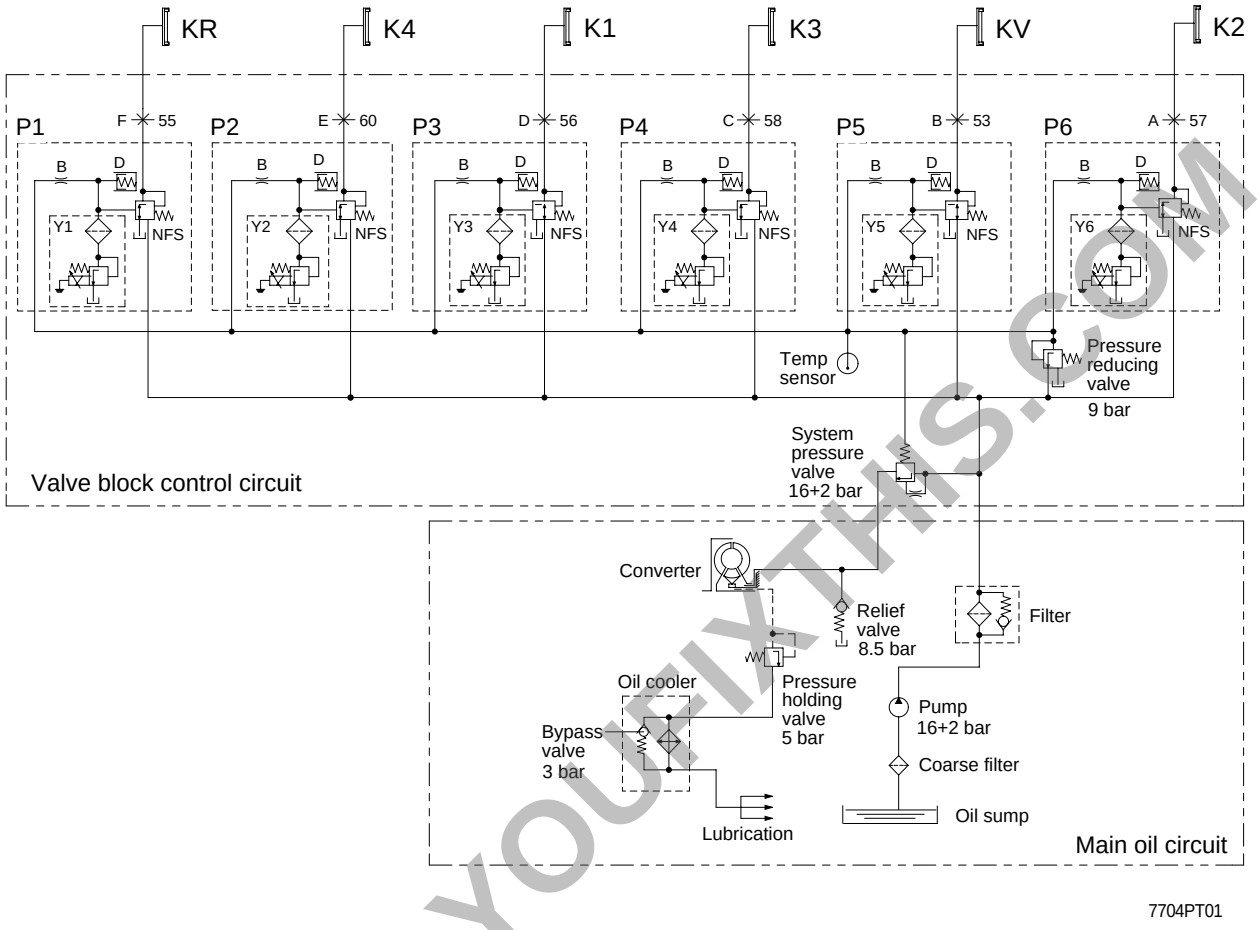
Fault code No.	Reason	Effect(only when fault code is active)
488	Intake manifold temperature signal indicates intake manifold temperature is above the minm-um engine protection limit.	Power derate and possible engine shutdown if engine protection shutdown feature is enabled.
489	Auxiliary device speed signal on pins 8 and 18 of the OEM harness is out of range of the ECM threshold.	Lose ability to control the speed of the auxiliary device.
493	ECM has detected a circuit failure on the injection control valve certifier circuit.	Slight loww of performance.
497	Error detected in the multiple unit synchronizat-ion control switch input, pins 24 and 38 of the OEM harness.	Multiple unit synchronization feature will be disabled.
515	High voltage detected at the auxiliary +5 VDC sensor supply voltage pin 49 of the engine harness.	Auxiliary device will **not** function.
516	Low voltage detected at the auxiliary +5 VDC sensor supply voltage pin 49 of the engine harness.	Auxiliary device will not function.
524	Error detected on the high speed governor droop selection switch in put pin 24 of the engine harness.	Operator can not select alternate high speed governor droop. Normal droop is used.
527	Error detected in the dual output driver "A" circuit pin 5 of the machine harness.	The device being controlled by the dual output driver "A"signal will **not** function properly.
528	Error detected on the torque curve selection switch input pin 39 of the machine harness.	Operator can not select alternate torque curves. Normal torque curve is used.
529	Error detected in the dual output driver "B" circuit pin 1 of the engine harness.	The device being controlled by the dual output driver "B" signal will **not** function properly.
539	Open circuit failure of the injection control valve transorb pin 6 of the engine harness.	Low power, possible ECM damage.
551	Idle validation signals on pins 25 and 26 of the machine harness indicate voltage detected simultaneously on both pins.	Engine will only idle.
599	Software has initiated an engine shutdown based on machine sensor inputs	Engine will shutdown.
768	Error detected in the output device driver(VGT or transmission shift modulation signal) signal pin 21 of the machine harness.	Can not control the VGT or transmission, depend-ing on application.
779	OEM switch signal at pin 16 of the engine harness indicates engine protection condition.	Power derate and possible engine shutdown if engine protection shutdown feature is enabled.

※ Some fault codes are not applied to this machine.

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HYDRAULIC CIRCUIT



NFS	Follow-on slide	P3	Proportional valve clutch K1
D	Oscillation damper	P4	Proportional valve clutch K3
B	Orifice	P5	Proportional valve clutch KV
P1	Proportional valve clutch KR	P6	Proportional valve clutch K2
P2	Proportional valve clutch K4	Y1~Y6	Pressure regulator valve with filter

Speed	Forward				Reverse			Neutral	Engaged clutch	Positions on the valve block	Current No. of the measuring points
	1	2	3	4	1	2	3				
Y1					X	X	X		KR	F	55
Y2				X					K4	E	60
Y3	X				X				K1	D	56
Y4			X	X			X		K3	C	58
Y5	X	X	X						KV	B	53
Y6		X				X			K2	A	57
Engaged clutch	K1,KV	KV,K2	KV,K3	K4,K3	KR,K1	KR,K2	KR, K3		-	-	-

