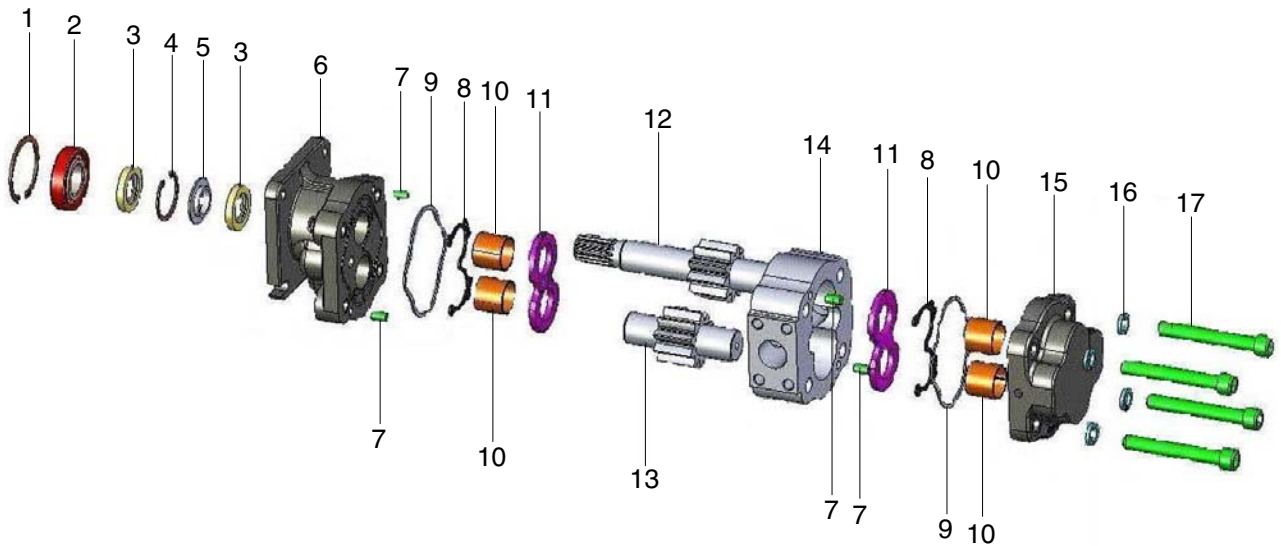


GROUP 2 STRUCTURE AND FUNCTION

1. MAIN PUMP

1) STRUCTURE



763G4SE05

1	Snap ring	7	Pin	13	Driven gear
2	Bearing	8	Seal ring	14	Pump body
3	Oil seal	9	Seal ring	15	Rear cover
4	Snap ring	10	Bearing	16	Spring washer
5	Plate	11	Side plate	17	Screw
6	Front cover	12	Drive gear		

2) MOUNTING REQUIREMENTS FOR GEAR PUMP

- (1) Before mounting the gear pump, check its normal rotating direction and for being suitable to whole system.
- (2) Entry of gear pump should keep clean and no pollution. Interfacing surface of entry and discharge should not be damaged and good sealing with O-ring seal should be guaranteed.
- (3) Check if the depth of mounting hole for gear pump is longer than the length of the shaft of pump so to prevent potential impact to the shaft and gear pump from burning out. Key shaft should be assembled normally.

