

MECHANICAL SHEAR

OPERATOR'S MANUAL

AMADA[®]

FOREWORD

This manual has been prepared to acquaint you with the installation, operation and maintenance procedures of your Amada machine. It is urged that this manual be read carefully for a thorough understanding of the machine to ensure long life and safe, efficient operation.

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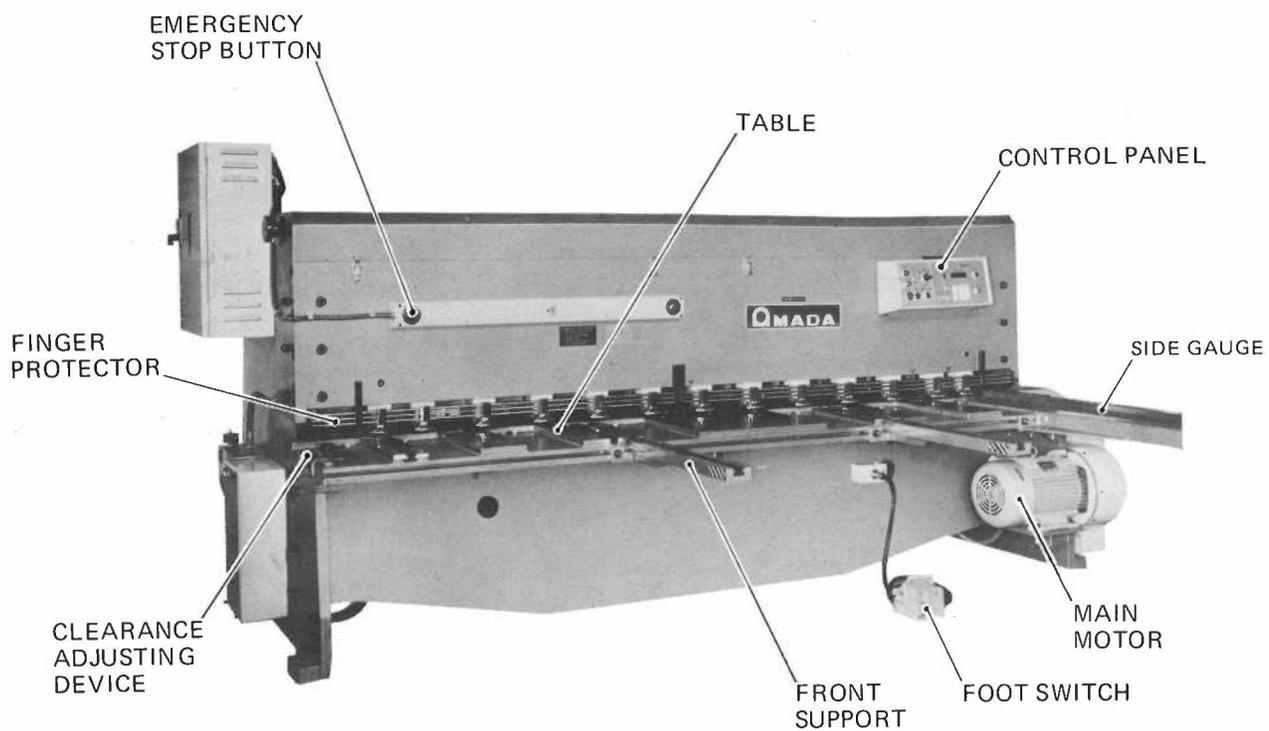
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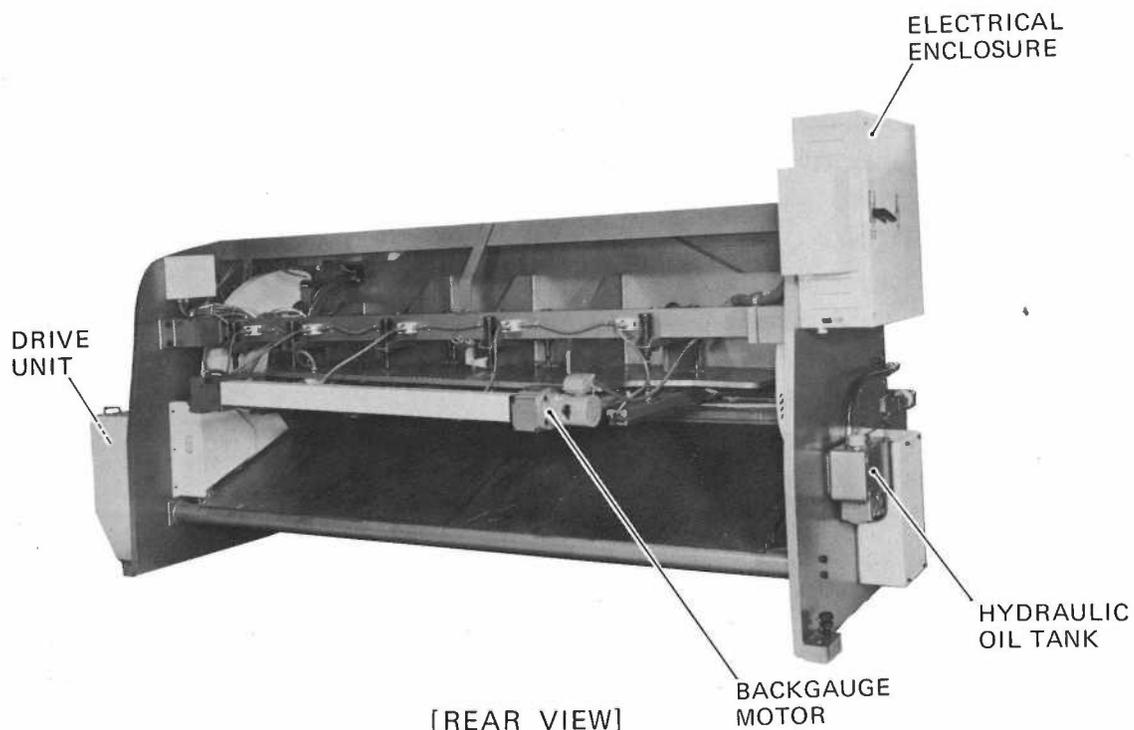
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[FRONT VIEW]



[REAR VIEW]

PRECAUTIONS FOR TROUBLE-FREE AND SAFE OPERATION

1. CHECK THE LEVEL OF THE MACHINE:

To maintain accuracy of the machine and to ensure safety, always check that the machine is level and that all anchor bolts are well tightened.

2. USE AND REPLENISHMENT OF RECOMMENDED OIL:

For lubricating and other oils, always use the recommended oil. Always check the quantity of oils for lubrication, holddown mechanism, etc. to keep them adequate.

3. STRICT OBSERVANCE OF THE CUTTING CAPACITY:

The cutting capacity of this machine is a maximum cuttable thickness of steel plate with tensile strength of 45 kg/mm^2 . Consult with your serviceman when any materials other than the above plates or any heat-treated materials (including plates with tensile strength of 45 kg/mm^2) are to be cut.

4. CHECK THE BLADE FOR WEAR AND EARLY REPLACEMENT:

If the blade is used with a worn cutting edge, the machine will be overloaded even if the thickness of the plate to be cut is kept within the cutting capacity of the machine. In addition, the accuracy will become poor and the blade regrinding will become more expensive. It is therefore economical to change the blade edge a little early.

5. ADJUSTMENT OF BLADE CLEARANCE:

Improper clearance will result in damage or early wear of the cutting blade, frequent formation of burrs, jamming of material, etc. Adjust if the clearance is improper.

6. IMPERATIVE USE OF THE HOLDDOWNS:

To make sure of safe operation, never proceed with the cutting until the material has been secured with the holddowns.

7. NEVER OPERATE WITH SAFEGUARDS REMOVED:

It is strongly suggested to never operate the machine with finger protector, frame gap cover and other safeguards removed, since it is very dangerous with these safeguards removed.

8. RIGID EXECUTION OF RETIGHTENING OF ALL BOLTS AND NUTS:

Check periodically that all bolts and nuts are secure and, if necessary, retighten them.

9. ASSIGN A PERSON TO BE COMPLETELY RESPONSIBLE FOR OPERATION AND MAINTENANCE:

To prevent an accident due to mis-operation or non-adherence to maintenance procedures, assign a person responsible for the operation and maintenance of the machine, including the power ON/OFF switch.

10. AVAILABILITY OF THIS OPERATOR'S MANUAL:

To help prevent anyone from operating the machine in any other way than described in this manual, keep this manual near the machine, as a ready reference at any time.

SECTION 1 – INSTALLATION

PLACEMENT

The foundation should be constructed of concrete, and must be flat and level. Ensure that there is sufficient space around the machine to afford easy material handling as well as easy access for inspection and maintenance.

CARRYING

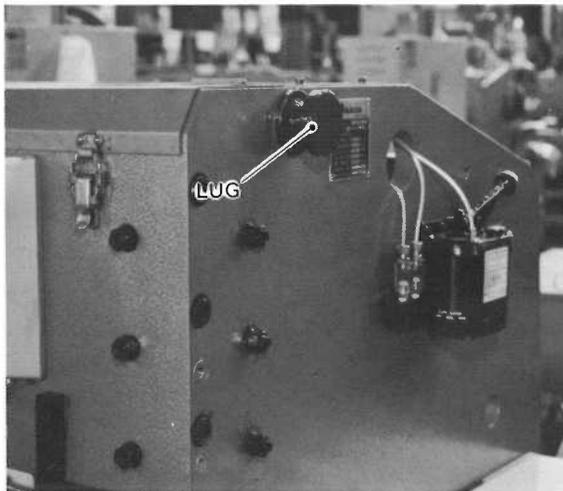
Unpack your machine carefully, and set it in position with a crane. When lifting the machine, attach the lifting cables securely to the lifting lugs on the left and right frames of the machine [Photo 1]. See the table below.

CAUTION: Be careful to protect the machine from any impact.

Model	Weight kg (lb)	Model	Weight kg (lb)
M-1245	2700 (5952)	M-1260	3700 (8157)
M-2045	4600 (10141)	M-2060	4700 (10361)
M-2545	5300 (11684)	M-2560	5500 (12125)
M-3045	7100 (15653)	M-3060	8400 (18519)
M-4045	11000 (24251)	M-4060	14000 (30865)

CLEANING

After the machine has been set in position, thoroughly remove the rust preventive coating with a suitable solvent. Apply a coat of machine oil to the surface of the table and other areas where rust formation might occur.



