SECTION 4 BRAKE SYSTEM

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GROUP 1 STRUCTURE AND FUNCTION

1. OUTLINE

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

The foot brake adopts the brake system of oil type at drive axle.

Oil pressure is generated in maximum 60 kgf/cm^2 through oil input path of the left and right drive axle housing, this pressure allows the piston brake to advance and compresses a friction plate and a plate.

So when the transportation travels, it is possible to brake.

The parking brake works by the switch installed on steering column.

2. SPECIFICATION

1) SERVICE BRAKE

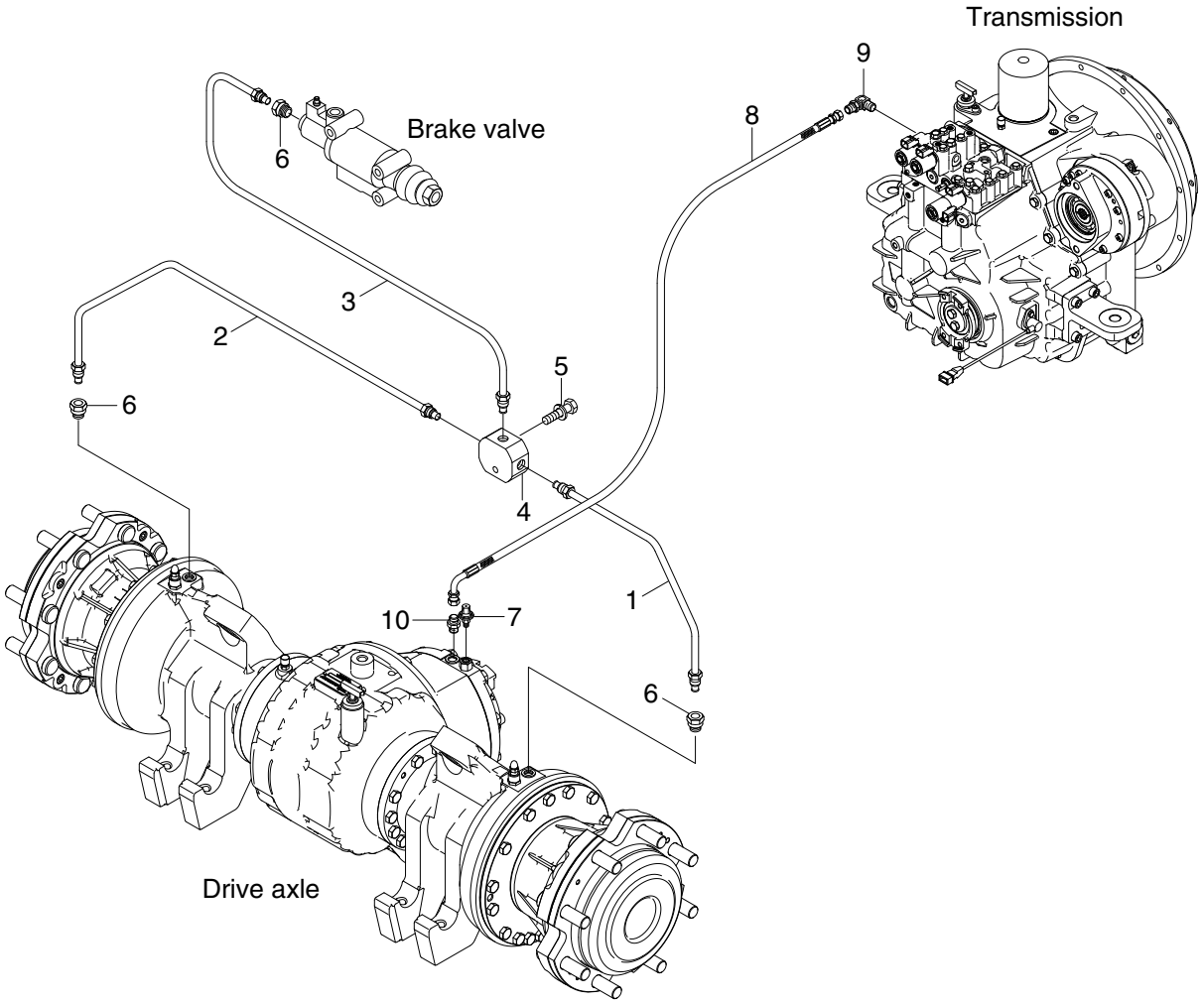
Item		Specification
Type		Wet disk brake
Pedal adjustment	Pedal height	130±4 mm (5.1±0.16 in)
	Play	0

