10M10 DRO
POWER SQUARING SHEAR

OPERATING INSTRUCTIONS

ROPER WHITNEY OF ROCKFORD, INC.

2833 HUFFMAN BLVD., ROCKFORD, ILLINOIS 61103-3990 * 815/962-3011 * FAX 815/962-2227

Website: www.roperwhitney.com * Email: info@roperwhitney.com

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ROPER WHITNEY of ROCKFORD, INC.
SAFETY RULES --- 10M10 SHEAR

1. WARNING:

   Electrical Danger -- Misuse or improper installation of machinery connected to a source of electricity may result in accidental shock that could cause injury or death.

   Installation must conform to National Electric Code (Article 250 - Grounding, etc.)

   Electrical connections must be made by a trained and qualified electrician. Electrical characteristics shown on motor plate and control panel must match the power source; and all electrically powered equipment must be grounded.

2. WARNING:

   Mechanical Danger -- Do not adjust the holddown; it is factory set for 1/4 inch gap and acts as the hand-guard. Do not exceed the work-piece material capacity -- otherwise serious damage will occur with your shear.

3. Machine to be operated by authorized personnel who have been trained by their supervisor with the working and safety features of the machine, and by reading and understanding the Operator's Manual.

4. Do not operate shear without reading this Operator's Manual and without proper supervisory instructions.

5. Perform all installation and set-up operations before applying power for electrical start-up.

6. Never operate machine with any guard removed; i.e., all required guarding to be installed and effective.

7. Never leave machine on or running unattended. When not in use, turn off all electrical power.

8. Never adjust machine with power on.

9. Avoid accidental start-up.

10. Do not use machine if servicing is required.

11. Use safety glasses and required protective tools.

12. Keep work areas clean and in proper order.

13. Be alert to all potential hazards.

INSTALLATION

RECEIVING

Immediately upon receiving the 10M10 mechanical shear, check it very carefully for damage or loss of parts in transit. Report any loss or damage to the delivering carrier promptly to insure proper handling of your claim. Also contact your Roper Whitney of Rockford Dealer. Prior to uncrating your 10M10 shear, read the instructions to remove and lift the shear.

WARNING: Do not lift the shear with a “fork-truck” at any point on the shear structure, because serious damage will occur to the shear. The only permissible procedure is to lift at the front of the ram by an “overhead sling” connected to an overhead crane or overhead lift of a “fork-truck”. The “overhead sling” must be connected to the cable guides which are located on the front side on each end of the ram.

LEVELING

WARNING: Shear must be removed from the shipping skid, and must be anchored securely to the floor. See lifting procedures of previously discussed Receiving Section. Reasonably level shear by referencing the table top in the length and depth directions. Leveling is accomplished with screws (owner supplied) installed in tapped 1/2-13 holes adjacent to each mounting hole.

CLEANING

WARNING: Machine electrical power must not be connected when cleaning transit shipment dirt. Clean machine thoroughly prior to connecting electrical power, and prior to running the shear. Despite precautions taken in preparing the shear for shipment, dirt and foreign material may accumulate on machine and other parts during transit, and can cause considerable damage unless thoroughly cleaned. It is extremely important to inspect and clean off any dirt and foreign material that may have accumulated. DO NOT attempt to blow dirt out or off with an air hose as this may force some foreign material into undesirable areas. Remove rustproofing compound with an acceptable solvent.

1.1.0. Description and Specification

1.1.1. Description

10M10 mechanical shear is built in strong all-welded steel and designed for maximum loading, allowing the machine to operate perfectly within the entire capacity area.

10M10 has the following standard equipment:

- Strong adjustable guideway
- 7.5 HP gear motor and brake
- Motor/manual backgauge 30” (0-750 mm)
- Blades with double edges
- Finger guard
- Operation tools and operating instructions
- Squaring arm with stop 40” (1000 mm)
- Sheet support with return plate
- Cutting line lighting

The range of special equipment is described in section 6.1.0.

1.1.2. Data

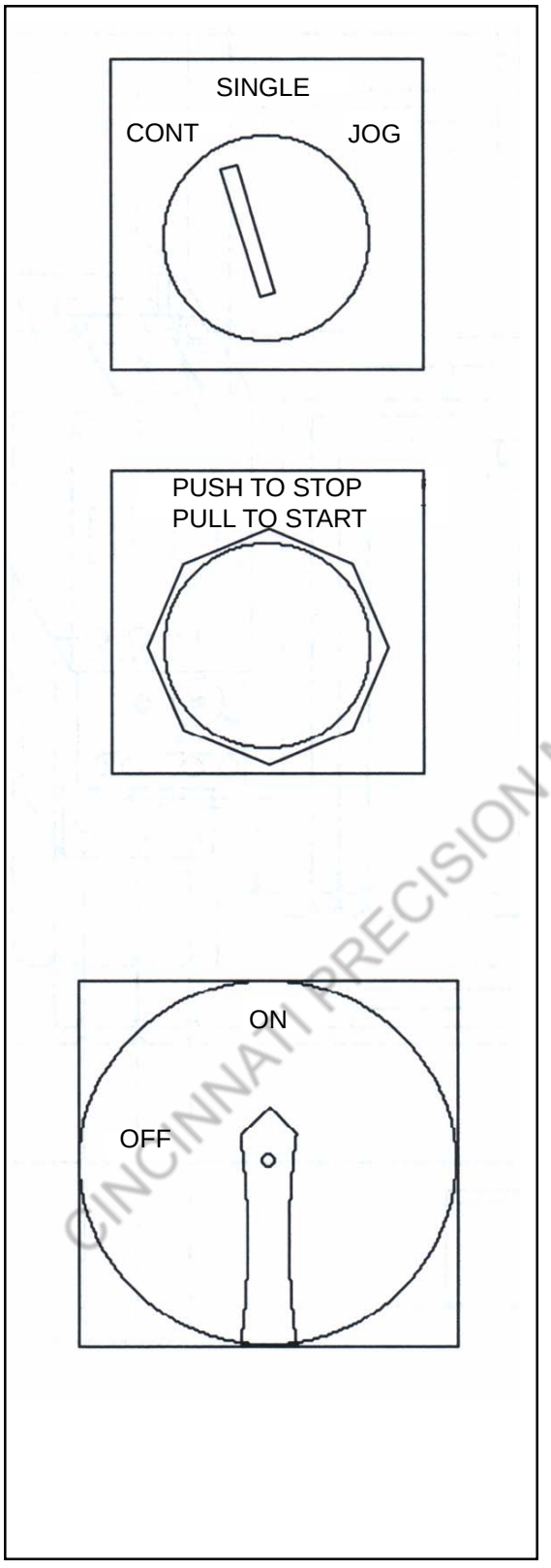
Model	Capacity	Cutting Angle	Strokes Per Min.	Motor HP
10M10	120” x 10ga	2°	43	7.5

1.1.3. Operational Functions

1. Switch on the power with the main switch (Fig. 1).

2. Pull the red mushroom switch (Fig. 1) in order to activate. The red light will illuminate. The machine is ready for operation.

