1. STRUCTURE

This service manual has been prepared as an aid to improve the quality of repairs by giving the serviceman an accurate understanding of the product and by showing him the correct way to perform repairs and make judgements. Make sure you understand the contents of this manual and use it to full effect at every opportunity.
This service manual mainly contains the necessary technical information for operations performed in a service workshop.
For ease of understanding, the manual is divided into the following sections.

SECTION 1 GENERAL
This section explains the safety hints and gives the specification of the machine and major components.

SECTION 2 STRUCTURE AND FUNCTION
This section explains the structure and function of each component. It serves not only to give an understanding of the structure, but also serves as reference material for troubleshooting.

SECTION 3 HYDRAULIC SYSTEM
This section explains the hydraulic circuit, single and combined operation.

SECTION 4 ELECTRICAL SYSTEM
This section explains the electrical circuit, monitoring system and each component. It serves not only to give an understanding electrical system, but also serves as reference material for trouble shooting.

SECTION 5 MECHATRONICS SYSTEM
This section explains the computer aided power optimization system and each component.

SECTION 6 TROUBLESHOOTING
This section explains the troubleshooting charts correlating **problems** to **causes**.

SECTION 7 MAINTENANCE STANDARD
This section gives the judgement standards when inspecting disassembled parts.

SECTION 8 DISASSEMBLY AND ASSEMBLY
This section explains the order to be followed when removing, installing, disassembling or assembling each component, as well as precautions to be taken for these operations.

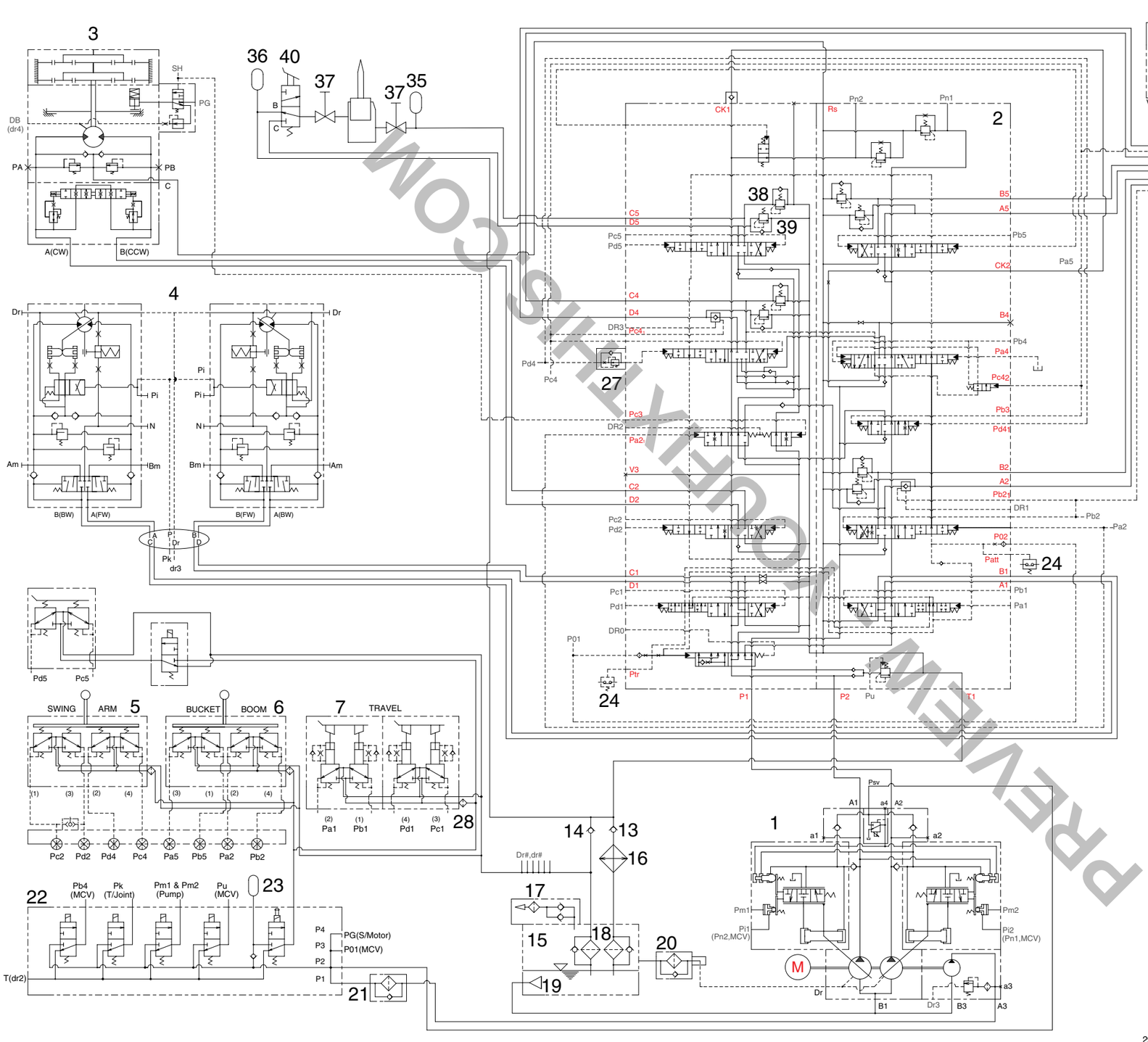
SECTION 9 COMPONENT MOUNTING TORQUE
This section shows bolt specifications and standard torque values needed when mounting components to the machine.

The specifications contained in this shop manual are subject to change at any time and without any advance notice. Contact your HYUNDAI distributor for the latest information.

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GROUP 1 HYDRAULIC CIRCUIT(#1177-)



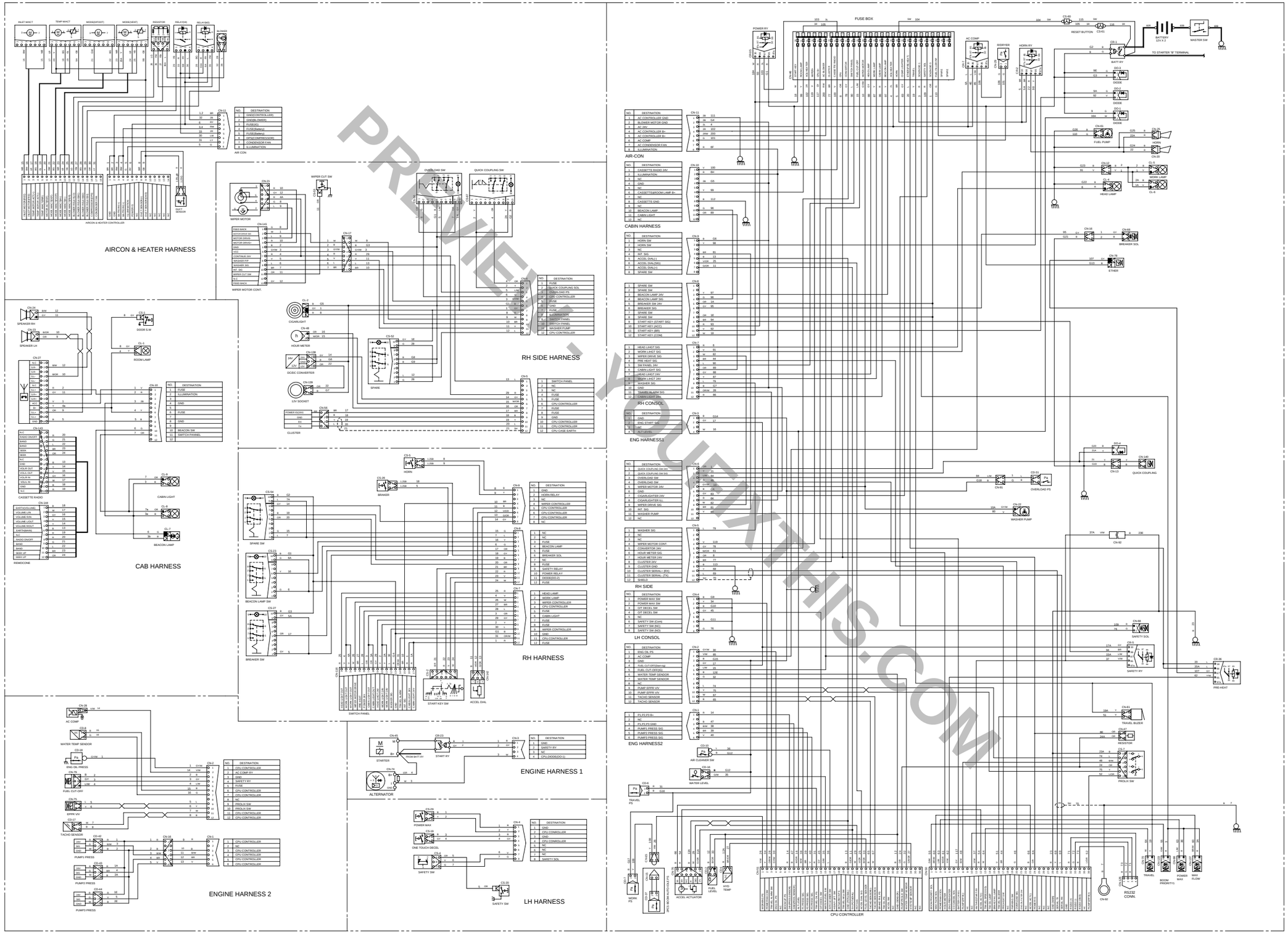
1	Main pump	21	Line filter
2	Main control valve	22	Solenoid valve
3	Swing motor	23	Accumulator
4	Travel motor	24	Pressure switch
5	RCV lever(LH)	25	Shuttle valve
6	RCV lever(RH)	26	Last guard filter
7	Rcv pedal	27	Rcv pedal
8	Boom cylinder(LH)	28	Shockless valve
9	Boom cylinder(RH)	29	Solenoid valve
10	Arm cylinder	30	Safety valve
11	Bucket cylinder	31	Safety valve
12	Turning joint	32	Press switch
13	Check valve	33	Shut off valve
14	Check valve	34	Pedal
15	Hydraulic tank	35	Accumulator
16	Oil cooler	36	Accumulator
17	Air breather	37	Stop valve
18	Bypass valve	38	Port relief valve
19	Return element	39	Port relief valve
20	Strainer	40	Selector valve

