

MODEL MM-35A

SERIAL NUMBER _____

WITH JOG MODE

OPERATOR'S MANUAL
&
PARTS LIST
FOR
METAL MUNCHER

WHEN ORDERING PARTS, CONTACT AREA DEALER, OR:



811 Eisenhower Drive South, Goshen, IN 46526
PO Box 877, Goshen, IN 46527-0877
Phone: 574-533-0371 Fax: 574-533-0403
Website: www.clausing-industrial.com

Jan of 1-7-91 - Clausing #1-114

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INTRODUCTION

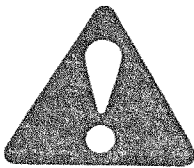
The Metal Muncher Hydraulic Iron Worker is the result of many years experience and engineering development. With proper care and regular maintenance, the advanced design and rugged construction assures you of trouble-free operation for many years.

SAFETY

As with any piece of equipment, operator safety is of primary importance.

Although every attempt has been made to provide safe operation and machine control, operators should stay constantly alert when working with the Metal Muncher Hydraulic Iron Worker.

The following symbol is used throughout this manual to bring attention to information regarding potential hazards.



CAUTION: FAILURE TO UNDERSTAND AND OBEY A SAFETY WARNING COULD RESULT IN PERSONAL INJURY TO THE OPERATOR OR OTHERS.

If any portion of the instructions or safety information presented in this manual is not clearly understood, contact your Metal Muncher dealer for clarification before beginning operation.



CAUTION: ALWAYS WEAR EYE PROTECTION WHEN OPERATING THE IRON WORKER.

STOP-START SWITCH

A special shut down switch is located on top of the terminal box at the side of the machine (see Fig. 1). Depress switch to halt all machine functions immediately. Raise switch to re-start.



CAUTION: BE CERTAIN TO TEST THIS SWITCH PRIOR TO EACH DAYS OPERATION.

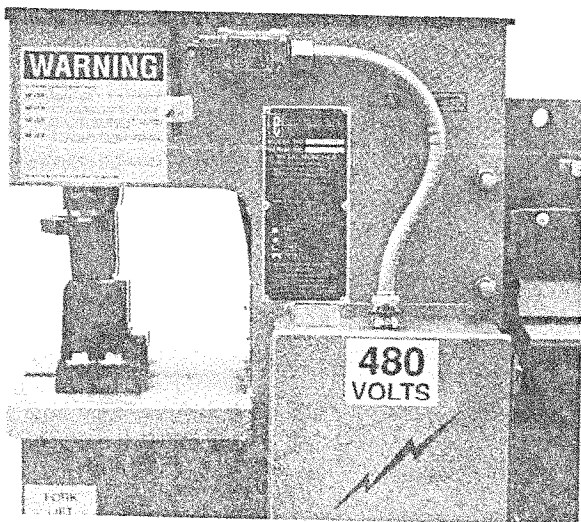


Figure 1. Stop-Start Switch

COPER/NOTCHER GUARD

This guard is intended to prevent possible injury at the coper/notcher station when working at the shear stations. As upper shear bar pivots, shear station blades and coper/notcher blade move simultaneously. When shear blade end is raised, coper/notcher end is lowered.



CAUTION: MAKE CERTAIN COPER/NOTCHER SAFETY COVER IS IN PLACE BEFORE OPERATING SHEAR STATIONS.

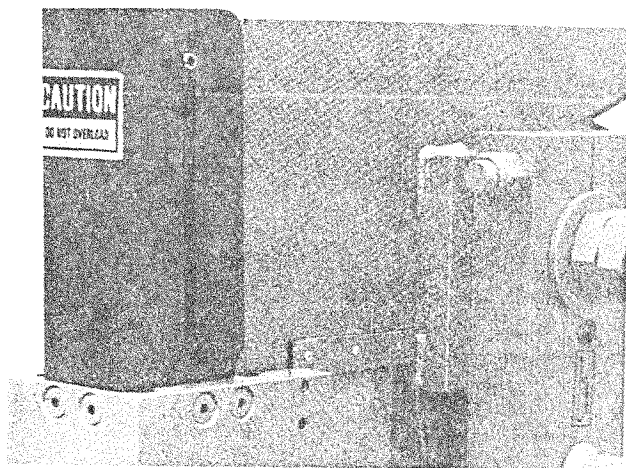


Figure 2. Guard in place

METAL MUNCHER INSTALLATION

Electrical Connection

The standard Metal Muncher unit is wired for 220 volt 3-phase operation. An optional 480 volt model is available upon request.



CAUTION: MAKE CERTAIN YOUR WIRING IS IN COMPLIANCE WITH THE ABOVE SPECIFICATIONS AND LOCAL ELECTRICAL CODES.

Instruct your electrician to familiarize himself with the wiring diagrams provided in this manual and to check all electrical connections on the machine itself before applying power.

Pre-Operation Check

In addition to the electrical connections discussed above, the following areas must be checked before the initial period of operation.



CAUTION: DISCONNECT POWER SUPPLY BEFORE PERFORMING ANY MAINTENANCE OR MAKING ADJUSTMENTS.

Check pump direction (see pg. 15). Rewire to obtain correct operation if necessary.

1. Check all hardware and tighten if necessary, including:
 - blade bolts, see page 7
 - trunion bolts, Ref. 11 on page 12
 - motor and pump mounting bolts, see page 12
 - cylinder tie bolts, Ref. 3 on page 12
 - upper shear bar pivot nuts, Ref. 3 on page 10
 - set screw on shear bar clevis pin, Ref. 15 on page 10
 - bar shear arm gib bolts, Ref. 16 & 19 on page 10
2. Check pins in valve control handle and linkage, page 10, Ref. 36 & 46.
3. Check for correct blade clearance (see Blade Maintenance, page 6.)
4. Check all hydraulic lines and connections. See page 15.
5. Properly lubricate machine (see page 6).
6. Check oil level plug. Capacity 8 gallons. Use Phillips 66 Magnus 315 20-W or equivalent.



CAUTION: NEVER USE HANDS TO CHECK FOR SUSPECTED HYDRAULIC LEAKS. IF HYDRAULIC FLUID PENETRATES THE SKIN, SEEK IMMEDIATE MEDICAL HELP.

NOTE: Repeat all steps above after first 10 hrs. of operation, then after each 30 days use.

CONTROL IDENTIFICATION

STOP-START SWITCH

Refer to Fig. 1, page 1.

FOOT CONTROL

This control (see Fig. 3) regulates movement of the hydraulic cylinder at the Punch Press work station.

Depress pedal to begin cylinder movement; release pedal and cylinder will return to top portion.

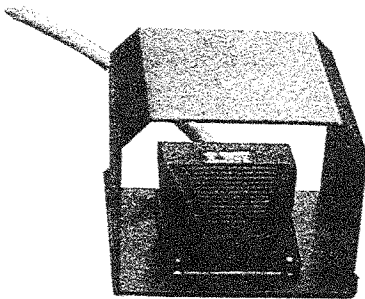


Figure 3

HAND CONTROL

The hand control is moved (as shown in Fig. 4) to raise or lower the blades at the shear stations and at the coper/notcher.

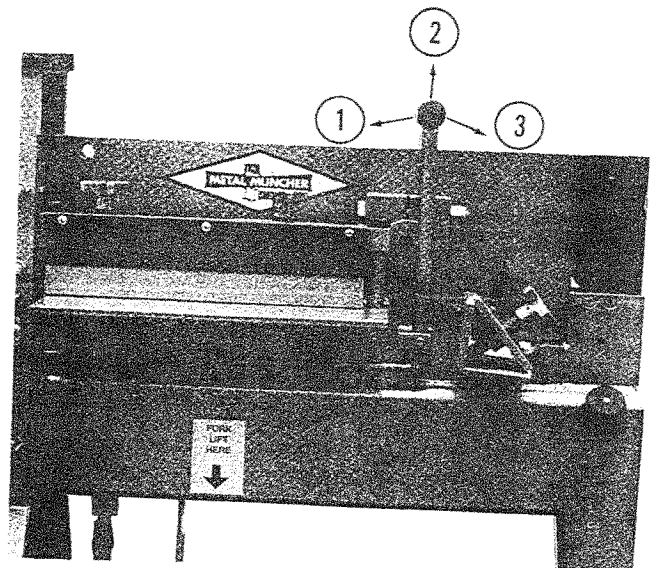


Figure 4

1. Lower Shear
2. Neutral
3. Lower Coper/Notcher

LIMIT SWITCH

This switch (Fig. 5) is provided to limit travel of the hydraulic cylinder during punching operations.

