COMPACT EXCAVATOR

TB015

WORKSHOP MANUAL

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SERIAL NUMBER
TB015 : 1153001～

TAKEUCHI
TAKEUCHI MFG.CO.,LTD.

10. 99
11434



I. GENERAL



II. SPECIFICATIONS



III. MACHINE CONFIGURATION



IV. HYDRAULIC UNITS



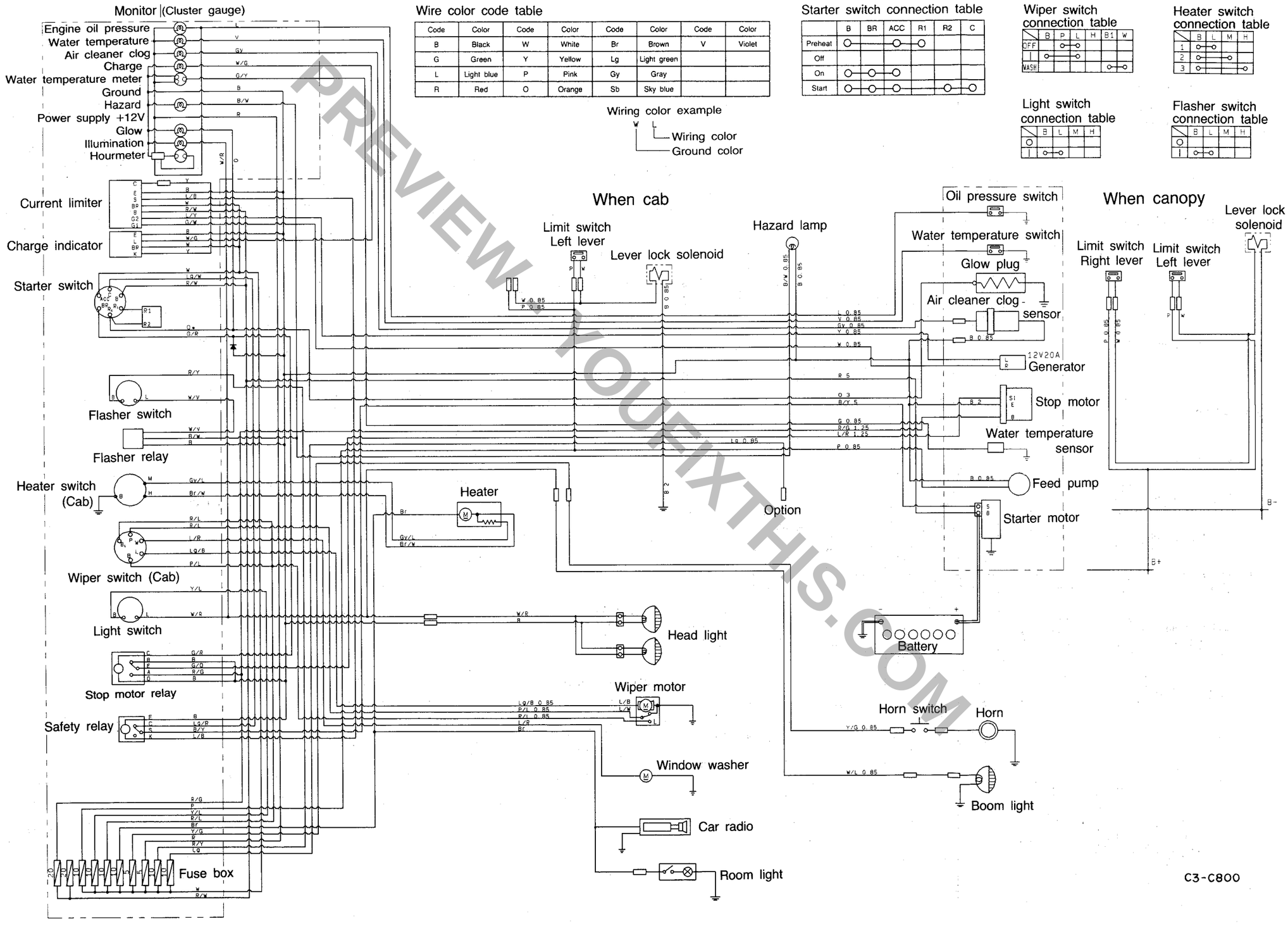
V. TROUBLESHOOTING

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ELECTRICAL SYSTEM

Electrical Wiring Diagram
Serial No. 1153001 ~ 1153067

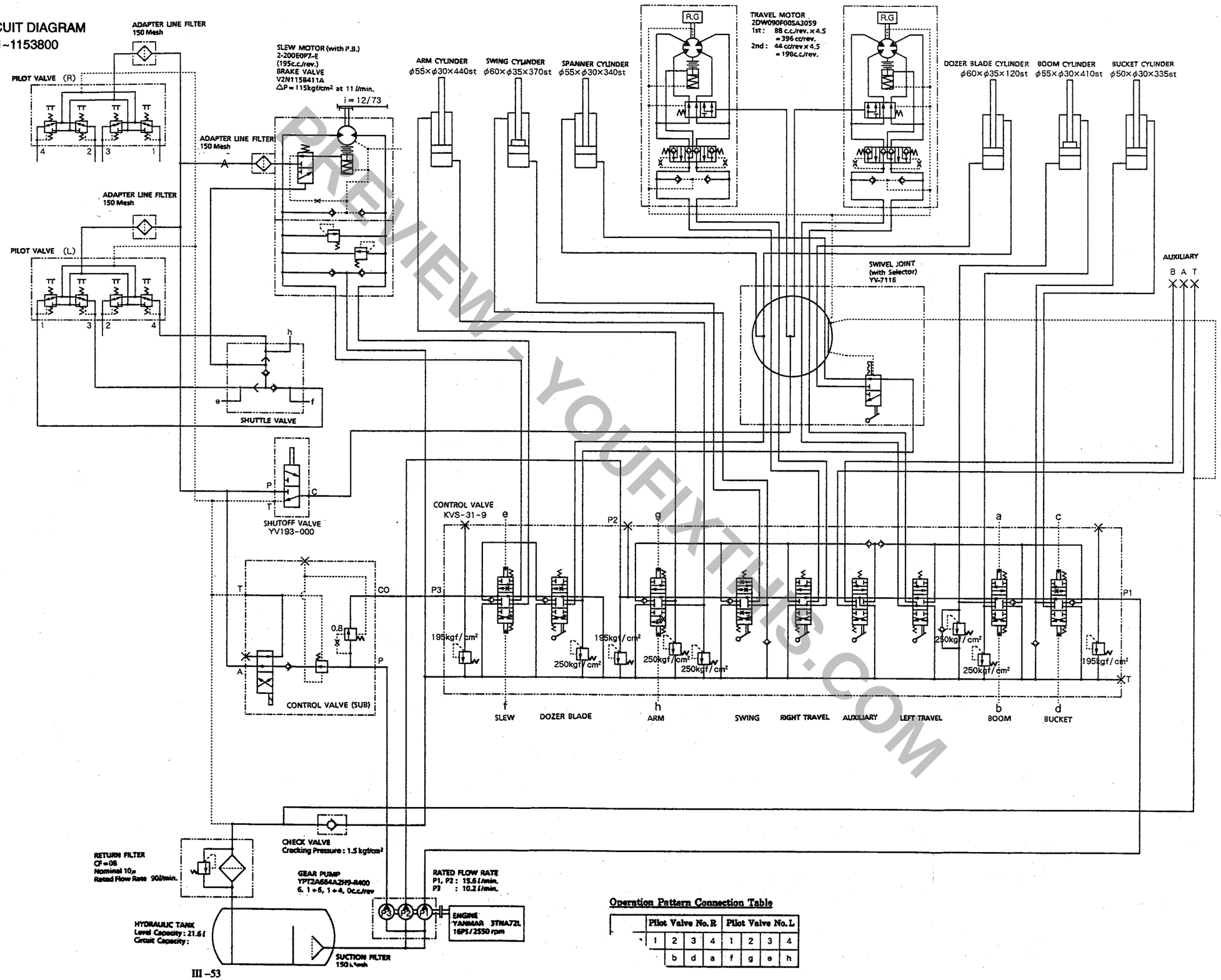


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HYDRAULIC SYSTEM

HYDRAULIC CIRCUIT DIAGRAM
Serial No. 1153001~1153800



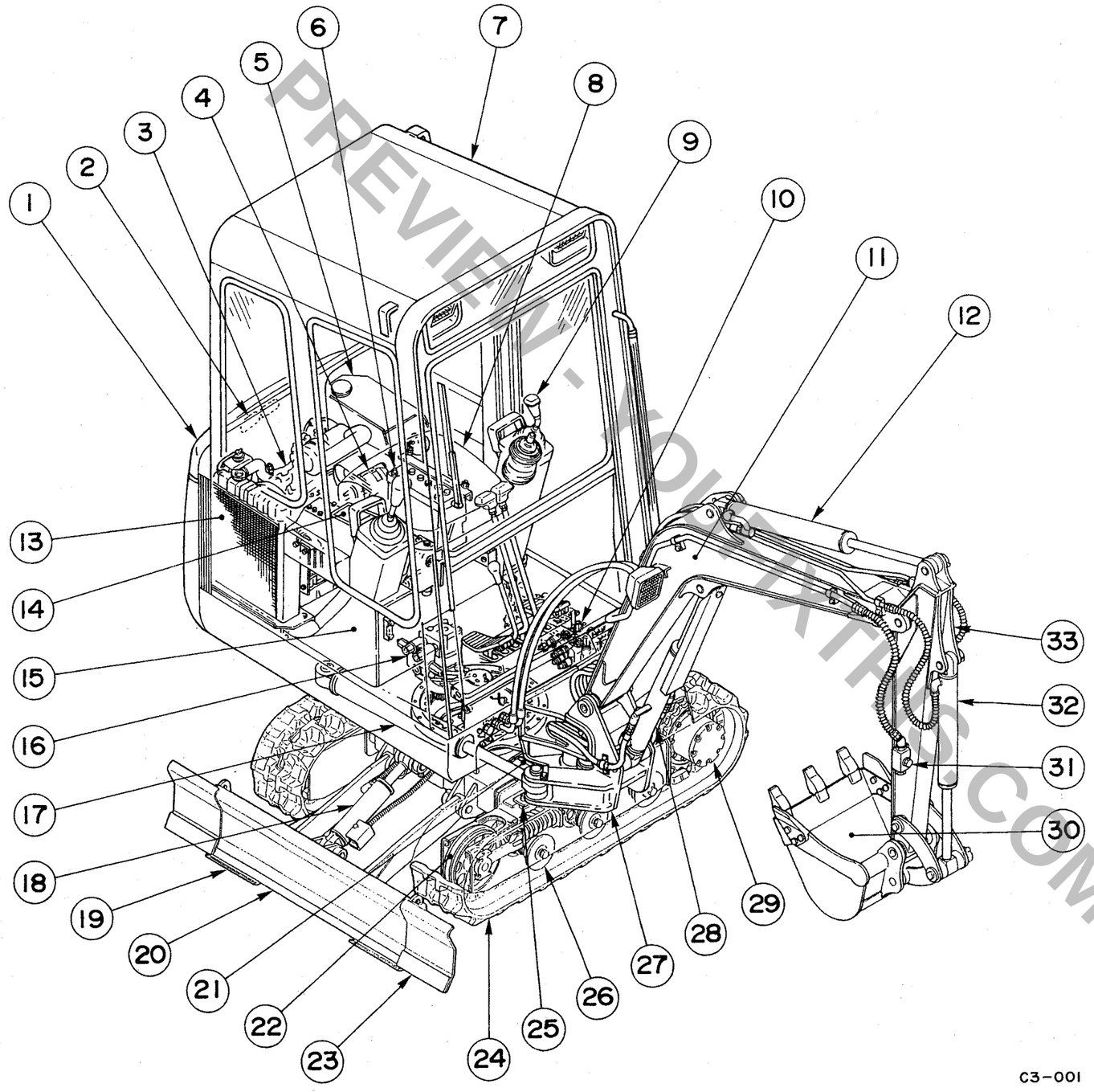
Operation Pattern Connection Table

	Pilot Valve No. R				Pilot Valve No. L			
	1	2	3	4	1	2	3	4
	b	d	a	f	g	e	h	

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NAMES OF COMPONENTS



1. Bonnet
2. Flasher lamp
3. Engine
4. Hydraulic pump
5. Fuel tank
6. Battery
7. Cab
8. Seat
9. Left operating lever
10. Control valve
11. Boom
12. Arm cylinder
13. Radiator
14. Monitor
15. Hydraulic tank
16. Slew motor
17. Swing cylinder
18. Blade cylinder
19. Road protector
20. Blade
21. Spanner cylinder
22. Idler
23. Plate
24. Crawler belt
25. Slide
26. Track roller
27. Bracket
28. Boom cylinder
29. Travel motor
30. Bucket
31. Auxiliary port
32. Bucket cylinder
33. Arm

