

EFFECTIVE DATE 1/1/81



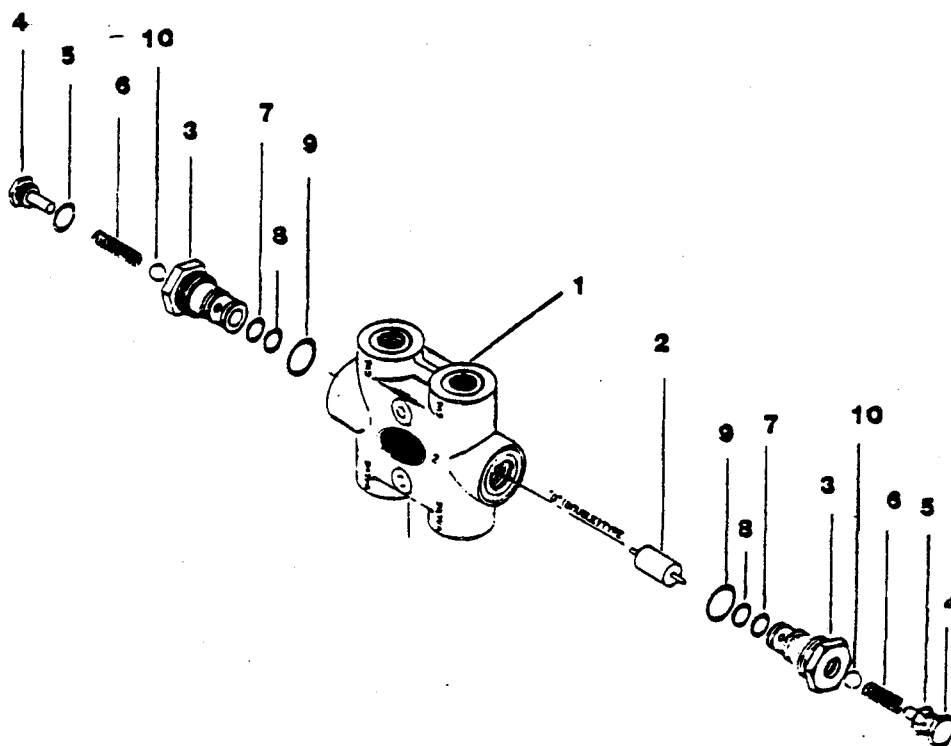
(Continued on Next Page)

MODEL 40-80-130 RM& BOC STABILIZER **VALVE BANK ASSEMBLY** **(Continued)**

ITEM NO.	QTY.	DESCRIPTION	PART NO.	INCLUDED IN VALVE SECT.			
				A	B	C	D
C	1	VALVE SECTION, stabilizer, left side	551-00058				
D	1	VALVE SECTION, right end outlet	551-00049				
1	1	ASSEMBLY, main relief valve	558-00100	X			
2	2	KIT, check plug	552-00002		X	X	
3	2	ASSEMBLY, positioner	552-00028		X	X	
4	2	KIT, retainer	552-00029		X	X	
5	2	HOUSING & SPOOL, (N.S.S.) (order complete valve section)			X	X	
6	5	PLATE, seal	551-00109		X	X	
7	2	ADAPTER, clevis	551-00119		X	X	
8	2	LOCKWASHER	551-00118		X	X	
9	1	CASTING, outlet cover		X			
10	4	STUD		X	X	X	X
11	4	NUT	558-00034	X	X	X	X
12	1	ASSEMBLY, main relief valve (optional)	557-00150	X			
13	2	PLUG & O-RING	558-00510	X			
14	2	O-RING		X			
(m)	as req'd	Included in seal kit	552-00013		X	X	
(p)	as req'd	Included in rebuilding kit	552-00032	X			
(q)	as req'd	Included in seal kit	552-00017	X			
(r)	as req'd	Included in rebuilding kit	552-00030	X			
(s)	as req'd	Included in seal kit	552-00018	X			
(t)	as req'd	Included in piston & cylinder kit	552-00031	X			

(N.S.S.) — NOT SOLD SEPARATELY

MODEL "LO" LOCK VALVE



ITEM NO.	QTY.	DESCRIPTION	PART NO.
	1	VALVE, "LO" lock	563-00002
1	1	HOUSING, valve N.S.S.	
(1) 2	1	PISTON, N.S.S.	
(1) 3	2	BODY, check N.S.S.	
(1) 4	2	CAP, check body N.S.S.	
(1) 5	2	SEAL, cap N.S.S.	
(1) 6	2	SPRING, check N.S.S.	
(1) 7	2	SEAL, body N.S.S.	
(1) 8	2	SEAL, back-up N.S.S.	
(1) 9	2	SEAL, head N.S.S.	
(1) 10	2	BALL, check N.S.S.	

(1) INCLUDED IN REPAIR KIT
(N.S.S.) NOT SOLD SEPARATELY

552-00144

NOTE: THESE LOAD LOCKS ARE LOCATED
ON THE OUTRIGGER HOUSINGS,
FOUR ARE REQUIRED.

EFFECTIVE DATE 1/1/81

6-18

RELIEF VALVE (used on Rear Mount Applications , 1750 P.S.I.)

PARTS LIST

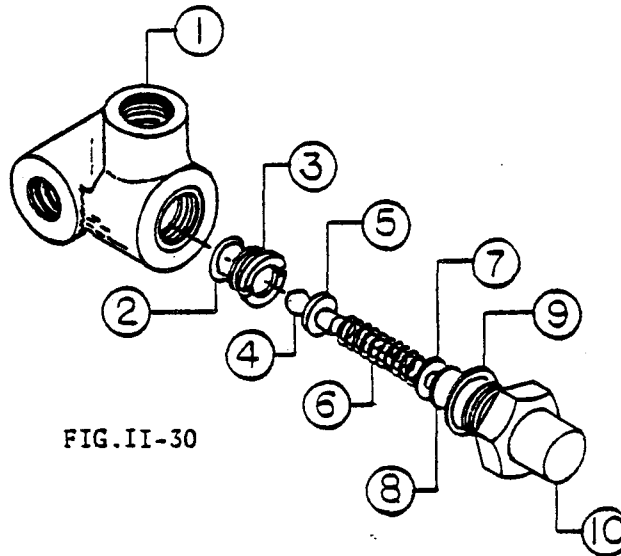


FIG.II-30

ITEM NO.	QTY.	DESCRIPTION	PART NUMBER
-	-	VALVE, relief assembly.....	63026
1	1	HOUSING.....	58118
(1) (2)	1	O-RING, seat.....	(58120)
(1)	1	RELIEF, seat.....	(58122)
4	1	RELIEF, ball.....	58124
(1)	1	SPACER, spring.....	(58130)
(1)	1	SPRING.....	(58126)
(1)	As Req'd	WASHER, spacer.....	(58129)
8	As Req'd	SHIM.....	58132
(1) (2)	1	GASKET, body.....	(58121)
10	1	BODY.....	58128

NOTE: Numbers in () indicate superceded numbers. Serviced only in appropriate kits.

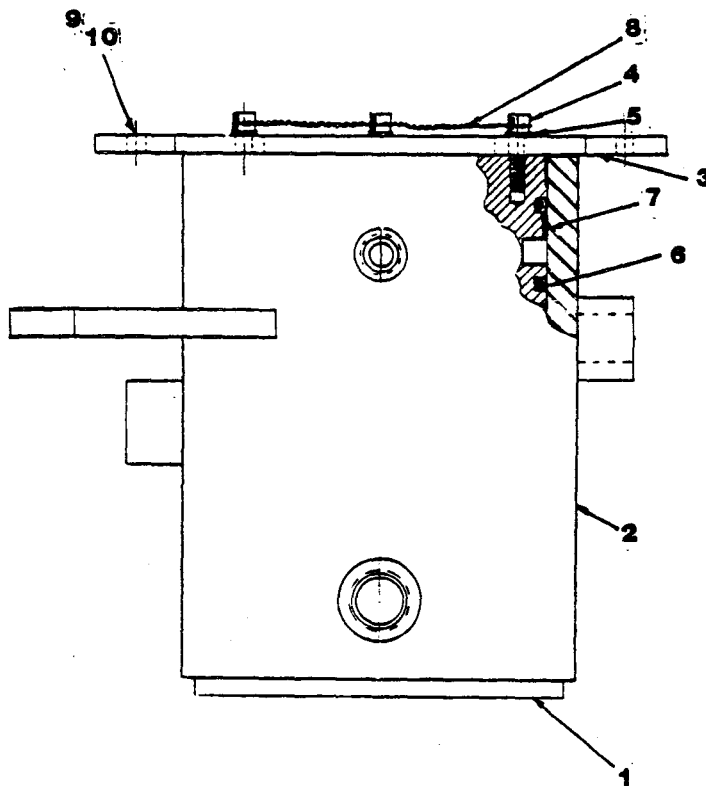
(1) Rebuilding kit includes items 2,3,5,6,7 and 9.... 52015
 (2) Seal kit includes items 2 and 9..... 52016

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 Supercedes Page Dated: 3/15/74

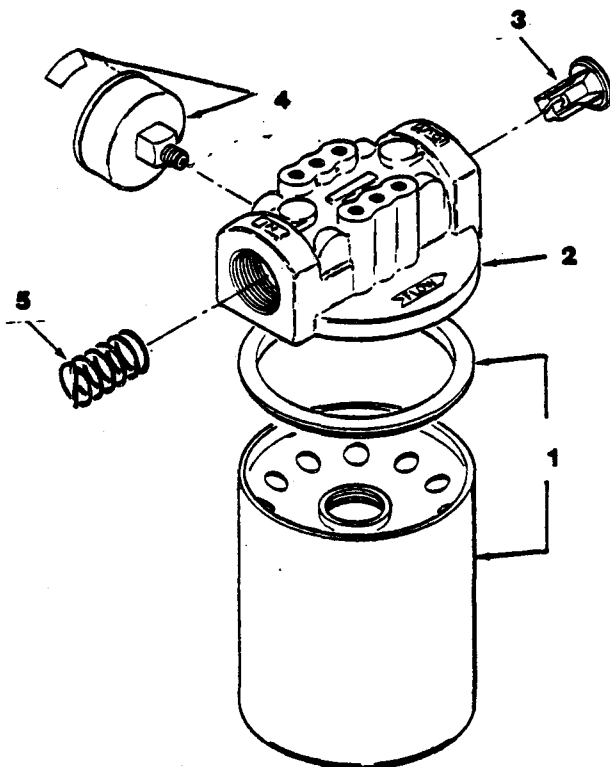
HYDRAULIC COLLECTOR ASSEMBLY

7" 5 PORT #692-00035

<u>ITEM</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>PART NO.</u>
0	1	ASSEMBLY, hyd collector.....	692-00035
1	1	SPOOL.....	693-00231
2	1	BARREL.....	693-00234
3	1	PLATE, mounting.....	691-00321
4	8	SCREW, cap.....	481-00238
5	8	WASHER, hi-collar lock.....	514-00311
6	6	SEAL, crown.....	550-00244
7	2	RING, wear.....	556-00790
8	1	WIRE, safety.....	539-00611
9	6	BOLT, 1/2 x 1 1/2 lg.....	510-00705
10	6	WASHER, 1/2 lock.....	514-00013

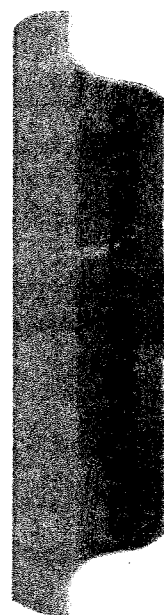


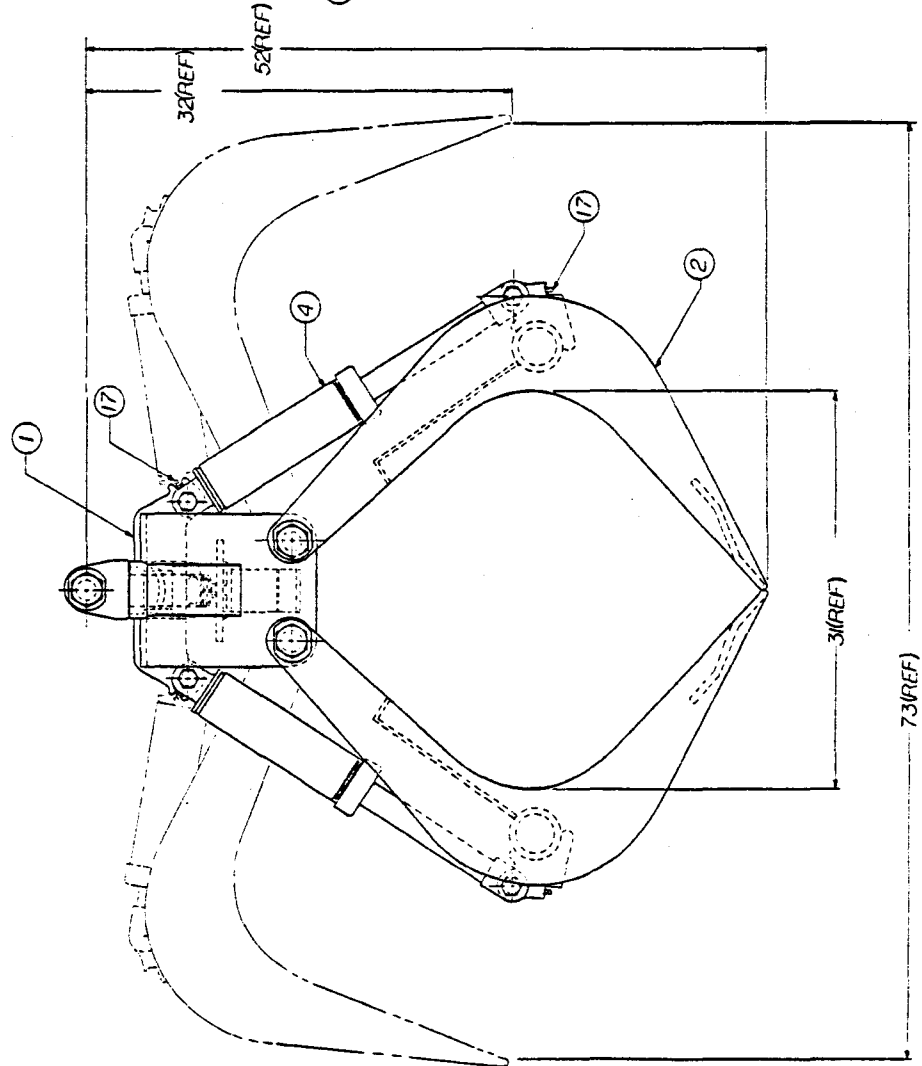
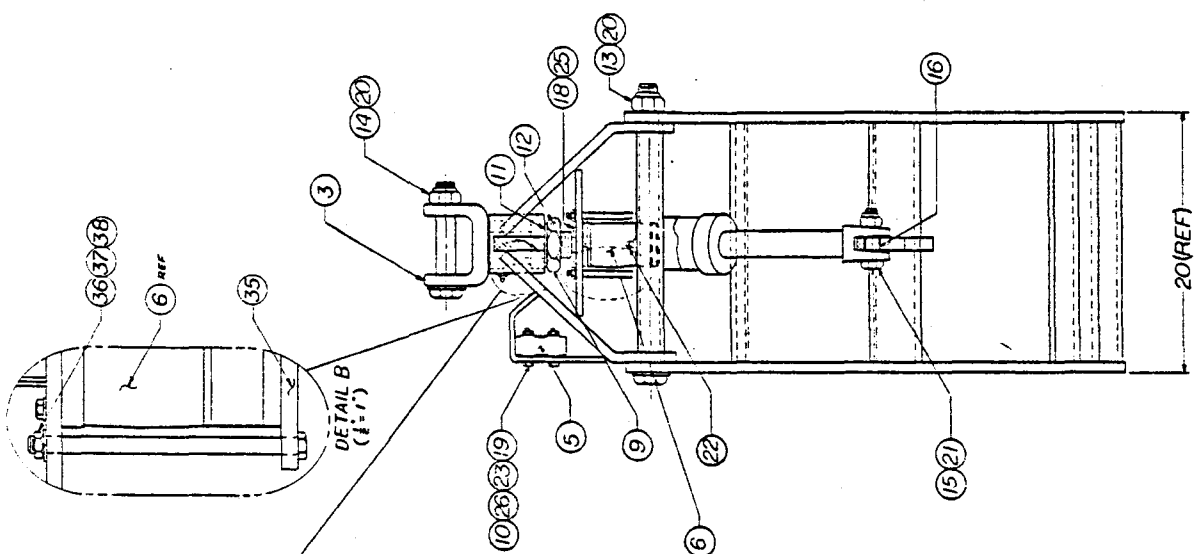
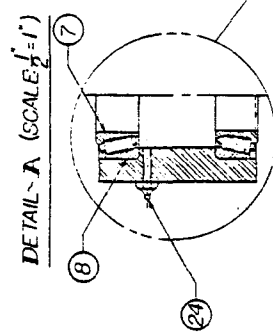
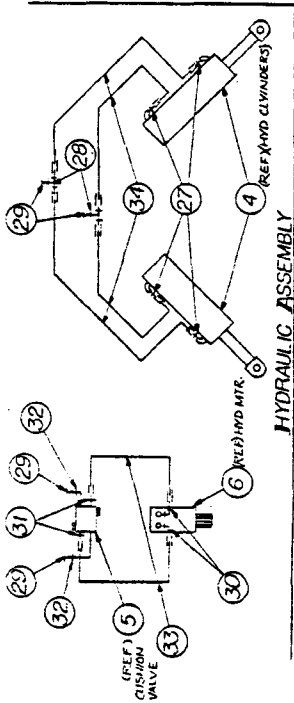
FILTER ASSEMBLY
(USED ON MODEL 80 CONTINUOUS AND SUPER 80)



ITEM	QTY.	DESCRIPTION	PART NO.
	1	ASSEMBLY, complete.....	565-00061
1	1	ELEMENT & SEAL KIT.....	552-00175
2	1	CASTING, head, N.S.S.....	
(1) 3	1	POPPET, relief valve, N.S.S.....	559-00008
4	1	INDICATOR.....	
(1) 5	1	SPRING, relief valve, N.S.S.....	
(1).....INCLUDED IN RELIEF VALVE KIT..... N.S.S.....NOT SOLD SEPARATELY			552-00088

EFFECTIVE: 10/22/82

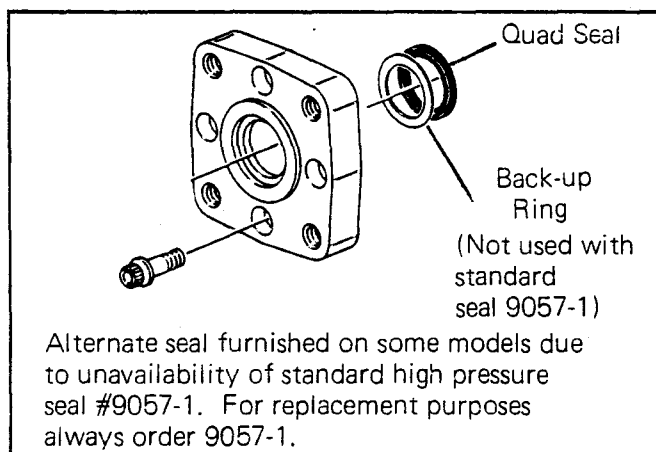
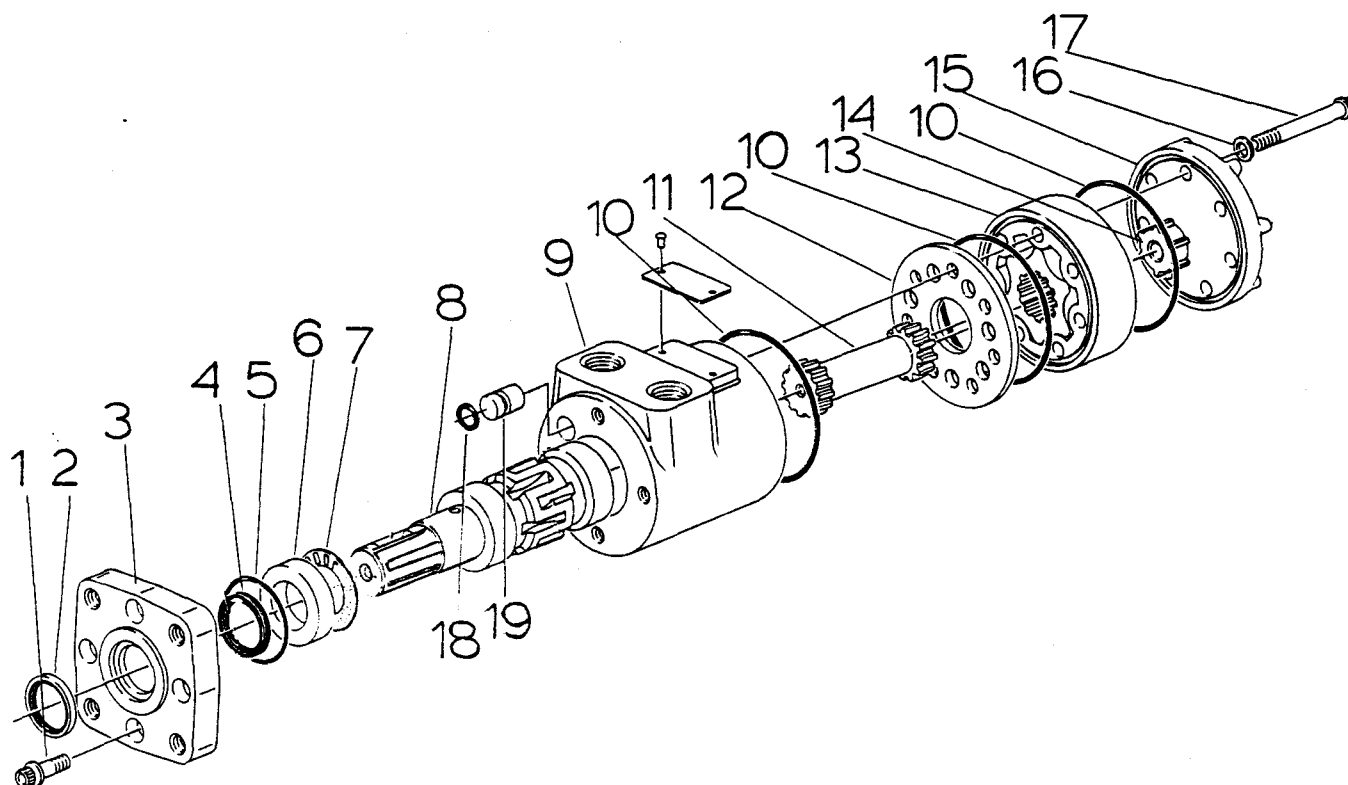




GRAPPLE ASSEMBLY
1/3 CORD BUTT
360° NONCONTINUOUS ROTATION
PARTS LIST

<u>ITEM</u>	<u>QTY.</u>	<u>DESCRIPTION</u>	<u>PART NO.</u>
-	1	ASSEMBLY, complete.....	154-00021
1	1	WELDMENT, head.....	153-00113
2	2	WELDMENT, arm.....	153-00116
3	1	WELDMENT, yoke.....	153-00188
4	2	ASSEMBLY, hydraulic cylinder 3½ x 10 x 2".....	812-00002
5	1	CUSHION, block.....	563-00124
6	1	MOTOR, hydraulic.....	560-00035
7	2	BEARING, cone 2"dia. bore.....	541-00718
8	2	BEARING, cup-3.6718 dia. bore.....	541-00717
9	1	NUT, yoke 2".....	481-00711
10	2	WASHER, lock 5/16".....	514-00010
11	1	WASHER, flat 2".....	514-00096
12	1	SCREW, socket set 3/8 x 3/8"LG.....	512-00616
13	2	BOLT, body fit 1½ x 21"LG.....	482-00314
14	1	BOLT, body fit 1½ x 7-5/8"LG.....	482-00347
15	4	BOLT, hex head 1 x 3½"LG.....	514-00426
16	4	BUSHING, hardened steel 1½OD x 1ID x 1"LG.....	542-00205
17	4	FITTING, grease ¼" straight.....	517-00321
18	4	BOLT, hex head 3/8 x 1"LG.....	510-00654
19	2	BOLT, hex head 5/16 x 2-3/4"LG.....	510-00638
20	3	NUT, hex lock thin 1½".....	513-00770
21	4	NUT, nylock 1".....	513-00434
22	2	FITTING, grease 1/8" 90.....	517-00304
23	2	NUT, hex 5/16".....	513-00207
24	1	FITTING, grease 1/8" straight.....	517-00300
25	4	WASHER, lock 3/8".....	514-00011
26	2	WASHER, flat 5/16".....	514-00081
27	4	ADAPTER, 08MP-08FPX.....	566-00008
28	2	TEE, 08FPX-08FPX-08FPX.....	566-00218
29	4	PLUG, 08MP.....	522-00323
30	2	ELBOW, 08MP-04FPX-90.....	566-00057
31	2	ADAPTER, 08MP-04FPX.....	566-00019
32	2	ELBOW, 08MP-08FPX-90.....	566-00059
33	2	04-2WR2-04MP-04MP-17.....	662-01372
34	4	08-2WR2-08MP-08MP-24.....	662-01373
35	1	PLATE, motor back-up.....	151-00502
36	4	BOLT, hex ½ x 8".....	510-00721
37	4	WASHER, lock ½".....	514-00013
38	4	NUT, hex ½".....	513-00210

GRAPPLE ROTATE MOTOR
(360° ROTATION)



EFFECTIVE: 5/2/77

GRAPPLE ROTATE MOTOR

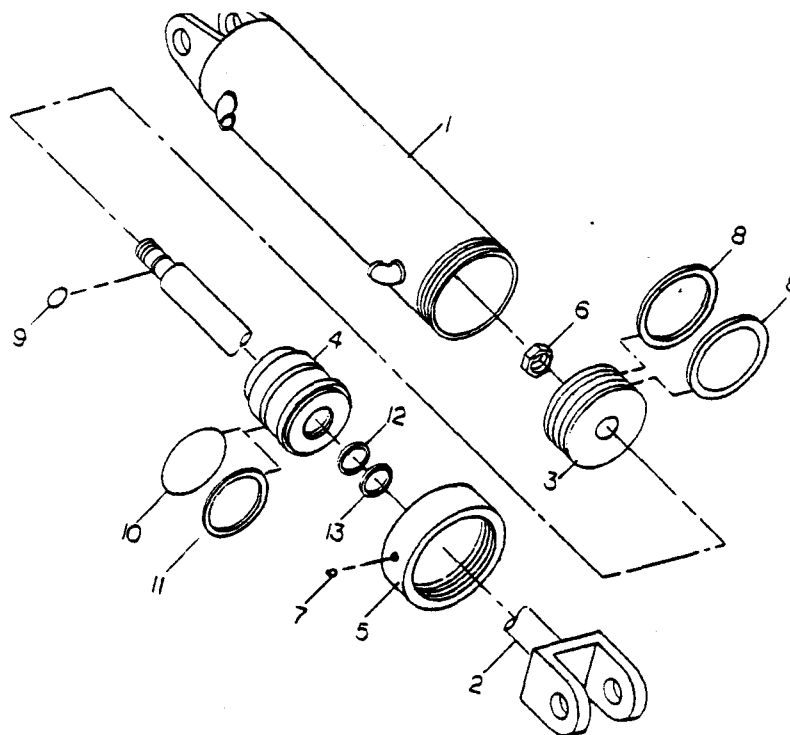
360° ROTATION

PARTS LIST

<u>ITEM NO.</u>	<u>QTY.</u>	<u>DESCRIPTION</u>	<u>PART NO.</u>
-	1	MOTOR, complete.....	560-00035
1	4	SCREW, cap.....	559-00601
* 2	1	SEAL, N.S.S.....	
3	1	FLANGE, mounting.....	559-00976
* 4	1	SEAL.....	---
* 5	1	O-RING.....	---
6	1	BEARING, race.....	559-00978
7	1	BEARING, needle thrust.....	559-00979
8	1	SHAFT, splined.....	559-00980
9	1	HOUSING, ½" NPTF parts.....	559-00981
* 10	3	O-RING.....	---
11	1	DRIVE.....	559-00616
12	1	PLATE, spacer.....	559-00983
13	1	GEROTOR.....	559-00984
14	1	SPACER.....	559-00985
15	1	CAP, end.....	559-00986
* 16	7	WASHER, seal.....	---
17	7	SCREW, cap.....	559-00621
18	1	SEAL, o-ring.....	---
19	1	PLUG, housing.....	559-00614

