TB23R

Compact Excavator

BOOK No. CD5E000

WORKSHOP MANUAL

Serial No. 12300007~

TAKEUCHI

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

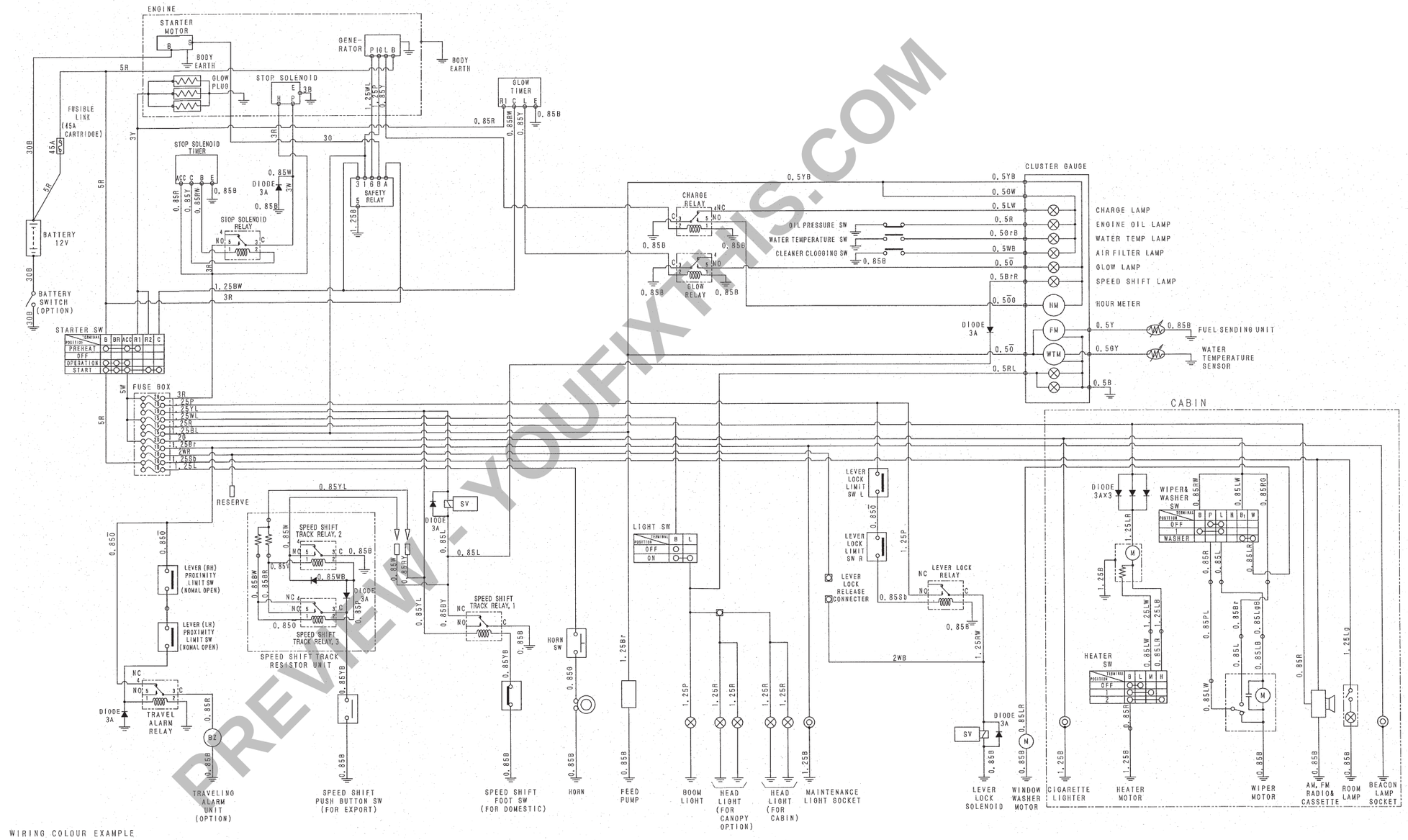
I . GENERAL
II . SPECIFICATIONS
III. MACHINE CONFIGURATION
IV. HYDRAULIC UNITS
V . TROUBLESHOOTING
VI. ENGINE

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

ELECTRICAL SYSTEM

ELECTRICAL WIRING DIAGRAM



WIRING COLOUR EXAMPLE



WIRING COLOUR TABLE

CODE	COLOUR	CODE	COLOUR	CODE	COLOUR
B	BLACK	W	WHITE	Br	BROWN
G	GREEN	Y	YELLOW	Lg	LIGHT GREEN
L	BLUE	P	PINK	Gr	GREY
R	RED	O	ORANGE	Sb	SKY BLUE
V	VIOLET	Dg	DARK GREEN	Ch	CHOCOLATE

