Disassembly / Reassembly Procedure

For Safety Use

Failure to observe the instructions given in this manual could cause this equipment not to fulfill its specific performance completely and in the worst case could result in serious accident. To avoid such possible trouble or accident, read this manual carefully for full understanding and compliance of/with the instructions.

In use of this equipment, special care must be paid to all the contents of "CAUTIONS". Failure to observe these cautions could result in hazard of bodily injury to operator and physical damage to the equipment itself. Observe the cautions and instructions given in this manual without fail.

Feel free to contact us for any unknown matter.

CONTENTS
1. Disassembly--------P2
2. Reassembly--------P6
3. Structure----------P16

TAIYO LTD.
1. Disassembly

CAUTION

- Before removing the cylinder, be sure to check that the circuit internal pressure is zero.
- When the cylinder is disassembled, do not use fire in the vicinity, since the working oil comes out more or less. Further, your hands may slip. Be fully careful.
- Some cylinder parts are heavy. If such parts are dropped, accidents will result. In addition, the parts may be distorted and cannot be used any more when they are dropped or dumped against other parts. So, be fully careful of handling of the cylinder parts.
- Be fully careful during the disassembly work, since fingers may be held between parts.

1-1 Precautions before disassembly

1) Before removing the cylinder, turn zero the circuit internal pressure, and turn OFF the POWER switch.

2) Sufficient measures are required to protect the rod end screw, port screw and rod surface from scratch. For example, if the cylinder is struck forcibly or dropped during the disassembly work, screw threads may be collapsed or the rod surface may be dented, resulting in a defective cylinder. Be fully careful of handling of the cylinder.

3) Where the fluid used is a non-combustible working oil, handle the seal and related parts particularly carefully. If the seal should get in touch with other oils, the seal will swell due to chemical change and become unusable.

4) remove the switch from the cylinder.

1-2 Special tools and parts required for disassembly

1) Spatula (for removing the packings)
   - Produce a spatula while referring to Fig. 1 shown below.
   - Never try to remove the packings using a pointed tool such as a screwdriver, since packings and the packing house will be damaged.

2) Packings and gaskets used for replacement

3) Other parts requiring replacement

Fig.1 Spatula
1-3 Disassembling method

Descriptions are given below on a disassembling method of a single rod cylinder. For disassembly of double rod cylinders, too, follow the same method.

1) Loosen the hexagon nut \( \bullet \) to take off the retainer plate (or flange bracket) \( \bullet \) and pull out the bush \( \bullet \).
At that time, chamfer the spanner setting area of the piston rod \( \bullet \) carefully, if scratch or fin is sound thereon.

[Note]
When pulling out the bush, take care not to scratch the bush inside surface.
If the bush inside surface is damaged then, oil will leak from the damaged portion during operation of the cylinder after assembly.

2) Remove the rod cover \( \bullet \) and the head cover \( \bullet \) from the cylinder tube \( \bullet \), and pull out the piston \( \bullet \) and piston rod \( \bullet \) assembly.

3) When removing the bush dust wiper \( \bullet \), rod packing \( \bullet \) and piston packing \( \bullet \), remove them using a tool like a spatula as shown below.

[Note]
Be careful not to scratch the dust wiper groove, rod packing groove and piston packing groove surface. If they are scratched, oil will leak from the scratched portion during operation of the cylinder after assembly.
Bush of cutting fluid resistant specifications (70/140HW-8 • 8R)
The dust wiper 1 is press fitted to the bush. Thus, disassembly and assembly are difficult. Where replacement of the dust wiper 1 is required, replace it together with the bush. If the bush is arranged by your company, we will deliver it after press fitting the dust wiper 1.

Bush structure of cutting fluid resistant specifications

4) Disassembly of piston rod and piston
   - The piston rod and the piston cannot be disassembled, since they are calked with a set screw turned in.
   - The piston rod and the piston of a double rod type cylinder can neither be disassembled, since a parallel pin is struck thereinto to fasten them for prevention of turning.

