

GROUP 6 TRAVEL DEVICE

■ TRAVEL MOTOR (TYPE 1)

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.

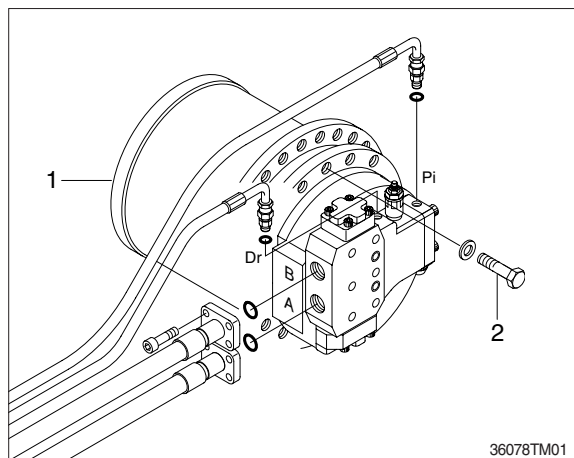
▲ Escaping fluid under pressure can penetrate the skin causing serious injury.

※ 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 hoses.
※ 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 : 380 kg (840 lb)

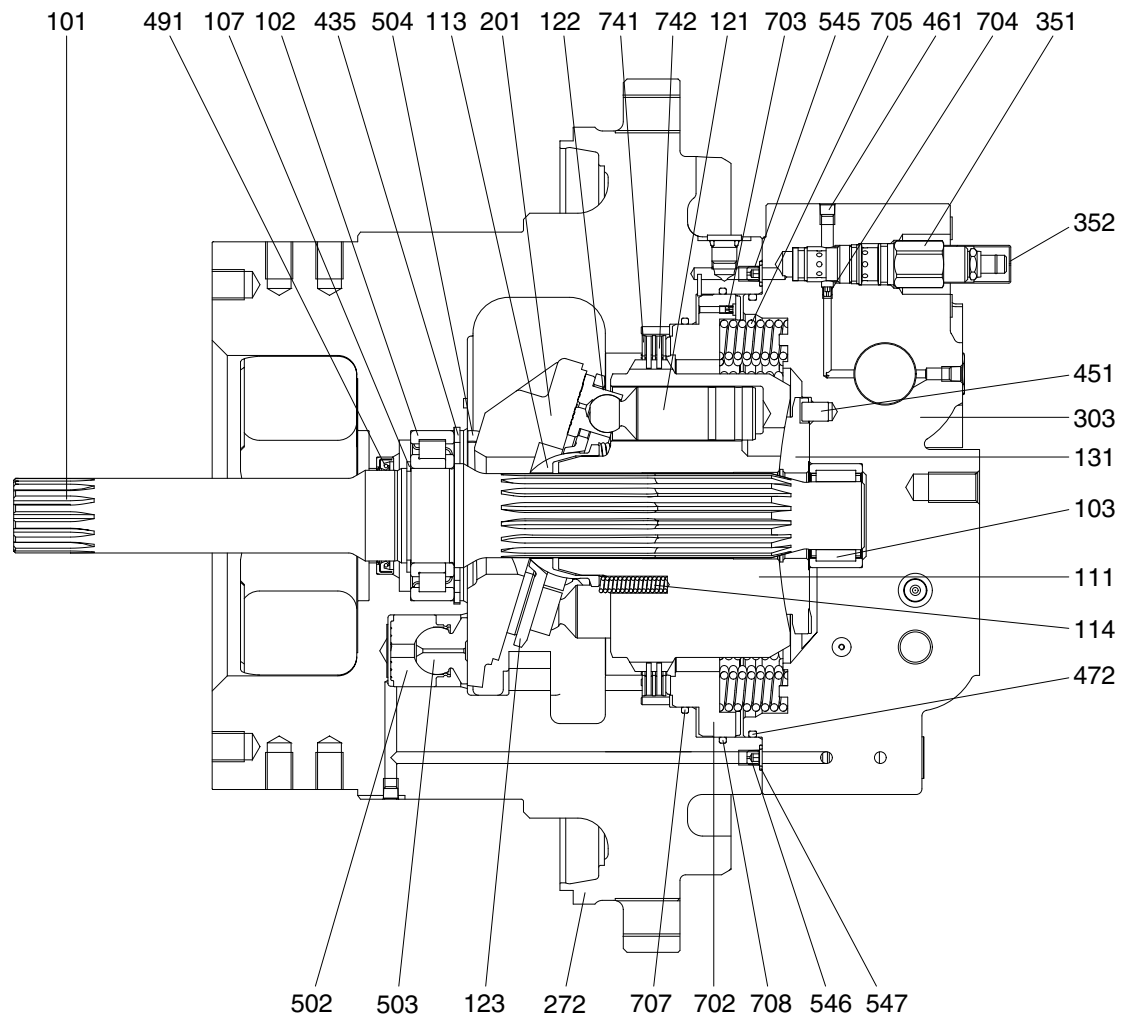
2) INSTALL

- (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. TRAVEL MOTOR (TYPE 1)

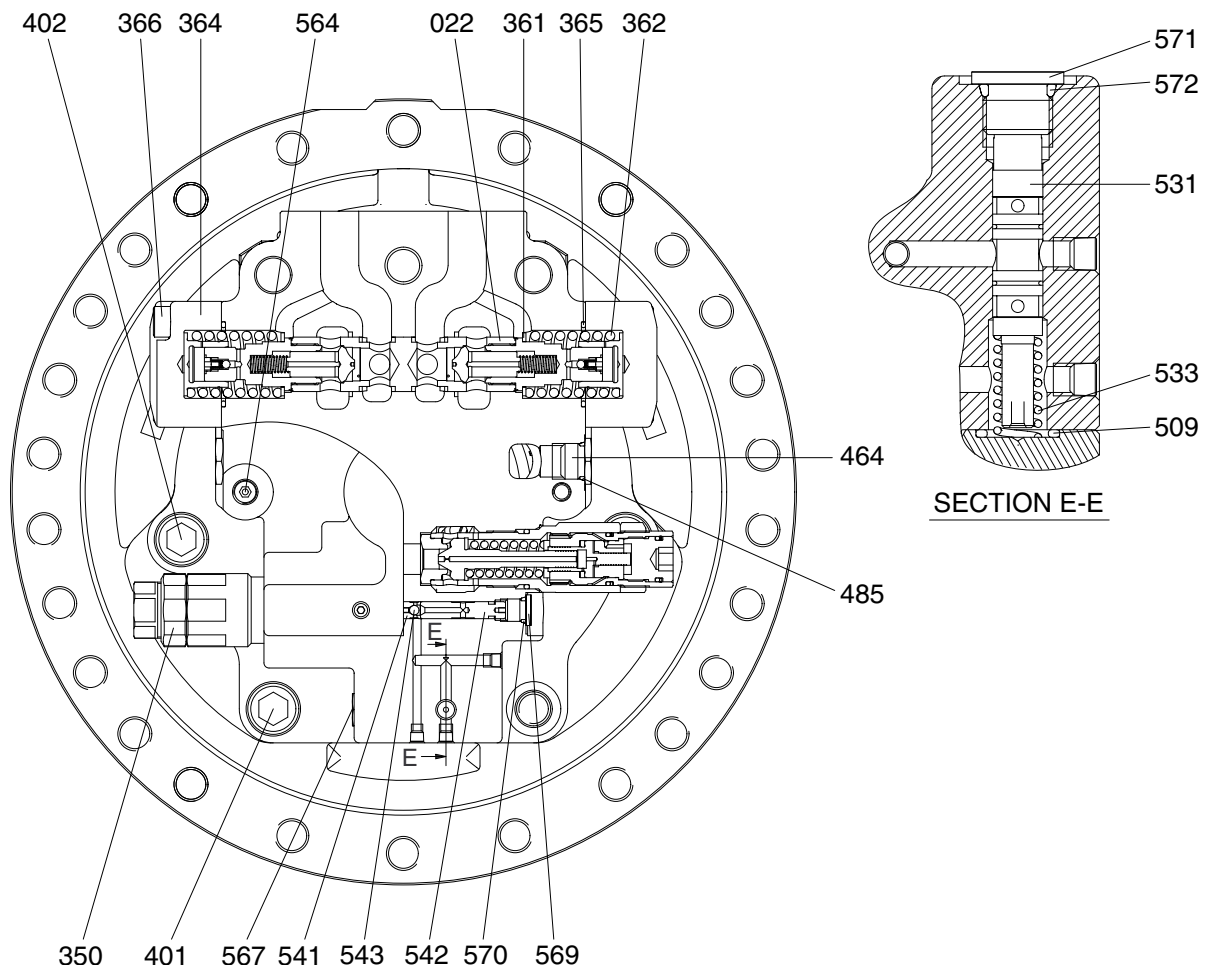
1) STRUCTURE (1/2)



3809A2TM02

101 Drive shaft	272 Shaft casing	545 Orifice
102 Roller bearing	303 Valve casing	546 Orifice
103 Needle bearing	351 Reducing valve	547 O-ring
107 Snap ring	352 Cover	702 Brake piston
111 Cylinder block	435 Snap ring	703 Orifice
113 Spherical bushing	451 Pin	704 Orifice
114 Cylinder spring	461 Plug	705 Brake spring
121 Piston	472 O-ring	707 O-ring
122 Shoe	491 Oil seal	708 O-ring
123 Set plate	502 Piston	741 Separation plate
131 Valve plate	503 Shoe	742 Friction plate
201 Swash plate	504 Pivot ball	

STRUCTURE (2/2)

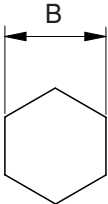


022	Counterbalance spool	402	Hex socket bolt	543	Steel ball
350	Relief valve	464	VP plug	564	Plug
361	Washer	485	O-ring	567	VP plug
362	Counterbalance spring	509	O-ring	569	RO plug
364	Counterbalance cover	531	Tilting spool	570	O-ring
365	O-ring	533	Tilting spring	571	RO plug
366	Hex socket	541	Seat	572	O-ring
401	Hex socket	542	Stopper		

3607A2TM03

2) TOOLS AND TIGHTENING TORQUE

(1) Tools

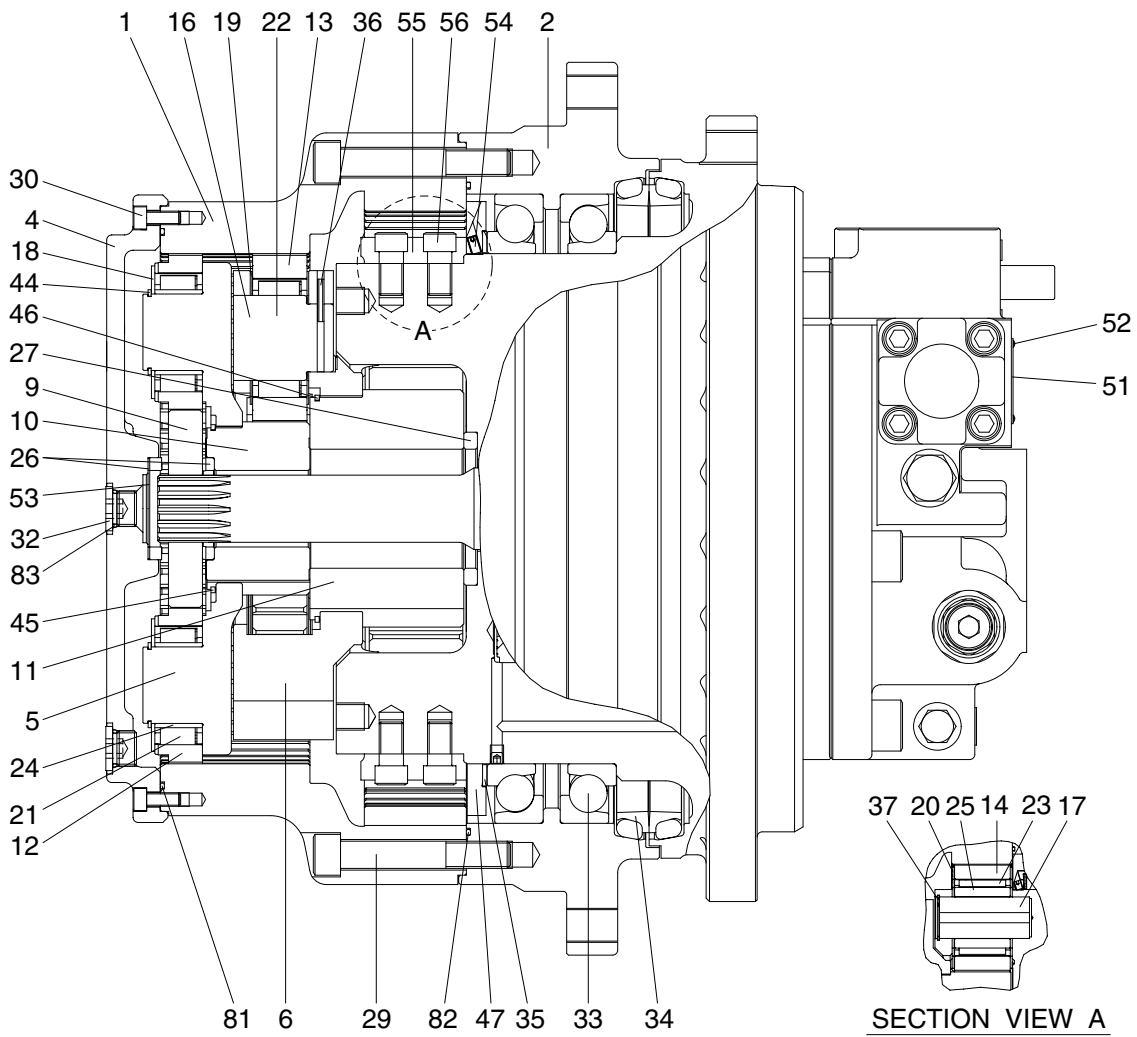
Tool name	Remark		
Allen wrench	2		
	2.5		
	4		
	6		
	8		
	10		
	17		
Socket for socket wrench, spanner	19		
	22.4		
	27		
	42		
Torque wrench	Capable of tightening with the specified torques.		
Plier (For hole, TPR-90)	For snap ring (435)		
Plier (For shaft)	For snap ring (107)		
(-) Driver	-		
Plastic hammer	Wooden hammer allowed. Nominal 1 or so		
Steel rod approx	7×7×200mm, Bearing (102, 103)		
Monkey wrench	-		
Oil seal inserting jig	-		
Bearing plier	-		
Seal tape	-		

(2) Tightening torque

Part name	Item	Size	Torque		Wrench size	
			kgf · m	lbf · ft	in	mm
Socket bolt	366	M12×45	10	72.3	0.39	10
Socket bolt	401	M20×100	44	318	0.67	17
Socket bolt	402	M20×50	44	318	0.67	17
Plug	461	NPTF 1/16	0.9	6.5	0.16	4
VP Plug	464	PF 1/4	11	79.6	1.06	27
Orifice	545, 546	NPTF 1/16	0.7	5.1	0.16	4
Plug	564	PT 1/2	2.2	15.9	0.24	6
VP Plug	567	PF 1/4	3.7	26.8	0.75	19
Plug	569	PF 1/4	3.7	26.8	0.24	6
Plug	571	PF 3/8	7.5	54.2	0.31	8
Orifice	703	M4×0.7	0.35	2.5	0.08	2
Orifice	704	M5×0.8	0.7	5.1	0.1	2.5

3. TRAVEL REDUCTION GEAR (TYPE 1)

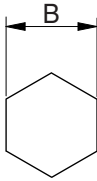
1) STRUCTURE



1	Ring gear	20	Side plate	37	Snap ring
2	Housing	21	Needle cage	44	Snap ring
4	Side cover	22	Needle cage	45	Clip
5	Carrier 1	23	Needle cage	46	W clip
6	Carrier 2	24	Inner ring	47	Nutring
9	Sun gear 1	25	Floating bushing	51	Name plate
10	Sun gear 2	26	Thrust ring	52	Rivet
11	Sun gear 3	27	Thrust ring	53	Washer
12	Planetary gear 1	29	Socket bolt	54	Set screw
13	Planetary gear 2	30	Socket bolt	55	Nutring stopper
14	Planetary gear 3	32	RO plug	56	Hex socket bolt
16	Pin 2	33	Angular bearing	81	O-ring
17	Pin 3	34	Floating seal	82	O-ring
18	Side plate	35	Shim	83	O-ring
19	Side plate	36	Spring pin		

2) TOOLS AND TIGHTENING TORQUE

(1) Tools

Tool name	Remark	
Allen wrench	4	
	8	
	10	
	14	
Spanner	27	
Torque wrench	Capable of tightening with the specified torques.	
Plier (for shaft)	Snap ring (037, 044)	
(-) Driver	For removing floating seal	
Plastic hammer	Wooden hammer allowed	
Eye bolt	M8, M10, M16, M20, For lifting-up	
Press (1 ton)	Angular bearing (033)	
Depth gauge straight edge	100mm depth, for adjusting shins (053)	
Tap M16	For removing screw lock in tapped holes	
Oil stone	For finishing mating faces	
Punch	For preventing spring pin from coming out	
Loctite (three bond 1373B)	Set screw (054)	
Loctite	Socket bolt (029)	
Nut ring inserting jig	Nut ring (047)	

(2) Tightening torque

Part name	Item	Size	Torque		Wrench size	
			kgf · m	lbf · ft	in	mm
Socket bolt	29	M16×100	30	217	0.55	14
	30	M8×20	3.5	25.3	0.24	6
Plug	32	PF 1/2	11	79.6	0.39	10
Set screw	54	M8×16	1.0	7.2	0.24	6

4. DISASSEMBLING

1) GENERAL PRECAUTIONS

- (1) Pay attention to not damaging contact surfaces for O-rings, oil seals, etc. and contact/sliding surfaces for gears, pins, bearings, etc.
- (2) This motor can be disassembled even in a state on the reduction gear.
However, in that case, pay full attention to preventing mud, dust, etc. from entering in it.
- (3) The numerical in parentheses following each part name indicates its part number shown in the attached **assembly drawings**.
- (4) The piping side of the motor is referred to as the rear side, and the output side as the front side.

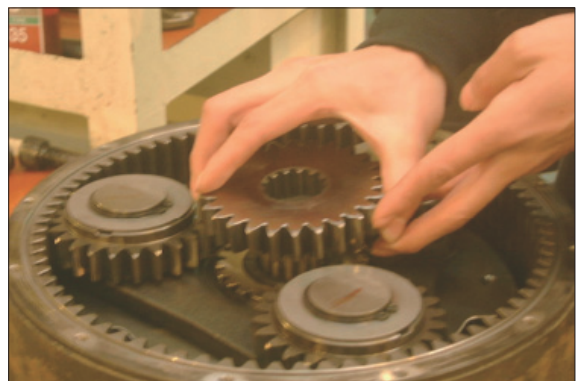
2) DISASSEMBLY OF REDUCTION GEAR

- (1) Select a disassembling place.
 - ※ Select a clean place.
 - ※ Spread rubber sheet or cloth on work bench to prevent parts from being damaged.
- (2) Remove dust, mud, etc. from reduction gear surfaces with washing oil or so.
- (3) Place reduction gear with its gear oil drain port or level gauge at the lowest position, and drain reduction gear oil.
 - ※ Receive gear oil with clean vessel and check it for abnormalities.
Renew gear oil.
- (4) Place reduction gear with its side cover (4) upward, and remove socket bolt (30), and remove side cover (4) and O-ring (81).



370078TM01

- (5) Remove sun gear 1 (9).



370078TM02

- (6) Remove carrier 1 (5), together with planetary gears 1 (12), sun gear 2 (10), etc. fitted.



370078TM03

(7) Disassembling of carrier 1 sub-assembly

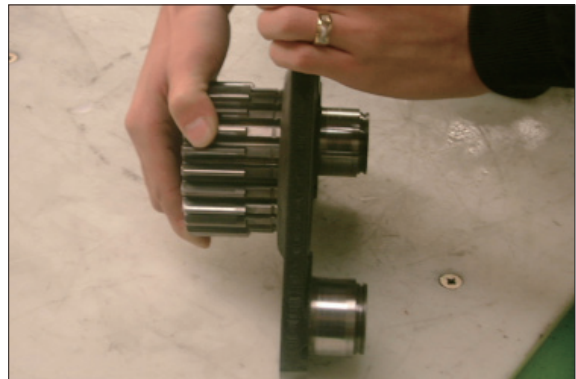
- ① Remove snap ring (44), and then remove side plate (18), planetary gear 1 (12), needle cage (21) and side plate (18).

※ If flaking is observed on the inner ring surface replace inner ring. In this case, replace planetary gear 1 and needle cage simultaneously.



370078TM04

- ② Remove circlip (45), and then remove carrier 1 (5) from sun gear 2 (10).



370078TM05

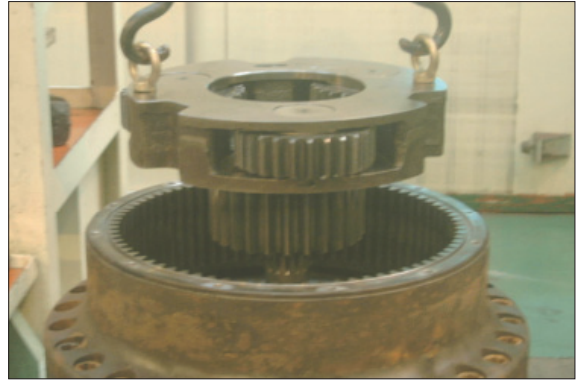
- ③ Remove thrust ring (26).