Fig. 1



MODE OF OPERATION SWITCH:

1. CONTINUOUS
2. SINGLE
3. JOG

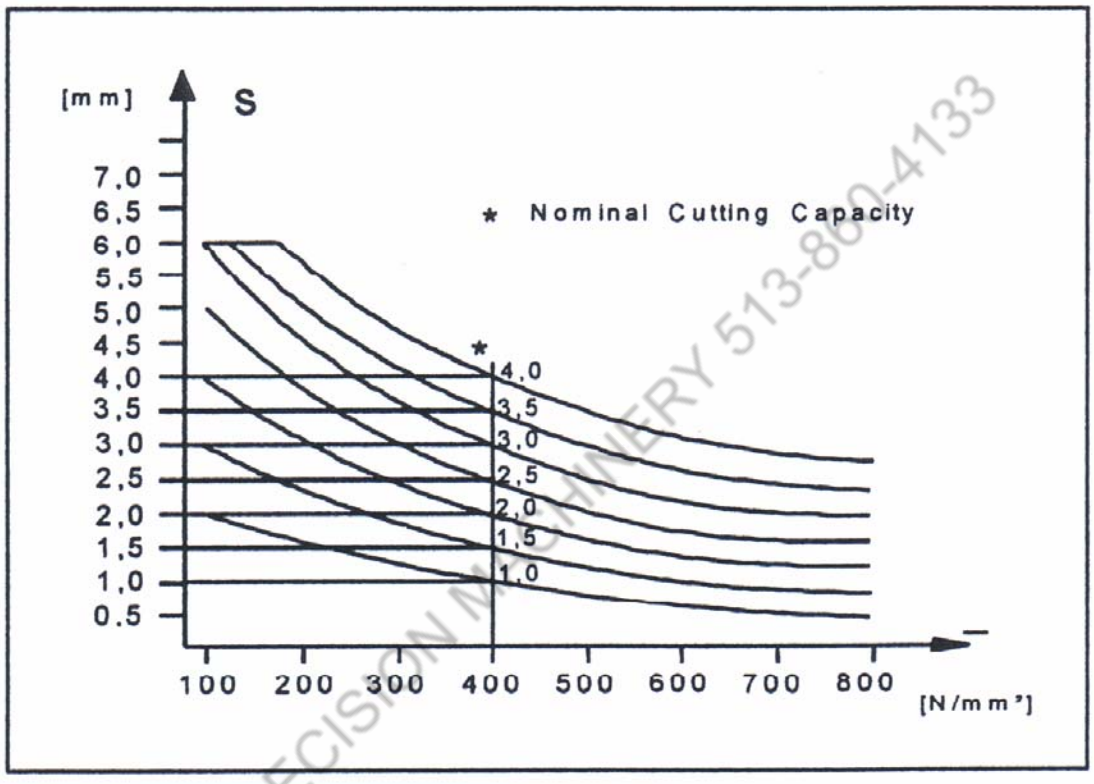
PULL: TURN ON MACHINE
(ILLUMINATED RED WHEN ON)

PUSH: TURN OFF MACHINE
PUSH: EMERGENCY STOP

3-PHASE ELECTRICAL
POWER DISCONNECT SWITCH

1.1.4. Capacity

The machine is dimensioned for sheet with ultimate stress 400 N/mm2. If you wish to cut sheet with another ultimate stress, please read the diagram below.



The opening of the hold-down is not allowed to exceed .236” (6 mm).

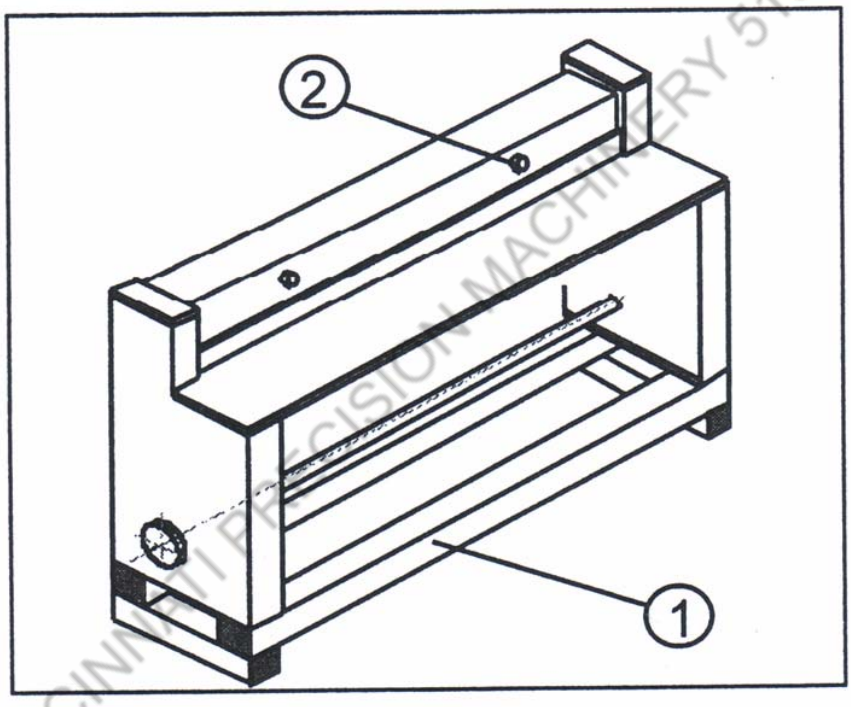
2.1.0. Mounting and Starting

The 10M10 shear is already mounted when delivered, however, the backgauge will have to be mounted afterwards.

2.1.1. Lifting Instructions

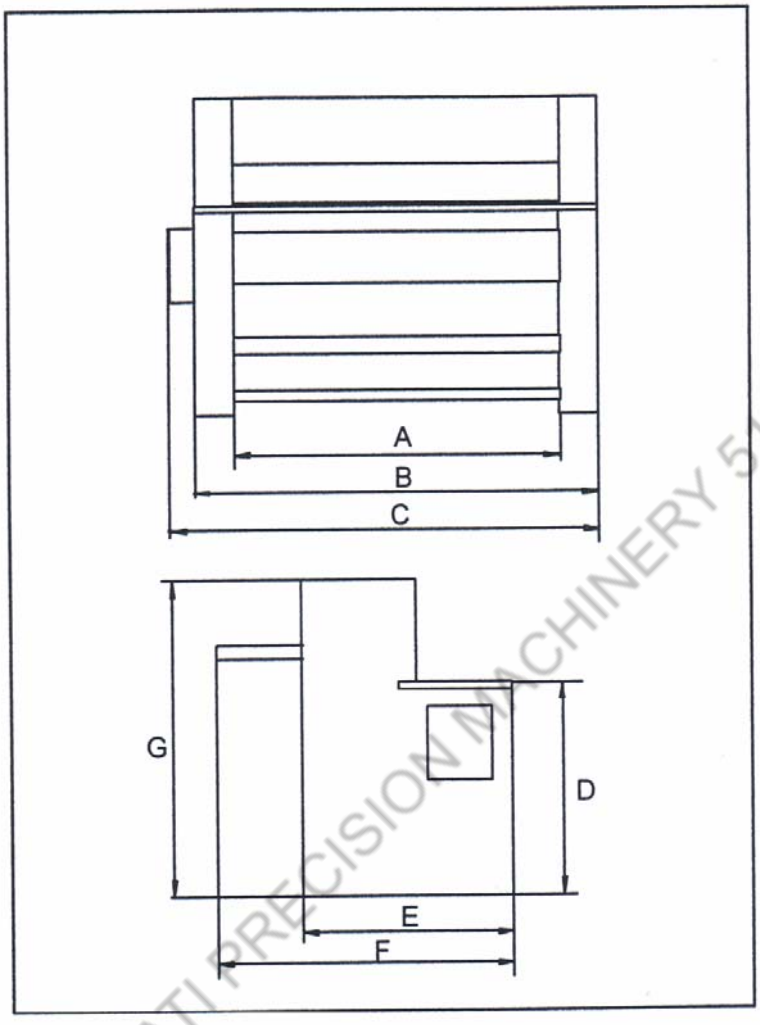
The machine is delivered with bearers (Fig. 2, Pos. 1). Use the bearers when unloading the machine from the van with a truck. After unloading the machine, remove the bearers and use the fittings to lift away the machine (Fig. 2, Pos. 2).