5) Disassembly of cushion valve
   (1) Loosen and remove the cushion valve nut with a monkey wrench or spanner.
   (2) Loosen the cushion plug.
      - In the case of a cylinder with the bore of 32 to 100, set the cushion plug turning jig on the slotted groove in the cushion plug, and loosen the cushion plug with a monkey wrench or spanner.
      - When the cylinder bore is 125 or larger, loosen the cushion plug directly with a monkey wrench or spanner.
(3) The valve seal \( \text{③} \) comes up together with the cushion valve ASSY, as the cushion plug \( \text{①} \) is loosened. Disconnect the valve seal \( \text{③} \). (\( \varnothing 32 \) to 100)

In the case of a cylinder with the bore of \( \varnothing 125 \) or larger, the valve seal remains in the cover after extraction of the cushion valve ASSY. So, remove the seal with a spatula or the like, then loosen the cushion plug \( \text{①} \) and remove the cushion valve O-ring \( \text{⑤} \) with a spatula.

6) Disassembly of check plug

Note) The valve seal \( \text{③} \) is a part same as the valve seal used in the cushion valve.

(1) Loosen the check plug \( \text{④} \), and take the check plug and the check spring \( \text{⑤} \) out of the cover.
(2) Remove the valve seal \( \text{③} \) with a spatula or the like as shown above.
   • In the case of a cylinder with the bore of \( \varnothing 32 \) to 100, the valve seal comes up together with the check plug.
(3) After the valve seal is taken out, take out the check ball \( \text{⑥} \).
2. Reassembly

⚠️ **CAUTION**

- Some cylinder parts are heavy. If such parts are dropped, accidents will result. In addition, the parts may be distorted and cannot be used any more when they are dropped or dumped against other parts. So, be fully careful of handling of the cylinder parts.
- Be fully careful during the assembly work, since fingers may be held between parts.
- Residual oil may be deposited on parts. Do not use a fire in the vicinity. Further, your hands may slip. Be fully careful.
- Be sure to wash the parts using washing liquid.

2-1 Precautions before reassembly

1) Do not connect pipings such as hoses to the cylinder parts.
   
   [Note]
   Working oil may flow out as a result of wrong operations.

2) Take sufficient measures to protect the rod end screw, port screw and rod surface from scratch.
   
   [Note]
   For example, if the cylinder is struck forcibly or dropped unexpectedly, screw threads may be collapsed or the rod surface may be dented, resulting in a defective cylinder. Be fully careful of handling of the cylinder.

3) Wash all parts (other than packings and gaskets) using washing liquid.
   
   [Note]
   Unless cylinder parts are washed, dirt and others will deposit on them to damage packings during operation of the cylinder after assembly, causing malfunction of the cylinder and leak of oil therefrom.

4) Thoroughly check the disassembled and washed parts carefully for abnormality, correct damages, if any, and replace parts with new ones, if damages cannot be repaired.

5) Replace packings and gaskets with new ones.

6) Handle replacing parts carefully. If dropped or dumped against others, parts will deform. Correct parts, if deformed. Replace parts with new ones, if they cannot be corrected. When parts are dropped, use them after removing dirt by washing.
2-2 Reassembling method

1) Fitting of piston packing
   Assemble the piston packing 1) in the direction shown below.
   [Note]
   Be careful not to fit the packing in a wrong direction. If the packing is fitted in a wrong
direction, malfunction of the cylinder or oil leak will be caused.

   ![](image1)

   The slipper seal has no specified fitting direction.

2) Fit the cover seal 2) or cover O-ring 3) to the head cover 4) and rod cover 5).
   The fitting procedure is as follows.
   (1) Apply working oil to be used to the groove all round.

   ![](image2)

   (2) Fit the cover seal 2) (or cover O-ring 3) to the cover as shown below.

