2. TECHNICAL DATA

2. Technical Data

2-1 Specifications

Item	Unit	ViO15-2
Main specifications of machine		
Dimensions		
Overall length (Transportation position)	in. (mm)	133.9 (3410)

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3. SERVICING STANDARDS

3-7 List of Tightening Torque

3-7-1 Machine

Unit : ft•lbf (N•m)

Applicable model:			ViO15-2		
Equipment			Thread size	Tightening torque	Adhesive
	No.	Tightening part			
Engine / Electrical equipment					

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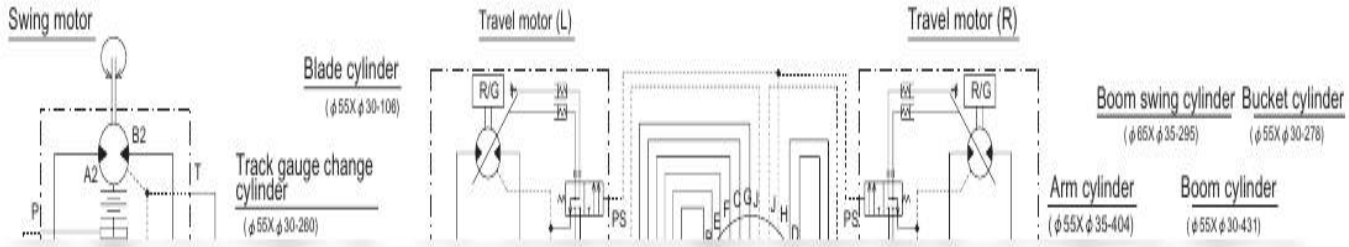
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5. HYDRAULIC SYSTEM

5-2 Hydraulic Circuit Schematic

5-2-1 For Standard Type Machines



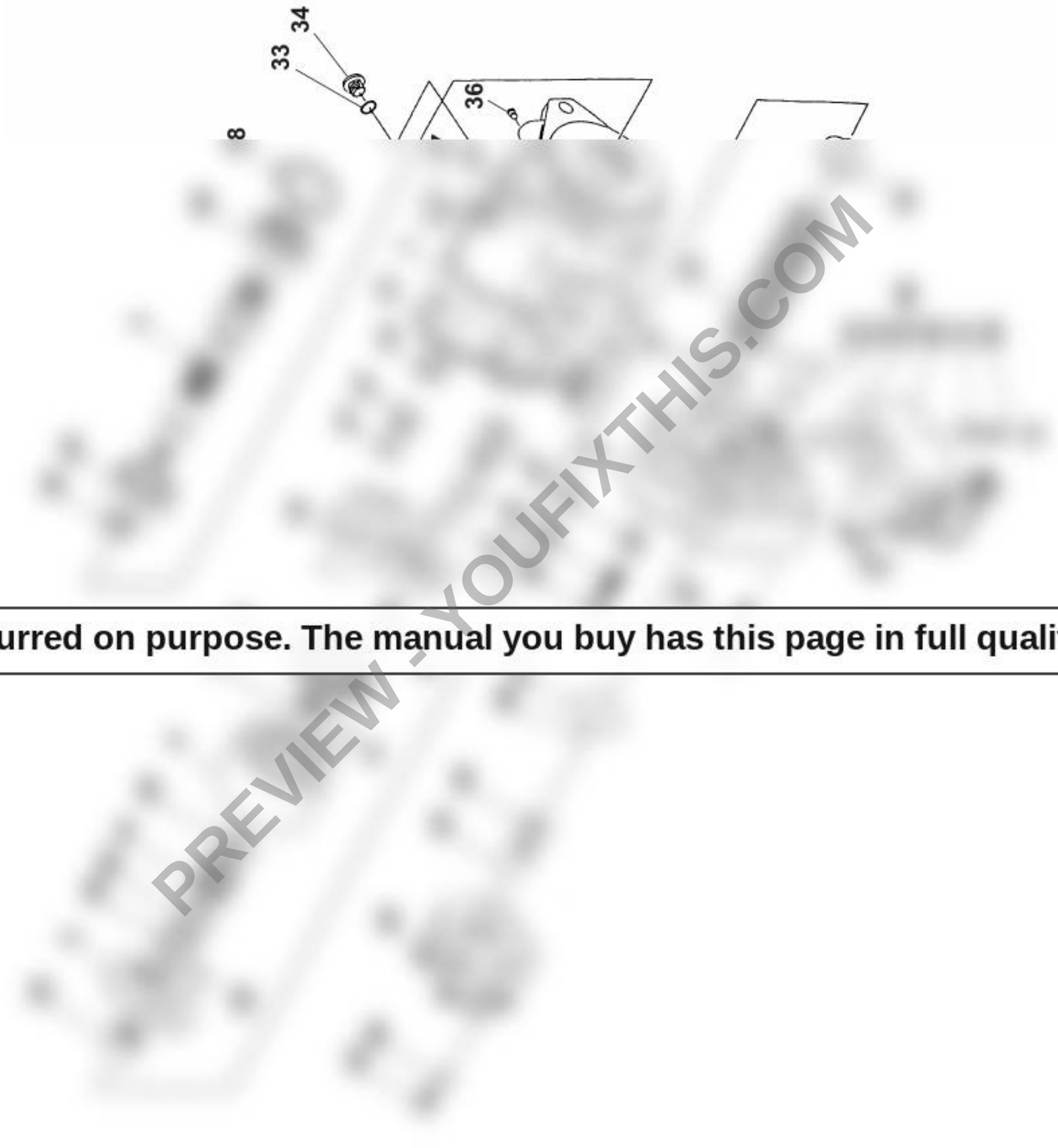
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6. HYDRAULIC EQUIPMENT

