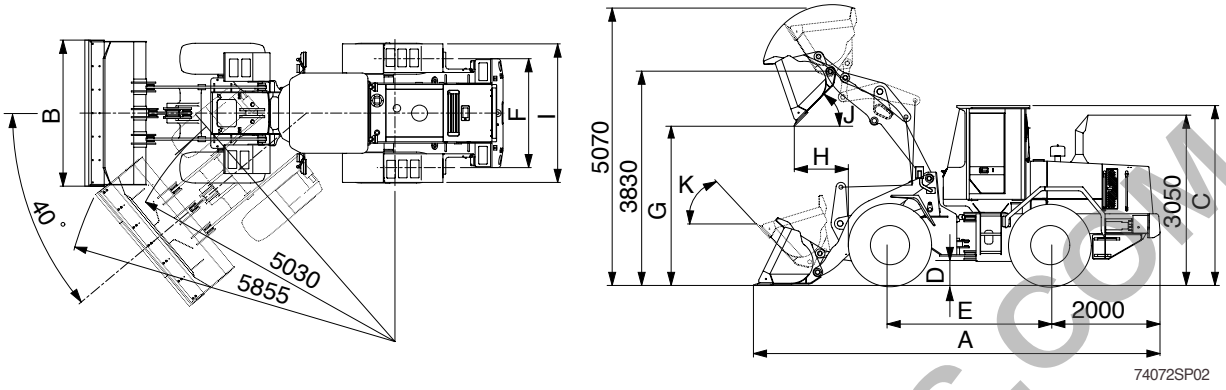
2. SPECIFICATIONS

1) WITHOUT TOOTH AND CUTTING EDGE TYPE BUCKET(HL740-7)



Description			Unit	Specification
Operating weight			kg(lb)	11500(25350)
Bucket capacity		Struck	$m^3(yd^3)$	1.7(2.2)
		Heaped		2.0(2.6)
Overall length		A	mm(ft-in)	7180(23' 7")
Overall width		B		2550(8' 4")
Overall height		C		3260(10' 8")
Ground clearance		D		417(1' 4")
Wheelbase		E		2900(9' 6")
Tread		F		1900(6' 3")
Dump clearance at 45°		G		2920(9' 7")
Dump reach(Full lift)		H		935(3' 1")
Width over tires		I		2430(8' 0")
Dump angle		J	Degree (°)	48
Roll back angle(Carry position)		K		47
Cycle time		Lift(With load)	sec	5.5
		Dump(With load)		1.2
		Lower(Empty)		2.8
Maximum travel speed			km/hr(mph)	38.2(23.8)
Braking distance			m(ft-in)	12(39' 4")
Minimum turning radius(Center of outside tire)				5.03(16' 6")
Gradability			Degree (°)	30
Travel speed	Forward	First gear	km/hr(mph)	6.9(4.3)
		Second gear		12.6(7.9)
		Third gear		24.0(15.0)
		Fourth gear		38.2(23.8)
	Reverse	First gear		7.3(4.5)
		Second gear		13.3(8.3)
		Third gear		25.3(15.8)

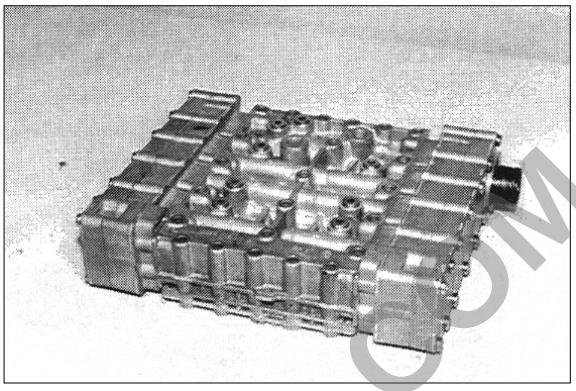
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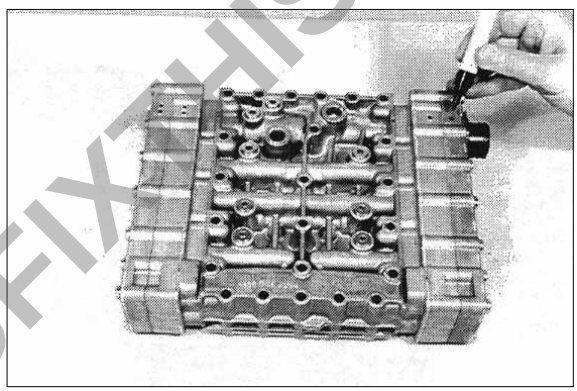
1. CONTROL VALVE

1) DISASSEMBLY

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

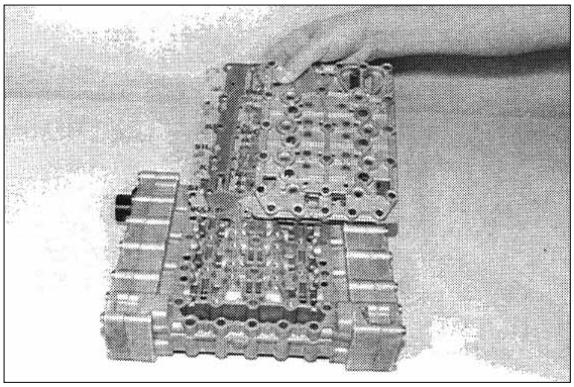


(2) Mark the installation position of the different covers, the housing and cable harness with the valve housing.

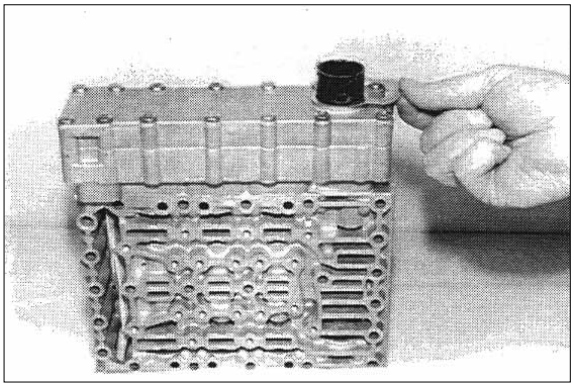


(3) Loosen socket head screws.
Separate duct plate, 1st gasket, intermediate plate and 2nd gasket from the valve housing.