Fig. 2



Model	Weight
10M10	6,300 lbs

2.1.2. Space Requirements



Distance	10M10	
A	122.4”	(3110 mm)
B	137”	(3482 mm)
C	143”	(3632 mm)
D	35.4”	(900 mm)
E	34”	(866 mm)
F	63”	(1600 mm)
G	52”	(1322 mm)

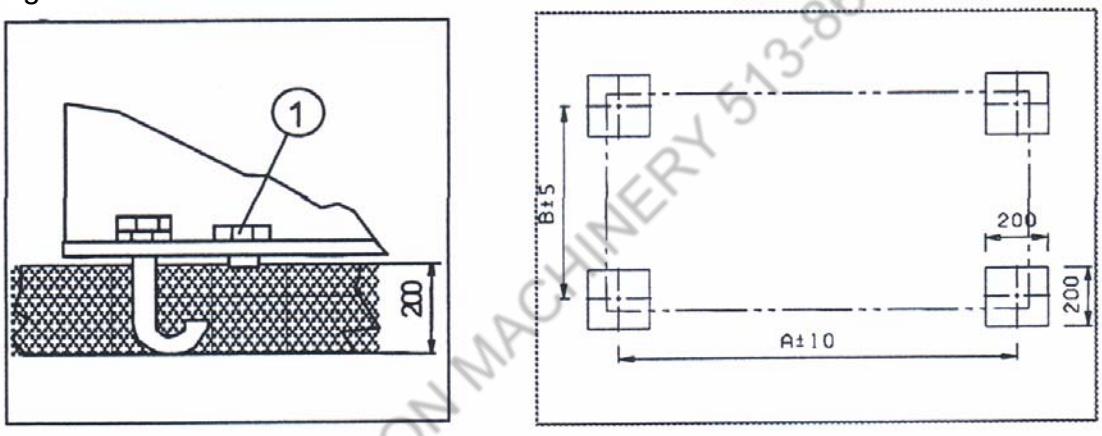
2.1.3. Erecting the Machine

To function properly, the 10M10 shear has to be placed on a stable bedplate. The table has to be entirely level when the shear is erected.

Fasten the shear to the bedplate with imbedded anchoring bolts. When erecting the machine, use the four adjustable corner supports (Fig. 3, Pos. 1).

After erecting the shear, examine the blade gap (Section 3.1.1.).

Fig. 3



Anchoring measures:

Model	A	B
10M10	133” (3380 mm)	27.6” (702 mm)

2.1.4. Electrical Installation

Voltage: 230V/460V, 3 Phase, 60 Hz
Consumption: 22/11 Amp
Mains fuse: 60/30 Amp

It is **IMPORTANT** that the direction of rotation of the motor follows the direction of the arrow (upwards/forward). The arrow is placed on the motor.

If the shear moves in the wrong direction the current has to be reversed.

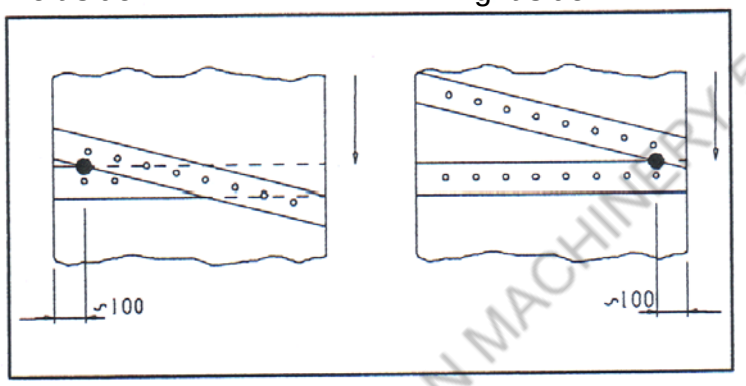
3.1.0. Adjustment of the 10M10 Shear

3.1.1. Adjustment of Blade Gap

In order to make the shear operate correctly the blade gap has to be adjusted for the sheet thickness and the sheet quality. Normally, the distance between the upper blade and the lower blade has to be approx. 5% of the sheet thickness. However, as there are many different sheet qualities the distance may vary. The blade gap has been set at about 60% of maximum sheet thickness.

Fig. 4

Left side Right side



IMPORTANT! It is important that the adjustment is made form a larger towards a smaller measure, i.e. start by turning the handle (Fig. 5, pos. 1) counter-clock wise to about 0.40 and after that adjust to the wanted value on the scale (Fig. 5, pos. 8) by turning the handle (Fig. 5, pos. 1) clockwise.

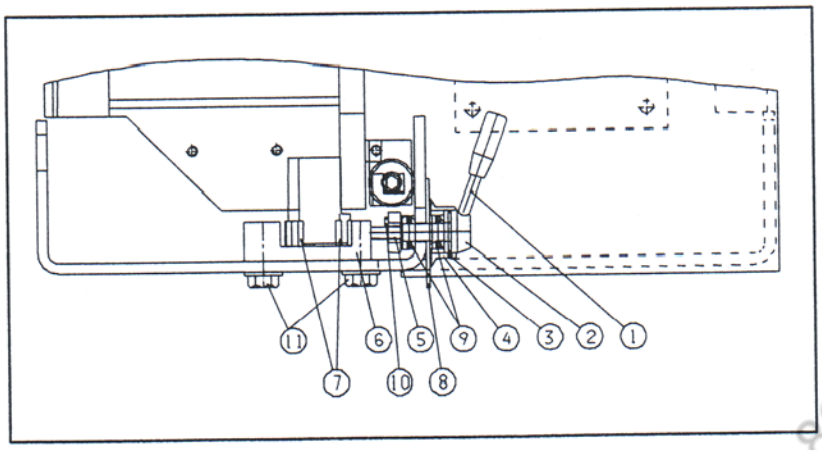
1. Choose jog on the main selector switch and activate the foot pedal jogging the ram so that the hold-down touches the table.

2. Loosen the bolts (Fig 5, pos. 11) on the right and the left side.

3. Adjust the blade gap to the wanted position by means of the handle (Fig. 5, pos. 1) to be read on the scale (Fig. 5, pos. 8). This adjustment has to be made on both sides of the machine.

4. Tighten the bolts (Fig. 5, pos. 11) on both sides of the machine.

Fig. 5



3.1.1.a Adjustment of the Blade Gap When Starting the Machine

It is necessary to control/adjust the blade gap when the machine has been erected. It is also necessary to adjust the blade gap after having exchanged the blades. The adjustment is necessary to be sure, that the actual blade gap and the scale for the adjustment of the blade gap fit together.

IMPORTANT! It is important that the adjustment is made form a larger towards a smaller measure, i.e. start by turning the handle (Fig. 5, pos. 1) counter-clock wise to about 0.40 and after that adjust to the wanted value on the scale (Fig. 5, pos. 8) by turning the handle (Fig. 5, pos. 1) clockwise.

1. Choose jog on the main selector switch and activate the foot pedal jogging the ram until the blades cross over each other by 3.937” (100 mm) on the left side (Fig. 4).

2. Loosen the bolts (Fig. 5, pos. 11) on both sides of the machine.

3. Adjust the blade gap by means of the handle (Fig. 5, pos. 1) until a blade gap of .001” (0.05 mm) is achieved. Examine with a blade feeler gauge.

IMPORTANT! It is very important that the blade gap is examined exactly in the blade cross over.

4. Tighten the bolts (Fig. 5, pos. 11) on the left side when the blade gap on the left side is .001” (0.05 mm).

5. Activate the foot pedal, jogging the ram until the blades cross over each other by 3.937” (100 mm) on the right side of the machine (Fig. 4).

6. Adjust the blade gap by means of the handle (Fig. 5, pos. 1) until a blade gap of .001” (0.05 mm) is achieved. Examine with a blade feeler gauge.

