

MULTIPRESS[®]

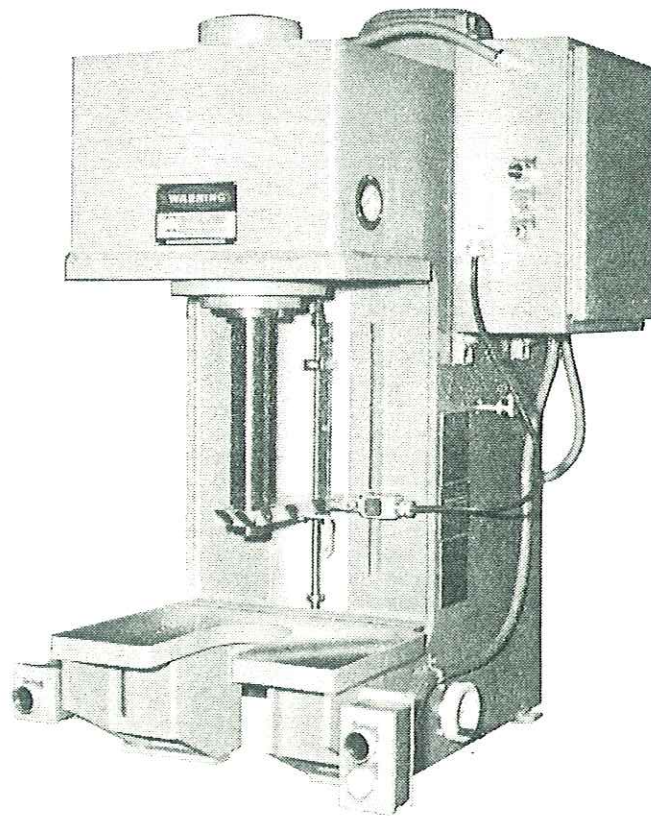
HYDRAULIC EQUIPMENT

operation instructions and service manual*

NOTICE

MULTIPRESS supplies service bulletins, parts lists and parts for presses with serial numbers below 30,000; only as a convenience to our customers. Any press with a serial number below 30,000 was not manufactured by MULTIPRESS.

All guarding and safety considerations are the responsibility of the current owner per ANSI B11.2 1995.



MODEL WR 4, 6 & 8 TON

MODEL WT 10 & 12 TON

MULTIPRESS[®]

(614) 228-0185

560 Dublin Avenue,

Columbus, Ohio 43215

*This Service Manual applicable to all WR presses after Serial No. 26660 and WT presses after Serial No. 26429

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INTRODUCTION

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 for at the established rate per day plus expenses. Multipress equipment sent to our factory for inspection and service will be rendered only upon receipt of purchase order for such service.

Current characteristics, dictated by the characteristics of the users' current are required at time of order.

MULTIPRESS® EQUIPMENT WARRANTY

If any Multipress equipment part of our manufacture which, after prepaid shipment to our factory and upon inspection at our factory or by a qualified factory representative, is proven defective in workmanship or material, it will be replaced free of charge providing that, within a period of six months from date of shipment from our factory it is still owned by the original purchaser and being used in recommended service and using an oil meeting our recommended specifications.

Parts other than of our manufacture bear only such warranties as their manufacturers allow. When upon inspection by a qualified representative, it is indicated that these parts are defective, we will endeavor to secure from the manufacturer the benefits of such warranties for our customers.

GENERAL

This manual is intended for reference when installing and preparing Multipress® Equipment for operation and is for normal maintenance, repair and upkeep of the equipment.

Due to the variety of optional major components required to make a press a complete and functional machine, this manual is limited to the major components of a **BASIC PRESS** and the parts within those components. Refer to individual manuals of optional major components for the parts and service of those components.

The optional major components referred to are as follows.

1. Control Valve
2. Shipper Rod Control
3. Hand or Electric Control
4. Accessories

The model number of the **BASIC PRESS** indicates the major components used. The nomenclature includes the frame size, rating in tons, horsepower of electric motor and cycle duty.

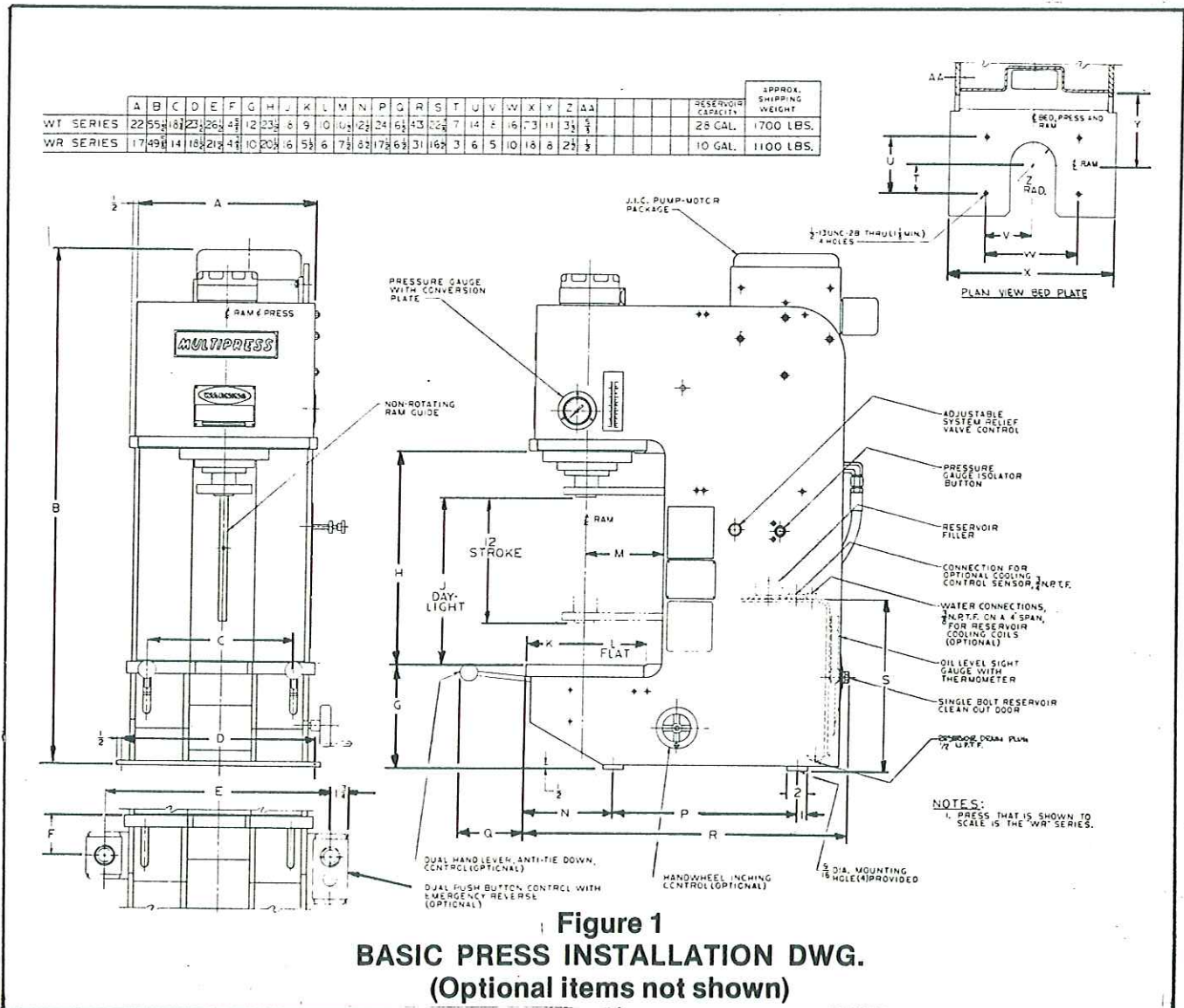
For example: WR65M

WR . . . Indicates frame size

6 . . . Indicates maximum tonnage

5 . . . Indicates electric motor horsepower

M . . . Indicates cycle duty



SPECIFICATIONS

BASIC "WR" & "WT" MODEL NO'S. & SPECIFICATIONS

The chart below is the key to the major components and basic specifications for Standard Basic Press model numbers.

| Press Model | Max Tons | Motor HP | Cycle Duty | Ram Speeds IPM @ 1800 RPM—60 Hz | | | | Pump 1R03-A1 | | Cylinder | | Max. Pressure PSI |
|------------------|----------|----------|------------|------------------------------------|------|-----------|--------|-----------------|-----------|----------|-------|----------------------|
| | | | | Closing | | Pressing | Return | Model | GPM ** | Bore | Ram | |
| | | | | *Diff'l | St'd | WR Series | | | | | | |
| WR45L | 4 | 5 | Light | 439 | 232 | 112 | 474 | T5C-003 | 4.3 | 2-1/4 | 1-5/8 | 2000 |
| WR47M | | 7 1/2 | Medium | 784 | 415 | 284 | 862 | T5C-005 | 7.5 | | | |
| WR47H | | | Heavy | 439 | 232 | 112 | 474 | T5C-003 | 4.3 | | | |
| WR65L | 6 | 5 | Light | 415 | 196 | 149 | 363 | T5C-005 | 7.5 | 3-1/4 | 2-1/4 | 1450 |
| WR65M | | 7 1/2 | Medium | 232 | 109 | 68 | 199 | T5C-003 | 4.3 | | | |
| WR67H | | | Heavy | 415 | 196 | 149 | 363 | T5C-005 | 7.5 | | | |
| WR85L | 8 | 5 | Light | 232 | 109 | 55 | 199 | T5C-003 | 4.3 | 3-1/4 | 2-1/4 | 1930 |
| WR87M | | 7 1/2 | Medium | 415 | 196 | 136 | 363 | T5C-005 | 7.5 | | | |
| WR80H | | | 10 | Heavy | 615 | 290 | 225 | 541 | T5C-006 | | | |
| WT Series | | | | | | | | | | | | |
| WT107L | 10 | 7 1/2 | Light | 402 | 193 | 156 | 367 | T5C-006 | 11.0 | 4 | 2-3/4 | 1590 |
| WT100M | | 10 | Medium | *** | 211 | 173 | 402 | T5C-008 | 12.0 | | | |
| WT100H | | | | 402 | 193 | 156 | 367 | T5C-006 | 11.0 | | | |
| WT127L | 12 | 7 1/2 | Light | 271 | 130 | 91 | 246 | T5C-005 | 7.5 | 4 | 2-3/4 | 1910 |
| WT120M | | 10 | Medium | *** | 211 | 167 | 402 | T5C-008 | 12.0 | | | |
| WT120H | | | | 271 | 130 | 91 | 246 | T5C-005 | 7.5 | | | |

