# CONTENTS

## SECTION 7 DISASSEMBLY AND ASSEMBLY

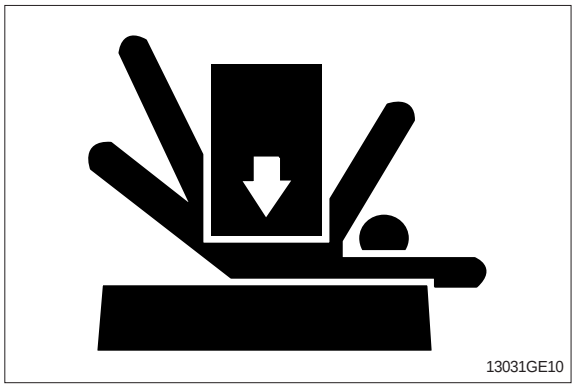


## SECTION 8 COMPONENT MOUNTING TORQUE

## SUPPORT MACHINE PROPERLY

Always lower the attachment or implement to the ground before you work on the machine. If you must work on a lifted machine or attachment, securely support the machine or attachment.

Do not support the machine on cinder blocks, hollow tiles, or props that may crumble under continuous load.
Do not work under a machine that is supported solely by a jack. Follow recommended procedures in this manual.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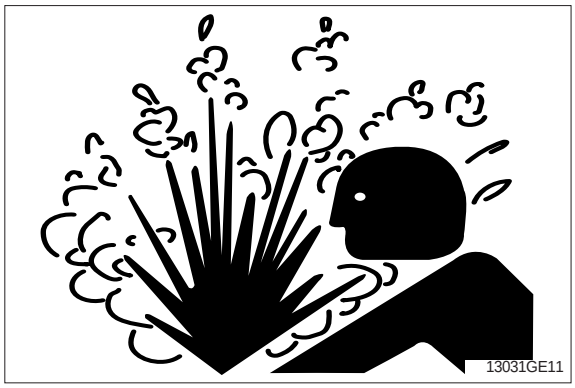
## SERVICE COOLING SYSTEM SAFELY

Explosive release of fluids from pressurized cooling system can cause serious burns.

Shut off engine. Only remove filler cap when cool enough to touch with bare hands.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## HANDLE FLUIDS SAFELY-AVOID FIRES

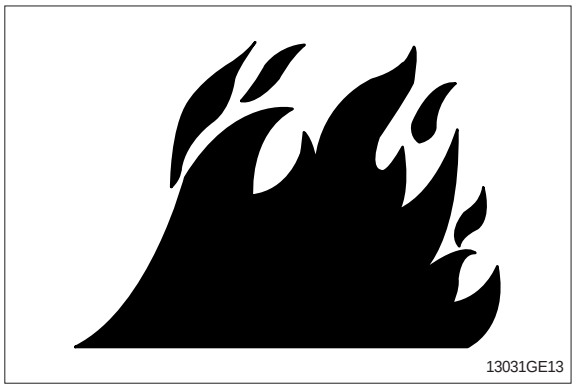
Handle fuel with care; It is highly flammable. Do not refuel the machine while smoking or when near open flame or sparks. Always stop engine before refueling machine.
Fill fuel tank outdoors.


13031GE12

Store flammable fluids away from fire hazards. Do not incinerate or puncture pressurized containers.

Make sure machine is clean of trash, grease, and debris.

Do not store oily rags; They can ignite and burn spontaneously.