2) PARKING BRAKE

Item	Specification
Type	SAHR (Spring Actuate Hydraulic Release)
Switch location	Steering column
Disc location	Drive axle carrier sub assy

3. BRAKE PIPING

1) STRUCTURE



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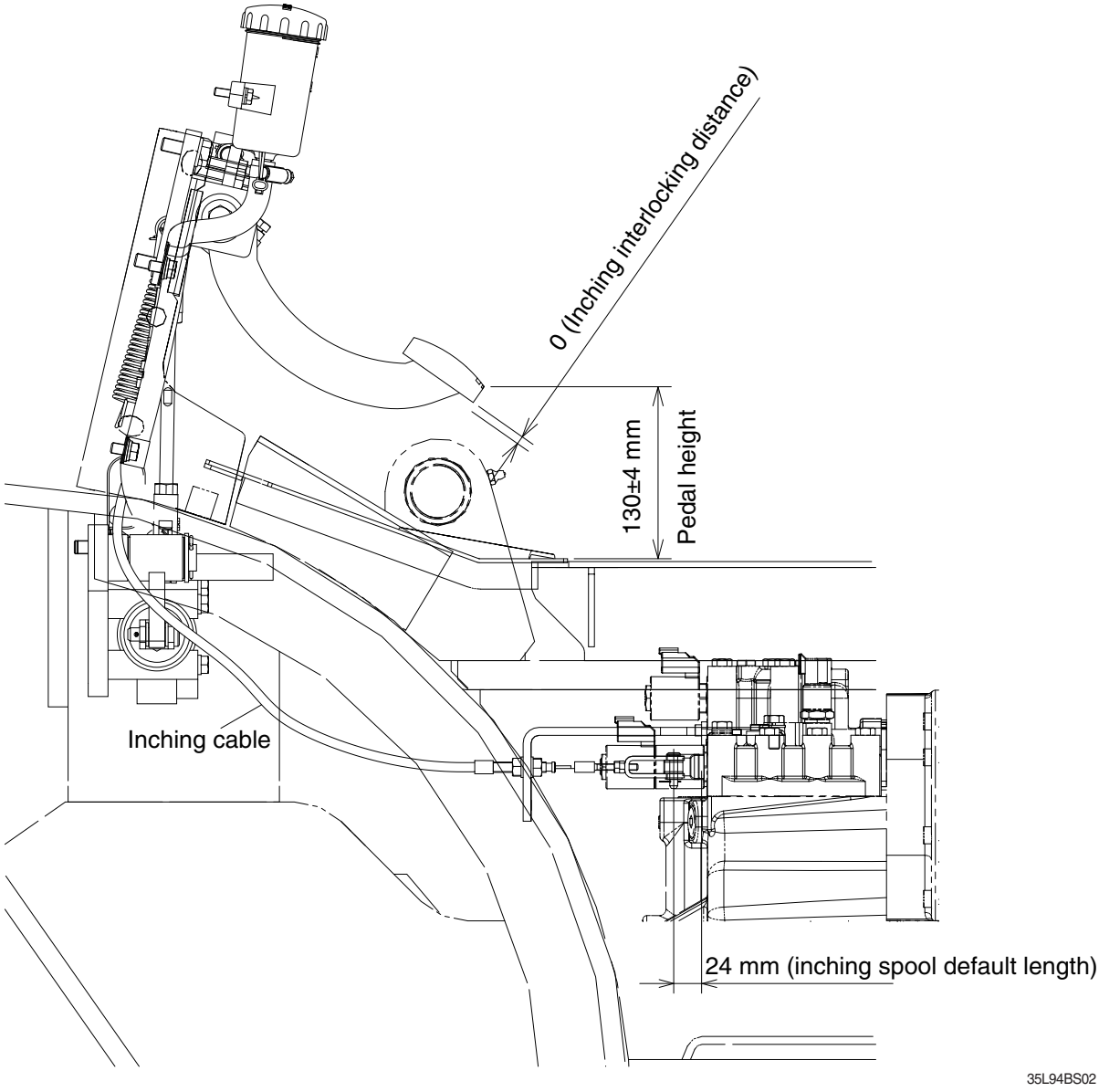
1	Pipe assy-LH	5	Bolt-hex	9	Elbow-90
2	Pipe assy-RH	6	Fitting	10	Connector
3	Pipe assy	7	Sensor-pressure		
4	Block-3way	8	Hose assy-Orfs&Thd		

