

## Power train

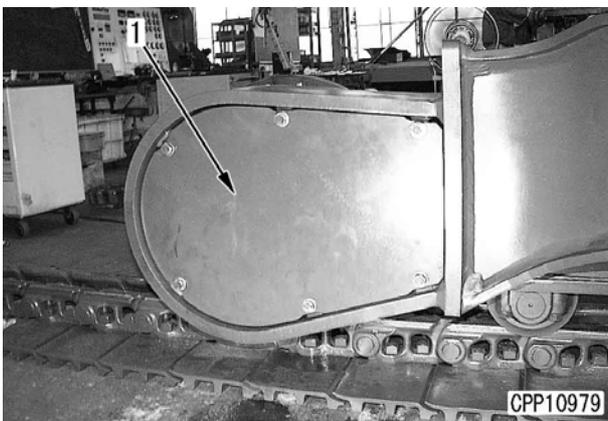
### Removal and installation of final drive assembly

#### Removal

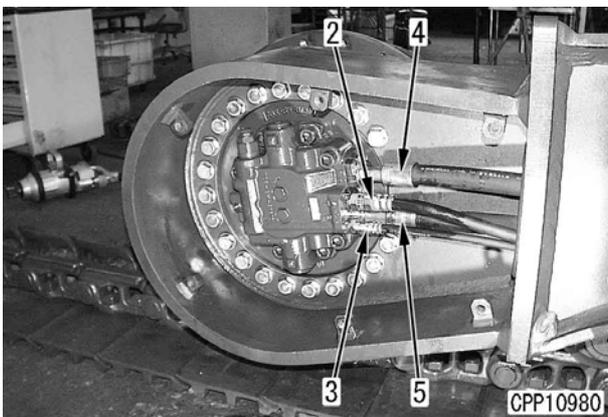
1. Remove the sprocket, referring to the "Removal and installation of sprocket" section in this manual.

**⚠ Lower the work equipment safely to the ground. Stop the engine and loosen the oil filler cap on the hydraulic tank to release pressure inside.**

2. Remove cover (1).



3. Disconnect drain hose (2), travel speed shifting hose (3) and motor hoses (4) and (5).

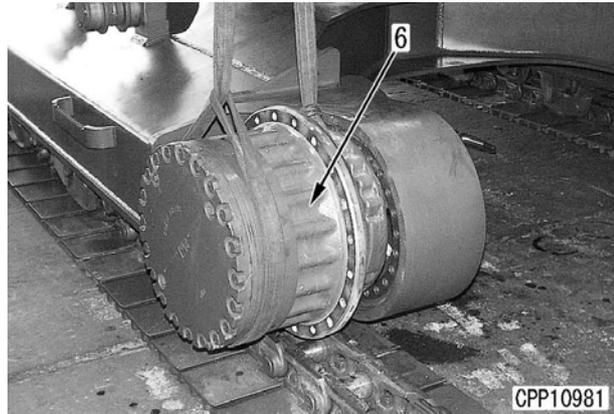


4. Remove 21 mounting bolts and then lift off final drive assembly (6). [\*1]

★ Be careful so that the nipple sealing surface on the hose mounting block may not be damaged.

★ When lifting off the final drive assembly, do not use a tapped hole for lifting the cover.

 Final drive assembly: **500 kg**



#### Installation

- Installation is done in the reverse order of removal.

[\*1]

 Mounting bolt: **490 – 608 Nm {50 – 62 kgm}**

- **Refilling with oil**

Refill hydraulic oil through the oil filler port to the specified level. Let the oil circulate in the hydraulic system by starting the engine. Then check the oil level again.

- **Air bleeding**

Refer to the "Bleeding air from various parts" section in the Testing and adjusting chapter of this manual.

## Disassembly and assembly of final drive assembly

### Special tools

Symbol	Part number	Part name	Necessity	Q'ty	N/R	Sketch
1	796-627-1610	Wrench assembly	■	1		
	796-627-1620	Wrench		1		
	796-427-1140	Pin		3		
	01314-20612	Screw		3		
D 2	796T-627-1630	Push tool	■	1	○	
	790-101-2510	Block	■	1		
	791-830-1320	Rod	■	2		
	01580-11613	Nut	■	2		
	790-101-2570	Washer	■	2		
	01643-31645	Washer	■	2		
	790-101-2570	Jack assembly	■	1		
	790-101-1102	Pump	■	1		
3	791-508-1510	Installer	■	1		
4	790-331-1110	Wrench	●	1		

### Disassembly

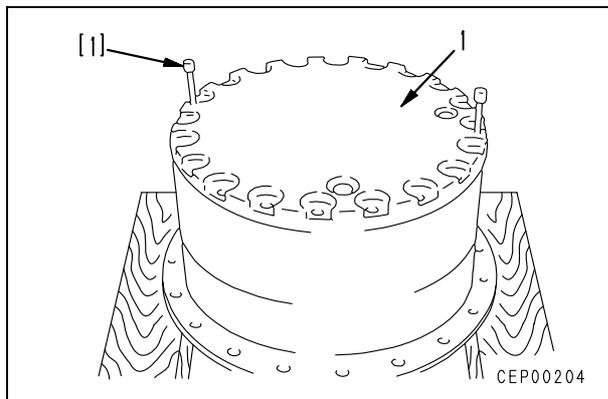
#### 1. Oil draining

Remove drain plug and drain oil from final drive case.

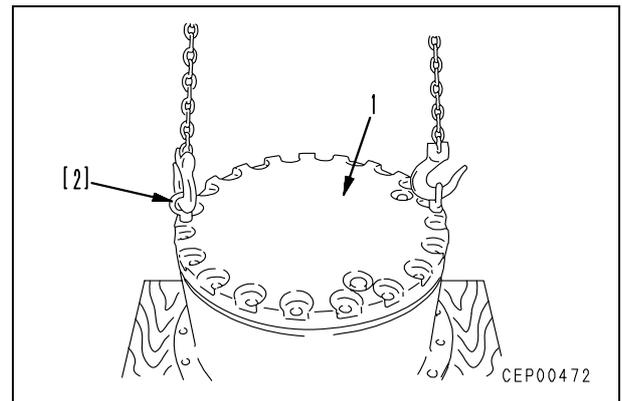
 Final drive case: Approx. 8.5 ℓ

#### 2. Cover

- 1) Remove the mounting bolts. Then, using forcing screws [1], separate cover (1) from the case.