TB23R ELECTRICAL WIRING DIAGRAM

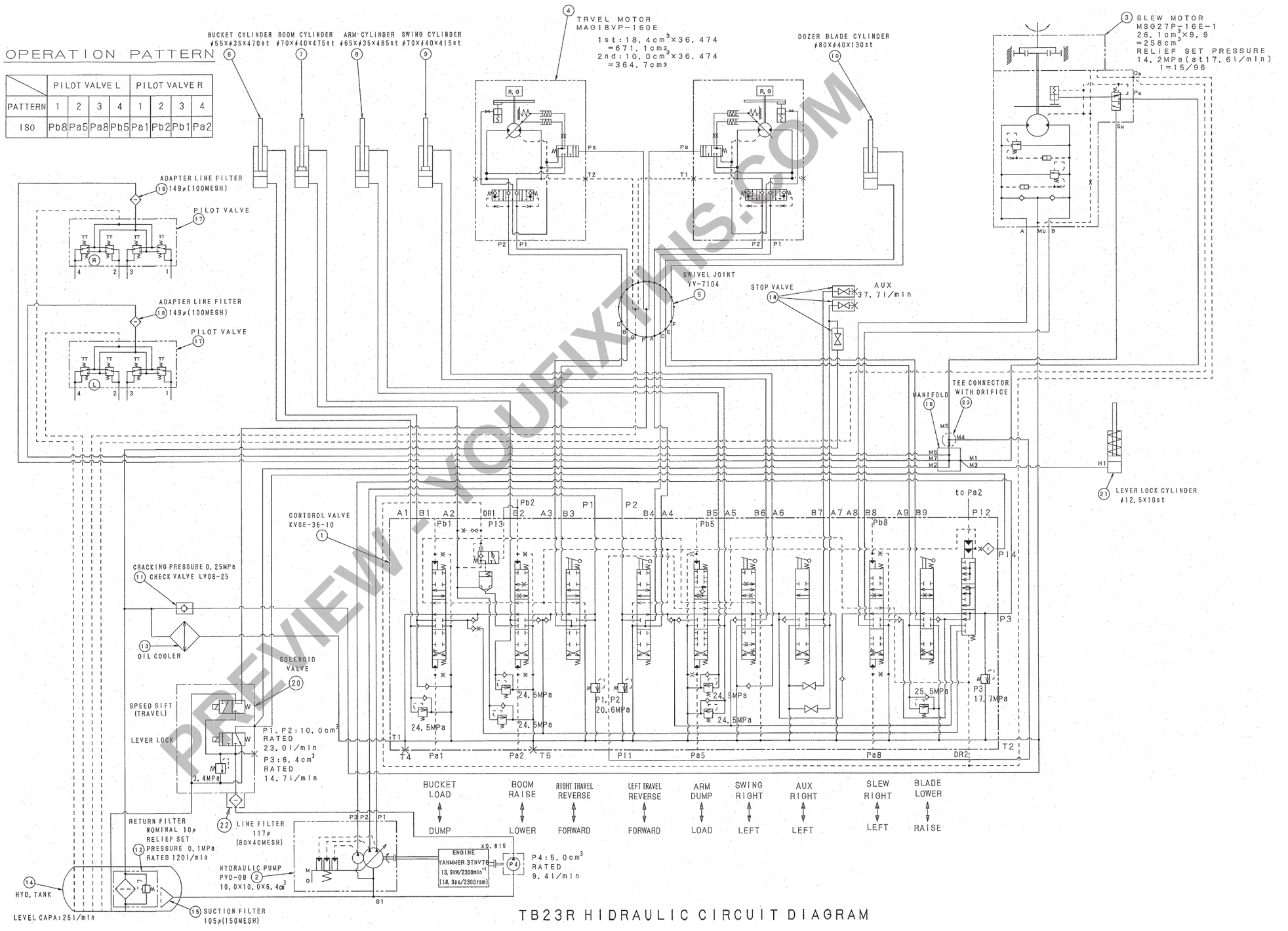
D5C800E

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

HYDRAULIC SYSTEM

HYDRAULIC CIRCUIT DIAGRAM



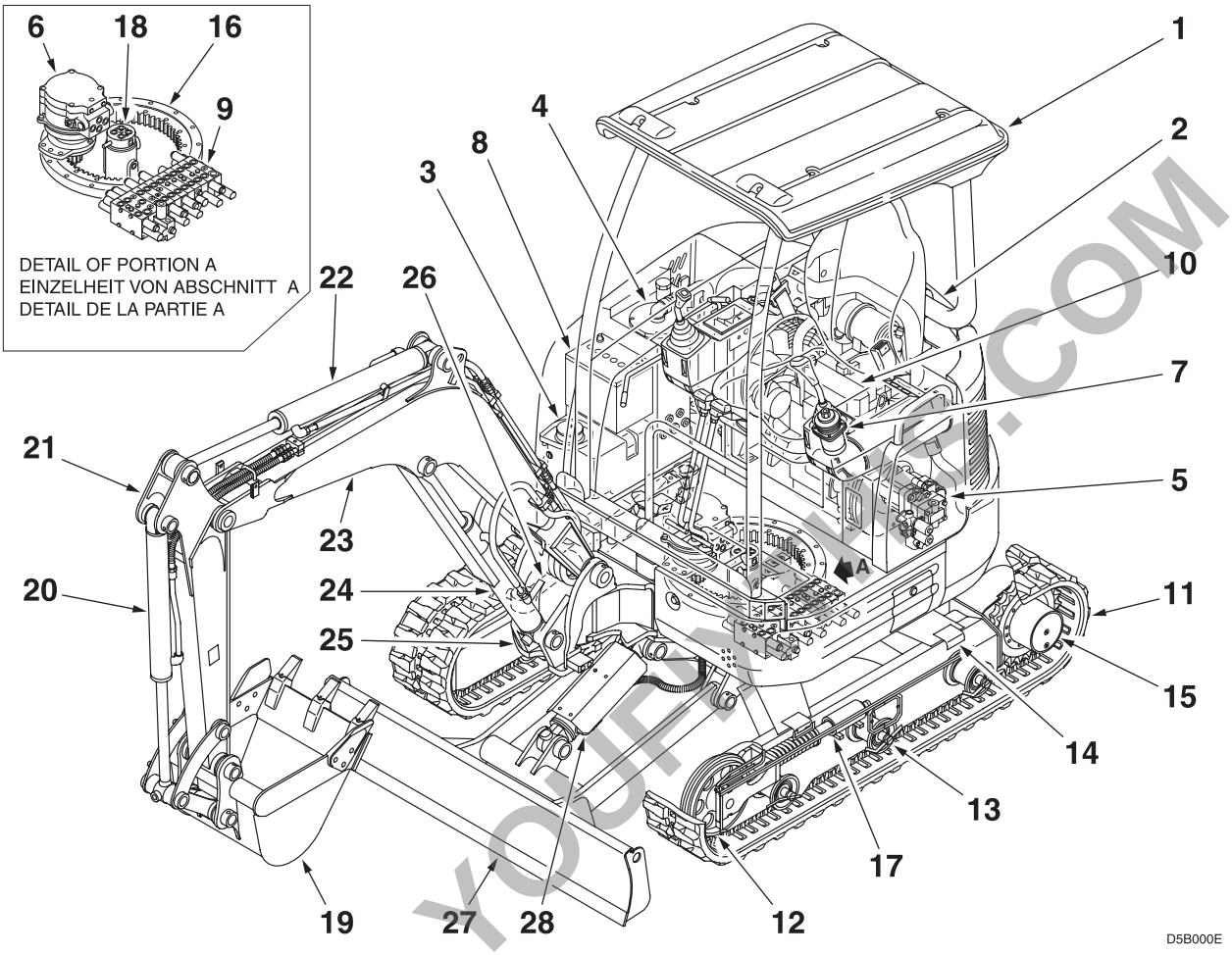
TB23R HIDRAULIC CIRCUIT DIAGRAM

D5C700E

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

NAMES OF COMPONENTS



1. Canopy
2. Engine Hood
3. Fuel Tank
4. Hydraulic Tank
5. Hydraulic Pump
6. Slew Motor
7. Pilot Valve
8. Battery
9. Control Valve
10. Engine
11. Crawler Belt
12. Idler
13. Track Roller
14. Shoe Slide
15. Travel Motor
16. Slew Bearing
17. Track Adjuster
18. Swivel Joint
19. Bucket
20. Bucket Cylinder
21. Arm
22. Arm Cylinder
23. Boom
24. Boom Cylinder
25. Swing Bracket
26. Swing Cylinder
27. Dozer Blade
28. Dozer Blade Cylinder

