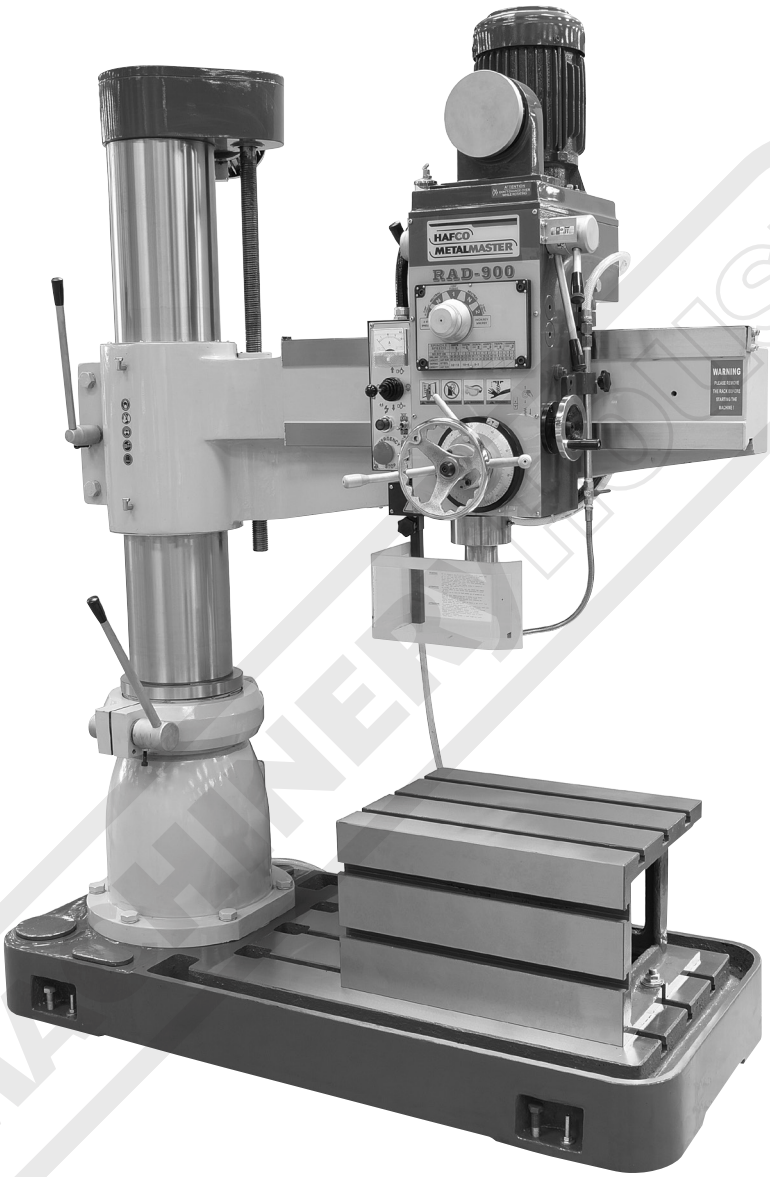
HAFCO METALMASTER



Edition : 2.0
Date: (02/25)

Instruction Manual

RADIAL ARM DRILL
RAD-900

Order Code: (D165)

MACHINE DETAILS

MACHINE.	RADIAL ARM DRILL
MODEL NO.	RAD-900
SERIAL NO.	
DATE OF MANF.	

Imported by

AUSTRALIA

HARE&FORBES MACHINERYHOUSE

www.machineryhouse.com.au

NEW ZEALAND

MACHINERYHOUSE

www.machineryhouse.co.nz

NOTE:
This manual is only for your reference. At the time of the compiling of this manual every effort to be exact with the instructions, specifications, drawings, and photographs of the machine was taken. Owing to the continuous improvement of the HAFCO METALMASTER machine, changes may be made at any time without obligation or notice. Please ensure the local voltage is the same as listed on the specification plate before operating any electric machine.

SAFETY SYMBOLS:
The purpose of safety symbols is to attract your attention to possible hazardous conditions.

⚠WARNING ***Indicates a potentially hazardous situation causing injury or death.***

⚠CAUTION ***Indicates an alert against unsafe practices.***

Note: Used to alert the user to useful information.

NOTE:
In order to see the type and model of the machine, please see the specification plate. Usually found on the back of the machine. See example (Fig.1)

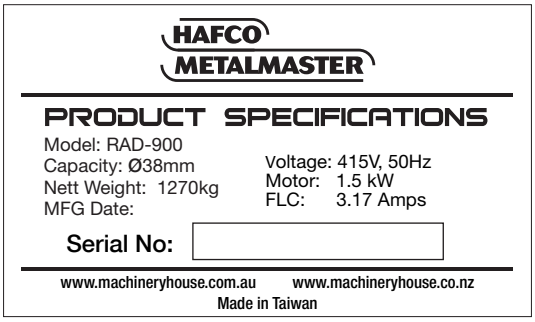


FIG.1

CONTENTS:

1.1 SPECIFICATIONS

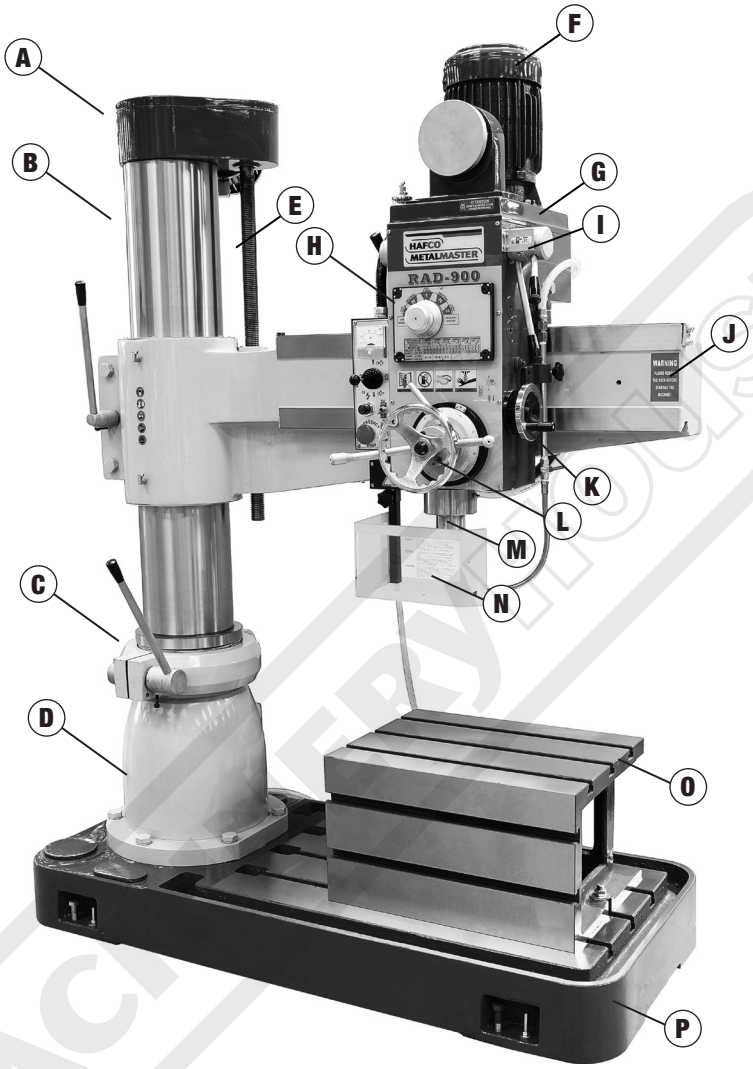
Order Code	D165
Model	**RAD-900**
Drill Capacity (mm)	Ø38
Thread Tapping Capacity	M20
Spindle Taper (MT)	4
Spindle Travel (mm)	200
Quill Diameter (mm)	70
Spindle To Column (min-max) (mm)	290 - 910
Spindle To Box Table (max) (mm)	785
Spindle To Base (max) (mm)	1110
Table Type	Square
Box Table Size (LxWxH) (mm)	550 x 405 x 315
T-Slot Size (mm)	20
Spindle Speed Steps (No.)	6
Spindle Speed Range (rpm)	88 - 1500
Motor Power (kW / hp)	1.5 / 2
Motor Voltage (V)	415
Nett Weight (kg)	1270

1.2 INCLUDED ACCESSORIES

- Coolant pump system with flexible hose.
- Work light mounted underneath arm providing direct light on workpiece.
- Instruction manual

1.3 IDENTIFICATION

Become familiar with the names and locations of the controls and features shown below to better understand the instructions when mentioned later in this manual.



A	Elevating worm gearbox and motor	**I**	Speed handles
B	Column sleeve	**J**	Radial arm
C	Column fixing ring	**K**	Manual feed hand-wheel
D	Column	**L**	Horizontal moving hand-wheel
E	Elevating screw	**M**	Spindle
F	Spindle motor	**N**	Spindle guard
G	Gear box	**O**	Table
H	Feed change handle	**P**	Base

2. IMPORTANT INFORMATION

2.1 GENERAL METALWORKING MACHINE SAFETY

DO NOT use this machine unless you have read this manual or have been instructed in the use of this machine in its safe use and operation.

WARNING

This manual provides safety instructions on the proper setup, operation, maintenance, and service of this machine. Save this manual, refer to it often, and use it to instruct other operators.

Failure to read, understand and follow the instructions in this manual may result in fire or serious personal injury—including amputation, electrocution, or death.

The owner of this machine is solely responsible for its safe use. This responsibility includes, but is not limited to proper installation in a safe environment, personnel training and authorization to use, proper inspection and maintenance, manual availability and comprehension of the application of the safety devices, integrity, and the use of personal protective equipment.

The manufacturer will not be held liable for injury or property damage from negligence, improper training, machine modifications or misuse.

- ✓ Always wear safety glasses or goggles.
- ✓ Wear appropriate safety footwear.
- ✓ Wear respiratory protection where required.
- ✓ Gloves should never be worn while operating the machine, and only worn when handling the workpiece.
- ✓ Wear hearing protection in areas > 85 dBA. If you have trouble hearing someone speak from one metre (three feet) away, the noise level from the machine may be hazardous.
- ✓ DISCONNECT THE MACHINE FROM POWER when making adjustments or servicing.
- ✓ Check and adjust all safety devices before each job.
- ✓ Ensure that guards are in position and in good working condition before operating.
- ✓ Ensure that all stationary equipment is anchored securely to the floor.
- ✓ Ensure all machines have a start/stop button within easy reach of the operator.
- ✓ Each machine should have only one operator at a time. However, everyone should know how to stop the machine in an emergency.

2.1 GENERAL SAFETY REQUIREMENTS Cont.

- ✓ Ensure that keys and adjusting wrenches have been removed from the machine before turning on the power. Appropriate storage for tooling should be provided.
- ✓ Ensure that all cutting tools and blades are clean and sharp. They should be able to cut freely without being forced.
- ✓ Stop the machine before measuring, cleaning or making any adjustments.
- ✓ Wait until the machine has stopped running to clear cuttings with a vacuum, brush or rake.
- ✓ Keep hands away from the cutting head and all moving parts.
- ✓ Avoid awkward operations and hand positions. A sudden slip could cause the hand to move into the cutting tool or blade.
- ✓ Return all portable tooling to their proper storage place after use.
- ✓ Clean all tools after use.
- ✓ Keep work area clean. Floors should be level and have a non-slip surface.
- ✓ Use good lighting so that the work piece, cutting blades, and machine controls can be seen clearly. Position any shade lighting sources so that they do not cause any glare or reflections.
- ✓ Ensure there is enough room around the machine to do the job safely.
- ✓ Obtain first aid immediately for all injuries.
- ✓ Understand that the health and fire hazards can vary from material to material. Make sure all appropriate precautions are taken.
- ✓ Clean machines and the surrounding area when the operation is finished.
- ✓ Use proper lock out procedures when servicing or cleaning the machines or power tools.

DO NOT

- × Distract an operator. Horseplay can lead to injuries and should be strictly prohibited.
- × Wear loose clothing, gloves, neck-ties, rings, bracelets or other jewellery that can become entangled in moving parts. Confine long hair.
- × Handle cuttings by hand because they are very sharp. Do not free a stalled cutter without turning the power off first. Do not clean hands with cutting fluids.
- × Use rags or wear gloves near moving parts of machines.
- × Use compressed air to blow debris from machines or to clean dirt from clothes.
- × Force the machine. It will do the job safer and better at the rate for which it was designed.

WARNING.

Loose hair, clothing, or jewelery could get caught in machinery and cause serious injury or death. Keep these items away from moving parts at all times to reduce this risk.

2.1 GENERAL SAFETY REQUIREMENTS Cont.

HAZARDS ASSOCIATED WITH MACHINES include, but are not limited to:

- Being struck by ejected parts of the machinery.
- Being struck by material ejected from the machinery.
- Contact or entanglement with the machinery.
- Contact or entanglement with any material in motion.

Health Hazards (other than physical injury caused by moving parts)

- Chemicals hazards that can irritate, burn, or pass through the skin.
- Airborne items that can be inhaled, such as oil mist, metal fumes, solvents, and dust.
- Heat, noise, and vibration.
- Ionizing or non-ionizing radiation. (X-ray, lasers, etc.)
- Biological contamination and waste.
- Soft tissue injuries. (for example, to the hands, arms, shoulders, back, or neck) resulting from repetitive motion, awkward posture, extended lifting, and pressure grip.

Other Hazards

- Slips and falls from and around machinery during maintenance.
- Unstable equipment that is not secured against falling over.
- Safe access to/from machines. (access, egress)
- Fire or explosion.
- Pressure injection injuries from the release of fluids and gases under high pressure.
- Electrical Hazards, such as electrocution from faulty or ungrounded electrical components.
- Environment in which the machine is used (in a machine shop, or in a work site)

WARNING!

The machine is the sole responsibility of the owner for its safe use. This responsibility includes but is not limited to proper installation in a safe environment, personnel training, proper inspection and maintenance, manual availability and comprehension. The manufacturer will not be held liable for injury or property damage from negligence, improper training, machine modifications or misuse.

WARNING!

Machines are safeguarded to protect the operator from injury or death with the placement of guards. Machines must not be operated with the guards removed or damaged.

2.2 SPECIFIC SAFETY FOR RADIAL DRILL

DO NOT use this machine unless you have been instructed in its safe use and operation and have read and understood this manual


Safety glasses must be worn at all times in work areas.


Long and loose hair must be contained.


Gloves must not be worn when using this machine.


Sturdy footwear must be worn at all times in work areas.


Close fitting/ protective clothing must be worn.


Rings and jewelery must not be worn.

PRE-OPERATIONAL SAFETY CHECKS

- ✓ Locate and ensure you are familiar with all machine operations and controls.
- ✓ Ensure all guards are fitted, secure and functional. Do not operate if guards are missing or faulty.
- ✓ Check workspaces and walkways to ensure no slip/trip hazards are present.
- ✓ Ensure the chuck key (if used) has been removed from the drill chuck.
- ✓ Follow correct clamping procedures to ensure work is secure.
- ✓ Erect a barricade if the job obstructs the walkway.
- ✓ Adjust the spindle speed to suit drill or cutter diameter.

OPERATIONAL SAFETY CHECKS

- ✓ Before making adjustments or before cleaning swarf accumulations, switch off and bring the machine to a stop.
- ✓ Feed downwards at a sufficient rate to keep the drill cutting.
- ✓ Feed with care as the drill breaks through the underside of the work.
- ✓ Use a safe working posture.

ENDING OPERATIONS AND CLEANING UP

- ✓ Switch off the machine when work completed.
- ✓ Leave the machine in a safe, clean and tidy state.

DON'T

- × Use faulty equipment. Immediately report suspect equipment.
- × Never leave the machine running unattended.
- × Hold the item being drilled with your hands. Use a clamp.

POTENTIAL HAZARDS AND INJURIES

- ❑ Hair/clothing getting caught in moving machine parts.
- ❑ Flying swarf and chips.
- ❑ Eye injuries.
- ❑ Sharp edges and burrs.

CAUTION!

It is impossible to cover all possible hazards Every workshop environment is different. These are designed as a guide to be used to compliment training and as a reminder to users prior to equipment use. Always consider safety first, as it applies to the individual working conditions.

