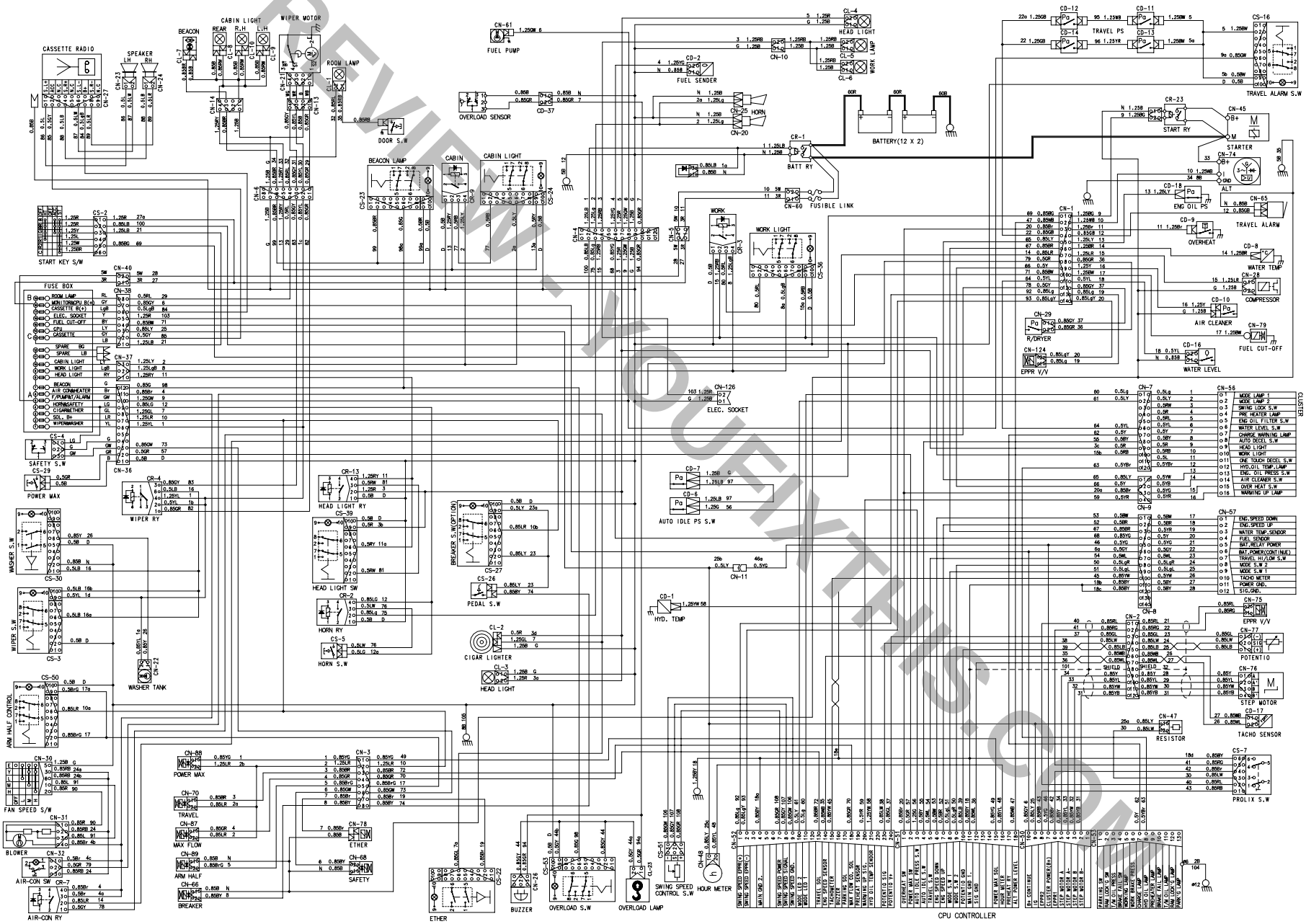
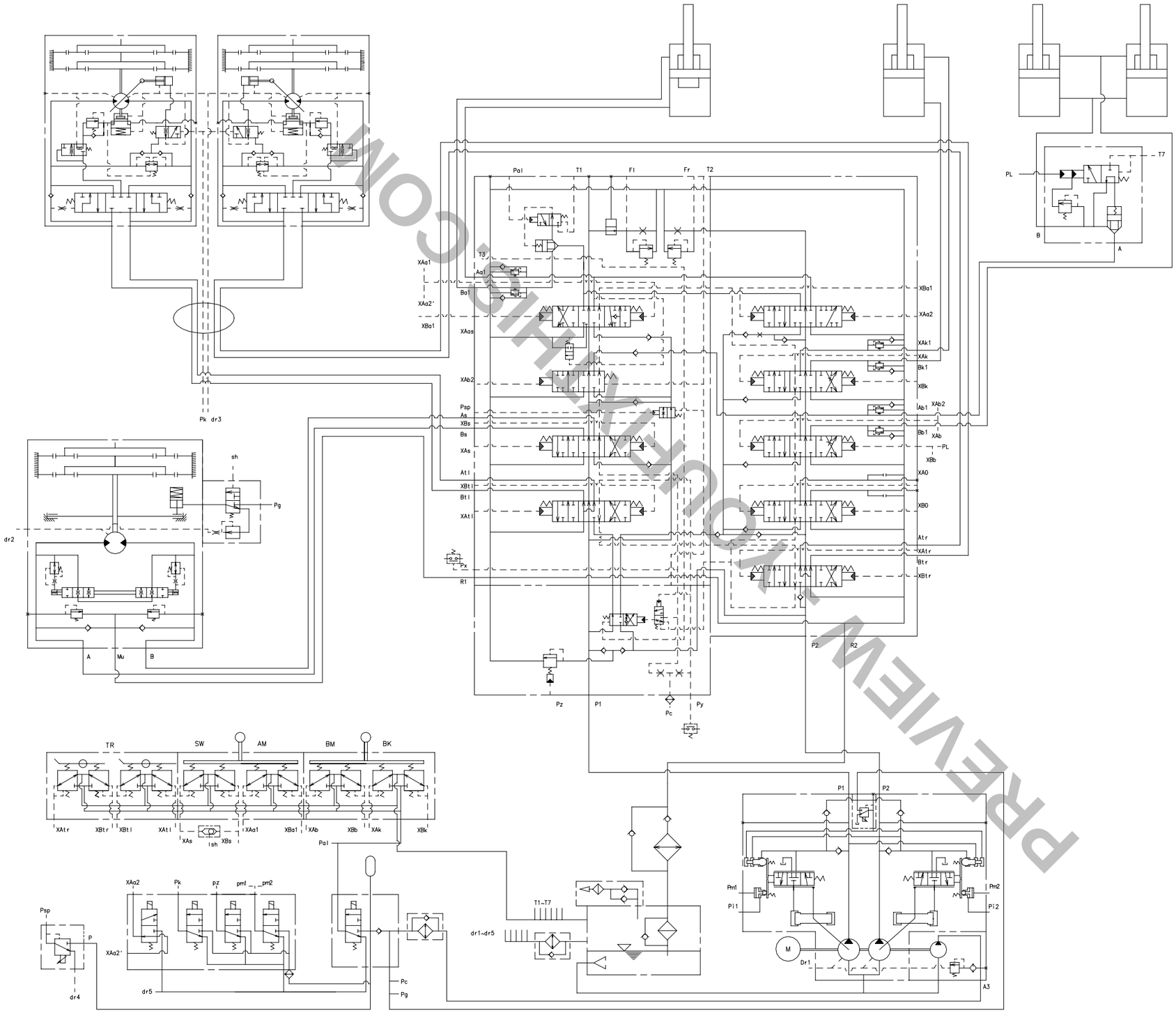


