## 1. REMOVAL AND INSTALL

### 1) REMOVAL


(1) Swing the work equipment 90° and lower it completely to the ground.

(2) Operate the control levers and pedals several times to release the remaining pressure in the hydraulic piping.

(3) Loosen the breather slowly to release the pressure inside the hydraulic tank.

⚠ Escaping fluid under pressure can penetrate the skin causing serious injury.

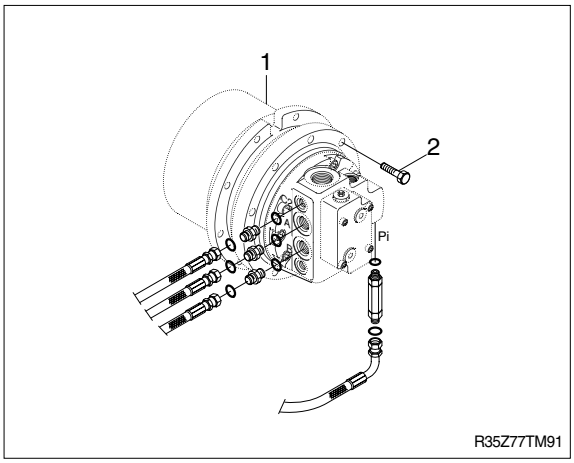
※ When pipes and hoses are disconnected, the oil inside the piping will flow out, so catch it in oil pan.

(4) Remove the track shoe assembly.
For details, see **removal of track shoe assembly**.

(5) Remove the cover.

(6) Remove the hose.

※ Fit blind plugs to the disconnected hoses.




(7) Remove the bolts and the sprocket.

(8) Sling travel device assembly(1).

(9) Remove the mounting bolts(2), then remove the travel device assembly.
· Weight : 80kg(180lb)

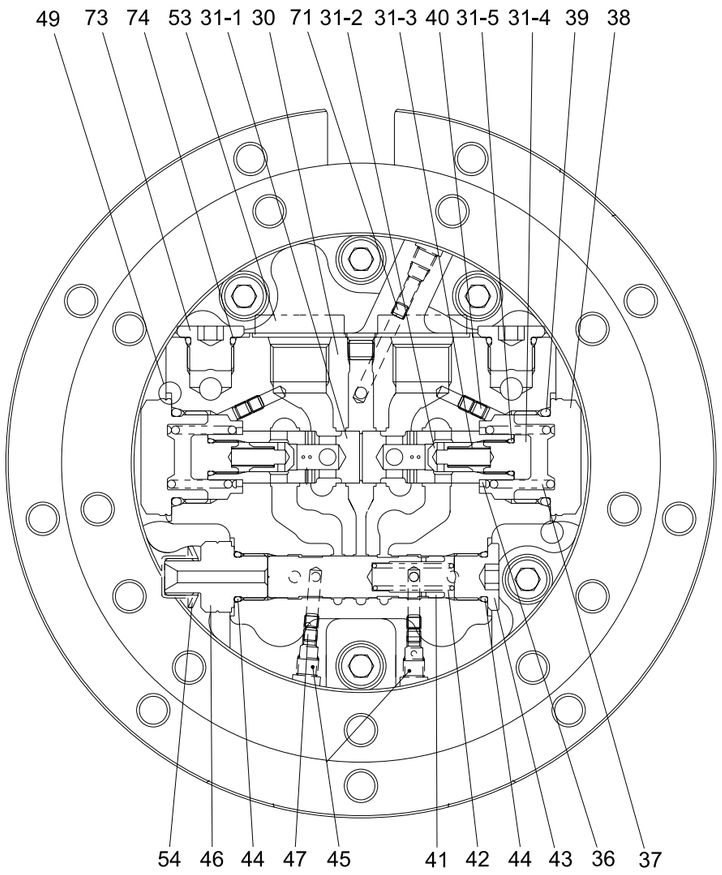
### 2) INSTALL

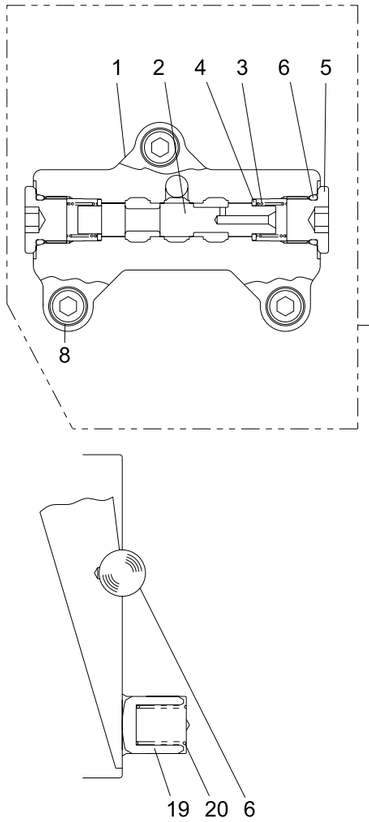
(1) Carry out installation in the reverse order to removal.

(2) Bleed the air from the travel motor.
① Remove the air vent plug.
② Pour in hydraulic oil until it overflows from the port.
③ Tighten plug lightly.
④ Start the engine, run at low idling, and check oil come out from plug.
⑤ Tighten plug fully.

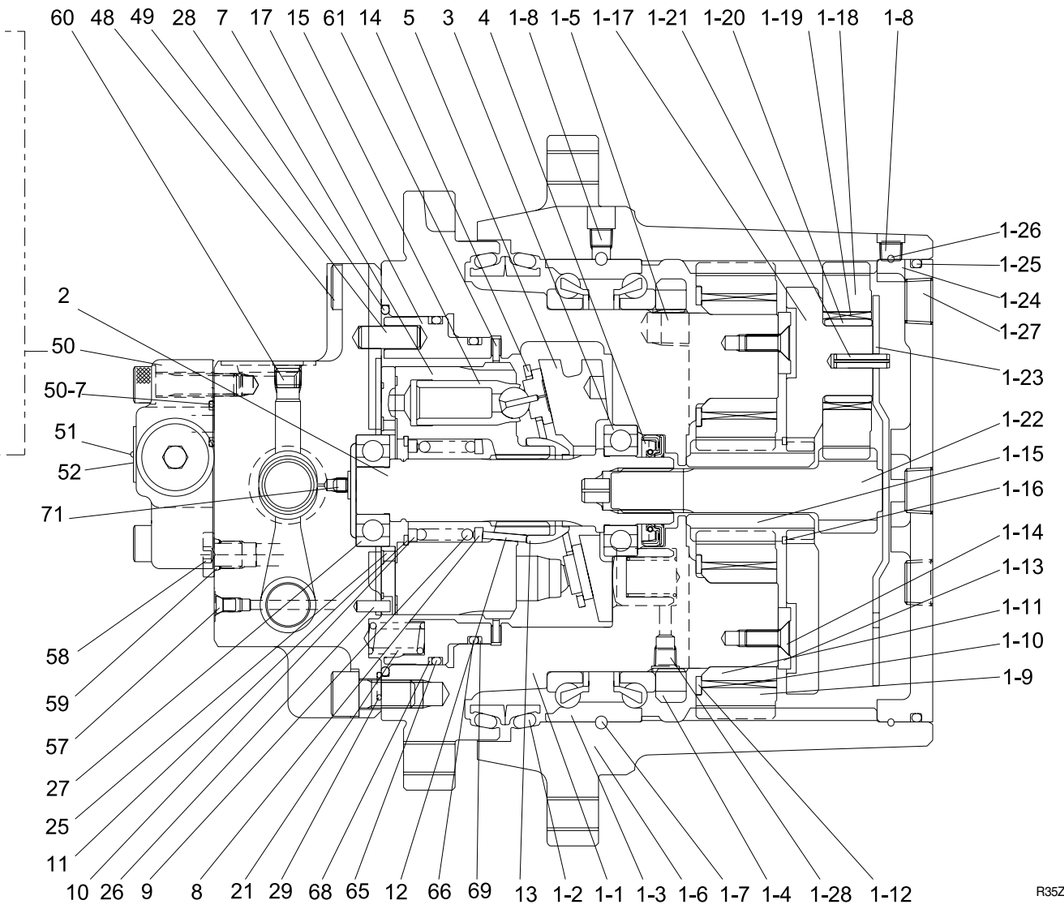
(3) Confirm the hydraulic oil level and check the hydraulic oil leak or not.

## 2) STRUCTURE




DETAIL OF 2 SPEED
LEAN TURNING PORTION




R35Z72TM01

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Gear box | 1-17 | Holder | 5 | Swash plate | 27 | Ball bearing |
| 1-1 | Flange holder | 1-18 | Planetary gear (A) | 6 | Steel ball | 28 | O-ring |
| 1-2 | Floating seal | 1-19 | Needle bearing | 7 | Cylinder block | 29 | O-ring |
| 1-3 | Angular bearing | 1-20 | Inner race | 8 | Color | 30 | Base plate |
| 1-4 | Ring nut | 1-21 | Spring pin | 9 | Spring | 31 | Plunger assy |
| 1-5 | Plug | 1-22 | Drive gear | 10 | Washer | 31-1 | Plunger |
| 1-6 | Housing | 1-23 | Thrust plate (1.8 t) | 11 | Snap ring | 31-2 | Check valve |
| 1-7 | Steel ball | 1-23 | Thrust plate (2.3 t) | 12 | Pin | 31-3 | Spring |
| 1-8 | Plug | 1-23 | Thrust plate (2.8 t) | 13 | Holder | 31-4 | Plug |
| 1-9 | Planetary gear B | 1-24 | Cover | 14 | Retainer plate | 31-5 | O-ring |
| 1-10 | Needle bearing | 1-25 | O-ring | 15 | Piston assy | 36 | Spring seat |
| 1-11 | Collar | 1-26 | Wire | 17 | Brake piston | 37 | Spring |
| 1-12 | Thrust washer | 1-27 | Plug | 19 | Piston assy | 38 | Cap |
| 1-13 | Thrust plate | 1-28 | Plug | 20 | Spring | 39 | O-ring |
| 1-14 | Screw | 2 | Shaft sub assy | 21 | Spring | 40 | Orifice |
| 1-15 | Sun gear | 3 | Ball bearing | 25 | Valve plate | 41 | Spool |
| 1-16 | Snap ring | 4 | Oil seal | 26 | Pin | 42 | Spring |

| | | | | | |
|---|---|---|---|---|---|
| 43 | Plug | 52 | Drive screw | 66 | O-ring |
| 44 | O-ring | 55 | Plug | 68 | Backup ring |
| 45 | Plug | 57 | O-ring | 69 | Backup ring |
| 46 | Plug | 58 | Plug | 71 | Spring |
| 47 | Orifice | 59 | Plug | 73 | Plug |
| 48 | Socket head bolt | 60 | Brake piston | 74 | O-ring |
| 49 | Pin | 61 | Disc | | |
| 50 | Valve assy | 62 | Spring | | |
| 50-1 | Valve body | 65 | O-ring | | |
| 50-2 | Spool | | | | |
| 50-3 | Spring | | | | |
| 50-4 | Spring seat | | | | |
| 50-5 | Plug | | | | |
| 50-6 | O-ring | | | | |
| 50-7 | O-ring | | | | |
| 50-8 | Socket head bolt | | | | |
| 51 | Name plate | | | | |