* INCLUDED IN SEAL KIT #565-00225
N.S.S. - NOT SOLD SEPARATELY

Effective Date 1-7-81

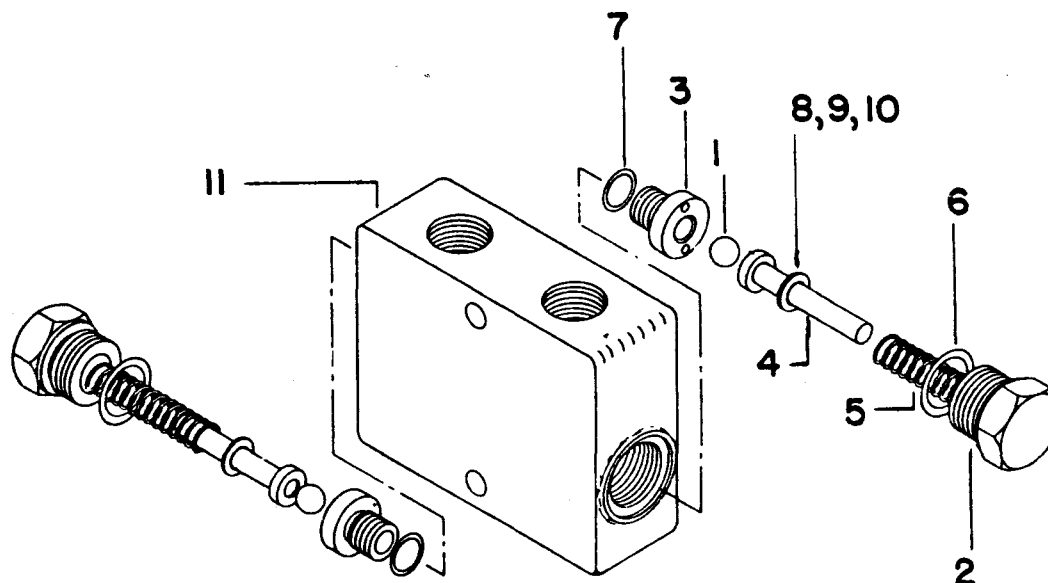


GRAPPLE CYLINDER
(3½ x 10 WITH 2" ROD)

<u>ITEM NO.</u>	<u>QTY.</u>	<u>DESCRIPTION</u>	<u>PART NO.</u>
0	1	ASSEMBLY, complete.....	812-0000
1	1	WELDMENT, butt and tube.....	832-00002
2	1	WELDMENT, rod.....	842-00001
3	1	PISTON.....	852-00000
4	1	GLAND.....	852-00300
5	1	CAP, gland.....	852-00812
6	1	NUT, hex lock thin 1½-12 UNF.....	513-00770
7	1	SCREW, set.....	512-00616
(1) (3) 8	2	SEAL, piston N.S.S.....	
(1) (3) 9	1	O-RING N.S.S.....	
(2) (3) 10	1	O-RING N.S.S.....	
(2) (3) 11	1	WASHER, back-up N.S.S.....	
(2) (3) 12	1	SEAL, rod N.S.S.....	
(2) (3) 13	1	SEAL, wiper N.S.S.....	
<u>SEAL KITS AVAILABLE</u>			
(1)		PISTON SEAL KIT.....	565-00482
(2)		GLAND SEAL KIT.....	565-00483
(3)		COMPLETE SEAL KIT.....	565-00533

N.S.S. - NOT SOLD SEPARATELY

Effective date 10-8-80



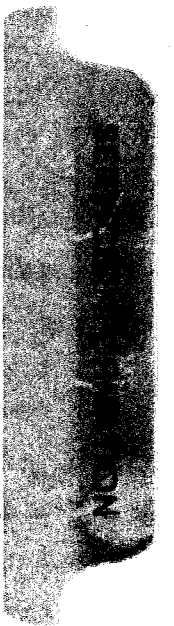
GRAPPLE CUSHION VALVE

PARTS LIST

ITEM	QTY	DESCRIPTION	PART NO.
0	1	VALVE, cushion.....	563-00124
(1) 1	2	BALL, steel.....	
(1) 2	2	CAP, spring.....	
(1) 3	2	SEAT, standard.....	
(1) 4	2	GUIDE, ball and spring.....	
(1) 5	2	SPRING.....	
(1) 6	2	O-RING, spring cap.....	
(1) 7	2	O-RING, seat.....	
(1) 8	A/R	WASHER, steel spacer, .010" thick.....	
(1) 9	A/R	WASHER, steel spacer, .040" thick.....	
(1) 10	A/R	WASHER, steel spacer, .020" thick.....	
(1) 11	1	HOUSING, valve.....	

NOTE: NUMBERS IN BRACKET () INDICATE SUPERCEDED NUMBERS.

(1) Included in Cushion Valve Kit.....552-00039



BARKO MODEL 40-60-80 LOADERS

SECTION III - SERVICE INFORMATION

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PUMP SERVICE MANUAL (VICKERS, COMMERCIAL)

GRAPPLE ROTATE MOTOR SERVICE MANUAL (CHAR-LYNN)

INSTRUCTIONS FOR REPLACING SEALS IN VALVES

INSTRUCTIONS FOR CENTER SECTION ASSEMBLIES

FILTER ELEMENT REPLACEMENT INSTRUCTIONS

INSTRUCTIONS FOR REPLACING BY-PASS SPRING IN FILTER

HYDRAULIC HINTS

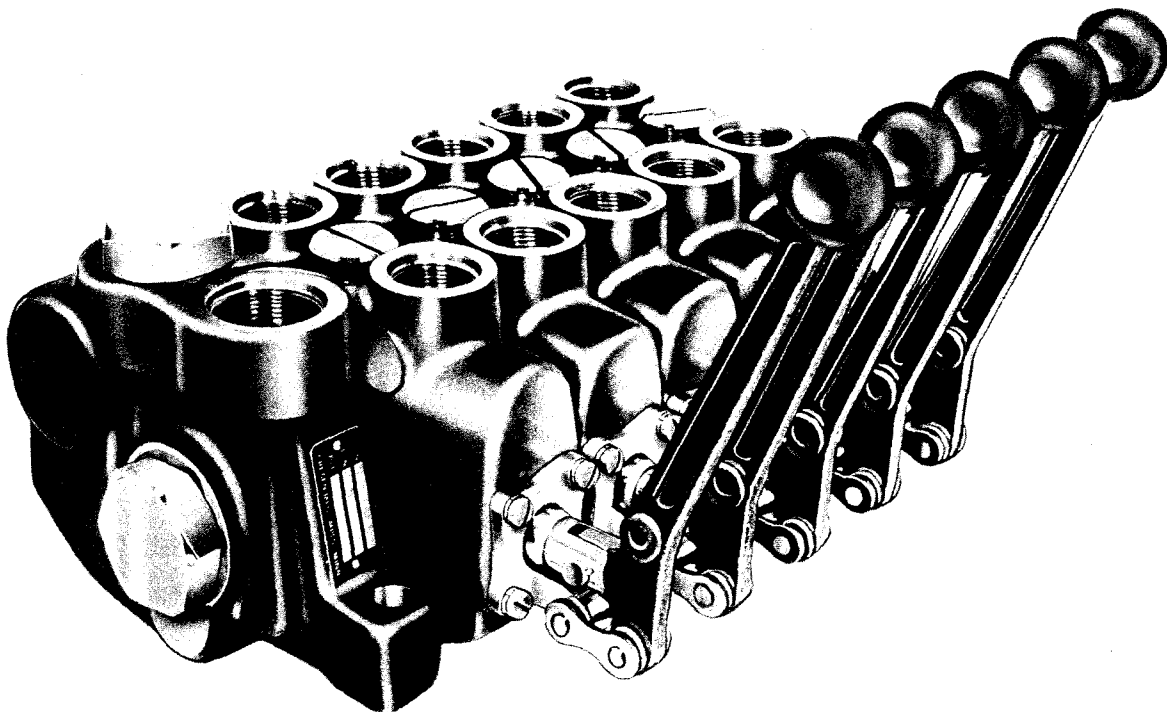


GRESEN

**HYDRAULIC
COMPONENTS**

**MODEL V42
SECTIONAL BODY
DIRECTIONAL CONTROL VALVE**

SERVICE and PARTS MANUAL



MOBILE

INDUSTRIAL

AGRICULTURAL

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Gresen Manufacturing Company reserves the right to discontinue or modify parts listed in these instructions. All specifications herein are approximate and may vary depending upon application. Conversions to metric equivalents herein have been rounded off to the nearest whole number for convenience.

SECTION I INTRODUCTION

This manual contains pertinent, step-by-step maintenance instructions plus parts ordering information and a complete part and service kit listing for Gresen's Model V42 Directional Control Valve.

If further assistance is required, contact:
Your Gresen Distributor or Representative

SECTION II

DESCRIPTION

Gresen's Model V42 Directional Control Valves are available with five different types of work sections, plus various options to meet specific job specifications.

The following paragraphs describe the five work sections and options with reference to the parts illustrations in Section IV in this manual.

3-WAY, 3-POSITION WORK SECTION (Refer to Figure 4-2)

Provides control of single acting cylinders or start and stop of non-reversible hydraulic motors where free-wheeling of motor is NOT required. The cylinder port is blocked in neutral position.

4-WAY, 3-POSITION WORK SECTION (Refer to Figure 4-3)

Provides control of double acting cylinders without the floating action plus hydraulic motor start, stop, and reverse control where free-wheeling is NOT required. Cylinder ports are blocked in neutral position.

4-WAY, 4-POSITION FLOAT WORK SECTION (Refer to Figure 4-4)

Provides control of double-acting cylinders requiring a floating action such as: loaders, dozers, snow plows, etc. Incorporated into the work section is a 4-position float positioner. Three positions are standard double-acting with spring return to neutral. The fourth position is detented to hold in float position (both cylinder ports open to tank).

4-WAY, 4-POSITION REGENERATIVE WORK SECTION (Refer to Figure 4-5).

Same as 4-way, 3-position work section except that the fourth "regeneration" position provides a large volume of oil for fast cylinder action, but with little force.

4-WAY, 3-POSITION WORK SECTION WITH PRESSURE DETENT RELEASE (Refer to Figure 4-6).

Provides automatic return to neutral position as soon as work cycle is completed. The spool is held in either power position by a detent assembly until released by predetermined pressure setting in the power circuit. Spool returns to neutral.

MID-INLET CONVERSION SECTION (Refer to Figure 4-7 thru 4-9).

Provides an inlet port for a secondary pump downstream in the valve assembly. Conversion sections are available in split flow, combined flow, and a two-position section for two-speed split or combined flow application.

SPOOL ACTION OPTIONS

SPRING RETURN TO NEUTRAL (Standard) (Refer to Figure 4-12).

Spool will return to neutral position from A or B power position when handle is released.

SPRING EXTENDED SPOOL, "A" Option (Refer to Figure 4-13).

Eliminates spring return to neutral. Spring returns to the spool "OUT" position only. Usually used for cam operation of spool.

INTERNAL HYDRAULIC DETENT RELEASE, "KO" Option (Refer to Figure 4-17).

Automatically returns spool to a neutral position as soon as work cycle is completed.

ROTARY SPOOL ACTUATOR, "W" Option (Refer to Figure 4-16).

Movement of spool is controlled by a rotary movement of the handle. Allows 90° rotation of spool in each direction from center.

3-POSITION DETENT, "D" Option (Refer to Figure 4-14).

Valve spool remains in any of three detented positions. No spring return to neutral.

1-POSITION SPOOL "IN" DETENT, "R" Option (Refer to Figure 4-18).

Work port "B" remains open to tank in detent position. Allows a single-acting cylinder to float. Spring returns spool to neutral.

REGENERATIVE SPOOL (Refer to Figure 4-19).

Regeneration position provides a large volume of hydraulic oil to cylinders for fast action, but with little force.

SOLENOID CONTROL (Refer to Gresen's Service and Parts Manual No. 1020).

HYDRAULIC CONTROL, "HR" or "HRO" Option
(Refer to Gresen's Service and Parts Manual No. 1016).

HANDLE ASSEMBLIES (Refer to Figures 4-20 thru 4-24). Provides a choice of either horizontal or vertical handle assemblies and coated with either red or black plastic or plain.

INLET and OUTLET COVERS (Refer to Section III, Parts Ordering Information).

RELIEF VALVES and WORK PORT CHECKS (Refer to Figures 4-25 thru 4-34).

SECTION III MAINTENANCE

REPLACING, ADDING OR REMOVING WORK SECTION ASSEMBLIES

NOTE

For clarification, the side containing the inlet cover (the cover containing the main relief valve) will be called the left end of the valve assembly. Refer to Figure 3-1.

1. Before disassembly, it is suggested that each work section be marked numerically to avoid incorrect reassembly.
2. Remove four hex nuts (Item 29, Figure 4-1) from the right end of the valve assembly using a 9/16" socket wrench. If the valve assembly consists of only one or two work sections, bolts and lock washers must be removed instead.
3. Remove the outlet cover and each section by sliding from assembly studs (Item 29, Figure 4-1).
4. If work sections are to be added or subtracted from the valve assembly, the four studs must be removed from the inlet cover and replaced with studs of proper length. Refer to Table 3-1.

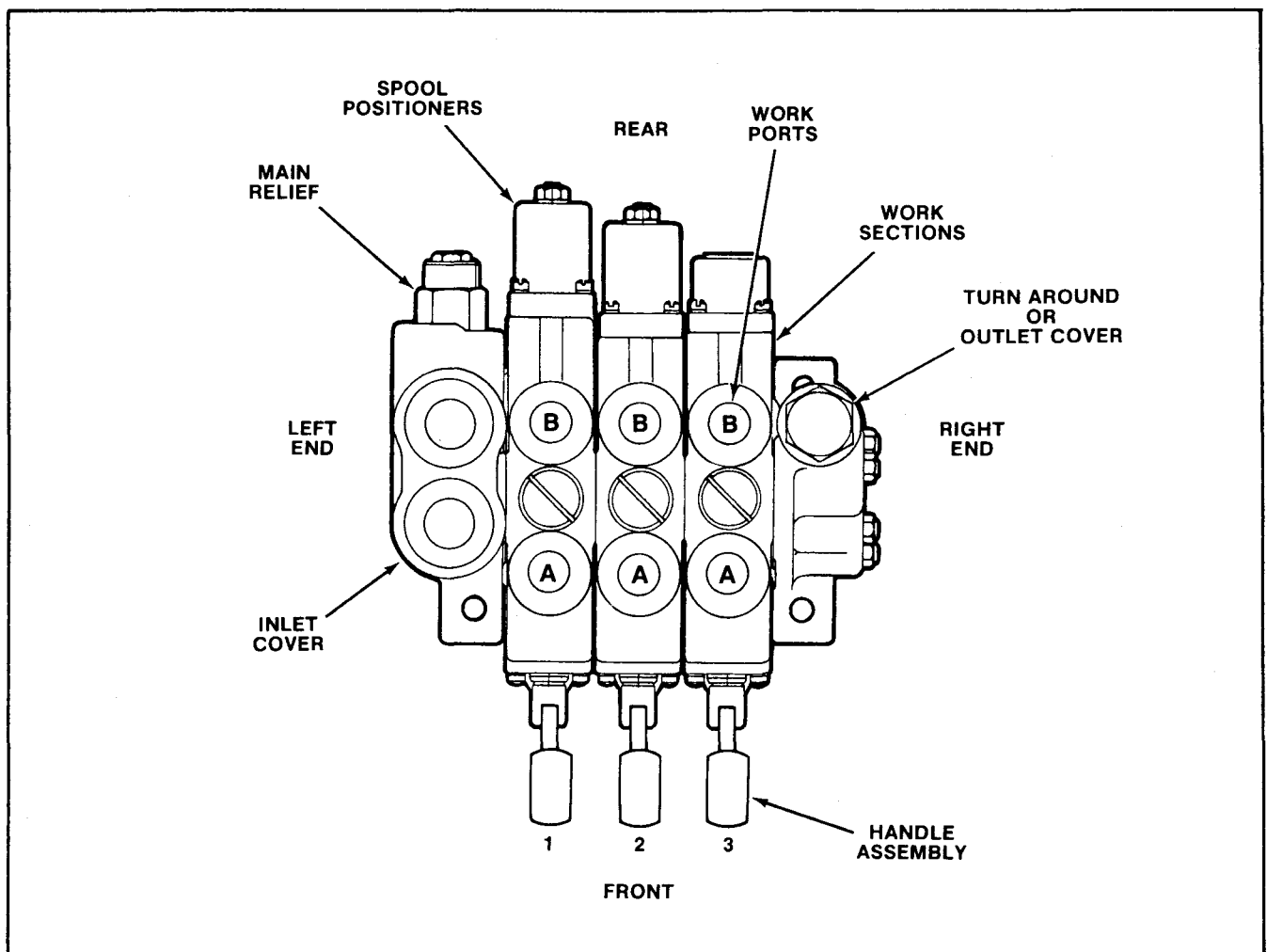


Figure 3-1. Schematic View of a Typical Model V42 Control Valve Assembly.

Table 3-1. Bolt and Stud Part Numbers

NO. OF WORK SECTIONS	OUTLET COVERS (RIGHT SIDE)		DESCRIPTION	
	PART NO. 8090- END OUTLET	PART NO. 8091- TOP OUTLET		
1	3732-125	3732-123	Bolt	Use Lock Washers Part No. 1039-001
2	3732-130	3732-129	Bolt	
3	3493-001	1672-001	Stud	
4	3493-002	1673-001	Stud	Use Stud Nuts Part No. 1665-001 Nuts are lock nuts, no lock washers required
5	3493-003	1674-001	Stud	
6	3493-004	1675-001	Stud	
7	3493-005	1755-001	Stud	
8	3493-006	1756-001	Stud	
9	3493-007	3493-008	Stud	

NOTE

Use lock nuts, part no. 1665-001, four required, with all assembly studs. Except for valve assemblies containing only one or two work sections, NO LOCK WASHERS required. Studs are of stress-proof material and should be replaced only with original equipment replacement parts. If the valve assembly contains only one or two work sections, assembly bolts with lock washers, part no. 1039-001, are used.

CAUTION

If stud nuts are not tightened to the proper torque, valve spools may bind or stick, or cause section seals to extrude.

REPLACING SPOOL SEALS

Figure 3-2 shows spool assembly — less the complete handle assembly. When the handle bracket is furnished, retainer plate and retainer screws are not used. Seal assembly is retained by handle bracket and its attaching parts.

5. Thoroughly clean O-ring counterbores and ground surfaces of each section.
6. Replace the three O-ring seals, two part no. 1621-001 and one part no. 1622-001. Buna-N seals are standard. For optional Viton Seals, see Cross Reference Chart on page 4-31.
7. Replace work sections on assembly studs in the same order in which they were removed. O-ring counterbores (with O-rings in place) should be to your left when facing the "A" port or front side of the valve assembly.

NOTE

Use care in replacing work section to avoid dislodging O-rings from counterbores.

8. When all work sections and the outlet cover are positioned on the assembly studs, replace stud nuts and tighten evenly to 18-22 foot pounds [24-30 joules].

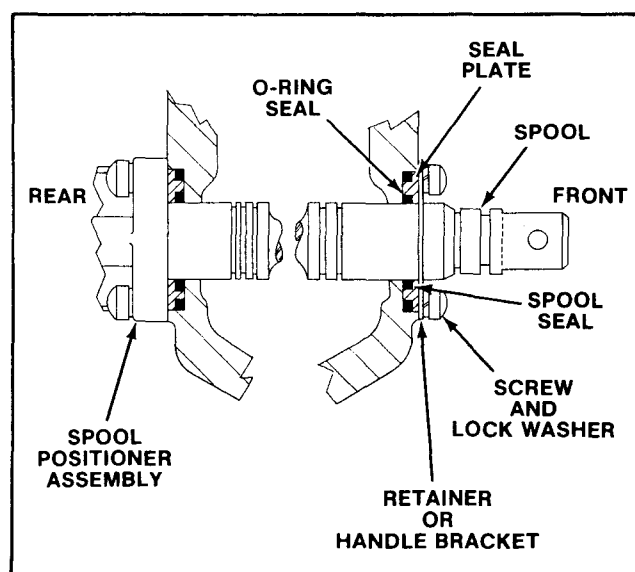


Figure 3-2. Spool Seal Assembly.

1. Remove spool positioner assembly from rear of work section. Keep in order of disassembly.

2. Remove complete handle bracket assembly or retainer and retainer screws from front of work section.
3. Remove seal plate from each end of work section.
4. Remove O-ring seals and spool seals from seal plates and thoroughly clean plates.
5. Lightly oil new seals. Insert them into grooves in seal plate.
6. Slide the seal plates over each end of the spool into the counterbore in the work section.
7. Reassemble parts in reverse order of disassembly.
8. Torque bonnet screws and handle bracket or seal retainer screws to 8-10 foot pounds [11-14 joules].

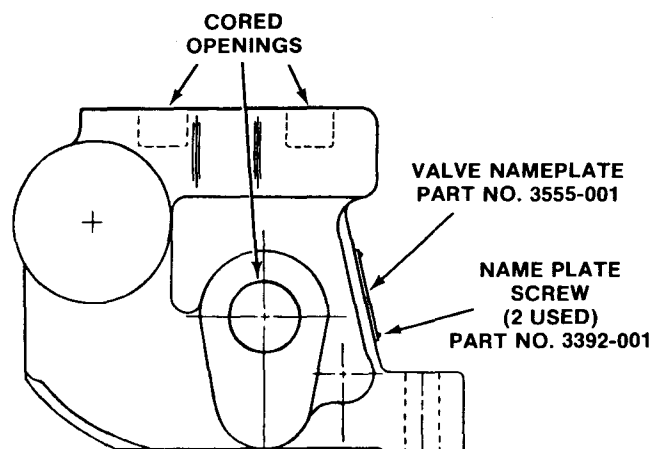
PARTS ORDERING INFORMATION

INLET COVER

Part No. 8089-

All inlet covers are machined to accept Models PK, DPK or NR plug. If the outlet port is not machined, then the outlet port in the right or outlet cover must be used for a tank return line. The inlet cover may be machined with several different combinations of port sizes and locations.

Use the following porting chart to determine the proper machining modification number. NPT and SAE threads cannot be intermixed in the same casting.

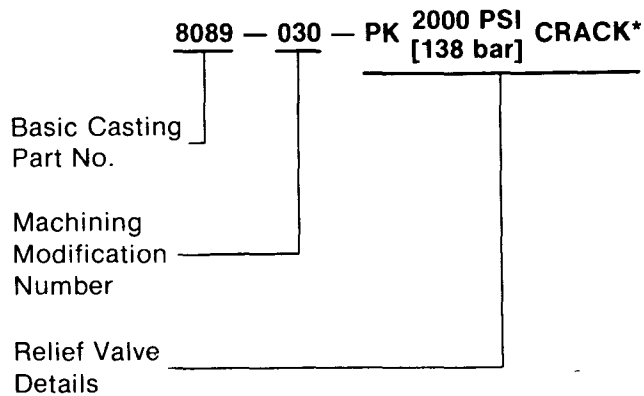


PORT LOCATION	NPT**	SAE				
		16	16	20	16	20
End In*	1-1/4"	16	16	20	16	20
Top In*	1-1/4"	16	16	20	16	20
End Out	1-1/4"	—	—	—	20	20
Top Out*	1-1/4"	16	20	20	20	20
Machining Modification Number	-030	-001	-004	-005	-007	-006

*These port locations are cored and will be plugged if not required.

**Ports with NPT pipe threads are limited to 2000 PSI [136 bar] max.

Ordering Example For Inlet Covers



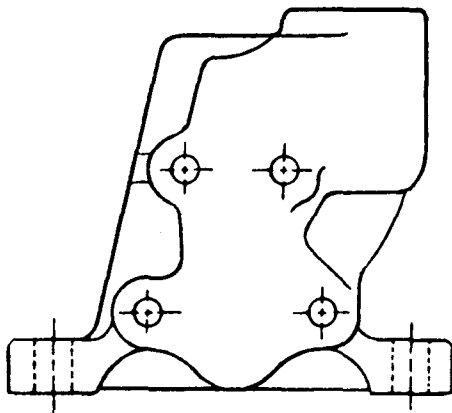
*Specify:

1. Model number of relief valve to be used. (See Figures 4-25 and 4-26).
2. Relief setting required. Crack pressure is setting when relief is passing 1 GPM [3.8 litres/min.]. Full flow is pressure setting when relief is passing specified GPM [litres/min].
3. "NR" (no relief) if plug is to be installed.
4. If "With no relief assembly or "NR" plug installed" is specified, relief cavity will be plugged with only a plastic shipping plug.

OUTLET COVERS

A choice of two outlet covers for the Model V42 is available: top outlet, part no. 8090-; and end outlet, part no. 8091-.

Top Outlet Cover, Part No. 8090—



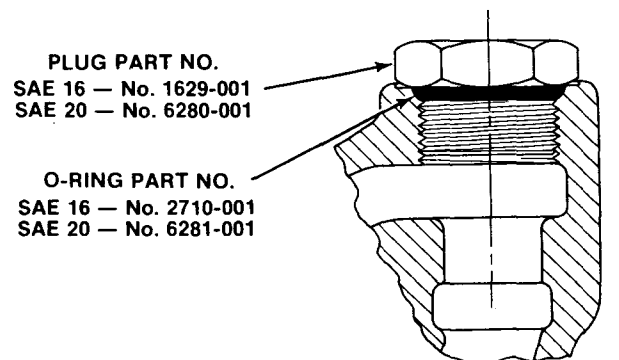
Standard machining provides a top outlet port for open center applications. When the top outlet port is plugged to provide a turnaround outlet flow, the outlet port must be located in the inlet cover.

Two options are available for the no. 8090 top outlet cover . . . power beyond and closed center applications. For power beyond, the core between the open

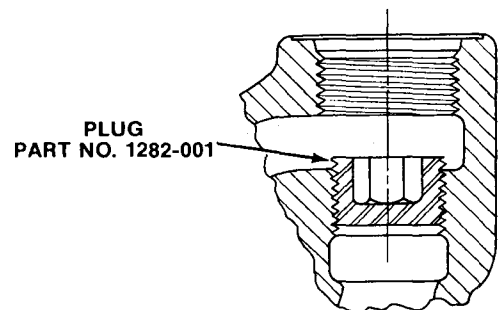
center and exhaust passages is tapped and plugged. The top outlet port becomes the power beyond port. The tank outlet port must be located in the inlet cover.

When the top power beyond port is plugged, the Valve Assembly may be used in a closed center application. For future conversion from standard open center to either power beyond or closed center applications, the outlet cover may be ordered with the core tapped but not plugged (for field conversion machining).

Options For The No. 8090 Outlet Cover



Turnaround plug option.

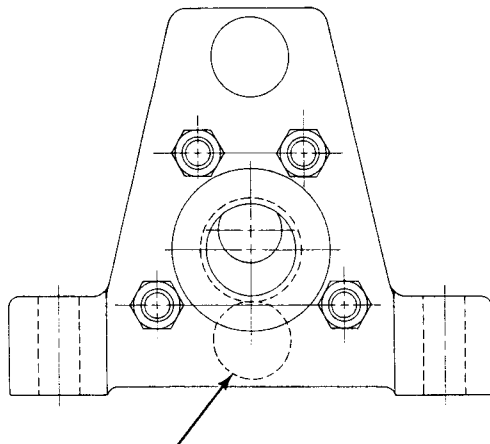


Power beyond option.

