

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.

MULTIPRESS® HYDRAULIC EQUIPMENT

operation instructions and service manual*

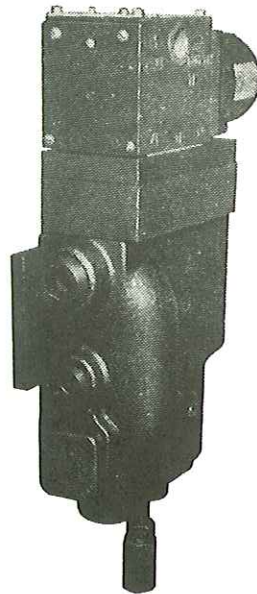
MODELS C300/C400 AUTOMATIC AND SINGLE CYCLE



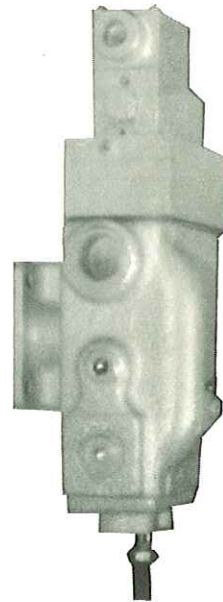
MODELS
C304
C364
C309
C369



MODELS
C304SSC
C364SSC
C304FSC
C364FSC



MODELS
C304SS1 C369SS1
C364SS1 C304FS1
C309SS1 C364FS1



MODELS
C404SS1 C469SS1
C464SS1 C404FS1
C409SS1 C464FS1

MULTIPRESS®

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SERVICE POLICY

The unitized construction of Multipress[®] Control Valves and the 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 representative will be charged for at the established rate per day plus expenses. Multipress equipment sent to our factory for inspection and service must be shipped prepaid. Factory service will be rendered only upon receipt of purchase order for such service.

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

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MULTIPRESS[®] EQUIPMENT WARRANTY

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

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

GENERAL

Your Multipress[®] Equipment Control Valve is a major component of your multipress equipment unit.

This manual is intended for reference when servicing and repairing Multipress[®] Equipment Model "C300" Control Valves.

Refer to your Basic Multipress service manual for instructions regarding preparation for operation and maintenance scheduling.

Refer to your Operating Controls service manual for instructions regarding actuation of these valves.

The model number of the Model "C300" Automatic Multipress Equipment Control Valves indicates the basic functions incorporated into the valves.

FOR EXAMPLE: C304FS1

C3 ... Indicates design

0 ... Indicates shuttle type

4 ... Indicates accessory or non-accessory type

FS ... Indicates control spool type

1, C or Blank ... Indicates type of actuation

When ordering parts for these valves it is important to include, the pump gallonage, the press model number and press serial number in order to assure that the correct parts are provided for your valve.

RECOMMENDED OIL SPECIFICATIONS

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

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

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

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

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

BASIC OPERATION OF ALL MODEL "C300" AUTOMATIC MULTIPRESS® EQUIPMENT CONTROL VALVES

I. These valves are basically four-way valves with the shuttle acting as the four-way spool. The control spool and the moveable sleeve between the shuttle and the body are the controls that cause reciprocation of the shuttle. The moveable sleeve is operated by adjustable stop collars on the shipper rod and the control spool is actuated and held in position by a selector lever control, dual lever control or a solenoid operated four-way valve as shown below.

When the control spool is in the "NEUTRAL" position it is spring centered in the valve body.

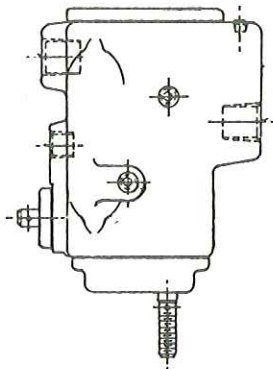


FIG. 1
C304, C309, C364 & C369
SELECTOR LEVER ACTUATED
VALVES

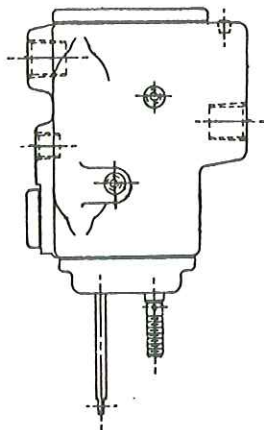


FIG. 2
C304FSC, C364FSC, C304SSC & C364SSC
DUAL LEVER ACTUATED
VALVES

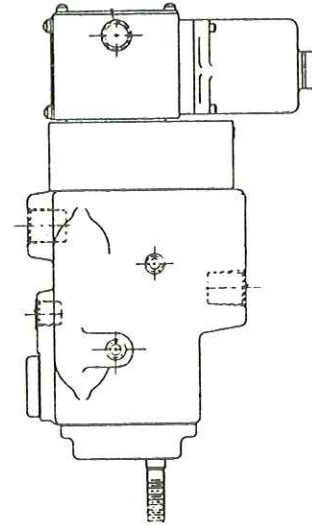


FIG. 3
C304FS1, C364FS1, C304SS1,
C364SS1, C309SS1 & C369SS1
ELECTRIC SOLENOID ACTUATED
VALVES

II. NEUTRAL ("UP") POSITION

A. The moveable sleeve is raised by the banjo resting against the upper stop collar and the shuttle is held down by its spring. This moveable position directs the pump volume to the control spool side of the valve.

1. WITH ALL VALVES EXCEPT "FS" VALVES

The pump volume by passes the control spool and goes through the top row of holes in the moveable sleeve and on to tank.

2. WITH "FS" VALVES

The pump volume must enter the control spool assembly and raise the control spool shuttle against its spring force. It is then directed out of the control spool assembly and goes thru the top row of holes in the moveable sleeve and on to tank.

B. This action in turn keeps the ram in the "UP" position because if the ram should start to drift down, the moveable sleeve would go with it and back pressure would be created at point "X" and transmitted to the bottom cylinder port, bringing the ram back up.

III. INCHING

Inching of the ram may be obtained by turning the handwheel on the side of the press after loosening the clamping screw of the upper stop collar. This action raises the moveable sleeve up beyond its "NEUTRAL" position creating a back pressure in the top cylinder port and opens the bottom cylinder port to tank through undercut "Z" therefore forcing the ram down. As long as the handwheel is kept turning, the moveable sleeve will stay in this position and the ram will continue to move down. If the handwheel is stopped, the moveable sleeve will come to rest in its "NEUTRAL" position which will stop the ram.

IV. SETTING THE PRESS RELIEF VALVE WITH INCHING CONTROL

The ram should be "INCHED" down, bottoming out the tooling and the handwheel should then be given approximately 1/2 turn extra. As a result of this action, all of the pump volume is forced to go to tank through the relief valve because the top row of holes in the moveable sleeve are completely shut off. Any pressure setting, within the limits prescribed by your basic press design, may now be obtained.

Cycling the STANDARD SPEED Valves

Models C304, C309, C304SSC, C304SS1 and C309SS1 AUTO-CYCLE VALVES
and Models C304FSC and C304FS1 SINGLE-CYCLE VALVES

(See Fig. 4 for diagram of "Auto-Cycle" Spools & Sleeve Ass'y.)

(See Fig. 5 for Diagram of "Single-Cycle Spool Only")

- A. Starting with the ram in the NEUTRAL ("UP") POSITION. The control spool is moved to the "AUTOMATIC" or "SINGLE" cycle position either manually or electrically. The outlet to tank is blocked. (The next function is determined by the type of control spool in the valve.)
1. **WITH C304, C304FSC & C304SS1 VALVES** The bottom of the shuttle is opened to full pump volume. Orifice "S" restricts this sudden surge of flow enough to overcome the shuttle spring force and the shuttle is immediately raised up.
restricts the flow of this oil enough to overcome the shuttle spring force and the shuttle is raised.
 2. **WITH C309 & C309SS1 VALVES** The sequence port is opened to full pump volume. Oil is directed to an external mechanism. This oil is delivered only when the ram is in the "UP" position and is intended to be used to operate the external mechanism thus creating a tie-up in sequence between the external mechanism and the main ram. Oil from an external source must now be applied to the control port of the valve. This oil is directed to the bottom of the shuttle. Orifice "S" restricts the flow of this oil enough to overcome the shuttle spring force and the shuttle is raised.
- B. The pump volume is now directed to the top cylinder port thru orifice "E" which assures enough back pressure at beginning of down stroke to maintain control port flow to the bottom of the shuttle when shuttle opens top cylinder port to pump volume, and the ram starts down.
- C. **Ram Extending (Standard Speed)** The bottom cylinder port is now open to tank through the exhaust holes in the moveable sleeve and orifice "R" in the shuttle. As the ram moves down the moveable sleeve goes with it for approximately 3/16 of an inch because it is spring centered. This action closes off the sequence holes at point "X".
1. **WITH "FS" VALVES ONLY** The control spool shuttle is forced down by its spring force. All of the exhaust oil coming from bottom cylinder must now pass to tank through orifice "R" in the shuttle, thus creating back pressure sufficient to keep the shuttle spring compressed. This back pressure is transmitted to the bottom of the

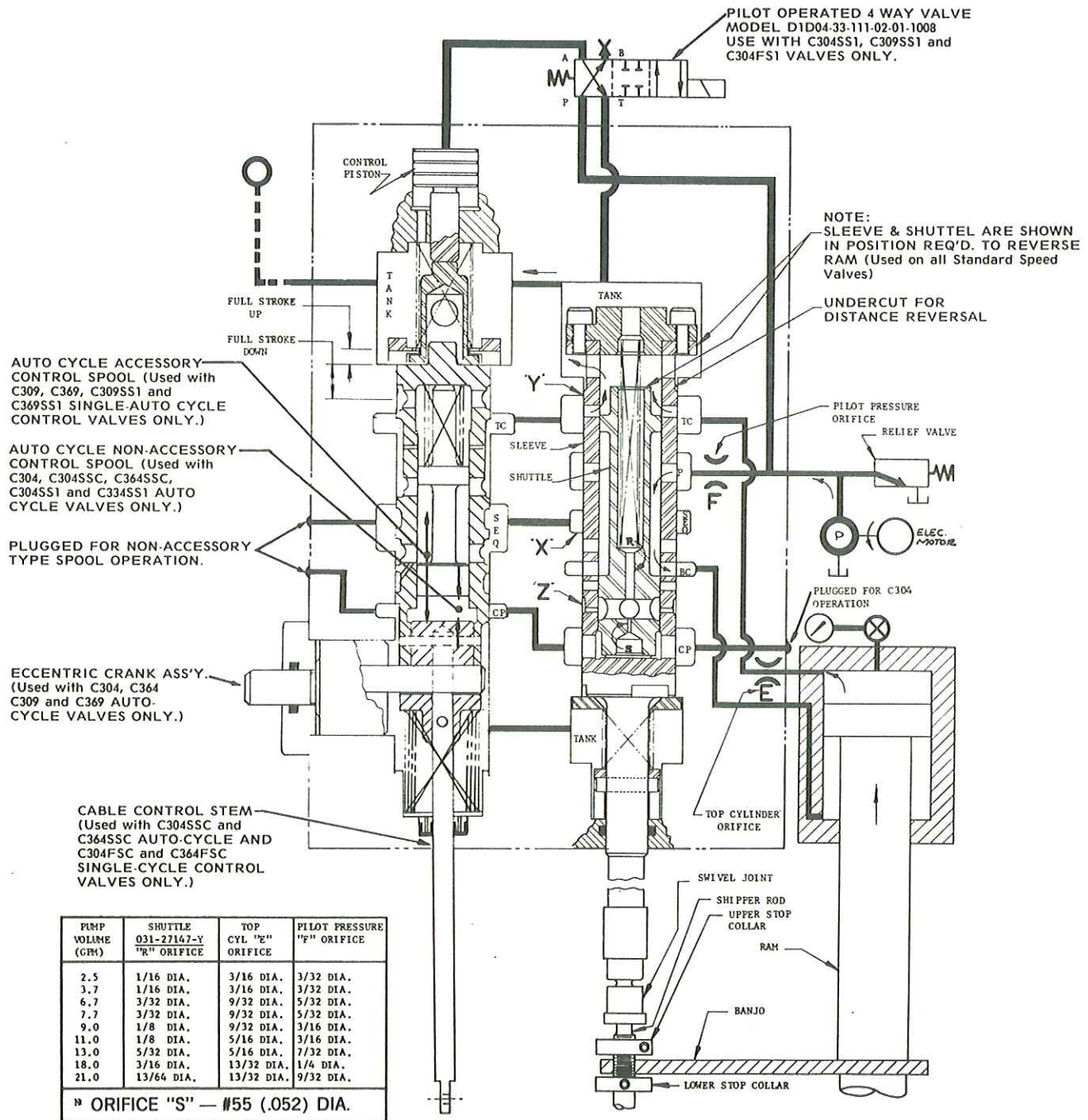
shuttle through orifice "S", therefore the shuttle is held up throughout the down stroke of the ram unless the control spool is allowed to become spring centered through release of the actuation device.

