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# Z17 GEN:2
# 170Z NXT2

## Compact Excavator



Service Manual

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# 2. TECHNICAL DATA

## 2. Technical Data

### 2-1 Specifications

| Item | | | | Unit | |
|---|---|---|---|---|---|
| Main specifications of machine | | | | | |
| Dimensions | | | | | |
| Overall length (Transportation position) | | | | in. (mm) | 135.8 (3450) |
| Cabin | Overall height | Transportation position | | in. (mm) | - |
| | | Traveling position | | in. (mm) | - |
| | Overall width | Full machine width | | in. (mm) | - |
| Canopy | Overall height | Transportation position | | in. (mm) | 90.6 (2300) |
| | | Traveling position | | in. (mm) | 90.6 (2300) |
| | Overall width | Full machine width (Maximum/Minimum) | | in. (mm) | 50.4 (1280)/37.4 (950) |
| Tumbler center distance | | | | in. (mm) | 46.3 (1176) |
| Track gauge (Maximum/Minimum) | | | | in. (mm) | 41.3 (1050)/28.3 (720) |
| Minimum ground clearance | | | | in. (mm) | 6.9 (175) |
| Traveling performance | | | | | |
| Travel speed | Rubber crawler | Low speed (Forward/Reverse) | | MPH (km/hr) | 1.3 (2.1)/1.3 (2.1) |
| | | High speed (Forward/Reverse) | | MPH (km/hr) | 2.6 (4.2)/2.6 (4.2) |
| Permissible water depth limit | | | | in. (mm) | 10.4 (265) |
| Work performance | | | | | |
| Bucket | Width (Standard) | | | in. (mm) | 17.7 (450) |
| | (Standard. JIS heaped capacity) | | | cu.ft. (cu.m) | 1.77 (0.05) |
| | Number of teeth / Installation method | | | pcs. | 3 / rubber pin lock type |
| Maximum digging depth | With blade raised | | | in. (mm) | 86.6 (2200) |
| | With blade on the ground | | | in. (mm) | 90.9 (2310) |
| Maximum depth of vertically digging | | | | in. (mm) | 72.8 (1850) |
| Maximum dumping height | | | | in. (mm) | 103.5 (2630) |
| Minimum front swing radius (with boom in front) | | | | in. (mm) | 60.4 (1535) |
| Minimum front swing radius (at 75 degrees right boom swing) | | | Cabin | in. (mm) | - |
| | | | Canopy | in. (mm) | 54.3 (1380) |
| Rear end swing radius | | | | in. (mm) | 25.2 (640) |
| Boom swing angle | | Cabin | Left | degrees | - |
| | | | Right | degrees | - |
| | | Canopy | Left | degrees | 42 |
| | | | Right | degrees | 65 |
| Maximum digging force | | Bucket | | lbs. (kN) | 3418 (15.2) |
| | | Arm | | lbs. (kN) | 1911 (8.5) |
| Maximum tractive force (Oil pressure force) (rubber) | | | | lbs. (kN) | 4114 (18.3) |
| Maximum swing inclination angle (with standard bucket) | | | | degrees | 23 (at loading) |

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## 3-7 List of Tightening Torque

### 3-7-1 Machine

Unit : ft•lbf (N•m)

| Applicable model: | | | | | |
|---|---|---|---|---|---|
| Equipment | | | Thread size | Tightening torque | Adhesive |
| | No. | Tightening part | | | |
| Engine / Electrical equipment | | | | | |
| | 1 | Engine mount vibroisolating rubber | Nut M10 | 18.1 to 23.9<br>(24.5 to 32.4) | 4T torque |
| | 2 | Engine mount vibroisolating rubber | Nut M14<br>(Fine screw thread) | 50.6 to 61.5<br>(68.6 to 83.4) | |
| | 3 | Engine × Engine mount | M10 | 32.6 to 43.4<br>(44.1 to 58.8) | Three Bond 1324 |
| | 4 | Engine stopper × Engine mount | M10 | 32.6 to 43.4<br>(44.1 to 58.8) | Three Bond 1324 |
| | 5 | Engine mount × Turning frame | M12 | 57.9 to 72.4<br>(78.5 to 98.1) | Three Bond 1324 |
| | 6 | Hose clip 60 (Intake hose installation) | – | 1.63 to 1.85<br>(2.16 to 2.45) | |
| | 7 | Battery holding rod | Nut M6 | 1.45 to 2.17<br>(2.0 to 2.9) | Lock nut<br>3.62 to 4.34 ft•lbf<br>(4.9 to 5.88 N•m) |
| | 8 | Fuel gauge unit | Pan head screw M5 | 0.89 to 1.11<br>(1.2 to 1.5) | |
| | 9 | CW-T (A-B) | Hose band 30 | 1.63 to 1.85<br>(2.2 to 2.5) | |
| | 10 | Battery cable terminals | Nut M6 | 2.17 to 2.89<br>(3.0 to 3.9) | |
| | 11 | Air cleaner | M8 | 14.5 to 16.6<br>(19.6 to 22.6) | |
| | 12 | Fuel tank band | Nut M10 | 1.85 to 2.15<br>(2.5 to 2.9) | 18.1 to 23.9 ft•lbf<br>(24.5 to 32.4 N•m)<br><Lock nut side> |
| | 13 | Safety starter switch | Lock nut M18<br>(Fine screw thread) | 21.7 to 25.3<br>(29.4 to 34.3) | |
| | 14 | Drain plug | | 57.9 to 72.4<br>(78.5 to 98.1) | |
| | 15 | Engine drain hose × Drain block | Hose clip | 1.59 to 1.81<br>(2.16 to 2.45) | |
| Driving system | | | | | |
| | 1 | Sprocket | M10 | 32.6 to 43.4<br>(44.1 to 58.8) | Three Bond 1324 |
| Travel device | | | | | |
| | 1 | Plugs (idler, adjust cylinder) | RC 1/8 | 6.51 to 7.23<br>(8.8 to 9.8) | Loctite 572 |
| | 2 | Idler seal cover × Crawler spring | M10 | 32.6 to 43.4<br>(44.1 to 58.8) | Three Bond 1324 |
| | 3 | Track roller tightening nut | M12 | 57.9 to 72.4<br>(78.5 to 98.1) | Three Bond 1324 |
| | 4 | Nipple valve | M16 | 36.2 (49.0) | |
| | 5 | Shoe slide plate | M10 | 32.6 to 43.4<br>(44.1 to 58.8) | Three Bond 1324 |

