#13

MODEL MM61E

SERIAL NUMBER 3127585

3" Shaft
Bosch Pump
C-H Rotary

NO
WARRANTY
IF
CENTER ENGINEERING CORP.
CLAY CENTER, KANSAS

METAL MUNCHER

METAL MUNCHER

operator's manual and parts list

CENTER ENGINEERING CO.
P. O. Box 192 Clay Center, Kansas 67432 Tel. 913—632-5631

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

ME165N5-F
~~#032489~~ 101999 Furney

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 DAY'S OPERATION.

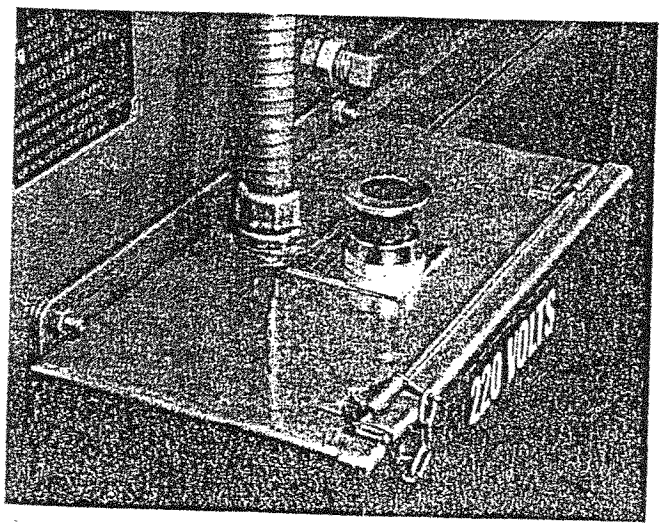


Figure 1. Stop-Start Switch

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.

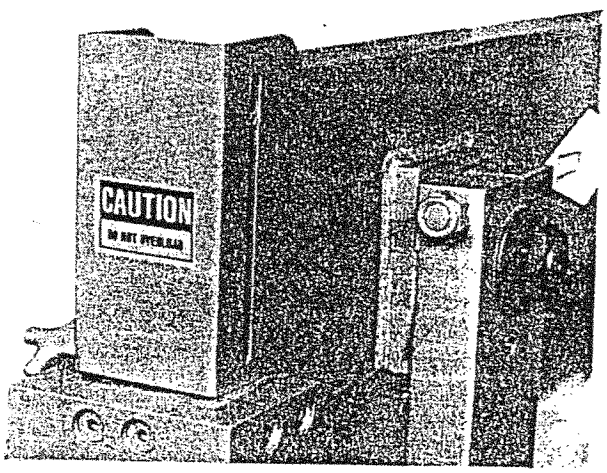


Figure 2. Guard in place

METAL MUNCHER INSTALLATION

Your Iron Worker has been completely adjusted and assembled at the factory and should require only electrical connection and an initial check-out prior to use.

Electrical Connection

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

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. 7). Rewire to obtain correct operation if necessary.

1. Check all hardware and tighten if necessary, including:
   - knife and trunion bolts
   - motor and pump mounting bolts
   - cylinder tie bolts
   - upper shear bar pivot nuts
   - set screw on shear bar clevis pin
2. Check pins in valve control handle and linkage
3. Check for correct knife clearance (see Knife Maintenance section)
4. Check all hydraulic lines and connections

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.

5. Properly lubricate machine (see lubrication section)
6. Release limit switch tabs from shipping position (see fig. 5).

CONTROL IDENTIFICATION

STOP-START SWITCH

Refer to Fig. 1, SAFETY section.

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 to stop cylinder movement.

NOTE: Cylinder operates in a complete cycle. Refer to Limit Switch section (pg. 3) for manual override instructions.

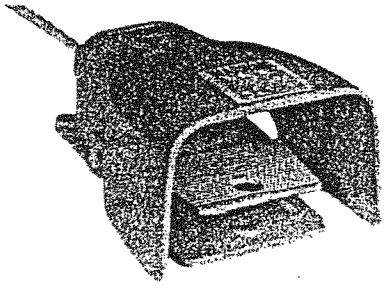


Figure 3.

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.

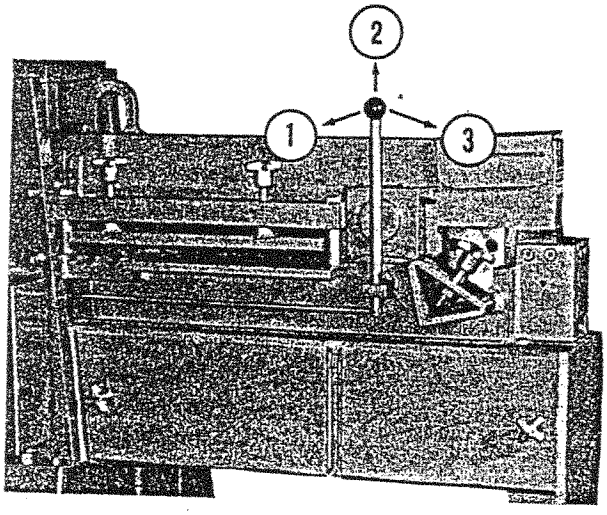


Figure 4.

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
Loosen hand knobs and position collars to allow the cylinder ram movement desired. Tighten hand knobs and carefully check stroke for proper adjustment prior to beginning work.

MANUAL CYLINDER REVERSAL
If it becomes necessary to raise the cylinder before the down stroke is completed, press down on the limit switch actuator (Item #3, Fig.5) to reverse the cylinder motion.

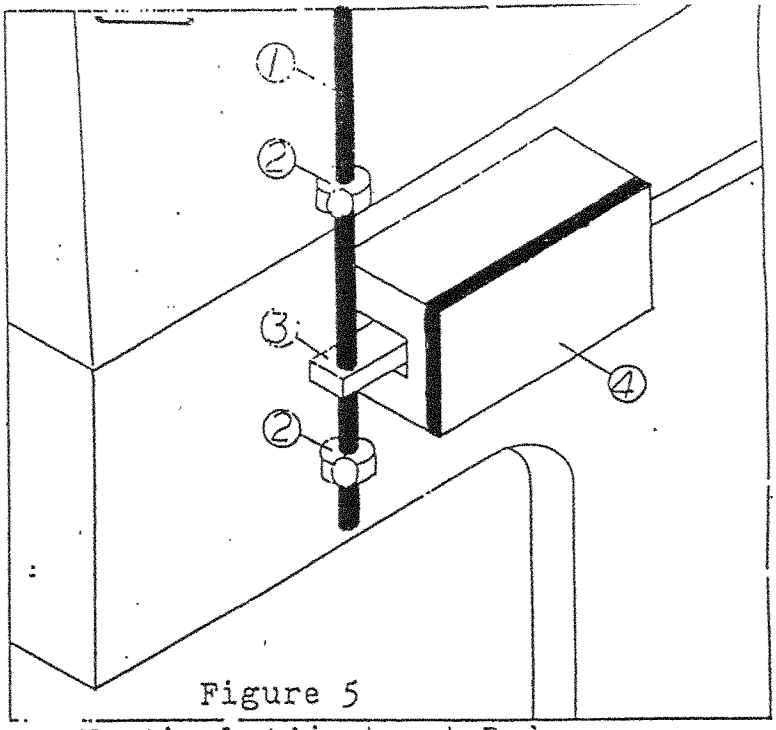


Figure 5

1. Vertical Adjustment Rod
2. Stroke Adjustment Collars w/Hand Knobs
3. Limit Switch Actuator 102888
4. Limit Switch Box

OPERATION

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

The Metal Muncher Iron Worker has a rated shearing capacity equal to the shearing point of mild steel (50,000 PSI). The various work stations also have material thickness limitations. These are specified at the beginning of 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;
Model 61..... ¾ inch
Model 90..... 1 inch

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

Shaft Guide
The shaft guide is necessary to prevent cylinder ram (and therefore punch) rotation.

