

Serial Number: _____

Model GB-70/100/135



Made in U.S.A.

Gap Bed Hydraulic Punch Press

operator's manual and parts list

“serving your fabricating needs since 1969”

3428 East B Ave, Plainwell, MI 49080

Telephone: (269) 492-0268

Web Site: www.kalamazoometalmuncher.com email: info@kalamazoometalmuncher.com

Operator's Manual
and
Parts List
for
Kalamazoo Metal Muncher

01-2012-GB70/100/135

When Ordering Parts, Contact **Area Dealer**
or call:

Kalamazoo Metal Muncher
3428 East B Ave
Plainwell, MI 49080
Phone: 269-492-0268

Always give Kalamazoo/Metal Muncher
Model and Serial number when ordering parts

Foreward

This manual has been prepared for those persons who will operate and maintain the KALAMAZOO/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 KALAMAZOO/METAL MUNCHER is warranted against defect in material or workmanship installed or performed at the factory. Because of the quality of workmanship, KALAMAZOO/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 KALAMAZOO/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.

KALAMAZOO/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 KALAMAZOO/METAL MUNCHER within ten days after receiving the machine. This must be done before warranty is in effect.

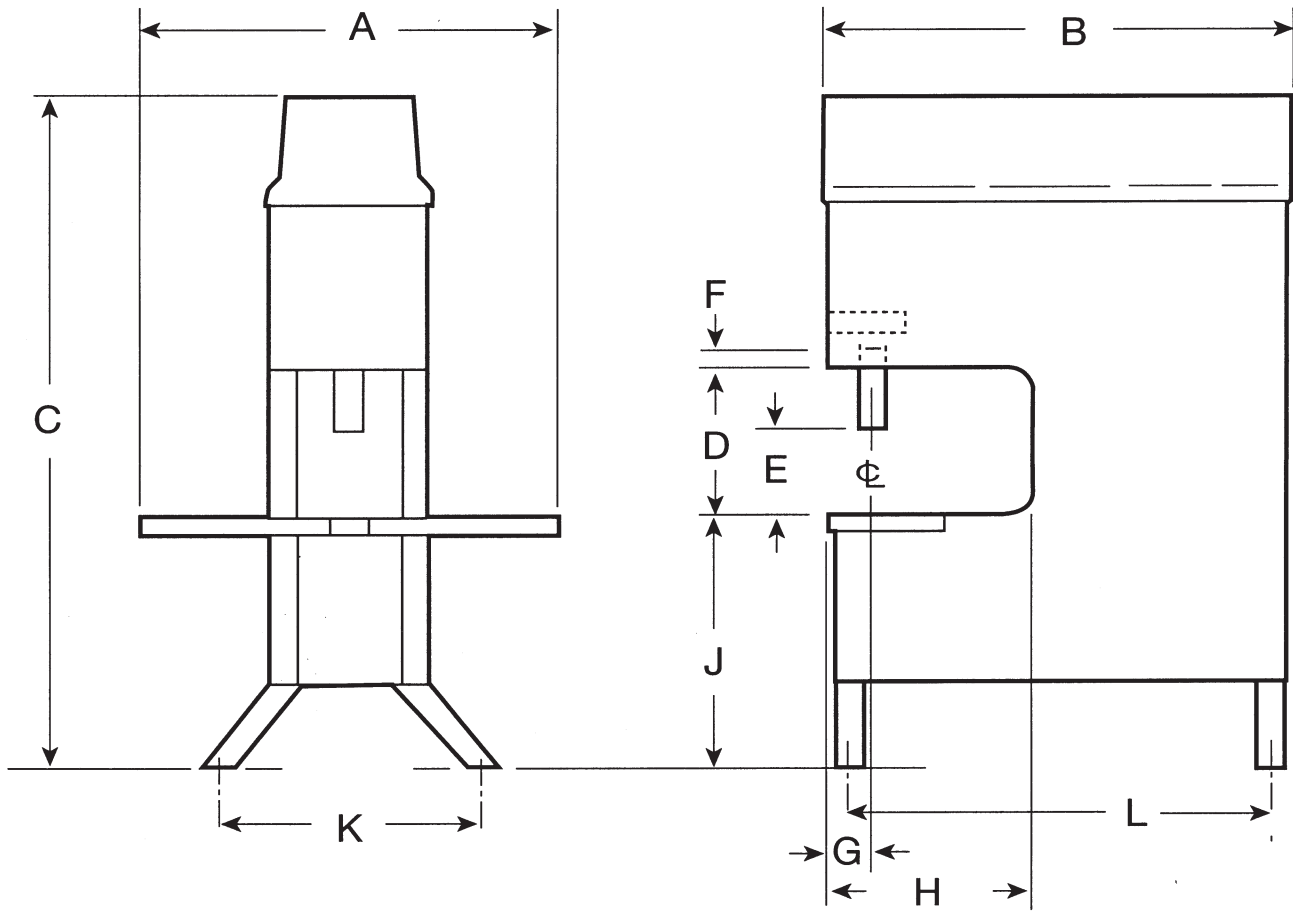
There are no warranties which extend beyond the description on the face hereof.

Hydraulic pump, valves, electric motors and starter are warranted by the original manufacturer ... not KALAMAZOO/METALMUNCHER.

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DIMENSIONAL CHART - KALAMAZOO/METAL MUNCHER



Model	A	B	C	D	E	F*	G	H	J	K	L
GB-40	21	22 ⁷ / ₈	65 ¹ / ₂	9	6 ⁷ / ₈	1 ⁷ / ₈	3 ¹ / ₂	11	34 ¹ / ₄	24 ³ / ₈	19 ¹ / ₄
GB-70	48	30	68 ¹ / ₄	14	8 ¹ / ₄	1 ¹ / ₄	4 ⁷ / ₈	14 ⁷ / ₈	30	25 ¹ / ₂	26 ¹ / ₂
GB-70-18	48	52 ¹ / ₂	78 ³ / ₄	18	10 ¹ / ₄	1 ¹ / ₄	4 ⁷ / ₈	23 ¹ / ₄	30	28 ³ / ₄	37 ¹ / ₄
GB-100	48	30 ⁷ / ₈	69 ¹ / ₄	14	8 ¹ / ₄	1 ¹ / ₄	4 ¹¹ / ₁₆	14 ³ / ₈	30	27	27 ¹ / ₂
GB-100-18	48	52 ¹ / ₂	80 ³ / ₄	18	10 ¹ / ₄	1 ¹ / ₄	4 ¹¹ / ₁₆	22 ⁷ / ₈	30	29 ³ / ₁₆	36 ⁵ / ₈
GB-135	48	52 ¹ / ₂	74 ³ / ₄	14	8 ¹ / ₄	1 ¹ / ₄	6	20 ¹ / ₂	30	31 ¹ / ₄	36 ¹ / ₂
GB-135-18	48	52 ¹ / ₂	79 ¹ / ₄	18	10 ¹ / ₄	1 ¹ / ₄	6	24 ¹ / ₂	30	32 ³ / ₈	36 ¹ / ₂

Dimensions in inches

* F is ram retracted

NOTE: All dimensions are approximate

INTRODUCTION

The KALAMAZOO/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 KALAMAZOO/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 KALAMAZOO/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

KALAMAZOO/METAL MUNCHER INSTALLATION

Electrical Connection

The standard KALAMAZOO/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 12, for rotation of motor and pump.

1. Check all hardware and tighten if necessary, including:
 - motor and pump mounting bolts
 - cylinder tie bolts
2. Check pins in valve control handle and linkage.



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.

3. Release limit switch quick adjustment collars from shipping position (see Fig.).
4. Check oil level plug. Capacity 10 gallons. Use ISO68 or equivalent.
5. Remove plastic shipping plug before mounting oil cap.

CONTROL IDENTIFICATION

STOP-START SWITCH

Refer to Fig. 1, SAFETY section.

FOOT CONTROL

This control (see Fig. 2) 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 9) for operation.



Figure 2

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 8) 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.

OPERATION



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

The KALAMAZOO/METAL MUNCHER Ironworker has a rated shearing capacity equal to the shearing point of mild steel (60,000 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 60,000 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.