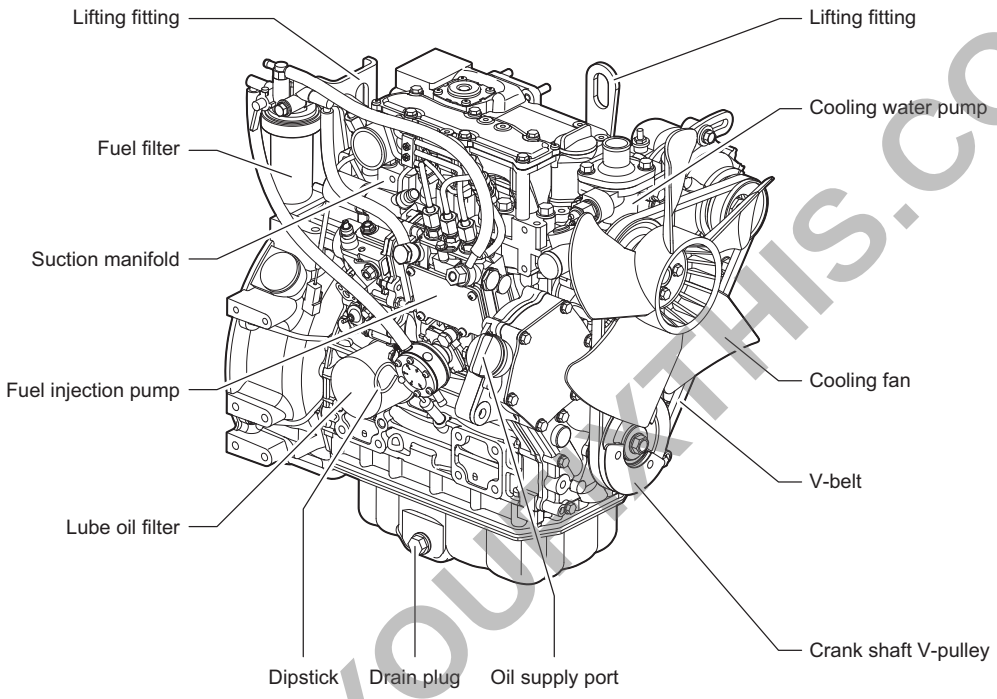
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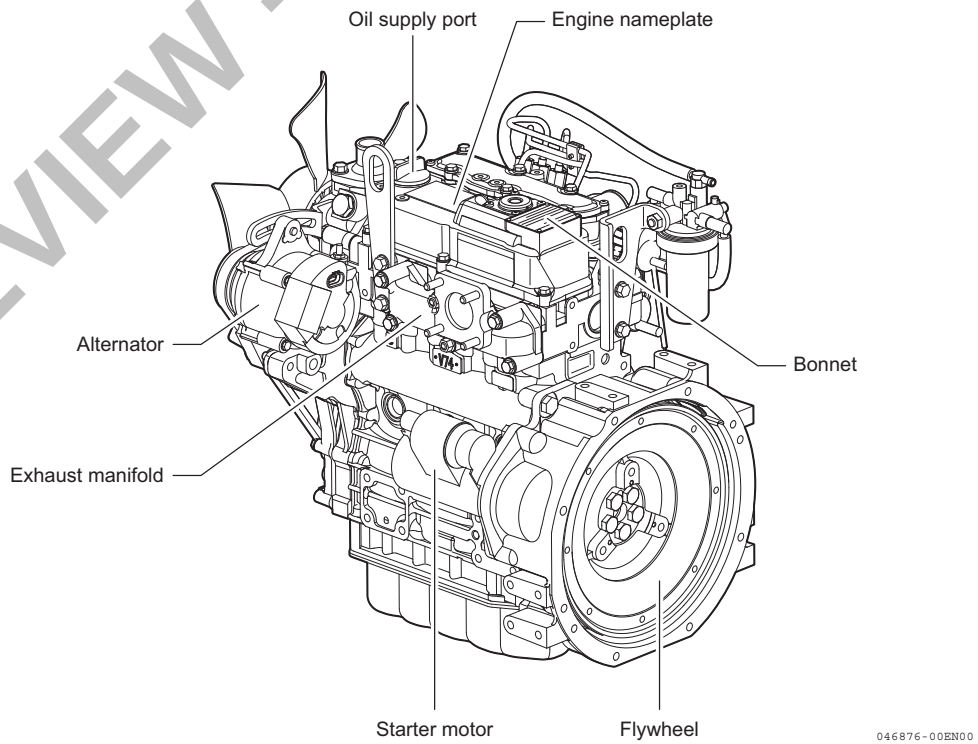


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## 4. Engine

### 4-1 Exploded View




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## 4-2 Measurement, Inspection and Adjustment

### 4-2-1 Measuring the Compression Pressure

**1) Measurement Procedure**

(1) Warm up the engine. Remove the fuel injection pipe and the fuel injection valve from the cylinder to be measured.

(2) Crank the engine before attaching the compression gauge adapter.

