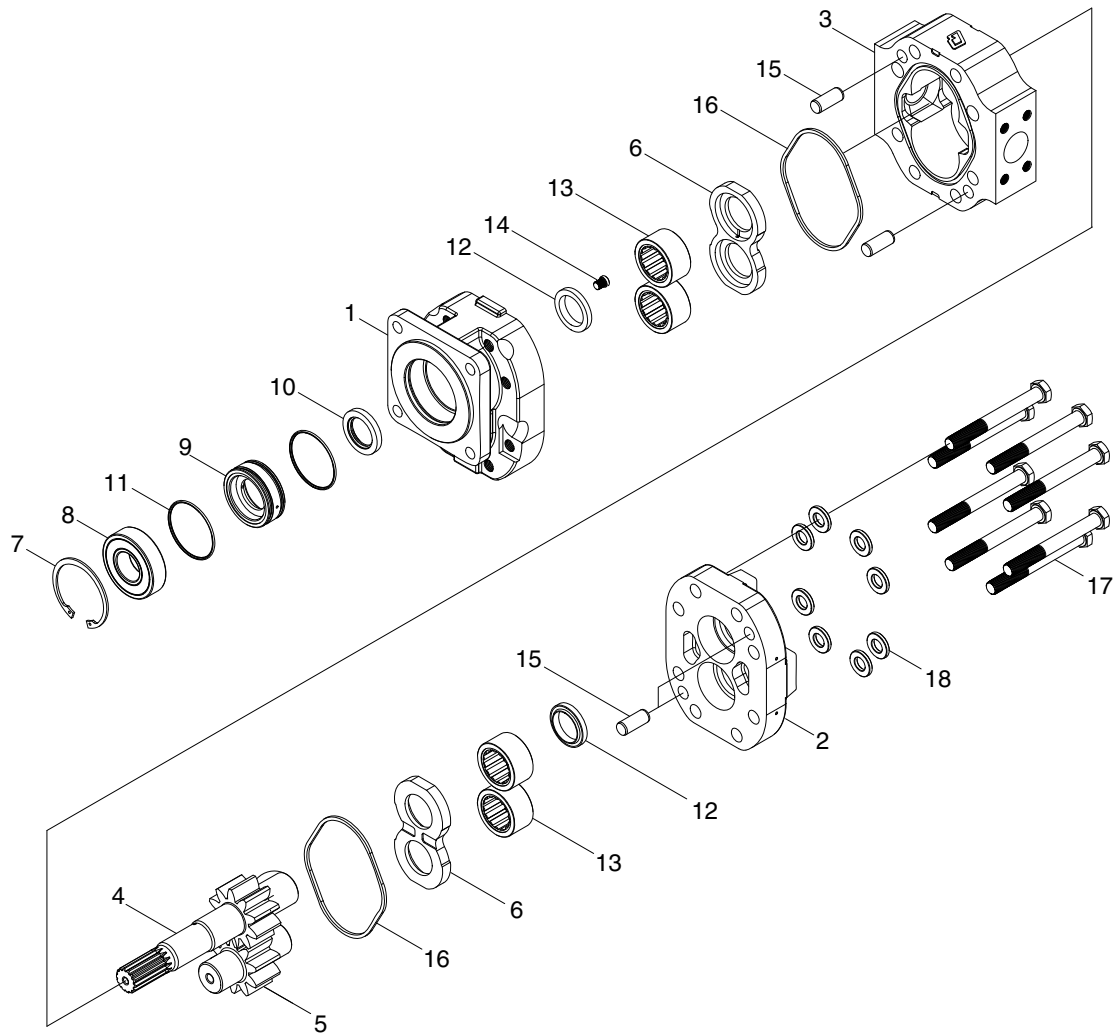


GROUP 2 STRUCTURE AND FUNCTION

1. MAIN PUMP

1) STRUCTURE



7615WE10

- | | | | | | |
|---|-----------------|----|-----------------|----|----------------|
| 1 | Shaft end cover | 7 | Snap ring | 13 | Roller bearing |
| 2 | Port end cover | 8 | Ball bearing | 14 | Screw plug |
| 3 | Gear housing | 9 | Retainer seal | 15 | Dowel pin |
| 4 | Drive shaft | 10 | Double lip seal | 16 | Gasket |
| 5 | Idler shaft | 11 | O-ring | 17 | Cap screw |
| 6 | Thrust plate | 12 | Ring seal | 18 | Washer |

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

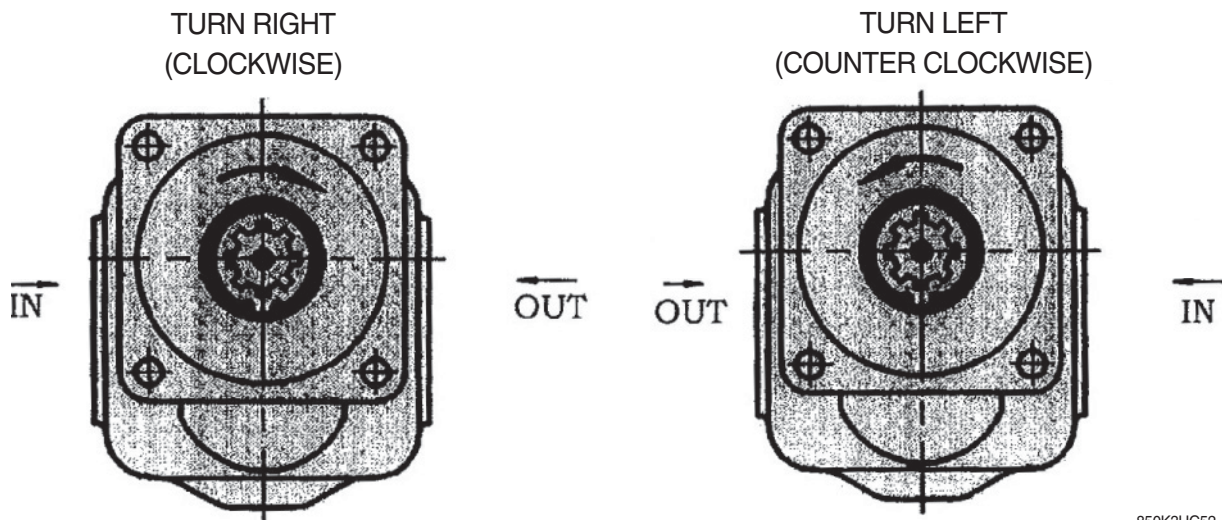
- (1) It's strictly prohibited for user to disassemble the product, or the manufacturer will not guarantee the performance of product.
- (2) Viscosity of oil is dependant to temperature. When oil temperature increases, its viscosity decreases. Therefore, oil temperature should be maintained under 80°C. 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.