Use the following porting chart to determine the proper machining modification number for the no. 8090 outlet cover. NPT and SAE threads cannot be intermixed in the same casting.

PORT LOCATION	NPT	SAE			
		16	20	—	—
Top Outlet		16	20	—	—
Power Beyond or Closed Center Option	1"—11-1/2	—	—	16	20
Machining Modification Number	-005	-006	-003	-002	-004

End Outlet Cover. Part No. 8091-

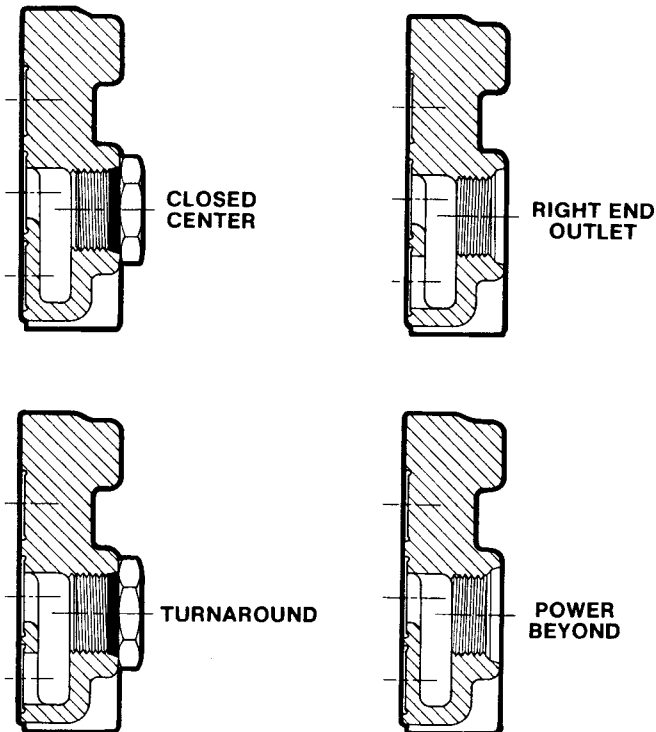


LOWER INTERNAL 13/16 HOLE

Standard machining provides an end outlet port for open center applications. When the end port is plugged to provide for a turnaround outlet flow, the outlet port must be located in the inlet cover.

Two options are available for the no. 8091 end outlet cover . . . power beyond and closed center applications. When the lower 13/16 inch hole (located on the inside) connecting the open center and exhaust passage is eliminated, the outlet port may be used for power beyond. When the power beyond port is plugged, the cover may be used for closed center applications.

Options For The No. 8091 — Outlet Cover



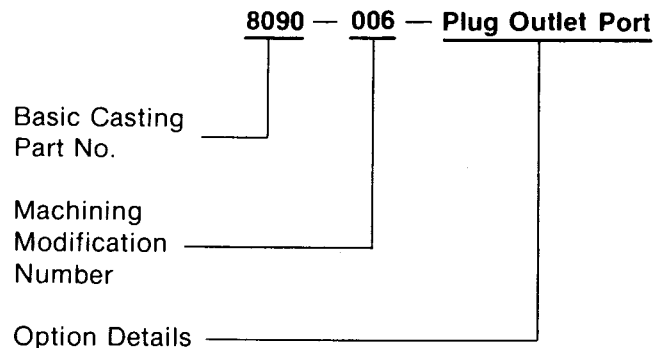
When the lower internal 13/16 inch hole is provided, the cover will operate in open center hydraulic circuits as a standard end port, or as a turnaround section when the outlet port is plugged.

When the power beyond or the closed center option is used, an outlet to tank must be provided on the left end section of the valve.

Use the following porting chart to determine the proper machining modification number for the no. 8091 outlet cover.

PORT LOCATION	NPT		SAE			
	1"	1-1/4"	16	20	—	—
Standard Outlet or Turnaround	1"	1-1/4"	16	20	—	—
Power Beyond or Closed Center	—	—	—	—	16	20
Machining Modification Number	-008	-002	-006	-004	-007	-035

Ordering Example For Outlet Covers



WORK SECTIONS

The following information is necessary for proper specification for each Model V42 work section:

1. Function of section
2. Options
3. Work port sizes
4. Work port "A" options
5. Work port "B" options
6. Handle end options

The chart shown on the following page will help in identifying options available and the information needed for proper ordering. Refer to Catalog No. 1019 for complete information on available options.

FUNCTION OF SECTION*	Check one for each section <input type="checkbox"/> 3-Way, Casting No. 8045, see Figure 4-2. <input type="checkbox"/> 4-Way, Casting No. 8045, see Figure 4-3. <input type="checkbox"/> 4-Way Float, Casting No. 8046, see Figure 4-4. <input type="checkbox"/> 4-Way Regenerative, Casting No. 8138, see Figure 4-5.
OPTIONAL FEATURES	<input type="checkbox"/> 3-Way, Free Flow <input type="checkbox"/> 4-Way, Free Flow <input type="checkbox"/> _____
WORK PORT SIZES "A" and "B" WORK PORTS	<input type="checkbox"/> SAE 12 (1-1/16" — 12 UN) Standard <input type="checkbox"/> SAE 16 (1-15/16" — 12 UN) <input type="checkbox"/> 3/4" — 14 NPT <input type="checkbox"/> 1" — 11-1/2 NPT Ports with NPT threads are limited to 2000 PSI [136 bar] max.
WORK PORT OPTIONS	Specify for "A" and "B" work ports <input type="checkbox"/> Anti-Cavitation Check, A-C <input type="checkbox"/> Upper Option Plug <input type="checkbox"/> Lower Option Plug <input type="checkbox"/> Work Port Relief, Non-Adjustable, RD50N _____ <input type="checkbox"/> Work Port Relief, Adjustable, RD50A _____ <div style="text-align: right;">Specify relief setting</div>
HANDLE-END OPTIONS**	<input type="checkbox"/> Standard Steel Retainer Assembly, LCHA <input type="checkbox"/> Vertical Handle, CVHA <input type="checkbox"/> Horizontal Handle, CHHA <input type="checkbox"/> Spool Boot Assembly <input type="checkbox"/> Less Handle Only, includes link assembly, LHO <input type="checkbox"/> Handle Bracket Only, less link assembly, HBO

*Each spool is fitted to its work section housing at the factory and neither part can be purchased separately. O-ring grooves are machined on the left side (when viewed from the "A" work port end) of each work section housing.

**When spool boot assembly is specified, handle bracket cannot be used.

MID-INLET CONVERSION SECTIONS

The following information is necessary for proper specification when ordering a mid-inlet conversion section:

1. Type of section
2. Port size
3. Relief valve type and setting

FUNCTION OF SECTION	<input type="checkbox"/> Combined Flow <input type="checkbox"/> Split Flow <input type="checkbox"/> 2-Position, combined or split flow
PORT SIZES	<input type="checkbox"/> SAE 16 (1-15/16" — 12 UN) Standard <input type="checkbox"/> 1" — 11-1/2 NPT Ports with NPT pipe threads are limited to 2000 PSI [136 bar] max.
RELIEF VALVE OPTIONS	For split or combined flow sections only <input type="checkbox"/> Model PK, _____ <input type="checkbox"/> Model DPK, _____ For 2-position selective sections only <input type="checkbox"/> Model RD50N, Non-adjustable, _____ <input type="checkbox"/> Model RD50A, Adjustable, _____ <div style="text-align: right;">Specify relief setting</div>

SECTION IV PARTS LISTING

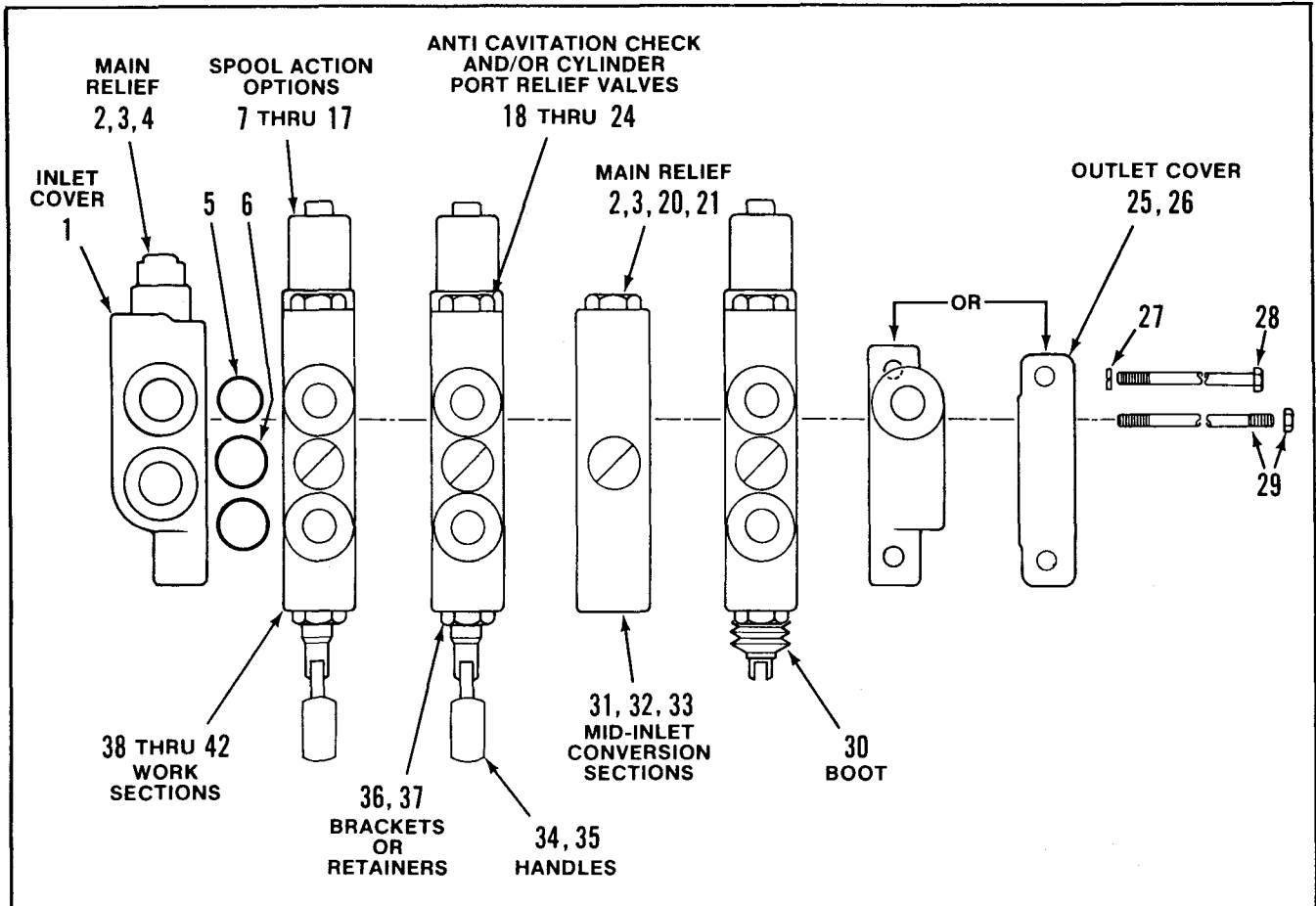


Figure 4-1. Model V42 Directional Control Valve, Typical Main Assembly.

MODEL V42 DIRECTIONAL CONTROL VALVE ASSEMBLY, TYPICAL MAIN ASSEMBLY

Item No.	Part No.	Description	Quantity Per Assembly
1	8089	COVER, Inlet (Refer to page 3-2)	1
2		RELIEF, PK (See Figure 4-25)	A/R
3		RELIEF, DPK (See Figure 4-26)	A/R
4	K-7014	PLUG, No Relief, (NR) (See Figure 4-27)	A/R
5	1622-001*	O-RING, Large	1 plus 1 per section
6	1621-001*	O-RING, Small	2 plus 2 per section
7	K-28060	POSITIONER, Spring Return to Neutral (See Figure 4-12)	A/R
8		POSITIONER, Spring Extended Spool (See Figure 4-13)	A/R
9	K-28025	POSITIONER, 3-Position Detent, "D" (See Figure 4-14)	A/R
10	K-28061	POSITIONER, Float, (See Figure 4-15)	A/R
11	K-28076	POSITIONER, Rotary, "W" (See Figure 4-16)	A/R
12		POSITIONER, Internal Pressure Detent Release, "KO" (See Figure 4-17)	A/R

MODEL V42 DIRECTIONAL CONTROL VALVE ASSEMBLY, TYPICAL MAIN ASSEMBLY (Continued)

Item No.	Part No.	Description	Quantity Per Assembly
13	K-28027	POSITIONER, Spool "IN" Detent Spring Return to Neutral "R" (See Figure 4-18)	A/R
14	K-28059	POSITIONER, Regenerative (See Figure 4-19)	A/R
15		POSITIONER, Hydraulic Remote (Refer to Catalog No. 1016)	A/R
16		POSITIONER, Hydraulic Remote (Refer to Catalog No. 1016)	A/R
17		POSITIONER, Solenoid Control (Refer to Catalog No. 1020)	A/R
18	K-28065	CHECK, Anti-Cavitation, Upper, (See Figure 4-28)	A/R
19	K-28064	CHECK, Anti-Cavitation, Lower, (See Figure 4-29)	A/R
20		RELIEF, RD50N, Non-Adjustable (See Figure 4-30)	A/R
21		RELIEF, RD50A, Adjustable (See Figure 4-31)	A/R
22		RELIEF, WH (Up to 3000 PSI [207 bar] only) (See Figure 4-32)	A/R
23		PLUG, Lower Anti-Cavitation (See Figure 4-33)	A/R
24		PLUG, Upper Anti-Cavitation (See Figure 4-34)	A/R
25	8090—	COVER, Top Outlet (See Page 3-3)	1
26	8091—	COVER, End Outlet (See Page 3-4)	1
27	1039-001	WASHER, Lock (for 1 or 2 work sections only)	4
28		BOLT, (See Table 3-1)	4
29		STUD and STUD NUT ASSEMBLY, (See Table 3-1)	4
30		BOOT ASSEMBLY (See Figure 4-24)	A/R
31		MID-INLET SECTION, Split Flow (See Figure 4-7)	A/R
32		MID-INLET SECTION, Combined Flow (See Figure 4-8)	A/R
33		MID-INLET SECTION, 2 Position (See Figure 4-9)	A/R
34		HANDLE ASSEMBLY, Vertical (See Figure 4-20)	A/R
35		HANDLE ASSEMBLY, Horizontal (See Figure 4-21)	A/R
36		RETAINER, Standard (See Figure 4-22)	A/R
37		BRACKET, Handle (See Figure 4-23)	A/R
38		WORK SECTION, 3-Way, 3-Position (See Figure 4-2)	A/R
39		WORK SECTION, 4-Way, 3-Position (See Figure 4-3)	A/R
40		WORK SECTION, 4-Way, 4-Position Float (See Figure 4-4)	A/R
41		WORK SECTION, 4-Way, 4-Position Regenerative (See Figure 4-5)	A/R
42		WORK SECTION, 4-Way, 3-Position With Pressure Detent Release (See Figure 4-6)	A/R

*Buna-N seals are standard for all Gresen valve assemblies. Optional Viton seals are available. See Cross Reference Tables on page 4-31.

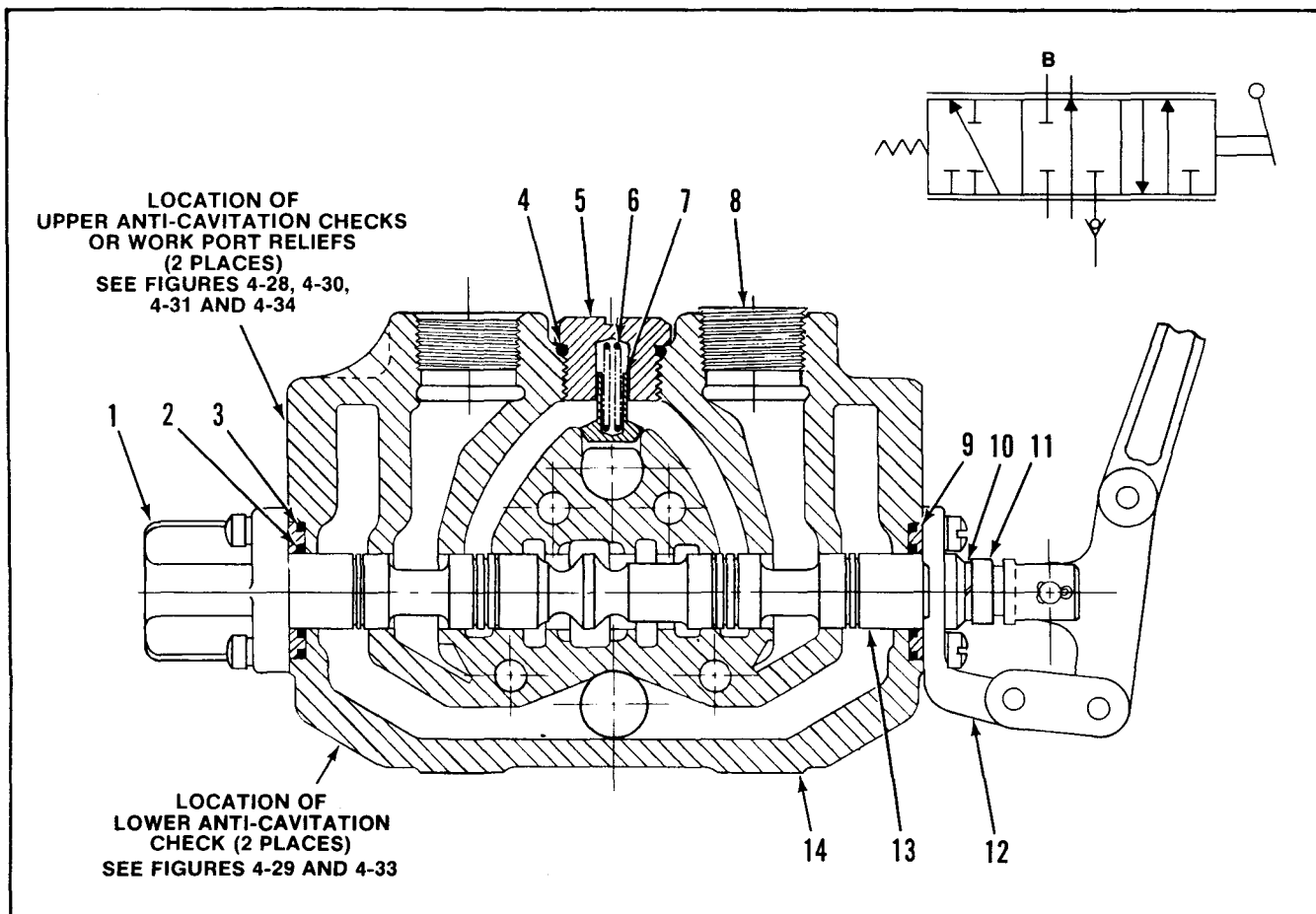


Figure 4-2. 3-Way, 3-Position Work Section

3-WAY, 3-POSITION WORK SECTION

Item No.	Part No.	Description	Quantity Per Section
	K-28029*	SEAL KIT (Contains items 2, 3 and 4 plus section seals)	
	K-7018*	SERVICE KIT (Contains items 4 thru 7)	
1	K-28060	POSITIONER, Standard (See Figure 4-12)	1
2	2931-001*	SEAL, Spool	2
3	3532-001*	SEAL, O-Ring	2
4	2709-001*	SEAL, O-Ring	1
5	7790-001	PLUG, Load Check	1
6	2796-001	SPRING	1
7	7791-001	POPPET	1
8		PLUG (See Table 4-3 for part number)	1
9	3531-001	PLATE, Seal	2
10	1039-001	WASHER, Lock	1
11	8351-001	ADAPTER, Clevis	1
12		HANDLE, BRACKET or RETAINER (See Figure 4-20 thru 4-24)	1
13	8059-001	SPOOL, 3-Way	1
14	8045-XXX	HOUSING, 3-Way	1

NOTE: These are matched parts and are not sold separately. See page 3-2 for ordering information.

*Buna-N seals are standard for all Gresen valve assemblies. Optional Viton seals are available. See Cross Reference Tables on page 4-31.

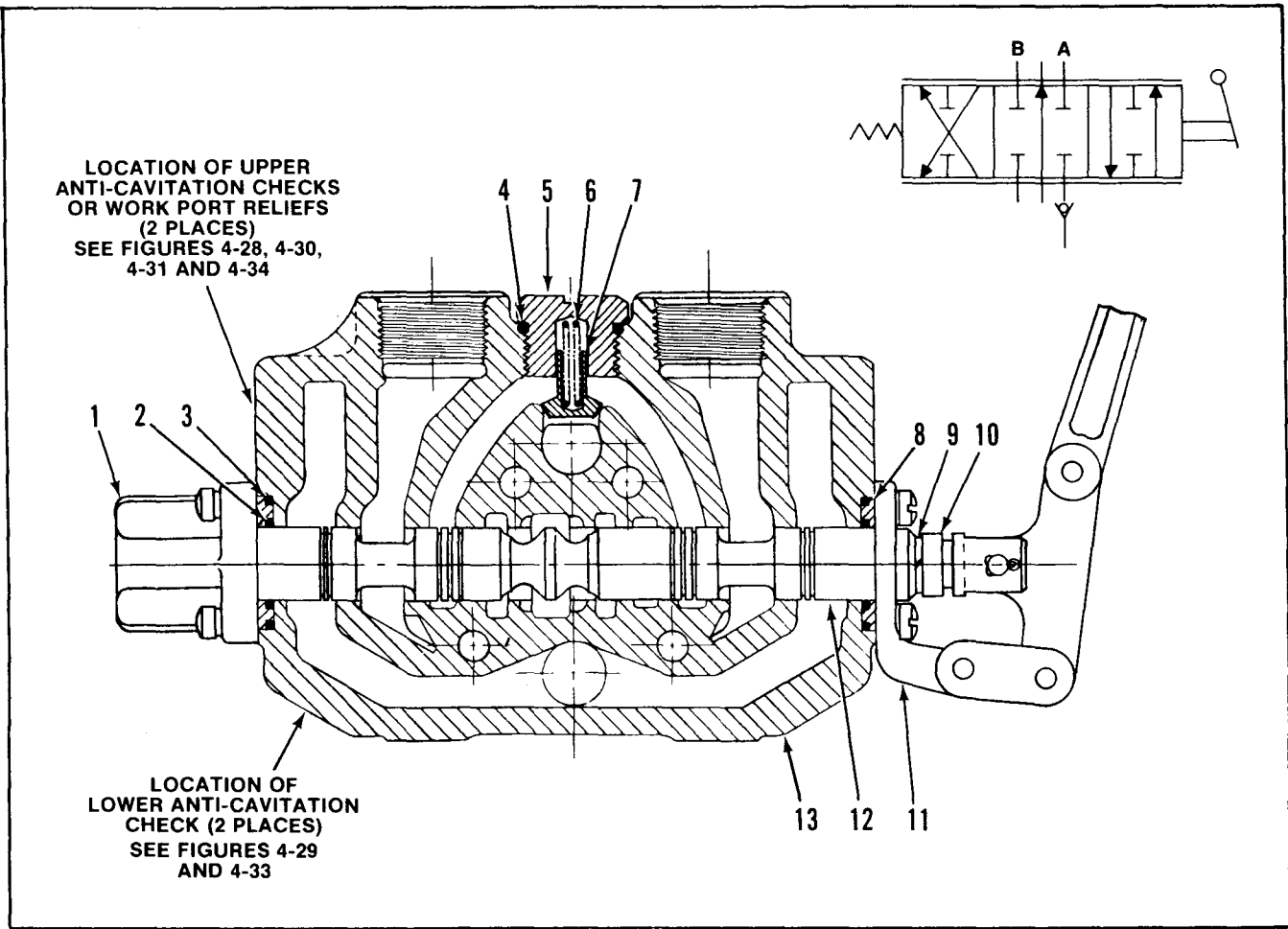


Figure 4-3. 4-Way, 3-Position Work Section

4-WAY, 3-POSITION WORK SECTION

Item No.	Part No.	Description	Quantity Per Section
	K-28029*	SEAL KIT (Contains items 2, 3 and 4 plus section seals)	
	K-7018*	SERVICE KIT (Contains items 4 thru 7)	
1	K-28060	POSITIONER, Standard (See Figure 4-12)	1
2	2931-001*	SEAL, Spool	2
3	3532-001*	SEAL, O-Ring	2
4	2709-001*	SEAL, O-Ring	1
5	7790-001	PLUG, Load Check	1
6	2796-001	SPRING	1
7	7791-001	POPPET	1
8	3531-001	PLATE, Seal	2
9	1039-001	WASHER, Lock	1
10	8351-001	ADAPTER, Clevis	1
11		HANDLE, BRACKET or RETAINER (See Figure 4-20 thru 4-24)	1
12	8060-001	SPOOL, 4-Way	1
13	8045-XXX	HOUSING, 4-Way	1

NOTE: These are matched parts and are not sold separately. See page 3-2 for ordering information.

*Buna-N seals are standard for all Gresen valve assemblies. Optional Viton seals are available. See Cross Reference Tables on page 4-31.

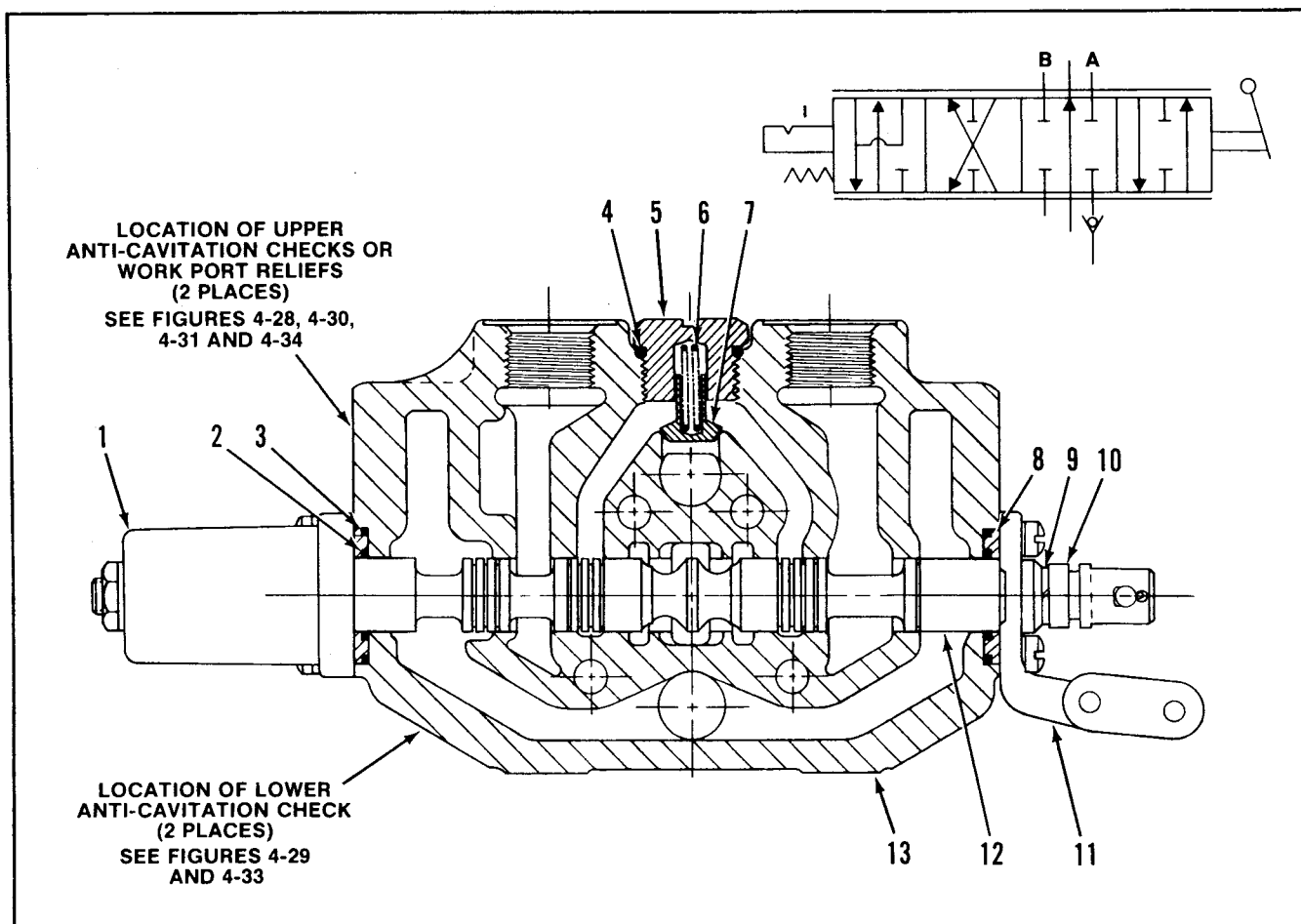


Figure 4-4. 4-Way, 4-Position Float Work Section.