***Note :***

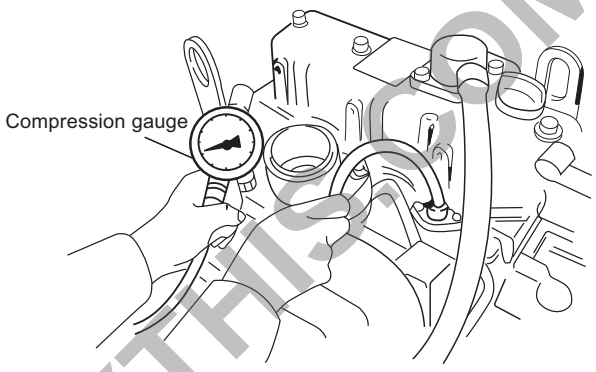
*Crank the engine when the regulator handle has been turned to "STOP" position (no injection state).*

(3) Attach the compression gauge adapter and the compression gauge to the cylinder to be measured.

***Note :***

*Never fail to attach the gasket to the tip of the adapter.*

(4) Crank the engine with the starter motor until the reading of the compression gauge is stabilized, according to the above step (2) and Note.




**Measuring the compression pressure**

**[Engine compression pressure (Reference values)]**

| Compression pressure at 250 rpm PSI (MPa) | | Variations of compression pressure among cylinders PSI (MPa) |
|---|---|---|
| Standard | Limit | |
| 455.4 to 484.4 (3.14 to 3.34) | 369.8 (2.55) | 28.4 to 42.7 (0.2 to 0.3) |

**2) Trouble Diagnosis Through Measurement of Compression Pressure**

Reduction in the compression pressure of the cylinder is one of the major causes of the increase in blow-by gas (which causes contamination and increased consumption of lubricating oil, and other trouble) and the engine starting failure. The compression pressure is influenced by the following factors :

(1) Degree of the clearance between the piston and the cylinder ;

(2) Degree of the clearance around the intake / exhaust valve seats ; and

(3) Gas leak through the nozzle gasket or the cylinder head gasket.

This means that the compression pressure decreases as the engine parts are worn and lose durability through the use of the engine over a long period of time.

In addition, the compression pressure is also decreased by scratches on the cylinder or the piston which are caused by dust or other foreign matters drawn in through the soiled filter element of the air cleaner, and wear or breakage of any piston rings. Therefore, the condition of the engine should be diagnosed by measuring the compression pressure.

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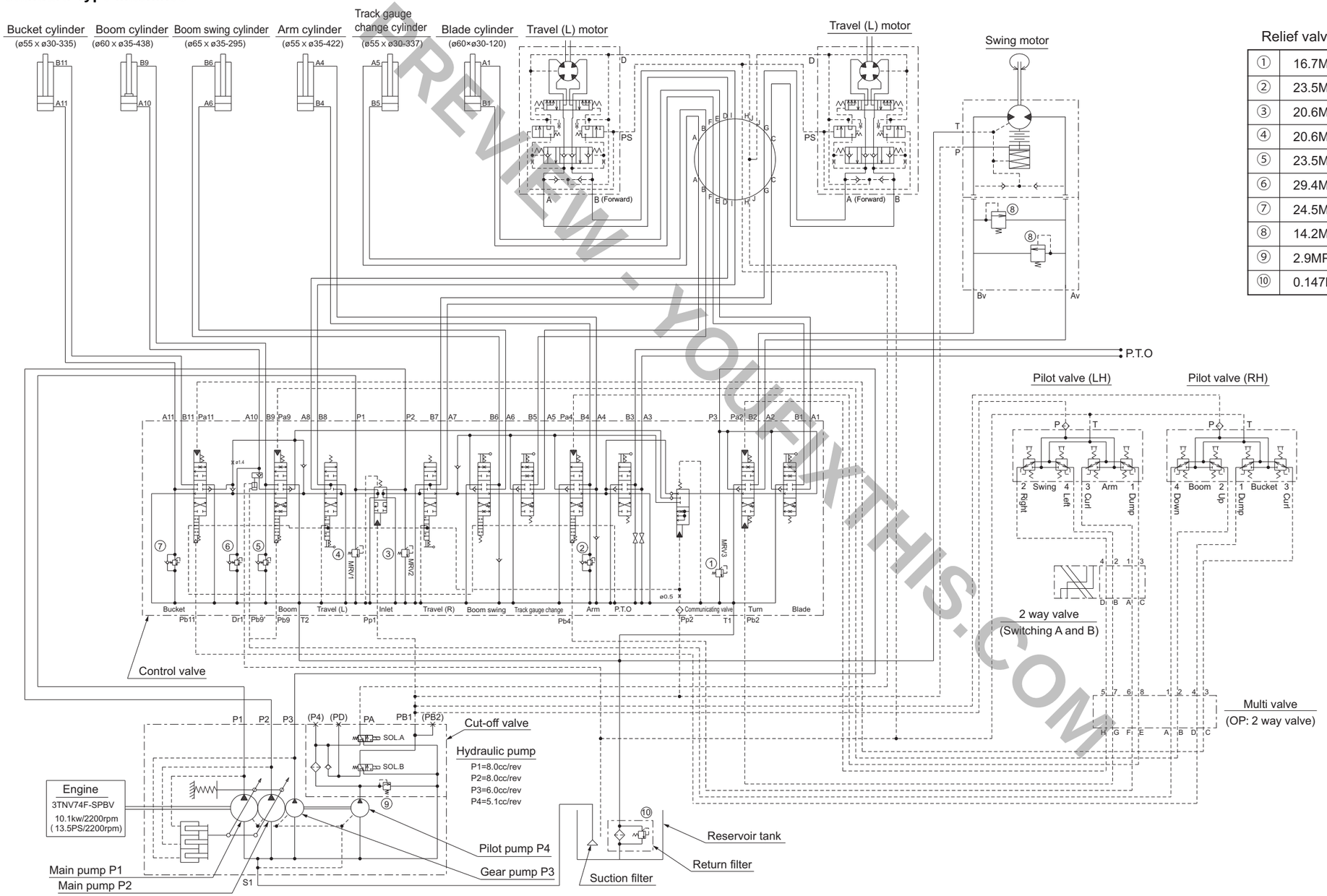


