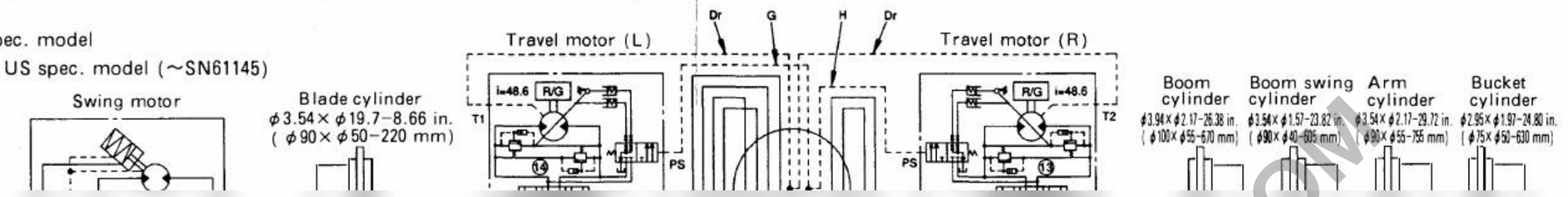
5. HYDRAULIC SYSTEM

5-2 Hydraulic Circuit Schematic (with P.T.O. Selector Valve)

EX spec. model
AS & US spec. model (~SN61145)