D. Ram Reversal The ram may now be reversed in any one of the following ways.

1. **PRESSURE REVERSAL** The ram contacts the work and immediately, pressure begins to build up to the relief valve setting. Also at this time, bottom cylinder oil has stopped and the shuttle spring has started to push the shuttle down. The shuttle is prevented from dropping fast by the oil under it being restricted on its way to tank by orifice "S". This slow dropping action permits the relief valve to reach its full setting before the shuttle has gone down far enough to reverse the ram, thus we have pressure reversal.
2. **DISTANCE REVERSAL** The lower stop collar must be raised up so that the banjo will strike it on the down stroke and pull the moveable sleeve down against its spring. This action dumps the pump volume to tank at point "Y", stalling the ram which stops the exhaust oil and the shuttle drops which reverse the ram just as it did in the PRESSURE REVERSAL sequence.
3. **EMERGENCY REVERSAL.** Refer to your Operating Controls manual for instructions regarding emergency reversal of these valves.

E. Ram Retracting Near the top of the upstroke the banjo contacts the upper stop collar raising the moveable sleeve. This action opens the sequence holes and closes the bottom cylinder port.

1. **WITH ALL VALVES EXCEPT "FS" VALVES** If the control spool has been held down in the "AUTOMATIC" cycle position, the pump volume will again kick the shuttle up and start another cycle. This "AUTOMATIC" cycling will continue until the control spool is manually or electrically released, allowing the pump volume to go to tank which will allow all of the parts previously mentioned to return to their "NEUTRAL" position which will stop the ram at the end of its upstroke.
2. **WITH "FS" VALVES ONLY** If the control spool assembly has been held down in the "SINGLE" cycle position, the control spool shuttle will be held down by its spring which will prevent the pump volume from raising the shuttle to start another cycle. Therefore the control spool must be either manually or electrically released, which will allow the control spool shuttle to be offset against its spring by the pump volume so that all previously mentioned parts are now in their "NEUTRAL" position which will stop the ram at the end of its upstroke.



NOTE
THIS DIAGRAM IS IN COMPOSITE FORM. USE ONLY
FOR OPERATIONAL FUNCTIONS IN CONJUNCTION
WITH "CYCLING" OR "BASIC OPERATIONS"
DESCRIPTIONS.

FIGURE 4
STANDARD SPEED SLEEVE ASS'Y. &
AUTO-CYCLE CONTROL SPOOL ASS'Y.

STANDARD SPEED VALVES

(Models C304, C309, C304FSC, C304SSC, C304FS1, C304SS1, C309SS1)

<p>A. Ram descends but will not return.</p>	<ol style="list-style-type: none"> 1. Check shuttle. It should move freely in sleeve. 2. Check spring at top of shuttle for breakage. 3. Check orifices in shuttle to be sure they are open. 4. If during reduction of Relief Valve setting, the ram reverses, check cylinder for leakage past piston rings.
<p>B. Ram will not descend.</p>	<ol style="list-style-type: none"> 1. Top collar too high on shipper rod and valve not centering. 2. Check relief valve setting. This valves minimum operating pressure should be 250 to 300 PSI. 3. Check relief valve for dirt, lint, etc. 4. Also check for dirt in valves. 5. Check shuttle as noted above. 6. Check pump and pressure lines for cracks or leaks. 7. Install smaller orifice in top cylinder port of valve at cylinder.
<p>C. Shipper rod arm breaks on "UP" stroke.</p>	<ol style="list-style-type: none"> 1. Check screws in top cap of sleeve. Be sure that all screws are in place and tight.
<p>D. Pressure will not build up before ram reverses.</p>	<ol style="list-style-type: none"> 1. Check lower stop collar. Shipper rod arm should not contact it unless distance reversal is required. 2. Check relief valve setting as noted above. 3. Check pump and pressure lines as noted above. 4. Possibly slightly smaller orifice "R" in shuttle to prevent shuttle from dropping too fast will help, especially on a blanking operation when pressure pads force the ram downward faster than normal attainable speeds. 5. Install smaller orifice in top cylinder port of valve at cylinder.
<p>E. Press overheats.</p>	<ol style="list-style-type: none"> 1. Be sure cooler coils within the press reservoir are attached to water lines and water is flowing through them. Setting on water valve should be 130° F maximum.
<p>F. Index table or other sequence line accessory creeps during inching.</p>	<ol style="list-style-type: none"> 1. Control spool does not return to neutral position when solenoid is de-energized. External sequence port must be fully blocked by control spool during inching. Check control spool and spool stop for excessive wear.

Cycling the DIFFERENTIAL SPEED Valves

Models C364, C369, C364SSC, C364SS1 and C369SS1 AUTO-CYCLE VALVES
and Models C364FSC and C364FS1 SINGLE CYCLE VALVES

(See Fig. 5 for diagram of "Single-Cycle" Spools & Diff'l. Sleeve Ass'y.)

(See Fig. 4 for diagram of "Auto-Cycle" Spools only.)

I. STARTING THE CYCLE

A. Starting with the ram in the NEUTRAL ("UP") POSITION. The control spool is moved to the "AUTOMATIC" or "SINGLE" cycle position either manually or electrically. The outlet to tank is blocked. (The next function is determined by the type of control spool in the valve.)

1. **WITH C364, C364FSC, C364SSC, C364FS1 & C364SS1 VALVES** The bottom of the shuttle assembly is opened to full pump volume, Orifice "C" restricts this sudden surge of flow enough to overcome the shuttle spring force and the shuttle assembly is immediately raised up.

2. **WITH C369 & C369SS1 VALVES** The sequence port is opened to full pump volume. Oil is directed to an external mechanism. This oil is delivered only when the ram is in the "UP" position and is intended to be used to operate the external mechanism thus creating a tie-up in sequence between the external mechanism and the main ram. Oil from an external source must now be applied to the control port of the valve. This oil is directed to the bottom of the shuttle assembly. Orifice "C" restricts the flow of this oil enough to overcome the shuttle assembly spring force and the shuttle assembly is raised.

B. The pump volume is now directed to the top cylinder port and the ram starts down.

II. RAM EXTENDING (DIFFERENTIAL SPEED)

A. The bottom cylinder port is now open to the inside of the shuttle assembly thru the exhaust holes in the moveable sleeve. Therefore, as the ram starts down, the exhaust oil from bottom cylinder raises poppet "M" up against its spring and allows the bottom cylinder oil to join the incoming pump volume on its way to top cylinder giving us a differential circuit. As the ram moves down, the moveable sleeve goes with it for ap-

proximately 3/16 of an inch because it is spring centered. This action closes off sequence holes at point "X".

1. **WITH "FS" VALVES ONLY** The control spool shuttle is forced down by its spring force.

B. The downward movement of the moveable sleeve also opens up the bottom cylinder holes to the exhaust port in the body. All of the exhaust oil coming from bottom cylinder must now pass through the shuttle assembly to top cylinder. The back pressure created by the exhaust oil holding poppet "M" in the up position is transmitted to the bottom of the shuttle assembly through orifice "A" and will hold the shuttle assembly up throughout the differential closing portion of the down stroke of the ram.

III. PRESSING SPEED

A. When the press ram meets resistance (part or die cushion, etc.), pressure is reduced on bottom cylinder side of poppet "M" and increased on the top cylinder side causing poppet "M" to descend. This action prevents bottom cylinder oil from going to top cylinder through the shuttle assembly, causing the press ram to change from "differential" speed to "pressing" speed. At this time, top cylinder oil entering the shuttle assembly raises poppet "N" against its spring and off of its seat. Now the bottom cylinder exhaust oil can go to tank through the bottom of poppet "N" and the back pressure created by orifice "D" is transmitted to the bottom of the shuttle through orifice "A" and "C" and will hold the shuttle up throughout this pressing speed portion of the down stroke of the ram.

NOTE: If, at any time during the "DIFFERENTIAL" or "PRESSING" speed portions of the down stroke of the ram, the control spool is allowed to become spring centered through release of the actuation device, the shuttle will drop causing the ram to immediately reverse and retract to the end of its up stroke and stop when the upper collar is shifted. The actuation device must now be re-actuated in order to start a new cycle.

IV. RAM REVERSAL

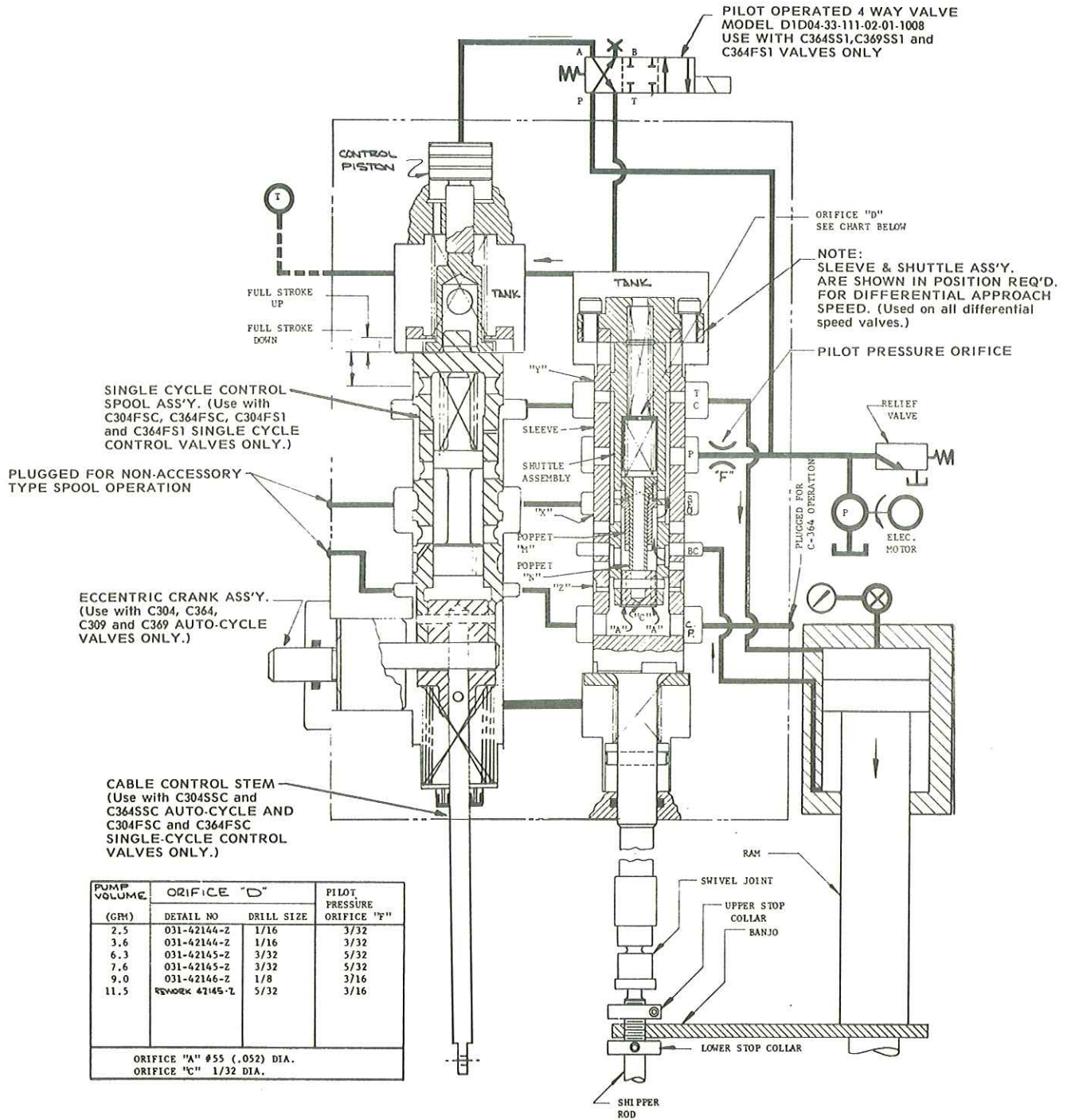
- A. The ram may now be reversed in any one of the following ways.
1. **PRESSURE REVERSAL** The ram resistance has built up to the point which causes the ram to stop and the relief valve is beginning to open. Bottom cylinder exhaust oil has stopped flowing and the shuttle assembly begins to drop. The dropping of the shuttle is slowed down by orifice "D". As the shuttle assembly completes its downward drop, the pump volume is directed to the bottom cylinder port and the ram reverses, giving pressure reversal.
 2. **DISTANCE REVERSAL** Do not distance reverse these valves. They are not designed for distance reversal.
 3. **EMERGENCY REVERSAL**. Refer to your Operating Controls manual for instructions regarding emergency reversal of these valves.