   ![](image3)
3) Apply working oil to be used to the inside surface of the cylinder tube, and fit the cylinder tube to the head cover.

[Note]
At that time, be careful so that no dirt may infiltrate the tube inside. If dirt should infiltrate the tube inside, packings will be damaged during operation of the cylinder, leading to malfunction of the cylinder or leak of oil therefrom.

4) Insert the piston/piston rod ASSY in the cylinder tube.

[Note]
At that time, be sufficiently careful so that the packing may not be damaged by the tube end face.

5) After insertion of the piston/piston rod, next fit the rod cover.

[Note]
At that time, be careful so that the cover seal of the rod cover may not disengage from the cover groove.
6) Fit the O-ring 9, dust wiper 28 and rod packing 27 to the bush 33. At that time, apply working oil to be used to the packing and bush inside surface. In the case of cylinders 70/140HW-8 · 8R (cutting fluid resistant specifications), check that the dust wiper 1 is press fitted to the bush.

[Note]
Be careful not to fit the packing in a wrong direction. Fitting of the packing in a wrong direction will cause malfunction of the cylinder or leak of oil therefrom.

![Diagram of cylinder parts](image)

7) After the packing is fitted to the bush, fit the bush to the rod cover 22.

[Note]
- At that time, insert the bush with the piston rod end screws wrapped with a tape or the like. Otherwise, the packing will be damaged by threads to result in leak of hydraulic oil.
- Check that the spanner setting area of the rod is free from burrs. In such a case, too, the packing will be damaged by threads to result in leak of hydraulic oil.

![Diagram showing wrapping with tape](image)

8) Fit the retainer plate (or flange bracket) 32, and run the tie rod 11 through the cover hole.

![Diagram showing tie rod and retainer plate](image)
9) Turn the tie rod nut into the threaded area of the tie rod by hand. Conduct temporary assembly after deciding the protrusion length of the tie rod threaded area from the cover end face while referring to the catalog and others.

If the screw-in length of the tie rod threaded area is shorter, strength of the threaded area reduces to cause break of the threaded area to cause come-off of the rod or cover, finally leading to break of peripheral equipment and accident resulting in injury or death. Be sure to turn in the tie rod threaded area as long as more than the screw outside diameter.

10) Tie rod tightening
(1) Do not tighten one piece of the tie rods only at one time but all according to the procedure shown below.

\[ \frac{1}{2} \times \text{Tightening torque} \quad \text{Tightening torque} \]

50% of specified torque \quad Specified torque

[Note]
Unilateral tightening of the tie rods will cause malfunction or chatter.

(2) Tighten the tie rod to the tightening torque confirming to each cylinder size shown in the following table.
[Note]
Unless the tie rods are tightened to the torque conforming to each size, strength of the threaded area will reduce, if the nut is loosening. This will cause break of the threaded area during operation to lead to come-off of the rod or cover to possibly cause break of peripheral equipment and accident resulting in injury or death.

