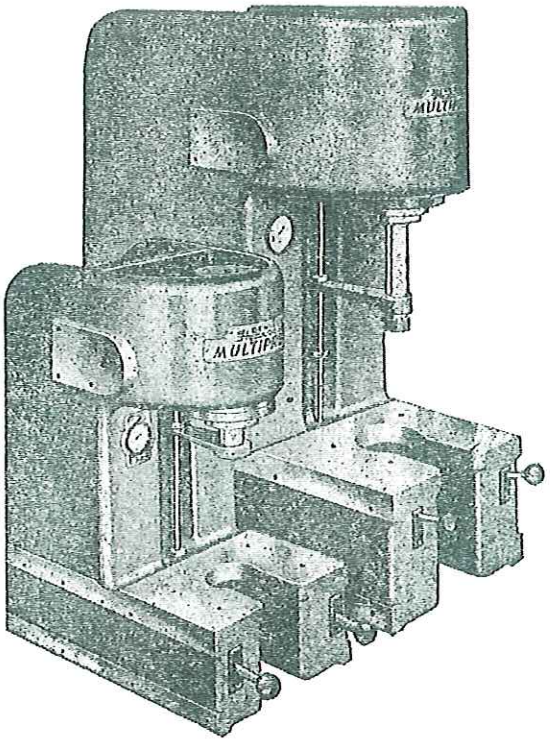
Instruction Manual 22----June 1948

Operating and Maintenance Instructions for



DENISON
Manually and Automatically Controlled Multipress
(Four, Six and Eight-Ton Capacities)

THE DENISON ENGINEERING CO.
COLUMBUS 16, OHIO

IMPORTANT

Read Carefully Before Placing Your Multipress in Operation

This instruction manual covers the operation of both manually and automatically controlled Multipresses for models designated by the following numbers:

4 Ton	6 Ton	8 Ton
MC02	M6C02	M8C02
MC61	M6C61	M8C61
MC03A12	M6C03A12	M8C03A72
MC04A12	M6C04A12	M8C04A72
MC64A12	M6C64A12	M8C64A72
MC09A12	M6C09A12	M8C09A72
MC69A12	M6C69A12	M8C69A72
MC08A12	M6C08A12	M8C08A72
MC13A12	M6C13A12	M8C13A72

The control features of each press are indicated by the valve model number included in the model number of the press. For example:

M	C04	A12
4-Ton Model	Control Valve	Water Cooler

All 4, 6 or 8-ton Multipresses with identical control valve systems, such as MC02, M6C02 and M8C02, retain the same ram actions and control features.

The 4 and 6-ton models are identical in dimensional characteristics differing only in their pumping units, pump pressures and maximum ram effort. The 8-ton models are larger, heavier and offer longer ram strokes plus additional daylight clearance between ram and bed of press. Dimensional specifications for all models are furnished on the following pages.

THE PARTS LIST COVERS 4, 6 AND 8-TON MODELS OF THE MULTIPRESS. BE SURE TO SELECT THE CORRECT LIST IN ORDERING REPLACEMENT PARTS.

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CHARTS AND ILLUSTRATIONS

INTRODUCTION

This manual has been prepared to provide users of manually and automatically controlled Multipresses with complete information regarding their operation and maintenance. The manual is intended to serve as a guide to safe operation and any occasional service or adjustment which may be necessary. There is nothing complicated or difficult in properly maintaining and operating the Multipress. The function of its parts can be easily understood and their trouble-free operation assured by carefully reading the descriptions and instructions given in the manual and following those instructions carefully.

Therefore, when the reservoir is filled to the correct level with proper hydraulic fluid, the unit connected to its electrical power source, and proper water connections made, the Multipress should require no further adjustment of parts to ready it for any service within its recommended power range.

WARRANTY

Within a period of six months from date of shipment from our factory, and when owned by the original purchaser and being used in recommended service, any Multipress part of our manufacture which, upon inspection at our factory, is proven defective in workmanship or material, will be replaced free of charge. This Warranty applies only to Multipress parts manufactured by The Denison Engineering Company.

Parts other than of our manufacture, bear such warranties as their manufacturers allow. When inspection indicates those parts defective, we will endeavor to secure the benefits of such warranties for our customers.

SERVICE POLICY

The extreme simplicity of Multipress, the unit construction of its component parts, 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 rate of $25.00 per day and expenses. Multipress equipment sent to our factory for inspection and service after expiration of the six month Warranty period must be shipped prepaid. Factory service will be rendered only upon receipt of purchase order for such service.

Instruct all operators to immediately stop the motor whenever any unusual pressure variations are noticed or circuit noises heard.

GENERAL DESCRIPTION AND OPERATING INSTRUCTIONS

There are three models of the manually controlled Multipress—Fast Approach, Multi-Speed and Manual Vibratory. The automatically controlled models of the Multipress consist of the Automatic series, the Automatic Fast Approach series, and the Automatic Multi-Speed and Vibra-Pres series. Each of these models is available in 4, 6 or 8-ton capacities. Unless specified otherwise, manually controlled models are furnished with dual hand lever controls, assuring maximum safety for the operator. Upon customer specification, they can be furnished with single hand lever (right or left) or foot pedal control. All automatic models are equipped with single lever selector control, as illustrated on Page 5 of this manual. However, the automatics can be furnished, if desired, with dual handle cable control or foot pedal cable control.

THE MANUAL FAST APPROACH C61 SERIES

Utilizing the same dual hand lever safety controls as the C02 manually controlled Multipress, the C61 Series offers manual control of ram speed and tonnage during the downstroke of the ram. In operation:

1. Both levers are depressed, causing the ram to descend at full 500 ipm downward travel.
2. Raising one lever slightly at any point during descent or upon contacting the work shifts the ram to normal (200 ipm) speed.
3. Releasing one lever completely causes ram to stop, exerting zero pressure.
4. Releasing both levers, ram returns to the "up" or starting position.

If the ram contacts the work at full speed, it is necessary only to raise the lever before full preset tonnage is imposed on the work. Prior to the shifting of the lever, the ram tonnage is one-half of the preset relief valve setting, which, of course, occurs during the portion of the stroke when minimum tonnage is needed.

THE MANUAL MULTI-SPEED C02 SERIES

Rapid ram speed for the approach portion of the stroke and regulative speed for the pressing portion is featured with this model. Raising the hand lever slightly at any point in the downward ram travel achieves this change of ram speed for the remainder of the stroke. Pressing speed is regulated by means of a simple knurled knob adjustment on the control valve.

THE MANUAL VIBRATORY C03 SERIES

With the vibratory action model of the manually controlled Multipress, the ram will descend, exert an initial pressure stroke upon the work at desired preset pressure, and will then make rapid repeat strokes upon the work until the hand levers are released. Each stroke is of exactly the same preset pressure and is adjustable between a few thousandths to one-half inch. The ram follows the work down with each compacting stroke, which makes this model ideally suitable for the compacting of powdered or granular material.

THE AUTOMATIC C04-C09 SERIES

The C04 control offers single lever control for entirely automatic ram movement and cycling. Moving the hand lever to the Hold Down position of the selector plate causes the ram to descend upon the work, where it dwells, exerting preset pressure until the operator returns the lever to idling. Moving the lever to Single Cycle position and immediately back to Idling causes the ram to descend, exert preset pressure on the work and then rise to a positive stop at the preset upstroke limit. Moving the lever to Continuous Cycling position causes the ram to descend, exert preset pressure on the work, rise to its upstroke limit, and then repeat that cycle of movement automatically. This action is known as "Pressure Reversal". It will repeat this action, and in perfectly timed sequence, until the lever is returned to Idling. Since the distance of ram travel can be regulated, frequence of cycling depends on the stroke length.

The C09 control, used for the interlock of a hydraulic accessory, is basically the same as the C04.

THE AUTOMATIC FAST APPROACH C64-C69 SERIES

With the automatic C64 model, the shift from high to normal ram speed is automatically accomplished upon contacting the work. The ram descends at 500 ipm, and when the resistance of the work is met, the ram automatically reverts to normal pressing speed and tonnage. Because of the design of the control valve, the ram cannot reverse until full preset pressure has been exerted, assuring an application of desired pressure with each cycle of the ram.

The C69 control is identical to the above Model C64 except that arrangement is made for interlock with a hydraulic accessory.

THE AUTOMATIC MULTI-SPEED AND VIBRA-PRES C08-C13 SERIES

The C08 control combines all the features of the C04 along with those of each of the manually controlled models. "Multi-Speed" feature permits rapid ram speed during the approach portion of its stroke and regulative speed during the pressing portion. The point in the ram's travel at which this speed change occurs is regulative. (See caution note on page 8.)

The "Vibra-Pres" control feature permits the making of repeat strokes, each of uniform pressure, length and speed, upon the work as part of each complete cycle of the ram. The ram can be controlled to automatically descend, exert pressure on the work, and then make short, uniform pressure strokes in any number from 1 to 25, and of any length from a few thousandths to one-half inch, before rising to its full upstroke limit. This ram action can be carried out in either Single or Continuous Cycling action. Frequency of the short repeat strokes depends on their regulated length and speed. The range is between a few per second to virtual vibration.

The C13 control, used for the interlock of a hydraulic accessory, is basically the same as the C08.

CONTROL DATA

DATA			M SERIES (4 TON)	M6 SERIES (6 TON)	M8 SERIES (8 TON)
Max. Ram Effort	Series C02 Only	lbs.	800 to 8,000	800 to 12,000	800 to 16,000
Max. Ram Effort	Series C03, C04, C09, C64, C69, C08, C13	lbs.	1,600 to 8,000	1,600 to 12,000	1,600 to 16,000
Adj. Pressing Speed	Series C02 Only	ipm	20 to 200	20 to 200	20 to 200
Adj. Pressing Speed	Series C08, C13 Only	ipm	40 to 200	40 to 200	40 to 200
Downward Ram Speed	Series C02, C03, C04, C09, C08, C13 Only	ipm	200	200	200
Downward Ram Speed	Series C61, C64, C69 Only	ipm	500	500	500
Upward Ram Speed	All Series	ipm	300	300	300
Adj. Vib. Strokes	Series C08, C13	per cycle	to 25	to 25	to 25
Max. Stroke	All Series	inches	6"	6"	12"
Max. Daylight	All Series	inches	12"	12"	18"
Max. Throat Depth	All Series	inches	6"	6"	8 1/8"
Press Bed Dimensions	All Series	inches	16" x 10 1/2"	16" x 10 1/2"	22" x 14"

FIG. 1 Control Data Chart for all series, 4-, 6- and 8-ton Multipresses.

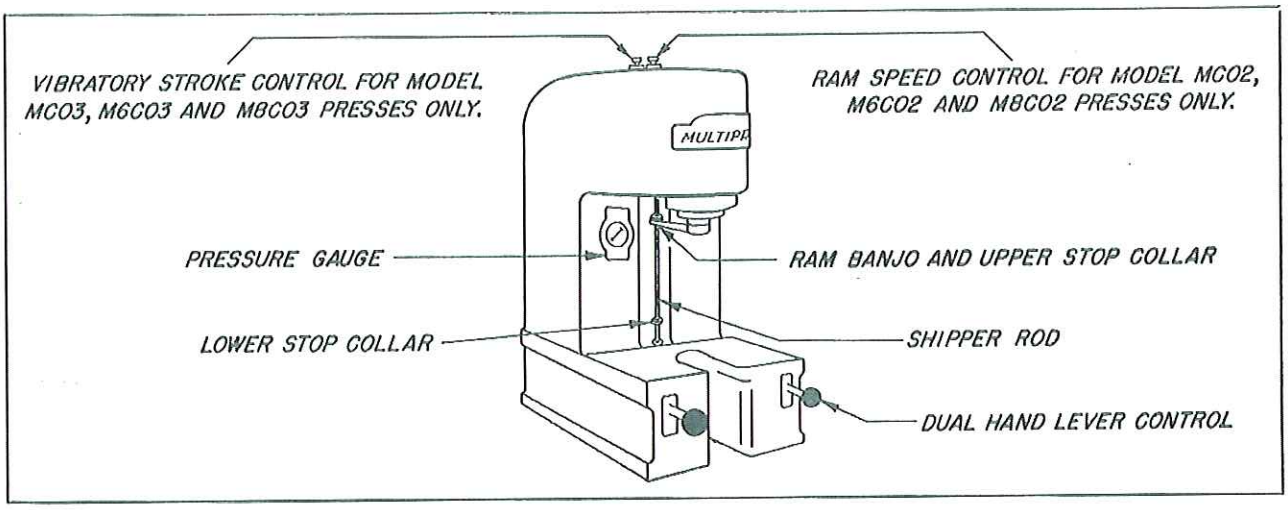
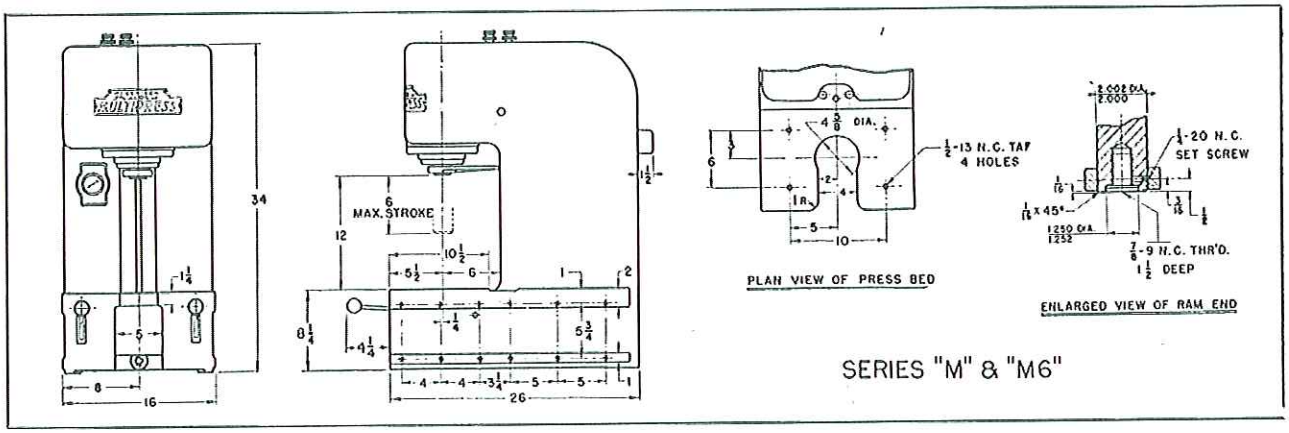


FIG. 2 Controls of the manually controlled Multipress.



