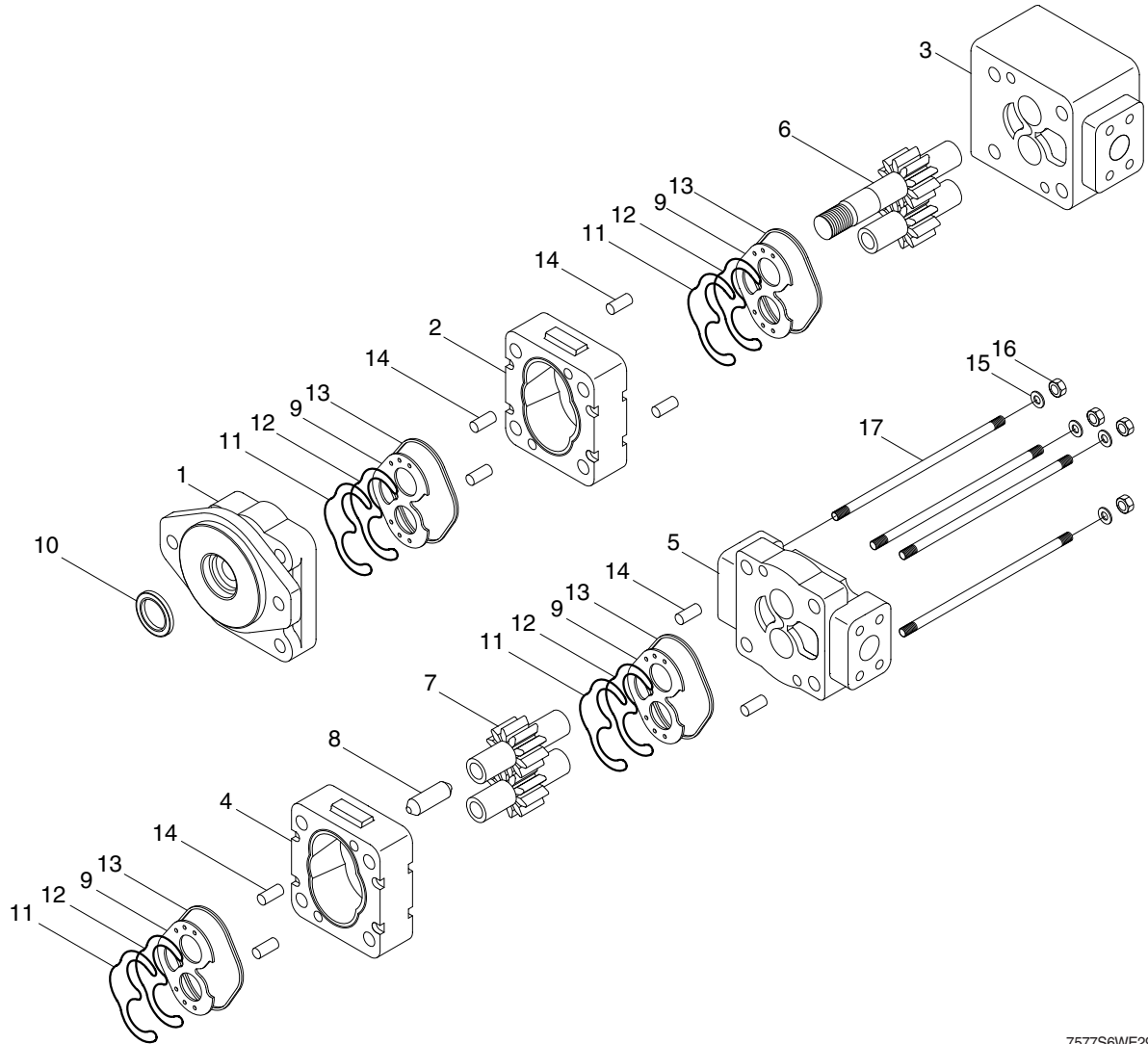


## GROUP 4 DISASSEMBLY AND ASSEMBLY

### 1. MAIN PUMP

#### 1) STRUCTURE



7577S6WE29

- |   |                |    |                 |    |             |
|---|----------------|----|-----------------|----|-------------|
| 1 | Front cover    | 7  | Driven gear set | 13 | Square seal |
| 2 | Housing        | 8  | Connector shaft | 14 | Dowel pin   |
| 3 | Carrier        | 9  | Thrust plate    | 15 | Washer      |
| 4 | Housing        | 10 | Lip seal        | 16 | Hex nut     |
| 5 | Rear cover     | 11 | Rubber seal     | 17 | Stud bolt   |
| 6 | Drive gear set | 12 | Back up seal    |    |             |

## 2) MANDATORY REPLACEMENT PARTS

Discard all seals including square seals, lip seals, rubber seals and back up seals. Fit new seals on reassembly. Thrust plates should also be replaced with new items from seal kit.

## 3) HANDLING/STORAGE

While disassembling pump, ensure no surfaces are scored or marked in any way. A rubber surfaced table will be beneficial. All components must be placed in a clean, dry and safe area.

Leakage will be created by scratches on components. If parts are to be left for any period ensure they are not exposed to dirt, dust and corrosion. Keep gears separate from each other in protective boxes.

## 4) INSPECTION OF PARTS

Wash all parts in a solvent and dry.

### (1) Cover, housing and carrier

The pump must be replaced if the damage listed is present.

Feature	Damage
Surfaces	Corrosion, nicks or burrs (slight burrs can be removed using an India stone)
Machined sealing Interfaces	Scores, cracks or corrosion

### (2) Gears

The pump must be replaced if the damage listed is present.

Feature	Damage
Surfaces	Corrosion, nicks or burrs (slight burrs can be removed using an India stone). Wear due to seal (s)
Journals	Pitting, wear, sufficient wear to change outside diameter
Tooth	Cracks or heavy scoring or chipped
Splines/keyways	Distortion or wear
End faces	Wear, cracks

### (3) Bolts/studs

The pump should be replaced if the damage listed is present.

Feature	Damage
Surfaces	Corrosion, nicks or burrs (slight burrs can be removed using an India stone), cracks or scoring, distortion or damage to thread form

## 5) ASSEMBLY

(1) Prepare sub assembled parts (front and rear cover, carrier, housing, thrust plate).

※ Grease must be spreaded slightly on each seal.



