

GROUP 3 PUMP DEVICE

1. REMOVAL AND INSTALL

1) REMOVAL

- (1) Lower the work equipment to the ground and stop the engine.
- (2) Operate the control levers and pedals several times to release the remaining pressure in the hydraulic piping
- (3) Loosen the breather slowly to release the pressure inside the hydraulic tank.

▲ Escaping fluid under pressure can penetrate the skin causing serious injury.

- (4) Loosen the drain plug under the hydraulic tank and drain the oil from the hydraulic tank.

· Hydraulic tank quantity : 90

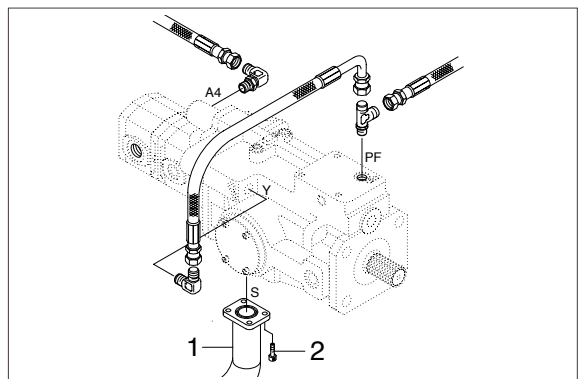
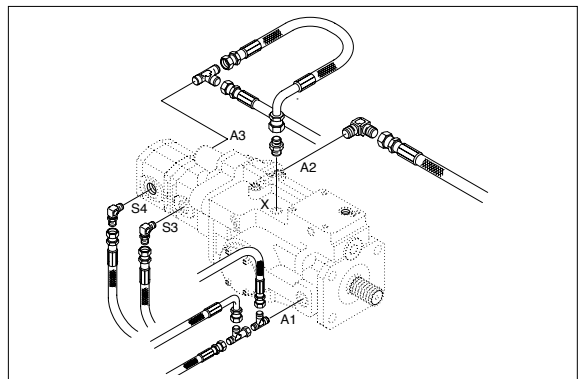
- (5) Disconnect pilot line hoses.
- (6) Remove bolts(2) and disconnect pump suction tube(1).

When pump suction tube is disconnected, the oil inside the piping will flow out, so catch it in oil pan.

- (7) Sling the pump assembly and remove the pump mounting bolts.

· Weight : 60kg(132lb)

Pull out the pump assembly from housing. When removing the pump assembly, check that all the hoses have been disconnected.

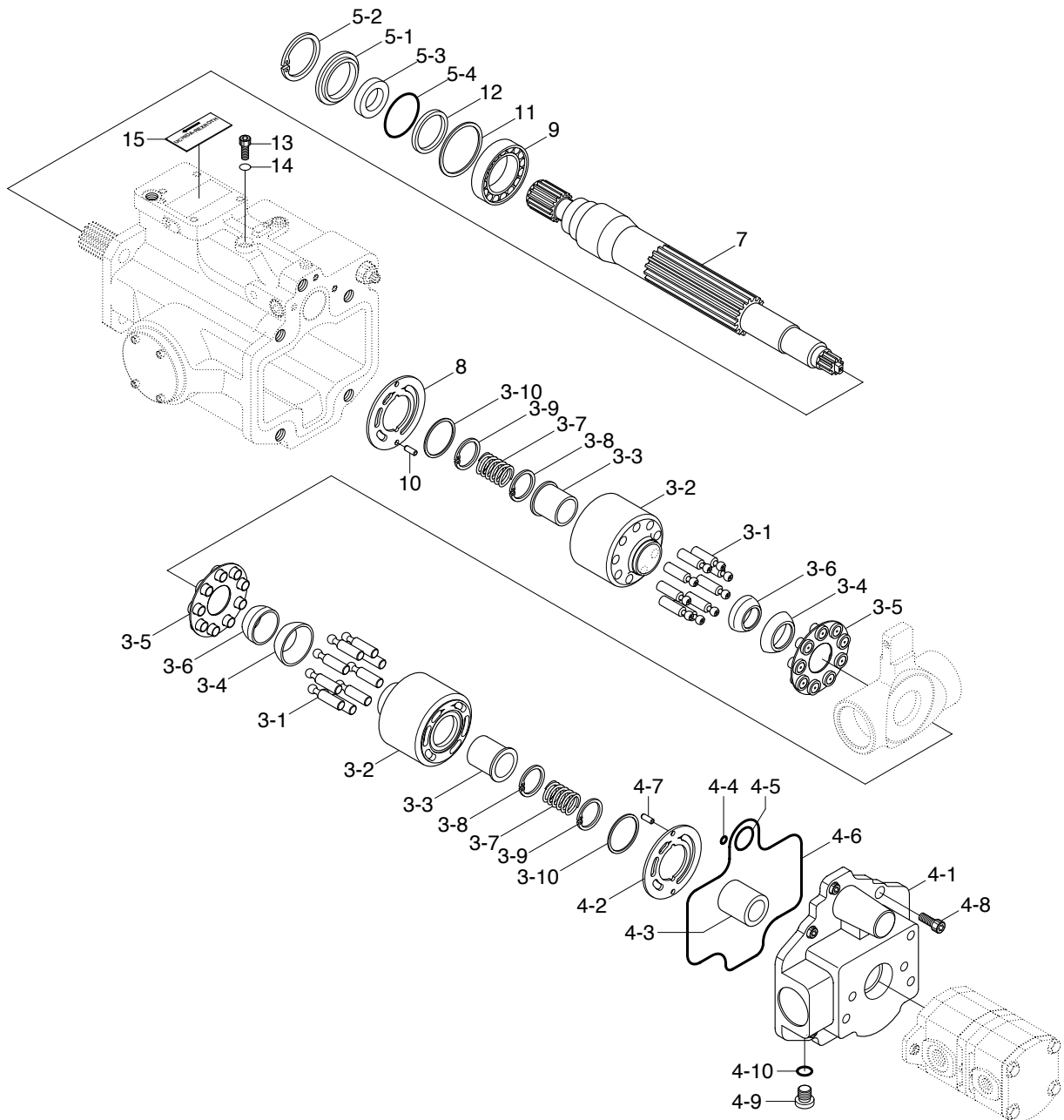


2) INSTALL

- (1) Carry out installation in the reverse order to removal.
- (2) Remove the suction strainer and clean it.
- (3) Replace return filter with new one.
- (4) Remove breather and clean it.
- (5) After adding oil to the hydraulic tank to the specified level.
- (6) Bleed the air from the hydraulic pump.
Remove the air vent plug(2EA).
Tighten plug lightly.
Start the engine, run at low idling, and check oil come out from plug.
Tighten plug.
- (7) Start the engine, run at low idling(3~5 minutes) to circulate the oil through the system.
- (8) Confirm the hydraulic oil level and check the hydraulic oil leak or not.

