HYUNDAI

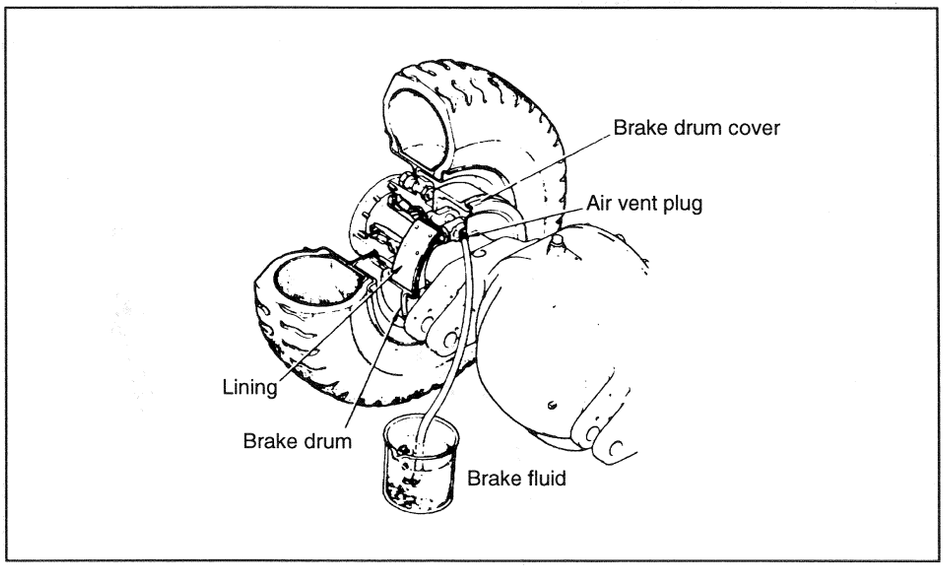
HYUNDAI
FORKLIFT TRUCK

Service Manual

HDF 50A
HDF 70A

- Before draining the oil, warm it up to a temperature at 30 to 40℃
- After replacing oil, filter element or strainer, bleed the air from circuit.
- When the strainer is located in the oil filler, the strainer must not be removed while adding oil.
- When adding oil, use the dipstick to check that the oil is at the correct level.
- When changing the oil or filter, check the drained oil and filter for any signs of excessive metal particles or other foreign materials.
- When removing parts containing O-ring, gaskets or seals, clean the mounting surface and replace with new sealing parts.
- After injecting grease, always wipe off the old grease that was forced out.
- Do not handle electrical equipment while wearing wet gloves, or in wet places, as this can cause electric shock.
- During maintenance, do not allow any unauthorized person to stand near the machine.
- Be sure you fully understand the contents of the operation. It is important to prepare necessary tools and parts and to keep the operating area clean.
- When checking an open gear case there is a risk of dropping things in. Before removing the covers to inspect such cases, empty everything from your pockets. Be particularly careful to remove wrenches and nuts.
- Way to use dispstick. Push the dipstick fully into the guide, and then pull out. Carrying out other difficult maintenance work carelessly can cause unexpected accidents. If you consider the maintenance is too difficult, always request the HYUNDAI Forklift distributor to carry it out.

- Before draining the oil, warm it up to a temperature of 30 to 40℃.
- After replacing oil, filter element or strainer, bleed the air from the circuit.
- Wear well fitting helmet, safety shoes and working clothes. When drilling, grinding, or hammering, always wear protective goggles. Always do up safety clothes properly so that they do not catch on protruding parts of machines. Do not wear oily clothes.
  When checking, always release battery plug.
- When working with others, choose a group leader and work according to his instructions. Do not perform any maintenance beyond the agreed work.
- The electrolyte is sulfamic acid, so it is dangerous. When measuring the specific gravity or temperature of the electrolyte, or when ading distilled water, be careful not to get electrolyte on your skin or clothes. If electrolyte gets on your clothes, wash it off with fresh water immediately. If electrolyte gets in your eyes, wash it out with fresh water and go to a doctor imediately.
- When working on top of the machine, be careful not to lose your balance and fall.
- Hand a caution sing in the operator's compartment(for example "Do not start" or "Maintenance in progress"). This will prevent anyone from starting or moving the machine by mistake.
- When the strainer is located in the oil filler, the strainer must not be removed while adding oil.
- When adding oil, use the dipstick to check that the oil is at the correct level.
- When changing the oil or filter, check the drained oil and filter for any signs of excessive metal particles or other foreign materials.
- When removing parts containing O-ring, gaskets or seals, clean the mounting surface and replace with new sealing parts.
- After injecting grease, always wipe off the old grease that was forced out.
- Do not handle electrical equipment while wearing wet gloves, or in wet places, as this can cause electric shock.
- During maintenance do not allow any unauthorized person to stand near the machine.
- Flames should never be used instead of lamps. Never use a naked flame to check leaks or the level of oil or electrolyte.



