

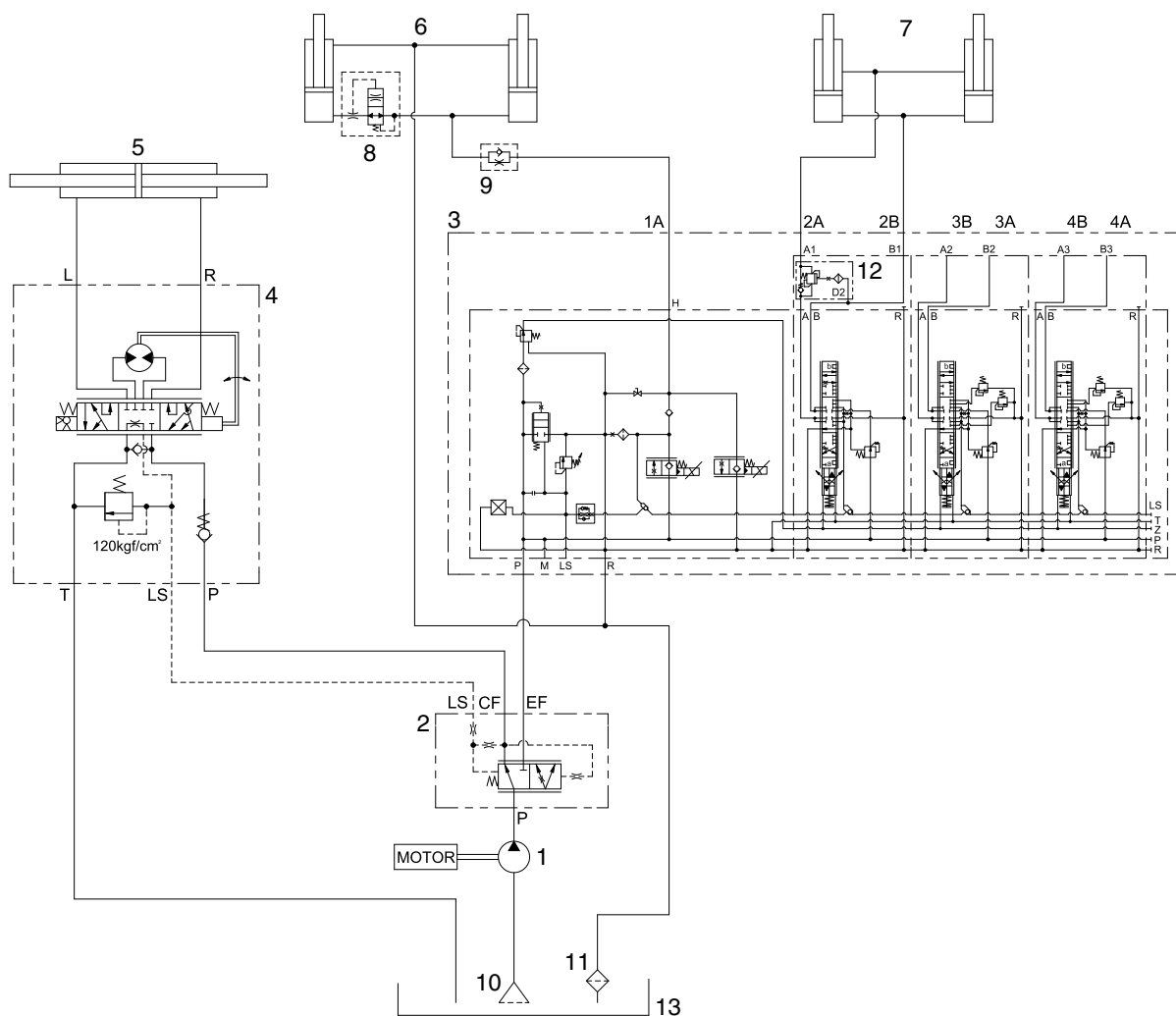
SECTION 6 HYDRAULIC SYSTEM

Group 1	Structure and function	6-1
Group 2	Operational checks and troubleshooting	6-17
Group 3	Disassembly and assembly	6-21

GROUP 1 STRUCTURE AND FUNCTION

1	Hydraulic gear pump	7	Tilt cylinder
2	Priority valve	8	Down safety valve
3	Main control valve	9	Down flow regulator
4	Steering unit	10	Suction strainer
5	Steering cylinder	11	Return filter
6	Lift cylinder	12	Hydraulic oil tank

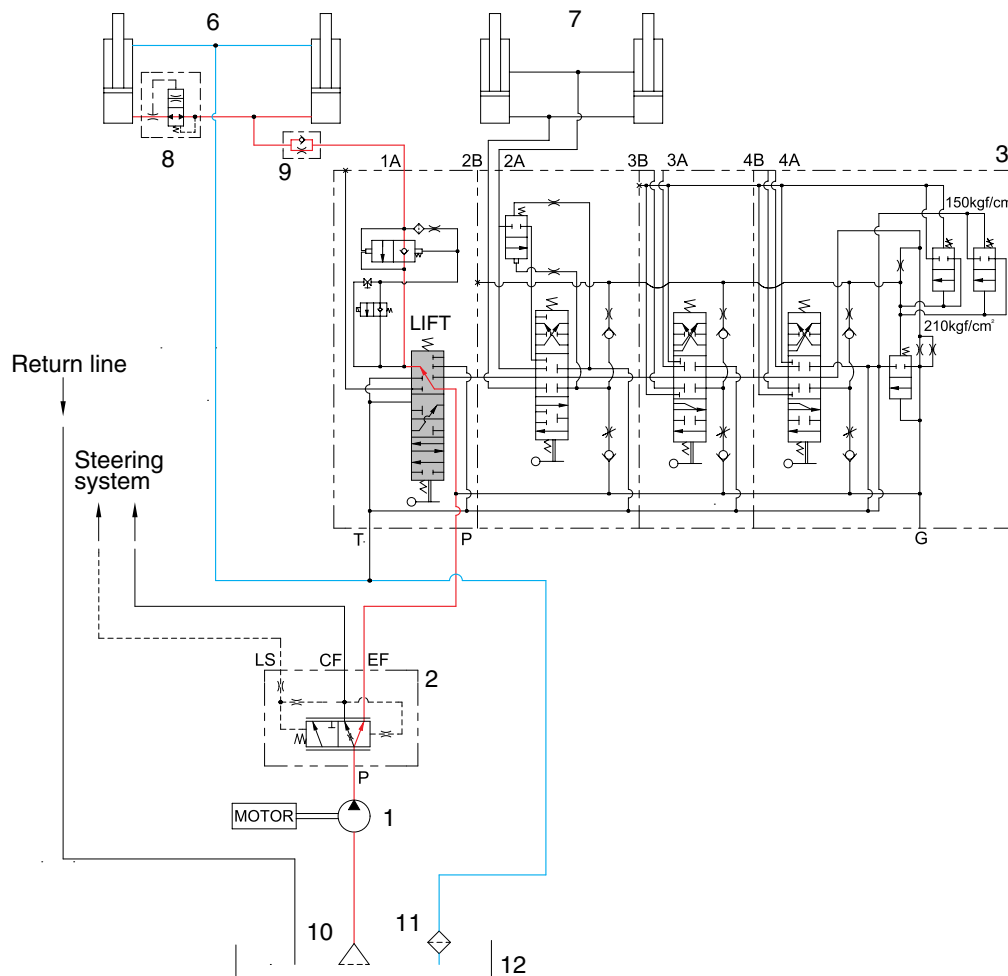
HYDRAULIC CIRCUIT (FINGERTIP TYPE)



40B9HS01

- | | |
|-----------------------|-----------------------|
| 1 Hydraulic gear pump | 8 Down safety valve |
| 2 Priority valve | 9 Down flow regulator |
| 3 Main control valve | 10 Suction strainer |
| 4 Steering unit | 11 Return filter |
| 5 Steering cylinder | 12 Auto tilt manifold |
| 6 Lift cylinder | 13 Hydraulic oil tank |
| 7 Tilt cylinder | |

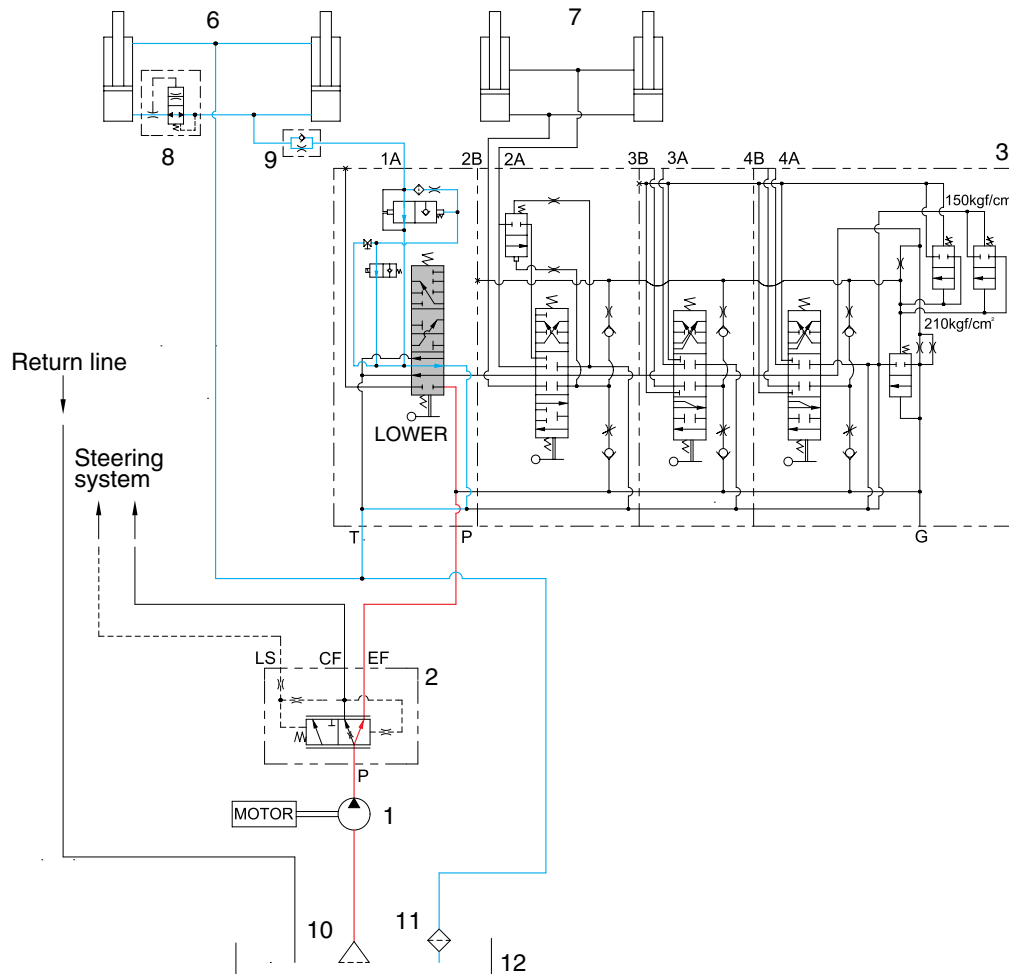
1) WHEN THE LIFT CONTROL LEVER IS IN THE LIFT POSITION



35B7HS02

When the lift control lever is pulled back, the spool on the first block is moves to lift position. The oil from hydraulic gear pump (1) flows into main control valve (3) and then goes to the large chamber of lift cylinder (6). The oil from the small chamber of lift cylinder (6) returns to hydraulic oil tank (12) at the same time. When this happens, the forks go up.

