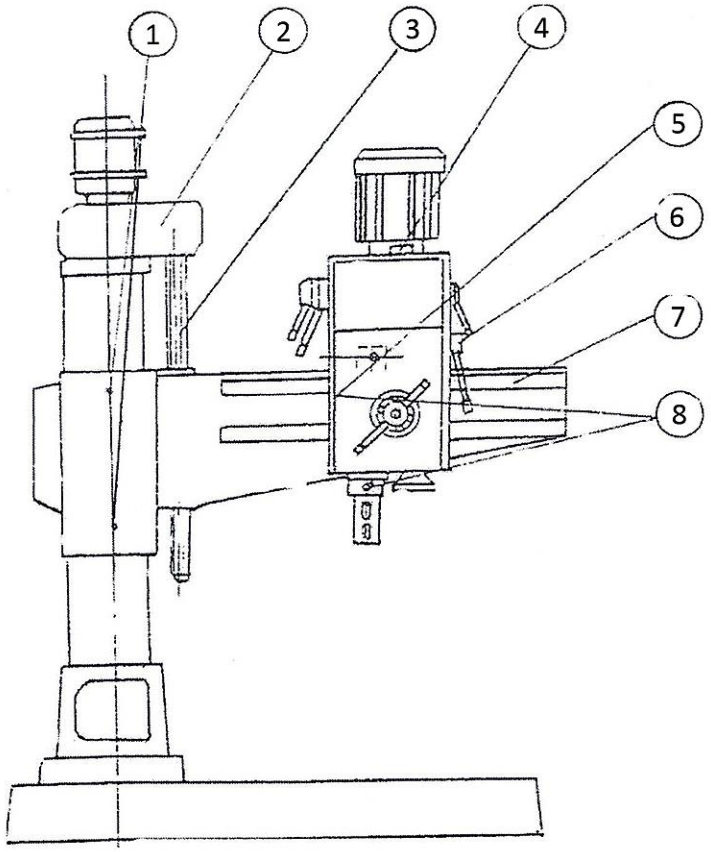
Any 10:1 (water to coolant) solution will work, however we recommend Baileigh B-Cool 20:1 (water to coolant) biodegradable metal cutting fluid. It has excellent cooling and heat transfer characteristics, is non-flammable, and extends tool and machine life. Each gallon of concentrate makes 21 gallons of coolant.

Storing Machine for Extended Period of Time

If this machine is to be inactive for a long period of time, prepare the machine as follows:

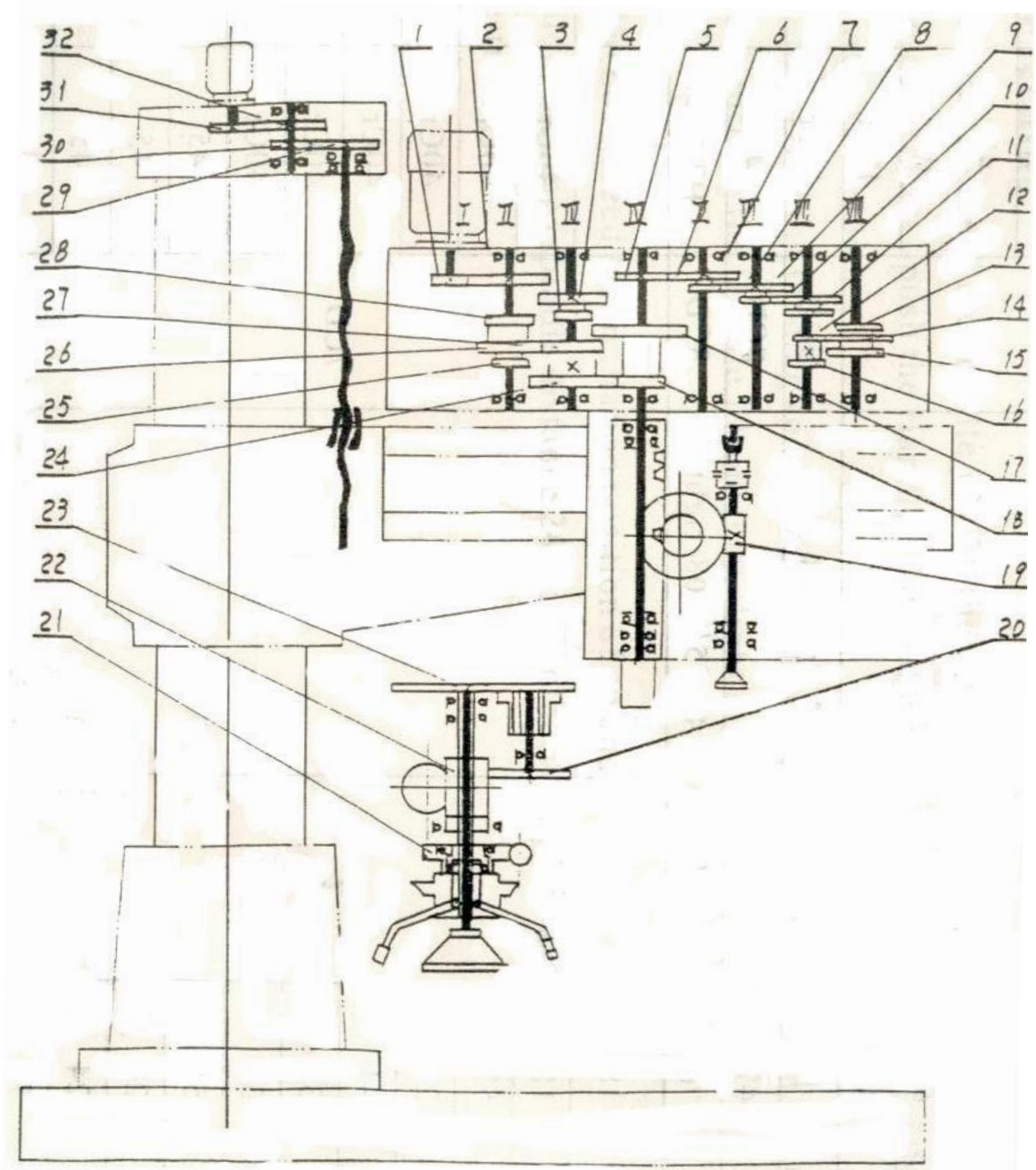
- Disconnect the electrical supply from the power panel.
- Empty and clean the coolant reservoir.
- Clean and grease the machine.
- Cover the machine.