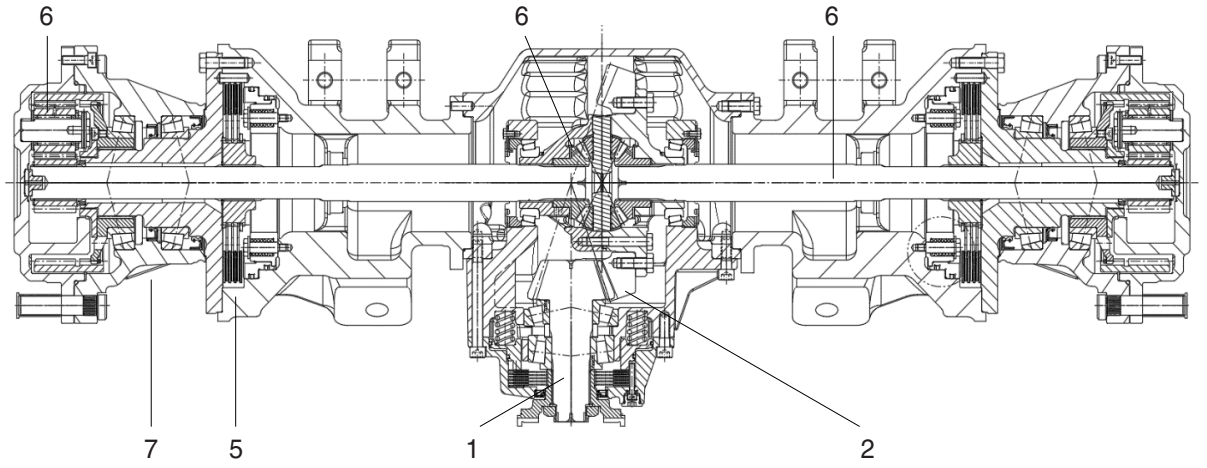
4. INCHING PEDAL AND LINKAGE

The brake pedal serves to actuate the hydraulic brakes on the front axle. At the beginning of the pedal stroke, the inching spool of the transmission control valve is actuated to shift the hydraulic clutch to neutral and turn off the driving force. By treading the pedal further, the brake is applied.