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GROUP 1 HYDRAULIC CIRCUIT

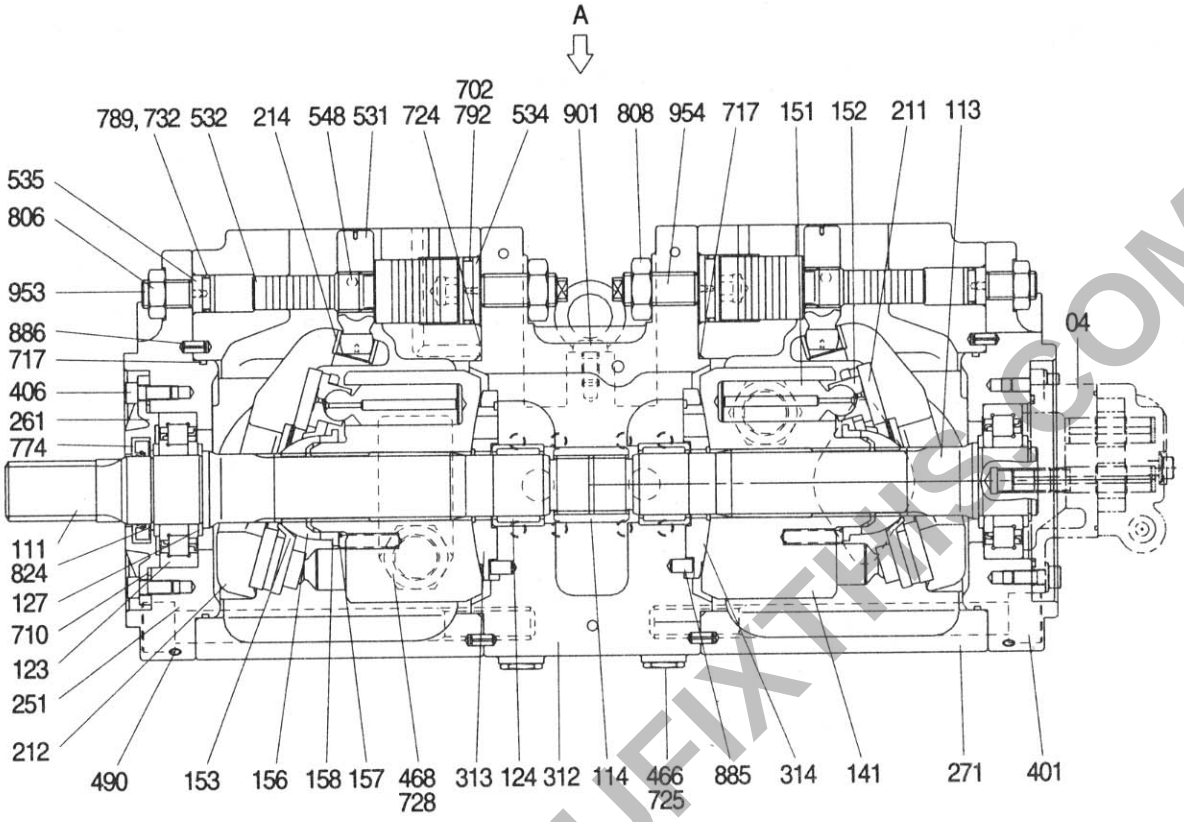


1 Main pump
2 Main control valve
3 Swing motor
4 Travel motor
5 RCV lever
6 RCV pedal
7 Boom cylinder(RH)
8 Boom cylinder(LH)
9 Arm cylinder
10 Bucket cylinder
11 Turning joint
12 Check valve
13 Check valve
14 Hydraulic tank
15 Oil cooler
16 Air breather
17 Bypass valve
18 Strainer assembly
19 Spin filter
20 Shuttle valve
21 Boom holding valve
22 Safety solenoid valve
23 Solenoid valve(4 cartridge)
24 Swing EPPR valve
25 Line filter
26 Pressure switch
27 Accumulator
28 Last guard filter
29 Last guard filter