LUBRICATION



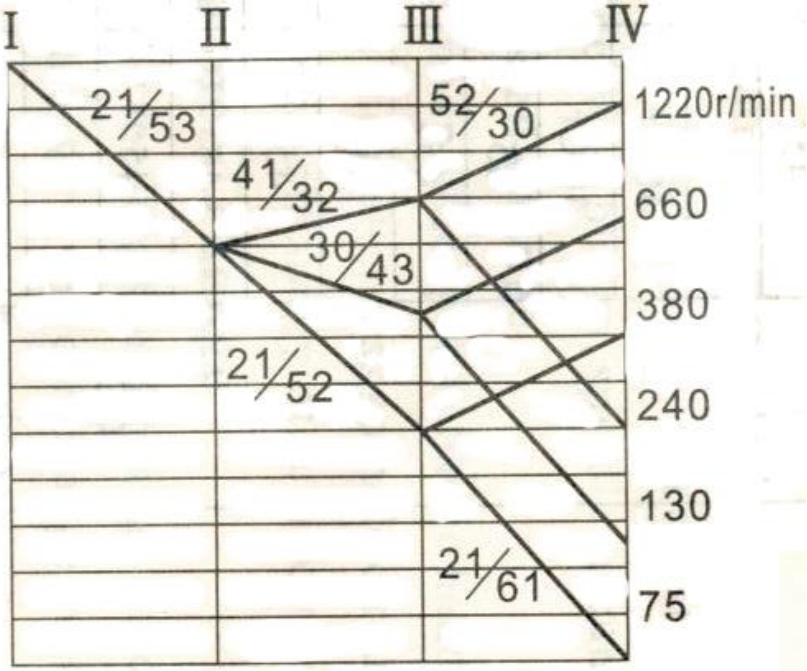
No	Lubricate part	lubricating oil No	Lubricate circle	Remarks
1	Spindle guide	68# machinery oil	Always keep oiling	
2	Up and down gear box	3# lubricate grease	Injecting oil three month one time	
3	Radial up and down thread bar	68# machinery oil	Injecting oil every time	
4	Spindle injecting oil hole	32# machinery oil	change oil three month one time	
5	Downstairs of spindle head body	3# Lubricate grease	change oil six month one time	
6	Spindle head bosy clamp equipment	32#machinery oil	Injecting oil every time	
7	Radial guide	68#machinery oil	Always keep oiling	
8	Spindle up and down bearing	2 Lubricate grease	Injecting oil every month	

