



**HYDRAULIC EQUIPMENT
OPERATING INSTRUCTIONS
AND SERVICE MANUAL**



SERIES "M5P" 6 TO 20 TON

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INTRODUCTION

MANUAL SCOPE

This manual is intended as a reference when installing and preparing MULTIPRESS equipment for operation, and for normal maintenance and equipment repair.

SERVICE POLICY

The simplicity of MULTIPRESS equipment, the unitized construction of its major components, and observance of the instructions in this manual assure ease of servicing by the user.

All field service requested by the user and rendered by our factory representatives will be charged at the established rate per day plus expenses. MULTIPRESS equipment may be sent to our factory for inspection and service only upon receipt of a purchase order for such service.

Current user requirements to be specified at time of order.

MULTIPRESS EQUIPMENT WARRANTY

The Seller warrants to the Buyer that on the date of shipment, the Goods shall be in substantial conformity with the specifications therefore and free from material defects in workmanship or material subject to the condition that Seller receive notice of a claim hereunder of shipment of Goods within six (6) months on labor, one (1) year for MULTIPRESS manufactured Parts, (Purchased Component Parts have original manufacturer's warranty).

This is the sole warranty of the Seller and all other warranties whether express or implied or written or oral are superseded hereby.

SAFETY

It is suggested for the user to be familiar with the current revision of ANSI B11.2, "American National Standard for Machine Tools - Hydraulic Power Presses - Safety Requirements for Construction, Care, and Use", for personal safety of the press operator.

WARNING AND CAUTION TAGS

Please observe the Caution, Warning, and Note tags on the press (reproduced below) and in this manual.

WARNING

TO PREVENT SERIOUS BODILY INJURY:

NEVER use this machine without guards or safety devices that are intended to prevent hands from remaining in the die space.

NEVER operate, service, or adjust this machine, or install dies, without proper instruction and without first reading and understanding the instructions in the operator's manual.

NEVER install dies or service this machine with the motor on, or the ram in an unblocked position.

CAUTION

Never operate the press if the oil level is low, or if the oil temperature is greater than 150°F. The use of a cooler is recommended when the fluid temperatures are expected to exceed 130°F.

NOTE

When components have been removed, some additional cycling may be required to ensure the entrapped air is removed and smooth operation occurs.