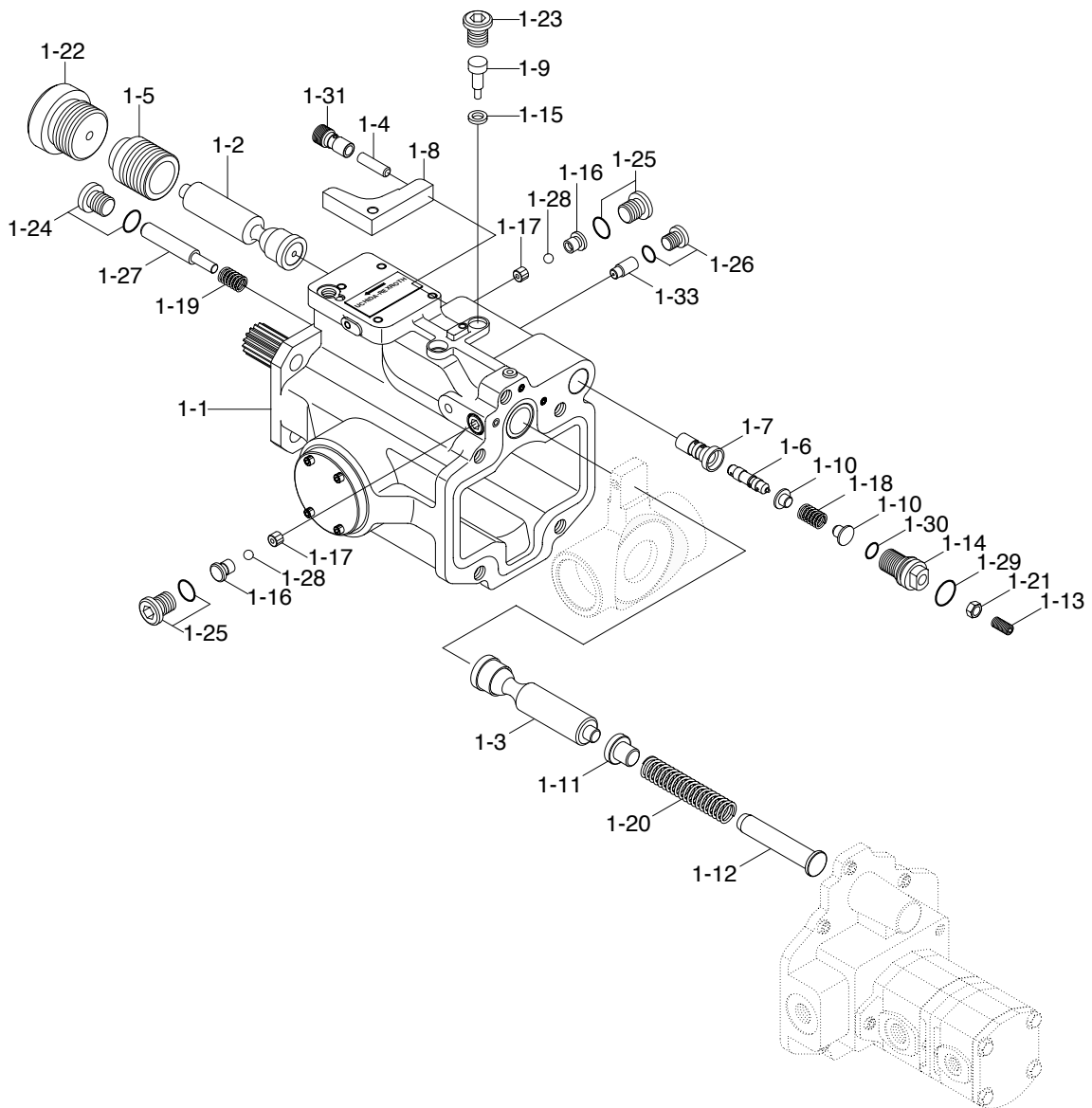
2. STRUCTURE

1) MAIN PUMP(1/3)



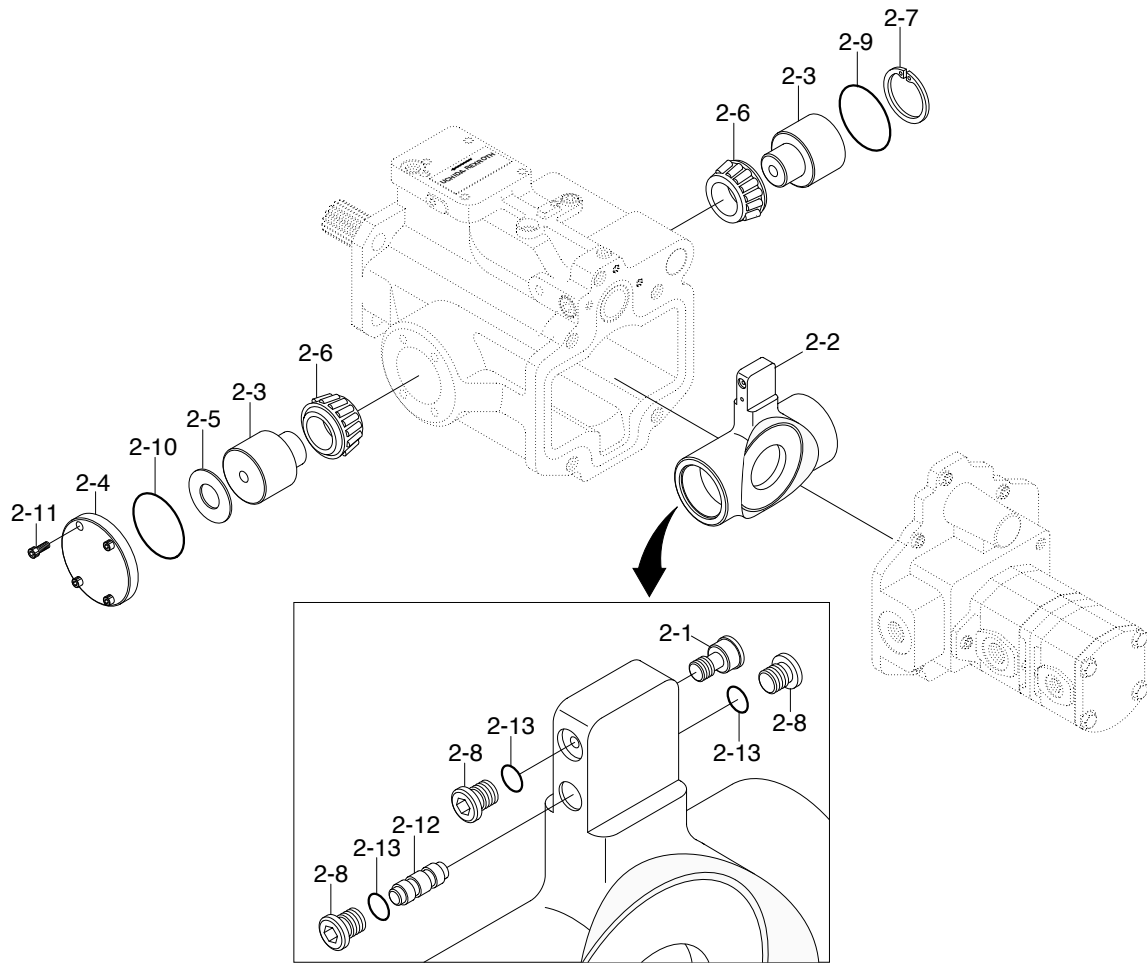
3	Rotary group	4-1	Cover	5-2	Retaining
3-1	Piston	4-2	Control plate	5-3	Oil seal
3-2	Cylinder block	4-3	Bearing	5-4	O-ring
3-3	Pin	4-4	O-ring	7	Shaft
3-4	Retainer	4-5	O-ring	8	Control plate
3-5	Plate	4-6	O-ring	9	Bearing
3-6	Guide	4-7	Pin	10	Pin
3-7	Spring	4-8	Bolt	11	Shim
3-8	Spring seat	4-9	Plug	12	C type retaining ring
3-9	Spring seat	4-10	O-ring	13	Plug
3-10	C type retaining ring	5	Case	14	O-ring
4	Cover	5-1	Case	15	Name plate

MAIN PUMP(2/3)



1	Control part	1-11	Spring seat B	1-22	Plug
1-1	Housing	1-12	Spring seat C	1-23	Plug
1-2	Control piston A	1-13	Adjust screw	1-24	Plug
1-3	Control piston B	1-14	Guide	1-25	Plug
1-4	Piston	1-15	Shim	1-26	Plug
1-5	Piston	1-16	Valve seat	1-27	Spool
1-6	Spool	1-17	Guide	1-28	Steel ball
1-7	Barrel	1-18	Spring	1-29	O-ring
1-8	Arm	1-19	Spring	1-30	O-ring
1-9	Shaft	1-20	Spring	1-31	Bushing
1-10	Seat spring A	1-21	Bolt	1-32	Orifice

MAIN PUMP(3/3)