7. Tighten the bolts (Fig. 5, pos. 11) by a blade gap of .001” (0.05 mm) on the right side.

8. Examine the blade gap on the left side to be sure that the adjustment has not moved.

9. Loosen the arrow disc (Fig. 5, pos. 4) with the screw (Fig. 5, pos. 3) on both sides.

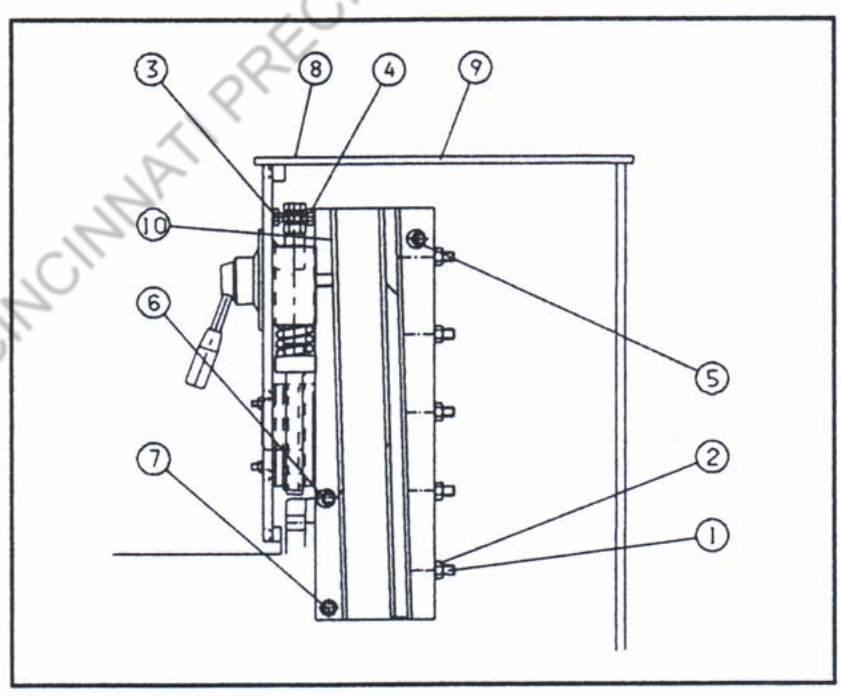
10. Turn the arrow disc (Fig. 5, pos. 4) until the arrow position is opposite .001” (0.05 mm) on the scale.

11. Tighten the arrow disc (Fig. 5, pos. 4) with the screw (Fig. 5, pos. 3) on both sides.

12. Tighten the set screw (Fig. 5a, pos. 3) to a firm stop. Tighten the nut (Fig. 5a, pos. 4).

The blade gap has now been adjusted. You can set the gap as wanted as per the above description.

Fig. 5a



3.1.2. Adjustment of Guideway

Adjust the guideway as follows:

1. Remove the shield (Fig. 6, pos. 1 & 3).

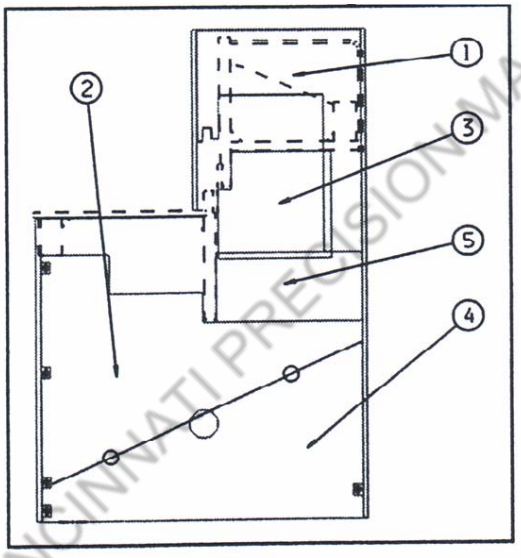
2. Loosen the nuts (Fig. 5a, pos. 2)

3. Adjust the air gap (Fig. 5a, pos. 10) by tightening the pivot screws (Fig. 5a, pos. 1) entirely. Loosen the same pivot screws approx. 4-5°, and counter-tighten the nuts (Fig. 5a, pos. 2). The space distance will now be approx. .0008” (0.02 mm). Examine with a blade feeler gauge.

4. Move the clamping beam up and down for 2-3 minutes. In case of discords loosen the guideway, as it has been tightened too much.

5. Replace the shield (Fig. 6, pos. 1 & 3).

Fig. 6



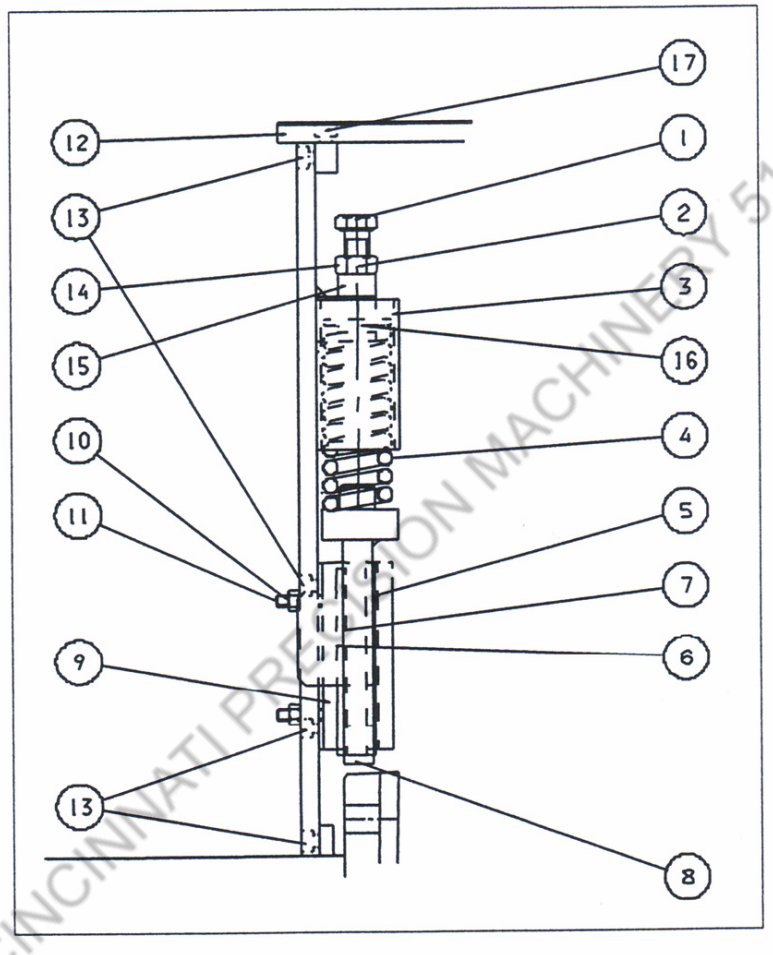
3.1.3. Adjustment of Guideway for Hold-Down

1. Loosen the nuts (Fig. 7, pos. 10).

2. Tighten the screws (Fig. 7, pos. 11) until there is only .001” (0.05 mm) space between the hold-down and its guide (Fig. 7, pos. 6).

3. Tighten the nuts (Fig. 7, pos. 10).

Fig. 7



3.1.4. Adjustment of Hold-Down Pressure

Adjust the hold-down pressure as follows:

1. Remove the screws (Fig. 7, pos. 17 under the rubber plate).

2. Remove the cap (Fig. 7, pos. 12).

3. Loosen the check-nut (Fig. 7, pos. 2).

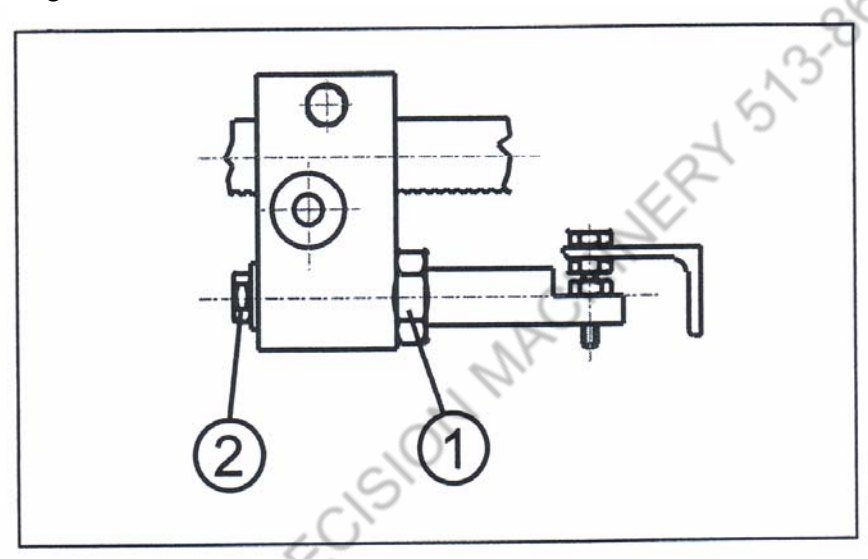
4. Use the screw (Fig. 7, pos. 1) to adjust the hold-down for the required pressure.