V. RAM RETRACTING

- A. Near the top of the up stroke the banjo contacts the upper stop collar, raising the sleeve. This

action opens the sequence holes and closes the bottom cylinder port.

1. **WITH ALL VALVES EXCEPT "FS" VALVES** If the control spool has been held down in the "AUTOMATIC" cycle position, the pump volume will again kick the shuttle assembly up and start another cycle. This "AUTOMATIC" cycling will continue until the control spool is manually or electrically released, allowing the pump volume to go to tank which will allow all of the parts previously mentioned to return to their "NEUTRAL" position which will stop the ram at the end of its up stroke when the upper collar is shifted.
2. **WITH "FS" VALVES ONLY** If the control spool assembly has been held down in the "SINGLE" cycle position, the control spool shuttle will be held down by its spring which will prevent the pump volume from raising the shuttle to start another cycle. Therefore the control spool must be either manually or electrically released, which will allow the control spool shuttle to be offset against its spring by the pump volume so that all previously mentioned parts are now in their "NEUTRAL" position which will stop the ram at the end of its up stroke when the upper collar is shifted.



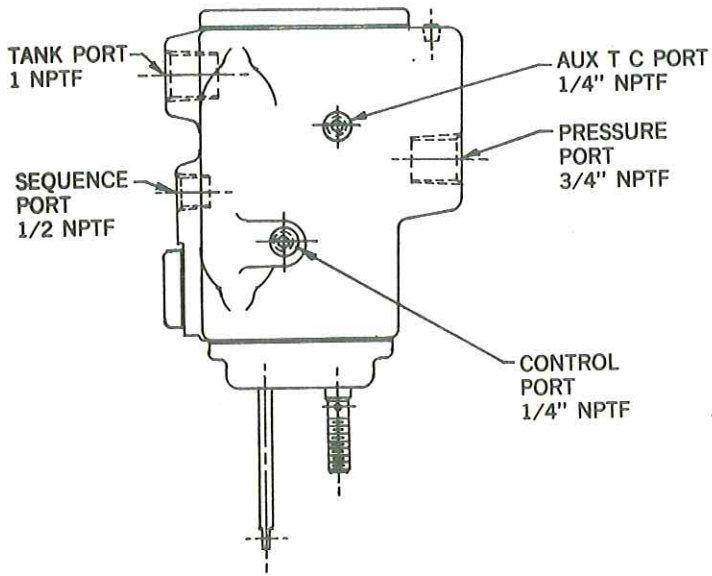
NOTE:
THIS DIAGRAM IS IN COMPOSITE FORM., USE ONLY FOR OPERATIONAL FUNCTIONS IN CONJUNCTION WITH "CYCLING" or "BASIC OPERATIONS" DESCRIPTIONS.

FIGURE 5
DIFFERENTIAL SPEED SLEEVE ASS'Y. & SINGLE CYCLE CONTROL SPOOL ASS'Y.

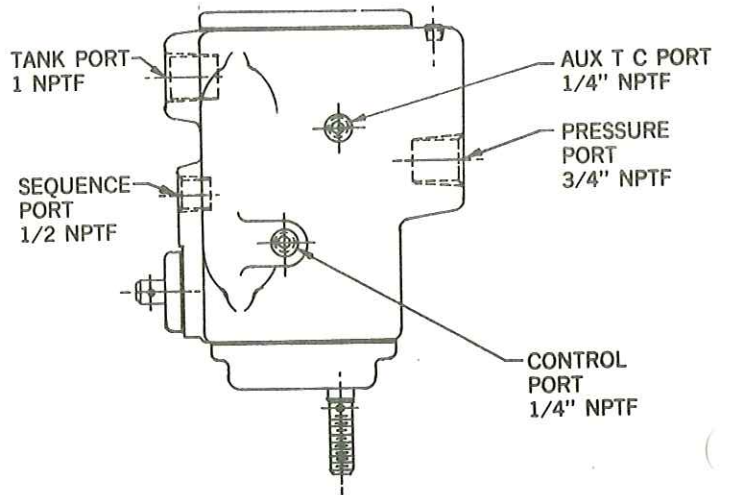
DIFFERENTIAL SPEED VALVES

(Models C364, C369, C364FSC, C364SSC, C364FS1, C364SS1, C369SS1)

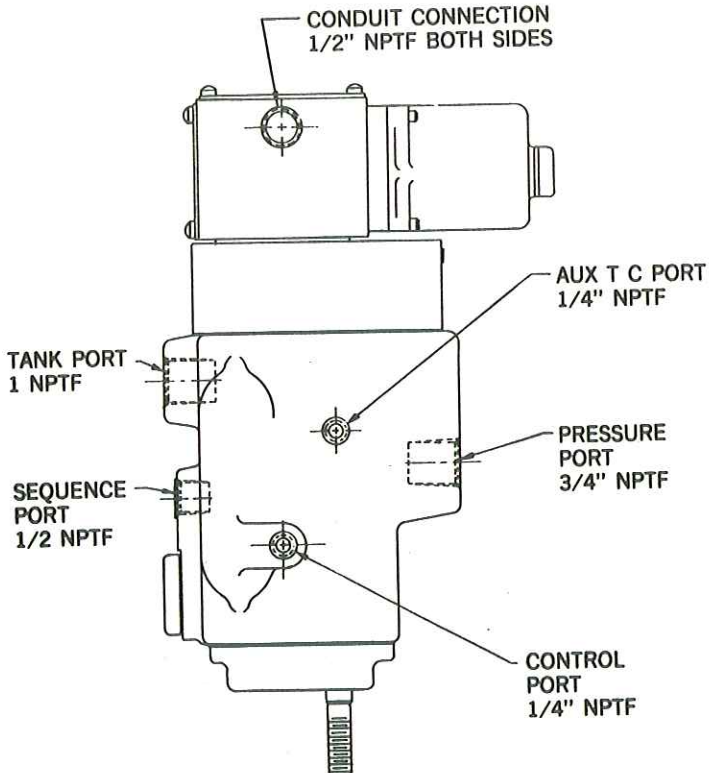
<p>A. Ram descends but will not return.</p>	<ol style="list-style-type: none"> 1. Check shuttle assembly. It should move freely in sleeve. 2. Check pins and poppets in shuttle assembly for breakage or sticking. 3. Check pins and spools in shuttle assembly for breakage or sticking. 4. Check orifices in shuttle assembly to be sure they are open. 5. If, during reduction of relief valve setting, the ram reverses, check cylinder for leakage past piston rings.
<p>B. Ram will not descend.</p>	<ol style="list-style-type: none"> 1. Top collar too high on shipper rod and valve not centering. 2. Check relief valve setting. This valves minimum operating pressure should be 250 to 300 PSI. 3. Check relief valve for dirt, lint, etc. 4. Also check for dirt in valves. 5. Check shuttle assembly as noted above. 6. Check pump and pressure lines for cracks or leaks.
<p>C. Shipper rod arm breaks on "UP" stroke.</p>	<ol style="list-style-type: none"> 1. Check screws in top cap of sleeve. Be sure that all screws are in place and tight.
<p>D. Pressure will not build up before ram reverses.</p>	<ol style="list-style-type: none"> 1. Check lower stop collar. Shipper rod arm should not contact it. 2. Check relief valve setting as noted above. 3. Check pump and pressure lines as noted above. 4. Possibly slightly smaller orifice "D" in shuttle assembly to prevent shuttle from dropping too fast will help. (1/32 dia. minimum allowable.) 5. Time delay limit switch (if used) being actuated too soon causes half tonnage to be applied to work even though pressure gauge shows full tonnage also, time delay period is shortened. Lower limit switch.
<p>E. Press overheats.</p>	<ol style="list-style-type: none"> 1. Be sure cooler coils within the press reservoir are attached to water lines and water is flowing through them. Setting on water valve should be 130° F maximum.
<p>F. Ram fails to go into fast approach speed.</p>	<ol style="list-style-type: none"> 1. Check shuttle assembly as noted above. 2. Pump in excess of 9 GPM and using a long stroke may be causing excessive back pressure preventing poppet "M" from raising against its spring force. Reduce GPM or shorten stroke.
<p>G. Ram takes short repeat strokes when in down position.</p>	<ol style="list-style-type: none"> 1. In all probability too short a ram stroke is being used. Lengthen stroke to at least 3/4 inch.
<p>H. Pin breakage in shuttle assembly.</p>	<ol style="list-style-type: none"> 1. Pump in excess of 9.0 GPM and using distance reversal. Distance reversal not recommended. 2. Press being used in blanking operation not recommended.
<p>J. Index table or other sequence line accessory creeps during inching.</p>	<ol style="list-style-type: none"> 1. Control spool does not return to neutral position when solenoid is de-energized. External sequence port must be fully blocked by control spool during inching. Check control spool and spool stop for excessive wear.



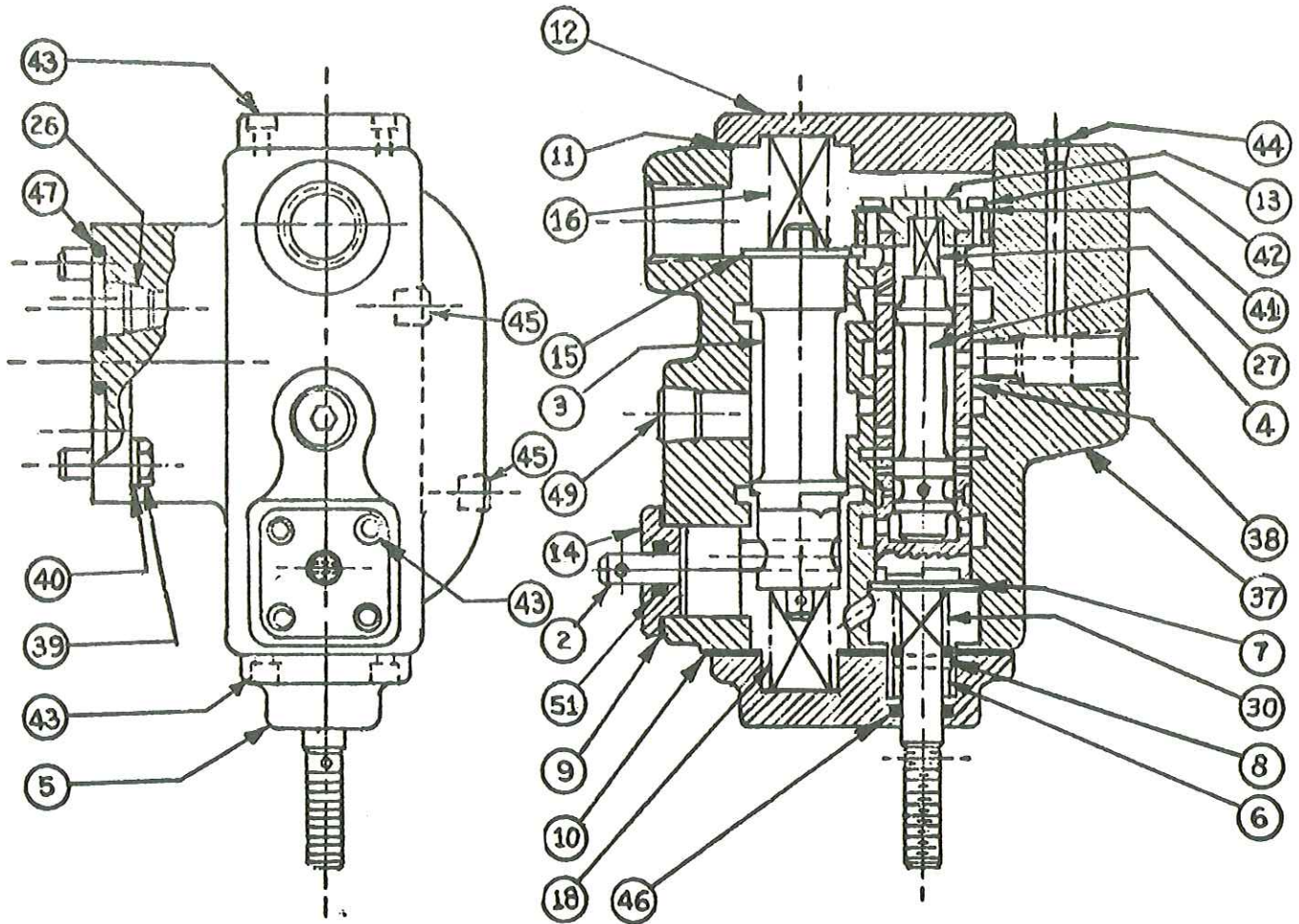
**PORTING DEFINITION FOR
C304FSC, C364FSC, C304SSC & C364SSC
DUAL LEVER ACTUATED
VALVES**