SPECIFICATIONS

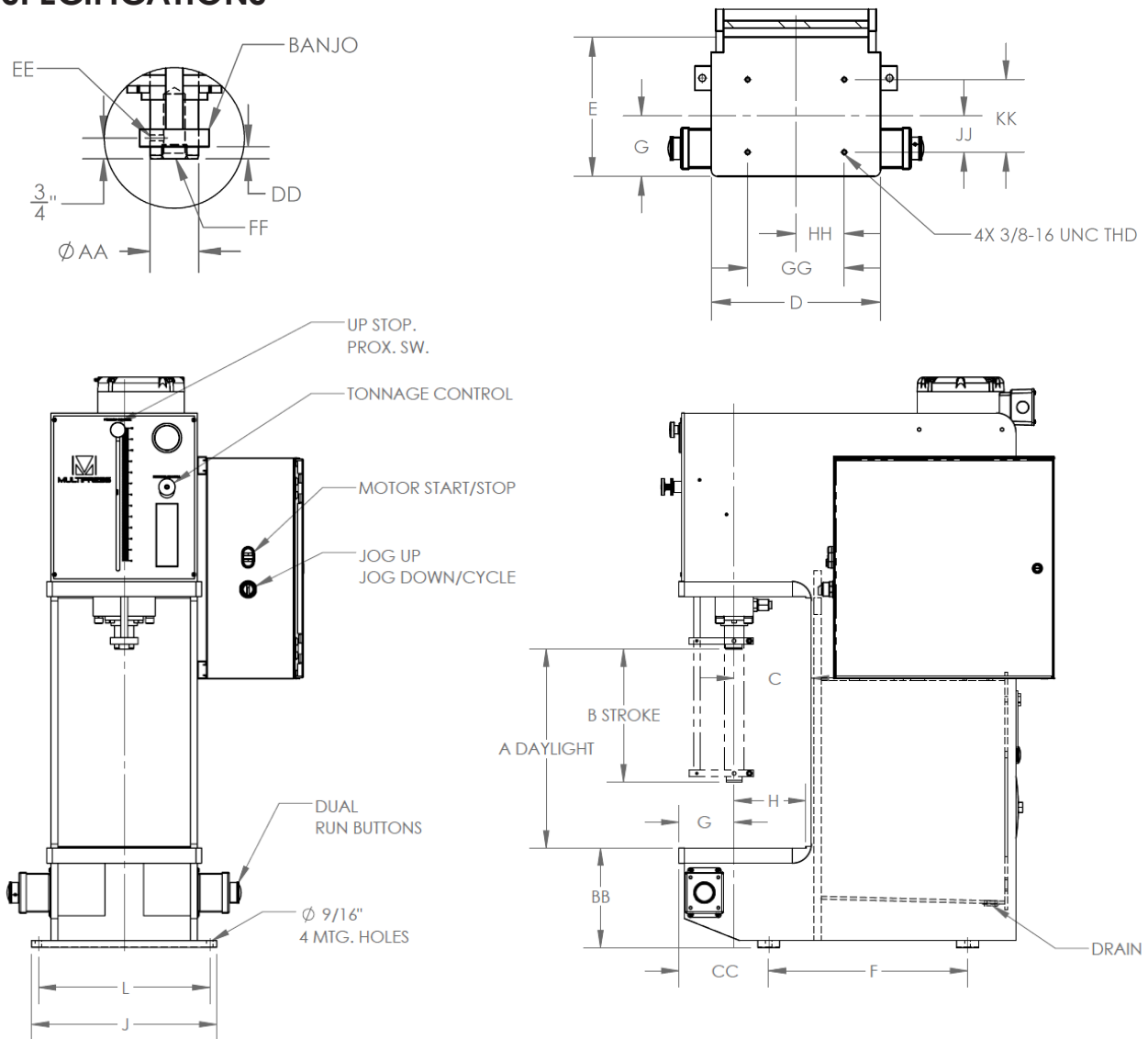


Figure 1 - Specifications

PRESS MODEL NO.		M5P-5P*	M5P-6	M5P-8	M5P-8P*	M5P-12	M5P-15	M5P-20
TONNAGE MAX.		5	6	8	8	12	15	20
RAM SPEED I.P.M	ADVANCED	600	430	440	585	420	420	216
	PRESS	235	210	165	140	165	165	106
	RETURN	390	415	270	190	270	270	208
CYLINDERS DIAMETERS	BORE	2 1/2"	2 1/2"	3 1/4"	3 1/4"	4"	4"	5"
	ROD	1 3/4"	1 3/4"	2"	2"	2 1/2"	2 1/2"	3 1/2"
OPERATING PRESSURE	MAX.	2,425	2,445	1,929	2,349	1,910	2,387	2,038
	MIN.	489	489	386	470	382	477	408
RAM EFFORT lbs.	MAX.	10,000	12,000	16,000	16,000	24,000	30,000	40,000
	MIN.	2,000	2000	4,000	4,000	6,000	8,000	8,000
RESERVOIR CAPACITY gal.		16	16	16	16	23	23	23
APPROX SHIPPING WT. lbs.		1,040	990	1,025	1,075	1,375	1,400	2,150

SPECIFICATIONS (CONT.)

MODEL	A	B	C	D	E	F	G	H	I	J	K	L
M5P-6	18	12	7	14	11.5	18	5	6.5	30.5	16.75	50.75	15.5
M5P-8	18	12	7	14	11.5	18	5	6.5	30.5	16.75	50.75	15.5
M5P-12/15	18	12	8	17	13.5	24	6	7.5	37.0	20.00	51.13	18.5
M5P-20	18	12	10	20	15.5	26	6	9.0	40.0	21.00	53.62	19.5

MODEL	AA*	BB	CC	DD	EE	FF	GG	HH	JJ	KK
M5P-6	1.75	9	8.13	7/16	1/4-20	7/8-9	8	4	3	6
M5P-8	2.00	9	8.13	7/16	1/4-20	7/8-9	8	4	3	6
M5P-12/15	2.50	11	8.63	7/16	1/4-20	7/8-9	10	5	3	6
M5P-20	3.50	12	9.12	3/8	3/8-16	1-14	12	6	4	8

2 & 4 POST GUIDED TOOL PLATE										4 POST	
MODEL	A	B	C	D	E	F	G	H	I	J	K
M5P-6/8	8	18	6	12	3	6	1.5	7.875	15.75	2.375	4.70
M5P-12/15	10	21	6	12	3	6	1.5	9.125	18.25	3.625	7.25
M5P-20	12	22	17	14	4	8	1.5	19.625	19.25	4.250	8.50