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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	251	Support	710	O-ring
111	Drive shaft(F)	261	Seal cover(F)	717	O-ring
113	Drive shaft(R)	271	Pump casing	724	O-ring
114	Spline coupling	312	Valve block	725	O-ring
123	Roller bearing	313	Valve plate(R)	728	O-ring
124	Needle bearing	314	Valve plate(L)	732	O-ring
127	Bearing spacer	401	Hexagon socket bolt	774	Oil seal
141	Cylinder block	406	Hexagon socket bolt	789	Back up ring
151	Piston	466	VP Plug	792	Back up ring
152	Shoe	468	VP Plug	806	Hexagon head nut
153	Set plate	490	Plug	808	Hexagon head nut
156	Bushing	531	Tilting pin	824	Snap ring
157	Cylinder spring	532	Servo piston	885	Pin
158	Spacer	534	Stopper(L)	886	Spring pin
211	Shoe plate	535	Stopper(S)	901	Eye bolt
212	Swash plate	548	Pin	953	Set screw
214	Bushing	702	O-ring	954	Set screw

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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	M16 × 2.0	10	72.3
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±17.3
4		Main pump housing mounting bolt	M10 × 1.5	4.8±0.3	34.7±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	12.2±1.3	88.2±9.4
7		Fuel tank mounting bolt	M20 × 2.5	46.0±5.1	332.7±36.9
8		Hydraulic oil tank mounting bolt	M20 × 2.5	46.0±5.1	332.7±36.9
9		Turning joint mounting bolt, nut	M16 × 2.0	29.6±3.2	214.1±23.1
10	P/Train system	Swing motor mounting bolt	M20 × 2.5	57.8±6.4	418±46.3
11		Swing bearing upper part mounting bolt	M20 × 2.5	57.8±6.4	418±46.3
12		Swing bearing lower part mounting bolt	M20 × 2.5	57.8±6.4	418±46.3
13		Travel motor mounting bolt	M16 × 2.0	23±2.5	166.4±18.1
14		Sprocket mounting bolt	M16 × 2.0	23±2.5	166.4±18.1
15	Under carriage	Carrier roller mounting bolt	M16 × 2.0	29.6±3.2	214.1±23.1
16		Track roller mounting bolt	M18 × 2.5	41.3±5.0	298.7±36.2
17		Track tension cylinder mounting bolt	M16 × 2.0	29.6±3.2	214.1±23.1
18		Track shoe mounting bolt, nut	M20 × 1.5	81±4.0	585.9±28.9
19		Track guard mounting bolt	M18 × 2.5	41.3±5.0	298.7±36.2
20	Others	Counter weight mounting bolt	M30 × 3.5	199±29	1439.4±209.8
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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3) DISASSEMBLY

(1) Select place suitable to disassembling.

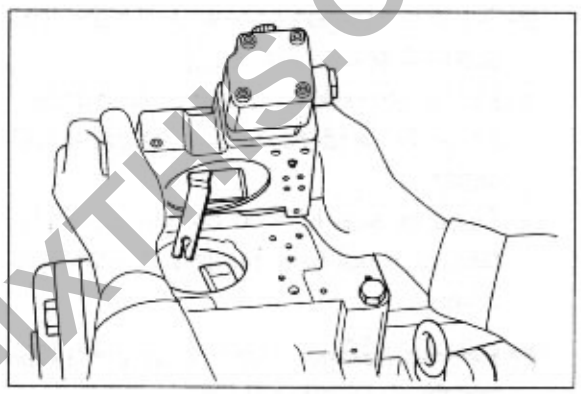
※ Select clean place.

※ Spread rubber sheet, cloth or so on on overhaul workbench top to prevent parts from being damaged.

(2) Remove dust, rust, etc, from pump surfaces with cleaning oil or so on.

(3) Remove drain port plug(468) and let oil out of pump casing.(front and rear pump)

(4) Remove hexagon socket head bolts (412, 413) and remove regulator.

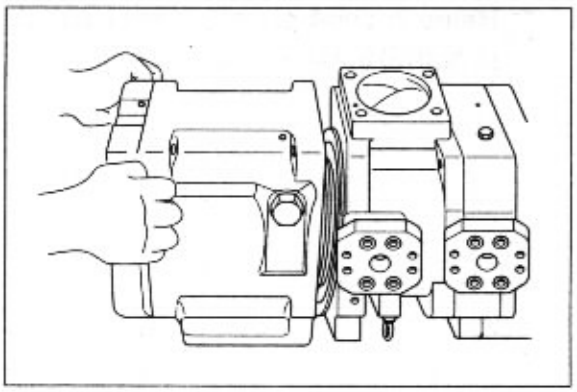


(5) Loosen hexagon socket head bolts(401) which tighten swash plate support(251), pump casing(271) and valve block(312).

※ If gear pump and so on are fitted to rear face of pump, remove them before starting this work.

(6) Place pump horizontally on workbench with its regulator-fitting surface down, and separate pump casing(271) from valve block (312).

※ Before bringing this surface down, spread rubber sheet on workbench without fail to prevent this surface from being damaged.



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SECTION 6 TROUBLESHOOTING

GROUP 1 HYDRAULIC AND MECHANICAL SYSTEM

1. INTRODUCTION

1) MACHINE IN GENERAL

(1) If even a minor fault is left intact and operation is continued, a fatal failure may be caused, entailing a large sum of expenses and long hours of restoration.
Therefore when even a small trouble occurs, do not rely on your intuition and experience, but look for the cause based on the troubleshooting principle and perform maintenance and adjustment to prevent major failure from occurring. Keep in mind that a fault results from a combination of different causes.

(2) The following lists up commonly occurring faults and possible causes with this machine. For the troubleshooting of the engine, refer to the coming troubleshooting and repair.