5. WET DISK BRAKE

1) STRUCTURE



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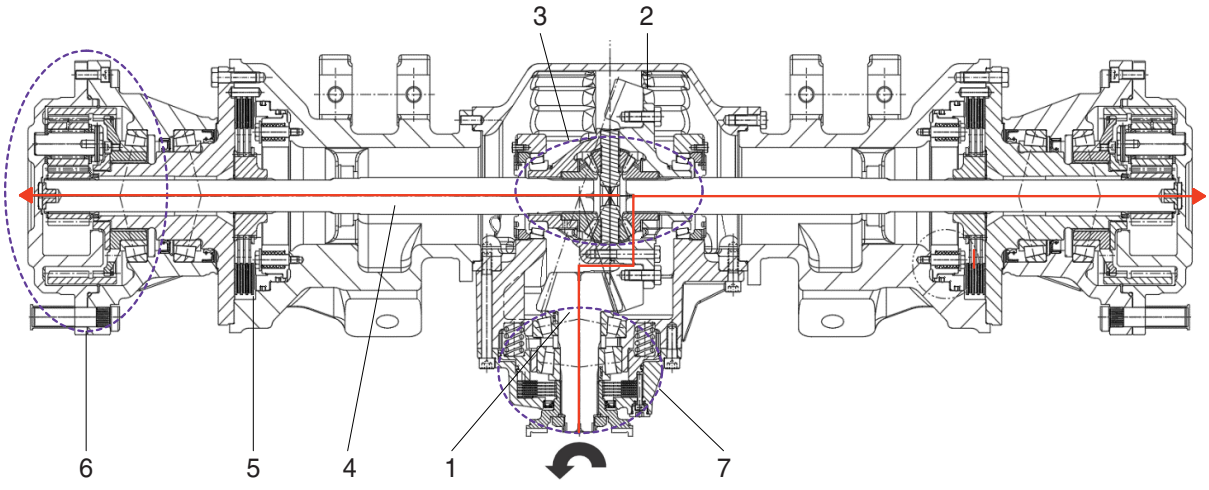
1	Pinion shaft	4	Axle shaft	7	Hub
2	Ring gear	5	Traveling brake		
3	Differential device	6	Hub reduction		

2) OPERATION

The drive axle is connected with the transmission output gear by drive shaft assembly. The power transferred by the drive shaft assembly is connected to the pinion shaft of drive axle, the pinion shaft delivers the power to the differential device through the ring gear. The differential device deliver the power to hub reduction through axle shaft.



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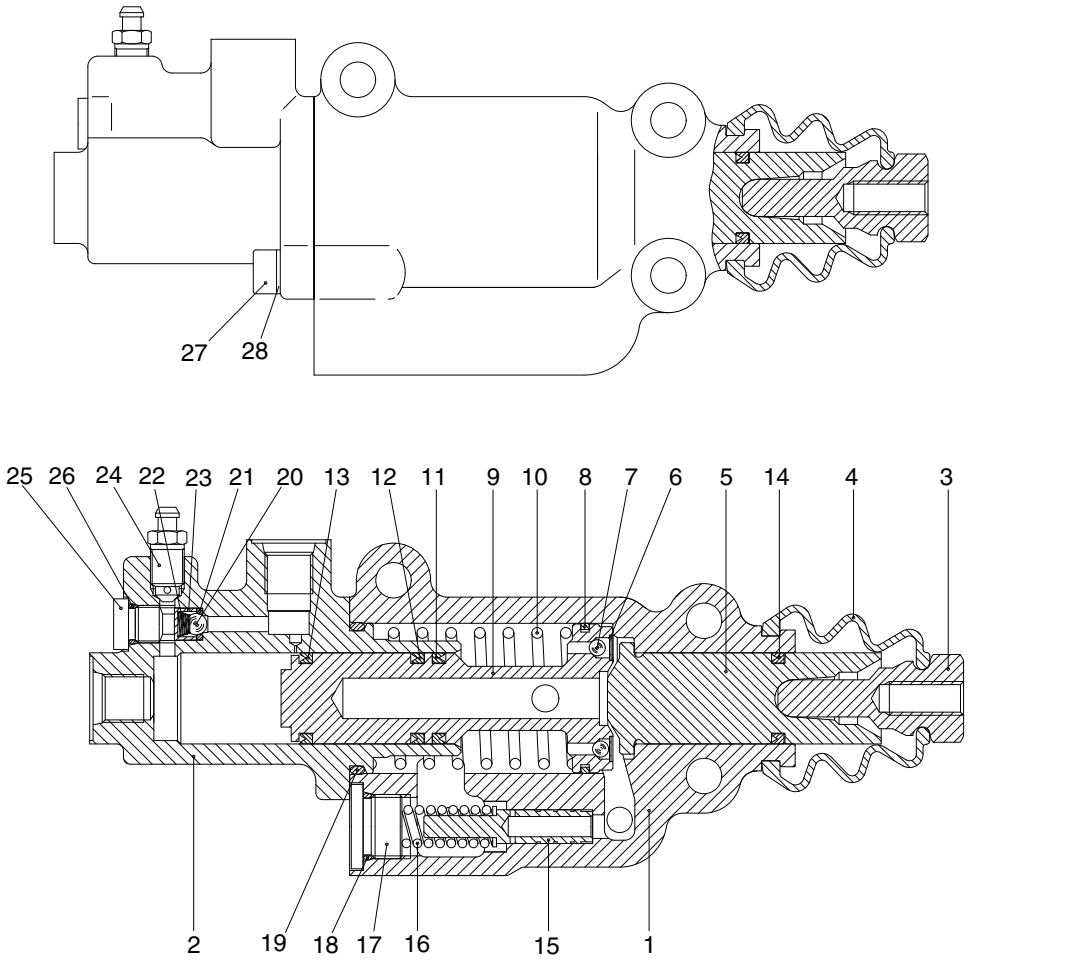
1	Pinion shaft	4	Axle shaft	7	Parking brake device
2	Ring gear	5	Service brake		
3	Differential device	6	Hub reduction		

