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

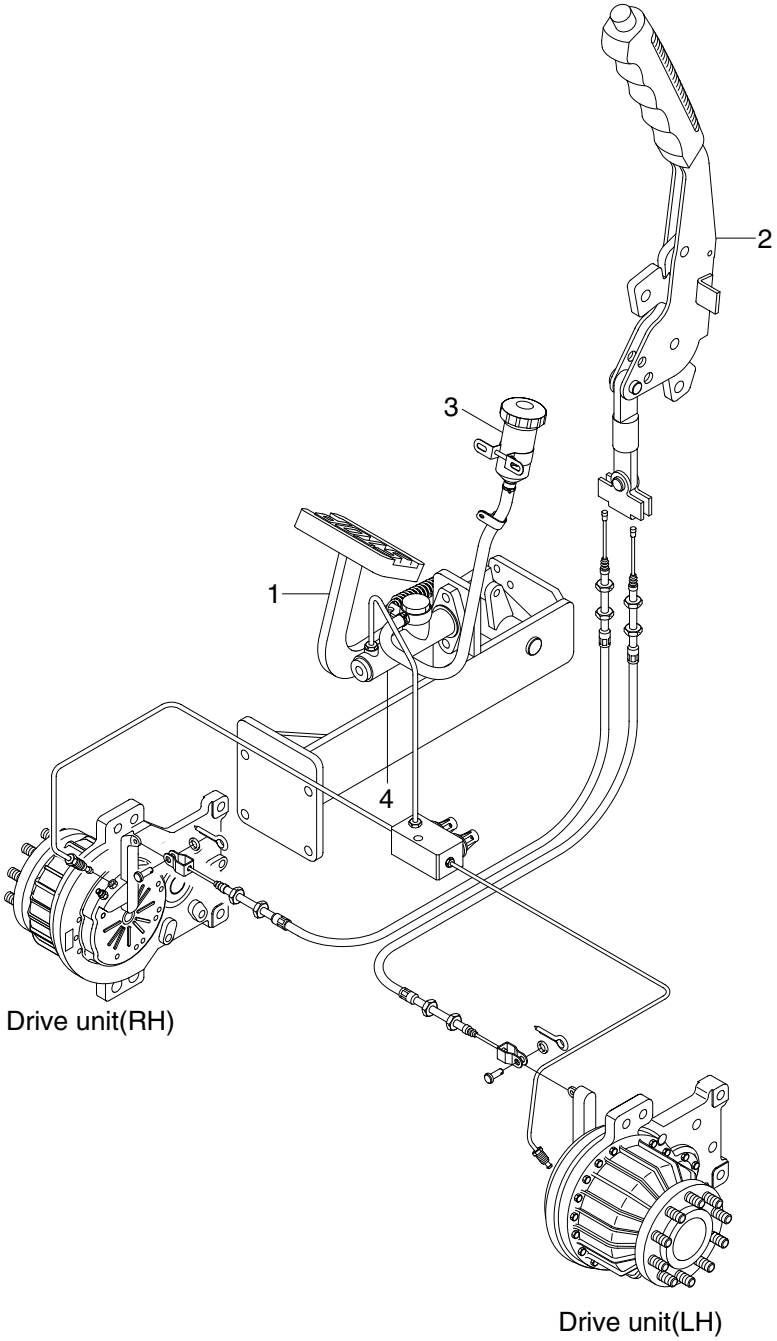
1) BRAKE

Item	Unit	Specification
Type	-	Wet disc brake
Brake fluid	-	Hydraulic oil ISO VG32 (AZOLLA ZS32)
Max. torque	N.m (at 70 bar)	4790

2) PARKING BRAKE

Item	Specification
Type	Ratchet, internal expanding mechanical type
Parking lever stroke	13.8°
Parking cable stroke	7.2mm

3. BRAKE PEDAL AND PIPING



22BH9BS01

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

4. CONNECTING THE BRAKE

We recommend to use a two-stage output cylinder for the service brake. Advantage compared to a single stage cylinder : the pedal stroke can be as small as possible.

Three connections M10×1 are provided for connecting the hydraulic brake system and the brake cable.

1) CONNECTING THE HYDRAULIC BRAKE SYSTEM

Connect the bleeder and the brake hose(hydraulic line) according to the assembly position.