(3) When carrying out troubleshooting, do not hurry to disassemble the components.
It will become impossible to find the cause of the problem.

(4) Ask user or operator the following.
① Was there any strange thing about machine before failure occurred?
② Under what conditions did the failure occur?
③ Have any repairs been carried out before the failure?

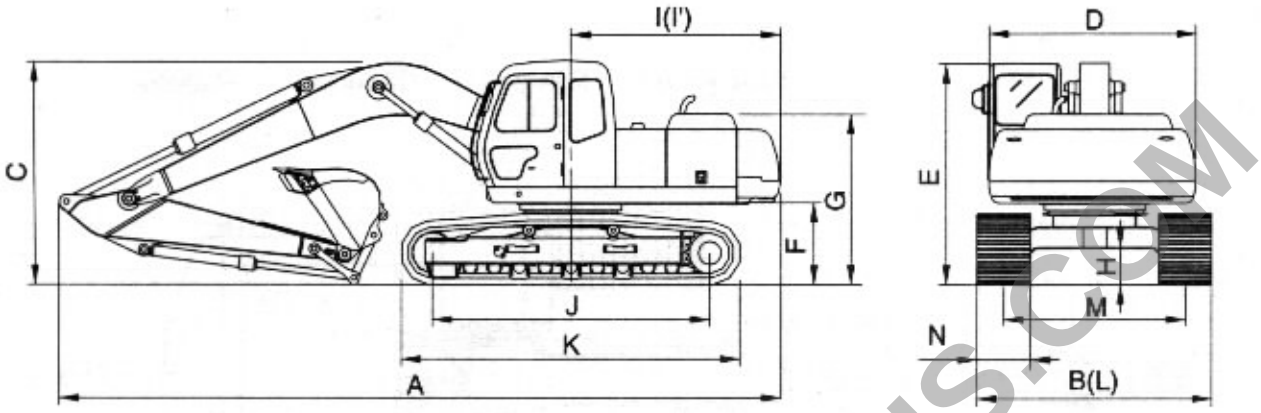
(5) Check before troubleshooting.
① Check oil and fuel level.
② Check for any external leakage of oil from components.
③ Check for loose or damage of wiring and connections.

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2. SPECIFICATION

1) ROBEX 210-3



Description		Unit	Specification
Operating weight		kg (lb)	20620 (45460)
Bucket capacity(PCSA heaped) ,standard		m^3 (yd^3)	0.87 (1.14)
Overall length	A	mm(ft-in)	9460 (31' 0")
Overall width, with 700mm shoe	B		2900 (9' 6")
Overall height	C		2970 (9' 9")
Superstructure width	D		2720 (8' 11")
Overall height of cab	E		2940 (9' 8")
Ground clearance of counterweight	F		1070 (3' 6")
Engine cover height	G		2230 (7' 4")
Minimum ground clearance	H		470 (1' 7")
Rear-end distance	I		2740 (9' 0")
Rear-end swing radius	I'		2750 (9' 0")
Distance between tumblers	J		3270 (10' 9")
Undercarriage length	K		4070 (13' 4")
Undercarriage width	L		2900 (9' 6")
Track gauge	M		2200 (7' 3")
Track shoe width, standard	N		700 (2' 4")
Travel speed (low/high)		km/hr(mph)	3.1 / 5.2 (1.9 / 3.2)
Swing speed		rpm	12.5
Gradeability		degree (%)	35 (70)
Ground pressure(700mm shoe)		kg/cm^2 (psi)	0.41 (5.83)

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GROUP 1 OPERATIONAL PERFORMANCE TEST

1. PURPOSE

Performance tests are used to check:

1) OPERATIONAL PERFORMANCE OF A NEW MACHINE

Whenever a new machine is delivered in parts and reassembled at a customer's site, it must be tested to confirm that the operational performance of the machine meets **Hyundai spec.**

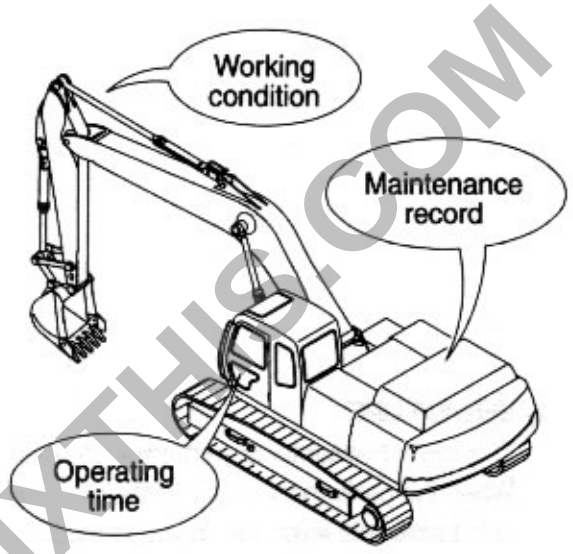
2) OPERATIONAL PERFORMANCE OF A WORKING MACHINE

With the passage of time, the machine's operational performance deteriorates, so that the machine needs to be serviced periodically to restore it to its original performance level.

Before servicing the machine, conduct performance tests to check the extent of deterioration, and to decide what kind of service needs to be done(by referring to the "Service Limits" in this manual).

3) OPERATIONAL PERFORMANCE OF A REPAIRED MACHINE

After the machine is repaired or serviced, it must be tested to confirm that its operational performance was restored by the repair and/or service work done.