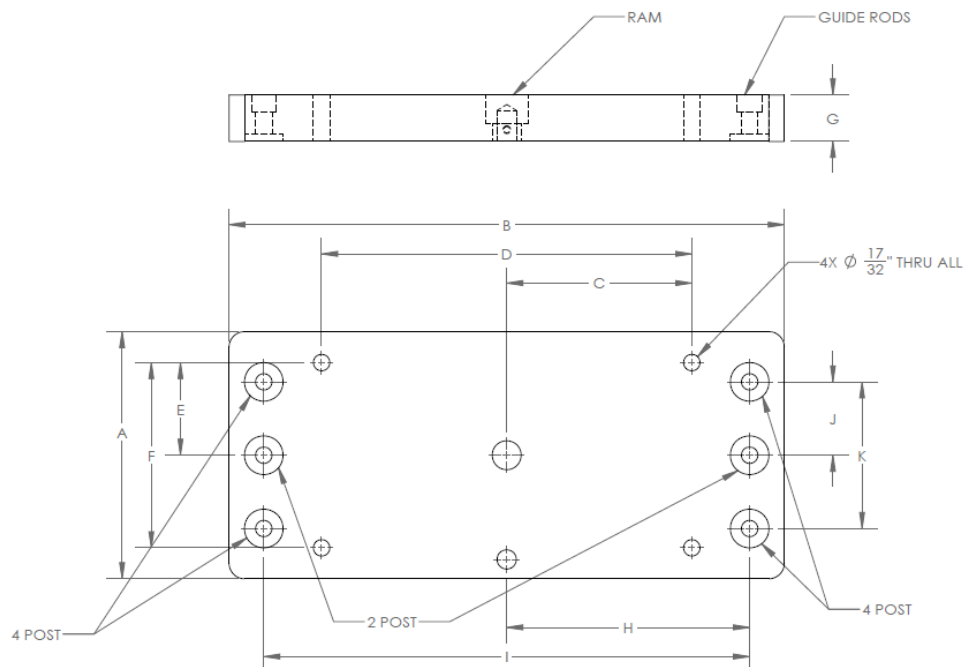


Figure 2 - Guided Tool Plate



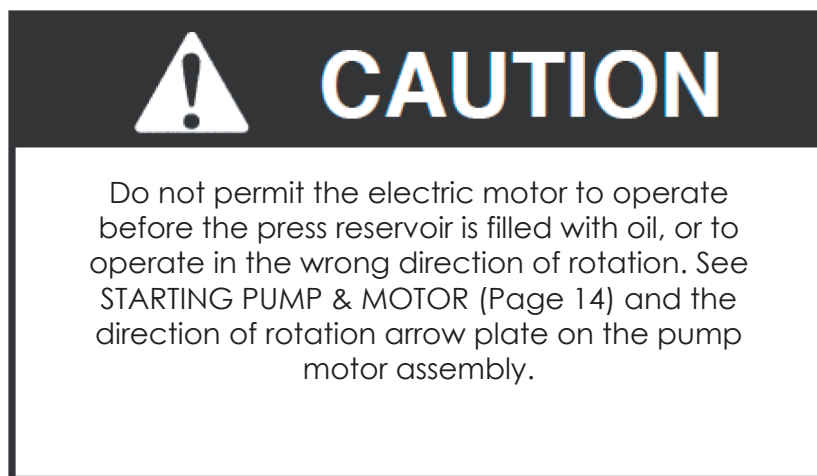
INSTALLATION

INSTALLATION INSTRUCTIONS

After removing the press from the shipping crate, stand the press upright near the area where it will be anchored. Care should be taken to avoid twisting or dropping the press during unpacking and transportation to the area of operation.

ELECTRIC

Your standard press is wired to be connected to current user requirements as specified when ordered. Connection of press to the users' power source should be accomplished by qualified personnel.



RECOMMENDED OIL SPECIFICATIONS

The warranty for MULTIPRESS equipment applies only when the proper hydraulic fluid has been used, and the oil contamination level is equal to, or better than NAS...1638...CLASS NO. 8 OR BETTER. NO PARTICLES OVER 200 MICRON. "New" oil as received, is not clean. Oil must be filtered via a 10 micron (or better) filter before filling the reservoir. A filter cart is recommended.

Certain basic physical and chemical properties are necessary for proper operation of MULTIPRESS. The following basic properties should be presented to the fluid supplier for their recommendation of a product for use in this MULTIPRESS.

VISCOSITY @ 100°F - 300 SUS ±20 SUS

VISCOSITY INDEX - 90 OR HIGHER

RUST & OXIDATION INHIBITORS - YES

ANTI-FOAM ADDITIVE - YES

SPECIFIC GRAVITY .882 - .887 @ 60F/ 60F (API Gravity 29-31)

It is suggested that the fluid supplier provide the user with certification that their product meets the above requirements.

FILLING THE OIL RESERVOIR

CLEANLINESS is the most important requisite in proper maintenance of the hydraulic equipment. Of the few maintenance difficulties encountered in the operation of oil hydraulic equipment, many of them are directly traceable to dirt or foreign matter in the oil.

EXTREME CARE should be exercised in maintaining a clean supply of oil in the reservoir and the hydraulic system of your MULTIPRESS equipment at all times. Make certain that no lint, dirt, abrasive scale, or other foreign materials enter the hydraulic system. Trouble-free operation over a long period of time may be obtained from the press by taking these precautions with the oil in the press. See MULTIPRESS EQUIPMENT WARRANTY on Page 6.

The oil reservoir is filled through the oil filler cap, which is located on top of the reservoir. Lift the filler cap and fill the reservoir with any clean oil meeting our recommended oil specifications on Page 10. Fill the reservoir to within 1" of the top of the reservoir, or to the high mark on the oil level gauge if provided.

CONTAMINANTS ARE FOUND IN NEW OIL SO A FILTER CART SHOULD BE EMPLOYED TO TRANSFER OIL INTO RESERVOIR.



CAUTION

Never operate the press if oil level is low, or if the oil temperature is greater than 150°F. The use of a cooler is recommended when fluid temperatures are expected to exceed 130°F.



