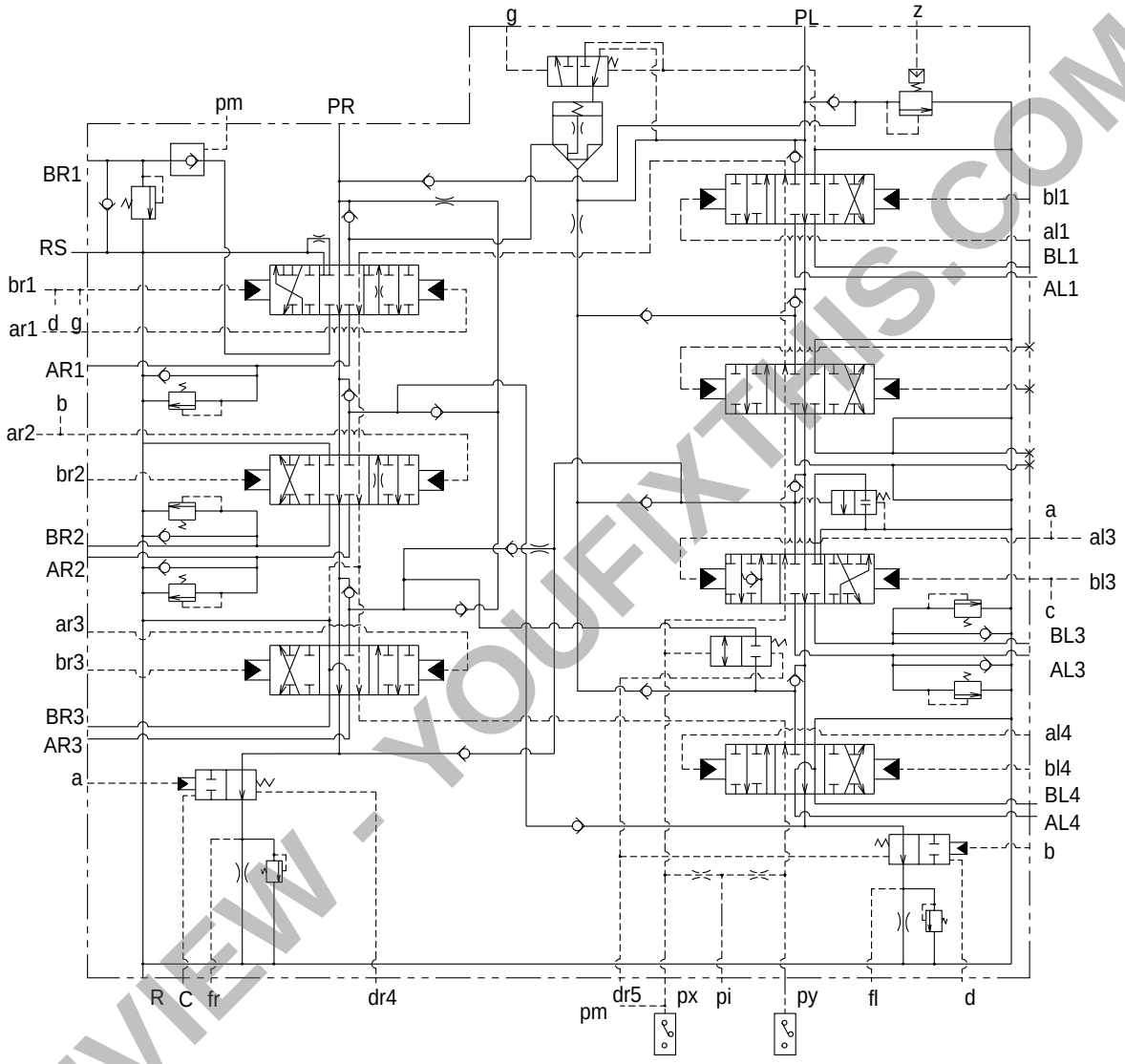
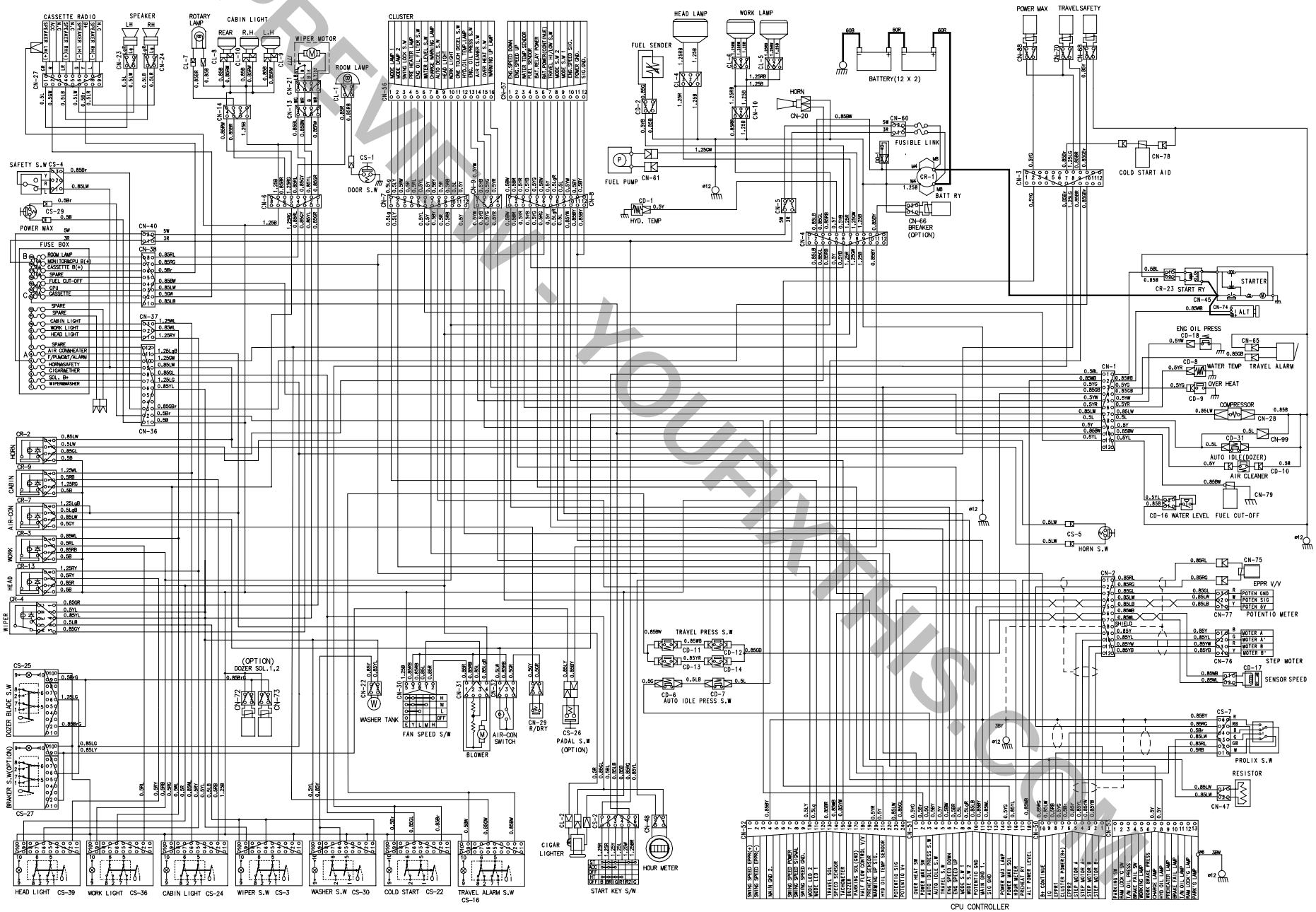
2. FUNCTION

