HAFCO METALMASTER

OPERATION MANUAL

PEDESTAL MILL DRILL

Model. DMF-44

Order Code D185

Edition No	*: DMF-44-1*
Date of Issue	*: 07/2020*

MACHINE DETAILS

MACHINE	PEDESTAL MILL DRILL
MODEL NO.	DMF-44
SERIAL NO.	
DATE OF MANF.	

DISTRIBUTED BY

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NOTE:
This manual is only for your reference. 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 this electric machine.

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)

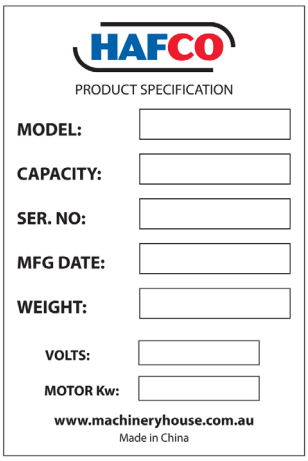


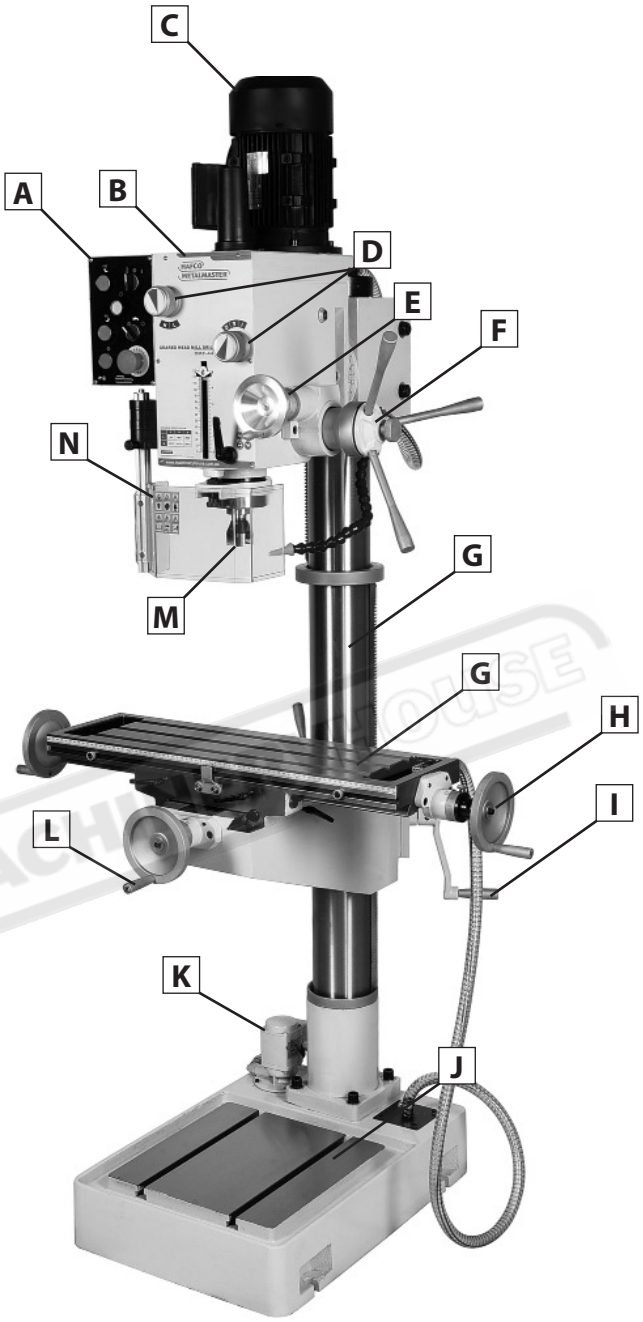
FIG.1

CONTENTS:

1.1 SPECIFICATION

Order Code	D185
MODEL	**DMF-44**
Type	Pedestal
Table Size (mm)	730 x 210
Column Size (mm)	Ø125
Spindle Tape	3MT
Longitudinal Travel (X-Axis) (mm)	480
Cross Travel (Y-Axis) (mm)	200
Vertical Travel (Z-Axis) (mm)	850
Type of Slides	Dovetail
Spindle to Table (mm)	630
Spindle Travel (mm)	120
Spindle Diameter (mm)	Ø75
Throat Depth (max) (mm)	280
Tilting Head (Left ~ Right)	±90º
Drilling Capacity (mm)	31.5
Drilling Capacity (mm)	28
Face Milling Capacity (mm)	80
Table T-Slot Size (mm)	14
Work Table Load Capacity (kg)	55
Spindle Speeds (No./rpm)	6 (95 - 1650)
Motor Power (kW / hp)	1.5 / 2
Voltage / Amperage (V / amp)	240 / 10
Dimensions (H x W x D) (cm)	1760 x 1060 x 760
Weight (kg)	350

1.2 IDENTIFICATION



A	Control Panel	**H**	Longitudinal Travel Hand-wheel
B	Head	**I**	Vertical Travel Handle
C	Motor	**J**	Base
D	Speed Selection Levers	**K**	Coolant Pump
E	Fine Spindle Feed	**L**	Cross Travel Hand-wheel
F	Course Spindle Feed	**M**	Spindle
G	Slotted Table	**N**	Cutter Safety Guard

1.3 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 set up may result in malfunction or unexpected results that can lead to serious injury, death, or machine/property damage.

A. FORWARD Button: Starts clockwise spindle rotation (as viewed from above). The spindle must be completely stopped before this button is pushed. (Fig.4.1)

B. DRILL OR TAP SELECTOR: Selects either a drilling or tapping option. When tap is selected the spindle reverses when it reaches the depth stop.

C. POWER Lamp: Illuminates when the machine is connected to power.

D. REVERSE Button: Starts counter-clock wise spindle rotation (as viewed from above). The spindle must be completely stopped before this button is pushed.

E. COOLANT PUMP SWITCH: Switches the coolant pump ON or OFF

F. STOP Button: Stops spindle rotation.

G. EMERGENCY STOP Button: Cuts power to the spindle motor and remains depressed until reset. Twist clockwise until it pops out to reset. (Fig.4.1)

H. HIGH/LOW RANGE LEVER: Selects either high or low spindle speed range. (Fig.4.2)

I. SPINDLE SPEED LEVER: Selects one of three spindle speeds in the selected speed range. (Fig.4.2)

FIG.4.1

FIG.4.2

4.2 DOWN- FEED CONTROLS

The machine is equipped with a course down-feed control mainly used for drilling or quick adjustment and a fine down-feed control used mainly when milling or where controlled down-feed is required. (Fig.4.3)

A. Depth Stop and Scale

B. Quill Lock Lever

C. Depth Stop Adjustment Knob

D. Fine Down-feed Hand-wheel

E. Down-feed Selector Knob

F. Coarse Down-feed Handle

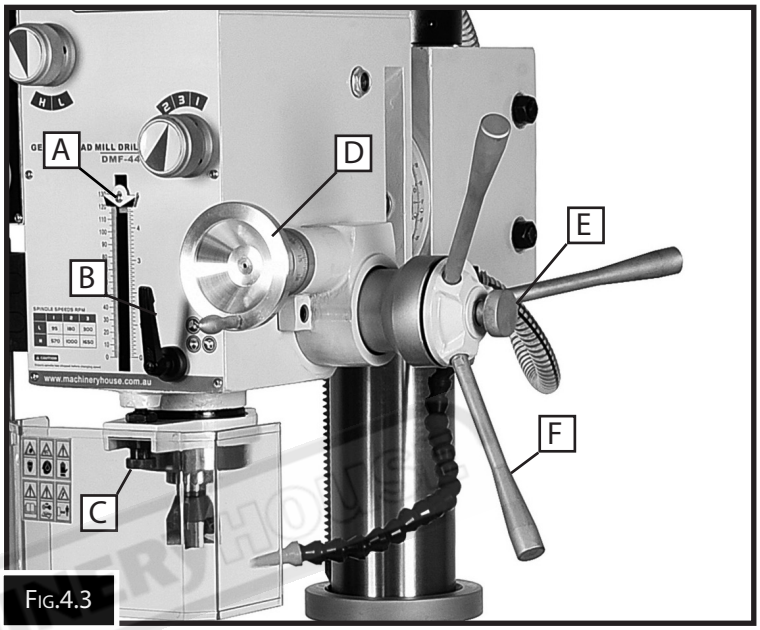


FIG.4.3

To Use The Coarse Down-Feed:

1. Loosen quill lock lever.(B in Fig.4.3)
2. Loosen down-feed selector knob "E" to engage coarse down-feed handles.
3. Position depth stop with adjustment knob."C"
4. Use coarse down-feed handles to raise and lower the spindle. "F"

To Use The Fine Down-Feed:

1. Loosen quill lock lever.
2. Tighten down-feed selector knob to engage fine down-feed hand wheel.
3. Position depth stop with adjustment knob.
4. Rotate fine down-feed hand wheel to raise and lower spindle.

To Set The Depth Stop:

The depth stop limits the downward movement of the cutting tool. With the use of the depth stop adjustment knob (see "C" in Fig.4.4), it can be positioned anywhere within 0–125mm. This is useful when performing the same operation multiple times.