3. POWER SUPPLY

3.1 ELECTRICAL REQUIREMENTS

Place the machine near an existing power source. Make sure all power cords are protected from traffic, material handling, moisture, chemicals, or other hazards. Make sure there is access to a means of disconnecting the power source. The electrical circuit must meet the requirements for 415V. To minimize the risk of electrocution, fire, or equipment damage, these machines should be hard wired with installation work and electrical wiring done by a qualified electrician.

NOTE : The use of an extension cord is not recommended as it may decrease the life of electrical components on your machine.

ELECTRICAL REQUIREMENTS

Nominal Voltage..... 415V
Cycle..... 50 Hz
Phase.....Three Phase
Power Supply Circuit.....10 Amps
Full Load Current..... 3.17 Amps

(Full load current rating is also on the specification plate on the motor.)

3.2 FULL-LOAD CURRENT RATING

The full-load current rating is the amperage a machine draws when running at 100% of the output power. Where machines have more than one motor, the full load current is the amperage drawn by the largest motor or a total of all the motors and electrical devices that might operate at one time during normal operations.

Full-Load Current Rating for these machine can be found on the motor nameplate.
It should be noted that the full-load current is not the maximum amount of amps that the machine will draw. If the machine is overloaded, it will draw additional amps beyond the full-load rating and if the machine is overloaded for a long period of time, damage, overheating, or fire may be caused to the motor and circuitry.
This is especially true if connected to an undersized circuit or a long extension lead. To reduce the risk of these hazards, avoid overloading the machine during operation and make sure it is connected to a power supply circuit that meets the requirements.

4 SET-UP

4.1 UNPACKING

This machine was carefully packaged for safe transport. When unpacking, separate all enclosed items from packaging materials and inspect them for shipping damage. If items are damaged, please contact your distributor.

NOTE: Save all the packaging materials until you are completely satisfied with the machine and have resolved any issues with the distributor, or the shipping agent.

When unpacking, check the packing list to make sure that all parts shown are included. If any parts are missing or broken, please contact your distributor.

4.2 CLEAN - UP

The unpainted surfaces of the machine have been coated with a waxy oil to protect them from corrosion during shipment. Remove the protective coating with a solvent cleaner or a citrus based degreaser.

Optimum performance from your machine will be achieved when you clean all moving parts or sliding contact surfaces that are coated with rust preventive products.

It is advised to avoid chlorine based solvents, such as acetone or brake parts cleaner, as they will damage painted surfaces and strip metal should they come in contact. Always follow the manufacturer's instructions when using any type of cleaning product.

4.3 SITE PREPARATION

When selecting the site for the machine, consider the largest size of workpiece that will be processed through the machine and provide enough space around the machine for operating the machine safely. Consideration should be given to the installation of auxiliary equipment. Leave enough space around the machine to open or remove doors/covers as required for the maintenance and service as described in this manual.

It is recommended that the machine is anchored to the floor to prevent tipping or shifting. It also reduces vibration that may occur during operation.

4.4 LIFTING INSTRUCTIONS

On the day that the machine arrives, make sure that a crane or forklift with sufficient capacity is available to unload the machine from the vehicle. Ensure access to the chosen site is clear and that doors and ceilings are sufficiently high and wide enough to receive the machine.

To handle the machine, the slings should be positioned so the machine is level when lifted. When using slings please take note of the sling angle and the loads that apply

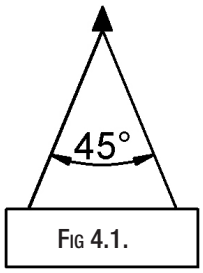


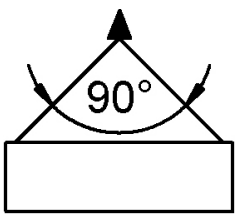
FIG 4.1.

When the slings are at a 45° angle then each sling is carrying the equivalent of 50% of load weight. (Fig.4.1).

When the slings are at a 90° angle then each sling will have a weight equal to 75% of the load on each sling. (Fig 4.2)

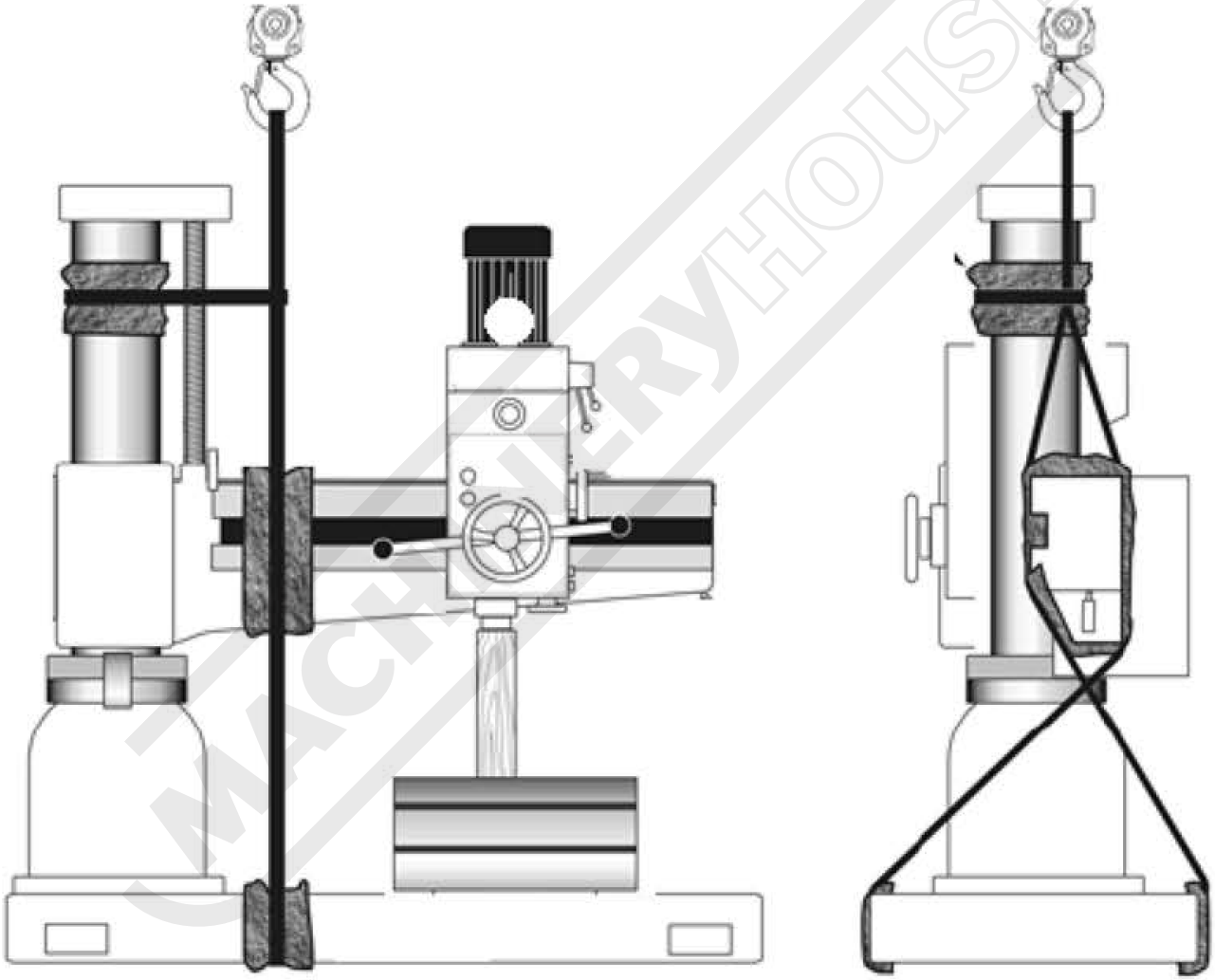
NOTE: The manufacturer recommends that only an experienced rigger is used.

FIG 4.2



4.4 LIFTING INSTRUCTIONS Cont.

1. Prepare the soft materials (as cushion), hook and web slings.
2. Lifting equipment: Make sure the appropriate lifting crane device can handle the load of the machine. (more than 3 ton) The foundation floor must be flat and structurally sound.
   - Sling the overall unit and put soft material in the place where the slings make contact with the surface of the machine to prevent damage to the surface.
   - Lift the machine up and move it to the position of installation.



WARNING.

Make sure everyone is away from the load before hoisting. The load must be under control when lowering loads or when the load is suspended. Rigging and crane operation must be carried out by persons with approved qualifications.

4.5 ANCHORING TO THE FLOOR

The machine is best mounted on a concrete slab.
Masonry anchors with bolts are the best way to anchor machinery, because the anchors sit flush with the floor surface, making it easy to unbolt and move the machine later if needed. (Fig. 4.3)

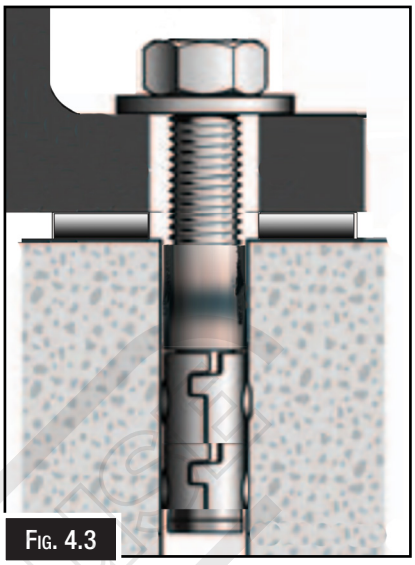


Fig. 4.3

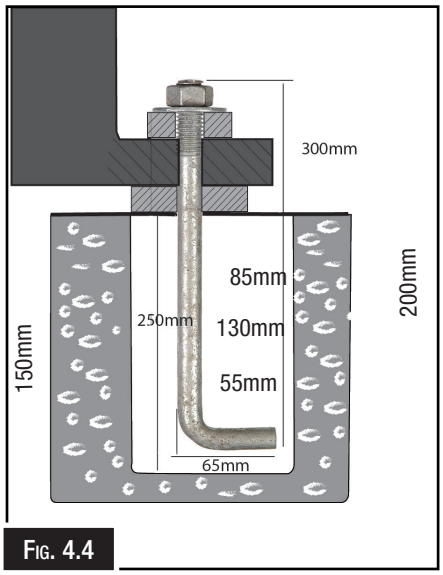


Fig. 4.4

In some cases a suitable foundation may not be available and a new one may need to be prepared.

The foundation should be concrete approximately 250mm thick with pockets left clear for the hold down bolts. The hold down bolts can be “L” shape as per the example in

Fig. 4.4

Screw the leveling screw into the holes in the machine base, then set the machine on the foundation, with the leveling pad under the each screw.

4.6 MACHINE LEVELING

To set your machine up so that it operates to optimum performance, the machine should be level.

To level the machine follow the procedure below.

After your machine has been anchored to a concrete slab floor, then the leveling is performed by loosening the hold down bolts, and then adjust the leveling screws next to the hold down bolt until the machine is level and does not rock. (Fig. 4.5) Place a level on the surface of the working table to check if level. The tolerance should be 1000:0.30mm, for both longitudinal and transverse.

Once the machine is level, then tighten the hold down bolts.

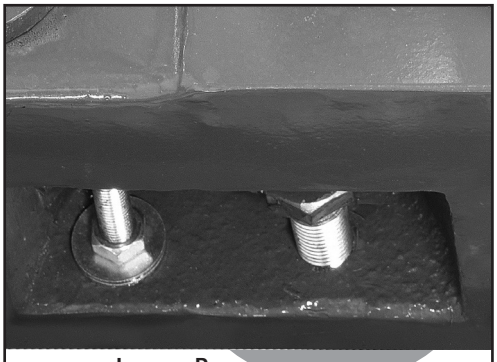


Fig. 4.5

CAUTION

The machine must not rest on supports other than those defined in Fig. 4.5

4.7 ASSEMBLY

The machine must be fully assembled before it can be operated. First clean any parts that are coated in rust preventative to ensure the assembly process can proceed smoothly.

After dismantling the wooden case, take out the manual, toolbox and other accessories shipped with the machine. After that, loosen the fixing screws used to attach the machine on the skid.

Remove the accessory box, then connect properly the machine to the power supply incoming line.

After the machine is properly installed, the most important point is that the main power cable is properly connected.

Inspect oil leakage at all the oil pipe joints, oil window, oil levels and associated parts of the machine tool, please disassemble and reassemble if necessary.

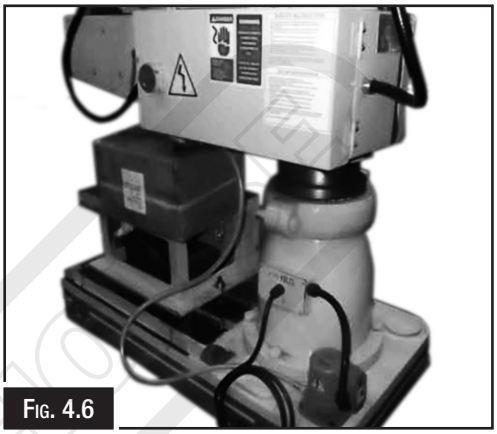


FIG. 4.6

4.8 TEST RUN

Once assembly is complete, test run the machine to ensure it is properly connected to the power and safety components are functioning correctly. Check that the direction of the motor is correct and make sure that the machine rotates in the correct direction.

If the direction is incorrect, isolate the machine and have the electrician make changes to the wiring.

If you find an unusual problem during the test run, immediately stop the machine, disconnect it from power, and fix the problem BEFORE operating the machine again. The Troubleshooting table in the Maintenance section of this manual may be able to help. If the problem persists then contact your dealers service technician.

To test run the machine:

1. Ensure the machine has been lubricated, then connect the machine to the power supply.
2. Make sure that the manual has been read and that the safety instructions at the beginning of the manual are understood. Make sure the machine has been setup correctly
3. Make sure all tools and objects used during set up have been cleared away from the machine.
4. Turn the machine ON. Make sure that the machine spindle and elevating screw is traveling in the correct direction.
6. Listen to and watch for abnormal noises or actions. The machine should run smoothly with little or no vibration or rubbing noises.
7. Any strange or unusual noises should be investigated and corrected before operating the machine again. Always disconnect the machine from power supply when investigating or correcting potential problems. The troubleshooting chart in the maintenance section may be helpful in rectifying a problem.
8. If all the components mentioned above are in the normal state, let the machine run for 30 mins.

Testing The Emergency Stop Button

Make sure that the emergency button is working correctly

1. Twist the top of the Emergency Stop button to ensure that it is in the raised position.
2. Start the machine and then press the emergency stop button. The machine should stop and the power should be cut off. If the machine cannot be started then the emergency stop is working correctly.
3. To reset the Emergency Stop twist the red top until it pops up. The machine should now work again.

5. OPERATION

This machine may perform many types of operations that are beyond the scope of this manual. Many of these operations may be dangerous or deadly if performed incorrectly.

The instructions in this section are written with the understanding that the operator has the necessary knowledge and skills to operate this machine. If at any time you are experiencing difficulties performing any operation, stop using the machine!

If you are an inexperienced operator, we strongly recommend that you read books, trade articles, or seek training from an experienced operator before performing any unfamiliar operations. ***Above all, your safety should come first!***

5.1 CONTROLS

The purpose of this control overview is to provide the novice machine operator with a basic understanding of how the machine is used during operation, and the machine controls and what they do. It also helps the operator to understand if they are discussed later in this manual.

NOTE: DO NOT start the machine until all of the setup instructions have been performed. Operating a machine that is not setup may result in malfunction or unexpected results that can lead to serious injury, death or damage to the machine or property.

