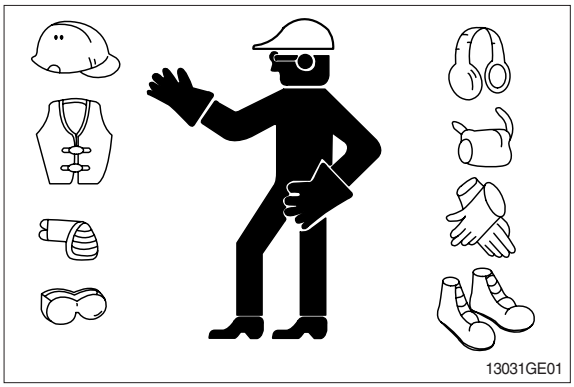
GROUP 1 SAFETY HINTS

FOLLOW SAFE PROCEDURE

Unsafe work practices are dangerous. Understand service procedure before doing work; Do not attempt shortcuts.

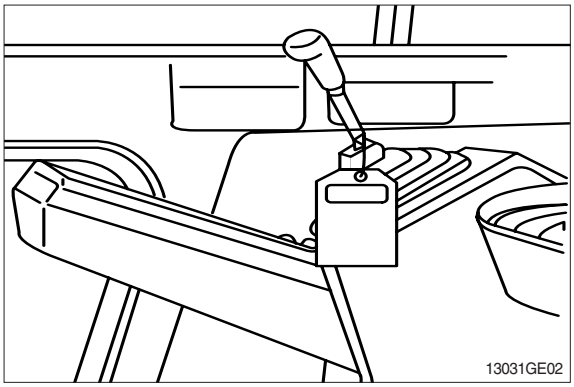
WEAR PROTECTIVE CLOTHING

Wear close fitting clothing and safety equipment appropriate to the job.



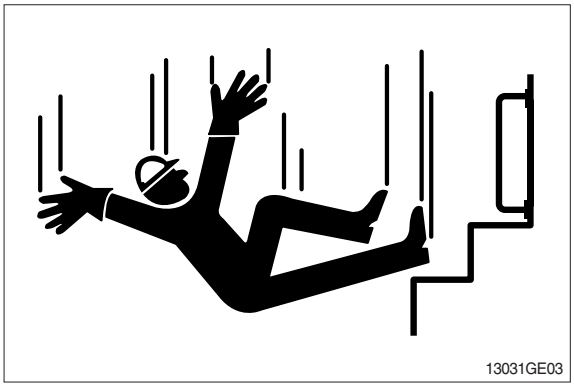
WARN OTHERS OF SERVICE WORK

Unexpected machine movement can cause serious injury.
Before performing any work on the excavator, attach a 「**Do Not Operate**」 tag on the right side control lever.



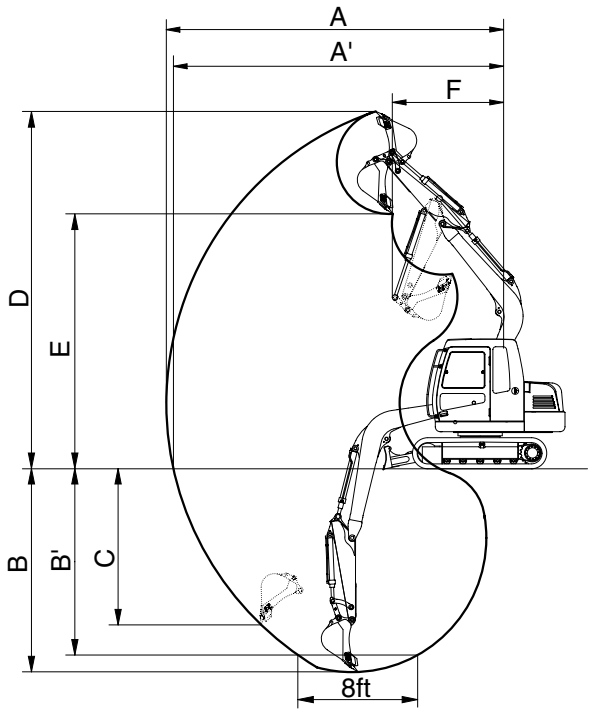
USE HANDHOLDS AND STEPS

Falling is one of the major causes of personal injury.
When you get on and off the machine, always maintain a three point contact with the steps and handrails and face the machine. Do not use any controls as handholds.
Never jump on or off the machine. Never mount or dismount a moving machine.
Be careful of slippery conditions on platforms, steps, and handrails when leaving the machine.



3. WORKING RANGE

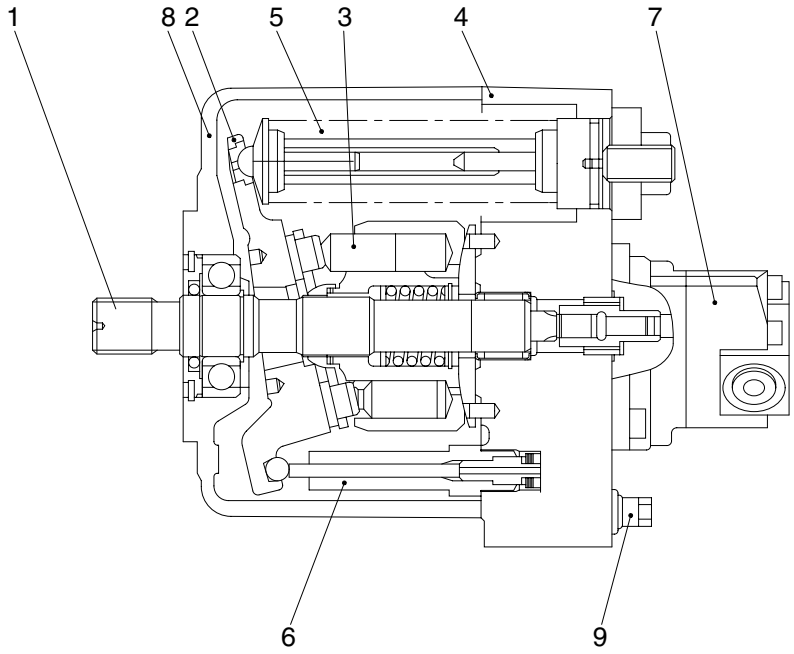
1) 3.7m(12' 2") MONO BOOM



7072SP03

Description		1.67m(5' 6") Arm
Max digging reach	A	6330mm (20' 9")
Max digging reach on ground	A'	6190mm (20' 4")
Max digging depth	B	4150mm (13' 7")
Max digging depth (8ft level)	B'	3810mm (12' 6")
Max vertical wall digging depth	C	3200mm (10' 6")
Max digging height	D	7260mm (23'10")
Max dumping height	E	5170mm (17' 0")
Min swing radius	F	1750mm (5' 9")
Bucket digging force	SAE	44.1 kN
		4500 kgf
		9920 lbf
	ISO	51.0 kN
		5200 kgf
		11460 lbf
Arm digging force	SAE	38.2 kN
		3900 kgf
		8600 lbf
	ISO	39.2 kN
		4000 kgf
		8820 lbf

2. PRINCIPAL COMPONENTS AND FUNCTIONS



7072MP03

1 Shaft assembly
2 Swash plate assembly
3 Rotary group
4 Cover assembly
5 Control spring assembly
6 Control piston assembly
7 Gear pump
8 Housing
9 Relief valve

This is a variable displacement double-piston pump for discharge with two equal displacements from one cylinder block. Because this is one rotary group, there is only one suction port.

The oil is divided into two equal flows by the control plate in the cover and directed to two discharge ports provided in the cover.

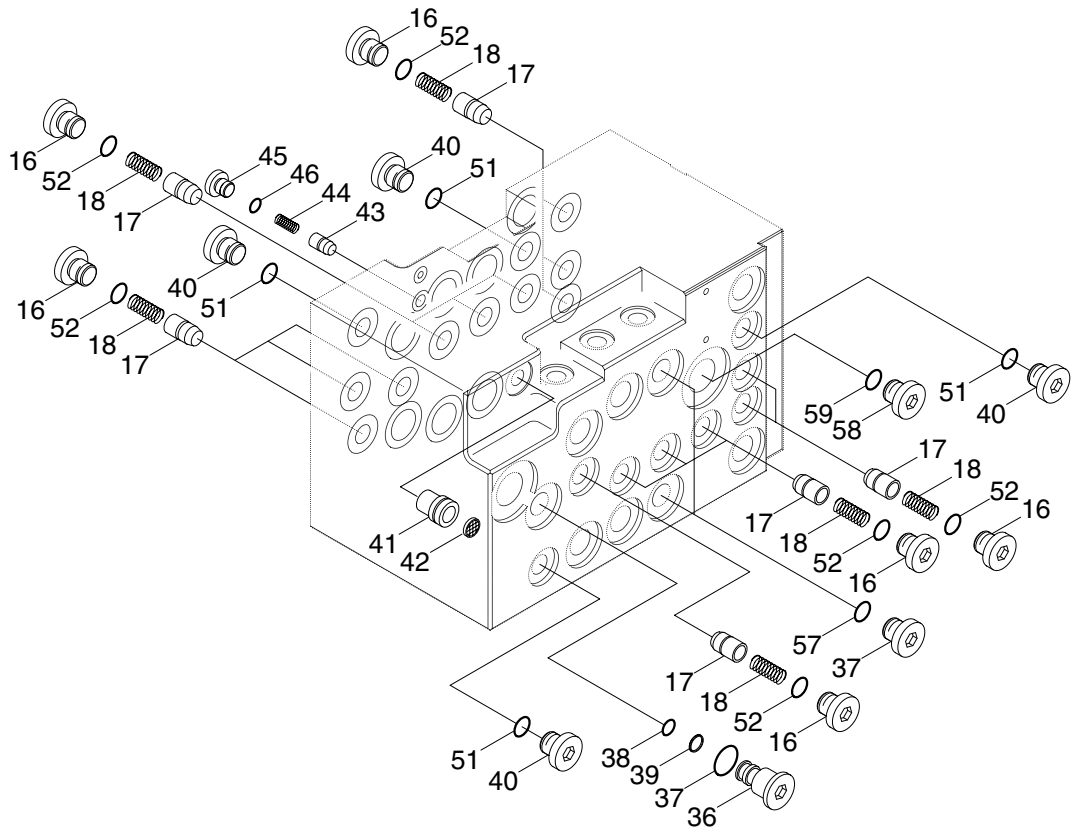
The discharge pressure directed to the control piston tilts the hanger by overcoming the spring force.

Since the piston stroke changes according to the tilting angle of the hanger, the flow can be changed.

The simultaneous tilting angle constant-output control method is employed.

The pilot pump can be connected to the same shaft via a coupling.

3) Structure(3/4)



7072MCV33

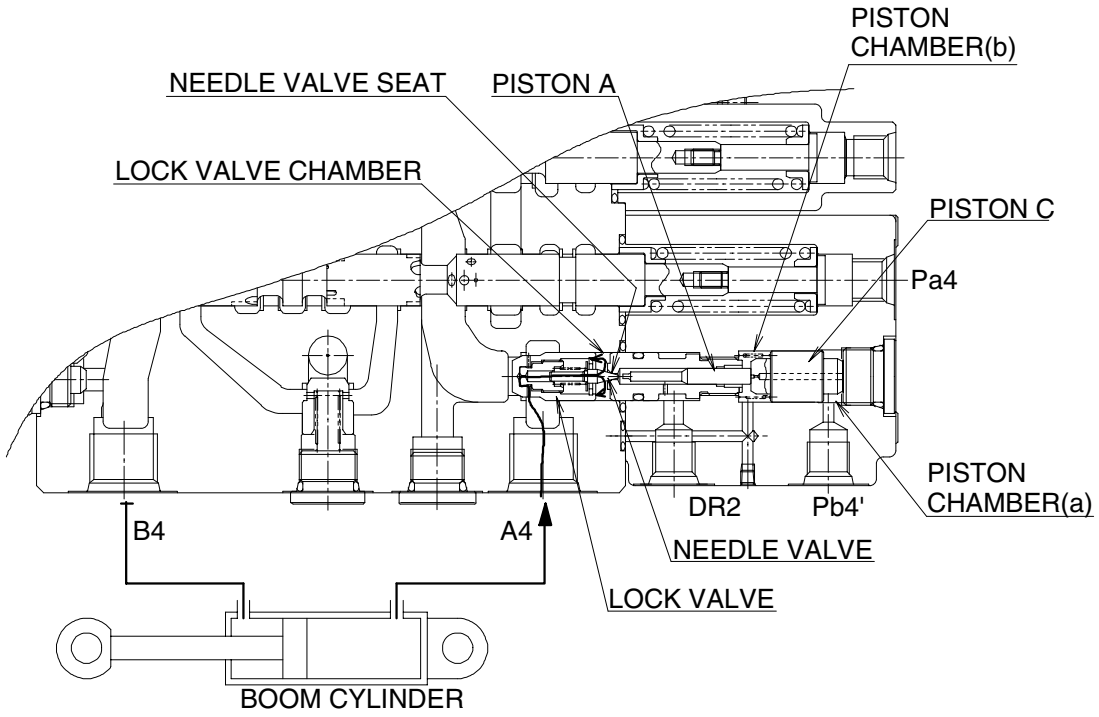
16	Plug	40	Plug	51	O-ring
17	Check valve	41	Restrictor plug	52	O-ring
18	Check valve spring	42	Coin type filter	57	Plug
36	Plug	43	Check valve	58	Plug
37	O-ring	44	Check valve spring	59	O-ring
38	O-ring	45	Plug		
39	Back up ring	46	O-ring		

2) ACTUATION OF LOCK VALVE(BOOM AND ARM)

(1) Holding

In the condition where the spool for booms on the neutral position, pilot piston chamber(A) is connected to the drain passage through pilot port(Pb4') used to release the lock valve, and piston chamber(b) is also connected to the drain passage through drain port(DR2).

Therefore, piston(C) must be held in the condition shown in the figure. Then the retaining pressure of the boom cylinder acts on the lock valve chamber as shown in the figure, and pushes the needle valve against the seat section, preventing the leakage on the boom cylinder head side. Consequently the movement of the boom cylinder due to the leakage is also prevented.

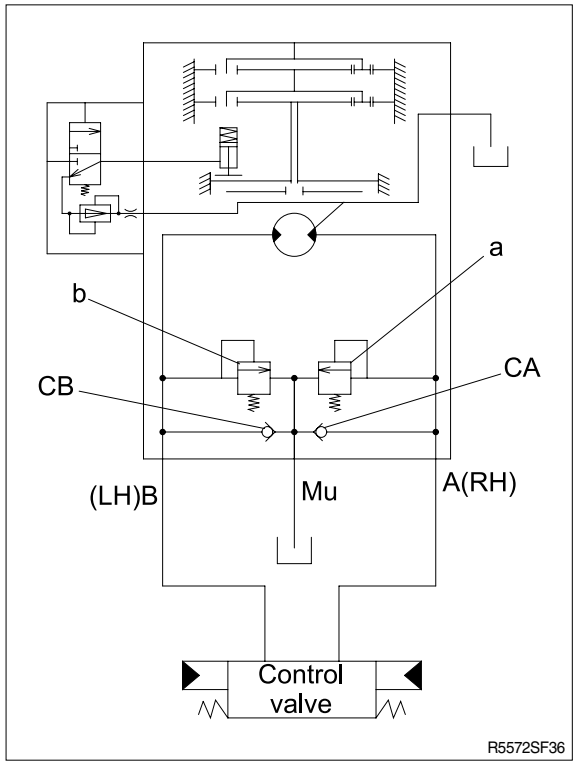


7072MCV10

2) MAKE UP VALVE

(1) Outline

The safety valve portion consists of a check valve and safety valve.