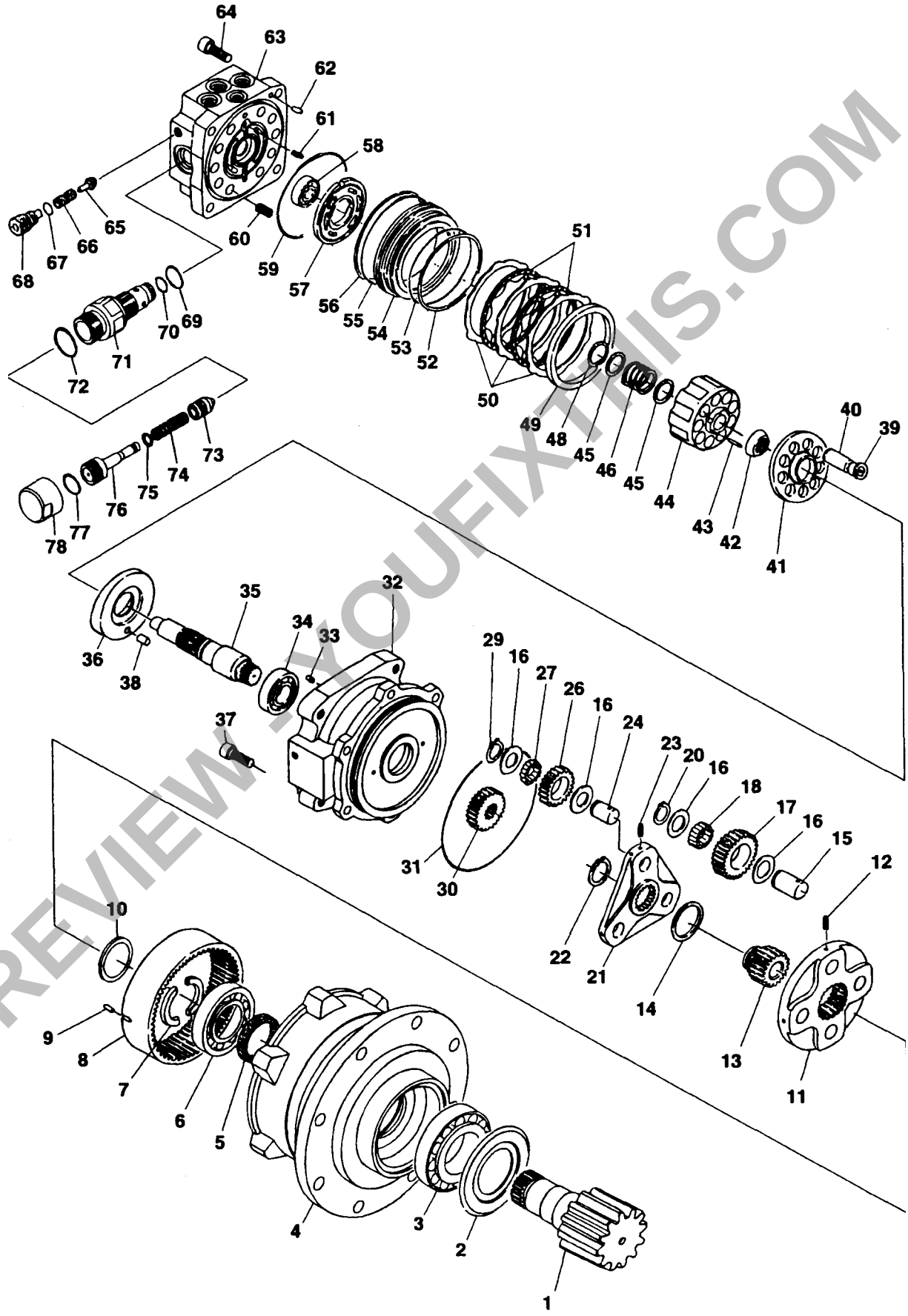


Relief valve pressure setting (Unit : PSI (kPa))

①	3697 (25498)	⑪	2133 (14711)
②	3697 (25498)	⑫	2986 (20595)
③	3413 (23537)	⑬	3271 (22556)
④	3697 (25498)	⑭	3271 (22556)

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3) Exploded view and parts



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3-7 Torque Specifications

3-7-1 Machine

Applicable model		B50-2B (US		
Equipment No.	Tightening part	Thread size	Tightening torque (ft·lbf. (N·m))	Screw locking agent
Engine · Electrical equipment				
1	Engine flexible mount	M16	151.8 to 173.5 (205.8 to 235.2)	Three Bond 1324

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5. Disassembly and Reassembly

1) Precautions for Disassembly and Reassembly

(1) Since the parts of this hydraulic system are precision made for tight clearances, be sure to perform disassembly and reassembly in a clean area that is free from dust.

(2) Prepare clean tools and cleaning oil and handle them carefully.

(3) First clean the external surface of removed assemblies.

(4) Before beginning, review the drawings of the internal construction and prepare the required parts according to the purpose and extent of disassembly.

(5) Never unnecessarily disassemble or readjust the adjusting screws, otherwise, set power changes and causes machine performance.

(6) In principle, seals and rings that have been removed must be replaced with new ones. As some replacement parts are available only in sub-assemblies, refer to the parts catalogue to prepare the necessary sub-assemblies in advance.

(7) O-rings

1. Lubricate the O-ring and the O-ring fitting seat with clean grease or hydraulic oil.
2. O-rings may not be damaged or distorted by heat.
3. Do not permanently deform O-rings.
4. Avoid rolling the O-ring when fitting it. A distorted O-ring may not return to its original shape, and therefore may cause oil leaks.

(8) Before beginning reassembly, check the mating surfaces of each section to be sure that there is no cleaning oil or hydraulic oil present. If reassembly is performed without cleaning this oil, it may be mistaken for oil leakage.

(9) When reassembling, hardwares must be tightened with using the torque wrench.

2) Tools for Disassembly and Reassembly

(Unit : in. (mm))

