



Operators Manual

# DR4 REVERSING VALVES

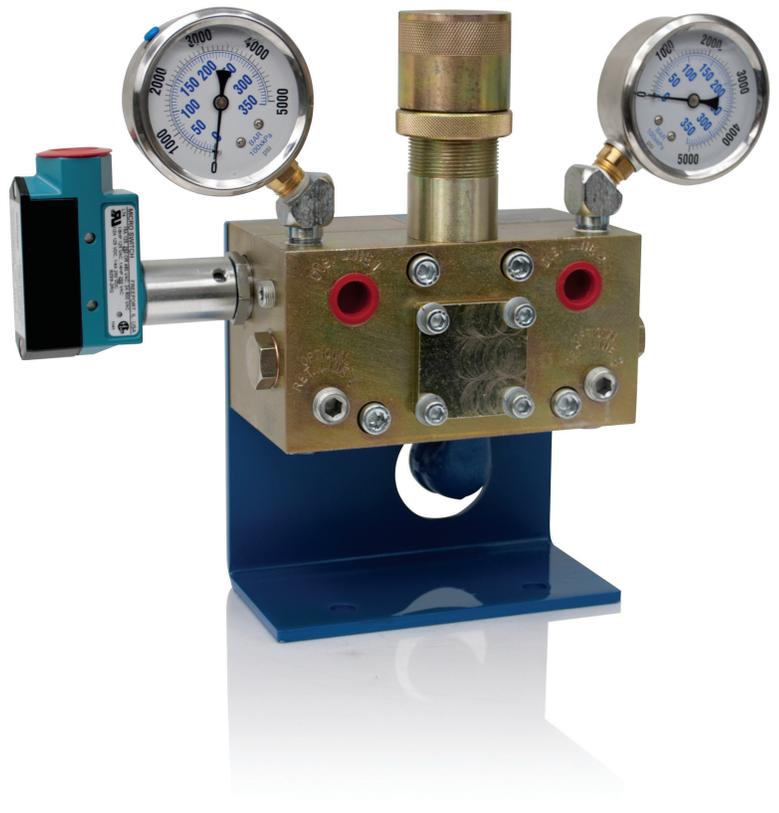
DR45K, DR459, DR460A & DR460B

DL1200 r#5



Features

- The DR4 reversing valves are activated by system pressure and are adjustable between 500 and 3500 psi.
- The DR4 reversing valves are control non-return and return systems using CS2000, DC36 and DC42 central stations.
- These reversing valves can also be used with air barrel pumps for spray and medium and large dualline systems.



DR459 Reversing Valve

Technical Data

<b>Lubricant</b>	SAE 10 oil to NLGI grade 2 grease	
<b>Materials</b>	Housing	Zinc with yellow chromate
	Piston	Low carbon steel
<b>Pressure Range</b>	500-3500 psi (34-240 bar)	
<b>Seals</b>	Buna 'N' Rubber	

**Illustrations and specifications are not binding in detail.  
 Designs are subject to modification and improvement without notice.**

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**INTRODUCTION**

The reversing valve alternates the flow of lubricant thru the lines of Dual Line systems so that lubricant is directed first to one supply line then the other, during system cycles. The reversing action is automatic, controlled hydraulically by the action of a pressure sensing mechanism within the valve.

Model DR4-5 reversing valves supersedes the DR10, DR2, DR4-1, DR4-2, DR4-3, and DR4-4 reversing valves.

DR4-5 valves are available for both return and non-return systems with adjustable pressure range as indicated below.

PRESSURE RANGE	SYSTEM
500-3500 psi	Non-Return
500-3500 psi	Return (Loop)

**REVERSING VALVES WITH SUB-ASSEMBLIES**

DR4 valves are assembled with various sub-assemblies (components) to fit the particular application; such as, loop or non-return system. Listed below are part numbers and description of the reversing valve with sub-assemblies.

PART NUMBERS	DESCRIPTIONS
DR459	Reversing Valve (DR45) and Bracket Mounting assembly, for Non-Return Systems (See Figure 5).
DR460A	Reversing Valve and Bracket Mounting Assembly (DR459), with Line Strainer (LS03120), for Grease-Non-Return System (See Figure 6).
DR460B	Reversing Valve and Bracket Mounting Assembly (DR459), with Line Strainer (LS03106), for Oil-Non-Return System (See Figure 6).