370078TM06

(8) Remove carrier 2 (6), with planetary gears 2 (13), sun gear 3 (11), etc. fitted.

※ Use M10 eyebolt. In this case, thrust ring (26) is removed simultaneously.



370078TM07

(9) Disassembling of carrier 2 sub-assembly

① Push in spring pin (36), and remove pin 2 (16), from carrier 2.

※ Carry out the following check in advance. If any abnormality should be found, carry out disassembling.

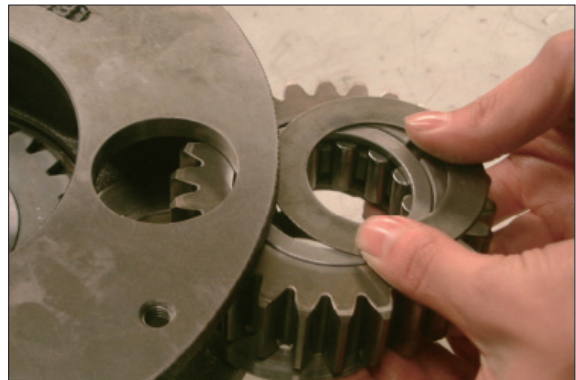
- Is there any crevice, crack or pitting on tooth surface of planetary gear?
- When turning planetary gear lightly, is there any abnormal noise or eccentric clearance? Carry out check similarly to the above for carrier 3.



370078TM08

② Remove side plate (20), planetary gear 2 (13), and needle bearing (22) from carrier 2.

③ Remove thrust ring (26).



370078TM09

④ Remove snap ring (46), and remove carrier 2 (6) from sun gear 3 (11).

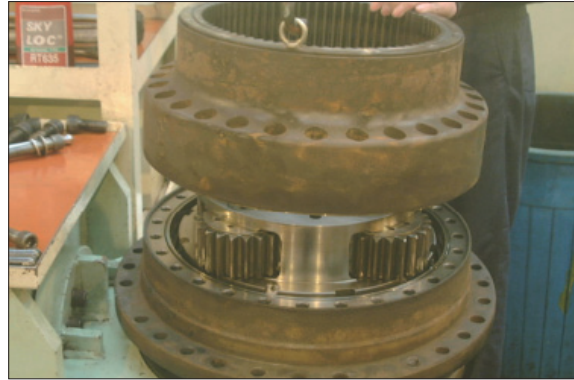
⑤ Remove thrust ring (27) from sun gear 3 (11).



370078TM10

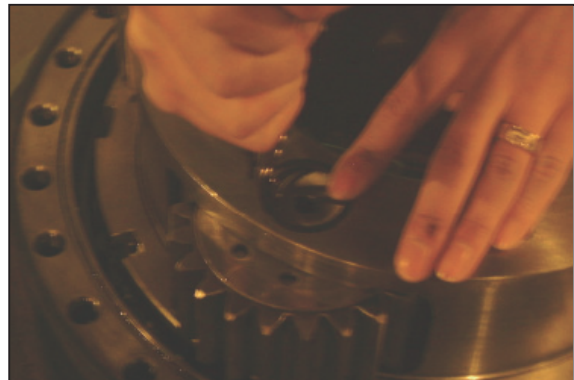
(10) Remove socket bolt (29), and then screw two M8 eyebolts on front side of ring gear (1), lift up ring gear with crane, and remove O-ring (82) from housing (2).

※ It is difficult to separate them, because it is assembled by LOCTITE.
In this case, if you can use wrench and pipe, it is easy to separate them.

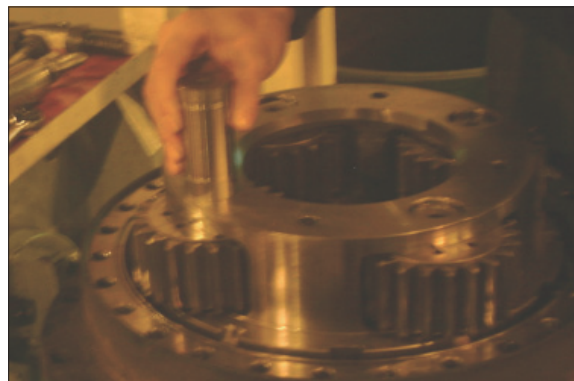


370078TM11

(11) Remove snap ring (37) and then remove pin 3 (17) from shaft casing (272).

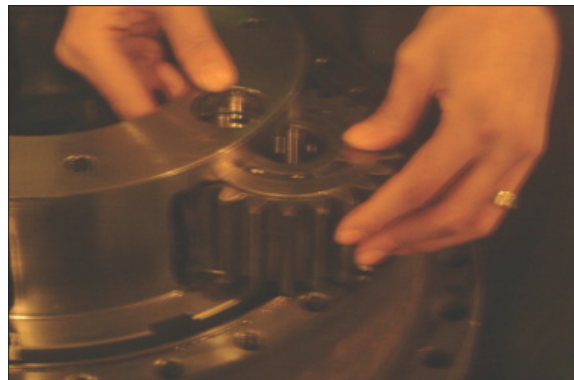


370078TM12



370078TM13

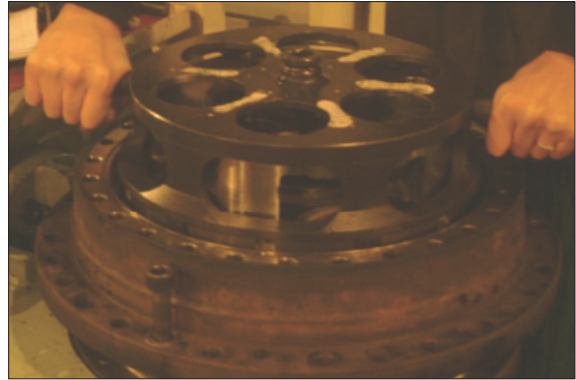
(12) Remove side plate (20), planetary gear 3 (14), needle cage (23), floating bushing (25) from shaft casing (272).



370078TM14

(13) Remove set screw (54) from nut ring (47), and then remove nut ring (47) from shaft casing (272).

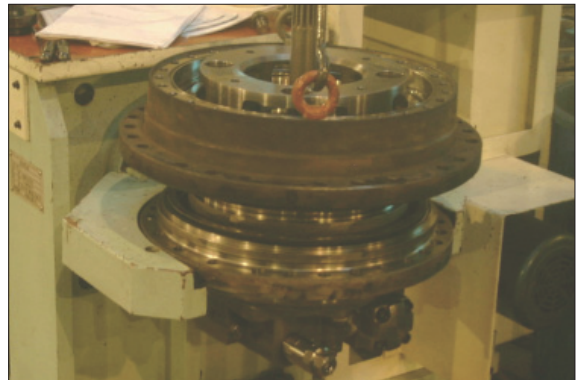
- ※ When disassembling nut ring, remove dust, mud, etc. from set screw hole by blasting compressed air.
And remove the nut ring by using the special tool for removing the nut ring.



370078TM15

(14) Remove housing (2), angular bearing (33), floating seal (34) from shaft casing (272).

- ※ Screw two M16 eye bolts on front side of housing (2).
Lift up housing (2) with crane.



370078TM17

(15) Remove floating seal (34) from housing (2), paying attention to not damaging it.

- ※ Pay attention to O-ring and sheet faces.



370078TM18

(16) Remove floating seal (34) from casing (272), pay attention to not damaging it.

- ※ Pay attention to O-ring and sheet faces.



370078TM19

(17) Remove angular bearing (33) from housing (2).

※ Bearing should be renewed once it is removed.

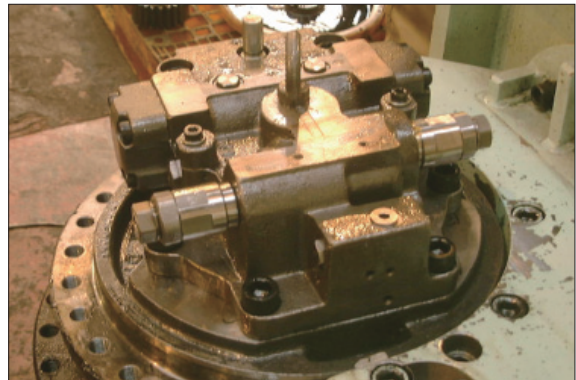


370078TM20

3) DISASSEMBLY OF MOTOR

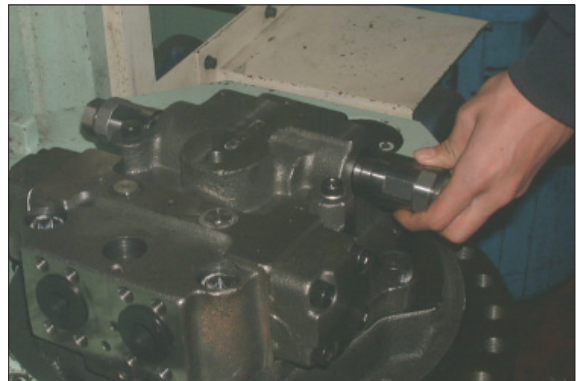
(1) Disassembling of motor main body

① Place hydraulic motor on bench with its output shaft down.



370078TM21

② Loosen relief valve (350), reducing valve (351), cover (352), plug, etc. They are fitted to valve casing (303).

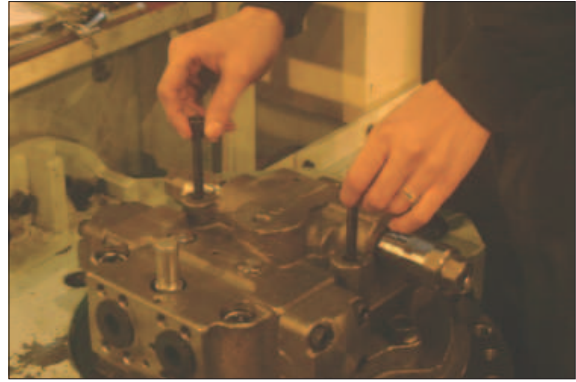


370078TM22



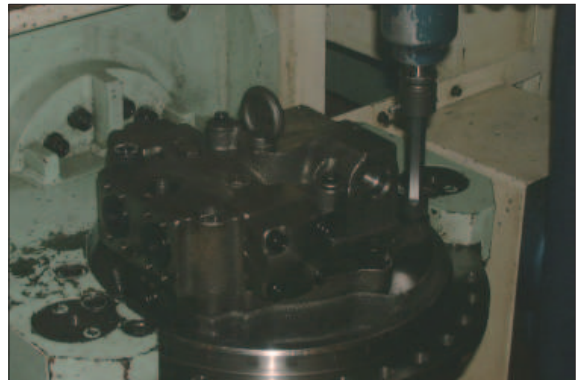
370078TM23

- ③ Remove plug (564) from valve casing (303). And then screw two M10×135 bolts on the holes of compelling brake release. Sub assembly (valve casing & brake piston)



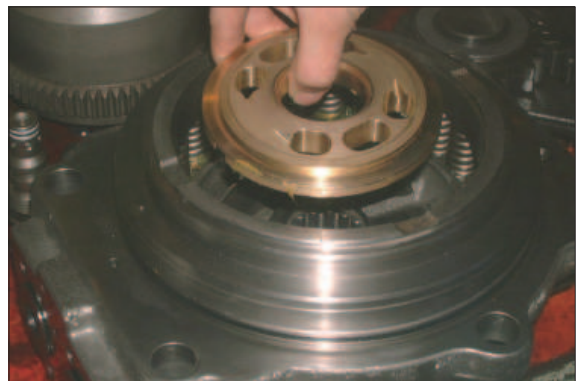
370078TM24

- ④ Remove socket bolts (401, 402) that assemble valve casing (303).



370078TM25

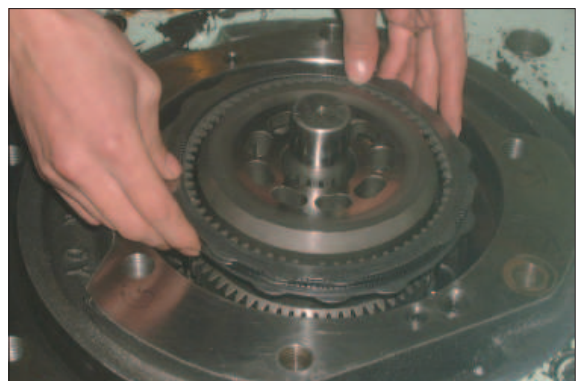
- ⑤ Remove the above socket bolt, and then separate valve casing sub-assembly and remove valve plate (131).



370078TM26

- ⑥ Pull out friction plate (742) and separation plate (741) from cylinder block (111).

- ※ In this case, motor should be located in horizontally.

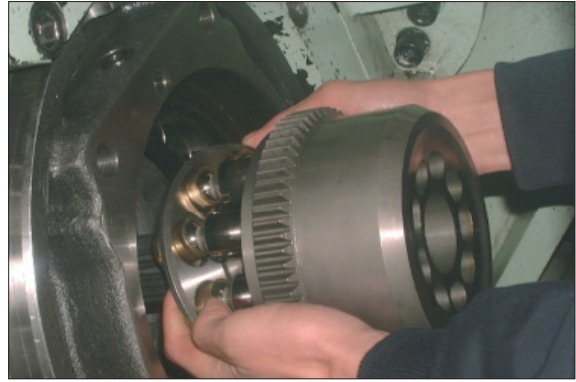


370078TM27

⑦ Pull out cylinder block and piston sub-assembly.

※ After placing the motor horizontally, take out cylinder block from casing.

※ Be careful not to damage the sliding parts of the cylinder block, spherical bushing and shoe.



370078TM28

⑧ Remove swash plate (201).



370078TM29

⑨ Remove pivot ball (504) and tilting piston sub assembly.



370078TM30

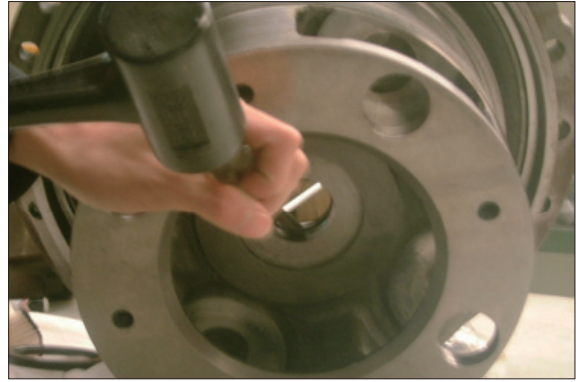
⑩ Take out snap ring (435), and then hit front side end face of shaft (101) lightly with plastic hammer or so to remove from casing (272).

※ Do not remove cylindrical roller bearing (102) as far as it remains normal.



370078TM31

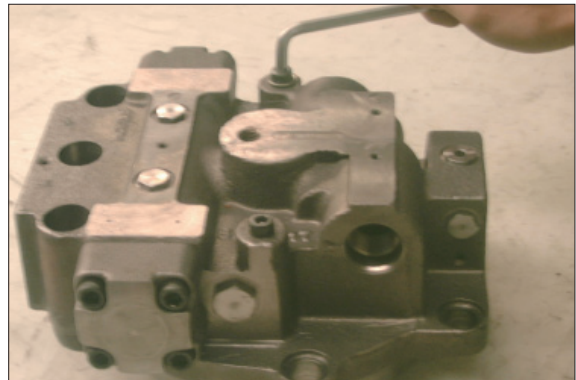
- ① Take out oil seal (491) from shaft casing (272).
- ※ Do not reuse the disassembling oil seal (491).



370078TM32

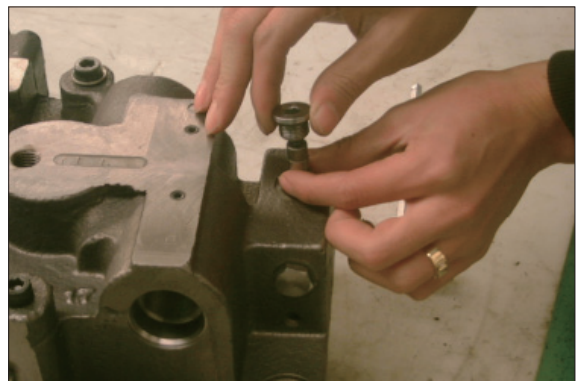
(2) Disassembling of valve casing sub-assembly

- ① Remove two M10 × 135 bolts for compelling brake release. Disassemble brake piston from valve casing.



370078TM33

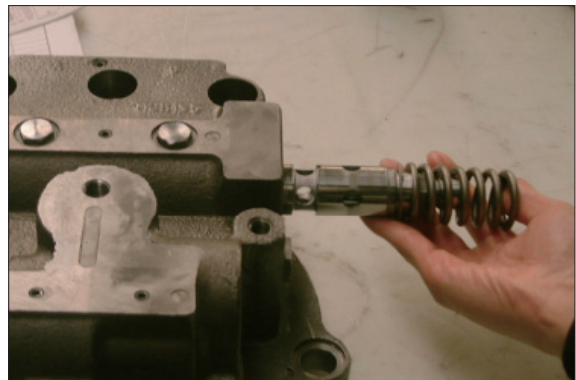
- ② Remove plug (571), tilting spring (533), and tilting spool (531) from valve casing.



370078TM34

- ③ Remove socket bolts (366), counterbalance cover (364), and counterbalance spool assembly.

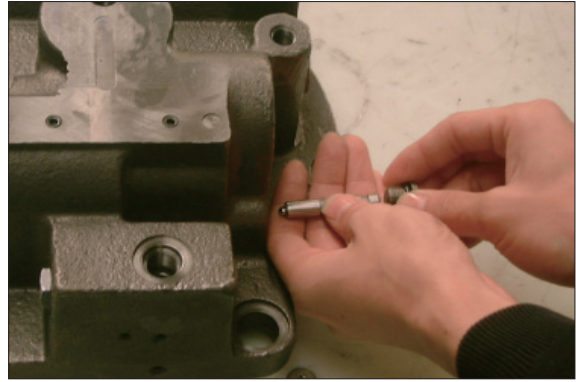
- ※ When any abnormality is found in counterbalance spool, counterbalance spring, etc. replace with the counterbalance spool sub assembly as a set.



370078TM35

- ④ Remove plug (569), stopper (542), steel ball (543) and seat (541).

※ When no abnormality is found in displacement changeover, it is not necessary to overhaul it specifically.
And don't remove needle bearing (103) as far as it remains normal.



370078TM36

(3) Disassembling of cylinder sub-assembly

- ① Pull out set plate (123), piston (121), and shoe (122) sub-assembly.



370078TM37

- ② Remove spherical bush (113) and cylinder spring (114).
That is all of the disassembling work.
The pins (451) force-fitted to the valve casing cannot be removed.



370078TM38

5. ASSEMBLING

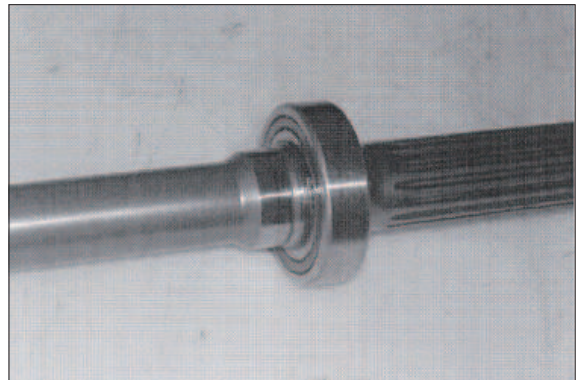
1) GENERAL CAUTIONS

- (1) Clean each part fully with washing oil and dry it by blasting compressed air. It is better not to use waste cloths as much as possible.
However, if they are to be used, use clean ones, and pay attention to not leaving lint and so on.
Don't clean the friction plate with washing oil without fail.
- (2) Use the torque wrench in tightening fitting screws and plugs to their respective torque shown in page 8-74, 8-76.
- (3) When hammering is required, use the plastic hammer and try to hit parts lightly.
- (4) Similarly to the disassembling procedures, the numeral in parentheses following each part name indicates its item number shown in the attached assembly drawings.

2) ASSEMBLY OF MOTOR

(1) Assembling driving shaft sub-assembly

- ① Put roller bearing (102) on drive shaft (101), and assemble snap ring (107) by using the plier.
 - ※ Roller bearing is press fit by the heat to drive shaft.
 - ※ Pay attention to not damaging oil seal sliding area of driving shaft.
 - ※ Pay attention to not fitting snap ring the other way around.



370078TM39

(2) Assembling of valve casing sub-assembly

- ① Tighten plugs (461, 564) into valve casing (303) with specified torque.
 - Plug(461) : 0.9 kgf · m (6.5 lbf · ft)
 - Plug(564) : 2.2 kgf · m (15.9 lbf · ft)



370078TM40

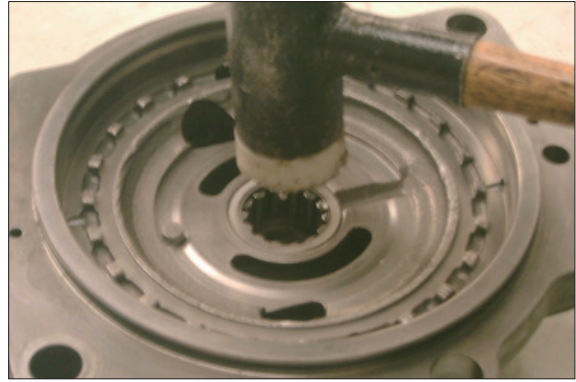
- ② Interference-fit pin (451).



370078TM41

③ Interference-fit needle bearing (103).

- ※ It is necessary when needle bearing was disassembled from the valve casing.