4-WAY, 4-POSITION FLOAT WORK SECTION

Item No.	Part No.	Description	Quantity
	K-28029*	SEAL KIT (Contains items 2, 3 and 4 plus section seals)	
	K-7018*	SERVICE KIT (Contains items 4 thru 7)	
1	K-28061	POSITIONER, Float (See Figure 4-15)	1
2	2931-001*	SEAL, Spool	2
3	3532-001*	SEAL, O-Ring	2
4	2709-001*	SEAL, O-Ring	1
5	7790-001	PLUG, Load Check	1
6	2796-001	SPRING	1
7	7791-001	POPPET	1
8	3531-001	PLATE, Seal	2
9	1039-001	WASHER, Lock	1
10	8351-001	ADAPTER, Clevis	1
11		HANDLE, BRACKET or RETAINER (See Figure 4-20 thru 4-24)	1
12	8061-001	SPOOL, Float	1
13	8046-XXX	HOUSING, 4-Way Float	1

NOTE: These are matched parts and are not sold separately. See page 3-2 for ordering information.

*Buna-N seals are standard for all Gresen valve assemblies. Optional Viton seals are available. See Cross Reference Tables on page 4-31.

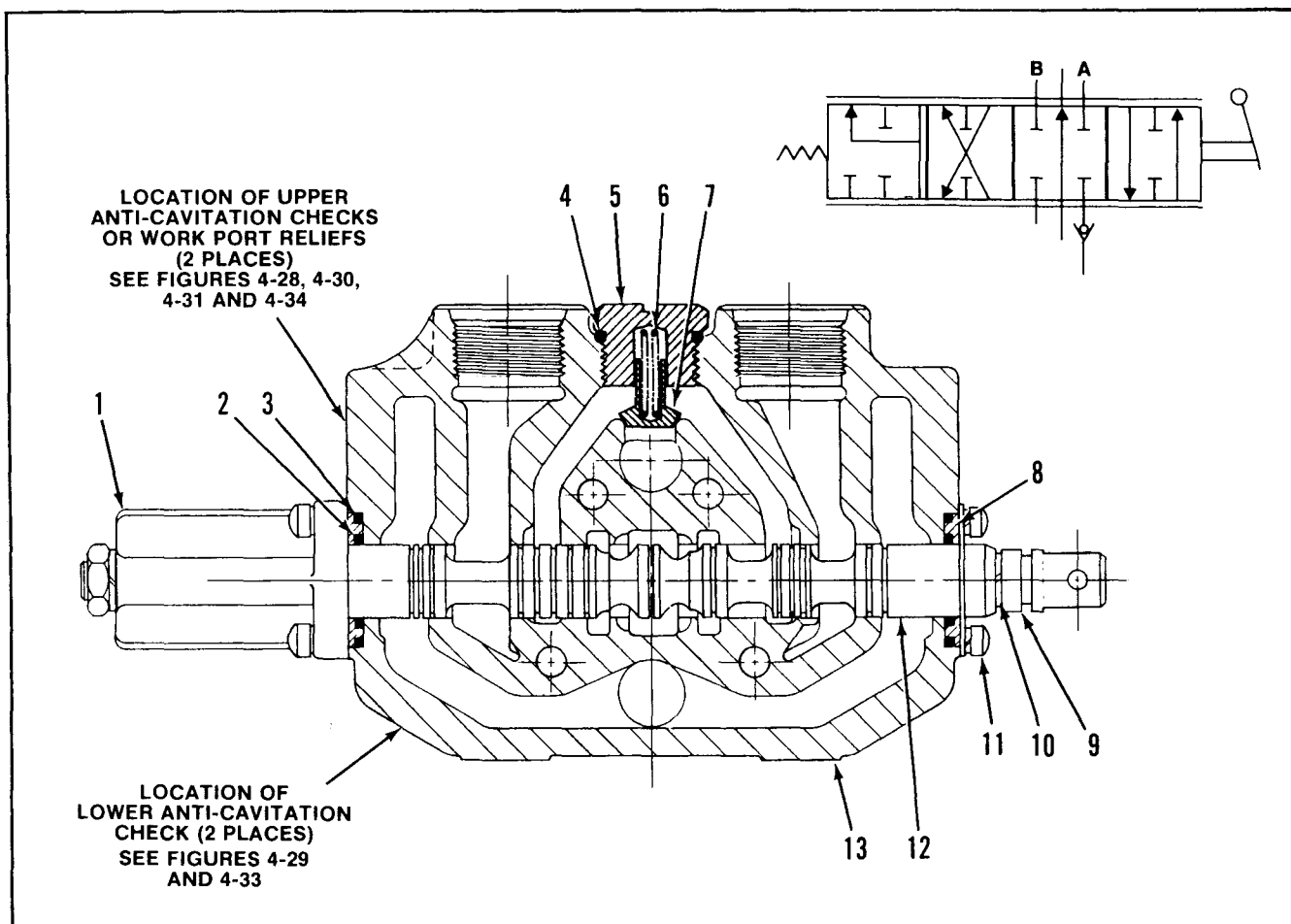


Figure 4-5. 4-Way, 4-Position Regenerative Work Section

4-WAY, 4-POSITION REGENERATIVE WORK SECTION

Item No.	Part No.	Description	Quantity
	K-28029*	SEAL KIT (Contains items 2, 3 and 4)	
	K-7018*	SERVICE KIT (Contains items 4 thru 7)	
1	K-28059	POSITIONER, Regenerative (See Figure 4-19)	1
2	2931-001*	SEAL, Spool	2
3	3532-001*	SEAL, O-Ring	2
4	2709-001*	SEAL, O-Ring	1
5	7790-001	PLUG, Load Check	1
6	2796-001	SPRING	1
7	7791-001	POPPET	1
8	3531-001	PLATE, Seal	2
9	8351-001	ADAPTER, Clevis	1
10	1039-001	WASHER, Lock	1
11		HANDLE, BRACKET or RETAINER (See Figure 4-20 thru 4-24)	1
12	8140-001	SPOOL, Regenerative	1
13	8138-XXX	HOUSING, 4-Way, Regenerative	1

NOTE: These are matched parts and are not sold separately. See page 3-2 for ordering information.

*Buna-N seals are standard for all Gresen valve assemblies. Optional Viton seals are available. See Cross Reference Tables on page 4-31.

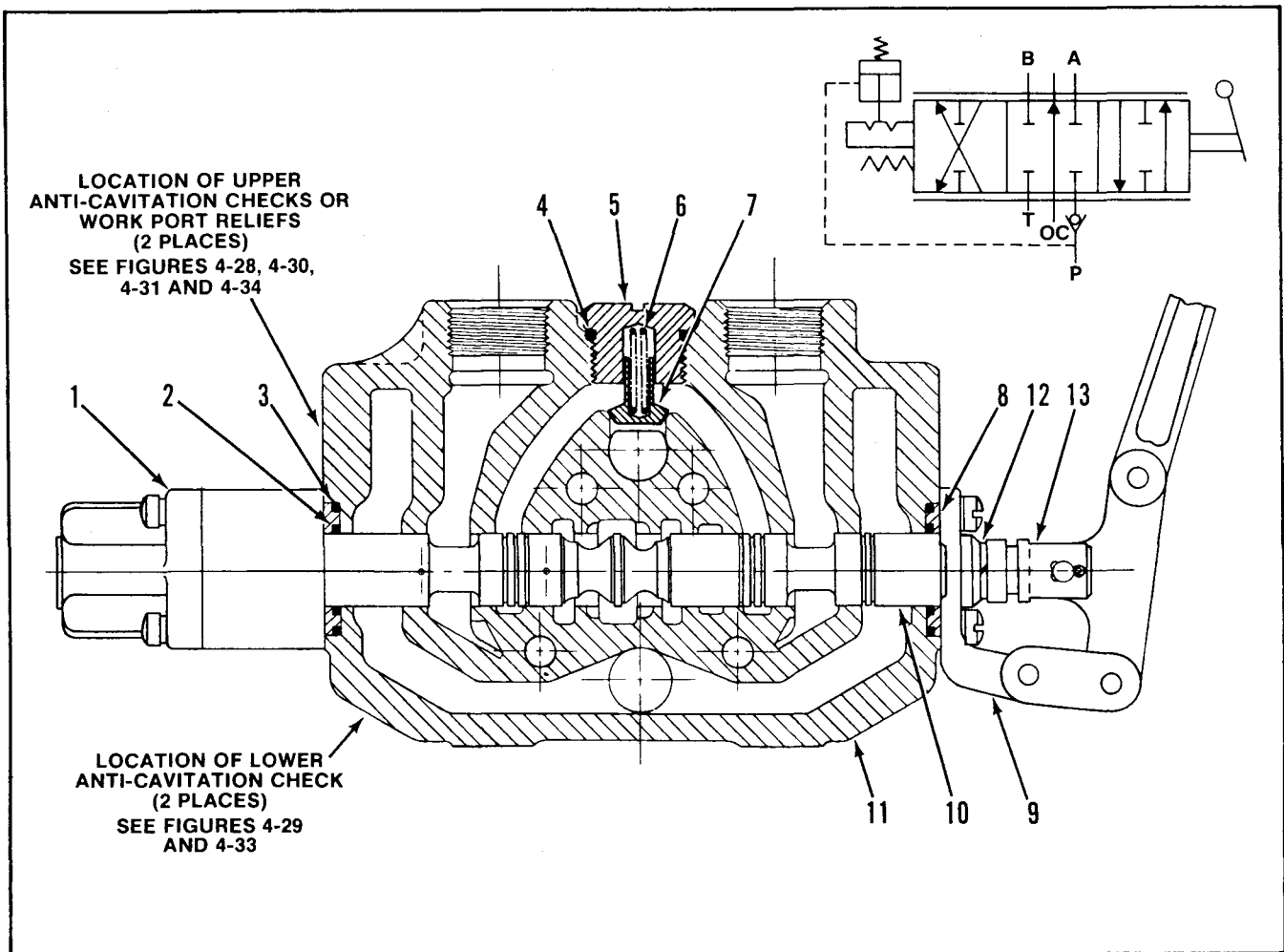


Figure 4-6. 4-Way, 3-Position Work Section With Pressure Detent Release.

4-WAY, 3-POSITION WORK SECTION WITH PRESSURE DETENT RELEASE

Item No.	Part No.	Description	Quantity
	K-28029*	SEAL KIT (Contains items 2, 3 and 4)	
	K-7018*	SERVICE KIT (Contains items 4 thru 7)	
1		POSITIONER, Pressure Detent Release (See Figure 4-17)	1
2	2931-001*	SEAL, Spool	2
3	3532-001*	SEAL, O-Ring	2
4	2709-001*	SEAL, O-Ring	1
5	7790-001	PLUG, Load Check	1
6	2796-001	SPRING	1
7	7791-001	POPPET	1
8	3531-001	PLATE, Seal	2
9		HANDLE, BRACKET or RETAINER (See Figure 4-20 thru 4-24)	1
10	8264-001	SPOOL, Pressure Detent Release	1
11	8045-XXX	HOUSING, 4-Way	1
12	1039-001	WASHER, Lock	1
13	8351-001	ADAPTER, Clevis	1

NOTE: These are matched parts and are not sold separately. See page 3-2 for ordering information.

*Buna-N seals are standard for all Gresen valve assemblies. Optional Viton seals are available. See Cross Reference Tables on page 4-31.

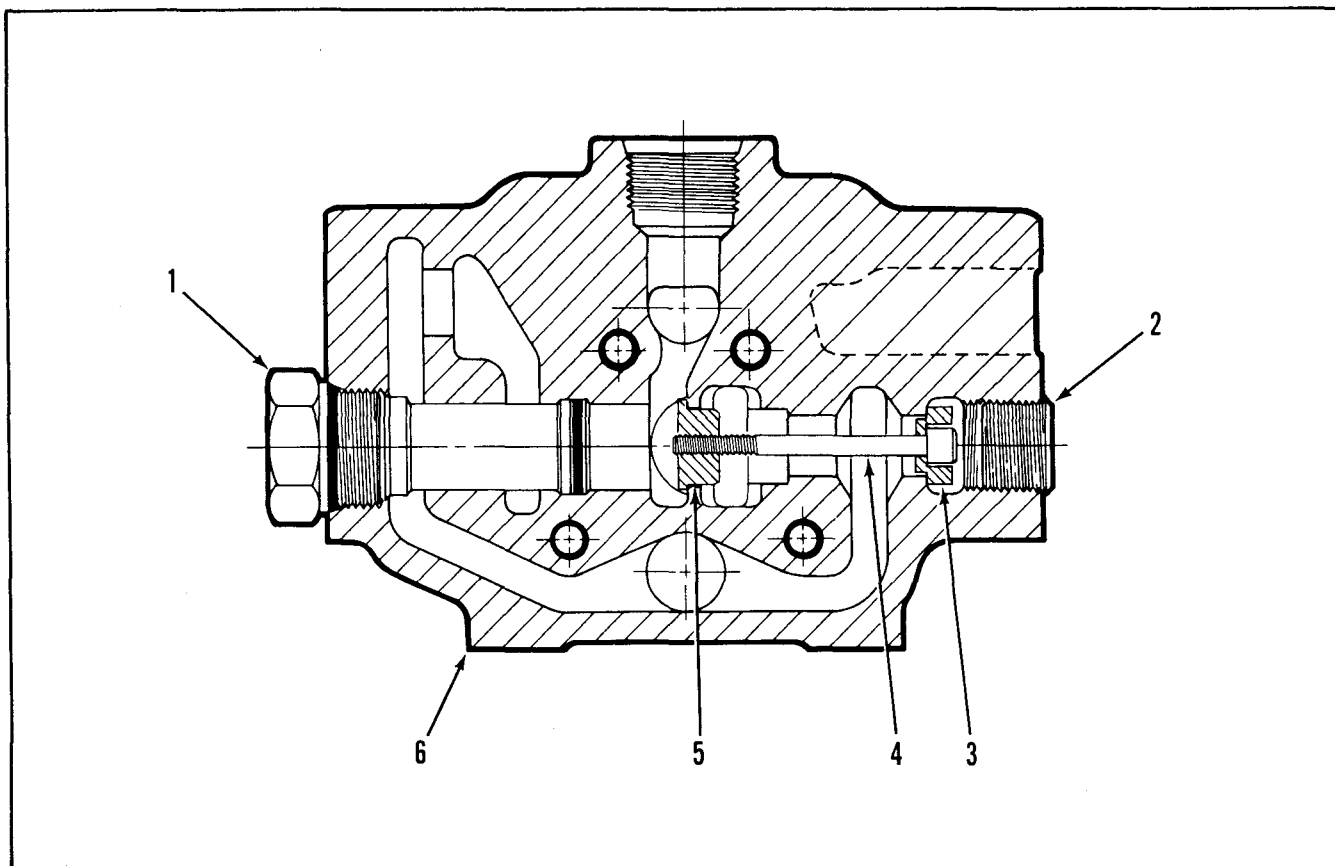


Figure 4-7. Split Flow Mid-Inlet Section

SPLIT FLOW MID-INLET SECTION

Item No.	Part No.	Description	Quantity
1		RELIEF VALVE (See Figures 4-25 thru 4-27)	1
2	0947-001	PLUG	1
3	8011-001	ADAPTER	1
4	3731-111	SCREW	1
5	8012-001	PLUG, Split Flow	1
6	3953-XXX	HOUSING	1

NOTE: Mid-Inlet Sections may be changed from split flow to combined flow in the field by replacing items 3, 4 and 5. Order:

K-7026 Split Flow Conversion Kit

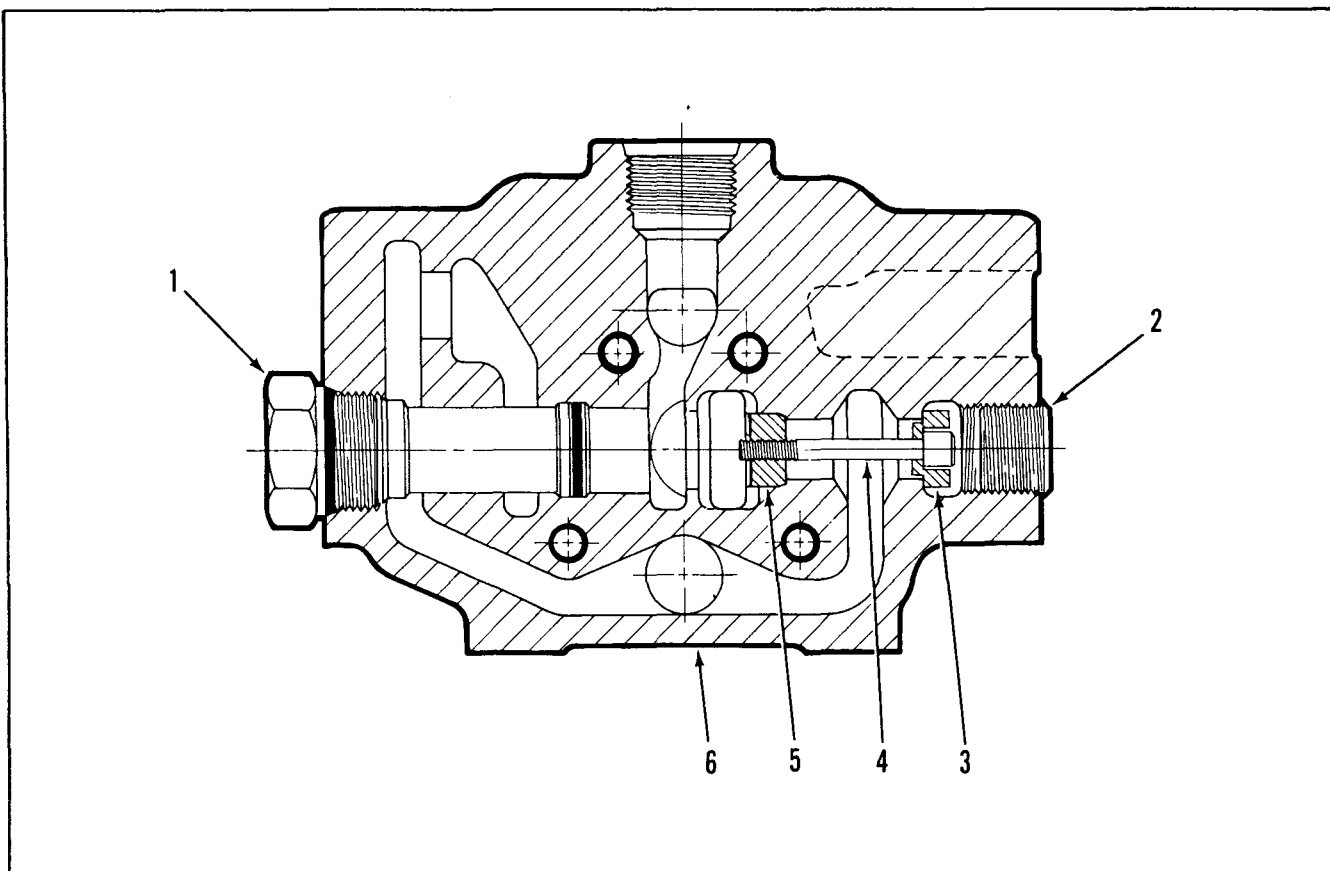


Figure 4-8. Combined Flow Mid-Inlet Section

COMBINED FLOW MID-INLET SECTION

Item No.	Part No.	Description	Quantity
1		RELIEF VALVE (See Figure 4-25 thru 4-27)	1
2	0947-001	PLUG	1
3	8011-001	ADAPTER	1
4	3731-108	SCREW	1
5	8013-001	PLUG, Combined Flow	1
6	3953-XXX	HOUSING	1

NOTE: Mid-Inlet Sections may be changed from combined flow to split flow in the field by replacing items 3, 4 and 5. Order:

K-7025 Combined Flow Conversion Kit.

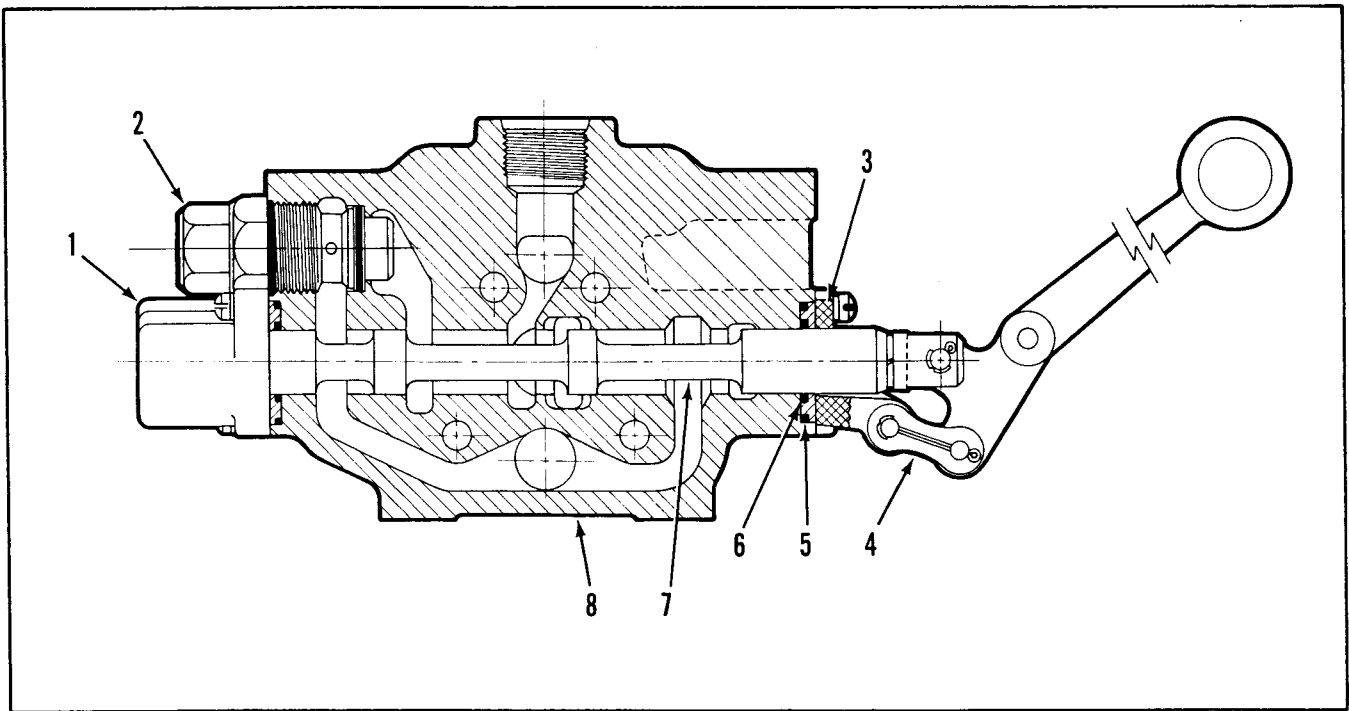


Figure 4-9. 2-Position Mid-Inlet Section

2-POSITION MID-INLET SECTION

Item No.	Part No.	Description	Quantity
	K-28029*	SEAL KIT (Contains items 5 and 6)	
1		POSITIONER, Load To Split Flow (See Figure 4-10)	1
		POSITIONER, Load To Combined Flow (See Figure 4-11)	1
2		RELIEF VALVE (See Figures 4-25 thru 4-27)	1
3	3531-001	PLATE, Seal	2
4		HANDLE ASSEMBLY (See Figures 4-20 thru 4-24)	1
5	3532-001*	SEAL, O-Ring	2
6	2931-001*	SEAL, Spool	2
7	3968-001	SPOOL	See Note
8	3953-XXX	HOUSING	

NOTE: These are matched parts and are not sold separately.

*Buna-N seals are standard for all Gresen valve assemblies. Optional Viton seals are available. See Cross Reference Tables on page 4-31.