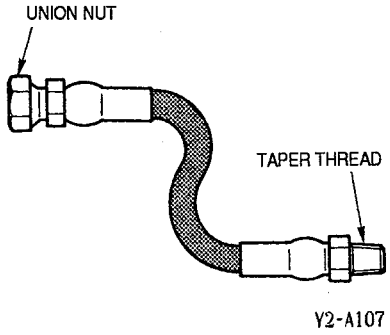
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TIGHTENING TORQUES

Hydraulic Hoses

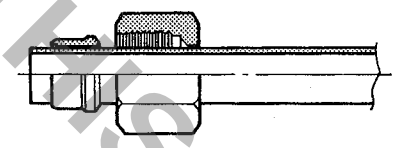
Hose Fitting Size	Torque			
	Union Nut (PF)		Taper Thread (PT)	
	kgf·m	ft-lb	kgf·m	ft-lb
1/8	$1.0^{+0.5}_{0}$	$7.3^{+3.5}_{0}$	1.2±0.12	8.7±0.8
1/4	$2.5^{+0.5}_{0}$	$18.1^{+3.5}_{0}$	3.0±0.30	21.7±2.1
3/8	$5.0^{+0.5}_{0}$	$36.2^{+3.5}_{0}$	5.5±0.55	39.8±3.9
1/2	$6.0^{+0.5}_{0}$	$43.4^{+3.5}_{0}$	9.0±0.90	65.1±6.4
3/4	$12.0^{+0.5}_{0}$	$86.8^{+3.5}_{0}$	15.0±1.50	108.5±10.7
1	$14.0^{+0.5}_{0}$	$101.3^{+3.5}_{0}$	20.0±2.00	144.7±14.3



Y2-A107

Bite Type Pipe Fitting for Steel Pipe

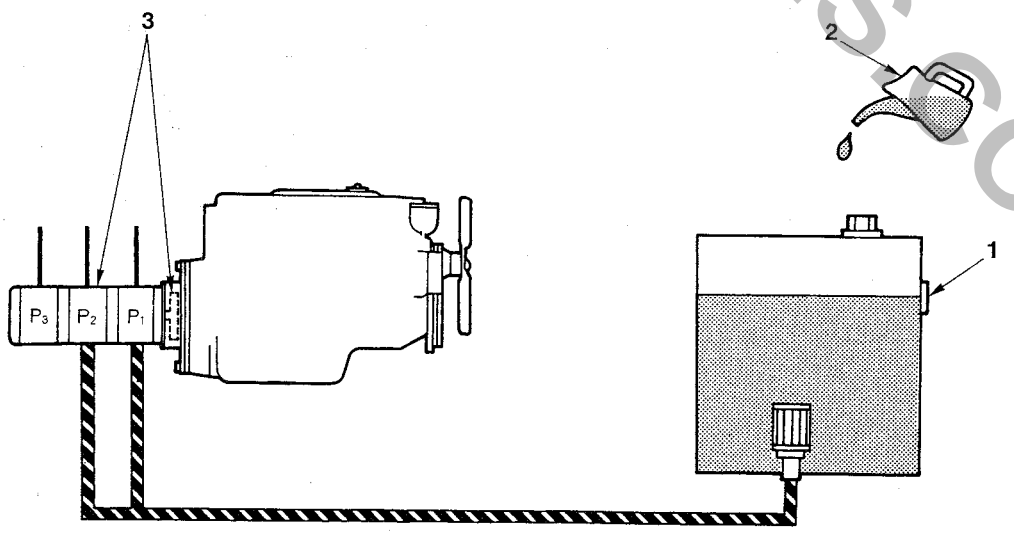
Pipe Outer Diameter (mm)	Torque	
	kgf·m	ft-lb
8	3.5±0.5	25.3±3.5
10	4.25±0.25	30.7±1.7
12	6.0±0.5	43.4±3.5
15	9.0±0.5	65.1±3.5
16	9.5±0.5	68.7±3.5
18	13.5±0.5	97.6±3.5
22	21.0±1.0	151.8±7.2
27.2	25.0±1.0	181.0±7.2
28	32.0±2.0	231.4±14.3
32	32.0±2.0	231.4±14.3
35	42.0±2.0	303.7±14.3


Y2-A108

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NO OPERATIONS CAN BE DONE.

1	Inspect the hydraulic oil level.	Insufficient →	2	Replenish the hydraulic oil.
↓ Proper Amount				
3	Pump or coupling is faulty.	→	• Repair the pump or replace the pump. • Replace the coupling.	



C3–E000

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SPECIFICATION TABLES

SPECIFICATIONS

Serial Number		1153001~	
Type		Canopy	Cab
Standard Bucket Capacity(SAE Rated)	(m^3)	0.037	←
Weight in Transport Condition	(kg)	1,500(1,550)	1,610(1,660)
Dimensions	(mm)		
Overall Length (in Transport Position)		3,695	←
Overall Width (in Transport Position)		960/1,300	←
Overall Height (in Transport Position)			
Serial Number: 1153001 ~ 1153181, 1153428 ~		2,270	2,320
Serial Number: 1153182 ~ 1153427		2,205	2,320
Minimum Ground Clearance		175	←
Minimum Height of Upper Machinery		470	←
Overall Width of Upper Machinery		940	←
Overall Width of Crawler		960/1,300	←
Overall Length of Crawler		1,385(1,370)	←
Minimum Slew Radius		1,360	←
Tail Swing Radius		1,085	←
Dozer Blade Width		960/1,300	←
Dozer Blade Height		250	←
Working Range	(mm)		
Maximum Digging Height		3,600	←
Maximum Digging Depth		2,200	←
Vertical Digging Depth		1,770	←
Maximum Digging Reach		3,775	←
Maximum Reach at Ground Level		3,680	←
Maximum Dumping Height		2,590	←
Bucket Offset: Right/Left		525/446	←
Dozer Blade Lift: Above/Below Ground		195/220	←
Performance			
Digging Force: Arm/Bucket	(kgf)	1,095/830	←
Slew Speed	(rpm)	8.8	←
Travel Speed	(km/h)	2.2/4.2	←
Traction Force	(kgf)	870	←
Gradeability	(degree)	20	←
Ground Pressure (JIS)	(kgf/cm^2)	0.294(0.308)	0.316(0.330)

* Values in ( ) are for models with steel crawler specifications.