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# 5. HYDRAULIC SYSTEM

## 5-2 Hydraulic Circuit Schematic

### 5-2-1 For Standard Type Machines




Relief valve set pressure

| | |
|---|---|
| ① | 16.7MPa(170 kgf/cm²) |
| ② | 23.5MPa(240 kgf/cm²) |
| ③ | 20.6MPa(210 kgf/cm²) |
| ④ | 20.6MPa(210 kgf/cm²) |
| ⑤ | 23.5MPa(240 kgf/cm²) |
| ⑥ | 29.4MPa(300 kgf/cm²) |
| ⑦ | 24.5MPa(250 kgf/cm²) |
| ⑧ | 14.2MPa(145 kgf/cm²) |
| ⑨ | 2.9MPa(30 kgf/cm²) |
| ⑩ | 0.147MPa(1.5 kgf/cm²) |

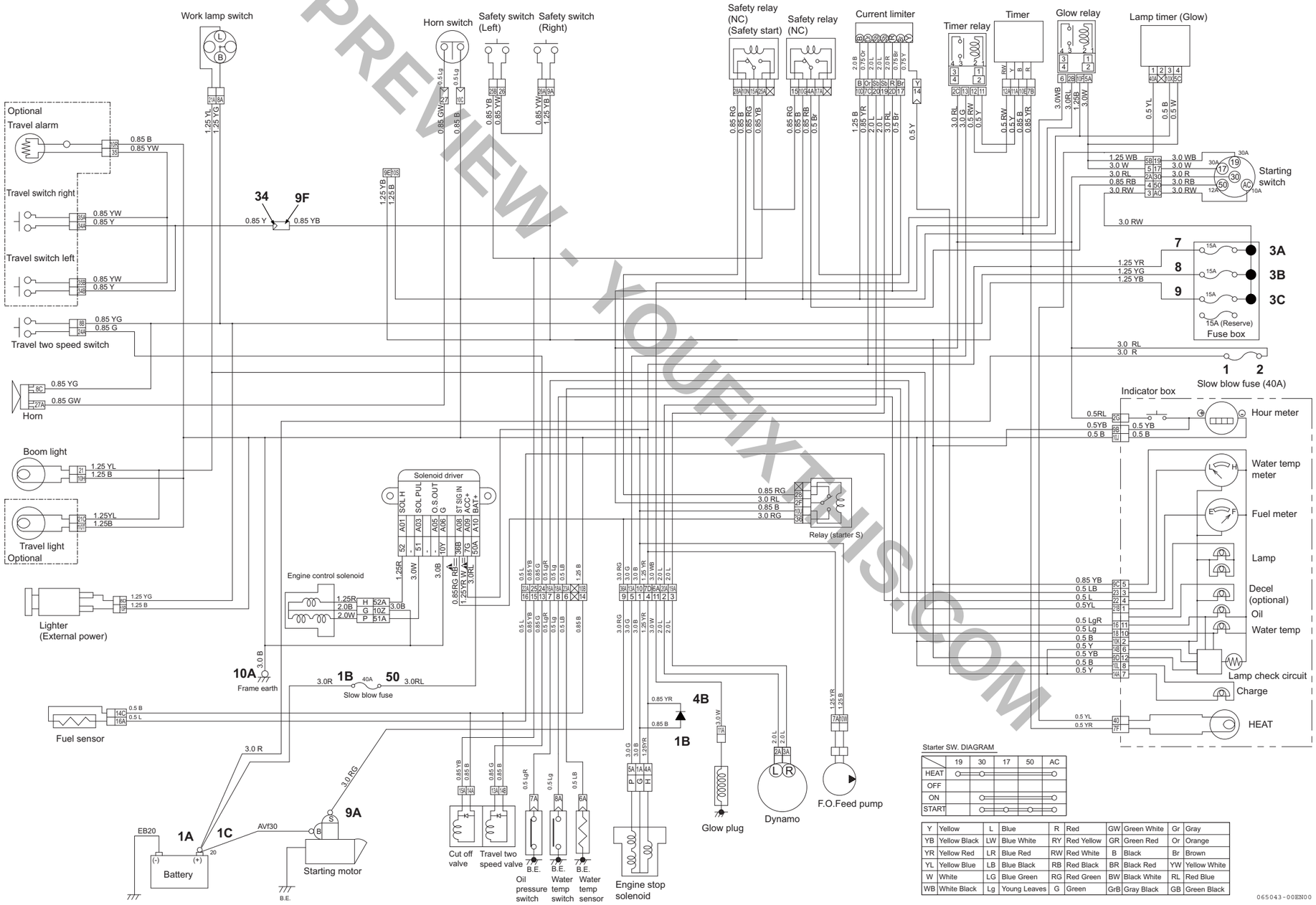
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## 7-1-3 Wiring Diagram

### 1) Standard Specifications




| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Y | Yellow | L | Blue | R | Red | GW | Green White | Gr | Gray |
| YB | Yellow Black | LW | Blue White | RY | Red Yellow | GR | Green Red | Or | Orange |
| YR | Yellow Red | LR | Blue Red | RW | Red White | B | Black | Br | Brown |
| YL | Yellow Blue | LB | Blue Black | RB | Red Black | BR | Black Red | YW | Yellow White |
| W | White | LG | Blue Green | RG | Red Green | BW | Black White | RL | Red Blue |
| WB | White Black | Lg | Young Leaves | G | Green | GrB | Gray Black | GB | Green Black |