SEQUENCE OF OPERATION

STARTING THE PUMP AND MOTOR

IMPORTANT: Prior to start-up:

1. Start and stop the electric motor in order to check proper rotation. There are arrows clearly marked on the motor indicating the correct rotation. If this is incorrect, check the wiring to the motor leads.
2. Lower the setting of the RELIEF VALVE by loosening the LOCKNUT and then turning KNOB counterclockwise until loose but not removed. See the PRESSURE ADJUSTMENT plate on the front of press.



CAUTION

If the motor is permitted to operate in the wrong direction of rotation, the pump will be damaged after only a few seconds due to lack of oil to lubricate its precision machined internal parts. When the oil in the reservoir is at the proper level and the pump is operating in the correct direction of rotation, the pump will prime.



CAUTION

If the press has been shipped to you with the ram extended, it is necessary to put the selector switch in the JOG UP position and then actuate the pushbuttons. The ram should go up if the motor and pump are operating in correct direction of rotation. The pump will prime itself and provide adequate lubrication.

NOTE

Ram may not retract if the RELIEF VALVE has been backed out too far.

INCHING

Set the selector switch to JOG DOWN. Simultaneously actuate and maintain actuation of both CYCLE START buttons to the desired position of the ram. Release of either button allows the ram to stop. Set the selector switch to JOG UP. Actuation of the dual push buttons allows the ram to move up.

NOTE

Upper proximity or limit switch (1PRS) must be actuated at the top of the stroke before switching to CYCLE mode. If this switch is not made, the unit will not cycle.

SET-UP

JOG the press to your desired lower stop position allowing ram to exert full pressure against a set up block or workpiece.

NOTE

Set-up tooling before setting pressure on the ram.

Adjust the pressure by loosening the relief valve LOCKNUT and turning the relief valve KNOB on front or side of press (clockwise increases pressure, counterclockwise decreases pressure). Set the selector switch and JOG the ram just off the work. If included, set the lower proximity or limit switch (2PRS) to that point. This adjustment allows you to select where the PLC takes over to approach the work, achieve tonnage, and time reverse. JOG the ram to your upper stop position. Set the upper proximity switch (1PRS) at that position.

NOTE

The ram must contact a set-up block or workpiece to deliver force, so the pressure GAUGE can be read.

CYCLING

Simultaneously actuate and maintain actuation of both CYCLE START buttons. The ram extends until it contacts the work, achieves tonnage and reverses or until the lower proximity switch (2PRS), if included, no longer senses the RAM GUIDE BAR, and reverses. Release of the CYCLE START buttons before contacting work or making lower proximity switch (2PRS) retracts the ram to its upper stop position.

AIR IN SYSTEM

It is not unusual for air to be entrapped in the cylinder, lines, or controls during initial start up procedures. Operate with the main relief adjustment at low setting until erratic action or noise disappears. It may also be necessary to "crack" a pressure line slightly to allow the air to escape. Re-tighten, and then proceed normally.



MAINTENANCE

GENERAL

The establishment and implementation of maintenance schedules is essential for the reliable operation of the hydraulic press equipment. The elapsed time for periodic maintenance and inspection is based upon environmental and operating conditions (including hours of operation) which are known only to the user of the equipment. Therefore, it is the responsibility of the user to ensure that the instructions outlined in this manual are carried out on a timetable which will ensure reliable and efficient operation of the equipment.

It is the responsibility of the user to maintain the MULTIPRESS equipment at all times in a day-to-day operation. The Manufacturer suggests that the following maintenance and service procedures be implemented and regularly practiced by the user.



WARNING

When any malfunction in MULTIPRESS equipment is encountered during the operation or inspection of press, operator(s) should immediately stop the press. Have qualified personnel interrupt the electrical power. Conspicuously tag the press indicating a malfunction. Report it to the proper authorities. Do not run the press until the malfunction has been eliminated.

MAINTENANCE AND INSPECTION

The following chart is provided to point out specific checkpoints and the schedule that should be applied for each point. Any (ITEM, ROUTINE, or PERIODIC) inspection points not included in this list, but considered to be pertinent to the maintenance of the press, should be included. If in doubt, consult the factory.

ITEMS TO BE INSPECTED	SCHEDULED			MALFUNCTION						
	DAILY ROUTINE	PERIODIC	DAMAGED KINKED	WORN	BROKEN OR CRACKED	HYDRAULIC	MECHANICAL	ELECTRICAL	MISALIGNMENT	OUT OF ADJUSTMENT
FRAME		X			X					
ELECTRIC MOTOR		X	X					X	X	
STARTER		X						X		
PUMPS		X				X	X		X	
VALVES		X				X	X			X
GAUGES		X	X		X					
SWITCHES		X	X	X	X		X	X		
OPERATING CONTROLS	X	X	X	X	X		X			X
TOOLING	X	X	X	X	X		X		X	
FEED AND/OR EJECTION MECHANICAL	X	X	X	X	X	X	X	X	X	X
OIL LEAKS	X	X								
HYDRAULIC LINES - PIPE, TUBE, HOSE		X	X		X		X			
HYDRAULIC FITTINGS		X			X		X			
ELECTRICAL LINES - WIRE, CABLE, CONDUIT		X	X	X	X		X	X		
GASKETS, SEALS, & O-RINGS		X		X		X	X			
RAM PACKING		X	X	X		X	X			
OIL LEVEL TOO LOW OR TOO HIGH	X	X								
OIL CONTAMINATION TOO HIGH		X								



INSPECTION

DAILY INSPECTION

Before operating MULTIPRESS equipment, each operator should make inspection checks indicated on Pages 26 and 27. These checks should be made after each shift change. In addition, the following inspection checks should be made by each operator before operating the press and after any break time.

