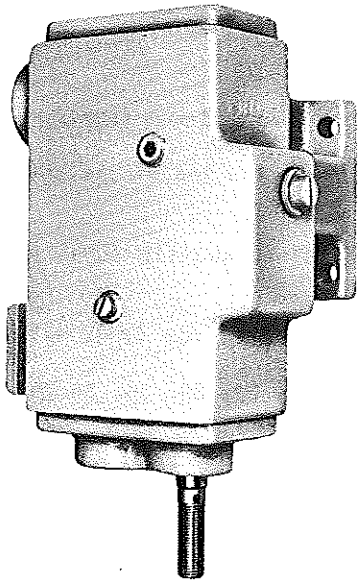
The Denison Engineering Co.
Columbus, Ohio

Multipress Control Valves

MODELS C64, C164, C69, C169



This is basically a four-way valve with the shuttle acting as the four-way spool. The movable sleeve between the shuttle and body, and the manual control spool is the control that causes reciprocation of the shuttle. The movable sleeve is operated by adjustable stop collars on the shipper rod. The manual control spool is actuated by an eccentric crank. A spring arrangement tends to hold the crank in "neutral", but it will lock in the "automatic" position and remain there until released.

For automatic operation, starting with the ram in the up position, the manual control spool is moved from the "neutral" position (with the control port covered and top cylinder port open) to the "automatic" position (control port open and top cylinder port blocked).

The movable sleeve is in the up position due to contact of the ram arm on the upper stop collar. Oil now flows from the pump through the sequence port to the control port, thus raising the shuttle against a spring. The pump volume is now directed to the top cylinder port which starts the ram down.

The exhaust oil from the bottom cylinder port is trapped and, therefore raises the shuttle against its light spring force. This directs the exhaust oil into the pressure supply which creates a differential circuit for fast ram approach speed.

As the ram starts down, the sleeve also starts down. It is spring centered and closes the sequence port. The shuttle is, however, maintained in its up position due to back pressure of the exhaust oil being transmitted through orifice (A) to the bottom of it. When the ram contacts the work and pressure build-up occurs in the top cylinder port, this pressure is directed to the poppet so that it ascends against its heavy spring.

The exhaust oil is now open to tank through orifice (B) so that the differential circuit is cut out. Enough back pressure is still maintained through orifice (A) and (C) so that the shuttle remains up. When the ram bottoms on the work, thus spilling the relief valve, the exhuast flow ceases. Pressure underneath the shuttle dissipates through orifice (C) and (B) so that the shuttle is spring returned downward.

Pump volume is now directed to the bottom cylinder port and the top cylinder port is open to tank. Thus the ram goes up. When the upper stop collar is contacted, the sequence port is opened, thus initiating another cycle.

Since the sequence port opens to top cylinder port, which opens to tank, moving the manual control handle to "neutral" allows the ram to complete its cycle, return to up position and stop. Thus single cycle operation is obtained by returning the manual control spool to "neutral" once the cycle has been initiated. (The circuit is illustrated in this position).

Distance reversal is accomplished by setting the bottom stop collar at the required reversal point. When the ram arm contacts the collar, the sleeve is pulled down, and the top cylinder port opens to tank through the undercut on the sleeve. The bottom cylinder port is partially restricted by the sleeve and the ram stops. Exhaust flow ceases and the shuttle drops, thus starting the ram up.

The ram can be reversed at any point in the down stroke by raising the manual control spool to the "emergency reverse" position. This opens the bottom of the shuttle through the control port to tank. This allows the shuttle to drop diverting the pump volume to the bottom cylinder port so the ram will return to its up position. To cause the ram to proceed to work and hold with full force, it is necessary to first move the control spool to the "automatic" position, thus initiating the cycle. The control spool is then moved to the "hold down" position so that the top cylinder port is connected to the control port. This prevents the valve shuttle from dropping when the flow from the bottom cylinder is no longer sufficient to create the necessary back pressure to hold the valve shuttle up.

Semi-automatic operation differs from automatic operation in that a different manual control spool is used. Oil entering the sequence port cannot go directly to the control port but must be connected to it through valving on an external mechanism.

This oil is delivered only when the ram is in up position and may be used to operate the external mechanism, thus creating a tie-up between the external mechanism and the main ram. Oil from any external source applied to the control port on the semi-automatic valve can be used to initiate a cycle of the main ram.

