

SECTION 1 GENERAL

Group 1 Safety Hints	1-1
Group 2 Specifications	1-5
Group 3 Periodic Replacement	1-13

SECTION 2 REMOVAL AND INSTALLATION OF UNIT

Group 1 Structure	2-1
Group 2 Removal and Installation of Unit	2-2

SECTION 3 POWER TRAIN SYSTEM

Group 1 Structure and Operation	3-1
Group 2 Troubleshooting	3-15
Group 3 Test and adjustments	3-19
Group 4 Disassembly and Assembly	3-23

SECTION 4 BRAKE SYSTEM

Group 1 Structure and Function	4-1
Group 2 Operational Checks and Troubleshooting	4-6
Group 3 Tests and Adjustments	4-9

SECTION 5 STEERING SYSTEM

Group 1 Structure and Function	5-1
Group 2 Operational Checks and Troubleshooting	5-10
Group 3 Disassembly and Assembly	5-12

SECTION 6 HYDRAULIC SYSTEM

Group 1 Structure and Function	6-1
Group 2 Operational Checks and Troubleshooting	6-22
Group 3 Disassembly and Assembly	6-26

SECTION 7 ELECTRICAL SYSTEM

Group 1 Component Location	7-1
Group 2 Electrical Circuit	7-2
Group 3 Component Specification	7-9
Group 4 Connector Destination	7-10
Group 5 Troubleshooting	7-12

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

- Thank you very much for reading the preview of the manual.
- You can download the complete manual from: www.heydownloads.com by clicking the link below



- Please note: If there is no response to **CLICKING** the link, please download this PDF first and then click on it.

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

SECTION 1 GENERAL



Group 1 Safety Hints 1-1

Group 2 Specifications 1-5

Group 3 Periodic Replacement 1-13

5. TORQUE CHART

Use following table for unspecified torque.

1) BOLT AND NUT

(1) Coarse thread

Bolt size	8T		10T	
	kgf · m	lbf · ft	kgf · m	lbf · ft
M 6 × 1.0	0.85 ~ 1.25	6.15 ~ 9.04	1.14 ~ 1.74	8.2 ~ 12.6
M 8 × 1.25	2.0 ~ 3.0	14.5 ~ 21.7	2.7 ~ 4.1	19.5 ~ 29.7
M10 × 1.5	4.0 ~ 6.0	28.9 ~ 43.4	5.5 ~ 8.3	39.8 ~ 60.0
M12 × 1.75	7.4 ~ 11.2	53.5 ~ 81.0	9.8 ~ 15.8	70.9 ~ 114
M14 × 2.0	12.2 ~ 16.6	88.2 ~ 120	16.7 ~ 22.5	121 ~ 163
M16 × 2.0	18.6 ~ 25.2	135 ~ 182	25.2 ~ 34.2	182 ~ 247
M18 × 2.0	25.8 ~ 35.0	187 ~ 253	35.1 ~ 47.5	254 ~ 344
M20 × 2.5	36.2 ~ 49.0	262 ~ 354	49.2 ~ 66.6	356 ~ 482
M22 × 2.5	48.3 ~ 63.3	349 ~ 458	65.8 ~ 98.0	476 ~ 709
M24 × 3.0	62.5 ~ 84.5	452 ~ 611	85.0 ~ 115	615 ~ 832
M30 × 3.0	124 ~ 168	898 ~ 1214	169 ~ 229	1223 ~ 1656
M36 × 4.0	174 ~ 236	1261 ~ 1704	250 ~ 310	1808 ~ 2242

(2) Fine thread

Bolt size	8T		10T	
	kgf · m	lbf · ft	kgf · m	lbf · ft
M 8 × 1.0	2.2 ~ 3.4	15.9 ~ 24.6	3.0 ~ 4.4	21.7 ~ 31.8
M10 × 1.2	4.5 ~ 6.7	32.5 ~ 48.5	5.9 ~ 8.9	42.7 ~ 64.4
M12 × 1.25	7.8 ~ 11.6	56.4 ~ 83.9	10.6 ~ 16.0	76.7 ~ 116
M14 × 1.5	13.3 ~ 18.1	96.2 ~ 131	17.9 ~ 24.1	130 ~ 174
M16 × 1.5	19.9 ~ 26.9	144 ~ 195	26.6 ~ 36.0	192 ~ 260
M18 × 1.5	28.6 ~ 43.6	207 ~ 315	38.4 ~ 52.0	278 ~ 376
M20 × 1.5	40.0 ~ 54.0	289 ~ 391	53.4 ~ 72.2	386 ~ 522
M22 × 1.5	52.7 ~ 71.3	381 ~ 516	70.7 ~ 95.7	511 ~ 692
M24 × 2.0	67.9 ~ 91.9	491 ~ 665	90.9 ~ 123	658 ~ 890
M30 × 2.0	137 ~ 185	990 ~ 1339	182 ~ 248	1314 ~ 1796
M36 × 3.0	192 ~ 260	1390 ~ 1880	262 ~ 354	1894 ~ 2562

2) INSTALLATION

After assembling mast components totally without piping connections, install mast assembly to the equipment.

※ **Installation procedure for each of mast component is the reverse of the removal procedure.**

(1) Mast support cap

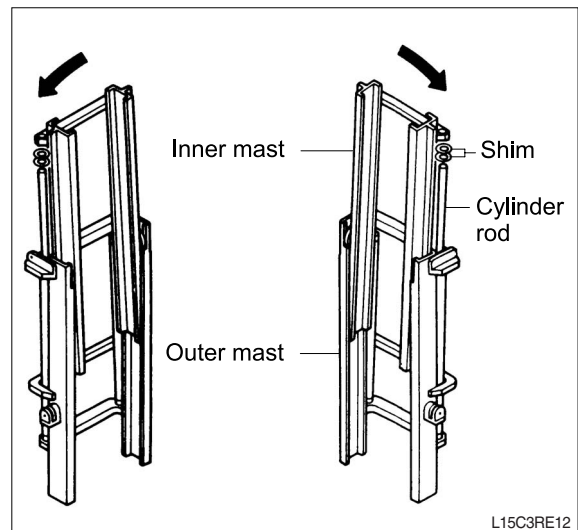
- ① Check the mast support cap and spring pin for wear.
- ② Jack up the machine so that the front is raised and then using an overhead hoist assemble outer mast to drive axle unit.
- ③ Tighten mounting bolts to mast support cap.
 - Tightening torque : 19.9~26.9kgf · m(144~195lbf · ft)

(2) Tilt cylinder pin

Hold the mast with a crane, operate the tilt control lever and align the holes, then knock the pin.