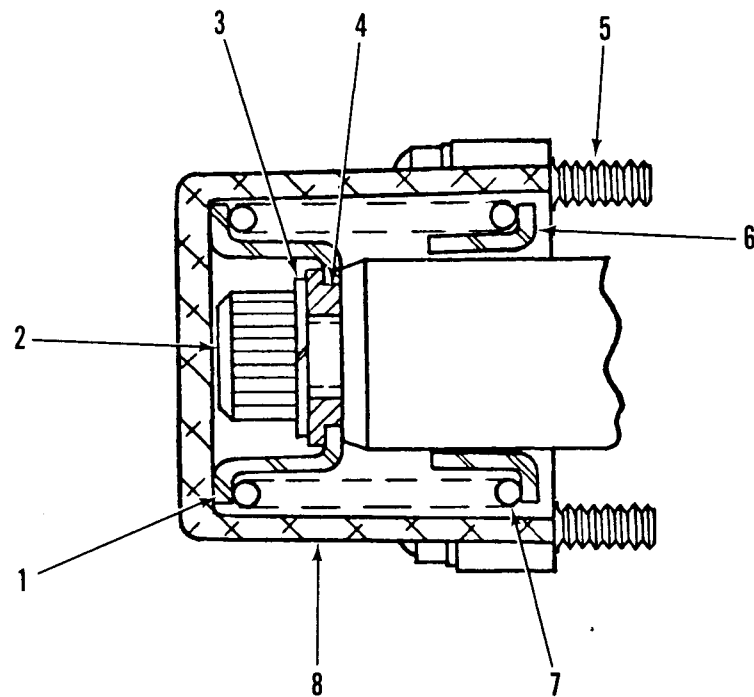


Figure 4-10. Spring Load To Split Flow Positioner

SPRING LOAD TO SPLIT FLOW POSITIONER

Item No.	Part No.	Description	Quantity
1	1609-001	COLLAR, Stop	1
2	3731-196	SCREW, Hex Soc Hd, 3/8—16 by 3/4 inch long	1
3	1039-001	WASHER, Lock	1
4	3967-001	SPACER, Spool	1
5	2673-001	SCREW, Fil. Hd, 1/4—20 by 1 inch long	4
6	3966-001	COLLAR, Stop	1
7	1625-001	SPRING, Centering	1
8	3481-001	BONNET	1

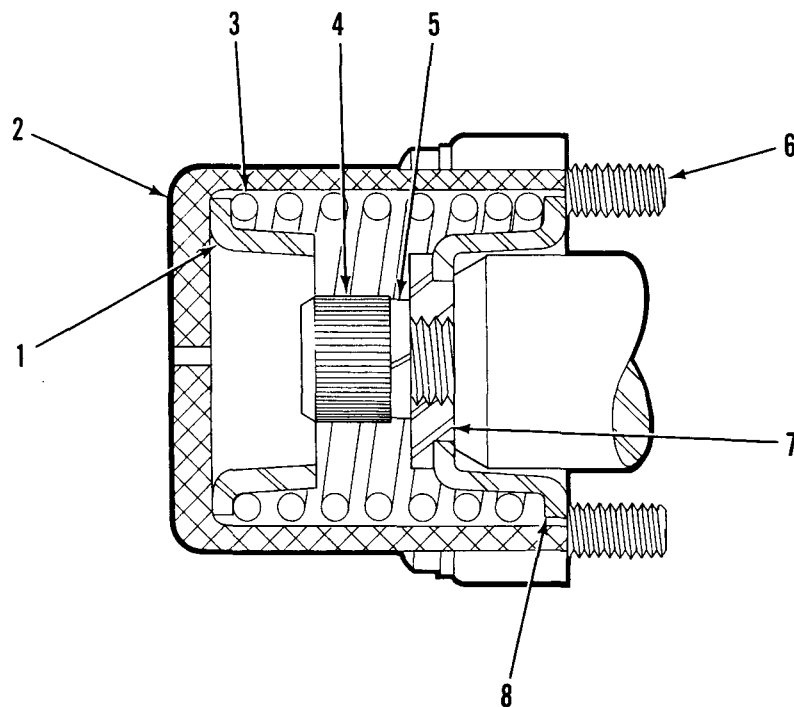


Figure 4-11. Spring Load To Combined Flow Positioner

SPRING LOAD TO COMBINED FLOW POSITIONER

Item No.	Part No.	Description	Quantity
1	3966-001	COLLAR, Stop	1
2	3481-001	BONNET	1
3	1625-001	SPRING	1
4	3731-196	SCREW, Hex Soc Hd, 3/8—16 by 3/4 inch long	1
5	1039-001	WASHER, Lock	1
6	2673-001	SCREW, Fil Hd, 1/4—20 by 1 inch long	4
7	3967-001	SPACER	1
8	1609-001	COLLAR, Spring	1

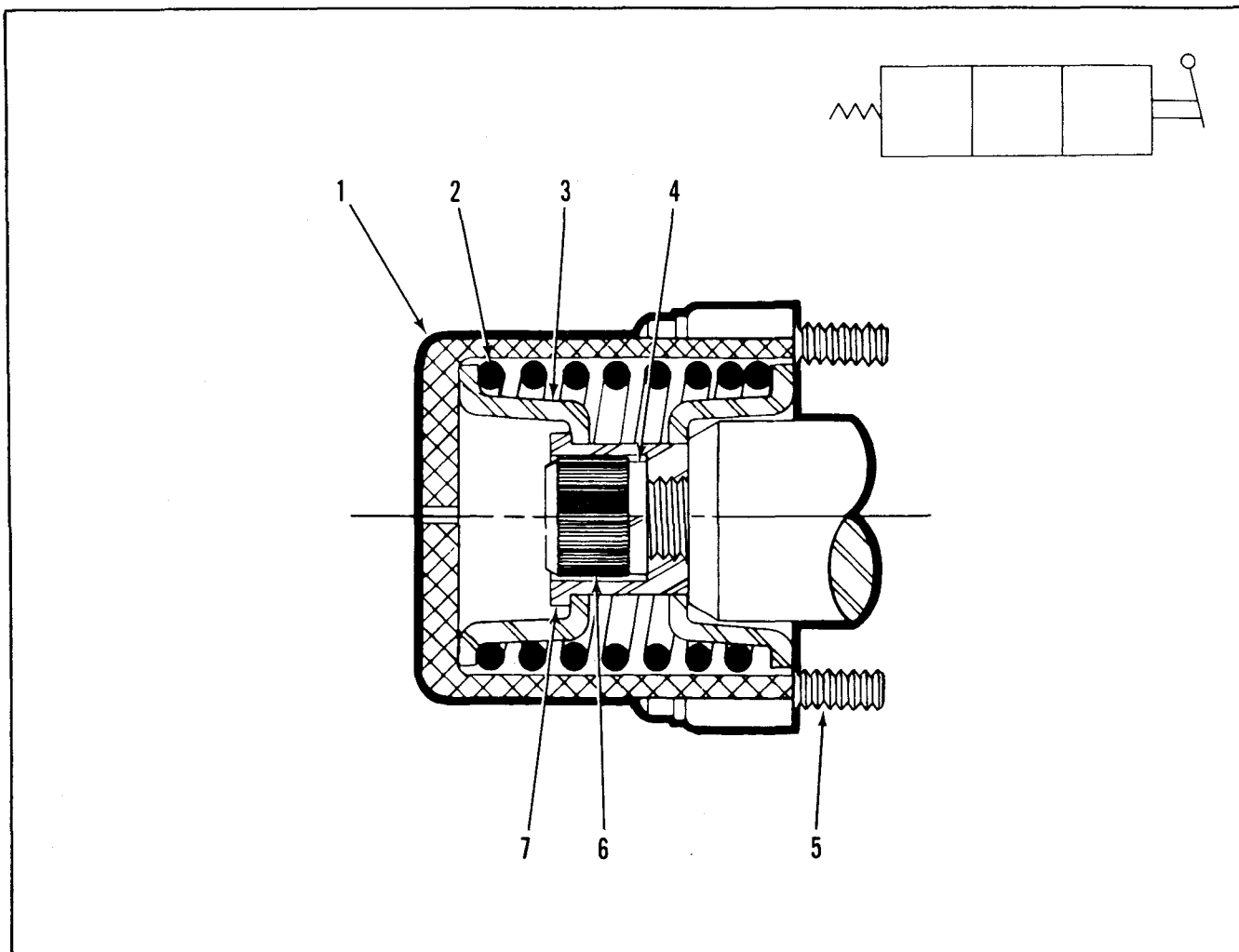


Figure 4-12. Spring Return to Neutral Positioner

SPRING RETURN TO NEUTRAL POSITIONER

Item No.	Part No.	Description	Quantity
	K-28060	REPLACEMENT KIT (Contains all items listed below)	
1	3481-001	BONNET	1
2	1608-001	SPRING	1
3	1609-001	COLLAR, Stop	2
4	1291-001	WASHER, Lock	1
5	2673-001	SCREW, Fil. Hd., 1/4—20 by 1 inch long	4
6	3731-196	SCREW, Hex. Soc. Hd., 3/8—16 by 3/4 inch long	1
7	3533-001	COLLAR, Spool	1

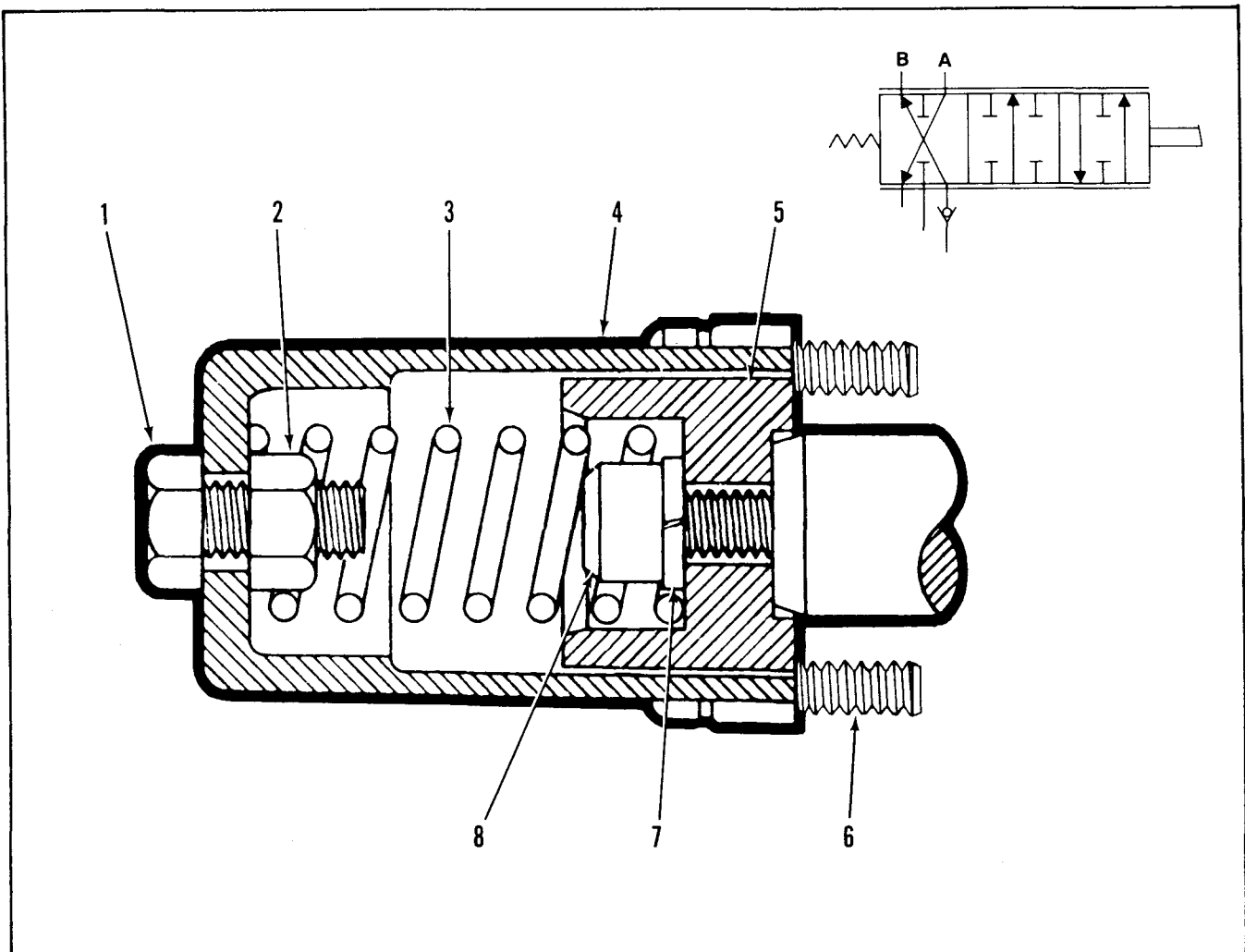


Figure 4-13. Spring Extended Spool Positioner

SPRING EXTENDED SPOOL POSITIONER

Item No.	Part No.	Description	Quantity
	K-28028	REPLACEMENT KIT (Contains all items listed below)	
1	3732-001	SCREW	1
2	1665-001	NUT Hex	1
3	1761-001	SPRING	1
4	3482-001	BONNET	1
5	3538-001	COLLAR, Stop	1
6	2673-001	SCREW, Fil. Hd., 1/4—20 by 1 inch long	4
7	1291-001	WASHER, Lock	1
8	3731-198	SCREW	1

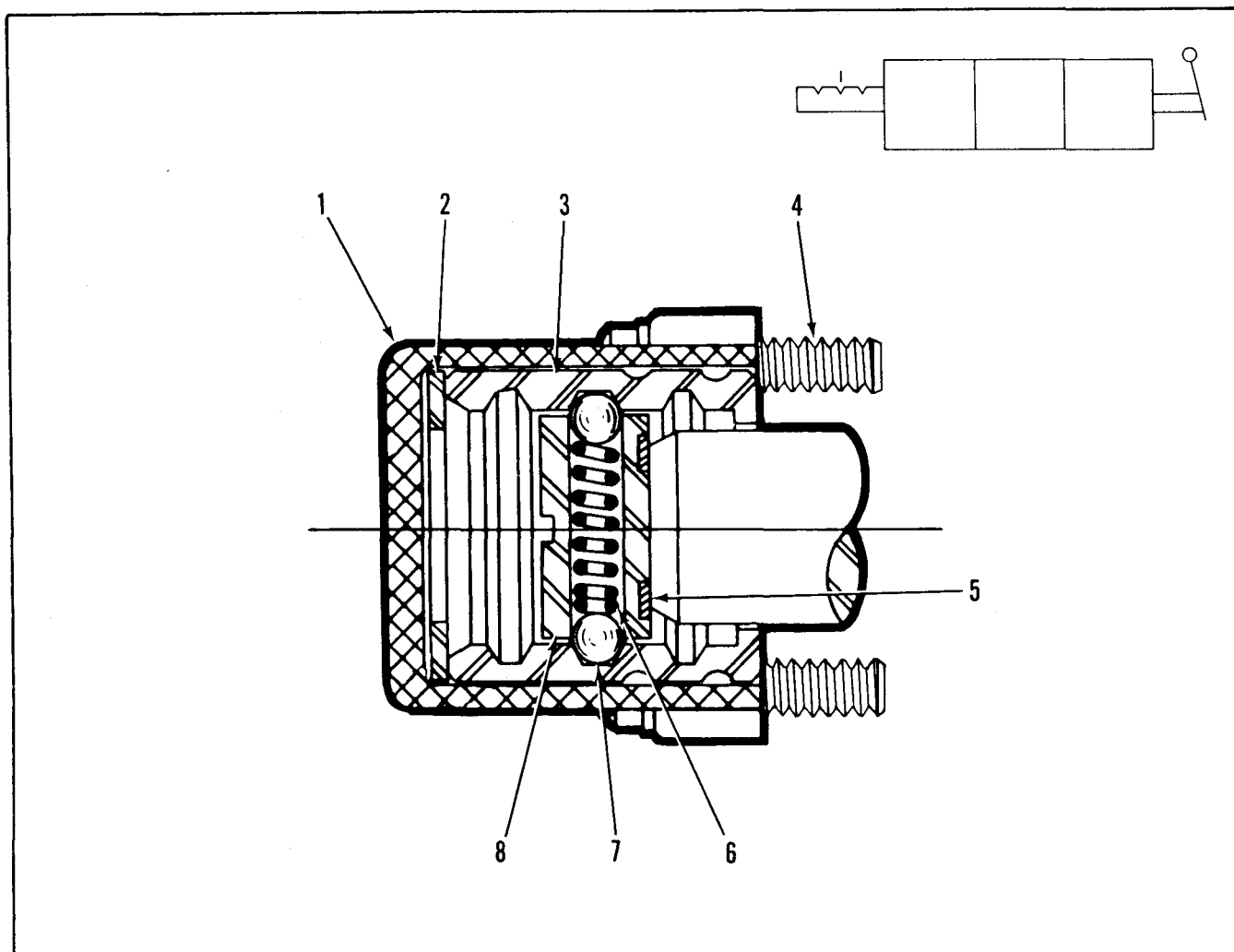


Figure 4-14. 3-Position Detent Positioner

3-POSITION DETENT POSITIONER

Item No.	Part No.	Description	Quantity
	K-28025	REPLACEMENT KIT (Contains all items listed below)	
1	3481-001	BONNET	1
2	3593-001	WASHER, Detent Stop	1
3	3583-001	SLEEVE, Detent	1
4	2673-001	SCREW, Fil. Hd., 1/4—20 by 1 inch long	4
5	1039-001	WASHER, Lock	1
6	1634-001	SPRING, Detent	1
7	0514-001	BALL	2
8	1627-001	HOLDER, Detent	1

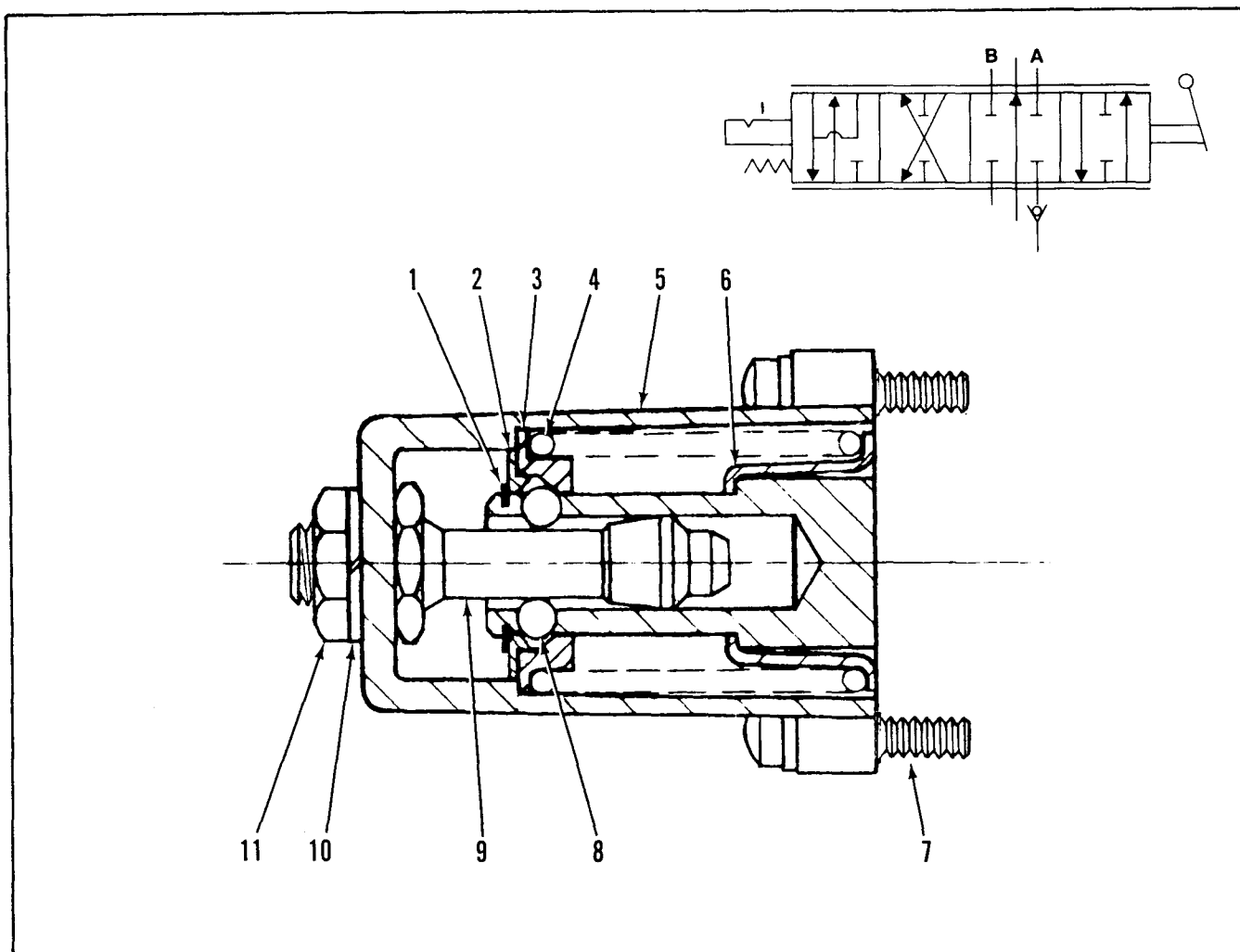


Figure 4-15. Float Positioner

FLOAT POSITIONER

Item No.	Part No.	Description	Quantity
	K-28061	REPLACEMENT KIT (Contains all items listed below)	
1	1741-001	RING, Retaining	1
2	1738-001	RETAINER, Detent Ball	1
3	1737-001	COLLAR, Spring	1
4	7711-001	SPRING	1
5	3482-001	BONNET	1
6	3535-001	COLLAR, Spring	1
7	2673-001	SCREW, Fil. Hd., 1/4—20 by 1 inch long	4
8	1700-001	BALL	4
9	3537-001	SPUD, Positioner	1
10	1732-001	WASHER, Lock	1
11	1731-001	NUT, Hex, 7/16" UNC 2A	

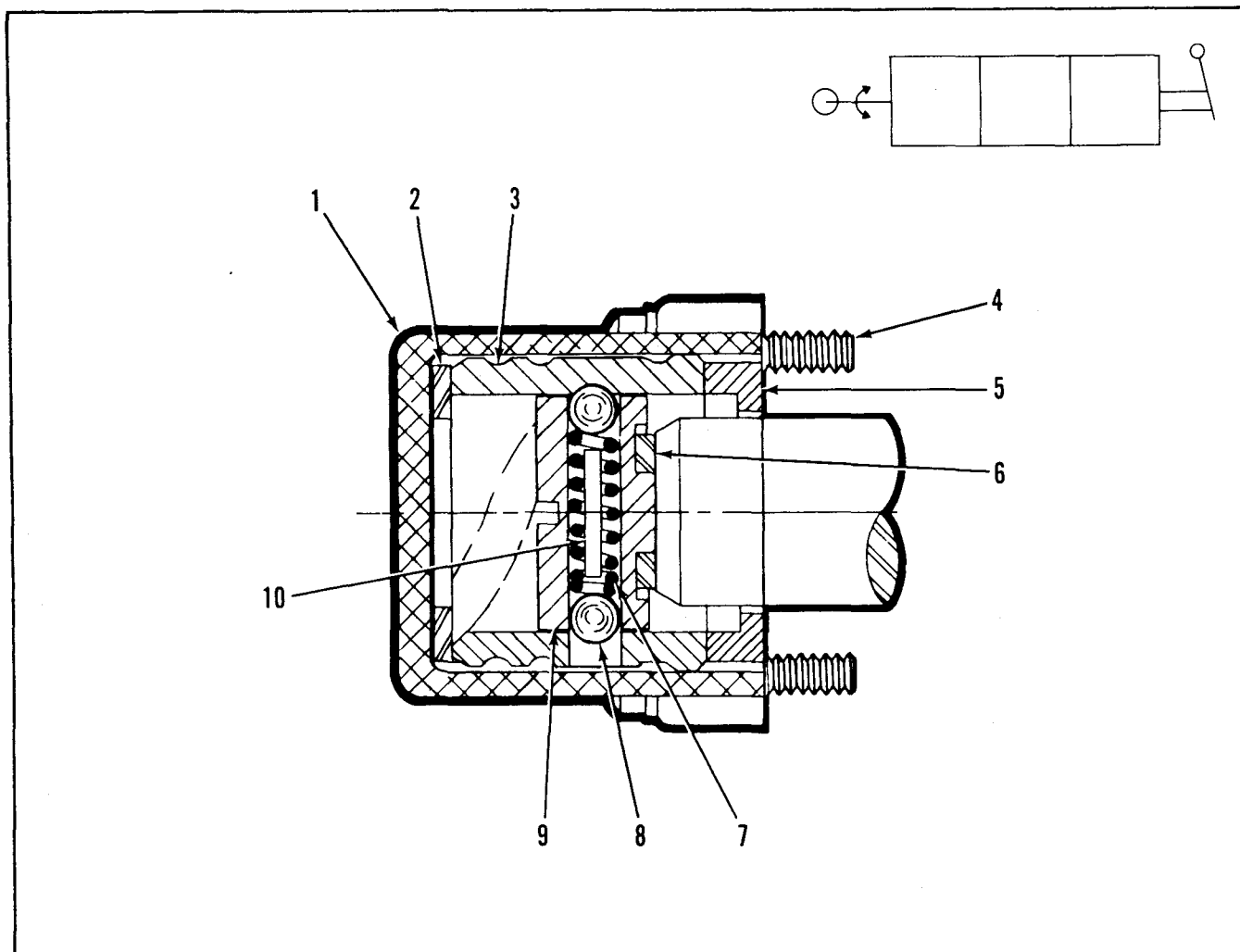


Figure 4-16. Rotary Positioner

ROTARY POSITIONER

Item No.	Part No.	Description	Quantity
	K-28026	REPLACEMENT KIT (Contains all items listed below)	
1	3481-001	BONNET	1
2	3593-001	WASHER, Detent Stop	1
3	3592-001	ACTUATOR, Rotary	1
4	2673-001	SCREW	4
5	3598-001	COLLAR, Stop	1
6	1039-001	WASHER, Lock	1
7	1634-001	SPRING, Detent	1
8	0514-001	BALL	2
9	1627-001	HOLDER, Detent	1
10	1768-001	PIN, Ball Stop	1

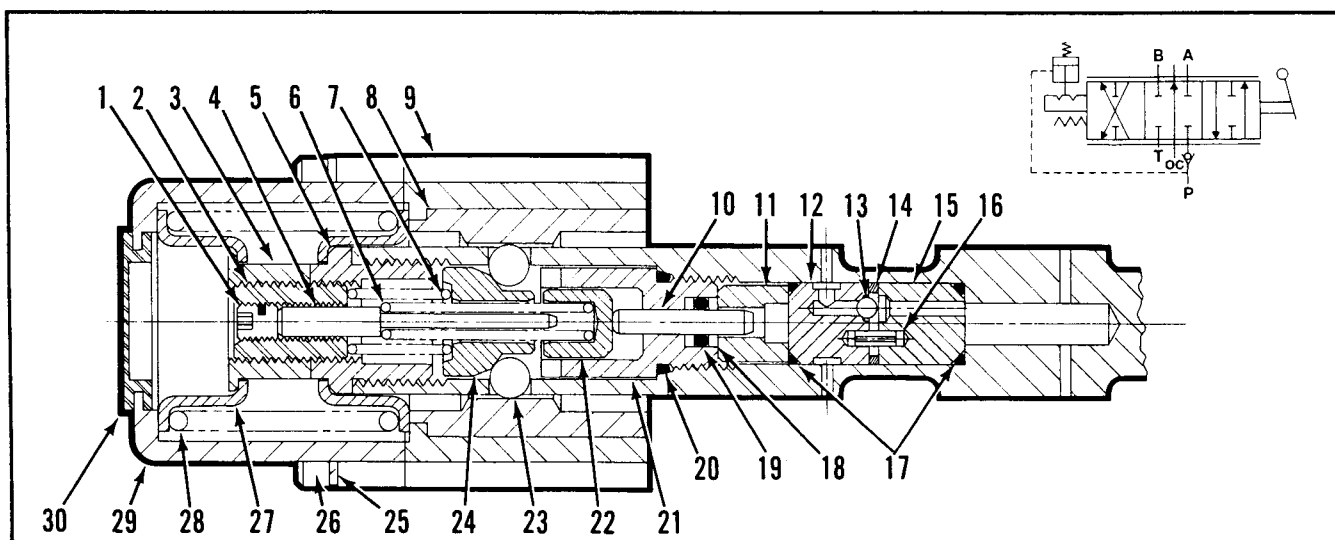


Figure 4-17. Internal Pressure Detent Release Positioner

INTERNAL PRESSURE DETENT RELEASE POSITIONER

Item No.	Part No.	Description	Quantity
	K-28088	SEAL KIT (Contains items 17 thru 20)	
1	7536-001	SETSCREW, Hex Soc, 1/4—28 by 1/4 inch long	1
2	7537-001	SLEEVE, Adjusting	1
3	7535-001	COLLAR, Spool	1
4	7939-001	GUIDE, Spring	1
5	7538-001	ADAPTER, Spool	1
6	7900-001	SPRING	1
7	1829-001	SPRING	1
8	7540-001	SLEEVE, Detent	1
9	7539-001	ADAPTER, Detent	1
10	7944-001	ROLLER, Needle	1
11	7945-001	RETAINER, Seal	1
12	7947-001	BODY, Check	1
13	7937-001	BALL	1
14	1883-001	SEAL	1
15	7948-001	BODY, Check	1
16	7940-001	PIN, Spring, .094 x .50 inch long	1
17	6884-001	SEAL, O-Ring	2
18	7907-001	WASHER, Backup	2
19	3328-001	SEAL, O-Ring	1
20	2705-001	SEAL, O-Ring	1
21	7943-001	PLUG, Seal Retainer	1
22	7942-001	PLUNGER	1
23	0023-001	BALL	4
24	7941-001	RAMP, Detent	1
25	0563-001	WASHER, Lock	4
26	3731-108	SCREW, Hex Soc. Hd., 1/4—20 by 2-1/2 inches long	4
27	1609-001	COLLAR, Spring	2
28	1625-001	SPRING	1
29	3481-002	BONNET	1
30	1612-001	DIAPHRAGM	1

*Buna-N seals are standard for all Gresen valve assemblies. Optional Viton seals are available. See Cross Reference Tables on page 4-31.