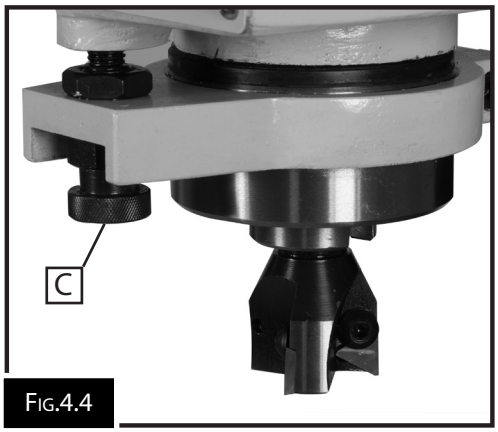


FIG.4.4

2. SAFETY

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 work-piece.
- ✓ 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.
- ✓ DISCONNECTION 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 METALWORKING MACHINE SAFETY 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

- × Do not distract an operator. Horseplay can lead to injuries and should be strictly prohibited.
- × Do not wear loose clothing, gloves, necktie's, rings, bracelets or other jewellery that can be come entangled in moving parts. Confine long hair.
- × Do not 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.
- × Do not use rags or wear gloves near moving parts of machines.
- × Do not use compressed air to blow debris from machines or to clean dirt from clothes.
- × Do not force the machine. It will do the job safer and better at the rate for which it was designed.

BEFORE OPERATING ANY MACHINE, TAKE TIME TO READ AND UNDERSTAND ALL SAFETY SIGNS AND SYMBOLS. IF NOT UNDERSTOOD SEEK EXPLANATION FROM YOUR SUPERVISOR.

2.1 GENERAL METALWORKING MACHINE SAFETY 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

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 DRILL/MILL

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 the operator is familiar with all the machine operations and controls.
- ✓ Ensure all guards are fitted, secure and functional. Do not operate if guards are missing or faulty.
- ✓ Check the workspaces and walkways to ensure no slip/trip hazards are present.
- ✓ Ensure the cutter is in good condition and securely mounted.
- ✓ Ensure the workpiece is securely clamped to the table or fixture.
- ✓ Ensure all tools and foreign objects have been removed from the machine.
- ✓ Check coolant delivery system to allow for sufficient flow of coolant.

OPERATIONAL SAFETY CHECKS

- ✓ Keep clear of moving machine parts.
- ✓ Follow correct clamping procedures. Keep overhangs as small as possible and check to make sure that the cutter will not be impeded by the clamps
- ✓ Set the correct speed to suit the cutter diameter, the depth of cut and the material.
- ✓ Ensure the cutter is clear of the workpiece before the machine is started.
- ✓ Before making adjustments and measurements or cleaning swarf accumulations, switch off and bring the machine to a complete standstill.

AFTER OPERATION HOUSEKEEPING

- ✓ Switch off the machine when the work is completed.
- ✓ Remove the milling cutters and store them safely.
- ✓ Remove all the swarf. Cover the table surface with light oil to prevent rust.
- ✓ Leave the machine and work area in a safe, clean and tidy state.

DON'T

- × Do not use faulty equipment. Immediately report suspect machinery.
- × Never leave the machine running unattended.
- × Do not leave equipment on top of the machine.

POTENTIAL HAZARDS AND INJURIES

❑ Sharp cutters. ❑ Eye injuries. ❑ Metal splinters and burrs. ❑ Flying debris.
❑ Hair/clothing getting caught in moving machine parts. ❑ Skin irritation.

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 240V.

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.....240V
Cycle.....50 Hz
Phase.....Single Phase
Power Supply Circuit.....10 Amps
Full Load Current.....7.1Amps

(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 machines at 240V is 7.1 Amps

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. SETUP

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, or missing, please contact your local distributor.
NOTE: Save all the packaging materials until you are completely satisfied with the machine and have resolved any issues between your distributor or the transport company. You may need to have the original packaging to file a freight claim. It will also be extremely helpful if you need to return your machine later.

4.2 INCLUDED ACCESSORIES

When unpacking the machine, check the accessories against the list below.

- ❑ Face milling cutter with inserts
- ❑ Keyed drill chuck and arbor
- ❑ Chuck key to suit
- ❑ MT3 to MT2 drill sleeve adapter
- ❑ Drill drift tool to remove drill chuck or taper shank drills
- ❑ 1 x M12 x 1.75mm draw-bar
- ❑ 1 x 1/2" x 12TPI draw-bar
- ❑ Safety cutter guard(Not Shown)

FIG. 4.1

4.3 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 prevented 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.

NOTE: ALWAYS WEAR SAFETY GLASSES AND USE DISPOSABLE GLOVES WHEN USING CLEANING PRODUCTS

⚠ CAUTION ***MANY CLEANING SOLVENTS CAN BE TOXIC IF INHALED. ONLY WORK IN A WELL-VENTILATED AREA.***

4.4 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.

4.5 LIFTING INSTRUCTIONS

⚠ WARNING ***This machine is extremely heavy. Serious personal injury may occur if safe moving methods are not followed. To be safe, you will need assistance and power equipment when moving the shipping crate and removing the machine from the crate.***

On the day that the machine arrives, make sure that a forklift or lifting device, 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.

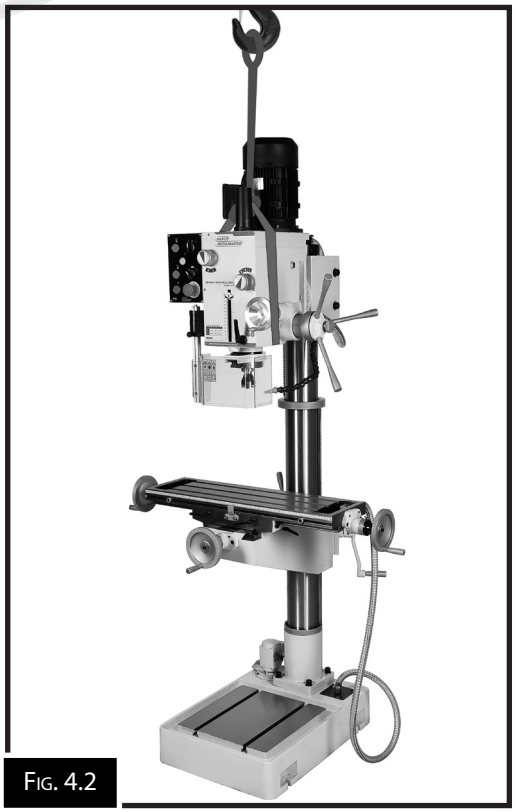


FIG. 4.2

LIFTING POINT

When lifting the machine only certified lifting slings should be used.
Hitch a web sling between the motor and the spindle. Ensure that when lifting, the machine does not tip over. Check that the lifting slings do not interfere with the parts of the machine that may be damaged. (Fig.2.1)

NOTE: When lifting a heavy load it is important that you have determined the centre of gravity before you begin lifting. Determining the centre of gravity is vital to achieving total control over the load.

4.6 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)

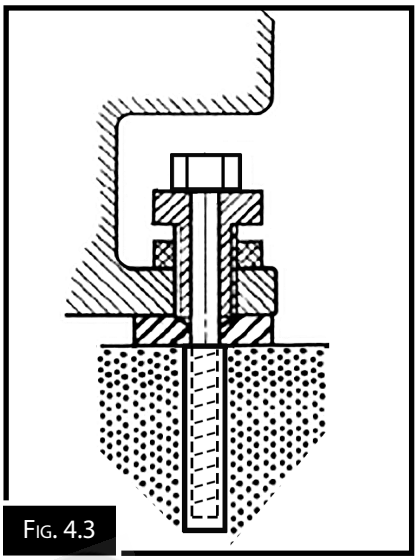


Fig. 4.3

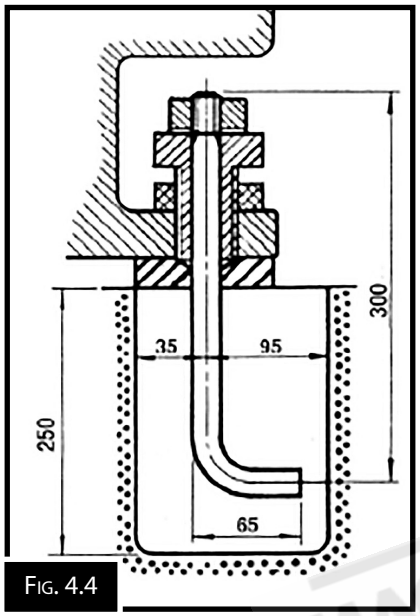


Fig. 4.4

In some case a suitable foundation may not be available and a new one may need to be prepared.
The foundation should be concrete approximately 200mm 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

4.7 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 inserting metal shims under each 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.

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

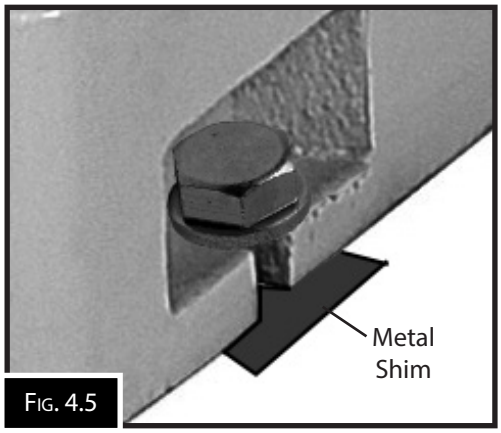


Fig. 4.5

4.8 ASSEMBLY

The machine must be fully assembled before it can be operated. To make sure the assembly process goes smoothly, clean all parts that have any heavy-duty rust preventative on them.