ADJUSTMENT

Press in on quick-set stroke buttons (Item No. 3, Fig. 5) and position stroke collars to allow the cylinder ram movement desired. Final fine adjustment is made by rotating the collars (Item No. 2, Fig. 5) on threaded vertical rod.

JOG SWITCH MODE

1. Turn jog switch to "on" position.
2. Depress foot switch and ram will move down for punch and die block location. See Fig. 6.
3. Turn jog switch to "off" position and ram will return to top of pre-set stroke, ready for standard limit switch operation.

STANDARD LIMIT SWITCH MODE

1. Turn toggle switch to "off" position.
2. Set stroke control collars at designated positions.
3. Depress foot switch and ram will travel down to pre-set stroke and stop.
4. Release foot switch and ram will return to top of pre-set stroke.
5. Repeat steps 3 and 4 for continuous operation.

OPERATION



CAUTION: ALWAYS WEAR EYE PROTECTION WHEN OPERATING THE METAL MUNCHER.

The Metal Muncher Iron Worker has a rated punching capacity equal to the shearing point of mild steel. The various work stations also have material thickness limitations. These are specified in the sections regarding the specific work stations.

PUNCH PRESS

NOTE: Do not attempt to punch material exceeding mild steel in strength or the dimensions shown below:

3/4" Round Hole in 1/2" x 60,000 PSI tensile
7/8" Round Hole in 1/2" x 50,000 PSI tensile

The Punch Press station includes the following items as standard equipment:

Shaft Guide

The shaft guide (Fig. 6) is necessary to prevent cylinder ram (and therefore punch) rotation. See also page 12, Ref. 23.

NOTE: Be certain shaft guide is securely attached to the cylinder ram.

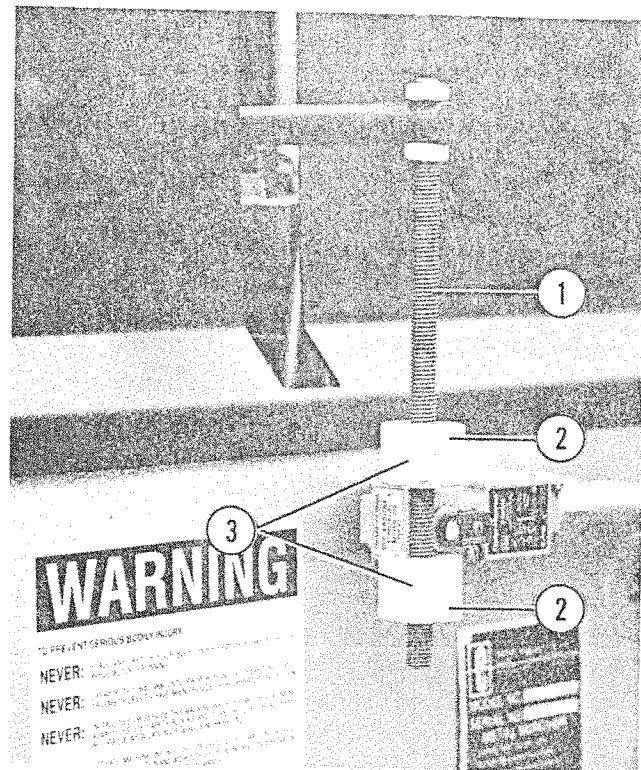


Figure 5

1. Vertical Adjustment Threaded Rod
2. Quick-set Micro Adjustment Collars
3. Quick-set Buttons

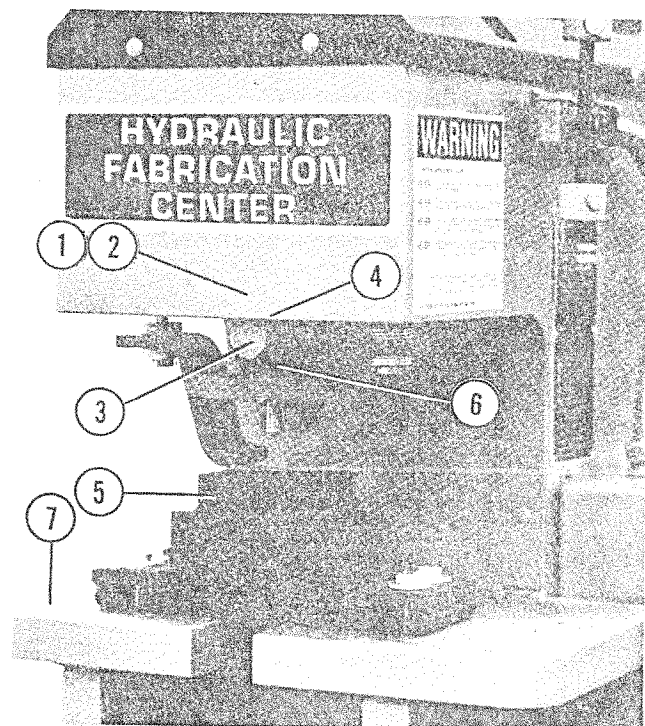


Figure 6

1. Shaft Guide
2. Cylinder Ram
3. Coupler Nut
4. Coupler
5. Die Holder Block
6. Clamp
7. Platen

Punch Coupler

The punch coupler simply provides a method of attaching the punch to the cylinder shaft. The punch coupler nut secures the punch itself to the punch coupler (See Fig. 6).

Die Holder Block

The function of the die holder block is explained in the name.

The Die Holder Block is provided with clamps and hardware (see Fig. 6) to secure it to the platen.



CAUTION: OPERATOR MUST WEAR EYE PROTECTION WHEN ALIGNING THE PUNCH AND DIE.

Punch Installation and Die Alignment (See Fig. 6)

Select a mated punch and die. Insert die in the die holder block and tighten securely.

Clamp the die holder block to the platen. Do not fasten securely at this time so that die holder block may be moved as necessary to assist proper alignment.

Insert punch in coupling nut and hand tighten nut to threaded punch adapter. Then back off nut approximately 3/16" to 1/4" allowing punch to move up and down freely in nut. Slowly (jogging) bring down cylinder shaft until end of punch enters die in die block. Center die block with punch for proper all around clearance. Tighten coupling nut securely with wrench. Re-check punch and die for proper clearance and tighten die block clamp bolts securely. Adjust limit switch stroke adjustment collars for proper punch penetration and cylinder ram stroke. (See page 3.) Then cycle several times to re-check for proper clearance and stroke.

NOTE: Be certain punch does not travel so far into die to cause shank portion to bind against die.

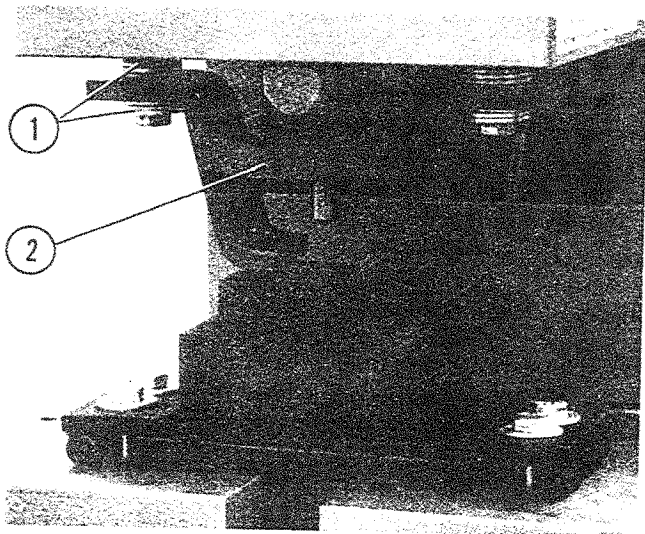


Figure 7.

1. Bolts & Washers 2. Stripper



CAUTION: DISCONNECT POWER SUPPLY BEFORE PERFORMING ANY MAINTENANCE OR MAKING ADJUSTMENTS.

Stripper

The stripper serves to remove punched material from the punch as the press cylinder moves upward. (Fig. 7)

To adjust stripper height loosen bolts on both sides and install correct number of washers to allow material to pass freely beneath stripper base. Retighten bolts.

NOTE: Stripper base must be parallel with surface of die holder block.