1) HYDRAULIC CIRCUIT DIAGRAM



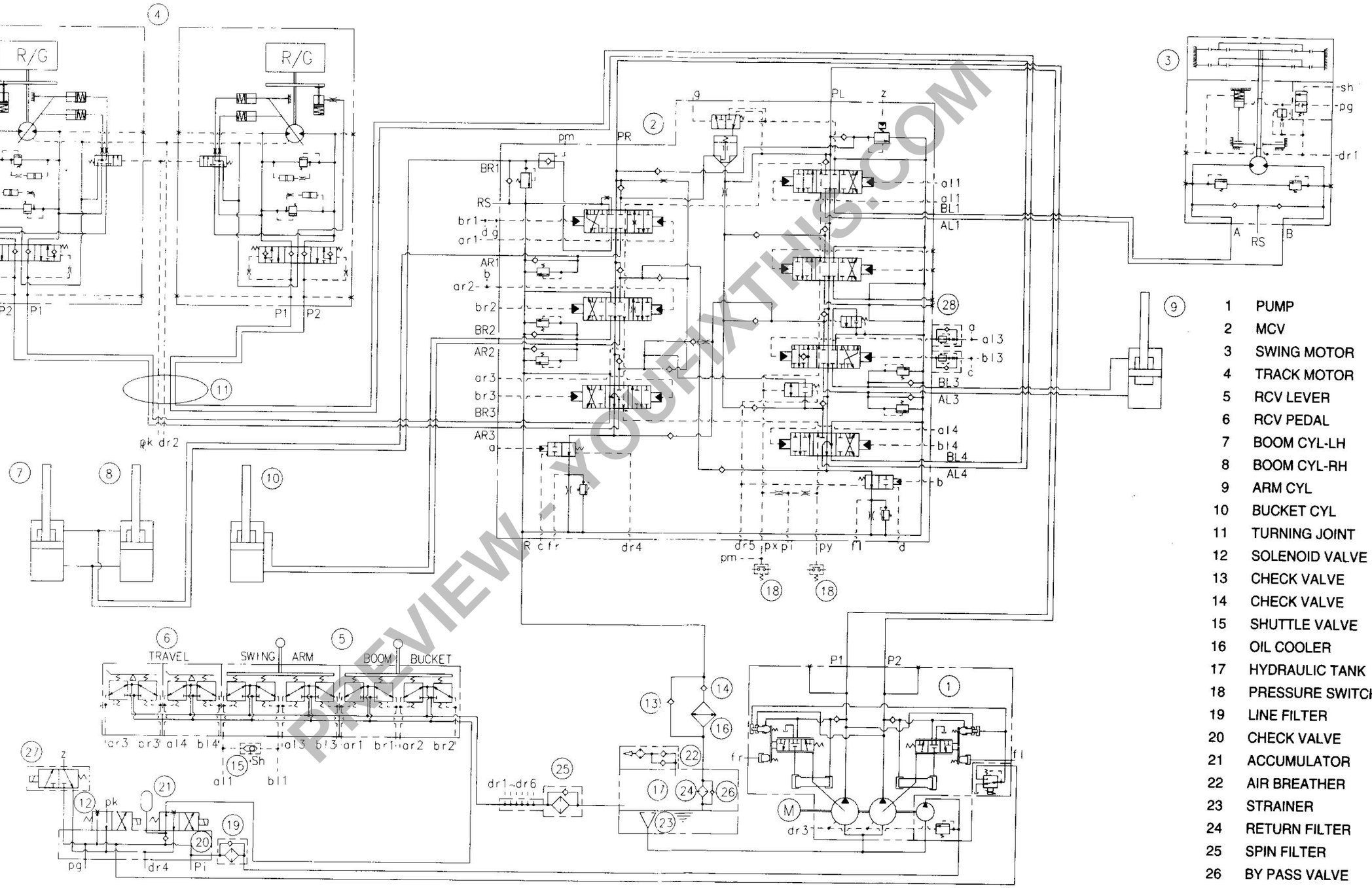
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1 PUMP
2 MCV
3 SWING MOTOR
4 TRACK MOTOR
5 RCV LEVER
6 RCV PEDAL
7 BOOM CYL-LH
8 BOOM CYL-RH
9 ARM CYL
10 BUCKET CYL
11 TURNING JOINT
12 SOLENOID VALVE
13 CHECK VALVE
14 CHECK VALVE
15 SHUTTLE VALVE
16 OIL COOLER
17 HYDRAULIC TANK
18 PRESSURE SWITCH
19 LINE FILTER
20 CHECK VALVE
21 ACCUMULATOR
22 AIR BREATHER
23 STRAINER
24 RETURN FILTER
25 SPIN FILTER
26 BY PASS VALVE
27 SOLENOID BLOCK

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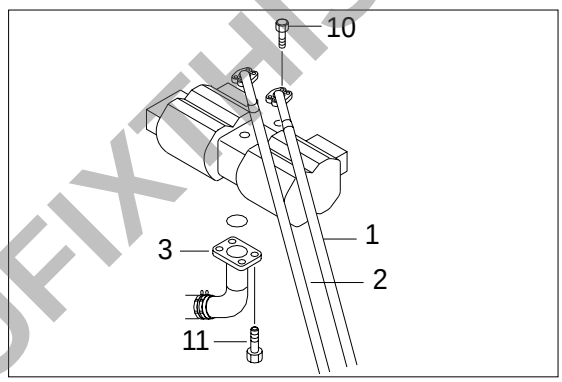
GROUP 3 PUMP DEVICE

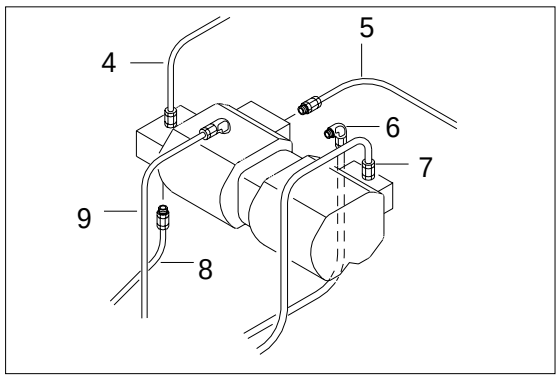
1. REMOVAL AND INSTALL

1) REMOVAL

(1) Lower the work equipment to the ground and stop the engine.
(2) Loosen the breather slowly to release the pressure inside the hydraulic tank.
⚠ Escaping fluid under pressure can penetrate the skin causing serious in injury.
(3) Loosen the drain plug under the hydraulic tank and drain the oil from the hydraulic tank.
· Hydraulic tank quantity : 150 ℓ
(4) Remove bolts(10) and disconnect pipe(1,2)
(5) Disconnect pilot line hoses(4,5,6,7,8,9)
(6) Remove bolts(11) and disconnect pump suction tube (3)
※ When pump suction tube is disconnected, the oil inside the piping will flow out, so catch it in oil pan.
(7) Sling the pump assembly and remove the pump mounting bolts.
· Weight : 84.5㎏
Pull out the pump assembly from housing.
※ When removing the pump assembly, check that all the hoses have been disconnected.