29073HC30

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GROUP 2 ELECTRICAL CIRCUIT (up to #0111)

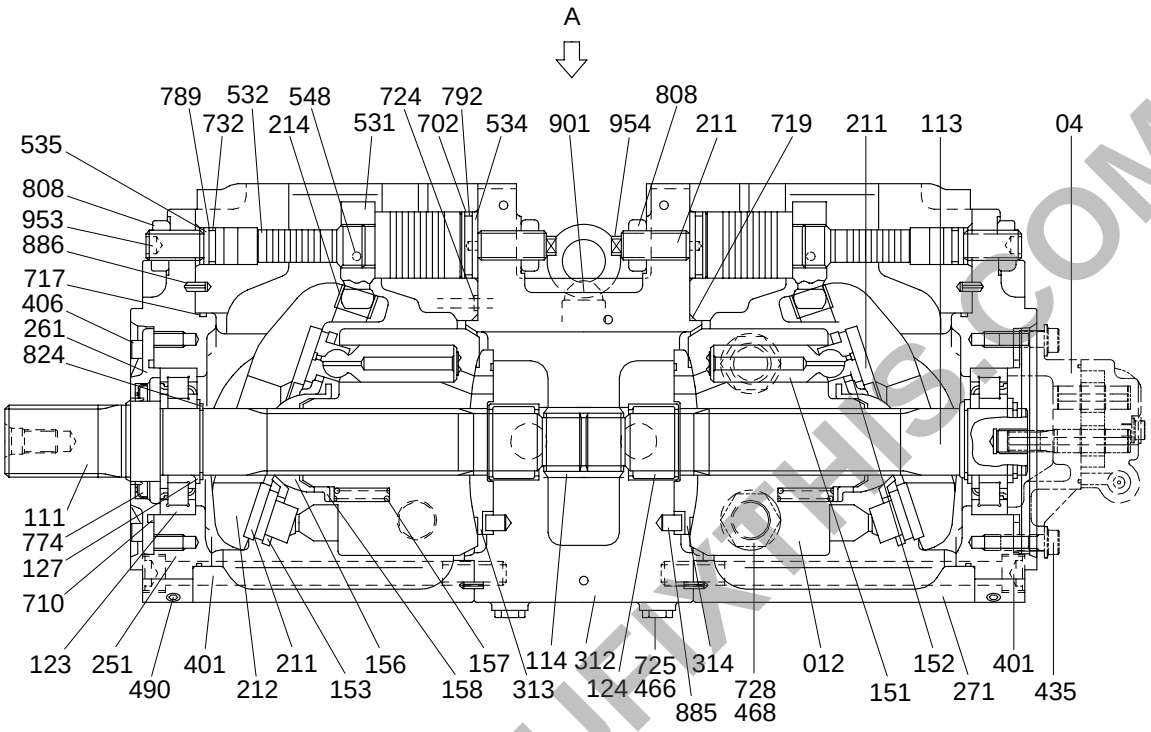
· Machine serial no : -# 0062



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1) MAIN PUMP(1/2)

The main pump consists of two piston pumps(front & rear) and valve block.



04	Gear pump	261	Seal cover(F)	717	O-ring
111	Drive shaft(F)	271	Pump casing	719	O-ring
113	Drive shaft(R)	312	Valve block	724	O-ring
114	Spline coupling	313	Valve plate(R)	725	O-ring
123	Roller bearing	314	Valve plate(L)	728	O-ring
124	Needle bearing	401	Hexagon socket bolt	732	O-ring
127	Bearing spacer	406	Hexagon socket bolt	774	Oil seal
141	Cylinder block	435	Flange socket bolt	789	Back up ring
151	Piston	466	VP plug	792	Back up ring
152	Shoe	468	VP plug	808	Hexagon head nut
153	Push plate	490	VP plug	824	Snap ring
156	Bushing	531	Tilting pin	885	Pin
157	Cylinder spring	532	Servo piston	886	Spring pin
158	Spacer	534	Stopper(L)	901	Eye bolt
211	Shoe plate	535	Stopper(S)	953	Set screw
212	Swash plate	548	Pin	954	Set screw
214	Bushing	702	O-ring		
251	Swash plate support	710	O-ring		

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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 injury.

(3) Loosen the drain plug under the hydraulic tank and drain the oil from the hydraulic tank.

· Hydraulic tank quantity : 210 ℓ

(4) Remove bolts(13) and disconnect pipe (1,2).

(5) Disconnect pilot line hoses(4, 5, 6, 7, 8, 9, 10, 11).

(6) Remove bolts(12) and disconnect pump suction tube (3).

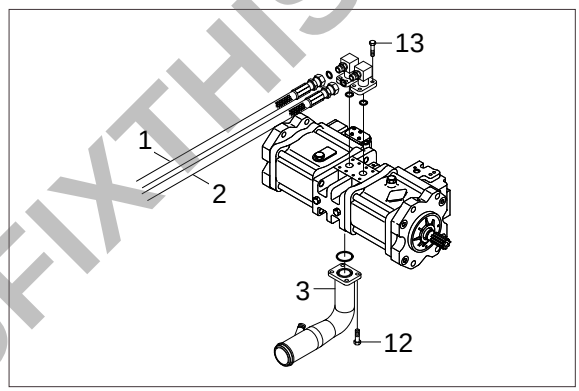
※ When pump suction tube is disconnected, the oil inside the piping will flow out, so catch it in oil pan.

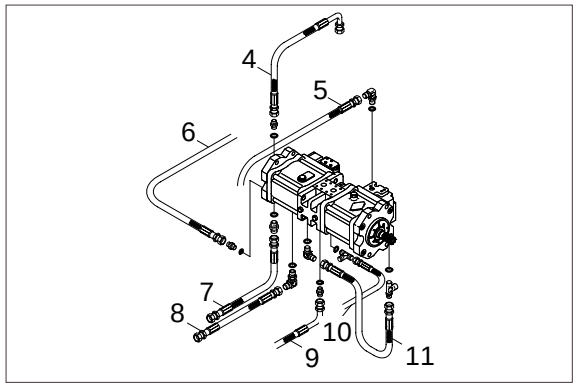
(7) Sling the pump assembly and remove the pump mounting bolts.

· Weight : 155kg(342lb)

※ Pull out the pump assembly from housing. When removing the pump assembly, check that all the hoses have been disconnected.