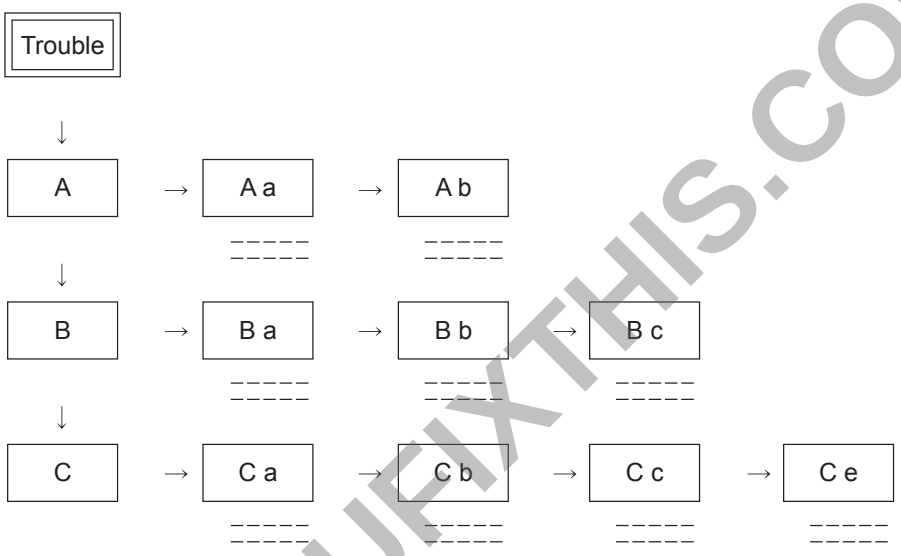
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## 10-2 Troubleshooting

### 10-2-1 Machine and Engine

**(How to use the charts)**




Factors related to the trouble are enumerated in the columns and instructions for corrective procedures are given below. It is recommended that the troubles be inspected and corrected one by one according to the chart.

| | ← Inspection item |
|---|---|
| – – – – – – – – – – – – | ← Remedy for failure |

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## 8. Periodic Inspection and Servicing

### 8-1 List of Periodic Inspection and Servicing

◇ : Check ○ : Supply ● : Replace □ : Adjust (clean) ■ : Oil & grease

| Check & service items | | | Daily | Every 50 | Every 100 | Every 250 | Every 500 | Every 1000 hrs |
|---|---|---|---|---|---|---|---|---|
| General | Check falling off, breakage of parts | | ◇ | | | | | |
| | Check loosened bolts & nuts, retighten | | ◇ | | | | | |
| | Check engine condition | | ◇ | | | | | |
| | Clean | | □ | | | | | |
| Lube oil | *Swing gear case oil | Check, resupply | | | | ◇/○ | | |
| | | Replace | | | ●1st time | | | ● |
| | *Travel reduction gear oil | Check, resupply | | | | ◇/○ | | |
| | | Replace | | | ●1st time | | | ● |
| | *Transmission oil | Check, resupply | ◇/○ | | | | | |
| | | Replace | | | ●1st time | | | ● |
| | *Differential gear oil | Check, resupply | | | ◇/□ | | | |
| | | Replace | | | ●1st time | | | ● |
| Hydraulic system | Hydraulic oil | Check, resupply | ◇/○ | | | | | |
| | | Replace | | | | | | ● |
| | Clean suction filter | | | | | □1st time | | □ |
| | Replace return filter | | | | | ● 1st time | ● | |
| | Check for abnormality of hydraulic pump | | ◇ | | | | | |
| Grease | Check grease-up positions, grease | | ■ | | | | | |
| | Greasing the swing gears and the swing bearings | | | ■ | | | | |
| | Greasing the track gauge change cylinder and the link fulcrum | | | ■ | | | | |
| Undercarriage | Check, adjust track tension | | ◇/□ | | | | | |
| | *Check air pressure, wear, flaw in tires | | ◇ | | | | | |
| Steering equipment | *Check performance, play of steering lever | | ◇ | | | | | |
| | Check performance, play of travel lever | | ◇ | | | | | |
| | *Check performance of speed change lever | | ◇ | | | | | |
| | *Check performance of forward/reverse pedal | | ◇ | | | | | |
| | *Check performance, play of steering wheel | | ◇ | | | | | |
| | *Brake pedal | Stroke | ◇ | | | | | |
| | | Performance | ◇ | | | | | |
| | *Parking brake | Stroke | ◇ | | | | | |
| | | Performance | ◇ | | | | | |
| | Check performance of accel. lever | | ◇ | | | | | |
| Electric equipment | Check front & work lights, horn | | ◇ | | | | | |
| | Check hourmeter function | | ◇ | | | | | |
| | Check function of change, oil and pilot lamps | | ◇ | | | | | |
| | Check wire breakage, short-circuits, loosened terminals retighten | | ◇ | | | | | |
| | Check, resupply battery fluid | | ◇/○ | | | | | |
| | Check specific gravity of electrolyte | | | | | | □As required | |
| | Check function of OK monitor | | ◇ | | | | | |



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Unit : ft•lbf (N•m)