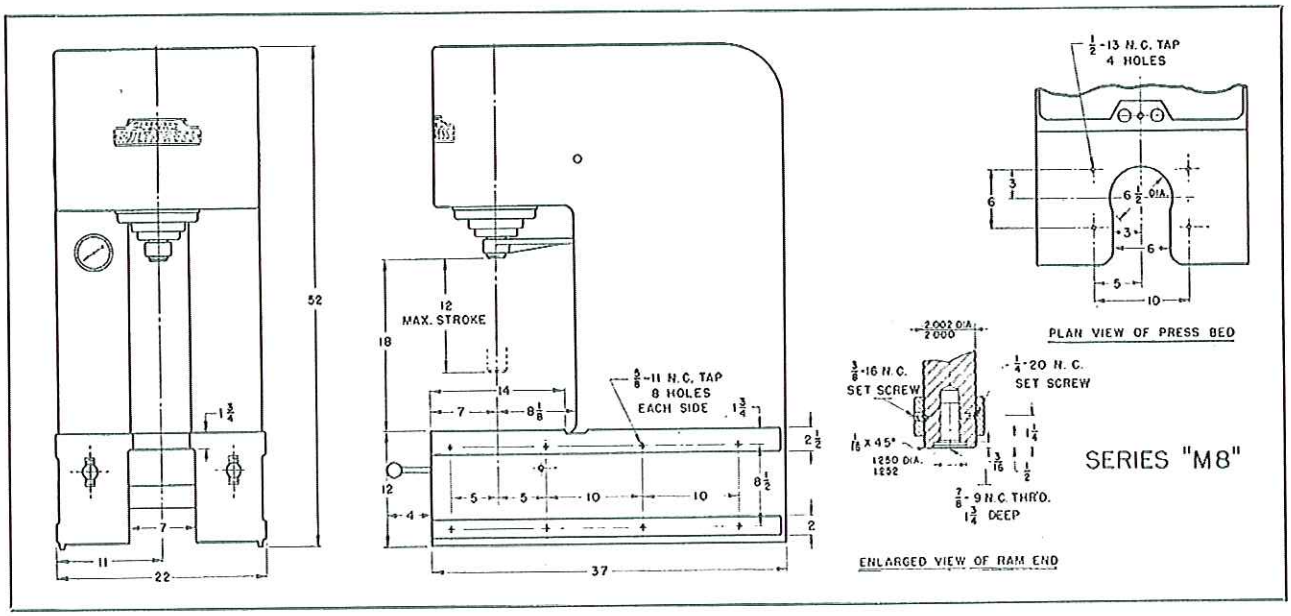


FIG. 3 Dimensional specifications of manually controlled 4-, 6- and 8-ton Multipresses

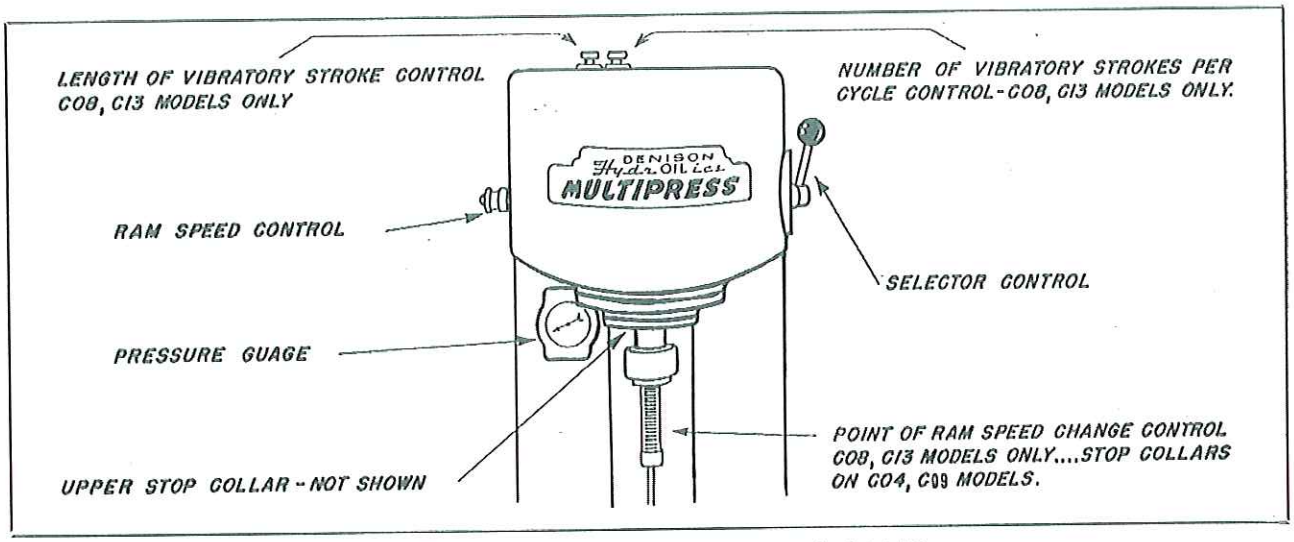
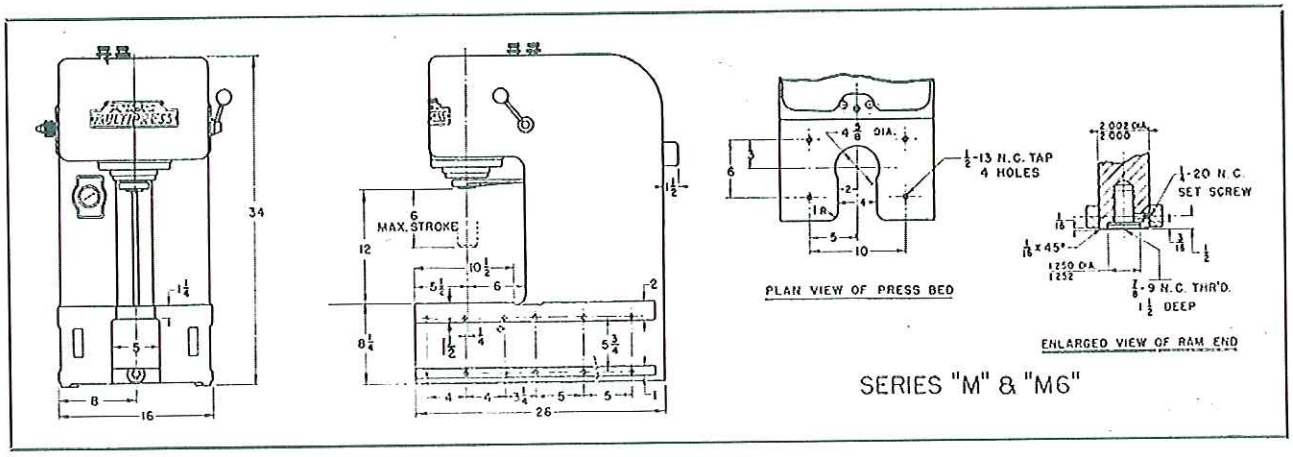


FIG. 4 Controls of the automatically controlled Multipress.



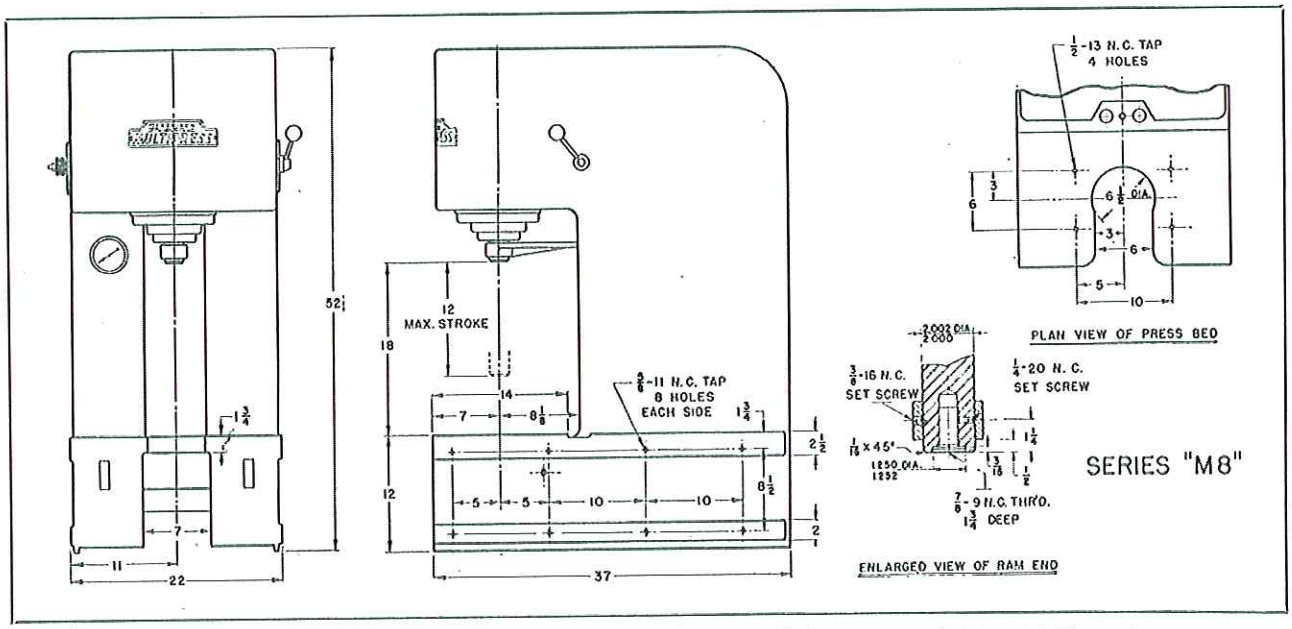


FIG. 5 Dimensional specifications of automatically controlled 4-, 6- and 8-ton Multipresses.

INSTALLATION AND PREPARATION FOR USE (ALL MODELS)

Please Read Carefully Before Operating Your Press

1. The standard Multipress electric current characteristic is 220 volts, 3 phase, 60 cycle. However, 440 volt, 3 phase, 60 cycle current may also be used. A motor starter with correct current characteristics for either of the above voltages must be used. A transformer is recommended for use in connection with the Start and Stop Push Button Switch. Motor starter and transformer are not furnished as standard Multipress equipment but will be supplied upon receipt of specifications.

CLEANLINESS is the most important requisite in proper maintenance of oil-hydraulic equipment. Of the few maintenance difficulties encountered in the operation of HydrOILic equipment, almost all 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 tank and hydraulic system of your equipment at all times. Make certain that no lint, dirt, abrasive, scale or other foreign material enters the pumps, valves or oil lines. CAREFUL ATTENTION to these simple precautions will repay owner and operator many times in low maintenance costs and trouble-free operation.

2. The oil reservoir is filled through the oil filler pipe. Break the seal on the oil filler pipe cap and remove it. Fill the oil reservoir of the 4- and 6-ton models with 11 gallons of high grade lubricant as per lubricant specification tag, located on motor housing, at rear of press. The 8-ton reservoir has a capacity of 35 gallons. Always use CLEAN oil of the highest quality. Drain oil through a filter during the filling operation. Be certain that no foreign matter enters the reservoir. Replace filler cap after oil reservoir has been filled. The oil level gauge is located on the motor mounting plate, to the right of the motor (when facing back of press). Sufficient oil is in the oil reservoir when the oil level indicator (colored red) has risen approximately 1 inch and is floating.

CAUTION

Put no more than 11 gallons of oil in the reservoir of the 4- and 6-ton models, 35 gal. in the 8-ton model. More will cause overflow during operation.

3. Direction of pump rotation must be as shown by the arrow on the motor frame at the rear of the press. Direction of rotation of motor and pump can be determined by viewing the motor rotor, while in operation, through the opening in the motor housing on the top of the motor. If the pump is permitted to rotate in the wrong direction, it will seize after a few seconds' operation, due to lack of oil. The result will be broken and scored parts. To reverse motor rotation, reverse the electrical connections either at motor conduit box or motor starter.

Should the location of the Multipress be changed and new electrical connections made, the above instructions regarding pump rotation must again be followed.

The pump uses hydraulic fluid for internal lubrication of its closely fitted parts. If the suction line to the oil reservoir is open and the oil supply sufficient, pump rotation in the proper direction will immediately pull oil into the pump and provide adequate lubrication.

4. Having filled the reservoir and insured proper direction of pump rotation, start the motor and allow it to run for a few minutes. Check the pipe lines and the tubing for any oil leakage which may have been caused by mishandling in shipment or installation.

5. Lower and raise the press ram in full strokes two or three times by operating control levers to flush air from system. Check pressure obtained by reading pressure gauge.

If the pressure recorded exceeds the rated press capacity, adjust the relief valve to bring the pressure down to the rated capacity. If the pressure produced is less than required and not more than maximum allowable, adjust the relief valve to increase the pressure. On manual models to preset working pressure or tonnage, depress both levers and allow ram to bottom. Then adjust relief valve to required pressure (see description of the Relief Valve, page 13). On automatic models, move selector control lever to ram down position and hold there. This will cause ram to remain in down position and pressure will be increased to setting of relief valve. It is necessary to ease selector control downward slowly until the ram reverses. The pressure gauge reading, at this point, indicates the pressure setting of the relief valve. Move selector control up to single cycle position to return ram to its upstroke limit and release pressure. Gauge shut-off valve should be closed after pressure has been reset or checked, if type of operation being performed on press will permit. This will greatly prolong the life of the pressure gauge.

6. Adjust the length of ram stroke to fit your particular operation by moving and locking the adjustable stop collars on the ram control shipper rod. These stop collars may be loosened and locked by means of an Allen wrench. Lower stop collars are not furnished on any C08-C13 Series Multipresses. The maximum length of stroke obtainable on 4- or 6-ton presses is 6 inches, 12 inches on the 8-ton and the minimum stroke of 1/16 inch on all series.

It is very important that the upper shipper rod collar (see Figure 6, Item 11), on all models, be set in a position so that the shipper rod arm (see Figure 6, Item 15) is approximately ¾ inch from the bottom of the cylinder when the ram is in its upper stroke limit. This precaution is taken to assure that the control valve spool during idle time with motor running is in its center position directing all oil volume and pressure to tank at minimum pressure. This prevents possible overheating of the press. Cap screws in the collars must be securely tightened to prevent slippage.

7. It is economical, and good operating policy, to adjust the relief valve for the minimum pressure needed to perform the required service. If it is set for excessive pressure, more power will be used than is necessary.

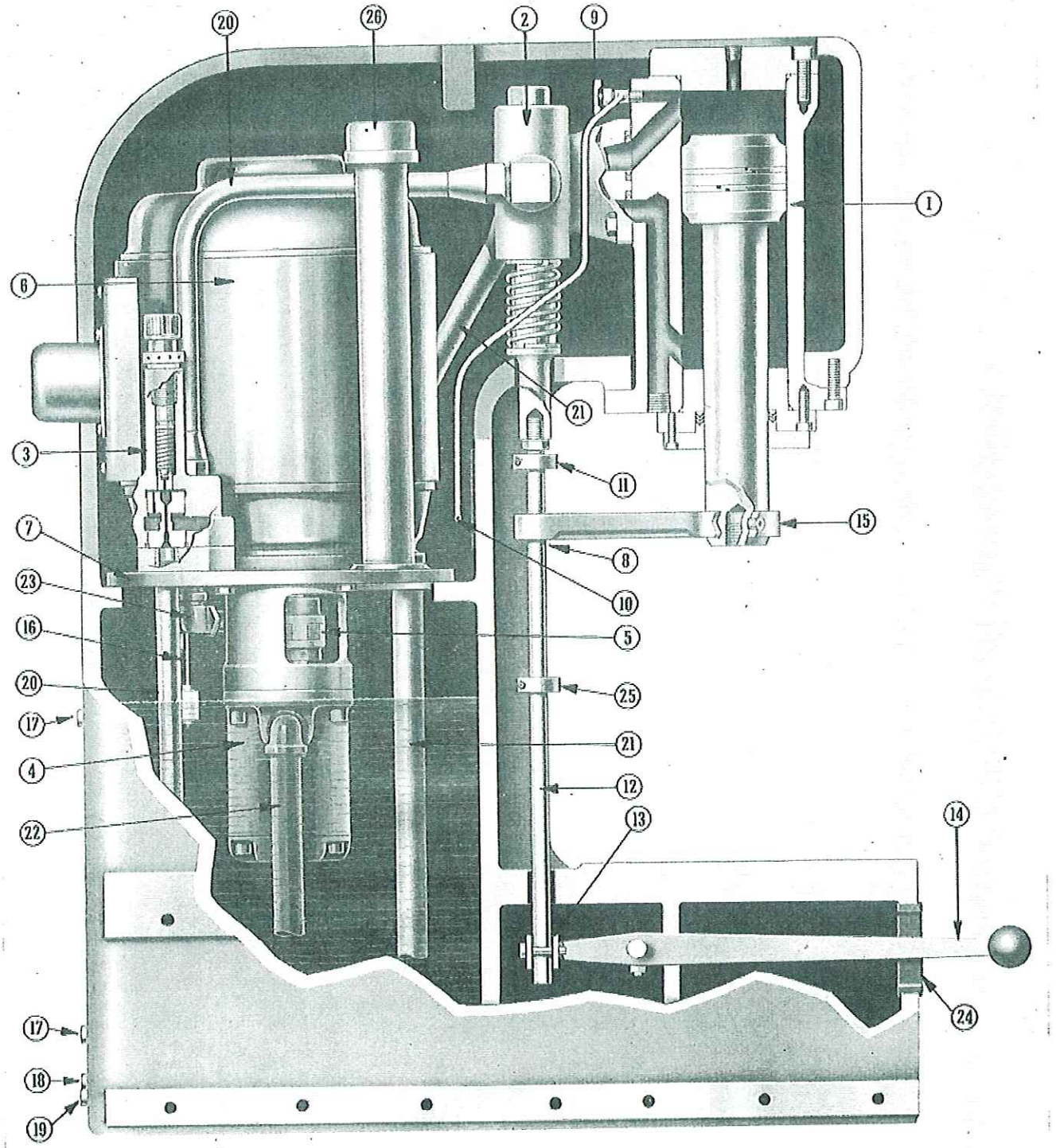


FIG. 6 Cutaway view of 4-ton manually controlled Multipress (4-ton model)

1. Hydraulic Cylinder
2. Four-way Control Valve (Model MC02 - See parts list for valves of other models.)
3. Pressure Relief Valve
4. Hydraulic Pump
5. Flexible Coupling
6. Electric Motor
7. Mounting Plate
8. Pressure Gauge
9. Gauge Shutoff Valve
10. Gauge Line
11. Stop Collar - Upper
12. Shipper Rod
13. Singletree
14. Hand Lever Arm
15. Ram Guide (Banjo Arm)
16. Oil Level Gauge
17. Water Connections (Used only when cooling coils are installed in reservoir for thermostatic cooling)
18. Drain Plug
19. Thermostatic Bulb Connection
20. Pressure Line 21. Return Line
22. Pump Suction Line
23. Relief Valve Return Line
24. Rubber Grommets
25. Stop Collar—Lower
26. Filler Cap

CAUTION

If the "point-of-ram-speed-change" device, on the C08-C13 Series only, is adjusted too high on the shipper rod, the ram guide or banjo arm will be broken when the ram comes down. The spring in this device will depress approximately two inches. Therefore, adjust it so that the ram will travel no more than two inches after the banjo guide has contacted its upper collar. This device controls the point at which ram speed changes from maximum fast to regulated pressing speed during downward travel.

