MODEL - MM135
SN# 0733 80498

Purchased
5/14/2014

OPERATOR'S MANUAL AND PARTS LIST FOR METAL MUNCHER

mm70-100-135

040197

WHEN ORDERING PARTS, CONTACT **AREA DEALER**, OR:

WEIR ENTERPRISES, LLC
Bill Weir
1537 17th Road
Clay Center, KS 67432
Phone: (785) 632-6306 Fax: (785) 632-5000
NEW & USED MACHINE TOOL SALES
METAL MUNCHER IRONWORKER PARTS,
SERVICE, REBUILDS

ALWAYS GIVE METAL MUNCHER MODEL AND SERIAL NUMBER WHEN ORDERING PARTS.

FORWARD

This manual has been prepared for those persons who will operate and maintain the METAL MUNCHER Ironworker. It is important that all persons responsible for the operation and maintenance of this equipment READ and UNDERSTAND the information presented in this manual.

The information on the following pages was the most recent available at the time of publication and selection of this material was made on the basis of a standard unit arrangement. Differences between the unit you received and the views contained in this manual are the result of design improvement and/or the addition of optional accessories specified on your order.

WARRANTY

The METAL MUNCHER is warranted against defect in material or workmanship installed or performed at the factory. Because of the quality of workmanship, METAL MUNCHER will within one year from date of purchase, free of charge, at our option, either repair or replace any part of this machine which our examination disclosed to be defective because of workmanship or defect in material. This warranty does not apply if the METAL MUNCHER has been used contrary to the directions enclosed or which has been subject to accident. ALTERATION, abuse, misuse, inadequate power supply and specifically DOES NOT APPLY TO: (1) **normal wear from moving or bearing parts; (2) any other representation, warranty, or liability related to the condition or use of the product.**

METAL MUNCHER will not be responsible for lost production or incidental damage suffered while machine is down under warranty.

Warranty shall consist of replacement of parts only (no labor). All transportation costs on parts submitted under this warranty must be paid by the user. No products or parts are to be returned without first obtaining written permission. All replacement parts will be invoiced. Parts subject to warranty must be returned within 30 days.

The warranty registration card must be signed by the sales agent and owner and returned to METAL MUNCHER within ten days after receiving the machine. This must be done before warranty is in effect.

There are no warranties which extend beyond the description on the face hereof.

Hydraulic pump, valves, electric motors and starter are warranted by the original manufacturer. . .not METAL MUNCHER.

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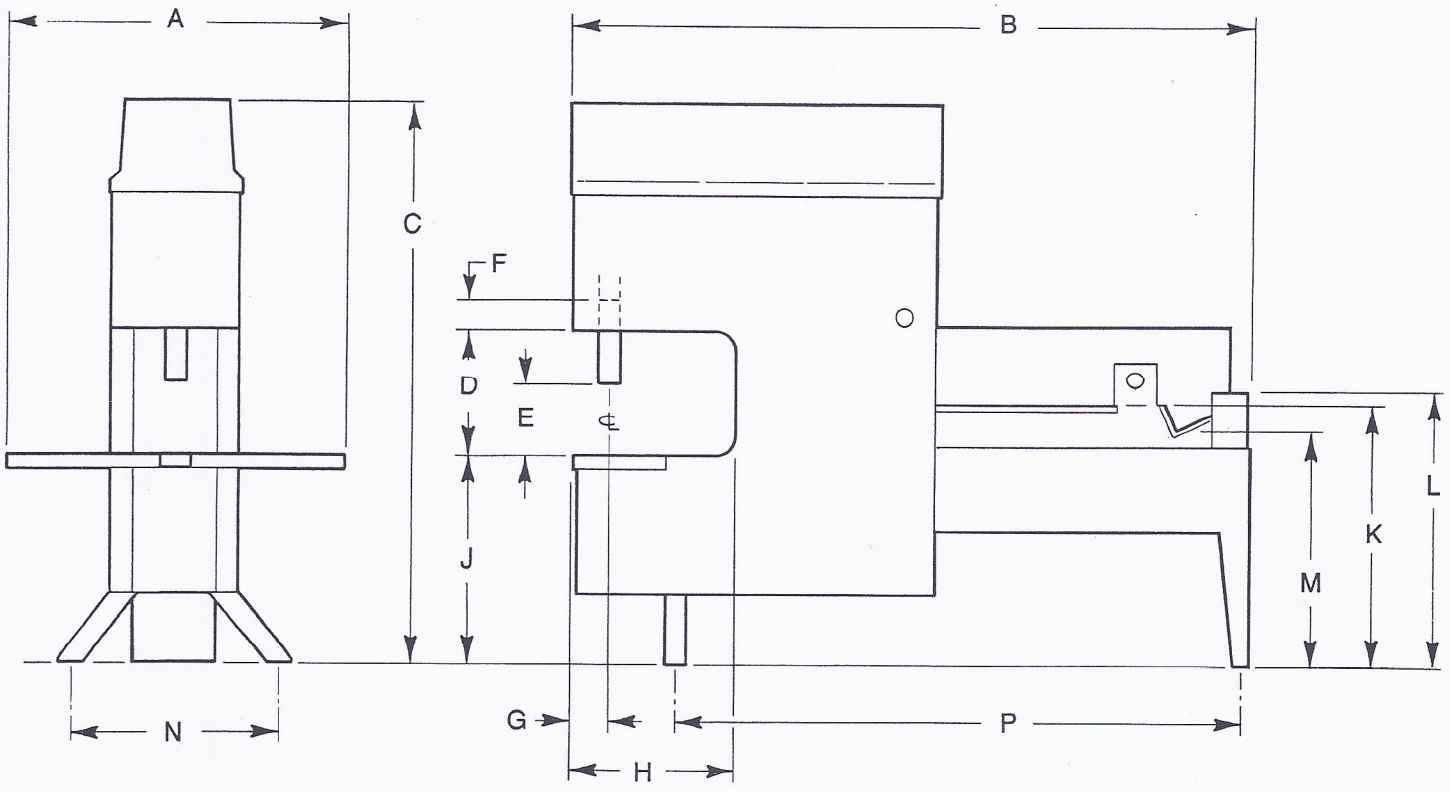
DIMENSIONAL CHART - METAL MUNCHER



Widest point (27-1/8") on MM-40 is outside at bottom of legs, not table

MODEL	Dimensions in Inches													
	A	B	C	D	E	F*	G	H	J	K	L	M	N	P
MM-40	21	60¼	65½	9½	6-7/8	1-7/8	3½	11	34¼	37-7/8	38-5/8	35	24-3/8	51
MM-70	48	73-5/8	68¼	14	8¼	1¼	4-7/8	14-7/8	30	37½	39	34½	25½	62-5/8
MM-70-18	48	97-5/8	78¾	18	10¼	1¼	4-7/8	23¼	30	37½	39	34½	28¾	83½
MM-100	48	76-1/8	69¼	14	8¼	1¼	4-11/16	14-3/8	30	37½	39	34½	27	65
MM-100-18	48	97-5/8	80¾	18	10¼	1¼	4-11/16	22-7/8	30	37½	39	34½	29-3/16	82-7/8
MM-135	48	97-5/8	74¾	14	8¼	1¼	6	20½	30	37½	39	34½	31¼	82¾
MM-135-18	48	97-5/8	79¼	18	10¼	1¼	6	24½	30	37½	39	34½	32-3/8	82¾

*F is Ram Retracted

NOTE: All dimensions are approximate.

INTRODUCTION

The METAL MUNCHER Hydraulic Ironworker 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 Ironworker.

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 IRONWORKER.

EMERGENCY STOP BUTTON

The emergency stop button is located on top of the electrical box at the side of the machine (see Fig. 1). Depress switch to halt all machine functions immediately. Raise switch to re-start.

Fuse Disconnect Switch is located on the electrical panel door (see Fig. 1).

CAUTION: BE CERTAIN TO TEST THIS SWITCH PRIOR TO EACH DAY'S OPERATION.

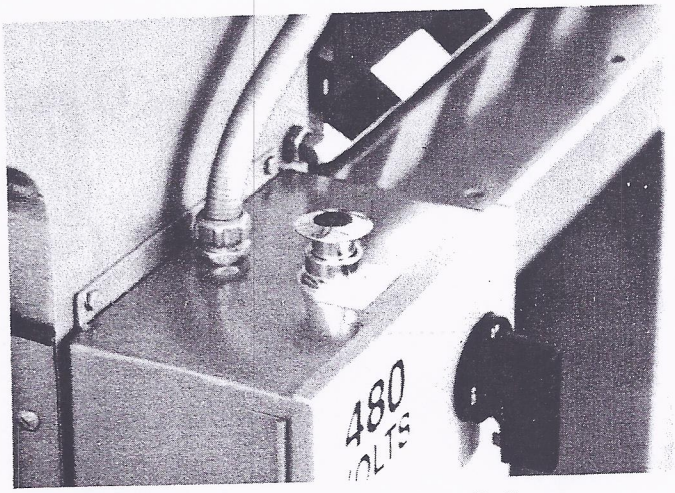


Figure 1. Emergency Stop Button

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 GUARD IS IN PLACE BEFORE OPERATING SHEAR STATIONS.

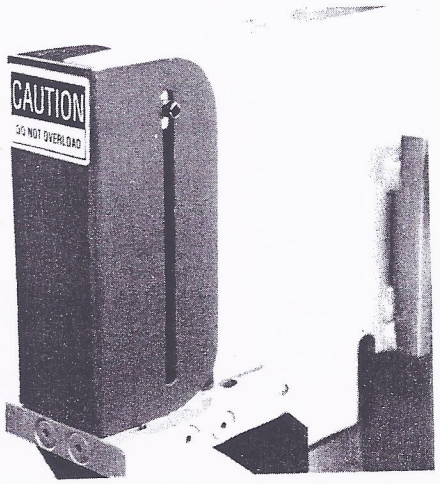


Figure 2. Guard in place

METAL MUNCHER INSTALLATION

Electrical Connection

The standard METAL MUNCHER unit is wired for 220 volt 3-phase operation. Optional single phase, 208 or 480 volt models are available upon request.

CAUTION: MAKE CERTAIN YOUR WIRING IS IN COMPLIANCE WITH MACHINE 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.

It is important to check pump direction. Clockwise rotation of the hydraulic pump shaft (when viewed from the shaft end of the pump and fan end of motor) is CRITICAL. Running pump in counter-clockwise rotation for more than thirty seconds will damage the shaft seal (causing oil leakage) and VOID any warranty. To check rotation, move rear control handle, if no movement, pump is running backwards (counter-clockwise). Rewire motor leads to obtain correct operation if necessary. See Hydraulic System, page 16, for rotation of motor and pump.

