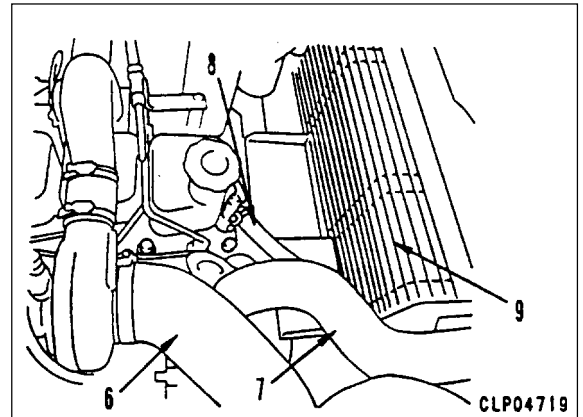
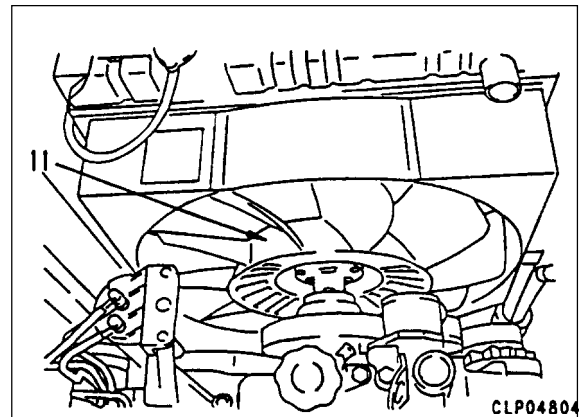


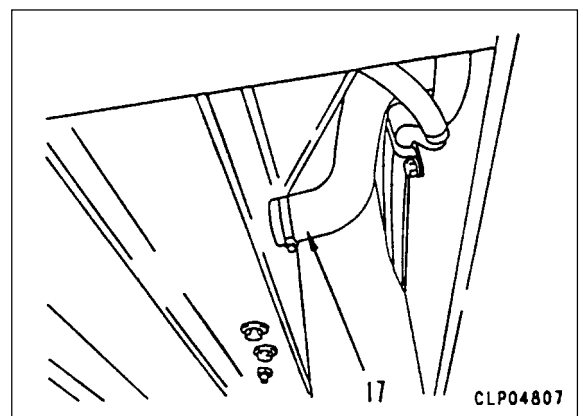
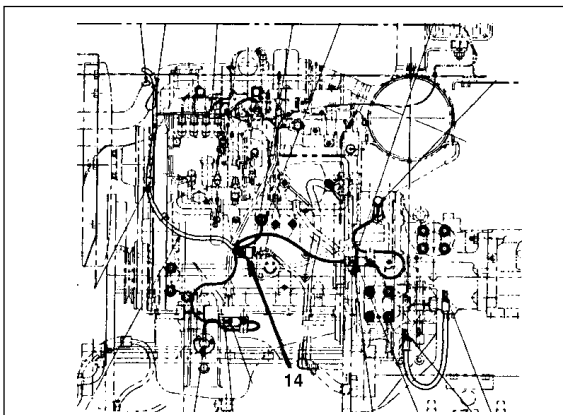
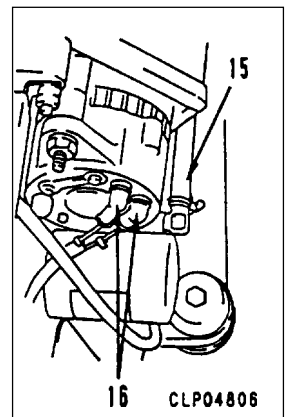
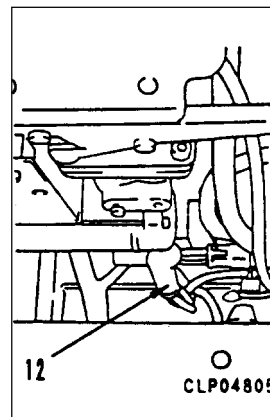
5. Disconnect intake hose (6).
6. Remove radiator inlet hose (7).
7. Disconnect heater hose (8).
8. Remove fan guard (9).



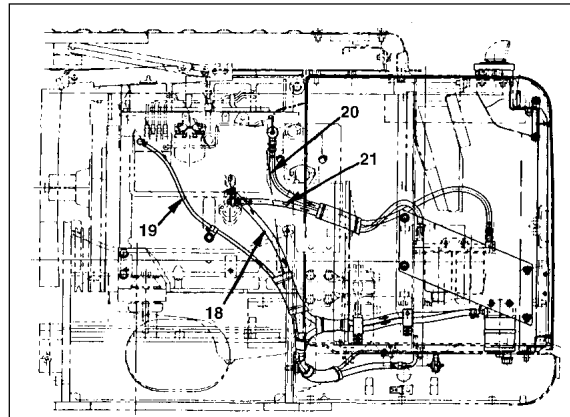
9. Remove fan (11).



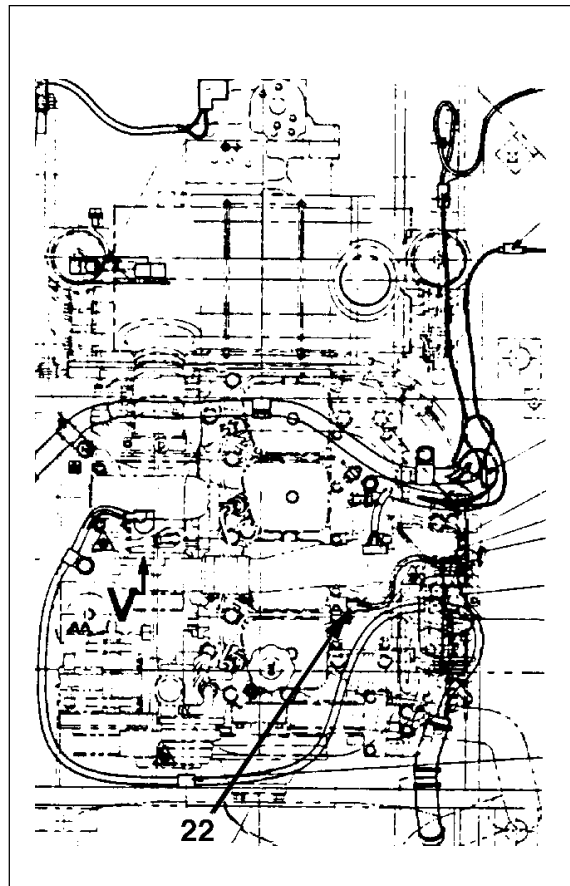
10. Disconnect starting motor wiring (12).
11. Disconnect engine wiring harness connector (14).
12. Disconnect heater hose (15).
13. Disconnect alternator wiring (16).
 - ★ Mark the wiring with tags to show the connection position.
14. Disconnect radiator outlet hose (17).



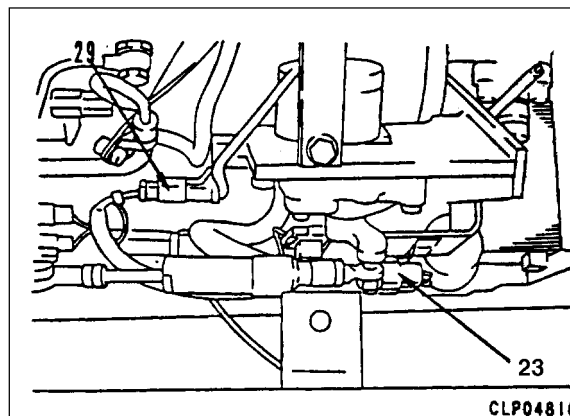
15. Disconnect fuel hoses (18), (19), (20) and (21).
★ When the hose is disconnected, fuel will flow out, so insert a wooden plug into the hose to prevent the fuel from leaking out.



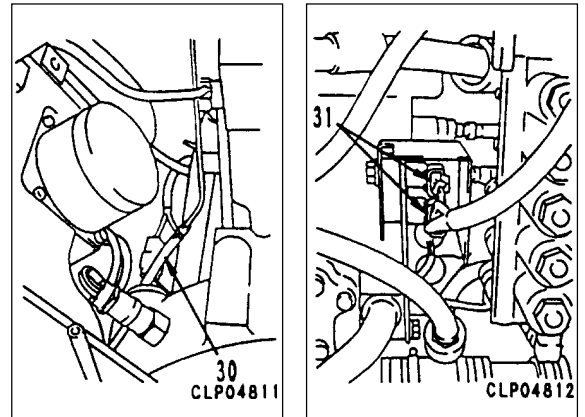
16. Disconnect electrical intake air heater wiring connector (22).



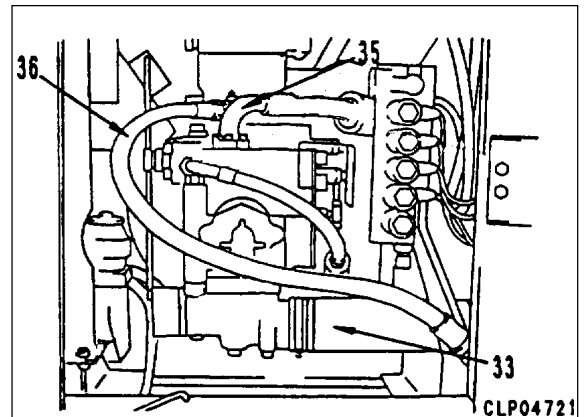
17. Disconnect 2 governor motor wiring connectors (23).



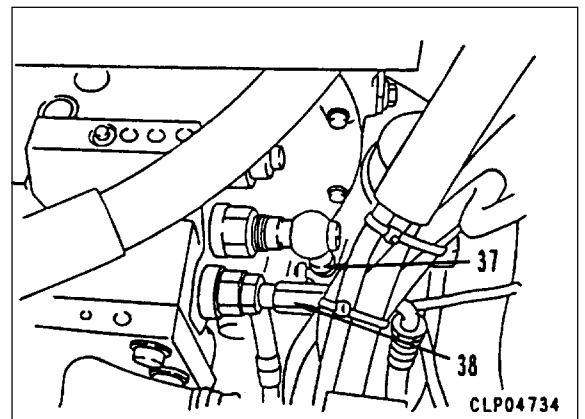
18. Disconnect EPC valve wiring connectors (31).




19. Disconnect main pump suction tube (33).
 20. Disconnect main pump outlet hose (35).
 21. Disconnect main pump drain hose (36).



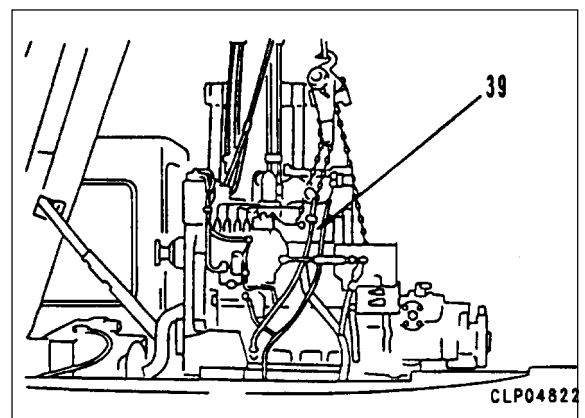
22. Disconnect hoses (37) and (38).
 23. Disconnect EPC valve basic pressure hose.



24. Remove mount bolt, then lift off engine and hydraulic pump assembly (39) slowly.  2
 * When removing the engine and hydraulic pump assembly, check that all wiring and piping has been disconnected, and be careful not to hit any part when removing.



Engine, hydraulic pump assembly: **420 kg**



INSTALLATION OF ENGINE, MAIN PUMP ASSEMBLY

- Carry out installation in the reverse order to removal.

❖ 2

- ★ Set the engine mount rubber as shown in the diagram, then install the engine and main pump assembly.



Engine mounting bolt:

$277.0 \pm 31.9 \text{ Nm}$ { $28.25 \pm 3.25 \text{ kgm}$ }

- **Refilling with water**

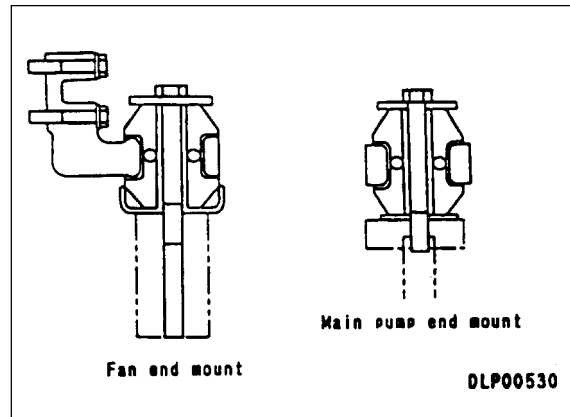
- ★ Add water through the water filler to the specified level. Run the engine to circulate the water through the system. Then check the water level again.

- **Refilling with oil (hydraulic tank)**

- ★ Add oil through the oil filler to the specified level. Run the engine to circulate the oil through the system. Then check the oil level again.

- **Bleeding air**

- ★ Bleed the air from the main pump. For details, see TESTING AND ADJUSTING, Bleeding air.



REMOVAL OF HYADRAULIC OIL COOLER ASSEMBLY

- ⚠** Lower the work equipment completely to the ground and stop the engine. Then loosen the oil filler cap slowly to release the pressure inside the hydraulic tank.
- Remove the hydraulic tank strainer, and using tool **B**, stop the oil.
 - When not using tool **B**, remove the drain plug, and drain the oil from the hydraulic tank and inside the system.



Hydraulic tank: Approx. 100 ℓ

- Remove battery and set oil container under chassis.
- Remove engine hood, then remove counterweight top cover and control valve top cover.
- Disconnect cooler hoses (2).
- Remove left and right bolts (3) and (4) and left and right plates (5).
- Sling hydraulic oil cooler assembly (6), remove 4 bottom mounting bolts, then lift off slowly.
 - ★ When removing the hydraulic oil cooler, be extremely careful not to damage the core.



Hydraulic oil cooler assembly: 30 kg.

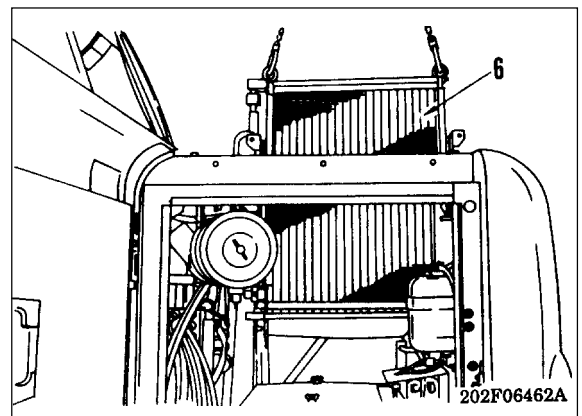
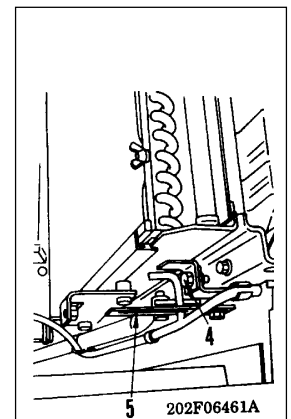
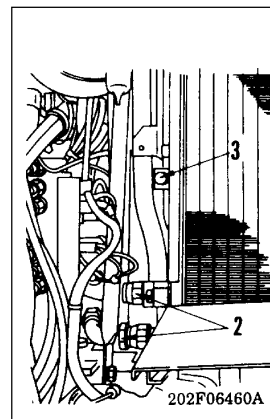
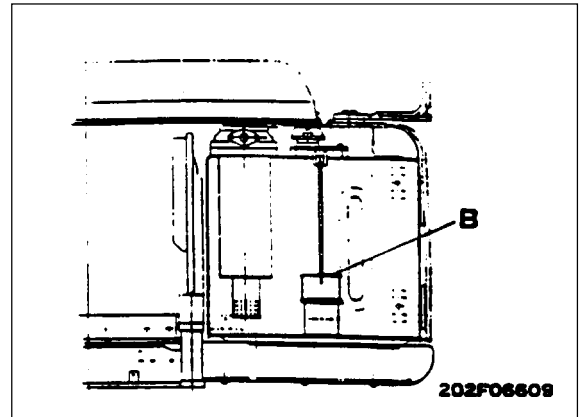
INSTALLATION OF HYDRAULIC OIL COOLER ASSEMBLY

- Carry out installation in the reverse order to removal.



- ★ Check that the O-ring is not damaged or deteriorated, then connect the hoses.

- Fill with refrigerant (R-134a).
- Refilling with oil (hydraulic tank)
 - ★ Add oil through the oil filler to the specified level. Run the engine to circulate the oil through the system. Then check the oil level again.



REMOVAL OF RADIATOR - HYDRAULIC OIL COOLER ASSEMBLY

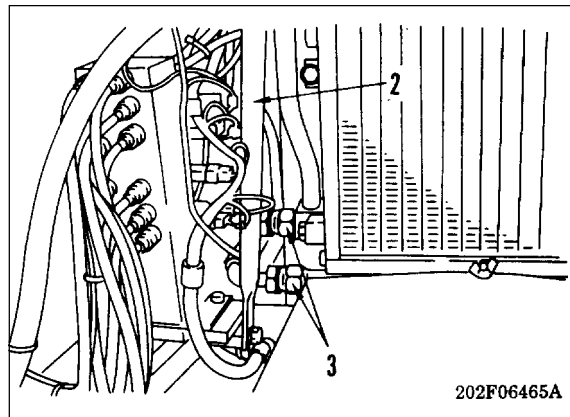
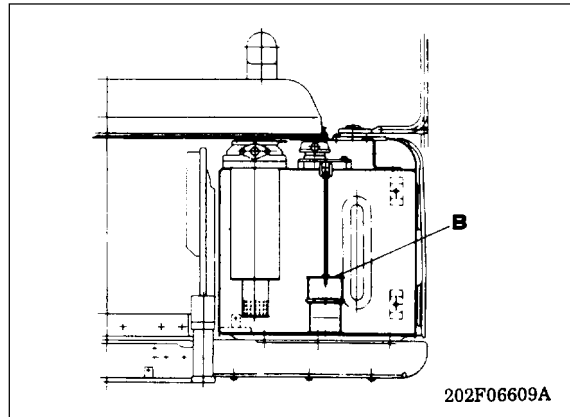
! Lower the work equipment completely to the ground and stop the engine. Then loosen the oil filler cap slowly to release the pressure inside the hydraulic tank.

- Remove the hydraulic tank strainer, and using tool **B**, stop the oil.
 - When not using tool **B**, remove the drain plug, and drain the oil from the hydraulic tank and inside the system.



Hydraulic tank: Approx. 100 %

- Drain engine coolant.
- Remove engine hood, then remove counterweight top cover and control valve top cover.
 - Remove left and right stays (2).
 - Disconnect hydraulic cooler hoses (3).



4. Disconnect aeration hose (4).
5. Disconnect radiator inlet hose (5).
6. Remove fan and belt guards (6) (7).
7. Disconnect radiator outlet hose (8).
8. Sling radiator and hydraulic oil cooler assembly (9), remove 4 bottom mounting bolts, then lift off slowly.

- ★ When removing the radiator and hydraulic oil cooler assembly, be extremely careful not to damage the core.



Radiator - Hydraulic oil cooler assembly:



75 kg

INSTALLATION OF RADIATOR - HYDRAULIC OIL COOLER ASSEMBLY

- Carry out installation in the reverse order to removal.



- ★ Check that the O-ring is not damaged or deteriorated, then connect the hoses.

- Fill with refrigerant (R-134a).



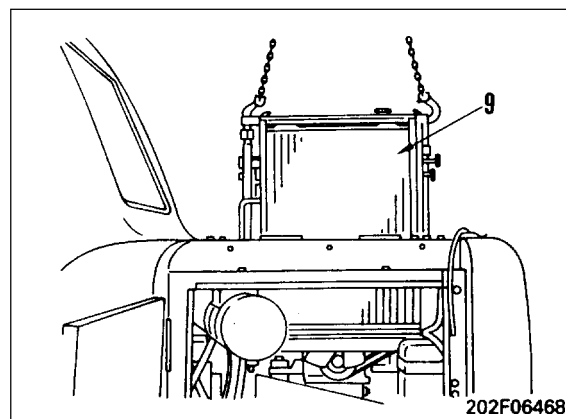
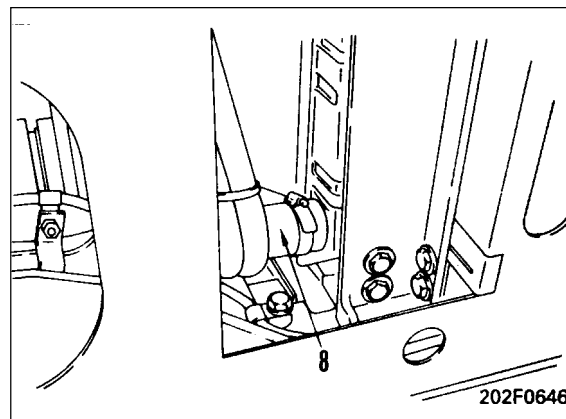
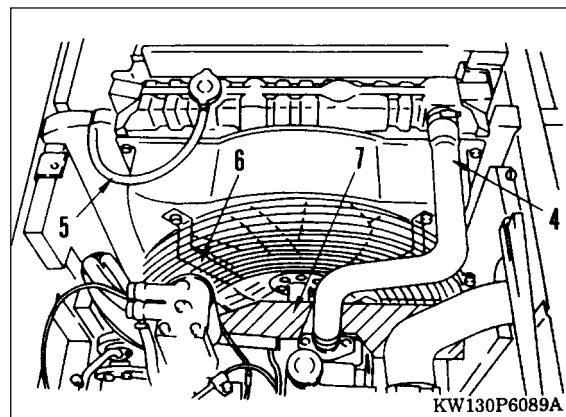
- ★ Install the radiator and hydraulic oil cooler assembly so that there is a clearance of 13 mm or more to the left and right, and top and bottom between the fan and shroud.

- Refilling with water

- ★ Add water through the water filler to the specified level.
Run the engine to circulate the water through the system. Then check the water level again.

- Refilling with oil (hydraulic tank)

- ★ Add oil through the oil filler to the specified level.
Run the engine to circulate the oil through the system. Then check the oil level again.



REMOVAL OF FUEL TANK ASSEMBLY

⚠ Disconnect the cable from the negative (-) terminal of the battery.

1. Loosen drain valve (1) of fuel tank and drain fuel.

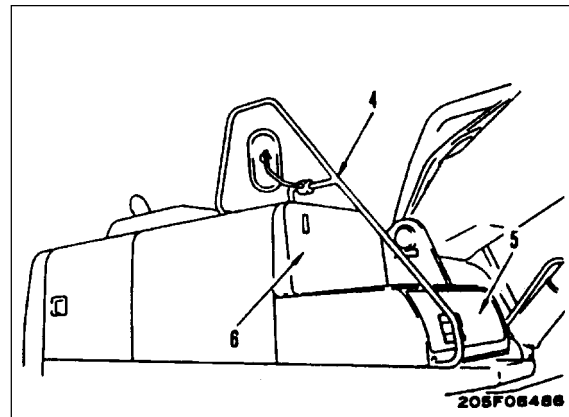
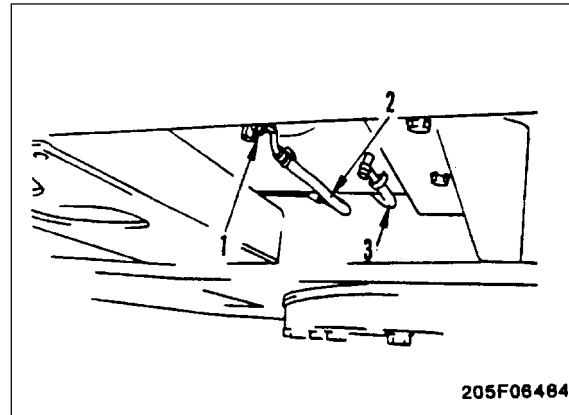


Fuel tank: Approx.250 / (when tank is full)

2. Disconnect fuel supply hose (2) and return hose (3).
3. Remove handrail (4), battery case (5), and cover (6).
4. Remove connector (7) from holder, and disconnect it.
 - ★ Remove the wiring from the clamp, then disconnect from the fuel tank.
5. If refuelling pump is fitted disconnect hose from tank tube.
6. Remove mounting bolts, and lift off fuel tank assembly (8).



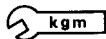
Fuel tank assembly: 100 kg.



INSTALLATION OF FUEL TANK ASSEMBLY

- Carry out installation in the reverse order to removal.

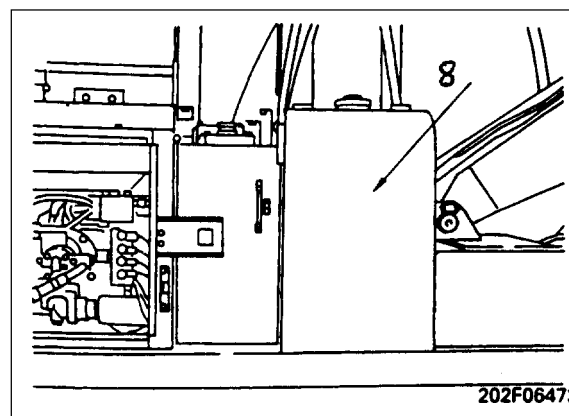
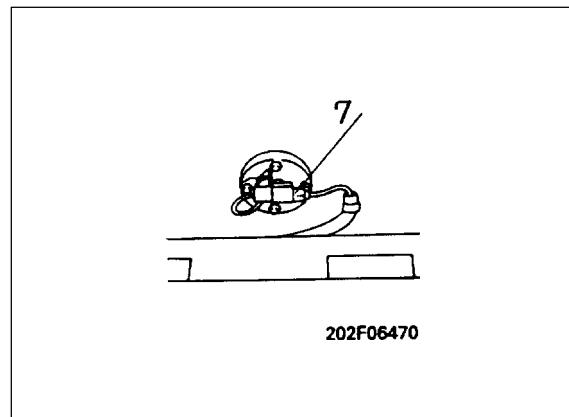
※ 1



Fuel tank mounting bolt:

$276.9 \pm 31.9 \text{ Nm}$ ($28.25 \pm 3.25 \text{ kgm}$)


- Refilling with oil (fuel tank)
Add fuel.



REMOVAL OF CENTER SWIVEL JOINT ASSEMBLY

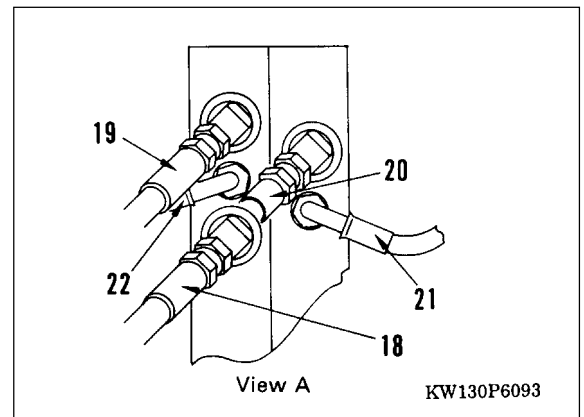
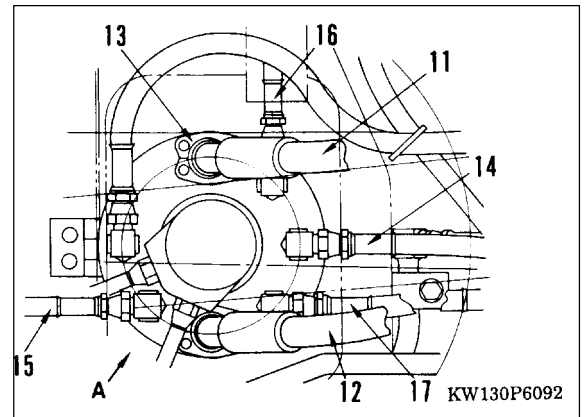
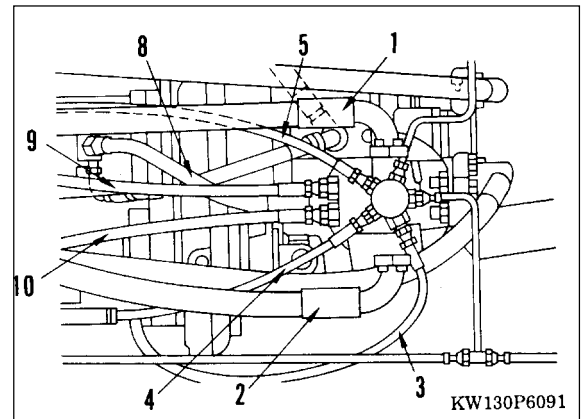
! Lower the work equipment completely to the ground and stop the engine. Then loosen the oil filler cap slowly to release the pressure inside the hydraulic tank.

★ Mark all the piping with tags to prevent mistakes in the mounting position when installing.

1. Disconnect hoses (1) and (2) between travel motor and swivel joint.
2. Disconnect pilot hoses (3), (4) and (5) and brake pipes (6) and (7).
3. Disconnect drain hoses (8) and steering hoses (9) and (10).
4. Disconnect hoses (11) (12) (13) & (14) between control valve and swivel joint.
5. Disconnect steering hoses (15) and (16) and drain hose (17).
6. Disconnect brake hoses (18) (19) and (20).
7. Disconnect travel speed selector hose (21) and suspension lock hose (22).
8. Remove center swivel joint assembly (23).  1



Center swivel joint assembly: 83 kg.



INSTALLATION OF CENTER SWIVEL JOINT ASSEMBLY

Carry out installation in the reverse order to removal.

 1

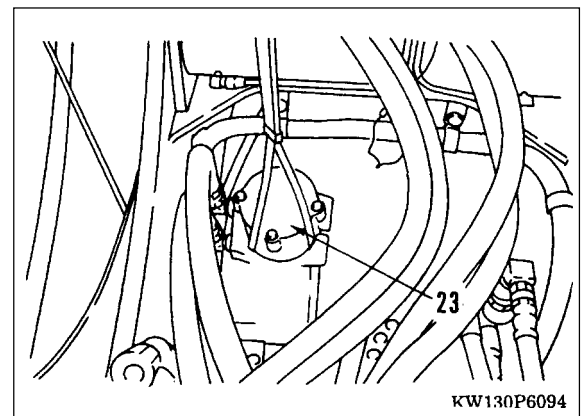


Thread of swivel joint mounting bolt:
Thread tightener (LT-2)



Swivel joint mounting bolt:
 $277 \pm 32 \text{ Nm}$ ($28.5 \pm 3.25 \text{ kgm}$).

- Refilling with oil (hydraulic tank)
 - ★ Add oil through the oil filler to the specified level. Run the engine to circulate the oil through the system. Then check the oil level again.
- Bleeding air
 - ★ Bleed the air from the travel motor. For details, see TESTING AND ADJUSTING, Bleeding air.



REMOVAL OF TRAVEL MOTOR ASSEMBLY

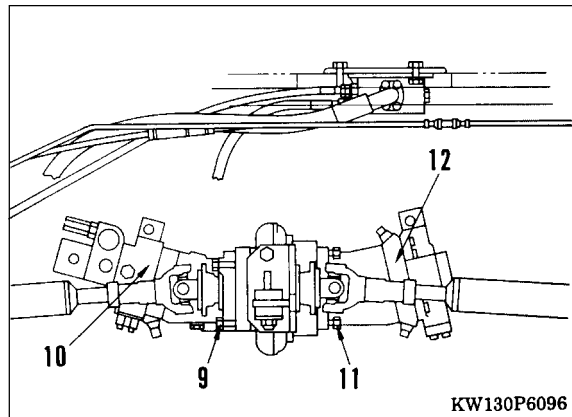
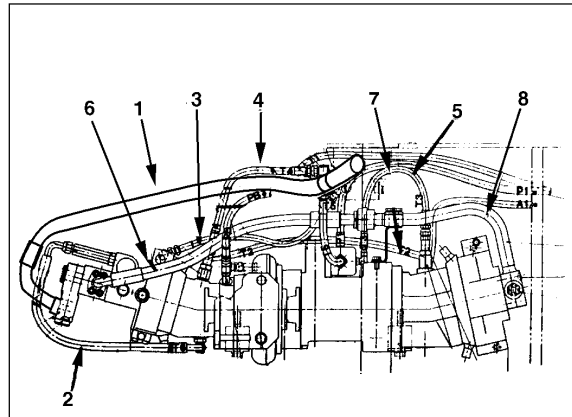
! Lower the work equipment completely to the ground and stop the engine. Then loosen the oil filter cap slowly to release the pressure inside the hydraulic tank.

1. Disconnect hoses 1, 2, 3, 4, 5, 6, 7 & 8. ❖ 1
2. Remove bolts (9) and (11). ❖ 2
3. Slide away each travel motor from transmission (Use slings). ❖ 3
 ★ Be extremely careful not to damage the hose adaptors.



Travel motor assembly:

Front: 45 kg
Rear: 80 kg



INSTALLATION OF TRAVEL MOTOR ASSEMBLY

- Carry out installation in the reverse order to removal.

❖ 1



Thread of travel motor mounting bolt:
Thread tightener (LT - 2).



Travel motor mounting bolt:

Rear : 276.9 ± 31.9 Nm (28.25 ± 3.25 kgm)
Front : 110.5 ± 12.5 Nm (11.25 ± 1.25 kgm)

- ★ Bleed the air from the travel motor.
For details, see TESTING AND ADJUSTING, Bleeding air from travel motor.
- Refilling with oil (hydraulic tank)
 - ★ Add oil through the oil filler to the specified level.
Run the engine to circulate the oil through the system. Then check the oil level again.

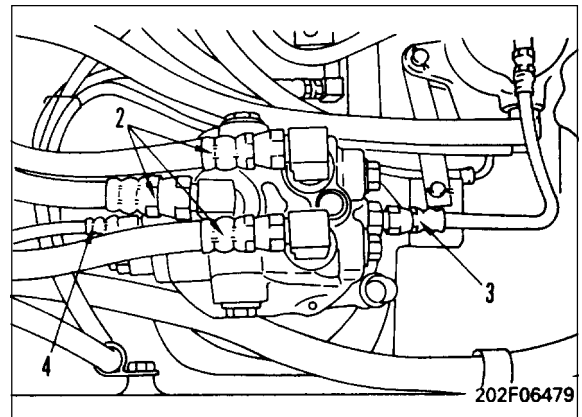
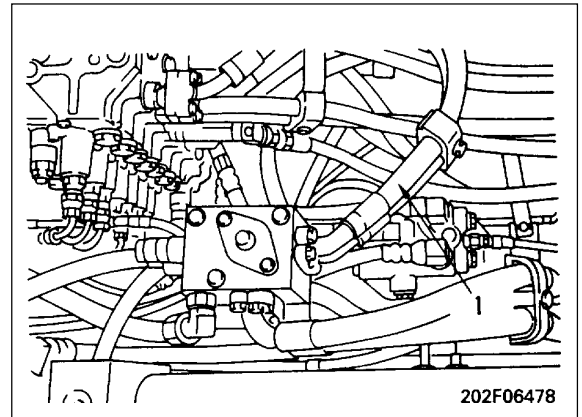
REMOVAL OF SWING MACHINERY • SWING MOTOR ASSEMBLY

- ⚠** Release the remaining pressure in the hydraulic circuit.
For details, see TESTING AND ADJUSTING, Releasing pressure in hydraulic circuit.

1. Disconnect hose (1).
2. Disconnect swing motor inlet and outlet hoses (2), (3), and (4).
3. Remove mounting bolts, sling swing machinery and swing motor assembly (5), then use forcing screw **①** to remove.
 - ★ When removing the swing machinery and swing motor assembly, lift off slowly and be careful not to damage the wiring or piping.




Swing machinery -
swing motor assembly: 110 kg.

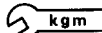


INSTALLATION OF SWING MACHINERY - SWING MOTOR ASSEMBLY

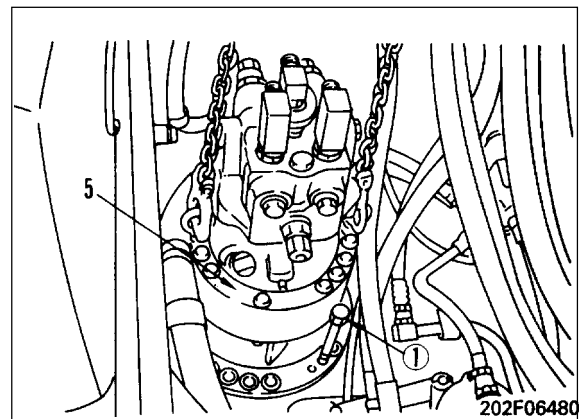
- Carry out installation in the reverse order to removal.



 Mating surface of swing machinery case:
Gasket sealant (LG-4 or LG-6).

 Swing machinery, swing motor assembly
mounting bolt:
 $276.9 \pm 31.9 \text{ Nm}$ ($28.25 \pm 3.25 \text{ kgm}$).

- Refilling with oil (hydraulic tank)
 - ★ Add oil through the oil filler to the specified level.
Run the engine to circulate the oil through the system. Then check the oil level again.
- Bleeding air
 - ★ Bleed the air from the swing motor.
For details, see TESTING AND ADJUSTING, Bleeding air.



DISASSEMBLY OF SWING MACHINERY ASSEMBLY

1. Draining oil

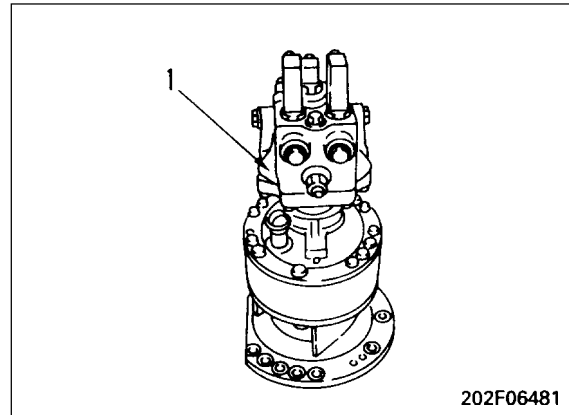
Remove drain plug and drain oil from swing machinery.



Swing machinery case: 2.5 %

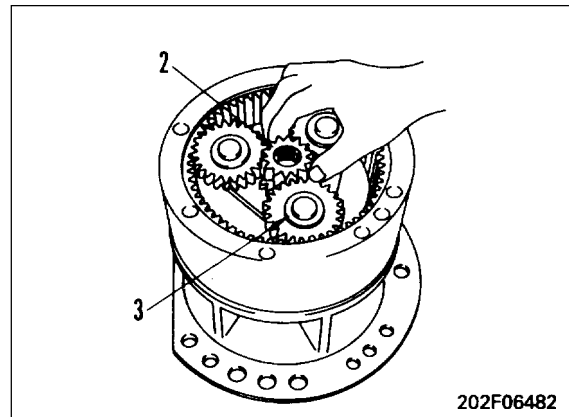
2. Swing motor assembly

Remove swing motor assembly (1).



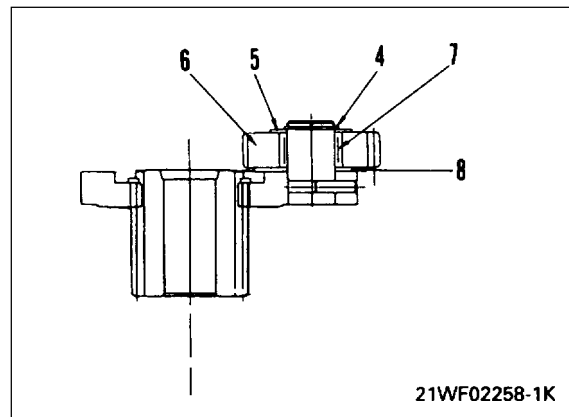
3. No. 1 carrier, No. 2 sun gear assembly

- 1) Remove No. 1 sun gear (2).
- 2) Remove No. 1 carrier and No. 2 sun gear assembly (3).

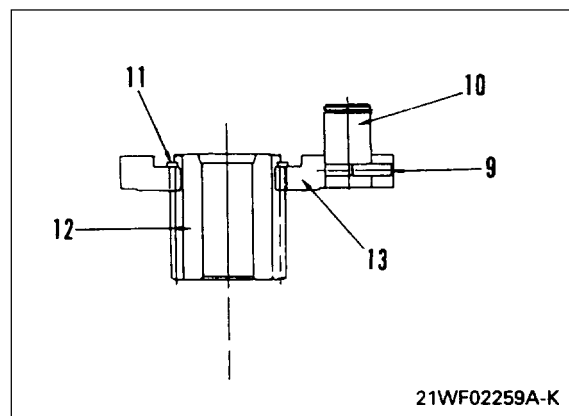


- 3) Disassemble No. 1 carrier and No. 2 sun gear assembly as follows.

- i) Remove snap ring (4), then remove thrust washer (5), gear (6), bearing (7), and thrust washer (8).

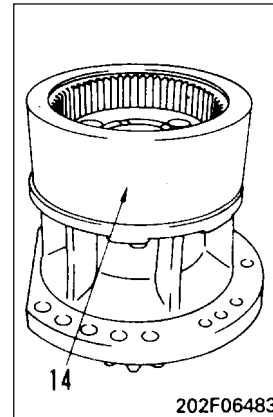


- ii) Knock in pin (9), and knock out shaft (10).
★ After removing the shaft, remove pin (9).
- iii) Remove snap ring (11), then remove No. 2 sun gear (12) from carrier (13).

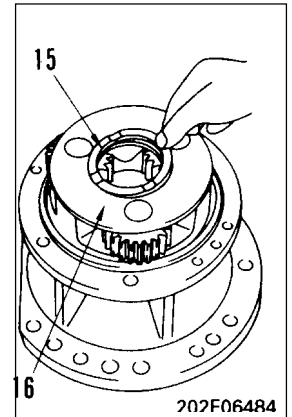


4. Ring gear

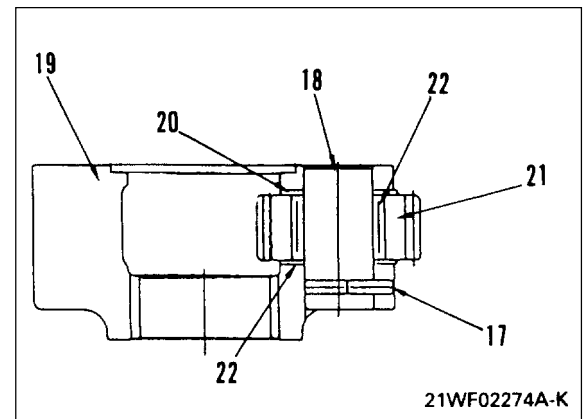
Remove ring gear (14).

**5. No. 2 carrier assembly**

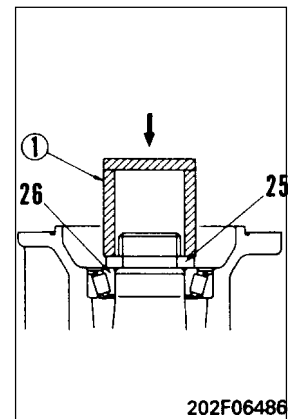
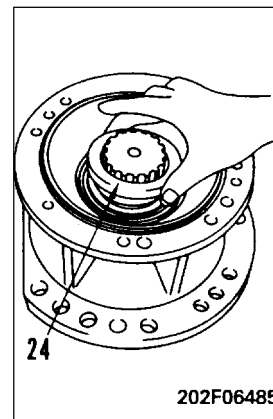
- 1) Remove spacer (15).
- 2) Remove No. 2 carrier assembly (16).



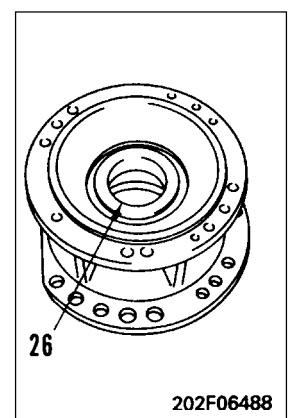
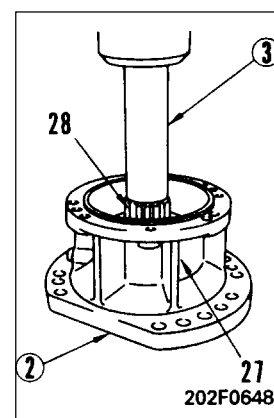
- 3) Disassemble No. 2 carrier assembly as follows.
 - i) Push in pin (17), and knock out shaft (18) from carrier (19).
 - ★ After removing the shaft, remove pin (17).
 - ii) Remove thrust washer (20), gear (21), bearing (22), and thrust washer (23).

**6. Retainer, collar**

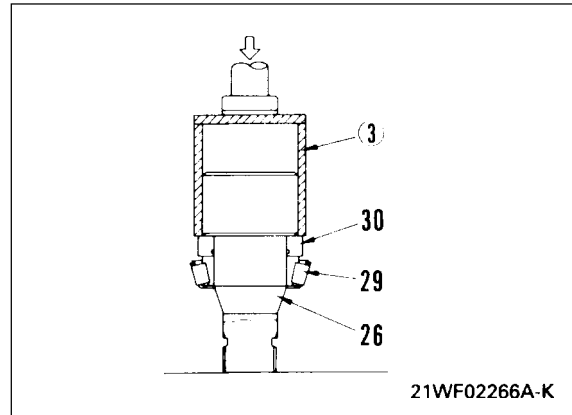
- 1) Remove retainer (24).
- 2) Set shaft and case assembly in press, push split collar (25) with push tool ①, and press fit bearing (26).
 - ★ Operate the press slowly, and press fit the bearing to a position where it is possible to remove the split collar.
- 3) Remove split collar (25).

**7. Shaft assembly**

- 1) Set block ② to shaft and case assembly (27), then using push tool ③, remove shaft assembly (28) with press.
- 2) Remove bearing (26).

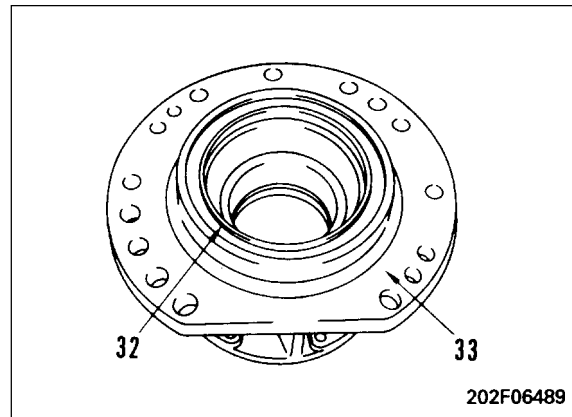


- 3) Set shaft assembly to press, then using push tool ④, remove bearing (29) and collar (30) from shaft (31).

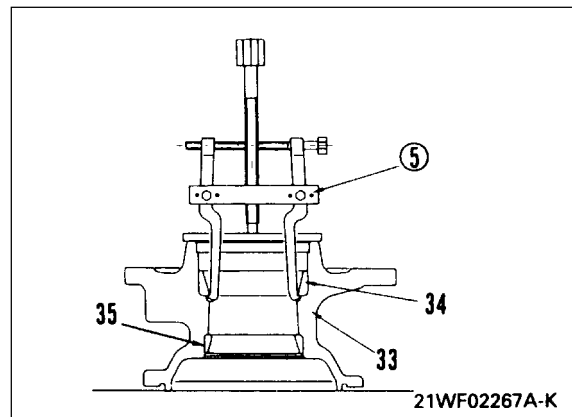


8. Oil seal, bearing outer races

- 1) Remove oil seal (32) from case (33).



- 2) Using puller ⑤, remove bearing outer races (34) and (35) from case (33).

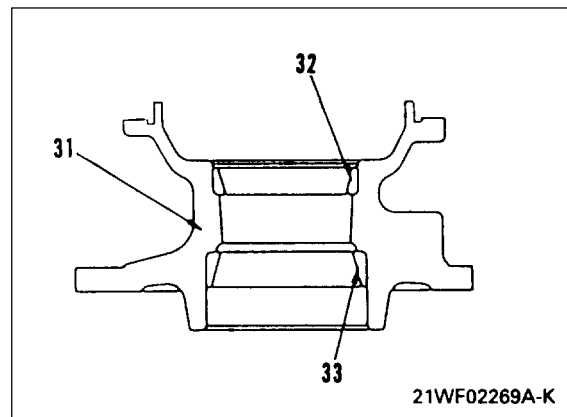


ASSEMBLY OF SWING MACHINERY ASSEMBLY

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

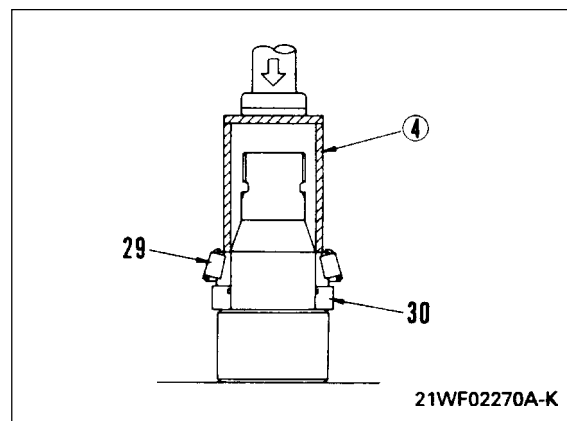
1. Bearing outer races

Using push tool, press fit outer races (34) and (35) to case (33).



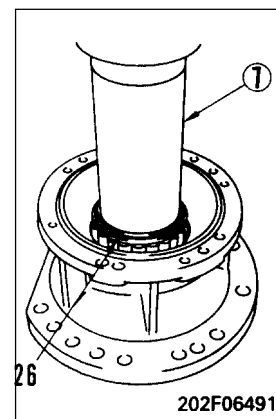
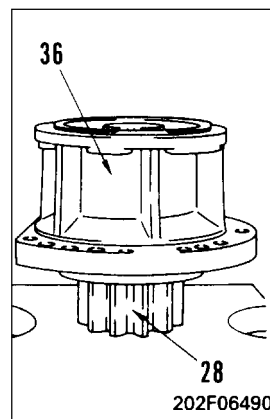
2. Shaft assembly

- 1) Fit O-ring to inside of collar (30), and install to shaft (31).
- 2) Using push tool ⑥, press fit bearing (29) with press.
- 3) Set case assembly (36) to shaft assembly (28).



- 4) Using push tool ⑦, press fit bearing (26) to a position where it is possible to insert split collar.

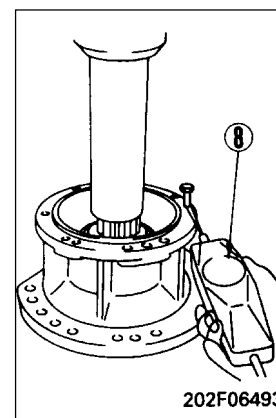
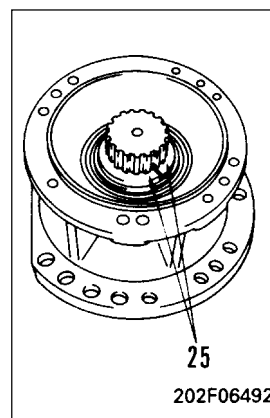
- ★ Press fitting force: 11.76 kN (1,200 kg).
- ★ Rotate the case and gradually press fit the bearing.



- 5) Install split collar (25).

- 6) Screw bolt (Thread dia. = 12 mm, Pitch = 1.75 mm) into case, then using push-pull scale ⑧, measure tangential force in direction of rotation.


- ★ Tangential force: Max. 176.4 N (18 kg).
- ★ The tangential force is the maximum force when starting rotation.

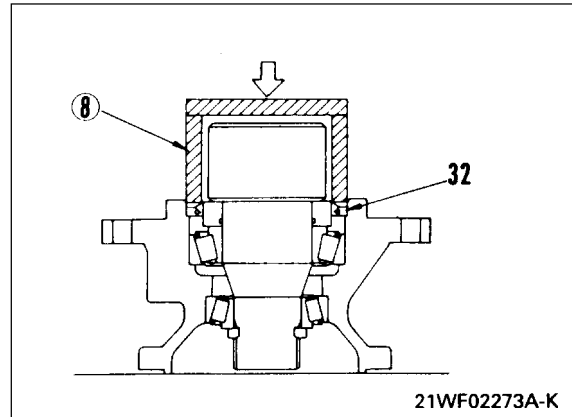


3. Oil seal

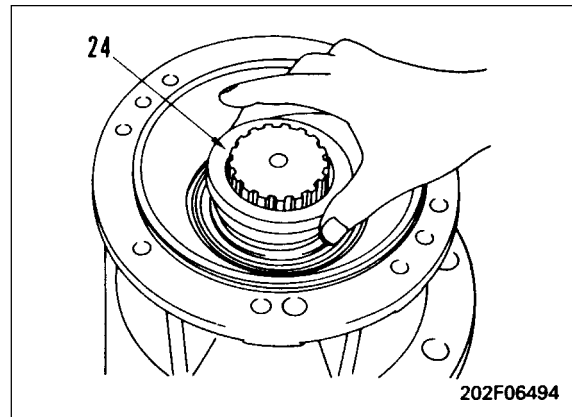
Using push tool ⑧, press fit oil seal (32).

★ Replace the oil seal with a new part.

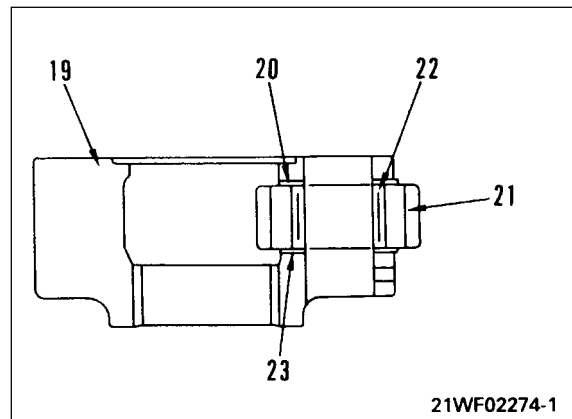
 Lip of oil seal: Grease (G2-LI).

**4. Retainer**

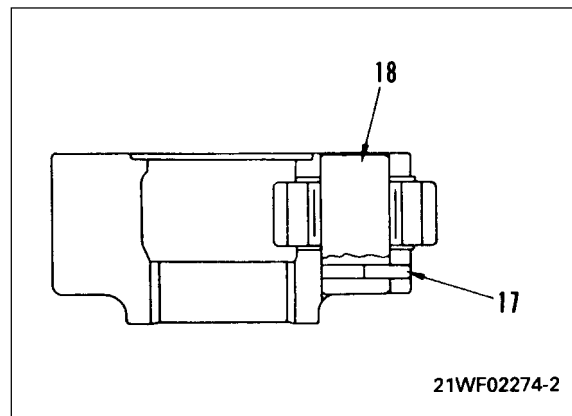
Install retainer (24).

**5. No. 2 carrier assembly**

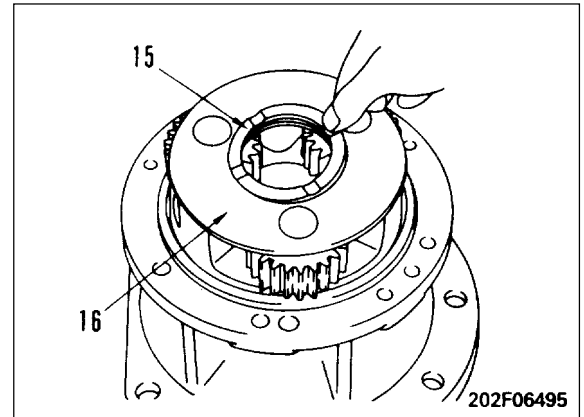
- 1) Assemble No. 2 carrier assembly as follows.
 - i) Assemble bearing (22) to gear (21).
 - ii) Fit top and bottom thrust washers (20) and (23), then set gear assembly to carrier (19).



- iii) Align position of pin holes of shaft and carrier, then tap with a plastic hammer to install shaft (18).
 - ★ When installing the shaft, rotate the planetary gear and be careful not to damage the thrust washer.
- iv) Insert pin (17).
 - ★ After inserting the pin, caulk the pin portion of the carrier.

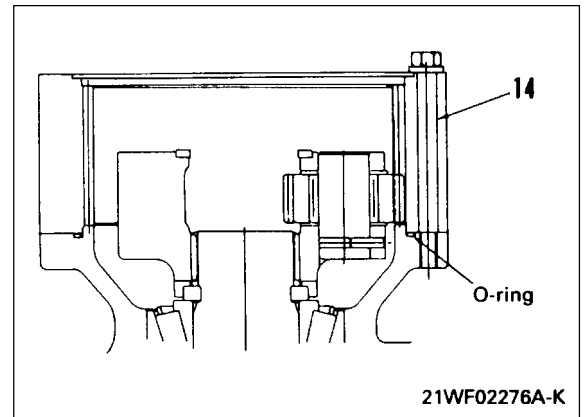


- 2) Install No. 2 carrier assembly (16) to shaft and case assembly.
- 3) Install spacer (15).



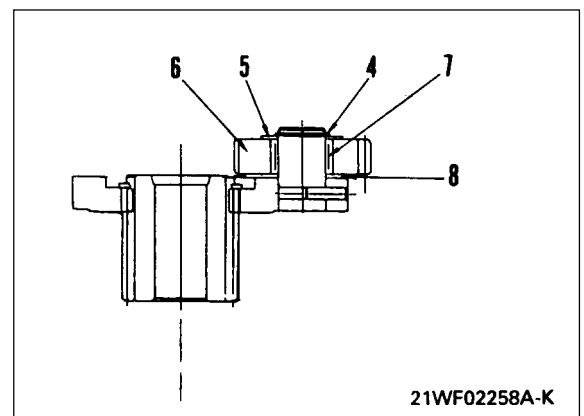
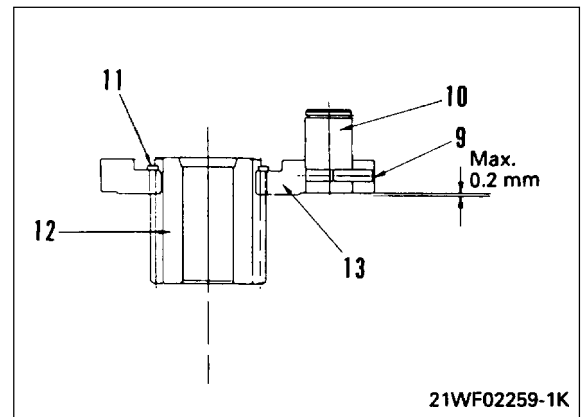
6. Ring gear

Assemble O-ring to shaft and case assembly, and install ring gear (14).

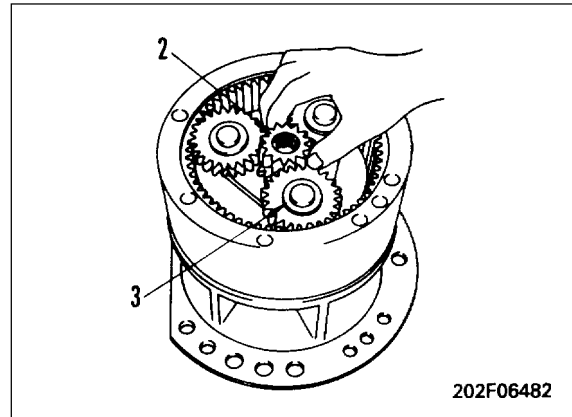


7 No. 1 carrier, No. 2 sun gear assembly

- 1) Assemble No. 1 carrier and No. 2 sun gear assembly as follows.
 - i) Assemble No. 1 carrier (13) to No. 2 sun gear (12), and install snap ring (11).
 - ii) Align position of pin holes of shaft and carrier, then tap with a plastic hammer to install shaft (10).
 - iii) Insert pin (9).
 - ★ After inserting the pin, caulk the pin portion of the carrier.
 - ★ Check that the stepped difference between the shaft and carrier is less than 0.2 mm.
 - iv) Assemble thrust washer (8), bearing (7), gear (6), thrust washer (5), and install snap ring (4).



- 2) Install No. 1 carrier and No. 2 sun gear assembly (3).
- 3) Install No. 1 sun gear (2).



8. Swing motor assembly

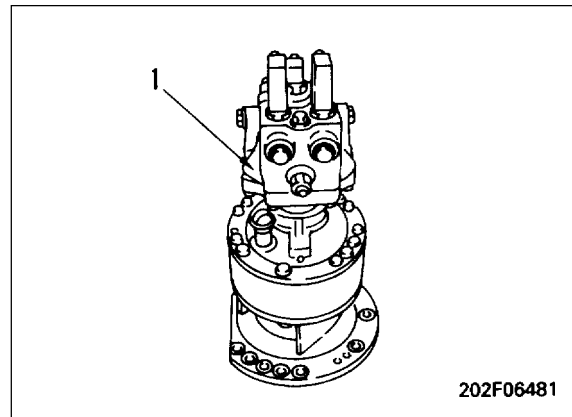
Install swing motor assembly (1).



kgm

Mounting bolt:

$110.3 \pm 12.3 \text{ Nm}$ ($11.25 \pm 1.25 \text{ kgm}$).



9. Refilling with oil

Tighten drain plug and add engine oil through oil filler.



Swing machinery case: Approx. 2.5 ٪