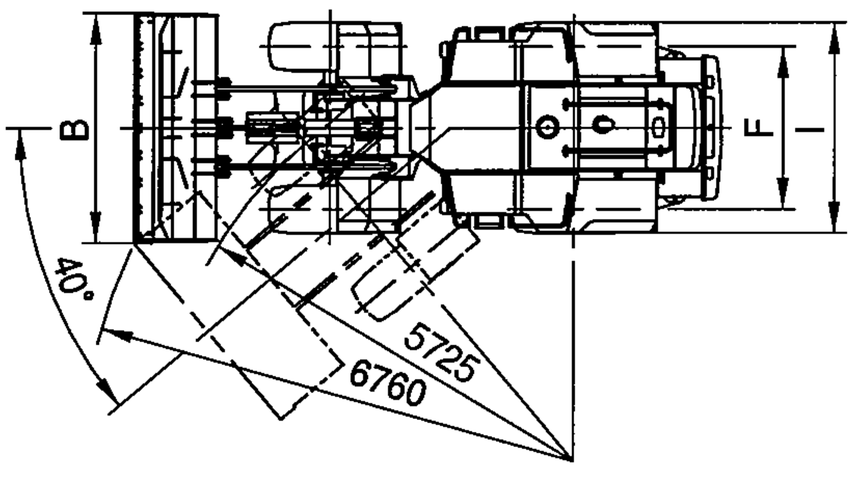
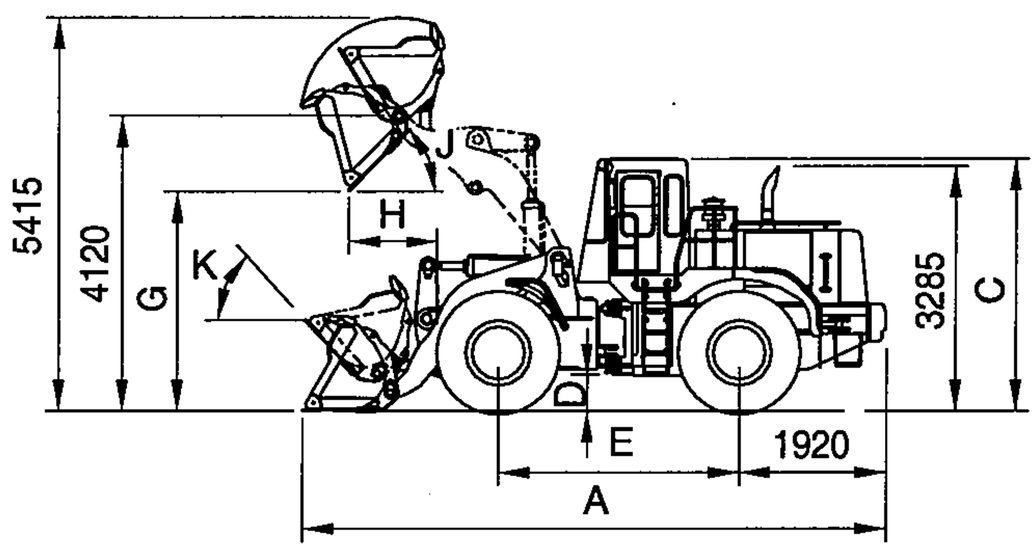
2. SPECIFICATIONS

1) WITHOUT TOOTH AND CUTTING EDGE TYPE BUCKET





Description		Unit	Specification
Operating weight		kg(lb)	17660(38930)
Bucket capacity	Struck	$m^3(yd^3)$	2.6(3.4)
	Heaped		3.0(3.9)
Overall length	A	mm(ft-in)	7860(25' 9")
Overall width	B		3100(10' 2")
Overall height	C		3460(11' 4")
Ground clearance	D		420(1' 5")
Wheelbase	E		3300(10' 10")
Tread	F		2160(7' 1")
Dump clearance at 45°	G		3080(10' 1")
Dump reach	H		1130(3' 8")
Width over tires	I		2770(9' 1")
Dump angle	J	Degree (°)	45
Roll back angle(carry position)	K		47.8
Cycle time	Lift(with load)	sec	6.6
	Dump(with load)		1.5
	Lower(empty)		3.0
Maximum travel speed		km/hr(mph)	36(22)
Braking distance		m(ft-in)	11(36' 1")
Minimum turning radius(outside bucket)			6.76(22' 2")
Gradability		Degree (°)	30
Travel speed	Forward - First gear	km/hr(mph)	7.6(4.7)
	Forward - Second gear		12.8(8.0)
	Forward - Third gear		23.6(14.7)
	Forward - Fourth gear		36.0(22.4)
	Reverse - First gear		8.0(5.0)
	Reverse - Second gear		13.5(8.4)
	Reverse - Third gear		24.7(15.4)

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(6) Table of fault codes

Fault code (Hex)	Int. code (Dec)	Meaning of the fault code possible reason for fault detection	Reaction of the TCU	Possible steps to repair	Remarks
11	48	**Logical error at gear range signal** TCU detected a wrong signal combination for the gear range • Cable from shift lever to TCU is broken • Cable is defective and is contacted to battery voltage or vehicle ground • Shift lever is defective	TCU shifts transmission to neutral OP-mode : Transmission shutdown	• Check the cables from TCU to shift lever • Check signal combinations of shift lever positions for gear range	Failure cannot be detected in systems with DW2/DW3 shift lever Fault is taken back if TCU detects a valid signal for the position
12	46	**Logical error at direction select signal** TCU detected a wrong signal combination for the direction • Cable from shift lever to TCU is broken • Cable is defective and is contacted to battery voltage or vehicle ground • Shift lever is defective	TCU shifts transmission to neutral OP-Mode : Transmission shutdown	• Check the cables from TCU to shift lever • Check signal combinations of shift lever positions F-N-R	Fault is taken back if TCU detects a valid signal for the direction at the shift lever
13	95	**Logical error at engine derating device** TCU detected no reaction of engine while derating device active	After selecting neutral, TCU change to OP mode limp home	• Check engine derating device	This fault is reset after power up of TCU
15	176	Logical error at direction select signal 2 shift lever TCU detected a wrong signal combination for the direction • Cable from shift lever 2 to TCU is broken • Cable is defective and is contacted to battery voltage or vehicle ground • Shift lever is defective	TCU shifts transmission to neutral if selector active OP mode : Transmission shutdown if selector active	• Check the cables from TCU to shift lever 2 • Check signal combinations of shift lever positions F-N-R	Fault is taken back if TCU detects a valid neutral signal for the direction at the shift lever
16	178	**Logical error at axle connection** Feedback axle connection measured by TCU and output signal axle connection don't fit • Axle can't be connected or disconnected due to mechanical problem • One of the cables from feedback axle connection switch to TCU is broken	OP mode : Normal	• Check the cables from TCU to feedback axle connection switch • Check signals of the feedback axle connection switch	

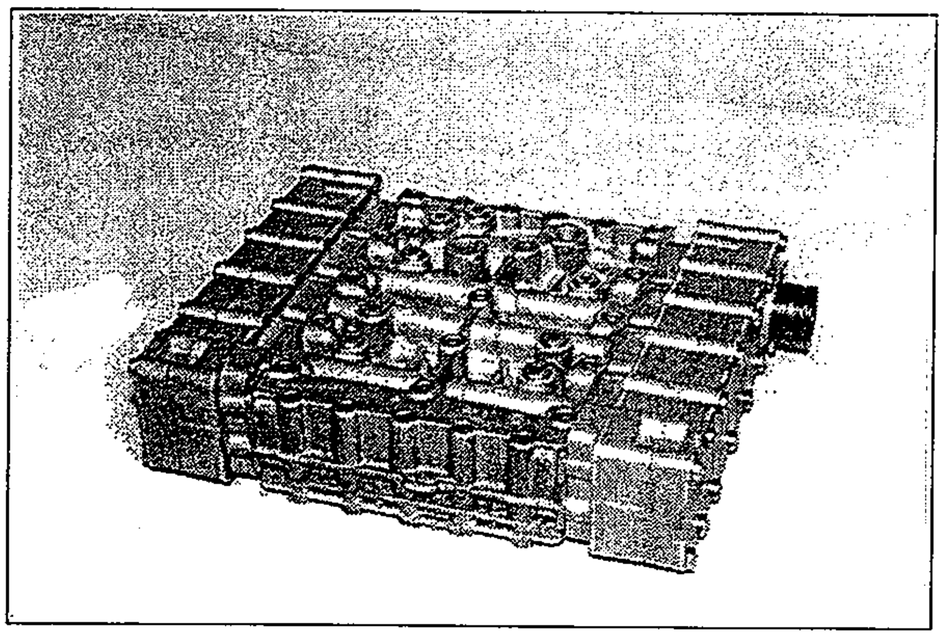
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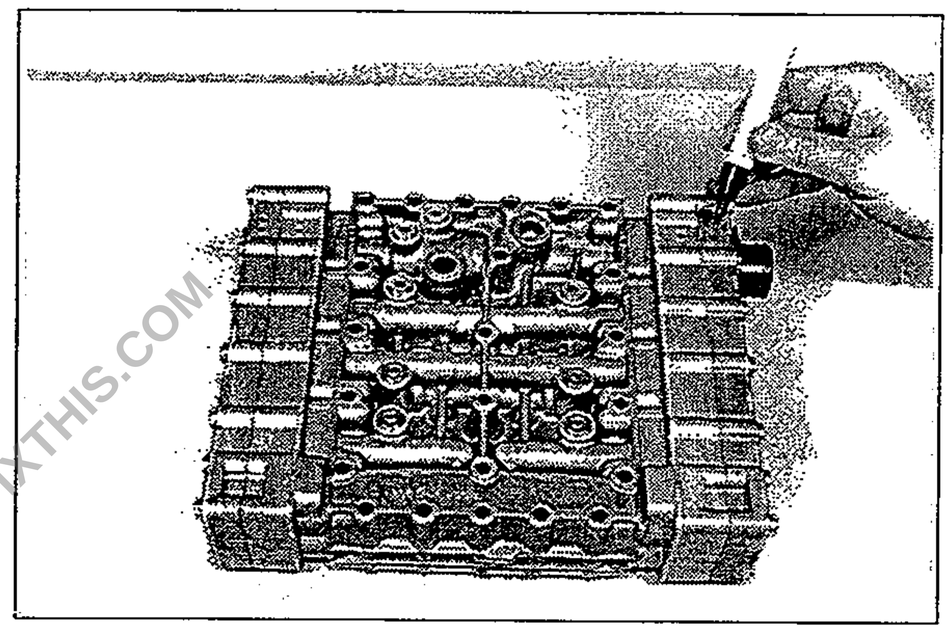
1. CONTROL VALVE

