

INSTRUCTION MANUAL

M-25 Chisel Morticer (240V) 160mm timber width capacity



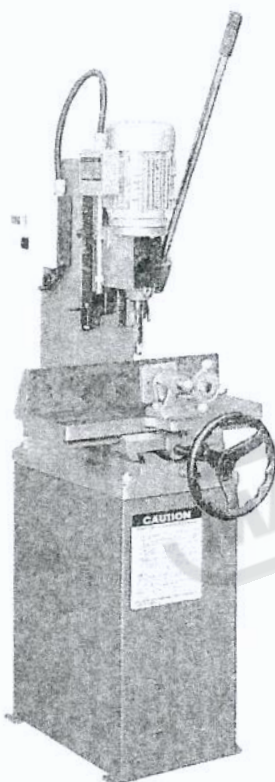
W345

W345 M-25 28/02/05

How to get the best and the safest from **Your** **CHISEL MORTICER**

OPERATOR'S MANUAL

Before operating the unit, please read this manual thoroughly, and retain it for future reference.



OWNER'S RECORD

The model and serial numbers are located at the front of your morticer.

Record the serial numbers in the space provided below. Refer to these numbers whenever you call upon your dealer regarding this product.

Model No. _____

Serial No. _____

Date Of Purchase _____

TABLE OF CONTENTS

Specification	1
Important Safety Instructions	2 ~ 3
Unpacking And Cleanup	3
Installation Requirements	3
Grounding Instructions	4
Electrical Controls / Overload Protection	5
How To Change The Voltage	5
Wiring Diagram	5
Adjustment Of Your Chisel Morticer	5 ~ 7
Fitting And Changing Of Hollow Square	
Chisel And Bit	7
Operating Instructions	7
Correct Use Of Hollow Square Chisels And Bits ..	8
Lubrication Guide Of Your Chisel Morticer	9
Parts Illustration	10
Replacement Parts List	11
Trouble Shooting	12

Help Us Help You ...

Read this book carefully.

It is intended to help you operate and maintain your new Chisel Morticer properly.

Do not operate the Morticer until you have read this manual and understood its operation thoroughly!

Does not accept liability connected with the use of this Morticer. It is imperative that operators understand normal safety procedures regarding this Morticer.

Think about it!

- * Keep hands away from the Hollow Square Chisel and Bit, Chuck Guard must be over the Drill Chuck.

If you received a damaged Morticer, immediately contact the dealer that sold you the Morticer.

Keep it handy for answers to your questions.

Save time and money. Before you request service, check the Problem Solver on page 10. It lists causes of minor operating problems that you can correct yourself.

SPECIFICATION

Max. Chisel Size Softwood	1 in (25mm)
Hardwood	3/4 in (19mm)
Timber Capacity	10 x 7 in (225 x 180mm)
Stroke Of Chisel Head	5 in (125mm)
Motor T.E.F.V	1 HP (0.75 KW)
Table Movement Longitudinal	16 in (400mm)
Lateral	3-1/2 in (90mm)
Weight	352 lbs. (160kgs)

IMPORTANT SAFETY INSTRUCTIONS

Read all instructions before using this machine.

Safety Rules for all Tools

1. **KEEP GUARDS IN PLACE** and in working order.
2. **REMOVE ADJUSTING KEYS AND WRENCHES.** Form habit of checking to see that keys and adjusting wrenches are removed from tool before turning it on.
3. **KEEP WORK AREA CLEAN.** Cluttered areas and benches invite accidents.
4. **DON'T USE IN DANGEROUS ENVIRONMENT.** Don't use power tools in damp or wet locations, or expose them to rain. Keep work area well lighted.
5. **KEEP CHILDREN AWAY.** All visitors should be kept safe distance from work area.
6. **MAKE WORKSHOP KID PROOF** with padlocks, master switches, or by removing starter keys.
7. **DON'T FORCE TOOL.** It will do the job better and safer at the rate for which it was designed.
8. **USE RIGHT TOOL.** Don't force tool or attachment to do a job for which it was not designed.
9. **WEAR PROPER APPAREL.** Wear no loose clothing, gloves, neckties, rings, bracelets, or other jewelry which may get caught in moving parts. Nonslip footwear is recommended. Wear protective hair covering to contain long hair.