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FLUID CAPACITIES

Serial Number		1153001~
Hydraulic Oil : Tank Level / Total System	(*l*)	21/30
Engine Oil : Upper Limit / Lower Limit	(*l*)	2.4/1.4
Travel Reduction Gear	(*l*)	0.4×2
Track Roller	(cc)	60×6
Idler	(cc)	45×2
Fuel Tank	(*l*)	19.5
Engine Cooling System	(*l*)	3.5

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RECOMMENDED LUBRICANTS

Item	Hydraulic Oil	Reduction Gears	Grease Fittings
Interval	Every 1,000 hrs.	(First 500 hrs.) Every 1,000 hrs.	Every 10 hrs. Every 50 hrs.
	Antiwear hydraulic oil	API GL-4 or GL-5 SAE 90	EP-2 Lithium-base grease
ESSO	Nuto H46	Gear oil GP 90	Beacon EP 2
MOBIL	DTE 25	Mobilube GX 90	Mobiluxe EP 2
GULF	Harmony 46 AW		Gulfcrown No.2 EP
TEXACO	Regal R&O 46	Thuban Universal 90	Multifak EP 2
SHELL	Tellus oil 46	Spirax EP 90	Alvania EP 2

1. When the oil is dirty or has deteriorated, replace it at shorter intervals than called for above.
2. As much as possible, when supplying oil and grease, use the same brand of lubricant. When replacing hydraulic oil, be sure to replace it all at once. Do not mix different brands of hydraulic oil.

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DISASSEMBLY AND ASSEMBLY

Removing the Engine

1. Disconnect the battery ground cable (1) from the [-] terminal of the battery.

2. Remove the plate on the hood.
   - Refer to the item "Removing the Cover".

3. Remove engine cover (F) and the cab bracket.
   - Refer to the item "Removing the Cab".

4. Disconnect the accelerator wire (2), the engine ground cable (3), and the drain hose (4).

5. Remove the radiator.
   - Refer to the item "Removing the Radiator".

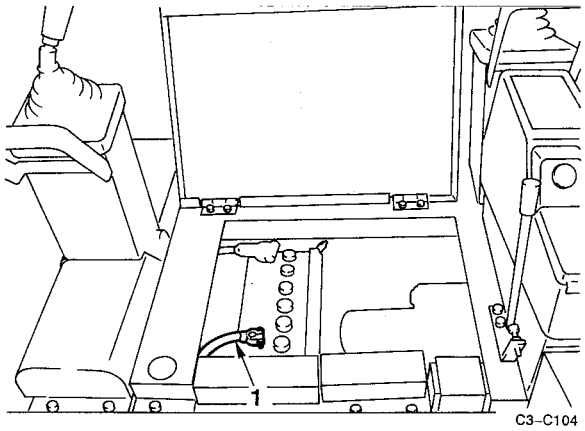
6. Remove the fuel tank.
   - Refer to the item "Removing the Fuel Tank".

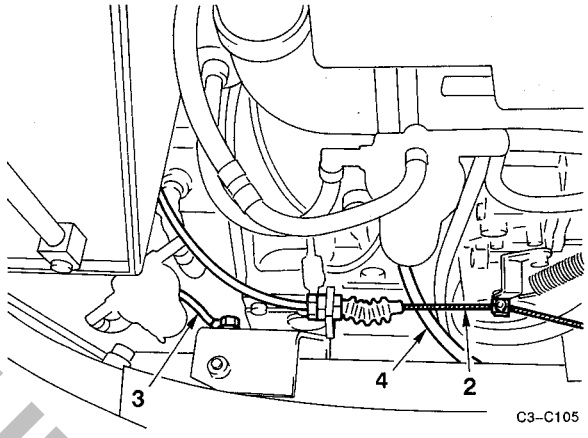
7. Remove the hydraulic pump.
   - Refer to the item "Removing the Hydraulic Pump".

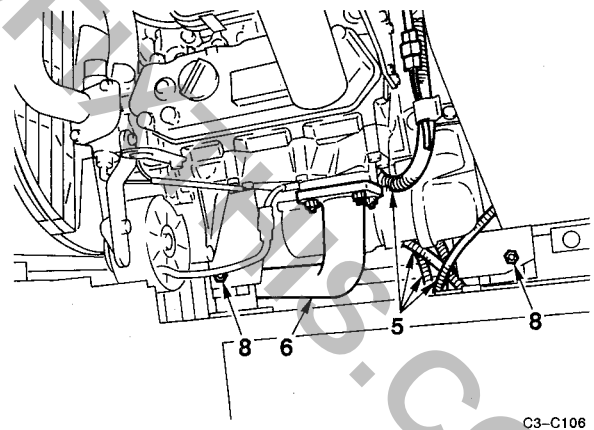
8. Disconnect the electrical wiring (5) from the engine.
   - Attach identification labels to each wire.

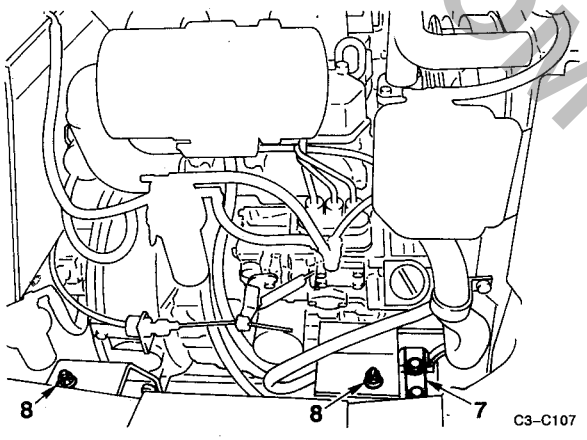
9. Take off the exhaust pipe (6), and remove the stopper (7).