Do not make changes in tooling setups while motor is running. In resetting shipper rod collars, shipper rod may be shifted slightly, causing ram to move, damaging tools or injuring operator.

INSTALLATION OF THERMOSTATIC WATER REGULATING VALVE WITH THERMOSTATIC BULB

All manually controlled C03 Series and all automatic series presses are equipped with cooling coils in their oil reservoirs. A thermostatic water regulating valve is also furnished with these models, to be used in conjunction with the cooling coils. This regulating valve is packaged separately and is not installed on any press before shipping.

NOTE

INSTALL THERMOSTATIC BULB BEFORE FILLING MULTIPRESS OIL RESERVOIR, OR DRAIN RESERVOIR BEFORE INSTALLING (SEE FIGURES 7 AND 8).

1. Remove 1/4 inch pipe plugs at upper right and lower left, in rear of Multipress.
2. Remove 3/4 inch pipe plug at lower right.
3. Install water inlet line, through the Thermostatic Water Regulating Valve, into Multipress, as shown.
4. Install Thermostatic Bulb, as shown.
5. Connect Water Outlet to drain.

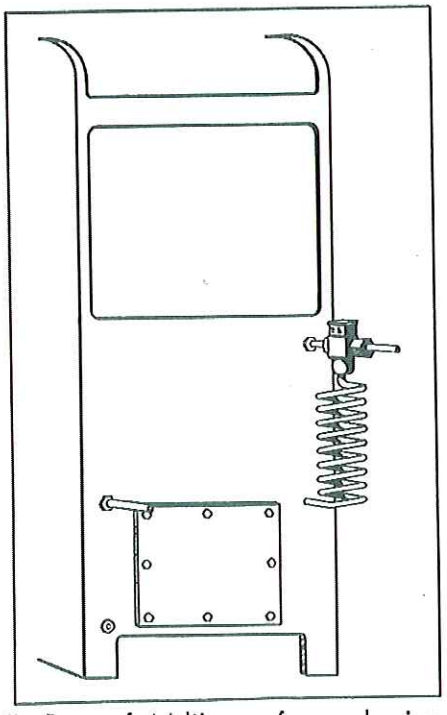


Figure 7—Rear of Multipress frame showing correct water connections and installations of thermostatic valves for 8-Ton models. (Included with Model A-72 cooling equipment.)

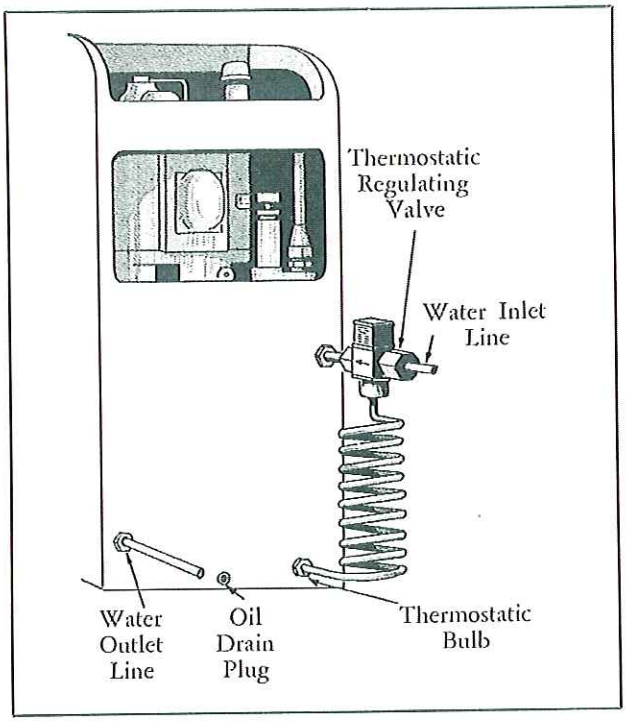


Figure 8—Rear of Multipress frame showing correct water connections and installation of thermostatic valve for 4- and 6-ton models. (Included with A12 cooling equipment.)

CAUTION

When connecting the water lines to the press through the 1/4 inch pipe taps in the bushings provided, be certain to hold the bushing with a wrench to keep it from turning while tightening the 1/4 inch nipples. The tube fitting on the end of the copper coils on the inside of the oil reservoir is screwed into the bushing, and the copper tubing will be damaged by twisting if the bushing is allowed to turn when installing water line.

Thermostatic Water Regulating Valve is set to open at 110° F.

RECOMMENDED HYDRAULIC OIL SPECIFICATIONS

FOR ALL 4-, 6- AND 8-TON MULTIPRESSES

The controls on most of the Multipresses and special equipment manufactured by The Denison Engineering Company have one or more hydraulic resistances in the system as part of the controls. In order that the units function properly, it is essential that the correct type of hydraulic oil be used.

It is also essential that the customer use a similar type of oil to that used in our plant when the tests were made. This will eliminate any trouble that may occur when the customer uses a heavier or lighter oil than that recommended.

Following is a list of approved hydraulic oils of similar viscosities and specifications. We recommend that these oils be used in our products.

Manufacturer	Trade Name	*Chemical Characteristics	Viscosity Index	Viscosity @ 100° F.	Viscosity @ 210° F.
Cities-Service Oil Company	Pacemaker T 300	Inhibited	95	300	52.5
Gulf Oil Company	Gulf Crest Oil "C" WCR	Inhibited	107	302	53.7
Gulf Oil Company	Gulf Crest Oil "C"	Uninhibited	107	302	53.7
E. F. Houghton and Company	Hydro-Drive MIH-20	Inhibited	105	300	54
Kendall Refining Company	Industrial 41-AA	Uninhibited	102	268	51
The Ohio Oil Company	Vepressa 354	Inhibited	90	320	52.5
The Ohio Oil Company	Terona 449	Uninhibited	90	335	54
Pure Oil Co.	Puritan Hvy. Medium Hd.	Inhibited	103	330	55
Pure Oil Co.	Puritan Hvy. Medium	Uninhibited	103	330	55
Shell Oil Company	Tellus 34	Inhibited	90	320	55
Shell Oil Company	Albus 34	Uninhibited	90	310	53
Socony-Vacuum Oil Company	Socony-Vacuum RL - 34 - C	Inhibited	95	295	53
Standard Oil Company of Ohio	Sohio Turbine Hv'y Med.	Inhibited	110	315	55
Standard Oil Company of Ohio	Sohio DE-52	Uninhibited	110	315	55
Standard Oil Co. of New Jersey	Teresso 52	Inhibited	109	316	55
Standard Oil Co. of New Jersey	931 Lubricant	Uninhibited	98	311	53
Sun Oil Co.	Sunvis 931	Inhibited	90	310	53
Sun Oil Co.	Sunvis 31	Uninhibited	90	310	53
The Texas Co.	Texaco Regal Oil PC (R&O)	Inhibited	90	300	51.5
The Texas Co.	Texaco Regal Oil PC	Uninhibited	90	300	51.5

*An inhibited oil has chemical additives to strengthen its various properties, such as: Viscosity Index, anti-foaming, oxidation stability, anti-corrosion, gum-solvency, film strength, and oiliness.

(See Installation Section for quantities of oil required.)

SERVICE TROUBLES AND REMEDIES

TROUBLE	CAUSE	REMEDY
PUMP NOT DELIVERING OIL.	Tank oil level too low. Oil intake pipe clogged. Air leak in suction line. Oil viscosity too heavy to pick up prime. Broken pump shaft or rotor.	Add recommended oil. Check pipe and clean if necessary. Will prevent priming, or cause noise and irregular action of control circuit. Thinner oil should be used, per recommendation on oil specification tag. Refer to preceding service data for replacement instructions.
PUMP NOT DEVELOPING PRESSURE.	Relief valve setting not high enough. Relief valve sticking open. Leak in hydraulic control system (cylinders or valves). Free recirculation of oil to tank being allowed through system. Vane or vanes stuck in rotor slot - In vane-type pump only. Head too loose. (Very, very infrequent.) Broken core passages in pump body. Small air leak at pump intake piping joints. Air leak at pump shaft packing. Relief valve chattering. Pump head too loose or a faulty head gasket.	Block machine travel, or oil circulation, and test with pressure gauge. Dirt under pressure adjustment poppet. (See relief valve instructions.) Must be tested independently by blocking off circuit progressively. Directional control valve may be in open center, neutral or other return line open unintentionally. Inspect for wedged chips or sticky oil, and reassemble per preceding instructions. Must not be tightened too tightly, see instructions before using wrench on head screws. Replace body and check maximum relief valve setting immediately for shock overload condition. Test by pouring oil on joints while listening for change in sound of operation. Tighten as required. Pour oil around shaft while listening for change in sound of operation. Refer to previous service instructions. Air being drawn into system at pump intake or pump shaft packing. (Check as above.) Test by pouring oil over head and replacing gasket per preceding instructions.
PUMP MAKING NOISE.	Partially clogged intake line, or restricted intake pipe. Restriction pulled into intake cores. Air bubbles in intake oil. Tank air vent plugged. Pump running too fast. Too high an oil viscosity.	Pump must receive intake oil freely or cavitation will take place. Remove head and clean carefully after valve plate bushings are removed. Check to be certain return lines are below oil level. Must be opened through breather opening at filler pipe cap. Check recommended maximum speed from descriptive literature. Use recommended oils. (Check with tag specifications.)
PRESS OVER HEATING	Water not circulating through cooling coils in oil reservoir. Cooling coils plugged, preventing proper water circulation. Upper shipper rod collar set too high, causing pressure to be applied to underside of piston with ram at upper stroke limit while press idles. Ram being held down under pressure for long period of time on manually controlled models.	Connect water lines or turn on shutoff valve in water line. Check water flow from return connection. Clean or replace copper coils in reservoir. Lower shipper rod collar approximately ¾" and securely tighten. Change cycle pattern or install cooling coils in reservoir.

MULTIPRESS RELIEF VALVE ASSEMBLY 25-1531-Y
FOR ALL 4-, 6- AND 8-TON MODELS

DESCRIPTION.

The Relief Valve, located on the motor mounting plate at the rear of the press, is used in the hydraulic circuit to guard against overload and to permit adjustment of maximum ram pressure. This valve can be adjusted so that, when any preset pressure is exceeded, the excess fluid volume is directed back to the tank. This insurance against excess pressure is accomplished without any main line fluctuation. Adjustment of the relief valve is very simple and provides a convenient method of varying maximum ram pressures for different operations. To adjust, loosen knurled locknut and turn the knurled adjusting screw. Clockwise rotation increases pressure and counterclockwise rotation decreases pressure. For working pressure ranges on all 4-, 6- or 8-ton Multipresses, please refer to chart on Page 3. **After adjustment, tighten locknut.**

MAINTENANCE

Fluctuating pressure, or loss of pressure at the relief valve, indicates that there is air mixed with the oil, or dirt particles in it. Very small chips or filings left in the tubing or piping, wiping cloth lint, core sand, or any such foreign substances can cause trouble. Every possible precaution should be taken to prevent any grit or dirt from entering the system when re-piping or servicing the machine and filling the tank with oil.

Small air bubbles often cause a "milky" appearance of the oil and this air will usually cause noisy pump and relief valve operation, as well as prevent the valve from maintaining steady pressures. Make certain that all system return pipes (including drain connections) discharging oil to the tank are well below the oil surface level; also, that there are no air leaks in the pump intake line. Either of these conditions will cause air to be mixed with the oil.

The relief valve is sometimes prevented from operating correctly by lint, pipe scale, or some other solid matter lodging between the pressure control piston and its seat. This results in fluctuating pressure or a complete loss of pressure. Usually the condition can be remedied by starting the pump and then loosening the locknut and backing off the adjusting screw counter-clockwise until 0 pressure reading is indicated on gauge. This relieves the pressure control spring and will often allow the circulating oil to clean away the dirt. The relief valve adjustment should then be turned back clockwise until the proper pressure has been reestablished.

If this procedure fails to remedy the trouble, the dirt or lint may be excessive and can only be removed by disassembling the valve and removing the operating parts.

It is necessary to remove the complete valve from the press to inspect the moving internal parts (see Figure 12, cross-sectional view of the relief valve). By removing adjusting screw, No. 15, Items 11, 12, 13 and 14 may be taken out for inspection. Be certain that the spring is in good condition, also "0" ring, No. 14. By removing subplate, No. 5, from the opposite end of valve body, Items 3, 4, 7, 9 and 10 may be disassembled. Inspect all parts carefully, especially ground surfaces and "0" rings. The square seating surface of the poppet, No. 10, spool, No. 9, and beveled seating surface of seat, No. 7, must all be in good condition for correct functioning of valve. The "0" rings on the spring retainer, seat and body should be replaced if slightest indication of wear is shown, to prevent excess oil leakage.

THIS IS IMPORTANT

When ordering parts or requesting service for your Denison HydrOILic Multipress, be sure to state the complete model and serial numbers as shown on tag on rear of press frame. Also be sure to refer to correct section of following parts list when ordering replacement parts. This list covers 4, 6 and 8-ton Multipresses only.

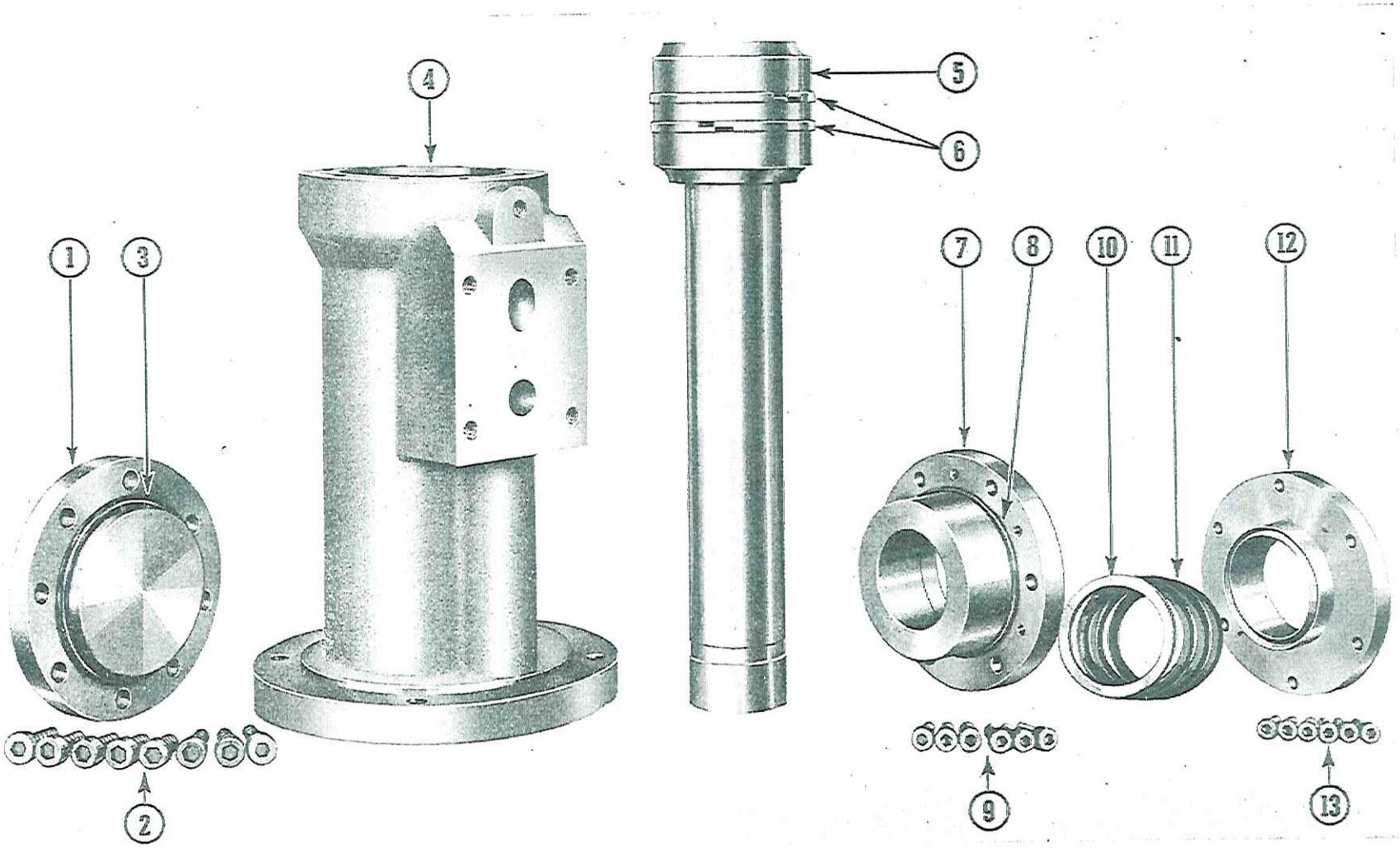


FIG. 9 Cylinder, Piston and Ram Assembly (4- and 6-ton models).