Guide is correctly installed at the factory and should need no further adjustment.

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

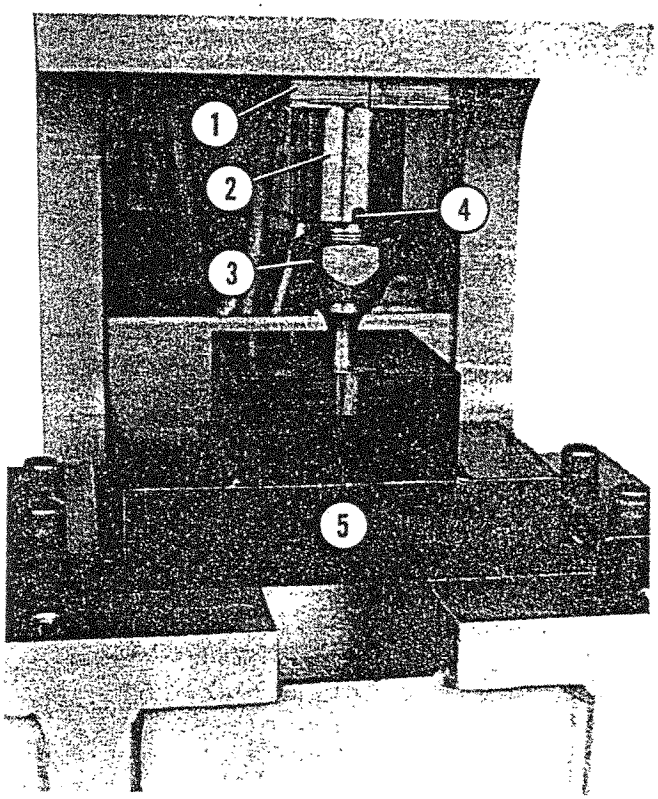


Figure 6.

1. Shaft Guide
2. Cylinder Ram
3. Coupler and Nut
4. Alignment Slot
5. Die Holder Block

Punch Coupler

The punch coupler simply provides a method of attaching the punch to the hydraulic 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.

Punch Installation and Die Alignment

Select a mating punch and die. Affix punch to coupler with coupler nut.

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 die into holder block. Check to be sure coupler nut is secure and punch is squarely installed in coupler.

Slowly bring the punch down into die and make sure it is correctly centered. Securely tighten die holder block to platen. When punch reaches desired depth, adjust limit switch to prevent further downward movement.

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

Stripper

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

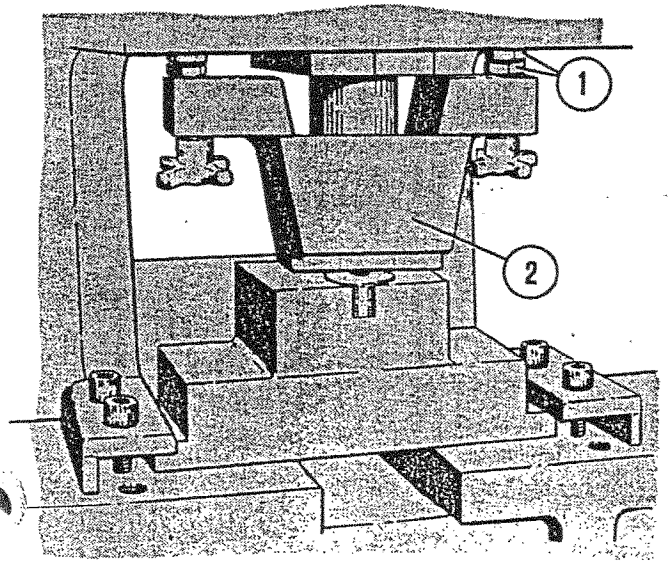


Figure 7.

1. Locknuts 2. Stripper

Adjustment

Loosen locknuts on both sides; adjust stripper to allow material to pass freely beneath stripper base. Secure locknuts against underside of stripper after desired adjustment is reached.

NOTE: Be certain stripper base is 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. ¾'' X 13 threaded holes are provided in the platen. Their primary use is to retain 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 (PN M-266-SC).

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

FLAT SHEAR BAR

NOTE: Do not attempt to shear material exceeding 1'' mild steel in strength or dimension.

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

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

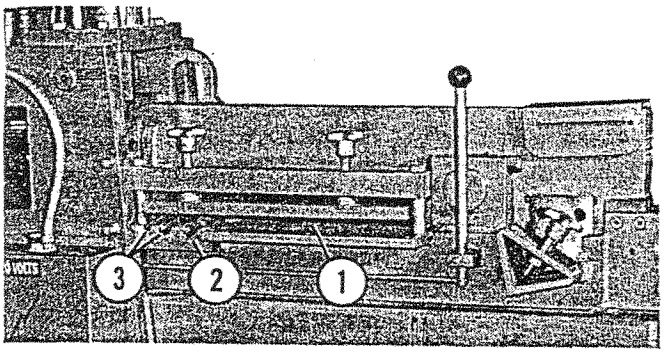


Figure 8.

1. Flat Shear Bar 2. Square Knife
3. Round Knife

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

The flat shear bar has a 17'' capacity for sheet stock when the round and square knives are in cutting position. This capacity may be increased to 22'' by simply inverting the round and square knives.

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 knives, 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., just mark the desired angle on the material, slide through the hold-down and align your mark with the blade.

For production work, adapt a guide plate or the squaring arm as necessary.

Round Knife

The round knife has two cutting areas. The small notch will accept stock up to ¾'' dia. The larger side will shear bar up to 1-3/8'' dia.

Square Knife

The square knife will accept material up to 1¼'' square.

ANGLE SHEAR

NOTE: Do not attempt to shear stock heavier than 3/8'' or with angle legs longer than 4''.

The angle shear is designed to cut angle stock to specific lengths. Angle legs may be of unequal length.

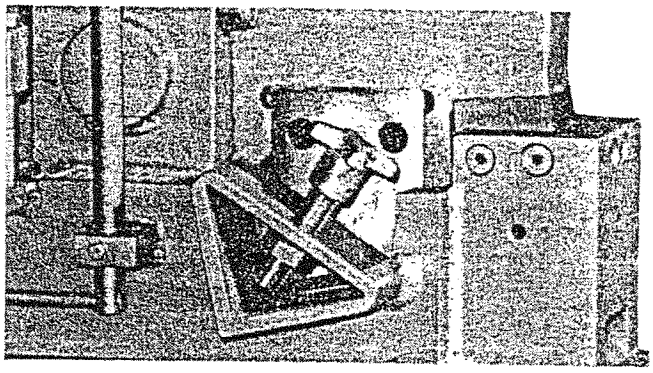


Figure 9. Angle Shear

NOTE: To obtain a precise 90 degree cut, the angle hold-down should be adjusted to a slip fit or tighter.

