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## 1. STRUCTURE

This service manual has been prepared as an aid to improve the quality of repairs by giving the serviceman an accurate understanding of the product and by showing him the correct way to perform repairs and make judgements. Make sure you understand the contents of this manual and use it to full effect at every opportunity.

This service manual mainly contains the necessary technical information for operations performed in a service workshop.

For ease of understanding, the manual is divided into the following sections.

### **SECTION 1 GENERAL**

This section explains the safety hints and gives the specification of the machine and major components.

### **SECTION 2 STRUCTURE AND FUNCTION**

This section explains the structure and function of each component. It serves not only to give an understanding of the structure, but also serves as reference material for troubleshooting.

### **SECTION 3 HYDRAULIC SYSTEM**

This section explains the hydraulic circuit, single and combined operation.

### **SECTION 4 ELECTRICAL SYSTEM**

This section explains the electrical circuit, monitoring system and each component. It serves not only to give an understanding electrical system, but also serves as reference material for trouble shooting.

### **SECTION 5 TROUBLESHOOTING**

This section explains the troubleshooting charts correlating problems to causes.

### **SECTION 6 MAINTENANCE STANDARD**

This section gives the judgement standards when inspecting disassembled parts.

### **SECTION 7 DISASSEMBLY AND ASSEMBLY**

This section explains the order to be followed when removing, installing, disassembling or assembling each component, as well as precautions to be taken for these operations.

### **SECTION 8 COMPONENT MOUNTING TORQUE**

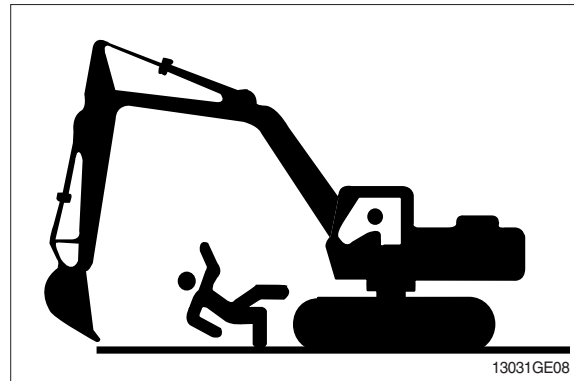
This section shows bolt specifications and standard torque values needed when mounting components to the machine.

The specifications contained in this shop manual are subject to change at any time and without any advance notice. Contact your HYUNDAI distributor for the latest information.

## KEEP RIDERS OFF EXCAVATOR

Only allow the operator on the excavator. Keep riders off.

Riders on excavator are subject to injury such as being struck by foreign objects and being thrown off the excavator. Riders also obstruct the operator's view resulting in the excavator being operated in an unsafe manner.

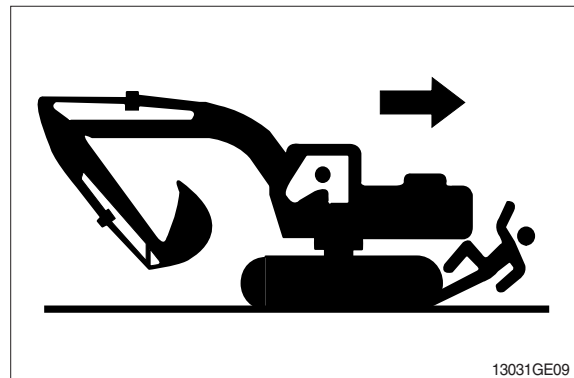


## MOVE AND OPERATE MACHINE SAFELY

Bystanders can be run over. Know the location of bystanders before moving, swinging, or operating the machine.

Always keep the travel alarm in working condition. It warns people when the excavator starts to move.

Use a signal person when moving, swinging, or operating the machine in congested areas. Coordinate hand signals before starting the excavator.



## OPERATE ONLY FROM OPERATOR'S SEAT

Avoid possible injury machine damage. Do not start engine by shorting across starter terminals.

NEVER start engine while standing on ground. Start engine only from operator's seat.

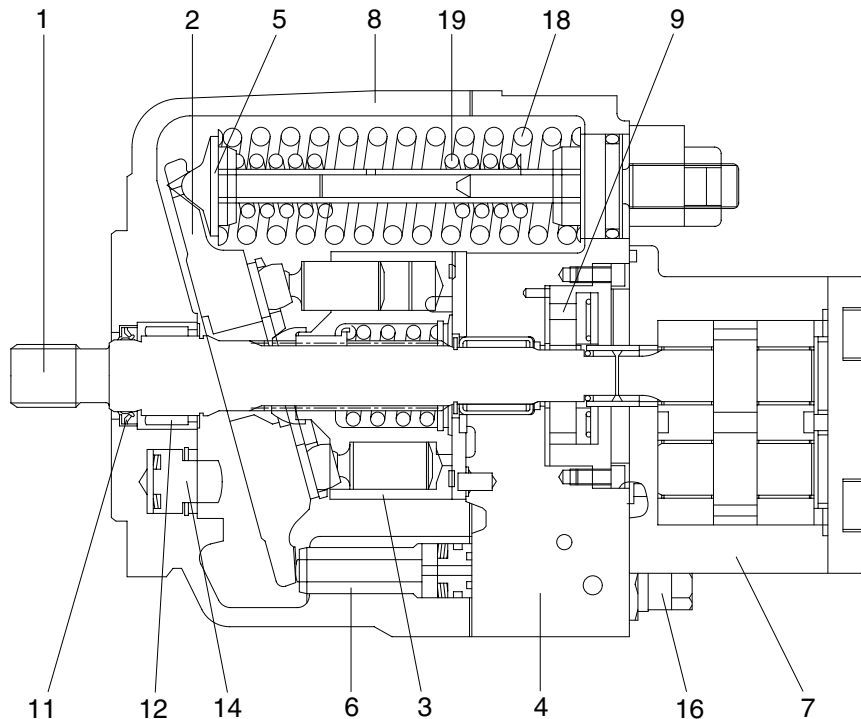


## PARK MACHINE SAFELY

Before working on the machine:

- Park machine on a level surface.
- Lower bucket to the ground.
- Turn auto idle switch off.
- Run engine at 1/2 speed without load for 2 minutes.
- Turn key switch to OFF to stop engine.  
Remove key from switch.
- Move pilot control shutoff lever to locked position.
- Allow engine to cool.

## 2. MAJOR COMPONENTS AND FUNCTIONS



R35Z72MP03

- |   |                         |    |                  |
|---|-------------------------|----|------------------|
| 1 | Drive shaft assembly    | 9  | Trochoid pump    |
| 2 | Swash plate assembly    | 11 | Oil seal         |
| 3 | Rotary group            | 12 | Bearing          |
| 4 | Port plate assembly     | 14 | Stopper assembly |
| 5 | Spring seat assembly    | 16 | Relief valve     |
| 6 | Control piston assembly | 18 | Spring           |
| 7 | Gear pump               | 19 | Spring           |
| 8 | Housing                 |    |                  |

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.

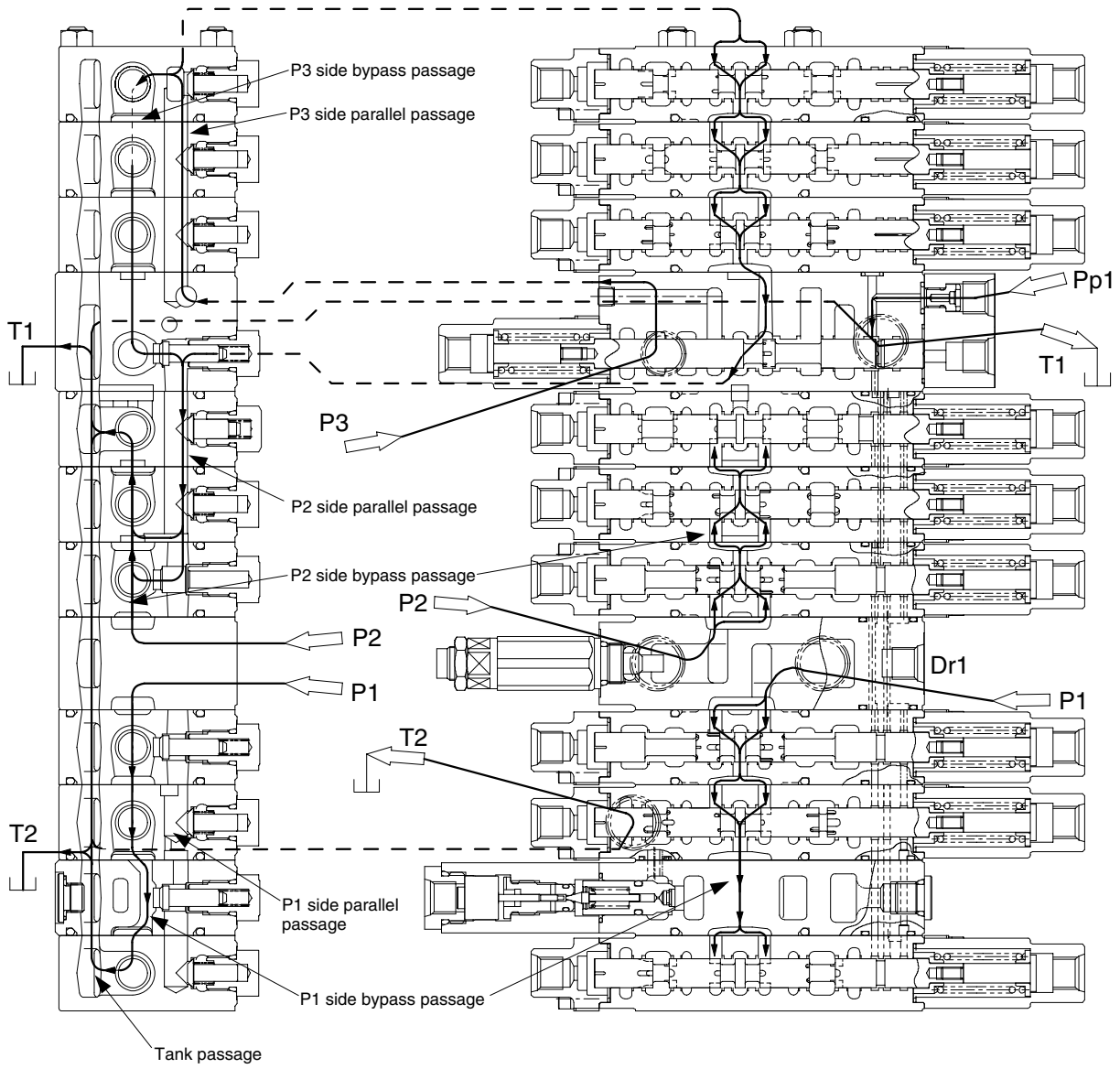
The oil is divided into two equal flows by the control plate in the cover and directed to two discharge ports provided in the cover.