1. Cylinder Head
2. Cap Screws
3. O-Ring Packing
4. Cylinder
5. Ram and Piston
6. Piston Rings
7. Stuffing Box
8. O-Ring Packing
9. Stuffing Box Cap Screws
10. Packing Follower Ring
11. V-Leather Packing
12. Gland
13. Gland Cap Screws

MULTIPRESS ASSEMBLY PARTS LIST

4, 6 and 8 Ton Models

Fig. No.	Ref. No.	Part No.	DESCRIPTION	Quantity
		35-10011-W	Frame—Press, 4 and 6 ton Basic Manually and Automatically Controlled Models	1
			Plug—1/2" Magnetic Countersunk Head	1
			Plug—3/4" Flush Pipe	3
			8-TON FRAME	
Not Shown		35-10749-W	Frame—8 ton Multipress, Basic Manually and Automatically Controlled Models	1
Not Shown			Plug—Pipe—3/4" Flush	4
Not Shown			Plug—Pipe—3/4" Magnetic Countersunk Head	1
Not Shown		35-10682-Y	Gasket (Clean Out Door)	1
Not Shown		35-10681-Y	Plate (Clean Out Door)	1
Not Shown			Screw—Hex Hd Cap 3/8—16 N.C. 2x1" Lg.	8

CYLINDER ASSEMBLY—4 AND 6 TON MULTIPRESSES

Fig. No.	Ref. No.	Part No.	DESCRIPTION	Quantity
9		25-1202-X	Cylinder—Assembly—Basic Manually and Automatically Controlled Models	1
9	1	35-10006-Z	Head—Cylinder	1
9	2		Screw—Soc. Hd Cap 1/2—13 N.C. x 1 1/4" Lg.	8
9	3–8	AN-6230-14	Packing—"O" Ring	2
9	4	35-10005-X	Body—Cylinder	1
9	5	35-10426-Y	Ram—(Used on Presses with Serial No. 520 and up)	1
9	6		Ring—Piston 3 1/4" O.D. x 3/16"—Step Seal	2
9	7	35-10008-Z	Box—Stuffing	1
9	9		Screw—Soc Hd Cap 3/8—16 N.C. x 1 Lg.	6
9	10	35-10009-Z	Ring—Packing Follower	1
9	11	1236-SX	Packing—Vim "V" Leather Rings 2 1/2" O.D. x 2" I.D.	4
9	12	35-10010-Z	Gland	1
9	13		Screw—Soc Hd Cap 1/4 x 20 N.C. x 3/4 Lg.	6
Not Shown			Screw—Soc Hd Cap 3/8 x 16 N.C. x 1 1/4 Lg.	4
Not Shown			Plug—1/4 Soc Pipe	1

CYLINDER ASSEMBLY—8 TON MULTIPRESS

NOTE: The 8-ton Cylinder is similar in construction to the 4 and 6 ton Cylinder 25-1202-X (See Fig. 9, Page 14)

Fig. No.	Ref. No.	Part No.	DESCRIPTION	Quantity
Not Shown		25-1315-X	Cylinder—Assembly 8-Ton—Basic Manually and Automatically Controlled Models	1
Not Shown		35-10669-X	Body	1
Not Shown			Plug—1/4 Socket, Pipe	2
Not Shown			Bushing, 3/8 to 1/8 Hex Pipe	1
Not Shown		35-10674-Z	Head—Cylinder	1
Not Shown		AN-6230-14	"O" Ring—Gasket	2
Not Shown			Screw—5/8—11 N.C. Soc Hd Cap, 1 3/4 Lg.	8
Not Shown		35-10670-Y	Ram	1
Not Shown			Rings—Piston—3 1/4 Dia. x 3/16—Step Seal	2
Not Shown		35-10672-Z	Box—Stuffing	1
Not Shown			Screw—1/2—13 N.C. Soc Hd Cap—1 1/4 Lg.	6
Not Shown		35-10009-Z	Ring—Packing Follower	1
Not Shown		1236-SX	Ring—Packing—Vim—"V" Leather 2 1/2" O.D. x 2" I.D.	3
Not Shown		35-10673-Z	Gland Packing	1
Not Shown			Screw—3/8—16 N.C. Soc Hd Cap—7/8 Lg.	6
Not Shown			Plug—1/4 Soc Pipe	1

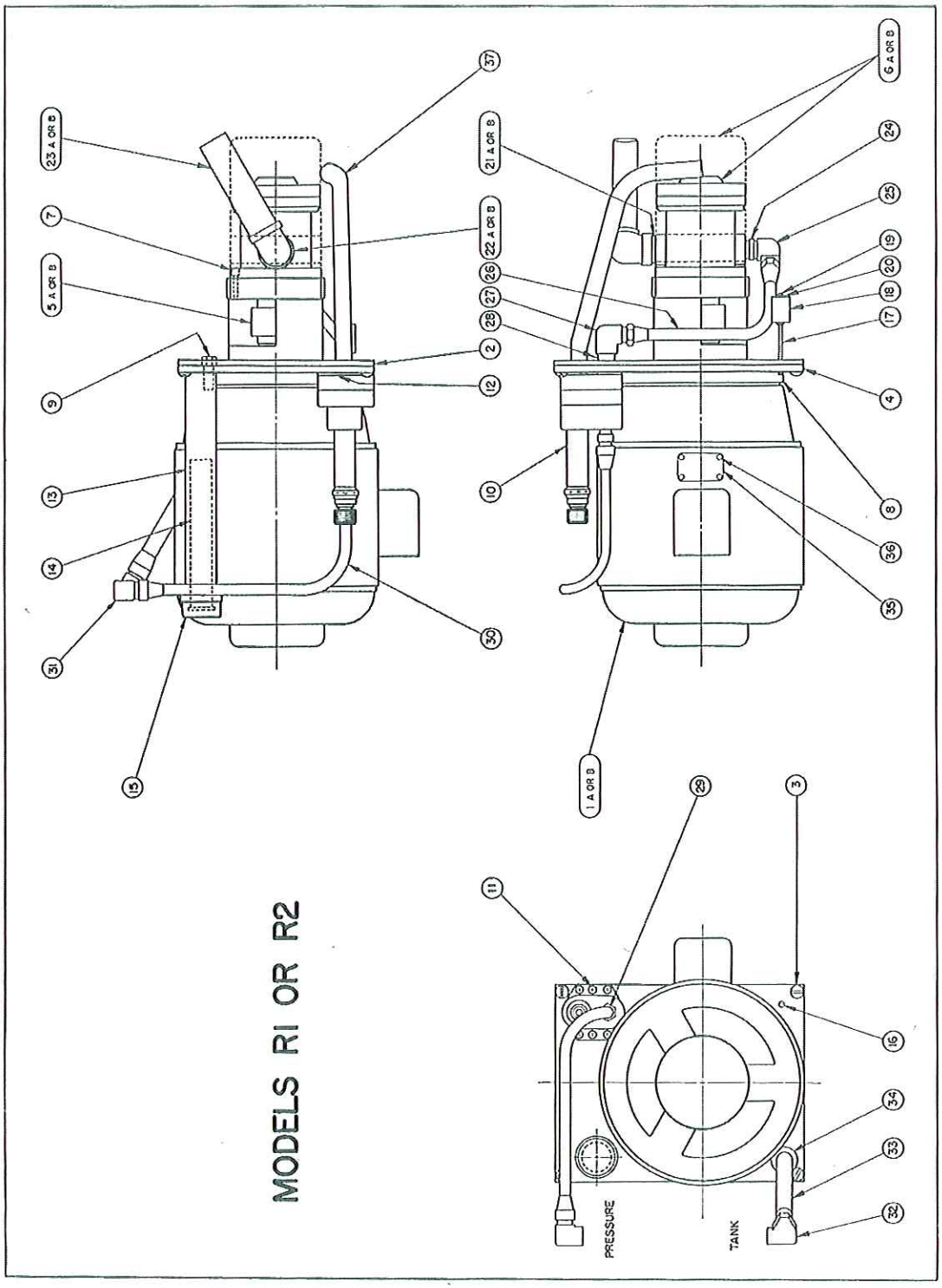


FIG. 10 Motor and Pump Assembly for 4- or 6-ton models.

MOTOR AND PUMP ASSEMBLY FOR 4-TON MULTIPRESS 25-1535-W (MODEL R-1)

Fig. No.	Ref. No.	Part No.	DESCRIPTION	Quantity
10		25-1535-W	Motor and Pump—Assembly (Basic Manually and Automatically Controlled Models)	1
10	1a		Motor—3 H.P.—1800 R.P.M.—225 Frame—"C" Flange—Face Type Mounting—Ball Brg. Vert. Mtg. Shaft End Down—No Feet—220-440 Volt—3 Phase—60 Cycle—Lubrication fittings, name, and wiring plates to be located on the vertical plane thru terminal box	1
10	2	35-10228-Y	Gasket	1
10	3		Screw—Round Head Machine 3/8—16 N.C. x 1	4
10	4	35-11855-X	Cover—Reservoir	1
10	5a	A-099	Coupling—1" Bore with 1/4 x 1/8 Keyway in one hub—3/4 Bore with Keyway for No. 11 Woodruff Key in other hub—Neoprene Spider—1-1/16 Hole through center	1
10	6a	V-105-A	Pump	1
10	7		Screw—Soc Hd Cap 3/8—16 N.C. x 1 1/4 Lg.	4
10	8	35-11856-Y	Bracket	1
10	9		Screw—Hex Hd Cap 1/2—13 N.C. x 1 1/2 Lg.	4
10	10	25-1531-Y	Valve—Relief (Max Pressure 1200 P.S.I.)	1
10	11		Screw—Soc Hd Cap 5/16—18 N.C. x 1 1/2 Lg.	2
10	12	35-12247-Z	Gasket	1
10	13		Pipe—1 1/4 Std. x 13 (Threaded)	1
10	14	35-11785-Z	Filter—Filler	1
10	15	35-10213-Z	Cap—Oil Filler	1
10	16	99-M-40	Nut—Elastic Stop	1
10	17	35-10026-Z	Rod—Float	1
10	18	35-10025-Z	Float—Liquid Level	1
10	19		Nut—Hex No. 4—40 N.C.	2
10	20		Washer No. 4	2
10	21a		Nipple—1 Std. Pipe x 1 1/2 Lg.	1
10	22a		Elbow—1 Std Pipe	1
10	23a		Pipe—1 Std. x 6 Lg. (Thd. one end)	1
10	24		Bushing—Hex Pipe 3/4 to 1/2	1
10	25	1405-10	Fitting—With Std Nut	1
10	26		Tube 5/8 O.D. x .049 Wall x 14 Lg.	1
10	27	1455-10	Fitting—With Std. Nut	1
10	28		Nipple—1/2 x Hvy. Pipe x 2 Lg.	1
10	29	1105-10	Fitting—With Std. Nut	1
10	30		Tube—5/8 O.D. x .049 Wall x 18 Lg.	1
10	31	1455-10	Fitting—With Std. Nut	1
10	32	1455-14	Fitting—With Std. Nut	1
10	33		Tube—7/8 O.D. x 24 Ga. x 22 Lg.	1
10	34	35-10024-Z	Collar—Dust	1
10	35	35-10293-Z	Plate—Data	1
10	36		Screw—Drive Type "U"—Size No. 2 x 1/4 Lg.	4
10	37	35-11860-Z	Pipe—1/2 Std. x 16"	1

MOTOR AND PUMP ASSEMBLY FOR 6-TON MULTIPRESS 25-1530-W (MODEL R-2)

Fig. No.	Ref. No.	Part No.	DESCRIPTION	Quantity
10		25-1530-W	Motor and Pump—Assembly (Basic Manually and Automatically Controlled Models)	1
10	1b		Motor 5 H.P.—1800 R.P.M.—225 Frame "C" Flange—Face Type Mounting—Ball Brg. Vert. Mtg.—Shaft End Down—No Feet—220-440 Volt—3 Phase—60 Cycle—Lubrication Fittings, name, and wiring plates to be located on the vertical plane through terminal box	1
10	2	35-10228-Y	Gasket	1
10	3		Screw—Round Head Machine 3/8—16 N.C. x 1	4
10	4	35-11855-X	Cover—Reservoir	1
10	5b	A-099	Coupling—1 Bore with 1/4 x 1/8 Keyway in One Hub—15/16 Bore with Keyway for No. 8 Woodruff Key in other Hub—Neoprene Spider 1-1/16 Hole Through Center	1

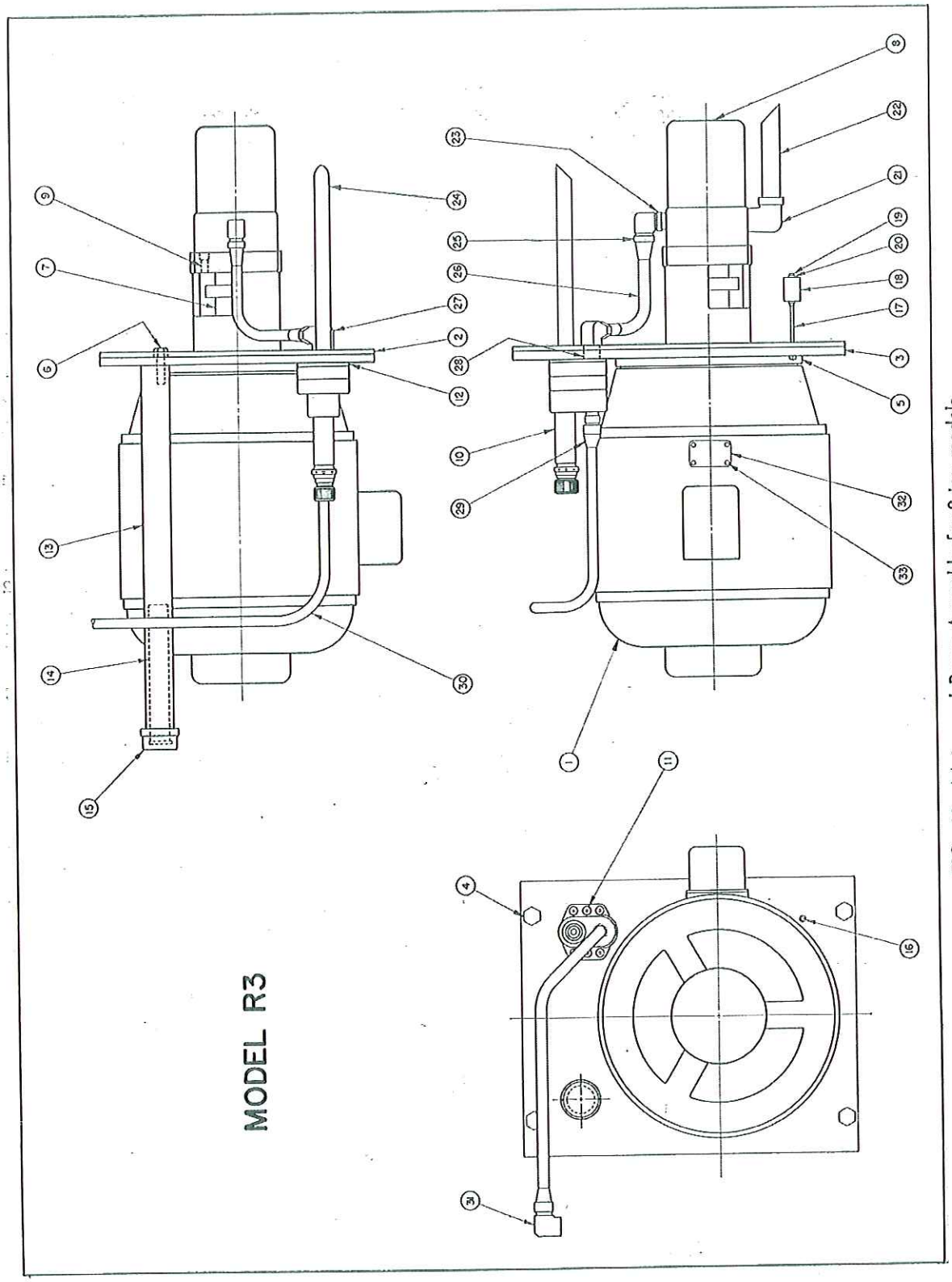


FIG. 11 Motor and Pump Assembly for 8-ton models.

