

DUAL LINE LUBRICATING SYSTEMS

MODEL : KRV-32L

HYDRAULIC-OPERATED REVERSING VALVE

INSTRUCTION MANUAL

**KWK** KOWA CORPORATION

( 1 ) Construction and function

This reversing valve serves to feed grease discharged from the pump alternately to the two main supply pipes. The grease fed by the pump actuates all measuring valves from one main supply pipe after passing through the reversing valve. After that, the grease returns to the reversing valve through its return port, actuating the valve piston by the pressure of the returning grease. The aforementioned piston movement changes over the grease so as to be connected to the other main supply pipe.

The composition is as show in Fig.1.

Two pistons are provided in the reversing valve. On one of the pistons, a rack is provided at the center part, which is engaged with a pinion. A lever and spring are attached to the pinion in order to retain the passage reversing pressure.

A cam is provided on the tip of the other piston to actuate a limit switch.

## (2) The principle of movement

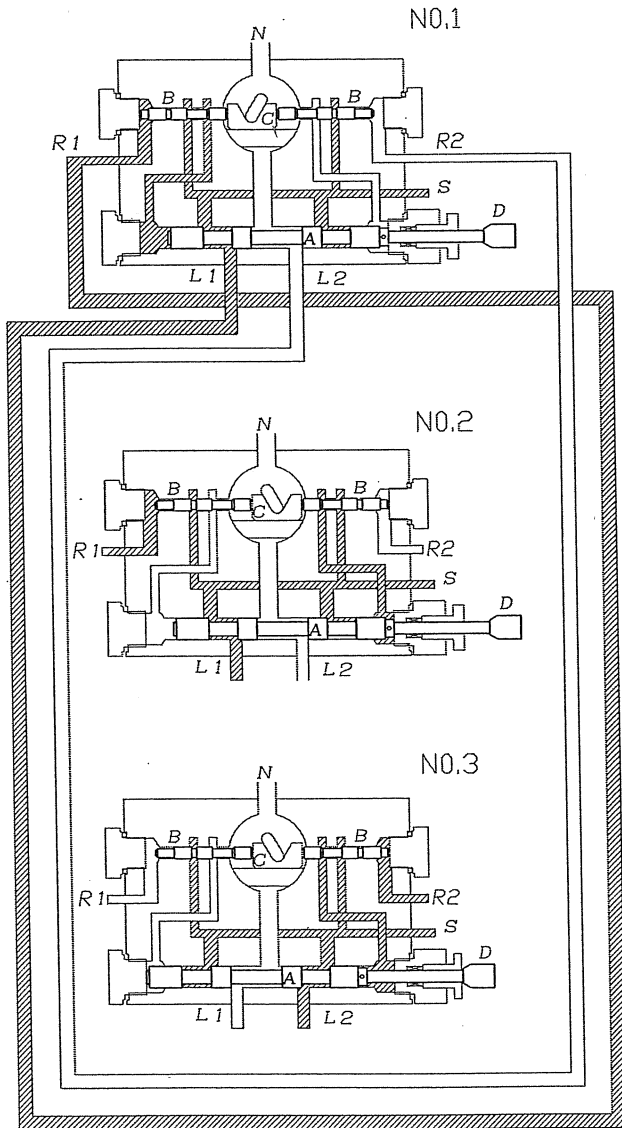


Fig.1

- (a) In No.1 of Fig.1, grease pressurized by the pump passes through the inlet S and is forced into the main supply pipe L1 by means of the piston A. At this time, the other main supply pipe L2-R2 is connected to the reservoir through N. The darkened part of Fig.1 shows the existence of pressurized grease. When the inner pressure of the main supply pipe L1 is raised, and all measuring valves complete their operations, the pressure at the end of the return pipe R1 from L1 begins to increase.
- (b) When the pressure in L1 exceeds the set valve, the rack piston B is moved to the right as shown in the No.2 of Fig.1. During this movement, grease entering into the cylinder through the inlet S is forced against the right end of the piston A by the movement of piston B. At the same time, the left end part of the piston A is connected to the relief line N.
- (c) Grease entering the cylinder through the inlet and pressurized by the pump moves the piston A to the left, as shown in the No.3 of Fig.1.

Upon completion of the above movement, the main supply pipe L1-R1 is connected to the relief line N. During this movement, the grease from the inlet S is fed to the main supply pipe L2. The piston A is provided with a switch lever D, as shown in Fig.1, so that the line reversing operations can be observed from the outside.