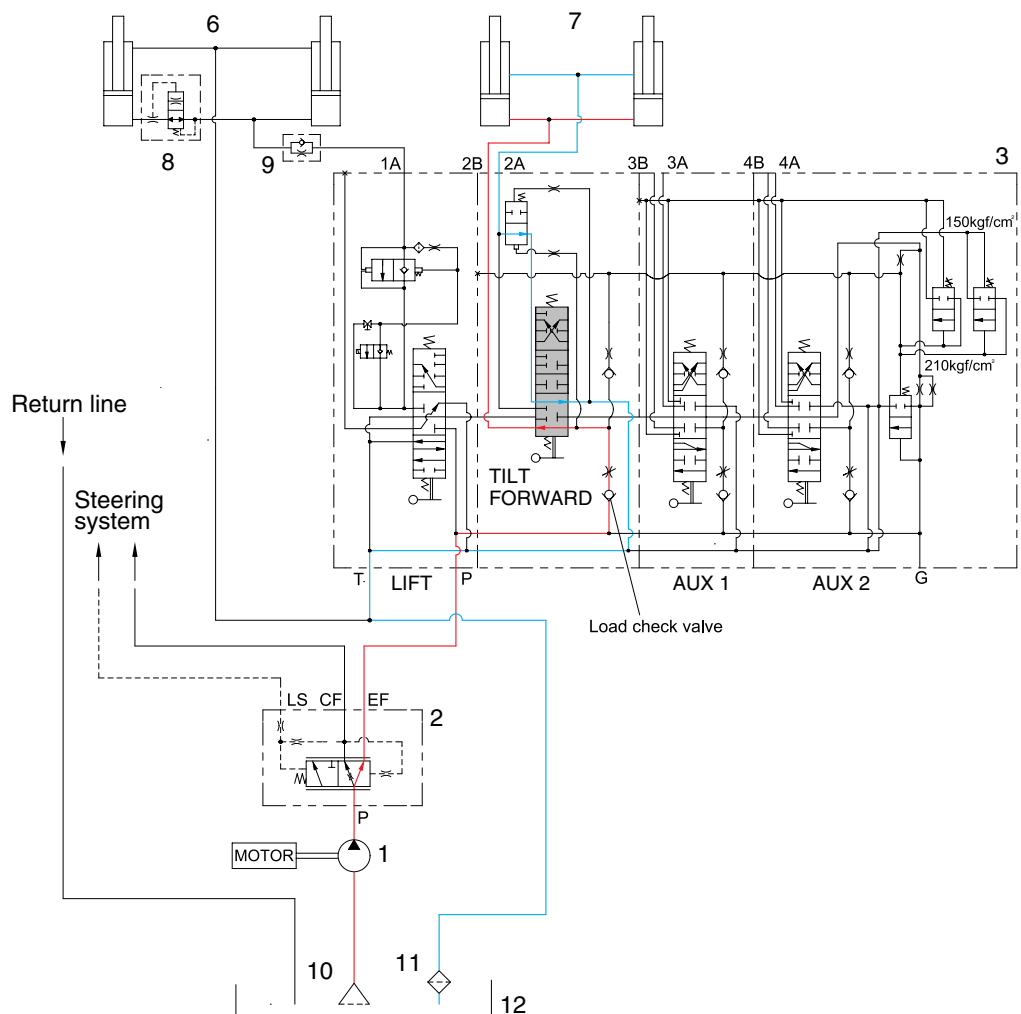
2) WHEN THE LIFT CONTROL LEVER IS IN THE LOWER POSITION



35B7HS03

When the lift control lever is pushed forward, the spool on the first block is moved to lower position. The work port(1A) and the small chamber and the large chamber are connected to the return passage, so the forks will be lowered due to its own weight.

3) WHEN THE TILT CONTROL LEVER IS IN THE FORWARD POSITION



35B7HS04

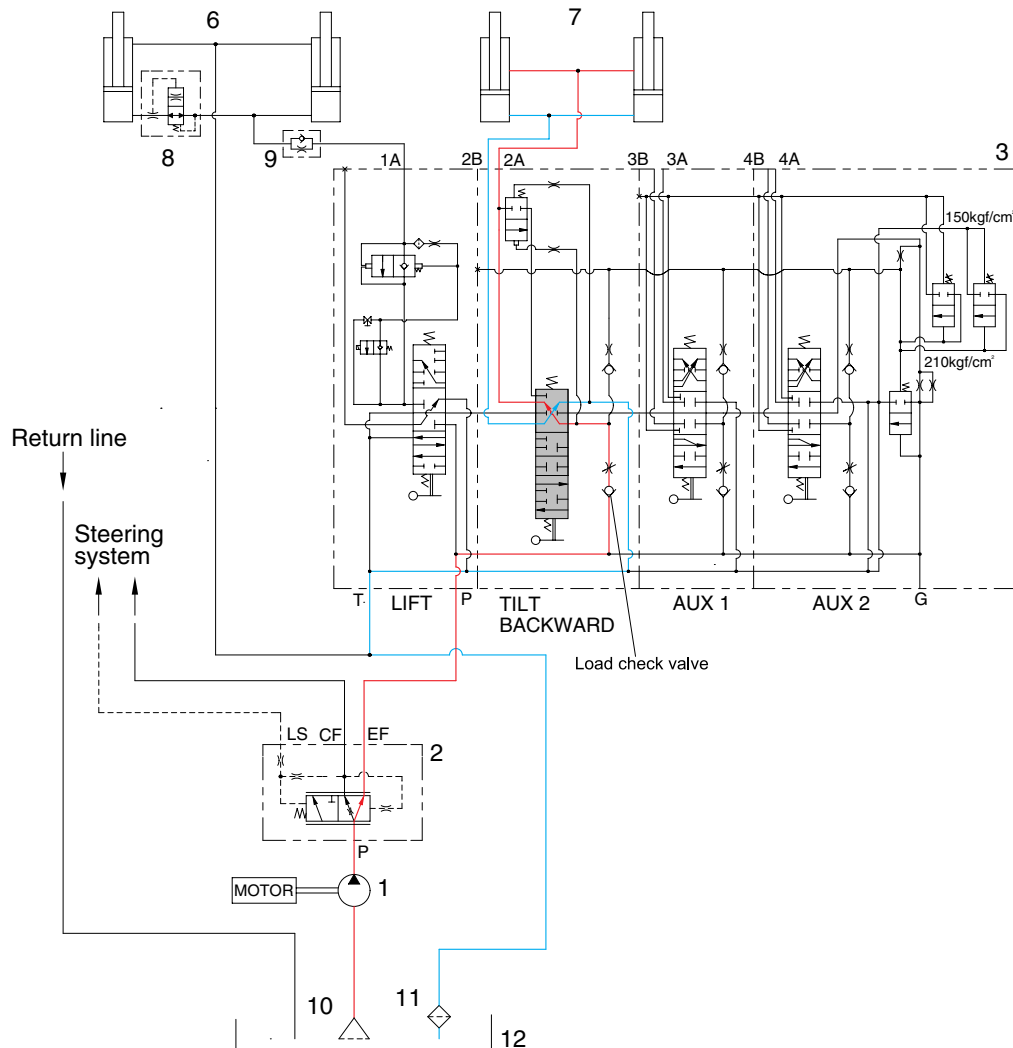
When the tilt control lever is pushed forward, the spool on the second block is moved to tilt forward position.

The oil from hydraulic gear pump (1) flows into main control valve (3) and then goes to the large chamber of tilt cylinder (7) by pushing the load check valve of the spool.

The oil at the small chamber of tilt cylinder (7) returns to hydraulic tank (12) at the same time.

When this happens, the mast tilt forward.

4) WHEN THE TILT CONTROL LEVER IS IN THE BACKWARD POSITION



35B7HS05

When the tilt control lever is pulled back, the spool on the second block is moved to tilt backward position.

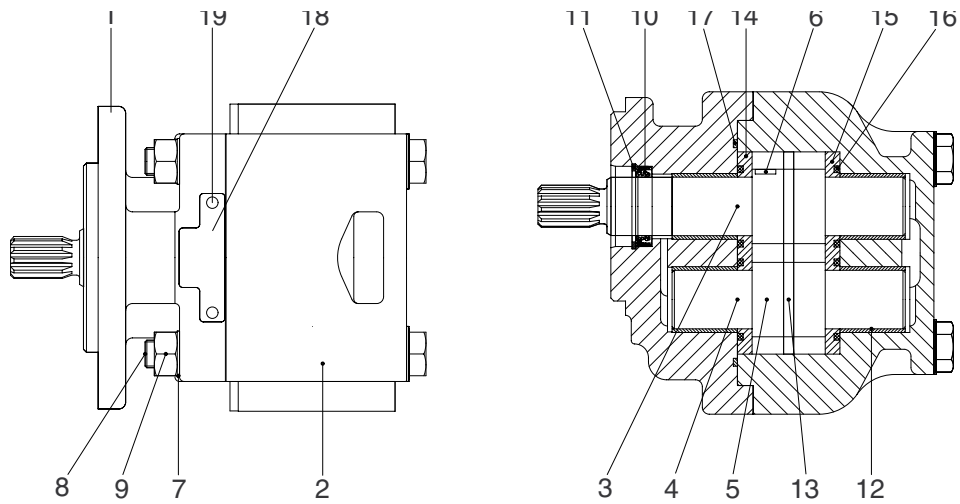
The oil from hydraulic gear pump (1) flows into main control valve (3) and then goes to the small chamber of tilt cylinder (7) by pushing the load check valve of spool.

The oil at the large chamber of tilt cylinder (7) returns to hydraulic tank (12) at the same time.

When this happens, the mast tilt backward.

2. HYDRAULIC GEAR PUMP

1) STRUCTURE

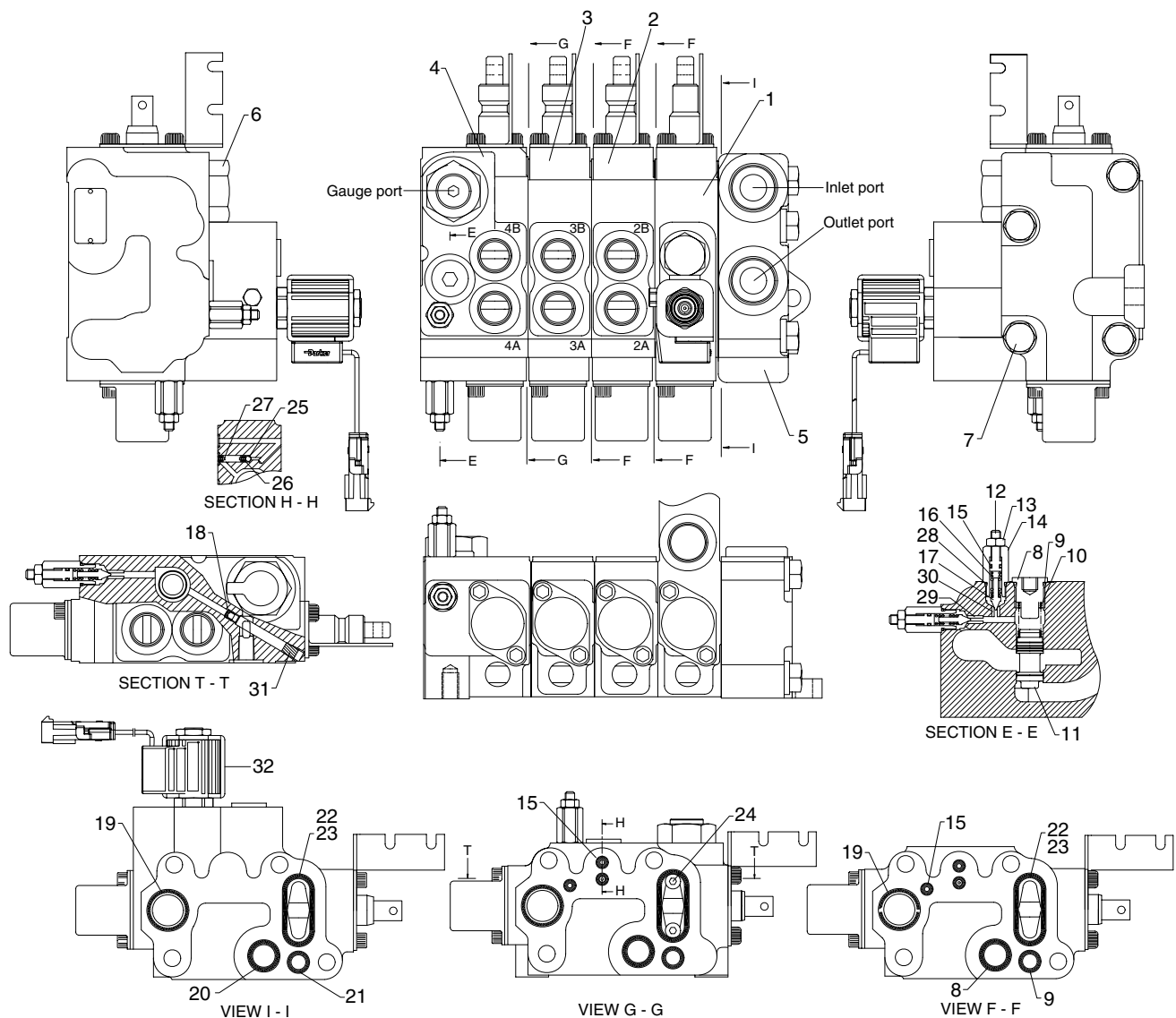


- | | | |
|-----------------|-----------------|---------------|
| 1 Flange | 8 Screw | 14 Plate |
| 2 Body | 9 Nut | 15 Seal |
| 3 Drive gear | 10 Lip seal | 16 Seal |
| 4 Driven gear | 11 Circlip | 17 Seal |
| 5 Floating gear | 12 Bushing | 18 Name plate |
| 6 Key | 13 Center plate | 19 Screw |
| 7 Washer | | |

35B7HS06

3. MAIN CONTROL VALVE

1) STRUCTURE (4- Spool)