2) INSTALL

(1) Carry out installation in the reverse order to removal
(2) Remove the suction strainer and clean it.
(3) Replace return filter with new.
(4) Remove breather and clean it.
(5) After adding oil to the hydraulic tank to the specified level.
(6) Bleed the air from the hydraulic pump.
① Remove the air vent plug(2EA)
② Tighten plug lightly
③ Start the engine, run at low idling, and check oil come out from plug.
④ Tighten plug.
(7) Start the engine, run at low idling (3~5 minutes) to circulate the oil through the system.
(8) Confirmed the hydraulic oil level and check the hydraulic oil leak or not.

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GROUP 2 TIGHTENING TORQUE

1. MAJOR COMPONENT

No.	Descriptions		Bolt size	Torque	
				kgf · m	lbf · ft
1	Engine	Engine mounting bolt, nut	M22 × 2.5	76.0±8.5	549.7±61.5
2		Radiator mounting bolt, nut	M12 × 1.75	12.2±1.3	88.2±9.4
3		Coupling mounting socket bolt	M16 × 2.0	22.1±2.4	159.8±17.4
4		Main pump housing mounting bolt	M10 ×1.5	2.8±0.3	20.3±2.2
5	Hydraulic system	Main pump mounting socket bolt	M20 ×2.5	42.0±4.5	303.8±32.5
6		Main control valve mounting bolt	M12 ×1.75	10.2±1.0	73.8±7.2
7		Fuel tank mounting bolt	M20 ×2.5	46.0±5.1	332.7±36.9
8		Hydraulic tank mounting bolt	M20 ×2.5	46.0±5.1	332.7±36.9
9		Turning joint mounting bolt	M12 ×1.75	12.2±1.3	88.2±9.4
10	P/Train system	Swing motor mounting bolt	M16 ×2.0	29.6±3.2	214.1±23.1
11		Swing bearing upper mounting bolt	M18 × 2.5	41.3±4.5	298.7±32.5
12		Swing bearing lower mounting bolt	M16 × 1.5	31.3±3.2	266.4±23.1
13		Travel motor mounting bolt	M16 × 2.0	23.0±2.5	166.4±18.1
14		Sprocket mounting bolt	M16 × 2.0	23.0±2.5	166.4±18.1
15	Under carriage	Upper roller mounting bolt	M16 × 2.0	21.0±2.3	151.9±16.6
16		Lower roller mounting bolt	M16 × 2.0	54.7±6.0	395.6±43.4
17		Track adjuster cylinder bolt	M16 × 2.0	29.6±3.2	214.1±23.1
18		Track chain and shoe mounting bolt, nut	9/16-18UNF	39.0±4.0	282.1±28.9
19		Track guard mounting bolt	M16 × 2.0	24.5±3.0	177.2±21.7
20	Others	Counter weight mounting bolt	M27 × 3.0	140.0±15	1012.6±108.5
21		Cab mounting bolt, nut	M20 × 2.5	57.9±6.4	418.8±46.3

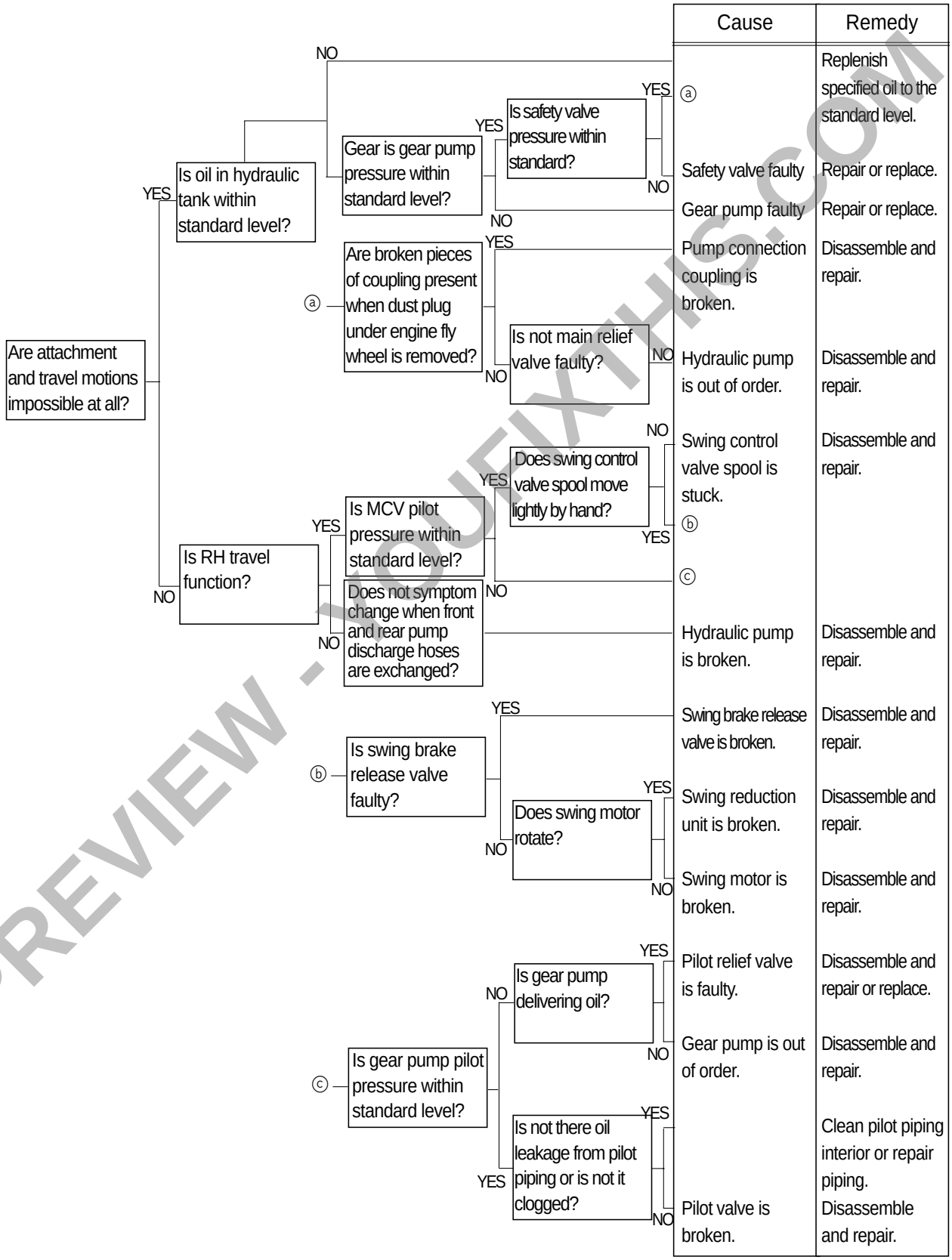
※ For tightening torque of engine and hydraulic components, see each components disassembly and assembly.