## 3) MAINTENANCE INSTRUCTION

### (1) Tools for disassembly and reassembly

| No. | Parts name | | Applicable components or parts |
|---|---|---|---|
| 1 | Torque wrench (Preset type) | (230) | Plug (1-5), (1-8), (45), (58), (60), Screw (1-14)<br>Orifice (40), (47), (62)<br>Socket head bolt (50-7), (50-8) |
| 2 | | (450) | Socket head bolt (48)<br>Plug (1-27), (31.4), (43), (46), (50-4), (50-5) |
| 3 | | (1800) | Housing (1-6), Ring nut (1-4)<br>Cap (38) |
| 4 | Hexagon bit for torque wrench | Width across flats 2.0 | Orifice (40) |
| 5 | | Width across flats 2.5 | Orifice (47), (62) |
| 6 | | Width across flats 4.0 | Plug (45), Screw (1-14) |
| 7 | | Width across flats 5.0 | Plug (1-8), (31-4) |
| 8 | | Width across flats 6.0 | Socket head bolt (50-7), (50-8)<br>Plug (1-5), (1-27), (31-4), (43), (58), (60)<br>Socket head bolt (48) |
| 9 | | Width across flats 8.0 | Plug (1-5), (50-4), (50-5), Housing (1-6) |
| 10 | Socket for socket wrench | Width across flats 10.0 | Socket head bolt (48) |
| 11 | | Width across flats 22.0 | Plug (46) |
| 12 | | Width across flats 36.0 | Cap (38) |
| 13 | Screw driver | | Floating seal (1-2)<br>Wire (1-26), Base plate (30)<br>Oil seal (4) |
| 14 | Hammer | | Angular bearing (1-3)<br>Plug (1-5), Steel ball (1-7)<br>Shaft (2), Oil seal (4)<br>Pin (26) |
| 15 | Plastic hammer | | Base plate (30), Cover (1-24) |
| 16 | Cutting pliers | | Wire (1-26) |
| 17 | Snap ring pliers | | Snap ring (11) |
| 18 | Punch | | Plug (1-5) |

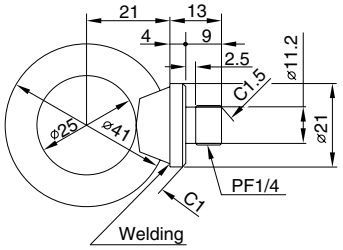
### (2) Special Tools

· Table

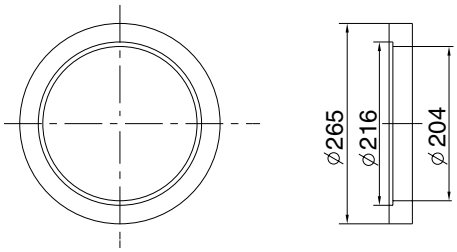
| No. | Parts name | Applicable components or parts |
|---|---|---|
| S-1 | Pin Dia. 5.5×30mm | Plug (31-4) |
| S-2 | Eyebolt PF 1/4 | Cover (1-24), Wire (1-26) |
| S-3 | Round bar dia. 20×1000mm | Cover (1-24), Wire (1-26) |
| S-4 | Piano wire dia. 0.2×700mm | Steel ball (1-7) |
| S-5 | Housing disassembly jig | Housing (1-6) |
| S-6 | Ring nut tightener | Ring nut (1-4) |
| S-7 | Round bar dia. 10×150mm | Angular bearing (1-3), Shaft (2) |
| S-8 | Ball bearing disassembly jig | Ball bearing (3) |
| S-9 | Floating seal assembly jig | Floating seal (1-2) |
| S-10 | Angular bearing press fitting jig | Angular bearing (1-3) |
| S-11 | Flange holder press fitting jig | Flange holder (1-1) |
| S-12 | Oil seal press fitting jig | Oil seal (4) |
| S-13 | Ball bearing press fitting jig | Shaft (2), Ball bearing (3) |
| S-14 | Shaft sub assembly press fitting jig | Shaft (2), Ball bearing (3) |
| S-15 | Snap ring assembly jig | Snap ring (11) |
| S-16 | Ball bearings press fitting jig | Ball bearing (27) |

※ Refer to page 7-67 for detail figure. (S1~S16)

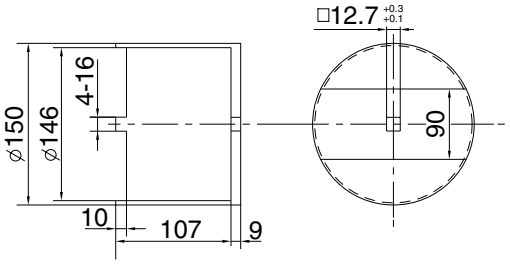
· Tools



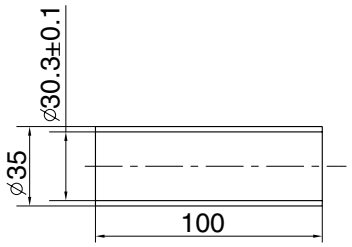

S-2 Eye bolt



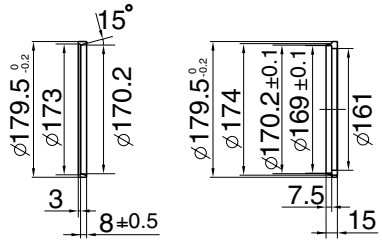

S-5 Housing disassembly



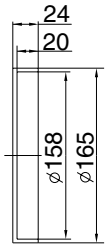

S-6 Ring nut tightener



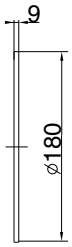

S-8 Ball bearing disassembly



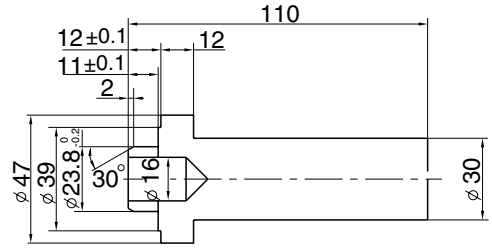

S-9 Floating seal assembly



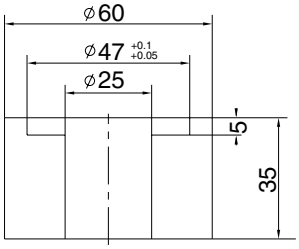

S-10 Angular bearing press fitting



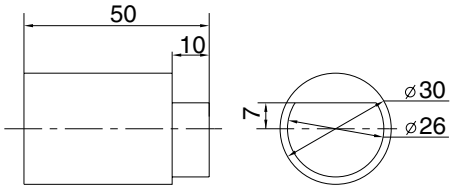

S-11 Flange holder press fitting



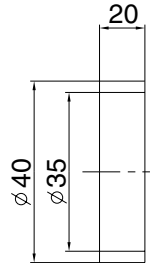

S-12 Oil seal press fitting




S-13 Ball bearing press fitting




S-15 Snap ring assembly




S-16 Ball bearing press fitting

## 2. DISASSEMBLY

### 1) GENERAL PRECAUTIONS

(1) Before disassembling the TM motors, check the items to be inspected and, for remedy against trouble, closely examine the nature of the trouble, so that the motor can be disassembled effectively.

(2) To disassemble the motor, use the disassembling procedures described in section 2-2, and select a clean place.

(3) Place a rubber or vinyl sheet or other such protective materials on your working bench to protect the surface of the motor to be serviced.

(4) During disassembly, give a match mark to the mating surfaces of each part.

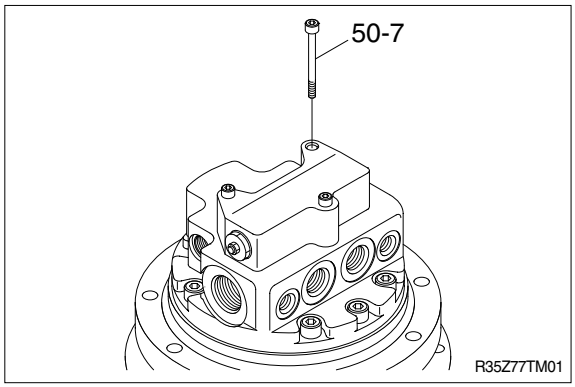
(5) Arrange removed parts in order so that they will not become damaged or missing during disassembly.

(6) Once seals have been disassembled, they should be replaced even if damage is not observed. Have replacement seals ready on hand before starting your disassembling job.

## 2) DISASSEMBLE TRAVEL MOTOR BY THE FOLLOWING PROCEDURE

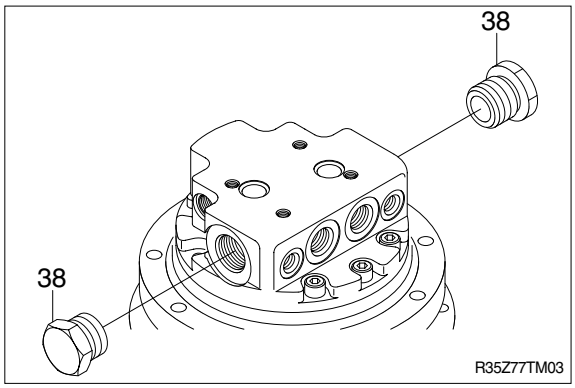
(1) Fix the motor with vise.
Loosen socket head bolt (50-7), (50-8) and remove valve assy (50).

· Tools required :
Torque wrench (No. 1)
Hexagonal bit for torque wrench (No. 7)

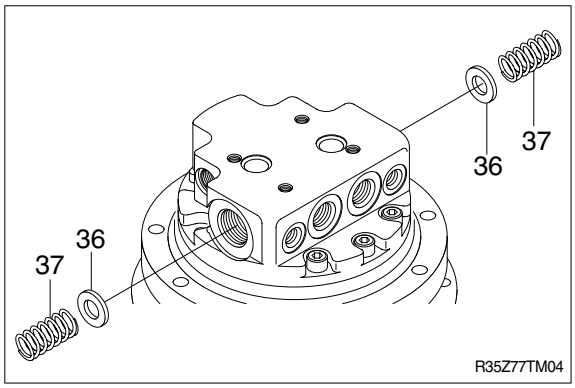



(2) Remove cap (38).