DRIVING SYSTEM

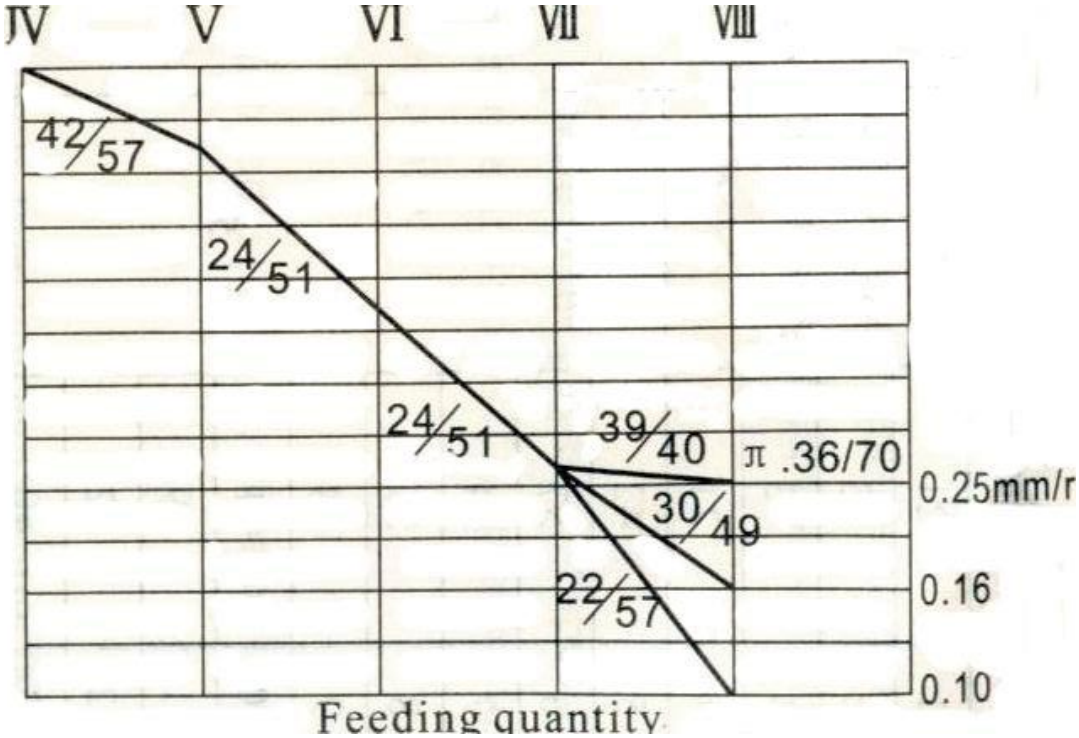


Driving system map

Spindle motor
1430r/min



Spindle speed

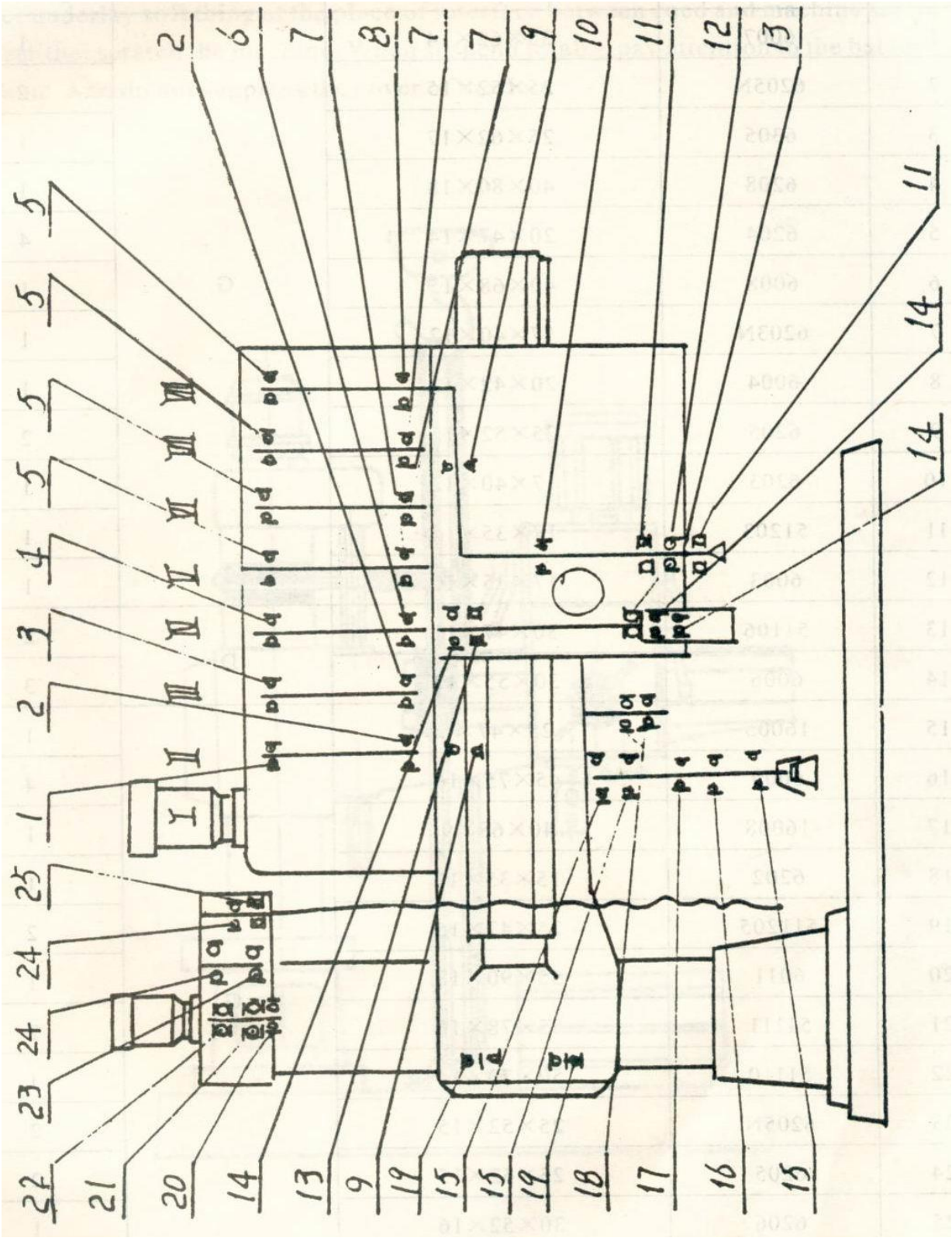


Feeding quantity

Parts of Drive System

No.	Tooth Number	Model No.	Angle and Direction	Precision Grade	Material No.	Head Treatment & Hardness
1	21	2		7CD	45	G52
2	53				45	G52
3	43				40Cr	G52
4	21				40Cr	G52
5	42	1.5			45	G52
6	57				45	G52
7	24				45	G52
8	51				45	G52
9	24				45	G52
10	51				45	G52
11	39				45	G52
12	22				45	G52
13	40				40Cr	G52
14	57				40Cr	G52
15	49				40Cr	G52
16	30				45	G52
17	61	2			40Cr	G52
18	30				40Cr	G52
19	1	1.5	4° 05' 08 right	8CD	40Cr	T235
20	47	2		7CD	45	G52
21	70	1.5	4° 05' 08 right	8CD	HT300	
22	18	2		7CD	40Cr	T235 D0.3-461
23	18				40Cr	G48
24	52				40Cr	G52
25	21				40Cr	G52
26	41				40Cr	G52
27	32				40Cr	G52
28	30				40Cr	G52
29	56				45	G52
30	24				45	G52
31	24				45	G52
32	71				45	G52