Method of air bleeding

① Remove the air vent plug, and fit the vinyl hose. Keep one end of the hose placed in a container filled with brake oil.
② Loosen the air vent valve by turning it approximately 3/4 of a turn, and depress the pedal fully. Then, loosen the air vent valve, and release the pedal.
③ Repeat the procedure ② until the hose discharges no more air bubbles.
④ Tighten the valve and put on the cap after discharging the air completely.

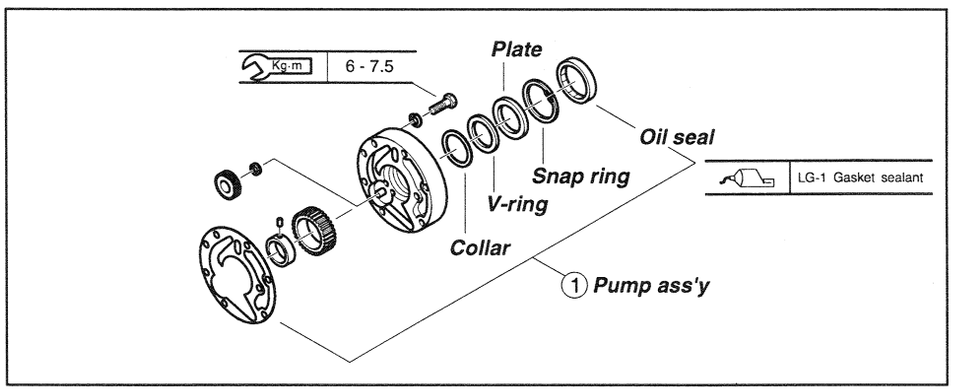
★Make sure that no foreign matter or dust enters during assembly.
Brake fluid : SAE 1703e
0.05 *l*
★Make sure that the operation oil in the booster is not mixed with other kinds of oils during assembly and disassembly.

1. Adjust the play of the brake pedal with the push rod on the booster.

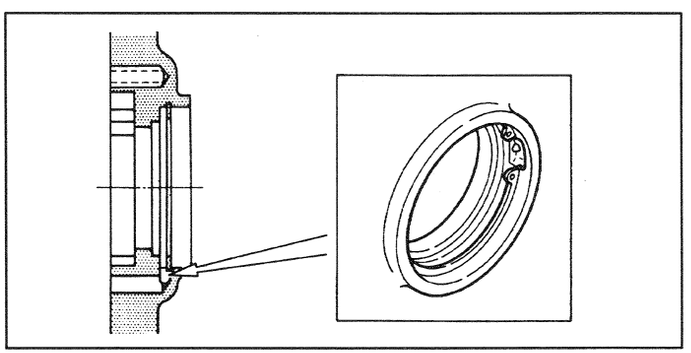
1-2. PRECAUTIONS WHEN ASSEMBLING

ASSEMBLING OF GEAR PUMP OIL SEAL

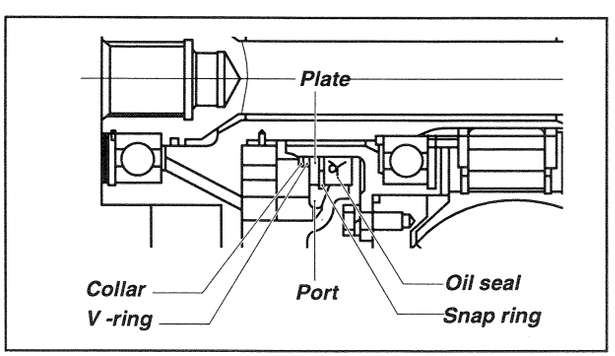
- Assemble the collar ad V-ring.
- Fit the plate on top, then fit the snap ring.



★Install the snap ring so that the end gap is positioned at the center of the hydraulic port.