(2) Put section sub assembly on the assembly table.

Assemble dowel pins.



(3) Assembly gear housing and thrust plate.

※ Check the contact status of square seal.



(4) Mount a jig on the shaft end to protect lip seal.

Assemble drive gear.



- (5) Assemble driven gear.  
Spread hydraulic fluid around gear set.



- (6) Assemble thrust plate.  
Rotate the shaft gear and check status of gear set.  
Assemble dowel pins and connector shaft.



- (7) Assemble sub assy of carrier.  
Inlet hole is located on the right side.  
※ Outlet drill hole is located at the bottom of carrier. Sub assy of piggy back type carrier is the same.



- (8) Assemble gear housing and thrust plate.  
※ Check the contact status of square seal.



- (9) Assemble drive gear set.  
Spread hydraulic fluid around gear set.



- (10) Assemble thrust plate.  
Rotate the shaft gear and check status of gear set.  
Assemble dowel pins and connector shaft.



- (11) Assemble the rear cover.  
Check the contact status of square seal.



- (12) Assemble stud bolt and washer.  
※ Washer : smooth - convex side up  
※ Keep bolts in dry condition after washing.



(13) Nuts are pre-assemble by hand.



(14) Use air impact to assemble nuts.  
At this time, assemble nuts diagonally.

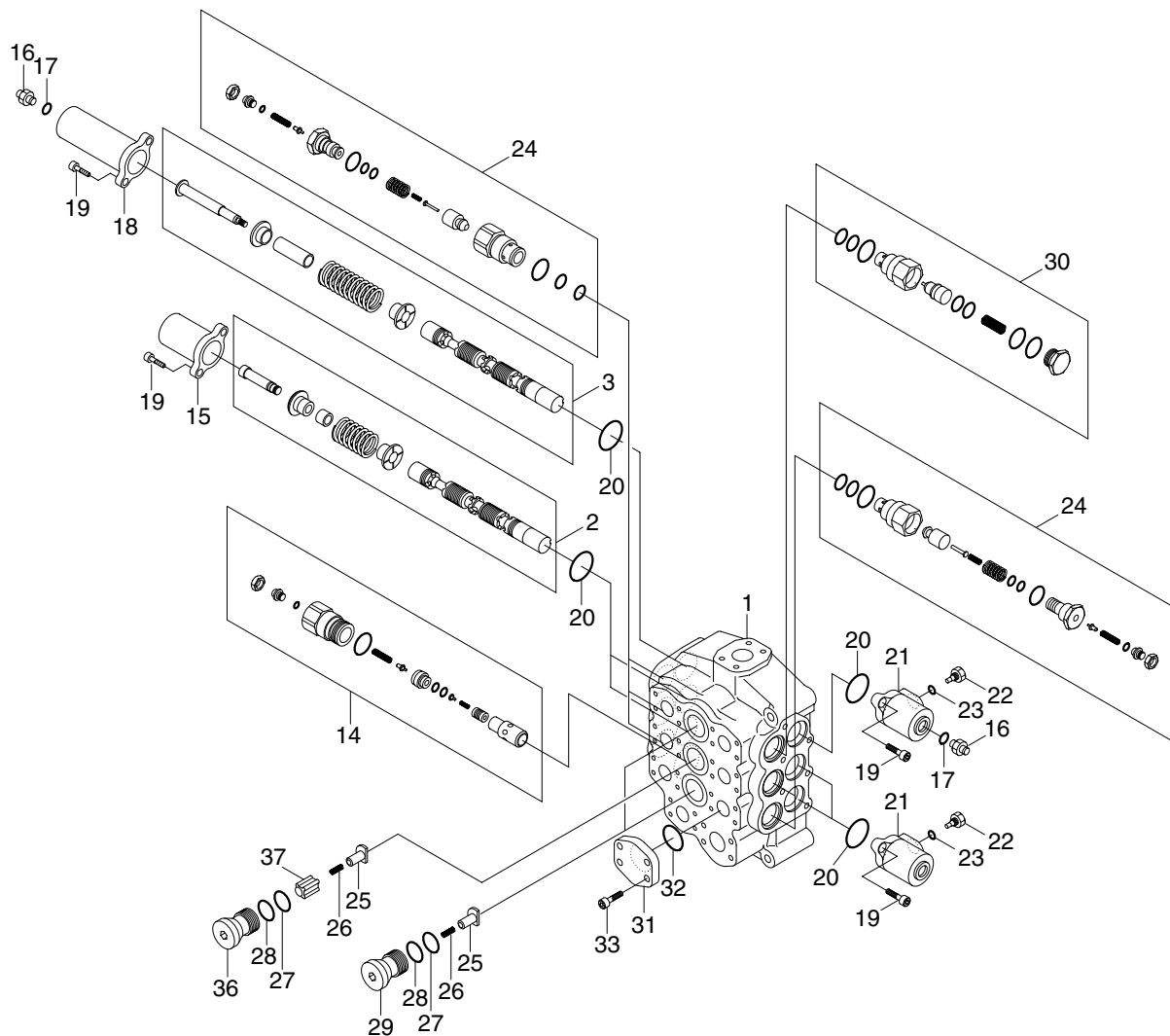


(15) Use torque wrench to assemble.  
· Tightening torque : 15 kgf · m  
(108 lbf · ft)



## 2. MAIN CONTROL VALVE

### 1) STRUCTURE



7607B6WE45

- |    |                   |    |                       |    |               |
|----|-------------------|----|-----------------------|----|---------------|
| 1  | Block             | 20 | O-ring                | 29 | Plug          |
| 2  | Spool assembly    | 21 | Pilot cap (C)         | 30 | Make up valve |
| 3  | Spool assembly    | 22 | Guide plug            | 31 | Cover         |
| 14 | Main relief valve | 23 | O-ring                | 32 | O-ring        |
| 15 | Pilot cap (A)     | 24 | Overload relief valve | 33 | Socket bolt   |
| 16 | Nipple            | 25 | Check                 | 36 | Plug          |
| 17 | O-ring            | 26 | Spring                | 37 | Check         |
| 18 | Pilot cap (B)     | 27 | O-ring                |    |               |
| 19 | Wrench bolt       | 28 | Back up ring          |    |               |