· Tightening torque : 1.2~1.6kgf · m(9~12lbf · ft)

When placing the hydraulic lines, the bending radii should be kept as large as possible to keep the resistance against the restoring forces for lifting the break as small as possible.

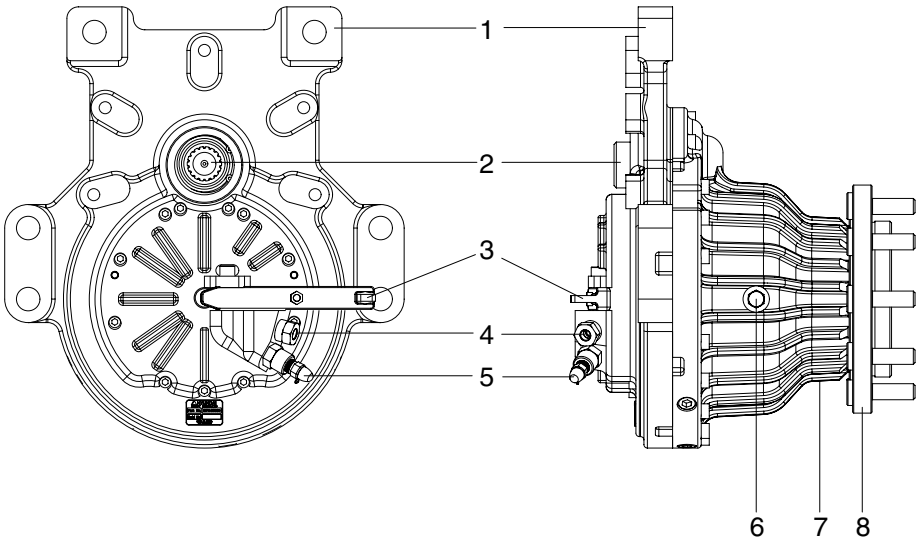
2) CONNECTING THE PARKING BRAKE CABLE

Screw the parking brake cable into the lever.

Check and maintain the installation dimensions when the installation has been finished.

When placing the brake cable, the bending radii should be kept as large as possible to keep the resistance against restoring forces of the brake as small as possible.

⚠ Bleed the brake system after filling of brake fluid. Refer to page 4-7.

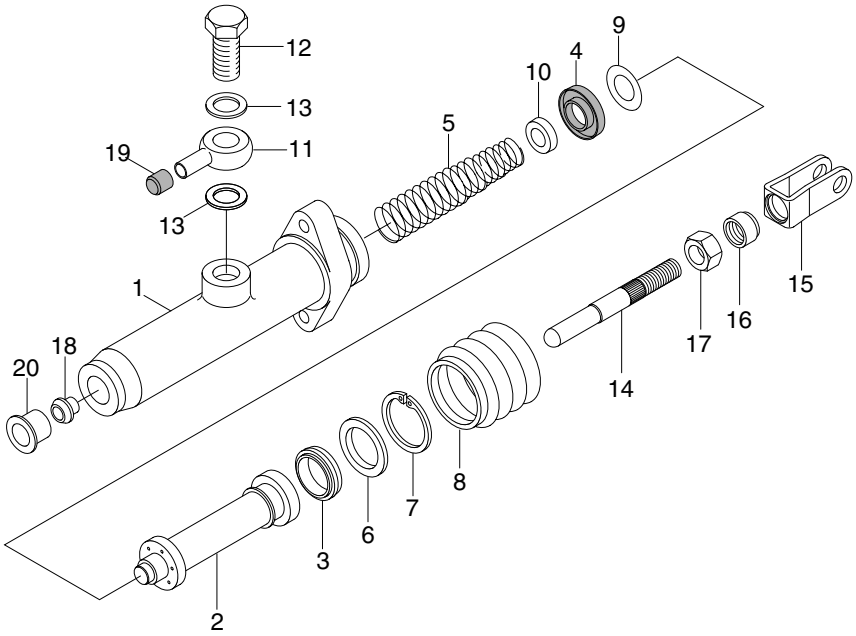


22B7BS10

1 Brake housing
2 Drive gear
3 Parking brake lever
4 Brake port
5 Bleeding valve
6 Air breather
7 Drive unit housing
8 Wheel hub

5. BRAKE MASTER CYLINDER

1) STRUCTURE



22B7BS09

1	Body	6	Plate	11	Union	16	Head pin
2	Piston	7	Snap ring	12	Union bolt	17	Nut
3	Secondary cup	8	Boot	13	Washer	18	Seat
4	Primary cup	9	Spacer	14	Rod	19	Cap
5	Spring	10	Spring seat	15	Head	20	Cap

2) DISASSEMBLY

(1) Remove the master cylinder boot(8) and remove the rod(14).