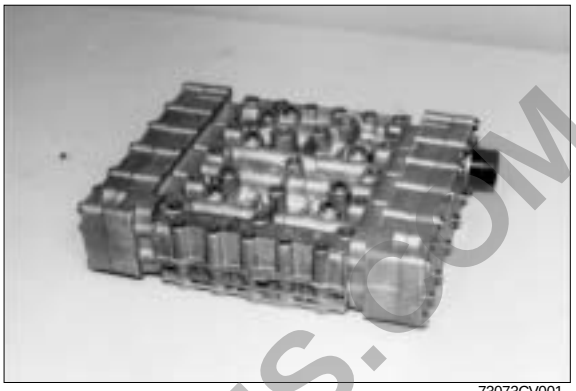
X : Pressure regulator under voltage

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1. CONTROL VALVE

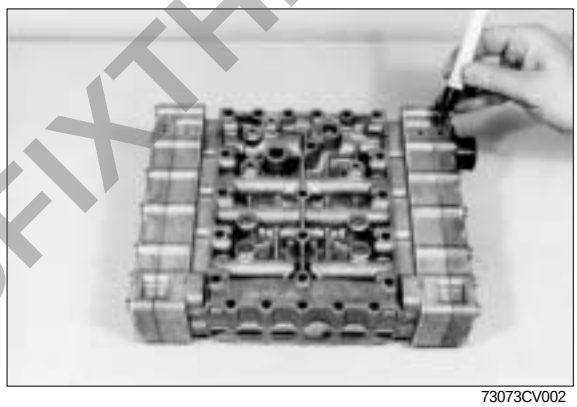
1) DISASSEMBLY

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



73073CV001

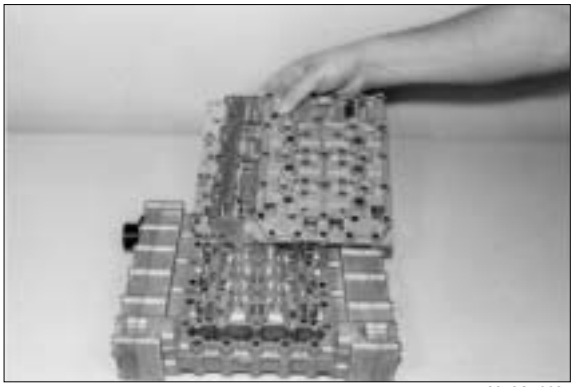
(2) Mark the installation position of the different covers, the housing and cable harness with the valve housing.



73073CV002

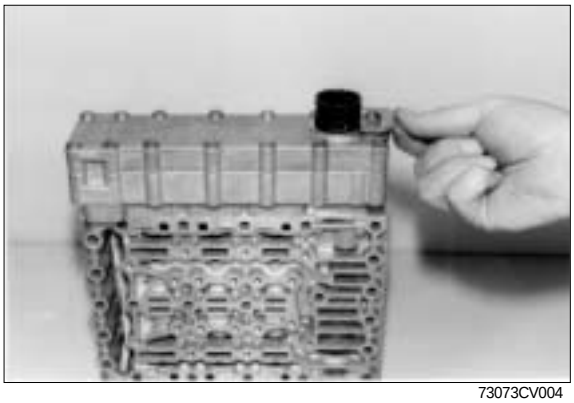
(3) Loosen socket head screws.
Separate duct plate, 1st gasket, intermediate plate and 2nd gasket from the valve housing.

※ Special tool
Box spanner 5873 042 002



73073CV003

(4) Remove retaining clip.



73073CV004

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5. TIGHTENING TORQUE OF MAJOR COMPONENT

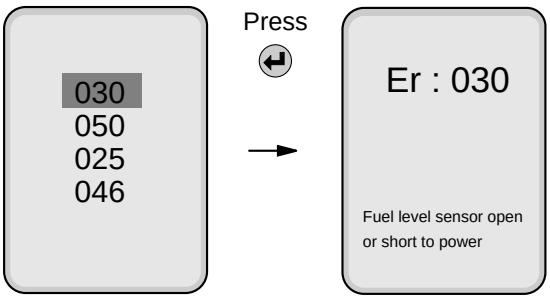
No	Items		Size	kgf · m	lbf · ft
1	Engine	Engine mounting bolt(6EA)	M24×2.0	100±15	723±109
2		Engine mounting bolt(Bracket, rear 8EA)	M12×1.75	10.7±2.1	77.4±15.2
3		Engine mounting bolt(Bracket, front 8EA)	M16×2.0	19.4±3.0	140±32.5
4		Radiator mounting bolt	M16×2.0	29.7±4.5	215±32.5
5		Fuel tank mounting bolt	M16×2.0	29.7±4.5	215±32.5
6		Air cleaner mounting bolt	M12×1.75	12.3±2.5	89.0±18.1
7	Hydraulic system	Main pump housing mounting bolt	M16×2.0	29.7±4.5	215±32.5
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		Flow amplifier mounting bolt	M10×1.5	6.9±1.4	49.9±10.1
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	M20×2.5	69±9.0	499±65.1
18	Power train system	Transmission mounting bolt	M20×2.5	46.3±7.0	335±50.6
19		Torque converter housing mounting bolt	M10×1.5	4.6±0.7	33.3±5.1
20		Front axle mounting bolt, nut	M30×2.0	199±29.9	1439±216
21		Rear axle support mounting bolt, nut	M36×3.0	308±46.2	2228±334
22		Tire mounting nut	M22×1.5	79±2.5	571±18
23		Drive shaft joint mounting bolt	1/2-20UNF	15.5±0.5	112±3.6
24	Others	Counterweight mounting bolt	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)	M27×2.0	124	900

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(2) Machine fault codes

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	
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	
	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	

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

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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.)

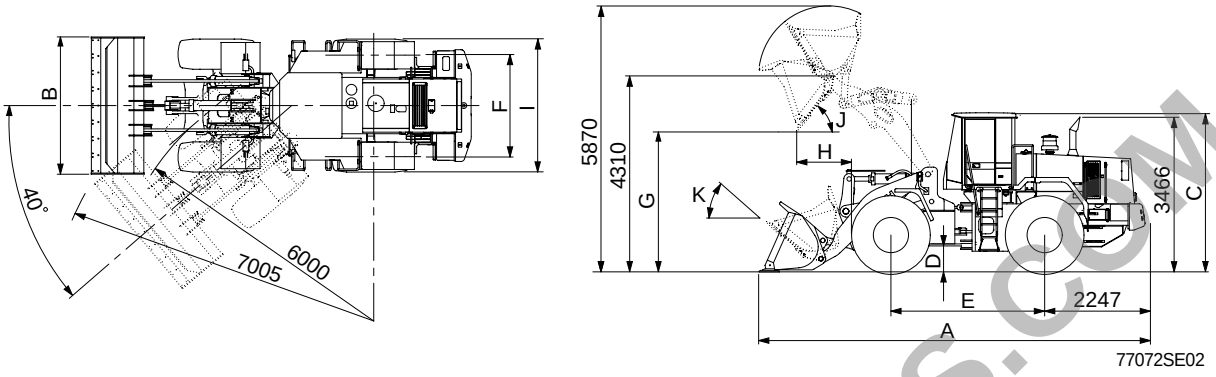
Problem	Cause	Remedy
Transmission slippage	Low oil level.	Add oil.
	Wrong oil grade.	Change oil.
	Restricted transmission pump suction screen.	Remove and clean screen.
	Leak in transmission control valve or gasket.	Remove valve and inspect gaskets.
	Low transmission pump flow due to worn pump.	Do transmission 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 3-20~3-46.