## 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.

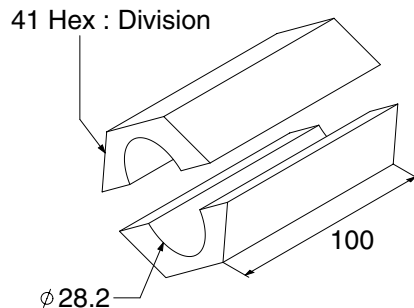
## 4) PRECAUTIONS FOR REASSEMBLY

- (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) SPECIAL TOOL

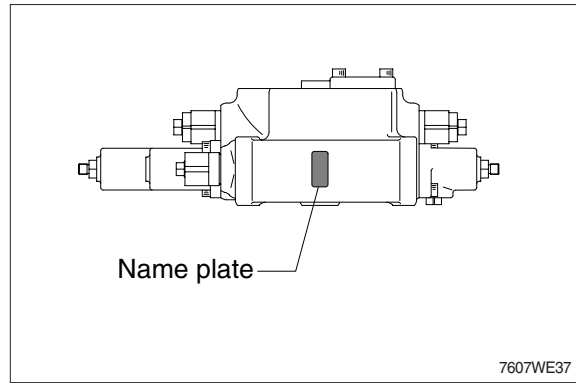
### · HOLDER

Material : copper





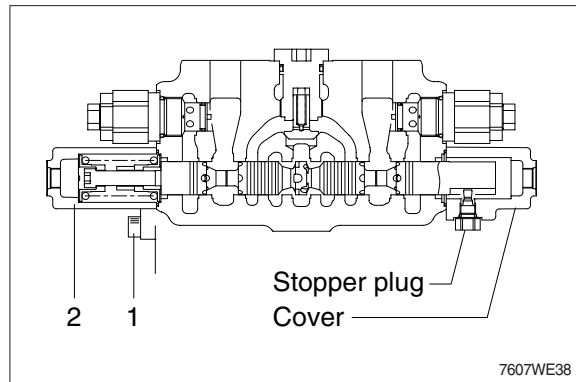
- ※ Regarding to change the main plunger
  - We can not supply the main plunger, because the plunger is fit for valve housing.
  - So, do not change the plunger at the field.
  - If changing plunger must be needed, then tell us model name of control valve and serial number written at its nameplate.



## 6) BUCKET PLUNGER AND ACCESSORY PLUNGER

- ※ Reassemble in the opposite order to disassemble.
- ※ To reassemble correctly, attach an identification tag immediately after parts are removed.

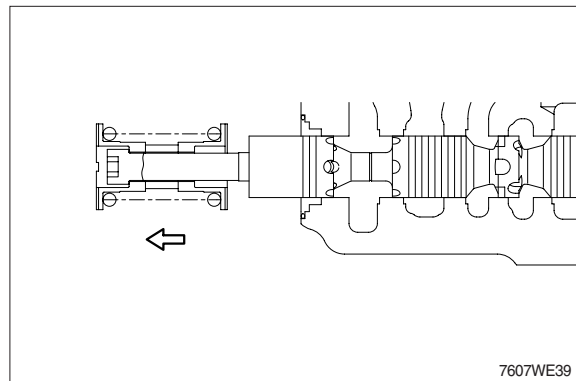
- (1) Remove hexagon socket bolts (1) then remove cover (2).
  - Hexagon socket bolt
  - Width across flat : 8 mm
  - Tightening torque : 5.1 kgf · m (36.8 lbf · ft)



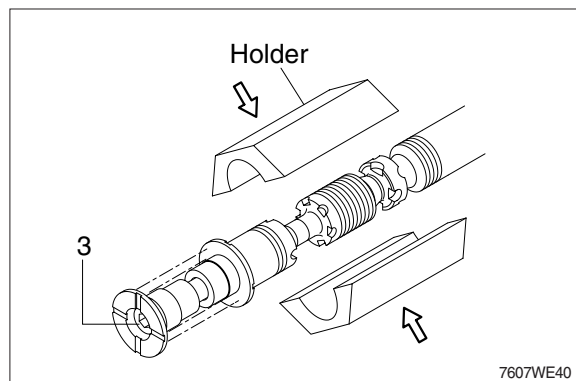
- ※ Reassembly
  - Install cover (2), after making sure that O-ring is placed on the edge of the housing hole.

- (2) Pull out spool assembly from housing.

- ※ Do not pull out the spool all at once. Pull slowly while fitting in the housing hole.
- ※ Reassembly
  - Set the key groove of the plunger with the stopper plug of the cover.



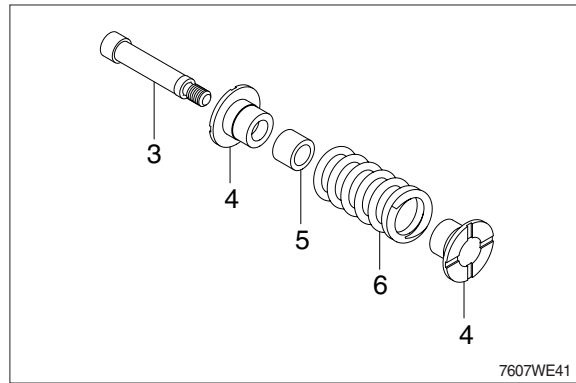
- (3) Set the spool between holders and loosen plunger cap (3) by using vise.
  - Plunger cap
  - Width across flat : 8 mm
  - Tightening torque : 6.1 kgf · m (44.2 lbf · ft)



- ※ Set the spool between holders and clamp them by a vise after degreasing the spool and holders as a special tool.

- (4) Remove the plunger cap (3), spring guide (4), spring (6) and sleeve (5).

※ Spring is different from boom section spring.



- (5) Remove hexagon socket bolts (8) then remove cover (9) after remove plug (7).

· Plug (7)

Width across flat : 19 mm

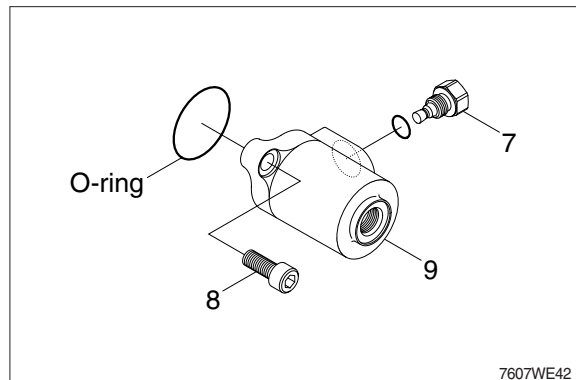
Tightening torque : 8.2 kgf · m (59.0 lbf · ft)

· Hexagon socket bolt (8)

Width across flat : 8 mm

Tightening torque : 5.1 kgf · m (36.8 lbf · ft)

※ Make sure that O-ring is on the face of housing.