6. BRAKE VALVE

1) STRUCTURE



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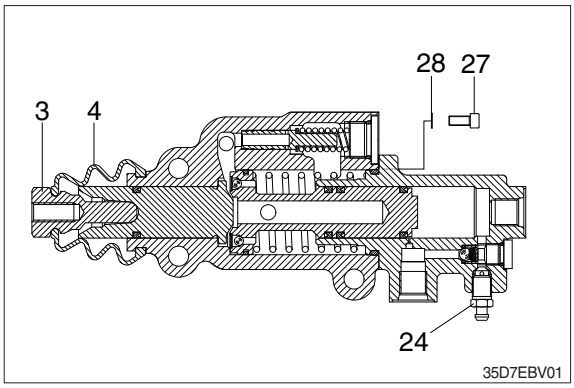
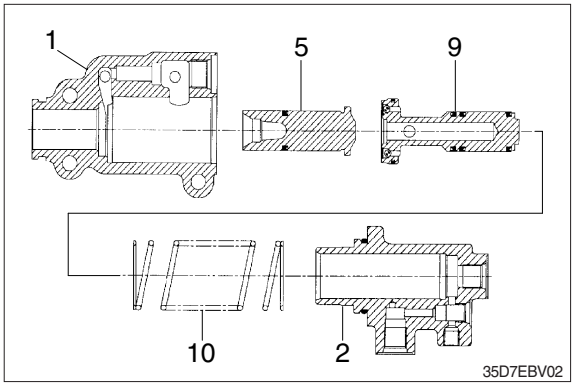
1	Front housing	11	U-cup seal	21	O-ring
2	Rear housing	12	U-cup seal	22	Spring
3	Push rod	13	U-cup seal	23	Gauge
4	Bellows	14	U-cup seal	24	Air bent
5	Master piston	15	Relief piston	25	Plug
6	Lock washer	16	Relief spring	26	O-ring
7	Piston ball	17	Relief plug	27	Bolt
8	Piston ring	18	O-ring	28	Spring washer
9	Servo piston	19	O-ring		
10	Servo spring	20	Ball		

2) DISASSEMBLY

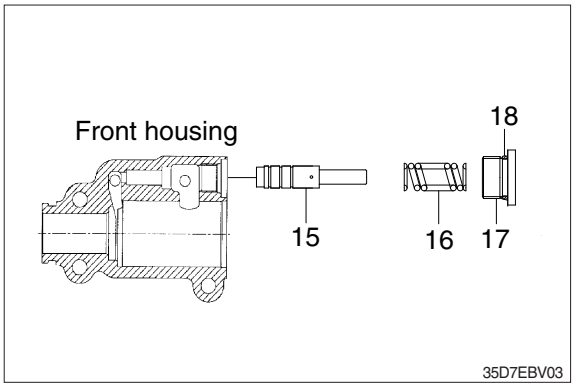
(1) Remove push rod (3), bellows (4), air vent (24), bolt (27) and washer (28).