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.



**Hydraulic oil flow in neutral**

## (10) SWING OPERATION

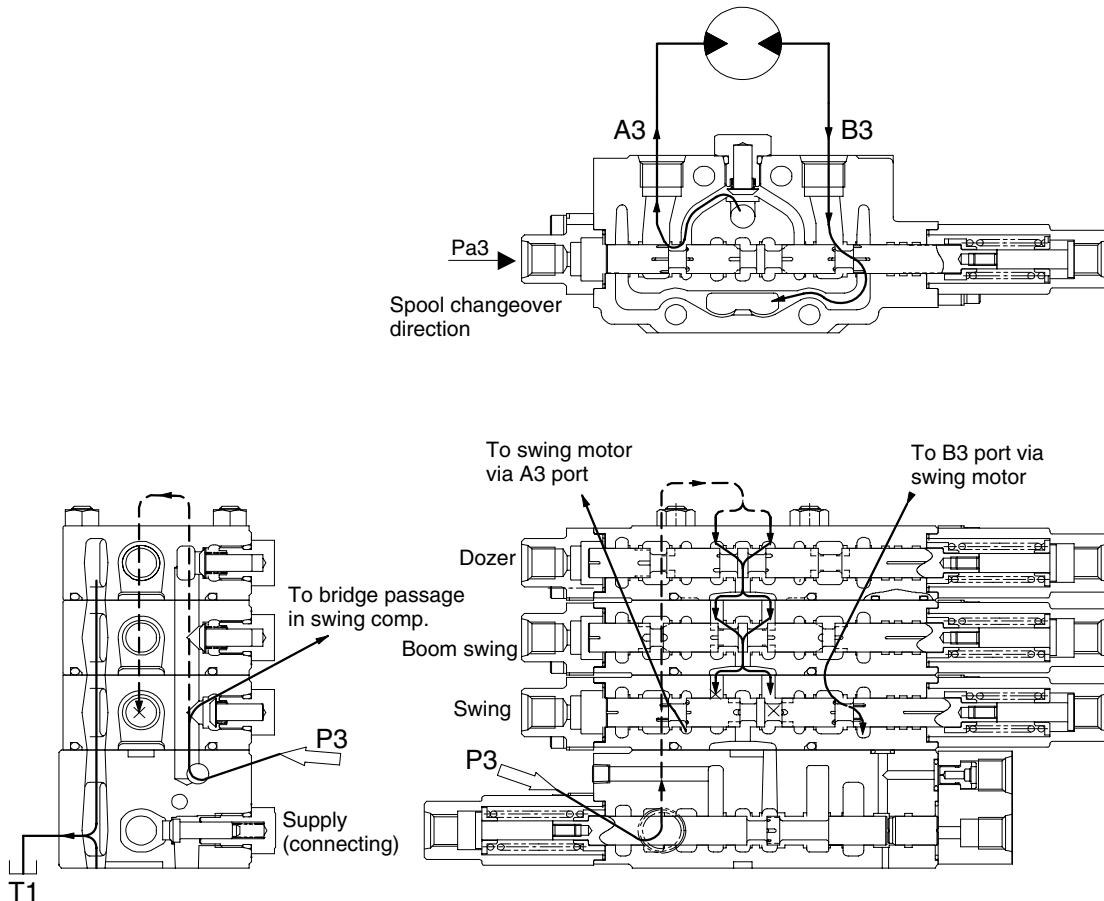
For the swing operation, both Pa pressurization and Pb pressurization are the same on operation so that only Pa pressurization is explained as follows.

When the right swing operation is carried out, the secondary pressure from the remote control valve is applied to Pa3 port to change over the swing spool.

Since the P3 side bypass passage is shut off at the swing section after the swing spool changeover, the oil flowed from P3 port through the P3 side parallel passage flows into A3 port through the load check valve in the swing section and the bridge passage since A3 port and the bridge passage have been opened after the spool changeover and then into the swing motor.

On the other hand, the oil returned from the swing motor flows into B3 port to the tank passage that has opened with the spool's notch after the spool changeover.

Then, the upper swing body swings right.