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GROUP 2 TIGHTENING TORQUE

1. MAJOR COMPONENTS

No.	Descriptions		Bolt size	Torque	
				kgf · m	lbf · ft
1	Engine	Engine mounting bolt, nut	M24 × 3.0	90 ± 7.0	651 ± 51
2		Radiator mounting bolt	M16 × 2.0	29.7 ± 4.5	215 ± 32.5
3		Coupling mounting socket bolt	M20 × 2.5	46.5 ± 2.5	336 ± 18.1
4		Main pump housing mounting bolt	M10 × 1.5	2.81 ± 0.3	20.3 ± 2.2
5	Hydraulic system	Main pump mounting socket bolt	M20 × 2.5	42 ± 4.5	304 ± 32.5
6		Main control valve mounting nut	M12 × 1.75	12.2 ± 1.3	88.2 ± 9.4
7		Fuel tank mounting bolt	M20 × 2.5	45 ± 5.1	32.5 ± 37
8		Hydraulic oil tank mounting bolt	M20 × 2.5	46 ± 5.0	333 ± 36
9		Turning joint mounting bolt, nut	M12× 1.75	12.3 ± 1.3	88.9 ± 9.4
10	Power train system	Swing motor mounting bolt	M20 × 2.5	57.9 ± 8.7	419 ± 62.9
11		Swing bearing upper part mounting bolt	M24 × 3.0	97.8 ± 10	707 ± 72.3
12		Swing bearing lower part mounting bolt	M24 × 3.0	97.8 ± 10	707 ± 72.3
13		Travel motor mounting bolt	M24 × 3.0	100 ± 10	723 ± 72.3
14		Sprocket mounting bolt	M20 × 2.5	57 ± 6.0	412 ± 43.3
15	Under carriage	Carrier roller mounting bolt, nut	M16 × 2.0	29.7 ± 4.5	215 ± 32.5
16		Track roller mounting bolt	M20 × 2.5	57.9 ± 8.6	419 ± 62.2
17		Track tension cylinder mounting bolt	M12 × 1.25	15 ± 0.5	108 ± 3.6
18		Track shoe mounting bolt, nut	M22 × 1.5	115 ± 5.0	831 ± 36
19		Track guard mounting bolt	M20 × 2.5	57.9 ± 8.7	419 ± 62.9
20	Others	Counter weight mounting bolt	M36 × 3.0	280 ± 30	2025 ± 217
21		Cab mounting bolt	M12 × 1.75	12.8 ± 1.5	92.6 ± 10.8
22		Operator's seat mounting bolt	M 8 × 1.25	4.05 ± 0.8	29.3 ± 5.8

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

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6. ERROR CODES TABLE

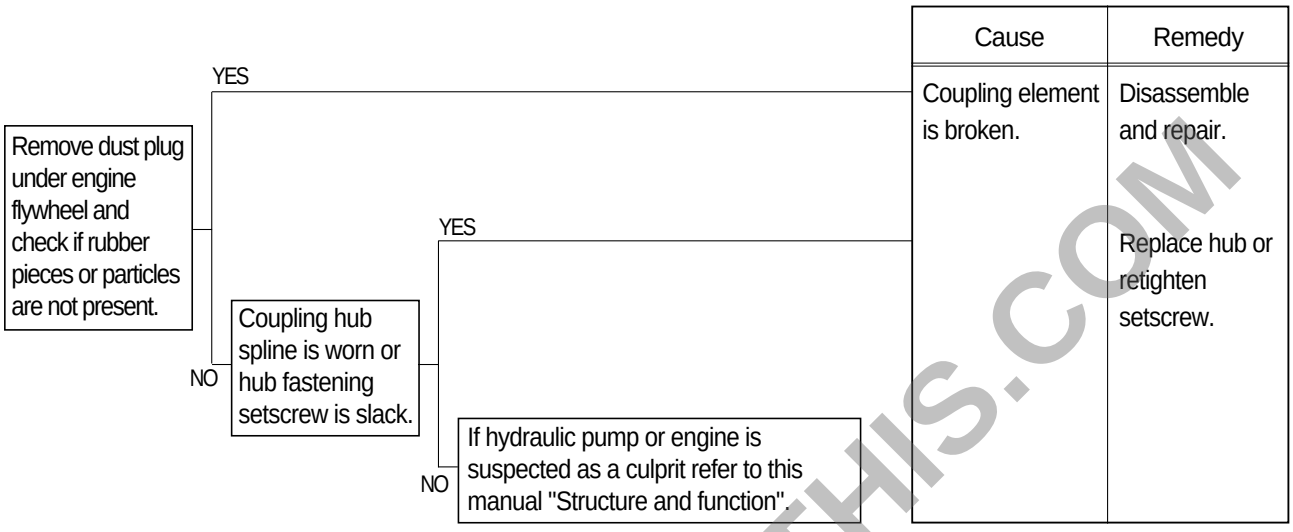
Error code No.	Description
1	Short circuit in accel actuator system
2	Potentiometer circuit is shorted to Vcc(5V) or battery +
3	Short circuit in pump EPPR valve system
4	Short circuit in boom down EPPR valve system
5	Short circuit in travel speed solenoid system
6	Short circuit in power boost solenoid system
7	Short circuit in max flow solenoid system
10	Short circuit in hour-meter system
11	Accel dial circuit is shorted to Vcc(5V) or battery +
12	P1 pressure sensor circuit is shorted to power supply(24V) line
13	P2 pressure sensor circuit is shorted to power supply(24V) line
14	P3 pressure sensor circuit is shorted to power supply(24) line
15	Boom down pressure circuit is shorted to power supply(24V) line
16	Accel actuator circuit is open or shorted to ground
17	Potentiometer circuit is open or shorted to ground
18	Pump EPPR valve circuit is open or shorted to ground
19	Boom down EPPR valve circuit is open or shorted to ground
20	Travel speed solenoid circuit is open or shorted to ground
21	Power boost solenoid circuit is open or shorted to ground
22	Max flow solenoid circuit is open or shorted to ground
25	Hour-meter circuit is open or shorted to ground
26	Accel dial circuit is open or shorted to ground
27	P1 pressure sensor circuit is open or shorted to ground
28	P2 pressure sensor circuit is open or shorted to ground
29	P3 pressure sensor circuit is open or shorted to ground
30	Boom down pressure sensor circuit is open or shorted to ground
31	Engine preheater circuit is open or shorted to ground
32	Travel alarm buzzer circuit is open or shorted to ground
33	Alternator circuit is open or shorted to ground
34	Controller input voltage is below 18V
35	Controller input voltage is over 38V
36	Communication error with cluster
37	Engine speed sensor circuit is open or shorted to ground
38	Anti-restart relay circuit is open or shorted to ground
39	Accel actuator does not stop at a target position
40	There is more than 500rpm difference between target speed and actual speed

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2. DRIVE SYSTEM

1) UNUSUAL NOISE COMES OUT OF PUMP CONNECTION

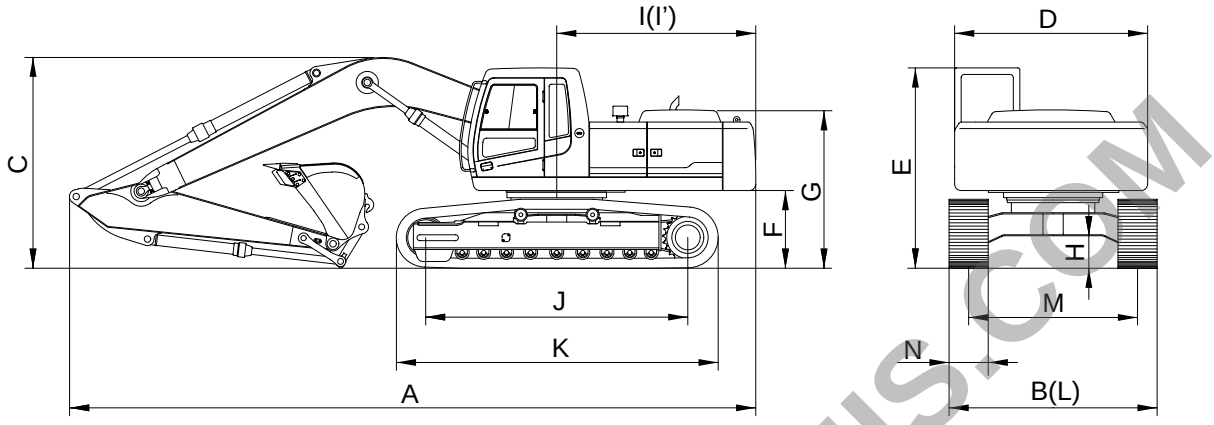


Cause	Remedy
Coupling element is broken.	Disassemble and repair.
	Replace hub or retighten setscrew.

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2. SPECIFICATIONS



Description		Unit	Specification
Operating weight		kg(lb)	28900(63710)
Bucket capacity(PCSA heaped), standard		$m^3(yd^3)$	1.27(1.66)
Overall length	A	mm(ft-in)	10560(34' 8")
Overall width, with 600mm shoe	B		3200(10' 6")
Overall height	C		3290(10' 10")
Superstructure width	D		2980(9' 9")
Overall height of cab	E		3010(9' 11")
Ground clearance of counterweight	F		1190(3' 11")
Engine cover height	G		3190(10' 6")
Minimum ground clearance	H		500(1' 8")
Rear-end distance	I		3200(10' 6")
Rear-end swing radius	I'		3120(10' 3")
Distance between tumblers	J		4030(13' 3")
Undercarriage length	K		4940(16' 2")
Undercarriage width	L		3200(10' 6")
Track gauge	M		2600(8' 6")
Track shoe width, standard	N		600(24")
Travel speed(Low/high)		km/hr(mph)	3.0/5.0(1.9/3.1)
Swing speed		rpm	11
Gradeability		Degree(%)	35(70)
Ground pressure(600mm shoe)		$kgf/cm^2(psi)$	0.55(7.82)