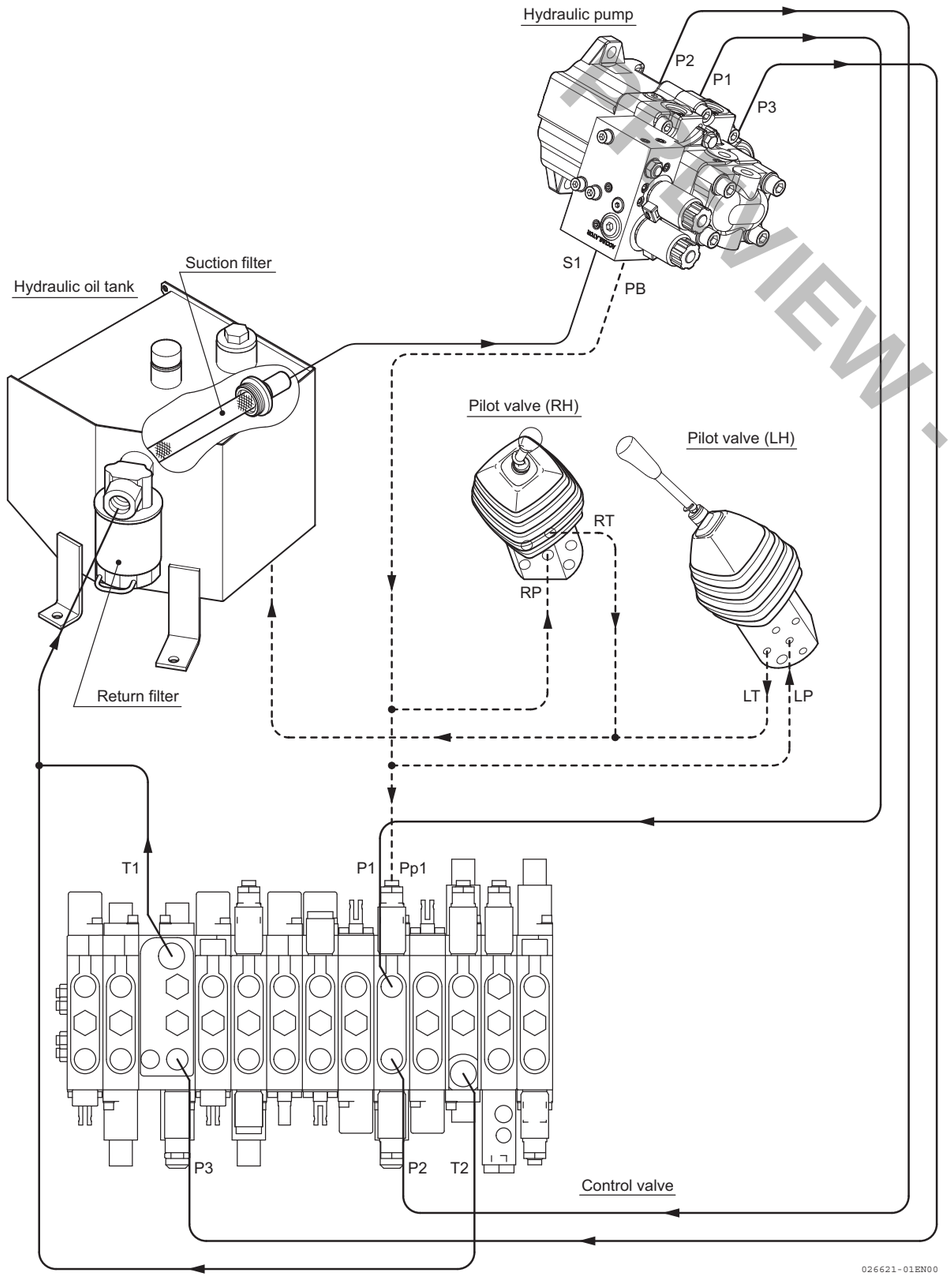
| Applicable model: | | | | | |
|---|---|---|---|---|---|
| Equipment | No. | Tightening part | Thread size | Tightening torque | Adhesive |
| Controls | | | | | |
| | 1 | Levers (L, R) × Pilot valve | Nut M14 (Fine screw thread) | 54.3 to 61.5 (73.5 to 83.4) | Three Bond 1324 |
| | 2 | Knobs (L, R) × Levers (L, R) | Binding head screw M4 | 1.48 to 2.14 (2.0 to 2.9) | Three Bond 1324 |
| | 3 | L-ball 8 × Link ball 8 | Nut M8 | 9.4 to 12.3 (12.7 to 16.7) | |
| | 4 | L-ball 8 × Rod | Nut M8 | 5.79 to 7.23 (7.84 to 9.8) | |
| | 5 | Valve mount × Turning frame | M12 | 57.9 to 72.3 (78.5 to 98.1) | Three Bond 1324 |
| | 6 | Accelerator cable | Nut M6 | 2.89 to 3.62 (3.9 to 4.9) | |
| | 7 | Blade cable, Boom swing cable, PTO cable | Nut M12 | 14.5 to 18.1 (19.6 to 24.5) | |
| Frame | | | | | |
| | 1 | Swing bearing × Frame | M12 (10.9T) | 79.6 to 94.9 (107.9 to 128.5) | Loctite 262 |
| Hydraulic equipment | | | | | |
| | 1 | CF Coupling | Hexagon socket head bolt M10 | 36.2 to 43.4 (49.0 to 58.8) | Three Bond 1324 |
| | 2 | Swivel joint × Track frame | M10 | 32.6 to 43.4 (44.1 to 58.8) | Three Bond 1324 |
| | 3 | Swing motor × Turning frame | M12 | 57.9 to 72.3 (78.5 to 98.1) | Three Bond 1324 |
| | 4 | Travel motor × Track frame | M10 | 32.6 to 43.4 (44.1 to 58.8) | Three Bond 1324 |
| | 5 | Drain plug M14 × Hydraulic oil tank | M14 | 43.4 (59.0) | |
| | 6 | Oil level gauge × Hydraulic oil tank | M10 | 10.9 to 12.3 (14.7 to 16.7) | |
| | 7 | Hose clip 13 | – | 1.11 to 1.85 (1.5 to 2.5) | Drain |
| | 8 | Hose clip 16 | – | 1.85 to 2.52 (2.5 to 3.4) | Drain |
| | 9 | Hose clip 35 | – | 2.89 to 3.62 (3.9 to 4.9) | Return BL-Hydraulic oil tank |
| | 10 | Hose clip 25 | – | 3.62 to 4.34 (3.9 to 4.9) | Hydraulic oil tank drain |
| | 11 | Hose clip 41 | – | 3.62 to 4.34 (4.9 to 5.9) | Suction |
| | 12 | Suction flange (Pump) | M10 | 18.1 to 23.9 (24.5 to 32.4) | |