3) NOTES IN USING

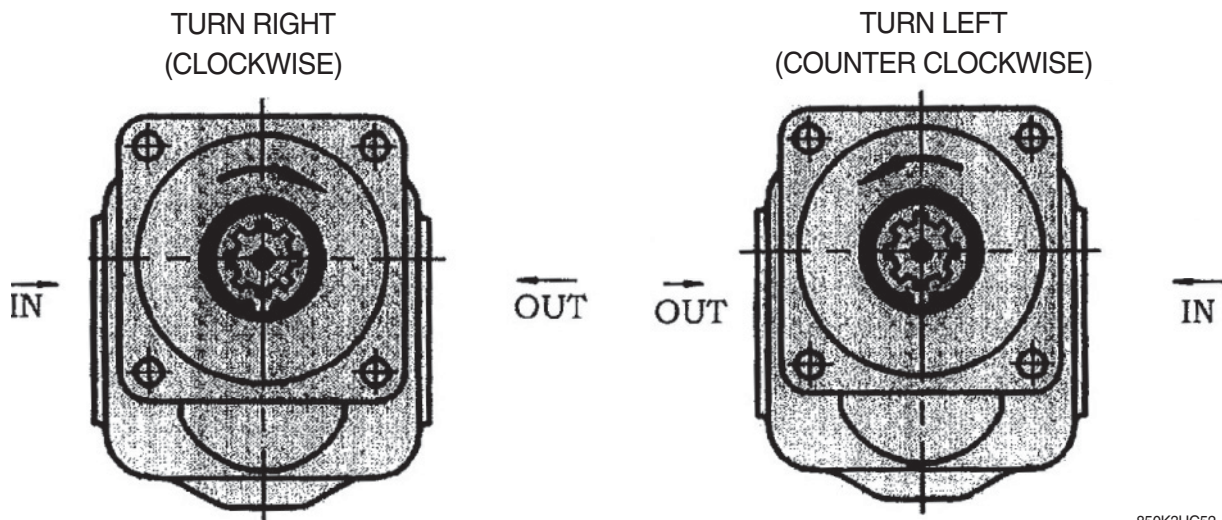
- (1) It's strictly prohibited for user to disassemble the product, or the manufacturer will not guarantee the performance of product.
- (2) Viscosity of oil is dependant to temperature. When oil temperature increases, its viscosity decreases. Therefore, oil temperature should be maintained under 80°C. To secure the gear pump working normally under different operating temperature, selected oil should feature little change by variation of temperature, and have good chemical durability and foam resistance. Use of ISO VG46 (ISO VG32, ISO VG68) anti-wear hydraulic oil is recommended.
- (3) No impurities from machine and corrosive substance should be in oil. There should be filtering devices with a precision of 25 µm in the system where the gear pump is working for.
- (4) For transmission of gear pump, the manners that may produce radial force to pump (such as direct geared and pulley transmission) are not permitted. Shaft bushing or elastic coupling can be used. Requirements for concentricity: not more than 0.05 mm for shaft bushing type, no more than 0.1 mm for coupling type. Axial force is not permitted.
- (5) The entry and discharge of gear pump should be assembled securely and sealing be reliable. Or air may be included and oil leaks caused to lower the performance of gear pump.
- (6) Max. pressure and max. rate of gear pump means momentary peak values permitted during operation. Long time of continued use of gear pump may shorten its life span.
- (7) Check if the depth of mounting hole for gear pump is longer than the length of the shaft of pump so to prevent potential impact to the shaft and gear pump from burning out.
- (8) Before mounting the gear pump, check the rotating direction of pump meets requirement.

4) TROUBLESHOOTING

Problem	Cause	Remedy
Noise in pump	Air in system.	Fasten up all the connectors.
	Insufficient oil supply.	Refill oil to an adequate level.
	Cold oil.	Run slowly.
	Contaminated suction filter.	Clean or replace the filter.
	Too thin suction pipe.	Use a larger pipe.
	Suction pipe is clogged.	Remove the obstruction.
	Clogged air filter in oil tank.	Clean or replace the air filter.
	Poor concentricity of pump and input shaft.	Inspect.
	Severe resonance with tank, peripheral parts of piping.	Check piping, elements and bolts for being securely fastened.
Pump lags in response or no response	Insufficient oil supply.	Refill oil to an adequate level.
	Improper pressure setting of relief valve.	Regulate the pressure of relief valve.
	Worn or damaged pump.	Repair or replace.
	Worn, leaking or stuck valve.	Repair or replace.
High oil temperature	Too low pressure setting at overflow valve.	Regulate pressure of overflow valve.
	Too low viscosity of hydraulic oil.	Use recommended hydraulic oil.
	Too low oil level.	Refill oil to an adequate level.
	Small tank.	Add an oil cooler or replace with larger tank.
	Worn or damaged pump.	Repair or replace.
Foam forms in oil	Air has entered into oil tank through suction pipe.	Fasten up all the connectors.
	Incorrect selection of oil.	Use recommended oil.
	Too low oil level.	Refill oil to an adequate level.
	Worn or damaged lip seal for main shaft.	Replace the lip seal for main shaft.

