SECTION 4 BRAKE SYSTEM

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GROUP 1 STRUCTURE AND FUNCTION

1. OUTLINE

There are two brake systems, the service brake system and the parking brake system.

In the service brake system, oil pressure is generated in the master cylinder by treading on the brake pedal. This pressure causes the brake lever to press the pressure pin which gives braking pressure to the disk carrier.

In the parking brake system, the brake lever is operated by cable. Therefore the pressure pin makes braking pressure onto the disk carrier.

2. SPECIFICATION

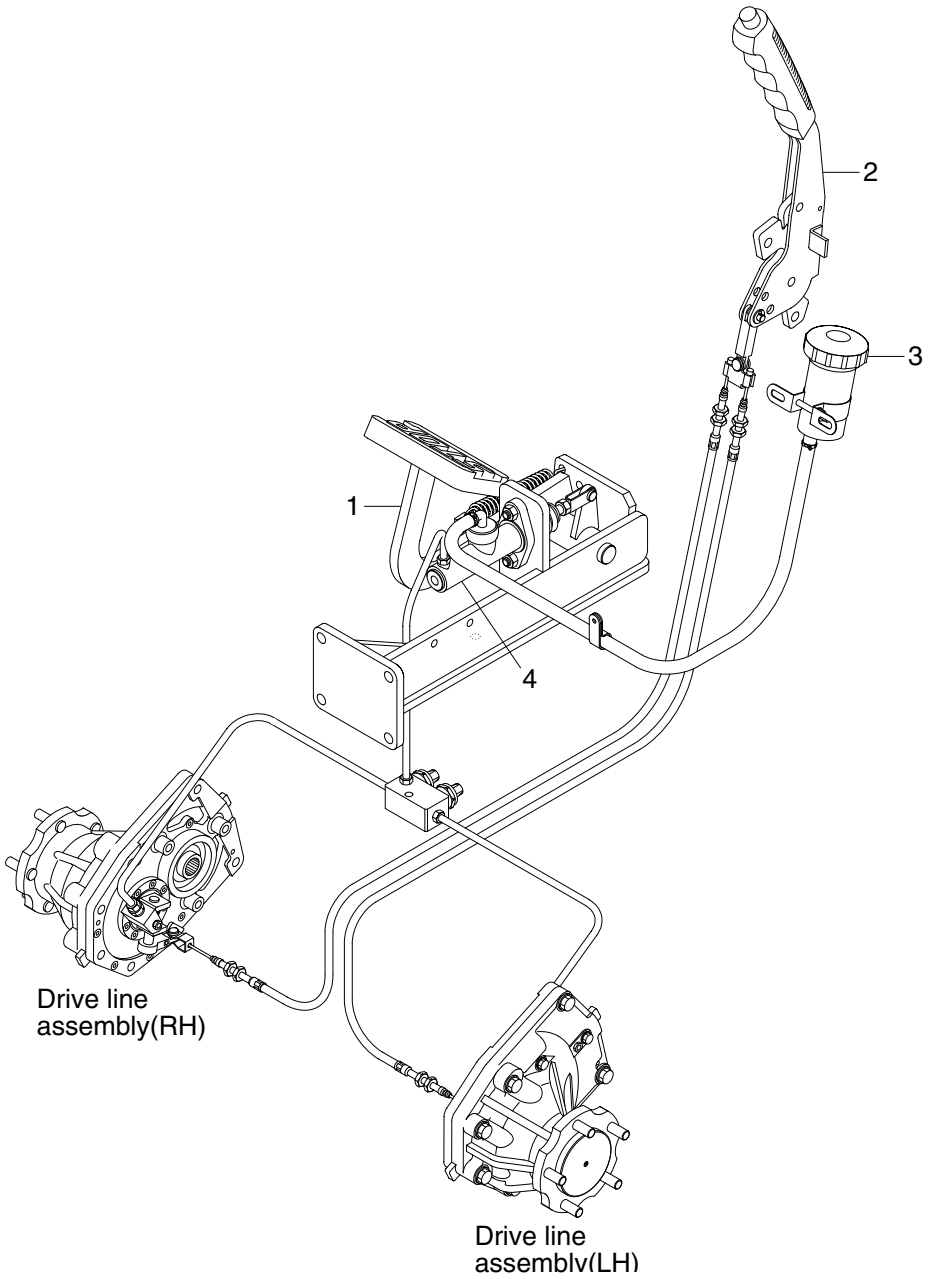
1) BRAKE

Item	Unit	Specification
Brake type	-	Wet disc brake
Brake fluid	-	Hydraulic oil ISO VG32 (AZOLLA ZS32)