1) DISASSEMBLY

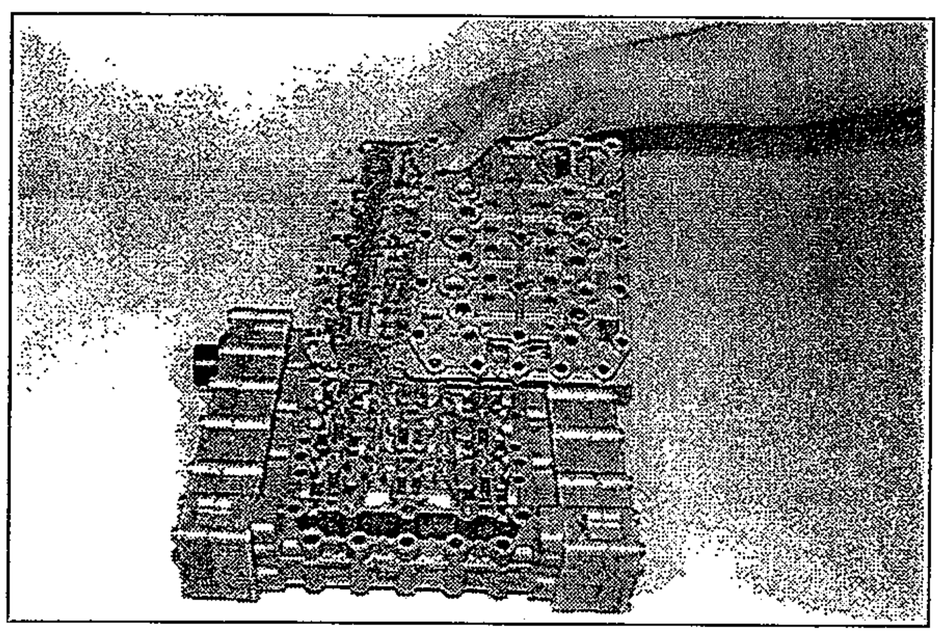
(1) Illustration on the right shows the complete control unit.



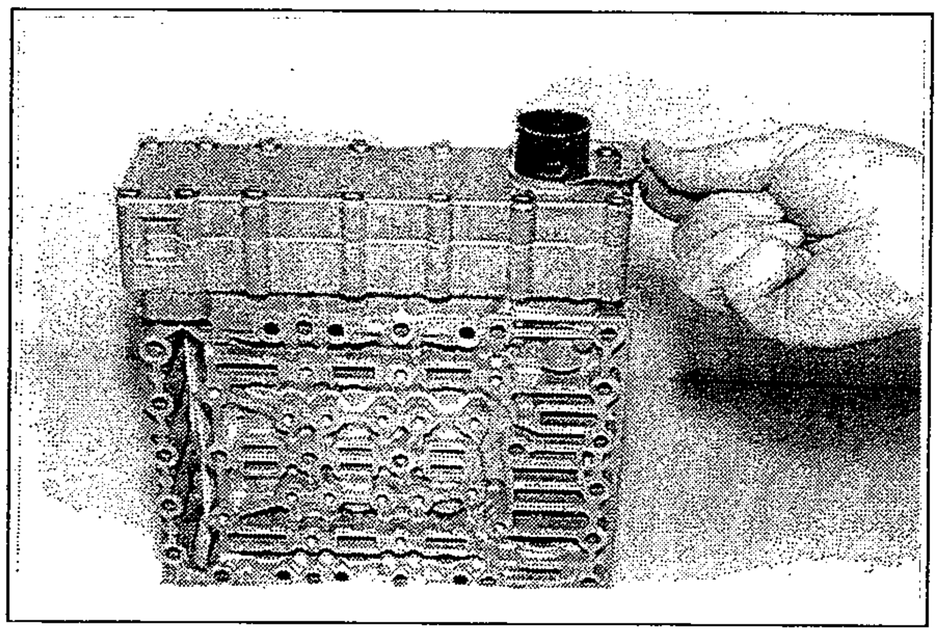
(2) Mark the installation position of the different covers, the housing and cable harness with the valve housing.



(3) Loosen socket head screws.
Separate duct plate, 1st gasket, intermediate plate and 2nd gasket from the valve housing.
Box spanner 5873 042 002



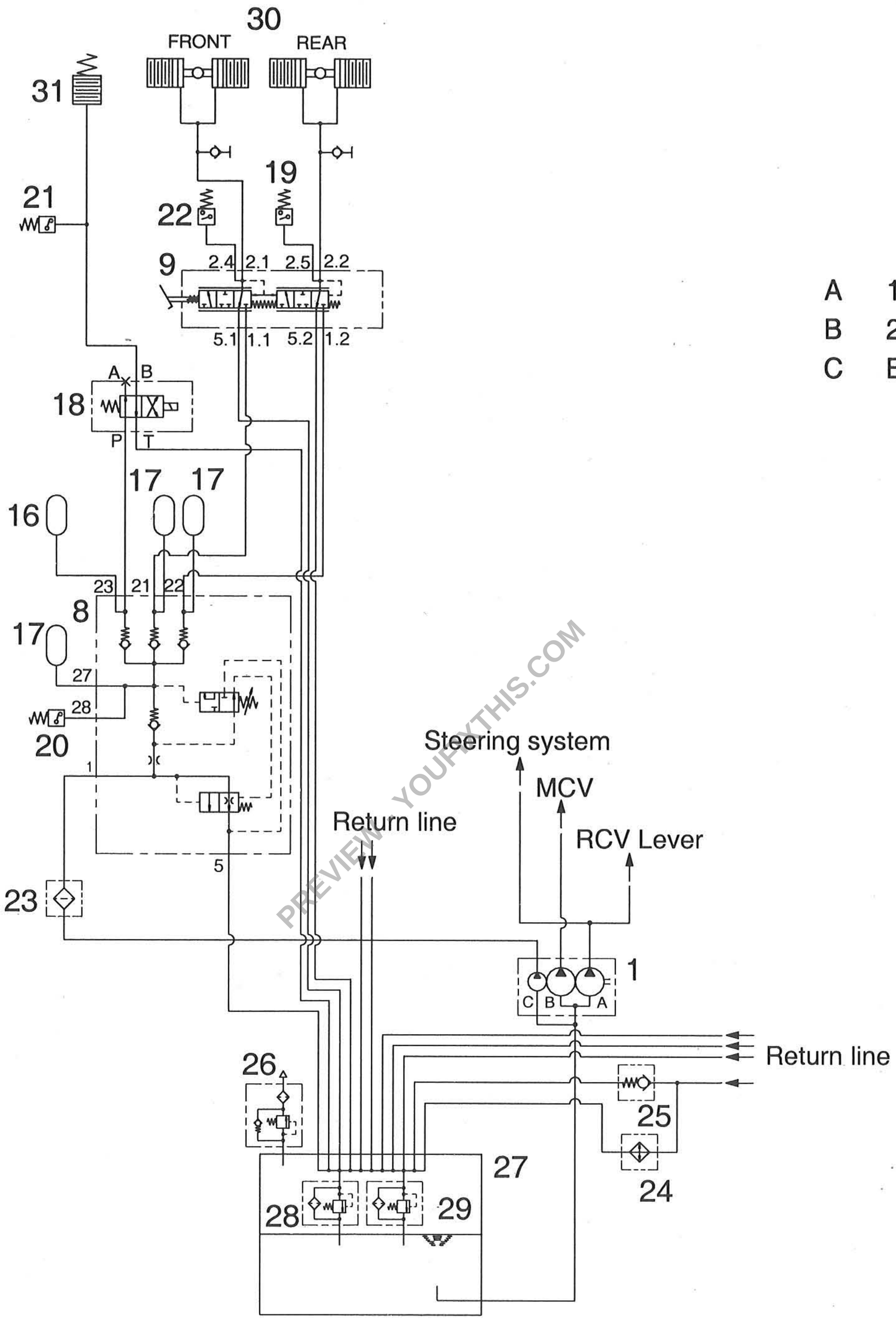
(4) Remove retaining clip.