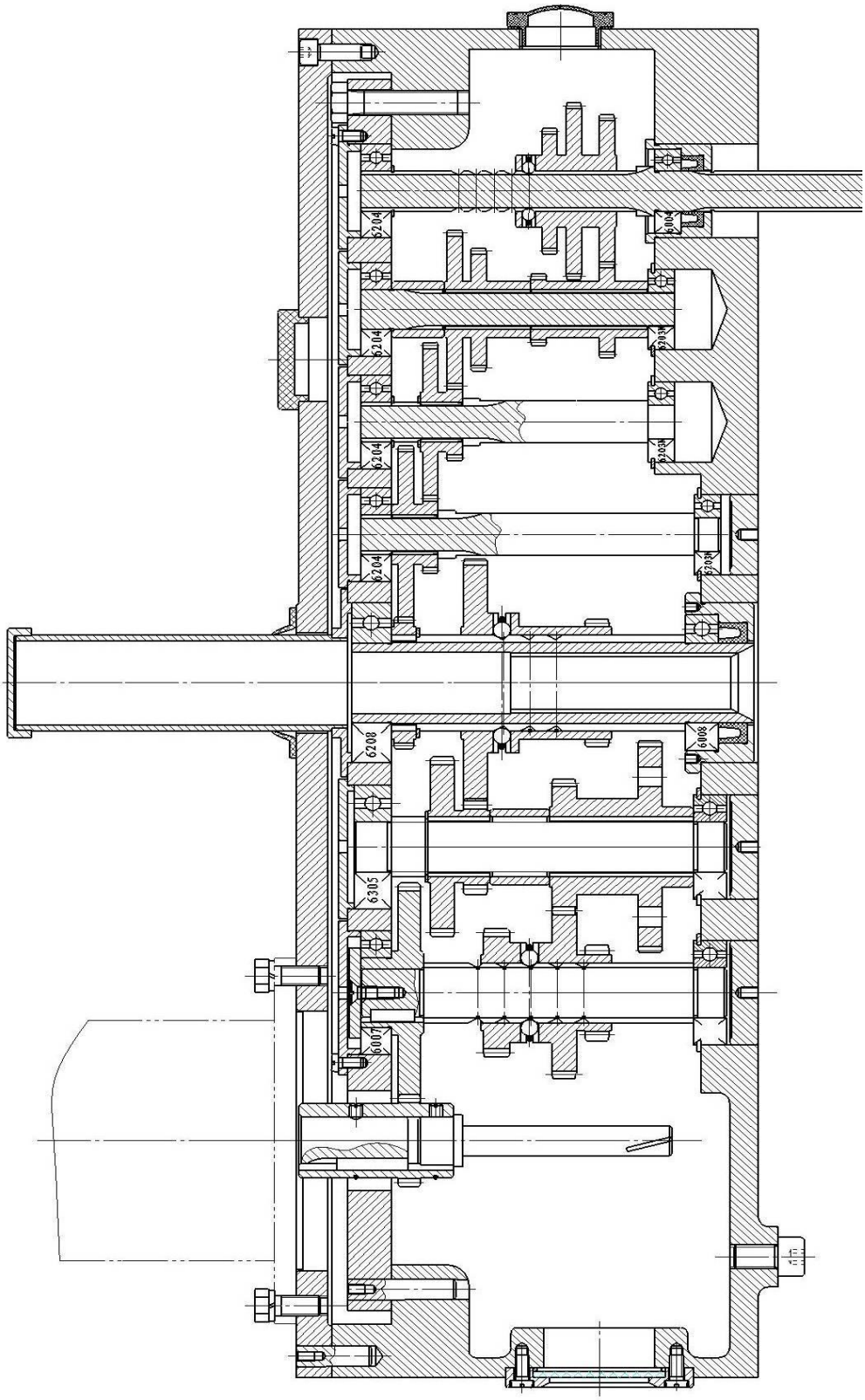
Bearing


2
6
7
8
7
7
9
10
11
12
13
5
5
5
5
4
3
2
1
25
24
24
23
22
21
20
14
13
9
12
15
15
19
18
17
16
15
11
14
14