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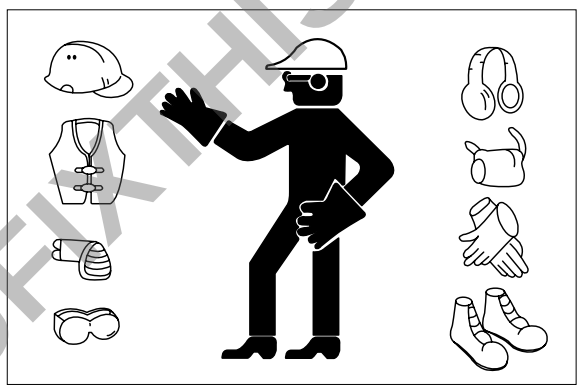
GROUP 1 SAFETY

FOLLOW SAFE PROCEDURE

Unsafe work practices are dangerous. Understand service procedure before doing work; do not attempt shortcuts.

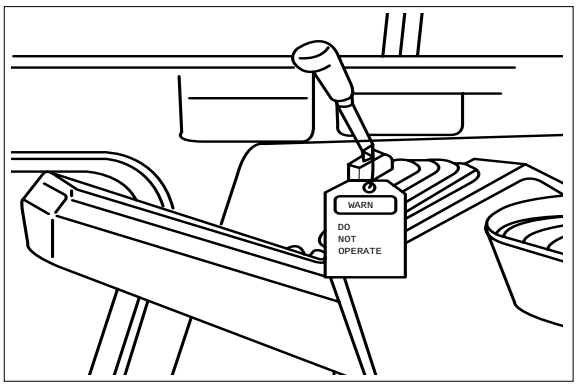
WEAR PROTECTIVE CLOTHING

Wear close fitting clothing and safety equipment appropriate to the job.



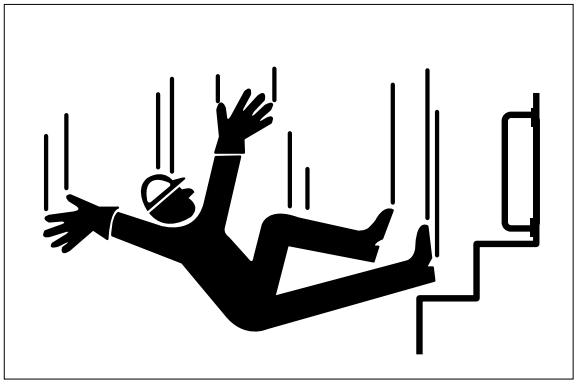
WARN OTHERS OF SERVICE WORK

Unexpected machine movement can cause serious injury.
Before performing any work on the excavator, attach a 「**Do Not Operate**」 tag on the right side control lever.



USE HANDHOLDS AND STEPS

Falling is one of the major causes of personal injury.
When you get on and off the machine, always maintain a three point contact with the steps and handrails and face the machine. Do not use any controls as handholds.
Never jump on or off the machine. Never mount or dismount a moving machine.
Be careful of slippery conditions on platforms, steps, and handrails when leaving the machine.



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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	59.5.	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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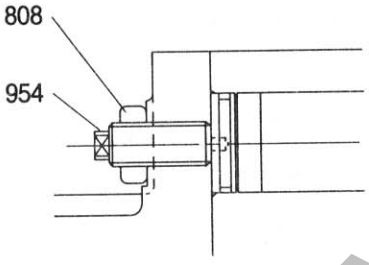
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(4) Adjustment of maximum and minimum flows

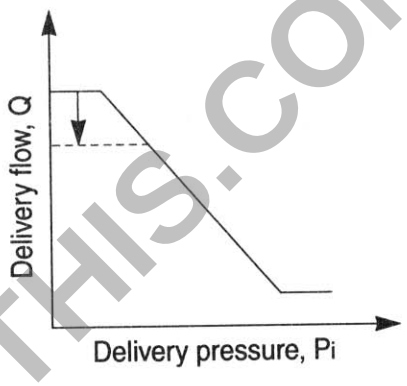
① Adjustment of maximum flow

Adjust it by loosening the hexagon nut(808) and by tightening(or loosening) the set screw(954).

The maximum flow only is adjusted without changing other control characteristics.



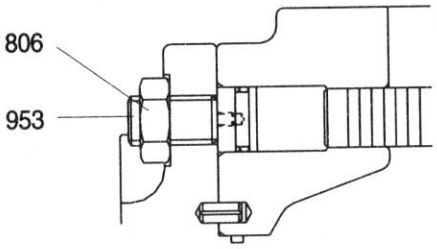
Speed	Adjustment of max flow	
	Tightening amount of adjusting screw (954)	Flow change amount
(min $^{-1}$)	(Turn)	(ℓ /min)
2100	+1/4	-6



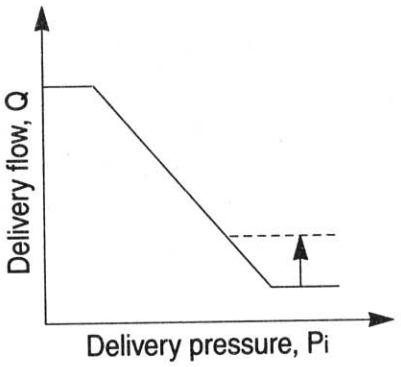
② Adjustment of minimum flow

Adjust it by loosening the hexagon nut(808) and by tightening(or loosening) the hexagonal socket head set screw (953). Similarly to the adjustment of the maximum flow, other characteristics are not changed.

However, remember that, if tightened too much, the required horsepower during the maximum delivery pressure(or during relieving) may increase.