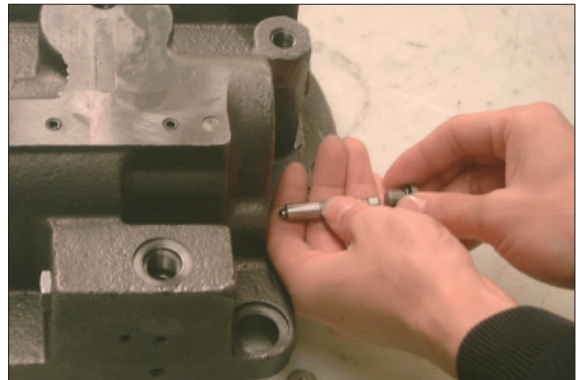


370078TM42

④ Assemble seat (541), steel ball (543), stopper (542) and RO plug (569) in the order named.

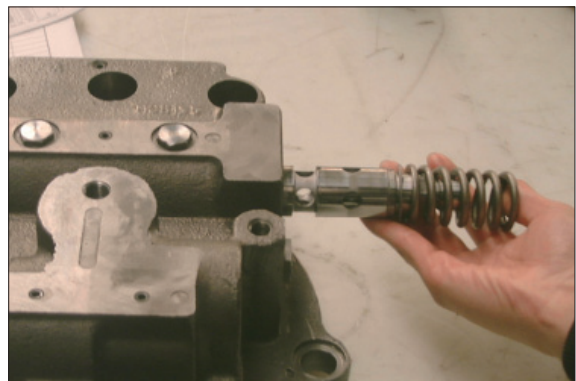
- Tightening torque : 3.7 kgf · m (26.8 lbf · ft)

- ※ Pay attention to not assembling seat and stopper the other way around.



370078TM43

⑤ Assemble counterbalance spool (360), washer (361), spring (362) in the order named.

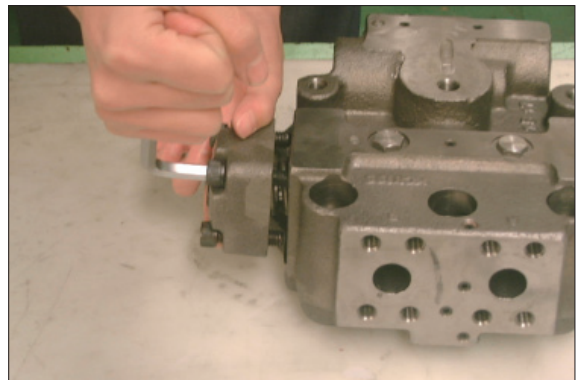


370078TM44

⑥ Fit counterbalance cover (364) by tightening socket bolt (366).

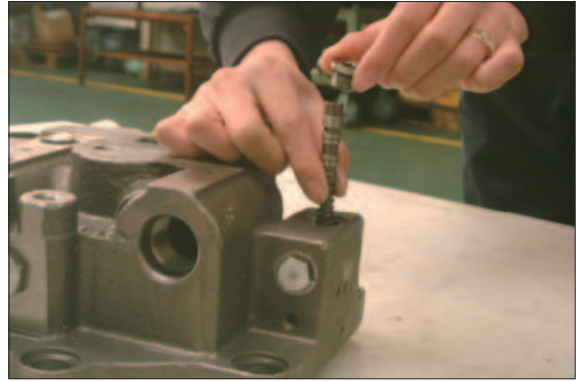
- Tightening torque : 10 kgf · m (72.3 lbf · ft)

- ※ Confirm that O-ring (365) has been inserted in cover.



370078TM45

- ⑦ Assemble tilting spool (531), tilting spring (533) and plug (571) in the order named.
· Tightening torque : 7.5 kgf · m (54.2 lbf · ft)



370078TM46

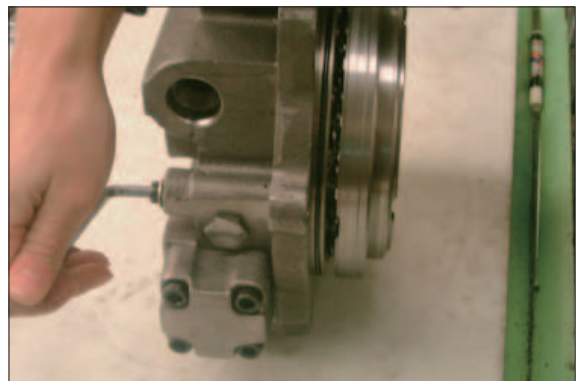
- ⑧ Assemble orifice (703) and tighten them into brake piston (702) to specified torque.
· Tightening torque : 0.35 kgf · m (2.5 lbf · ft)



370078TM47

- ⑨ Assemble brake spring (705) in brake piston (702). And then screw two M10×135 bolts on the holes for compelling brake release.
Sub-assembly (valve casing & brake piston)

- ※ After finishing assembly, two M10×135 bolts will be removed.



370078TM48

(3) Assembling of cylinder sub-assembly

- ① Fit cylinder spring (114) and spherical bush (113) to cylinder block (111).
※ Match spline phase of cylinder block (111) to that of spherical bush.



370078TM49

- ② Put piston (121), shoe (122) sub-assembly in set plate (123) and then assemble them to cylinder block (111).



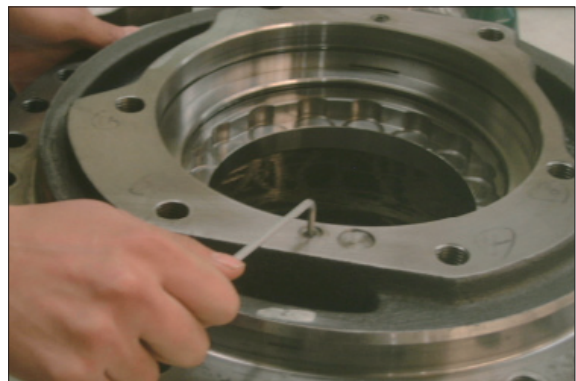
370078TM50

(4) Assembling of motor main body

- ① Tighten plug (461) and orifice (545, 546) into shaft casing (272) to specified torque.
- Plug (461) : 0.9 kgf · m (6.5 lbf · ft)
 - Plug (545, 546) : 0.7 kgf · m (5.1 lbf · ft)



370078TM51



370078TM51A

- ② Interference-fit oil seal (491) into shaft casing (272) by special tool.



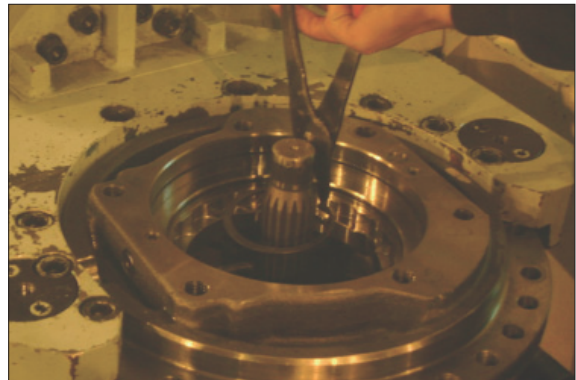
370078TM52

③ Interference-fit the shaft sub-assembly.
And then assemble snap ring (435).

※ Interference-fit outer race of cylindrical roller bearing (102) by hitting lightly with hammer, utilizing key.



370078TM53



370078TM54A

④ Assemble tilting piston sub-assembly
and pivot ball (504) into shaft casing
(272).



370078TM54



370078TM54A

⑤ Assemble swash plate (201) onto pivot ball (504).

※ Apply grease on sliding area of swash plate rear surface.

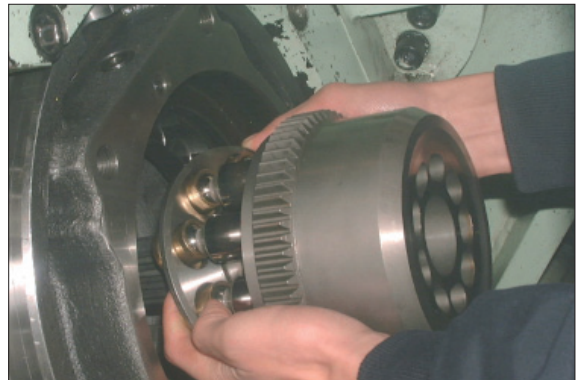
※ Confirm with finger tips of both hands if swash plate moves smoothly.



370078TM55

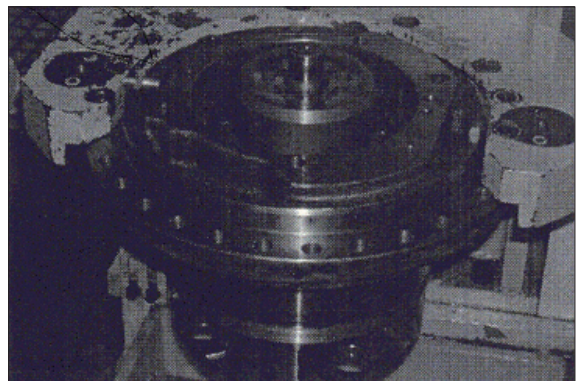
⑥ Change position of shaft casing (272) from vertical one to horizontal one. And then mount cylinder block sub-assembly.

※ Pay attention to not dropping swash plate.



370078TM56

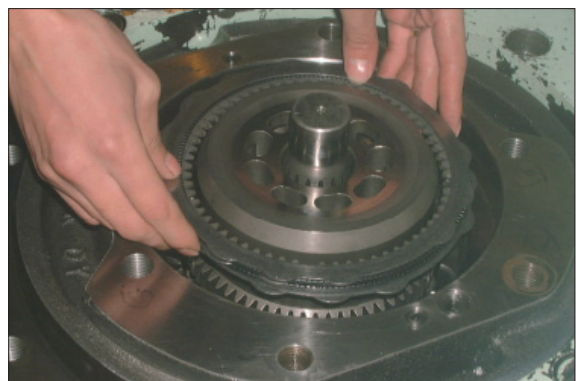
⑦ Change position of shaft casing (272) from horizontal one to vertical one.



370078TM57

⑧ Fit separation plate (741) and friction plate (742) into cylinder block (111).

※ Mate hole of separation plate each other.

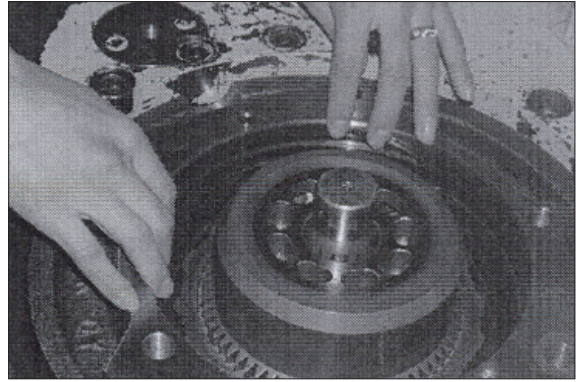


370078TM27

⑨ Assemble O-ring (707, 708) into shaft casing (272).

※ Do not reuse the disassembling O-ring (707, 708).

※ Coat the O-ring with grease.
(O-ring can be protected by grease)



370078TM59

⑩ Fit valve plate (131) to valve casing (303) sub-assembly. Assemble them to casing, and then tighten them with socket bolt (401, 402).

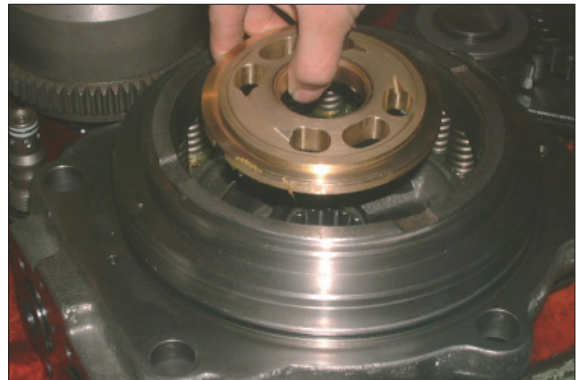
· Socket bolt (401, 402) Tightening torque : 44 kgf · m (318 lbf · ft)

※ Apply grease on valve plate rear surface and pay attention to not dropping valve plate.

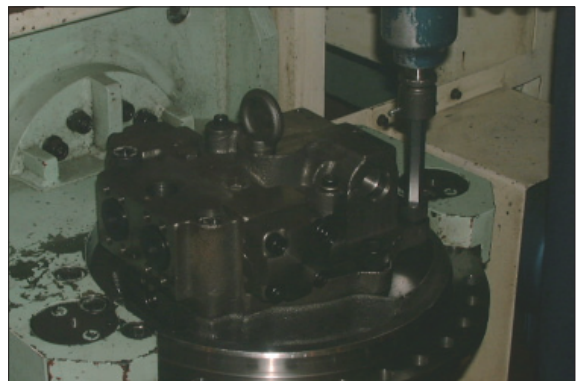
※ Use guide bolt.

※ Apply grease on roller of needle bearing and pay attention to easy to assemble with driving shaft.

※ Use crane in assembling valve casing to shaft casing.



370078TM60



370078TM60A

⑪ Tighten to specified torque plugs, relief valve (350), reducing valve (351), etc. fitted to valve casing sub-assembly.

· Tightening torque :

- Relief valve (350) : 18 kgf · m (130 lbf · ft)

- Reducing valve (351) : 4.5 kgf · m (32.5 lbf · ft)

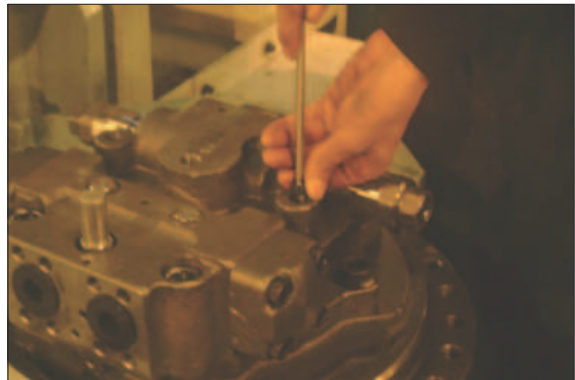


370078TM61



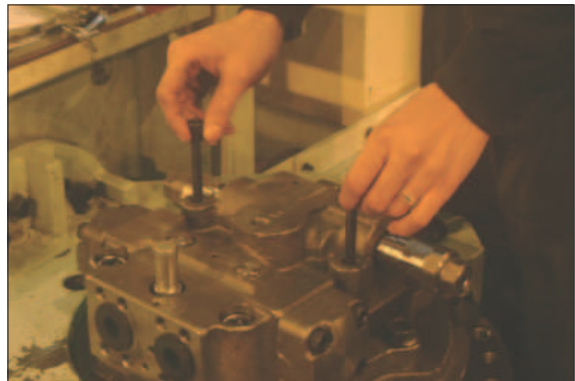
370078TM61A

⑫ Mount cover (352).



370078TM63

⑬ Disassemble two M10×135 bolts on the holes for compelling brake release. And then assemble plug (564).
· Tightening torque : 2.2 kgf · m (15.9 lbf · ft)



370078TM24

3) ASSEMBLY OF REDUCTION GEAR

(1) Place housing (2) with its front side up, and fit angular bearings (33) with their back faces mated.

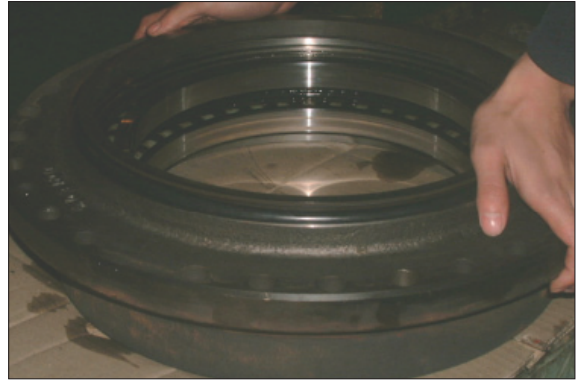
- ※ Fit angular bearings one by one with press or key hammer.
- ※ When housing is to be reused, remove screw lock of its tapped holes with M16 tap.



370078TM64

(2) Fit O-ring to floating seal (34) without twisting it, and then to housing (2).

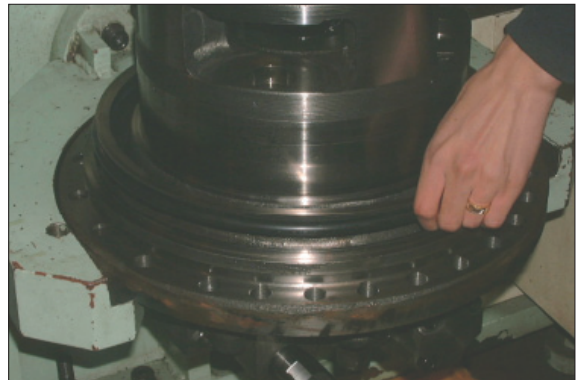
- ※ Apply grease to O-ring thinly.
- ※ Do not reuse the disassembling O-ring.



370078TM65

(3) Similarly, fit floating seal to shaft casing (272) of hydraulic motor.

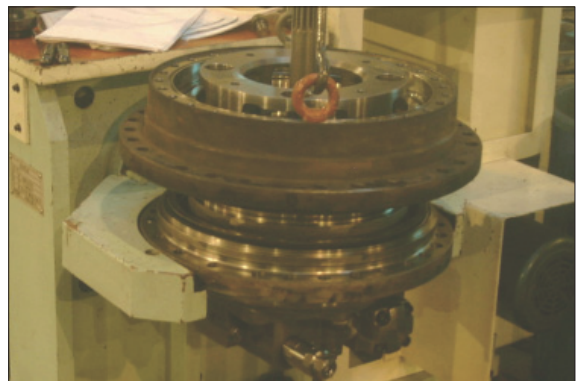
- ※ Do not reuse the disassembling O-ring.



370078TM66

(4) Lift up housing sub-assembly with its floating seal side down, and put inner diameter of angular bearing on outer diameter of shaft casing.

- ※ Pay attention to not damaging sliding faces of floating seal.



370078TM67

(5) Assemble shim (35) to nut ring (47).

- ※ Apply grease between shim and nut ring.

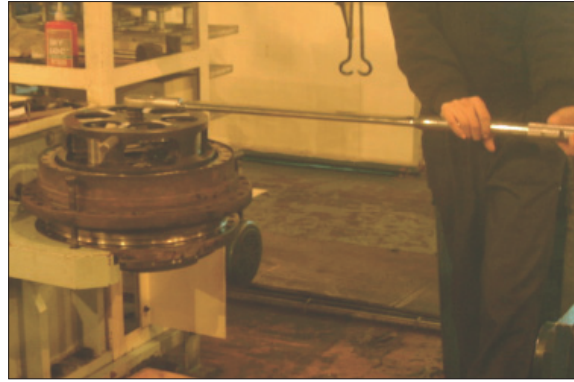


370078TM68

(6) Insert nut ring assembled shim to shaft casing, and then tighten it to specified torque, utilizing special tool.

※ After tighten it to maximum torque and then disassemble, and then tighten it to specified torque.

· Tightening torque : 60 kgf · m (434 lbf · ft)



370078TM70

(7) After assemble set screw (54) affixed LOCTITE, and punch at hole to lock it. Pay attention to not be lifted nut ring (47).

※ Screw the set screw, until upper side of set screw is lower than tilting side of nut ring.

· Loctite specifications : Three bond 1373B

· Tightening torque : 1 kgf · m (7.2 lbf · ft)



370078TM71

(8) Assemble thrust ring (27) into shaft casing (272).

※ Pay attention to not assembling thrust ring (27) the other way around.

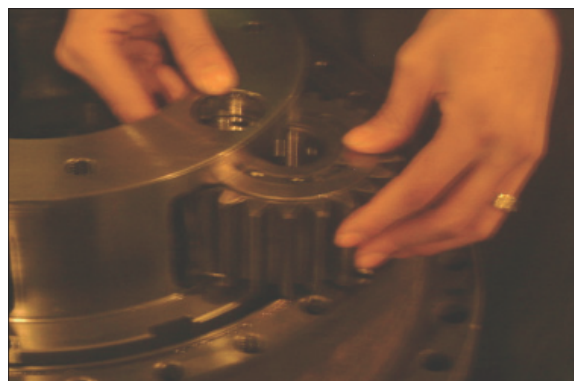
(Oil groove is located upside.)



370078TM72

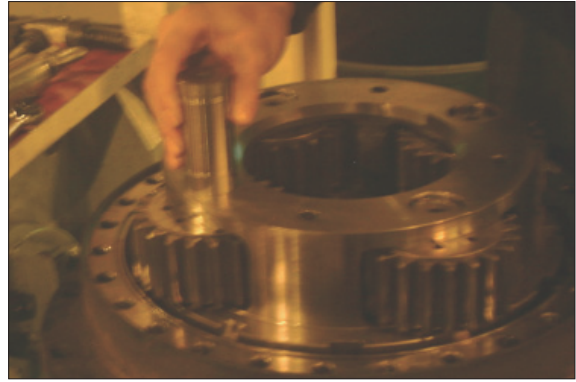
(9) Put needle cage (23) into inside of planetary gears 3 (14), and insert them into shaft casing, holding them between side plates (20).

※ Mate pin hole of shaft casing with center of planetary gear.

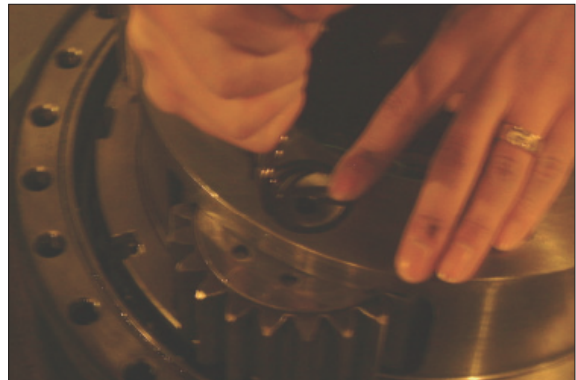


370078TM73

(10) Insert pin 3 (17) into shaft casing, and then assemble snap ring (37).