Punch Operation



CAUTION: THICKNESS OF MATERIAL TO BE PUNCHED MUST NEVER EXCEED PUNCH DIAMETER. IF THIS CONDITION EXISTS, PUNCH MAY SHATTER, CAUSING OPERATOR INJURY.

Proper alignment of punches and dies is essential to good results and long equipment life. Assure that punches and dies are in good condition.

NOTE: Worn punches will increase stripping pressure and can warp material. Apply lubricant to punch periodically to ease stripping and lengthen punch life.

The Metal Muncher Iron Worker is easily adapted for use as a shop press to install or remove bearings, gears, etc.

When doing this type work, adequate support must be provided for the various items in order to prevent damage to them or to the machine. 1/2" x 13 threaded holes are provided in the platen. Their primary uses are to retain die block and guides for lower bending dies, but they may also be used to retain various tooling if desired.

Special care must be taken to prevent damage to the cylinder shaft end. A special coupling is recommended. See page 12, Ref. No. 83.



CAUTION: ALWAYS KEEP ANY WORK CENTERED ON PLATEN OR OTHER SUPPORT AND PROPERLY ALIGNED WITH PRESS SHAFT.

FLAT BAR SHEAR (ROUND & SQUARE)

NOTE: Do not attempt to shear material exceeding 5/8" mild steel in strength or dimension.

This work station includes the round and square blades as well.



CAUTION: MAKE CERTAIN COPER/NOTCHER SAFETY COVER IS IN PLACE BEFORE OPERATING SHEAR STATIONS.

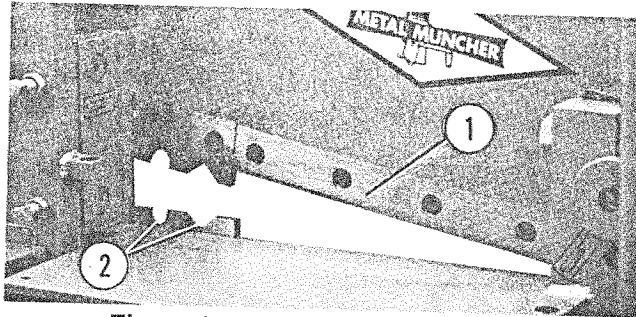


Figure 8. (Shown without guard)

1. Flat Bar Blade 2. Round & Square Blade

NOTE: Shearing materials thicker or harder than advised can result in chipped or broken blades and machine system damage.

The flat bar shear has capacity for mild steel stock shown below:

5/8" x 6"

1/2" x 8"

1/4" x 13"

NOTE: Always keep hold-down against material to at least a slip fit or tighter. A loose hold-down will allow material to be drawn or wedged between blades, forcing them apart and causing premature wear.

Clamp the hold-down securely against the material when desiring the most precise, cleanest cut possible.

To make mitre cuts on bar stock, etc., mark the desired angle on the material, slide through the hold-down and align the mark with the blade.

For production work, adapt an optional production table and the squaring arm assembly as necessary.

Round and Square Blades

The round cutting area will accept stock up to 1" diameter.

The square cutting area will accept stock up to 1" square.

ANGLE SHEAR

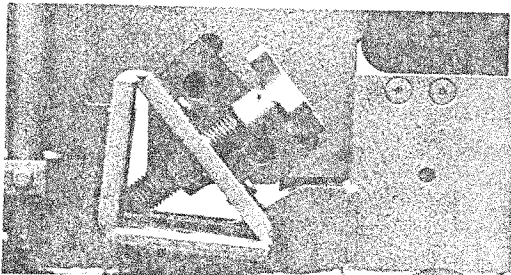


Figure 9. Angle Shear

The Angle Shear capacity is 3" x 3" x 5/16" angle in mild steel. It will make 90 degree cuts. Mitred ends can be cut in the coper. Unequal leg angles can be cut. To obtain a good cut, the angle must be held with the holddown screw.

In the holddown assembly, four adjusting screws are provided. These are factory set to obtain a 90 degree cut. Should adjustment be necessary, the two screws in the vertical leg of the holddown assembly adjust the cut in horizontal leg. The screws in the horizontal leg of the holddown adjust the cut in the vertical leg. Stock stands must be at proper height to insure 90 degree cuts.

Maintain .005-.010 clearance between knives. Lower knives have four cutting edges. Rotate to new edge when dull. Upper knife has only one cutting edge. Use surface grinder to resharpen knives.

COPER/NOTCHER

NOTE: Do not attempt to work material exceeding 5/16" mild steel in strength or dimension.

The Coper-Notcher is one of the most versatile stations on the Metal Muncher. Good cutting results and longevity depend on proper use and adjustment.

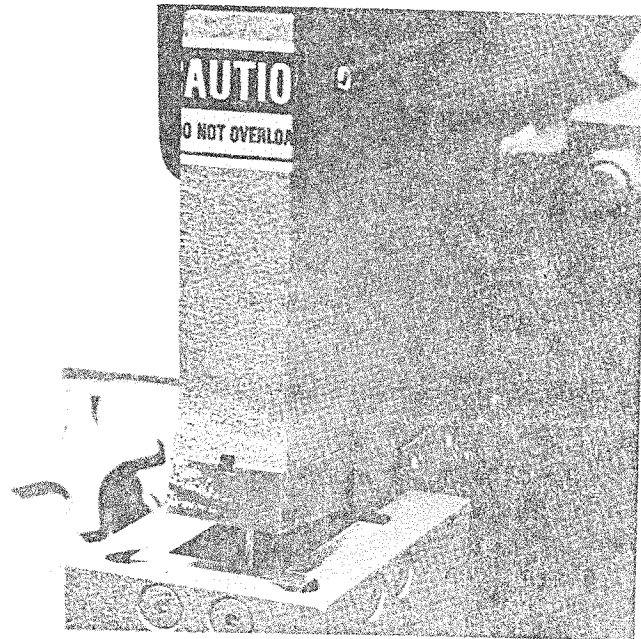


Figure 10. Coper/Notcher

(Shown with guard in up position)

Notice that as you face the front, the upper blade is angled from left to right. This angle or "rake" greatly reduces the necessary shearing pressure. Cuts should be made as close to the right (thick) side as possible. This will give best results and allow gib to take up side pressure.

GIB ADJUSTMENT

Gib adjustment screws (Ref. 1, Fig. 11) will need periodic takeup to keep upper and lower coper blades adjusted to maintain correct clearance.

LUBRICATION

Your Metal Muncher has been designed to incorporate the fewest possible moving parts to enhance reliability and keep necessary maintenance to a minimum. All general lubrication points are marked with the international lubrication symbol and should be easy to locate. These points should be lubricated every 10 operating hours with a good grade of automotive grease. Of course, this may be done more frequently if deemed necessary.

The areas listed below are of special importance and should be lubricated as shown, without fail:

- Bar Shear Cylinder Clevis every 10 hrs.
 - Bar Shear Pivot Pin every 10 hrs.
 - Bar Shear Trunion every 10 hrs.
 - Bar Shear Gib every 5 hrs.
 - Pivot Pin Support Blocks every 10 hrs.
- For locations see Ref. 25 on pages 10 & 12.

SHEAR ARM GIB ADJUSTMENT

The shear arm gibs, located on either side of the shear arm, are used to maintain proper blade clearances on the round and square blades and flat bar blades. See Fig. 11. To adjust gibs, loosen large flat head socket capscrews (Ref. 1) enough so gib bar can be moved in or out as required. Loosen jam nuts (Ref. 2) on square head setscrews (Ref. 3) mounted in side plates. Tighten or loosen setscrews (Ref. 3) as required to move gib bars (Ref. 4) in or out to maintain correct blade clearance between upper and lower shear arms. (See clearance recommendations below.) After proper clearance adjustments are completed, tighten flat head socket capscrews (Ref. 1) and tighten jam nuts (Ref. 2). Run shear arm up and down several times and recheck clearances before cutting material.