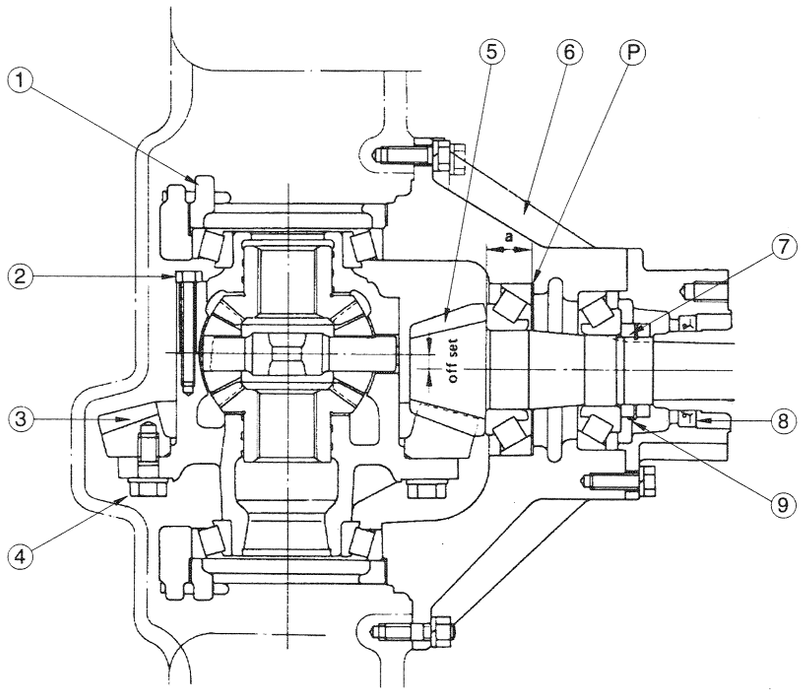
★Press-fit the oil seal.



(unit : mm)

No.	Check item			Criteria		Remedy	Remarks
				Standard size	Repair limit		
A	Thickness of plate	A1	Drive	1.3-1.5	1.1	Replace	
		A2	Driven	2.9-3.1	2.8		Depth of oil groove : min.0.05
B	Seal ring	B1	End gap (piston inserted)	0.15-0.35	1.10		
		B2	Width	2.97-2.99	2.75		
		B3	Inside diameter of contact face (piston end)	45.00-45.025	45.30		
		B4	Ring groove width(shaft end)	3.10-3.15	3.30		
C	Piston ring	C1	End gap (pistion inserted)	0.3-0.5	1.20		
		C2	Width	4.47-4.49	4.25		
		C3	Inside diameter of contact face (piston end)	145.00-145.063	145.300		
		C4	Ring groove width(shaft end)	4.55-4.65	4.85		
D	Thrust washer thicknes			2.9-3.1	2.5		
E	Seal ring	E1	End gap (cap inserted)	0.1-0.3	1.0		
		E2	Width	2.47-2.49	2.25		
		E3	Inside diameter of contact face (cap end)	30.000-30.021	30.300		
		E4	Ring groove width(cap end)	2.60-2.65	2.80		
F	Spacer width			118.2-118.3	118.0		
Gears		Backlash		0.15-0.39	—		If damage is seen on tooth face
		Thrust clearance		0.3-0.7	—		

4-6. ASSEMBLY



① After adjusting backlash, tighten so that starting torque for ring gear and pinion shaft is 310-570 kgcm.
② 5-7.5 kgm Coat thread (hole) with Loctite #271.
③ Reading of dial gauge for runout of rear face of gear: Max. 0.1
④ 16-20 kgm Coat thread with Loctite #271.
⑤ Pinion shaft
⑥ Differential carrier
⑦ Tighten so that pinion gear starting friction torque 20-40 kgcm
⑧ Coat all seal contact surface with grease (G2-L1) when assembling
⑨ Bend to both sides as shown in diagram

2. ASSEMBLY

Use only brake fluid in Master Cylinder Section.

LUBRICATE ALL RUBBER COMPONENTS FROM REPAIR KIT WITH CLEAN TYPE FLUID USED IN THE SYSTEM.

1) Clean all parts thoroughly before assembling.
2) Gently insert new piston assembly(2) into new piston assembly(3). Note direction of piston assembly(2).
3) Insert new seat(6), new check valve(5) and spring(4) into housing bore.

