



11. Rear pump assembly

- 1) Install O-rings to front and rear end caps.
- 2) Raise rear pump assembly (7), align spline, and install.


 Mounting nut: 28.5 ± 3 kgm

12. TVC and CO, NC valve assembly

- 1) Fit O-ring and install CO, NC valve assembly (6). (Front pump)

 Mounting bolt: 3.2 ± 0.3 kgm


- 2) Fit O-ring, install TVC and CO, NC valve assembly (5), then clamp wiring. (Rear pump)

 Mounting bolt: 3.2 ± 0.3 kgm

- 3) Fit O-ring and install tube (3).

 Joint bolt: 1.8 ± 0.2 kgm

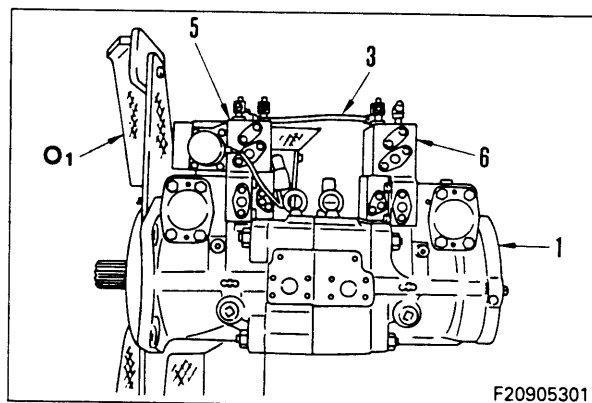
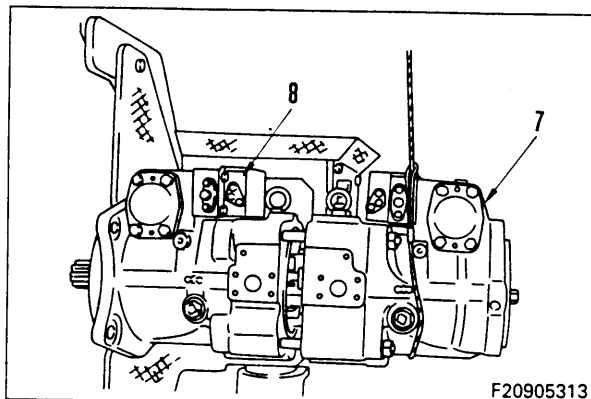
- 4) Install strainer, then install hose (2).

 Sleeve nut: 8 ± 2 kgm

- ★ After completion of assembly, check the quality of the parts.

After completing the assembly of the pump assembly, use a test stand (A type or C type) to check the quality.

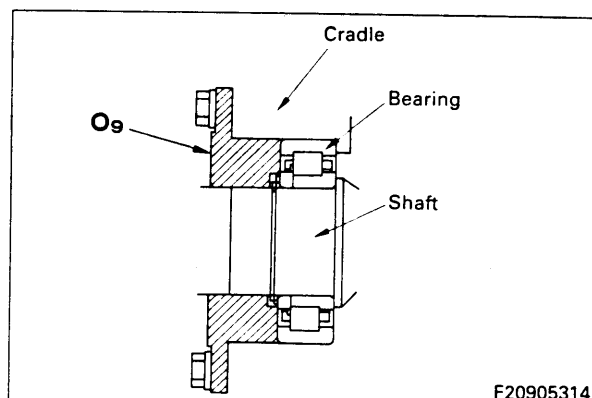
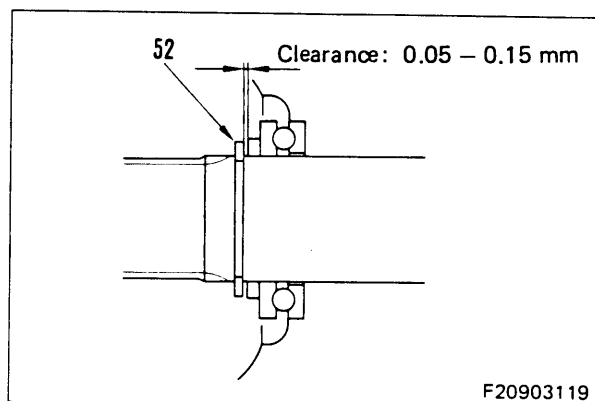
- ★ For details of the procedure for checking quality, see TESTING METHOD.



Reference: Assembly procedure when using tool O₉

- Assemble spring in cylinder block.
- ★ See Assembly Step 7-1).
- Do not install the housing to the cradle.

1. Install tool O₉ in mounting position for housing.
2. Assemble up to Step 6-6).
3. Select a washer so that the clearance between washer (52) and snap ring (51) is 0.05 – 0.15 mm.
4. Remove tool O₉, and install housing to cradle.
5. For the rest of the assembly, see the procedure from Step 8.

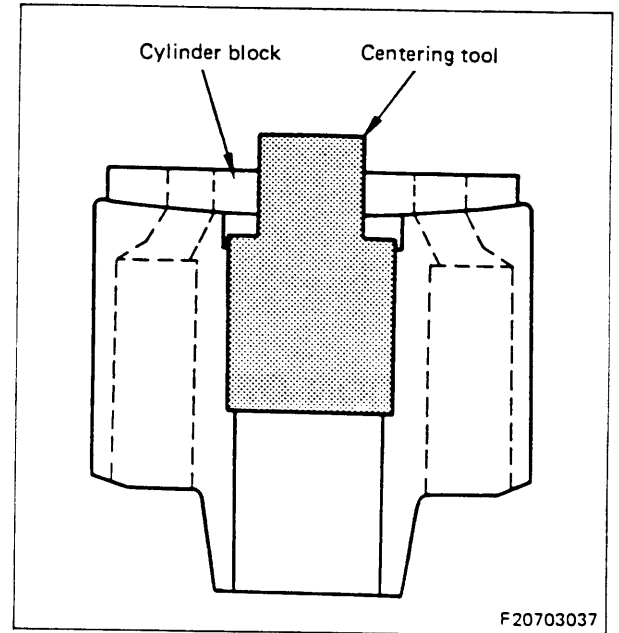


CHECKING CONTACT BETWEEN CYLINDER BLOCK AND VALVE PLATE, AND ROCKER CAM AND CRADLE

1. Checking contact between cylinder block and valve plate.

- 1) Make a centering tool for the cylinder block and valve plate.
★ The tool can be made of a soft material such as plastic or bakelite.
- 2) Remove grease from the parts to be checked.
★ Do not wipe with a cloth.
- 3) Set the tool in position, and coat the cylinder block side with inspection paint.
★ Apply the paint thinly.
- 4) Put the valve plate on top, push with a force of 4 – 5 kg, and rotate 2 – 3 times.
- 5) Remove the valve plate, transfer the contact surface to tape, and check the contact surface.
★ The standards for the contact surface are as follows.

Valve plate	a. Seal	Min. 80%
Cylinder block	a. Seal	Min. 80%



2. Checking contact between rocker cam and cradle

- 1) Remove grease from the parts to be checked.
★ Do not wipe with a cloth.
- 2) Set the tool in position, and coat the cradle side with inspection paint.
★ Apply the paint thinly.
- 3) Put the rocker cam on top, push with a force of 4 – 5 kg, and move 2 – 3 times from the stopper contact position to the maximum angle.
- 4) Remove the rocker cam, transfer the contact surface to tape, and check the contact surface.
★ The standard for the contact surface are as follows.

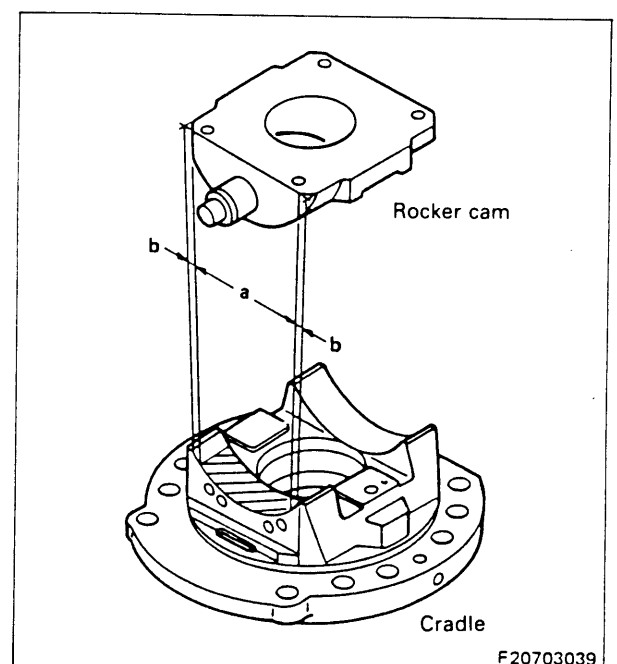
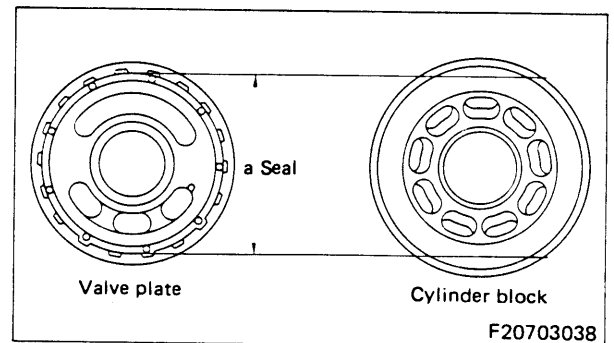
Pump Model	Dimension a (mm)	Contact surface	Contact b from a to outside
HPV 090	72	Min. 80%	Min. 50%

- ★ If there is no contact at the center but only at the outside, the contact is no good.

Reference:

If the contact is not within the contact standard value, when carrying, always lap both parts together.

- ★ Parts with scratches cannot be reused.



REMOVAL OF SERVO VALVE ASSEMBLY


1. Remove CO•NC assembly.
For details, see REMOVAL OF CO•NC VALVE ASSEMBLY.
2. Remove servo valve assembly (1). ※ 1

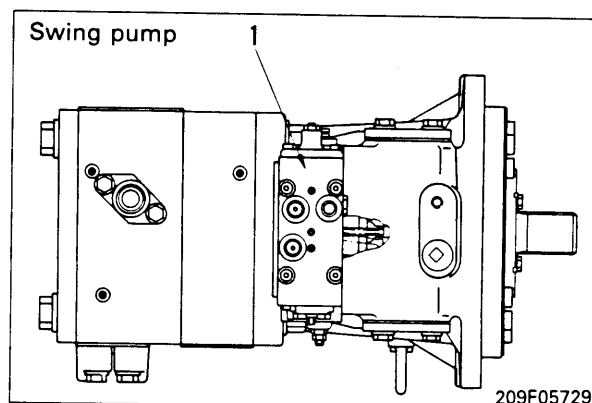
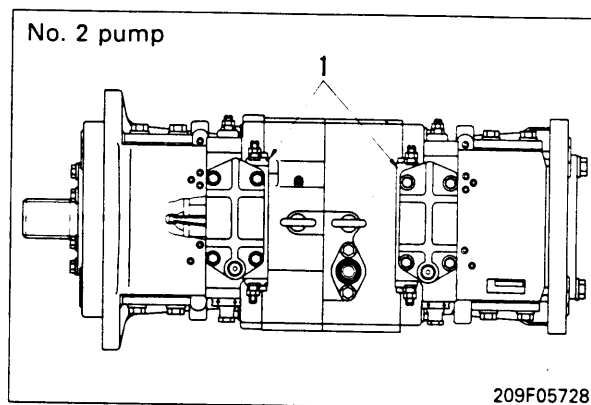
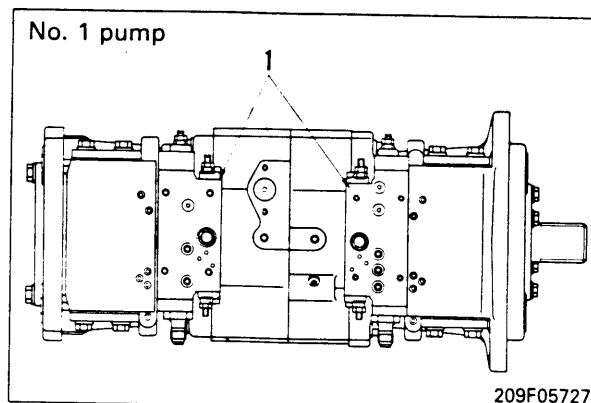
INSTALLATION OF SERVO VALVE ASSEMBLY

- Carry out installation in the reverse order to removal.

※ 1

- ★ Push in by hand until the dowel pin is completely inserted, then tighten the mounting bolts.

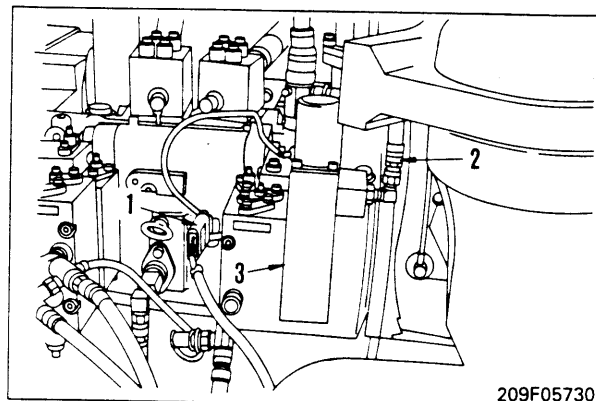
 Mounting bolt: 3.2 ± 0.3 kgm



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REMOVAL OF TVC VALVE ASSEMBLY


1. Disconnect wiring connector (1).
2. Disconnect hose (2).
3. Remove TVC valve assembly (3). ※ 1



INSTALLATION OF TVC VALVE ASSEMBLY

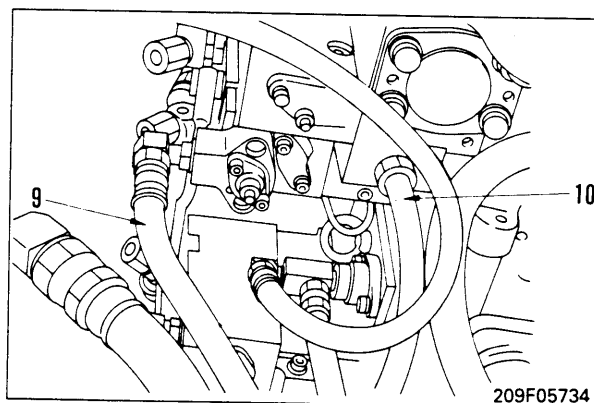
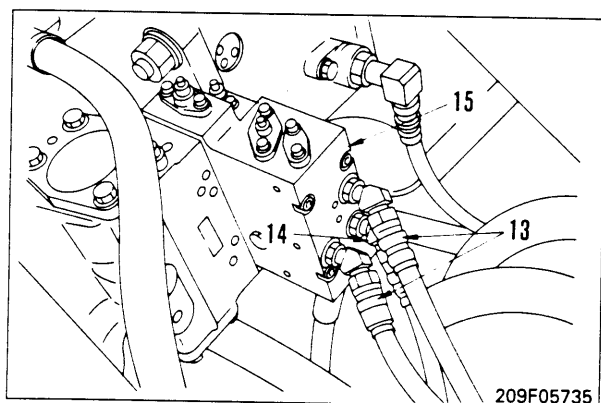
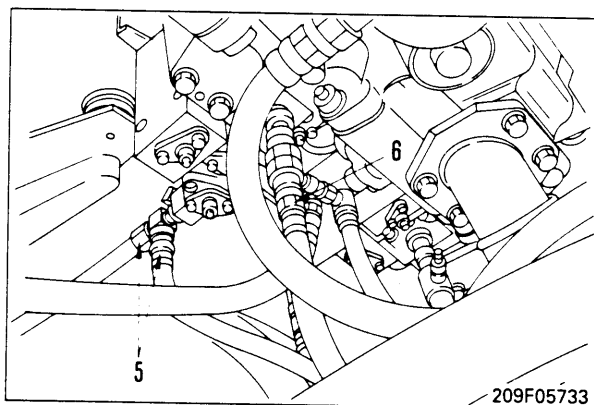
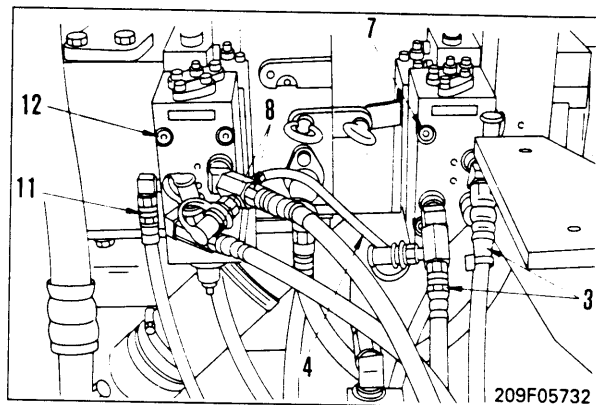
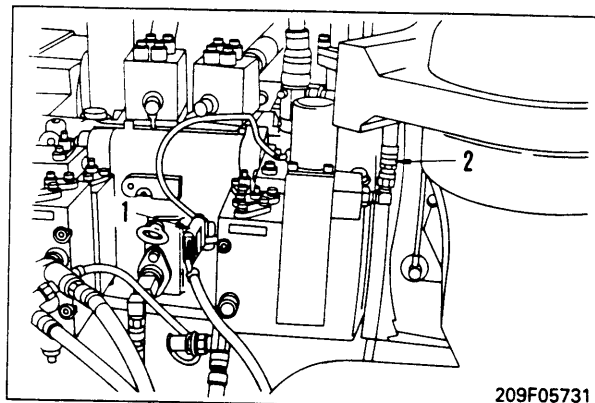
- Carry out installation in the reverse order to removal.

※ 1

 Mounting bolt: 3.2 ± 0.3 kgm

REMOVAL OF CO·NC VALVE ASSEMBLY


- **For front No. 1 pump**
 - 1) Disconnect wiring (1) and hose (2).
 - 2) Disconnect jet sensor hose (3).
 - 3) Disconnect tube (4).
 - 4) Disconnect CO cancel hose (5).
 - 5) Disconnect No. 2 pump control hose (6).
 - 6) Remove CO·NC valve assembly (7) together with TVC valve.
- **For rear No. 1 pump**
 - 1) Disconnect jet sensor hose (8).
 - 2) Disconnect tube (4).
 - 3) Disconnect CO cancel hose (9).
 - 4) Disconnect No. 2 pump control hose (10).
 - 5) Disconnect TVC output pressure hose (11).
 - 6) Remove CO·NC valve assembly (12).
- **For swing pump**
 - 1) Disconnect jet sensor hose (13).
 - 2) Disconnect TVC output pressure hose (14).
 - 3) Remove CO·NC valve assembly (15).



INSTALLATION OF CO·NC VALVE ASSEMBLY

- Carry out installation in the reverse order to removal.

※ 1

 Mounting bolts: 3.2 ± 0.3 kgm

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REMOVAL OF NO. 2 PUMP ASSEMBLY

⚠ Lower the work equipment to the ground and stop the engine. Operate the control levers several times to release the remaining pressure in the hydraulic piping. Then loosen the oil filler cap slowly to release the pressure inside the hydraulic tank.

★ After disconnecting hoses, fit blind plugs to prevent dirt or dust from entering, and mark with tags to prevent mistakes in the mounting position when connecting.

1. Remove cover, then remove strainer from inside tank.
2. Remove strainer from rod, install tool **L** in place of strainer, assemble inside hydraulic tank again, then fit spring and install cover.

★ When not using tool **L**, loosen the drain valve under the hydraulic tank and drain the oil from the hydraulic tank.



Hydraulic tank: Approx. 480 ℓ

3. Remove drain plug under PTO case, and drain oil from PTO case.



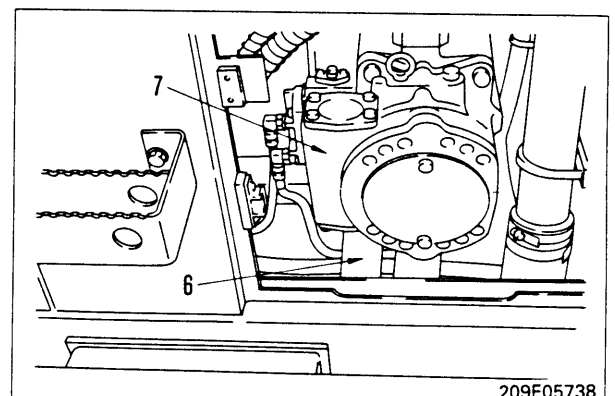
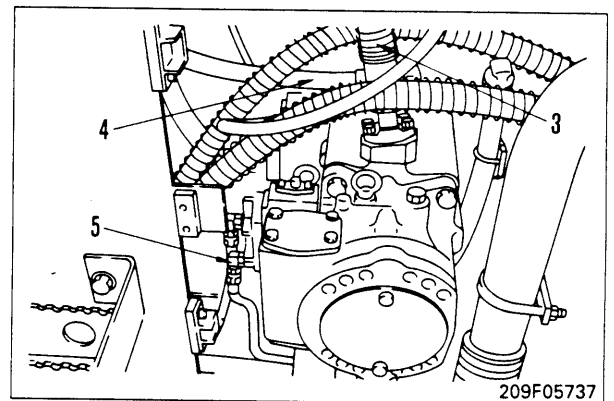
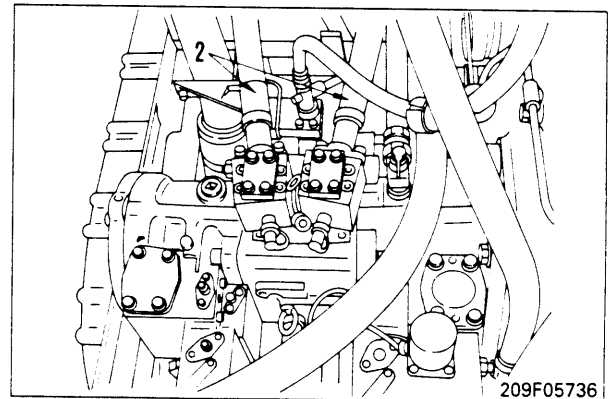
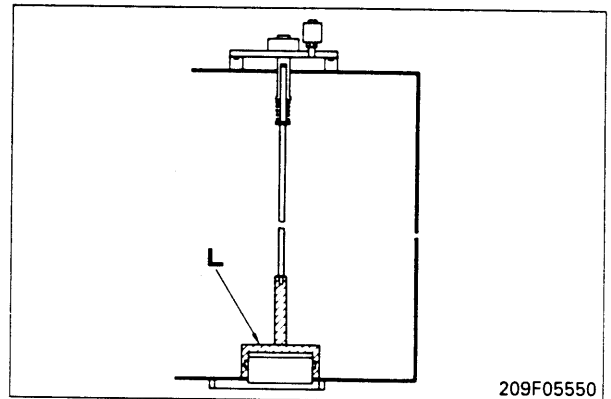
PTO case: Approx. 10 ℓ

4. Disconnect No. 1 pump outlet hose (2).
5. Disconnect No. 2 pump outlet hoses (3) and (4).
6. Disconnect 4 hoses (5) for safety lock valve.
7. Disconnect pump inlet tube (6).
- ★ When the pump inlet tube is disconnected, the oil inside the piping will flow out, so catch it in an oil pan.
8. Sling No. 2 pump assembly, and remove mounting bolts, then remove No. 2 pump assembly (7).



No. 2 pump assembly: 150 kg

★ When removing the pump assembly, check that all the hoses have been disconnected.



INSTALLATION OF NO. 2 PUMP ASSEMBLY

- Carry out installation in the reverse order to removal.
- ★ After adding oil to the hydraulic tank to the specified level, run the engine to circulate the oil through the system. Then check the oil level in the hydraulic tank again.
- ★ Bleed the air from the main pump.
For details, see TESTING AND ADJUSTING, Bleeding air from main pump.

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REMOVAL OF SWING PUMP ASSEMBLY

- ⚠ Lower the work equipment to the ground and stop the engine. Operate the control levers several times to release the remaining pressure in the hydraulic piping. Then loosen the oil filler cap slowly to release the pressure inside the hydraulic tank.
- ★ After disconnecting hoses, fit blind plugs to prevent dirt or dust from entering, and mark with tags to prevent mistakes in the mounting position when connecting.

1. Remove cover, then remove strainer from inside tank.
2. Remove strainer from rod, install tool **L** in place of strainer, assemble inside hydraulic tank again, then fit spring and install cover.
 - ★ When not using tool **L**, loosen the drain valve under the hydraulic tank and drain the oil from the hydraulic tank.

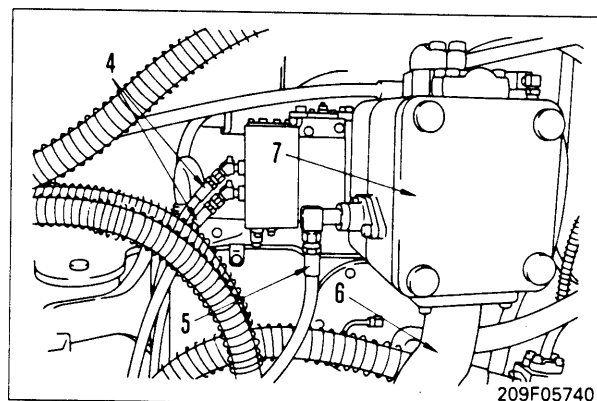
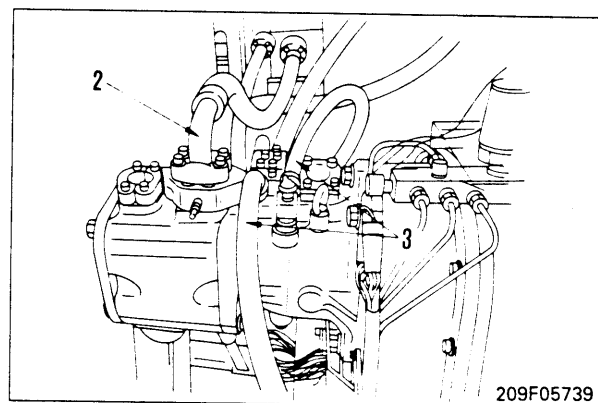
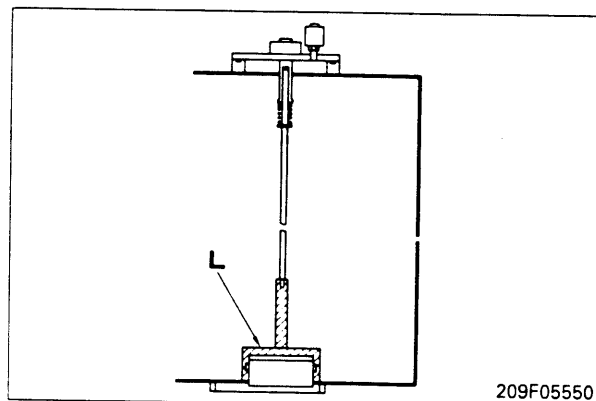


Hydraulic tank: Approx. 480 l

3. Disconnect pump outlet hose (2).
4. Disconnect hose (3).
5. Disconnect hoses (4) and (5).
6. Loosen clamp, and disconnect pump inlet tube (6).
 - ★ When the pump inlet tube is disconnected, the oil inside the piping will flow out, so catch it in an oil pan.
7. Sling swing pump assembly, and remove mounting bolts, then remove swing pump assembly (7).



Swing pump assembly: 140 kg



INSTALLATION OF SWING PUMP ASSEMBLY

- Carry out installation in the reverse order to removal.
- ★ After adding oil to the hydraulic tank to the specified level, run the engine to circulate the oil through the system. Then check the oil level in the hydraulic tank again.
- ★ Bleed the air from the swing pump.

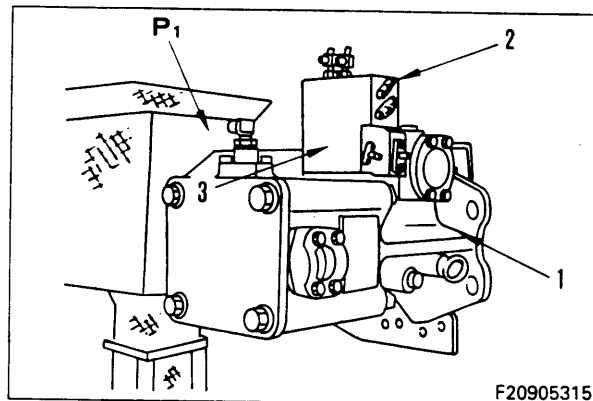
For details, see TESTING AND ADJUSTING, Bleeding air from swing pump.

DISASSEMBLY OF SWING PUMP ASSEMBLY (HPV 160)

DISASSEMBLY OF PUMP BODY

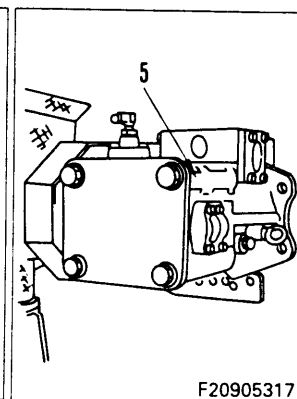
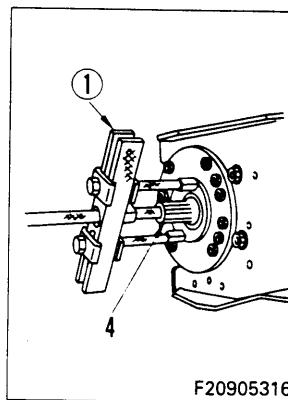
1. CO-NC valve and servo valve assembly

- 1) Set pump assembly (1) in tool P₁.
- 2) Remove CO-NC valve (2) and servo valve assembly (3) as a set.



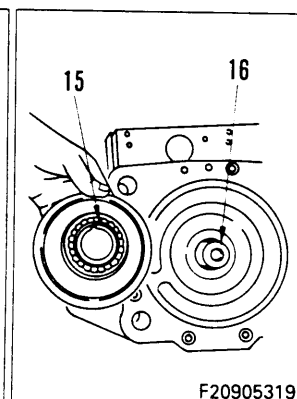
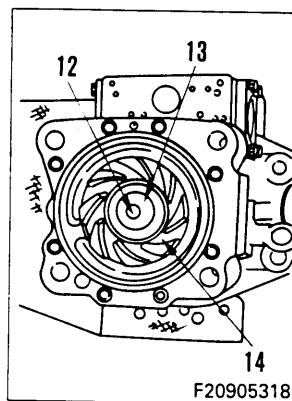
2. End cap

- 1) Using puller ①, push shaft (4) to end cap side, then stop effect of spring inside cylinder block.
- 2) Remove nut, then remove end cap (5).



- 3) Remove bolt (12), then remove plate (13), shim, impeller (14), bearing (15), and key (16).

★ Check the number and thickness of the shims, and keep in a safe place.

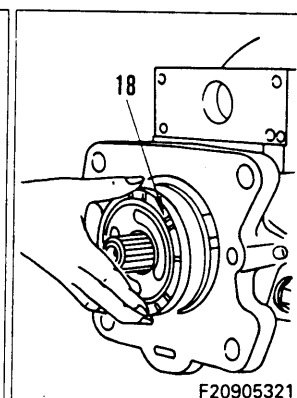
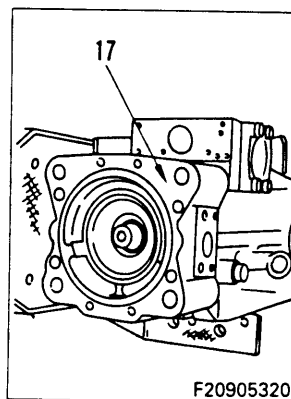


- 4) Remove 7 bolts, then remove end cap (17).

- 5) Remove valve plate (18).

★ This is stuck to the cylinder block, so lever it off and be careful not to damage it.

- 6) Remove puller ① installed at Step 2-1).



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