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Millimeters to inches

1mm = 0.03937in

	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

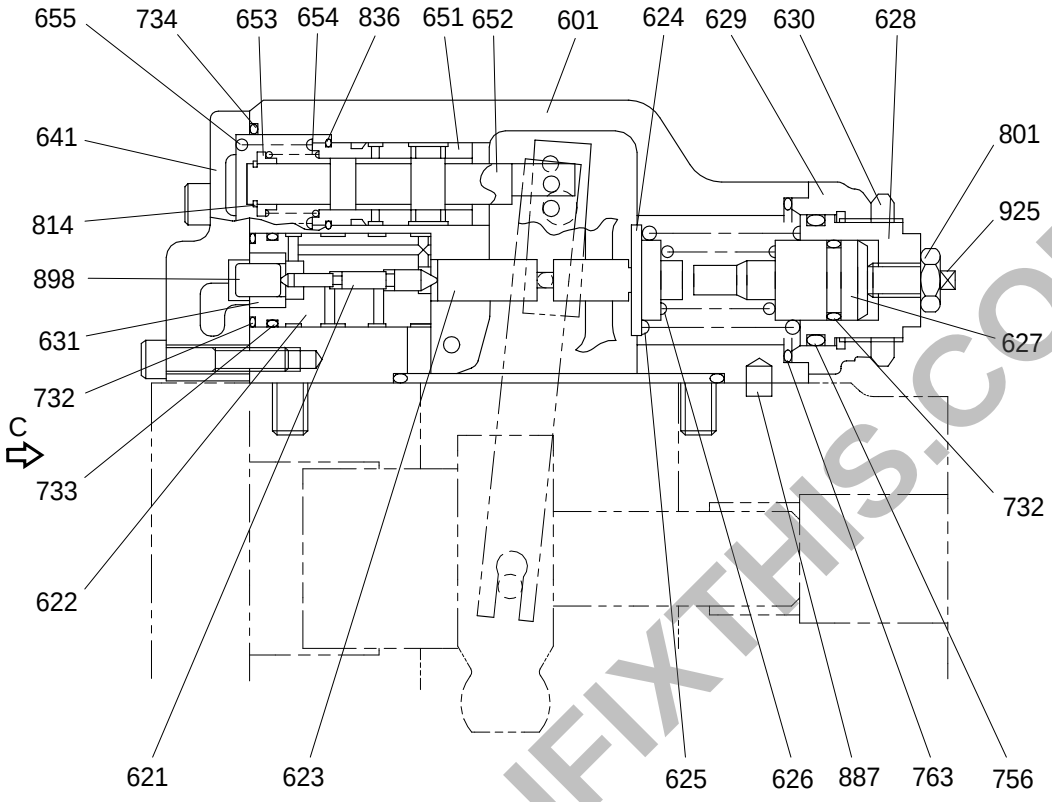
1kg = 2.2046lb

	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	59.5.	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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REGULATOR(2/2)



SECTION A-A

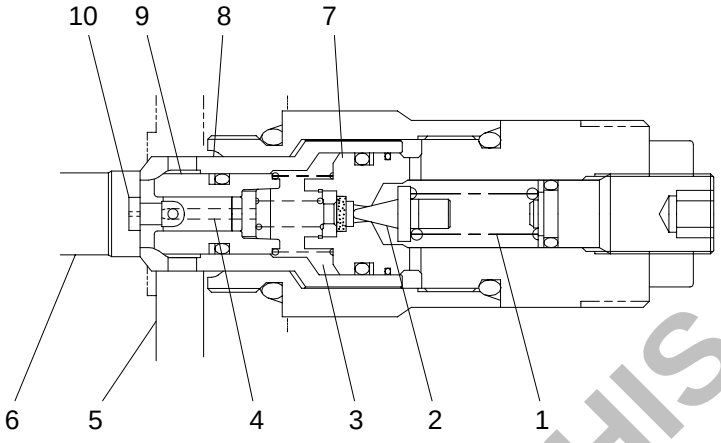
412	Hexagon socket screw	631	Sleeve, pf	730	O-ring
413	Hexagon socket screw	641	Pilot cover	732	O-ring
436	Hexagon socket screw	642	Adjust screw(QMC)	733	O-ring
438	Hexagon socket screw	643	Pilot piston	734	O-ring
496	Plug	644	Spring seat(Q)	735	O-ring
601	Casing	645	Adjust stem(Q)	755	O-ring
611	Feed back lever	646	Pilot spring	756	O-ring
612	Lever(1)	647	Stopper	763	O-ring
613	Lever(2)	648	Piston(QMC)	801	Nut
614	Fulcrum plug	651	Sleeve	814	Snap ring
615	Adjust plug	652	Spool	836	Snap ring
621	Compensator piston	653	Spring seat	858	Snap ring
622	Piston case	654	Return spring	874	Spring pin
623	Compensator rod	655	Set spring	875	Pin
624	Spring seat(C)	656	Block cover	887	Pin
625	Outer spring	708	O-ring	897	Pin
626	Inner spring	722	O-ring	898	Pin
627	Adjust stem(C)	723	O-ring	924	Set screw
628	Adjust screw(C)	724	O-ring	925	Adjust screw(QI)
629	Cover(C)	725	O-ring		
630	Lock nut	728	O-ring		

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(2) Port relief valve

Limits the service pressure in a cylinder circuit.



Port relief valves and make up valves are fitted between the cylinders of the working devices(Boom, arm, bucket) and their spools. In the case of an external force acting on the cylinder rod with its spool in neutral, the pressure in the cylinder could become excessive. The port relief valve(602) restricts this pressure to the set pressure of the valve.

Port relief valve(602) have also the additional function of a make up valve. It is possible, under the influence of an external force acting on a cylinder that a condition can occur where insufficient flow is available to match cylinder velocity. If this occurs then a vacuum and thereby cavitation could exist. To eliminate such an occurrence, a make up valve operates to break this vacuum by supplying the return flow into the cylinder.

The hydraulic fluid between the cylinder and its spool flows into the path(6) to pressurize the port relief valve(602). The hydraulic fluid in the path(6) flows into the spring chamber(3) through the path(4) in the piston(10). If the pressure is lower than the pressure setting, the poppet(2) is shut off because the force of the spring(1) overcomes the pressure. So the path(6) and the spring chamber(3) have the same pressure. Because the spring chamber(3) side pressured area of the seat(8) and the plunger(9) is larger than that of the path(6) side, seat(8) and the plunger(9) are pushed in the right direction to be seated securely and then the hydraulic fluid in the path(6) doesn't escape into the return path(5).

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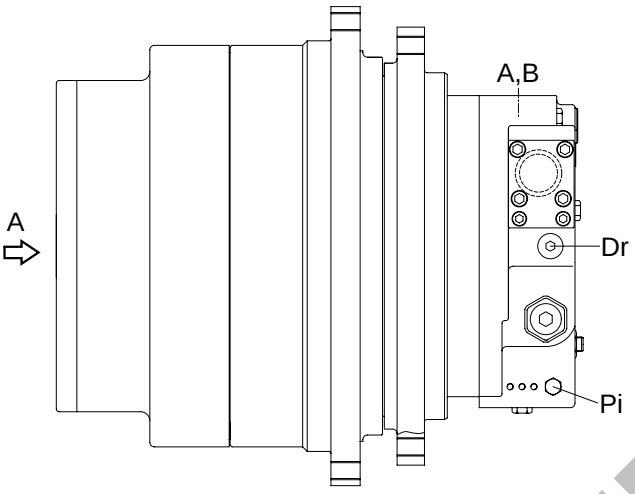
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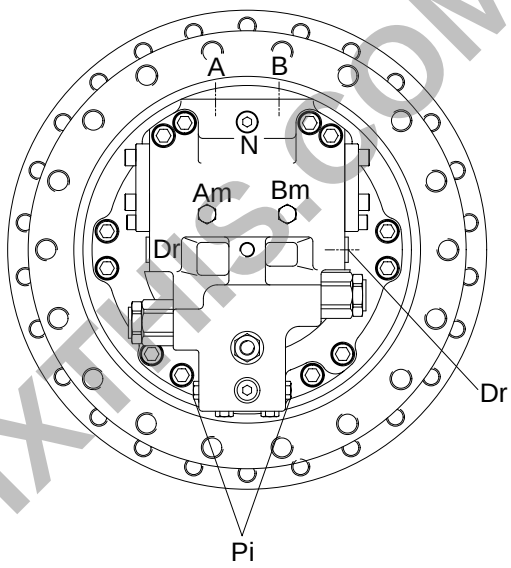
GROUP 4 TRAVEL DEVICE(#1215 and up)

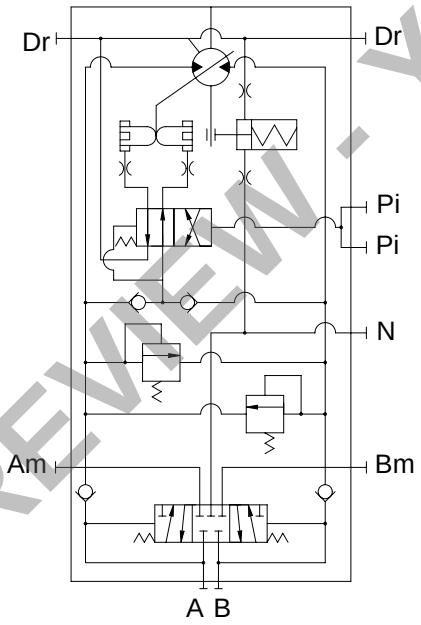
1. CONSTRUCTION

Travel device consists travel motor and gear box.