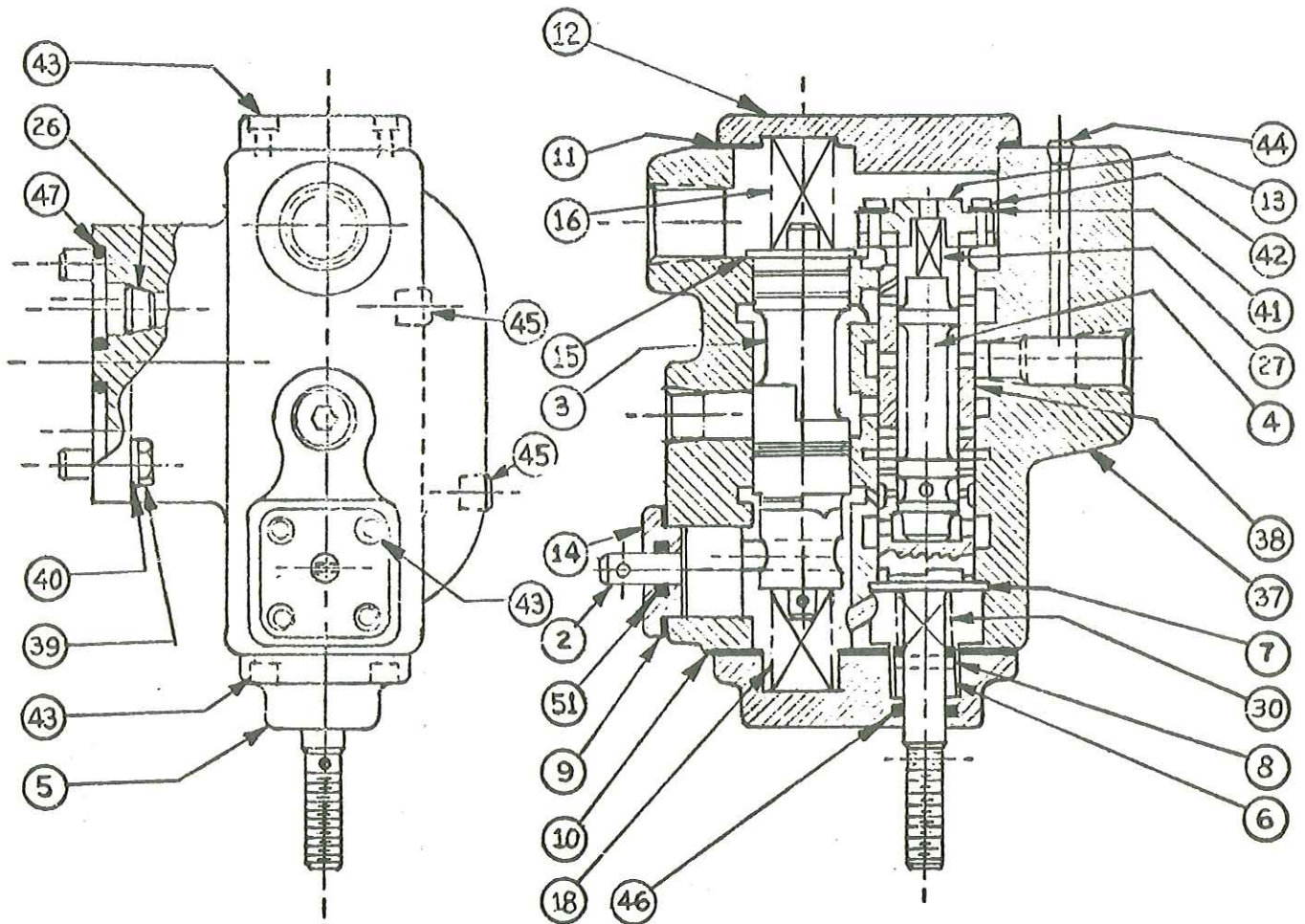
**PORTING DEFINITION FOR
C304, C309, C364 & C 369
SELECTOR LEVER ACTUATED
VALVES**



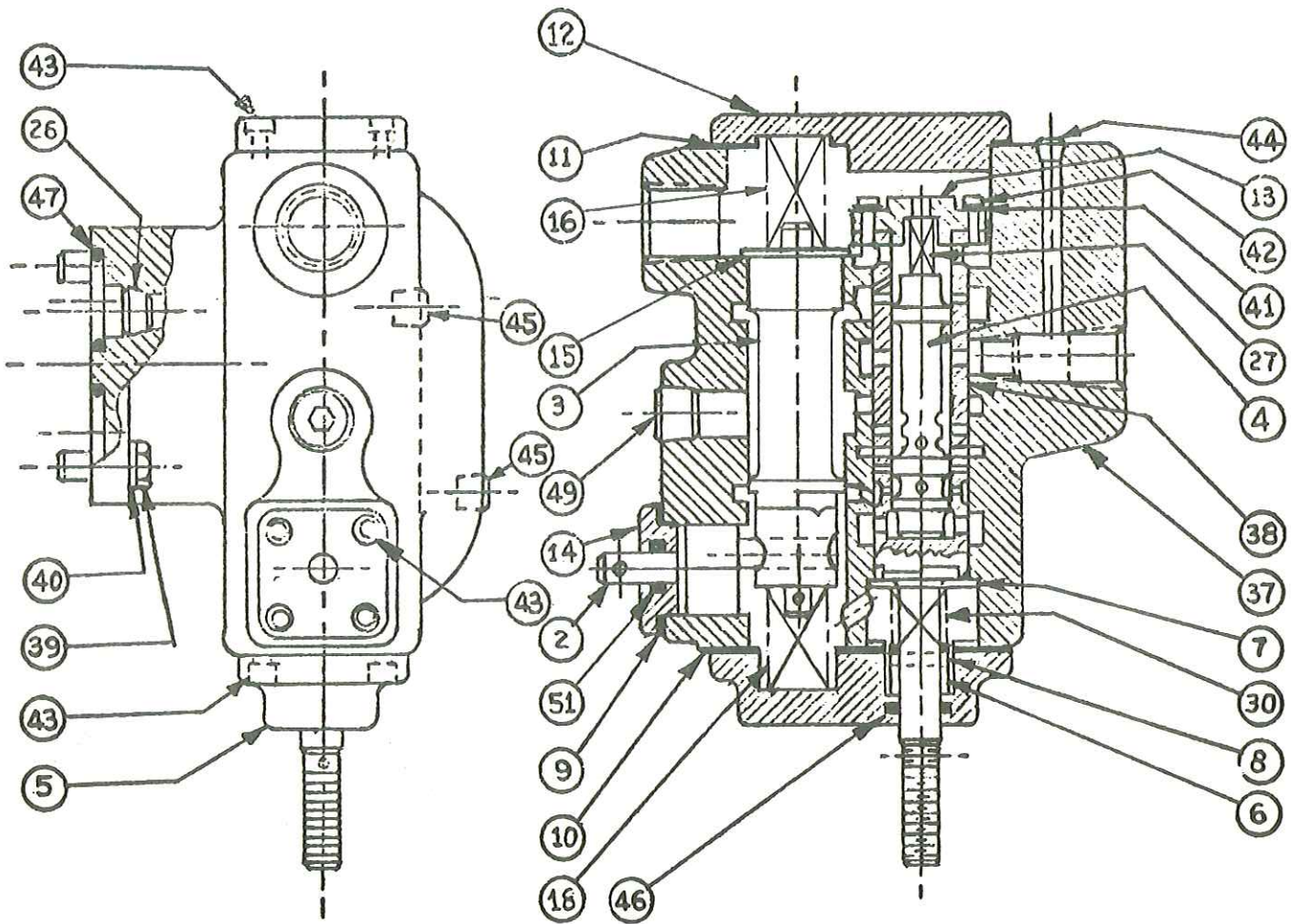
**PORTING DEFINITION FOR
C304FS1, C364FS1, C304SS1, C364SS1, C309SS1 & C369SS1
ELECTRIC SOLENOID ACTUATED VALVES**



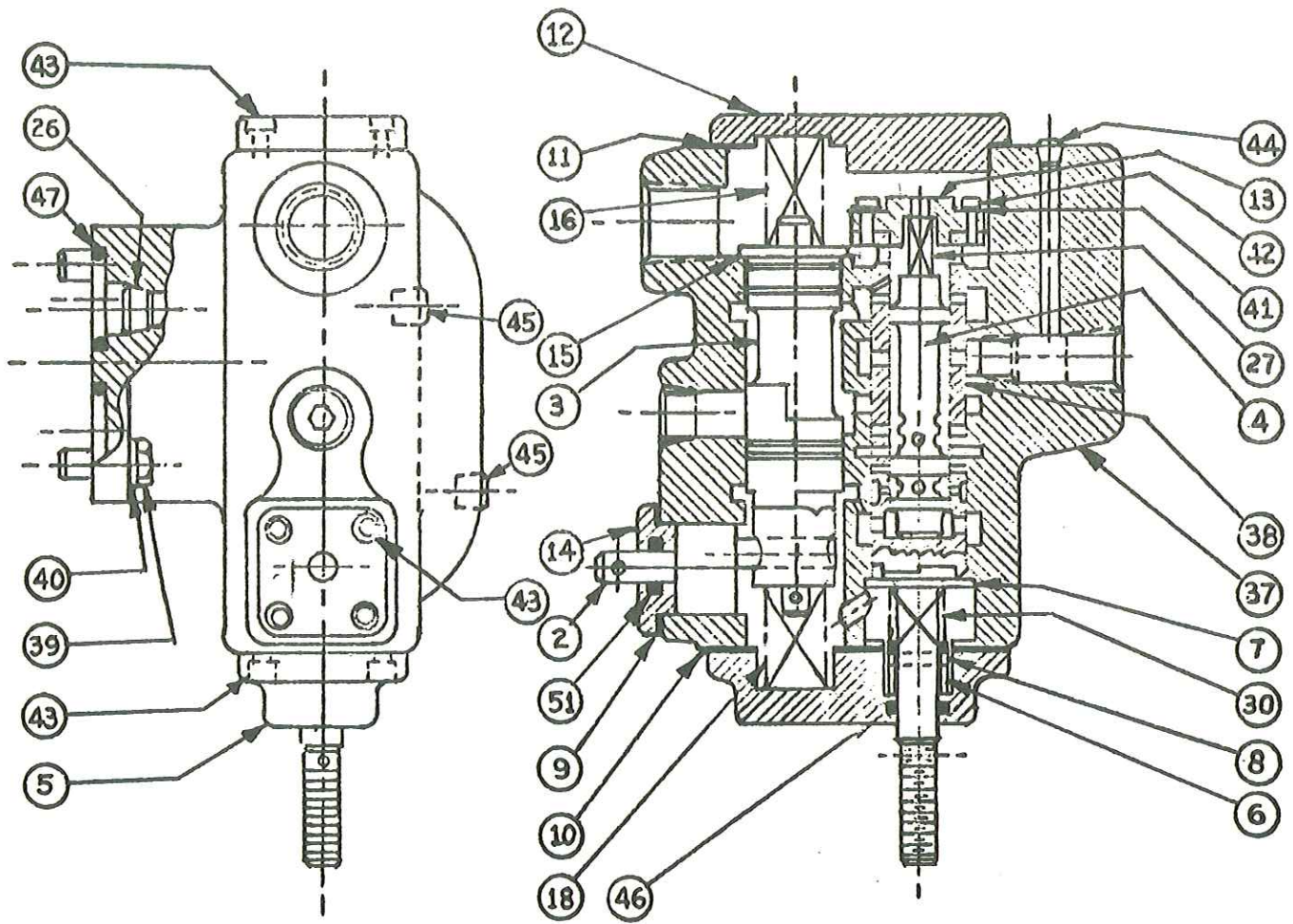
MODEL C304
MANUALLY CONTROLLED AUTO-SINGLE CYCLE VALVE ASS'Y.
 010-24269