**PREVIOUS PART NUMBER CROSS:**

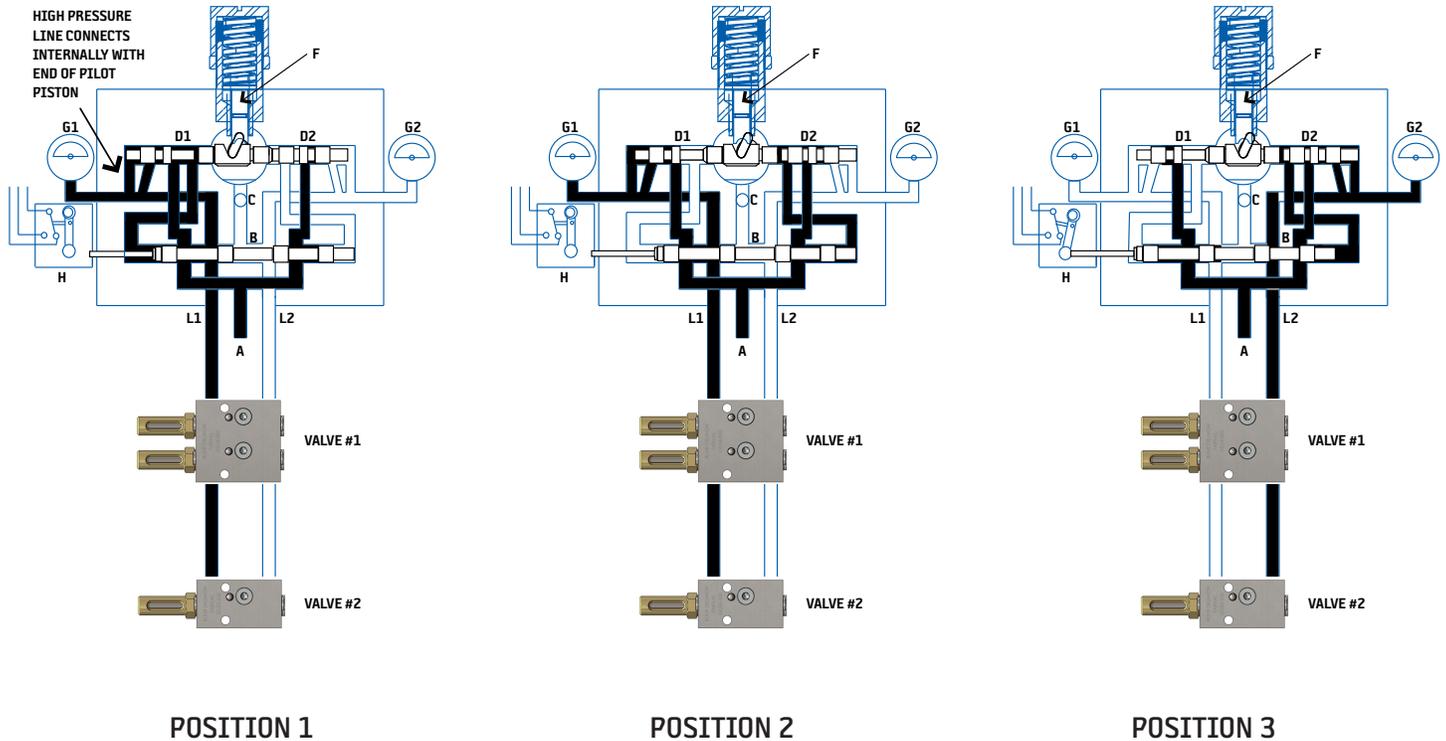
1. DR459 replaces DR437
2. DR460A replaces DR440A
3. DR460B replaces DR440B

**DR4-5 Pressure Adjustment:**

1. Factory set @ 1500 psi
2. Always make adjustment while system is under pressure
3. Clockwise = Higher pressure  
Counter Clockwise = Lower pressure
4. Unscrewing too far will cause internal damage

DR4'S IN A NON-RETURN SYSTEM

The following schematic, with pistons and ports shown in one plane for clarity, shows one half of a complete DR4 reversing valve operating cycle for a non-return system. The other half cycle is identical except pressure is applied to line L2 with line L1 relieved. At the end of the second cycle, piston D and B will have returned to position 1. Black indicated line under pressure.



**POS. 1:** Timer (not shown) starts pump. Lube from pump enters Port A. Reversing piston B at point P1 directs flow from Port A to supply line L1. Line pressure at point P2 holds piston B in position.

Line L2 is relieved to the reservoir thru Port C.

Rising pressure causes all measuring valves to discharge to bearing.

**POS. 2:** Pressure in the line L1 continues to rise, acting on pilot piston D1, until it can overcome the spring force applied at point F. (This is adjustable between 500-3,500 psi). The Pilot piston moves to the position show.

Lube flow is re-directed to the right end of piston B by piston D2.

Pressure created by movement of pilot piston D2 at its right end is relieved thru Port C.

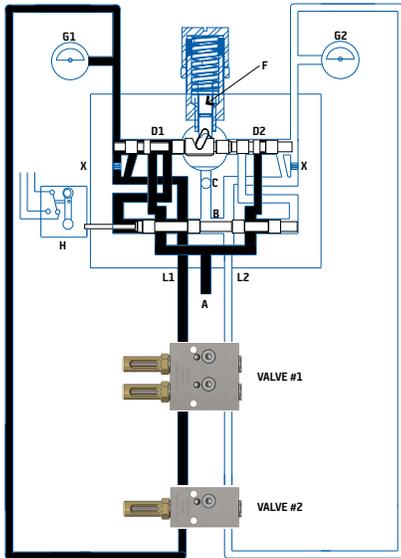
**POS. 3:** Rising pressure moves piston B to new position (extreme left) tripping switch H stopping pump and relieving line L1. When timer starts next half cycle, line L2 will be pressurized and line L1 relieved.

KEY:

- LUBRICANT UNDER PRESSURE FROM PUMP
- RELIEF AND RETURN TO RESERVOIR

DR4'S IN A LOOP SYSTEM

By installing two pipe plugs (U119AC, see "X" Pos. 1 below), and removing two pipe plugs (U119BC) in the return ports **R1** and **R2**, the DR4's can be converted to loop operation. The two line then make a complete loop to operate the pilot piston. Valve operation is otherwise the same as the above description for non-return system.