Exception: The reference to gloves may be omitted from the instructions for a grinder.
10. **ALWAYS USE SAFETY GLASSES.** Also use face or dust mask if cutting operation is dusty. Everyday eyeglasses only have impact resistant lenses, they are NOT safety glasses.
11. **SECURE WORK.** Use clamps or a vise to hold work when practical. It's safer than using your hand and it frees both hands to operate tool.
12. **DON'T OVERREACH.** Keep proper footing and balance at all times.
13. **MAINTAIN TOOLS WITH CARE.** Keep tools sharp and clean for best and safest performance. Follow instructions for lubricating and changing accessories.
14. **DISCONNECT TOOLS** before servicing; when changing accessories, such as blades, bits, cutters, and the like.
15. **REDUCE THE RISK OF UNINTENTIONAL STARTING.** Make sure switch is in off position before plugging in.
16. **USE RECOMMENDED ACCESSORIES.** Consult the owner's manual for recommended accessories. The use of improper accessories may cause risk of injury to persons.
17. **NEVER STAND ON TOOL.** Serious injury could occur if the tool is tipped or if the cutting tool is unintentionally contacted.
18. **CHECK DAMAGED PARTS.** Before further use of the tool, a guard or other part that is damaged should be carefully checked to determine that it will operate properly and perform its intended function — check for alignment of moving parts, binding of moving parts, breakage of parts, mounting, and any other conditions that may affect its operation. A guard or other part that is damaged should be properly repaired or replaced.
19. **DIRECTION OF FEED.** Feed work into a blade or cutter against the direction of rotation of the blade or cutter only.
20. **NEVER LEAVE TOOL RUNNING UNATTENDED. TURN POWER OFF.** Don't leave tool until it comes to a complete stop.

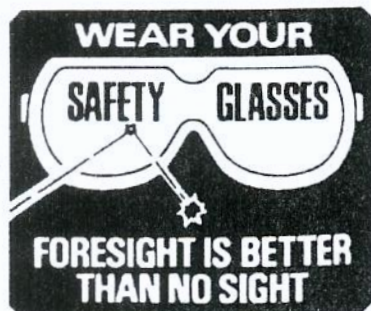
IMPORTANT SAFETY INSTRUCTIONS

Read all instructions before using this machine.

Additional Safety Rules For The Chisel Morticer

- * Do not operate the Morticer until you have read this manual and understand its operation thoroughly!
- * Make sure wiring codes and recommended electrical instructions are followed and machine is properly grounded.
- * Check that switch is in OFF position before plugging in power cord.
- * Keep hands away from the hollow square chisel and bit, guard must be over drill chuck.
- * Always disconnect the power source before making any adjustments.
- * Be sure rotation of bit is correct before operating.
- * Remember, this machine was made to mortice or drill.
- * If you are not thoroughly familiar with operation of this Chisel Morticer, get advice from supervisor or other qualified person.
- * Always wear eye protection or face shield.
- * Keep guards and covers in place.
- * Always use the clamp to clamp the the workpiece. DO NOT use hands to support.
- * Remove chuck key. When a chuck key is used, remove it immediately after locking or unlocking a tool in the chuck. If it is not removed, starting the spindle can cause it to be thrown off the chuck and could result in serious injury.
- * Keep hands away from the spindle when the machine is under power. Never clear chips when the spindle is under power and never use the hands to clear chips; use a brush or chip rake.

SAVE THESE INSTRUCTIONS



UNPACKING AND CLEANUP

To ensure maximum performance from your Chisel Morticer, clean it properly; and install it accurately before use.

As soon as you receive the Chisel Morticer, we recommend you follow these procedures:

1. Inspect packing crate for damage in transit. Record damage, and report it immediately to shipper.
2. Open crate and check that machine arrived in good condition. If not, let your industrial distributor know immediately.
3. Before lifting machine, remove all foot bolts locking it to its shipping base.
4. Transport machine to location with a hand truck or dolly.
5. Clean off anti-rust protection by using a suitable solvent.
6. Do not use solvents on plastic parts and electric cord; solvents dissolve or damage plastic and electric cord.

INSTALLATION REQUIREMENTS

Levelling

For best cutting performance, locate Chisel Morticer on solid, level foundation.

With machine in position, test table surface lengthwise and crosswise with machinist level.

Place metal shims under low corners. Check that all four corners are supported, then tighten leg screws, retest level of table surface in both directions; and adjust if necessary.

Grounding Instructions

1. All grounded, cord-connected tools:

In the event of a malfunction or breakdown, grounding provides a path of least resistance for electric current to reduce the risk of electric shock. This tool is equipped with an electric cord having an equipment-grounding conductor and a grounding plug. The plug must be plugged into a matching outlet that is properly installed and grounded in accordance with all local codes and ordinances.

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

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

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

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

Repair or replace damage or worn cord immediately.

2. Grounded, cord-connected tools intended for use on a supply circuit having a nominal rating less than 150 volts:

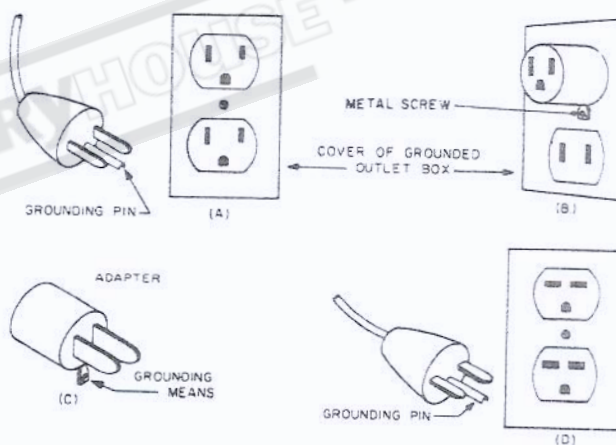
This tool is intended for use on a circuit that has an outlet that looks like the one illustrated in Sketch A in Figure 1. The tool has a grounding plug that looks like the plug illustrated in Sketch A in Figure 1. A temporary adapter, which looks like the adapter illustrated in Sketches B and C, may be used to connect this plug to a 2-pole receptacle as shown in Sketch B if a properly grounded outlet is not available. The temporary adapter should be used only until a properly grounded outlet can be installed by a qualified

electrician. The green-colored rigid ear, lug, and the like, extending from the adapter must be connected to a permanent ground such as a properly grounded outlet box.