1. Check all hardware and tighten if necessary, including:
   - blade and trunion bolts
   - motor and pump mounting bolts
   - cylinder tie bolts
   - upper shear bar pivot nuts
   - set screw on shear bar clevis pin
   - bar shear arm gib bolts
2. Check pins in valve control handle and linkage.
3. Check for correct blade clearance (see Blade Maintenance, page 10).
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 hours of operation, then after each 30 days use.

5. Properly lubricate machine (see Lubrication, page 11).
6. Release limit switch quick adjustment collars 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: See Standard Limit Switch Mode (page 7) for operation.

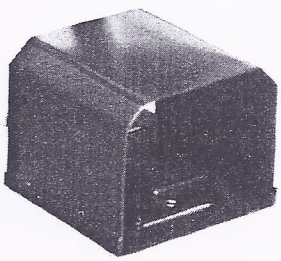


Figure 3

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.

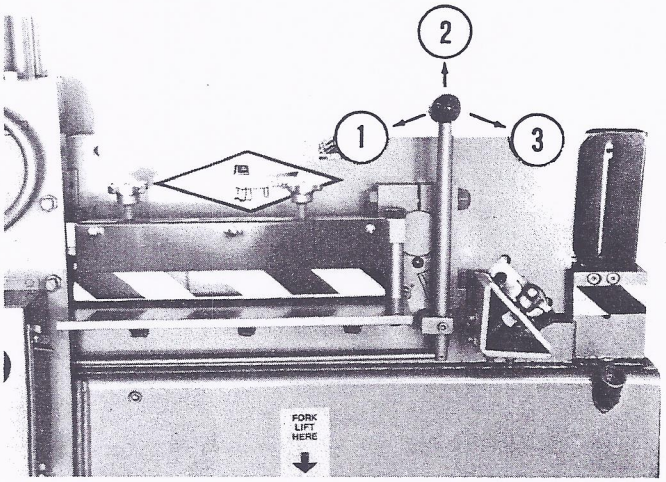


Figure 4
1. Lower Shear 2. Neutral
3. Lower Coper-Notcher

LIMIT SWITCH

This switch (Fig. 5) is provided to limit travel of the front hydraulic cylinder ram during punch or press work operation.

STROKE ADJUSTMENT

Press in on quick-set stroke buttons (Item No. 3, Fig. 5) and position stroke collars (Item No. 2, Fig. 5) to allow the ram stroke desired. Final fine adjustment is made by rotating the stroke collars on the vertical threaded rod (Item No. 1, Fig. 5).

STANDARD LIMIT SWITCH MODE

1. Depress foot switch and ram will travel down, strike preset stroke collar and STOP.
2. Release foot switch and ram will travel up, strike preset stroke collar, STOP and reset for next cycle.
3. Repeat steps 1 and 2 for repeated cycles.

JOG RAM DOWN

Depress and release foot switch repeatedly as needed to jog ram DOWN for punch and die block alignment (see page 4) or for locating the punch point to a center punch location on material to be punched.

RAM RETRACT

To retract ram UP before striking the lower limit stroke collar, release foot switch and push the retract button (Item No. 7, Fig. 6). The ram will travel UP and strike stroke collar to reset for next cycle.

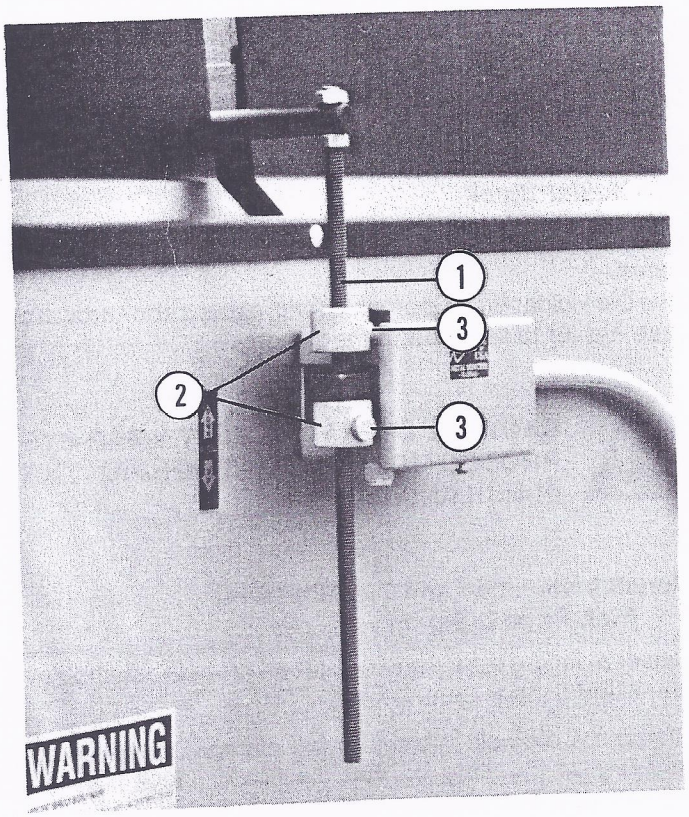


Figure 5
1. Vertical Adjustment Threaded Rod
2. Quick Adjustment Collars
3. Quick-set Buttons

OPERATION

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

The METAL MUNCHER Ironworker has a rated shearing capacity equal to the shearing point of mild steel (65,000 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 65,000 PSI mild steel in strength, or the maximum thickness shown below. Material thickness should **NEVER** exceed the point diameter of the punch.

Model 70	7/8 inch
Model 100	1 inch
Model 135	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.

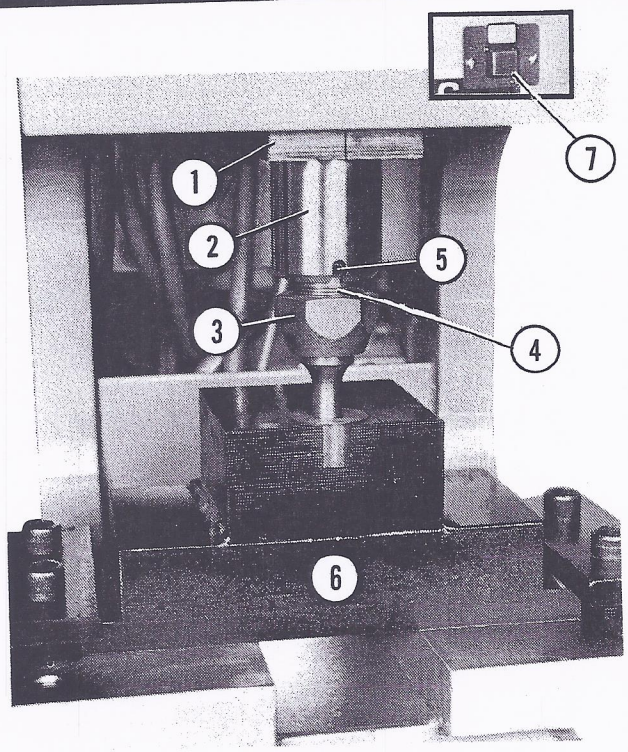


Figure 6
1. Shaft Guide
2. Cylinder Ram
3. Punch Coupling Nut
4. Threaded Punch Coupling Adapter
5. Alignment Slot
6. Die Holder Block
7. Retract Button

Punch Coupling Adapter

The punch coupling adapter simply provides a method of attaching the punch to the cylinder shaft. The punch coupling nut secures the punch itself to the punch coupling adapter (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 (Ref. Page 7, Fig. 6)

Select a mating 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. Then cycle several times to re-check for proper clearance and stroke. (See Punch & Die Clearance Chart, page 11.)

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

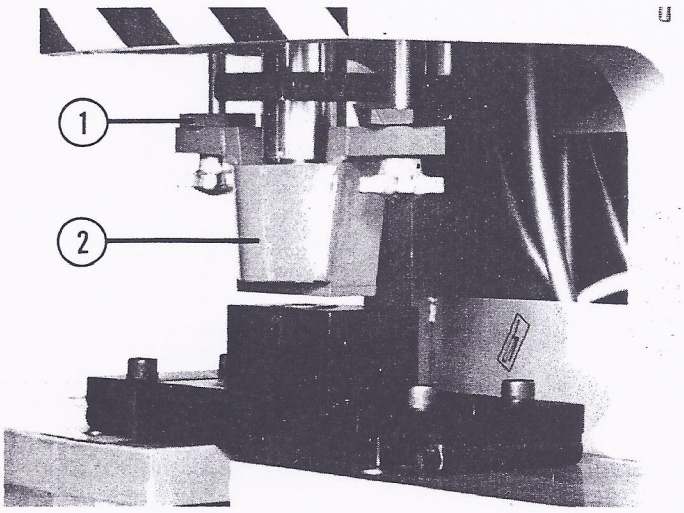


Figure 7.
1. Locknuts 2. Stripper

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.

Adjustment

Loosen locknuts on both sides; adjust stripper to allow material to pass freely beneath stripper base. Secure locknuts.

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 POINT 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 Ironworker 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. 3/4" x 10 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 shaft protector is recommended.

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 blades as an option.

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

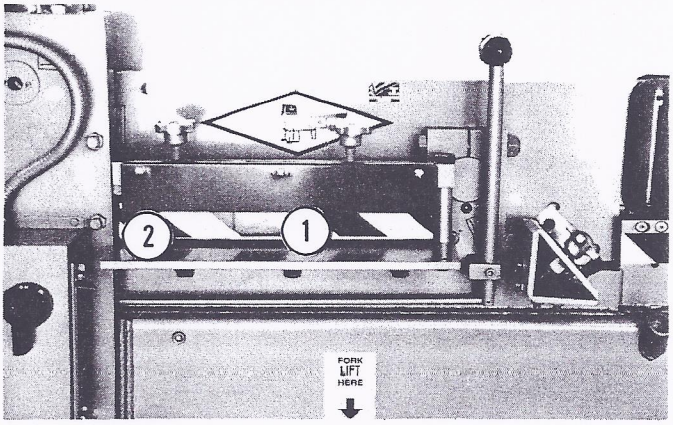


Figure 8.
1. Flat Bar Shear
2. Round and Square Blade (option)

(Note: Guard shown in down position.)