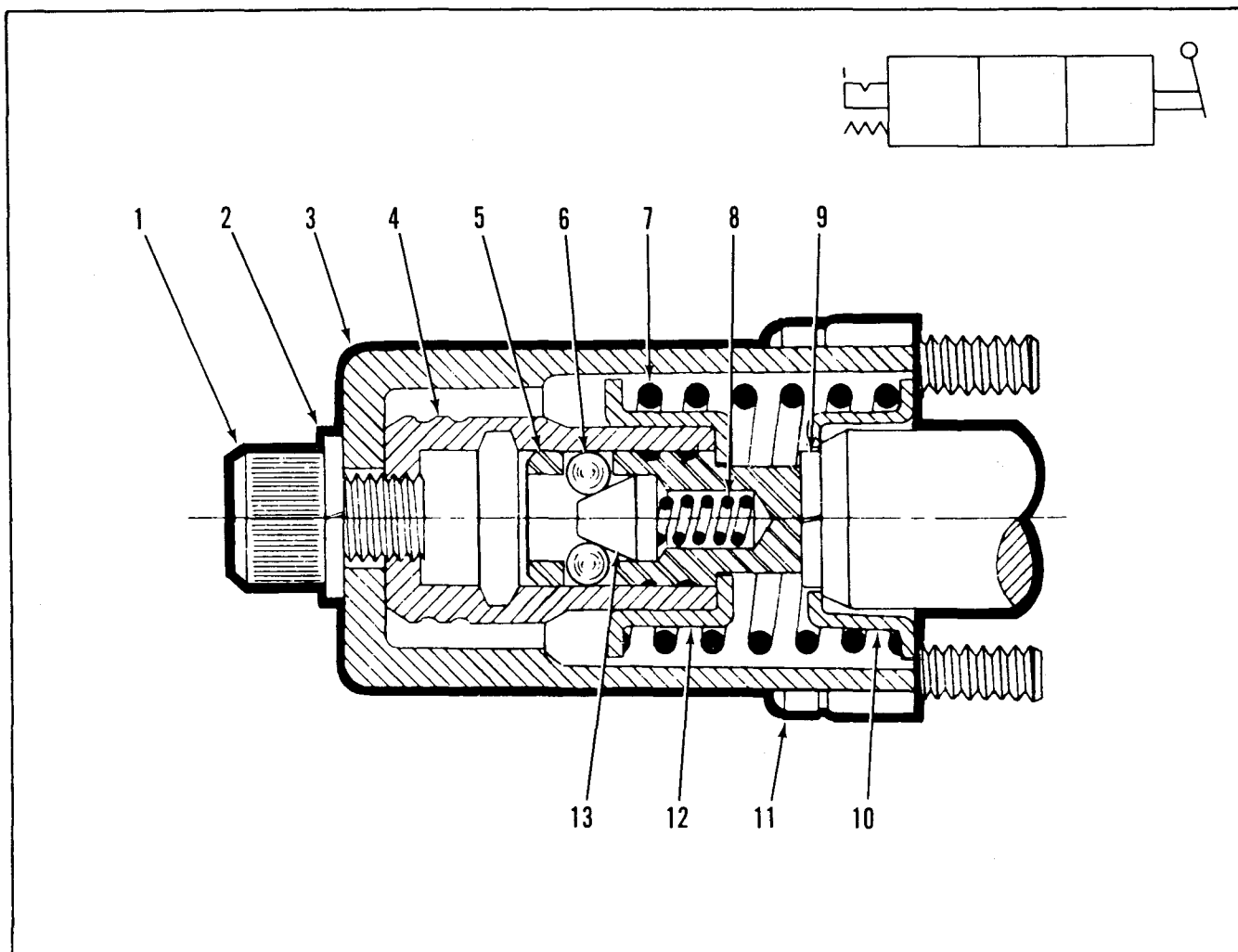


Figure 4-18. Spool "IN" Detent With Spring Return To Neutral Positioner

SPOOL "IN" DETENT WITH SPRING RETURN TO NEUTRAL POSITIONER

Item No.	Part No.	Description	Quantity
	K-28027	REPLACEMENT KIT (Contains all items listed below)	
1	1776-001	SCREW	1
2	1732-001	WASHER, Lock	1
3	3482-001	BONNET	1
4	3586-001	SLEEVE, Detent	1
5	3585-001	HOLDER, Detent	1
6	1700-001	BALL	4
7	1625-001	SPRING, Centering	1
8	1634-001	SPRING, Detent	1
9	1039-001	WASHER, Lock	1
10	1609-001	COLLAR, Stop	1
11	2673-001	SCREW, Fil. Hd., 1/4—20 by 1 inch long	4
12	1774-001	COLLAR, Detent	1
13	1773-001	FOLLOWER, Detent	1

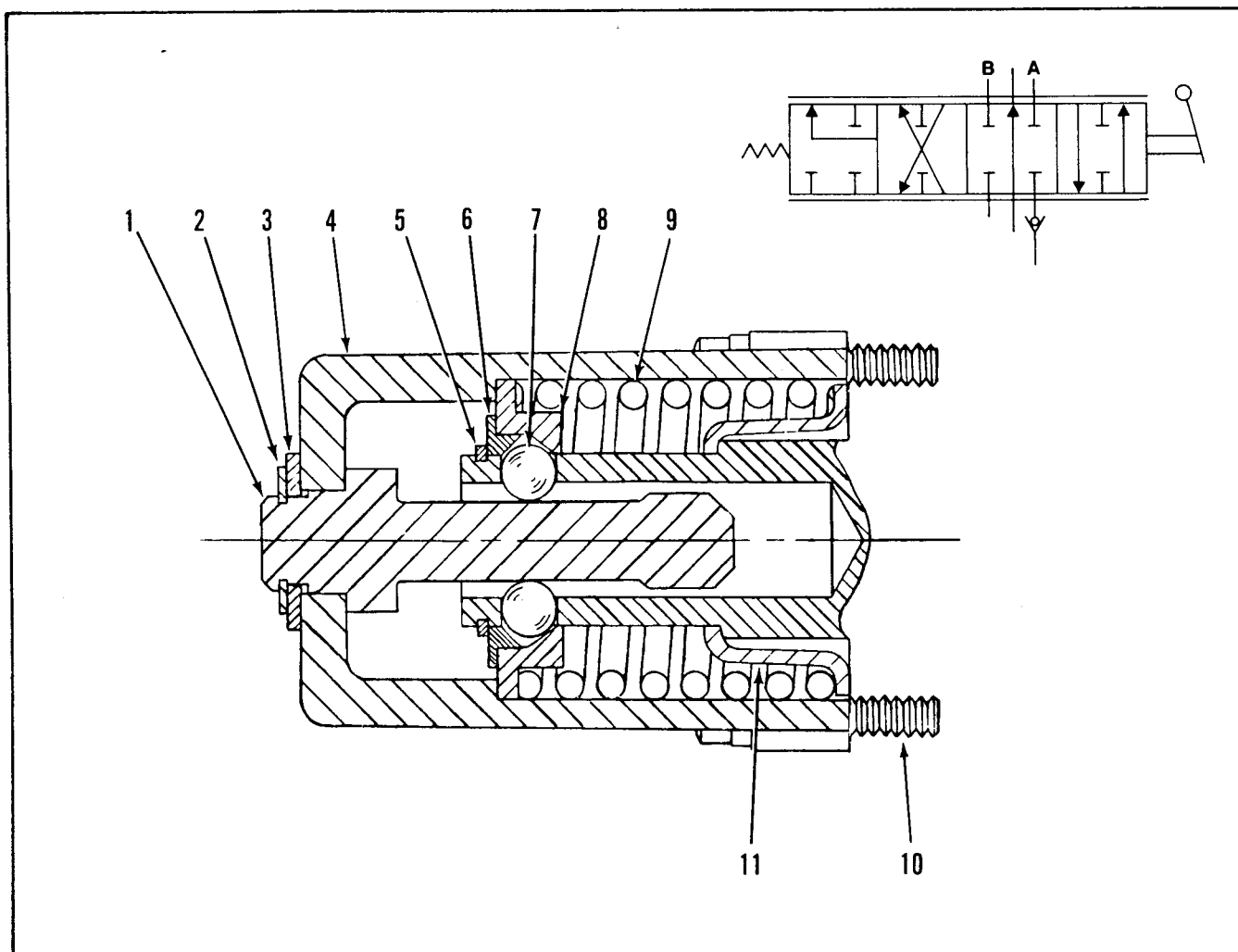


Figure 4-19. Regenerative Spool Positioner

REGENERATIVE SPOOL POSITIONER

Item No.	Part No.	Description	Quantity
	K-28059	REPLACEMENT KIT (Contains all items listed below)	
1	8554-001	POSITIONER	1
2	7442-001	RING, Retaining	1
3	0509-001	WASHER, Plain	1
4	3482-001	BONNET	1
5	1741-001	RING, Retaining	1
6	1738-001	ADAPTER	1
7	1700-001	BALL	4
8	3534-001	COLLAR, Detent	1
9	7170-001	SPRING	1
10	2673-001	SCREW, Fil. Hd., 1/4—20 by 1 inch long	4
11	3535-001	COLLAR, Stop	1

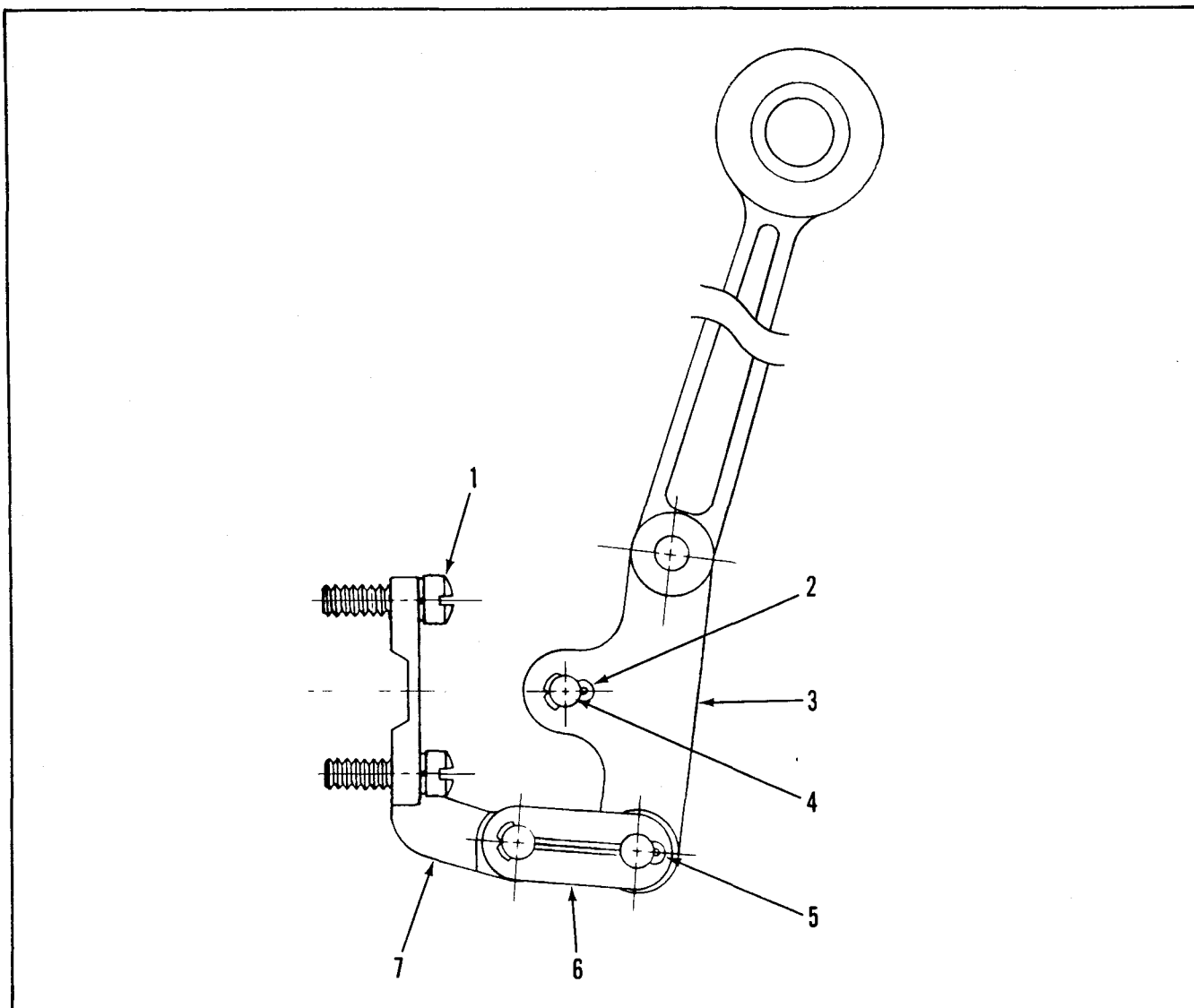


Figure 4-20. Vertical Handle

VERTICAL HANDLE

Item No.	Part No.	Description	Quantity
		REPLACEMENT KITS (Contains all items listed below)	
	K-28080	Replacement Kit With Black Plastic Coated Handle (Standard)	
	K-28081	Replacement Kit With Red Plastic Coated Handle	
	K-28082	Replacement Kit With Plain Handle	
1	1620-001	SCREW, Fil. Hd., 1/4—20 by 3/4 inch long	4
2	0086-001	PIN, Cotter, 0.078 by 0.50 inch long	1
3	8349-001	HANDLE, Vertical, Black Plastic Coated (Standard)	1
	8349-002	HANDLE, Vertical, Red Plastic Coated (Optional)	1
	8349-003	HANDLE, Vertical, Plain (Optional)	1
4	0085-001	PIN, Clevis	1
5	0929-00	PIN, Cotter, 0.062 by 1.50 inches long	1
6	3452-001	SIDE PLATE (Less pins)	1
	3453-001	SIDE PLATE (With pins)	1
7	8348-001	BRACKET, Handle	1

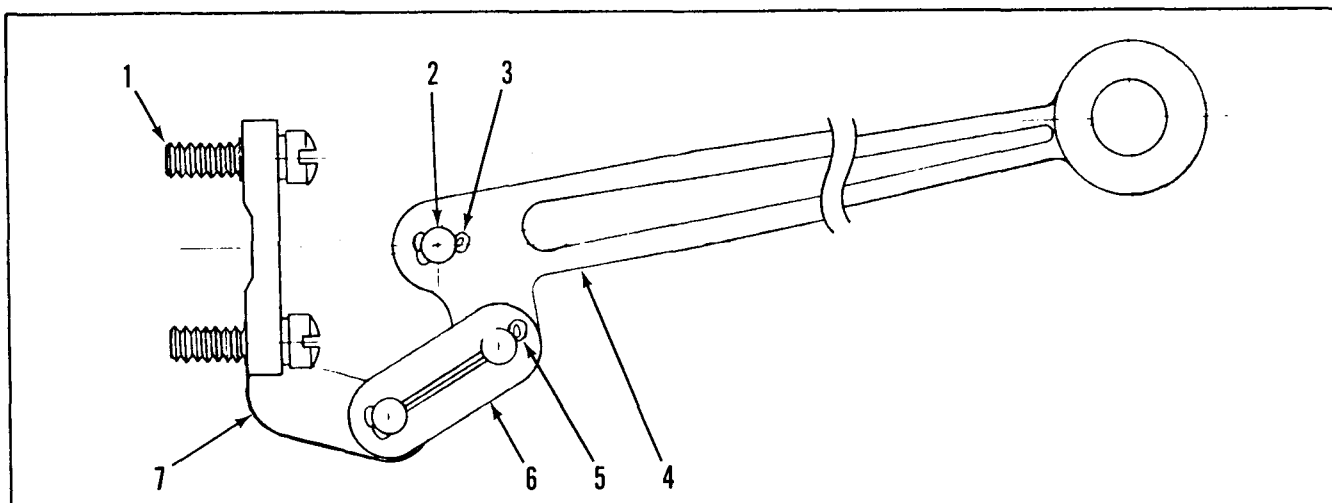


Figure 4-21. Horizontal Handle

HORIZONTAL HANDLE

Item No.	Part No.	Description	Quantity
		REPLACEMENT KITS (Contains all items listed below)	
	K-28083	Replacement Kit with Black Plastic Coated Handle (Standard)	
	K-28084	Replacement Kit with Red Plastic Coated Handle	
	K-28085	Replacement Kit with Plain Handle	
1	1620-001	SCREW, Fil. Hd., 1/4—20 by 3/4 inch long	4
2	0085-001	PIN, Clevis	1
3	0086-001	PIN, Cotter, 0.078 by 0.50 inch long	1
4	3249-001	HANDLE, Horizontal, Black Plastic Coated (Standard)	1
	3249-002	HANDLE, Horizontal, Red Plastic Coated (Optional)	1
	3249-003	HANDLE, Horizontal, Plain (Optional)	1
5	0929-001	PIN, Cotter, 0.062 by 1.50 inches long	1
6	3452-001	SIDE PLATE (Less pins)	1
	3453-001	SIDE PLATE (With pins)	1
7	8348-001	BRACKET, Handle	1

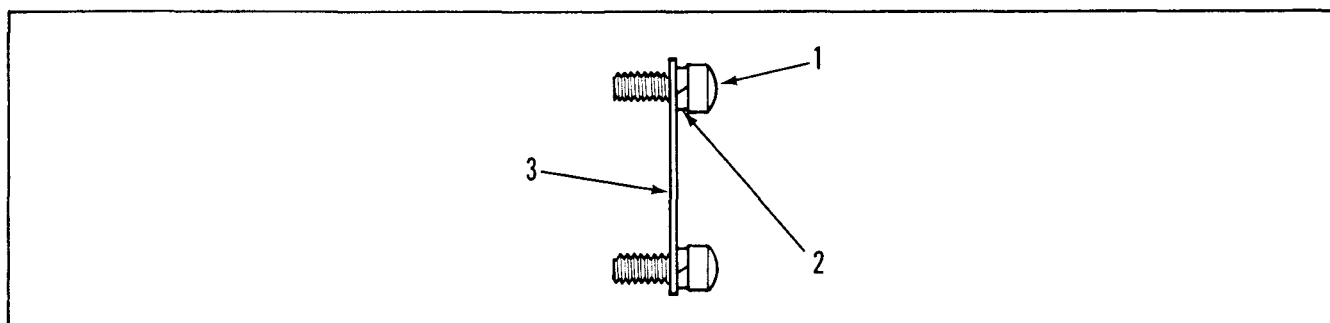


Figure 4-22. Standard Seal Retainer

STANDARD SEAL RETAINER

Item No.	Part No.	Description	Quantity
	K-28022	REPLACEMENT KIT (Contains items 1, 2 and 3)	
1	0510-001	SCREW, Button Hd., 1/4—20 UNC by 1/2 inch long	4
2	0563-001	WASHER, Lock	4
3	0725-001	PLATE, Retainer	1

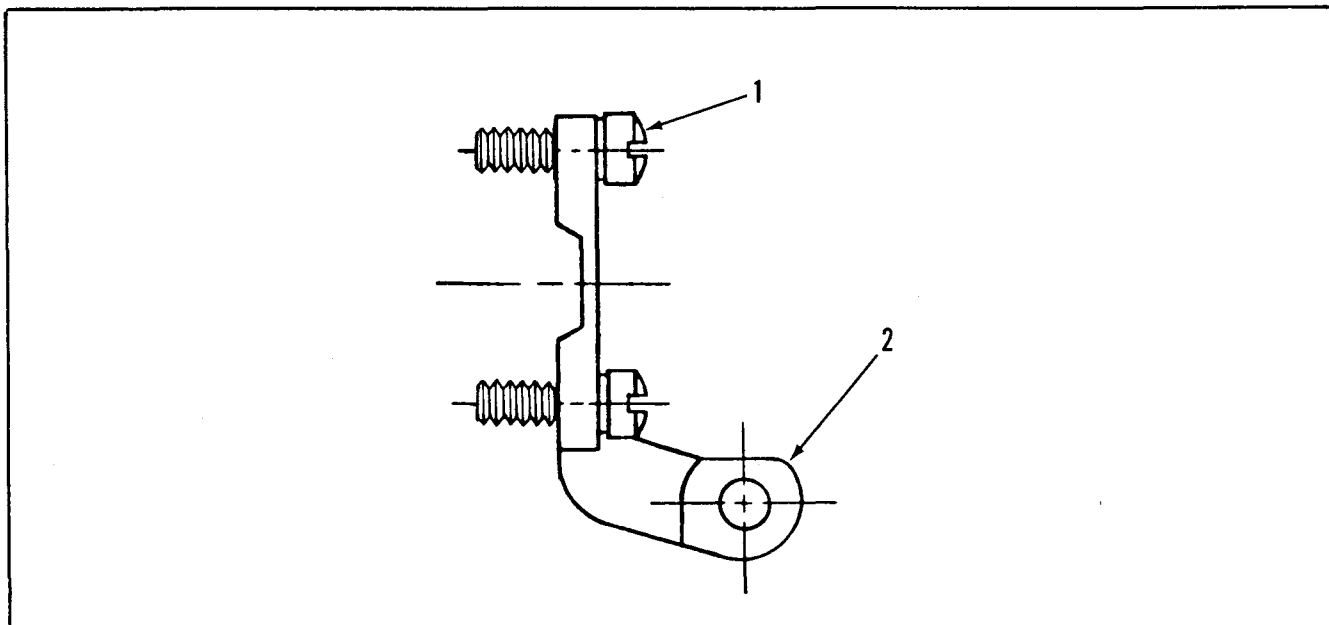


Figure 4-23. Handle Bracket

HANDLE BRACKET

Item No.	Part No.	Description	Quantity
	K-28086	REPLACEMENT KIT (Contains items 1 and 2)	
1	1620-001	SCREW, Fil. Hd., 1/4—20 by 3/4 inch long	4
2	8348-001	BRACKET, Handle	1

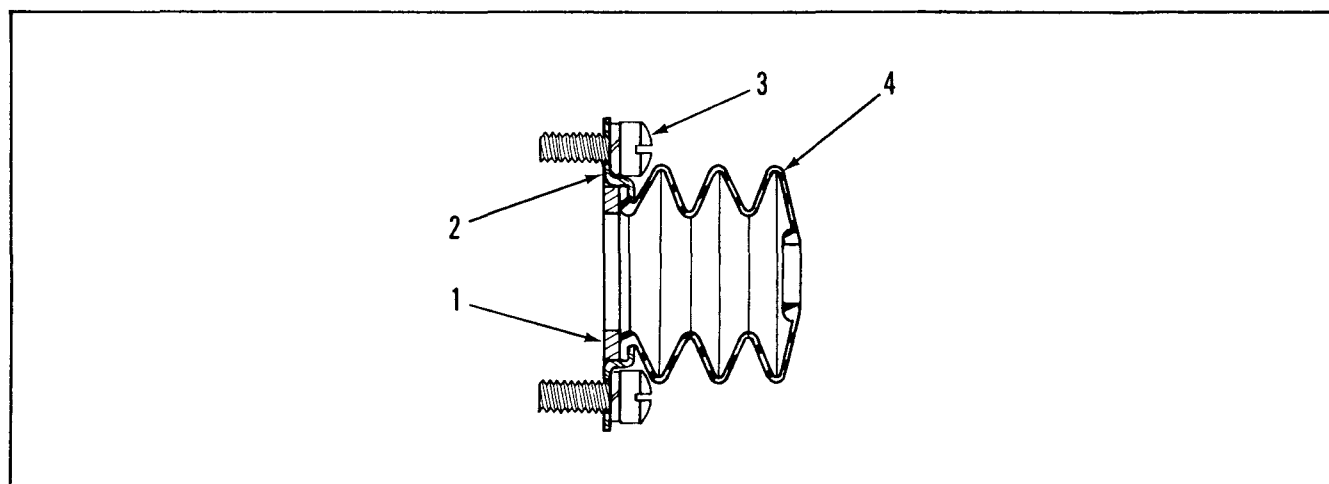


Figure 4-24. Spool Protective Boot

SPOOL PROTECTIVE BOOT

Item No.	Part No.	Description	Quantity
	K-7021	REPLACEMENT KIT (Contains all items listed below)	
1	7722-001	WASHER, Breather	1
2	7721-001	RETAINER, Boot	1
3	1620-001	SCREW and LOCK WASHER, Fil. Hd., 1/4—20 by 3/4 inch long	4
4	7723-001	BOOT, Dust	1

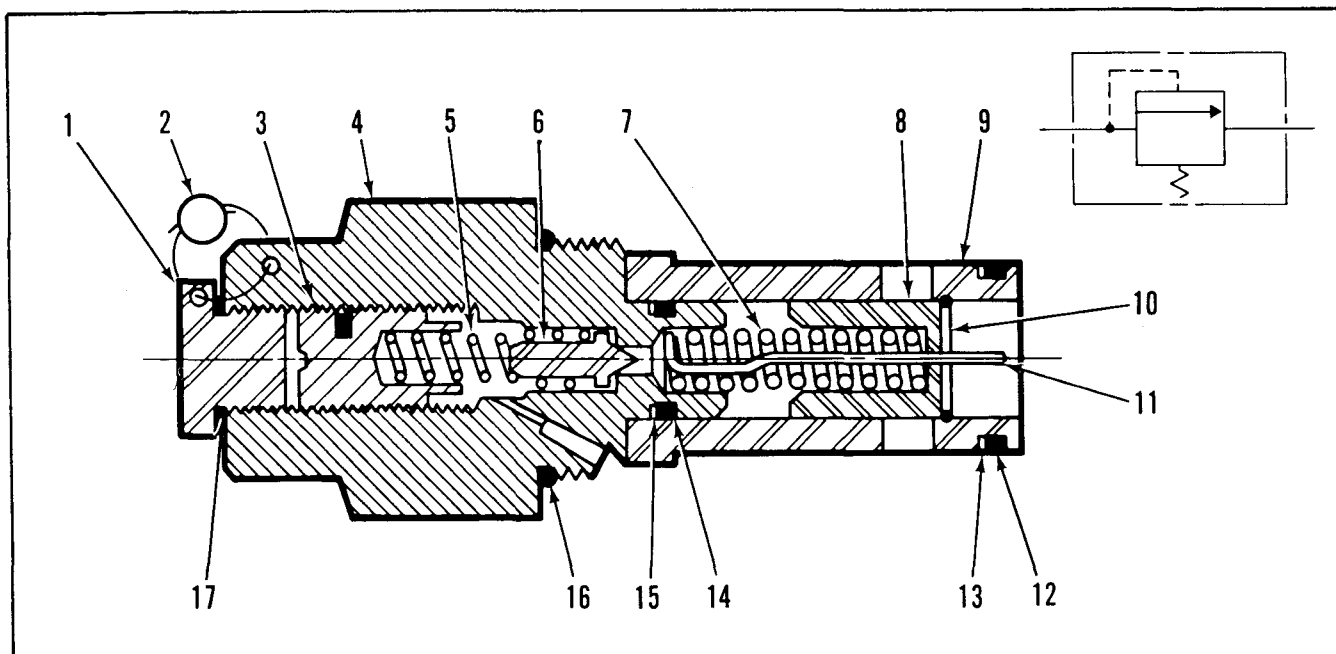


Figure 4-25. Model PK Relief Valve

MODEL PK RELIEF VALVE

Item No.	Part No.	Description	Quantity
	K-21003	SERVICE KIT, Rebuilding (Contains items 5 thru 9 and 11 thru 17)	
	K-21004	SERVICE KIT, Piston and Cylinder (Contains items 8 thru 11)	
	K-7005*	SEAL KIT (Contains items 12 thru 17)	
1	1687-001	CAP, Standard	1
	1687-002	CAP, Optional, Tamper Proof	1
2	1234-001	LOCKWIRE, Tamper Proof	1
3	1693-001	SCREW, Adjusting	1
4	1709-001	BODY, Relief, Standard	1
	1709-002	BODY, Relief, Optional, Tamper Proof	1
5	1695-001	SPRING, Pilot	1
6	2797-001	POPPET	1
7	1696-001	SPRING, Piston	1
8	1682-001	PISTON	1
9	1797-001	CYLINDER	1
10	1649-001	RING, Piston Retaining	1
11	3159-001	PIN, Piston	1
12	1698-001*	SEAL, O-Ring	1
13	1783-001	WASHER, Backup	1
14	0926-001*	SEAL, O-Ring	1
15	1785-001	WASHER, Backup	1
16	2709-001*	SEAL, O-Ring	1
17	1686-001	GASKET, Cap	1

} See Note

} Not Sold Separately. Order K-7005

NOTE: These are matched parts and are not sold separately. Order Service Kit K-21004.