## 7) BOOM PLUNGER

- (1) Remove hexagon socket bolts (1) then remove cover (2).

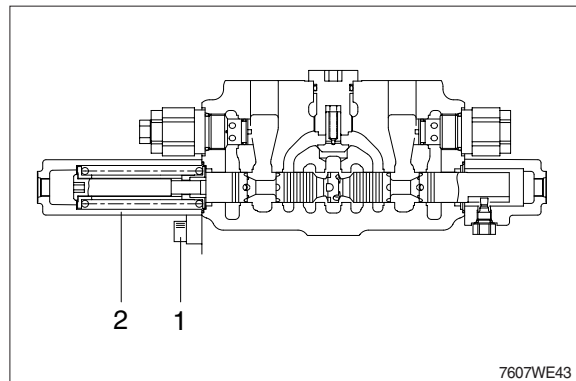
· Hexagon socket bolt

Width across flat : 8 mm

Tightening torque : 5.1 kgf · m (36.8 lbf · ft)

※ Reassembly

Install cover (2), after making sure that O-ring is placed on the edge of the housing hole.

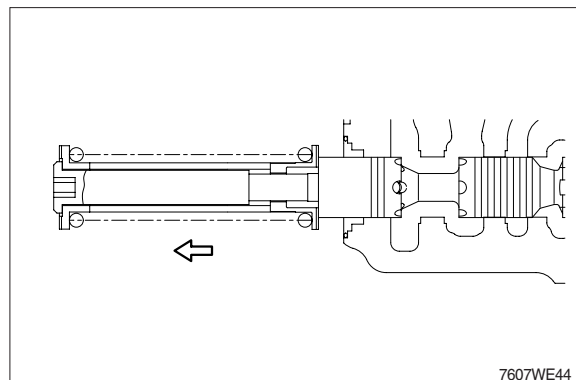


- (2) Pull out spool assembly from housing.

※ Do not pull out the spool all at once. Pull slowly while fitting in the housing hole.

※ Reassembly

Set the key way of the plunger to the stopper plug of the cover.



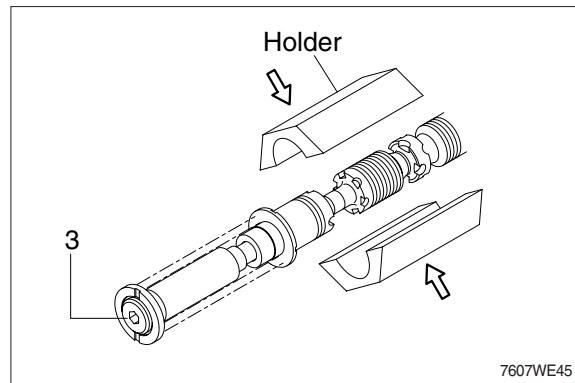
- (3) Set the spool between holders and loosen plunger cap (3) by using vise.

- Plunger cap

Width across flat : 8 mm

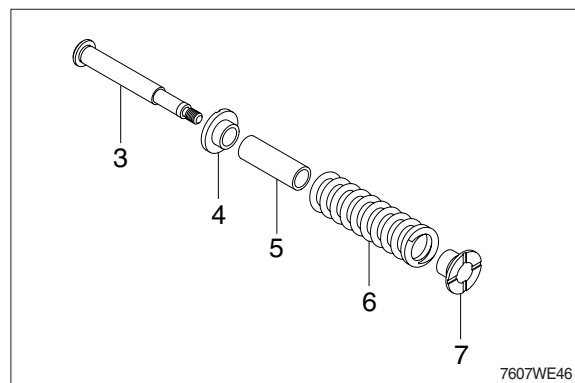
Tightening torque : 6.1 kgf · m (44.2 lbf · ft)

- ※ Set the spool between holders and clamp them by a vise after degreasing the spool and holders as a special tool.



- (4) Remove the plunger cap (3), spring guide (4), spring (6), sleeve (5) and spring guide (7).

- ※ Spring is different from the other section spring.



- (5) Remove hexagon socket bolts (9) then remove cover (10) after remove plug (8).

- Plug (8)

Width across flat : 19 mm

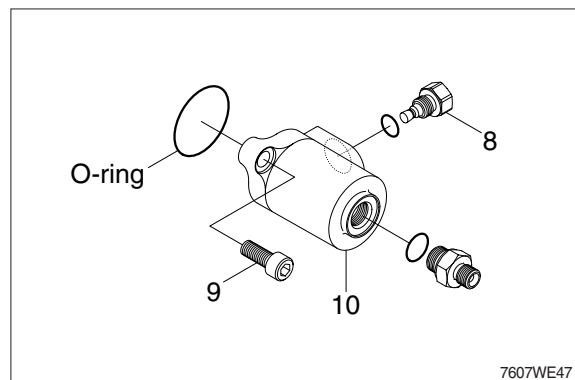
Tightening torque : 8.2 kgf · m (59.0 lbf · ft)

- Hexagon socket bolt (9)

Width across flat : 8 mm

Tightening torque : 5.1 kgf · m (36.8 lbf · ft)

- ※ Confirm that O-ring is put to end face of housing.



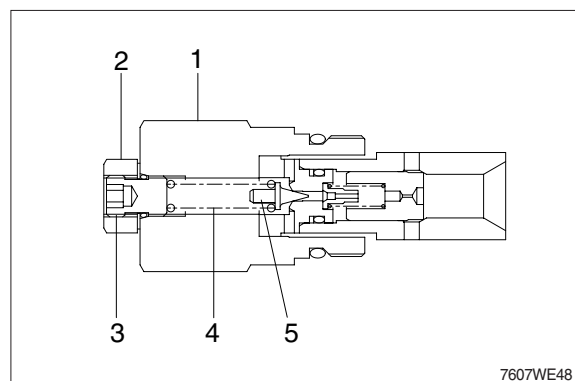
## 8) MAIN RELIEF VALVE

- (1) Loosen cap (1) and remove the main relief cartridge from the body.