¡ Special tool
Box spanner 5873 042 002



(4) Remove retaining clip.



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2. TROUBLESHOOTING

1) TRANSMISSION

※ **Diagnose malfunction charts are arranged from most probable and simplest to verify, to least likely, more difficult to verify. Remember the following steps when troubleshooting a problem :**

Step 1. Operational check out procedure(See group 3 in section 1.)
Step 2. Operational checks(In this group.)
Step 3. Troubleshooting
Step 4. Tests and/or adjustments(See group 3.)

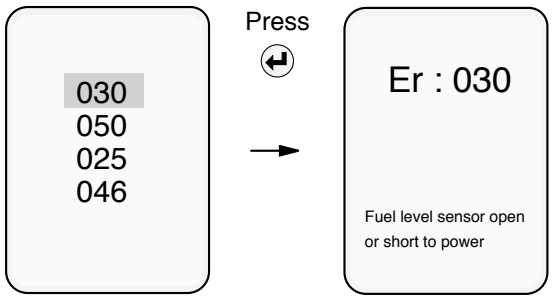
Problem	Cause	Remedy
Transmission slippage	Low oil level.	Add oil.
	Wrong oil grade.	Change oil.
	Restricted transmission pump suction screen.	Remove and clean screen.
	Leak in transmission control valve or gasket.	Remove valve and inspect gaskets.
	Low transmission pump flow due to worn pump.	Do transmission pump flow test.
	Weak or broken pressure regulating valve spring.	Do transmission system pressure test.
Error code on display	Something wrong in transmission.	Go to transmission error code group at page 3-25~3-53.

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(3) Fault code

When selecting the fault code menu, it shows all of the fault codes which mean abnormal conditions of present time.



77073CD60

※ To go out from fault explanation window, press ▲ button.
(Press ↵ , M to go out to first menu.)

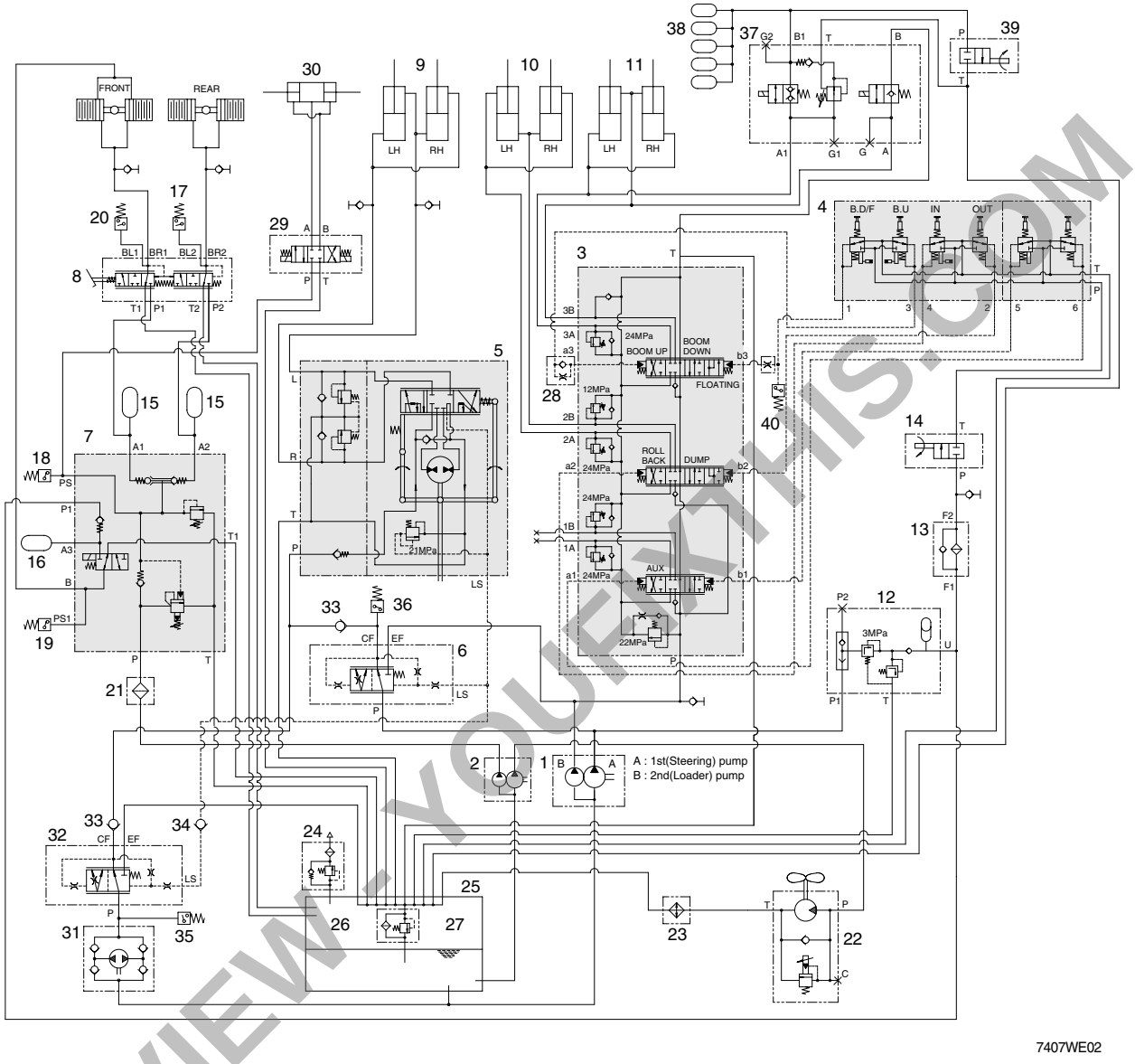
※ **No error** will be indicated in case that there's no fault.