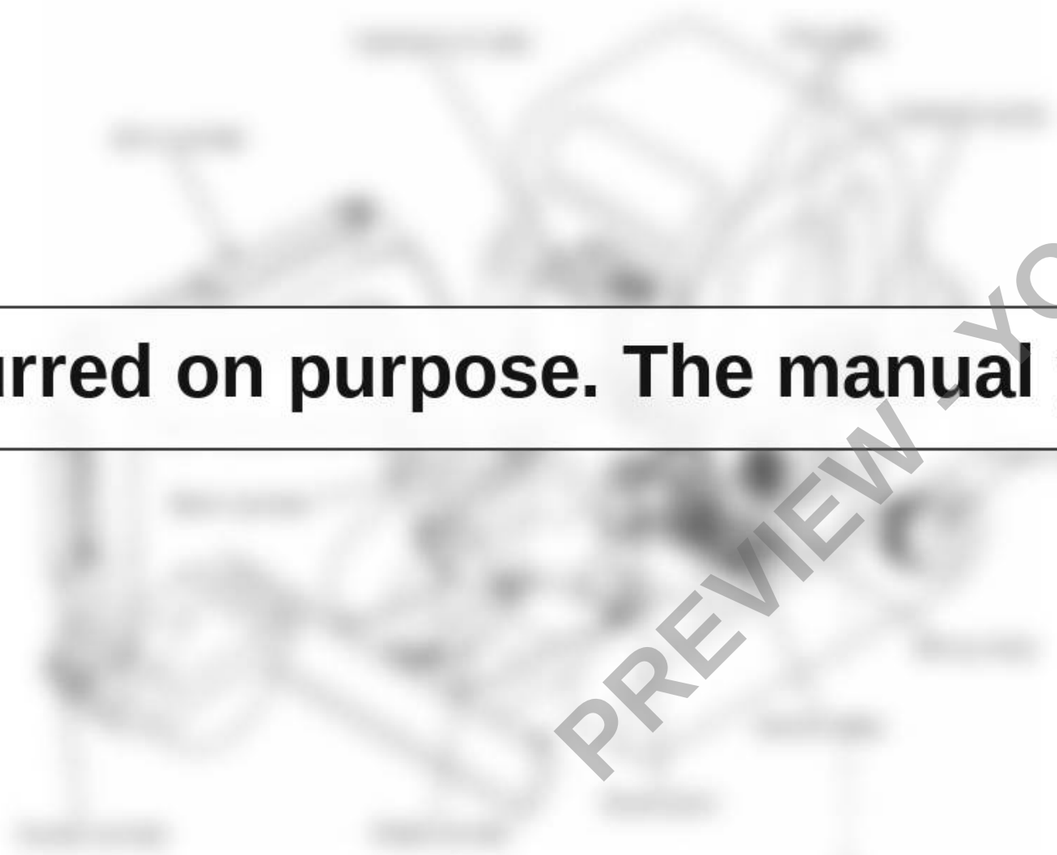
No.	Tools		No.	Tools	
1	Torque wrench	Size 450	13	Adjustable wrench	L=9.8 (250)
2	Torque wrench	Size 230	14	Screwdriver (minus)	B=0.24 to 0.39 (6 to 10)
3	Socket	Hex size 3	15	Snapring pliers	ϕ1.18 (ϕ30) hole
4	Socket	Hex size 4	16	Snapring pliers	ϕ1.57 (ϕ40) hole
5	Socket	Hex size 6	17	Pliers	
6	Socket	Hex size 8	18	Hammer	
7	Socket	Hex size 10	19	Plastic hammer	
8	Allen wrench	Hex size 3	20	Others	Grease
9	Allen wrench	Hex size 4			Hydraulic oil
10	Allen wrench	Hex size 6			Pump holder tool
11	Allen wrench	Hex size 8			
12	Allen wrench	Hex size 10			

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5. HYDRAULIC SYSTEM

5-1 Outline

The hydraulic system consists of the engine, variable displacement piston pumps, gear pump, control valve, boom cylinder, arm cylinder, bucket cylinder, boom swing cylinder, blade cylinder, swing motor, swivel joint, two travel motors, oil cooler and hydraulic oil tank.
The oil discharged from the variable displacement piston pumps and the gear pump flows to the actuators through the control valve.
The hydraulic pilot operation system comprises the pilot pump, cut-off valve mounted on the main hy-