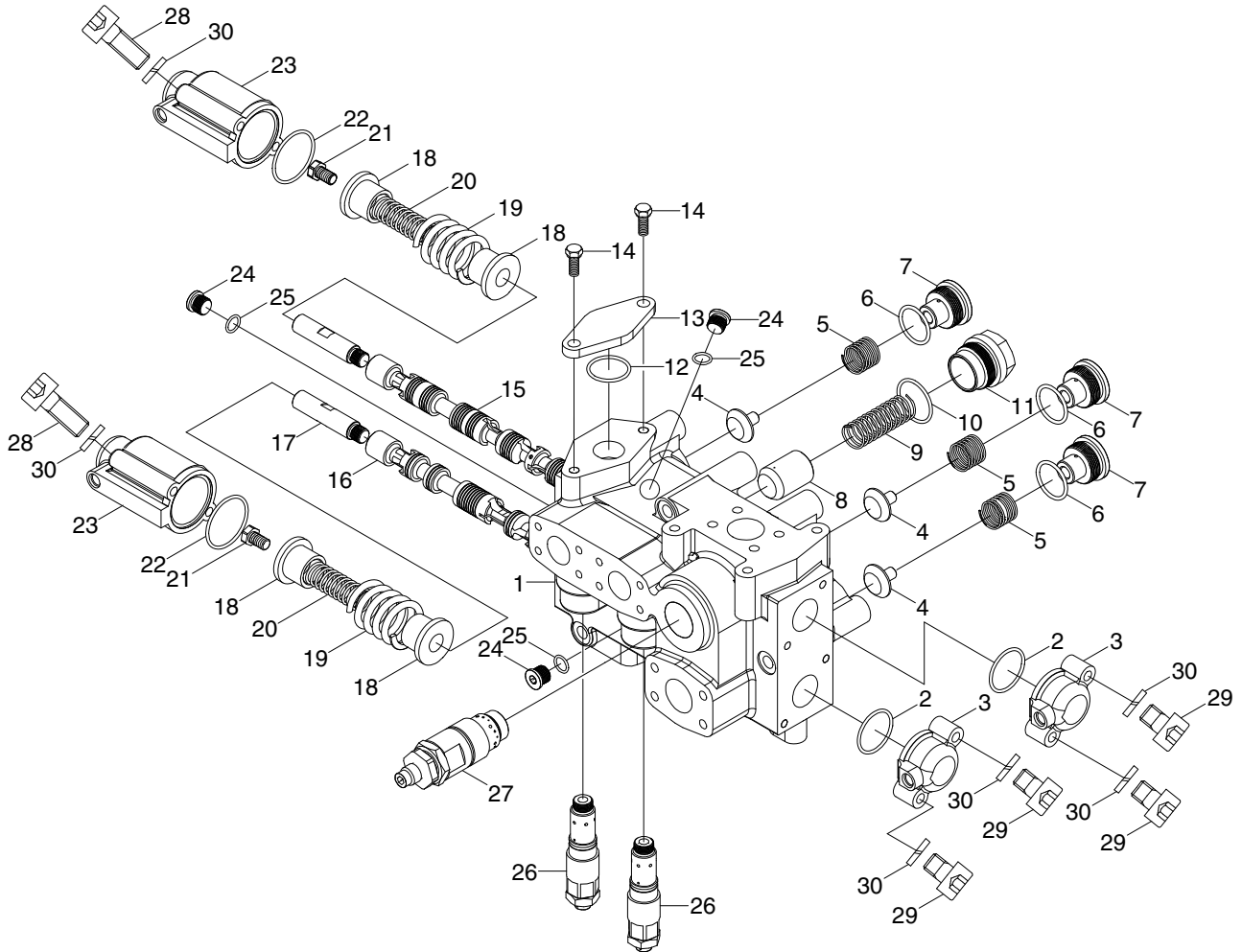
5) NOTICE IN PLACING ORDER



850K3HC52

2. MAIN CONTROL VALVE

1) STRUCTURE



7615WE11

- | | | | | | |
|----|-----------------------|----|-----------------|----|----------------|
| 1 | Valve body | 11 | Cap | 21 | Bolt |
| 2 | O-ring | 12 | O-ring | 22 | O-ring |
| 3 | End cap | 13 | Cap | 23 | End cap |
| 4 | Check valve | 14 | Bolt | 24 | Plug screw |
| 5 | Spring | 15 | Bucket spool | 25 | O-ring |
| 6 | O-ring | 16 | Boom spool | 26 | Overload valve |
| 7 | Valve cover | 17 | Poppet guide | 27 | Safety valve |
| 8 | Oil compensator valve | 18 | Spring retainer | 28 | Screw |
| 9 | Spring | 19 | Spring | 29 | Screw |
| 10 | O-ring | 20 | Spring | 30 | Washer |

2) OVERVIEW

The main control valve is of monolithic sliding structure, featuring series and parallel connection, port flange connection, including dual (bucket, boom) and triple (auxiliary, bucket, boom) type, and incorporates various service valves (relief valve, overload valve, make-up valve). This product features compactness, reliable working, improved performance, good sealing and easy in repair.

3) MODEL DESCRIPTION



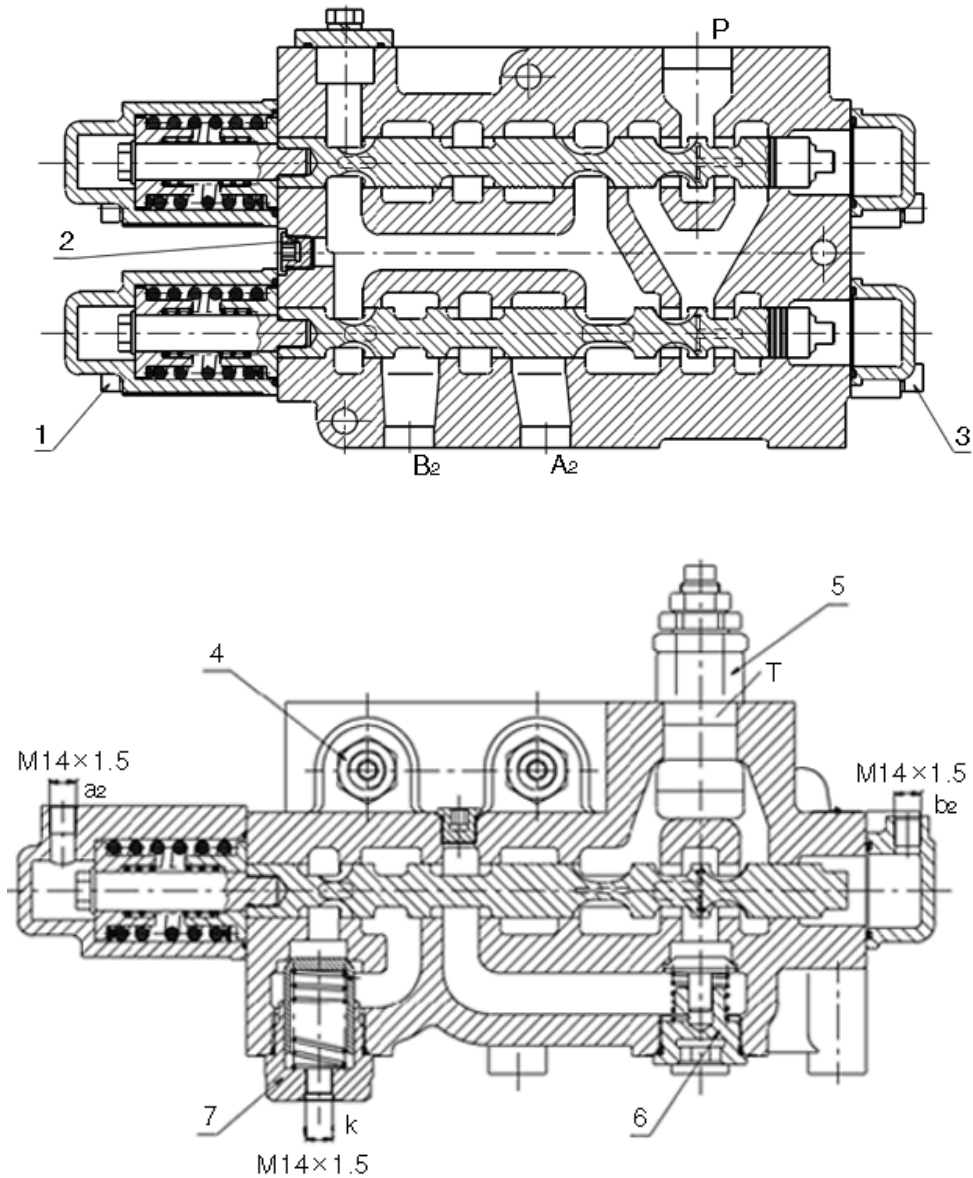
4) TECHNICAL DATA

Item		Unit	Specification
Nominal flow		ℓ /min	250
Nominal pressure		MPa	20
Regulating range		MPa	8~20
Pressure loss	Neutral	MPa	<0.3
	Operation	MPa	<0.6
Overload pressure regulating range		MPa	8~25

5) STRUCTURE AND WORKING PRINCIPLE

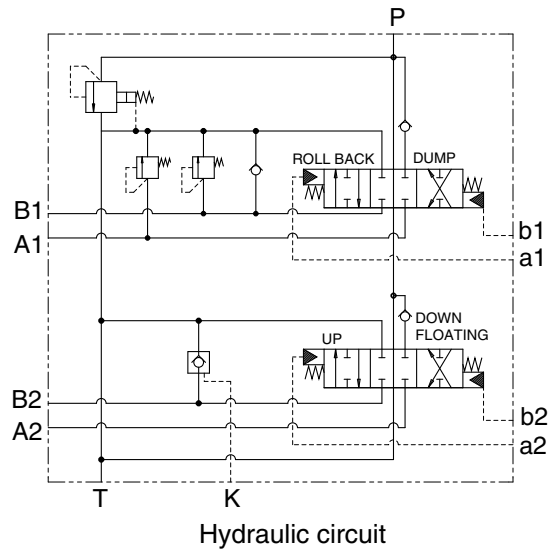
(1) STRUCTURE

This valve is of hydraulic controlled pilot and spring return type as shown in the diagram below.