A **Main Isolating Switch:** Isolates the power from the machine. (Fig 5.1)

⚠ WARNING	
SAFETY FIRST 	***Disconnect all power from the machine before servicing. There may be multiple power sources present. Remove the plug from the power point or remove the fuse if hardwired. Failure to do may cause death or injury.***

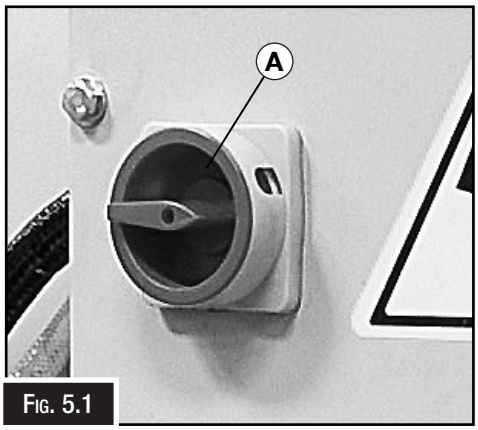


Fig. 5.1

5.1 CONTROLS Cont.

B **Ampere Indicator:** It controls the spindle motor loading, when the motor is overloaded, the overload switch will be tripped. (Fig. 5.2)

C. **4 Way Select Switch:** Controls 4 operations

Top: Raises the Radial Arm

Low: Lowers the Radial Arm

Right: Rotates the Spindle clockwise.

Left: Rotates the Spindle anti-clockwise.

D. **Power ON Switch:** Switches on the power to the control circuit and allows all the switches to be active.

E. **Emergency Stop Button:** When pressed cuts the power to the control panel and motors. The power remains disconnected until the button is reset.

To reset the button must be twisted until it pops up. The button D can now be pressed and the power is restored to the control panel.

F. **Light Switch:** The switch turns on the work light that is built into the arm.

G. **Coolant Switch:** Turns the coolant ON or OFF (Fig. 5.2)

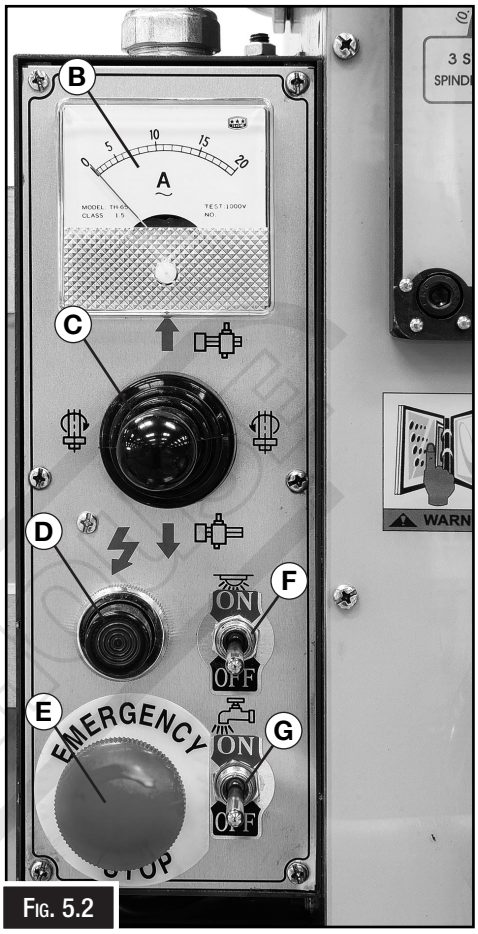


Fig. 5.2

H. **Radial Arm Clamp:** Clamps the radial arm after the arm has been raised or lowered. (Fig. 5.3)

Note: The clamp must be released before raising or lowering the radial arm.

I. **Column Clamp:** Clamps the column to stop it from rotating horizontally.

J. **Motor Head Clamp:** Clamps the motor head along the radial arm.

K. **Feed Selection Button:** Changes the feed to auto or manual mode.

Auto mode: Push in the button.

Manual mode: Pop out the button.

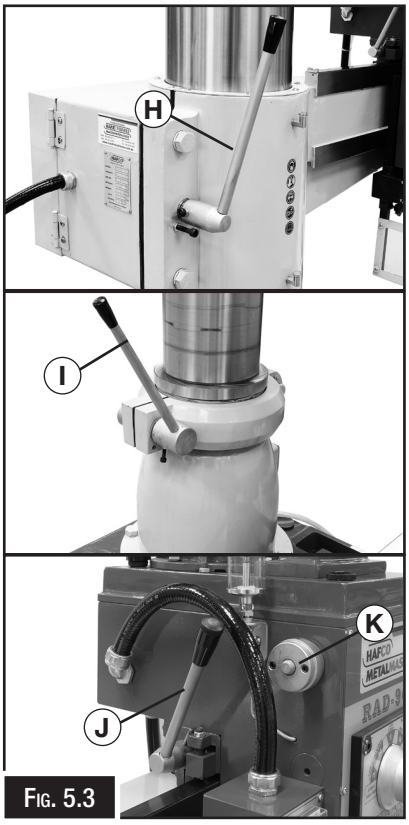


Fig. 5.3

5.1 CONTROLS Cont.

L **Depth Stop Clamp:** Clamps the depth stop dial after it has been set. (Fig. 5.4)

The graduation collar is used to set the drilling depth, e.g. when spindle drill touch the table surface, To perform the 30mm drilling depth process, the graduation dial should be set to 30, then locked with the eccentric lever (L in Fig 5.4). It should be locked when performing the auto feed.

M. **Motor Head Movement Handwheel:** Moves the motor head along the radial arm.

Note: The Motor Head clamp must be released before it can be moved along the radial arm. (J in Fig: 5.3)

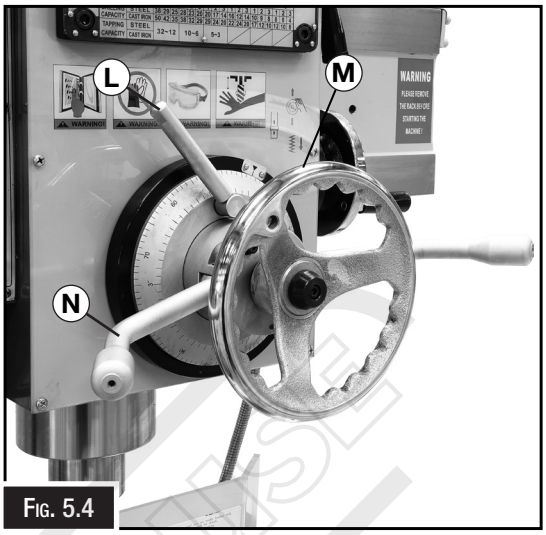


Fig. 5.4

N. **Spindle & Feed Handle:** Used to raise and lower the spindle. Also when pushed towards the machine, engages the auto feed to the spindle. (Fig. 5.4)

Auto mode: push in the lever.

Manual mode: pull out the lever.

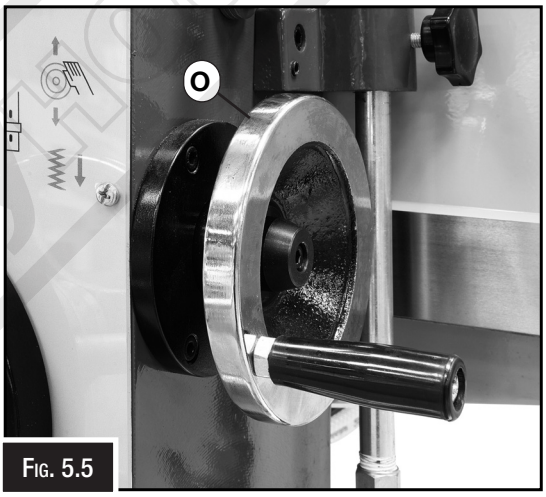


Fig. 5.5

O. **Manual Spindle Down Feed:** When button “K” in Fig. 5.3 is released the auto feed to the spindle does not work when handles “N” are pushed away from the operator.

The spindle now can only be moved up or down by using the hand wheel “O” in Fig. 5.5.

5.2 OPERATION SAFETY PROTECTION

a. **Machine spindle Feed:**
Overload of the self-feed. Stops the feed when overloaded through a spherical clutch.

b. **Upper limit of machine spindle:**
Cuts off the power supply through micro switch.

c. **Lower limit of machine spindle:**
Stops the spindle feeding and runs idle.

d. **Radial arm lift:**
Equipped with upper limit and lower limit switches that cut off power to the lift motor.

e. **Motor overload:**
Each motor return is equipped with overload protection. Cuts off power immediately when a motor overloads.

f. **The protection cover must be close during machining.**
When the cover is open the spindle will not operate.

5.3 CHANGING THE SPINDLE SPEED

The spindle speed for drilling and tapping operation is controlled by the levers displayed in Fig. 5.6.

- **P. Selection Lever:** Selects position 1, 2, 3.
- **Q. High or Low Lever:** Selects Low or High speed range.

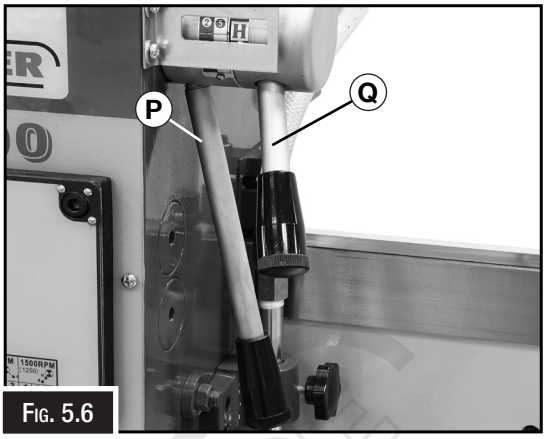


Fig. 5.6

The Speed list oo (at 50 or 60HZ)
e.g. 88rpm is at 60HZ speed/ 73 is at 50HZ speed when "Q" is at low speed mode and selection lever "P" is at selection "1".

The reference chart also recommends the spindle speed and the drill and tapping capacity. (Fig. 5.7)

SPINDLE SPEEDS 60 (50) ∞		88RPM (73) L 1			154RPM (128) L 2			282RPM (234) L 3			455RPM (379) H 4			796RPM H 5			1500RPM H 6		
SELECT ON		1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
DRILLING CAPACITY	STEEL	38	29	25	28	23	20	20	17	14	16	12	14	10	9	8	8	6	4
	CAST IRON	50	42	35	38	32	29	29	24	20	22	24	20	17	12	10	12	10	8
TAPPING CAPACITY	STEEL	32~12			10~6			5~3											
	CAST IRON																		

Fig. 5.7

5.4 SETTING THE SPINDLE FEED

The feed dial has five positions. (Fig. 5.8)

1. This position feeds the spindle down 0.05mm each revolution of the spindle.
2. This position feeds the spindle down 0.09mm each revolution of the spindle.
3. This position feeds the spindle down 0.153mm each revolution of the spindle.

N. Selects no feed

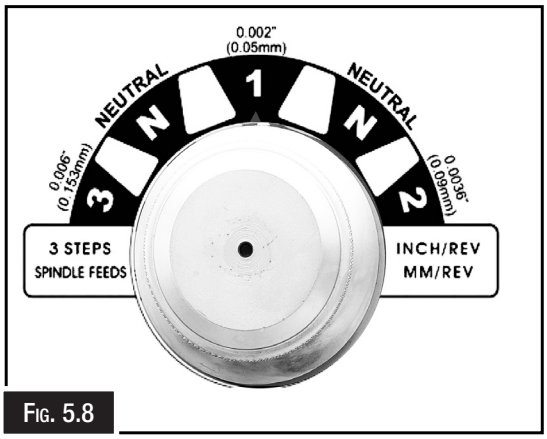


Fig. 5.8

5.5 SETTING UP FOR TAPPING

The chart below sets out the speeds for tapping size in steel and cast iron.

Note: Hafco Metalmaster recommend that a tapping chuck be used to hole the taps.

SPINDLE SPEEDS 60 (50) ∞		88RPM (73) L 1			154RPM (128) L 2			282RPM (234) L 3			455RPM (379) H 4			796RPM H 5			1500RPM H 6		
SELECT ON		1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
DRILLING CAPACITY	STEEL	38	29	25	28	23	20	20	17	14	16	12	14	10	9	8	8	6	4
	CAST IRON	50	42	35	38	32	29	29	24	20	22	24	20	17	12	10	12	10	8
TAPPING CAPACITY	STEEL	32~12			10~6			5~3											
	CAST IRON																		

6. MAINTENANCE

It is very important that regular maintenance of the equipment is carried out. The operators need to follow the daily maintenance procedures.

For optimum performance from this machine, the maintenance schedule listed below and in this section must be followed.

6.1 SCHEDULE

1-1 Inspection before operating:

a. That the machine is clean.
b. That the machine has been lubricated.
c. That the parts of each turning and movable part is adjusted correctly.

Methods of inspection and Treatment:

@ Ensure that the machine has no dust and iron residue on the sliding surfaces, and all tools have been removed. Avoid hindering the sliding or rotation of each component. Wipe off the dust on the parts to prevent rust.

@ Adjust the daily oil level.

@ Use both hands to push and check the radial arm turning and lateral movement. If it is too loose or tight and If necessary adjust.

1-2 Inspection before starting the motor

a. That the electricity has been switched ON.
b. That the machine control is operating correctly.
c. That any noise or vibration is not excessive
d. Cooling system
e. Lubricant path

Methods of inspection and Treatment:

@ Move the starting lever to the right side and reverse rotation position. Check the rotation of the spindle. Check the workpiece is securely attached to the table. Forward and reverse lever and, start and stop operation are operating correctly.

@ Identify the micro-switch action of the right and reverse rotation control levers, the automatic feed control lever and the spindle transmission control lever.

@ Under the restriction of main rotation speed and feed speed, the operation is idle. Examine the noise and vibration do not exceed normal levels.

@ Check coolant, start the motor and check if there is any leakage.

@ Check whether the lubricating oil flows into the lubricant positions.

1-3 Check during operation.

a. Bearing temperature
b. Motor temperature
c. Noise and vibration
d. Quality of the product
e. Safety.

@ Touch the bearing to check its temperature.

@ Check the motor temperature when operating high load cutting.

@ If finding excessive noise and vibration, stop operating and check the reason.

@ When the quality of the finish is found to be abnormal. Find out the reason before continuing.

@ The machine must be stopped if unattended.

6.1 SCHEDULE Cont.

1-4 Check after operation

a. The clutch device.
b. Cleaning tool.
c. Return the part to the previous position.
d. Cleaning machine.

@ Place the clutch control lever in the idling position.
@ Wipe and clean all the tools, then place them in their correct place.
@ Move the radial arm and gear box to the most suitable position and clamp.
@ Wipe and clean the oil stains and chips on the machine. In addition, apply a thin layer of oil to the sliding surfaces.

Weekly Maintenance

The following should be carried out each week.

I. Lubrication system
2. Cooling system
3. Transmission system
4. Safety installation

Maintenance and treatment methods:

@ Clean oil hole, oil tank, and replenish the oil tank.
@ Clean cooling oil tank and replenish the coolant.
@ Check every transmission device and adjust if necessary for looseness and tightness.
@ Check the limitation of lift and feed components.

Monthly Maintenance

The following items are carried out each month.

Maintenance items:

1. Cleaning machine
2. Electricity system

Maintenance and treatment methods:

@ Clean dust and iron residue from the narrow openings of the machines and parts.
@ Check whether the connection of the wires are firm and secure, whether the fixing crews are loose, and whether each switch joint is in good condition.

Annual Maintenance.

