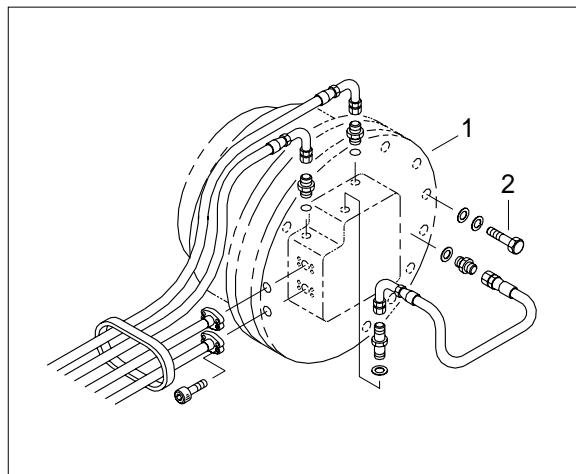


GROUP 6 TRAVEL DEVICE

1. REMOVAL AND INSTALL

1) REMOVAL

- (1) Swing the work equipment 90° and lower it completely to the ground.
- (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.
 - ※ When pipes and hoses are disconnected, the oil inside the piping will flow out, so catch it in oil pan.
- (4) Remove the track shoe assembly.
For details, see **removal of track shoe assembly**.
- (5) Remove the cover.
- (6) Remove the hose.
 - ※ Fit blind plugs to the disconnected hoses.
- (7) Remove the bolts and the sprocket.
- (8) Sling travel device assembly(1).
- (9) Remove the mounting bolts(2), then remove the travel device assembly.
 - Weight : 187kg(412lb)

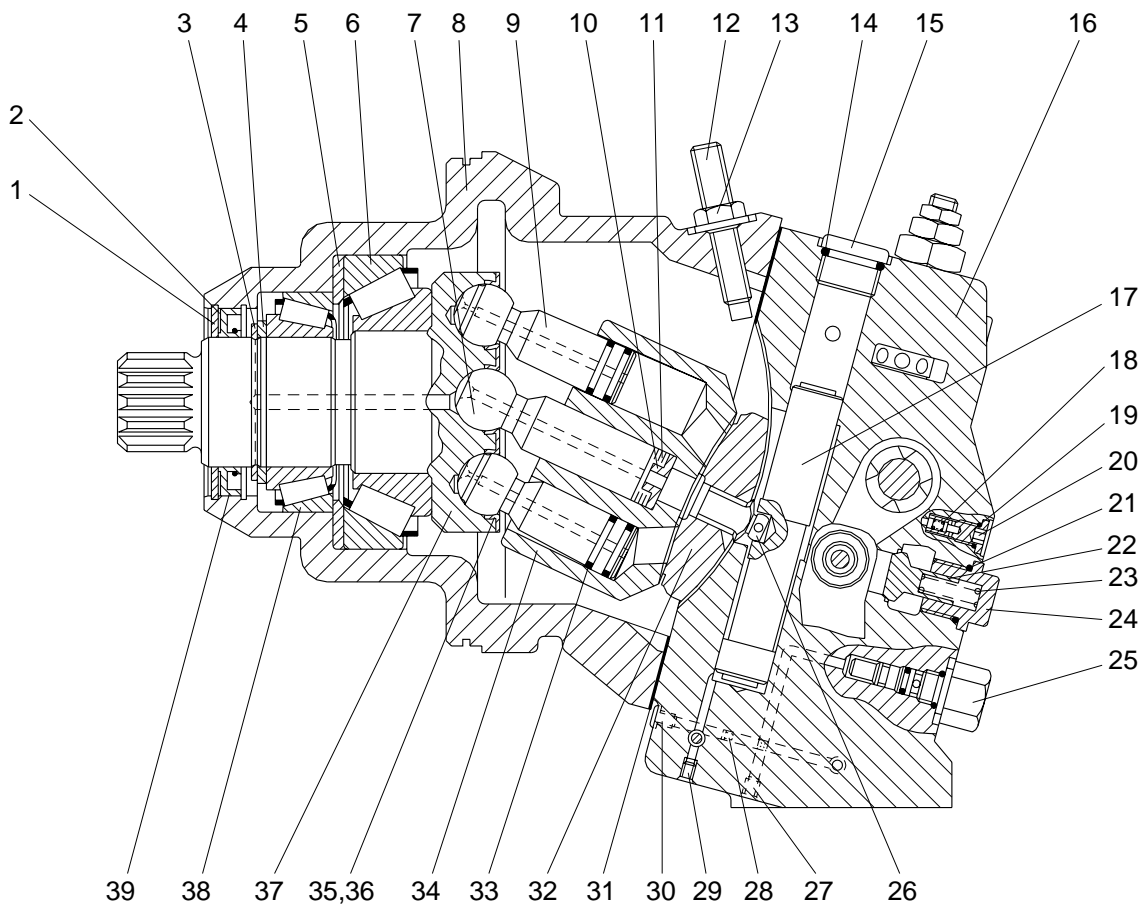


2) INSTALL

- (1) Carry out installation in the reverse order to removal.
- (2) Bleed the air from the travel motor.
 - ① Remove the air vent plug.
 - ② Pour in hydraulic oil until it overflows from the port.
 - ③ Tighten plug lightly.
 - ④ Start the engine, run at low idling, and check oil come out from plug.
 - ⑤ Tighten plug fully.
- (3) Confirm the hydraulic oil level and check the hydraulic oil leak or not.

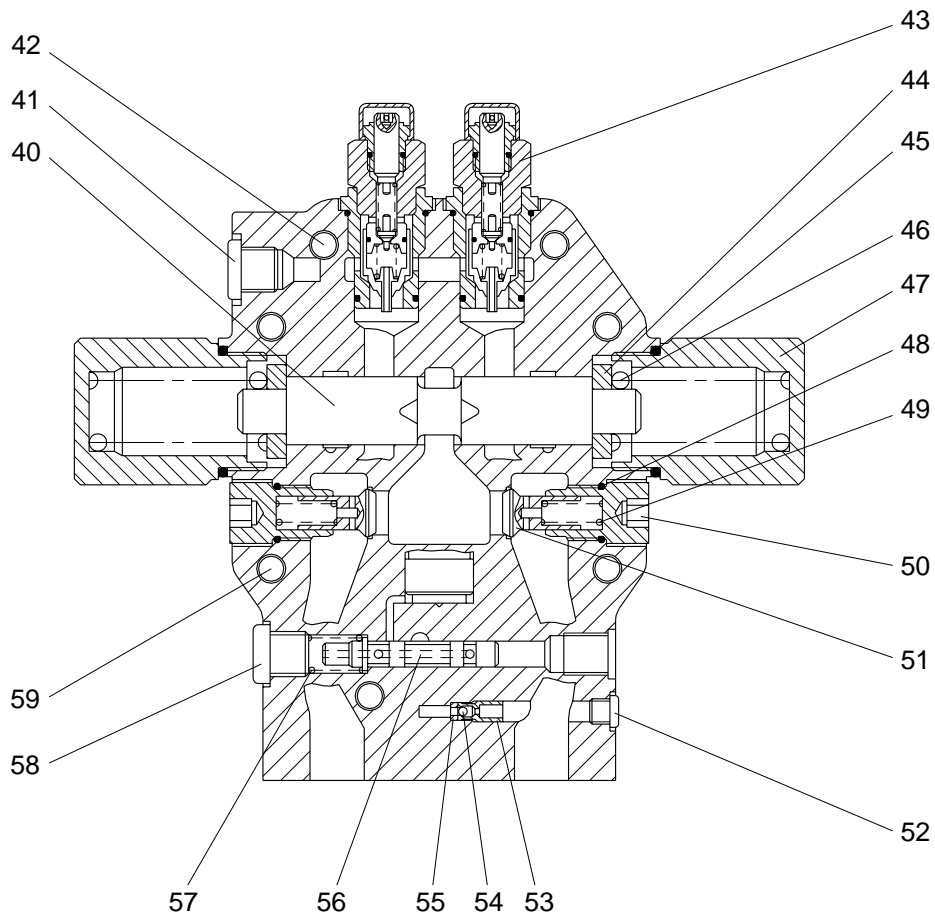
2. TRAVEL MOTOR

1) STRUCTURE(1/2)



1	Retainer	14	O-ring	27	Double break off pin
2	Shim	15	Lock screw	28	Orifice
3	Retainer	16	Port plate	29	Double break off pin
4	Back up plate	17	Positioning piston	30	Lock screw
5	Shim	18	Spring	31	Gasket
6	Taper roller bearing	19	O-ring	32	Control lens
7	Center pin	20	Valve screw	33	Steel seal
8	Housing	21	O-ring	34	Cylinder
9	Piston	22	Valve poppet	35	Retaining plate
10	Spring collar	23	Spring	36	Screw
11	Cup spring	24	Lock screw	37	Drive shaft
12	Taper pin	25	Set assembly	38	Taper roller bearing
13	Lock nut	26	Positioning trunnion	39	seal

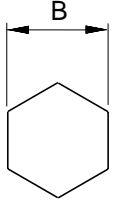
STRUCTURE(2/2)



40	Brake piston	47	Lock screw	54	Ball
41	Lock screw	48	O-ring	55	Bushing
42	Socket head screw	49	Spring	56	Control piston
43	Pressure relief valve	50	Lock screw	57	Spring
44	Washer	51	Valve poppet	58	Lock screw
45	O-ring	52	Lock screw	59	Socket head screw
46	Spring	53	Valve screw		