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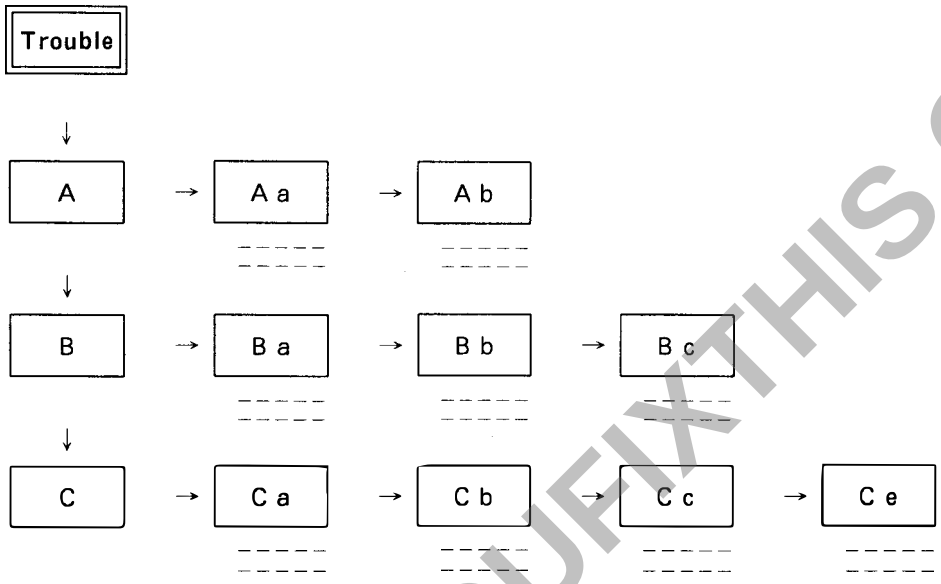
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10. TROUBLESHOOTING

10-2 Troubleshooting

10-2-1 Machine and Engine

(How to use the charts)



Factors related to the trouble are enumerated in the columns and instructions for corrective procedures are given below. It is recommended that the troubles be inspected and corrected one by one according to the chart.

[ ] ← Inspection item

- - - - - - - - - ← Remedy for failure

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2. TECHNICAL DATA

2-1 Specifications

Item			Unit	B50-2B (US
Main Specifications of Machine				
Dimensions				
Overall length (Transportation position)			in. (mm)	215.0 (5460)
Cabin	Overall height	Transportation position	in. (mm)	98.8 (2510)
		Traveling position	in. (mm)	98.8 (2510)
	Overall width	Full machine width	in. (mm)	76.8 (1950)

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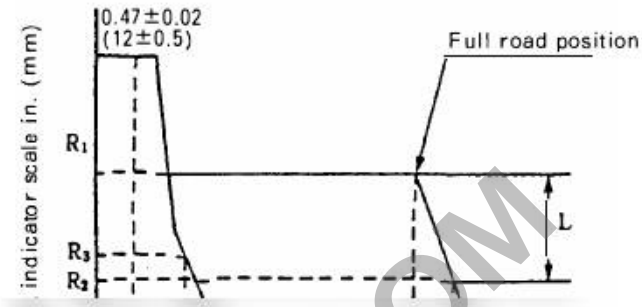
1. Adjustment of governor

(by using a pump tester and referring to the adjustment service data for the standard values)

(1) Adjusting the fuel limit bolt

(Adjusting full load stopper)

1. Set the fuel control lever to the fuel increase position and while keeping the



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3. SERVICING STANDARDS

3-1 Machine Performance

Model					B50-2B (US	
	Item	Measuring condition		Unit	Standard	Wear limit
	Boom speed Max. cylinder extension	Machine position No load	Up		1.8	2.0



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3-2 Engine

(1) Nominal and allowance values

Applicable model			4TNE88-B1VM	
Item		Unit	Standard	Wear limit
Cylinder head				
Cylinder head distortion		in. (mm)	≤0.002 (0.05)	0.006 (0.15)
Valve seat angle	Intake	degrees	120	

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8. List of Periodic Inspection and Servicing

