2. TECHNICAL DATA

Item		Unit	ViO50-1
Lubrication device			
	Lubrication pump		Trochoid pump
	LO pressure control valve opening pressure	kgf/cm²	3 to 4
	LO filter		Cartridge type
	LO filter filtration area	cm²	1240
	Filter valve opening pressure	kgf/cm²	0.8 to 1.2
	Operating pressure of alarm switch	kgf/cm²	0.4 to 0.6

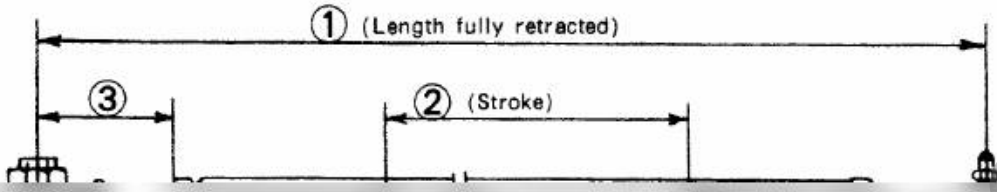
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3-5 Hydraulic Equipment

3-5-1 Hydraulic Cylinder



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(4) Fuel should bubble out at specified fuel injection timing (b.T.D.C.).

Note: *Check the fuel injection timing (b.T.D.C.) for all the cylinders.*

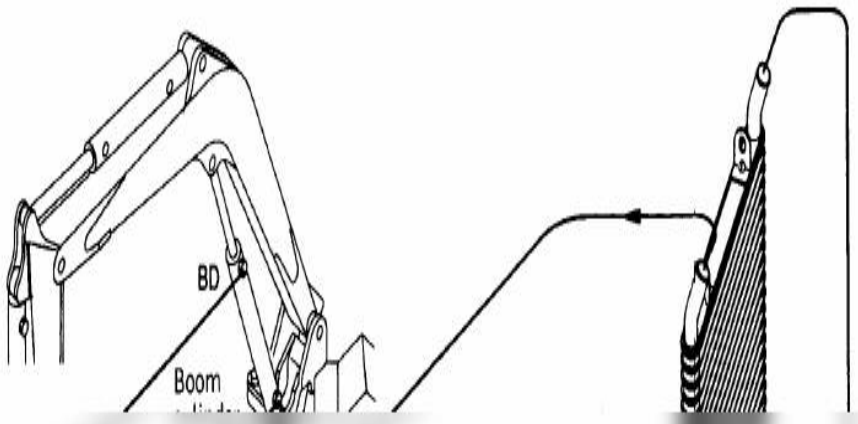


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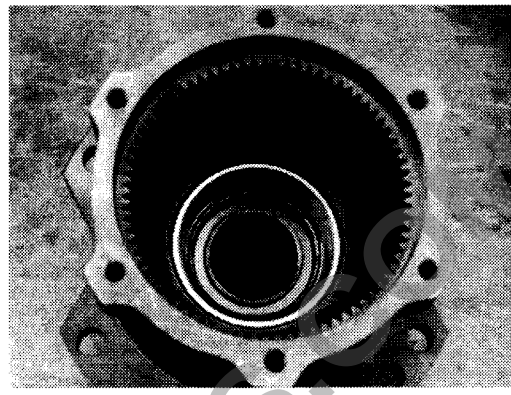
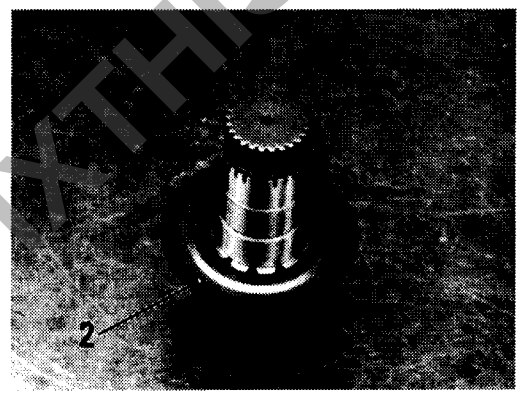
5. HYDRAULIC SYSTEM