10. Take off the cushion rubber installation nuts (8), and remove the engine assembly.
    - Engine Weight: Approx. 100 kg.









Installing the Engine.

To install the engine, follow the procedure used for removal in reverse order.

- Cushion Rubber Installation Nut Tightening Torque: 4.5 kgfm [bottom]; 5.6 kgfm [top]
- Stopper Installation Bolt Tightening Torque: 10.4 kgfm [screw lock application]

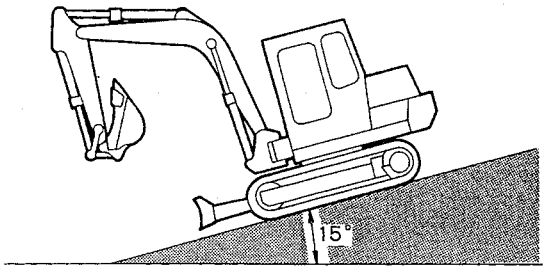
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Natural Travel Drop

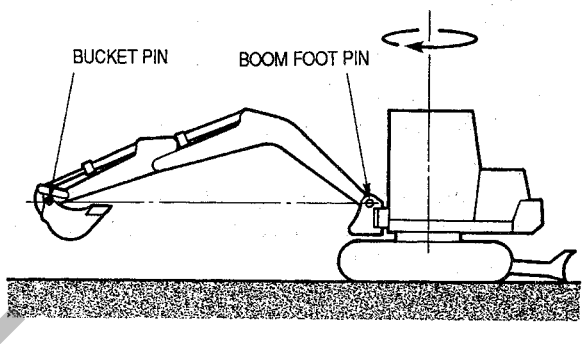
- Engine : Stopped
- Hydraulic Oil Temp. : 50°C ~ 60°C
- Grade : 15°
- Measurement Posture : Fully extend the boom, arm and bucket cylinder and completely retract the dozer blade cylinder.
- With the excavator parked at angle for 5 minutes, measure the extent of natural drop.



Y2-B233

Slew Time

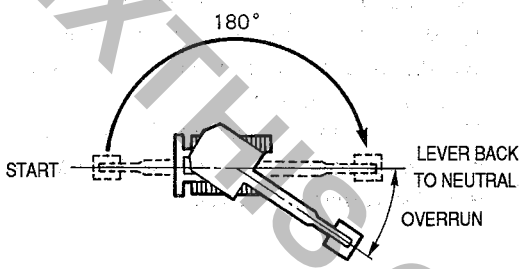
- Engine : Rated R.P.M.
- Hydraulic Oil Temp. : 50°C ~ 60°C
- Measurement Posture : Completely retract the arm cylinder, fully extend the bucket cylinder and adjust so that boom foot pin and bucket pin are at matching height. Rest the dozer blade on the ground.
- With the hoe attachment in a no-load state, wait 1 rotation, then measure the time required for the next 2 rotations.



Y2-B234

Overrun When Slewing Stops

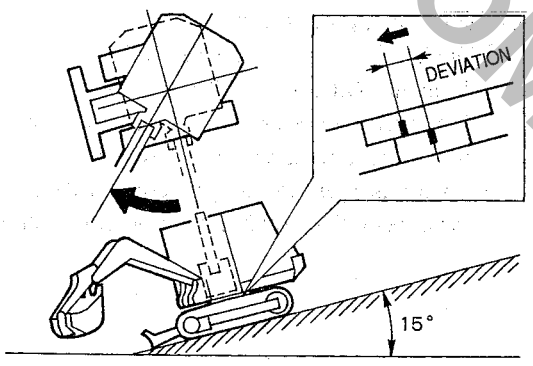
- Engine : Rated R.P.M.
- Hydraulic Oil Temp. : 50°C ~ 60°C
- Measurement Posture : Same as that for measuring slew time.
- Draw matching marks on the outer race of the slew bearing and lower frame at an exactly 180 degrees rotation from the starting point. With the hoe attachment in a no-load state, rotate 180 degrees at, which point return the operation lever to neutral. Measure the differential between the position marks and the point the hoe attachment stops.