2) TOOLS AND TIGHTENING TORQUE

(1) Tools

Tool name	Remark	
Allen wrench	2.5	
	4	
	6	
	8	
	10	
	14	
Socket for socket wrench, spanner	19	
Torque wrench	Capable of tightening with the specified torques.	
Pliers	-	
(-) Driver	150mm	
Plastic and iron hammer	Wooden hammer allowed. Nominal 1 or so	
Steel rod approx	7 × 7 × 200mm	
Monkey wrench	-	
Oil seal inserting jig	-	
Bearing pliers	-	
Seal tape	-	
Press (0.5ton)	-	
Oil stone	-	
Bearing assembling jig	-	
Liquid packing	Loctite #577	
Screw lock	Loctite #243	

(2) Tightening torque

Part name	Item	Size	Torque	
			kgf · m	lbf · ft
Lock nut	13	M12	7.0	50.9
Lock screw	30	M8 × 1.0	0.55	4
Lock screw	41	M22 × 1.5	6.1	44
Socket head screw	42	M12 × 90	8.8	63.4
Lock screw	52	M10 × 1.0	1.0	7
Lock screw	58	M14 × 1.5	3.0	22
Socket head screw	59	M12 × 110	8.8	63.4

3) DISASSEMBLY

(1) General precautions

- ① Before disassembling the motor, check the items to be inspected and, for remedy against trouble, closely examine the nature of the trouble, so that the motor can be disassembled effectively.
- ② To disassemble the motor, use the disassembling procedures described in section 2) and select a clean place.
- ③ Place a rubber or vinyl sheet or other such protective materials on your working bench to protect the surface of the motor to be serviced.
- ④ During disassembly, give a match mark to the mating surfaces of each part.
- ⑤ Arrange removed parts in order so that they will not become damaged or missing during disassembly.
- ⑥ Once seals have been disassembled, they should be replaced even if damage is not observed. Have replacement seals ready on hand before starting your disassembling job.

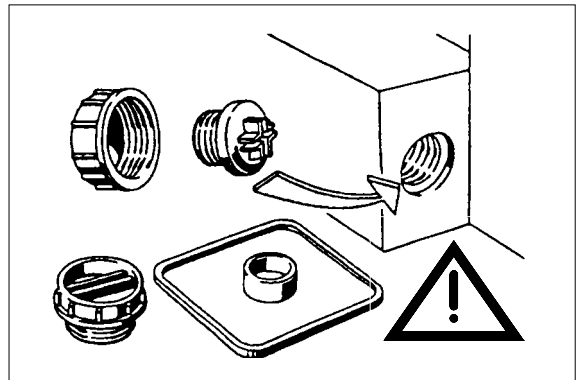
(2) Seal kit and component group

① Attention

Observe the following notices when carrying out repair work at hydraulic aggregates!

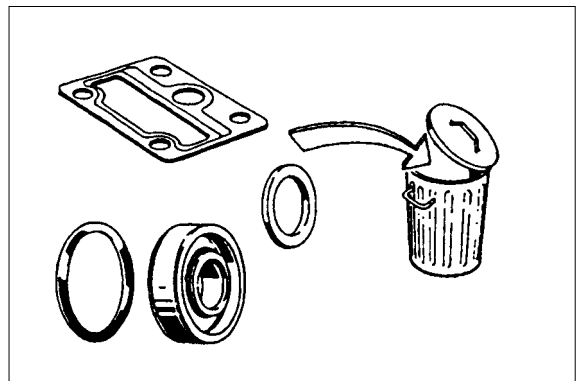


② Close all ports of the hydraulic aggregates.



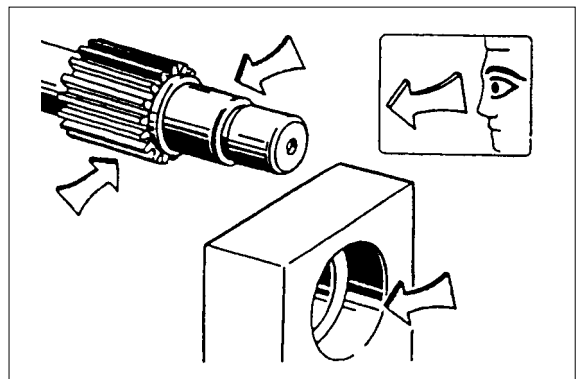
③ Replace all seals.

Use only original spare parts.

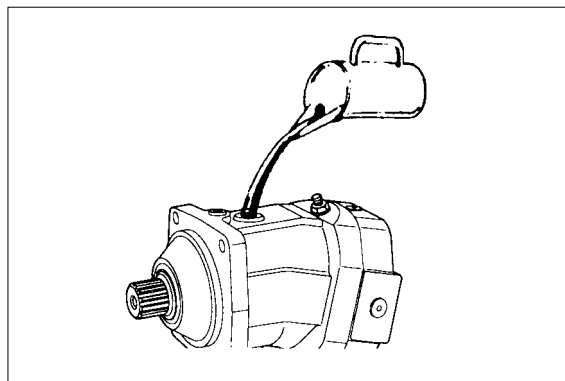


④ Check all seal and sliding surfaces for wear.

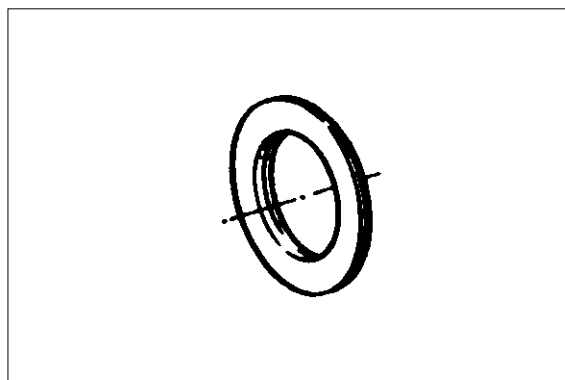
※ Rework of sealing area f.ex. with abrasive paper can damage surface.



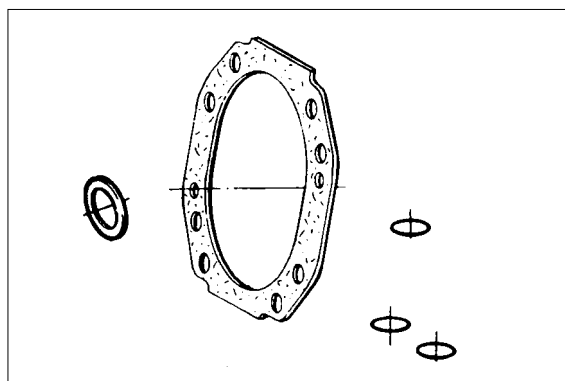
- ⑤ Fill up hydraulic aggregates with hydraulic oil before start-up.



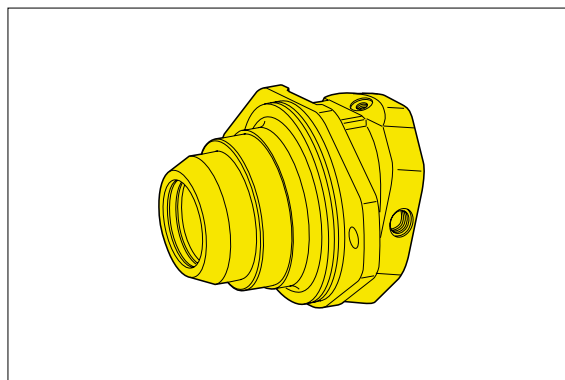
- ⑥ Seal kit for drive shaft.



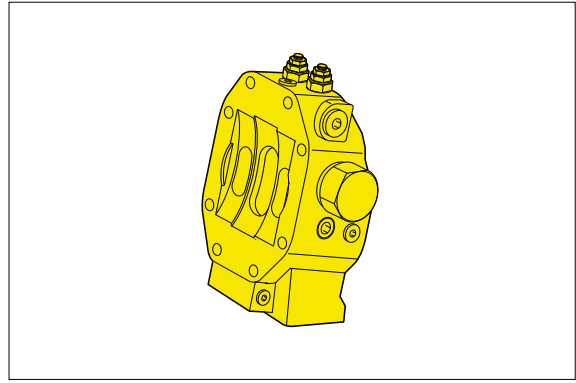
- ⑦ Complete seal kit



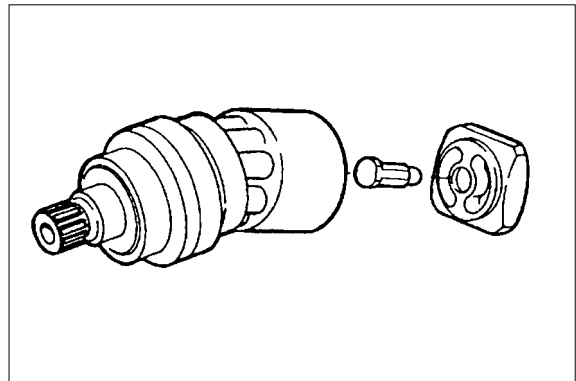
- ⑧ Housing



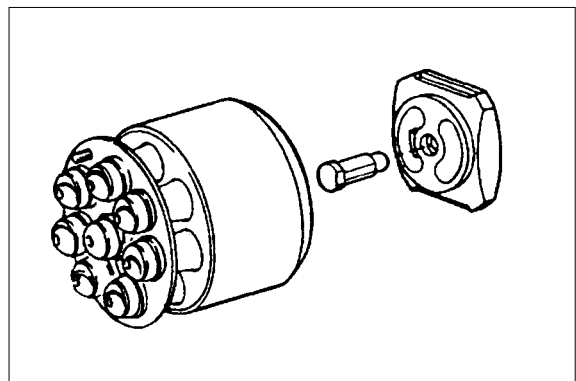
- ⑨ HZ-control device
Endcover with stroking piston and counterbalance valve.