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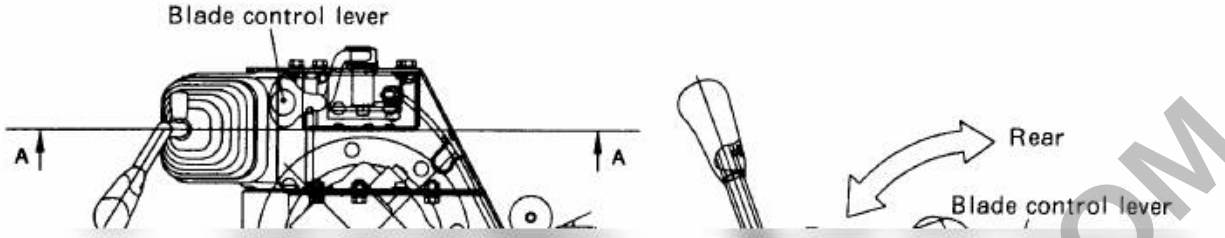
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Procedure	
(21) Remove outer races of taper-roller bearings **3** and **6**, and oil seal **5**. ***Notes:*** *a) Do not remove outer races of bearings because of its difficulty if not required.* *b) Replace removed oil seal with a new one.*	
(22) Remove inner race of taper-roller bearing **3** and ring **2**. ***Notes:*** *a) Do not remove inner race press-fitted to pinion shaft if not required.* *b) Replace removed ring with a new one.*	

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7-3-7 Adjustment of Blade Control Lever

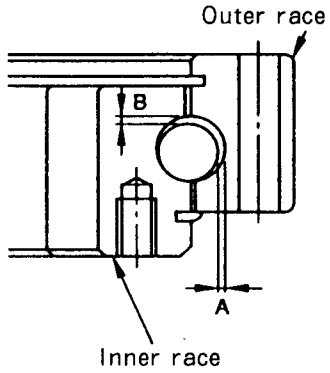
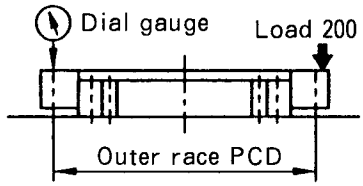
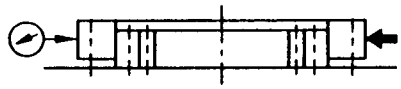


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5. Service standards

			Standard	Wear limit
	Axial clearance B 		0.05 to 0.25mm	0.55 mm
	Radial clearance, A Load 200 kgf 		0.05 to 0.30mm	0.6 mm
Steel ball dia.			ϕ25.4 mm	–
Tightening torque	Upperstructure × Outer race	M16×80	27 to 31 kgf-m	Apply LOCTITE 262 or its equivalent.
	Undercarriage × Inner race	M16×90		

Note:

Supply multi-purpose grease to the swing bearing.

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4-12 Starter Motor

The starter motor is installed on the flywheel housing. When the starting key switch is turned on, the starter motor pinion files out and engages the ring gear of the flywheel. Then the main contact is closed, current flows, and the engine is started.

After the engine starts, the pinion automatically returns to its initial position when the starting key switch is released. Once the engine starts, the starting key switch should be released immediately. Otherwise, the starter motor may be damaged or burned out.



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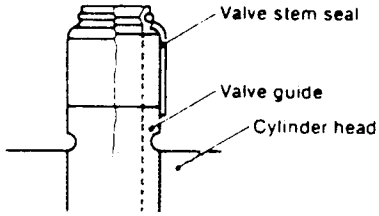
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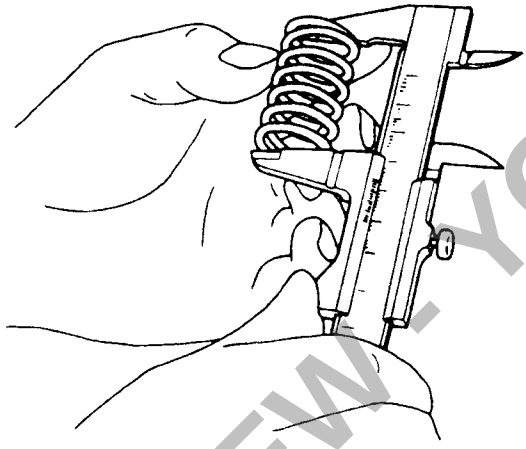
(4) Valve stem seals
The valve stem seals in the intake/exhaust valve guides cannot be refused once they are removed-be sure to replace them.
When assembling the intake/exhaust valves, apply an adequate amount of engine oil on the valve stem before inserting them.