### Right swing operation

**(2) When running at 2nd speed (high speed)**

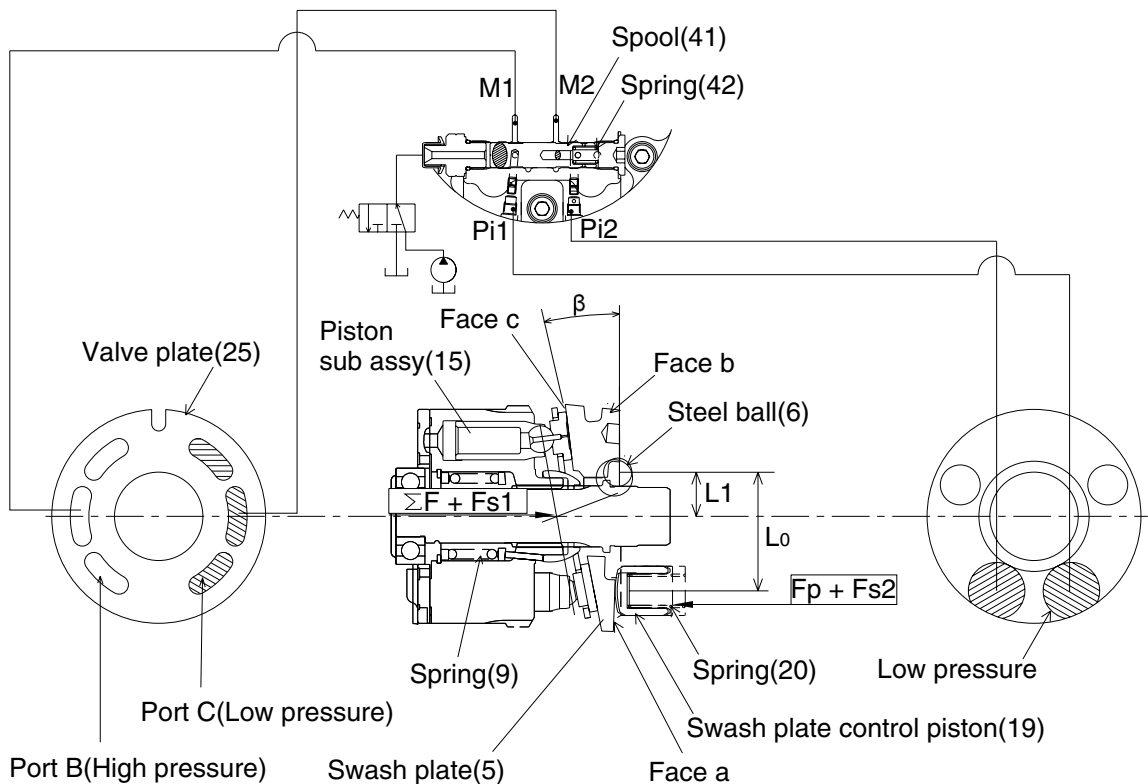
When control valve is set to the 2nd speed position, the pressure oil delivered by the pump is led to spool (41) and spool (41) is switched to the position shown below in the figure. And the pressurized oil flows into each ports Pi1 and Pi2 through ports M1 and M2 and the motor driving pressure (P1 : high pressure and P2 : low pressure) is led to each swash plate control piston (19). Therefore the force pushing up the swash plate acts on swash plate control piston (19).

$$F_{p1} = A_p \times P1 \qquad F_{p2} = A_p \times P2$$

When steel ball (6) is placed on the tilting center, the balance of moment acting on swash plate (5) is in the condition of  $(\Sigma F + F_{s1}) \times L1 < (F_p + F_{s2}) \times L_o$  depending on the total  $\Sigma F$  of driving force of piston sub assy (15).

The face "b" of swash plate (5) stabilizes and the swash plate angle become  $\beta$ , consequently the motor speed is the 2nd speed (high speed).

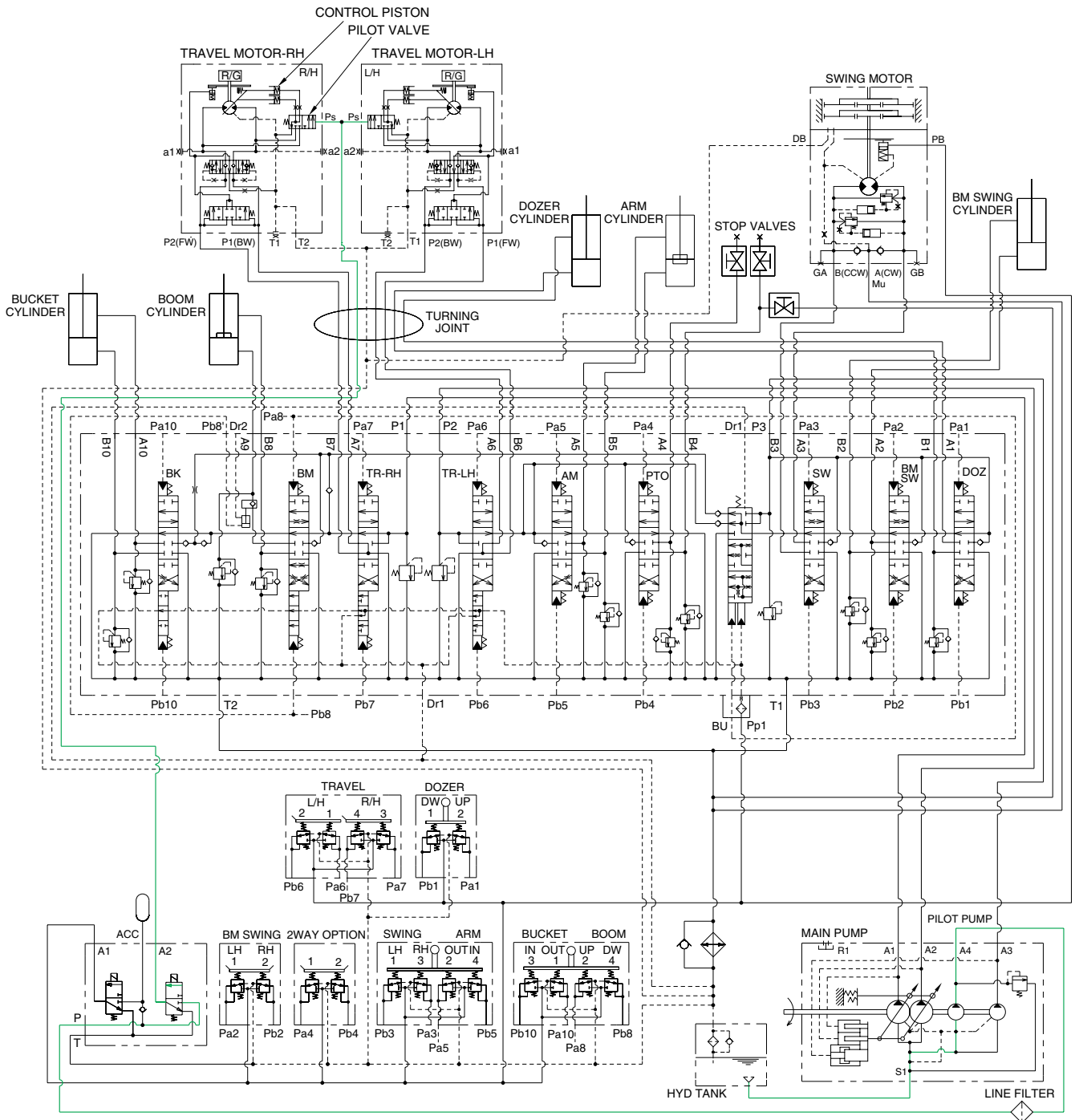
While the engine is stopped, spool (41) is returned to the 1st speed position by the force of spring (9) since pressurized oil does not flow. When steel ball (6) is placed on the tilting center, the balance of moment acting on swash plate (5) is in the condition of  $F_s \times L1 > F_p \times L_o$ , the face "a" of swash plate (5) stabilizes and the swash plate angle become  $\alpha$ , consequently the motor speed at starting is always the 1st speed.