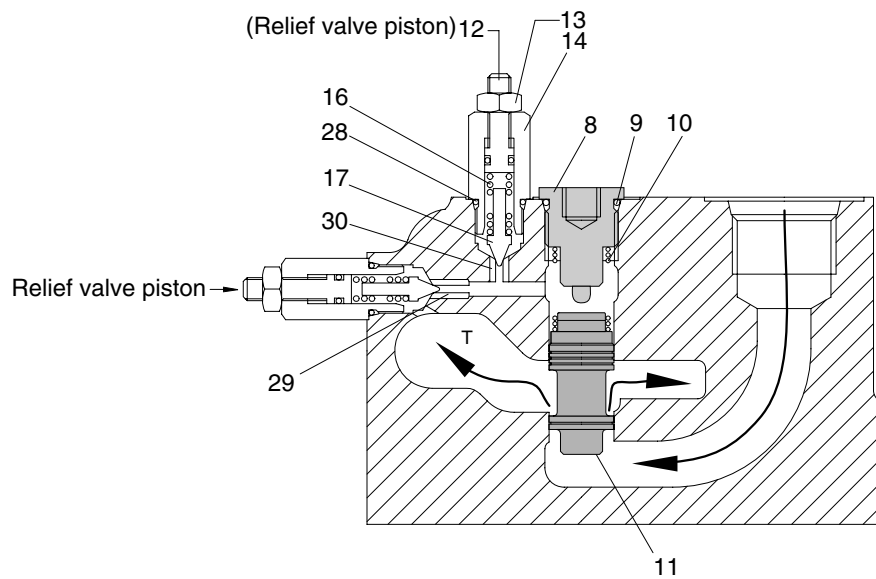
Port name	Size	Port name	Size
2A, 2B, 3A, 3B, 4A, 4B	3/4-16UNF-2B	Inlet port	1-1/16-12UNF-2B
Gauge port	PF1/4	Outlet port	1-1/16-12UNF-2B

35B7HS07

- | | | |
|---------------------|------------------|--------------------------|
| 1 Lift block assy | 12 Relief piston | 22 O-ring |
| 2 Tilt block assy | 13 Nut | 23 O-ring, retainer |
| 3 Aux1 block assy | 14 Relief plug | 24 Plug |
| 4 Aux2 block assy | 15 O-ring | 25 Steel ball |
| 5 T cover | 16 Relief spring | 26 Load sensor spring |
| 6 Gauge plug assy | 17 Pilot poppet | 27 Load sensor spring |
| 7 Long bolt | 18 Plug | 28 O-ring |
| 8 Hydrostat plug | 19 O-ring | 29 System relief seat |
| 9 O-ring | 20 O-ring | 30 Secondary relief seat |
| 10 Hydrostat spring | 21 O-ring | 32 Solenoid valve assy |
| 11 Hydrostat sleeve | | |

2) INLET SECTION OPERATION

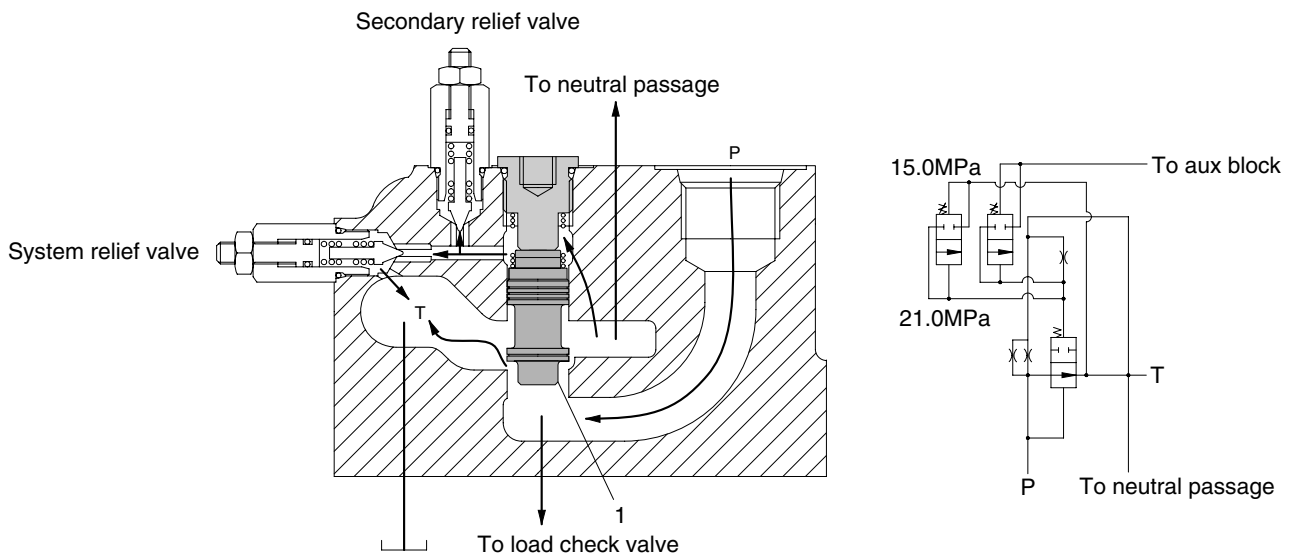
(1) Structure and description



20D7HS08

- | | | | |
|----|------------------|----|-----------------------|
| 8 | Hydrostat plug | 14 | Relief plug |
| 9 | O-ring | 16 | Relief spring |
| 10 | Hydrostat spring | 17 | Pilot poppet |
| 11 | Hydrostat sleeve | 28 | O-ring |
| 12 | Relief piston | 29 | System relief seat |
| 13 | Nut | 30 | Secondary relief seat |

(2) Operation



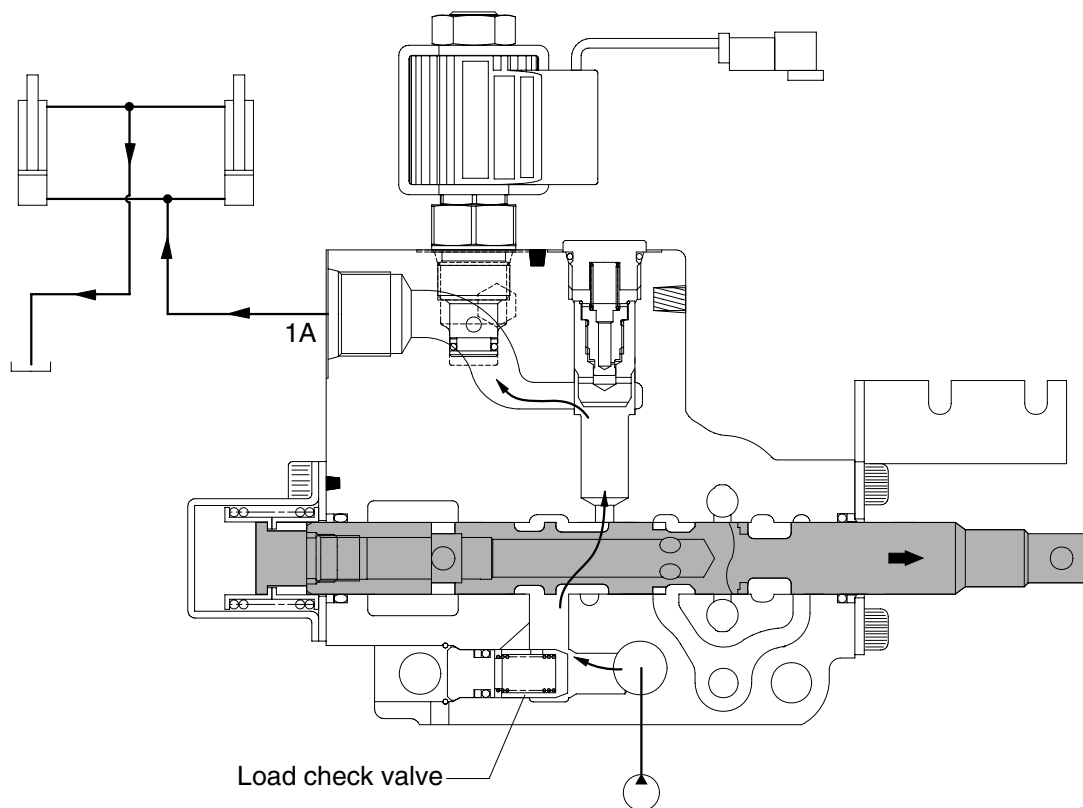
35B7HS15

Oil flows from P (pump) port to reservoir (T) by pushing hydrostat spool (1).

Before the center bypass line closed, hydrostat spool is keep opening, so pump port (P) and tank port (T) are always connected in operation to minimize heat generation.

3) LIFT SECTION OPERATION

(1) Lift position



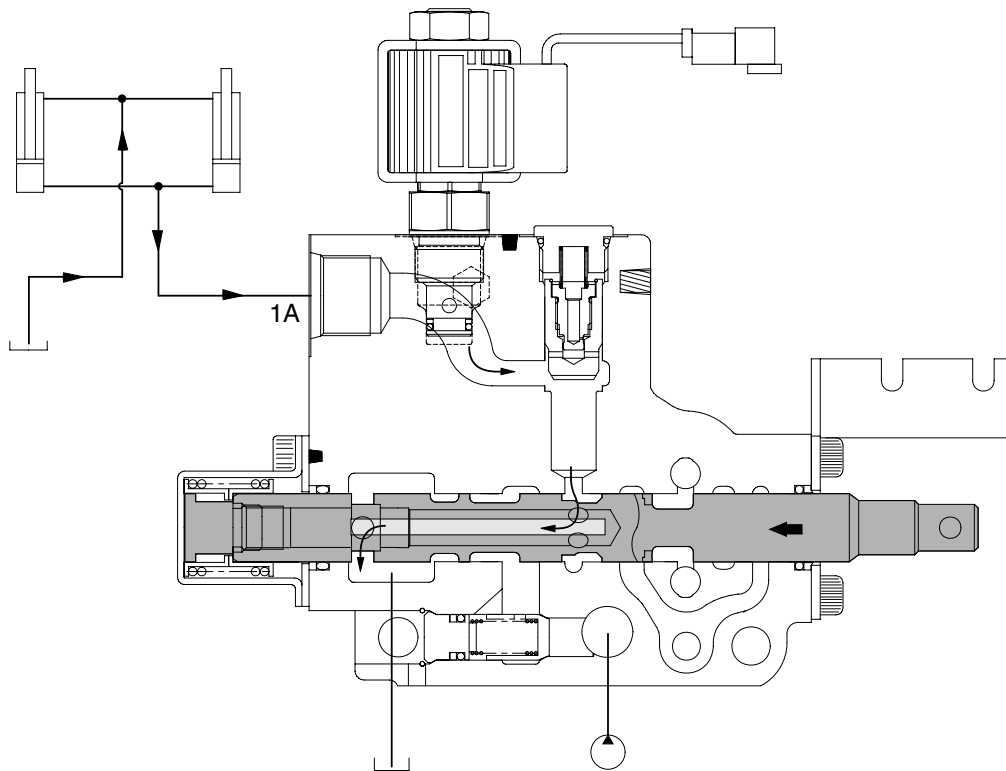
When the lift control lever is pulled back, the spool moves to the right and the neutral passage is closed.

The oil supplied from the pump pushes up the load check valve and flow into lift cylinder port (1A).

The pump pressure reaches proportionally the load of cylinder and fine control finished by shut off of the neutral passage.

The return oil from cylinder flows into the tank.

(2) Lower position



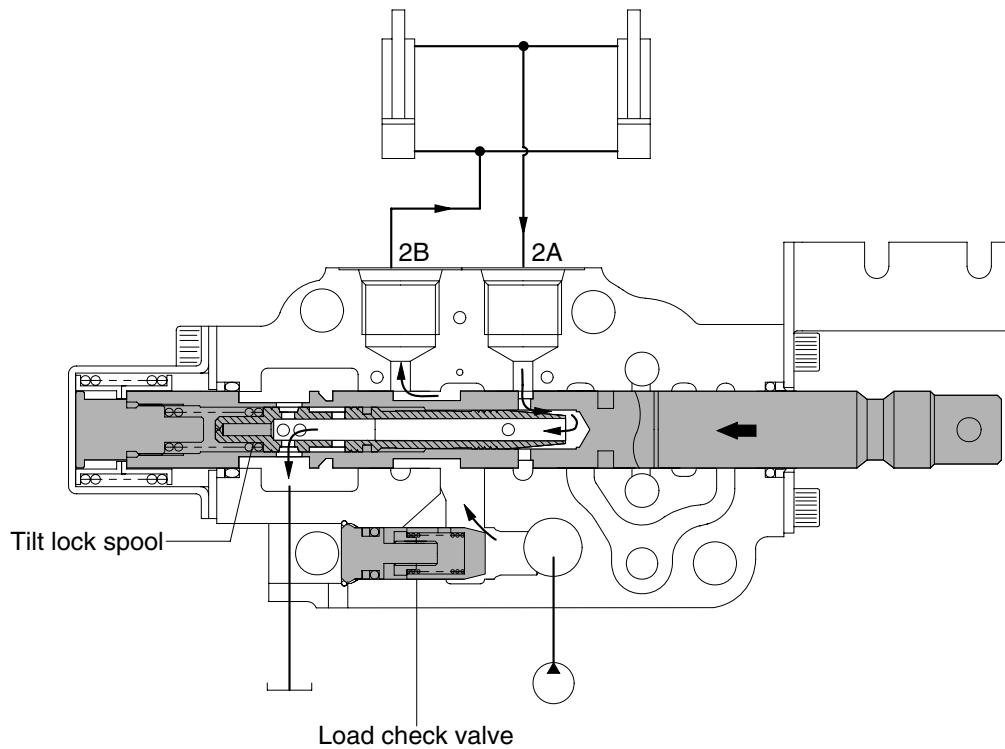
35B7HS10

When the lift control lever is pushed forward, the spool moves to the left and the neutral passage is closed.