NOTE : Not all cylinders contain a check valve and seat.

4) Insert new piston assembly(3) into housing bore.
5) Install new retaining ring(1).

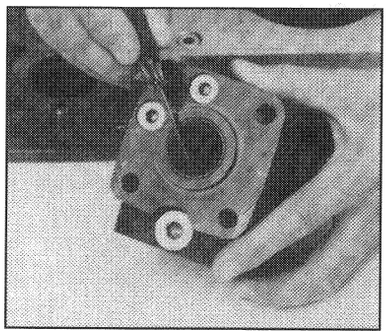
7-3. POWER ASSIST SECTION

1. DISASSEMBLY

1) Drain fluid from unit before disassembling.
2) Remove push rod(1) and boot(2) from Power Assist Section.
3) Loosen end plug(3) using a spanner wrench and remove internal parts assembly(22) from housing(16).
4) Remove spring(15) and retainer(14) from internal parts assembly.
5) Remove end plug(3) from piston(8). Remove o-ring(4) from end plug. Remove retaining ring(7), cup(6) and back-up ring(5) from bore of end plug. Not all models use retaining ring(7).

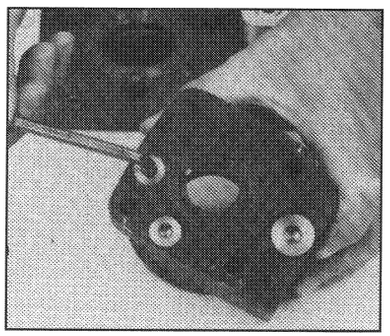
NOTE : Care must be taken so as not to scratch the bore of end plug(3).

14. Remove dust seal and o-ring/kin-ring.

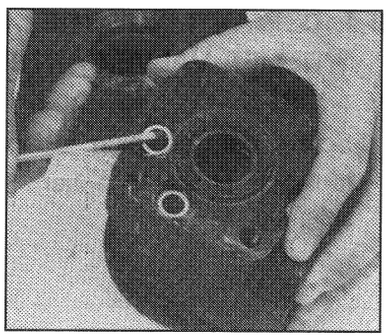


8-3. DISMANTLING THE DUAL SHOCK VALVES FOR OSPC/ OSPC LS

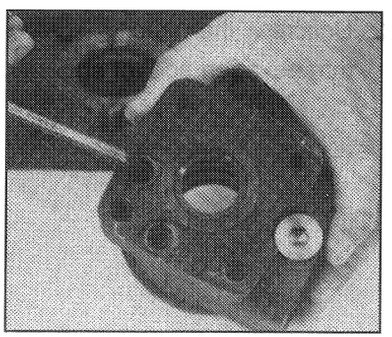
1. Remove plugs from shock valves using a 6 mm hexagon socket spanner.



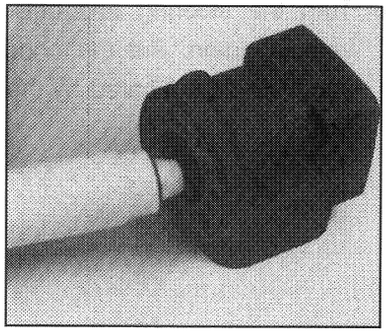
2. Remove seal washers(2-off).



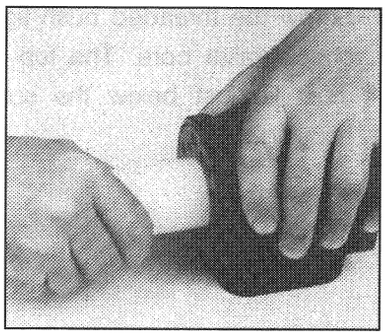
3. Unscrew the setting screws using a 6 mm hexagon socket spanner.