**At 2nd speed (high speed)**



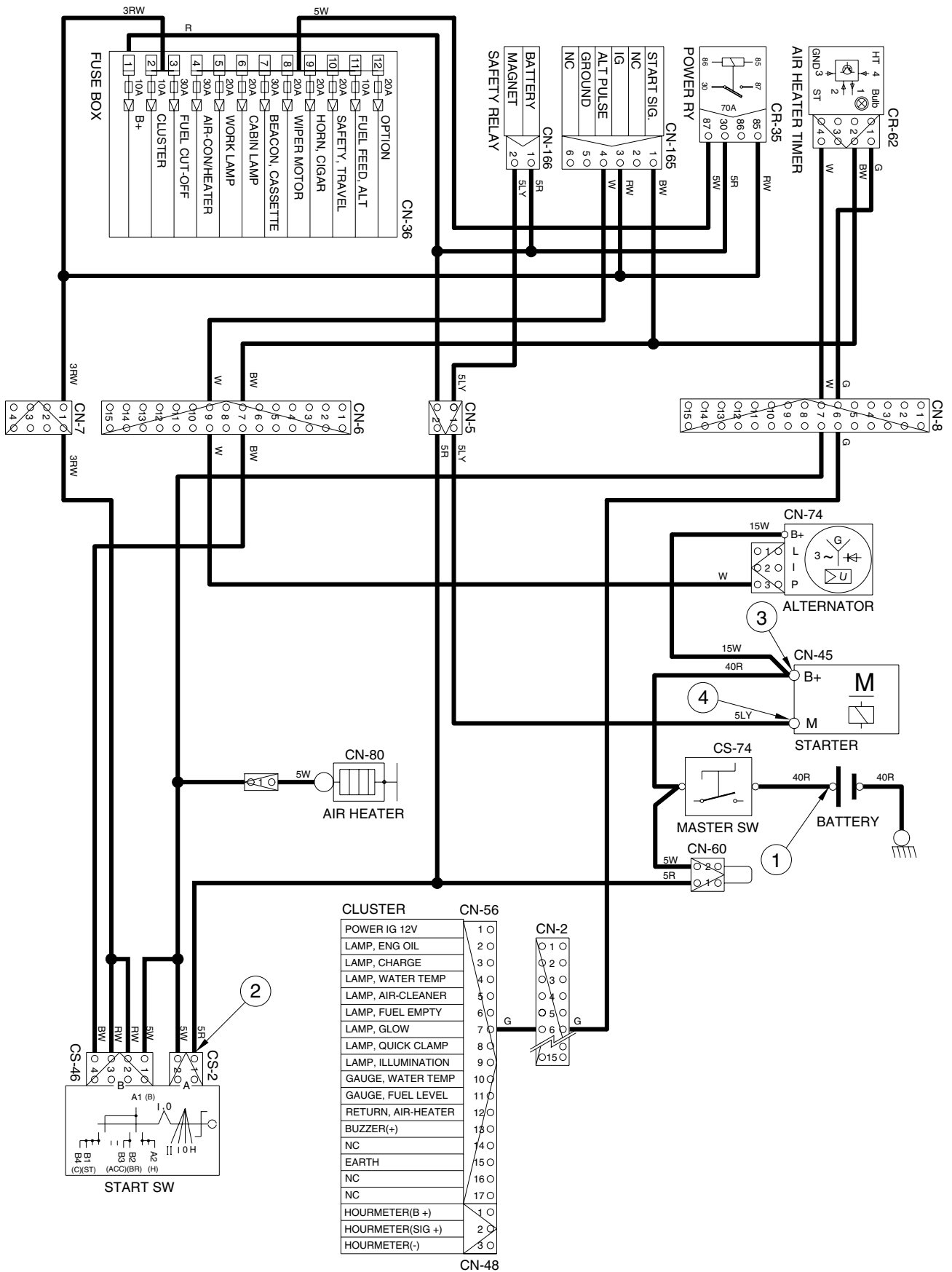
### 3. TRAVEL SPEED CONTROL SYSTEM



R35Z93HC05

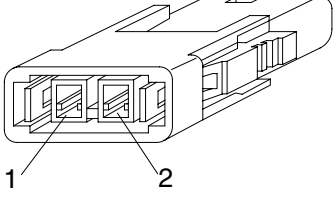
When the travel speed switch is pushed, the travel speed solenoid valve is actuated and the discharged oil from the pilot pump flows to the **Ps** port of pilot valve in the travel motors. As a result, the control piston is pushed by the main oil flow, thus the displacement is minimized. When the travel speed switch is pushed once more, the travel speed solenoid valve is return to original position by the force of spring, the hydraulic oil of **Ps** port returns to the hydraulic tank. As a result, the control piston is returned by the main oil flow, thus the displacement is maximized.