(2) Function

When the swing is stopped, the output circuit of the motor continues to rotate because of inertia. For this reason, the pressure at the output side of the motor becomes abnormality high, and this will damage the motor. To prevent this, the oil causing the abnormal hydraulic pressure is allowed to escape from the outlet port (high-pressure side) of the motor to port **Mu**, thereby preventing damage to the motor.

Compared with a counterbalance valve, there is no closed-in pressure generated at the outlet port side when slowing down the swing speed. This means that there is no vibration when slowing down, so the ease of swing control is improved.

(3) Operation

① When starting swing

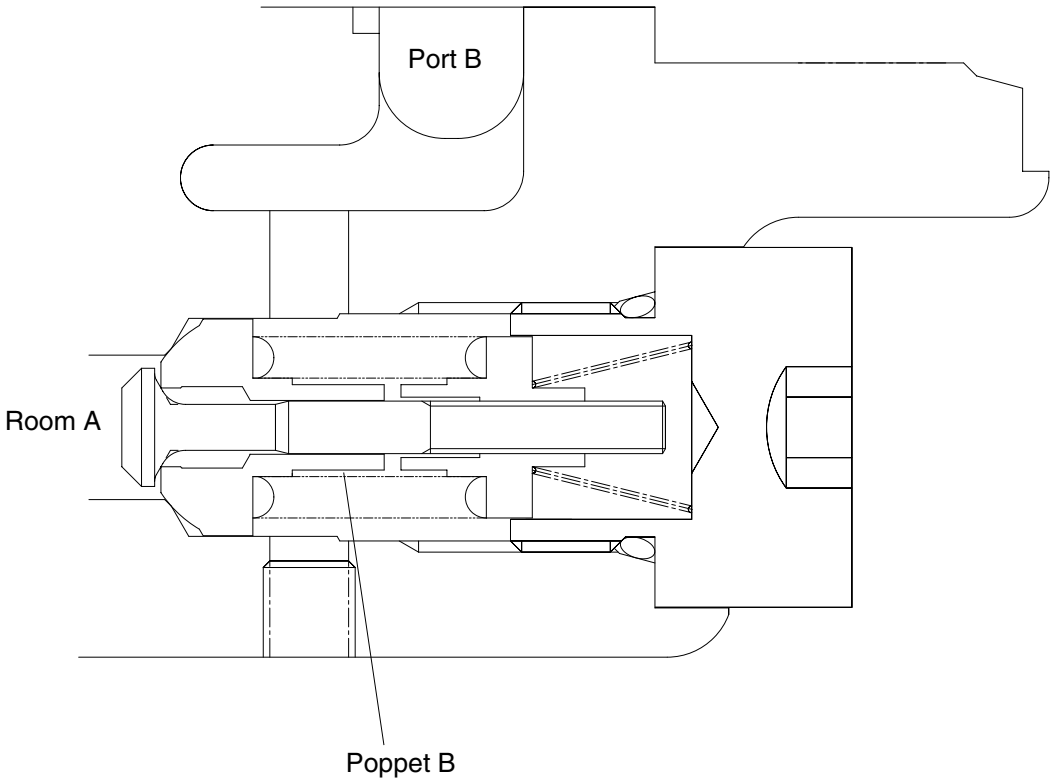
When the swing control lever is operated to left swing, the pressurized oil from the pump passes through the control valves and is supplied to port **B**. Because of this, the pressure at port **B** rises, staring torque is generated in the motor, and the motor starts to rotate. The oil from the outlet port of the motor passes from port **A** through the control valve and returns to the tank.

2) WORKING OF RELIEF VALVE

Relief valve carries on two functions of followings.

(1) It standardizes a pressure in case of driving a hydraulic motor ; bypasses and extra oil in a motor inlet related to acceleration of an inertia to an outlet.

(2) In case of an inertia stopped, it forces an equipment stopped, according to generating the pressure of a brake on the projected side.
Room A is always connected with port A of a motor. If the pressure of port is increased, press poppet B. And if it is higher than the setting pressure of a spring, the oil of an hydraulic flows from room A to port B, because poppet A is detached from the contact surface of seat A.

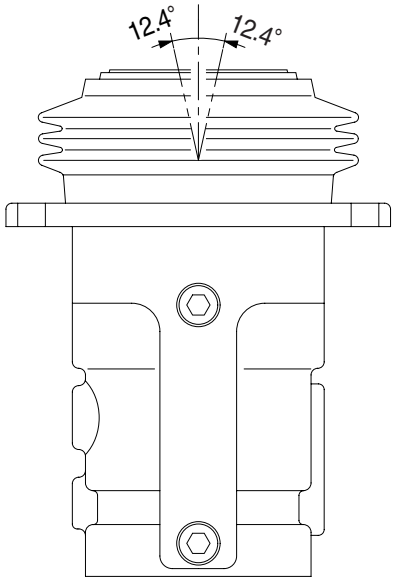


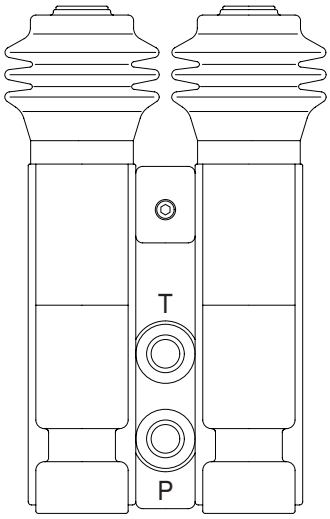
7072TM04

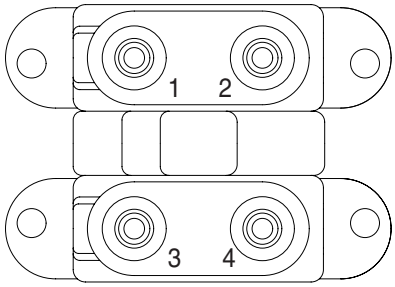
GROUP 6 RCV PEDAL

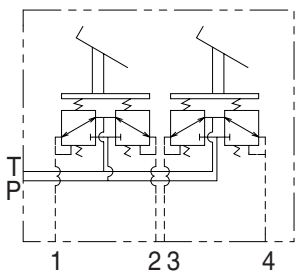
1. STRUCTURE

The casing(Spacer) has the oil inlet port P(Primary pressure), and the oil outlet port T(Tank). In addition the secondary pressure is taken out through ports 1, 2, 3 and 4 provided at the bottom face.







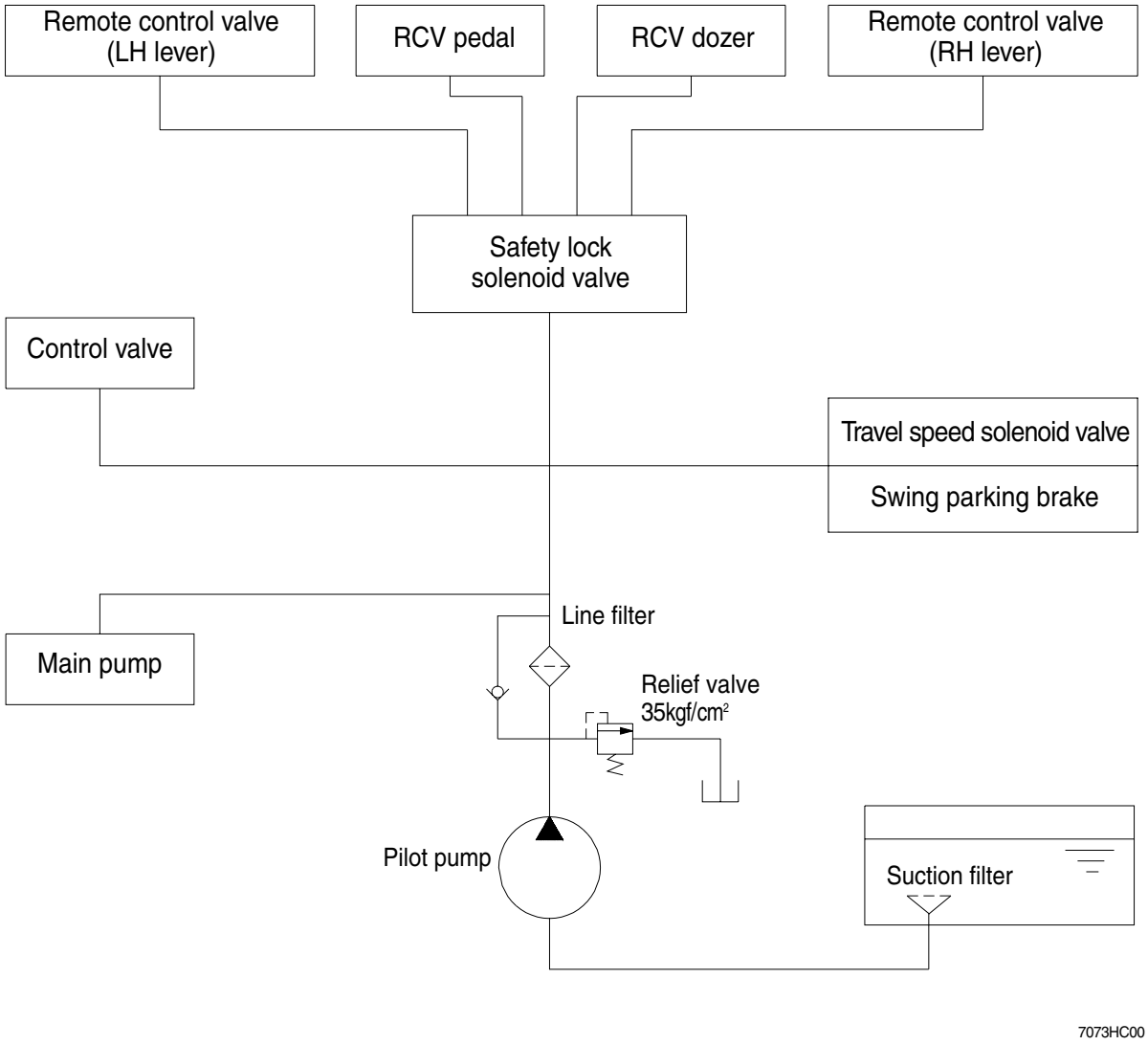


Hydraulic circuit

Port	Port	Port size
P	Pilot oil inlet port	PF 1/4
T	Pilot oil return port	
1	Travel(LH, Forward)	
2	Travel(LH, Backward)	
3	Travel(RH, Forward)	
4	Travel(RH, Backward)	

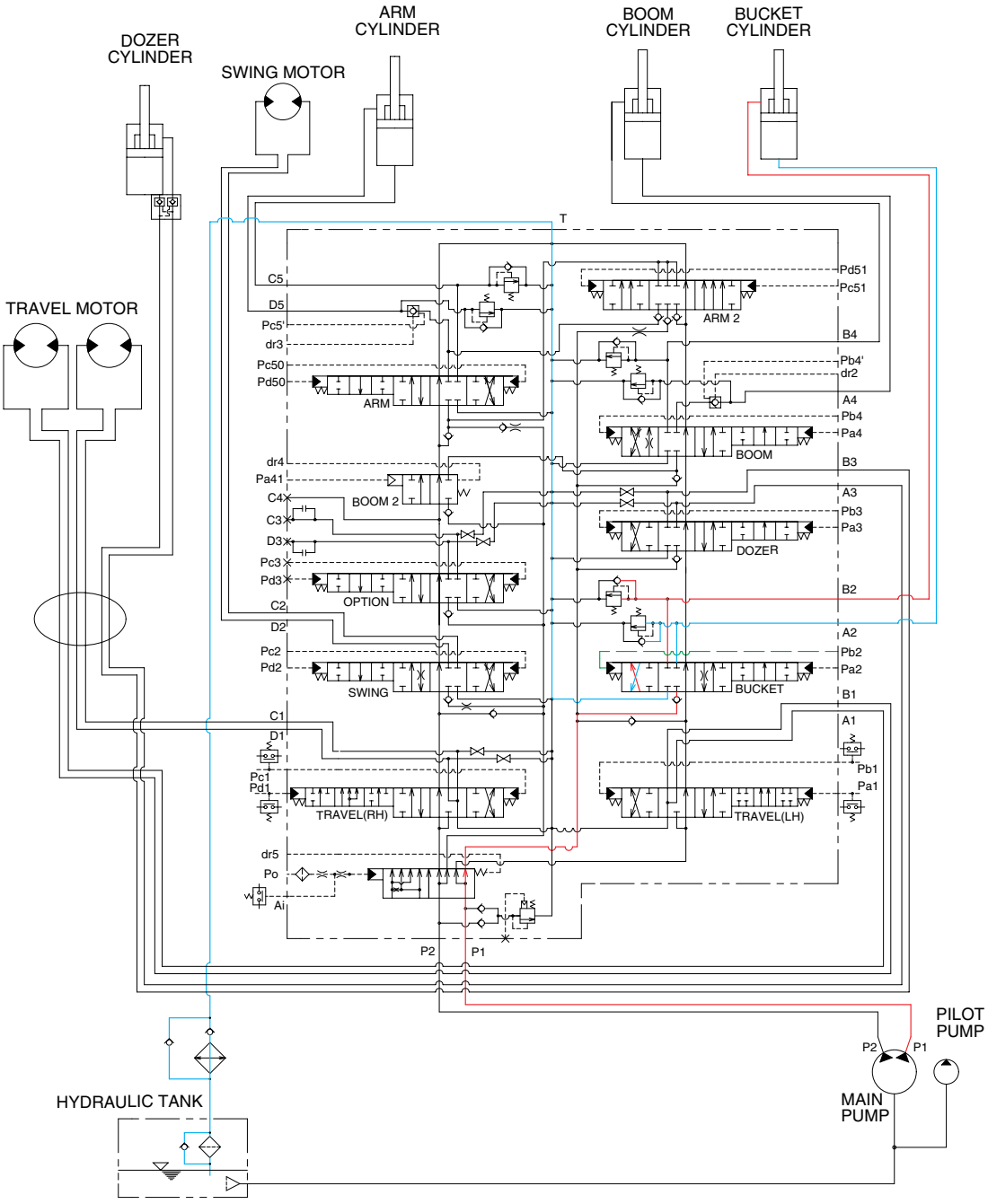
14072SF73

GROUP 3 PILOT CIRCUIT



The pilot circuit consists of suction circuit, delivery circuit and return circuit.
The pilot pump is provided with relief valve, receives the oil from the hydraulic tank through the suction filter.
The discharged oil from the pilot pump flows to the remote control valve through line filter, travel speed solenoid valve, swing parking brake, main control valve and safety lock solenoid valve.