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

The flat bar shear has a 24" x 1/4" mild steel capacity for sheet stock. Optional: A special Hy-Performance blade is available to replace the upper flat bar blade and increase shearing capacity to 24" x 1/2" mild steel plate.
Optional: Round and square blades are available to replace the short front flat bar blade section. This shortens the flat bar shear capacity to 17-1/2".

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 a guide plate or the squaring arm as necessary.

Round and Square Blades (Optional)

The round cutting area will accept stock up to 1-3/8" diameter.

The square cutting area will accept stock up to 1-1/4" 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.

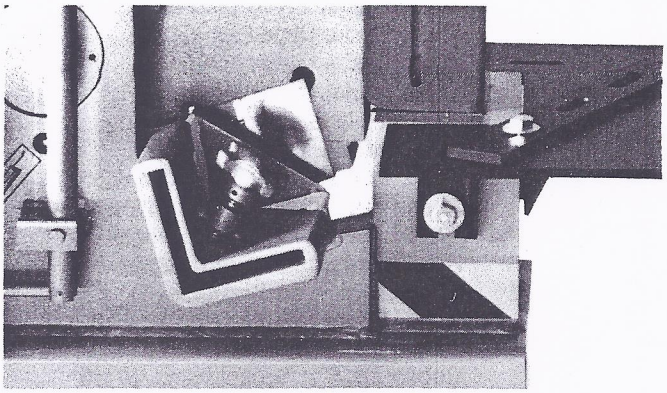


Figure 9. Angle Shear

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.

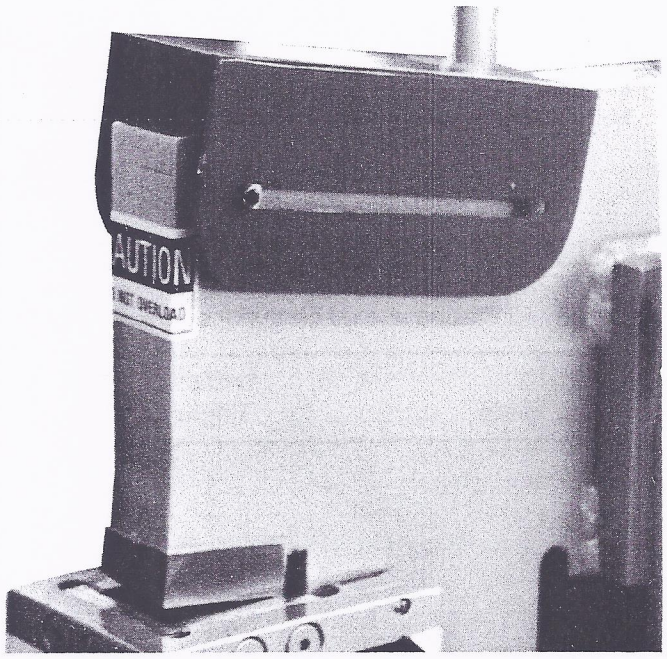
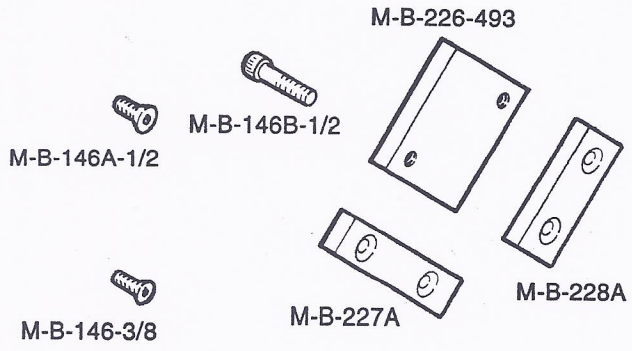


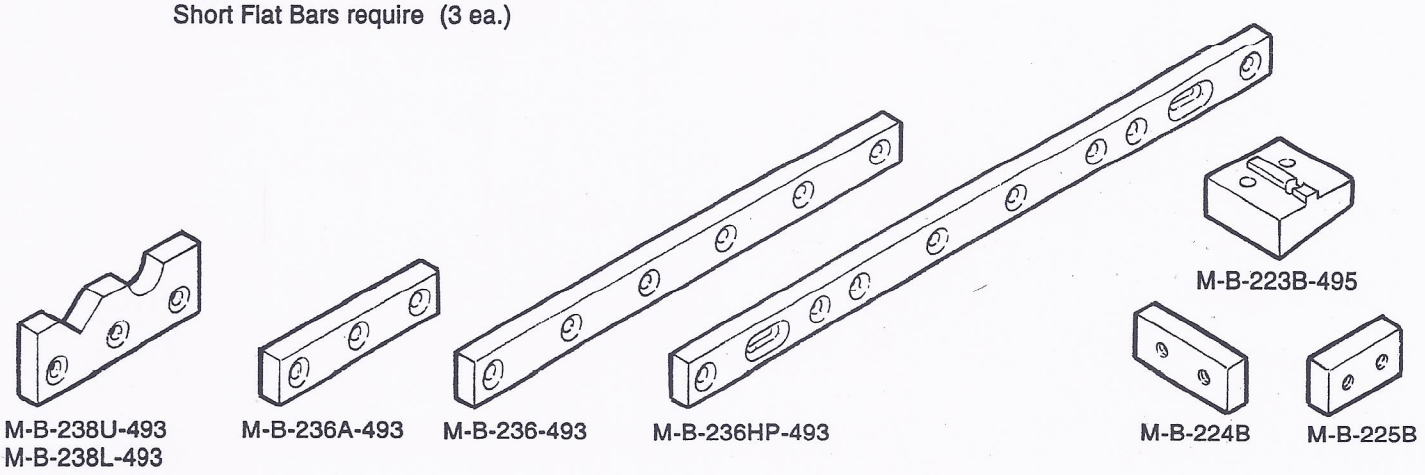
Figure 10. Coper-Notcher (shown with guard up)

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 left (thick) side as possible.

BLADES

PART NO.	DESCRIPTION	NO. REQ'D.
M-B-223B-495	Coper Blade, Upper	1
M-B-224B	Coper Blade, Lower (long)	2
M-B-225B	Coper Blade, Lower (short)	1
M-B-226-493	Angle Blade, Upper	1
M-B-227A	Angle Blade, Lower (long)	1
M-B-228A	Angle Blade, Lower (short)	1
M-B-236-493	Flat Bar Blade, 17-5/8" long	2
M-B-236A-493	Short Flat Bar Blade, 6½" long	2
M-B-236HP-493	Hy-performance Blade, optional 24-1/8" long	1
	Round and Square Blade, optional:	
M-B-238U-493	Round and Square Blade, Upper	1
M-B-238L-493	Round and Square Blade, Lower	1
M-B-146A-1/2	Flat Socket Head Capscrew, ½" x 1½"	9
	Upper Coper requires (3)	
	Lower Coper requires (2 ea.)	
M-B-146B-1/2	Capscrew, Flat Socket Head ½" x 3"	2
	Upper Angle requires (2)	
M-B-146-3/8	Capscrew, Flat Socket Head 3/8" x 1¼"	22
	Lower Angles require (2 ea.)	
	Long Flat Bars require (6 ea.)	
	Short Flat Bars require (3 ea.)	





BLADE MAINTENANCE

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

Blade	Available Edges	Side Clearance	End Clearance
Flat Bar	4	.005-.010"	— —
Round	1	.005-.010"	— —
Square	1	.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"

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.

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 Figure 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.

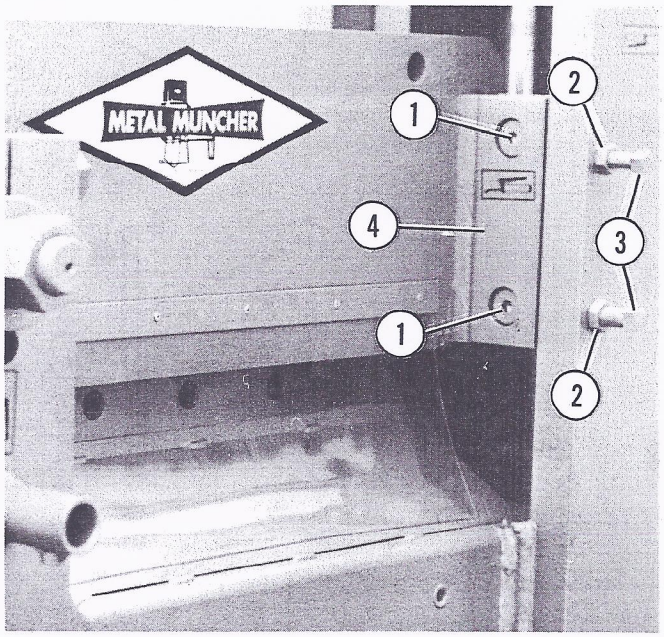


Figure 11.

PUNCH AND DIE CLEARANCES

IMPORTANT: Material thickness should never exceed the point diameter of the punch.

To determine standard Punch & Die clearances for punching mild steel:

PLATE:

1/4" to 1/2" material thickness ..... 1/32" clearance

1/2" to 3/4" material thickness ..... 1/16" clearance

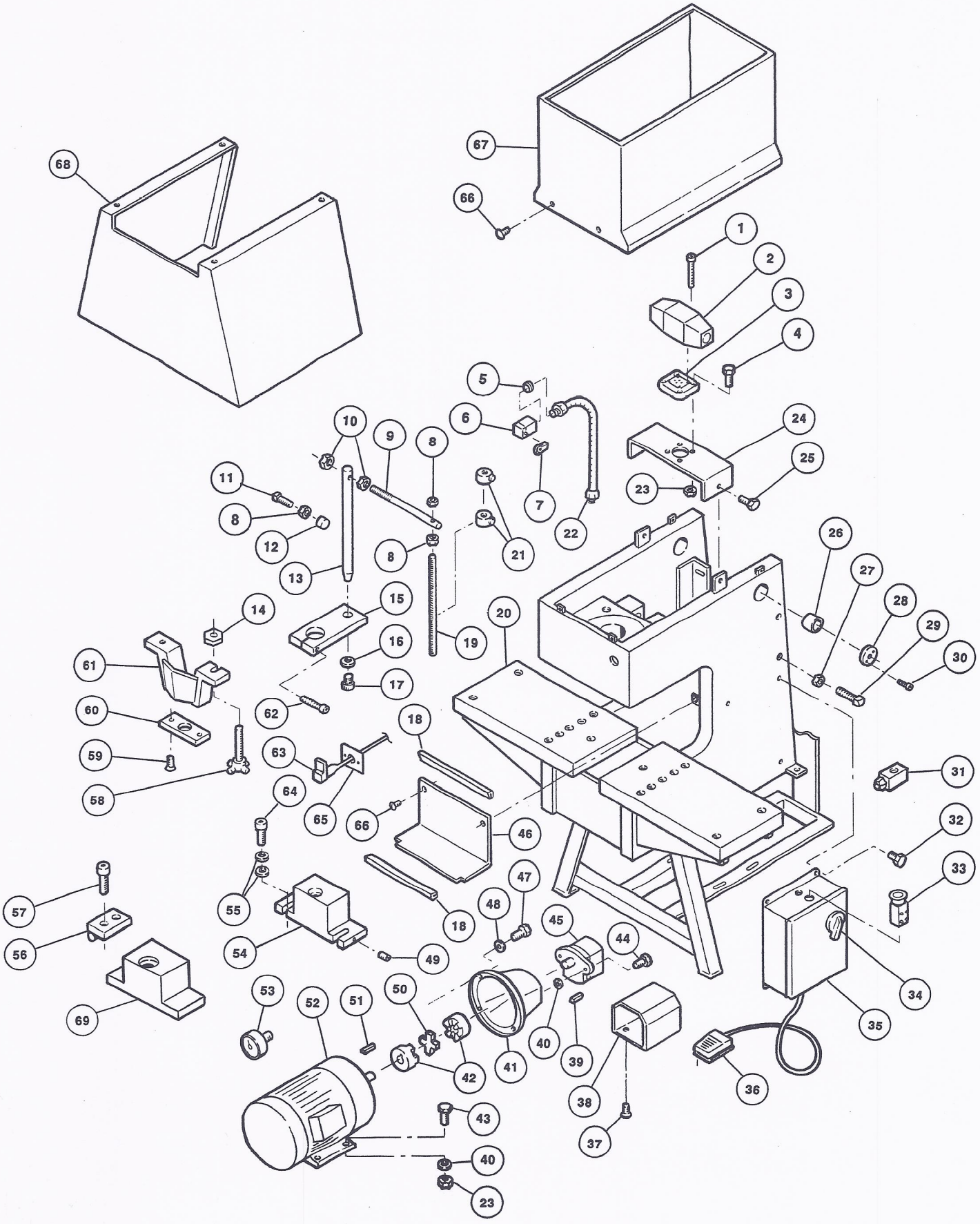
3/4" and over material thickness ..... 3/32" clearance

GAUGE STOCK:

15 ga. to 13 ga. material thickness ..... 0.10"

(1/64" clearances available)

PUNCH PRESS END PARTS EXPLOSION



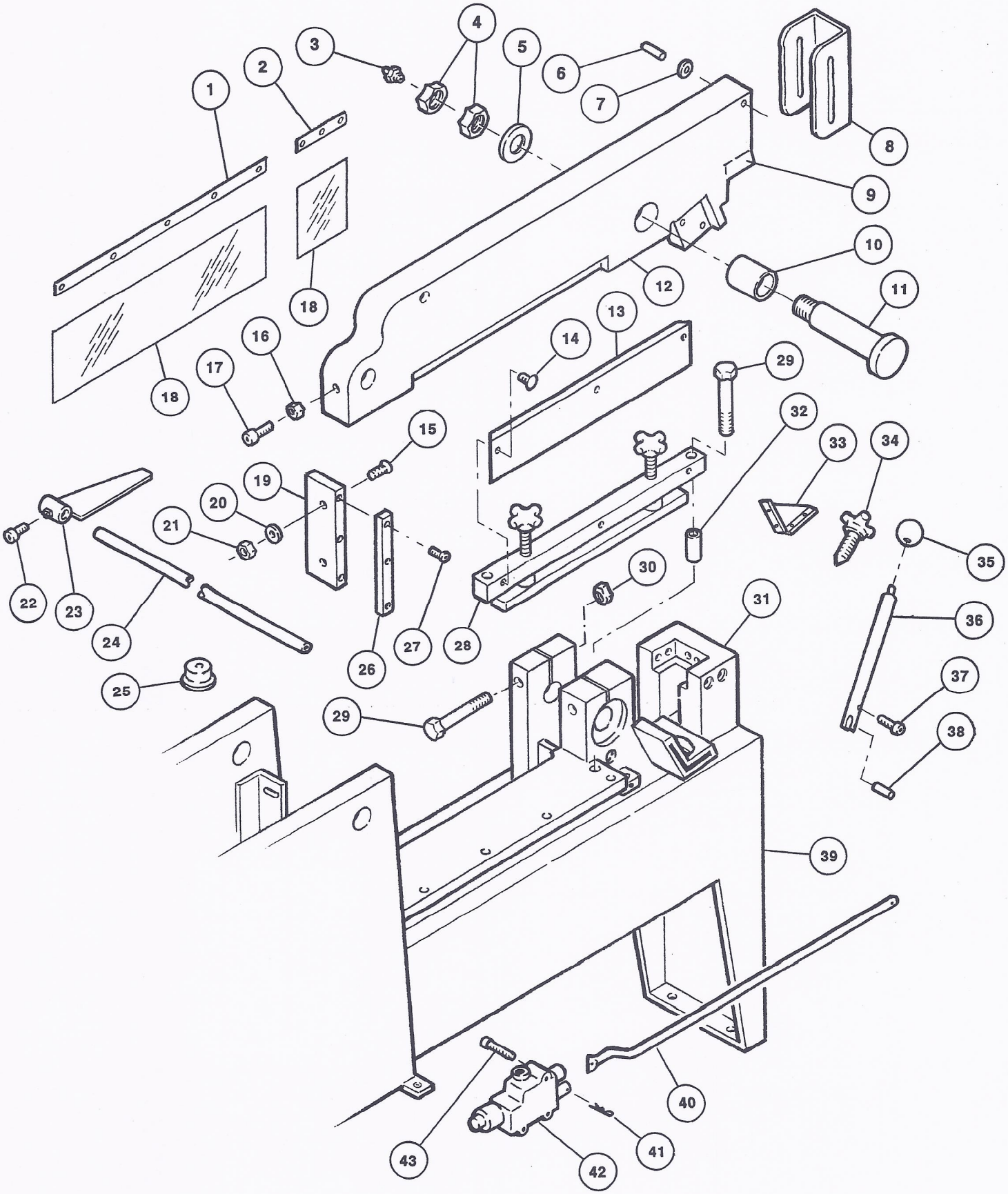
PUNCH PRESS END PARTS LISTING

REF. NO.	PART NO.	DESCRIPTION	QTY. REQ'D.
1	M-PH-181CS	Capscrew, 1/4" x 2-3/4" Socket Head	4
2	M-PH-181V	Solenoid Valve	1
3	M-PH-181SP	Sub Plate, Solenoid Valve	1
4	M-PH-181-CSA	Capscrew, 3/8" x 1-1/2" Hex Head	4
5	M-PE-165D	Bushing, 3/4" NPT to 1/2" NPT	1
6	M-PE-165	Complete Limit Switch Assembly	1
7	M-PE-165L	Roller Lever Only for Limit Switch	1
8	M-P-292JN	Jam Nut, 1/2"	4
9	M-P-292CA	Cross Arm	1
10	M-P-292JNA	Jam Nut, 3/4"	2
11	M-P-292SS	Set Screw, 1/2" x 2" Square Head	2
12	M-P-292NB	Nylon Bushing	2
13	M-P-292SG	Shaft Guide Shaft	1
14	M-P-241SN	Stripper Nut	2
15	M-P-292CB	Clamp Bar, Shaft Guide Shaft	1
16	M-P-292FW	Flat Washer, 3/4"	1
17	M-P-292CS	Capscrew, 3/4" x 1" Lg. Socket Head	1
18	M-P-400EP	Edge Protector (Specify Length Req'd.)	1
19	M-P-292TR	Threaded Rod, Shaft Guide	1
20	M-P-126	Main Frame	1
21	M-P-292QN	Quick Set Stroke Collar	2
22	M-PE-165C	Conduit, Limit Switch	1
23	M-PEH-181N	Nut, 3/8"	2
24	M-PH-181MB	Mounting Bracket, Valve	1
25	M-PH-181CSA	Capscrew, 3/8" x 1/2" Hex Head	6
26	M-P-243	Bushing, Bronze 2" x 2"	2
27	M-P-246JN	Jam Nut, 5/8"	4
28	M-P-401	Bushing Keeper	2
29	M-P-246GB	Gib Adj. Bolt 5/8" Sq. Head Set Screw (Specify Length)	4
30	M-P-401CS	Capscrew, 1/4" x 3/4" Socket Head	4
31	M-PH-181RV	Relief Valve	1
32	M-PE-165CS	Capscrew, 1/4" x 1/2" Hex Head	4
33	M-PE-165SS	Start-Stop Switch	1
34	M-PE-402	Disconnect Switch	1
35	M-PE-165EB	Electric Control Panel Box	1
36	M-PE-165FS	Electric Foot Switch	1
37	M-PE-165SH	Screw, 1/4" x 1/2" Flat Socket Head	4
38	M-PE-165FSC	Foot Switch Cover	1
39	M-PH-209K	Square Key, 3/16" x 3/4" Lg.	1

REF. NO.	PART NO.	DESCRIPTION	QTY. REQ'D.
40	M-PH-209FW	Flat Washer, 3/8"	6
41	M-PH-209PMA	Pump-to-Motor Adapter	1
42	M-PEH-209FC	Flex Coupler Half #4 (Specify Bore Dia. and Brand)	2
43	M-PE-100CS	Capscrew, 3/8" x 1" Hex Head	2
44	M-PH-209CS	Capscrew, 3/8" x 1-1/2" Hex Head	4
45	M-PH-209	Hydraulic Gear Pump	1
46	M-P-400	Throat Shield	1
47	M-PE-100CSA	Capscrew, 1/2" x 1-1/4" Hex Head	4
48	M-PE-100FW	Flat Washer, 1/2"	4
49	M-P-249SS	Set Screw, 3/8" x 3/4"	1
50	M-PEH-100FC	Flex Coupler Insert #4 (Specify Bore Dia. and Brand)	1
51	M-PE-100MK	Key, Motor Shaft	1
52	M-PE-100	Electric Motor	1
53	M-PH-181PG	Pressure Gauge	1
54	M-P-249	Die Holder Block (For 70 ton Models)	1
55	M-P-249FW	Flat Washer, 3/4" Hardened	4
56	M-P-249H	Die Block Hold-down (For Models over 70 Ton)	2
57	M-P-253	Capscrew, 3/4" x 3" Lg. Socket Head	4
58	M-P-158BA	Stripper Bolt Assembly	2
59	M-P-158CS	Capscrew, 3/8" x 1-1/4" Flat Socket Head	2
60	M-P-158BP	Stripper Bottom Plate	1
61	M-P-158	Stripper	1
62	M-P-292CS	Capscrew, 1/2" x 4" Hex Socket	1
63	M-PE-402	Retract Switch Complete	1
64	M-P-249CS	Capscrew, 3/4" x 2" Socket Head	2
65	M-PE-402FP	Face Plate for Retract	1
66	M-P-163CS	Capscrew, 1/4" x 1/2" Truss Head	6
67	M-P-159	Hood	1
68	M-P-107	Shield, Lower Front	1
69	M-P-249A	Die Holder Block (For Models Over 70 Ton)	1
	M-P-249C	Die Holder Block Assembly, Quick Clamp - Includes Ref. 54, 55, 64 (For 70 Ton Models)	1
	M-P-249CA	Die Holder Block Assembly, (For Models Over 70 Ton) Includes Ref. 56, 57, 69	1

ALWAYS GIVE METAL MUNCHER MODEL AND SERIAL NUMBER WHEN ORDERING PARTS.