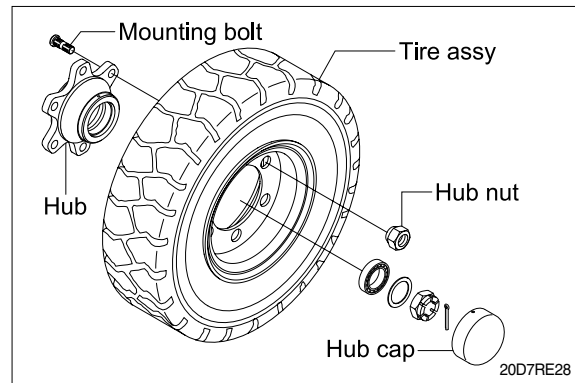
(3) Lift cylinder installation and adjustment

- ① Assemble the lift cylinder inside the outer mast, then tighten the stopper bolt. If the cylinder assembly has been replaced, adjust as follows so that the left and right cylinders are synchronized at the maximum lifting height.
 - ② Assemble the cylinder rod to the inner mast, and check the left-to-right play of the mast at the maximum lifting height.
- ※ If play is to LEFT, install adjustment shim to LEFT cylinder.
- ※ If play is to RIGHT, install adjustment shim to RIGHT cylinder.
- Shim thickness : 1.0mm(0.04in)



(2) Rear wheel

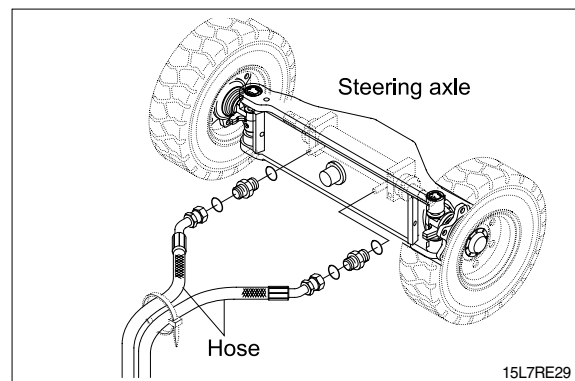
Remove mounting bolt and hub nut with socket wrench and then carefully take out the tire assembly.



(3) Hose

Drain hydraulic oil in the hoses and cylinder before removing them.

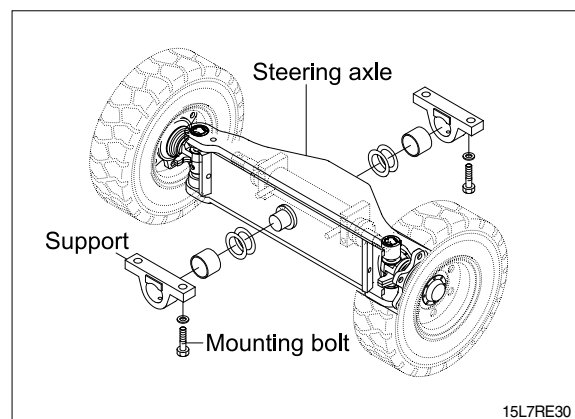
Loosen connector and then disconnect the hoses.



(4) Mounting bolt

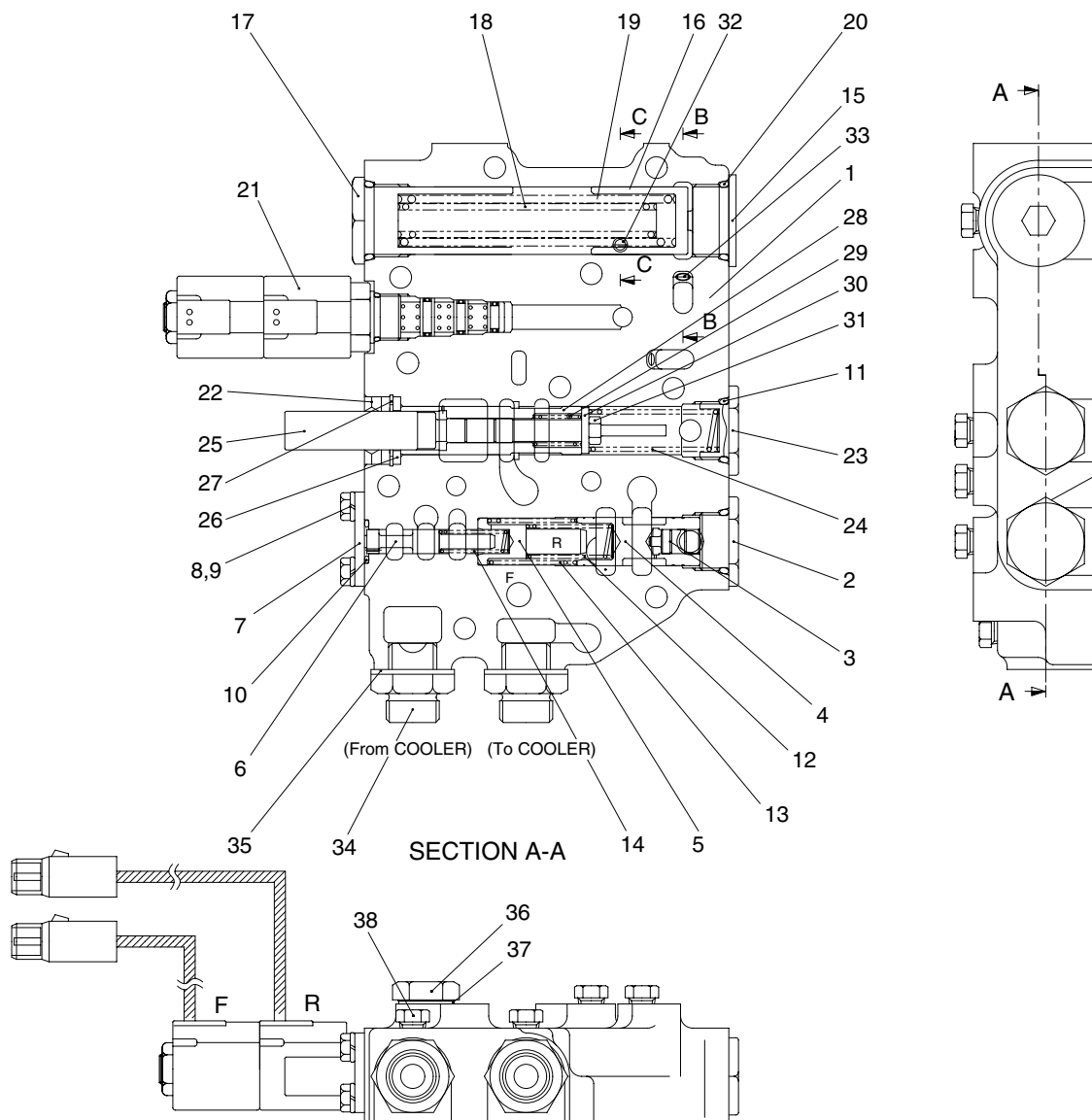
Put a block under the steering axle, support on a truck, and raise the frame with a crane. Remove the mounting bolts installing to the frame, and pull out to the rear.