The spool moves to the lift lower position, opening up the neutral passage to tank and (1A) → T. In lift lower position the fork drops due to its own weight.

4) TILT SECTION OPERATION

(1) Tilt forward position



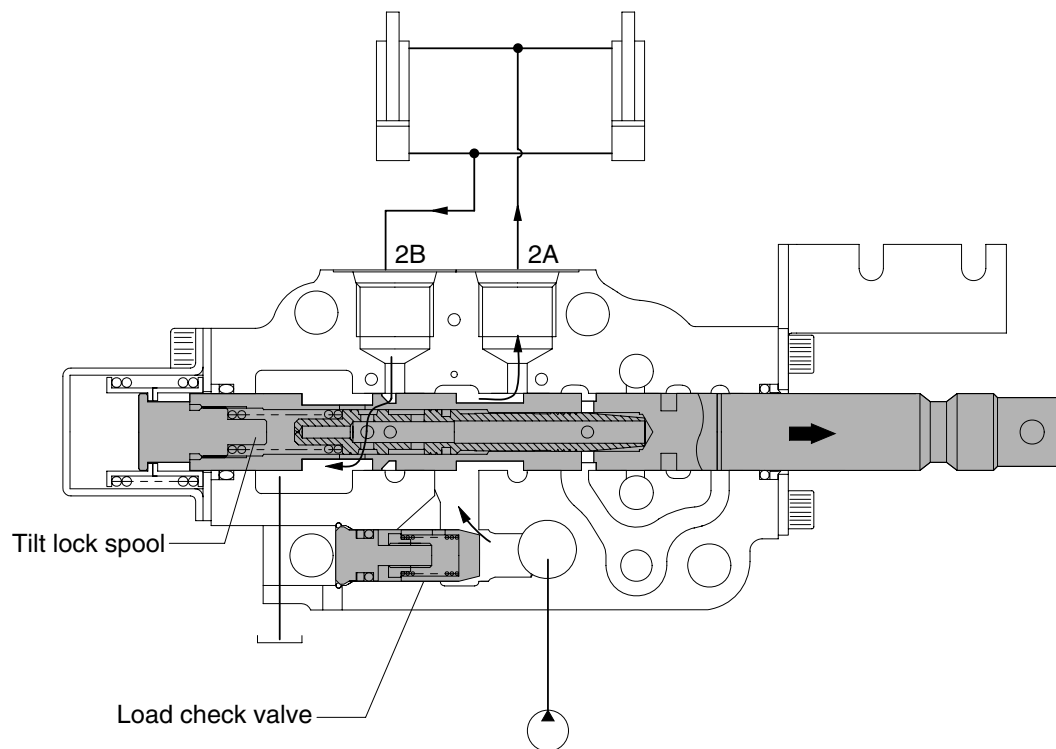
35B7HS11

When the tilt control lever is pushed forward, the spool moves to the left and the neutral passage is closed.

The oil supplied from the pump pushes up the load check valve and flow into tilt cylinder port (2B). The pump pressure reaches proportionally the load of cylinders and fine control finished by closing the neutral passage.

The return oil from cylinder port (2A) flows into the tank through the hole of the tilt lock spool.

(2) Tilt backward position



35B7HS12

When the tilt control lever is pulled back, the spool moves to the right and the neutral passage is closed.

The oil supplied from the pump pushes up the load check valve and flows into tilt cylinder port (2A). The pump pressure reaches proportionally the load of cylinder and fine control finished by shut off of the neutral passage.

The return oil from cylinder port (2B) flows into the tank via the low pressure passage.

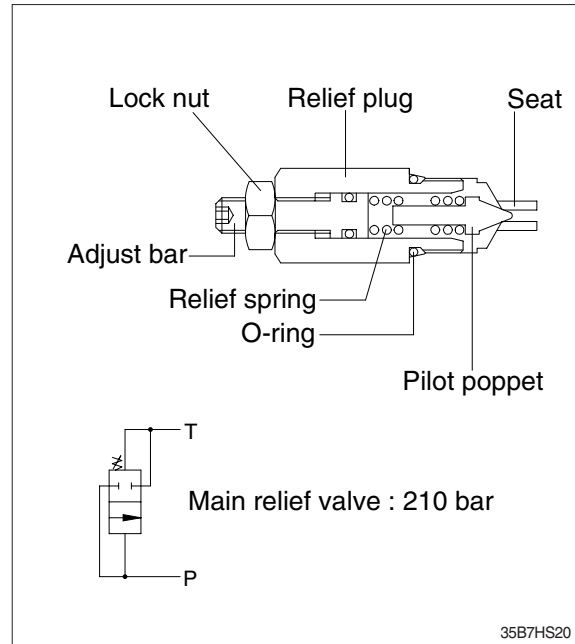
5) MAIN RELIEF VALVE

(1) Pressure setting

A good pressure gauge must be installed in the line which is in communication with the work port relief. A load must be applied in a manner to reach the set pressure of the relief unit.

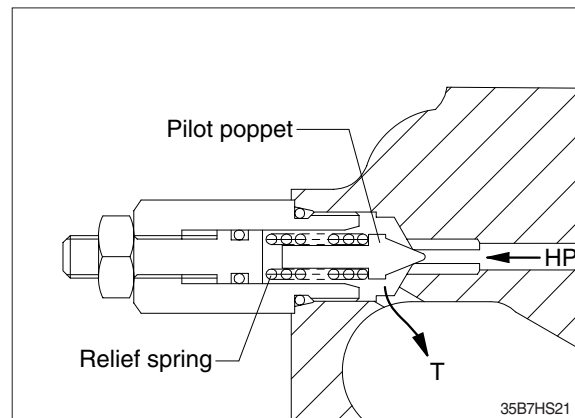
Procedure

- ① Loosen lock nut.
- ② Set adjusting bar to desired pressure setting.
- ③ Tighten lock nut.
- ④ Retest in similar manner as above.

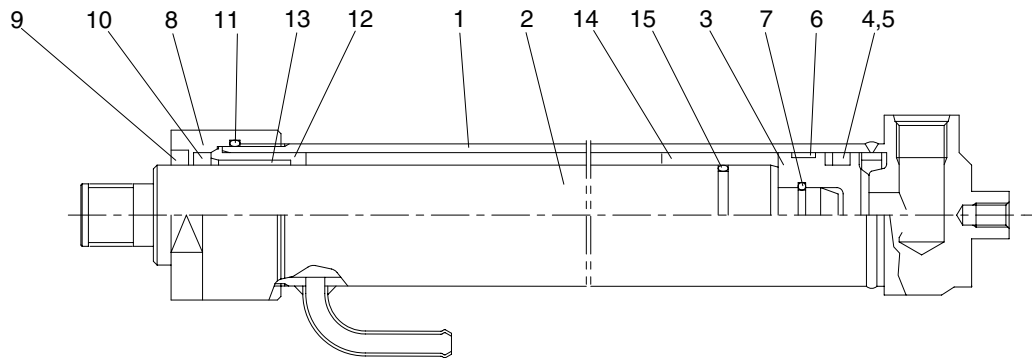


(2) Operation

Pressurized oil over the relief pressure pushes pilot poppet and flows to tank passage, therefore the system pressure keeps under the adjusted relief pressure.



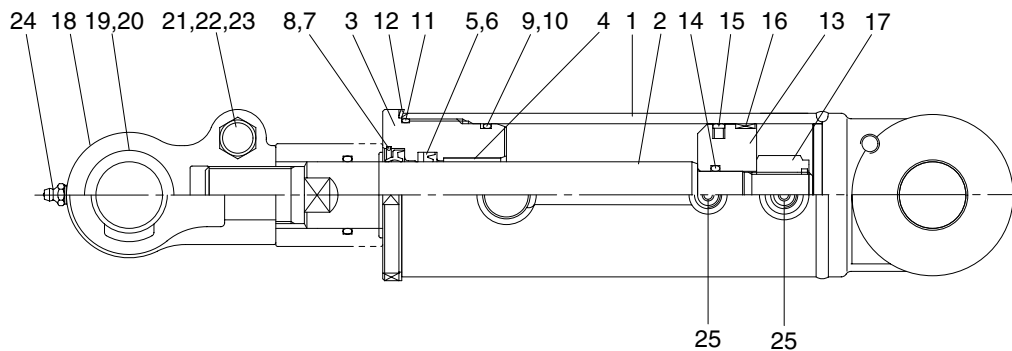
4. LIFT CYLINDER



D255HS18

- | | | |
|-----------------|------------------|---------------|
| 1 Tube assembly | 6 Wear ring | 11 O-ring |
| 2 Rod | 7 Retaining ring | 12 Guide |
| 3 Piston | 8 Gland | 13 DU bushing |
| 4 Piston seal | 9 Dust wiper | 14 Spacer |
| 5 Back up ring | 10 Rod seal | 15 O-ring |

5. TILT CYLINDER



35B7HS25

- | | | |
|-----------------|-----------------|----------------------|
| 1 Tube assembly | 10 Back up ring | 18 Rod eye |
| 2 Rod | 11 Lock washer | 19 Spherical bearing |
| 3 Gland | 12 Washer | 20 Retaining ring |
| 4 Du bushing | 13 Piston | 21 Hexagon bolt |
| 5 Rod seal | 14 O-ring | 22 Hexagon nut |
| 6 Back up ring | 15 Back up ring | 23 Spring washer |
| 7 Dust wiper | 16 Wear ring | 24 Grease nipple |
| 8 Snap ring | 17 Nylon nut | 25 O-ring |
| 9 O-ring | | |

GROUP 2 OPERATIONAL CHECKS AND TROUBLESHOOTING

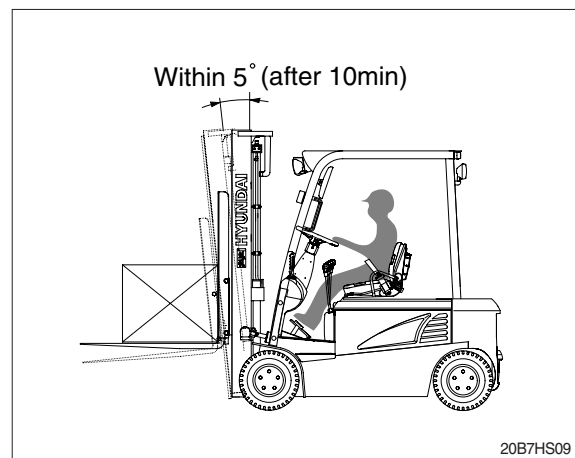
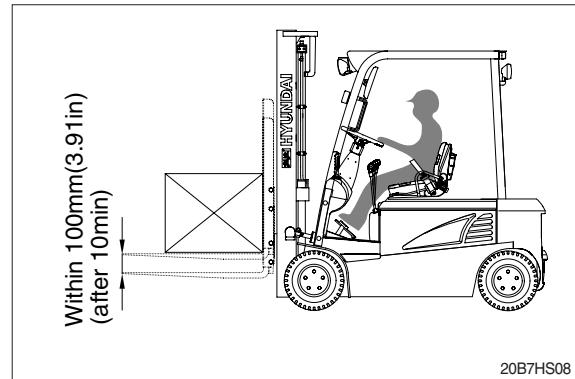
1. OPERATIONAL CHECKS

1) CHECK ITEM

- (1) Check visually for deformation, cracks or damage of rod.
- (2) Set mast vertical and raise 1 m from ground. Wait for 10 minutes and measure hydraulic drift (amount forks move down and amount mast tilts forward).
 - Check condition
 - Hydraulic oil : Normal operating temp (50°C)
 - Mast substantially vertical.
 - Rated capacity load.
 - Hydraulic drift
 - Down (Downward movement of forks)
: Within 100 mm (3.9 in)
 - Forward (Extension of tilt cylinder)
: Within 5°
- (3) If the hydraulic drift is more than the specified value, replace the control valve or cylinder packing.
Check that clearance between tilt cylinder bushing and mounting pin is within standard range.