Y2-B235

Natural Slew Drop

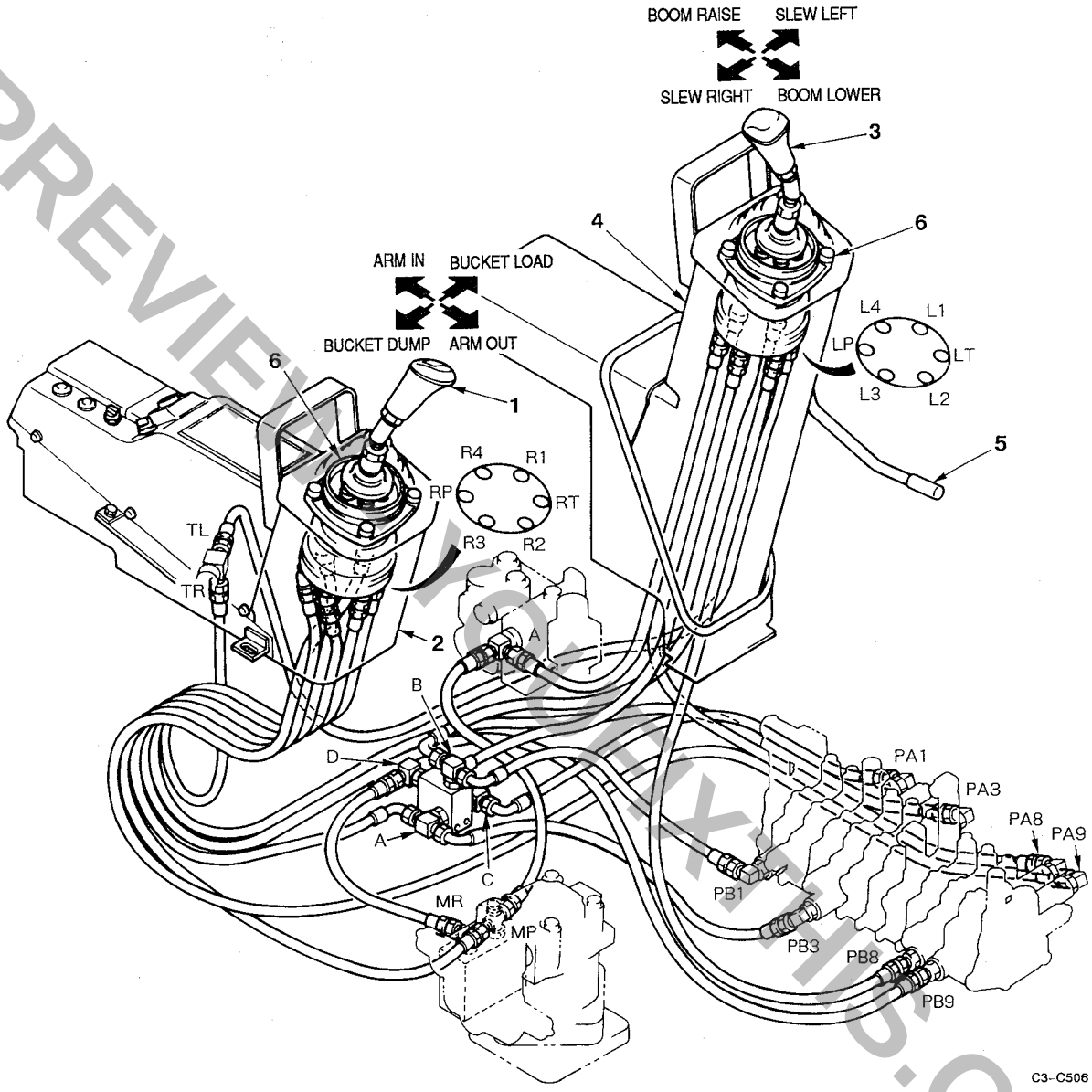
- Engine : Stopped
- Hydraulic Oil Temp. : 50°C ~ 60°C
- Grade : 15°
- Measurement Posture : Same as that for measuring slew time.
- Rotate the upper machinery so that it is directly abeam of the grade, then draw positional marks on the slew bearing's outer race and the lower frame. Then measure the distance that develops between the marks after 5 minutes.



Y2-B236

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■ G Type (JCB); Cab



◆ Table of Connections ◆

Right Pilot Valve	R1 ↔ PA9	Control Valve
	R3 ↔ PB9	
	RP ↔ MP	Slew Motor
	RT ↔ TR	Tank
	R2 ↔ PA3	Control Valve
	R4 ↔ A	Shuttle Valve
Left Pilot Valve	L1 ↔ B	Shuttle Valve
	L3 ↔ C	
	L2 ↔ PB8	Control Valve
	L4 ↔ PA8	
	LP ↔ A	Control Valve (Sub)
	LT ↔ TL	Tank

Shuttle Valve	A ↔ PB3	Control Valve
	D ↔ MR	Slew Motor
	B ↔ PB1	Control Valve
	C ↔ PA1	

1. Right Operation Lever
2. Right Lever Stand
3. Left Operation Lever
4. Left Lever Stand
5. Left Lock Lever
6. Pilot Valve

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For Boom Head Side

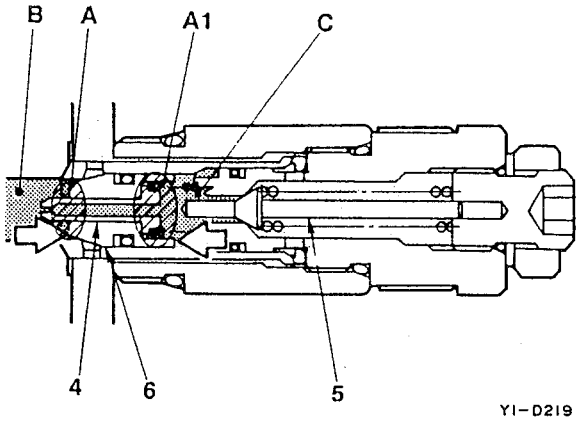
1. Relieving Operation

a. When the pressure in the circuit is low with respect to the set valve, the relief valve is maintained at equilibrium. Pressure from the pump passes from chamber B to the orifice in piston (4), then reaches chamber C and the needle valve (5). On the other hand, forces F and F1 are acting in the arrow directions on both sides of the main poppet (6).

$F = P \times A$ $F1 = P \times A1$

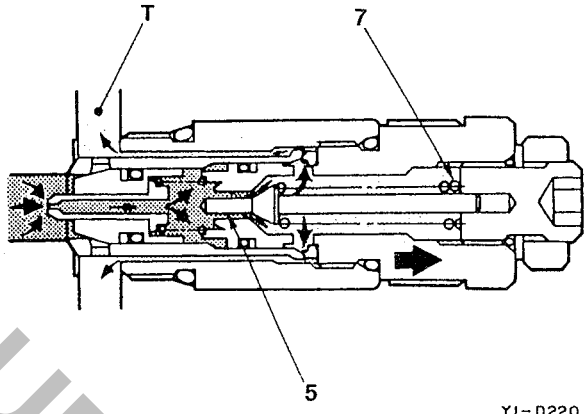
P : Pressure A, A1 : Sectional Area

Since the sectional area of A is less than that of A1, the main poppet (6) is pushed by the force "F1 – F" to the seat surface on the left side.



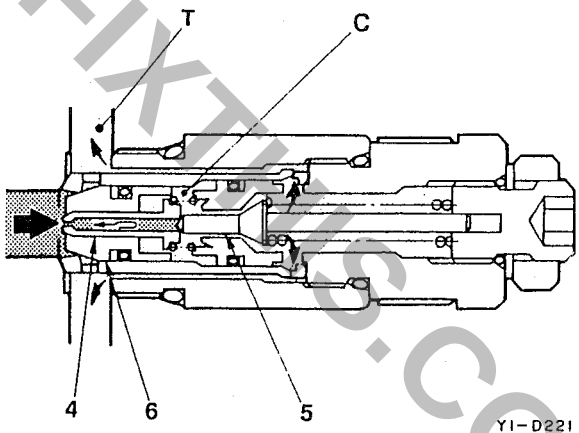
YI-D219

b. If the pressure in the circuit becomes higher than the force of the spring (7), the needle valve (5) is pushed to the right by hydraulic pressure, opening. Oil then flows around the circumference of the needle valve (5) and passes through the slits, flowing into the tank passage (T).