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2. HYDRAULIC CIRCUIT

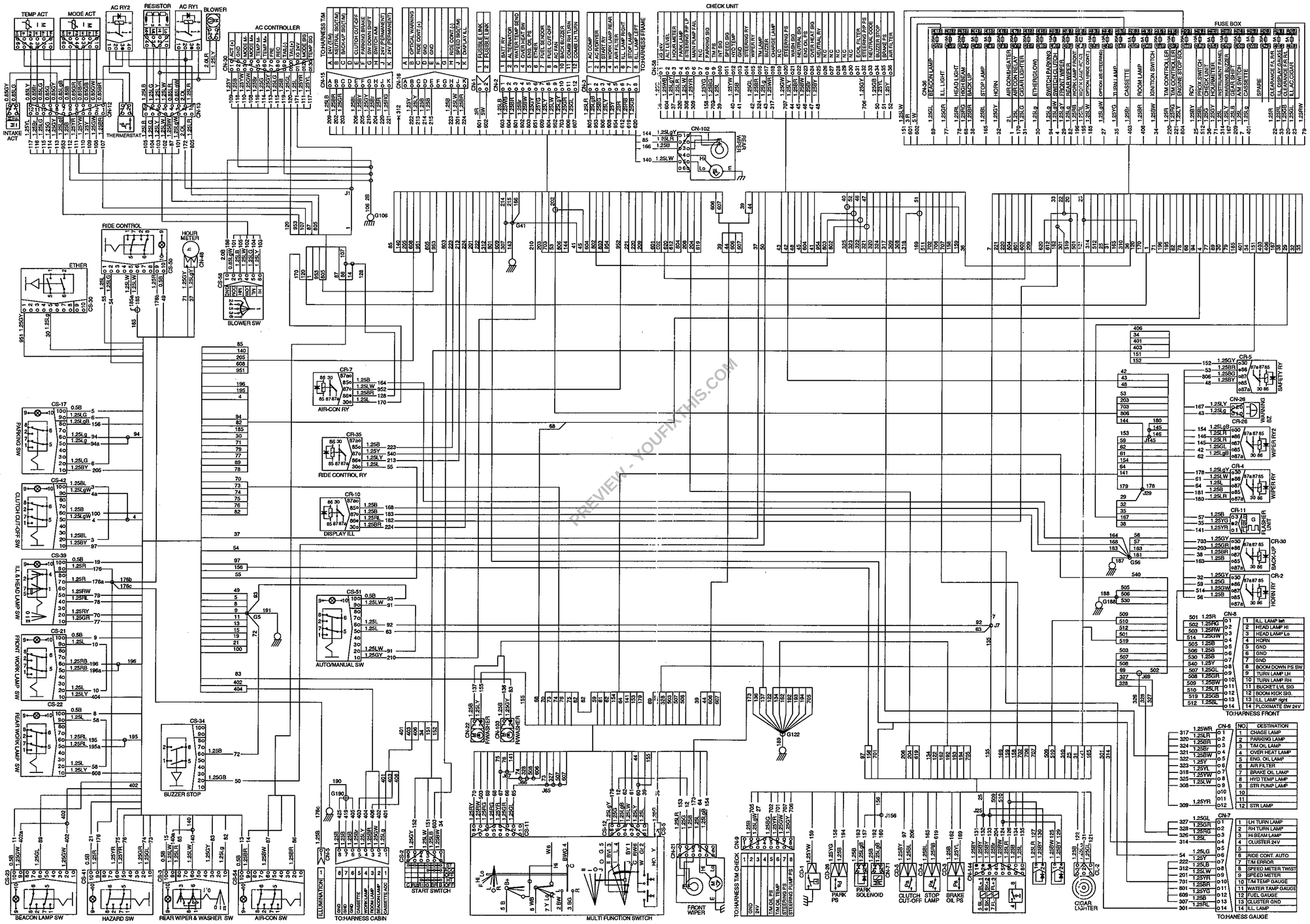


A 1st pump
B 2nd pump
C Brake pump

1	Main pump	20	Pressure switch	27	Hydraulic tank
8	Cut off valve	21	Pressure switch	28	Return filter
9	Brake valve	22	Pressure switch	29	Bypass valve
16	Accumulator	23	Line filter	30	Axle
17	Accumulator	24	Oil cooler	31	Parking brake
18	Solenoid valve	25	Check valve		
19	Pressure switch	26	Air breather		

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GROUP 2 ELECTRICAL CIRCUIT



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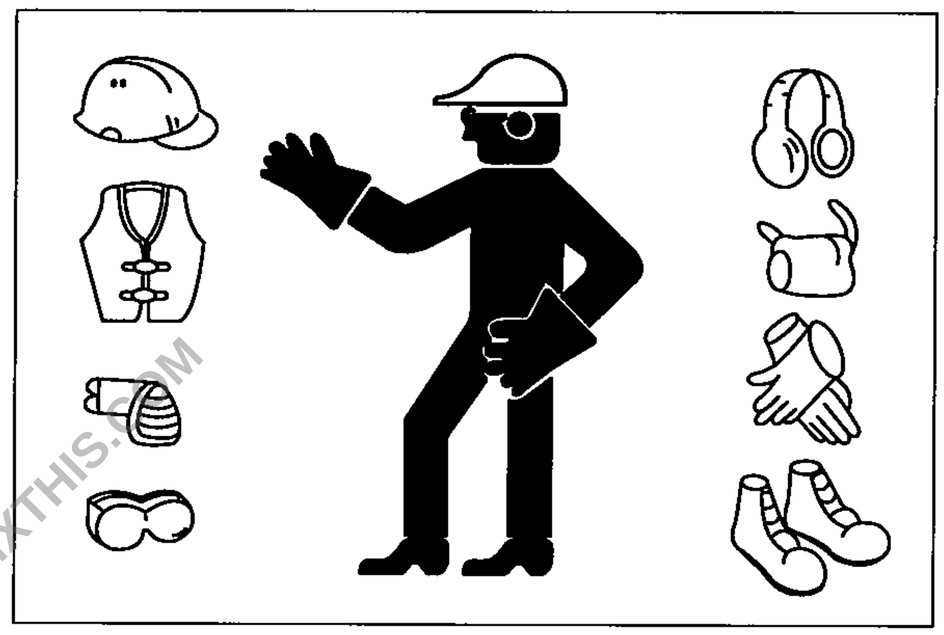
GROUP 1 SAFETY HINTS

FOLLOW SAFE PROCEDURE

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

WEAR PROTECTIVE CLOTHING

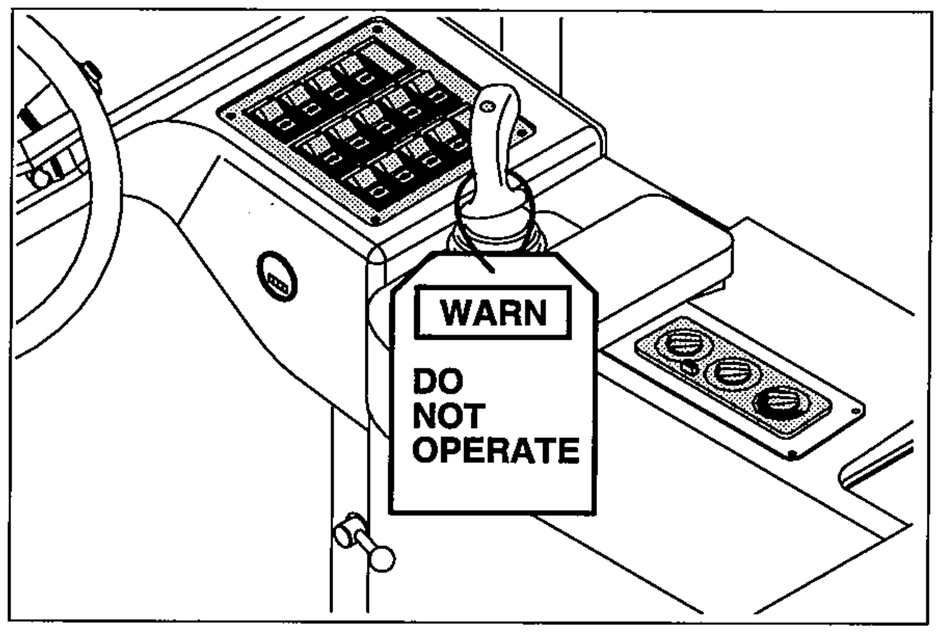
Wear close fitting clothing and safety equipment appropriate to the job.



WARN OTHERS OF SERVICE WORK

Unexpected machine movement can cause serious injury.

Before performing any work on the wheel loader, attach a 「**Do Not Operate**」 tag on the right side controller lever.