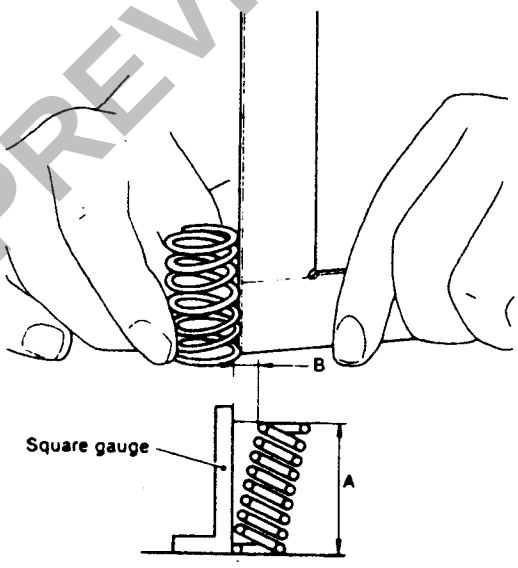
4-2-4 Valve springs

1. Checking valve springs

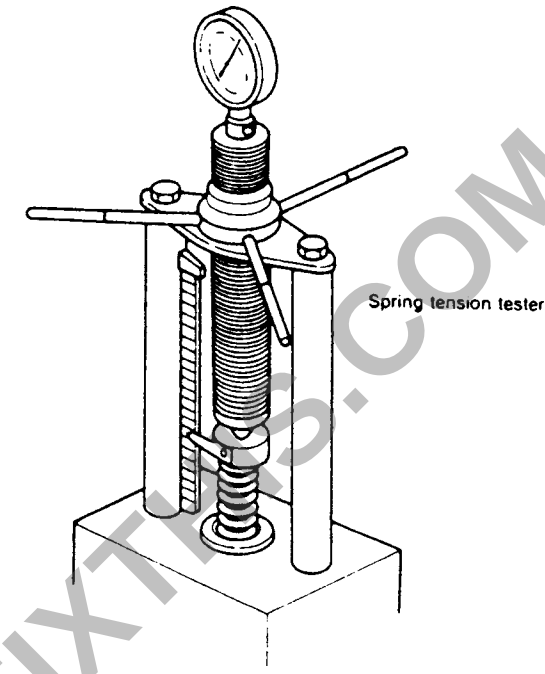
(1) Check the spring for scratches or corrosion.
(2) Measure the free length of the spring.



(3) Measure inclination.

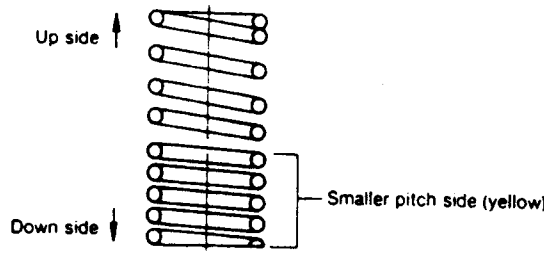


(4) Measure spring tension.



Valve spring	Standard	Wear limit
Free length Length when attached Load when attached	See separate service data (Page, 4–8–1)	

Assembling valve springs
The side with the smaller pitch (painted yellow) should face down (cylinder head).



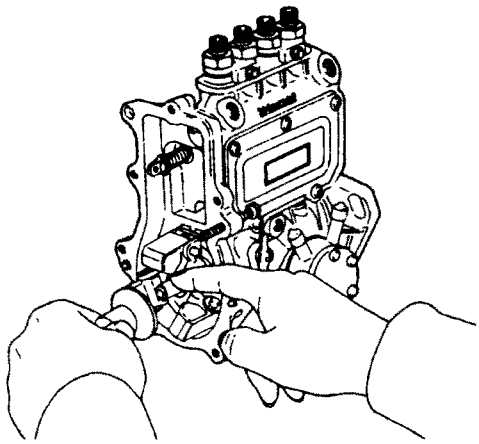
Note: *The pitch of the valve spring is uneven. The side with the smaller pitch (yellow) should face down (cylinder head) when assembled.*

(5) Spring retainer and spring cotter
Inspect the inside face of the spring retainer, the outside surface of the spring cotter, the contact area of the spring cotter inside surface and the notch in the head of the valve stem. Replace the spring retainer and spring cotter when the contact area is less than 70%, or when the spring cotter has been recessed because of wear.