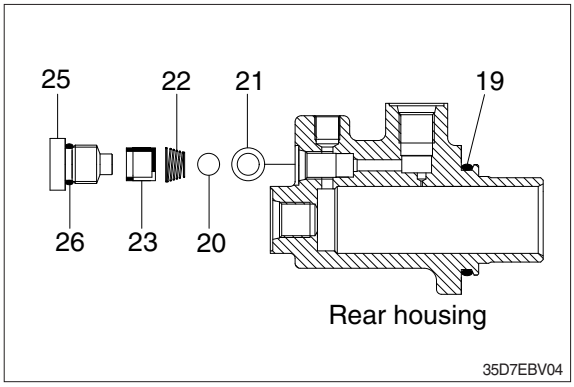
(2) Remove front housing (1), rear housing (2), servo spring (10), servo piston (9) and master piston (5).



(3) Remove relief plug (17) with O-ring (18), relief spring (16) and relief piston (15).



(4) Remove O-ring (19), check plug (25) with O-ring (26), cage (23), check spring (22), check ball (20) and O-ring (21).



3) INSPECTION AND ASSEMBLY

(1) Clean all parts thoroughly and lubricate the parts either with mineral or with hydraulic oil, according to their use destination.

(2) All single parts are to be checked for damage and replaced, if required.

(3) Assembly is in opposite order to disassembly.

(4) Seal kit : XKAU-00176

⚠ Use only brake fluid (Azolla ZS32) into the compensation reservoirs.

GROUP 2 OPERATIONAL CHECKS AND TROUBLESHOOTING

1. OPERATIONAL CHECKS

1) BRAKE PIPING

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

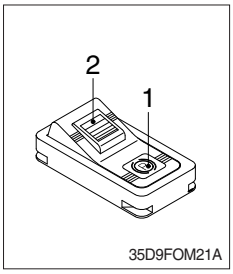
(2) Operate brake pedal and check operating force when pedal in depressed. Check also change in operating force, and change in position of pedal when pedal is kept depressed.

2) PARKING BRAKE

(1) Position 1
Parking brake is applied and front wheel is locked.

(2) Position 2
Parking brake is released.

※ **Before moving the truck be sure the parking brake is released.**



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2. TROUBLESHOOTING

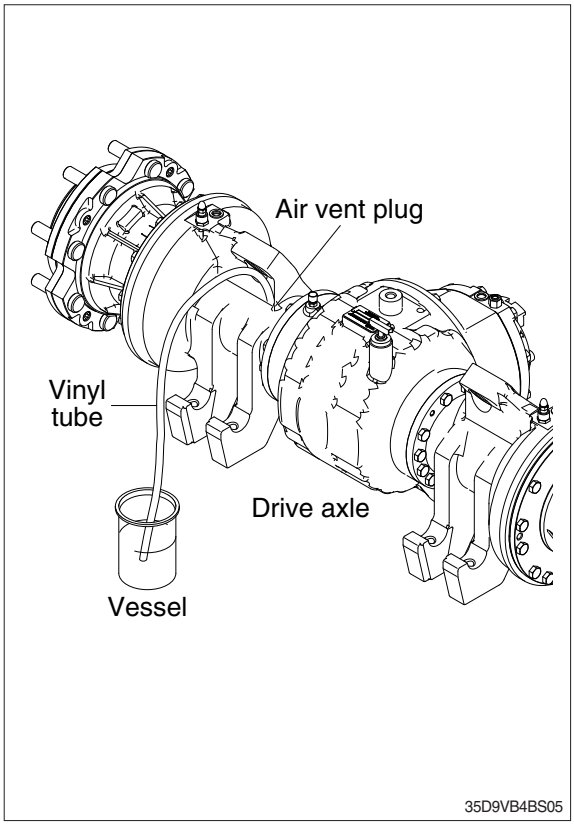
The truck use transmission hydraulic system as a hydraulic system mentioned below