Problem	Cause	Remedy
Insufficient flow of pump or pressure	Damaged side plate.	Replace side plate.
	Air has entered into the system.	Fasten up all the connectors.
	Too high viscosity of oil.	Use recommended oil.
Leaks occur even after replacing lip seal for main shaft	Contaminated oil.	Change all the oil.
	Damaged lip seal for main shaft has damaged the sealing area of drive gear.	Replace drive gear shaft.
	Worn or damaged seal ring.	Replace seal ring.

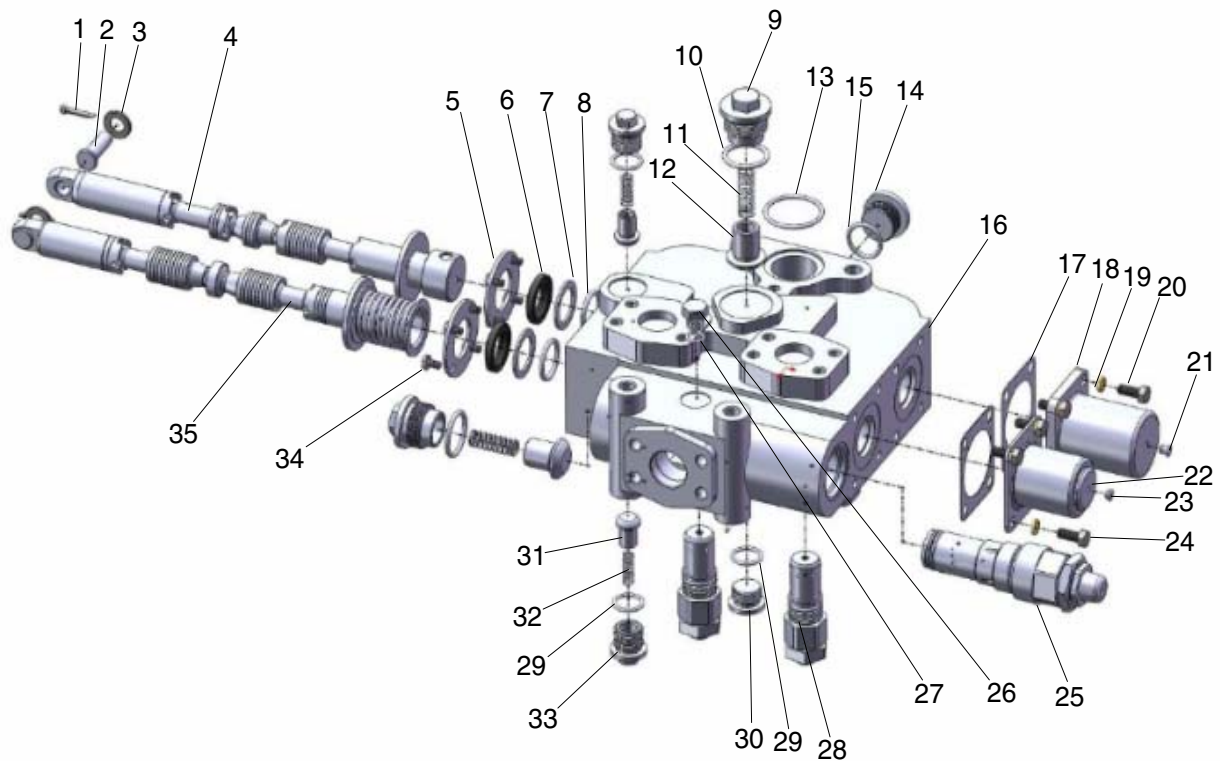
5) NOTICE IN PLACING ORDER



850K3HC52

2. MAIN CONTROL VALVE

1) STRUCTURE



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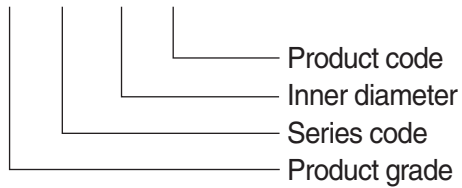
1	Split pin	14	O-ring	26	Test port plug
2	Pin	15	O-ring	27	O-ring
3	Washer	16	Valve body	28	Relief valve
4	Body	17	Sealing spacer	29	O-ring
5	Press plate	18	End cover	30	Plug
6	Dust seal	19	Washer	31	Valve cover
7	Washer	20	Bolt	32	Check valve spring