◇:Check ○:Resupply ●:Replace □:Adjust(clean) △:Oil & grease

Check & service items			Daily	Every 50	Every 100	Every 250	Every 500	Every 1000 hrs
General	Check falling off, breakage of parts		◇					
	Check loosened bolts & nuts, retighten		◇					
	Check engine condition		◇					
	Clean		□					
Lube oil	*Swing gear case oil	Check, resupply				○		
		Replace			● 1 st time			●
	Travel reduction gear oil	Check, resupply				○		
		Replace			● 1 st time			●
	*Transmission oil	Check, resupply	◇					
		Replace			● 1 st time			●
	*Differential gear oil	Check, resupply			◇			
		Replace			● 1 st time			●
Hydraulic system	Hydraulic oil	Check, resupply	◇					
		Replace						●
	Clean suction filter					□ 1 st time		□
	Replace return filter					● 1 st time	●	
	Check for abnormality of hydraulic pump		◇					
Grease	Check grease-up positions, grease		△					
	Greasing the swing gears and the swing bearings			△				
Under-carriage	Check, adjust track tension		◇					
	*Check air pressure, wear, flaw in tyres		◇					
Steering equipment	Check performance, play of steering lever		◇					
	Check performance, play of travel lever		◇					
	*Check performance of speed change lever		◇					
	*Check performance of forward/reverse pedal		◇					
	*Check performance, play of steering wheel		◇					
	*Brake pedal	Stroke	◇					
		Performance	◇					
	*Parking brake	Stroke	◇					
		Performance	◇					
	Check performance of accel.level		◇					
Electric equipment	Check front & work lights, horn		◇					
	Check hourmeter function		◇					
	Check function of change, oil and pilot lamps		◇					
	Check wire breakage, short-circuits, loosened terminals, retighten		◇					
	Check, resupply battery fluid		◇					
	Check specific gravity of electrolyte						□ As required	
	Check function of OK monitor		◇					

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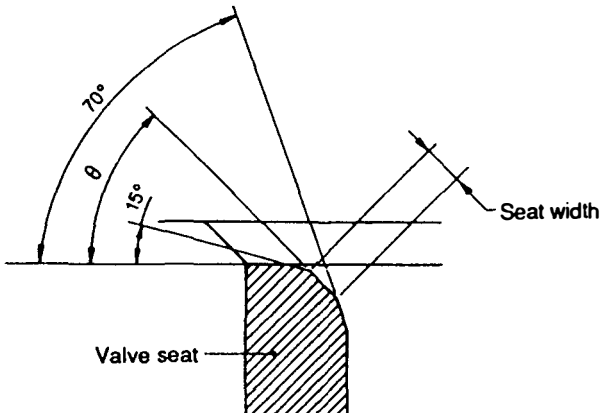
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(Valve seat correction angle)

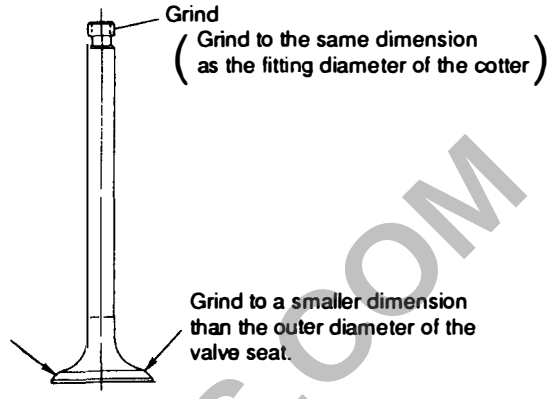
(3) Knead valve compound with oil and finish the valve seat by lapping.

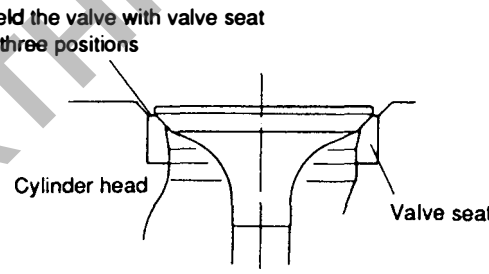
※ *If any valve requires correction, be sure to measure the oil clearance between the valve stem outside dia. and valve guide inside dia. If the oil clearance exceeds the limit, replace the valve or valve guide before correcting the valve seat surface. (For oil clearance between the valve and valve guide, refer to section 3 in this chapter.)*

(4) Finally, lap the valve using only oil.

