

MULTIPRESS®

service information

MULTIPRESS SERVICE INSTRUCTIONS FOR

B, D, F, G, and H10 Frame Sizes

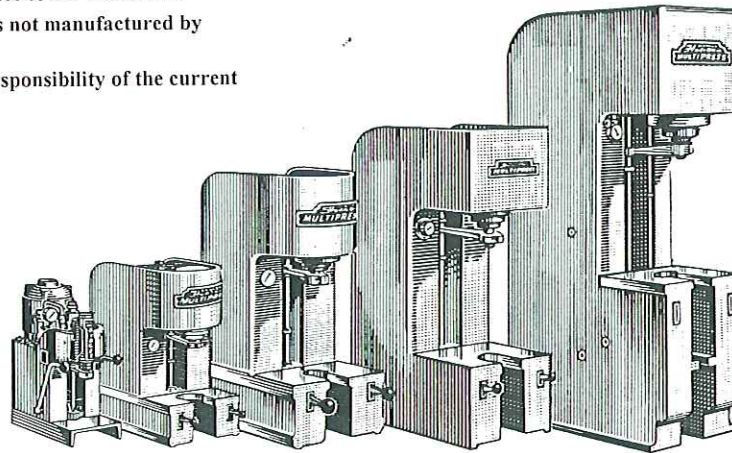
NOTE: NOT ALL PARTS SHOWN IN THIS BOOK ARE AVAILABLE.

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.



INTRODUCTION

This manual is intended for reference in the normal maintenance, repair and upkeep of your Multipress. Each major component and parts within

that component are covered in the following pages and complete parts lists are shown for all models through 10-ton capacity.

MULTIPRESS MODEL NUMBERS

1 Ton	2 Ton	3 Ton	4 Ton	5 Ton	6 Ton	8 Ton	10 Ton
BA1	DB2	DC3	DA4	GD5	DE6	FE8	GA10
BB1	DD2		DB4	HE5	DF6	FF8	GB10
BC1	FD2		DF4		DG6	FG8	GC10
BD1			DH4		DJ6		HB10
BE1			DK4		DK6		HC10
BE1			DM4		DL6		HD10
BG1			FA4				
			FB4				
			FC4				
			FH4				

The model number of your press indicates the components used in its make-up. It includes frame size, cylinder and pumping unit combination, type

of control valve and operating controls.

For example:

DF4 C04 C20

D
Frame
Size

F
Cylinder and
Pump Unit
Combination

4
Tonnage
Capacity

C04
Control
Valve

C20
Operating
Control

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 or by qualified factory representative, is proven defective in workmanship or material, will be replaced free of charge.

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 established rate per day plus 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.

Current characteristics are required at time of order dictated by the characteristics of the users' current. In any event, a motor starter corresponding to the voltage of the electric motor in the press should be used. A transformer is recommended for use with the motor start and stop pushbutton switch. Motor starter and transformer are not standard Multipress equipment but are supplied upon receipt of specifications.

INSTALLATION and PREPARATION FOR USE

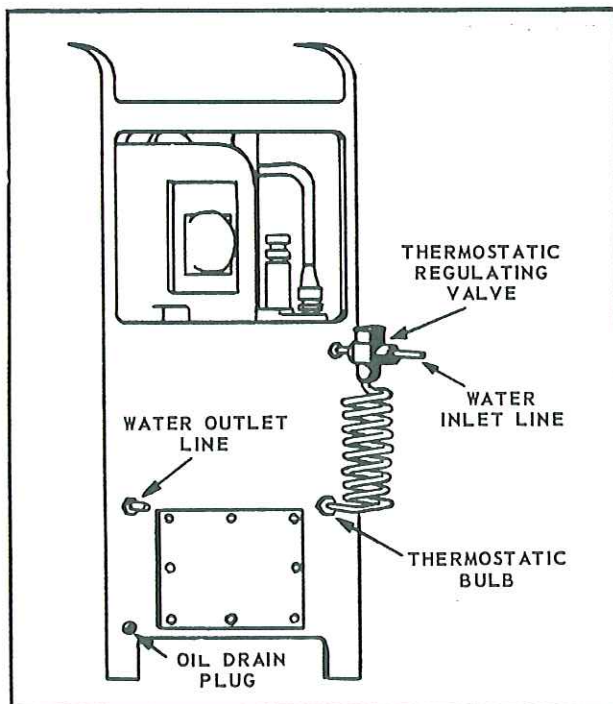


FIG. 1
REAR VIEW OF MULTIPRESS
SHOWING TYPICAL INSTALLATION OF THERMOSTATIC
CONTROLS FOR WATER COOLED OIL RESERVOIR SYSTEM

INSTALLATION OF THERMOSTATIC WATER REGULATING VALVE WITH THERMOSTATIC BULB. All manually controlled CO3 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.*

1. Remove 1/4" pipe plugs at upper right and lower left, in rear of Multipress.
2. Remove 3/4" 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.

For installation of thermostatic bulb on "H" frame presses, bulb is installed in center hole below access door. Water line connections, inlet and outlet can be installed in either hole opposite center hole.

APPROVED HYDRAULIC OILS FOR USE IN DENISON PRODUCTS

The controls on most of the Multipresses and special equipment manufactured 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 too, that was 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 recommended.

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

Viscosity @ 100° F	300 SUS/plus or minus 15 SUS
Viscosity Index	90 or higher
Rust and Oxidation Inhibitors	Yes
Anti-foam Additive	Yes
API Gravity	27 Minimum

NOTE: It is recommended but not necessary that the fluid contain anti-wear additive. To provide minimum noise and greater life the hydraulic fluid for the Multipress should contain a minimum of 0.05% by weight of zinc and a minimum of 0.05% by weight of phosphorous content as zinc dithiophosphate or an amount of other anti-wear additive which will impart equal properties to the fluid.

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

When connecting water lines to rear of press, be sure to hold bushings in press frame with a wrench to prevent them from turning. These bushings are connected to the cooling coils within the reservoir and if the bushing is allowed to turn, the coils may be damaged. The thermostatic regulating valve is set to open at 110° F.

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 owners and operator many times in low maintenance costs and trouble-free operation.

The oil reservoir is filled through the oil filler pipe. Break the seal on the oil filler pipe cap and remove it. The oil reservoirs of the various frame size presses should be filled with the following

quantities of oil: *B Frame* - 5 gals., *D Frame* - 11 gals., *F Frame* - 35 gals., *G Frame* - 35 gals., *H Frame* - 55 gals.

Always use *clean* oil of the highest quality as indicated by the lubricant specification tag located at the rear of the press. 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. Sufficient oil is in the reservoir when the oil level indicator, colored red, has risen approximately 1 inch and is floating. "H" frame press reservoirs should be filled until dial indicator reads full, or when the oil level is approximately 1½ inches from the motor mounting plate.

All of the oils listed on page 3 meet specifications. They have a minimum Viscosity Index of 90 and Viscosity of approximately 300 S.S.U. at 100° F.

Direction of pump rotation is 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 opera-

tion, 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 or scored parts. To reverse motor rotation, reverse the electrical connections either at motor conduit box or motor starter.

The pump utilizes the 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.

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 mis-handling in shipment or installation.

Lower and raise the press ram in full strokes two or three times by operating control mechanism to flush air from system. Check pressure by opening shut-off gauge valve and read 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, allow ram to bottom. Then adjust relief valve to required pressure (see description of the Relief Valve, Page 18). 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. This will greatly prolong the life of the pressure gauge. **THIS IS NOT A PRODUCTION TYPE GAUGE.**

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 or

on solenoid operated manual valves.

It is very important that the upper shipper rod collar, on all models, be set in a position so that the shipper rod arm is approximately 3/4 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 to tank at minimum pressure. This prevents possible over-heating of the press. Cap screws in the collars must be securely tightened to prevent slippage.

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.

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. See Fig. 2 below. 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.