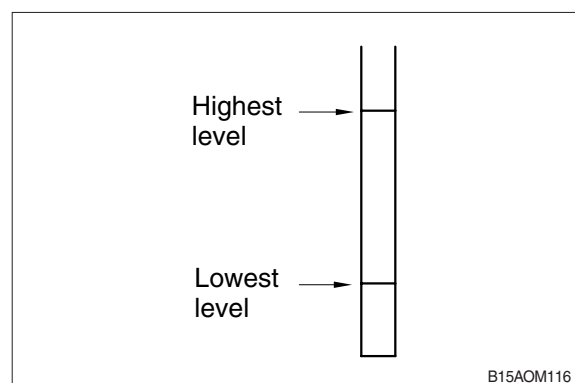
mm (in)

Standard	Under 0.6 (0.02)
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2) HYDRAULIC OIL

- (1) Using dipstick, measure oil level, and oil if necessary.
- (2) When changing hydraulic oil, clean suction strainer (screwed into outlet port pipe) and line filter (screwed into inlet pipe). Line filter uses paper element, so replace periodically (every 6 months or 1000 hours)



3) CONTROL VALVE

- (1) Raise forks to maximum height and measure oil pressure.
Check that oil pressure is 210kgf/cm².
(2990 psi)

2. TROUBLESHOOTING

1) SYSTEM

Problem	Cause	Remedy
Large fork lowering speed	- Seal inside control valve defective. - Oil leaks from joint or hose. - Seal inside cylinder defective.	- Replace spool or valve body. - Replace. - Replace packing.
Large spontaneous tilt of mast	- Tilting backward : Check valve defective. - Tilting forward : tilt lock valve defective. - Oil leaks from joint or hose. - Seal inside cylinder defective.	- Clean or replace. - Clean or replace. - Replace. - Replace seal.
Slow fork lifting or slow mast tilting	- Lack of hydraulic oil. - Hydraulic oil mixed with air. - Oil leaks from joint or hose. - Excessive restriction of oil flow on pump suction side. - Relief valve fails to keep specified pressure. - Poor sealing inside cylinder. - High hydraulic oil viscosity. - Mast fails to move smoothly. - Oil leaks from lift control valve spool. - Oil leaks from tilt control valve spool.	- Add oil. - Bleed air. - Replace. - Clean filter. - Adjust relief valve. - Replace packing. - Change to ISO VG46. - Adjust roll to rail clearance. - Replace spool or valve body. - Replace spool or valve body.
Hydraulic system makes abnormal sounds	- Excessive restriction of oil flow pump suction side. - Gear or bearing in hydraulic pump defective.	- Clean filter. - Replace gear or bearing.
Control valve lever is locked	- Foreign matter jammed between spool and valve body. - Valve body defective.	- Clean. - Tighten body mounting bolts uniformly.
High oil temperature	- Lack of hydraulic oil. - High oil viscosity. - Oil filter clogged.	- Add oil. - Change to ISO VG46. - Clean filter.

2) HYDRAULIC GEAR PUMP

Problem	Cause	Remedy
Pump does not develop full pressure	• System relief valve set too low or leaking. • Oil viscosity too low. • Pump is worn out.	• Check system relief valve for proper setting. • Change to proper viscosity oil. • Repair or replace pump.
Pump will not pump oil	• Reservoir low or empty. • Suction strainer clogged.	• Fill reservoir to proper level. • Clean suction strainer.
Noisy pump caused by cavitation	• Oil too thick. • Oil filter plugged. • Suction line plugged or too small.	• Change to proper viscosity. • Clean filters. • Clean line and check for proper size.
Oil heating	• Oil supply low. • Contaminated oil. • Setting of relief valve too high or too low. • Oil viscosity too low.	• Fill reservoir to proper level. • Drain reservoir and refill with clean oil. • Set to correct pressure. • Drain reservoir and fill with proper viscosity.
Foaming oil	• Low oil level. • Air leaking into suction line. • Wrong kind of oil.	• Fill reservoir to proper level. • Tighten fittings, check condition of line. • Drain reservoir, fill with non-foaming oil.
Shaft seal leakage	• Worn shaft seal. • Worn shaft in seal area.	• Replace shaft seal. • Replace drive shaft and seal.

3) MAIN RELIEF VALVE

Problem	Cause	Remedy
Can't get pressure	• Poppet D, E or K stuck open or contamination under seat.	• Check for foreign matter between poppets D, E or K and their mating parts. Parts must slide freely.
Erratic pressure	• Pilot poppet seat damaged. • Poppet C sticking in D.	• Replace the relief valve. • Clean and remove surface marks for free movement.
Pressure setting not correct	• Normal wear. Lock nut & adjust screw loose.	• See *Test of main control valve.
Leaks	• Damaged seats. • Worn O-rings. • Parts sticking due to contamination.	• Replace the relief valve. • Install seal and spring kit. • Disassemble and clean.

★ A good pressure gauge must be installed in the line which is in communication with the main relief. A load must be applied in a manner to reach the set pressure of the main relief unit.

Then, follow these steps:

- Loosen lock nut.
- Set adjusting nut to desired pressure setting.
- If desired pressure setting cannot be achieved, add or remove shims as required.
- Tighten lock nut.
- Retest in similar manner as above.

4) LIFT CYLINDER

Problem	Cause	Remedy
Oil leaks out from rod cover through rod	• Foreign matters on packing. • Unallowable score on rod. • Unusual distortion of dust seal. • Chrome plating is striped.	• Replace packing. • Smooth rod surface with an oil stone. • Replace dust seal. • Replace rod.
Oil leaks out from cylinder rod cover thread	• O-ring damaged.	• Replace O-ring.
Rod spontaneously retract	• Scores on inner surface of tube. • Unallowable score on the inner surface of tube. • Foreign matters in piston seal.	• Smooth rod surface with an oil stone. • Replace cylinder tube. • Replace piston seal.
Wear (clearance between cylinder tube and wear ring)	• Excessive clearance between cylinder tube and wear ring.	• Replace wear ring.
Abnormal noise is produced during tilting operation	• Insufficient lubrication of anchor pin or worn bushing and pin. • Bent tilt cylinder rod.	• Lubricate or replace. • Replace.

GROUP 3 DISASSEMBLY AND ASSEMBLY

1. HYDRAULIC GEAR PUMP

1) DISASSEMBLY

- (1) Put the unit back side down to your work place.



- (2) Remove all fasteners, bolts and nuts.



- (3) Put all removed parts on a safe place.



- (4) Remove the mounting flange.



- (5) Remove the gear set and remove the balance plate from bottom of the body.



- (6) Remove the snap ring (located in front of the shaft seal ring).



- (7) Use proper and safe tools for this operation.



- (8) Push out the shaft seal.



- (9) Check balance plates, the mid plate and the sealing parts.



- (10) Assemble new sealing parts, the rubber seal first, the plastic seal on top.



- (11) Check all parts of the gear set including the key for the split gear.



- (12) Remove the section seal from mounting flange.



2) ASSEMBLY

- (1) Clean all mounting faces of the mounting flange from sealant and dirt.



- (2) Be careful, avoid mechanical surface damages.



- (3) Clean all mounting faces of the body from sealant and dirt.



- (4) Assemble the lower balance plate into the body, sealing parts can be fixed with grease. Position is rotation sensitive.



- (5) Assemble the basic gears into the body, journals and other contact faces should be oiled with clean hydraulic fluid.



- (6) Assemble the mid plate to the gear set. The mid plate is not rotation sensitive.



- (7) Fit the key to the drive shaft. The key should be fixed with grease.



- (8) Assemble careful the sliding gears to the basic gears. Check that the key is in the correct position.



- (9) Put the upper balance plate on top of the gear set. Position is rotation sensitive.



- (10) Prepare the shaft seal for assembly.
Use a proper assembly fixture.



- (11) The shaft seal should be packed with some grease.



- (12) Press in the shaft seal to bottom of the shaft seal bore.



(13) Assemble the snap ring.



(14) Check the section seal. Use of a new one is recommended in each case.



(15) Clean all assembly faces again.



(16) Put a rope of loctite sealant out side the interlock track on the body (it's for corrosion protection).



- (17) Fit an assembly fixture for shaft seal protection to the drive shaft.



- (18) The assembly fixture should be oiled with clean hydraulic fluid to lubricate the shaft seal lip during assembly.



- (19) Fit the mounting flange careful from top down to the body. Fit the interlock track correct.



- (20) Remove the shaft seal protection fixture careful.

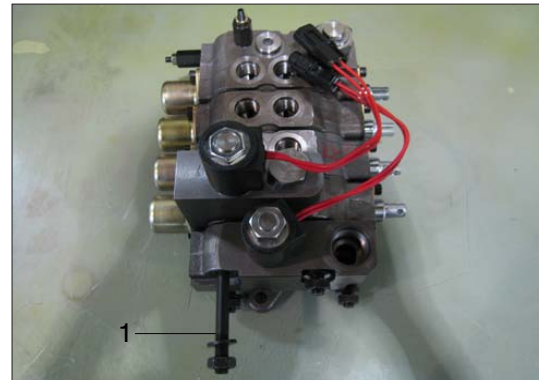


- (21) Fit fasteners, bolts or nuts with correct assembly torque, according to values shown on unit assembly drawing.



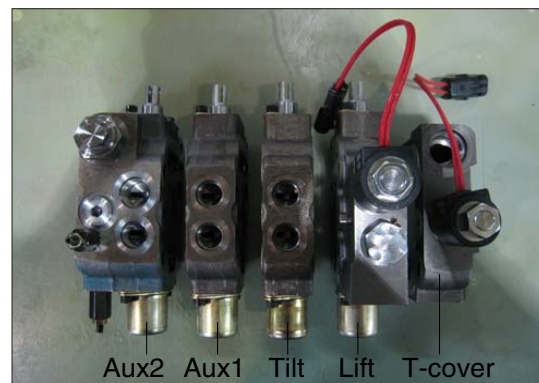
2. MAIN CONTROL VALVE

- 1) Remove bolt (1) to separate the valve section.



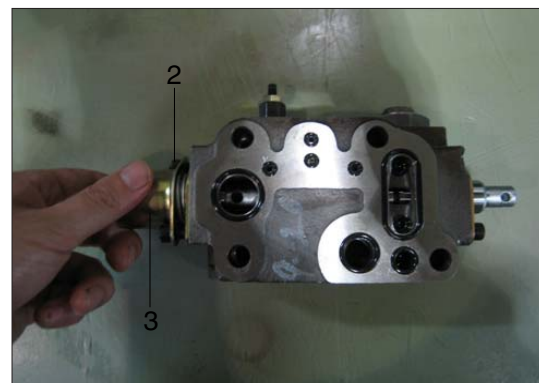
20D7MCV01

- 2) Divide the valve body.



20D7MCV02

- 3) Remove dust cap (3) and bolt (2) from the valve body.



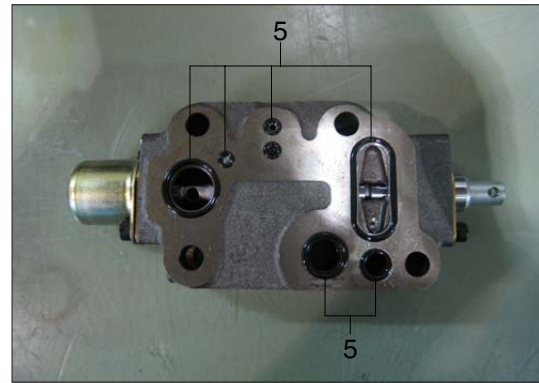
20D7MCV03

- 4) Remove attachment spool (4) from the valve body.



20D7MCV04

5) Remove O-ring seals (5) from the valve body.



20D7MCV05

6) Remove tilt spool (6) from the valve body.



20D7MCV06

7) Remove lift spool (7) from the valve body.

8) Remove lock poppet (8) from the valve body.

9) Remove normal close solenoid valve (9) from the valve body.



20D7MCV07

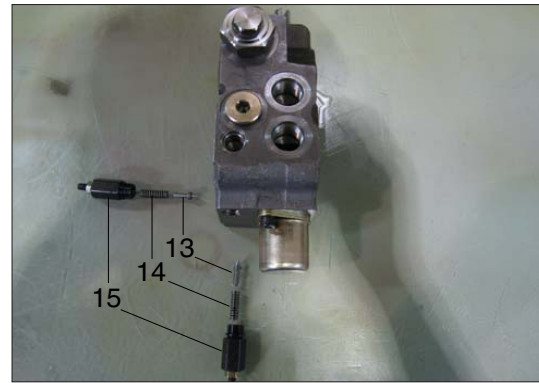
10) Remove plug (12) and spring (11).

11) Remove hydrostate (10).