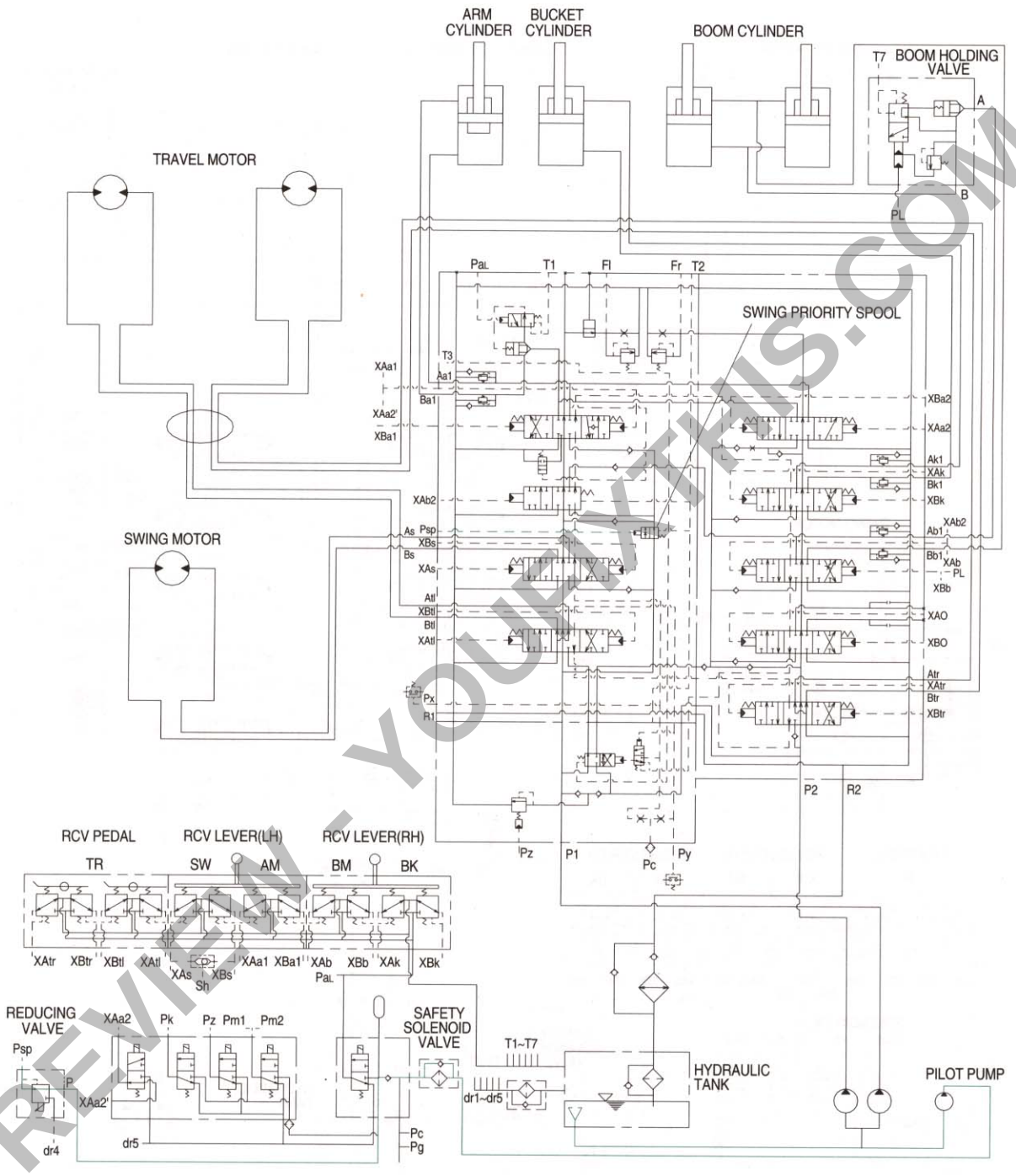
Speed	Adjustment of min flow	
	Tightening amount of adjusting screw (953)	Flow change amount
(min $^{-1}$)	(Turn)	(ℓ /min)
~~2100~~ 2000	+1/4	~~+4.8~~ 4.6



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8. SWING PRIORITY SYSTEM



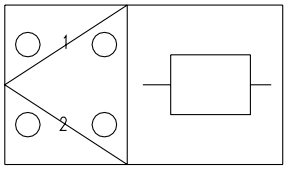
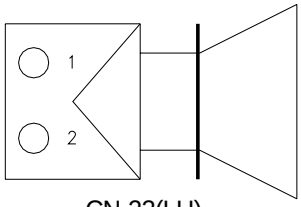
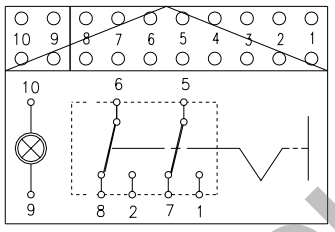
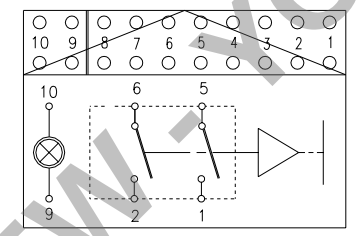
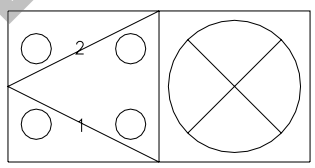
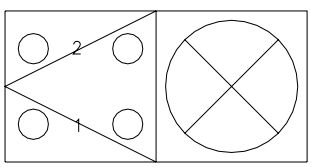
When carrying out the combined operation of swing and boom or arm of the left control valve, the swing speed can be lowered than operating speed of boom or arm. To prevent it, reducing valve is used.

The oil from pilot pump flows into the reducing valve through the line filter.

Psp pressure from reducing valve shifts the swing priority spool to the right and decreases the oil flow rate to the boom or arm section by orifice.

This is called the swing priority system.