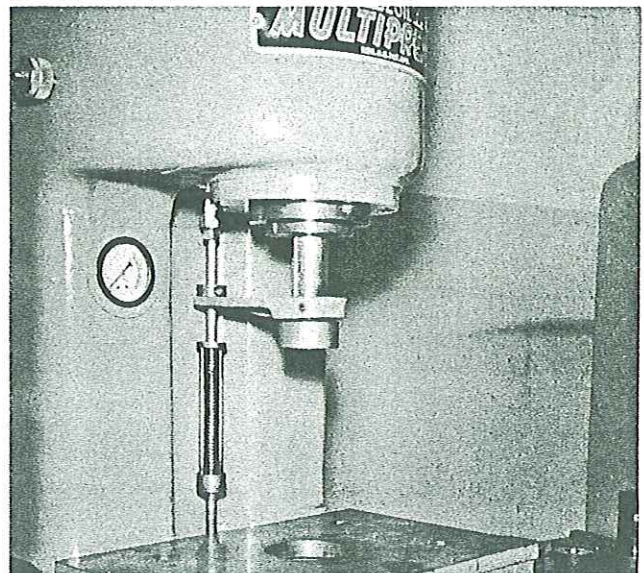


FIG. 2
"POINT-OF-RAM-SPEED-CHANGE" DEVICE

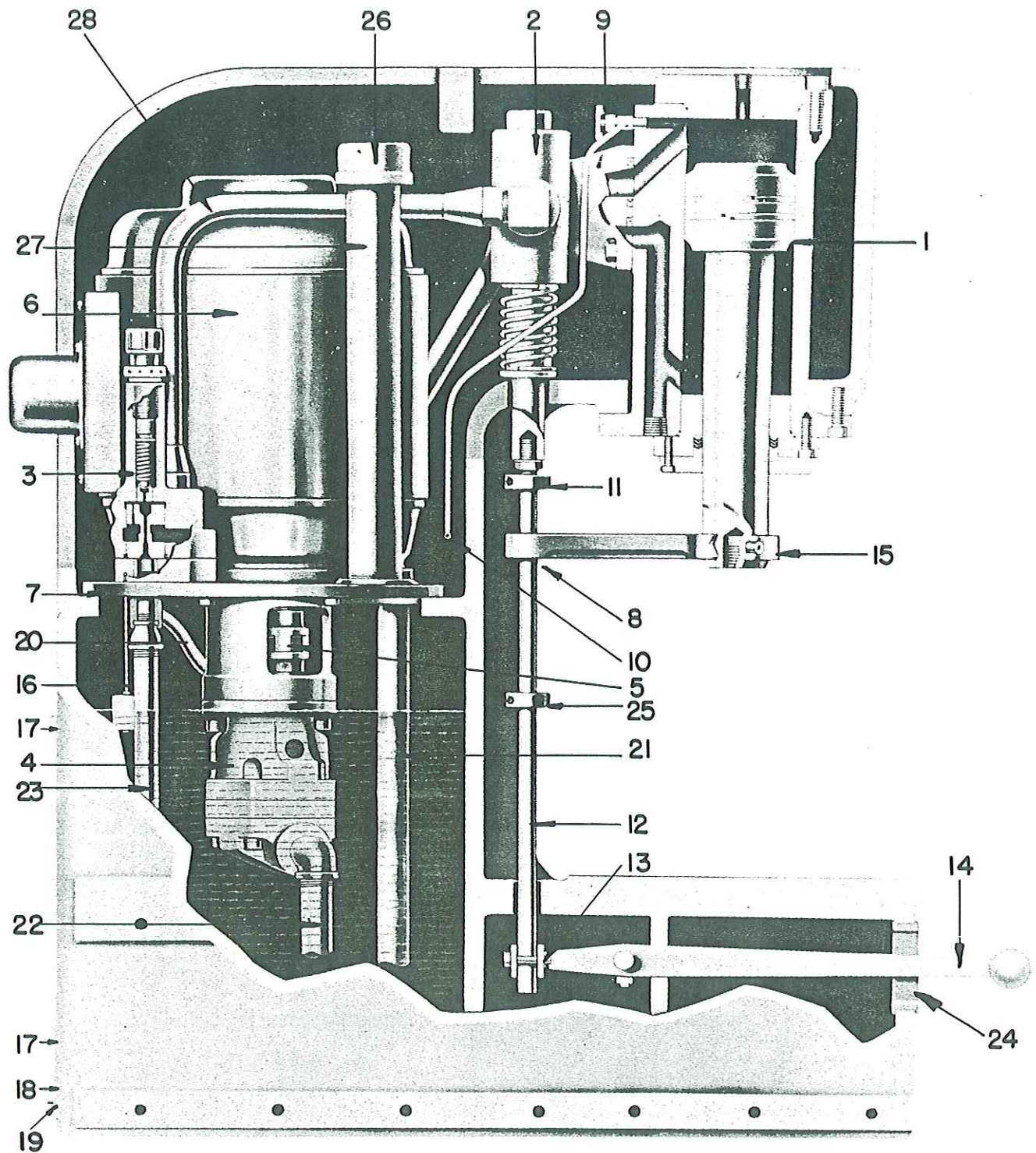


FIG. 3 - CUTAWAY VIEW SHOWING ALL COMPONENT PARTS OF THE C01 MANUALLY CONTROLLED MULTIPRESS. ALL MULTIPRESSES ARE OF THE SAME BASIC DESIGN.

- | | | | |
|---|---------------------------|---|--|
| 1. Hydraulic Cylinder | 7. Mounting Plate | 16. Oil Level Gauge | 21. Return Line (Tank Line) |
| 2. Four-way Control Valve
(Model C01 - See parts
list for valves of other
models.) | 8. Pressure Gauge | 17. Water Connections
(Used only when cooling
coils are installed in
reservoir for thermostatic
cooling.) | 22. Pump Suction Line |
| 3. Pressure Relief Valve | 9. Gauge Shutoff | | 23. Relief Valve Return Line |
| 4. Hydraulic Pump | 10. Gauge Line | | 24. Rubber Grommets |
| 5. Flexible Coupling | 11. Stop Collar | | 25. Stop Collar (Lower) |
| 6. Electric Motor | 12. Shipper Rod | | 26. Filler Cap |
| | 13. Singletree | | 27. Oil Filler Pipe |
| | 14. Hand Lever Arm | | 28. Pressure Line from
Relief Valve |
| | 15. Ram Guide (Banjo Arm) | | |
| | | 18. Drain Plug | |
| | | 19. Thermostatic Bulb Conn. | |
| | | 20. Pump Pressure Line | |

MULTIPRESS CONTROL VALVES

C01

This is the basic, manual control valve. Available with either foot pedal or hand lever safety controls for the operation of the press ram. Dual hand lever control is standard unless otherwise specified.

C61

Same as C01 except used with differential circuit. This feature increases approach speed of ram approximately 165%. Return speed remains same as standard.

C02

Offers controlled pressing speed of ram. Choice of foot pedal or hand lever controls. Ram will descend at full speed or at controlled pressing speed, apply preset pressure and return at full return speed. Choice of control levers as above.

C03

Features manual control of ram with adjustable length vibratory strokes – short, repeat strokes that are applied upon the work as long as control levers are depressed. These repeat strokes are of full preset tonnage and are used where consecutive applications of pressure are necessary. Vibratory strokes may be adjusted "out" for straight ram cycling if desired. Choice of control levers.

C04

Basic automatic press. Features choice of either automatic or single cycling of press ram. Ram will reverse upon attaining preset pressure automatically whether applied on work or against stroke length control. This feature provides automatic reversal of ram for either distance or pressure requirements.

C64

Same as C04 except it includes different circuit. This feature increases approach speed of ram approximately 165%. Return speed remains as standard.

C57

The C57 servo valve is a valve that through its unique linkage with the hand control gives instant response ram action. The use of this valve gives extremely close control over ram speed.

C09

Automatic cycling identical to C04 control except provision is made for the interlocking of hydraulic accessories through control system of press.

C69

Automatic cycling identical to C64 control except provision is made for the interlocking of hydraulic accessories through control system of press.

C08

Automatic cycling plus vibratory repeat strokes which may be regulated both for length and number. For example, ram may be preset to descend, exert preset pressure, and then make short repeat pressure strokes upon work of any number between 1 and 10. The ram returns to its retracted position automatically.

C13

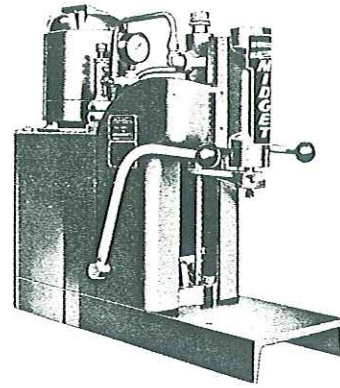
Automatic cycling identical to C08 control (including vibratory repeat strokes) except provision is made for interlock of hydraulic accessories through control system of press.