SHEAR END PARTS EXPLOSION



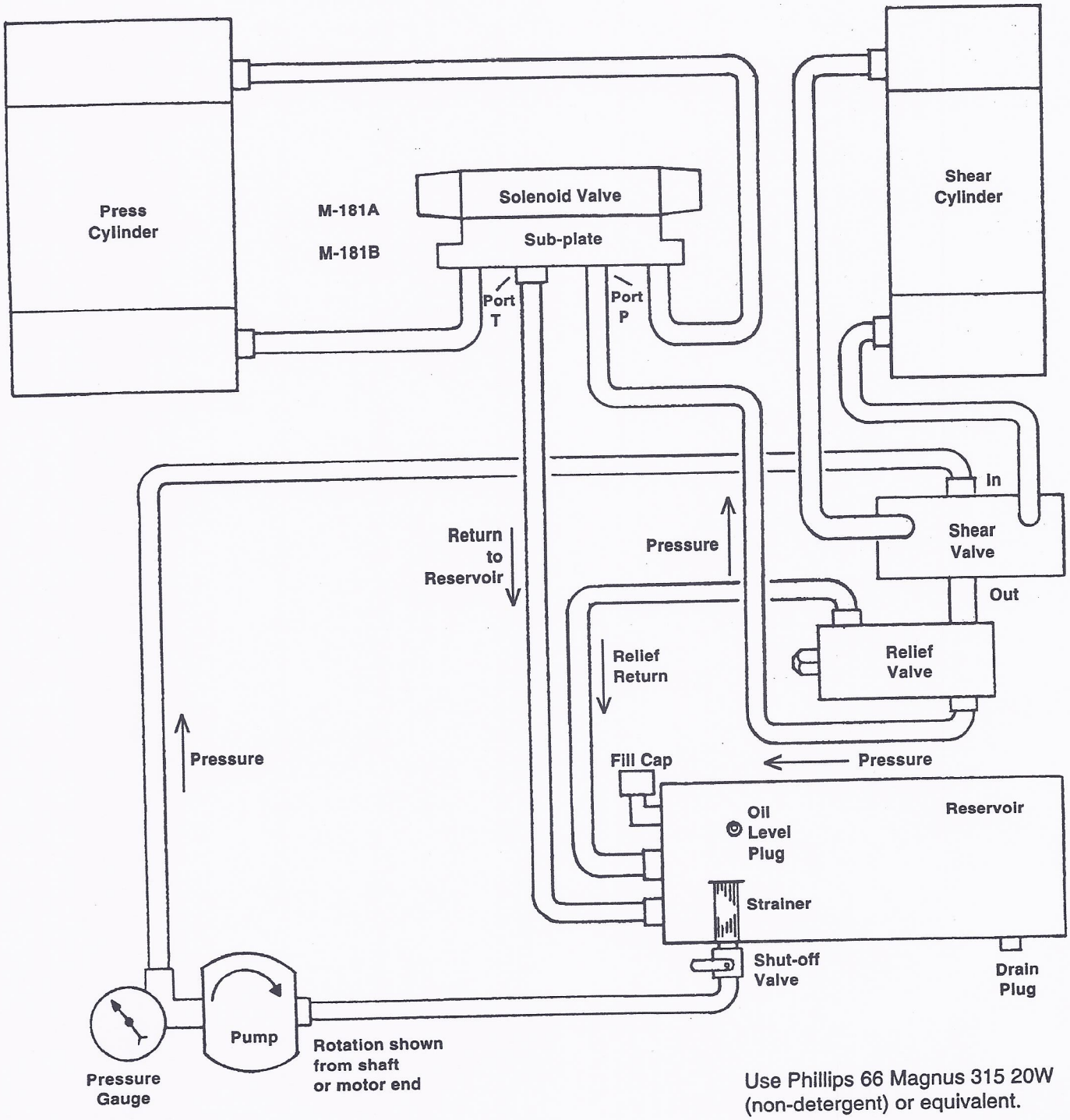
SHEAR END PARTS LISTING

REF. NO.	PART NO.	DESCRIPTION	QTY. REQ'D.
1	M-S-247SL	Strip, Long-For Plastic Shield	1
2	M-S-247SS	Strip, Short-For Plastic Shield	1
3	M-S-147GZ	Grease Zerk, 1/8" NPT	3
4	M-S-147JN	Jam Nut, 1-1/2" NC	2
5	M-S-147FW	Washer, Flat 1-1/2"	1
6	M-S-302RP	Roll Pin, 3/8" x 1"	2
7	M-S-302FW	Washer, Flat 3/8"	As Req'd.
8	M-S-302CS	Coper Shield	1
9	M-S-223P	Coper Pad (Welded in)	1
10	M-S-147D	Bronze Bushing 2-3/4" OD x 2-1/2" ID, 4" Length	1
11	M-S-147PP	Bar Shear Pivot Pin - Threaded 2-1/2"	1
	M-S-147	Bar Shear Pivot Pin Assembly 2-1/2" (Includes Ref. 3, 4, 5, 11)	1
12	M-S-247	Upper Shear Arm (Factory Installed)	1
13	M-S-240FS	Shield, Flat Bar Holddown	1
14	M-S-240CS	Capscrew, 1/4" x 1/2" Truss Head	3
15	M-S-244CS	Capscrew, 5/8" x 2" Flat Socket Head	4
16	M-S-247HN	Nut, Hex 3/8"	1
17	M-S-247CS	Capscrew, 3/8" x 1-1/2" Socket Head	1
18	M-S-247PS	Clear Plastic Shield for Rear Arm	As Req'd.
19	M-S-246	Gib Mounting Block	2
	M-S-244	Complete Gib Assembly (Includes Ref. 19, 26, 27)	2
20	M-S-244FW	Washer, Flat 5/8"	4
21	M-S-244HN	Hex Nut, 5/8" NC	4
22	M-S-306CS	Capscrew, 3/8" x 1" Hex Head	1
23	M-S-306BF	Back Gauge Flag	1
24	M-S-306BP	Back Gauge Pipe	1
	M-S-306	Back Gauge Assembly (Includes Ref. 22, 23, 24)	1

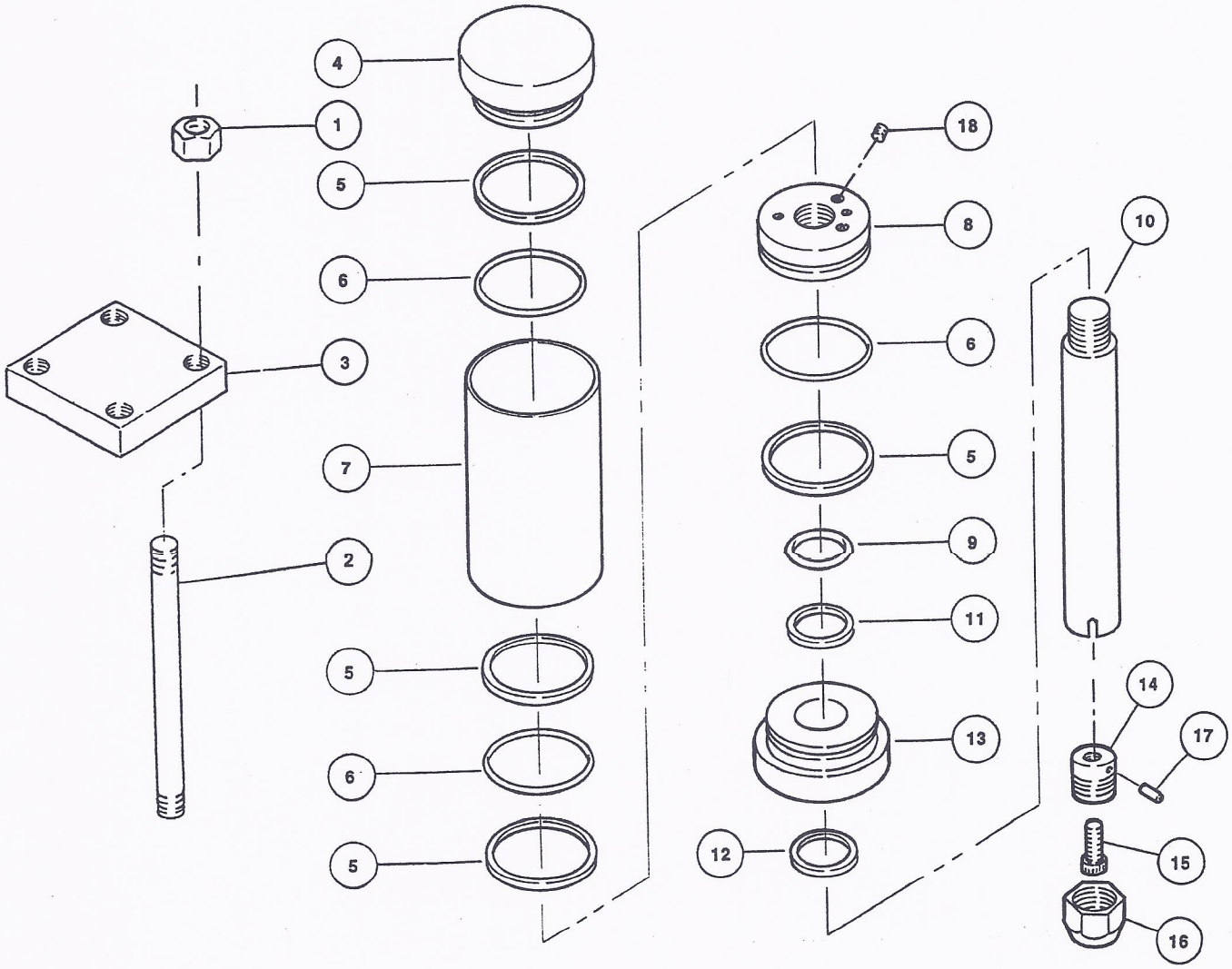
REF. NO.	PART NO.	DESCRIPTION	QTY. REQ'D.
25	M-SH-403	Oil Fill Cap	1
26	M-S-244	Ryertex Gib	2
27	M-S244CS	Capscrew, 3/8" x 1-1/4" Flat Socket Head	6
28	M-S-240	Flat Bar Holddown Assembly (Includes Ref. 28, 29, 30)	1
29	M-S-147CS	Capscrew, 7/8" NF x 7" Hex	4
30	M-S-147LN	Locknut, 7/8"	2
31	M-S-303	Coper Block	1
32	M-S-235A	Holddown Spacer	2
33	M-S-248S	Shield, Angle Holddown	1
34	M-S-248	Angle Holddown Screw Assembly	1
35	M-S-152K	Knob for Rear Control Handle	1
36	M-S-152H	Rear Control Handle	1
37	M-S-152CS	Capscrew, 3/8" x 2" (or 1-3/4") Socket Head	1
38	M-S-153RP	Roll Pin, 3/16" x 3/4"	1
	M-S-153	Rear Control Handle Assembly (Includes Ref. 35, 36, 37, 38)	1
39	M-S-126	Main Frame	1
40	M-153CR	Control Rod	1
41	M-SH-181CP	Cotter Pin	1
42	M-SH-181	Hyd. Control & Pressure Valve (Manual)	1
43	M-SH-181CS	Capscrew, 5/16" x 2" Hex Head	3
Not Shown	M-S-164A	Decal Kit	1