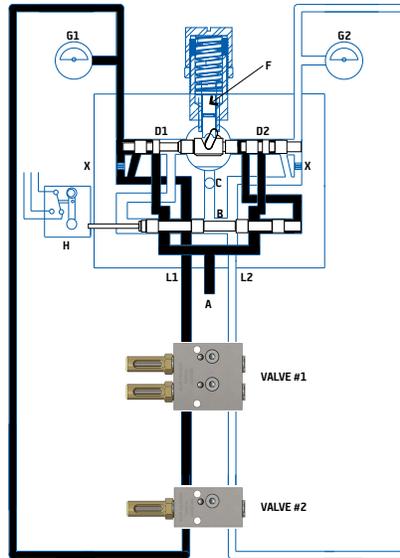


POSITION 1

**POS. 1:** Timer (not shown) starts pump. Lube from pump enters Port **A**. Reversing piston **B** at point **P1** directs flow from Port **A** to supply line **L1**. Line pressure at point **P2** holds piston **B** in position.

Line **L2** is relieved to the reservoir thru Port **C**.

Rising pressure causes all measuring valves to discharge to bearing.

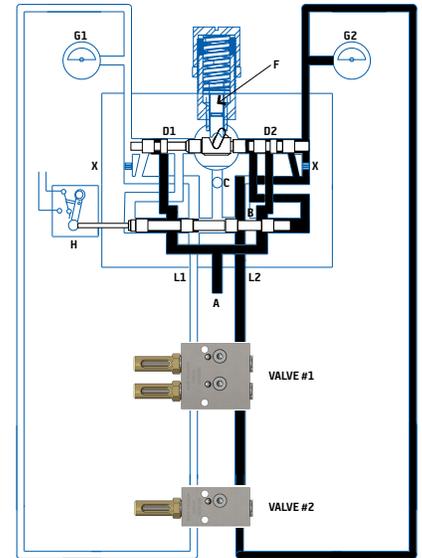


POSITION 2

**POS. 2:** Pressure in the line **L1** continues to rise, acting on pilot piston **D1**, until it can overcome the spring force applied at point **F**. (This is adjustable between 500-3,500 psi). The Pilot piston moves to the position show.

Lube flow is re-directed to the right end of piston **B** by piston **D2**.

Pressure created by movement of pilot piston **D2** at its right end is relieved thru Port **C**.

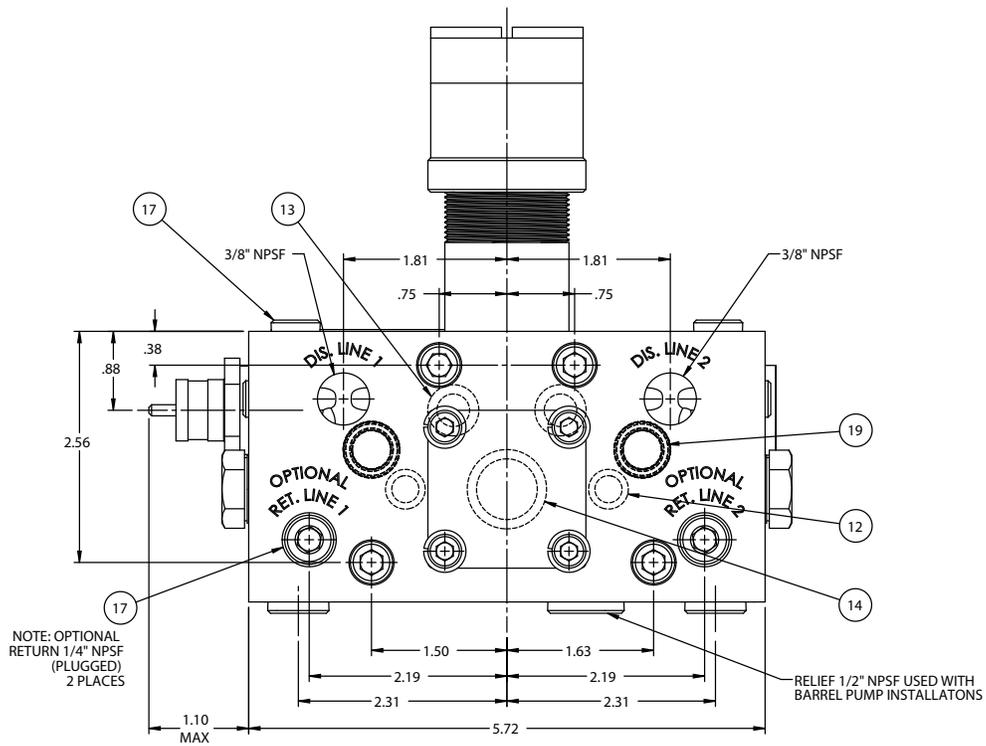
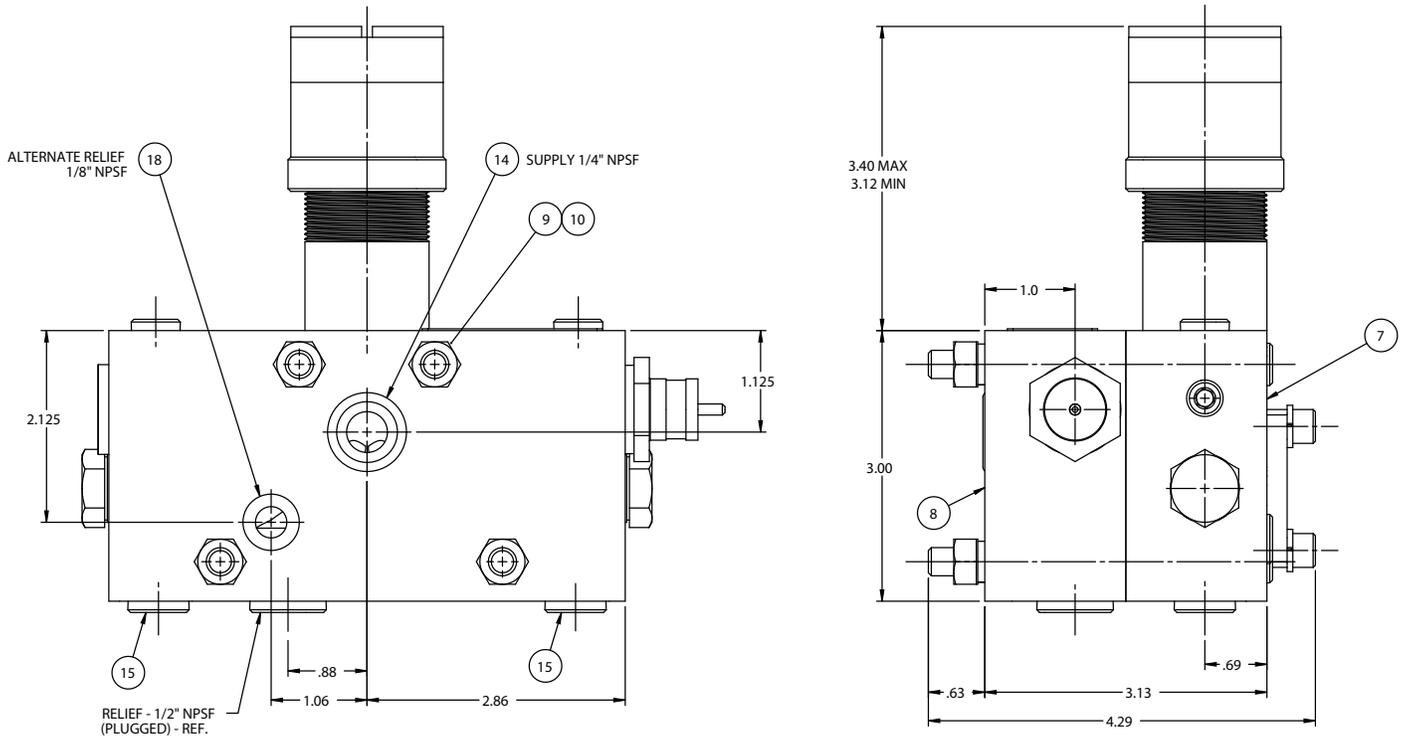