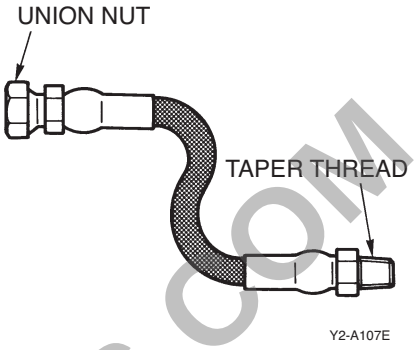
PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

TIGHTENING TORQUES

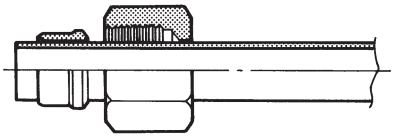
Hydraulic Hoses

Hose Fitting Size	Torque			
	Union Nut (G)		Taper Thread (R)	
	N·m	ft-lb	N·m	ft-lb
1/8	9.8 $^{+4.9}_{0}$	7.3 $^{+3.5}_{0}$	11.8 ±1.2	8.7 ±0.8
1/4	24.5 $^{+4.9}_{0}$	18.1 $^{+3.5}_{0}$	29.4 ±2.9	21.7 ±2.1
3/8	49 $^{+4.9}_{0}$	36.2 $^{+3.5}_{0}$	53.9 ±5.4	39.8 ±3.9
1/2	58.8 $^{+4.9}_{0}$	43.4 $^{+3.5}_{0}$	88.3 ±8.8	65.1 ±6.4
3/4	117.7 $^{+4.9}_{0}$	86.8 $^{+3.5}_{0}$	147.1 ±14.7	108.5 ±10.7
1	137.3 $^{+4.9}_{0}$	101.3 $^{+3.5}_{0}$	196.1 ±19.6	144.7 ±14.3



Bite Type Pipe Fitting for Steel Pipe

Pipe Outer Diameter (mm)	Torque	
	N·m	ft-lb
8	34.3 ±4.9	25.3 ±3.5
10	41.7 ±2.5	30.7 ±1.7
12	58.8 ±4.9	43.4 ±3.5
15	88.3 ±4.9	65.1 ±3.5
16	93.2 ±4.9	68.7 ±3.5
18	132.4 ±4.9	97.6 ±3.5
22	205.9 ±9.8	151.8 ±7.2
27.2	245.2 ±9.8	181.0 ±7.2
28	313.8 ±19.6	231.4 ±14.3
32	313.8 ±19.6	231.4 ±14.3
35	411.9 ±19.6	303.7 ±14.3



PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

CONTENTS

OVERALL MACHINE
No operations can be done. 4
All operation can be done, but there is no power. 7
The boom, bucket, slew and arm do not move at all, or the speed is low. 9
MACHINE TRAVEL
The machine will not travel at all. 11
Right or left travel is impossible. 12
Speed drops in the left or right travel, causing the machine to travel in a curve. 14
Machine won't accelerate during travel. 17
SLEWING
No slewing can be done. 20
Right or left slewing cannot be done. 23
Slewing speed is low, or there is no power. 25
The machine slews, but overrun when slewing stops is great, or it cannot be stopped. 27
When stopped on a slope, the slewing body cannot maintain its posture after stopping 29
BOOM
The boom cylinder doesn't move. 30
Boom cylinder operation is slow, or there is no power. 32
When the boom operation lever is pulled gently, the boom drops temporarily. 35
The amount of boom natural drop is great. 36
ARM
The arm cylinder doesn't move. 37
Arm cylinder operation is slow, or there is no power. 39
The amount of arm natural drop is great. 41
BUCKET
The bucket cylinder doesn't move, or there is no power. 42
The amount of bucket natural drop is great. 44
BOOM SWING
The swing cylinder doesn't move. 45
DOZER BLADE
The dozer blade cylinder doesn't move, or there is no power. 46
The amount of dozer blade natural drop is great or the dozer blade won't hold the machine up. 48

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

SPECIFICATIONS TABLES

SPECIFICATIONS

Serial Number		12300007~		
Crawler		Rubber	Steel	Rubber Pad
Machine Mass: Canopy	kg	2080	2130	2220
Cab	kg	—	—	—
Engine Rated Output	kW (PS) /min^{-1}	13.9 (18.9) /2300		
Standard Bucket Capacity: Heaped/Struck	m^3	0.066/0.048		
Performance				
Slew Speed	min^{-1}	9.6		
Travel Speed 1st/2nd	km/h	2.4/4.2		
Maximum Tractate Force.	kN (kgf)	21.6 (2200)	23.3 (2380)	
Gradeability	degree	58 (30)		
Ground Pressure: Canopy	kPa (kgf/cm^2)	26.9 (0.27)	27.6 (0.28)	28.7 (0.29)
Cab		—	—	—
Auxiliary Hydraulics Flow Rate	kPa (kgf/cm^2)	37.71		
Digging Force				
Maximum Digging Force: Bucket	kN (kgf)	19.0 (1938)		
Arm	kN (kgf)	11.9 (1210)		