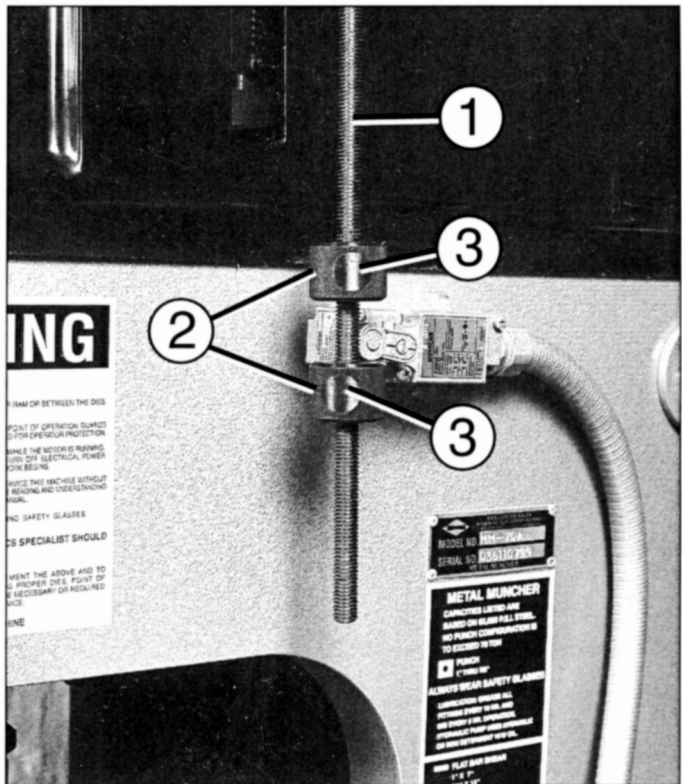


Figure 5

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

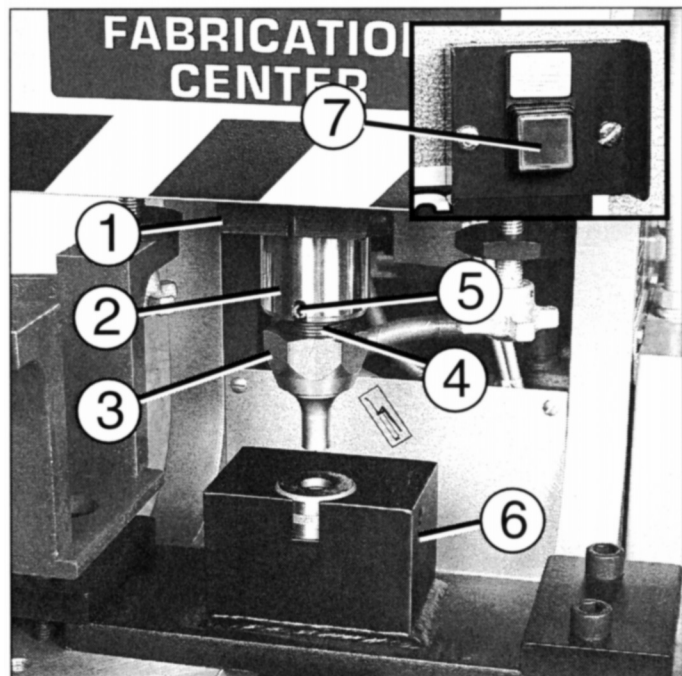


Figure 6

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 9, 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.

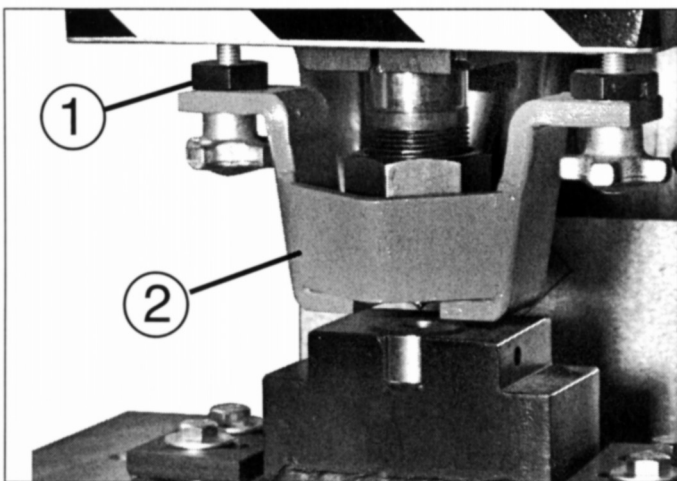


Figure 7 1. Locknuts 2. Stripper



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 KALAMAZOO/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.

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:

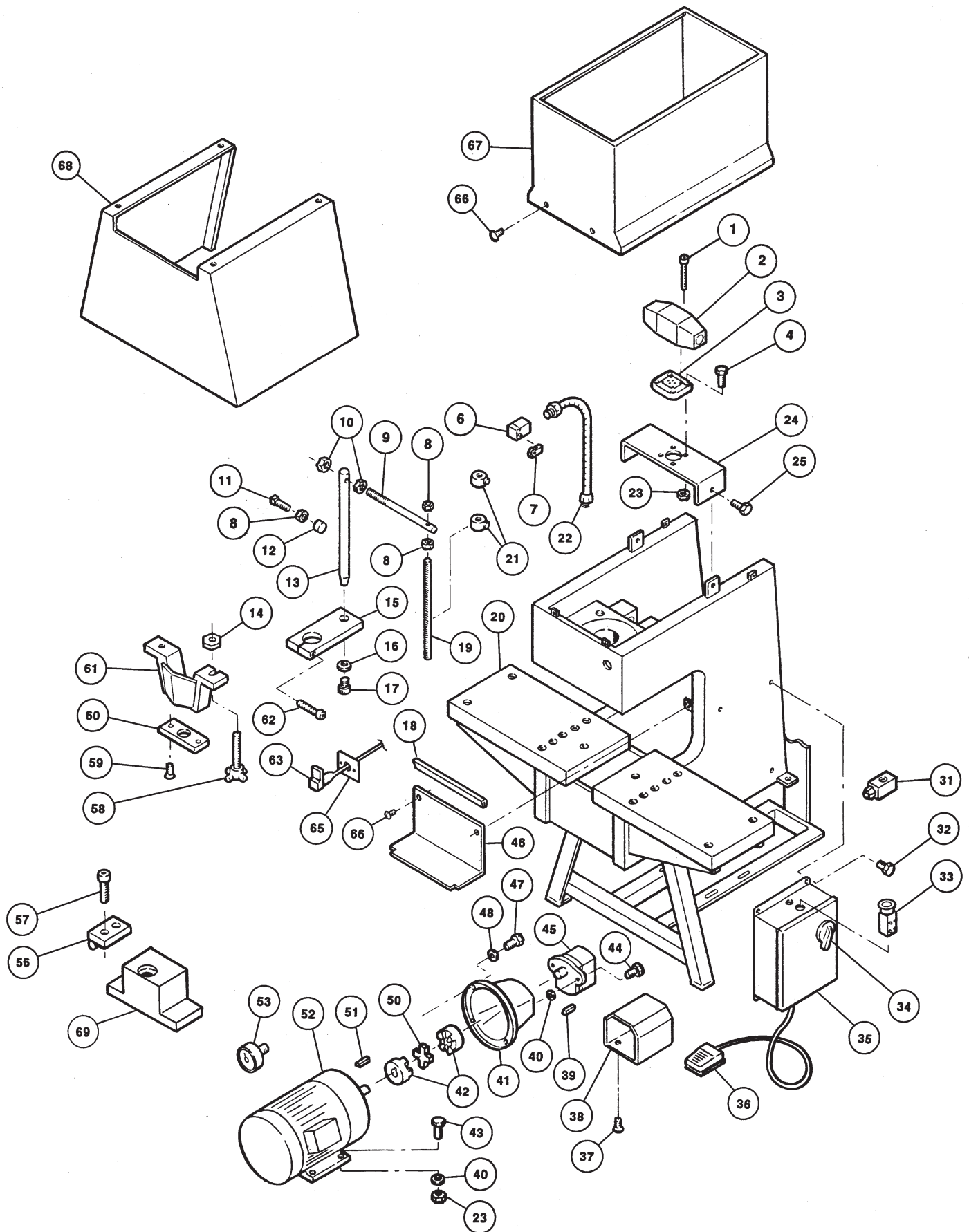
1/4" to 1/2" material thickness	1/32" clearance
1/2" to 3/4" material thickness	1/16" clearance
3/4" and over material thickness	3/32" clearance

GAUGE STOCK:

15 ga. to 13 ga. material thickness	0.10"
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(1/64" clearances available)

