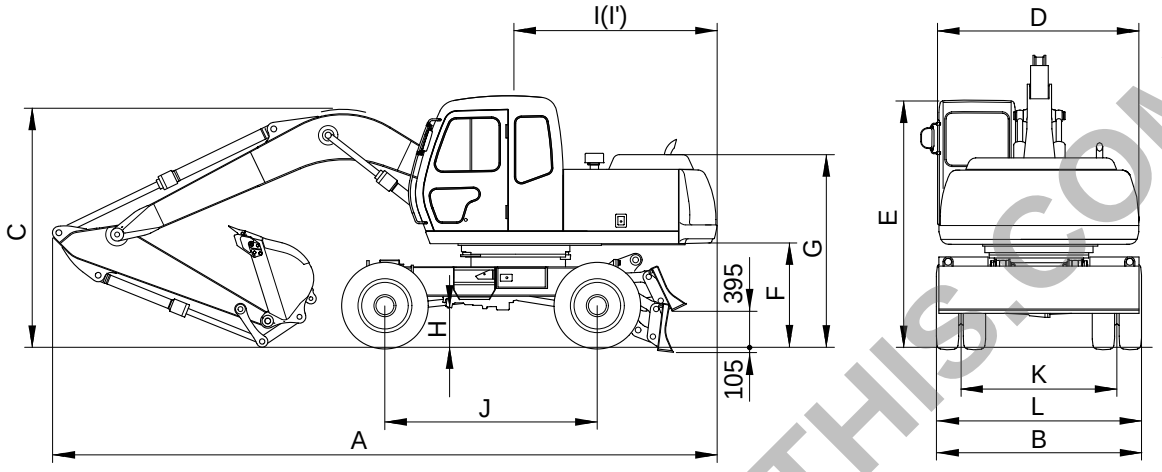
2. SPECIFICATIONS

1) 4.6m(15' 0") ONE PIECE BOOM, 2.1m(6' 11") ARM AND REAR DOZER BLADE

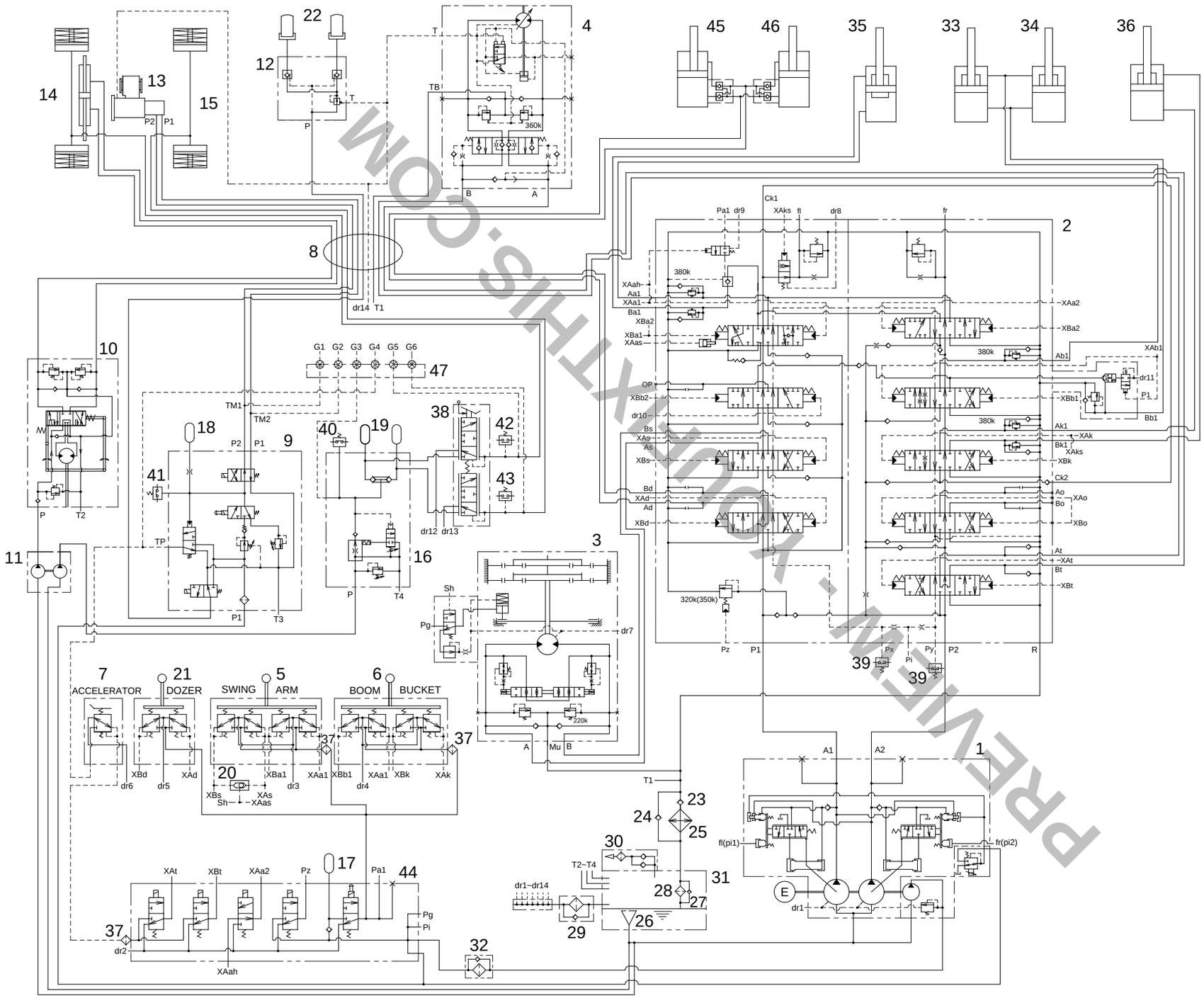


Description		Unit	Specification
Operating weight		kg(lb)	12500(27560)
Bucket capacity(PCSA heaped), standard		$m^3(yd^3)$	0.51(0.67)
Overall length	A	mm(ft-in)	7780(25' 6")
Overall width	B		2490(8' 2")
Overall height	C		3060(10' 0")
Superstructure width	D		2470(8' 1")
Cab height	E		3030(9' 11")
Ground clearance of counterweight	F		1220(4' 0")
Engine cover height	G		2330(7' 7")
Minimum ground clearance	H		365(1' 2")
Rear-end distance	I		2260(7' 5")
Rear-end swing radius	I'		2260(7' 5")
Wheel base	J		2600(8' 6")
Tread	K		1914(6' 3")
Dozer blade width	L		2490(8' 2")
Travel speed	Low	km/hr(mph)	7.8(4.9)
	High		30(18.7)
Swing speed		rpm	14.3
Gradeability		Degree(%)	30(58)

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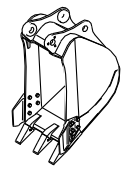
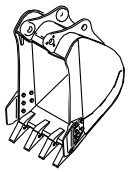
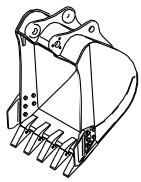
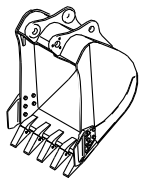
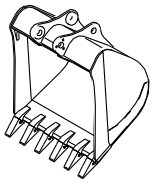
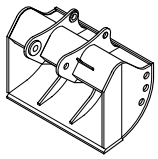
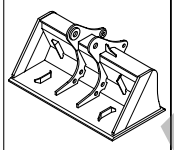
GROUP 1 HYDRAULIC CIRCUIT



1 Main pump
2 Main control valve
3 Swing motor
4 Travel motor
5 RCV lever(LH)
6 RCV lever(RH)
7 Accelerator pedal
8 Turning joint
9 Transmission valve
10 Steering valve
11 Gear pump
12 Locking valve
13 Transmission
14 Front axle
15 Rear axle
16 Brake supply valve
17 Accumulator
18 Accumulator
19 Accumulator
20 Shuttle valve
21 RCV lever-Dozer
22 Oscillating cylinder
23 Check valve
24 Check valve
25 Oil cooler
26 Strainer
27 Bypass valve
28 Return filter
29 Spin filter
30 Air breather
31 Hydraulic tank
32 Line filter
33 Boom cylinder(RH)
34 Boom cylinder(LH)
35 Arm cylinder
36 Bucket cylinder
37 Last guard filter
38 Brake valve
39 Pressure switch
40 Pressure switch
41 Pressure switch
42 Pressure switch
43 Pressure switch
44 Solenoid valve
45 Dozer cylinder(RH)
46 Dozer cylinder(LH)
47 Gauge block

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2) TWO PIECE BOOM

						
0.22m³ PCSA heaped bucket	0.4~0.46m³ PCSA heaped bucket	※0.51m³ PCSA heaped bucket	0.58~0.63m³ PCSA heaped bucket	0.70m³ PCSA heaped bucket	◈0.45m³ PCSA heaped bucket	▣0.55m³ PCSA heaped bucket