3. Exploded View and Component Parts



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8. Periodic Inspection and Servicing

8-1 List of Periodic Inspection and Servicing

◇ : Check ○ : Supply ● : Replace □ : Adjust (clean) ■ : Oil & grease

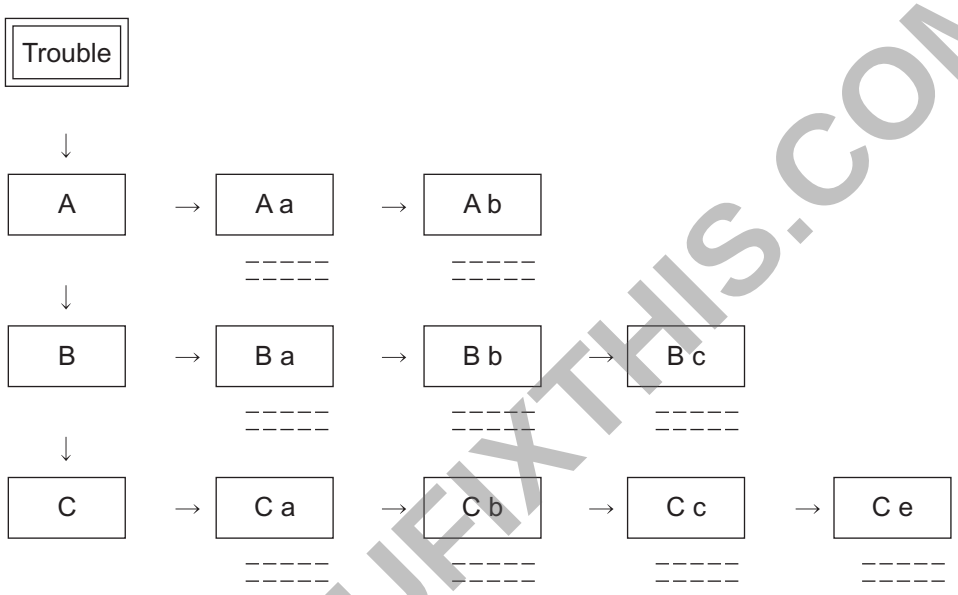
Check & service items			Daily	Every 50	Every 100	Every 250	Every 500	Every 1000 hrs
General	Check falling off, breakage of parts		◇					
	Check loosened bolts & nuts, retighten		◇					
	Check engine condition		◇					
	Clean		□					
Lube oil	*Swing gear case oil	Check, resupply				◇/○		
		Replace				●1st time		●
	Travel reduction gear oil	Check, resupply				◇/○		
		Replace				●1st time		●
	*Transmission oil	Check, resupply	◇/○					
		Replace			●1st time			●
	*Differential gear oil	Check, resupply			◇/□			
		Replace			●1st time			●
Hydraulic system	Hydraulic oil	Check, resupply	◇/○					
		Replace						●
	Clean suction filter					□1st time		□
	Replace return filter					● 1st time	●	
	Check for abnormality of hydraulic pump		◇					
Grease	Check grease-up positions, grease		■					
	Greasing the swing gears and the swing bearings			■				
	Greasing the track gauge change cylinder and the link fulcrum			■				
Undercarriage	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. lever		◇					
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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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.