- Cap (1)

Width across flat : 41 mm

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



(2) Loosen hex nut (2), and remove adjust screw (3), spring (4) and pilot poppet (5).

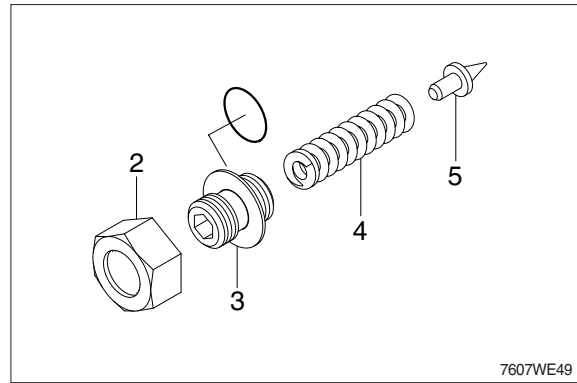
· Hex nut (2)

Width across flat : 19 mm

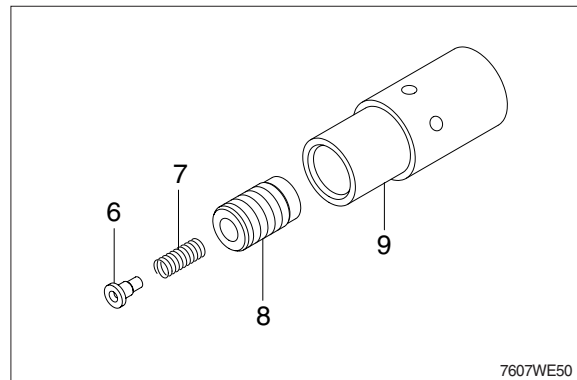
Tightening torque : 3.3 kgf · m (23.6 lbf · ft)

· Adjust screw (3)

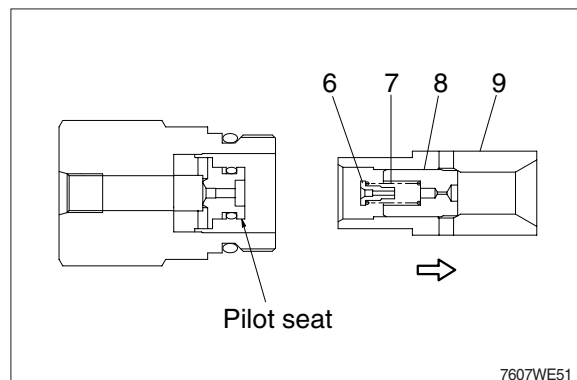
Width across flat : 22 mm



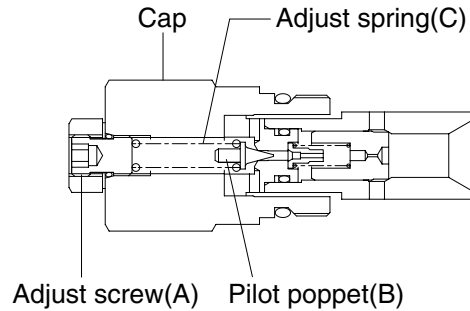
(3) Pull out sleeve (9), and remove orifice (6), spring (7) and main poppet (8).



※ Do not disassemble pilot seat, because the pilot seat is assembled with pressure.



## (5) RESETTING THE RELIEF PRESSURE



7607WE52

- ※ If setting pressure is mistaken, hydraulic unit may be destroyed and danger may be caused.  
Do not raise by any means more than the pressure decided for every model.

### Temporary assembly and setting

- ① Check the position of setting pressure 0 MPa.  
Set adjusting screw (A) temporarily in the position that pilot poppet (B) contacts to pilot seat.  
Then pressure adjusting spring (C) begins to be effective.
- ② Install the main relief valve which is set temporarily to main body.  
Tighten cap with torque wrench.
  - Tightning torque : 10.2 kgf · m (73.8 lbf · ft)

### To set pressure

- ① Attach exact pressure gauge at exit of pump or gauge port of control valve.
  - ② Operate the pump with rated speed.
  - ③ Operate plunger either boom or bucket at full stroke and check the pressure.
  - ④ Turn adjusting screw (A) (right turn) and set pressure with checking pressure gauge.
    - One quarter turn of adjusting screw (A) equals about 4 MPa.
    - Setting pressure 20.6 MPa (210 kgf/cm<sup>2</sup>) at 220 l /min.
    - Relief is very sensitivity. So, do not turn adjusting screw (A) suddenly.
  - ⑤ Tighten lock nut with torque wrench holding adjusting screw.
    - Tightning torque : 3.3 kgf · m (23.6 lbf · ft)
- ※ Operate plunger and check the setting pressure, again.

## 9) PORT RELIEF VALVE

- ※ Do not disassemble adjusting screw.  
It's impossible to readjust setting pressure exactly on the machine.

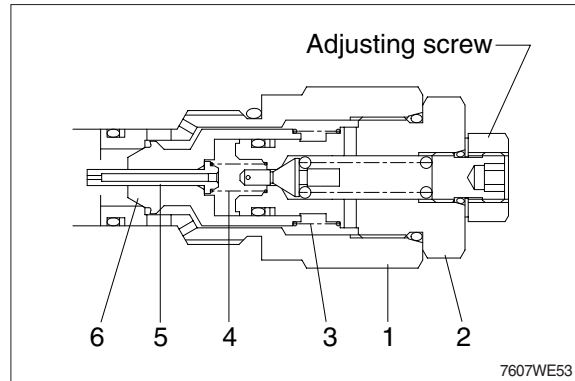
### (1) Loosen sleeve (1) and remove relief valve.

- Sleeve (1)

Width across flat : 41 mm

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

- ※ Install to original position.