Specified Tie Rod Tightening Torque Table

<table>
<thead>
<tr>
<th>Bore (mm)</th>
<th>32</th>
<th>40</th>
<th>50</th>
<th>63</th>
<th>80</th>
<th>100</th>
<th>125</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tie rod screw</td>
<td>M10-1.25</td>
<td>M10-1.25</td>
<td>M10-1.25</td>
<td>M12-1.5</td>
<td>M16-1.5</td>
<td>M18-1.5</td>
<td>M22-1.5</td>
</tr>
<tr>
<td>Tightening torque</td>
<td>70H-8</td>
<td>41 (410)</td>
<td>41 (410)</td>
<td>41 (410)</td>
<td>35 (350)</td>
<td>87 (870)</td>
<td>130 (1300)</td>
</tr>
<tr>
<td>N · m (kgf · cm)</td>
<td>140H-8</td>
<td>70 (700)</td>
<td>170 (1700)</td>
<td>250 (2500)</td>
<td>460 (4600)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bore (mm)</th>
<th>140</th>
<th>150</th>
<th>160</th>
<th>180</th>
<th>200</th>
<th>224</th>
<th>250</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tie rod screw</td>
<td>M24-1.5</td>
<td>M27-1.5</td>
<td>M27-1.5</td>
<td>M30-1.5</td>
<td>M33-1.5</td>
<td>M39-1.5</td>
<td>M42-1.5</td>
</tr>
<tr>
<td>Tightening torque</td>
<td>70H-8</td>
<td>310 (3100)</td>
<td>450 (4500)</td>
<td>450 (4500)</td>
<td>630 (6300)</td>
<td>830 (8300)</td>
<td>1400 (14000)</td>
</tr>
<tr>
<td>N · m (kgf · cm)</td>
<td>140H-8</td>
<td>610 (6100)</td>
<td>880 (8800)</td>
<td>880 (8800)</td>
<td>1100 (11000)</td>
<td>1400 (14000)</td>
<td>2400 (24000)</td>
</tr>
</tbody>
</table>
11) Cushion valve assembly (⌀32 〜 100)

**CAUTION**

Valve seal: In the case of the CX type (⌀32 to 100), valve seals have to be mounted in the specified direction. Fit the valve seal after checking the mounting direction. If the valve seal is mounted in a wrong direction, note carefully that the packing will be damaged to cause leak of hydraulic oil.

1. Check the direction of the valve seal and the rubber material. For check of the valve seal direction and the packing material, see the figure shown below. In the case of the CR type (⌀125 to 250), there is no specific requirement in the mounting direction.

2. Turn the cushion valve into the cushion plug.

3. Mount the valve seal on the shaft of the cushion valve while taking care of the direction of the valve seal, and turn the valve seal and cushion valve ASSY into the cover directly.

   [Note]
   At that time, note carefully the valve seal may be damaged, if it is tuned in after the cushion valve is inserted.

4. Tighten the ASSY to the torque of 12 to 15 N·m using the cushion plug turning jig used for disassembly. Then, fit the cushion lock nut to the cushion valve.

Valve seal

Assemble the marked side with the cylinder inside.

(ID mark)
Hydrogenated nitrile rubber : Orange
Fluoric rubber : White

ID mark side
12) Cushion valve assembly (Ø 125 ～ 250)
   (1) Check the rubber material of the valve seal oblins according to the procedure same as that for the CX type.

   (2) Apply working oil to the O-ring groove in the cushion valve oblins.

   (3) Fit the cushion valve O-ring oblins to the cushion valve oblins. At that time, be sure to insert the O-ring from the end side (tapered side) of the cushion valve.

   (4) Apply working oil to the inside of the cushion plug oblins, and turn in the cushion valve oblins. At that time, turn in the cushion valve slowly with care not to scratch the O-ring.

   (5) Fit the valve seal oblins to the cover. Valve seals of the CR type have no specified mounting direction.

   (6) Turn the cushion valve ASSY into the cover slowly. Then, tighten it to the torque of 12 to 15 N · m with a spanner or the like, and fit the cushion valve nut oblins.
13) Check plug assembly (32 ~ 100)

**CAUTION**

Valve seal: In the case of the CX type (32 to 100), valve seals have to be mounted in the specified direction. Fit the valve seal after checking the mounting direction. If the valve seal is mounted in a wrong direction, note carefully that the packing will be damaged to cause leak of hydraulic oil.

(1) Check the direction of the valve seal and the rubber material. For check of the valve seal direction and the packing material, see the figure shown below. In the case of the CR type (125 to 250), there is no specific requirement in the mounting direction. The valve seal is same as that used for the cushion valve.

(2) Fit the valve seal to the check plug. At that time, be careful of the valve seal direction.

[Note] If the valve seal is fitted to the cover in the hole first, the seal may be damaged when the check plug is turned in.

(3) Fit the steel ball and the spring to the check fitting hole in the cover. Where no cushion is provided, the steel ball and the spring are not required.