Fig. No.	Ref. No.	Part No.	DESCRIPTION	Quantity
10	6b	25-1329-W	Pump	1
10	7		Screw—Soc. Hd. Cap 3/8—16 N.C. x 1 1/4 Lg.	4
10	8	35-11856-Y	Bracket	1
10	9		Screw—Hex Hd. Cap 1/2—13 N.C. x 1 1/2 Lg.	4
10	10	25-1531-Y	Valve—Relief (Max Pressure 1600 P.S.I.)	1
10	11		Screw—Soc. Hd. Cap 5/16—18 N.C. x 1 1/2 Lg.	2
10	12	35-12247-Z	Gasket	1
10	13		Pipe—1 1/4 Std. x 13 (Threaded)	1
10	14	35-11785-Z	Filter—Filler	1
10	15	35-10213-Z	Cap—Oil Filler	1
10	16	99-M-40	Nut—Elastic Stop	1
10	17	35-10026-Z	Rod—Float	1
10	18	35-10025-Z	Float—Liquid Level	1
10	19		Nut—Hex No. 4—40 N.C.	2
10	20		Washer No. 4	2
10	21b		Nipple—3/4 Std. Pipe x 1 3/8	1
10	22b		Elbow—3/4 Std. Pipe	1
10	23b		Pipe—3/4 Std. x 6 lg. Thd. One End	1
10	24		Bushing—Hex Pipe 3/4 to 1/2	1
10	25	1405-10	Fitting—With Std. Nut	1
10	26		Tube—5/8 O.D. x .049 Wall x 14 Lg.	1
10	27	1455-10	Fitting—With Std. Nut	1
10	28		Nipple—1/2 x Hvy. Pipe x 2 Lg.	1
10	29	1105-10	Fitting—With Std. Nut	1
10	30		Tube 5/8 O.D. x .049 Wall x 18 Lg.	1
10	31	1455-10	Fitting—With Std. Nut	1
10	32	1455-14	Fitting—With Std. Nut	1
10	33		Tube—7/8 O.D. x 24 Ga. x 22 Lg.	1
10	34	35-10024-Z	Collar—Dust	1
10	35	35-10293-Z	Plate—Data	1
10	36		Screw—Drive—Type "U"—Size No. 2 x 1/4 Lg.	4
10	37	35-11860-Z	Pipe—1/2 Std. x 16"	1

MOTOR AND PUMP ASSEMBLY FOR 8-TON MULTIPRESS 25-1538-W (MODEL R-3)

Fig. No.	Ref. No.	Part No.	DESCRIPTION	Quantity
11		25-1538-W	Motor and Pump—Assembly (Basic Manually and Automatically Controlled Models)	1
11	1		Motor—7 1/2 HP — 1800 R.P.M. — Ball Brg. — Vertical Mtg. — Shaft End Down—No Feet—284 Frame "C" Flange—Face Type Mtg.—220-440 Volt—3 Phase—60 Cycle—Lubrication fittings, name, and wiring plates to be located on the vertical plane thru terminal box	1
11	2	35-10683-Y	Gasket	1
11	3	35-11862-X	Cover—Reservoir	1
11	4		Screw—Hex. Hd. Cap 5/8—11 N.C. x 1 1/4 Lg.	4
11	5	35-11863-Y	Bracket	1
11	6		Screw—Hex Hd. Cap 1/2—13 N.C. x 1 1/2 Lg.	4
11	7	A-110	Coupling—1 1/4 Bore with 1/4 x 1/8 Keyway in one Hub—15/16 Bore with Keyway for No. 8 Woodruff Key in other Hub—Neoprene Spider with 1-9/32 Hole through Center	1
11	8	25-1329-W	Pump—(Use Wabble Plate 35-10325-Y)	1
11	9		Screw—Soc. Hd. Cap 3/8—16 N.C. 1 1/2	4
11	10	25-1531-Y	Valve—Relief (Max Pressure 2200 P.S.I.)	1
11	11		Screw—Soc. Hd. Cap 5/16—18 N.C. 1 1/2	2
11	12	35-12247-Z	Gasket	1
11	13		Pipe—1 1/4 Std. x 22 Lg. (Threaded)	1
11	14	35-11785-Z	Filter—Filler	1
11	15	35-10213-Z	Cap—Oil Filler	1
11	16	99-M-40	Nut—Elastic Stop	1
11	17	35-10026-Z	Rod—Float .094 Dia. x 4 5/8 Lg.	1
11	18	35-10025-Z	Float—Liquid Level	1
11	19		Nut—Hex No. 4—40 N.C.	2

Fig. No.	Ref. No.	Part No.	DESCRIPTION	Quantity
11	20		Washer No. 4	2
11	21		Elbow—3/4 Std. Street	1
11	22		Pipe—1/2 Std. x 12 Thd. One End—Other end at 45°	1
11	23		Bushing—Hex Pipe 3/4 to 1/2	1
11	24		Pipe—1/2 Std. x 12 Thd. One End—Other end at 45°	1
11	25	1405-10	Fitting—With Std. Nut	1
11	26		Tube—5/8 O.D. x .049 Wall x 10	1
11	27	1455-10	Fitting—With Std. Nut	1
11	28		Nipple—1/2 x Hvy. Pipe x 1 1/2 Lg.	1
11	29	1105-10	Fitting—With Std. Nut	1
11	30		Tube—5/8 O.D. x .049 Wall x 24 Lg.	1
11	31	1455-10	Fitting—With Std. Nut	1
11	32	35-10293-Z	Data Plate	1
11	33		Screw—Drive Type "U"—Size No. 2 x 1/4 Lg.	4

RELIEF VALVE ASSEMBLY 25-1531-Y
(Used on all Multipress Models of 4, 6 and 8 ton capacity)

Fig. No.	Ref. No.	Part No.	DESCRIPTION	Quantity
12	1	35-11857-Y	Body—Relief Valve	1
12	2		Plug—Soc. Pipe 1/4"	2
12	3	AN-6227-21	Packing "O" Ring	1
12	4	AN-6227-17	Packing "O" Ring	1
12	5	35-11858-Z	Plate—Sub Relief Valve	1
12	6		Screw—Soc. Hd. Cap—5/16—18 N.C. x 1"	4
12	7	35-11859-Z	Seat—Relief Valve	1
12	8	35-11729-Z	Sleeve	1
12	9	35-11573-Z	Spool	1
12	10	35-11572-Z	Poppet	1
12	11	35-12456-Z	Center	1
12	12	35-12455-Z	Spring—Compression	1
12	13	35-11614-Z	Retainer—Spring	1
12	14	AN-6227-9	Packing "O" Ring	1
12	15		Screw—Soc. Hd. Cap with Serrated Hd.—3/4—16 N.F. x 1 3/4	1
12	16	35-10157-Z	Nut—Lock	1
12	17		Spacers	1

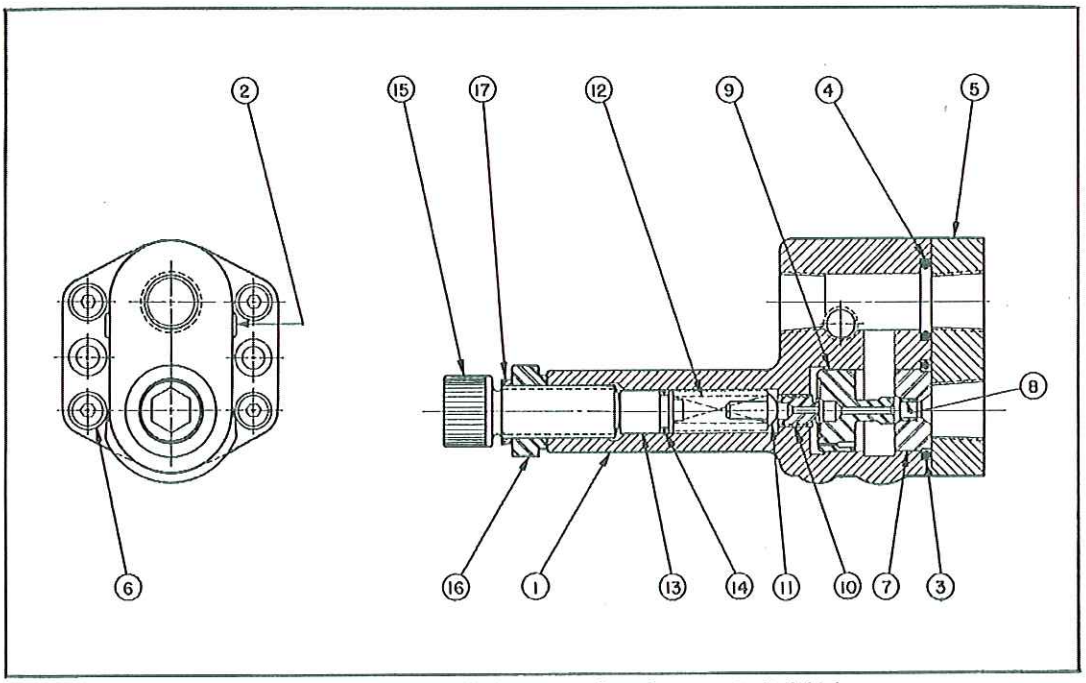


FIG. 12 Cross-sectional drawing of Multipress Relief Valve.

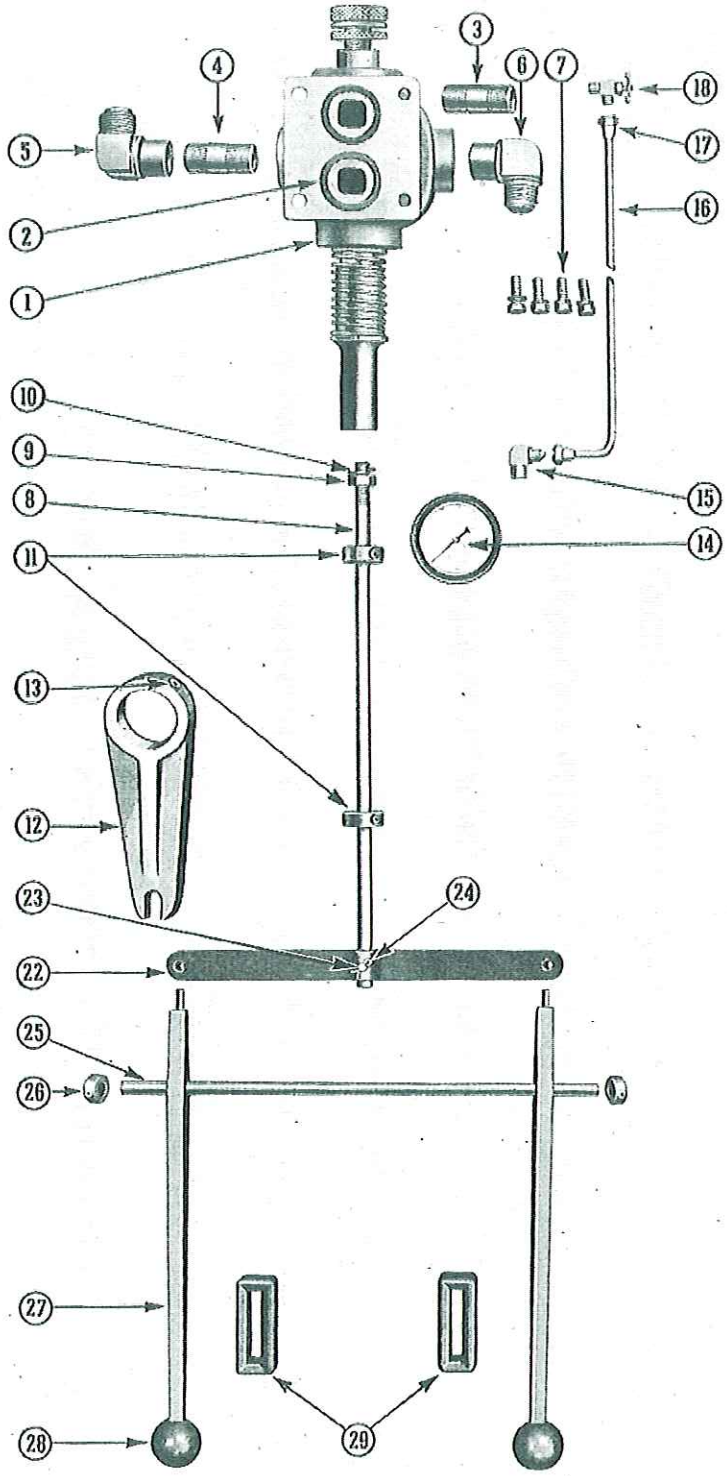


FIG. 13 Control System Assembly for all manually controlled Multipresses.

CONTROL SYSTEM ASSEMBLY FOR ALL MANUALLY CONTROLLED 4 AND 6-TON MULTIPRESSES

Fig. No.	Ref. No.	Part No.	DESCRIPTION	Quantity
13	1	25-1781-X	Valve—4-Way Assembly—C61 Series	1
13	1	25-1209-X	Valve—4-Way Assembly—CO2 Series	1

Fig. No.	Ref. No.	Part No.	DESCRIPTION	Quantity
13	1	25-1242-W	Valve—4-Way Assembly—CO3 Series	1
13	2	42305	Rings—Pressure Sealing	2
13	3		Nipple—¾ Pipe x 2⅝ Lg ex hvy (All Manual Series)	1
13	4		Nipple—½ Pipe x 3½ Lg ex hvy (C61 and CO2 Series Only)	1
13	4		Nipple—½ Pipe x 2¼ Lg ex hvy (CO3 Series Only)	1
Not Shown			Bushing—Pipe—ex hvy ¾ x ½	1
13	5	1455-10	Fitting—Compression Tube	1
13	6	1455-14	Fitting—Compression Tube	1
13	7		Screw—Hex Hd Cap ⅜—16 N.C. x 1 Lg.	4
13	8	35-10013-Z	Rod—Shipper	1
13	9		Nut—Std. Hex ½—20 N.F.	1
13	10	1224	Washer—Shakeproof lock or equivalent	1
13	11	35-10017-Z	Collar—Stop—Shipper Rod	2
13	11		Screw—Soc Hd Cap ¼—28 N.F. x ⅝ Lg (For Stop Collars)	2
13	12	35-10428-Z	Arm—Shipper Rod (Banjo Collar)	1
13	13		Screw—Soc Cone Pt Set ⅜—16 N.C. x ½ Lg.	2
13	14		Gauge—Pressure—U.S. Gauge Fig. 645, 2½ Dial, 2000 lbs. Calibrated in lbs. and tons on a 3¼ Ram, ¼ Male pipe thds, for mtg on 1½ thk panel	1
13	15	1455-4-4	Fitting	1
13	16		Tube—Seamless Copper ¼ O.D. x .032 Wall x 19½ Lg.	1
13	17	W41X4	Nut—Tube	1
13	18	320	Valve—Shut-Off Cock	1
Not Shown		35-10075-Z	Coupling—Shipper Rod (CO3 Series Only)	1