ALWAYS GIVE METAL MUNCHER MODEL AND SERIAL NUMBER WHEN ORDERING PARTS.

HYDRAULIC SYSTEM - STANDARD MM MODEL
(Models 40, 70, 100, 135, 70-18, 100-18, 135-18)



Use Phillips 66 Magnus 315 20W (non-detergent) or equivalent.



PRESS CYLINDER

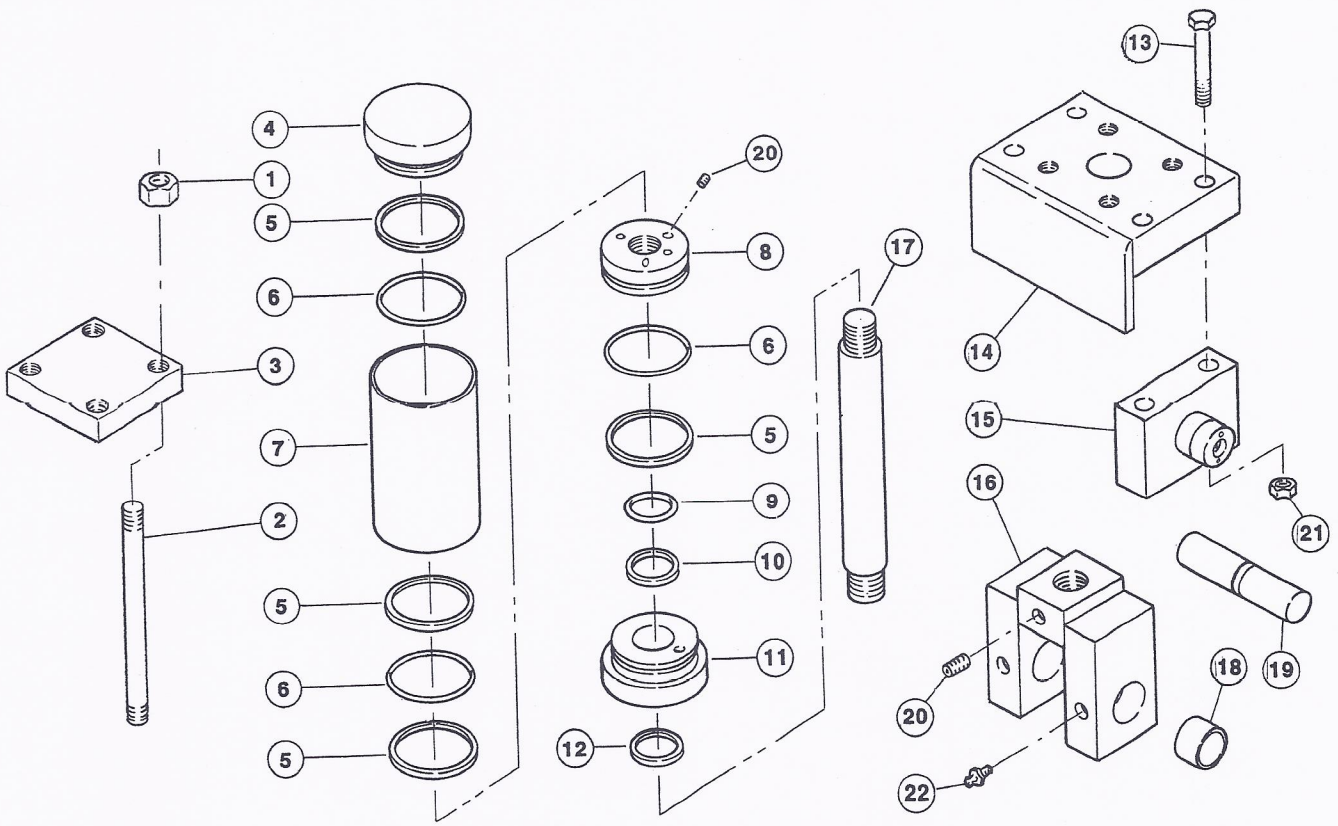
Ref. No.	Part No.	Description	Qty. Req'd.
1	M-PC-254	Hex Nut Gr. 8 **	4
2	M-PC-256	Tie Rod **	4
3	M-PC-255	Tie Down Plate **	1
4	M-PC-111A	Press Cylinder Plug	1
5	M-PC-257	Back-up Ring	4
6	M-PC-258	"O" Ring	3
7	M-PC-259	Cylinder Barrel **	1
8	M-PC-261	Piston	1
9	M-PC-120	"O" Ring Seal, Shaft Seal 3"	1
10	M-PC-262	Press Cylinder Shaft, 3" Dia. **	1
11	M-PC-114	Back-up Ring, Shaft Seal 3"	1
12	M-PC-123	Wiper Seal, 3" Shaft	1
13	M-PC-263	Head	1

Ref. No.	Part No.	Description	Qty. Req'd.
14	M-PC-266	Adapter, Threaded Punch Coupling	1
15	M-PC-266A	Capscrew, 5/8" x 2-1/2" Hex Socket	1
16	M-PC-271	Punch Coupling Nut (specify size) **	1
17	M-PC-266P	Roll Pin	1
18	M-PC-261S	Set Screw	2
*	M-PC-296-7	7" Cylinder Repair Kit (Press)	1
*	M-PC-294-8	8" Cylinder Repair Kit (Press)	
*	M-PC-300-10	10" Cylinder Repair Kit (Press)	
*	M-PC-299-7	7" Cylinder Complete, assembled less tie bolts	
*	M-PC-297-8	8" Cylinder Complete, assembled less tie bolts	
*	M-PC-301-10	10" Cylinder Complete, assembled less tie bolts	
*	M-PC-266SP	Stem Punch Coupling Adapter with bolt	

* Not Shown

** When ordering shaft, barrel, tie rod, or tie down plate specify overall length and diameter to ensure proper fit.

Always give METAL MUNCHER Model and Serial Number when ordering parts.



SHEAR CYLINDER

Ref. No.	Part No.	Description	Qty. Req'd.
1	M-SC-254	Hex Nut Gr. 8, 7/8" - 9	4
2	M-SC-277-493	Tie Bolt, Bar Shear Cylinder 16" Lg.	4
3	M-SC-110	Tie Down Plate, 5" Cylinder	1
4	M-SC-129	Plug, Bar Shear Cylinder	1
5	M-SC-112	Back-up Ring, 5"	4
6	M-SC-113	"O" Ring, 5"	4
7	M-SC-276-493	5" Cylinder Barrel, Bar Shear 9¾ Lg.	1
8	M-SC-118	Piston, 5"	1
9	M-SC-120	"O" Ring Seal, Shaft Seal 2"	1
10	M-SC-114	Back-up Ring, Shaft Seal 2"	1
11	M-SC-122	Head, 5"	1
12	M-SC-123	Wiper Seal, 2" Shaft	1
13	M-SC-272	Capscrew, 7/8-14 Gr. 8 x 7"	4

Ref. No.	Part No.	Description	Qty. Req'd.
14	M-SC-273	Mounting Plate, Bar Shear Cylinder	1
15	M-SC-274	Trunion Block	2
16	M-SC-275-C	Clevis only	1
17	M-SC-118-493	Piston Shaft, 14"	1
18	M-SC-243A	Bronze Bushing, 2¼ O.D. x 2" I.D. x 2 Lg.	1
19	M-SC-133	Clevis Pin, Bar Shear	1
20	M-SC-118B-60	Set Screw, 3/8 x 1/2" Lg.	2
21	M-SC-272L	Locknut, 7/8"-14	1
22	M-SC-275S	Grease Zerk	1
*	M-SC-275-493	Piston Shaft/Clevis Assembly	
*	M-SC-295-5	Cylinder Repair Kit (Shear) 5" (Kit includes all "O" Rings, Back-up Rings and Wiper Seal.)	
*	M-SC-298-5	5" Cylinder complete, assembled less tie bolts	

* Not Shown

Always give METAL MUNCHER Model and Serial Number when ordering parts.

TROUBLE SHOOTING

The following is a trouble shooting guide to be used by maintenance personnel should a problem occur with your METAL MUNCHER. Many of these problems can be solved in your facility by following a step-by-step procedure for isolating the problem. If the problem cannot be isolated and corrected in your shop, any information regarding your effort to isolate the area should be relayed to the service department at Fab Center Sales to assist them in finding a solution. These efforts will assure restoring your machine to full operational status with the minimum amount of down-time.