Capacity		Width		Weight	Recommendation(Two piece boom)		
					4.90m(16' 1") boom		
PCSA heaped	CECE heaped	Without side cutter	With side cutter		1.9m arm (6' 3")	2.1m arm (6' 11")	2.5m arm (8' 2")
0.22m³ (0.29yd³)	0.20m³ (0.26yd³)	520mm (20.5")	620mm (24.4")	310kg (680lb)			
0.40m³ (0.52yd³)	0.35m³ (0.46yd³)	760mm (29.9")	860mm (33.9")	385kg (850lb)			
0.46m³ (0.60yd³)	0.40m³ (0.52yd³)	850mm (33.5")	950mm (37.4")	405kg (890lb)			
※0.51m³ (0.67yd³)	0.45m³ (0.59yd³)	935mm (36.8")	1035mm (40.8")	440kg (970lb)			
0.58m³ (0.76yd³)	0.50m³ (0.65yd³)	1030mm (40.6")	1130mm (44.5")	455kg (1005lb)			
0.63m³ (0.82yd³)	0.55m³ (0.72yd³)	1110mm (43.7")	1210mm (47.6")	470kg (1040lb)			
0.70m³ (0.92yd³)	0.60m³ (0.78yd³)	1205mm (47.4")	—	485kg (1070lb)			
◈0.45m³ (0.59yd³)	0.40m³ (0.52yd³)	1520mm (59.8")	—	410kg (900lb)			
▣0.55m³ (0.72yd³)	0.45m³ (0.59yd³)	1800mm (70.9")	—	585kg (1290lb)			

※ : Standard bucket

◈ : Ditching bucket

▣ : Slope finishing bucket

Applicable for materials with density of 2000kg/m³ (3370lb/yd³) or less

Applicable for materials with density of 1600kg/m³ (2700lb/yd³) or less

Applicable for materials with density of 1100kg/m³ (1850lb/yd³) or less

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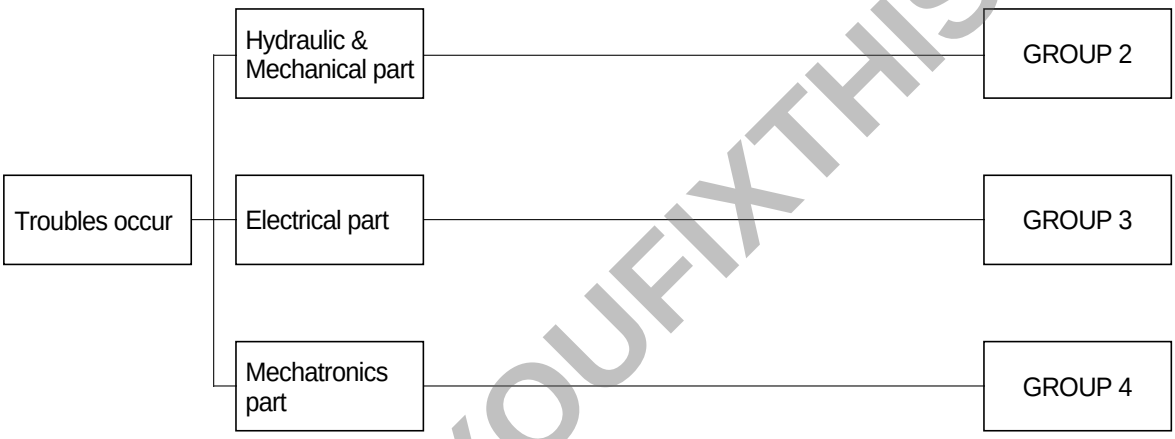
SECTION 6 TROUBLESHOOTING

GROUP 1 BEFORE TROUBLESHOOTING

1. INTRODUCTION

When a trouble is occurred in the machine, this section will help an operator to maintain the machine with easy.

The trouble of machine is parted Hydraulic & Mechanical system, Electrical system and Mechatronics system. At each system part, an operator can check the machine according to the troubleshooting process diagram.



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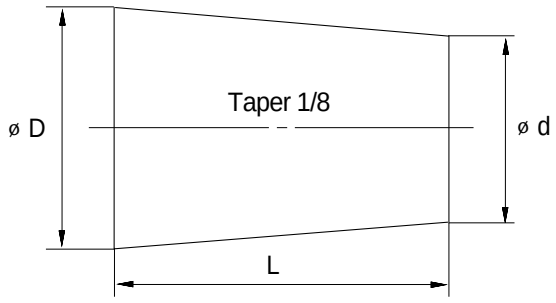
SECTION 8 DISASSEMBLY AND ASSEMBLY

GROUP 1 PRECAUTIONS

1. REMOVAL WORK

1) Lower the work equipment completely to the ground.
   If the coolant contains antifreeze, dispose of it correctly.
2) After disconnecting hoses or tubes, cover them or fit blind plugs to prevent dirt or dust from entering.
3) When draining oil, prepare a container of adequate size to catch the oil.
4) Confirm the match marks showing the installation position, and make match marks in the necessary places before removal to prevent any mistake when assembling.
5) To prevent any excessive force from being applied to the wiring, always hold the connectors when disconnecting the connectors.
6) Fit wires and hoses with tags to show their installation position to prevent any mistake when installing.
7) Check the number and thickness of the shims, and keep in a safe place.
8) When raising components, be sure to use lifting equipment of ample strength.
9) When using forcing screws to remove any components, tighten the forcing screws alternately.
10) Before removing any unit, clean the surrounding area and fit a cover to prevent any dust or dirt from entering after removal.
11) When removing hydraulic equipment, first release the remaining pressure inside the hydraulic tank and the hydraulic piping.
12) If the part is not under hydraulic pressure, the following corks can be used.

Nominal number	Dimensions		
	D	d	L
06	6	5	8
08	8	6.5	11
10	10	8.5	12
12	12	10	15
14	14	11.5	18
16	16	13.5	20
18	18	15	22
20	20	17	25
22	22	18.5	28
24	24	20	30
27	27	22.5	34



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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(Eng-bracket)	M12 × 1.75	10.0±0.5	72.3±3.6
2		Engine mounting bolt(Bracket-Frame)	M22 × 2.5	48.0±2.0	347±14.4
3		Radiator mounting bolt, nut	M12 × 1.75	9.3±1.9	67.3±13.7
4		Coupling mounting bolt	M16 × 2.0	22.1±2.4	159±17.3
5	Hydraulic system	Main pump mounting bolt	M10 × 1.5	4.80±0.3	34.7±2.2
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	333±36.9
8		Hydraulic oil tank mounting bolt	M20 × 2.5	46.0±5.1	333±36.9
9		Turning joint mounting bolt, nut	M16 × 2.0	29.6±1.3	214±23.1
10	Power train system	Swing motor mounting bolt	M16 × 2.0	29.6±3.2	214±23.1
11		Swing bearing upper mounting bolt	M18 × 2.5	41.3±4.5	299±32.5
12		Swing bearing lower mounting bolt	M16 × 1.5	31.3±3.2	226±23.1
13		Front axle mounting bolt, nut	M16 × 2.0	29.6±3.2	214±23.1
15		Rear axle mounting bolt, nut	M20 × 2.5	58.0±6.3	420±45.6
16		Transmission mounting bolt	M20 × 2.5	44.0±3.5	318±14.5
17		Oscillating cylinder mounting bolt	M22 × 1.5	83.2±9.2	602±66.5
18		Oscillating cylinder support bolt	M16 × 2.0	29.6±3.2	214±23
19		Wheel nut	M20 × 1.5	50.0±0.5	362±3.6
20		Front drive shaft mounting bolt, nut	M10 × 1.0	5.9±0.6	42.7±4.3
21		Rear drive shaft mounting bolt, nut	M10 × 1.0	5.9±0.6	42.7±4.3
22	Others	Counter weight mounting bolt	M27 × 3.0	140±15.0	1013±108
23		Cab mounting bolt, nut	M12 × 1.75	12.2±1.3	88.2±9.4
24		Operator's seat mounting bolt	M 8 × 1.25	1.17±0.1	8.5±0.7