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4. SWING SYSTEM

1) BOTH LH AND RH SWING ACTIONS ARE IMPOSSIBLE

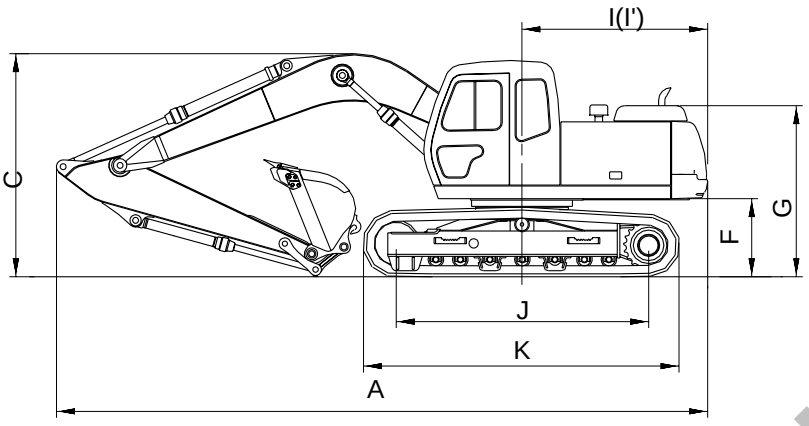


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2. SPECIFICATIONS

1) ROBEX 130LC-3



Description		Unit	Specification
Operating weight		kg (lb)	13800 (30400)
Bucket capacity(PCSA heaped), standard		㎥ (yd³)	0.51 (0.67)
Overall length	A	mm (ft-in)	7720 (25' 4")
Overall width, with 600㎜ shoe.	B		2600 (8' 6")
Overall height	C		2740 (9' 0")
Superstructure width	D		2410 (7' 11")
Cab height	E		2740 (9' 0")
Ground clearance of counterweight	F		935 (3' 1")
Engine cover height	G		1995 (6' 6")
Minimum ground clearance	H		440 (1' 5")
Rear-end distance	I		2200 (7' 3")
Rear-end swing radius	I'		2350 (7' 9")
Distance between tumblers	J		3000 (9' 10")
Undercarriage length	K		3750 (12' 4")
Undercarriage width	L		2600 (8' 6")
Track gauge	M		2000 (6' 7")
Track shoe width, standard	N		600 (24")
Travel speed (low/high)		㎞/hr (mph)	3.2/5.2 (2.0/3.2)
Swing speed		rpm	13.6
Gradeability		degree (%)	40 (84)
Ground pressure(600 ㎜ shoe)		㎏/㎠ (psi)	0.35 (5.0)

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Millimeters to inches

1mm = 0.03937 in

	0	1	2	3	4	5	6	7	8	9
0		0.039	0.079	0.118	0.157	0.197	0.236	0.276	0.315	0.354
10	0.394	0.433	0.472	0.512	0.551	0.591	0.630	0.669	0.709	0.748
20	0.787	0.827	0.866	0.906	0.945	0.984	1.024	1.063	1.102	1.142
30	1.181	1.220	1.260	1.299	1.339	1.378	1.417	1.457	1.496	1.536
40	1.575	1.614	1.654	1.693	1.732	1.772	1.811	1.850	1.890	1.929
50	1.969	2.008	2.047	2.087	2.126	2.165	2.205	2.244	2.283	2.323
60	2.362	2.402	2.441	2.480	2.520	2.559	2.598	2.638	2.677	2.717
70	2.756	2.795	2.835	2.874	2.913	2.953	2.992	3.032	3.071	3.110
80	3.150	3.189	3.228	3.268	3.307	3.346	3.386	3.425	3.465	3.504
90	3.543	3.583	3.622	3.661	3.701	3.740	3.780	3.819	3.858	3.898

Kilogram to Pound

1kg = 2.2046 lb

	0	1	2	3	4	5	6	7	8	9
0		2.20	4.41	6.61	8.82	11.02	13.23	15.43	17.64	19.84
10	22.05	24.25	26.46	28.66	30.86	33.07	35.27	37.48	39.68	41.89
20	44.09	46.30	48.50	50.71	51.91	55.12	57.32	59.53	61.73	63.93
30	66.14	68.34	70.55	72.75	74.96	77.16	79.37	81.57	83.78	85.98
40	88.18	90.39	92.59	94.80	97.00	99.21	101.41	103.62	105.82	108.03
50	110.23	112.44	114.64	116.85	119.05	121.25	123.46	125.66	127.87	130.07
60	132.28	134.48	136.69	138.89	141.10	143.30	145.51	147.71	149.91	152.12
70	154.32	156.53	158.73	160.94	163.14	165.35	167.55	169.76	171.96	174.17
80	176.37	178.57	180.78	182.98	185.19	187.39	189.60	191.80	194.01	196.21
90	198.42	200.62	202.83	205.03	207.24	209.44	211.64	213.85	216.05	218.26

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(2) Total horsepower control

The regulator decreases the pump tilting angle(delivery flow) automatically to limit the input torque within a certain value with a rise in the delivery pressure P_1 of the self pump and the delivery pressure P_2 of the companion pump.

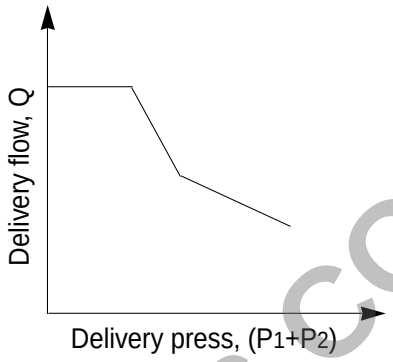
(The input horsepower is constant when the speed is constant.)

Since the regulator is of the simul taneous total horsepower type that operates by the sum of load pressures of the two pumps in the tandem double-pump system, the prime mover is automatically prevented from being overloaded, irrespective of the load condition of the two pumps, when horsepower control is under way.

Since this regulator is of the simultaneous total horsepower type, it controls the tilting angles(displacement volumes) of the two pumps to the same value as represented by the following equation :

$$T_{in} = P_1 \times q/2\pi + P_2 \times q/2\pi$$
$$= (P_1+P_2) \times q/2\pi$$

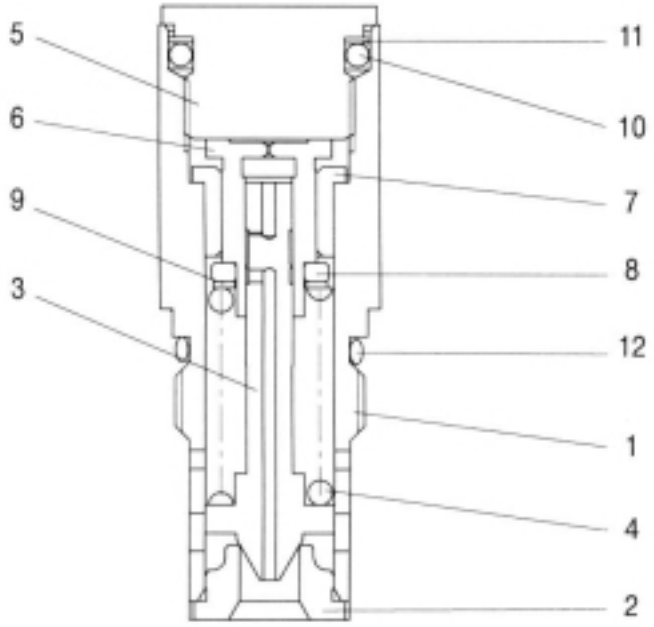
The horsepower control function is the same as the flow control function and is summarized in the following.(For detailed behaviors of respective parts, refer to the section of flow control).