1. Make sure that each component is in the proper condition and position for start up and be aware of any movement which will occur during start up procedure.
2. Check for foreign objects which may cause injury or damage and remove before start up.
3. Check for leaks.
4. Connect electric power to starter box and then actuate MOTOR START push button. With the motor running and driving the hydraulic pump, make the following inspection checks:
 - a. Check for oil leaks.
 - b. Make sure each component is in the proper position to start cycling.
 - c. Make sure press operates in manner prescribed by sequence of operations.

SAMPLE ROUTINE LOG

If any checkpoints are malfunctioning or could lead to a malfunction, a written report should be generated indicating the problem and what was done to correct it, and then made a part of the press history.

PERIODIC INSPECTION

At the scheduled intervals in the table below, the users' maintenance should check each of the items.

In addition, each component of the PRESS should be checked for proper performance as follows:

1. Make sure that all devices function in accordance with the electrical circuit and sequence of operations.
2. Check all mechanical linkages.
3. Check the pressure setting of the Manifold Relief Valve.
4. Check for leaks.

SAMPLE PERIODIC LOG

If any checkpoints are found to be malfunctioning or could lead to a malfunction, a written report should be generated, indicating the problem and what was done to correct it, and then made a part of the press history.

EVERY 50 HRS. OPERATION		
CHECK	METHOD	REMEDY
Lubrication	Visual	Grease & Oil lubrication points
Check fluid levels in hydraulic and lubrication tanks		Fill as necessary with recommended fluids using filtration when filling hydraulic oil tanks
EVERY 100 HRS. OPERATION		
CHECK	METHOD	REMEDY
Cleanliness of hydraulic system filters if equipped	Visually by indicator or dismantling	Clean or replace filter element according to type
Chafing or wear of hydraulic hoses	Visual	Replace as required
Hydraulic connections for dryness and tightness	Visual and with suitable tool	Tighten or reseal as necessary (under a pressure condition)
General tightness of fastenings on rams, switches, gates, safety shocks, etc.	Visual	Take suitable action
EVERY 500 HRS. OPERATION		
CHECK	METHOD	REMEDY
Examine the operation of safety equipment	Visually and by operation of all parts	As required
Main press frame alignment deflection under pressure	Visual	As required
Tightness of tie rod nuts if fitted	Visual & with suitable tool	Tighten as necessary (according to manufacturers instructions)
AFTER 5,000 HRS. OPERATION OR ANNUALLY		
CHECK	METHOD	REMEDY
Cylinder packings	Visual	Replace packings
Frame and tie-rod damage or fatigue	Visual and with suitable non-destructive testing procedures	As required
Flatness of bolsters, platens, etc.	Visual and with suitable measuring equipment	Reface as required

Contamination of hydraulic fluid	Sample sent for analysis	Either top-up with clean fluid or drain and clean reservoir. Replace with new fluid of correct specification.
Reservoir air breather	Visual	Clean or renew element
Hose clamps	Suitable tools	Tighten as required
Hydraulic fluid filters if equipped	Strip and check mechanisms seals, and elements	Replace as necessary according to manufacturers recommendations
Accuracy of hydraulic pressure gauges	Comparison	Re-calibrate or replace as required
Heat exchanger efficiency if equipped	Use suitable temperature measuring equipment	As required
Heat exchanger fluid leakage if equipped	Visual	Strip or reseal or replace as necessary
Solenoids and relays for smooth operation	Audio and visual	Clean or replace as required
Condition of flexible electrical conduit and cable trunking	Visual	Repair or replace as required
Accumulator pre-charge pressure if equipped	With special equipment	Recharge with nitrogen if required, or return to manufacturer if repairs are necessary
Pump Drive Shaft Alignment Couplings	Measure Visual	Adjust as necessary Adjust or renew
Pump Shaft Bearings Output Noise Level	Manual by press performance Audio equipment	Seek expert advice for overhaul or replace complete
Valves (General) Operation Wear	By performance Strip and visually check spools and springs	Clean and Adjust or replace as necessary



RELIEF VALVE SERVICE

RELIEF VALVE OPERATION

At times, the relief valve is prevented from satisfactorily operating by the presence of lint, pipe scale, or foreign matter. This may cause fluctuations of pressure or pressure failure.

Quite often, this condition can be corrected by starting the pump, loosening the relief Valve Locknut, then turning the Relief Valve Knob counter-clockwise. Oil circulating through the Relief Valve to the reservoir may wash out foreign matter within the valve. Then reset to the desired pressure.