Description	Code	Meaning	Remark
Electrical system	010	Power input voltage low	Below 18V
	011	Power input voltage high	Above 38V
	012	Alternator voltage low	Below 5V
	013	Alternator voltage high	Above 36V
	014	Buzzer circuit open or short to ground	
	015	Buzzer circuit short to power	
	016	Wiper relay open or short to ground	
	017	Wiper relay short to power	
Hydraulic system	020	Hydraulic oil temperature sensor open or short to power	
	021	Hydraulic oil temperature sensor short to ground	
Engine system	030	Fuel level sensor open or short to power	
	031	Fuel level sensor short to ground	
	032	Safety relay open or short to ground	Restarting prevention
	033	Safety relay short to power	Restarting prevention
	034	Cooling fan driving valve open or short to ground	
	035	Cooling fan driving valve short to power	
T/M system	050	Auto select switch supply power open or short to power	
	051	Auto select switch supply power short to ground	
	052	Clutch cutoff supply power open or short to power	
	053	Clutch cutoff supply power short to ground	
Steering system	060	Emergency steering relay open or short to ground	Option
	061	Emergency steering relay short to power	Option
Communication	070	MCU communication error	
	071	TCU communication error	
	072	ECM communication error	
Others	080	Speedometer output signal(from TCU) bad	
	081	MCU memory error	
	082	MCU clock error	
	083	MCU clock battery error	
	084	Monitor memory error	

MCU : Machine control unit TCU : Transmission control unit ECM : Engine control module

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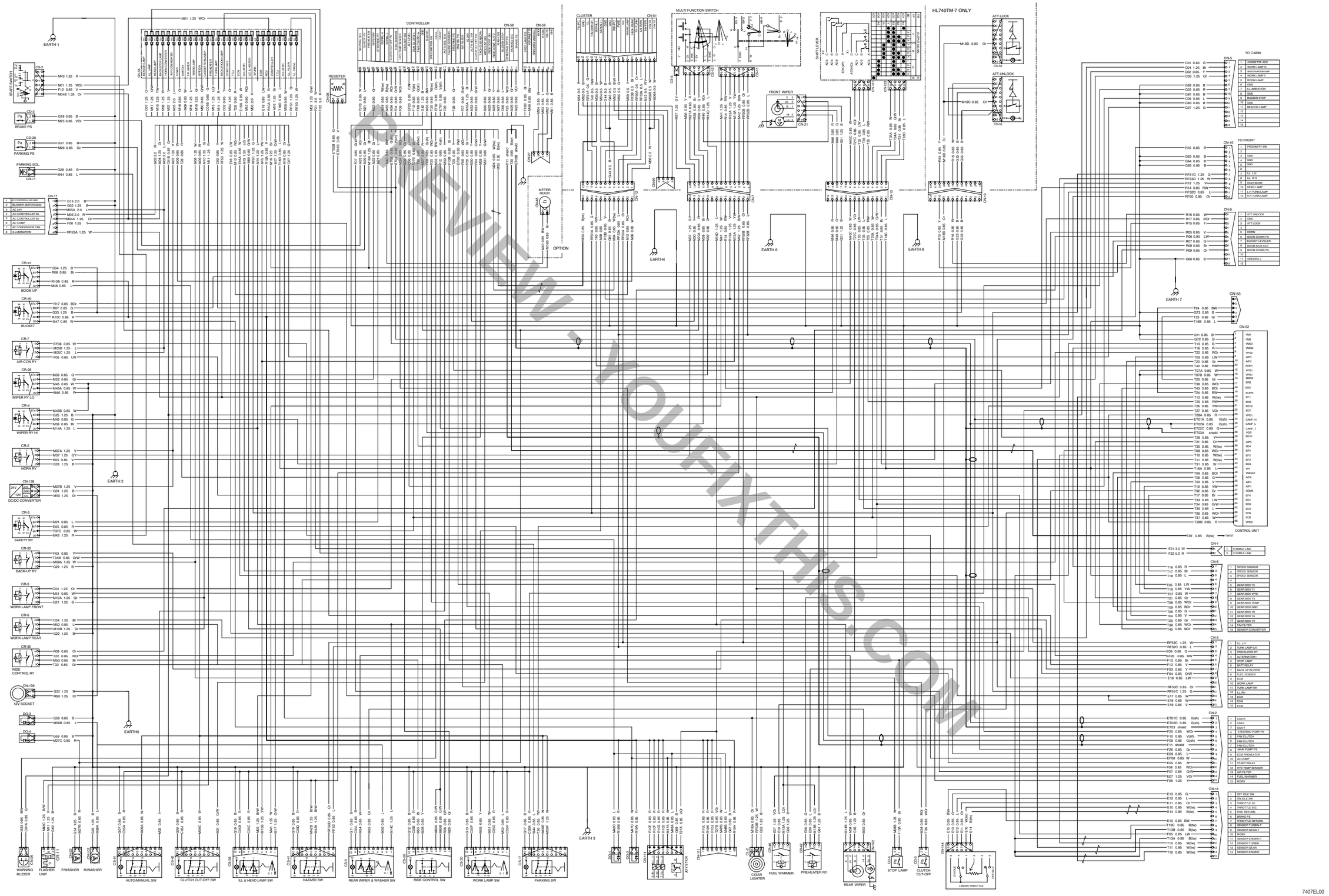
HYDRAULIC CIRCUIT(HL740TM-7)



1	Main pump	15	Accumulator	28	Shockless valve
2	Fan+Brake pump	16	Accumulator	29	Solenoid valve
3	Main control valve	17	Pressure switch	30	Quick coupler cylinder
4	Remote control valve	18	Pressure switch	31	Emergency pump kit(Option)
5	Steering unit	19	Pressure switch	32	Priority valve(Option)
6	Priority valve	20	Pressure switch	33	Check valve(Option)
7	Cut off valve	21	Line filter	34	Check valve(Option)
8	Brake valve	22	Fan motor	35	Pressure switch(Option)
9	Steering cylinder	23	Oil cooler	36	Pressure switch(Option)
10	Bucket cylinder	24	Air breather	37	Ride control valve(Option)
11	Boom cylinder	25	Hydraulic tank	38	Accumulator(Option)
12	Pilot supply unit	26	Return filter	39	Safety valve(Option)
13	Line filter	27	By pass valve	40	Pressure switch(Option)
14	Safety valve				

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5. TIGHTENING TORQUE OF MAJOR COMPONENT