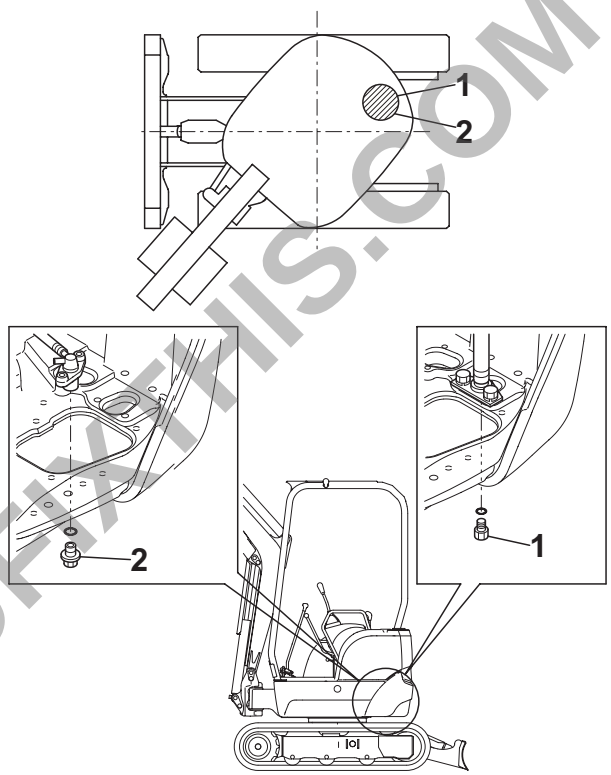
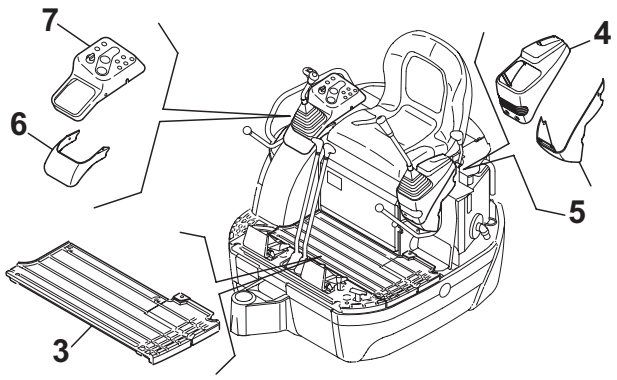
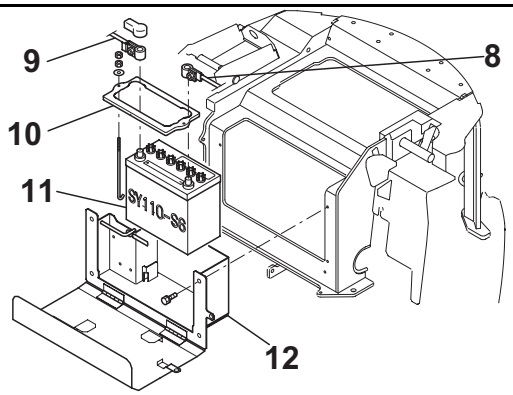
← Inspection item