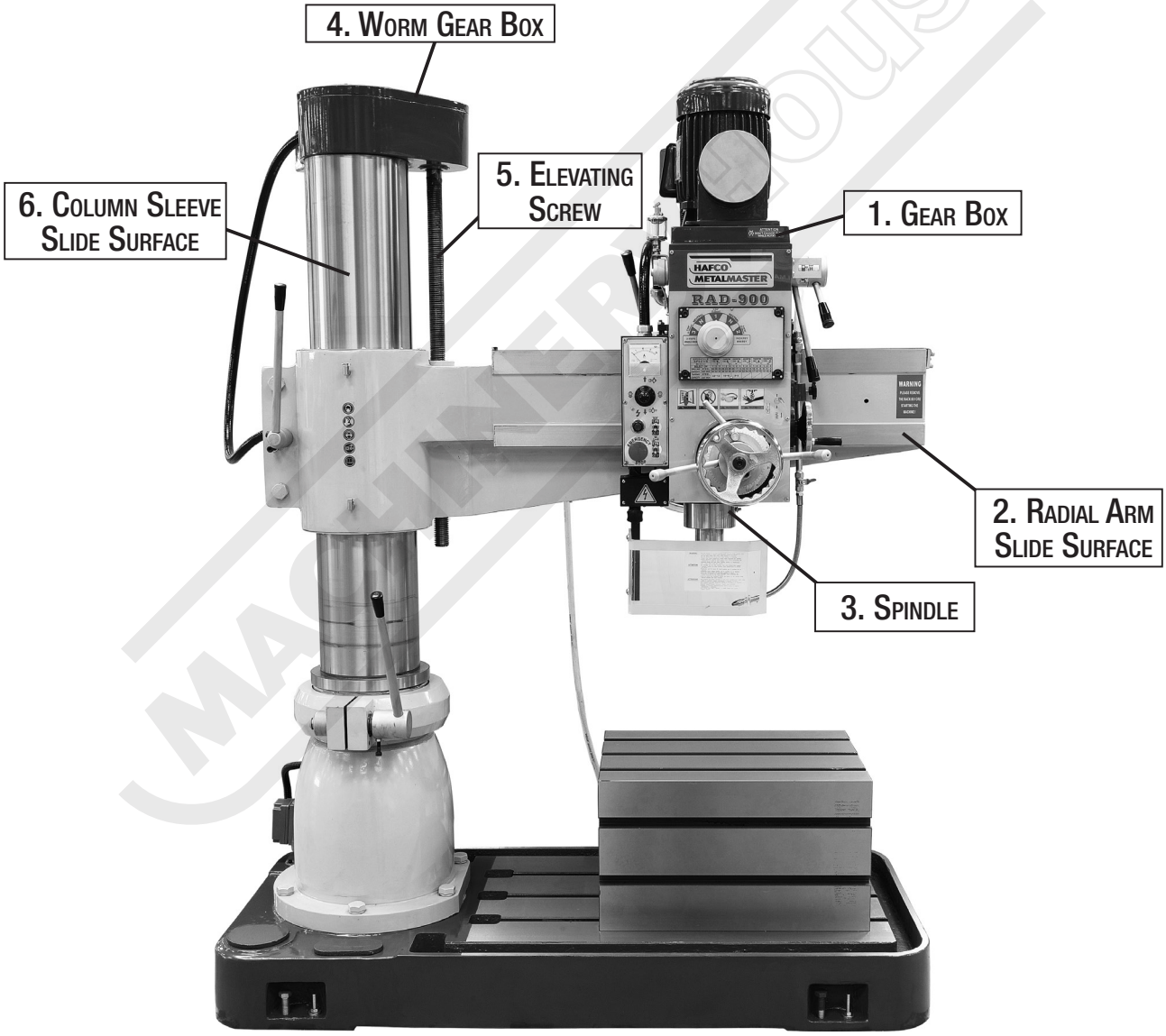
The following items are regularly implemented after a year:

Maintenance items:

1. Change oil in gearbox.
2. Check wear and tear condition of gears and ball bearings.
3. Check each screw is tightened.

6.2 LUBRICATION

Maintenance Parts	Oil	Time	Method
1. Gear Box	Shell Omala 220	Twice a year	Change the oil
2. Radial Arm Slide Surface	Shell Tonna T68	Once a Month	Oil Can
3. Spindle	Grease	Twice a year	Grease Gun
4. Worm Gear Box	Shell Omala 220	Twice a year	Change the oil
5. Elevating Screw	Shell Tonna T68	Daily	Oil Can
6. Column Sleeve Side Surface	Shell Tonna T68	Daily	Oil Can



6.3 TROUBLESHOOTING

Review the troubleshooting and procedures in this section if a problem develops with your machine. If you need replacement parts then follow the procedure in the beginning of the spare parts section or if additional help with a procedure is required, then contact your distributor.

Note: Make sure you have the model of the machine, serial number,and manufacture date before calling.

Symptom	Possible Cause	Possible Solution
Excessive Vibration.	1. Motor out of balance. 2. Faulty Motor. 3. Loose machine clamps.	1. Balance or replace motor. 2. Replace faulty motor. 3. Tighten the machine clamps.
Motor Stalls.	1. Feed too great. 2. Dull drill. 3. Motor not building up to running speed. 4. Faulty motor.	1. Reduce feed rate. 2. Sharpen the drill or replace. 3. Replace or repair motor. Check fuses on each leg of the power. 4. Replace Motor.
Noisy Operation	1. Excessive vibration. 2. Improper quill adjustment. 3. Noisy spline. 4. Noisy motor.	1. Find vibration and correct condition. 2. Adjust quill. 3. Lubricate spline. 4. Check motor bearings or loose fan.
Drill or Tool heats up or burns work.	1. Excessive speed. 2. Chips not clearing the hole. 3. Dull drill. 4. Feed rate too slow. 5. Rotation of drill incorrect. 6. Lack of cutting oil or coolant.	1. Reduce the spindle speed. 2. Use pecking operation to clear chips. 3. Sharpen tool or replace. 4. Increase feed rate enough to clear chips. 5. Reverse spindle rotation. 6. Use cutting oil or coolant. (Steel)
Drill leads off.	1. No spot drill. 2. Cutting lips on the drill off centre. 3. Quill loose in head. 4. Bearing play.	1. Centre punch or centre drill the workpiece. 2. Regrid the drill. 3. Tighten the quill. 4. Adjust or replace spindle bearings.
Excessive drill runout or wobble.	1. Failure to clamp the workpiece. 2. Drill bent. 3. Dirt in the spindle taper.	1. Clamp the workpiece to the table. 2. Replace the drill. 3. Eject drill and clean the spindle and drill taper.
Workpiece comes loose or spins.	1. Workpiece not clamped correctly. 2. Drill jaming.	1. Securely clamp the workpiece to the table. 2. Ensure the drill is sharpen and the hole is not running off centre.

WARNING!

Disconnect all power from the machine before servicing. There may be multiple power sources present. Remove the plug from the power point or remove the fuse if hardwired. Failure to do may cause death or injury.

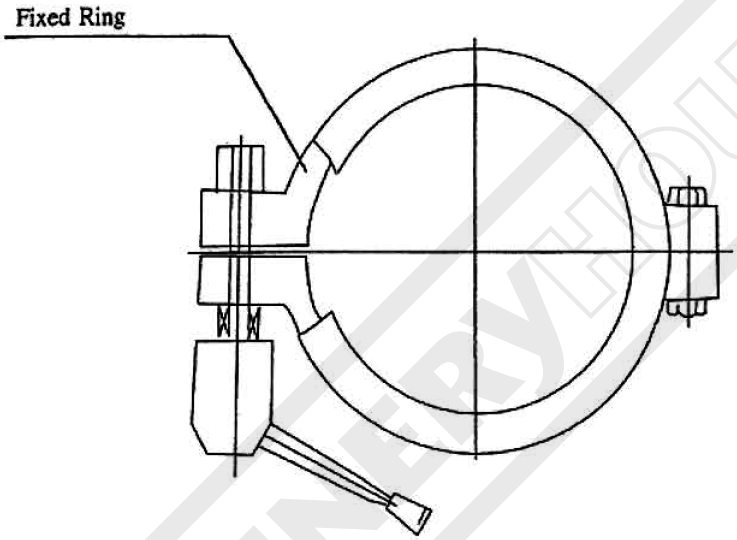
6.4 MACHINE ADJUSTMENTS

The machine has been setup and adjusted in the factory, but over the life of the machine adjustments may need to be made to keep the machine in optimum performance. Adjustments should only be done by an experienced maintenance fitter. If adjustment is needed, please perform according to the steps below.

1. Adjusting the column clamp fixing ring.

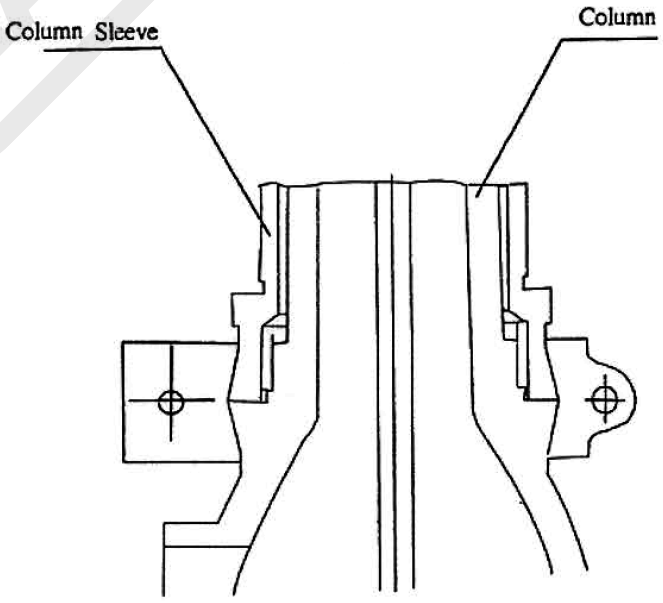
This can be adjusted to loosen or tighten through adjusting the regulating bolt, on the rear end of the lever handle.

NOTE: A loose fixing ring may cause the motor to overload.



2. Loosening or tightening the pillar stand

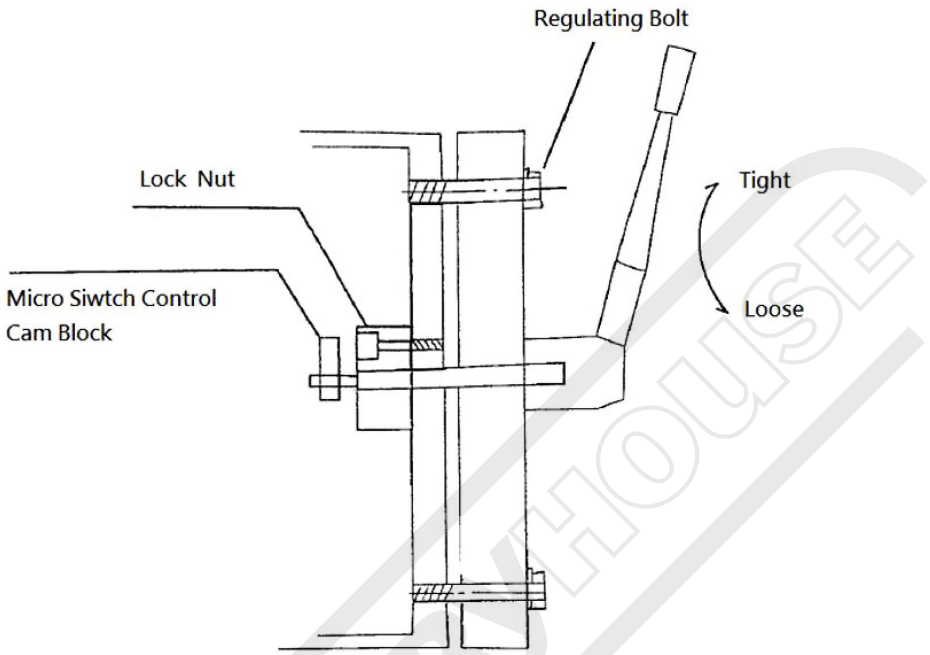
This can be adjusted to loosen or tighten through adjusting the regulating bolt, on the rear end of the lever handle.



6.4 MACHINE ADJUSTMENTS Cont.

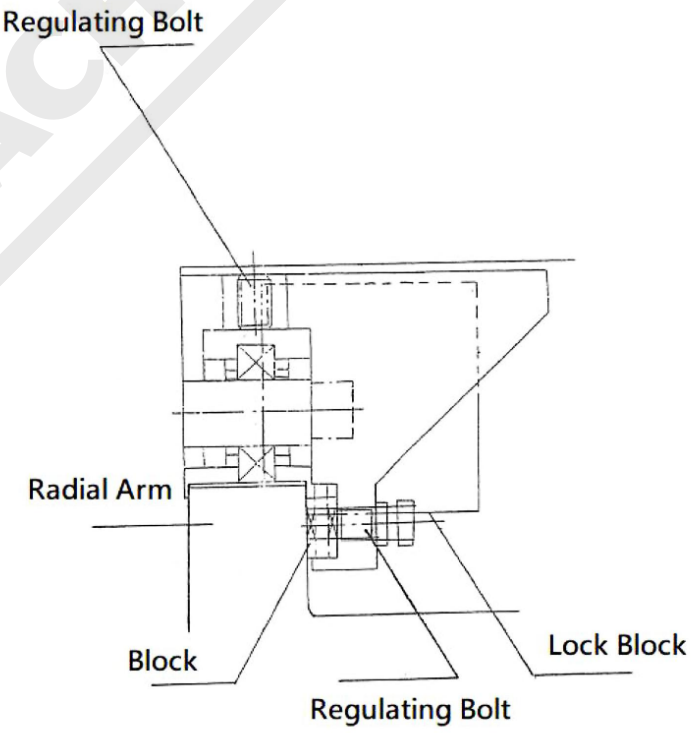
3. Fix loosening or tightening gear box clamp

This can be adjusted to loosen or tighten through adjusting the regulating bolts, on the clamp plate.



4. Adjusting the radial arm sliding rail

This can be adjusted to loosen or tighten through adjusting the regulating bolts, on the clamp plate.



RADIAL ARM DRILL
RD-900

Order Code: (D165)

Edition : 2.0
Date: (01/25)

The following section covers the spare parts diagrams and lists that were current at the time this manual was originally printed. Due to continuous improvements of the machine, changes may be made at anytime without notification.

HOW TO ORDER SPARE PARTS

1. Have your machines model number, serial number & date of manufacture on hand, these can be found on the specification plate mounted on the machine
2. A scanned copy of your parts list/diagram with required spare part/s identified.

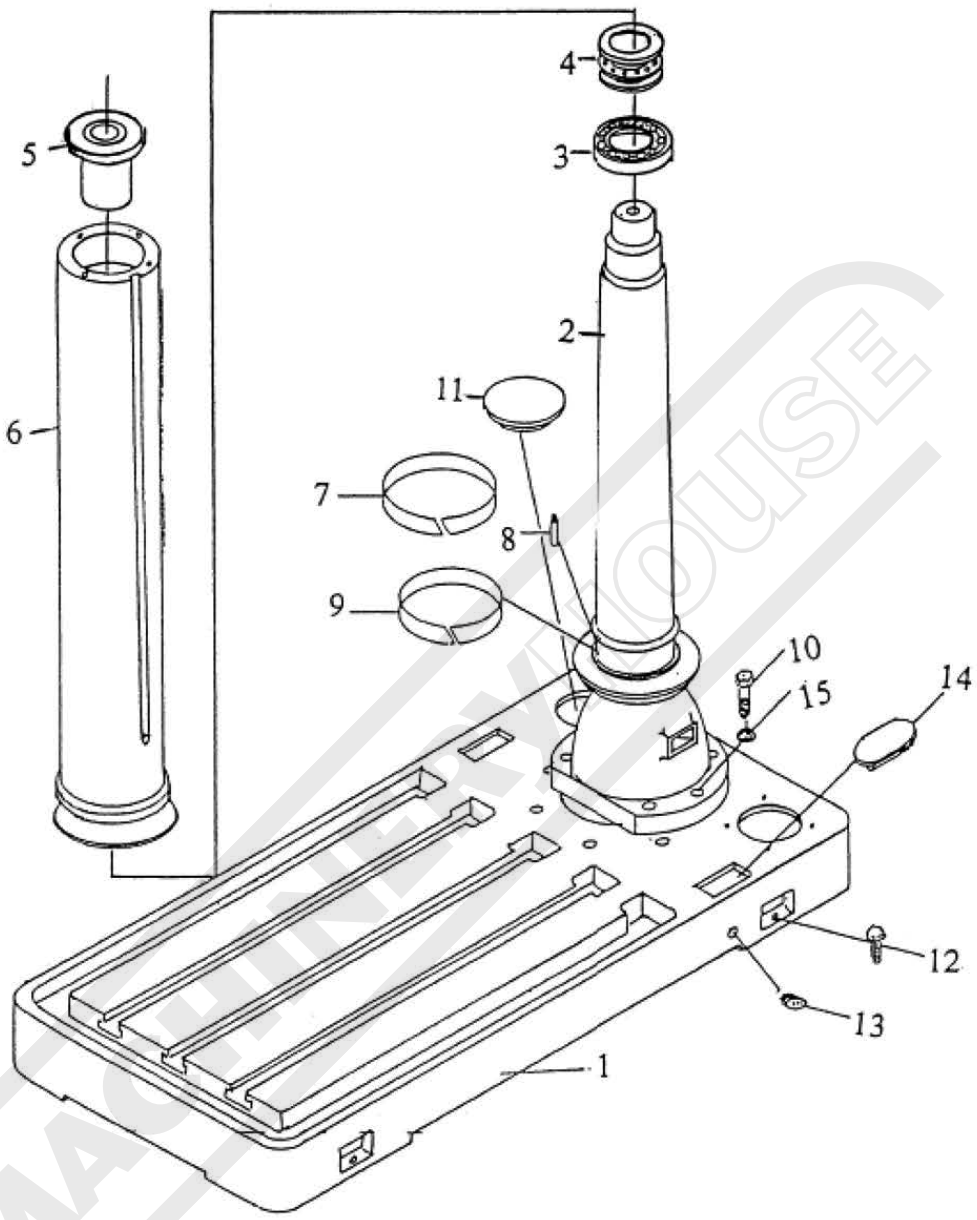
NOTE: SOME PARTS MAY ONLY BE AVAILABLE AS AN ASSEMBLY

3. Go to www.machineryhouse.com.au/contactus and fill out the inquiry form attaching a copy of scanned parts list.

WARNING!
Electricity is dangerous and could cause death.
All electrical work must be carried out by a qualified electrician.