NOTE

Reference the hydraulic schematic supplied with the press, or contact Manufacturing for cylinder repair kits.

CYLINDER SERVICE

Disrupt electrical power to Press before servicing. To service the cylinder, remove all tooling from ram. Remove the Ram Guide Assembly. Disconnect the hydraulic lines from Cylinder. Loosen or disconnect lines at the manifold to prevent being bent or kinked. Remove the four nuts from the anchor bolts.

When ordering cylinder packing and/or parts, be sure to include the cylinder brand name, model, and serial numbers. Also include the Press model and serial numbers to ensure receiving the correct parts.

NOTE

When hydraulic lines and fittings have been taken loose or replaced, care must be taken to assure all lines have been securely tightened to prevent leaks and ingestion of air into the system which would cause permanent damage to the unit.

NOTE

When components have been removed, some additional cycling may be required to ensure the entrapped air is removed and smooth operation occurs.

MANIFOLD ASSEMBLY

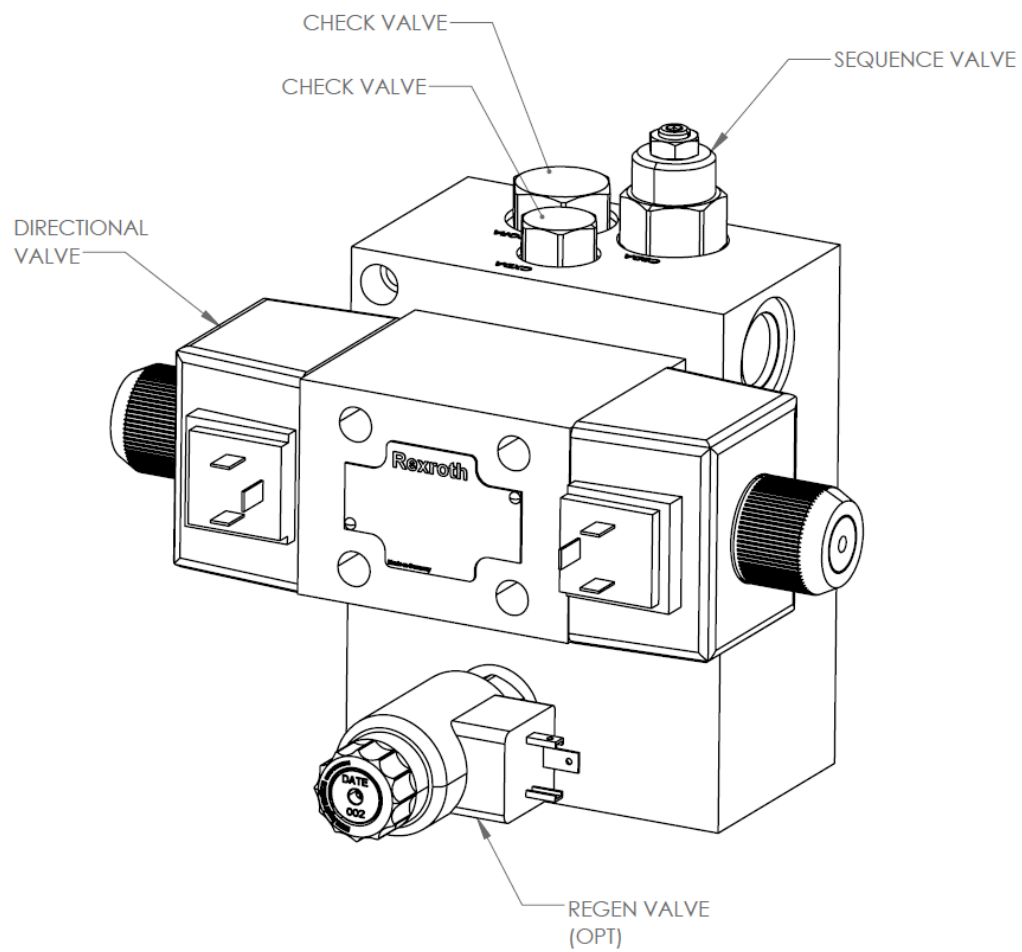


Figure 2

M5P HYDRAULIC CIRCUIT

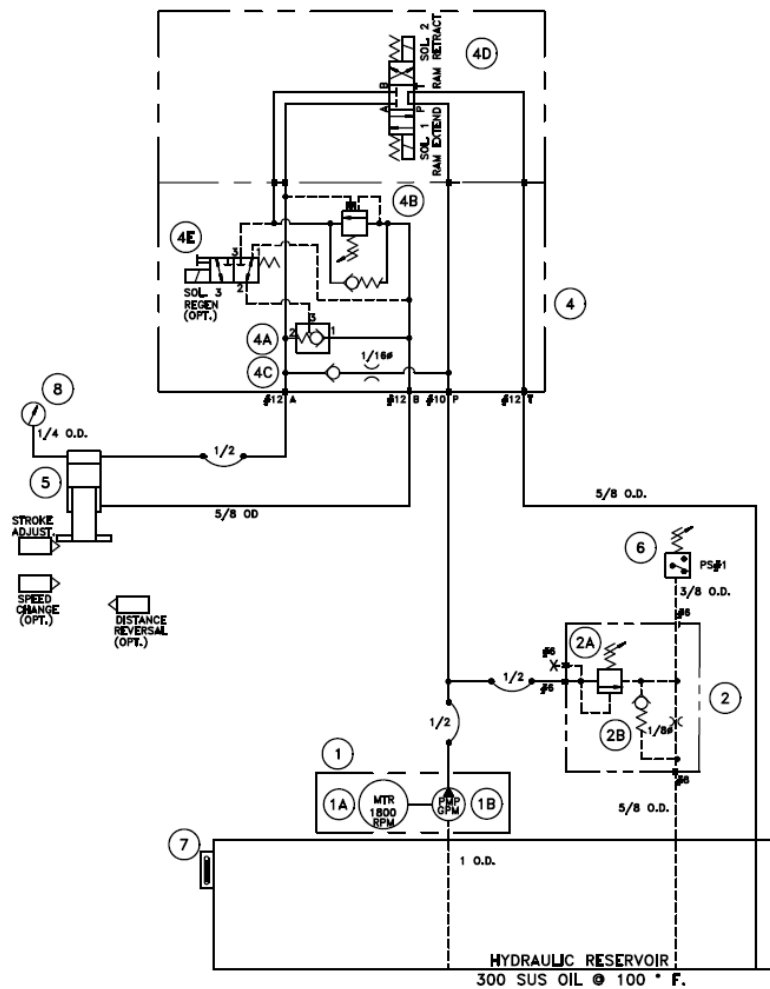


Figure 3