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5. ERROR CODES TABLE

Display		Problems
Current error	Recorded error	
Err : 00	TIME Err : 00	No problem
Err : 01	TIME Err : 01	Short circuit in accel actuator 2 lines
Err : 02	TIME Err : 02	Potentiometer is shorted to Vcc(5V) or battery(+)
Err : 03	TIME Err : 03	Short circuit in pump EPPR valve 2 lines
Err : 04	TIME Err : 04	Short circuit in swing EPPR valve 2 lines
Err : 05	TIME Err : 05	Short circuit in travel solenoid 2 lines
Err : 06	TIME Err : 06	Short circuit in power max solenoid 2 lines
Err : 07	TIME Err : 07	Short circuit in max flow solenoid 2 lines
Err : 08	TIME Err : 08	Short circuit in cut off cancel solenoid 2 lines
Err : 09	TIME Err : 09	Short circuit in swing lock solenoid 2 lines
Err : 10	TIME Err : 10	Short circuit in hourmeter 2 lines
Err : 12	TIME Err : 12	P1 pressure sensor is shorted to battery(+)
Err : 13	TIME Err : 13	P2 pressure sensor is shorted to battery(+)
Err : 14	TIME Err : 14	P3 pressure sensor is shorted to battery(+)
Err : 16	TIME Err : 16	Accel actuator circuit is open or shorted to ground
Err : 17	TIME Err : 17	Potentiometer circuit is open or shorted to ground
Err : 18	TIME Err : 18	Pump EPPR valve circuit is open or shorted to ground
Err : 19	TIME Err : 19	Swing EPPR valve circuit is open or shorted to ground
Err : 20	TIME Err : 20	Travel solenoid circuit is open or shorted to ground
Err : 21	TIME Err : 21	Power max solenoid circuit is open or shorted to ground
Err : 22	TIME Err : 22	Max flow solenoid circuit is open or shorted to ground
Err : 23	TIME Err : 23	Cut off cancel solenoid circuit is open or shorted to ground
Err : 24	TIME Err : 24	Swing lock solenoid circuit is open or shorted to ground
Err : 25	TIME Err : 25	Hourmeter circuit is open or shorted to ground
Err : 26	TIME Err : 26	Swing speed dial circuit is open or shorted to ground
Err : 27	TIME Err : 27	P1 pressure sensor circuit is open or shorted to ground
Err : 28	TIME Err : 28	P2 pressure sensor circuit is open or shorted to ground
Err : 29	TIME Err : 29	P3 pressure sensor circuit is open or shorted to ground
Err : 32	TIME Err : 32	Battery power input circuit is open
Err : 33	TIME Err : 33	No alternator voltage input
Err : 34	TIME Err : 34	Controller input voltage is less than 18V
Err : 35	TIME Err : 35	Controller input voltage is greater than 38V
-	TIME Err : 36	Error in data receiving from cluster
Err : 37	TIME Err : 37	Engine speed sensor circuit is open or shorted to ground or sensor signal is less than 1V
Err : 38	TIME Err : 38	Anti-restart relay circuit is open or shorted to ground
Err : 39	TIME Err : 39	Accel actuator does not stop at a target position
Err : 40	TIME Err : 40	There is more than 500rpm difference between target speed and actual speed
Err : 41	TIME Err : 41	Hydraulic oil temperature sensor circuit is shorted to ground
Err : 42	TIME Err : 42	Fuel level sensor circuit is shorted to ground
Err : 43	TIME Err : 43	Coolant temperature sensor circuit is shorted to ground
Err : 45	TIME Err : 45	Hydraulic oil temperature sensor circuit is open or shorted to battery(+)
Err : 46	TIME Err : 46	Fuel level sensor circuit is open or shorted to battery(+)
Err : 47	TIME Err : 47	Coolant temperature sensor circuit is open or shorted to battery(+)

※ Every machine may not have all of the above error codes. For example, machines not equipped pressure sensors will not have the error codes 12, 13, 14, 27, 28, 29.

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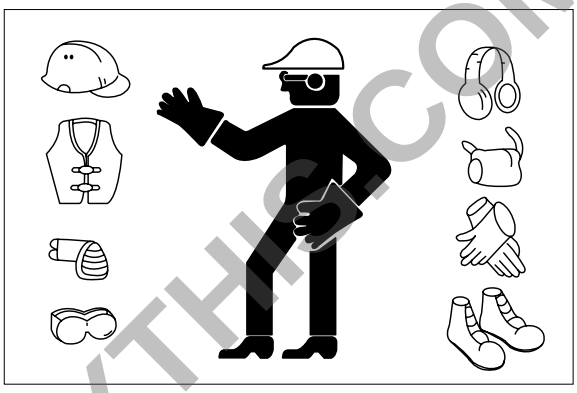
GROUP 1 SAFETY

FOLLOW SAFE PROCEDURE

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

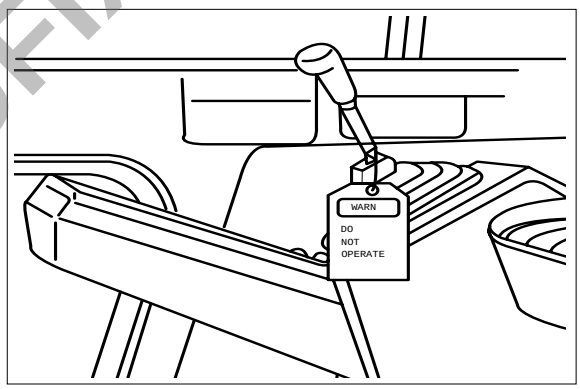
WEAR PROTECTIVE CLOTHING

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



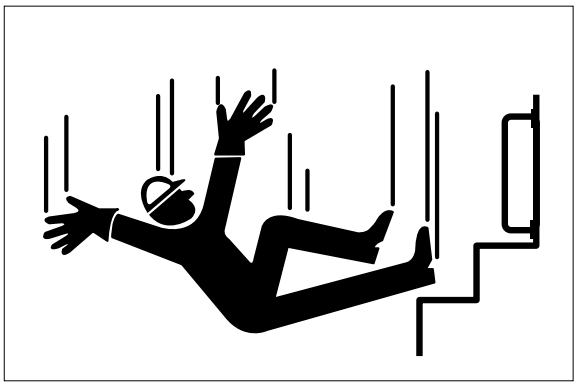
WARN OTHERS OF SERVICE WORK

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

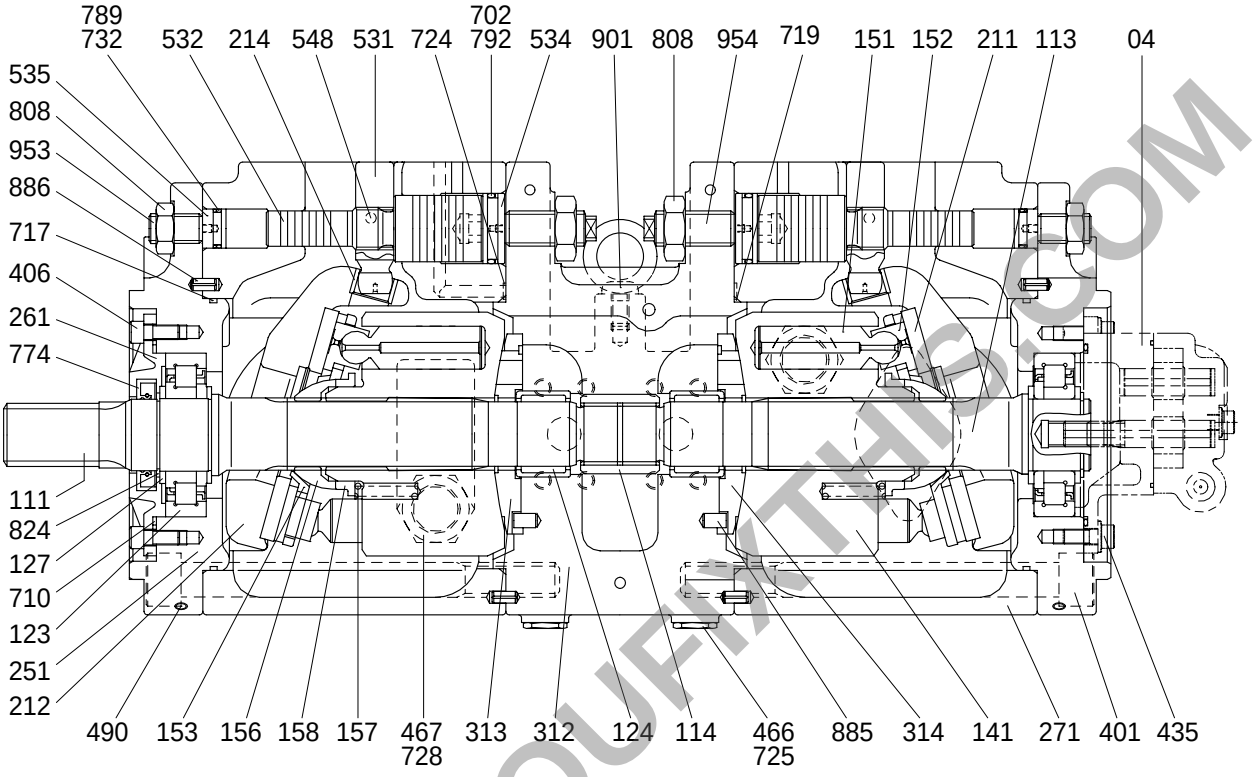
	0	1	2	3	4	5	6	7	8	9
0		2.20	4.41	6.61	8.82	11.02	13.23	15.43	17.64	19.84
10	22.05	24.25	26.46	28.66	30.86	33.07	35.27	37.48	39.68	41.89
20	44.09	46.30	48.50	50.71	51.91	55.12	57.32	59.5.	61.73	63.93
30	66.14	68.34	70.55	72.75	74.96	77.16	79.37	81.57	83.78	85.98
40	88.18	90.39	92.59	94.80	97.00	99.21	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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1) MAIN PUMP