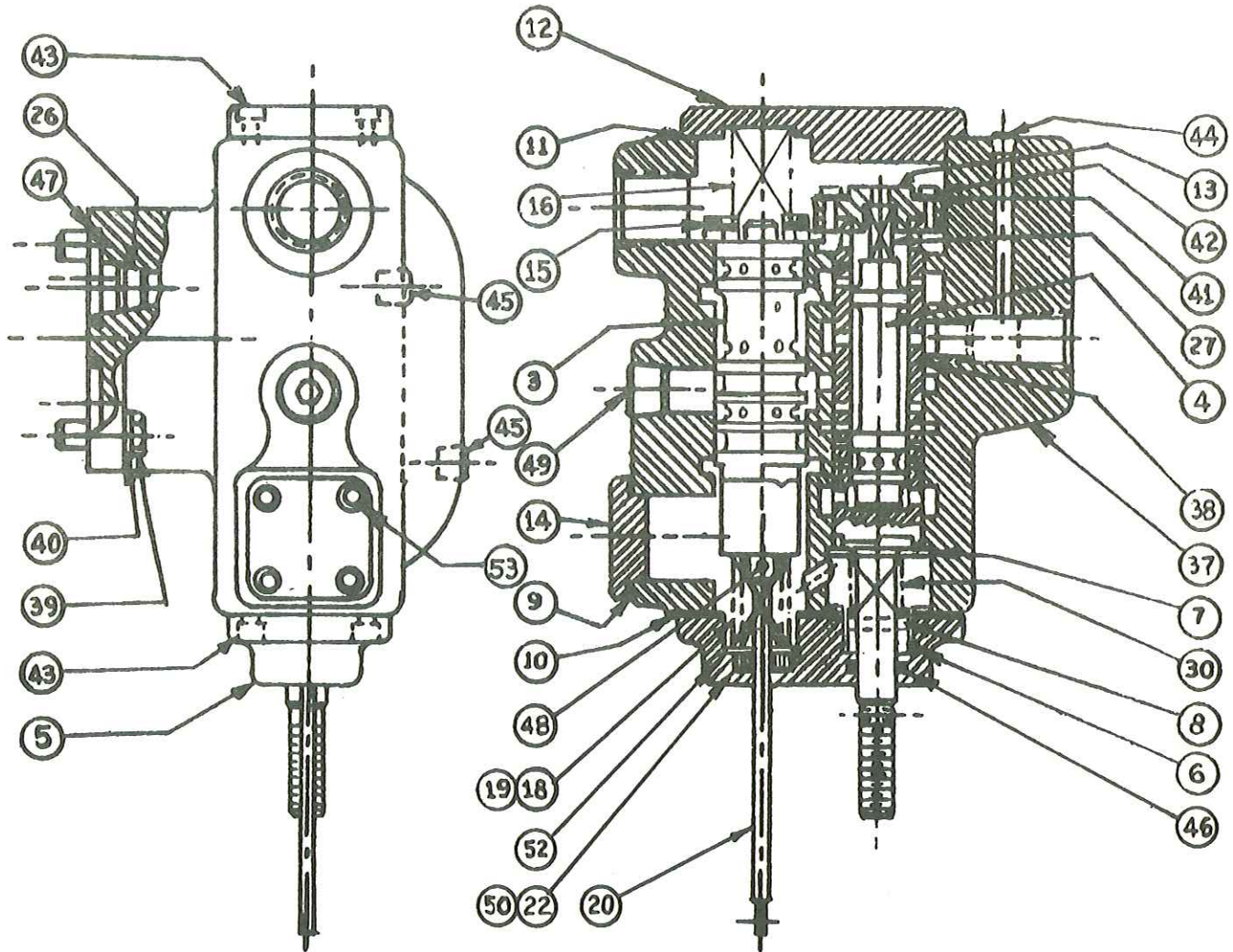
MODEL C309
MANUALLY CONTROLLED AUTO-SINGLE CYCLE VALVE ASS'Y.
 010-24270



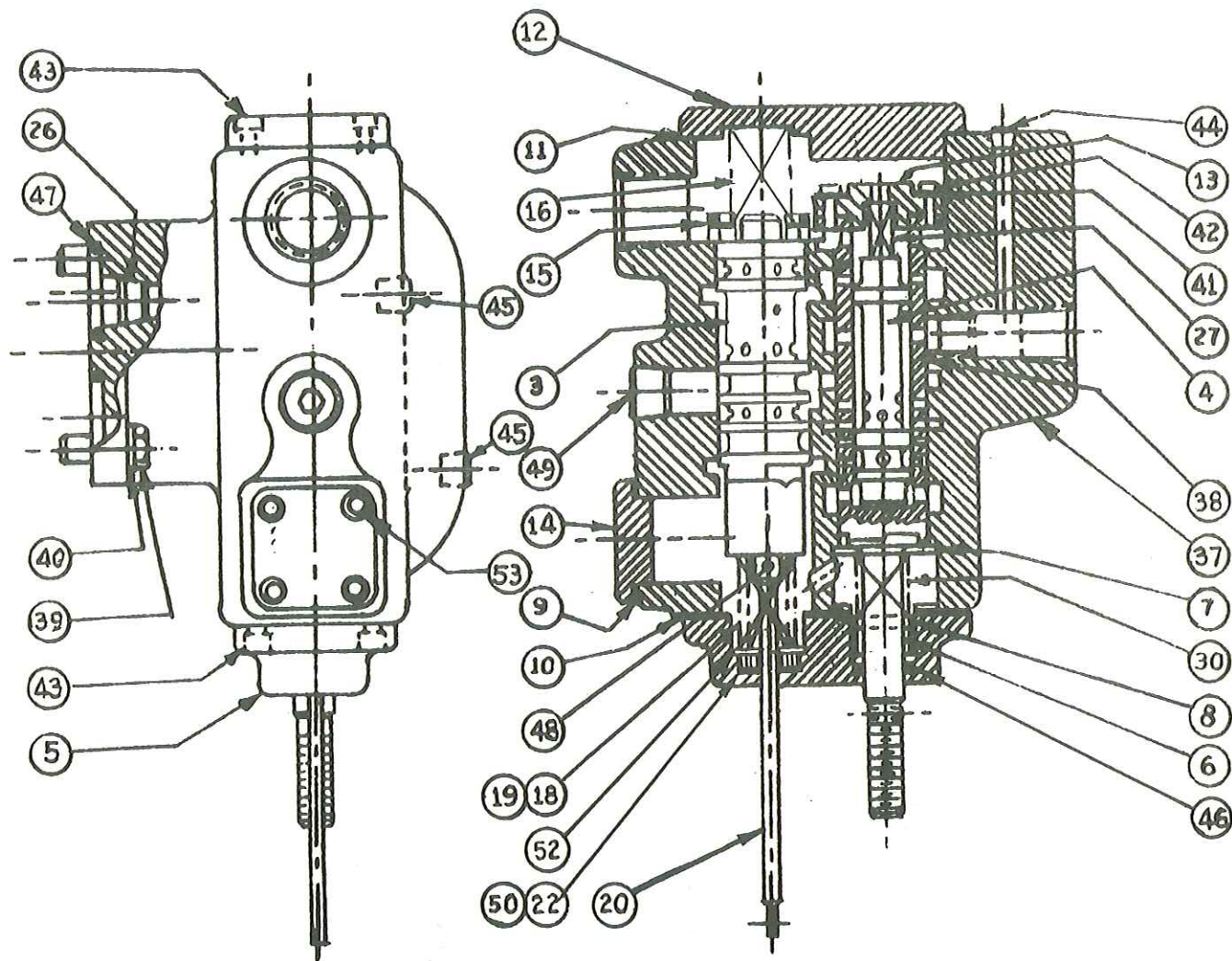
MODEL C364
MANUALLY CONTROLLED AUTO-SINGLE CYCLE VALVE ASS'Y.
 010-24271



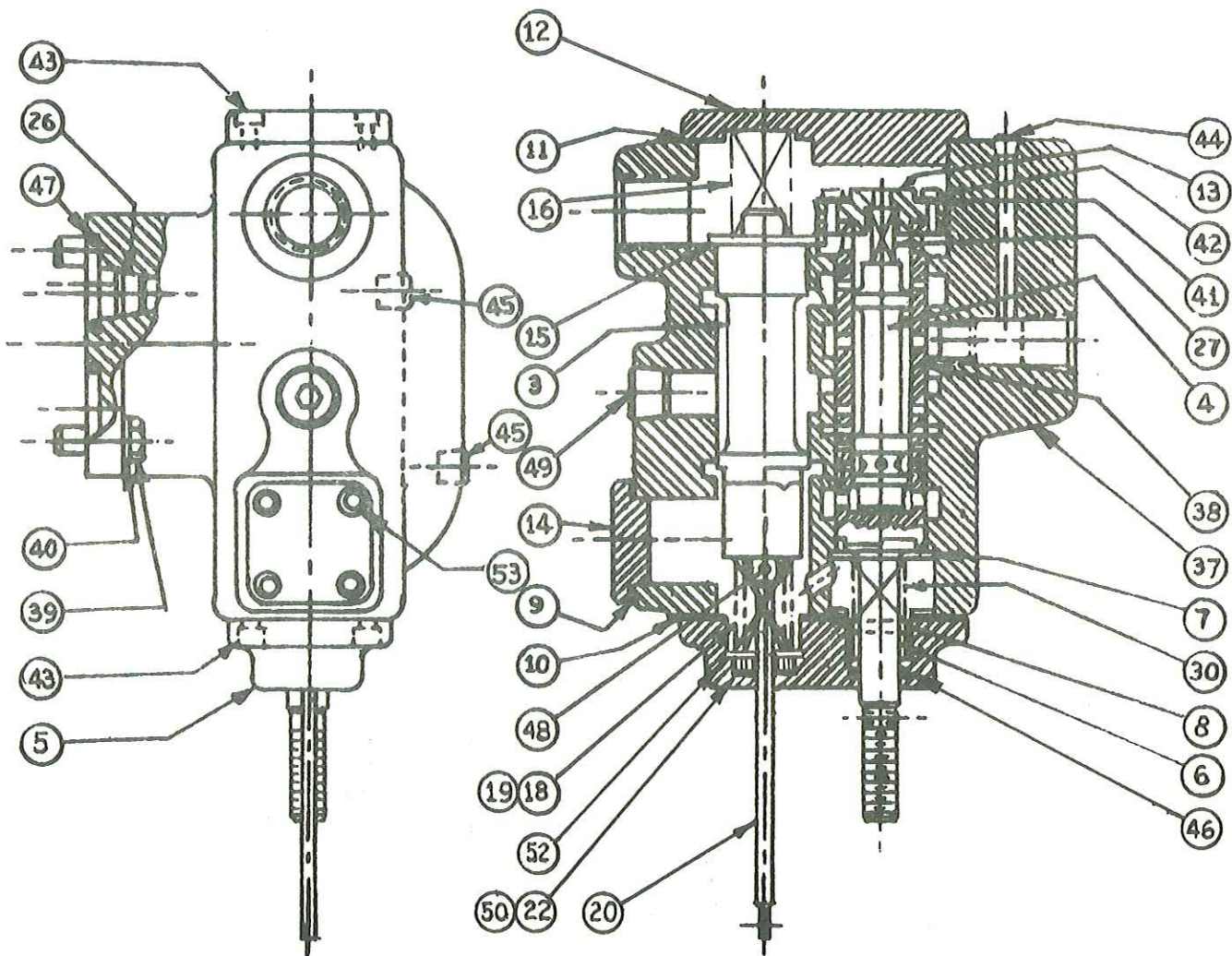
MODEL C369
MANUALLY CONTROLLED AUTO-SINGLE CYCLE VALVE ASS'Y.
 010-24272