13031GE13

## 8. SPECIFICATIONS FOR MAJOR COMPONENTS

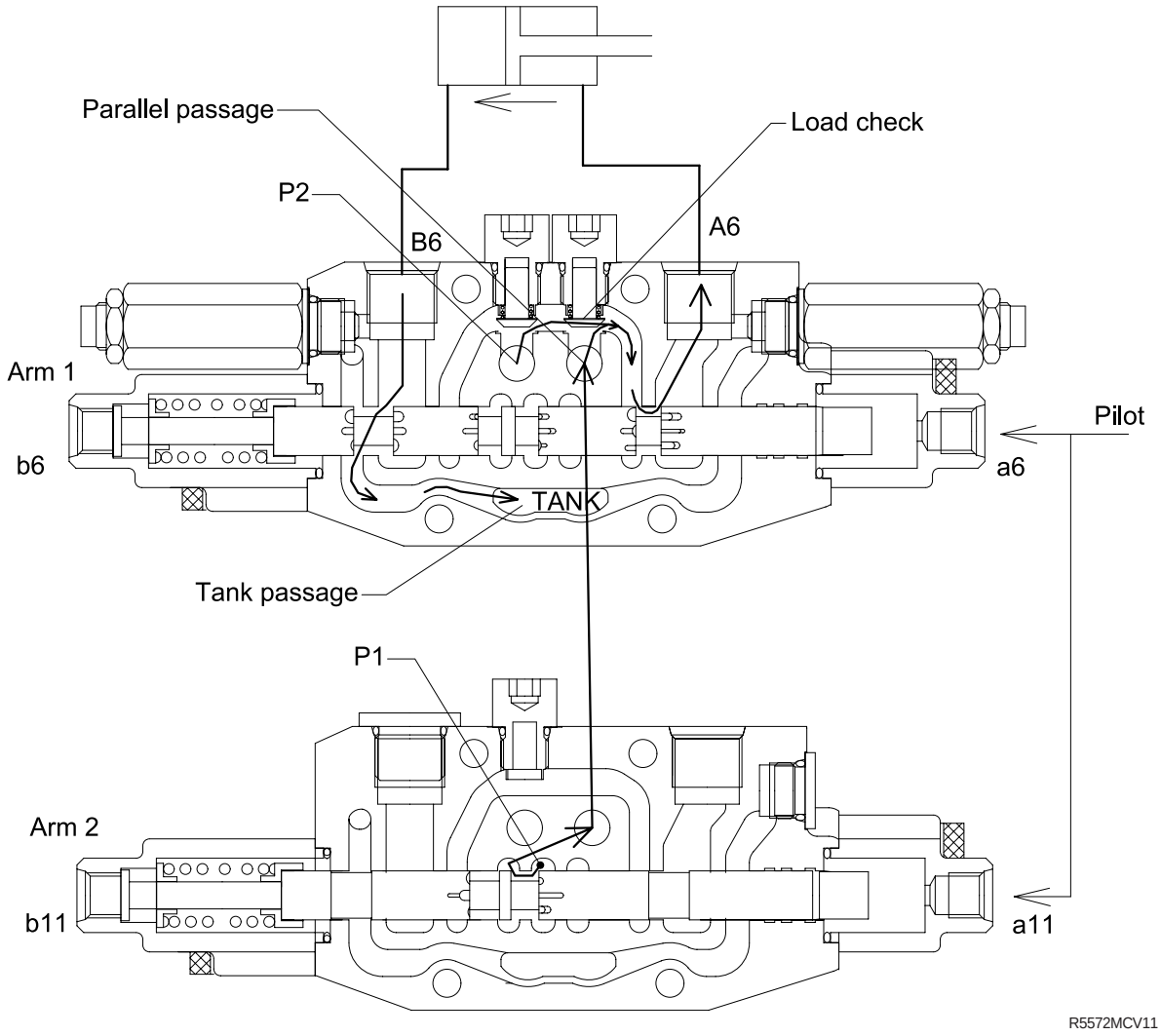
### 1) ENGINE

| Item | Specification |
|---|---|
| Model | Yanmar 4TNV98-EPHYB |
| Type | 4-cycle diesel engine, low emission |
| Cooling method | Water cooling |
| Number of cylinders and arrangement | 4 cylinders, in-line |
| Firing order | 1-3-4-2 |
| Combustion chamber type | Direct injection type |
| Cylinder bore × stroke | 98 × 110mm(3.85" × 4.33") |
| Piston displacement | 3319cc(203cu in) |
| Compression ratio | 18.5 : 1 |
| Rated gross horse power(SAE J1995) | 57Hp at 2400rpm(42.5kW at 2400rpm) |
| Maximum torque at 1550rpm | 20.5kgf · m(148lbf · ft) |
| Engine oil quantity | 11.6 ℓ (3.1U.S. gal) |
| Dry weight | 270kg(595lb) |
| High idling speed | 2400 + 50rpm |
| Low idling speed | 1050 ± 100rpm |
| Rated fuel consumption | 175.6g/Hp · hr at 2400rpm |
| Starting motor | 12V-3.0kW |
| Alternator | 12V-80A |
| Battery | 1 × 12V × 100Ah |

### 2) MAIN PUMP

| Item | Specification |
|---|---|
| Type | Variable displacement tandem axis piston pumps |
| Capacity | 2 × 26.3cc/rev |
| Maximum pressure | 220kgf/cm$^2$ (3130psi) |
| Rated oil flow | 2 × 58 ℓ /min (15.3U.S. gpm/ 12.8U.K. gpm) |
| Rated speed | 2200rpm |

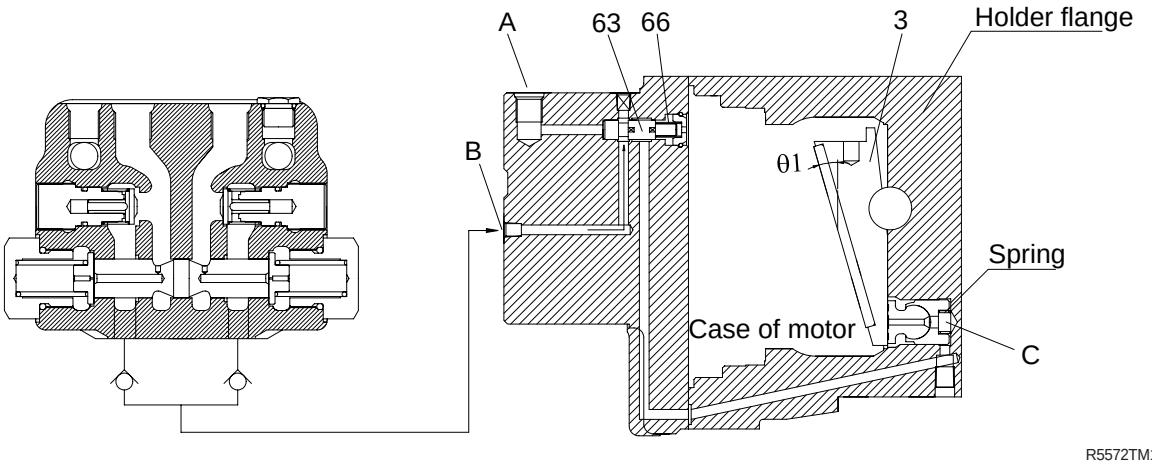
② Arm roll out operation




During arm roll out operation the pilot pressure from RCV is supplied to the port a6 and the a11 and shifts arm1 spool and arm2 spool in the left direction.
The hydraulic fluid from pump P2 flows into arm1 spool through the parallel passage. Then it enters into the arm cylinder rod side through the load check valve and the port A6.
At same time, the hydraulic oil from the pump P1 flows into the arm summation passage in arm 1 spool through the arm 2 spool.
The return flow from the arm cylinder head side returns to the hydraulic tank through the port B60 the arm1 spool and tank passage.