COPER/NOTCHER

NOTE: Do not attempt to work material exceeding 3/8'' 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.

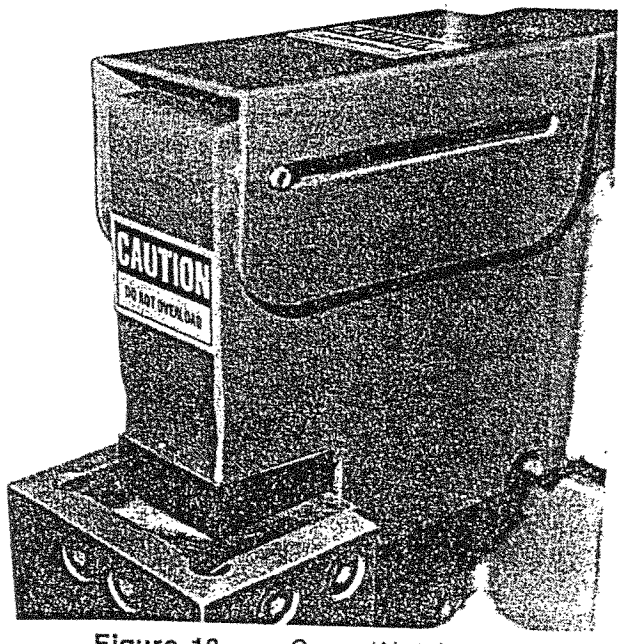


Figure 10. Coper/Notcher

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

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.
Electric Motor	every 2 years

BLADES

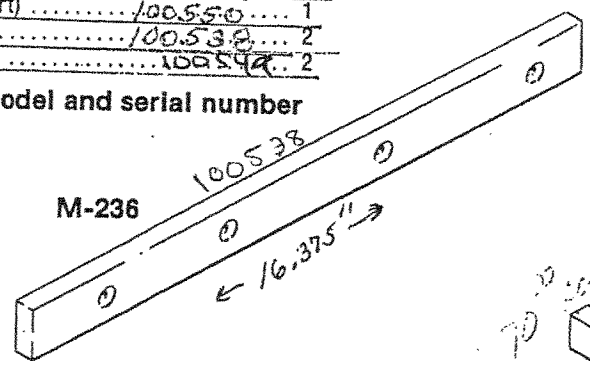
Upper Angle Blade 6 3/8 TO 6 1/8 = 100552
6 1/8 or less = 100553

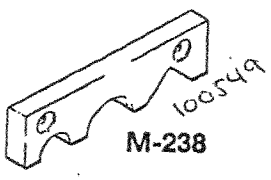
Part Number	Description	No. Req'd.
M-146	Flat Socket Head Cap Screw, ½" X 1½	as required
M-223B	Coper Blade, Upper	1
M-224B	Coper Blade, Lower (long)	2
M-225B	Coper Blade, Lower (short)	1
M-226	Angle Blade, Upper	1
M-227A	Angle Blade, Lower (long)	1
M-228A	Angle Blade, Lower (short)	1
M-236	Flat Bar Blade	2
M-238	Round and Square Blade	2

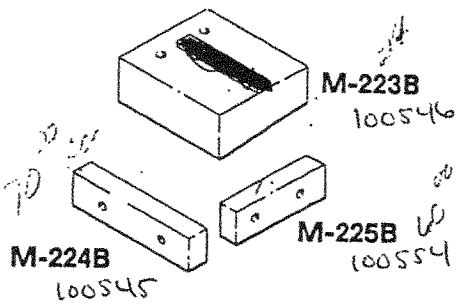
100546 - Keyed
102 618 - Un Keyed

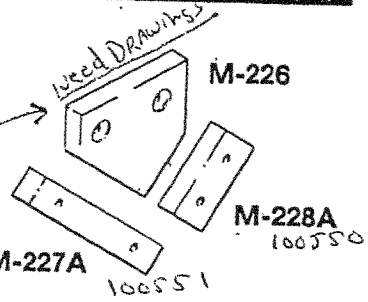
100552 - need size longer

Always give Iron Worker model and serial number when ordering parts.