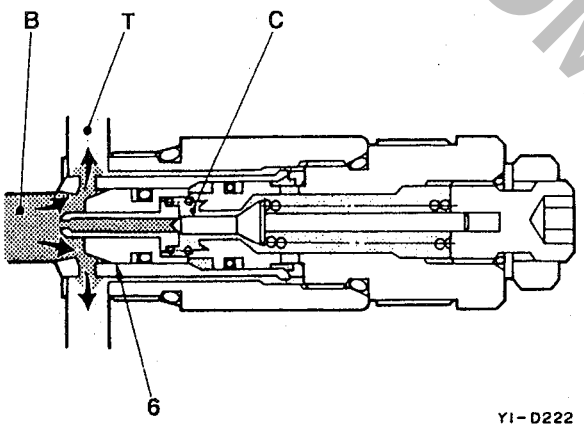
YI-D220

c. When the needle valve (5) opens, the pressure drops on the back side of the piston (4), pushing the piston (4) to be pushed to the right, seating with the needle valve (5). This shuts off the flow of hydraulic oil to the rear of the main poppet (6). As a result, the pressure in chamber C on the inside drops.



YI-D221

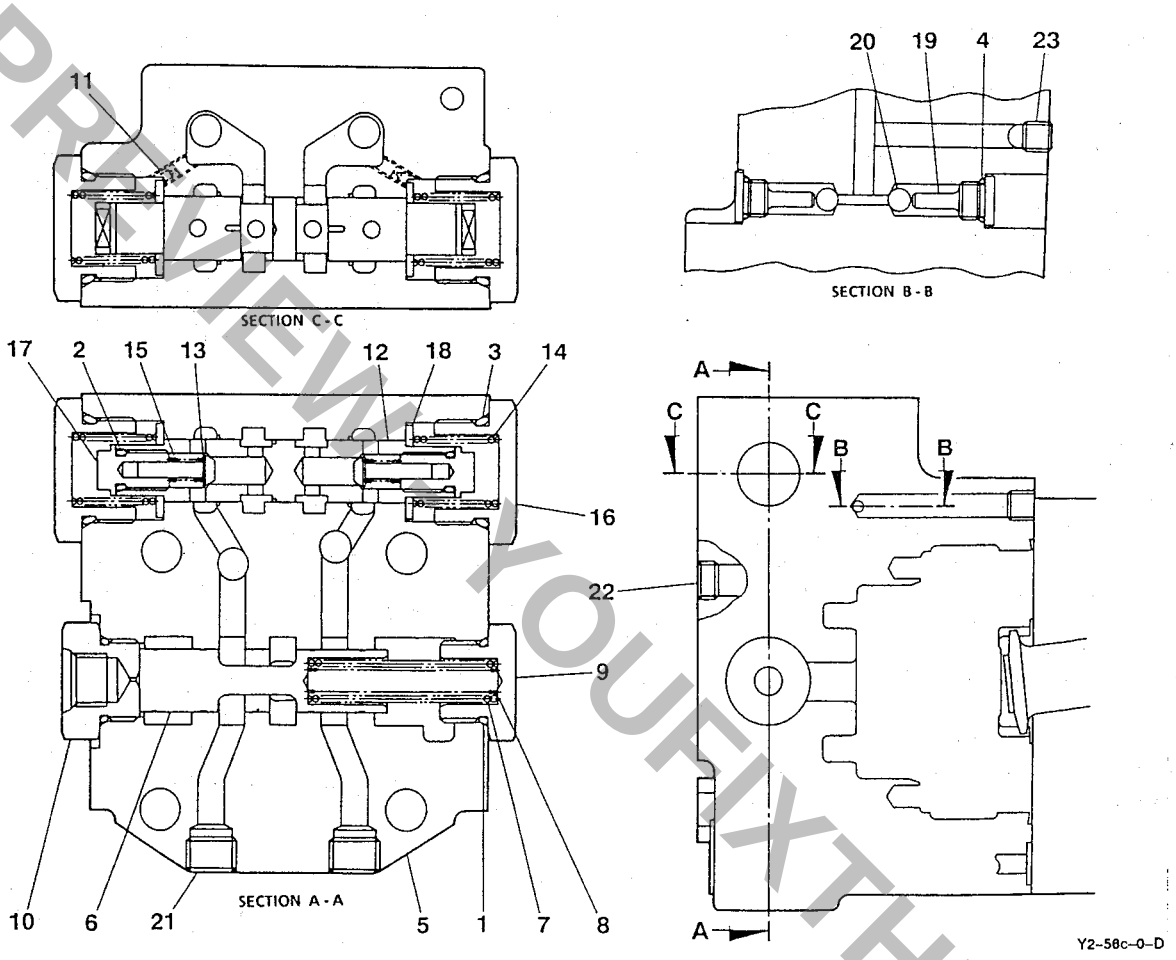
d. Compared to the chamber B side, the pressure in chamber C is low and there is no equilibrium in pressure. For this reason, the main poppet (6) opens and pressurized oil flows to the tank passage (T).