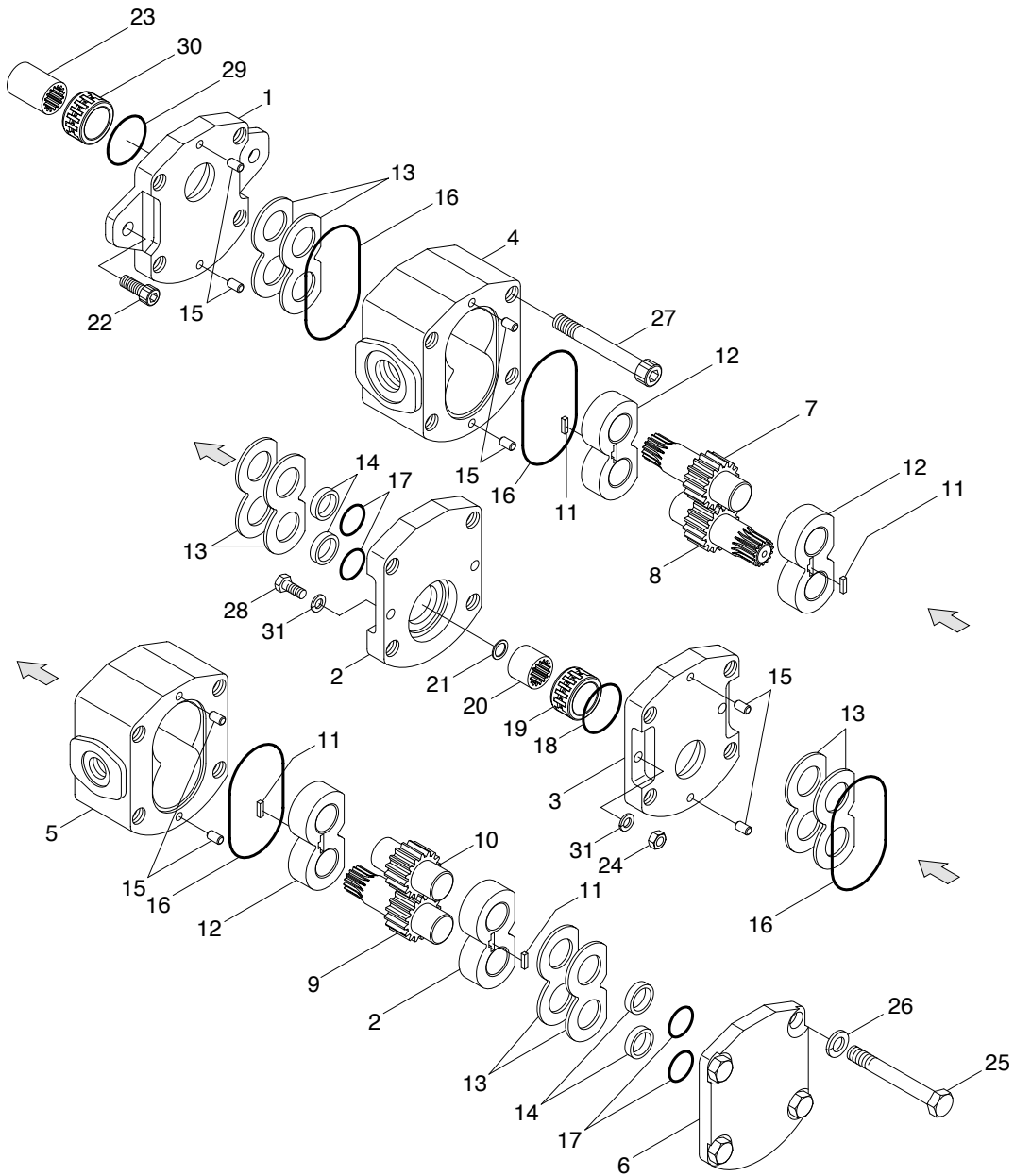


2 Hanger
 2-1 Pilot piston
 2-2 Hanger
 2-3 Shaft
 2-4 Plate

2-5 Shim
 2-6 Bearing
 2-7 Retaining
 2-8 Plug
 2-9 O-ring

2-10 O-ring
 2-11 Bolt
 2-12 Spool
 2-13 O-ring

2) GEAR PUMP

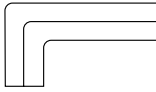
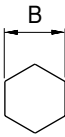


1	Frame	12	Side plate	22	Socket bolt
2	Frame	13	Plate	23	Coupling
3	Frame	14	Guide	24	Nut
4	Case	15	Parallel pin	25	Bolt
5	Case	16	Ring	26	Spring washer
6	Cover	17	O-ring	27	Bolt
7	Gear	18	O-ring	28	Bolt
8	Gear	19	Bushing	29	O-ring
9	Gear	20	Coupling	30	Bushing
10	Gear	21	Retaining	31	Plain washer
11	Ring				

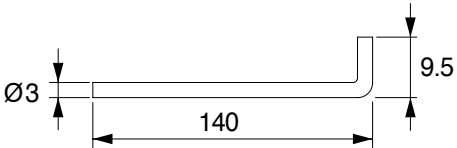
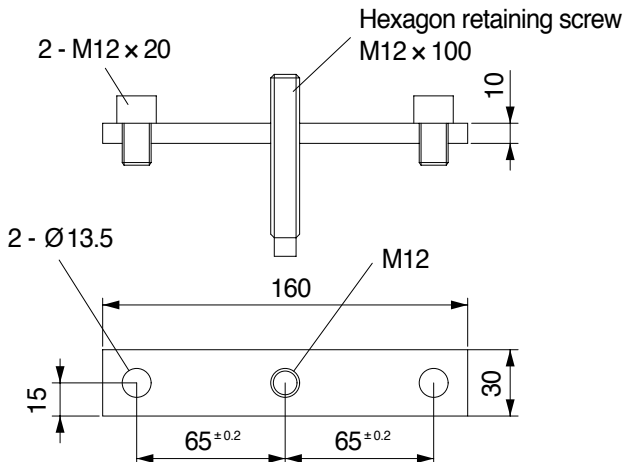
3. TOOLS AND JIG

Assembly or disassembly requires following tools and jig.

1) TOOLS

Name	Size	Quantity	
Allen wrench 	3		1
	5		
	8		
	10		
	22		
Spanner	24		
Plastic hammer	Medium size	1	
Snap ring plier	Medium size	1	
Driver	Mimus type, medium size	2	
Torque wrench	Capable of tightening with the specified torques	-	
Pincette	-	1	

2) JIG

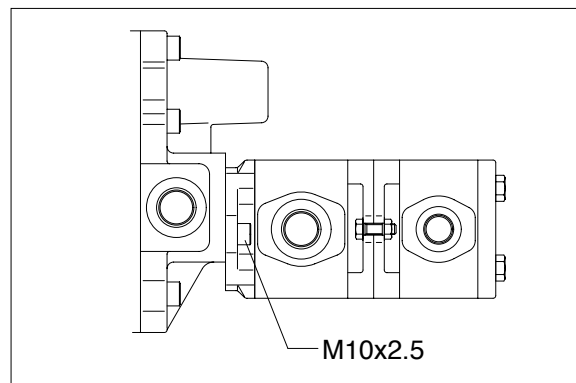
Name	Shape	Quantity
Arm shaft removal	M5 bolt, M5 x 30	1
Barrel removal jig		1
Hanger assembly jig	 <p>2 - M12 x 20</p> <p>Hexagon retaining screw M12 x 100</p> <p>2 - Ø13.5</p> <p>160</p> <p>M12</p> <p>15</p> <p>65^{±0.2}</p> <p>65^{±0.2}</p> <p>30</p> <p>10</p>	1
Hanger shaft jig	M8 bolt, M8 x 100	1

4. DISASSEMBLY

1) PRECAUTION

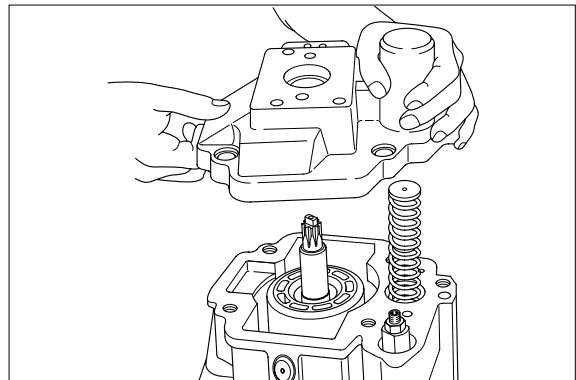
- (1) Select clean place.
- (2) Take care not to mix or drop each part.
- (3) Do not loosen or tighten the nut of adjustment screw. It can change the torque valve.
- (4) Do not mistake front parts for rear parts and attach the tag on each part.
- (5) Gear pump is dealt with as an assembly.

- 2) Remove 2 hexagon socket head bolts and remove gear pump.