PRESS		CYLINDER				MOTOR-PUMP ASSY.				PRESS		CYLINDER				MOTOR-PUMP ASSY.			
Model	Cap	Piston	Ram	Stroke	Threads Ram End	GPM	Type	PSI	HP	Model	Cap	Piston	Ram	Stroke	Threads Ram End	GPM	Type	PSI	HP
BA1						2	Vane	1130	1½	DJ6	6				7/8-9 NC	3	Vane	1450	3
BB1						3	Vane	1130	1½	DK6	6	¾	2	12	1½ Deep	7	Vane	1450	5
BC1						2	Vane	1130	1½	DL6	6					9	Vane	1450	5
BD1	1	1½	7/8	6	1/2-13 NC 1-1/8 Deep	3	Vane	1130	1½	FD2	2					11	Vane	1000	7½
BE1						2	Vane	1130	1½	FA4	4					3	Vane	2000	7½
BF1						3	Vane	1130	1½	FB4	4	2¼	1-3/8	12		7	Vane	2000	7½
BG1	BASE & MOTOR-PUMP ASSY. NOT INCLUDED									FC4	4					9	Vane	2000	7½
DB2	2					7	Vane	1000	3	FH4	4					11	Vane	1000	7½
DD2	2					11	Vane	1000	5	FE8	8	¾	2	12	7/8-9 NC	¾	Vane	1930	7½
DC3	3	2¼	1-3/8	6	1½ Deep	9	Vane	1500	5	FF8	8					7¼	Vane	1930	7½
DA4	4					3	Vane	2000	3	FG8	8				1¼ Deep	9	Vane	1930	7½
DB4	4					7	Vane	2000	5	GD5	5					11	Vane	1000	7½
DF4	4					7	Vane	970	3	GA10	10					3	Vane	1940	7½
DH4	4					11	Vane	970	5	GB10	10					7	Vane	1940	7½
DE6	6	¾	2	6		3	Vane	1450	3	GC10	10	3-5/8	2	12		9	Vane	1940	7½
DF6	6					7	Vane	1450	5	HE5	5					11	Vane	970	7½
DG6	6					9	Vane	1450	5	HB10	10					3	Vane	1940	7½
DK4	4	¾	2	12		7	Vane	970	3	HC10	10					7	Vane	1940	7½
DM4	4					11	Vane	970	5	HD10	10					9	Vane	1940	7½

CHART SHOWING CHARACTERISTICS OF B, D, F, G AND H SERIES PRESSES

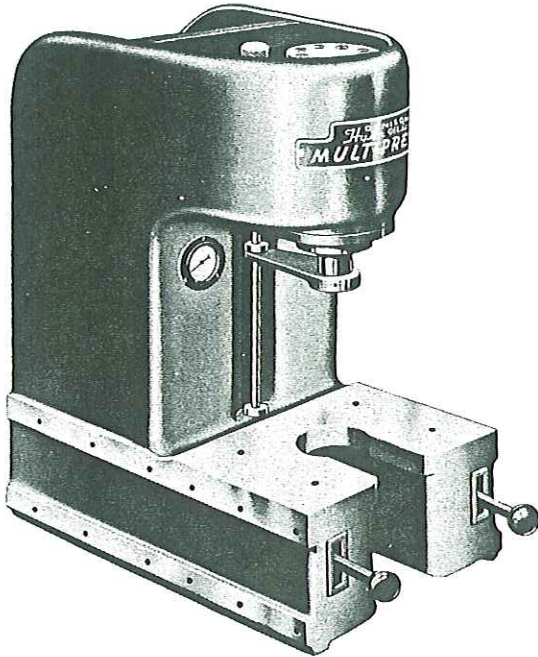
MULTIPRESS FRAMES

Multipress frames are divided into two groups — the bench size group and the floor models. The bench size presses are classed B, D, F, and G frames, while the floor model is designated as H frame. All frames are of the same type differing only in overall dimensions. The size of the frame is dictated by the daylight and maximum tonnage for which it is designed.



B FRAME

This is the smallest of the bench size presses. The B frame press is supplied for three different types of mountings as shown in the chart. Because of its extremely small size, and unlike the other reservoir base bench size units, the B frame presses have separate pumping units which are independent of the press frame. These pumping units are to the rear of the press and are mounted on the same base as the press frame, as shown by the illustration.

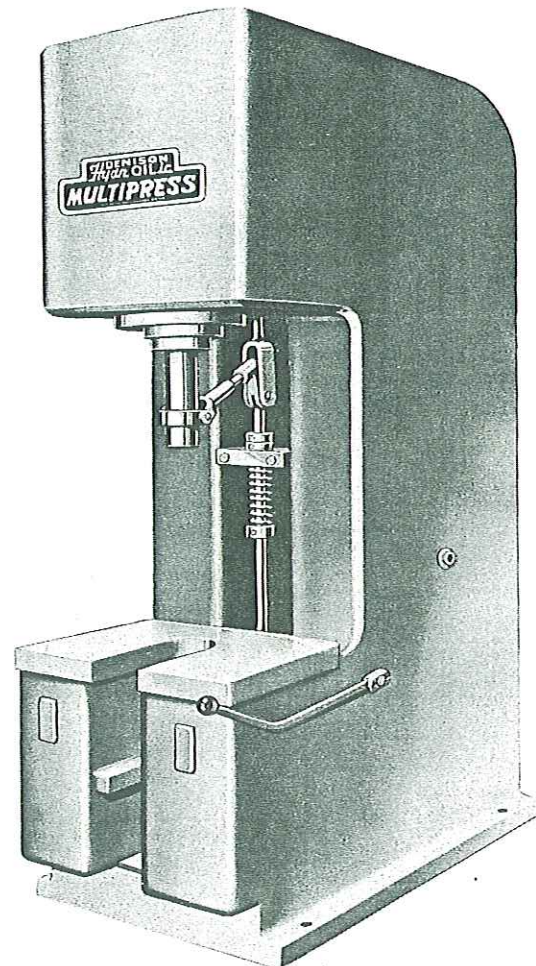


D, F AND G FRAMES

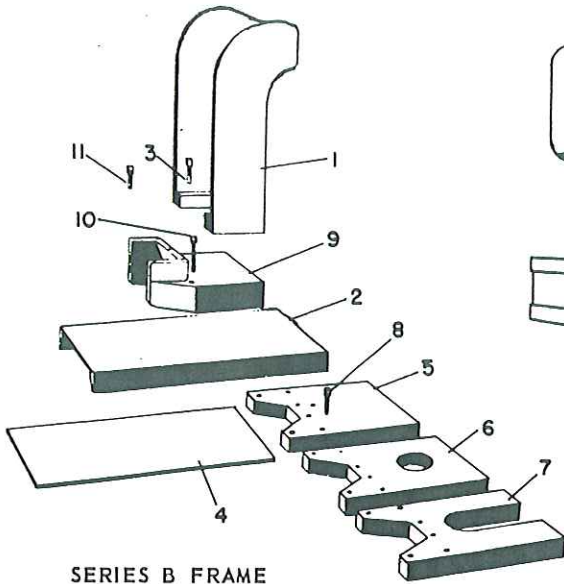
These Multipress frames are self-contained units differing only in overall size, daylight and maximum tonnage capacities. They are of conventional open throat, C-type design, each available for interchangeable pumping units, cylinders, control valves and operating controls.

H FRAME

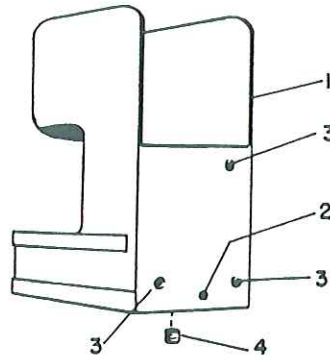
Consisting of models HE5, HB10, HC10 and HD10. The H series is very similar to the other frames described. Being of floor model type it is, of course, larger than the others in every respect. However, its component parts such as the pumping unit and cylinder are of basically the same design and are assembled in a manner similar to the others.