8	O-ring	21	Endcover rubber	33	Check valve
9	Valve cover	22	End cover	34	Screw
10	O-ring	23	Endcover rubber	35	Valve stem
11	Check valve spring	24	Bolt		
13	Check valve	25	Safety valve		

2) OVERVIEW

Multi-way directional valve is of integrated slide valve structure which includes 2 spools valve (bucket and boom spool) and triple multi-way valve (service spool, bucket spool, boom spool). Oil ways include parallel and series connection. Multi-way valve has also various service valves (overflow valve, overload valve, makeup valve) attached. As a hydraulic device for main equipment of large and medium loader, the valve features compact structure, reliable functions, high performance, good sealing, and convenient repair.

3) MODEL IDENTIFICATION

G - DF - XX -XX

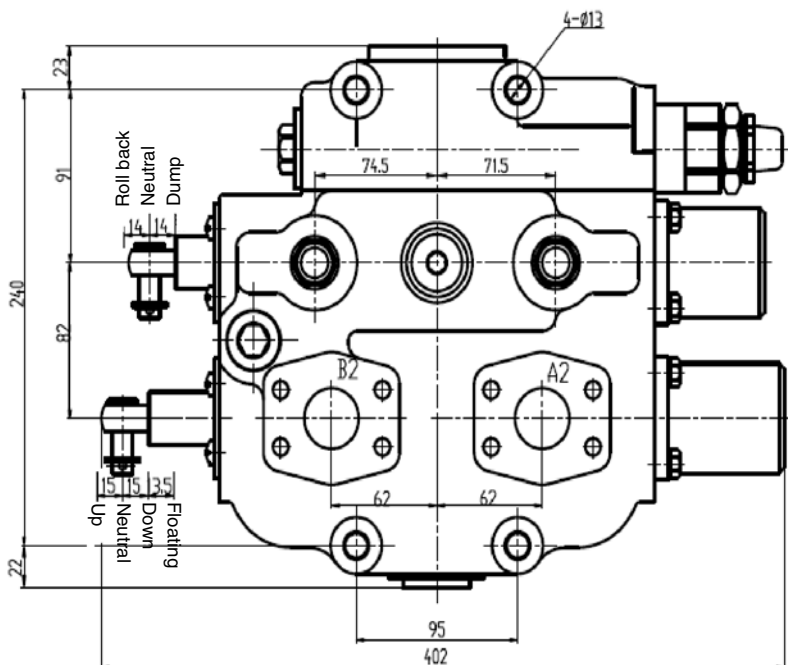
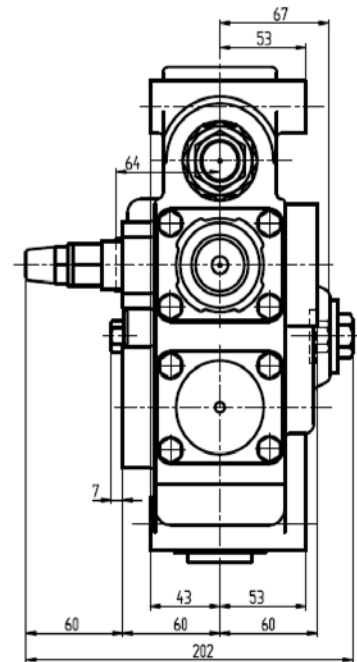
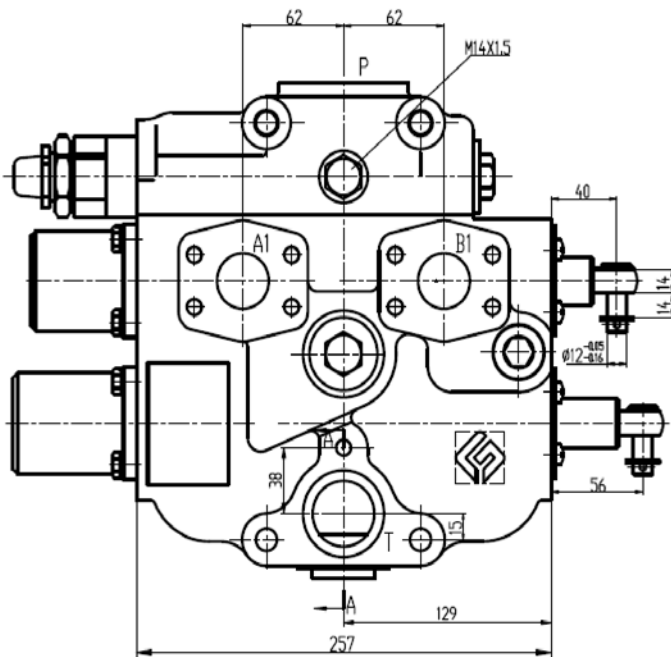