POSITION 3

**POS. 3:** Rising pressure moves piston **B** to new position (extreme left) tripping switch **H** stopping pump and relieving line **L1**. When timer starts next half cycle, line **L2** will be pressurized and line **L1** relieved.

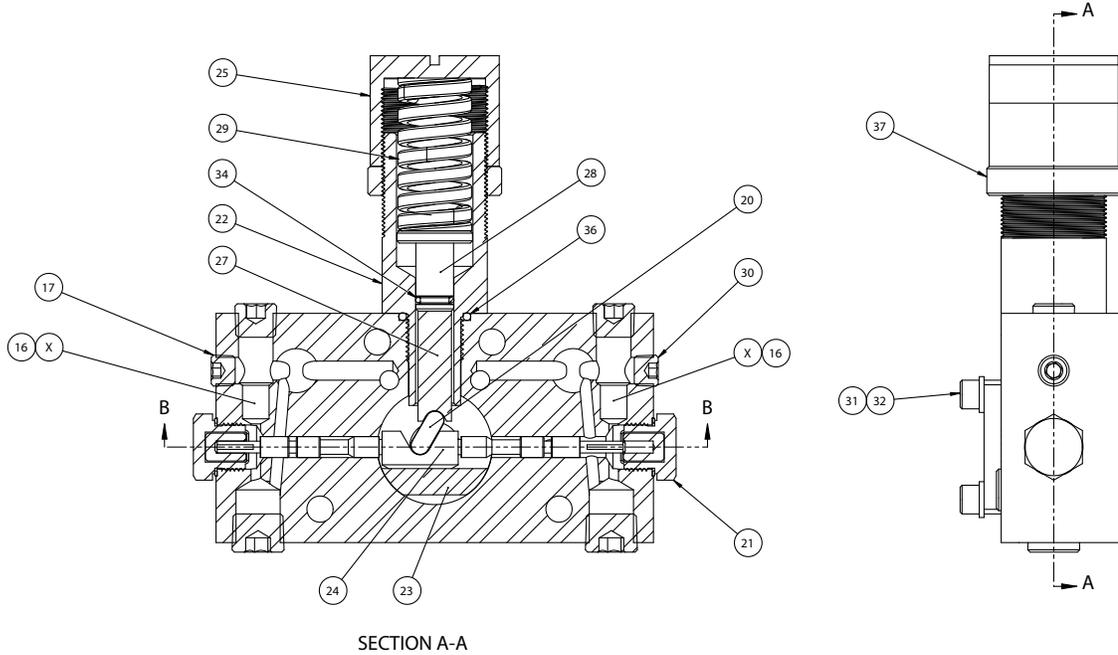
KEY:

- LUBRICANT UNDER PRESSURE FROM PUMP
- RELIEF AND RETURN TO RESERVOIR



DR45 Details

PRESSURE CONTROL - OVER - CENTER MECHANISM



**DR4-5 Pressure Adjustment:**

1. Factory set @ 1500 psi
2. Always make adjustment while system is under pressure
3. Clockwise = Higher pressure  
Counter Clockwise = Lower pressure
4. Unscrewing too far will cause internal damage

Figure 2 - Pressure Adjusting Sub-Assembly

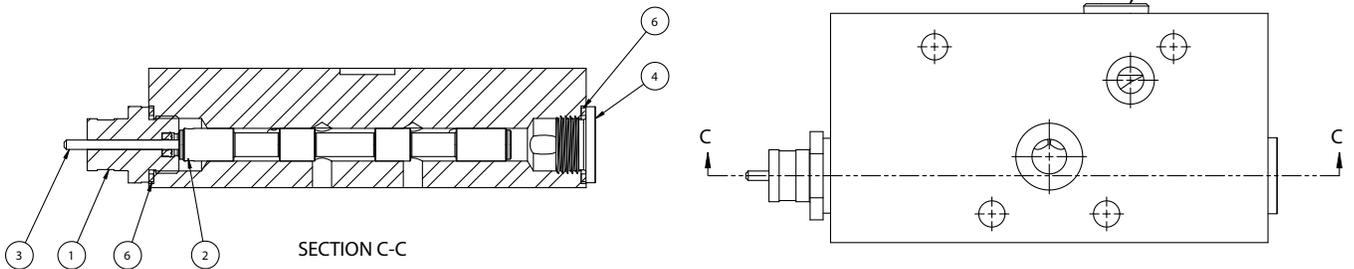


Figure 3 - Flow Control Sub-Assembly

NOTES:

1. Installing U119AC 1/8" NPT pipe plugs at "X" will convert the DR45 from a Non-Return type to a Loop type.
2. System Pressure can be adjusted with cap.
3. Factory Setting: 1500 psi

DR45 Parts

ITEM NUMBER	QUANTITY	PART NUMBER	DESCRIPTION
1	1	200903	Packing Gland Assembly
2	1	U1220A4	Pin
3	1	FT25187	Stem Indicator
4	1	U1522H	Plug Main Bore
5	1	U119DC	Plug Pipe Hex Soc. 1/2"
6	2	U1305AN*	Washer - Copper, 3/4"
7	1	DR410035	Pressure Adjustment Assembly
8	1	DR410045	Flow Control Valve Assembly
9	4	U213FS	Washer - Lock 5/16"
10	4	U219B	Nut - Hex 5/16"-18
11	4	U225B15	Screw - Soc. HD.Cap 5/16"-18 x 3 1/2"
12	2	U1720011*	Seal "O" Ring
13	2	U1720110*	Seal "O" Ring
14	2	U1720115*	Seal "O" Ring
15	2	U119CC	Plug Pipe Hex Soc. 3/8"
16	2	U119AC	Plug Pipe Hex Soc. 1/8"
17	4	U119BC	Plug Pipe Hex Soc. 1/4"
18	1	U1720111*	Seal "O" Ring
19	2	U1722J*	Seal Quad Ring
20	1	DR410101*	Link - Throw
21	2	LB10484	Plug & Sleeve Assembly
22	1	RET10567B	Retainer
23	1	PLA10568B	Plate - Slipper
24	1	BLO10570B*	Block - Slider
25	1	CAP10571A	Cap - Pressure Adjusting Spring
26	1	PLA10573B	Plate - Cover
27	1	RET10574B	Retainer - Pivot Guide
28	1	PLU10575B	Plug - Pivot Guide Contact
29	1	SPR10652B*	Spring
30	2	U119AC	Plug Pipe Hex Soc. 1/8"
31	4	U212A1	Screw Soc. HD. Cap - 1/4"-28 x 1/2"
32	4	U213E	Washer - Lock 1/4"
33	2	U1305AC*	Washer - Copper - 5/8" O.D.
34	1	U1720012*	Seal "O" Ring
35	1	U1720029*	Seal "O" Ring
36	1	U1720116*	Seal "O" Ring
37	1	NUT11027A	Nut - Lock

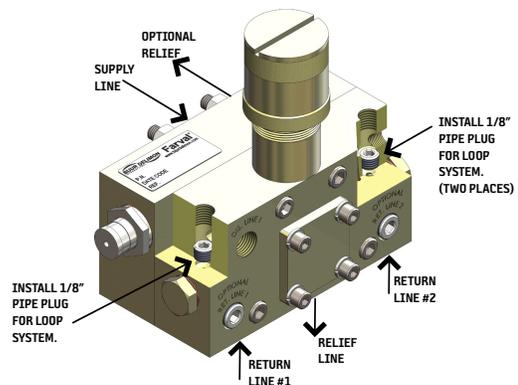
\*Included in DR45 Repair Kit - Part Number KIT12861A

Valve bodies and Pistons are selectively fitted and must be replaced in sets

**CONVERSION OF DR45 REVERSING VALVE TO LOOP SYSTEM**

Valves are shipped for non-return systems, without the 1/8" pipe plugs installed (see illustration). All that is required is to make the discharge connections on the front face of the valve.