2. Guid the assembly tool right to the bottom.

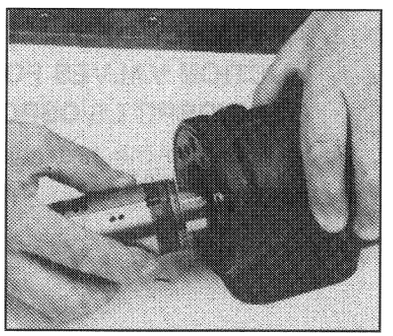


3. Press and turn the lip seal into place in the housing.

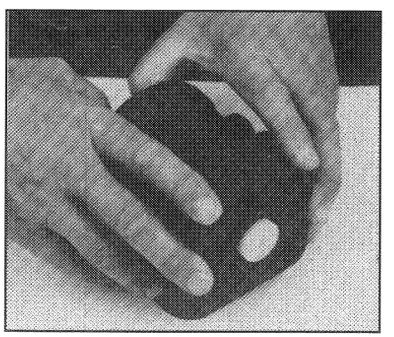


4. With a light turning movement, guide the spool and sleeve into the bore.

NOTE : Fit the spool set holding the cross pin horizontal.

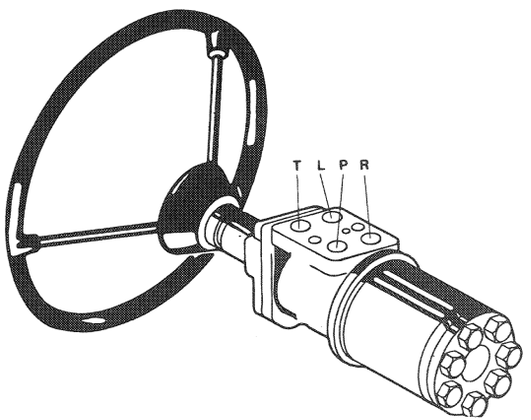


5. The spool set will push out the assembly tool guide. The o-ring and kin-ring are now in position.



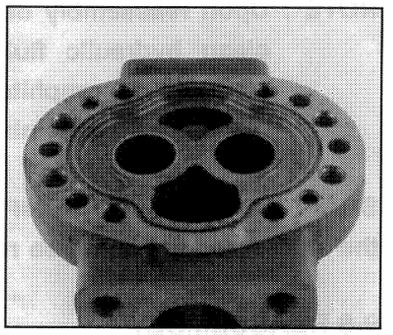
8-16. MAX. TIGHTENING TORQUE AND HYDRAULC CONNECTIONS

L: Left port
R: Right port
T: Tank
P: Pump

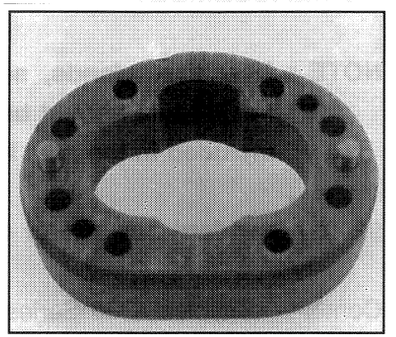


Screwed connection	Max. tightening torque daNm (lbf·in)			
	With cutting edge	With copper washer	With aluminium washer	With O-ring
1/4 BSP.F	4 (350)	2 (180)	3 (270)	—
3/8 BSP.F	6 (530)	2 (180)	5 (440)	—
1/2 BSP.F	10 (900)	3 (270)	8 (700)	—
7/16-20 UNF	—	—	—	2 (180)
3/4-16 UNF	—	—	—	6 (530)
M12×1.5	4 (350)	2 (180)	3 (270)	2 (180)
M18×1.5	7 (620)	2 (180)	5 (440)	5 (440)
M22×1.5	10 (900)	3 (270)	8 (700)	7 (620)

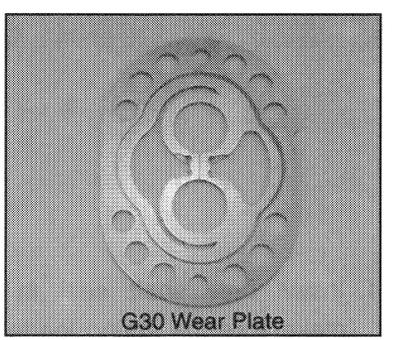
5. Inspect bearings in rear cover for excessive wear, scoring, flaking or movement of bearings.



6. Inspect the gear pockets inside the center section. It is normal for the surface inside the gear housing to show a clean "wipe" on the inside gear pocket wall on the intake side. There should not be excessive wear or deep scratches and gouges.