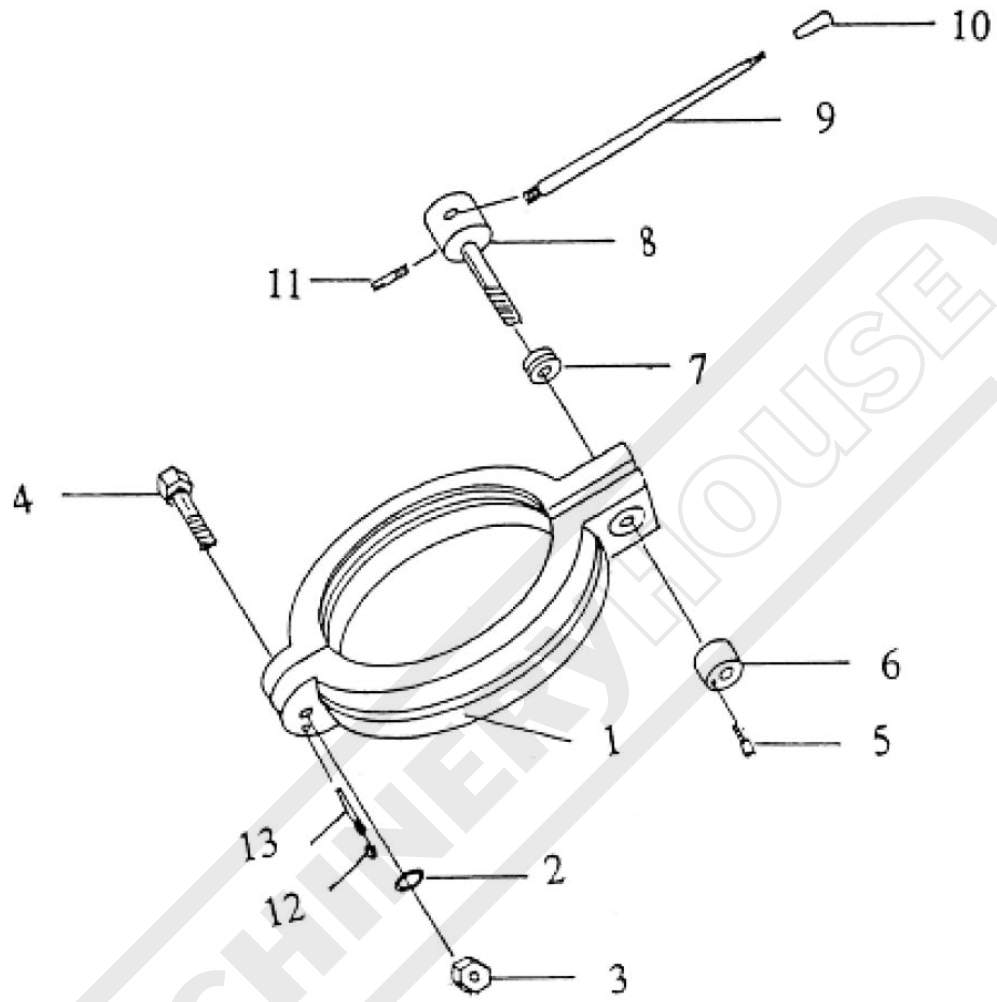
CAUTION!
It is impossible to cover all possible hazards Every workshop environment is different. These are designed as a guide to be used to compliment training and as a reminder to users prior to equipment use. Always consider safety first, as it applies to the individual working conditions.

COLUMN SPARE PARTS



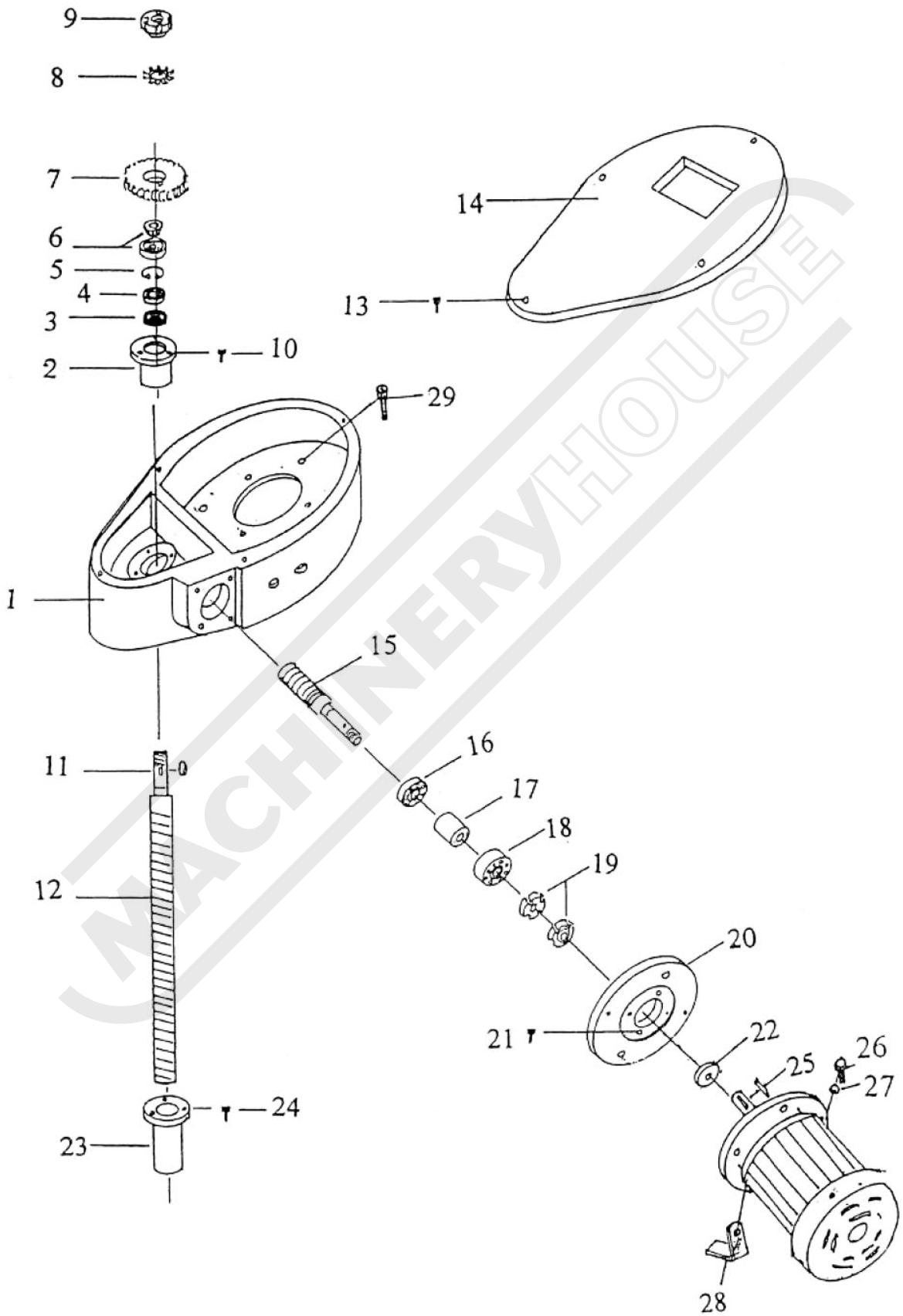
Index No.	Part No.	Description	Size	Qty
1	1101	Base		1
2	1102	Column		1
3		Ball Bearing	#6018	1
4		Thrust Bearing	#51116	1
5	1118	Cap		1
6	1103	Column sleeve		1
7	1143	Collar		1
8	1141	Needle Bearing		90
9	1142	Collar		1
10		Bolt	3/4”10NCx80L	6
11	1149	Round		1
12		Bolt	5/8”x2-1/2”	4
13		Oil Bolt	3/4”xUNF16	1
14	1150	Long cover		2
15		Spring Washer	3/4”	6

CLAMP SPARE PARTS



Index No.	Part No.	Description	Size	Qty
1	1104	Clamp		1
2		Spring Washer	3/4”	1
3		Nut	3/4”-I0NC	1
4		Bolt	3/4”X100L	1
5		Bolt	M6x25L	1
6	142	Nut		1
7		Thrust bearing	#51105	1
8	144	Locking Screw		1
9	1110	Handle		1
10	1111	Handle		1
11	1236-2	Bolt		1
12		Nut	M8	1
13		Pin	#6x70L	1

ELEVATING WORM GEAR BOX DIAGRAM



ELEVATING WORM GEAR BOX PARTS LIST

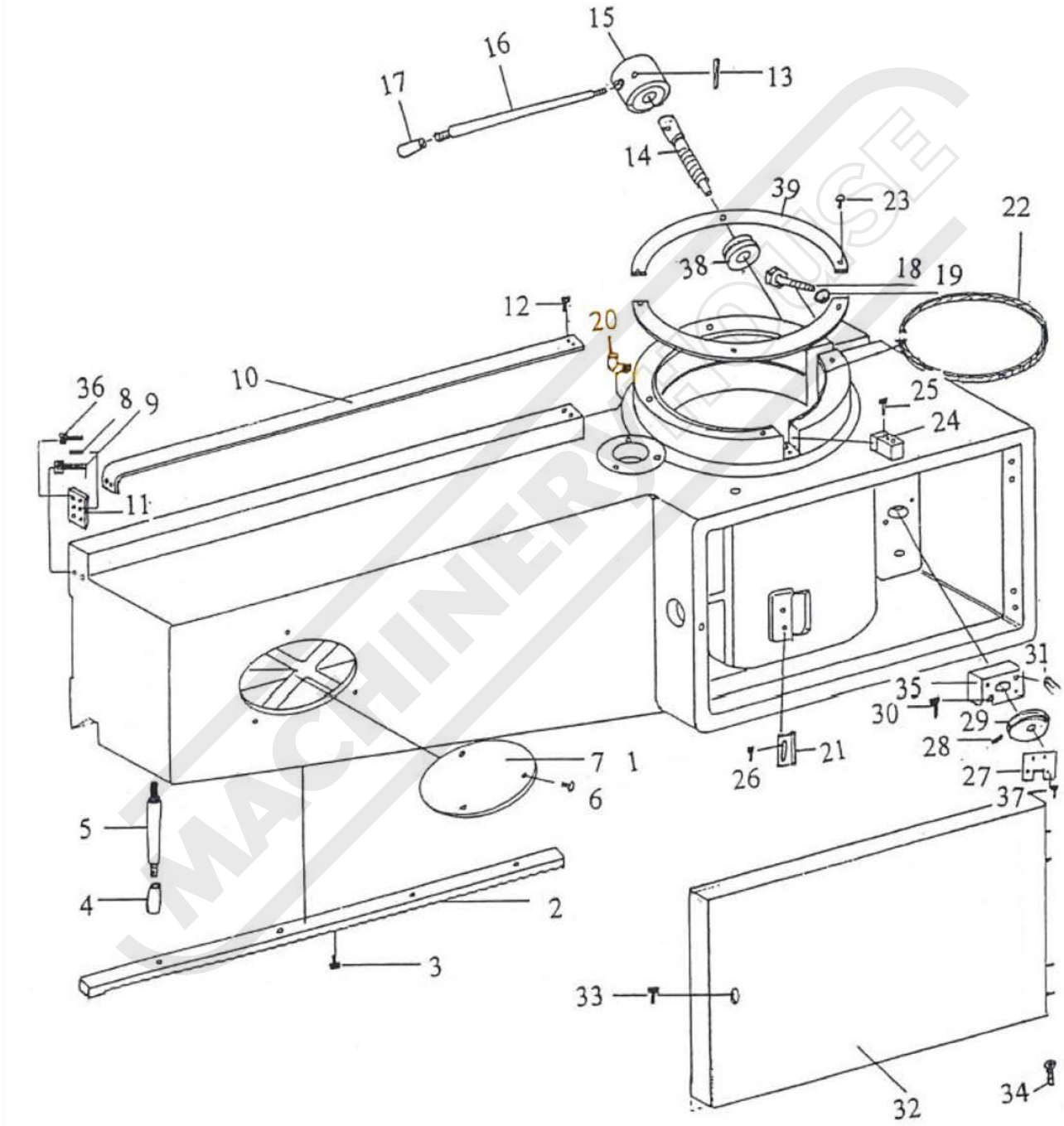
Index No.	Part No.	Description	Size	Qty
1	1119	Gear Box		1
2	1132	Seat		1
3		Oil Seal	TC305458	1
4		Roller Bearing	# 6005Z	1
5		C Snap Ring	R47	1
6		Taper Roller Bearing	# 30205	1
7	1124	Worm Gear		1
8		Collar	AWO5	1
9	1133	Nut		1
10		Bolt	M6x20L	3
11		Key	6x6x18L	1
12	1121	Elevating Screw		1
13		Bolt	M8x25L	4
14	1120	Cover		1
15	1125	Bolt		1
16		Roller Bearing	# 6006Z	1
17	1127	Bolt Bushing		1
18		Roller Bearing	# 6206	1
19	1126	Nut		2
20	1128	Motor Base		1
21		Bolt	M8x20L	4
22		Oil Seal	TC28488	1
23	1122	Nut		1
24		Bolt	M6x25L	3
25		Motor	1HP/4P	1
26		Bolt	3/8”x1L”	4
27		Spring Washer	3/8”	4
28	1501	Stop Seat		1
29		Bolt	M10x50L	7

NOTE: SOME INDIVIDUAL PARTS MAY ONLY BE AVAILABLE AS AN ASSEMBLY

WARNING!

Disconnect all power from the machine before servicing. There may be multiple power sources present. Remove the plug from the power point or remove the fuse if hardwired. Failure to do may cause death or injury.