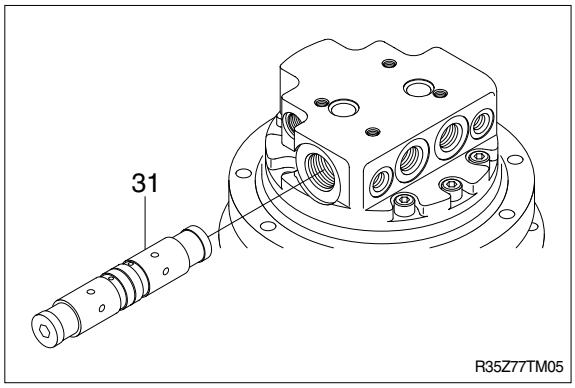
· Tools required :
Torque wrench (No. 3)
Socket for torque wrench (No. 12)




(3) Take out spring (37), spring seat (36).

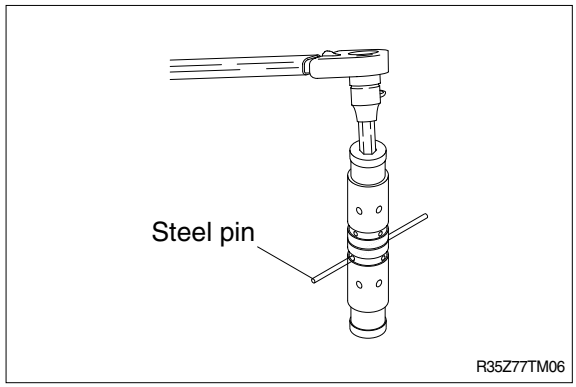



(4) Remove plunger sub assy (31) turning slowly.
Be careful not to damage around the plunger.

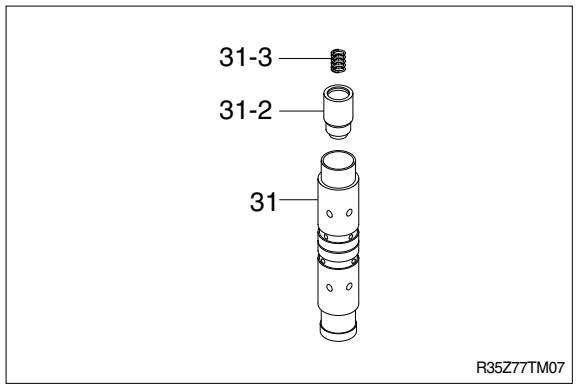


(5) Disassembly of plunger sub assy is not required when it operates normally.
Insert pin S-1, dia. 5.5 × 30, in the through hole dia.6 of the plunger sub assy, and fix it with vase.

· Tools required :
Torque wrench (No. 2)
Hexagonal bit for torque wrench (No. 8)
Pin (S-1)

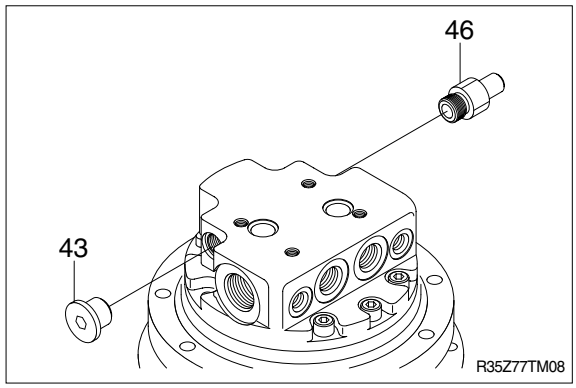



(6) Remove spring (31-3), check valve (31-2). And store the parts so that the respective parts make a set as it was when assembling again, taking care of the combination of the right and left check valves to the plunger.

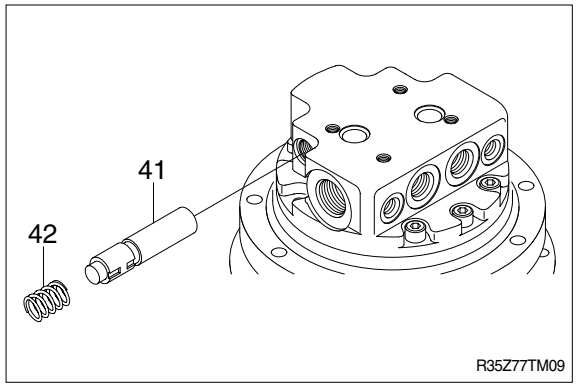



(7) Remove plugs (43), (46).

· Tools required :
Torque wrench (No. 2)
Hexagonal bit for torque wrench (No. 9)
Socket for torque wrench (No. 11)



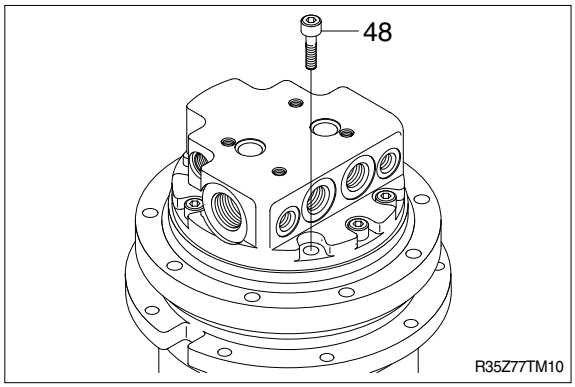

(8) Removing spring (42), spool assy (41). Be careful not to damage around the spool.



(9) Remove socket head bolt (48).

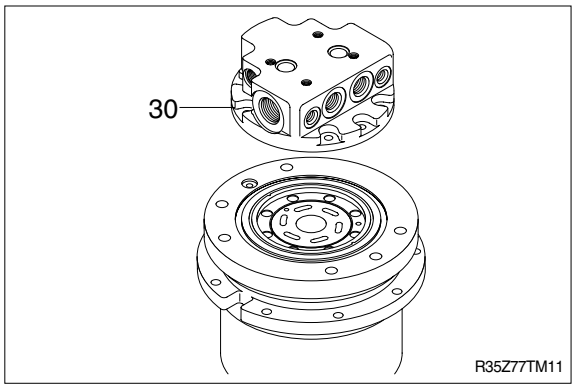
· Tools required :
Torque wrench (No. 3)
Hexagonal bit for torque wrench (No. 10)

※ **Points (with parking brake type)**
To disassemble the motor easily, socket head bolt (48) should be loosened evenly because base plate (30) lift up by the reactive force of springs (21), (32).

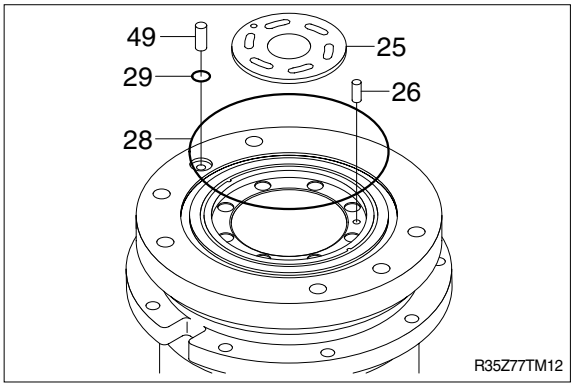



(10) Remove base plate (30).
Then, pay attention so that cylinder block (7) does not come out. When it is difficult to remove, strike it by use of plastic hammer. If it is more difficult to remove, remove it by lightly prying with screwdriver.

· Tools required :
Plastic hammer (No. 15)
Screwdriver (No. 13)

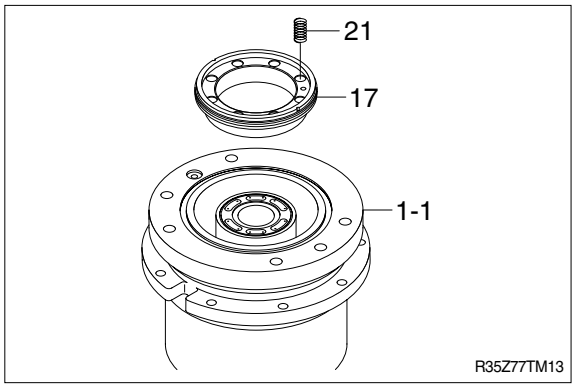



(11) With parking brake type.
Remove pin (26), (49), valve plate (25), O-rings (28, 29).

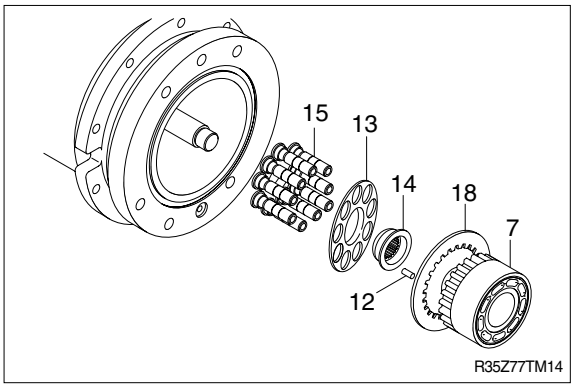



(12) This process is the only parking brake type.
Remove spring (21) and brake piston (17). Blow compressed air into parking brake releasing port (show the photograph with red circle) on flange holder(1-1).

※ Before working, put rag on all surface of brake piston because brake piston fly out and oil flies off when working.



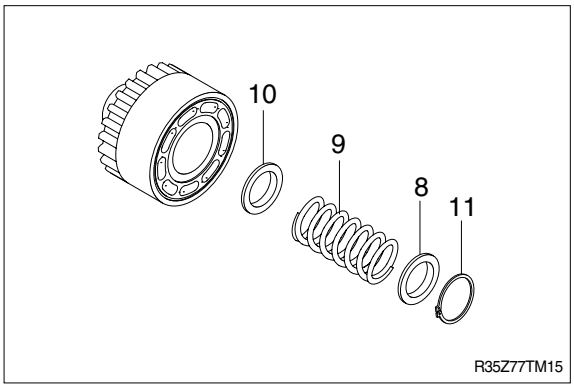
(13) Remove cylinder block sub assy (7), pin (12), retainer holder (13), retainer plate (14), piston sub assy (15). Be careful not to damage the sliding surface of the cylinder block.
Only parking brake type, remove disk plate (18)



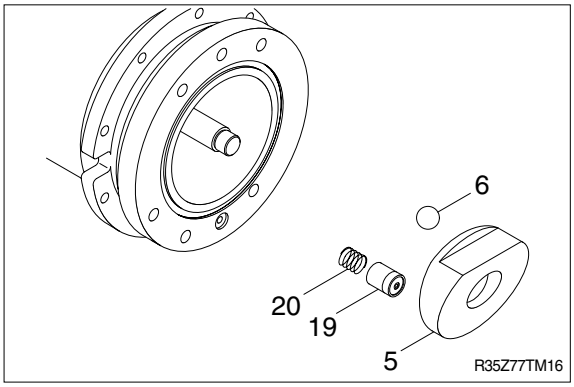

(14) Remove snap ring (11) by use of plier. Remove washer (8), spring seat (10) and spring (9). Be careful not to damage the sliding surface of the cylinder block.

- Tools required :
  Snap ring pliers (No. 17)

※ Pay attention not to pinch fingers by the inside spring when removing the snap ring.