4) TECHNICAL DATA

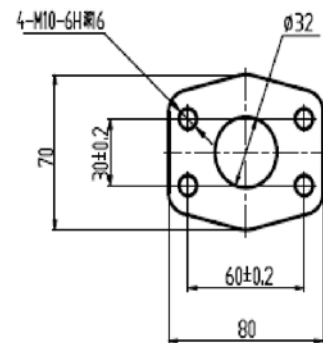
Item	Unit	Specification (GDF-32)
Nominated flow	ℓ /min	250
Nominated pressure	MPa	20
Pressure regulating range	MPa	8 ~ 20
Pressure regulating range of overload valve	MPa	8 ~ 25

5) STRUCTURE AND WORKING PRINCIPLE

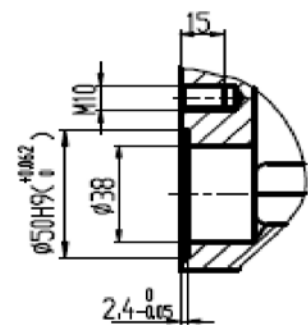
(1) Structure



P,A,B port size

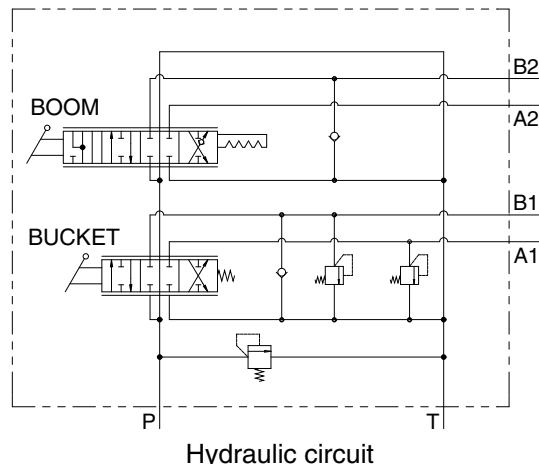


A - A



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(2) Working Principle



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Boom spool has 4 positions and 6 ways . It can realize the function of raising, holding, lowering and floating.

Main relief valve control the whole pressure of the system. Once the pressure exceeds the rated pressure, the valve would open a way direct to tank to protect the system against over pressure.

In the multi-way directional valve, port P is flow inlet , T is flow return. A1 and B1 connect to the large chamber and small chamber of bucket cylinder respectively. A2 and B2 connect to the large chamber and small chamber of boom cylinders respectively. Check valve is used to prevent pressure oil flowing back to the tank so that fix the “nodding” problem.

(1) Neutral position

When bucket spool and boom spool are at neutral positions, oil from pump returns to tank directly through port P.

(2) Boom raising

When the boom spool is pulled out, the oil way from P to T is closed. Fluid flows directly to A2 which is connected to the large chamber of boom cylinders. The oil in the small chamber would return to tank through B2. Then the boom raises.