– – – – – – – – – – ← Remedy for failure

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7-1-5 Removal and Reinstallation of Engine

1) Removal

Procedure	
(1) Swing the upperstructure so that the drain plug **1** of the hydraulic oil tank and the cooling water drain plug **2** are positioned halfway between the right and left crawlers. Then, lower the bucket to the ground and stop the engine. (2) Remove the drain plug **1** from the hydraulic oil tank and drain the hydraulic oil. Type: YANMAR SUPER HYDRO OIL (VG 46 class) or its equivalent Quantity: 3.6 Gals. (13.8 L) (3) Remove the drain plug **2** from the two-way cock for cooling water and drain the cooling water. Cooling water quantity: 2.3 Qts. (2.2 L)	
(4) Remove the step A **3**, the panel (UP) **4**, the panel L (LOW) **5** and the panel R **6**. (5) Remove the indicator box **7**, and then disconnect the harness connectors.	
(6) Disconnect the battery cable (negative) **8** and the battery cable (positive) **9** and remove the battery clamp **10**. Then remove the battery **11**. (7) Remove the battery mount **12**.	

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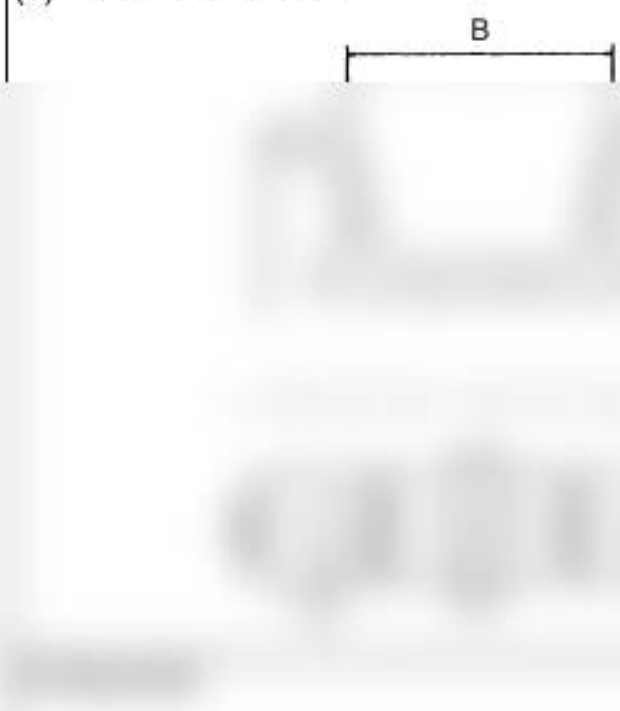
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3. SERVICING STANDARDS

[Unit : in. (mm)]

Applicable model		ViO15-2		
Part		Measuring position	Standard	Wear limit
(3) Track roller & shaft		A	Ø0.98 (Ø25)	-
		B		

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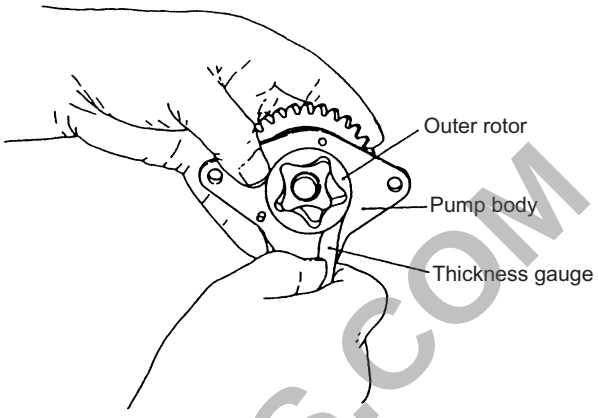
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4-2-9 Trochoid Pump

1) Clearance Between Outer Rotor and Pump Body

Insert a thickness gauge between the outer rotor and the pump body to measure the clearance.