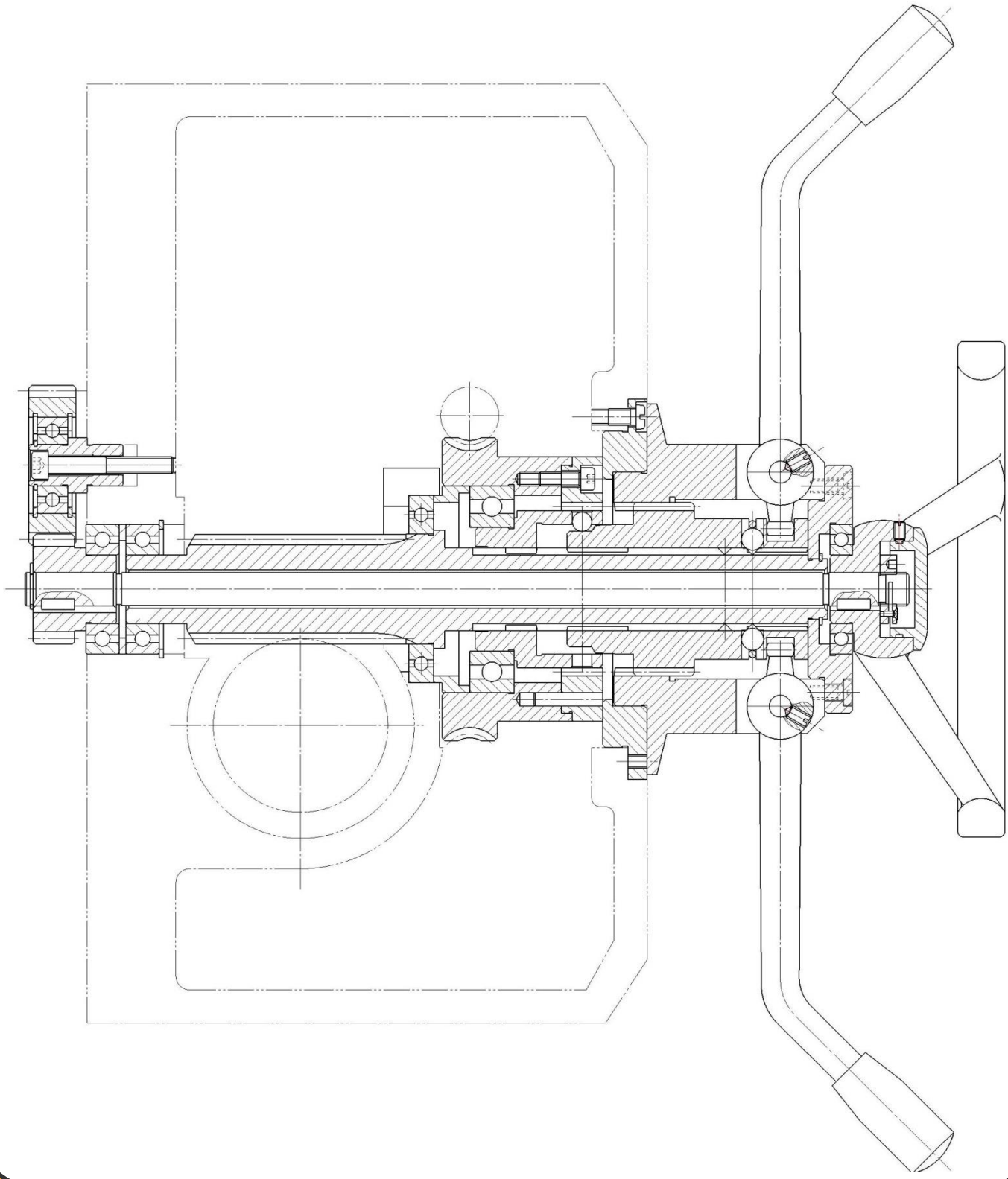
Position of Roll Bearing

NO.	Item	Specification	Precision	Qty.
1	6007	35×62×14	G	1
2	6205N	25×52×15		2
3	6305	25×62×17		1
4	6208	40×80×18		1
5	6204	20×47×14		4
6	6008	40×68×15		1
7	6203N	17×40×12		1
8	6004	20×42×12		1
9	6205	25×52×15		2
10	6203	17×40×12		1
11	51203	17×35×12		1
12	6003	17×35×10		1
13	51106	30×47×11	D	2
14	6006	30×55×13		3
15	16005	25×47×8	G	1
16	6009	45×75×16		4
17	16008	40×68×9		1
18	6202	15×35×11		1
19	511205	25×47×15		2
20	6011	55×90×18		1
21	51111	55×78×16		2
22	51110	50×70×14		1
23	6205N	25×52×15		2
24	6205	25×52×15		2
25	6206	30×52×16		1