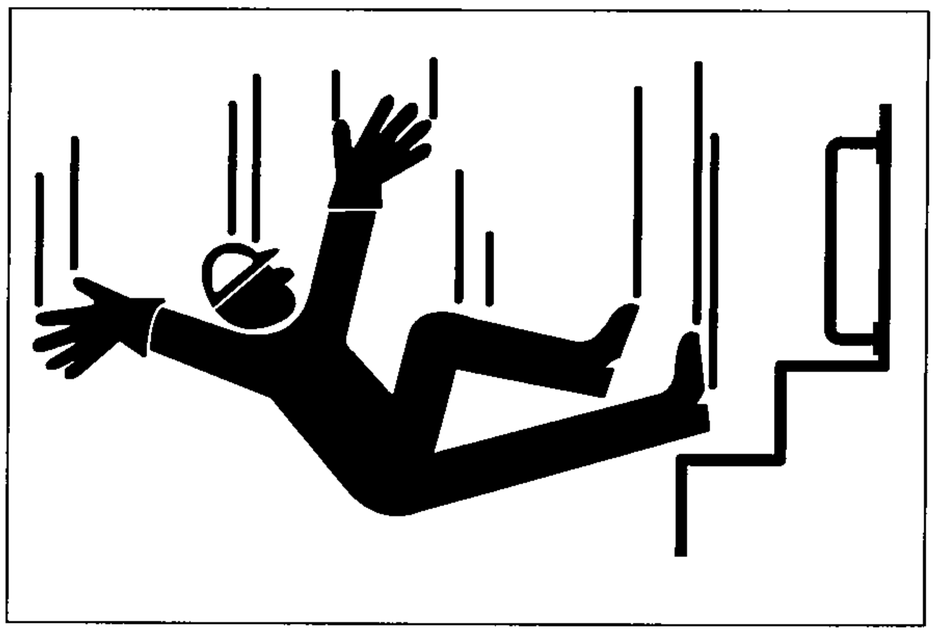


USE HANDHOLDS AND STEPS

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 = 0.03937in

	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

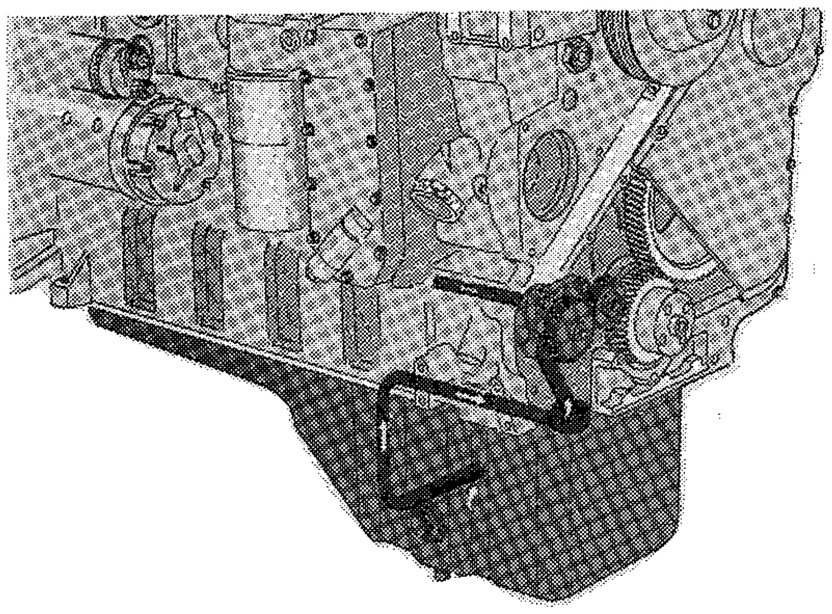
	0	1	2	3	4	5	6	7	8	9
0		2.20	4.41	6.61	8.82	11.02	13.23	15.43	17.64	19.84
10	22.05	24.25	26.46	28.66	30.86	33.07	35.27	37.48	39.68	41.89
20	44.09	46.30	48.50	50.71	51.91	55.12	57.32	59.5.	61.73	63.93
30	66.14	68.34	70.55	72.75	74.96	77.16	79.37	81.57	83.78	85.98
40	88.18	90.39	92.59	94.80	97.00	99.21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

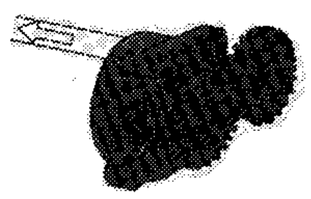
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5. LUBRICATING SYSTEM

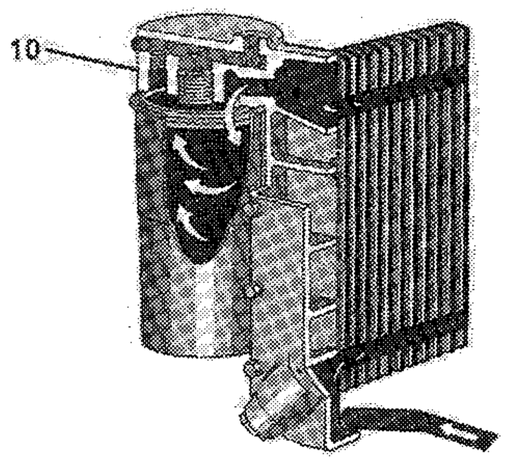
1) LUBRICATING OIL SYSTEM

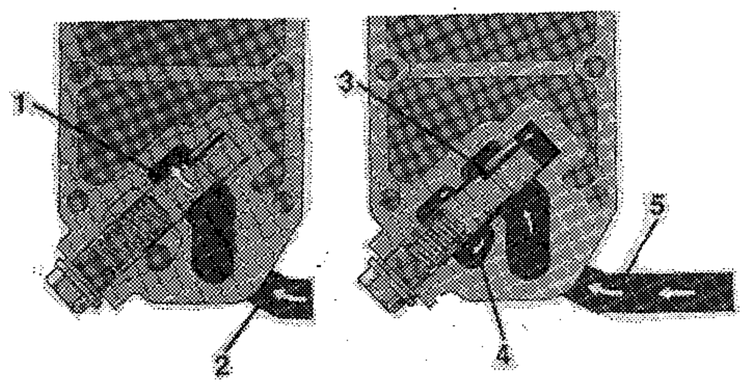




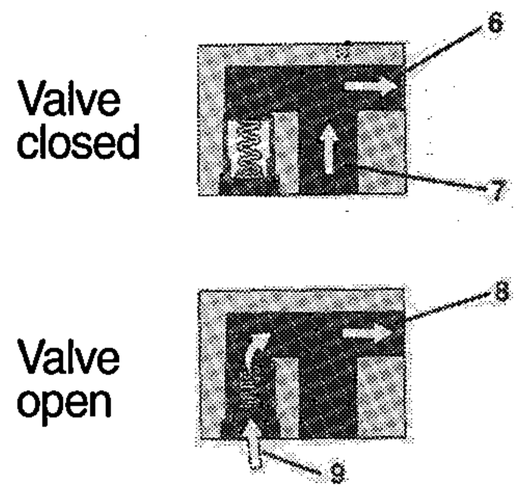
Gerotor lubricating oil pump

Lubricating oil cooler; full flow filter





Pressure regulating valve



Filter bypass valve

1	To oil cooler	5	From pump	9	From oil cooler
2	From pump	6	To main oil rifle	10	Filter bypass valve
3	To oil cooler	7	From filter		
4	To pan	8	To main oil rifle		

The oil flow begins as the gerotor type oil pump pulls oil from the oil pan through the rigid, internally mounted suction tube. The oil pump then delivers the oil through an internal drilling in the cylinder block to the oil pressure regulator, which is located in the oil cooler cover. The valve relieves oil pressure during cold starting and regulates oil pressure after the oil is warm. The regulator valve remains closed until the oil pressure is approximately 315kPa (45psi). When the oil pressure is greater than 315kPa(45psi), the valve begins to open and pressure is relieved by allowing some of the oil to return to the pan. The valve plunger has a tapered shoulder which creates a variable opening to regulate the pressure.

From the regulator cavity, the oil flows through the cooler cover and cooler element. Coolant flowing past the plates of the element cools the oil.

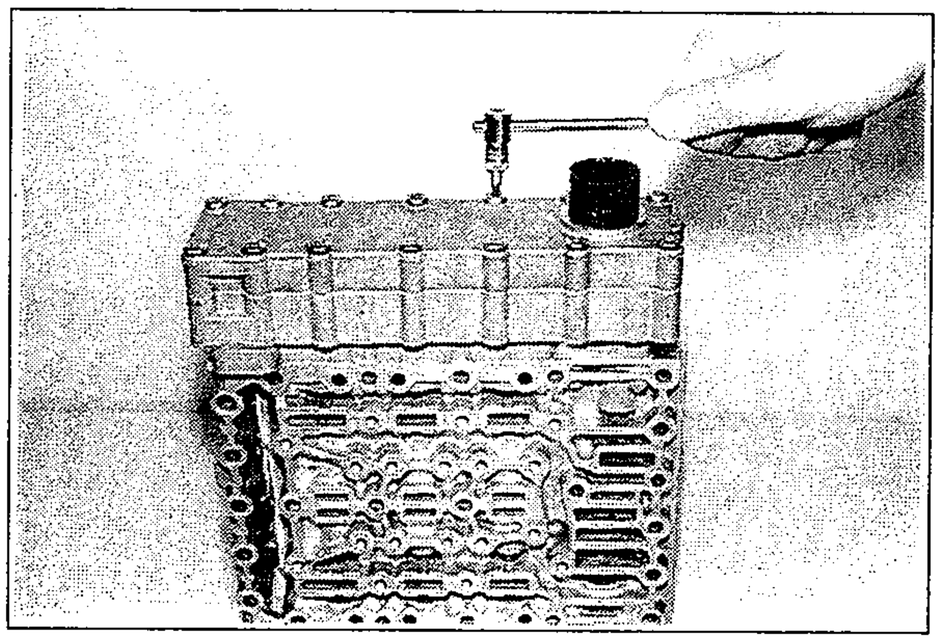
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Fault code (Hex)	Int. code (Dec)	Meaning of the fault code possible reason for fault detection	Reaction of the TCU	Possible steps to repair	Remarks
A1	84	**S.C. to ground at difflock or axle connection solenoid** TCU detected a wrong voltage at the output pin, that looks like a S.C. to vehicle ground • Cable is defective and is contacted to vehicle ground • Difflock solenoid has an internal defect • Connector pin is contacted to vehicle ground	No reaction OP mode : Normal	• Check the cable from TCU to the difflock solenoid • Check the connectors from difflock solenoid to TCU • Check the resistance* of difflock solenoid	* See Chapter (7)
A2	85	**S.C. to battery voltage at difflock or axle connection solenoid** TCU detected a wrong voltage at the output pin, that looks like a S.C. to battery voltage • Cable is defective and has no connection to battery voltage • Difflock solenoid has an internal defect • Connector pin is contacted to battery voltage	No reaction OP mode : Normal	• Check the cable from TCU to the difflock solenoid • Check the connectors from difflock solenoid to TCU • Check the resistance* of difflock solenoid	* See Chapter (7)
A3	86	**O.C. at difflock or axle connection solenoid** TCU detected a wrong voltage at the output pin, that looks like a O.C. for this output pin • Cable is defective and has no connection to TCU • Difflock solenoid has an internal defect • Connector has no connection to TCU	No reaction OP mode : Normal	• Check the cable from TCU to the difflock solenoid • Check the connectors from difflock solenoid to TCU • Check the resistance* of difflock solenoid	* See Chapter (7)
A4	96	**S.C. to ground at warning signal output** TCU detected a wrong voltage at the output pin, that looks like a S.C. to vehicle ground • Cable is defective and is contacted to vehicle ground • Warning device has an internal defect • Connector pin is contacted to vehicle ground	No reaction OP mode : Normal	• Check the cable from TCU to the warning device • Check the connectors from warning device to TCU • Check the resistance* of warning device	* See Chapter (7)