MACHINE RAM CYCLE RATES APPROXIMATE CYCLES PER MINUTE USING PRESSURE REVERSAL (The cycles per minute may vary approximately 10%)

| WR Series | | | | | | | | | | | | |
|--|-----------|-------|-------|-------|-------|-------|-------|------|------|------|------|---------------------|
| Length of Stroke | | 1/2 | 3/4 | 1 | 1 1/2 | 2 | 2 1/2 | 3 | 4 | 5 | 6 | Press Models |
| Valve | GPM ** | | | | | | | | | | | |
| 2 1/4" Dia. Cyl.—1800 RPM Motor | | | | | | | | | | | | |
| C304 | 4.3 | 135.1 | 111.1 | 94.3 | 72.4 | 58.8 | 49.4 | 42.7 | 33.5 | 27.6 | 23.4 | WR45L, WR47H |
| | 7.5 | 167.6 | 145.6 | 129.0 | 105.0 | 88.4 | 76.3 | 67.2 | 54.2 | 45.4 | 39.1 | WR47M |
| C364 | 4.3 | 156.7 | 133.9 | 116.7 | 92.9 | 77.2 | 66.0 | 57.7 | 46.0 | 38.3 | 32.8 | WR45L, WR47H |
| | 7.5 | 185.2 | 160.2 | 151.1 | 127.7 | 110.5 | 97.4 | 87.1 | 71.9 | 61.2 | 53.2 | WR47M |
| 3 1/4" Dia. Cyl.—1800 RPM Motor | | | | | | | | | | | | |
| C304 | 4.3 | 89.9 | 67.6 | 54.6 | 39.4 | 30.8 | 25.3 | 21.5 | 16.5 | 13.4 | 11.3 | WR65M, WR85L |
| | 7.5 | 123.2 | 99.2 | 83.1 | 62.6 | 50.3 | 42.0 | 36.1 | 28.1 | 23.0 | 19.5 | WR65L, WR67H, WR87M |
| | 11.0 | 148.0 | 122.7 | 105.4 | 82.3 | 67.6 | 57.3 | 49.8 | 39.4 | 32.6 | 27.8 | WR80H |
| C364 | 4.3 | 113.0 | 89.4 | 74.1 | 55.0 | 43.8 | 36.4 | 31.1 | 24.1 | 19.7 | 16.6 | WR65M, WR85L |
| | 7.5 | 147.8 | 124.2 | 107.1 | 83.9 | 69.0 | 58.6 | 50.9 | 40.4 | 33.4 | 28.5 | WR65L, WR67H, WR87M |
| | 11.0 | 168.5 | 147.1 | 130.4 | 106.2 | 89.7 | 77.5 | 68.3 | 55.2 | 46.3 | 39.9 | WR80H |
| WT Series | | | | | | | | | | | | |
| 4" Dia. Cyl.—1800 RPM Motor | | | | | | | | | | | | |
| C304 | 7.5 | 99.5 | 77.1 | 62.9 | 45.9 | 36.2 | 29.9 | 25.4 | 19.6 | 15.9 | 13.4 | WT127L, WT120H |
| | 11.0 | 123.0 | 99.0 | 82.9 | 62.4 | 50.1 | 41.8 | 35.9 | 28.0 | 22.9 | 19.4 | WT107L, WT100H |
| | 12.0 | 128.2 | 104.2 | 87.7 | 66.6 | 53.7 | 45.0 | 38.7 | 30.3 | 24.8 | 21.1 | WT100M, WT120M |
| C364 | 7.5 | 124.0 | 100.0 | 83.8 | 63.2 | 50.8 | 42.4 | 36.5 | 28.4 | 23.3 | 19.7 | WT127L, WT120H |
| | 11.0 | 147.1 | 123.7 | 106.6 | 83.3 | 68.6 | 58.1 | 50.5 | 40.0 | 33.1 | 28.3 | WT107L, WT100H |

*THESE CLOSING SPEEDS ARE AVAILABLE IN VALVE MODELS C261, C264, C269, C257, C364 and C369 only. Closing speeds with all other valves are shown in St'd column.

** Pump delivery (GPM) Theoretical @ 1800 RPM

*** Presses using T5C-008 pumps are not available with differential approach speed circuits (C264, C269, C364, C369 and C261 valves). Oil cooler required on presses using T5C-006 and T5C-008 pumps.

INSTALLATION

INSTALLATION INSTRUCTIONS

After removing press from shipping crate, stand the press upright near the area where it will be anchored to the floor.

Care should be taken to avoid twisting or dropping of the press during the uncrating and transportation to the area of operation.

BENCH (Fig. 11)

If your press is to be mounted on an bench. Uncrate the bench and assemble per instructions in crate. Bolt bench firmly to the floor.

Position press on bench and bolt firmly in place using shims to compensate for any unevenness between top of bench and press.

WATER REGULATING VALVE

If your press is to use cooling coils, a thermostatic water regulating valve is packaged with your press but not installed.

1. Remove the two 3/8" pipe plugs and the one 3/4" pipe plug near the rear edge of the top of the reservoir.
2. Connect 3/8" water line to the inlet port thru valve.
3. Connect 3/8" water line to outlet port and to drain.
4. Install thermostatic bulb in the 3/4" port.
5. The regulating valve should be set to open at 110°F.

RECOMMENDED OIL SPECIFICATIONS

Warranty for Multipress® equipment applies only when the proper hydraulic fluid has been used and oil contamination level is equal to or better than "NAS . . . 1638 . . . CLASS No. 8 OR BETTER, NO PARTICLES OVER 200 MICRON".

Certain basic physical and chemical properties are necessary for proper operation of the press.

The following basic properties should be presented to the fluid supplier* for his recommendation of a product for use in this press:

| | |
|---|------------------------------|
| Viscosity @ 100°F | 300 SUS/plus or minus 15 SUS |
| Viscosity Index | 90 or higher |
| Rust and oxidation inhibitors | yes |
| Anti-foam additive | yes |
| Specific gravity; 0.882-0.887 at 60°F/60°F (API Gravity; 29-31) | |

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

FILLING THE OIL RESERVOIR

CLEANLINESS is the most important requisite in proper maintenance of oil 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 hydraulic system of your Multipress® Equipment at all times. Make certain that no lint, dirt, abrasive scale or other foreign material enters 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 3.)

The oil reservoir is filled thru the oil filler breather assembly which is located on top of the reservoir. Remove the filler breather cap and fill the reservoir with any clean oil meeting our RECOMMENDED OIL SPECIFICATIONS above. Approximately 10 gallons are required for "WR" and 28 gallons for "WT" press to fill the reservoir to within 1/2" of the top of the oil level-temperature gauge on the back of the reservoir of the press.

CAUTION

Never operate press if oil level is not within the high-low limits of the oil level-temperature gauge or if the oil temperature is greater than 150°F.

ELECTRIC

Your standard press came to you wired to be connected to current characteristics as specified when ordered.

Connection of press to users' power source should be accomplished by qualified personnel.

Motor starter with transformer or electric control and disconnecting means in accordance with all applicable electric codes are optional Multipress® equipment but are supplied upon receipt of specifications. If not supplied, a motor starter and disconnecting means corresponding to the electrical requirements of the electric motor and or electric control in accordance with all applicable electric codes should be used. (The electrical requirements for your press are stamped on the nameplate which is attached to the side of your press.) In conjunction with motor start, stop push-buttons of the motor starter, it is recommended that a transformer be used.

Follow the wiring schematic as shown in the starter box (also Fig. 2) or in the electric control enclosure and connect the proper line voltage to the starter box or electric control enclosure mounted on the side of your press.

CAUTION

Do not permit electric motor to operate before press reservoir is filled with oil or to operate in the wrong direction of rotation. (See STARTING PUMP & MOTOR instructions and direction of rotation arrow plate on pump-motor assembly.)

STARTING THE PUMP & MOTOR

Before starting the pump and motor, lower the setting of the relief valve (Item #7, Fig. 8) by loosening lock nut and then turning knob counter-clockwise until loose but not removed. (See PRES-SURE ADJUSTMENT plate on right side of press.)

CAUTION

If the press has been shipped to you with the press ram extended. The ram

will retract and stop against the upper stop collar as soon as the motor is started, if the motor and pump are operating in the correct direction of rotation. Note: Ram may not retract if Relief Valve has been backed off too far.

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 itself and provide adequate lubrication.

When it is determined that the pump and motor are operating in the correct direction, start the motor and allow it to run for a few minutes to remove air from the hydraulic system and to check pipe and hose lines for any oil leakage which may have developed since leaving the factory.