To assemble the machine:

1. Place the crank handle on the spindle that raises the table, making sure that the set screw is lined up with the dimple on the shaft. When the set screw is lined up tighten the screw.(Fig. 4.6)

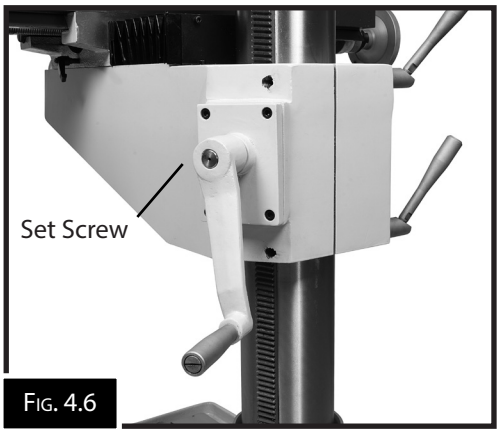


FIG. 4.6

2. Mount the cross travel and longitudinal hand-wheels to the shafts and tighten socket head cap screws and the washers to the shafts. (Fig. 4.7)

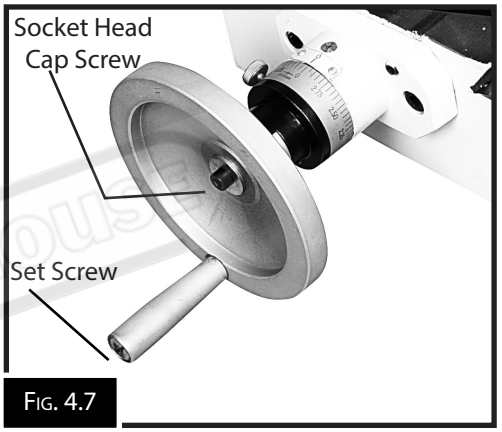


FIG. 4.7

3. Install the three coarse down-feed handles onto the coarse down-feed hub and tighten. (Fig. 4.8)

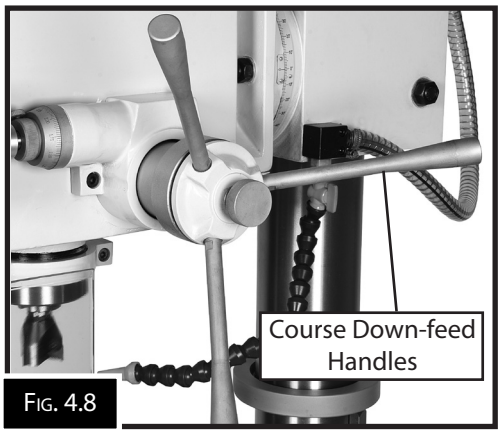


FIG. 4.8

4.9 CHECKING LUBRICATION

The headstock oil reservoir must have the proper amount of oil in it before the machine can be operated for the first time. Damage caused by running the machine without oil in the reservoir will not be covered under warranty. The oil level can be viewed by checking the level in the oil sight glass on the side of the headstock. (Fig. 4.9) If oil needs to be added, then refer to the Lubrication section, in the Maintenance Section, for details on how to fill the oil.

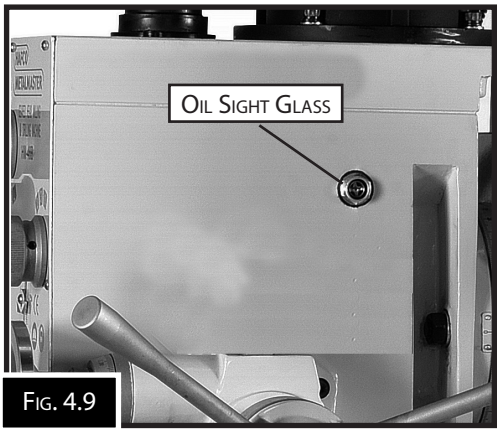


Fig. 4.9

4.10 TEST RUN

Test run the machine to ensure it is properly connected to power and safety components are functioning correctly. 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. Consult The Troubleshooting table in the maintenance section of this manual for possible solution.

The Test Run consists of verifying the following:

1) The motor powers up and runs correctly, and
2) the safety disabling mechanism on the emergency stop button works correctly.
3) Cutter Safety Guard limit switch works correctly.

To test run the mill/drill:

1. Clear all setup tools away from machine.
2. Close the cutter safety guard and connect the machine to power supply. Power lamp should light.
3. Press EMERGENCY STOP button (G in Fig. 4.10) This will help prevent unexpected startup when machine is connected to power
4. Shift high/low range lever (H) right to "L" and spindle speed lever (I) right to "1". This selects a spindle speed of 95 RPM (refer to spindle speed chart on headstock).

Note: You may need to rotate spindle back and forth by hand while putting pressure on the shift lever to allow gears to mesh.

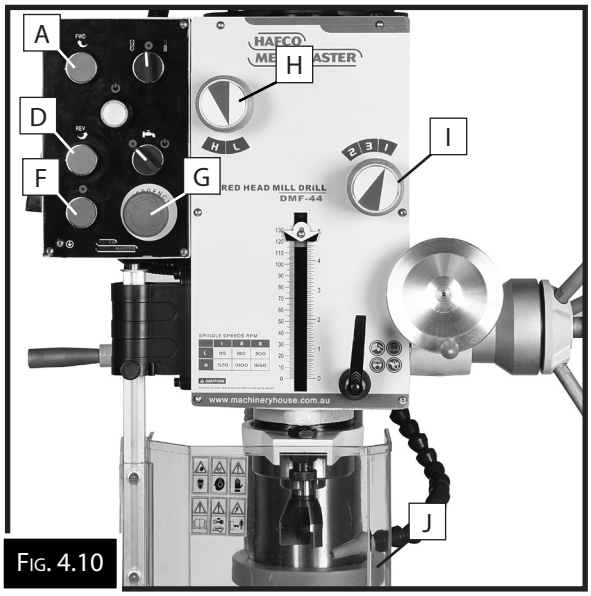


Fig. 4.10

4.10 TEST RUN Cont.

5. Twist EMERGENCY STOP button (G in Fig. 4.10) clockwise until it pops out - this resets the button and enables the power to control panel and motor.

6. Press the SPINDLE FORWARD button (A in Fig 4.10). Spindle should rotate clockwise (as viewed from top) and machine should run smoothly with little to no vibration or rubbing noises.

7. Press STOP button (F in Fig. 4.10) and wait for spindle to completely stop.

8. Press SPINDLE REVERSE button.(D in Fig. 4.10) Spindle should rotate counterclockwise (as viewed from top).

10. Press EMERGENCY STOP button (G in Fig. 4.10) and wait for spindle to completely stop.

11. Without resetting EMERGENCY STOP button, press SPINDLE FORWARD button. Machine should not start.

NOTE: If the machine does start (with EMERGENCY STOP button pushed in), immediately disconnect the power to machine as EMERGENCY STOP safety feature is not working correctly. This safety feature must work properly before proceeding with regular operations.
Refer to Troubleshooting on Page 28 for possible solution.

12. Twist EMERGENCY STOP button clockwise to reset it. (Fig. 4.11)

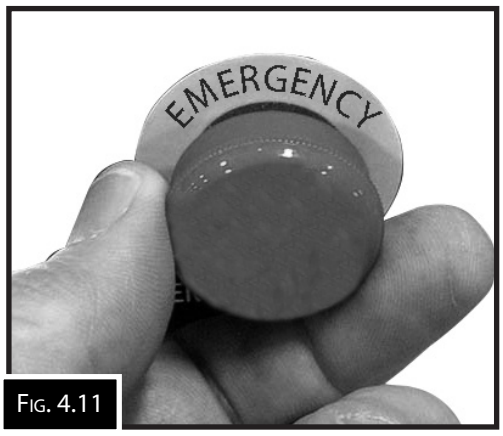


Fig. 4.11

13. Check that the light on the control panel is on, then open the Cutter Safety Guard (G in Fig.4.10) and with the guard open the light will go out. Close the guard and the light should come on.

NOTE: THE CUTTER SAFETY GUARD MUST BE CLOSED FOR THE SPINDLE MOTOR TO START.

Once everything is working as it should then the Test Run is complete and the machine can be used for normal operation.

5. OPERATION.

5.1 OPERATION OVERVIEW

The purpose of this overview is to provide the novice machine operator with a basic understanding of how the machine is used during operation, so the machine controls/components discussed later in this manual are easier to understand.
Due to the generic nature of this overview, it is not intended to be an instructional guide. To learn more about specific operations, read this entire manual and seek additional training from experienced machine operators, and do additional research outside of this manual by reading "how-to" books, trade magazines, or visiting websites.

When undergoing a typical operation, the operator needs to do the following:

1. Examines the workpiece to make sure it is suitable for the machining operation.

2. Check the machine to ensure that it is safe to use and put on protective clothing and safety equipment.

3. Place the workpiece on the table and securely clamp it to the table.

4. Select the correct cutting tool for the job and with the machine disconnected from power, install the cutting tool using the correct holder.

5. Raise the table so the cutting tool is just above the workpiece.

6. Select the correct spindle speed for the cutter and the workpiece.

7. Connect the machine to the power supply and turn it ON.

8. Uses the down feed, or table controls to perform the cutting operation.

9. Turn the machine OFF and wait for the spindle to completely stop before removing the workpiece, changing tooling, or changing spindle speeds.

5.2 HEADSTOCK MOVEMENT

The headstock is designed to move up and down along the Z axis and tilt 90 degrees side to side.