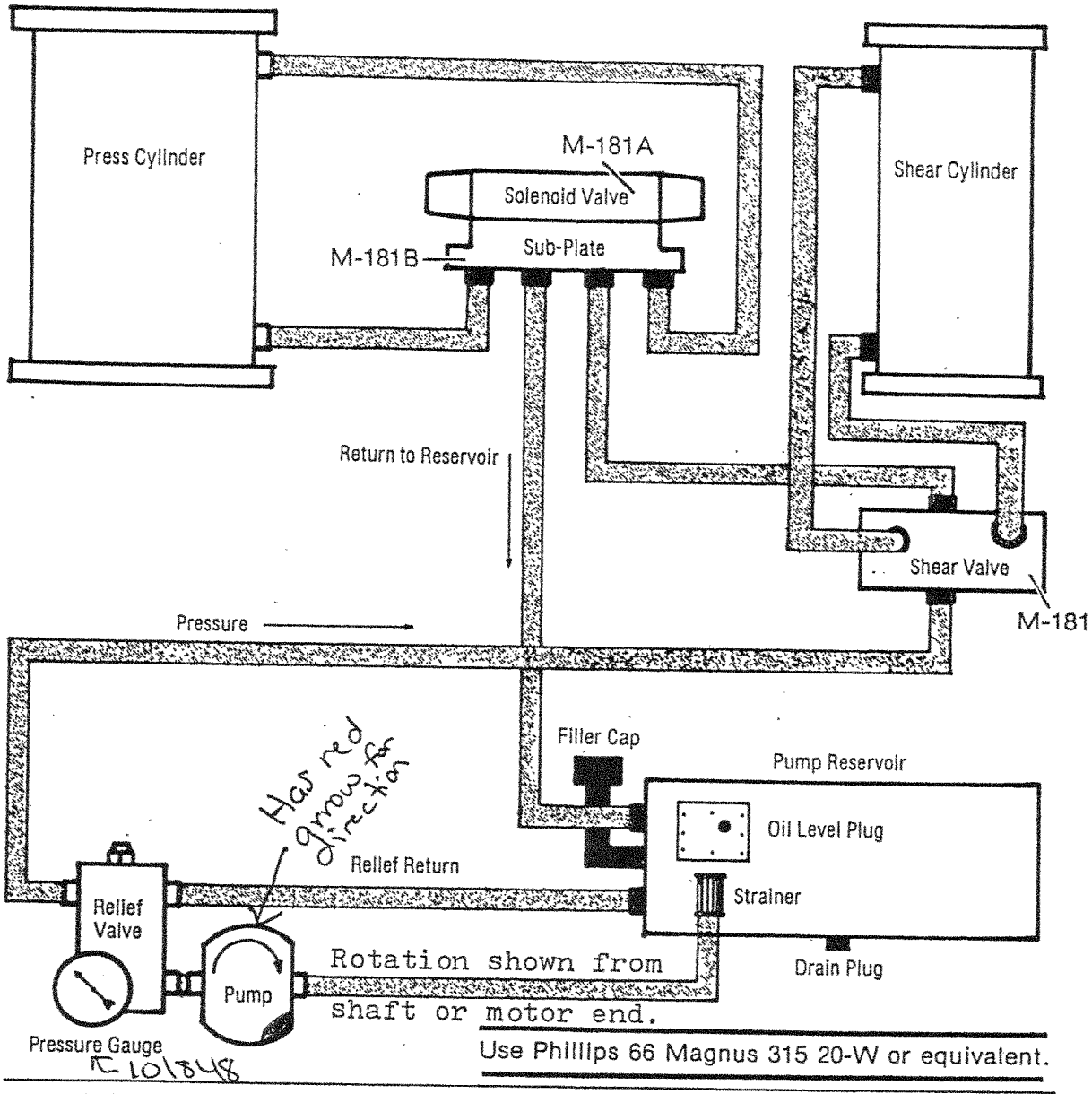
KNIFE MAINTENANCE

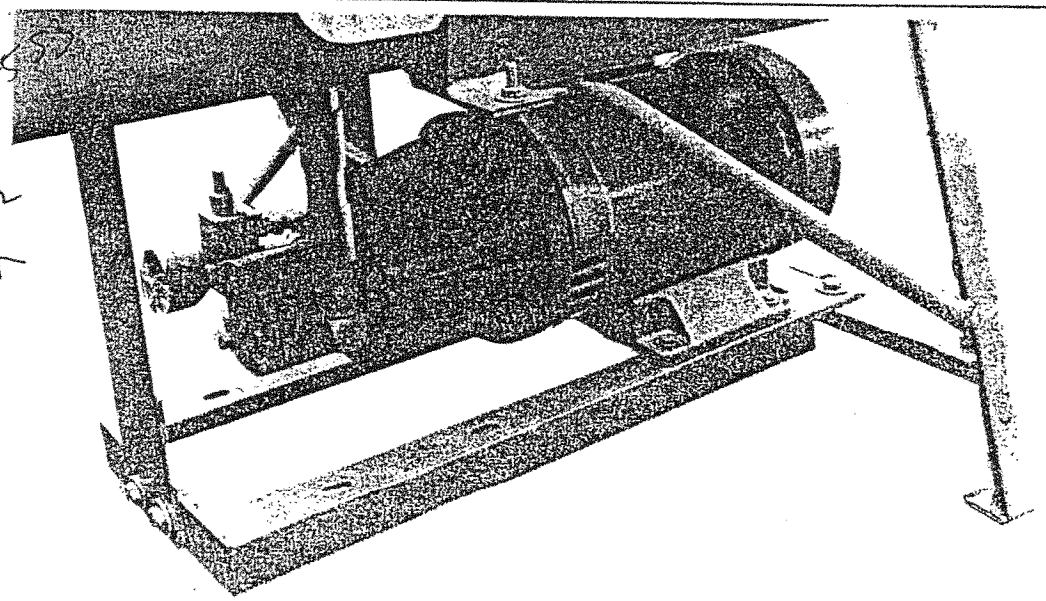
All Knives should be surface-ground for sharpening. NOTE: Grind Knives on broad sides only.

Knife	Available Edges	Side Clearance	End Clearance
Flat Bar	4	.005-.010''	— —
Round (Inverted)	1	.005-.010''	— —
	2	.005-.010''	— —
Square (Inverted)	1	.005-.010''	— —
	2	.005-.010''	— —
Angle (upper)	1	.005-.010''	— —
(lower)	4*	.005-.010''	— —
Coper (upper)	1	.005-.010''	— —
(lower-long)	4	.005-.010''	Less than .062''
(lower-short)	4	.005-.010''	Less than .062''

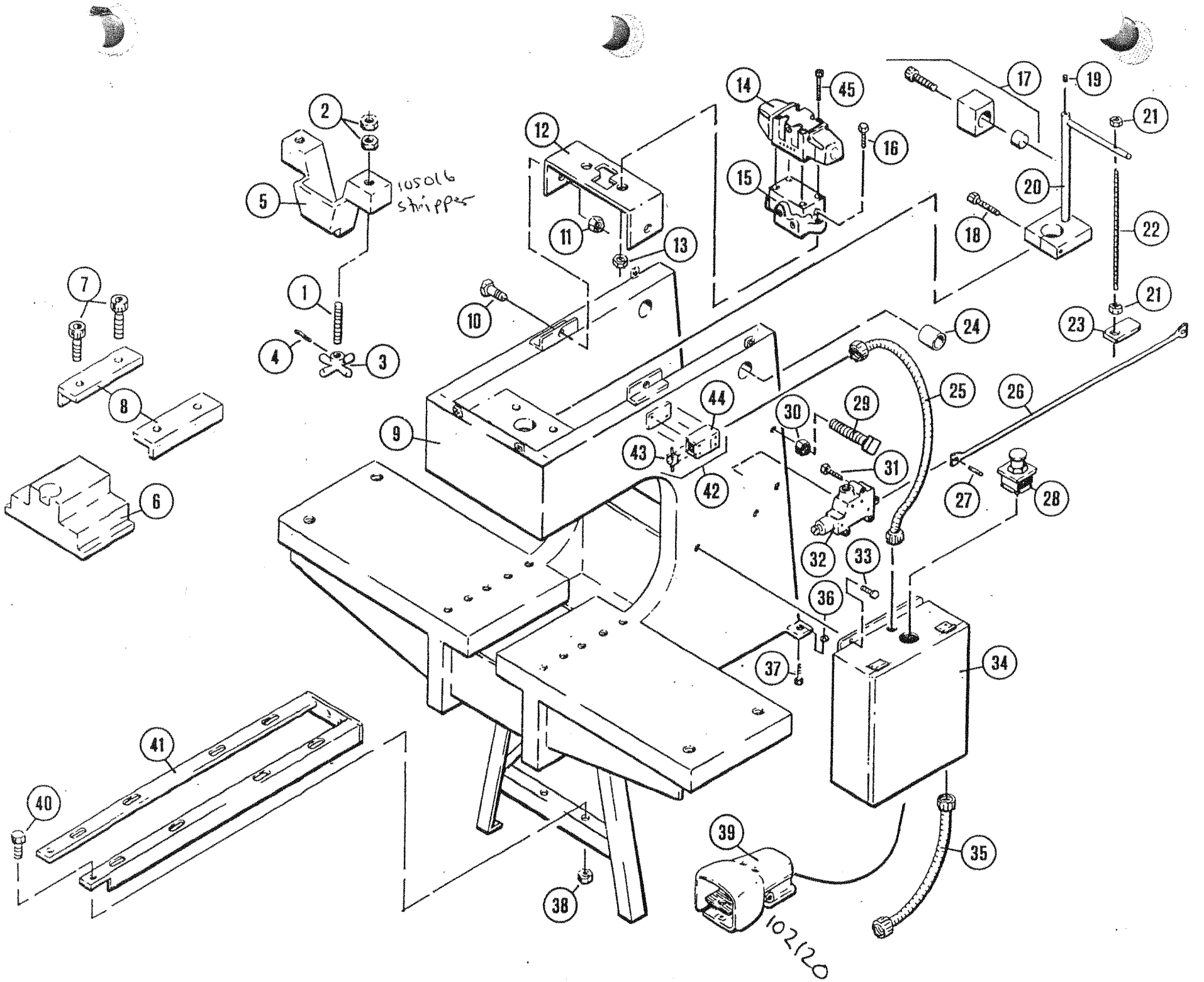
* after Metal Muncher SN-2134.