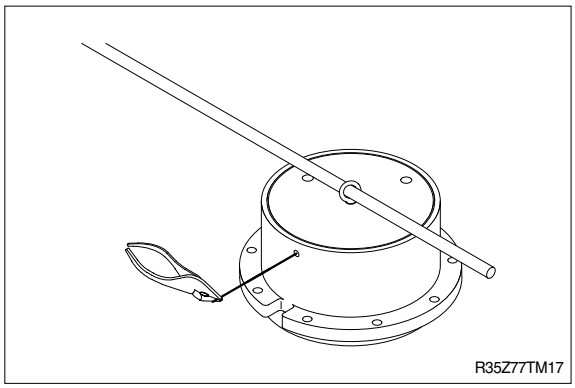



(15) Remove swash plate (5), steel ball (6), piston sub assy (19) and spring (20).



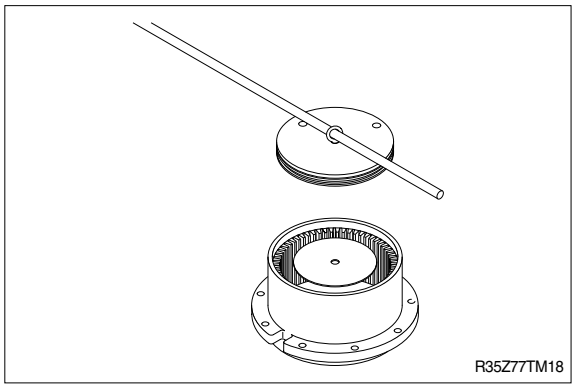
(16) Remove plugs (1-27), (1-8). Attach eyebolt (PF 1/4) to the threaded hole of plug (1-27) and insert pry-bar (length 1 [m]) in the eye hole, and turn the bar until wire (1-26) can be seen through the threaded hole of plug (1-8). Draw the wire outside when the wire end can be seen.

- Tools required :
  Torque wrench (No. 1, No. 2)
  Eyebolt PF 1/4 (S-2)
  Hexagonal bit for torque wrench (No. 7, No. 8)
  Round bar dia. 20 × 1000mm (S-3)
  Screw driver (No. 13), cutting pliers (No. 16)

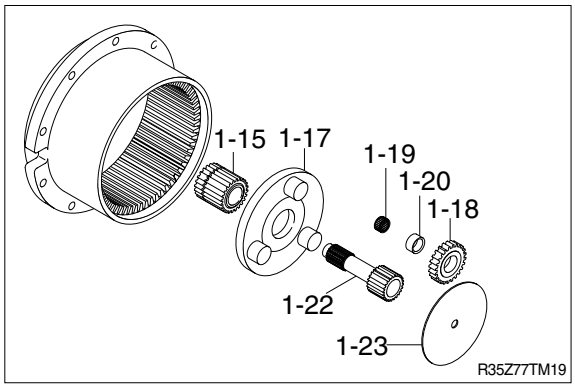



(17) Hook eyebolt and remove cover (1-24)

- Tools required :
  Eyebolt PF 1/4 (S-2)
  Round bar dia. 20 × 1000mm (S-3)



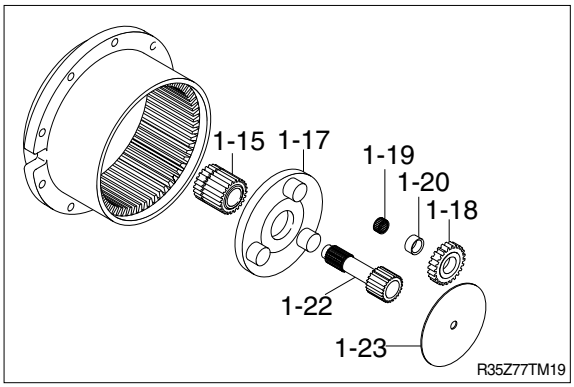

(18) Remove sun gear assy (1-15), holder (1-17), planetary gear A (1-18), needle bearing (1-19), inner race (1-20), drive gear (1-22) and thrust plate (1-23).



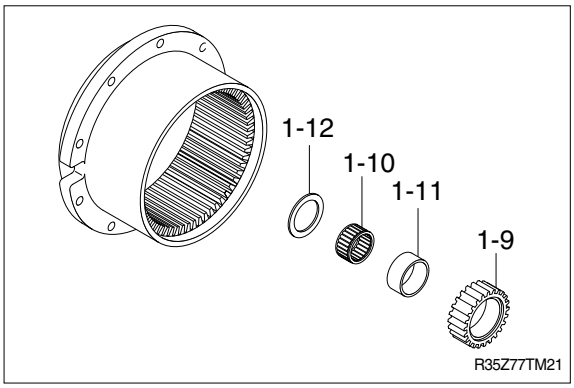
(19) Remove thrust plate (1-13) and screw (1-14).

· Tools required :
Torque wrench (No. 1)
Hexagonal bit for torque wrench (No. 6)

※ It is easy to remove the screw after heated fully by heater because screw (1-14) is applied loctite.

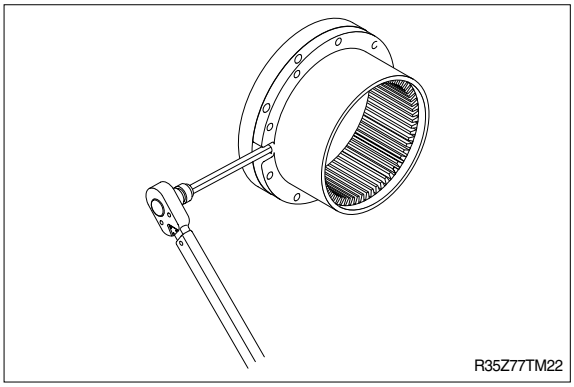



(20) Remove planetary gear B (1-9), needle bearing (1-10), inner race (1-11) and thrust washer (1-12).
Be careful not to damage the tooth surface of gear and the rolling section of the collar.




(21) Remove plug (1-8).

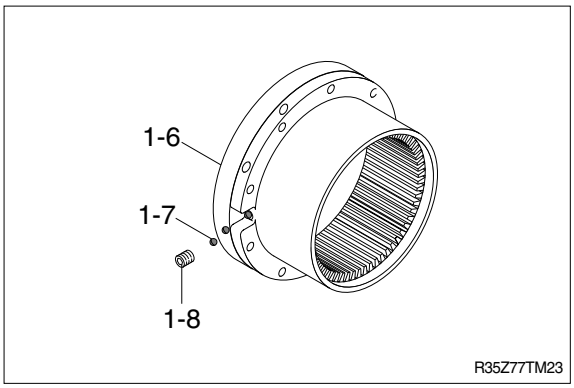
· Tools required :
Torque wrench (No. 1)
Hexagonal bit for torque wrench (No. 7)




(22) Take out steel balls (1-7) from the threaded hole of plug (1-8). After degreasing (thinner, white gasoline. etc), take out them by blowing air. Put piano wire through the threaded hole to be sure that all steel balls (1-7) are taken out.

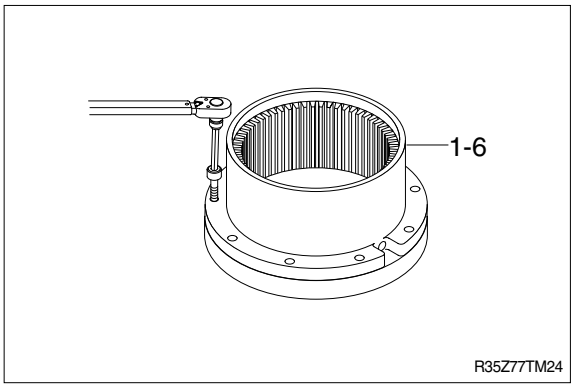
· Tools required :
Hammer (No. 14), piano wire (S-4)

※ When it is difficult to remove, take out steel balls (1-7) striking around housing (1-6) by hammer.



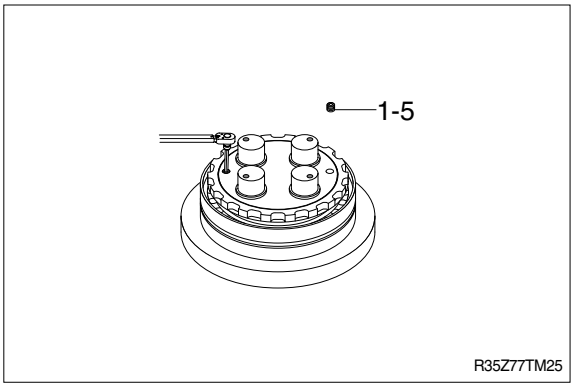
(23) Attach jig between flange holder (1-1) and housing (1-6), and tighten 3 bolts M14¡¿2.0 uniform from the housing side.

· Tools required :
Torque wrench (No. 3)
Hexagonal bit for torque wrench (No. 10)
Housing disassembly (S-5)




(24) Remove plug (1-5).

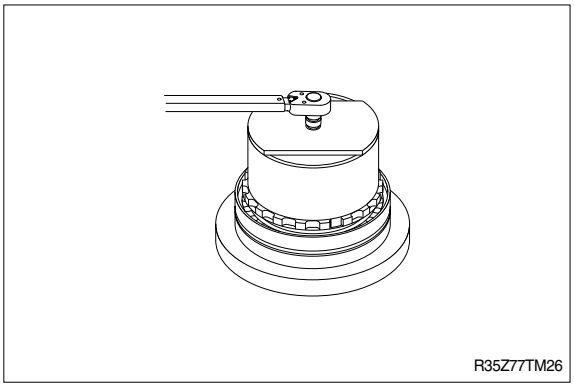
· Tools required :
Torque wrench (No. 1)
Hexagonal bit for torque wrench (No. 9)




(25) Removing ring nut (1-4).

· Tools required :
Torque wrench (No. 3)
Ring nut tightener (S-6)

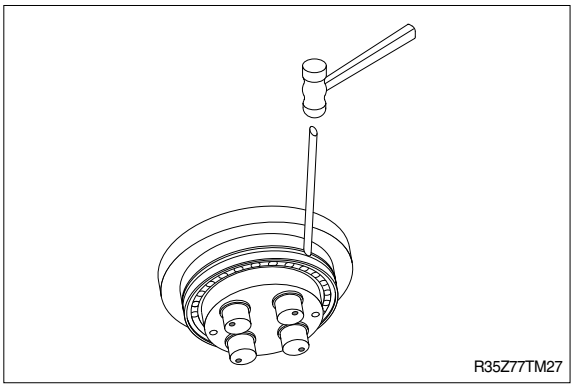
※ If fix them by vise, fix around of outside of flange holder absolutely.