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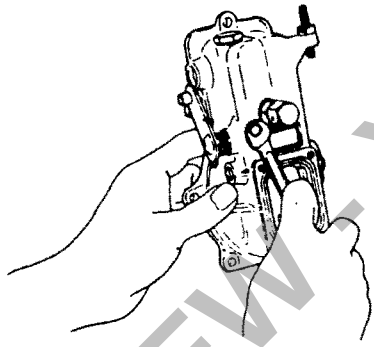
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(2) Open the governor weight to the outside, and insert the sleeve in the end of the fuel pump camshaft.



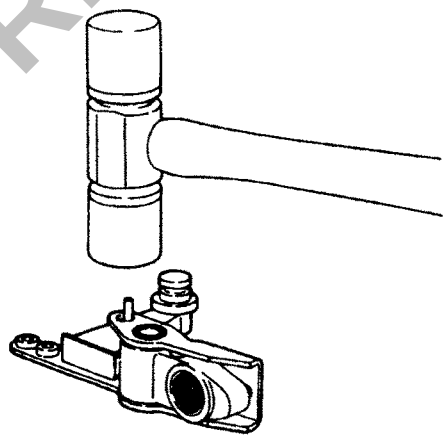
Note: *Make sure that the sleeve moves smoothly after inserting it.*

(3) When the stop lever has been disassembled, mount the stop lever return spring on the stop lever, tap the stop lever lightly with a wooden hammer to insert it, and tighten the stop lever stop pin.

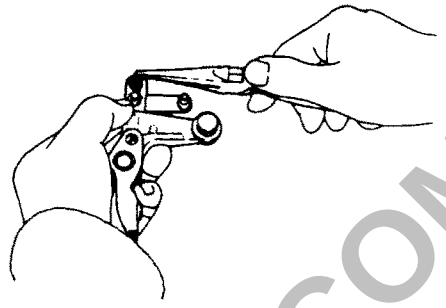


(4) When the control lever shaft has been removed, lightly tap the control lever shaft and washer from inside the governor case, using an appropriate plate.

(5) If the governor has been disassembled, tap in the spring pin.

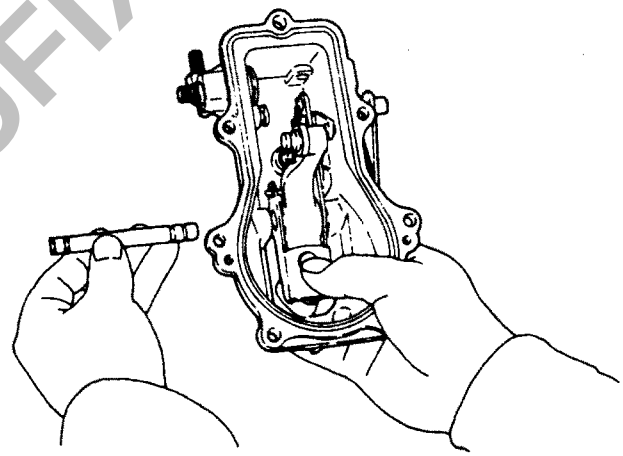


(6) Mount the governor lever assembly to the governor link.

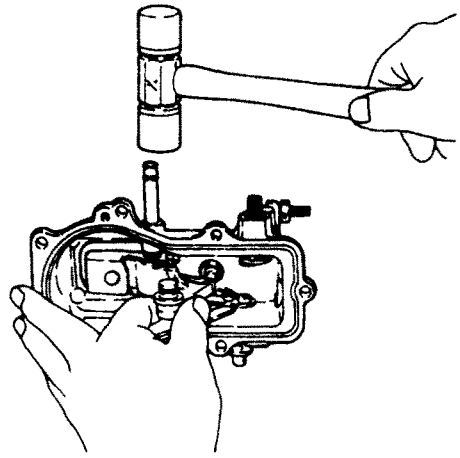


Note: *1. Make sure that the correct governor link mounting holes are used, and that it is mounted in the correct direction.*
2. Make sure that the governor link moves smoothly.

(7) Put the governor lever shaft assembly in the governor case, insert the governor lever shaft, and tap it until the O-ring groove comes out the opposite side of the governor case.



Note: *1. Fit the O-ring to the side you have tapped in.*

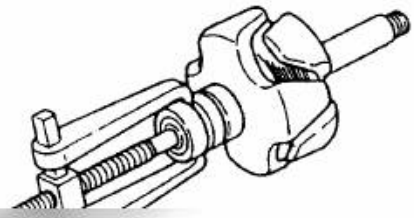


2. Make sure to insert the governor lever shaft in the correct direction.

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4) Check the rear side ball bearing. If the rotation of the bearing is heavy, or produces abnormal sounds, replace the ball bearing.