CONTROL SYSTEM ASSEMBLY FOR ALL MANUALLY CONTROLLED 8-TON MULTIPRESSES

Fig. No.	Ref. No.	Part No.	DESCRIPTION	Quantity
13	1	25-1781-X	Valve—4-Way Assembly—C61 Series	1
13	1	25-1209-X	Valve—4-Way Assembly—CO2 Series	1
13	1	25-1242-W	Valve—4-Way Assembly—CO3 Series	1
13	2	42305	Rings—Pressure Sealing	2
13	2		Nipple—¾ Pipe x 4 Lg ex hvy (All Manual Series)	1
13	4		Nipple—½ Pipe x 3½ ex hvy (C61 and CO2 Series Only)	1
13	4		Nipple—½ Pipe x 2¼ ex hvy (CO3 Series Only)	1
Not Shown			Bushing—Pipe ex hvy ¾ x ½	1
13	5	1455-10	Elbow—Tube Fitting	1
13	6	1455-14	Elbow—Tube Fitting	1
13	7		Screw—Hex Hd Cap ⅜—16 N.C. x 1 Lg.	4
13	8	35-10684-Z	Rod—Shipper	1
13	9		Nut—Standard Hex ½—20 N.F. x 1 Lg.	1
13	10		Washer—½ Shakeproof or equivalent	1
13	11	35-10017-Z	Collar Stop—Shipper Rod	2
13	11		Screw—Soc Hd Cap ¼—28 N.F. x ⅝ Lg (For Stop Collars)	2
13	12	35-10685-Z	Arm—Shipper Rod (Banjo Collar)	1
13	13		Screw—Soc Cone Pt Set ⅜—16 N.C. x ½ Lg.	2
13	14		Gauge—Pressure—U.S. Gauge Fig. 645, 3½ Dial, Range 0-3000 P.S.I. and in tons on a 3¼ Dia. ram, ¼ Male pipe thds, lower back connection for mtg on ½ thk panel	1
Not Shown			Screw—Self-tapping Type "F" No. 8—32 x ⅜ lg.	3
13	15	1405-4	Fitting—Tube	1
13	16		Tube—Seamless Copper ¼ O.D. x .032 Wall x 32" lg	1
13	17	W41X4	Nut—Tube	1
13	18	320	Valve—Gauge—Shut Off	1
Not Shown		2450	Coupling—Reducing ¼ to ⅛ 3000 lbs.	1
Not Shown		35-10075-Z	Coupling—Shipper Rod (CO3 Series Only)	1
Not Shown		35-10024-Z	Collar—Dust	1
Not Shown		35-10692-Z	Plate—Valve Spacer	1
Not Shown		42305	Rings—Pressure Sealing	2
Not Shown		35-10984-Z	Stud—Valve Mounting	4
Not Shown			Nut—Standard Hex ⅜—16 N.C.	4

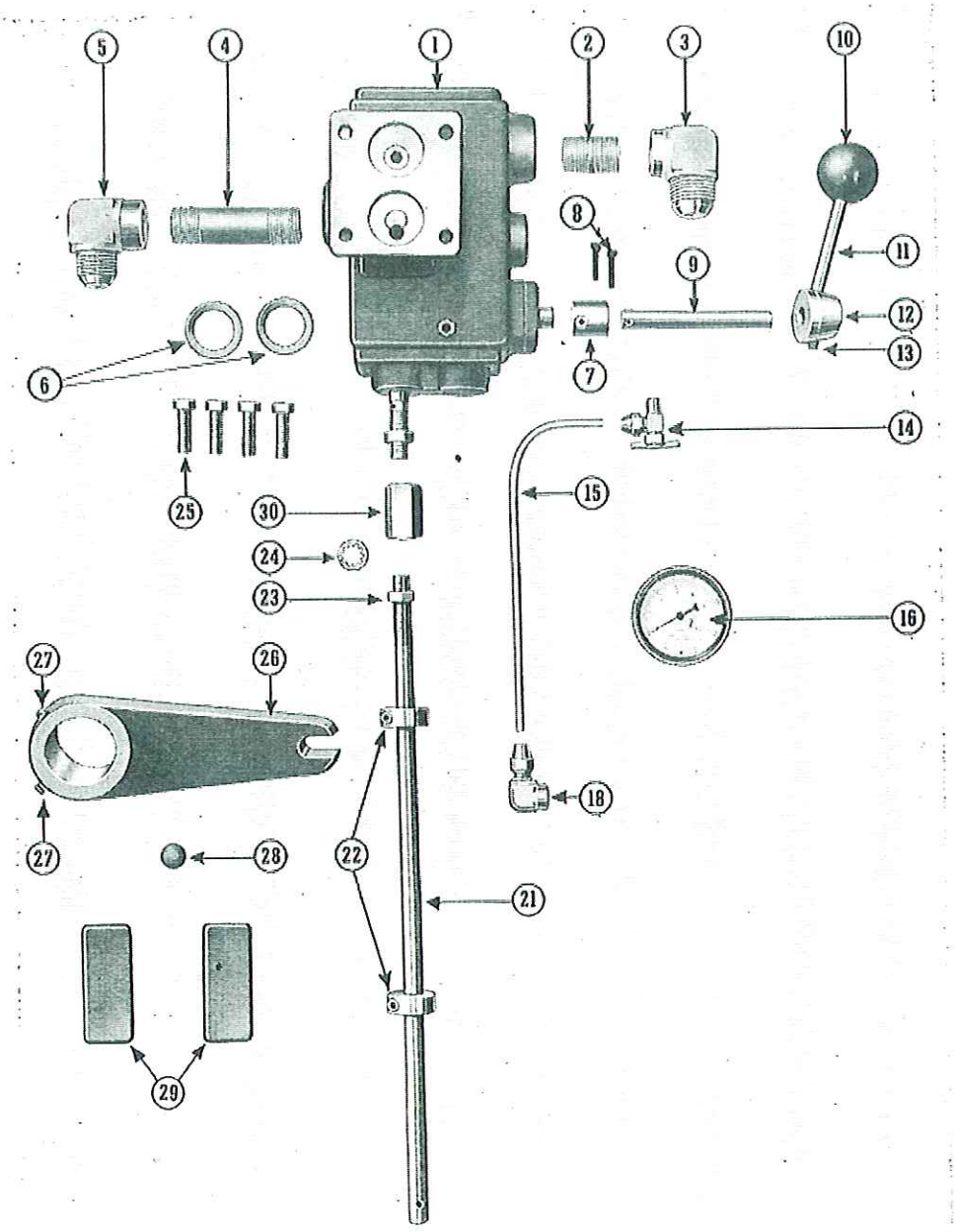


FIG. 14 Control System for C04, C09, C64 and C69 series of automatically controlled Multipresses.

CONTROL SYSTEM ASSEMBLY FOR AUTOMATICALLY CONTROLLED 4 AND 6-TON, SERIES CO4, CO9, C64, C69 MULTIPRESSES

Fig. No.	Ref. No.	Part No.	DESCRIPTION	Quantity
14	1	25-1210-X	Valve—Operating Control—CO4 Series	1
14	1	25-1211-X	Valve—Operating Control—CO9 Series	1
14	1	25-1841-X	Valve—Operating Control—C64 Series	1
14	1	25-1842-X	Valve—Operating Control—C69 Series	1
14	2		Nipple—¾ Pipe—close ex hvy	1
14	3	1455-14	Fitting—Compression Tube	1
14	4		Nipple—½ Pipe x 3½ lg. ex hvy	1
14	5	1455-10	Fitting—Compression Tube	2
14	6	42305	Ring—Pressure Sealing (On Control Valve)	1
14	7	35-10091-Z	Coupling—Valve	

Fig. No.	Ref. No.	Part No.	DESCRIPTION	Quantity
14	8		Screw—Soc Hd Cap No. 10—24 N.C. x 7/8 lg.	2
14	9	35-10089-Z	Shaft—Valve Operating	1
14	10	S-446-3	Knob—3/8—16 N.C. x 1 1/4 Deep Molded Thds	1
14	11	35-10078-Z	Stud—Special	1
14	12	35-10088-Z	Hub—Hand Lever	1
14	13		Screw—Soc Hd Set—Cup Point, 5/16—18 N.C. x 3/8	1
14	14	320	Valve—Gauge Shut-Off with W41X4 Tube Nut	1
14	15		Tube—Copper, 1/4 O.D. x .032 Wall x 19 1/2 lg.	1
14	16		Gauge—Pressure—U.S. Gauge Fig. 645, 2 1/2 Dial, 2000 lbs., Calibrated in lbs. and tons on a 3 1/4 ram, 1/4 male pipe thds, for mtg on 1 1/2 thick panel	1
14	18	1455-4-4	Fitting—Tube	1
14	21	35-10013-Z	Rod—Shipper	1
14	22	35-10017-Z	Collar—Shipper Rod—Stop	2
14	22		Screw—Soc Hd Cap, 1/4—28 N.F. x 5/8 lg (Stop Collar)	2
14	23		Nut—Standard, 1/2—20 N.F.	1
14	24	1224	Washer—Lock	1
14	25		Screw—Hex Hd Cap, 3/8—16 N.C. x 1 Lg.	4
14	26	35-10428-Z	Arm—Shipper Rod	1
14	27		Screw—Soc Cone Pt Set, 3/8—16 N.C. x 1/2 Lg.	2
14	29	35-10130-Z	Grommet—Rubber	2
14	30	35-10075-Z	Coupling—Shipper Rod	1

CONTROL SYSTEM ASSEMBLY FOR AUTOMATICALLY CONTROLLED 8-TON, SERIES CO4, CO9, C64, C69 MULTIPRESSES

Fig. No.	Ref. No.	Part No.	DESCRIPTION	Quantity
14	1	25-1210-X	Valve—Operating Control—CO4	1
14	1	25-1211-X	Valve—Operating Control—CO9	1
14	1	25-1841-X	Valve—Operating Control—C64	1
14	1	25-1842-X	Valve—Operating Control—C69	1
14	2		Nipple—3/4 Pipe x 4" Lg.	1
14	3	1455-14	Elbow—Tube fitting	1
14	4		Nipple—1/2 Pipe x 3 1/2 lg. ex hvy	1
14	5	1455-10	Elbow—Tube Fitting	1
14	6	42305	Rings—Pressure Sealing (On Control Valve)	2
14	7	35-10091-Z	Coupling—Valve	1
14	8		Screw—Soc Hd Cap, No. 10—24 N.C. x 7/8 Lg.	2
14	9	35-11076-Z	Shaft—Valve Operating	1
14	10	S-446-3	Knob—3/8—16 N.C. x 1 1/4 Deep Molded Thds	1
14	11	35-10078-Z	Stud—Special	1
14	12	35-10088-Z	Hub—Hand Lever	1
14	13		Screw—Soc Hd Set—Cup Pt—5/16—18 N.C. x 3/8	1
14	14	320	Valve—Gauge Shut-Off with W41X4 Tube Nut	1
14	15		Tube—Copper, 1/4 O.D. x .032 Wall x 32 Lg.	1
14	16		Gauge—Pressure—U.S. Gauge Fig. 645, 3 1/2 Dial, Range 0-3000 P.S.I. and in tons on a 3 1/4 Dia. ram, 1/4 male pipe thds, lower back connection for mounting on 1/2 thick panel	1
14	18	1405-4	Fitting—Tube	1
14	21	35-10684-Z	Rod—Shipper	1
14	22	35-10017-Z	Collar—Shipper Rod Stop	2
14	22		Screw—Soc Hd Cap 1/4—28 N.F. x 5/8 lg (Stop Collar)	2
14	23		Nut—Std Hex 1/2—20 N.F.	1
14	24	1224	Washer—Lock	1
14	25		Screw—Hex Hd Cap 3/8—16 N.C. x 1 Lg	4
14	26	35-10685-Z	Arm—Shipper Rod (Banjo)	1
14	27		Screw—Soc Set Cone Pt, 3/8—16 N.C. x 1/2 Lg.	2
14	28	35-10130-Z	Grommet—Rubber	2
Not Shown		35-10692-Z	Plate—Valve Spacer	1
Not Shown		42305	Ring—Pressure Sealing	2
Not Shown		35-10984-Z	Stud—Valve Mounting	4
Not Shown			Nut—Std Hex, 3/8—16 N.C. 3	4

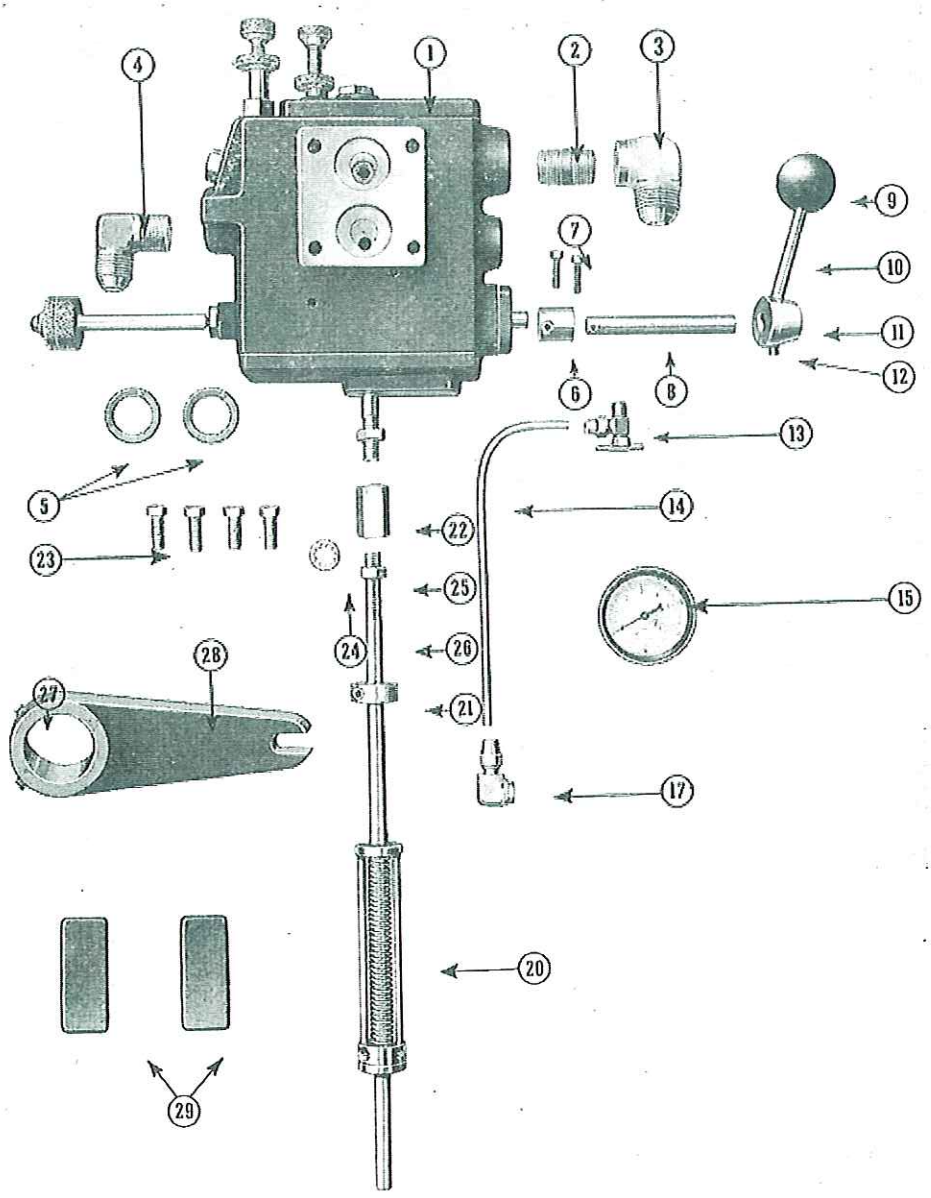


FIG. 15 Control System Assembly for C08 and C13 series of automatically controlled Multipresses.