7. Inspect bronze side of both wear plates for erosion, pitting, scratches or scoring, replace if damaged.

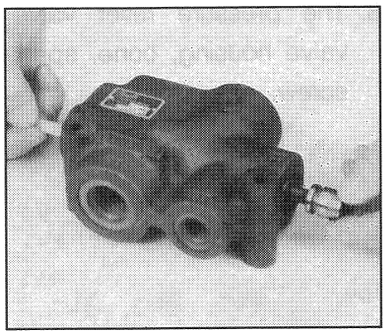


G30 Wear Plate

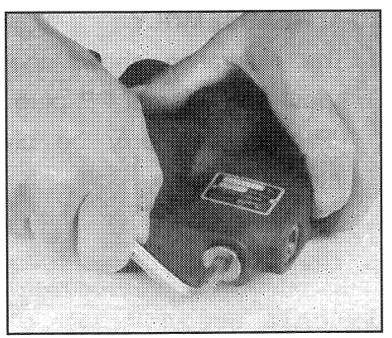
9-5. GENERAL INFORMTION

It is important that the relationship of the front cover, center section and rear cover is correct. Notches cast into the outside surface of these three parts must be aligned for proper reassembly of this pump. Failure to properly assemble this pump will result in low flow, low pressure and possible damage to the pump.

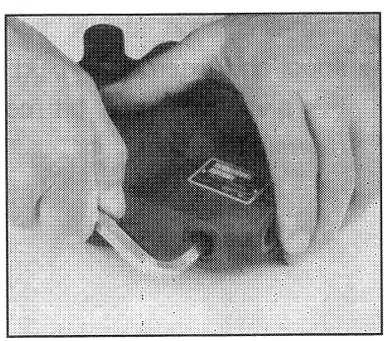
4. Press out the spool using the nylon pin.



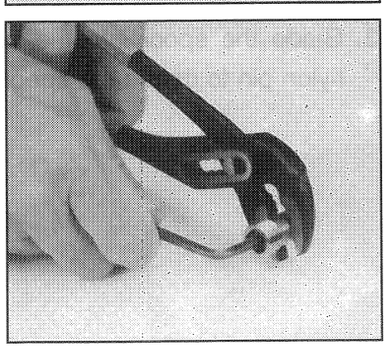
5. Screw out the pressure relief valve plug (8mm hexagon socket spanner).



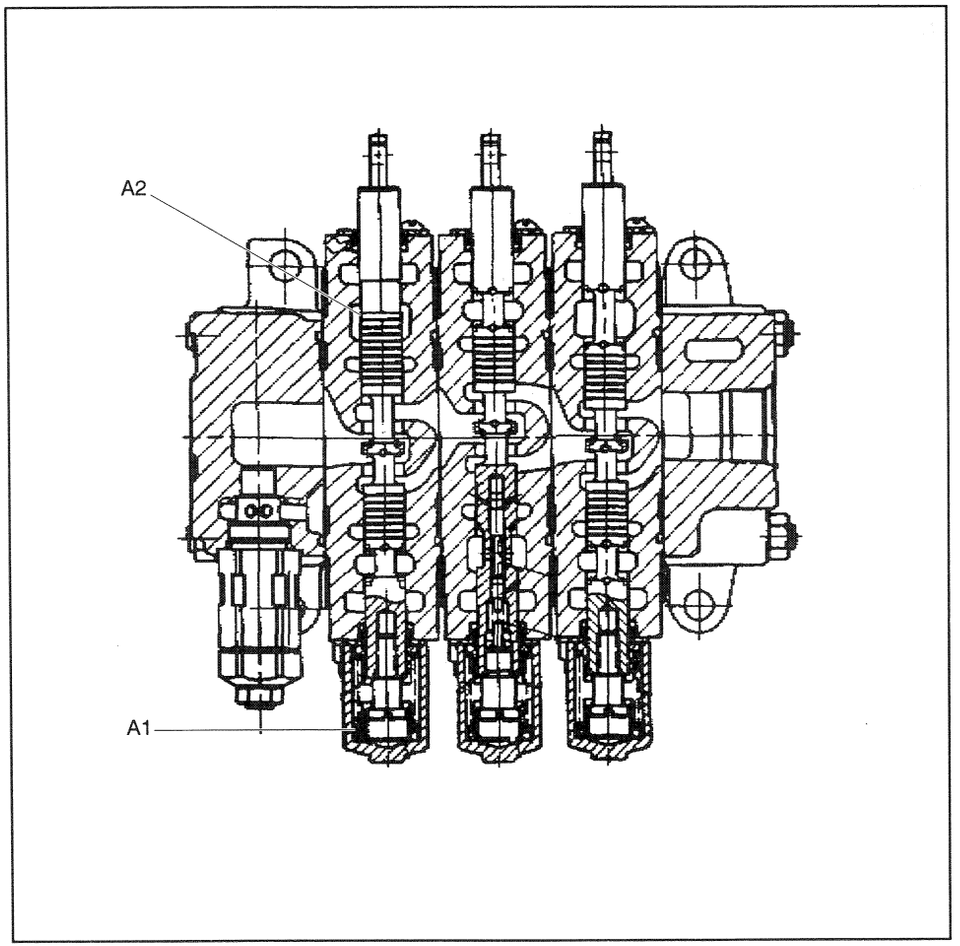
6. Screw out the pressure relief valve (10 mm hexagon socket spanner).