⚠ WARNING ***THE HEAD IS HEAVY AND WILL REQUIRE SUPPORT WHEN TILTING. ARRANGE FOR SOME HELP TO SUPPORT THE HEAD.***

To Raise or Lower the Headstock

1. DISCONNECT THE MACHINE FROM POWER!
2. Loosen both Z-axis lock nuts shown in Fig. 5.1

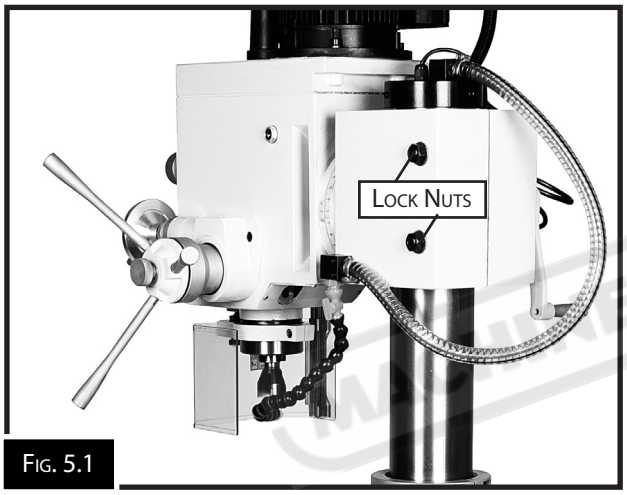


FIG. 5.1

3. Use Z-axis crank shown in Fig. 5.2 to adjust the headstock height.
4. Tighten Z-axis lock nuts to secure the head


FIG. 5.2

To Tilt The Headstock

1. DISCONNECT THE MACHINE FROM POWER!
2. Loosen the three locking hex nuts a 1/4 to 1/2 a turn. There is one on either side of the head (Fig. 5.3) and one under the bottom of the head (see Fig. 5.4).

NOTE: The 3 nuts must only be loosened a quarter to a half a turn maximum to avoid the head disengaging from the tilting mechanism and the head dropping under its own weight.

3. Using the scale shown as a guide, swivel the headstock and re-tighten the three hex nuts to secure it

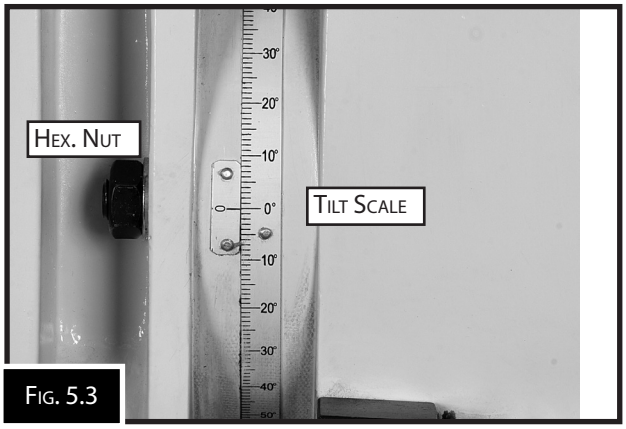


FIG. 5.3

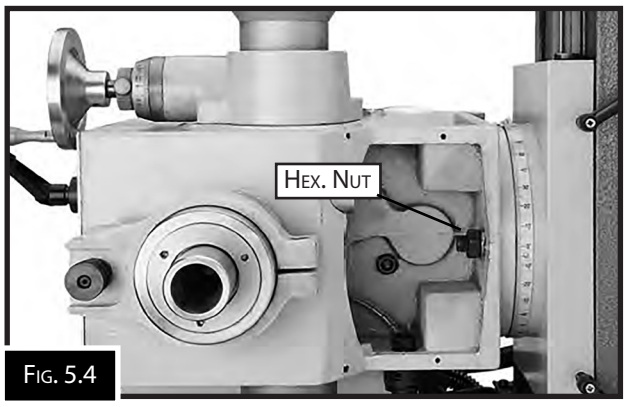


FIG. 5.4

5.3 SPINDLE MOVEMENT

The machine is fitted with two options for Spindle down-feed movement on this machine It is controlled by two mechanisms:

1) The coarse down-feed lever,
2) Fine down-feed hand-wheel

USING COARSE DOWN FEED

Coarse down-feed is typically used for drilling, because it allows you to quickly lower the spindle with varying speed/pressure, using the handles (B in Fig. 5.5). When the depth is reached and the handles released it retracts the spindle back to the top position.
To engage coarse down-feed, make sure the spindle is completely stopped, and loosen the down-feed selector knob (A in Fig. 5.5)

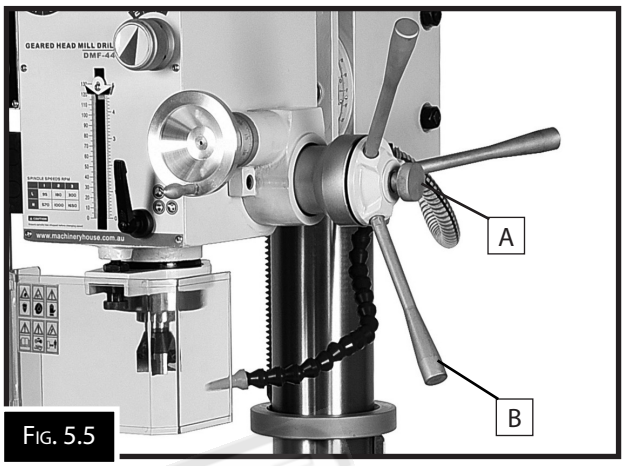


FIG. 5.5

USING FINE DOWN-FEED

Fine down-feed is typically used when precise, vertical positioning of an end-mill or cutter is used when milling a flat surface across the face of a workpiece. The fine down-feed hand-wheel (Fig. 5.6) is equipped with a graduated collar with 0.025mm increments. Each complete revolution of the hand-wheel equals 0.250mm. After each adjustment, the quill lock lever (Fig. 5.7) should be locked to ensure the spindle height cannot move until the entire milling operation is complete.
To engage fine down-feed, make sure the spindle is completely stopped, and tighten the down-feed selector. (A in Fig. 5.5) Rotate the fine down-feed hand-wheel to raise or lower the spindle. (Fig. 5.6)

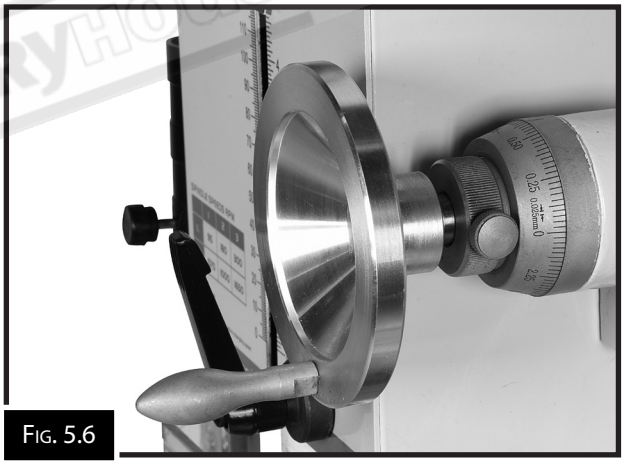


FIG. 5.6

NOTE: BEFORE MAKING HEIGHT ADJUSTMENTS MAKE SURE THAT THE CUTTER IS CLEAR OF THE WORKPIECE.

FIG. 5.7

5.4 SETTING UP FOR TAPPING

The Hafco Metalmaster DMF-44 is fitted with a Tapping mode. When selected the spindle turns clockwise until it comes up against a micro switch in the depth stop which will bring the spindle to a complete stop and then reverse the spindle. The feed of the tap is by hand using the course down feed with handles.

To Use The Tapping Mode:

1. DISCONNECT MACHINE FROM POWER!

2. Install the tap, into a tapping chuck and bring it down until it touches the top of the hole to be tapped. Select the maximum tapping depth on the depth gauge, (Fig. 5.8) making sure that the tap does not bottom out.

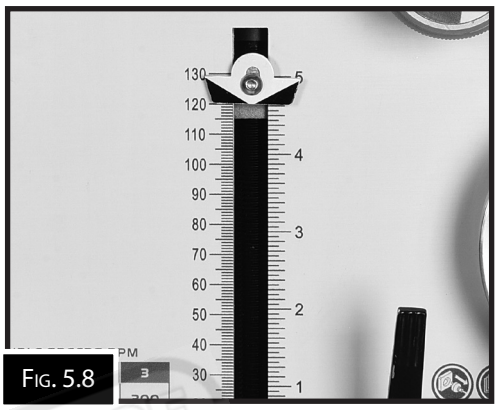


Fig. 5.8

3. Adjust the depth stop by turning the knurled knob (A in Fig. 5.9) accordingly.

4. Apply some tapping fluid to the contact point of the tap and to the workpiece.

5. Connect the machine to power.

6. Select the "tapping" mode with the drilling/tapping switch on the control panel (Fig. 5.10)

Fig. 5.9

7. Select the appropriate spindle speed. Speeds vary according to the type of material of the work piece, the tap, and the procedure. There are several on-line resources to choose from for calculating the spindle speed.

8. Using the course feed handles, slowly lower the tap into the drilled hole, applying enough pressure for the tap to start cutting.