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

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

FIGURE 1
GROUNDING METHODS



4. Permanently connected tools:

This tool should be connected to a grounded metal permanent wiring system; or to a system having an equipment-grounding conductor.

For All Double-insulated Tools

1. When servicing use only identical replacement parts.

Electrical controls/Overload Protection

DO NOT OVERLOAD. This Chisel Morticer is equipped with a magnetic control system. The magnetic switch is fitted with a thermal overload cut-out, and if the motor is overloaded will automatically switch itself off. If this occurs, check the rotating parts are running freely, and lubricate if required. If all is free then it may be necessary to reduce drilling pressure slightly, i.e. operate at a slower rate of feed.

How To Change The Voltage.

(only the machine is equipped with a double voltages of motor)

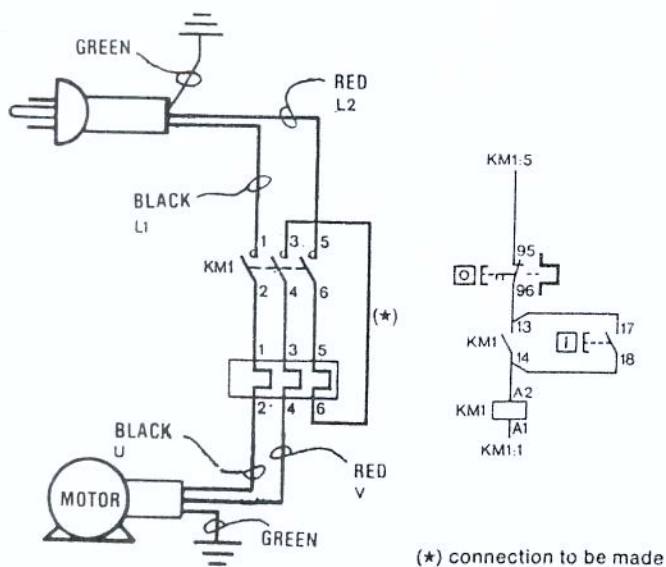
When changing voltage from low volt to high volt or from high volt to low volt you must:

1. Change wiring at motor junction box to appropriate voltage using the diagram located on the inside of junction box cover.
2. Replace thermal overload to appropriate range of amperage.

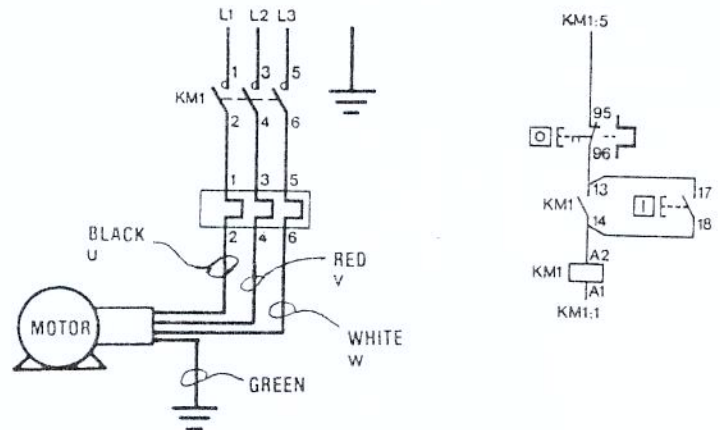
Do Not Plug machine in wrong voltage, this will damage the motor and electrical controls and void the Warranty.

WIRING DIAGRAM

Single Phase



Three Phase



ADJUSTMENT OF YOUR CHISEL MORTICER

Disconnect Machine From The Power Source Before Adjusting This Machine.

Morticer Head Adjustment

The morticer head is provided with independent vertical adjustment to obtain correct leverage. To adjust the morticer head:

1. Disconnect machine from the power source.
2. Loosen the lock knob on the headstock and then remove the chuck guard.
3. Holding the morticer head to loosen the lock nut. This prevent the head from accidentally falling while the head is loosened. Shown in Fig. 2.