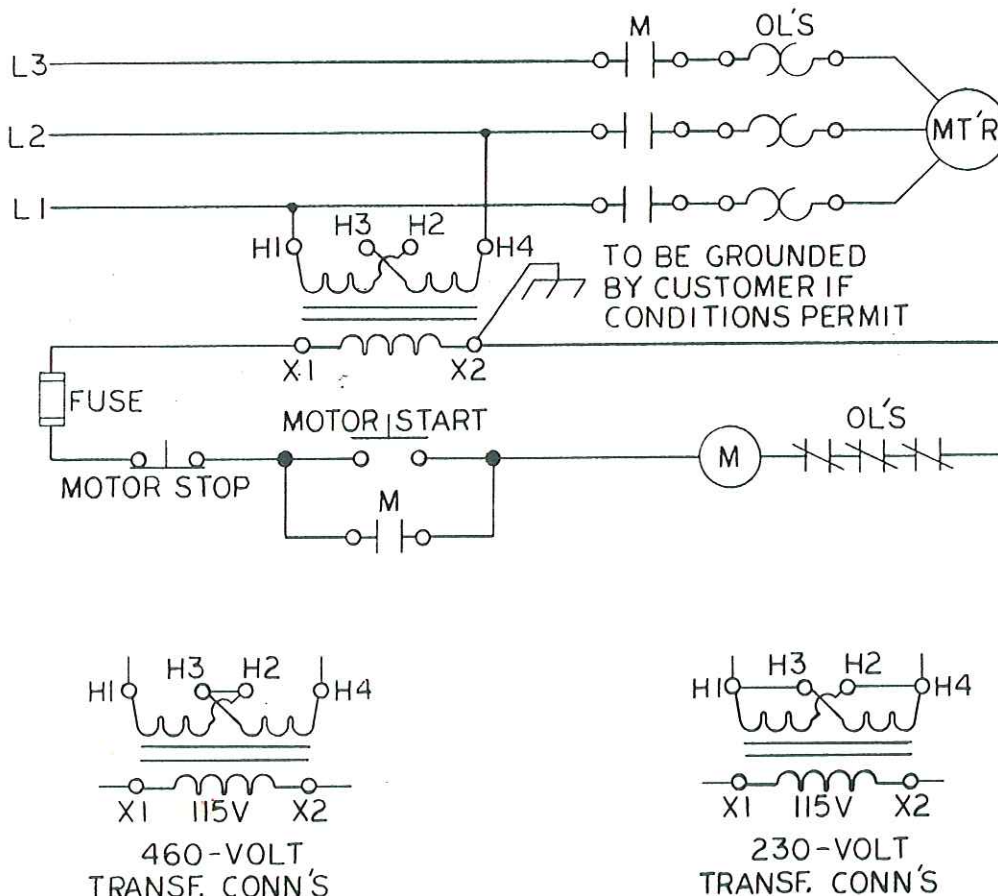


Figure 2
WIRING SCHEMATIC

SETTING OPERATING PRESSURES AND TOOLING

1. If your press is equipped with an electric control circuit, turn the "CYCLE" selector switch to "INCH" position.
2. Loosen and lower bottom stop collar on shipper rod to a point where it will not be contacted by the banjo (Item #24 on page 14) when press ram is fully extended.
3. Lower and raise press ram several full strokes by either turning the handwheel inching control (See 6a) or by operating the mechanical lever control (See 6b) (according to how your press is equipped) to flush air from the system. (See sequence of operations for your press.)

NOTE

Set and adjust tooling (if required) before setting pressure on the ram. Set lower stop collar on the shipper rod to protect tooling if required.

4. To adjust pressure on ram, first make sure that relief valve (Item #7, Fig. 8) is as previously set per "STARTING THE PUMP & MOTOR" instructions.
5. Lower the bottom stop collar far enough to allow ram to exert full pressure against a part or block.
6. Lowering the Ram
 - a. If your press is equipped with a handwheel type inching control shipper rod assembly, unlock the upper stop collar on the shipper rod located above the banjo in the throat of the press by loosening the clamping screw. Turn the handwheel of the inching control to lower ram. After ram contacts part or block, turn handwheel approximately 1/2 turn more. Check pressure on ram by pressing button on Gauge Isolator Valve (Item #51, Fig. 8) on the right side of press and read pressure gauge. After setting operating pressure use handwheel to return press ram to upper position and tighten clamping screw of upper stop collar firmly before cycling press.
 - b. If your press is equipped with a non-inching or vibratory type shipper rod assembly and a mechanical lever control, enlist the aid of another person to operate the mechanical lever control.

CAUTION

Keep hands off of the ram or the tooling. When the ram has extended and is against the part or block and while maintaining the control mechanism

actuated, check the pressure on ram by pressing button on Gauge Isolator Valve (Item #51, Fig. 8) on the right side of press and read pressure gauge.

7. Setting the Relief Valve

Now, loosen lock nut of pressure relief valve (Item #7, Fig. 8) and turn adjusting screw clockwise to increase pressure or counter clockwise to decrease pressure. The maximum pressure setting must not exceed the maximum PSI as shown opposite your basic press model number in chart on page 5. The relief valve should be set very near the minimum pressure needed to perform the required service in order to conserve power and prevent excessive heating of the oil. After adjustment is made, the lock nut must be turned clockwise until firmly contacting locking sleeve. Caution must be taken to not turn the adjusting screw too rapidly since the lag in pressure change may cause an eventual magnified change in pressure. This is especially important when pressures are increased. Rapid turning may increase the pressure to a dangerous amount causing failure of some units of the system.

SETTING THE RAM STROKE (Upper Limit)

1. If your press is equipped with an electric control circuit, turn the "CYCLE" selector switch to "INCH" position.
2. If your press is equipped with a handwheel type inching control shipper rod assembly, unlock the stop collar on the shipper rod located above the banjo in the throat of the press by loosening the clamping screw. Turn the handwheel of the inching control to inch ram down to desired upper limit of ram stroke and then tighten clamping screw in the upper stop collar firmly before cycling press.
3. If your press is equipped with a non-inching or vibratory type shipper rod assembly and a mechanical lever control, enlist the aid of another person to operate the mechanical lever control. As soon as the ram has started to extend and is off of the upper stop collar, on shipper rod above banjo in throat of press, depress the "MOTOR STOP" push button and maintain the mechanical lever control actuated until the press ram stops. Next, have qualified personnel interrupt electric power to press. Now loosen clamping screw in the upper stop collar and then tighten the clamping screw in the upper stop collar firmly after it has been moved to desired position and before cycling press.

MAINTAINING MULTIPRESS® EQUIPMENT

MAINTENANCE INSTRUCTIONS

The establishment and implementation of maintenance schedules is essential for the reliable operation of 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 insure that the instructions outlined in this manual are carried out on a time table which will insure reliable and efficient operation of the equipment.

It is the responsibility of the user to maintain the Multipress® Equipment at all times in day-to-day operation. The manufacturer

suggests that the following maintenance and service procedures be implemented and regularly practiced by the user.

WARNING

When malfunction in any Multipress® Equipment is encountered during the operation or inspection of the equipment, operator(s) should immediately stop the equipment, have qualified personnel interrupt the electric power to the equipment and conspicuously tag it, indicating the malfunction, and then report it to the proper authorities. Do not run the equipment until the malfunction has been eliminated.

MAINTENANCE AND INSPECTION CHECK LIST

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

| ITEM TO BE INSPECTED | SCHED. INSPECT. | | MALFUNCTIONS | | | | | | | |
|---|-----------------|----------|--------------------------|------|-------------------|----------------------------|-------|-------|---------------|-------------|
| | Routine (Daily) | Periodic | Damaged Kinked or Dented | Worn | Broken or Cracked | Loose Conn. or Elec. Short | | | Mis-alignment | Out of Adj. |
| | | | | | | Hyd. | Mech. | Elec. | | |
| Frame | | ✓ | | | ✓ | | | | | |
| Electric Motor | | ✓ | ✓ | | | | | ✓ | ✓ | |
| Starter | | ✓ | | | | | | ✓ | | |
| Pumps | | ✓ | | | | ✓ | ✓ | | ✓ | |
| Valves | | ✓ | | | | ✓ | ✓ | | | ✓ |
| Gauges | | ✓ | ✓ | | ✓ | | | | | |
| Switches | | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | | |
| Operating Controls | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | | ✓ |
| Tooling | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | |
| Feed and/or Ejection Mech. | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Oil Leaks | ✓ | ✓ | | | | | | | | |
| Hydraulic Lines <small>Pipe, Tube Hose</small> | | ✓ | ✓ | | ✓ | | | ✓ | | |
| Hydraulic Fittings | | ✓ | | | ✓ | | | ✓ | | |
| Electrical Lines <small>Wire, Cable Conduit</small> | | ✓ | ✓ | ✓ | ✓ | | | ✓ | | |
| Gaskets, Seals & O-Rings | | ✓ | | ✓ | | ✓ | ✓ | | | |
| Ram Packing | | ✓ | ✓ | ✓ | | ✓ | ✓ | | | |
| Oil Level Too Low or Too High | ✓ | ✓ | | | | | | | | |
| Oil Contamination Too High | | ✓ | | | | | | | | |

ROUTINE (DAILY) MAINTENANCE AND INSPECTION

Before operating Multipress® equipment each operator should make the inspection checks indicated in chart on page 12. These checks should be made after each shift change.

In addition, the following inspection checks should be made by each operator before operating equipment after any break time.

1. Make sure that each equipment 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 loose items foreign to the operation

or function of the machine which might cause damage or injury and clear such items from the equipment before start up.

3. Check for oil 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 that each equipment component is in the proper position to start cycling.
 - c. Make sure that press operates in manner prescribed in sequence of operations.