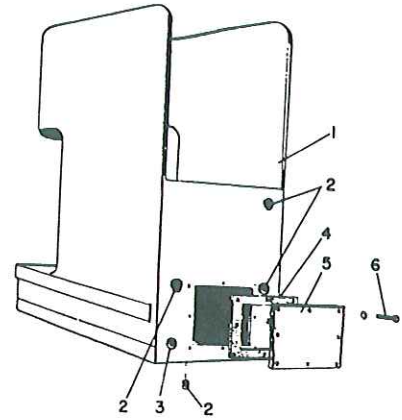
PARTS LIST - FRAMES - SERIES B, D, F, G & H



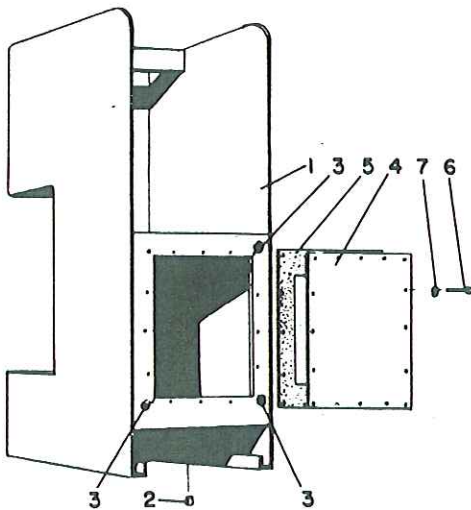
SERIES B FRAME



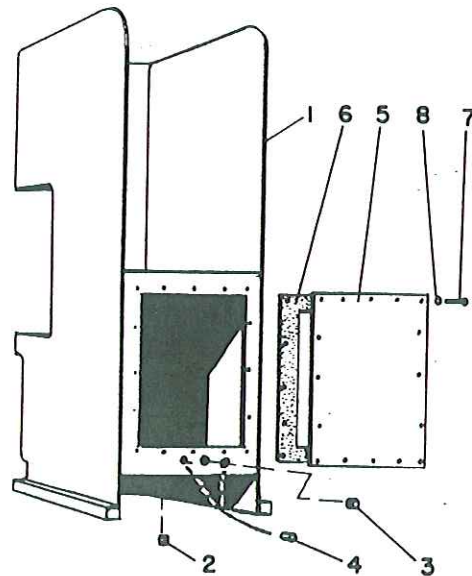
SERIES D FRAME



SERIES F FRAME



SERIES G FRAME



SERIES H FRAME

REF NO.	PART NO.	DESCRIPTION	QTY.
SERIES B FRAME			
1	031-12458	Frame - Press, 1 ton basic manually and automatically controlled models for all B frame presses - Channel Base (Models BA1 and BB1)	1
2	031-13313	Base - Channel	1
3	308-24220	Screw - Cap, soc. hd. 5/8-11 NC x 1-3/4 in. lg.	6
4	25-1917	Plate - Mounting, Model B15, add one of the following alternate bases:	
5	25-1682	Base - Plain, Model B11	
6	25-1681	Base - Round hole, Model B12	
7	25-1657	Base - U slot, Model B13	
8	308-24240	Screw - Cap, soc. hd. 5/8-11 NC x 2 in. lg. -Extended Daylight (Models BE1 and BF1)	6
9	25-1808	Base - Model B14	1
10	308-20380	Screw - 1/2-13 NC x 4-1/2 in. lg.	2
11	308-24240	Screw - 5/8-11 NC x 2 in. lg.	6

REF. NO.	PART NO.	DESCRIPTION	QTY.
SERIES D FRAME			
1	031-10011	Frame - Press, 6 ton basic manually and automatically controlled models	1
2	488-01502	Plug - Magnetic, Countersunk hd. (1/2 in.)	1
3	431-91200	Plug - Pipe, flush (3/4 in.)	3
4	410-93200	Plug - Pipe, flush (2 in.)	1
SERIES F FRAME			
1	031-10749	Frame - Press, 8 ton - basic manually and automatically controlled models	1
2	431-91200	Plug - Pipe, flush, (3/4 in.)	3
3	488-01503	Plug - Magnetic, countersunk hd, (3/4 in.)	1
4	031-17571	Gasket (clean out door)	1
5	35-13990Y	Plate (clean out door)	1
6	306-14160	Screw - Cap, hex. hd. (5/16 - 16 NC x 1 in. lg.)	14
SERIES G FRAME			
1	031-13852	Frame - Press, 10 ton basic manually and automatically controlled models for all G frame presses	1
2	488-01503	Plug - Magnetic, 3/4 in.	1
3	431-91200	Plug - Pipe, 3/4 in. standard	3
4	031-13855	Cover - Plate	1
5	031-13856	Gasket	1
6	306-16160	Screw - Cap, hex. hd. (3/8 - 16NC x 1 in. lg.)	16
7	346-10024	Washer - Lock, standard (3/8 in.)	16
SERIES H FRAME			
1	031-13757	Frame - Press, 10 ton basic manually and automatically controlled models for all H Frame presses	1
2	488-01504	Plug - Magnetic, (1 in.)	1
3	431-90800	Plug - Pipe, standard, (1/2 in.)	1
4	431-90400	Plug - Pipe, standard, (1/4 in.)	2
5	031-13164	Door - Tank access	1
6	031-13162	Gasket	1
7	306-16180	Screw - Cap, hex. hd. (3/8 - 16 NC x 1-1/4 in. lg.)	16
8	346-10024	Washer - Lock, standard (3/8 in.)	16

MOTOR - PUMP ASSEMBLIES

All Multipress pumping units are indicated in the first two letters of the press model number. The first two code letters and the first code number of the press model number will designate the type of pumping unit your Multipress uses. For example: A DK4 model press specifies a pumping unit with a 3 hp electric motor, a 7-1/4 gpm pump and operates at 970 max. psi (see chart on page 6). A complete description, as well as maintenance instructions of each unit, follows.

B FRAME MOTOR-PUMP ASSEMBLY

The pumping unit for all B frame Multipresses is powered by a 1-1/2 hp, 1800 rpm, vertical mounted electric motor. The vane type pump, available in either 2 or 3 gpm sizes, operates at maximum 1130 psi on all models of this series. When it is necessary to do service work, either on the pump flexible coupling or pressure line from the pump to the relief valve, it is advisable to remove the complete pumping unit from the reservoir. This is easily accomplished by disconnecting the pressure line from

the relief valve to the four-way control valve as well as the return line from the control valve. Also disconnect the lead in wires to the electric motor. The four hold down screws are then taken out to disconnect the motor mounting plate. The complete pumping unit can then be lifted out of the reservoir.

After the pumping unit is removed from the reservoir, the pump, tube lines and motor coupling are accessible. If the pump is replaced, be certain to align the pump shaft and motor shaft correctly and securely tighten all connections on suction and pressure lines. After the unit is serviced, it may be installed in the same manner as removed.

MOTOR-PUMP ASSEMBLIES FOR D, F, G AND H FRAME MULTIPRESSES

The pumping units for these presses are, although larger, very similar to those of the B frame group. As shown in the chart on Page 6 these units are powered by either a 3, 5 or 7 1/2 hp, C flange, vertically mounted electric motor and use a single stage vane type.

With every model the electric motor is connected to the pump by a flexible coupling. Lubrication of the motor should be made periodically according to good motor maintenance. There are two grease plugs on top of the motor and one in the bottom end bell.

The oil reservoir of the B, F and D frames is incorporated in the press frame. The motor mounting

plate supports the electric motor relief valve assembly, oil filter pipe and oil level gauge. This plate also serves as the reservoir cover and may be easily and quickly removed for inspection or cleaning.

On F, G and H frames the access door in back of frame can be removed for cleaning and inspection purposes.