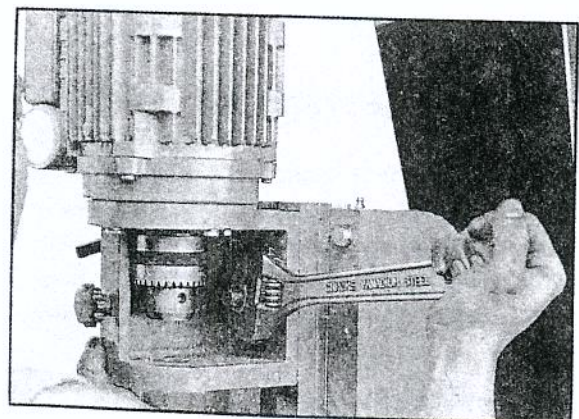


Fig. 2.

4. Raise or lower the morticer head to set it at desired position then tighten the lock nut.
5. Replace the chuck guard.

Setting Of Depth

The depth of chiseling can be controlled by adjusting setting bar and setting collar. Shown in Fig. 3. Use the haunch stop (A) to set 2 sections of chiseling.

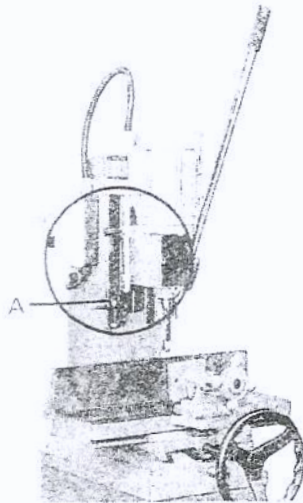


Fig. 3

Table Insert

The table insert must be removed before making penetratively cutting Fig. 4, (A).

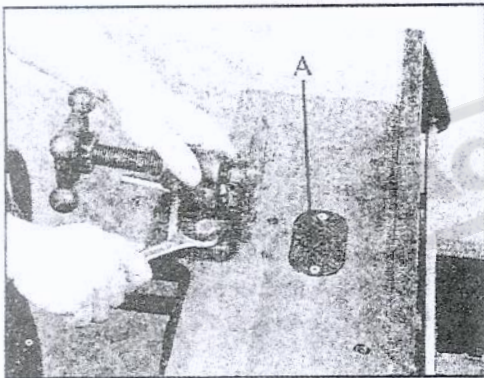


Fig. 4

Adjustment Of The Clamping Unit Position

The clamping unit can be adjusted and located on three positions. When clamping timber ensure that the clamp bracket locates in the nearest hole in the table as possible to the job, therefore reducing the amount of thread to be used, this also reduces the strain on the clamp mechanism and increases the rate of operation.

To adjust the clamping unit:

Unscrew two bolts to remove the clamping unit to appropriate position then screw up this clamping unit tightly as shown in Fig. 4.

Single Handwheel Control To Longitudinal And Lateral Movement

The worktable can be operated for longitudinal and lateral movement by controlling the handwheel.

Push the shaft of handwheel to engage with rack for longitudinal movement as shown in Fig. 5.

Pull the shaft of handwheel to engage with lead screw for lateral movement as shown in Fig. 6.

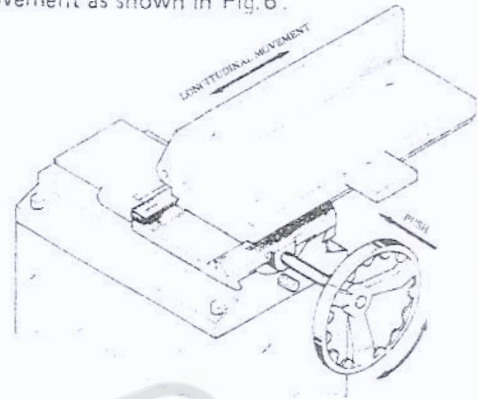


Fig. 5

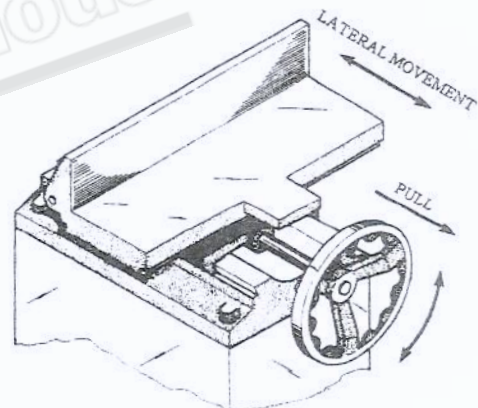


Fig. 6

Setting Of Longitudinal Movement

There are two stops at rear of worktable which are provided for repetitive work. The stops can be adjusted by loosening set screws on the stops with the key provided as shown in Fig. 7.

Tighten the set screws when the stops has been adjusted at required positions.



Fig. 7

The Counterbalance Weight

This Morticer is equipped with a Counterbalance Weight in the stand for precise trouble free operation. The counterbalance weight was factory fixed on the side of stand to avoid damage of carrying. Before operating machine, the counterbalance weight must be released freely and be sure it has been hooked with the suspension rope before releasing it from the stand.

Fitting And Changing Of Hollow Square Chisel And Bit

This machine has been designed to take chisels ranging from 1/4" to 1". Also available metric chisels and bits – in the following range: 6.0mm to 25.0mm, and the notes which follow apply to all these sizes.