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	467	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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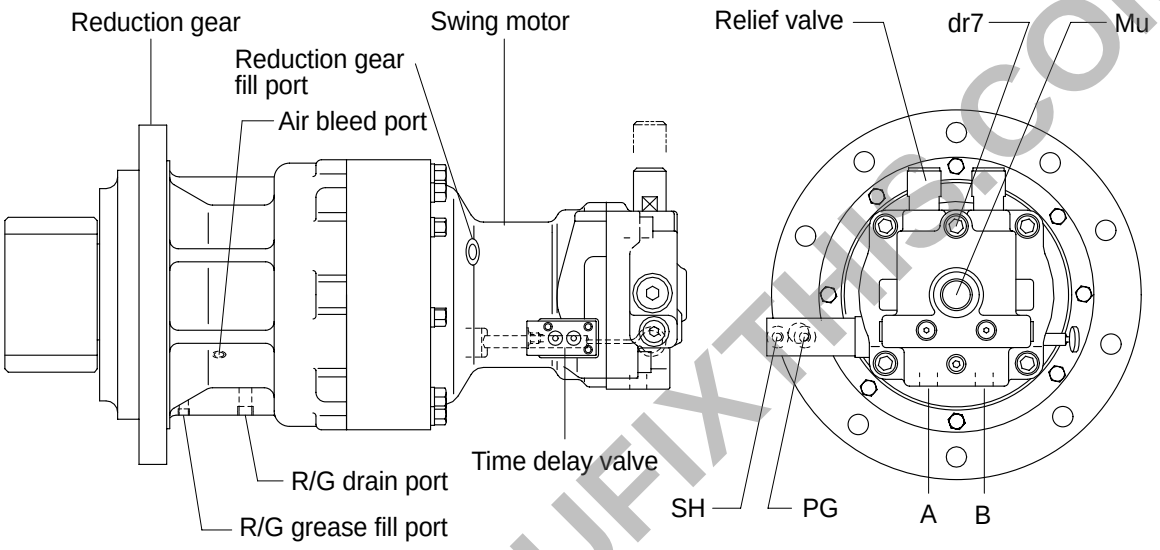
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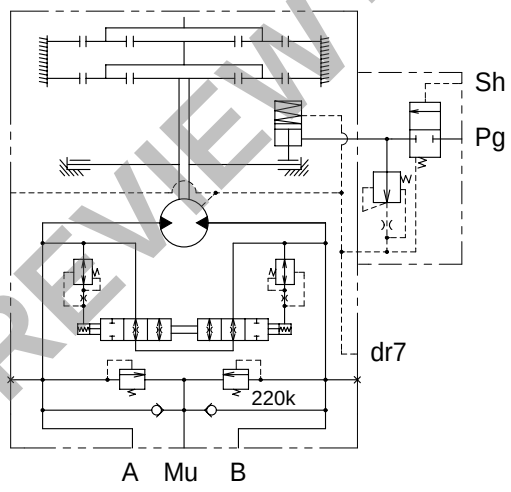
GROUP 3 SWING DEVICE

1. STRUCTURE

Swing device consists swing motor, swing reduction gear.

Swing motor include mechanical parking valve, relief valve, make up valve and time delay valve.





Hydraulic circuit

Port	Port name	Port size
A	Main port	PF 3/4
B	Main port	PF 3/4
dr7	Drain port	PF 3/8
Mu	Make up port	PF 3/4
Sh	Brake release port	PF 1/4
Pg	Stand by port	PF 1/4

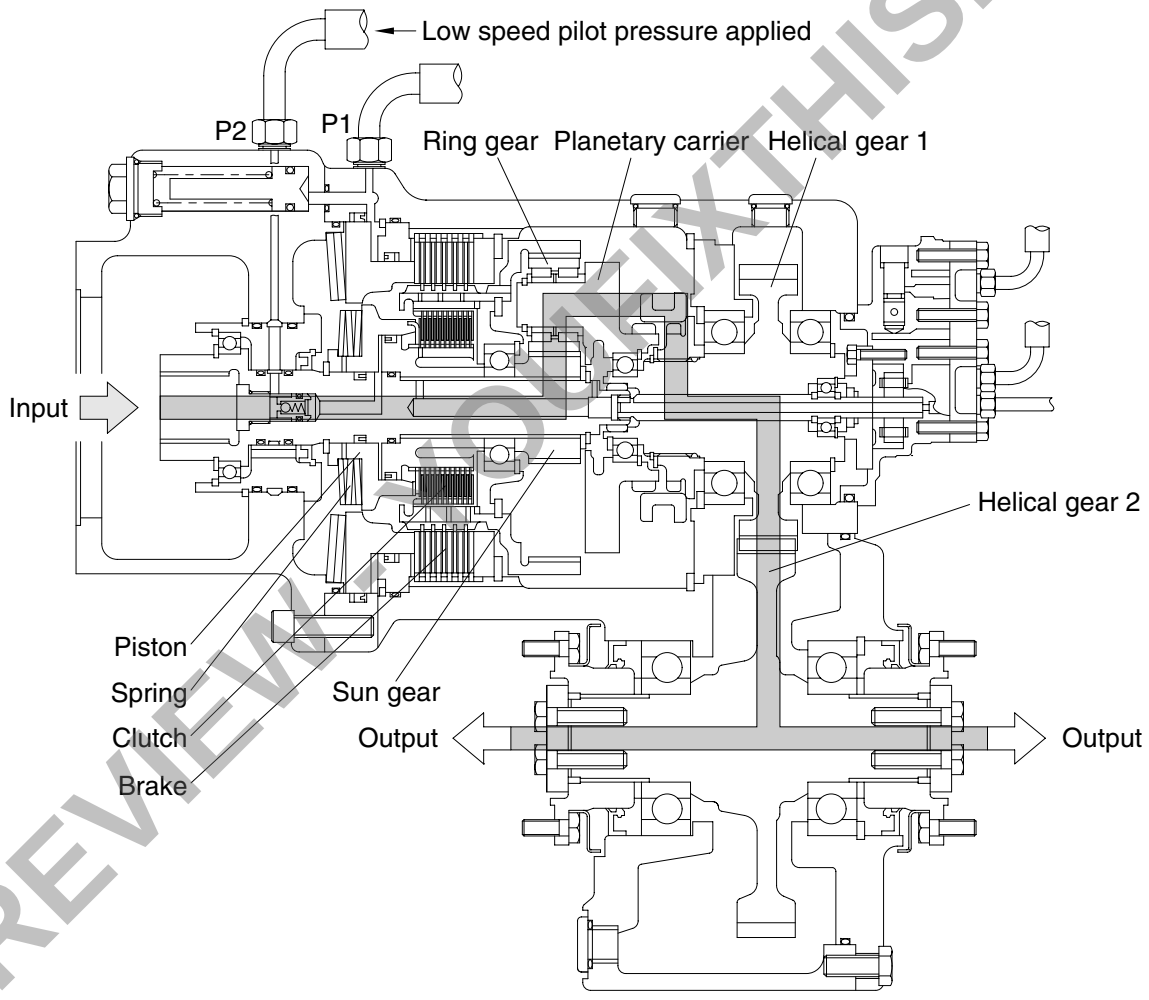
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The disconnect device should only be used in emergency in order to remove the machine from a danger zone should power fail or should transmission control pressure not be available.

The shift interlock(7) prevents downshifts at high machine speeds and thus prevents over-rotation of the travel motor. If the low speed gear is selected while the high speed gear is engaged and input speed is above approx. 800rpm, the low speed gear shift is inhibited and only performed if input speed is below this limit. With higher viscosity oil(Cold starting), the downshift is performed at a lower input speed. Upshifts are always possible.The speed-dependent interlock is effective in both directions. It does not prevent the possibility of over-rotation when the machine is coasting. For this, a drive brake valve should be fitted to the travel motor.