Spindle and feeding speed change structure

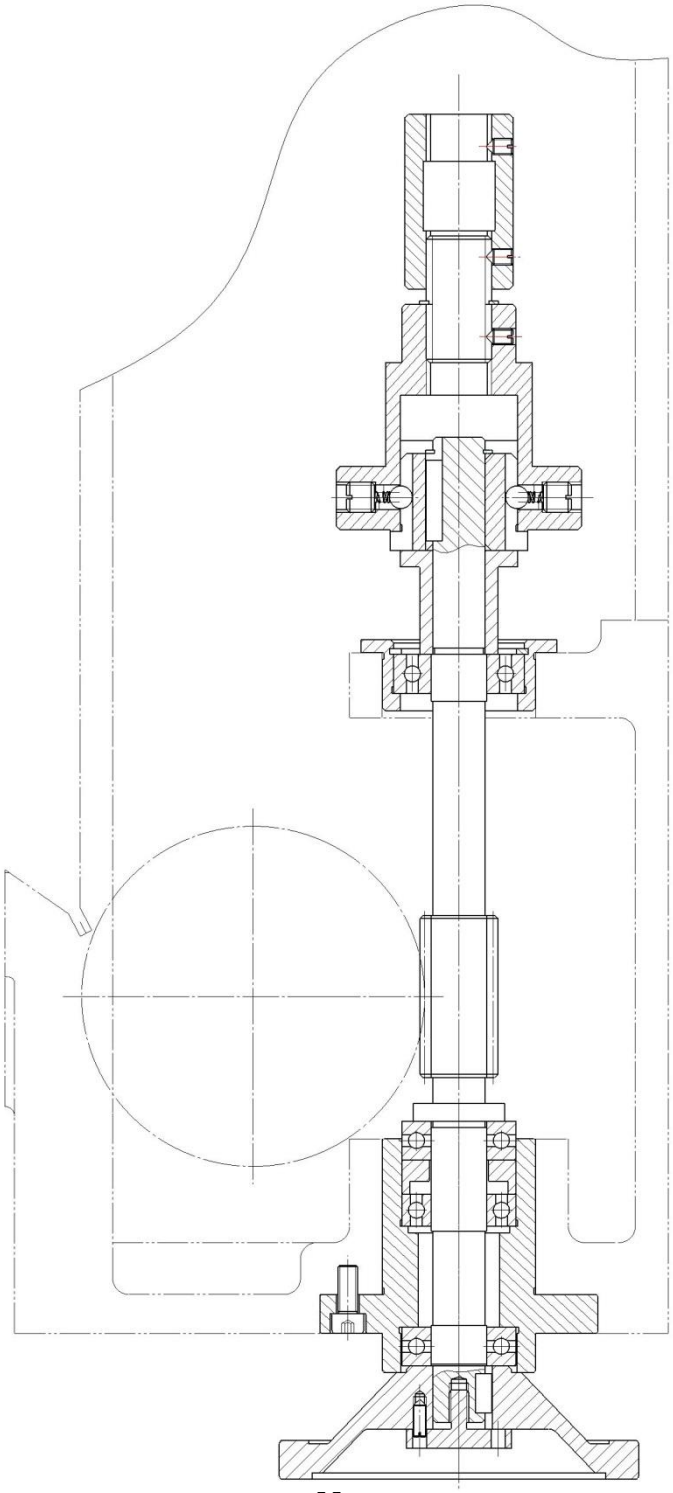


Horizontal shaft structure



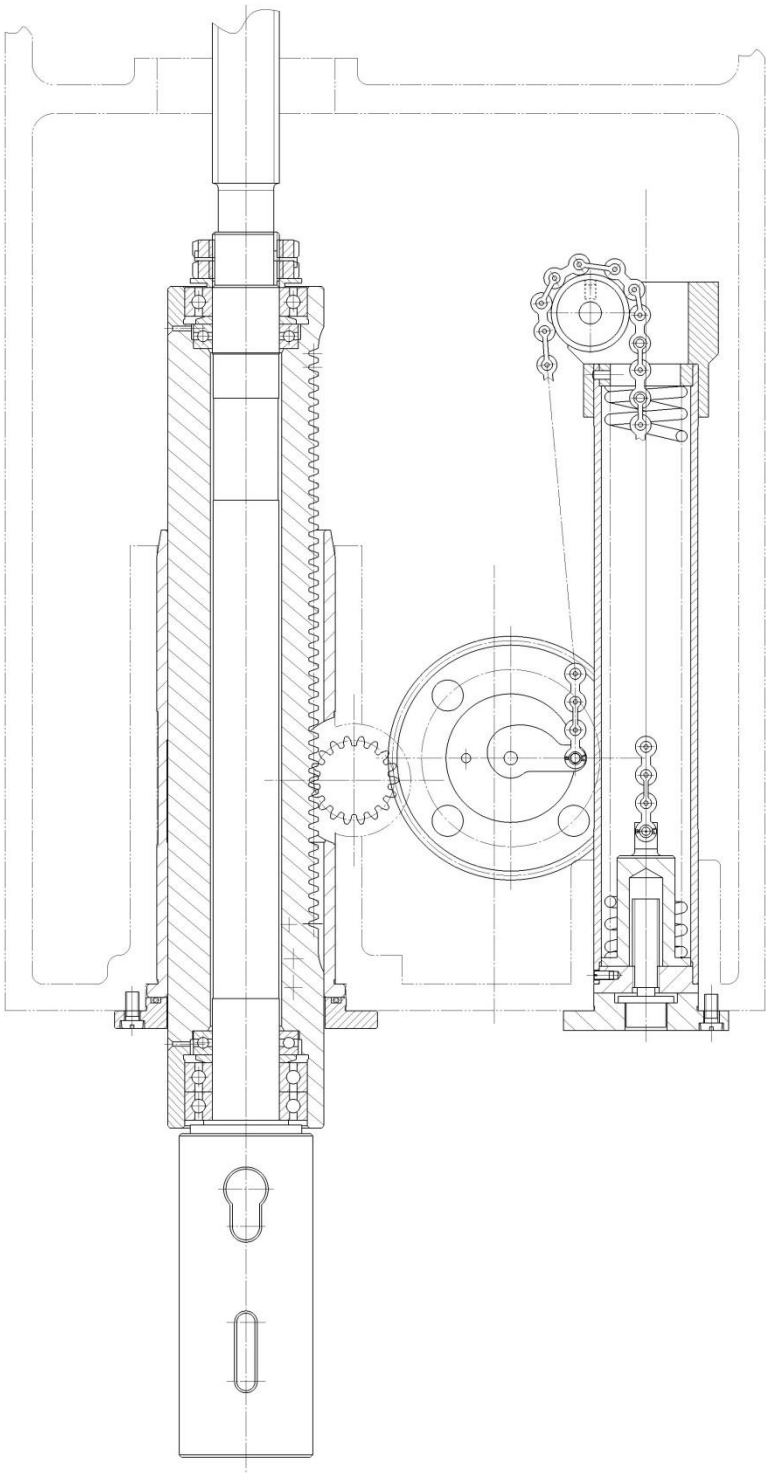
Worm shaft structure

Adjust the feeding insurance clutch
Open the cover on the right of spindle head, adjust bolt 1, enable the pressure of Spring increase or decrease, then spindle feeding resistant power to a allowed number.