(3) Boom lowering

When the boom spool is pushed in at the first position, the oil way from P to T is closed too. Fluid flows directly to B2 which is connected to the small chamber of the boom cylinders. The oil in the large chamber would return to tank through A2. Then the boom lowers.

(4) Boom floating

When the boom spool is pushed in further more, all the inlet port P and large chamber and small chamber of boom cylinders are connected to tank. The cylinders become floating by the weight of equipment and bearing the force from ground.

(5) Bucket roll back

When the bucket spool is pulled out. The oil way from P to T is closed. Fluid flows directly to A1 which is connected to the large chamber of bucket cylinder. The oil in the small chamber would return to tank through B1. Then the bucket rolls back.

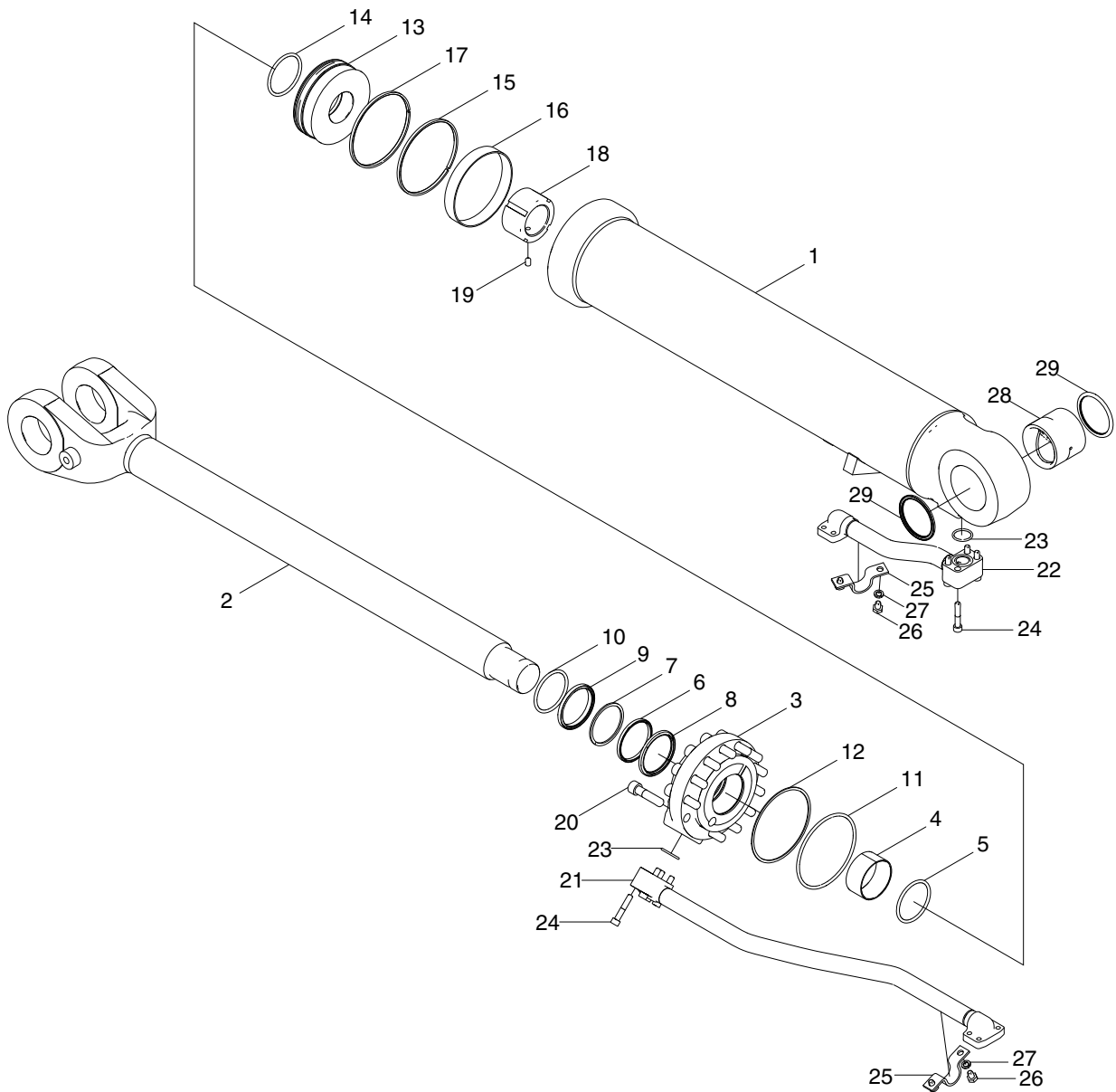
7) TROUBLESHOOTING

No.	Problem	Cause	Remedy
1	Insufficient operating pressure	1. Pressure of main relief valve is on low side.	1. Regulate pressure of main relief valve.
		2. Spool of main relief valve is stuck.	2. Remove and clean, or replace valve spool.
		3. Damaged pressure regulating spring.	3. Replace with new product.
		4. Too much pressure loss in system line.	4. Replace piping, or regulate pressure of main relief valve within the allowable range of pressure.
2	Insufficient operating flow	1. Oil supply to system is insufficient.	Check oil source and repair oil pump.