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2. SPECIFICATIONS

1) WITHOUT TOOTH AND CUTTING EDGE TYPE BUCKET



Description			Unit	Specification
Operating weight			kg(lb)	22800(50270)
Bucket capacity		Struck	$m^3(yd^3)$	3.4(4.5)
		Heaped		3.9(5.1)
Overall length		A	mm(ft-in)	8530(28' 0")
Overall width		B		3100(10' 2")
Overall height		C		3550(11' 8")
Ground clearance		D		505(1' 8")
Wheelbase		E		3440(11' 3")
Tread		F		2300(7' 7")
Dump clearance at 45°		G		3194(10' 6")
Dump reach(Full lift)		H		1226(4' 0")
Width over tires		I		2975(9' 9")
Dump angle		J	Degree (°)	48
Roll back angle(Carry position)		K		49
Cycle time		Lift(With load)	sec	5.7
		Dump(With load)		1.4
		Lower(Empty)		2.8
Maximum travel speed			km/hr(mph)	38(23.7)
Braking distance			m(ft-in)	12(39' 4")
Minimum turning radius(Center of outside tire)				6(19' 8")
Gradability			Degree (°)	30
Travel speed	Forward	First gear	km/hr(mph)	7.4(4.6)
		Second gear		12.3(7.7)
		Third gear		26.3(16.4)
		Fourth gear		38.0(23.7)
	Reverse	First gear		7.4(4.6)
		Second gear		12.3(7.7)
		Third gear		26.3(16.4)

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Group 2 Operational Checks and Troubleshooting ---------- 5-18
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Group 4 Disassembly and Assembly ---------- 6-62

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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. Brake system and clutch cut off checks

- Park brake capacity check ㅇ ㅇ _____
- Park brake transmission lockout check ㅇ ㅇ _____
- Service brake pump flow check ㅇ ㅇ _____
- Service brake capacity check ㅇ ㅇ _____
- Brake accumulator precharge check ㅇ ㅇ _____
- Brake system leakage check ㅇ ㅇ _____
- Service brake pedal check ㅇ ㅇ _____
- Service and park brake system drag check ㅇ ㅇ _____
- Clutch cut off check ㅇ ㅇ _____

5. Driving checks

- Transmission oil warm up procedure ㅇ ㅇ _____
- Transmission noise check ㅇ ㅇ _____
- Speedometer check ㅇ ㅇ _____
- Transmission kick down system check ㅇ ㅇ _____
- 1st, 2nd, 3rd and 4th speed clutch pack drag check ㅇ ㅇ _____
- Transmission pressure, pump flow and leakage check ㅇ ㅇ _____
- Transmission shift modulation check ㅇ ㅇ _____
- Torque converter check ㅇ ㅇ _____
- Engine power check ㅇ ㅇ _____

6. Hydraulic system checks

- Hydraulic system warm up procedure ㅇ ㅇ _____
- Hydraulic pump performance check ㅇ ㅇ _____
- Pilot control valve boom float check ㅇ ㅇ _____
- Boom down solenoid valve check ㅇ ㅇ _____
- Control valve lift check ㅇ ㅇ _____
- Bucket rollback circuit relief valve check ㅇ ㅇ _____
- Bucket dump circuit relief
  Low pressure check ㅇ ㅇ _____
  High pressure check ㅇ ㅇ _____
- Boom and bucket cylinder drift check ㅇ ㅇ _____
- Boom down solenoid valve leakage check ㅇ ㅇ _____
- Pilot controller check ㅇ ㅇ _____
- Return to dig check ㅇ ㅇ _____
- Boom height kickout check-if equipped ㅇ ㅇ _____

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(5) DEFINITION OF OPERATING MODES

① **Normal**

There's no failure detected in the transmission system or the failure has no or slight effects on transmission control. TCU will work without or in special cases with little limitations.(See following table)

② **Substitute clutch control**

TCU can't change the gears or the direction under the control of the normal clutch modulation.
TCU uses the substitute strategy for clutch control. All modulations are only time controlled. (Comparable with EST 25)

③ **Limp-home**

The detected failure in the system has strong limitations to transmission control. TCU can engage only one gear in each direction. In some cases only one direction will be possible.
TCU will shift the transmission into neutral at the first occurrence of the failure. First, the operator must shift the gear selector into neutral position.
If output speed is less than a threshold for neutral to gear and the operator shifts the gear selector into forward or reverse, the TCU will select the limp-home gear.
If output speed is less than a threshold for reversal speed and TCU has changed into the limp-home gear and the operator selects a shuttle shift, TCU will shift immediately into the limp-home gear of the selected direction.
If output speed is greater than the threshold, TCU will shift the transmission into neutral. The operator has to slow down the vehicle and must shift the gear selector into neutral position.

④ **Transmission-shutdown**

TCU has detected a severe failure that disables control of the transmission.
TCU will shut off the solenoid valves for the clutches and also the common power supply(VPS1).
Transmission shifts to neutral. The park brake will operate normally, also the other functions which use ADM1 to ADM8.
The operator has to slow down the vehicle. The transmission will stay in neutral.

⑤ **TCU-shutdown**

TCU has detected a severe failure that disables control of system.
TCU will shut off all solenoid valves and also both common power supplies(VPS1, VPS2). The park brake will engage, also functions are disabled which use ADM 1 to ADM 8.
The transmission will stay in neutral.

※ **Abbreviations**

OC : Open circuit
SC : Short circuit
OP mode : Operating mode
TCU : Transmission control unit
EEC : Electronic engine controller
PTO : Power take off

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Reversings in the speeds 3 and 4 are realized dependent on the driving speed.

- Above the programmed reversing limit, the machine is braked down by downshifts of the electronic control unit(EST-37A) to the permitted driving speed, and only then, the reversing into the correspondingly preselected speed will be carried out.
- Below the permitted driving speed, the reversing is carried out immediately.

(4) Specific kickdown function

By means of the kickdown-button, integrated in the gear selector, it is at any time possible to select in the speeds 2F and 2R(i.e. position 2 of the gear selector, at automatic mode also in the 2nd speed of the automatic range) the 1st speed by a short touch. This kickdown state can be cancelled by :

1. Pressing the kickdown-button again
2. Realization of a reversal operation
3. Change of the gear selector position by the following modification
   Gear selector(DW-3) - (Rotation) of the driving position 1···4.

The kickdown function will be always terminated by shifting to neutral.

(5) Clutch cut off

Especially at wheel loaders, the clutch cut off can be activated through a switch signal. It is interrupting the power flow in the transmission as long as this signal is active. Besides, this function can be used for the transmission-neutral shifting at applied hand brake or as **emergency-stop**(In this case, a restarting is only possible through the gear selector-neutral position).

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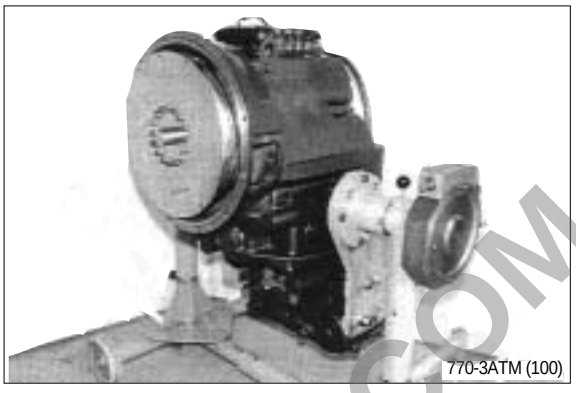
2. GEARBOX

1) DISASSEMBLY

Fasten transmission on assembly car.

※ Special tool

Assembly car	5870 350 000
Clamping bracket	5870 350 071


770-3ATM (100)

Disassemble complete shift control, remove pressure lines and duct plate.