PROBLEMS

MACHINE WILL NOT START

For possible cause check:

1. Voltage, amps, and fuses at power source.
2. Fuses in electrical enclosure inside cabinet
   A. Blown fuse - loose wire in the control box.
   B. Loose fuse - fuse holder not making contact with fuse.
3. Voltage to motor starter.
4. Voltage output of transformer.
5. Wiring connections in electrical enclosure and motor junction box.
6. Main disconnect.

MACHINE STARTS BUT WILL NOT OPERATE

For possible cause check:

1. Hydraulic oil level.
2. Hydraulic system connections for tightness.
3. Pump rotation (clockwise when viewed from pump shaft end or fan end of motor) and that pump is driven by motor.
4. Activation of solenoid valve. See valve schematic for sequence of testing.
5. Improper limit switch stop settings allowing cylinder to bottom out and allowing oil to bypass without cylinder ram movement.
6. Be sure shut-off valve from reservoir is in open position.

MACHINE DOES NOT SEEM TO HAVE ENOUGH POWER TO PUNCH LARGE DIAMETER HOLES

For possible cause check:

1. Material is too hard, beyond capacity of tonnage rating of machine.
2. Proper die clearance for material thickness. (Ref. clearance chart, page 11.)
3. Sharpness of punch point.
4. Improper limit switch setting is not letting machine complete a full stroke cycle.
5. Operating pressure needs to be checked and possibly reset. (This operation should only be handled by a factory representative or dealer from which machine was purchased.)

TROUBLE SHOOTING, Cont'd.

PROBLEMS

MATERIAL CHIPS EDGES FROM KNIFE BLADES WHEN CUTTING MATERIAL

For possible cause check:

1. Material may be too hard.
2. To insure that blade cutting edges are sharp.
3. Blade clearance with no material in machine to be .005 - .010.
   A. Clearance may be set at .005 for 1/8" and less material thickness.
4. Shearing across welds.
5. Shearing rounds (rebar).

MACHINE LEAVES BURR WHEN CUTTING PLATE

For possible cause check:

1. Clearance between blades. Clearance must be set per instruction manual. (Ref. page 10.) Adjust shear arm gibs.
2. Add blade shims of correct thickness if further adjustment is needed. (Clearance may be set at .005 per 3A above.)
3. Insure that blades are sharp.
4. That material holddowns hold material down snugly.

MACHINE OVERHEATS

For possible cause check:

1. Insure that starter overload is on proper setting. (This should be the same as the amps drawn by the motor as listed on the motor.)
2. Improper stop settings allowing machine to operate beyond end stroke causing hydraulic oil to bypass and build up heat.
3. Motor fan not operating properly (Due to blown fuse, loose wiring connection, broken fan or hub.)
4. Check that strainer is not clogged.

RESET ON MOTOR KICKS OUT **SINGLE PHASE ONLY**

For possible cause check:

1. Insure that starter overload is on proper setting. (This should be the same as the amps drawn by the motor as listed on the motor.)
2. Overheating - see problem listed previously.
3. Hydraulic oil level.

TROUBLE SHOOTING FOR HYDRAULICS

CAUSES	REMEDIES

A — PUMP UNUSUALLY NOISY OR CAVITATION

CAUSES	REMEDIES
1. Low oil supply.	1. Fill Oil to proper level.
2. Oil too heavy.	2. Change to proper weight oil.
3. Dirty oil strainer.	3. Install new strainer.
4. Restriction or partially clogged suction line.	4. Remove restriction in suction line.
5. Air bubbles in intake oil.	5. Use non-foaming hydraulic oil.
6. Reservoir air vent plugged.	6. Air must be allowed to breathe into reservoir. Clean out or replace breather.
7. Air leaks at pump intake piping joint or at pump shaft packing or inlet pipe opening.	7. Test by pouring oil on joints while listening for change in sound of operation. Tighten joints.
8. Flexible coupling misalignment.	8. Re-align flexible coupling.
9. Worn or broken parts.	9. Replace parts.
10. Pump head too loose or faulty head gasket.	10. Test by pouring oil over pump head, and tighten head carefully or replace gasket.

B — PUMP TAKES TOO LONG TO RESPOND OR FAILS TO RESPOND

CAUSES	REMEDIES
1. Low oil supply.	1. Fill oil to proper level.
2. Relief valve pressure set too low.	2. Reset to correct pressure setting using gauge.
3. Pump worn or damaged.	3. Inspect, repair, or replace pump.
4. Oil intake pipe plugged.	4. Clean out intake pipe.
5. Wrong direction of shaft rotation.	5. Must be reversed immediately to prevent seizure and breakage of parts due to lack of oil.
6. Dirt in pump.	6. Dismantle and clean pump.
7. Air leak in suction line, preventing priming.	7. Repair leaks.
8. Oil too heavy to pick up prime.	8. Use lighter oil.

C — NO PRESSURE IN THE SYSTEM

CAUSES	REMEDIES
1. Pump not delivering oil.	1. Follow remedies given above.
2. Relief valve setting not high enough.	2. Increase pressure setting of relief valve.
3. Relief valve leaking.	3. Check valve seat for scoring mark and reseat.
4. Spring in relief valve broken.	4. Replace spring and readjust valve.
5. Internal leakage in control valves or cylinders.	5. Repair and replace.

D — EXCESSIVE WEAR ON PUMP

CAUSES	REMEDIES
1. Oil weight too light at working conditions.	1. Check for recommended oil weight.
2. Sustained high pressure above maximum pump rating.	2. Check relief valve maximum setting.
3. Drive misalignment.	3. Check and correct.
4. Air circulation causing chatter in system.	4. Remove air from system.

E — EXCESSIVE HEATING OF OIL

CAUSES	REMEDIES
1. Foreign material lodged between the relief valve plunger and relief valve seat.	1. Inspect and remove foreign material.
2. Using very light weight oil in hot climate.	2. Drain and refill with proper weight oil.
3. Using too heavy oil.	3. Use recommended weight oil.
4. Oil level too low.	4. Fill to proper oil level.
5. Relief valve pressure too high or too low.	5. Set relief valve at correct pressure.
6. Pump worn and oil slips by pump.	6. Replace or repair pump.
7. Leaking relief valve.	7. Replace or repair relief valve.
8. Relief valve does not operate.	8. Replace or repair relief valve.

F — OIL FOAMING

CAUSES	REMEDIES
1. Air leaking into suction line from tank to pump.	1. Tighten all connections.
2. Wrong kind of oil.	2. Drain and refill with non-foaming type of hydraulic oil.
3. Oil level too low.	3. Fill to proper oil level.

G — CYLINDERS CREEP WHEN STOPPED IN INTERMEDIATE POSITION

CAUSES	REMEDIES
1. Internal leakage in cylinder or control valves.	1. Replace piston o-rings and backups or replace cylinder if walls are scored. Replace or repair valve.

H —TIMES OF OPERATION LONGER THAN SPECIFIED

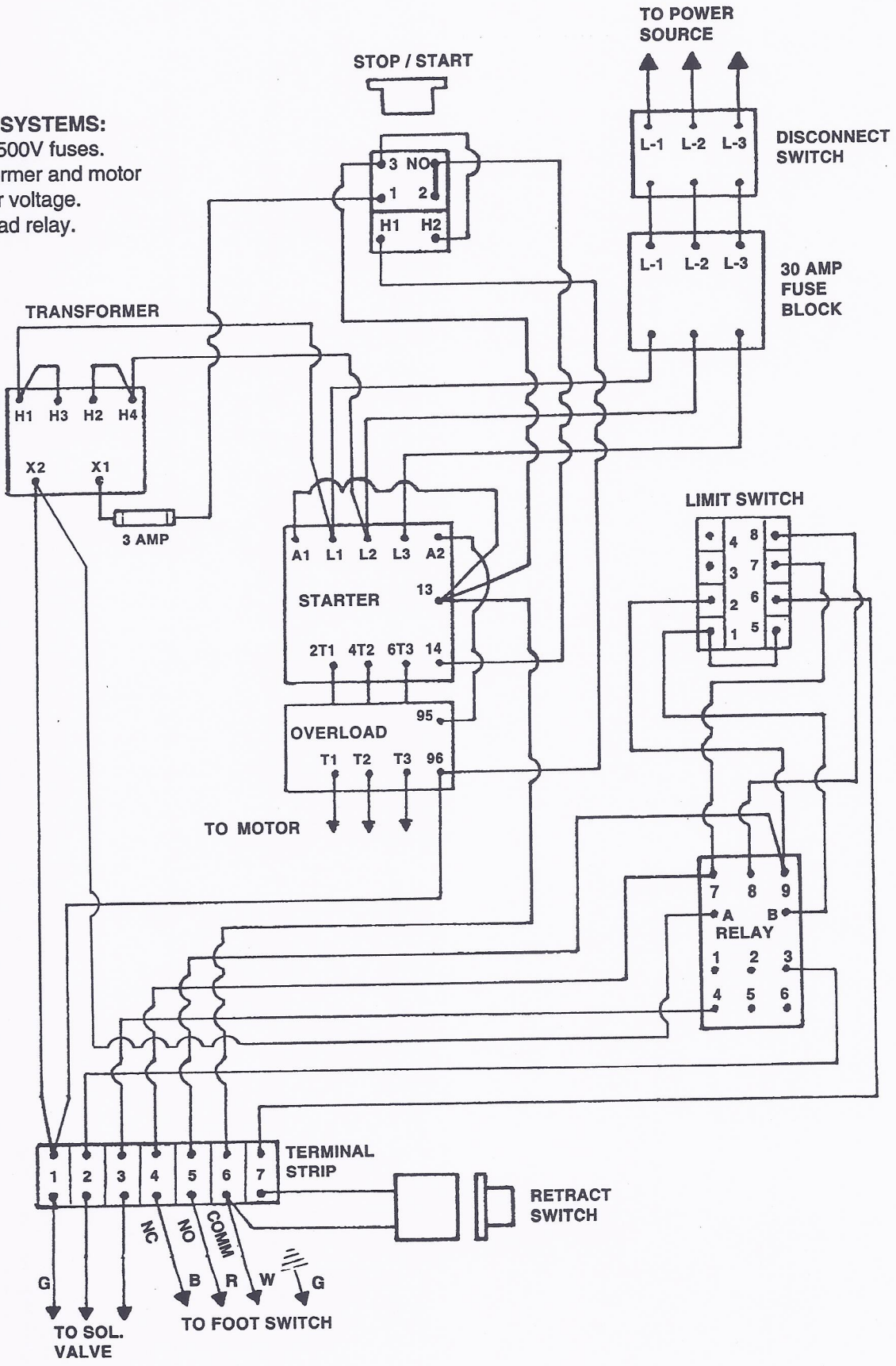
CAUSES	REMEDIES
1. Worn pump.	1. Repair or replace pump.
2. Internal leak in cylinder or control valve.	2. Replace piston o-rings and backups or replace cylinder if walls are scored. Replace or repair valve.
3. Air in system	3. Bleed the system and tighten joints.
4. If action is slow on starting up, then speeds up after oil heats up, oil is too heavy weight. If action slows down after oil heats up, oil is too light weight.	4. Use oil weight recommended by manufacturer.