# STARTING CIRCUIT

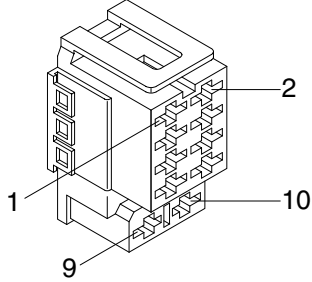


R35294EL05

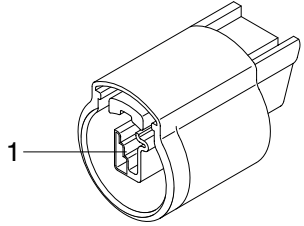
**15) MOLEX 2CKTS CONNECTOR**

No. of pin	Receptacle connector (female)	Plug connector (male)
2	 <p style="text-align: right;">35215-0200</p>	

**16) ITT SWF CONNECTOR**

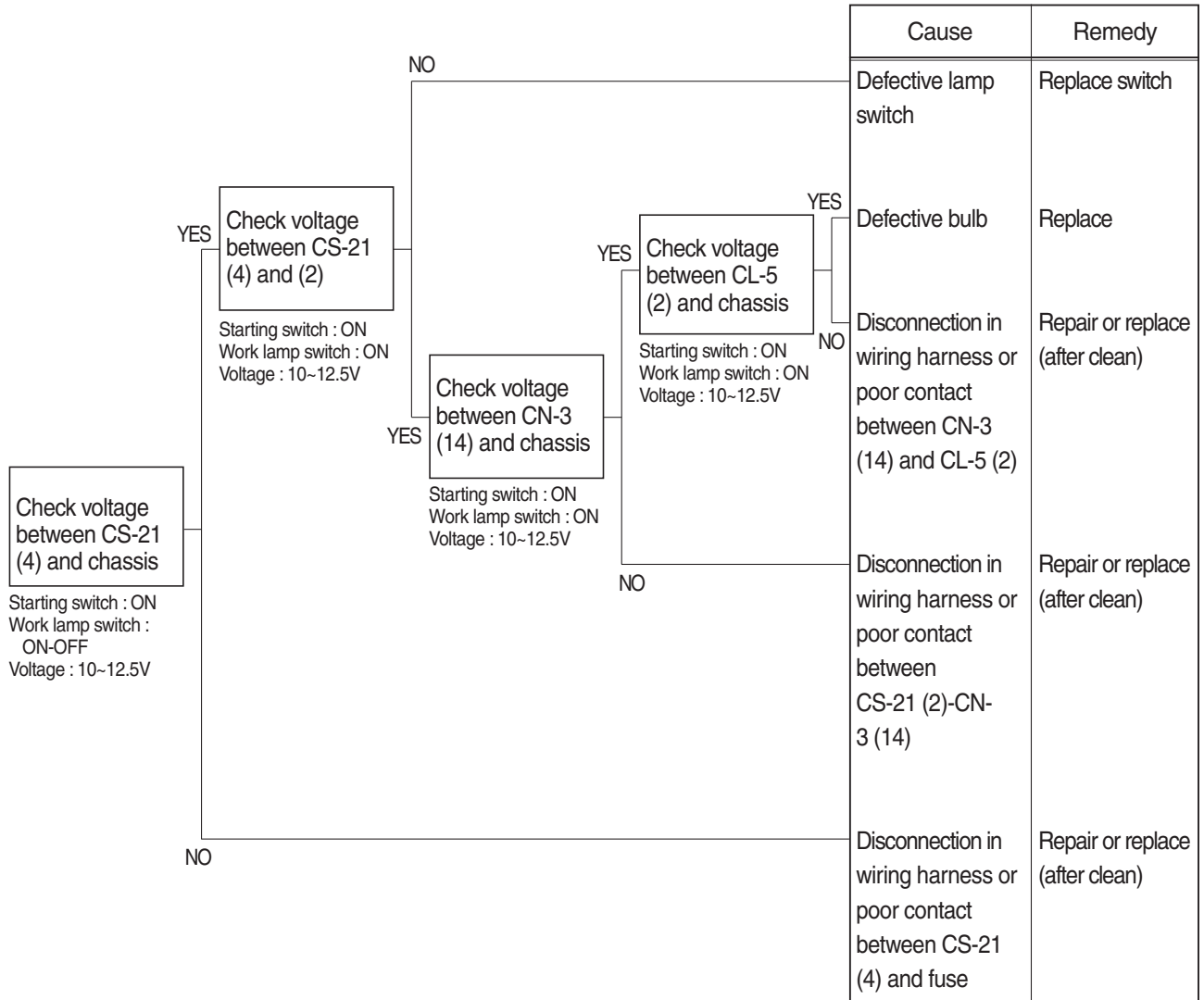
No. of pin	Receptacle connector (female)	Plug connector (male)
10	 <p style="text-align: right;">SWF593757</p>	