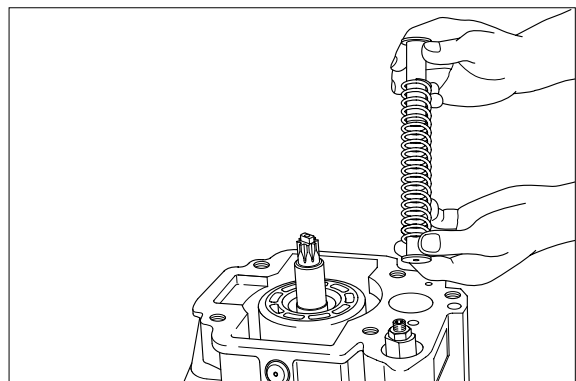


3) DISASSEMBLING PISTON PUMP

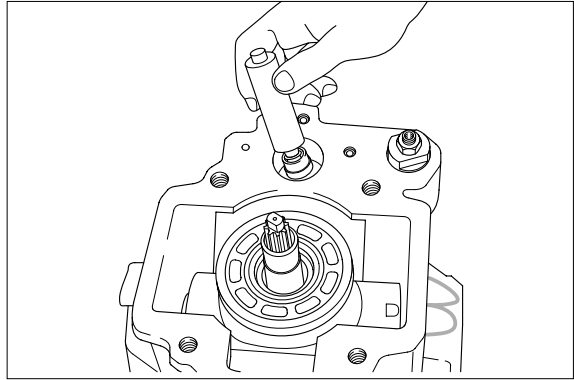
- (1) Remove 5 hexagon socket head bolts and remove cover.
Take care not to tweak the spring and not to drop the control plate.



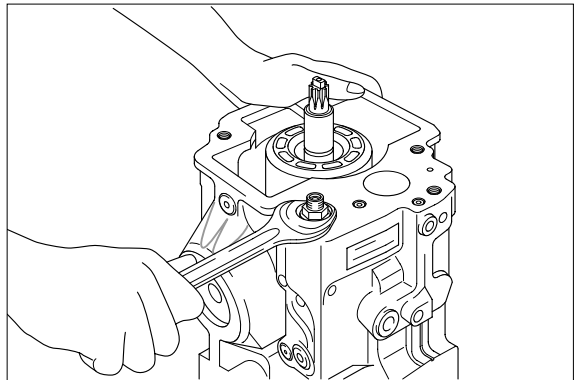
- (2) Take out the spring and the spring seat.



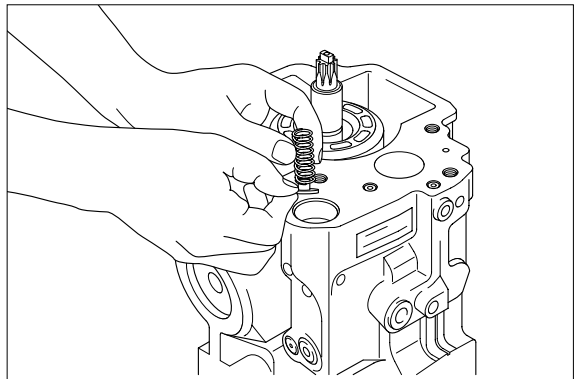
(3) Remove control piston.



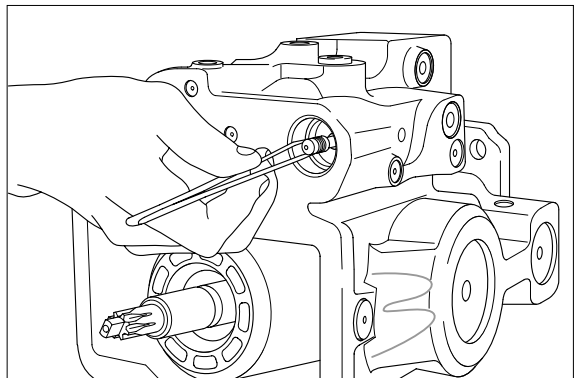
(4) Remove guide and do not loosen the nuts of 24 screw area(Power adjustment side).



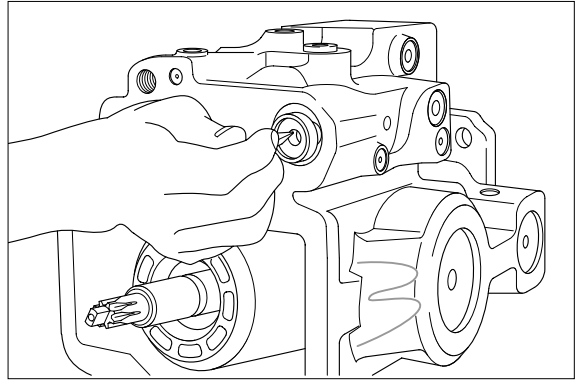
(5) Remove the spring and the spring.



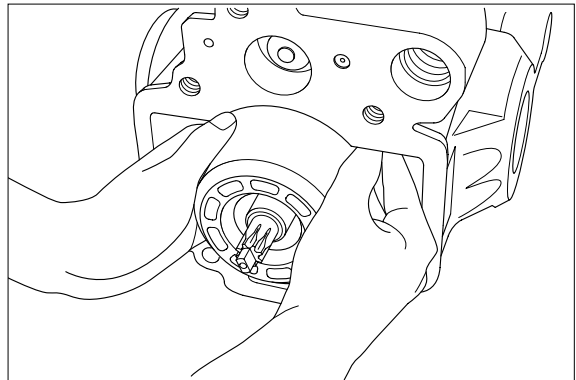
(6) Take out spool using a pincette.



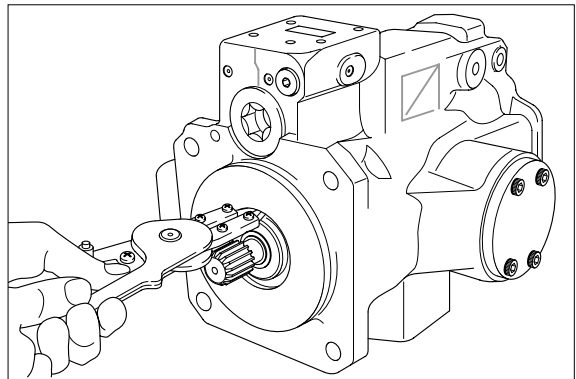
(7) Pull out barrel using a jig.



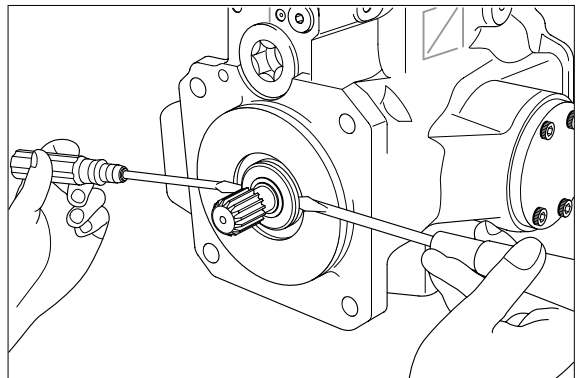
(8) Remove rotary group.(Rear side)



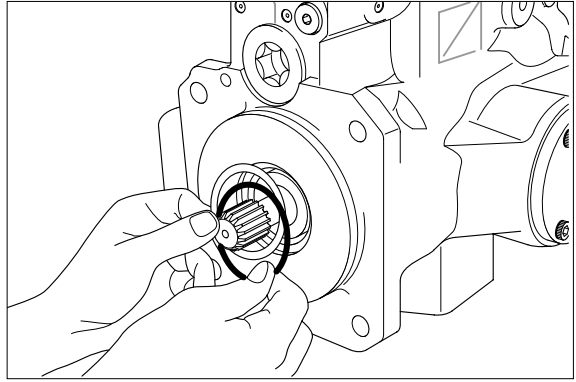
(9) Remove C type retaining ring using the plier.



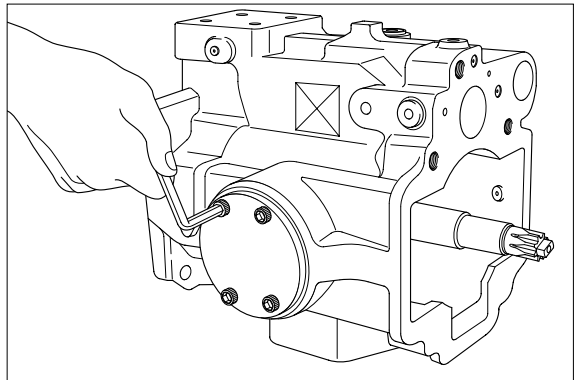
(10) Remove seal case using 2 minus drivers.