NOTE: A tapping chuck is required to use the tapping function (Order Code T004B)

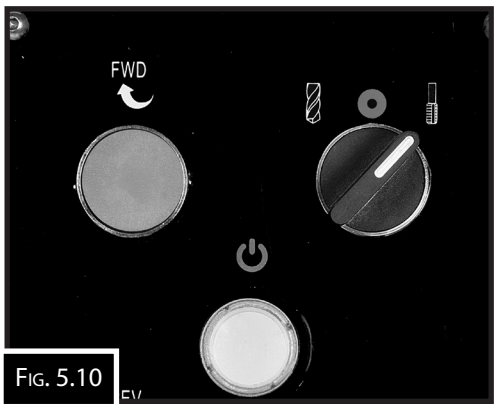


Fig. 5.10

5.5 TABLE MOVEMENT

The table has travel in three directions called "X" , "Y" and "Z" axis (Fig. 5.11)

X Axis is the Longitudinal Travel
Y Axis is the Cross Travel
Z Axis is the Vertical Travel

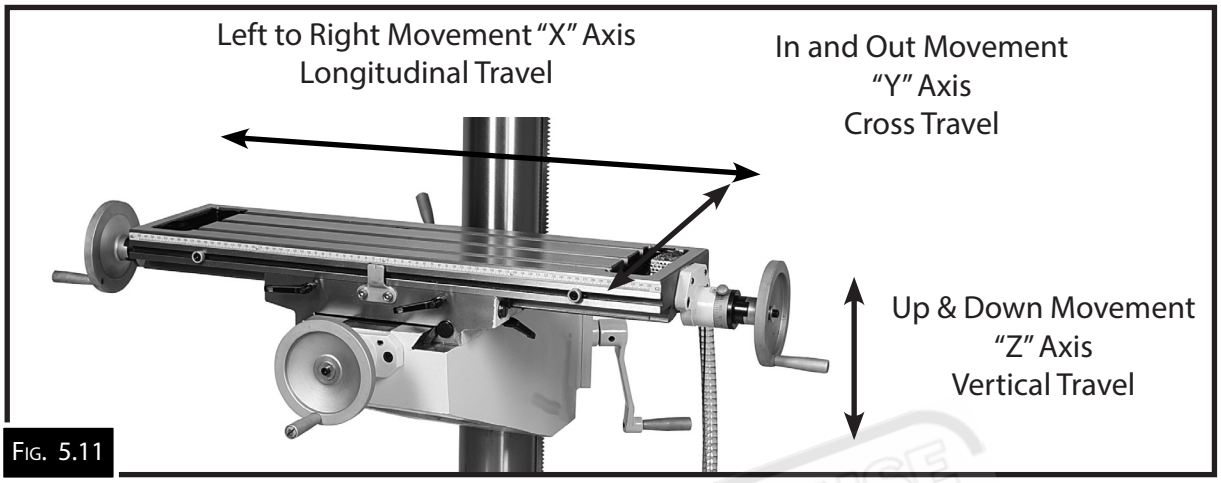


FIG. 5.11

GRADUATION DIALS

The hand-wheels have graduated dials on the "X" and "Y" axis, that are used to determine table movement in 0.05mm increments, with one full revolution equaling 0.30mm
A thumb screw is provides so the graduated dial can be adjusted to a relative starting point. (Fig. 5.12 & Fig. 5.13)

FIG. 5.12

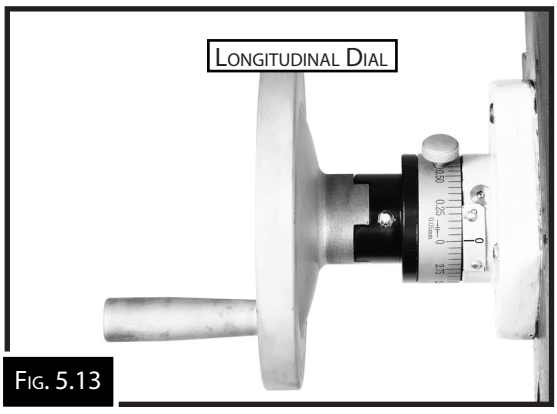


FIG. 5.13

Before moving the table make sure that the table lock for that movement has been unlocked. Always lock the table if not using the movement in that direction. (Fig. 5.14)

NOTE: WHEN TIGHTENED, TABLE LOCKS PROVIDE TABLE RIGIDITY IN THAT PATH OF TABLE TRAVEL FOR INCREASED PRECISION.

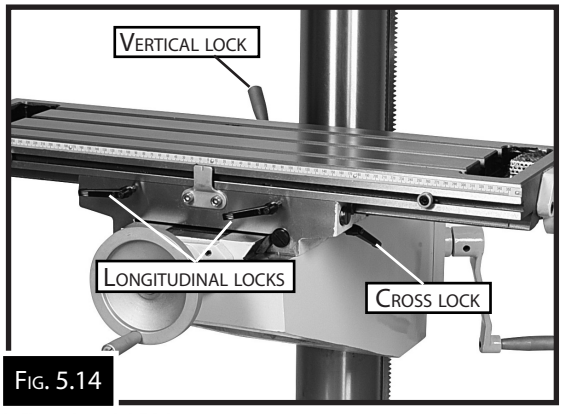


FIG. 5.14

5.6 INSTALLING & REMOVING THE TOOLING

The machine is fitted with a 3MT spindle to hold the tooling. While the taper will hold drills where pressure is applied to the end of the drill, with milling cutters pressure is applied to the side of the cutter , therefore the cutter arbor needs to be held also with a draw-bar.

To install the tooling:

1. DISCONNECT THE MACHINE FROM POWER!
2. Remove the draw-bar cap, so the draw-bar is exposed. (Fig. 5.15)
3. Clean the mating surfaces then insert the tooling in the spindle with force so that the taper holds the arbor..
4. Working from the top, thread the draw-bar by hand into the tooling until it is snug, then use a spanner to tighten it.
5. Replace the draw-bar cap


Fig. 5.15

NOTE: Height of draw-bar inside spindle can be changed by rotating adjustment nut. Do not over-tighten the draw-bar. Over-tightening makes the tool removal difficult and may cause damage to the arbor and threads.

To remove the tooling:

1. DISCONNECT THE MACHINE FROM POWER!
2. Remove the draw-bar cap.
3. Un-thread the draw-bar from tooling one full rotation.

NOTE: DO NOT FULLY UN-THREAD THE TOOLING FROM THE DRAW-BAR, OR THE DRAW-BAR AND TOOL THREADS COULD BE DAMAGED IN THE NEXT STEP.

4. Tap the top of draw-bar with a soft face hammer to unseat the taper.
5. Hold onto the tooling with one hand and fully un-thread the draw-bar.


Fig. 5.16

5.7 CHANGING THE SPEEDS

Selecting the correct spindle speed is important for safe and satisfactory results, as well as maximizing tool life.
To set the spindle speed for your operation, you will need to:

1. Determine the best spindle speed for the cutting task,
2. Configure the spindle speed levers to produce the required spindle speed.

Determining Spindle Speed

Many variables affect the optimum spindle speed to use for any given operation, but the two most important are the recommended cutting speed for the workpiece material and the diameter of the cutting tool, as noted in the formula. (Fig. 5.17)

Cutting speed, typically is defined in meters per minute (M/Min), is the speed at which the edge of a cutting tool moves across the material surface.
A recommended cutting speed is an ideal speed for cutting a type of material in order to produce the desired finish and optimize tool life.

$$(RPM) = \frac{\text{Cutting Speed m/min} \times 1000}{\text{Cutter Diameter} \times 3.14}$$

Fig. 5.17

Books such as Fitting and Machinery Technical Manual (L341) or Machine Shop Practice, and some Internet sites, provide excellent recommendations for which cutting speeds to use when calculating the spindle speed. These sources also provide a wealth of additional information about the variables that affect cutting speed and they are a good educational resource.
Also, there are a large number of easy-to-use spindle speed calculators that can be found on the Internet. These sources will help you take into account the applicable variables in order to determine the best spindle speed for the operation.

SETTING THE SPINDLE SPEED

Use the chart below or the one on the headstock when setting the spindle speed. The spindle must be stopped before the change gears can be moved. With the spindle completely stopped, position the high/low range and spindle speed levers according to the chart. (Fig. 5.18)

	1	2	3
L	95	180	300
H	570	1000	1650

Fig. 5.18

6. MAINTENANCE

6.1 LUBRICATION:

All ball bearings in your mill/drill are sealed for life, requiring no lubrication.
Points requiring lubrication are:

1. Internal spline drive assembly. Keep this area well lubricated with a good grade grease, insert grease in the hole at the top of spindle pulley spline driver, lube **TWICE YEARLY**.

2. A light film of oil applied to the quill, table and column will reduce wear, prevent rust, and assure ease of operation. **EVERY 30 DAYS.** Fluid Film (O040 or O043)

3. Quill return spring should receive oil (SAE 20) **ONCE YEARLY**. Remove cover plate and apply oil with oil can or small brush.

4. IMPORTANT: The gear box should be filled with oil such as SAE 68 to the level in the sight glass. **CHANGE OIL EVERY 12 MONTHS.**

5. Apply oil to quill pinion **EVERY 90 DAYS.**

NOTE: Use extreme care when performing these operations and keep hands clear of pinch points. Do not apply with motor running.

6.2 CHANGING THE GEAR BOX OIL

The headstock oil should be changed every 12 months.

To Change The Oil.

1. Run the spindle for 5 or 10 minutes at 570rpm to warm the oil

2. DISCONNECT THE MACHINE FROM THE POWER

3. Open the drain plug to allow the oil to drain from the opening completely. (Fig. 6.1)

4. Replace the oil drain plug and remove the oil filler plug, and fill the gearbox with oil until the oil level reaches the middle of the oil fluid lever indicator. (Fig. 6.2)

5. Then replace the oil filler plug.

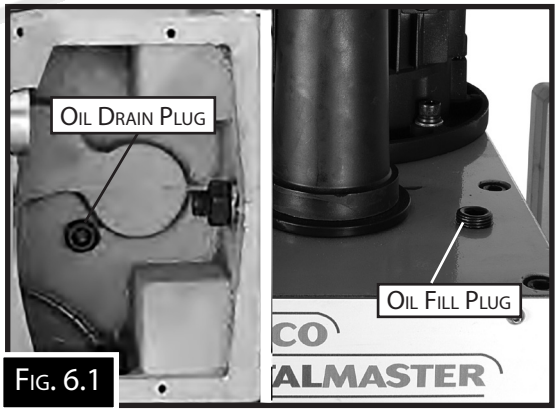


Fig. 6.1

Fig. 6.2

6.3 GIB ADJUSTMENT

Gibs are tapered lengths of metal that are sandwiched between two moving surfaces. Gibs the gap between these surfaces and how they slide past one another. Correctly adjusting the gibs is critical to producing good milling results.
Tight gibs make the table movement more accurate but stiff. Loose gibs make moving the table sloppy but easier to do. The goal of gib adjustment is to remove unnecessary sloppiness without causing the ways to bind.
Gibs are adjusted with a screw on each end of the gib, that move the tapered gib back-and-forth to increase or decrease the friction pressure between the sliding surfaces. The process of properly adjusting the gibs requires trial-and-error and patience.
Refer to Fig. 6.3-6.4 to identify the locations of the table and saddle, and one of the two adjustment screws for each.