5. Tighten the check-nut (Fig. 7, pos. 2) and mount the cap (Fig. 7, pos. 12).

3.1.5. Adjustment of Back Gauge (manual with racks)

Adjust the back gauge by means of the adjusting screw (Fig. 8, pos. 1), after having loosened the set screw (Fig. 8, pos. 2).

Fig. 8

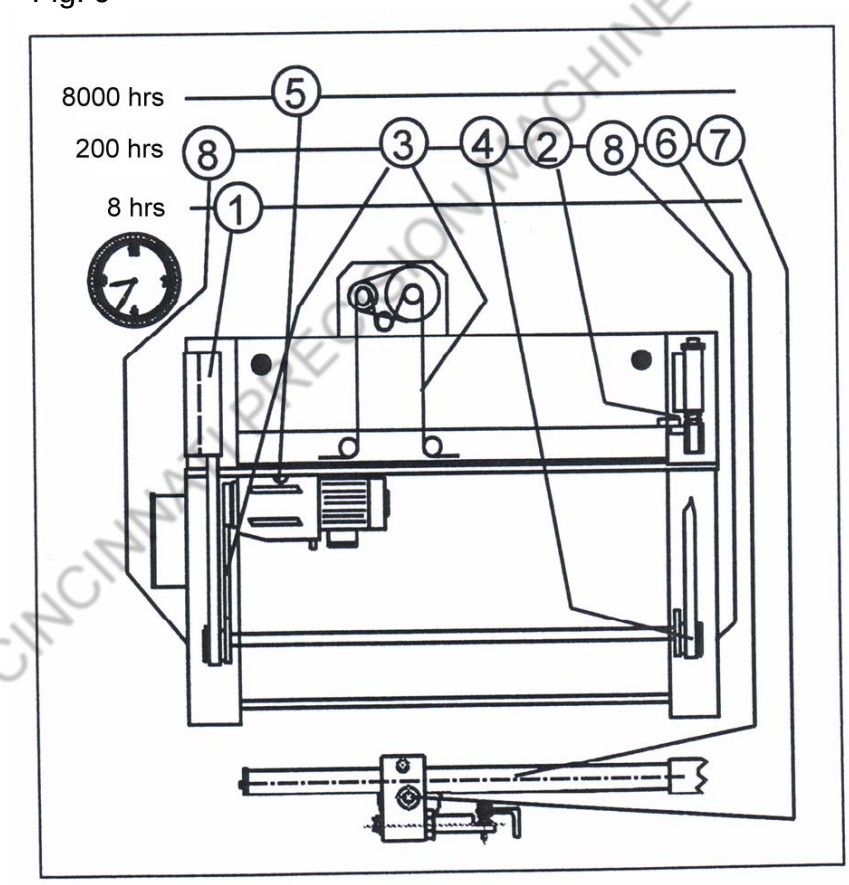


4.1.0. Lubrication and Maintenance

The lubrication points are shown on figure 9. For lubrication use non-acid oil. Lubricate on a regular basis. Use chain spray for the chain behind the left side frame.

No.	Machine Part	Lubricant
1	Guideway for clamping beam	White Lithium Grease
2	Guideway for hold-down	White Lithium Grease
3	Chain gear	White Lithium Grease
4	Eccentric bearings	White Lithium Grease
5	Gear box	Mobilgear 630
6	Rack	White Lithium Grease
7	Driving wheel	White Lithium Grease
8	Main bearings	White Lithium Grease

Fig. 9

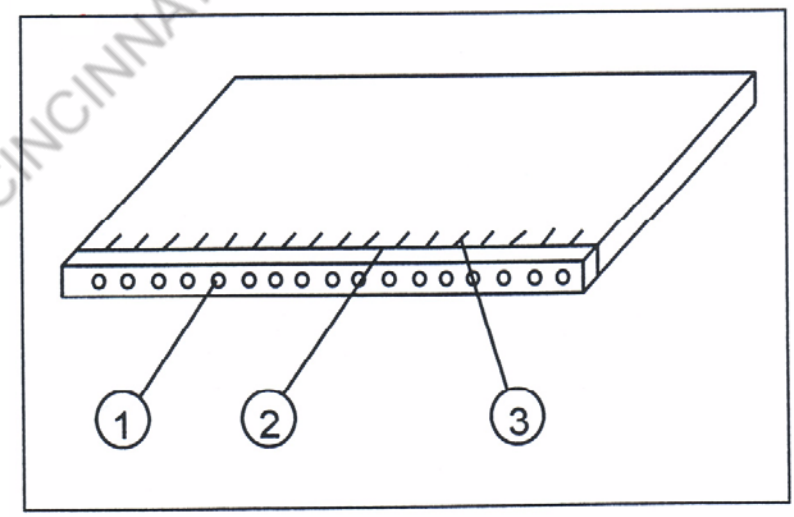


4.1.1. Replacement of Rubber Strip

If the rubber strip is worn out it has to be replaced as follows:

1. Remove the hold-down (Section 8.1.4).
2. Remove the old pop rivets (Fig. 10, pos. 1) with a .130” drill (3.3 mm drill).
3. Remove the old rubber strip and clean the contact face (Fig. 10, pos. 2) in order to remove rubber and glue remains.
4. Make a small mark with e.g. a pencil (Fig. 10, pos. 3) in front of each hole in the hold-down.
5. Remove the protection tape of the new rubber strip, attach the rubber to the hold-down and fasten it with a rubber hammer.
6. Each mark shows where holes will have to be drilled in the rubber strip. Use a .130” (3.3 mm) drill in the middle of the hold-down.
7. Countersink the holes in the rubber strip approx. .060” - .079” (1.5-2.0 mm) with a .275” drill (7 mm drill).
8. Place the pop rivets, .126” dia. x .394” (3.2 mm dia. x 10 mm), in the holes and fasten them with pop rivet nippers.
9. Fasten the rubber strip with a rubber hammer and mount the hold-down (Section 8.1.4).

Fig. 10



5.1.0. Possible Faults

1. The shear operates slowly and the overload trips. Possible cause:

The brake rectifier is burned out. The rectifier is located in the motor's terminal box. To determine this, measure the voltage across terminals 5 and 6. The voltage should be approx. 103V DC (see circuit diagram).

The air gap of the brake is not adjusted correctly, has to be .007"-.012" (0.2-0.3 mm).

2. The cut-off sheet has burrs. Possible cause:

The blade gap is not adjusted correctly (has to be approx. 5% of the sheet thickness, section 3.1.1.).

The guideways have too much backlash (section 3.1.2. and 3.1.3.).

The blades are worn out and have to be turned/ground (section 8.1.1. and 8.1.2).

3. The shear cannot cut the maximum sheet thickness. Possible cause:

The brake does not function (section 5.1.0., point 1).

The blade gap is not adjusted correctly (section 5.1.0., point 2).

The cross section (square) of the connection wire is too small, causing too large of a power loss. Ask your electrician whether the wire fits the motor size. The power loss will also be too large if the wire is too long.

4. The shear blows the main fuses. Possible cause:

The fuses are too small (section 2.1.4). Change the fuses, however, if they are blown again, call your electrician.

Short-circuit in the main-circuit (circuit diagram).

5. The overload disconnects. Possible cause:

The brake is stuck (section 5.1.0., point 1).

When the shear cuts many small pieces of sheet the motor might get hot and the overload disconnects. Choose continuous stroke (position 2) with the reverser switch in order to make the motor not activate the brake between the individual cuts.

6. The eccentric bearings get hot. Possible cause:

When operating in position 2 (continuous stroke) it will be necessary to lubricate the eccentric bearings with non-acid oil (section 4.1.0).