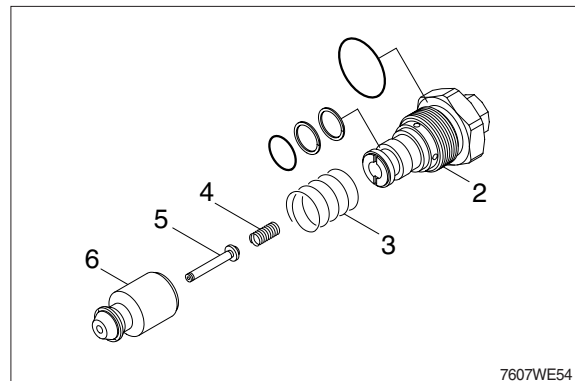


### (2) Loosen and remove relief seat sub-assembly (2). And remove spring (3),(4) piston (5), and main poppet (6).

- Relief seat (2)

Width across flat : 36 mm

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



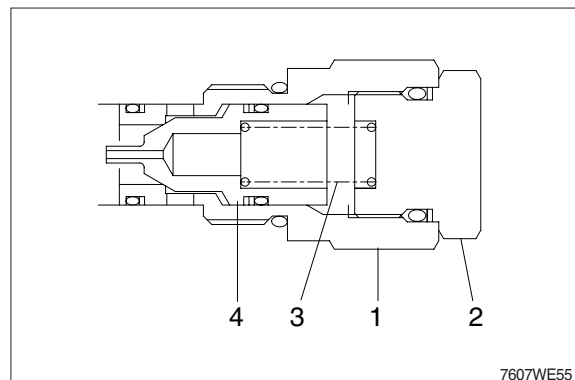
## 10) MAKE UP VALVE

### (1) Loosen sleeve (1) and remove relief valve.

- Sleeve (1)

Width across flat : 41 mm

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

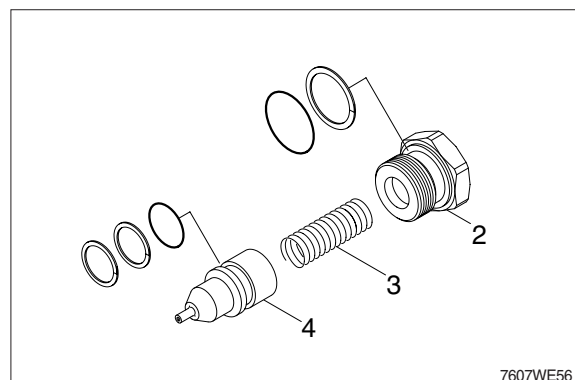


### (2) Remove cap (2) and pull out spring (3), poppet (4).

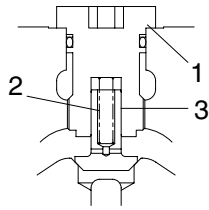
- Cap (2)

Width across flat : 36 mm

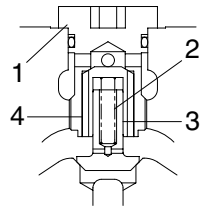
Tightening torque : 10.2 kgf · m  
(73.8 lbf · ft)



## 11) LOAD CHECK VALVE



- Bucket for 2-spools valve
- Aux for 3-spools valve
- Boom for 2 & 3-spools valve



- Bucket for 3-spools valve

7607WE57

Example for explanation : Bucket section of 3-spools valve (double check)

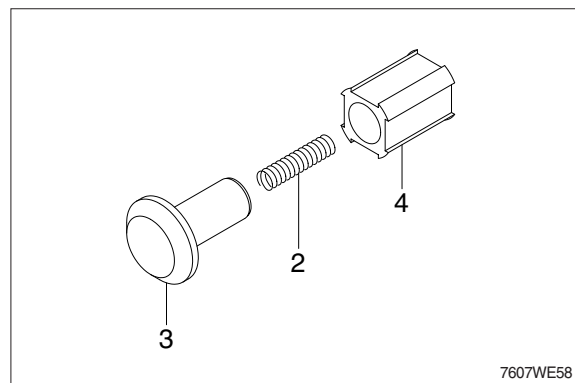
- (1) Remove cap (1) pull out spring (2), check (3) and (4)

- Cap (2)

Width across flat : 36 mm

Tightening torque : 25.5 kgf · m (184 lbf · ft)

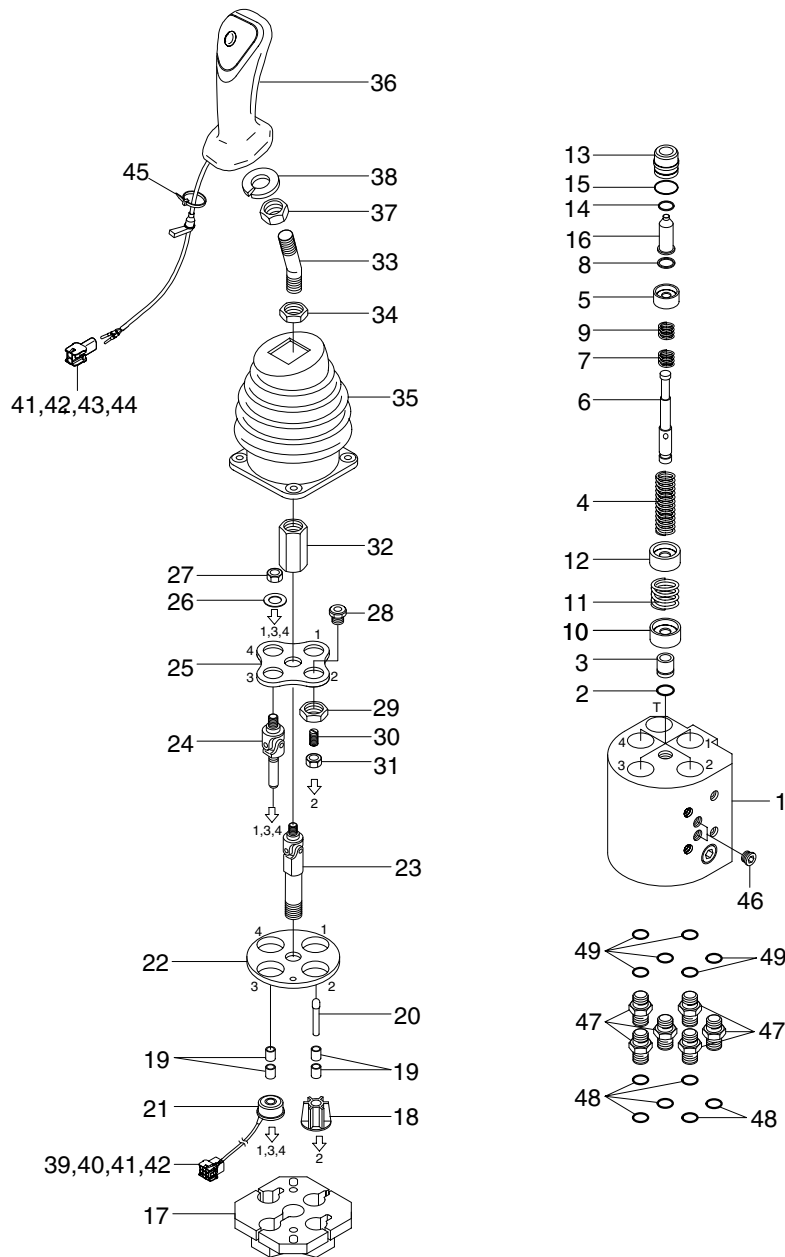
- ※ When reassembly ;  
Be careful for the back-up ring not to protrude.
- ※ Only Bucket section has double check.