370078TM74



370078TM74A

(11) Assemble O-ring (82) to housing (2), and then assemble ring gear (1).
Pay attention to its meshing planetary gear 3 (14) and ring gear (1), utilizing crane.

- ※ Applying grease to O-ring thinly.
- ※ Do not reuse the disassembling O-ring.



370078TM75

(12) Assemble ring gear (1) and housing (29).
(Screw socket bolt (29), and tighten it to specified torque, with torque wrench.)
· Tightening torque : 30 kgf · m (217 lbf · ft)
· Loctite specifications : #636



370078TM76

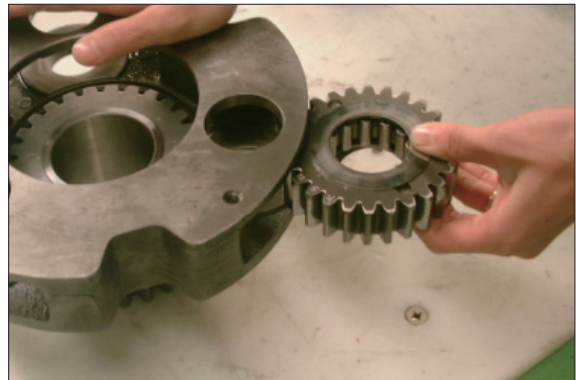
(13) Assembling carrier 2 sub-assembly

- ① Assemble carrier 2 (6) to sun gear 3 (11), and fit clip (46).
- ② Place carrier 2 with sun gear 3 up.



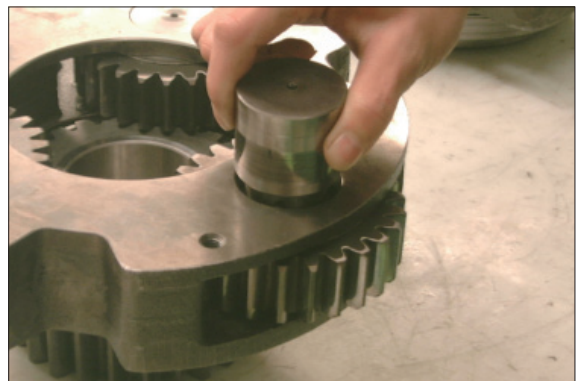
370078TM77

- ③ Put needle cage (22) into inside of planetary gear 2 (13), and insert them into carrier 2, holding them between side plates (19).



370078TM78

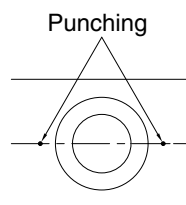
- ④ Insert pins 2 (16) into carrier 2.



370078TM78A

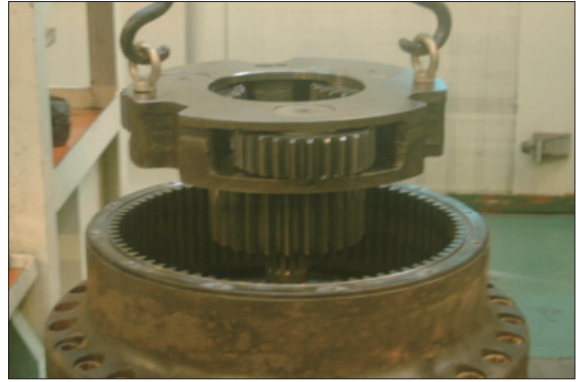
- ⑤ Insert spring pin (36) into pin holes of carrier 2 and pin 2, and punch at two points as figure to lock it.

※ Mate pin hole of carrier 2 with center of planetary gear.



370078TM79

- (14) Screw two M10 eyebolts into carrier 2 sub-assembly, and assemble it with crane, paying attention to its meshing with planetary gear 2 and ring gear.

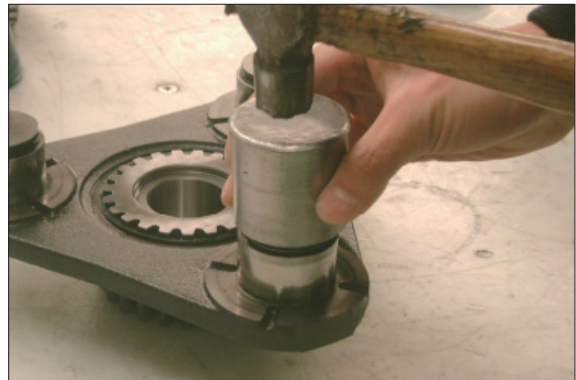


370078TM80

(15) Assembling of carrier 1 sub-assembly

- ① Interference-fit inner ring (24) to carrier 1 (5).

※ Inner ring is press-fit by the heat to carrier 1 (5).



370078TM81

- ② Assemble carrier 1 (5) to sun gear 2 (10), and fit clip (45).



370078TM82

- ③ Assemble thrust ring (26) to sun gear 2 (10).

※ Pay attention to not assembling thrust ring (26) the other way around. (Oil groove is located upside.)



370078TM83

- ④ Put needle cage (21) into inside of planetary gear 1 (12), and assemble them, holding them between side plates (18). Then fit snap ring (44) on them.



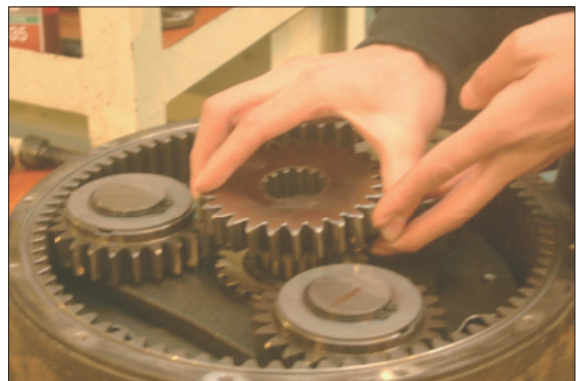
370078TM84

- (16) Assemble carrier 1 (5) sub-assembly to ring gear (1).
Paying attention to its meshing with carrier 1 sub-assembly and ring gear (1).



370078TM85

- (17) Assemble sun gear 1 (9) to drive shaft (101) paying attention to its meshing with sun gear and drive shaft (101).



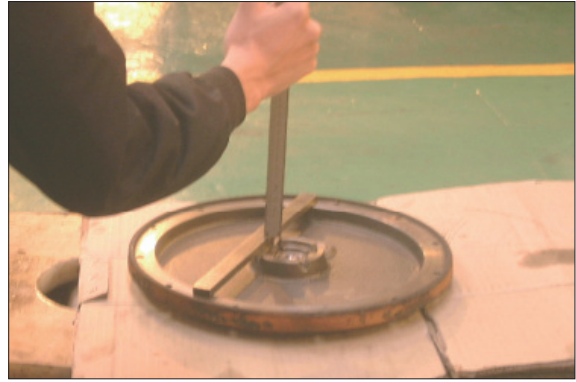
370078TM86

- (18) Measure height "A" from sun gear 1 end face to ring gear (1) mating face with straight edge and depth gage.



370078TM87

- (19) Measure height "B" from side cover (4) mating face to center hold bottom with straight edge and depth gage.



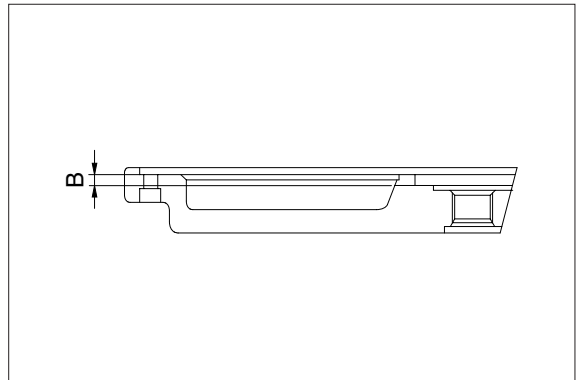
370078TM88

- (20) Obtain optimum thickness with the following formula.

$$1.5 \sim 2.0 = (B+A)$$

- (Thickness of thrust ring + thickness of washer)

- ※ Keep axial clearance between sun gear and washer 1.5~2.0 mm.



370078TM89

- (21) Place washer (53) of above-selected thickness and thrust ring (26) to center of side cover (4).

- ※ Pay attention to not assembling thrust ring (26) the other way around and punch it (Oil groove is located upside)



370078TM90

- (22) Assemble O-ring (81) into ring gear.

And degrease and dry mating faces of side cover & ring gear. Then lift side cover(4) up, and place it on ring gear.

And tighten socket bolt (30) to specified torque to fix side cover.

- Tightening torque : 3.5 kgf · m (25.3 lbf · ft)



370078TM91

- (23) Tighten plug (32) to specified torque at side cover (4).
- Tightening torque : 11.0 kgf · m (79.6 lbf · ft)

That is all of the assembling work. After fitting the motor this reduction gear, supply oil until overflows from the level gauge.



370078TM92

4) CHECKING FACTS AFTER ASSEMBLY

(1) Air test of reduction gear

Disassemble plug (32) of reduction gear part.

When compressed air (0.3 kgf/cm²) is inserted that in water during the 2 minutes, it should be not happened air bubble.

- Gear oil : 5.5 liter (SAE 85W-140, API GL-5 or better)

(2) Air test of hydraulic motor

One port should be opened, the others port should be closed.

When compressed air (3 kgf/cm²) is inserted opened port in water during the 2 minutes, it should be not happened air bubble.

- Working fluid : 1.5 liter

■ TRAVEL MOTOR (TYPE 2)

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.

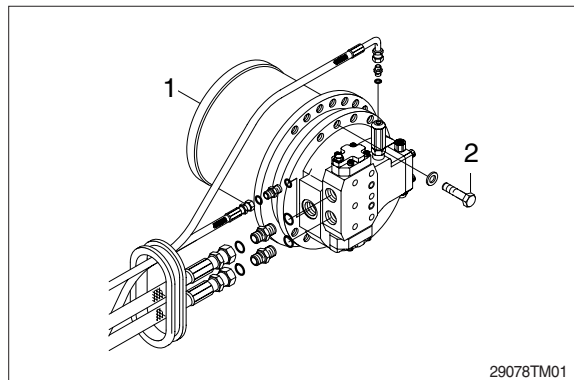
▲ Escaping fluid under pressure can penetrate the skin causing serious injury.

※ 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 : 425 kg (940 lb)

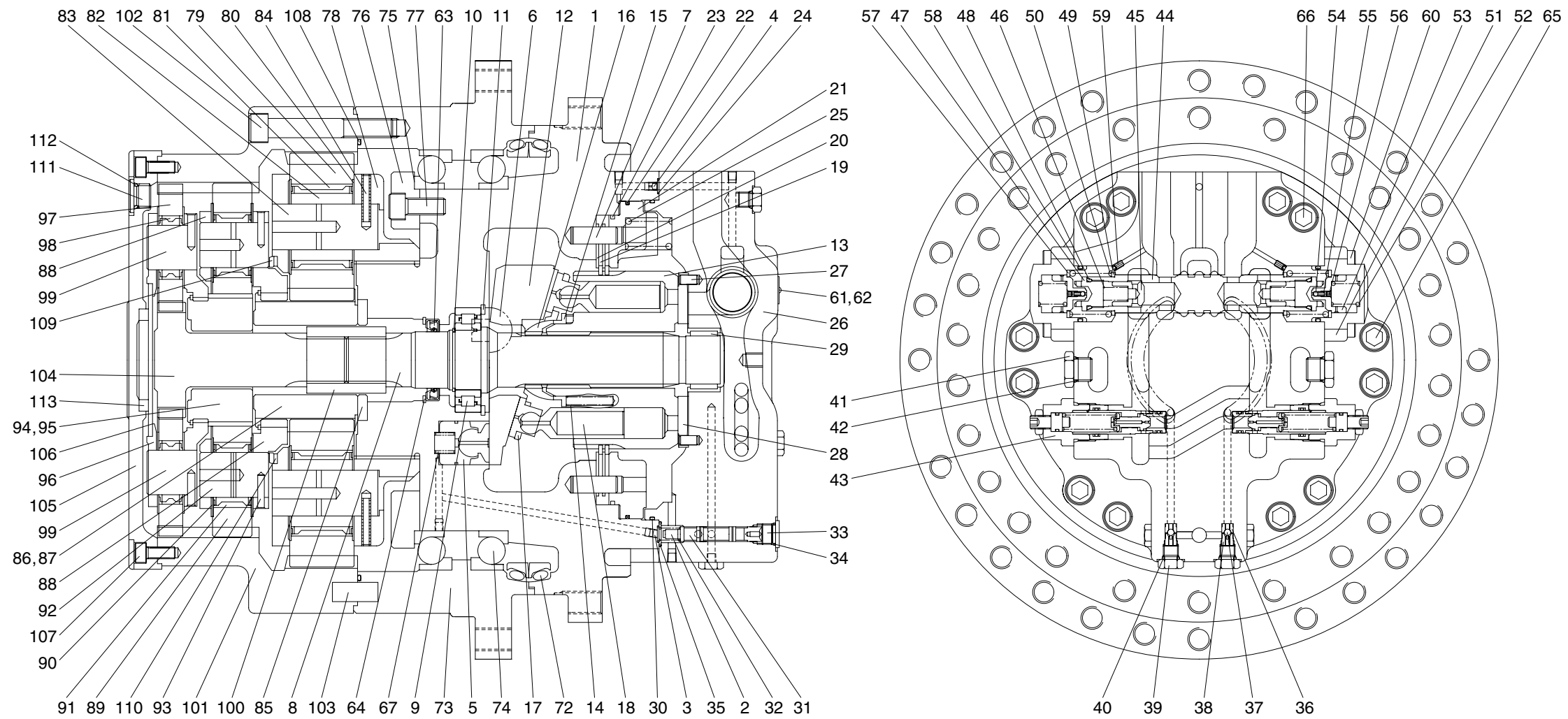
2) INSTALL

- (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. SPECIFICATION

1) TRAVEL MOTOR



3809A2TM22

1 Shaft casing	15 Spacer	29 Needle bearing	43 Relief valve assy	57 Spring seat	75 Shim	89 Planetary gear	103 Planetary pin
2 Plug	16 Ball guide	30 O-ring	44 Main spool	58 O-ring	76 Bearing guide	90 Plate	104 Drive gear
3 Orifice	17 Set plate	31 Swash spool	45 Check	59 Orifice	77 Wrench bolt	91 Needle bearing	105 End cover
4 Orifice screw	18 Piston & Shoe assy	32 Swash spring	46 Spring	60 Wrench bolt	78 Carrier	92 Pin	106 Plate
5 Swash piston	19 Friction plate	33 Plug	47 Plug	61 Name plate	79 Planetary gear	93 Spring pin	107 Wrench bolt
6 Swash ball	20 Separator plate	34 O-ring	48 O-ring	62 Rivet	80 Plate	94 Sun gear	108 O-ring
7 Brake pin	21 Brake piston	35 O-ring	49 Spring seat	63 Oil seal	81 Needle bearing	95 Snap ring	109 Ring
8 Shaft	22 Piston ring	36 Seat	50 Spring	64 Snap ring	82 Bearing bushing	96 Carrier	110 Ring
9 Roller bearing	23 Piston ring	37 Steel ball	51 Cover	65 Wrench bolt	83 Pin	97 Planetary gear	111 Plug
10 Stop ring	24 O-ring	38 Stopper	52 Spring	66 Wrench bolt	84 Spring pin	98 Needle bearing	112 O-ring
11 Lock ring	25 Brake spring	39 Plug	53 Spool	67 Spring pin	85 Thrust plate	99 Pin	113 Bushing
12 Swash plate	26 Valve casing	40 O-ring	54 Steel ball	72 Floating seal	86 Sun gear	100 Coupling	
13 Cylinder block	27 Valve plate pin	41 Plug	55 Spring	73 Hub	87 Snap ring	101 Ring gear	
14 Cylinder spring	28 Valve plate	42 O-ring	56 Plug	74 Bearing	88 Carrier	102 Wrench bolt	

2) TOOL AND TIGHTENING TORQUE

(1) Tools

Name of tools	B-size	Name of part applied
Hexagonal L-Wrench	4	Plug (2), Orifice screw (3, 4)
	8	Plug (33)
	10	Wrench bolt (60)
	27	Hex (43)
Socket wrench/ spanner	19	Hp plug (39)
	27	Hp plug (41)
Snap-ring plier (for holes, axis)		Ring stop (10), Snap ring (64)
Hammer		Needle bearing (29), Pin (7, 27)
Torque wrench		Size : 500 kgf · m, 3000 kgf · m
Jig for oil seal assembling		Oil seal (63)
Heating tool for bearing		Roller bearing (11)

(2) Tightening torque

NO.	Part name	Standard	Size	Torque	
				kgf · m	lbf · ft
2	Plug	NPTF 1/16	4	0.9±0.2	6.51±1.45
3, 4	Orifice screw	NPTF 1/16	4	0.7	5.06
33	Plug	PF 3/8	8	7.5	54.25
39	HP plug	PF 1/4	19	3.7	26.76
41	HP plug	PF 1/2	27	11	79.56
43	Relief valve	HEX 27	27	18±1.0	130±7.0
60	Wrench bolt	M12×35L	10	13	94.03
65	Wrench bolt	M16×50L	14	13	94.03
66	Wrench bolt	M16×100L	14	6.7	48.46

2. DISASSEMBLING

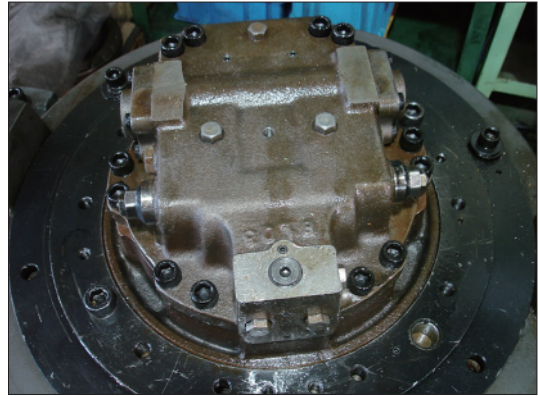
1) GENERAL INSTRUCTIONS

- (1) Generally, hydraulic equipment is precisely manufactured and clearances between each parts are very narrow. Therefore, disassembling and assembling works should be performed on the clean place where dusts hardly gather. Tools and kerosene to wash parts should also be clean and handled with great care.
 - (2) When motor is removed from the host machine, wash around the ports sufficiently and put the plugs so that no dust and/or water may invade. Take off these plugs just before the piping works when re-attach it to the host machine.
 - (3) Before disassembling, review the sectional drawing and prepare the required parts, depending on the purpose and the range of disassembling.
Seals, O-rings, etc., if once disassembled, are not reusable.
There are some parts that should be replaced as a subassembly.
Consult with the parts manual in advance.
 - (4) The piston can be inserted to whichever cylinder block for the initial assembling.
However, their combination should not be changed if they are once used. To reuse them, put the matching mark on both pistons and cylinder block before disassembling.
- ▲ Take great care not to pinch your hand between parts while disassembling nor let fall parts on your foot while lifting them.**

2) DISASSEMBLEING

(1) Set up the motor assembly on the workbench for disassembly.

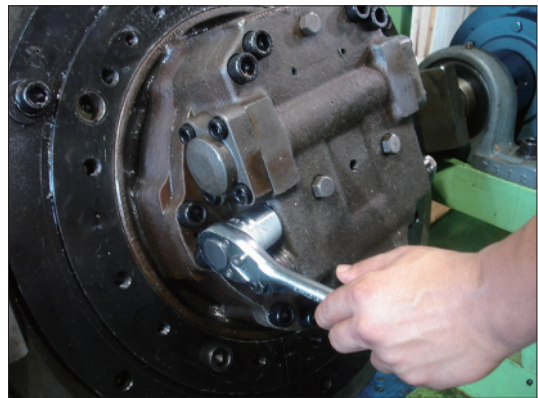
※ When you spin the disassembly-assembly jig at 90°, please fix the motor drain plug (56) to the bottom.



3809A2TM040

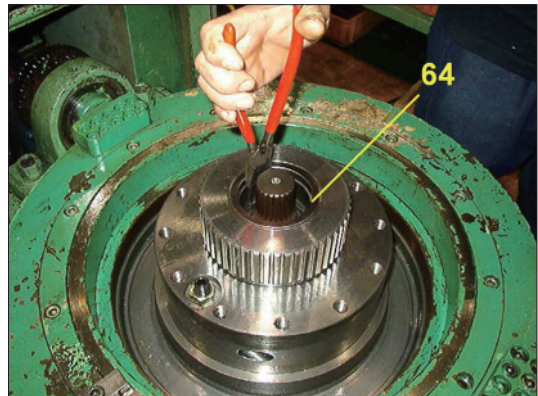
(2) Please emit the oil in the motor case with dismantlement for the drain plug (56).

※ Please inspect whether there are some kinds of foreign substance (metal powders, processed chips and others) during drain oil.