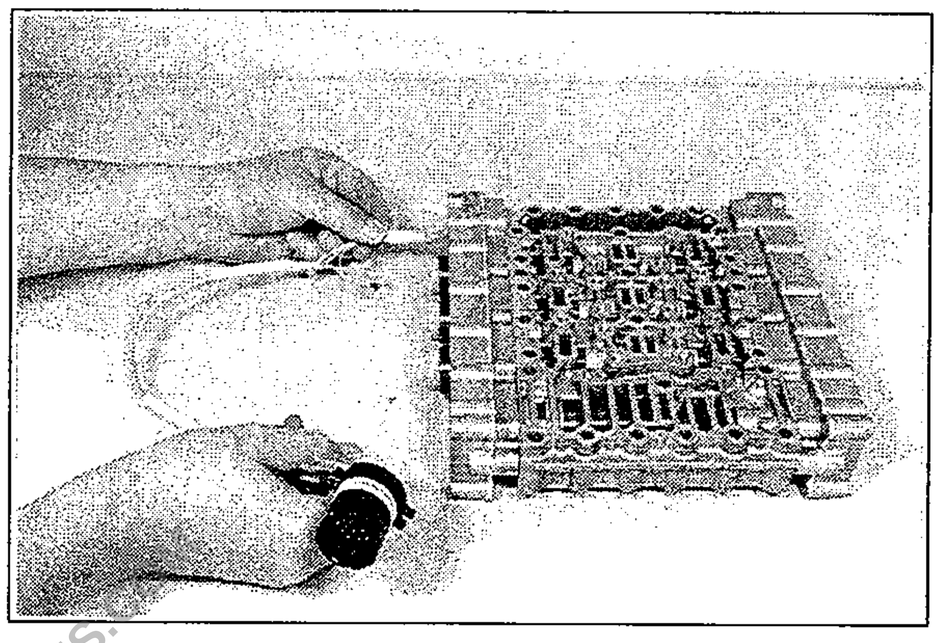
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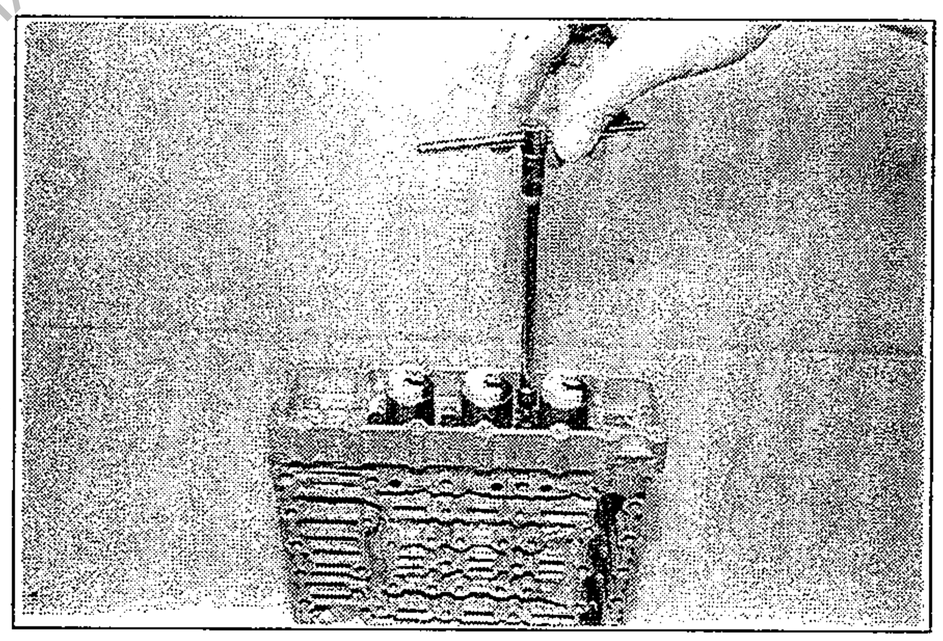
(5) Loosen socket head screws.
Separate cover from housing and cable harness.
Box spanner 5873 042 002



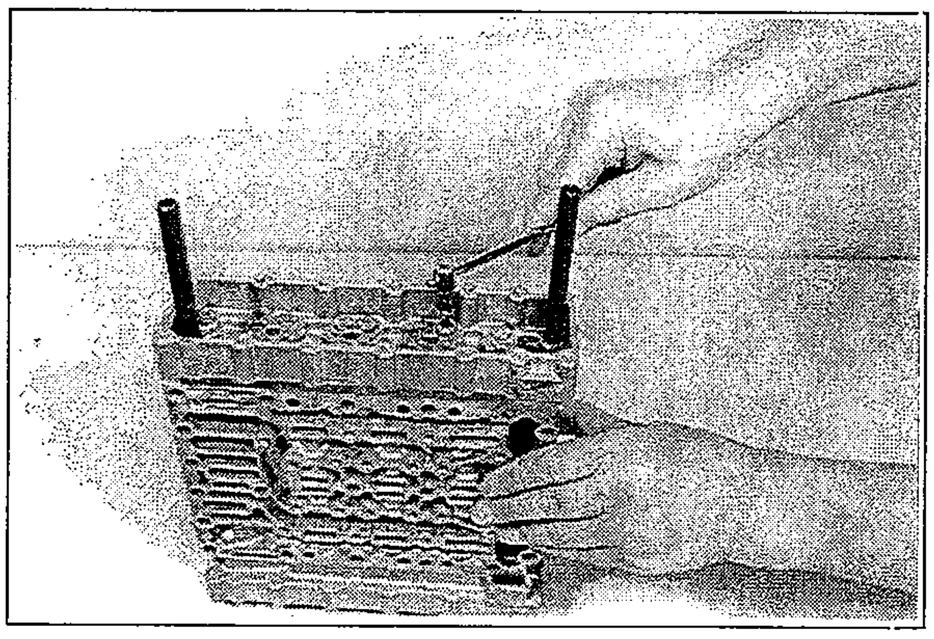
(6) Disassemble opposite cover.
Disconnect pressure regulator and remove cable harness.



(7) Loosen socket head screws, remove fixing plate and pressure regulators(3EA).
Box spanner 5873 042 002



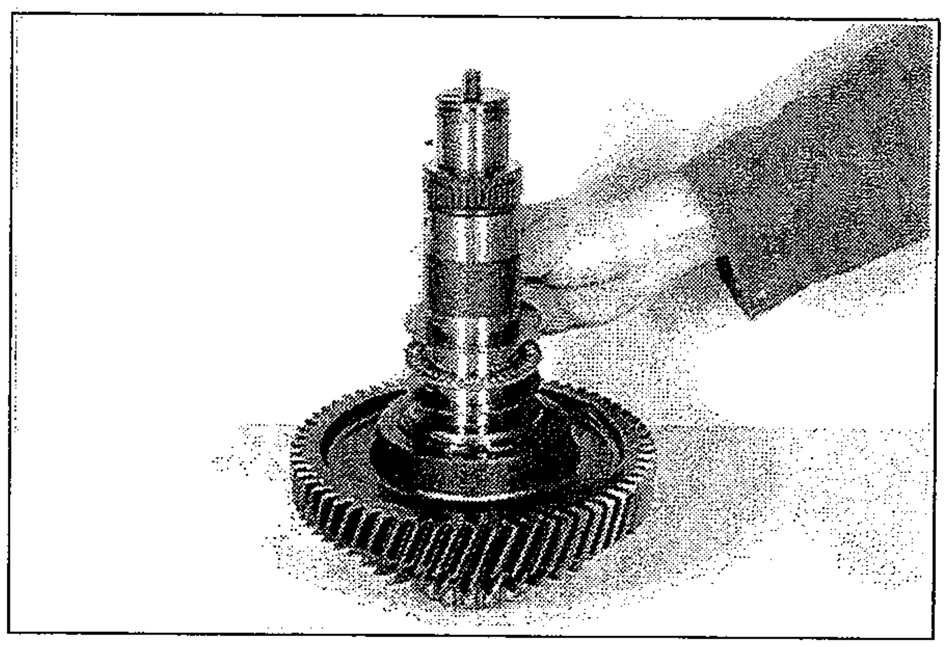
(8) Loosen two socket head screws and locate housing provisionally, using adjusting screws(Housing is under spring preload).
Now, loosen remaining socket head screws.
Box spanner 5873 042 002
Adjusting screws 5870 204 036