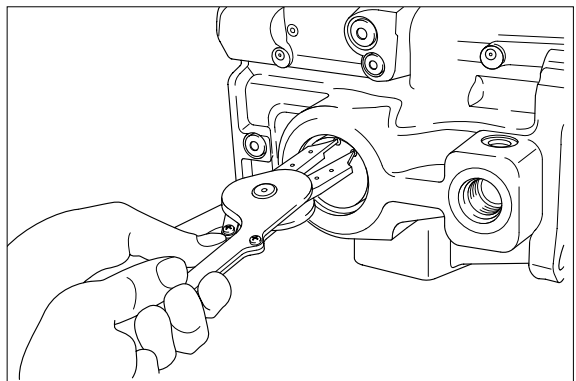
(11) Remove the O-ring and the shim.



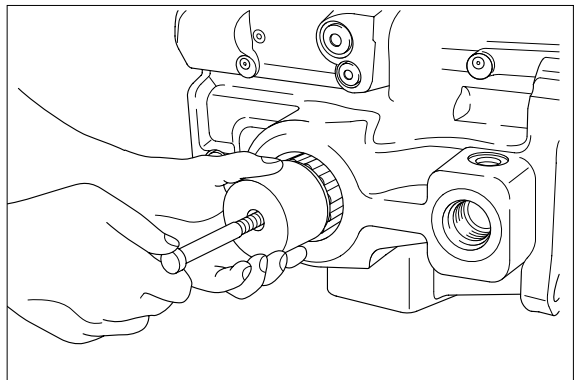
(12) Remove 4 hexagonal socket bolts, the cover and the shim.



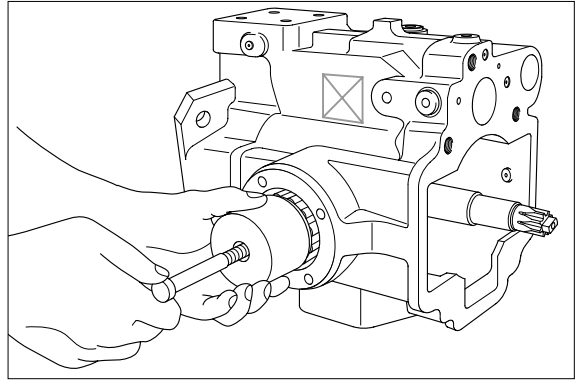
(13) Using the plier remove C type retaining ring.



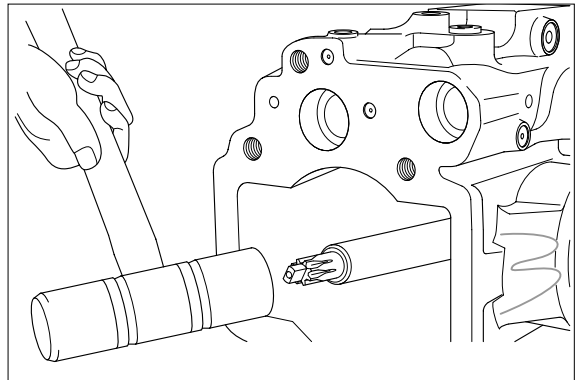
(14) Fitting M8 bolt into the tap hole, remove the shaft.



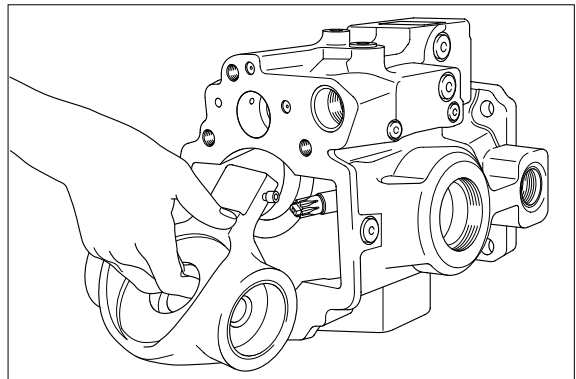
(15) Remove the opposite shaft as in work 14.



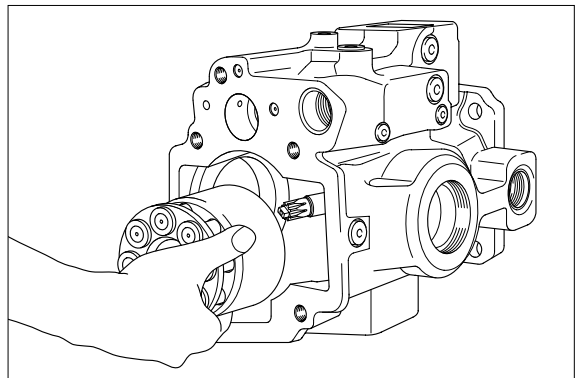
(16) Tap lightly ends of drive shafts with a plastic hammer.



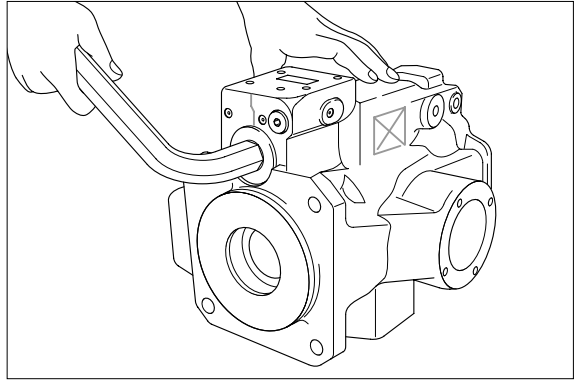
(17) Holding the shaft, remove the hanger.



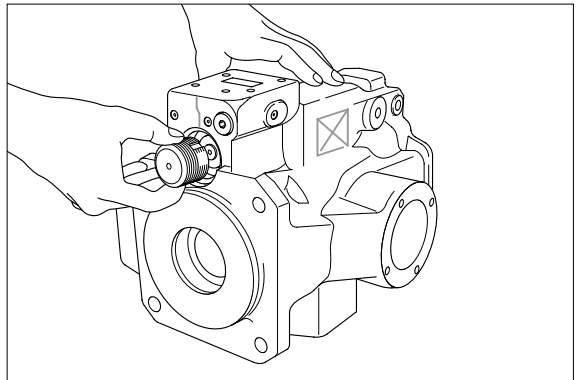
(18) Holding the shaft remove front rotary group and then take out shaft completely.



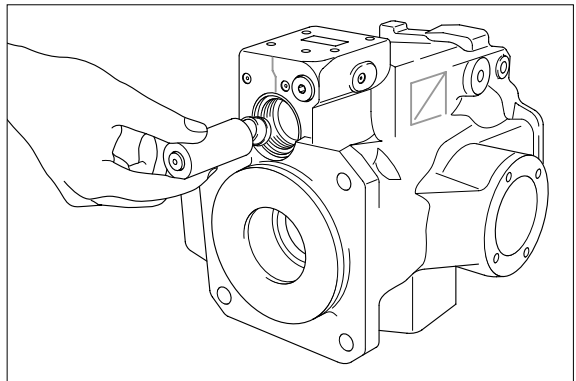
(19) Remove the plug.



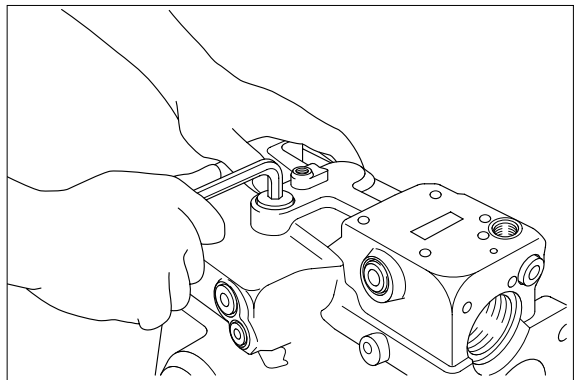
(20) Pushing the control piston from the housing inside take out the piston.



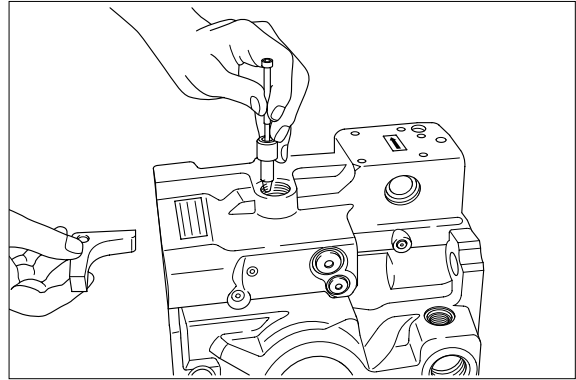
(21) Remove the control piston.