CONTROL SYSTEM ASSEMBLY FOR AUTOMATICALLY CONTROLLED 4 AND 6-TON, SERIES CO8, C13, MULTIPRESSES

Fig. No.	Ref. No.	Part No.	DESCRIPTION	Quantity
15	1	25-1219-W	Valve—Operating Control—CO8 Series	1
15	1	25-1219-W	Valve—Operating Control—C13 Series	1
15	2	....	Nipple—¾ ex hvy close	1
15	3	1455-14	Fitting—Tube	1
15	4	1455-10	Fitting—Tube	1
Not Shown		....	Nipple—½ ex hvy close	1
15	5	42305	Rings—Pressure Sealing (On Control Valve)	2
15	6	35-10091-Z	Coupling—Valve	1
15	7	....	Screw—Soc Hd Cap No. 10—24 N.F. x ⅞ lg	2
15	8	35-10176-Z	Shaft—Valve Operating	1

Fig. No.	Ref. No.	Part. No.	DESCRIPTION	Quantity
15	9	S-446-3	Knob—3/8—16 N.C. x 1 1/4 Deep Molded Thds	1
15	10	35-10078-Z	Stud—Special	1
15	11	35-10088-Z	Hub—Hand Lever	1
15	12		Screw—Soc Hd Set—Cup Pt—5/16—18 N.C. x 3/8 lg	1
15	13	320	Valve—Gauge Shut-Off	1
15	14		Tube—Copper, 1/4 O.D. x .032 Wall x 19 1/2 lg.	
15	15		Gauge—Pressure, U.S. Gauge Fig. 645, 2 1/2 Dial, 2000 lbs., Calibrated in lbs. and tons on a 3 1/4 Dia ram, 1/4 male pipe thds for mtg on 1 1/2 thk panel	1
				1
15	17	1455-4-4	Fitting—Tube	1
15	20	25-1226-Z	Change of Ram Speed Assembly	1
15	21	35-10017-Z	Collar—Shipper Rod Stop	1
15	21		Screw—Soc Hd Cap, 1/4—28 N.F. x 5/8 lg (Stop Collar)	1
15	22	35-10075-Z	Coupling—Shipper Rod	4
15	23		Screw—Hex Hd Cap, 3/8—16 N.C. x 1 Lg	1
15	24	1224	Washer—Lock	1
15	25		Nut—Standard, 1/2—20 N.F.	1
15	26	35-10013-Z	Rod—Shipper	2
15	27		Screw—Soc Cone Pt Set, 3/8—16 N.C. x 1/2 lg (For Shipper Rod Arm)	1
15	28	35-10428-Z	Arm—Shipper Rod (Banjo)	2
15	29	35-10130-Z	Grommet—Rubber	

CONTROL SYSTEM ASSEMBLY FOR AUTOMATICALLY CONTROLLED 8-TON, SERIES CO8, C13 MULTIPRESSES

Fig. No.	Ref. No.	Part. No.	DESCRIPTION	Quantity
15	1	25-1219-W	Valve—Operating Control—CO8 Series	1
15	1	25-1219-W	Valve—Operating Control—C13 Series	1
15	2		Nipple—3/4 Std Pipe x 3 Lg	1
15	3	1455-14	Fitting—Tube	1
Not	Shown		Nipple—1/2 ex hvy close	1
15	4	1455-10	Fitting—Tube	2
15	5	42305	Rings—Pressure Sealing (On Control Valve)	1
15	6	35-10091-Z	Coupling—Valve	2
15	7		Screw—Soc Hd Cap, No. 10—24 N.C. x 7/8 Lg	1
15	8	35-11076-Z	Shaft—Valve Operating	1
15	9	S-446-3	Knob—3/8—16 N.C. x 1 1/4 Deep Molded Thds	1
15	10	35-10078-Z	Stud—Special	1
15	11	35-10088-Z	Hub—Hand Lever	1
15	12		Screw—Soc Hd Set—Cup Pt—5/16—18 N.C. x 3/8 lg	1
15	13	320	Valve—Gauge Shut-Off with W41X4 Nut	1
15	14		Tube—Copper—1/4 O.D. x .032 Wall x 32 Lg	
15	15		Gauge—Pressure—U.S. Gauge Fig. 645, 3 1/2 Dial, Range 0-3000 P.S.I. and in tons on a 3 1/4 Dia ram, 1/4 male pipe thds, lower back connection for mtg on 1/2 thk panel	1
				1
15	17	1405-4	Fitting—Tube	1
15	20	25-1226-Z	Change of Ram Speed Assembly	1
15	21	35-10017-Z	Collar—Shipper Rod Stop	1
15	21		Screw—Soc Hd Cap, 1/4—28 N.F. x 5/8 lg (Stop Collar)	1
15	22	35-10075-Z	Coupling—Shipper Rod	4
15	23		Screw—Hex Hd Cap, 3/8—16 N.C. x 1 Lg	1
15	24	1224	Washer—Lock	1
15	25		Nut—Standard 1/2—20 N.F.	1
15	26	35-10684-Z	Rod—Shipper	2
15	27		Screw—Soc Set Cone Pt, 3/8—16 N.C. x 1/2 lg (For Shipper Rod Arm)	1
15	28	35-10685-Z	Arm—Shipper Rod (Banjo)	2
15	29	35-10130-Z	Grommet—Rubber	1
Not	Shown	35-10692-Z	Plate—Valve Spacer	2
Not	Shown	42305	Rings—Pressure Sealing	4
Not	Shown	35-10984-Z	Stud—Valve Mounting	4
Not	Shown		Nut—Std Hex, 3/8—16 N.C.—3	

C-18 DUAL HAND CONTROL ASSEMBLY FOR MANUALLY OPERATED 4 AND 6-TON MULTIPRESSES

Fig. No.	Ref. No.	Part. No.	DESCRIPTION	Quantity
13	22	35-10012-Z	Singletree—Lever	1
13	23		Pin—Clevis 3/16 Dia. x 1-1/16 Effective Lg.	1
13	24		Pin—Cotter 1/16 x 3/8 Lg.	1
13	25	35-10015-Z	Shaft—Cross	1
13	26	SC50	Collar	2
13	27	35-10014-Z	Lever—Hand	2
13	28	S-446-3	Knob	2
13	29	35-10128-Z	Grommet—Syn. Rubber	2

C-21 DUAL HAND CONTROL ASSEMBLY FOR MANUALLY OPERATED 8-TON MULTIPRESS

		25-1388-X	Control—Dual Hand	..
13	29	35-10128-Z	Grommet Rubber	2
13	27	35-10690-Z	Lever—Hand	2
13	28	S-446-3	Knob with 3/8"—16 N.C. 2 Molded Thds	2
13	25	35-10691-Z	Shaft—Cross—1/2" Dia. x 21 1/2" Lg.	1
13	26	SC-50	Collar	2
13	22	35-10689-Z	Lever—Control	1
13	23		Pin—Clevis—3/16" Dia. x 1-1/16" Effective Lg.	1
13	24		Pin—Cotter—1/16" x 3/8" Lg.	1

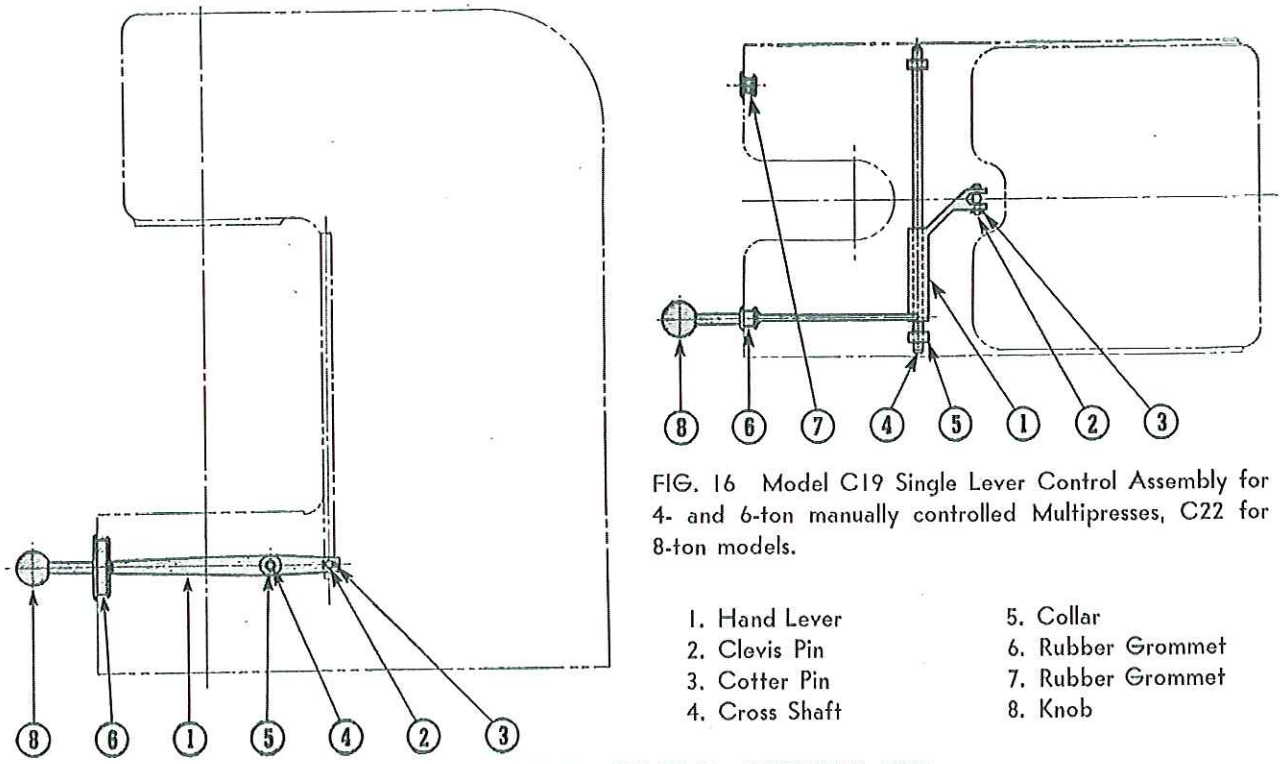


FIG. 16 Model C19 Single Lever Control Assembly for 4- and 6-ton manually controlled Multipresses, C22 for 8-ton models.

1. Hand Lever
2. Clevis Pin
3. Cotter Pin
4. Cross Shaft
5. Collar
6. Rubber Grommet
7. Rubber Grommet
8. Knob

C-19 SINGLE LEVER CONTROL ASSEMBLY FOR MANUALLY OPERATED 4 AND 6-TON MULTIPRESSES

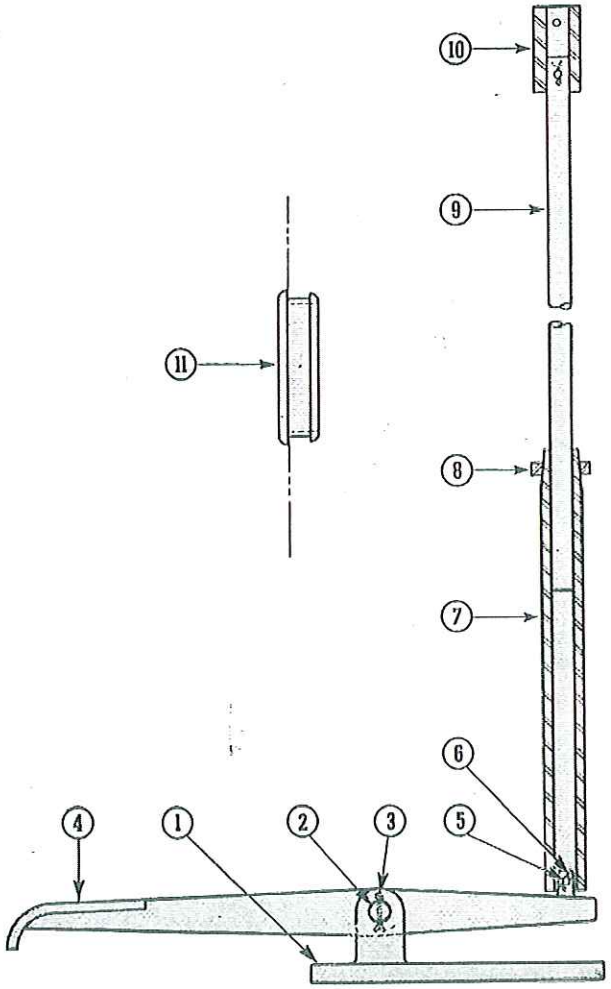
		25-1227-X	Accessories—Manual Control (Single Lever)	..
16	1	35-10216-Y	Lever—Hand	1
16	2		Pin—Clevis 3/16" Dia. x 1-1/16" Lg.	1
16	3		Pin—Cotter 1/16" Dia. x 3/8" Lg.	1
16	4	35-10015-Z	Shaft—Cross	1
16	5	SC-50	Collar	2
16	6	35-10128-Z	Grommet—Rubber—Syn.	1
16	7	35-10130-Z	Grommet—Rubber—Syn.	1
16	8	S-446-3	Knob	1

C-22 SINGLE LEVER CONTROL ASSEMBLY FOR MANUALLY OPERATED 8-TON MULTIPRESS

Fig. No.	Ref. No.	Part. No.	DESCRIPTION	Quantity
		25-1495-X	Control—Single Lever	..
Not	Shown	35-11731-Y	Arm—Control	1
16	2		Pin—Clevis 3/16" Dia. x 1-1/16" Effective Lg.	1
16	3		Pin—Cotter 1/16" x 3/8" Lg.	1
Not	Shown		Screw—Soc. Set 1/4"—20 N.C. x 3/8" Lg.	1
16	1	35-11730-Z	Lever—Hand 1/2" Dia. x 14" Lg.	1
16	8	S-446-3	Knob—Kurz-Kasch with 3/8"—16 N.C. Molded Thds.	1
16	6	35-10128-Z	Grommet—Henrite Products Co.	1
16	7	35-10130-Z	Grommet—Henrite Products Co.	1
16	4	35-10691-Z	Shaft—Cross 1/2" Dia. x 21 1/2" Lg.	1

C-17 FOOT PEDAL CONTROL ASSEMBLY FOR MANUALLY OPERATED 4 AND 6-TON MULTIPRESSES

		25-1228-Y	Control—Foot Pedal Assembly	..
17	1	35-10221-Z	Bracket—Foot Pedal	1
17	2	D-7453-Z	Pin—Clevis	1
17	3		Pin—Cotter 3/32" x 3/4" Lg.	2
17	4	35-10220-Z	Pedal—Foot	1
17	5		Pin—Clevis 3/16" Dia. x 1-1/16" Effective Lg.	2
17	6		Pin—Cotter 1/16" Dia. x 3/8" Lg.	2
17	7	35-10218-Z	Coupling Adjustable	1
17	8		Nut—1/2" Pipe Lock	1
17	9	35-10217-Z	Rod—Shipper	1
17	10	35-10219-Z	Coupling	1
17	11	35-10130-Z	Grommet—Syn. Rubber	2



1. Foot Pedal Bracket
2. Clevis Pin
3. Cotter Pin
4. Foot Pedal
5. Clevis Pin
6. Cotter Pin
7. Adjustable Coupling
8. Pipe Lock Nut
9. Shipper Rod
10. Coupling
11. Rubber Grommet

FIG. 17 Model C17 Foot Pedal Control Assembly for 4- and 6-ton manually controlled Multipresses, C29 for 8-ton models.

C-29 FOOT PEDAL CONTROL ASSEMBLY FOR MANUALLY OPERATED 8-TON MULTIPRESS

Fig. No.	Ref. No.	Part. No.	DESCRIPTION	Quantity
		25-1475-Z	Control—Foot Pedal	--
17	1	35-10221-Z	Bracket—Foot Pedal	1
17	2	D-7453-Z	Pin—Clevis, 1/2" Dia. x 1 3/4" Lg.	1
17	3		Pin—Cotter, 3/32" x 3/4" Lg.	2
17	4	35-11654-Y	Pedal—Foot	1
17	5		Pin—Clevis, 3/16" Dia. x 1-1/16" Effective Lg.	2
17	6		Pin—Cotter, 1/16" Dia. x 3/8" Lg.	2
17	7	35-10218-Z	Coupling—Adjustable, 1/2" Pipe 9 1/2" Lg.	1
17	8		Nut—1/2" Pipe Lock	1
17	9	35-11653-Z	Rod—Shipper,	1
17	10	35-10219-Z	Coupling—	1
17	11	35-10130-Z	Grommet—Rubber	2

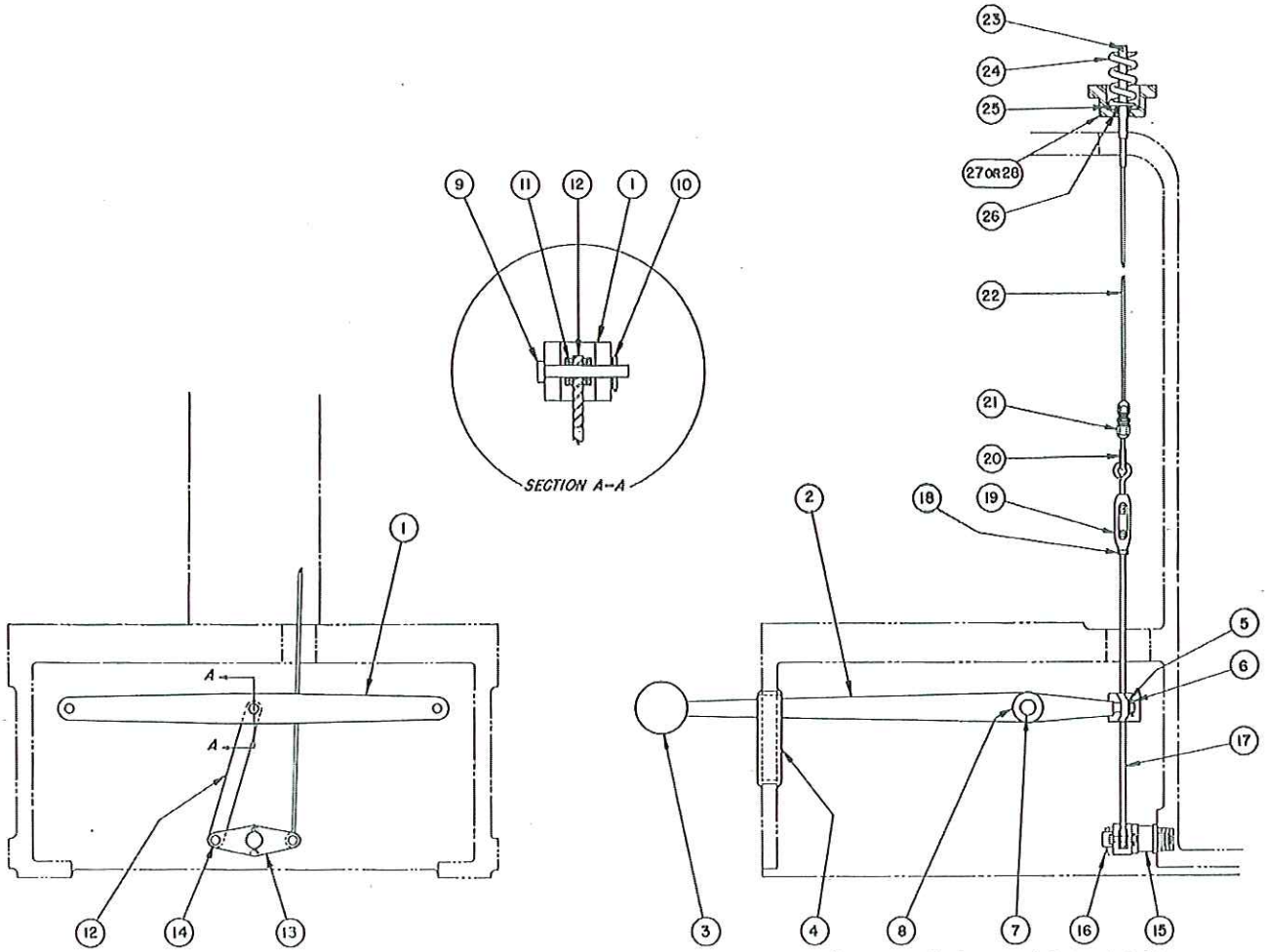


FIG. 18 Model C28 Dual Handle Cable Control Assembly for all automatically controlled 4- and 6-ton Multipresses.