No	Items		Size	kgf · m	lbf · ft
1	Engine	Engine mounting bolt(2EA)	M20×2.5	57.9±8.7	419±62.9
2		Engine mounting bolt(Bracket)	M12×1.75	10.7±1.6	77.4±11.6
3		Radiator mounting bolt	M16×2.0	29.7±4.5	215±32.5
4		Fuel tank mounting bolt	M16×2.0	29.7±4.5	215±32.5
5		Air cleaner mounting bolt(4EA)	M 8×1.5	2.5±0.5	18.1±3.6
6		Air cleaner mounting bolt(Bracket)	M12×1.75	12.3±2.5	89.0±18.1
7	Hydraulic system	Main pump housing mounting bolt	M12×1.75	12.8±3.0	92.6±21.7
8		Main control valve mounting bolt	M12×1.75	12.8±3.0	92.6±21.7
9		Steering unit mounting bolt	M10×1.5	6.9±1.4	49.9±10.1
10		Priority valve	M 8×1.25	2.5±0.5	18.1±3.6
11		Brake valve mounting bolt	M 8×1.25	2.5±0.5	18.1±3.6
12		Fan and brake pump mounting bolt	M10×1.5	6.9±1.4	49.9±10.1
13		Cut-off valve mounting bolt	M12×1.75	12.8±3.0	92.6±21.7
14		Remote control lever mounting bolt	M 6×1.0	1.1±0.2	8.0±1.4
15		Pilot supply unit mounting bolt	M 8×1.25	2.5±0.5	18.1±3.6
16		Safety valve	M 8×1.25	2.5±0.5	18.1±3.6
17		Hydraulic oil tank mounting bolt	M16×2.0	29.7±4.5	215±32.5
18	Power train system	Transmission mounting bolt(Bracket, front)	M20×2.5	57.9±8.7	419±62.9
19		Transmission mounting bolt(Bracket, rear)	M16×2.0	18.4±2.0	133±14.5
20		Front axle mounting bolt, nut	M24×2.0	100±15	723±109
21		Rear axle support mounting bolt, nut	M24×2.0	100±15	723±109
22		Tire mounting nut(20.5-25 16PR, L3)	M22×1.5	70±2.0	506±15
23		Drive shaft joint mounting bolt	3/8-24UNF	6.0±0.8	43.4±5.8
24	Others	Counterweight mounting bolt, nut	M30×2.0	199±29.9	1439±216
25		Operator's seat mounting bolt	M 8×1.25	3.4±0.8	24.6±5
26		ROPS Cab mounting bolt(4EA)	M24×3.0	27.5±2.5	199±18.1

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GROUP 1 SAFETY HINTS

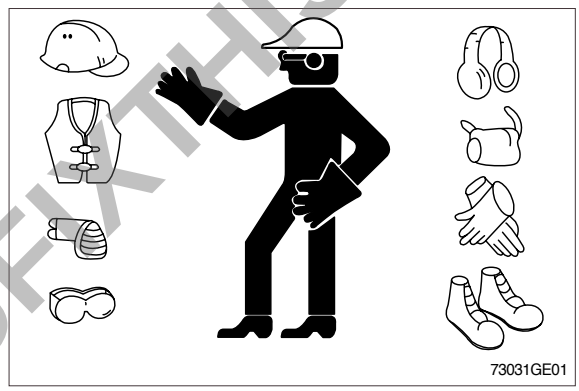
FOLLOW SAFE PROCEDURE

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



WEAR PROTECTIVE CLOTHING

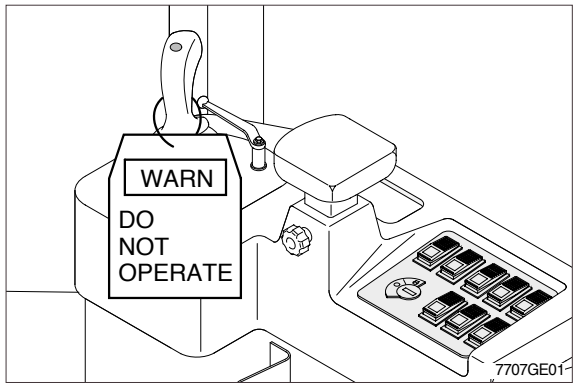
Wear close fitting clothing and safety equipment appropriate to the job.



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.