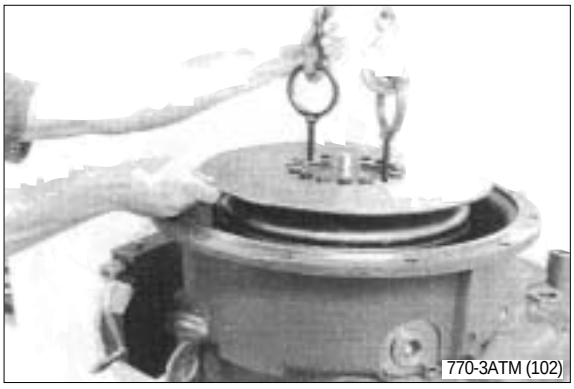

770-3ATM (101)

(1) Converter-input

① Separate torque converter from transmission, using lifting device.

※ Special tool

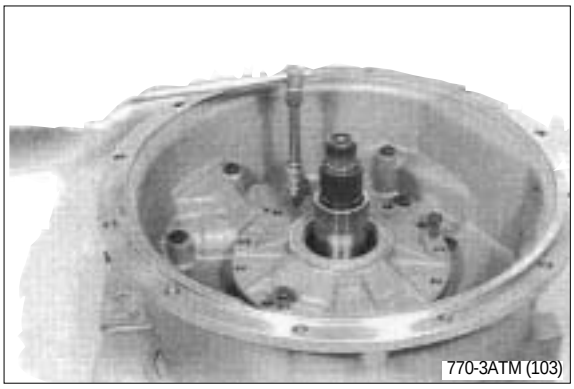
Set of eye bolts	5870 240 002


770-3ATM (102)

② Loosen screw connection.
Separate bearing cover from converter bell, using forcing screws(3EA).

※ Special tool

Forcing screws(M10)	5870 204 005


770-3ATM (103)

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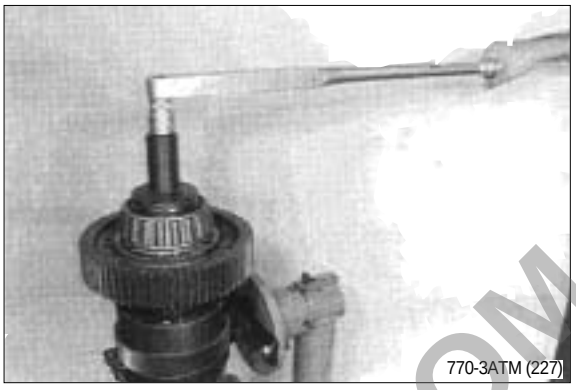
Tilt clutch 180° (K3 side).

Wet thread of the slotted nut with loctite (Type No.262) and install slotted nut with the chamfer showing downward.

· Torque limit : 82kgf · m(800Nm)

※ Special tool

Hook spanner 5870 401 110



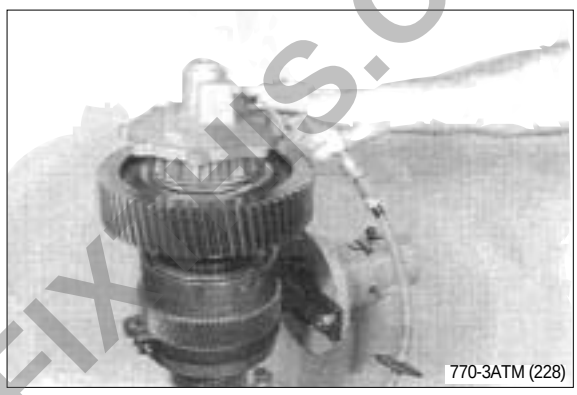
770-3ATM (227)

Check function of the clutches by means of compressed air

For this purpose, squeeze rectangular rings in, engage them and assemble bearing cover.

※ At correctly installed components, the closing, respectively opening of the clutches is clearly audible.

Now, remove bearing cover again.



770-3ATM (228)

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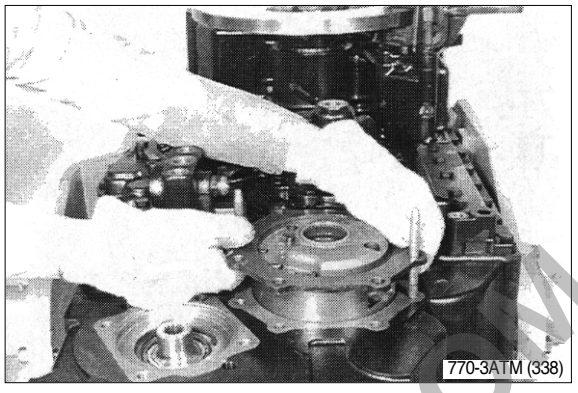
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(4) Install two adjusting screws and introduce pump until contact is obtained.

※ Pay attention to the radial installation position.

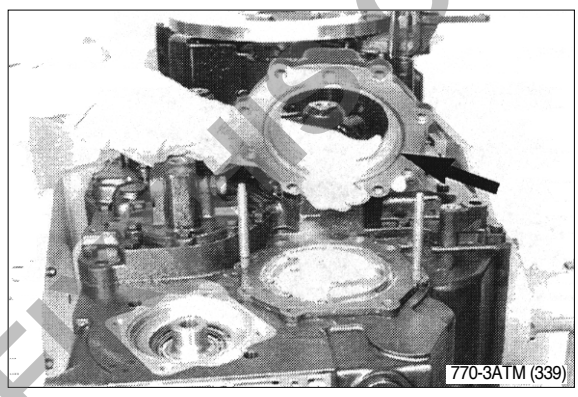
※ Special tool

Adjusting screw 5870 204 021


770-3ATM (338)

(5) Install O-ring(Arrow) and fasten pump flange, respectively pump by means of hexagon head screws.

· Torque limit(M12/8.8) : 8.1kgf · m(79Nm)


770-3ATM (339)

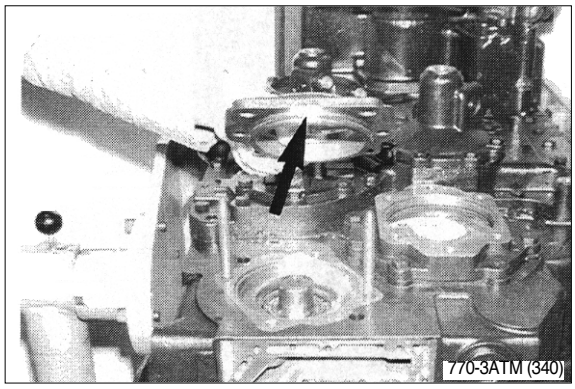
(6) Insert O-ring(Arrow) into the annular groove of the pump flange(Power take-off) and oil it.

Mount two adjusting screws and fasten flange by means of hexagon head screws.