The machine is supplied with two bushes to suit the two sizes of chisel shank diameters and will suit the complete range of chisels.

Tools required for fitting chisels are:

One 4mm Hex. Wrench. One Key, Chuck.

To Fit Chisel:

Before fitting or changing a chisel and bit place a piece of timber on the worktable to prevent accidental damage to chisel and bit should they drop down.

1. Disconnect machine from the power source.
2. Loosen the lock knob on the chisel head then remove the chuck guard.
3. Loosen the set screw located in the headstock.
4. Select the correct bush for the shank of the required chisel and assemble into the chisel head. Press the bush up as far as it will go, checking that the hole in the side of the bush lines up with the set screw, at the same time screw in this set screw until it enters the hole in the side of the bush, far enough to prevent the bush from falling out.
5. Insert the hollow square chisel into the chisel head and push up until it butts against the bush, then hold the hollow square chisel up, but do not tighten. Set the hollow square chisel square to the table fence, with lower clearance slots to the side, then tighten set screw through bush firmly as shown in Fig.8.

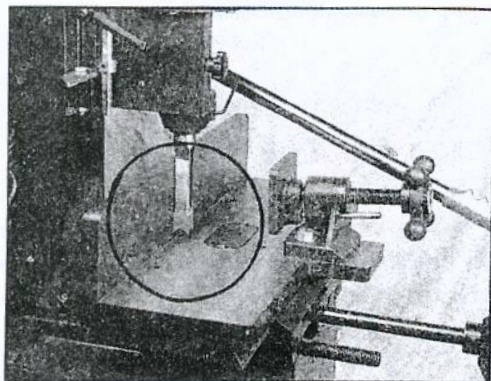


Fig.8

6. Use the key to open the drill chuck and pass the drill bit through the hollow square chisel and into the chuck, then set it to give clearance "A" as shown on drawing Fig. 9.

The clearance "A" will vary to suit the type of wood and size of chisel. Generally larger chisels require larger clearance, see also notes on "Correct Use Of Chisels And Bits".

Note: The clearance of 2mm/5mm may be varied to suit type of wood and size of chisel. Generally the larger chisels require greater clearance.

7. Rotate the chuck by hand to check that everything is running freely.
8. Replace the chuck guard on the chisel head and tighten the lock knob.

OPERATING INSTRUCTIONS

When clamping timber ensure that the clamp bracket locates in the nearest hole in the table as possible to the job, therefore reducing the amount of thread to be used, this also reduces the strain on the clamp mechanism and increases the rate of operation.

If a mortice or hole is required to a definite depth, bring the chisel or drill down to the surface of the workpiece then loosen the setting bolt on the headstock to adjust the required depth from the distance between the low end of setting bar and the haunch stop on the column, then tighten the setting bolt. Two depths may be obtained by setting the collar stop in the same way. This will give one depth and by switching the haunch stop to the right, the collar stop becomes effective for the second depth.

When cutting a mortice or drilling right through a piece of timber set the collar stop so that chisel does not touch the worktable at its lowest position. Place a piece of wood on the worktable thicker than the clearance between chisel and worktable and clamp the workpiece on top of this.

When cutting a deep mortice it is advisable to take the chisel down in stages of about 25mm, moving the table along for each successive cut. This enables the chisel to clear itself of chips, and avoid subsequent overheating, particularly when cutting hard or green wood.

There are two stops at rear of worktable which are provided for repetitive work. The stops can be adjusted/set by loosening set screws on the stops with the key provided.

Should, after long use, the tables/slides or the headstock develop a degree of side play, this can be rectified by slackening slightly the hex. hd. screws on the rail bar, and adjusting the retaining bolts until side play is eliminated, but taking care not to interfere with normal movement. Tighten the hex. hd. screws firmly after adjustment.

CORRECT USE OF HOLLOW SQUARE CHISELS AND BITS

You can expect excellent service from the tools if proper care is taken in using them. Before you set the chisel and bit, be sure to check the following points;

1. Always keep the tip of chisel and bit sharp and correctly shaped.
2. If you use a badly worn bit, chip clearance will be difficult leading to breakage of the chisel, but if you use the bit correctly shaped then the chisel will last longer and give excellent service.
3. Replace the worn bit with a new one. Breakage of the chisel invariably occurs from using a damaged bit.
4. Make sure the entire assembly is correctly held with proper clearance of 2mm-5mm at point "A". Correct clearance at this point should be maintained in any case. If there is no clearance and bit nose comes in contact with the cutting bevel of the chisel, friction occurs which finally causes the chisel to break.
5. Rotate the machine manually to see if the bit rotates smoothly and if so, the entire assembly is correctly set.
6. Always secure the chisel and bit firmly. Breakage of the chisel, in most case, occurs when there is not enough clearance at point "A".