7607WE58

### 3. REMOTE CONTROL VALVE

#### 1) STRUCTURE



7407S6WE48

1	Body	14	Rod seal	27	Nut	40	Rear holder
2	O-ring	15	O-ring	28	Plug	41	Terminal
3	Plug	16	Push rod	29	Nut	42	Seal wire
4	Spring	17	Plate	30	Set screw	43	Housing
5	Spring seat	18	Rod stopper	31	Nut	44	Rear holder
6	Spool	19	Bushing	32	Nut	45	Clip band
7	Spring seat	20	Rod	33	Handle bar	46	Plug
8	Stopper	21	Magnet	34	Nut	47	Connector
9	Spring	22	Plate	35	Boot	48	O-ring
10	Spring seat	23	Joint assy	36	Handle assy	49	O-ring
11	Spring	24	Joint assy	37	Nut		
12	Spring seat	25	Plate	38	Spring washer		
13	Plug	26	Washer	39	Housing		



## 2) DISASSEMBLY

(1) Remove the boot (35) and loosen nut (34).

- Tool : spanner 19 mm



7607BRCV01



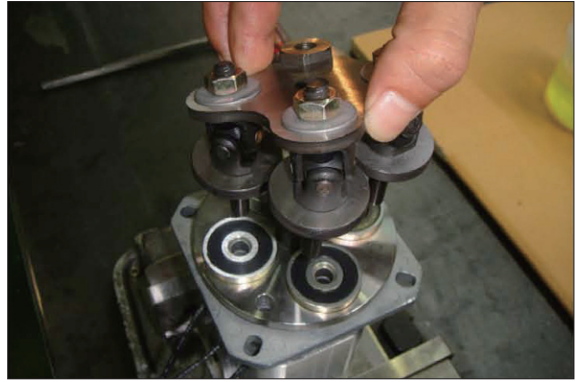
7607BRCV02

(2) Remove nut (32).



7607BRCV03

(3) Disassemble plate kit.



7607BRCV04

(4) Remove rod (20).



7607BRCV05

(5) Remove joint assembly (23).

· Tool : spanner 17 mm



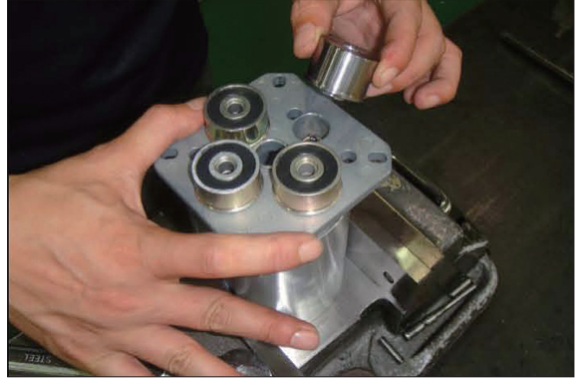
7607BRCV06

(6) Disassemble plate (22).



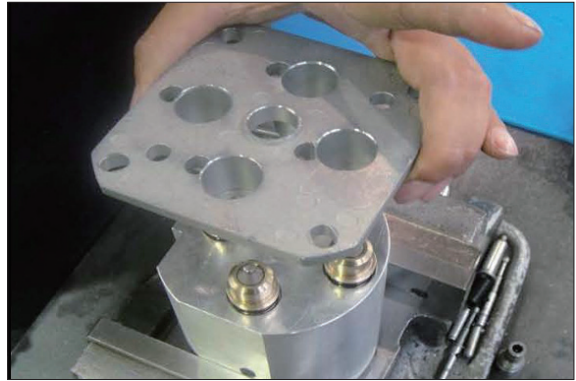
7607BRCV07

(7) Disassemble magnet (21) and rod stopper (18).



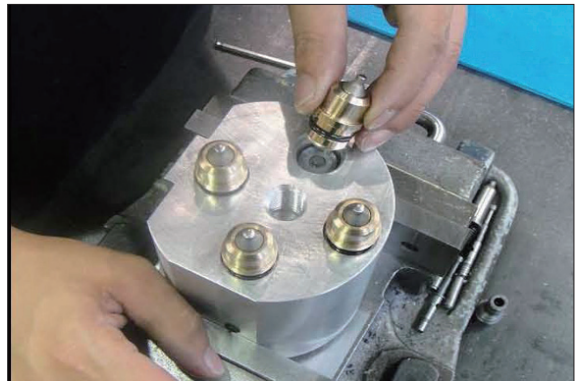
7607BRCV08

(8) Disassemble plate (17).



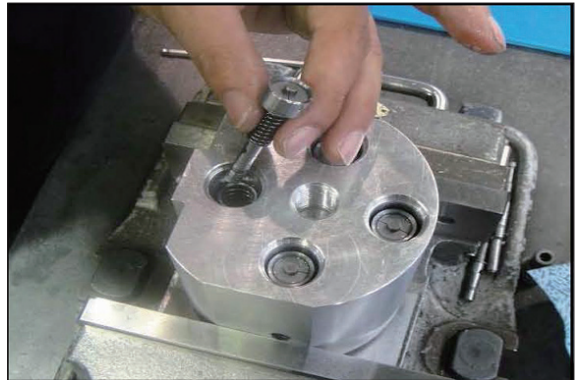
7607BRCV09

(9) Disassemble plug kit.



7607BRCV10

(10) Disassemble spring (4) and spool kit.



7607BRCV11

(11) Disassemble plug (2).

- Tool : wrench 10 mm



7607BRCV12

### 3) ASSEMBLY

- (1) Coat oil on O-ring and mount plug (3) into body assembly (1).



7607BRCV13

- (2) Tighten the plug (3).