HYDRAULIC SYSTEM





Parts Ordering Information — Motor, Relief Valve, Pressure Gauge, and Pump
These components vary from model to model. Contact the factory for ordering.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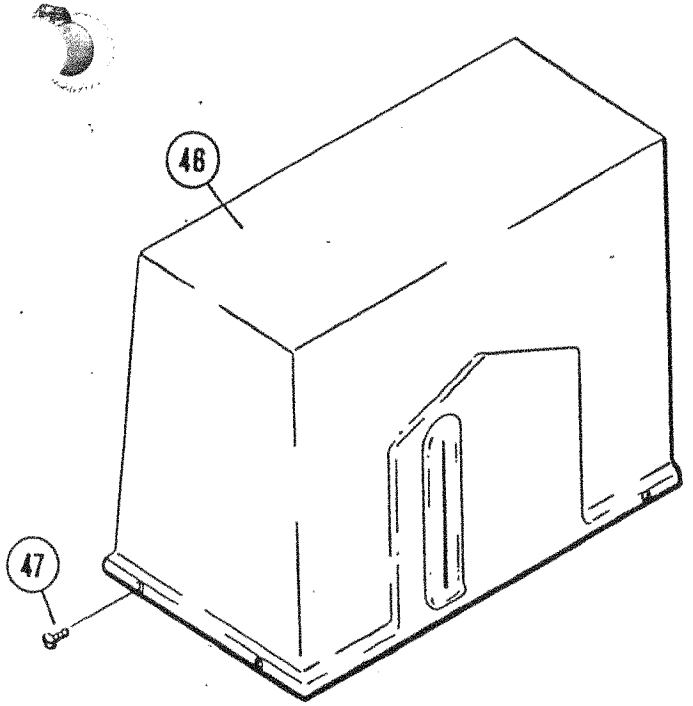
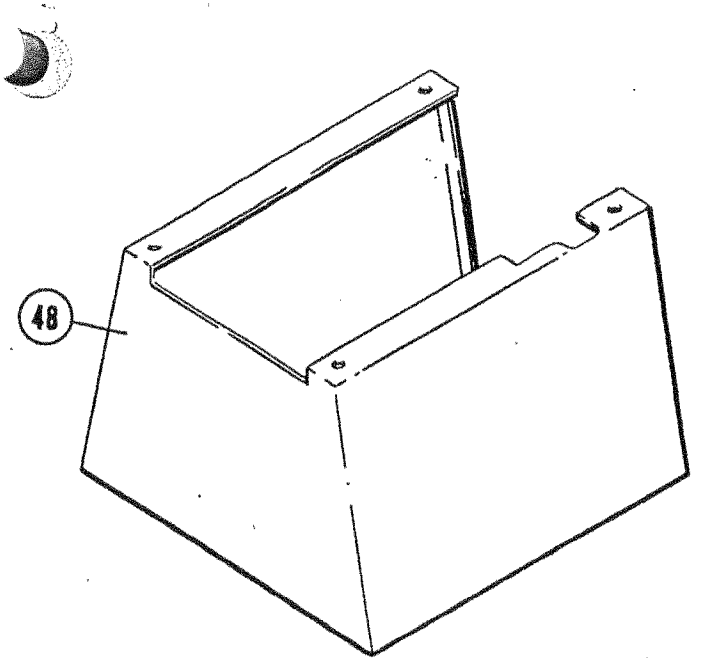




MAINFRAME (HEAD)

Ref. No.	Part No.	Description	Qty. Req'd.
1	M-167	Stripper Attaching Bolt 101554 1-3+4	2
2	M-241	Nut, Hex 100410	2
3	M-142	Hand Knob 102812	2
4		Roll Pin 101505 105017	2
5	M-158	Stripper 105016 ~~101517 w/1234~~	1
6	M-249	Die Holder Block 102955-6 2⅜ hole 6" high	1
7	M-253	Clamp Bolts 100308	4
8	M-252	Clamping Bar 100874	2
9	M-126	Main Frame	1
10	M-163	Bolt, Hex 100256	2
11	M-163A	Nut, 5/16" 100314	2
12	M-181E	Valve Mounting Bracket	1
13	M-181D	Nut	2
X14	M-181A	Solenoid Valve 101849	1
*15	M-181B	Sub Plate, Solenoid Valve 102037	1
16	M-181C	Mounting Bolt, Sub-Plate	2
17*	M-292C	Adjusting Block Assy., Shaft Guide	
18	M-293	Cap Screw	1
19	M-292D	Set Screw	1
20	M-292	Shaft Guide 104074	1
21	M-202E	Nut, ¾" Hex	2
22	M-292A	Threaded Rod, Shaft Guide 100796	1
23	M-292B	Flap	1
24	M-243	Bushing, Bronze 100493	2

Ref. No.	Part No.	Description	Qty. Req'd.
25	M-165G	Conduit, Limit Switch	1
26	M-153A	Control Rod	1
27	M-153B	Roll Pin	1
28	M-165	Start-Stop Switch Push Pull 101999	1
29	M-246B	Gib Adj. Bolt	4
30	M-246A	Lock Nut, Gib Adj. Bolt 100326	4
31	M-181G	Mounting Bolt, Manual Valve	2
32	M-181	Hydraulic Control & Pressure Valve (Manual)	1
33	M-165F	Mounting Bolt, Electric Panel	4
34	M-165A	Electric Control Box	1
35	M-210A	Conduit, Motor Lead	1
36	M-107B	Nut	4
37	M-107A	Mounting Bolt, Lower Shield	4
38	M-210D	Motor Mount Nut	4
39	M-165B	Electric Foot Pedal 102120 New Style	1
40	M-210C	Motor Mount Bolt	4
41	M-210B	Motor Mount	1
42	M-165E	Complete Limit Switch Assy -106051 Plunger	1
43	M-165D	Limit Switch Head	1
44	M-165C	Limit Switch Body	
45	M-181F	Mounting Bolt, Bracket	4
46	M-159A	Hood 102517	1
47	M-163	Bolt	4
48	M-107	Shield, Lower Front	1

* Part of mainframe weldment on later models.