SAMPLE ROUTINE LOG

If any check points are found to be malfunctions or could lead to a malfunction, a written report should be made, indicating the problem and what was done to correct it and then made a part of the history of this equipment.

| | | | MALFUNCTION CHECK POINTS | | | | | | |
|------------------|--------------------|---------------------|--------------------------|-----------|-----------|--------------|---------------|---------------|---------|
| Date of Inspect. | Oper. Press. (PSI) | Total No. of Cycles | Oil Leaks | Oil Level | Oil Temp. | Hyd. Comp's. | Elec. Comp's. | Mech. Comp's. | Remarks |
| | | | | | | | | | |
| | | | | | | | | | |
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PERIODIC MAINTENANCE AND INSPECTION

At regularly scheduled intervals the users' maintenance department should check each piece of the Multipress® Equipment for those items listed on page 9 and 10 and record in PERIODIC LOG on page 11.

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

1. When equipped with an electrical circuit, make sure that all devices function in accordance with the schematic diagram, and sequence of operations. Repair or replace any faulty device; see electric circuit service man-

ual or circuit drawing for identification of parts.

2. Check all mechanical linkage and adjustments; adjust, repair or replace as necessary to comply with operating and/or adjustment instructions in this manual or manual of the operating control.
3. Check the hydraulic system as follows:
 - a. Check pressure setting of pressure control valve; adjust if necessary.
 - b. Check operational cycle to insure that all valves function in accordance with the schematic diagram and sequence of operations; repair or replace faulty valves.
 - c. Check the entire system for leaks; repair as required to eliminate problem.

SAMPLE PERIODIC LOG

If any check points are found to be malfunctions or could lead to a malfunction, a written report should be made, indicating the problem and what was done to correct it and then made a part of the history of this equipment.

| MALFUNCTION CHECK POINTS | | | | | | | | | | |
|--------------------------|-------------------|---------------------|------------------|-----------|-----------|-----------|--------------|---------------|---------------|---------|
| Date of Inspect. | Oper-Press. (PSI) | Total No. of Cycles | Oil Contam Level | Oil Leaks | Oil Level | Oil Temp. | Hyd. Comp's. | Elec. Comp's. | Mech. Comp's. | Remarks |
| | | | | | | | | | | |
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SERVICING MULTIPRESS® EQUIPMENT

SERVICE INSTRUCTIONS

Have qualified personnel interrupt the electric power to the equipment whenever service is to be performed.

SERVICE ON PUMP

Disconnect pressure line at pump. Remove suction line which extends from pump into reservoir at pump. Remove coupling guards and screws, loosen set screw in pump half of coupling, remove hex head cap screws holding pump to adapter while supporting pump and then withdraw pump from adapter. See service bulletin No. SVP-T5Ca for service on vane pump.

1. SERVICE ON CYLINDER (Fig. 4)

Remove all tooling which is attached to the ram, remove banjo from the ram. Utilizing a container to catch oil spillage, remove the socket head cap screws from the packing gland and remove the gland. Remove the four packing rings being careful not to damage ram or stuffing box. Packing may be replaced at this time. (See packing installation instructions.) If it should be necessary to replace piston rings, remove the socket head cap screws from the stuffing box and remove the stuffing box. Carefully withdraw ram from cylinder body.

2. INSTALLING PISTON RINGS

Extreme care should be exercised when installing piston rings on the piston as well as inserting piston with rings in the cylinder. Inspect piston ring grooves for small nicks or burrs. When present, they should be removed with a hard sharp stone or tool. The parts should then be thoroughly washed and cleaned to remove all foreign matter before re-assembly.

3. INSTALLING PACKING

The packing for all cylinders used in the WR and WT Multipress® Equipment is furnished as a set. Each set contains two rubber and two fabric rings. If the packing around the ram should ever develop a leak the entire set of four rings must be replaced.

The new packing should be oiled before installation. One at a time and with extreme care slide lips of packing over banjo relief on ram, then using a wooden tool press ring lips carefully into the stuffing box (see "CROSS SECTION OF PACKING GLAND," Fig. 3 for sequence of inserting rubber and fabric rings). Do not force, tap lightly. Replace packing gland and tighten screws firmly.

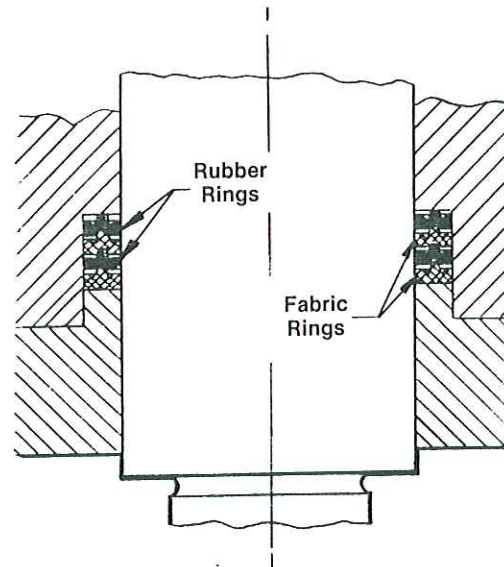


Figure 3
INSTALLATION-UNEELPAC
(For Cylinder Rams)

CYLINDER & RAM ASSEMBLIES

"WR" & "WT" PRESSES
PARTS LIST FOR CYLINDER AND RAM ASSEMBLIES
Cylinder Code Numbers S11-03782, S11-03783, S11-03785

| Ref. No. | Part No. | Description | Qty. |
|----------|-----------|--|-------|
| ** | S11-03783 | Cylinder assembly 2-1/4" bore 12" stroke | WR |
| ** | S11-41774 | Cylinder assembly 2-1/4" bore 12" stroke | WR |
| 1 | 358-12126 | 1/4—20 x 3/4 S.H.C. screw (Nylok) | 6 |
| 2 | 031-23354 | Packing gland | 1 |
| 3 | 633-0004 | "Uneepac" packing (4 rings) | 1 set |
| 4 | 358-20180 | 1/2—13 x 1-1/4 S.H.C. screws | 6 |
| 5 | 031-23349 | Stuffing box | 1 |
| 6 | 671-00228 | "O" ring 70—6230—6 ARP—228 | 2 |
| 7 | 031-23342 | Ram (2-1/4 x 1-5/8 x 1-3/8) | 1 |
| ** | 031-90238 | Ram (2-1/4 x 1-5/8 x 1-3/8) | WR |
| 8 | 625-23018 | Piston ring (2-1/4 O.D. x 3/16 wide) | 2 |
| ** | 9 | Screw—SHC 7/16-14 UNC x 1-1/4" lg. | 4 |
| 10 | 358-24220 | 5/8—11 x 1-3/4" S.H.C. screw | 8 |
| 11 | 031-13872 | Cylinder head | 1 |
| 12 | 431-90800 | 1/2" Soc. pipe plug | 1 |
| 13 | 488-35044 | Plug Hollow Hex | 2 |
| 14 | 031-13870 | Cylinder body | 1 |
| 15 | 031-25502 | Collar, banjo | 1 |

| | | | |
|----|------------|--|-------|
| ** | S11-03782 | Cylinder assembly 3-1/4" bore 12" stroke | WR |
| ** | S11-41775 | Cylinder assembly 3-1/4" bore 12" stroke | WR |
| 1 | 358-14106 | 5/16—18 x 5/8 S.H.C. screw (Nylok) | 6 |
| 2 | 031-23352 | Packing gland | 1 |
| 3 | 633-00007 | "Uneepac" packing (4 rings) | 1 set |
| 4 | 358-20180 | 1/2—13 x 1-1/4 S.H.C. screws | 6 |
| 5 | 031-23351 | Stuffing box | 1 |
| 6 | 671-00236 | "O" ring 70—6230—14 ARP—236 | 2 |
| 7 | 031-23350 | Ram (3-1/4 x 2-1/4 x 2) | 1 |
| ** | 031-90239 | Ram (3-1/4 x 2-1/4 x 2) | WR |
| 8 | 625-23026 | Piston ring (3-1/4 O.D. x 3/16 wide) | 2 |
| ** | 9 | Screw—SHC 7/16-14 UNC x 1-1/4" lg. | 4 |
| 10 | 358-24220 | 5/8—11 x 1-3/4 S.H.C. screw | 8 |
| 11 | 031-10674 | Cylinder head | 1 |
| 12 | 431-90800 | 1/2" Soc. pipe plug | 1 |
| 13 | 488-35044 | Plug Hollow Hex | 2 |
| 14 | 031-10669 | Cylinder body | 1 |
| 15 | Not req'd. | | |

| | | | |
|----|------------|--------------------------------------|-------|
| ** | S11-03785 | Cylinder assembly 4" bore 12" stroke | WT |
| ** | S11-41776 | Cylinder assembly 4" bore 12" stroke | WT |
| 1 | 358-14120 | 5/16—18 x 3/4 S.H.C. screw | 4 |
| 2 | 031-23650 | Packing gland | 1 |
| 3 | 633-00006 | "Uneepac" packing (4 rings) | 1 set |
| 4 | 358-20186 | 1/2—13 x 1-1/4 S.H.C. screw (Nylok) | 8 |
| 5 | 031-23654 | Stuffing box | 1 |
| 6 | 691-00242 | "O" ring 70—6230—20 ARP—242 | 2 |
| 7 | 031-23659 | Ram (4 x 2-3/4 x 2) | 1 |
| ** | 031-90240 | Ram (4 x 2-3/4 x 2) | WR |
| 8 | 625-33032 | Piston ring (4" O.D. x 3/16 wide) | 2 |
| ** | 9 | Screw—SHC 7/16-14 UNC x 1-1/4" lg. | 4 |
| 10 | 358-20220 | 1/2—13 x 1-3/4 S.H.C. screw | 8 |
| 11 | 031-23658 | Cylinder Head | 1 |
| 12 | 431-90800 | 1/2" Soc. pipe plug | 1 |
| 13 | 488-35044 | Plug Hollow Hex | 2 |
| 14 | 031-23656 | Cylinder body | 1 |
| 15 | Not req'd. | | |