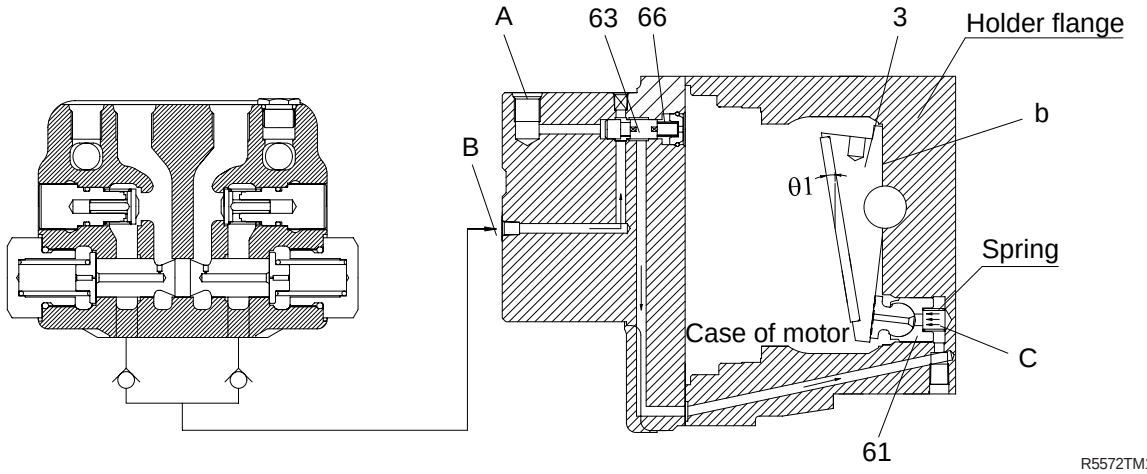
### 4) HIGH/LOW SPEED CHANGEOVER MECHANISM