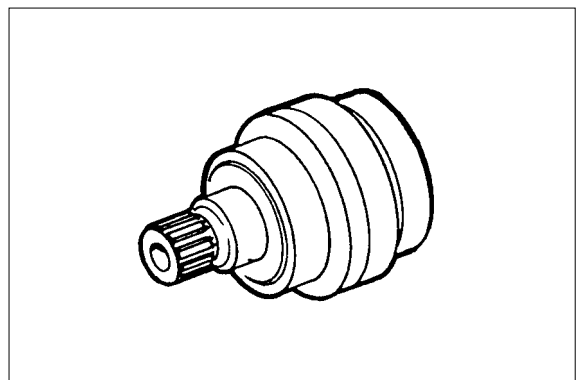
- ⑩ Complete rotary group.



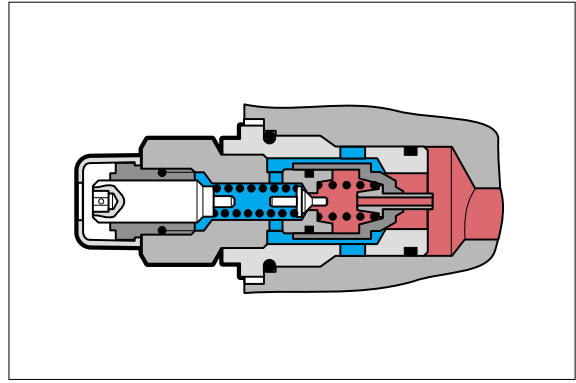
- ⑪ Rotary group
Hydraulic part.



- ⑫ Rotary group
Mechanical part.

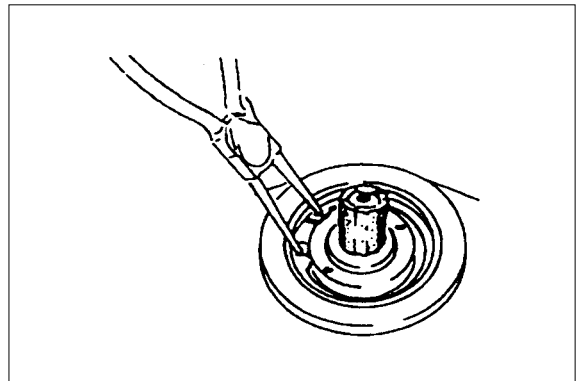


⑬ Relief valve/Make up check valve

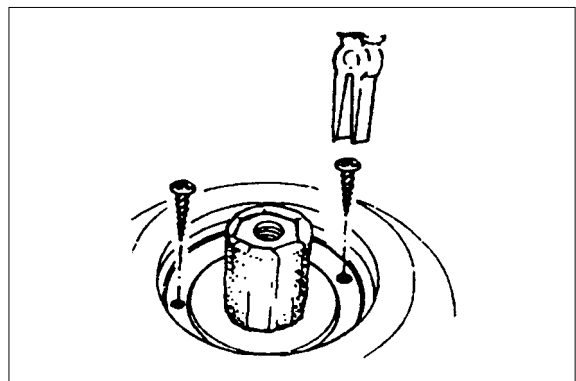


(3) Sealing the drive shaft

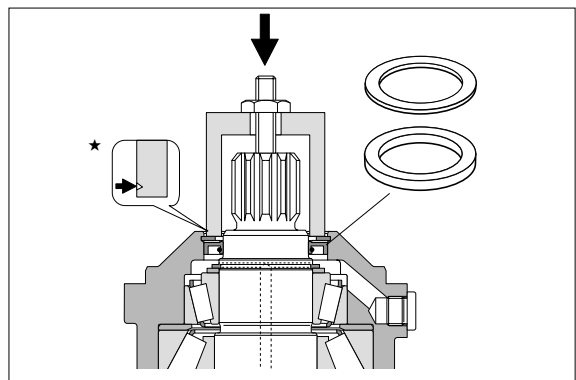
- ① Protecting the drive shaft.
Remove retaining ring and shim.



- ② Screw in sheet metal screw into the holes fitted with rubber.
Pull out seal with pliers.



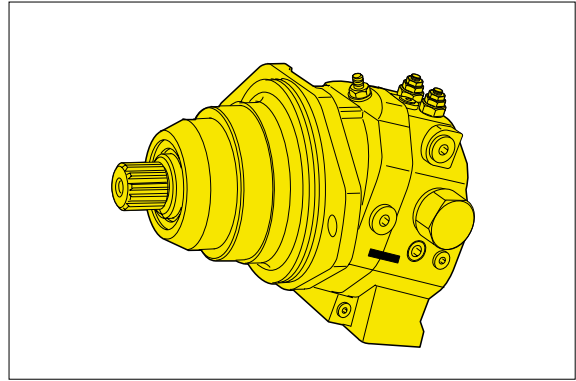
- ③ Press in shaft seal and shim with bush to stop.
※ Pay attention to pressing depth!
*Mark for pressing depth.
Assemble retaining ring.



(4) Seal the port plate with counterbalance valve

① Mark port plate.

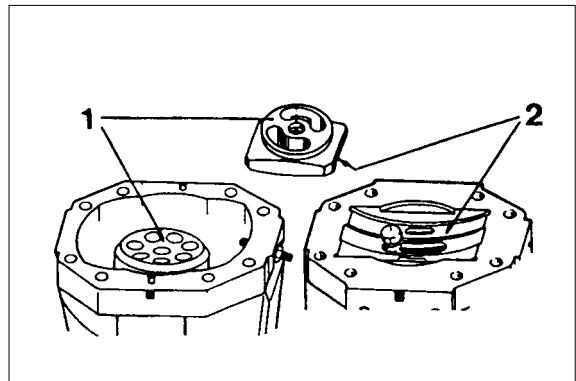
Remove fixing screws. disassemble.



② Inspect!

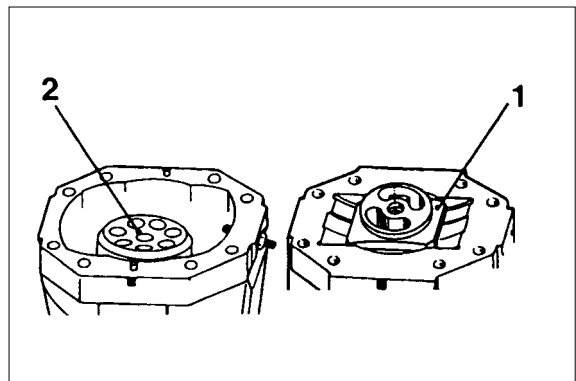
Cylinder running areas(1), lens sliding surfaces(2).

Do not remove cylinder.



③ Assembly aid

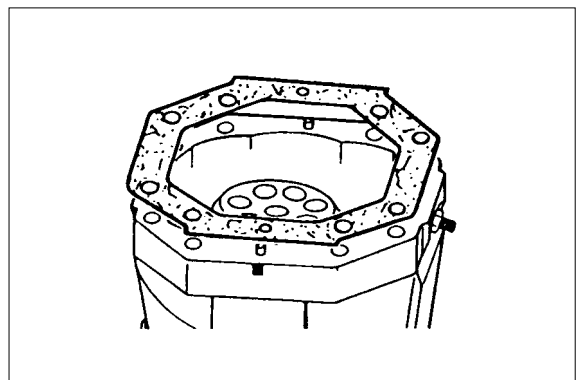
Fit control lens(1) in sliding surface with grease. Swivel rotary group(2) in housing according to position of control lens.



④ Assembly aid

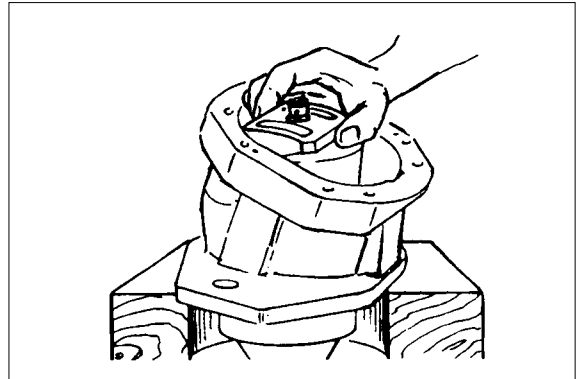
Lay new seal on flat. No fluid seal-seal thickness has been allowed for in rotary group adjustment.

Note tightening torque.

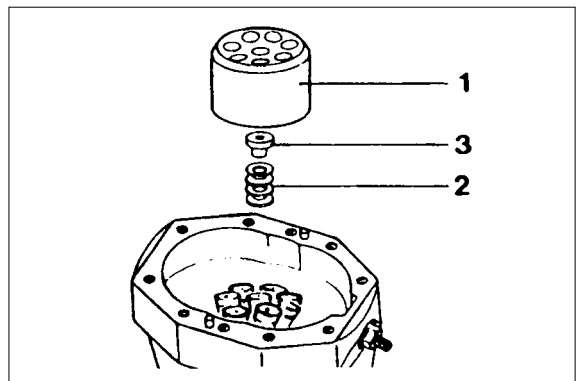


(5) Disassembling the rotary group

① Remove control lens.

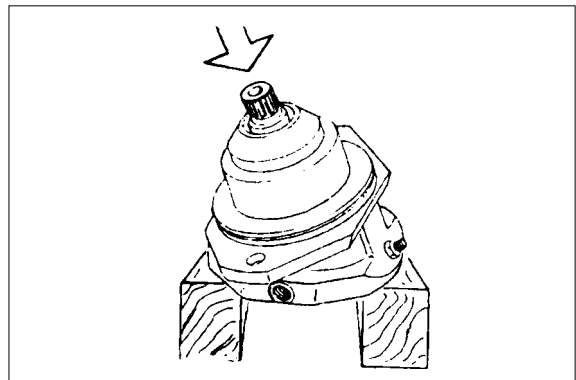


② Remove cylinder(1) with four cup springs (2) and spring washer(3).