There are shims between the support and steering axle to prevent play.



4. CONTROL VALVE

1) STRUCTURE



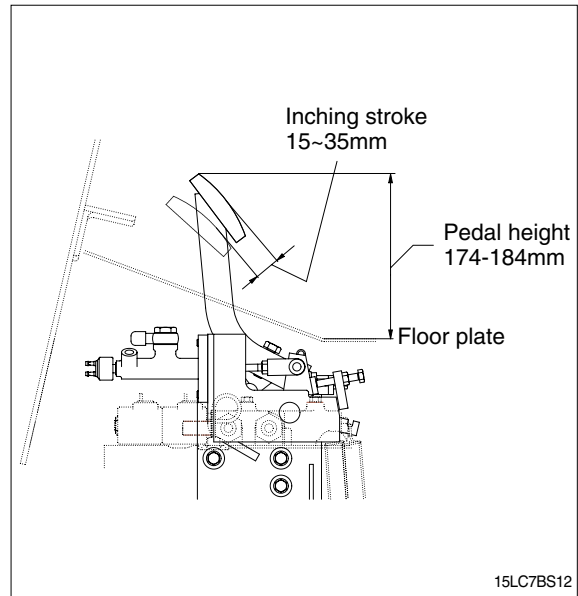
D153PT28

- | | | |
|-----------|-------------------|------------------|
| 1 Body | 14 Spring | 27 Snap ring |
| 2 Plug | 15 Plug | 28 Valve |
| 3 Piston | 16 Piston | 29 Spring |
| 4 Valve | 17 Stopper | 30 Stopper |
| 5 Stopper | 18 Spring | 31 Nut |
| 6 Valve | 19 Spring | 32 Screw |
| 7 Plate | 20 O-ring | 33 Screw |
| 8 Washer | 21 Solenoid valve | 34 Nipple |
| 9 Bolt | 22 Oil seal | 35 Spring washer |
| 10 O-ring | 23 Plug | 36 Plug |
| 11 O-ring | 24 Spring | 37 Washer |
| 12 Spring | 25 Spool | 38 Plug |
| 13 Spring | 26 Plate | |

GROUP 3 TESTS AND ADJUSTMENTS

1. INCHING PEDAL

- 1) Depress inching pedal fully, and move gear shift lever to FORWARD or REVERSE. Check that machine does not move even when engine speed is increased slightly.
- 2) Adjust stopper bolt so that pedal height is 174~184mm (6.9~7.2 in).
- 3) Adjust bolt so that brake pedal interconnects with inching pedal at a stroke of 15~35mm (0.6~1.4in).



2. HYDRAULIC PRESSURE

- 1) Block wheels of truck, and pull parking lever. Install oil pressure gauge at inlet of control valve.
- 2) Move direction control lever to FORWARD or REVERSE, depress accelerator pedal and run engine at 1500rpm. Measure clutch pressure and torque converter pressure and check that they are within specified range.

3. ENGINE STALL SPEED

Move direction control lever to FORWARD or REVERSE, and run engine at maximum speed. Check that maximum engine speed is within specified range.

- ※ This check raises the temperature of the oil in the torque converter, so do not run this test for a long period.

Model	Stall speed
HYUNDAI beta	1680 ± 100rpm

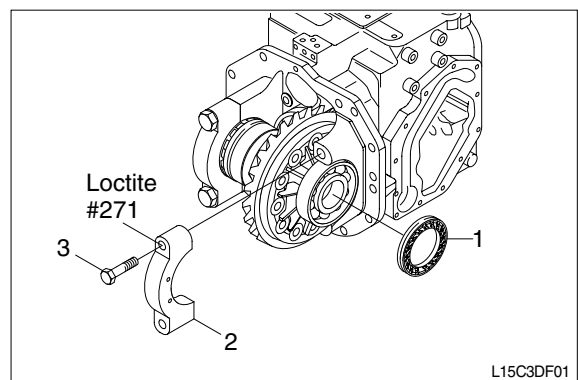
4. DIFFERENTIAL

1) Fitting differential assembly

- (1) Install the differential assembly and fit adjust screw gear(1).
- (2) Apply loctite in the hole of cap(2), and temporarily tighten with bolt(3).

2) Adjustment of backlash

- ※ Tighten the adjust screw gear(1).