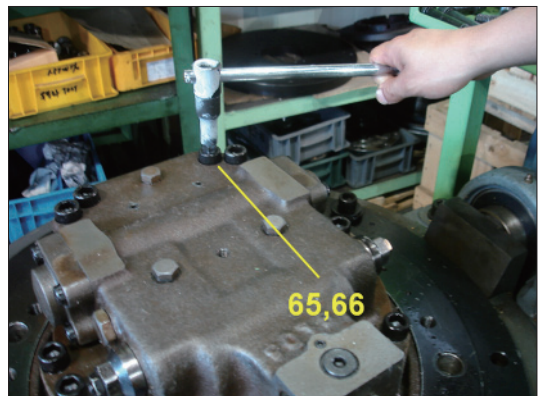
3809A2TM041

(3) Disassemble the snap-ring (64) using pliers.



3809A2TM042

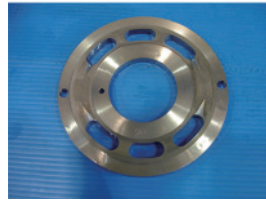
(4) Please disassemble the hexagonal socket bolt (65, 66) fixing the valve casing.



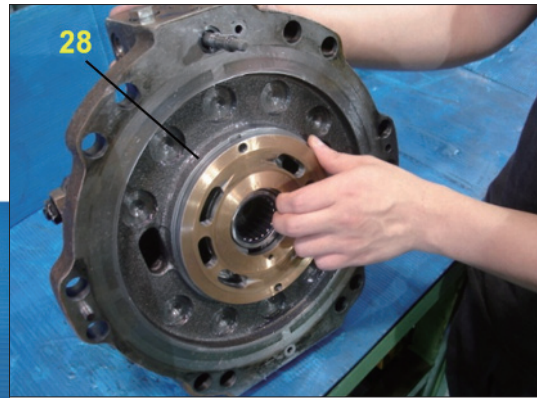
3809A2TM043

(5) Disassemble the valve plate (28) after the valve casing sub.

※ If abrasion on the valve plate, please change to new product.



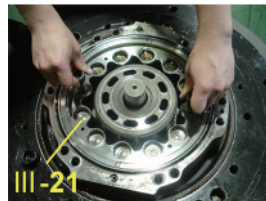
3809A2TM044A



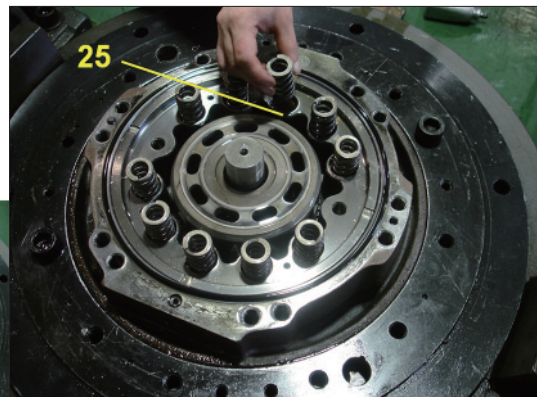
3809A2TM044

(6) Remove brake springs (25) and take the brake piston out by screwing a M16 screw into the brake piston.

※ Number of brake springs is 10.



3809A2TM045A



3809A2TM045

(7) Remove the cylinder and piston assembly.

※ It is easier to work by placing the motor shaft horizontal.



3809A2TM046

(8) Take swash plate (12) out.



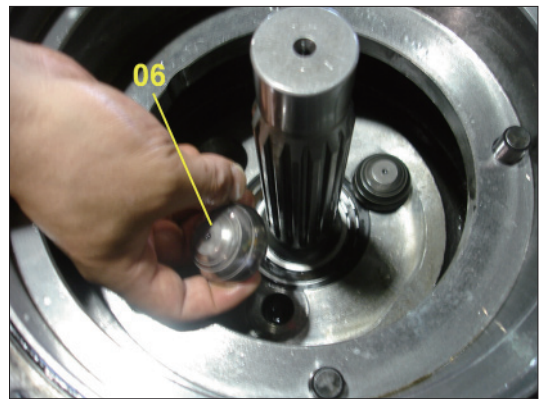
3809A2TM047

(9) Take swash piston kit out.



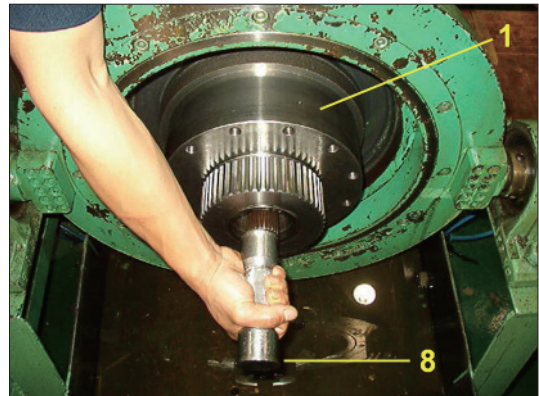
3809A2TM048

(10) Take swash ball (06) out.



3809A2TM049

(11) Take out shaft (8) from shaft casing (1) by striking the bottom part lightly with a hammer.
※ Be careful not to damage the roller bearing (9).

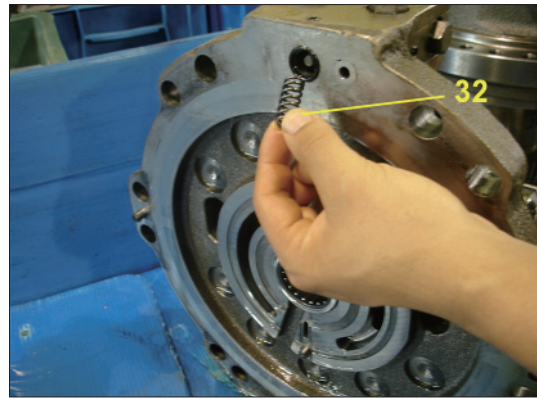


3809A2TM050

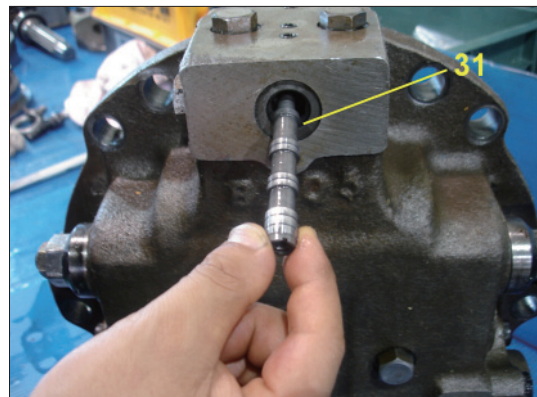
(12) Take valve casing sub out.

※ Be careful not to damage the needle bearing (29).

① Remove automatic control spring (32), automatic control spool (31).

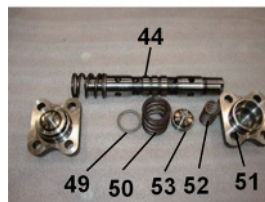


3809A2TM051

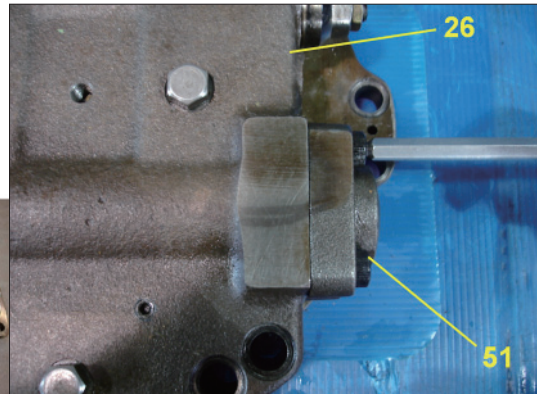


3809A2TM052

② Take out main spool cover (51) from valve casing (26). Remove spring (52), spool (53), spring seat (49), spring (50) and main spool (44) in sequence.

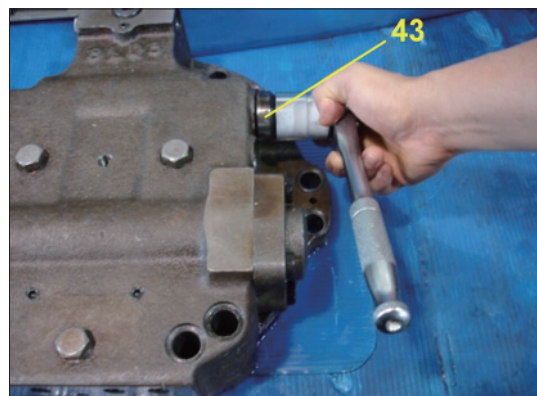


3809A2TM053A



3809A2TM053

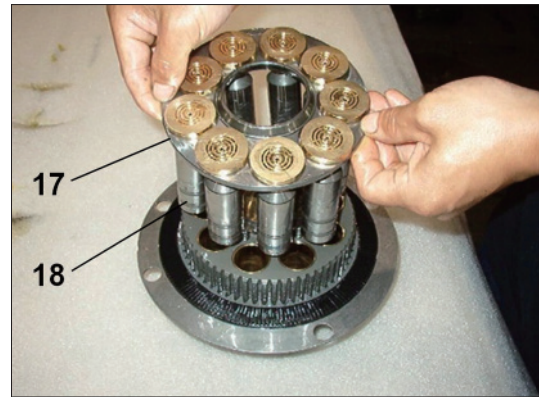
③ Remove relief valve assembly (43).



3809A2TM054

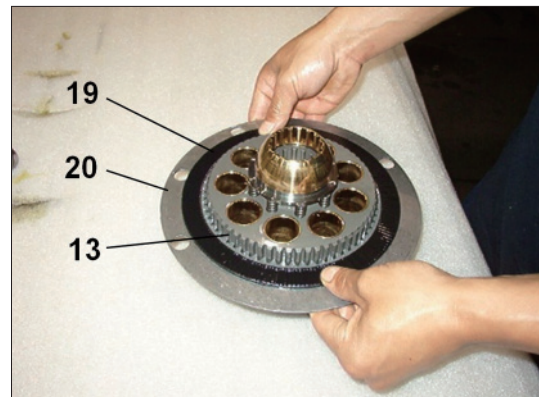
(13) Take cylinder sub out.

① Remove set plate (17) and piston (18) sub.



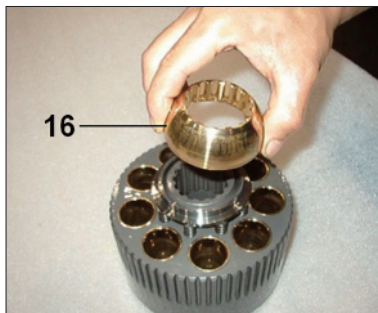
3809A2TM055

② Remove friction plates (19) and separate plates (20) from cylinder block (13).

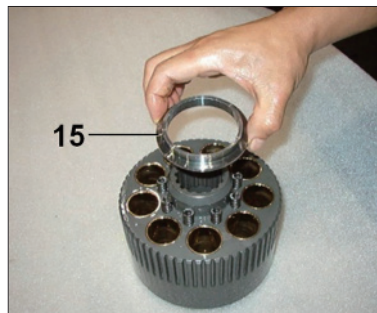


3809A2TM056

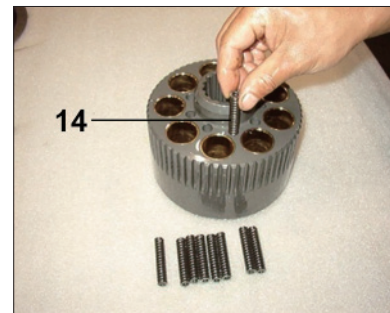
③ Remove ball guide (16), spacer (15), cylinder spring (14).



3809A2TM057



3809A2TM058



3809A2TM059

※ Disassembly has completed.

Check that the motor parts are broken or not.

3) ASSEMBLING TRAVEL MOTOR

(1) Shaft sub assembly

- ① Fit bearing spacer to shaft (08) and press-fit roller bearing (09).
- ※ Press the roller bearing after preheating.



3809A2TM060



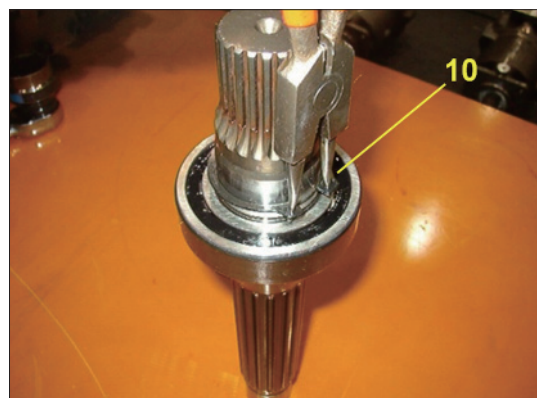
3809A2TM061

- a. Induction heating apparatus temperature : 100°C
- b. Be careful not to damage the sliding surface for the seal on the shaft.



3809A2TM062

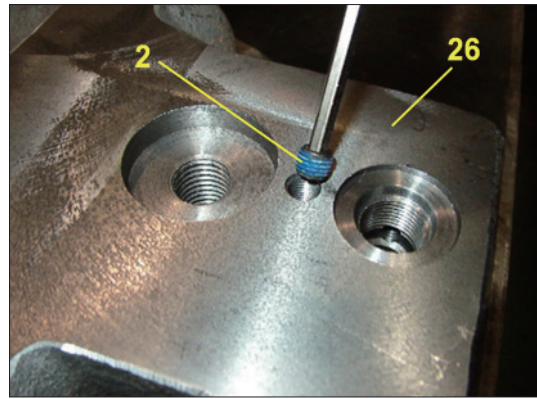
- ② Insert stop ring (10) with snap ring pliers.
- ※ Pay attention to the direction of the stop ring.
(round direction is bearing direction.)



3809A2TM063

(2) Assemble valve casing sub assembly

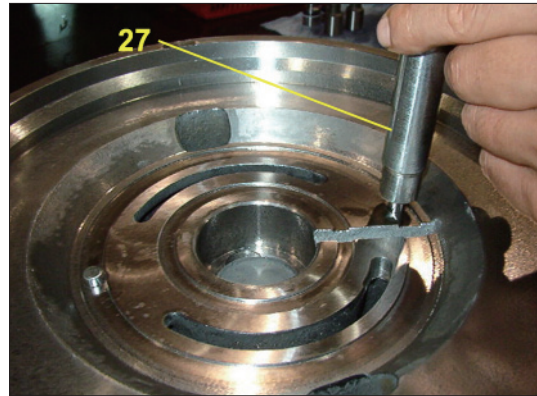
- ① Tighten plugs (2) to valve casing (26) to the specified torque.
 - a. Apply loctite to the plug, and tighten them to the specified torque.
 - Tightening torque : 70~110 kgf · cm



3809A2TM064

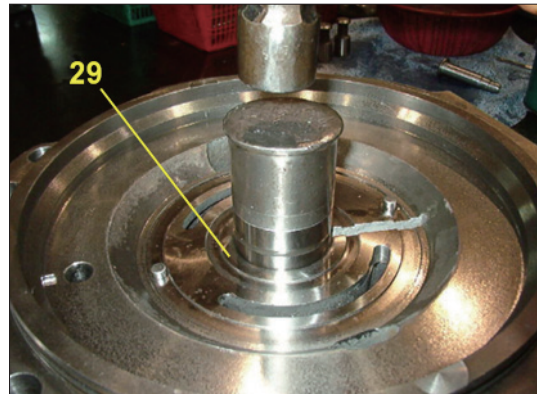
- ② Press-fit pin (27).

The pin's length will be 5 mm from valve plate with contacted area using a hammer.



3809A2TM065

- ③ Assemble needle bearing (29).
 - Tools : Press-fit jig and hammer.

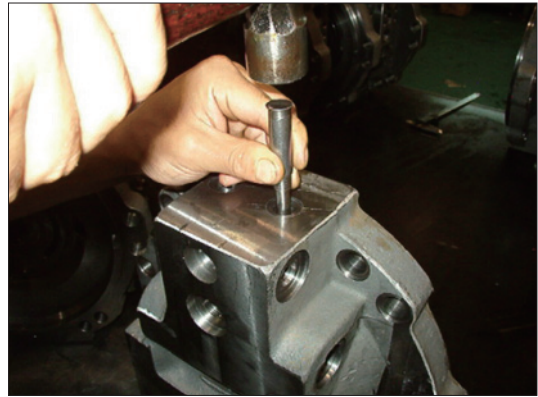


3809A2TM066

④ Assemble seat (36), ball (37), stopper (38), O-ring (40) and HP plug (39) in sequence.



3809A2TM067

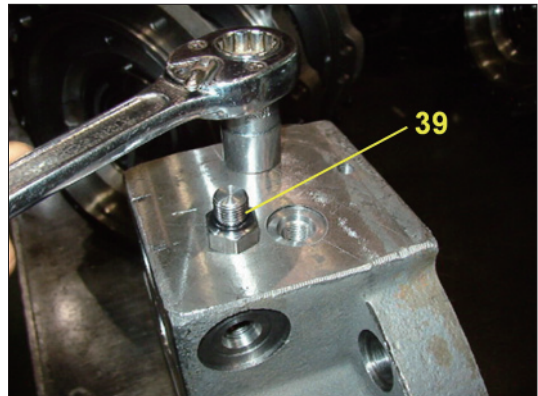


3809A2TM068

※ Pay attention to the direction of the seat and stopper.
· Tightening torque : 370 kgf · cm

⑤ Assemble HP plug (39) to the specified torque.

· 5 places
· Tightening torque : 370 kgf · cm



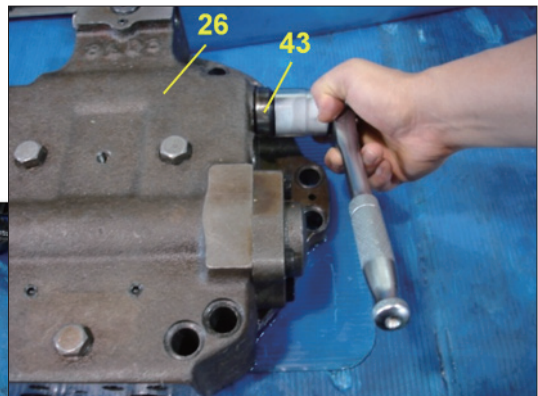
3809A2TM069

⑥ Mount relief valve (43) to the specified torque.

· Tightening torque : 2200 kgf · cm

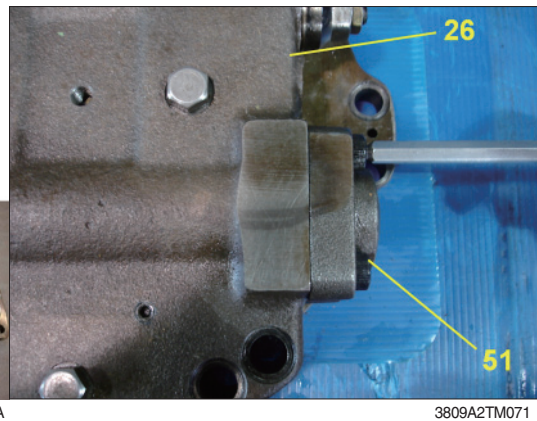
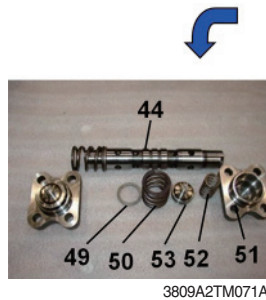


3809A2TM070A

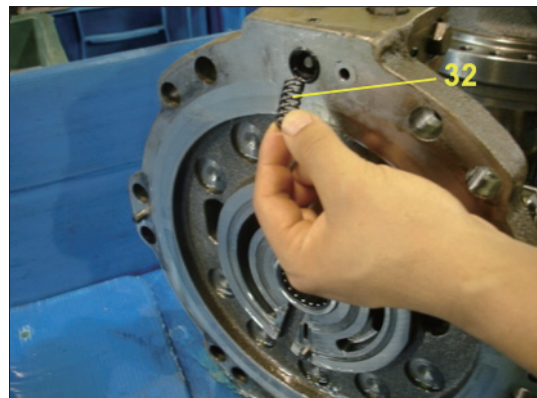
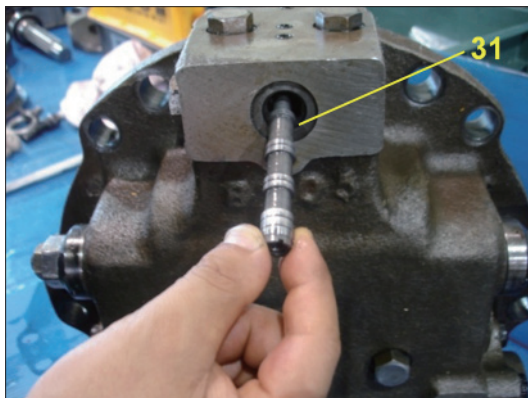


3809A2TM070

- ⑦ Assemble main spool cover (51), spring (52), spool (53), spring seat (49), spring (50), and main spool (44) in sequence.



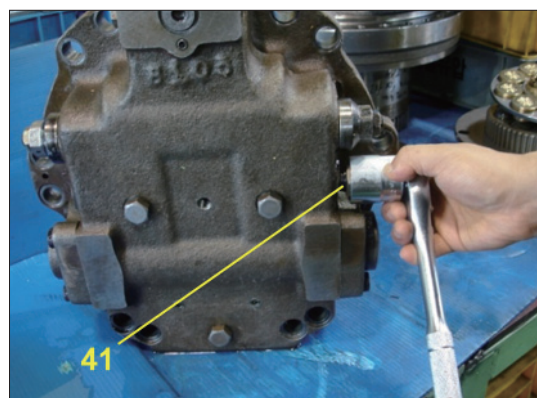
- ⑧ Assemble automatic control spool (31), spring (32), O-ring (35).
 · Tightening torque : 750 kgf · cm



- ⑨ Insert O-ring (30) to valve casing.
 Apply grease to the O-ring.