	Standard	Wear limit
Clearance between outer rotor and pump body	Refer to Section "3-2 1) Nominal and Allowable Values".	

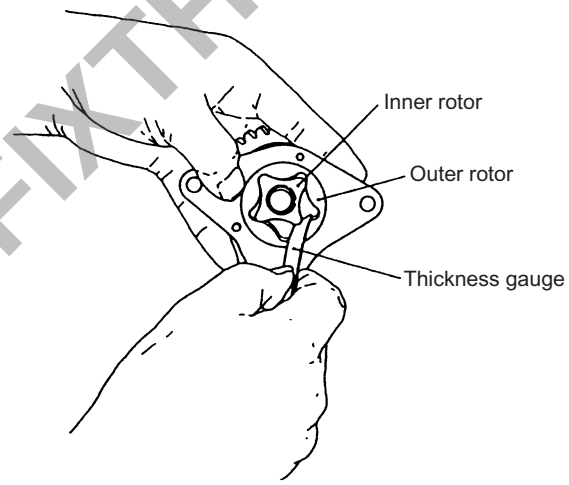


(Measuring the clearance between outer rotor and pump body)

2) Clearance Between Outer Rotor and Inner Rotor

Insert a thickness gauge between the top of the inner rotor tooth and the top of the outer rotor tooth to measure the clearance.

	Standard	Wear limit
Clearance between outer rotor and inner rotor	Refer to Section "3-2 1) Nominal and Allowable Values".	

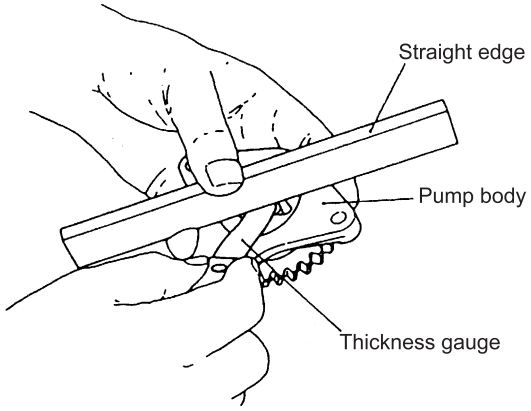


(Measuring the clearance between outer rotor and inner rotor)

3) Distortion Between Pump Body and Inner Rotor, Outer Rotor

Place a straight edge on the end face of the pump body and insert a thickness gauge between the straight edge and the rotors to measure the distortion.

	Standard	Wear limit
Distortion between the pump body and the inner and outer rotors	Refer to Section "3-2 1) Nominal and Allowable Values".	



(Measuring the distortion between pump body and inner and outer rotors)

4) Clearance Between Rotor Shaft and Side Cover Shaft Hole

Measure the rotor shaft outside diameter and the side cover shaft hole diameter, and calculate the difference between the hole diameter and the outside diameter.

	Standard	Wear limit
Clearance between rotor shaft and side cover shaft hole	Refer to Section "3-2 1) Nominal and Allowable Values".	

5) Others

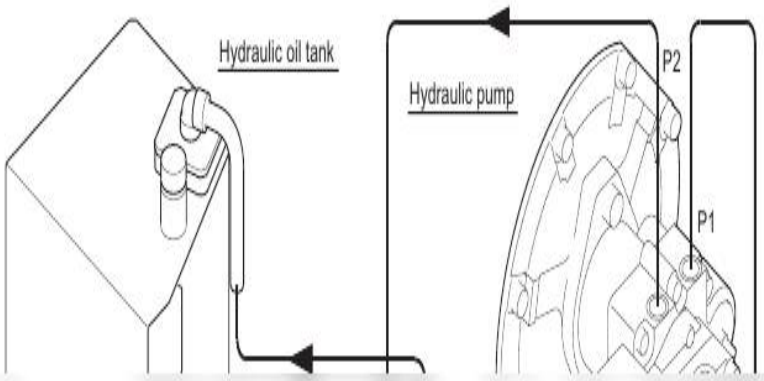
(1) Check for looseness of the engagement of the drive gear and the rotor shaft, and replace the entire assembly if there is looseness or play.