**17) MWP NMWP CONNECTOR**

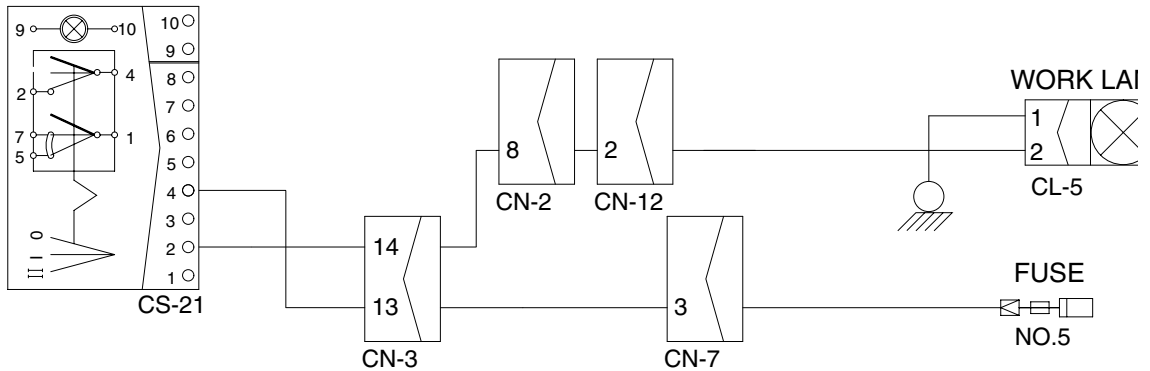
No. of pin	Receptacle connector (female)	Plug connector (male)
1	 <p style="text-align: right;">NMWP01F-B</p>	

## 12. WHEN STARTING SWITCH IS TURNED ON, WORK LAMP DOES NOT LIGHTS UP

- 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.5.
- After checking, insert the disconnected connectors again immediately unless otherwise specified.



### LIGHT SW



R35Z75TS21

#### 4. TRAVEL MOTOR

Wash all parts disassembly in treated oil and dry in the compressed air.

Perform maintenance including replacement or corrections in accordance with the following criterion.

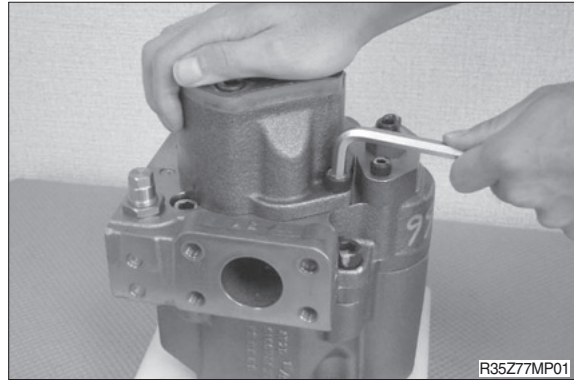
No.	Part name	Check Points	Criterion (recommended standards for replacement)	Measures
1	Floating seal (1-2)	Sliding surface	No remarkable flaws, wear, or seizure are noted.	Replacement
2	Angular bearing (1-3)	Rolling surface	No remarkable flaws, wear, or flaking are noted on balls and race.	Replacement
3	Housing (1-6)	Gear tooth surface	No remarkable flaws, wear, or flaking are noted on gear tooth surface. (note 1)	Replacement
4	Planetary gear A (1-18), B (1-9)	Gear tooth surface and rolling surface of inner side	No remarkable flaws, wear, or flaking are noted as same as No.3	Replacement
5	Needle bearing (1-10), (1-19)	Rolling surface of needle bearing	No remarkable flaws, wear, or flaking are noted.	Replacement
6	Inner race (1-11), (1-20)	Rolling surface of inner race	No remarkable flaws, wear, or flaking are noted.	Replacement
7	Thrust washer (1-12)	Sliding surface	No remarkable flaws, wear, or seizure are noted.	Replacement
8	Thrust plate (1-13), (1-23)	Sliding surface	No remarkable flaws, wear, or seizure are noted.	Replacement
9	Sun gear (1-15)	Gear tooth surface	Same as No. 3	Replacement
10	Holder (1-17)	Sliding surface of planetary gear A	No remarkable flaws, wear, or seizure are noted.	Replace planetary A and holder.
11	Drive gear (1-22)	Gear tooth surface	Same as No. 3	Replacement
13	O-ring (1-25), (28), (29), (39), (31-5), (44), (50-6), (50-7)	Surface and hardness	No flaws and deflection are noted. Not hardened.	Recommend that seals be replaced with new ones at time of reassembly, since rubber materials normally deteriorate with age.
14	Shaft (2)	Sliding surface of oil seal	No remarkable flaws, wear.	Replacement
15	Ball bearing (3), (27)	Same as No. 2.	Same as No. 2.	Replacement
16	Oil seal (4)	Surface and hardness of seal lip	No flaw, wear or deflection are noted. Not hardened.	Replacement

Note 1 : Pitching in this instance refers to a case where pitching occurs in more than 10% of engagement area per tooth surface.