#### (1) At low speed-at pilot pressure of less than 10kgf/cm²(0.98Mpa)



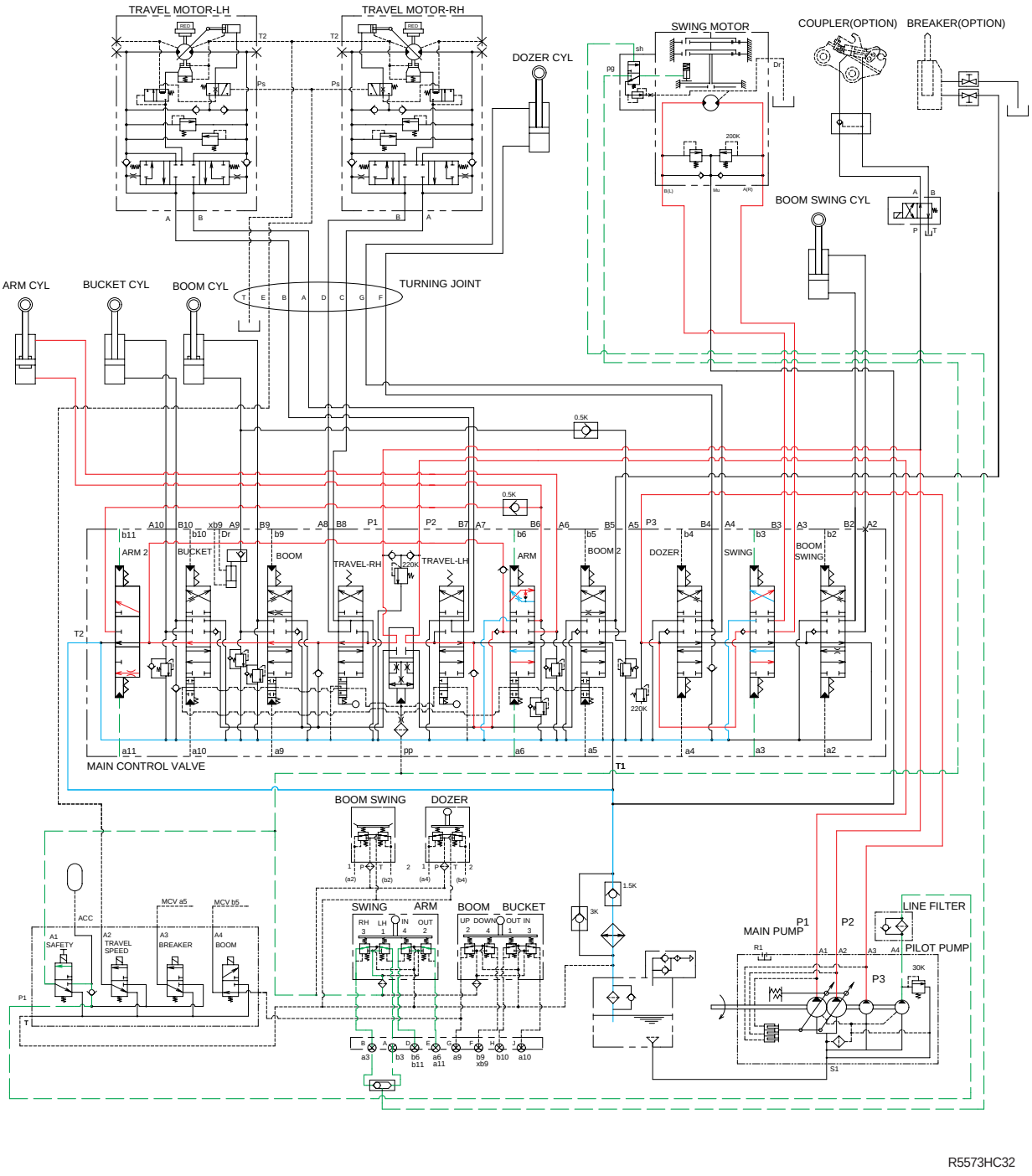

When no pilot pressure is supplied from port (A) at a pressure of 10kgf/cm²(0.98Mpa) or less, valve(63) is pressed toward the left by the force of spring(166), the pressurized oil supply port B is shut off, and oil in chamber (C) is released into the motor case via valve(63).
Consequently, swash plate(3) is tilted at a maximum angle($\theta$1°) and the piston displacement of hydraulic motor becomes maximum, thus leading to low-speed rotation.

#### (2) At high speed-at pilot pressure of 20kgf/cm²(1.96Mpa) or more




When a pilot pressure is supplied from port (A) at a pressure of 20kgf/cm²(1.96Mpa) or more, the pressure overcomes the force of spring(66) and valve(63) is pressed toward the right. The pressurized oil at supply port (B) is then introduced into chamber (C) via valve(63).
Piston(61) pushes up swash plate(3) until it touches side (b) of the holder flange.
At this time, swash plate(3) is tilted at a minimum angle($\theta$2°) and the piston displacement of hydraulic motor becomes maximum, thus leading to high-speed rotation.

## 3. COMBINED SWING AND ARM OPERATION

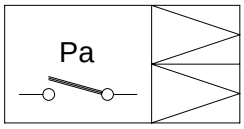
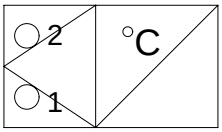
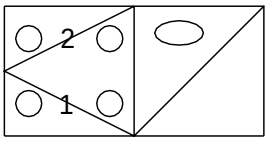
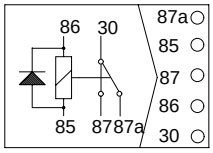
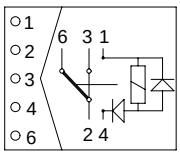
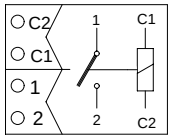



When the swing and arm functions are operated, simultaneously the swing spool and arm spools in the main control valve are moved to the functional position by the pilot oil pressure from the remote control valve.

The oil from the P3 pump flows into the swing motor through swing spool.

The oil from the P1 and P2 pump flows into the arm cylinder through the arm and arm 2 spool.

The superstructure swings and the arm is operated.

| Part name | Symbol | Specification | Check |
|---|---|---|---|
| Air cleaner pressure switch |  CD-10 | Pressure: 635mm$H_2O$ (N.O TYPE) | ※ Check contact<br>Normal : ∞ Ω |
| Water temp sensor |  CD-8 | 12V 0.5A | ※ Check contact<br>High level : ∞ Ω<br>Low level : 0 Ω |
| Fuel sender |  CD-2 | - | ※ Check resistance<br>Full : 100 Ω<br>Low : 500 Ω<br>Empty warning :700 Ω |
| Relay |  CR-2 CR-3 CR-4<br>CR-5 CR-12 CR-13<br>CR-33 CR-36 CR-62 | 12V 20A | ※ Check resistance<br>Normal : About 160 Ω<br>(For terminal 85-86)<br>: 0 Ω (For terminal 30-87a)<br>: ∞ Ω (For terminal 30-87) |
| Relay |  CR-67 CR-68 | 12V 20A | ※ Check resistance<br>Normal : About 0.02 Ω<br>(For terminal 2-4) |
| Relay |  CR-23 CR-24 | 12V 60A | ※ Rated coil current 1.2±0.3A |

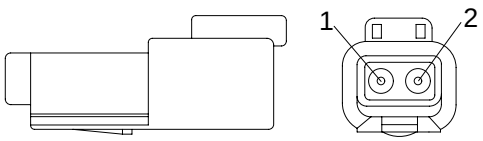
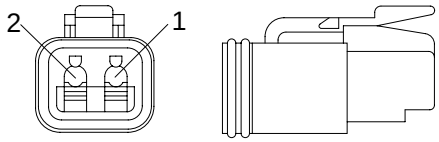
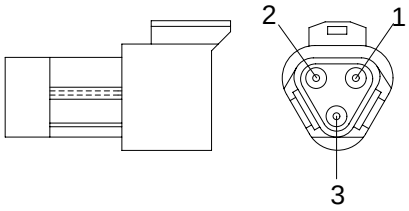
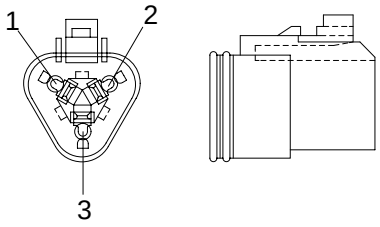
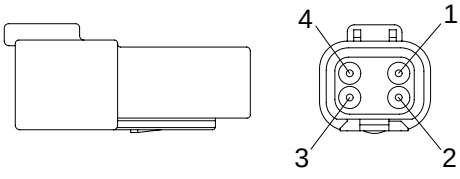
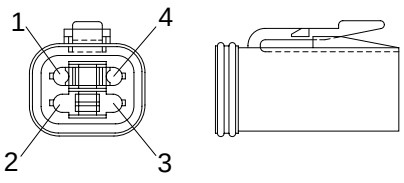
## 14) DEUTSCH DT CONNECTORS