(2) Push the oil pressure regulating valve piston from the drill hole side to check if the piston returns normally. Replace the entire assembly if the piston does not return due to the broken spring or any other trouble.

(3) Check that the rotor shaft rotates smoothly when the drive gear is rotated.

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5. HYDRAULIC SYSTEM



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6. HYDRAULIC EQUIPMENT

6. Service Standards

Clean the parts to be checked and completely dry them

Check the major parts carefully and replace any ones on which excessive wear or damage that may cause malfunction is found.

Replace deformed or damaged seals.

Procedure	
(1) Piston assembly and cylinder barrel	

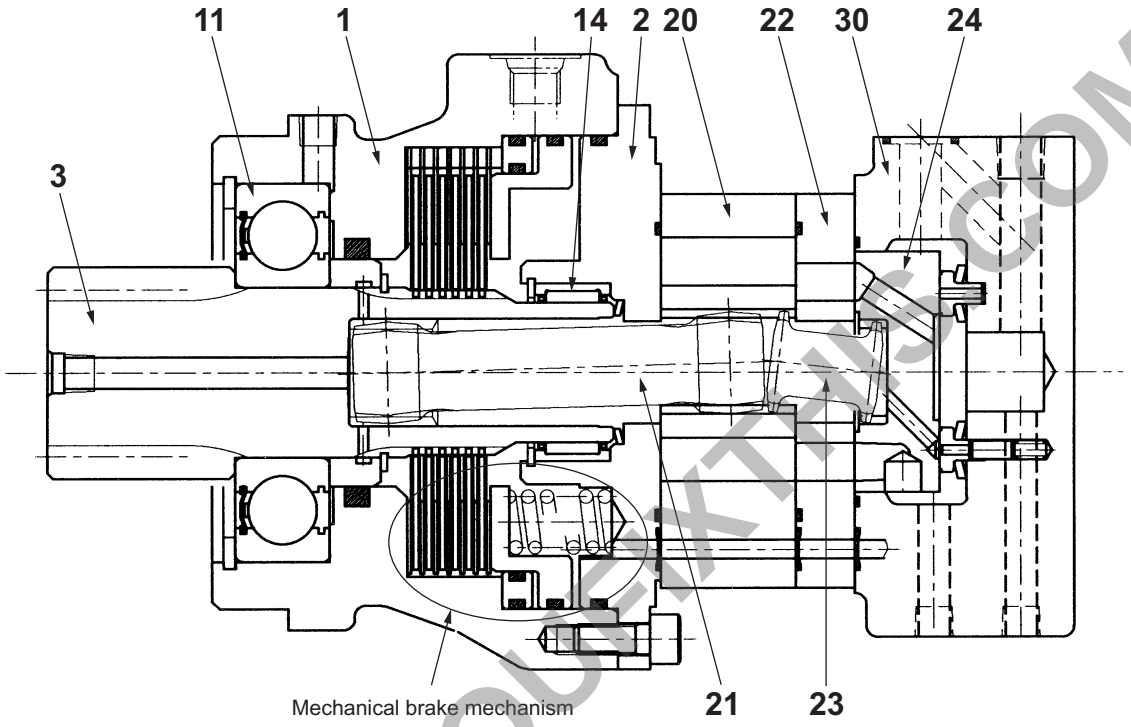
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6-4 Swing Motor