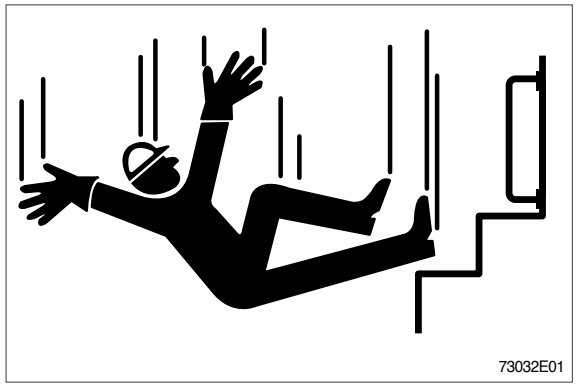


USE HANDHOLDS AND STEPS

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

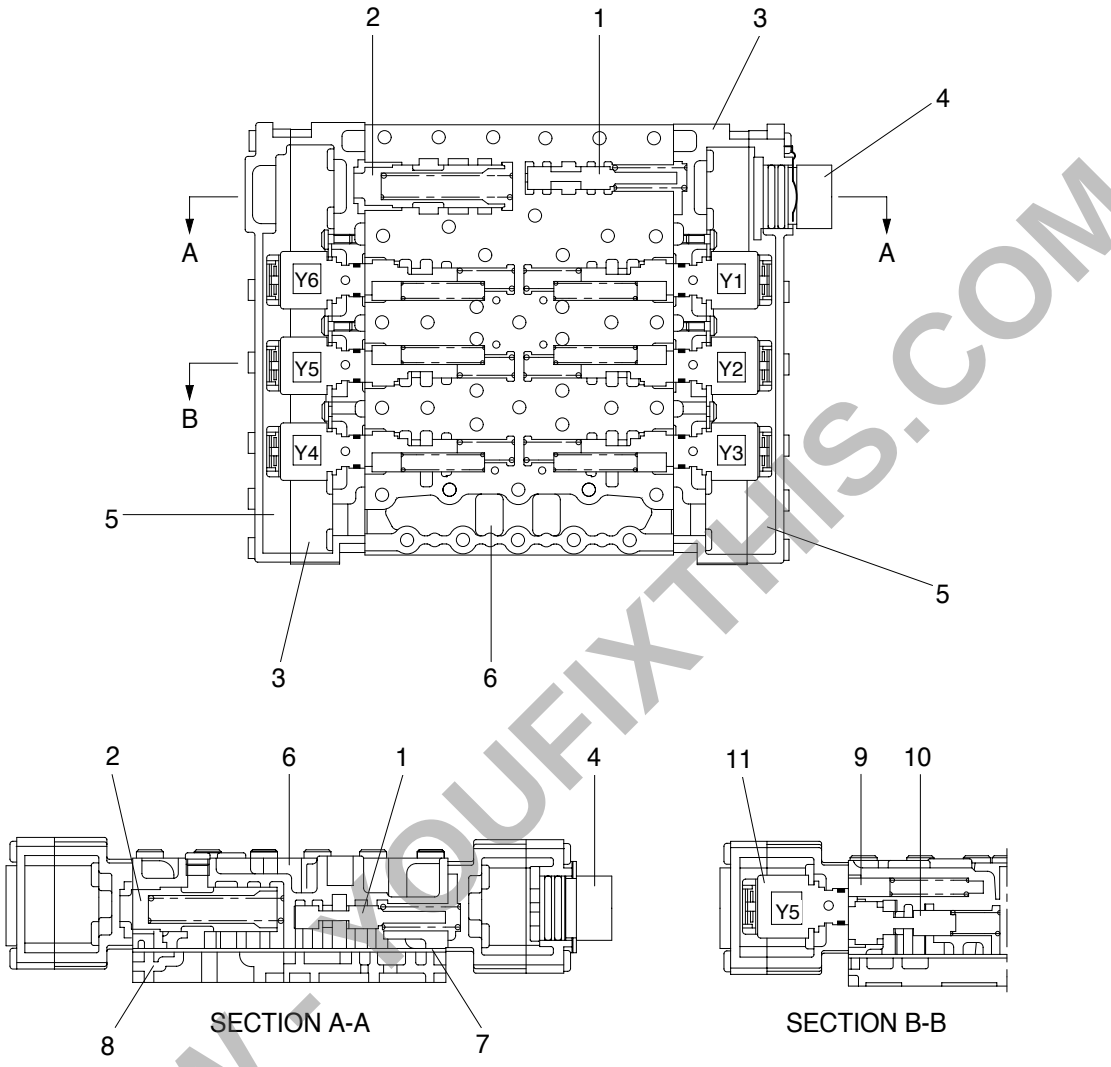
1kg = 2.2046lb

	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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4) ELECTRO-HYDRAULIC SHIFT CONTROL WITH PROPORTIONAL VALVE



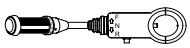
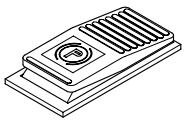
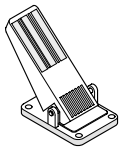
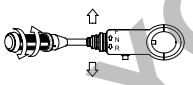
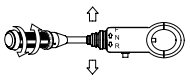
1 Pressure reducing valve(9bar)
2 System pressure valve(16+2bar)
3 Housing
4 Cable harness
5 Cover
6 Valve block
7 Intermediate sheet
8 Duct plate
9 Oscillation damper
10 Follow-on slide
11 Pressure regulator

Transmission control see schedule of measuring points, hydraulic schematic and electro-hydraulic control unit at page 3-2, 3-14 and 3-78.

The six clutches of the transmission are selected through the 6 proportional valves P1 to P6. The proportional valve(Pressure regulator-unit) consists of pressure regulator(e.g. Y1), booster valve oscillation damper.

The pilot pressure of 9 bar for the control of the follow-on slides is created by the reducing valve. The pressure oil (16+2bar) is directed through the follow-on slide to the corresponding clutch.

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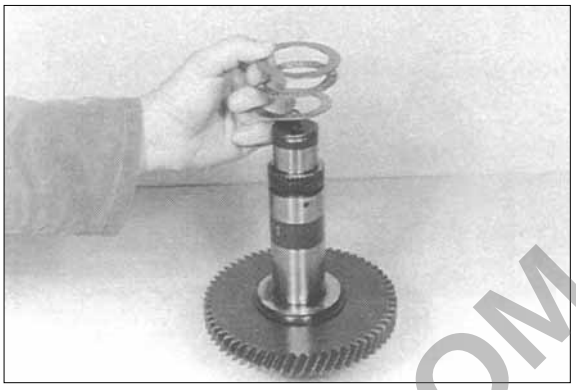
Item	Description	Service action
	LOOK/FEEL : Transmission must shift to former(2nd or 3rd or 4th) gear. **NOTE** : If gear selector lever kick down switch or RCV lever switch is pressed twice, transmission will shift down the immediately back to former gear.	
Forward, reverse and 4th speed clutch pack drag check ※ **Transmission must be warmed up for this check.** Engine running.	  	Park unit on level surface. Apply service brakes. Move gear selector lever to neutral. Move gear selector lever to 1st. Release parking brake and service brakes. Run engine at low idle. **LOOK** : Unit must not move in either direction. **NOTE** : If unit moves forward, either the forward pack or the 4th speed pack is dragging.	**OK** Check completed. **NOT OK** If unit moves, repair transmission.
Transmission shift modulation check Engine running.		Run engine at approximately 1300rpm. Put transmission in 1st forward, shift several times from forward to reverse and reverse to forward. Repeat check in 2nd gear. **LOOK** : Unit must slow down and change direction smoothly.	**OK** Check completed. **NOT OK** Go to unit shifts too fast, chapter 2 in this group.
Torque converter check		Start engine. Apply service brakes and release parking brake. Move gear selector lever to 3rd speed. Move gear selector control lever to forward "F" position. Increase engine speed to high idle. **LOOK** : Torque converter stall rpm must be within the following range. Stall rpm : 2240±70rpm Move gear selector control lever to neutral "N" position and run for 15 seconds.	**OK** Check completed. **NOT OK** If stall rpm are too low or too high, problem may be engine power or torque converter. **IF OK** Replace transmission torque converter.