PUNCH PRESS PARTS EXPLOSION

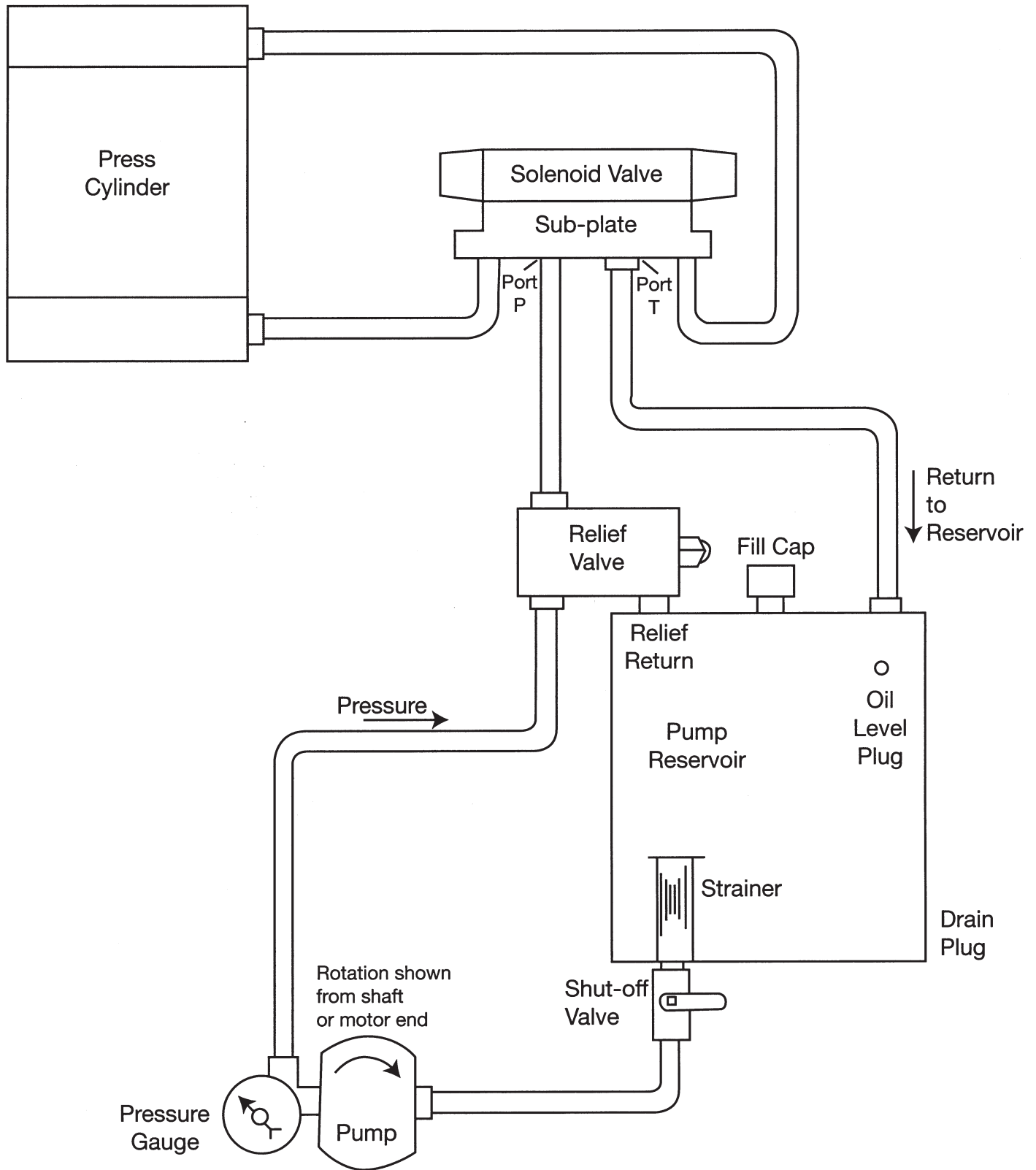


PUNCH PRESS PARTS LISTING

REF. NO.	PART NO.	DESCRIPTION	QTY. REQ'D.	REF. NO.	PART NO.	DESCRIPTION	QTY. REQ'D.
1	M-PH-181 CS	Capscrew, 1/4" x 2-3/4" Socket Head	4	39	M-PH-209K	Square Key, metric	1
2	101849	Solenoid Valve	1	40	100349	Flat Washer, 3/8"	6
3	102087	Sub Plate, Solenoid Valve	1	41	101840	Pump-to-Motor Adapter	1
4	100255	Capscrew, 3/8" x 1-1/2" Hex Head	4	42	M-PEH-209FC	Flex Coupler Half #4 (Specify Bore Dia. and Brand)	2
6	102142	Complete Limit Switch Assembly	1	43	100235	Capscrew, 3/8" x 1-1/2" Hex Head	4
7	101794	Roller Lever Only for Limit Switch	1	44	100253	Capscrew, 3/8" x 1" Hex Head	2
8	100331	Jam Nut, 1/2"	4	45	105610	Hydraulic Gear Pump	1
9	M-P-292CA	Cross Arm	1	46	M-P-400	Throat Shield	1
10	100323	Jam Nut, 3/4"	2	47	100262	Capscrew, 1/2" x 1-1/4" Hex Head	4
11	100289	Set Screw, 1/2" x 2" Square Head	2	48	100351	Flat Washer, 1/2"	4
12	101552	Nylon Bushing	2	50	M-PEH-100FC	Flex Coupler Insert #4 (Specify Bore Dia. and Brand)	1
13	M-P-292SG	Shaft Guide Shaft	1	51	M-PE-100MK	Key, Motor Shaft	1
14	100410	Stripper Nut	2	52	M-PE-100	Electric Motor	1
15	M-P-292CB	Clamp Bar, Shaft Guide Shaft	1	53	101848	Pressure Gauge	1
16	100354	Flat Washer, 3/4"	1	56	100874	Die Block Hold-down	2
17	101042	Capscrew, 3/4" x 1" Lg. Socket Head	1	57	100308	Capscrew, 3/4" x 3" Lg. Socket Head	4
18	102408	Edge Protector (Specify Length Req'd.)	1	58	M-P-1 58BA	Stripper Bolt Assembly	2
19	M-P-292TR	Threaded Rod, Shaft Guide	1	59	100297	Capscrew, 3/8" x 1-1/4" Flat Socket Head	2
20	M-P-126	Main Frame	1	60	105013	Stripper Bottom Plate	1
21	100502	Quick Set Stroke Collar	2	61	105016	Stripper	1
22	102145	Conduit, Limit Switch	1	62	100267	Capscrew, 1/2" x 4" Hex Socket	1
23	100314	Nut, 3/8"	2	63	103135	Retract Switch Complete	1
24	M-PH-181MB	Mounting Bracket, Valve	1	65	101607	Face Plate for Retract	1
25	100287	Capscrew, 3/8" x 1/2" Hex Head	6	66	102388	Capscrew, 1/4" x 1/2" Truss Head	6
31	105226	Relief Valve	1	67	M-P-159	Hood	1
32	100236	Capscrew, 1/4" x 1/2" Hex Head	4	68	M-P-107	Shield, Lower Front	1
33	101999	Start-Stop Switch	1	69	M-P-249A	Die Holder Block (For Models Over 70 Ton)	1
34	105069	Disconnect Switch	1		M-P-249CA	Die Holder Block Assembly, Includes Ref. 56, 57, 69	1
35	101901	Electric Control Panel Box	1				
36	102120	Electric Foot Switch	1				
37	102388	Screw, 1/4" x 1/2" Flat Socket Head	4				
38	100425	Foot Switch Cover	1				

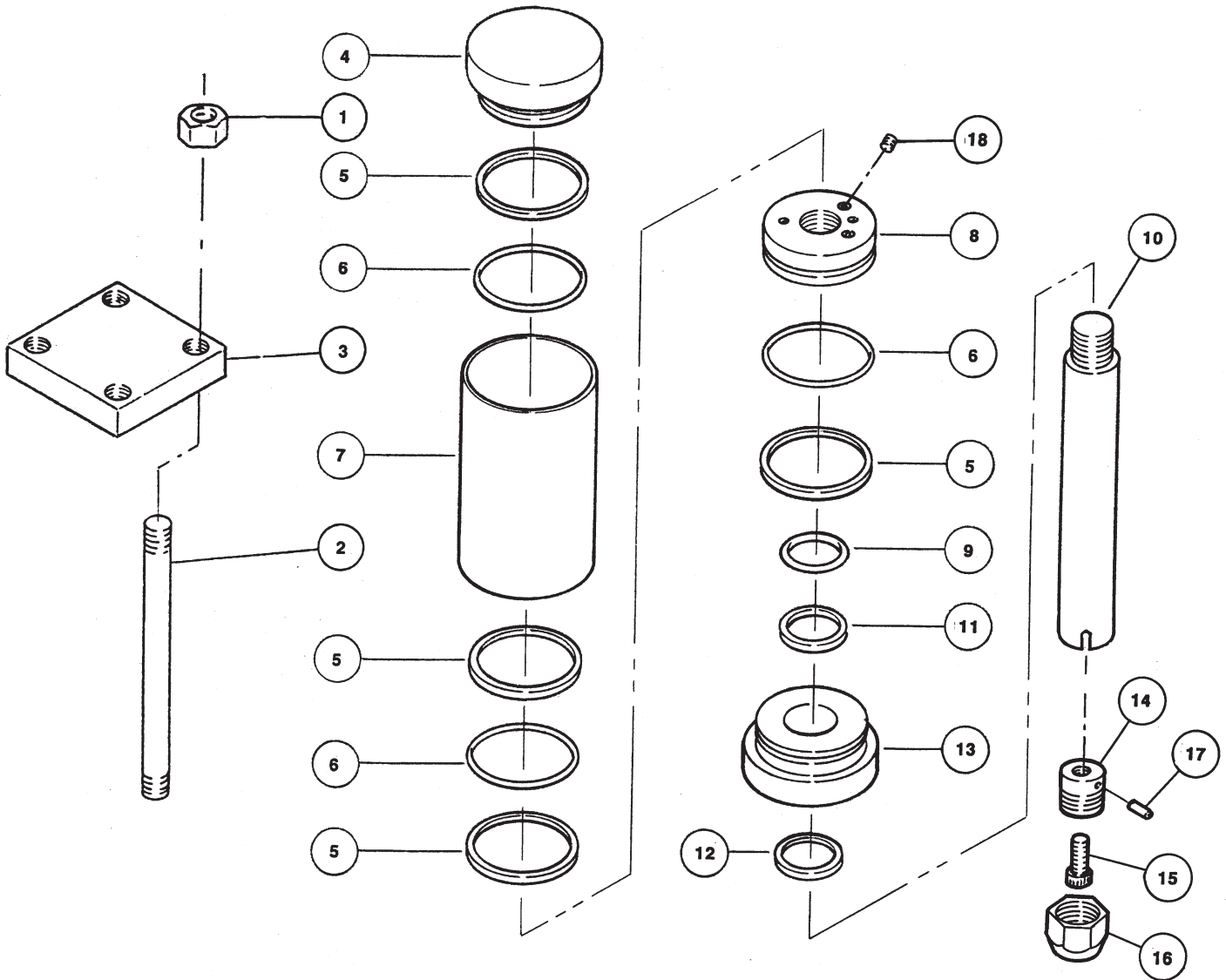
ALWAYS GIVE KALAMAZOO/MUNCHER MODEL AND SERIAL NUMBER WHEN ORDERING PARTS.

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



Check oil level plug. Capacity 10 gallons
Use ISO68 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	101161	"O" Ring Seal, Shaft Seal 3"	1
10	M-PC-262	Press Cylinder Shaft, 3" Dia. **	1
11	101162	Back-up Ring, Shaft Seal 3"	1
12	101155	Wipe 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	100311	Capscrew, 5/8" x 2-1/2" Hex Socket	1
16	M-PC-271	Punch Coupling Nut (specify size) **	1
17	101073	Roll Pin	1
18	100287	Set Screw	2
*	102720	7" Cylinder Repair Kit (Press)	1
*	102718	8" Cylinder Repair Kit (Press)	
*	102719	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 or tie down plate specify overall length and diameter to ensure proper fit.