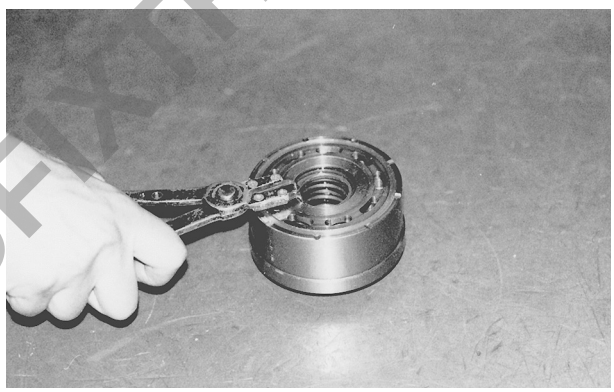
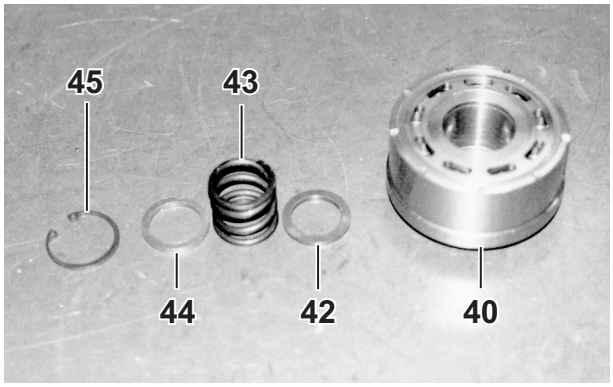
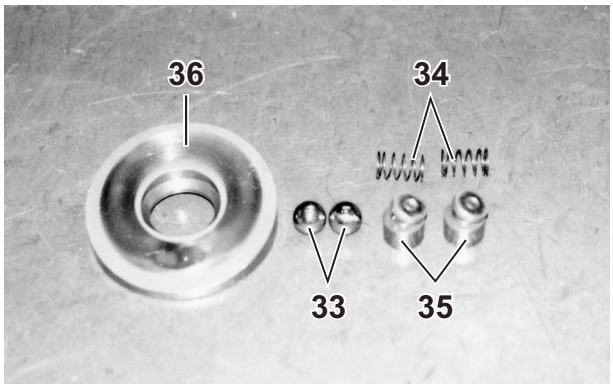
1. Structure and Functions



This hydraulic swing motor consists of an orbit motor and a pinion gear assembly.
The swing motor with a mechanical brake has friction plates splined to the pinion gear **3** and steel plates splined to the bearing housing **1**. In this structure, the brake is operated under the brake torque which is produced by frictional force generated by the piston ring and the coil springs.
The hydraulic motor has six holes in the valve **24** and seven holes in the valve plate **22**, and the displacement per revolution is 14.9 cu. in. (244 cu. cm).
The pinion gear assembly consists of the pinion gear **3** and the two bearings **11** and **14** supporting the pinion gear.
The hydraulic oil which flows in through the brake valve is fed to the valve housing **30**.

No.	Part
1	Bearing housing
2	Flange mounting
3	Pinion gear
11	Front bearing
14	Rear bearing
20	Roller
21	Drive
22	Valve plate
23	Valve drive
24	Valve
30	Valve housing

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Procedure	
(13) Remove the cylinder barrel assembly, the pins **41**, the retainer holder **39**, the retainer plate **38** and the piston assemblies **37**. ***Note :*** *Take care not to damage the sliding surface of the cylinder barrel.*	
(14) Remove the internal snap ring **45** from the cylinder barrel **40**. ***Note :*** *Take care not to damage the sliding surface of the cylinder barrel.* **Tool :** • Snap ring pliers 15	
(15) Remove the washer **44**, the spring **43** and the collar **42**.	
(16) Remove the swash plate **36**, the steel balls **33**, the piston assemblies **35** and the springs **34**.	

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7. ADJUSTMENT AND REPAIR

7-1-6 Removal and Reinstallation of Starter Motor

1) Removal

Procedure	
(1) Lower the bucket to the ground and stop the engine.	