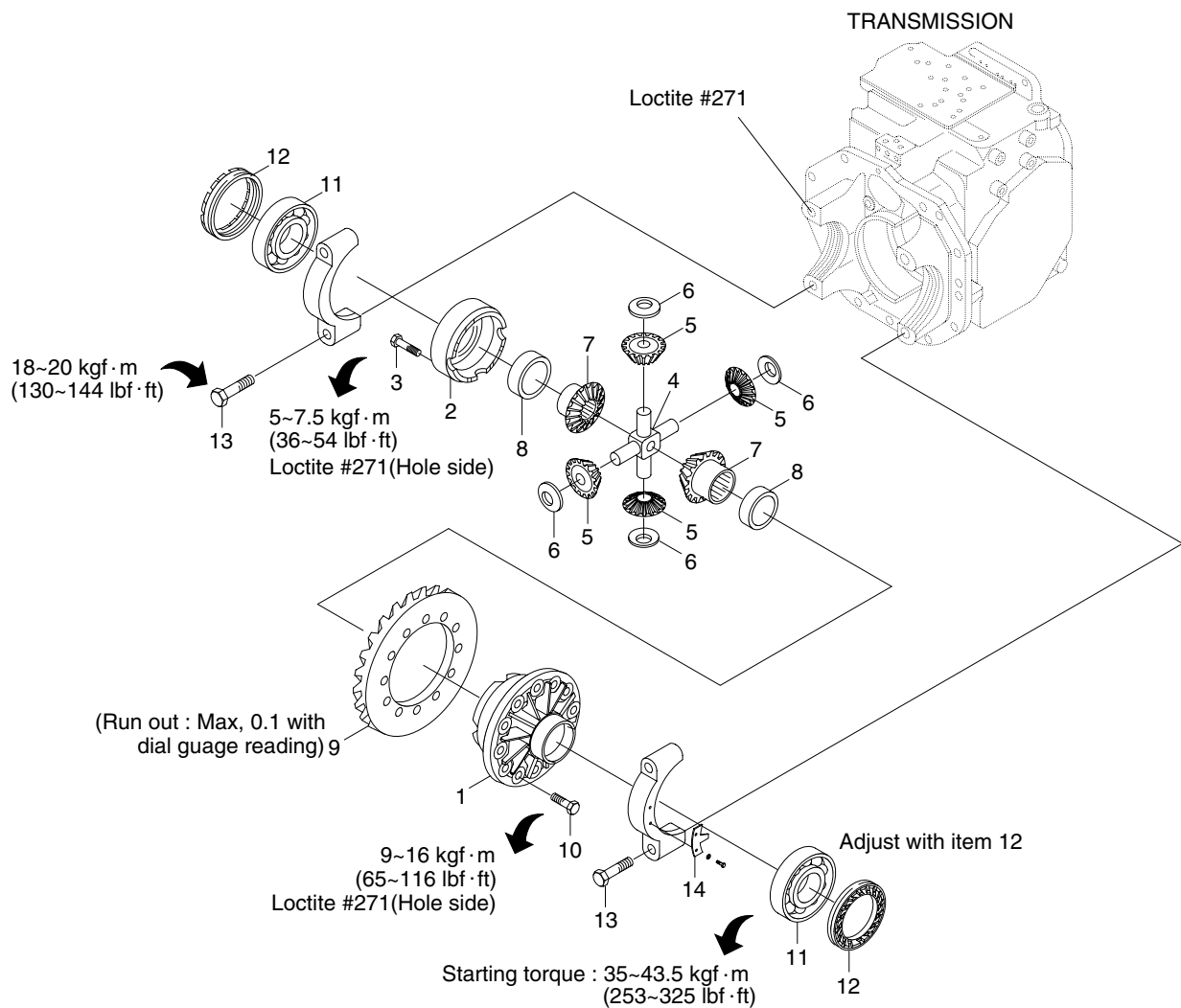


Unit : mm(in), kg(lb)

No.	Check item				Criteria		Remedy
					Standard size	Repair limit	
A	Torque converter input output valve	A ₁	Clearance between piston and housing hole		0.015-0.025 (0.0006-0.001)	0.065 (0.0025)	Replace piston
		A ₂	Torque converter inlet relief valve spring	Free length	89.9 (3.54)	87.3 (3.43)	
				Installed length	63 (2.48)	63 (2.48)	
				Installed load	7.70 (16.98)	6.94 (15.3)	
		A ₃	Torque converter output pressure adjusting valve spring	Free length	122 (4.80)	120.4 (4.74)	
				Installed length	103.5 (4.07)	103.5 (4.07)	
				Installed load	3.45 (7.61)	3.11 (2.36)	
B	Oil seal O.D				-	60 (2.36)	Replace
C	Torque converter impeller valve	C ₁	Oil seal mating face outer dia		59.952-60.000 (2.360-2.362)	59.852 (2.356)	
E	Seal spring	E ₁	Clearance of abutment when housing is inserted		0.1-0.3 (0.004-0.012)	1.0 (0.04)	
		E ₂	Ring with		2.47-2.49 (0.097-0.098)	2.7 (0.089)	
F	Turbine shaft(Seal ring groove width)				2.56-2.60 (0.100-0.102)	2.7 (0.106)	
G	Housing(Seal ring portion inner dia)				48.0-48.025 (1.889-1.890)	48.12 (1.894)	
H	Impeller hub O.D				47.951-47.970 (1.887-1.888)	Clearance between hub and bushing 0.1(0.0039)	
I	Pump bushing				47.975-48.000 (1.889-1.890)		
J	Pilot(Tip outer dia)		Isuzu engine		15 (0.59)	14.85 (0.38)	Corrected by hard chrome plating

3. DIFFERENTIAL

1) STRUCTURE



L15C3DF04

※ Ring gear and pinion must be replaced as one unit.
Do not replace one without the other.

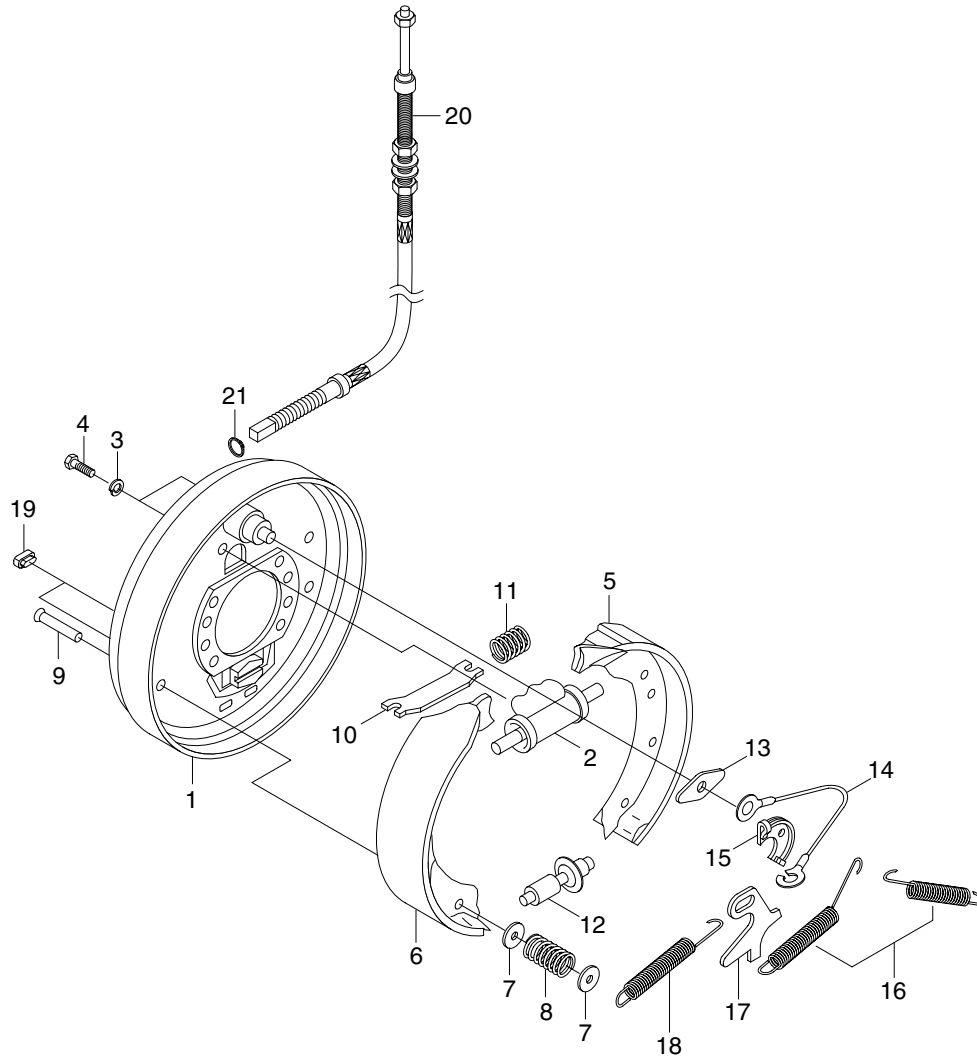
1 Case	6 Washer	11 Taper bearing
2 Case	7 Differential pinion	12 Screw gear
3 Hexagon bolt	8 Bushing	13 Bolt
4 Spider	9 Bevel gear	14 Plate
5 Differential pinion	10 Bolt	