**Parts used on split ring style banjo only.

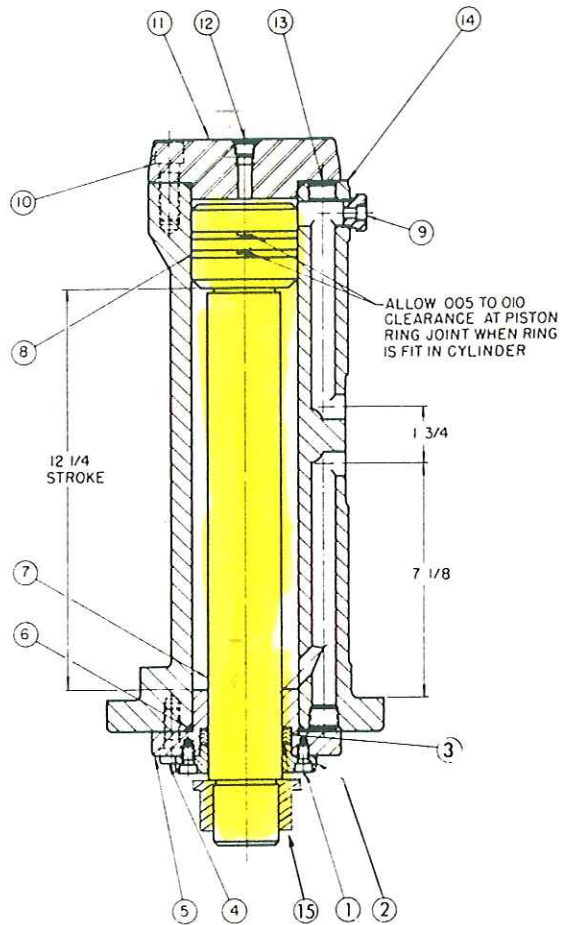


Figure 4
CYLINDER ASSEMBLY

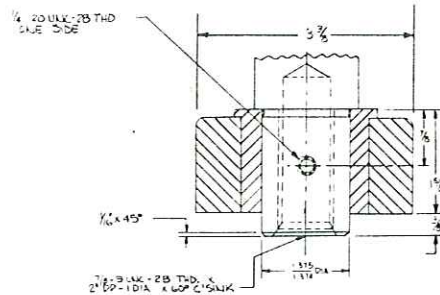


Figure 5
RAM NOSE TYPE 1
(Used on 2 1/4" Bore Cylinders)

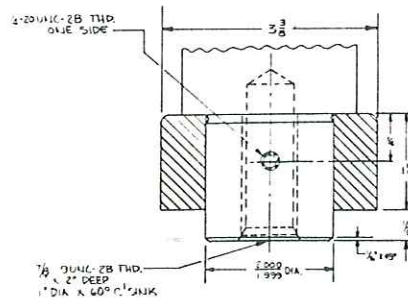


Figure 6
RAM NOSE TYPE 2
(Used on 3 1/4" & 4" Bore Cylinders)
THREADED RAM NOSE STYLES

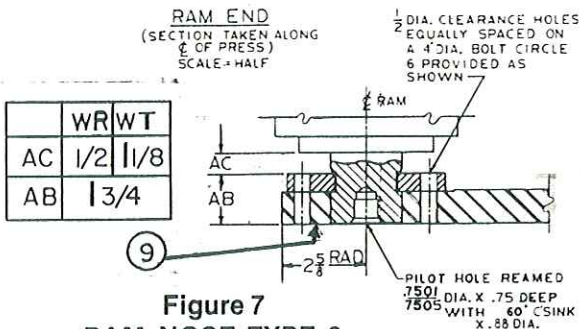


Figure 7
RAM NOSE TYPE 3
(Used on 2 1/4", 3 1/4" & 4" Bore Cylinders)
SPLIT RING BANJO STYLE

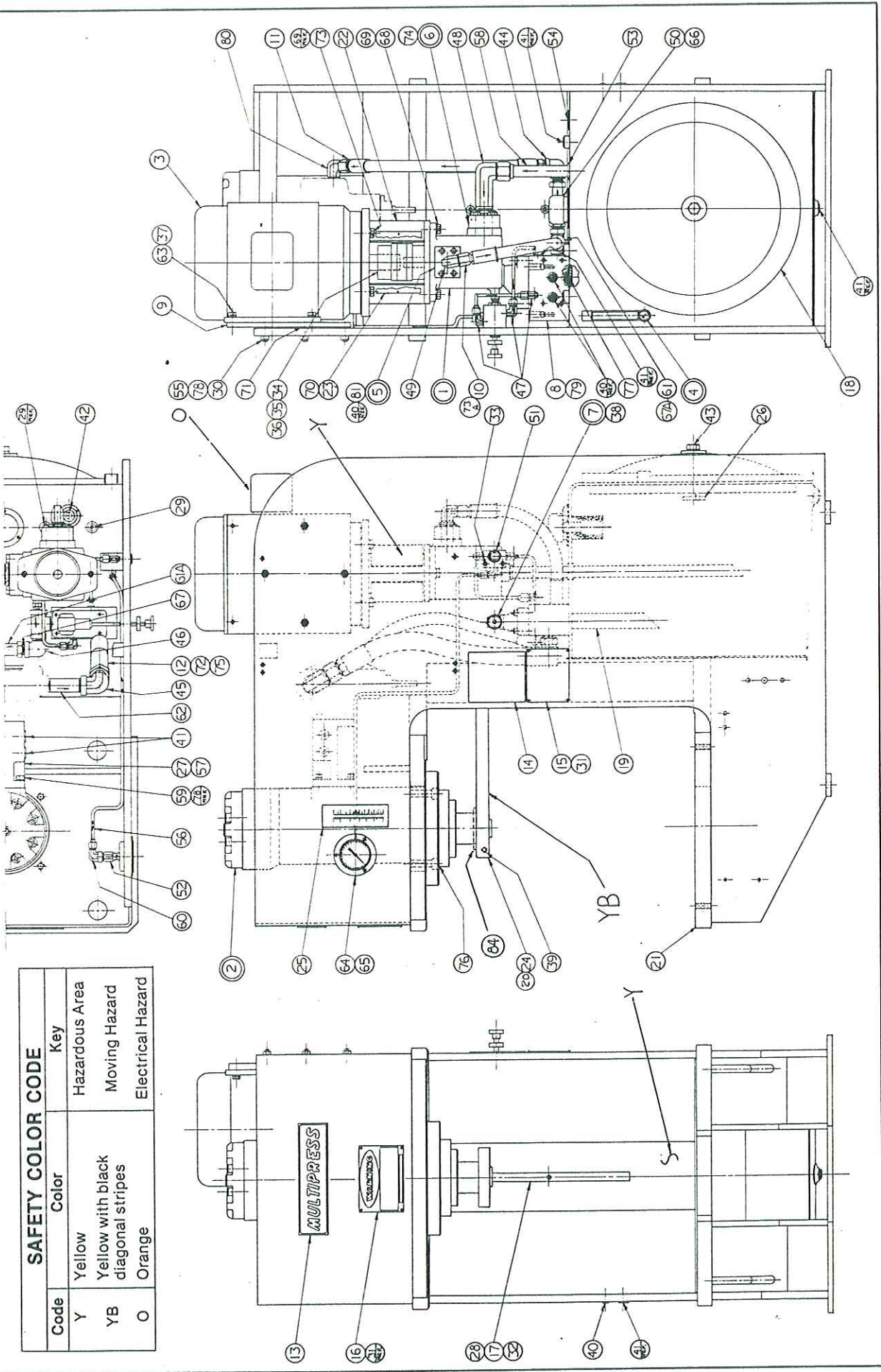


Figure 8
MULTIPRESS® EQUIPMENT BASIC MODELS “WR” and “WT”

- NOTES:
1. ELECTRIC MOTOR, IN PARTIAL PLAN VIEW, HAS BEEN OMITTED FOR CLARITY.
 2. PRESS SHOWN IS A “WT” SERIES.