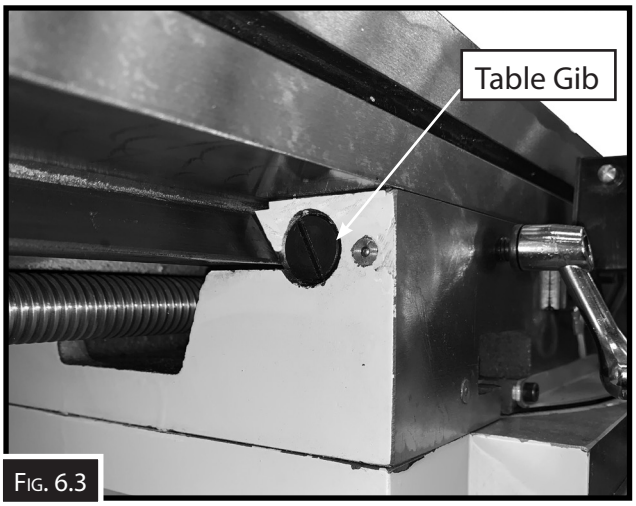


FIG. 6.3

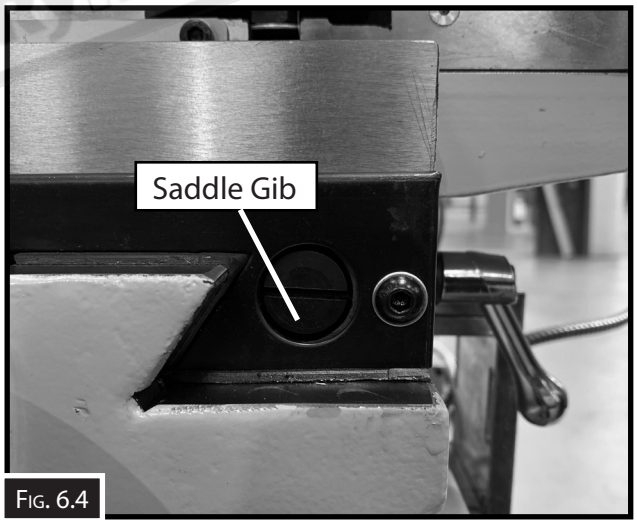


FIG. 6.4

NOTE: It will be necessary to remove small parts, such as way wipers and covers, to access the gib adjustment screws.

The following is the method used to adjust the gibs.

1. DISCONNECT THE MACHINE FROM POWER!

2. Make sure all table locks are loose.

3. Loosen one gib adjustment screw, then tighten the other the same amount to move the gib.

4. Use the handles to move the table until you feel a slight drag in the path of the movement. Repeat Steps 3–4 as necessary.

6.4 TROUBLESHOOTING

Symptom	Possible Cause	Possible Solution
Machine will not start	1. Power not connected to the machine 2. Emergency Stop Button not reset 3. Cutter safety guard not closed	1. Check that power is connected to the machine 2. Reset emergency stop button 3. Close the cutter safety guard.
Tool loose in spindle.	1. Tool is not fully drawn up into spindle taper. 2. Debris on tool or in spindle taper 3. Taking too big of a cut	1. Tighten drawbar. 2. Clean tool and spindle taper. 3. Lessen depth of cut and allow chips to clear.
Breaking tools or cutters.	1. Spindle speed/feed rate is too fast. 2. Cutting tool is too small. 3. Cutting tool getting too hot. 4. Taking too big of a cut. 5. Spindle extended too far down	1. Set spindle speed correctly or use slower feed rate 2. Use larger cutting tool and slower feed rate. 3. Use coolant or oil for appropriate application. 4. Lessen depth of cut and allow chips to clear. 5. Fully retract spindle and raise table. This increases rigidity.
Workpiece or tool vibrates or chatters during operation.	1. Table locks not tight. 2. Workpiece not secure. 3. Spindle speed/feed rate is too fast. 4. Spindle extended too far down . 5. Quill lock lever not tight. 6. Gibs too loose in table.	1. Tighten table locks. 2. Properly clamp workpiece on table or in vise. 3. Set spindle speed correctly or use slower feed rate (Page 25). 4. Fully retract spindle and raise table This increases rigidity. 5. Tighten quill lock lever. 6. Tighten gibs.
Table is hard to move.	1. Table locks are tightened down. 2. Chips have loaded up on ways. 3. Ways are dry and need lubrication. 4. Table limit stops are interfering. 5. Gibs are too tight.	1. Fully release table locks . 2. Frequently clean away chips or debris. 3. Lubricate ways. 4. Make sure that table limit stops are not in the way 5. Adjust gibs .
Headstock is hard to raise.	1. Headstock lock(s) or gib is at fault. 2. Headstock leadscrew is binding. 3. Gib is too tight.	1. Loosen/replace lock lever and adjust gib 2. Clean and relubricate headstock leadscrew and gears. 3. Adjust gib.
Bad surface finish	1. Spindle speed/feed rate is too fast. 2. Dull or incorrect cutting tool. 3. Wrong rotation of cutting tool 4. Workpiece not secure. 5. Spindle extended too far down	1. Set spindle speed correctly or use slower feed rate (Page 25). 2. Sharpen cutting tool or select one that better suits the operation. 3. Check for proper cutting tool rotation. 4. Properly clamp workpiece on table or in vise. 5. Fully retract spindle and raise table. This increases rigidity.
Cutting results not square.	1. Table and spindle are not at 90° 2. Table travel is inconsistent	1. Square the spindle to the table using an engineers square and adjusting the head rotation 2. Adjust gibs .
Spindle overheats	1. Poor spindle bearing lubrication. 2. Spindle bearings too tight. 3. Mill operated at high speeds for extended period.	1. Replace spindle bearings. 2. Properly adjust spindle bearing preload. 3. Allow mill to cool.
Noisy Operation	1. Faulty Motot 2. Faulty Bearings	1. Replace or repair motor 2. Replace bearings.

SPARE PARTS SECTION

PEDESTAL MILL DRILL

Model. DMF-44

Order Code D185

Edition No	*: DMF-44-1*
Date of Issue	*: 07/2020*

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 any time without notification.

HOW TO ORDER SPARE PARTS

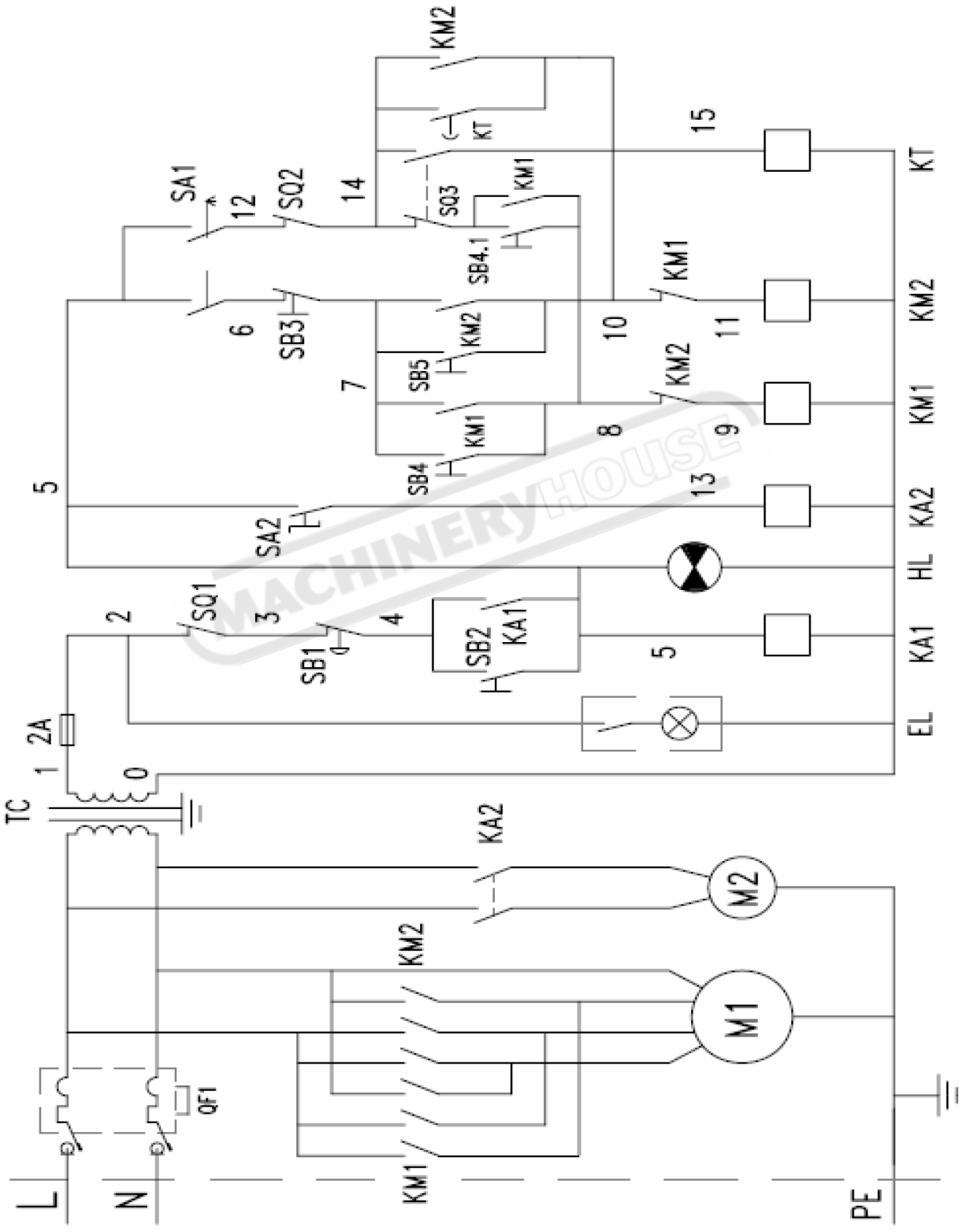
1. Have your machines **model number, serial number & date of manufacture** on hand, these can be found on the specification plate mounted on the machine
2. A scanned copy of your parts list/diagram with required spare part/s identified.