RADIAL ARM DIAGRAM

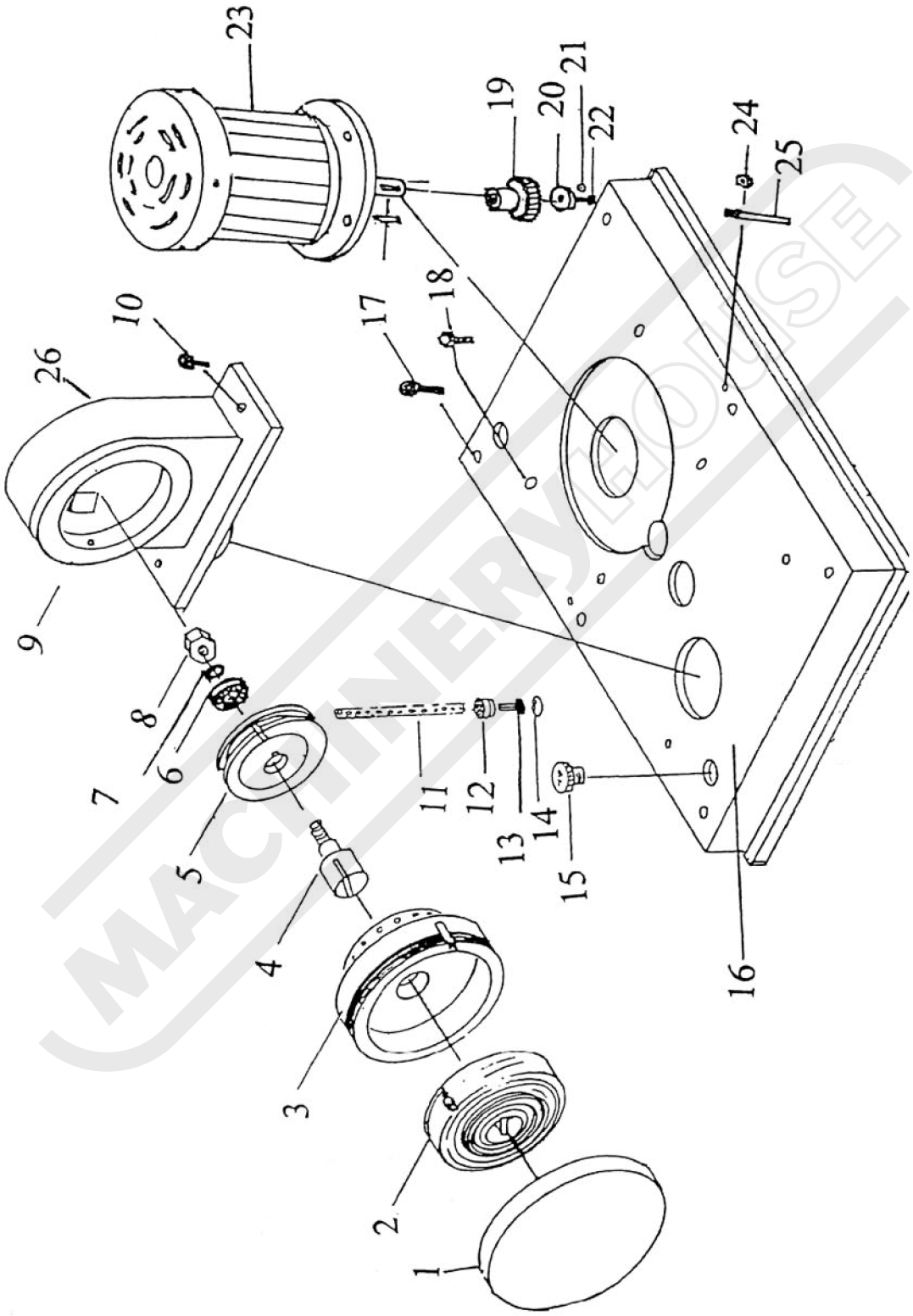


RADIAL ARM PARTS LIST

Index No.	Part No.	Description	Size	Qty
1	1105	Radial Arm		1
2	1417	Rack		1
3		Bolt	M6x16L	4
4	1111	Handle		1
5	1112	Handle		1
6		Bolt	M6xl0	3
7	304	Cover		1
8		Bolt	Set6x16	2
9		Bolt	6x10	2
10	1152	Steel Efflorescent		1
11	1107	Adjustment seat		1
12		Bolt	M6x12	2
13		Pin	#4x50L	1
14	1136	Locking bolt		1
15	1108	Joint		1
16	1110	Handle		1
17	1111	Handle	Plastic	1
18		Bolt	3/4”x4”	2
19		Spring Washer	3/4”	2
20		Oil Cup	PTl/8”	2
21	314	Micro Seat		1
22	1153	Oil Ligature		2
23		Bolt	M6x12L	10
24	251	Key		1
25		Bolt	M6x25	2
26		Bolt	M6x12L	2
27	313	Micro Seat		1
28		Bolt	Set 6x10L	1
29	1117	Collar		1
30		Bolt	M6x25L	1
31		Pin	M5x50L	1
32	302	Cover of Electricity		1
33		Bolt	M6x10L	1
34		Bolt	M6x10L	4
35	1135	Handel Joint Nut		1
36		Bolt	M6x10L	2
37		Bolt	3/16”x 3/8”L	2
38		Thrust Bearing	#51104	1
39	306	Arm cover		4

NOTE: SOME INDIVIDUAL PARTS MAY ONLY BE AVAILABLE AS AN ASSEMBLY

MOTOR PLATE PARTS LIST

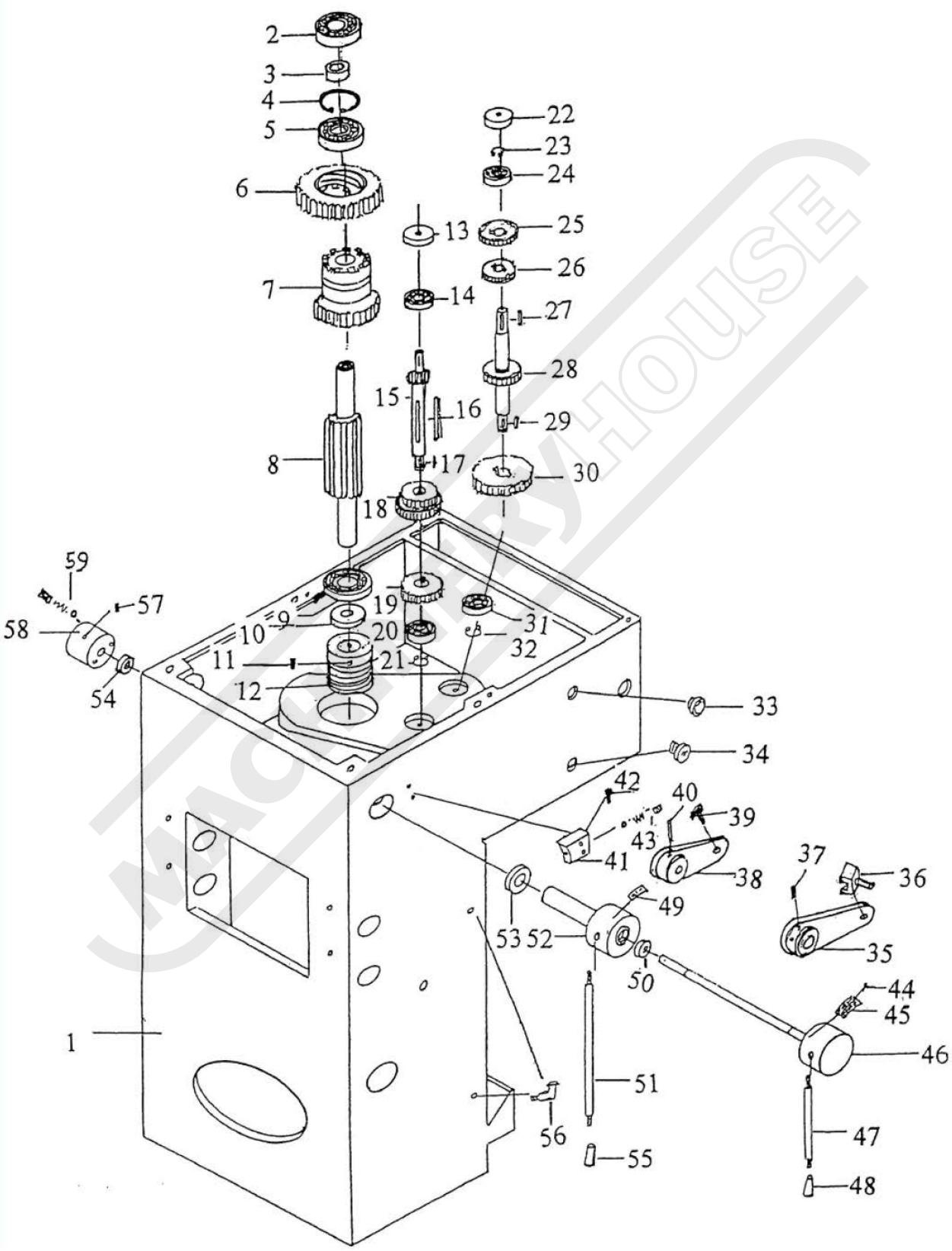


MOTOR PLATE PARTS LIST

Index No.	Part No.	Description	Size	Qty
1	1215	Spring Cover		1
2	1503	Spring		1
3	1214	Spring Fix Seat		1
4	1217	Spring Fix Bolt		1
5	1216	Spring Adjusting seat		1
6		Bearing	# 6204	1
7		Spring Washer	1/2”	1
8		Nut	1/2”	1
9		Bolt	SetM8x30L	1
10		Bolt	M6x25L	2
11	1504	Chain	P=6.35	1
12		Bearing	# 696ZZ	2
13	1224	Chain Connector		1
14		C Snap Ring	R15	1
15		Oil Bolt	3/4”xUNF16	1
16	1202	Gear Box Cover		1
17		Bolt	M8x50L	6
18		Bolt	3/8”xl”	4
19	1203	Motor Gear		1
20	1327	Fixed Sleeve		1
21		Spring Washer	MS	1
22		Bolt	M5x25L	1
23		Motor	2HP. 4P	1
24		Nut	MS	1
25		Pin	#4x50L	1
26	1213	Spring Seat		1

NOTE: SOME INDIVIDUAL PARTS MAY ONLY BE AVAILABLE AS AN ASSEMBLY

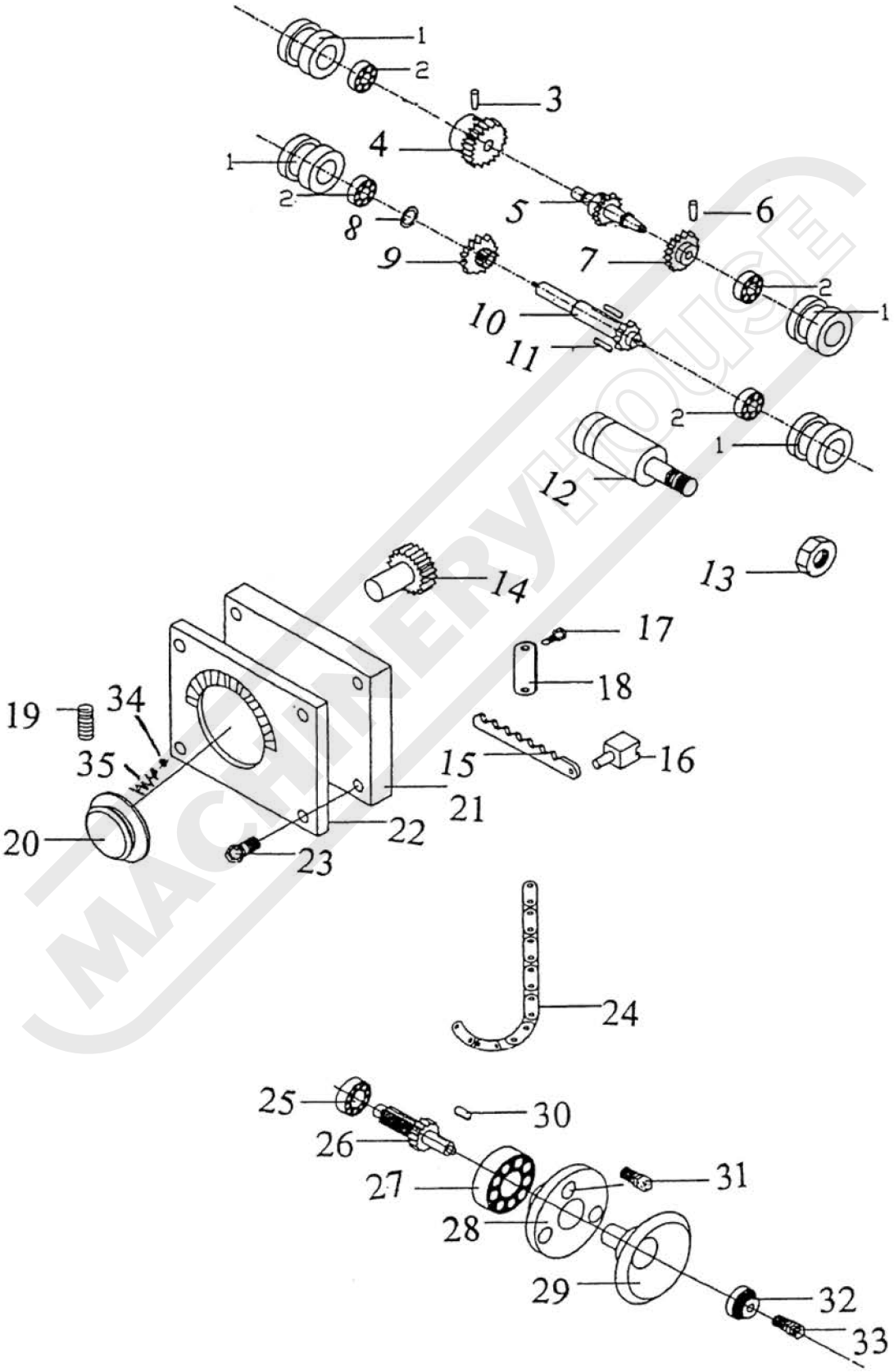
UPPER GEARBOX DIAGRAM



UPPER GEAR BOX PARTS LIST

Index No.	Part No.	Description	Size	Qty
1	1201	Gear box		1
2		Bearing	# 6007Z	1
3	1218	Bearing Shim		1
4		C Snap Ring	R62	1
5		Bearing	# 6007Z	1
6	1219	Gear A		1
7	1220	Gear B		1
8	1221	Spindle shaft		1
9		Bearing	# 6007Z	1
10		Oil Seal	TC35x55x8	1
11		Bolt	Set M6x10	2
12	1222	Set Screw		1
13	1205	Cover		1
14		Bearing	# 6004Z	1
15	1210	Gear Shaft		1
16		Key	M6x50L	2
17		Key	M6x12L	2
18	1211-1-2-3	Gear		1
19	1212	Gear		1
20		Bearing	#6004Z	1
21		C Snap Ring	S20	1
22	1209	Cover		1
23		C Snap Ring	S20	1
24		Bearing	# 6004Z	1
25	1204	Gear		1
26	1207	Gear		1
27		Key	M6x20L	2
28	1206	Shaft		1
29		Key	M6x16L	2
30	1208	Gear		1
31		Bearing	# 6004Z	1
32		C Snap Ring	S24	1
33		Oil glass	1/2”	1
34		Oil Bolt	3/4” xUNF16	1
35	1305	Change Seat		1
36	1306	Copper Seat		1
37		Bolt	M8x20L	2
38	1308	Casting Seat		1
39	1309	Steel Change Seat		1
40		Pin	M5x50L	1
41	1304-1	Fixed Seat		1
42		Bolt	M5x25L	2
43		Ball & Spring Seat	l/4”xM8xM8	1 x Set
44		Motor Bolt	M2	4
45		Plate	6 Speed	1
46	1302	Connector		1
47	1301	Handle		1
48	1111	Plastic Handle	Plastic	1
49		Plate	H.L	1
50		Oil Seal	TC16x26x7	1
51	1303	Handle		1
52	1304	Seat		1
53		Oil Seal	TC30x45x8	1
54		Oil Seal	TC16x26x7	1
55	1111	Plastic Handle		1
56		Oil Cup	PTl/8	2
57		Bolt	SetM8x30	1
58	1310	Change Seat		1
59		Ball &Spring Seat	5/16”xM6.8xM8	2Set