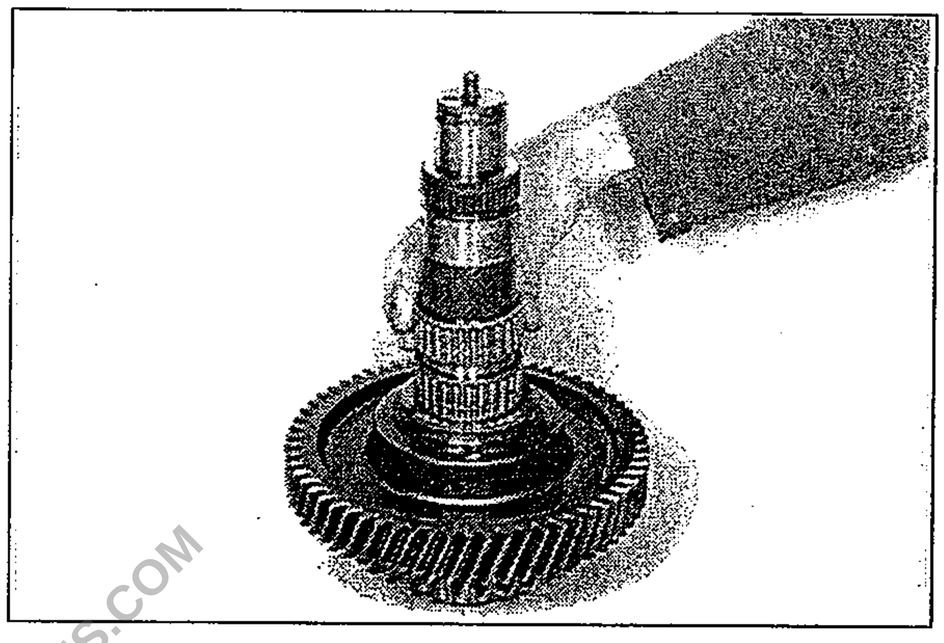
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⑬ Assemble both axial washers as well as needle case.

※ Upper and lower axial washer have the same thickness(55 × 78 × 1).

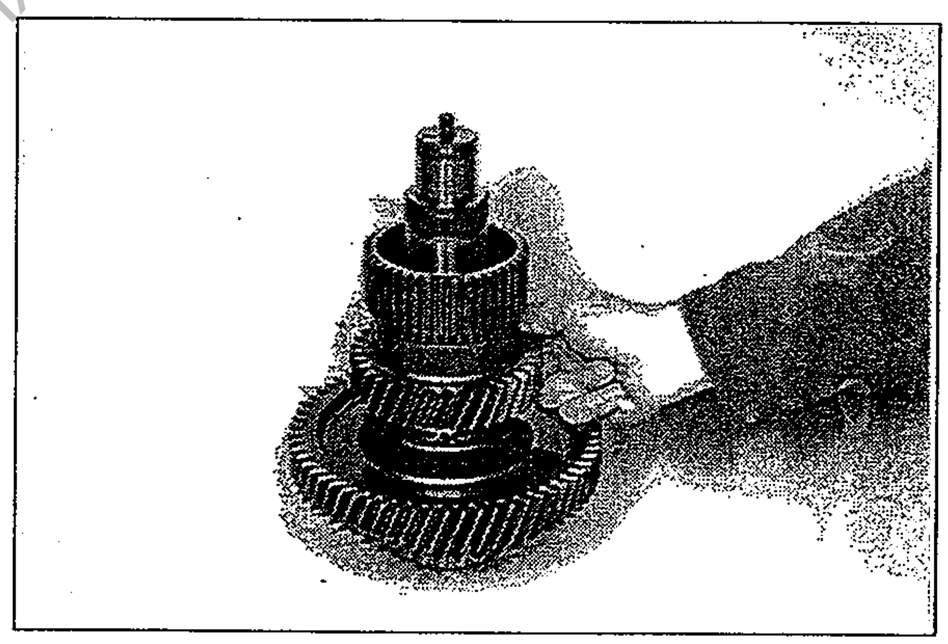


⑭ Assemble both needle bearings.



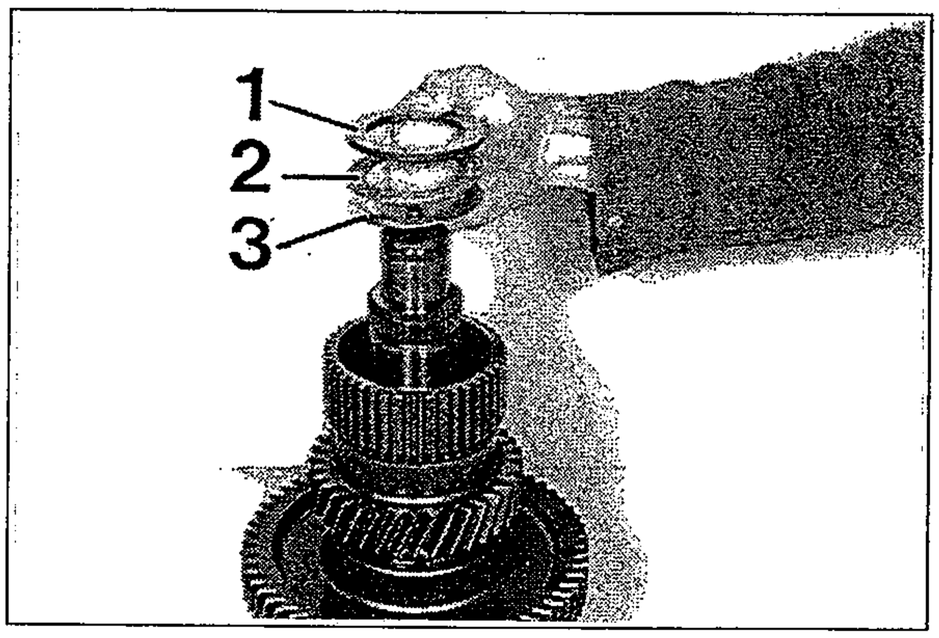
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⑮ Assemble idler gear.



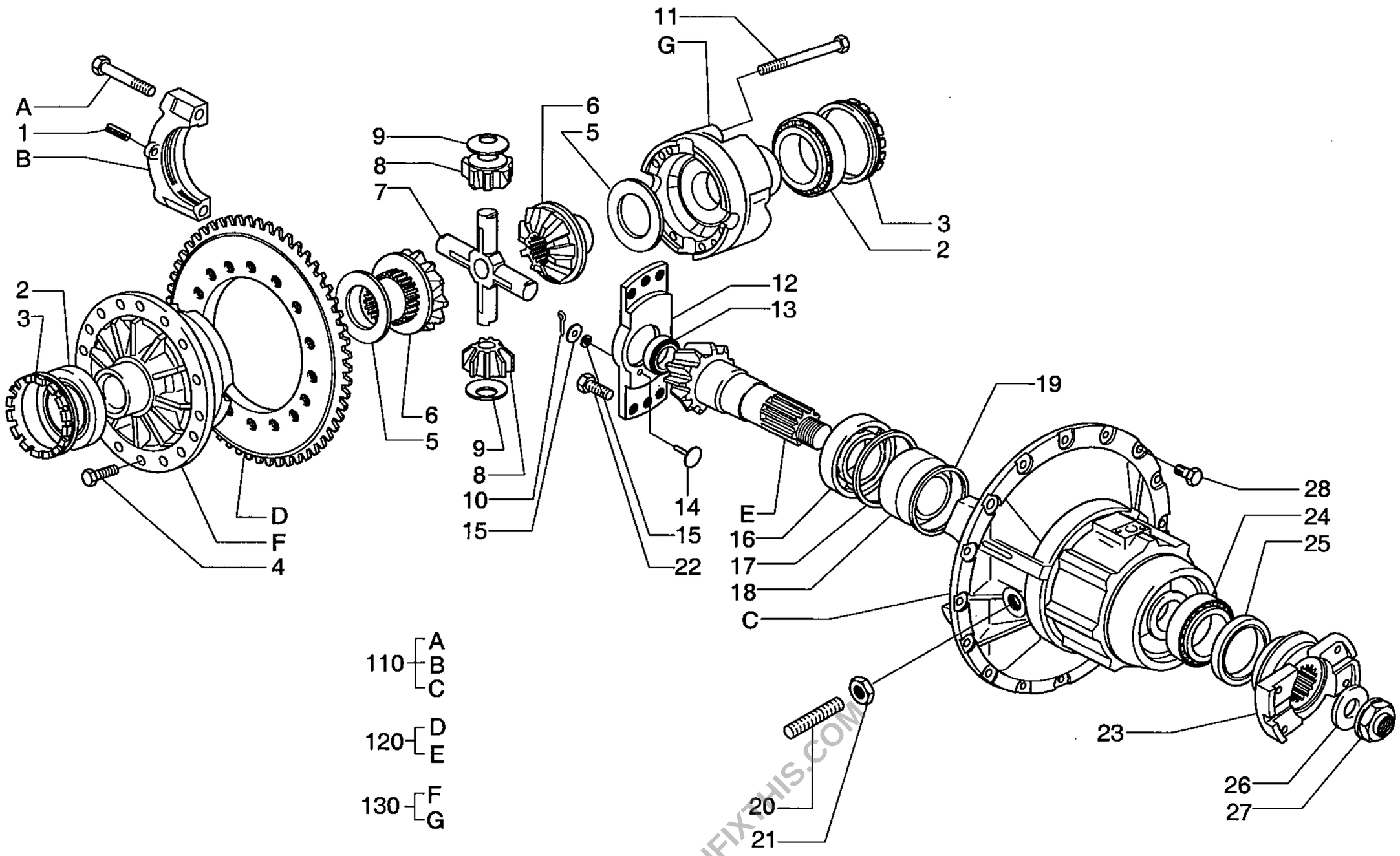
⑯ Assemble axial washer 3(55 × 78 × 1), needle cage 2 and running disk 1(55 × 78 × 5).