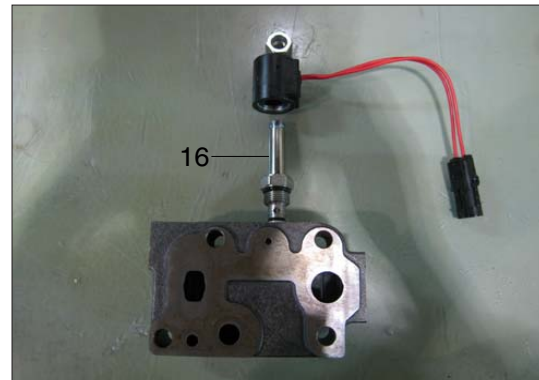
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12) Remove relief plugs (15), springs (14) and poppets (13).



20D7MCV09

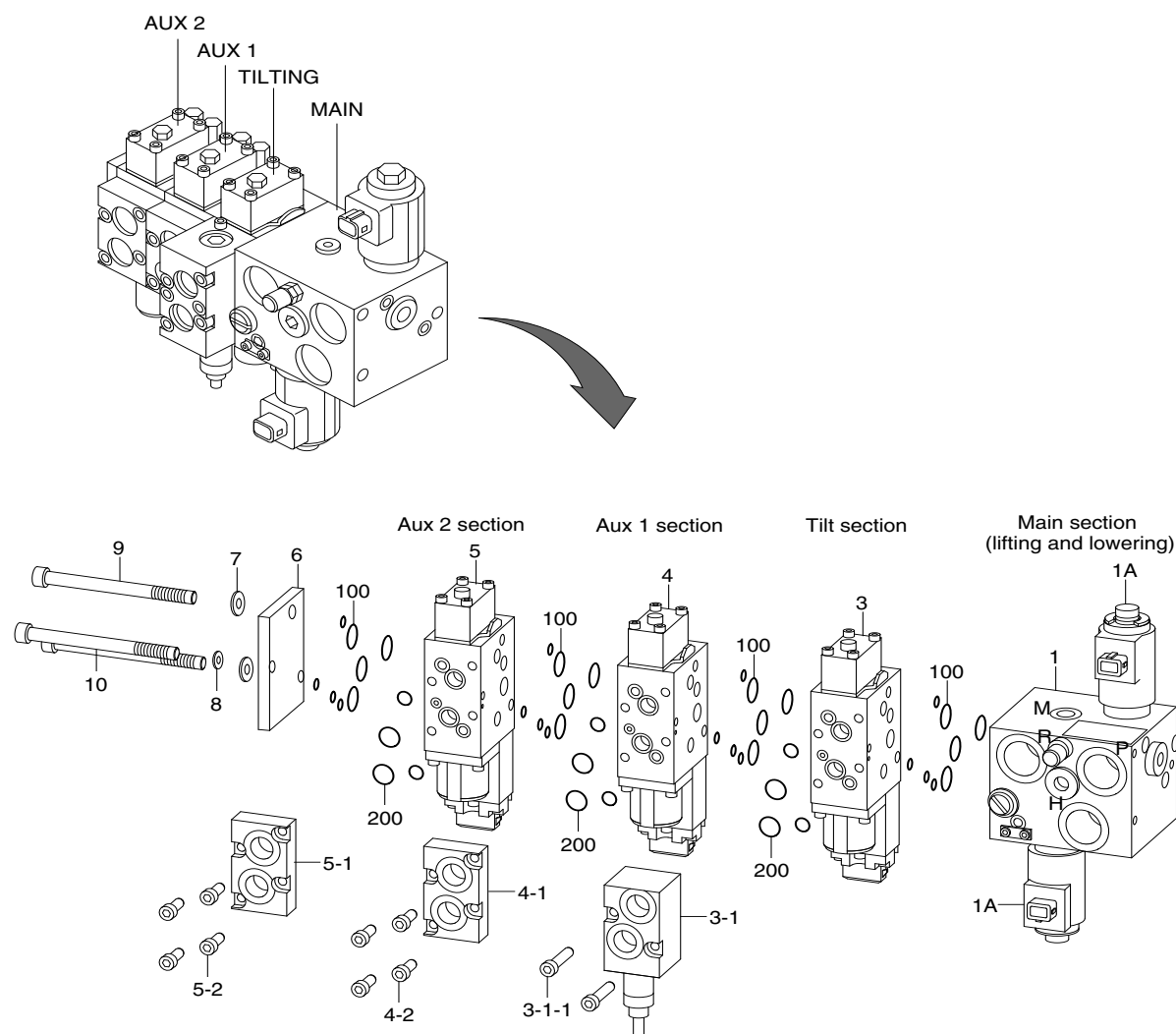
13) Remove normal open solenoid valve (16) from the valve body.



20D7MCV10

2-1. MAIN CONTROL VALVE (FINGERTIP, OPT)

1) STRUCTURE



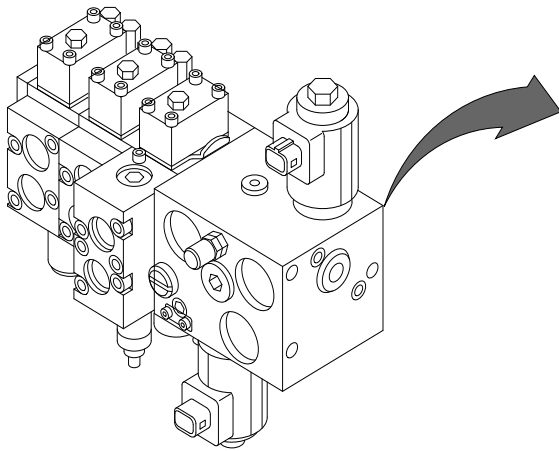
※ Tightening torque

- Item (3-1-1, 4-2, 5-2, 10) : 0.97 kgf·m (7.0 lbf.ft)
- Item (9) : 2.35 kgf·m (16.9 lbf.ft)

25L7AFT01

1	Main block	4-1	Block	7	Plain washer
1A	Solenoid valve (lift)	4-2	Socket head screw	8	Plain washer
3	Tilt block	5	Aux block (auxiliary 2)	9	Tension rod
3-1	Adapter	5-1	Block	10	Tension rod
3-1-1	Socket head screw	5-2	Socket head screw	100	Section seal kit
4	Aux block (auxiliary 1)	6	End plate	200	Section seal kit

2) MAIN SECTION



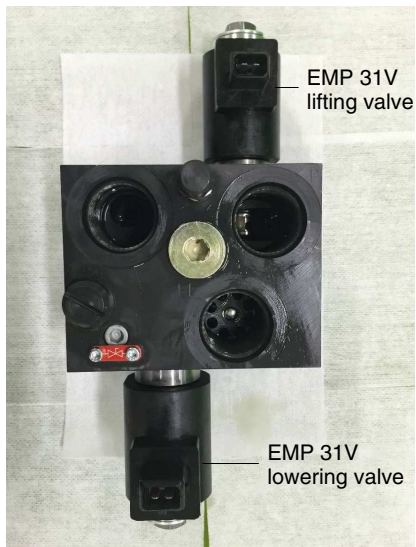
25L7AFT02

※ Flow rate : 100 lpm

※ Maximum pressure : 250 bar

(1) Lifting and lowering valve

① Main section



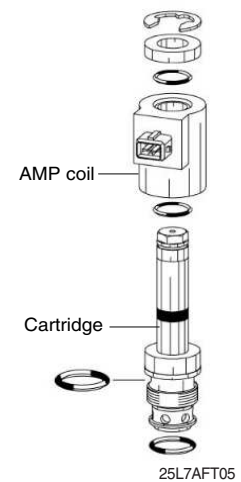
25L7AFT03

② EMP solenoid valve



25L7AFT04

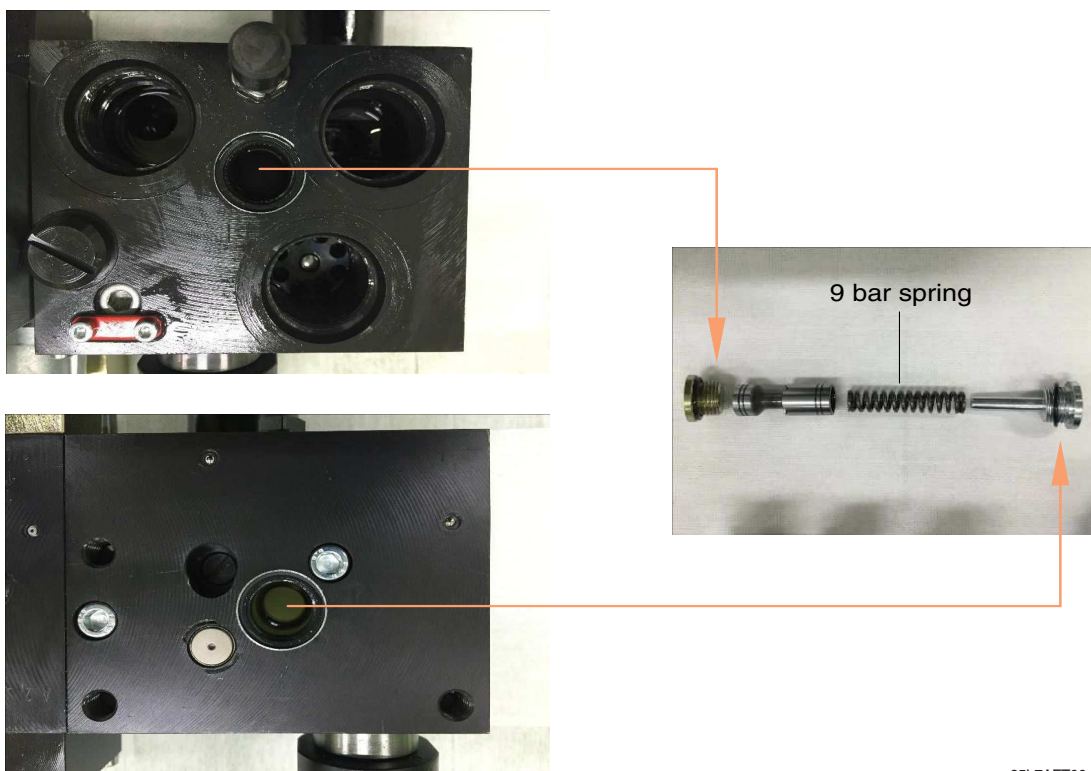
※ Tightening torque
6.12 kgf·m (44.2 lbf·ft)



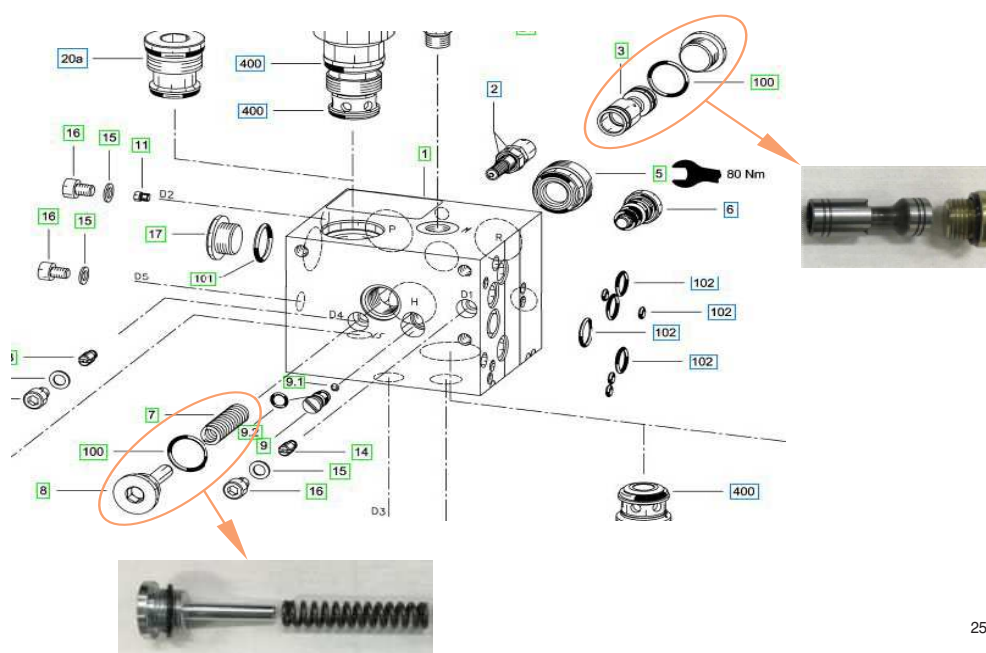
25L7AFT05

※ When it can't control lifting & lowering, need to check EMP valve. Because of contamination material EMP valve often can't operate properly that means valve poppet and seat opened.

(2) 3-way controller



25L7AFT06

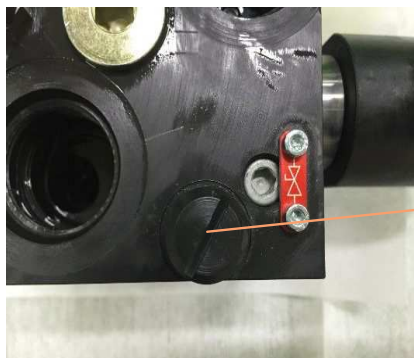


25L7AFT07

※ During unloading, supplied oil by the pump return to tank keeping 9 bar of system pressure.