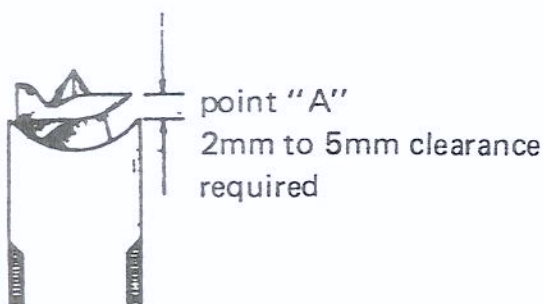


Fig. 9

Abrasion Of Chisel And Bit.

The hollow chisel and bit is completely different to other tools and performs the boring, wood cutting, and ejecting of chips from the opening of the chisel all at the same time. The chips are conveyed in the twist of bit through the hollow of the chisel and ejected from the opening. Abrasion will be seen where excess friction occurs in chip clearance.

Bit abrasion

Examining the bit nose. You will see the tips of the brad point, spur and cutting lip dulled when abrasion begins. Sharpen these points with a square or flat smooth file of suitable size, but always file the inside of spur, or cutting lip from below in the throat of the bit. Never file the outside of the spur. Never grind the bit nose. When sharpening please try to maintain the original shape. Then examine the twist. If you see any signs of wear in the twist such as irregular grooves or hollows on the external surface of the twists, the bit is badly worn and impossible to re-form in any way, and replacement is necessary.

Abrasion of the bit usually occurs thrice as much as that of the chisel. That is, the chisel is three times as durable as the bit, and if you replace a badly worn bit, the chisel will again outlast it.

Chisel Abrasion.

Look downward into the hollow of the chisel from the angle of the blade tip. When the four angles of the inside blade bevel, at the point of turning into the round hollow are dulled, or the square cut corners become round, the angles or the corners should be filed to regain the original shape.

When abrasion occurs to the extent of making the thickness of the entire blade noticeably thin, the blade will be liable to break in operation. When you see excessive abrasion, it is advisable to replace the chisel with a new one.

How To Avoid The Breakage Of The Chisel

Breakage will occur from excessive abrasion. In most case, abrasion is seen in the bit. Replace the bit immediately when you find the strokes heavy, or see the morticed hole has a very rough surface, or in the case of binding chip clearance.

LUBRICATION GUIDE OF YOUR CHISEL MORTICER

Do not operate machine until properly lubricated.

Lubricate all slides with grease to allow free movement when operating the slides.

Index	Position	Interval	Sutable Types Of Oil	Fig. No.
A.	Slide Ways	Frequently	Grease	10
B.	Gears	"	"	11
C.	Lead Screw, Slide	"	"	12
D.	Lead Screw, Clamp	"	Oil SAE-30	10
E.	Soft, Handwheel	"	"	10
F.	Rock	"	Grease	12