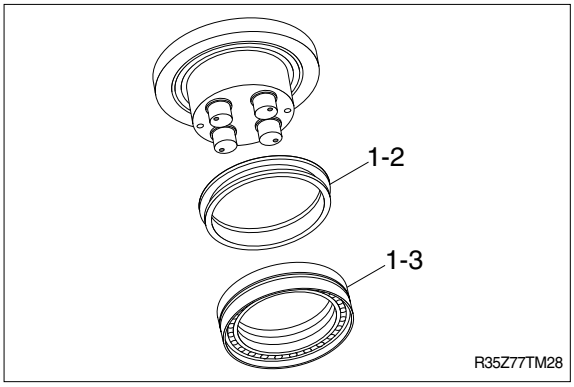

(26) Apply pry-bar to the groove for steel balls (1-7), and remove angular bearing (1-3) striking it by hammer.

· Tools required :
Hammer (No. 14)
Round bar dia. 10 × 150㎜ (S-7)

※ When removing, strike the groove turning. If strike the groove on one portion, angular bearing wouldn't be removed.



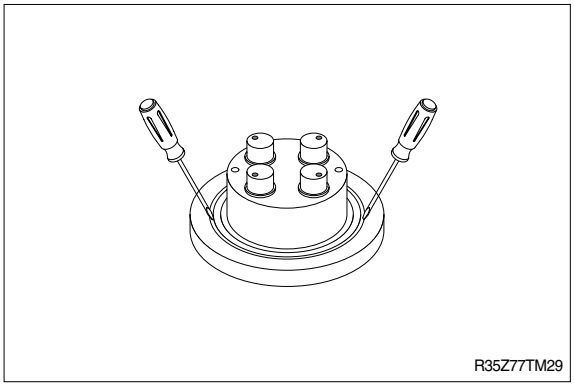
(27) Remove floating seal (1-2) and angular bearing (1-3).




(28) Remove other floating seal (1-2) by use of two drivers.

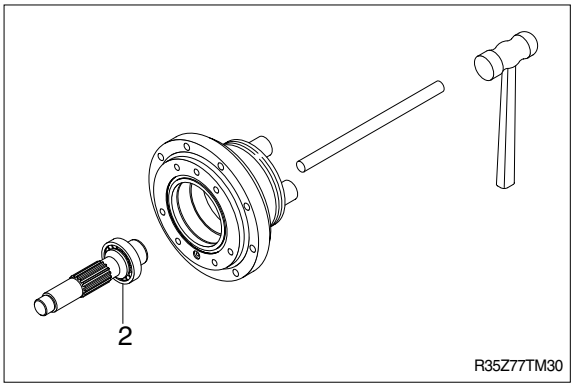
· Tools required :
Screw driver (No. 13)

※ Be careful not to damage the sliding surface of floating seal (1-2).



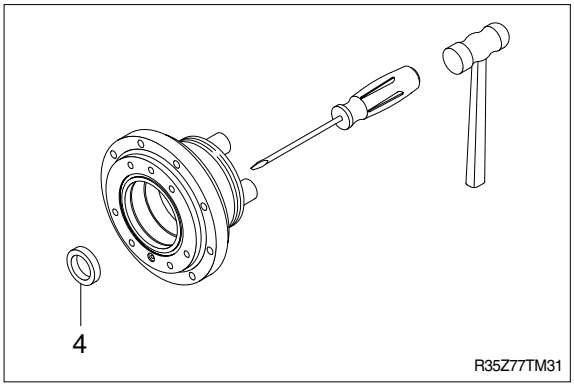

(29) Apply pre-bar to the hold of spline, and remove shaft (2) striking it by hammer.

· Tools required :
Screw driver (No. 12)
Round bar dia. 10 × 150㎜(S-7)




(30) Remove oil seal (4).

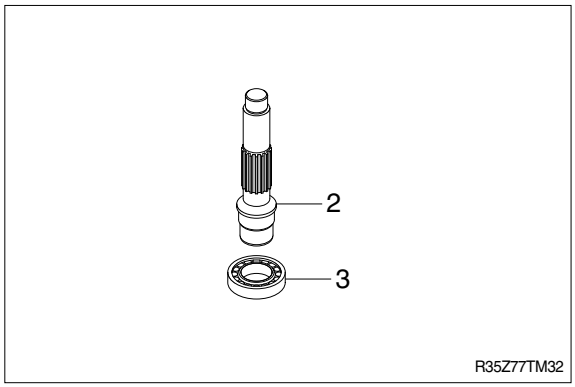
· Tools required :
Screw driver (No. 13)
Hammer (No. 14)



(31) Take out ball bearing (3) from shaft (2).

· Tools required :
Ball bearing disassembly jig (S-8)

(32) Completed.



## 3. REASSEMBLY

### 1) GENERAL PRECAUTIONS

(1) Reassemble in a work area that is clean and free from dust and grit.

(2) Handle parts with bare hands to keep them free or linty contaminants.

(3) Repair or replace the damage parts.
Each parts must be free of burrs its corners.

(4) Do not reuse O-rings, oil seal and floating seal that were removed in disassembly.
Provide the new parts.

(5) Wash all parts thoroughly in a suitable solvent.
Dry thoroughly with compressed air
Do not use the cloths.

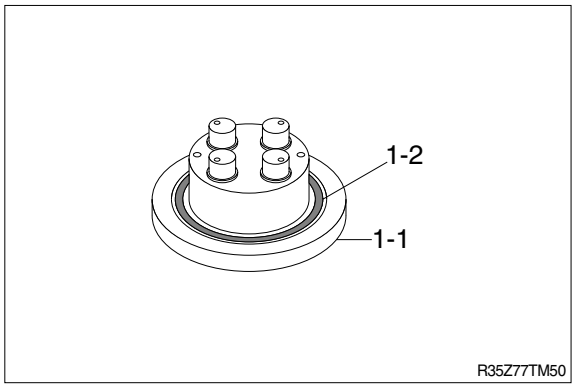
(6) When reassembling oil motor components of TM motor, be sure to coat the sliding parts of the motor and valve with fresh hydraulic oil.(NAS class 9 or above).

(7) Use a torque wrench to tighten bolts and plugs, to the torque specified as follows.

## 2) ASSEMBLE THE TRAVEL MOTOR BY THE FOLLOWING PROCEDURE

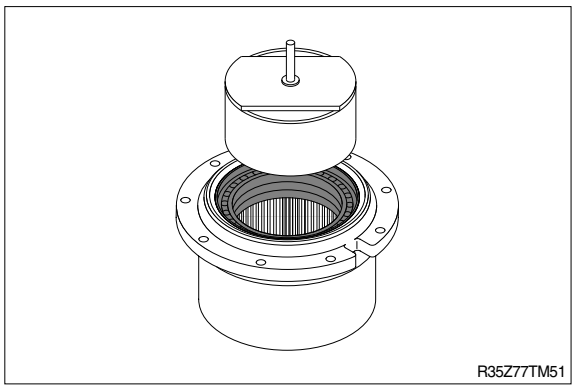
(1) Apply grease to floating seal (1-2) and install it on flange holder (1-1).

· Tools required :
Floating seal assembly jig (S-9)



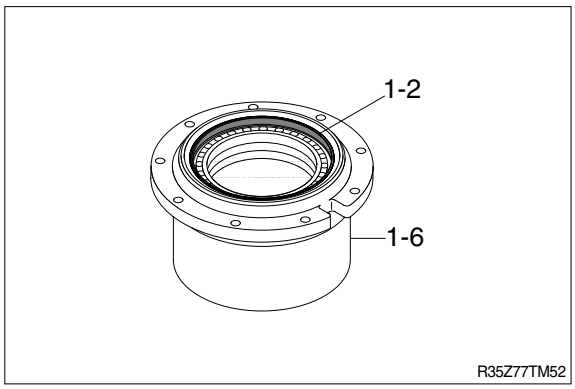

(2) Press fit angular bearings (1-3) to housing (1-6).

· Tools required :
Angular bearings press fitting jig (S-10)




(3) Apply grease to the second floating seal and place it on the concentric circle. Install it on housing (1-6).

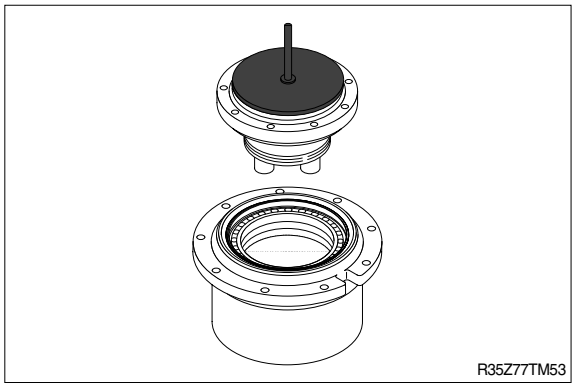
· Tools required :
Floating seal assembly jig (S-9)




(4) Apply lubricating oil on the sliding surface of floating seal after make the surface clean by rags.
Install flange holder (1-1) in housing (1-6).

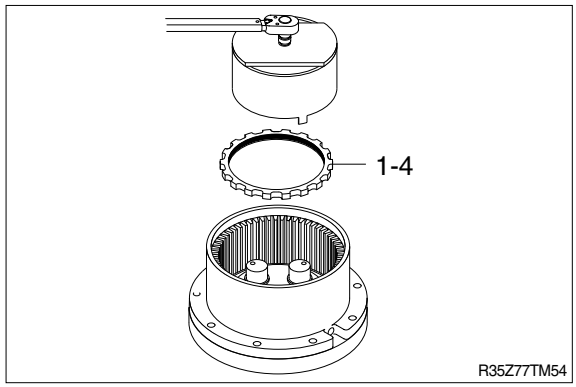
· Tools required :
Flange holder press fitting jig (S-11)

※ If there are foreign articles on the sliding surface of floating seal (1-2), it causes oil leak.



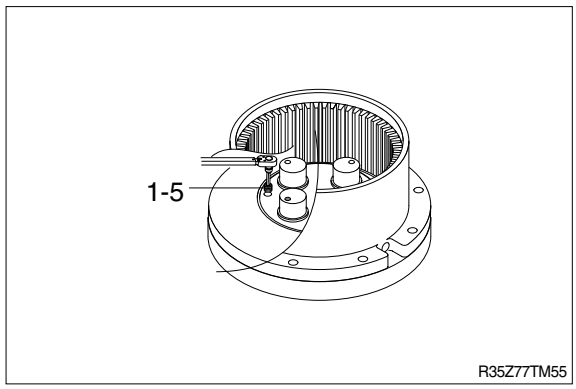
(5) Tighten angular bearing (1-3) with ring nut (1-4)

· Tools required :
Torque wrench (No. 3)
Ring nut tightener (S-6)
Tightening torque 23.9±1.0 kgf · m
(173±7.2 lbf · ft)



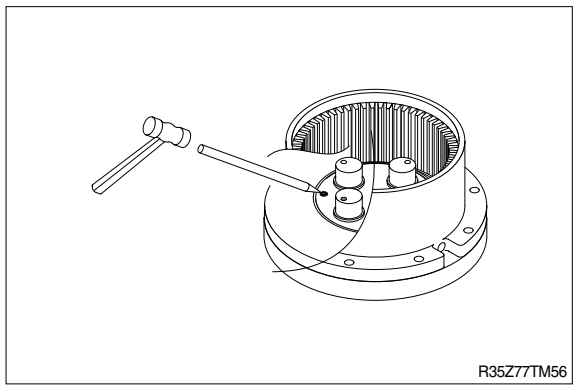

(6) Tighten plug (1-5).
The seal tape is not allowed to wrap for assembling of this plug.