LOWER GEAR BOX DIAGRAM

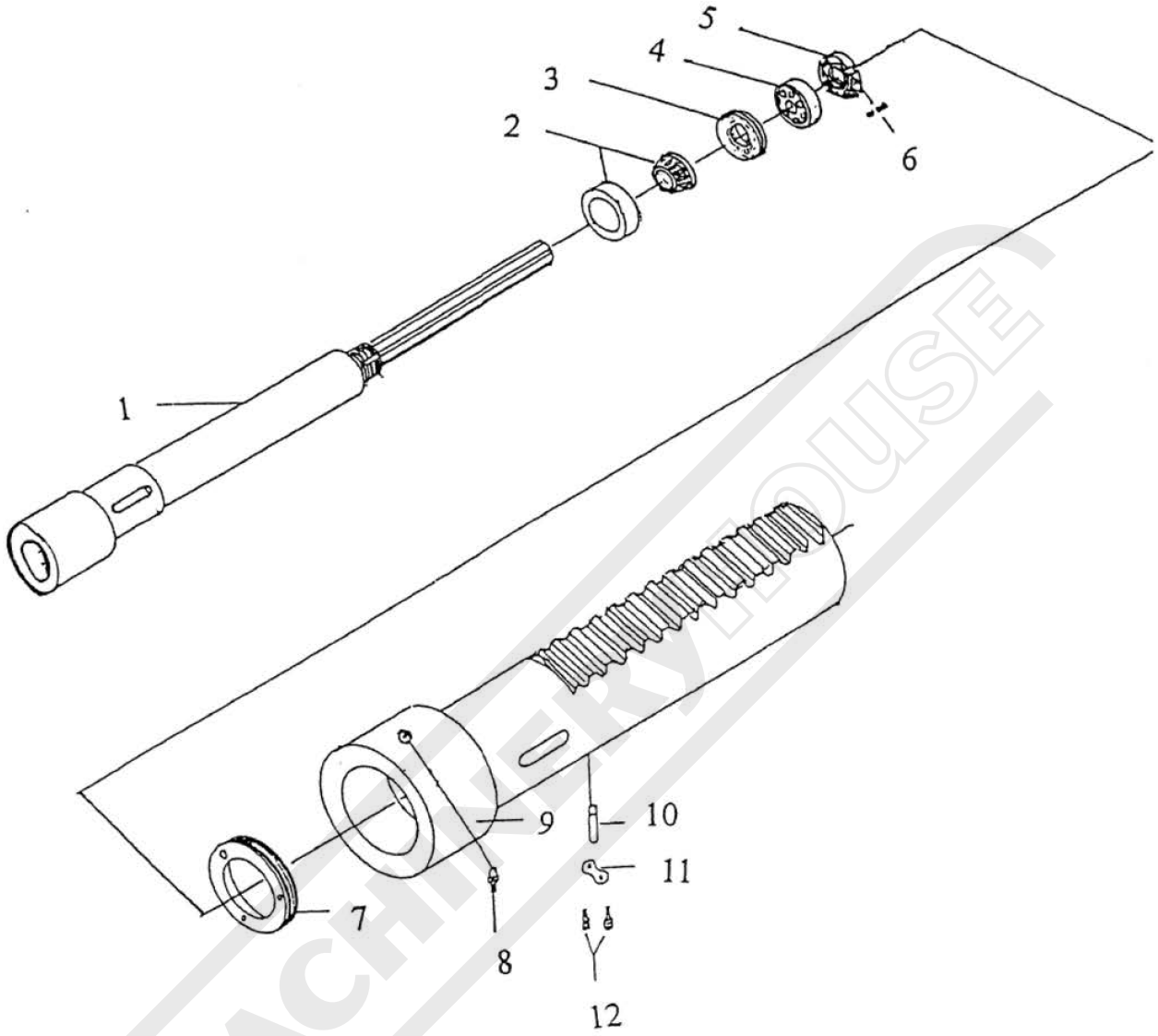


LOWER GEAR BOX PARTS LIST

Index No.	Part No.	Description	Size	Qty
1	1316	Bearing Block		4
2		Bearing	# 6002Z	4
3		Pin	# 4x50L	1
4	1319	Worm Gear		1
5	1317	Shaft		1
6		Pin	# 4x38L	1
7	1318	Gear		1
8		C Snap Ring	S22	1
9	1322	Gear		1
10	1321	Shaft		1
11		Key	M6x50L	2
12	1323	Idle Wheel		1
13		Nut	3/8”	1
14	1313	Pinion		1
15	1314	Rack		1
16	1315	Fork		1
17		Bolt	3/16”x3/8	2
18	1505	Plate		1
19		Bolt	M8x30L	1
20	1312	Handle		1
21	1311	Micro-Infeed Base		1
22	1506	Index Plate		1
23		Bolt	M8x20L	4
24		Chain	P=9.52	1
25		Bearing	# 6002Z	1
26	1324	Cover		1
27		Hand Wheel	# 6204	1
28	1325	Key		1
29	1326	Bolt		1
30		Fixed Sleeve	M5x12L	1
31		Bolt	M5x16L	3
32	1327	Ball		1
33		Spring	M5x30L	1
34			5/16”	1
35			M4	1

NOTE: SOME INDIVIDUAL PARTS MAY ONLY BE AVAILABLE AS AN ASSEMBLY

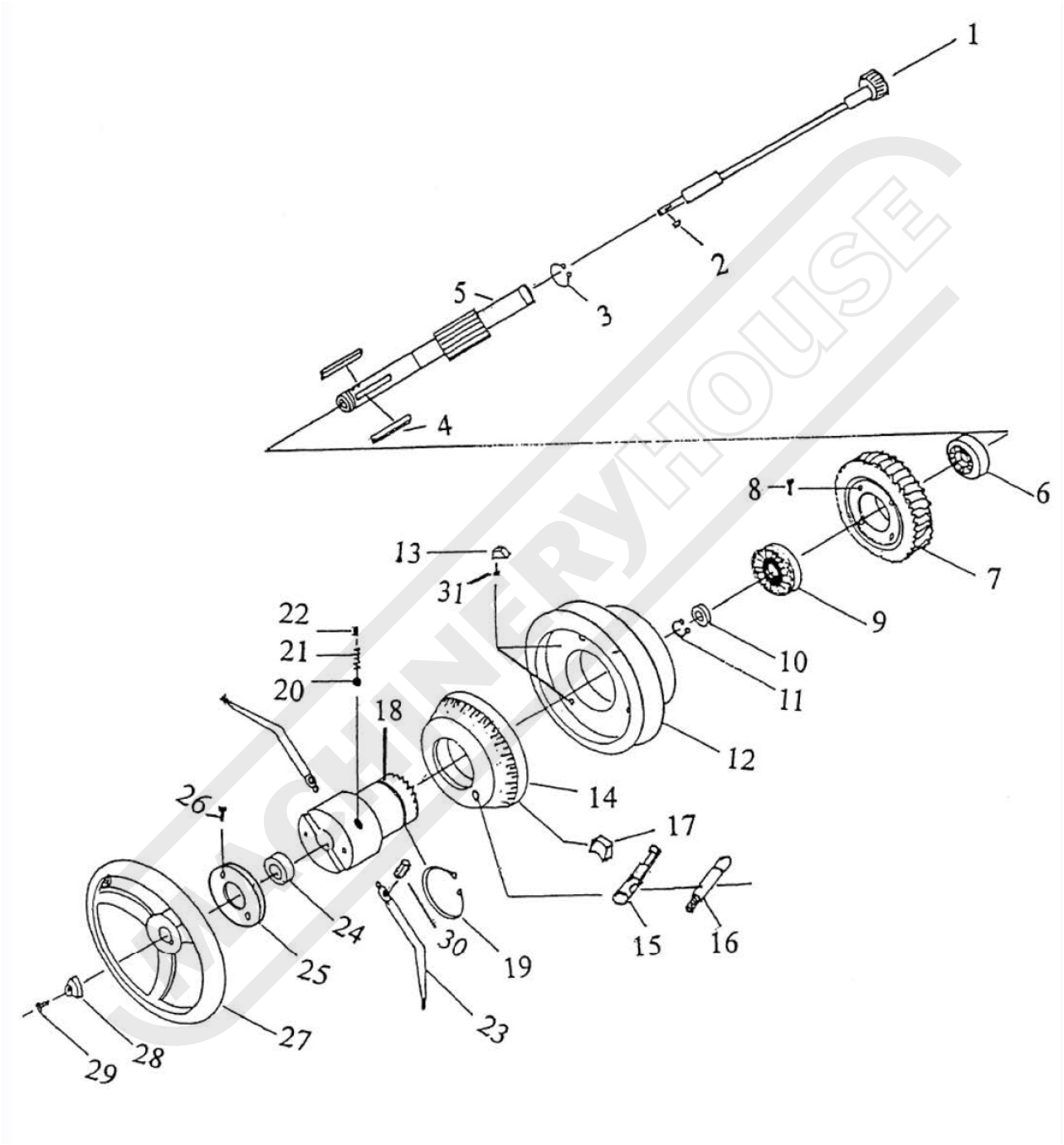
MAIN SPINDLE SPARE PARTS



Index No.	Part No.	Description	Size	Qty
1	1226	Spindle		1
2		Taper Roller Bearing	#32209	1
3		Thrust Bearing	# 51106	1
4		Roller Bearing	# 6006Z	1
5	1223	Nut		1
6		Bolt	SetM5x5L	2
7	1228	Cover		1
8		Grease Nipple	PTI/8”	1
9	1227	Spindle Sleeve		1
10	1330	Bolt		1
11		Plate	MCCO8B	1
12		Bolt	M5x10L	2

NOTE: SOME INDIVIDUAL PARTS MAY ONLY BE AVAILABLE AS AN ASSEMBLY

HAND IN FEED DIAGRAM

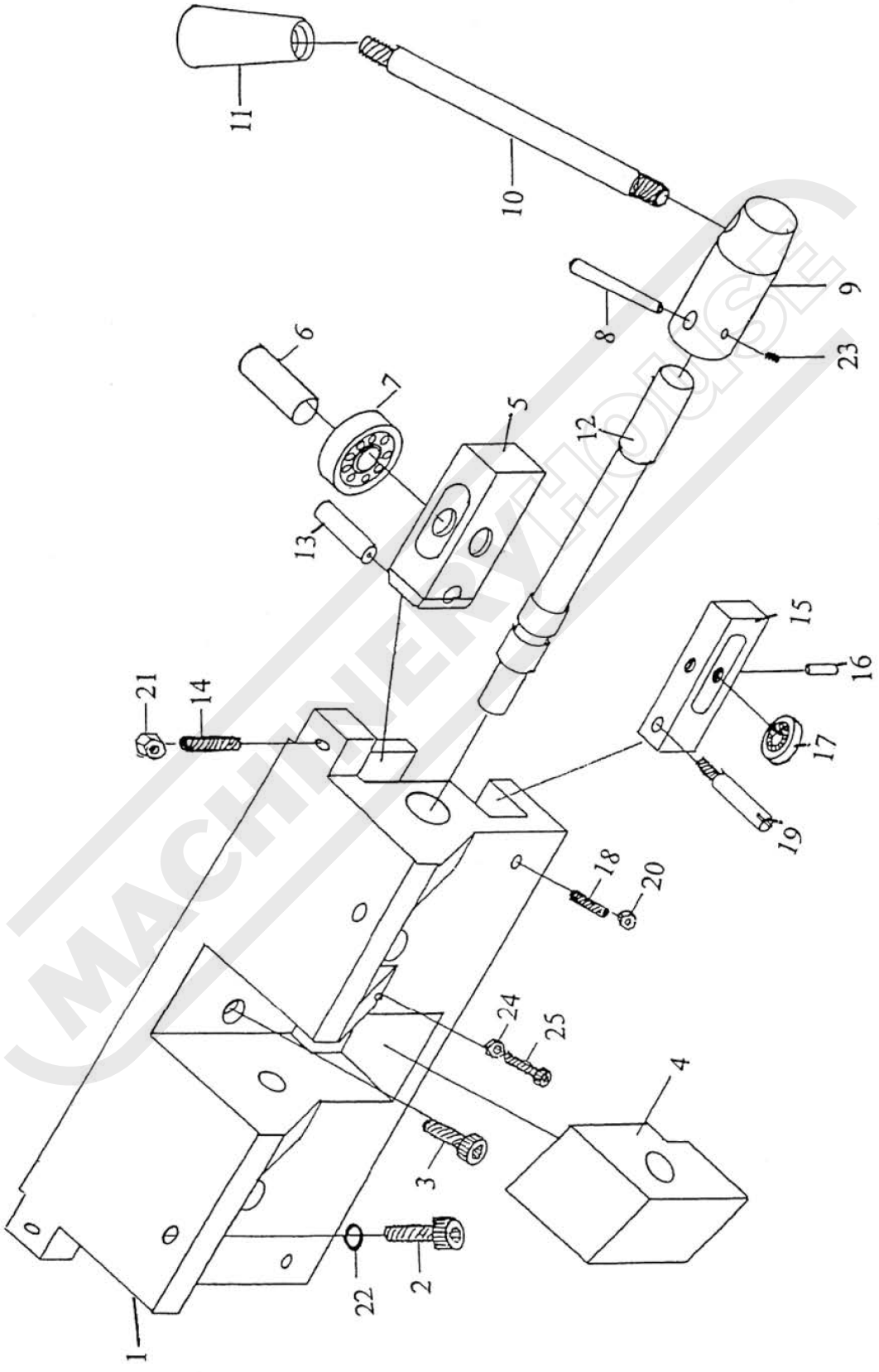


HAND IN FEED PARTS LIST

Index No.	Part No.	Description	Size	Qty
1	1415	Gear Shaft		1
2		Key	M5x5x10	1
3		C Snap Ring	S24	1
4		Key	M6x6x50	2
5	1414	Adjustment Wheel		1
6		Ball Bearing	# 6005Z	1
7	1413	Worm Gear		1
8		Bolt	M5x12	6
9	1408	Feed Gear		1
10	1412	Covering		1
11		C Snap Ring	S25	1
12	1401	Graduation Ring Base		1
13	1419	Cam		1
14	1402	Graduated Collar		1
15	1410	Eccentric Lever		1
16	1410-1	Handle		1
17	1411	Block		1
18	1405	Clutch		1
19		C Snap Ring	S68	1
20		Ball	1/4”	1
21		Spring	M8x20L	1
22		Bolt	Set8x10	1
23	1406	Feed Handle		2
24	1404	Locking Collar		1
25	1418	Clutch Cover		1
26		Bolt	M5x12	2
27	1403	Wheel		1
28	1327	Fixed Sleeve		1
29		Bolt	M5x25	1
30		Pin	M8x50L	2
31		Bolt	M5x12L	4