6. BUCKET ROLL OUT OPERATION



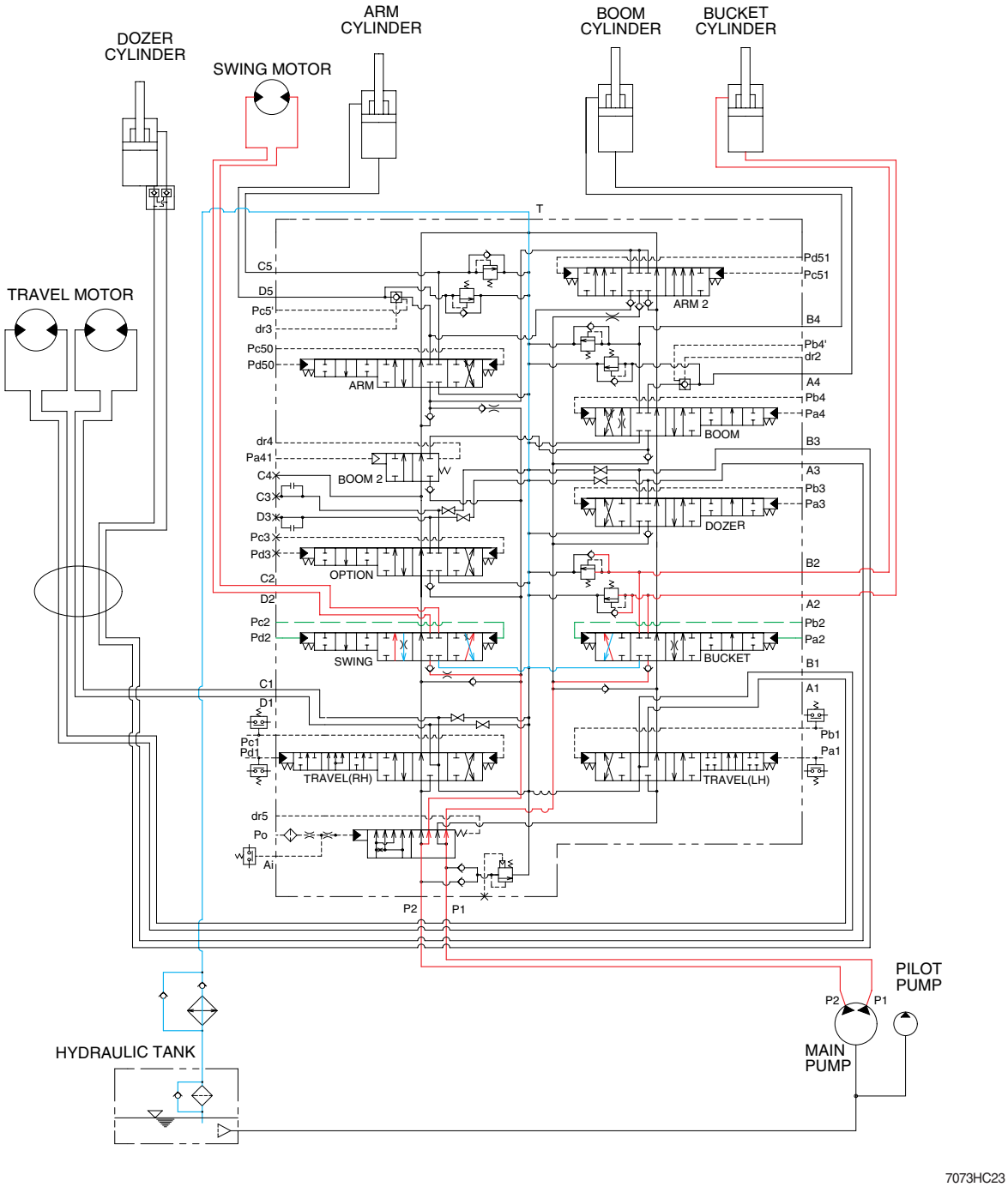
When the right control lever is pushed right, the bucket spool in the main control valve is moved to the roll out position by the pilot oil pressure from the remote control valve.

The oil from the P1 pump flows into the main control valve and then goes to the small chamber of bucket cylinder.

At the same time, the oil from the large chamber of bucket cylinder returns to the hydraulic oil tank through the bucket spool in the main control valve. When this happens, the bucket rolls out.

The cavitation which will happen to the rod of the bucket cylinder is also prevented by the make-up valve in the main control valve.

4. COMBINED SWING AND BUCKET OPERATION

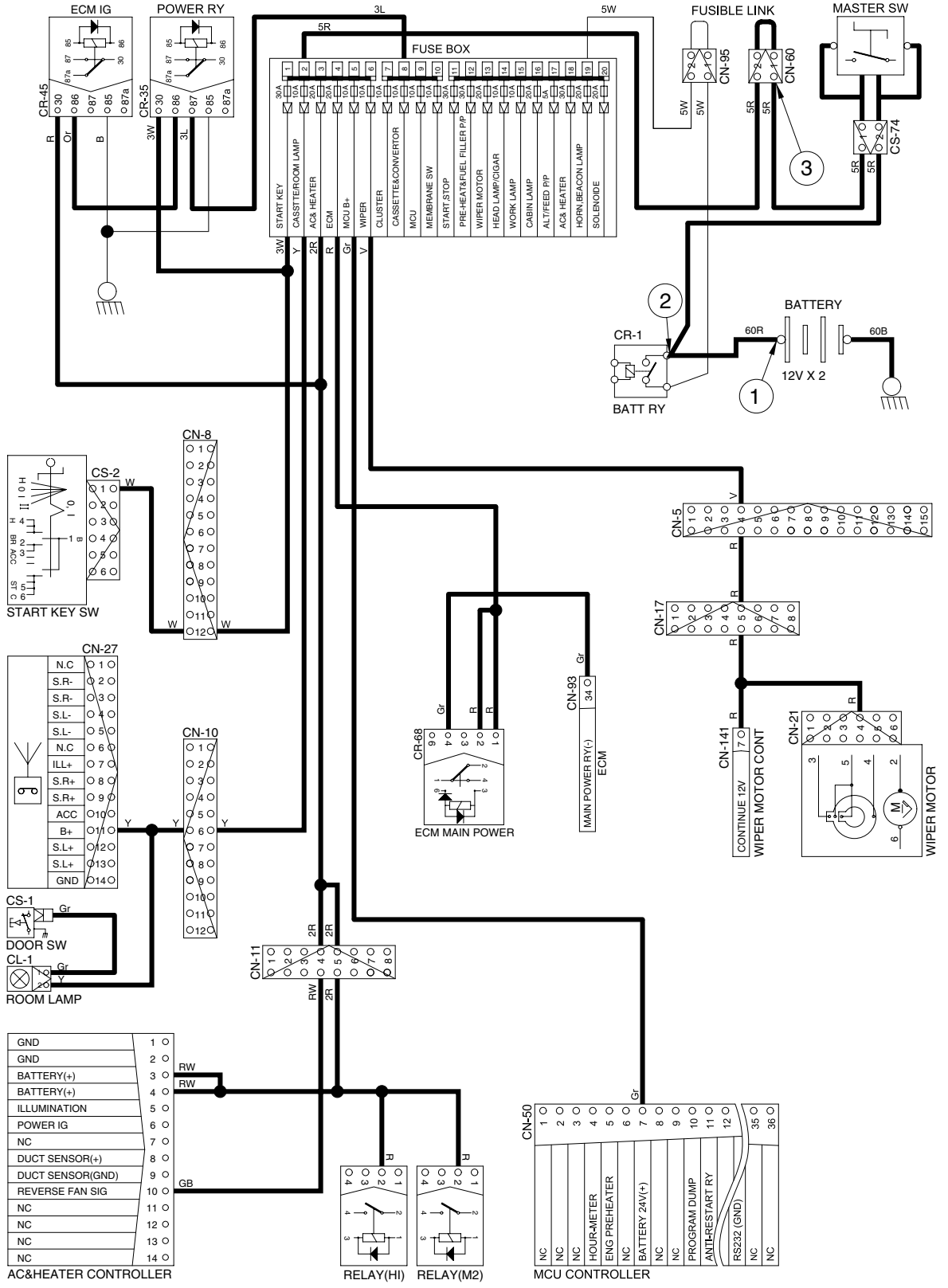


When the swing and bucket functions are operated, simultaneously the swing spool and bucket spool in the main control valve are moved to the functional position by the pilot oil pressure from the remote control valve.

The oil from the P2 pump flows into the swing motor through the swing spool.

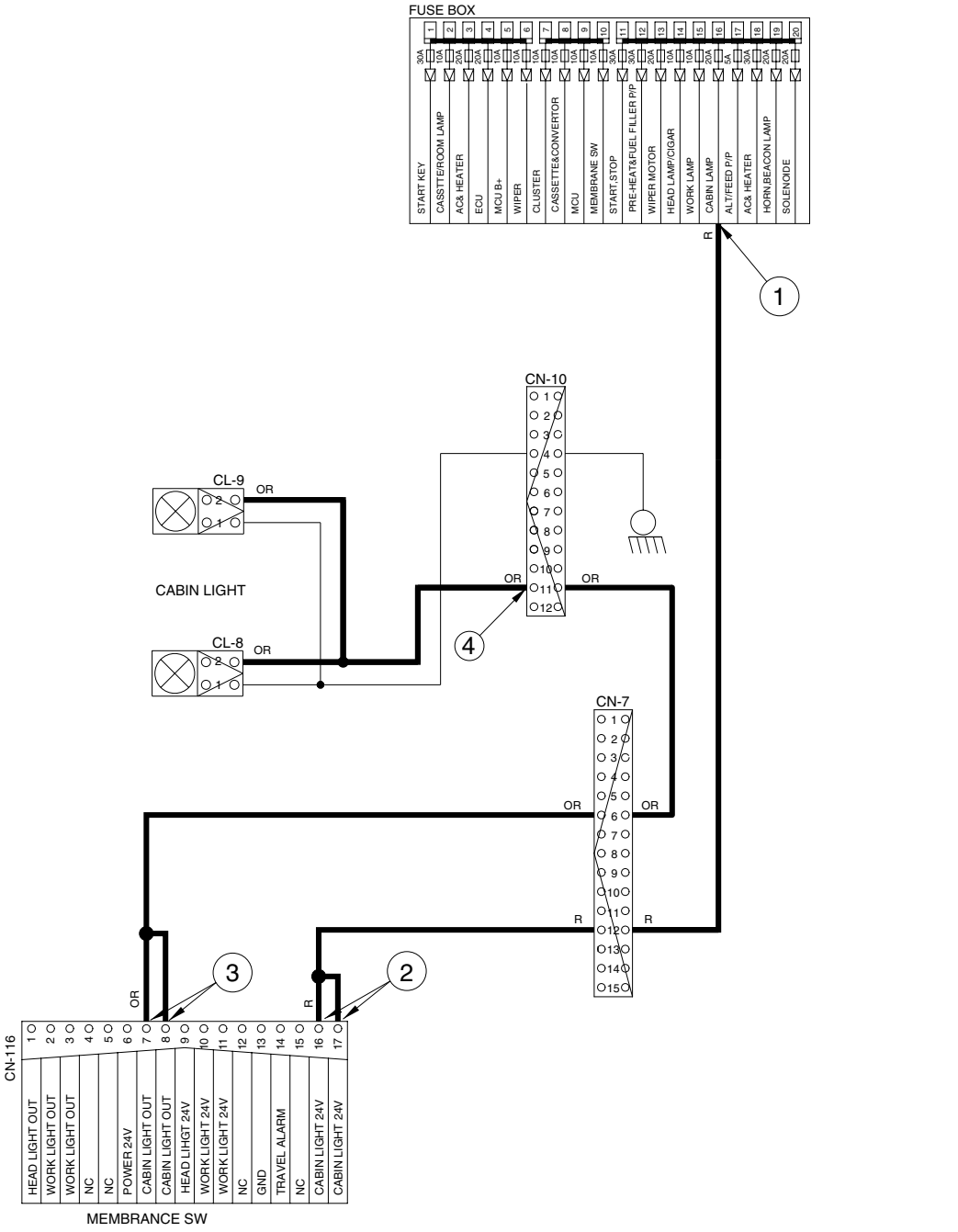
The oil from the P1 pump flows into the bucket cylinder through the bucket spool.

POWER CIRCUIT



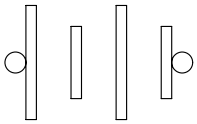
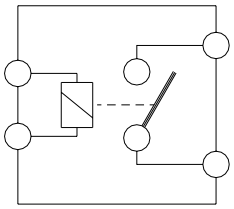
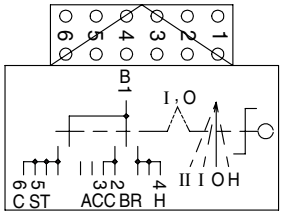
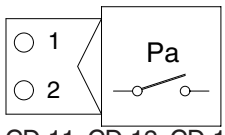
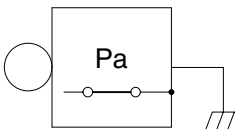
807A4EL15

CAB LAMP CIRCUIT



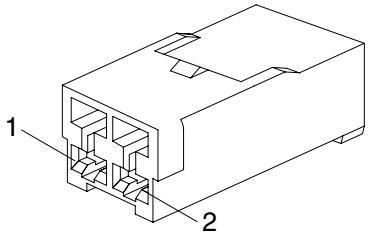
807A4EL09

GROUP 3 ELECTRICAL COMPONENT SPECIFICATION

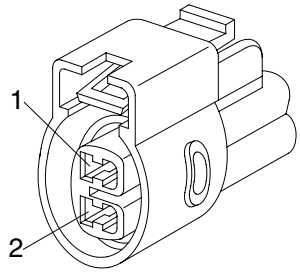
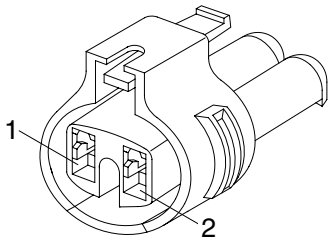
Part name	Symbol	Specification	Check
Battery		12V × 68Ah (2EA)	※ Check specific gravity 1.280 over : Over charged 1.280 ~ 1.250 : Normal 1.250 below : Recharging
Battery relay	 CR-1	Rated load : 24V 100A(continuity) 1000A(30second)	※ Check coil resistance (M4 to M4) Normal : About 50 Ω ※ Check contact Normal : ∞ Ω
Start key	 CS-2	24V 40A	※ Check contact OFF : ∞ Ω (For each terminal) ON : 0 Ω (For terminal 1-3 and 1-2) START : 0 Ω (For terminal 1-5)
Pressure switch (For overload)	 CD-11, CD-12, CD-13 CD-14, CD-31	3 ~ 6 kgf/cm² (N.O TYPE)	※ Check contact Normal : ∞ (OPEN)
Pressure switch (For engine oil)	 CD-18	0.5 kgf/cm² (N.C TYPE)	※ Check resistance Normal : 0 Ω (CLOSE)