[Photo 1]

LEVELING AND ANCHORING

Place three spirit levels on the table as shown in the photo, and adjust the left-and-right and fore-and-aft levels of the machine with level adjustment bolts located on the legs of the frames. Machine level should be within a tolerance of 0.05 mm per meter in any direction. After the proper level position has been obtained, anchor the machine with anchor bolt nuts [Photo 2].

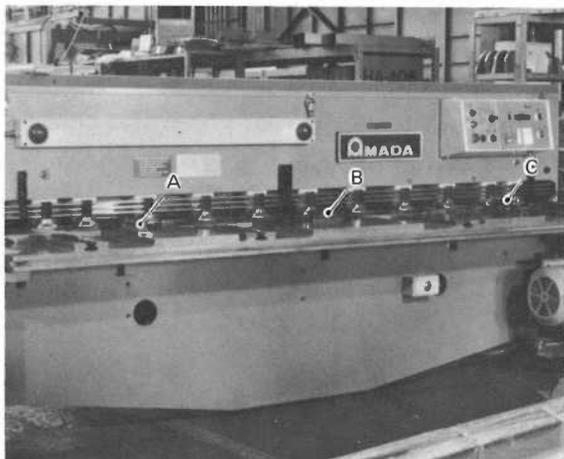
ELECTRICAL CONNECTIONS

To make electrical connections, proceed as follows:

- (1) Remove the screws that secure the electrical enclosure door, move the door lever to "Reset Open" and open the door [Photo 3].
- (2) Connect the power supply cable to the input terminal of the circuit breaker and the ground wire to the ground terminal [Photo 4].

Spirit levels A and C: fore-and-aft direction

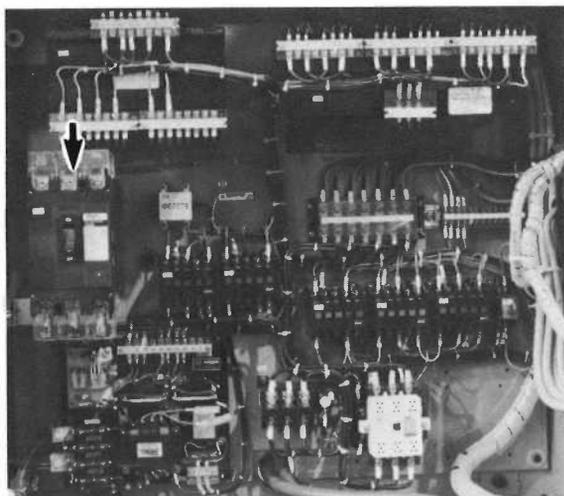
Spirit level B: left-and-right direction



[Photo 2]



[Photo 3]



[Photo 4]

Max. power consumption

kW

	M-1245	M-1260	M-2045	M-2060	M-2545
Main motor	3.7	5.5	5.5	5.5	5.5
Backgauge motor	0.4	0.4	0.4	0.4	0.4
Total power consumption	4.1	5.9	5.9	5.9	5.9

	M-2560	M-3045	M-3060	M-4045	M-4060
Main motor	7.5	7.5	11.0	11.0	11.0
Backgauge motor	0.4	0.4	0.4	0.4	0.4
Total power consumption	7.9	7.9	11.4	11.4	11.4

Recommended cable data

The following data is the cross-sectional area of cables to be used when your machine is operated on 200 volts, ac. Use the data as a guide in determining the appropriate cables according to your power supply.

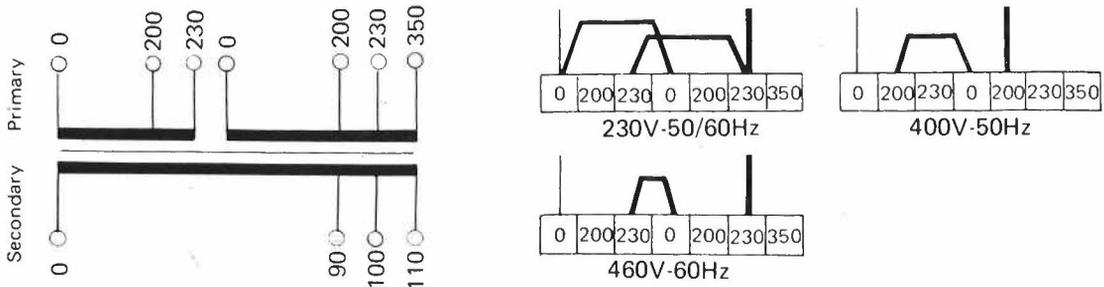
M-1245, M-1260	5.5 mm ² (0.00853 sq.in)
M-2045, M-2060, M-2545, M-2560, M-3045	8 mm ² (0.0124 sq.in)
M-3060, M-4045, M-4060	14 mm ² (0.0217 sq.in)

The power supply of your machine should agree with the voltage indicated on the label attached to the electrical enclosure. If the power line voltage is changed from those indicated on the label, change the wiring connections of the motor and transformer and reset or replace the thermal relay.

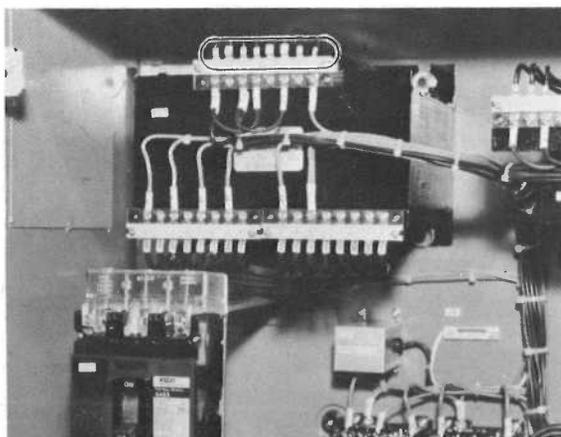
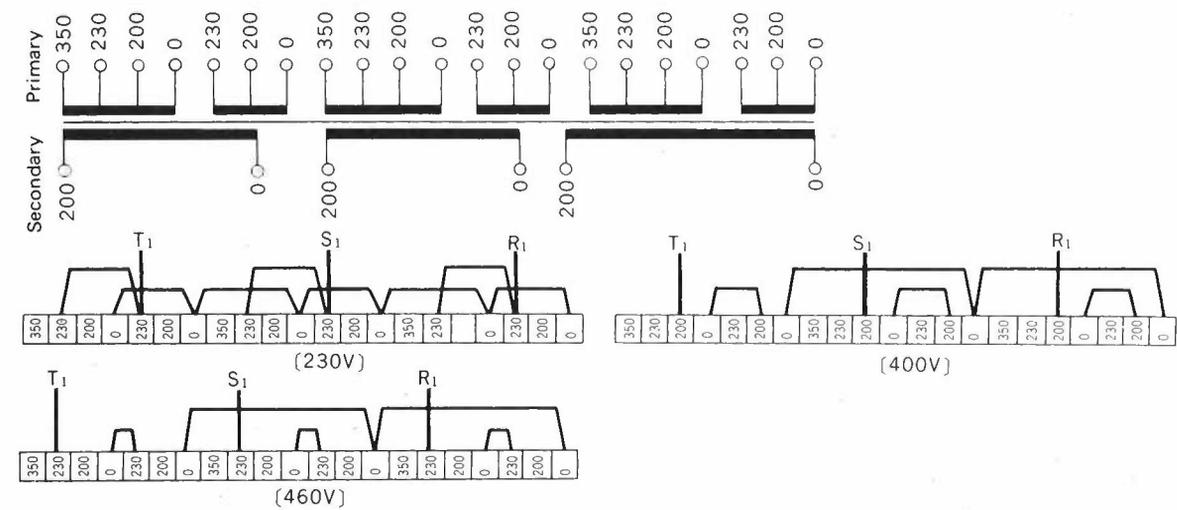
CAUTION: To protect personnel from an electrical shock and the machine from possible damage, all electrical work should be done by a qualified electrician.

CHANGING WIRING CONNECTIONS AT TRANSFORMER TERMINALS

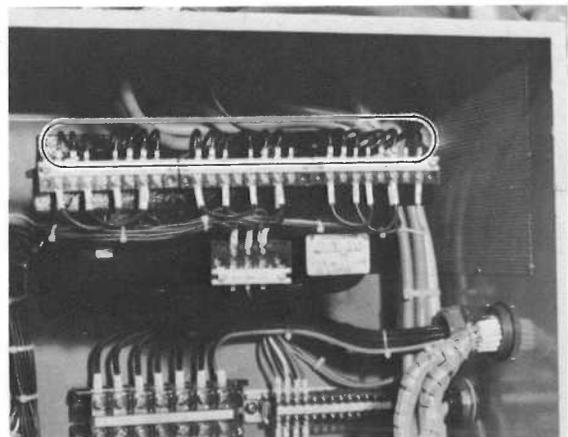
Machine transformer [Photo 5]



Backgauge transformer [Photo 6]

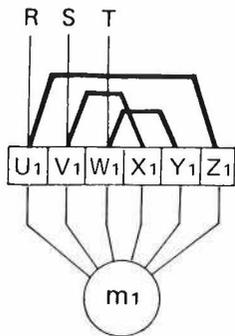


[Photo 5]

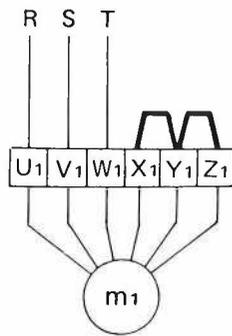


[Photo 6]

CHANGING WIRING CONNECTIONS AT MAIN MOTOR TERMINALS
 M-1245, M-1260, M-2045 and M-2545 models [Photo 7]