Item	Size	Torque		Quantity
		kgf · m	lbf · ft	
1	M10 × 100	3.6 ~ 4.1	26.0 ~ 29.7	4
2	M18 × 1.5	3.6 ~ 4.6	26.0 ~ 33.3	3
3	M10 × 45	3.6 ~ 4.1	26.0 ~ 29.7	4
4	M20 × 1.5	4.6 ~ 5.6	33.3 ~ 40.5	2
5	M33 × 2	6.6 ~ 7.1	47.7 ~ 51.4	1
6	M42 × 2	19.4 ~ 24.5	140 ~ 177	3
7	M48 × 2	26.5 ~ 35.2	192 ~ 254	1

(2) WORKING PRINCIPLE



7615WE22

The main control valve has boom control spool and bucket control spool. The bucket spool has three positions, i.e. neutral, roll back and dump. Boom spool has four positions, i.e., hold, raise, lower and float. Port P is flow inlet, T is flow return port and port A1 and B1 are connected to large and small chamber of bucket cylinder, respectively, and port A2 and B2 are to large and small chamber of boom cylinder.

① Neutral position

When remote control lever is in neutral positions, the flow can't pass, the main control valve is in neutral position, and the flow from main pump returns directly to tank through port T of main control valve.

② Bucket roll back and dump

When remote control lever is pulled left, the flow from pump opens one-way valve, and is directed to A1 cavity, then to large chamber of bucket cylinder to make the bucket roll back. Likewise, when remote control lever is pushed right, the flow from pump opens one-way valve, and is directed to B1 cavity, and then to the small cavity of bucket cylinder to make the bucket dump, while the flow in large cavity returns through cavity A1.

③ Raise and lower of boom

When the remote control lever is pulled back, the flow from pump opens one-way valve, and is directed to cavity A2, then to large chamber of boom cylinder to make the boom to raise, while the flow in small chamber returns through cavity B2.

Likewise, when the remote control lever is pushed forward, the flow from pump opens one-way valve, and is directed to cavity B2, then to the small chamber of boom cylinder to make the boom to lower, while the flow in large chamber returns through cavity A2.

④ Float position

In this case, the position of remote control lever is the same as in lower position, except that the sequence valve opens as the control lever is in float position, the flow in discharging way, K, inside main control valve is directed to tank through 2C port inside the remote control valve to make make-up valve for the small cavity of boom cylinder inside main control valve to open, and the port P, A2, B2 and T become connected to keep the cylinder in floating position.

⑤ Function of main relief valve, overload valve and make-up valve

Main relief valve controls pressure in system. When pressure in system exceeds rated value, the main relief valve opens and the flow returns to tank to protect the hydraulic system against overpressure. When the bucket receives external impact or is interfered with by other mechanism, overload valve opens for safety. Makeup valve functions to make up oil for cylinder to prevent a chamber to be evacuated.

6) MOUNTING AND USING

- (1) When transporting, mounting, and storing the product, be careful that the product does not receive impacts that may damage the machined surface or flange face.
- (2) Never disassemble the product in a dusty place before assembling to machine to prevent dust from entering.
- (3) Check that rated pressure, sliding function, oil-way type and other features conform to system requirements.
- (4) Mounting plate and bracket should be level, mounting screws fastened in even torque, and the valves should be in good alignment.
- (5) Operating fluid should be clean, cleanliness meeting NAS 1638 10 grade and up.
- (6) Allowable oil temperature range : -20~80°C, normal oil temperature $50 \pm 5^\circ\text{C}$.

7) TROUBLESHOOTING

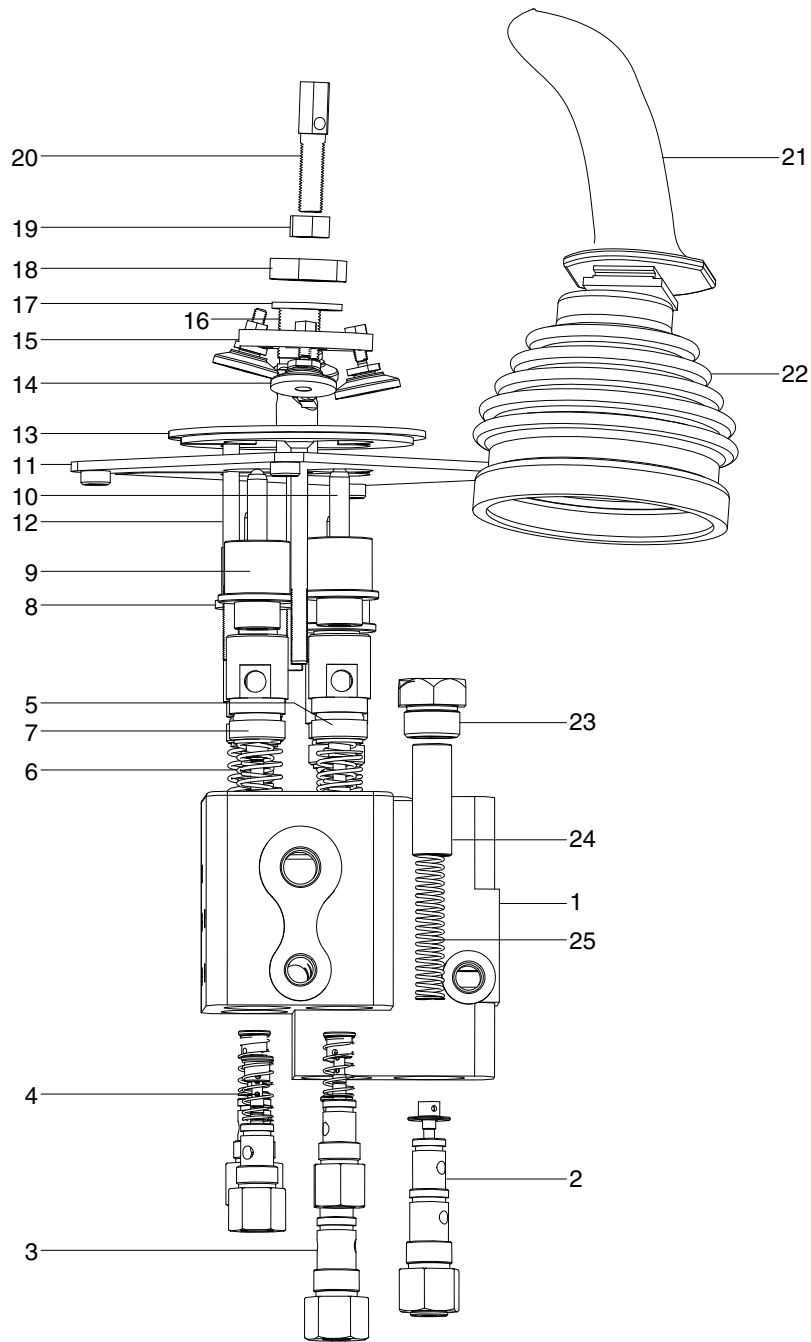
No.	Problem	Cause	Remedy
1	Insufficient operating pressure	1. Pressure of main relief valve is on low side.	1. Regulate pressure of main relief valve.
		2. Spool of main relief valve is stuck.	2. Remove and clean, or replace valve spool.
		3. Damaged pressure regulating spring.	3. Replace with new product.
		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.