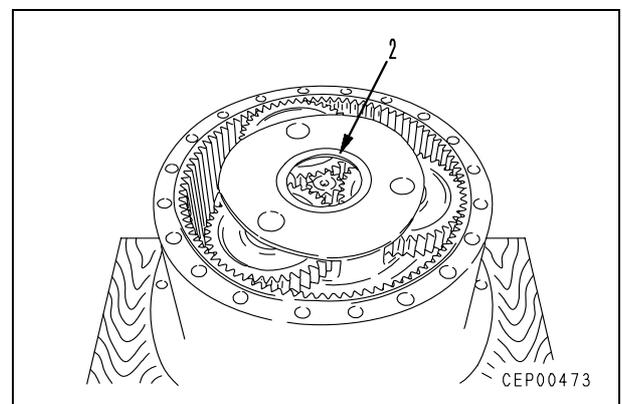


- 2) Remove cover (1) using eyebolt [2].



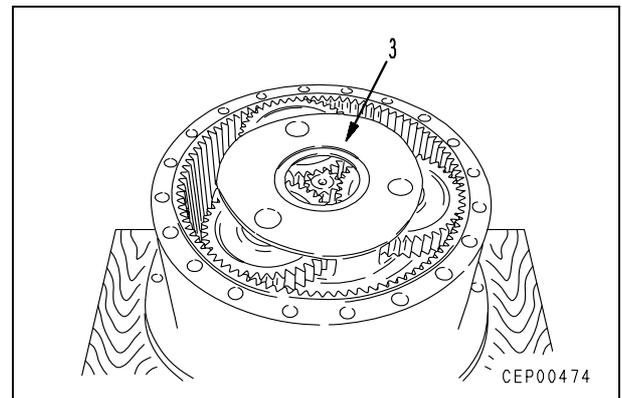
#### 3. Spacer

- Remove spacer (2).



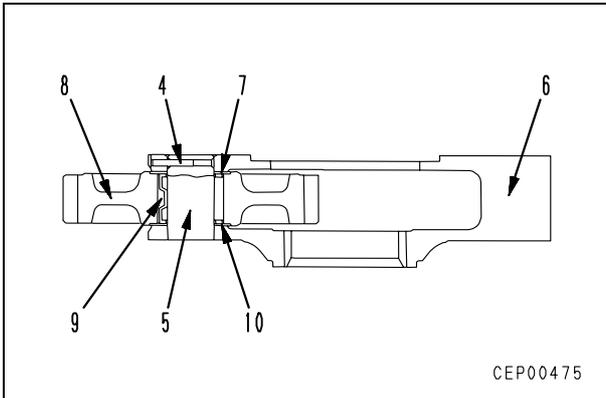
#### 4. No.1 carrier assembly

- 1) Remove No.1 carrier assembly (3).



2) Disassemble No. 1 carrier assembly as follows.

- ★
- 1] Insert pin (4) and drive shaft (5) out of carrier (6).
- ★ After removing the shaft, remove pin (4).
- 2] Remove thrust washer (7), gear (8), bearing (9), and thrust washer (10).

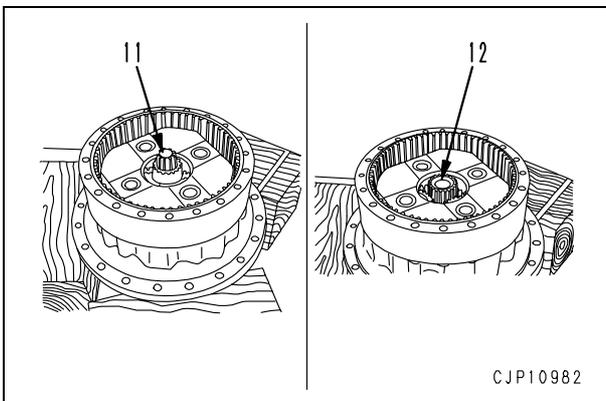


**5. No.1 sun gear shaft**

Remove No. 1 sun gear shaft (11).

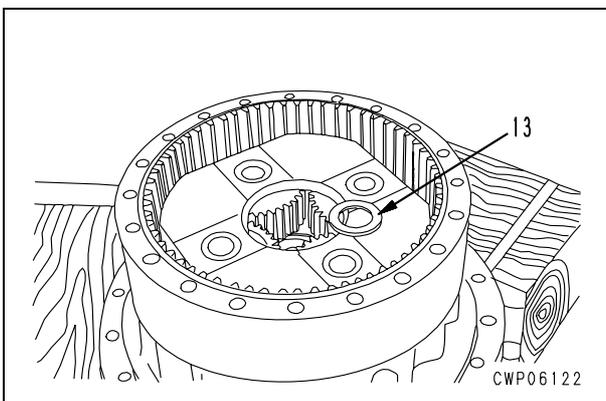
**6. No.2 sun gear shaft**

Remove No. 2 sun gear shaft (12).



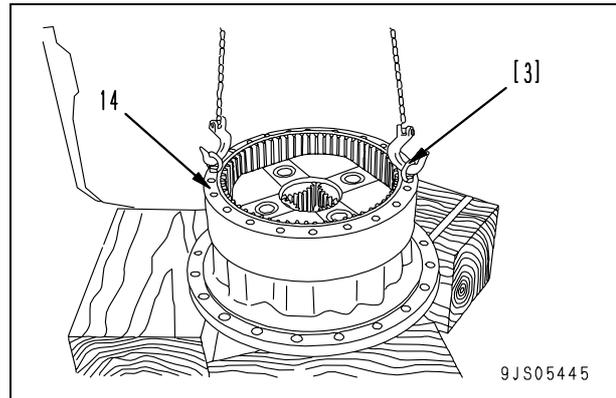
**7. Thrust washer**

Remove thrust washer (13).



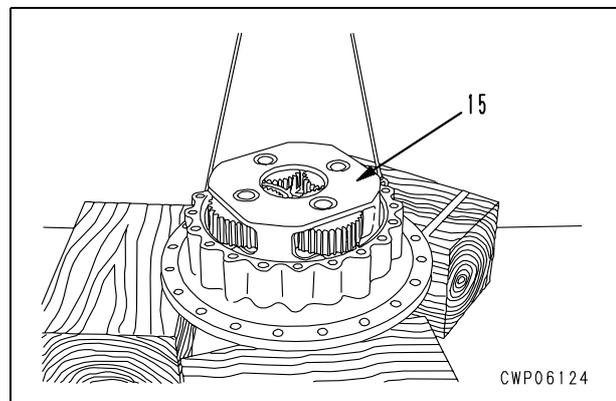
**8. Ring gear**

Remove ring gear (14) using eyebolt [3].