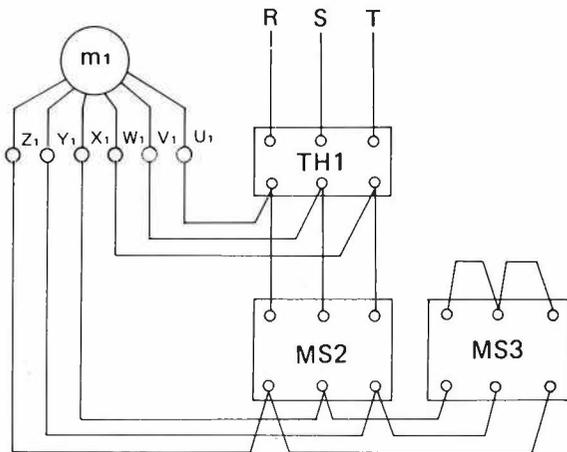


230V-50/60Hz

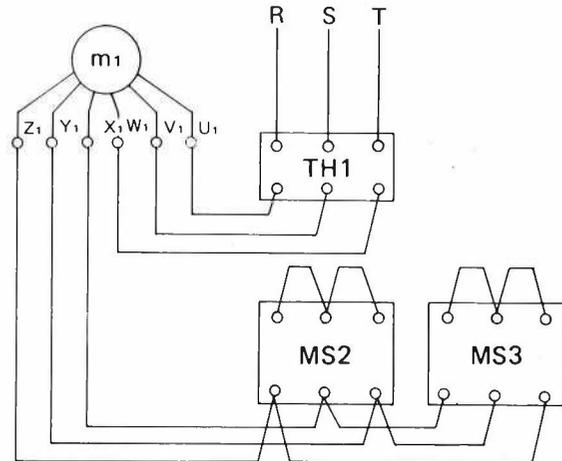


400V-50Hz
 460V-60Hz

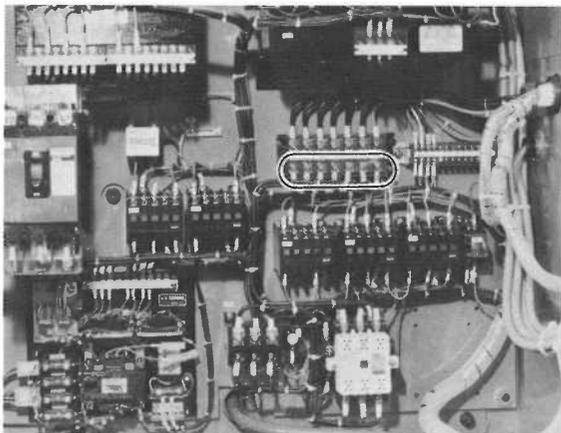
M-2060, M-2560, M-3045, M-3060, M-4045 and M-4060 models [Photo 8]



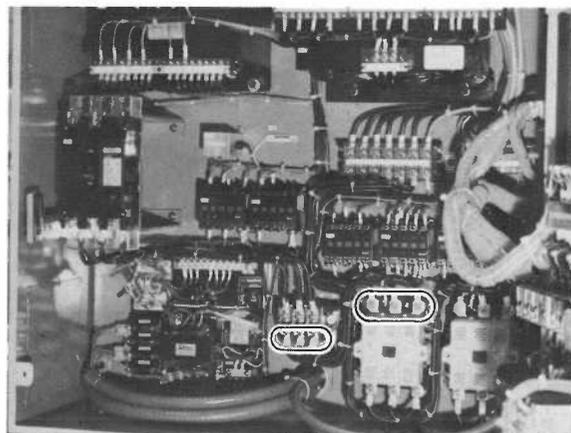
230V-50/60Hz



400V-50Hz, 460V-60Hz



[Photo 7]



[Photo 8]

- (3) After making the proper wiring connections, close the electrical enclosure door and move the door lever to ON to turn on the circuit breaker. Next, turn on the POWER ON/OFF switch on the control panel and press the DRIVE button. Check to make sure the main motor rotates in the direction indicated by the arrow on the motor. If it rotates in the reverse direction, immediately press the emergency stop button to stop the motor, turn the circuit breaker and factory's main power off, and then interchange any two phase connections of the power supply cable [Photo 9].

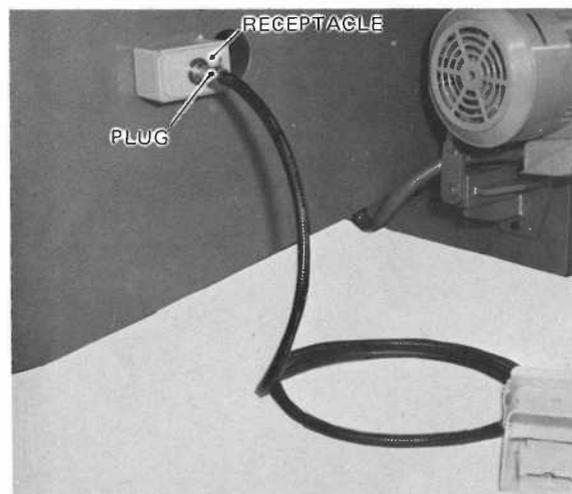
After confirming that the main motor rotates in the correct direction, install and tighten the screws which hold the electrical enclosure.

CONNECTING THE FOOT SWITCH

Connect the foot switch cable plug to the receptacle [Photo 10].



[Photo 9]

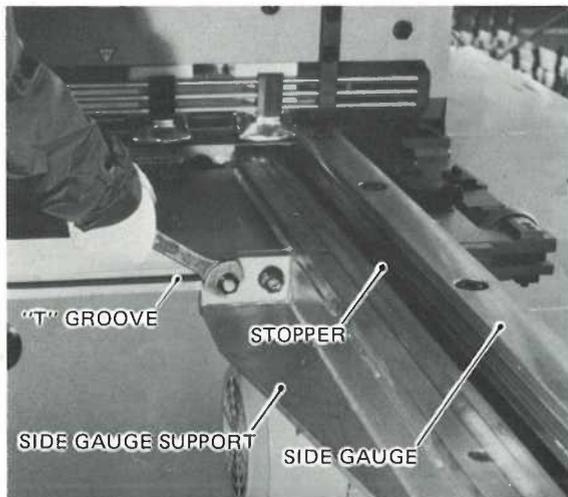


[Photo 10]

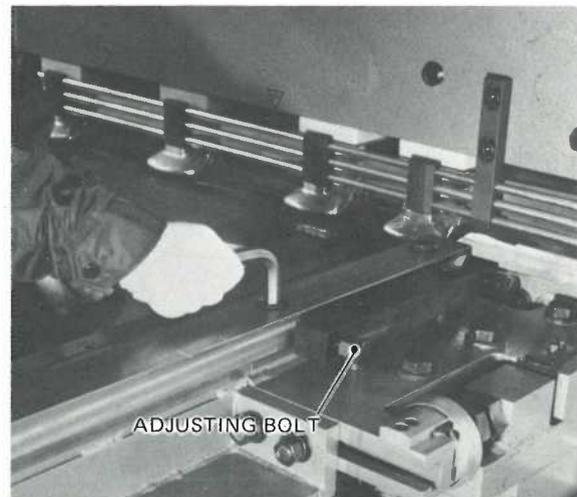
INSTALLING THE SIDE GAUGE

- (1) Insert the "T" bolts (furnished with the machine) into the "T" groove at the front of the table, and position the side gauge support by aligning its mounting holes with the "T" bolts. Temporarily tighten the side gauge support with the nuts.
- (2) Align the stopper slide groove in the side gauge support with the groove in the table. Adjust the side gauge support so that the stopper slides smoothly along the slide groove.
- (3) Tighten the nuts to secure the side gauge support [Photo 11].
- (4) Tighten the bolts to secure the side gauge to its support [Photo 12].

IMPORTANT: Prior to actual shearing operations, shear test pieces to make sure the squareness of the side gauge, in relation to the blades, is correct. If it is not correct, loosen the bolts and adjust the position of the side gauge with the adjusting bolts.



[Photo 11]



[Photo 12]

INSTALLING THE FRONT SUPPORT

- (1) Insert the "T" bolts (furnished with the machine) into the "T" groove at the front of the table, and position the front support by aligning its mounting holes with the "T" bolts. Temporarily hold the front support with the nuts.
- (2) Align the stopper slide groove in the front support with the groove in the table, so that the stopper can slide along the groove smoothly.
- (3) Tighten the nuts to secure the front support [Photo 13].

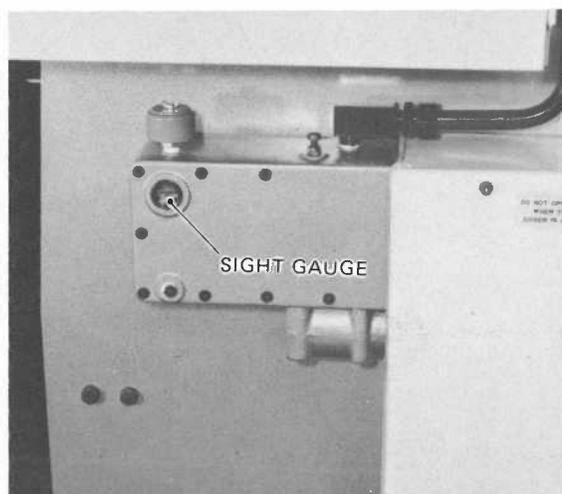
NOTE: The three-meter front support is a standard accessory on model M-4060. Install the front support on the table using a crane, then attach the front support stand to the support. Make sure the front support is level after installation.

CHECKING THE HYDRAULIC OIL LEVEL

Check the level of oil in the hydraulic tank with the sight gauge. The oil is used for the hold-down mechanism [Photo 14].



[Photo 13]



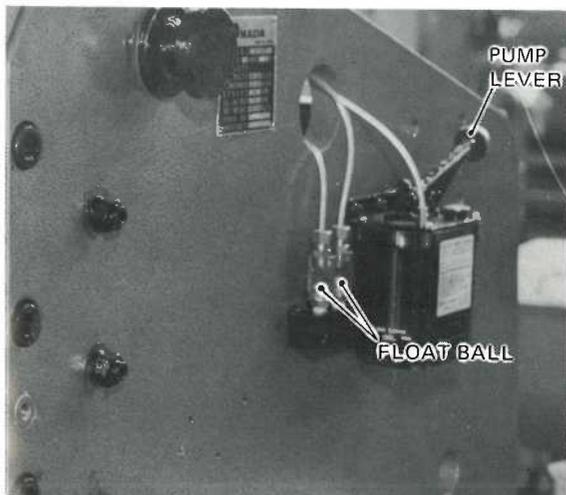
[Photo 14]

INITIAL LUBRICATION

- (1) Check the level of oil in the lubrication oil pump.
- (2) Check the float balls to make sure they are lower than the lower red lines on the oil signal units.
- (3) Move the pump lever down 3 or 4 times until the float balls are higher than the lower red lines [Photo 15].