※ *1. After the valve seat is corrected, thoroughly clean the valve and cylinder head using diesel oil or the like. Thoroughly remove the valve compound or grindstone powder.*

2. For slightly poor contact, take steps (3) and (4).



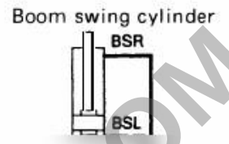


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5-3-5 Boom Swing

To swing the boom to the right, the boom swing pedal is moved to the right. The oil from the piston pump P2 flows through the ports P2 and A5 of the control valve to BSR of the boom swing cylinder to retract its cylinder rod.
The return oil from BSL of the boom swing cylinder flows back to the hydraulic oil tank through the ports B5, T1 and



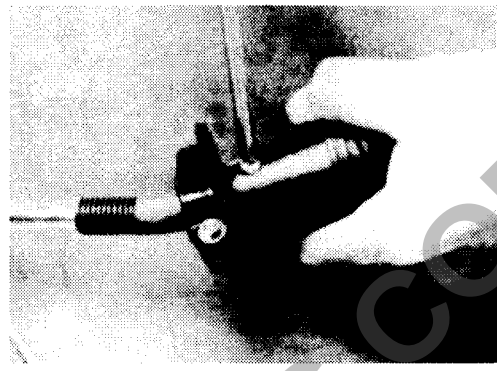
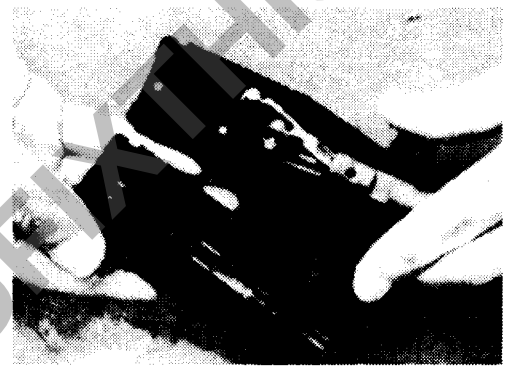
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2) Valve ass'y and relief valve

Trouble	Check	Result	Cause	Remedy
1. Malfunction of valve (Oil does not flow properly.) (Pressure is not stable.)	(1) Check the relief valve.	● Set pressure is low.	● Pressure is not set correctly.	● Set to the specified value.
		● Spool does not work properly.	● Damaged or worn spool	● Replace the valve.
	(2) Check the solenoid-operated directional control valve.	● Voltage does not flow through solenoid.	● Damaged solenoid	● Replace the solenoid.
			● Loose connector	● Connect the connector.
		● Spool does not work properly.	● Clogged spool	● Disassemble and wash the spool, and replace hydraulic oil.
			● Damaged or worn spool	● Replace the valve.
	(3) Check the manual directional control valve.	● Spool does not work properly.	● Clogged spool	● Disassemble and wash the spool, and replace hydraulic oil.
			● Damaged or worn spool	● Replace the valve.
2. Leakage	(1) Check the torque of the bolt.	● Bolt is loosened.	● Improper installation	● Retighten the bolt to the specified torque.
	(2) Check the O-ring and packing.	● O-ring or packing is faulty.	● Damaged O-ring or packing	● Replace the O-ring and packing.
	(3) Check the clamp face of the O-ring and packing.	● Clamp face is faulty.	● Damaged clamp face	● Replace the valve.