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3) RELIEF VALVE



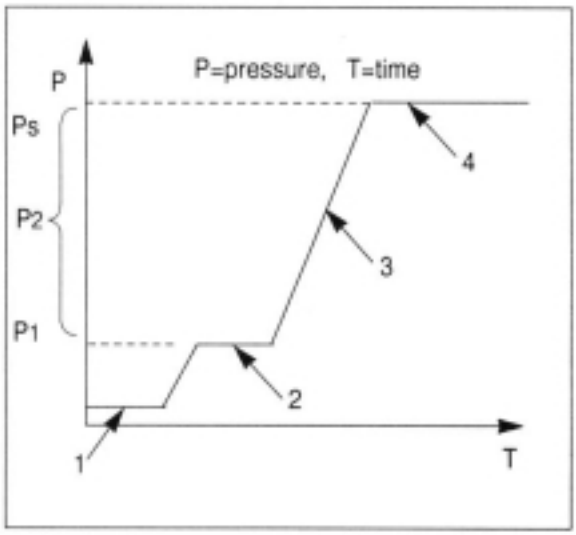
1 Body
2 Seat
3 Plunger
4 Spring
5 Adjusting screw
6 Piston
7 Bushing
8 Spring seat
9 Shim
10 O-ring
11 Back up ring
12 O-ring

(1) Construction of relief valve

The valve casing contains two cartridge type relief valves that stop the regular and reverse rotations of the hydraulic motor. The relief valves relieve high pressure at start or at stop of swing motion and can control the relief pressure in two steps, high and low, in order to insure smooth operation.

(2) Function of relief valve

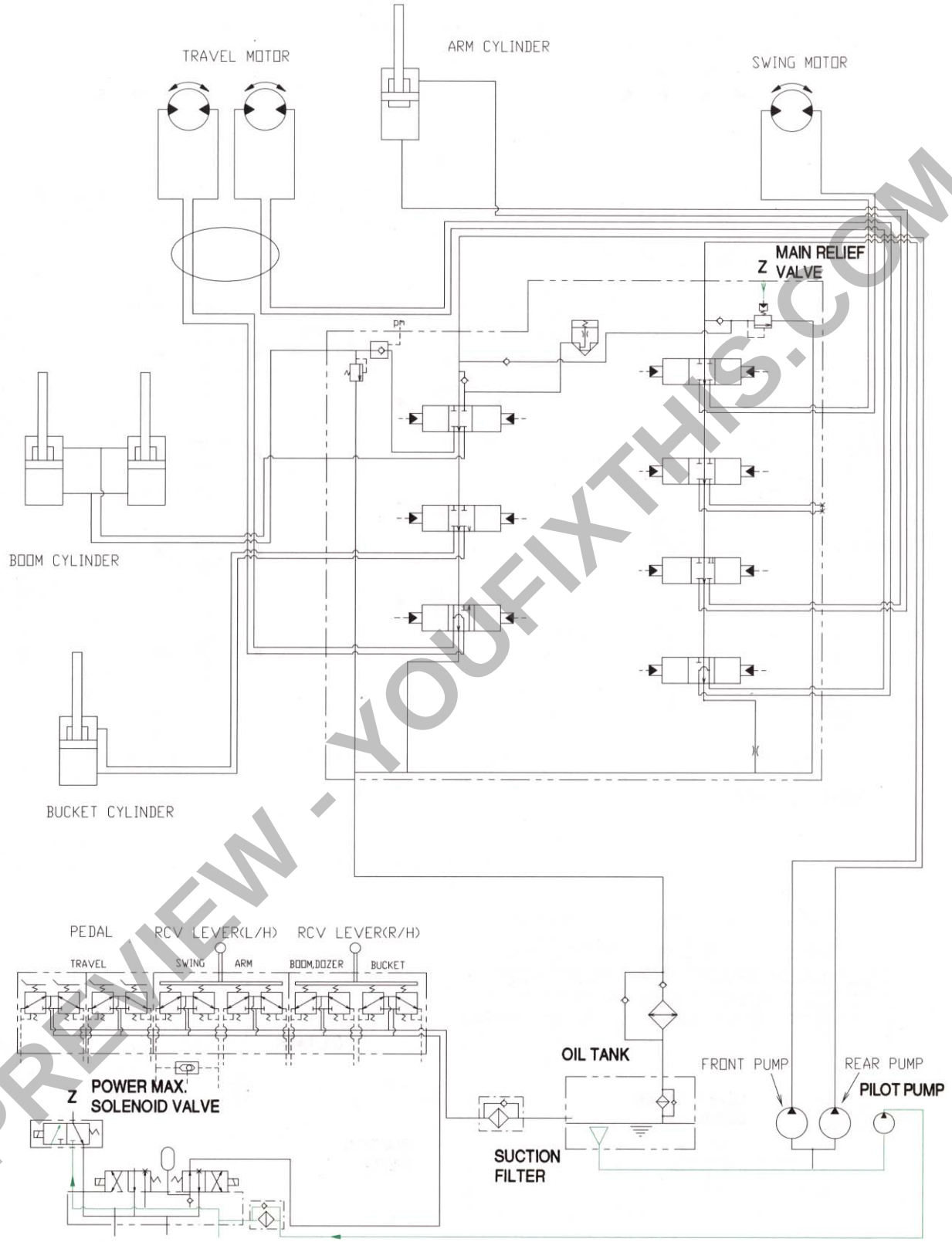
Figure illustrates how the pressure acting on the relief valve is related to its rising process. Here is given the function, referring to the figure following page.



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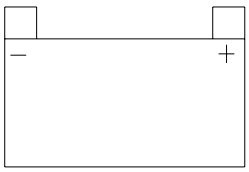
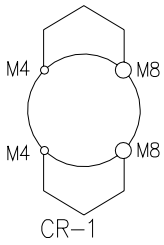
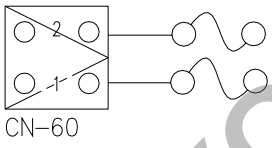
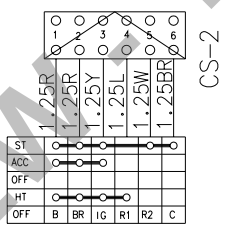
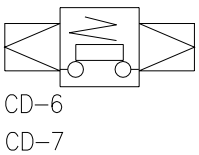
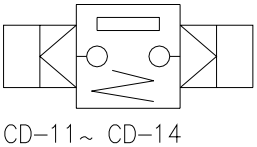
3. MAIN RELIEF PRESSURE CHANGE CIRCUIT



When the power max switch keeps pressed, the main relief valve pressure changes from 320㎏/㎠ to 350㎏/㎠ for maximum 8 seconds.

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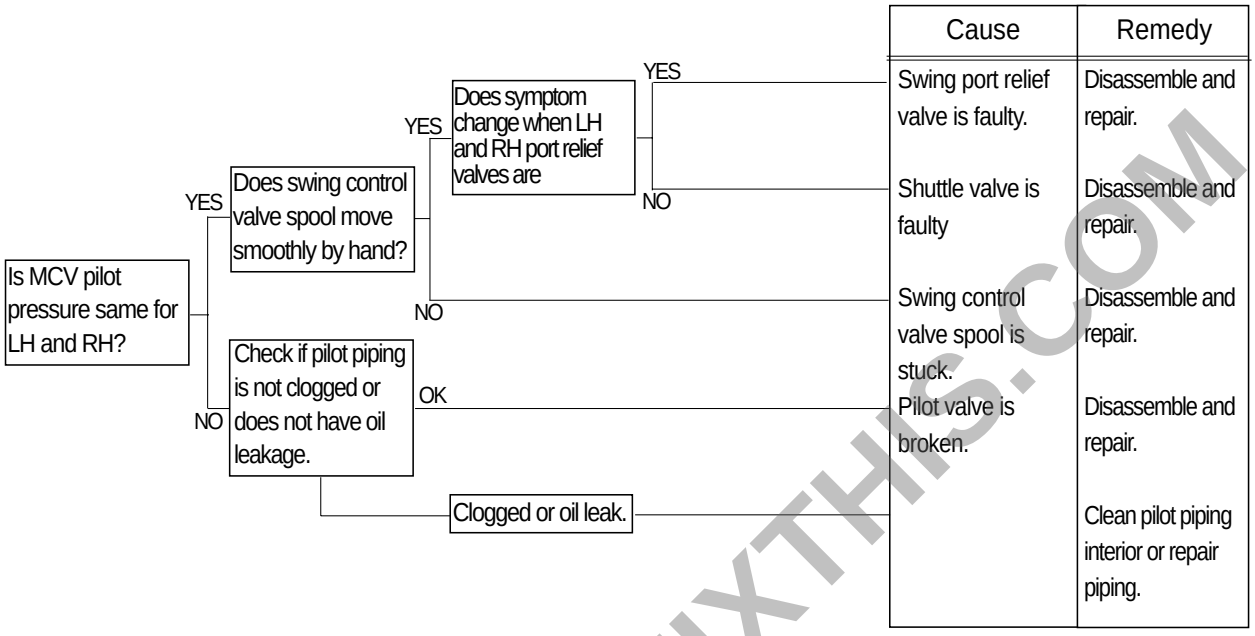
GROUP 4 ELECTRICAL COMPONENT SPECIFICATION