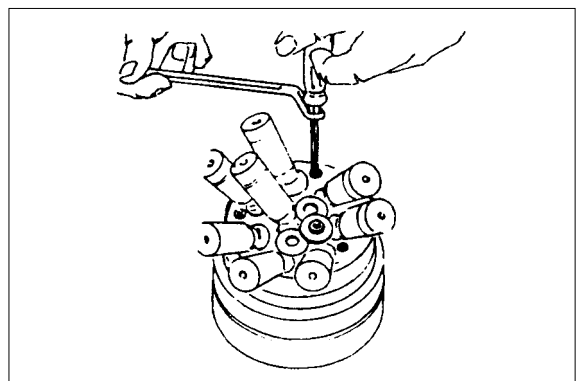
③ Press out rotary group!

* For re-use of bearings do not beat.



④ Remove retaining plate.

Bolts are glued with Loctite.



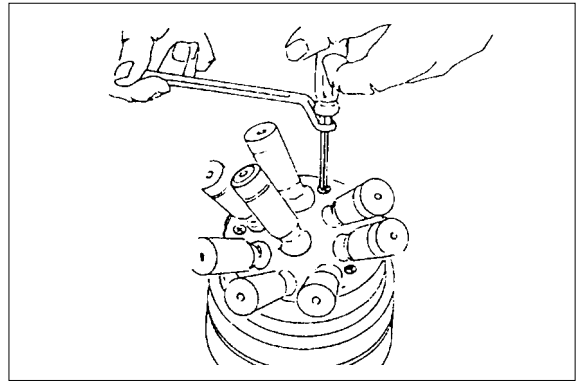
4) ASSEMBLY

(1) General precautions

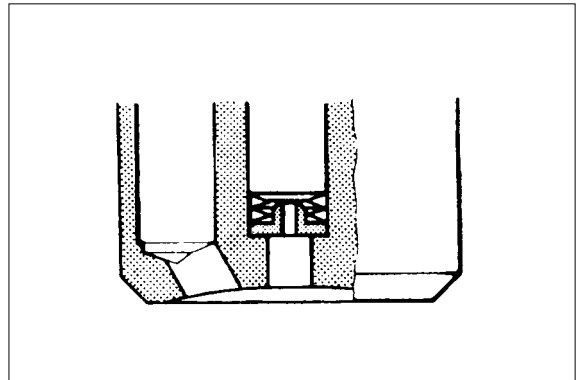
- ① Reassemble in a work area that is clean and free from dust and grit.
- ② Handle parts with bare hands to keep them free of liny contaminants.
- ③ Repair or replace the damaged parts.
Each parts must be free of burrs its corners.
- ④ Do not reuse O-rings, oil seal and floating seal that were removed in disassembly.
Provide the new parts.
- ⑤ Wash all parts thoroughly in a suitable solvent.
Dry thoroughly with compressed air.
Do not use the cloths.
- ⑥ When reassembling oil motor components of motor, be sure to coat the sliding parts of the motor and valve with fresh hydraulic oil. (NAS class 9 or above)
- ⑦ Use a torque wrench to tighten bolts and plugs, to the torque specified as follows.

(2) Assembly of rotary group

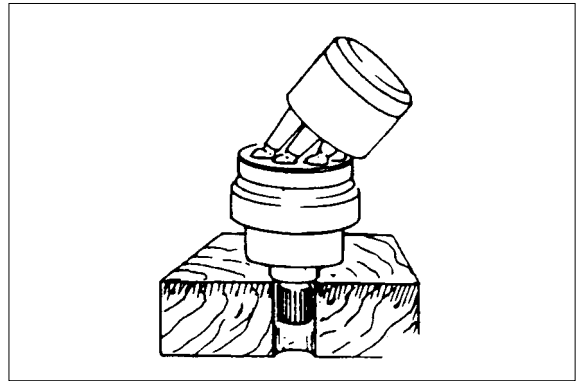
- ① Insert retaining plate with piston and center pin.
Use screws with precote coating.



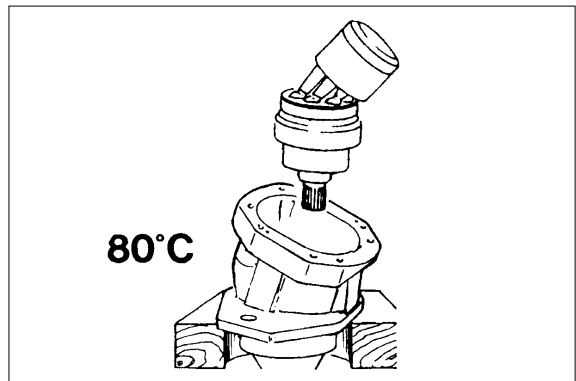
- ② Make sure all parts are fitted correct.



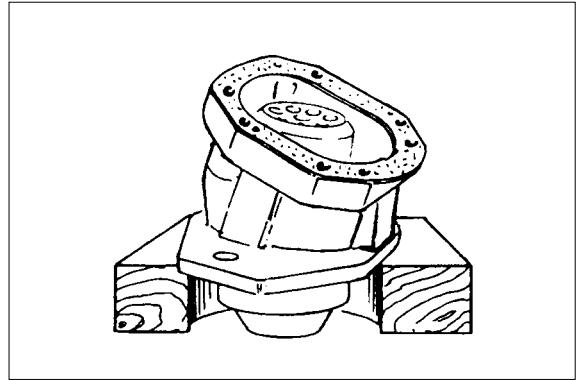
- ③ Swivel cylinder block to max. angle.



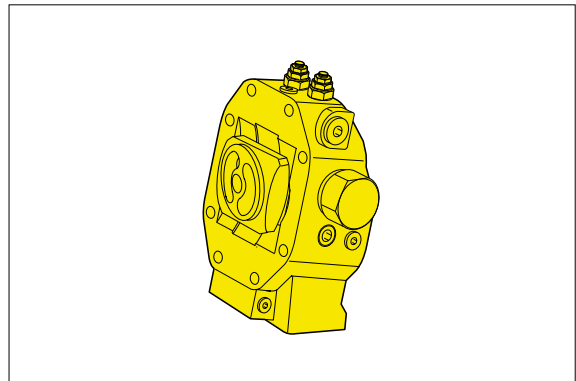
- ④ Warm up housing to approx. 80°C.
Insert rotary group.



- ⑤ Insert adjustment pins.
Put on gasket.

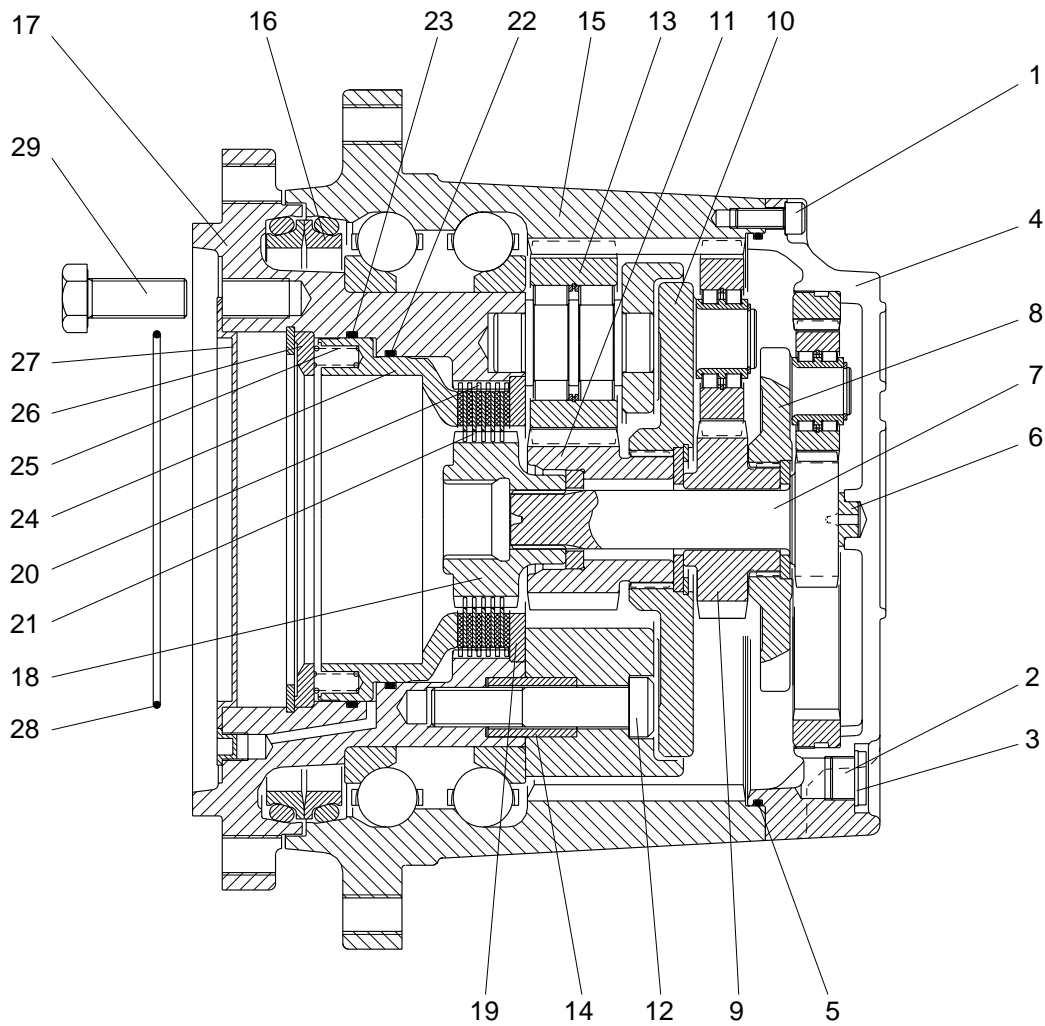


- ⑥ Glue control lens with grease into slide track.