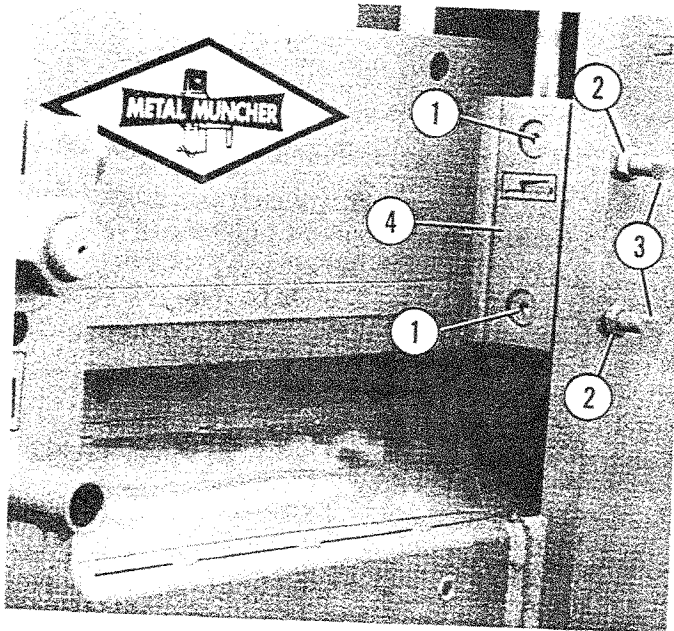


Figure 11

BLADE MAINTENANCE

All Blades should be surface-ground for sharpening.

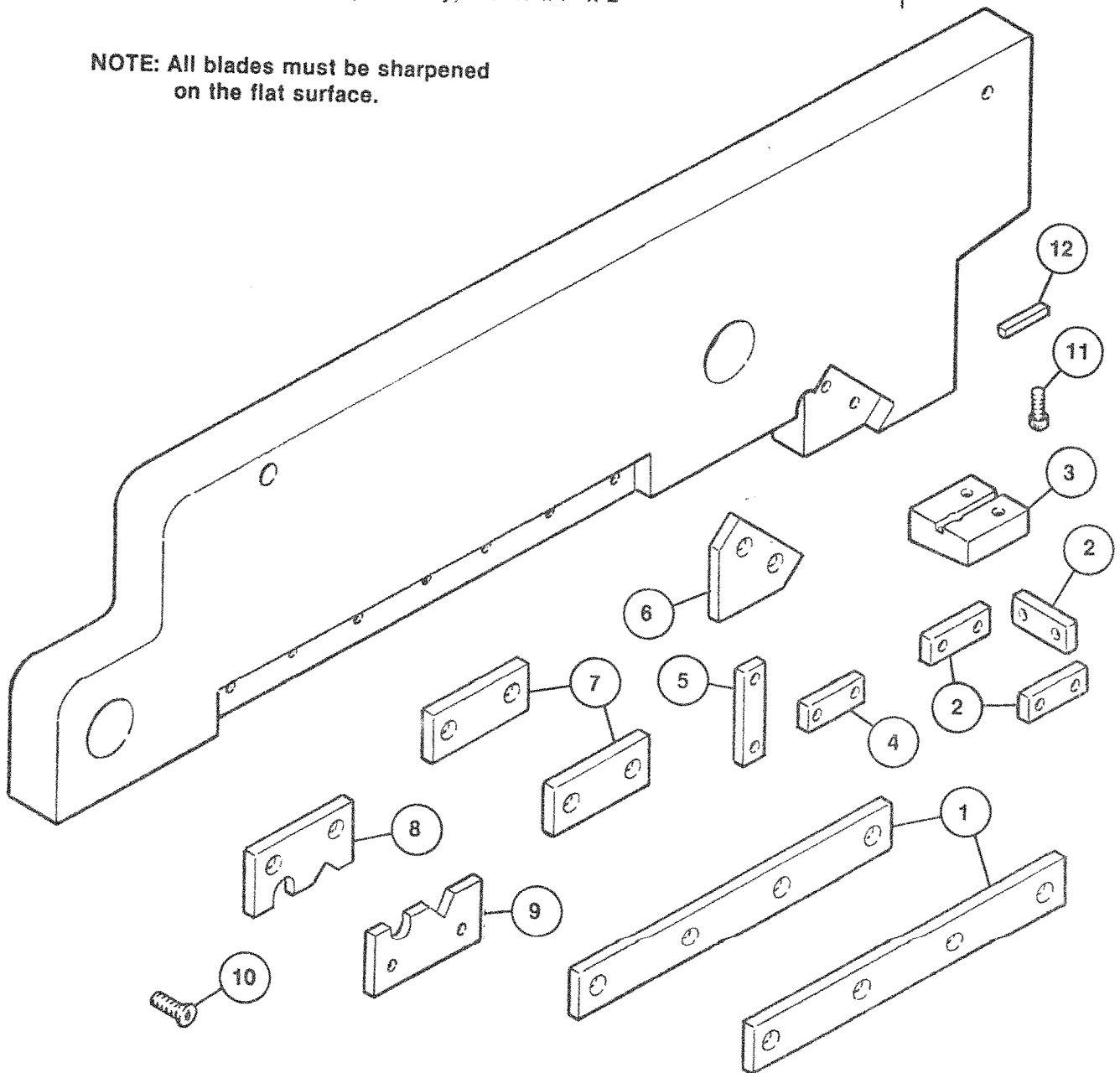
NOTE: Grind Blades on broad sides only.

Ref. No. Page 7	Blade	Available Edges	Side Clearance	End Clearance
1	Flat Bar	4	.005-.010"	— —
8-9	Round	1	.005-.010"	— —
8-9	Square	1	.005-.010"	— —
6	Angle	1	.005-.010"	— —
4-5	(upper)	4	.005-.010"	— —
	(lower)	4	.005-.010"	— —
3	Coper	1	.005-.010"	— —
2	(upper)	1	.005-.010"	— —
	(lower)	4	.005-.010"	Less than .062"