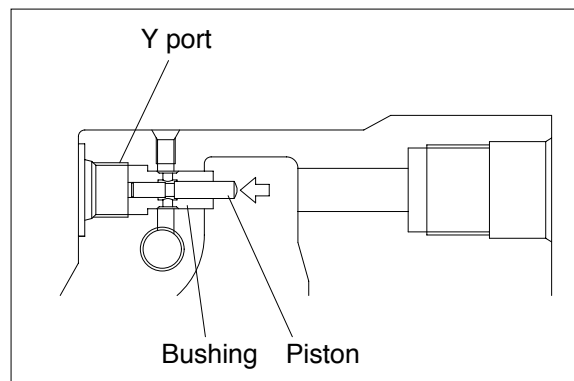
(22) Remove the plug.



(23) Fit M5 bolt into pulling out tapped hole and the arm and the shim can be removed easily from the housing inside.



(24) Pushing the piston using a steel bar remove the piston and the bushing for shaft.



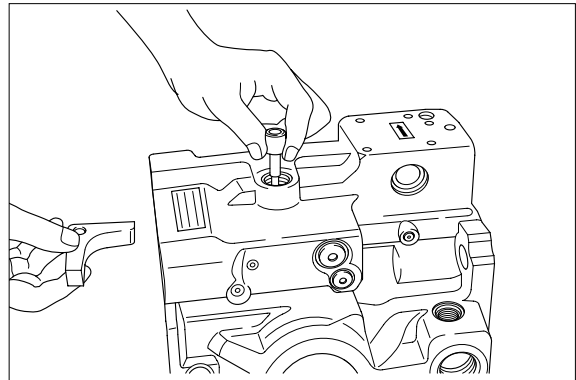
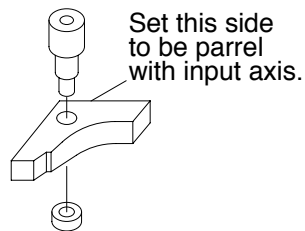
5. ASSEMBLY

1) PRECAUTION

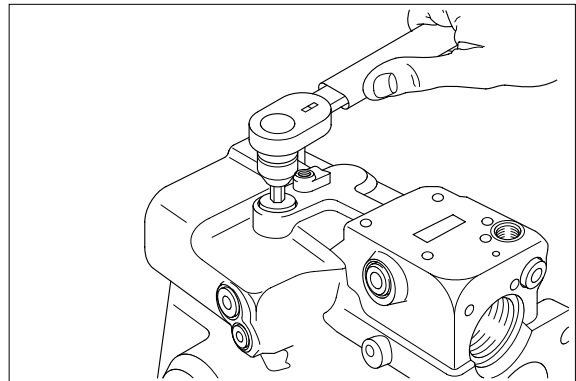
- (1) Clean each part fully with cleaning oil.
- (2) Do not fail to prevent each part from being damaged or impurities.
- (3) Do not mistake front parts for rear parts.
- (4) Seal parts are to be arranged in their original direction.
- (5) Using the torque wrench, adjust the plug and the tapped part to the standard torque.

2) ASSEMBLY

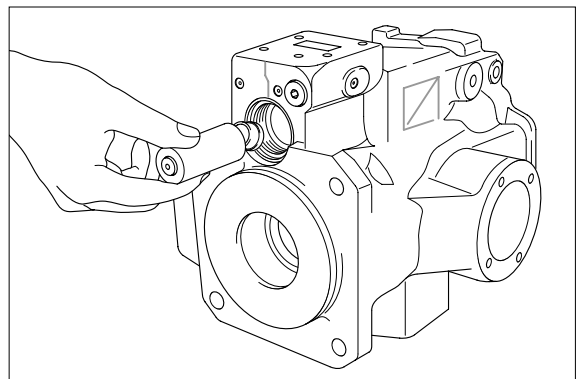
- (1) After arranging the shim and the arm into the housing, insert shaft.



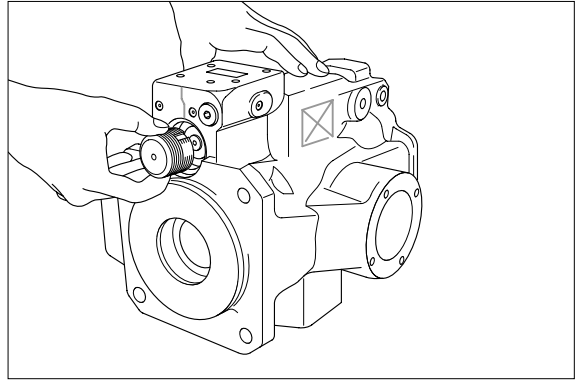
- (2) Assemble plug.
Confirm smooth activity of arm.
· Tightening torque : 5.2kgf · m(37.6lbf · ft)



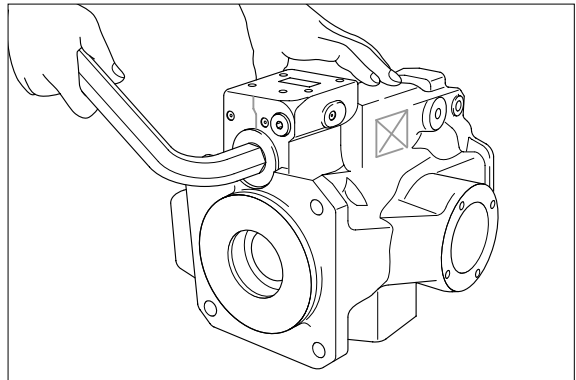
- (3) Fit the control piston.



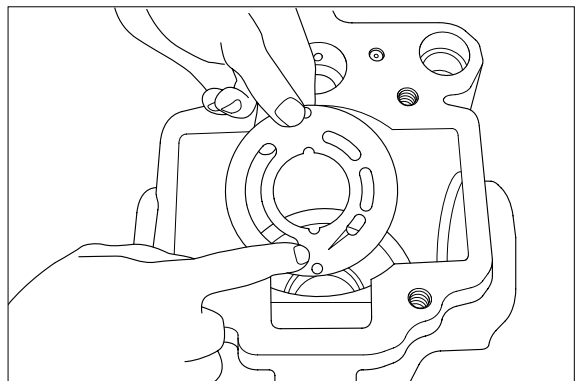
(4) Fit the piston without tweak to the casing.



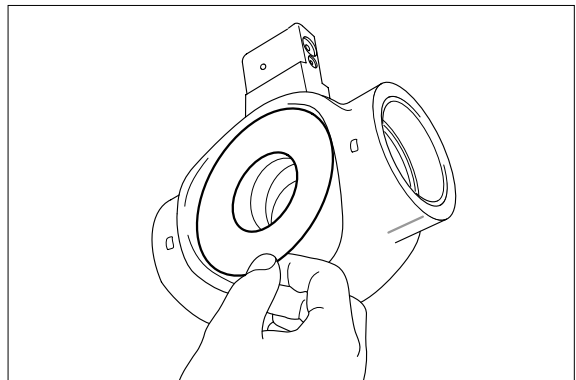
(5) Fit the plug to the pump casing.
· Tightening torque : 26kgf · m(188lb · ft)



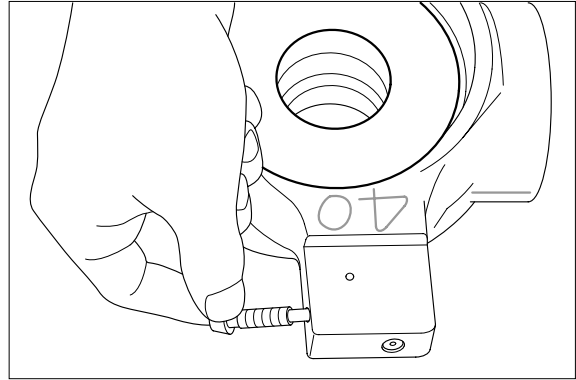
(6) Assemble front control plate.
Apply grease to the surface and check parts missing.