2) LOW SPEED(Forward & reverse)

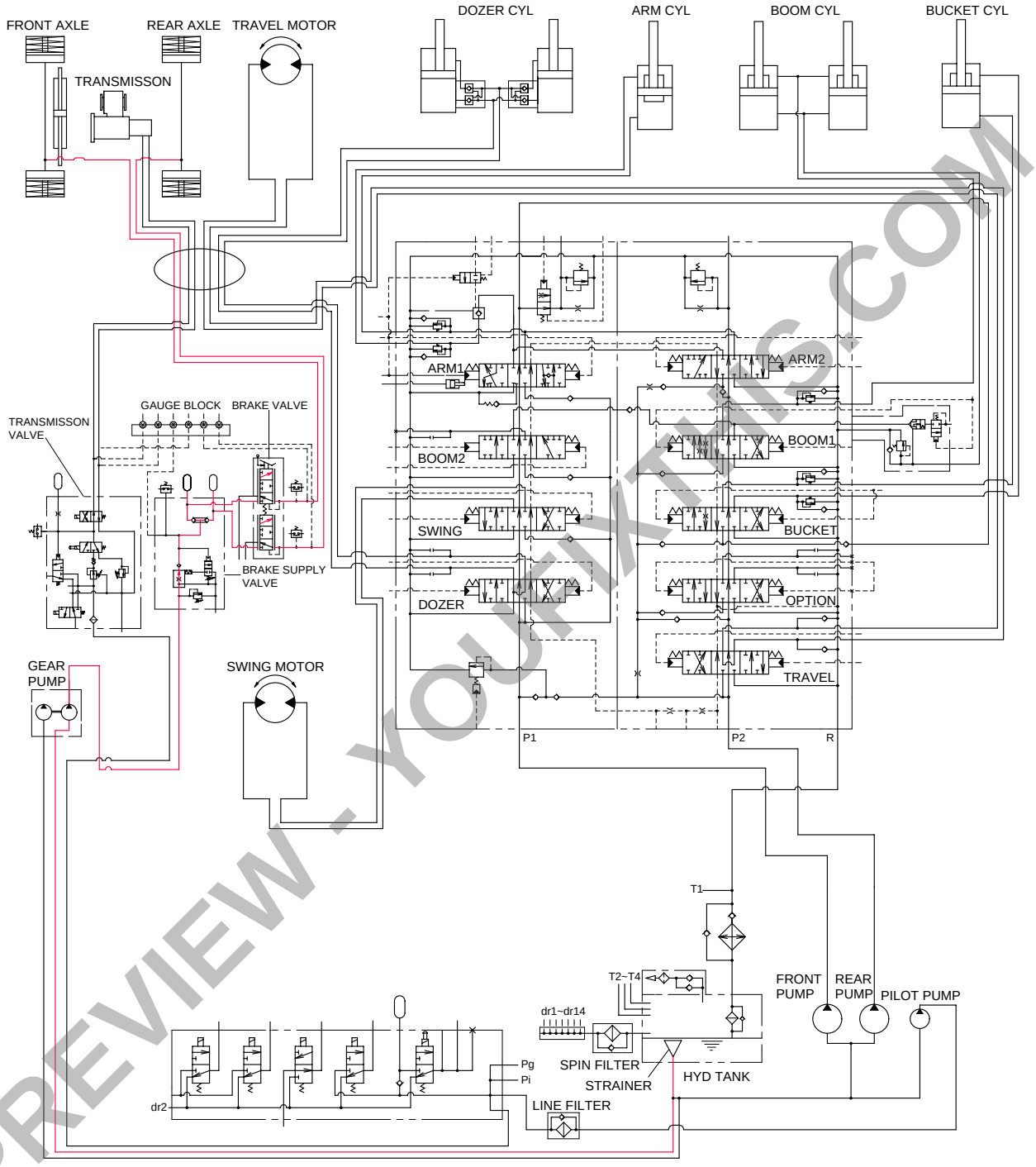


17032TM04

In low speed operation, the planet drive ring gear is supported on the closed brake fixed to the housing. In this gear, there is no pressure in the brake piston space so spring force acts on the multi-disc pack. Therefore, the clutch is opened.

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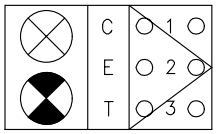
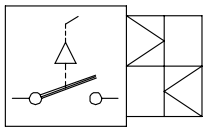
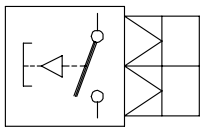
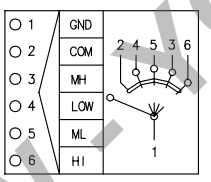
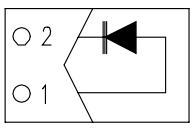
11. FRONT AND REAR AXLE BRAKE SYSTEM(SERVICE BRAKE)



When the brake pedal(Valve) is pushed, the discharged oil from the gear pump flows into the front and rear axle brake disc through the solenoid valve of brake supply valve.
This pressure is applied to axle brake disc, thus the brake is applied.

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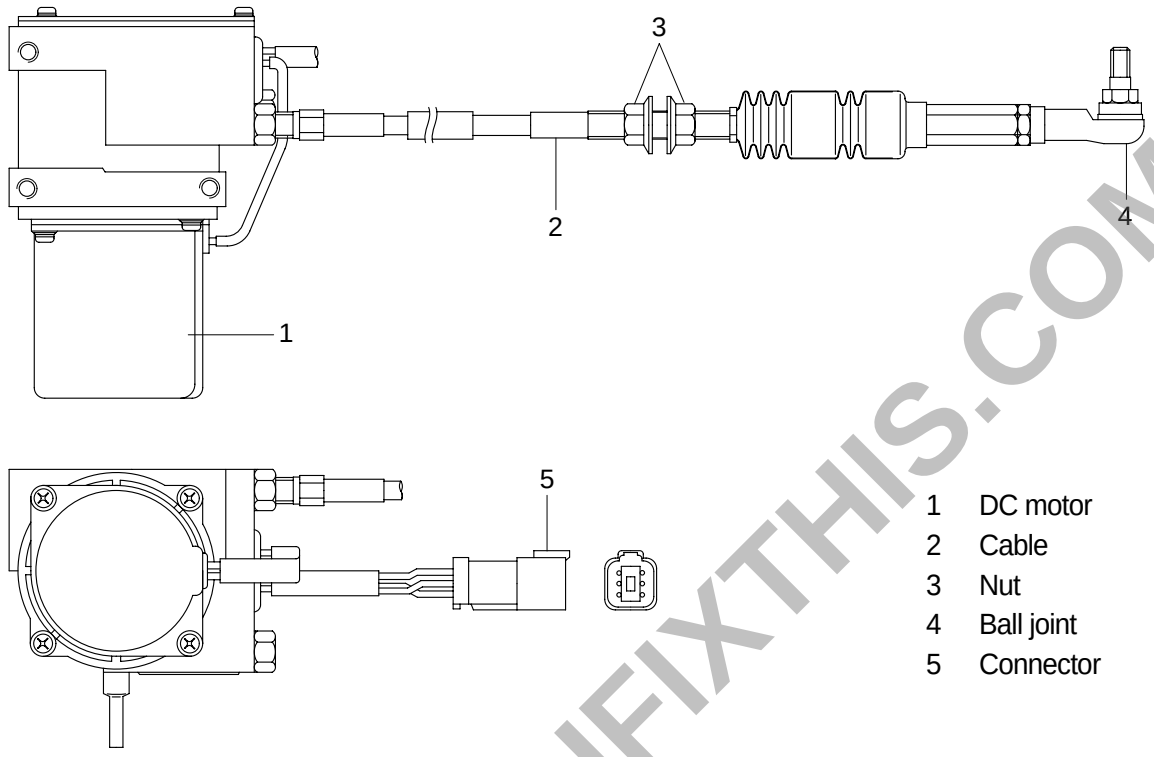
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Part name	Symbol	Specifications	Check
Front combi lamp	 CL-24 CL-25	24V 21W 24V 10W	※ Check resistance Normal : 2.1 Ω (For terminal 2-3) 4.8 Ω (For terminal 1-2)
Pedal switch	 CS-26	24V 15A	※ Check resistance Normal ON : 0 Ω (For terminal)
Power max switch	 CS-29	24V 6A	※ Check contact Normal : 15M Ω
Blower switch	 CS-17	-	※ Check resistance Low : 0 Ω (For terminal 1-4) ML : 0 Ω (For terminal 1-5) MH : 0 Ω (For terminal 1-3) MI : 0 Ω (For terminal 1-6) COM : 0 Ω (For terminal 1-2)
Diode	 CN-140	600V, 3A	-

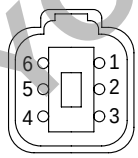
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3) ACCEL ACTUATOR