Max. brake torque	N · m (at 60bar)	2450
Max. braking pressure	bar	140
Oil volume (Never use disc)	cc	1.6

2) PARKING BRAKE

Item	Specification
Type	Ratchet, internal expanding mechanical type
Parking lever stroke (°)	18.6
Parking cable stroke	9.7mm

3. BRAKE PEDAL AND PIPING



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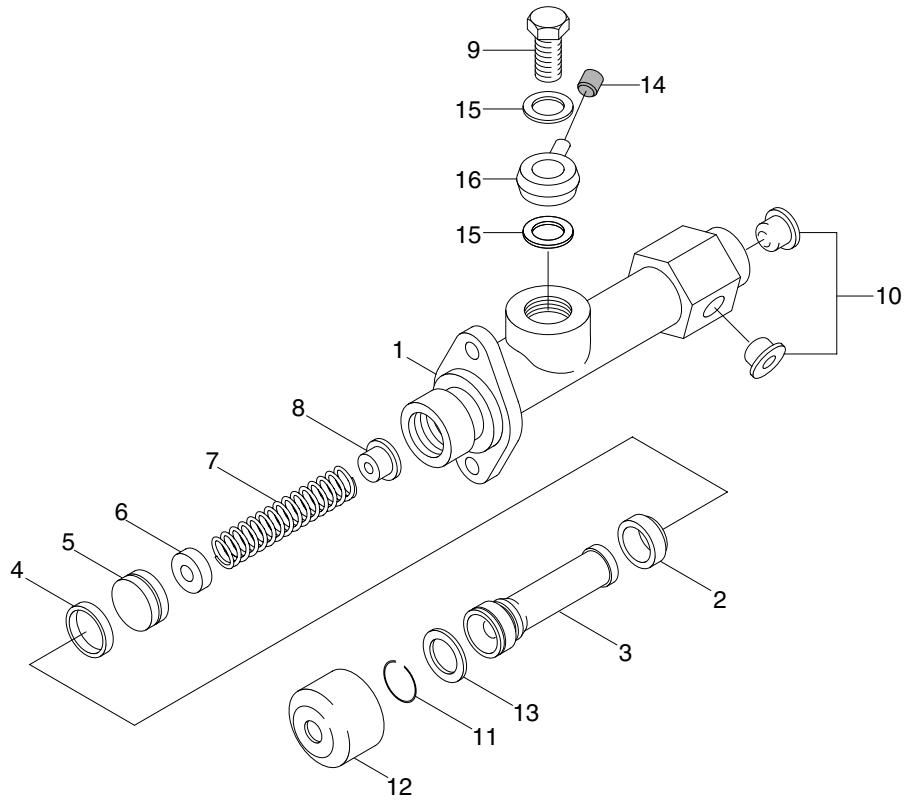
1 Brake pedal & bracket assy
2 Parking lever assy
3 Reservoir tank assy
4 Brake master cylinder

4. BRAKE MASTER CYLINDER

1) STRUCTURE



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1	Body	7	Spring	13	Plate
2	Secondary cup	8	Check valve assembly	14	Cap
3	Piston	9	Union bolt	15	Gasket
4	Spacer	10	Cap	16	Union
5	Primary cup	11	Retaining ring		
6	Spring seat	12	Boot		