NOTE: a) Do not forcibly move the pump lever up. It will gradually return to its original position.

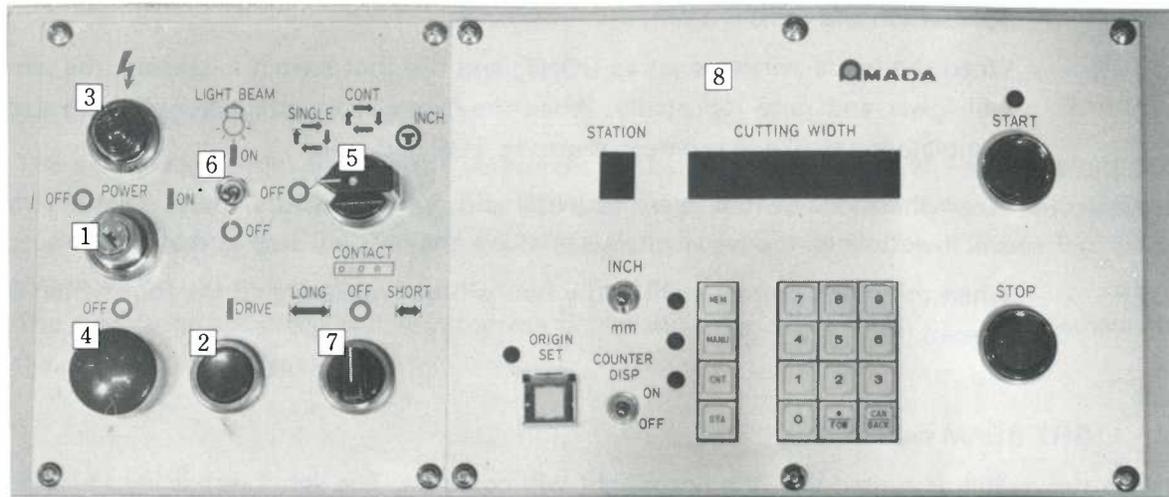
b) While the machine is operating, move the pump lever 3 or 4 times every one hour to provide proper lubrication.



[Photo 15]

SECTION 2 – CONTROLS

CONTROL PANEL



[Photo 16]

1. POWER ON/OFF switch (w/key)

When this switch is turned ON, power will be on. Power will off when the switch is turned OFF.

2. DRIVE button

When this button is pressed, the main motor will start.

3. Motor drive light

This light is on while the main motor is operating.

4. Emergency stop button

When this button is pressed, all machine operations will stop immediately. To resume machine operation, press the DRIVE button (2), raise the ram near its TDC in the INCH mode, and then make one complete stroke of ram operation in the SINGLE mode.

5. Mode switch

This switch is used to set the machine in any of the following modes.

- SINGLE – When the mode switch is set to SINGLE and the foot switch is pressed, the ram will make one stroke of operation. To perform the next stroke, release the foot switch and press it again.
- CONT. – When the mode switch is set to CONT. and the foot switch is pressed, the ram will lower and raise repeatedly. When the foot switch is released, the ram will complete the stroke in progress, return to TDC and stop.
- INCH. – When the mode switch is set to INCH and the foot switch is pressed, the ram will lower. When the foot switch is released, the ram will stop at that position.
- OFF – When the mode switch is OFF, the ram will not move even if the foot switch is pressed.

6. LIGHT BEAM switch

When this switch is turned ON, the beam light will come on. The light beam is used to align the line scribed on the worksheet for accurate shearing.

7. CONTACT switch

This switch is used for automatic shearing operation without pressing the foot switch. Automatic shearing is performed by butting the worksheet against the auto-shearing limit switches built into the backgauge. The switch should be set to SHORT or LONG in relation to the length of the worksheet. This switch is effective only when the mode switch is set to SINGLE.

NOTE: When automatic shearing is not required, be sure to turn the CONTACT switch off.

8. Backgauge control panel

For the description of the buttons and switches and operational procedures of the backgauges, refer to the "Programmable Backgauge Operating Instructions" furnished with your machine.

EMERGENCY STOP BUTTON

When this button is pressed, all machine operations will stop immediately. This button has the same function as the emergency button (4) on the control panel. To resume machine operation, press the DRIVE button (2), raise the ram near its TDC in the INCH mode, and then perform one complete stroke operation of the ram [Photo 17].

SIDE GAUGE AND FRONT SUPPORT

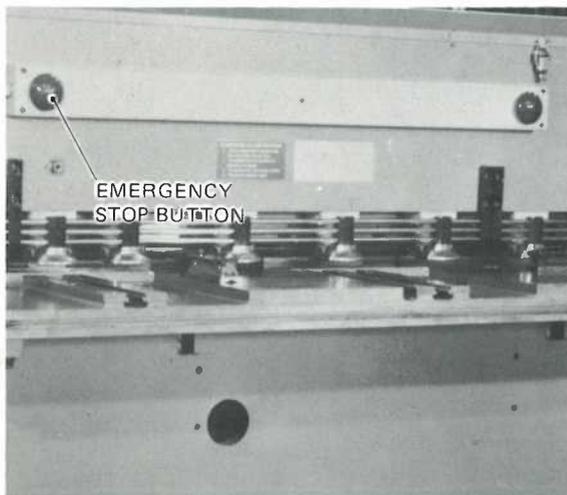
The side gauge is used to align the worksheet so that it can be sheared at a right angle (90°). It is necessary to adjust the position of the side gauge if the worksheet cannot be sheared at that angle. Refer to "Installing the Side Gauge" on page 1-7 outlined in Section 1 for instructions.

The side gauge and front support stoppers determine the cutting width of the worksheet on the operator side [Photo 18].

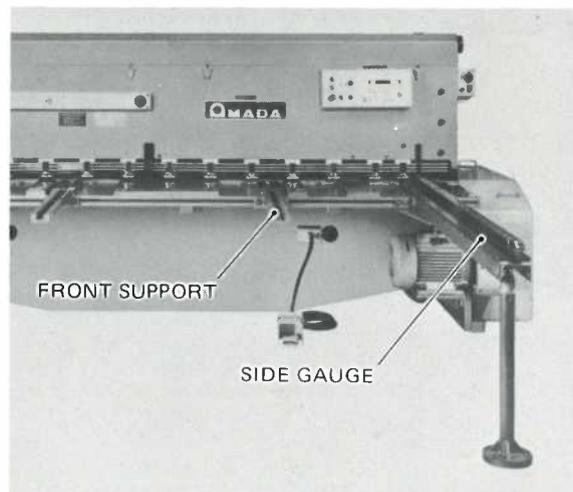
BEAM LIGHT

Beam lights are used for shearing the worksheet by aligning the line scribed on the worksheet with the cutting edge of the upper blade. Beam lights come on when the LIGHT BEAM switch is turned ON. The mode switch should be set to SINGLE.

NOTE: If the backgauge obstructs the feeding of the worksheet, move it backward and then reverse it. For the reversing procedure, refer to "Programmable Backgauge Operating Instructions" furnished with the machine.



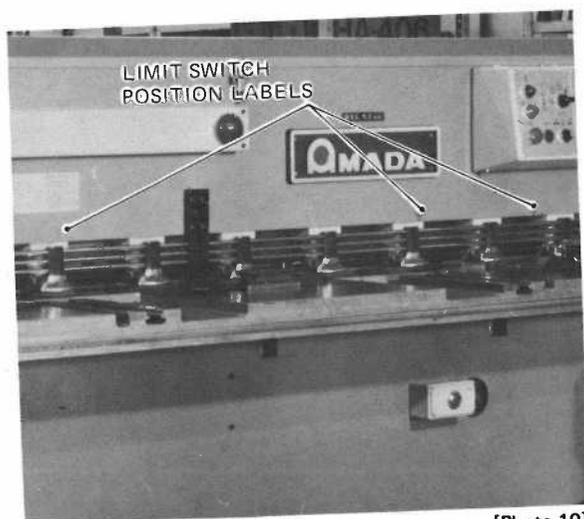
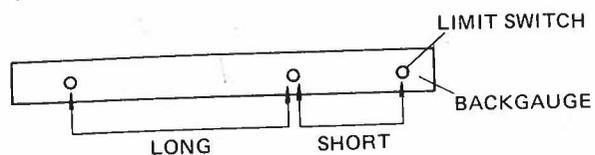
[Photo 17]



[Photo 18]

AUTOMATIC SHEARING LIMIT SWITCHES

When these limit switches, built into the backgauge, are pressed by butting the worksheet against the backgauge, shearing operation can be performed without pressing the foot switch. With the mode select switch set to SINGLE, set the CONTACT switch to SHORT or LONG depending on the cutting width of the worksheet and butt the worksheet against the affected limit switches. Shearing operation will start [Photo 19].



[Photo 19]

SECTION 3 – OPERATION

BLADE CLEARANCE ADJUSTMENT

The optimum blade clearance varies with the type and thickness of the worksheet to be sheared. In the case of mild steel plates, for example, the best shearing will be obtained by setting the blade clearance to within 5 to 7% of the worksheet thickness. The following table furnishes information which is helpful in determining the optimum blade clearance by thickness of mild steel plates.