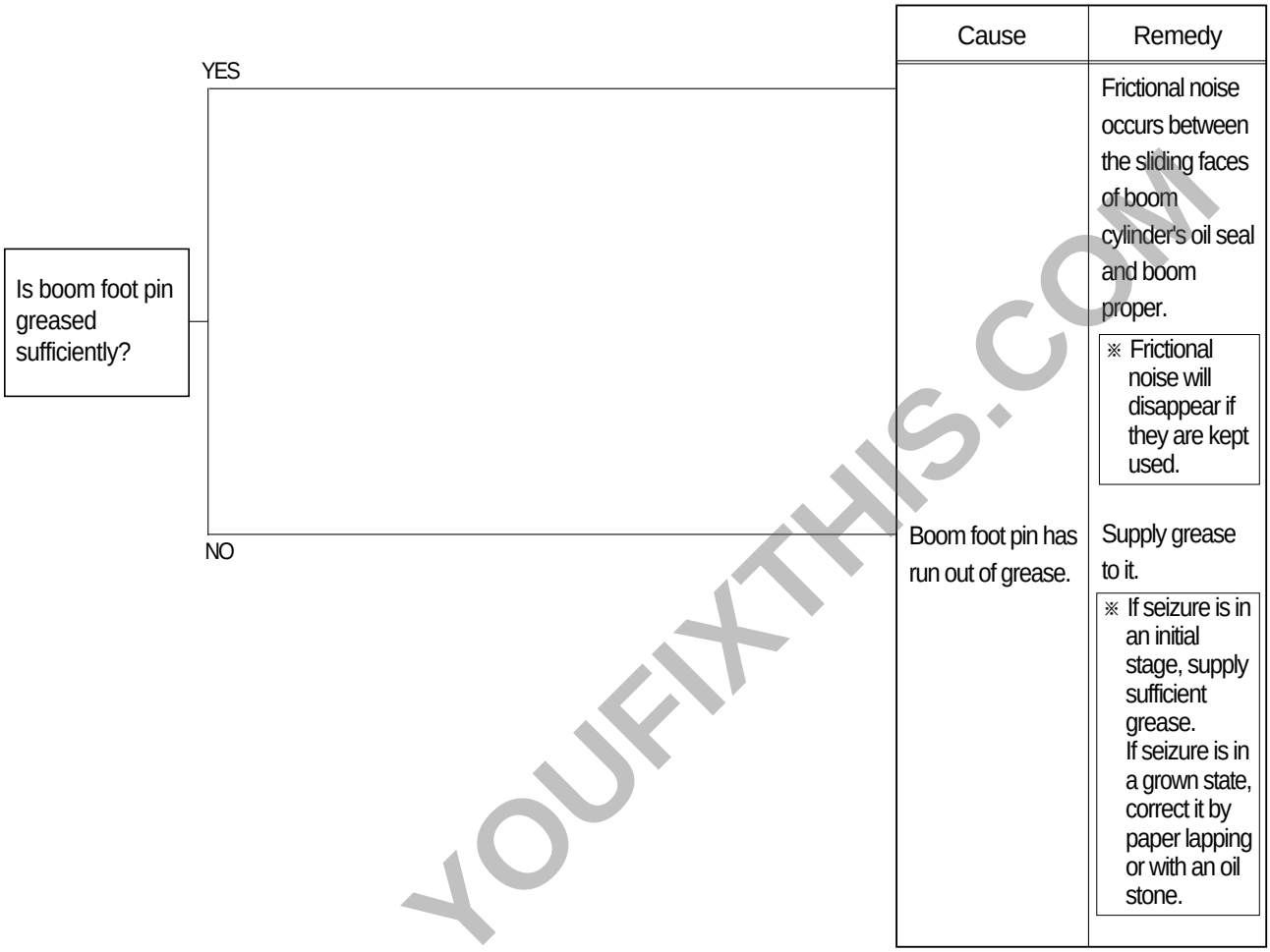
1 DC motor
2 Cable
3 Nut
4 Ball joint
5 Connector

Connector		
Type		6P, female
Line color & description	1	White(Potentiometer 5V)
	2	Blue(Potentiometer SIG)
	3	Black(Potentiometer GND)
	4	-
	5	Green(Motor+)
	6	Yellow(Motor -)
Inspection		Check resistance Spec : 1~2 Ω(Between No.5-6) 0.8~1.2kΩ (Between No.1-3)

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5) BOOM MAKES A SQUEAKING NOISE WHEN BOOM IS OPERATED



Cause	Remedy
	Frictional noise occurs between the sliding faces of boom cylinder's oil seal and boom proper. ※ Frictional noise will disappear if they are kept used.
Boom foot pin has run out of grease.	Supply grease to it. ※ If seizure is in an initial stage, supply sufficient grease. If seizure is in a grown state, correct it by paper lapping or with an oil stone.

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2) ENGINE SPEED

(1) Measure the engine speed at each power mode.

※ The engine speed at each power mode must meet standard RPM ; If not, all other operational performance data will be unreliable. It is essential to perform this test first.

(2) Preparation

① Warm up the machine, until the engine coolant temperature reaches 50°C or more, and the hydraulic oil is 50±5°C.

② Push the H-mode switch and confirm that the fuel injection pump governor lever comes into contact with the high-idle stopper.

③ To measure engine RPM.

(3) Measurement

① Start the engine. The engine will run at start idle speed. Measure engine speed with a tachometer.

② Measure and record the engine speed at each mode(H.S.L.F).

③ Select the H-mode.

④ Lightly operate the bucket control lever a few times, then return the control lever to neutral; The engine will automatically enter the auto-idle speed after 4 seconds.

⑤ Measure and record the auto deceleration speed.

(4) Evaluation

The measured speeds should meet the following specifications.

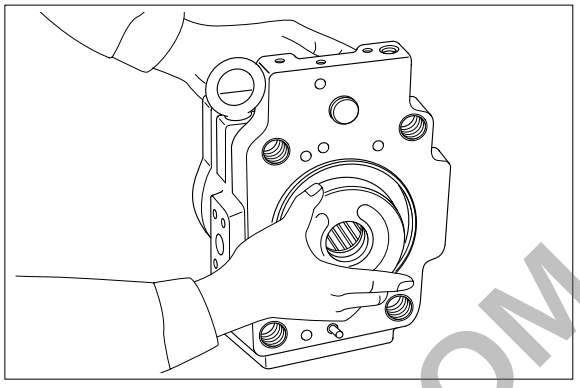
Unit : rpm

Model	Engine speed	Standard	Remarks
R130W-3	Start idle	950±100	
	H mode	2450±50	
	S mode	2250±50	
	L mode	2250±50	
	F mode	1750±50	
	Auto decel	1200±100	

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(7) Fit valve plate(313) to valve block(312), entering pin into pin hole.

※ Take care not to mistake suction / delivery directions of valve plate.

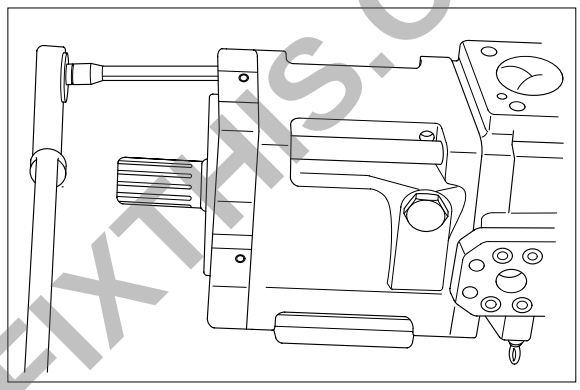


(8) Fit valve block(312) to pump casing(271) and tighten hexagon socket head bolts (401).

※ At first assemble this at rear pump side, and this work will be easy.

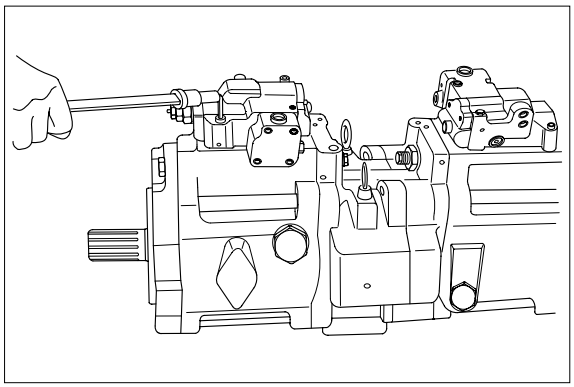
※ Take care not to mistake direction of valve block.

※ Clockwise rotation(Viewed from input shaft side) - Fit block with regulator up and with delivery flange left, viewed from front side.



(9) Putting feedback pin of tilting pin into feedback lever of regulator, fit regulator and tighten hexagon socket head bolts (412, 413).

※ Take care not to mistake regulator of front pump for that of rear pump.



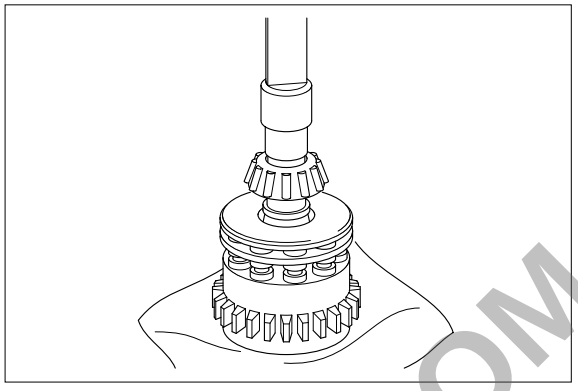
(10) Fit drain port plug(467).

This is the end of reassembling procedures.

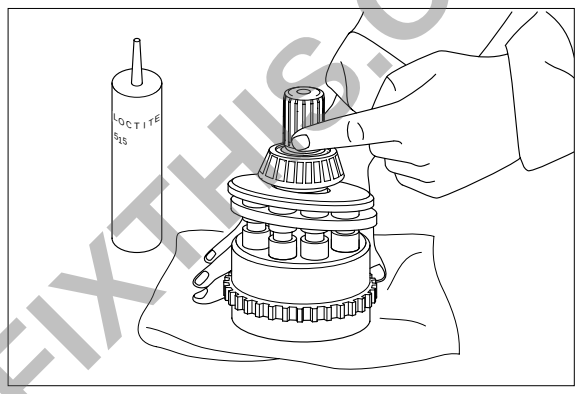
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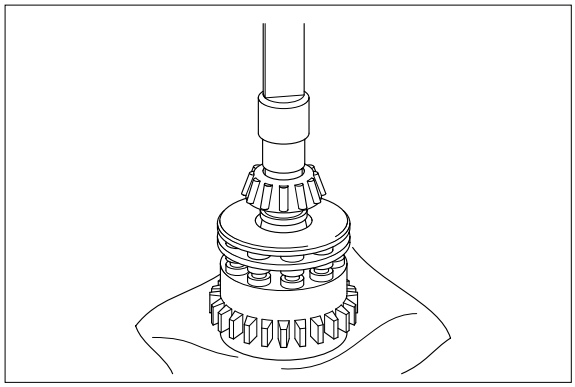
⑤ Assemble inner race of taper roller bearing(3) to cylinder(24).