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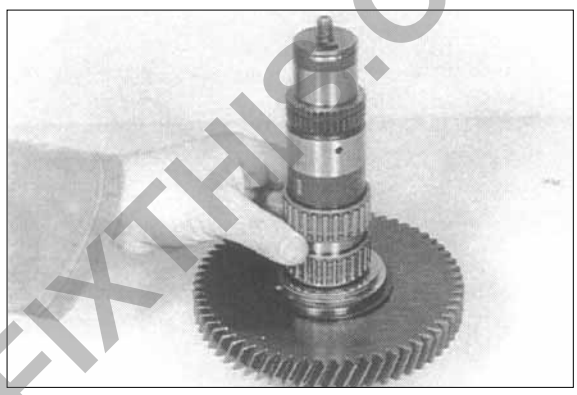
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¤ Assemble both axial washers as well as needle cage.

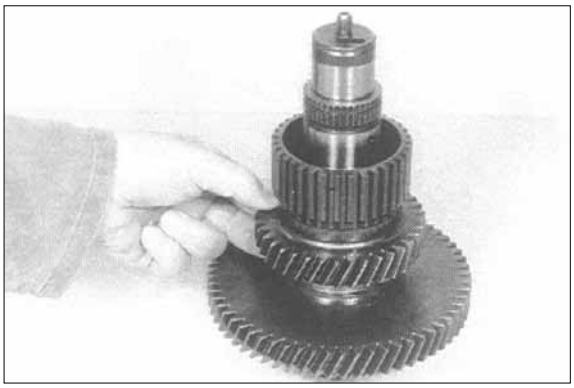
¡ Upper and lower axial washer have the same thickness(50¡¿70¡¿1).



¤ Assemble both needle bearings.

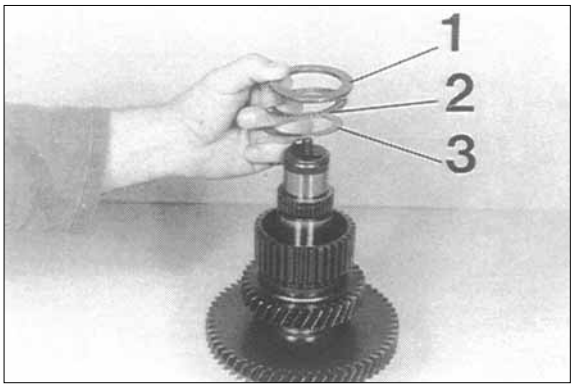


¤ Assemble idler gear.



¤ Assemble axial washer 3(50¡¿70¡¿1) needle cage 2 and running disk 1(50¡¿70¡¿4).

¡ Install running disk 1 with the chamfer facing the needle cage.

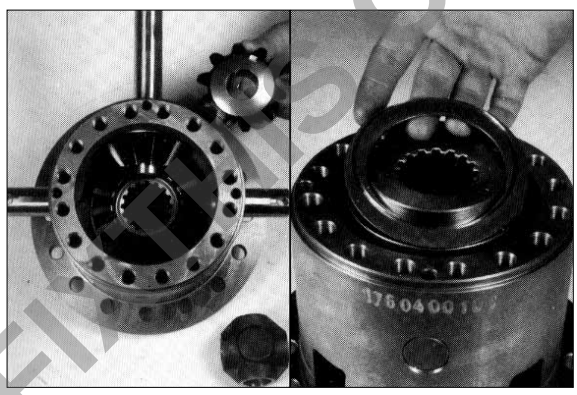


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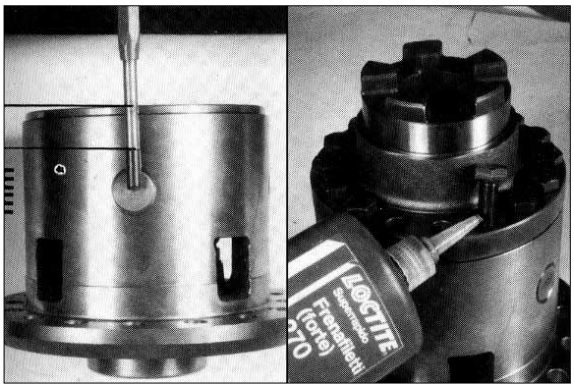
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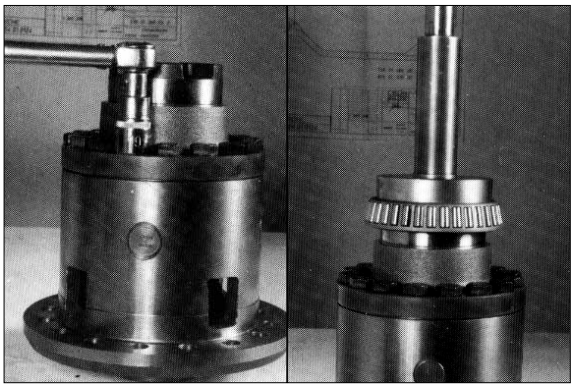
(2) Mounting sun wheels and planet gears.



(3) Insert the spring pins half way up the pin.