NOTE: SOME PARTS MAY ONLY BE AVAILABLE AS AN ASSEMBLY

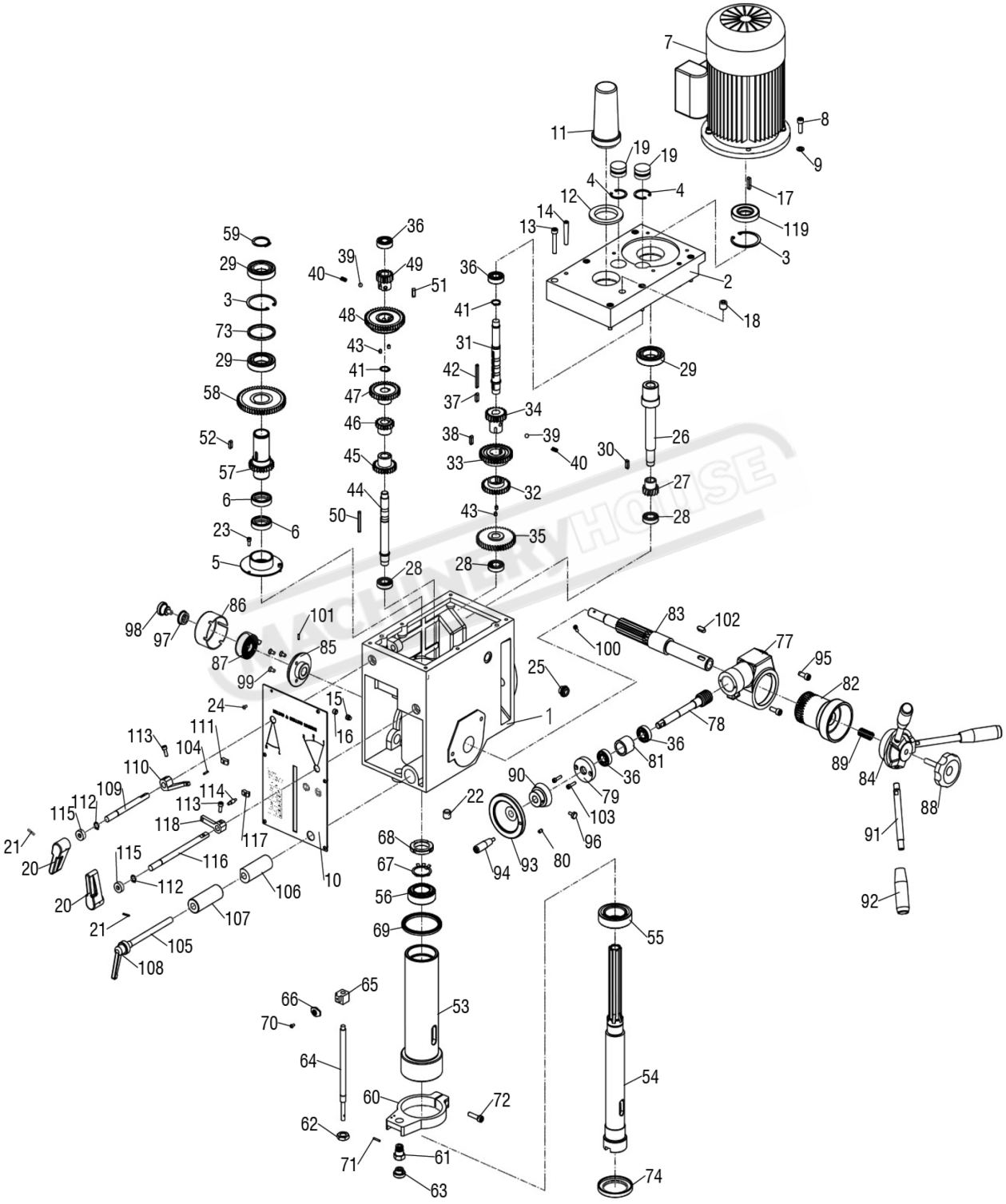
3. Go to www.machineryhouse.com.au/contactus and fill out the inquiry form attaching a copy of scanned parts list.

CONTENTS

240V WIRING DIAGRAM



DMF-44 HEAD SPARE PARTS DIAGRAM



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

DMF-44 HEAD SPARE PARTS LIST

ITEM		DESCRIPTION	QTY.	ITEM		DESCRIPTION	QTY.
1	20010B	HEAD BODY	1	37	6X14	KEY	1
2	20011B	HEAD BODY COVER	1	38	6X28	KEY	1
3	Ø 62	INT RETAINING RING	2	39	Ø 8	BALL	2
4	Ø 35	INT RETAINING RING	2	40		SPRING	2
5	20018B	AIRTIGHT BASE	1	41	Ø18	EXT RETAINING RING	2
6	45X35X10	AIRTIGHT RING	2	42	5X50	KEY	1
7	1.5KW	MOTOR	1	43	M6X12	SCREW	4
8	M8X25	SCREW	1	44	20107B	III SHAFT	1
9	M8	WASHER	1	45	20109-B	GEAR Z25	1
10	20201	PLATE	1	46	20110-2-B	GEAR Z18	1
11	20304-1B	ARBOR BOLT COVER	1	47	20112-B	GEAR Z32	1
12	20304-2B	ARBOR BOLT COVER BASE	1	48	20113-B	GEAR Z43	1
13	M8X45	SCREW	6	49	20115-B	GEAR Z16	1
14	8H40	PIN	2	50	5X50	KEY	1
15	M10X10	SCREW	1	51	6X18	KEY	1
16	M10X8	SCREW	1	52	6X18	KEY	1
17	6X28	KEY	1	53	20019	SPINDLE SLEEVE	1
18	ZG3/8"	BOLT	1	54	20104B	SPINDLE	1
19	20020B	CAP	2	55	30207 /P5	BEARING	1
20	20307B	SPEED LEVER	2	56	30206 /P5	BEARING	1
21	3X18	PIN	2	57	20114-B	SPLINED SLEEVE Z25	1
22	ZG3/8"	OIL PLUG	1	58	20116-B	GEAR Z53	1
23	M5X10	SCREW	3	59	Ø35	EXT RETAINING RING	1
24	M4X8	SCREW	6	60	20012	FEED BASE	1
25	M18X1.5	OIL POINTER	1	61	20128	SUPPORT BASE	1
26	20105B I	SHAFT	1	62	20129	NUT	1
27	20105-1-B	GEAR Z14	1	63	20130	KNOB	1
28	6003 / P5	BEARING	3	64	20131	GRADUATED ROD	1
29	6007 / P5	BEARING	3	65	20021	FIXED BOLT	1
30	5X25	KEY	1	66	20132	SCALE BOARD	1
31	20106B II	SHAFT	1	67	Ø30	LOCK WASHER	1
32	20108-B	GEAR Z29	1	68	M30X1.5	LOCK NUT	1
33	20110-1-B	GEAR Z35	1	69	20308	RUBBER WASHER	1
34	20111-B	GEAR Z21	1	70	M4X8	SCREW	1
35	20106-1-B	GEAR Z41	1	71	3X18	SPLIT PIN	1
36	6202 / P5	BEARING	4	72	M8X30	BOLT	1