**MOTOR AND PUMP ASSEMBLY
FOR
MODELS BA1, BB1, BC1, BD1, BE1, AND BF1**

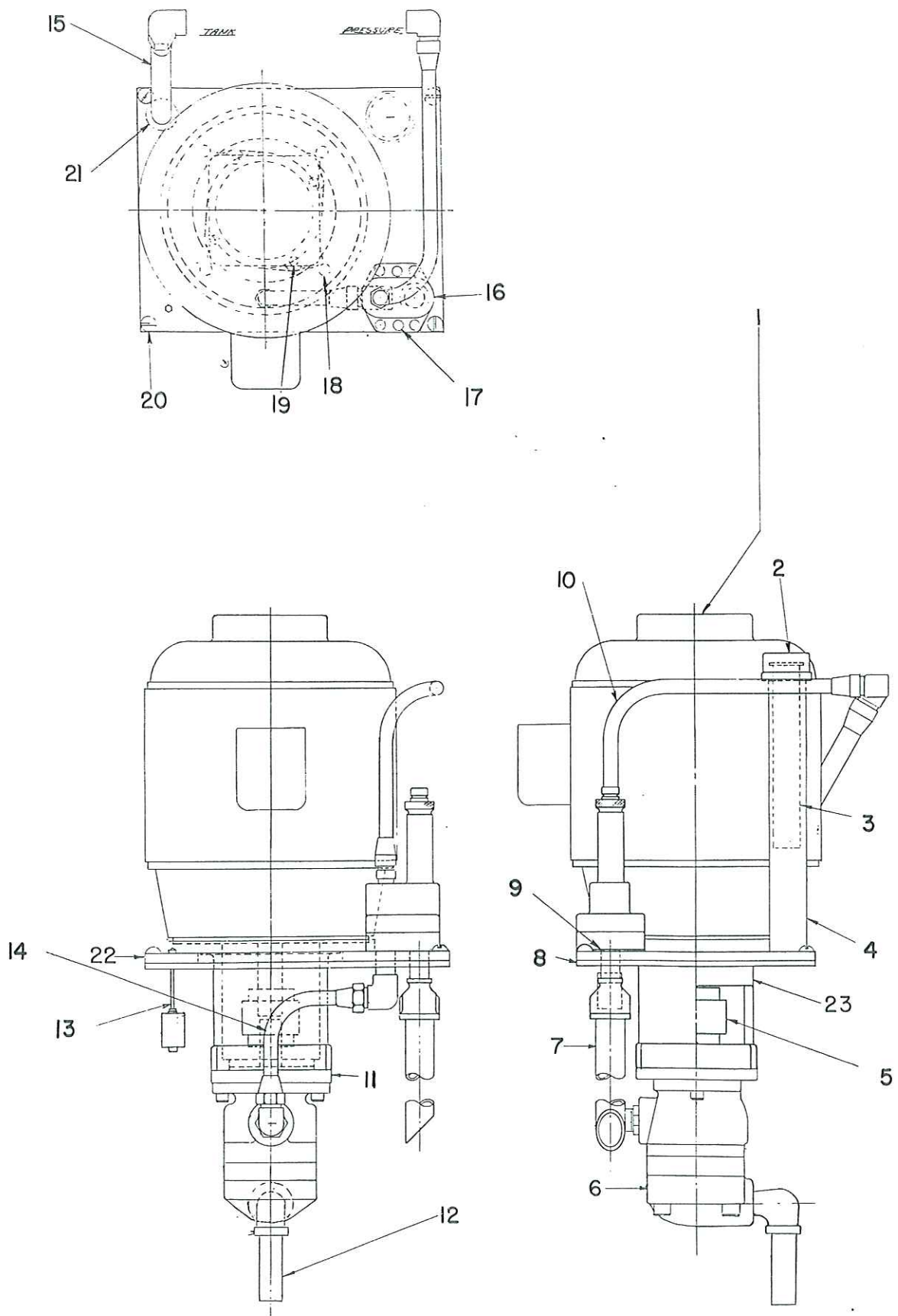
REF. NO.	PART NO.	DESCRIPTION	QTY.
	25-1901	Motor and Pump Assembly	
1	132-11-	Motor - 1-1/2 H.P. 1800 RPM Frame, 184 C Flange Face Type Mtg., Vert. Mtg. Shaft End Down No Feet	1
2	031-10213	Cap Oil Filler	1
3	031-11785	Filter - Filler	1
4	441-20280	Nipple - Pipe (1-1/4 Std. x 7 in. lg.)	1
5	212-72000	Coupling - 3/4 in. Bore with 3/16 x 3/32 Keyway both ends one hub 7/8 in. bore Neoprene Spider 15/16 in. hole through center (L095)	1
6	TMB13F-R	Pump - 2 GPM for Models BA1, BC1, and BE1 only	1
	TMB14F-R	Pump - 3 GPM for Models BB1, BD1, and BF1 only	1
7		Relief Valve Drain Line	1
8	031-12539	Gasket	1
9	031-12247	Gasket	1
10		Pressure Line from Relief Valve to Control Valve complete with fittings	1
12		Pump Suction Line complete with fittings	1
13	013-00205	Float - Liquid Level Assy.	1
14		Pressure Line complete with fittings from pump to relief valve	1
15		Drain Line complete with fittings from Control Valve to tank	1
16	25-1531-Y	Relief Valve	1
17	308-14200	Screw - Soc. Hd. Cap (5/16 - 18 x 1 1/2)	2
18	306-16160	Screw - Hex. Hd. Cap (3/8 - 16 x 1)	4
20	306-20160	Screw - Cap Hex. Hd. (1/2 - 13 x 1)	4
21	031-13311	Collar - Dust	1
22	031-17099	Bracket and Reservoir Cover	1
NS	A103	Oil Cooler - Required only with auto. valves, optional with man. valves	1
NS	501-34220	Pressure - Gauge (SK1716)	1

NOTE: You must list model number and serial number of your press when ordering above parts.

**MOTOR AND PUMP ASSEMBLIES
FOR
MODELS DB2, DD2, DC3, DA4, DB4, DF4,
DH4, DE6, DG6, DK4, DM4, DJ6, DK6, AND DL6**

REF. NO.	PART NO.	DESCRIPTION	QTY.
	25-1535W	Motor and Pump Assy. for Models DB2, DD2, DF4, DH4, DK4, and DM4	1
	25-1530W	Motor and Pump Assy. for Models DC3, DA4, DB4, DE6, DF6, DG6, DK6, and DL6	1
1	132-240-	Motor - 3 H.P. 1800 RPM Frame, 213 C Flg. face type mtg., ball bearing, vert. mtg. shaft end down, no feet for models DB2, DA4, DF4, DE6, DK4, DJ6	1
1	132-300-	Motor - 5 H.P. 1800 RPM Frame 215, C Flg. face type mtg., ball bearing, vert. mtg. shaft end down, no feet, for models, DD2, DC3, DB4, DH4, DF6, DG6, DM4, DK6, DL6	1
2	031-10213	Cap - Oil Filler	1
3	031-11785	Filter - Filler	1
4	441-20520	Pipe - (1-1/4 std. x 13 in.)	1

(Continued on Page 12)



TYPICAL MOTOR PUMP ASSEMBLY FOR ALL MULTIPRESSES.

REF. NO.	PART NO.	DESCRIPTION	QTY.
5	212-74002	Coupling-1-1/8" bore with 1/4 x 1/8 KW one end 3/4" bore with 3/16 x 3/32 KW other end - use with TMB Pumps	1
	212-74001	Coupling-1-1/8" bore with 1/4 x 1/8 KW one end 7/8" bore with 3/16 x 3/32 KW other end - use with TMC Pumps	1
6	TMB15F-R	Pump - Vane type, 7-1/4 GPM for Models DB2, DF4, DK4, DB4, DF6, DK6	1
	TMC1F-R	Pump - Vane type, 11 GPM for Models DD2, DH4, DM4	1
	TMB12F-R	Pump - Vane type 9 GPM for Models DC3, DG6, DL6	1
	TMB14F-R	Pump - Vane type, 3-1/4 GPM for Models DA4, DE6, DJ6	1
7		Relief Valve Drain Line	1
8	031-10228	Gasket	1
9	031-12247	Gasket	1
10		Pressure Line from Relief Valve to Control Valve complete with fittings	1
11	031-16217	Pump - Adapter	1
12		Pump - Suction Line complete with fittings	1
13	013-00205	Float - Liquid Level Assy.	1
14		Pressure Line Complete with fittings from pump to relief valve	1
15		Drain Line complete with fittings from control valve to tank	1
16	25-1531-Y	Relief Valve	1
17	308-14200	Screw - Soc. Hd. Cap (5/16 - 18 x 1 1/2)	2
18	306-20200	Screw - Hex. Hd. (1/2 - 13 x 1 1/2)	4
19	308-16160	Screw - Soc. Hd. (3/8 - 16 x 1)	4
20	310-16160	Screw - Mach. Rd. Hd. (3/8 - 16 x 1)	4
21	031-10024	Collar - Dust	1
22	031-11855	Cover - Reservoir	1
23	031-11856	Bracket	1
NS	501-45027	Pressure Gauge SK 1842 for DD2, DA4, DB2, DC3 Models	1
NS	501-34046	Pressure Gauge SK 1727 for DF4, DE6, DK4, DJ6, DH4, DG6, DM4, DK6, DL6 Models	1
NS	A12 S11-10338	Oil - Cooler complete with thermostatic reg. valve req'd with auto. valves optional equipment with manual valves	1
NS	485-03200	Valve - Shutoff Cock (Weather - Head No. 320)	1

NOTE: You must list model number and serial number of your press when ordering above parts.