5. WHEEL BRAKE

1) STRUCTURE

The wheel brake assembly mounts to the flange on the drive axle housing casting and is basically contained within the hub assembly.

The inside of the hub is machined and acts as the brake drum.



15LC7BS03

1	Back plate-LH/RH	8	Shoe hole down spring	15	Adjuster guide
2	Wheel cylinder	9	Shoe hole down pin	16	Shoe return spring
3	Spring washer	10	Strut	17	Adjuster lever-LH/RH
4	Cylinder bolt	11	Strut spring	18	Adjuster spring
5	Shoe & lining assembly sec	12	Adjuster assembly-LH/RH	19	Rubber
6	Shoe & lining assembly pri-LH/RH	13	Shoe guide	20	Parking cable assembly-LH/RH
7	Shoe hole down cup	14	Adjuster cable	21	E-ring

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

- Thank you very much for reading the preview of the manual.
- You can download the complete manual from: www.heydownloads.com by clicking the link below



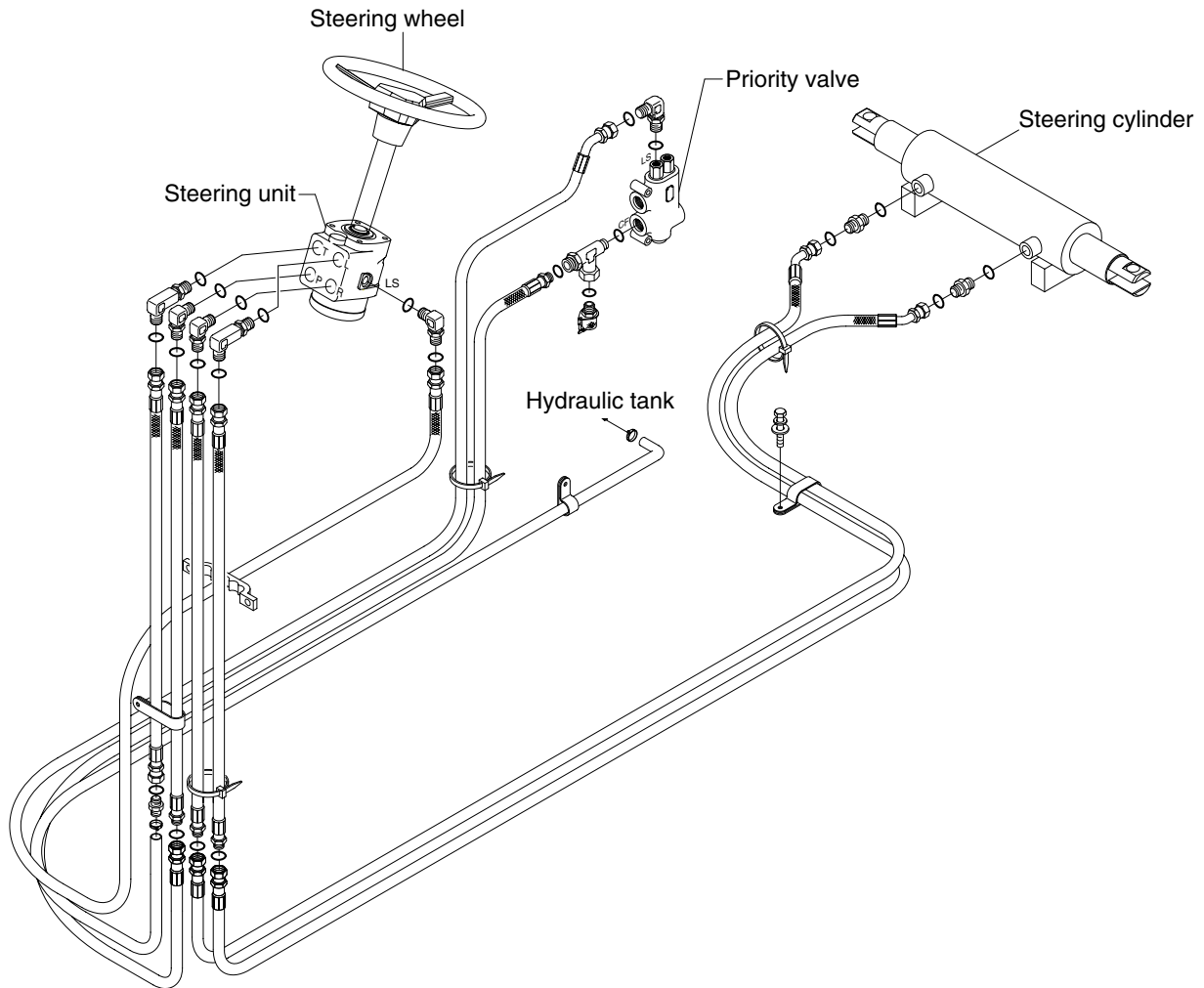
- Please note: If there is no response to **CLICKING** the link, please download this PDF first and then click on it.