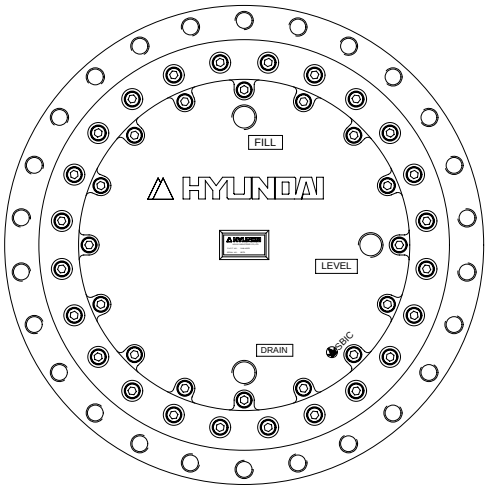
Travel motor includes brake valve, parking brake and high/low speed changeover mechanism.







CIRCUIT DIAGRAM



VIEW A

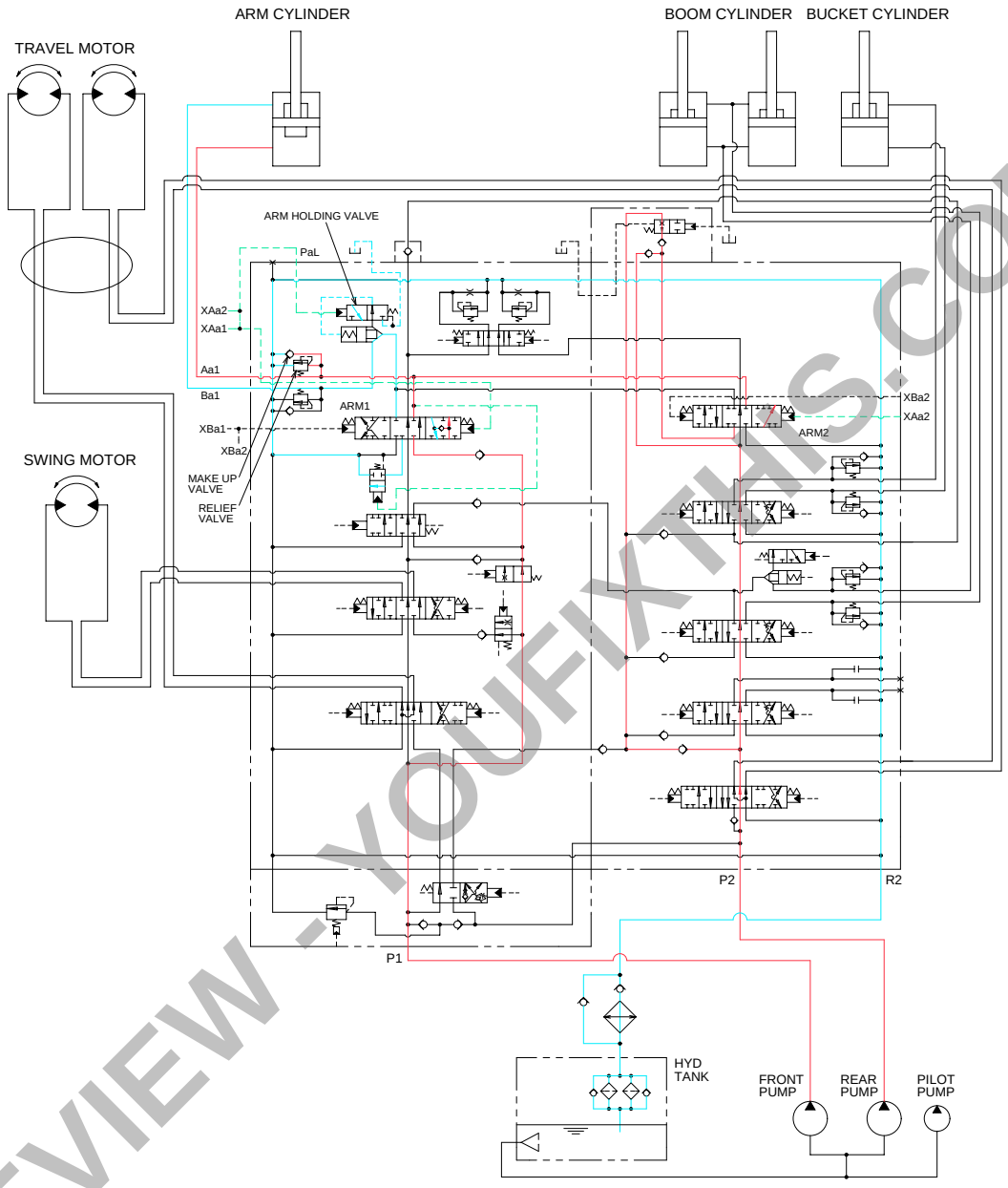
300072TM01A

Port	Port name	Port size
A, B	Valve port	PF 1
Pi	Pilot port	PF 1/4
Dr	Drain port	PF 1/2
Am, Bm	Gage port	PF 1/4
N	Parking release port	PF 1/4

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3. ARM ROLL IN OPERATION



When the LH control lever is pulled back, the arm spools in the main control valve are moved to the roll in position by the pilot oil pressure from the remote control valve.

The oil from the front and rear pump flows into the main control valve and then goes to the large chamber of arm cylinder.

At the same time, the oil from the small chamber of arm cylinder returns to the hydraulic oil tank through the arm spool in the main control valve. When this happens, the arm roll in.

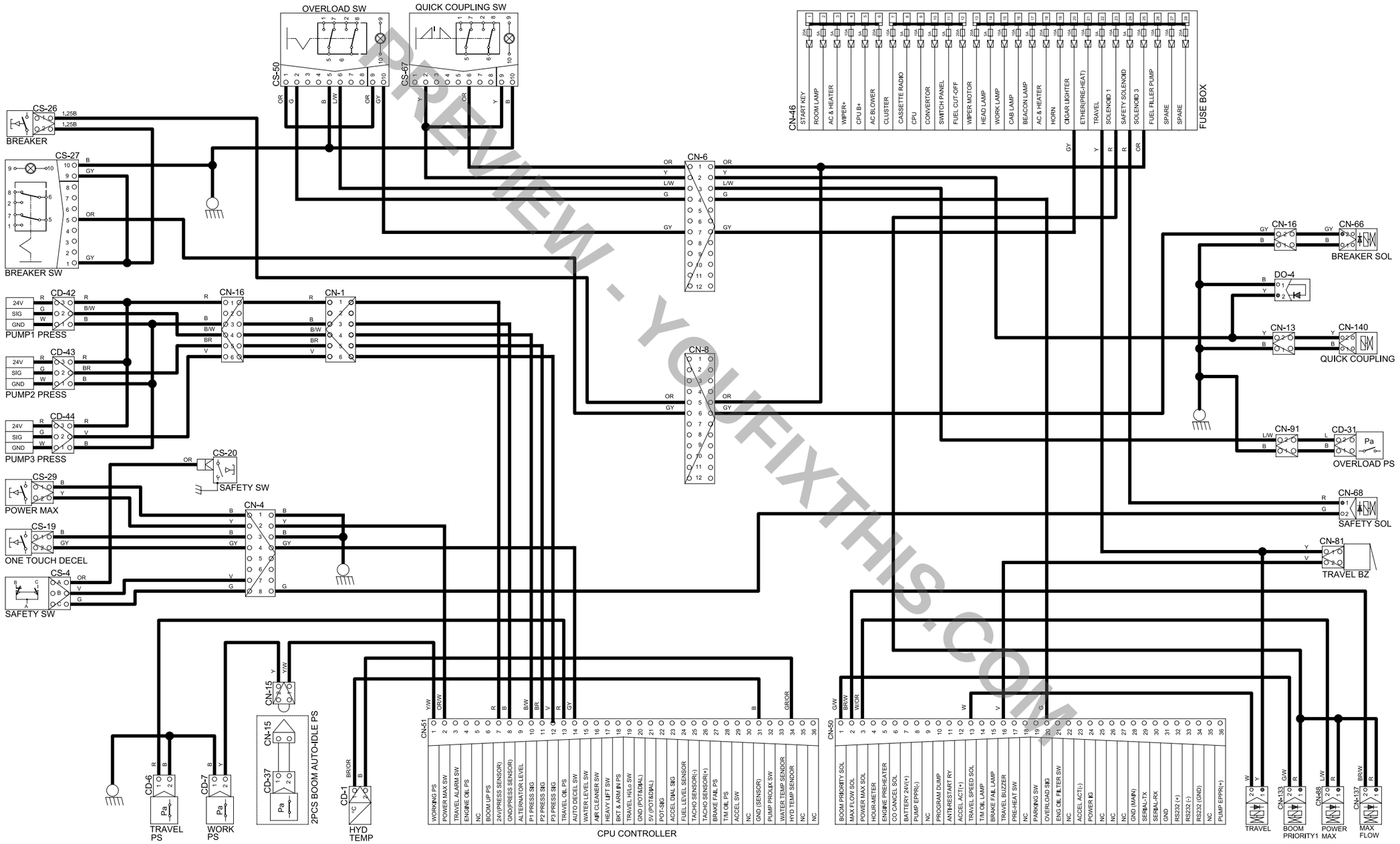
When the roll in speed of arm is faster, the oil returned from the small chamber of arm cylinder combines with the oil from both pump, and flows into the large chamber of the arm cylinder by a make up valve.