3. REDUCTION GEAR

1) STRUCTURE

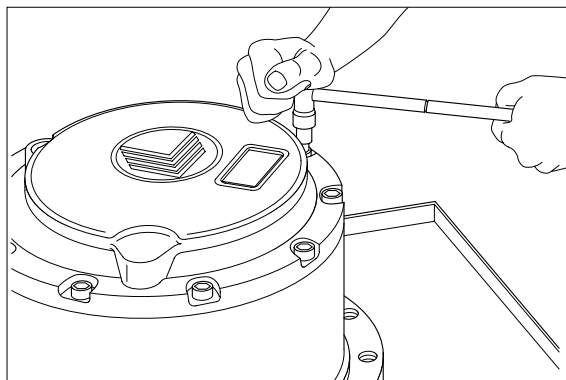


1	Screw	11	Sun gear 3	21	Steel ring
2	Breather plug	12	Screw	22	O-ring
3	Washer	13	Reduction gear 3	23	O-ring
4	Cover set	14	Bushing	24	Piston
5	O-ring	15	Housing	25	Spring
6	Pad	16	Lifetime seal	26	Disc pushing
7	Sun gear 1	17	Hub	27	Circlip
8	Reduction gear 1	18	Shaft brake	28	O-ring
9	Sun gear 2	19	Disc pushing	29	Screw
10	Reduction gear 2	20	Sinteriz disc		

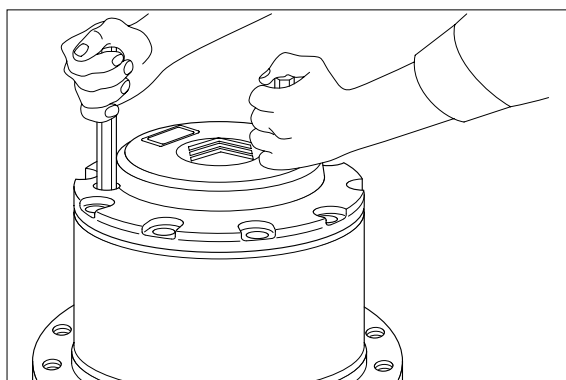
2) DISASSEMBLY

(1) Gears

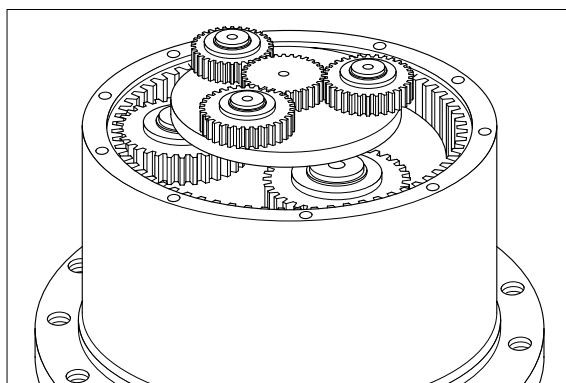
- ① Drain the oil out of the breather plug(2) until the gearbox is empty, take off the bolts(1).



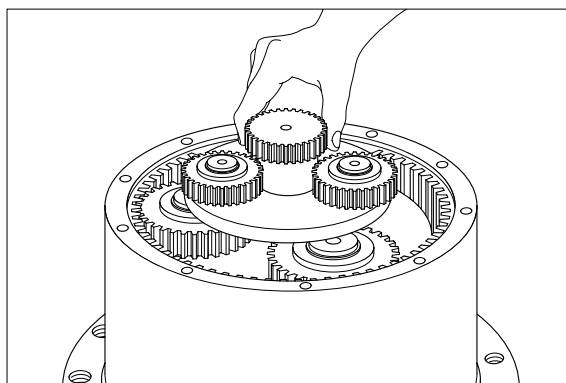
- ② Take off the cover(4) tightening two bolts M22 × 1.5 in the tapped holes of the plugs.



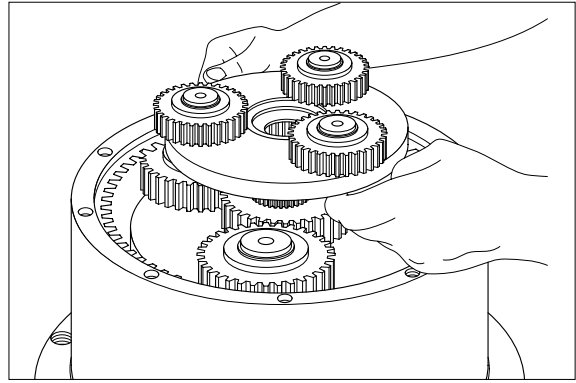
- ③ Now you can see the 1st and the 2nd reduction stages.



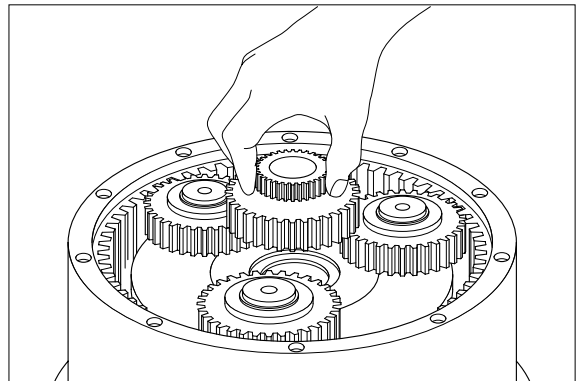
- ④ Remove 1st sun gear(7).



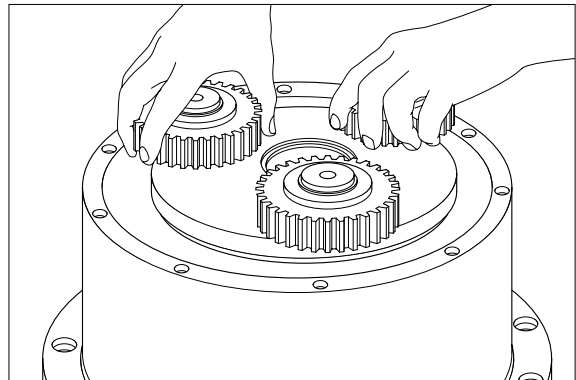
- ⑤ Remove the 1st reduction planetary carrier complete with gears(8).



- ⑥ Remove the 2nd sun gear(9).

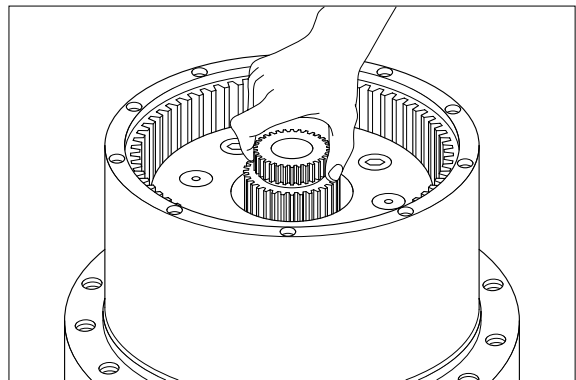


- ⑦ Remove the 2nd reduction planetary carrier complete with gears(10).

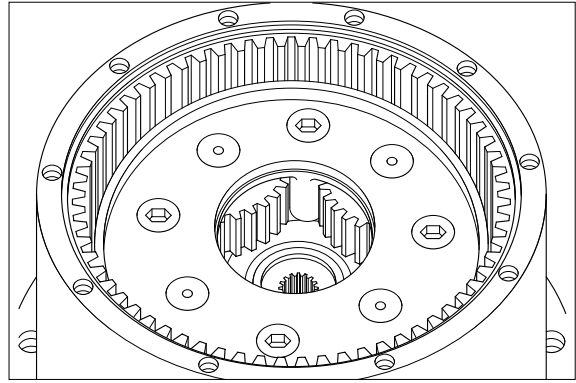


- ⑧ Remove the 3rd sun gear(11).

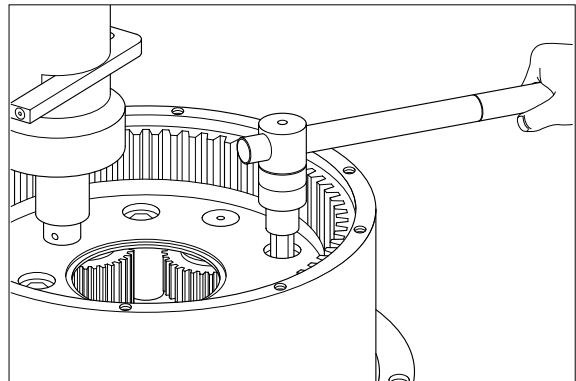
- ※ Now you can check the complete 1st and 2nd reductions and the 3rd reduction pinion.
in order to disassembling the 3rd stage planetary carrier with the gears you have to take the gearbox off the machine, put it on a bench and use some tools.



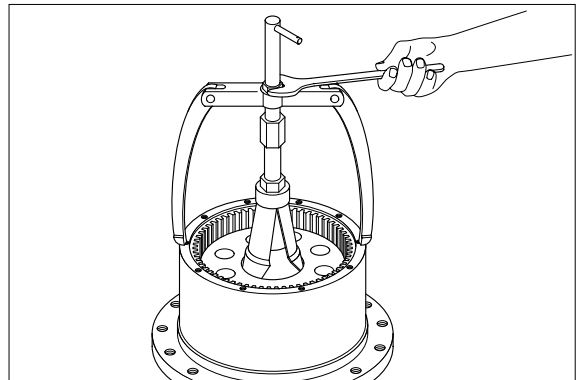
- ⑨ Take off the track motor, removing the bolts(29).
Put the gearbox on the bench on its vertical axis.