8) NOTES IN DISASSEMBLY

- (1) Keep clean field for assembly. Dust and dirt shall be strictly prevented from entering the valves.
- (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. REMOTE CONTROL VALVE (STD, SINGLE LEVER TYPE)

1) STRUCTURE



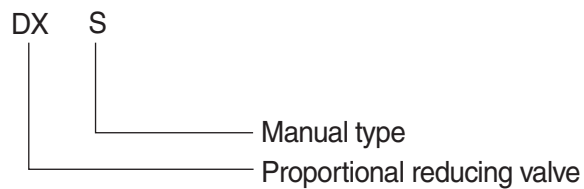
- | | | | | | |
|---|------------------------|----|---------------------|----|--------------|
| 1 | Valve body | 10 | Pressure pin group | 19 | Nut |
| 2 | Sequence valve assy | 11 | Mounting plate unit | 20 | Handle joint |
| 3 | Metering unit 2 | 12 | Serew | 21 | Handle unit |
| 4 | Metering unit 1 | 13 | Cover | 22 | Rubber cover |
| 5 | Compression bar unit 1 | 14 | Pressure plate unit | 23 | Plug screw |
| 6 | Spring | 15 | Mounted plate | 24 | Guide sleeve |
| 7 | Compression bar unit 2 | 16 | Nut | 25 | Spring |
| 8 | Shaft sleeve | 17 | Washer | | |
| 9 | Electromagnet | 18 | Nut | | |

7615WE12

2) OVERVIEW

This product has solenoid positioning in boom raise, float and bucket roll back. Pressure delivery by remote control valve shows linear change, providing better speed regulation and wider speed regulating range, and has become a main hydraulic element used for working equipment of loaders.

3) MODEL DESCRIPTION

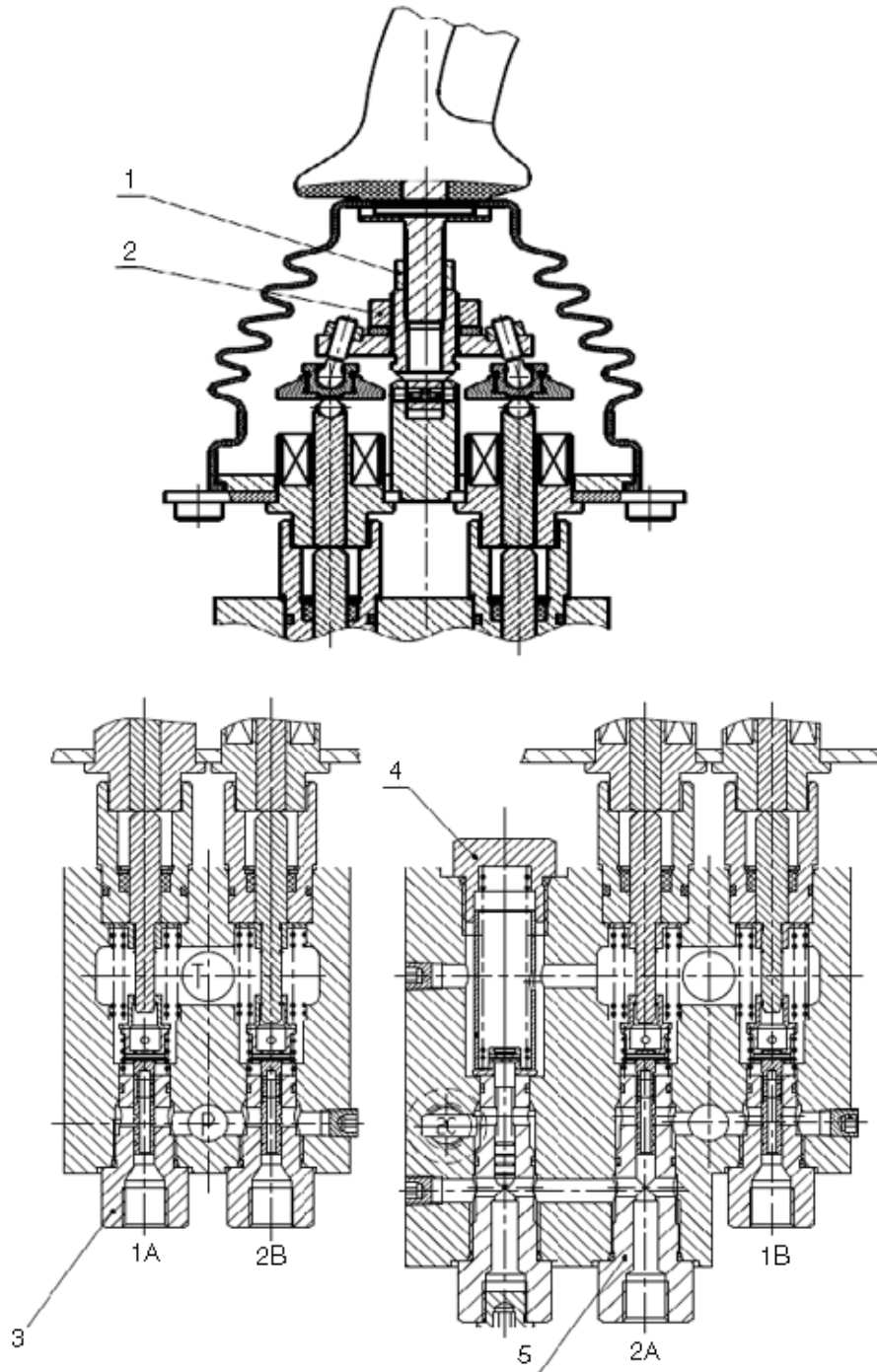


4) TECHNICAL DATA

Item	Unit	Specification
Nominal flow	ℓ /min	10
Max. pressure	MPa	5
Pressure control range	MPa	0.5~2.5
Solenoid operating voltage	Voltage	DC 24V

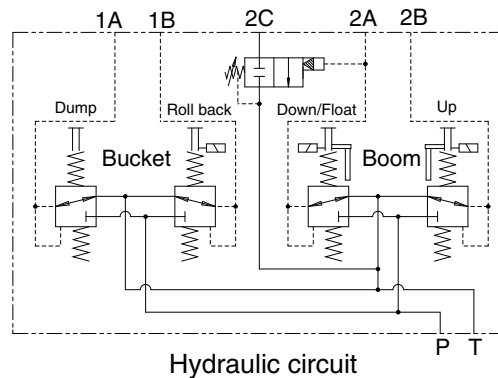
5) STRUCTURE AND WORKING PRINCIPLE

(1) STRUCTURE



Item	Size	Torque		Quantity
		kgf · m	lbf · ft	
1	M12	3.6 ~ 4.5	26.0 ~ 32.5	1
2	M20	17.0 ~ 21.0	123 ~ 152	1
3	M20 × 1.5	8.2 ~ 10.2	59.3 ~ 73.8	3
4	M22 × 1.5	10.2 ~ 12.2	73.8 ~ 88.5	2
5	M27 × 2	8.2 ~ 10.2	59.3 ~ 73.8	1

(2) WORKING PRINCIPLE



7615WE23

The remote control valve has bucket part and boom part, where bucket part has three positions, i.e. dump, neutral and roll back, and boom part has four positions, i.e. raise, hold, lower and float. There is solenoid positioning at boom raise, float and bucket roll back position. The flow is directed to P and returns from T. 1A, 1B, 2A, 2B and 2C are flow control port, which are connected to related control port of hydraulic main control valve, respectively.