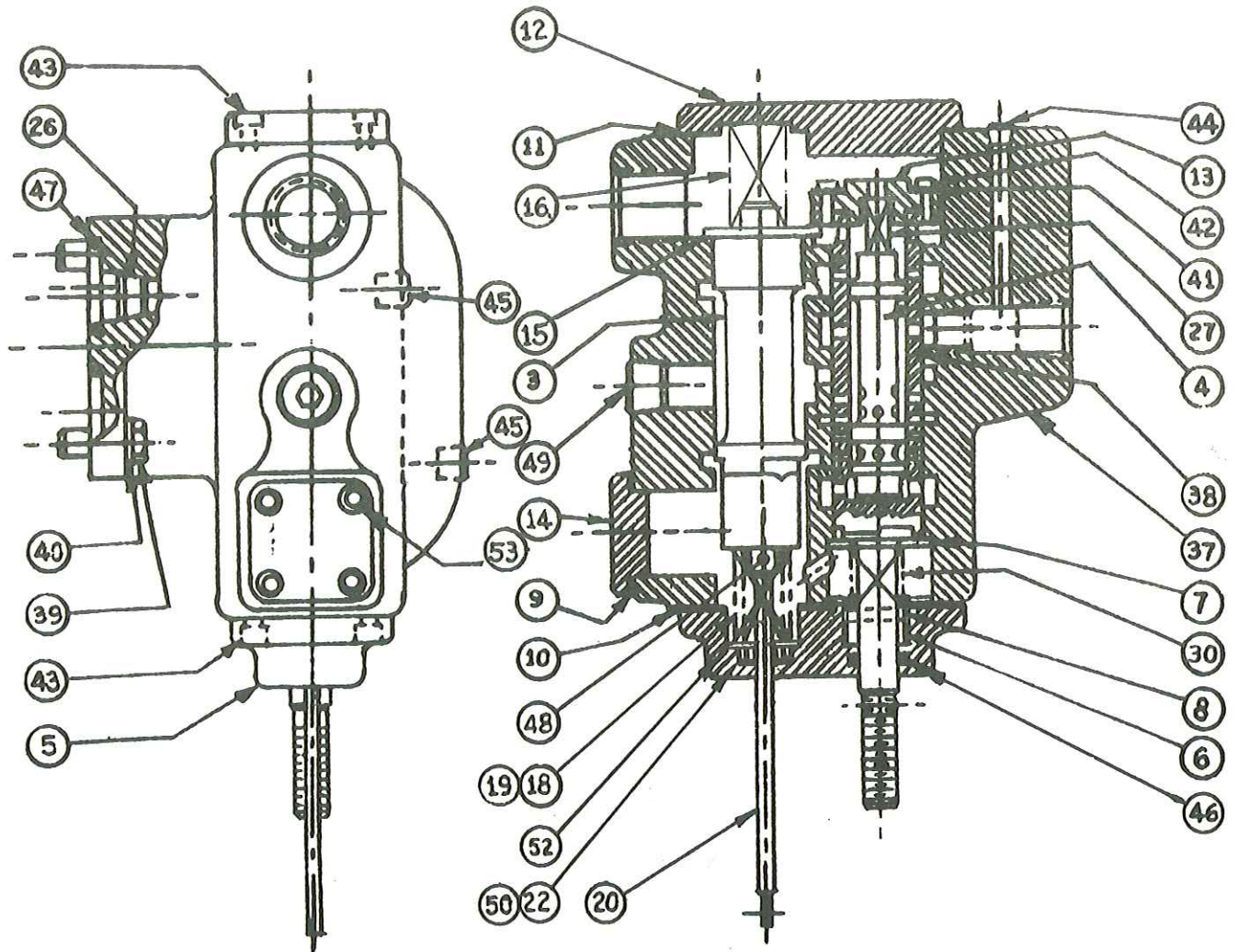
MODEL C304FSC
 MANUALLY CONTROLLED SINGLE CYCLE VALVE ASS'Y.
 010-24273



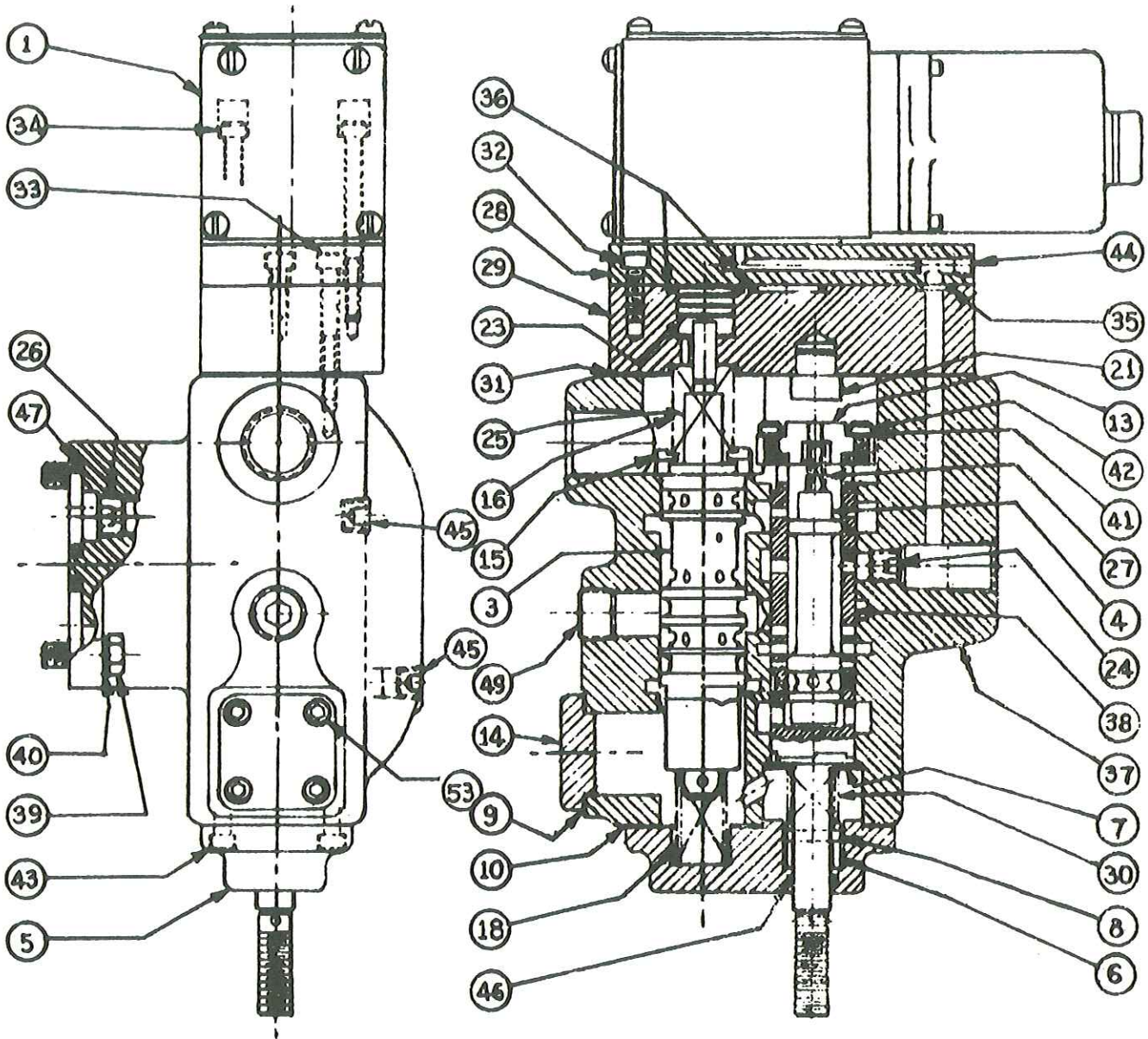
MODEL C364FSC
MANUALLY CONTROLLED SINGLE CYCLE VALVE ASS'Y.
.010-24274



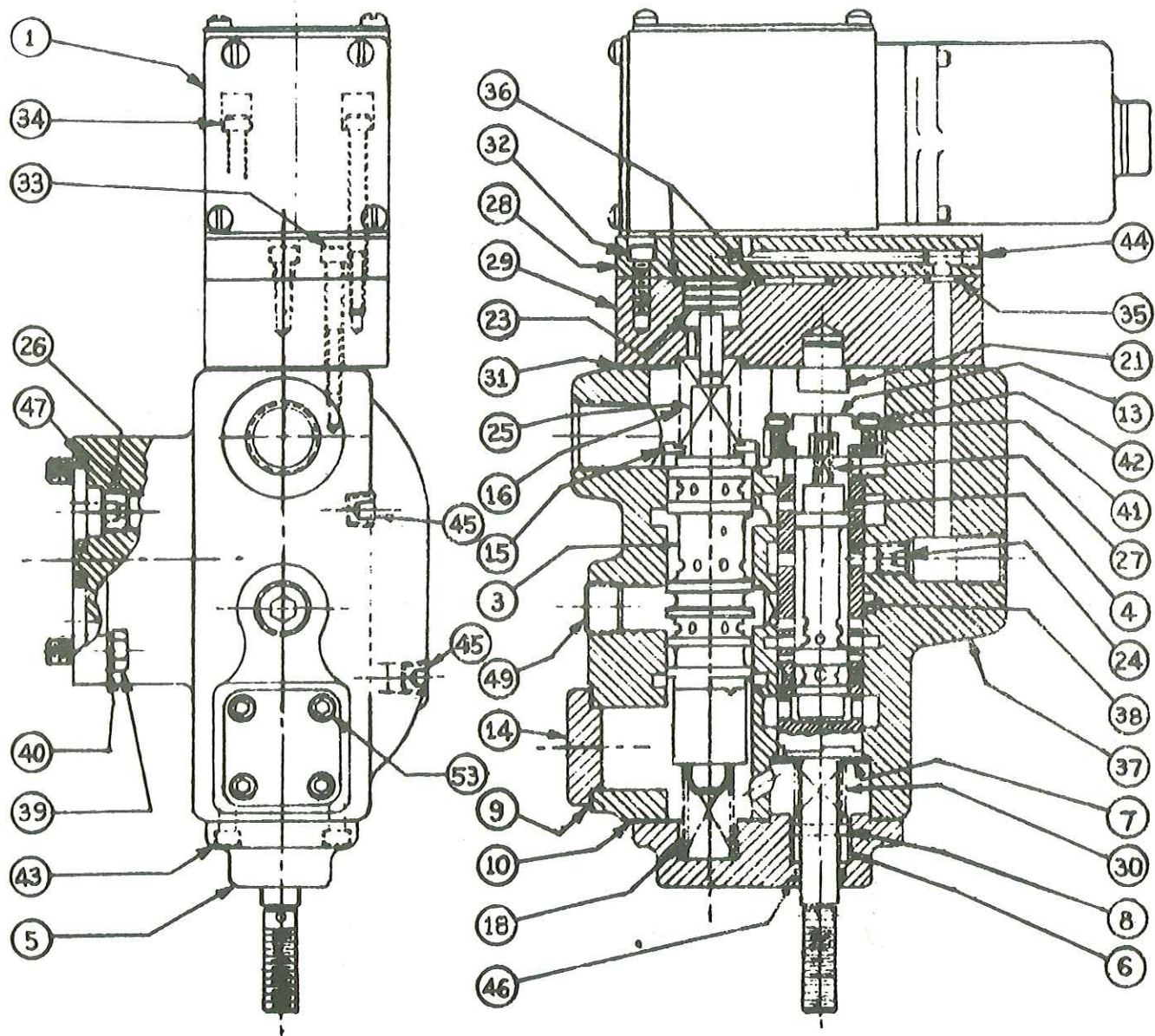
MODEL C304SSC
 MANUALLY CONTROLLED AUTO-SINGLE CYCLE VALVE ASS'Y.
 010-24275