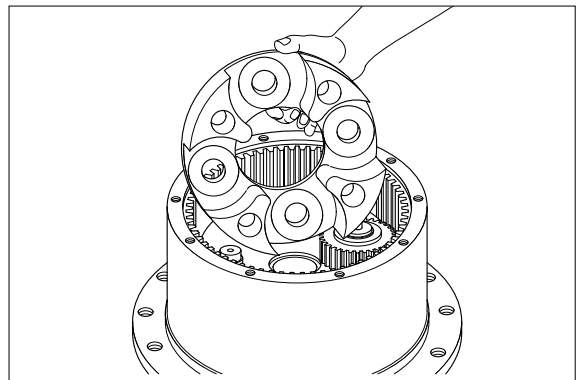
- ⑩ Take off the four bolts(12) that lock the 3rd stage planet carrier.



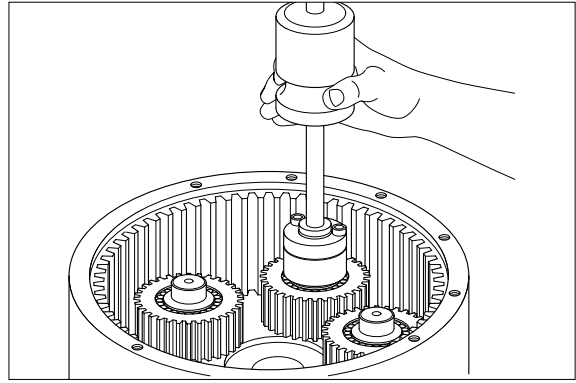
- ⑪ Using a puller for interiors, pull the planetary carrier(13) up.



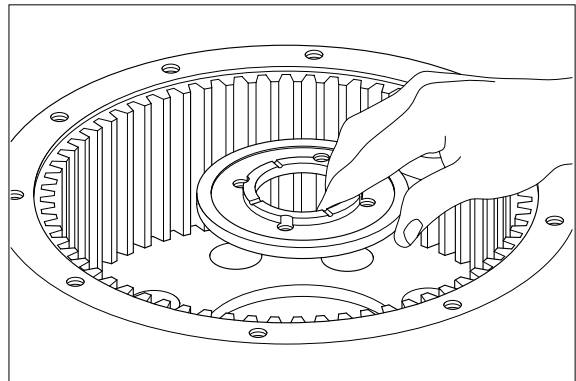
- ⑫ View of the planetary carrier



- ⑬ Take off the kit pin-bearing-planet of the 3rd stage(13).



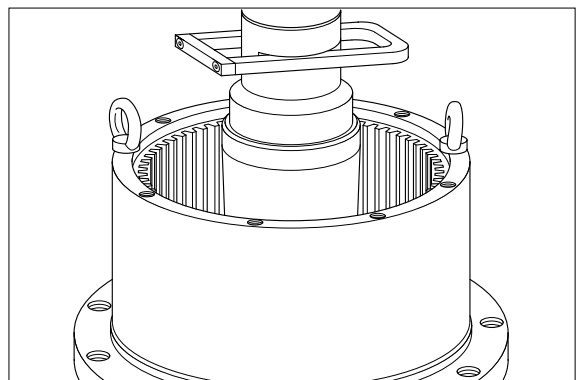
- ⑭ Take off the disc pushing(19).



(2) Main ball bearing

The bearing never requires any revision being the external rolling track machined on the housing of the gearbox it cannot be replaced by itself. On the other hand, this operation may be required in order to replace the lifetime seal.

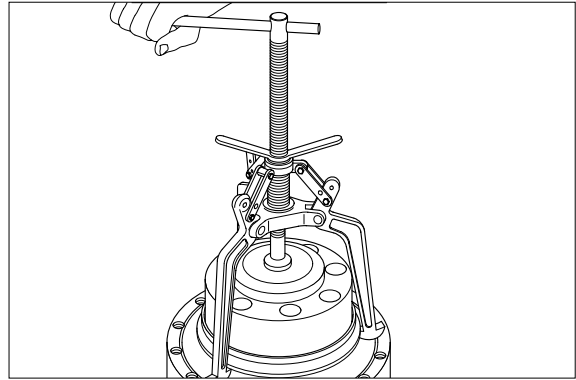
- ⑮ Put the gearbox under a press.
Using spacers under the housing(15) press on the hub(17) to slide it out.
※ When making this operation, make sure to collect properly all the balls of the bearing that will fall out.



- ⑩ Remove the inner race of the bearing from the hub.

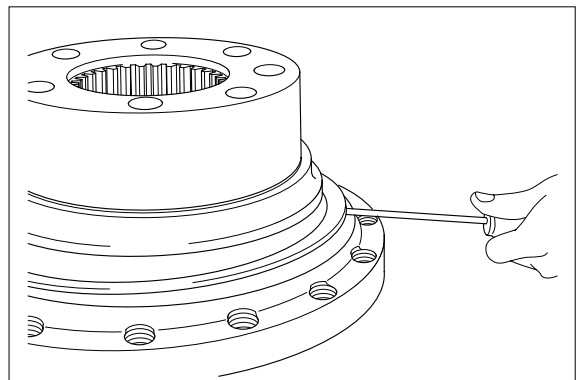
Check the bearing on the housing(15) as the outer race is machined in the housing itself.

- ※ In case there is a need to replace the bearing, it will be supplied already preassembled on the housing(15).



(3) Lifetime seal

- ⑪ Disassembling half lifetime seal from the hub(17) and the other half from the housing(15).

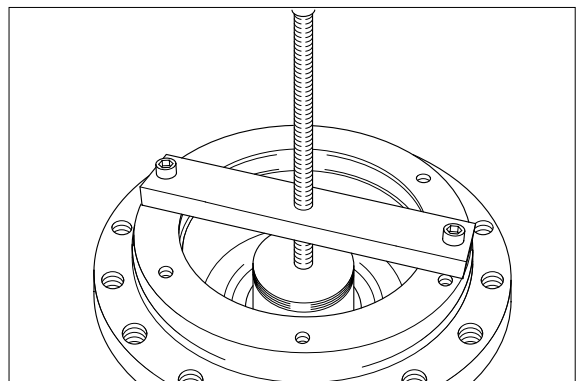


(4) Brake

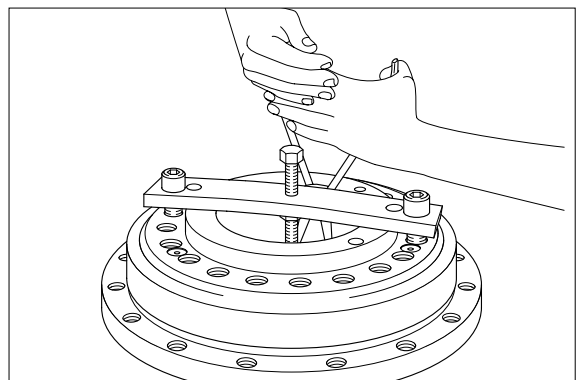
For disassembling the brake you can work eventually with the gearbox still mounted on the machine.

- ⑫ Now you can see the brake.

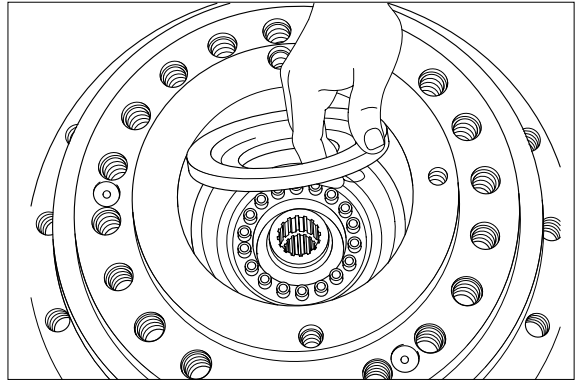
Using the screw press fixed on the motor flange by the two bolts push on the disc pushing(26) in a way to free the circlip (27) from the spring pressure(25).



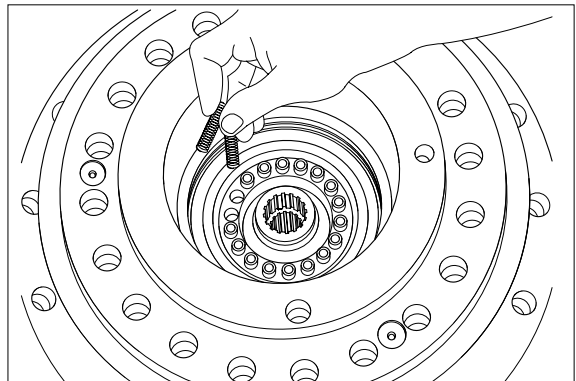
- ⑬ Using the proper nippers, take the circlip(27) off the seat.



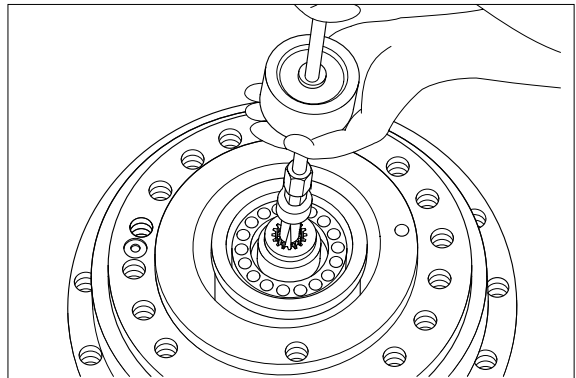
⑳ Take off the disc pushing(26).