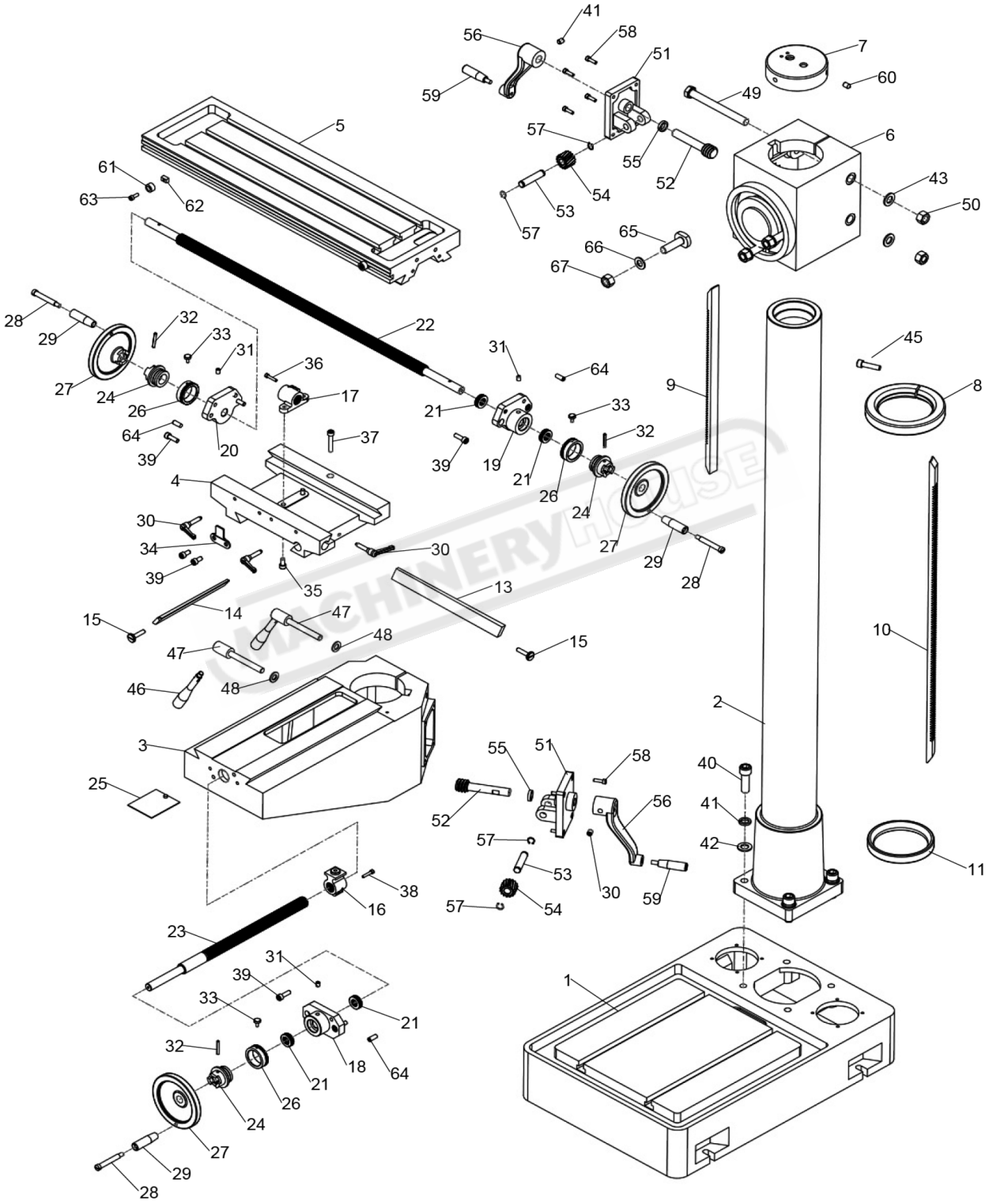
NOTE: SOME INDIVIDUAL PARTS MAY ONLY BE AVAILABLE AS AN ASSEMBLY

DMF-44 HEAD SPARE PARTS LIST

ITEM		DESCRIPTION	QTY.	ITEM		DESCRIPTION	QTY.
73	20024B	SEPARATING RING	1	108		ADJUST HANDLE	1
74	20133B	BEARING COVER	1	109	20125B	LEVER SHAFT	1
75	M5X6	SCREW (R8)	1	110	20022-1B	LEVER	1
76	M5X4	PIN (R8)	1	111	20204-2B	LEVER BRACKET	1
77	20015	WORM WHEEL BOX	1	112	12	EXT RETAINING RING	2
78	20119	WORM SHAFT	1	113	M6X16	SCREW	2
79	20302	WORM COVER	1	114	20204-3B	LEVER ROD	1
80	M6X12	SCREW	1	115	12X22X8	OIL SEAL	2
81	20120	SEPARATING RING	1	116	20126B	LONG LEVER SHAFT	1
82	20016	WORM WHEEL	1	117	20204-1B	LEVER BRACKET	1
83	20117	PINION SHAFT	1	118	20022-2B	LEVER	1
84	20013	HANDLE BODY	1	119	35X62X10	OIL SEAL	1
85	20118	SPRING BASE	1				
86	20123	SPRING CAP	1				
87	20122	SPRING PLATE	1				
88	20303	BIG RIPPLE HANDLE	1				
89		COMPRESSION SPRING	1				
90	20017	GRADUATED PLATE	1				
91	20121B	HANDLE ROD	1				
92	20301B	HANDLE BALL	1				
93	20306B	HANDLE WHEEL	1				
94	20305-B	HANDLE ROD	1				
95	M8X25	SCREW	2				
96	10107	SCREW	1				
97	203063	WASHER	1				
98	203066	SCREW	1				
99	M6X12	SCREW	3				
100	M5X12	SCREW	1				
101	3X12	PIN	2				
102	8X20	KEY	1				
103	M5X20	SCREW	2				
104	3X15	PIN	1				
105	20124B	FIXED BOLT	1				
106	20203B	FIXED TIGHT BLOCK	1				
107	20202B	FIXED TIGHT BLOCK	1				

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

DMF-44 TABLE & COLUMN SPARE PARTS DIAGRAM



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

DMF-44 TABLE & COLUMN SPARE PARTS LIST

ITEM		DESCRIPTION	QTY.	ITEM		DESCRIPTION	QTY.
1	10002/40H	BASE	1	45		SCREW M10 X 40	1
2	10001/40H	COLUMN	1	46	10023/40H	HANDLE	2
3	10003/40H	LIFTING TABLE	1	47	10022/40H	ADJUST BOLT	2
4	10005/40H	SLIP SADDLE	1	48		WASHER 12	2
5	10004/40H	WORK TABLE	1	49		BOLT M16 X 190	2
6	10016/40H	ELEVATING BODY	1	50		NUT M16	2
7	10014/40	COLUMN LID	1	51	10017/40	BRACKET	2
8	10012/40H	LOCKED GUIDE RING	1	52	10112/40	WORM SHAFT	2
9	10014/40H	UP RACK	1	53	10113/40	SMALL SHAFT	2
10	10015/40H	LOW RACK	1	54		HELICAL GEAR	2
11	02-04/ZX30	GUIDE RING	1	55	10201/40	WASHER	2
12				56	10018/40	ROCK HANDLE	2
13	10006/40H	GIB STRIP	1	57		RETAINING RING	4
14	10007/40H	GIB STRIP	1	58		SCREW M6 X 25	8
15	10106/40	ADJUST SCREW	2	59		TURN HANDLE	2
16	10203/40	GUIDE SCREW NUT	1	60		SCREW M8X 12	3
17	10202/40	GUIDE SCREW	1	61	10109/40	FIXED BLOCK SUPPORT	2
18	10021/40	GUIDE SCREW SUPPORT	1	62		NUT M6	2
19	10020/40	RIGHT SUPPORT	1	63		SCREW M6 X 16	2
20	10019/40	LEFT SUPPORT	1	64		PIN 8 X 25	6
21		BEARING 51103	4	65		T BOLT M14X55	3
22	10008/40H	TABLE SCREW	1	66		WASHER M14	3
23	10009/40H	BASE SCREW	1	67		NUT M14	3
24	10102/40H	DIAL CLUTCH	2				
25	10110/40	WAY COVER	1				
26	10111/40	GUADUATION PLATE	3				
27	10301/40	HANDWHEEL	3				
28	20305-2B/40	SCREW	3				
29	20305-1B-40	TURN HANDLE	3				
30		ADJUST HANDLE	3				
31		OIL CUP8	3				
32		PIN 5X35	3				
33	10107/40	SCREW	3				
34	10105/40	FIXED BLOCK	1				
35		SCREW M8 X 16	2				
36		SCREW M5 X 25	1				
37		SCREW M8 X 45	1				
38		SCREW M5 X 25	1				
39		SCREW M8 X 20	8				
40		BOLT M14 X 60	4				
41		LOCK WASHER 14	4				
42		FLAT WASHER 14	6				
43		FLAT WASHER 16	2				

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

⚠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

Milling Machine Safety Instructions

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

1. **Maintenance.** Make sure the mill 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. **Mill Condition.** Mill must be maintained for a proper working condition. Never operate a mill that has damaged or worn parts. Scheduled routine maintenance should performed on a scheduled basis.

3. **Leaving a Mill Unattended.** Always turn the mill off and make sure all moving parts have come to a complete stop before leaving the mill. Do not leave mill 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 mill spindle or moving parts.

5. **Chuck key safety.** Always remove your chuck key, draw bar wrench, 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. **Tooling selection & holding.** Always use the correct cutting tool for the job you are milling. Make sure it is sharp and held firmly in place.

8. **Cutting Tool inspection.** Inspect Drill and end mills 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.

9. **Reversing the spindle.** Make sure the spindle has come to a complete stop before changing the direction of the spindle. Do not slow or stop the spindle by using you hand.

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

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

12. **Clearing chips.** Always use a brush to clear chips. Never clear chips when the mill is running.

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

14. **Clean work area.** Keep the area around the mill clean from oil, tools and chips.

15. **Tilting head.** Use an assistant to help support the head correctly. Make sure bolts that secure the head for tilting are not loosened to much as head can slip and cause serious injury. Please refer to Mill head Tilting Instructions for correct procedure.

16. **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

Milling 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 workpiece on mill table.
B	CRUSHING	HIGH	Mill head tilting adjustment - please refer to mill head tilting instruction sheet for correct procedure. Incorrect adjustment may result in the head becoming detatched and a crushing hazard
C	CUTTING, STABBING, PUNCTURING	MEDIUM	Isolate power to machine prior to any checks or maintenance being carried out. Do not adjust or clean machine until the machine has fully stopped.
D	SHEARING	MEDIUM	Make sure all guards are secured shut when machine is on. Isolate power to machine prior to any checks or maintenance.
F	STRIKING	MEDIUM	Ensure tooling is secure in chuck. Wear safety glasses. Stand clear of moving parts on machine. Remove all loose objects around moving parts. Ensure correct spindle direction when milling.
H	ELECTRICAL	MEDIUM	All electrical enclosures should only be opened with a tool that is not to be kept with the machine. 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			

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

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