		2. Too much leaks inside valve.	
		a. Too high oil temperature, low viscosity	a. Take measures to reduce oil temperature.
		b. Improper hydraulic oil.	b. Change hydraulic oil.
		c. Too much clearance between slide valve and valve body.	c. Replace slide valve to keep a reasonable clearing.
		3. Main relief valve failure.	3. Repair or replace the main relief valve.
3	Malfunction in return	1. Damaged or deformed return spring.	1. Replace with new product.
		2. Dirt between valve lever and valve body.	2. Clean part.
4	External seeps and leaks	1. Damaged seal ring.	1. Replace with new product.
		2. Loose fastening pieces.	2. Fasten related fastening piece.
		3. Too high oil temperature, low viscosity.	3. Takes measures to reduce oil temperature.
		4. Poor sealing on flange surface.	4. Check fastening and sealing of related parts.
5	Bucket dumping	1. Overload valve is stucked.	1. Clean and reassemble.
		2. Dirty fluid.	2. Change fluid.
		3. Damaged O-ring.	3. Replace O-ring.
		4. Internal leakage of cylinder.	4. Inspect cylinder.

8) NOTES IN DISASSEMBLY

- (1) Keep clean field for assembly. Dust and dirt shall be strictly prevented.
- (2) Never clean rubber sealing pieces with gasoline.
- (3) To prevent from damage to part, never knock a part with an iron object when disassembling.
- (4) Be sure to clean all the parts with kerosene or cleaner before assembling.
- (5) After assembling, be sure to perform test and only passed product can be used.