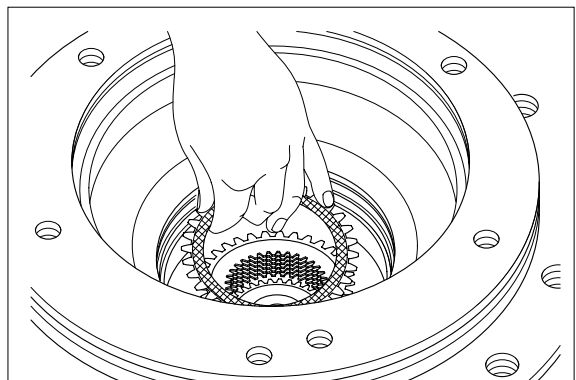
㉑ Take the springs(25) out of the piston (24).



㉒ Using a puller for interiors take the piston (24).

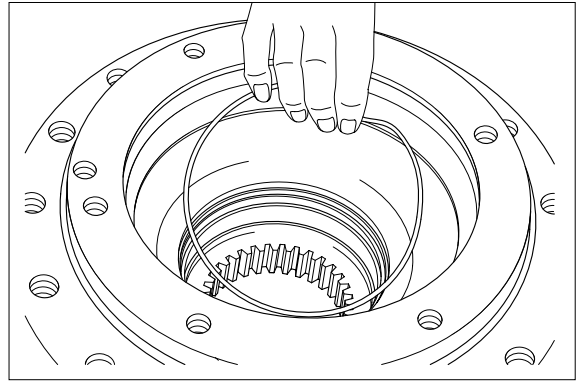


㉓ Take the brake disc package(21, 20) out.



④ Remove the O-ring seals(22) and (23).

※ At this point the disassembly is completed and all the parts are available for inspection.



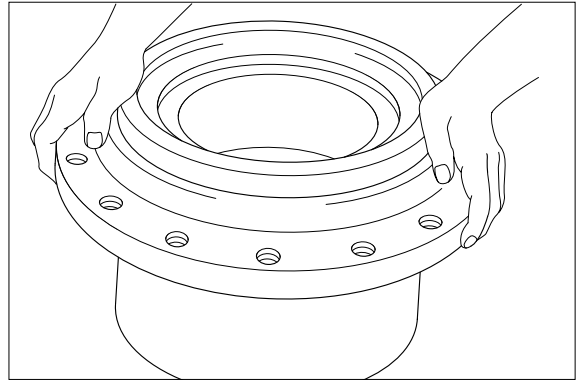
3) REASSEMBLY

For the correct assemble of gearbox please follow these basic instructions:

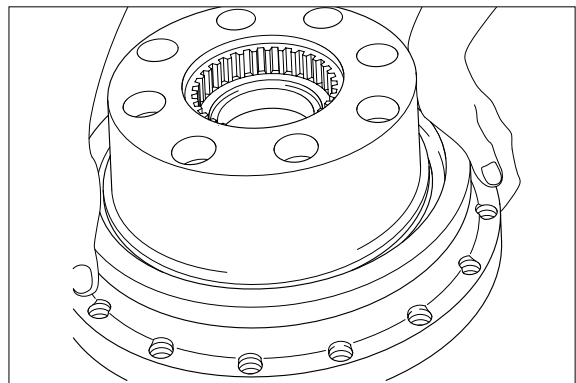
- a) In case of damaged gears, for example a planetary, replace all the reduction assembly and not only the damaged gear.
- b) Before reassembling the O-ring, gaskets and the oil seals:
Concerned should be removed.
Clean with care all the housing of the seal and put some grease on the gasket before mounting.
- c) Never change only one part of the lifetime seal, always the two rings together.

(1) Lifetime seal

- ②6 Put up one of the two halves of the seal on the housing(15) of the gearbox.

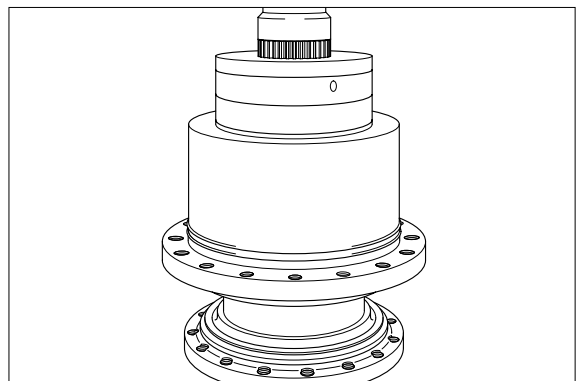


- ②7 Put the other half of the seal on the hub (17).



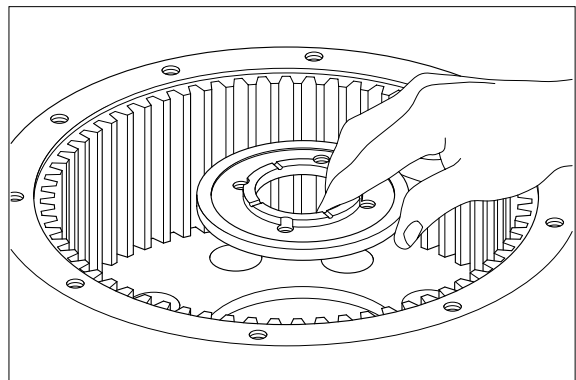
(2) The main bearing

- ②8 Place the hub(17) under a press with the motor adapter side against the press. Place the flange on the unit : the function is to pilot the assembly of the housing & bearing unit. Take the unit put it on the hub and push with the press on the inner race of the bearing by mean of the steel ring until it reaches the shoulder of the hub.

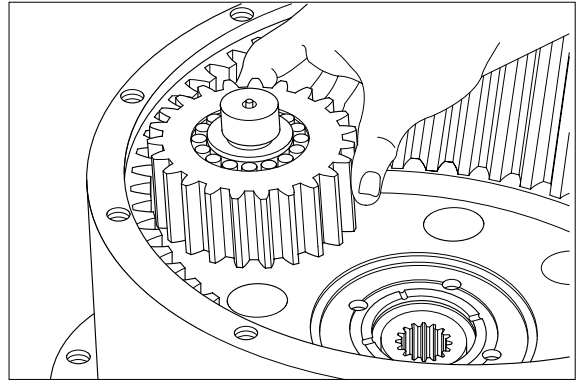


(3) Gears

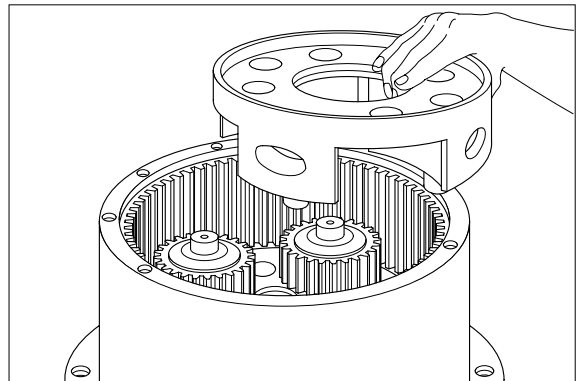
- ②9 Insert the disc pushing(19).



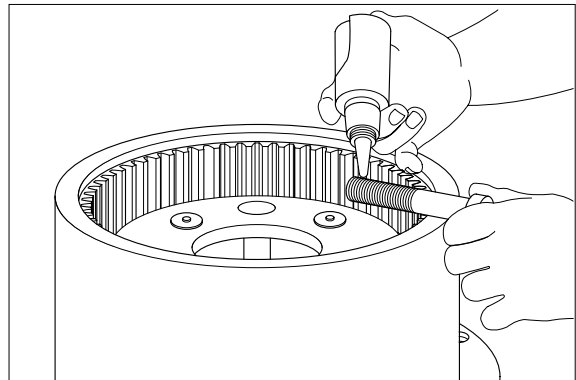
- ③⑩ Press the kit pin-bearing-planet(13) into the hub(17)



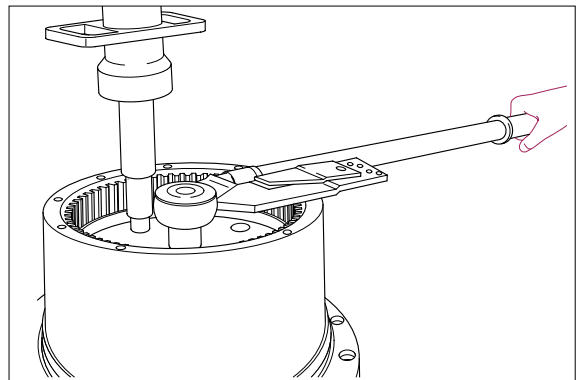
- ③⑪ Press the planetary carrier(13) on the hub(17).



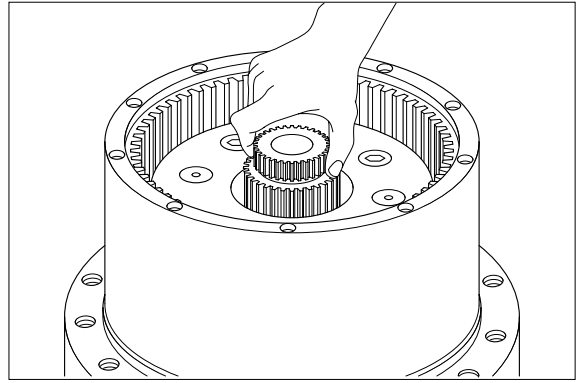
- ③⑫ Mount the four bolts(12) using loctite type 243.