Part name	Symbol	Specifications	Check
Battery		12V X 100Ah (2EA)	※ Check specific gravity 1.280 over : over charged 1.280 ~ 1.250 : normal 1.250 below : recharging
Battery relay		Rated load : 24V 100A(continuity) 1000A(30seconds)	※ Check coil resist Normal : about 50Ω ※ Check contact Normal : ∞Ω
Fusible link		60A	※ Check disconnection Normal : 0Ω (connect ring terminal and check resist between terminal 1 and 2)
Start key		-	※ Check contact OFF : ∞Ω(for each terminal) ON : 0Ω(for terminal 1-3 and 1-5) START : 0Ω(for terminal 1-3 and 1-5)
Pressure switch (for auto idle)		10㎏/㎠ (N. C TYPE)	※ Check contact Normal : 0Ω(CLOSE)
Pressure switch (for travel alarm)		4 ~ 6㎏/㎠ (N. O TYPE)	※ Check contact Normal : 0∞(OPEN)

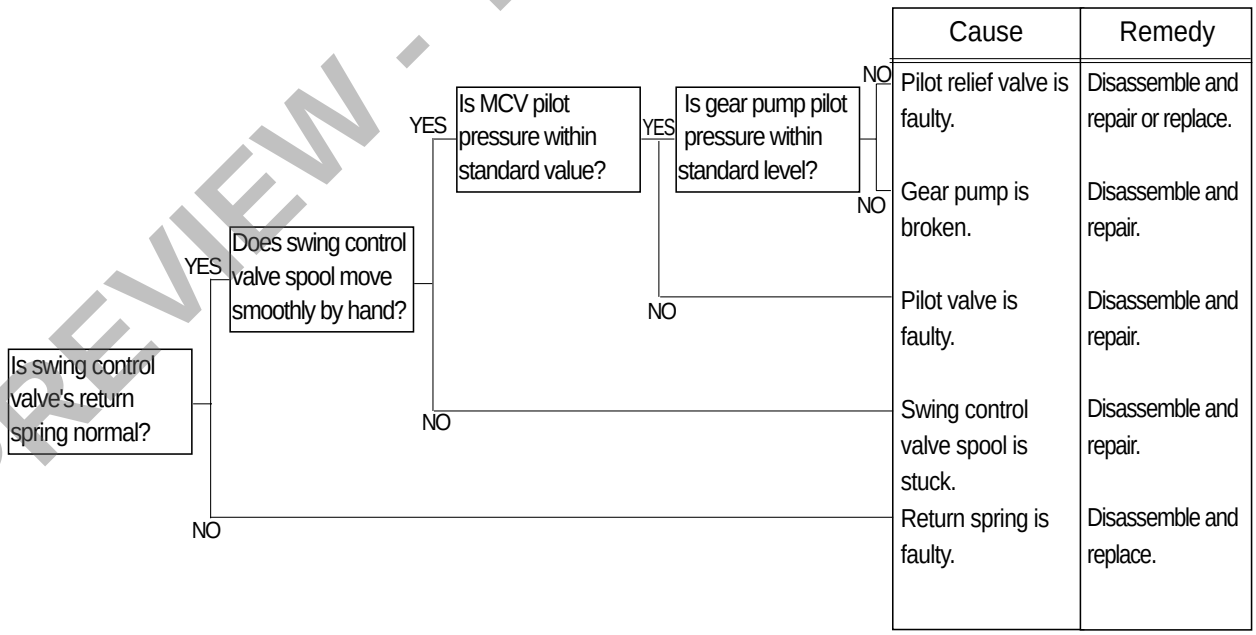
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3) SWING MOTION IS IMPOSSIBLE IN ONE DIRECTION