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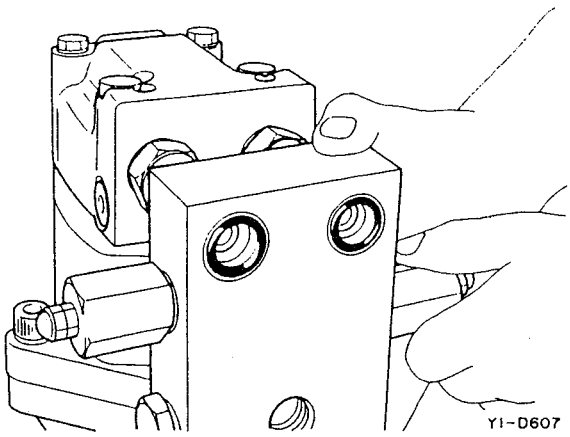
Valve Assembly



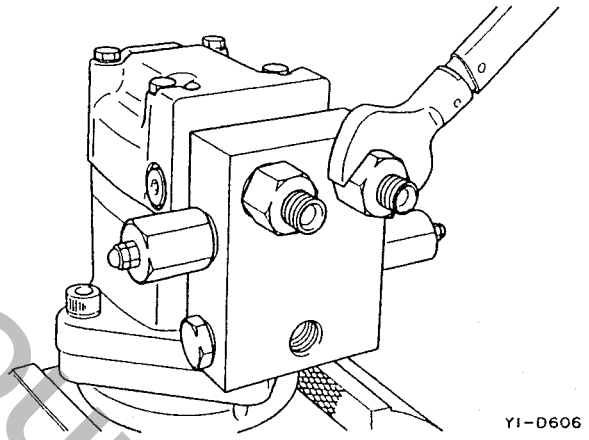
1. O-Ring
2. O-Ring
3. O-Ring
4. O-Ring
5. Valve Housing
6. 2nd-Speed Spool
7. 2nd-Speed Spring
8. 2nd-Speed Spring
9. 2nd-Speed Plug
10. 2nd-Speed Pilot Connector
11. Orifice
12. Spool
13. Poppet
14. Main Spring
15. Spring
16. Plug
17. Plug
18. Washer
19. Plug
20. Ball
21. Blind Plug
22. Blind Plug
23. Blind Plug

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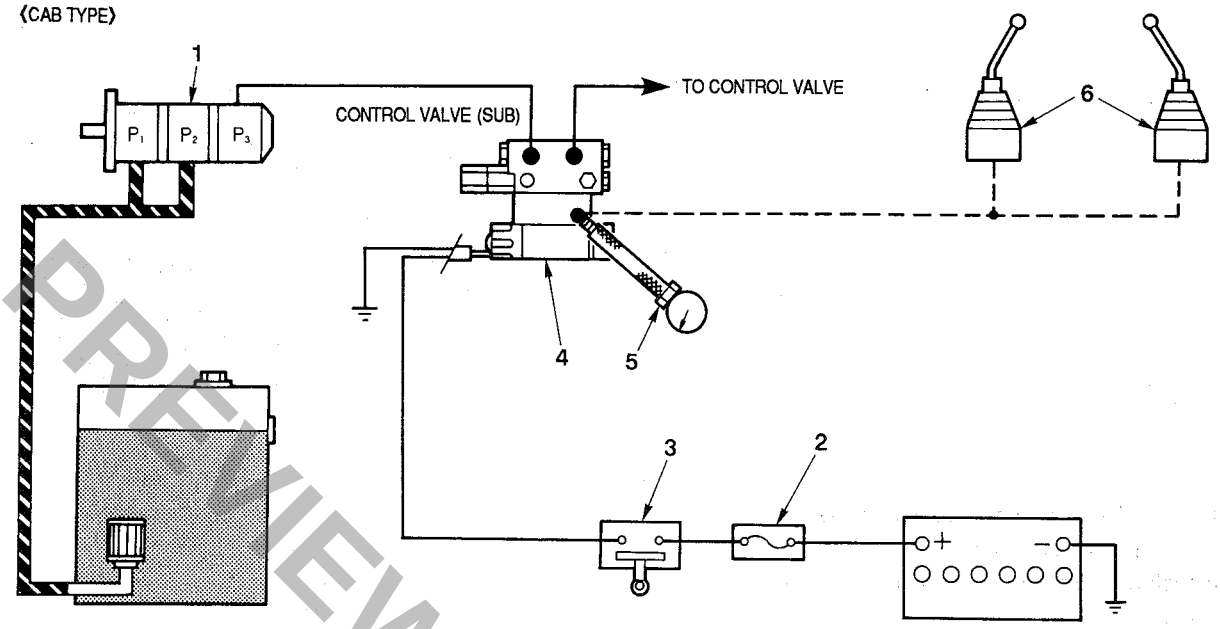
8. Install the valve body.



9. Install the bushing.
   • Bushing Tightening Torque : 4 kgf·m

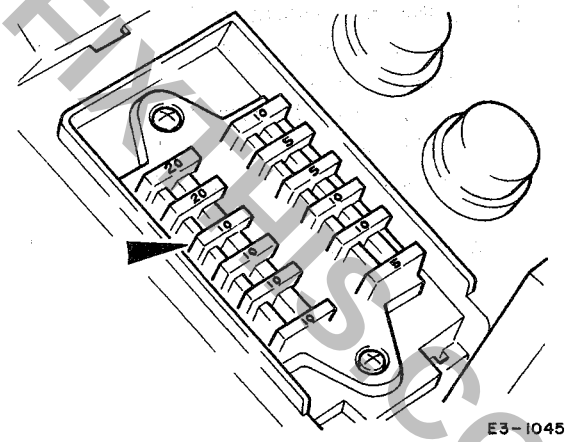


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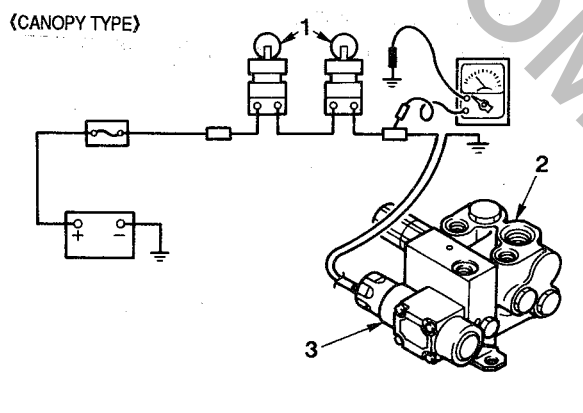


1. Inspect the hydraulic pump (P3).
   Check the hydraulic pump P3 which is the hydraulic source of the pilot valve.
   - Operate the blade lever and if the blade is functioning, the hydraulic pump P3 should be normal.

2. Inspect the fuse.
   Check the fuse for the electrical circuits that operate the solenoid valve.



3. Inspect the limit switch.
   Depending on the operational position setting of the lever stand, the limit switch (1) will go to an "ON" status. In this mode, check to test whether there is any voltage up to the lever lock solenoid valve of the control valve (sub) 2.
   - If there is voltage then it is normal.



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