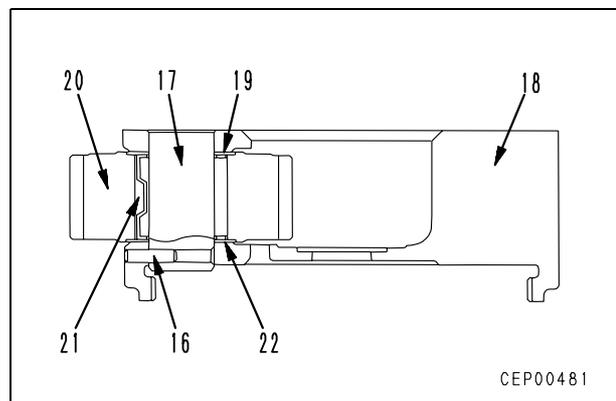
**9. No.2 carrier assembly**

1) Remove No.2 carrier assembly (15).



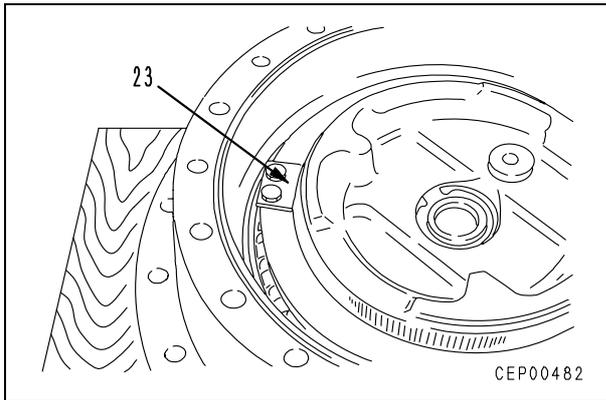
2) Disassemble No. 2 carrier assembly as follows.

- 1] Insert pin (16) and drive shaft (17) out of carrier (18).
- ★ After removing the shaft, remove pin (16).
- 2] Remove thrust washer (19), gear (20), bearing (21), and thrust washer (22).

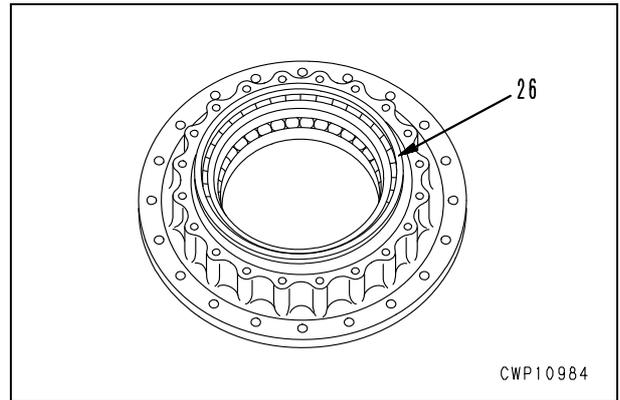


**10. Nut**

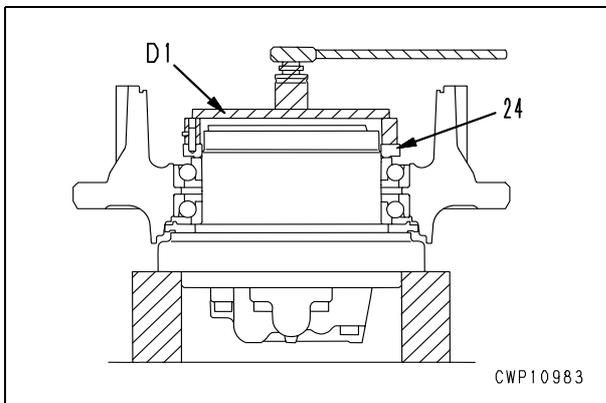
- 1) Remove lock plate (23).



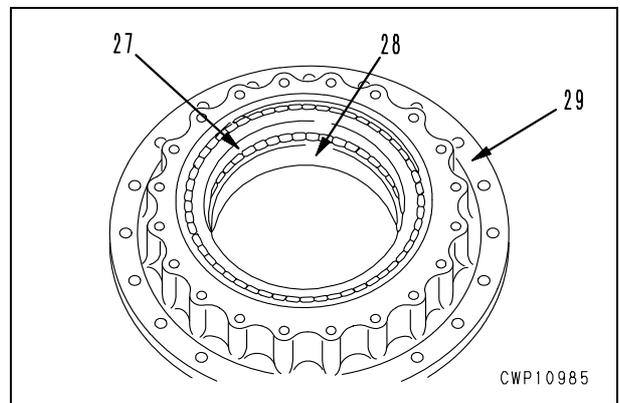
- 2) Disassemble the hub assembly as follows.
  - 1] Remove floating seal (26).



- 2) Use tool D1 to remove nut (24).

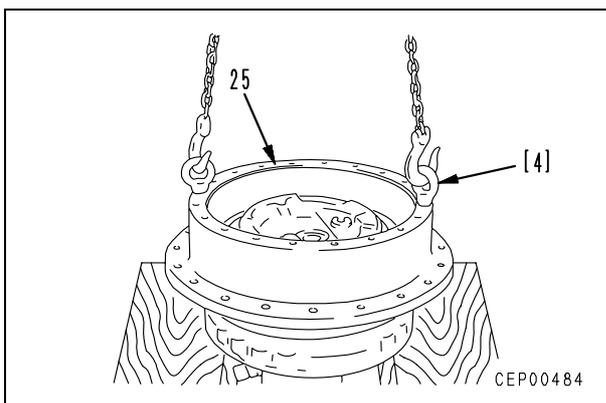


- 2] Remove bearings (27) and (28) from hub (29).