I — EXTERNAL OIL LEAKAGE ON CYLINDERS.

CAUSES	REMEDIES
1. End caps leaking.	1. Tighten tie rod nuts if possible or replace o-rings, backups and shaft seal if necessary.

WIRING DIAGRAM - 220/230/240 VOLT - 3 PHASE

IMPORTANT:
440/480 VOLT SYSTEMS:
Fuse with 15A 500V fuses.
Change transformer and motor leads for proper voltage.
Replace overload relay.



January, 1994

Integral Heater
Overload Relay
Sizes B through E, Q

Class 48
Cat No
See Below

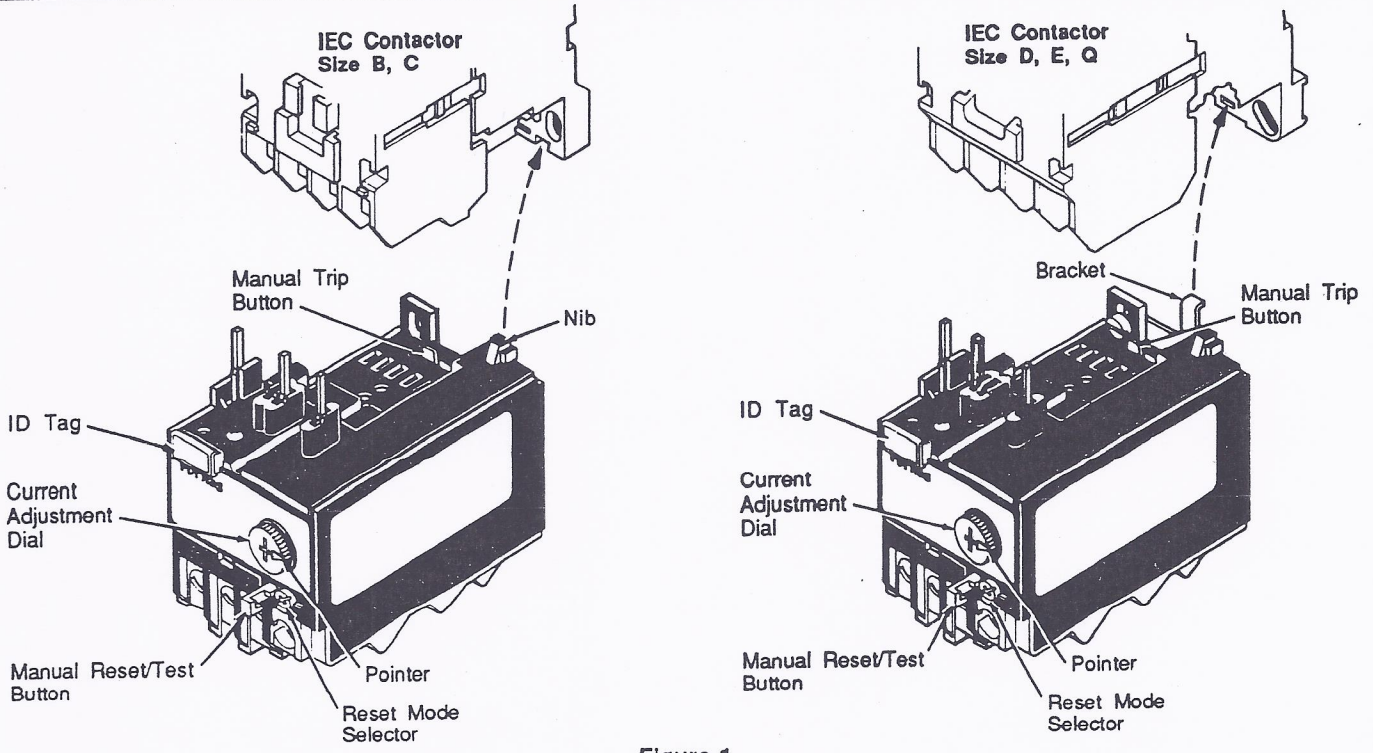


Figure 1

Description

Each of these overload relays has a current adjustment dial (*see Figure 1*). For setting the current at a value of full load amps within its range, refer to the rating table. The reset mode selector provides a choice of manual reset, automatic reset or test function. In the manual reset mode, the manual reset/test button is pressed to reset the overload relay. In the test function mode, the reset/ test button is pressed to change the state of the control circuit contacts without tripping the overload. The manual trip button is used to check the tripping function in the manual reset mode by sliding the button toward the printed side of the overload relay to trip the relay.

Use with sizes B through E Class 21 suffix E contactors or Size Q contactor to assemble a starter as indicated in the rating table. For a Class 21 suffix E contactor, the last character in the catalog number is E, e.g. 21DF32A*E.

Rating: Each overload relay has a full load current range as listed in the table.

Contactor Sizes	Full Load Current Range (Amperes)	Overload Relay Catalog No
B, C	0.24-0.38	48AH004
B, C	0.38-0.62	48AH006
B, C	0.62-1.0	48AH010
B, C	1.0-1.7	48AH017
B, C	1.7-2.5	48AH025
B, C	2.5-4.0	48AH040
B, C	4.0-6.0	48AH060
B, C	6.0-9.0	48AH090
B, C	8.5-12.5	48AH125
D, E, Q	12-17	48BH170
D, E, Q	16-23	48BH230
D, E, Q	23-32	48BH320

Contents of Kit: Each kit contains the applicable overload relay and mounting bracket and screws, if required.

Warning: Before performing installation or maintenance turn off electrical power to the controls to avoid electric shock.

INSTALLATION

Mounting

1. Loosen the three load terminal screws on the contactor.

2. For size B and C, insert overload nib into the contactor base, then insert the three overload relay leads in the contactor load terminals. For size D, E and Q contactors, attach bracket to overload, then attach bracket to mounting slot on contactor base, then insert leads into contactor load terminals. Terminal screw tightening torque is specified in step 5.

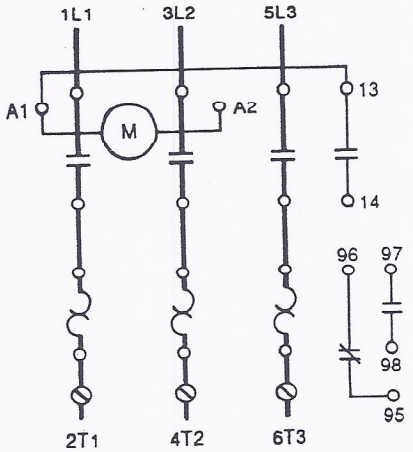


Figure 2

Figure 2 is the wiring diagram for the three phase starter. Note that the control terminals are located on the underside of the overload relay. The dashed line in *Figure 3* indicates the connection required to adapt the starter for single phase operation; select wire size to suit the load requirements and per applicable regulations (NEC, etc.).

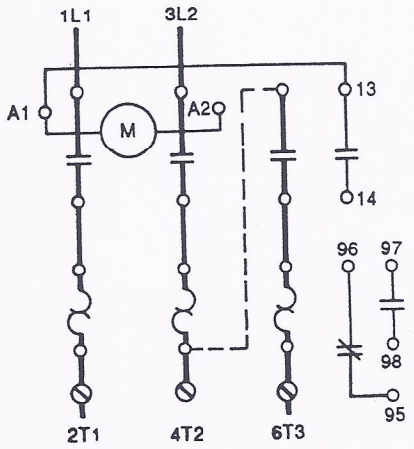


Figure 3

3. Secure the starter to the starter mounting panel or DIN rail.

4. Wire the starter as required for the installation. *Figure 4* shows a typical application. The fuse rating for the control circuit (terminals 95-98) is printed on the side of the overload relay. The maximum fuse rating (non time delay) for the main circuit is also noted on the side of the overload relay. When using time delay fuses, do not exceed 150% of the setting selected.

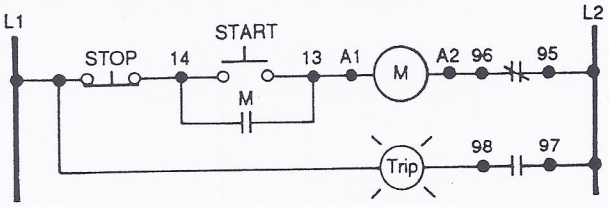


Figure 4

5. Contactor line and load terminal screw minimum tightening torque is 11 lb-in (1.24 Newton-meters) for starter sizes B and C, and 14 lb-in (1.58 Newton-meters) for starter sizes D, E and Q. Tightening torque for the load terminals of the overload relay is 12 lb-in minimum (1.35 Newton-meters) and 20 lb-in maximum (2.26 Newton-meters).

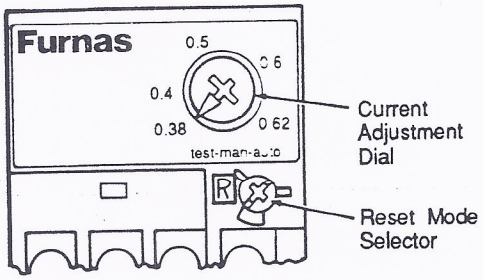


Figure 5

Adjustments

To change the position of the reset mode selector, use a screwdriver to turn the selector to the desired position on the label. Be sure electrical power is turned off as noted in the warning. Set the current adjustment dial to the desired position. Use a screwdriver to rotate the dial until the pointer aligns with the desired current value.

Observe the following:

1. For motors with a service factor of 1.15 or greater, set dial at motor nameplate full load current (FLA). Example: To control a 1.15 service factor motor with a FLA of 28 amperes, set dial at 28.

2. For motors with a service factor of 1.0, set dial at 0.9 x FLA. Example: To control a 1.0 service factor motor with FLA of 28 amperes, set dial at 25.