CYCLE	- DE-ENERGIZED + ENERGIZED	SOL. 1 EXTEND	SOL. 2 RETRACT	SOL. 3 FAST
IDLE		-	-	-
FAST EXTEND		+	-	+
RAM EXTEND, FULL PRESSURE		+	-	-
RAM RETURN TO PROXIMITY SWITCH 1 SETTING		-	+	-
JOG CYCLE				
JOG DOWN		+	-	-
JOG UP		-	+	-

M5P HYDRAULIC CIRCUIT COMPONENTS

W6A HYDRAULIC CIRCUIT COMPONENTS					
ITEM	QTY.	DESCRIPTION			
1	1	PUMP/MOTOR ASSY			
1A	1	MOTOR			
1B	1	PUMP			
2	1	RELIEF VALVE ASSY			
2A	1	RELIEF VALVE			
2B	1	CHECK VALVE			
4	1	MANIFOLD PACKAGE			
4A	1	CHECK VALVE			
4B	1	SEQUENCE VALVE			
4C	1	CHECK VALVE 30 PSI			
4D	1	DIRECTIONAL VALVE 4-WAY DBL SOL			
4E	1	REGEN SOL VALVE (OPT.)			
5	1	HYDRAULIC CYLINDER			
		BORE	ROD	STROKE	PRESSURE
6 TON	OPT.	2 1/2	1 3/4	12	2445
8 TON	OPT.	3 1/4	2	12	1929
12 TON	OPT.	4	2 1/2	12	1910
15 TON	OPT.	4	2 1/2	12	2387
20 TON	OPT.	5	3 1/2	12	2038
5A	1	HYDRAULIC CYLINDER W/POSITIVE STOP			
		BORE	ROD	STROKE	PRESSURE
5 TON	OPT.	2 1/2	1 3/4	12	2425
8 TON	OPT.	3 1/4	2	12	2349
6	1	PRESSURE SWITCH			
7	1	RESERVOIR SIGHT GAUGE			
8	1	PRESSURE GAUGE			

POSITIVE STOP ASSEMBLY

To set the depth stop, perform the following:

1. Remove the COVER.
2. Set the DEPTH STOP NUT at the position you would like the MAIN RAM to stop.
3. Tighten the JAM NUT against the DEPTH STOP NUT.
4. Replace the COVER.