PARTS LISTS PRESS ASSEMBLY

| Item | Part No. | Description | Qty. | |
|------|-------------------|--------------------------------------|------|----|
| | | | WR | WT |
| 1 | See Page No. 16 | Pump—Vane T5C Type | 1 | 1 |
| 2 | * See Page No. 13 | Cylinder Assembly | 1 | 1 |
| 3 | See Page No. 16 | Motor—Elect. | 1 | 1 |
| 4 | 031-11889 | Gauge—Oil, Sight, Temp. | 1 | 1 |
| 5 | S12-22217 | Conn.—Press. 1" NPTF | 1 | 1 |
| 6 | S14-10786 | Conn.—Suct. 1-1/2" NPTF | 1 | 1 |
| 7 | See Page No. 18 | Valve—Relief (R4V03-53510-A1) | 1 | 1 |
| 8 | 031-90244 | Manifold—Double "R4V" | 1 | 1 |
| 9 | 031-47703 | Plate—Motor Mounting | 1 | 1 |
| 10 | 031-42937 | Hose—Press. 1/2" I.D. | 1 | 1 |
| | 031-45410 | Hose—Press. 1/2" I.D. | 1 | 1 |
| 11 | 031-27996 | Hose—Press. 1/2" I.D. | 1 | 1 |
| | 031-45467 | Hose—Press. 1/2" I.D. | 1 | 1 |
| 12 | 031-44407 | Hose—Tank 1" I.D. | 1 | 1 |
| 13 | 031-23448 | Plate—Insg. | 1 | 1 |
| 14 | 031-42902 | Plate—Relief Valve Control | 1 | 1 |
| 15 | 031-10131 | Plate—Name | 1 | 1 |
| 16 | 031-48097 | Plate—Warning | 1 | 1 |
| 17 | 031-23760 | Guide—Ram | 1 | 1 |
| 18 | 032-49740 | Cover—Cleanout | 1 | 1 |
| | 031-90186 | Cover—Cleanout | 1 | 1 |
| 19 | 031-69359 | Pipe—Return; 1" Std. | 1 | 1 |
| 20 | 031-25502 | Collar—Banjo | 1 | 1 |
| 21 | 031-48308 | Frame | 1 | 1 |
| | 031-90243 | Frame | 1 | 1 |
| 22 | 031-47778 | Adapter | 1 | 1 |
| 23 | 032-49301 | Guard—Coupling | 2 | 2 |
| 24 | 031-23369 | Banjo | 1 | 1 |
| | 031-23550 | Banjo | 1 | 1 |
| | * 031-90233 | Banjo - 2 1/4" Cyl. | 1 | 1 |
| | * 031-90235 | Banjo - 3 1/4" Cyl. | 1 | 1 |
| | * 031-90237 | Banjo | 1 | 1 |
| 25 | 031-42879 | Plate—Press. Ga. Conv. (12-Ton) | 1 | 1 |
| | 031-90284 | Plate—Press. Ga. Conv. (10-Ton) | 1 | 1 |
| | 031-42877 | Plate—Press. Ga. Conv. (8-Ton) | 1 | 1 |
| | 031-42872 | Plate—Press. Ga. Conv. (6-Ton) | 1 | 1 |
| | 031-42874 | Plate—Press. Ga. Conv. (4-Ton) | 1 | 1 |
| 26 | 032-90129 | Anchor—Cleanout Cover | 1 | 1 |
| | 031-90195 | Anchor—Cleanout Cover | 1 | 1 |
| 27 | 031-48312 | Spacer—Cont. Valve | 1 | 1 |
| | 031-90242 | Spacer—Cont. Valve | 1 | 1 |
| 28 | 306-16120 | Screw—H.H.C. 3/8-16 UNC x 3/4" Lg. | 2 | 2 |
| 29 | 431-90600 | Plug—3/8" Soc. Pipe | 2 | 2 |
| 30 | 311-16221 | Screw—S.S. 3/8-16 UNC x 1-3/4" Lg. | 4 | 4 |
| 31 | 320-10203 | Screw—Drive #2 x 3/16 Lg. | 8 | 8 |
| 32 | 345-10024 | Washer—Flat 3/8 S.A.E. | 2 | 2 |
| 33 | 358-12160 | Screw—S.H.C. 1/4-20 UNC x 1" Lg. | 2 | 2 |
| 34 | See Page No. 16 | Pump—Motor Parts | | |
| 37 | | | | |
| 38 | 358-16180 | Screw—S.H.C. 3/8-16 UNC x 1-1/4" Lg. | 4 | 4 |
| 39 | 358-16260 | Screw—S.H.C. 3/8-16 UNC x 2-1/4" Lg. | 1 | 1 |
| 40 | 431-90400 | Plug—1/4" S. Pipe | 4 | 4 |
| 41 | 431-90800 | Plug—1/2" S. Pipe | 8 | 8 |

* Parts used on splitting style banjo assemblies only.

| Item | Part No. | Description | Qty. | |
|------|-----------------|---------------------------------------|------|----|
| | | | WR | WT |
| 42 | 431-91200 | Plug—3/4" S. Pipe | 1 | 1 |
| 43 | 306-24280 | Screw—H.H.C. 5/8-11 UNC x 2-1/2" Lg. | 1 | 1 |
| | 306-24220 | Screw—H.H.C. 5/8-11 UNC x 1-3/4" Lg. | 1 | 1 |
| 44 | 424-20800 | Elbow—Pipe 1/2 x 90° | 1 | 1 |
| 45 | 407-01612 | Elbow—Red. 1" x 3/4" | 1 | 1 |
| | 474-11617 | Elbow—Fem. Tube | 1 | 1 |
| 46 | 426-30800 | Elbow—Pipe Str. 1/2 x 90° | 1 | 1 |
| 47 | 473-10404 | Elbow—Tube | 5 | 5 |
| 48 | 473-15004 | Elbow—X-Long Tube | 1 | 1 |
| | 484-11616 | Elbow—Long Tube | 1 | 1 |
| 49 | 426-15001 | Elbow—Tube | 1 | 1 |
| | 473-15012 | Elbow—Tube | 1 | 1 |
| 50 | 506-85002 | Filler Cap Assy. | 1 | 1 |
| 51 | 517-00001 | Isolator Gauge | 1 | 1 |
| 52 | 533-00001 | Snubber—Pressure Gauge | 1 | 1 |
| 53 | 606-25001 | Grommet | 1 | 1 |
| 54 | 606-25002 | Plug, Grommet | 1 | 1 |
| 55 | 333-16000 | Nut—Hex 3/8-16 UNC | 4 | 4 |
| 56 | 804-04035 | Tube—1/4 O.D. x 48" Lg. | 1 | 1 |
| 57 | 671-00121 | O-Ring | 2 | 2 |
| 58 | 803-16065 | Tube—1" O.D. x 20" Lg. | 1 | 1 |
| 59 | 306-16180 | Screw—H.H.C. 3/8-16 UNC x 1-1/4 Lg. | 2 | 4 |
| | 358-16300 | Screw—S.H.C. 3/8-16 UNC x 2-3/4 Lg. | 2 | 2 |
| 60 | 474-10404 | Elbow—Fem. Tube | 1 | 1 |
| 61 | 427-20800 | TEE—1/2" | 1 | 1 |
| 61A | 513-25608 | Valve—Check | 1 | 1 |
| 62 | 442-16100 | Nipple—1" x 2-1/2" Lg. | 1 | 1 |
| | 442-16160 | Nipple—1" x 4" Lg. | 1 | 1 |
| 63 | 306-16160 | Screw—H.H.C. 3/8-16 UNC x 1" Lg. | 4 | 4 |
| 64 | 501-99660 | Gauge—Pressure | 1 | 1 |
| 65 | 310-08041 | Screw—R.H.M. #8-32 UNC x 1/4" Lg. | 3 | 3 |
| 66 | 352-15003 | Pop Rivet #AD-66-AH | 3 | 3 |
| 67 | 442-08010 | Nipple—1/2" x 1-1/8" Lg. | 1 | 1 |
| | 442-08100 | Nipple—1/2" x 2-1/2" Lg. | 1 | 1 |
| 68 | See Page No. 16 | Pump—Motor Assy. | | |
| 71 | | | | |
| 72 | 406-01200 | Elbow—Pipe Str. 3/4 x 90° | 1 | 1 |
| 73 | See Page No. 16 | Pump—Motor Assy. | | |
| 74 | 433-92416 | Bushing—Hex. 1-1/2" x 1" | 1 | 1 |
| 75 | 470-35006 | Connector—Long | 1 | 1 |
| 76 | 358-20180 | Screw—S.H.C. 1/2-13 UNC x 1-1/4" Lg. | 4 | 4 |
| | 358-24260 | Screw—S.H.C. 5/8-11 UNC x 2-1/4" Lg. | 1 | 4 |
| 77 | 431-92500 | Plug—1/2" Soc. Flush | 1 | 1 |
| 78 | 346-10024 | Lockwasher—3/8" | 6 | 8 |
| 79 | 358-14280 | Screw—S.H.C. 5/16-18 UNC x 2-1/2" Lg. | 2 | 2 |
| 80 | 473-15019 | Elbow—Tube | 1 | 1 |
| 81 | 433-91608 | Bushing—Hex Redu. 1" x 1/2" | 1 | 1 |
| 82 | 031-72555 | Gasket—Clean Out Cover | 1 | 1 |
| | 032-69729 | Gasket—Clean Out Cover | 1 | 1 |
| 83 | 636-80006 | Washer—Seal | 1 | 1 |
| 84 | * 031-90234 | Retainer—Banjo | 1 | 1 |
| | * 031-90236 | Retainer—Banjo | 1 | 1 |