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

TROUBLE SHOOTING

The following is a trouble shooting guide to be used by trained maintenance personnel should a problem occur with your KALAMAZOO/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 KALAMAZOO/METAL MUNCHER 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

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 HYDRAULIC

CAUSES

REMEDIES

A - PUMP UNUSUALLY NOISY OR CAVITATION

- | | |
|---|---|
| <ol style="list-style-type: none">1. Low oil supply.2. Oil too heavy.3. Dirty oil strainer.4. Restriction or partially clogged suction line.5. Air bubbles in intake oil.6. Reservoir air vent plugged.
7. Air leaks at pump intake piping joint or at pump shaft packing or inlet pipe opening.8. Flexible coupling misalignment.9. Worn or broken parts.10. Pump head too loose or faulty head gasket. | <ol style="list-style-type: none">1. Fill Oil to proper level.2. Change to proper weight oil.3. Install new strainer.4. Remove restriction in suction line.5. Use non-foaming hydraulic oil.6. Air must be allowed to breathe into reservoir. Clean out or replace breather.7. Test by pouring oil on joints while listening for change in sound of operation. Tighten joints.8. Re-align flexible coupling.9. Replace parts.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

- | | |
|---|--|
| <ol style="list-style-type: none">1. Low oil supply.2. Relief valve pressure set too low.3. Pump worn or damaged.4. Oil intake pipe plugged.5. Wrong direction of shaft rotation.
6. Dirt in pump.7. Air leak in suction line, preventing priming.8. Oil too heavy to pick up prime. | <ol style="list-style-type: none">1. Fill oil to proper level.2. Reset to correct pressure setting using gauge.3. Inspect, repair, or replace pump.4. Clean out intake pipe.5. Must be reversed immediately to prevent seizure and breakage of parts due to lack of oil.6. Dismantle and clean pump.7. Repair leaks.8. Use lighter oil. |
|---|--|

C - NO PRESSURE IN THE SYSTEM

- | | |
|---|---|
| <ol style="list-style-type: none">1. Pump not delivering oil.2. Relief valve setting not high enough.3. Relief valve leaking.4. Spring in relief valve broken.5. Internal leakage in control valves or cylinders. | <ol style="list-style-type: none">1. Follow remedies given above.2. Increase pressure setting of relief valve.3. Check valve seat for scoring mark and reseal.4. Replace spring and readjust valve.5. Repair and replace. |
|---|---|

D - EXCESSIVE WEAR ON PUMP

- | | |
|---|--|
| <ol style="list-style-type: none">1. Oil weight too light at working conditions.2. Sustained high pressure above maximum pump rating.3. Drive misalignment.4. Air circulation causing chatter in system. | <ol style="list-style-type: none">1. Check for recommended oil weight.2. Check relief valve maximum setting.3. Check and correct.4. Remove air from system. |
|---|--|

E - EXCESSIVE HEATING OF OIL

- | | |
|--|--|
| <ol style="list-style-type: none">1. Foreign material lodged between the relief valve plunger and relief valve seat.2. Using very light weight oil in hot climate.3. Using too heavy oil.4. Oil level too low.5. Relief valve pressure too high or too low.6. Pump worn and oil slips by pump.7. Leaking relief valve.8. Relief valve does not operate. | <ol style="list-style-type: none">1. Inspect and remove foreign material.
2. Drain and refill with proper weight oil.3. Use recommended weight oil.4. Fill to proper oil level.5. Set relief valve at correct pressure.6. Replace or repair pump.7. Replace or repair relief valve.8. Replace or repair relief valve. |
|--|--|

F - OIL FOAMING

- | | |
|---|--|
| <ol style="list-style-type: none">1. Air leaking into suction line from tank to pump.2. Wrong kind of oil.3. Oil level too low. | <ol style="list-style-type: none">1. Tighten all connections.2. Drain and refill with non-foaming type of hydraulic oil.3. Fill to proper oil level. |
|---|--|

G - CYLINDERS CREEP WHEN STOPPED IN INTERMEDIATE POSITION

- | | |
|--|---|
| <ol style="list-style-type: none">1. Internal leakage in cylinder or control valves. | <ol style="list-style-type: none">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

- | | |
|---|--|
| <ol style="list-style-type: none">1. Worn pump.2. Internal leak in cylinder or control valve.
3. Air in system4. 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. | <ol style="list-style-type: none">1. Repair or replace pump.2. Replace piston o-rings and backups or replace cylinder if walls are scored. Replace or repair valve.3. Bleed the system and tighten joints.4. Use oil weight recommended by manufacturer |
|---|--|

I - EXTERNAL OIL LEAKAGE ON CYLINDERS.

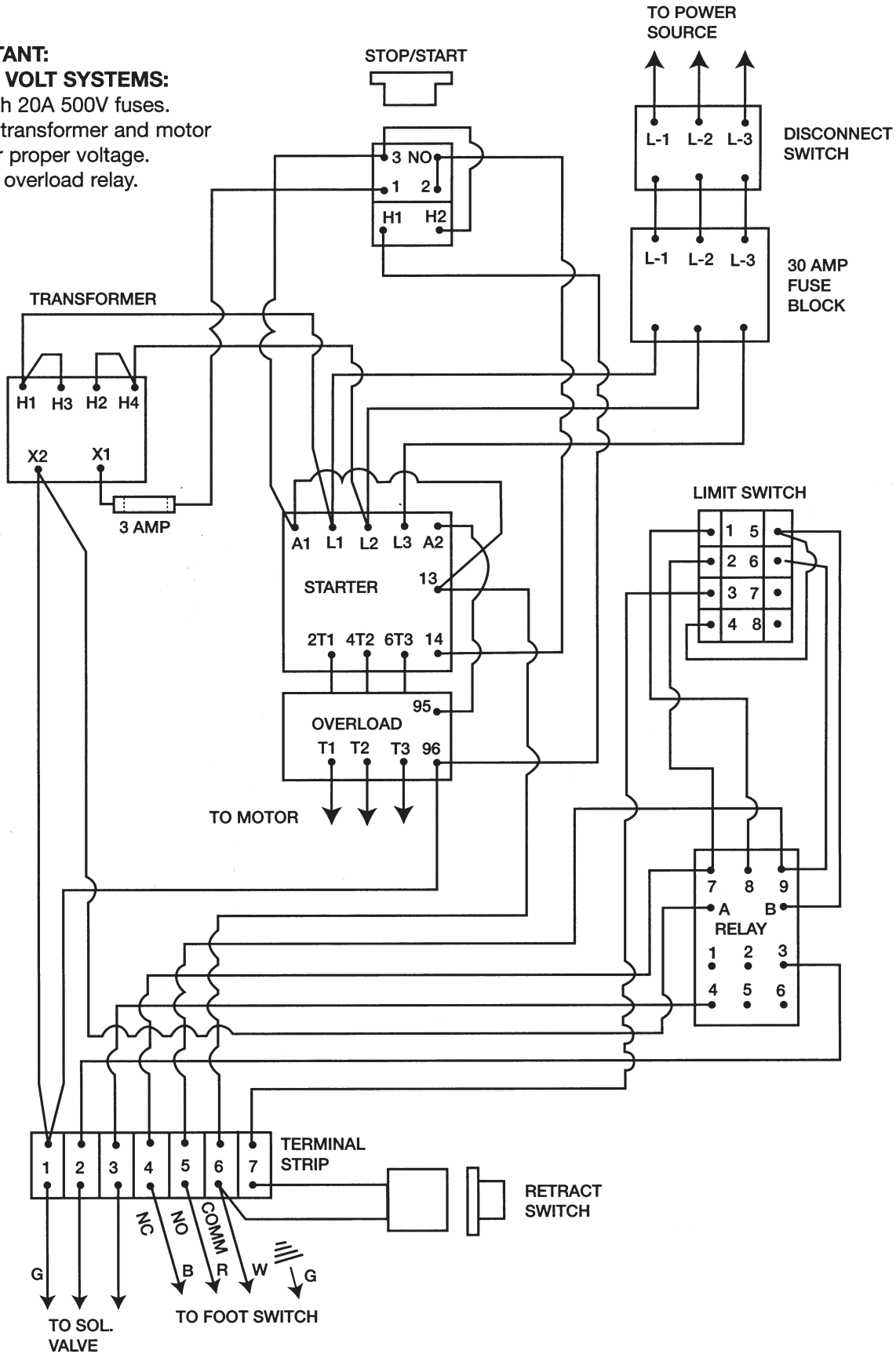
- | | |
|--|---|
| <ol style="list-style-type: none">1. End caps leaking. | <ol style="list-style-type: none">1. Tighten tie rod nuts if possible or replace o-rings, backups and shaft seal if necessary |
|--|---|