The excessive pressure in the arm cylinder bottom end circuit is prevented by relief valve.

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ELECTRIC CIRCUIT FOR HYDRAULIC (up to #0111)



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4. HEAD AND WORK LIGHT CIRCUIT (#0112 and up, TIER II)

1) OPERATING FLOW

Fuse box (No.16) → I/conn〔CN-7(7)〕→ Switch panel〔CN-116(9)〕
Fuse box (No.17) → I/conn〔CN-7(8)〕→ Switch panel〔CN-116(10,11)〕

(1) Head light switch ON

Head light switch ON〔CN-116(1)〕→ I/conn〔CN-7(1)]
- → Head light ON〔CL-4(1)〕
- → I/conn〔CN-10(2)〕→ Cassette radio illumination ON〔CN-27(7)〕
- → I/conn〔CN-11(8)〕→ AC & Heater controller illumination ON
- → I/conn〔CN-6(8)〕→ Cigarlight〔CL-2〕

(2) Work light switch ON

Work light switch ON〔CN-116(2,3)〕→ I/conn〔CN-7(2)〕→ I/conn〔CN-12(1)〕
→ Work light ON〔CL-5(2), CL-6(2)〕

2) CHECK POINT

Engine	Start switch	Check point	Voltage
STOP	ON	① - GND(Fuse box) ② - GND(Switch power input) ③ - GND(Switch power output) ④ - GND(Head light)	20~25V
STOP	ON	⑤ - GND(Fuse box) ⑥ - GND(Switch power input) ⑦- GND(Switch power output) ⑧ - GND(Work light)	20~25V

※ GND : Ground

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2) CLUSTER CHECK PROCEDURE

(1) Start key : ON

① Check monitor initial 5 seconds

a. All lamps light up.
b. Buzzer sound.

② Check monitor after 5 seconds : Indicate cluster version and machine condition

a. Cluster program version : CL : 1.4 ◄— Indicates program version 1.4 for 2 seconds.
b. Tachometer : 0rpm
c. Fuel gauge : All light up below appropriate level
d. Hydraulic temperature : All light up below appropriate level
e. Engine coolant temperature gauge : All light up below appropriate level
f. Warning lamp

※ During start key **ON** the engine oil pressure lamp and battery charging lamp go on, but it is not abnormal.

※ When engine coolant temperature below 30$_{\circ}$C, the warming up lamp lights up.

③ Indicating lamp state

a. Work mode selection : General work
b. Power mode selection : S mode
c. User mode selection : No LED ON
d. Auto decel LED : ON
e. Travel speed pilot lamp : Low(Turttle)

(2) Start of engine

① Check machine condition

a. Tachometer indicates at present rpm
b. Gauge and warning lamp : Indicate at present condition.

※ When normal condition : All warning lamp OFF

c. Work mode selection : General work
d. Power mode selection : S mode
e. User mode selection : No LED ON
f. Auto decel LED : ON
g. Travel speed pilot lamp : Low(Turttle)

② When warming up operation

a. Warming up lamp : ON
b. 10 seconds after engine started, engine speed increases to1200 rpm(Auto decel LED : ON)

※ Others same as above ①.

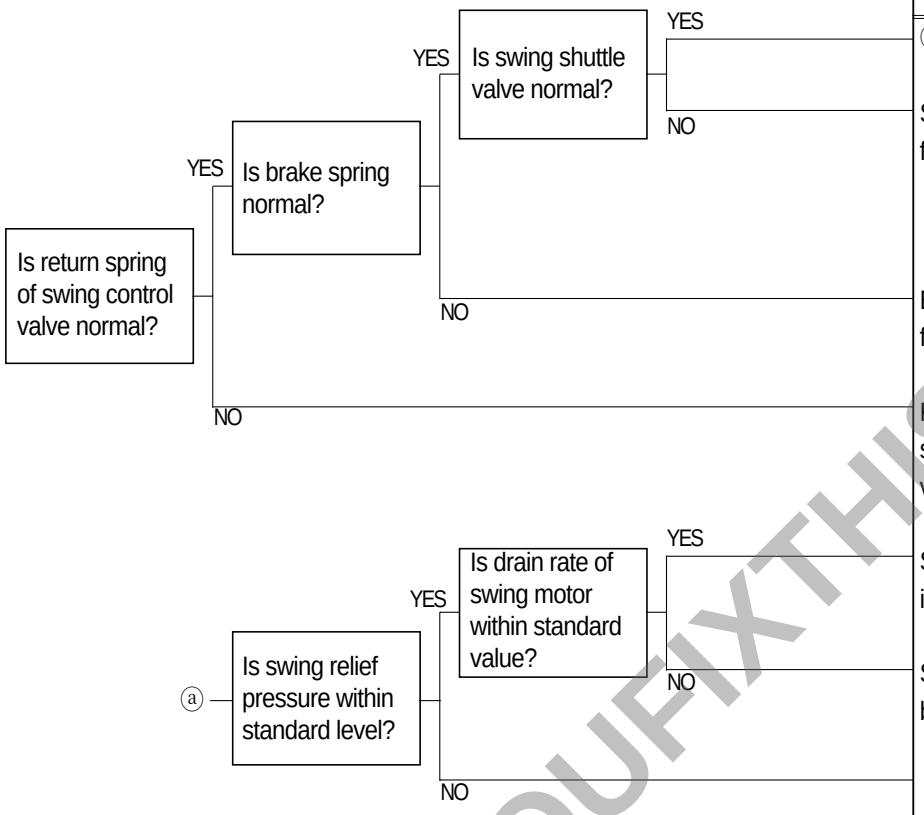
③ When abnormal condition

a. The lamp lights up and the buzzer sounds.
b. If **BUZZER STOP** switch is pressed, buzzer sound is canceled but the lamp light up until normal condition.

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5) THE SWING UNIT DRIFTS WHEN THE MACHINE IS AT REST ON A SLOPE



Cause	Remedy
ⓐ	
Shuttle valve is faulty.	Disassemble and replace.
Brake spring is faulty.	Disassemble and replace.
Return spring of swing control valve is faulty.	Disassemble and replace.
Swing relief valve is faulty.	Disassemble and repair or replace.
Swing motor is broken.	Disassemble and repair.
	Adjust swing relief valve pressure or replace swing relief valve.

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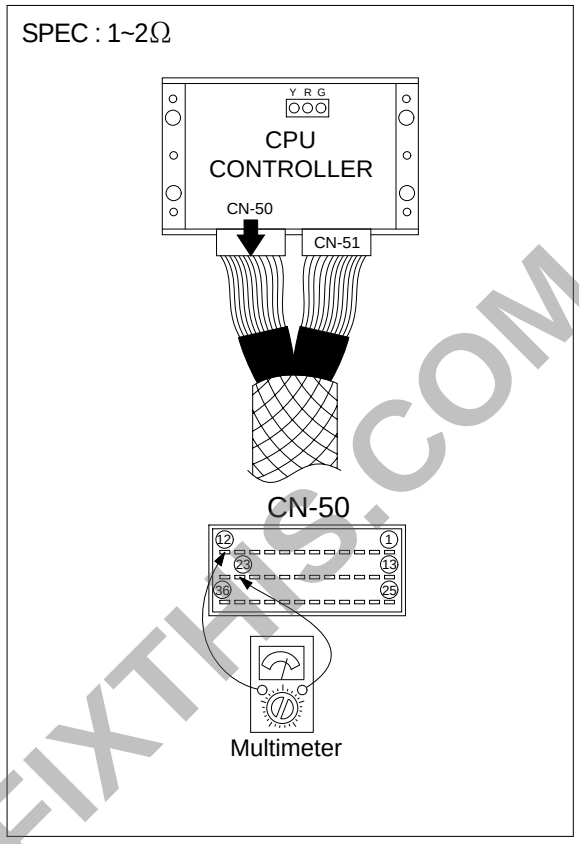
2) TEST PROCEDURE

(1) **Test 11 :** Check resistance.

① Starting key OFF.

② Disconnect connector CN-50 from CPU controller.

③ Check resistance between CN-50(12)-(23) as figure.