52PA3G2U

101853 - STANDARD

-106117 old style

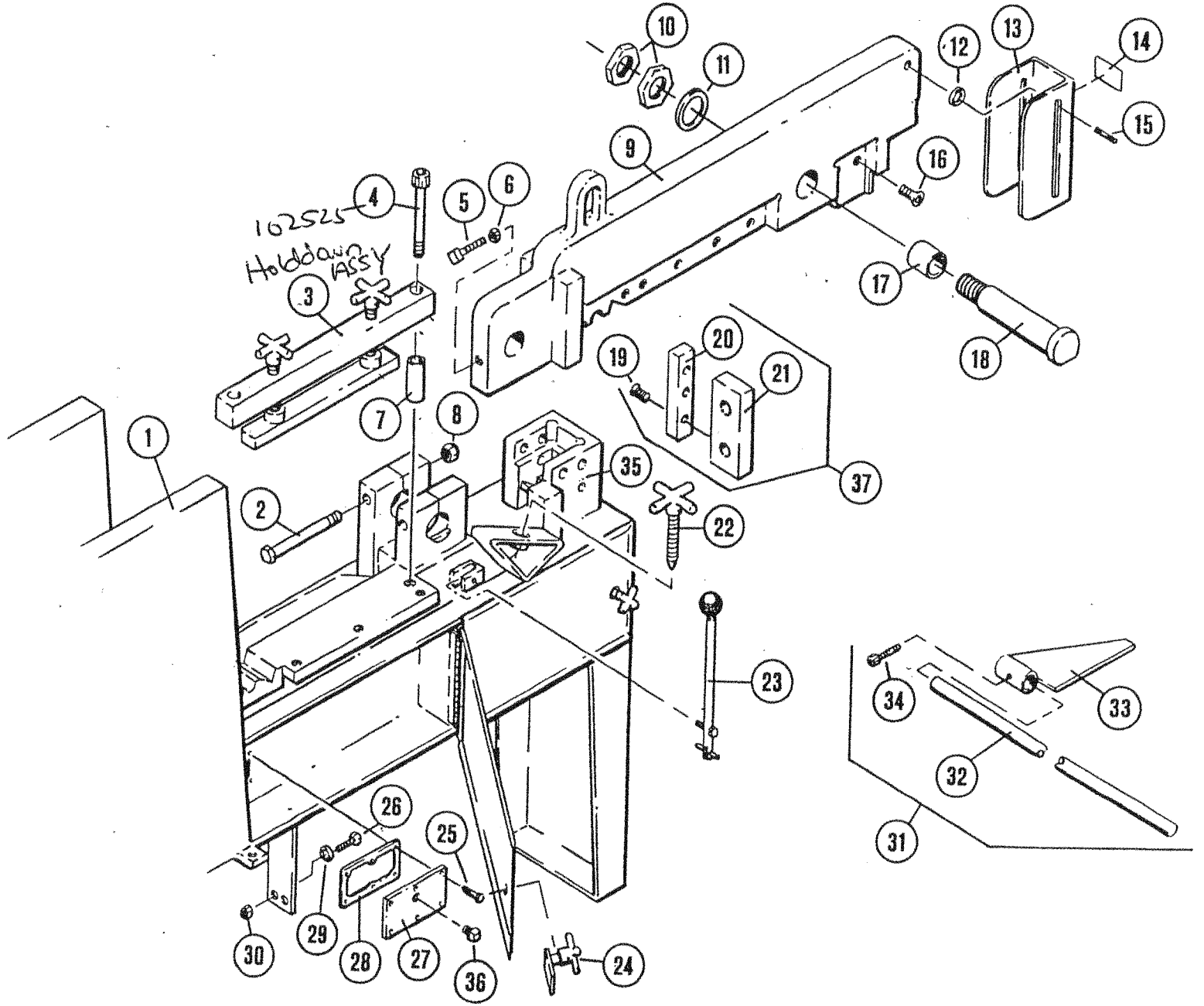
ROTARY 101792 - Body
101793 - Head - Rear
OR 106052 101790 - Body
101794 - Lever

C-H

*14/15 - if customer has Rivett sock. valve - Replace with subplate 102095 + Solenoid 102252

plunger type 106049 = E50SB - Body

L-590-5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MAINFRAME (REAR)

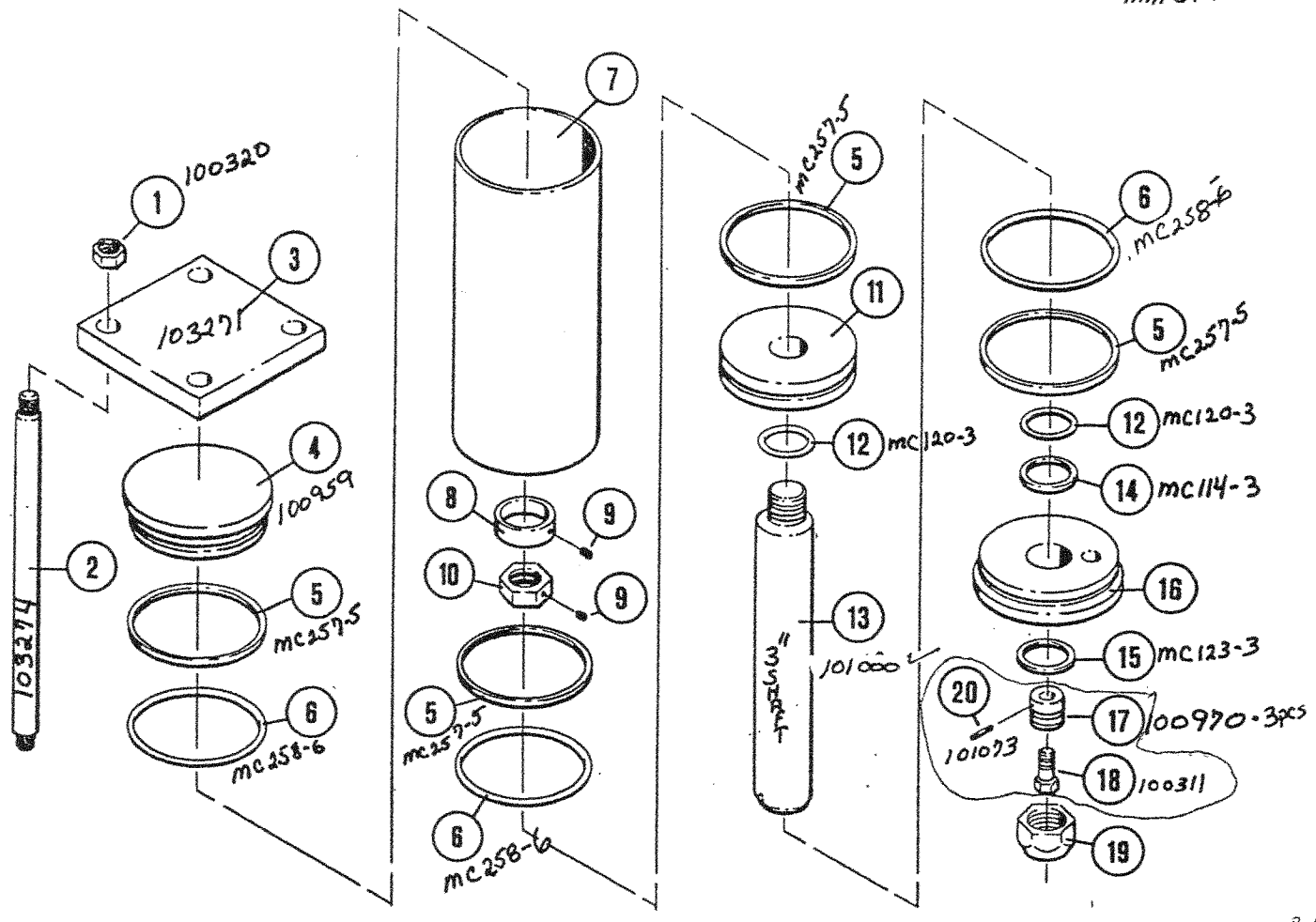
Ref. No.	Part No.	Description	Qty. Req'd.
1	M-126	Main Frame	1
2	M-147E	7/8" X 7" Hex Cap Screw 100018	1
3	M-240	Flat Bar Holddown Assembly 102525	1
4	M-235	¾-10 X 6 Hex Cap Screw	2
5	M-247A	Yoke Pin Set Screw	1
6	M-247B	Yoke Pin Set Screw Lock Nut	1
7	M-235A	Holddown Spacer	2
8	M-147F	7/8" Lock Nut 100320	1
9	M-247	Upper Shear Bar	1
10	M-147C	Jam Nut	2
11	M-147B	Bar Shear Pivot Pin Washer	1
12	M-302A	Coper Shield Washer 100349	as reqd.
13	M-302	Coper Shield 100923	1
14	M-302B	Decal 105182	1
15	M-302C	Coper Shield Roll Pin 101073	2
16	M-146	Blade Bolt MB146-1/2	1
17	M-147D	Bronze Bushing M147D 100497	1
18	M-147A	Bar Shear Pivot Pin (Threaded Type) 101110	1
19	M-244B	Wear Gib Bolt 100297	as reqd.
20	M-244A	Ryertex Strip 100764	as reqd.
21	M-246	Gib Mounting Block 103079	as reqd.
22	M-248	Angle Holddown Screw Assembly	1
23	M-152	Rear Control Handle Assembly	1
24	M-142A	Hand Knob Assembly	1
25	M-304B	Inspection Plate Bolt	6
26	M-210C	Motor Mount Bolt	4
27	M-304	Reservoir Inspection Plate	1
28	M-304A	Gasket	1
29	M-210E	Motor Mount Bolt Lock Nut	4
30	M-210D	Motor Mount Nut	4
31	M-306	Back Gauge Assembly	1
32	M-306A	Back Gauge Tube	1
33	M-306B	Back Gauge Flag	1
34	M-306C	Back Gauge Set Screw	1
35	M-303	Coper Block	1
36	M-305	Oil Level Plug	1
37	M-244	Complete Gib Assembly 105232	1
*	M-164A	Decal Kit	