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

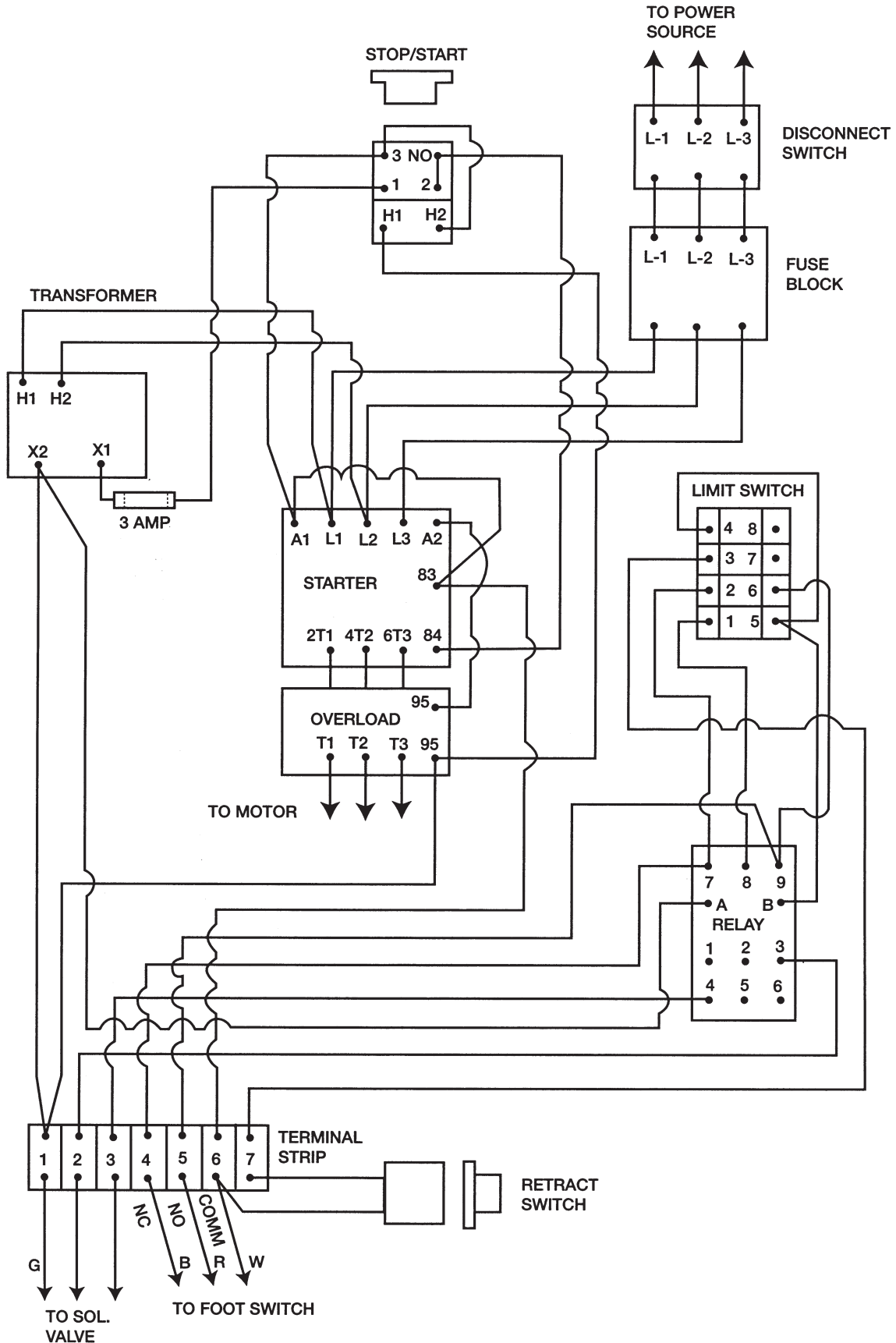
IMPORTANT:

440/480 VOLT SYSTEMS:

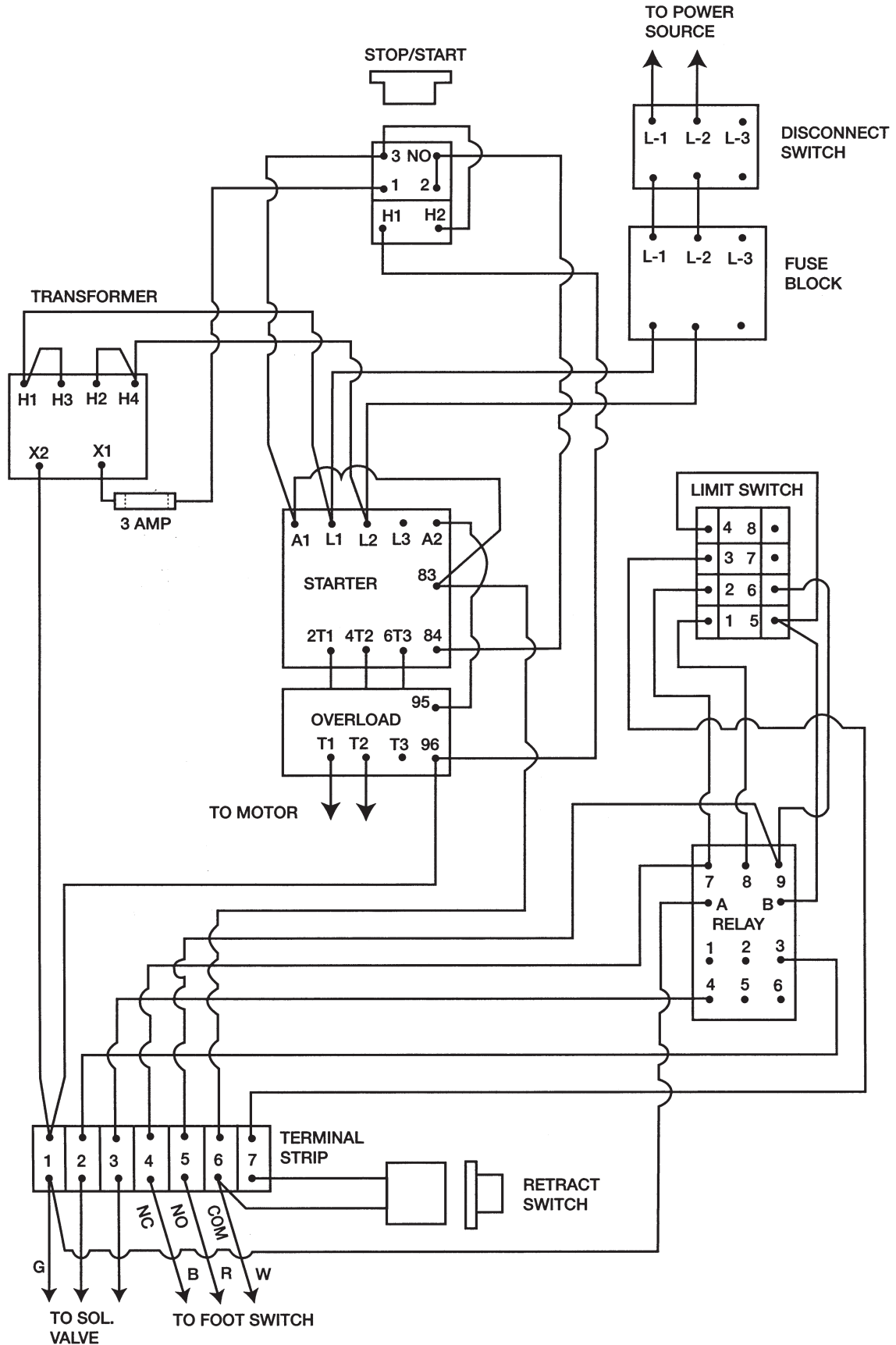
Fuse with 20A 500V fuses.
 Change transformer and motor leads for proper voltage.
 Replace overload relay.



WIRING DIAGRAM - 208 VOLT - 3 PHASE



WIRING DIAGRAM - 220 VOLT - 1 PHASE



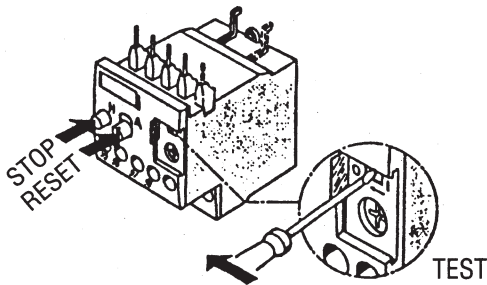
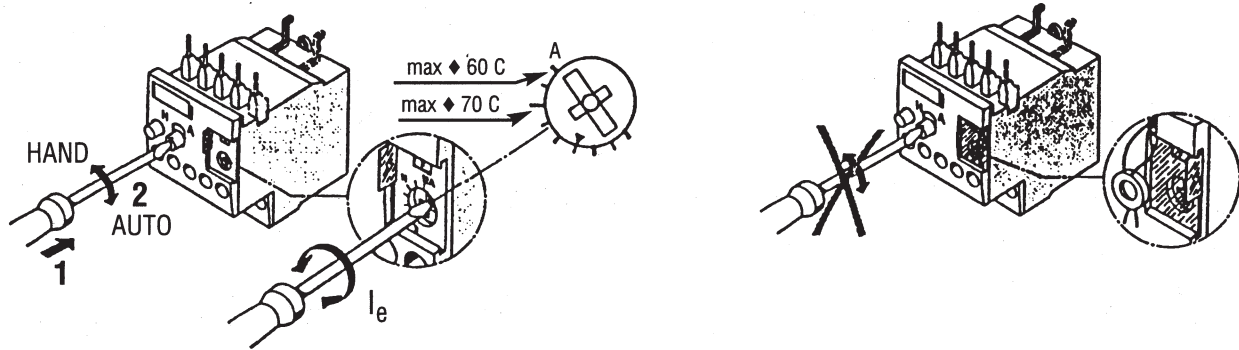
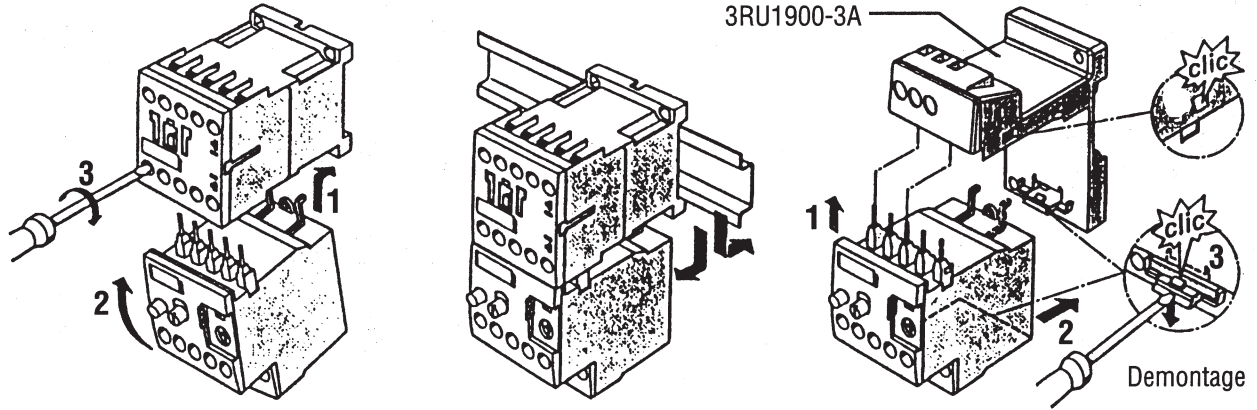
SIEMENS Overload Relay