Optimum blade clearance (mild steel)	
Worksheet thickness mm (in)	Blade clearance mm (in)
$\frac{1}{32}$ 1.0 (0.039)	0.04 to 0.09 (0.0016 to 0.0035)
$\frac{3}{32}$ 2.0 (0.079)	0.08 to 0.16 (0.0032 to 0.0063)
$\frac{1}{8}$ 3.0 (0.118)	0.12 to 0.24 (0.0047 to 0.0094)
$\frac{5}{32}$ 4.0 (0.157)	0.20 to 0.32 (0.0079 to 0.0126)
$\frac{3}{16}$ 5.0 (0.197)	0.25 to 0.40 (0.0098 to 0.0157)
$\frac{1}{4}$ 6.0 (0.236)	0.36 to 0.48 (0.0142 to 0.0189)

$0.004 = 22g, 16g + 10g =$
 $.4 = \frac{1}{4} \text{ HR}$

When adjusting the blade clearance, use the following procedures:

- (1) Remove the finger protector [Photo 20].
- (2) Turn the circuit breaker ON.
- (3) Turn the POWER ON/OFF switch ON.
- (4) Press the DRIVE button.
- (5) Set the mode switch to INCH.
- (6) Press the foot switch to lower the ram until the left end of the upper blade overlaps approximately 30 mm (1.2 in) with the lower blade.

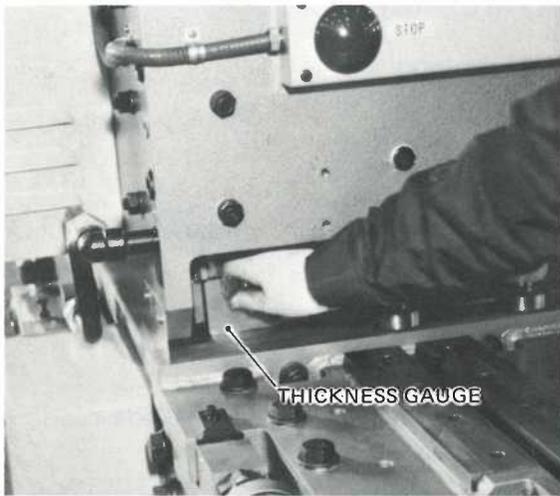
5/5/94
 $2 = \text{scribble} (.010)$

CAUTION: Never allow the blades to jam with each other. If there is any possibility of jamming, the table should be moved toward the operator.



[Photo 20]

- (7) Insert a thickness gauge between the upper and lower blades to measure the blade clearance [Photo 21].
- (8) Press the foot switch to lower the ram further, and measure the blade clearances at the center and the right end of the blade.
- (9) If it is necessary to adjust the blade clearance, loosen the table retaining bolts [Photo 22].
- (10) Move the table back or forward, as required, while measuring the blade clearances at the left, center and right, until the required clearances are obtained [Photos 23 and 24].
- (11) Tighten the table retaining bolts.
- (12) Install the finger protector.

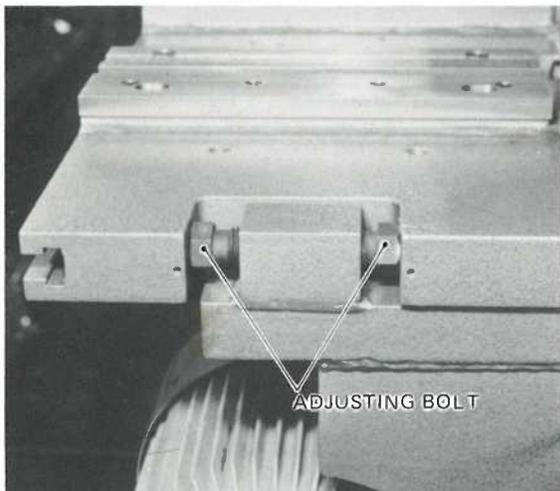


[Photo 21]



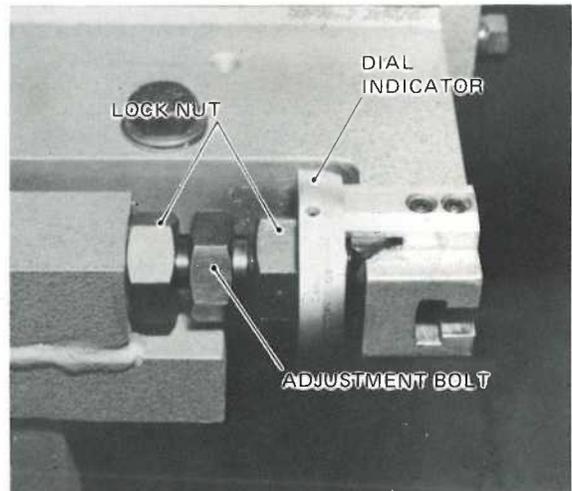
[Photo 22]

M-1245, M-2045, M-2545, M-3045 and
M-4045 models



[Photo 23]

M-1260, M-2060, M-2560, M-3060 and
M-4060 models



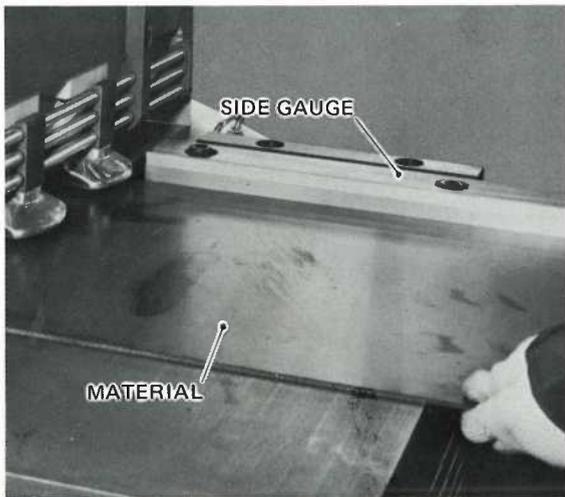
[Photo 24]

SINGLE MODE OPERATION

In the single mode, the ram makes one stroke of operation each time the foot switch is pressed.

To set the machine in this mode, proceed as follows:

- (1) Turn the circuit breaker ON.
- (2) Turn the POWER ON/OFF switch ON.
- (3) Press the DRIVE button. The MOTOR DRIVE light will come on.
- (4) Move the backgauge to the required shearing width position. (For backgauge operation, refer to the "Programmable Backgauge Operating Instructions" furnished with your machine.)
- (5) Set the mode switch to SINGLE.
- (6) Place the worksheet on the table and butt it against the side gauge [Photo 25].
- (7) With the worksheet held in that position, move the worksheet toward the backgauge until its front end extends 5 to 25 mm (0.2 to 1 in) beyond the blade for proper trimming.
NOTE: The trimming width should be at least twice the thickness of the worksheet and more than 5 mm (0.2 in).
- (8) Press the foot switch to trim the worksheet.
- (9) Move the worksheet toward the backgauge along the side gauge and butt the trimmed surface against the backgauge.
- (10) Press the foot switch to shear the worksheet to the required shearing width.



[Photo 25]

CONTINUOUS MODE OPERATION

In the continuous mode, the ram will continue to move up and down while the foot switch is being pressed. When the foot switch is released during operation, the ram will rise to TDC after the cycle of operation in progress has been completed.

To operate the machine in this mode, proceed as follows:

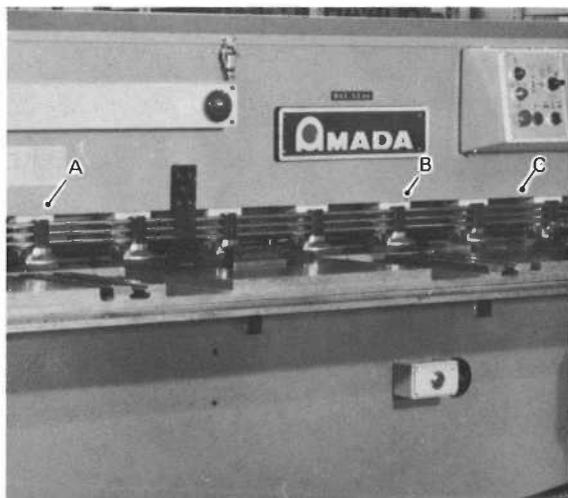
- (1) Repeat steps (1) through (8) outlined under "Single Mode Operation".
- (2) Set the mode switch to CONT.
- (3) Butt the trimmed surface of the worksheet against the backgauge and press the foot switch. Worksheet will be sheared to the same size by butting it each time against the backgauge, in relation to the movement of the ram, while pressing the foot switch.

AUTOMATIC SHEARING MODE OPERATION

In the automatic shearing mode, the ram makes one stroke of operation to shear the worksheet each time the worksheet butts against the automatic shearing limit switches built into the backgauge. The foot switch need not be pressed.

To operate the machine in this mode, proceed as follows:

- (1) Repeat steps (1) through (8) outlined under "Single Mode Operation".
- (2) Set the mode switch to SINGLE.
- (3) Set the CONTACT switch to SHORT or LONG in relation to the length of the worksheet.
NOTE: Labels are attached to the front surface of the machine which indicate the positions of the three limit switches built into the backgauge. When the CONTACT switch is set to SHORT, the ram will move down and up by pressing the limit switches shown by labels A and B; when the switch is set to LONG, the ram will move down and up by pressing the limit switches shown by labels B and C [Photo 26].
- (4) Each time the worksheet butts against the backgauge, the ram moves down and up to perform shearing operation.



[Photo 26]

SECTION 4 – MAINTENANCE

DAILY MAINTENANCE

Before each day's operation, perform the following maintenance operations:

1. Check the oil level in the lubrication oil pump. If it drops close to 1/3 the full level, add oil up to the full level.

Recommended oil: Mobil Vactra Oil No. 2
Esso Febis K68
Shell Tonna Oil T68

2. Push the pump lever three to four times until the float balls rise above the lower red lines on the oil signal units [Photo 27]. For details, refer to "Initial Lubrication" on page 1-9.

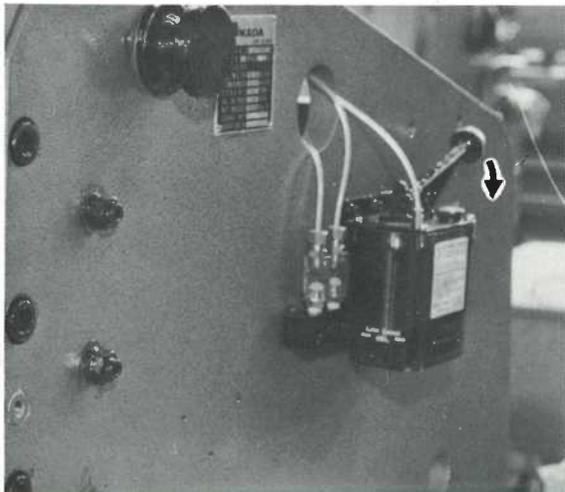
3. Add oil to the threads of the carriage through the upper hole by using an oiler [Photo 28].