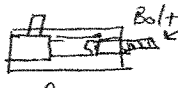
* Not shown.

#out to length comes 4" long

Always give Iron Worker model and serial number when ordering parts.

6 cylinder
MM61E + GB50





Stem punch adapter 100

Cyl. w/ 2" shaft –
Cyl. w/ 3" shaft –

Front Cylinder - Press

Seal Kit # MC296-6-3

Press Cylinder

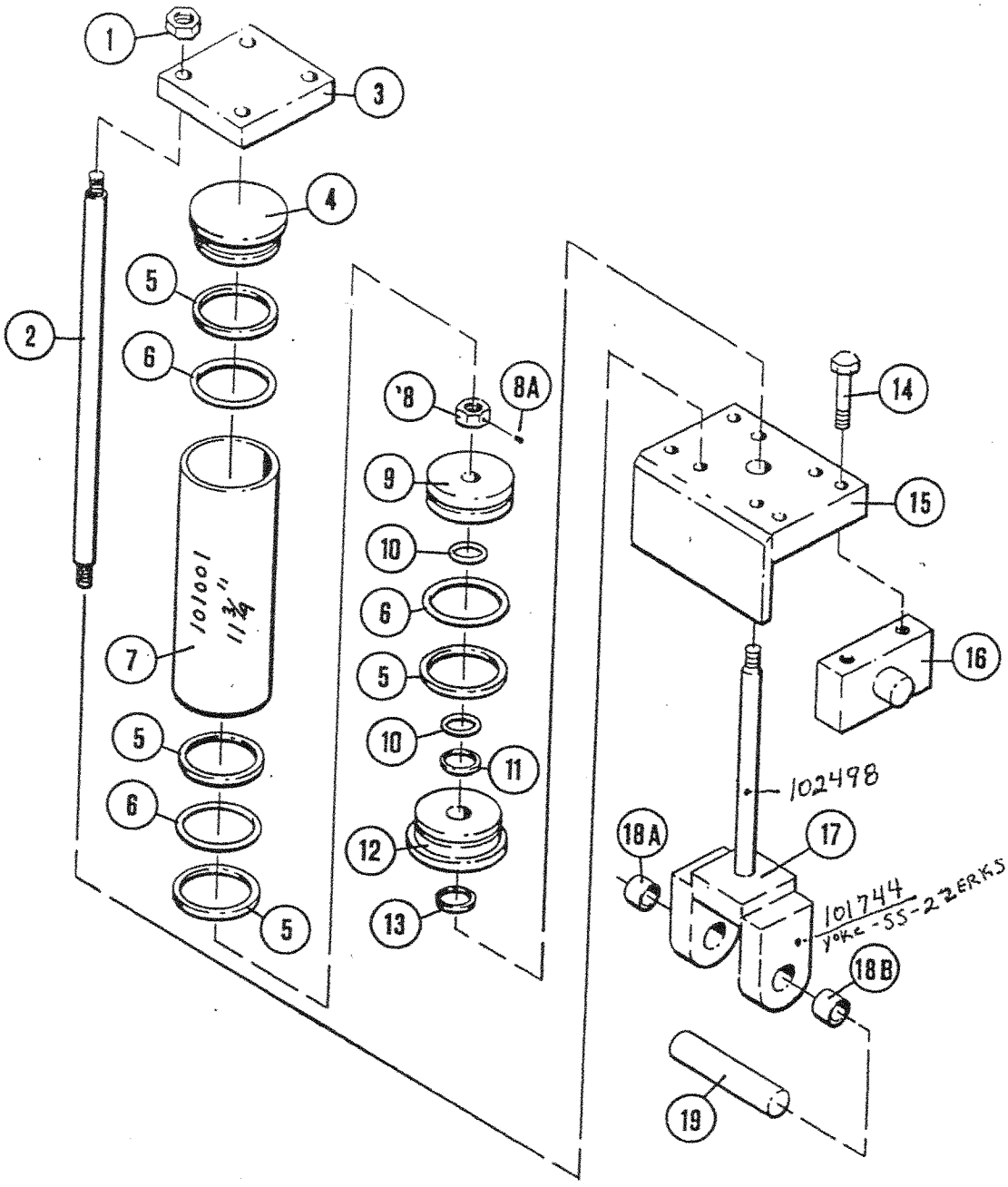
Ref. No.	Part No.	Description	Qty. Req'd.
1	M-254	Hex Nut, 7/8" - 9 ... 100320	4
2	M-256	Tie Bolt, 7/8" ... 103274	4
3	M-255	Tie Down Plate ... 103271	1
4	M-111A	Press Cylinder Plug ... 100959	1
5	M-257	Back-up Ring ... MC257-5	4
6	M-258	6" "O" Ring ... MC258-6	3
7	M-259	Cylinder Barrel	1
8	M-291	Piston Stop Spacer	1
9	M-260A	Set Screw, 5/16, Socket Head	2
10	M-260	Hex Nut, 1½" - 6	1
11	M-261	Piston	1
12	M-120	"O" Ring Seal, Shaft Seal 3" MC120-3	2
13	M-262	Press Cylinder Shaft, 3" Dia. 101000 ✓	1
14	M-114	Back-up Ring, Shaft Seal 3" ... MC114-3	1
15	M-123	Wiper Seal, 3" Shaft ... MC123-3	1
16	M-263	Head	1
17	M-266	Adapter, Threaded Punch Coupling 100970	1
18	M-266A	Cap Screw, 5/8 X 2½, Hex Head ... 100311	1
19**	M-271	Punch Coupling Nut ... 100975	1
20	M-266-P	Roll Pin ... 101073	1
*	M-296	6" Cylinder Repair Kit (press) MC296-6-3	
*	M-294	8" Cylinder Repair Kit (press) MC294-8	
*	M-300	10" Cylinder Repair Kit (press) MC300-10	
*	M-299	6" Cylinder Complete; assembled less tie bolts	
*	M-297	8" Cylinder Complete; assembled less tie bolts	
*	M-301	10" Cylinder Complete; assembled less tie bolts	
*	M-266SP	Stem Punch Coupling Adapter with bolt + Pin	100989 K 100994 K 101697 K

* Not shown. Specify 6", 8" or 10" cylinder size when ordering parts.