(2) Remove the snap ring(7) and take out the plate(6), the piston(2), the piston primary cup(4), and piston spring(5).

(3) Specification of master cylinder.

- Cylinder bore diameter : 19.05㎜
- Piston stroke : 23.0㎜

3) INSPECTION

(1) Clean and check these components.

※ Use isopropyl alcohol or brake fluid for washing the components. Do not use gasoline, kerosene or any other mineral oils. When using alcohol, do not leave rubber parts in the liquid for more than 30 seconds.

(2) Inspect the inside wall of the master cylinder, and if any faults are found, replace the cylinder assembly.

(3) Replace the boot(8), the primary cup(4), piston(2), if deformation or any other defect is found.

4) ASSEMBLY

※ Prior to assembly make sure again of no contaminant of the components. Apply a thin coat of brake oil to the components.

- Assembly is in opposite order to disassembly.

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)

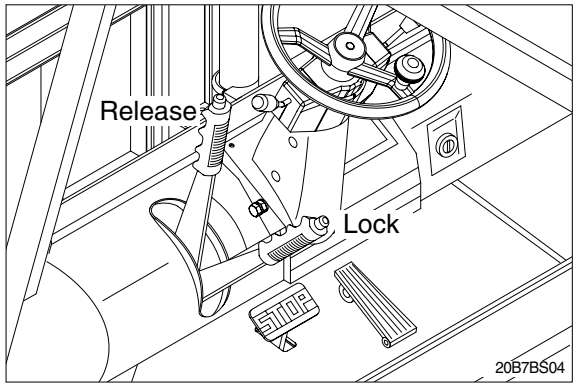
· Stopping distance : Within 5m(16' 5")

(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

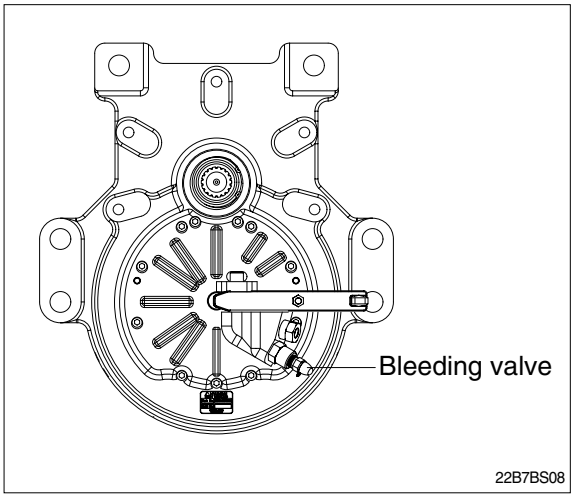
Problem	Cause	Remedy
Brakes do not work	· Oil leakage in the system or oil to low low in tank.	· Repair oil leakage. After bleeding fill fill oil tank of master cylinder to specified level with brake oil.
	· Air trapped in the system.	· Bleed air completely from the brake lever.
	· Worn out of deteriorated 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 TESTS AND ADJUSTMENTS

1. BLEED THE BRAKE SYSTEM

The brake system must be bleeded after replenishing with brake fluid.

1) Remove cap from bleeding valve and fit proper hose to collect escaping brake fluid in a vessel.
2) Apply pressure by operating the brake pedal.
3) Open bleeding valve approx. half a turn with a spanner and press the brake pedal simultaneously to bleed the system.



※ Collect escaping brake fluid into a suitable vessel.
Do not drain brake fluid into the soil or the gutters.

⚠ Close the bleeding valve before releasing the brake pedal.

※ Repeat this procedure until the brake fluid escapes without bubbles.
Check the brake fluid container for sufficient fluid and refill if necessary.

4) When brake fluid escapes without bubbles tighten bleeding valve, remove hose and put dust protector onto the bleeding valve.
   · Tightening torque : 5kgf · m (37lbf · ft)

2. 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 (0.15~0.23in)