The switch lever D actuates the limit switch when moving to the right and left, by which the lubricating pump is stopped.

When the lubricating pump is started again, grease is admitted into the main supply pipe L2 as shown in No.3 of Fig.1.

After all, the measuring valve has been actuated by grease pressurized by the pump, the pressure at R2 line. When the pressure exceeds the set value, the piston B is moved to the left. With the movement of the piston B, the pressurized grease from the inlet S is forced against the left end of the piston A. This allows the piston A to move to the right as shown in No.1 of Fig.1. At this time, the limit switch is actuated by means of the switch lever D, and the lubricating pump stops. The line reversing pressure of this hydraulic-operated reversing valve can be adjusted by means of a spring tension adjustment screw attached to the pinion C. In other words, the adjustment can be accomplished by changing the pressure at the extreme end of the pipe which is used to move piston B meshed with pinion C to the opposite side.

### (3) Adjustment of the changed over pressure

#### 1) Adjusting meth

Loosen the lock nut of the hydraulic-operated reversing valve and adjust the changed over pressure by turning the adjust screw while watching the pressure gauges (P1e and P2e). Operate the pump while checking the changed over pressure. (Left turn of the adjust screw increases the changed over pressure.)

#### 2) Lock nut locking

After the pressure adjustment, be sure to fasten the lock nut. If neglected, the pressure adjust screw is turned by vibration and the changed over pressure may be disordered.

The line reversing pressure of the hydraulic-operated reversing valve has been adjusted at 4MPa in KWK factory before delivery.

No.	NAME	P. No.	Q'ty	MASS	REMARKS	No.	NAME	P. No.	Q'ty	MASS	REMARKS
52	HEX. BOLT	HB	2	0.01	M5X16L	26	ROLL PIN	PP	1	-	Ø2X10L
51	E-RING	ER	1	-	E10	25	O-RING	OR	1	-	1AP34
50	PLUG	HS-PG	1	0.01	Rc1/8	24	COVER PLATE	-	1	0.14	K-804273
49	STEEL BALL	SB	1	-	5/16 (Ø7.9375)	23	HEX. PLUG	A9007	1	0.03	KS-800263
48	SPRING	HN	1	-	KS-802012	22	BACK UP RING	BUR	2	-	P-6
47	HEX. NUT	HN	4	-	M6	21	SK SEAL	SKSEAL	1	-	P-6
46	HEX. BOLT	HB	4	0.02	M6X16L	20	SWITCH CAM	A9006	1	0.02	KS-800252
45	BASE PLATE	-	1	0.45	KS-804274B2	19	SWITCH CAM ROD	A9003	1	0.02	KS-800251R1
44	PLUG	-	6	0.01	GPM1/32	18	PACKING PLATE	A9005	1	0.02	KS-800265R1
43	PLUG	-	18	0.04	GPM1/16	17	CUPPER PACKING	X3012	2	-	Ø23X81.8, 5x2t
42	SPRING WASHER	SW	4	-	M4	16	PACKING GLAND	A9004	1	0.06	KS-800264R1
41	HEX. SOCKET BOLT	CB	4	0.01	M4X14L	15	PILOT PISTON	-	1	0.08	KS-804262R1
40	SPRING WASHER	SW	8	-	M5	14	O-RING	OR	1	-	P-13
39	HEX. NUT	HN	2	-	M6	13	O-RING	OR	1	-	S-28
38	HEX. SOCKET BOLT	CB	2	0.01	M3X12L	12	CUPPER PACKING	X3017	2	-	Ø2X81.6, 5x2t
37	HEX. SOCKET BOLT	CB	4	0.01	M3X16L	11	MAIN PISTON PLUG	-	2	0.10	KS-804264
36	HEX. SOCKET BOLT	CB	2	0.01	M3X20L	10	MAIN PISTON	-	2	0.04	KS-804263R1
35	SPRING WASHER	SW	8	-	M6	9	SLIPPER PLATE	-	1	0.03	KS-804265
34	HEX. SOCKET BOLT	CB	4	0.02	M6X12L	8	SLIDE BLOCK	-	1	0.04	KS-804266
33	CUPPER PACKING	X3004	1	-	Ø9X65, 5x1, 5t	7	LINK PLATE	-	1	0.01	KS-804267
32	PRESSURE SWITCH	W1001	1	0.30	AT1/4MMØX350K	6	SPRING RETAINER	-	1	0.04	KS-804268
31	STEEL BALL	SB	1	-	1/8 (Ø3.175)	5	SPRING	-	1	0.06	KS-804270
30	AIR VENT SCREW	X1005	1	0.01	KS-800124	4	ROCK NUT	-	1	0.02	KS-804272
29	BLACKET	-	1	0.03	KS-804273	3	ADJUST SCREW	-	1	0.08	KS-804271
28	LIMIT SWITCH	W2010	1	0.36	D4C-1203	2	SPRING HOLDER	-	1	0.25	KS-804269R1
27	SPRING PIN	SPP	1	-	Ø2X10L	1	BODY	-	1	5.20	KS-804391R3