7. Hold the pressure relief valve firmly with the multigrip pliers and screw out the setting screw (5 mm hexagon socket spanner).



14. CONTROL VALVE



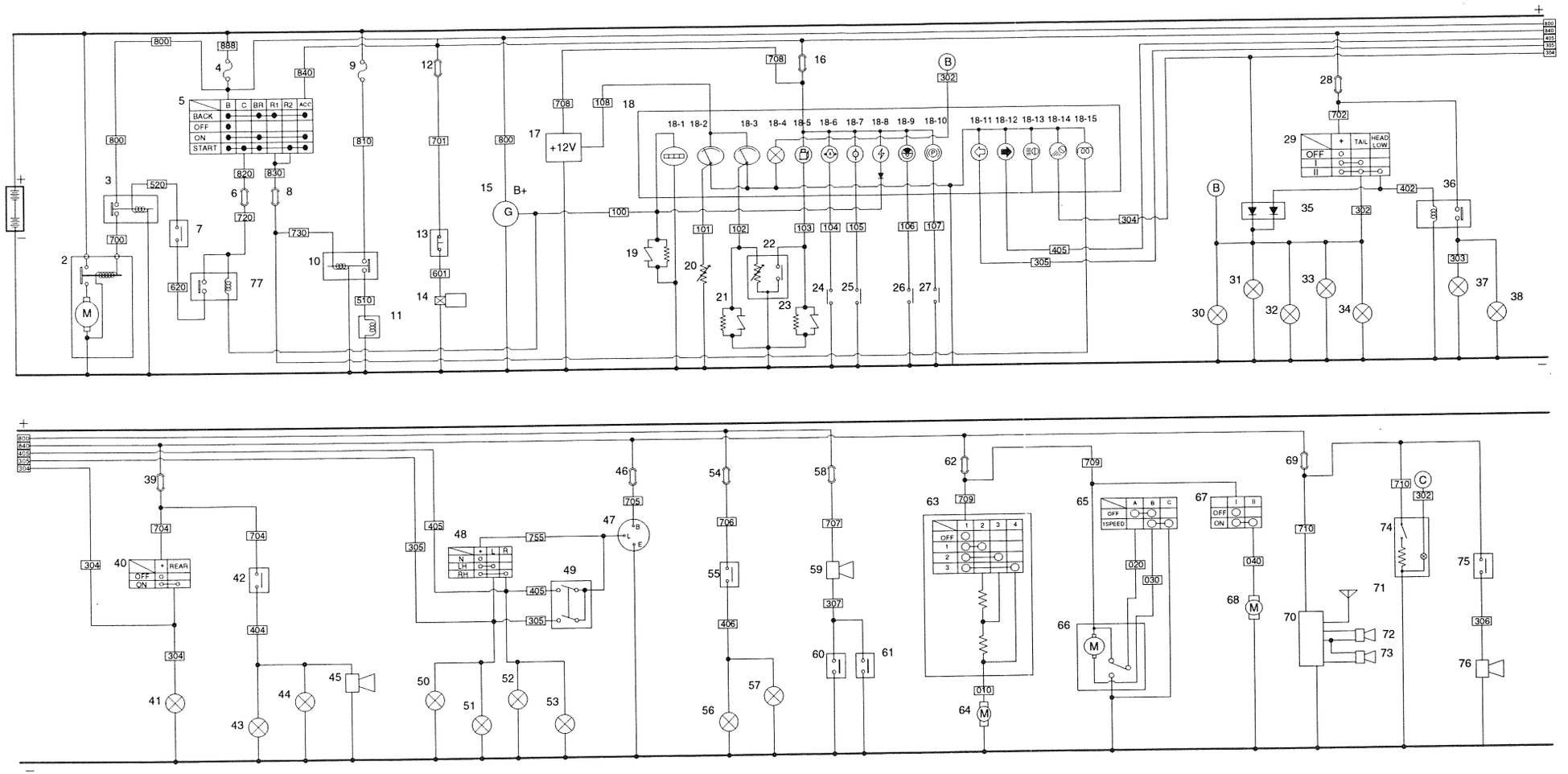
- Wash all parts thoroughly. Remove detergent and dust completely with compressed air, and coat with hydraulic oil.