4) MACHINE SWINGS BUT DOES NOT STOP



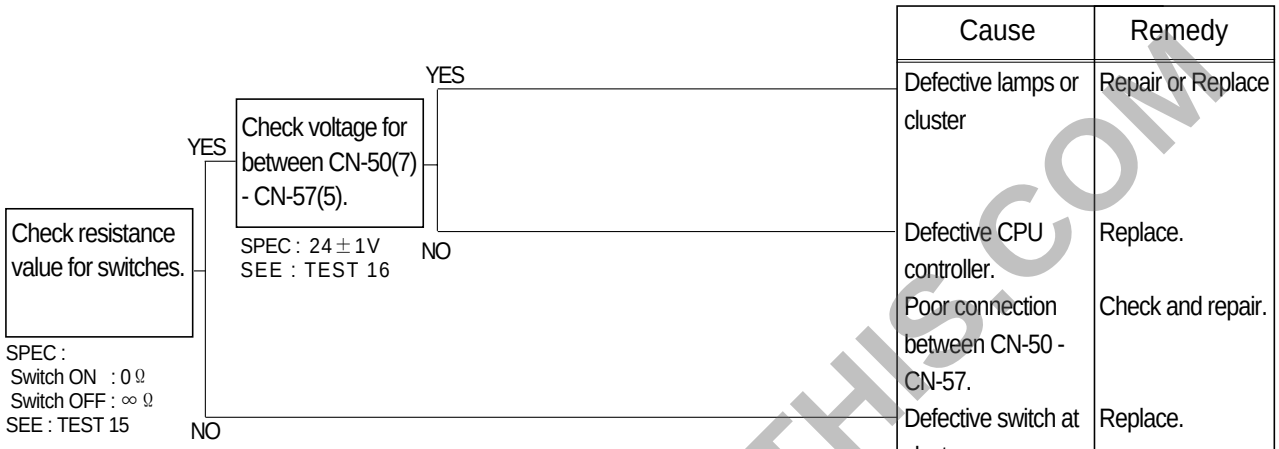
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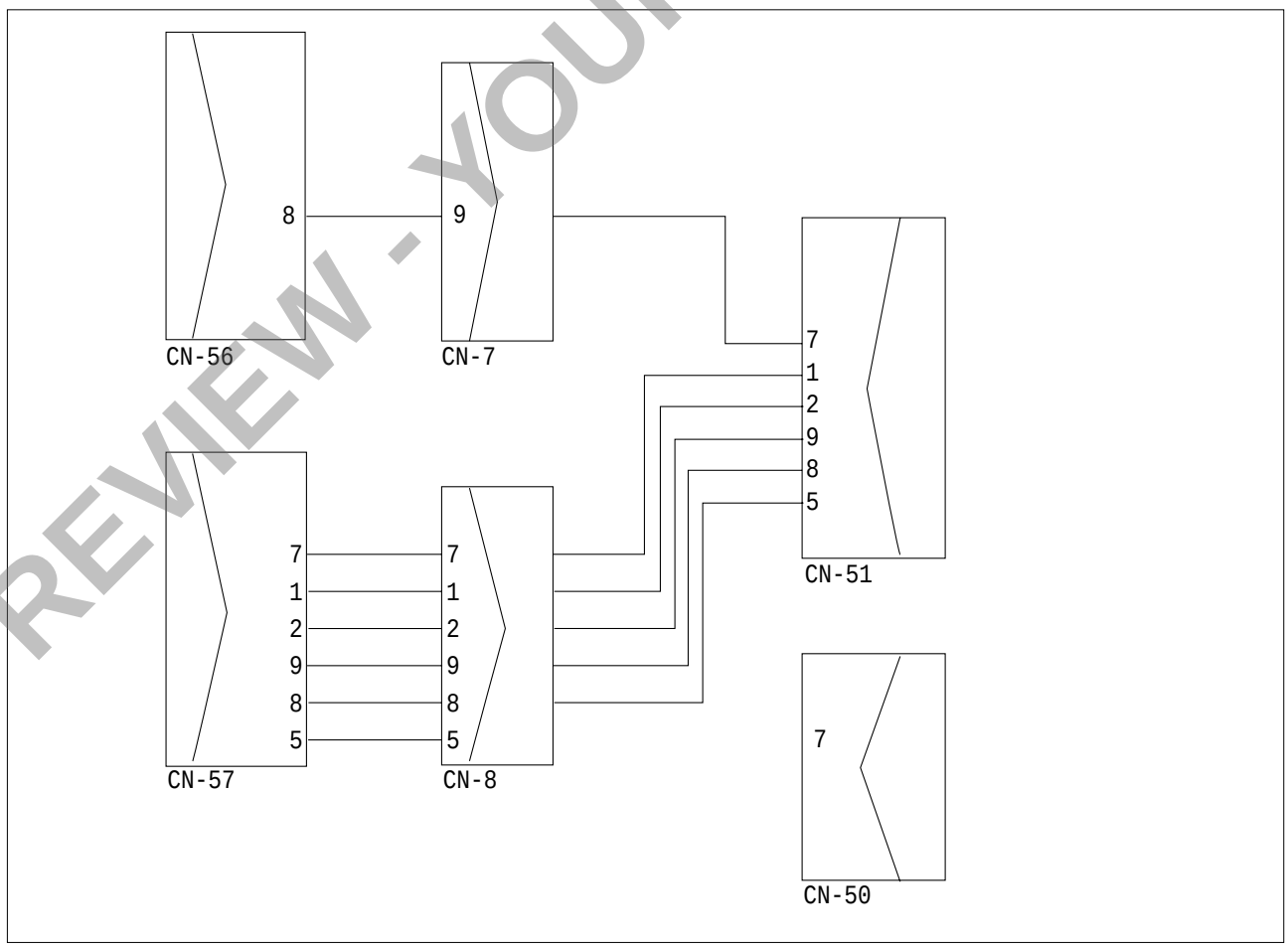
6. CLUSTER LAMPS ARE ON WHEN ENGINE RUN OR MALFUNCTION OF MODE SELECTION SYSTEM

※ Before carrying out below procedure, check all the related connectors are properly inserted.

1) INSPECTION PROCEDURE



Wiring diagram



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3. SWING DEVICE

Part name	Inspection item	Remedy
Balance plate	· Worn less than 0.03㎜ · Worn more than 0.03㎜ · Sliding surface has a seizure(even though small).	· Lapping · Replace · Replace
Shoe of piston assembly	· Sliding surface has a damage. · Sliding surface depression(凵) dimension less than 0.45㎜ or has a large damage.	· Lapping · Replace parts or motor
Piston of piston assembly	· Sliding surface has a seizure(even though small)	· Replace motor
Piston hole of cylinder assembly	· Sliding surface has a seizure. · Sliding surface has a damage.	· Replace motor · Replace motor
Taper roller bearing Needle bearing Roller bearing	· In case 3000hour operation · Rolling surface has a damage.	· Replace · Replace

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GROUP 5 SWING DEVICE

1. REMOVAL AND INSTALL OF MOTOR

1) REMOVAL

(1) Lower the work equipment to the ground and stop the engine.
(2) Loosen the breather slowly to release the pressure inside the hydraulic tank.

⚠ Escaping fluid under pressure can penetrate the skin causing serious in injury.

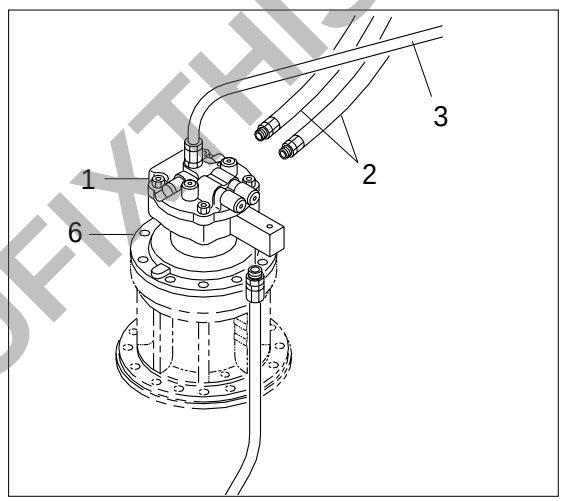
※ When pipes and hoses are disconnected, the oil inside the piping will flow out, so catch it in oil pan.



(3) Disconnect hose assy(2)
(4) Disconnect pilot line hoses(3,4,5)
(5) Sling the swing motor assembly(1)and remove the swing motor mounting bolts (6)
- Motor device weight : 107kg(236lb)
- Tightening torque : 12kgf · m (86.8lbf · ft)

(6) Remove the swing motor assembly

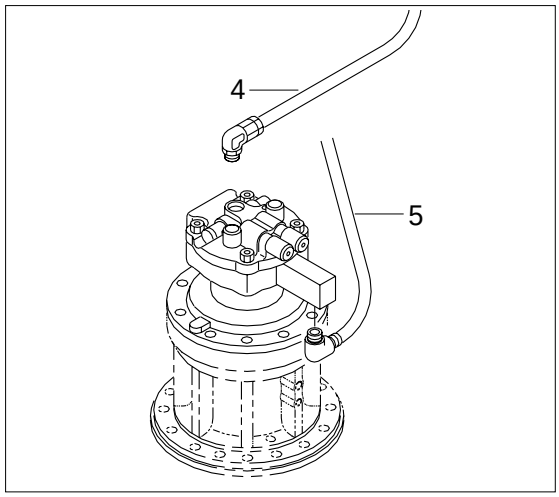
※ When removing the swing motor assembly, check that all the piping have been disconnected.



2) INSTALL

(1) Carry out installation in the reverse order to removal
(2) Bleed the air from the swing motor.
① Remove the air vent plug.
② Pour in hydraulic oil until it over flows from the port.
③ Tighten plug lightly.
④ Start the engine, run at low idling, and check oil come out from plug.
⑤ Tighten plug fully.

(3) Confirmed the hydraulic oil level and check the hydraulic oil leak or not.