**MOTOR AND PUMP ASSEMBLY
FOR
MODELS FD2, FA4, FB4, FC4, FH4, FE8,
FF8, FG8, GD5, GA10, GB10 AND GC10**

REF. NO.	PART NO.	DESCRIPTION	QTY.
	25-3826	Motor and Pump Assy. for Models FD2, FH4, GD5	1
	25-3825	Motor and Pump Assy. for Models FA4, FB4, FC4, FE8, FF8, FG8, GA10, GB10, GC10	1
1	132-370	Motor-7 1/2 H.P. 1800 RPM frame 254, U Face type mtg, Ball Brg, vert.mtg, shaft end down, no feet	1
2	031-10213	Cap - Oil Filler	1
3	031-11785	Filter - Filler	1
4	441-20880	Pipe - 1-1/4 Std. x 22 in. lg. (for "F" frame presses only)	1
	441-20320	Pipe - 1-1/4 Std. x 8 in. lg. (for "G" frame presses only)	1
5	212-75000	Coupling - 1-3/8" bore with 5/16 x 5/32 KW one end 3/4" bore with 3/16 x 3/32 KW other end - use with TMB Pumps	1
	212-75003	Coupling - 1-3/8" bore with 5/16 x 5/32 KW one end 7/8" bore with 3/16 x 3/32 KW other end - use with TMC Pumps	1
6	TMC1F-R	Pump - Vane type 11 GPM for Models FD2, FH4, and GD5	1
	TMB14F-R	Pump - Vane type 3-1/4 GPM for Models FA4, FE8 and GA10	1
	TMB15F-R	Pump - Vane type 7-1/4 GPM for Models FB4, FF8, GB10	1
	TMB12F-R	Pump - Vane type 9 GPM for Models FC4, FG8, GC10	1
7		Relief Valve Drain Line	1
8	031-10683	Gasket	1
9	031-12247	Gasket	1
10		Pressure Line from relief valve to control valve complete with fittings	1
11	031-16217	Adapter - Pump	1

(Continued on next page)

REF. NO.	PART NO.	DESCRIPTION	QTY.
12		Pump - Suction line complete with fittings	1
13	013-00206	Float - Liquid Level Assy.	1
14		Pressure Line - Complete with fittings from pump to relief valve	1
15		Drain Line - Complete with fittings from control valve to tank	1
16	25-1531-Y	Relief Valve	1
17	308-14200	Screw - Soc. Hd. Cap (5/16 - 18 x 1 1/2)	2
18	306-20200	Screw - Hex. Hd. Cap (1/2 - 13 x 1 1/2)	4
19	308-16160	Screw - Soc. Hd. Cap (3/8 - 16 x 1)	4
20	306-24180	Screw - Hex. Hd. (5/8 - 11 x 1 1/4)	4
22	031-15774	Cover - Reservoir	1
23	031-11856	Bracket	1
NS	A72 S11-10339	Cooler - Coil Complete with thermostatic reg. valve. Req'd only with automatic valves. Optional with manual valves	1
NS	501-46128	Pressure gauge (SK1726) ("F" frame only)	1
NS	485-03200	Valve - Shut-off cock (weatherhead No. 320)	1
NS	501-46130	Pressure Gauge (SK1882) ("G" frame only)	

NOTE: You must list model number and serial number of your press when ordering above parts.

**MOTOR AND PUMP ASSEMBLY
FOR
HE5, HB10, HC10 AND HD10**

REF. NO.	PART NO.	DESCRIPTION	QTY.
	25-2076W	Motor and Pump Assy. for all H Frame Presses	1
1	132-370	Motor - 7-1/2 1800 RPM Frame 254 U, Flange Face type mtg., ball brg. vertical mtg. shaft end down, no feet	1
2	031-10213	Cap - Oil filler	1
3	031-11785	Filter - Filler	1
4	441-20120	Nipple - Pipe - 1-1/4 std. x 3" lg.)	1
5	212-75000	Coupling - 1-3/8" bore with 5/16 x 5/32 KW one end 3/4" bore with 3/16 x 3/32 KW other end	1
		- use with TMB Pumps	
	212-75003	Coupling - 1-3/8" bore with 5/16 x 5/32 KW one end 7/8" bore with 3/16 x 3/32 KW other end	1
		- use with TMC Pumps	
6	TMC1F-R	Pump - Vane type 11 GPM for Model HE5	1
	TMB14F-R	Pump - Vane type 3-1/4 GPM for Model HB10	1
	TMB15F-R	Pump - Vane type 7-1/4 GPM for Model HC10	1
	TMB12F-R	Pump - Vane type 9 GPM for Model HD10	1
7		Relief Valve - drain line	1
8	031-13781	Gasket	1
9	031-12247	Gasket	1
10		Pressure Line from relief valve to control valve	1
11	031-16217	Adapter - Pump	1
12		Pump - Suction line complete with fittings	1
13	013-00206	Float - Liquid Level Assy.	1
14		Pressure Line complete with fittings from pump to relief valve	1
15		Drain Line complete with fittings from control valve to tank	1
16	25-1531Y	Relief valve	1
17	308-14200	Screw - Soc. Hd. Cap (5/16 - 18 NC x 1-1/2)	2
18	306-20200	Screw - Hex. Hd. (1/2 - 13 NC x 1-1/2)	4
19	308-16160	Screw - Soc. Hd. (3/8 - 16NC x 1)	4
20	306-24180	Screw - Hex. Hd. (5/8 - 11 NC x 1-1/4)	4
22	031-18561	Cover - Reservoir	1
23	031-11856	Bracket	1
NS	501-46730	Pressure - Gauge (SK1882)	1
NS	25-3612-W	Cooler - Coil	1
NS	485-05300	Valve - Shut-off (Weatherhead No. 530)	1

NOTE: You must list model number and serial number of your press when ordering above parts.

CYLINDER AND RAM ASSEMBLIES

The cylinder and pumping unit of each Multipress is always indicated in the first two code letters and the first code number of the press model number. For example: A DK4 model press specifies a cylinder consisting of 3-1/4 inch piston, a 2 inch ram and having a maximum stroke of 12 inches.

CYLINDERS

The cylinders for all B, D, F, G and H frame Multipresses are of the double action type and are basically alike, differing only in size as shown in the cylinder and pump unit chart. The cylinders are cast with internal coring to provide oil passage to both ends of the cylinder. A banjo collar fits over the end of the ram and rides up and down with it, being guided by the shipper rod in the throat of the Multipress, preventing the ram from turning in the cylinder.

The piston has been fitted at the factory with two piston rings for sealing against pressure leakage. If it should ever be necessary to install new rings, extreme care should be exercised in their installation. When installing the 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 putting into operation.

MAINTENANCE

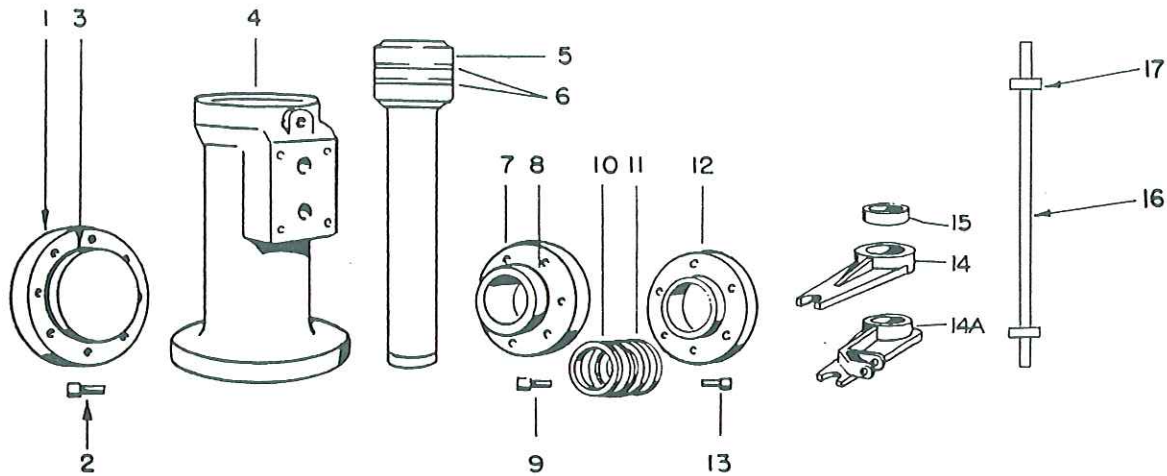
If oil leakage develops after press has been in

operation for some time, the packing gland should be tightened slightly. This may be accomplished by drawing down the cap screws, which hold the packing gland in place. It is necessary that the cap screws be tightened evenly and across the diameter of the bolt circle.

To install new ram packing in the press cylinder, first remove ram tooling attached to the ram. The banjo collar must also be dropped down off the ram by removing set screws. Remove the socket head cap screws which hold the packing gland in place and remove the gland. The four rings of "V" type packing should then be removed very carefully, being careful not to damage surface of ram or stuffing box. The bronze packing follower ring is located above the packing in the stuffing box. The new packings should be wiped with oil. During the installation of new packing, care should be exercised when sliding lips of packing over banjo relief on ram, then lips should be carefully inserted in stuffing box. A wooden tool should be used to press new packing into the stuffing box. (Do not force; tap lightly.) First, install follower ring then four "V" packing rings with open end of the "V" facing upward. These should be inserted singularly and carefully pushed to the top of the stuffing box. It is important to tighten the cap screws down evenly across the bolt diameter. Do not tighten the packing gland too tight; just tight enough to stop leakage. (Allow slight leakage at first for lubrication.) The packing gland can be tightened more at a later time if necessary to compensate for slight wear.