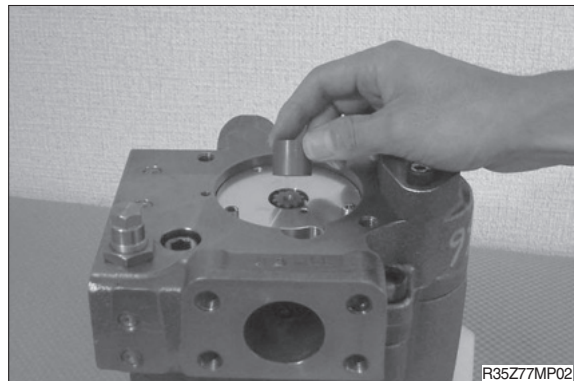
### 3. DISASSEMBLING PROCEDURE

#### 1) DISASSEMBLING THE GEAR PUMP

- (1) Remove the hexagon socket head cap screw. (M10 × 25, 2 pieces)  
Hexagon socket screw key (8 mm)  
※ Be careful because the O-ring (at 2 pieces) are provided to the housing.

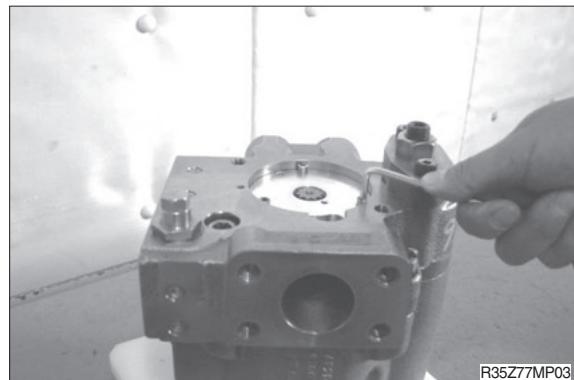


- (2) Remove the coupling.



#### 2) DISASSEMBLING THE TROCHOID PUMP

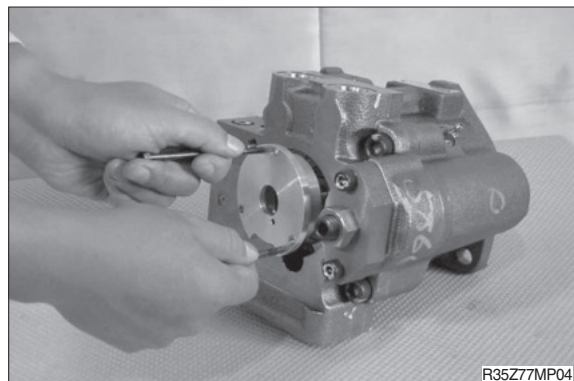
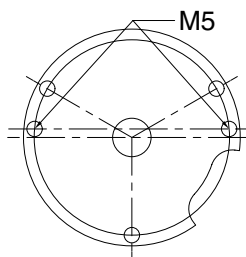
- (1) Remove the hexagon socket head cap screw. (M5 × 12, 3 pieces)  
Hexagon socket screw key (4 mm)



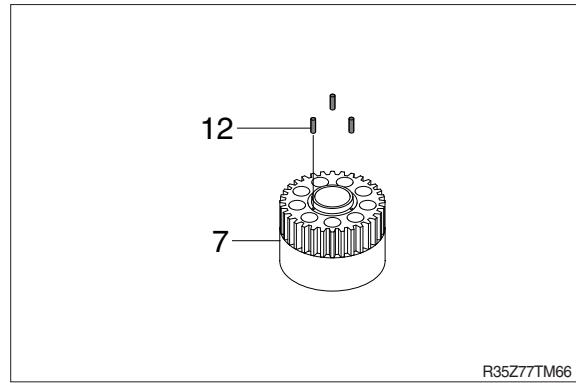
- (2) Remove the case, the side plate (A), and the gear.

Use the hexagon socket head cap screws.

For example : M5 × 90, 2 pieces

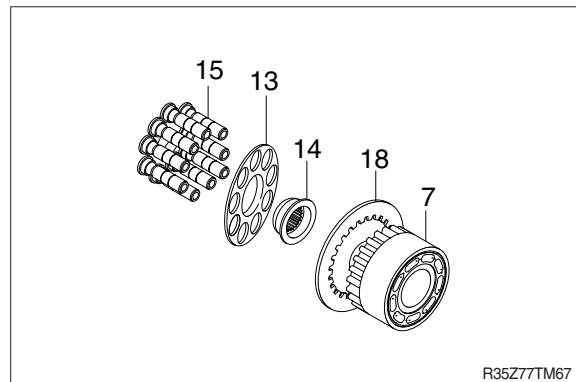


(21) Apply grease to pin (12) install pins in three holes of cylinder block (7).



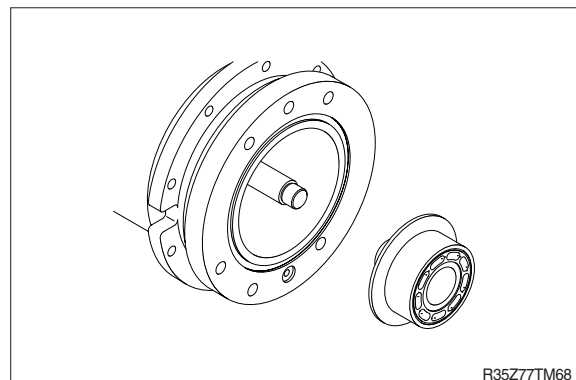
(22) Install retainer holder (13), retainer plate (14) and piston sub assy (15). Apply hydraulic oil in 99 holes of cylinder block (7).

Only parking brake type  
Install disk plate (18).



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

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



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

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