When shifting the lever and pressing pin, pressure rod is pushed down, making the metering spring to push metering valve down to shut off the way between control cavity and return cavity, and making inlet cavity and control cavity connected. Then, the flow reaches one end of main control valve to push the valve to move, realizing spool operation.

At the same time, the flow in control cavity is exerted on the lower part of metering spool to keep balance with the force of metering spring. The control lever keeps in a certain position, with a certain spring force, which features as if a process of operation of a fixed reducing valve.

Spring force changes by angle of control lever: longer is the angle, stronger the spring force, higher the pressure in control cavity, and the push that main control valve receives is increased accordingly, i.e. the strike of main valve and operated angle of remote control valve handle is directly proportional, and proportional control is realized.

When control lever is shifted to the full raise or full roll-back position, a solenoid will work to set the control lever in the position. When control lever is shifted continuously in lower position through to float position, remote control valve will be locked since there is not solenoid positioning feature in the position, so pressure in control port increases, opening sequence valve inside the remote control valve to release pressure at 2C port of discharging orifice.

6) MOUNTING AND USING

- (1) When transporting, mounting, and storing the product, be careful that the product does not receive impacts that may damage the machined surface or flange face.
- (2) Never disassemble the product in a dusty place before assembling to machine to prevent dust from entering.
- (3) Check that rated pressure, sliding function, oil-way type and other features conform to system requirements.
- (4) Mounting plate and bracket should be level, mounting screws fastened in even torque, and the valves in good alignment.
- (5) Operating fluid should be clean, cleanliness meeting NAS 1638 10 grade and up.
- (6) Allowable oil temperature range: -20 ~ 80°C, normal oil temperature 50±5°C.

7) TROUBLESHOOTING

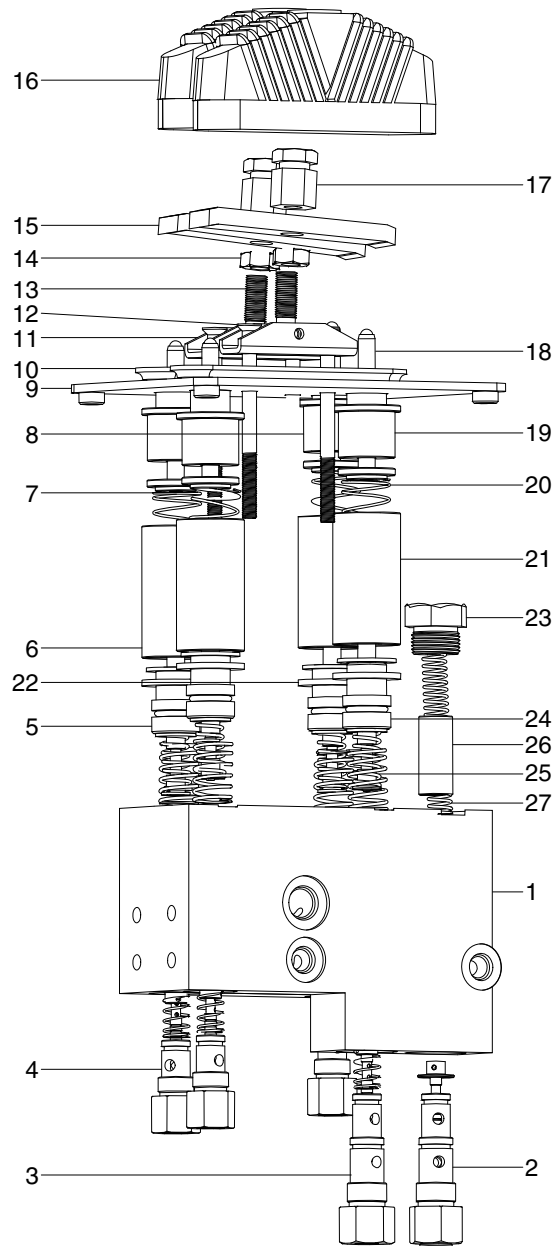
Problem	Cause	Remedy
Return failure	Deformed return spring of pilot valve.	Replace with new product.
	Dirt between pressure rod and bore.	Clean the parts.
Unreliable positioning	Insufficient suction force of solenoid.	Replace with new product.
	Circuit current and voltage do not meet requirements.	Repair.
	Dirt between solenoid and press plate.	Remove dirt.
	Clearance between press bar and rod is not adjusted appropriately.	Adjust to meet requirements.
Pilot valve control failure	Stuck metering spool or moving failure.	Check cleanliness of the fluid and clean valve spool and hole.
	Deformed metering spring.	Replace with new spring.
	Insufficient control flow or pressure.	Check control fluid supply system for normal operation.

8) NOTES IN DISASSEMBLY

- (1) Keep clean field for assembly. Dust and dirt shall be strictly prevented from entering the valves.
- (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.

4. REMOTE CONTROL VALVE (OPT, TWO LEVER TYPE)

1) STRUCTURE



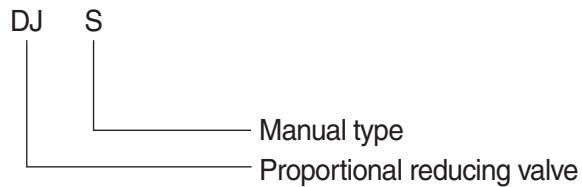
7615WE13

- | | | | | | |
|---|------------------------|----|--------------------|----|----------------|
| 1 | Valve body | 10 | Glue sheath seat | 19 | Electromagnet |
| 2 | Sequence valve assy | 11 | Bracket | 20 | Pressing plate |
| 3 | Metering unit 2 | 12 | Screw | 21 | Sleeve |
| 4 | Metering unit 1 | 13 | Bolt | 22 | Washer |
| 5 | Compression bar unit 1 | 14 | Nut | 23 | Plug screw |
| 6 | Washer | 15 | Mound layer | 24 | Valve bar unit |
| 7 | Spring | 16 | Rubber cover | 25 | Spring |
| 8 | Shaft sleeve | 17 | Nut | 26 | Guide sleeve |
| 9 | Mounting plate unit | 18 | Pressure pin group | 27 | Spring |

2) OVERVIEW

This product adopts two levers control and has solenoid positioning in raise, float and roll back position. Pressure delivery by remote control valve shows linear change, providing better speed regulation and wider speed regulating range. This product has become a main hydraulic element for working equipment of loaders.