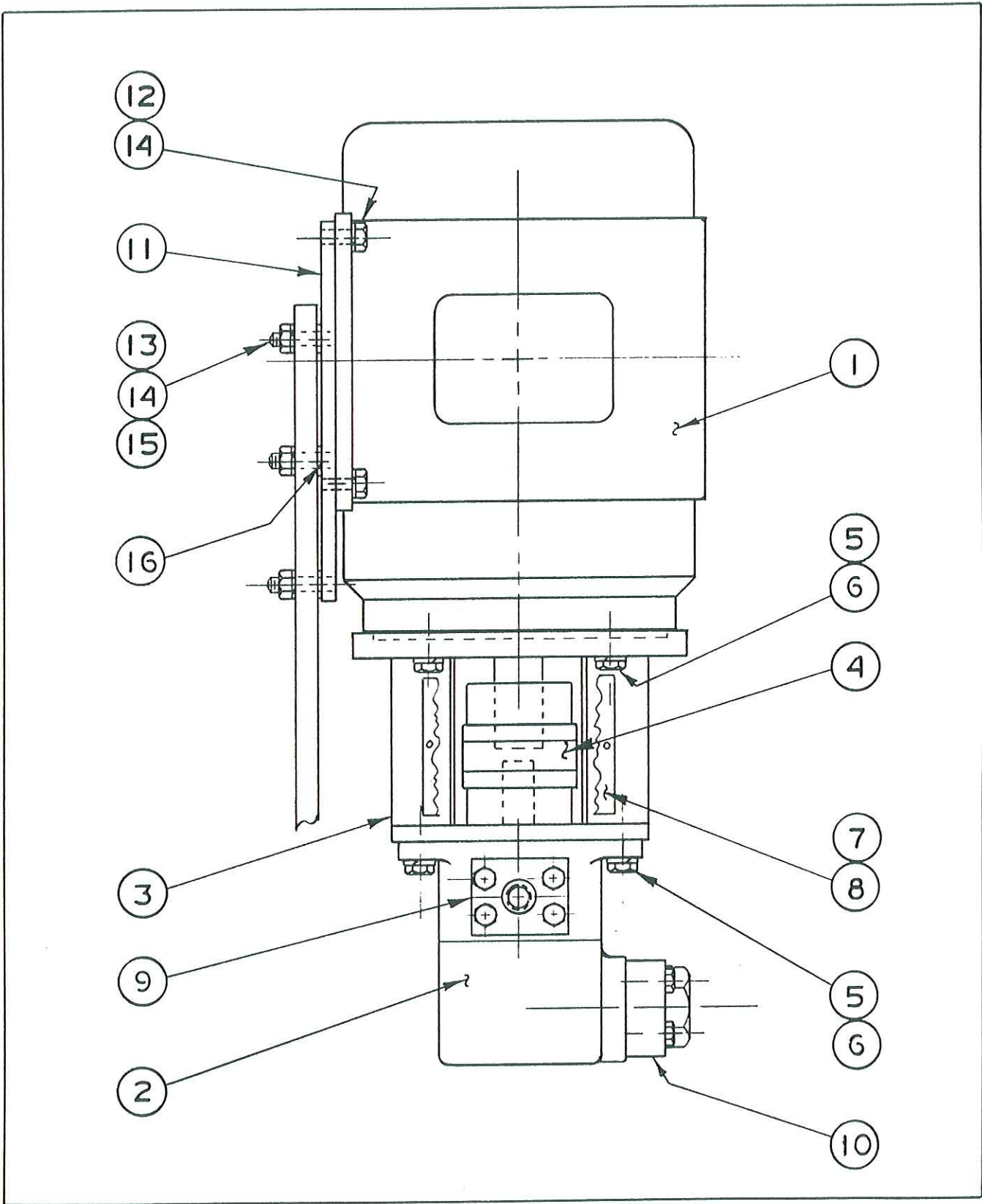


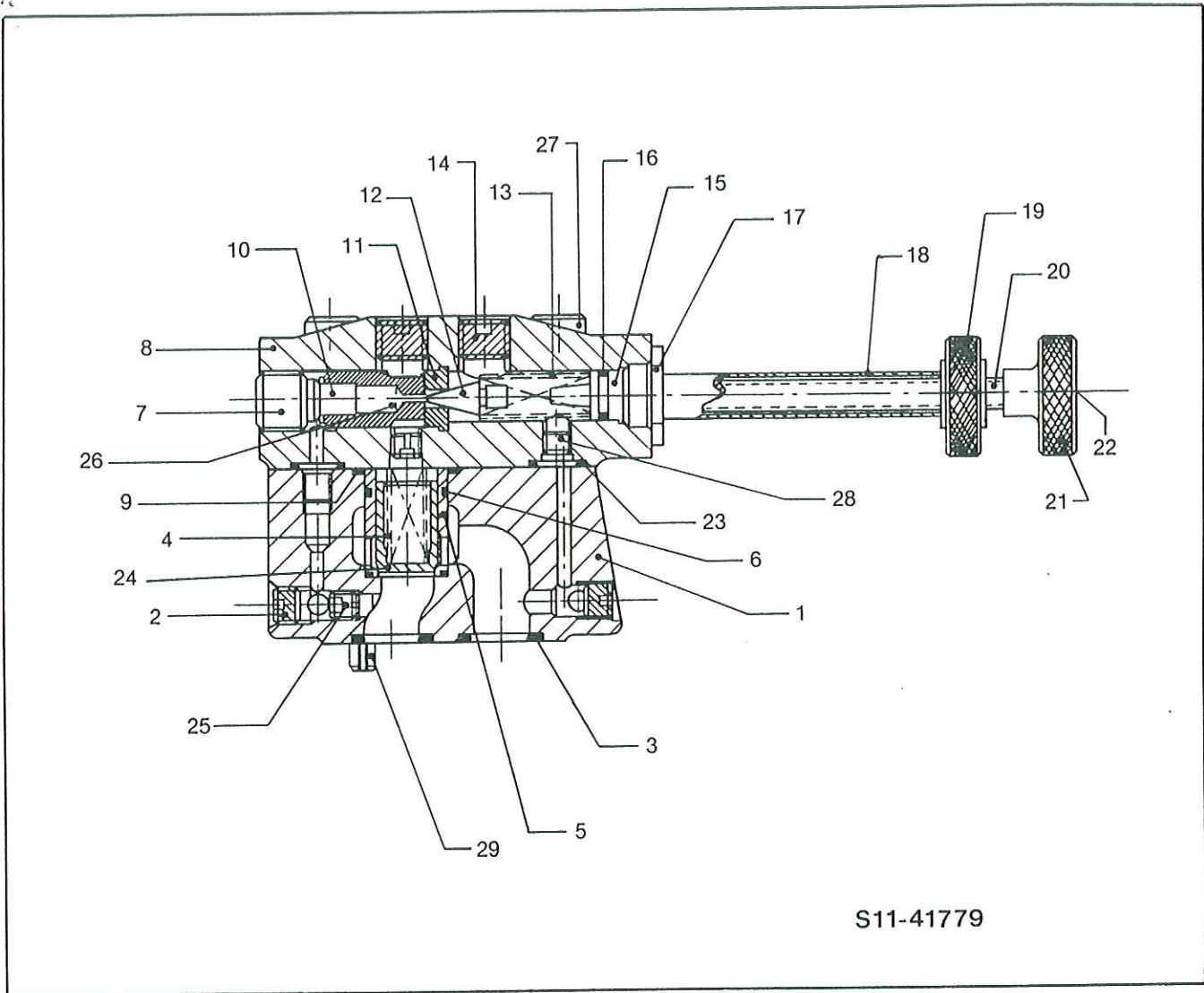
Figure 9
MOTOR & PUMP ASSEMBLY

PUMP-MOTOR ASSEMBLY

PARTS LIST (Pump-Motor Assembly)

| Item | Part No. | Description | S11-41777 | S11-41778 |
|------|-----------|---|-----------|-----------|
| 1 | Ref. Only | Motor, Elec. 5 HP, 1800 RPM, "C" Face HFM Frane 184TC | 1 | |
| | | 7½ HP, | 213TC | 1 |
| | | 10 HP, | 215TC | 1 |
| 2 | Ref. Only | Pump | 1 | 1 |
| 3 | 031-47778 | Adapter, Pump to Motor | 1 | 1 |
| 4 | 212-85071 | Coupling, (Pump Half) | 1 | 1 |
| | 212-84012 | Coupling, (Motor Half) | 1 | |
| | 212-85014 | Coupling, (Motor Half) | | 1 |
| | 212-85042 | Insert, Coupling | 1 | 1 |
| 5 | 306-20180 | Screw, HHC 1/2-13 x 1-1/4 Lg. | 6 | 6 |
| 6 | 346-10032 | Washer, 1/2" St'd. Lock | 6 | 6 |
| 7 | 032-49301 | Guard, Coupling | 2 | 2 |
| 8 | 320-60806 | Screw, Self Tap. #8-32 x 3/8 Lg. | 4 | 4 |
| 9 | 032-47613 | Flange—1" Pressure W/1/4 NPTF | 1 | 1 |
| | 306-40047 | Screw—HHC 3/8-16 UNC x 1-3/4 | 4 | 4 |
| | 691-10222 | Gasket—Tetraseal | 1 | 1 |
| 10 | 034-27264 | Connection—4 Bolt | 1 | 1 |
| | 358-20220 | Screw—Soc. Hd. Cap 1/2-13 N.C. x 1-3/4 | 4 | 4 |
| | 691-10227 | Gasket—Tetraseal | 1 | 1 |
| 11 | 031-47703 | Plate, Motor to Press Mt'g. | 1 | 1 |
| 12 | 306-16160 | Screw, HHC 3/8-16 x 1 Lg. | 4 | 4 |
| 13 | 311-16221 | Screw, S.S. Oval Pt. 3/8-16 x 1-3/4 | 4 | 4 |
| 14 | 346-10024 | Washer, 3/8 St'd. Lock | 8 | 8 |
| 15 | 333-16000 | Nut, Hex 3/8-16 | 4 | 4 |
| 16 | 334-00004 | Nut, Hex Lock 3/8-16 | 4 | 4 |

Item 9 thru 16 not included in pump/motor ass'y.



S11-41779

Figure 10
RELIEF VALVE ASSEMBLY

| Item | Part No. | Description | Qty. |
|------|-----------|---------------------------|------|
| 1 | 036-38563 | Valve Body | 1 |
| 2 | 431-90204 | Plug, 1/8" NPTF | 2 |
| 3 | 691-00116 | O-Ring | 2 |
| 4 | 036-38448 | Spring | 1 |
| 5 | 036-38442 | Sleeve | 1 |
| 6 | 691-00018 | O-Ring | 2 |
| 7 | 312-35051 | Screw—Socket Set Half Dog | 1 |
| 8 | 016-81075 | Cap | 1 |
| 9 | 691-00022 | O-Ring | 1 |
| 10 | 036-27548 | Spacer | 1 |
| 11 | 036-11692 | Seal | 1 |
| 12 | 036-81030 | Cone | 1 |
| 13 | 036-12289 | Spring—5000 PSI | 1 |
| 14 | 431-90404 | Plug, 1/4" NPTF | 1 |
| 15 | 036-21767 | Piston | 1 |

| Item | Part No. | Description | Qty. |
|------|-----------|---------------------------------------|------|
| 16 | 671-00012 | O-Ring | 1 |
| 17 | 036-21765 | Spring Retainer | 1 |
| 18 | 031-90245 | Adj. Screw Lock Sleeve | 1 |
| 19 | 032-42927 | Knob—Control Locking | 1 |
| 20 | 031-90246 | Screw—Adjusting | 1 |
| 21 | 036-24504 | Knob—Hand | 1 |
| 22 | 312-13080 | Screw—Socket Set | 1 |
| 23 | 691-00013 | O-Ring | 4 |
| 24 | 036-38444 | Spool | 1 |
| 25 | 036-25528 | Plug, Orifice | 2 |
| 26 | 036-81029 | Plug, Orifice | 1 |
| 27 | 359-15220 | Screw—S.H.C. 3/8"-24 UNF x 1-3/4" Lg. | 4 |
| 28 | 431-90104 | Plug, 1/16" NPTF | 1 |
| 29 | 325-16100 | Roll Pin 1/4" x 5/8" | 1 |
| 30 | S16-39211 | Seal Kit | 1 |