7. The sheet is stuck in the shear. Possible cause:

Release the sheet by opening the electrical control cabinet and replacing wire L1 by wire L3 (circuit diagram). **Be aware that only an electrician is allowed to replace the wires.** Close the electricity cabinet and switch on the main power. Choose tipping (position 3) with the reverser switch. Activate the foot switch intermittently, causing the shear to move slowly upwards and releasing the sheet. Pull out the sheet and switch off the main power. Replace wire L1 by wire L3 whereupon the shear will move in the right direction. Switch on the main supply and the shear will be ready for operation.

Other possible causes: wrong adjustment of blade gap, poor blade quality, wrong adjustment of guideway, brake malfunction (read points regarding these problems).

8. The hold-down does not stop at the top. Possible cause:

The endstop is activated too late, and the endstop arm has to be adjusted slightly upwards until the hold-down stops in the top.

The endstop is activated too early, and the endstop arm has to be adjusted slightly downwards until the hold-down stops in the top.

6.1.0. Equipment

Special equipment available:

- Return plate with tilting plate (back to sender)
- Table extension
- Front operated manual back gauge with spindles
  25.60”, 29.54”, 39.37” (650, 750 & 1000mm)
- Motorized back gauge with pre-selection
  (ELGO 71P controller) 25.60”, 29.54”, & 39.37” (650, 750, & 1000mm)
- Motorized back gauge with pre-selection and ball screws (NCO controller)
  25.60” & 39.37” (650 & 1000mm)
- Programmable motorized backgauge with ball screws (NCP controller)
  25.60” & 39.37” (650 & 1000mm)
- Safety guard at the rear of machine
- Adjustable squaring arm with graduated scale
- Conveyor unit
- Stacking unit

7.1.0. Operational Limitations

The capacities of the 10M10 Shear are listed on page 6.

Important! The machine might be overloaded if the capacities specified are not observed.

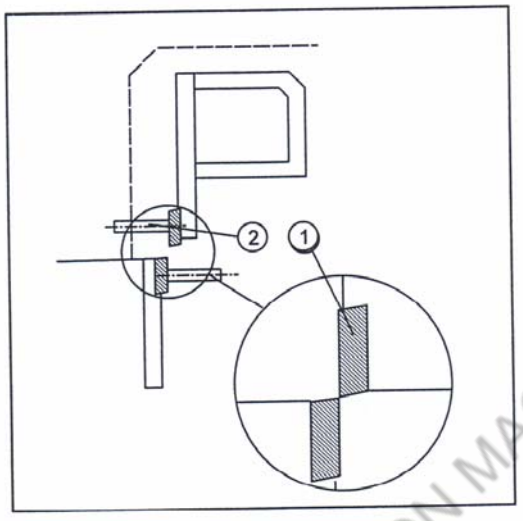
It is not allowed to use this machine for cutting profiles or solid bar stocks (e.g. round steel bars, angle steel or square steel).

8.1.0. Removing Blades

Switch off the main power before removing the blades. For safety reasons we recommend that any replacement of the blades is carried out by 2 people.

When removing the blades, it is important to remove the lower blade before the upper blade. When mounting the blades it is important to mount the upper blade before the lower blade.

Fig. 11



8.1.1. Lower Blade

Remove the lower blade as follows:

1. Switch off and lock the main switch.
2. Remove all screws, however, there has to be one remaining screw in each side of the shear.
3. Place 2 pcs. M12-thread pieces or screw (Fig. 11, pos. 2) for lifting the blade.
4. Remove the two remaining screws. The blade can now be lifted off.
5. It is important to clean both the contact face and the blade before mounting the blade.
6. Mount the blade as described above, but in reverse order.
7. **Remember to adjust the blade gap and turn the blades as shown in Fig. 11, pos. 1.**

8.1.2. Upper Blade

Remove the upper blade as follows:

1. Switch off and lock the main switch.
2. Remove the hold-down (Section 8.1.4.).
3. Remove all screws, however, there has to be one remaining screw in each side of the shear.
4. Place 2 pcs. M12-thread pieces or screws for lifting the blade.
5. Remove the two remaining screws. The blade can now be lifted off.
6. It is important to clean both the contact face and the blade before mounting.
7. Mount the blade as described above, but in reverse order.
8. Remember to adjust the blade gap and turn the blades as described in Fig. 11, pos. 1.

8.1.3. Chain

When the motor chain of the shear is removed, the clamping beam might fall down. Therefore the clamping beam has to be supported between the upper blade and the lower blade. We recommend that you only remove the chain when the clamping beam is placed in the bottom position.

8.1.4. Hold-Down

1. Choose tipping (position 3) and move the upper cutter bar to bottom position.

2. Disconnect the shear (remove the fuses).

3. Remove the top shield (Fig. 7, pos. 12).

4. Remove the side frame (Fig. 6, pos. 1).

5. Loosen the nut (Fig. 7, pos. 2).

6. Loosen the screw (Fig. 7, pos. 1) entirely. The pressure of the spring towards the hold-down will now be eliminated.

7. Remove the bolts (Fig. 7, pos. 14) and remove thrust arm for hold-down (Fig. 7, pos. 15).

8. Remove the thrust pad (Fig. 7, pos. 4) and the spring (Fig. 7, pos. 16).

9. Loosen the nut (Fig. 7, pos. 10) and the bolt (Fig. 7, pos. 11).

10. Remove the slide rail (Fig. 7, pos. 9). **Important! The hold-down is now only supported on one side.**

11. Remove the bolts (Fig. 7, pos. 13) and remove the front plate (Fig. 7, pos. 17).

12. It is now possible to move the hold-down to the table and lift it away.

13. Mount the hold-down in reverse order and adjust the guideway for the hold-down (see section 3.1.3.).

8.2.0. Important Information

Be aware that this machine has to be adjusted if the sheet thickness is changed.

Be aware of the capacity limitations as well as the other limitations of this machine.

If problems occur, which cannot be solved with these operating instructions, please contact your supplier.

9.1.0. Sheet Support with Return Plate

The sheet support transports the sheet to the gauge rail, whereupon the return plate delivers the sheet in front of the shear.

Fig. 12

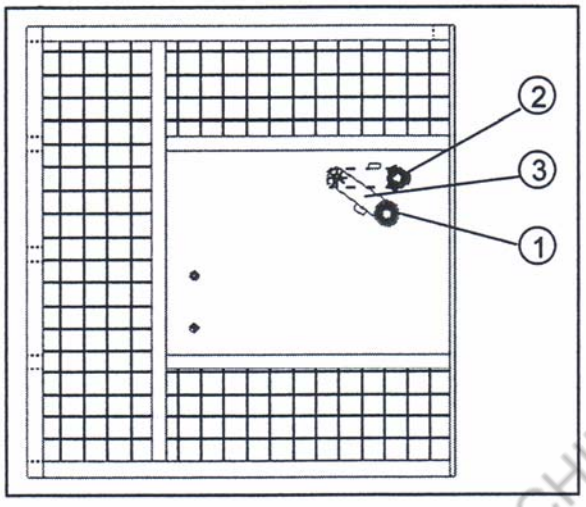
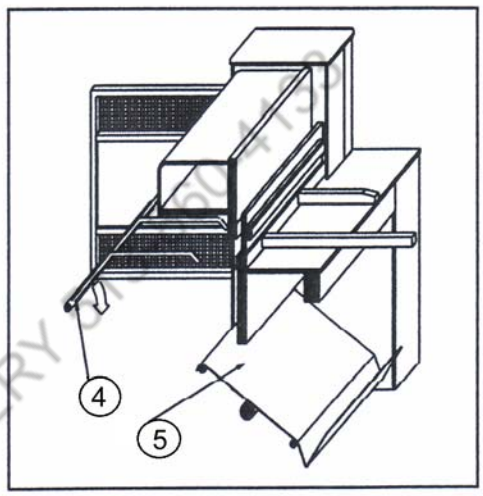


Fig. 13



Sheet Support in Operation

1. Place the handle (Fig. 12, pos. 3) in position 2 (Fig. 12).

2. The sheet support (Fig. 13, pos. 4) will move in the direction of the arrow, when the shear moves downwards, and the return plate (Fig. 13, pos. 5) will deliver the sheet in front of the shear.