SIRIUS 3R 3RU1.1/3RU1.2

CE EN 60947, IEC 947

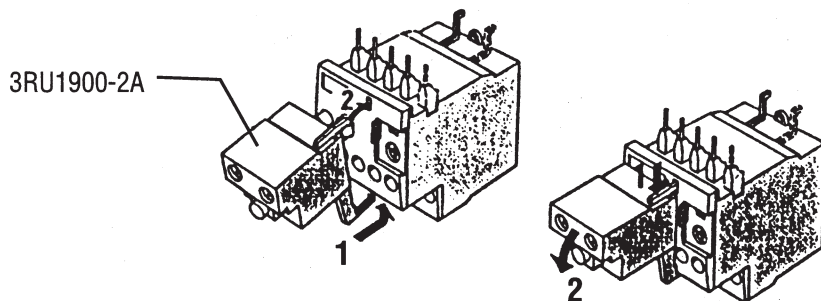
Assembly Instructions

Order No.: 3ZX1012-ORU11-1AA1

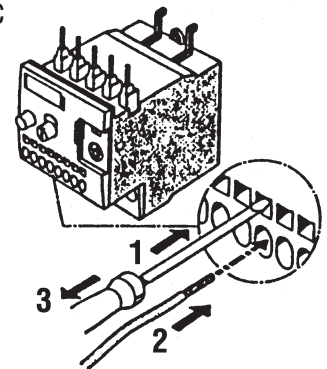


	TEST	STOP	RESET
NC 95 96			
NO 97 98			

REMOTE RESET







3RU1116-..C
3RU1.26-..D

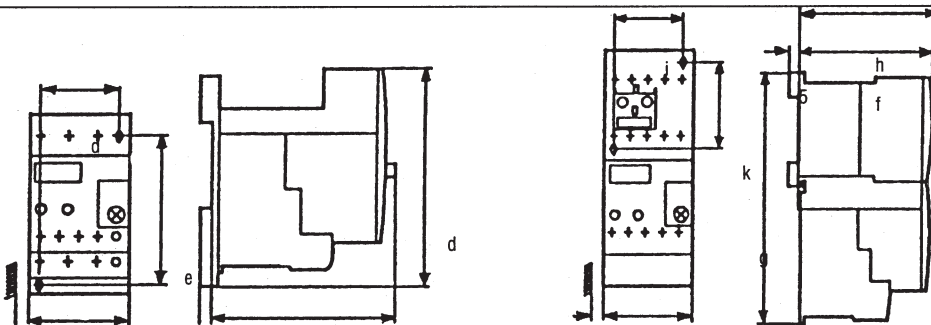
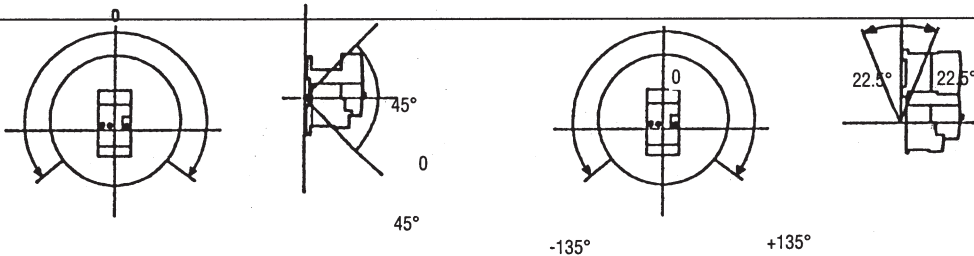
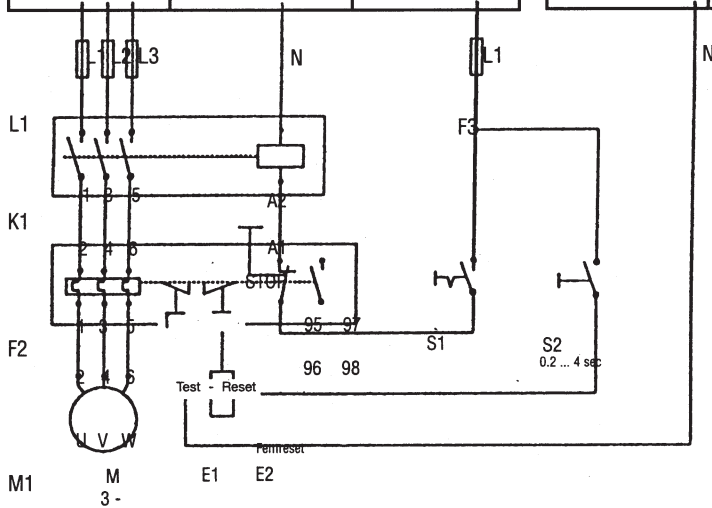


SIEMENS Overload Relay Con't

SIRIUS 3R 3RU1.1/3RU1.2

Order No.: 3ZX1012-ORU11-1AA1

Screw	3RU1116-..6		3RU1116-..C1		Screw	A1/A2:NO/NC		L1 L2 L3		
	3RU1.26-..B		3RU1.26-..D			T1 T2 T3				
	0.8 ... 1.2 Nm 7 to 10.3 LB. IN		---			0.8 ... 1.2 Nm 7 to 10.3 LB. IN		2.0 ... 2.5Nm 18 to 20 LB. IN		
	2 x 0.5 ... 1.5mm ² 2 x 0.75 ... 2.5mm ²		2 x 0.5 ... 2.5mm ²			2 x 0.5 ... 1.5mm ² 2 x 0.75 ... 2.5mm ²		2 x 1 ... 2.5mm ² 2 x 2.5 ... 6mm ²		
10	2 x 0.5 ... 2.5mm ²		2 x 0.5 ... 1.5mm ²		10	2 x 0.5 ... 2.5mm ²		2 x 1 ... 2.5mm ² 2 x 2.5 ... 6mm ² max. 2 x 10mm ²		
AWG	2 x 18 to 14		2 x 18 to 14		AWG	2 x 18 to 14		2 x 14 to 10		



Order No.	a	b	c	d	e	f	g	h	i	k
3Ru1.1	45	72.3	87.2	35	75	67.5	118	69.9	35	50
3RU1.1 Cage Cl.	45	72.5	96.7	35	75	-	-	-	-	-
3RU1.2	45	89.5	97.1	35	85	85	143.5	89.5	35	60
3RU1.2 Cage Cl	45	89.5	97.1	35	85	85	146.5	89.5	35	60

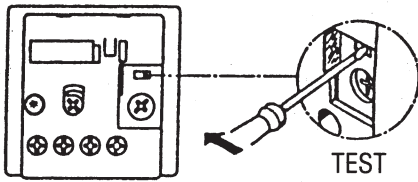
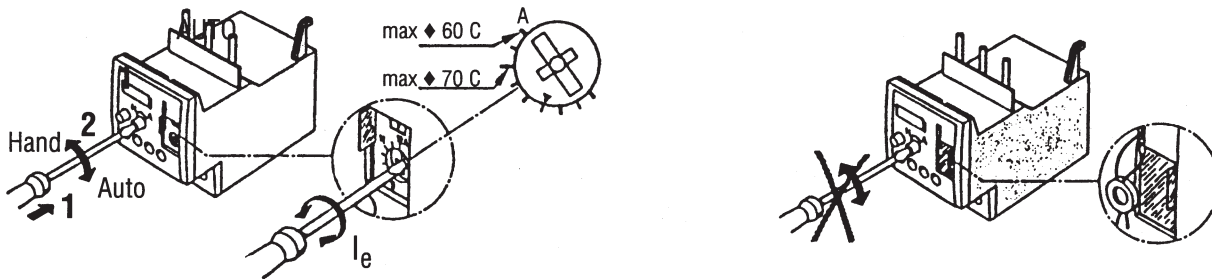
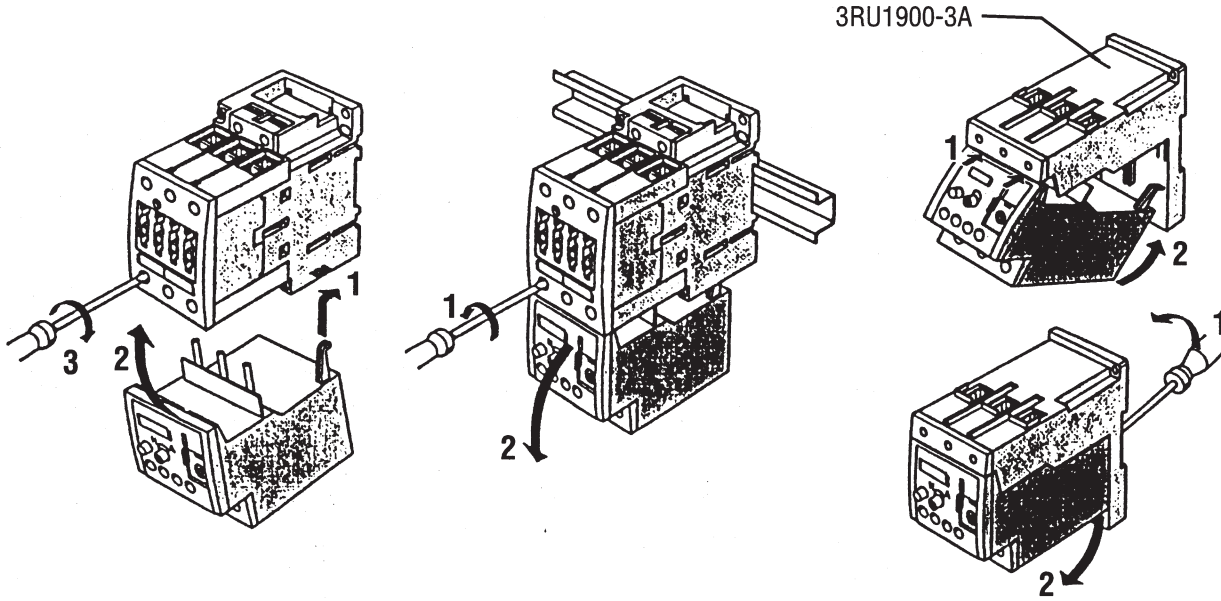
SIEMENS Overload Relay