· Torque limit(M14/8.8) : 12.7kgf · m (125Nm)

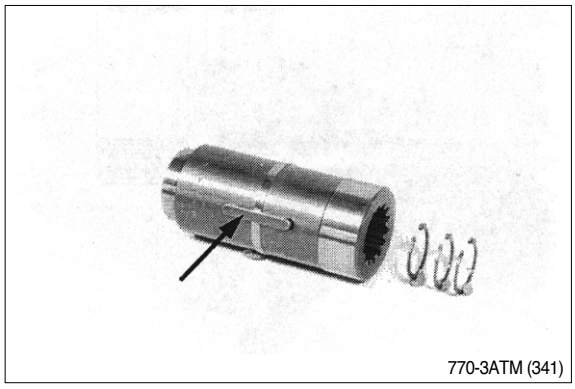
※ Special tool

Adjusting screw 5870 204 022


770-3ATM (340)

8) DRIVE SHAFT(Power take-off pump)

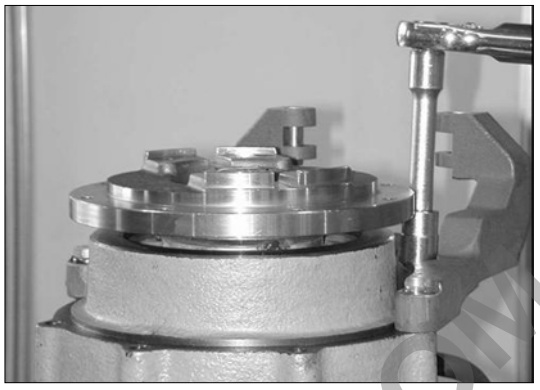
(1) Squeeze V-rings(3EA) into the recess of the driver(Internal gearing). Mount fitting key(Arrow).


770-3ATM (341)

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⑥ Remove the fixed bolts of bracket-caliper.

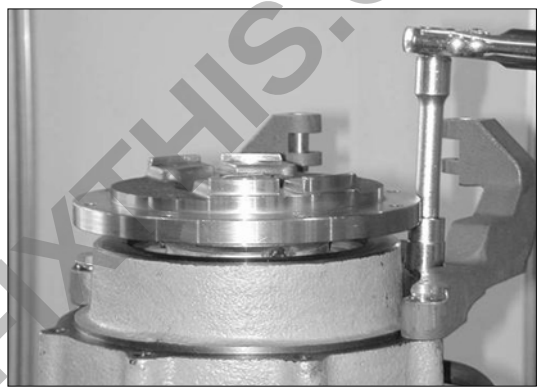


AX027

(2) ASSEMBLY

① Install bracket-caliper.

· Tightening trque
11.4~12.6kgf · m(82.5~91.1lbf · ft)



AX113

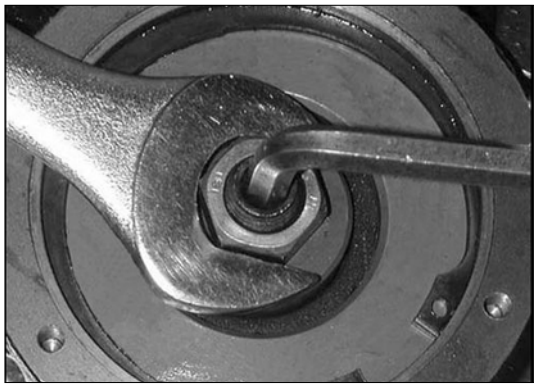
② Fit disc on flange, and tighten bolts.

· Tightening trque
6~7kgf · m(43.4~50.6lbf · ft)



AX114

③ Remove cover and O-ring of caliper, and release nut and pin screw.

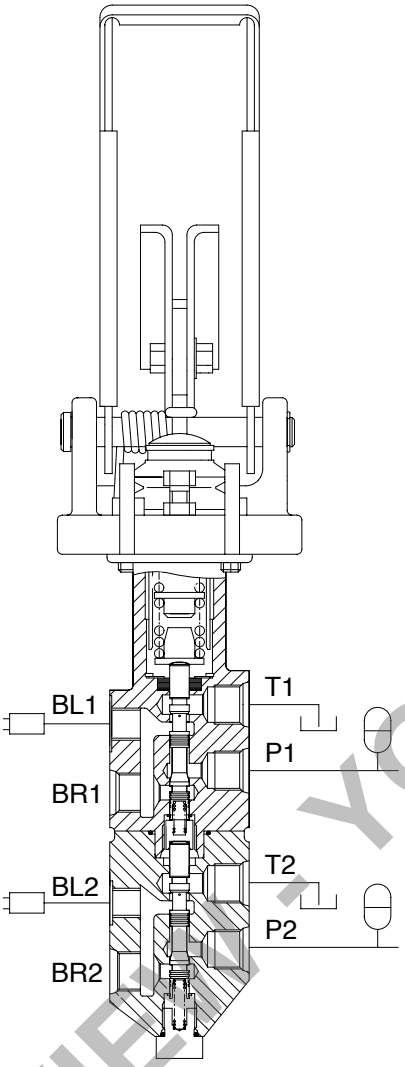


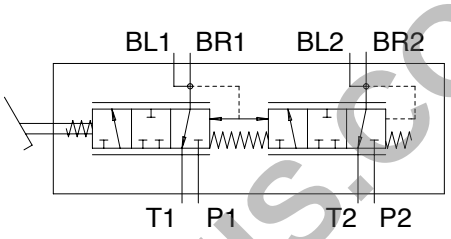
AX115

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2) OPERATION





Hydraulic circuit

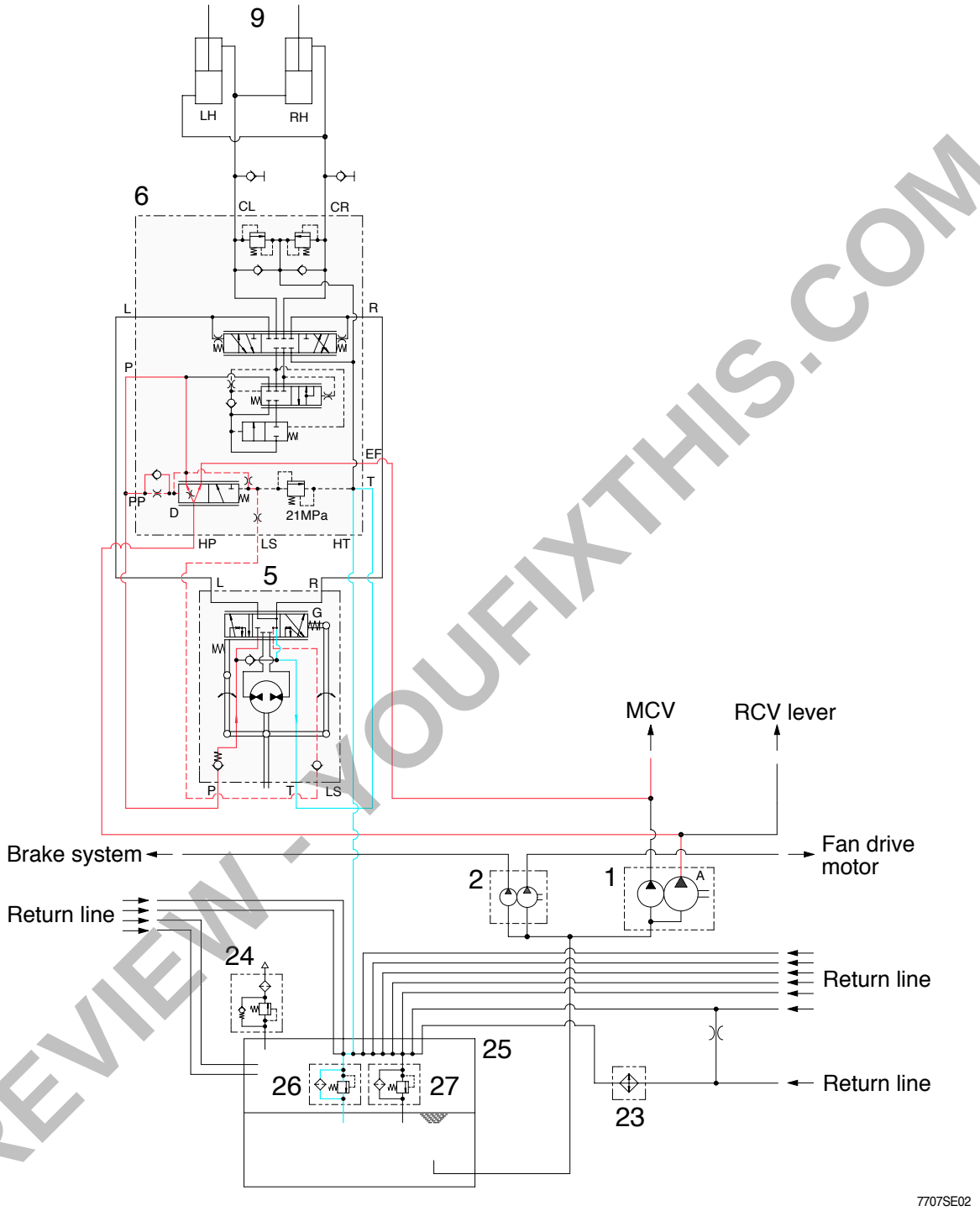
Porte	Port name	Port size
P1, P2	Port	PF3/8
T1, T2	Drain port	PF3/8
BR1, BR2	Brake cylinder port	PF3/8
BL1	Pressure switch port	PF1/4
BL2	Pressure switch port	M12×1.5