Recommended oil: Mobil Vactra Oil No. 2
Shell Tonna Oil T68

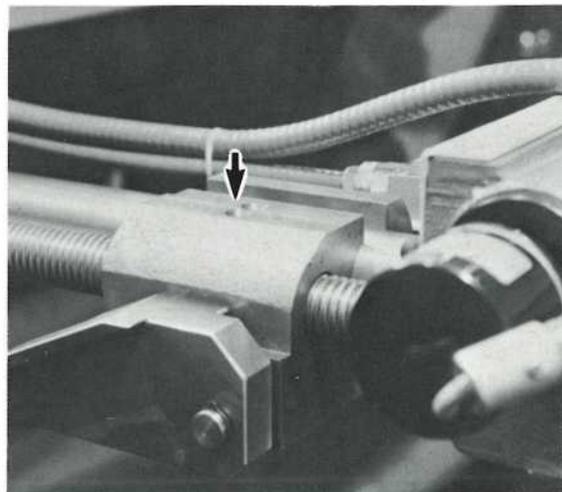
4. Check the hydraulic oil level for the holddowns, and add oil if necessary.

Recommended oil: Mobil Hydraulic Fluid 56
Shell Tellus C56

5. Check the upper and lower blades for wear or breakage. If worn or broken, replace the faulty blade. For replacement procedures, refer to "Removing and Installing the Blade" on page 4-3.



[Photo 27]



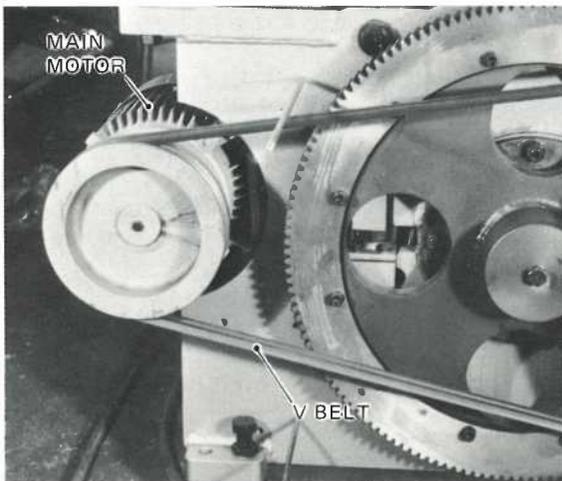
[Photo 28]

PERIODIC MAINTENANCE

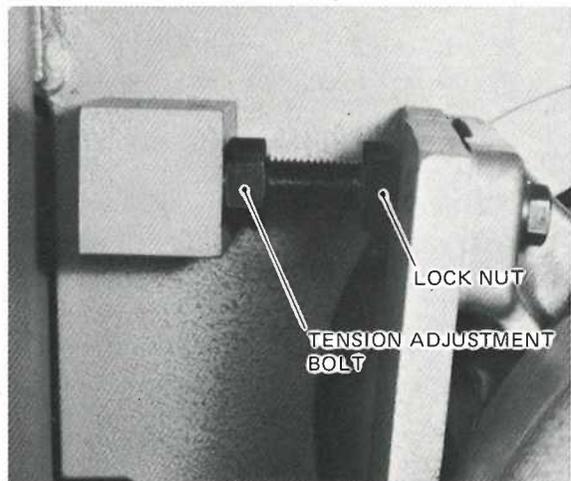
Once a month, perform the following maintenance operations:

1. Check the V belt of the main motor for proper tension. If necessary, adjust it. The belt should be adjusted so that it can deflect 1.6 mm (0.06 in) for a distance of 100 mm (3.9 in) between the rotary shafts when pressed midway between the motor pulley and the flywheel [Photos 29, 30, 31].
2. Check the level of the machine, and adjust it if it is incorrect. Refer to "Leveling and Anchoring" on page 1–2 for adjustment procedures.
3. Check the backgauge to make sure it is parallel with the blades. If it is not, adjust it. Refer to "Adjustment of Backgauge Parallelism" on page 4–8 for adjustment procedures.

M-1245, M-1260, M-2045, M-2060, M-2545,
M-2560 and M-3045 models



[Photo 29]



[Photo 30]

M-3060, M-4045, M-4060 models



[Photo 31]

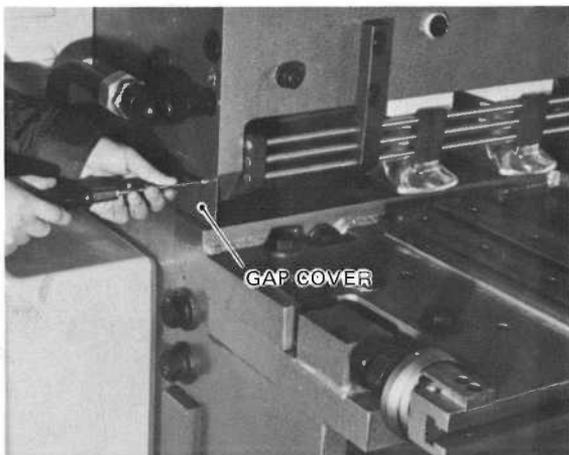
REMOVING AND INSTALLING THE BLADE

Use of a worn or broken blade tip adversely affects the performance of the machine as well as the shearing accuracy of the worksheet. The position of cutting edge should be changed so that the other cutting edge of the blade (the blade has four cutting edges on its corners) will be set in position or the blade should be replaced with a new one.

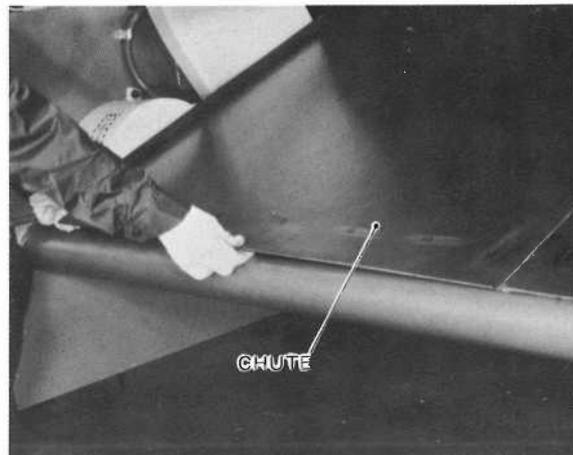
NOTE: a) Before removing or installing the blade, make sure the circuit breaker is OFF.
b) To ensure safety, always remove the lower blade first, then the upper blade.
When installing the blades, install the upper blade first, then the lower blade.

Removing the lower blade

- (1) Open the blade-to-blade clearance as wide as possible. Refer to "Blade Clearance Adjustment" on page 3-1.
- (2) Remove the left and right frame gap covers [Photo 32].
- (3) Remove the finger protector.
- (4) Remove the chute from the rear of the machine [Photo 33].

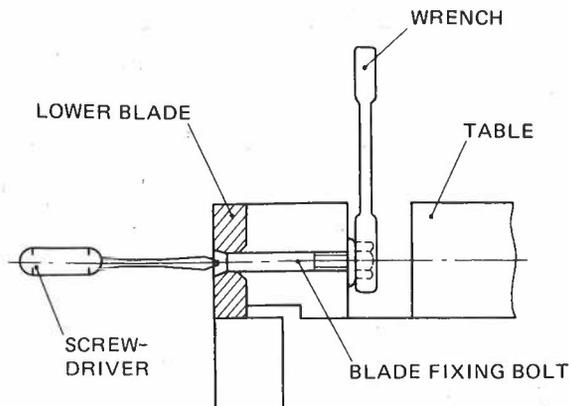


[Photo 32]



[Photo 33]

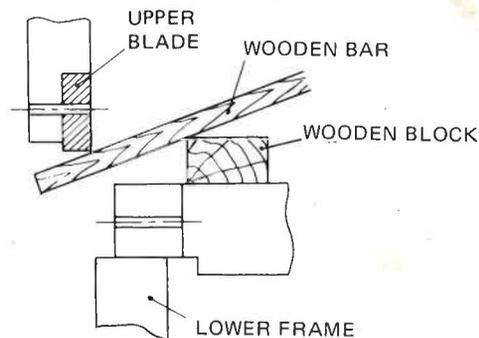
- (5) Remove all bolts except for the two located on both ends of the lower blade. To do this, one operator holds the bolts with a screwdriver at the rear of the machine and the other loosens the nut with a wrench at the front.



- (6) Remove the remaining two bolts from the lower blade. Be careful not to drop the blade.
- (7) Slide the lower blade along the surface of the lower frame and remove it from either frame gap.

Removing the upper blade

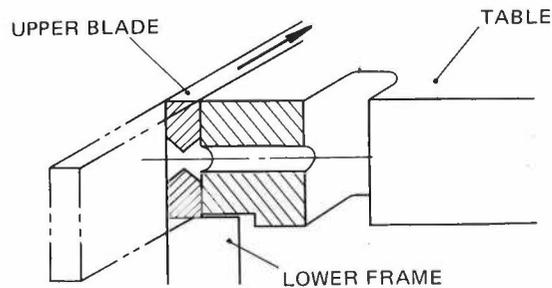
- (1) Place a wooden block and bar on the left and right sides of the table in order to support the weight of the upper blade.



- (2) Remove all bolts except for the two on both ends of the upper blade.
- (3) While supporting the weight of the upper blade, remove the bolt from each end of the blade.
- (4) Gradually lower the wooden bar to lower the blade to the lower frame, and withdraw it from the frame gap.

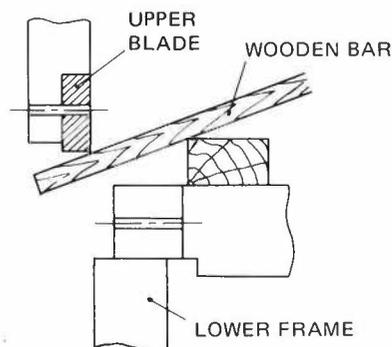
Installing the upper blade

- (1) Clean the mating surface of the ram to the upper blade then polish it with an oil stone.
- (2) Insert the upper blade through the frame gap and slide it on the lower frame until it reaches the mounting position.