(3) Pressure Reducing valve & G damping screw

① Pressure reducing valve



- ※ Pressure reducing valve controls valve actuation by supplying internal control oil.
- ※ Use flat screw driver.
- ※ Tightening torque
0.71 kgf·m (5.2 lbf·ft)



25L7AFT08

② G damping screw

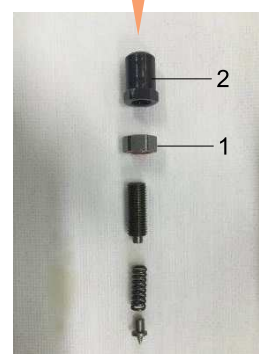


- ※ G damping increased throttling effect of load sensing line.
- ※ Tightening torque
1.02 kgf·m (7.4 lbf·ft)



25L7AFT09A

(4) Pressure relief valve



25L7AFT10



25L7AFT11

※ Use with a 12 mm spanner.

※ Tightening torque (2)
1.43 kgf·m (10.3 lbf·ft)



25L7AFT12

※ Use with a 3 mm wrench.

※ Tightening torque (1)
1.43 kgf·m (10.3 lbf·ft)

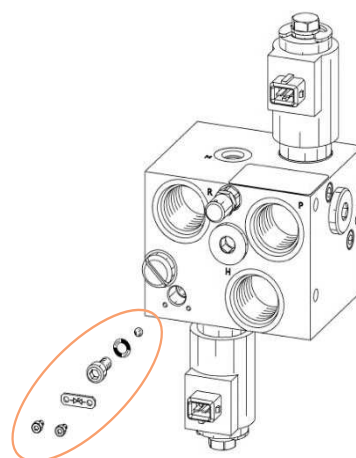
⤵ = Pressure increases
⤴ = Pressure decreases

※ Rotating clockwise to increase setting pressure with a wrench.

※ 80 bar increase and decrease per 1 turn.

(5) Emergency lowering valve and shuttle valve

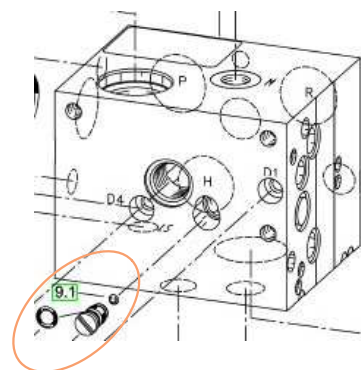
① Emergency lowering valve



25B9UFT14

※ When need to force lowering, rotate counter clockwise increasingly with emergency lowering valve.

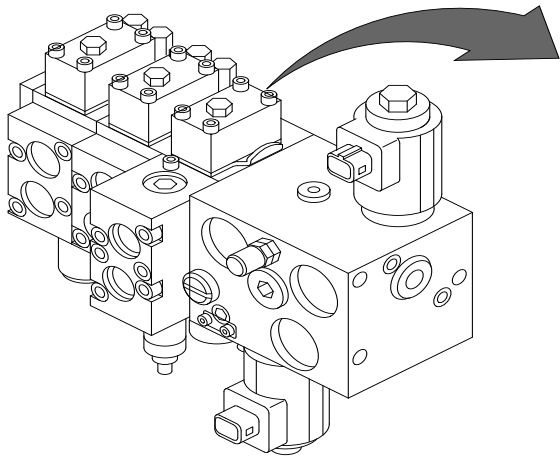
② Shuttle valve



25L7AFT15

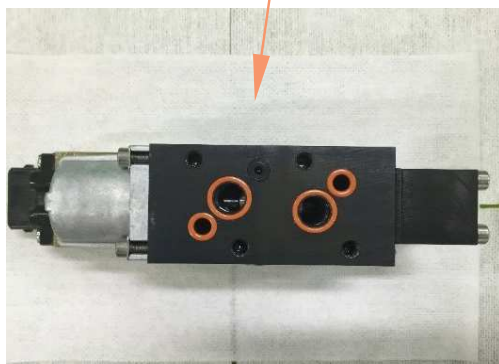
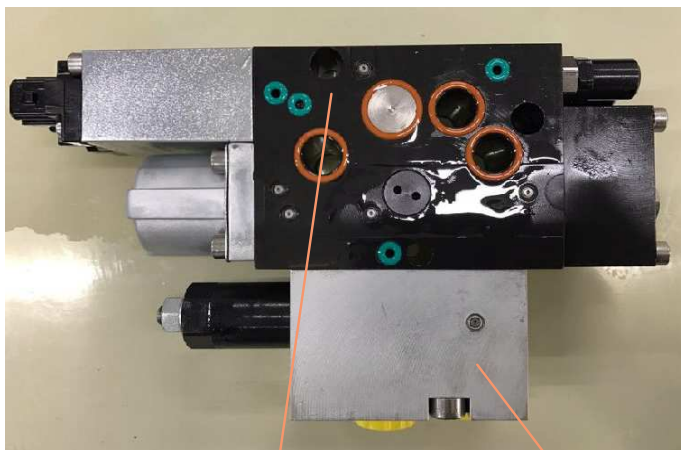
※ Transfer bigger load pressure through shuttle valve.
 ※ Use a flat screw driver.

3) TILT SECTION



- ※ Flow rate : 40 lpm
- ※ Load holding pressure : 210 bar

(1) Proportional directional valve



① Valve section block



② Counter balance valve block

(2) Disassembly valve section



① Disassemble spool



※ All block type, 40lpm

② Disassemble coil



※ AMP 4 pin coil



25L7AFT18

③ Disassembling process

a. Release spring cap.



25L7AFT19

b. Release spring cap completely.



25L7AFT20

c. Release lever block.



25L7AFT21

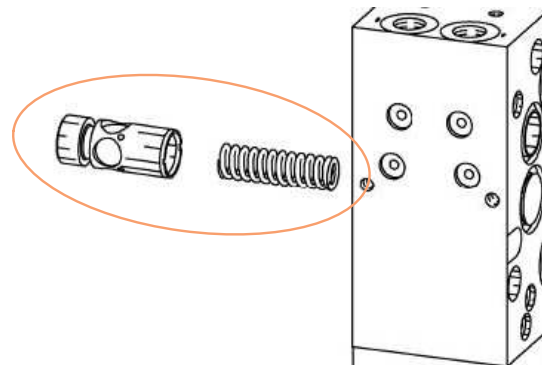
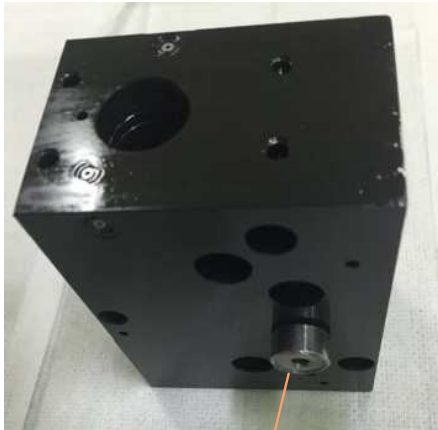
d. Pull out spool.



25L7AFT22

(3) 2 way controller and shuttle valve

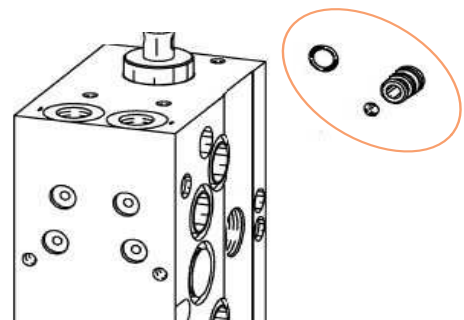
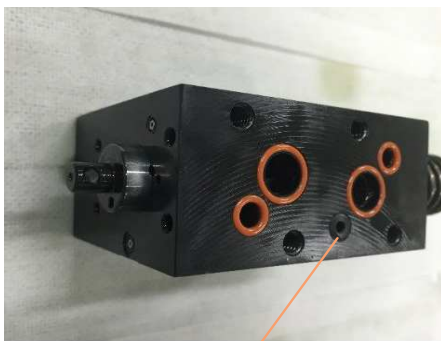
① 2 way controller (6 bar)



25L7AFT24

※ 2 way controller make it keep 6 bar regardless of load change between in and out of spool.

② Shuttle valve

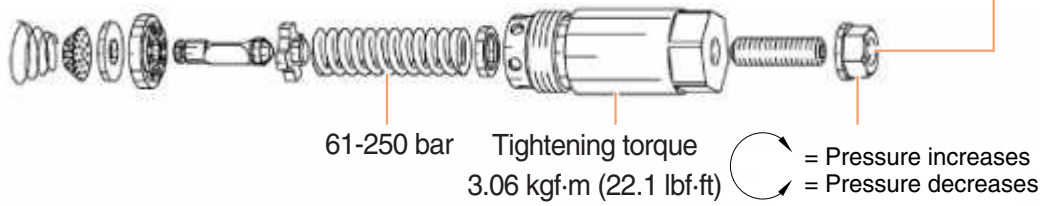


25L7AFT25

- ※ Transfer bigger load pressure through shuttle valve.
- ※ Fix 4 mm bolt and pull out.

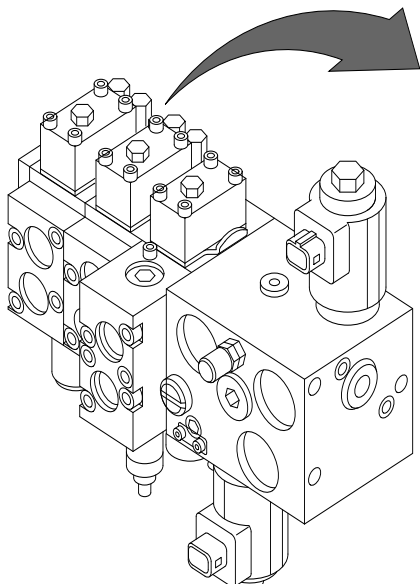
(4) Counter balance valve

※ Counter balance valve needs during tilting out operation.



25L7AFT28A

4) AUXILIARY SECTION

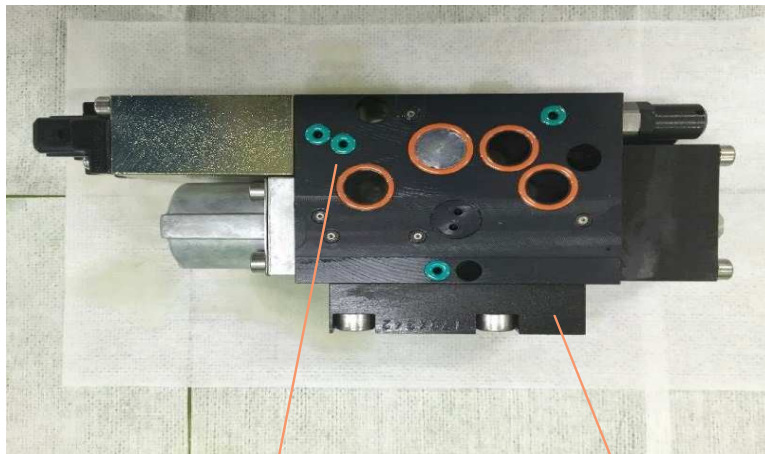


25L7AFT29

※ Flow rate : 40 lpm

※ Pressure limit aux section : 140 bar

(1) Proportional directional valve



① Valve section block

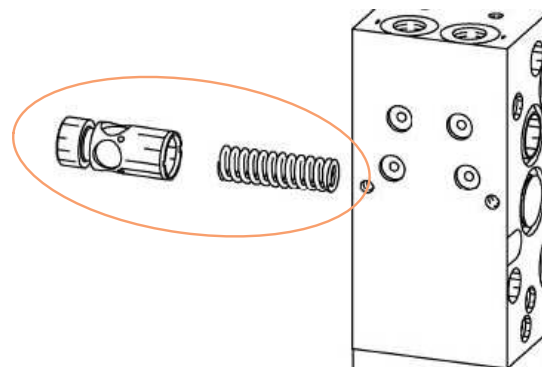
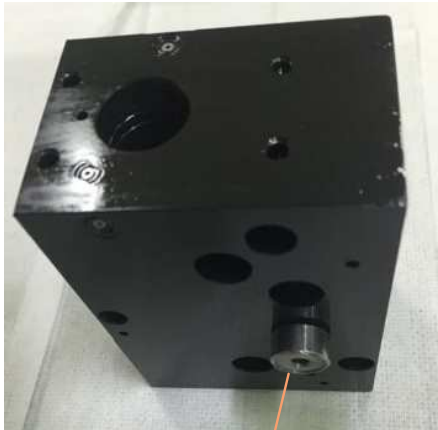


② Ancillary block

25L7AFT30

(2) 2 way controller and shuttle valve

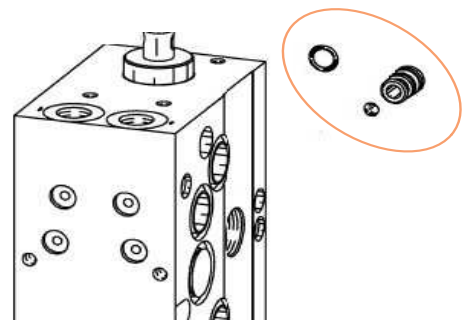
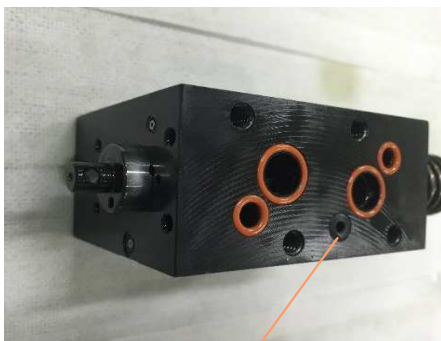
① 2 way controller (6 bar)



25L7AFT24

※ 2 way controller make it keep 6 bar regardless of load change between in and out of spool.