Due to the close tolerances of the working parts in a pilot operated relief valve, it is important that the system be kept free of all foreign matter. A filter should be installed in any system incorporating pilot operated reliefs.

*Buna-N seals are standard for all Gresen valve assemblies. Optional Viton seals are available. See Cross Reference Tables on page 4-31.

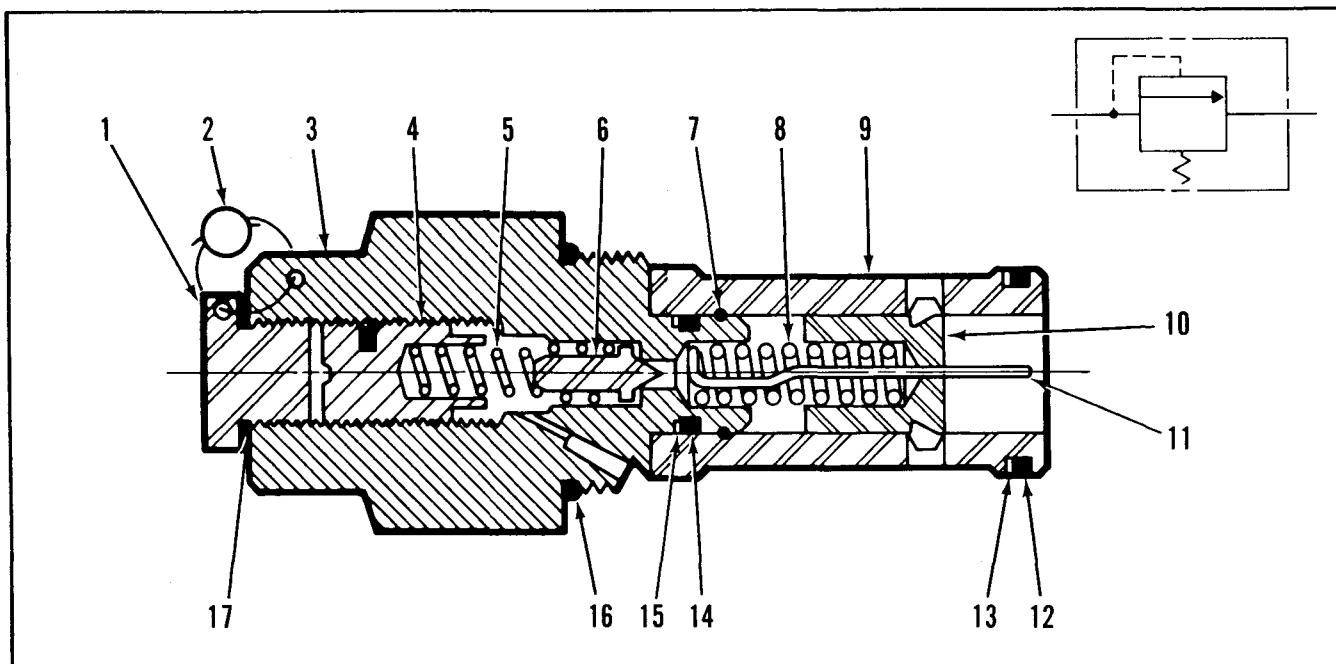


Figure 4-26. Model DPK Relief Valve

MODEL DPK RELIEF VALVE

Item No.	Part No.	Description	Quantity
	K-21006	SERVICE KIT, Rebuilding (Contains items 5, 6 and 8 thru 17)	
	K-21005	SERVICE KIT, Piston and Cylinder (Contains items 9 thru 11)	
	K-7005*	SEAL KIT (Contains items 12 thru 17)	
1	1687-001	CAP, Standard	1
	1687-002	CAP, Optional, Tamper Proof	1
2	1234-001	LOCKWIRE, Tamper Proof	1
3	1709-001	BODY, Relief, Standard	1
	1709-002	BODY, Relief, Optional, Tamper Proof	1
4	1693-001	SCREW, Adjusting	1
5	1799-001	SPRING, Pilot	1
6	2797-001	POPPET	1
7	1710-001	LOCKWIRE	1
8	1696-001	SPRING, Piston	1
9	1708-001	CYLINDER	1
10	1705-001	PISTON	1
11	3159-001	PIN, Piston	1
12	1698-001*	SEAL, O-Ring	1
13	1783-001	WASHER, Backup	1
14	0926-001*	SEAL, O-Ring	1
15	1785-001	WASHER, Backup	1
16	2709-001*	SEAL, O-Ring	1
17	1686-001	GASKET, Cap	1

See Note

Not Sold Separately. Order K-7005

Note: These are matched parts and are not sold separately. Order Service Kit K-21005.

Due to the close tolerances of the working parts in a pilot operated relief valve, it is important that the system be kept free of all foreign matter. A filter should be installed in any system incorporating pilot operated reliefs.

*Buna-N seals are standard for all Gresen valve assemblies. Optional Viton seals are available. See Cross Reference Tables on page 4-31.

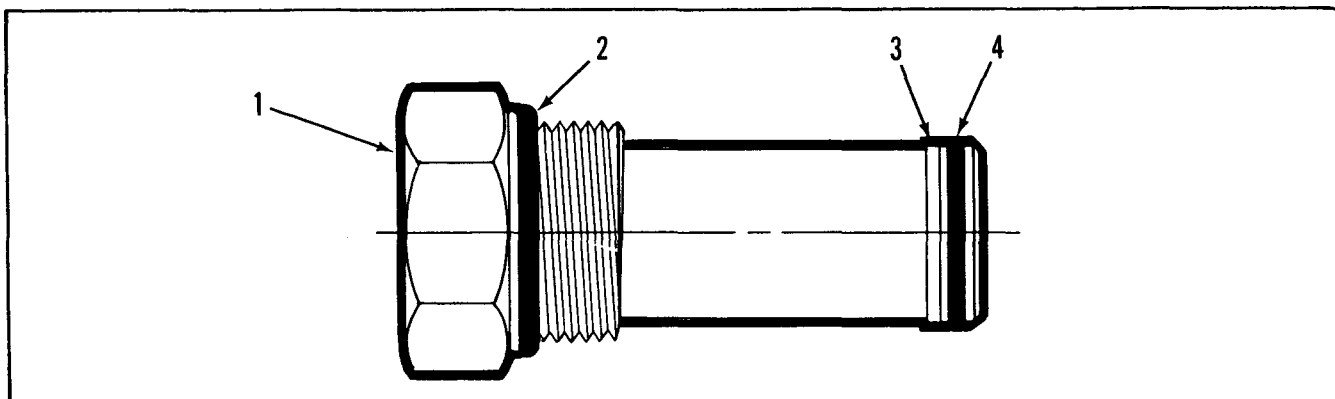


Figure 4-27. No Relief "NR" Plug (Main Relief)

NO RELIEF "NR" PLUG (MAIN RELIEF)

Item No.	Part No.	Description	Quantity
	K-7014	REPLACEMENT KIT (Contains all items listed below)	
1	2952-001	PLUG, Relief	1
2	2709-001*	SEAL, O-Ring	1
3	1783-001	WASHER, Backup	2
4	1698-001*	SEAL, O-Ring	1

*Buna-N seals are standard for all Gresen valve assemblies. Optional Viton seals are available. See Cross Reference Tables on page 4-31.

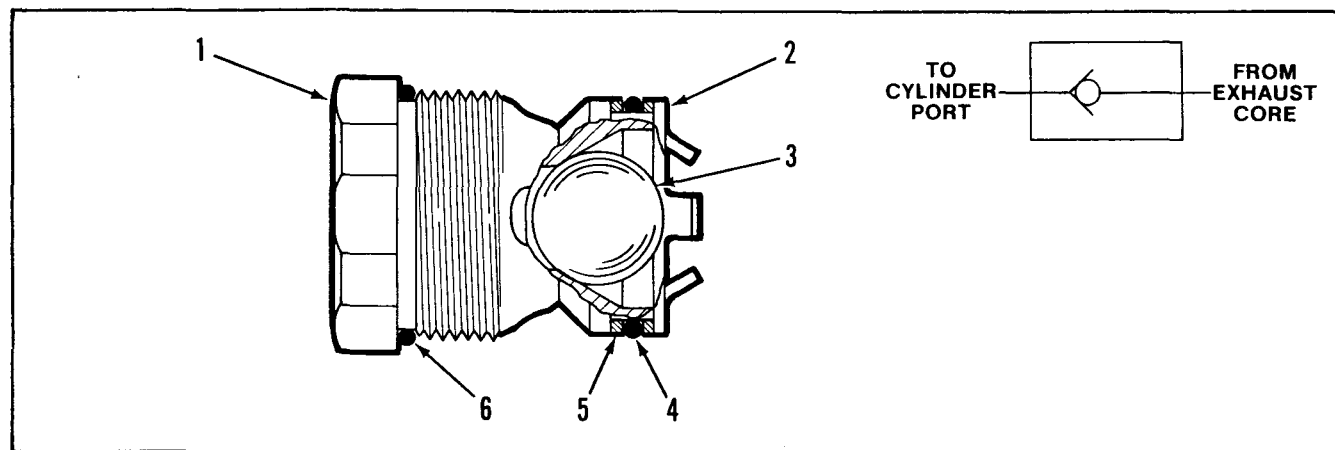


Figure 4-28. Upper Anti-Cavitation Check Valve

UPPER ANTI-CAVITATION CHECK VALVE

Item No.	Part No.	Description	Quantity
	K-28064	REPLACEMENT KIT (Contains all items listed below)	
	K-28062	SEAL KIT (Contains items 4, 5 and 6)	
1	6529-001	BODY	1
2	1661-001	RETAINER, Ball	1
3	2742-001	BALL	1
4	1718-001	SEAL, O-Ring	1
5	6530-001	WASHER, Backup	2
6	1615-001*	SEAL, O-Ring	1

} Not Sold Separately. Order K-28062

*Buna-N seals are standard for all Gresen valve assemblies. Optional Viton seals are available. See Cross Reference Tables on page 4-31.

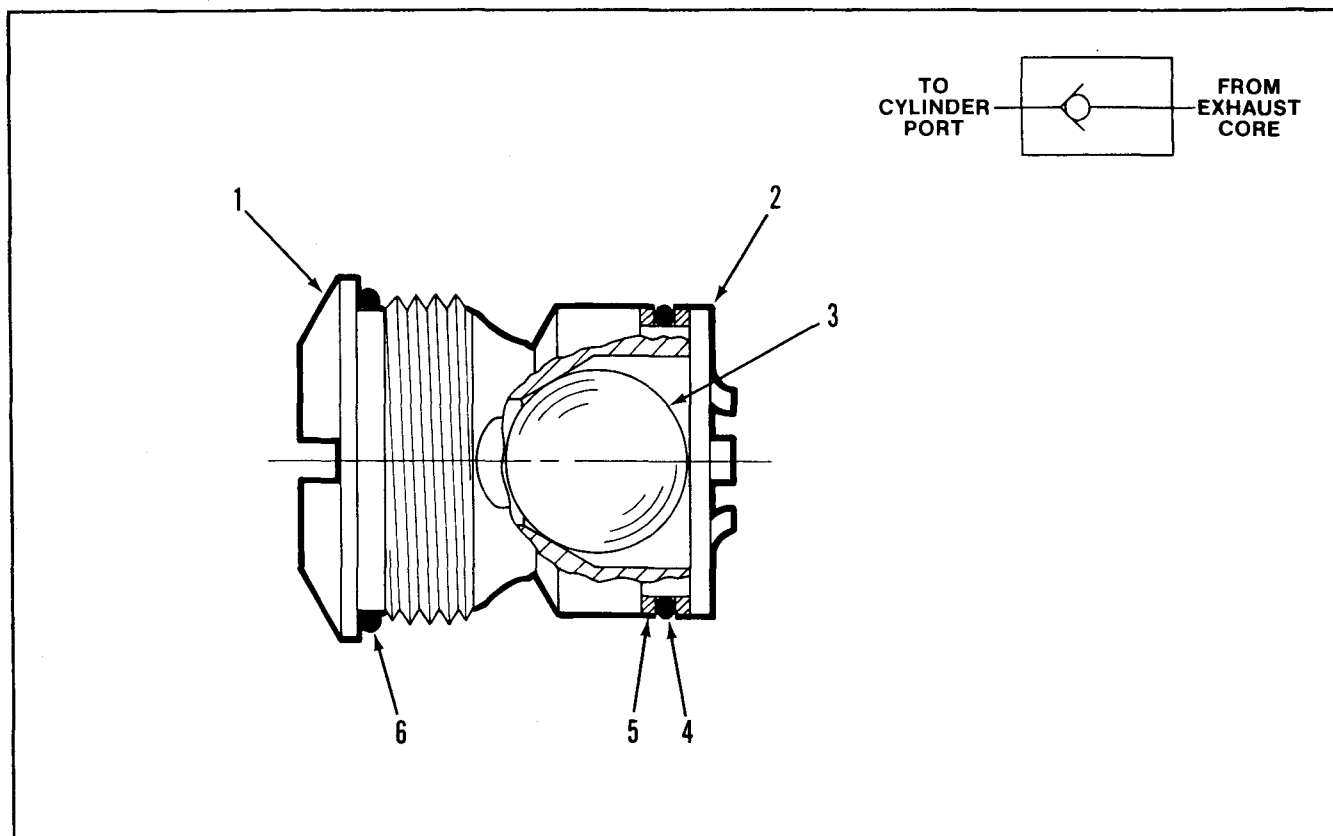


Figure 4-29. Lower Anti-Cavitation Check Valve

LOWER ANTI-CAVITATION CHECK VALVE

Item No.	Part No.	Description	Quantity
	K-28065	REPLACEMENT KIT (Contains all items listed below)	
	K-28063	SEAL KIT (Contains items 4, 5 and 6)	
1	6526-001	BODY	1
2	1659-001	RETAINER, Ball	1
3	1656-001	BALL	1
4	1660-001	SEAL, O-Ring Not	1
5	6527-001	WASHER, Backup	2
6	1698-001*	SEAL, O-Ring	1

*Buna-N seals are standard for all Gresen valve assemblies. Optional Viton seals are available. See Cross Reference Tables on page 4-31.

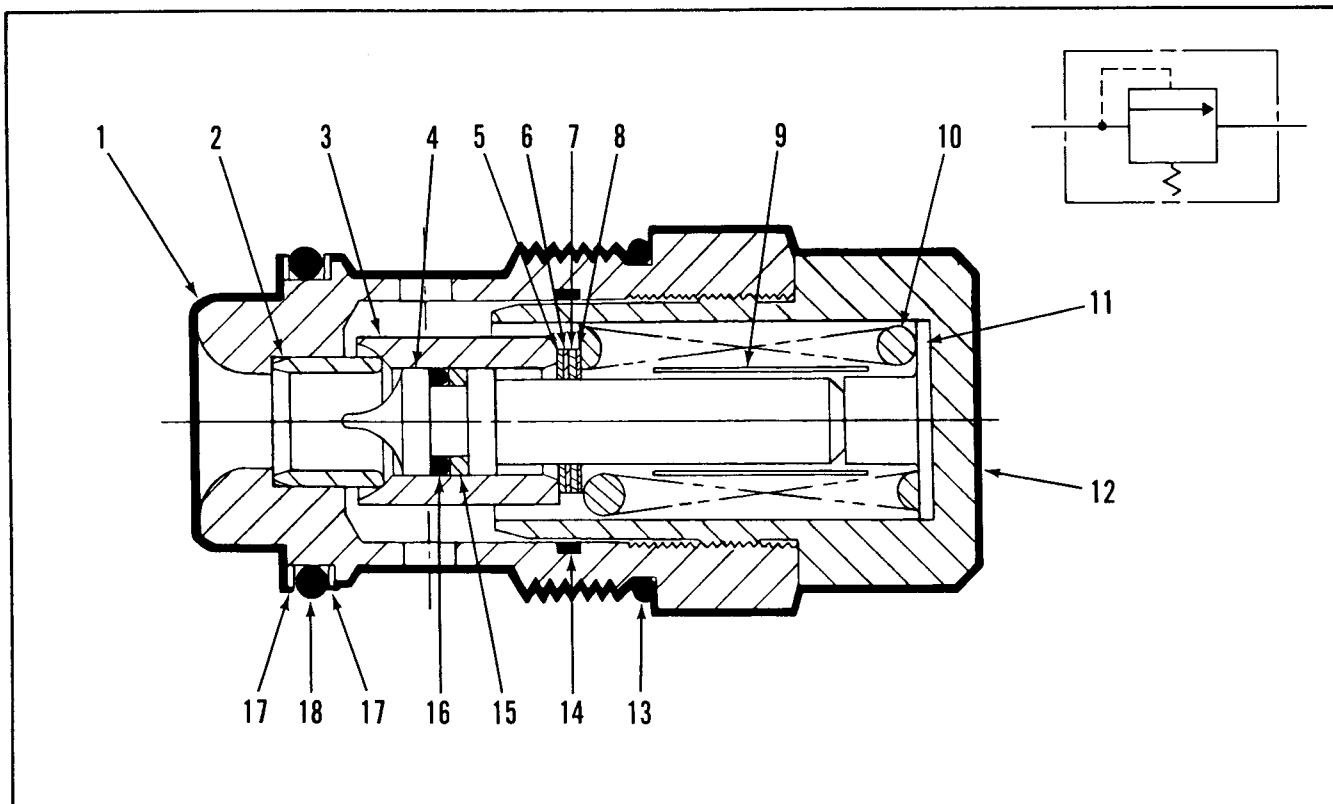


Figure 4-30. Model RD50N Relief Valve (Non-adjustable)

MODEL RD50N MAIN RELIEF VALVE (Non-Adjustable Type)

Item No.	Part No.	Description	Quantity
	K-6126	For complete Cartridge, order RD50N SEAL KIT (Contains items 13 thru 18)	
1	8114-001	BODY, Relief	1
2	8036-001	SEAT	1
3	8115-001	POPPET	1
4	8041-001	GUIDE, Poppet	1
5	0462-001	SHIM (.010)	A/R
6	0459-001	SHIM (.020)	A/R
7	0458-001	SHIM (.040)	A/R
8	8430-001	SHIM (.005)	A/R
9	7874-001	SLEEVE, Spring Dampening	1
10	8407-001	SPRING, (Standard, S.S., 500-1000 PSI Crack) [34-69 bar]	1
	1870-001	SPRING, (Standard, S.S., 1001-2500 PSI Crack) [70-173 bar]	1
	7497-001	SPRING, (Standard, S.S., 2501-4000 PSI Crack) [174-276 bar]	1
11	8436-001	SPACER, Poppet Guide	1
12	8437-001	CAP	1
13	1615-001*	SEAL, O-Ring	1
14	6814-001*	SEAL, O-Ring	1
15	7774-001	RING, Backup	1
16	8043-001	SEAL, O-Ring	1
17	6530-001	RING, Backup	2
18	1718-001	SEAL, O-Ring	1

*Buna-N seals are standard for all Gresen valve assemblies. Optional Viton seals are available. See Cross Reference Tables on page 4-31.

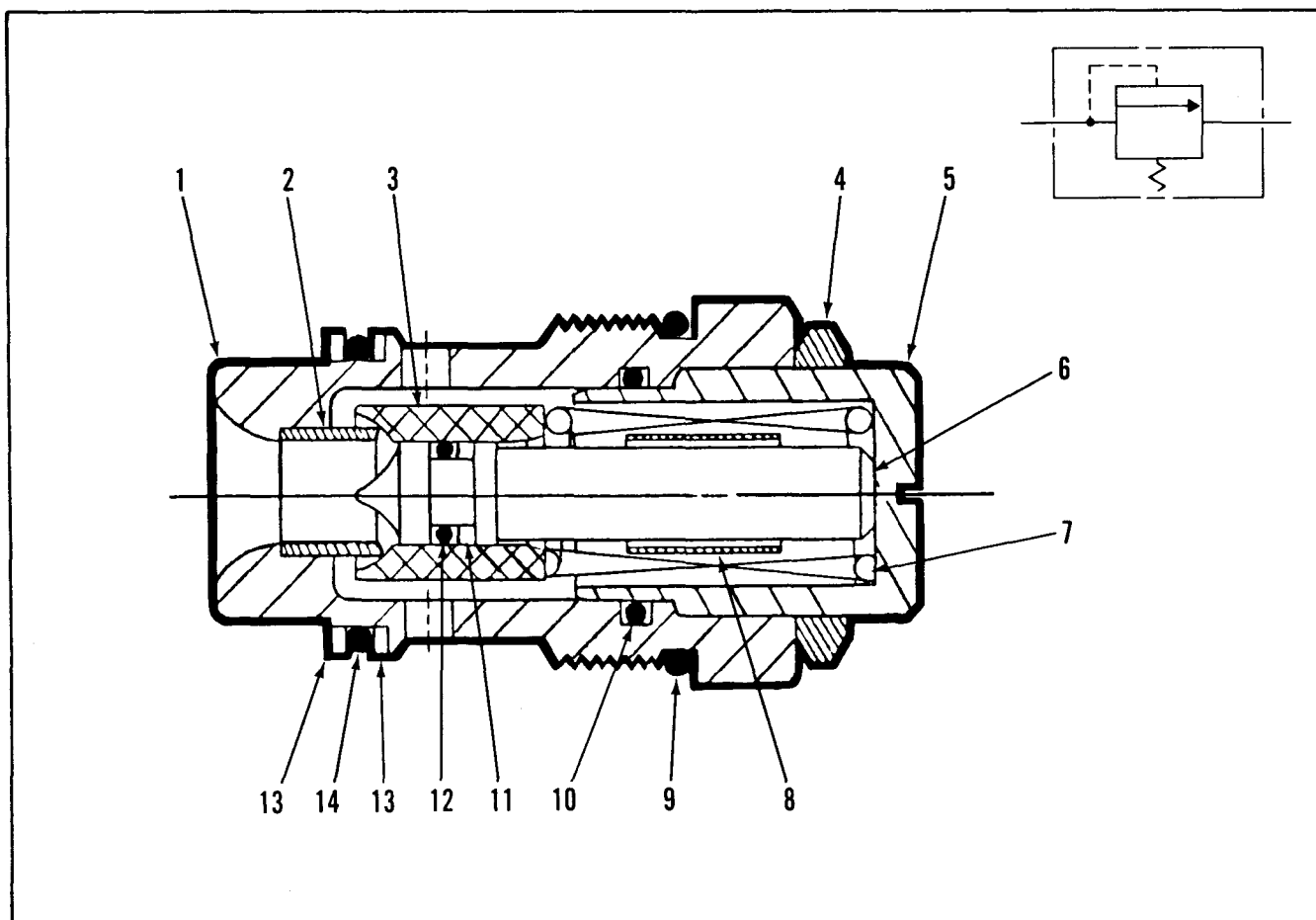


Figure 4-31. Model RD50A Relief Valve (Adjustable within the spring range.)

MODEL RD50A MAIN RELIEF VALVE (Adjustable within the spring range.)

Item No.	Part No.	Description	Quantity
	K-6126	For complete Cartridge, order RD50A SEAL KIT (Contains items 9 thru 14)	
1	8114-001	BODY, Relief	1
2	8036-001	SEAT	1
3	8115-001	POPPET	1
4	8116-001	NUT, Jam	1
5	8117-001	CAP	1
6	8041-001	GUIDE, Poppet	1
7	1869-001	SPRING, (Standard, S.S., 500-1000 PSI Crack) [34-69 bar]	1
	1870-001	SPRING, (Standard, S.S., 1001-2500 PSI Crack) [70-173 bar]	1
	7497-001	SPRING, (Standard, S.S., 2501-4000 PSI Crack) [174-276 bar]	1
8	7874-001	SLEEVE, Dampening	1
9	1615-001*	SEAL, O-Ring	1
10	6814-001*	SEAL, O-Ring	1
11	7774-001	Ring, Backup	1
12	8043-001	SEAL, O-Ring	1
13	6530-001	RING, Backup	2
14	1718-001	SEAL, O-Ring	1

Not Sold Separately. Order K-6126

*Buna-N seals are standard for all Gresen valve assemblies. Optional Viton seals are available. See Cross Reference Tables on page 4-31.

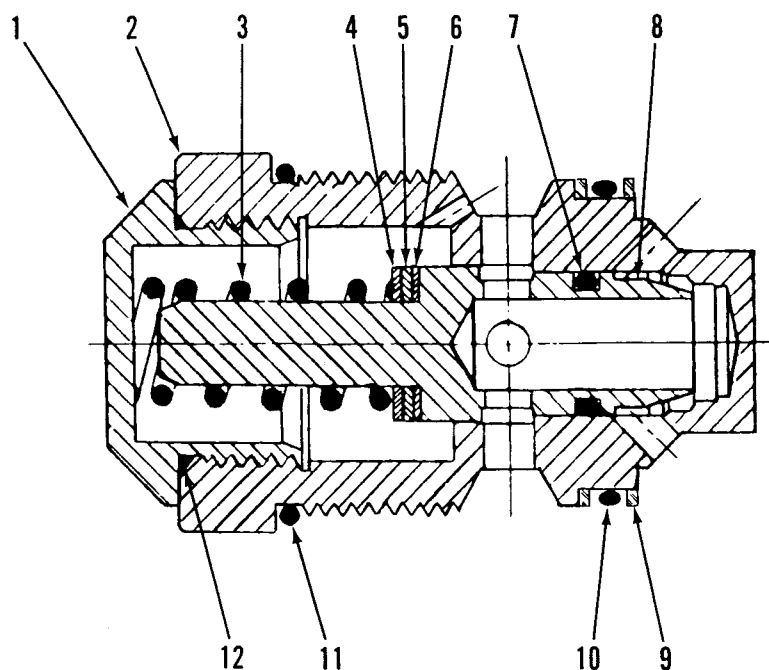


Figure 4-32. WH Relief Valve (For pressures up to 3000 PSI [207 bar] only.)

WH RELIEF VALVE

Item No.	Part No.	Description	Quantity
	K-19002	SERVICE KIT (Contains items 7 and 8)	
	K-19003	SEAL KIT (Contains items 9 thru 12)	
1	1880-001	CAP, Relief	1
2	6533-001	BODY	1
3	1450-001	SPRING, 500-1350 PSI [34-93 bar]	1
	1864-001	SPRING, 1351-1750 PSI [94-121 bar]	1
	1451-001	SPRING, 1751-2200 PSI [122-152 bar]	1
	1865-001	SPRING, 2201-3000 PSI [153-207 bar]	1
	1870-001	SPRING, S.S., 2201-2600 PSI [153-179 bar]	1
	7497-001	SPRING, S.S., 2601-3000 PSI [180-207 bar]	1
4	0458-001	SHIM, (.040 inch) [1,02mm]	A/R
5	0459-001	SHIM, (.020 inch) [0,51mm]	A/R
6	0462-001	SHIM, (.010 inch) [0,25mm]	A/R
7	1881-001	RING, Piston	1
8	1883-001	POPPET, Relief	1
9	6530-001	WASHER, Backup	2
10	1718-001	SEAL, O-Ring	1
11	1615-001*	SEAL, O-Ring	1
12	2707-001*	SEAL, O-Ring	1

*Buna-N seals are standard for all Gresen valve assemblies. Optional Viton seals are available. See Cross Reference Tables on page 4-31.