DT 06 - 3S - ★★★★

- ★★★★ : Modifications(See below)
- 3S : Number of contacts(P : Pin, S : Socket)
- 06 : 04 : Receptacle, 06 : Plug
- DT : Deutsch connectors

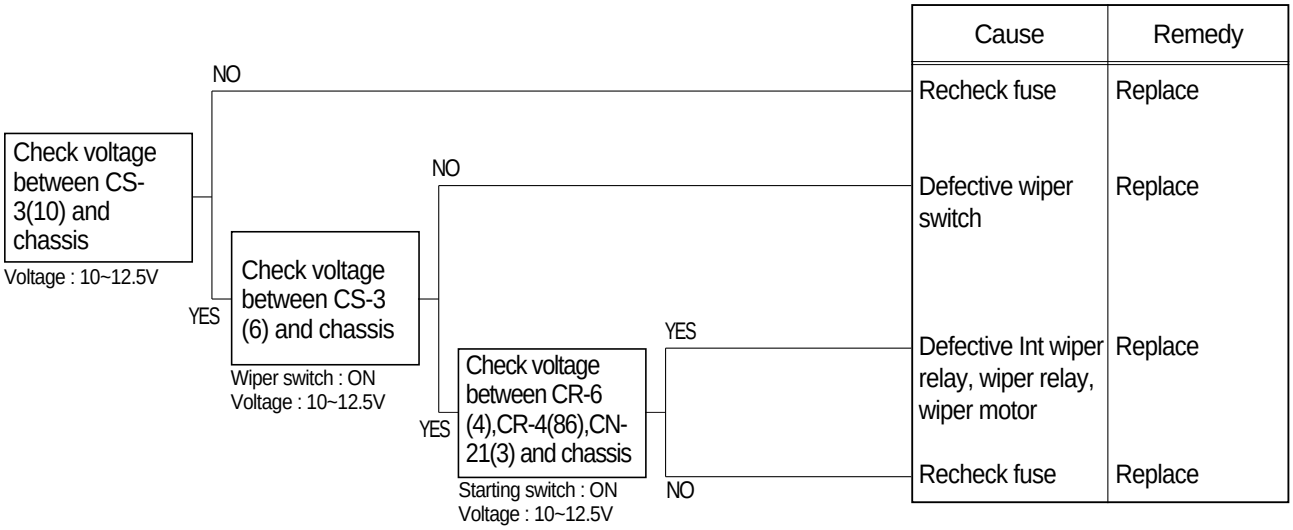
※ Modification

E003 : Standard end cap - gray
E004 : Color of connector to be black
E005 : Combination - E004 & E003
EP04 : End cap
EP06 : Combination P012 & EP04
P012 : Front seal enhancement - connectors color to black for 2, 3, 4 & 6pin

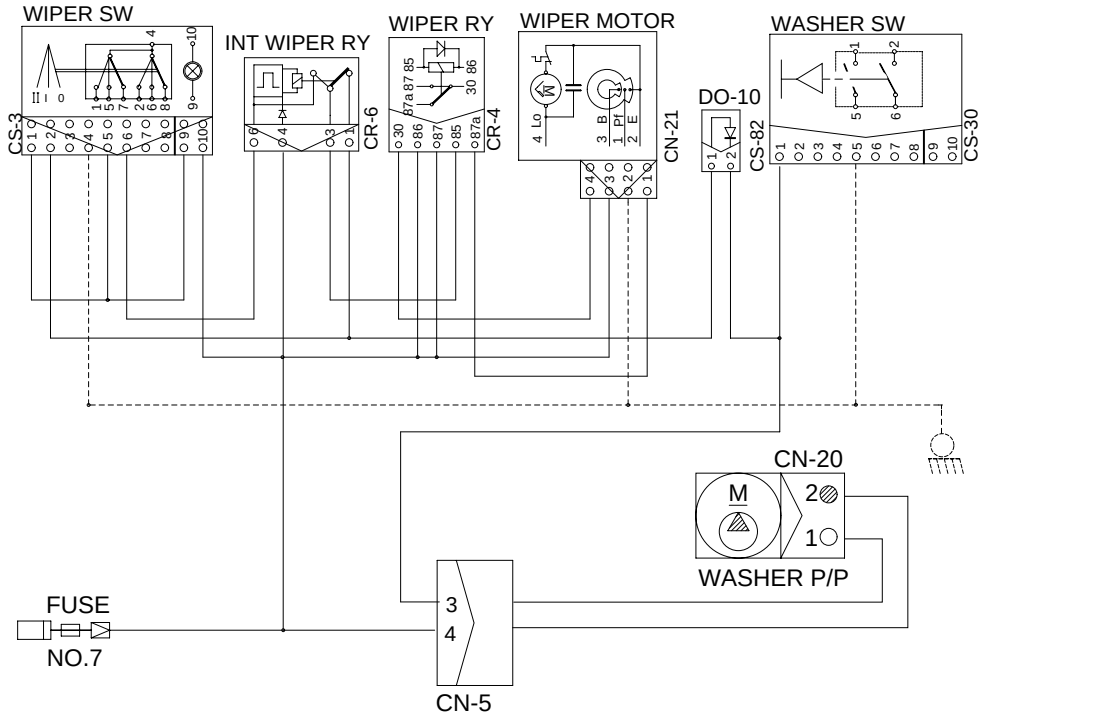
| No. of pin | Connector(Female) | Connector(Male) |
|---|---|---|
| 2 |  DT06-2S |  DT06-2P |
| 3 |  DT06-3S |  DT06-3P |
| 4 |  DT06-4S |  DT06-4P |