3) MODEL DESCRIPTION

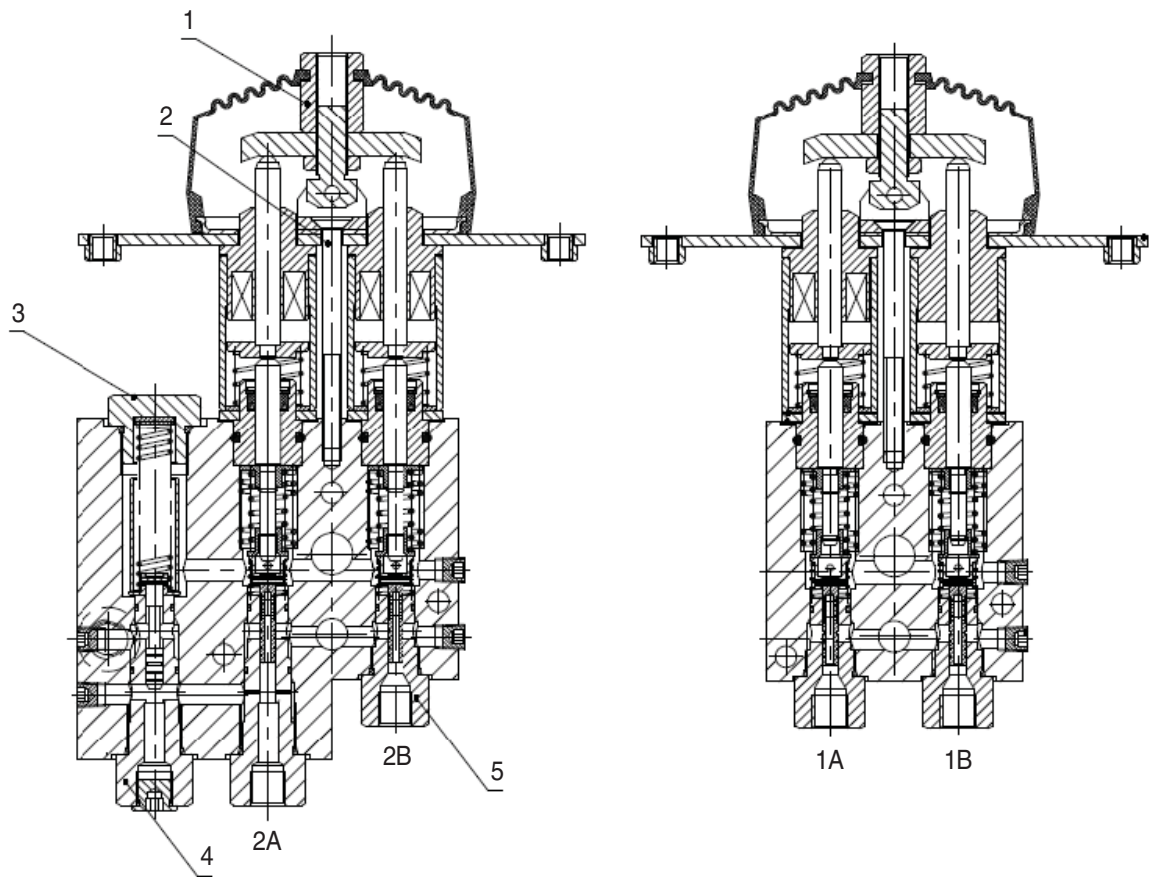


4) TECHNICAL DATA

Item	Unit	Specification
Nominal flow	ℓ /min	10
Maximum pressure	MPa	5
Pressure control range	MPa	0.5~2.5
Solenoid operating voltage	Voltage	DC 24V

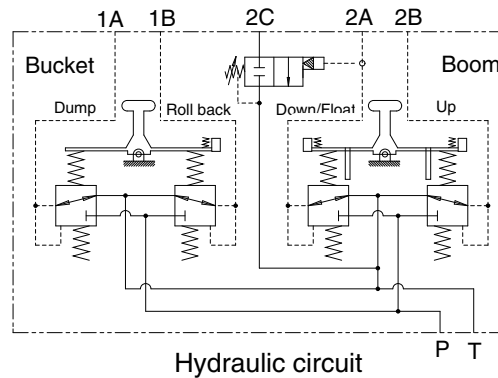
5) STRUCTURE AND WORKING PRINCIPLE

(1) STRUCTURE



Item	Size	Torque		Quantity
		kgf · m	lbf · ft	
1	M12	3.6 ~ 4.5	26.0 ~ 32.5	2
2	M8 × 95	2.2 ~ 3.0	15.9 ~ 21.7	2
3	M22 × 1.5	10.2 ~ 12.2	73.8 ~ 88.5	2
4	M20 × 1.5	8.2 ~ 10.2	59.3 ~ 73.8	3
5	M27 × 2	8.2 ~ 10.2	59.3 ~ 73.8	1

(2) WORKING PRINCIPLE



7615WE24

The remote control valve has bucket part and boom part, where bucket part has three positions, i.e. dump, neutral and roll back, and boom part has four positions, i.e. raise, hold, lower and float. There is solenoid positioning at boom raise, float and bucket roll back position. The flow is directed to P and returns from T. 1A, 1B, 2A, 2B and 2C are flow control port, which are connected to related control port of hydraulic main control valve, respectively.

When shifting the lever and pressing pin, pressure rod is pushed down, making the metering spring to push metering valve down to shut off the way between control cavity and return cavity, and making inlet cavity and control cavity connected. Then, the flow reaches one end of main control valve to push the valve to move, realizing spool operation.

At the same time, the flow in control cavity is exerted on the lower part of metering spool to keep balance with the force of metering spring. The control lever keeps in a certain position, with a certain spring force, which features as if a process of operation of a fixed reducing valve.

Spring force changes by angle of control lever: longer is the angle, stronger the spring force, higher the pressure in control cavity, and the push that main control valve receives is increased accordingly, i.e. the strike of main valve and operated angle of remote control valve handle is directly proportional, and proportional control is realized.

When control lever is shifted to the full raise or full roll-back position, a solenoid will work to set the control lever in the position. When control lever is shifted continuously in lower position through to float position, remote control valve will be locked since there is not solenoid positioning feature in the position, so pressure in control port increases, opening sequence valve inside the remote control valve to release pressure at 2C port of discharging orifice.

6) MOUNTING AND USING

- (1) When transporting, mounting, and storing the product, be careful that the product does not receive impacts that may damage the machined surface or flange face.
- (2) Never disassemble the product in a dusty place before assembling to machine to prevent dust from entering.
- (3) Check that rated pressure, sliding function, oil-way type and other features conform to system requirements.
- (4) Mounting plate and bracket should be level, mounting screws fastened in even torque, and the valves in good alignment.
- (5) Operating fluid should be clean, cleanliness meeting NAS 1638 10 grade and up.
- (6) Allowable oil temperature range: -20 ~ 80°C, normal oil temperature 50±5°C.

7) TROUBLESHOOTING

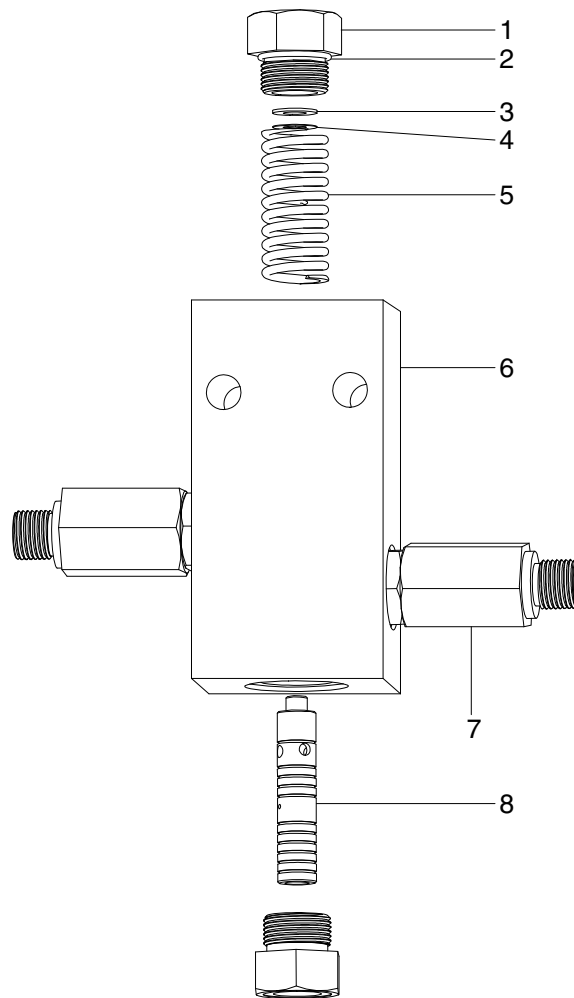
Problem	Cause	Remedy
Return failure	Deformed return spring of pilot valve.	Replace with new product.
	Dirt between pressure rod and bore.	Clean the parts.
Unreliable positioning	Insufficient suction force of solenoid.	Replace with new product.
	Circuit current and voltage do not meet requirements.	Repair.
	Dirt between solenoid and press plate.	Remove dirt.
	Clearance between press bar and rod is not adjusted appropriately.	Adjust to meet requirements.
Pilot valve control failure	Stuck metering spool or moving failure.	Check cleanliness of the fluid and clean valve spool and hole.
	Deformed metering spring.	Replace with new spring.
	Insufficient control flow or pressure.	Check control fluid supply system for normal operation.