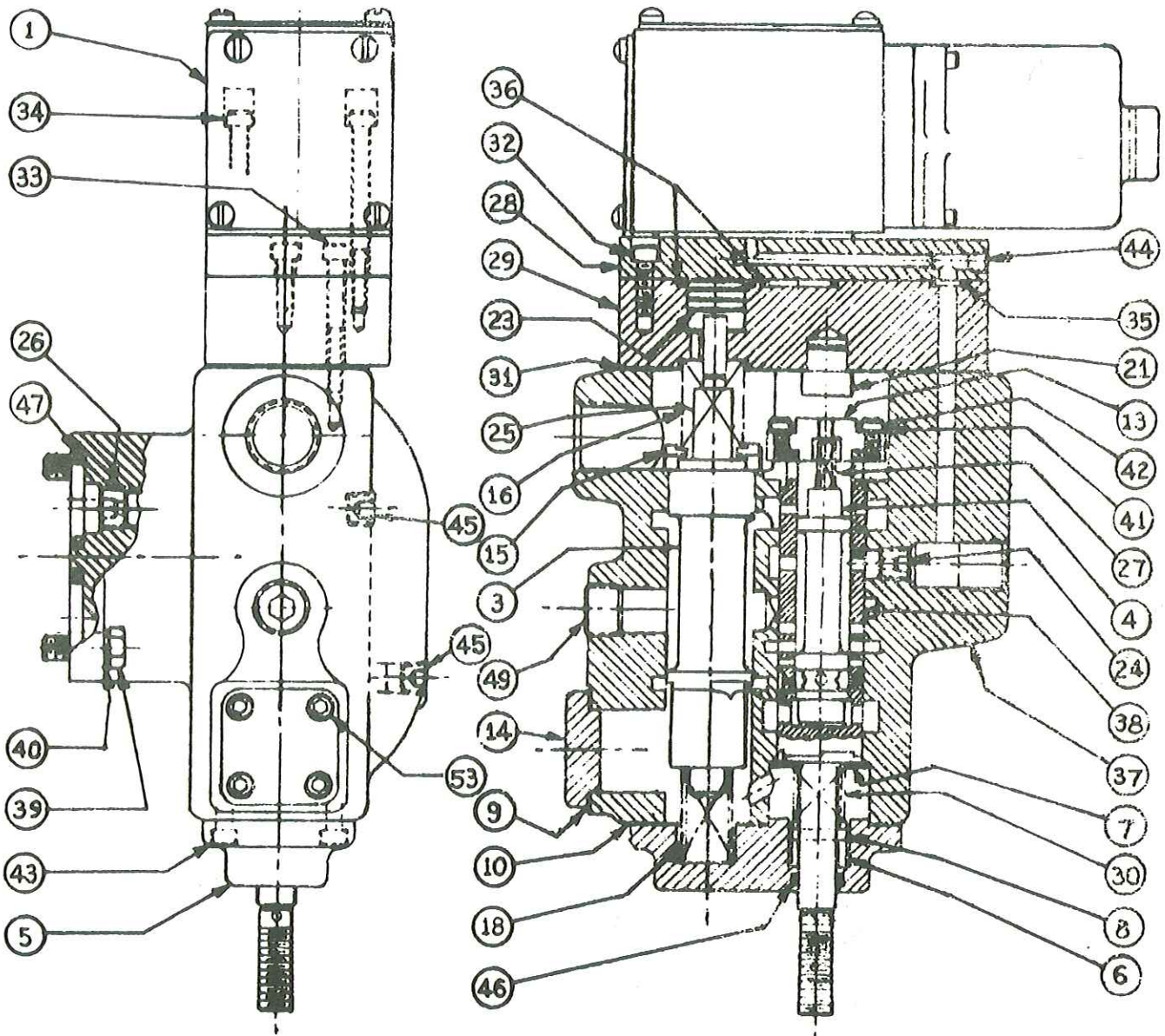
MODEL C364SSC
 MANUALLY CONTROLLED AUTO-SINGLE CYCLE VALVE ASS'Y.
 010-24276



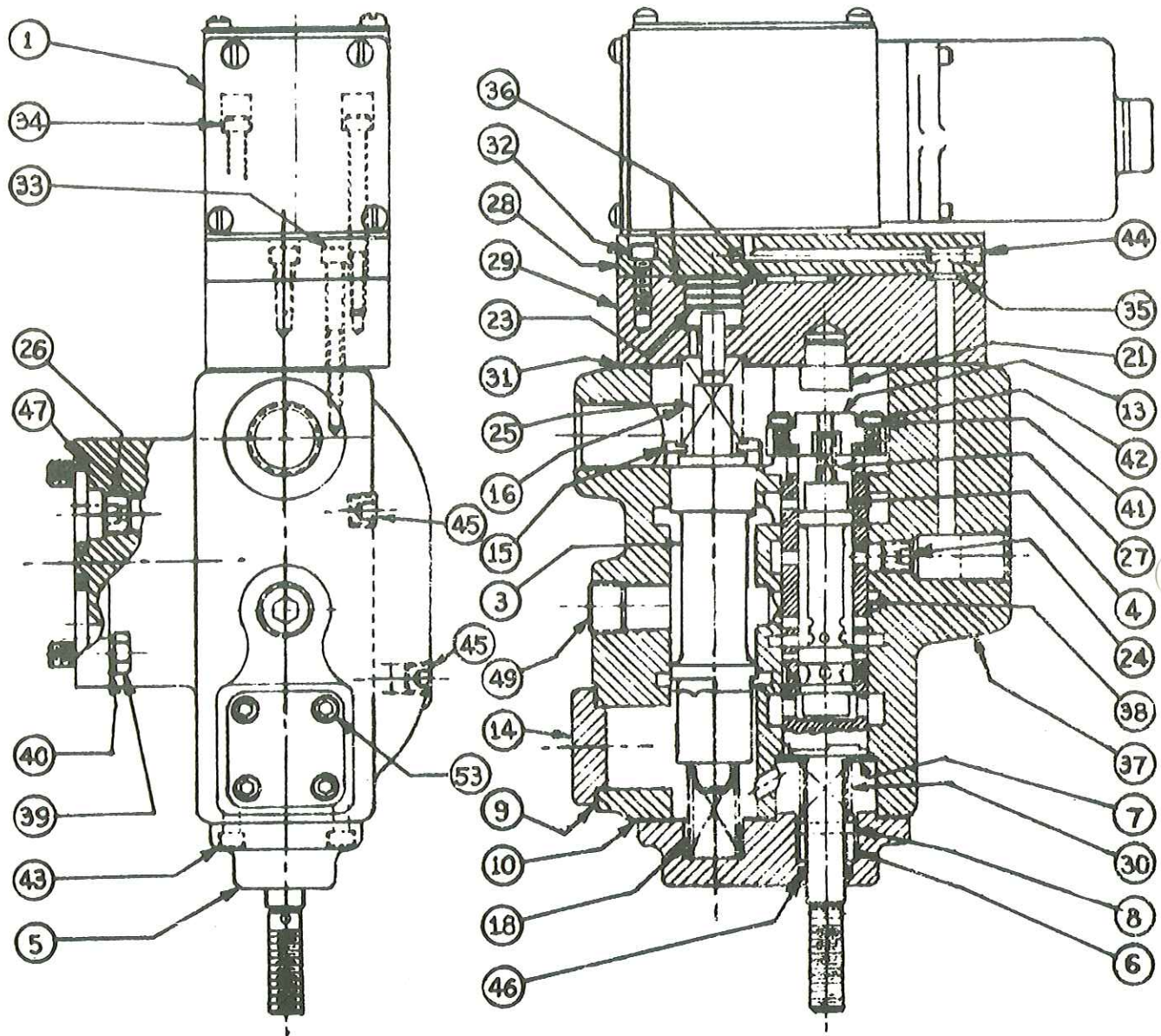
MODEL C304FS1 (110 V - 60 HZ)
 SOLENOID CONTROLLED SINGLE CYCLE VALVE ASS'Y.
 010-24683



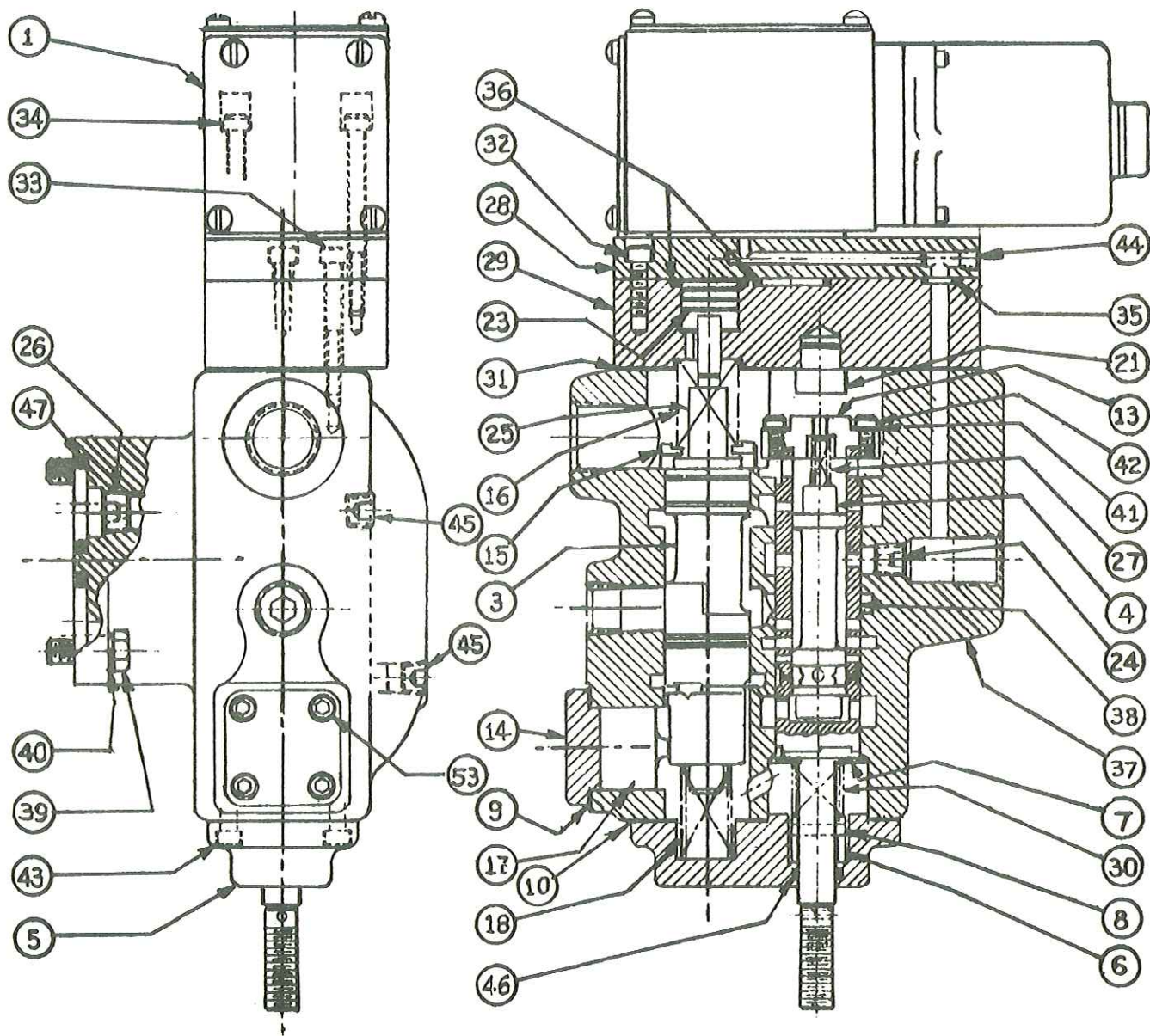
MODEL C364FS1 [110 V—60 HZ]
 SOLENOID CONTROLLED SINGLE CYCLE VALVE ASS'Y.
 010-24684