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

DISASSEMBLY AND ASSEMBLY

Removing the Engine

1. Disconnect the battery ground cable (1) from the battery.

2. Remove the canopy or cab.

3. Remove the covers around the engine.
   ☞ "Removing the Covers"

4. Remove the radiator oil cooler.
   ☞ "Removing the Radiator Oil Cooler"

5. Disconnect the coolant drain hose (2).

6. Remove the fuel tank.
   ☞ "Removing the Fuel Tank"

7. Remove the hydraulic pump.
   ☞ "Removing the Hydraulic Pump"

8. Disconnect the intake hose (3) and exhaust hose (4) from the pump P4.

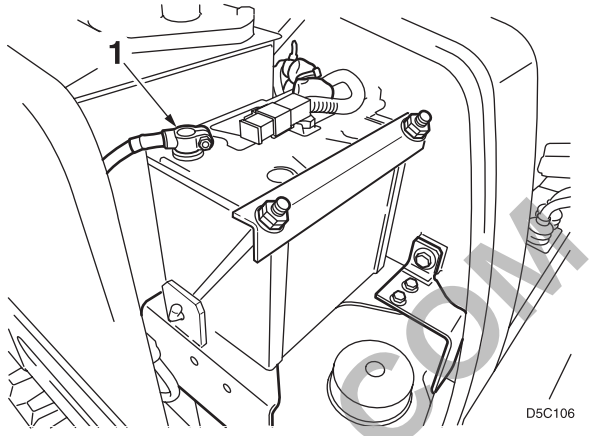
9. Disconnect the accelerator wire (5) from the engine, and remove the bracket (6) with the wire still attached.

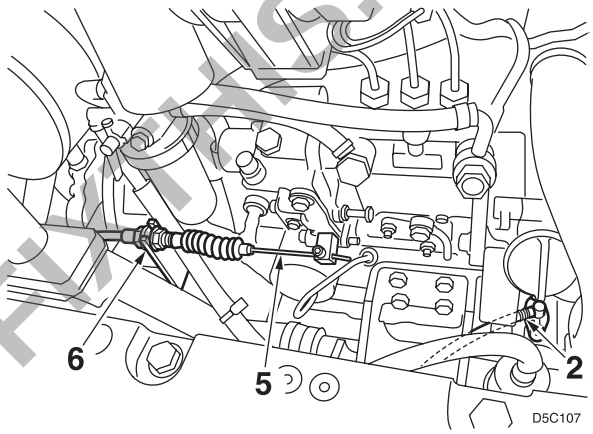
10. Disconnect the battery cable (7) and all the connections on the engine side of the electric wirings (8).
    - Attach identification labels to individual wirings.
    - Disconnect the wirings from the clamp and the band.

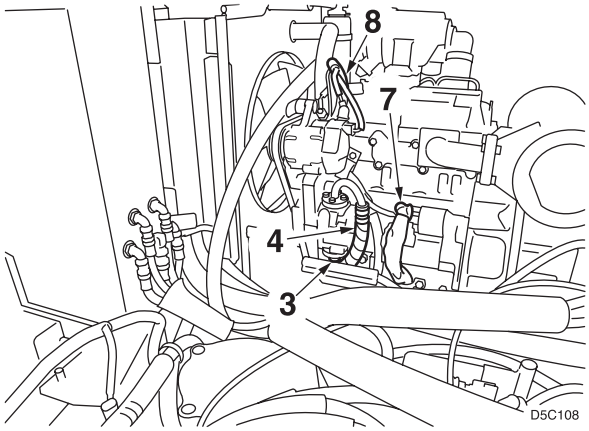
11. Disconnect the engine ground cable (9).

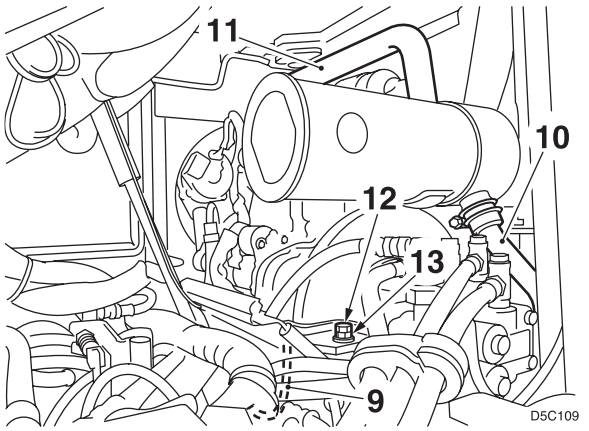
12. Remove the muffler pipe (10) and air hose (11).

13. Remove the cushion rubber tightening double nuts of the engine foot.
    Nut (12): 54.9 N·m
    Nut (13): 44.1 N·m









PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

2. Inspection and adjustment

2.1 Periodic maintenance schedule

The engine periodic inspection timing is hard to determine as it varies with the application, load status, qualities of the fuel and lube oils used and handling status. General rules are described here.

○: User-maintenance ◎: Parts replacement ●: Shop-inspection

Classification	Item	Daily	Maintenance period				
			Every 50 hours	Every 250 hours or 3 months	Every 500 hours or 6 months	Every 1000 hours or one year	Every 2000 hours or two years
Whole	Visual check around engine	○					
Fuel oil system	Fuel tank level check and fuel supply	○					
	Fuel tank draining		○				
	Bleeding the fuel system		○				
	Water separator draining		○				
	Water separator cleaning				○		
	Fuel filter element replacement				◎		
Lubricating oil system	Lube oil level check and replenishment	○					
	Lube oil replacement		◎ 1st time	◎ 2nd time and thereafter			
	Lube oil filter replacement						
Cooling water system	Cooling water level check and replenishment	○					
	Radiator fin cleaning			○			
	Cooling fan V-belt tension check		○ 1st time	○ 2nd time and thereafter			
	Cooling water replacement					◎	
	Cooling water path flushing and maintenance						
Rubber house	Fuel pipe and cooling water pipe inspection and maintenance	○					●
Governor	Inspection and adjustment of governor lever and accelerator	○		○			●
Air intake system	Air cleaner cleaning and element replacement			○	◎		
	Diaphragm assy inspection					● (2 years)	
Electrical system	Warning lamp & instruments function check	○					
	Battery electrolyte level check and battery recharging		○				
Cylinder head	Intake/exhaust valve clearance adjustment					●	
	Intake/exhaust valve seat lapping						●
Fuel injection pump and nozzle	Fuel injection nozzle pressure inspection					●*	
	Fuel injection timing adjustment Fuel pump inspection and adjustment						●*

*) EPA allows to maintain the emission related parts as shown in 1.6.3 of chapter1.