SIRIUS 3R 3RU1.3

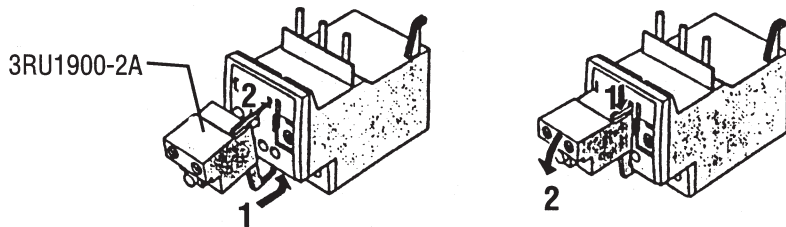
CE EN 60947, IEC 947

Assembly Instructions

Order No.: 3ZX1012-ORU11-1CA1








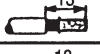

	TEST	STOP	RESET
NC 95 96			
NO 97 98			

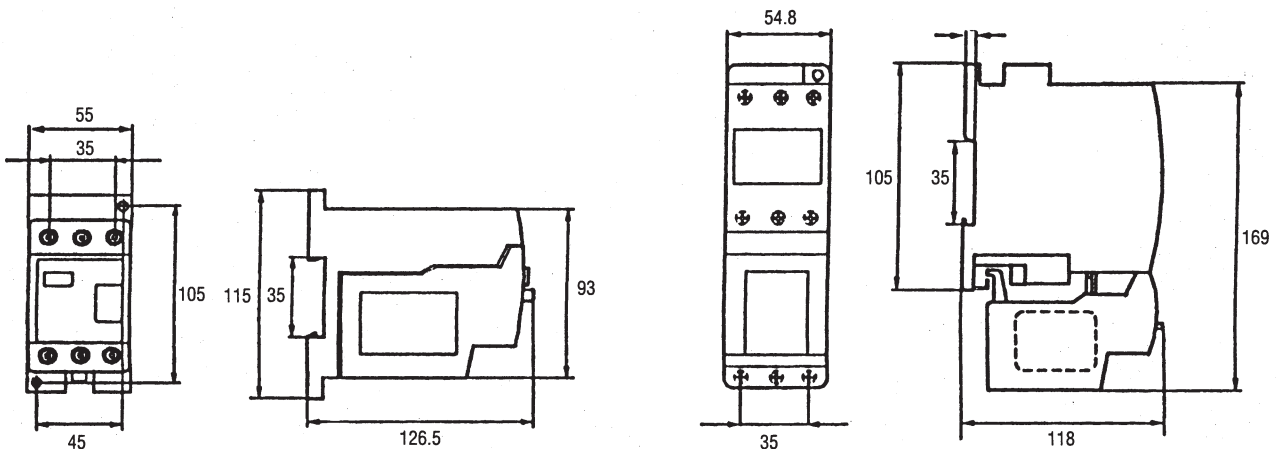
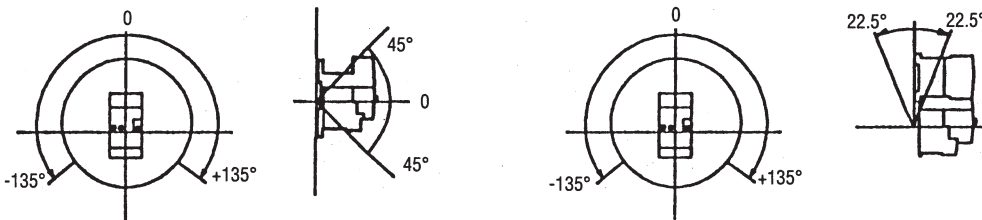
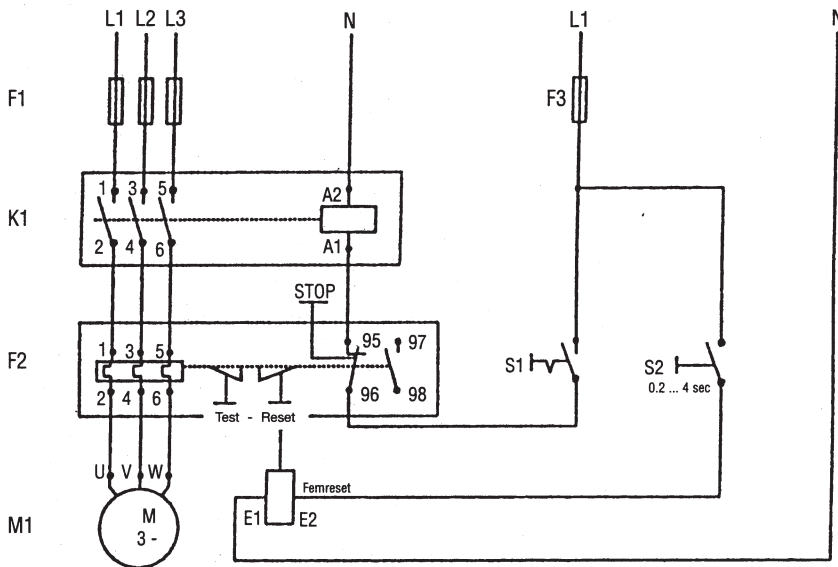
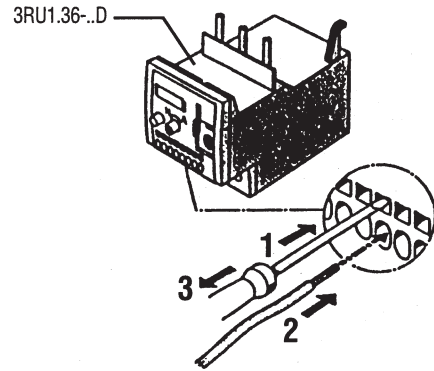


SIEMENS Overload Relay Con't

SIRIUS 3R 3RU1.3

Order No.: 3ZX1012-ORU11-1CA1

	A1/A2:NO/NC 3RU1.36-..B		3RU1.36-..D		L1 L2 L3 T1 T2 T3
	0.8 ... 1.2 Nm 7 to 10.3 LB. IN		—		3 ... 4.5Nm 27 to 40 LB. IN
	2 x 0.5 ... 1.5mm ² 2 x 0.75 ... 2.5mm ²		2 x 0.5 ... 2.5mm ²		2 x 0.75 ... 16mm ²
	2 x 0.5 ... 2.5mm ²		2 x 0.5 ... 1.5mm ²		2 x 0.75 ... 16mm ² 1 x 0.75 ... 25mm ²
—	—	—		—	2 x 0.75 ... 2.5mm ² 1 x 0.75 ... 35mm ²
AWG	2 x 18 to 14		2 x 18 to 14	AWG	2 x 18 to 3 1 x 18 to 2



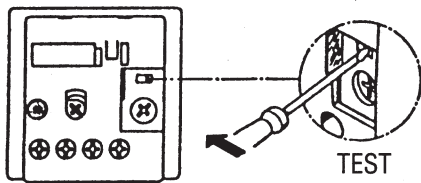
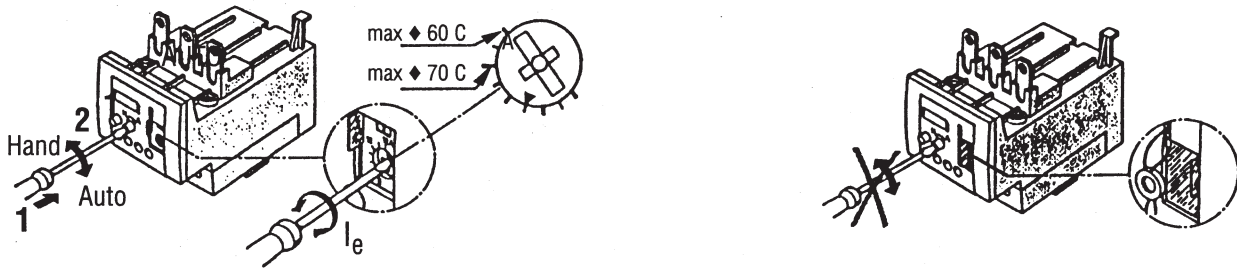
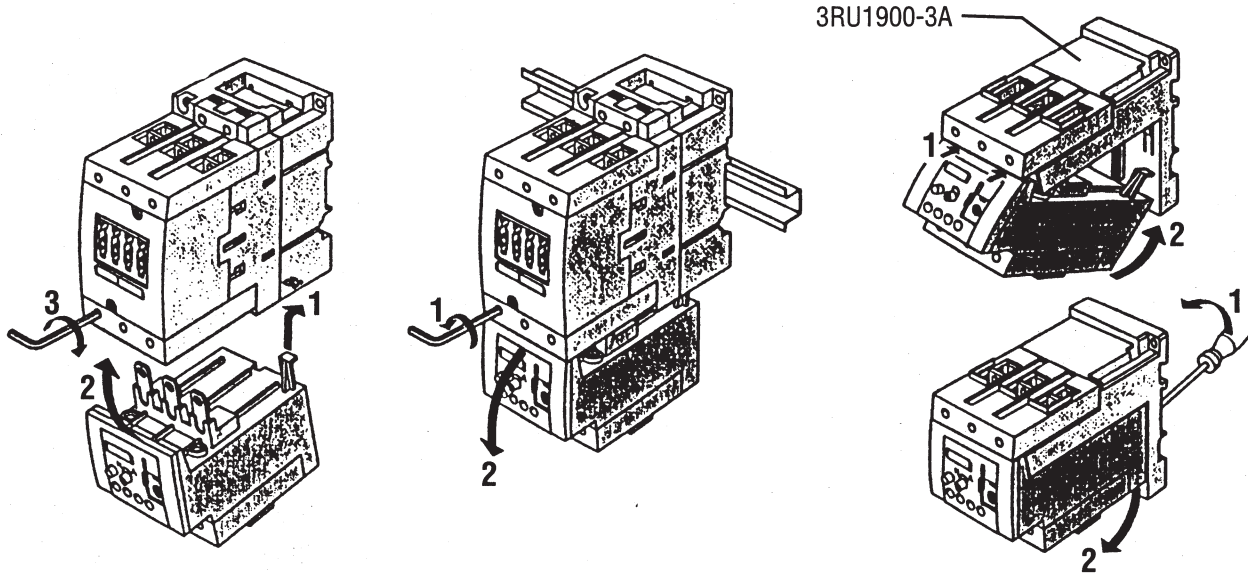
SIEMENS Overload Relay