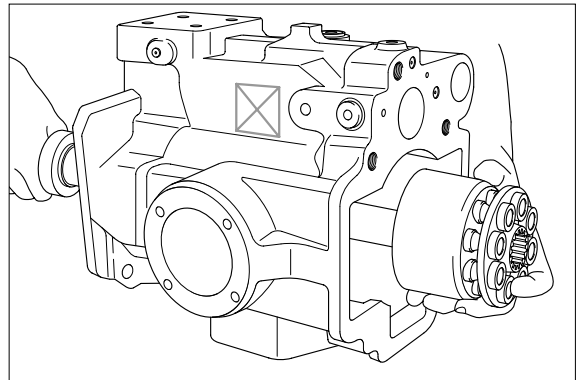
(7) Fit plate into the hanger on both side.
Take care not to reverse the direction of the plate and don't fail to grease the hanger side and check the parts missing prevent parts front impurities.



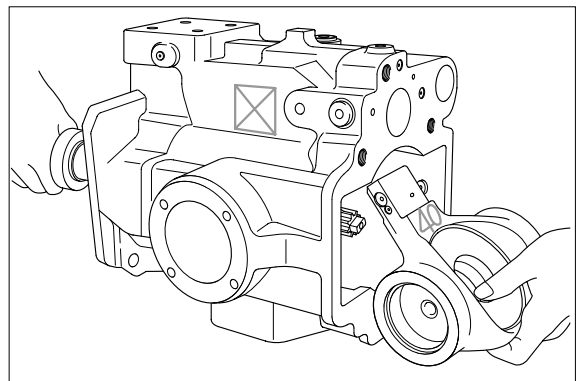
- (8) Fit pilot piston into the hanger.
Apply grease to the hole inside and check parts missing.
· Tightening torque : 0.65kgf · m(4.7lbf · ft)



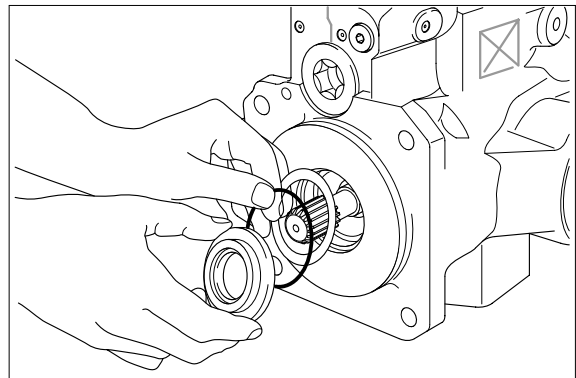
- (9) Fit front rotary group into the casing.
When the shaft penetrates half the casing
fix the group with spline and insert the
group into the casing.



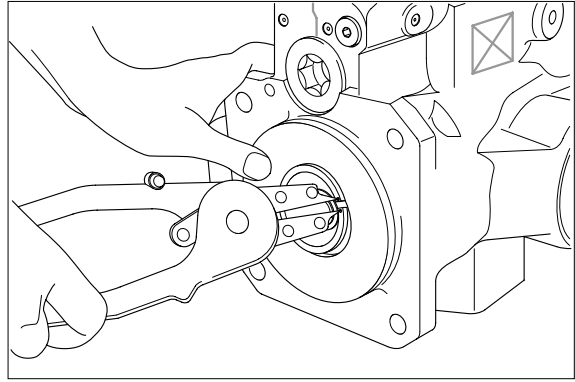
- (10) Fit the assembled hanger into the casing
and insert the shaft completely.
Do not tap the shaft strongly.



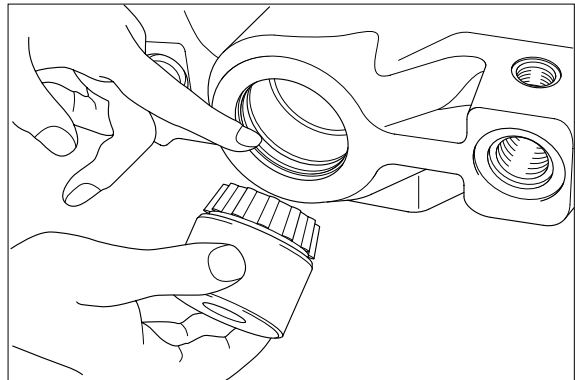
- (11) Confirm the shafts insert completely then
assemble shim, O-ring and seal case to
the pump.
Apply grease to the oil seal.



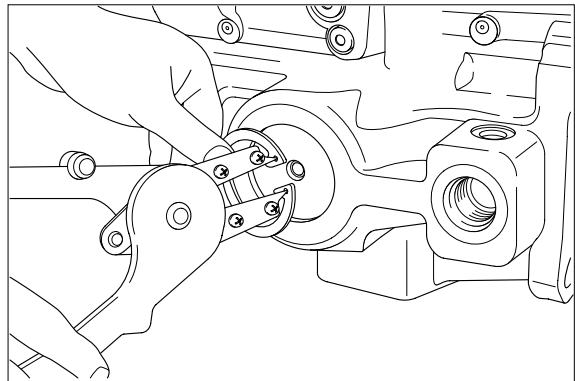
(12) Using the plier, assemble the C type retaining ring.



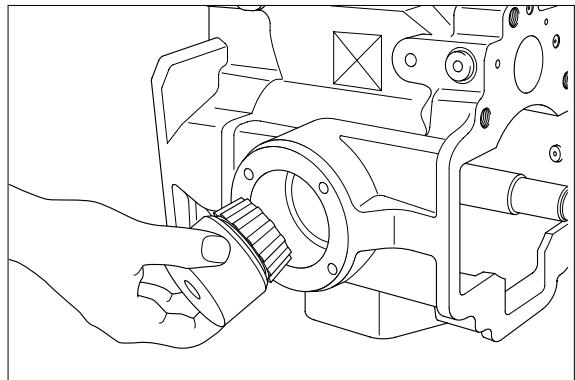
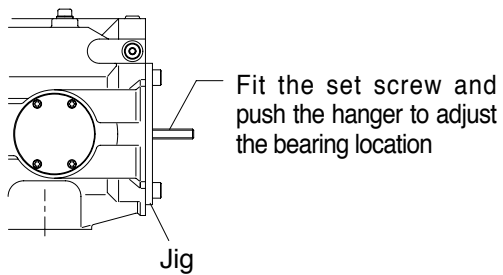
(13) Fit the O-ring and the shaft the housing.
Apply the grease lightly to O-ring surface.
After adjusting the hanger insert the shaft into the housing.



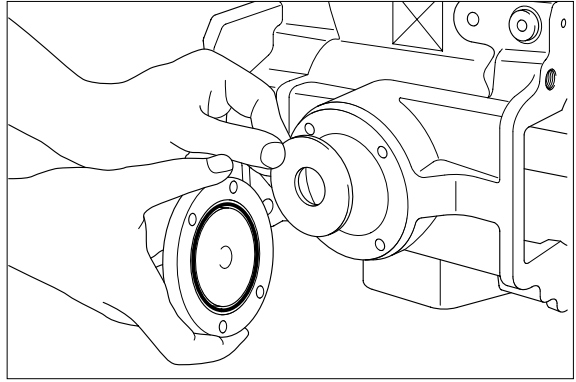
(14) Using the plier assemble C type retaining ring.



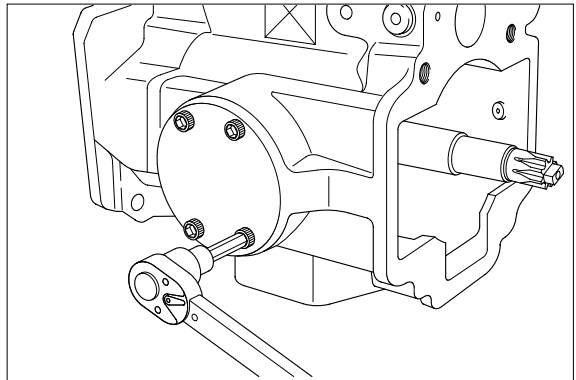
(15) Using the jig, assemble opposite shaft.
Fit the set screw and push the hanger to adjust the bearing location.



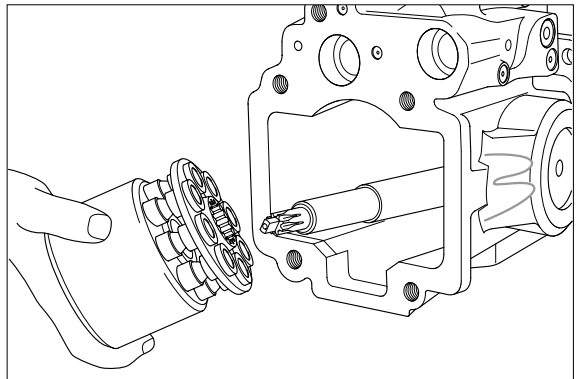
- (16) After assembling the O-ring to the cover, arrange the shim and the cover. Apply grease to the shim and the O-ring and take care not to miss the parts.