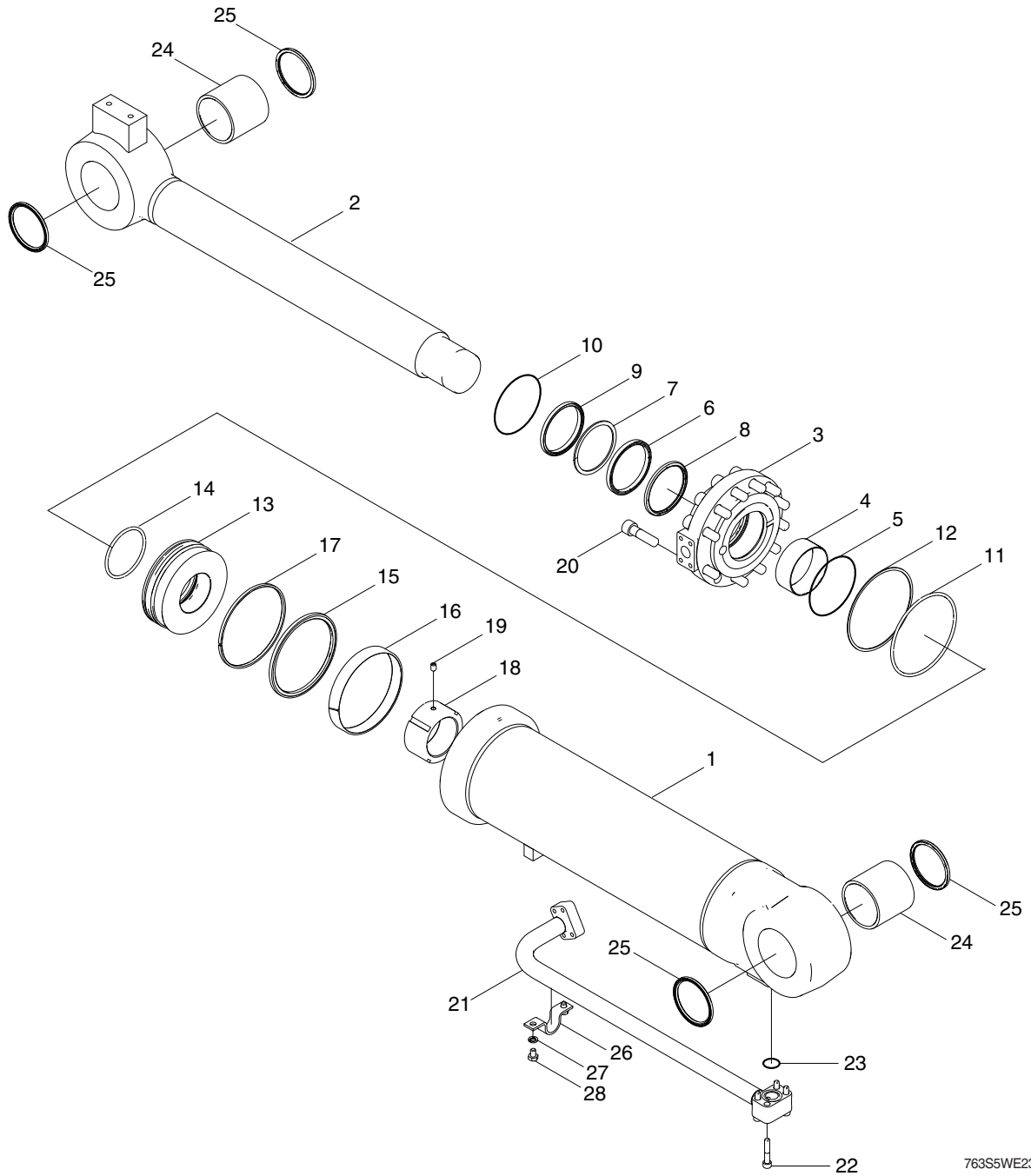
3. BOOM CYLINDER



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- | | | | | | |
|----|---------------|----|--------------|----|---------------|
| 1 | Tube assembly | 11 | O-ring | 21 | Pipe assembly |
| 2 | Rod assembly | 12 | Back up ring | 22 | Pipe assembly |
| 3 | Gland | 13 | Piston | 23 | O-ring |
| 4 | Bushing | 14 | O-ring | 24 | Socket bolt |
| 5 | Snap ring | 15 | Piston seal | 25 | Pipe clamp |
| 6 | Rod seal | 16 | Wear ring | 26 | Hexagon bolt |
| 7 | Back up ring | 17 | Dust ring | 27 | Spring washer |
| 8 | Buffer ring | 18 | Lock nut | 28 | Pin bushing |
| 9 | Dust wiper | 19 | Set screw | 29 | Dust seal |
| 10 | Snap ring | 20 | Socket bolt | | |

4. BUCKET CYLINDER



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- | | | | | | |
|----|---------------|----|--------------|----|---------------|
| 1 | Tube assembly | 11 | O-ring | 21 | Pipe assembly |
| 2 | Rod assembly | 12 | Back up ring | 22 | Socket bolt |
| 3 | Gland | 13 | Piston | 23 | O-ring |
| 4 | DU bushing | 14 | O-ring | 24 | Pin bushing |
| 5 | Snap ring | 15 | Piston seal | 25 | Dust seal |
| 6 | Rod seal | 16 | Wear ring | 26 | Pipe clamp |
| 7 | Back up ring | 17 | Dust ring | 27 | Spring washer |
| 8 | Buffer ring | 18 | Lock nut | 28 | Hexagon bolt |
| 9 | Dust wiper | 19 | Set screw | | |
| 10 | Snap ring | 20 | Socket bolt | | |