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

SECTION 5 STEERING SYSTEM

GROUP 1 STRUCTURE AND FUNCTION

1. OUTLINE



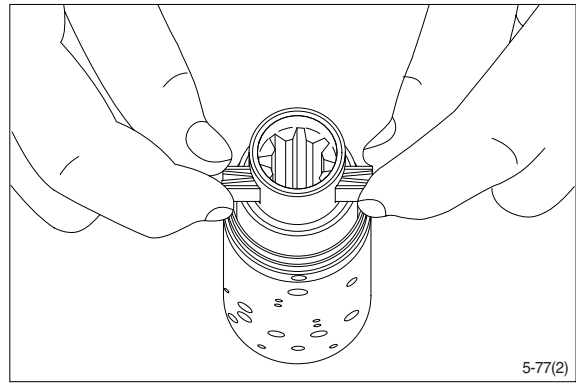
15LC7SS01

The steering system for this machine is composed of steering wheel assembly, steering unit, steering cylinder, steering axle and pipings. The steering force given to the steering wheel enters the steering unit through the steering column. The required oil flow is sensed by the function of the control section of the unit, and pressurized oil delivered from the hydraulic pump is fed to the steering cylinder. The force produced by the steering cylinder moves the knuckle of steering tires through the intermediate link.

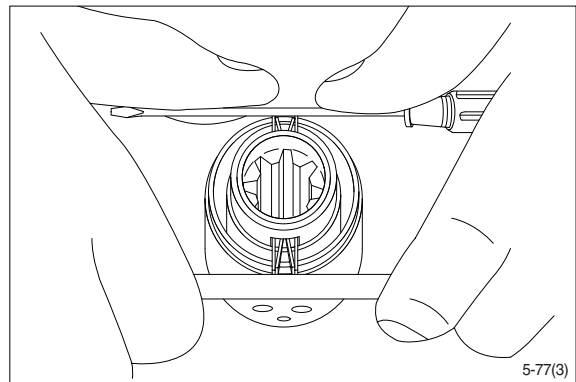
The axle body is unit structure having steering knuckles installed to its both ends by means of kingpins. Hub and wheel are mounted through bearing to spindle of knuckle.

Problem	Cause	Remedy
Steering wheel turns unsteadily. Steering system makes abnormal sound or vibration.	• Lockout loosening. • Metal spring deteriorated. • Gear backlash out of adjustment. • Lockout loosening. • Air in oil circuit.	• Retighten. • Replace. • Adjust. • Retighten. • Bleed air.
Abnormal sound heard when steering wheel is turned fully	Valve • Faulty. (Valve fails to open.) Piping • Pipe(from pump to power steering cylinder) dented or clogged.	• Adjust valve set pressure and check for specified oil pressure. • Repair or replace.
Piping makes abnormal sounds.	Oil pump • Lack of oil. • Oil inlet pipe sucks air. • Insufficient air bleeding.	• Add oil. • Repair. • Bleed air completely.
Valve or valve unit makes abnormal sounds.	Oil pump • Oil inlet pipe sucks air. Valve • Faulty. (Unbalance oil pressure) Piping • Pipe(from pump to power steering) dented or clogged. • Insufficient air bleeding.	• Repair or replace. • Adjust valve set pressure and check specified oil pressure. • Repair or replace. • Bleed air completely.
Insufficient or variable oil flow.	• Flow control valve orifice clogged.	• Clean
Insufficient or variable discharge pressure.	Piping • Pipe(from tank to pipe) dented or clogged.	• Repair or replace.
Steering cylinder head leakage (Piston rod)	• Packing foreign material. • Piston rod damage. • Rod seal damage and distortion. • Chrome gilding damage.	• Replace • Grind surface with oil stone. • Replace • Grind
Steering cylinder head thread (A little bit leak is no problem)	• O-ring damage.	• Replace
Welding leakage	• Cylinder tube damage.	• Tube replace.
Rod	• Tube inside damage. • Piston seal damage and distortion	• Grind surface with oil stone. • Replace
Piston rod bushing inner diameter excessive gap	• Bushing wear.	• Replace

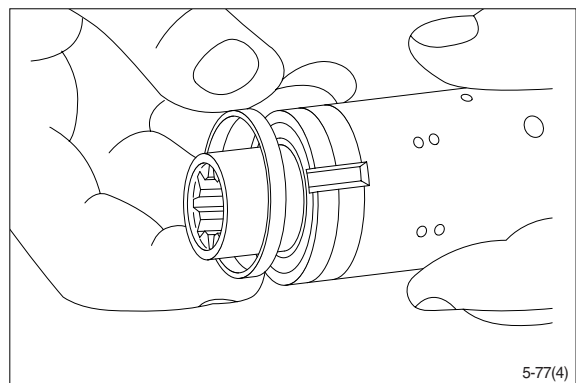
- (5) Press the springs together and push the neutral position springs into place in the sleeve.



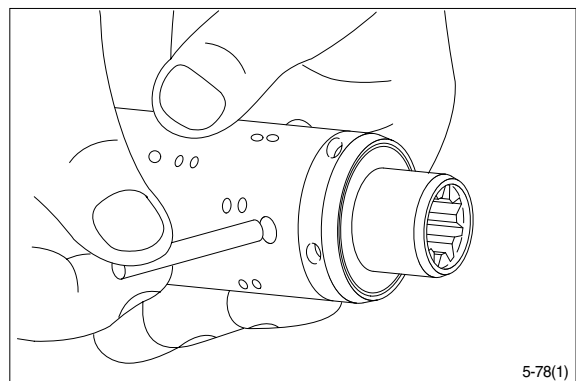
- (6) Line up the springs and center them.



- (7) Guide the ring down over the sleeve.
※ **The ring should be able to rotate free of the springs.**



- (8) Fit the cross pin into the spool / sleeve.



2) DISASSEMBLY

※ Before disassembling steering cylinder, release oil in the cylinder first.

- (1) Put wooden blocks against the cylinder tube, then hold in a vice.
- (2) Remove the gland by hook a wrench in the notch of cylinder head and turn counter-clockwise.
- (3) Remove the cylinder rod and piston from the tube.
- (4) Check wear condition of the sealing parts. If there are some damage, replace with new parts.