7.61kg

SECTIONAL VIEW A-A

SECTIONAL VIEW B-B

SECTIONAL VIEW C-C

RETURN PORT Rc3/8

SUPPLY PORT Rc3/8

AIR VENT SCREW

No. 1 RETURN PORT Rc3/8

No. 1 DISCHARGE PORT Rc3/8

No. 2 DISCHARGE PORT Rc3/8

No. 2 RETURN PORT Rc3/8

MODEL KRV-32 SL

HYDRAULIC-OPERATED  
REVERSING VALVE

INSTRUCTION MANUAL



KOWA CORPORATION

2007.11.19

## (1) CONSTRUCTION AND FUNCTION

This system is provided for feeding grease being fed from pump alternately to two main supply pipes.

Grease being fed from the pump passes through a hydraulic operated reversible valve, which is fed to the main supply pipe on one side to actuate the measuring valve and to increase the pressure in the pipe line. Grease in increased pressure actuates the piston of the hydraulic operated reversible valve via a reversing line in the hydraulic operated reversible valve, which reverses the oil path from the pump to an opposite main supply pipe.

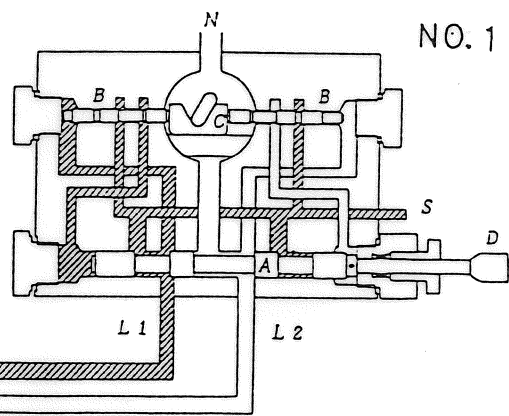
FIG. 5 shows its construction.

The inside of the hydraulic operated reversible valve is provided with a slide block and two main pistons & one pilot piston at its ends.

The slide block is depressed by using a spring via a link to maintain the reversing pressure in construction.

The end of the pilot piston is provided with the cam for actuating the limit switch in order to obtain the reversing signal.

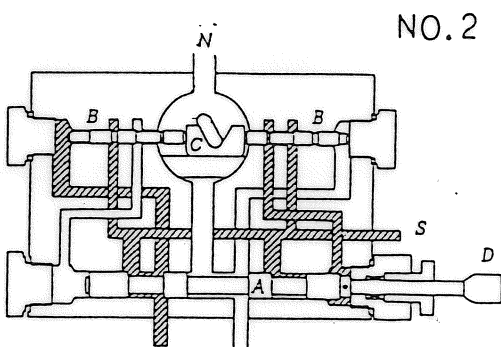
(2) Function



- (a) In No.1 of Fig. 5, grease pressurized by the pump passes through the inlet S and is forced into the main supply pipe L1 by means of the piston A. At this time, the other main supply pipe L2 is connected to the reservoir through N.

The darkened part of Fig. 5 show the existence of pressurized grease.

When the inner pressure of the main supply pipe L1 is raised, and all measuring valves complete their operations, the pressure at the end of the return pipe R1 from L1 begins to increase.



- (b) When the pressure in L1 exceeds the set value, the piston B is moved to the right as shown in the No.2 of Fig. 5. During this movement, grease entering into the cylinder through the inlet S is forced against the right end of the piston A by the movement of piston B. At the same time, the left end part of the piston A is connected to the relief line N.