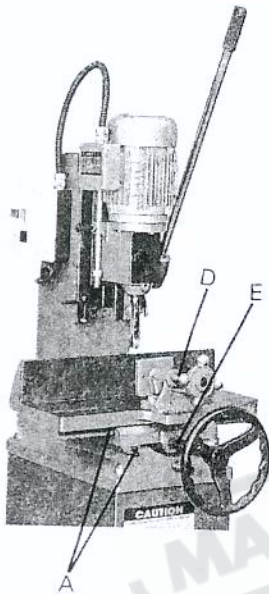


Fig. 10

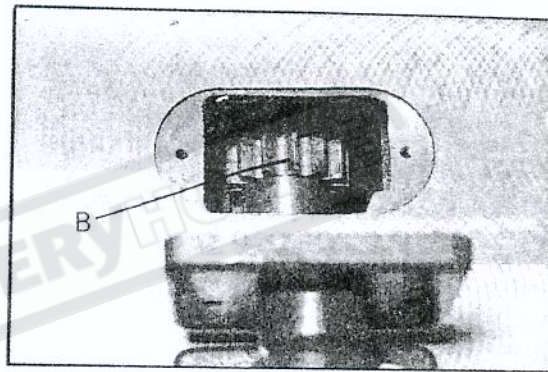


Fig. 11

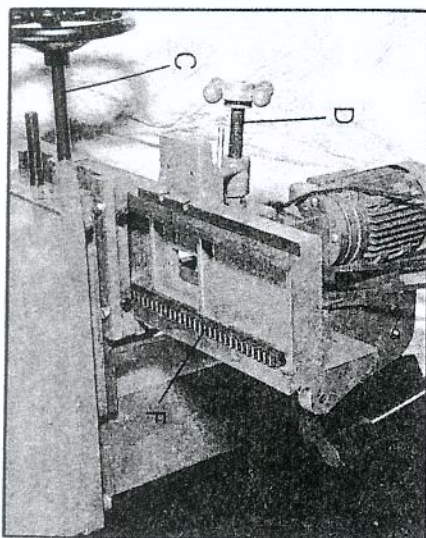
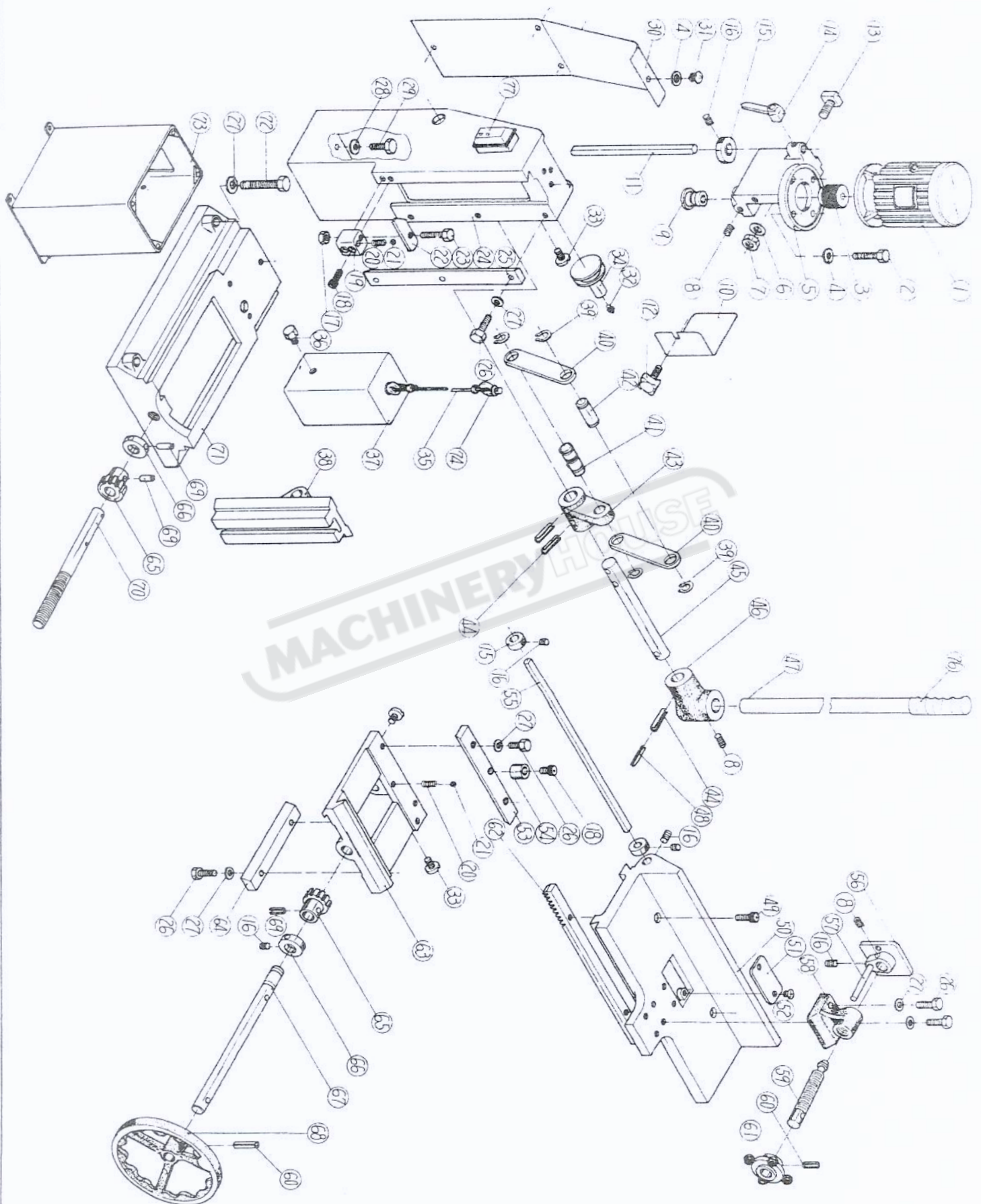