· Tools required :
Torque wrench (No. 1)
Hexagonal bit for torque wrench (S-9)
Tightening torque 3.5±0.5 kgf · m
(25.2±3.6 lbf · ft)



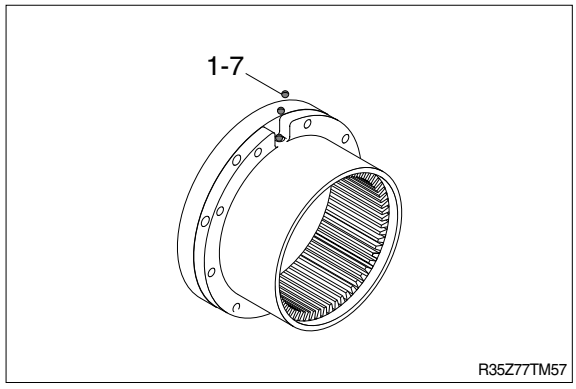

(7) Caulk plug (1-5) two positions with punch to lock.

· Tools required :
Hammer (No. 14)
Punch (No. 18)




(8) Place steel balls (1-7) (99 pcs) in.

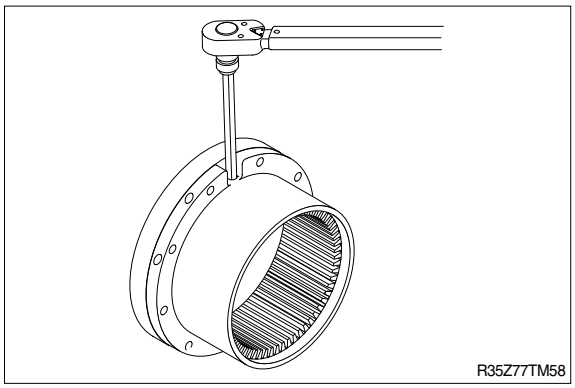
※ If it is difficult to place steel balls in, beat on the side of housing (1-6) by using of plastic hammer.



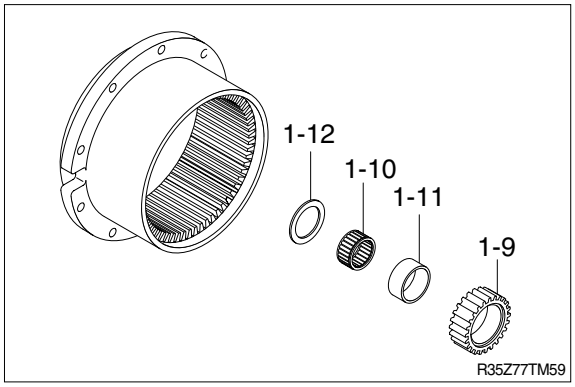
(9) Wrap plug (1-8) with seal tape, and tighten it.

· Tools required :
Torque wrench (No. 1)
Hexagonal bit for torque wrench (No. 7)
Tightening torque 0.8±0.1 kgf · m
(5.8±0.7 lbf · ft)

※ Tighten plug (1-8) until the head of plug is obscured against the surface of sprocket guide.

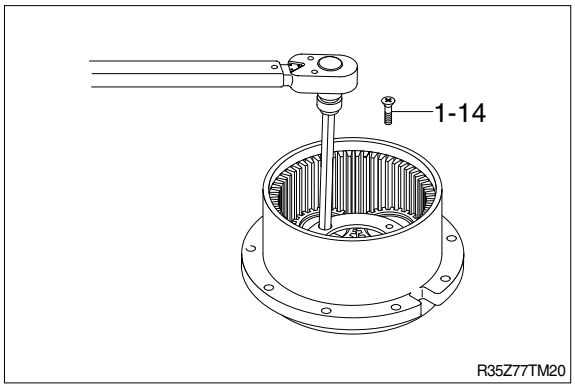



(10) Install planetary gear B (1-9), needle bearing (1-10), inner race (1-11) and thrust washer (1-12).

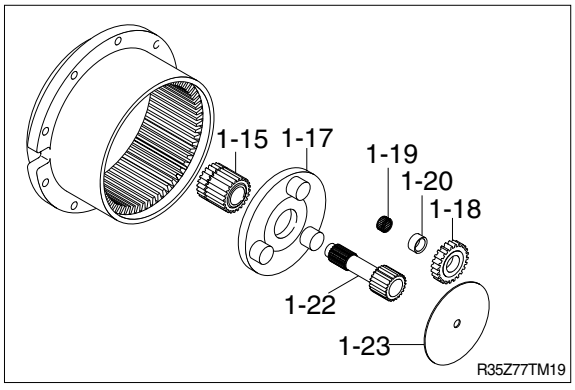



(11) Put thrust plate (1-13) on the trunnion section of flange holder, apply loctite #262 to screw (1-14) and tighten it.
Before applying the loctite, degrease the parts completely and us hardening accelerator.

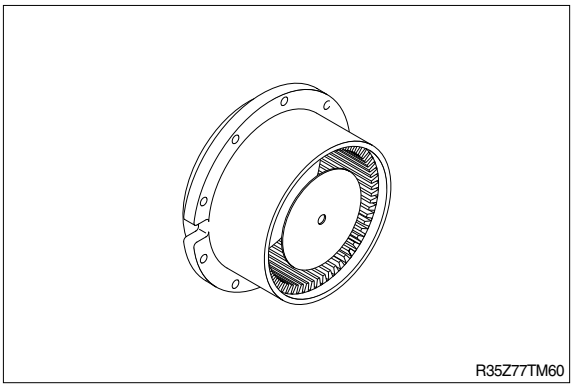
· Tools required :
Torque wrench (No. 1)
Hexagonal bit for torque wrench (No. 6)
Tightening torque 1.3±0.06 kgf · m
(9.4±0.4 lbf · ft)




(12) Install sun gear assy (1-15) with snap ring (1-16), holder (1-17) with inner race (1-20), planetary gear A (1-18), needle bearing (1-19) and drive gear (1-22).

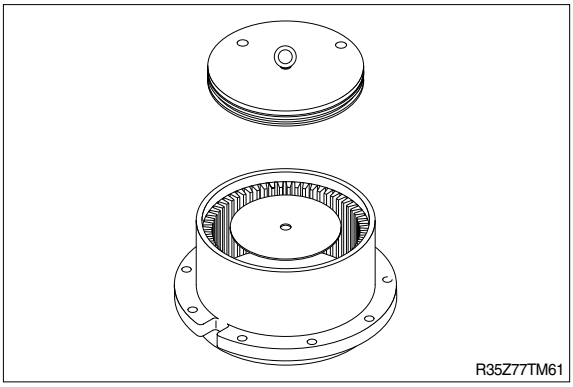


(13) Install thrust plate (1-23).



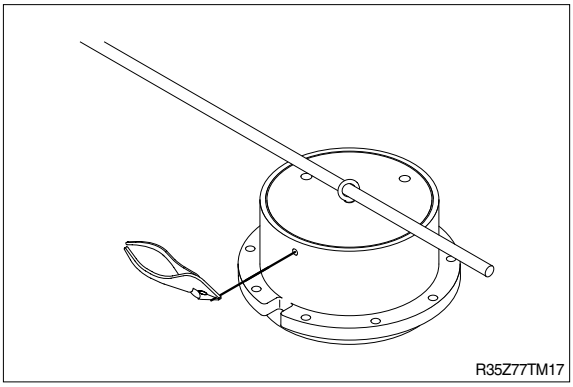

(14) Apply grease to O-ring (1-25), fit the O-ring on cover (1-24), and install cover (1-24) to housing (1-6) matching the threaded hole of socket plug (1-8) of housing (1-6) with the U-groove (for piano wire).

· Tools required :
Plastic hammer (No. 14)
Eye bolt (S-2)



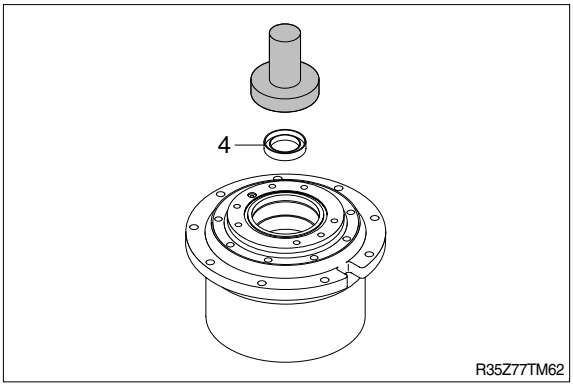

(15) Bend 6 [mm] of the top end of wire (1-26) at right angle, insert it into the threaded hole of the housing, and wind the piano wire turning the cover. Wrap socket plug (1-8) with seal tape before tightening.

· Tools required :
Eye bolt (S-2)
Round bar dia. 20 × 1000 [mm] (S-3)
Torque wrench (No. 1)
Hexagonal bit for torque wrench (No. 7)
Tightening torque 0.8 ± 0.1 kgf · m
(5.8 ± 0.7 lbf · ft)



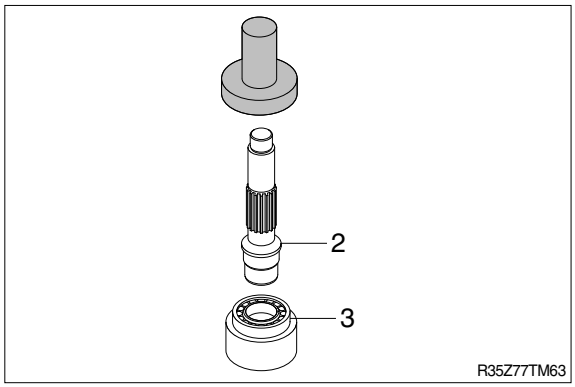

(16) Apply grease to oil seal (4) and press fit it in flange holder.

· Tools required :
Oil seal press fitting jig (S-12)



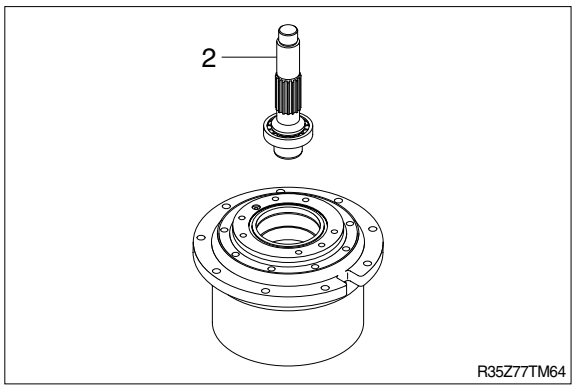
(17) Press fit ball bearing (3) on shaft (2).