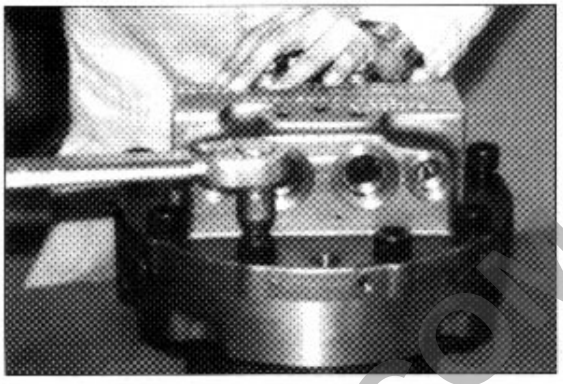


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② Tighten socket bolts(66).

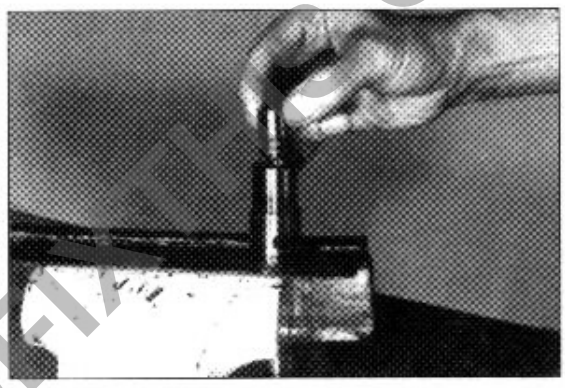
※ Tightening torque : 10 ~ 11 kgf · m



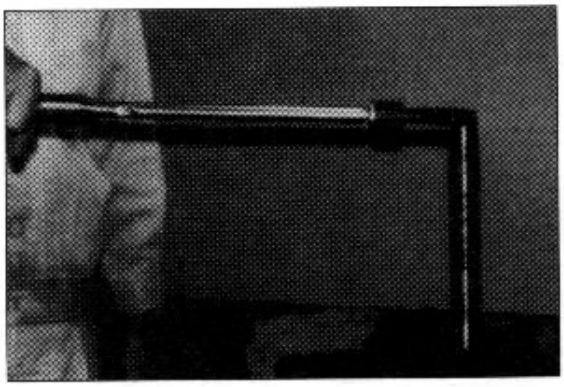
(6) Assembling the plunger

① Fix round bar(Ø 10) into plunger(4) and fix it in a vise.

Fix check valve(6) and spring(7) to plunger(5).



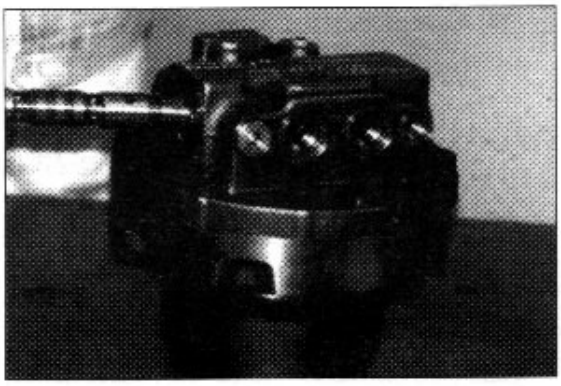
② Fix O-ring(9) and plug(8) to plunger(5).



③ Fix plunger(4) to base plate(3).

※ Before assembling, applying hydraulic oil to sliding surface of plunger.

※ Fix flunger(4) by turning it slowly and confirm that it slides smoothly.



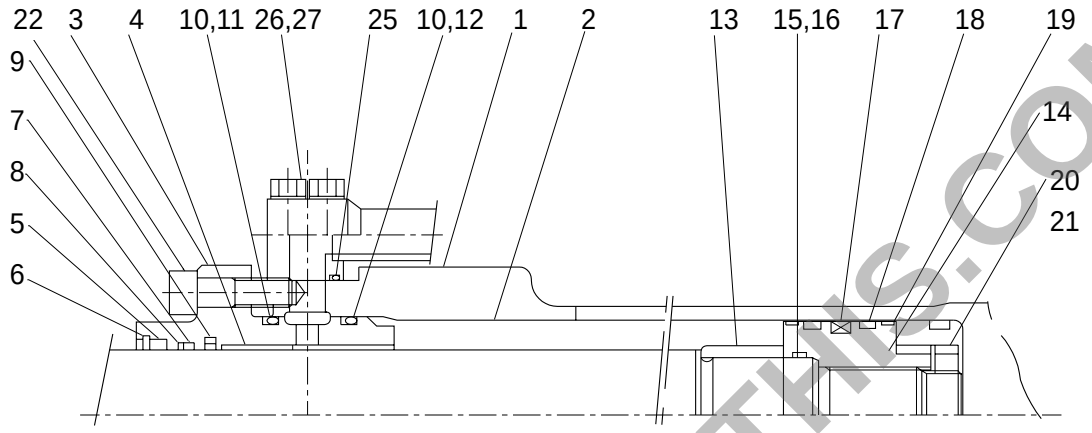
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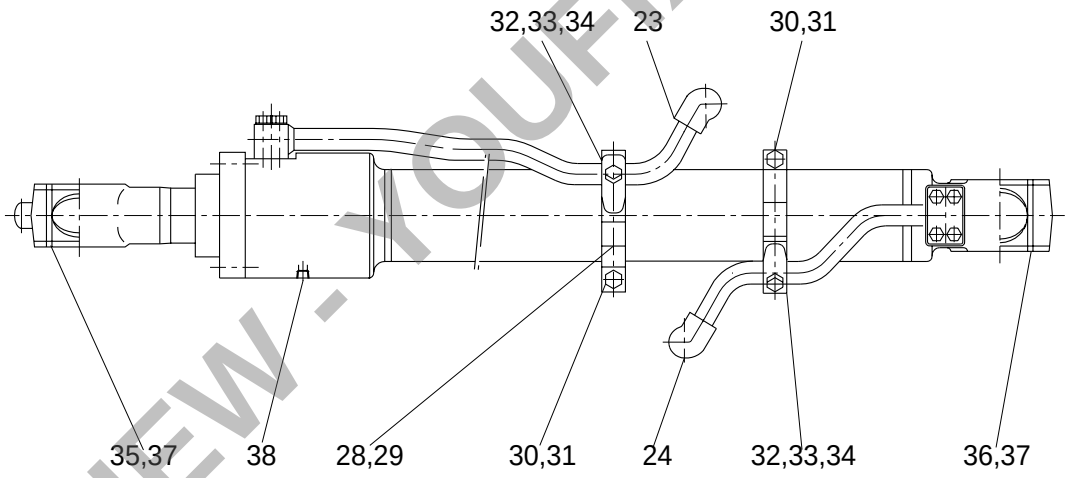
2. DISASSEMBLY AND ASSEMBLY

1) STRUCTURE

(1) Bucket cylinder



Internal detail



1	Tube assembly	14	Piston	27	Spring washer
2	Rod assembly	15	O-ring	28	Band assembly
3	Cylinder head	16	Back up ring	29	Band
4	Rod bushing	17	Piston seal	30	Hexagon bolt
5	Dust seal	18	Wear ring	31	Spring washer
6	Snap ring	19	Dust ring	32	Pipe clamp
7	Rod seal	20	Lock nut	33	Hexagon bolt
8	Back up ring	21	Lock washer	34	Spring washer
9	Step seal	22	Hexagon socket head bolt	35	Pin bushing
10	O-ring	23	Pipe assembly	36	Pin bushing
11	Back up ring	24	Pipe assembly	37	Pin dust seal
12	Back up ring	25	O-ring	38	Hexagon plug
13	Cushion ring	26	Hexagon bolt		

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