(4) Turn in the check plug, and tighten it. The specified tightening torque is 8 to 10 N·m.
14) Check plug assembly (Ф 125 ~ 250)
(1) Check the rubber material of the valve seal Ф according to the procedure same as that for the CX type. There is no specific requirement in the mounting direction. The valve seal Ф is same as that used for the cushion valve.

(2) Fit the steel ball Ф and the valve seal Ф to the check fitting hole in the cover.

(3) Next, insert the spring Ф. Where no cushion is provided, the steel ball and the spring are not required.

(4) Turn in the check plug Ф.

(5) Tighten the check plug. The specified tightening torque is 8 to 10 N · m.
15) Double rod assembly

The cylinder assembling method, tie bolt tightening method, tightening torque and cushion valve • check plug assembling method are same as those for the single rod cylinder.

Required precautions only are described below.

(1) Piston rod ASSY shape (Piston) represented by B rod
(Without switch : H-8D) (With switch : H-8RD)

<table>
<thead>
<tr>
<th>Bore</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>100</td>
</tr>
<tr>
<td>32</td>
<td>140</td>
</tr>
</tbody>
</table>

Even if no switch is provided (H-8D), the magnet is provided for 32 to 100 bore cylinders. In the case of cylinders with the bore of 63 or 80, a magnet and a yoke plate (iron) are inserted.

(2) The backup ring is in the piston packing. When assembling the packing, be careful not to mistake the position.
Standard type

Double acting single rod/standard type/70H-8, 140H-8 (rod A, B, C)

- Bore ø32 - ø250

The detailed structure of the piston varies depending on the bore.

Enlarged drawing of part A
- Bore ø32 - ø160
- Bore ø180 - ø250

Enlarged drawing of part B (cushion valve)
- Bore ø32 - ø100
- Bore ø125 - ø250

Parts list

<table>
<thead>
<tr>
<th>#</th>
<th>Name</th>
<th>Material</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cylinder tube</td>
<td>Carbon steel for machine structural use</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Rod cover</td>
<td>Carbon steel for machine structural use (ø32 - ø80) Structural rolled steel (ø100 - ø250)</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Head cover</td>
<td>Carbon steel for machine structural use (ø32 - ø80) Structural rolled steel (ø100 - ø250)</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Piston</td>
<td>Gray cast iron</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>Piston rod</td>
<td>Carbon steel for machine structural use</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>Bush</td>
<td>Copper alloy</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>Retainer</td>
<td>Carbon steel for machine structural use (ø32 - ø40) Structural rolled steel (ø100 - ø250)</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>Cushion ring</td>
<td>Cast iron</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>Stop ring</td>
<td>Carbon steel for machine structural use (ø32 - ø125) Piano wire (ø40 - ø250)</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>Set screw</td>
<td>Chrome molybdenum steel</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>Cushion plug</td>
<td>Carbon steel for machine structural use</td>
<td>2</td>
</tr>
<tr>
<td>12</td>
<td>Cushion valve</td>
<td>Chrome molybdenum steel</td>
<td>2</td>
</tr>
<tr>
<td>13</td>
<td>Cushion lock nut</td>
<td>Structural rolled steel</td>
<td>2</td>
</tr>
<tr>
<td>14</td>
<td>Check plug</td>
<td>Carbon steel for machine structural use</td>
<td>4</td>
</tr>
<tr>
<td>15</td>
<td>Check spring</td>
<td>Piano wire</td>
<td>4</td>
</tr>
<tr>
<td>16</td>
<td>Check ball</td>
<td>High carbon chromium bearing steel</td>
<td>4</td>
</tr>
<tr>
<td>17</td>
<td>Tie rod</td>
<td>Carbon steel for machine structural use (7 MPa for ø32 - ø250) Chrome molybdenum steel (7 MPa for ø32 - ø40, 14 MPa)</td>
<td>4</td>
</tr>
<tr>
<td>18</td>
<td>Tie rod nut (type 2)</td>
<td>Carbon steel for machine structural use</td>
<td>8</td>
</tr>
</tbody>
</table>

- The quantities shown in the table above are applicable to the type with both ends cushioned.
- The item with the quantity in the ( ) mark may not be used depending on the bore and rod dia.
Switch set type

Double acting single rod/switch set/70H-6R, 140H-8R (rod A, B, and C)

- Bore Ø32 - Ø140

The detailed structure of the piston varies depending on the bore.