· Tools required :
Ball bearing press fitting jig (S-13)
Shaft sub assembly press fitting jig (S-14)

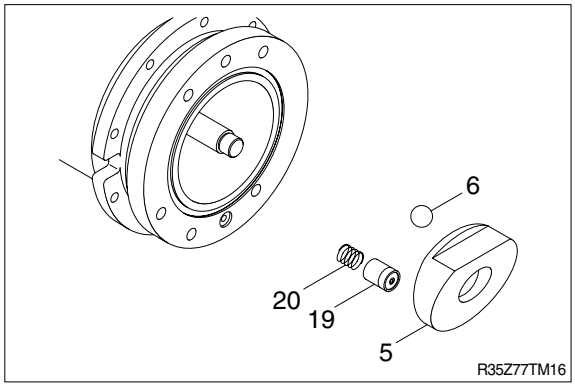



(18) Press fit shaft sub assy (2) in flange holder (1-1).

· Tools required :
Shaft sub assembly press fitting jig (S-14)

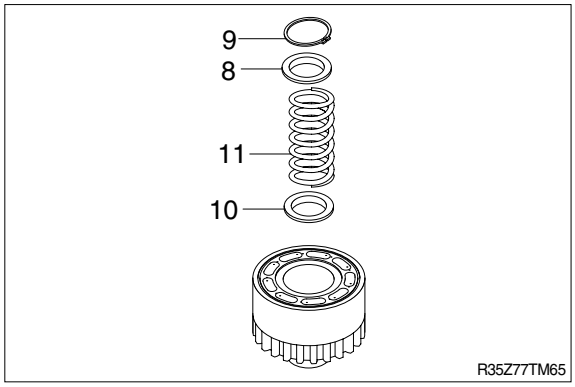



(19) Install steel ball (6), spring (20), piston assy (19) and swash plate (5) on flange holder (1-1).
Apply hydraulic oil to the sliding surface of the swash plate.

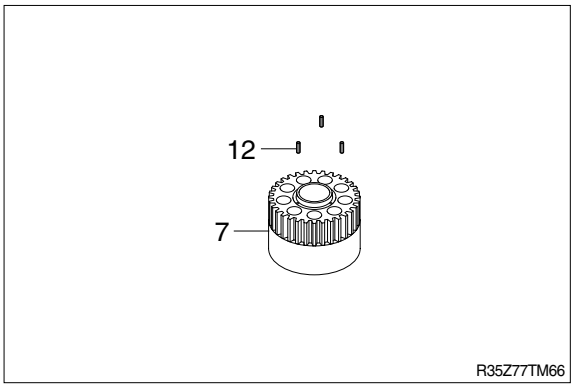



(20) Install washer (8), spring (11), spring seat (10) and snap ring (9) on cylinder block (7).

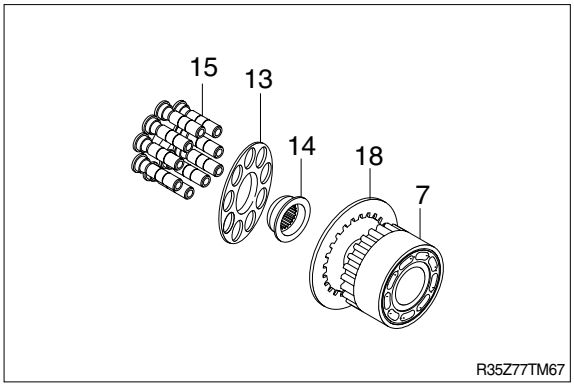
· Tools required :
Snap ring pliers (No. 17)
Snap ring assembly jig (S-16)



(21) Apply grease to pin (12) install pins in three holes of cylinder block (7).

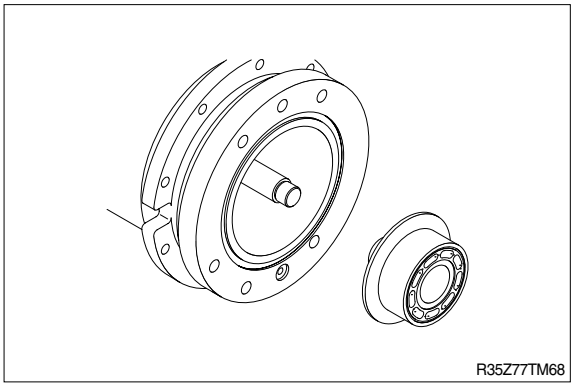



(22) Install retainer holder (13), retainer plate (14) and piston sub assy (15). Apply hydraulic oil in 99 holes of cylinder block (7).
Only parking brake type
Install disk plate (18).



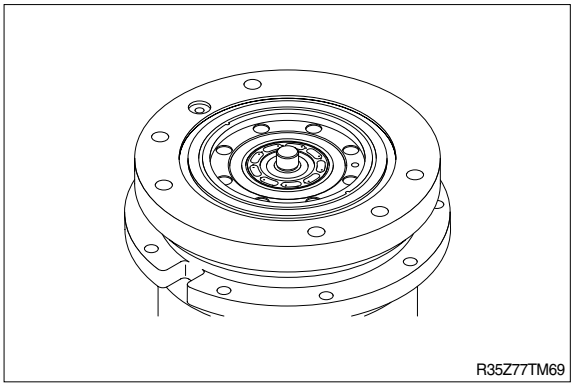

(23) Place the motor laterally, and install the cylinder block sub assy regarding the spline of the shaft as a guide.

※ Location of spline tooth of cylinder block(7) should be aligned that of retainer holder (13) to install them easily.

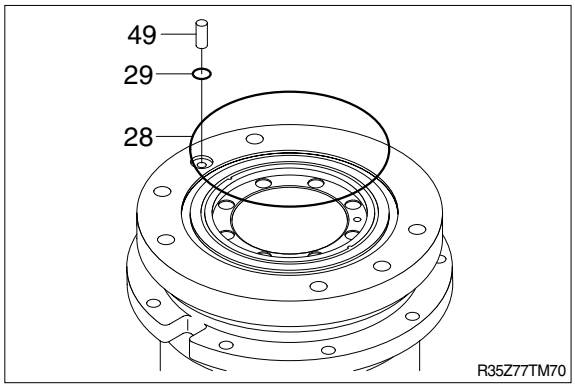



(24) Push the cylinder block by hand, and check that the spring contracts and restores. Apply hydraulic oil to the sliding surface of the cylinder block.

※ Confirm no foreign articles on surface of cylinder block, marked a circle. If there are foreign articles on it, wipe off them.

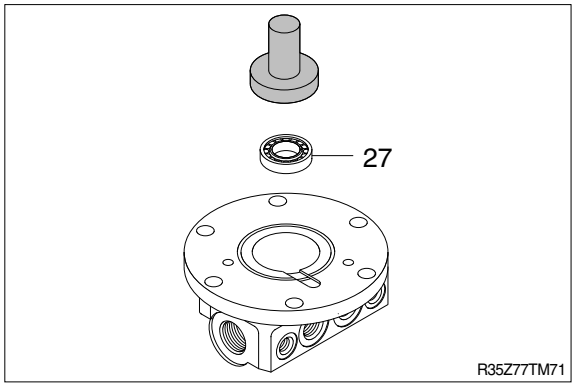


(25) Apply grease to O-ring (28), (29) and install pin (49) and them on flange holder (1-1)

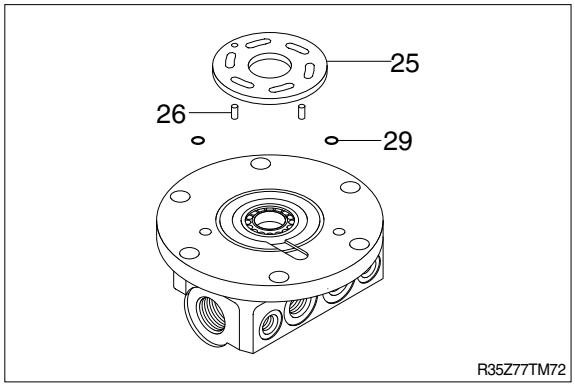



(26) Press fit ball bearing (27) on base plate (30).

· Tools required :
Ball bearing press fitting jig (S-16)

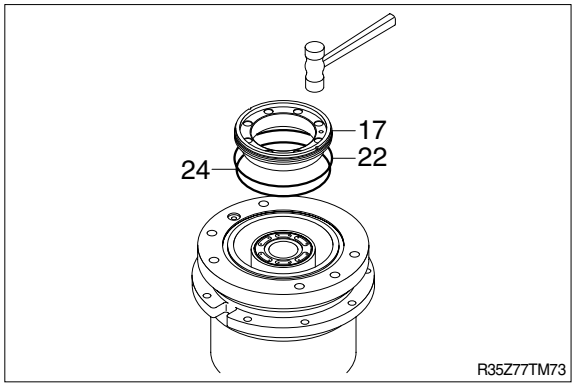



(27) Apply grease on the back side of valve plate (25), and install it and pin (26), O-ring (29) on base plate.




(28) This process is only parking brake type.
Apply grease to O-rings (22), (24) and install them to brake piston (17).
Install brake piston (17) to flange holder (1-1) to align pin (61) installed on base plate in No. 29 with holes on brake piston (17).
When install it, beat on evenly outside of brake piston by using of plastic hammer.

· Tools required :
Plastic hammer (No. 15)

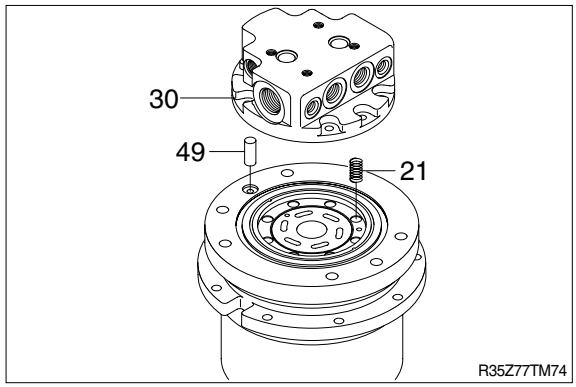


(29) With parking brake type.

Install springs (21), base plate (30), Pin (49).

※ Be careful of installing as springs (21), (32) don't fall down.

It's difficult to fall down by greased them.




(30) Tighten socket head bolt (48).