NOTE: When sliding the upper blade, be careful not to drop it.

- (3) Place a wooden bar under the upper blade. Raise it to align the mounting holes, as shown in the figure, in order to contact the mating surface.



- (4) Install and temporarily tighten the mounting bolts.
- (5) Tighten all the bolts, starting with the middle one and work toward the outer ends of the blade.

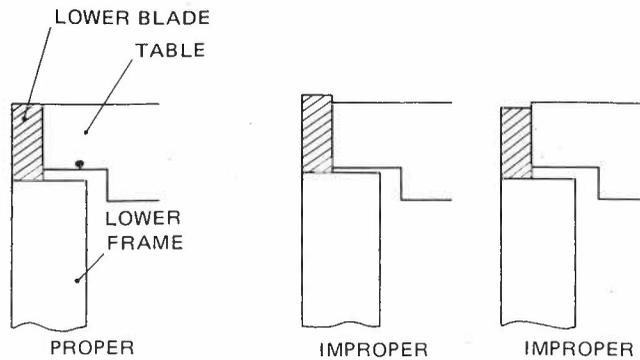
IMPORTANT: Do not tighten the bolts the other way around. This will cause the middle of the blade to have poor contact with the ram.

Installing the lower blade

- (1) Clean the mating surface of the table to the lower blade and polish it with an oil stone.
- (2) Insert the blade through the frame gap, and slide it on the lower frame until it reaches the mounting position.
- (3) Install the blade mounting bolts and temporarily tighten them with the nuts.
- (4) Tighten all the bolts, starting with the middle one and work toward the outer ends of the blade.

IMPORTANT: Do not tighten the bolts the other way around. This will cause the middle of the blade to have poor contact with the table.

- (5) Make sure the upper surface of the table is flush with the upper surface of the lower blade. If it is not, adjust the height of the lower blade as outlined under "Lower Blade Height Adjustment" on page 4-7.



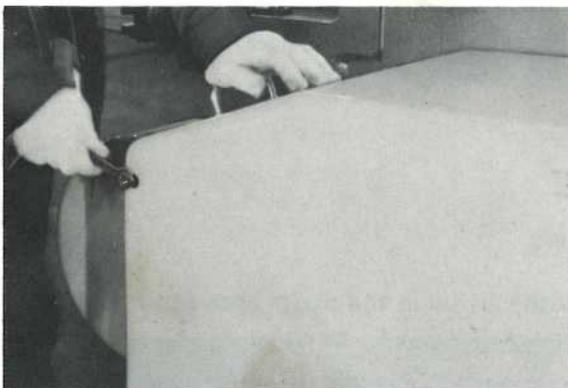
- (6) Adjust the blade clearance. Refer to "Blade Clearance Adjustment" on page 3-1 for adjustment procedures.
- (7) Shear several test pieces of worksheet to make sure the blades are properly installed.
- (8) Install the finger protector.
- (9) Install the frame gap covers.

LOWER BLADE HEIGHT ADJUSTMENT

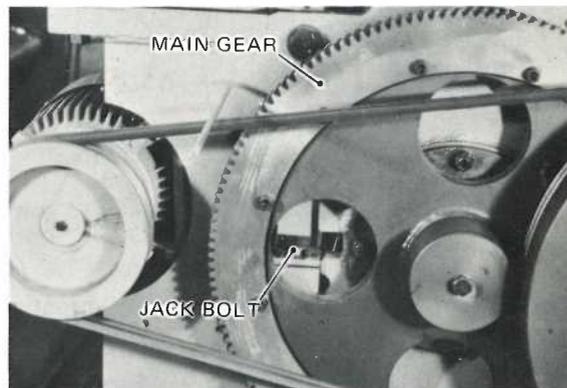
After installing the lower blade, check to see if the upper surfaces of the blade and table are flush. If not, adjust the lower blade height as follows:

NOTE: If the blade is higher than the table, the worksheet will not be fed in properly; if it is lower than the table, an undue bending force will be applied to the worksheet, resulting in a deflected end of the worksheet.

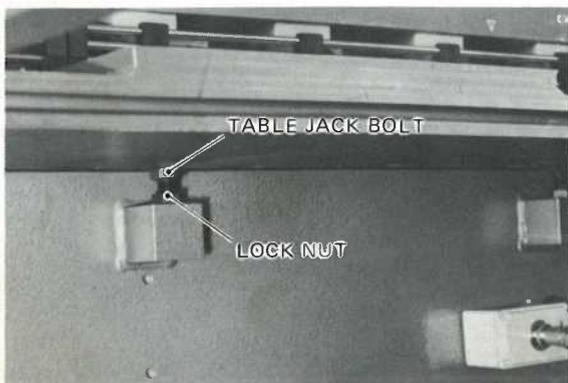
- (1) Remove the drive unit cover [Photo 34].
- (2) Rotate the main gear in the INCH mode until the through-hole in the main gear is aligned with the jack bolt [Photo 35].
- (3) Loosen the lock nuts of the table jack bolts, and loosen the jack bolts [Photo 36].
- (4) Loosen the mounting bolts which hold the lower frame onto the left and right frames [Photo 37].
- (5) Loosen the lock bolts and adjust the jack bolts on the lower frame so that the lower blade is flush with the upper surface of the table.
- (6) Turn the table jack bolts until their bolt heads firmly contact the lower surface of the table.
- (7) Tighten the lock bolts used with the lower frame and table jack bolts. Also tighten the lower frame mounting bolts securely.
- (8) Install the drive unit cover.



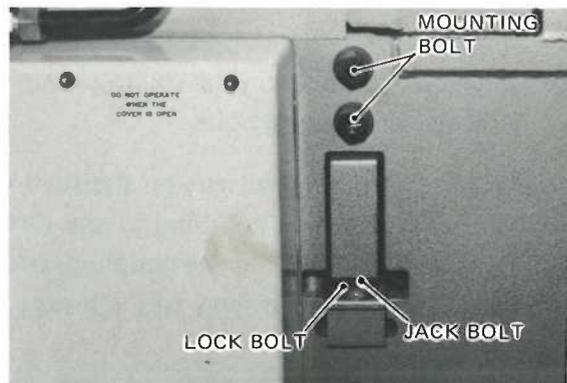
[Photo 34]



[Photo 35]



[Photo 36]



[Photo 37]

ADJUSTMENT OF BACKGAUGE PARALLELISM

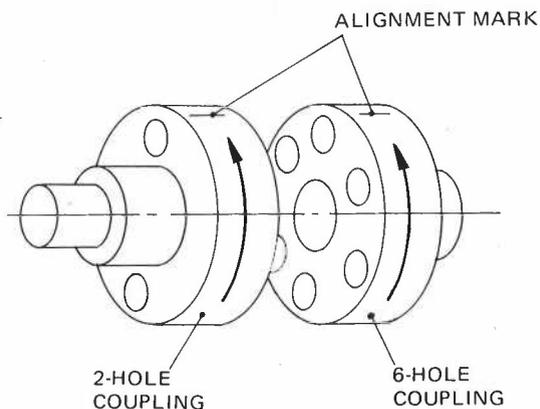
If the width of a worksheet which has been sheared on the left and right sides of the backgauge are not the same, the backgauge should be adjusted for proper parallelism. Prior to adjustment, perform steps (1) and (2) below:

- (1) Move the backgauge so that the CUTTING WIDTH display shows "50" mm (or "2.00" in).
- (2) Butt a 1.6 mm (0.063 in) thick test piece (approx. 200 mm wide and 500 mm long or 8 inch wide and 20 inch long) against the left, middle and right of the backgauge and cut the test piece, respectively. Measure the widths of the three cut-off pieces.

NOTE: To provide the best result for backgauge adjustment, data obtained by shearing a test sheet of 50 mm (or 2 in) in width and 1.6 mm (0.063 in) in thickness should be used.

If the sheet which has been sheared at the left of the backgauge (as viewed from the front of the machine) is wider than the one at the right, proceed as follows:

- (1) Turn the circuit breaker to OFF.
- (2) Remove the connecting rod cover from the backgauge.
- (3) Mark the location of the bolts which connect the couplings and remove the bolts.



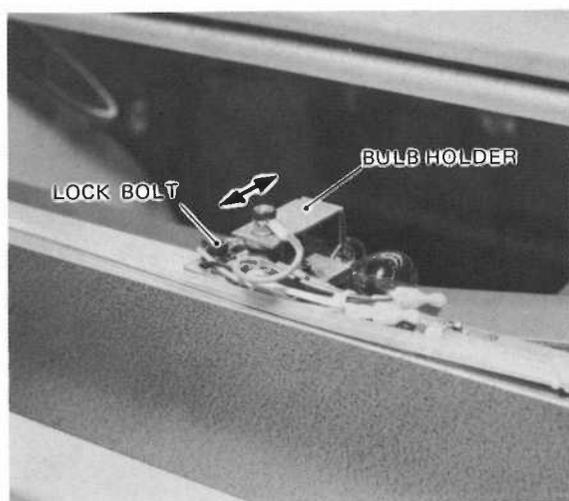
- (4) Turn the six-hole coupling in the direction of the arrow in the figure above to relocate the bolt holes, while the two-hole coupling is kept stationary. Movement of one bolt hole makes the backgauge move forward approximately 0.07 mm (0.003 in). In this way, adjust the bolt hole position as required until correct adjustment is made.
- (5) Align the bolt holes in the six-hole coupling with the two-hole coupling, and tighten them with two connecting bolts.

If the width of the sheet cut on the right of the backgauge is greater than that cut on the left, turn the two-hole coupling in the direction shown by the arrow in the figure above. After properly positioning the coupling, shear a test sheet and adjust the indication value on the CUTTING WIDTH display to the measured value.

BEAM LIGHT ADJUSTMENT

If shearing cannot be accurately performed by aligning the scribed line with the light beam, adjust the position of the beam light as follows:

- (1) Move the backgauge to an optional cutting width (50 mm, for example).
- (2) Turn the beam light on.
- (3) Butt a straightedge against the backgauge and check to make sure the 50 mm point on the straightedge corresponds with the beam line of the beam light.
- (4) If they are not aligned properly, loosen the bolts which hold the bulb holder and move the holder back and forth to adjust the beam light position [Photo 38].
- (5) After properly adjusting the beam light, move the backgauge backward. Shear test sheets to make sure the alignment of the beam line is correct.