8) NOTES IN DISASSEMBLY

- (1) Keep clean field for assembly. Dust and dirt shall be strictly prevented from entering the valves.
- (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.

5. PRESSURE SELECT VALVE

1) STRUCTURE



7615WE14

1 Fitting
2 O-ring
3 Adjusting shim

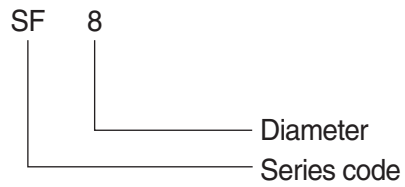
4 Thin shim
5 Spring
6 Valve body

7 Check valve
8 Spool

2) OVERVIEW

Pressure select valve is a hydraulic element developed for pilot control of wheel loader. this unit is installed inside oil control circuit to direct the flow into pilot valve and is used to lower the boom to the ground from a high position as engine suddenly dies.

3) MODEL DESCRIPTION

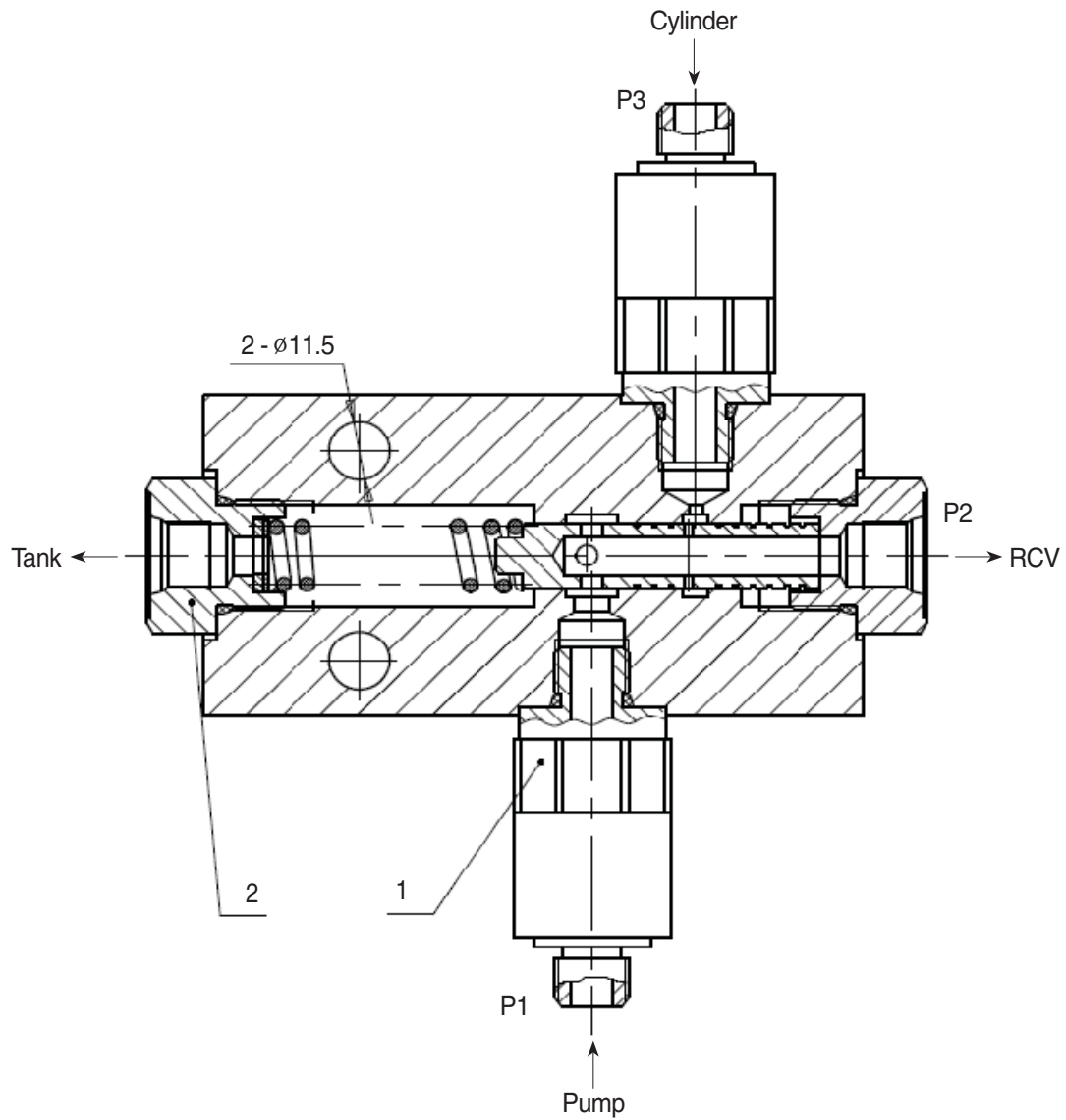


4) TECHNICAL DATA

Item	Unit	Specification
Nominal flow	ℓ / min	20
Nominal pressure	MPa	2.5

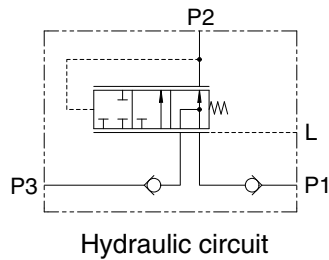
5) STRUCTURE AND WORKING PRINCIPLE

(1) STRUCTURE



Item	Size	Torque		Quantity
		kgf · m	lbf · ft	
1	M14 × 1.5	1.5 ~ 2.0	10.8 ~ 14.5	2
2	M22 × 1.5	5.1 ~ 7.1	36.9 ~ 51.4	2

(2) WORKING PRINCIPLE



7615WE25

Port P1 is connected to pilot pump, P2 to the inlet of remote control valve, P3 to large cavity of boom, and L returns. When pilot pump work normally, the flow from it is directed to P1, out from P2 after pressure reduction through internal cavity of valve lever, and then to remote control valve to perform control operation. The pressure of flow is generally set at 3 MPa (i.e., high pressure from P1 is reduced to 3 MPa and the flow runs out from P2). At the time, the way to large cavity of boom is cut off by check valve and thus P3 is blocked.

When engine dies, pilot pump does not supply fluid, and no pressure fluid is supplied from P1. When boom is in raise position, pressure fluid in large cavity push check valve to open and is exerted to P3 and directed to the inlet cavity of remote control valve and, when pilot valve is in hold position, then the way is blocked by pilot sliding valve. When pilot valve is in lower position, pressure fluid in P3 is connected, and directed to pilot valve after pressure reduction (Reduced pressure is approx. 1.5 MPa) to perform bucket dump and boom raising operation. At the time, the check valve at the other side shuts off the way of pilot pump.

6) MOUNTING AND USING

- (1) When transporting, mounting, and storing the product, be careful that the product does not receive impacts that may damage the machined surface or flange face.
- (2) Never disassemble the product in a dusty place before assembling to machine to prevent dust from entering.
- (3) Check that rated pressure, sliding function, oil-way type and other features conform to system requirements.
- (4) Mounting plate and bracket should be level, mounting screws fastened in even torque, and the valves should be in good alignment.
- (5) Operating fluid should be clean, cleanliness meeting NAS 1638 10 grade and up.
- (6) Allowable oil temperature range : -20 ~ 80°C, normal oil temperature 50 × 5°C.