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3. SWING DEVICE

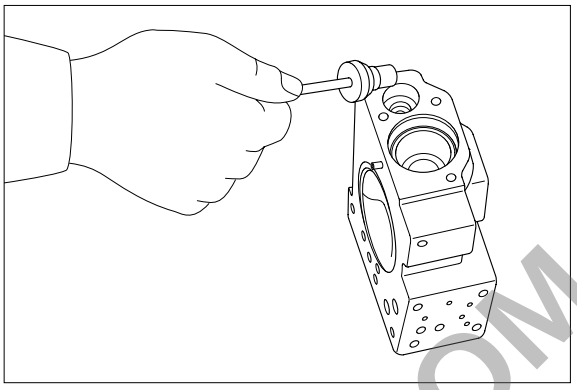
Part name	Inspection item	Remedy
Shoe of piston assembly	· Sliding surface has a damage. · Sliding surface depression(⊔) dimension less than 0.45㎜ or has a large damage.	· Lapping · Replace parts or motor
Piston of piston assembly	· Sliding surface has a seizure(Even though small).	· Replace motor
Piston 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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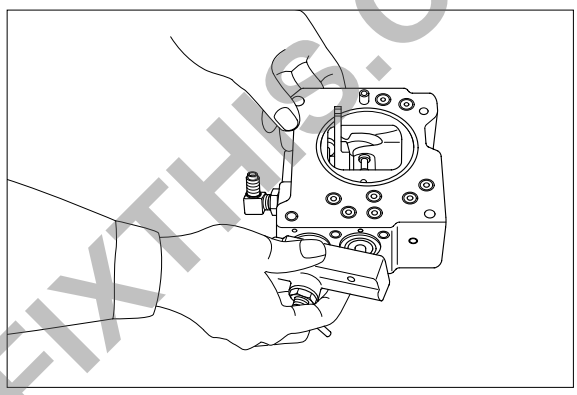
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(5) After removing cover(C, 629) subassembly, take out outer spring(625), inner spring (626) and spring seat(C, 624) from compensating section.
Then draw out adjusting ring(Q, 645), pilot spring(646) and spring seat(644) from pilot section.

※ Adjusting ring(Q,645) can easily be drawn out with M4 bolt.



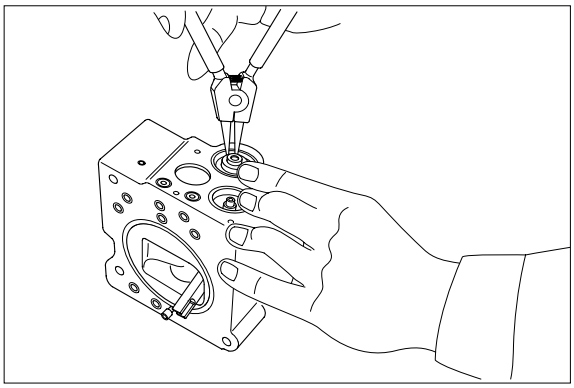
(6) Remove hexagon socket head screws (436, 438) and remove pilot cover(641).
After removing pilot cover, take out set spring(655) from pilot section.



(7) Remove snap ring(814) and take out spring seat(653), return spring(654) and sleeve(651).
Sleeve(651) is fitted with snap ring(836).

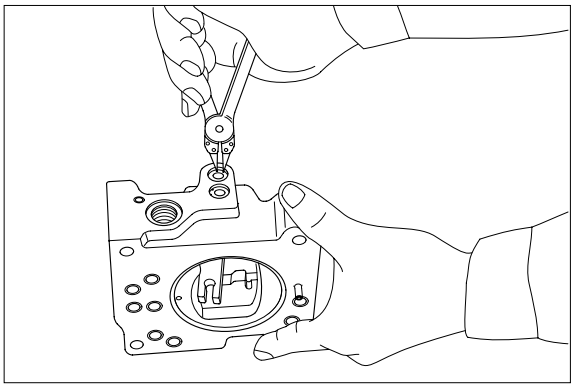
※ When removing snap ring(814), return spring(654) may pop out.

※ Take care not to lose it.



(8) Remove locking ring(858) and take out fulcrum plug(614) and adjusting plug (615).

※ Fulcrum plug(614) and adjusting plug (615) can easily be taken out with M6 bolt.

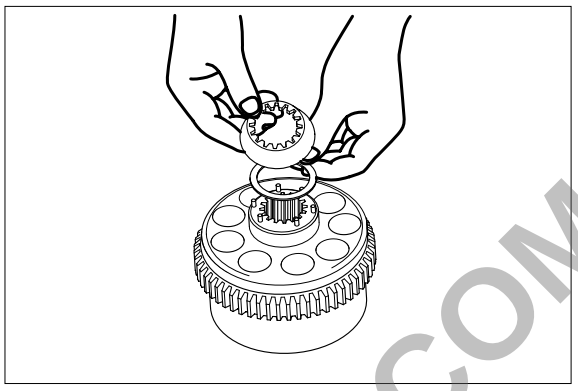


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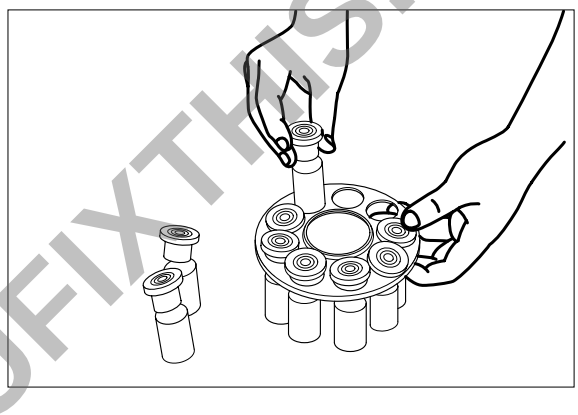
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(8) Insert the push rod(116) into the cylinder (111). Place the retainer(113) assembled with spacer(117) onto the cylinder.

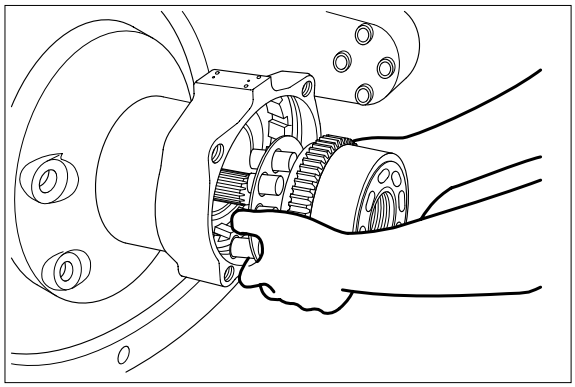
※ Insert two push rods in each hole.



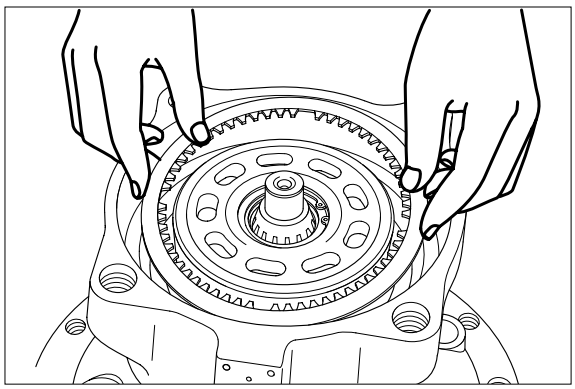
(9) Install the piston sub-assembly(121, 122) to the set plate(123).



(10) Reassemble the piston assembly(121, 122) to the cylinder(111).



(11) Place the casing(301) under the front cover(304) and reassemble 3 sheets of separate plate(743) and then 2 sheets of friction plate(742) to the casing(301).



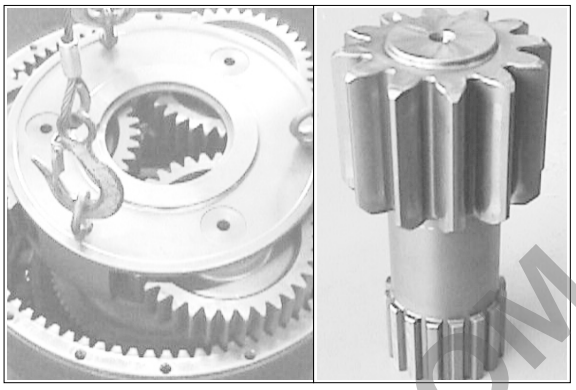
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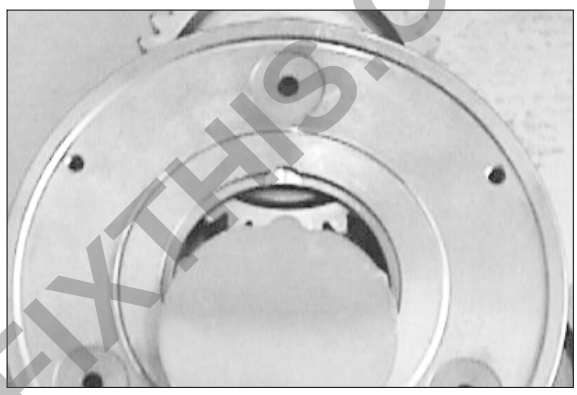
(9) Installing carrier 1 assembly

① Putting carrier 1 assembly in ring gear (17), rotate planetary gears 1(6) by hand and adjust carrier 1(2) to mesh with sun gear 2(10).