## 11. WHEN STARTING SWITCH IS TURNED ON, WIPER MOTOR 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 the fuse No.7 is not blown out.
- After checking, insert the disconnected connectors again immediately unless otherwise specified.



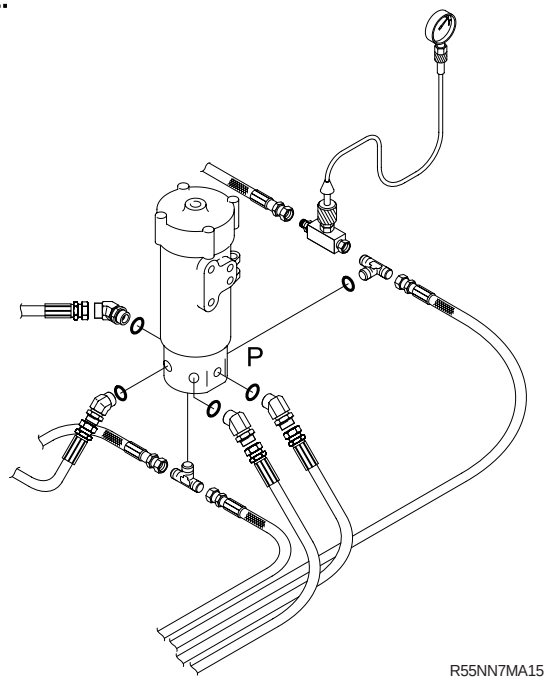

| Cause | Remedy |
|---|---|
| Recheck fuse | Replace |
| Defective wiper switch | Replace |
| Defective Int wiper relay, wiper relay, wiper motor | Replace |
| Recheck fuse | Replace |



## 14) FOR TRAVEL SPEED SELECTING PRESSURE:

### (1) Preparation

① Stop the engine.
② Push the pressure release button to bleed air.
③ To measure the speed selecting pressure: Install a connector and pressure gauge
④ assembly to turning joint P port as shown. Start the engine and check for on leakage from the adapter.
⑤ Keep the hydraulic oil temperature at 50±5°C.



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### (2) Measurement

① Select the following switch positions.
Travel mode switch : 1 speed
2 speed
② Measure the travel speed selecting pressure in the Hi or Lo mode.
③ Lower the bucket to the ground to raise the track off the ground. Operate the travel lever at full stroke and measure the fast speed pressure.
④ Repeat steps ② and ③ three times and calculate the average values.

### (3) Evaluation

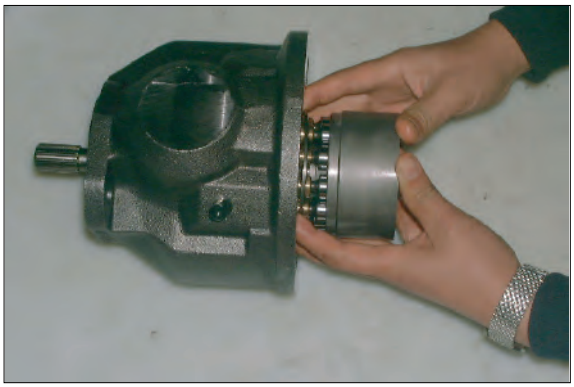
The average measured pressure should be within the following specifications.

Unit : kgf / cm$^2$

| Model | Travel speed mode | Standard | Maximum allowable | Remarks |
|---|---|---|---|---|
| R55-7A | 1 Speed | 0 | - | |
| | 2 Speed | 30±5 | - | |

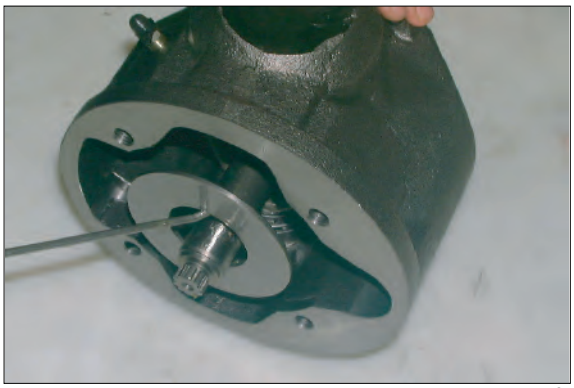
### (2) The removal of rotary group

① Lay the pump on the side and take out the rotary group from the shaft.



R55NM7HP11

② Remove the plate.