(4) Brush

The brush is hard and wears slowly, but when it is worn beyond the allowable limit, replace it. When replacing the brush, also check the strength of the brush spring.

To check, push the spring down to 2mm (0.078in.) from the end of the brush holder, and read the gauge.



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2. Theory of operation

1) Pump function

- The cylinder barrel, which is splined to the drive shaft, revolves with the shaft.
- The pistons installed into the cylinder barrel, following the swash plate, make a reciprocating motion, which causes the volume of the cylinder to change, thereby enabling the

to the bottom dead center, thereby decreasing the volume, the oil in the cylinder barrel is discharged to the discharge port. (Discharge stroke)

- By changing the inclination of the swash plate, the piston stroke is changed and thus

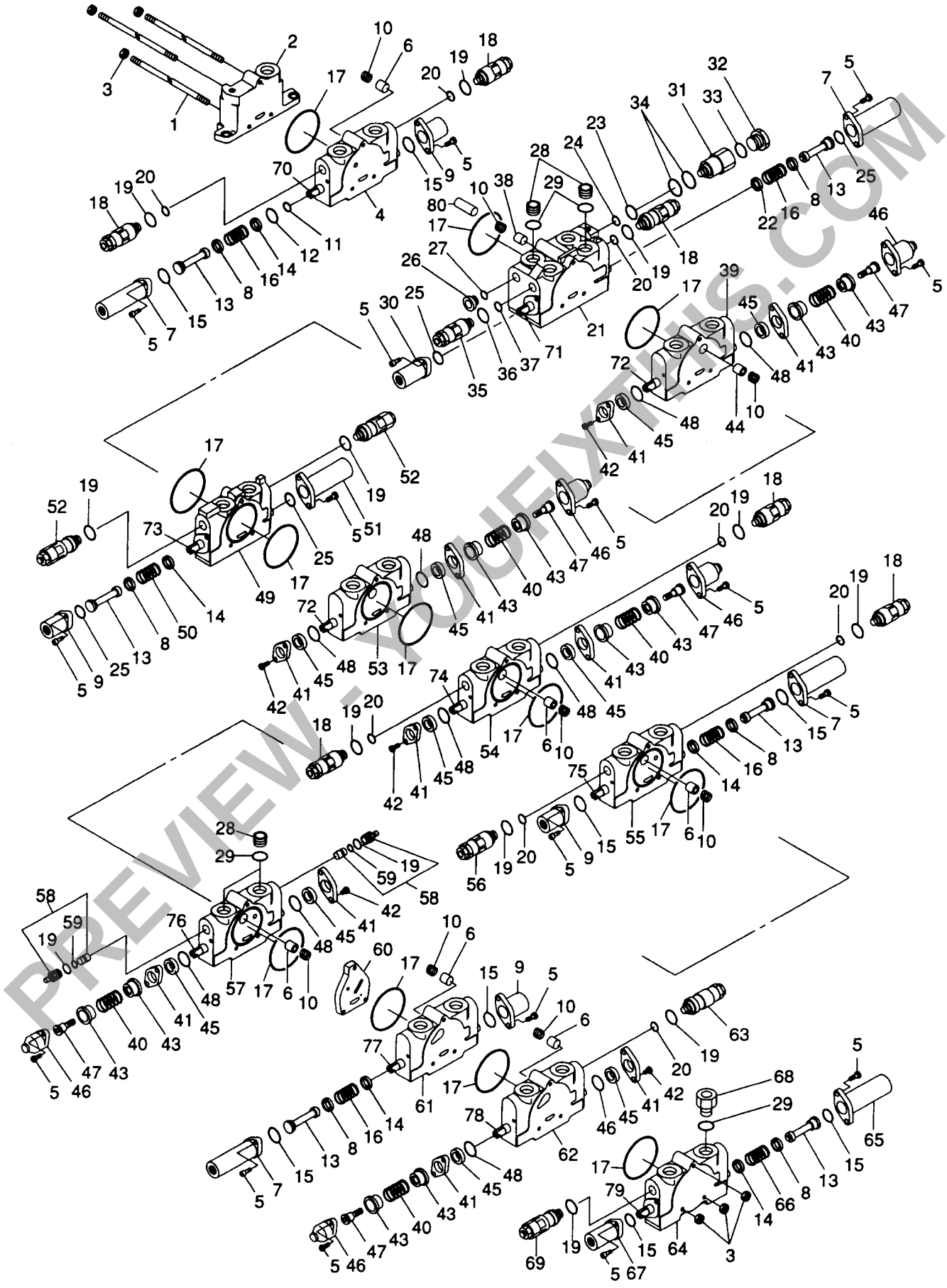
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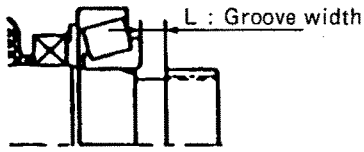
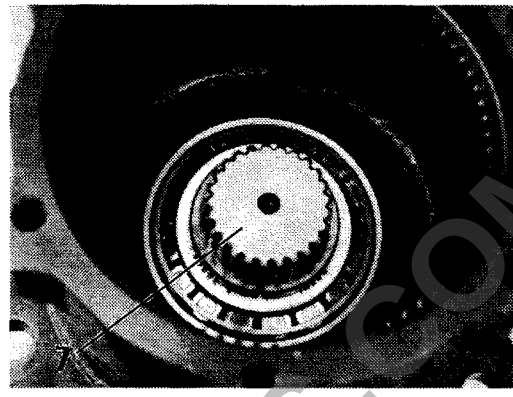
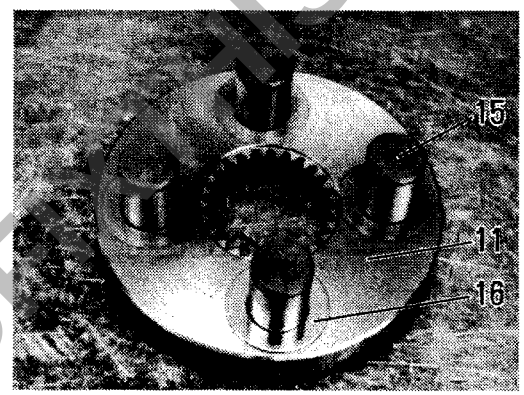
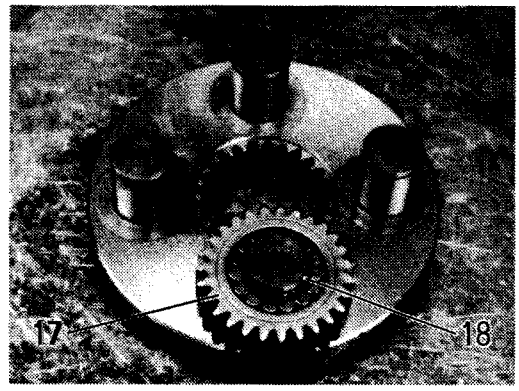
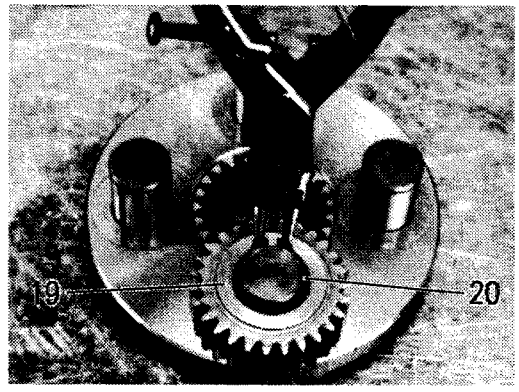