7707BS22

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1) NEUTRAL



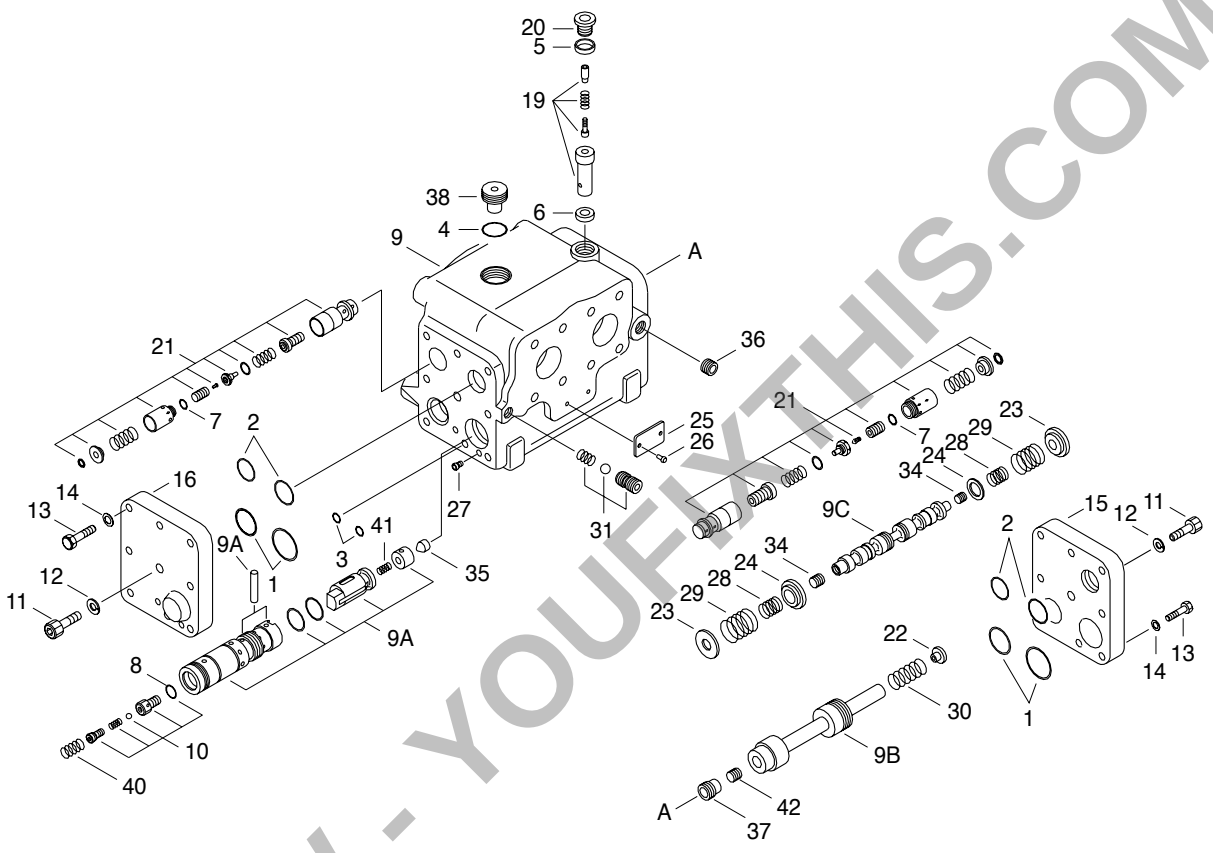
- The steering wheel is not being operated so control spool(G) does not move.
- The oil from the steering pump(A) enters port HP of the priority valve of flow amplifier and the inlet pressure oil moves the spool(D) to the right.
- Almost all of pump flow goes to the loader system(Main control valve) through the EF port and partly flows into the hydraulic tank(25) through the control spool(D).
- This small flow is useful to prevent the thermal shock problem of the steering unit(5).

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1. FLOW AMPLIFIER

1) STRUCTURE



(770-3ATM) 5-36

1	O-ring	12	Spring washer	28	Spring
2	O-ring	13	Screw	29	Spring
3	O-ring	14	Spring washer	30	Spring
4	O-ring	15	End cover	31	Throttle check valve
5	Washer	16	End cover	34	Orifice
6	Washer	19	Relief valve	35	Orifice
7	O-ring	20	Plug	36	Orifice
8	O-ring	21	Shock, suction valve	37	Plug
9	Housing	22	Spring seat	38	Plug
9A	Amplifier valve	23	Spring seat	40	Spring
9B	Priority valve	24	Spring guide	41	Spring
9C	Directional valve	26	Name plate	42	Orifice
10	Check valve	27	Orifice		
11	Screw				

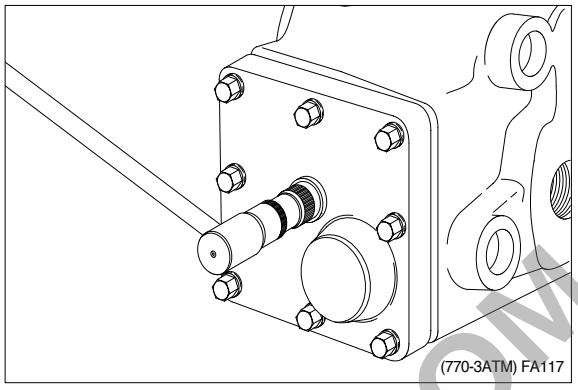
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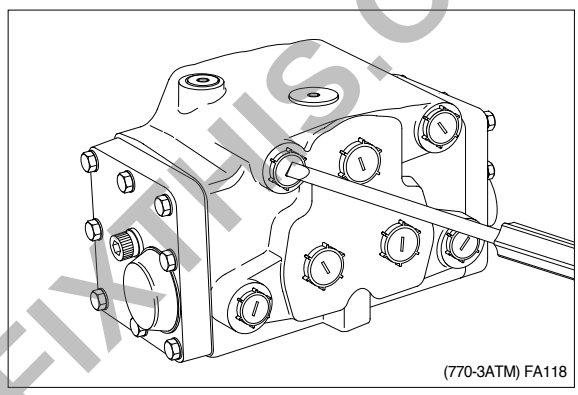
⑧ Fit screws with spring washers.