SIRIUS 3R 3RU1.4

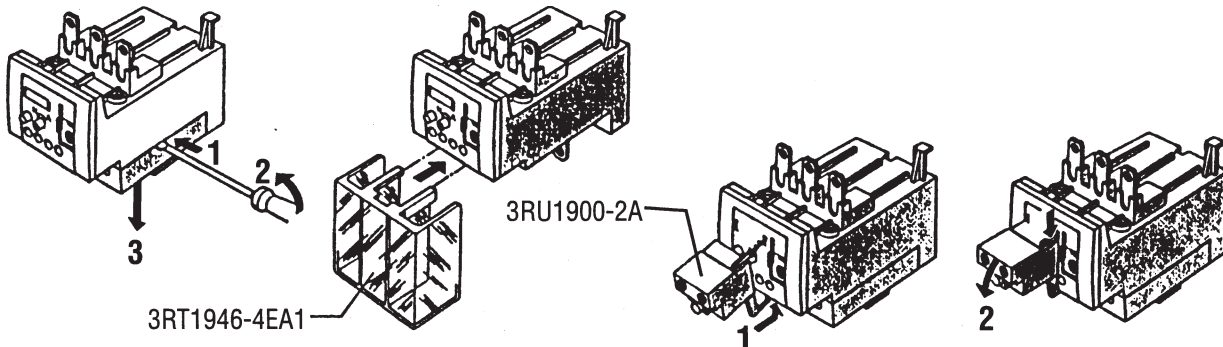
CE EN 60947, IEC 947

Assembly Instructions

Order No.: 3ZX1012-ORU11-1DA1



	TEST	STOP	RESET
NC 95 96			
NO 97 98			



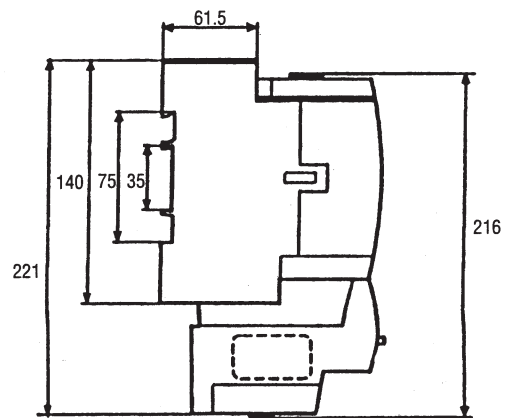
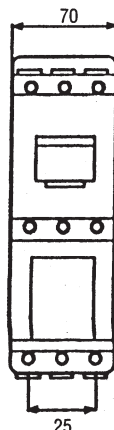
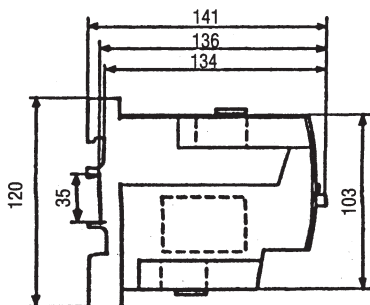
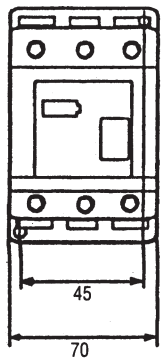
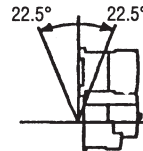
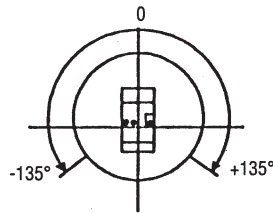
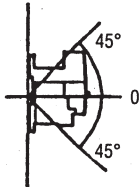
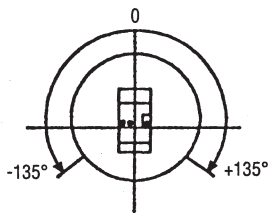
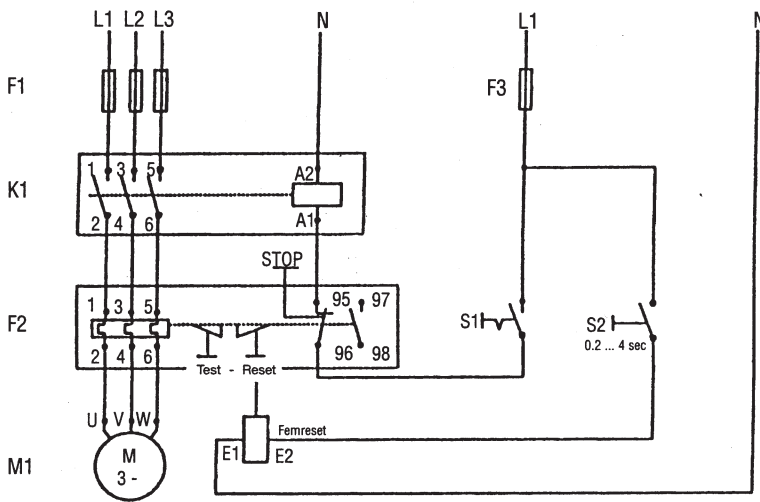
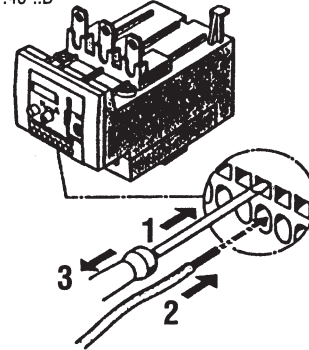
SIEMENS Overload Relay Con't

SIRIUS 3R 3RU1.4

Order No.: 3ZX1012-ORU11-1CA1

	A1/A2:NO/NC			L1 L2 L3
	3RU1.46-.B	3RU1.46-.D		T1 T2 T3
$\varnothing 5 \dots 6 \text{ mm/PZ2}$	0.8 ... 1.2 Nm 7 to 10.3 LB. IN	---	min 22	4 ... 6Nm 35 to 53 LB. IN
10	2 x 0.5 ... 1.5mm ² 2 x 0.75 ... 2.5mm ²	2 x 0.5 ... 2.5mm ²	17	2 x 2.5 ... 16mm ²
10	2 x 0.5 ... 2.5mm ²	2 x 0.5 ... 1.5mm ²	17	2 x 2.5 ... 35mm ² 1 x 2.5 ... 50mm ²
---	---	---	17	2 x 10 ... 2.5mm ² 1 x 10 ... 35mm ²
AWG	2 x 18 to 14	2 x 18 to 14	AWG	2 x 10 to 1/0 1 x 10 to 2/0

3RU1.46-.D



CLAUSING/METAL MUNCHER WARRANTY

The KALAMAZOO/METAL MUNCHER is warranted against defect in material or workmanship installed or performed at the factory. Because of the quality of workmanship, KALAMAZOO/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 KALAMAZOO/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.

KALAMAZOO/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 KALAMAZOO/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 KALAMAZOO/METAL MUNCHER.

KALAMAZOO/METAL MUNCHER
3428 East B Ave
Plainwell, MI 49080
Phone: 269-492-0268

NOTICE TO BUYER

Fill out and mail the tear-out card below to insure proper warranty registration.

-WARRANTY REGISTRATION CARD

Delivery Report

Owner - Company _____

Sold by _____

Person to Contact _____

Address _____

Tele. No. _____

Address _____

Date Sold _____

SN No. _____ Model No. _____

Owner has been checked out on KALAMAZOO/METAL MUNCHER use and safety precautions.

The following has been explained to me in detail and I fully understand the operation of the METAL MUNCHER.

By _____

_____ Shearing, punching, coping capacities

_____ Punch & die alignment

_____ Brake & spec. tooling alignment

_____ Shear, Angle, Notcher knife adj.

_____ Wear guide adj.

_____ Lubrication

_____ Hyd. System

_____ Electrics

KALAMAZOO/METAL MUNCHER
3428 East B Ave
Plainwell, MI 49080
Phone: 269-492-0268

_____ Date _____

Owner's Signature

FIRST
CLASS
STAMP

KALAMAZOO/METAL MUNCHER
3428 East B Ave
Plainwell, MI 49080
Phone: 269-492-0268