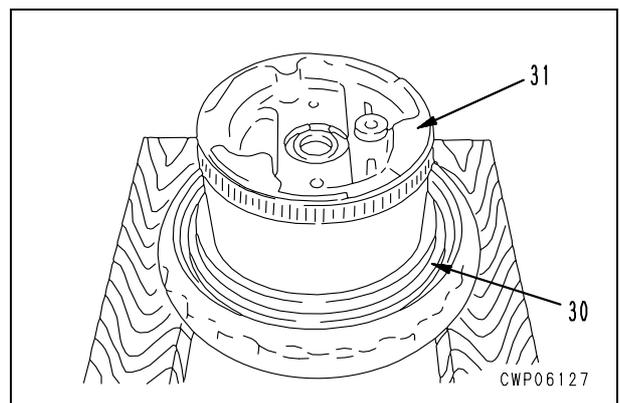


**11. Hub assembly**

- 1) Using eyebolts [4], remove hub assembly (25) from travel motor.



- 3) Remove floating seal (30) from travel motor (31).

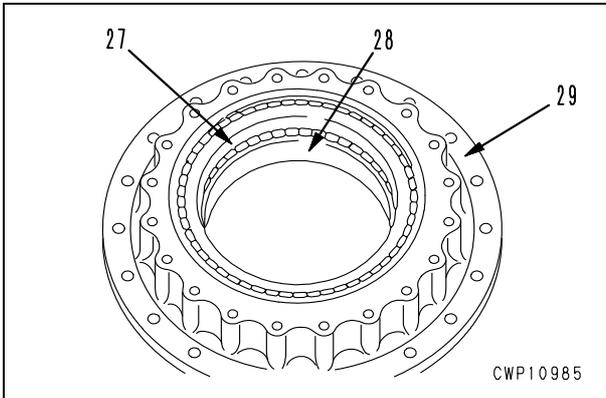


**Assembly**

★ Clean all parts and check for dirt or damage. Coat the sliding surfaces of all parts with engine oil before installing.

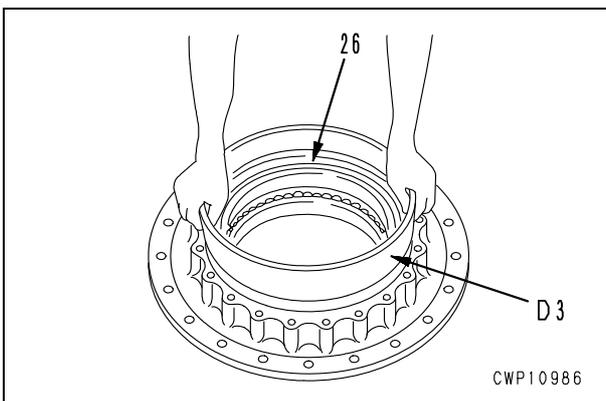
**1. Hub assembly**

1) Using the push tool, press-fit bearings (27) and (28) to hub (29).



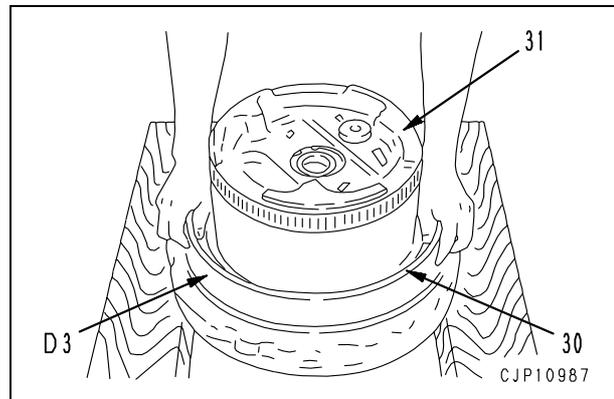
2) Use tool D3 to install floating seal (26).

- ★ Remove all oil and grease from the O-ring and O-ring contact surface and dry up these sections before installing the floating seal.
- ★ After installing the floating seal, check that the angle of the floating seal is within 1 mm.
- ★ After installing the floating seal, coat the sliding surface thinly with engine oil (EO30).

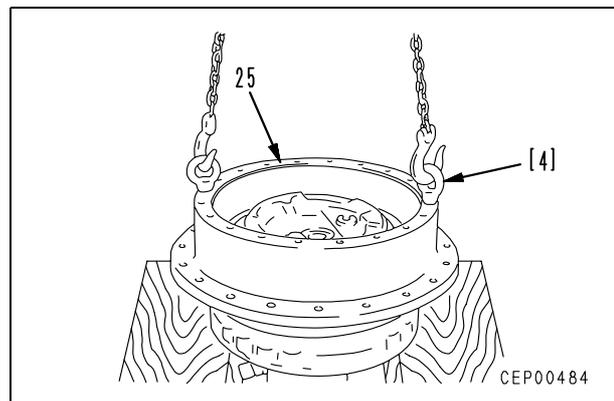


3) Using tool D3, install floating seal (30) onto travel motor (31).

★ The procedure for installation is the same as in Step 2) above.



4) Using eyebolts [4], set hub assembly (25) onto the travel motor. Then tap the bearing using the push tool to press-fit it.

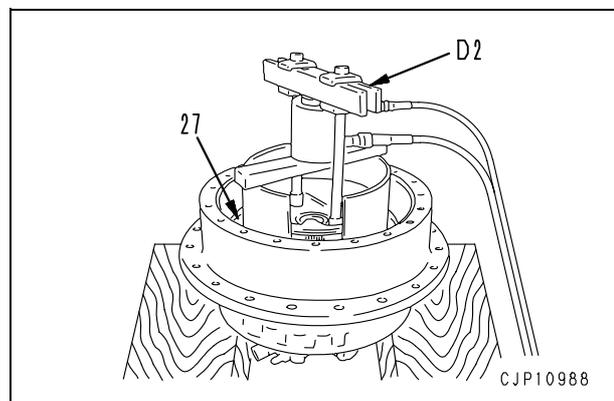


**2. Nut**

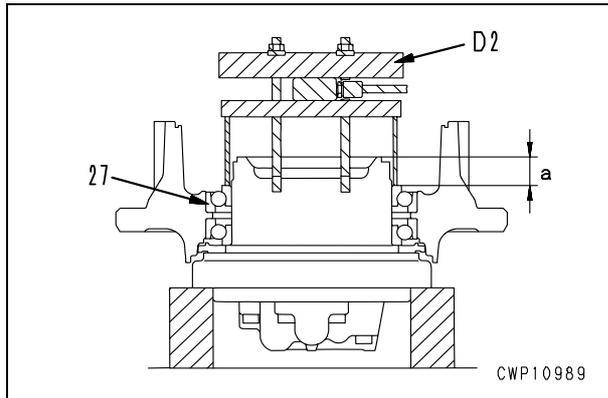
1) Install nut as follows.