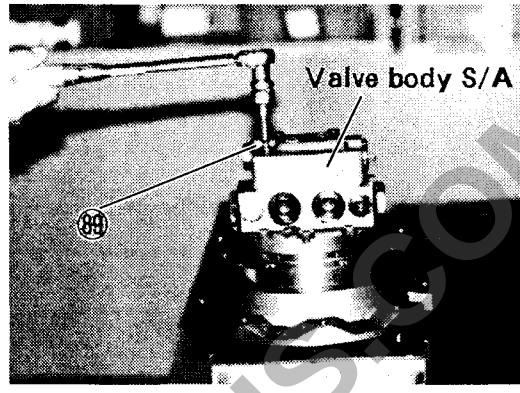
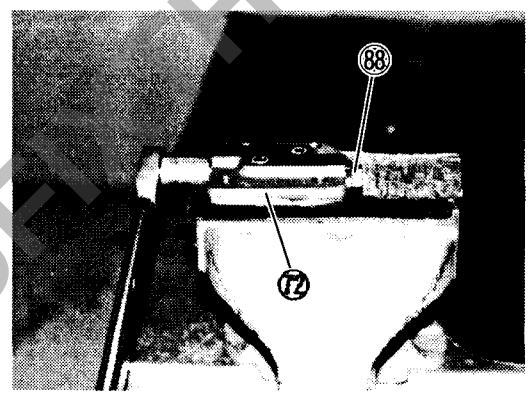
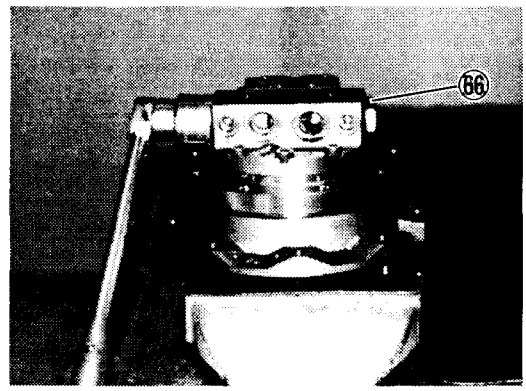
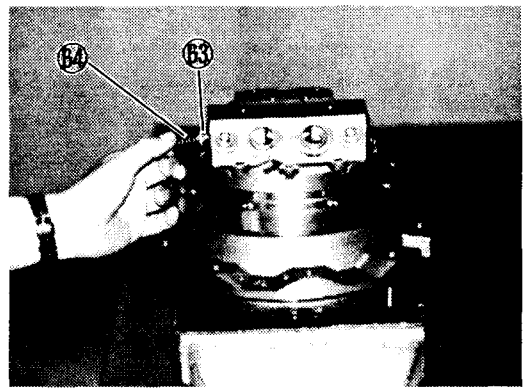
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Procedure	Photo
(19) Loosen the screws 3 (431) and 1 (411) with a plus screwdriver and remove the screw 1 (411), nut (412) and plain washer (413).	
(20) Disassemble the handle (401) into two. ***Note:*** *For the valve with switch, the switch lever (452), switch (455) and switch seats 1 (453) and 2 (454) can be taken out.*	
(21) Cleaning of Parts : 1) Put all parts in rough cleaning vessel filled with kerosene and clean them (rough cleaning) ***Note:*** • *If dirty part is washed with kerosene just after putting it in vessel, it may be damaged. Leave it in kerosene for a while to loosen dust and dirty oil.* • *If the kerosene is polluted, parts may be damaged and the performance of the re-assembled valve may drop.* *Therefore, control cleanliness of kerosene fully.* 2) Put parts in final cleaning vessel filled with kerosene, turning the parts slowly to clean them even to their insides (finish cleaning). Wipe kerosene off the parts with clean waste cloth.	

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3) Disassembly

Procedure	Photo
(1) Fasten the motor by vise. Remove the socket head bolt ⑧⑨ and the valve body S/A . **Tools:** • Torque wrench (2) • Hexagon bit (7) for above	
(2) If there is no abnormality in the valve body S/A, it need not be disassembled. Fasten the valve body ⑦② by vise. Remove the plug ⑧⑧and the relief valve S/A. Remove the relief housing ⑧⓪left inside by clamping the outer circumference with pliers. Apply cloth or other padding for removing. **Tools:** • Torque wrench (3) • Socket (13) for abvove • Pliers (19)	
(3) Remove the plug ● and the cap ⑥⑥. **Tools:** • Torque wrench (2), (4) • Sockets (11), (14) for above	
(4) Remove the spring ● and the spring seat ●.	