Connector number	Type	No. of pin	Destination	Connector part No.	
				Female	Male
CS-74	-	2	Master switch	S813-030200	-
CS-82	SWF	10	Seat heater	SWF593757	-
CS-84	SWF	10	Fuel warmer	SWF593757	-
LAMP					
CL-1	KET	2	Cab room lamp	MG610392	-
CL-2	AMP	3	Cigar light	S810-003202	-
CL-4	KET	2	Head lamp	S814-00200	-
CL-5	DEUTSCH	2	Work lamp-LH	-	DT04-2P-E004
CL-6	DEUTSCH	2	Work lamp-RH	-	DT04-2P-E004
CL-7	CB104	1	Beacon lamp	S822-014004	-
CL-8	DEUTSCH	2	LH cabin light	DT04-2S	DT04-2P-E005
CL-9	DEUTSCH	2	RH cabin light	DT04-2S	DT04-2P-E005
SENDER					
CD-1	AMP	2	Hydraulic Temp sender	85202-1	-
CD-2	AMP	2	Fuel sender	-	S816-102002
CD-8	AMP	2	Water temp sender	1-178390-2	-
CD-10	RING TERM	1	Air cleaner switch	GP890469	-
CD-11	KET	2	Travel alarm pressure switch	MG640795	-
CD-12	KET	2	Travel alarm pressure switch	MG640795	-
CD-13	KET	2	Travel alarm pressure switch	MG640795	-
CD-14	KET	2	Travel alarm pressure switch	MG640795	-
CD-17	-	2	Tacho sensor	6189-0552	-
CD-18	RING TERM	1	Engine oil pressure switch	171809-2	-
CD-31	DEUTSCH	2	Overload pressure switch	DT06-2S-EP06	DT04-2P-E004
CD-62	-	1	CSD	7323-7414-40	-

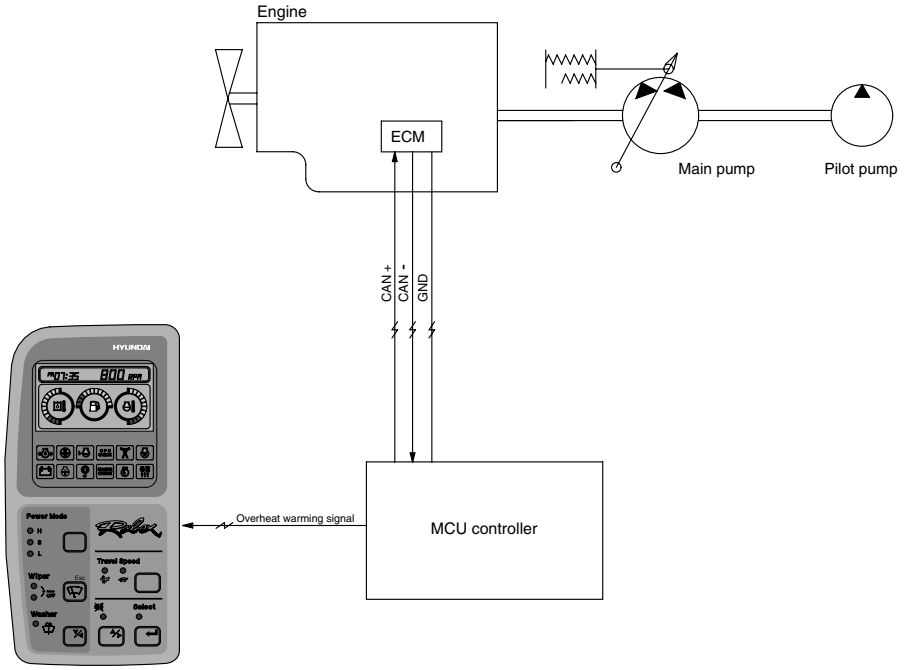
11) KET 090 CONNECTOR

No. of pin	Receptacle connector(Female)	Plug connector(Male)
2	 MG610070	

12) KET 090 WP CONNECTORS

No. of pin	Receptacle connector(Female)	Plug connector(Male)
2	 MG640605	
2	 MG640795	

GROUP 5 ENGINE OVERHEAT PREVENTION FUNCTION



807A5MS05

1. MCU controller reads engine coolant temperature through the temperature sensor and when the engine coolant boils up to 110°C, it sends overheat warning signal to the cluster and decrease the engine speed same as accel dial **7** position.
2. If the coolant temperature drops less than 100°C, the MCU controller returns the mode to the mode set before. And if mode set is changed during the function, the MCU controller cancels the function. Even if the overheat prevention function is canceled by mode change, the overheat warning lamp turns OFF only when the coolant temperature is less than 100°C.

3. LOGIC TABLE

Description	Condition	Function
Actuated	- Coolant temperature : Above 110°C - Accel dial set : Above **8**	- Engine rpm drop to accel dial 7 position - Overheat warning lamp & buzzer : ON
Canceled	- Coolant temperature : Less than 100°C - Changed mode set by operator ※ If any of the above conditions is applicable, engine overheat prevention function is canceled	- Return to the mode and accel dial set before - Hold on the changed set
Overheat warning lamp	- Coolant temperature : Less than 100°C	- Overheat warning lamp : OFF

5. Warning of main operation screen

1) Warning display

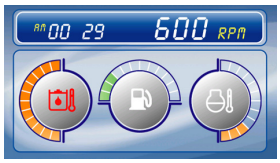
(1) Engine coolant temperature


- This lamp blinks and the buzzer sounds when the temperature of coolant is over the normal temperature 105℃(221℉) .
- Check the cooling system when the lamp blinks.

(2) Fuel level


- This lamp blinks and the buzzer sounds when the level of fuel is below 28 ℓ (7.4U.S. gal).
- Fill the fuel immediately when the lamp blinks.

(3) Hydraulic oil temperature

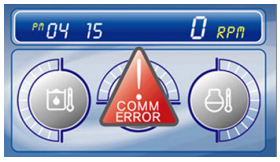



- This warning lamp operates and the buzzer sounds when the temperature of hydraulic oil is over 105 ℃(221 ℉) .
- Check the hydraulic oil level when the lamp blinks.
- Check for debris between oil cooler and radiator.

(4) All gauge


- This lamp blinks and the buzzer sounds when the all gauge is abnormal.
- Check the each system when the lamp blinks.

(5) Communication error



- Communication problem between MCU controller and cluster makes the lamp blinks and the buzzer sounds.
- Check if any fuse for MCU burnt off.
  If not check the communication line between them.

2) Pop-up icon display

No	Switch	Selected mode	Display
1	Power mode switch	High power work mode	
		Standard power work mode	
		Light power work mode	

No	Switch	Selected mode	Display
2	Travel speed control switch	Low speed	
		High speed	

GROUP 2 HYDRAULIC AND MECHANICAL SYSTEM

1. INTRODUCTION

1) MACHINE IN GENERAL

(1) If even a minor fault is left intact and operation is continued, a fatal failure may be caused, entailing a large sum of expenses and long hours of restoration.
Therefore when even a small trouble occurs, do not rely on your intuition and experience, but look for the cause based on the troubleshooting principle and perform maintenance and adjustment to prevent major failure from occurring. Keep in mind that a fault results from a combination of different causes.

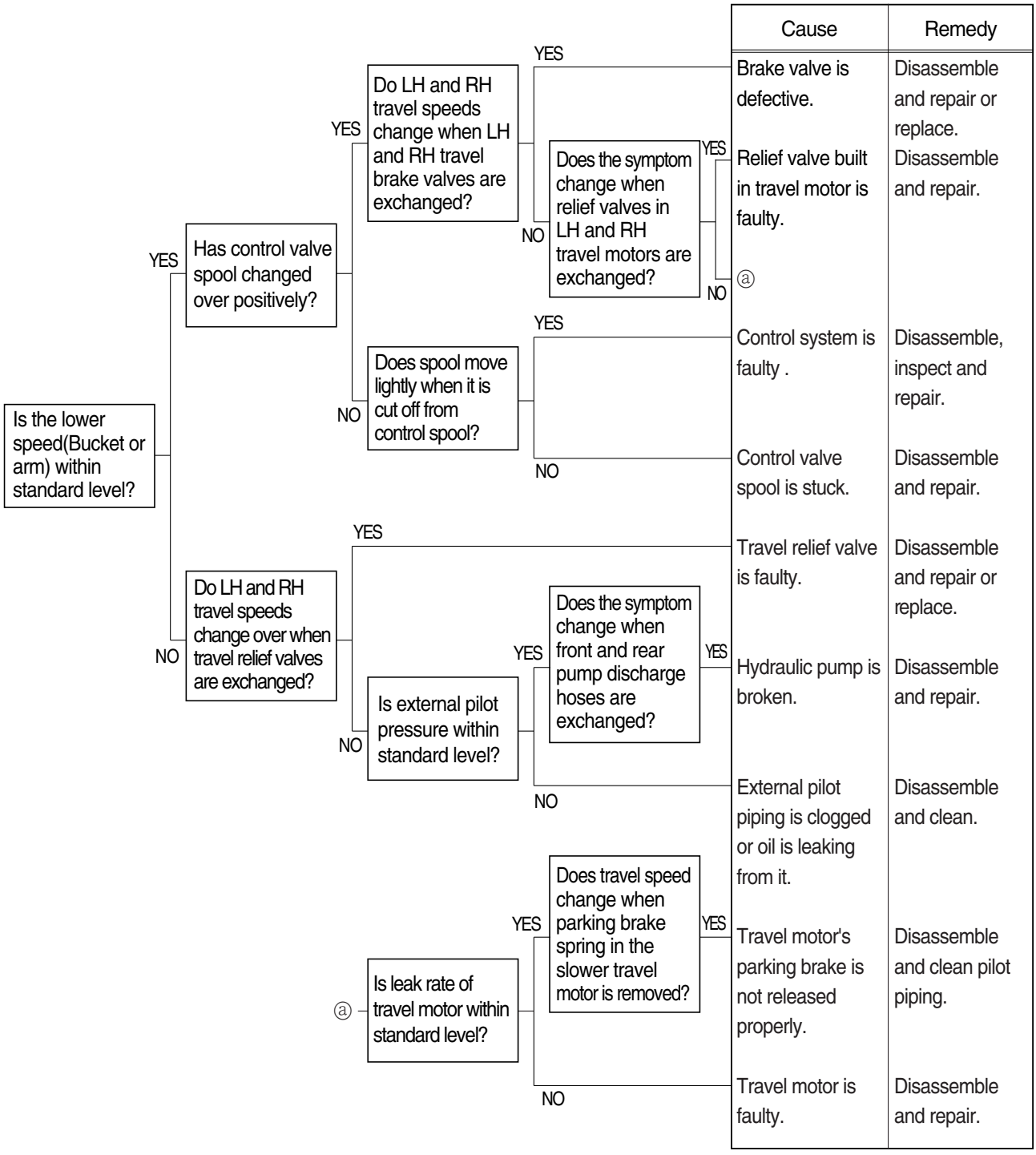
(2) The following lists up commonly occurring faults and possible causes with this machine. For the troubleshooting of the engine, refer to the coming troubleshooting and repair.

(3) When carrying out troubleshooting, do not hurry to disassemble the components.
It will become impossible to find the cause of the problem.

(4) Ask user or operator the following.
① Was there any strange thing about machine before failure occurred?
② Under what conditions did the failure occur?
③ Have any repairs been carried out before the failure?

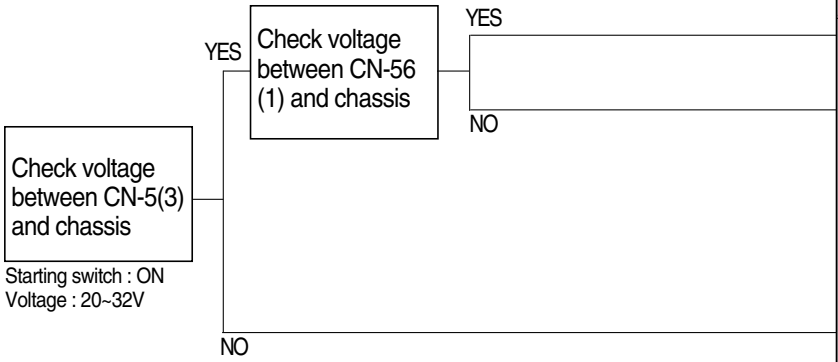
(5) Check before troubleshooting.
① Check oil and fuel level.
② Check for any external leakage of oil from components.
③ Check for loose or damage of wiring and connections.

2) SPEED ON ONE SIDE FALLS AND THE MACHINE CURVES

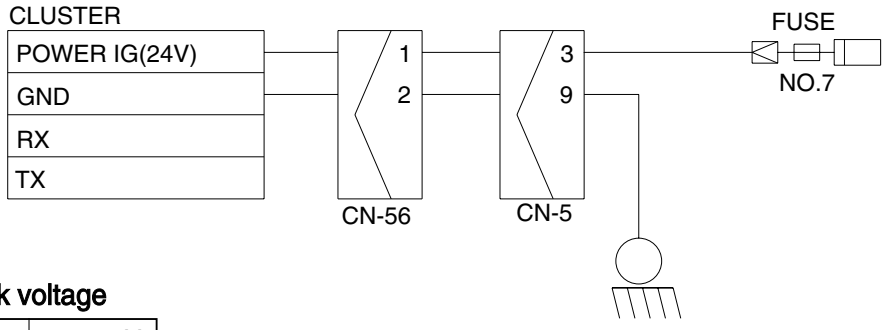


1. WHEN STARTING SWITCH IS TURNED ON, MONITOR PANEL DISPLAY DOES NOT APPEAR

- Before disconnecting the connector, always turn the starting switch OFF.
- Before carrying out below procedure, check all the related connectors are properly inserted and short of fuse No.7.
- After checking, insert the disconnected connectors again immediately unless otherwise specified.