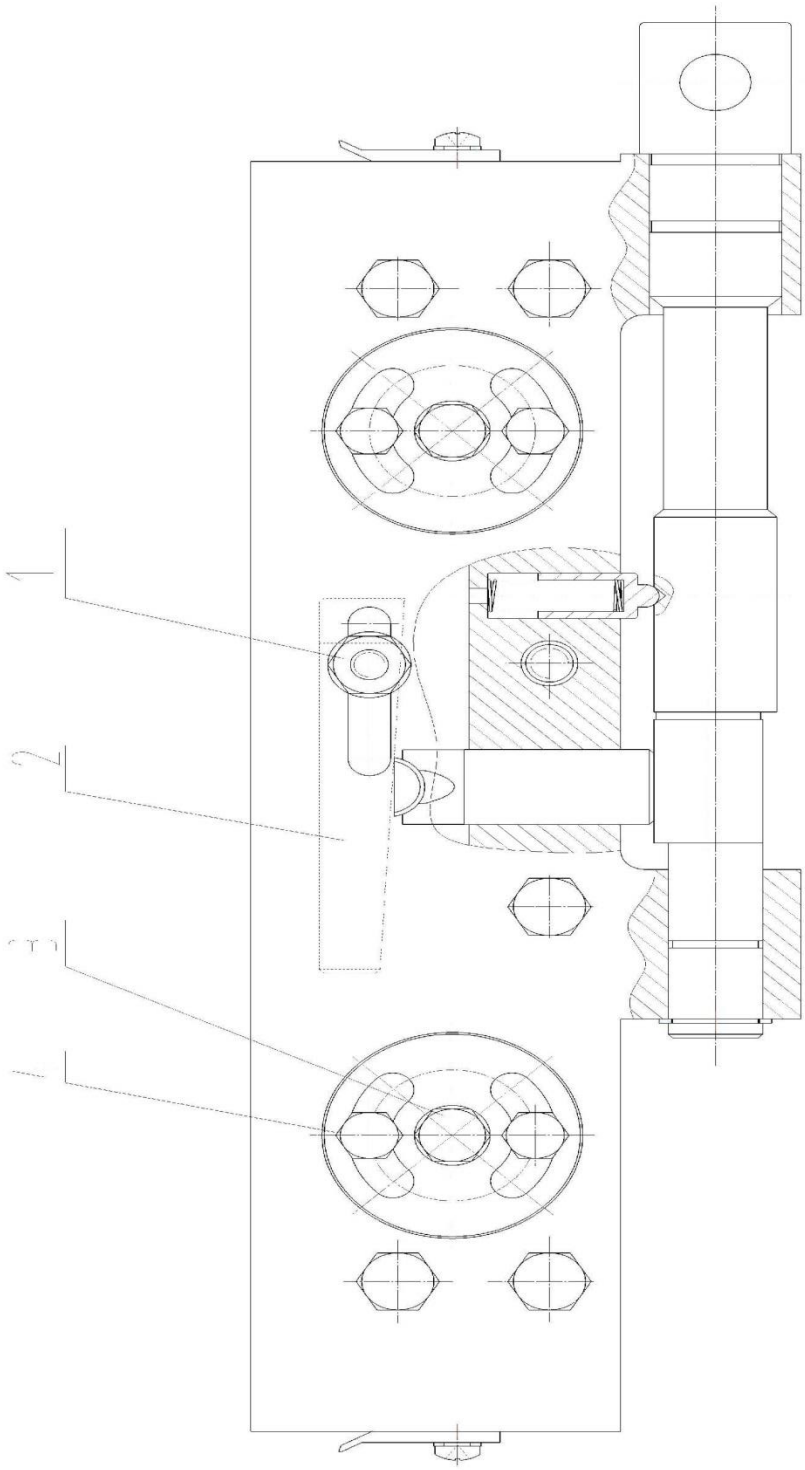
Spindle and its balancing structure

Adjust the balance of spindle:
Counter-clockwise loosen the screw 1, which can increase the balancing power. Otherwise, reduce the balancing power.