· Tightening torque : 2.6 ± 0.5kgf · m (18.8 ± 3.6lbf · ft)

· Tightening torque : 8.2 ± 1kgf · m for large screw (59.3 ± 7.2lbf · ft)


(770-3ATM) FA117

⑨ Fit plastic plugs.


(770-3ATM) FA118

This completes assembly.

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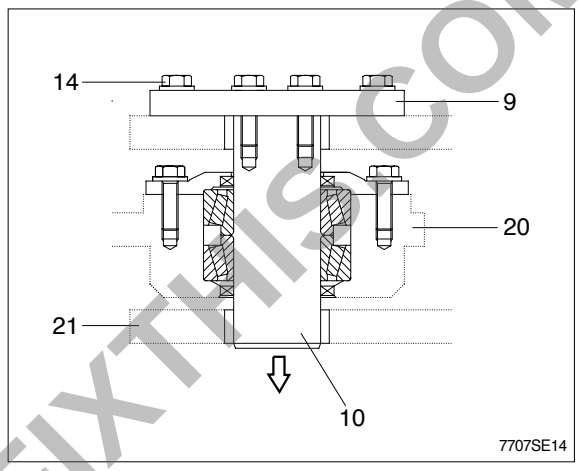
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2) DISASSEMBLY

After supporting the front frame and the rear frame as horizontally as possible using wood blocks and jacks, disassemble as follows: In order to facilitate the disassembly/assembly of the center pivot pins, remove the drive shaft, hydraulic line and steering cylinder first.

(1) Maintain the horizontal level of front frame(20) and rear frame(21), and then remove hexagon bolt(14) and plate(9).

(2) Take out upper pin(10) to the downside using a metal punch.



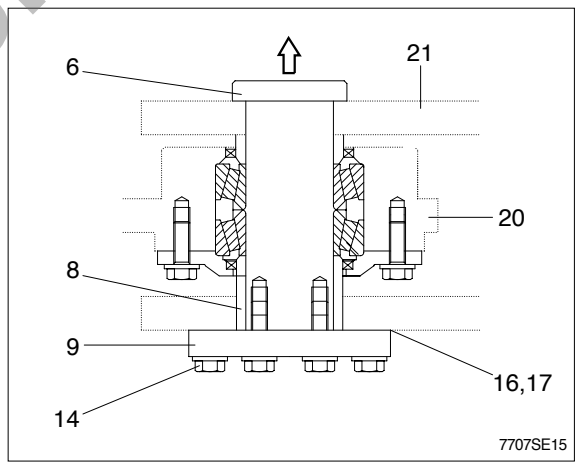
(3) Maintain the front frame horizontal level, remove hexagon bolts(14) and then remove the plate(9) and shims(16,17).

(4) Take out lower pin(6) to the upside using a metal punch carefully.

(5) Jack up or lifting the front frame(20) slightly, the collar(8) protrudes over the rear frame.
Remove the collar(8).

(6) Lift the frame by passing the slinging wire rope at four positions of front frame, in order to separate it from the rear frame.

(7) Support the front frame safely.



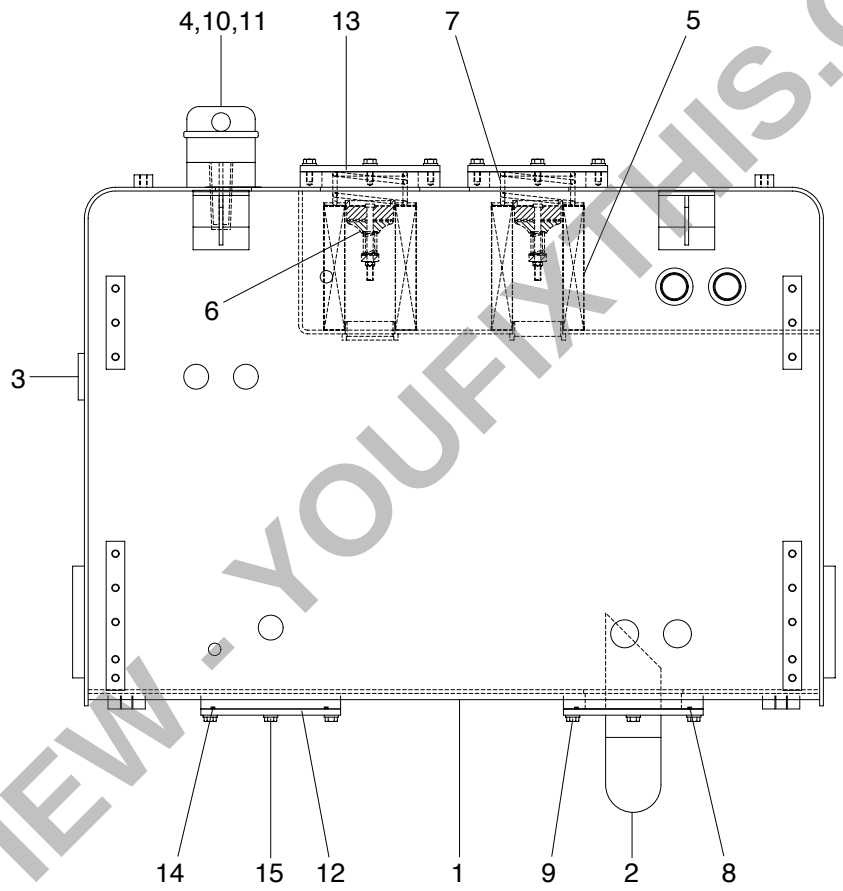
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8. HYDRAULIC OIL TANK

1) STRUCTURE

- The oil from the hydraulic tank is sent from the pump through main control valve to the cylinders. In the return circuit, the oil from various parts merges.
- A part of oil is cooled in the oil cooler, passes through the hydraulic filter and returns to the hydraulic tank(1).
- If the hydraulic return oil filter becomes clogged, return filter bypass valve(6) acts to allow the oil to return directly to the hydraulic tank(1). This prevents damage to the hydraulic filter(5). The bypass valve(6) is also actuated when negative pressure is generated in the circuit.