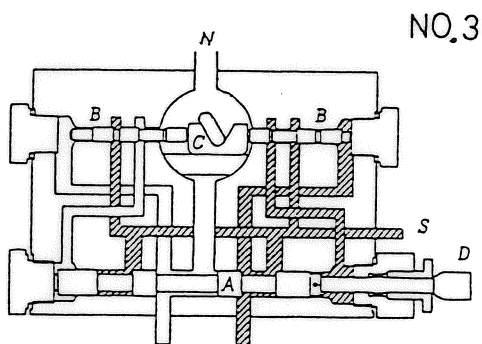


Fig. 5

- (c) Grease entering the cylinder through the inlet and pressurized by the pump moves the piston A to the left, as shown in the No.3 of Fig.5. Upon completion of the above movement, the main supply pipe L1 are connected to the relief line N.



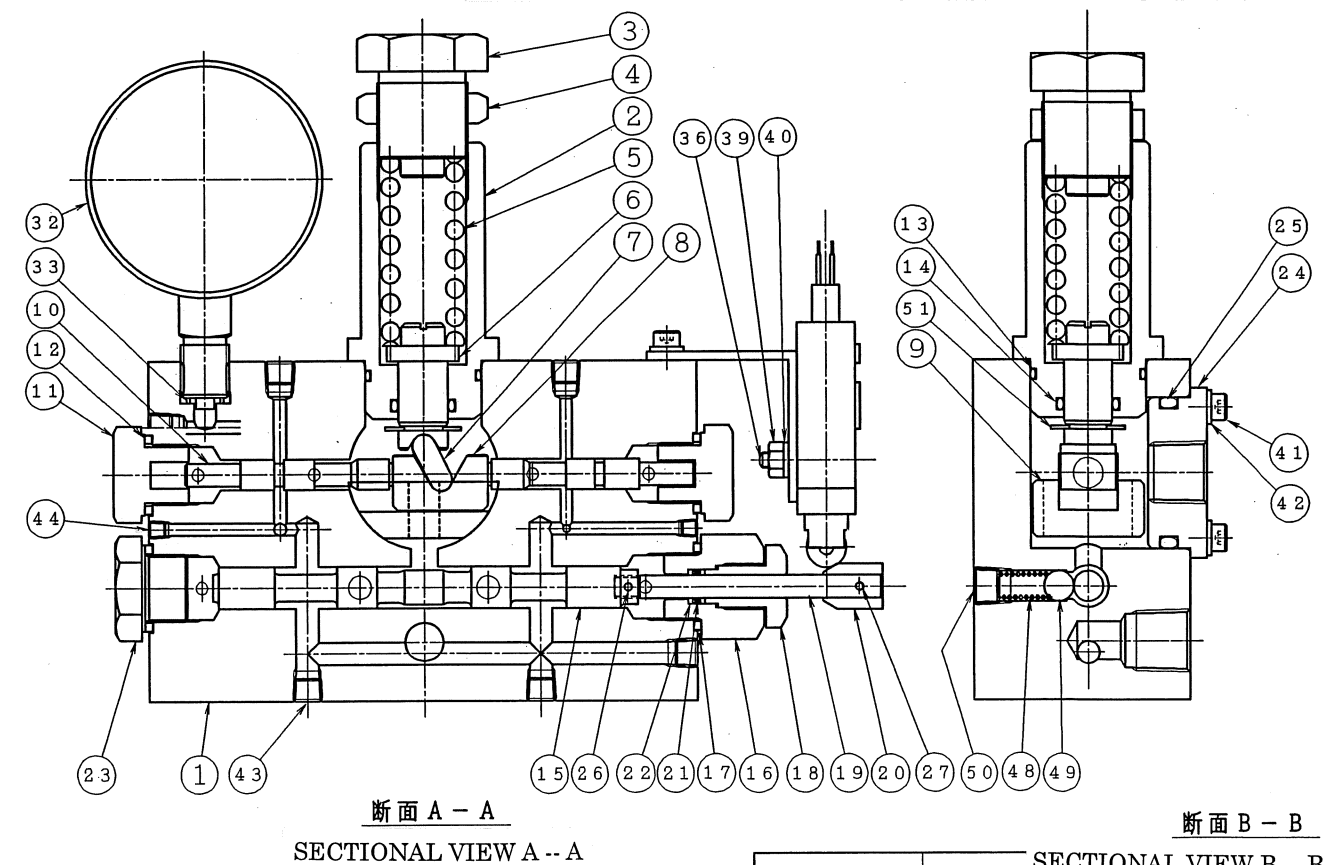
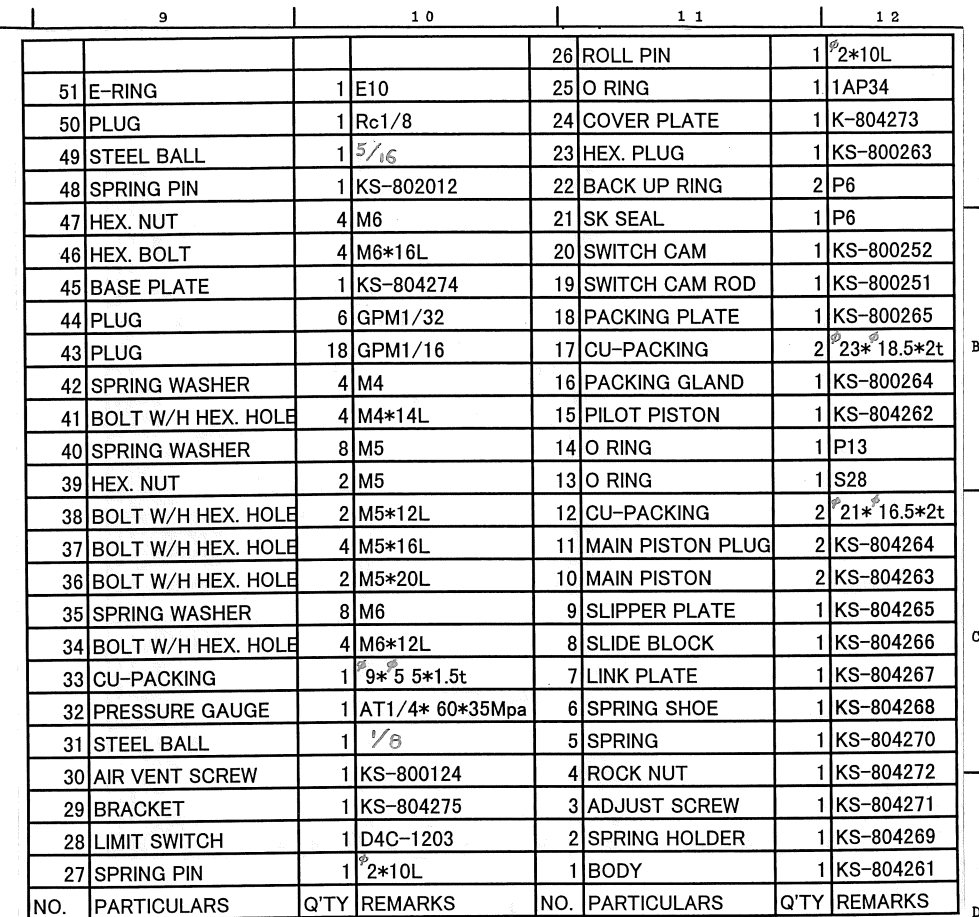
During this movement, the grease from the inlet S is fed to the main supply pipe L2. The piston A is provided with a switch lever D, as shown in Fig.5, so that the line reversing operations can be observed from the outside.