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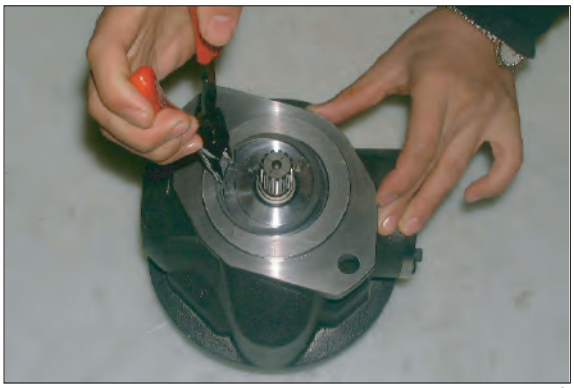
### (3) The removal of the shaft

① Remove the C-type stop ring.
(Snap ring pliers for hole)



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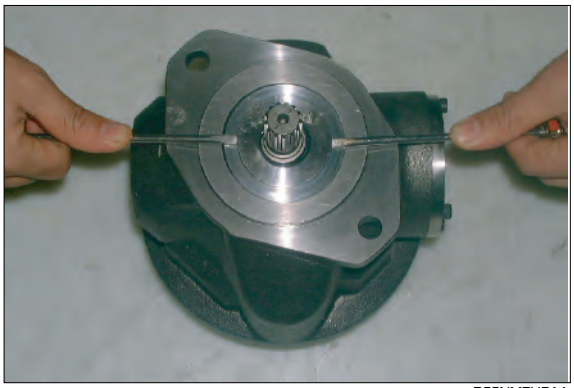
② Use two standard screw-drivers to remove the oil seal case.



R55NM7HP14

# GROUP 4 MAIN CONTROL VALVE

## 1. REMOVAL AND INSTALL OF MOTOR

### 1) REMOVAL

(1) Lower the work equipment to the ground and stop the engine.

(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) Disconnect hydraulic hose.

(5) Disconnect pilot line hoses.

(6) Remove links.

(7) Sling the control valve assembly and remove the control valve mounting bolt.

・Weight : 40kg(90lb)

(8) Remove the control valve assembly.
When removing the control valve assembly, check that all the piping have been disconnected.

### 2) INSTALL

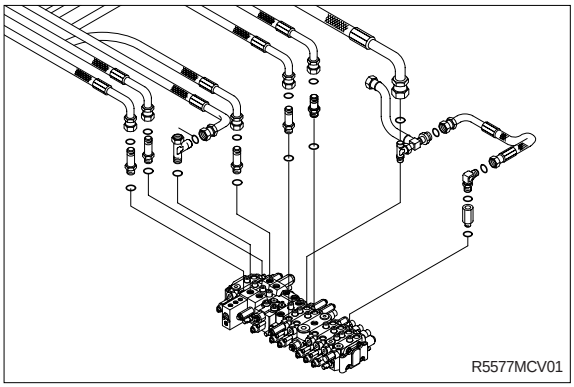
(1) Carry out installation in the reverse order to removal.

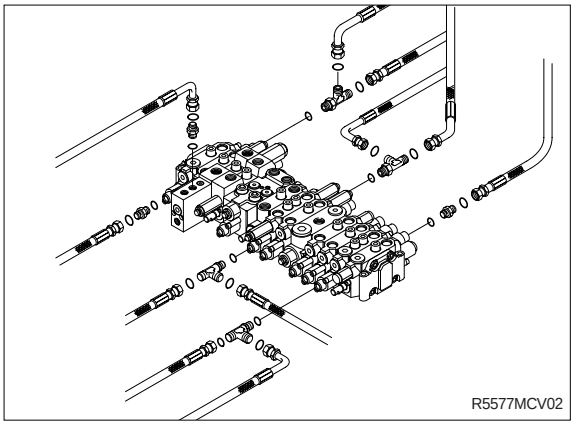
(2) Bleed the air from below items.

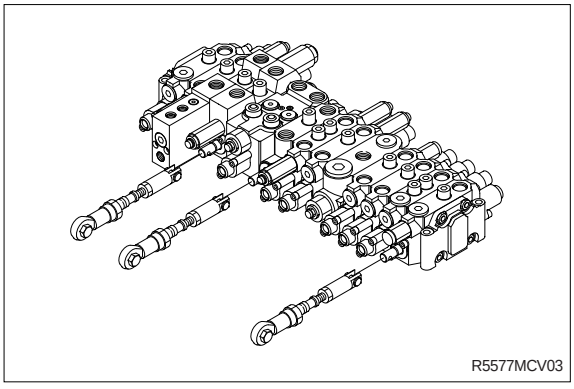
① Cylinder(Boom, arm, bucket)
② Swing motor
③ Travel motor

※ See each item removal and install.

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

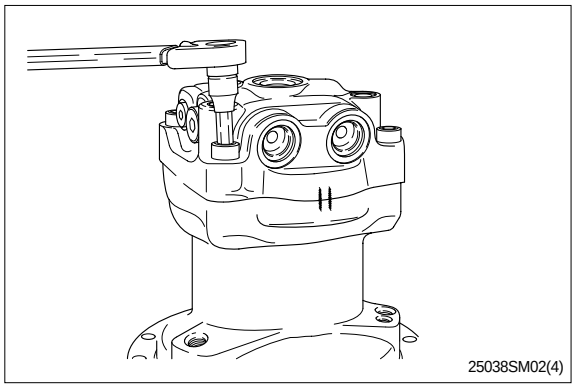



(16) Tighten cover(12) and housing(1) with 12㎜ hexagonal socket bolt(18).