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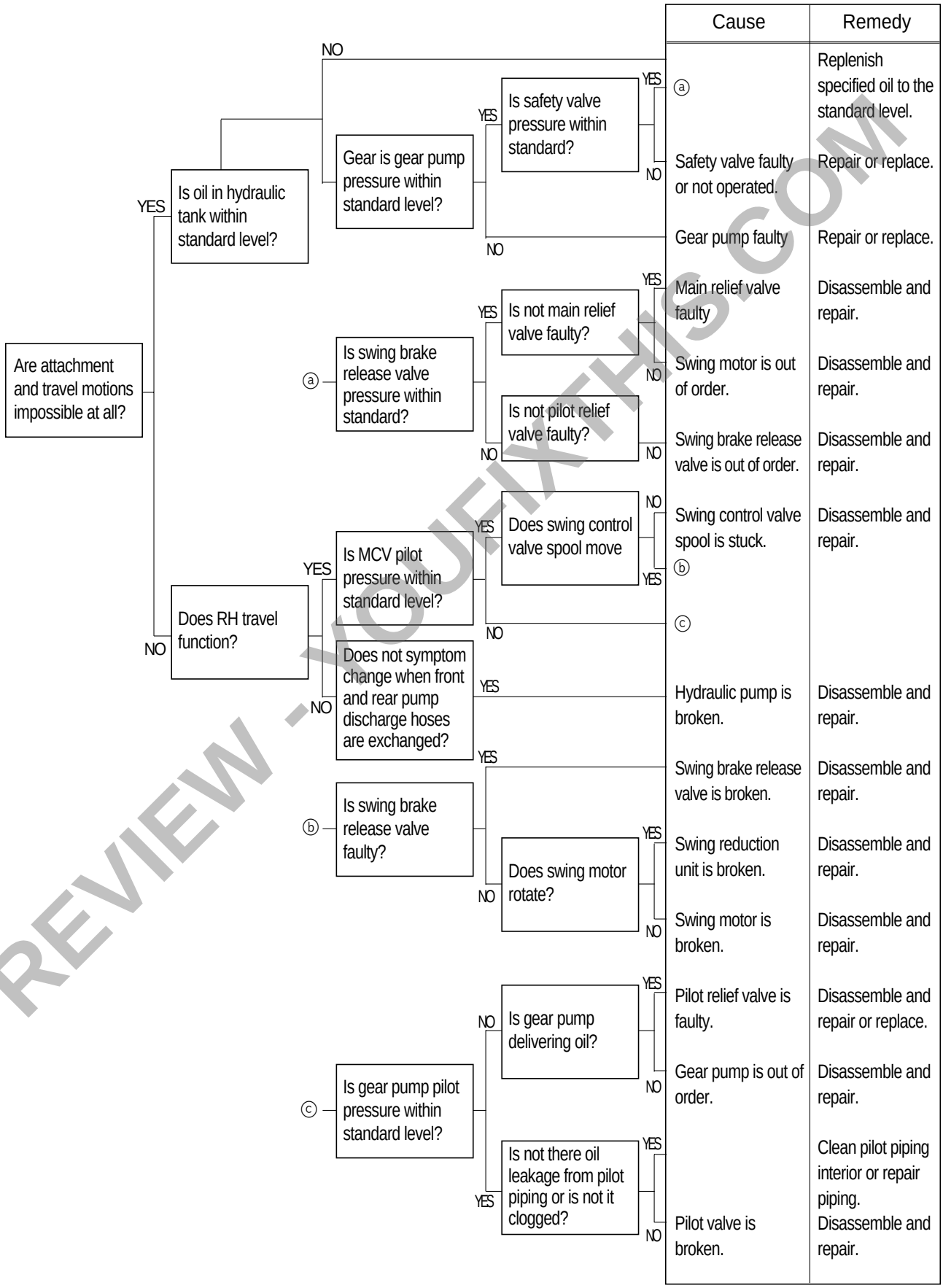
Part name	Symbol	Specifications	Check
Resistor	 CN-47	90Ω 20W ± 5%	※ Check resist Normal - 50Ω
Speaker	 CN-23(LH) CN-24(RH)	4Ω 20W	※ Check resist Normal - 50Ω
Switch (Looking type)		24V 8A	※ Check contact Normal ON - 0Ω (for terminal 1-5,2-6) - ∞Ω (for terminal 5-7,6-8) OFF - ∞Ω (for terminal 1-5,2-6) - 0Ω (for terminal 5-7,6-8)
Switch (Non-looking type)		24V 8A	※ Check contact Normal ON - 0Ω (for terminal 1-5,2-6) - ∞Ω (for terminal 5-7,6-8) OFF - ∞Ω (for terminal 1-5,2-6) - 0Ω (for terminal 5-7,6-8)
Head lamp	 CL-3, CL-4	24V 70W (H3 TYPE)	※ Check disconnection Normal : 1.2 Ω
Work lamp	 CL-5, CL-6	24V 70W (H3 TYPE)	※ Check disconnection Normal : 1.2Ω

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4. SWING SYSTEM

1) BOTH LH AND RH SWING ACTIONS ARE IMPOSSIBLE



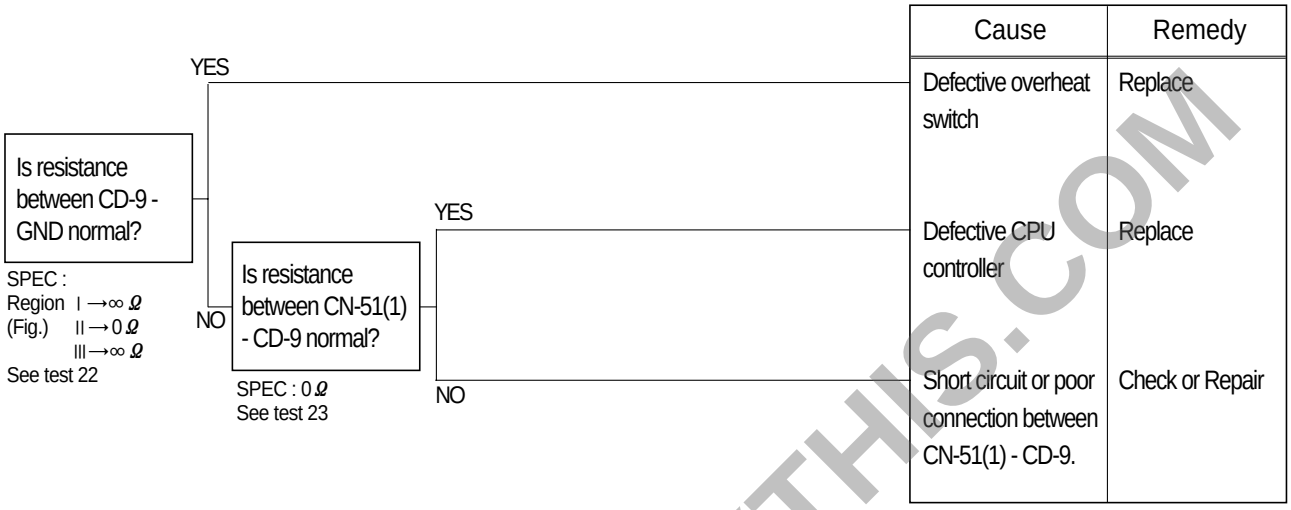
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10. MALFUNCTION OF OVERHEAT