Fig. 12



REPLACEMENT PARTS LIST

Key No	Part No.	Description	Q'ty	Key No.	Part No.	Description	Q'ty
1	DA-D01	Motor	1	40	DA-D18	Connecting Link	2
2	5A-A306	Hex. Hd. Scr. M6x1.0P-30	4	41	DA-D19	Crank Pin	1
3	LK-Y13	Drill Chuck 1/2"	1	42	DA-D20	Crank Pin	1
4	5E-A004	Washer ϕ 1/4"	8	43	DA-D21	Crank Arm	1
5	DA-D02	Head Body	1	44	5F-E308	Roll Pin ϕ 8-504	3
6	5E-A023	Washer ϕ 17mm	1	45	DA-D22	Crank Shaft	1
7	5B-A009	Hex. Nut M16x1.5P	1	46	DA-D23	Connecting Bend	1
8	5A-C403	Set Scr. M8x1.25P-16	1	47	DA-D24	Operating Lever	1
9	DA-D03	Holder, Chisel ϕ 13/16"	1	48	5F-E213	Roll Pin ϕ 5-504	1
10	DA-D04	Chuck Guard	1	49	5A-B405	Soc. Hd. Cap Scr. M8x1.25P-35	2
11	DA-D05	Depth Setting Bar	1	50	DA-D25	Worktable	1
12	5A-G004	Lock Knob M8x1.25P-16	1	51	DA-D26	Table Insert	1
13	5A-L101	Scr., T-Cap	1	52	5A-E201	Counter Sunk Hd. Scr. M5x0.8P-10	2
14	5A-L001	Bolt, Setting M8x1.25P-15	1	53	DA-D27	Strip	1
15	DA-D06	Collar Stop	3	54	DA-D28	Collar, Stop	1
16	5A-C301	Set Scr. M6x1.0P-6	7	55	DA-D29	Bar, Setting	1
17	5B-D004	Self-Locking Nut M8x1.25P	1	56	DA-D30	Plate, Clamp	1
18	5A-B404	Soc. Hd. Cap Scr. M8x1.25P-30	3	57	DA-D32	Guide Rod	1
19	DA-D08	Locating Block	1	58	DA-D33	Base, Clamp	1
20	JH-T07	Spring	2	59	DA-D31	Lead Screw	1
21	5I-B103	Steel Ball ϕ 8	2	60	5F-E257	Roll Pin ϕ 6-364	2
22	DA-D07	Stop Plate	1	61	DA-D34	Knob	1
23	5A-A414	Hex. Hd. Scr. M8x1.25P-50	1	62	DA-D35	Rack	1
24	DA-D10	Column, Morticer	1	63	DA-D36	Lateral Slide	1
25	DA-D12	Strip	1	64	DA-D42	Strip	1
26	5A-A405	Hex. Hd. Scr. M8x1.25P-30	9	65	DA-D37	Gear	2
27	5E-A009	Washer ϕ 5/16"	13	66	DA-D39	Collar, Setting	2
28	5E-A012	Washer ϕ 1/2"	3	67	DA-D38	Shaft Operating	1
29	5A-A605	Hex. Hd. Scr. M12x1.75P-40	3	68	DA-D40	Handwheel	1
30	DA-D11	Rear Cover	1	69	5F-E256	Roll Pin ϕ 6-32	3
31	5A-D401	Scr., Pan-Head M6x1.0P-10	4	70	DA-D41	Lead Screw	1
			3	71	DA-D43	Base	1
33	DA-D13	Special Screw	6	72	5A-A410	Hex. Hd. Scr. M8x1.25P-60	4
34	DA-D14	Pulley	1	73	DA-D44	Stand	1
35	DA-D15	Suspension Rope	1	74	DA-D45	Hook Bolt	2
36	5A-A302	Hex. Hd. Scr. M6x1.0P-12	1	75	DA-03A	Holder, Chisel ϕ 3/4"	1
37	DA-D16	Counterbalance Weight	1	76	DA-D46	Grip Rubber	1
38	DA-D17	Slide, Vertical	1	77		Magnetic Switch	1
39	5F-A011	Retaining Ring Ext. STW-20	4				

Note: When ordering repair parts always give the following informations:

* Model Number * Name of Item * Key No. * Part No. * Part Description

TROUBLE SHOOTING GUIDE FOR CHISEL MORTICER

Should any difficulty arise during operation, check the power cord and connection, then go through the following list.

Symptom	Possible Causes And Corrections
Morticer will not start	1. Fuse blown or circuit breaker tripped. * Replace fuse or reset circuit breaker. 2. Cord damaged. * Have cord replaced by an Authorized Service Center or Service Station.
Overload kicks out frequently	1. Extension cord too light or too long. * Replace with adequate size cord. 2. Chisel and bit in poor condition (dull, gummedy, broken) * Clean or replace the chisel and bit. 3. Stock is too wet. * Dry stock for cutting.
Bit does not come up to speed	1. Extension cord too light or too long. * Replace with adequate size cord. 2. Low (house) current. * Contact your electrician. 3. Motor not wired for correct voltage. * Refer to motor name plate for correct wiring.
Morticer makes unsatisfactory cuts	1. Dull hollow square chisel and bit. * Sharpen or replace the chisel and bit. 2. Gum or pitch on the chisel and bit. * Remove the chisel and bit and clean with turpentine and steel wool. 3. Gum or pitch on the worktable or fence causing unsquare cutting. * Clean the worktable and fence with turpentine. 4. The chisel and bit was not correctly set. * Make sure the entire assembly is correctly held with proper clearance of 2mm—5mm at point "A". See "Correct Use Of Hollow Square Chisels And Bits"
Work burns	1. Dull the chisel and bit. * Sharpen or replace the chisel and bit. 2. The bit has worn out or is broken. * Replace the worn bit with a new one.
The bit down drilling.	1. The bit is worn out or broken. * Replace the worn bit with a new one. 2. The bit is not sharp enough. * Always keep the tip of chisel and bit sharp and correctly shaped. 3. The drill chuck has been loosened to clamp the drill bit. * Tighten the drill chuck with a key provided.
Machine vibrates excessively	1. Damaged chisel bit. * Replace the damaged bit with a new one. 2. Stand or bench on uneven floor. * Reposition on flat level surface. Fasten to floor if necessary.

Note: 1) * Remedy.

— 12 —

2) Disconnect machine from the power source before servicing the machine