PARTS LIST FOR CYLINDER AND RAM ASSEMBLIES

REF. NO.	PART NO.	DESCRIPTION	QTY.
1-1/2 IN. DIA. CYLINDER WITH 6 IN. STROKE FOR MODELS BA1, BB1, BC1, BD1, BE1, BF1 AND BG1			
	S11-00936	Cylinder Assembly - Series B Multipress 25-1651-X	1
1	031-11790	Head - Cylinder	1
2	308-16120	Screw - Cap, soc. hd. (3/8 - 16 x 3/4)	8
3-8	671-00222	"O" Ring - 70 Dur. (6227-27)	2
4	031-11786	Body - Cylinder	1
5	031-11787	Ram and Piston	1
6	625-21012	Ring - Piston (1-1/2 OD x 1/8 in. face)	2
7	031-12457	Box - Stuffing	1
9	308-16160	Screw - Cap, soc. hd. (3/8 - 16 x 1)	6
11	613-15136	Packing - "V" type, 7/8 ID x 1-3/8 OD x 9/16 in. depth, 3 rings with top and bottom adapters	1 set
12	031-11789	Gland	1
13	308-16146	Screw - Cap, Soc. hd. (3/8 - 16 x 7/8) Nylok	3
NS	431-90400	Plug - Pipe (1/4 in. soc.)	1
14	031-12460	Arm - Shipper rod	1
	031-12947	Arm - Shipper rod (for use with dial feed)	1
16	031-12462	Shipper Rod	1
17	031-10017	Collars - Shipper Rod	2



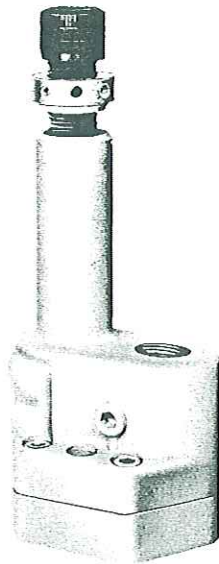
REF. NO.	PART NO.	DESCRIPTION	QTY.
2-1/4 IN. DIA. CYLINDER WITH 6 IN. STROKE FOR MODELS DB2, DD2 DC3, DA4 AND DB4			
	S11-00964	Cylinder Assembly, Series D Multipress 25-1844-X	1
1	031-13047	Head - Cylinder	1
2	308-20180	Screw - Cap, Soc. Hd., (1/2 - 13 x 1 1/4)	8
3-8	671-00228	"O" Ring - 70 Dur. (6230-6)	2
4	031-13046	Body - Cylinder	1
5	031-12073	Ram and Piston	1
6	625-23018	Ring - Piston (2-1/4 OD x 3/16 face)	2
7	031-13048	Box - Stuffing	1
9	308-16160	Screw - Cap, Soc. Hd. (3/8 - 16 x 1)	6
11	613-10168	Packing - "V" type, 1-3/8 ID x 1-7/8 OD x 25/32 in. depth, 4 rings with top and bottom adapters	1 set
12	031-13049	Gland	1
13	308-12126	Screw - Cap, soc. hd. (1/4 - 20 x 3/4) Nylok	6
	311-12043	Screw - Set, cone point soc. (1/4 - 20 x 1/4)	1
	431-90400	Plug - Pipe (1/4 in. soc.)	1
	431-90800	Plug - Pipe (1/2 in. soc.)	1
14	031-10428	Arm - Shipper rod	1
15	031-12075	Sleeve	1
16	031-10013	Shipper Rod	1
17	031-10017	Collars - Shipper Rod	2
3-1/4 IN. DIA. CYLINDER WITH 6 IN. STROKE FOR MODELS DF4, DH4, DE6, DF6 AND DG6			
	S11-00452	Cylinder Assembly, Series D Multipress 25-1202-X	1
1	031-10006	Head - Cylinder	1
2	308-20180	Screw - Cap, Soc. Hd., (1/2 - 13 x 1 1/4)	8
3-8	671-00236	"O" Ring - 70 Dur. (6230-14)	2
4	031-10005	Body - Cylinder	1
5	031-10426	Ram and Piston	1
6	625-23026	Ring - Piston (3-1/4 OD x 3/16 face)	2
7	031-10008	Box - Stuffing	1
9	308-16160	Screw - Cap, soc. hd. (3/8 - 26 x 1)	6
10	031-10009	Ring - Follower	1
11	613-40199	Packing - "V" type, (2-1/2 OD x 2 in. ID x 5/32 in. depth solid rings)	1 set
12	031-10010	Gland	1
13	308-12120	Screw - Cap, soc. hd. (1/4 - 20 x 3/4)	6

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REF. NO.	PART NO.	DESCRIPTION	QTY.
3-1/4 IN. DIA. CYLINDER WITH 6 IN. STROKE (continued)			
	308-16180	Screw - Cap, soc. hd. (3/8 - 16 x 1/4)	4
	431-90400	Plug - Pipe (1/4 in. soc.)	1
	431-90800	Plug - Pipe (1/2 in. soc. - flush)	1
14	031-10428	Arm - Shipper rod	1
	031-12199	Arm - Shipper rod (for use with dial feed)	1
16	031-10013	Shipper Rod	1
17	031-10017	Collars - Shipper Rod	2
3-1/4 IN. DIA. CYLINDER WITH 12 IN. STROKE FOR MODELS DK4, DM4, DJ6, DK6 AND DL6			
	S11-00466	Cylinder Assembly, Series D Multipress 25-1257-X	1
1	031-10006	Head - Cylinder	1
2	308-20180	Screw - Cap, soc. hd. (1/2 - 13 x 1/4)	8
3-8	671-00236	"O" Ring - 70 Dur. (6230-14)	2
4	031-10344	Body - Cylinder	1
5	031-10427	Ram and Piston	1
6	625-23026	Ring - Piston, (3-1/4 OD x 3/16 in. face)	2
7	031-10008	Box - Stuffing	1
9	308-16160	Screw - Cap, soc. hd. (3/8 - 16 x 1)	6
10	031-10009	Ring - Packing follower	1
11	613-40199	Packing - "V" type (2-1/2 OD x 2 in. ID x 5/32 depth solid rings)	1 set
12	031-10010	Gland	1
13	308-12126	Screw - Cap, soc. hd. (1/4 - 20 x 3/4) Nyllok	6
	308-16180	Screw - Cap, soc. hd. (3/8 - 16 x 1/4)	4
	431-90600	Plug - Pipe, (3/8 in. flush)	2
	431-90400	Plug - Pipe, (1/4 in. soc.)	1
14	031-10428	Arm - Shipper rod	1
	031-12199	Arm - Shipper rod (for use with dial feed)	1
16	031-10013	Shipper Rod	1
17	031-10017	Collars - Shipper rod	2
2-1/4 IN DIA. CYLINDER WITH 12 IN. STROKE FOR MODELS FD2, FA4, FB4 AND FC4			
	S11-00996	Cylinder Assembly, Series F Multipress 25-2079-X	1
1	031-13872	Head - Cylinder	1
2	308-24220	Screw - Cap, soc. hd. (5/8 - 11 x 1/4)	8
3-8	671-00228	"O" Ring - 70 Dur. (6230-6)	2
4	031-13870	Body - Cylinder	1
5	031-12375	Ram and Piston	1
6	625-23018	Ring - Piston (2-1/4 OD x 3/16 in. face)	2
7	031-13871	Box - Stuffing	1
9	308-20180	Screw - Cap, soc. Hd. (1/2 - 13 x 1/4)	6
11	613-10168	Packing - "V" type, 1-7/8 OD x 1-3/8 ID x 25/32 in. depth, 4 solid rings including top and bottom adapters	1 set
12	031-13049	Gland	1
13	308-12126	Screw - Cap, soc. hd. (1/4 - 20 x 3/4) Nyllok	6
	311-12043	Screw - Set, cone point soc. (1/4 - 20 x 1/4)	1
	431-90600	Plug - Pipe (3/8 in. soc.)	2
	413-00602	Bushing - Hex (3/8 to 1/8 in.)	1
	431-90400	Plug - Pipe (1/4 in. soc.)	1
14	031-10685	Arm - Shipper rod	1
15	031-12379	Sleeve	1
16	031-10684	Shipper Rod	1
17	031-10017	Collars - Shipper Rod	2