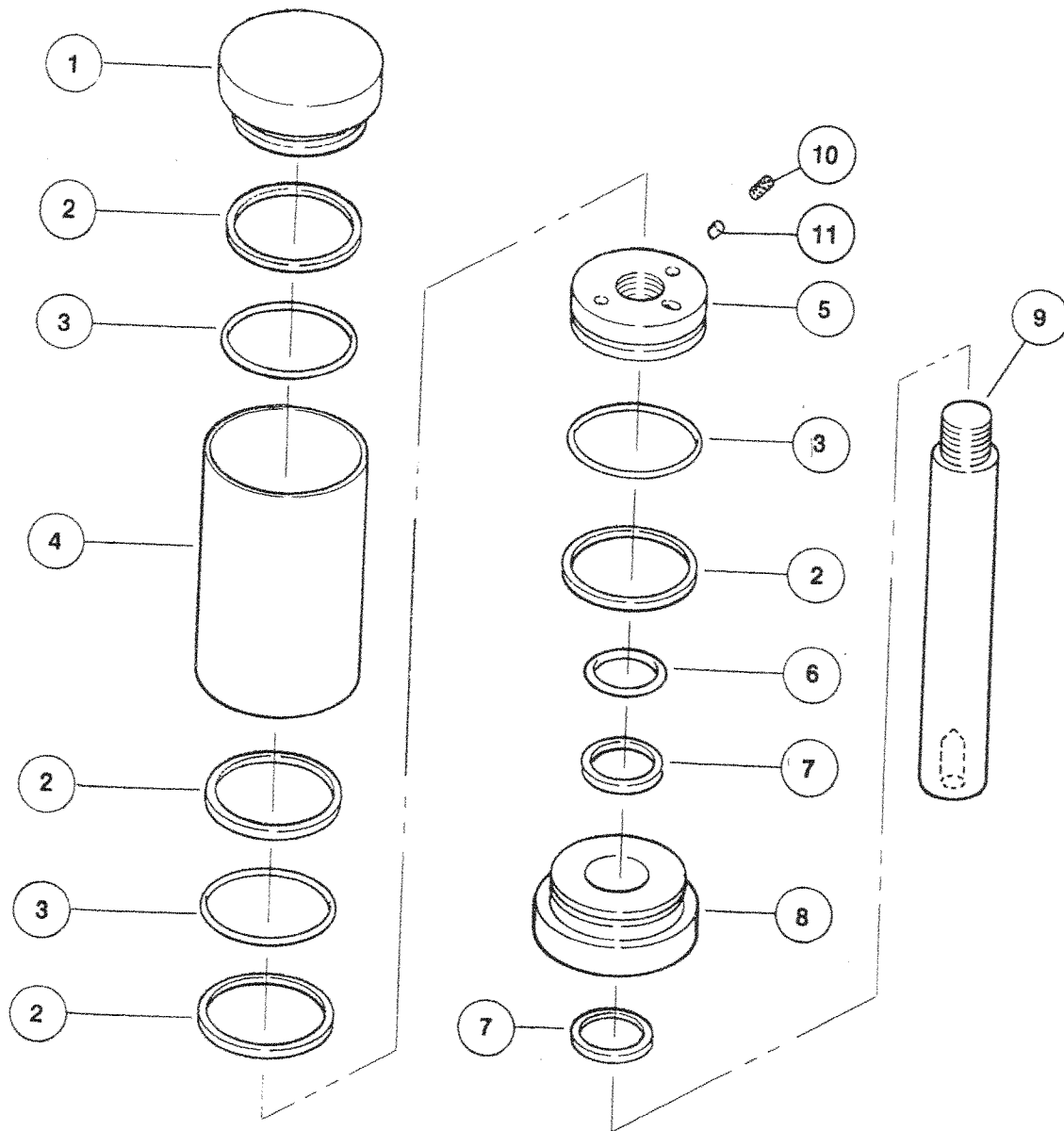
MM-35A BLADES

Ref. No.	Part No.	Description	Qty. Req'd.
1	M-236-35	Flat Bar Blade 14" long	2
2	M-223-35	Coper Blade, Lower	3
3	M-223B-35	Coper Blade, Upper	1
4	M-228A-35	Angle Blade, Lower (short)	1
5	M-227A-35	Angle Blade, Lower (long)	1
6	M-226-35	Angle Blade, Upper	1
7	M-236A-35	Short Flat Bar Blade 5" long	2
8	M-238A-35	Round & Square Blade, Upper	1
9	M-238B-35	Round & Square Blade, Lower	1
10	M-146-35	Flat Socket Head Capscrew, 3/8" x 1-1/4"	as req'd.
11	M-146A-35	Socket Head Capscrews, 5/16" x 1" long	3
12	M-223K-35	Square Key, 1/4" x 1/4" x 2"	1

NOTE: All blades must be sharpened on the flat surface.



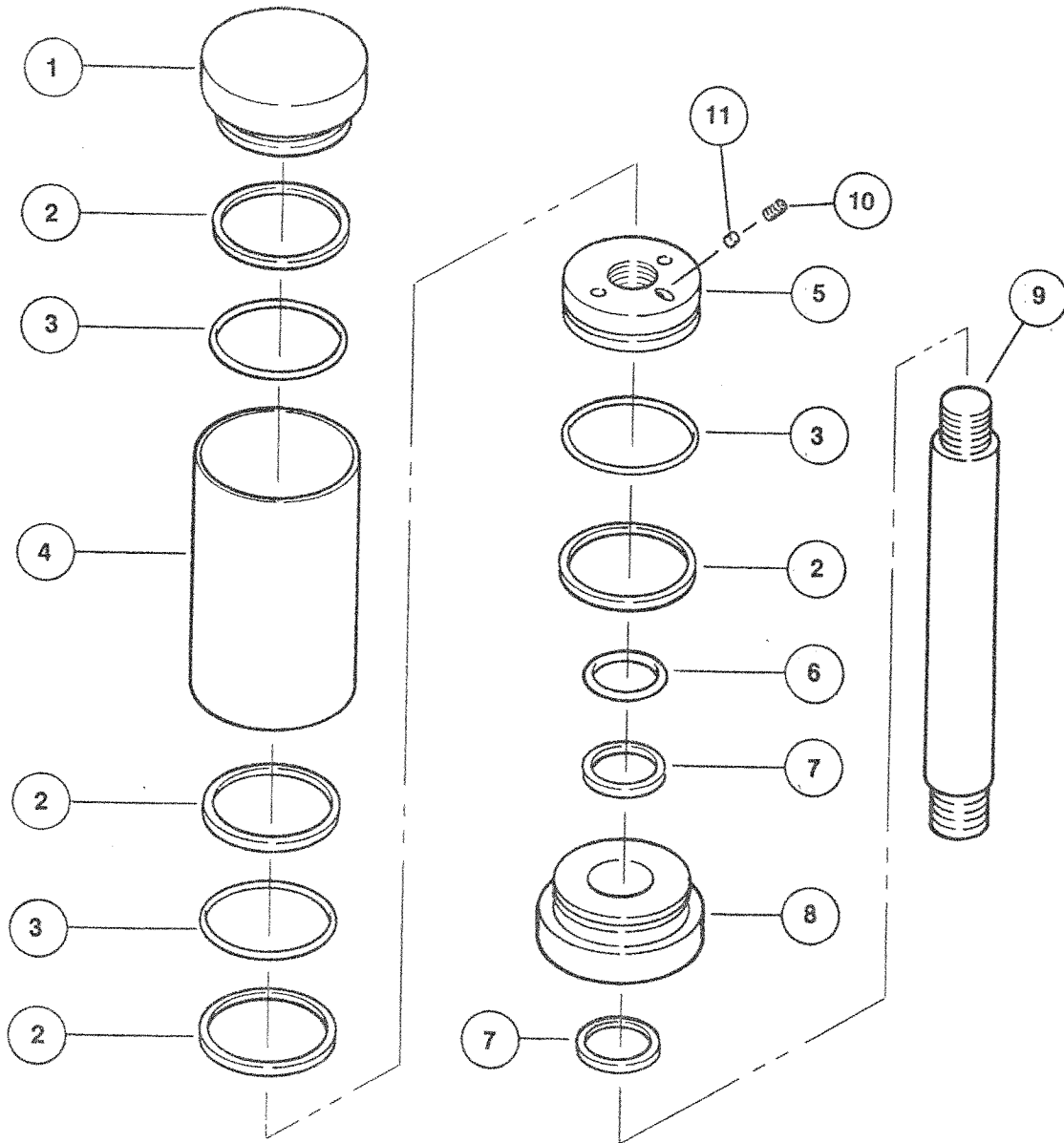
5" FRONT CYLINDER — MM-35A



REF. NO.	PART NO.	DESCRIPTION	QTY. REQ'D.
1	M-111A-35	Plug Press Cylinder	1
2	M-257-35	Back-up Ring, 5"	4
3	M-258-35	"O" Ring, 5"	3
4	M-259-35	5" Cylinder Barrel, 8-1/4" long	1
5	M-259A-35	Piston, 5" (threaded)	1
6	M-120-35	"O" Ring Seal for 2" Shaft	1
7	M-114-35	Back-up Ring, 2"	1
8	M-263-35	Head, 5"	1
9	M-259B-35	Press Cylinder Shaft, 11-3/4" long	1
10	M-257B-35	Set Screw, 3/8" x 1/2"	1
11	M-257C-35	Shaft Thread Protector, Aluminum	1
	M-296-35	5" Cylinder Repair Kit, Complete (Factory recommends ordering complete kit)	

Always give Metal Muncher Model and Serial Number when ordering parts.