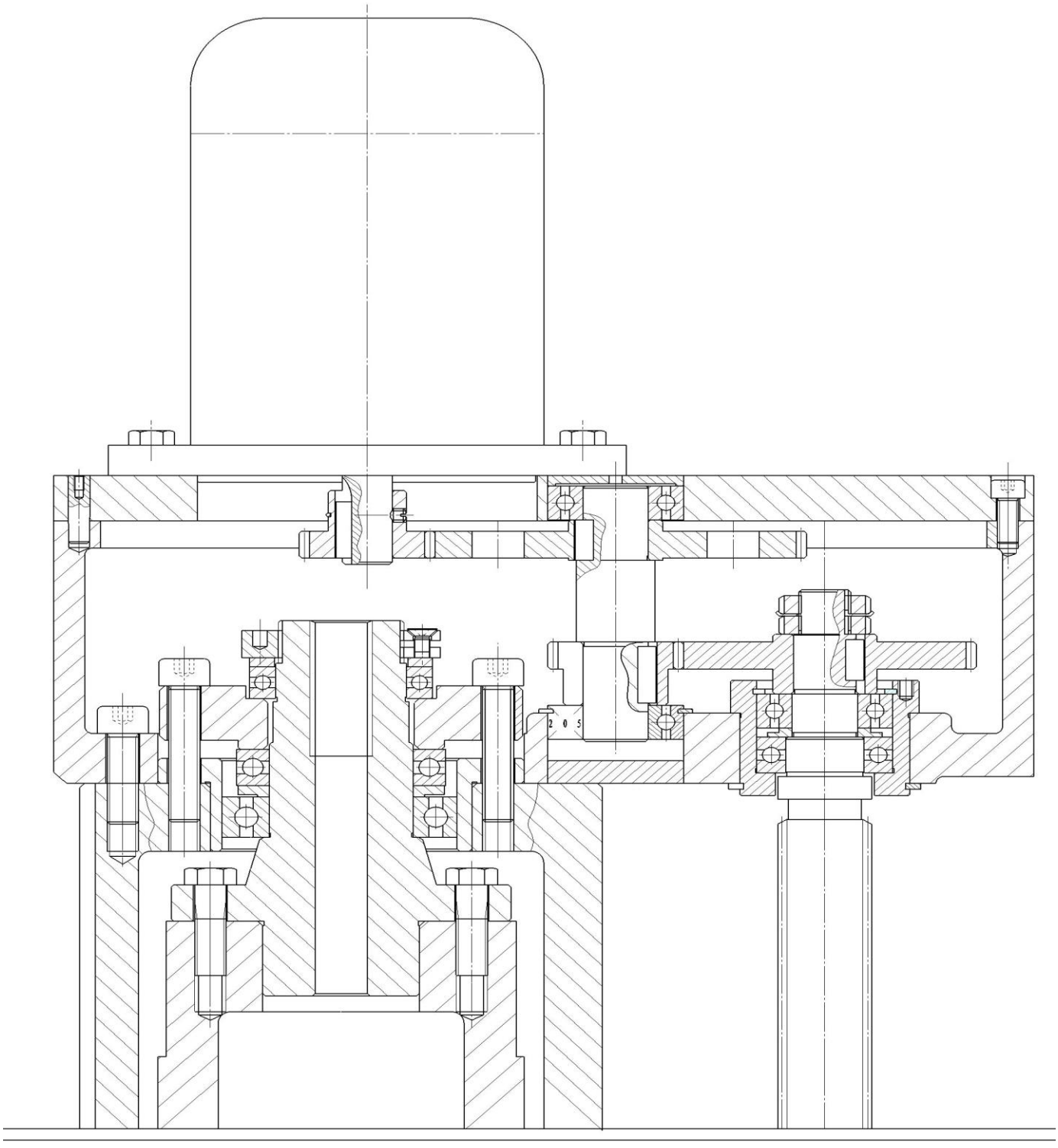


Head clamping structure

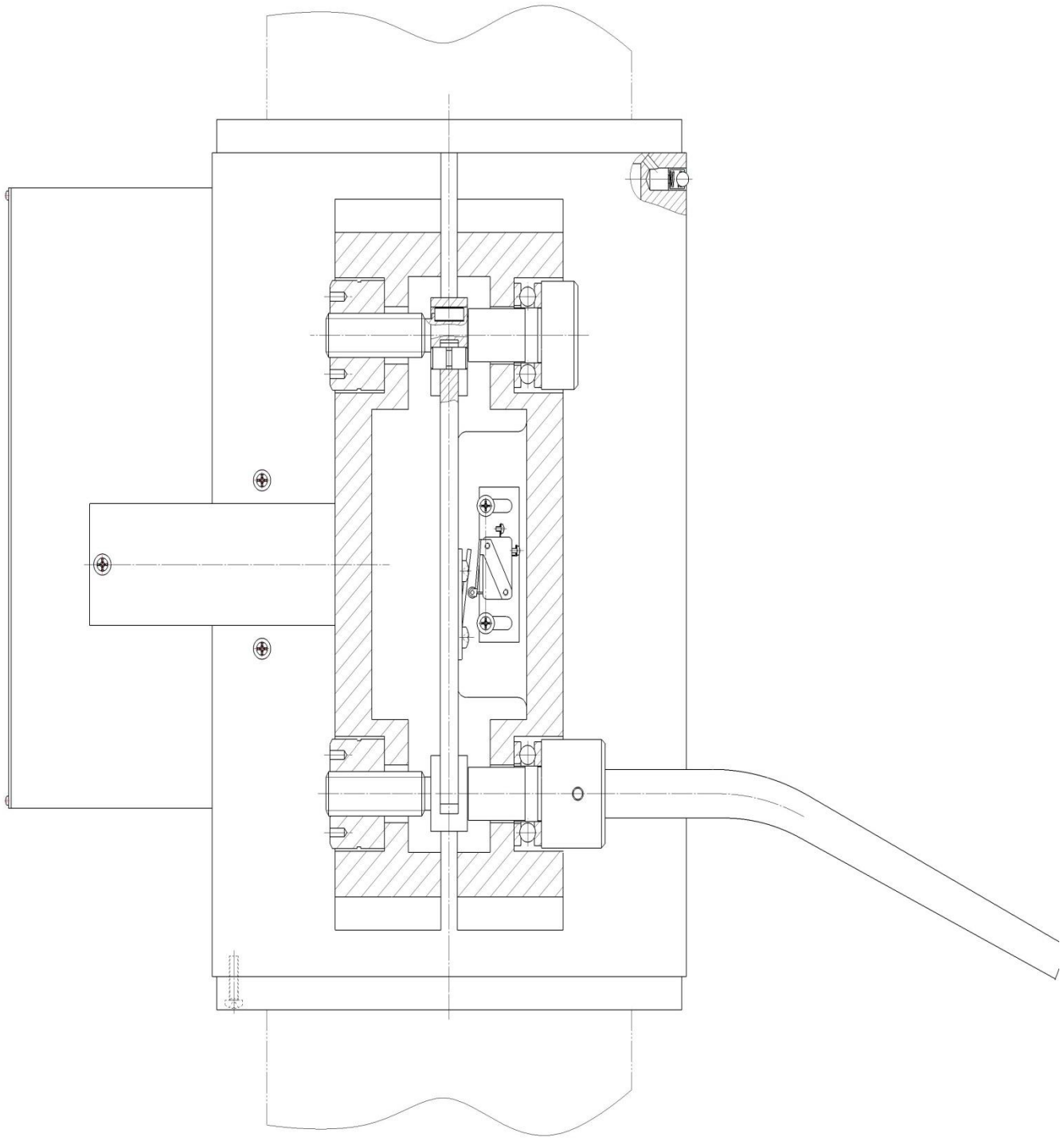
Adjust the head clamping power
Loosen the nut 1 and remove the part 2, which can adjust the power of head clamping.
Generally speaking, put the 300N on the hand wheel, the head cannot shake.



Column arm up and down



Arm and Clamp



BAILEIGH INDUSTRIAL, INC. 1625 DUFEK DRIVE MANITOWOC, WI 54220
PHONE: 920. 684. 4990 FAX: 920. 684. 3944
www.baileigh.com

BAILEIGH INDUSTRIAL LTD. UNIT D SWIFT POINT
SWIFT VALLEY INDUSTRIAL ESTATE, RUGBY
WEST MIDLANDS, CV21 1QH UNITED KINGDOM
PHONE: +44 (0)24 7661 9267 FAX: +44 (0)24 7661 9276
WWW.BAILEIGHINDUSTRIAL.CO.UK