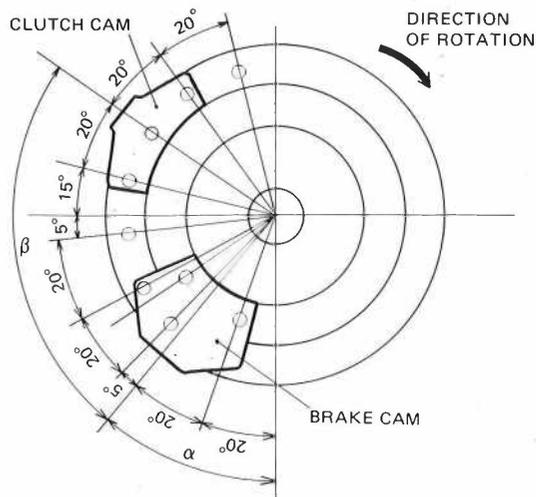


[Photo 38]

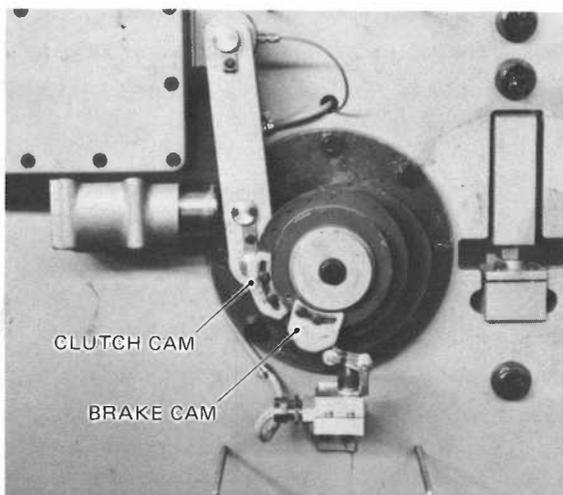
RAM STOP POSITION ADJUSTMENT

If the ram stops before or after its TDC, use the following procedure to adjust the ram so that it will stop at TDC.

- (1) Remove the cover from the electromagnetic clutch located on the left side frame of the machine. The clutch and brake cams will be exposed [Photo 39].
- (2) Check that the brake cam is set at " α " = 50° to 60° (shown in the following figure).



- (3) Set the clutch cam at " β " = 80° to 90° .
 - (4) If the ram stops after TDC, set the clutch cam mounting angle " β " slightly larger than the specified angle. If the ram stops before TDC, set the angle " β " slightly smaller than the specified angle. In either case, ensure the angle " β " falls within the 60 to 100° range.
- NOTE: If the ram stops significantly off TDC and the holddown device remains activated, it is necessary to adjust the mounting position of the brake cam.



[Photo 39]

ACCESSORY GUIDE

SPECIAL ACCESSORY

Front support w/scale

The front support is provided with a scale to determine the required shearing width of the worksheet without using the backgauge.

To set the required shearing width of the worksheet using the stopper, proceed as follows:

- (1) Position the stopper in relation to the required shearing width of the worksheet, using the scale as a guide. Tighten the stopper with the lock bolt.
- (2) Turn the adjustment nut to make a fine adjustment of the shearing width.

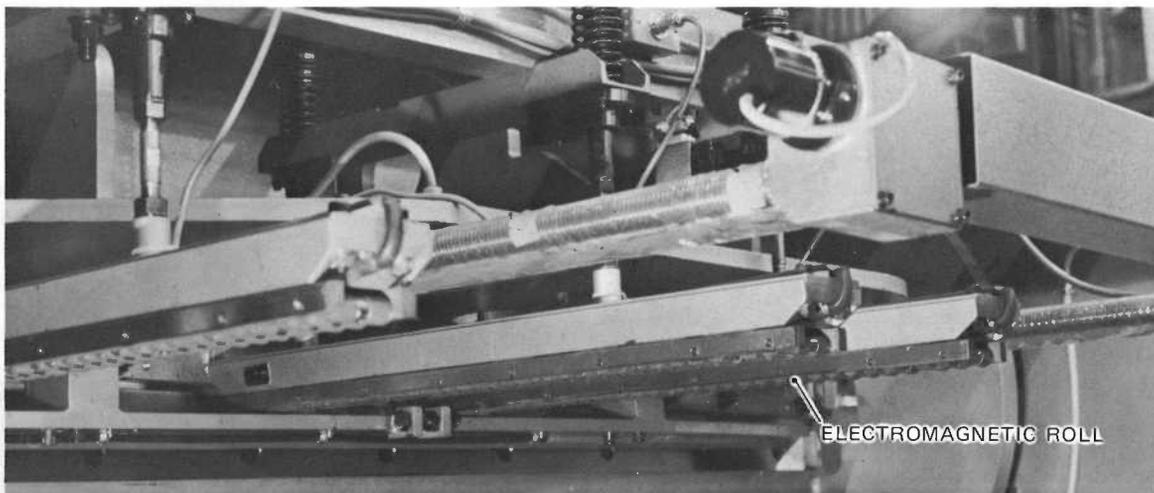
NOTE: The normal clearance between the stopper and the adjustment nut is 5 mm (0.2 in) or thereabouts. Shearing thin worksheets requires a wider clearance before the shearing width is set.

Electromagnetic sheet support [Photo 40]

This device attracts the worksheet with an electromagnetic roll, which eliminates the possibility of worksheet deflection between the backgauge and blades, so that the worksheet can be sheared accurately to the desired width.

To activate this device, turn the ON/OFF switch to ON, and set the adjustment dial to correspond to the weight of the worksheet. When the dial is turned clockwise, the magnetic force increases; when the dial is turned counterclockwise, the magnetic force decreases.

NOTE: The electromagnetic sheet support cannot be used with the machine equipped with an automatic release backgauge.



[Photo 40]

Pneumatic sheet support [Photo 41]

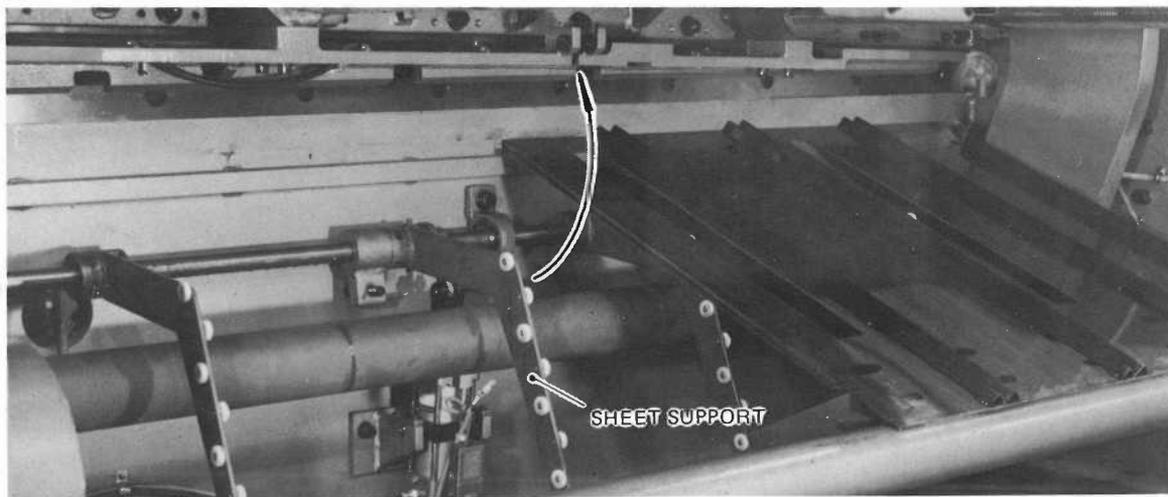
This device is operated by pneumatic pressure to hold the worksheet to the support, which eliminates the possibility of worksheet deflection between the backgauge and blades, so that the worksheet can be sheared accurately to the desired width.

To activate the device, turn the ON/OFF switch ON.

Automatic release backgauge

This backgauge automatically reverses itself at the backward end so that it will not interrupt the feeding of the worksheet to be sheared.

NOTE: This device is a standard accessory on models M-3060 and M-4060.



[Photo 41]

SPECIFICATIONS

Unit: mm (in)

Machine model	M-1245	M-1260	M-2045	M-2060	M-2545	M-2560	M-3045	M-3060	M-4045	M-4060
Item										
Max. thickness of worksheet [Tensile strength: 45 kg/mm ² (64000 psi)]	4.5 (0.18)	6.5 (0.26)	4.5 (0.18)	6.5 (0.26)	4.5 (0.18)	6.5 (0.26)	4.5 (0.18)	6.5 (0.26)	4.5 (0.18)	6.5 (0.26)
Max. cutting length	1240 (48.82)		2000 (78.74)		2500 (98.43)		3060 (120.4)		4080 (160.6)	4100 (161.4)
Blade length	1340 (52.7)		2300 (90.5)		2800 (110.2)		3380 (133.0)		4430 (174.4)	
Type of blade	Four-edged blade									
Gap depth	65 (2.56)						300 (11.81)			65 (2.56)
Rake angle	1°28'		1°18'	1°28'	1°18'	1°28'	1°18'	1°28'	1°18'	1°28'
No. of strokes (spm)	75	60						50	52	
Main motor kW (HP)	3.7 (5)	5.5 (7.5)				7.5 (10)		11.0 (15)		
Backgauge motor kW (HP)	0.4 (0.5)									
Machine weight kg (lb)	2700 (5952)	3700 (8157)	4600 (10141)	4700 (10361)	5300 (11684)	5500 (12125)	7100 (15653)	8400 (18519)	11000 (24251)	14000 (30865)
Holddown type	Hydraulic									
No. of holddown units	6		9		11		13		16	
Light beam (No. of bulbs)	40W x 2				40W x 3		40W x 4		40W x 5	

Specifications are subject to change without notice.

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200, Ishida, Isehara, Kanagawa, JAPAN

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