★Do not use rage to remove detergent and dust.

★Use light oil or trichloroethylene as a detergent. Keep the detergent away from fire.

★Replace dust seals, U-packings and O-rings. Install new ones coated with grease, taking care not to scratch them. Use hydraulic oil for cleaning.

2. WIRING DIAGRAM



Item	Points for Inspection	Frequency						
		Before starting	Every 100 hours	Initial 200 hours	Every 200 hours	Every 600 hours	Every 1200 hours	Every 2400 hours
Steering system								
Steering wheel	• Play, wobbling	○						
Tires	• Pressure, wear, damage	○						
Hubs, Rims	• Tightening torque, damage, deformation, cracking	○						
Wheel bearings	• Abnormal noise, play				○			
Gear box	• Oil leaks, installation • Fitting of power steering, looseness				○ ○			
Linkage	• Bending, damage, wear						○	
Knuckles	• Play, deformation, damage						○	
Minimum turning radius	• Large discrepancy from rating						○	
Axles	• Deformation, cracking, damage							○
Brake system								
Brake pedals	• Play	○						
Brake fluid	• Amount • Change	○					○	
Wheel brakes	• Function, unbalanced engaging	○						
Inching pedal	• Play, height when depressed	○						
Inching brake	• Function	○						
Parking brake	• Play and function	○						
Brake linkage	• Play, looseness, damage, wear				○			
Piping	• Leaking, looseness, damage • Air-tightness, oil sealing				○		○	
Brake drum	• Clearance between lining • Mounting condition, wear				○			○
Brake linings	• Wear • Brake drag				○			○

<table>
<tr><th>Sys-tem</th><th>Check item</th><th>Checking procedure</th></tr>
<tr><td rowspan="4">Brake system</td><td>7. Brake drum
• Wear
• Damage</td><td>Repair limit(parking brake)
<table><tr><td>Inside diameter of drum</td><td>Wheel</td><td>Max. 219 mm</td></tr></table>
Repair limit
<table><tr><td rowspan="2">Clearance between drum and lining</td><td>Wheel</td><td>0.1-0.2 mm</td></tr><tr><td>Parking brake</td><td>0.1-0.1 mm</td></tr></table></td></tr>
<tr><td>8. Back plate
• Deformation
• Cracks
• Damage
• Tightening torque</td><td><table><tr><td>kg·m</td><td>Wheel brake</td><td>15-21 kg·m</td></tr><tr><td>kg·m</td><td>Parking brake</td><td>16-20 kg·m</td></tr></table></td></tr>
<tr><td>9. Braking force
• Pulling to one side
• Abnormal noise</td><td><table><tr><td>Operating force*</td><td>20-30 kg</td></tr></table>
*Parking brake lever
1) Braking force(stopping distance)
<table><tr><td rowspan="2">Wheel brake</td><td>Unloaded</td><td>Max. 5 m</td></tr><tr><td>Loaded</td><td>Max. 2.5 m</td></tr></table>
Check on a dry flat paved surface.
When unloaded, drive the truck at 20 km/h ; when loaded, drive the truck at 10 km/h, then stop the truck suddenly to check.
2) Braking force(holding on slopes)
<table><tr><td rowspan="2">Parking brake</td><td>Unloaded</td><td>Min. 11.2°</td></tr><tr><td>Loaded</td><td>Min. 8.4°</td></tr></table></td></tr>
<tr><td>10. Wheel bearing
• Play
• Abnormal noise</td><td>1) Jack up wheel, hold tire at top and bottom and check for play.
2) Rotate wheel by hand, and check for heaviness or abnormal noise during rotation.</td></tr>
</table>