3. When the shear has reached its top position the sheet support will return to its starting position.

Sheet Support Not in Operation

1. Place the handle (Fig. 12, pos. 3) in position 1 (Fig. 12).

2. The sheet support (Fig. 13, pos. 4) will move in the direction of the arrow, when the shear moves downwards, and the return plate (Fig. 13, pos. 5) will deliver the sheet behind the shear.

3. The sheet support will remain in its position, even after the shear has returned to its top position.

10.1.0. Return Plate with Tilting Plate

This equipment makes it possible to choose whether to deliver the sheet in front of or behind the shear.

Fig. 14

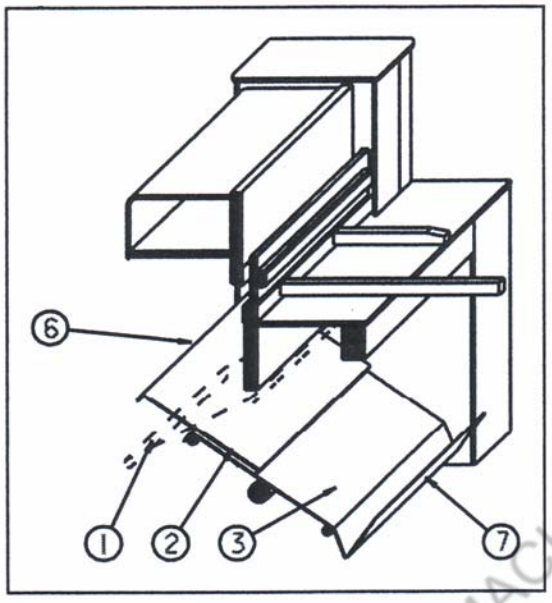
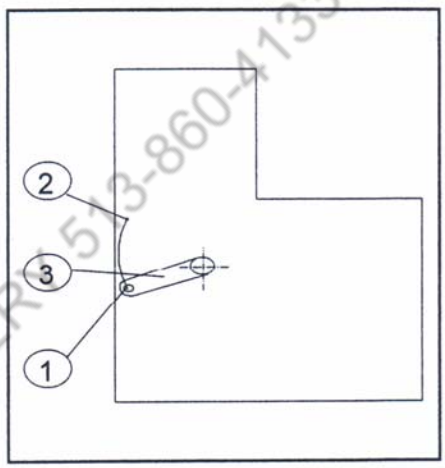


Fig. 15



Delivery of the Sheet In Front of the Shear

1. Place the handle (Fig. 15, pos. 3) in position 2 (Fig. 15).

2. When the tilting plate (Fig. 14, pos. 2) is placed in position 6 (Fig. 14) the return plate (Fig. 14, pos. 3) will deliver the sheet in front of the shear.

Delivery of the Sheet Behind the Shear

1. Place the handle (Fig. 15, pos. 3) in position 1 (Fig. 15).

2. When the tilting plate (Fig. 14, pos. 2) is placed in position 1 (Fig. 14) the return plate (Fig. 14, pos. 3) will deliver the sheet behind the shear.

11.1.0. Motorized Back Gauge with Automatic Rough Adjustment/Fine Hand Adjustment

Adjust the motorized backgauge as follows - example 13.78” (350 mm):

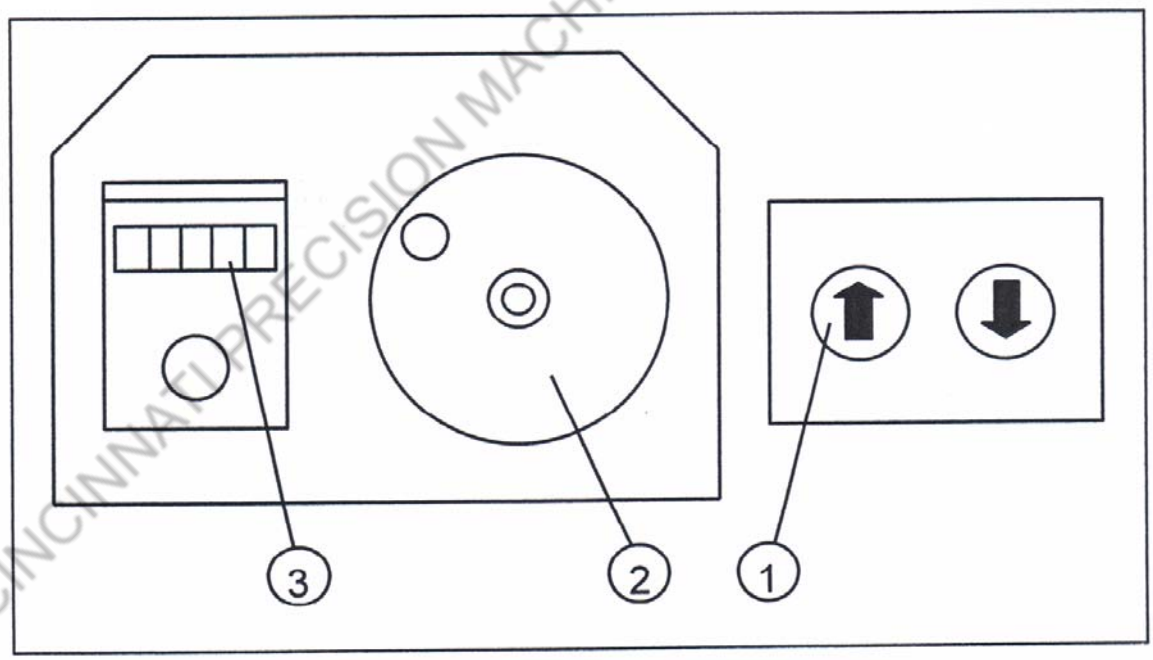
1. Use the push button (Fig. 16, pos. 1) to move the back gauge as closely to the required position as possible.

   It is important that the adjustment is made from a larger to a smaller measure.

2. Use the hand wheel (Fig. 16, pos. 2) to place the back gauge exactly at the required position (in this case 13.78”, which will be displayed in the counting display Fig. 16, pos. 3).

The procedure applies for all measures.