Enlarged drawing of B (cushion valve)

- Bore Ø32 - Ø100
- Bore Ø125 - Ø140

Parts list

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Material</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>①</td>
<td>Cylinder tube</td>
<td>Stainless steel</td>
<td></td>
</tr>
<tr>
<td>②</td>
<td>Rod cover</td>
<td>Carbon steel for machine structural use (Ø32 - Ø80) Structural rolled steel (Ø100 - Ø140)</td>
<td>1</td>
</tr>
<tr>
<td>③</td>
<td>Head cover</td>
<td>Carbon steel for machine structural use (Ø32 - Ø60) Structural rolled steel (Ø100 - Ø140)</td>
<td>1</td>
</tr>
<tr>
<td>④</td>
<td>Piston R</td>
<td>Special copper alloy</td>
<td>1</td>
</tr>
<tr>
<td>⑤</td>
<td>Piston H</td>
<td>Special copper alloy</td>
<td>1</td>
</tr>
<tr>
<td>⑥</td>
<td>Piston rod</td>
<td>Carbon steel for machine structural use</td>
<td>1</td>
</tr>
<tr>
<td>⑦</td>
<td>Bush</td>
<td>Copper alloy</td>
<td>1</td>
</tr>
<tr>
<td>⑧</td>
<td>Retainer</td>
<td>Carbon steel for machine structural use (Ø32 - Ø60) Structural rolled steel (Ø100 - Ø140)</td>
<td>1</td>
</tr>
<tr>
<td>⑨</td>
<td>Cushion ring</td>
<td>Cast iron</td>
<td>1</td>
</tr>
<tr>
<td>⑩</td>
<td>Wear ring</td>
<td>Synthetic resin</td>
<td>2</td>
</tr>
<tr>
<td>⑪</td>
<td>Stop ring</td>
<td>Carbon steel for machine structural use</td>
<td>(1 )</td>
</tr>
<tr>
<td>⑫</td>
<td>Magnet</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>⑬</td>
<td>Set screw</td>
<td>Chrome molybdenum steel</td>
<td>1</td>
</tr>
<tr>
<td>⑭</td>
<td>Cushion plug</td>
<td>Carbon steel for machine structural use</td>
<td>2</td>
</tr>
<tr>
<td>⑮</td>
<td>Cushion valve</td>
<td>Chrome molybdenum steel</td>
<td>2</td>
</tr>
<tr>
<td>⑯</td>
<td>Cushion lock nut</td>
<td>Structural rolled steel</td>
<td>2</td>
</tr>
<tr>
<td>⑰</td>
<td>Check plug</td>
<td>Carbon steel for machine structural use</td>
<td>4</td>
</tr>
<tr>
<td>⑱</td>
<td>Check spring</td>
<td>Piano wire</td>
<td>4</td>
</tr>
<tr>
<td>⑲</td>
<td>Check ball</td>
<td>High carbon chromium bearing steel</td>
<td>4</td>
</tr>
<tr>
<td>⑳</td>
<td>Tie rod</td>
<td>Carbon steel for machine structural use (7 MPa: for Ø32 - Ø140) MSC-1/5 (14 MPa: for Ø32 - Ø80)</td>
<td>4</td>
</tr>
<tr>
<td>㉑</td>
<td>Tie rod nut (type 2)</td>
<td>Carbon steel for machine structural use</td>
<td>8</td>
</tr>
<tr>
<td>㉒</td>
<td>Switch</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

- The quantities shown in the table above are applicable to the type with both ends cushioned.
- The item with the quantity in the ( ) mark may not be used depending on the bore and rod dia.
Fluid proof type

Double acting single rod/cutting fluid proof type 70HW-8, 140HW-8, 70HW-8R, 140HW-8R (rod B/rod C)

- Bore ø32 - ø125

Standard type

- The detailed structure of the piston varies depending on the bore.
- Wiper-seal part is specially designed in order to prevent the invasion of foreign body.