Cause	Remedy
Defective cluster	Replace
Disconnection in wiring harness or poor contact between CN-5(3)-CN-56(1)	Repair or replace (After clean)
Disconnection in wiring harness or poor contact between CN-5(3)- and fuse No.7	Repair or replace (After clean)



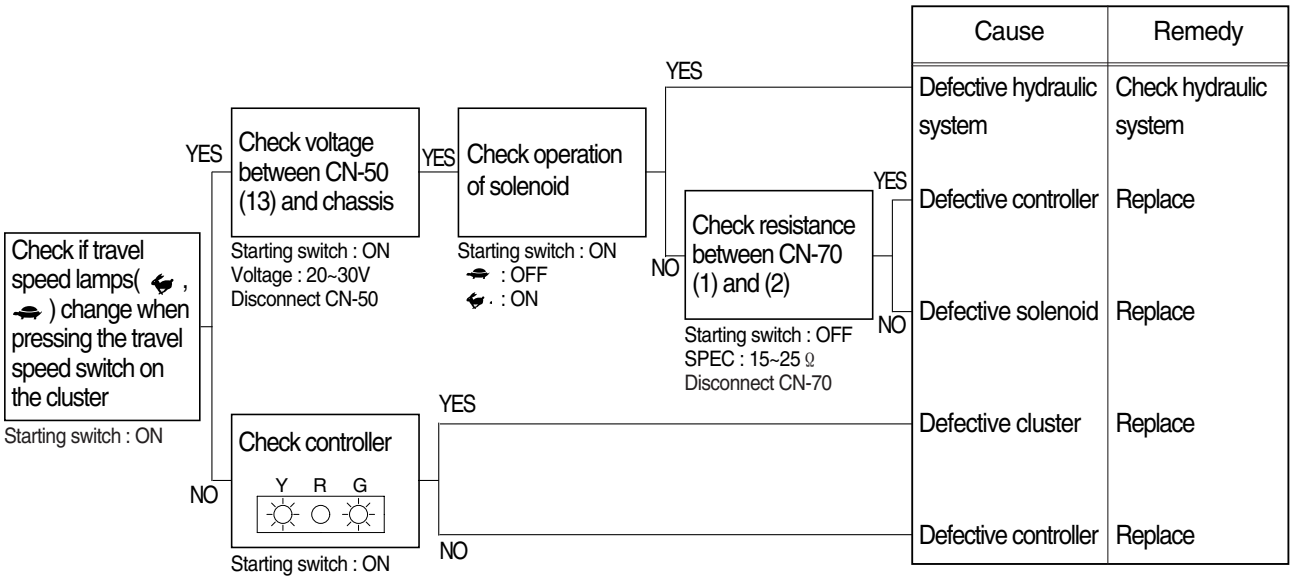
Check voltage

YES	20 ~ 30V
NO	0V

807A6TS01

11. WHEN TRAVEL SPEED 1, 2 DOES NOT OPERATE

- Before disconnecting the connector, always turn the starting switch OFF.
- Before carrying out below procedure, check all the related connectors are properly inserted and short of fuse No.22 .
- After checking, insert the disconnected connectors again immediately unless otherwise specified.



807A6TS06

3. OPERATION FOR PERFORMANCE TESTS

1) Observe the following rules in order to carry out performance tests accurately and safely.

(1) The machine

Repair any defects and damage found, such as oil or water leaks, loose bolts, cracks and so on, before starting to test.

(2) Test area

① Select a hard, flat surface.

② Secure enough space to allow the machine to run straight more than 20m, and to make a full swing with the front attachment extended.

③ If required, rope off the test area and provide signboards to keep unauthorized personnel away.

(3) Precautions

① Before starting to test, agree upon the signals to be employed for communication among coworkers. Once the test is started, be sure to communicate with each other using these signals, and to follow them without fail.

② Operate the machine carefully and always give first priority to safety.

③ While testing, always take care to avoid accidents due to landslides or contact with high voltage power lines. Always confirm that there is sufficient space for full swings.

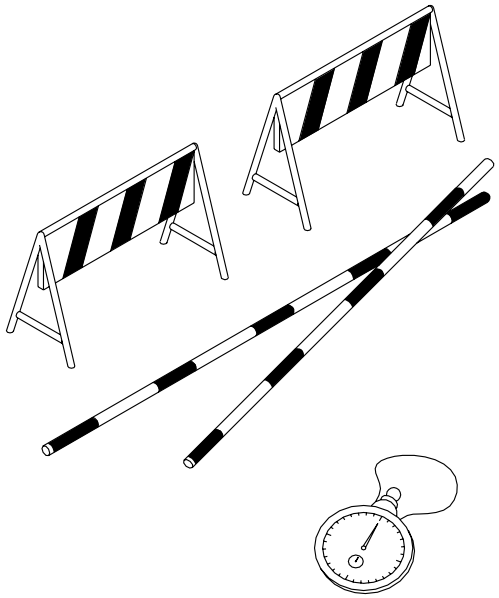
④ Avoid polluting the machine and the ground with leaking oil. Use oil pans to catch escaping oil. Pay special attention to this when removing hydraulic pipings.

(4) Make precise measurements

① Accurately calibrate test instruments in advance to obtain correct data.

② Carry out tests under the exact test conditions prescribed for each test item.

③ Repeat the same test and confirm that the test data obtained can be procured repeatedly. Use mean values of measurements if necessary.



10) DIG FUNCTION DRIFT CHECK

(1) Measure dig function drift, which can be caused by oil leakage in the control valve and boom, standard arm, and standard bucket cylinders, with the loaded bucket.
When testing the dig function drift just after cylinder replacement, slowly operate each cylinder to its stroke end to purge air.

(2) Preparation

① Load bucket fully. Instead of loading the bucket, weight(W) of the following specification can be used.

· $W=M^3 \times 1.5$

Where :

M^3 = Bucket heaped capacity(m^3)

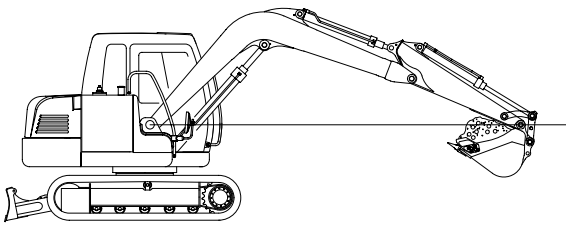
1.5 = Soil specific gravity

② Position the arm cylinder with the rod 20 to 30㎜ extended from the fully retracted position.

③ Position the bucket cylinder with the rod 20 to 30㎜ retracted from the fully extended position.

④ With the arm rolled out and bucket rolled in, hold the bucket so that the height of the bucket pin is the same as the boom foot pin.

⑤ Keep the hydraulic oil temperature at 50±5°C.



7077MS11

(3) Measurement

① Stop the engine.

② Five minutes after the engine has been stopped, measure the changes in the positions of the boom, arm and bucket cylinders.

③ Repeat step ② three times and calculate the average values.

(4) The measured drift should be within the following specifications.

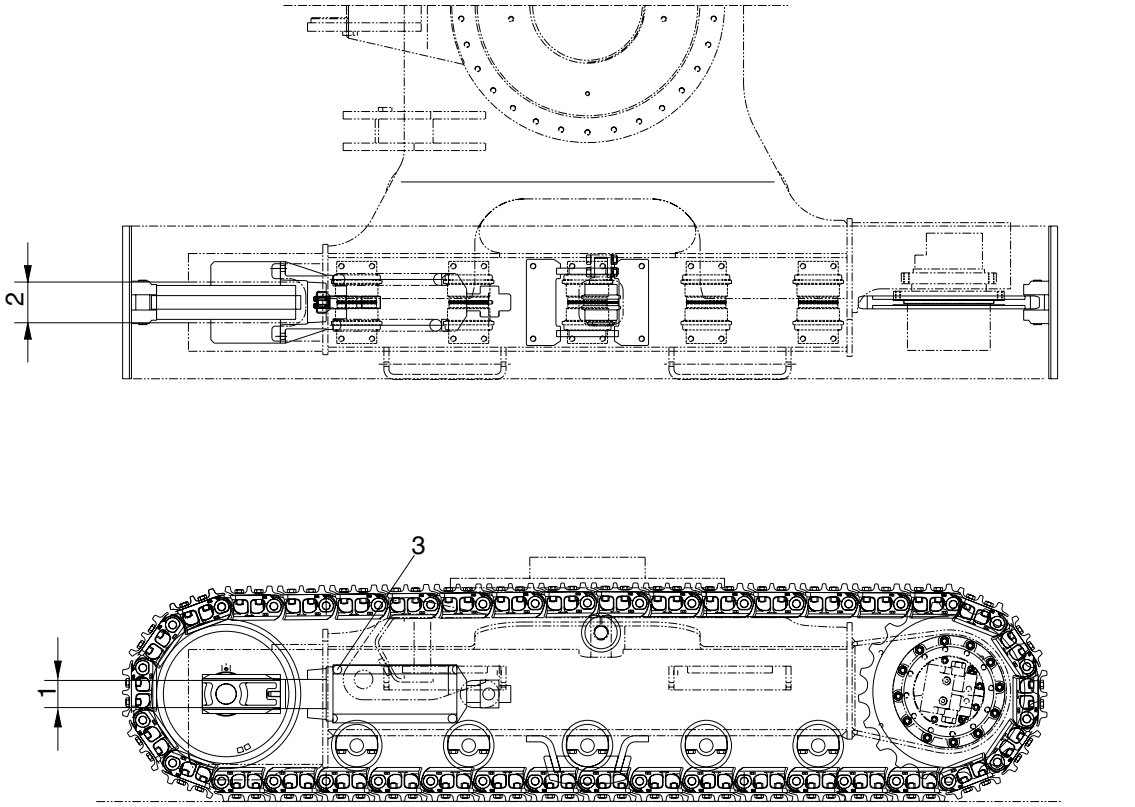
Unit : mm / 5min

Model	Drift to be measured	Standard	Maximum allowable	Remarks
R80-7A	Boom cylinder	10 below	20	
	Arm cylinder	10 below	20	
	Bucket cylinder	40 below	50	

3. SWING DEVICE

Part name	Inspection item	Remedy
Shoe of piston assembly	· Sliding surface has a damage. · Sliding surface depression(⌐¬) dimension less than 0.45mm or has a large damage.	· Lapping · Replace parts or motor
Piston of piston assembly	· Sliding surface has a seizure(Even though small).	· Replace motor
Piston hole of cylinder assembly	· Sliding surface has a seizure. · Sliding surface has a damage.	· Replace motor · Replace motor
Taper roller bearing Needle bearing Roller bearing	· In case 3000hour operation. · Rolling surface has a damage.	· Replace · Replace

5) TRACK FRAME AND RECOIL SPRING



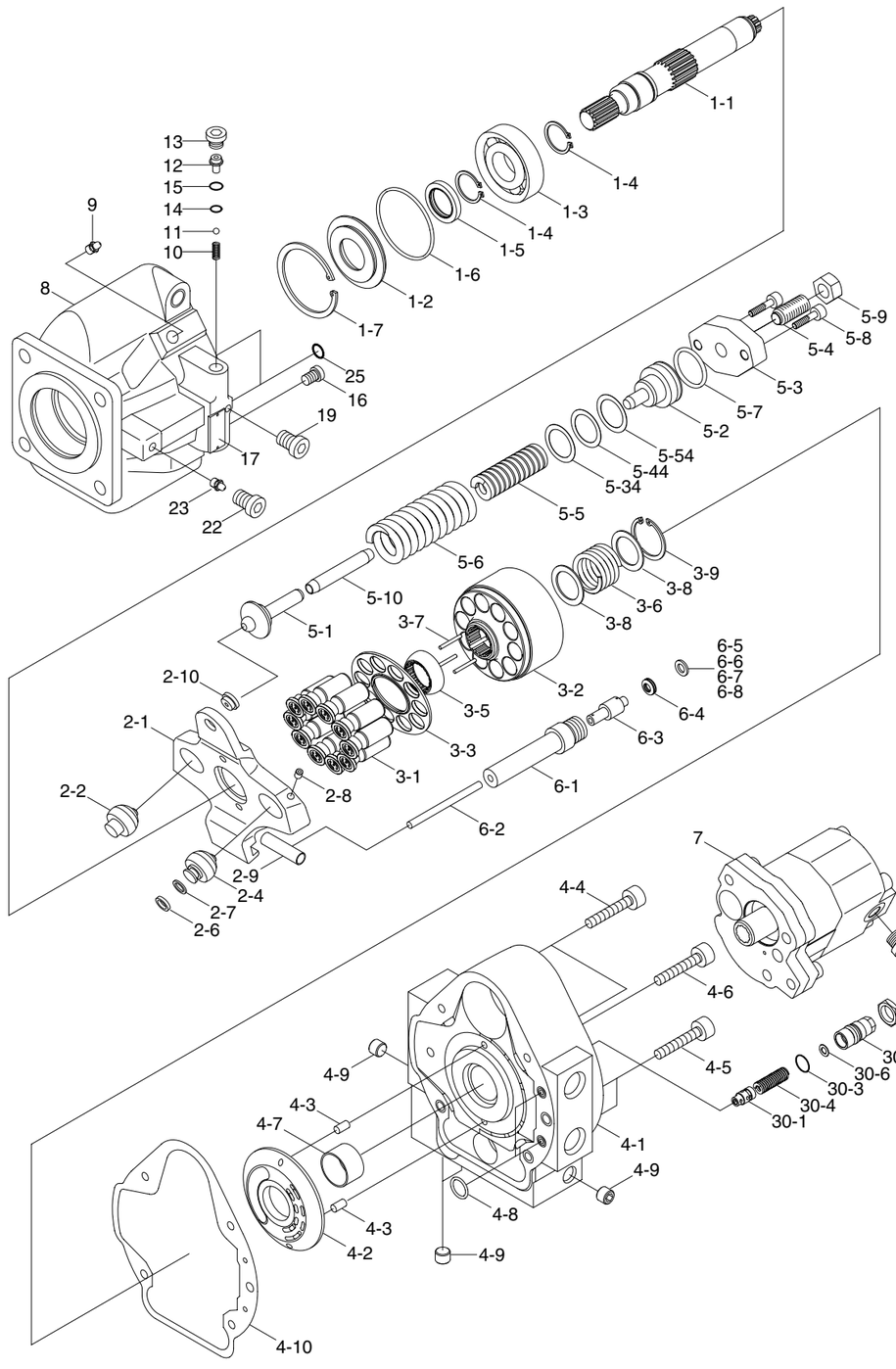
7077MS20

Unit : mm

No.	Check item	Criteria					Remedy
1	Vertical width of idler guide		Standard size	Tolerance	Repair limit		Rebuild or replace
		Track frame	92	+2 0	96		
		Idler support	90	- 0 - 1.5	87		
2	Horizontal width of idler guide	Track frame	172	+2 0	176		
		Idler support	170	-	168		
3	Recoil spring	Standard size			Repair limit		Replace
		Free length	Installation length	Installation load	Free length	Installation load	
		ø 170 × 370	320	5,083kg	-	4,174kg	