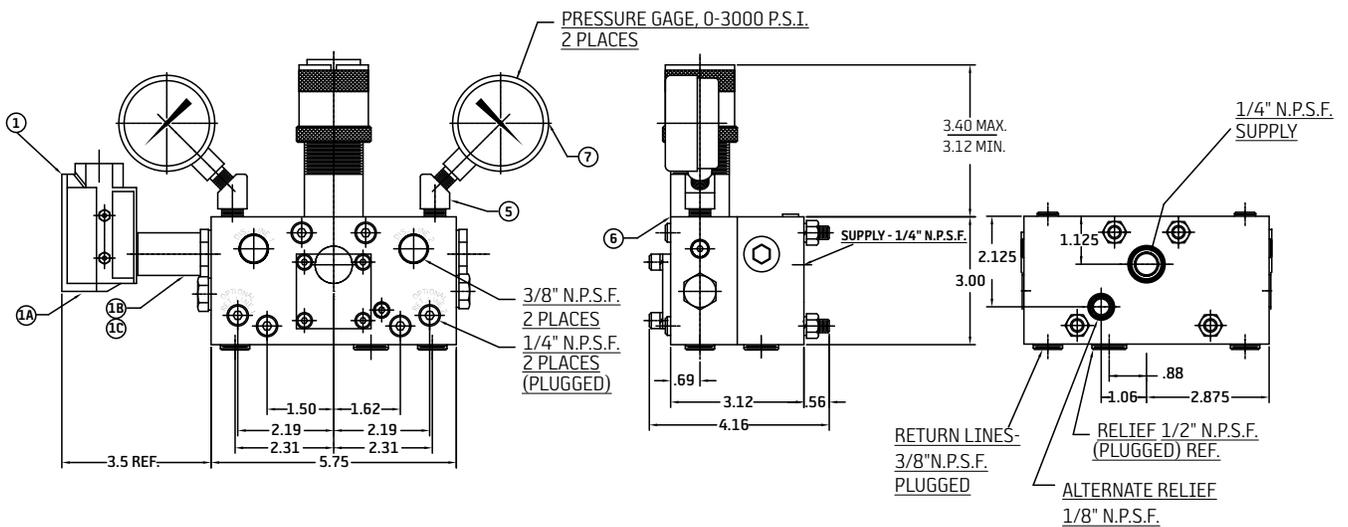
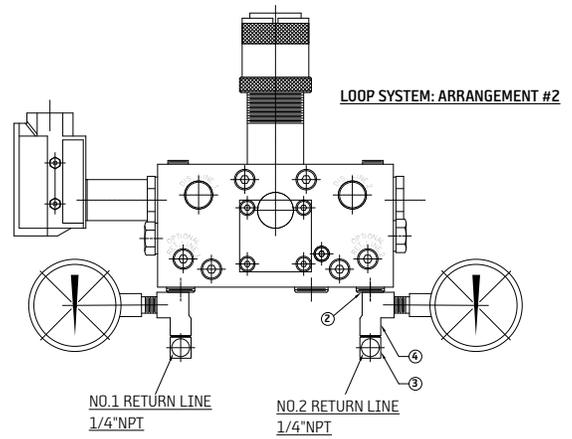
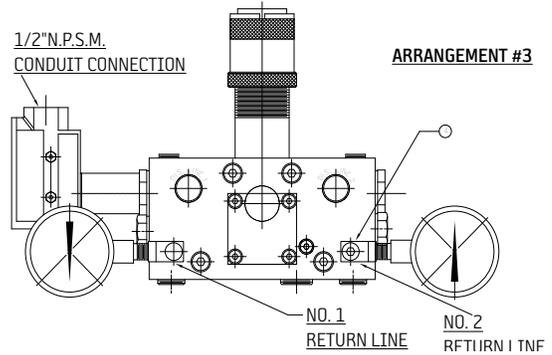
For loop systems, install the 1/8" pipe plugs as shown and make the return connections to either the return ports on the front face, or the two return ports located on the bottom of the valve.



Module Kit DR45K

REVERSING VALVE MODULE  
(MODULE KIT DR45K)

No. Required Arrangements			Item #	Description	Part Number
#3	#2	#1			
1	1	1	1	Switch and Bracket Assembly	FT15801C8
			1a	Switch	U10623
			1b	Switch Bracket	FT15528
2			2	Bushing - Face - 3/8" x 1/4" P.	U148C2
2			3	Elbow - Street - 1/4" P. Brass	U152B
2	2		4	Tee - Street - 1/4" P.	U156B
		2	5	Elbow - Street - 1/4" P. 45 Deg.	U1103B
1	1	1	6	Reversing Valve Assembly	DR4-5
2	2	2	7	Gauge-Pressure 0-5,000 P.S.I.	U902F



NON-RETURN SYSTEM  
ARRANGEMENT #1  
Standard from factory.

DR45 Parts

NO. Req'd	Item #	Description	Part #
1	1	BRACKET- MOUNTING	BRA11019B
1	2	REVERSING VALVE ASSY	DR45K
1	3	NIPPLE 1/2P X 1-1/8"LG	U101D2
1	4	ELBOW 1/2P	U103D
1	5	PIPE PLUG HEX SOC 1/8	U119AC
2	6	PRESSURE GAUGE	U902F
1	7	SWITCH 7 BRACKET ASSY	FT15801C8
1	7A	SWITCH	U10623
1	7B	BRACKET	37041
1	7C	SCREW	37037