REF. NO.	PART NO.	DESCRIPTION	QTY.
3-1/4 IN DIA. CYLINDER WITH 12 IN. STROKE FOR MODELS FH4, FE8, FF8 AND FG8			
	S11-00471	Cylinder Assembly, Series F Multipress 25-1315-X	1
1	031-10674	Head - Cylinder	1
2	308-24220	Screw - Cap, soc. hd. (5/8 - 11 x 1 3/4)	3
3-8	671-00236	"O" Ring - 70 Dur. (6230-14)	2
4	031-10669	Body - Cylinder	1
5	031-10670	Ram and Piston	1
6	625-23026	Ring - Piston (3-1/4 OD x 3/16 in. face)	2
7	031-10672	Box - Stuffing	1
9	308-20180	Screw - Cap, soc. hd. (1/2 - 13 x 1 1/4)	6
10	031-10009	Ring - Packing follower	1
11	613-40199	Packing - "V" type (2-1/2 OD x 2 in. ID x 5/32 in. depth solid rings)	1 SET
12	031-10673	Gland	1
13	308-16146	Screw - Cap, soc. hd. (3/8 - 16 x 7/8) Nylök	6
	431-90400	Plug - Pipe (1/4 in. soc.)	1
	431-90602	Plug - Pipe (3/8 in. soc.)	2
	433-90602	Bushing - Hex. (3/8 to 1/8 in.)	1
14	031-10685	Arm - Shipper rod	1
	031-12328	Arm - Shipper rod (for use with dial feed)	1
16	031-10684	Shipper rod	1
17	031-10017	Collars - Shipper rod	2
3-5/8 IN. DIA. CYLINDER WITH 12 IN. STROKE FOR MODELS GD5, GA10, GB10, GC10, HE5, HB10, HC10 AND HD10			
	S11-00989	Cylinder Assembly, Series G and H Multipresses 25-2014-X	1
1	031-13703	Head - Cylinder	1
2	308-26220	Screw - Cap, soc. hd. (3/4 - 10 x 1 3/4)	8
3-8	671-00239	"O" Ring - 70 Dur. (6230-17)	2
4	031-13700	Body - Cylinder	1
5	031-13701	Ram and Piston	1
6	625-23029	Ring - Piston (3-5/8 OD x 3/16 in. face)	2
7	031-13702	Box - Stuffing	1
9	308-20180	Screw - Cap, soc. hd. (1/2 - 13 x 1 1/4)	8
10	031-10009	Ring - Packing follower	1
11	613-40199	Packing - "V" type, (2-1/2 OD x 2 in. ID x 5/32 in. depth solid rings)	1 SET
12	031-10673	Gland	1
13	308-16146	Screw - Cap, soc. hd. (3/8 - 16 x 7/8) Nylök	6
	431-90600	Plug - Pipe, 3/8 in. soc.	2
14	031-13853	Arm - Shipper rod (for G frame presses only)	1
	031-13858	Arm - Shipper rod (for H5 and H10 frame presses only)	1
16	031-13859	Shipper rod	1
17	031-10017	Collars - Shipper rod	2

Multipress Relief Valve



RELIEF VALVE (25-1531-Y)

The system 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 when no cylinder head relief valve is used. This valve can be adjusted so that when any preset pressure is exceeded, the excess volume and pressure is directed back to tank.

To adjust, loosen knurled locknut and turn the knurled adjusting screw. Clockwise rotation increases pressure and counter-clockwise rotation decreases pressure. After adjustment, tighten locknut.

MAINTENANCE PROCEDURE

1. Remove complete valve from pumping unit.
2. Remove adjusting screw (15) and locknut (16).
3. By turning valve upside down spring retainer (13) and spring (12) along with spring center should then drop out.
4. Remove "O" ring (3), seat (7), spool (9) and poppet (10).
5. Inspect seating surface of seat (7) for wear, chips or dirt.
6. Inspect spool (9) for chips or rounded edges on sealing surface at lower end and be sure that the tiny orifice opening is clear of foreign matter.
7. Inspect poppet (10) for broken or rounded edges or dirt.
8. Be sure that all parts move freely in the body.
9. Before reassembling in reverse order be certain that all parts are clean with no dirt, lint or abrasive material clinging to them.

SERVICE

The most usual cause for relief valve failure is foreign material; such as lint, pipe scale, or abrasive material. Any of these materials can cause the valve to stick open or closed.

When dirt or foreign materials cause the valve either to stick open or close, backing the adjusting screw off to "O" pressure will many times wash the material on through the valve and restore proper operation.

SERVICE TIPS

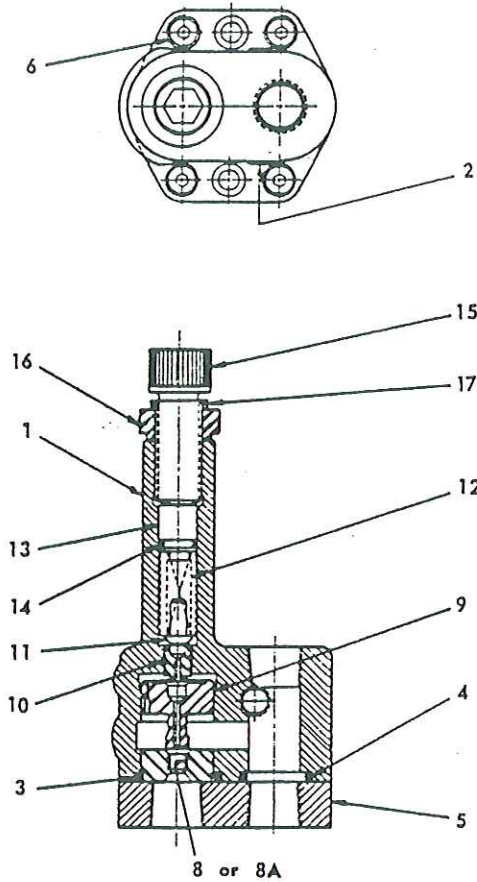
A. Loss of pressure	<ol style="list-style-type: none"> 1. Plug pressure line and insert gauge into 1/4" opening in body of relief valve after removing plug to determine if the relief valve or pumping unit is at fault. 2. Relief Valve sticking open. Disassemble valve and wash parts in solvent. 3. Inspect ground surfaces for chipped edges. Replace if necessary.
B. Sudden drop of pressure.	<ol style="list-style-type: none"> 1. Plug pressure line and insert gauge into 1/4" opening in body of relief valve after removing plug to determine if the relief valve or pumping unit is at fault. 2. Remove adjusting screw and inspect for broken spring.
C. Pressure cannot be adjusted.	<ol style="list-style-type: none"> 1. Inspect for broken spring. 2. Inspect for sticking spring center. 3. Inspect for sticking spring retainer.

D. Fluctuating pressure.

1. Inspect for broken spring.
2. Inspect return line from relief valve which extends beneath the oil. Many times a small crack appears at the threads or the line breaks completely off, causing oil to aerate.
3. Inspect pump for leakage and worn parts.

PARTS LIST

RELIEF VALVE



REF. NO.	PART NO.	DESCRIPTION	QTY.
1	031-11857	Body - Valve	1
2	431-90400	Plug - Pipe (1/4 in. soc.)	2
3	691-00216	"O" Ring - 90 Dur. (6227-21)	1
4	691-00212	"O" Ring - 90 Dur. (6227-17)	1
5	031-11858	Plate - Sub	1
6	308-14160	Screw - Cap, soc. hd. (5/16 - 18 x 1)	4
8	25-3033-Z	Seat and Sleeve Assy. (used with volumes exceeding 4 gpm)	1
	25-3032-Z	Seat and Sleeve Assy. (used with volumes of 4 gpm or less)	1
* 9	031-11573	Spool	1
* 10	031-11572	Poppet	1
11	031-12456	Center	1
12	031-12455	Spring - Compression	1
13	031-11614	Retainer - Spring	1
14	671-00111	"O" Ring - 70 Dur. (6227-9)	1
15	309-25229	Screw - Cap, soc. hd. serrated hd. (3/4 - 16 x 1 3/4)	1
16	031-10157	Nut - Lock	1
17	803-14035	Spacer - 7/8 OD x .049 wall (cut to length at assembly)	1

* Can be purchased only as an assembly which includes both item 9 and 10.

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QUALITY PRODUCTS, INC.

560 Dublin Avenue,

Telephone (614) 228-0185

Fax (614) 228-2358

Columbus, Ohio 43215