** If other than standard #45 Coupling Adapter specify type punch used.

102717-1 6" cyl seal kit

Always give Iron Worker model and serial number when ordering parts.



REAR

Shear Cylinder

Ref. No.	Part No.	Description	Qty. Req'd.
1	M-254	Hex Nut, 7/8" - 9 ... 100320	4
2	M-277	Tie Bolt, Bar Shear Cylinder ... 103274	4
3	M-110	Tie Down Plate, 4½" Cylinder ... 100388	1
4	M-129	Head, Bar Shear Cylinder ... 100957	1
5	M-112	Back-up Ring, 4½" ... MC112-4.5	4
6	M-113	"O" Ring, 4½" ... MC113-4.5	3
7	M-276	4½" Cylinder Barrel, Bar Shear ... 101001	1
8	M-260	Hex Nut, 1½" - 6	1
8A	M-260A	Socket Set Screw, 5/16	1
9	M-118	Piston, 4½" ... 100952 (Southwestern)	1
10	M-120	"O" Ring Seal, Shaft Seal 2" ... MC120-2	2
11	M-114	Back-up Ring, Shaft Seal 2" ... MC114-2	1
12	M-122	Head, 4½" ... 100955	1
13	M-123	Wiper Seal, 2" Shaft ... MC123-2	1
14	M-272	Cap Screw, 7/8 - 9 Gr. 5 X 4	4
15	M-273	Mounting Plate, Bar Shear Cylinder	1
16	M-274	Pivot Block	2
17	M-275	Piston Shaft, Clevis 101744 yoke only	1
18A	M-243A	Bronze Bushing, 2¼ O.D. X 2" I.D. X 1-3/4 L.	1 100493*
18B	M-243B	Bronze Bushing, 2¼ O.D. X 2" I.D. X 2 L	1 100493
19	M-133	Clevis Pin, Bar Shear ... 101742	1
*	M-295	Cylinder Repair Kit (Shear), 4½" (Kits Include all "O" Rings, Back-up Rings and Wiper Seal.)	— MC295-4..
*	M-298	4½" Cylinder complete; assembled less tie bolts	

* Not shown.

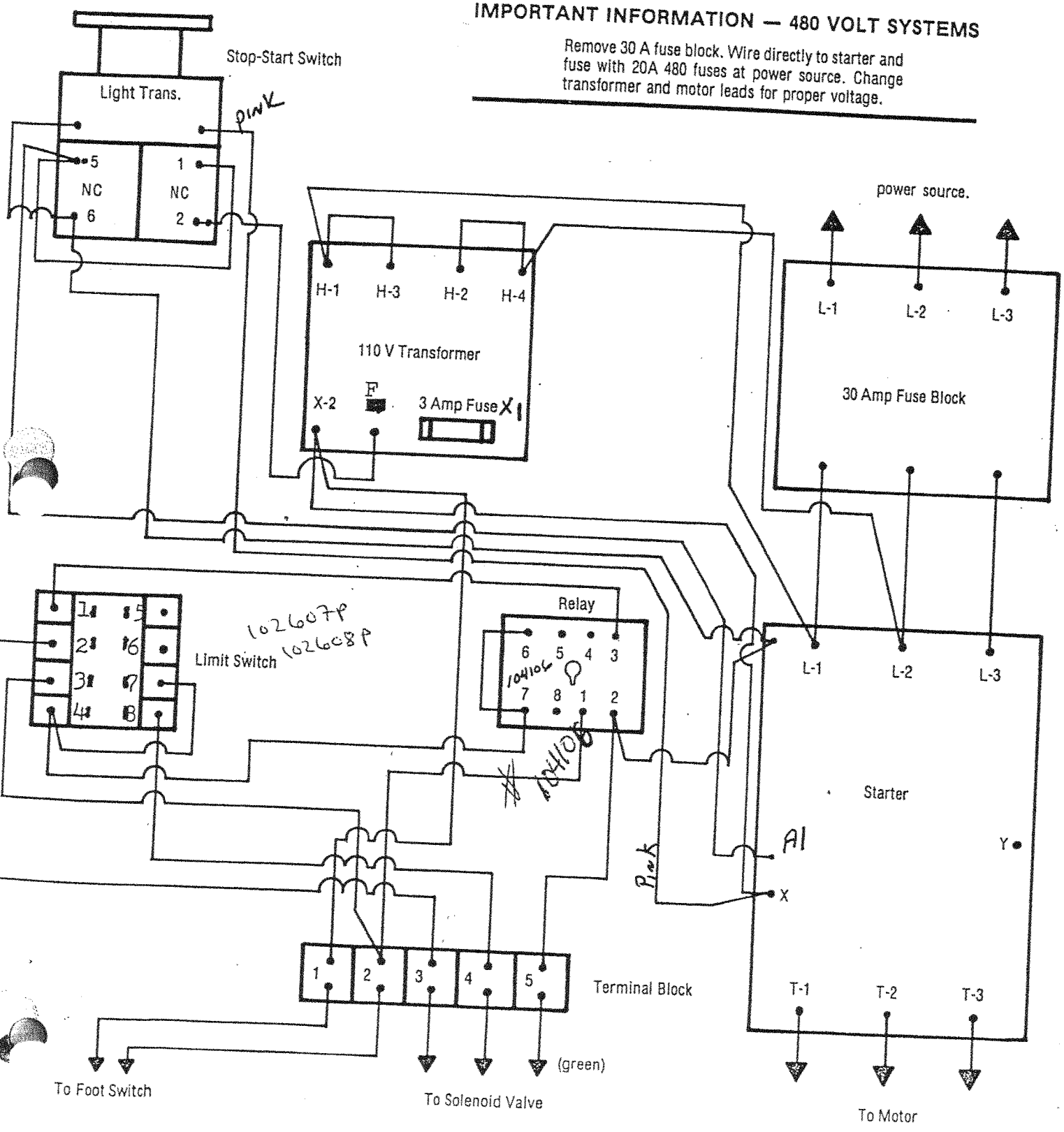
102715-1 4½" seal kit *have to cut

Always give Iron Worker model and serial number when ordering parts.

WIRING DIAGRAM
230 Volt Single Relay

IMPORTANT INFORMATION — 480 VOLT SYSTEMS

Remove 30 A fuse block. Wire directly to starter and fuse with 20A 480 fuses at power source. Change transformer and motor leads for proper voltage.



WIRING DIAGRAM
230 Volt Double Electric

THIS DRAWING PERTAINS ONLY TO MACHINES WITH REAR ELECTRICS.

Change fuses to 500 volt - TRON FNQ-15 Amp.
Change heaters to Gould Cat. No. G30T41.
Change transformer and motor leads for 480 volt operation.