1] Use tool D2 to press the inner lace of bearing (27).

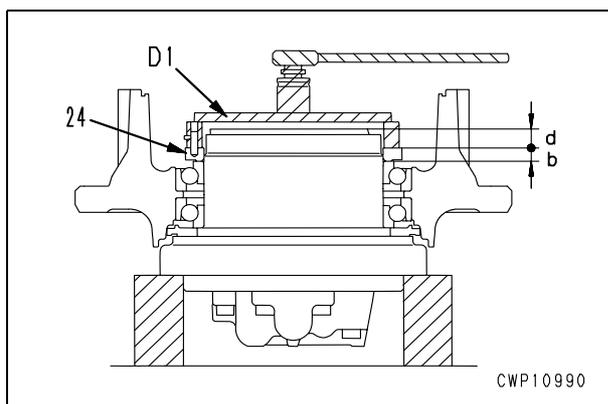
- ★ Pressing force  
**12.7 – 16.7 kN {1.3 – 1.7 ton}**
- ★ Rotate the hub 2 – 3 turns before pressing the bearing inner race.



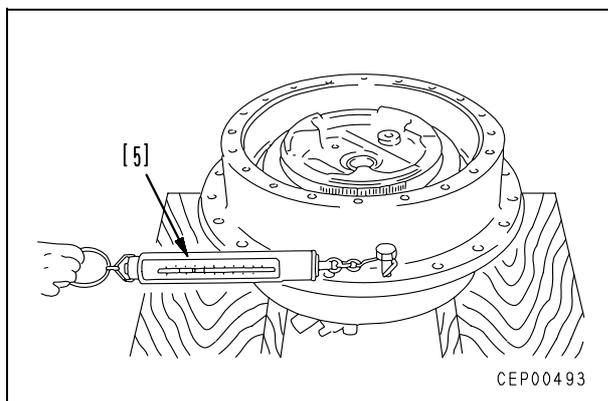
- 2] Under the above condition, measure dimension (a).



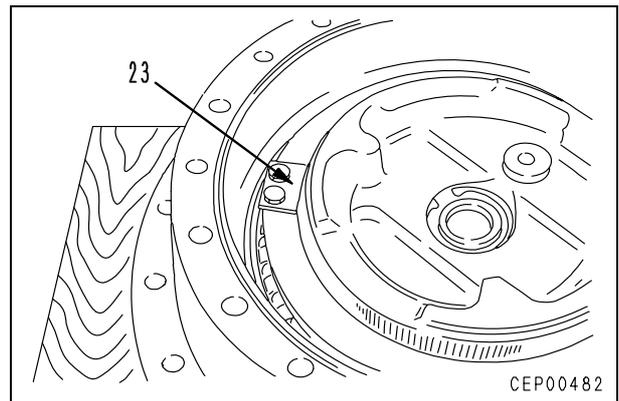
- 3] Measure thickness (b) off the independent nut (24).  
 4] Determine **Calculate  $a - b = c$**   
 5] Using tool **D1**, tighten nut (24) until dimension (d) becomes the value of (c) calculated above.



- 6] Using push-pull scale [5], measure tangential force of the hub to the motor case in the rotation direction.
- ★ Tangential force:  
**Max. 490 N {50 kg}**
  - ★ The tangential force denotes the maximum force at start of the rotation.



- 7] Install lock plate (23).



- ★ When installing the lock plate, avoid notch (j) of the travel motor and fit it to the spline totally (under the condition of (k))

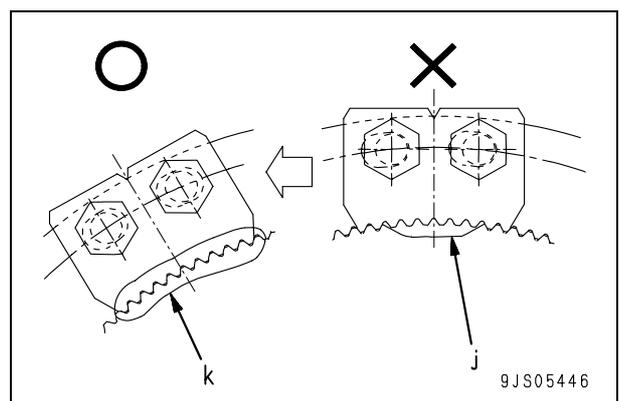
Thread of mounting bolt:

**Adhesive (LT-2)**

Mounting bolt:

**49 – 74 Nm {6 – 7.5 kgm}**

- ★ Do not apply the adhesive (LT-2) to the tapped portion of the nut.

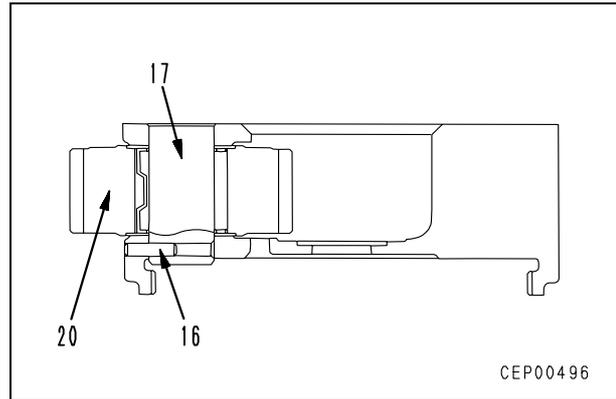
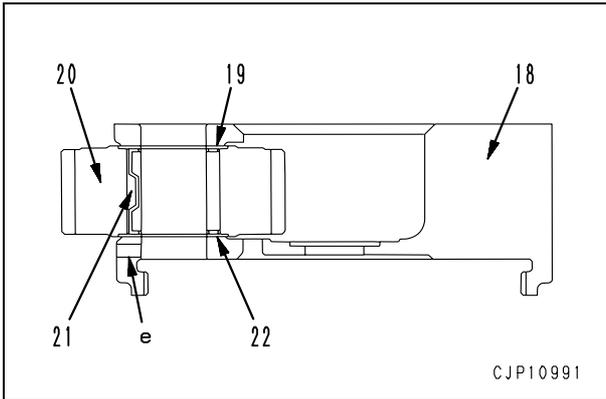


### 3. No.2 carrier assembly

- 1) Assemble No. 2 carrier assembly as follows.

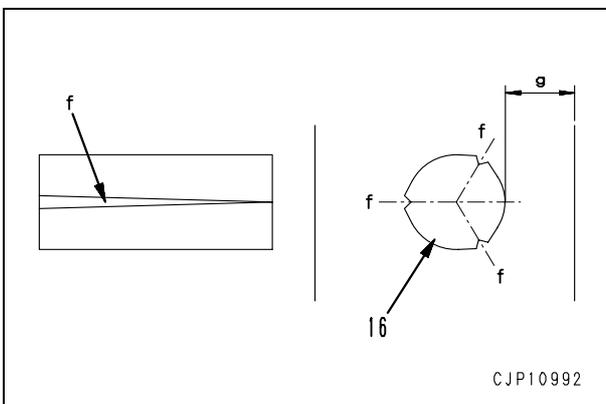
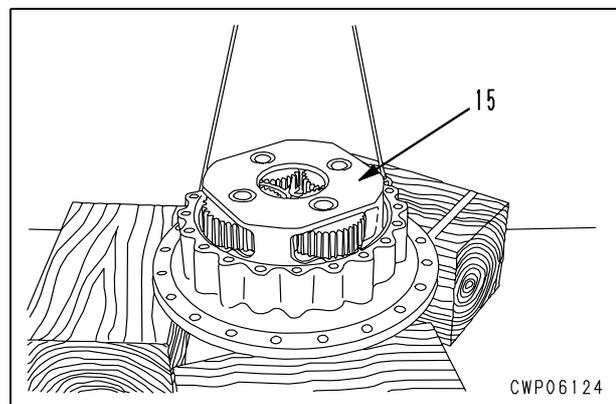
- ★ Replace thrust washers (19) and (22) as well as pin (16) with new ones.
- ★ There are traces of expansion on the end surface of carrier side hole (e) which were originally caused when the pin was inserted. Make such the end surfaces are smooth enough before reassembly.

- 1] Assemble bearing (21) to gear (20), fit top and bottom thrust washers (19) and (22) and then set the gear assembly on carrier (18).



- 2] Align the position of pin holes on the shaft and carrier, then tap with a plastic hammer to install shaft (17).
  - ★ Install the shaft, rotating the planetary gear. Take care so that thrust washer is not damaged.
- 3] Insert pin (16).
  - ★ When inserting the pin, take care that the 3 claws (parts (f)) on the periphery of the pin will not be placed on the thin parts of the carrier (parts (g)). Since the thin parts may be on the opposite side, confirm them on each carrier. If there is a groove, avoid placing the claws on that groove.

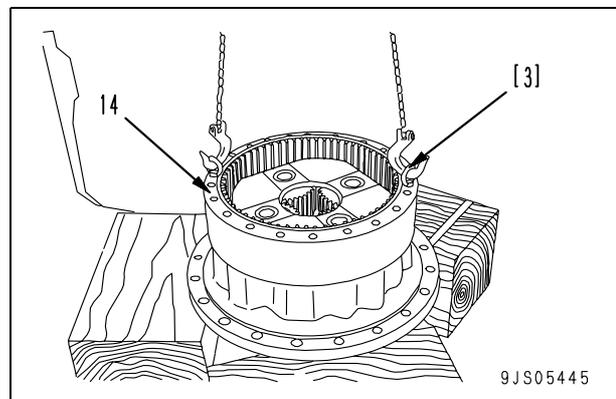
- 2) Install No.2 carrier assembly (15).
  - ★ Align the position so that the 3 tips of the gear shafts of carrier assembly (15) enter the 3 hollows in the end face of the motor case, then install.



**4. Ring gear**

- Fit the O-ring to the hub. Using eyebolts [3], sling ring gear (14) and install it to the hub, matching their bolt holes to each other.
- ★ Remove all grease and oil from the mating surface of the ring gear and hub.
  - ★ Do not put any gasket sealant on the mating surface of the ring gear and hub under any circumstances.

- ★ After inserting the pin, caulk the pin portion of the carrier.
- ★ After assembling the carrier assembly, check that gear (20) rotates smoothly.

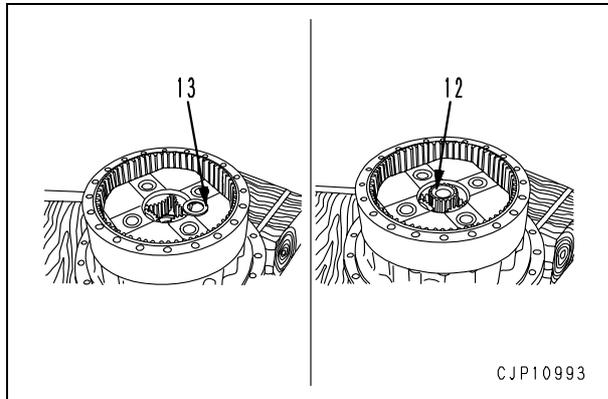


**5. Thrust washer**

Install thrust washer (13).

**6. No.2 sun gear**

Install No. 2 sun gear (12).

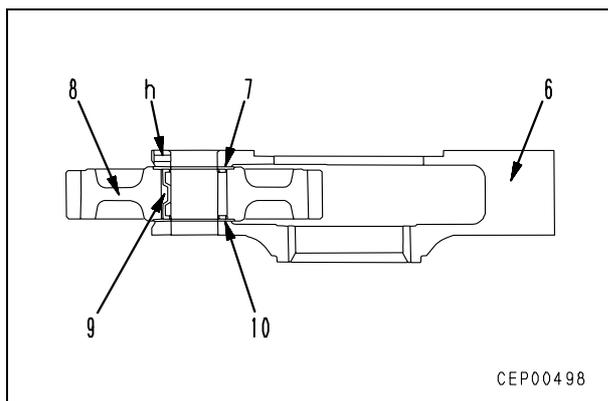


**7. No.1 carrier assembly**

1) Assemble No. 1 carrier assembly as follows.

- ★ Replace thrust washers (7) and (10) as well as pin (4) with new ones (For pin (4), see the next page).
- ★ There are remains of caulking when the pin is inserted at the end face of hole (h) at the side of the carrier. Remove the caulked metal from the inside diameter of the hole before starting to assemble.

1] Assemble bearing (9) to gear (8), fit top and bottom thrust washers (7) and (10) and then set the gear assembly on carrier (6).



2] Align the position of pin holes on the shaft and carrier, then tap with a plastic hammer to install shaft (5).

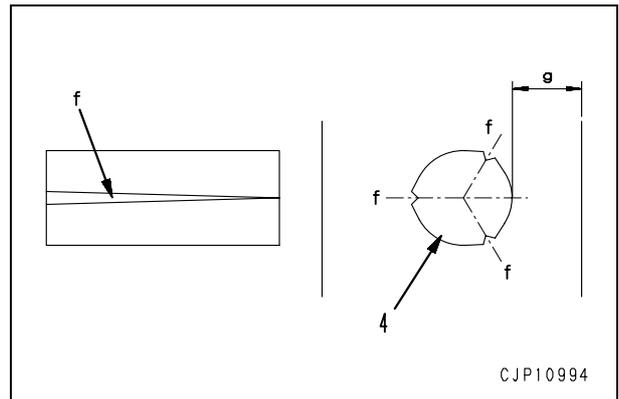
- ★ Install the shaft, rotating the planetary gear. Take care so that thrust washer is not damaged.

3] Insert pin (4).

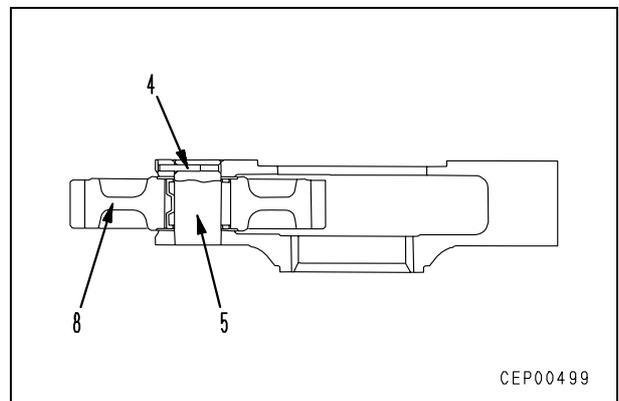
- ★ When inserting the pin, take care that the 3 claws (parts (f)) on the periphery of the pin will not be placed on the thin parts of the carrier (parts (g)).

Since the thin parts may be on the opposite side, confirm them on each carrier.

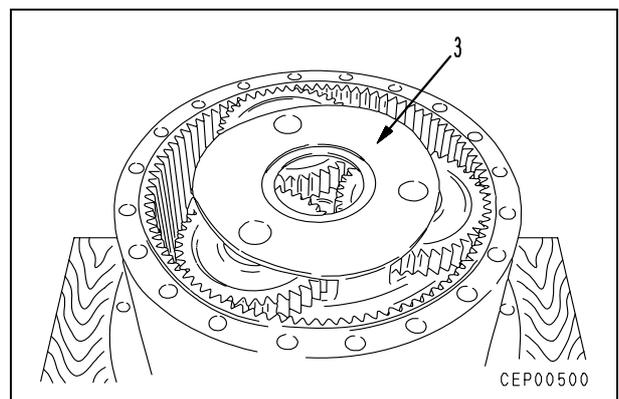
If there is a groove, avoid placing the claws on that groove.



- ★ After inserting the pin, caulk the pin portion of the carrier.
- ★ After assembling the carrier assembly, check that gear (8) rotates smoothly.

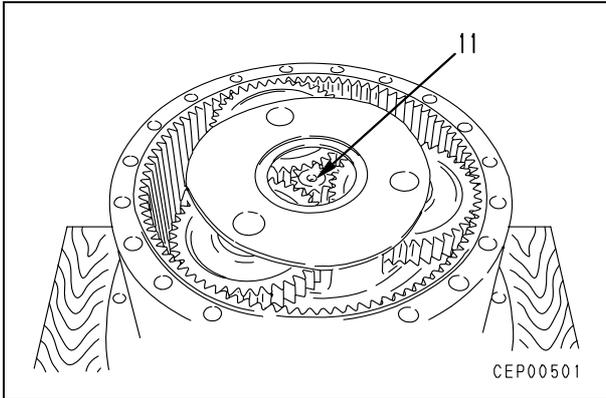


2) Install No.2 carrier assembly (3).



**8. No.1 sun gear shaft**

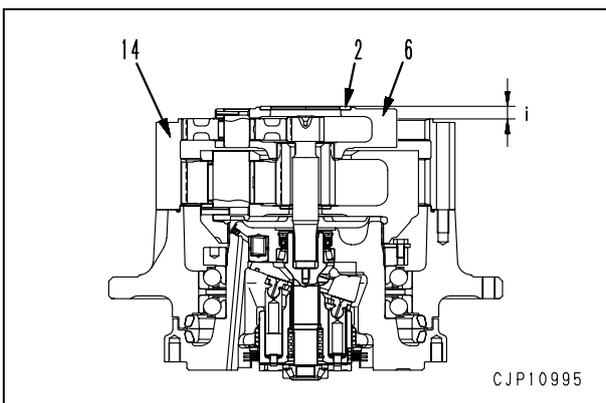
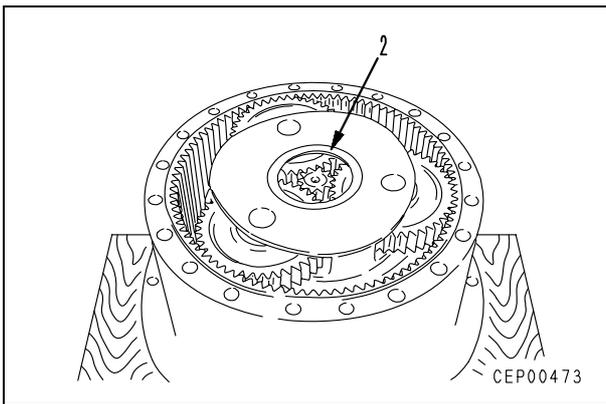
Assemble No. 1 sun gear shaft (11).



**9. Spacer**

Install spacer (2).

- ★ After installing the spacer, measure the dimension (i). If the dimension (i) is 15 mm or greater, the assembly is not done correctly. Check the assembly procedure again.

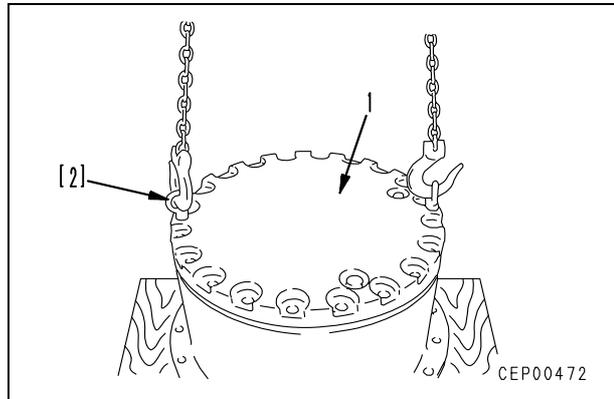


**10. Cover**

1) Using eyebolts [2], install cover (1).

☞ Cover mounting surface:

**Gasket sealant (LG-6)**



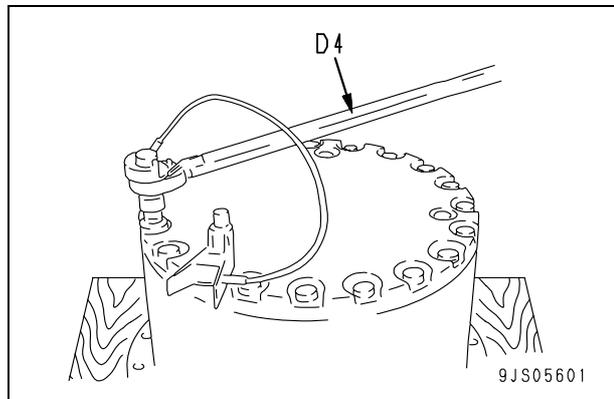
2) Tighten the mounting bolts according to the following procedure.

☞ Mounting bolt:

1st step : **98 Nm {10 kgm}**

2nd step: **Using tool D4, retighten each mounting bolt by 100 – 110°.**

- ★ If tool **D4** is not available, make a match mark on the cover and the bolt with paint and then tighten the bolt by 100 – 110°.



**11. Refilling with oil**

Tighten the drain plug and feed engine oil through oil filler.

☞ Final drive case: **12 ℓ**

- ★ Do a final check of the oil level at the determined position after installing the final drive assembly to the chassis.

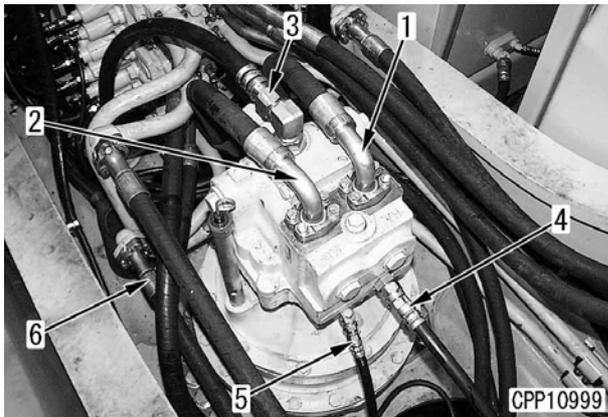
## Removal and installation of swing motor and swing machinery assembly

### Removal

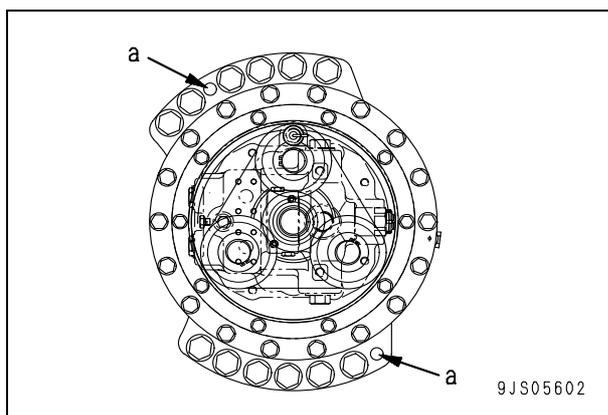
⚠ Release the remaining pressure in the hydraulic circuit. For details, see Testing and adjusting, "Release of remaining pressure in hydraulic circuit".

⚠ Lower the work equipment to the ground for safety. After stopping the engine, loosen the oil filler cap on the hydraulic tank to release the residual pressure inside the tank and move the work equipment lock lever to the LOCK position.

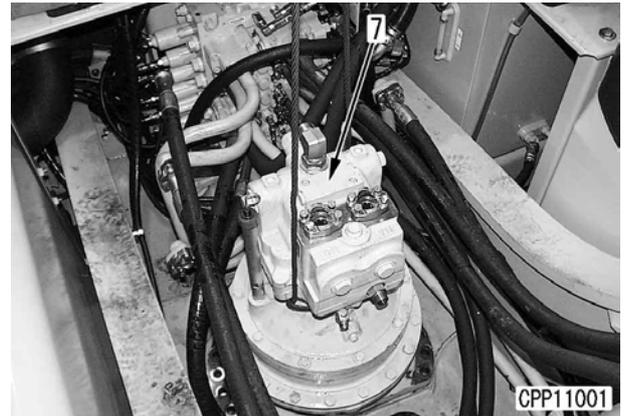
- Disconnect 5 swing motor hoses (1) through (5).
  - (1): Between the swing motor and control valve (port MA)
  - (2): Between the swing motor and control valve (port MB)
  - (3): Suction hose (port S)
  - (4): Drain hose (port T)
  - (5): Pilot hose for relieving swing brake (port B)
- Disconnect arm cylinder hoses (6).



- Remove the mounting bolts.
- Tighten a forcing screw in position (a) shown in the following figure to separate the swing motor and swing machinery assembly. [\*1]



- Lift and remove swing motor and swing machinery assembly (7).
    - ★ When lifting off the swing motor and swing machinery assembly for removal, do so slowly so that the hoses and other parts may not be damaged.
    - ★ Use care in the lift until you can pull out the pilot.
-  Swing motor and swing machinery assembly: **550 kg**



### Installation

- Installation is done in the reverse order of removal.

[\*1]

 Mounting bolt:  
824 – 1,030 Nm {84 – 105 kgm}

- Refilling with oil (hydraulic tank)**  
Refill hydraulic oil through the oil filler port to the specified level. Let the oil circulate in the hydraulic system by starting the engine. Then check the oil level again.
- Air bleeding**  
Bleed the air from the circuit between the valve and the hydraulic cylinder. For details, see Testing and adjusting, "Bleeding air from various parts".