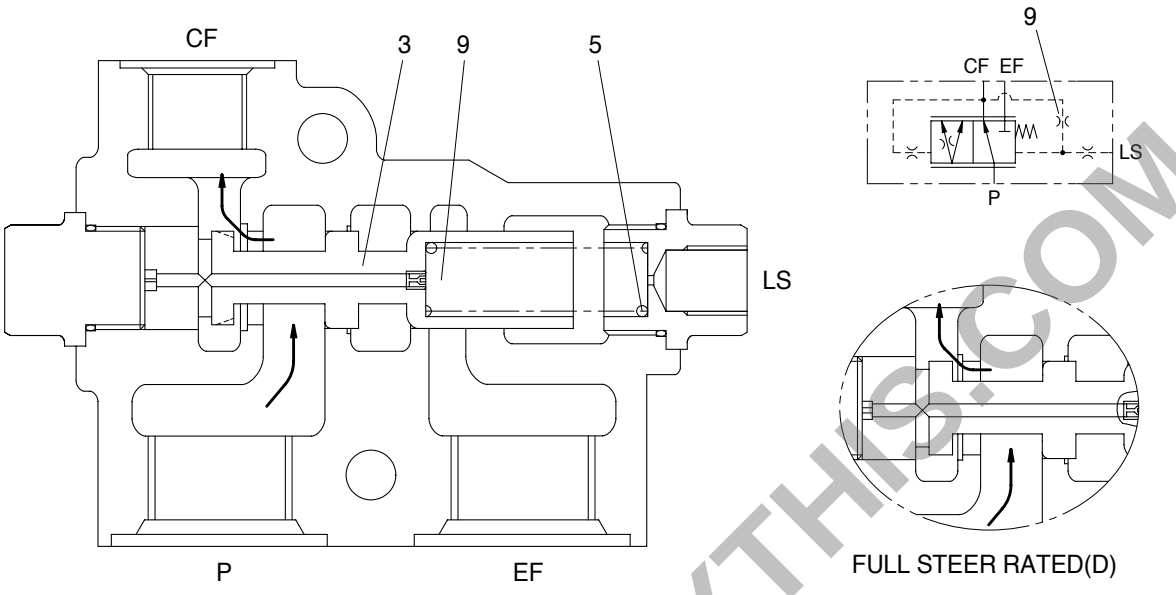
(4) Torque all bolts M12¡¿35¡¿1.25-10K and M12¡¿30¡¿1.25-10K with a torque wrench bolts clamping torque 13.8~14.1kgf¡/m(100~102lbf¡/ft).
Use loctite 270.



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(2) Midturn



When the machine is steered, load sensing pressure from the steering valve flows through the orifices LS port in the priority valve. Load sensing pressure plus spring(5) force move the spool(3) to the against the pilot pressure on the left end of the spool. This restricts flow to the loader through the EF port while the CF port is opened to the steering valve.

The load sensing circuit is control circuit that routes steering workport pressure to the spring side of the priority valve spool. It allows the priority valve spool to sense the pressure that is required to steer the unit under varying conditions.

During normal steering conditions, oil is entered into the load sensing circuit through an orifice in the steering valve. When steering at the full steer rate(D), the orifice opens to an unrestricted passage. At low engine speed, the spool will shift to the full left position, directing all flow to the steering valve. At high idle, the steering system can use about one-half of the pump flow. Therefore, the excess oil flows to the main control valve.

The load-sensing circuit receives the majority of its flow from the load sensing orifice in the steering valve. Some flow is also supplied from the CF port through orifice(9) in the priority valve spool.

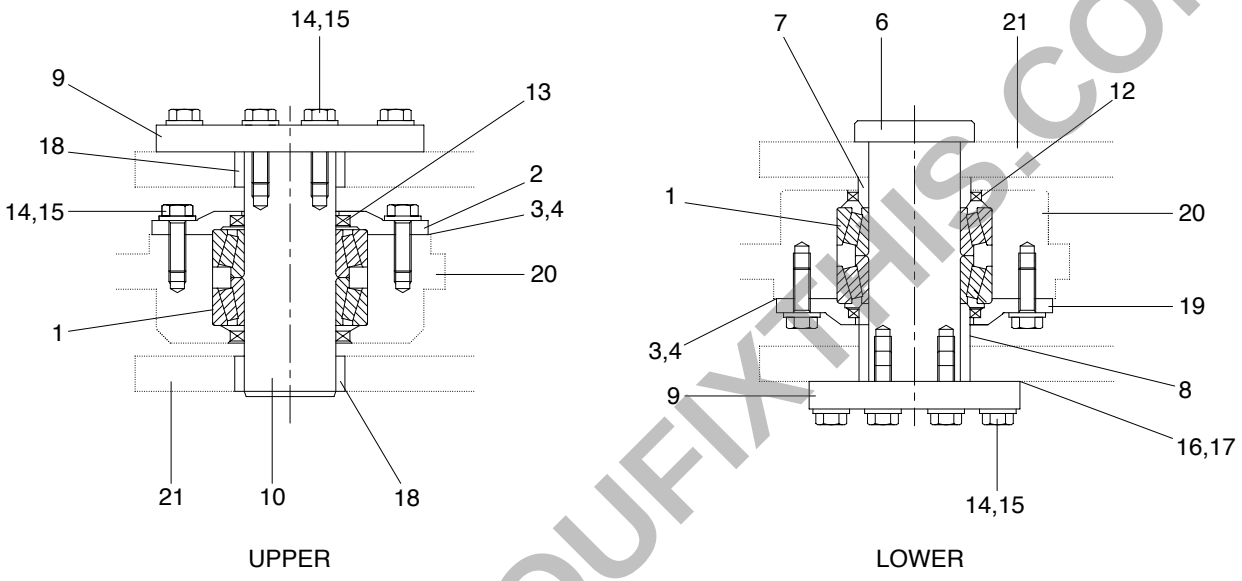
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5. CENTER PIVOT PIN

1) CONSTRUCTION

Figure shows the construction of the center pivot pin assembly. This assembly serves to connect the front frame with the rear frame; two sets of assemblies are provided, one each for the upper and lower parts. The numbers in parentheses following the parts name denote the item numbers shown in the figure in the disassembly and assembly procedures.



1	Bearing	9	Plate	16	Shim(0.1T)
2	Retainer	10	Pin	17	Shim(0.5T)
3	Shim(0.1T)	12	Seal	18	Bushing
4	Shim(0.5T)	13	Seal	19	Retainer
6	Pin	14	Hexagon bolt	20	Front frame
7	Collar	15	Hardened washer	21	Rear frame
8	Collar				

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※ **Followings are general precautions for the hydraulic system and equipment.**

1) Every structure has its limit of strength and durability. The relief valve is installed to limit the pressure on the hydraulic equipment and protect various parts of the wheel loader from possible damage. Therefore, never change the preset pressure of the relief valve unless absolutely necessary.