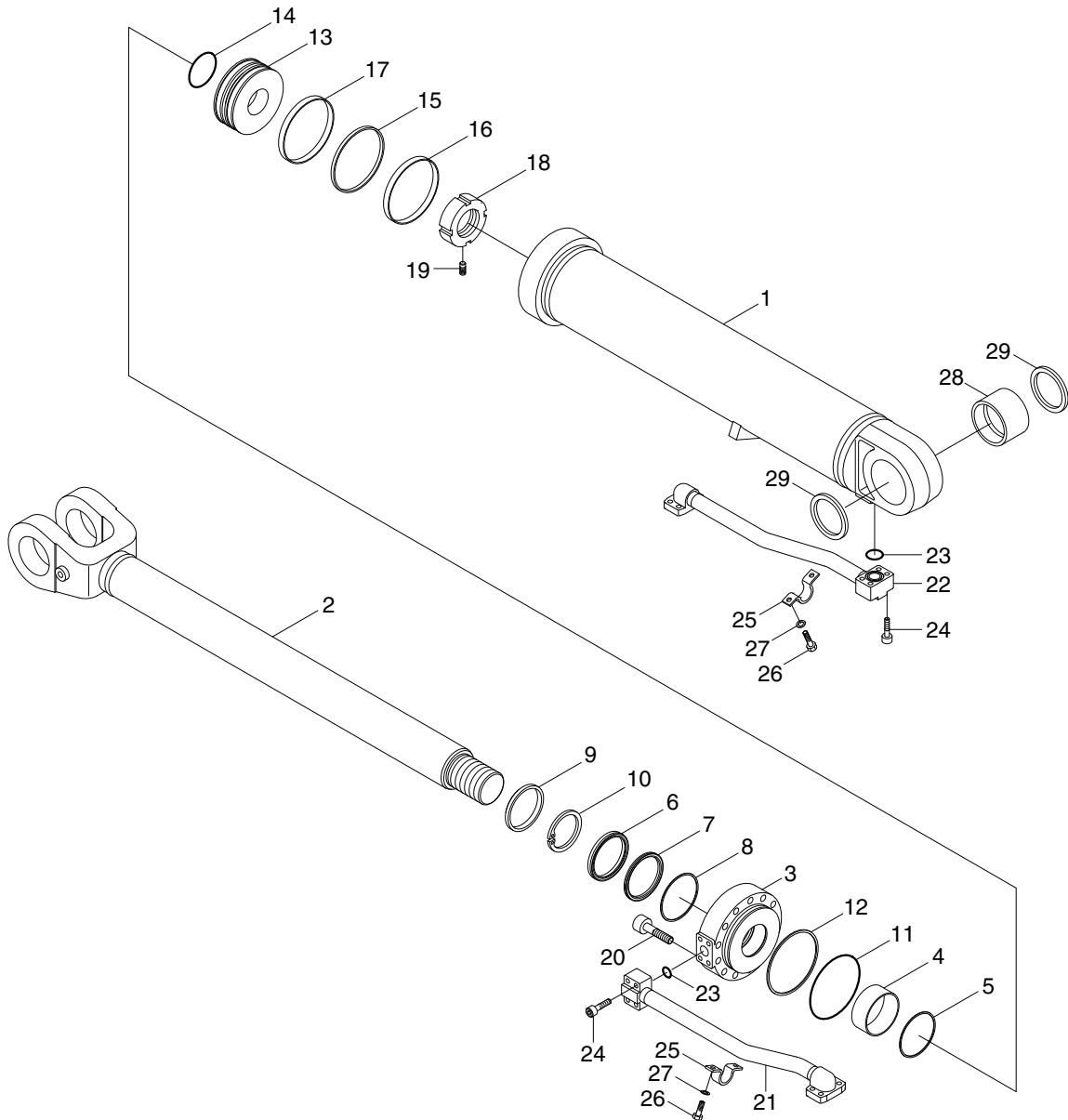
7) TROUBLESHOOTING

Problem	Cause	Remedy
External seeps and leaks	Damaged seal ring.	Replace with new product.
	Loose fastening pieces.	Fasten up related fastening pieces.
Unstable P2 port	Stuck spool or unsmooth moving.	Check fluid for cleanness, and clean spool and valve hole.
	Deformed spring.	Change spring.

8) NOTES IN DISASSEMBLY

- (1) Keep clean field for assembly. Dust and dirt shall be strictly prevented from entering the valves.
- (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.

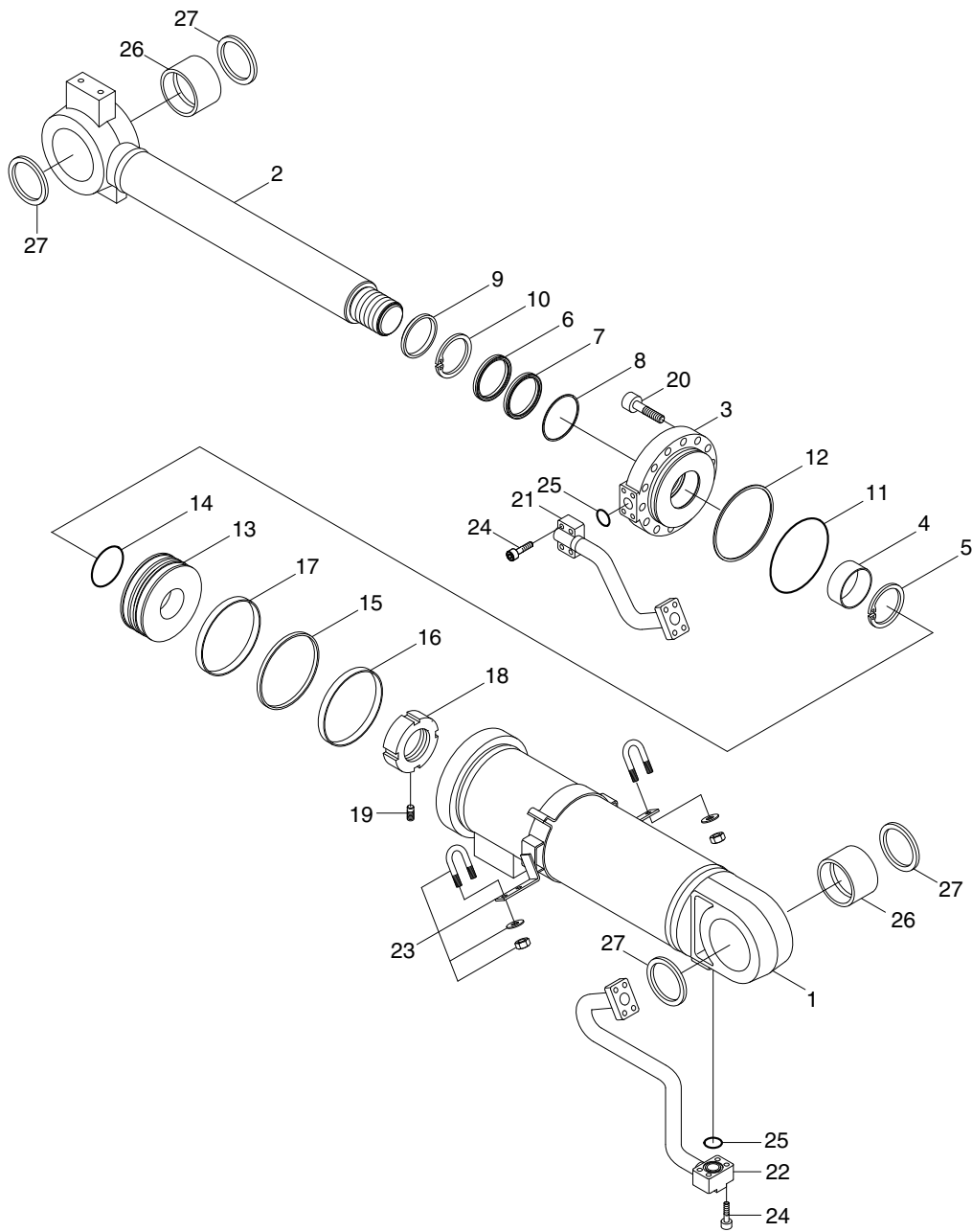
6. BOOM CYLINDER



7615WE26

- | | | | | | |
|----|---------------|----|--------------|----|---------------|
| 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 | | |

7. BUCKET CYLINDER



7615WE28

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