② Shuttle valve



25L7AFT25

※ Transfer bigger load pressure through shuttle valve.

※ Fix 4 mm bolt and pull out.

(3) Second relief valve

- ※ Controlling individual section pressure, rotating clockwise to increase setting pressure with wrench.
- ※ 80 bar increase and decrease per 1 turn.



25L7AFT26



- ※ Use with a 12 mm spanner.
- ※ Tightening torque (1)
1.43 kgf·m (10.3 lbf·ft)



25L7AFT27

- ※ Use with a 3 mm wrench.
- ※ Tightening torque (2)
1.43 kgf·m (10.3 lbf·ft)

↻ = Pressure increases
↺ = Pressure decreases

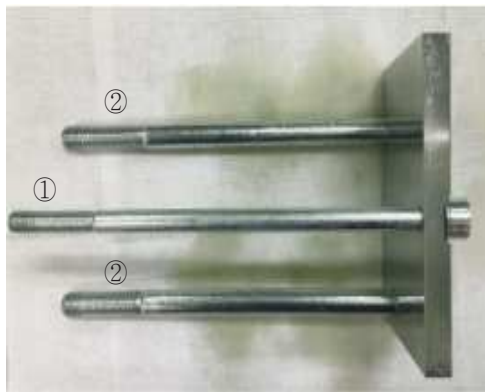
5) ADD SECTION PART

(1) Disassembly



① Tightening torque
0.97 kgf·m (7.0 lbf·ft)

② Tightening torque
2.35 kgf·m (16.9 lbf·ft)

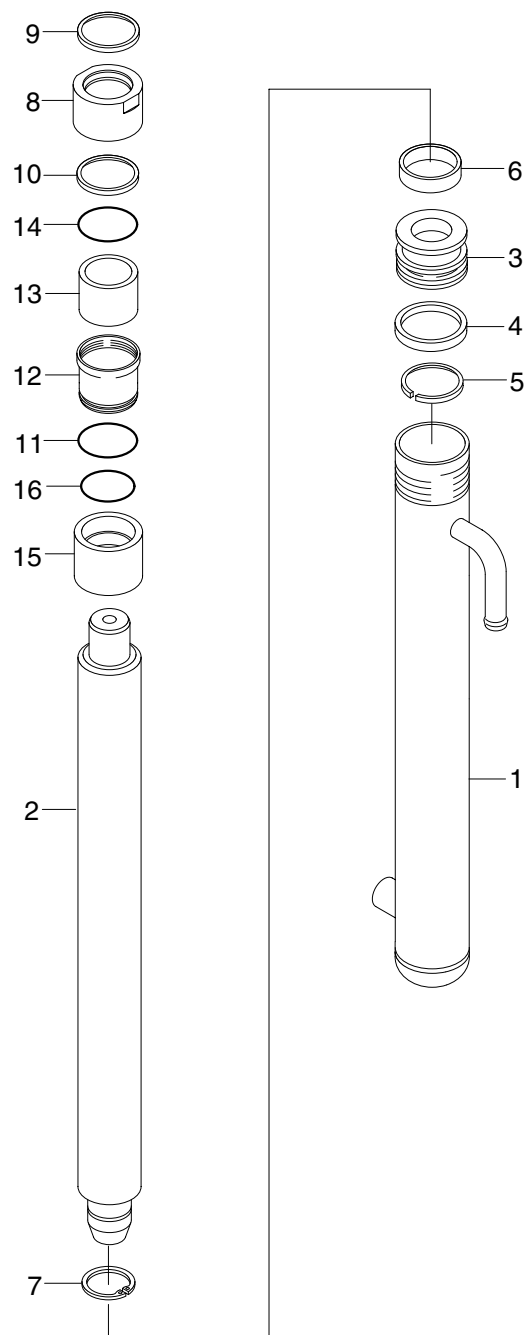


40B9HS02

※ When it needs to disassemble HMPL valve, it's possible to release tension rod sets.

3. LIFT CYLINDER

1) STRUCTURE



- 1 Tube assy
- 2 Rod
- 3 Piston
- 4 Piston seal
- 5 Back up ring
- 6 Wear ring

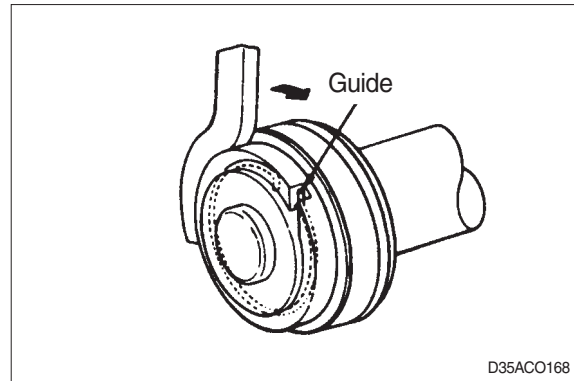
- 7 Retaining ring
- 8 Gland
- 9 Dust wiper
- 10 Rod seal
- 11 O-ring

- 12 Guide
- 13 Du bushing
- 14 O-ring
- 15 Spacer
- 16 O-ring

35B7HS23

2) DISASSEMBLY

- (1) Hold the cylinder tube in a vice, loosen the cylinder head and remove it.
Remove the spacer from the cylinder tube and knock out the bushing. Hook a wrench in the hole in the retainer at the piston end and turn. Lever up the edge of the guide, then turn the guide in again and the guide can be removed.



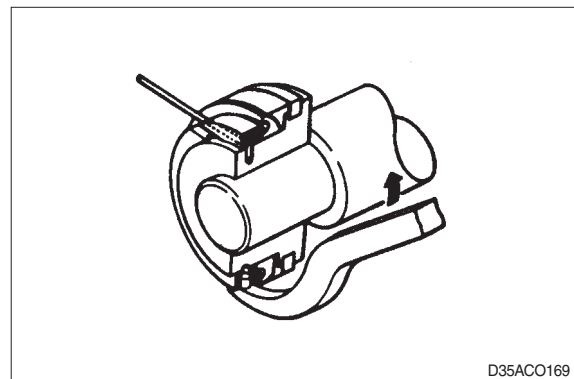
3) CHECK AND INSPECTION

mm (in)

Check item	Standard size	Repair limit	Remedy
Clearance between cylinder rod & bushing	0.072~0.288 (0.003~0.011)	0.5 (0.020)	Replace bushing
Clearance between piston ring & tube	0.05~0.030 (0.002~0.012)	0.5 (0.020)	Replace piston ring

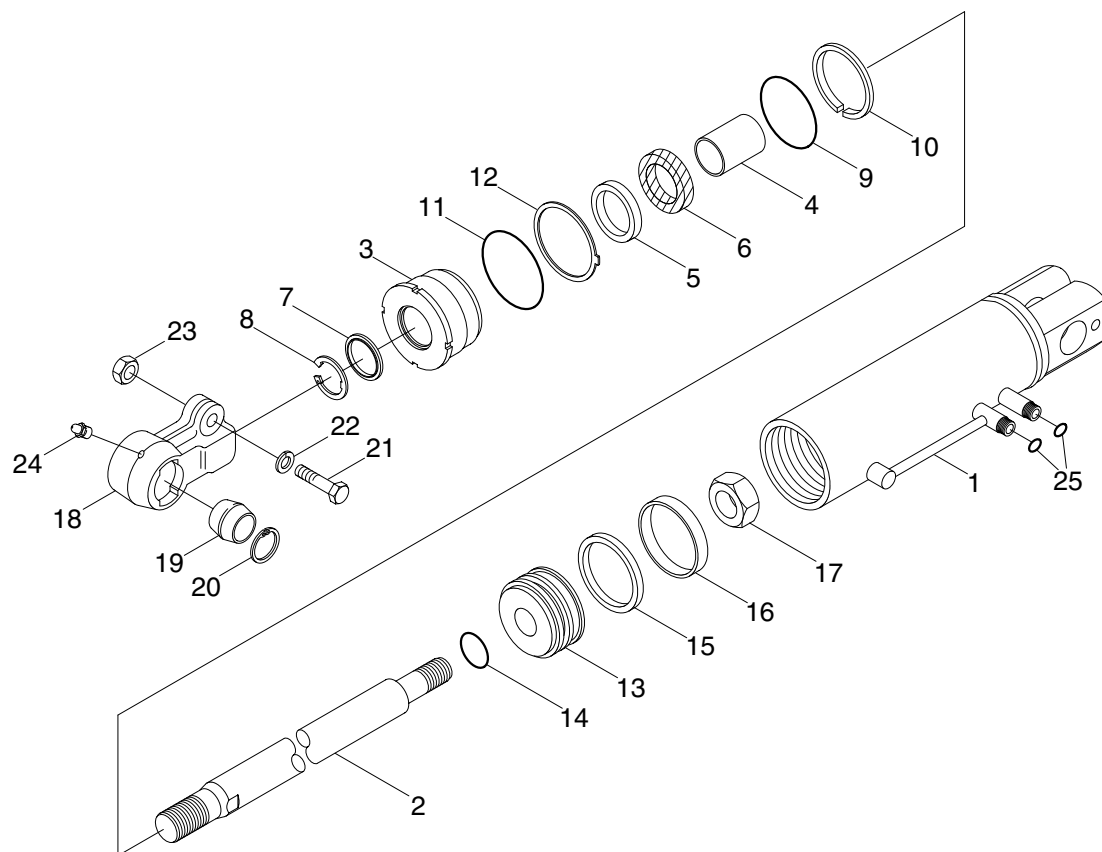
4) ASSEMBLY

- (1) Soak the piston ring in hydraulic oil at a temperature of 40 to 50°C, expand the inside diameter and assemble on the piston. Install a piston seal.
Bend the edge of the guide and rotate it to install the guide completely.



4. TILT CYLINDER

1) STRUCTURE



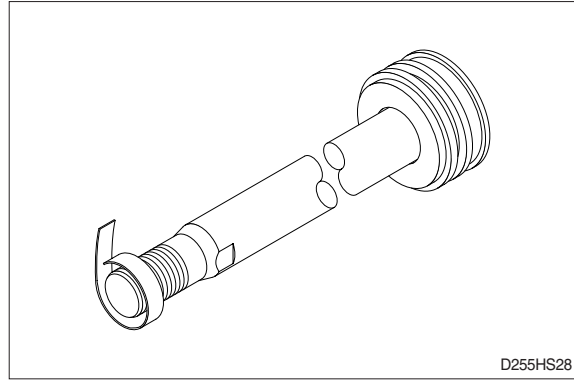
35B7HS24

1	Tube assy	10	Back up ring	18	Rod eye
2	Rod	11	Lock washer	19	Spherical bearing
3	Gland	12	Washer	20	Retaining ring
4	Bushing	13	Piston	21	Hexagon bolt
5	Rod seal	14	O-ring	22	Hexagon nut
6	Back up ring	15	Back up ring	23	Spring washer
7	Dust wiper	16	Wear ring	24	Grease nipple
8	Snap ring	17	Nylon nut	25	O-ring
9	O-ring				

2) DISASSEMBLY

- (1) Hold the parallel parts of the cylinder tube bottom in a vice and mark the rod head end to show how much it is screwed in, then remove the rod head. Next, hook a wrench into the notch at the cylinder head and remove the cylinder head from cylinder tube.

When doing this, wind tape round the threaded part of the rod and be careful not to damage the dust seal and rod seal inside cylinder head.



3) CHECK AND INSPECTION

mm (in)

Check item	Standard size	Repair limit	Remedy
Clearance between cylinder rod & bushing	0.072~0.288 (0.003~0.011)	0.5 (0.020)	Replace bushing
Clearance between rod head bushing & pin	0.10~0.35 (0.004~0.014)	0.6 (0.024)	Replace bushing