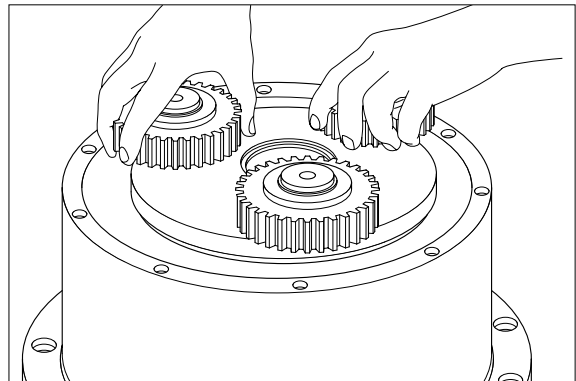
- ③⑬ Tighten at a torque 55~56kgf · m(398~405ft · lb).



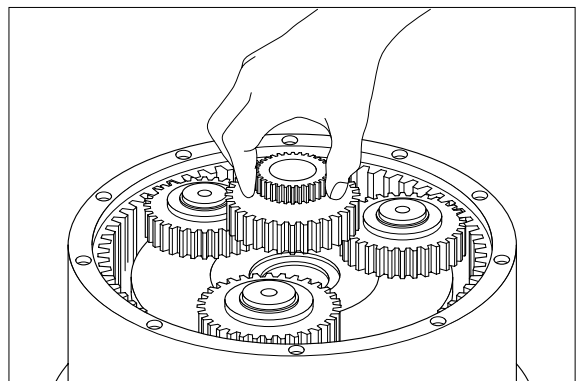
34 Put on the 3rd sun gear(11).



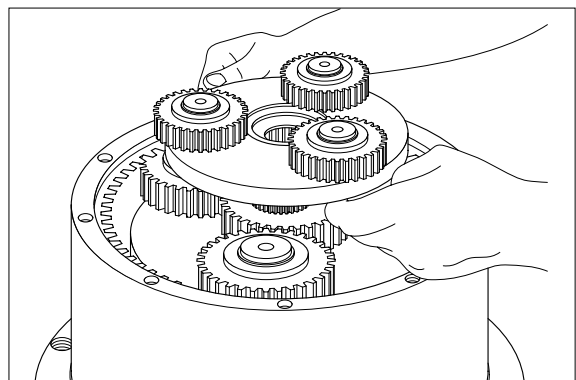
35 Mount the 2nd stage planetary carrier complete with gears(10).



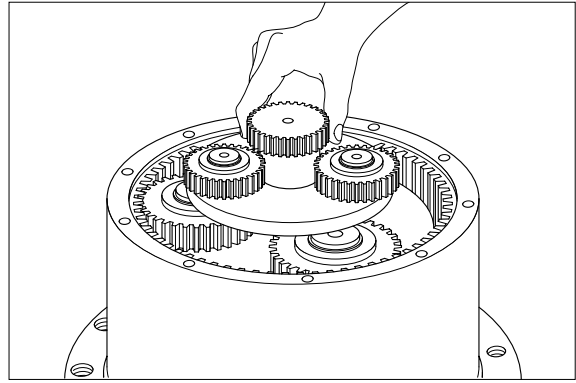
36 Insert the 2nd sun gear(9).



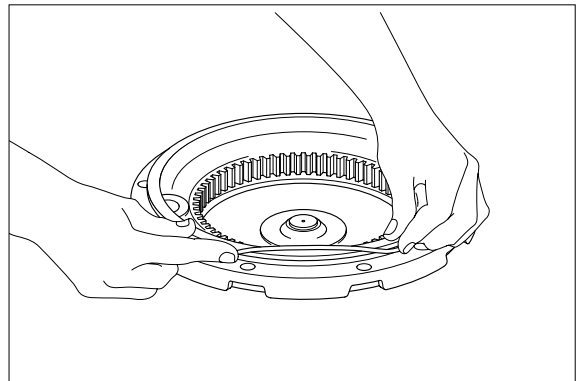
37 Assemble the 1st stage planetary carrier complete with gears(8).



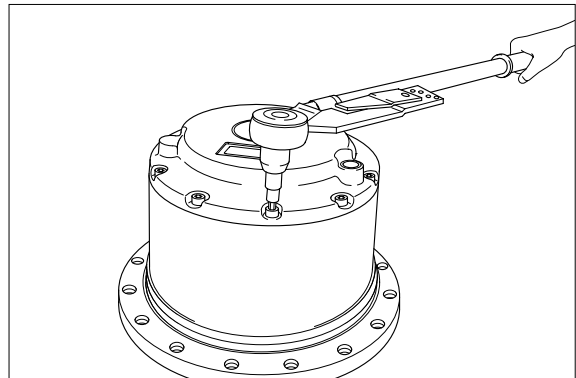
- ③⑧ Insert the 1st sun gear(7).



- ③⑨ Mount the O-ring seal(5) on the cover(4).

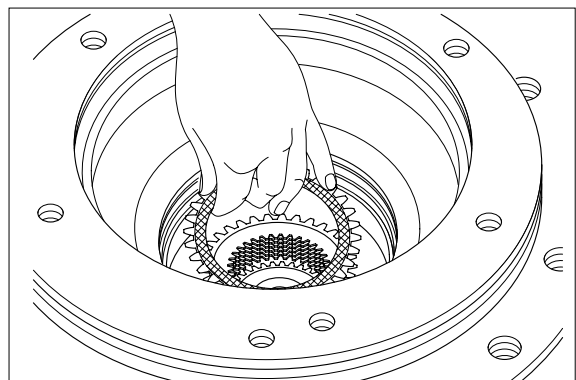


- ④⑩ Mount the cover(4) on the housing(15) and tighten the bolts(1) at a torque of 8.2~8.7kgf · m(59~ 63ft · lb).

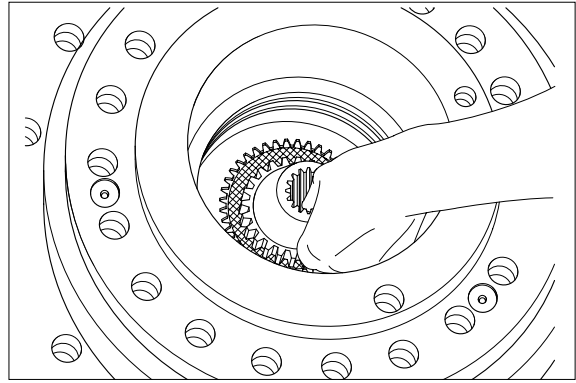


(4) Assembly brake

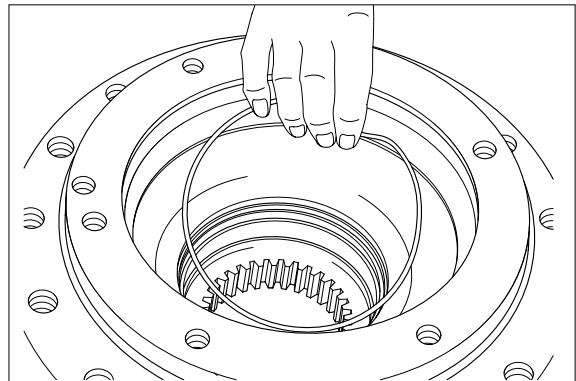
- ④⑪ Put the gearbox vertically, input side up.
Assemble the brake disc package inside the seat as follows : The discs must be alternated, starting with a sintered bronze one with external spline(20) and following with a steel one with internal spline(21) and so on until you have 6 bronze discs with external teeth, and 5 steel discs with internal teeth.



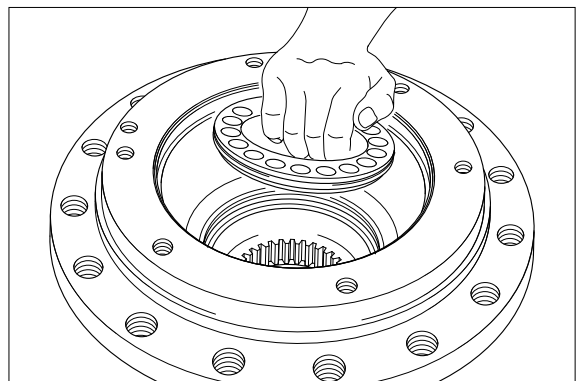
④② Slide in the brake shaft(18) in.



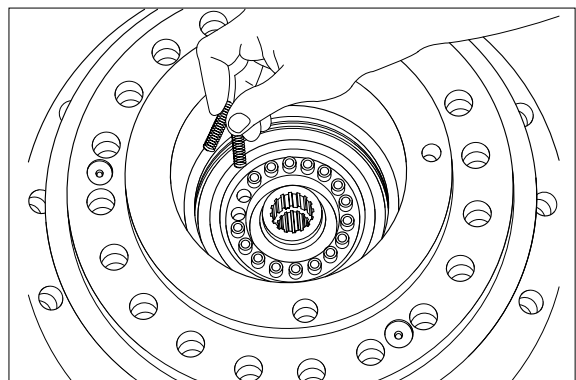
④③ Fit the O-ring seal(22 and 23) on the hub(17).



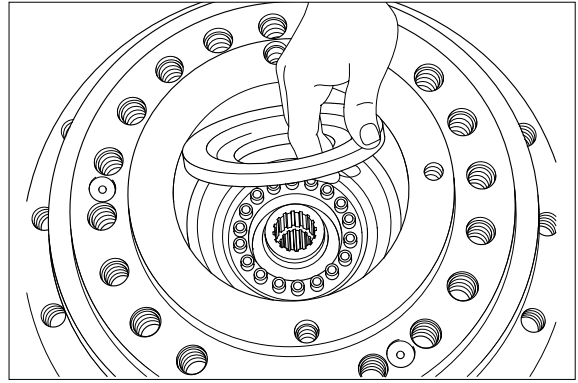
④④ Insert the piston(24) into the hub(17) taking care not to damage the O-ring.



④⑤ Assemble the spring(25) on the piston (24).



- ④⑥ Assemble and push the disc pushing (26).



- ④⑦ Put the circlip(27) in its seat.