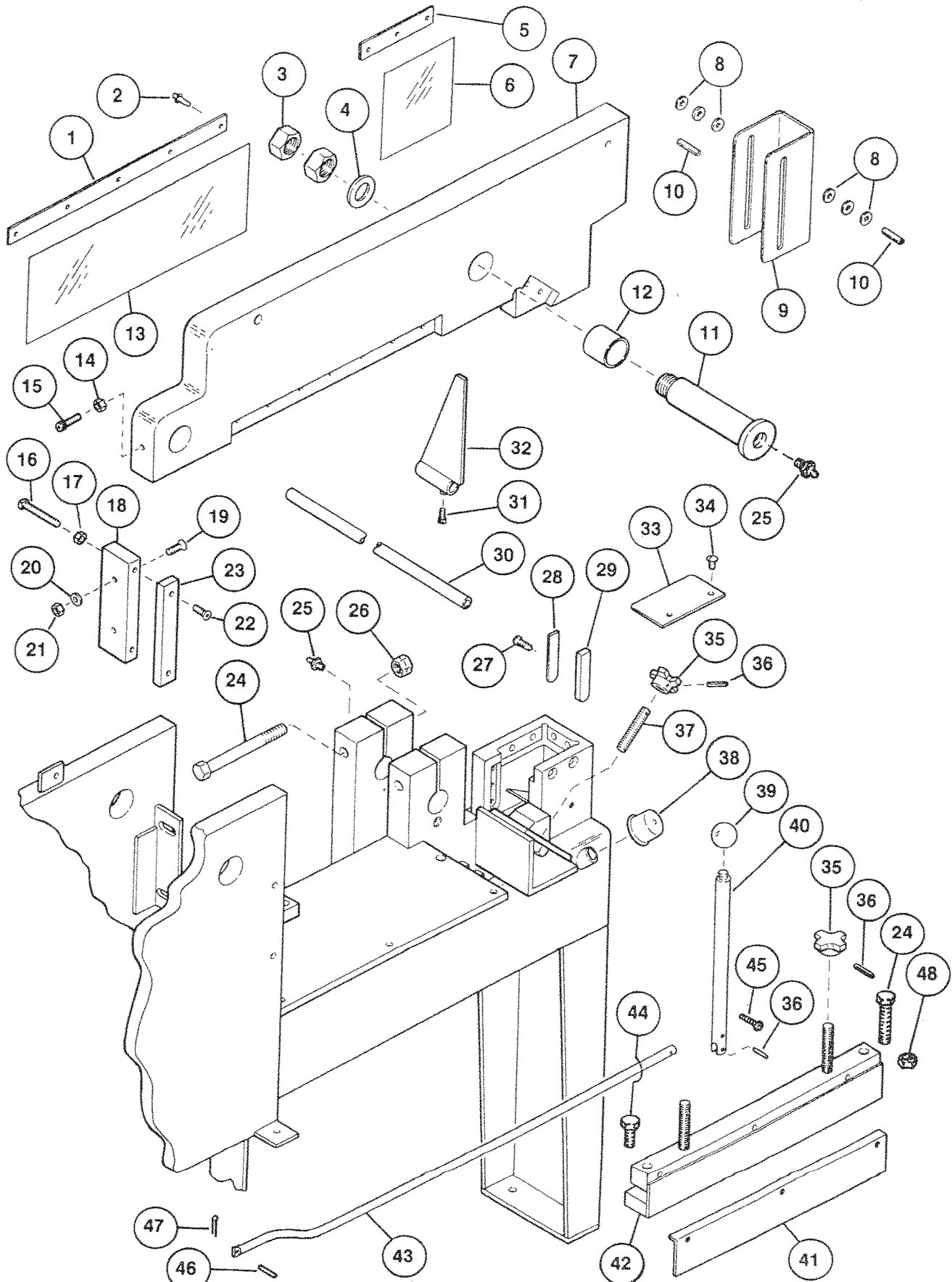
4 1/2" REAR CYLINDER — MM-35A



Ref. No.	Part No.	Description	Qty. Req'd.
1	M-129-35A	Plug, Shear Cylinder	1
2	M-112-35A	Back-up Ring, 4-1/2"	4
3	M-113-35A	"O" Ring, 4-1/2"	3
4	M-276-35A	4-1/2" Cylinder Barrel, 8-1/4" long	1
5	M-118A-35A	Piston, 4-1/2" (threaded)	1
6	M-120-35A	"O" Ring Seal for 2" Shaft	1
7	M-114-35A	Back-up Ring, 2"	1
8	M-122-35A	Head, 4-1/2"	1
9	M-275-35A	Shear Cylinder Shaft, 12-1/4" long	1
10	M-118B-35A	Set Screw, 3/8" x 1/2"	1
11	M-118C-35A	Shaft Thread Protector, Aluminum	1
	M-295-35A	4-1/2" Cylinder Repair Kit, Complete (Factory recommends ordering complete kit)	1

Always give Metal Muncher Model and Serial Number when ordering parts.