2. MAIN PUMP(1/2)

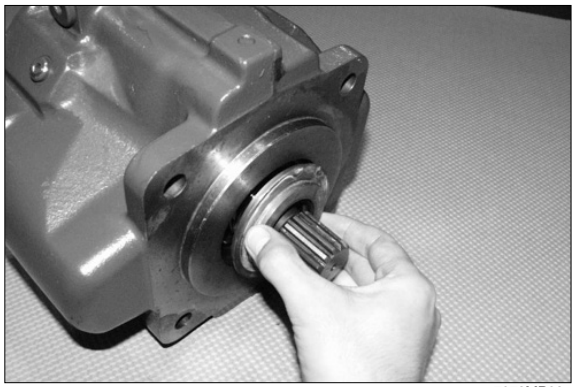
1) STRUCTURE



1	Shaft assembly	5-5	Spring
1-1	Shaft	5-6	Spring
1-2	Seal retainer	5-7	O-ring
1-3	Bearing	5-8	Bolt
1-4	Retaining ring	5-9	Nut
1-5	Oil seal	5-10	Guide
1-6	O-ring	5-34	Shim
1-7	Retaining ring	5-44	Shim
2	Swash plate assembly	5-54	Shim
2-1	Hanger	6	Control spring assembly
2-2	Guide	6-1	Cylinder
2-4	Guide	6-2	Piston
2-6	O-ring	6-3	Piston
2-7	Back up ring	6-4	Plate spring
2-8	Plug	6-5	Spacer
2-9	Pin	6-6	Spacer
2-10	Bush	6-7	Spacer
3	Rotary group	6-8	Spacer
3-1	Piston	7	Gear pump
3-2	Cylinder block	8	Housing
3-3	Retainer	9	Air vent valve
3-5	Guide	10	Bush
3-6	Spring	11	Steel ball
3-7	Parallel pin	12	Plug
3-8	Spring spacer	13	Plug
3-9	Retaining ring	14	Packing
4	Port plate assembly	15	Shim
4-1	Cover	16	Plug
4-2	Control plate	17	Name plate assembly
4-3	Parallel pin	18	Plug
4-4	Bolt	19	Plug
4-5	Bolt	22	Plug assembly
4-6	Bolt	23	Orifice
4-7	Bearing	25	Square ring
4-8	Square ring	30	Relief valve
4-9	Plug	30-1	Spool
4-10	Packing	30-2	Adjust screw
5	Control spring assembly	30-3	O-ring
5-1	Spring spacer	30-4	Spring
5-2	Spring spacer	30-5	Nut
5-3	Cover	30-6	Shim
5-4	Adjust screw		

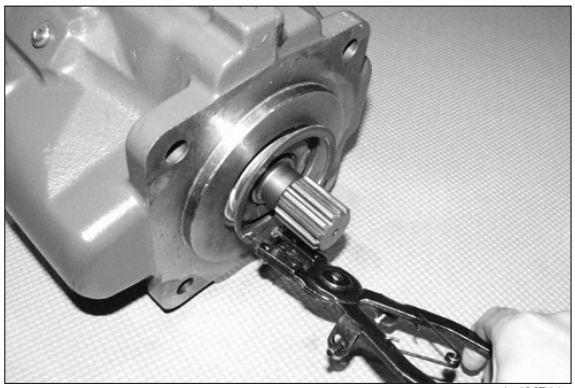
7078MP102

③ Install the oil seal case into the shaft.
Apply grease to the oil seal lip beforehand.



7078MP28

④ Install the retaining ring to fix the shaft.
(Pliers for retaining rings, bore use 80)



7078MP29

(5) Assembling of the rotary group

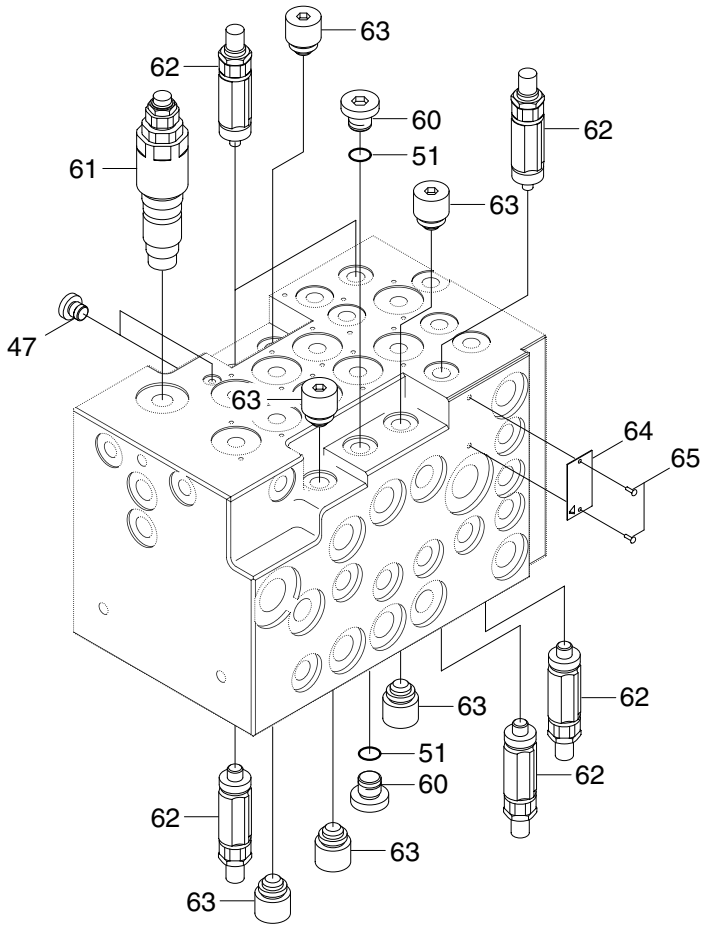
① Apply grease to 3 parallel pins.
Install 3 parallel pins into the cylinder block.

7078MP30

② Apply grease to the guide.
Install the guide on 3 parallel pins

7078MP30A

STRUCTURE(4/4)



7072MCV34

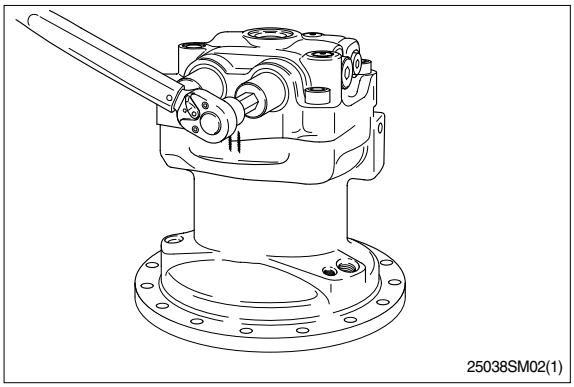
47 Plug
48 O-ring
51 O-ring
60 Plug
61 Main relief valve
62 Overload relief valve
63 Relief valve plug
64 Name plate
65 Pin

2) DISASSEMBLY

(1) Removal of relief valve assembly

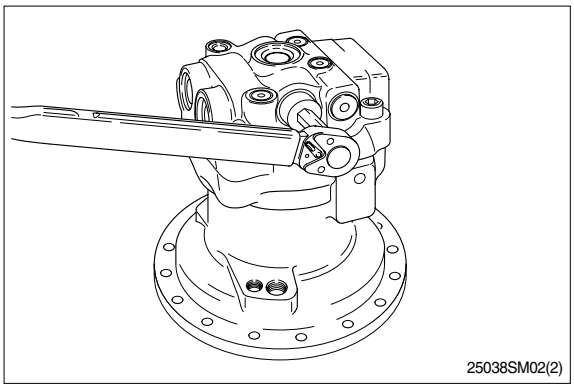
Remove cap of relief valve assembly(17) with 14㎜ hexagonal wrench.

※ Assemble removed relief valve assembly (17) to original state when reassembling.



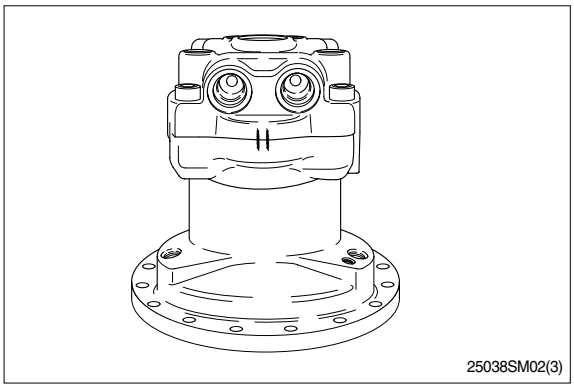
(2) Removal of make up valve and bypass valve assembly

Loosen plug(37) with 14㎜ hexagonal wrench, and remove check valve(35) and spring(36).



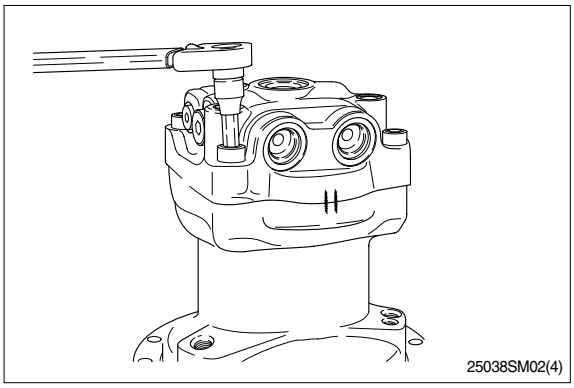
(3) Marking at swing motor

Before disassembling motor, make a matching mark between cover(12) and housing(1) for easy reassembling.

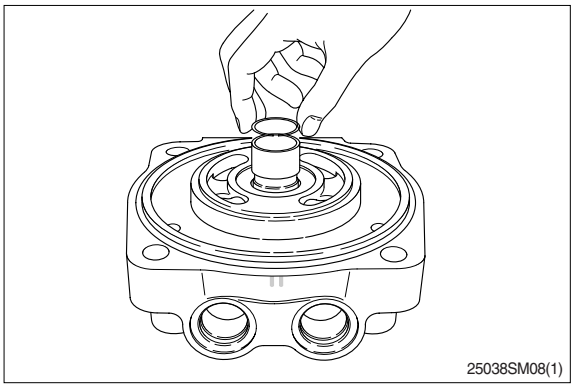


(4) Remove mounting bolts of cover

Loosen hexagon socket bolt(18) with 12㎜ hexagonal wrench.

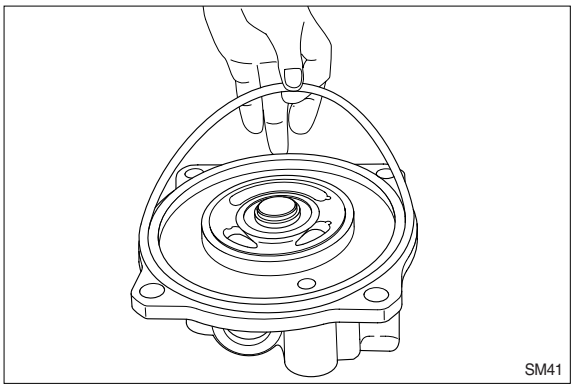


(12) Assemble inner race of needle bearing (15) and shim(22) to cover(12).

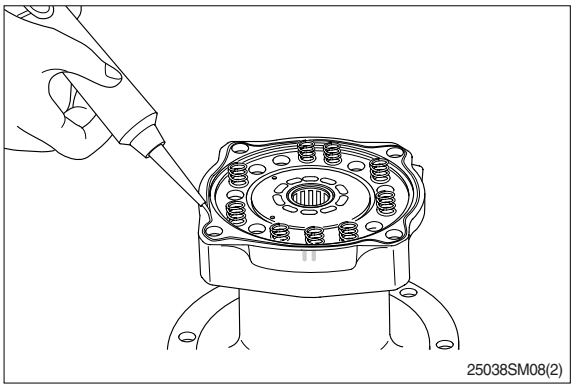


(13) Assemble O-ring(29) to cover(12).

※ Lubricate O-ring with grease.



(14) Apply three bond of white color to distinguish oil leakage from remaining oil in bolt hole of cover(12).

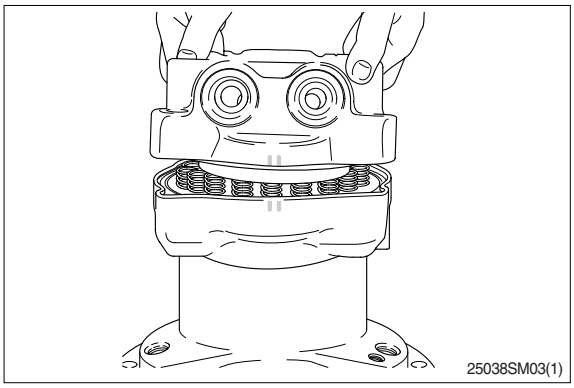


(15) Cover

Assemble cover(12) and valve plate(16) to housing(1) lightly, holding them up with hands.

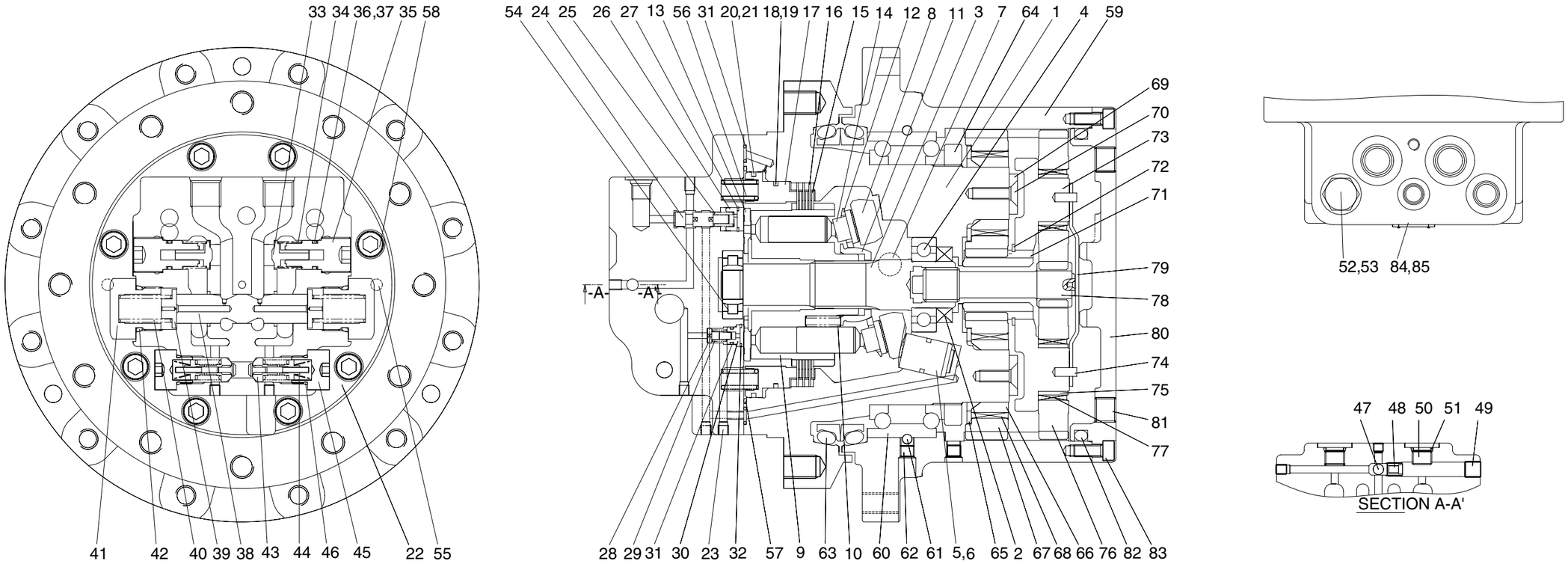
※ When assembling, be careful not to detach valve plate(16) from cover(30).