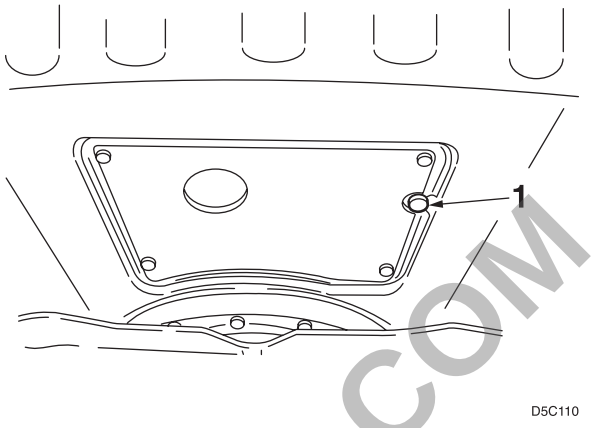
PREVIEW - YOUFIXTHIS.COM
Download full manual at youfixthis.com

PREVIEW - YOUFIXTHIS.COM

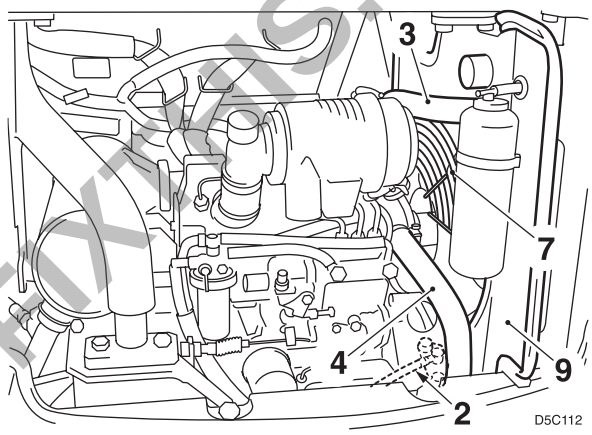
Download full manual at youfixthis.com

Removing the Radiator and Oil Cooler

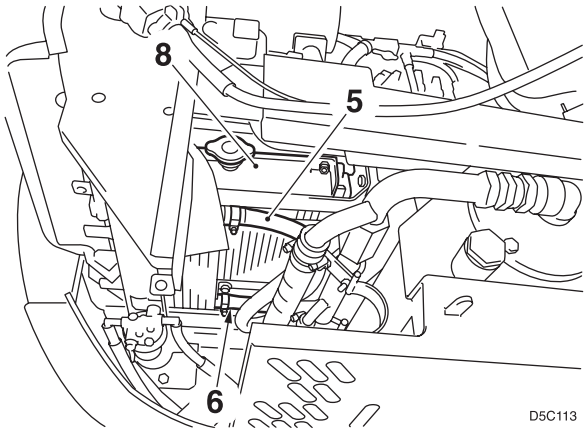
1. Remove the canopy or cab.
2. Remove the covers around the engine.
   ☞ "Removing the Covers"
3. Loosen the drain plug (1) to bleed out the engine coolant.
   • Engine coolant volume: Approx. 3.5 L
4. Disconnect the coolant drain hose (2).
5. Disconnect the radiator hoses (3) and (4).
6. Disconnect the oil cooler hoses (5) and (6).
   • Prepare a plate to catch drips of the hydraulic oil.
7. Remove the fan guard (7).
8. Suspend the radiator and oil cooler (8) together with the bracket (9), and remove them carefully without touching other parts.
   • Slide them to the front to prevent the shroud from hitting the cooling fan.



D5C110



D5C112

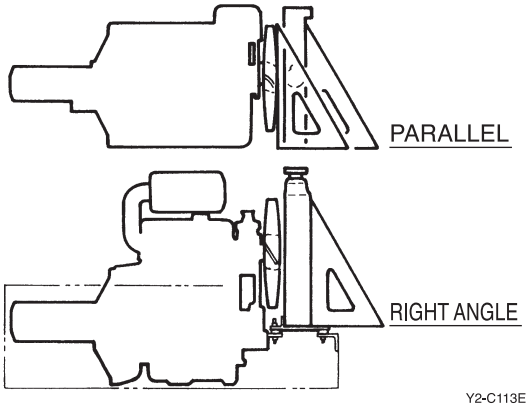


D5C113

Installing the Radiator and Oil Cooler

Follow the same procedure as for removal in the reverse order.

• The radiator should be mounted at right angles to the main body frame and parallel to the cooling fan.

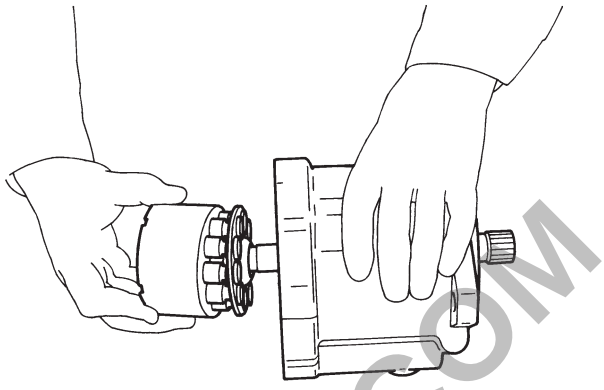


Y2-C113E

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

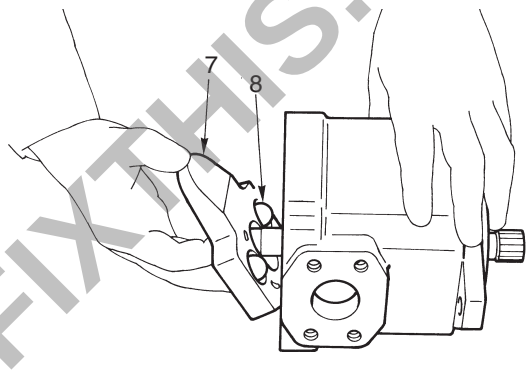
5. Remove the cylinder block from the body S.



Y3–D109

6. Remove the swash plate (7) and swing pins (8) from the body S.

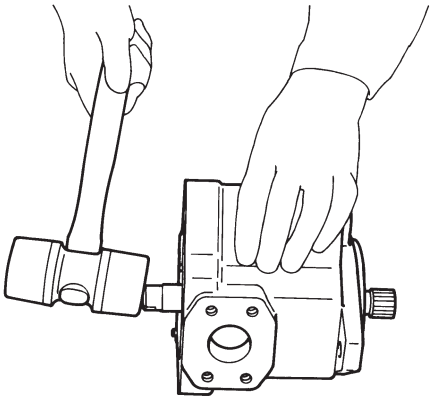
7. Remove the stopper pin A and two conical spring washers, and then remove the stopper pin B, two conical spring washers and the piston from the body S.
   - Parts should be stored so that they can be placed at the same positions when they are assembled.