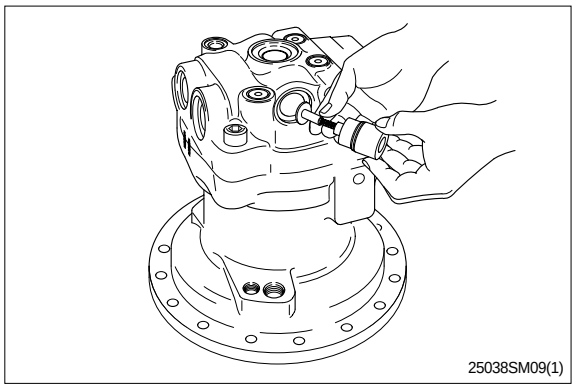
・Tightening torque : 16kgf・m(116lbf・ft)




**(17) Make up valve**

Assemble check(35) and spring(36) to cover(12) and tighten plug(37) with 14㎜ hexagonal socket bolt.

・Tightening torque : 14kgf・m(101lbf・ft)

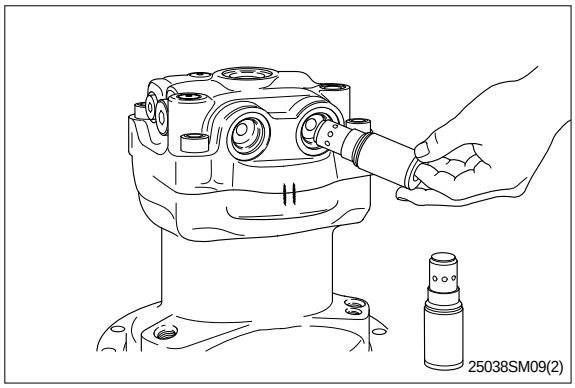



**(18) Relief assembly**

Assemble relief valve assembly(17) to cover(12) with 14㎜ hexagonal socket bolt.

・Tightening torque : 8kgf・m(58lbf・ft)

※ Be cautious of assembling method.



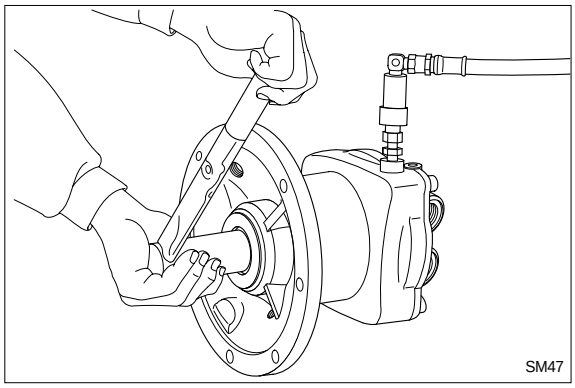

**(19) Check of assembly**

Load pilot pressure of 20kgf/㎠ to brake release port after opening inlet and outlet port.

Check if output shaft is rotated smoothly around torque of 0.5~1kgf・m.

If not rotated, disassemble and check.

This completes assembly.



# GROUP 8 TURNING JOINT

## 1. REMOVAL AND INSTALL

### 1) REMOVAL

(1) Lower the work equipment to the ground and stop the engine.

(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) Disconnect all hoses.

(5) Sling the turning joint assembly (1) and remove the mounting bolt(2).

- Weight : 30kg(70lb)
- Tightening torque : 12.3± 1.3kgf · m (88.9± 9.4lbf · ft)

(6) Remove the turning joint assembly.

※ When removing the turning joint, check that all the hoses have been disconnected.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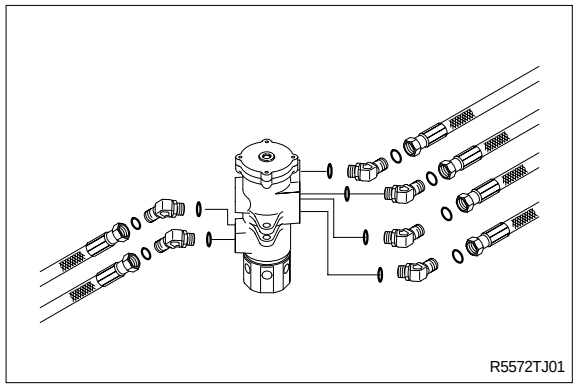

R5572TJ01

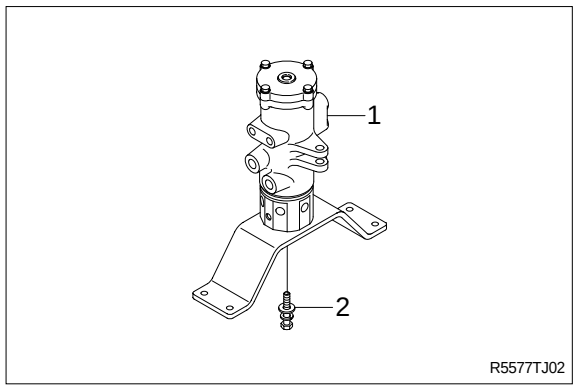
### 2) INSTALL

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

※ Take care of turning joint direction.

※ Assemble hoses to their original positions.

※ Confirm the hydraulic oil level and check the hydraulic oil leak or not.



R5577TJ02