The switch lever D actuates the limit switch when moving to the right and left, by which the lubricating pump is stopped.

When the lubricating pump is started again, grease is admitted into the main supply pipe L2 as shown in No.3 of Fig.5.

After all the measuring valve have been actuated by grease pressurized by the pump, the pressure at the end of L2 line. When the pressure exceeds the set value, the piston B is moved to the left. With the movement of the piston B, the pressurized grease from the inlet S is forced against the left end of the piston A. This allows the piston A to move to the right as shown in No.1 of Fig.5. At This time, the limit switch is actuated by means of the switch lever D, and the lubricating pump stops. The line reversing pressure of this hydraulic-operated reversing valve can be adjusted by means of a spring tension adjustment screw attached to the pinion C. In other words, the adjustment can be accomplished by changing the pressure at the extreme end of the pipe which is used to move piston B meshed with pinion C to the opposite side.

The line reversing pressure of the hydraulic-operated reversing valve has been adjusted at 10Mpa (100 kg/cm<sup>2</sup>) in KWK factory before delivery.



CUSTOMER		SECTIONAL VIEW B -- B	
SPECIFICATION			
CHECKED BY	DRAWN BY	KRV-32SL ASS'Y  REVERSING VALVE	
	K. TANAKA		
	1998.6.9		
SEC. CHIEF	DESIGNED BY		
<b>KOWA CORP.</b>  OSAKA JAPAN		DWG. No. KS-804277 	
		CPD. No.	
		CODE No.	
 3RD ANGLE PROJECTION		SCALE	1 / 1
10	11	DATE OF ISSUE	MFG. NO.

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