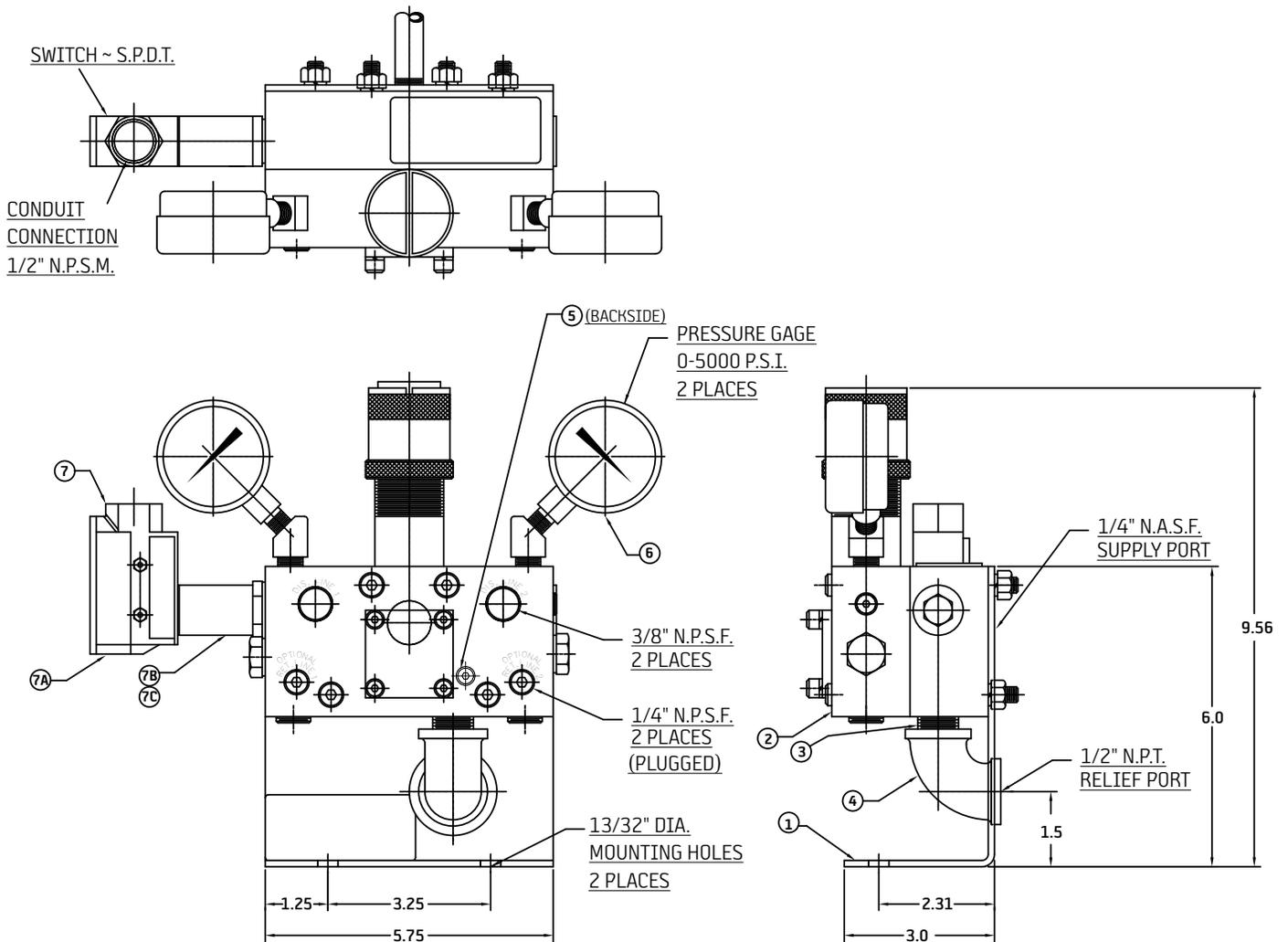


Figure 5 - DR459 Reversing Valve and Bracket Mounting Assembly for Non-Return Systems

Arrangement		Item #	Description	Part #
NO. 2 Req'd	NO. 1 Req'd			
	X	-	REV VLV & BRKT ASSY W/LS	DR460A
X		-	REV VLV & BRKT ASSY W/LS	DR460B
1	1	1	REV VALVE & BRKT ASSY	DR459
X	1	2	LINESTRAINER 3/8	LS03120
1	1	3	NIPPLE 1/4PX 3"LG	U101B8
1	1	4	NIPPLE 3/8P X 1-1/2"LG	U101C2
1	1	5	ELBOW-REDUCER 3/8X1/4	U113CB
1	X	6	LINSTRAINER	LS03106
2	2	7	PRESSURE GAUGE	U902F
1	1	8	SWITCH & BRACKET ASSY	FT15801C8
1	1	8A	SWITCH	U10623
1	1	8B	BRACKET	37041
1	1	8C	SCREW	37037