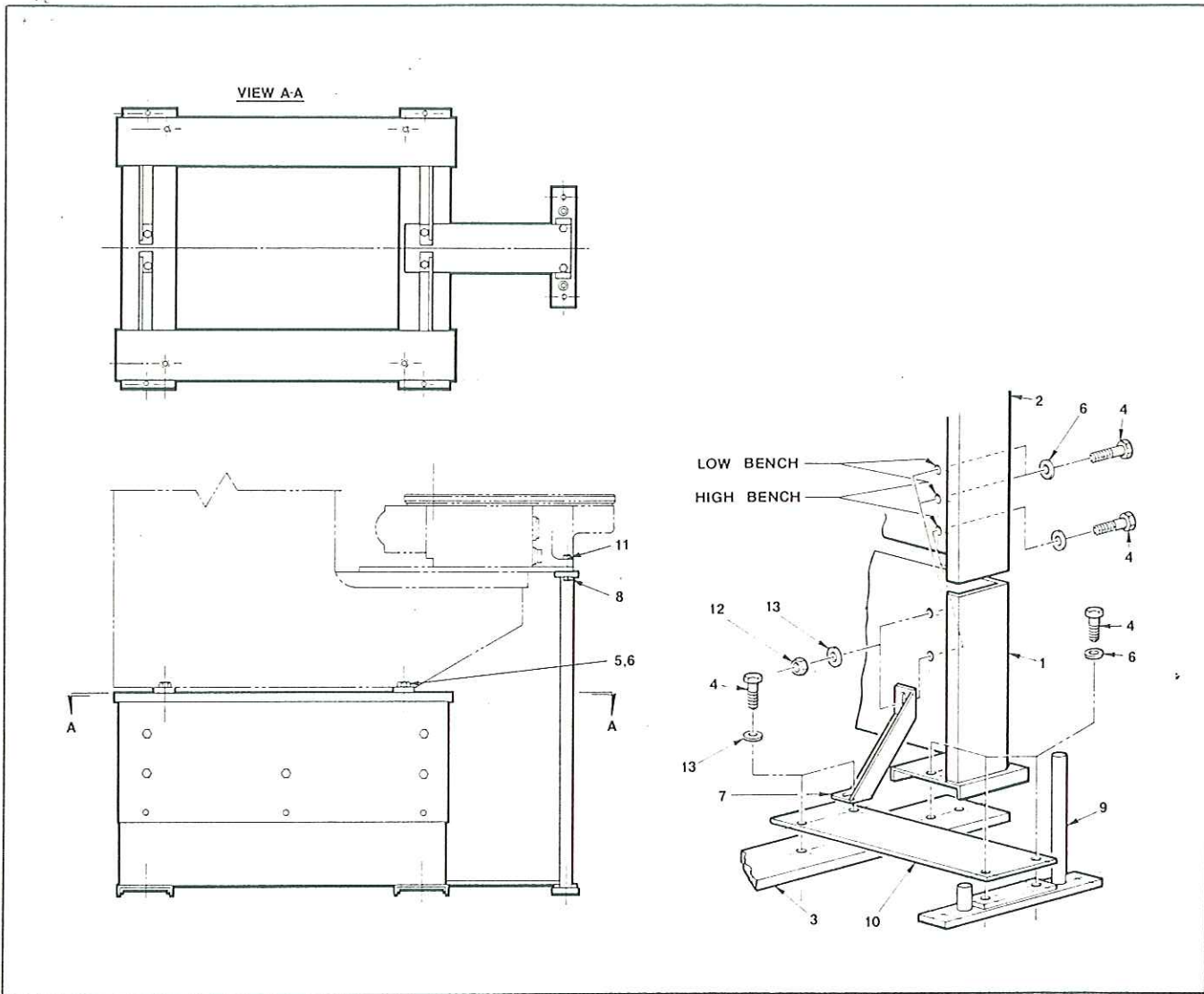
SERVICE ON RELIEF VALVE (Fig. 10)

At times, the relief valve is prevented from operating satisfactorily due to the presence of lint, pipe scale, or some other foreign matter between the control seat (11) and cone (12). This may cause fluctuating pressure or pressure failure.

Quite often this condition may be corrected by starting the pump, releasing the lock nut (19) and sufficiently backing off (CCW) adjusting screw (21) to remove all spring pressure from cone (12). Oil circulating through the cap and discharging through spool (24) to the reservoir quite frequently will eliminate the foreign matter. The adjusting screw should then be turned clockwise until the desired pressure is reached.

If the above operation does not eliminate the trouble, the following procedure should be followed.

1. Remove the socket set screw (7) from cap and cone seat.
2. Remove the cap assembly (8) from the body (1) being careful not to lose or damage the "O" rings.
3. Remove the adjusting screw (21) and spring retainer (17).
4. Remove seal piston (15) by threading in a 10-24 screw into the tapped end and pulling out.
5. Remove compression spring (13) and cone (12).
6. Examine control seat (11), if the seat appears to be deformed or otherwise damaged, it may be removed by inserting a 7/16" dia. brass rod from the adjusting screw end and then pressed or driven out.
7. Thoroughly clean cap (8) giving special attention to drilled passages which communicate with the body. It is recommended that the cap be washed in stoddard solvent and then all holes blown out with clean compressed air. Do not wipe with rags, as they may leave lint.
8. Clean and inspect all parts removed from cap (8). If cone (12) shows a full sealing ring, it is satisfactory and may be reused, otherwise replace with new part. Examine control seat (11). If seat is damaged, use opposite sealing edge. If that too is damaged, replace part.
9. Reassemble:
 - a. Press control seat (11) into cap (8) through the hole where socket set screw (7) was removed until it reaches the shoulder. Tool required for this operation is a 9/16" dia. brass rod having a 3/8" dia. drilled hole in the end. This is done to prevent damage to seat.
 - b. Assemble spring (13) on cone (12), add seal ring (16) to piston (15) which is inserted into opposite end of spring. Insert this assembly, cone first, into the end of cap (8) from which it was removed and thread adjusting plug (17) into cap and tighten to hold parts in cap. Assemble lock nut (19) and sleeve (18) onto adjusting screw assy. (20, 21, 22) and thread into adjusting plug (17).
 - c. Install cone seat spacer (10) and screw socket set screw (7) into cap and tighten.
10. Next, remove spring (4) and spool (24) from the body (1).
11. Clean all parts thoroughly in stoddard solvent. Use clean compressed air to blow out all passages.
12. Examine seat in sleeve (5) making sure that it is clean and that the seating edge does not show defets. If seat is defective, replace. Do not regrind defective part, as such procedure will unbalance characteristics of the valve, resulting in unsatisfactory operation of the valve.
13. Examine tapered seat surface of spool (24). This surface should show a perfect seating ring. If inspection indicates improper seating, replace part. A satin appearance near the sealing ring does not mean a defective part. Spool erosion does, however, necessitate replacement.
14. Reassemble cap assembly to body assembly. It is advisable to replace all "O" rings. Be sure all "O" rings are in place before completing this assembly. Cap screws fastening cap (8) to the body (1) should be drawn down uniformly and tightened securely. Loose cap screws will allow extrusion of the "O" rings.



**Figure 11
BENCH ASSEMBLY**

| Item | Part No. | Description | S11-44722 | S11-44723 | S11-44724 | S11-44725 |
|------|-------------|-----------------------------|----------------------------------|----------------------------|-----------------------------------|----------------------------|
| | | | WR Low Bench w/Index Table | WR High or Low Bench | WT Low Bench w/ Index Table | WT High or Low Bench |
| 1 | 031-90376-C | Support—Lower | 2 | 2 | — | — |
| | 031-90381-C | Support—Lower | — | — | 2 | 2 |
| 2 | 031-90377-C | Support—Upper | 2 | 2 | — | — |
| | 031-90382-C | Support—Upper | — | — | 2 | 2 |
| 3 | 031-90378-C | Cross Bar | 2 | 2 | — | — |
| | 031-90383-C | Cross Bar | — | — | 2 | 2 |
| 4 | 306-20140 | Screw 1/2-13 NC x 7/8 | 24 | 22 | 24 | 22 |
| 5 | 306-20160 | Screw 1/2-13 NC x 1 | 4 | 4 | 4 | 4 |
| 6 | 348-10032 | Lockwasher 1/2 | 24 | 22 | 24 | 22 |
| 7 | 031-90807-C | Support—Brace | — | — | 4 | 4 |
| | 031-90992-B | Support—Brace | 4 | 4 | — | — |
| 8 | 335-20100 | Nut Hex Jam 1/2-13 UNC | 2 | — | 2 | — |
| 9 | 031-90379-B | Support | 1 | — | 1 | — |
| 10 | 031-90380-A | Tie Bar | 1 | — | 1 | — |
| 11 | 358-20240 | Screw-S.H.C. 1/2-13 UNC x 2 | 2 | — | 2 | — |
| 12 | 333-20000 | Nut Hex 1/2-13 UNC | 10 | 10 | 10 | 10 |
| 13 | 344-10032 | Washer 9/16 | 14 | 14 | 14 | 14 |