3) CHECK AND INSPECTION

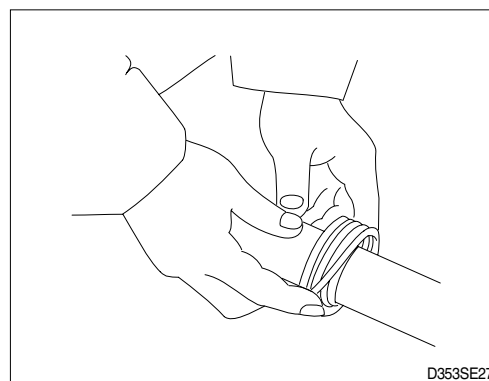
mm(in)

Check item	Criteria		Remedy
	Standard size	Repair limit	
Clearance between piston & cylinder tube	0.064~0.137 (0.0025~0.0054)	0.180 (0.0070)	Replace piston seal
Clearance between cylinder rod & bushing	0.024~0.112 (0.0009~0.0044)	0.120 (0.0049)	Replace bushing
Seals, O-ring	Damage		Replace
Cylinder rod	Dents		Replace
Cylinder tube	Biting		Replace

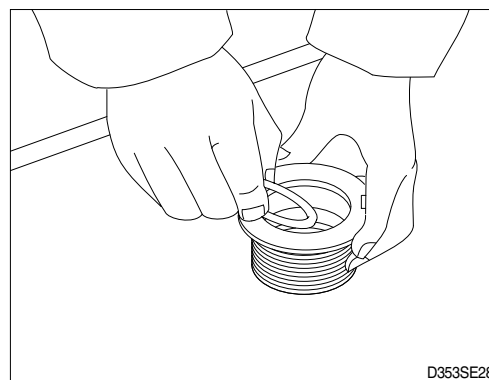
4) ASSEMBLY

- (1) Install a new piston seal the groove on the piston.

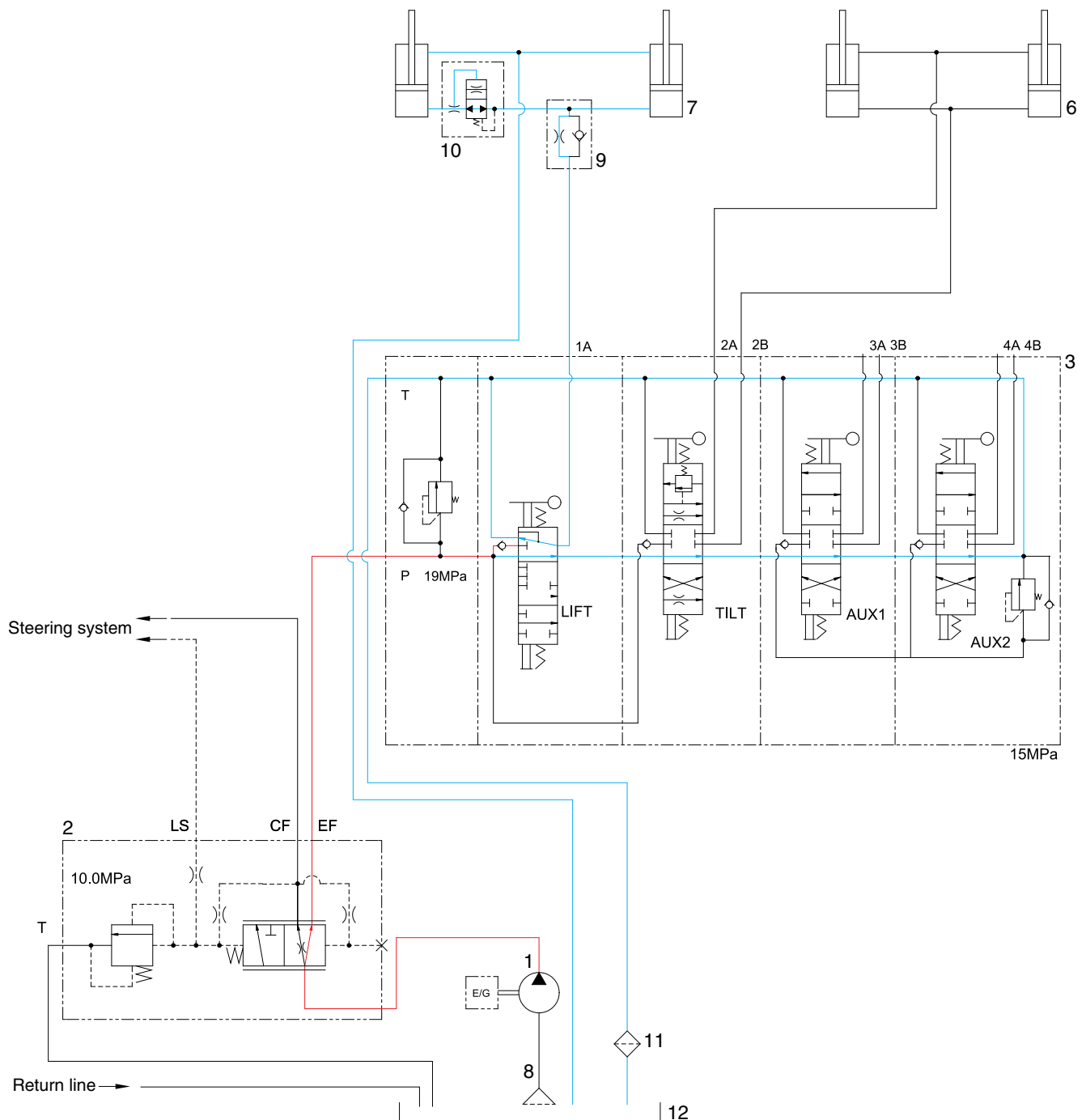
※ Be careful not to scratch the seal too much during installation or it will not seat properly.



- (2) Install the rod seal to the position in the gland applying a slight coat with grease prior to install.



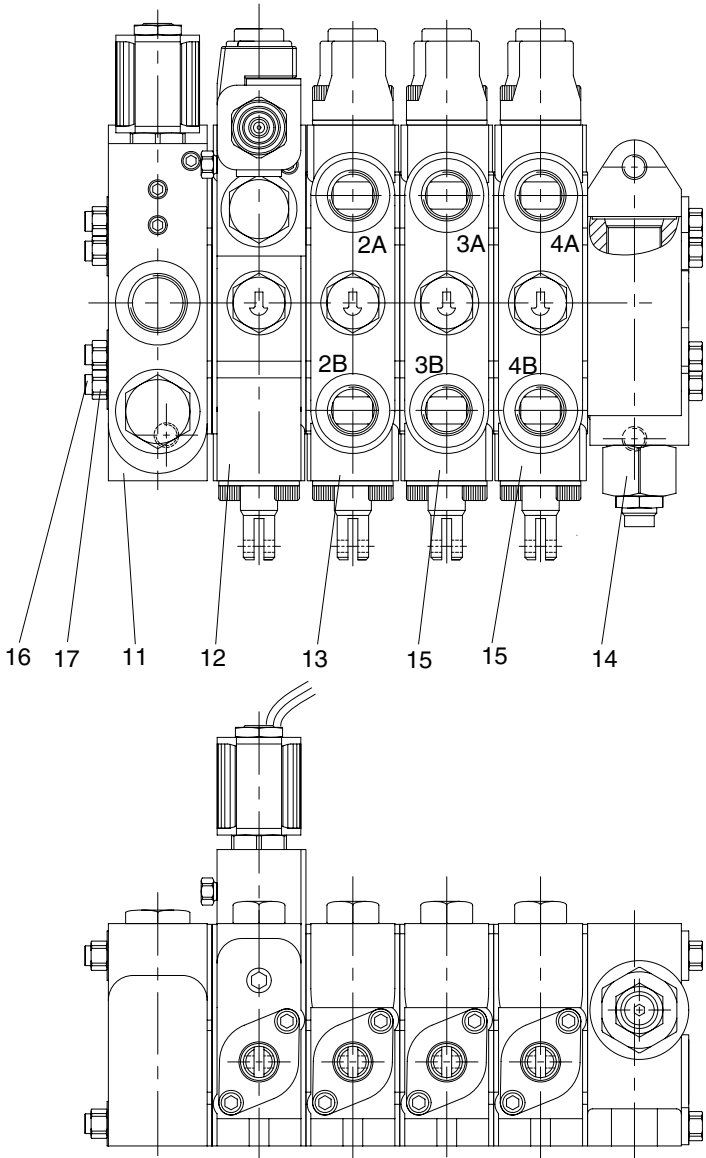
2) WHEN THE LIFT CONTROL LEVER IS IN THE LOWER POSITION