2) Since the hydraulic equipment is built with precision, the presence of only the slightest amount of dust and/or other particles in the hydraulic circuit might cause wear and/or damage, resulting in unstable functions and/or damage, resulting in unstable functions and/or unexpected accidents. Therefore, always keep hydraulic oil clean. Periodically, check the filter in the return circuit and replace the element as necessary.

3) Extract about 200cc of hydraulic oil from the tank as a sample every 6 months. If possible, have it analyzed by a specialist to confirm that the oil can still be used. Never extract the oil for sampling until the oil temperature has become the normal operating temperature. Since the replacement period varies depending on operating conditions, refer to **Operator's manual** and change oil.

4) Should the equipment get damaged due to the presence of metal particles and/or foreign matter in the circuit drain out the hydraulic oil and carry out flushing. Also, replace the filter element and clean the hydraulic tank. Change the hydraulic oil entirely.

5) When checking the filter, if found metal particles in the element, drain out the hydraulic oil entirely, flush the whole circuit, and then fill with new oil. The presence of metal particles may indicate internal damage to the equipment. In such a case, check carefully before flushing, and repair or replace as required.

6) To add and/or change the hydraulic oil, always use recommended oil.(Refer to the list of recommended oils and lubricants at page 1-24, **Recommended lubricants**.) Never mix oil of different makes of kinds.

7) To change the hydraulic oil, use a clean vessel and funnel for pouring it into the tank. Never use cloth because it might cause the presence of lint in the circuit.

8) When removing the hydraulic equipment, be sure to put plugs or caps on hoses, tube lines and ports. Also, enter mating marks for later identification.

9) Disassemble and/or assemble the hydraulic equipment only in a clean place free of dust. When disassembling, be careful about the interchangeability of parts, and clean the disassembled parts with pure and clean mineral cleansing oil. Clean the internal passages as well. After the parts have dried, wipe them off with a clean lint-free cloth.

10) When overhauling the hydraulic equipment replace all O-rings, backup rings, etc. with new ones. Assemble O-rings with grease or vaseline applied.

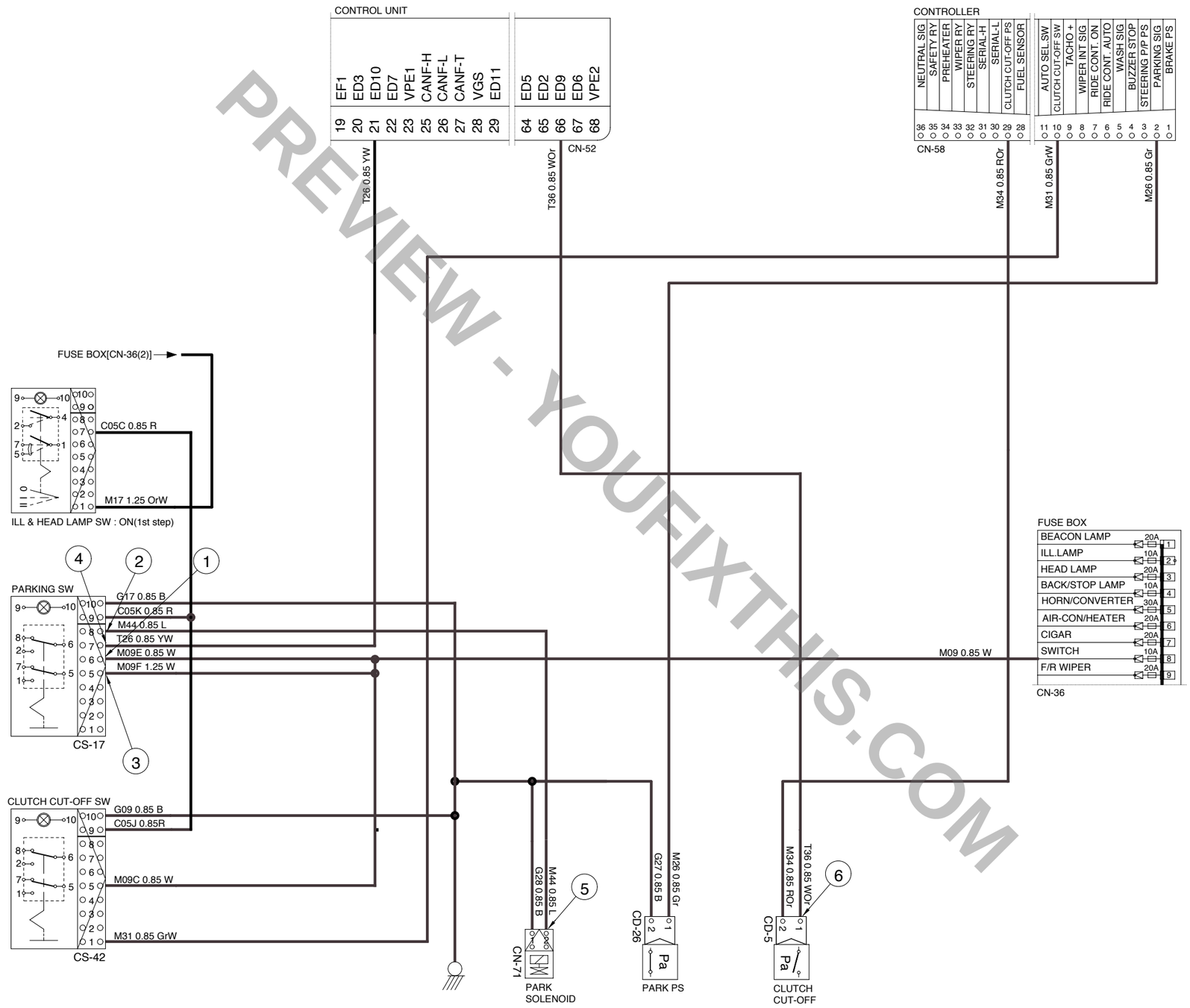
11) After installing the equipment, add more hydraulic oil to make up for that lost during disassembly.

12) Tighten joints correctly. Loose joints will cause the hydraulic oil to leak. If the oil leaks, the tank oil level drops and air gets sucked in, so the pump will break down. Also loose joints in suction lines will take air in and might cause abnormal noise, malfunction or damage to pumps.

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ELECTRIC PARKING, DECLUTCH CIRCUIT



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