⑥ Apply loctite to bearing mounting area of inner race of cylinder(24) lightly.



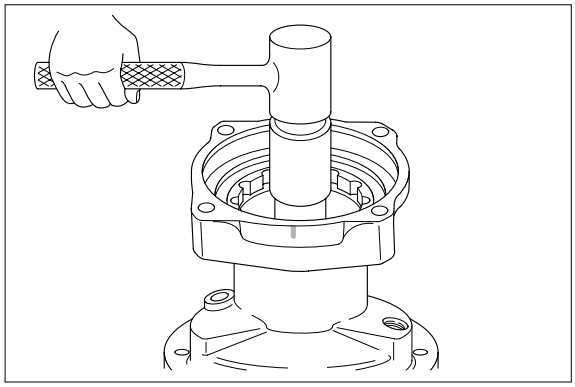
⑦ Assemble inner race(1) to cylinder(24).



(3) Assembly of oil seal

Apply three bond of white color on outer surface of oil seal(2) and assemble and insert it.

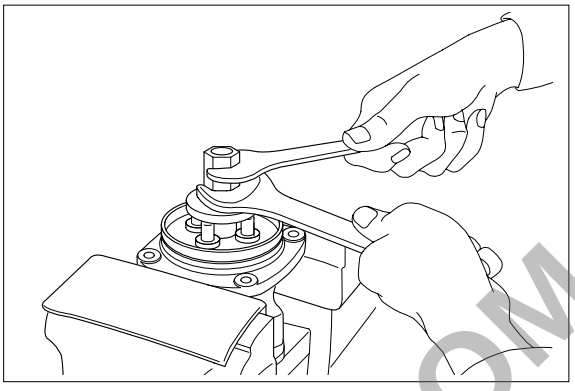
※ Before assembling, lubricate lip of oil seal with grease.

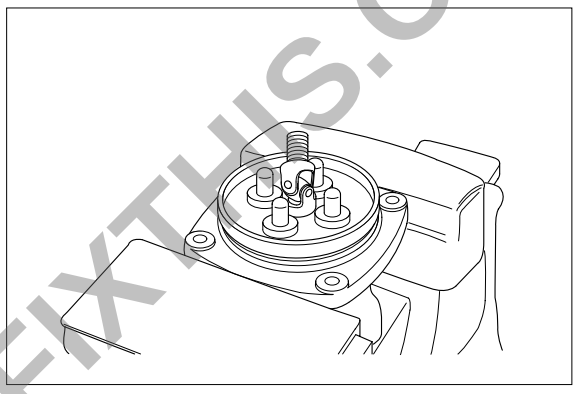


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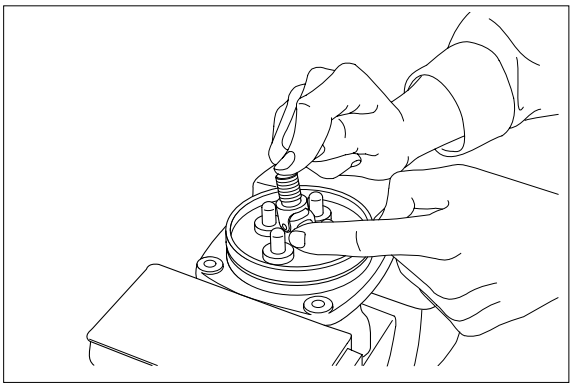
(5) Loosen adjusting nut(20) and plate(19) with spanners on them respectively, and remove them.

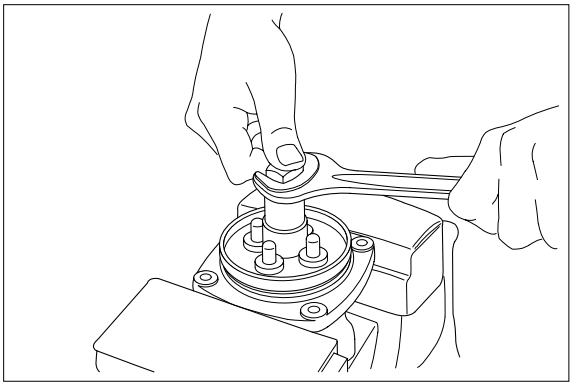




(6) Turn joint anticlockwise to loosen it, utilizing jig(Special tool).

※ When return spring(10) is strong in force, plate(16), plug(11) and push rod(14, 15) will come up on loosening joint.
Pay attention to this.



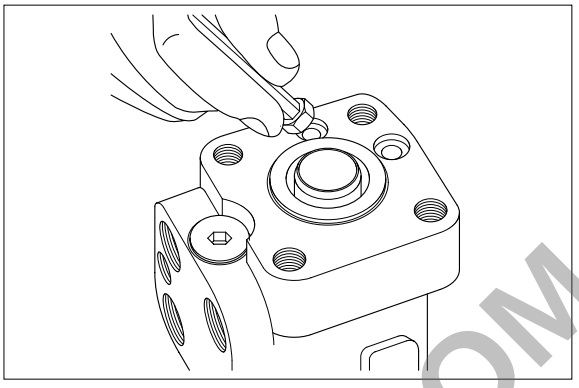


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(42) Screw plug with seal ring into the two shock valves using a 6㎜ hexagon socket spanner.

- Tightening torque : 3.1kgf · m
  (22.4lbf · ft)

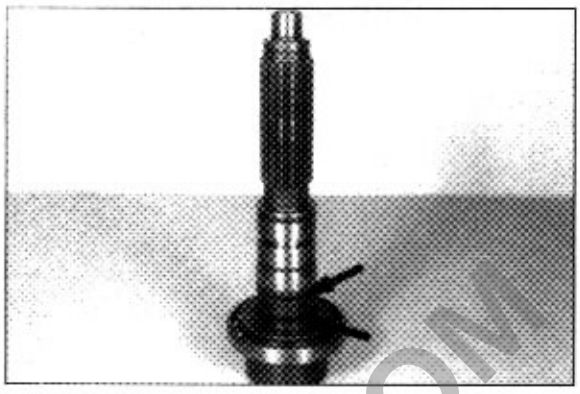


Steering valve is now assembled.

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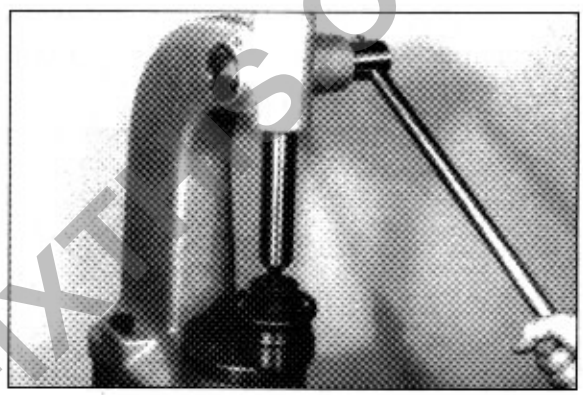
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(2) Squeeze in the two rectangular rings (Arrows) and engage them.



(3) Install shaft seal.

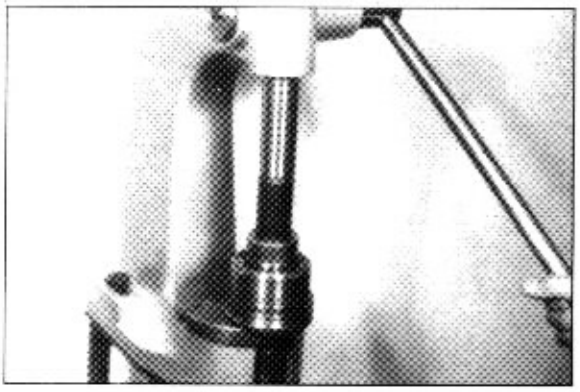
※ By application of the prescribed driver, the exact installation depth is given. Wet outer diameter of shaft seal with spirit. Grease the sealing lip.



(4) Fix shaft seal by means of snap ring.



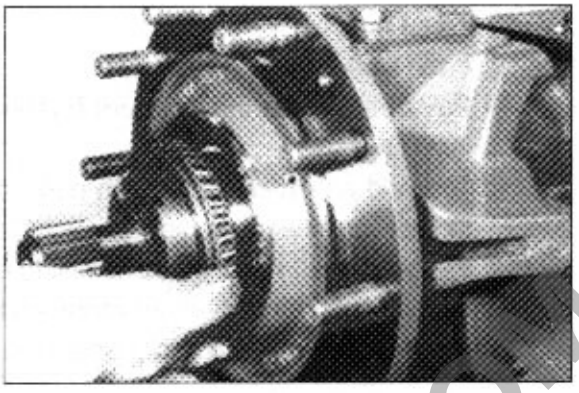
(5) Grease the two rectangular rings, align them centrically and press the drive shaft into the guide sleeve until contact is obtained.