NOTE: SOME INDIVIDUAL PARTS MAY ONLY BE AVAILABLE AS AN ASSEMBLY

FIXED GEAR BOX SPARE PARTS

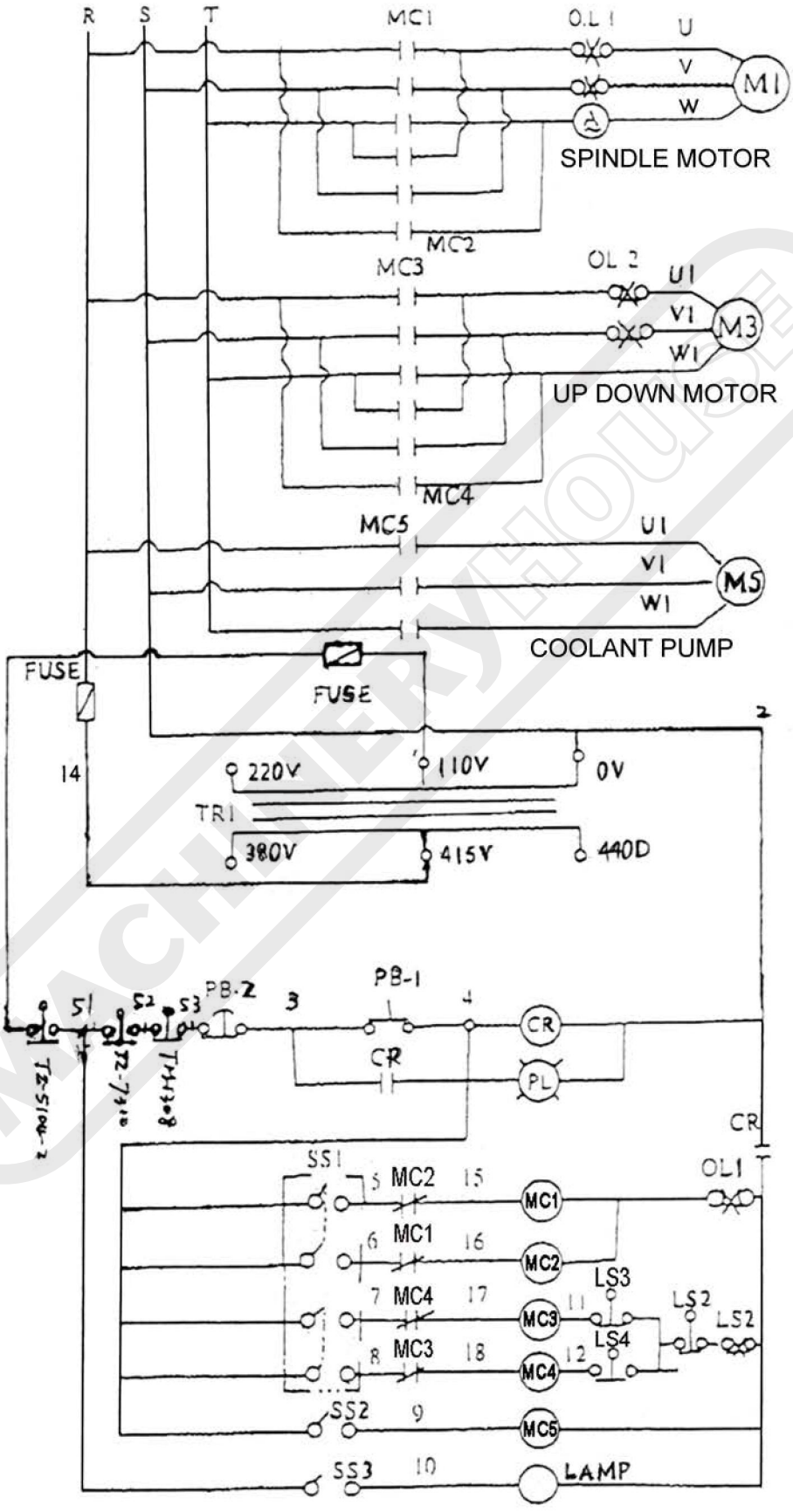


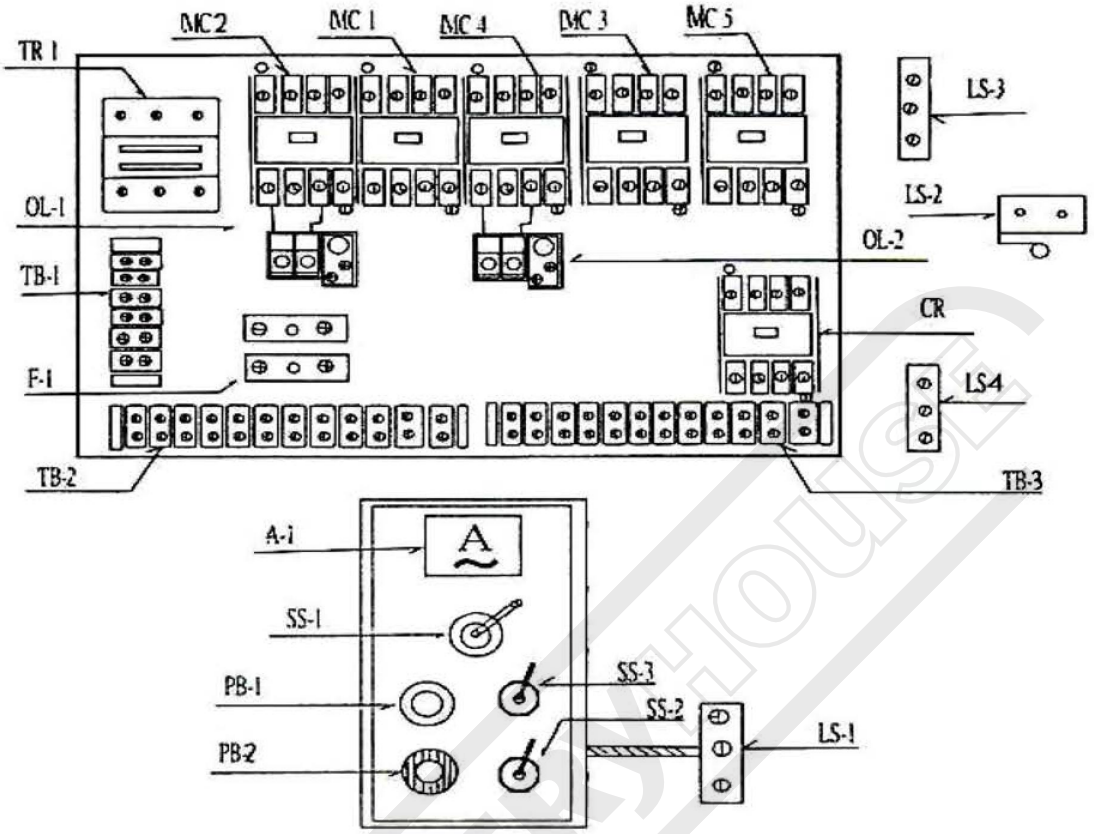
FIXED GEAR BOX PARTS LIST

Index No.	Part No.	Description	Size	Qty
1	1229	Gear Box Fixed Seat		1
2		Bolt	M10x25L	2
3		Bolt	M8x25L	2
4	1232	Lock Block		1
5	1230	Bearing Seat		2
6	1231	Bearing Shaft		2
7		Ball Bearing	#6202ZZ	2
8		Pin	#4x50L	1
9	1235	Joint		1
10	1303	Hand Lever		1
11	1111	Handle	Plastic	1
12	1234	Eccentric Shaft		1
13	1236	Fixed Bolt		2
14		Bolt	M8x25L	2
15	1233	Bearing Seat		2
16	1238	Bearing Shaft		2
17		Ball Bearing	#628ZZ	2
18		Bolt	M8x30L	2
19	1236-2	Bearing Shaft		2
20		Nut	MS	2
21		Nut	MS	2
22		Spring Washer	MIO	2
23		Bolt	Set M6x10	1
24		Nut	M6	1
25		Bolt	M6x25L	1

NOTE: SOME INDIVIDUAL PARTS MAY ONLY BE AVAILABLE AS AN ASSEMBLY

WIRING DIAGRAM





NO.	Item
MC1	Magnetic Contactor
MC2	Magnetic Contactor
MC3	Magnetic Contactor
MC4	Magnetic Contactor
MC5	Magnetic Contactor
CR	Magnetic Contactor
TR1	Transformer
TB-1	Wire Connect Table Board
TB-2	Wire Connect Table Board
TB-3	Wire Connect Table Board
OL-1	Load-Relay
OL-2	Load-Relay
F-1	Euse
A-1	Ammeter
PB-1	Starter
PB-2	Off-Switch
SS-1	4 Direction-Switch
SS-2	Coolant Switch
SS-3	Worklight On-off Switch
CS-1	Electrode Exchange
LS-1	Microswitch AM-1308
LS-2	Microswitch AM-1704
LS-3	Microswitch AM-1308
LS-4	Microswitch AM-1308

⚠WARNING

General Machinery Safety Instructions

Machinery House
requires you to read this entire Manual before using this machine.

1. **Read the entire Manual before starting machinery.** Machinery may cause serious injury if not correctly used.
2. **Always use correct hearing protection when operating machinery.** Machinery noise may cause permanent hearing damage.
3. **Machinery must never be used when tired, or under the influence of drugs or alcohol.** When running machinery you must be alert at all times.
4. **Wear correct Clothing.** At all times remove all loose clothing, necklaces, rings, jewelry, etc. Long hair must be contained in a hair net. Non-slip protective footwear must be worn.
5. **Always wear correct respirators around fumes or dust when operating machinery.** Machinery fumes & dust can cause serious respiratory illness. Dust extractors must be used where applicable.
6. **Always wear correct safety glasses.** When machining you must use the correct eye protection to prevent injuring your eyes.
7. **Keep work clean and make sure you have good lighting.** Cluttered and dark shadows may cause accidents.
8. **Personnel must be properly trained or well supervised when operating machinery.** Make sure you have clear and safe understanding of the machine you are operating.
9. **Keep children and visitors away.** Make sure children and visitors are at a safe distance for you work area.
10. **Keep your workshop childproof.** Use padlocks, Turn off master power switches and remove start switch keys.
11. **Never leave machine unattended.** Turn power off and wait till machine has come to a complete stop before leaving the machine unattended.
12. **Make a safe working environment.** Do not use machine in a damp, wet area, or where flammable or noxious fumes may exist.
13. **Disconnect main power before service machine.** Make sure power switch is in the off position before re-connecting.
14. **Use correct amperage extension cords.** Undersized extension cords overheat and lose power. Replace extension cords if they become damaged.
15. **Keep machine well maintained.** Keep blades sharp and clean for best and safest performance. Follow instructions when lubricating and changing accessories.
16. **Keep machine well guarded.** Make sure guards on machine are in place and are all working correctly.
17. **Do not overreach.** Keep proper footing and balance at all times.
18. **Secure workpiece.** Use clamps or a vice to hold the workpiece where practical. Keeping the workpiece secure will free up your hand to operate the machine and will protect hand from injury.
19. **Check machine over before operating.** Check machine for damaged parts, loose bolts, Keys and wrenches left on machine and any other conditions that may effect the machines operation. Repair and replace damaged parts.
20. **Use recommended accessories.** Refer to instruction manual or ask correct service officer when using accessories. The use of improper accessories may cause the risk of injury.
21. **Do not force machinery.** Work at the speed and capacity at which the machine or accessory was designed.
22. **Use correct lifting practice.** Always use the correct lifting methods when using machinery. Incorrect lifting methods can cause serious injury.
23. **Lock mobile bases.** Make sure any mobile bases are locked before using machine.
24. **Allergic reactions.** Certain metal shavings and cutting fluids may cause an ellergic reaction in people and animals, especially when cutting as the fumes can be inhaled. Make sure you know what type of metal and cutting fluid you will be exposed to and how to avoid contamination.
25. **Call for help.** If at any time you experience difficulties, stop the machine and call you nearest branch service department for help.

⚠WARNING

Drilling Machine Safety Instructions

Machinery House
requires you to read this entire Manual before using this machine.

1. **Maintenance.** Make sure the Drill is turned off and disconnect from the main power supply and make sure all moving parts have come to a complete stop before any inspection, adjustment or maintenance is carried out.

2. **Drill Condition.** Drill must be maintained for a proper working condition. Never operate a Drill that has damaged or worn parts. Scheduled routine maintenance should performed on a scheduled basis.

3. **Leaving a Drill Unattended.** Always turn the Drill off and make sure all moving parts have come to a complete stop before leaving the Drill. Do not leave Drill running unattended for any reason.

4. **Avoiding Entanglement.** Remove loose clothing, belts, or jewelry items. Never wear gloves while machine is in operation. Tie up long hair and use the correct hair nets to avoid any entanglement with the Drill spindle or moving parts.

5. **Chuck key & wrench safety.** Always remove chuck keys, wrenches and any service tools immediately after use. Chuck keys left in the chuck can cause serious injury.

6. **Understand the machines controls.** Make sure you understand the use and operation of all controls.

7. **Drill bit selection.** Always use the correct Drill bit for the job you are Drilling. Make sure you use the correct shank drill bit for you drilling machine.

8. **Secure the Drill Bit.** Properly tighten and securely lock the drill bit in the chuck.

9. **Cutting Tool inspection.** Inspect Drill for sharpness, chips, or cracks before use. Replace any cutting tools immediately if dull, chipped or cracked. Handle new cutting tools with care. Cutting edges are very sharp and can cause lacerations.

10. **Reversing the spindle.** Make sure the spindle has come to a complete stop before changing the direction of the spindle.

11. **Stopping the spindle.** Do not slow or stop the spindle by using you hand.

12. **Speed selection.** Select the appropriate speed for the type of work, material, and tool bit. Allow the Drill to reach full speed before beginning a cut.

13. **Changing Belts for speed selection.** Always allow the machine to come to a complete stop and turn power off before changing belts. Not turning power off when changing belts can cause serious injury.

14. **Clearing chips.** Always use a brush to clear chips. Never clear chips when the drill is running.

15. **Power outage.** In the event of a power failure during use of the drill, turn off all switches to avoid possible sudden start up once power is restored.

16. **Clean work area.** Keep the area around the drill clean from oil, tools, chips.

17. **Surface/workpiece area.** Before turning the drill on, make sure the table is clear of any objects (tools, scraps, off-cuts etc.) Do not drill material that does not have a flat surface. unless a suitable support is used.

18. **Table Lock.** Make sure the table is tightened before starting the drill.

19. **For - Radial Drill Arm Lock.** Make sure the arm is locked before leaving or starting a radial arm drill. An unlocked radial drill arm can swing and cause serious injury.

20. **Drilling Sheet metal.** All sheet metal should be clamped to the table before drilling.

21. **Mounting workpieces.** Use clamps or vices to secure workpiece before drilling. Position work so you avoid drilling into table.

22. **Guarding.** Do not operate the drill when chuck guard is removed.

23. **Eye and hand protection.** A face shield with safety glasses is recommended. Always keep hands and fingers away from the drill bit. Never hold a work[piece in your hand while drilling. Do not wear gloves while operating the drill.

24. **Drill operation.** Never start the drill with the drill bit pressed against the workpiece. Feed the drill evenly into the workpiece. Back the drill out of deep holes. Turn the machine off and clear chips and scrap pieces with a brush. Turn power off, remove drill bit, and clean the table before leaving the machine.

25. **Call for help.** If at any time you experience difficulties, stop the machine and call you nearest branch service department for help.

PLANT SAFETY PROGRAM

NEW MACHINERY HAZARD IDENTIFICATION, ASSESSMENT & CONTROL

Drilling Machine

Developed in Co-operation Between A.W.I.S.A and Australia Chamber of Manufactures
This program is based upon the Safe Work Australia, Code of Practice - Managing Risks of Plant in the Workplace (WHSA 2011 No10)

Item No.	Hazard Identification	Hazard Assessment	Risk Control Strategies (Recommended for Purchase / Buyer / User)
A	ENTANGLEMENT	HIGH	Eliminate, avoid loose clothing / Long hair etc.
B	CRUSHING	LOW	Secure & support work material on drill table.
C	CUTTING, STABBING, PUNCTURING.	MEDIUM	Isolate power to machine prior to any checks or maintenance being carried out. Do not adjust or clean until the machine has fully stopped.
D	SHEARING	MEDIUM	Isolate power to machine when changing speeds or maintenance is being carried out. Make sure all guards are secured shut when machine is on.
F	STRIKING	MEDIUM	Ensure workpieces are tightly secured on machine. Wear safety glasses. For Radial Arm Drills ensure that arm is locked before drilling. Ensure correct spindle direction when drilling..
H	ELECTRICAL	MEDIUM	All electrical enclosures should only be opened with a tool that is not to be kept with the machine. Never clean or dust machine when power is on. Machine should be installed & checked by a Licensed Electrician.
M	HIGH TEMPERATURE	LOW	Wear appropriate protective clothing to prevent hot swarf.
O	OTHER HAZARDS, NOISE.	LOW	Wear hearing protection as required.
Plant Safety Program to be read in conjunction with manufactures instructions			

HARE&FORBES MACHINERYHOUSE

www.machineryhouse.com.au

MACHINERYHOUSE

www.machineryhouse.co.nz

Authorised and signed by:
Safety officer:.....
Manager:.....

Revised Date: 12th March 2012

ENVIRONMENT PROTECTION

Recycle unwanted materials instead of disposing of them as waste. All tools, accessories and packaging should be sorted, taken to a recycling centre and disposed of in a manner which is compatible with the environment. When the product becomes completely unserviceable and requires disposal, drain any fluids (if applicable) into approved containers and dispose of the product and fluids according to local regulations.

IMPORTED BY

HARE&FORBES MACHINERYHOUSE

Australian Distributor

Hare & Forbes Machineryhouse
Sydney - Melbourne
Adelaide - Brisbane - Perth

Ph: 1300 202 200
www.machineryhouse.com.au

MACHINERYHOUSE

New Zealand Distributor

Machineryhouse
Auckland
Christchurch

Ph: 0800 142 326
www.machineryhouse.co.nz