※ Install running disk 1, with the chamfer facing the needle cage.



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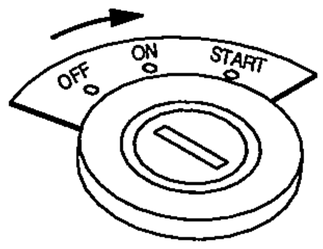
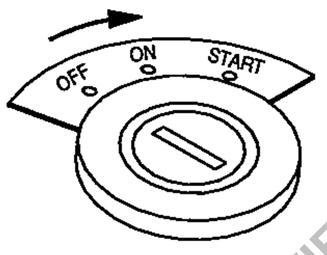
(3) Disassembling differential unit(Rear axle)



① Hammer out spring pins(1) locking slotted rings(3) and release then.
※ Mark caps(B) to match parts at reassembly.
② Release fixing screws(A) and remove caps(B) and relevant threaded rings(3).
③ Release and remove screws(22) securing support(12) of bearing(13) of bevel pinion shank.
④ Remove support(12) of bevel pinion bearing by means of puller screws.
⑤ Lift up differential unit from differential support(C), along with bearing support(12).
⑥ Remove ring gear deflection plunger(20) and relevant counternut(21).
⑦ Insert a screw in the seat of plunger(20) to react against unscrewing torque of pinion ring nut(27).
※ This screw should have a threaded length of 100㎜, its tip should shaped so as not to be damaged when contacting pinion teeth.
※ Make sure that screw be correctly engaged in pinion teeth.
⑧ Straighten notches on pinion ring nut(27).
⑨ Unlock and undo ring nut.
⑩ Remove drive flange(23), washer and pinion ring nut, then, back up reaction screw.

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Item	Description	Service action
Brake accumulator precharge check ※ The axles and hydraulic oil must be at operating temperature for this check.	 Start and run engine for 30 seconds. Stop engine and turn key switch to ON and wait 5 seconds. **NOTE** : Engine oil pressure lamp will be on due to no engine oil pressure.  Count the number of times the brake pedal can be fully depressed before the low brake pressure warning lamp comes ON. **LOOK** : Warning lamp must come on in 1-5 applications. Start engine and operate at low idle. Observe monitor while applying brake pedal with maximum force. **LOOK/LISTEN** : Brake pressure indicator must not come ON.	**OK** Check completed. **NOT OK** Make sure brake pedal is not binding and keeping brakes partially engaged. Bleed brakes in group 3. Check brake system pressure in group 3. **NOT OK** If light comes on with engine running, accumulator has lost it's charge. Inspect and recharge accumulator, group 3.
Brake system leakage check	Start engine and wait 30 seconds.  Stop engine. Wait 2 minutes. Turn key switch to ON and wait 5 seconds.  **LOOK** : Brake oil pressure warning lamp must not come on within 2 minutes after stopping engine.	**OK** Check completed. **NOT OK** If brake leakage is indicated with brakes released, check leakage at accumulator inlet check valve and brake valve. If brake leakage is indicated with brakes applied, check for leakage at brake valve and brake pistons. Check individual component leakage.

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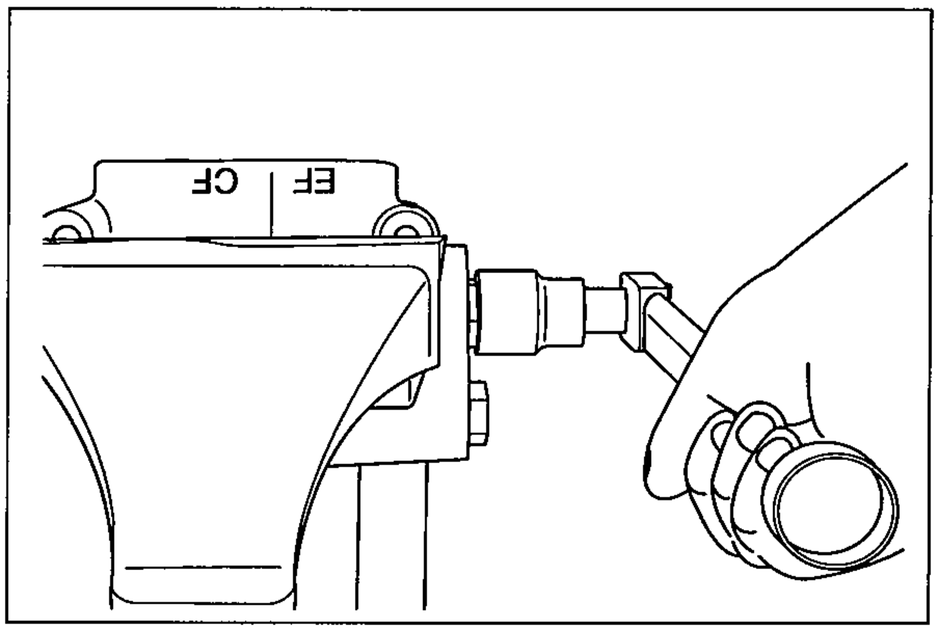
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3) DISASSEMBLY

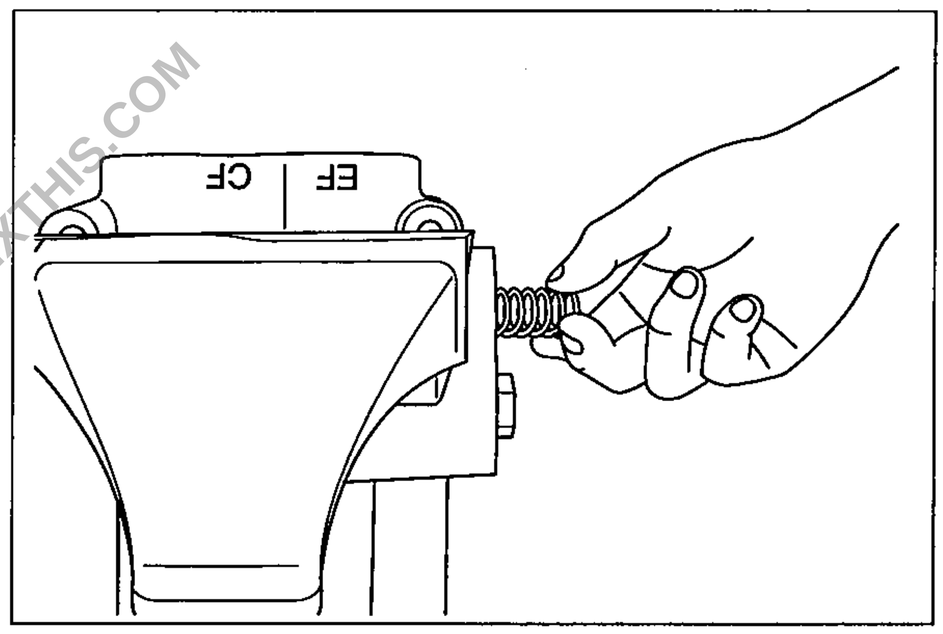
※ Cleanliness is the primary means of assuring satisfactory the priority valve life.
Select clean place.
Before removing the piping, clean the surrounding area of valve ports.

(1) Fix the housing(1) in a vise with copper or lead sheets.
Do not over tighten jaws.

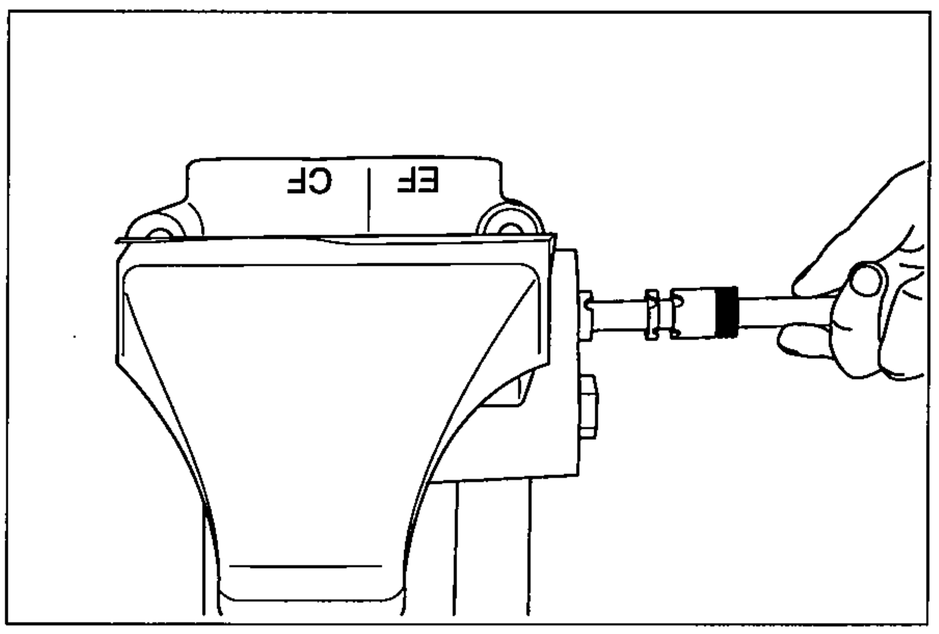
(2) Loosen plug(18) for LS port.



(3) Remove spring (6).



(4) Remove spool assy(2).