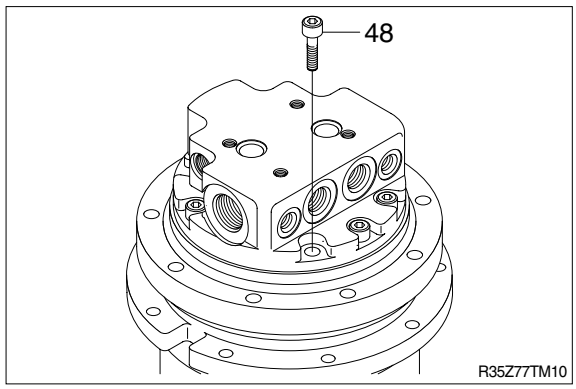
· Tools required :

Torque wrench (No. 2)

Hexagonal bit for torque wrench (No. 10)

Tightening torque : 13.1±0.7 kgf · m

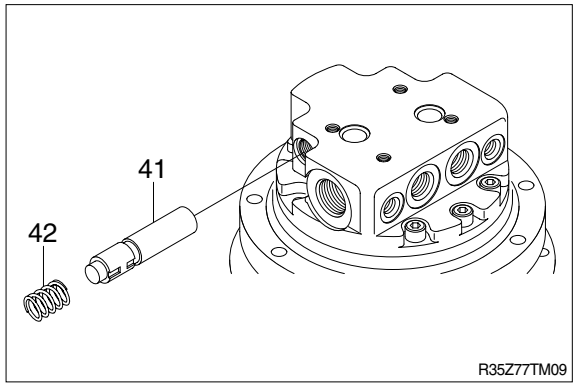
(94.8±5.1 lbf · ft)




(31) Place spool (41) and spring (42) in.

Place the spool in while turning to prevent them from sticking.

Apply hydraulic oil to the spool before installation.




(32) Tighten plugs (43), (46) with O-ring (44).

· Tools required :

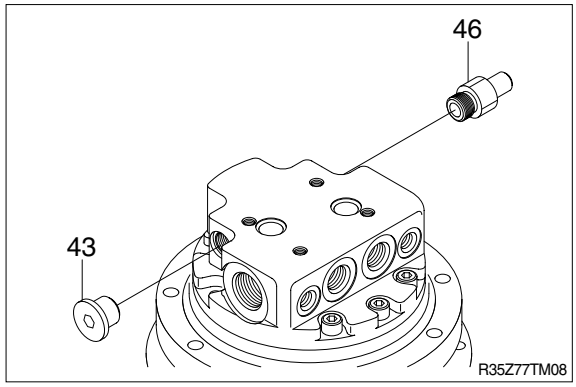
Torque wrench (No. 2)

Hexagonal bit for torque wrench (No. 9)

Socket for torque wrench (No. 11)

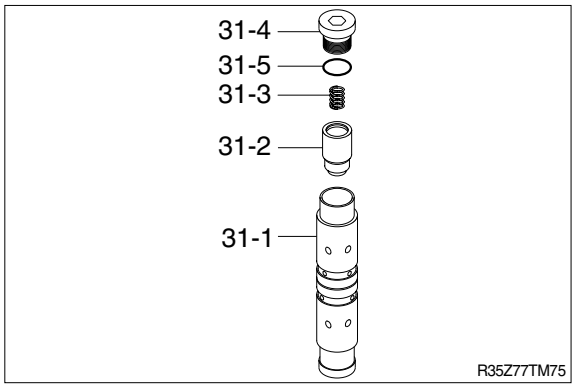
Tightening torque : 5.5±0.5 kgf · m

(39.8±3.6 lbf · ft)

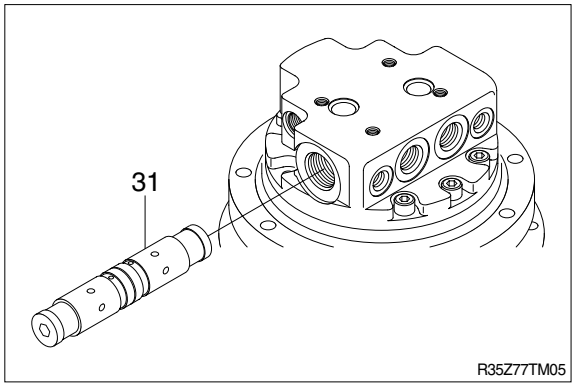


(33) Install check valve (31-2), spring (31-3) and plug (31-4) with O-ring (31-5) to plunger (31-1).
Apply a slight grease to the O-ring.

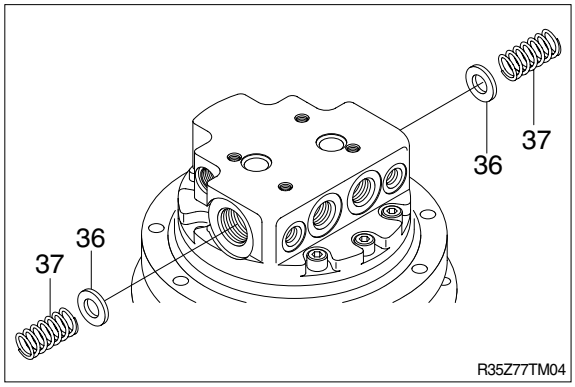
· Tools required :
Torque wrench (No. 2)
Hexagonal bit for torque wrench (No. 8)
Tightening torque : 3.3±0.2 kgf · m
(23.5±1.8 lbf · ft)




(34) Install plunger assy (31) on base plate (30).
Install it while turning to prevent it from sticking.
Apply hydraulic oil to plunger assy (31) before installation.

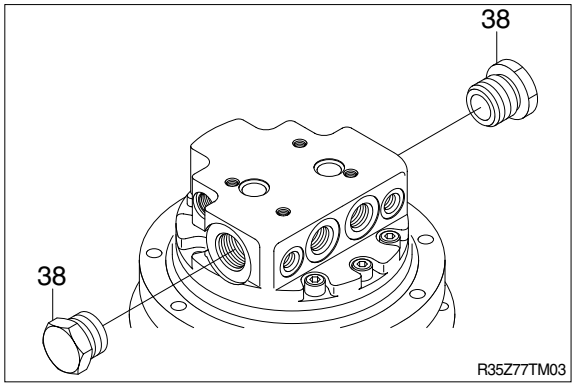



(35) Place spring (37) and spring seat (36) in.




(36) Tighten cap (38) with O-ring (39).
Apply a slight grease to the O-ring.

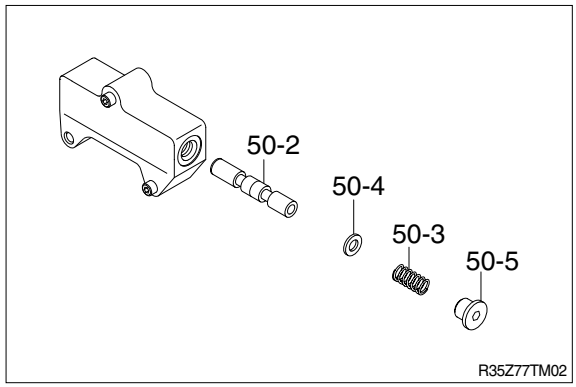
· Tools required :
Torque wrench (No. 3)
Hexagonal bit for torque wrench (No. 10)
Tightening torque : 24.5±0.5 kgf · m
(177±3.7 lbf · ft)



(37) With parking brake type

Install spool (50-2), spring (50-3) and spring seat (50-4) in valve body (50-1), and tighten plug (50-5)

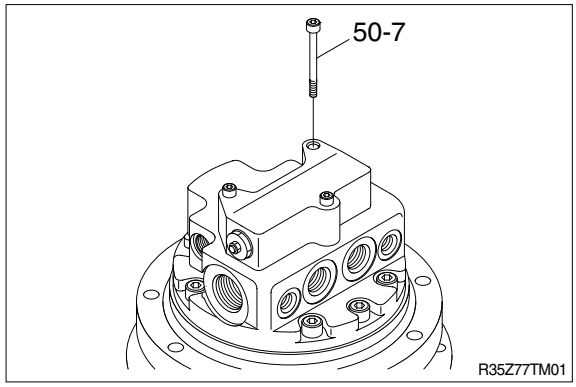
· Tools required :
Torque wrench (No. 2)
Hexagonal bit for torque wrench (No. 9)
Tightening torque : 5.5±0.5 kgf · m
(39.8±3.6 lbf · ft)




(38) Fit O-rings (50-6) or (50-7) to valve body, and put valve assy (50) on base plate (30).

Tighten socket head bolt (50-7), (50-8).

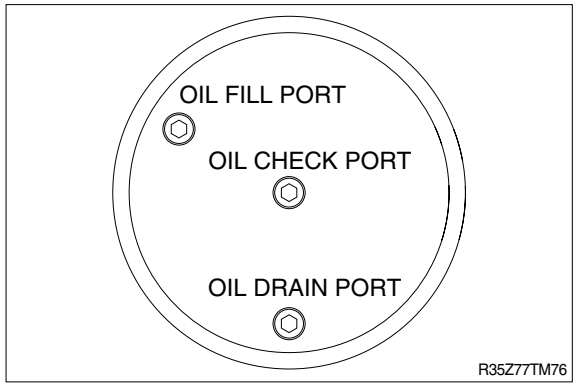
· Tools required :
Torque wrench (No. 1)
Hexagonal bit for torque wrench (No. 7)
Tightening torque : 3.8±0.2 kgf · m
(27.2±1.4 lbf · ft)



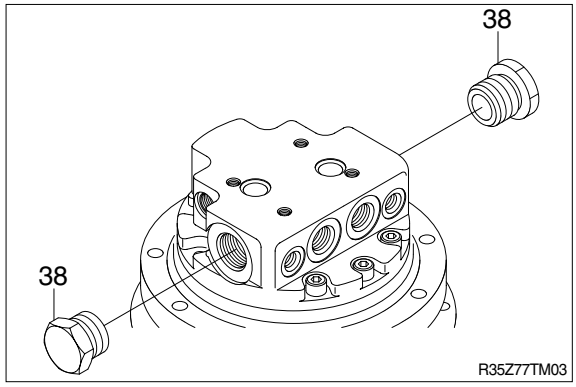

(39) Pour the gear oil through the threaded hole of plug (1-27).

Wind the plug with seal tape before tightening.

· Tools required :
Torque wrench (No. 2)
Hexagonal bit for torque wrench (No. 8)
(No. 9)
PF 1/4 ··· Tightening torque wrench
3.5±0.5 kgf · m
(25.3±3.6 lbf · ft)
PF 1/4 ··· Tightening torque wrench
4.0±0.2 kgf · m
(28.9±1.5 lbf · ft)




(40) Completed.



### 3) QUALITY CHECK AFTER REASSEMBLY

(1) Air leak test of reduction unit

Remove one plug (① or ② or ③) of the reduction unit apply compressed air (0.03 [MPa]) through tapped hole of plug in water for two minutes, and observe that are no bubbles.

(2) Air leak test of motor

Seal all piping ports on the motor except one port with plugs, and apply compressed air (0.03 [MPa]) through open port in water for two minutes. Observe that there are no bubbles.

(3) Upon completion of leak test in subparagraphs (1) and (2) above, fill the motor case with new hydraulic fluid. Run the motor crosswise for two minutes filling hydraulic fluid at flow rate of 20 liters per minute.

Confirm that there is no excessive heat, vibration or noise during running.