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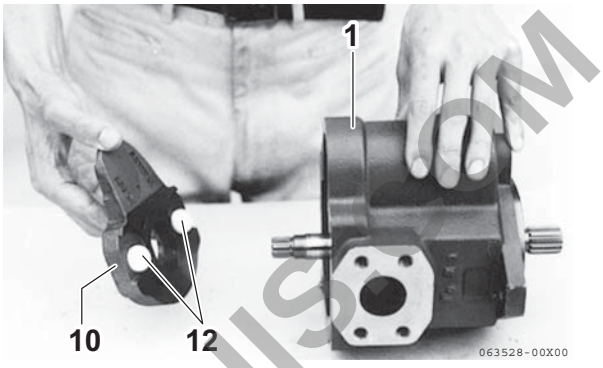
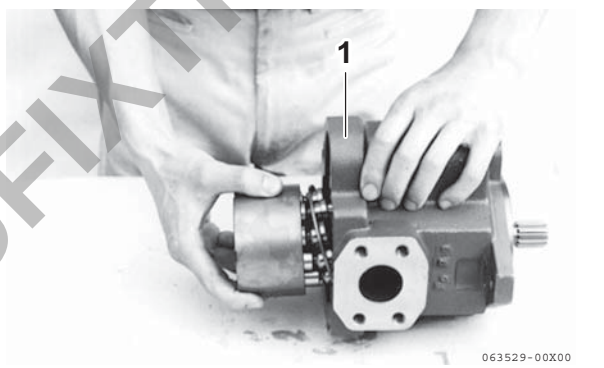
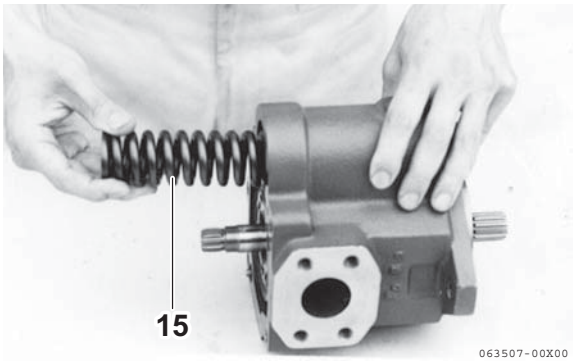
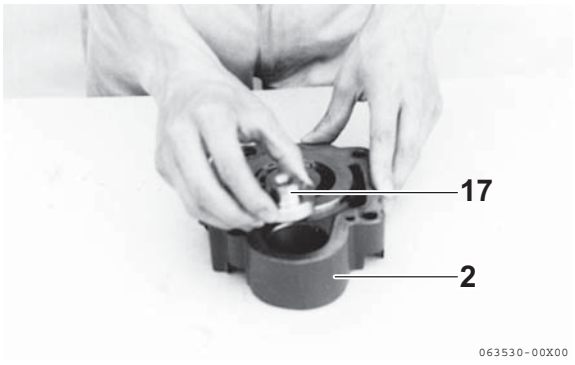
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# 5. HYDRAULIC SYSTEM






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| Procedure | |
|---|---|
| (4) Put the rocking pins **12** into the holes in the swash plate **10**, and install it with the rocking pins fitted into the holes in the body S **1**. |  |
| (5) Install the cylinder barrel kit into the body S **1**. |  |
| (6) Install the spring holder **16** on the spring T 1 **15**, and fit the globular part of spring holder **16** into the hole in the swash plate **10**. |  |
| **4. Installation of body H kit**<br>(1) Install the spring guide **17** into the body H **2**. |  |

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**5. Disassembly and Reassembly of Accessory Valve**

**1) Precautions for Disassembly and Reassembly**

In principle, assembly replacement is performed on the accessory valve. However, disassembly and reassembly are performed in case of emergency.

(1) Cleaning and inspection

Inspect each part after cleaning all parts with clean oil (mineral oil) and drying with compressed air.

[1] The seat surface of the regulating valve must be an even working face and free from any defects.
[2] The outer surface sliding portion of the regulating valve tip must be free from scratch or the like.
[3] The springs must be free from breakage, distortion, wear or the like.
[4] The O-rings and backup rings must be free from distortion, wear or the like.
Replace by the relief valve assembly when the abnormal part is found in the above inspection.
However, the O-rings can be replaced by part.

(2) Precautions for reassembly

[1] Care must be taken for the following points for handling of O-rings at the time of installing each part of the relief valve assembly.
[2] The O-rings may not have any defects in molding or be damaged in handling or distorted by heat.
[3] Do not extend any O-rings with such great force as to permanently deform them.
[4] Avoid rolling the O-rings when fitting them. A distorted O-ring may not return to its original shape, and therefore, may cause oil leakage.

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**3) Disassembly Procedure**

At the time of disassembly, clean the worksites and prepare the clean plastic case for storing parts. Clean around the port of the motor before removal of the piping and bolts, and remove the paint film and dirt from each joint with the wire brush.

***Note :***

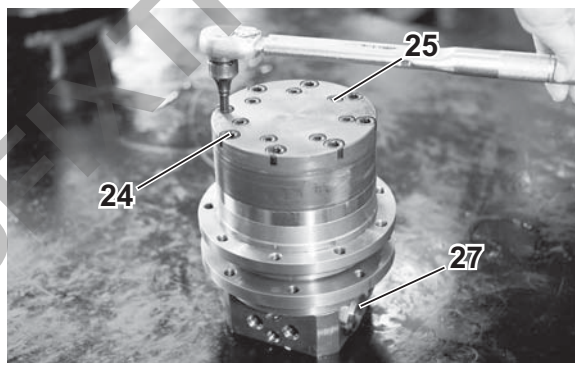
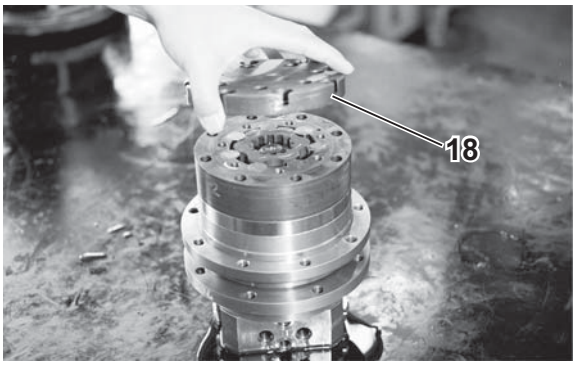
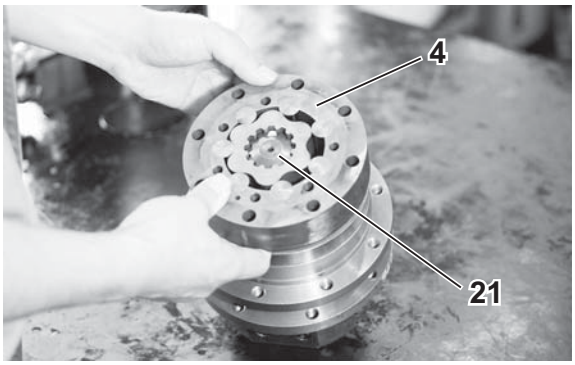
*Do not disassemble the following assy except when required:*