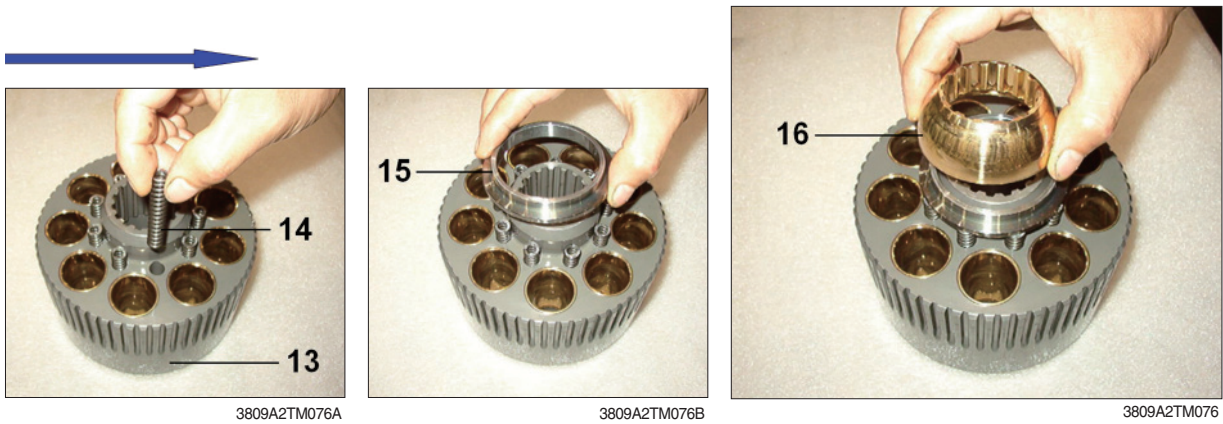


- ⑩ Assemble drain plug (41) to the specified torque.
 · Tightening torque : 1100 kgf · cm

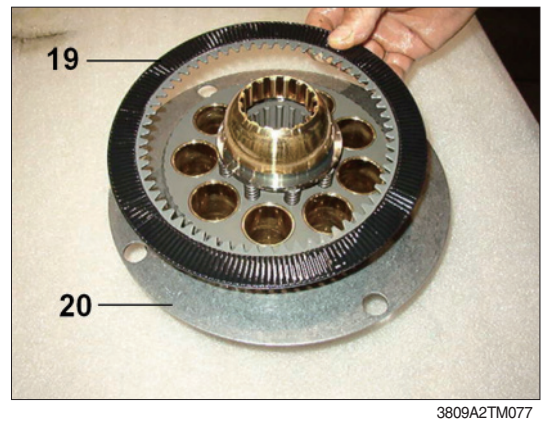


(3) Assemble cylinder sub assembly

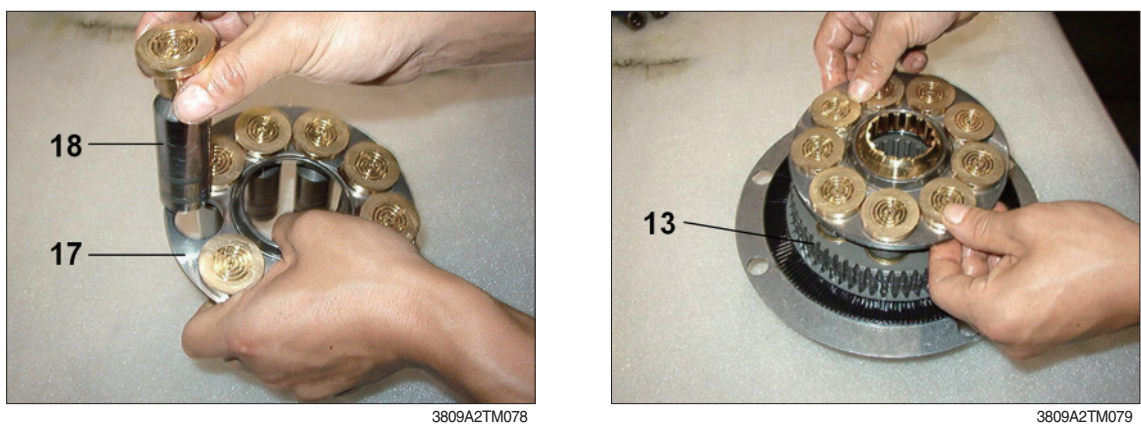
- ① Fit cylinder spring (14), spacer (15) and ball guide (16) to cylinder block (13).
Align the phase of the cylinder and the spline of the ball guide.



- ② Assemble friction plates (19) and separate plates (20).

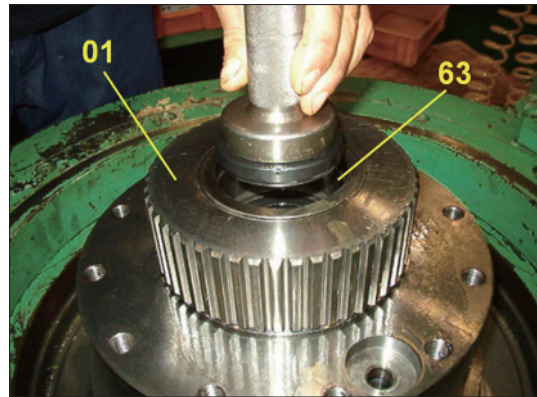


- ③ Insert the assembly of piston shoe (18) to retainer set plate (17) and fit it to the cylinder block (13).



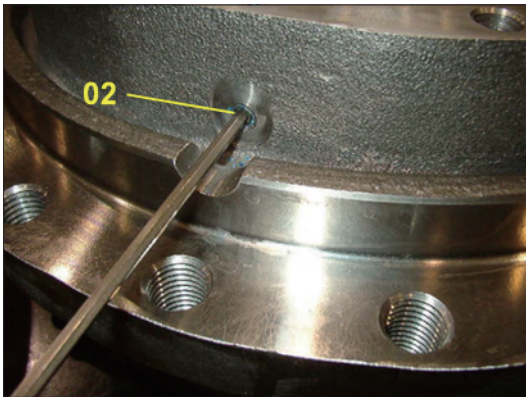
(4) Fit oil-seal (63).

※ Be careful not to damage the lip of the seal.

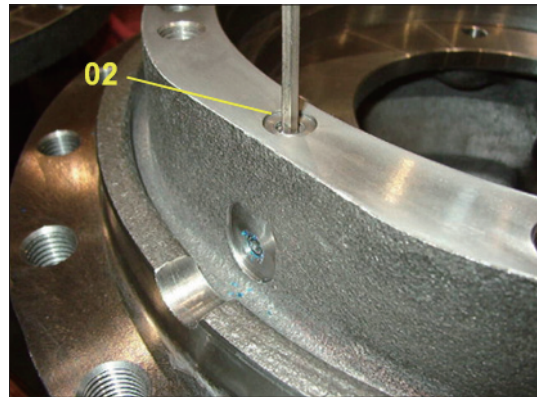


3809A2TM080

(5) Assemble plug (02) to the specified torque.



3809A2TM081



3809A2TM082

① Apply loctite to the plug and assemble.

② Tightening torque : 70~110 kgf · cm

(6) Fit pins (7).

- Tools : Hammer

Pin (7) : Please keep the length at 19 mm
from surface of the shaft casing.

Pin (7) numbers - 4 EA



3809A2TM083

(7) Assemble the shaft sub assembly.



3809A2TM084

(8) Assemble swash plate (12).



3809A2TM085

(9) Assemble swash piston kit assembly.



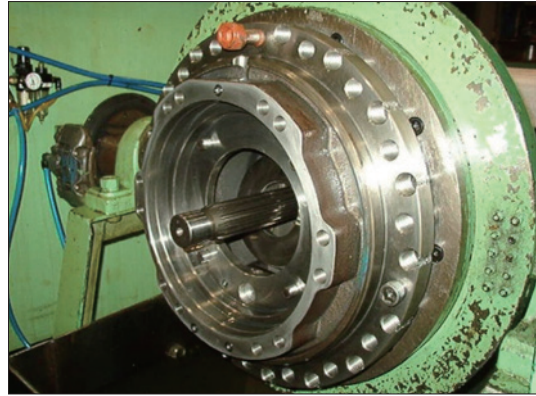
3809A2TM086

(10) Assemble swash ball (06).



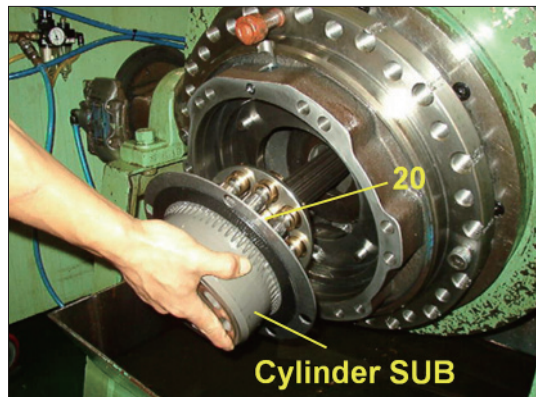
3809A2TM087

- (11) Work when the shaft casing is at the vertical direction.
※ Be careful not to drop the swash plate.



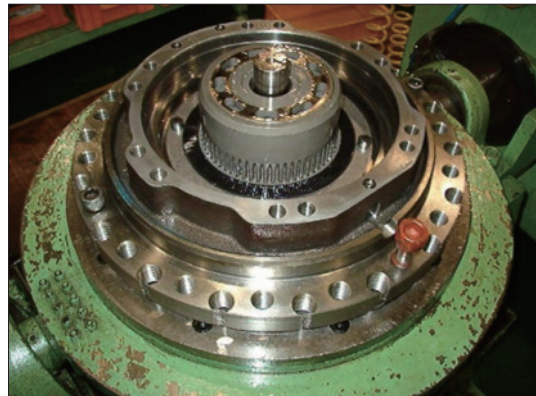
3809A2TM088

- (12) Fit the cylinder sub assembly.
※ Align the separate plates (20) to the pin.



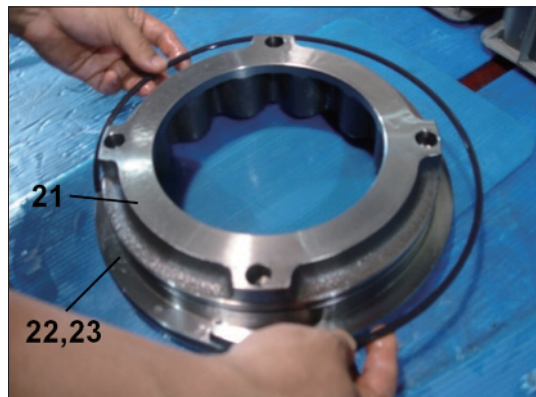
3809A2TM089

- (13) Place the motor vertical again.



3809A2TM090

- (14) Fit piston ring (22), piston ring (23) to brake piston (21).



3809A2TM091

(15) Fit the brake piston (21) to the shaft casing (01).

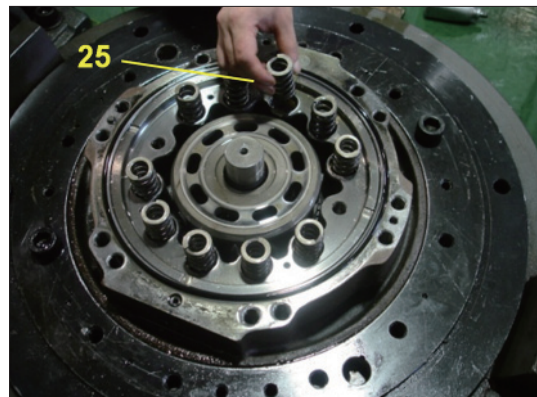
※ Pay attention to the direction of the brake piston.



3809A2TM092

(16) Mount brake springs (25).

① Numbers : Springs - 10EA , Holes - 10EA



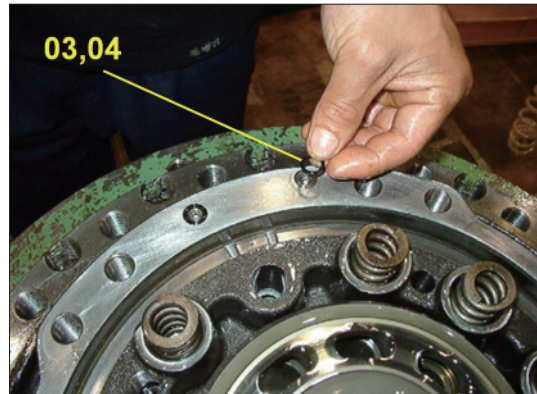
3809A2TM093

(17) Tighten orifice (03, 04) to the specified torque.

① Numbers and size : (03) 1 EA - \varnothing 0.6

(04) 1 EA - \varnothing 0.8

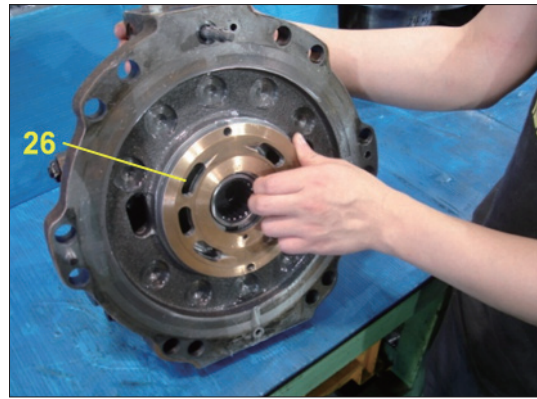
② Tightening torque : 70 kgf · cm



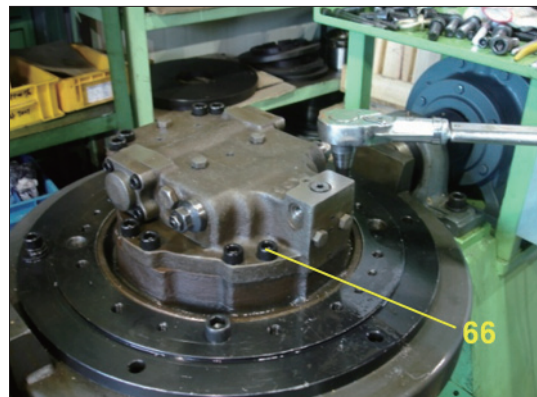
3809A2TM094

(18) Mount valve plate (26) to valve casing and tighten it with hexagonal socket bolt (66).

- ① Apply grease to the valve plate back and be careful not to drop the valve plate.
- ② When you assemble the valve casing to shaft casing, please use a crane.
- ③ The hole ($\varnothing 5$) of valve plate will be located for inlet and outlet port of valve casing.
- ④ Coat grease to swash spool of swash spring.
 - Tightening torque : 2400 kgf · cm
 - Bolt tightening torque : 1800 ± 100 kgf · cm

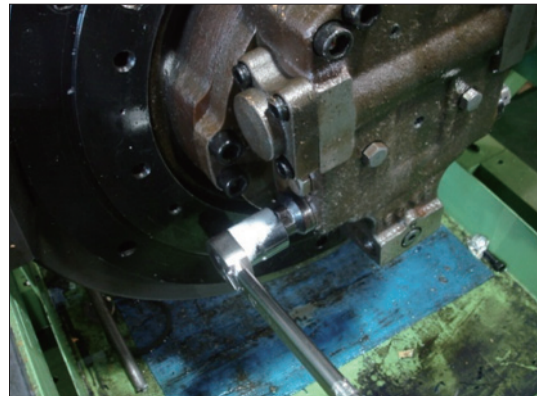


3809A2TM095



3809A2TM096

(19) Tighten relief valves (43) to the specified torque.



3809A2TM097

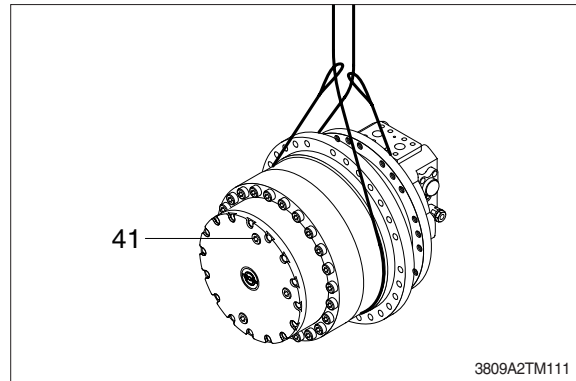
※ Assembly has completed.

3. DISASSEMBLING REDUCTION GEAR

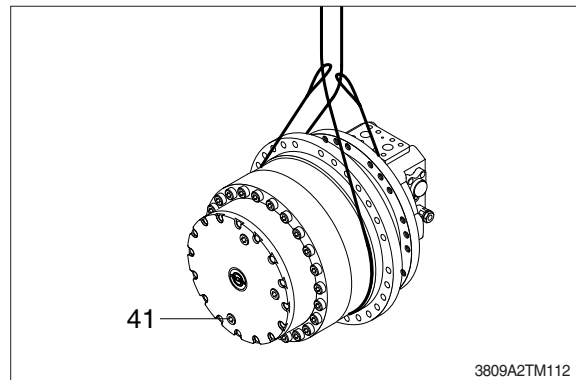
1) DISASSEMBLY

(1) Loosen drain plug (41).

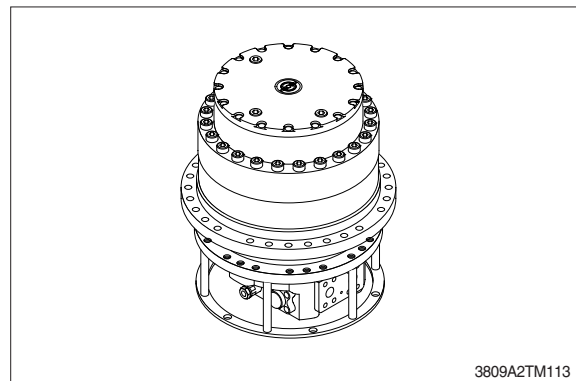
- Do not remove drain plug (41) at once.
- Because gear oil was compressed, plug and oil protrude suddenly.



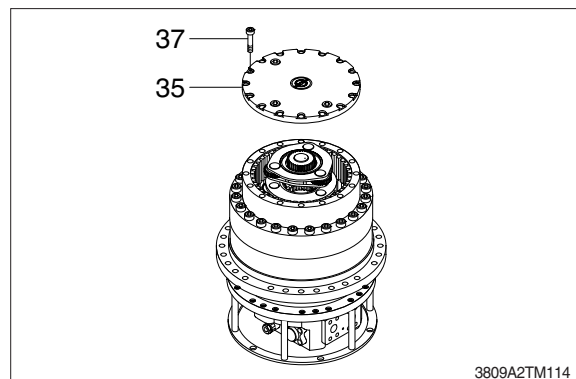
(2) After loosening drain plug (41), drain gear oil.



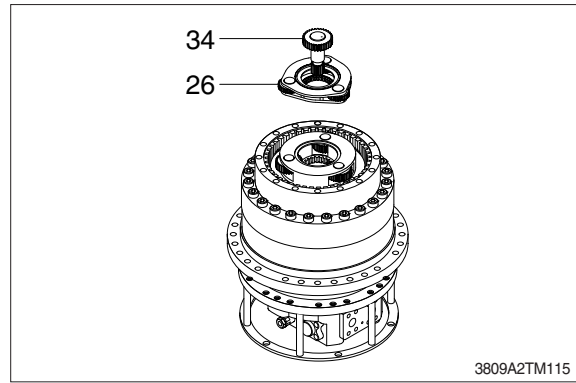
(3) Overturn the traveling device.



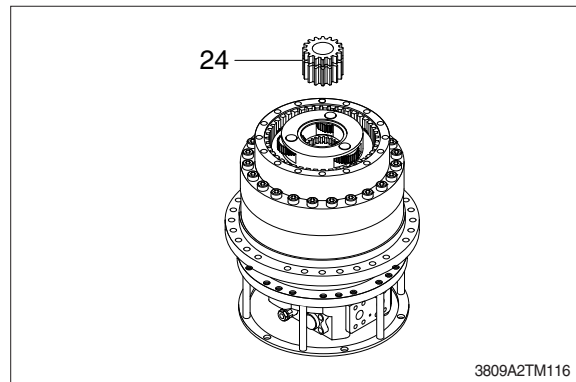
(4) After loosening bolt (37), take cover (35) off.



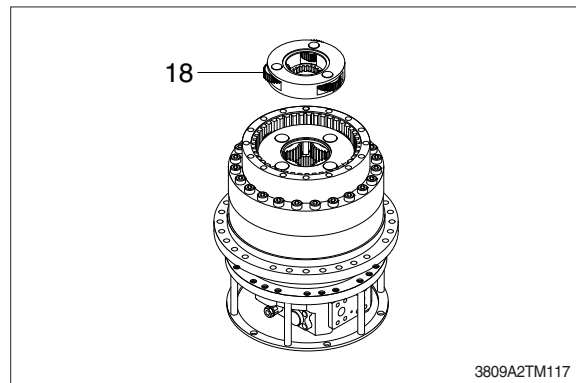
(5) Remove drive gear (34) and No.3 carrier (26).



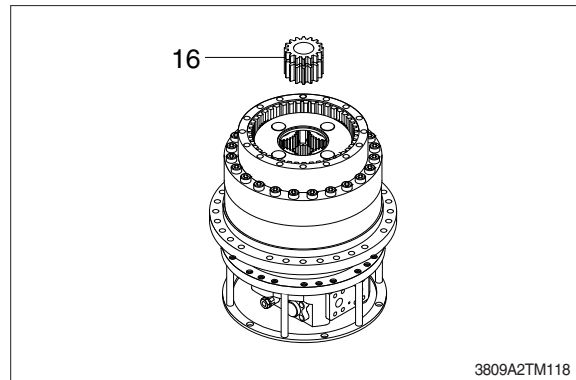
(6) Remove No.2 sun gear B (24).