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⑤ Fix the hub by means of the heated bearing inner race.



(8) Internal gear

One-piece internal gear, piston reset / socket head screws

※ For the following reassembly, the use of the assembly help special tool is recommended.

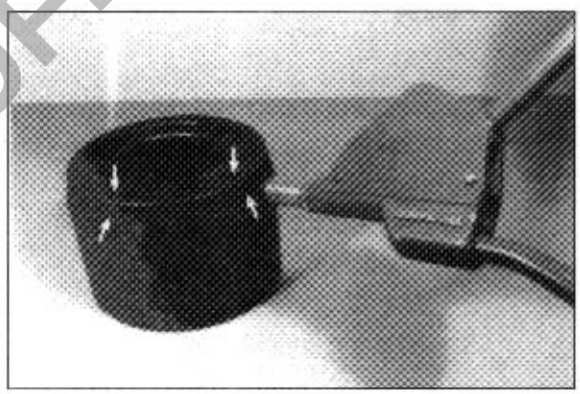
※ Special tool

Assembly ring 5870 347 013

① Close bores(See Arrows) by means of screw plugs.

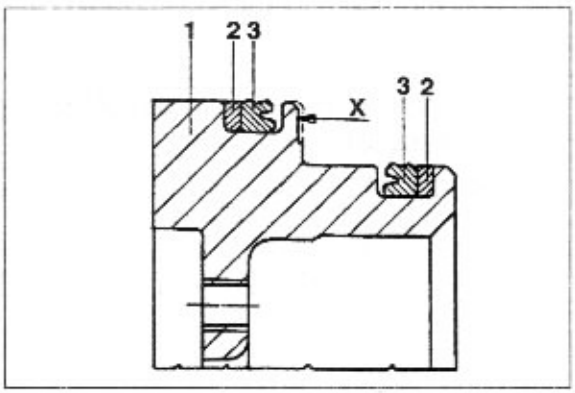
※ Special tool

Lever riveting tongs 5870 320 016



② Heat the two back-up rings in an oil bath and insert them in the piston recesses. Install grooved rings.

※ Pay attention to the installation position, see draft on the right.



· Reference Draft

1 Piston
2 Back-up rings
3 Grooved rings
X Pressure chamber

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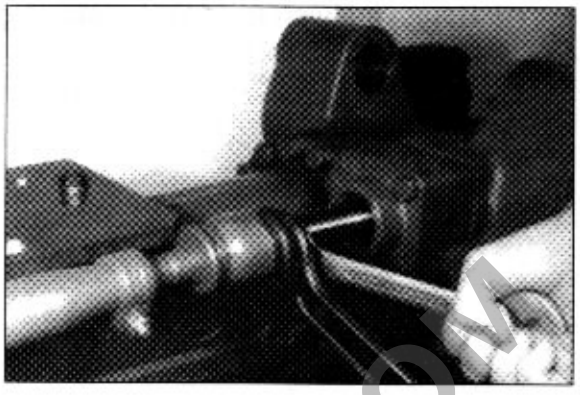
Version-tie rod "without" stop ring for the steering lock

⑧ Heat bolting piston rod / axial joint.
Loosen bolting and remove complete tie rod.

※ Disassemble second tie rod accordingly.

※ Special tool

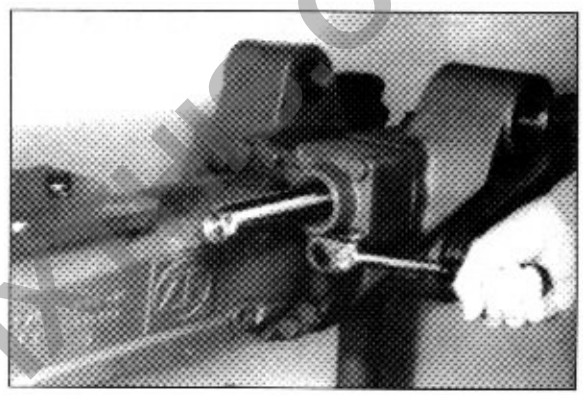
Hot-air blower(220V)	5870 221 500
Hot-air blower(110V)	5870 221 501



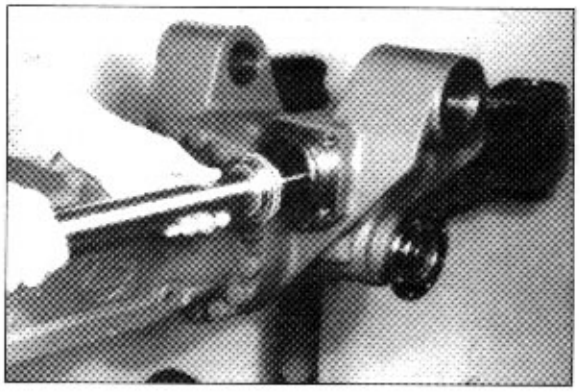
(2) Remove piston and cylinder

① Loosen hex head screws and pull off guide Ⅱ.
If necessary, remove sealing elements.

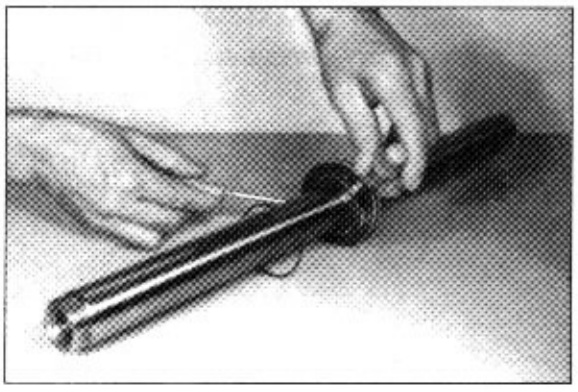
※ Pay attention to the released shim.



② Pull piston rod out of the cylinder.



③ Remove snap ring, circlip and split ring.



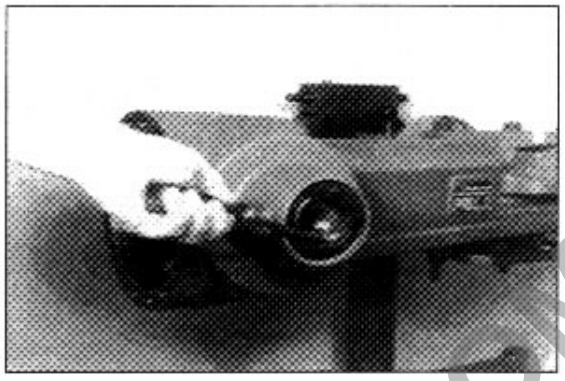
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(13) Pry shaft seal out of the axle casing and remove the released roller bearing.

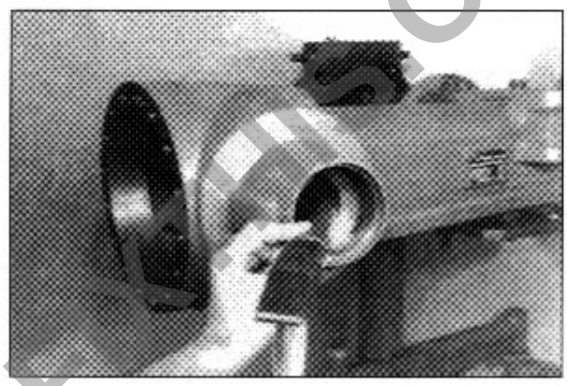
※ Special tool

Pry bar	5870 345 065



(14) Drive the bearing outer race out of the inner bearing bore.

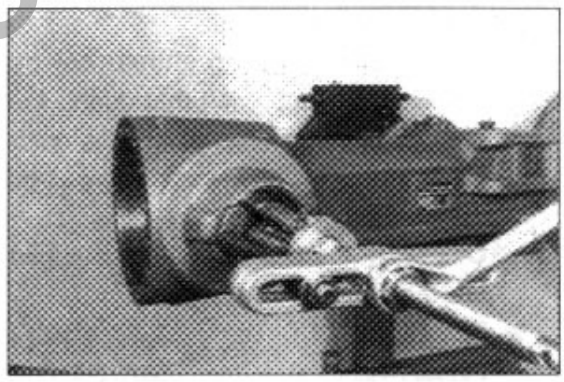
※ Pay attention to the released spacing washer.



(15) Pull the bearing outer race out of the outer bearing bore.

※ Special tool

Internal puller	5870 300 019
Counter support	5870 300 020



2) REASSEMBLY

(1) Determine shim thickness, to obtain a faultless contact pattern

※ If crown wheel or drive pinion are damaged, both parts must be renewed together.

At the new installation of a complete bevel gear set, pay attention to the same mating number of drive pinion and crown wheel.

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