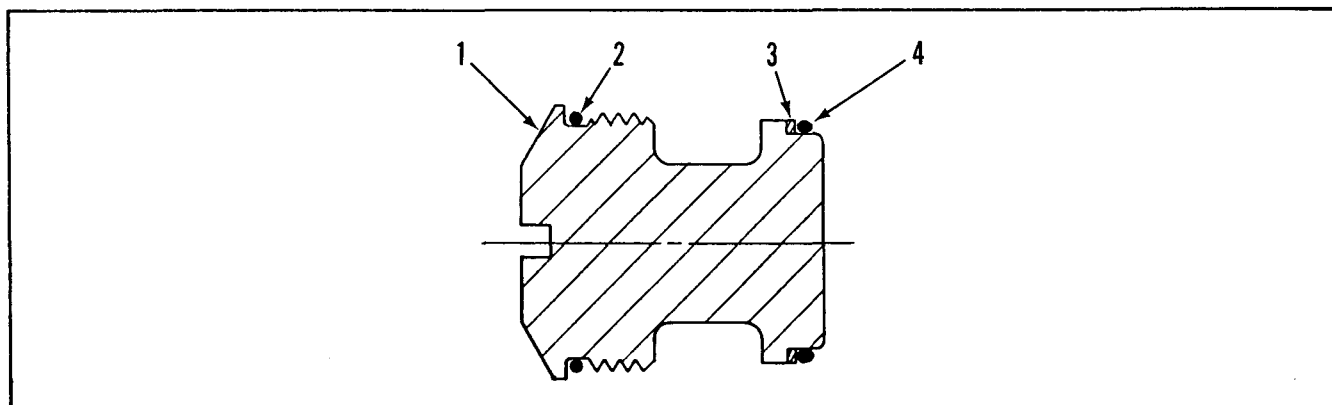


Figure 4-33. Lower Anti-Cavitation Plug

LOWER ANTI-CAVITATION PLUG

Item No.	Part No.	Description	Quantity
	K-28087	REPLACEMENT KIT (Contains all items listed below)	
	K-28063	SEAL KIT, (Contains items 2, 3 and 4)	
1	6759-001	PLUG	1
2	1698-001*	SEAL, O-Ring	1
3	6527-001	WASHER, Backup	2
4	1660-001	SEAL, O-Ring	1

*Buna-N seals are standard for all Gresen valve assemblies. Optional Viton seals are available. See Cross Reference Tables on page 4-31.

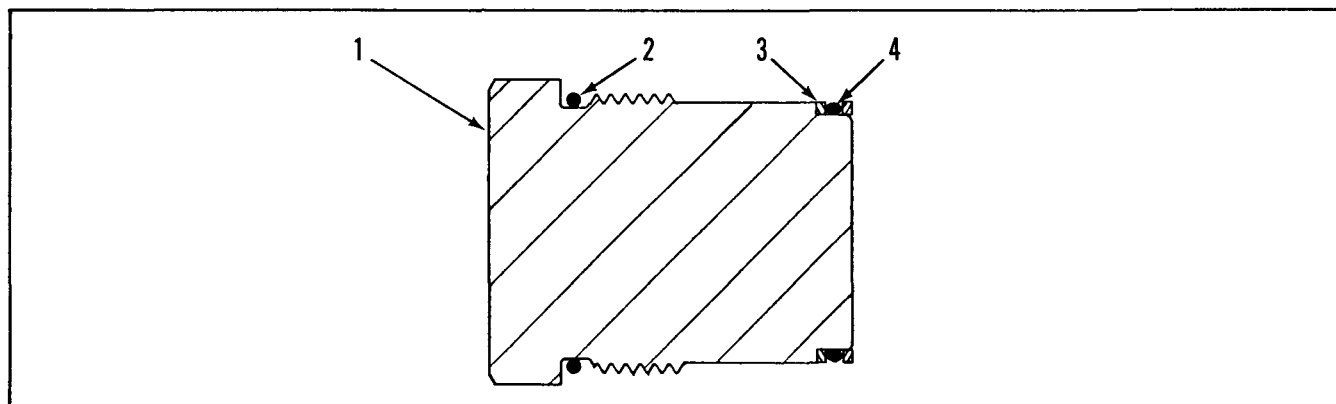


Figure 4-34. Upper Anti-Cavitation Plug

UPPER ANTI-CAVITATION PLUG

Item No.	Part No.	Description	Quantity
	K-6132	REPLACEMENT KIT (Contains all items listed below)	
	K-28062	SEAL KIT (Contains items 2, 3 and 4)	
1	6760-001	PLUG	1
2	1615-001*	SEAL, O-Ring	1
3	6530-001	WASHER, Backup	2
4	1718-001	SEAL, O-Ring	1

*Buna-N seals are standard on all Gresen valve assemblies. Optional Viton seals are available. See Cross Reference Tables on page 4-31.

Standard Buna-N Seals and O-Rings

All standard Gresen products utilize Buna-N seals which are compatible with petroleum base, water-in-oil emulsions, and water-glycol fluids. Phosphate ester type fire-resistant fluids will cause Buna-N seals to swell. This swelling is not normally detrimental to static seals, but will be a problem for dynamic seals such as valve spool seals. Swelling of these seals can result in binding. The temperature range of Buna-N seals is -40°F to +260°F [-40°C to +127°C].

Table 4-1. Cross Reference for Seals and O-Rings Buna-N to Viton

Buna-N Part No.	Viton Part No.	Application
0926-001	6273-001	Relief Seal
1615-001	7447-001	Relief and Check Seal
1621-001	6274-001	Large Section Seal
1622-001	6275-001	Small Section Seal
1660-001	None	Check Seal
1698-001	6276-001	Relief and Check Seal
1718-001	None	Relief and Check Seal
2707-001	7448-001	Relief Seal
2709-001	6277-001	Relief Plug Seal
2931-001	6278-001	Spool Seal
3532-001	6272-001	Spool Seal
6814-001	7450-001	Relief Seal
7877-001	None	Piston Seal
7951-001	None	Piston Seal

Optional Viton Seals and O-Rings

Viton seals are recommended for most applications that use phosphate-ester type fluids. Viton seals will not swell when in contact with phosphate-ester type fluids. The temperature range for Viton seals is -20°F to +400°F [-29°C to +260°C] in dynamic applications and -40°F to +400°F [-40°C to +250°C] in static applications. Viton seals are available for Gresen Model V42 Valves.

Table 4-2 Cross Reference For Seal Kits. Buna-N to Viton

Buna-N Part No.	Viton Part No.	Application
K-7005	K-7019	PK and DPK Relief Valve Seals
K-7014	K-28033	No Relief "NR" Plug Kit
K-7018	K-7020	Check Plug Kit
K-28029	K-28032	Spool and Section Seals

Table 4-3. Cylinder Port Plugs and Seals for 3-Way Work Sections

Part No.	Description
1282-001	Cylinder Port Plug (3/4" NPTF)
1288-001	Cylinder Port Plug (1" NPTF)
1726-001	Cylinder Port Plug (SAE 12)
1629-001	Cylinder Port Plug (SAE 16)
2708-001	O-Ring for SAE 12 Plug
2710-001	O-Ring for SAE 16 Plug

GRESEN



GRESEN MANUFACTURING COMPANY • DIVISION OF DANA CORPORATION
P.O. BOX 1313, MINNEAPOLIS, MN 55440 TELEPHONE: (612) 623-1960 TELEX 290492

BARKO HYDRAULICS

HYDRAULIC FITTING AND HOSE DESCRIPTION SYSTEM

HYDRAULIC FITTING DESCRIPTION SYSTEM

THE HYDRAULIC FITTING DESCRIPTION SYSTEM WILL CONSIST OF TWO PARTS SEPARATED BY A DASH. EACH PART WILL COMPLETELY DESCRIBE ONE END OF THE FITTING. THE DESCRIPTION CODE WILL BE SHOWN IN THE DESCRIPTION COLUMN OF ALL DRAWINGS AND BILLS OF MATERIAL. EACH FITTING WILL ALSO HAVE AN (8) DIGIT PART NUMBER WHICH WILL APPEAR IN THE PART NUMBER COLUMN OF ALL DRAWINGS AND BILLS OF MATERIAL.

THE DESCRIPTION CODE FOR EACH PART WILL CONTAIN:

1. THREAD SIZE
2. END TYPE (MALE OR FEMALE)
3. THREAD TYPE (PIPE, JIC, ETC.)

SPECIALITY ADAPTOR, SUCH AS TEES OR ELBOWS, ARE IDENTIFIED BY THE ADDITION OF A CODE AFTER THE BASIC CATALOG NUMBER.

PART 1 THREAD SIZE

<u>DASH NUMBER</u>	<u>NPTF-NPSM</u>	<u>JIC FLARELESS</u>
02	1/8-27	-
03	-	3/8-24
04	1/4-18	7/16-20
05	-	1/2-20
06	3/8-18	9/16-18
08	1/2-14	3/4-16
10	-	7/8-14
12	3/4-14	1-1/16-12
14	-	1-3/16-12
16	1-11-1/2	1-5/16-12
20	1-1/4-11-1/2	1-5/8-12
24	1-1/2-11-1/2	1-7/8-12
32	2-11-1/2	2-1/2-12

O RING BOSS DASH NUMBERS ARE THE SAME AS JIC.

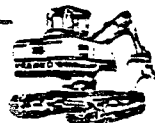
O RING FLANGE DASH NUMBERS ARE DETERMINED BY NOMINAL FLANGE SIZE.

JIC AND FLARELESS DASH NUMBERS INDICATE TUBE O.D.

JIC COUPLINGS AND STRAIGHT THREAD O RING BOSS FITTINGS ARE SAE STANDARD SCREW THREADS.



**BARKO
HYDRAULICS**



SUPERSEDES ISSUE OF

ENGINEERING STANDARDSSECTION K 4.6
2/18/80THREAD DESCRIPTIONS

- NPTF DRY SEAL AMERICAN STANDARD TAPER PIPE THREAD. WHEN THE THREAD IS WRENCH TIGHTENED THE CRESTS ARE CRUSHED, CREATING A SEAL.
- NPSM THIS THREAD IS USED ON THE FEMALE SWIVEL NUT OF PIPE SWIVEL ADAPTORS. THE LEAKPROOF JOINT IS NOT MADE BY THE SEALING FIT OF THE THREADS, BUT BY A TAPERED SEAT IN THE COUPLING END.
- JIC THIS NOMENCLATURE STANDS FOR "JOINT INDUSTRY CONFERENCE", AND SPECIFIES A 37° ANGLE OR SEAT TO BE USED WITH HIGH PRESSURE HYDRAULIC TUBING. COUPLINGS OR ADAPTORS SPECIFIED AS JIC HAVE 37° TAPERED SEATS.

FLARELESS

ARE THREE(3) PIECE DESIGN - BODY, NUT, FERRULE. WEDGING ACTION OF FERRULE, WHEN DRAWN DOWN BY NUT FORMS SEAL BETWEEN BODY AND FERRULE WHILE CUTTING EDGE OF FERRULE BITES INTO THE WALL FORMING ANOTHER SEAL.

PART 2 END TYPEPART 3 THREAD TYPE

<u>TYPE OF END</u>	<u>CODE</u>	<u>TYPE OF THREAD</u>	<u>CODE</u>
MALE	M	PIPE THREAD (NPTF-NPSM)	P
FEMALE	F	JIC-37° FLARE	J
SWIVEL	X	STR. THRD. O RING BOSS	B
FLARELESS	A	4-BOLT O RING FLANGE	FL
LONG	L	FLARELESS (BODY ONLY)	U
		SAE 45° FLARE	S

EXAMPLES

12MP-12FPX

3/4" SWIVEL
MALE PIPE
PIPE FEMALE
3/4"

1st 2nd
END END

12MP-12FPX-90

3/4" 90°
MALE SWIVEL
PIPE PIPE
FEMALE
3/4"

1st 2nd
END END

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HYDRAULICS

SUPERSEDES ISSUE OF

SHEET 3 OF 3

ENGINEERING STANDARDS

SECTION K 4.6
2/18/80

08MP - 16MJ

1/2" 1" MALE
MALE 37° FLARE
PIPE

10MB - 10MJ-45

5/8" 5/8" MALE 37°
MALE FLARE 45°
STR. ELBOW
THD
O-RING

ORDER OF CODING OF ENDS

ORDER OF CODING IS AS FOLLOWS:

<u>CODE</u>	<u>DESCRIPTION</u>
FL	O RING FLANGE
MB	SAE STRAIGHT THREAD O RING
MP	MALE PIPE
FP	FEMALE PIPE
FJX	FEMALE JIC SWIVEL
MJ	MALE JIC
FPX	FEMALE PIPE SWIVEL

NOTE:

THE ORDER OF CODING MUST BE FOLLOWED. EDP EQUIPMENT MAY BE USED TO SORT BY DESCRIPTION.

BILL OF MATERIAL EXAMPLE:

THIS IS A TYPICAL BILL OF MATERIAL AS PRINTED FROM THE IBM TERMINAL. THE FIRST ITEM ON THE BILL ILLUSTRATES HOW A FITTING WILL BE CALLED OUT.

IRFL	STAT	ASSY COMPONENT PART NUMBER	DESCRIPTION	IPN CPP ISR PMO U/M	QTY PER
		566-00990	ADAPTOR 12MP-12MJ	3	2.00
		652-00400	ASSY-HYD TUBING	3	2.00

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**BARKO
HYDRAULICS**



SUPERSEDES ISSUE OF

ENGINEERING STANDARDSSECTION K 4.7
2/18/80HYDRAULIC HOSE DESCRIPTION SYSTEM

THIS HYDRAULIC HOSE DESCRIPTION SYSTEM IS DESIGNED TO BE AS SHORT AND DESCRIPTIVE AS POSSIBLE. THE DESCRIPTIVE CODE WILL BE SHOWN UNDER THE DESCRIPTION COLUMN ON ALL DRAWINGS AND BILLS OF MATERIAL. EACH HOSE WILL ALSO HAVE AN 8 DIGIT PART NUMBER WHICH WILL APPEAR IN THE PART NUMBER COLUMN OF ALL DRAWINGS AND BILLS OF MATERIAL.

THE DESCRIPTIVE CODE HAS SIX BASIC PARTS:

- | | |
|-------------------------|---------------------------------|
| 1. HOSE SIZE | 4. COUPLING TYPE |
| 2. HOSE TYPE | 5. COUPLING THREAD TYPE |
| 3. COUPLING THREAD SIZE | 6. OVERALL HOSE ASSEMBLY LENGTH |

THE SIX BASIC PARTS ARE COMBINED INTO A DESCRIPTIVE CATALOG NUMBER WHICH WITHOUT ADDITIONAL DATA, CAN BE DECODED.

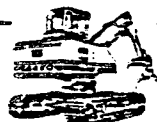
PART 1 HOSE SIZE

THE DASH NUMBER SHOWS HOSE ID IN 16th's OF AN INCH.

<u>DASH NUMBER</u>	<u>HOSE ID</u>	<u>DASH NUMBER</u>	<u>HOSE ID</u>
03	3/16	12	3/4
04	1/4	14	7/8
05	5/16	16	1
06	3/8	20	1-1/4
08	1/2	24	1-1/2
10	5/8	32	2

PART 2 HOSE TYPE

<u>HOSE TYPE</u>	<u>SAE SPEC</u>	<u>WORK PRESS</u>
2WR2	100R2 TYPE A OR AT-----	2000 PSI THRU 1" DIA.
4WR9	100R9 TYPE A OR AT-----	2500 PSI THRU 1-1/4" DIA.
4WR10	100R10 TYPE A OR AT-----	4000 PSI THRU 1" DIA.
6WR11	100R11-----	5000 PSI THRU 1" DIA.
4WXT3	NONE-----	2500 PSI THRU 2" DIA.
6WXT5	NONE-----	5000 PSI THRU 1-1/2" DIA.

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SUPERSEDES ISSUE OF

HOSE CODE:

THE FIRST TWO DIGITS (4WR11) SIGNIFY THE NUMBER OF LAYERS OF STEEL REINFORCING WIRE FOR EXAMPLE, 4W DESIGNATES 4 WIRE

THE REMAINING PORTION OF THE CODE (4WR10) DESIGNATES THE SAE SPECIFICATION WITHIN SAE 100, FOR EXAMPLE, R10 DESIGNATES HOSE CONFORMING TO SAE 100R10

IF THE 2nd PORTION OF THE DESCRIPTION BEGINS WITH AN X (4WX-----) THERE IS NOT AN SAE SPEC APPLICABLE TO THAT PARTICULAR HOSE. THE SPECIFICATIONS FOR THIS TYPE OF HOSE WILL BE DEFINED WITHIN THIS SECTION. EXAMPLE: 4WXT3 THE XT3 DESIGNATES THAT THE HOSE IS NOT COVERED BY AN SAE SPEC. AND THEREFORE WILL BE DEFINED IN THIS SECTION.

BARKO XT3 HOSE SPEC

CONSTRUCTION:

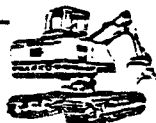
DISPERSED FABRIC REINFORCED, SYNTHETIC RUBBER INNER TUBE, FOUR PLIES OF SPIRALLY WRAPPED WIRE REINFORCEMENT, WEATHER ABRASION RESISTANT SYNTHETIC RUBBER COVER.

APPLICATION:

VERY HIGH PRESSURE HYDRAULIC SERVICE WITH PETROLEUM OR WATER BASE FLUIDS.

TEMPERATURE RANGE: - 40° TO + 250° F.

<u>HOSE ID</u>	<u>OVER WIRE OUTER DIA</u>	<u>MIN. BEND RAD.</u>	<u>MAX. CONT. WORK PRESS.</u>	<u>MIN BURST PRESS.</u>
.375 IN.	.654 IN.	5.0 IN.	4000 PSI	16,000 PSI
.5 IN.	.795 IN.	7.0 IN.	4000 PSI	16,000 PSI
.750 IN.	1.090 IN.	9.5 IN.	3000 PSI	12,000 PSI
1.000 IN.	1.375 IN.	12.0 IN.	4000 PSI	16,000 PSI
1.250 IN.	1.730 IN.	16.5 IN.	3000 PSI	12,000 PSI
1.500 IN.	1.985 IN.	20.0 IN.	2500 PSI	10,000 PSI
2.000 IN.	2.506 IN.	25.0 IN.	2500 PSI	10,000 PSI



SHEET 3 OF 6

ENGINEERING STANDARDS

SECTION K 4.7
2/18/80

THE XT3 SPEC HOSE WILL BE PURCHASED FROM COUPLERS AS COMPLETE ASSEMBLIES (WITH BOTH ENDS ATTACHED). THIS HOSE IS AVAILABLE FROM (NOT LIMITED TO) THE FOLLOWING SOURCES.

<u>SOURCE</u>	<u>IDENTIFICATION</u>
AEROQUIP-----	FC250A
ANCHOR-----	MCS250
CATERPILLAR-----	XT3
GATES-----	GS4
PARKER HANNIFIN-----	771C
STRATO-FLEX-----	SF3270

BARKO XT5 HOSE SPEC:

CONSTRUCTION:

DISPERSED FABRIC POLYMER INNER TUBE, FOUR TO SIX WIRE HIGH TENSILE STEEL WIRE SPIRAL WOUND REINFORCING (4 WIRE .750 & 1.00 SIZE; 6 WIRE 1.250 & 1.500), TOUGH POLYMER OUTER COVER - OIL, WEATHER AND ABRASION RESISTANT. COMPLETE HOSE TESTED FOR A MILLION CYCLES AT 120% WORKING PRESSURE.

APPLICATION:

EXTREME HIGH PRESSURE HYDRAULIC SERVICE.

TEMPERATURE RANGE: - 40° TO + 250° F.

<u>HOSE ID</u>	<u>OVER WIRE OUTER DIA.</u>	<u>MIN BEND RAD.</u>	<u>MAX. CONT. WORK PRESS.</u>	<u>MIN. BURST PRESSURE</u>
.750 IN.	1.143 IN.	9.5 IN.	5000 PSI	20,000 PSI
1.000 IN.	1.404 IN.	12.0 IN.	5000 PSI	20,000 PSI
1.250 IN.	1.842 IN.	16.5 IN.	5000 PSI	20,000 PSI
1.500 IN.	2.136 IN.	20.0 IN.	5000 PSI	20,000 PSI



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SECTION K 4.7
2/18/80

ENGINEERING STANDARDS

THE XT5 SPEC HOSE WILL BE PURCHASED FROM COUPLERS AS COMPLETE ASSEMBLIES (WITH BOTH ENDS ATTACHED). THIS HOSE IS AVAILABLE FROM (NOT LIMITED TO) THE FOLLOWING SOURCES.

<u>SOURCE</u>	<u>IDENTIFICATION</u>
AEROQUIP-----	FC273
CATERPILLAR-----	XT5
STRATO-FLEX-----	SF4240

PART 3 HOSE END THREAD SIZE

THE THREAD SIZE DASH NUMBER IS USED AS THE FITTING SIZE NUMBER. IT IS ASSUMED THAT THE HOSE END OF THE FITTING IS THE SAME SIZE AND DASH NUMBER AS THE HOSE

PART 4 THREAD SIZE

<u>DASH NUMBER</u>	<u>NPTF-NPSM</u>	<u>JIC</u>
02	1/8-27	-
03	-	3/8-24
04	1/4-18	7/16-20
05	-	1/2-20
06	3/8-18	9/16-18
08	1/2-14	3/4-16
10	-	7/8-14
12	3/4-14	1-1/16-12
14	-	1-3/16-12
16	1-11-1/2	1-5/16-12
20	1-1/4-11-1/2	1-5/8-12
24	1-1/2-11-1/2	1-7/8-12
32	2-11-1/2	2-1/2-12

O-RING BOSS DASH NUMBERS ARE THE SAME AS JIC.

O-RING FLANGE DASH NUMBERS ARE DETERMINED BY NOMINAL FLANGE SIZE.



**BARKO
HYDRAULICS**



SUPERSEDES ISSUE OF

NPTF & NPSM THREADS ARE STANDARD PIPE SIZE. FOR EXAMPLE:
1/4-18 IS 1/4 INCH STANDARD PIPE, 18 THREADS PER INCH.

JIC THREADS ARE STRAIGHT THREADS USED FOR 37° FLARE FITTINGS
AND STRAIGHT THREAD O RING FITTINGS. FOR EXAMPLE: 3/8-24
3/8 IS NOMINAL OD & 24 IS THE NUMBER OF THREADS PER INCH.

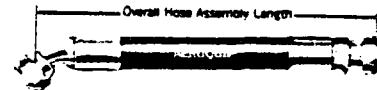
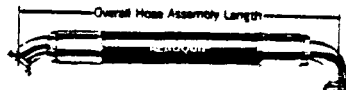
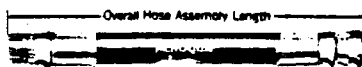
PART 5 HOSE END TYPE AND THREAD TYPE

THE HOSE END CATALOG NUMBER CONSISTS OF TWO PARTS, THE BASIC END
CODE AND THE THREAD CODE.

BASIC END	CODE	THREAD	CODE
MALE	M	PIPE THREAD (NPTF-NPSM)	P
FEMALE	F	JIC 37° FLARE	J
SWIVEL	X	O RING BOSS	B
FLARELESS FITTING -		O RING FLANGE	FL
NUT AND FERRULE	A	FLARELESS FITTING -	
LONG	L	BODY ONLY	U
SAE 45° FLARE	S		

PART 6 HOSE LENGTH

THE OVERALL HOSE ASSEMBLY LENGTH IS ALWAYS STATED IN INCHES.
THE LENGTH IS THE TOTAL LENGTH OVER THE FITTINGS.



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SUPERSEDES ISSUE OF

ENGINEERING STANDARDS

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SECTION K 4.7
2/18/80

ORDER OF END CODING

A 90° OR 45° END WILL BE THE FIRST TO BE CODED FOLLOWED BY FL, FJX, MJ, MP IN THIS ORDER.

NOTE:

THE ORDER OF CODING MUST BE FOLLOWED. EDP EQUIPMENT IS USED TO GENERATE A MASTER PART NUMBER LIST, AND THE SORT IS MADE BY DESCRIPTION. IF ALL ENDS ARE NOT IN PROPER SEQUENCE, MORE THAN ONE PART NUMBER COULD BE ASSIGNED TO A HOSE.

HOSE CODING EXAMPLES

<u>HOSE SIZE</u>	<u>HOSE TYPE</u>	<u>FIRST END SIZE CODE</u>	<u>2nd END SIZE CODE</u>	<u>OVERALL LENGTH IN INCHES</u>
08	2WR2	08FJX90L	10MJ	65
1/2" HOSE	2 WIRE SAE 100R2 HOSE	1/2" HOSE TO 1/2" 90° LONG DROP FEMALE 37° JIC SWIVEL	1/2" HOSE TO 5/8" MALE 37° JIC	65 INCHES LG.
16	4WR9	20FL90	16MP	35
1" HOSE	4 WIRE SAE 100R9 HOSE	1" HOSE TO 1 1/2 90° 4 BOLT O RING FLANGE	1" HOSE 1" MALE PIPE	35 INCHES LG.

BILL OF MATERIAL EXAMPLE:

THIS IS A TYPICAL BILL OF MATERIAL AS PRINTED FROM THE IBM TERMINAL. THE SECOND ITEM ON THE BILL ILLUSTRATES HOW A HYDRAULIC HOSE WILL BE CALLED OUT.

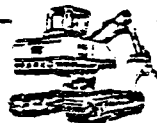
10G5 ASSY STAT	COMPONENT PART NUMBER	DESCRIPTION	IPN TSR	CPP PMD	U/M	QTY PER
	152-00007	ASSY-CAST GRPL HANGER 2X1-1/2	AY3	M	EA	1.00
10G6 10G7 ***	662-01309	08-2WR2-10MJ-08MP-72	3		EA	4.00

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SUPERSEDES ISSUE OF

HYDRAULIC HINTS

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TROUBLE-SHOOTING GUIDE

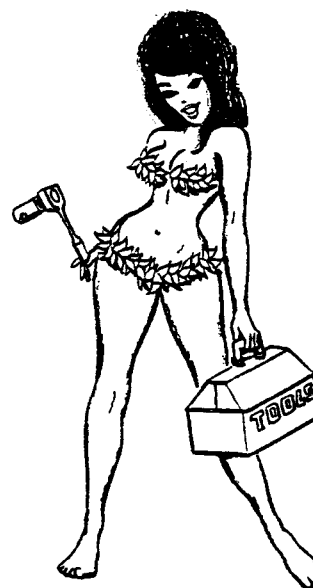
GENERAL. The trouble shooting charts and maintenance hints that follow are of a general system nature but should provide an intuitive feeling for a specific system. The more general information is covered in the immediately following paragraphs. Effect and probable cause charts start on Page 3.

SYSTEM DESIGN. There is, of course, little point in discussing the design of a system which has been operating satisfactorily for a period of time. However, a seemingly uncomplicated procedure such as relocating a system or changing a component part can cause problems. Because of this, the following points should be considered:

A. Each component in the system must be compatible with and form an integral part of the system. For example, an inadequate size filter on the inlet of a pump can cause cavitation and subsequent damage to the pump.

B. All lines must be of proper size and free of restrictive bends. Undersize or restricted line results in a pressure drop in the line itself.

C. Some components must be mounted in a specific position with respect to other components or the lines. The housing of an in-line pump, for example, must remain filled with fluid to provide lubrication.



D. The inclusion of adequate test points for pressure readings, although not essential for operation, will expedite trouble-shooting.

KNOWING THE SYSTEM. Probably the greatest aid to trouble-shooting is the confidence of knowing the system. Every component has a purpose in the system. The construction and operating characteristics of each one should be understood. Some additional practices which will increase your ability and also the useful life of the system follow:

A. Know the capabilities of the system. Each component in the system has a maximum rated speed, torque, or pressure. Loading the system beyond the specification simply increases the possibility of failure.