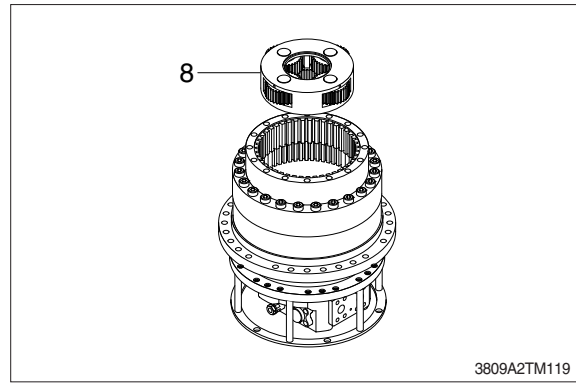
(7) Remove No.2 carrier B (18).



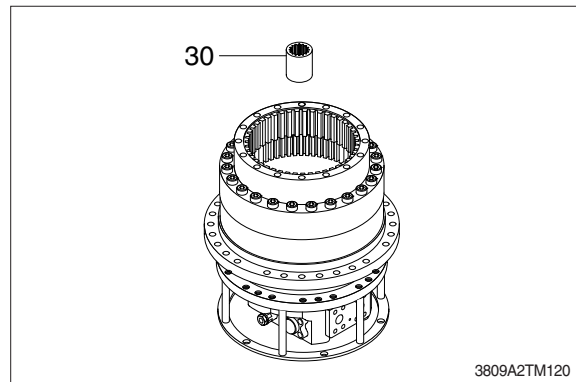
(8) Remove No.1 sun gear A (16).



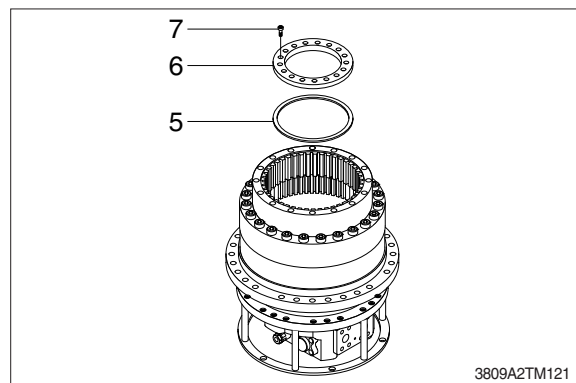
(9) Remove No.1 carrier A (8).



(10) Remove coupling (30).

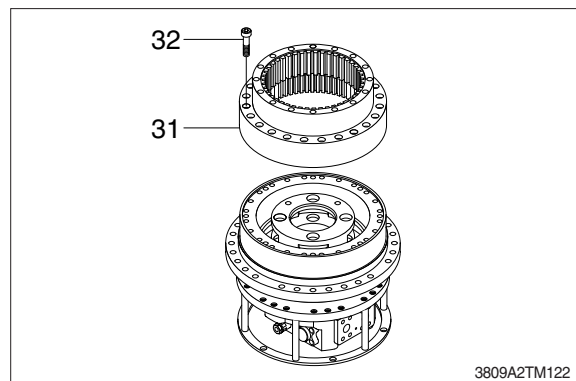


(11) After loosening bolt (7), remove bearing guide (6) and shim (5).

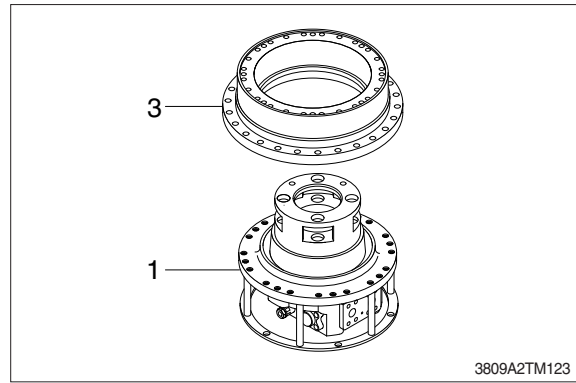


(12) After loosening bolt (32), remove ring gear (31).

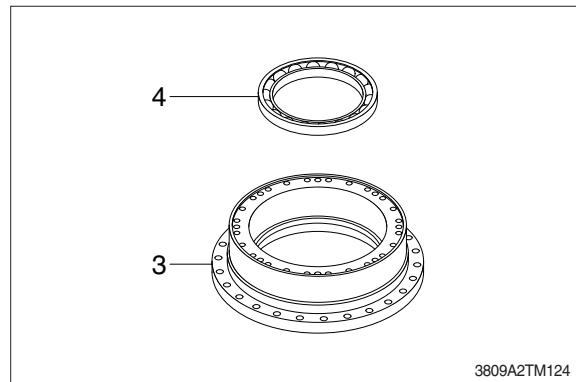
- Tools : I-bolt, Hoist



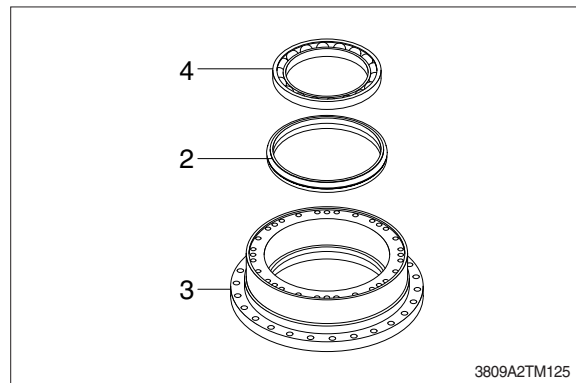
(13) Remove hub (3) from assembly (1).
- Tools : I-bolt, Hoist



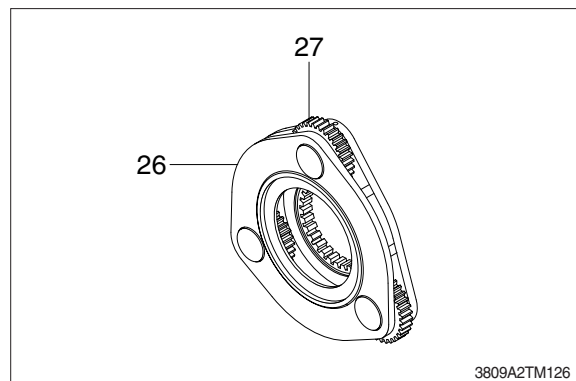
(14) Remove angular bearing (4) from hub (3).



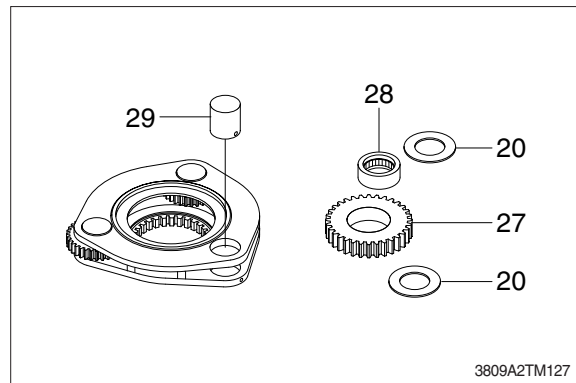
(15) Remove floating seal (2) and angular bearing (4) at opposite of hub (3).



(16) Remove planetary gear C (27) from No.3 carrier C (26).



(17)After removing pin (29), remove No.3 planetary gear C (27), needle bearing (11) and plate C (20).



(18)Remove No.2 carrier B (18) assy.

(19)Remove No.1 carrier A (8) assy.

※ Disassembly has completed.

4. ASSEMBLING REDUCTION GEAR

- General precautions

Clean every part by kerosene and dry them by air blow.

Surfaces to be applied by loctite must be decreased by solvent.

Check every part for any abnormalities.

Each hexagon socket head bolt should be used with loctite No. 242 applied on its threads.

Apply gear oil slightly on each part before assembling.

Take great care not to pinch your hand between parts or tools while assembling nor let fall parts on your foot while lifting them.

Inspection before reassembling

Thrust washer

- Check if there are seizure, abnormal wear or uneven wear.
- Check if wear is over the allowable limit.

Gears

- Check if there are pitting or seizure on the tooth surface.
- Check if there are cracks on the root of tooth by die check.

Bearings

- Rotate by hand to see if there are something unusual such as noise or uneven rotation.

Floating seal

- Check flaw or score on sliding surface or on O-rings.

1) Track gearbox, assembly

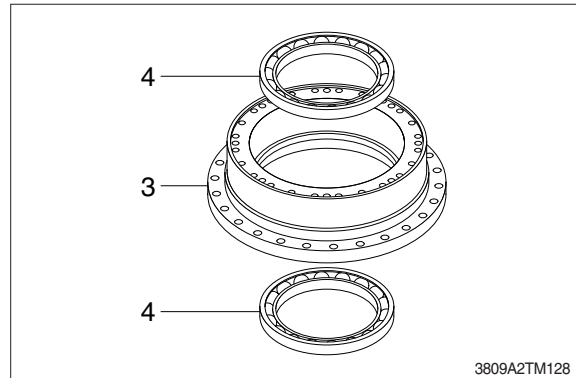
Before assembly track gearbox

Please observe following item.

- Wash all parts cleanly using solvent and dry all parts perfectly using compressed air.
- Check metal dust in casing and cleansing solution.
- Before application packing, please remove oil certainly.
- Before insert needle bearing, apply grease to bearing inlet enough.
- Apply lubricant to rotation part and sliding part.
- Damaged part or discolored part exchanges by new parts.

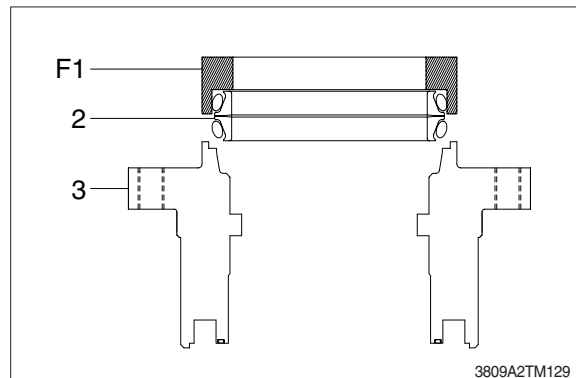
(1) Assemble hub

- ① Press fit angular bearing (4) to hub (3).



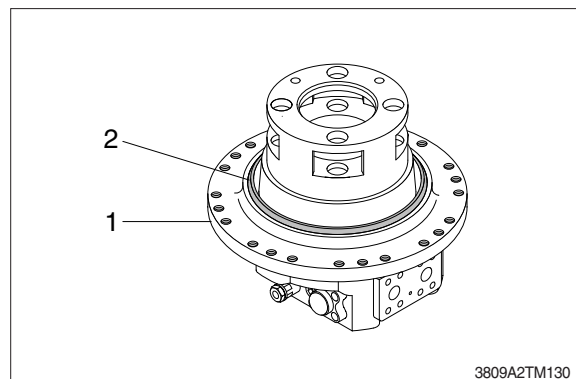
- ② Assemble floating seal (2) to hub (3) using press jig (F1).

- Remove completely the oil of surface that O-ring and O-ring contact.
- Dry completely the floating seal.
- After assembling the floating seal, check floating seal angle (within 1 mm).
- After assembling the floating seal, coat lubricant to the sliding surface of the floating seal.

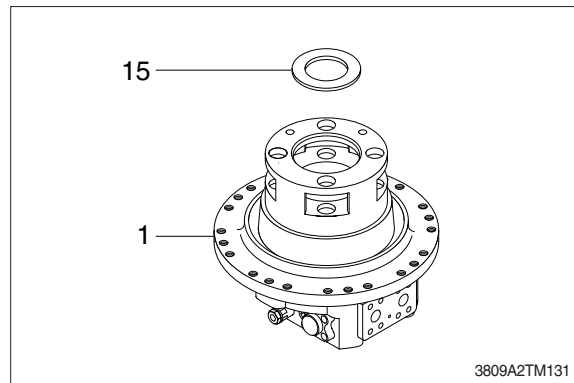


- ③ Assemble floating seal (2) to track motor (1) using press jig (F1).
Assembling sequence is same with sequence (②).

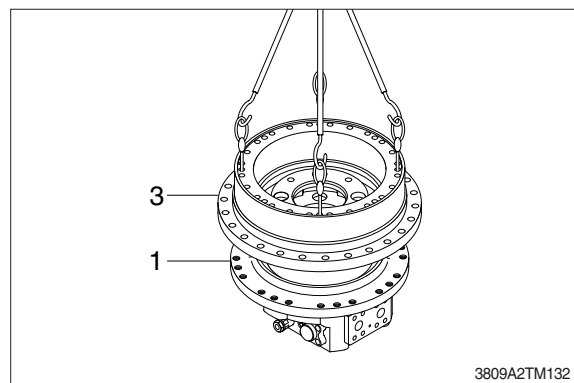
- Remove completely the oil of surface that O-ring and O-ring contact.
- Dry completely the floating seal.
- After assembling floating seal, coat lubricant to the sliding surface of the floating seal.



(2) Assemble thrust plate (15) to spline surface of track motor (1).

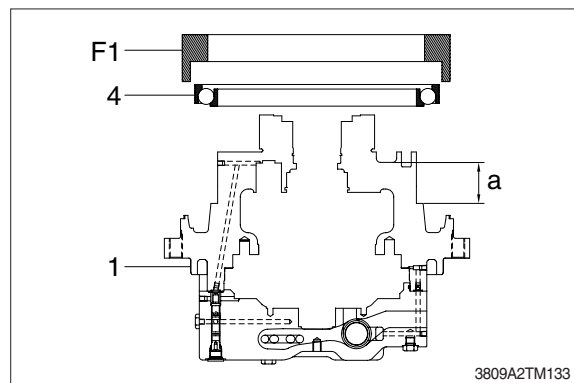


(3) Insert the assembly of hub (3) to track motor (1).



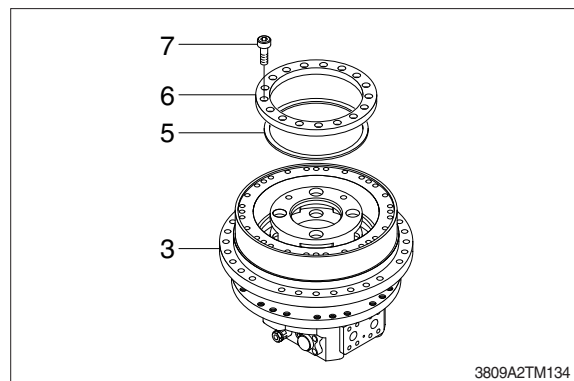
(4) Stick bearing (4) to track motor (1) using press jig (F1).

- Don't heat the bearing.
- Don't hit the bearing retainer.
- Spin the hub. (two times ~ three times)
- Measure "a" size of figure.



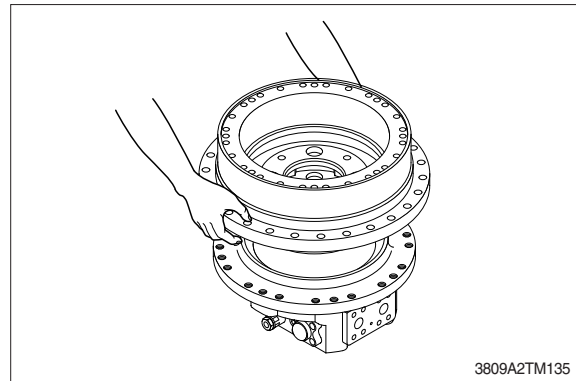
(5) After assembling shim (5), assemble bearing guide (6) using bolt (7).

- Select thickness of shim (5) and assembly.
- Apply loctite #262 to bolt (7).
- Tightening torque : 1300 kgf · cm



(6) Assemble bearing guide.

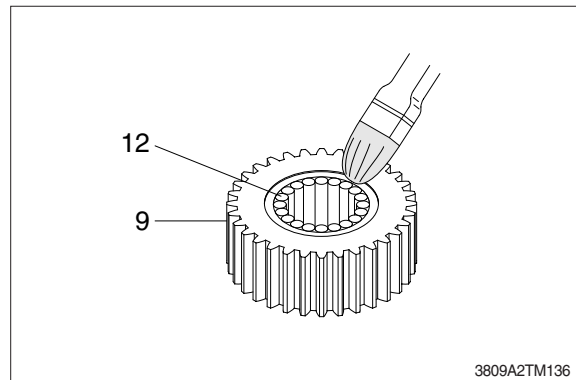
According to the hub turn, we can check it goes on smoothly or not.



(7) Assemble No.1 carrier A (8) sub.

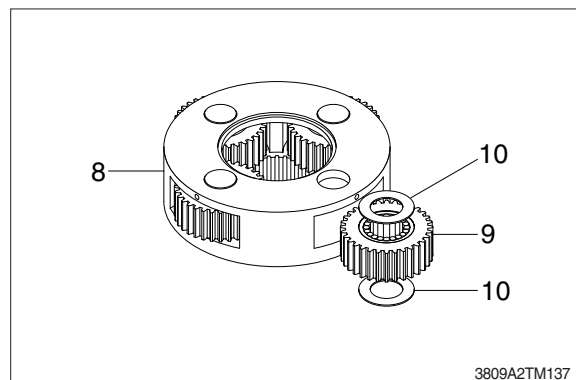
① Mount bearing bushing (12) to No.1 planetary gear A (9).

- Bearing bushing numbers : 18EA
- Insert needle and coat grease.



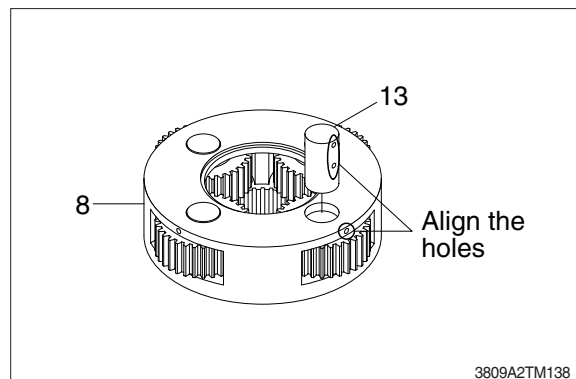
② Mount No.1 planetary gear A (9) and plate A (10) to No.1 carrier A (8).

- Align the hole of carrier and needle inside diameter.

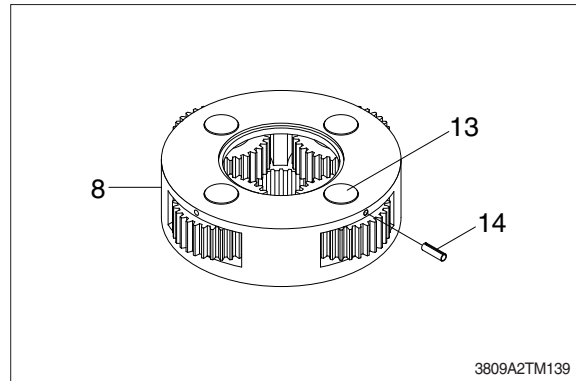


③ Put pin (13) on holes of No.1 carrier A (8).

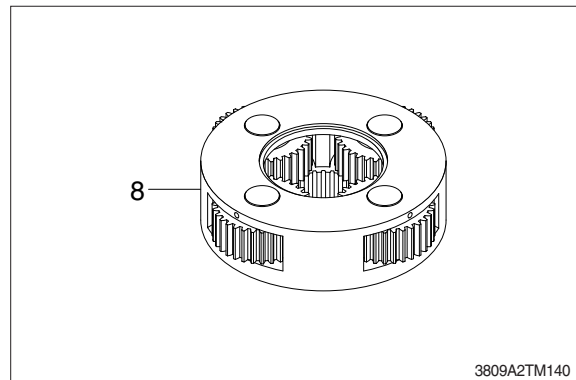
- ※ Align the holes of the carrier and pin holes.
- ※ Beat on it lightly with hammer and put in.



- ④ Assemble carrier (8) and pin (13) striking pin (14) by hammer.
After assembly pin (14), caulking.



- ⑤ Complete remainder by equal method.

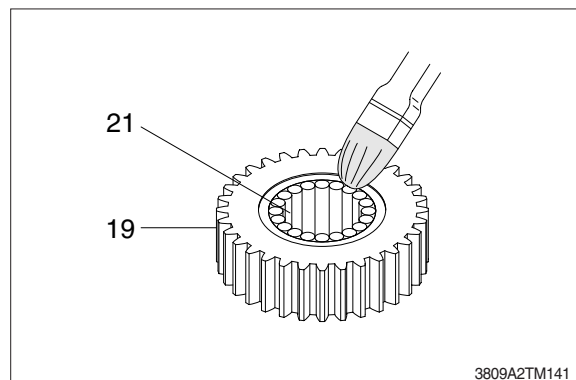


- (8) Assemble No.2 carrier B (18) sub.

- ① Mount needle (21) to No.2 planetary gear B (19).

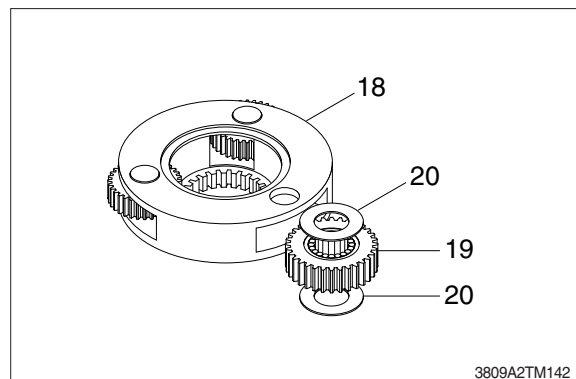
- Needle numbers : 15 EA

Insert needle and coat grease.