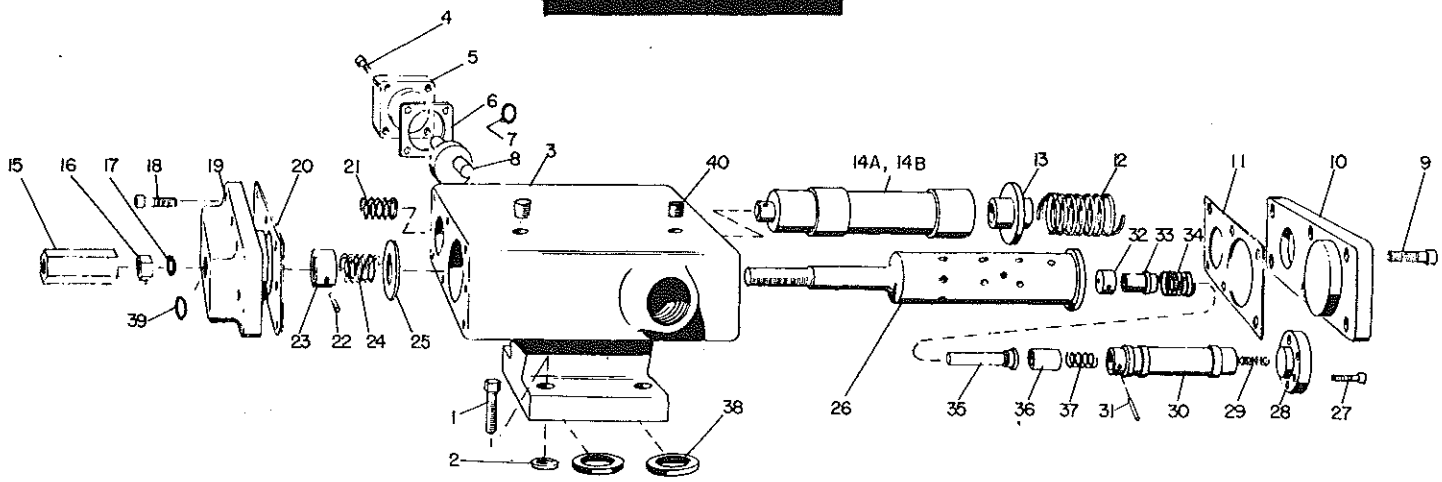
SERVICE TIPS

A. Ram descends but will not return.	1. Check shuttle. Should move freely in sleeve. 2. Check spring at the top of the shuttle for breakage. 3. Check orifices in shuttle to be sure they are open. 4. Check relief valve for failure to open. 5. Check parts 32, 33, 34, 35, 36 and 37 for breakage or sticking.
B. Ram will not descend.	1. Check relief valve setting. This valve's minimum operating pressure is 300 psi. 2. Check relief valve for dirt, lint, etc. 3. Also check for dirt in valves. 4. Check shuttle as above. 5. Check pump and pressure line. Line may be broken. 6. Install smaller orifice in top cylinder port of valve at cylinder.
C. Shipper rod arm breaks on "up" stroke.	1. Check screws in top cap of sleeve. Be sure that all screws are in place and tight.
D. Pressure will not build up before ram reverses.	1. Check lower stop collar. Arm should not contact it unless distance reversal is required. 2. Check relief valve setting. Should be at least 300 psi. 3. Check pressure lines for cracks and other leaks. 4. Possibly slightly smaller orifice in bottom of shuttle will help. 5. Smaller orifice in pipe plug in top cylinder port of valve at cylinder. 6. Possibly use a smaller top orifice in shuttle. This is especially true on a blanking operation when pressure pads force the ram downward faster than normal speeds obtainable.

SERVICE TIPS (cont.)

E. Press overheats.	1. Be sure cooler coils within the press tank are attached to water lines and water is flowing through them.
F. Ram fails to go into fast approach speed.	1. Check springs 34 and 37 for breakage. 2. Check poppet 35.
G. Ram takes short repeat strokes when in down position (Models C69 and C169 only).	1. In all probability too short a stroke is being used. Lengthen stroke to at least 3/4 inch.