C4D108

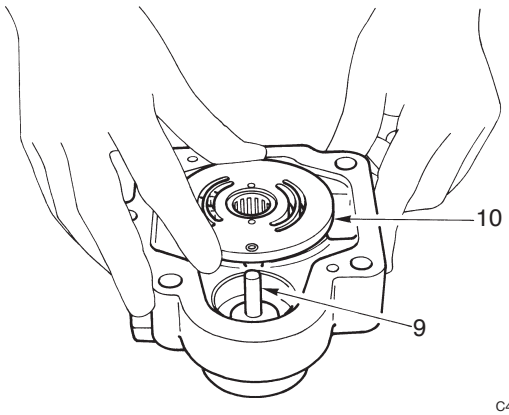
8. Remove the snap ring from the shaft side of the body S.

9. Remove the shaft assembly and oil seal from the body S.
   - Use a plastic hammer to take off the shaft assembly.



Y3–D111

10. Remove the spring guide (9) and valve plate (10) from the body H.
    - To remove the spring guide, drive the set screw into the set screw hole of the body H and push out the spring guide.

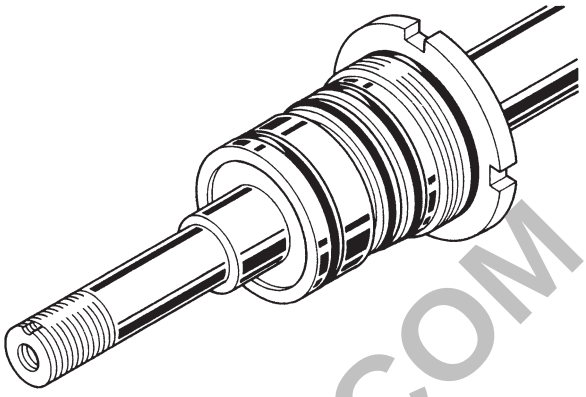


C4D109

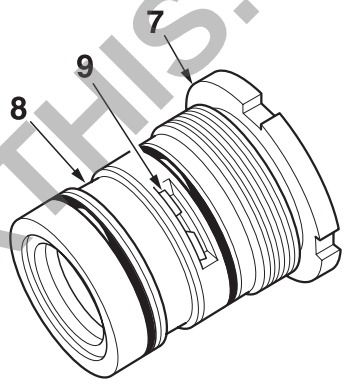
PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

3. Remove the rod cover assembly.



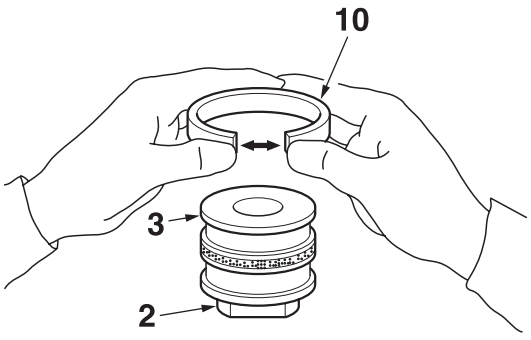
4. Separate the rod cover assembly (7) and retainer assembly (8).
   a. Turn the retainer (8) until the bent part at the tip of the ring (9) can be seen in the notched part of the retainer (8).
   b. Pull the tip of the ring (9) with pliers while turning the retainer (8) to pull the ring (9).
   c. Remove the holder from the inside of the rod cover.



Piston

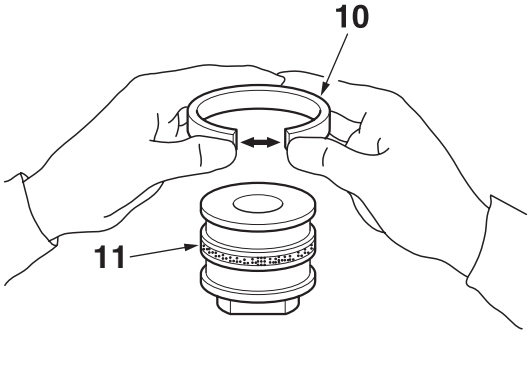
Boom, Arm, Bucket

1. Remove the wear ring (10) from the piston (2) and the packing holder (3).
   - Spread the wear ring at the cut portion the minimum amount necessary for it to be removed. Remove it in the direction of the shaft.



Dozer Blade, Swing

1. Remove the wear ring (10), then remove the piston packing (11).
   - Spread the wear ring at the cut portion the minimum amount necessary for it to be removed. Remove it in the direction of the shaft.
   - Either cut the piston packing off or use a flat bladed screwdriver, etc. to take it off.



PREVIEW - YOUFIXTHIS.COM
Download full manual at youfixthis.com

DISASSEMBLY AND ASSEMBLY

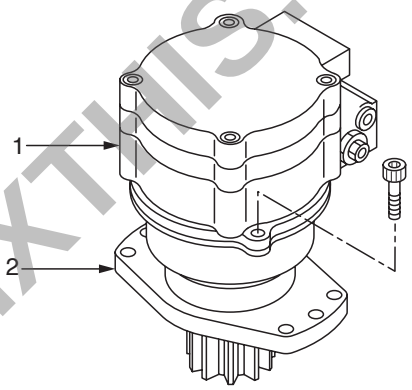
General Cautions

- Carry out disassembly and assembly operations in a clean place and provide clean containers to place the disassembled parts in.
- Before disassembly, clean around the ports and remove the paint from each joint using a wire brush.
- Wash the disassembled parts and dry them with compressed air. Do not use a rag, as this could cause clogging of dirt.
- Make match marks on each part so that they will be assembled in the same positions when reassembled.
- Replace all seals with new ones each time the unit is disassembled, coating them lightly with grease.
- Check each part to make sure there is no abnormal wear or seizing and use sandpaper, etc. to remove any burrs, sharp edges, etc.

Disassembly

Slew Motor

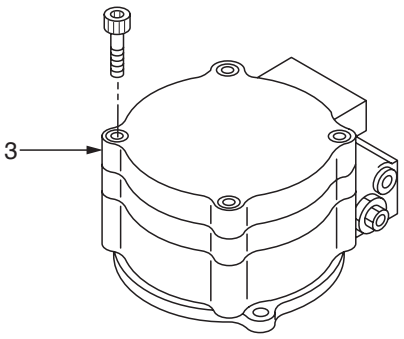
1. Remove the cap screws to disassemble the slew motor into the hydraulic motor (1) and the reduction gear (2).
   - Mark the mating position on both the hydraulic motor and the reduction gear so that they can be mated correctly when reassembling.
   - Fix the hydraulic motor with a vise.