- Tool : wrench 10 mm
- Tightening torque (M14) :  
 $30 \pm 3 \text{ kgf} \cdot \text{m}$  ( $217 \pm 21.7 \text{ lbf} \cdot \text{ft}$ )



7607BRCV14

- (3) Assemble spring (4).



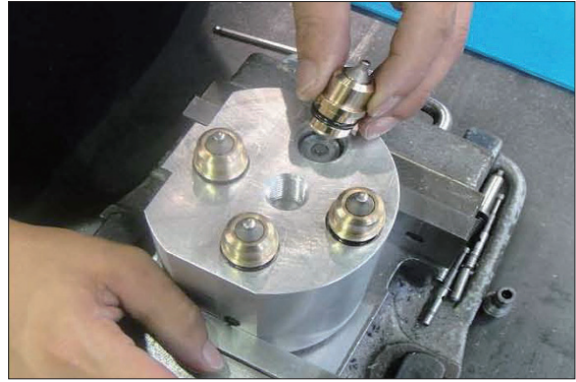
7607BRCV15

- (4) Assemble spool kit.



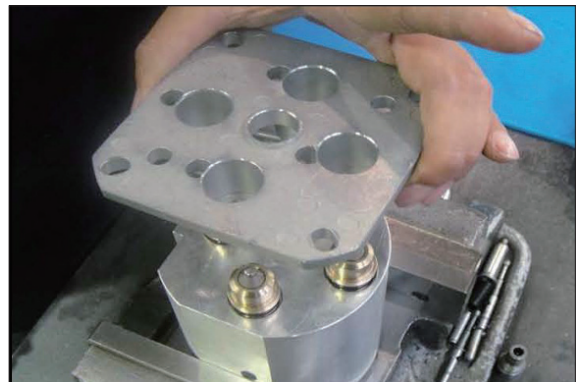
7607BRCV16

(5) Assemble plug kit.



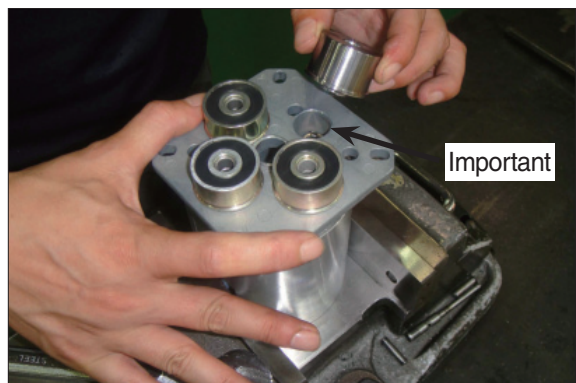
7607BRCV17

(6) Assemble plate (17).



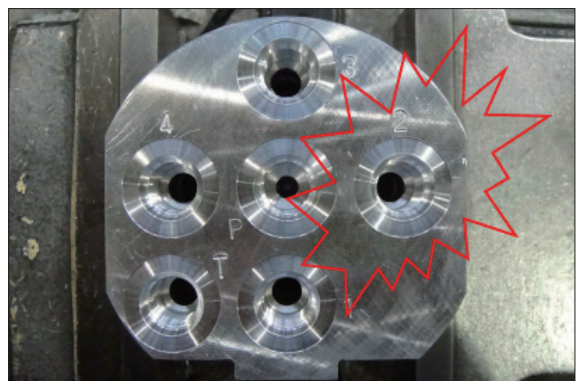
7607BRCV09

(7) Assemble magnet (21) at port 1, 3 and 4.  
Assemble rod stopper (18) at port 2.



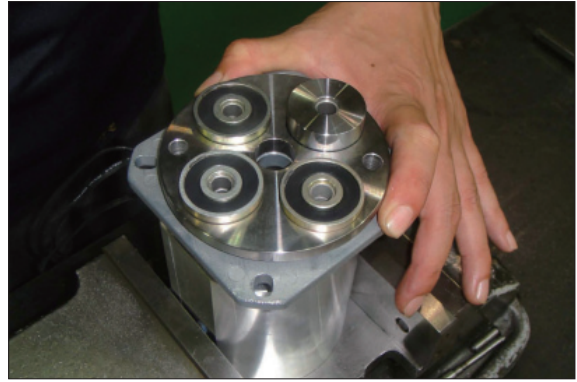
7607BRCV19

(8) Confirm port 2 on the bottom of the body.



7607BRCV20

(9) Assemble plate (22).



7607BRCV21

(10) Assemble joint assembly (23) and put grease on joint pin lightly.

- Tools : spanner 17 mm
- Tightening torque (M16) :  
 $45 \pm 4.5 \text{ kgf} \cdot \text{m}$  ( $325 \pm 32.5 \text{ lbf} \cdot \text{ft}$ )



7607BRCV22



7607BRCV23

(11) Assemble rod (20).



7607BRCV24

(12) Assemble plate kit.

Put a bit of grease on rod (20) and Joint (24).



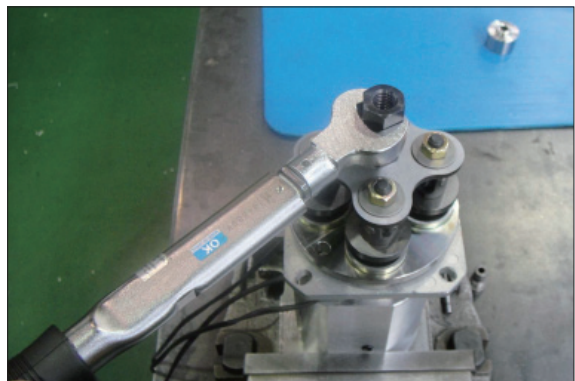
7607BRCV04

(13) Assemble nut (32).

- Tool : spanner 17 mm
- Tightening torque (M12) :  
 $40 \pm 4 \text{ kgf} \cdot \text{m}$  ( $289 \pm 28.9 \text{ lbf} \cdot \text{ft}$ )



7607BRCV03



7607BRCV02



(14) Assemble nut (34).

- Tool : spanner 19 mm
- Tightening torque (M12) :  
 $40 \pm 4 \text{ kgf} \cdot \text{m}$  ( $28 \pm 28.9 \text{ lbf} \cdot \text{ft}$ )



7607BRCV01

(15) Assemble the boot (35).



7607BRCV25