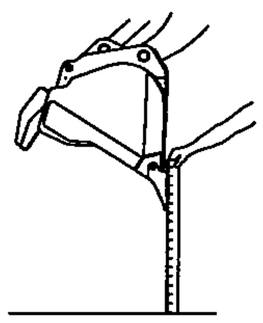
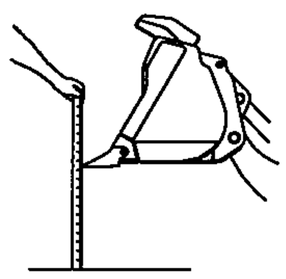
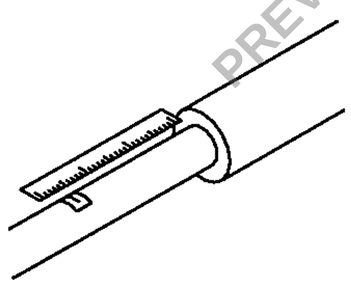
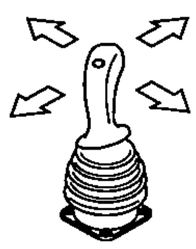


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Item	Description	Service action
Boom cylinder leakage check Heat hydraulic oil to operating temperature.	 Dump bucket until teeth or cutting edge is perpendicular to the ground. Raise boom until cutting edge is about 1m(3ft) above ground. Stop engine. Measure drift from tooth or cutting edge to ground for 1 minute. Wait 10 minutes. Measure drift from tooth or cutting edge to ground for 1 minute. **LOOK :** Compare the drift rate between the first measurement and the second measurement.	**OK** Drift is approximately the same between first and second measurement. Repair main control valve or circuit relief valve. **NOT OK** If drift is considerably less on second measurement, repair cylinder.
Bucket cylinder leakage check Heat hydraulic oil to operating temperature.	 Raise bucket about 1m(3ft) off ground with bucket level. Stop engine. Place a support under boom. Measure drift from tooth or cutting edge to ground for 1 minute. Wait 10 minutes. Measure drift from tooth or cutting edge to ground for 1 minute. **LOOK :** Compare the drift rates between the first measurement and the second measurement.	**OK** Drift is approximately the same between first and second measurement. Repair main control valve or circuit relief valve at page 6-53. **NOT OK** Drift is considerably less on second measurement. Repair cylinder.
Check valve of safety valve leakage check Heat hydraulic oil to operating temperature.	 Put bucket level and position about 1.2m(4ft) above ground. Place a piece of tape on cylinder rod at least 51mm(2in) from rod guide. Run engine at low idle in safety-release position. **LOOK :** Bucket must not drift up.	**OK** Check complete. **NOT OK** Check or replace safety valve.
Pilot control valve (RCV lever) check	 Stop engine. Turn key switch to OFF position. Move control lever to all positions and then release. **LOOK :** Lever must return to neutral when released from all positions.	**OK** Check completed. **NOT OK** Repair pilot control valve.

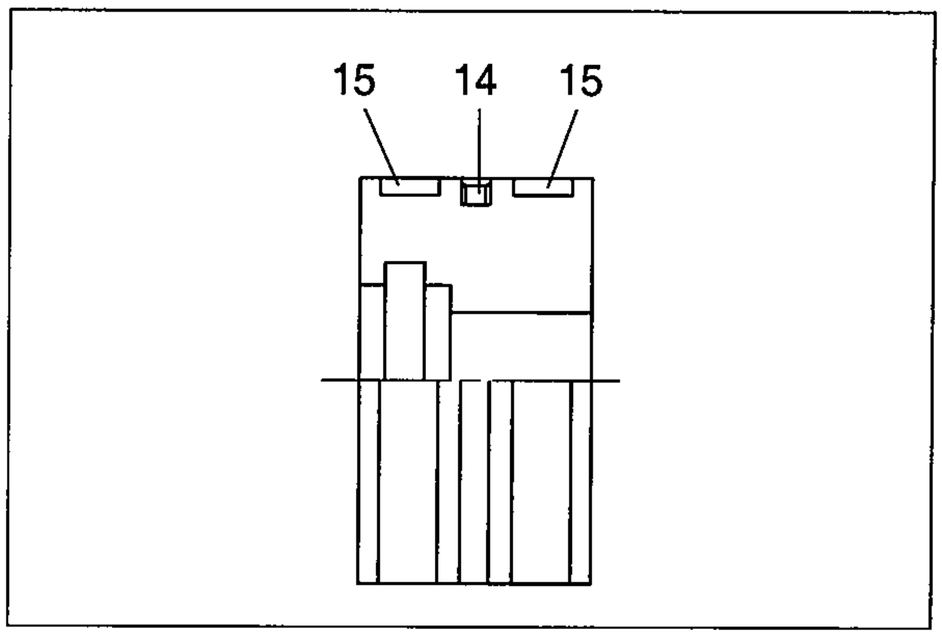
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(3) Disassemble the piston assembly

① Remove wear rings(15) and piston seal (14).

※ Exercise care in this operation not to damage the grooves.



(4) Disassemble gland assembly

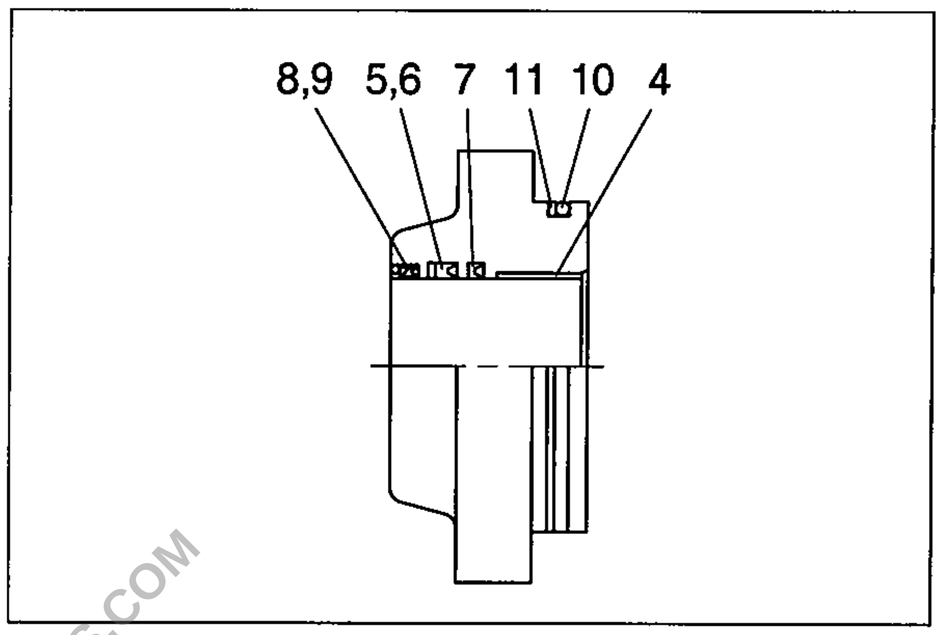
① Remove back up ring(11), and O-ring (10).

② Remove snap ring(9) and dust wiper(8).

③ Remove back up ring(6), rod seal(5) and buffer ring(7).

※ Exercise care in this operation not to damage the grooves.

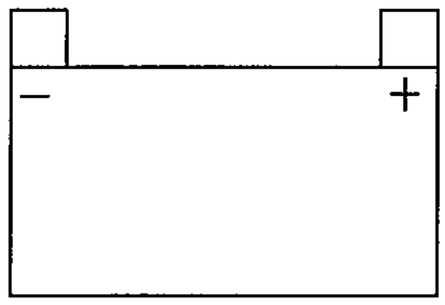
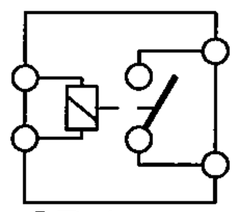
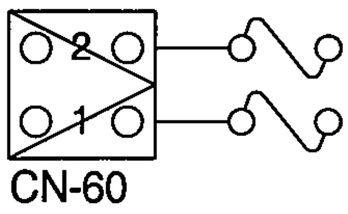
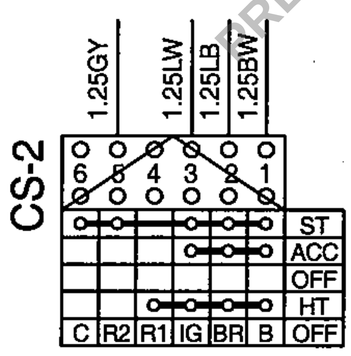
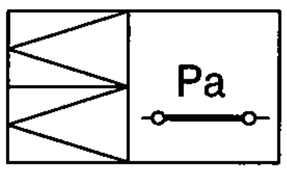
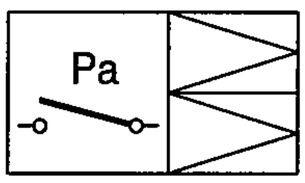
※ Do not remove seal and ring, if does not damaged.



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GROUP 4 ELECTRICAL COMPONENT SPECIFICATION

Part name	Symbol	Specifications	Check
Battery		12V × 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 (30 Seconds)	※ Check coil resistance Normal : About 50 Ω ※ Check contact Normal : ∞ Ω
Fusible link		24V 60A	※ Check disconnection Normal : 0 Ω (Connect ring terminal and check resistance between terminal 1 and 2)
Start key		-	※ Check contact OFF : ∞ Ω (For each terminal) ON : 0 Ω (For terminal 1-3) ∞ Ω (For terminal 1-5) START : 0 Ω (For terminal 1-3 and 1-5)
Pressure switch	 CD-3 CD-26 CD-25 CD-39	N.C TYPE	※ Check contact Normal : 0 Ω (Close)
Pressure switch	 CD-4 CD-40 CD-5	N.O TYPE	※ Check contact Normal : ∞ Ω (Open)

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