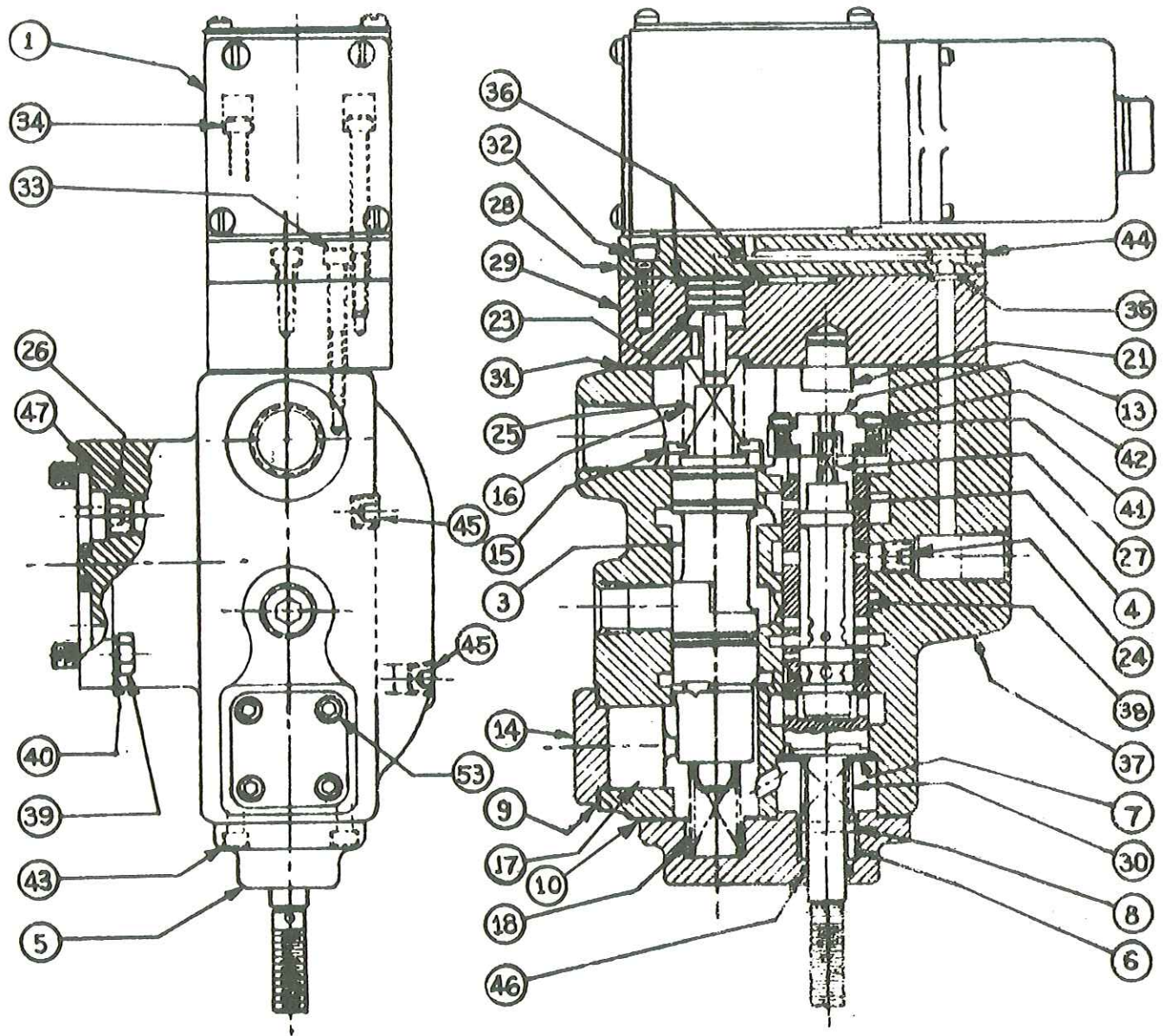
MODEL C304SS1 (110 V - 60 HZ)
SOLENOID CONTROLLED AUTO-SINGLE CYCLE VALVE ASS'Y.
010-24685



MODEL C364SS1 (110 V - 60 HZ)
SOLENOID CONTROLLED AUTO-SINGLE CYCLE VALVE ASS'Y.
 010-24686



MODEL C309SS1 (110 V - 60 HZ)
 SOLENOID CONTROLLED AUTO-SINGLE CYCLE VALVE ASS'Y.
 010-24687

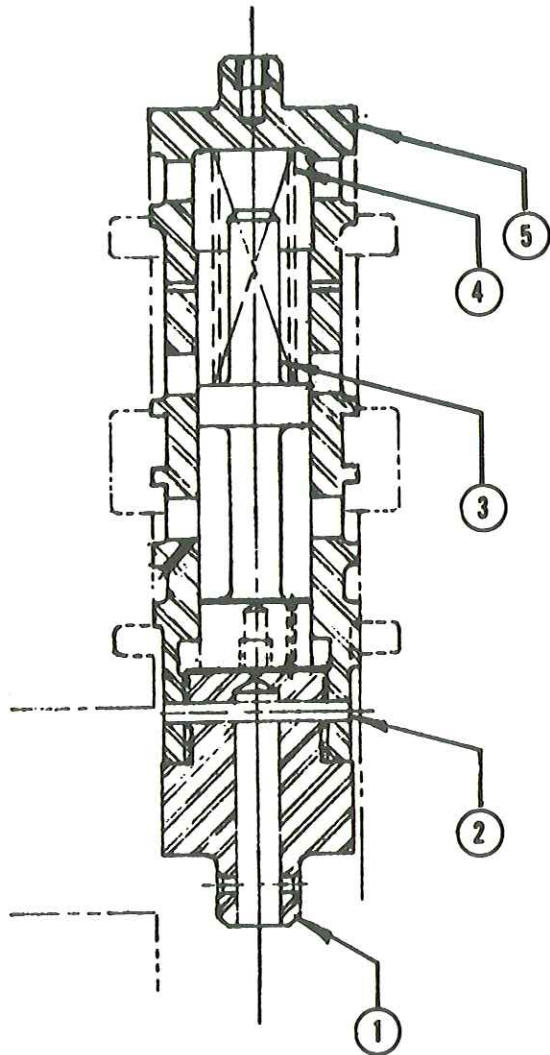


MODEL C369SS1 (110 V - 60 HZ)
 SOLENOID CONTROLLED AUTO SINGLE CYCLE VALVE ASS'Y.
 010-24688

parts list

Item	Part No.	Description	Model No.	Part No.	Description	Model No.
	010-01494	4 way valve		030-48411	Piston	
	D1004-33			030-14767	Orifice "F"	
	536-00001	4 way valve		030-48413	Plunger	
		D01 Series		030-5227	Plunger	
	010-00454	Eccentric		030-21572	Orifice "F"	
	010-12244	04-64 Sing		030-22108	Spring 64-69	
		spool assem		030-22057	Spring 04-09	
	030-17000	04-64 Auto		030-48472	Plate-Pilot	
	030-25546	09-69 Auto		030-53318	Plate-Pilot	
		Spool		030-48473	Block-Pilot	
	030-25785	09-69 Elec-Auto		030-22251	Spring-Sleeve	
		Spool		030-48475	Gasket-Block	
	010-14423	Shuttle-Diff'l		358-12300	SCHS 1/2-20X2 3/4	
	030-27147	Shuttle-Std		359-09246	SCHS #10-32-2	
	030-10076	Cap - Bottom		671-00214	O Ring	
	030-10834	Cap-Bottom		030-48471	O Ring	
		Cable Control		040-00117	Body-Valve	
	030-10078	Collar Sleeve		030-48474	Sleeve	
	030-10079	Washer-Sleeve		306-16160	BHCS 3/8-16X1	
	024-21214	Sleeve Stem		346-10024	3/8 Lockwasher	
		Pin (030-10080)		348-10010	#10 Int. Lockwasher	
	030-10081	Gasket-Cap		358-10060	SHCS #10-24X3/8	
		Side		358-12100	SHCS 1/2-20X5/8	
	030-10083	Gasket-Cap		431-90100	1/16 Pipe Plug	
		Bottom		431-90400	1/2 pipe plug	
	030-10084	Gasket-Cap		671-00218	O Ring-Strc	
		Top		325-06080	Pin 3/32X1/2	
	030-10085	Cap-Top		431-90800	1/2 Pipe Plug	
	030-10086	Cap-Sleeve		616-00112	Packing Rod	
		Std. Speed		030-10853	O Ring	
	030-14298	Cap-Sleeve		306-12140	BHCS 1/2-20X7/8	
		Diff'l Speed				
	030-10090	Cap - Side				
	030-13363	Cap - Side				
	488-35044	Slide Plug				
		W/axel				
	030-10092	Stop-Spool				
	030-13733	Stop-Spool				
	030-22307	Spring				
	030-25784	Pin-Align				
	030-22265	Spool Bottom				
		Spring				
	030-69781	Spring				
	030-22278	Spring (inner)				
	030-11136	Spring (outer)				
	030-13462	Rod-Cable				
	030-48412	Button-Stop				
	030-13851	Ring Support				

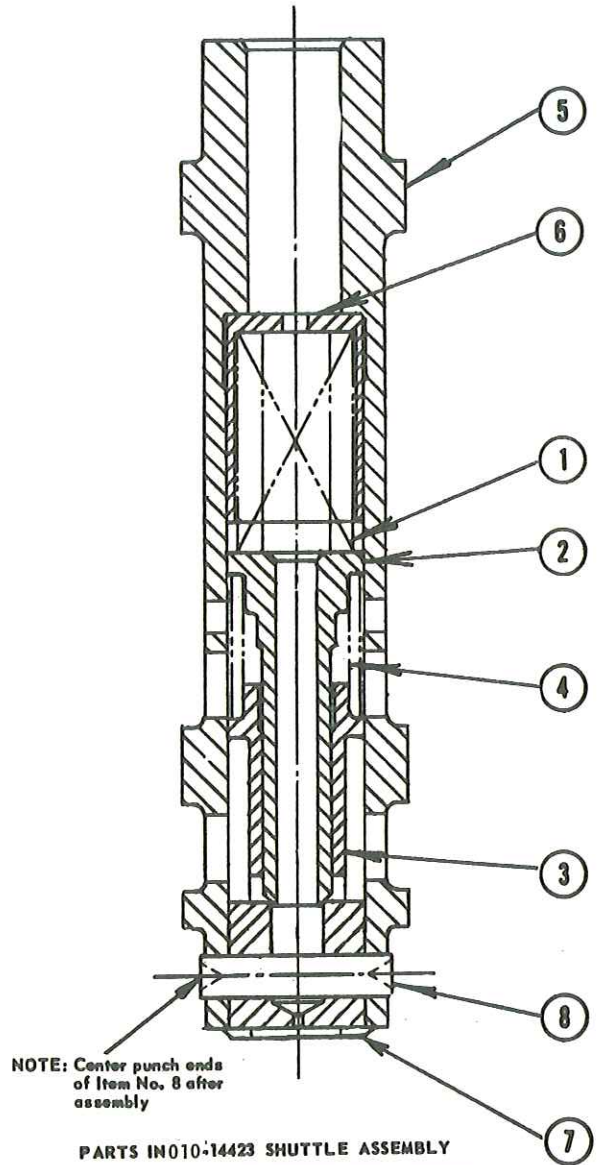
Item	Part No.	Description	Model No.	Part No.	Description	Model No.
	000-00042			C469SSI		
	000-00041			C409SSI		
	000-00040			C464SSI		
	000-00039			C404SSI		
	000-00038			C464FSI		
	000-00037			C404FSI		
	010-24688			C369SSI		
	010-24687			C309SSI		
	010-24686			C364SSI		
	010-24685			C304SSI		
	010-24684			C364FSI		
	010-24683			C304FSI		
	010-24276			C364SSC		
	010-24275			C304SSC		
	010-24274			C364FSC		
	010-24273			C304FSC		
	010-24272			C369		
	010-24270			C309		
	010-24271			C364		
	010-24269			C304		



PARTS IN010-12244 FULL SAFETY SPOOL

Item	Part No.	Description
1	030-27148	Plug - Valve
2	325-08160	Roll Pin
3	030-17128	Shuttle - Valve
4	030-22141	Spring
5	030-17129	Spool - Valve

Safety Spool Assembly for C304FS & C364FS



NOTE: Center punch ends of Item No. 8 after assembly

PARTS IN010-14423 SHUTTLE ASSEMBLY

Item	Part No.	Description
1	030-13244	Spring
2	030-14295	Poppet
3	030-14296	Shuttle
4	030-22183	Spring
5	030-25667	Shuttle Valve
6	030-42144	Orifice & Spring Retainer for 3.6 GPM Pump
	030-42145	Orifice & Spring Retainer for 6.3 & 7.6 GPM Pump
	030-42146	Orifice & Spring Retainer for 9.0 & 11.5 GPM Pump
7	030-42147	Seat, Poppet
8	030-13040	Pin

Differential Shuttle Assembly for All C364 & C369