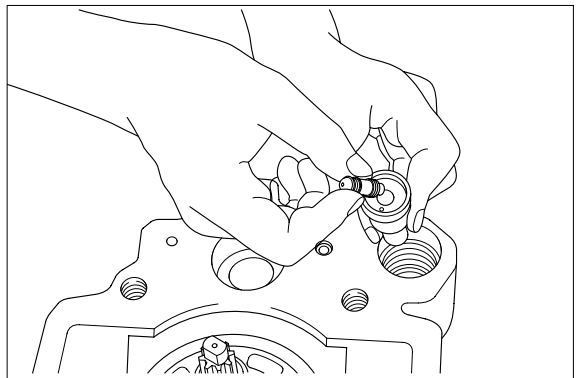
- (17) Fix the cover with 4 hexagon bolt to the casing.
· Tightening torque : 1.5kgf · m(10.8lbf · ft)



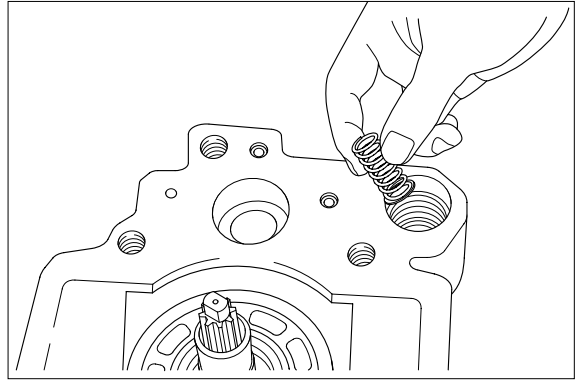
- (18) Assemble rear rotary group.



- (19) Assemble the barrel and the spool.

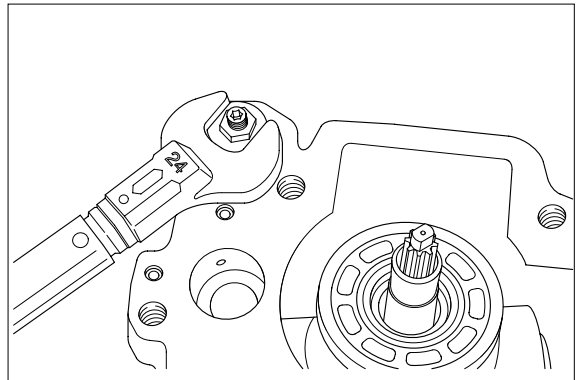


(20) Assemble spring and spring seat.



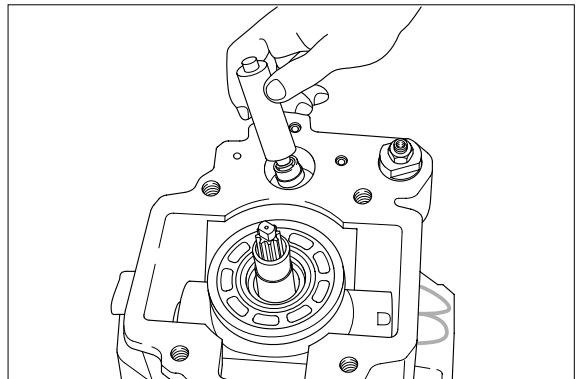
(21) Assemble guide.

· Tightening torque : 8kgf · m(57.9lbf · ft)

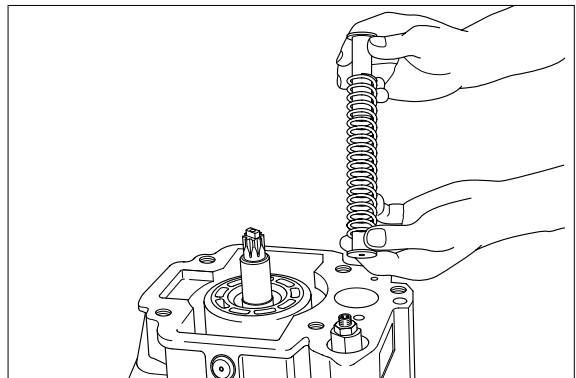


(22) Assemble control piston(Small diameter side) push piston into the cylinder till the hanger reaches the maximum tilting position.

Do not tap the piston.



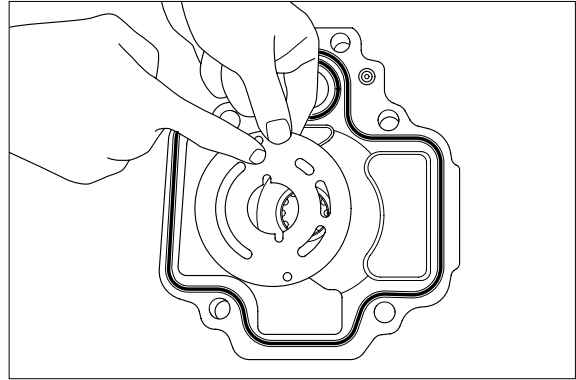
(23) Assemble spring seat, spring and spring seat(Long) in the order named.



(24) Assemble O-ring and control plate into cover.

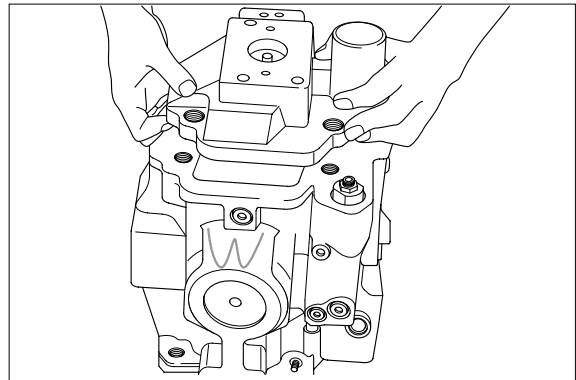
Do not miss any part and apply to grease.
Take care not to mistake suction/delivery directions of valve plate and keep direction described in the picture.

The control plates direction is cannot be changed.



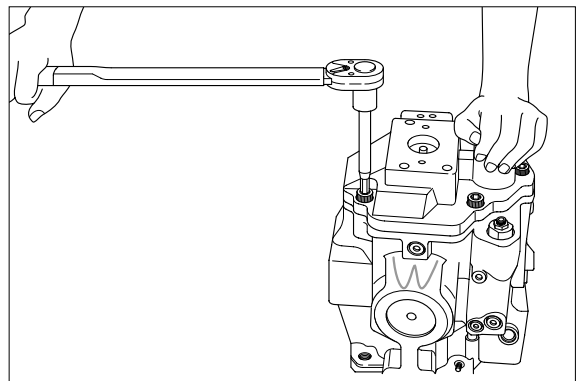
(25) Fit the assembled cover to pump casing.

Take care to insert cover straightly without tweaking between shaft and bearing confirm if there are any missed parts.

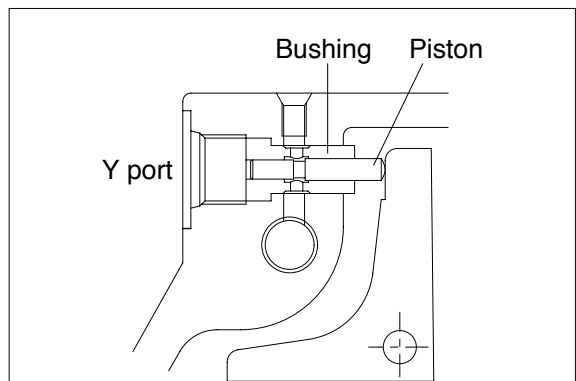


(26) Tighten the cover with 5 hexagon socket head bolts.

· Tightening torque : 12.5kgf · m(90.4lbf · ft)



(27) After inserting the piston into the bushing, assemble the bushing to the Y port.



(28) Assembling the gear pump

Align the shaft with spline in the coupling and fix the gear pump using two bolts (M10 × 25).

- Tightening torque : 7kgf · m(50.6lbf · ft)