15LC7AHS04

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

5) STRUCTURE (4 SPOOL - TRAVEL WITH MAST OPSS)



15L7HS57

Port name	Size
Inlet port	7/8-14UNF
Outlet port	7/8-14UNF
Work port	3/4-16UNF

- 11

Inlet block assy
- 12

Lift block assy
- 13

Tilt block assy
- 14

Outlet block assy
- 15

Auxiliary block assy
- 16

Long bolt
- 17

Nut

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.	• Replace the relief valve. • Clean and remove surface marks for free movement.
Pressure setting not correct	• Normal wear. Lock nut & adjust screw loose.	• See *How to set pressure on work main relief.
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:

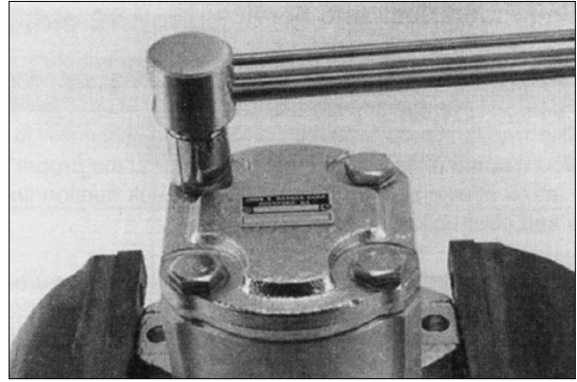
- Loosen lock nut.
- Set adjusting nut to desired pressure setting.
- If desired pressure setting cannot be achieved, add or remove shims as required.
- Tighten lock nut.
- Retest in similar manner as above.

(17) Place mounting flange of the pump back in the protected jawed vise and alternately torque the bolts.

- Tighten torque : 6~7kgf · m
(43.4~50.6lbf · ft)

(18) Remove pump from vise.

(19) Place a small amount of clean oil in the inlet of the pump and rotate the drive shaft away from the inlet one revolution. If the drive shaft binds, disassemble the pump and check for assembly problems, then reassemble the pump.

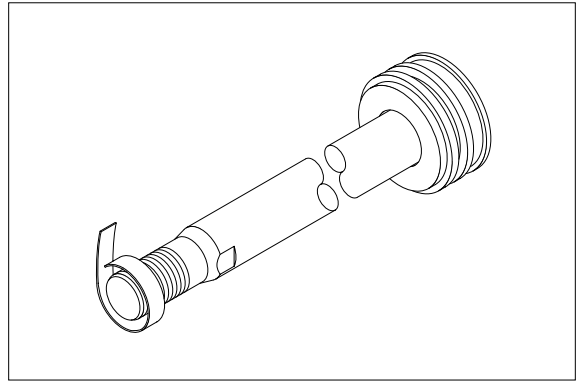


PUMP 26

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

GROUP 3 COMPONENT SPECIFICATION

No	Part name	Qty	Specification	Remark
1	Battery	1	CCA : 550 20HR : 60AH CMF 60(223×168×220)	
2	Working lamp	1	12V, 55W	
3	Combination lamp	2	12V, 21W(T/S) 12V, 10W(Back) 12V, 5W (Tail) 12V, 21W(Stop)	
4	Head lamp	2	12V, 55W	
5	Flasher lamp	2	85±10 C/M, (23W+23W)×2+3W×2	
6	Flasher & Relay	1	12V, 20A (Relay) 12V, (21W+21W)×2+3W(Flasher) 130W (Harzard)	
7	Back horn	1	12V, 90±5dB, 60±10C/M	
8	Horn	1	12V, MAX 3.5A, 105~120dB	
9	Master switch	1	180A	
10	Combination switch	1	12V, 16A	
11	Hazard switch	1	12V, 16A	
12	Start switch	1	12V/24V, 15~28A	
13	OPSS unit	1	12V/24V, MAX 0.5A(at 12V)	
14	Relay (4P)	2	12V, 20A	
15	Relay (5P)	2	12V, 20A	

2) FORKS

Problem	Cause	Remedy						
Abrasion	Long-time operations causes the fork to wear and reduces the thickness of the fork. Inspection for thickness is needed. · Wear limit : Must be 90% of fork thickness	If the measured value is below the wear limit, replace fork.						
Distortion	Forks are bent out of shape by a number of reasons such as overloading, glancing blows against walls and objects, and picking up load unevenly. · Difference in fork tip height <table border="1"><tr><th>Fork length (mm)</th><th>Height difference(mm)</th></tr><tr><td>below 1200</td><td>3</td></tr><tr><td>above 1200</td><td>6</td></tr></table>	Fork length (mm)	Height difference(mm)	below 1200	3	above 1200	6	If the measured value exceeds the allowance, replace fork.
Fork length (mm)	Height difference(mm)							
below 1200	3							
above 1200	6							
Fatigue	Fatigue failure may result from the fatigue crack even though the stress to fork is below the static strength of the fork. Therefore, a daily inspection should be done. · Crack on the fork heel. · Crack on the fork weldments.	Repair fork by expert. In case of excessive distortion, replace fork.						

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

- Thank you very much for reading the preview of the manual.
- You can download the complete manual from: www.heydownloads.com by clicking the link below



- Please note: If there is no response to **CLICKING** the link, please download this PDF first and then click on it.

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL