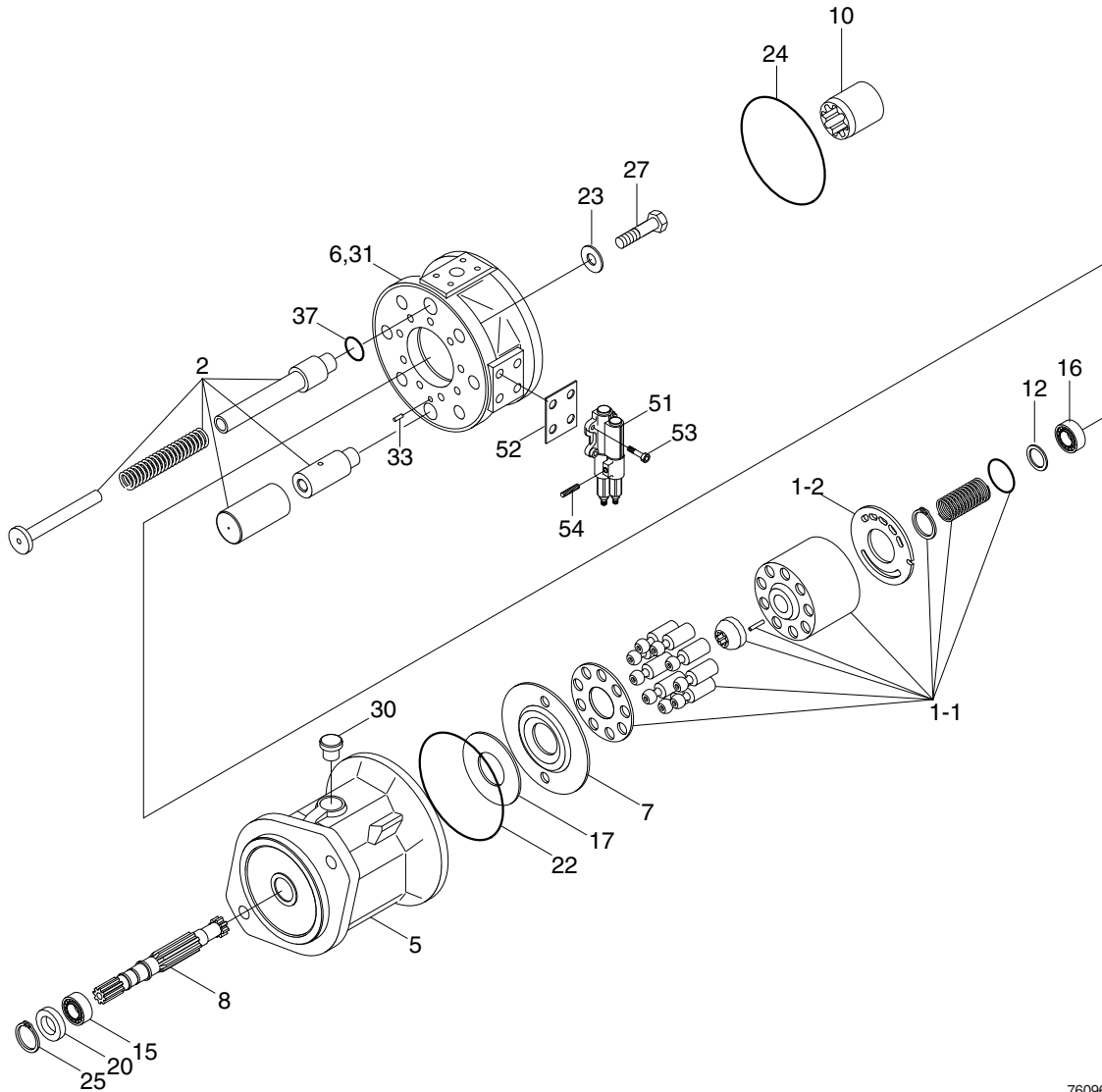


## GROUP 4 DISASSEMBLY AND ASSEMBLY

### 1. MAIN PUMP

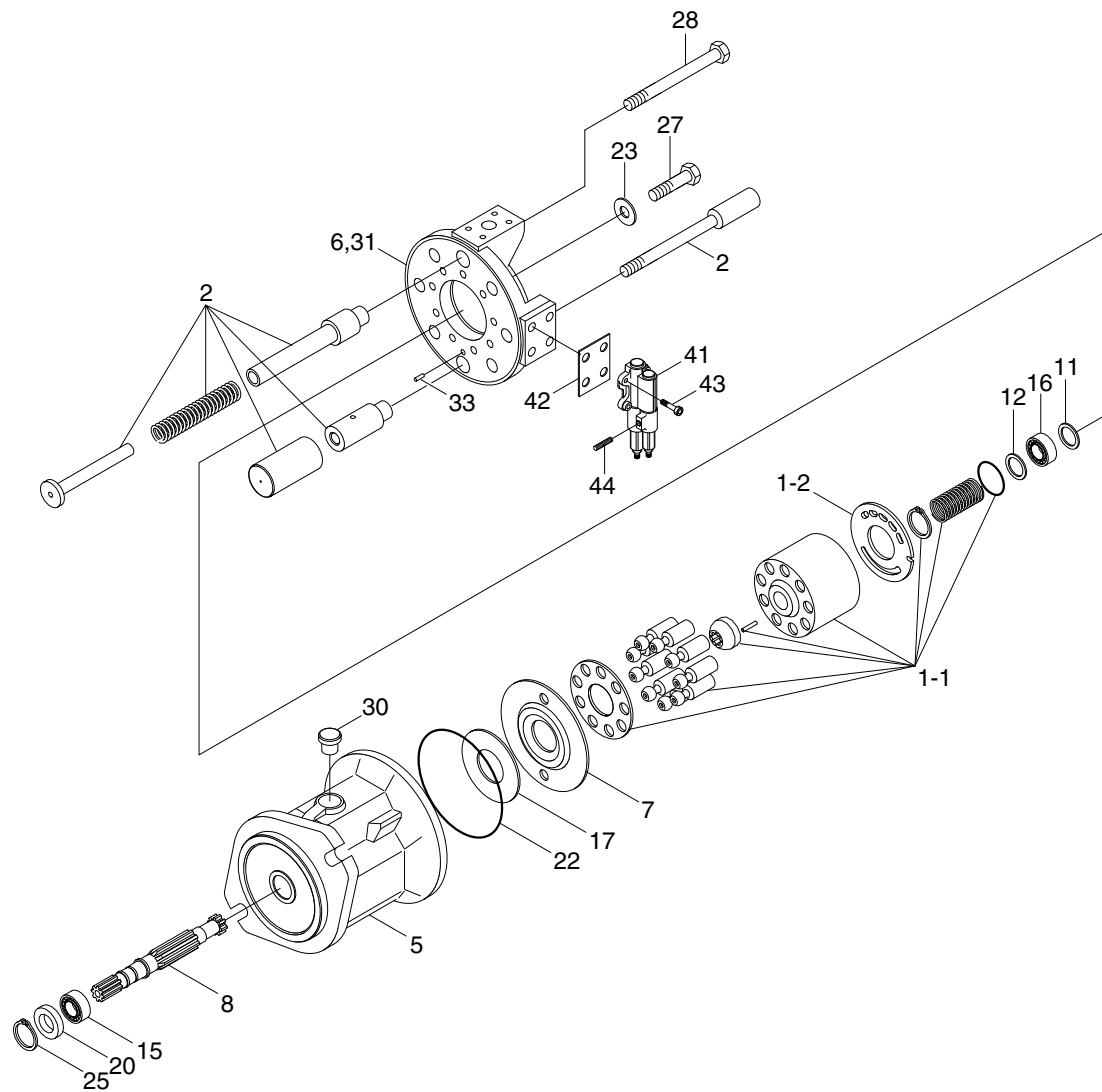
#### 1) STEERING (1/2)



76096WE11

1	Rotary group	12	Adjustment shim	27	Socket screw
1-1	High speed rotary group	15	Taper roller bearing	30	Locking screw
1-2	Control plate	16	Taper roller bearing	31	Double break-off pin
2	Adjusting piece	17	Bearing liner	33	Cylinder pin
5	Pump housing	20	Shaft seal ring	37	Side mark ring
6	Port plate	22	O-ring	51	Control valve
7	Swash plate	23	O-ring	52	Gasket
8	Drive shaft	24	O-ring	53	Socket head screw
10	Splined hub	25	Retaining ring	54	Locking screw

## LOADER (2/2)



76096WE12

- |     |                         |    |                      |    |                      |
|-----|-------------------------|----|----------------------|----|----------------------|
| 1   | Rotary group            | 12 | Adjustment shim      | 28 | Locking screw        |
| 1-1 | High speed rotary group | 15 | Taper roller bearing | 30 | Locking screw        |
| 1-2 | Control plate           | 16 | Taper roller bearing | 31 | Double break-off pin |
| 2   | Adjusting piece         | 17 | Bearing liner        | 33 | Cylinder pin         |
| 5   | Pump housing            | 18 | Shaft seal ring      | 41 | Control valve        |
| 6   | Port plate              | 22 | O-ring               | 42 | Gasket               |
| 7   | Swash plate             | 23 | O-ring               | 43 | Socket screw         |
| 8   | Drive shaft             | 25 | Retaining ring       | 44 | Locking screw        |
| 11  | Adjustment shim         | 27 | Socket screw         |    |                      |

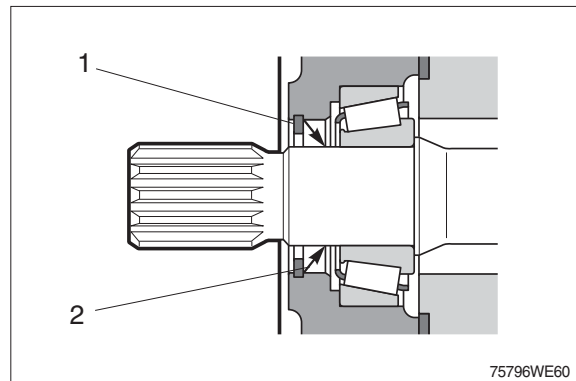
## 2) GENERAL REPAIR GUIDELINES

- ※ Observe the following guidelines when carrying out repairs on hydraulic pumps.
- (1) Close off all openings of the hydraulic unit.
- (2) Replace all of the seals.  
Use only original spare parts.
- (3) Check all sealing and sliding surfaces for wear.
- ※ Re-work of the sliding surfaces by using, for example abrasive paper, can damage the surface.
- (4) Fill the hydraulic pump with hydraulic oil before commissioning.

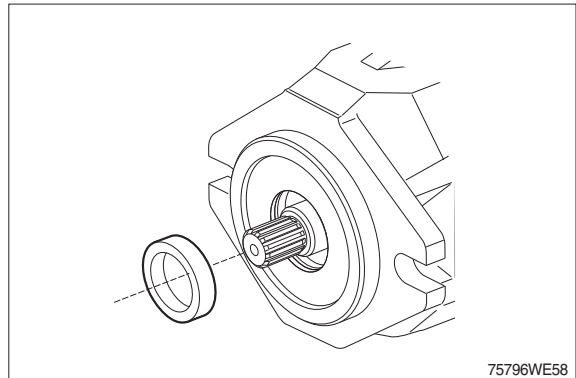
## 3) SEALING THE DRIVE SHAFT

- (1) Protect the drive shaft.  
Remove the circlip.  
Remove the shaft seal.

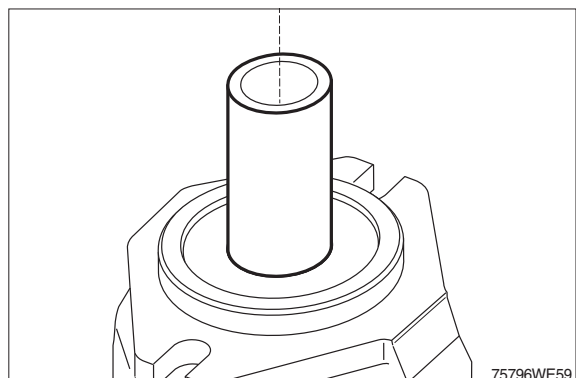
1 Circlip 2 Shaft seal



- (2) Change the shaft seal and check its sliding surface (drive shaft) and housing, grease the sealing ring.

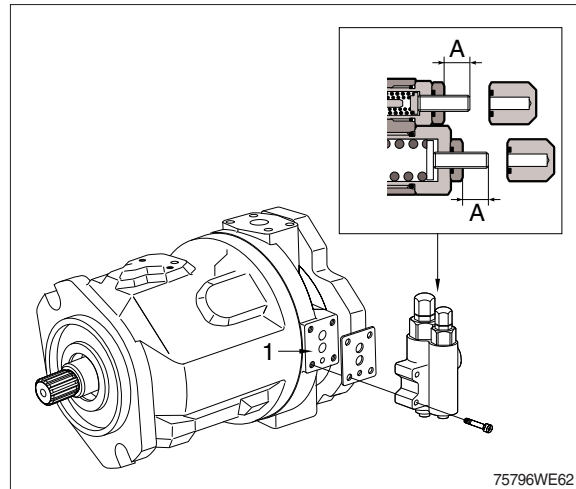


- (3) Assemble the sealing ring, fitting tool holds the correct position of the sealing ring in the pump housing.  
Assemble the circlip in the correct position.



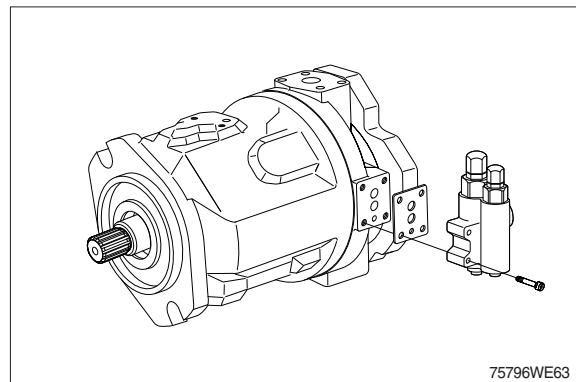
#### 4) SEALING / CLEANING THE CONTROL VALVE

- (1) Disassemble the control valve.
- ※ Measure dimension A and note down.
- Check sealing surface (1).

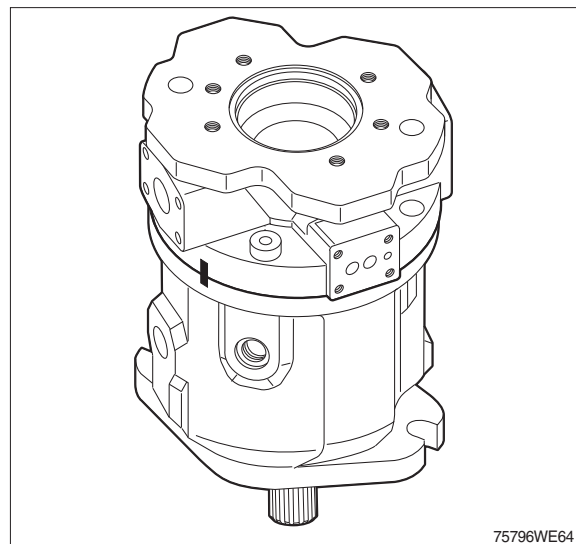


#### 5) DISASSEMBLE THE PUMP

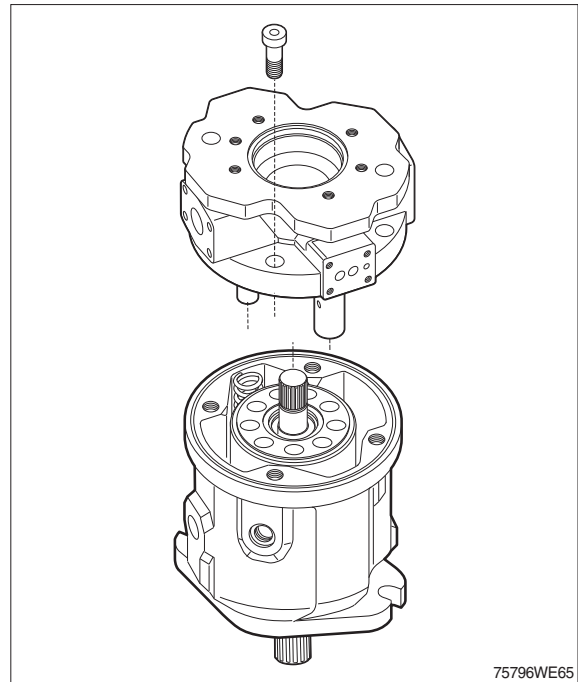
- (1) Remove the control valve.



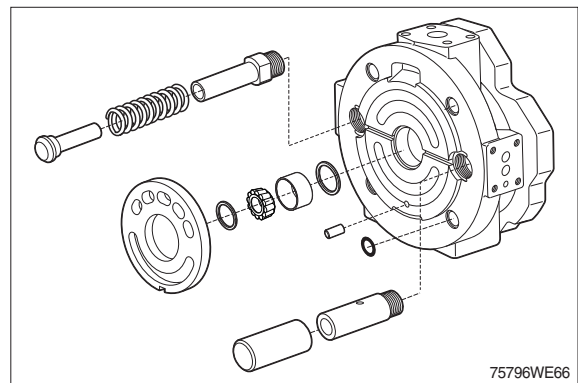
- (2) Mark the location of the connection plate on the housing.



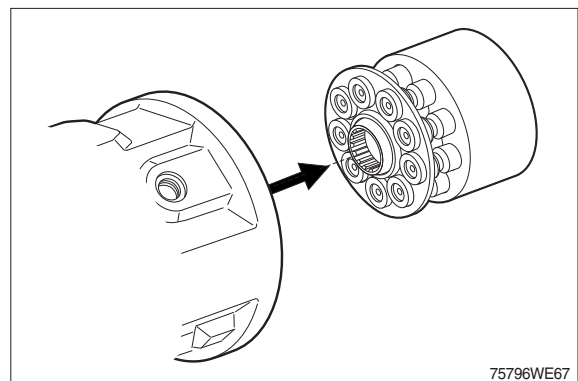
- (3) Remove the connection plate fixing bolts and the connection plate.  
※ Distributor plate and adjustment piston can drop down.



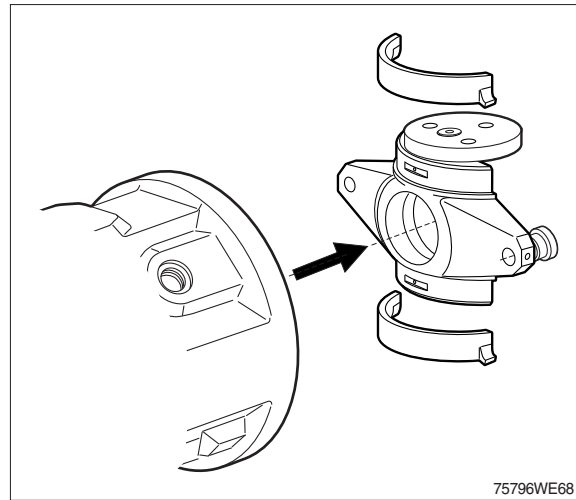
- (4) Remove distributor plate.  
Take note of the orientation.  
※ Remove bearing with withdrawal tool.  
Do not damage the sealing surface.



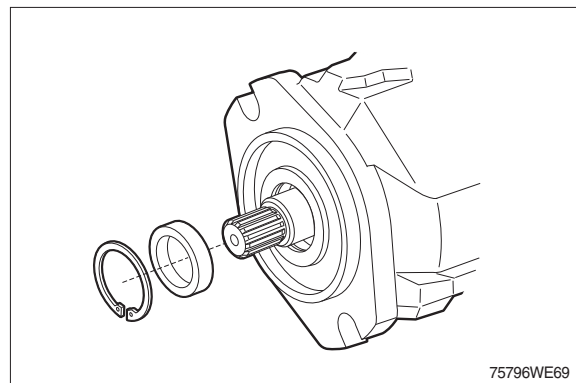
- (5) Remove the rotary group in a horizontal position.



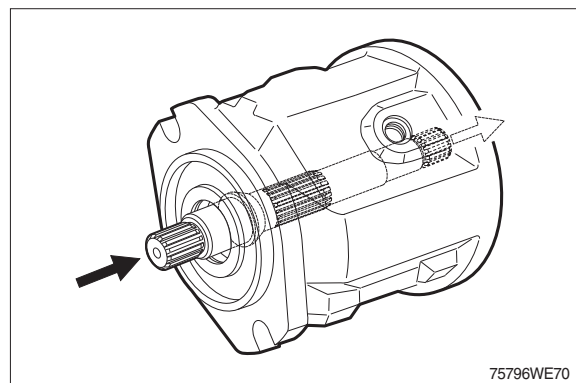
(6) Remove swash plate and bearing shells.



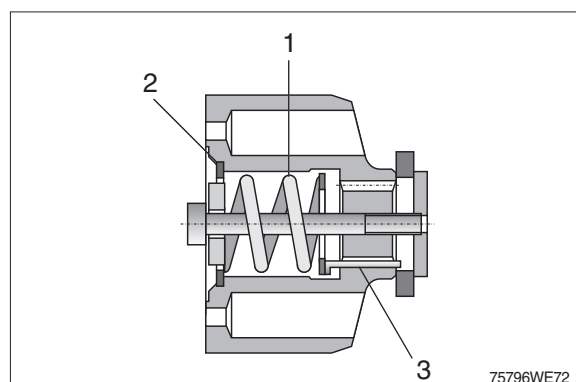
(7) Remove the circlip and the shaft seal.



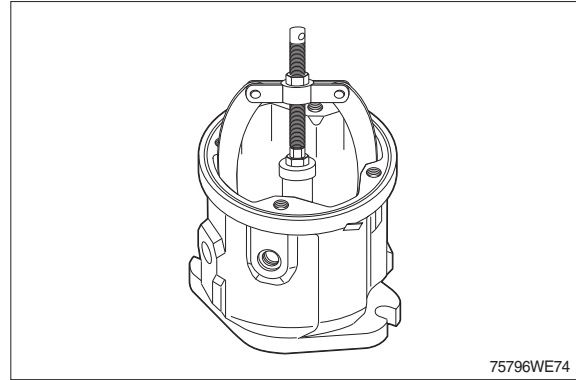
(8) Remove the drive shaft through rear side.



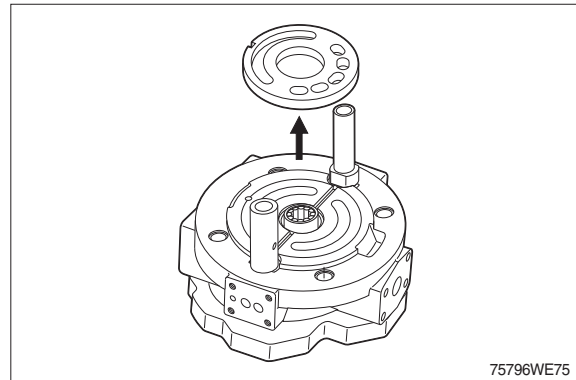
(9) Pre-tension the spring (1) using a suitable device.  
Remove circlip (2).  
Remove spring (1) and pressure pins (3).



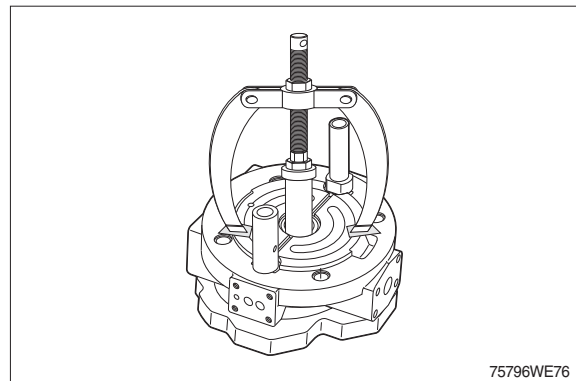
- (10) Use bearing puller to remove outer bearing race of front bearing out of housing press seat.



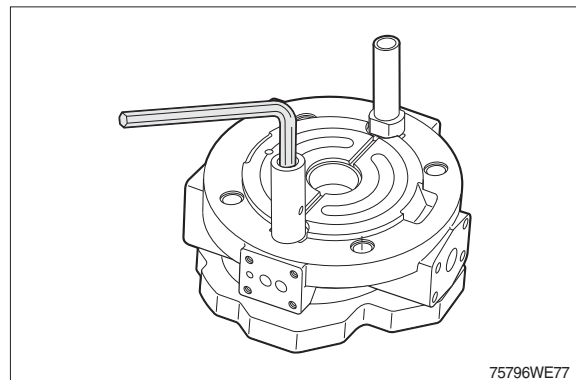
- (11) Remove the control plate.



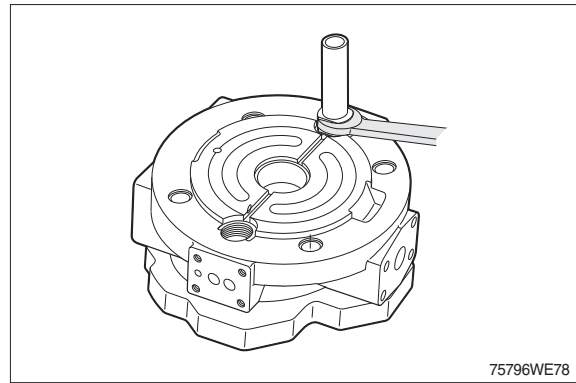
- (12) Use bearing puller to remove outer bearing race of rear bearing - press seat.



- (13) Disassemble the guide of control piston (Mounting position: pilot valve side).

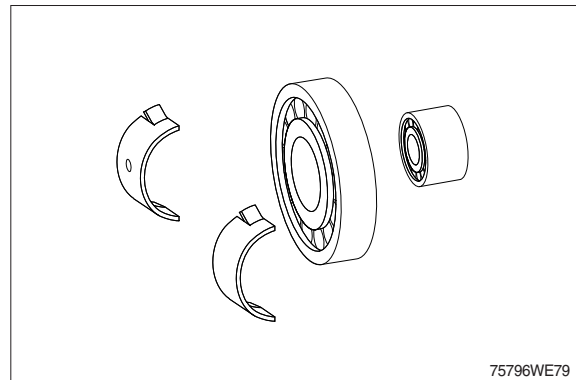


(14) Disassemble the guide of the opposite piston.



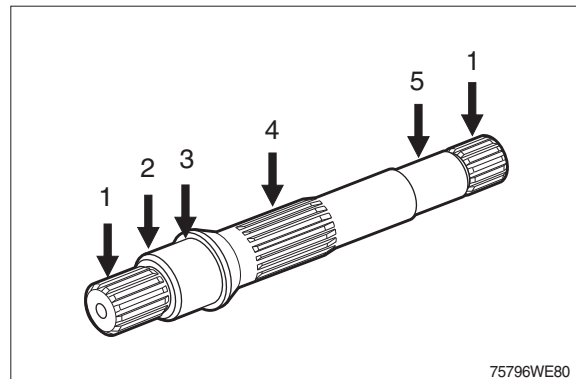
## 6) INSPECT HINTS

(1) Renew all bearings.



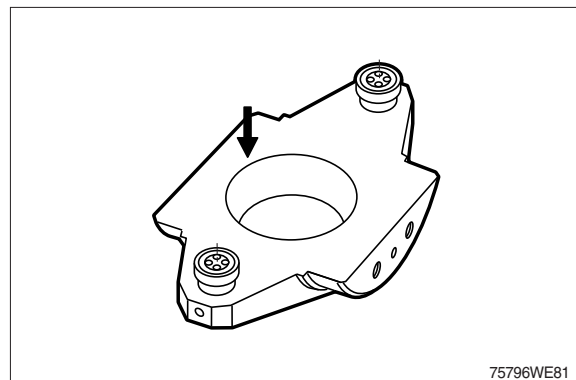
(2) Check :

- 1 Wear on splines, rust
- 2 Drive shaft seal wear grooves
- 3 Bearing seat
- 4 Splines for cylinder drive
- 5 Bearing seat



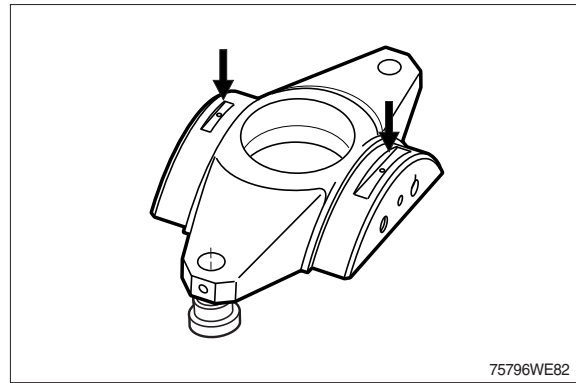
(3) Check :

Sliding surface free of grooves.

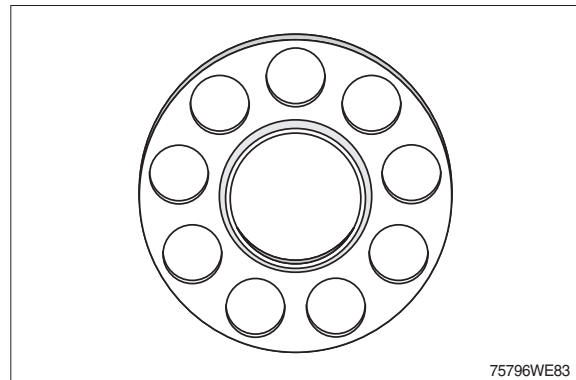




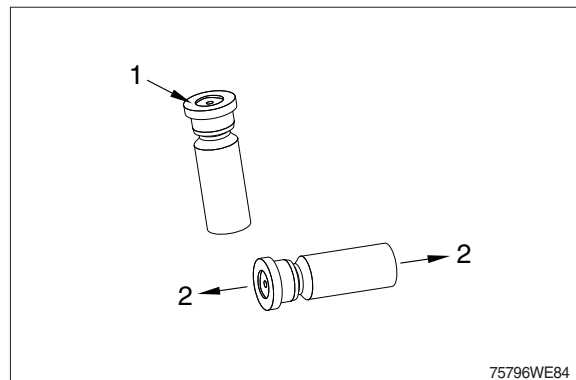
- (4) Check :  
Bearing surfaces.



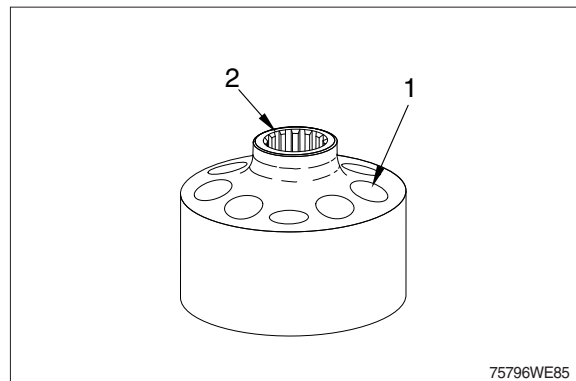
- (5) Check :  
That the retaining plate is free of grooves  
and that there is no wear in the slipper  
pad area.



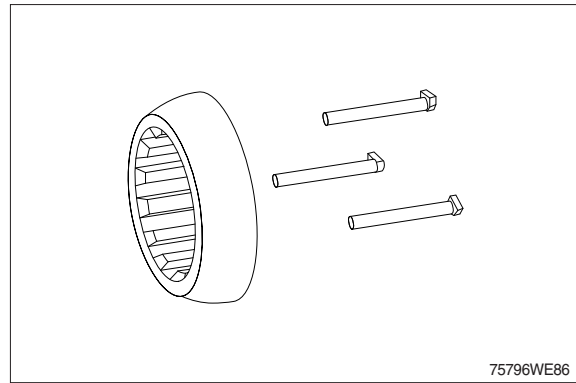
- (6) Check :  
Check to see that there are no scratches  
or metal deposits on the sliding surface  
(1) and that there is no axial play (2)  
(Pistons must only be replaced as a set).



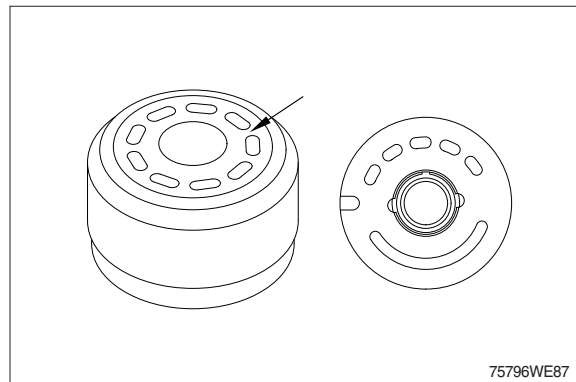
- (7) Check :  
1 Cylinder bores  
2 Splines



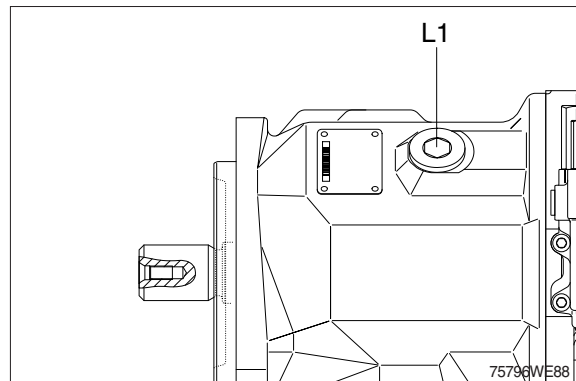
(8) Free of grooves, no signs of wear.



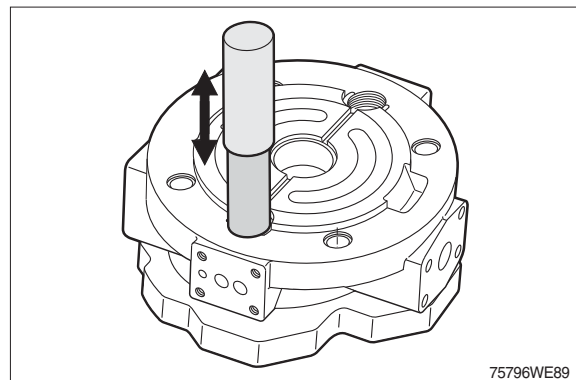
(9) Check :  
Cylinder sliding surface free of grooves,  
no wear, no embedded foreign particles.  
That there are no scratches on the control  
plate. (Only replace them as a set).



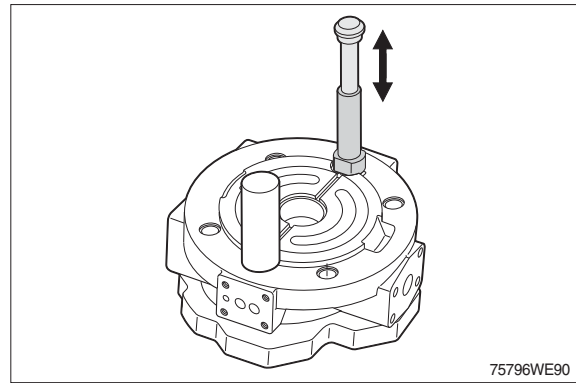
(10) Check :  
Mounting surface - control plate  
undamaged.



(11) Check :  
Check running conditions of the control  
piston.

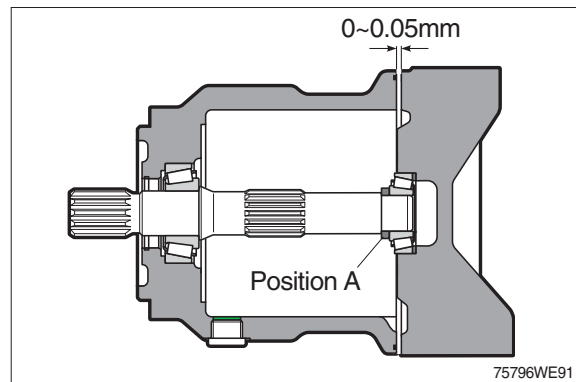


- (12) Check :  
Check running conditions of the opposite piston.



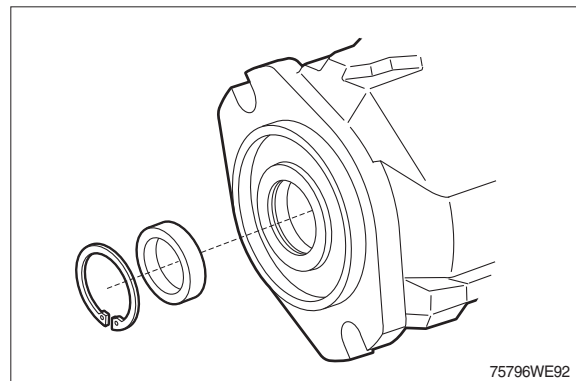
### 7) ADJUSTMENT OF TAPER ROLLER BEARING SET

- (1) Cast iron housing must have initial tension of the bearings: 0~0,05 mm, grind position A if necessary.

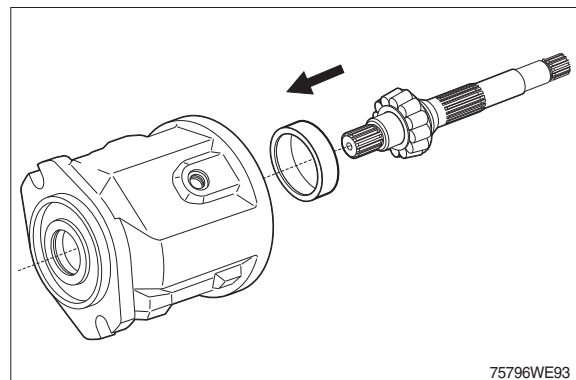


### 8) PUMP ASSEMBLY

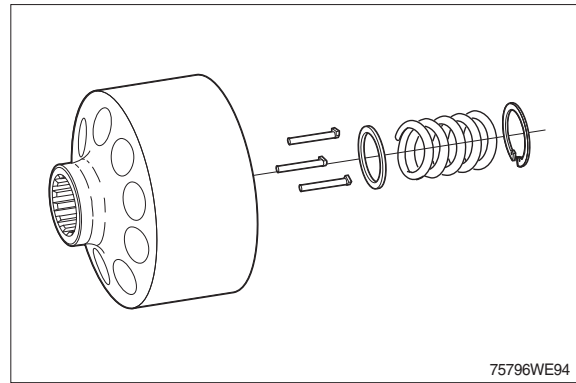
- (1) Fit the seal into the housing.  
Fit the circlip.



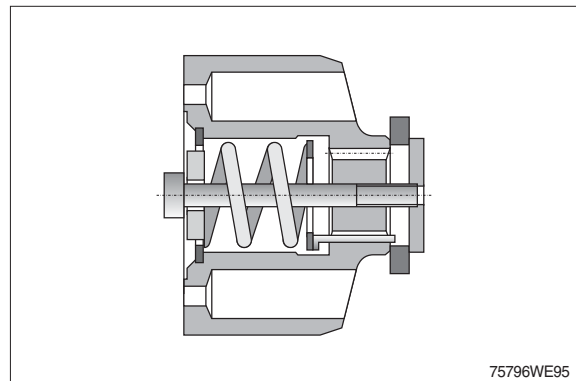
- (2) Fit the drive with bearing from rear end.  
※ Do not touch seal lip with edge of keyway or spline.



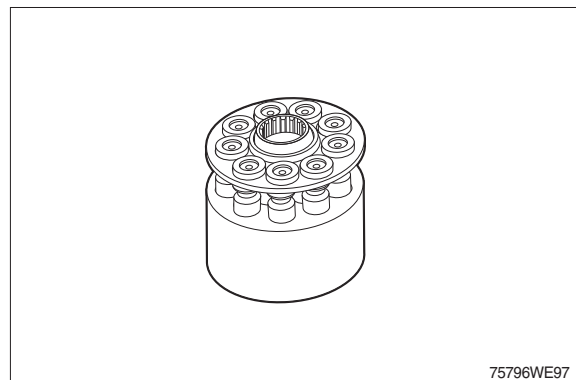
(3) Fit pressure pins using an assembly aid.



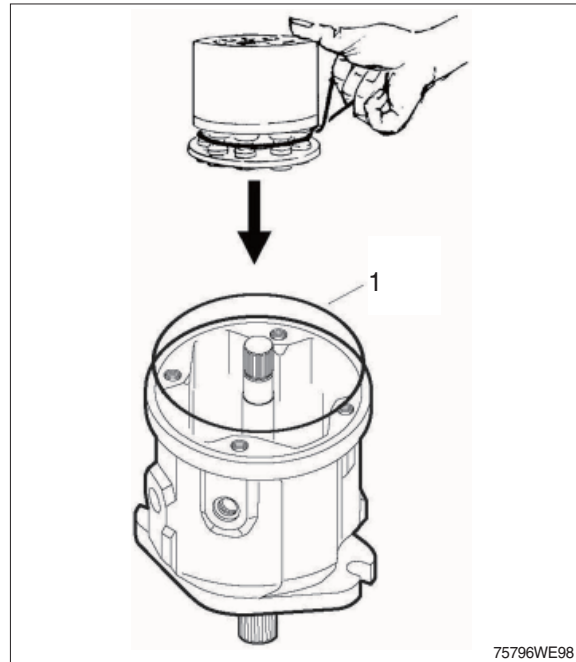
(4) Pre-tension the spring using a suitable device.



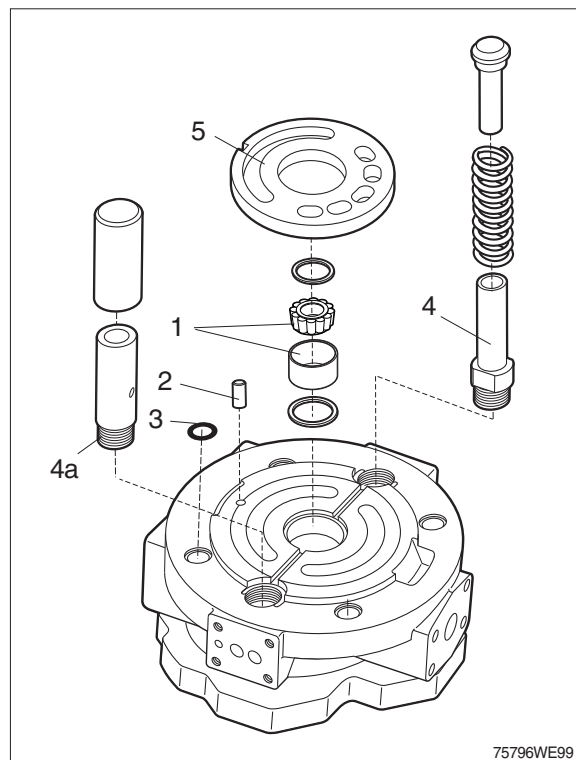
(5) Assemble piston with retaining plate.  
※ Oil piston and slipper pad.



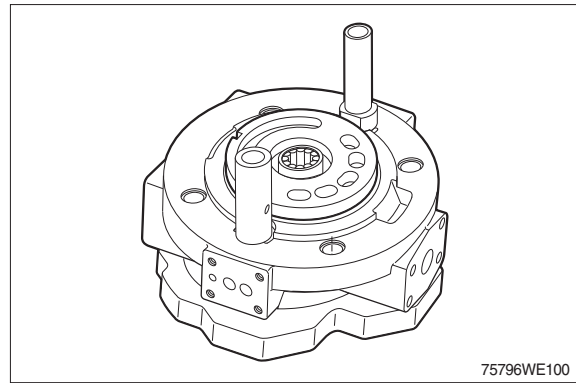
- (6) Fit rotary group.  
 ※ Hold the piston by using an O-ring.  
 Fit O-ring (1).



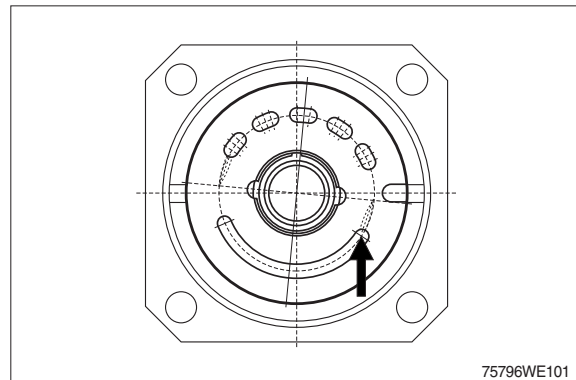
- (7) Fit bearing (1) in connection plate.  
 Fit cylindrical pin (2).  
 Fit O-rings (3) 4 pieces.  
 Fit adjustment spool (4) and guide piston (4a).  
 Fit distributor plate (5) (direction of rotation dependent)  
 ※ Assembly.  
 Hold the components in place with grease.



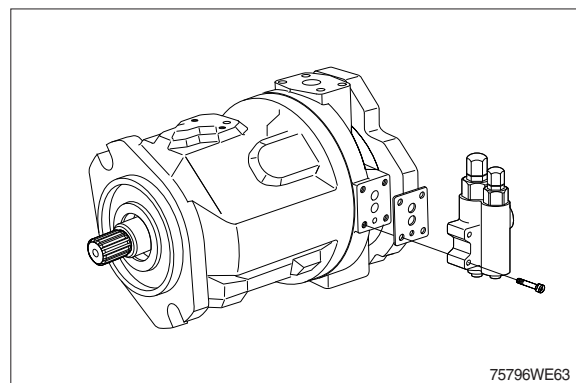
- (8) Fit distributor plate.  
※ Assembly aid : Grease



- (9) For clockwise rotation pumps the distributor plate is off-set by 4° to the right from the centre position.  
(Clockwise and anti-clockwise rotation distributor plates are not identical).

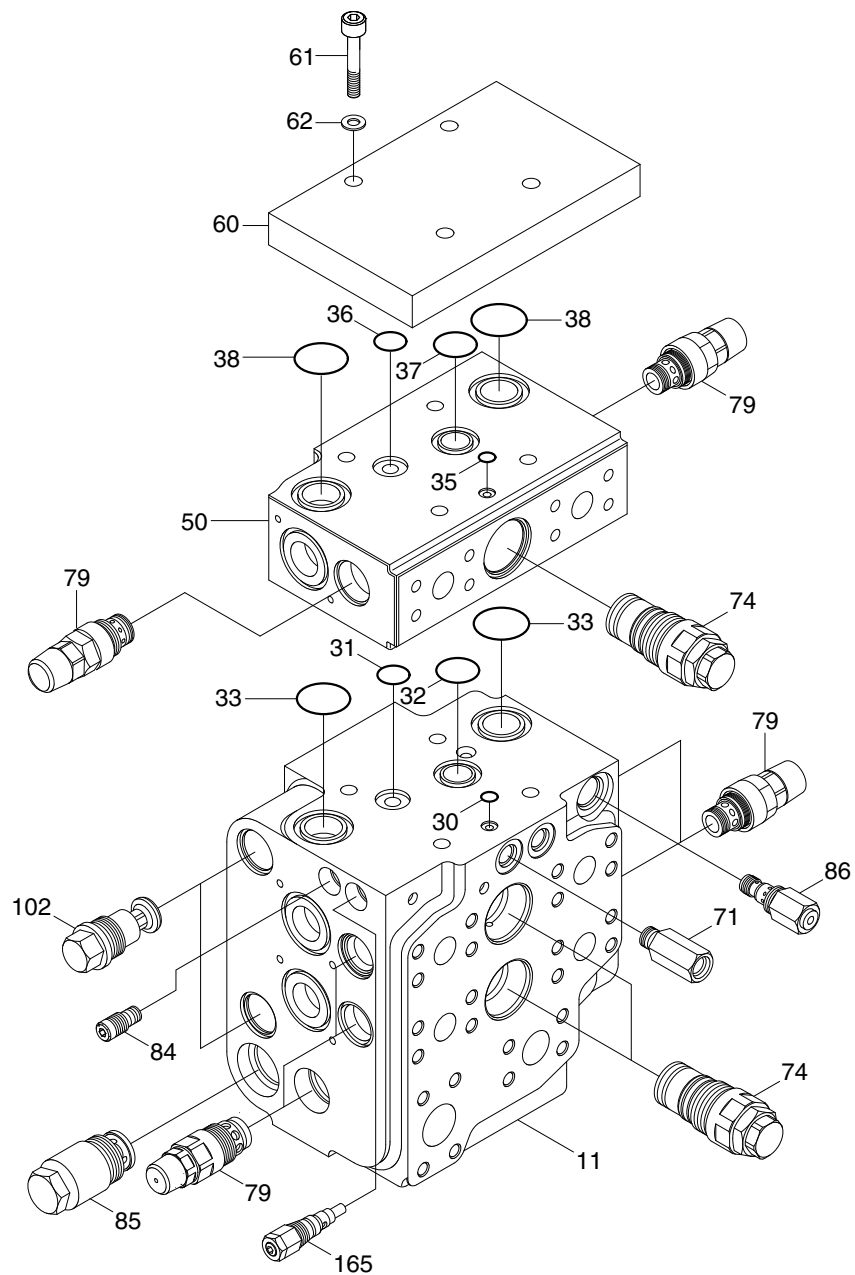


- (10) Fit connection plate and control valve.



## 2. MAIN CONTROL VALVE

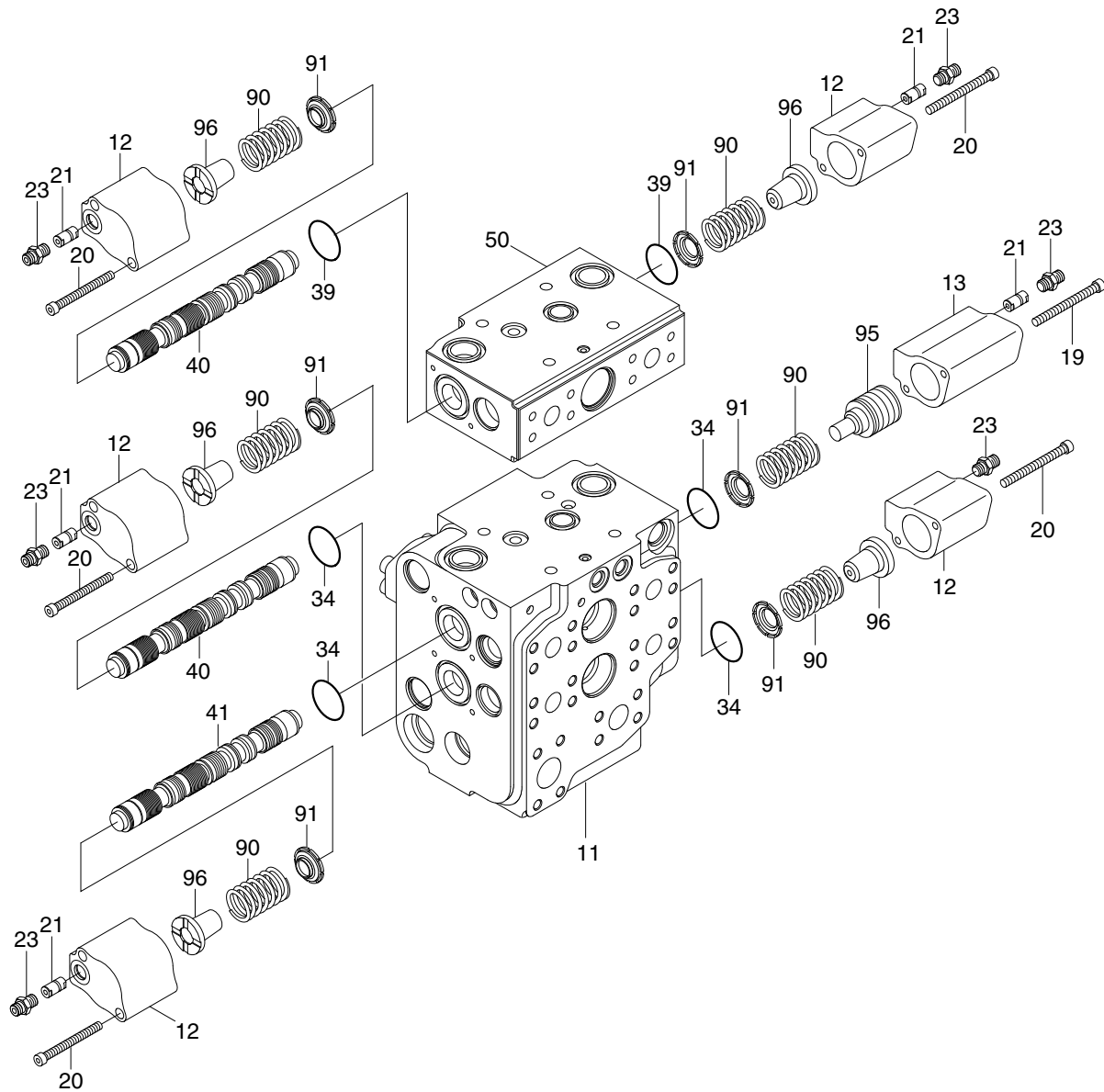
### 1) STRUCTURE (1/2)



76096WE13

11	Housing	37	O-ring	74	Compensator valve
30	O-ring	38	O-ring	79	Pressure valve
31	O-ring	50	Housing	84	Flow regulator
32	O-ring	60	Plate	85	Precharge valve
33	O-ring	61	Cylinder screw	86	Pilot oil supply
35	O-ring	62	Washer	102	Locking screw
36	O-ring	71	Shuttle valve	165	Pressure relief valve

## STRUCTURE (2/2)



76096WE14

- |    |         |    |                             |    |                    |
|----|---------|----|-----------------------------|----|--------------------|
| 11 | Housing | 21 | Throttle check valve        | 50 | Housing            |
| 12 | Cover   | 23 | Threaded steel pipe fitting | 90 | Compression spring |
| 13 | Cover   | 34 | O-ring                      | 91 | Spring retainer    |
| 14 | Cover   | 39 | O-ring                      | 95 | Spring retainer    |
| 19 | Bolt    | 40 | Spool                       | 96 | Spring retainer    |
| 20 | Bolt    | 41 | Spool                       |    |                    |



## **2) GENERAL PRECAUTIONS**

- (1) Clean room with no dust is recommended for maintenance. Because hydraulic components are precision, and have minute clearance. Tool and wash-oil must be clean, too. Handle them carefully.
- (2) At removing control valve from the machine, wash around the piping port, and neither dust nor water should go into inside with plugging. It is same at attaching the machine.
- (3) Prepare the required parts by checking structure figure before assembly. There are parts which are supplied with only sub-assembly part, so check the parts list before assembly.

## **3) PRECAUTIONS FOR DISASSEMBLY**

- (1) Handle the components carefully not to drop them or bump them with each other as they are made with precision.
- (2) Do not force the work by hitting or twisting as burred or damaged component may not be assembled or result in oil leakage or low performance.
- (3) When disassembled, tag the components for identification so that they can be reassembled correctly.
- (4) Once disassembled, O-ring and back-up rings are usually not to be used again.(Remove them using a wire with its end made like a shoe-horn. Be careful not to damage the slot)
- (5) If the components are left disassembled or half-disassembled, they may get rust from moisture or dust. If the work has to be interrupted, take care to prevent rust and dust.

## **4) PRECAUTIONS FOR REASSEMBLY**

- (1) Take the same precautions as for disassembly.
- (2) When assembling the components, remove any metal chips or foreign objects and check them for any burrs or dents. Remove burrs and dents with oil-stone, if any.
- (3) O-rings and back-up rings are to be replaced with new ones, as a rule.
- (4) When installing O-rings and back-up rings, be careful not to damage them. (Apply a little amount of grease for smoothness)
- (5) Tighten the bolts and caps with specified torque.

## 5) DISASSEMBLY AND ASSEMBLY

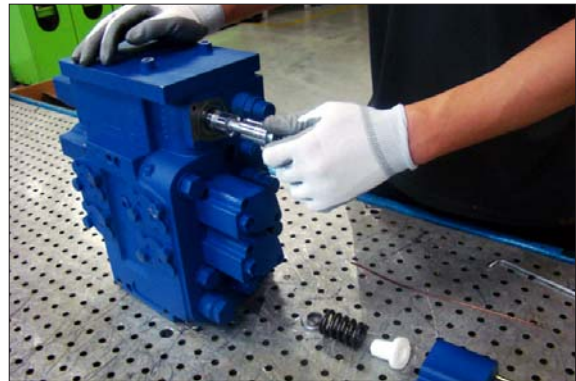
### (1) Spool

- ① Loosen the bolt (2EA).
  - Tool : Wrench 5 mm
  - Tightening torque : 0.85 kgf · m  
(6.1 lbf · ft)



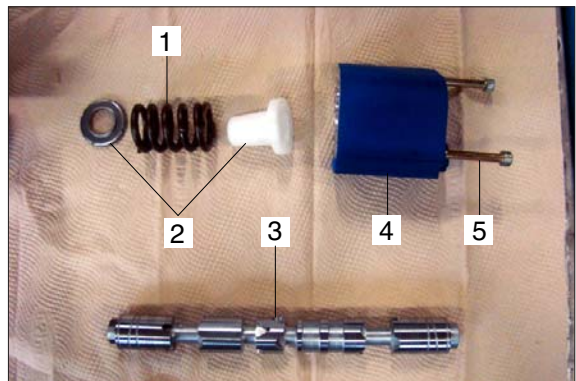
76096WE40

- ② Remove the cover, spring retainer, spring and spool.



76096WE41

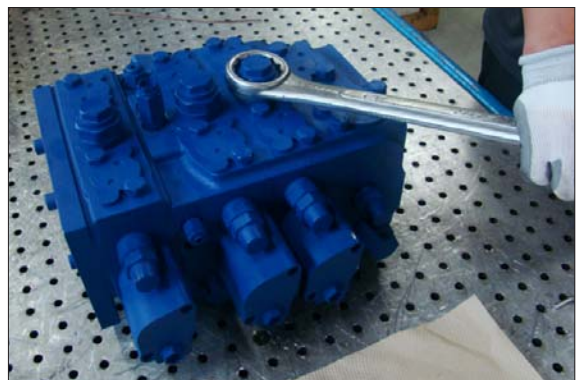
- 1 Spring
- 2 Spring retainer
- 3 Spool
- 4 Cover
- 5 Bolt



76096WE42

### (2) Compensator valve

- Tool : Spanner 42 mm



76096WE43

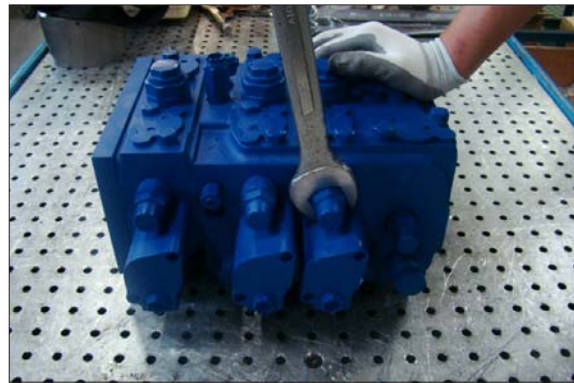
- Tightening torque : 20.4 kgf · m  
(148 lbf · ft)



76096WE44

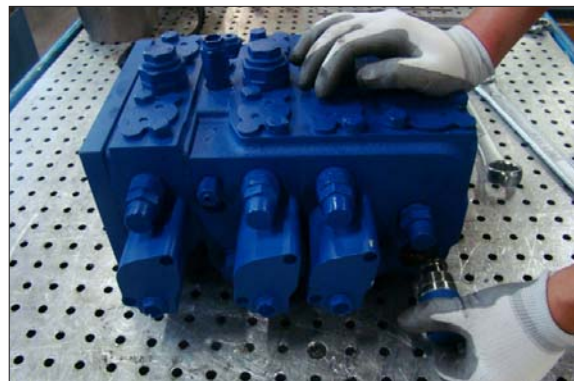
### (3) Port relief valve

- Tool : Spanner 30 mm



76096WE45

- Tightening torque : 10.2 kgf · m  
(73.8 lbf · ft)



76096WE46

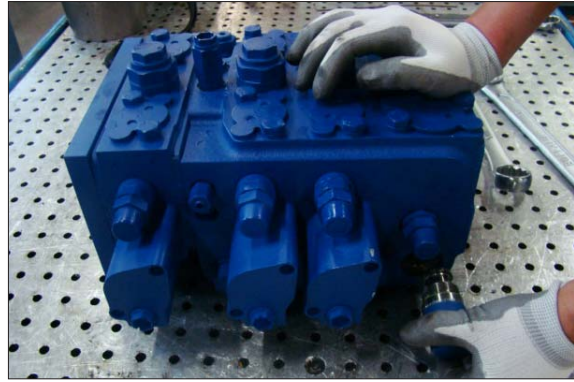
### (4) Precharge valve

- Tool : Spanner 32 mm



76096WE47

- Tightening torque : 6.1 kgf · m  
(44.3 lbf · ft)



76096WE48

**(5) Shuttle valve**

- Tool : Spanner 22 mm



76096WE49

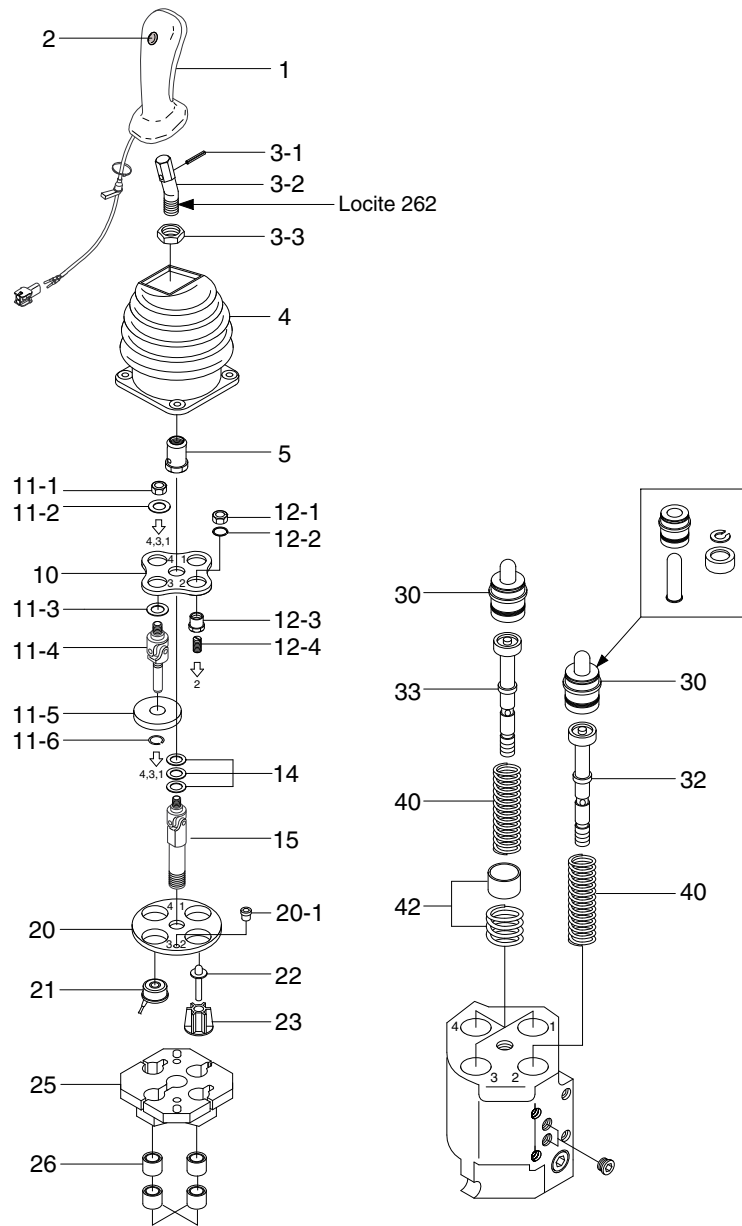
- Tightening torque : 3.6 kgf · m  
(25.8 lbf · ft)



76096WE50

### 3. REMOTE CONTROL VALVE

#### 1) STRUCTURE



7707WE64

- |      |                  |      |                          |    |                            |
|------|------------------|------|--------------------------|----|----------------------------|
| 1    | Handle           | 11-4 | Cardan                   | 22 | Intermediary plunger kit   |
| 2    | Push button      | 11-5 | Armature                 | 23 | Intermediary plunger guide |
| 3-1  | Locking pin      | 11-6 | Spring ring              | 25 | Electric bracket           |
| 3-2  | Bent lever       | 12-1 | Counter nut              | 26 | Bushing                    |
| 3-3  | Nut              | 12-2 | Spring ring              | 30 | Plunger kit                |
| 4    | Rubber boot      | 12-3 | Switch plate screw       | 32 | Regulation unit            |
| 5    | Locking nut      | 12-4 | Press screw              | 33 | Regulation unit            |
| 10   | Cardan bracket   | 14   | Shims (0.1, 0.2, 0.5 mm) | 40 | Return spring              |
| 11-1 | Self-locking nut | 15   | Cardan                   | 42 | Prefeeling point kit       |
| 11-2 | Washer           | 20   | Flange                   |    |                            |
| 11-3 | Washer           | 21   | Solenoid                 |    |                            |

## 2) DISASSEMBLY AND ASSEMBLY

### (1) PUSH BUTTON

- ※ The remote control valve does not need to be removed from the machine to perform this operation.

Remove worn pushbutton using a small screwdriver.

The installation of new elements is performed without any special tools; the parts are simply pressed into place.

### (2) RUBBER BOOT

- ① Remove the remote control valve from the machine or free the valve by unscrewing the 4 screws fixing the plate in order to release the electrical cable.

- Assembly

Torque : 1.02 kgf · m (7.4 lbf · ft)

Hold the remote control valve using a vice or a vice-grip wrench (clamp onto the body).

- ※ The pilot unit does not need to be removed from the machine to release the cable. However, it is recommended to lift the control unit by undoing the 4 fixing screws on the arm rest.
- ※ It is unnecessary to remove the units with no electrical functions.

- ② Lift and turn the boot inside out.

- ③ Remove the grommet (7) from its emplacement to free the cable.

- ④ Loosen the handle mounting nut (3-3) using a 19 mm open-end wrench.

- Assembly : torque 4.08 kgf · m (29.5 lbf · ft)

- ⑤ Unscrew and remove the handle (1).

- Assembly

- Add loctite 262 onto the lever thread

- Torque : 4.08 kgf · m (29.5 lbf · ft)

- ⑥ Replace the faulty rubber boot (4) with a new one.

- ⑦ Replace the handle (1) following the disassembly instructions in reverse order.

### (3) HANDLE

- ① Clamp the threaded section of the lever (3-2) in a vice fitted with V-shaped vice clamp.

- ② Remove the pin (3-1) using a 5mm pin driver.

- ③ Replace the lever (3-2) onto the new handle (1) and secure it with the pin (3-1) using a 5mm pin driver.

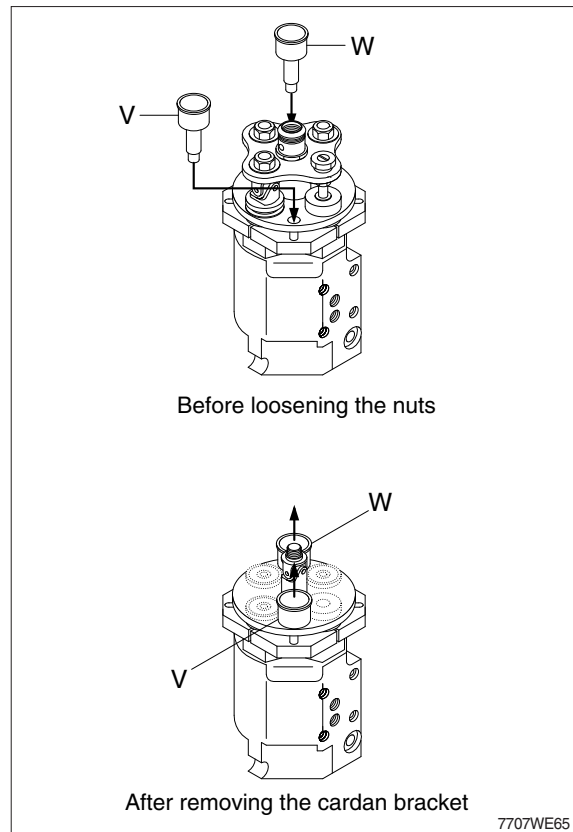
- ※ Respect the position of the curved lever to ensure that the handle is correctly oriented as indicated by the machine's technical specifications.

- ④ Replace the nut (3-3) on the threaded section and replace the boot (4).

#### (4) DETENT CARDAN BRACKET KIT

- ※ Remove the 2 grommets (20-1) from the flange (20).
- ※ Place centering sleeves V & W to avoid damaging the cardan knuckles while loosening the nuts.
- ※ Unscrew the locking nut (5) using a 23mm open-end wrench.
  - Assembly : Torque  $4.08 \pm 0.4 \text{ kgf} \cdot \text{m}$   
( $29.5 \pm 2.9 \text{ lbf} \cdot \text{ft}$ )

- ① Unscrew the self-locking nut (11-1) using a 13mm open-end wrench.
  - Assembly
  - Torque  $1.02 \text{ kgf} \cdot \text{m}$  ( $7.4 \text{ lbf} \cdot \text{ft}$ )
  - Place centering sleeves (V-W) to avoid damaging the cardan knuckles while screwing the nuts.
- ② Remove : - Friction washer (11-2)
  - Friction washer (11-3)
  - Cardan/armature assembly (11-4 ~ 11-6)



#### (5) NON-DETENT PLUNGER KIT

- ① Unscrew the self-locking nut (12-1) using a 13 mm open-end wrench.
  - Reassembly : - Torque  $1.02 \text{ kgf} \cdot \text{m}$  ( $7.4 \text{ lbf} \cdot \text{ft}$ )
  - Place centering sleeves (V-W) to avoid damaging the cardan knuckles while screwing the nuts.
- ② Undo the snap ring (12-2) using a flat-end screwdriver.
- ③ Remove the screw assembly (12-3, 12-4)

#### (6) CARDAN

- ① Remove the centering sleeves V & W.
- ② Remove the cardan bracket (10) and the shims (14).
- ③ Unscrew the cardan (15) using a 17 mm open-end wrench.
  - Reassembly : - Ungrease the cardan threads
  - Add loctite 262 onto the cardan threads (both end)
  - Torque  $4.08 \text{ kgf} \cdot \text{m}$  ( $29.5 \text{ lbf} \cdot \text{ft}$ )

#### (7) SOLENOID AND CONNECTOR

- ※ It is advised to mount the connector onto the solenoid cable once the remote control valve is assembled.
- ① Remove the flange (20) and the electrical bracket (25),
  - ② Remove the protecting bushes (26) from the electrical bracket (25).
  - ③ Undo the solenoid (21) from the electric bracket (25).
  - ④ Replace the solenoid.
  - ※ Clean the polar face using a piece of cloth and pay attention not to hit them.
  - ⑤ Assembly : Place the solenoid cable in its emplacement on the electric bracket before fitting the protection bushes.

### **(8) INTERMEDIARY PLUNGER KIT**

- ① Undo the intermediary plunger guide (23).
- ② Remove and replace the intermediary plunger kit assembly (22).

### **(9) GUIDE / PLUNGER AND REGULATION UNIT**

※ Beware of the plungers that might jump out due to the spring return.

- ① Remove : - Guide/plunger assembly (30).
  - Regulation unit (32/33).
  - Return spring (40).
  - Pre-feeling point kit (42).
- ② The remote control valve is now totally disassembled.  
Assemble in reverse order following the torque specification.