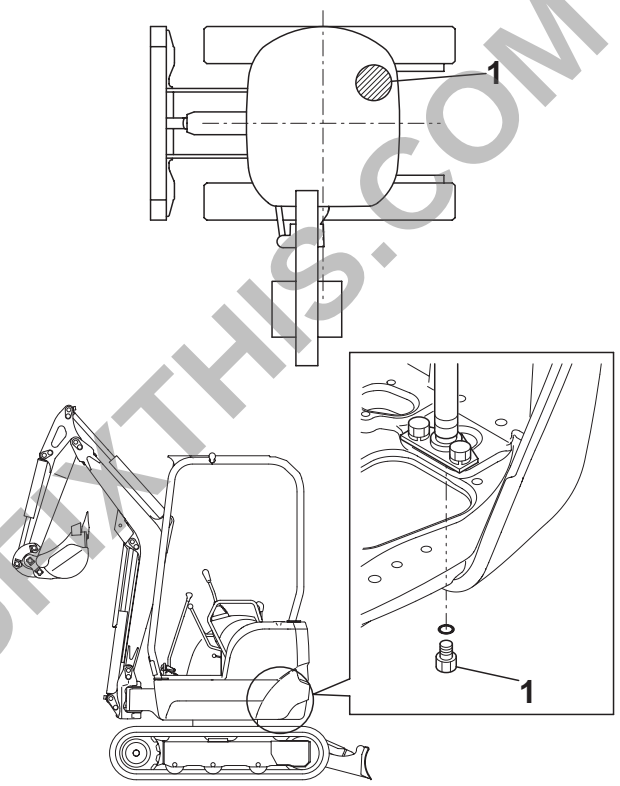
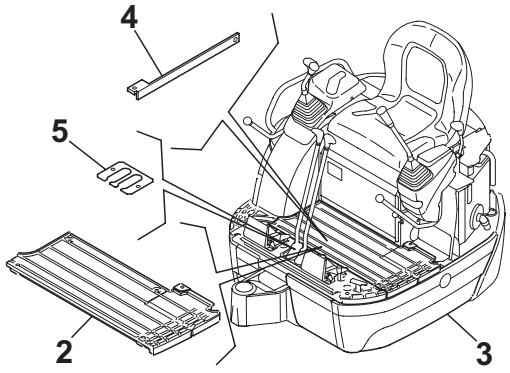
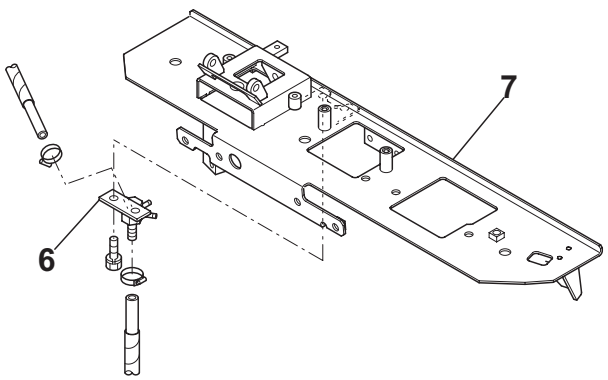
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7-5-3 Removal and Reinstallation of Swing Motor

1) Removal

Procedure	
(1) Swing the upperstructure so that the drain plug **1** of the hydraulic oil tank is positioned halfway between the right and left crawlers. Then, lower the bucket to the ground and stop the engine. (2) Remove the drain plug **1** from the hydraulic oil tank and drain the hydraulic oil. Hydraulic oil quantity: 3.6 Gals. (13.8 L)	
(3) Remove the step A **2**, the frame L cover **3** and the step rib **4**. ***Note :*** *Remove the plate **5** before removing the step rib **4**.*	
(4) Remove the joint **6** (with the hose) from the pedal mount **7**.	

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9. REFERENCE DATA

9. Fuel, Lube Oil and Grease Recommended

Item	Type
Engine oil	Engine oil SAE 10W30, CD class
Travel reduction gear oil	Gear oil SAE90 (GL-4)
Hydraulic oil	ISO VG46

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