Switch set (piston structure)

Enlarged drawing of B (cushion valve)

- Bore ø32 - ø190
- Bore ø125

The detailed structure of the piston varies depending on the bore. The structure of other sections is common to the standard type.

Parts list

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Material</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cylinder tube</td>
<td>Standard type carbon steel for machine structural use</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Swash set stainless steel</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Rod cover</td>
<td>Carbon steel for machine structural use (ø32 - ø60)</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Structural rolled steel (ø60 - ø125)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Head cover</td>
<td>Carbon steel for machine structural use (ø32 - ø60)</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Structural rolled steel (ø100 - ø125)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Piston</td>
<td>Grey cast iron</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>Piston R</td>
<td>Special copper alloy</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>Piston H</td>
<td>Special copper alloy</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>Piston rod</td>
<td>Carbon steel for machine structural use</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>Bush</td>
<td>Copper alloy</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>Retainer</td>
<td>Carbon steel for machine structural use (ø32 - ø60)</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Structural rolled steel (ø100 - ø125)</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Cushion ring</td>
<td>Cast iron</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>Washer</td>
<td>Synthetic resin</td>
<td>2</td>
</tr>
<tr>
<td>12</td>
<td>Stop ring</td>
<td>Carbon steel for machine structural use</td>
<td>(1)</td>
</tr>
<tr>
<td>13</td>
<td>Magnet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Bolt screw</td>
<td>Chrome molybdenum steel</td>
<td>1</td>
</tr>
<tr>
<td>15</td>
<td>Cushion plug</td>
<td>Carbon steel for machine structural use</td>
<td>2</td>
</tr>
<tr>
<td>16</td>
<td>Cushion valve</td>
<td>Chrome molybdenum steel</td>
<td>2</td>
</tr>
<tr>
<td>17</td>
<td>Cushion lock nut</td>
<td>Structural rolled steel</td>
<td>2</td>
</tr>
<tr>
<td>18</td>
<td>Check plug</td>
<td>Carbon steel for machine structural use</td>
<td>4</td>
</tr>
<tr>
<td>19</td>
<td>Check spring</td>
<td>Piano wire</td>
<td>4</td>
</tr>
<tr>
<td>20</td>
<td>Check ball</td>
<td>High carbon chromium bearing steel</td>
<td>4</td>
</tr>
<tr>
<td>21</td>
<td>Tie rod</td>
<td>Carbon steel for machine structural use (ø60 - ø135)</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chrome molybdenum steel (7MPa for ø60 - ø60, 14 MPa)</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Tie rod nut (type 2)</td>
<td>Carbon steel for machine structural use</td>
<td>8</td>
</tr>
<tr>
<td>23</td>
<td>Switch</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* The quantities shown in the table above are applicable to the type with both ends cushioned.
* The item with the quantity in the ( ) mark may not be used depending on the bore and rod dia.
**Double rod type**

- 19

---

**Note**) Piston and center bracket are common for both B and C rods.

---

**Backup ring (fluoric resin)**

**Piston packing**

**Parallel pin**

**Piston (copper alloy)**

**B-rod**

**C-rod**

**Plastic**

---

**Note**) Piston is common for both B and C rods.

---

**Backup ring (fluoric resin)**

**Piston packing**

**Parallel pin**

**B-rod**

**C-rod**

**Plastic**

**Piston (cast iron)**