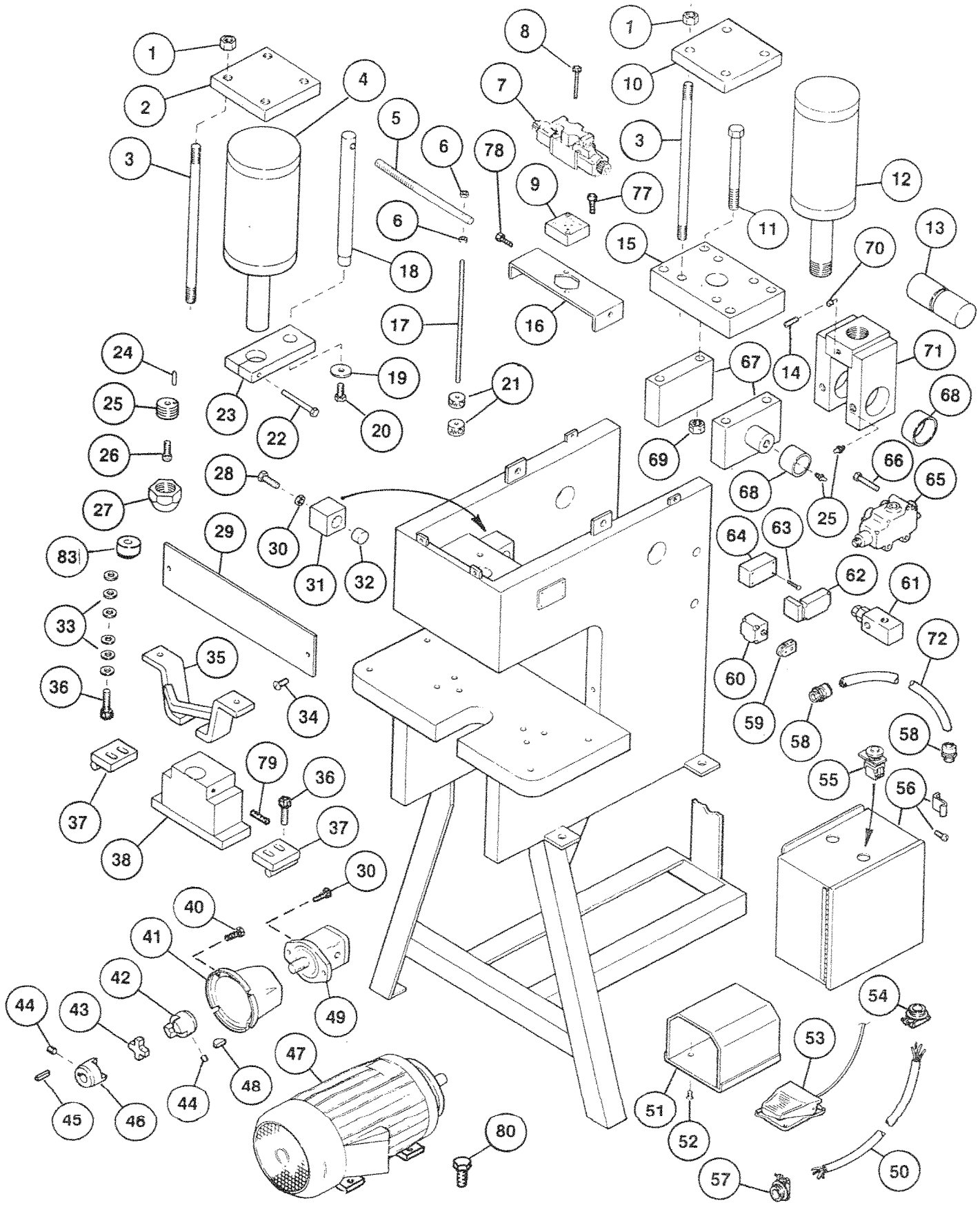
MM-35A PARTS LIST — REAR MAINFRAME



MM-35A PARTS LIST — REAR MAINFRAME

Ref. No.	Part No.	Description	Qty. Req'd.	Ref. No.	Part No.	Description	Qty. Req'd.
1	M-110A-35	Backup Strip, Safety Shield	1	24	M-244A-35	Hex Head Capscrew, 7/8" x 7" Gr. 8	3
2	M-110C-35	Pop Rivet	8	25	M-244B-35	Nut, 7/8" Hex Ny-Lock	2
3	M-147C-35	Nut, 1-1/2" Hex Jam	2	26	M-244C-35	Grease Zerk	2
4	M-147B-35	Flat Washer, 1-1/2"	1	27	M-244D-35	3/8" x 3/4" Setscrew	3
5	M-110B-35	Backup Strip, Safety Shield	1	28	M-245A-35	Back Plate, Coper Gib	1
6	M-111-35	Safety Shield, Angle	1	29	M-245B-35	Coper Wear Gib	1
7	M-247-35	Upper Shear Bar	1	30	M-306A-35	Back Gauge Tube	1
8	M-302A-35	Flat Washer, 3/8"	6	31	M-306C-35	Socket Head Capscrew, 3/8" x 1"	1
9	M-302-35	Coper Safety Shield	1	32	M-306B-35	Back Gauge Flag	1
10	M-302C-35	Roll Pin, 3/8" x 1"	2	33	M-307-35	Angle Hold-down Guard	1
11	M-147A-35	Pivot Pin, Bar Shear	1	34	M-307A-35	Round Slotted Head Screw, 1/4" x 3/4"	5
12	M-147D-35	Bronze Bushing, 2" O.D.	1	35	M-529-35	Knob, Hold-down	2
13	M-110-35	Safety Shield, Shear Bar	1	36	M-529A-35	Roll Pin, 3/16" x 1"	4
14	M-247D-35	Nut, 3/8" Hex	1	37	M-529B-35	Threaded rod, 1"	1
15	M-247E-35	Socket Head Setscrew, 3/8" x 1-1/2"	1	38	M-508-35	Filler Cap	1
16	M-246A-35 <i>10359</i>	Square Head Screw, 5/8" x 3" (Half Dog Point) for gib block adjustment	4	39	M-152A-35	Knob, Rear Control	1
17	M-246B-35	Nut, 5/8" Hex Jam	4	40	M-152-35	Arm, Rear Control	1
18	M-246-35	Gib Mounting Block	2	41	M-528-35	Flat Bar Hold-down Shield	1
19	M-246C-35 <i>100500</i>	Flat Socket Head Screw, 5/8" x 2"	4	42	M-240-35	Flat Bar Hold-down Assembly	1
20	M-246D-35	Flat Washer, 5/8"	4	43	M-153A-35	Control Rod	1
21	M-246E-35	Nut, 5/8" Hex	4	44	M-235-35	Socket Head Capscrew, 3/4" x 3"	1
22	M-246F-35	Flat Socket Head Screw, 3/8" x 1-1/4"	4	45	M-152B-35	Hex Head Capscrew, 5/16" x 2"	1
23	M-246G-35	Gib Material <i>102204</i>	2	46	M-153B-35	Roll Pin, 3/16" x 3/4"	1
				47	M-153C-35	Cotter Pin	1
				48	M-235A-35	Nut, 3/4" Hex	2
				49	M-245C-35	Wear Gib Stop	1
				50	M-245D-35	#10-24 x 1-1/4" Machine Screw	1

MM-35A PARTS LIST — FRONT MAINFRAME

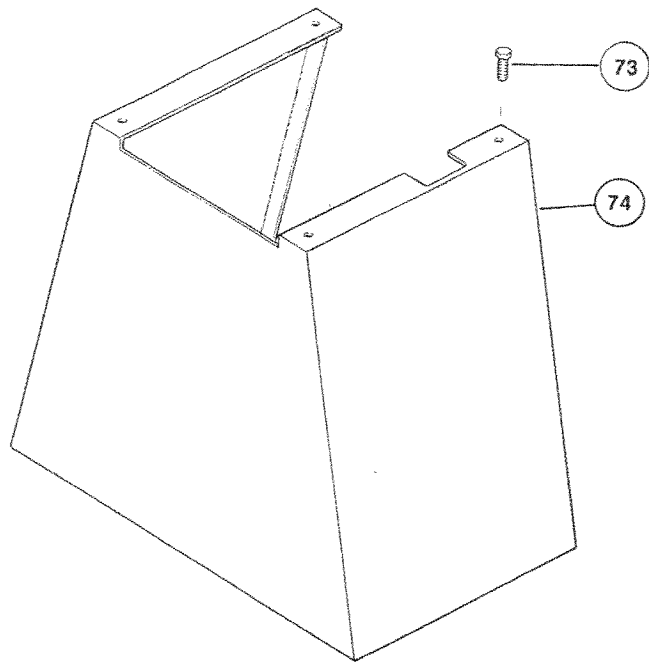
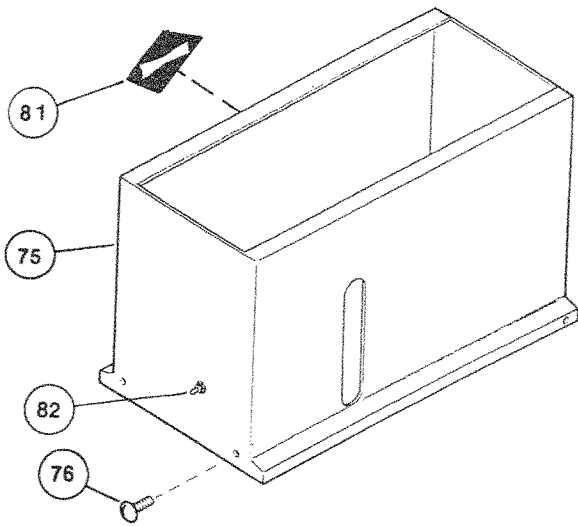


MM-35A PARTS LIST — FRONT MAINFRAME

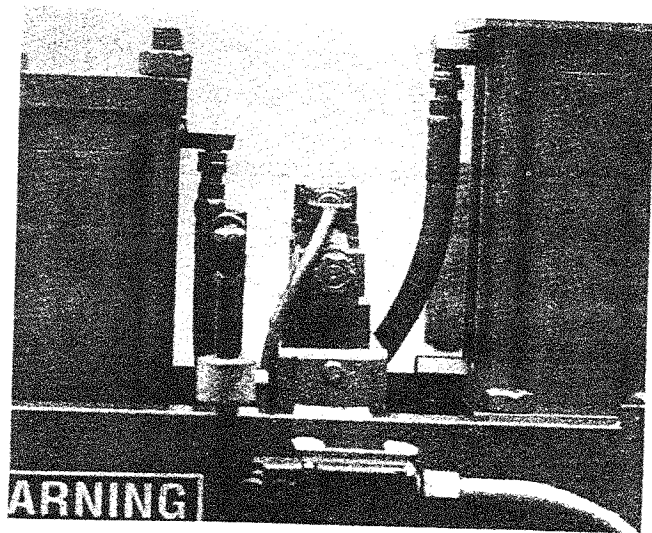
Ref. No.	Part No.	Description	Qty. Req'd.	Ref. No.	Part No.	Description	Qty. Req'd.
1	M-254-35	Nut, 7/8"	8	45	M-543D-35	Square Key, 1/4" x 1-1/2"	1
2	M-255-35	Tie down plate, press cylinder	1	46	M-503-35	Motor Coupler	1
3	M-256-35A	Tie Rod, 7/8" x 14" long	8	47	M-210-35	Motor (specify 1 or 3 phase)	1
4	M-298P-35	5" Cylinder Complete (see page 8 for parts breakdown)	1	48	M-543E-35	Woodruff Key, 3/16" x 3/4"	1
5	M-523A-35	Cross Arm, 3/4"	1	49	M-543-35	Hydraulic Pump	1
6	M-523B-35	Nut, 1/2" Hex Jam	2	50	M-166A-35	Four Wire Electric Cord	1
7	M-181A-35	Solenoid Valve	1	51	M-165A-35	Shield, Foot Switch	1
8	M-293-35	Hex Socket Head Capscrew, #10-24 x 2"	4	52	M-165B-35	Flat Slotted Head Machine Screw 1/4" x 1/2"	4
9	M-181B-35	Sub Plate, Solenoid Valve	1	53	M-165-35	Foot Switch	1
10	M-511-35A	Tie Down Plate, Shear Cylinder	1	54	M-166B-35	Connector, 3/4" 2 screw	1
11	M-535-35A	Hex Head Capscrew, 7/8" x 7" Gr. 8	4	55	M-167-35	Start/Stop Switch	1
12	M-298S-35A	4-1/2" Shear Cylinder (see page 9 for parts breakdown)	1	56	M-166-35	Electrical Box	1
13	M-133-35A	Yoke Pin	1	56	includes	Slotted Fillister Head Machine Screw	2
14	M-512A-35	Socket Head Setscrew, 3/8" x 1/2"	1	56	includes	Clip, Elect. Box	2
15	M-510A-35A	Cylinder Mount Plate	1	57	M-166C-35	Connector, 1" 2 screw	1
16	M-181E-35	Mount Bracket, Solenoid Valve	1	58	M-166D-35	Liquid Type, Conduit Fitting, 1/2" straight	1
17	M-523C-35	Threaded Vertical Rod, 1/2"	1	59	M-165E-35	Roller Lever, Limit Switch	1
18	M-523D-35A	Shaft Guide Rod	1	60	M-165C-35	Limit Switch Head	1
19	M-523E-35	Flat Washer, 3/4"	1	61	M-181R-35	Pressure Relief Valve	1
20	M-523F-35	Hex Head Capscrew, 3/4" x 1"	1	62	M-165D-35	Limit Switch Body	1
21	M-523G-35	Stroke Control Knob	2		M-165CO-35	Limit Switch Complete - Consists of Ref.'s 69-60-62-63 - see copy	
22	M-523H-35	Hex Head Capscrew 1/2" x 3-1/2"	1	63	M-165F-35	Round Slotted Head Machine Screw	2
23	M-523-35	Shaft Guide Clamp Bar	1	64	M-165G-35	Limit Switch Receptacle	1
24	M-266B-35	Roll Pin, 1/4" x 1"	1	65	M-181-35	Hydraulic Control & Pressure Valve (Manual)	1
25	M-266-35	Punch Coupler Adapter	1	66	M-181G-35	Hex Head Capscrew, 1/4" x 2	3
26	M-266A-35	Socket Head Capscrew, 1/2" x 1-3/4"	1	67	M-510-35A	Trunion Block	2
27	M-271-35	Punch Coupling Nut (Specify #37 or #45)	1	68	M-243-35	Bronze Bushing, 2" I.D.	4
28	M-524C-35	Square head Setscrew, 1/2" x 2"	2	69	M-535A-35	Locknut, 7/8"	4
29	M-525-35	Front Shield	1	70	M-257C-35	Shaft Thread Protector, Aluminum	1
30	M-524B-35	Jam Nut, 1/2"	2	71	M-512-35A	Yoke	1
31	M-524-35	Shaft Guide Wear Block	2	72	M-166E-35	Liquid Type Conduit, 1/2"	1
32	M-524A-35	Shaft Guide, Wear Block Insert	2	73	M-107B-35	Hex Head Capscrew, 5/16" x 1"	4
33	M-526A-35	Flat Washer, 1/2"	12	74	M-107-35	Skirt	1
34	M-525A-35	Round Slotted Head Capscrew, 1/4" x 3/4"	2	75	M-159A-35	Hood	1
35	M-158-35	Stripper	1	76	M-525A-35	Truss Head Machine Screw, 1/4" x 3/4"	4
36	M-526-35	Hex Head Capscrew, 1/2" x 2-1/2"	4	77	M-293A-35	Socket Head Capscrew, 1/4" x 3/4"	2
37	M-252-35	Clamping Bar	2	78	M-293B-35	Hex Head Capscrew, 5/16" x 1"	2
38	M-249-35	Die Holder Block (Specify 59/82 or 62/85)	1	79	M-249A-35	Setscrew, 3/8" x 3/4"	1
39	M-543A-35	Hex Head Capscrew, 3/8" x 1-1/4"	2	80	M-534-35	Hex Head Capscrew, 5/16" x 1-1/4"	4
40	M-543B-35	Hex Head Capscrew, 1/2" x 1-1/4"	4	81	M-164A-35	Metal Muncher Decal	1
41	M-543C-35	Shaft Guard	1	82	M-166F-35	Jog Switch	1
42	M-505-35	Pump Coupler	1	83	M-259C-35	Shaft End Protector (Also brake set adapter)	1
43	M-504-35	Coupling Insert (rubber)	1				
44	M-544-35	Setscrew, 3/8" x 1/2"	2				
					not shown M-507-35	Starter (complete)	1