Fig. 16

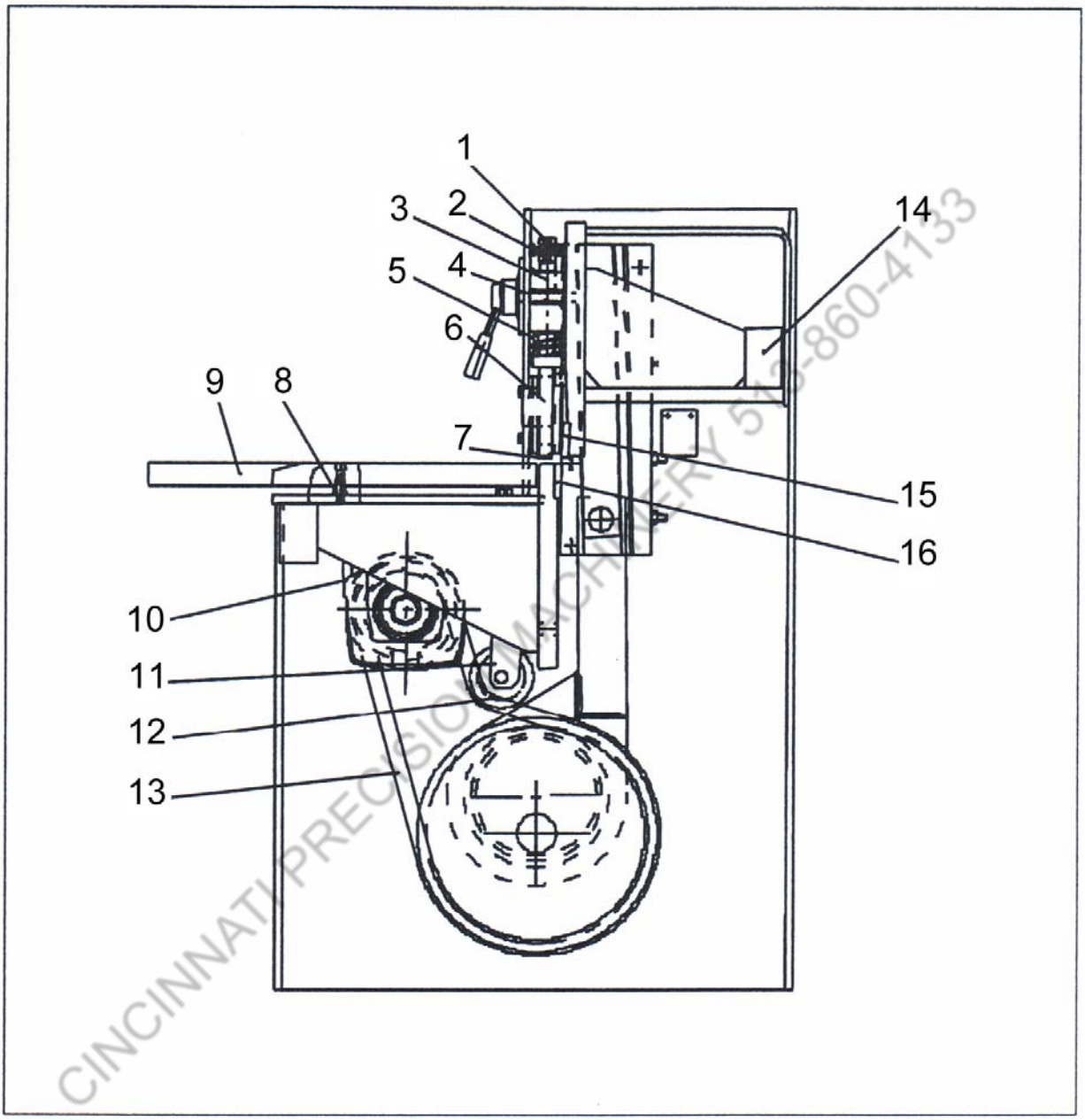


12.1.0 Spare Parts

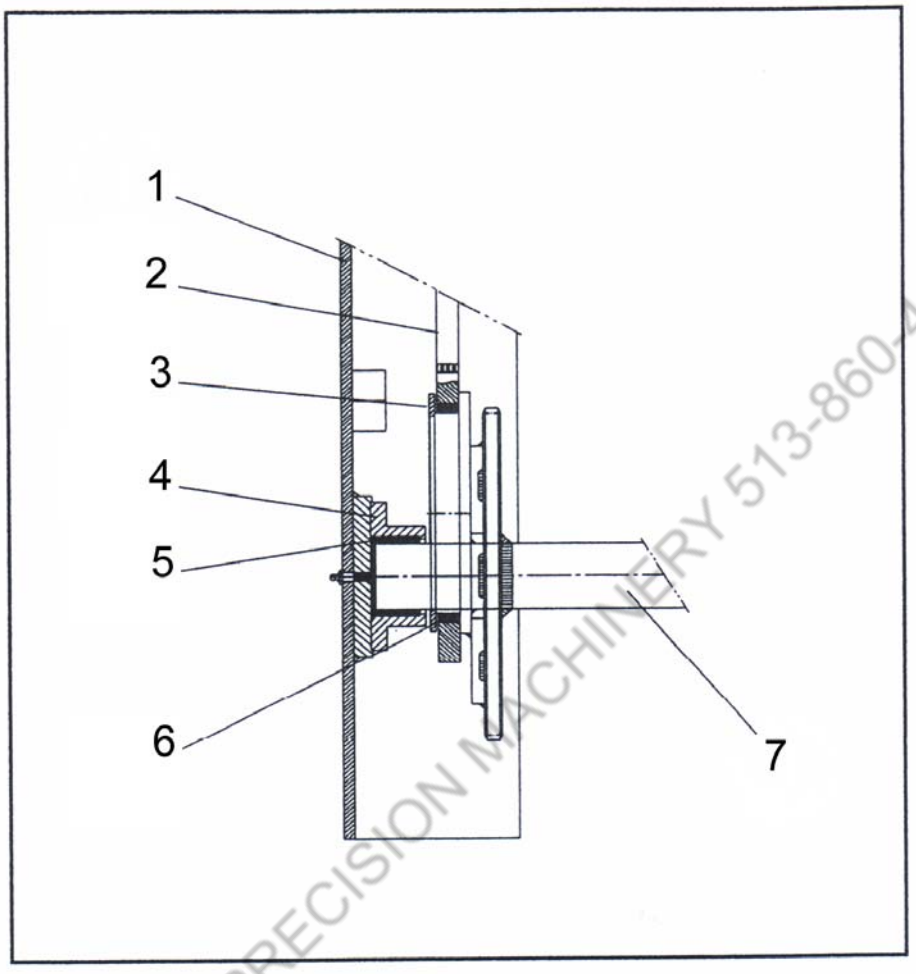
12.1.1. Spare Parts - Various

ITEM	PART NAME	PART #
1	Machine Screw, M16 x 60	
2	Nut, M16	
3	Pressure Disc	
4	Cover Plate for Hold-Down w/Guide Pipe	
5	Spring	
6	Hold-down	
7	Rubber for Hold-down	
8	Set Screw for Table Extension	
9	Rail for Table	
10	Gear Motor w/Brake	
11	Chain Tightener	
12	Chain Wheel	
13	Roller Chain	
14	Upper Cutter Bar	
15	Upper Blade	
16	Lower Blade	

12.1.1 Spare Parts - Various Figure

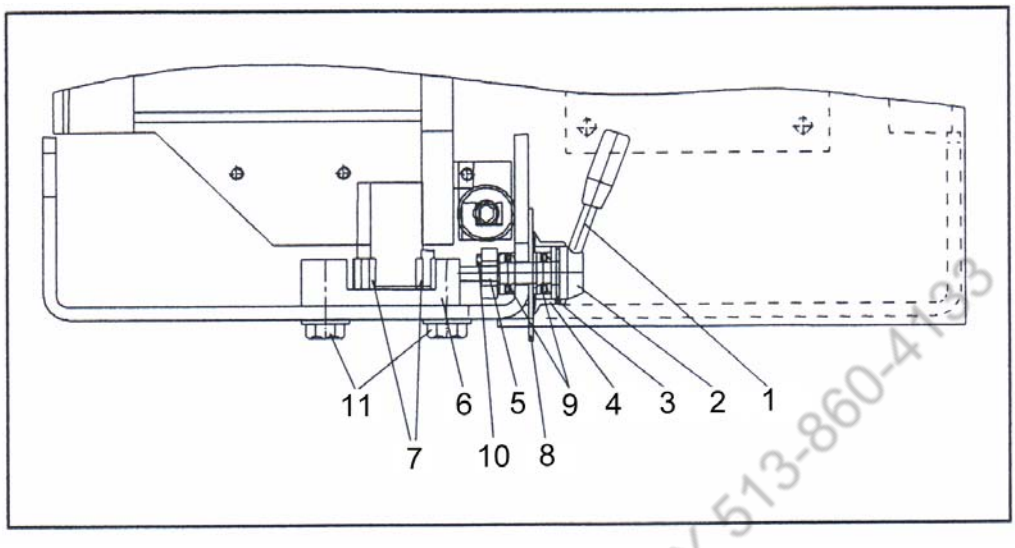


12.1.2. Spare Parts - Pulling Device



ITEM	PART NAME	PART #
1	Side Plate	
2	Pulling Arm	
3	Control Ring	
4	Bearing Housing for Main Bearing	
5	Main Bearing	
6	Bearing for Pulling Arm	
7	Eccentric Shaft	

12.1.3. Spare Parts for Adjustment of Blade Gap



ITEM	PART NAME	PART #
1	Handle	
2	Eccentric for Blade Gap Adjustment	
3	Pivot Screw for Arrow Disk	
4	Adjustable Arrow Disk	
5	Adjustment Nut	
6	Slide Guide	
7	Slide Brass	
8	Scale	
9	Thrust Bearing	
10	Locking Screw	
11	Bolts	