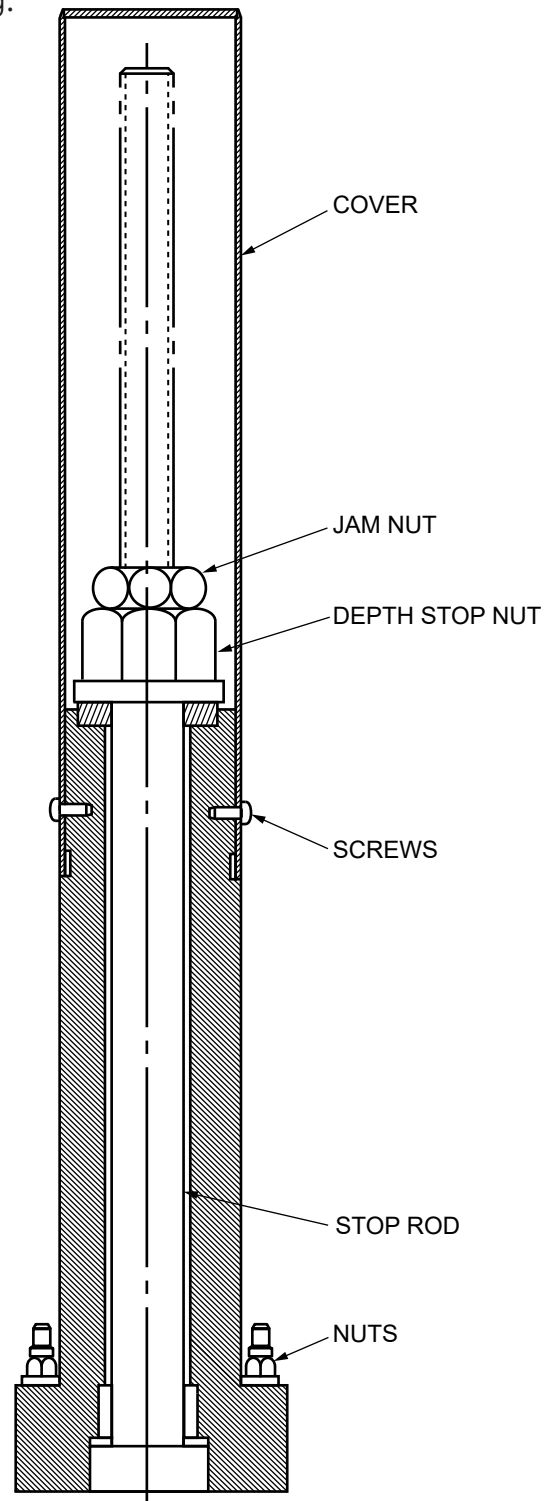


Figure 4



SAFETY PROCEDURES

SAFETY PROCEDURES CHECKLIST

Perform the following:

1. **STOP THE HYDRAULIC POWER UNIT MOTOR AND INSERT SAFETY BLOCK BEFORE REACHING INTO THE DIE AREA.**
2. Clean the bolster plate, dies, and press surface before installing dies. Misalignment caused by dirt, chips of metal or other foreign materials could result in injury to the operator or damage to press and dies.
3. Lock the control panel or disconnect switch in the OFF position to prevent unauthorized use of the press and unintentional start.
4. Clamp the bolster plate firmly to the press. Be sure bolts are in good condition so that constant vibration will not allow plate to move out of position.
5. NEVER install worn or damaged dies. Use the proper die for the press size to prevent overloading.
6. All dies should be securely fastened before moving the press to a new location.
7. When a new die is being installed in a press, the press slide should be high enough to provide adequate clearance for the die set.
8. If dies are clamped to the press, use enough clamps and the proper size clamps to hold dies firmly in position.
9. When working with another man or a crew, be sure all persons are clear of the press before jogging or cycling the press.
10. Perform all necessary adjustments during and after die installation before cycling the press.
11. Observe press operation for a sufficient length of time to determine that the press is working properly.
12. Before releasing the press for production operation, replace all guards, covers, and safety devices for operator protection.
13. Do not leave tools, bolts, or other obstructions in or near the die area.

TROUBLESHOOTING

BASIC TROUBLESHOOTING

In the event of non-standard performance, use the table below.

TROUBLESHOOTING	
PROBLEM	POSSIBLE CAUSE
RAM STARTS DOWN - NO FAST DIFFERENTIAL APPROACH	SEQUENCE VALVE 4B SET TOO LOW - INCREASE THE SETTING
RAM APPROACH AND RETURN SPEEDS ARE 1/3 OF NORMAL	DIRECTIONAL VALVE 4D IS NOT OPERATING - CHECK SOL OR VALVE SPOOL
RAM BOTTOMS OUT ON RETURN STROKE	PROXIMITY SWITCH IS DEFECTIVE OR MAY NOT BE ACTUATED
RAM REVERSES WHEN CYCLE START BUTTON(S) RELEASED AFTER THE PINCH POINT	PROXIMITY SWITCH IS DEFECTIVE OR MAY NOT BE ACTUATED
RAM DRIFTS DOWN AT IDLE POSITION	VALVE 4B IS DEFECTIVE OR KEPT OPEN BY PARTICLES IN DIRTY OIL
MOTOR RUNS, BUT RAM DOES NOT CYCLE	COUPLING TO THE PUMP IS BROKEN, THE SUCTION LINE IS LOOSE, OR DIRECTIONAL VALVE 4D IS DEFECTIVE
OIL TEMPERATURE ABOVE 135°F	COOLING WATER PRESSURE OR FLOW RATE IS TOO LOW - CALCIFIED COOLING COILS OR DEFECTIVE WATER REGULATING VALVE
RAM COMES DOWN AND STAYS DOWN AT FULL PRESSURE	DIRECTIONAL VALVE 4D IS DEFECTIVE - SPOOL STUCK OR THE RETURN SPRING BROKEN
RAM CHATTERS AT FAST APPROACH	SEQUENCE VALVE 4B SETTING IS TOO CLOSE TO DIFFERENTIAL PRESSURE - INCREASE THE SETTING





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