② Marking sure that coupling is on the shaft end, install sun gear 1(9) on center.



③ Facing sharp edged side to cover(1), place thrust plate(8) on carrier 1(2).

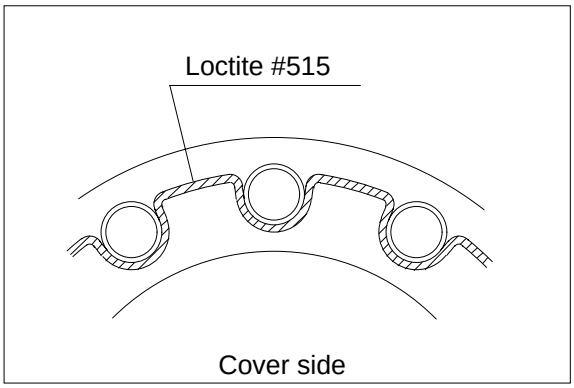


(10) Installing cover

※ Gear oil can be filled before installing cover(1) if you can measure presscribed volume of oil.

① Apply loctite No.515 on mating surfaces of cover(1) and ring gear(17) and install cover(1) on ring gear(17).

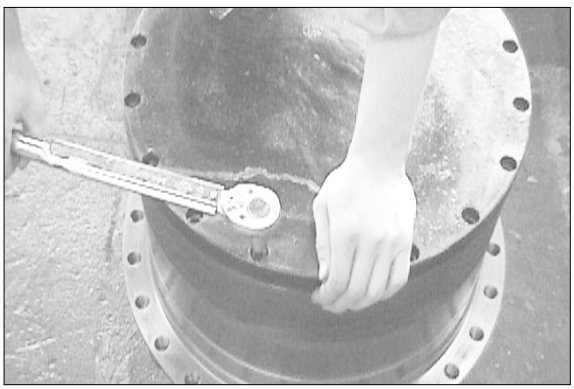
② Apply loctite No.242 on threads of 18 - M10×30 hexagon socket head bolts (24) and tighten them with the torque of 7kgf · m(50.6lbf · ft).



(11) Filling gear oil

① Fill gear oil(SAE 90 API class GL-4 or GL-5, 11 litters) from two R(PT) 3/4 ports for taper screw plugs(26).

② Wrap taper plugs(26) with seal tape and put and tighten them on cover(1).



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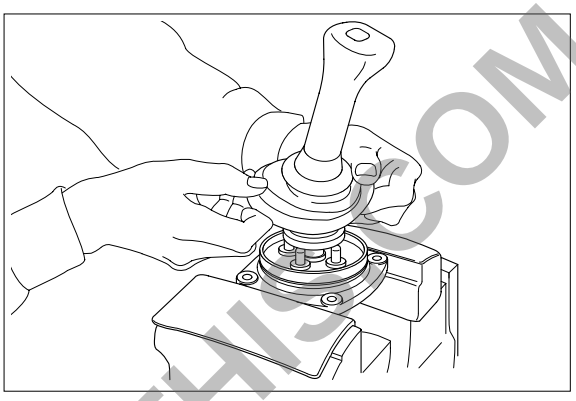
3) DISASSEMBLY

(1) Clean pilot valve with kerosene.

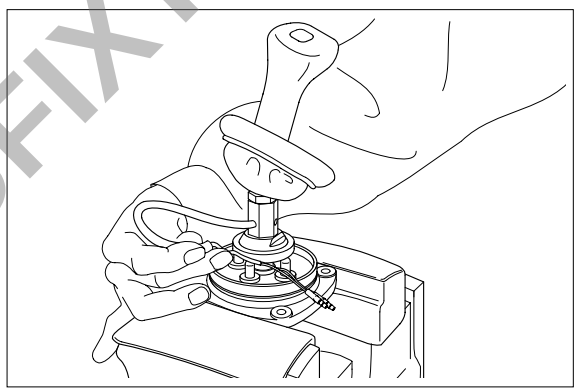
※ Put blind plugs into all ports

(2) Fix pilot valve in a vise with copper(or lead) sheets.

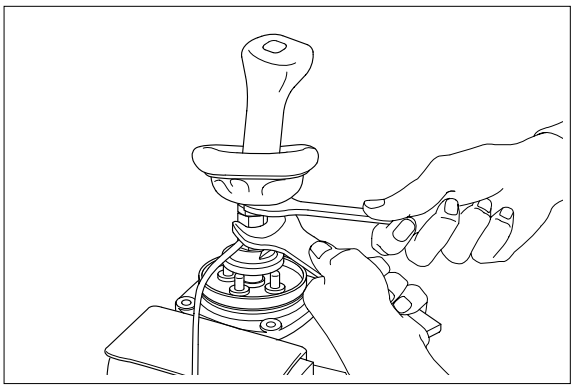
(3) Remove end of boot(25) from case(1) and take it out upwards.



※ For valve with switch, remove cord also through hole of casing.



(4) Loosen lock nut(20) and adjusting nut(19) with spanners on them respectively, and take out handle section as one body.



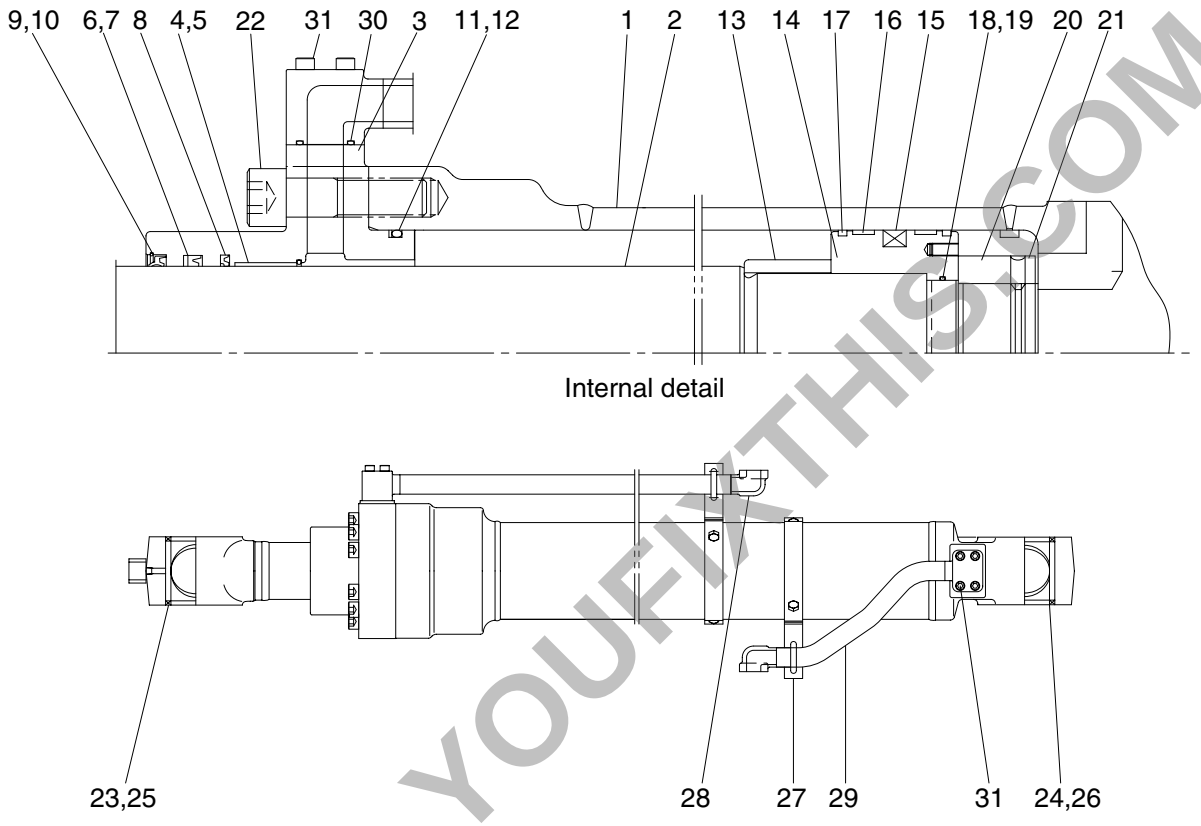
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2. DISASSEMBLY AND ASSEMBLY

1) STRUCTURE

(1) Bucket cylinder



1	Tube assembly	12	Back up ring	23	Pin bushing
2	Rod assembly	13	Cushion ring	24	Pin bushing
3	Gland	14	Piston	25	Dust seal
4	DD2 bushing	15	Piston seal	26	Dust seal
5	Snap ring	16	Wear ring	27	Band assembly
6	Rod seal	17	Dust ring	28	Pipe assembly
7	Back up ring	18	O-ring	29	Pipe assembly
8	Buffer ring	19	Back up ring	30	O-ring
9	Dust wiper	20	Lock nut	31	Hexagon socket head bolt
10	Snap ring	21	Hexagon socket set screw		
11	O-ring	22	Hexagon socket head bolt		

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