E5D612

Brake Valve and Hydraulic Motor

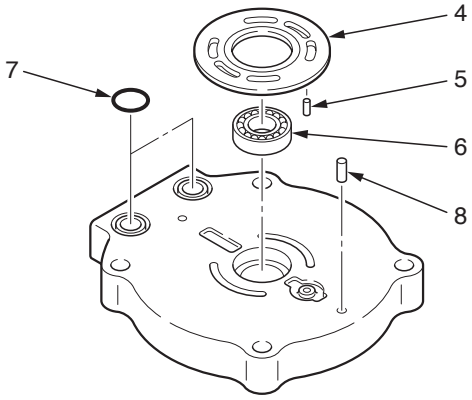
1. Remove the cap screws and then the cover (3).
   - Be careful not to drop the valve plate.



E5D613

2. Remove the valve plate (4) and pin (5) from the cover.

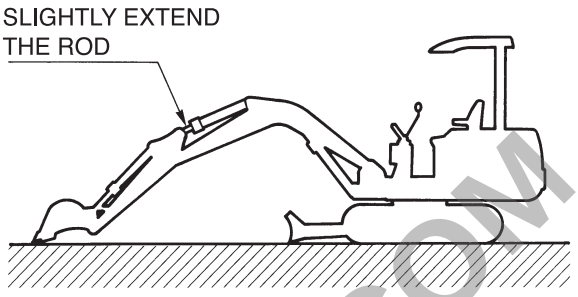
3. Remove the bearing (6), O-ring (7) and pin (8) from the cover.



E5D614

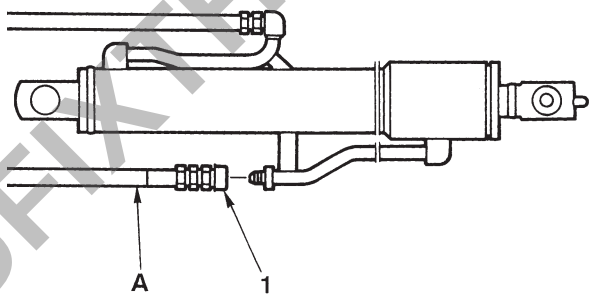
PREVIEW - YOUFIXTHIS.COM
Download full manual at youfixthis.com

5. Inspect the boom cylinder.
   Boom Cylinder internal Leakage Inspect (1)
   a. With the bucket cylinder fully retracted and with the rod of the arm cylinder a little extended from the fully retracted position, lower the bucket front end to the ground.



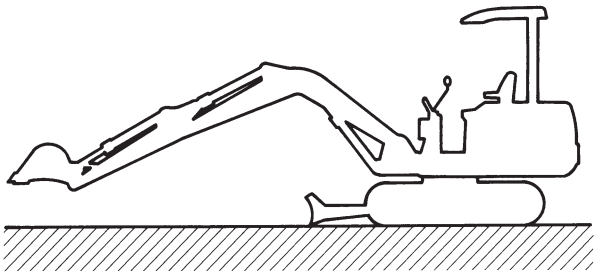
Y2-E304E

   b. Disconnect the rod side hose (A) only and let the oil in the piping run out.
   Insert a plug (1) in the disconnected hose.

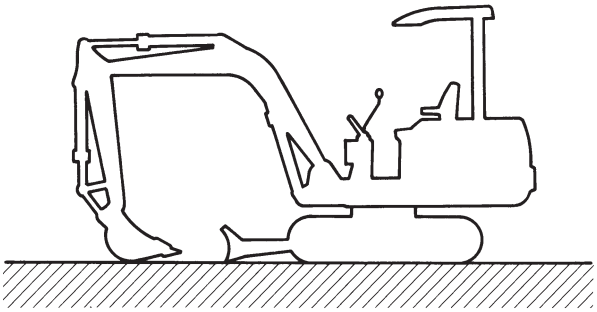


C3–E302

   c. Retract the arm cylinder and lift the bucket so it is floating above the ground.
   At this time, if there is oil leaking from the piping of the cylinder where the hose was disconnected, and if the boom cylinder's rod is retracted, the cylinder is leaking internally. Also, if there is no leakage of oil from the cylinder's piping, if the boom cylinder's rod is retracted, the control valve is leaking internally.


Y2-E306

   Boom Cylinder Internal Leakage Inspect (2)
   a. Place the machine in the posture shown in the figure.


Y2-E307

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

2.2 Periodic inspection and maintenance procedure

2.2.1 Check before daily operation

Be sure to check the following points before starting an engine every day.

No.	Inspection Item
(1)	Visual check around engine
(2)	Fuel tank level check and fuel supply
(3)	Lube oil level check and replenishment
(4)	Cooling water level check and replenishment
(5)	Fuel pipe and cooling water pipe inspection and maintenance
(6)	Inspection and adjustment of governor lever and accelerator
(7)	Warning lamp & instruments function check

(1) Visual check around engine.

If any problem is found, do not use before the engine repairs have been completed.

- Oil leak from the lubrication system
- Fuel leak from the fuel system
- Cooling water leak from the cooling water system
- Damaged parts
- Loosened or lost bolts
- Fuel, radiator rubber hoses, V belt cracked, loosened clamp

(2) Fuel tank level check and fuel supply

Check the remaining fuel oil level in the fuel tank and refuel the recommended fuel if necessary. (Refer to 1.3.1

(3) Lube oil level check and replenishment

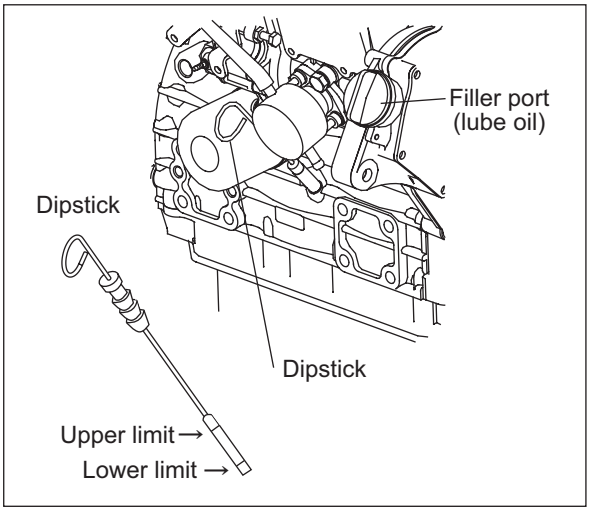
(a)Checking oil level

Check the lube oil level with the dipstick, after adjusting the posture of the machine unit so that an engine may become a horizontality. Insert the dipstick fully and check the oil level. The oil shall not be contaminated heavily and have appropriate viscosity. No cooling water or diesel fuel shall be mixed.