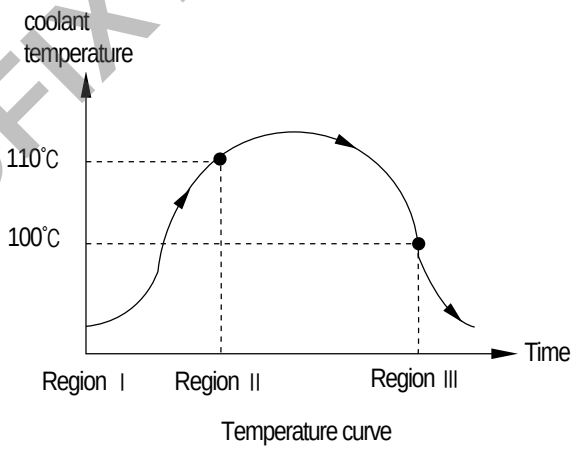
※ Before carrying out below procedure, check all the related connectors are properly inserted.

1) INSPECTION PROCEDURE



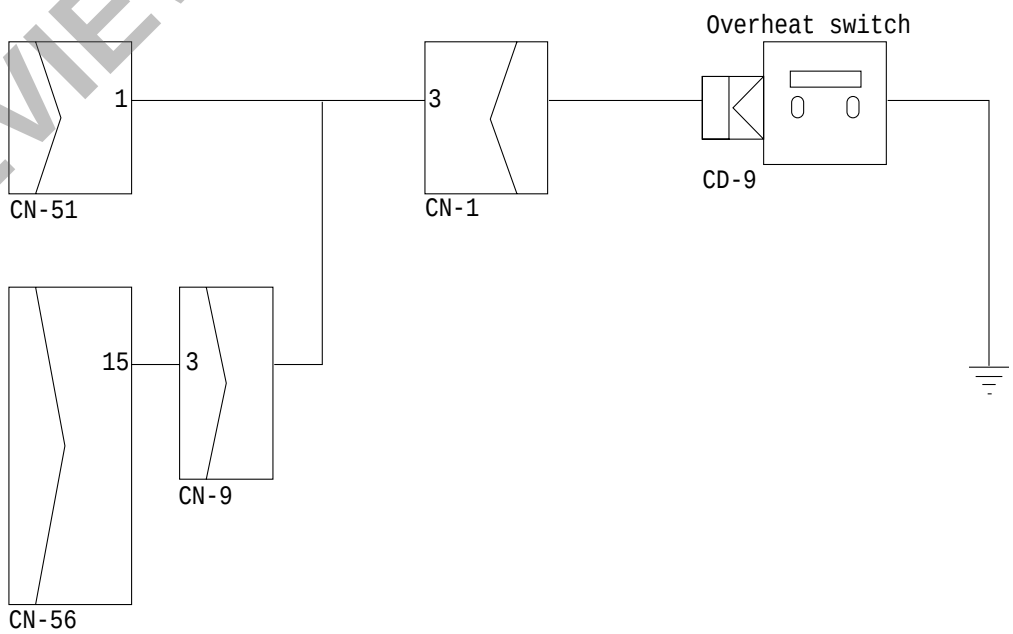
※ Overheat switch ON : coolant temperature 110℃

※ Overheat switch OFF : coolant temperature 100℃



Temperature curve

Wiring diagram



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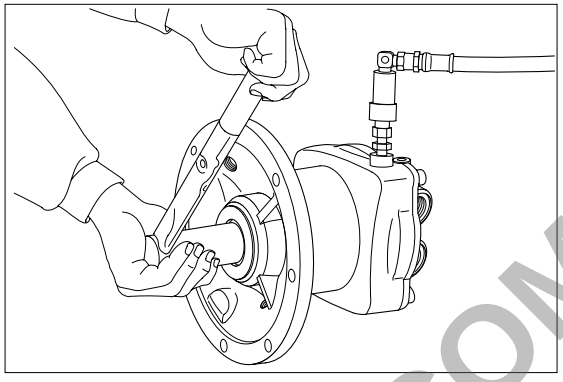
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(20) Check of assembly

Load pilot pressure of 30kgf/cm^2 to brake release port after opening inlet and outlet port.

Check if output shaft is rotated smoothly around torque of 2~3kgf · m.

If not rotated, disassemble and check.



This completes assembly.

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⑨ Using the clearance measurements, calculate the appropriate thrust bearing thickness as follows.

· Measure the clearance between the edge of the carrier(3) and that of ring gear A(4).
Take this clearance as **X**
X = **B** - **A**
A : Dimension required
B : Jig dimension

· Next, determine the thrust bearing of the appropriate thickness.
Take this thickness as **T**.
T = (**C** - **X**) - (0.3 to 0.6)

⑩ Using the results of steps(7) through(9) above,select the appropriate thickness from three types.
Then, proceed with the original reassembling operation.

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