※ Fit matching marks on housing(1) and cover(12) made before disassembling.



2. TRAVEL MOTOR

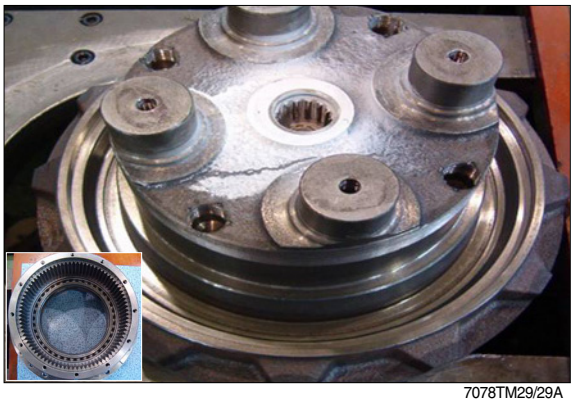
2) STRUCTURE



7072TM02

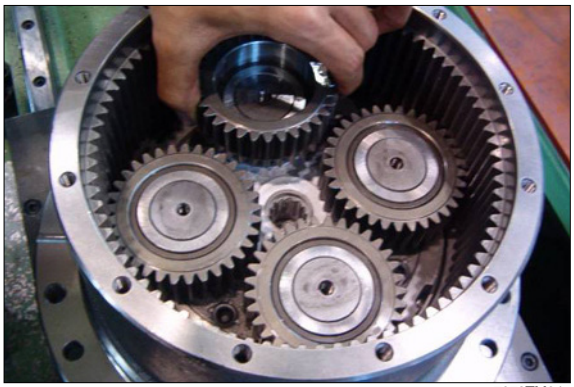
1	Shaft casing	16	Parking plate	31	O-ring	45	Plug	59	Ring gear	73	Carrier
2	Oil seal	17	Parking piston	32	Snap ring	46	O-ring	60	Angular bearing	74	Spring pin
3	Shaft	18	O-ring	33	Check	47	Steel ball	61	Steel ball	75	Collar
4	Bearing	19	Back up ring	34	Spring	48	Check seat	62	Plug	76	Planetary gear(B)
5	Swash piston	20	O-ring	35	Plug	49	Plug	63	Floating seal	77	Needle bearing
6	Piston ring	21	Back up ring	36	O-ring	50	Plug	64	Nut	78	Drive gear
7	Swash steel ball	22	Rear cover	37	Back up ring	51	O-ring	65	Washer	79	Thrust plate
8	Swash plate	23	Plug	38	Main spool	52	Roller bearing	66	Collar	80	Ring gear cover
9	Cylinder block	24	Spool	39	Spring seat	53	O-ring	67	Planetary gear(A)	81	Plug
10	Spring	25	Spring	40	Spring	54	Hex plug	68	Needle bearing	82	O-ring
11	Ball guide	26	Stopper	41	Plug	55	Parallel pin	69	Plate	83	Wrench bolt
12	Set plate	27	Snap ring	42	O-ring	56	Spring	70	Bolt	84	Name plate
13	Valve plate	28	Check	43	Relief valve assembly	57	O-ring	71	Sun gear	85	Rivet
14	Piston assembly	29	Spring	44	Spring	58	Wrench bolt	72	Snap ring	86	Seal kit
15	Friction plate	30	Seat								

⑬ Put the reduction gear on the assembling jig and then disassembling ring gear(59).



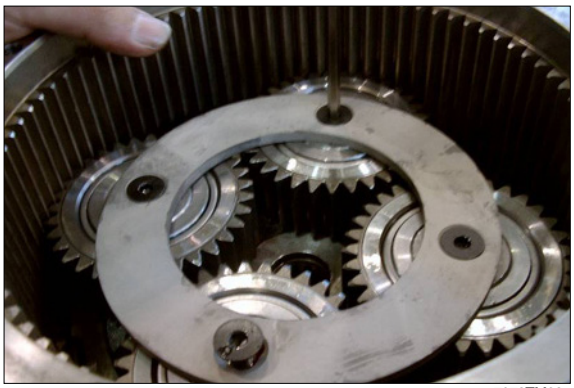
7078TM29/29A

⑫ Assemble planetary gear(67)-4EA to the ring gear(59).



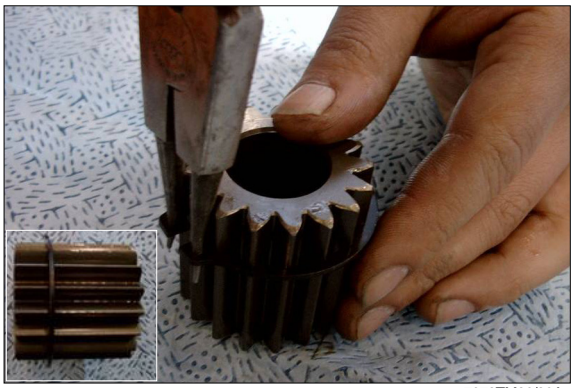
7078TM24

⑬ Assemble plate(69)-1EA to the ring gear(59) and then combine plate head bolt(70)-4EA with L-wrench.
(after paste loctite and then combine the plate head bolt).



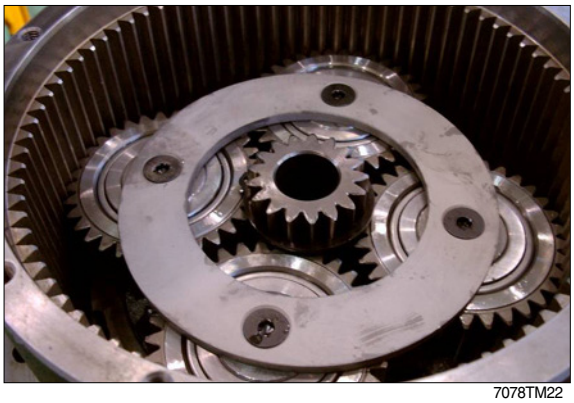
7078TM23

⑭ Assembling snap ring(72) to the sun gear(71) with a plier jig.



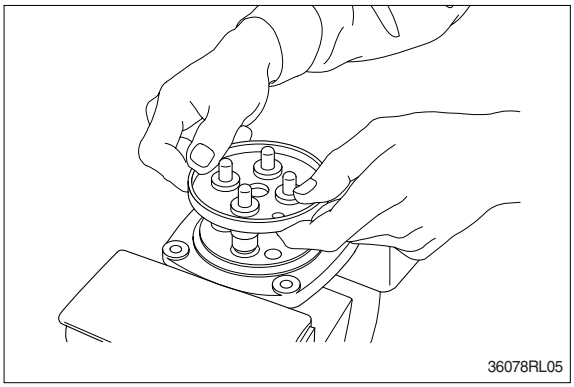
7078TM86/86A

⑮ Assemble sun gear with snap ring assembly to the ring gear(59).



7078TM22

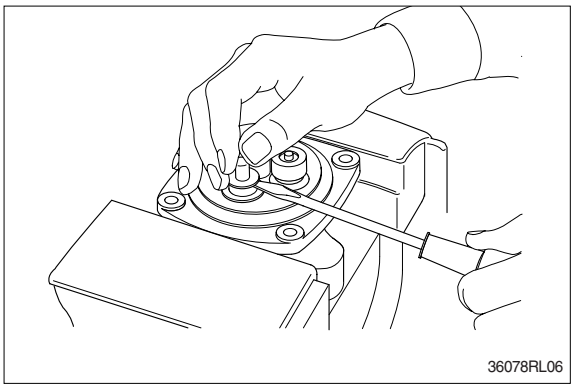
(8) Remove plate(16).



(9) When return spring(10) is weak in force, plug(11) stays in casing because of sliding resistance of O-ring.

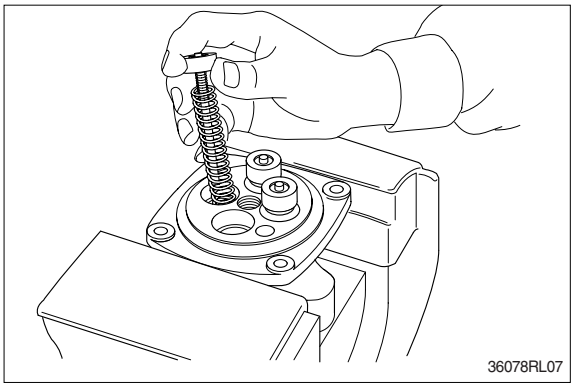
※ Take it out with minus screwdriver.
Take it out, utilizing external periphery groove of plug and paying attention not to damage it by partial loading.

※ During taking out, plug may jump up due to return spring(10) force.
Pay attention to this.

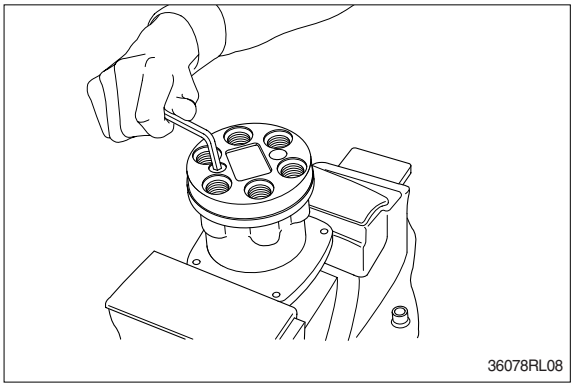


(10) Remove reducing valve subassembly and return spring(10) out of casing.

※ Record relative position of reducing valve subassembly and return springs.

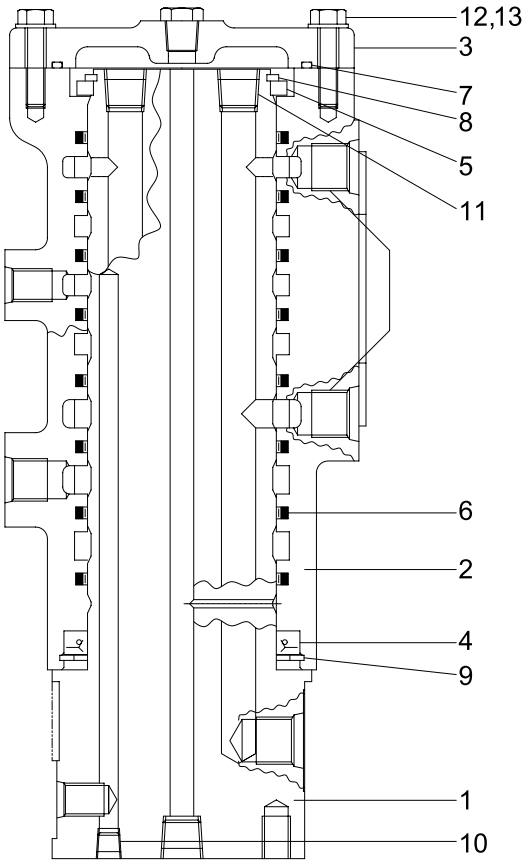


(11) Loosen hexagon socket head plug(2) with hexagon socket screw key.



2. DISASSEMBLY AND ASSEMBLY

1) STRUCTURE



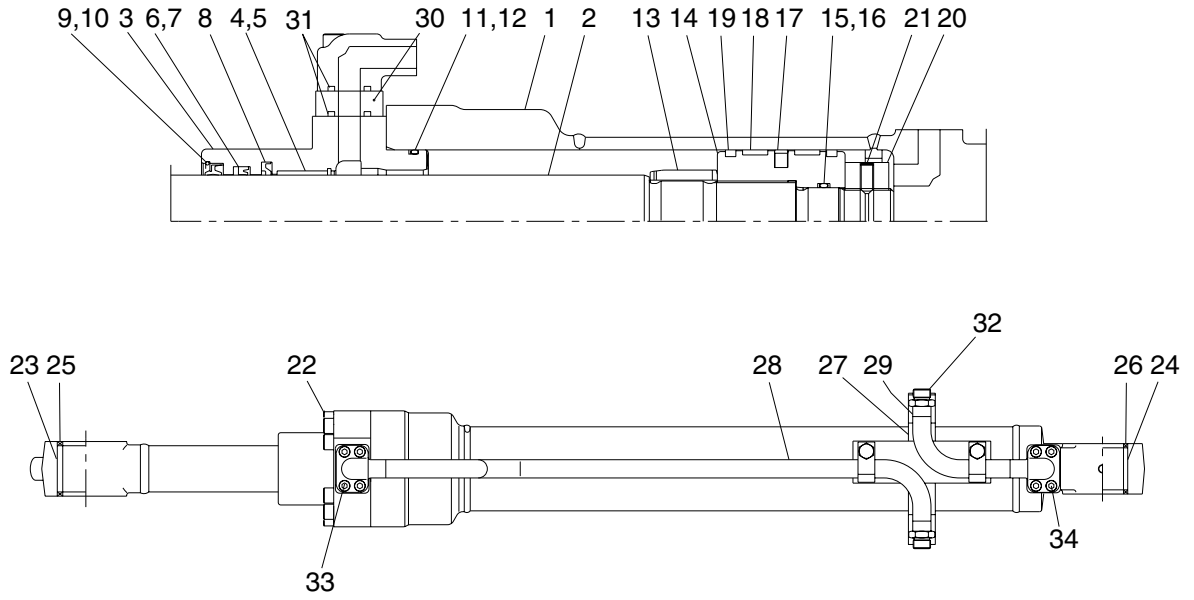
R55NM7TJ01

1	Hub	6	Slipper seal	10	Plug
2	Shaft	7	O-ring	11	Plug
3	Cover	8	Retainer ring	12	Hexagon bolt
4	Oil seal	9	Retainer ring	13	Spring washer
5	Ring				

2. DISASSEMBLY AND ASSEMBLY

1) STRUCTURE

(1) Bucket cylinder



7078CY03

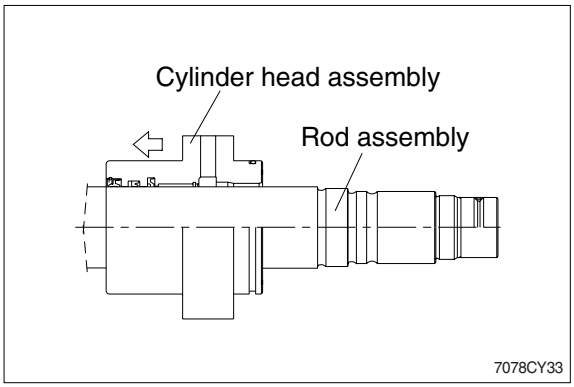
1	Tube assembly	13	Cushion ring	24	Pin bush
2	Rod assembly	14	Piston	25	Dust seal
3	Gland	15	O-ring	26	Dust seal
4	DD2 bush	16	Back up ring	27	Band assembly
5	Snap ring	17	Piston seal	28	Pipe assembly(R)
6	Rod seal	18	Wear ring	29	Pipe assembly(B)
7	Back up ring	19	Dust ring	30	Flange
8	Buffer ring	20	Lock nut	31	O-ring
9	Dust wiper	21	Screw	32	O-ring
10	Snap ring	22	Hexagon socket head bolt	33	Hexagon socket head bolt
11	O-ring	23	Pin bush	34	Hexagon socket head bolt
12	Back up ring				

(3) Install piston and cylinder head

① Fix the rod assembly to the work bench.