7707WE19

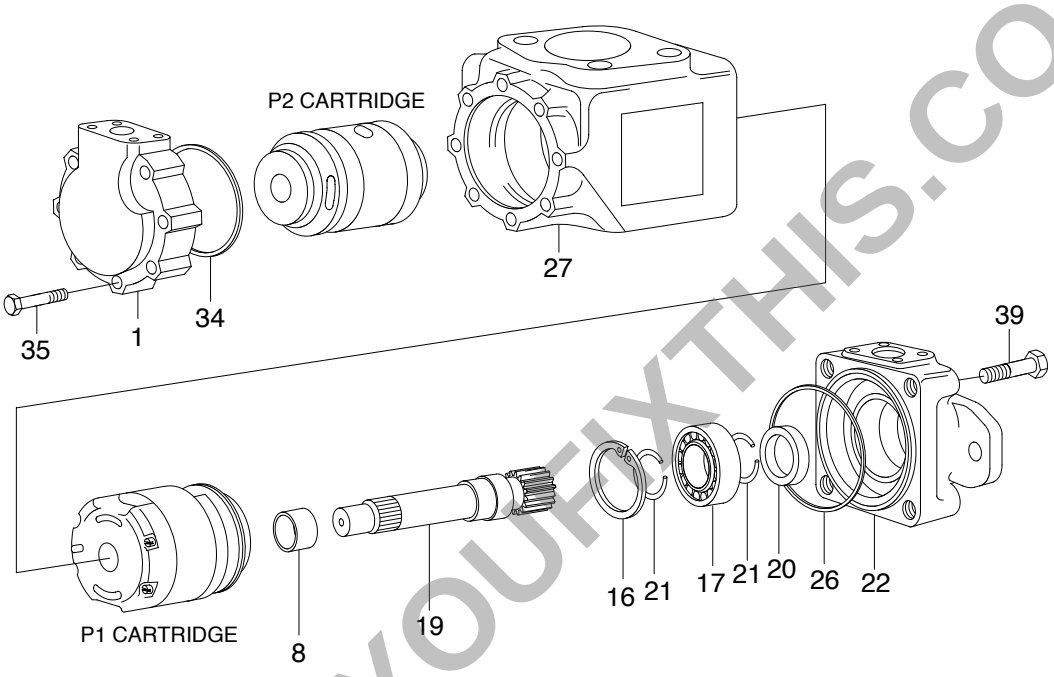
1	Hydraulic tank wa	9	Bolt
2	Pipe wa	10	Retaining ring
3	Sight gauge	11	Strainer
4	Air breather	12	Cover
5	Element assembly	13	Cover
6	By pass valve	14	O-ring
7	Spring	15	Bolt
8	O-ring		

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1. MAIN PUMP

1) STRUCTURE



7707WE28

1	End cap	22	Mounting cap
2	Bushing	26	Section seal
16	Internal snap ring	27	Center housing
17	Ball bearing	34	Section seal
19	Splined shaft	35	Cap screw
20	Shaft seal	39	Cap screw
21	Internal snap ring		

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2. HEAD LIGHT CIRCUIT

1) OPERATING FLOW

Fuse box(No.3) → Head light switch [CS-39(4)] → Light switch ON, 2nd step [CS-39(2)]
→ I/conn [CN-7(7)] → Multi function switch [CS-11(8)]
- → Multi function switch MIDDLE [CS-11(7)] → I/conn [CN-7(6)] → I/conn [CN-10(10)]
  - → LH Head light low beam ON [CL-3(1)]
  - → RH Head light low beam ON [CL-4(1)]
- → Multi function switch DOWN [CS-11(6)] → I/conn [CN-7(5)] → I/conn [CN-10(9)]
  - → LH Head light high beam ON [CL-3(2)]
  - → RH Head light high beam ON [CL-4(2)]
- → I/conn [CN-12(7)]
  - → Cluster high beam pilot lamp ON [CN-51(6)]

2) CHECK POINT

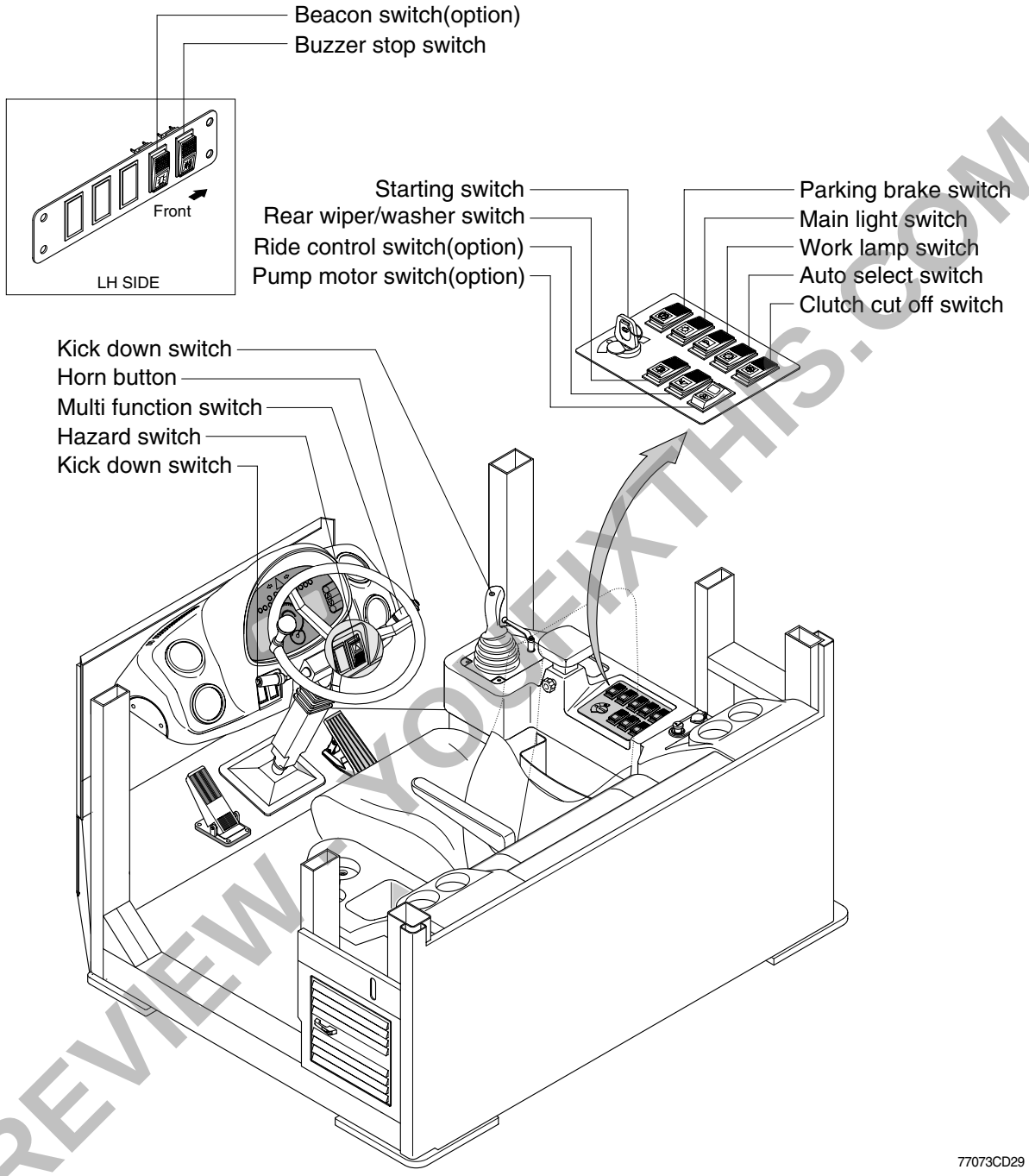
Engine	Key switch	Check point	Voltage
OFF	ON	① - GND (Switch input) ② - GND (Switch output) ③ - GND (Multi function input) ④ - GND (Multi function output) ⑤ - GND (Multi function output) ⑥ - GND (Low beam) ⑦ - GND (High beam) ⑧ - GND (Passing B^+)	20~25V

※ GND : Ground

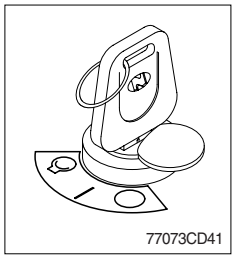
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2. SWITCHES



1) STARTING SWITCH



(1) There are three positions, OFF, ON and START.

- ◯ (OFF) : None of electrical circuits activate.
- | (ON) : All the systems of machine operate.
- ⊘ (START) : Use when starting the engine.
  Release key immediately after starting.

※ **Key must be in the ON position with engine running maintain electrical and hydraulic function and prevent serious machine damage.**

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