Problem	Cause	Remedy
Insufficient braking force	· Hydraulic system leaks oil. · Hydraulic system leaks air. · Disk worn. · Brake valve malfunctioning. · Hydraulic system clogged.	· Repair and add T/M oil. · Bleed air. · Replace. · Repair or replace. · Clean.
Brake acting unevenly. (truck is turned to one side during braking.)	· Tires unequally inflated. · Brake out of adjustment. · Disk surface roughened. · Wheel bearing out of adjustment. · Hydraulic system clogged.	· Adjust tire pressure. · Adjust. · Repair by polishing or replace. · Adjust or replace. · Clean.
Brake trailing.	· Pedal has no play. · Piston cup faulty. · Brake valve return port clogged. · Hydraulic system clogged. · Wheel bearing out of adjustment.	· Adjust. · Replace. · Clean. · Clean. · Adjust or replace.
Brake chirps	· Brake trailing. · Piston fails to return. · Disk worn. · Disk surface roughened.	· See above. Brake trailing. · Replace. · Replace. · Repair by polishing or replace.
Brake squeaks	· Disk surface roughened. · Disk worn. · Excessively large friction between disk plate.	· Repair by polishing or replace. · Replace. · Clean and apply brake grease.
Large pedal stroke	· Brake out of adjustment. · Hydraulic line sucking air. · Oil leaks from hydraulic line, or lack of oil. · Disk worn.	· Adjust. · Bleed air. · Check and repair or add T/M oil. · Replace.
Pedal dragging.	· Twisted push rod caused by improperly fitted brake valve. · Brake valve seal faulty.	· Adjust. · Replace.

1. AIR BLEEDING OF BRAKE SYSTEM

※ **Check transmission oil level and fill if insufficient.**

1) Air bleeding should be performed by two persons :
   One rides on truck for depressing and releasing brake pedal : the other person is on the ground and removes cap from air vent plug on wheel cylinder.
2) Block the front wheel securely and apply parking brake.
3) Start the engine.
4) Attach a vinyl tube to air vent plug and immerse other end of tube into a vessel filled with hydraulic oil.
5) Loosen air vent plug by turning it 3/4 with a wrench. Depress brake pedal to drain oil mixed with air bubbles from plug hole.
6) Depress brake pedal until no air bubbles come out of air vent plug hole.
7) After completion of air bleeding, securely tighten air vent plug. Install cap on plug.

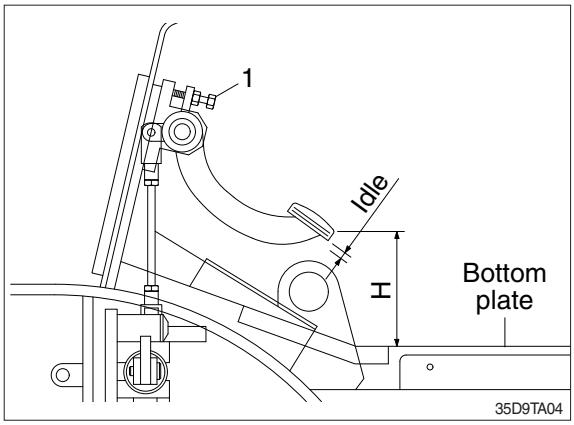


2. ADJUSTMENT OF PEDAL

1) BRAKE PEDAL
   · Adjust stopper bolt (1) so that pedal height is "H".
   · Adjust nut at the push rod of brake valve so that pedal play is idle stroke.

Unit : mm

H	Idle
130±4	2~4



2) INCHING PEDAL

- Adjust stopper bolt (1) so that pedal height is "H".
- Adjust rod of inching cable so that inching pedal play is idle stroke when pedal height is "H".
- Adjust bolt (2) so that brake pedal interconnects with inching pedal at inching pedal stroke "P".

Unit : mm

H	P	IDLE	A
130±4	0	5	24