PARTS LIST MODELS C64, C164, C69, C169

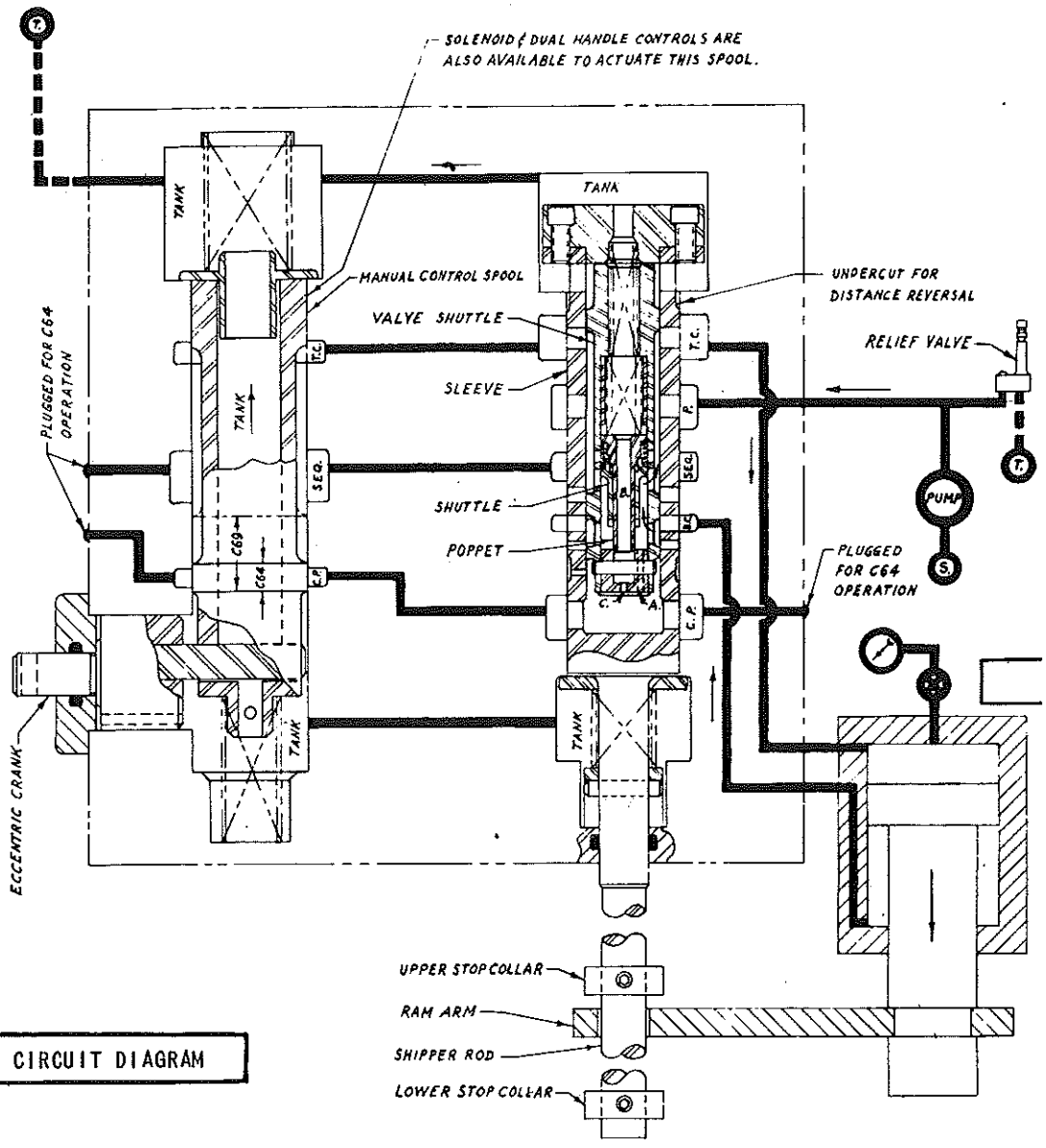


ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	COMM	Screw - Cap, hex hd, 3/8-16 NC x 1 in. lg	4
2	COMM	Washer - Lock, 3/8 in.	4
3	35-10071-X	Body	1
4	COMM	Screw - Cap, soc hd, 1/4-20 NC x 5/8 in. lg	4
5	35-10090-Z	Cap - End	1
6	35-10081-Z	Gasket - End cap	1
7	6227-10	Packing - "O" ring	1
8	25-1212-Z	Eccentric Assembly	1
9	COMM	Screw - Cap, soc hd, 1/4-20 NC x 5/8 in. lg	6
10	35-10085-Z	Cap - Valve end	1
11	35-10084-Z	Gasket - End cap	1
12	35-12006-Y-17	Spring - Compression	1
13	35-10092-Z	Follower - Spring	1
14A	35-10072-Y	Spool - Control (Models C64 and C164)	1
14B	35-10095-Y	Spool - Control (Models C69 and C169)	1
15	35-10075-Z	Coupling - Shipper rod	1
16	COMM	Nut - Hex, standard, 1/2-20 NF	1
17	1224	Washer	1
18	COMM	Screw - Cap, soc hd, 1/4-20 NC x 5/8 in. lg	6
19	35-10076-Z	Cap - Valve end	1
20	35-10083-Z	Gasket - End cap	1
21	35-12005-Y-32	Spring - Compression	1

22	35-10080-Z	Pin - Plain	1
23	35-10078-Z	Collar - Slotted	1
24	35-12005-Y-18	Spring - Compression	1
25	35-10079-Z	Washer - Counter sunk	1
26	35-10074-Y	Spool - Valve	1
27	COMM	Screw - Cap, soc hd, 10-24 NC x 3/8 in. lg	6
28	35-14298-Y	Cap - Spool end	1
29	35-12002-Y-61	Spring - Compression	1

*The following parts for the Fast Traverse Shuttle (25-2207-Z) should be ordered from the factory as an assembly. # 13700 10/15/58

30	35-14293-Z	Shuttle - Valve	1
31	35-13040-Z	Pin	1
32	35-14297-Z	Stop	1
33	35-14296-Z	Shuttle	1
34	35-12003-Y-47	Spring	1
35	35-14295-Z	Poppet	1
36	35-14294-Z	Spacer	1
37	35-13244-Z	Spring	1
38	42305	Vickerseal	2
39	6227-11	Packing - "O" ring	1
40	COMM	Plug - Pipe, 1/4 in. flush	2



CIRCUIT DIAGRAM