When lube oil is supplied after the engine running, check the lube oil level after about 10 minutes pass after the engine shutdown so that the lube oil inside may be returned to the oil pan.

Standard

The level shall be between the upper and lower limit lines on the dipstick.



PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

4.2.7 Valve guide replacement

1)Use a valve guide extraction tool(4.1.2(1) No.1 in Chapter 4) and extract the valve guide from the cylinder head.

2)Put liquid nitrogen or ether (or alcohol) with dry ice added in a container and put the valve guide for replacement in it for cooling. Then insert it in with a valve guide inserting tool (Refer to No.2 of 4.1.2(1) in Chapter 4).

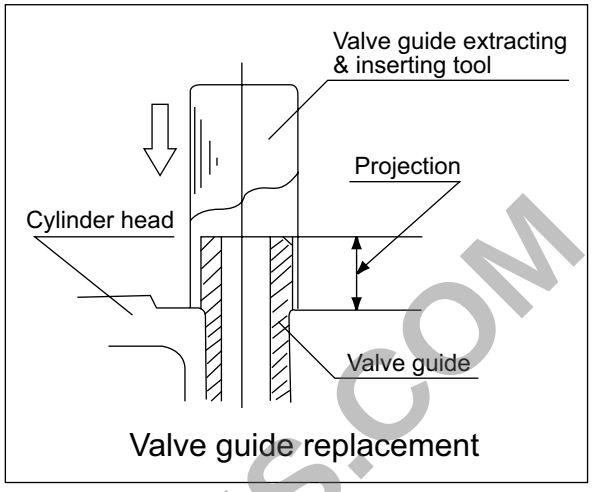
⚠ CAUTION

Do not touch the cooled valve guide with bare hands to avoid skin damage.

3)Check the inside diameter and finish to the standard inside diameter as required with a reamer.

4)Check the projection from the cylinder head.

Projection	(mm)
9.8 to 10.0	



Valve guide replacement

4.2.8 Valve stem seal replacement

Always use a new valve stem seal after the intake/ exhaust valve or valve stem seal is disassembled. Since the one for the exhaust valve is marked with yellow paint, do not confuse the intake and exhaust valves.

[NOTICE]

Painting is applied to the springs of both intake/ exhaust valve stem seals for the distinction because both parts are different. Be careful because it causes oil down when the attachment of intake/ exhaust is mistaken.

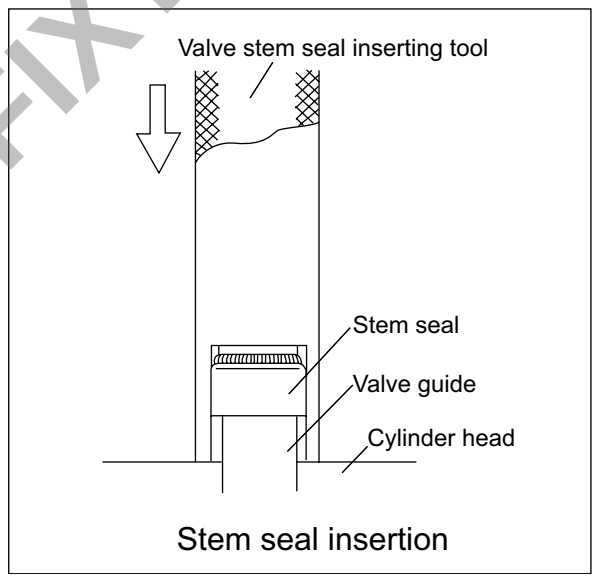
Distinction coloration for the intake is “white” and for the exhaust “black”.

1)Apply lube oil to the lip.

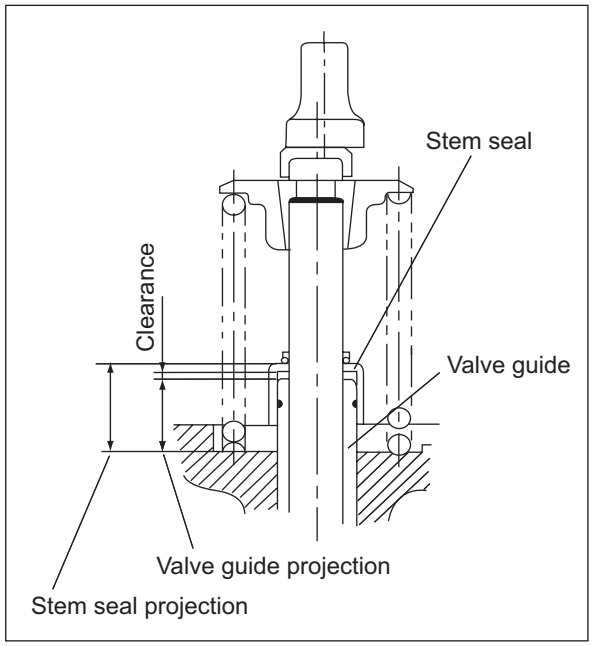
2)Push with the inserting tool (Refer to No.5 of 4.1.2(1) in Chapter 4) for installation.

3)Measure and check the projection of valve stem seal to keep proper clearance between valve guide and stem seal.

Projection	(mm)
10.9 to 11.2	



Stem seal insertion



PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

PREVIEW ONLY

You're viewing 18 of 412 pages

The full manual includes:

- All 412 pages, complete
- Searchable PDF (find any keyword)
- No watermarks
- Instant download
- Print-ready quality

GET FULL MANUAL NOW

Yanmar 2TNV70, 3TNV70, 3TNV76, TB23R Compact Excavator, 2/3TNV70 Workshop Manual

Scan or click anywhere
youfixthis.com

Click anywhere on this page to get the full manual