2) DISASSEMBLY AND ASSEMBLY

(1) Remove the boot(12).
(2) Take out the retaining ring(11) and plate(13).
(3) Take out the piston(3), secondary cup(2), spacer(4), primary cup(5), spring seat(6), spring(7) and check valve assembly(8) from cylinder.
(4) Perform assembly in reverse order of disassembly and add special working.
· Body and metallic parts should be washed and cleaned with petroleum solvents then dry the parts by air. Rubber parts should be washed with brake oil.
· Coat the rubber grease inner surface of cylinder.

2) INSPECTION

(1) Cylinder

Check the corrosion and pitching of inner surface of cylinder.
If any defects are noted, replace the parts.

(2) Piston

Check for wear of piston, replace the piston if necessary.

Item	Standard gap	Allowable limit
Gap of cylinder and piston	0.020~0.080mm	0.2mm

(3) Rubber parts

Check for wear of secondary cup and primary cup and replace them with new ones if necessary.

GROUP 2 OPERATIONAL CHECKS AND TROUBLESHOOTING

1. OPERATIONAL CHECKS

1) BRAKE PIPING

(1) Check pipes, hoses and joints for damage, oil leakage or interference.

(2) Operate brake pedal and check operating force when pedal in depressed. Check also change in operating force, and change in position of pedal when pedal is kept depressed.

2) BRAKING FORCE

(1) Select a dry, flat, paved surface and, drive truck at maximum speed. When signal is given, stop truck immediately and measure distance from point where signal was given to point where truck stopped(unloaded)

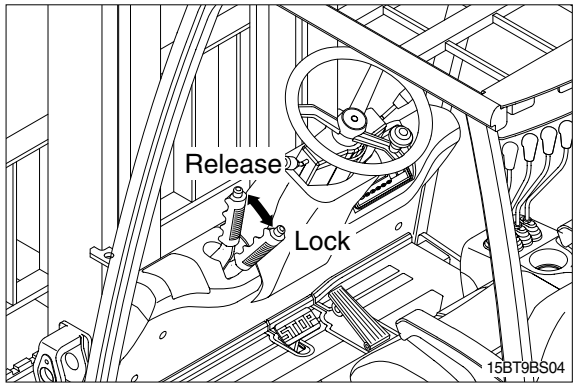
· Stopping distance : Within 5m(16' 5")

(2) Check that there is no pulling of steering wheel, pulling by brakes to one side or abnormal noise when making emergency stops.

3) PARKING BRAKE

(1) Operating force of parking lever is 20 - 30 kgf · m(144 - 217lbf · ft).

(2) Check that parking brake can hold machine in position when loaded on 15% slope. If there is no slope available, travel at low speed and check braking effect of parking brake.



2. TROUBLESHOOTING

Problem	Cause	Remedy
Brakes do not work	· Oil leakage in the system or oil to low low in tank.	· Repair oil leakage. After bleeding fill fill oil tank of master cylinder to specified level with brake oil.
	· Air trapped in the system.	· Bleed air completely from the brake lever.
	· Worn out of deteriorated piston cup in master cylinder resulting in oil leakage	· Inspect cylinder and piston for degree of wear. On satisfactory, replace cup.
Brake pedal travel too large	· Air trapped in the system.	· Bleed air completely out. · Inspect oil tube joints & connections and replace leaking parts.
Wheel feel heavy	· Return port in master cylinder closed by piston cup.	· Inspect master cylinder. · Repair or replace pedal return spring.

GROUP 3 ADJUSTMENTS

1. ADJUSTMENT OF PEDAL

1) BRAKE PEDAL

(1) Pedal height from floor plate adjust with stopper bolt.

· Pedal height : 140~145mm (5.5~5.7in)

(2) Play

Adjust with rod of mast cylinder.

· Pedal play : 4~6mm (0.16~0.23in)