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(3) Remove the counterweight (L, the side weight (L and the cover L.

Note:

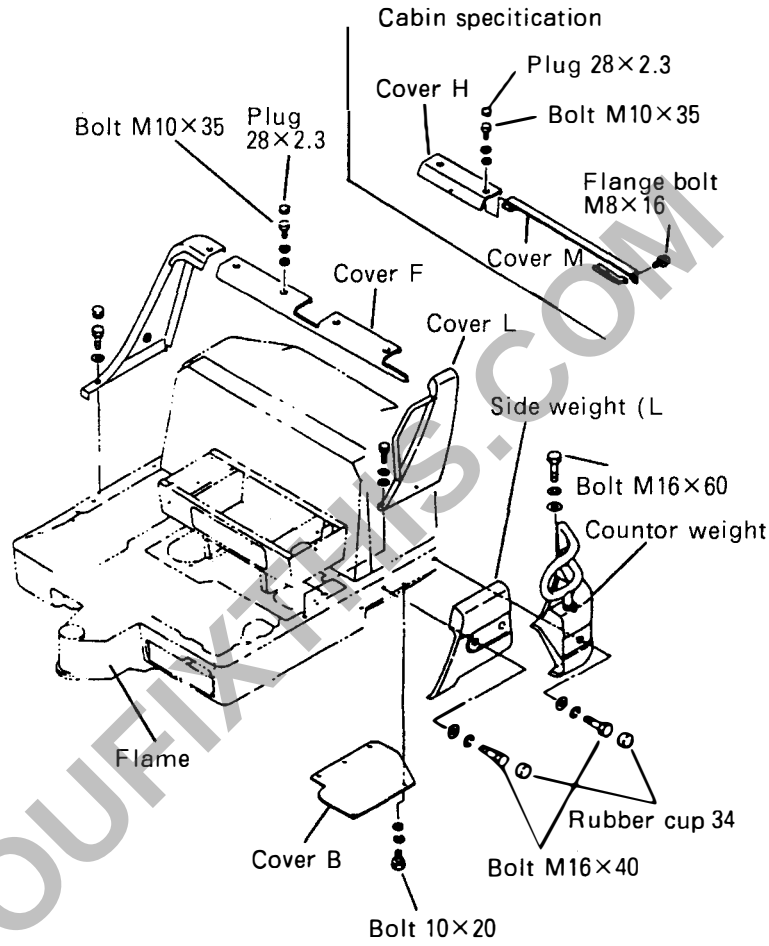
For the cabin specification, the cover L is not installed.

(4) Remove the three plugs 28 × 2.3 and bolts M10×35 to remove the cover B.

Note:

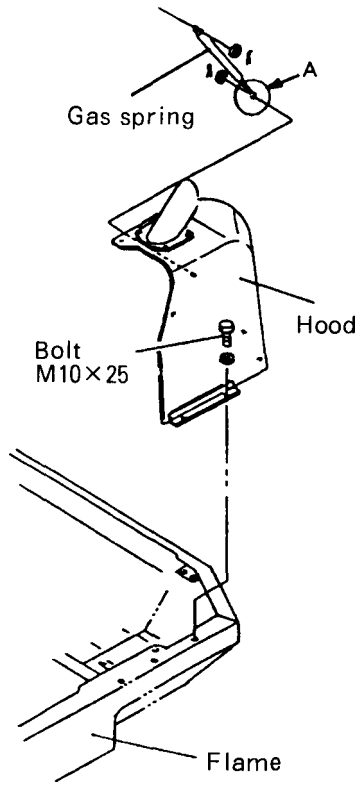
For the cabin specification, remove the flange bolt 8×16 and the two plugs 28× 2.3 and bolts M10 × 35 to remove the cover M.

(5) Remove the bolt M10×20 on the bottom side of the turning frame to remove the cover B.



(6) Remove the gas spring (shown as A in the lower figure).

(7) Remove the six bolts M10×25 to remove the fuel tank.



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