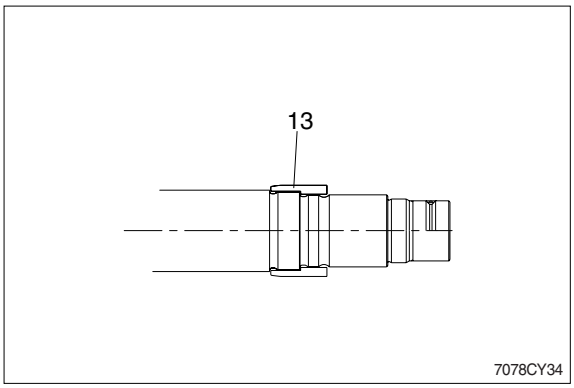
② Apply hydraulic oil to the outer surface of rod assembly(2), the inner surface of piston and cylinder head.

③ Insert cylinder head assembly to rod assembly.



④ Insert cushion ring(13) to rod assembly.

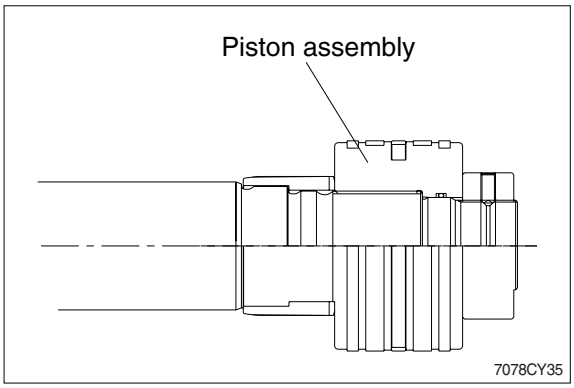
※ Note that cushion ring(13) has a direction in which it should be fitted.



⑤ Fit piston assembly to rod assembly.

· Tightening torque :

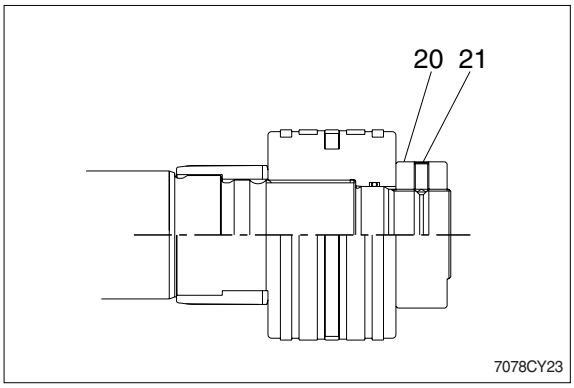
Item		kgf · m	lbf · ft
Boom	14	75±7.5	542±54
Arm	14	50±5.0	326±36
Bucket	14	50±5.0	326±36
Dozer	14	100±10	723±72



⑥ Fit lock nut(20) to piston and screw(21).

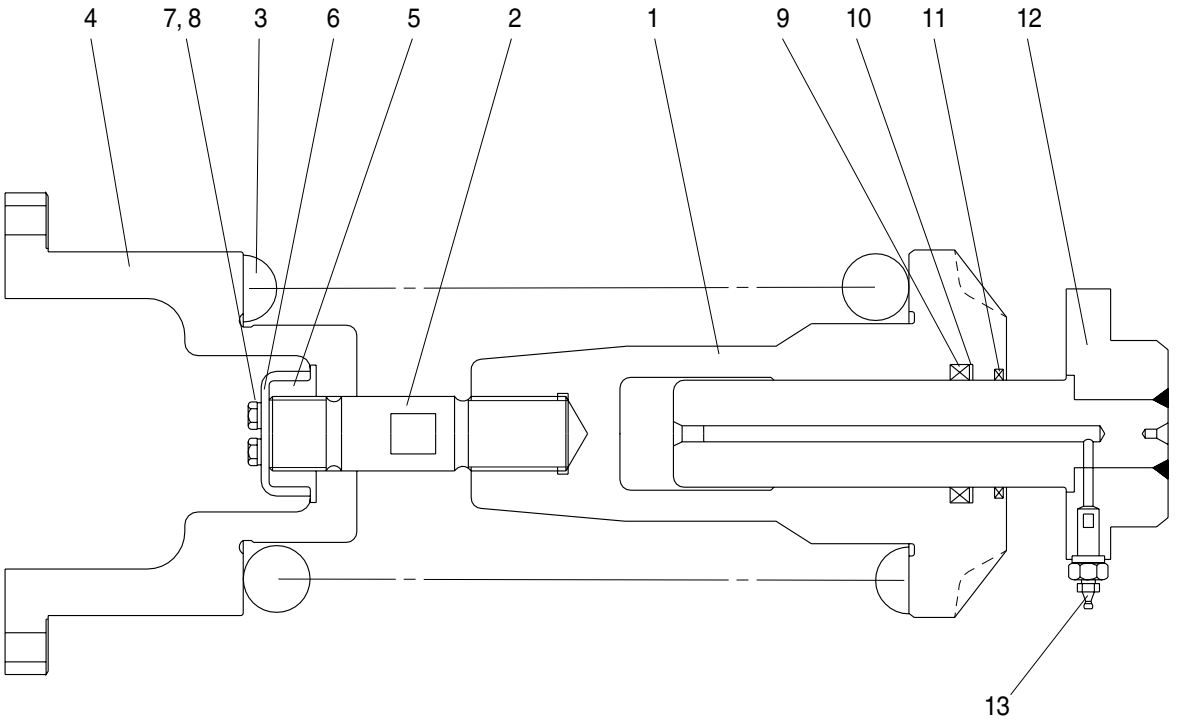
· Tightening torque :

Item		kgf · m	lbf · ft
Boom	20	130±13	940±94
Arm	20	75±7.5	542±54
Bucket	20	75±7.5	542±54



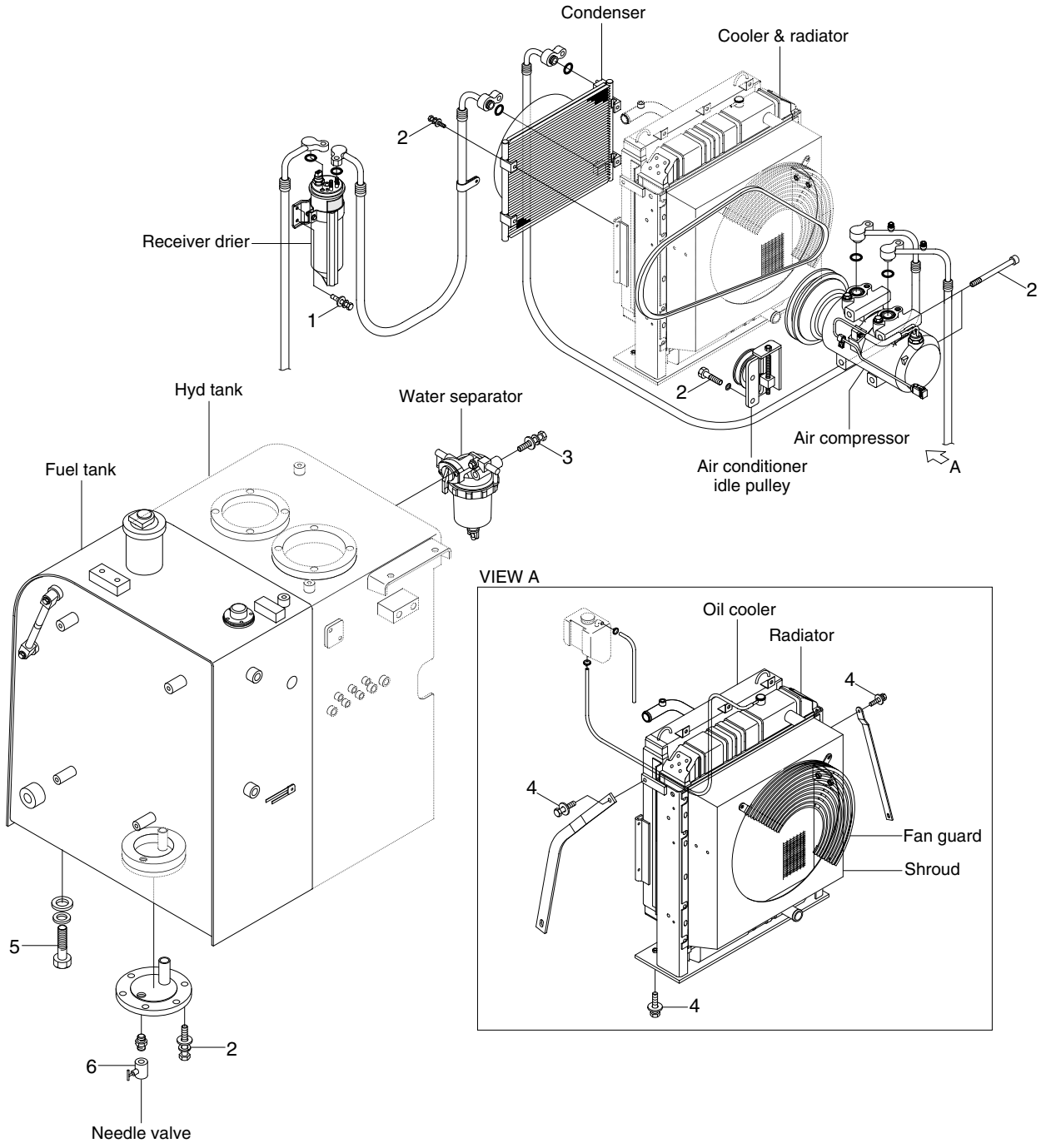
4) DISASSEMBLY AND ASSEMBLY OF RECOIL SPRING

(1) Structure



1	Body	6	Lock plate	11	Dust seal
2	Tie bar	7	Bolt	12	Rod assembly
3	Spring	8	Spring washer	13	Grease valve
4	Bracket	9	Rod seal		
5	Lock nut	10	Back up ring		

2. COOLING SYSTEM AND FUEL TANK MOUNTING



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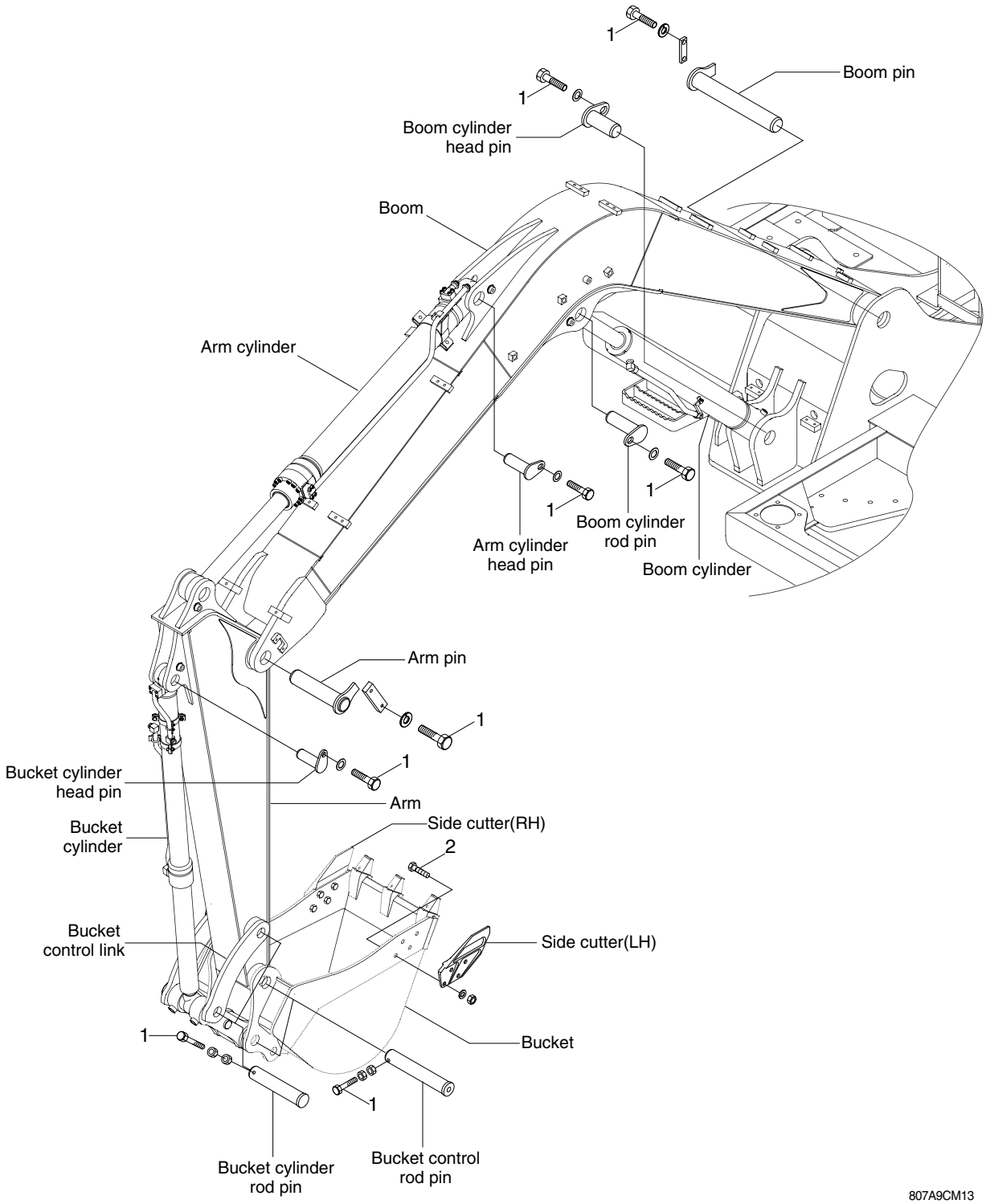
· Tightening torque

Item	Size	kgf · m	lbf · ft
1	M 6 ×1.0	1.05±0.2	7.6 ±1.45
2	M 8 ×1.25	2.5±0.5	18.1±3.6
3	M10×1.5	6.9±1.4	49.9±10.1

Item	Size	kgf · m	lbf · ft
4	M12×1.75	12.2±1.3	88.2±9.4
5	M 16 ×2.0	29.7±4.5	215±36.2
6	-	2.3±0.6	16.6±4.3



· Tightening torque

Item	Size	kgf · m	lbf · ft
1	M12×1.75	12.8±3.0	92.6±21.7

Item	Size	kgf · m	lbf · ft
2	M20×2.5	57.9±8.7	419±62.9