C28 DUAL HANDLE CABLE CONTROL FOR 4 AND 6 TON AUTOMATIC MODELS ONLY ASSEMBLY 25-1573-X

Fig. No.	Ref. No.	Part. No.	DESCRIPTION	Quantity
18	1	35-10012-Z	Lever—Control	1
18	2	35-11993-Z	Lever—Hand	2
18	3	S-446-3	Knob—With 3/8 N.C. Molded Thds.	2
18	4	35-10128-Z	Grommet	2
18	5	D-6126-Z	Washer	2

Fig. No.	Ref. No.	Part. No.	DESCRIPTION	Quantity
18	6		Pin—Cotter—1/16 Dia. x 1/2	2
18	7	35-10015-Z	Shaft—Cross	1
18	8	SC-50	Collar	4
18	9		Pin—Clevis 3/16 Dia. x 1-31/32 Effective Length	1
18	10		Pin—Cotter 1/16 Dia. x 3/8	3
18	11		Washer—No. 10 S.A.E. Std.	4
18	12	35-11991-Z	Link	1
18	13	35-11990-Z	Arm—Rocker	1
18	14		Pin—Clevis 3/16 Dia x 21/32 Effective Length	2
18	15	35-11741-Z	Pin	1
18	16		Pin—Cotter 1/8 Dia. x 1	1
18	17	35-11992-Z	Link	1
18	18		Nut—Hex—8—32 N.C.	1
18	19		Turnbuckle—8—32 N.C. x 1 1/4 Takeup—Eye with L. H. Thds. One End	1
18	20	AN-100-3	Thimble	1
18	21		Clamp—Wire Rope for 3/32 Cable	1
18	22	25-1340-Z	Cable	1
18	23		Pin—3/32 Dia. x 1/2	1
18	24	35-11136-Z	Spring—Compression	1
18	25	35-10853-Z	Washer	1
18	26	AN-6227-5	Packing "O" Ring	1
			NOTE: Use Following Item With CO4, CO9, C64 and C69 Valves	
18	27	35-10834-Y	Cap—End (Detail 35-10076-Z on Valve Not Used)	1
			NOTE: Use Following Item With CO8 and C13 Valves	
18	28	35-10835-Y	Cap—End (Detail 35-10175-Y on Valve Not Used)	1

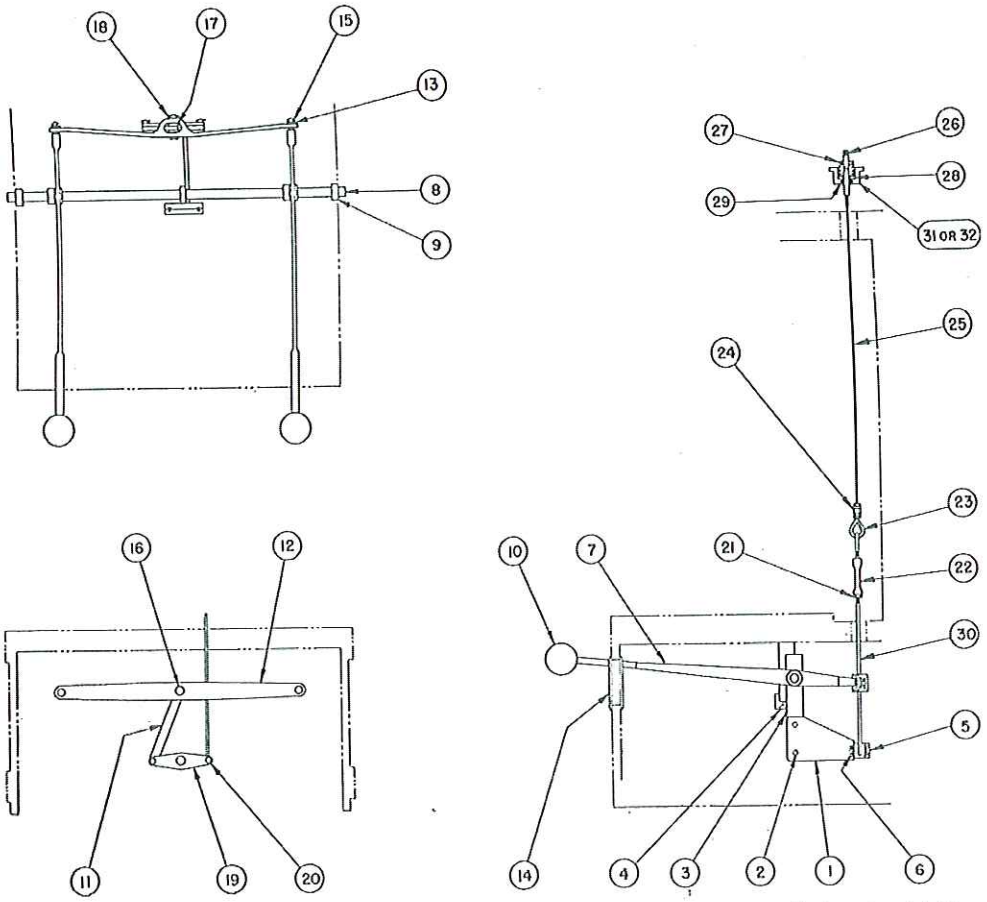


FIG. 19 Model C31 Dual Handle Cable Control Assembly for all automatically controlled 8-ton Multipresses.

C31 DUAL HANDLE CABLE CONTROL FOR 8 TON AUTOMATIC MODELS ONLY
ASSEMBLY 25-1574-X

Fig. No.	Ref. No.	Part. No.	DESCRIPTION	Quan.
19	1	35-11750-Z	Bracket	1
19	2		Screws—Hex. Hd. Cap 1/4—20 N.C. x 5/8	2
19	3	35-11995-Z	Strap	1
19	4		Screw—Soc. Set, Cone Pt. 1/4—20 N.C. x 1/2	2
19	5	35-11997-Z	Bolt—Shoulder	1
19	6		Nut 3/8—16 N.C. Std. Hex.	1
19	7	35-11749-Z	Lever—Hand	2
19	8	35-10691-Z	Shaft—Cross	1
19	9	SC-50	Collar	4
19	10	S-446-3	Knob—With 3/8—16 N.C. Thd.	2
19	11	35-11991-Z	Link	1
19	12	35-10689-Z	Lever—Control	1
19	13		Washer—1/4 S.A.E. Std.	2
19	14	35-10128-Z	Grommet	2
19	15		Pin—Cotter—1/16 Dia x 1/2	2
19	16	AN-393-35	Pin—3/16 x 1-3/32 Effective Length	1
19	17		Washer—No. 10 S.A.E. Std.	4
18	18		Pin—Cotter—1/16 x 3/8	3
19	19	35-11996-Z	Arm—Roller	1
19	20	AN-393-21	Pin—3/16 x 21/32—Effective Length	2
19	21		Nut—Hex No. 8—32 N.C.	1
19	22		Turnbuckle—No. 8—32 N.C. x 1 1/4 Takeup—Eye With Left Hand Thds one end	1
19	23	AN-100-3	Thimble	1
19	24		Clamp—Wire Rope For 3/32 Cable	1
19	25	25-1340-Z	Cable	1
19	26		Pin—3/32 Dia. x 1/2	1
19	27	35-11136-Z	Spring—Compression	1
19	28	35-10853-Z	Washer	1
19	29	AN-6227-5	Packing—"O" Ring 3/8 O.D. x 1/4 I.D.	1
19	30	35-11992-Z	Link	1
			NOTE: Use Following Item With CO4, CO9 Valves	
19	31	35-10834-Y	Cap—End (Detail 35-10076-Z on Valve Not Used)	1
			NOTE: Use Following Item With CO8 and C13 Valves	
19	32	35-10835-Y	Cap—End (Detail 35-10175-Y on Valve Not Used)	1

C40 CABLE-TYPE FOOT PEDAL CONTROL FOR 4, 6 AND 8 TON AUTOMATIC MODELS ONLY
ASSEMBLY 25-1600-X

Fig. No.	Ref. No.	Part. No.	DESCRIPTION	Quantity
20	1	35-12121-Y	Bracket—Pedal	1
20	2	35-12125-Z	Cam	1
20	3		Screw—Soc. Hd. Cap—1/4—20 N.C. x 1/2	2
20	4	35-12005-Y-21	Spring—Compression	1
20	5	35-12122-Y	Pedal	1
20	6	AN-394-67	Pin	1
20	7		Pin—Cotter—1/16 Dia. x 1/2	3
20	8		Screw—Soc. Hd. Cap—3/8—16 N.C. x 1/2	1
20	9	35-12123-Z	Latch	1
20	10		Screw—Soc. Hd. Cap—1/4—20 N.C. x 1 1/4	1
20	11	29U040	Nut—Elastic Stop—1/4 20 N.C.	2
20	12	35-12130-Z	Link	1
20	13	AN-394-23	Pin	1
20	14	35-12124-Z	Link	1
20	15	AN-394-25	Pin	1
20	16	35-12126-Z	Spring—Tension	1
20	17		Screw—Soc. Hd. Cap—1/4—20 N.C. x 1	1
20	18		Turnbuckle—Eye and Eye—No. 8—32 N.C. x 1 1/4 Take Up	1
20	19		Nut—Hex—No. 8—32 N.C.	1

	Ref. No.	Part. No.	DESCRIPTION	Quantity
	20	AN-100-3	Thimble	1
20	21		Clamp—Wire Rope for 3/32 Dia. Cable	1
20	22	25-1340-Z	Cable	1
20	23	AN-6227-5	Packing—"O" Ring	1
20	24	35-10853-Z	Washer	1
20	25	35-11136-Z	Spring—Compression	1
20	26		Pin—3/32 Dia. x 1/2	1
		NOTE: Use Following Item With CO4, CO9, C64 and C69 Valves		
20	27	35-10834-Y	Cap—End (Detail 35-10076-Z on Valve Not Used)	1
		NOTE: Use Following Item With CO8 and C13 Valves		
20	28	35-10835-Y	Cap—End (Detail 35-10175-Y on Valve Not Used)	1

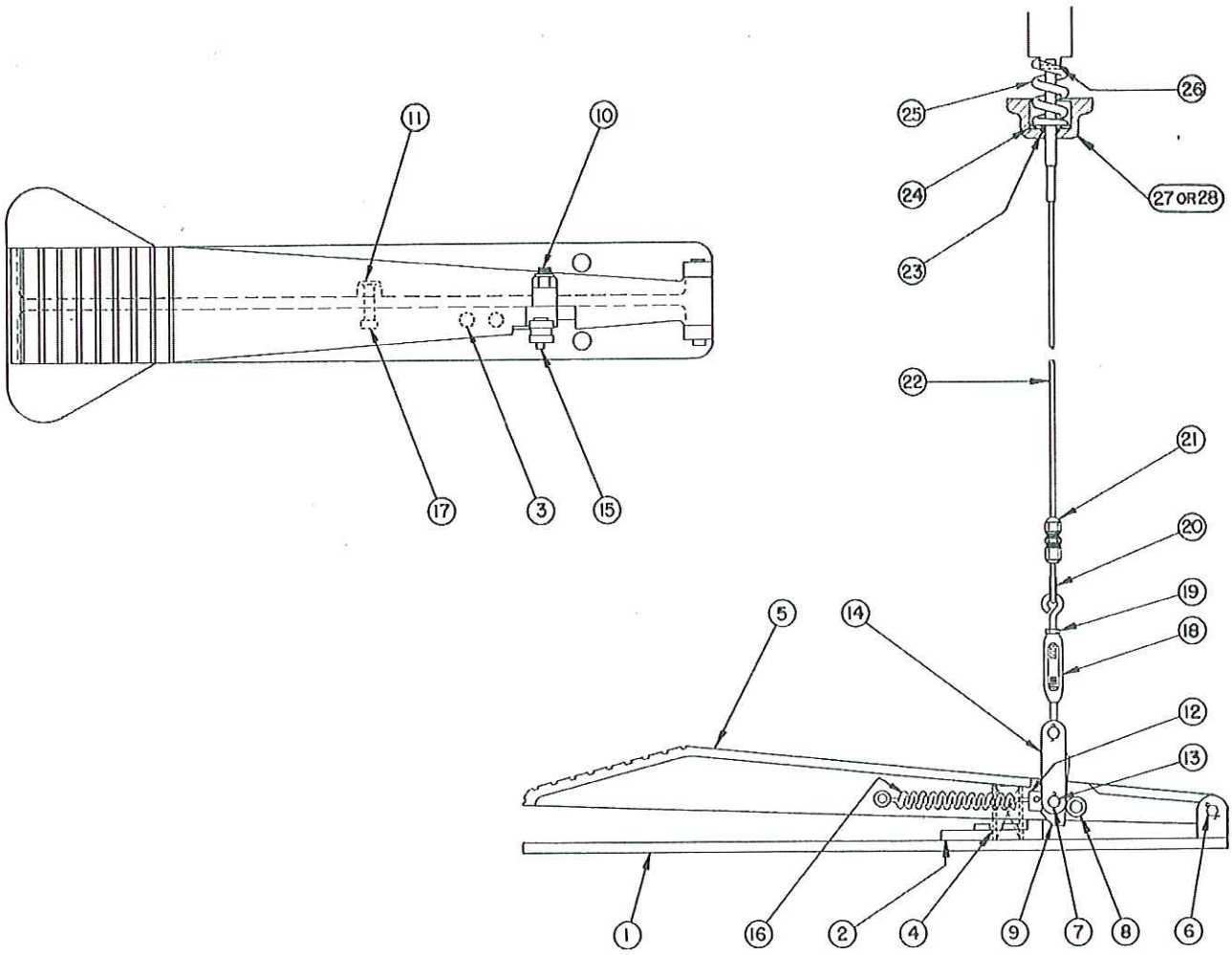


FIG. 20 Model C40 Cable Type Foot Pedal Control Assembly for all automatically controlled 4-, 6- and 8-ton Multipresses.

NOTE: Position of 3/8 - 16 N.C. x 1/2 lg. Soc. Hd. Cap Screw and Cam (35-12125-Z) shown for continuous cycling operations. Place screw in opposite side and move cam (35-12125-Z) forward for single cycle operations.