*Roller assy **4***

*Spindle/wheel assy **5***

*End cover assy **27***

*Valve assy **28***

| Procedure | |
|---|---|
| (1) Place the wheel side as the top surface, fix the body by pinching the end cover assy **27** with a vise.<br><br>(2) Loosen 7 pieces of the M10 bolts **24** and 7 pieces of the M8 bolts **25** to remove them.<br><br>***Note :***<br>*The Locktite residue is adhered in the bolts and tap holes. Remove the Locktite residue cleanly before assembly.* |  |
| (3) Remove the roller cover **18**. |  |
| (4) Remove the spacer **21**.<br><br>(5) Remove the roller assy **4**. |  |



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### 7-3-4 Adjustment of Travel Levers

**1) Position of Travel Lever Grips**

Remove the step and the side cover L.

(1) Difference in height between the right and left lever grips : Within 0.08 in. (2 mm)

(2) Adjustment

Difference in side level

- Loosen the nut **1** of the L-ball and rotate the rod **2** to adjust the position of the lever grip to 2.44 in. (62 mm) from the rear end of the lever stand (for each lever grip) as shown in figure.
- After adjusting the difference in side level between both levers to 0.12 in. (3 mm) or less, tighten the nuts **1**.

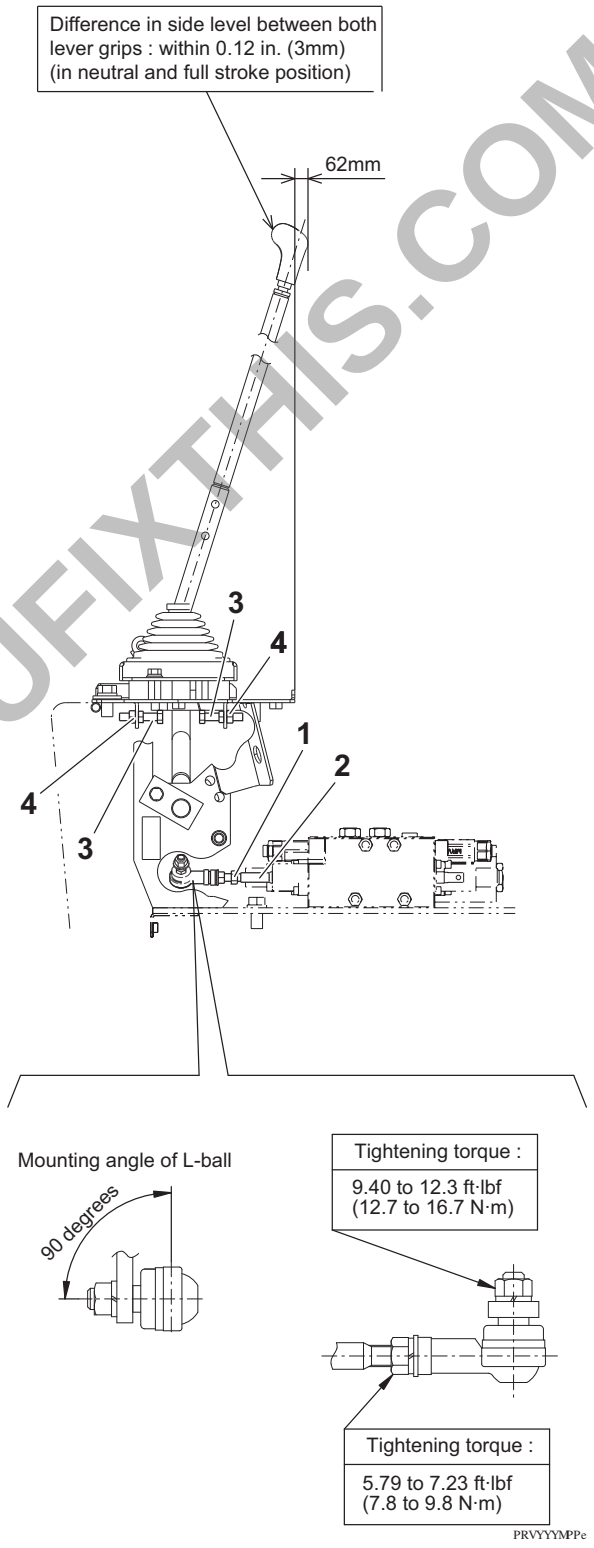
**2) Adjustment of Stopper Bolts**
**(For Forward Travel and Reverse)**

(1) Loosen the lock nuts **4** of the stopper bolts **3**.

(2) Screw in the stopper bolts **3** so that the travel lever will not touch them.

(3) Move the travel lever to its stroke end, and loosen the stopper bolt **3** until the bolt head touches the travel lever (for each stopper bolt).

(4) Loosen the stopper bolt **3** half a turn further and tighten the lock nut **4** to fix it.




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