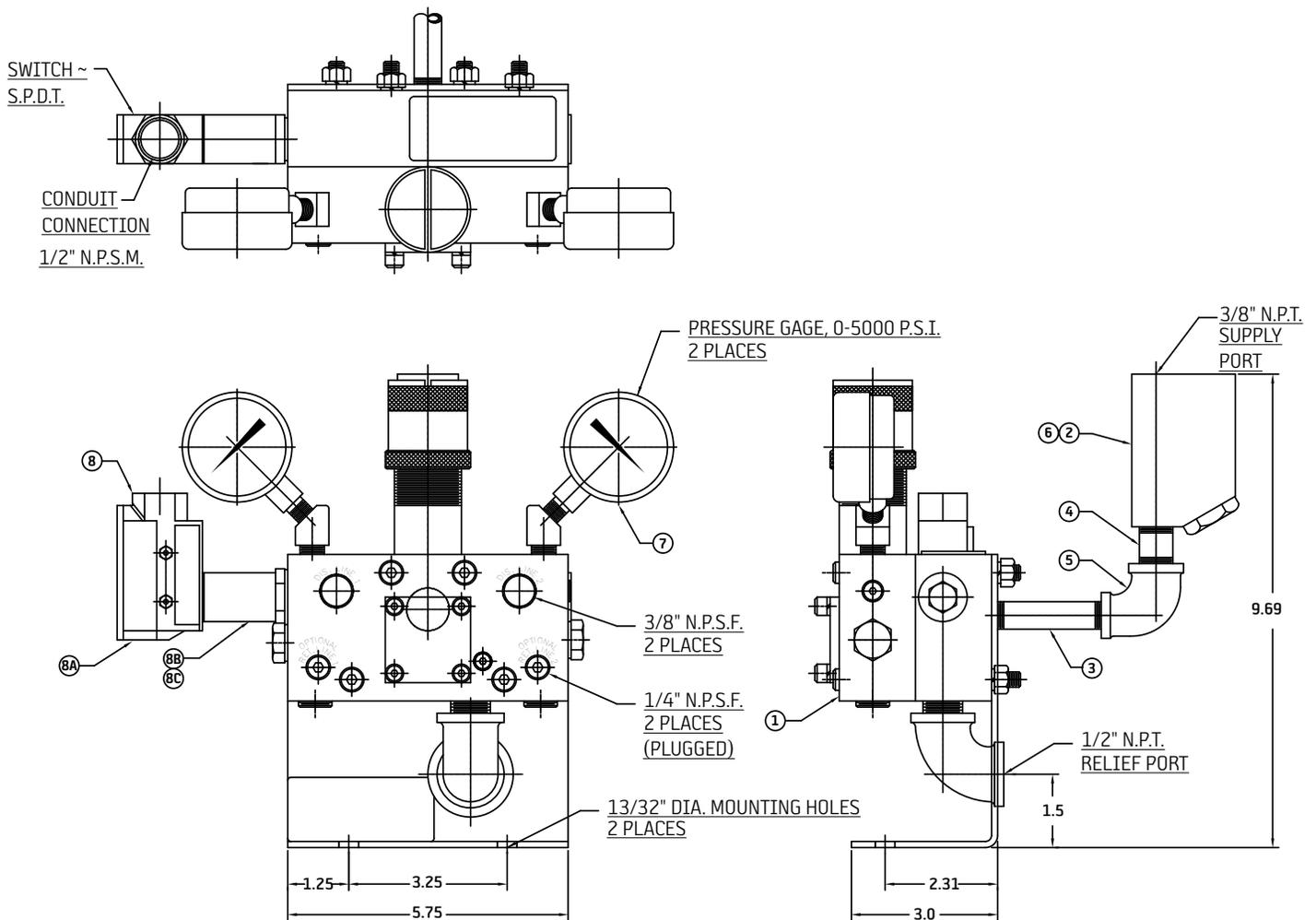


Figure 6 - DR460A(Arrangement 1) Reversing Valve and Bracket Mounting Assembly (DR459), with Line Strainer(LS03120) for Grease Non-Return Systems.  
 DR460B (Arrangement 2) Reversing Valve Bracket Mounting Assembly (DR459), with Line Strainer (LS03106) for Oil Non-Return Systems.

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### CORPORATE HEADQUARTERS (USA)

*Bijur Delimon International*  
2100 Gateway Centre Blvd.  
Suite 109  
Morrisville, NC 27560

(919) 465 4448 **TEL**  
(800) 631 0168 **TOLL-FREE**  
(919) 465 0516 **FAX**

### GERMANY

*Bijur Delimon International*  
Arminstrasse 15  
40227 Düsseldorf

(+49) 211 / 77 74-0 **TEL**  
(+49) 211 / 77 74-210 **FAX**

### CHINA

*Nanjing Bijur Machinery Products, Ltd.*  
#9 Hengtong Road  
Nanjing Xingang Economic & Technical  
Development Zone  
Nanjing 210038

(+86) 25-85801188 **TEL**  
(+86) 25-85802288 **FAX**

### UNITED KINGDOM

*Denco Lubrication Limited*  
Ramsden Court  
Ramsden Road Rotherwas  
Industrial Estate  
Hereford, HR2 6LR

(+44) (0) 1432365000 **TEL**  
(+44) (0) 1432365001 **FAX**

### IRELAND

*Bijur Lubricating Ireland Limited*  
Gort Road  
Ennis, County Clare

(+353) 6568-21543 **TEL**  
(+353) 6568-29667 **FAX**

### FRANCE

*Bijur Products, Inc.*  
PB 50 - ZI de Courtabœuf  
9, Avenue de Quebec  
F-91942 Courtabœuf Cedex

(+33) (0)169298585 **TEL**  
(+33) (0)169077627 **FAX**

### SPAIN

*Lubricacion Centralizada de Limon S.A.*  
Avenida Txori Erri 3  
48150 Sondica Vicaya

(+34) 94-453-2000 **TEL**  
(+34) 94-453-2500 **FAX**

### INDIA

*Bijur Delimon India Private Limited*  
H-Block, A 56/1  
M.I.D.C., Pimpri  
Pune- 411018, Maharashtra

(+91) 2032319149 **TEL**  
(+91) 2027451725 **FAX**