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3. Exploded view and component parts

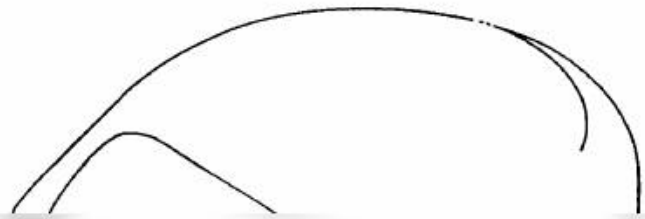


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Procedure	
(33) Install two preload collars **7**. ***Note:*** *The thickness of preload collar should be 0 to +0.05 mm larger than groove width: L between end face of taper-roller bearing and that of pinion shaft.*  	
(34) Install thrust washers **16** onto pins b1 **15** of carrier 1 **11**.	
(35) Install gears b1 **17** and insert rollers **18** between pins b1 and gears b1. ***Note:*** *Number of rollers: 17 pcs. per gear b1*	
(36) Install thrust washers **19** and then external snap rings **20** to assemble carrier 1 assembly.	

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3. Heater



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7-6 Engine Hood and Cabin

7-6-1 Engine Hood

⚠ When there are two people for the work, be sure to decide signs for communication between them before the work.

1. Adjustment of height

(1) Loosen the four bolts (with spring washers) 10×30.

(2) Turn the two bolts 10×50 to adjust the height of the brackets F and R.

Note:

The difference in height between the engine hood and the engine hood cover should be within 2 mm.

(3) Tighten the lock nuts 10 for the bolts 10×50.

2. Adjustment of position

(1) Install the engine hood onto the brackets B temporarily and tighten three bolts 10×20 for each bracket B lightly.

(2) After closing the engine hood, check the clearance A, which is shown in the right figure, and the position of the engine hood.

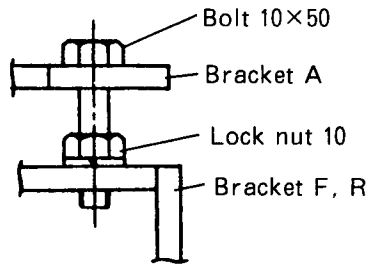
(3) Open the engine hood carefully and put a round rod into the remaining bolt hole in the bracket B to adjust the position of the engine hood by moving the round rod.

(4) Close the engine hood carefully to check the clearance A and the position of the engine hood again.

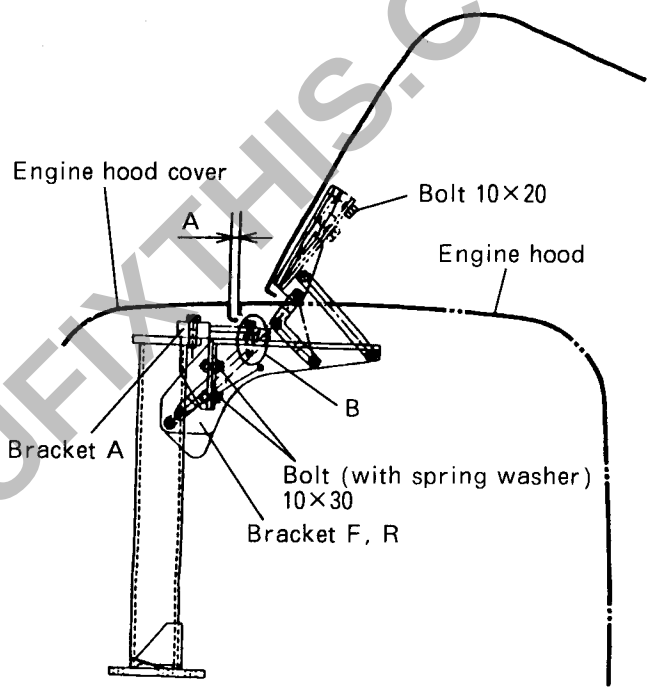
(5) If the clearance A is within the specified range and the difference in height between the engine hood and the engine hood cover is within the specified value, open the engine hood carefully and tighten all eight bolts for the brackets B.

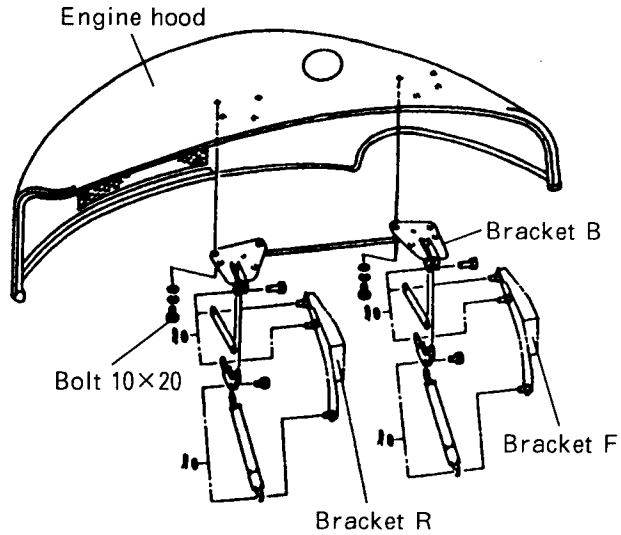
Clearance A : 13 to 15 mm
Difference in height : Within 2 mm

(6) If the values are not within the above ones, repeat the steps (2) to (5).



Enlarged view of B





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