(See page 14 for further illustration.)

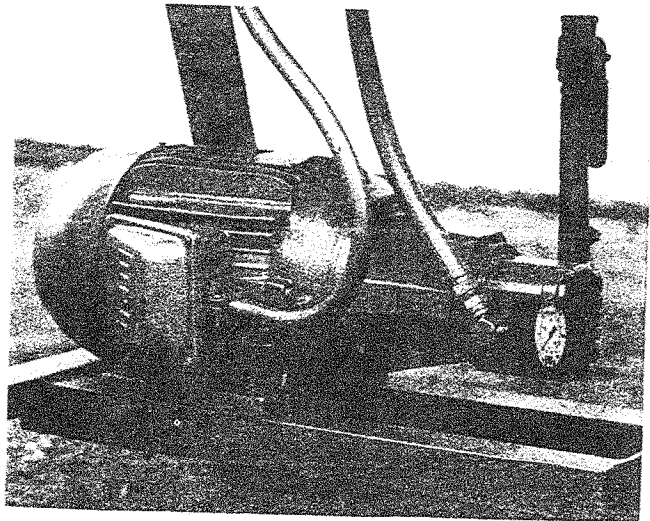
MM-35A PARTS LIST — FRONT MAINFRAME, Cont'd.



HYDRAULIC SYSTEM



Solenoid Valve

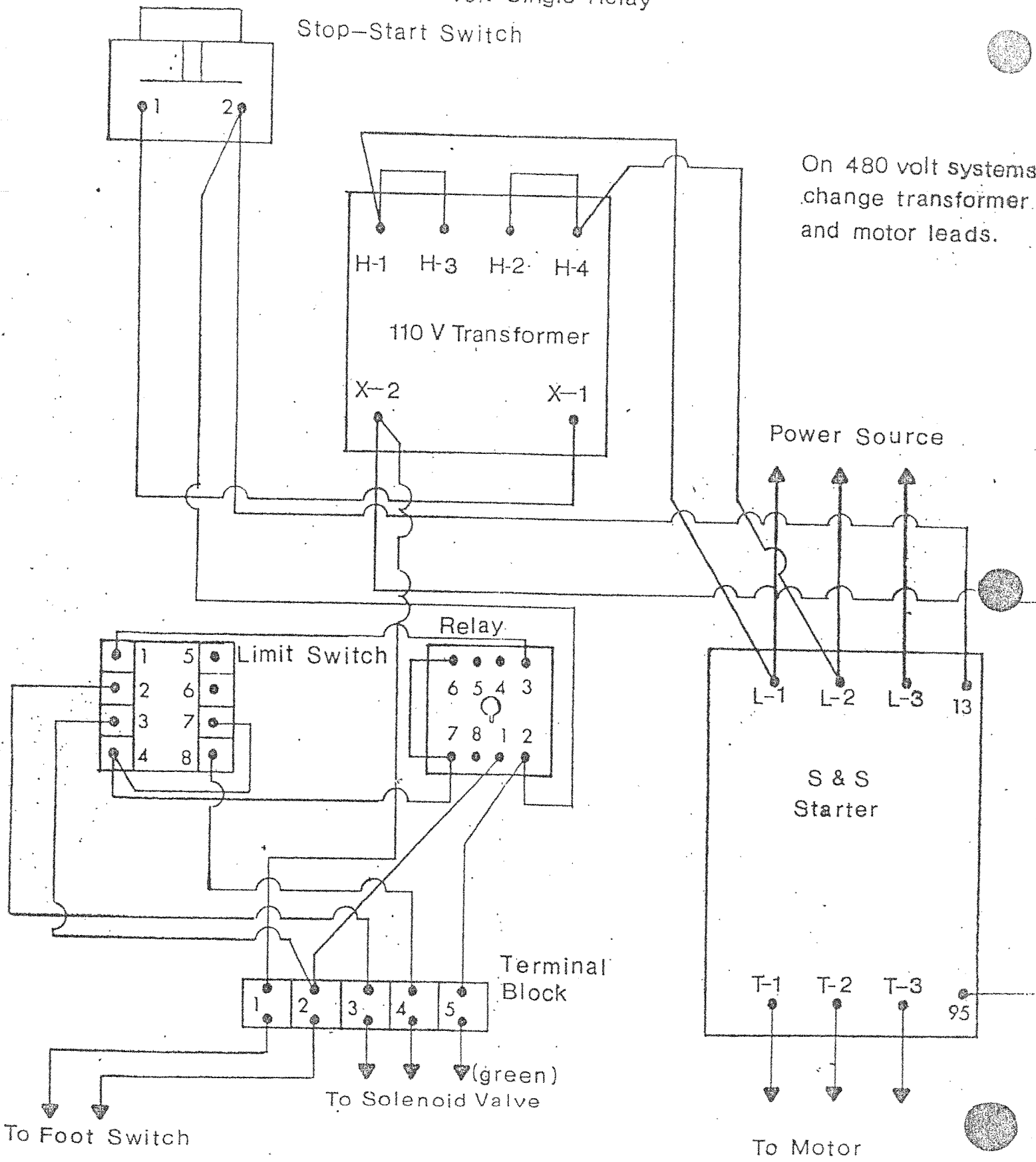


Parts Ordering Information —
Motor, Pressure Gauge, and Pump
These components vary from model to model.

MM-35 & GB-35 Metal Muncher

230 Volt Single Relay

Stop-Start Switch



*For ELECTRIC FOOT CONTROL (Press Cylinder Only)