- ② Insert No.2 planetary gear B (19) and plate B (20) to No.2 carrier B (18).

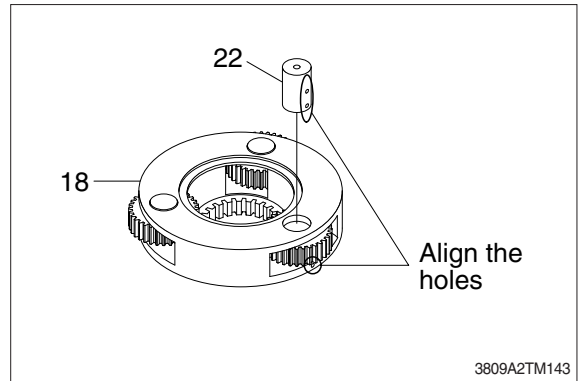
- Align the holes of the carrier and pin holes.



③ Put pin (22) on holes of No.2 carrier B (18).

※ Align the holes of the carrier and pin holes.

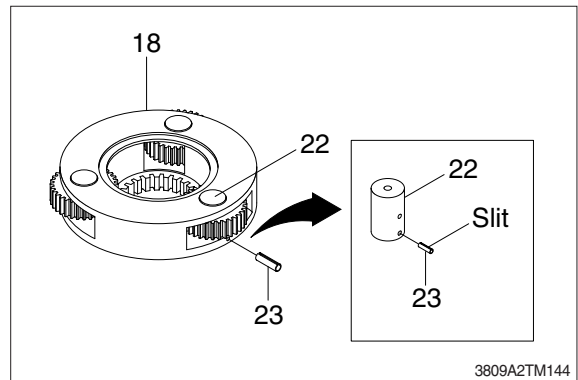
※ Beat on it lightly with hammer and put in.



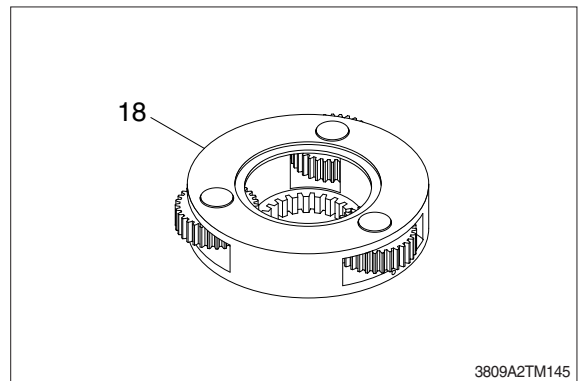
④ Assemble carrier (18) and pin (22), striking pin (23) by hammer.

- If the pin's divided side is not located in the above, it will be damaged during operation.

- After assembly pin, caulking.



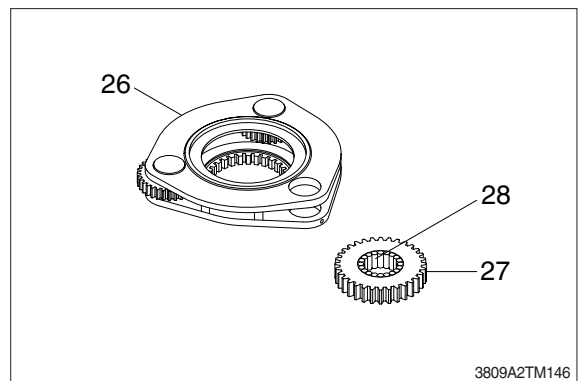
⑤ Complete remainder by equal method.



(9) Assemble No.3 carrier C (26) sub.

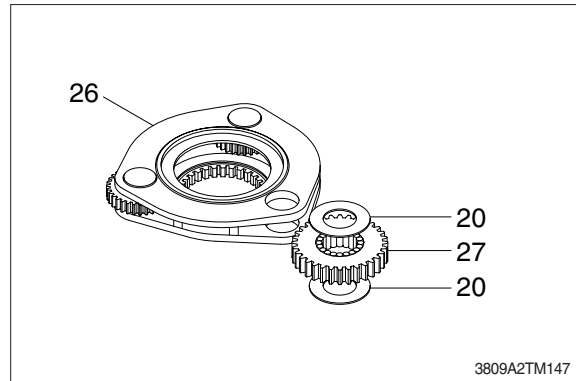
① Insert needle bearing (28) to No.3 planetary gear C (27).

Insert needle and coat grease.



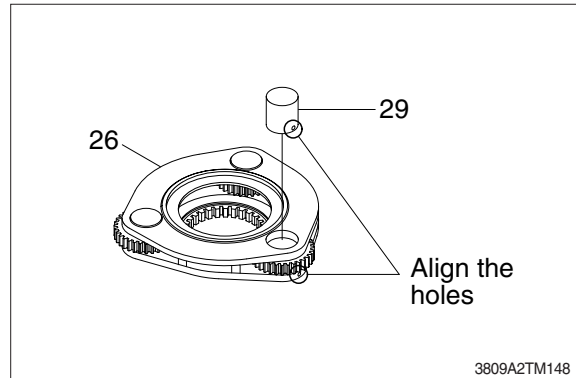
② Insert No.3 planetary gear C (27) and plate C (20) to No.3 carrier C (26).

- Align the holes of the carrier and inside diameter of needle bearing.



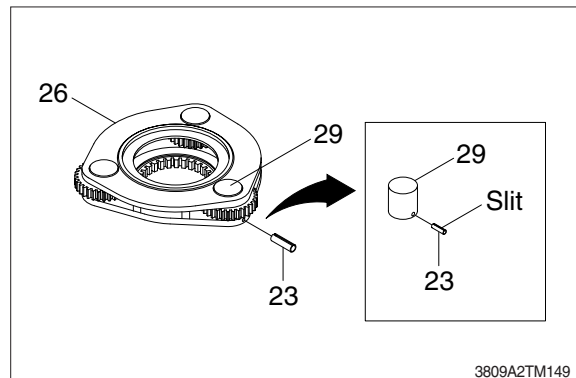
③ Put pin (29) on holes of No.3 carrier C (26).

- ※ Align the holes of the carrier and pin holes.
- ※ Beat on it lightly with hammer and put in.

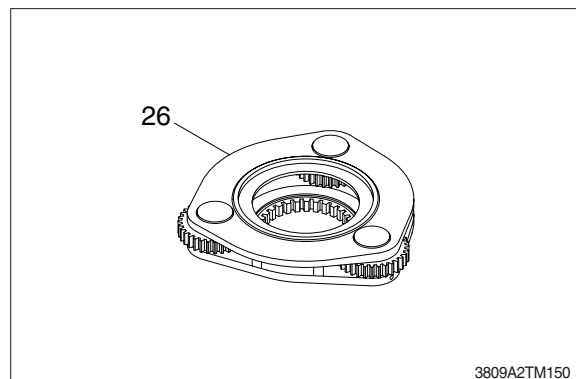


④ Assemble carrier (26) and pin (29) striking pin (23) by hammer.

- If the pin's divided side is not located in the above, it will be damaged during operation.
- After assembly pin, caulking.

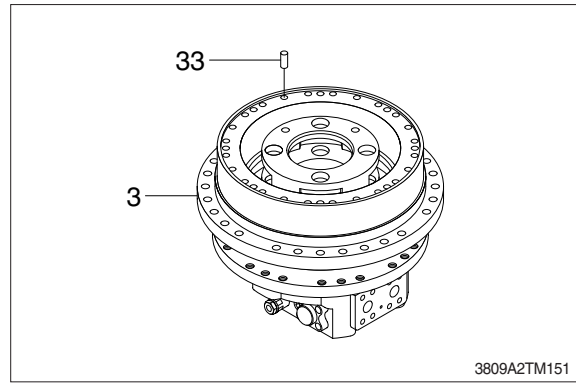


⑤ Complete remainder by equal method.



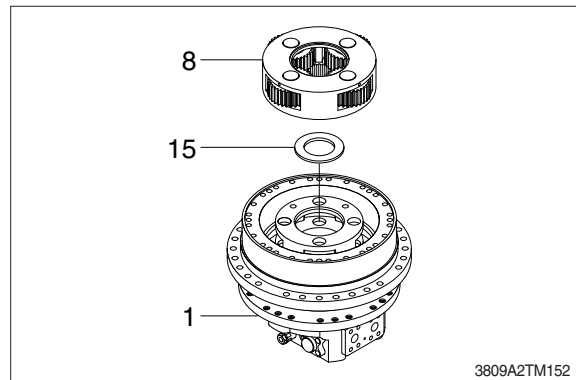
(10) Press-fit parallel pin (33) to the surface of hub (3).

- Parallel pin numbers : 8EA

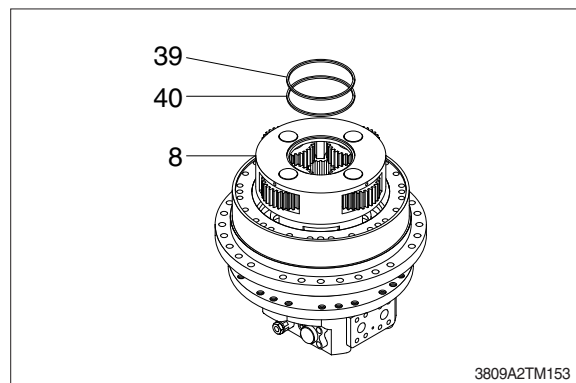


(11) Insert thrust plate (15) to shaft casing of track motor (1).

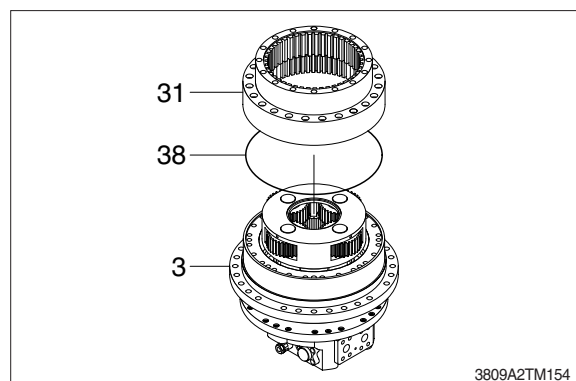
Press-fit No.1 carrier A (8) assy to shaft casing spline using hoist.



(12) Press-fit ring (39, 40) to the No.1 carrier A (8) assy.

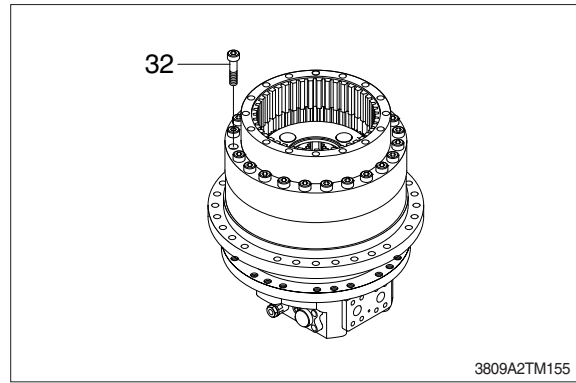


(13) Mounting O-ring (38) into hub (3), and assemble ring gear (31) to hub (3).

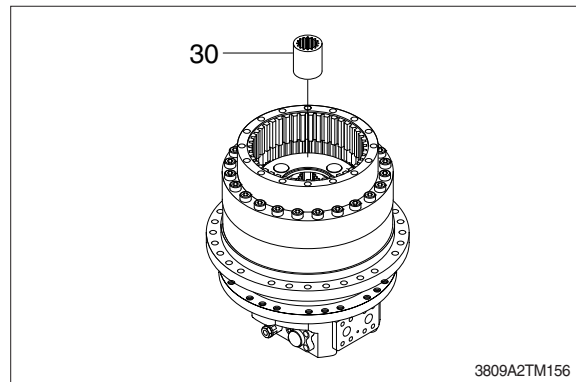


(14) Tighten hub and ring gear.

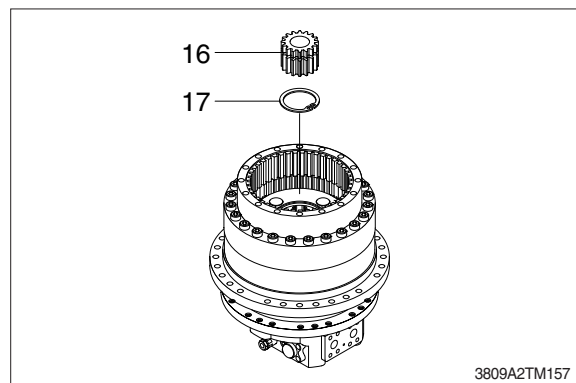
- Bolt numbers : 24 EA
- Tightening torque : 1800 kgf · cm



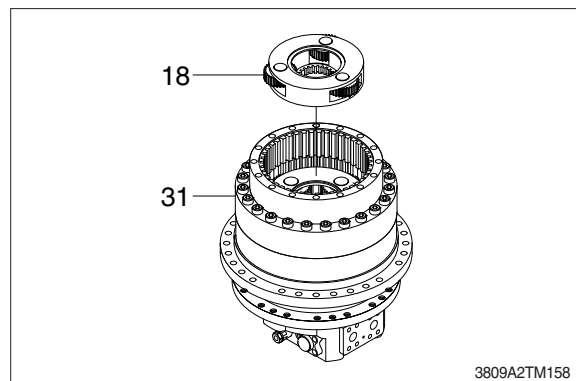
(15) Insert coupling (30) to spline of shaft.



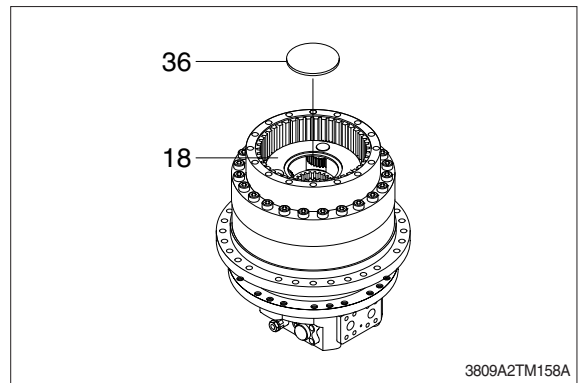
(16) Assemble snap ring (17) to sun gear A (16).
Insert sun gear A (16) to carrier A.



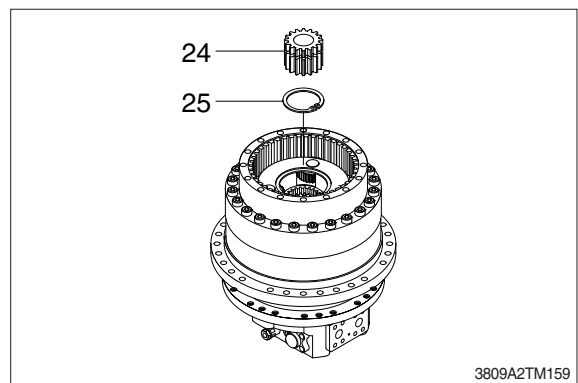
(17) Assemble carrier B (18) to ring gear (31).



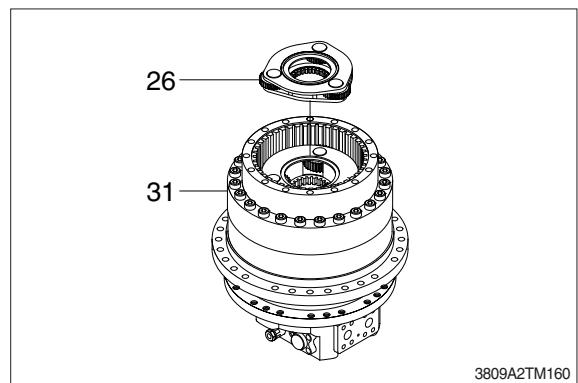
(18) Assemble plate (36) to carrier B (18).



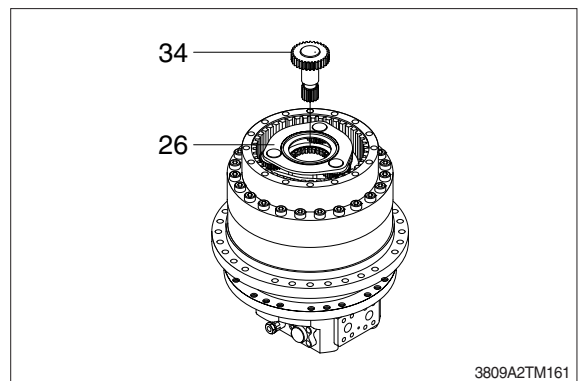
(19) Assemble snap ring (25) to sun gear B (24).
Insert carrier B to sun gear B (24).



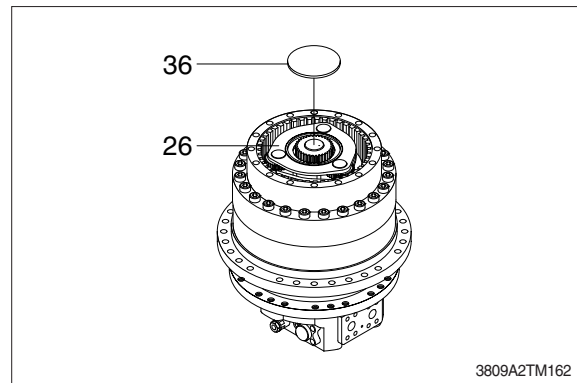
(20) Assemble carrier C (26) assy to ring gear (31).
After assembling, check whether gear rotate or not.



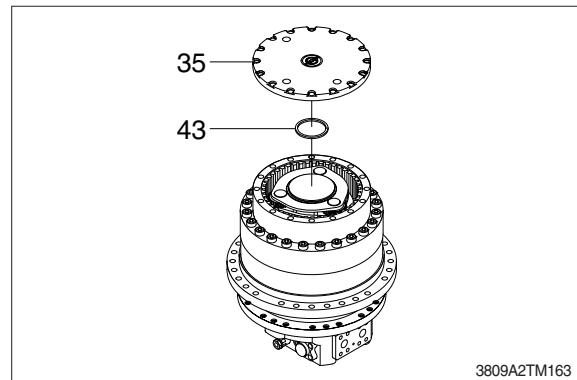
(21) Assemble carrier C (26) to drive gear (34).



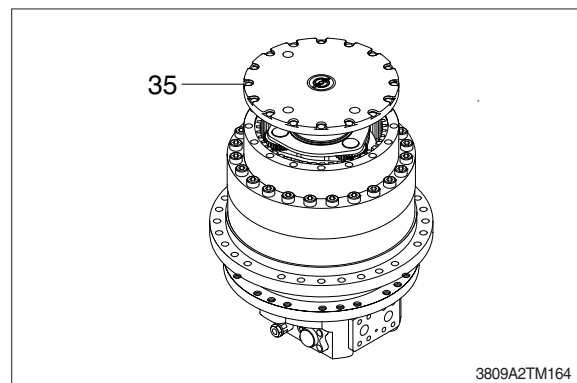
(22) Assemble plate (36) to carrier C (26).



(23) Press-fit bushing (43) to cover (35).

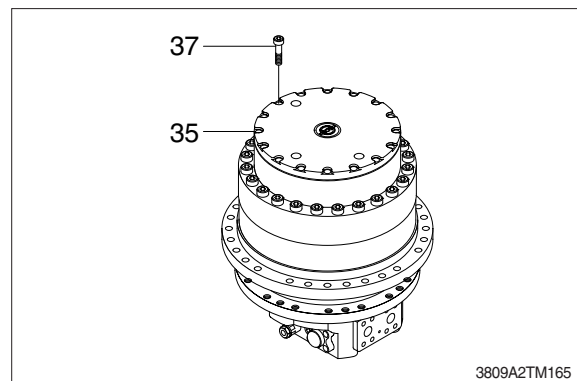


(24) Assemble cover (35).



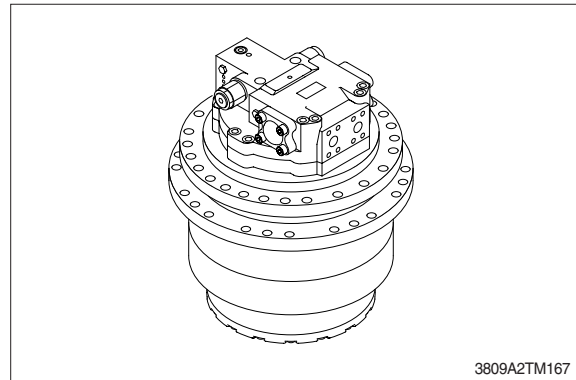
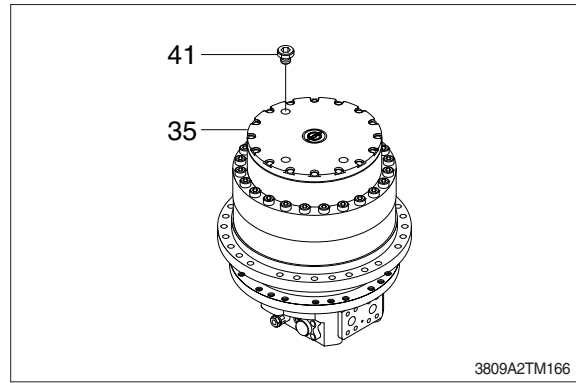
(25) Assemble cover (35) and tighten them to the specified torque.

· Tightening torque : 750 kgf · cm



(26) Inject gear oil and assemble plug (41) of cover (35).

- Volume of gear oil : 4.5 liter



※ Assembly has completed.