

⚠ Caution

Cylinder needs to be disassembled/assembled at clean environment. Use a clean cloth. Before disassembly, eliminate the dirt on the outer surface so that foreign material does not enter the cylinder or the guide.

1. Disassembly

1-1. Tools

Retaining ring plier for hole, hexagon wrench, spanner, socket wrench (or air impact wrench).

1-2. Fix the piston rod so that it is not scratched. Remove the guide rod assembly by loosening the plate mounting bolt with a hexagon wrench or socket wrench.

Or, loosen the plate set bolt with the air impact wrench to remove the guide rod assembly.

Continue the work without removing the guide rod from the plate.

1-3. Remove the two retaining rings (rod and head side) with the retaining ring pliers, and pull out the collar, head cover and piston rod assembly.

For air cushion type and end lock type, it is necessary to remove the collar and parts below.

Air cushion type (ø80, ø100)

- Set screw at the bottom of the cylinder.

End lock type

- End lock unit (See below)

Bore size (mm)	Retaining ring size	Width across flat (mm)	Plate mount bolt tightening torque (kgf·cm)
12	RTW-13	5	14
16	RTW-18	6	34
20	RTW-22	8	52
25	RTW-26	10	88
32	RTW-34	14	220
40	RTW-42	14	220
50	RTW-52	17	440
63	RTW-65	17	440
80	RTW-82	22	1,240
100	RTW-102	27	2,000

Removal of End Lock (With End Lock)

1. Tools

Retaining ring plier for hole, hexagon wrench, spanner, socket wrench (or air impact wrench), watchmakers screw driver.

2. Insert the manual bolt from the top of the end lock unit rubber cap, and screw the bolt into the lock piston, (Not necessary for -*L, lock type)

3. Remove two hexagon socket head cap screws to pull out the end lock unit.

4. For ø20 to ø63, remove the lock piston seal. For ø80, ø100, remove the packing seal retainer and locking piston seal.

5. Remove the lock holder mounting bolt to remove the lock unit and gasket.

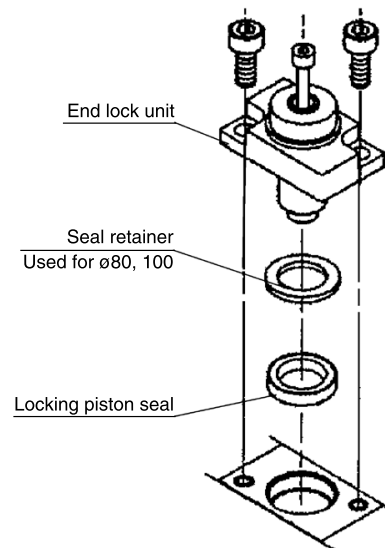


Fig. 1 How to remove the end lock

2. Removal of the Seal

2-1. Rod seal

a. Tools

Watchmakers screw driver, etc.

b. Insert the driver to the collar front to pull out the seal like Fig. 2.

Do not damage the seal groove on the collar at this time.

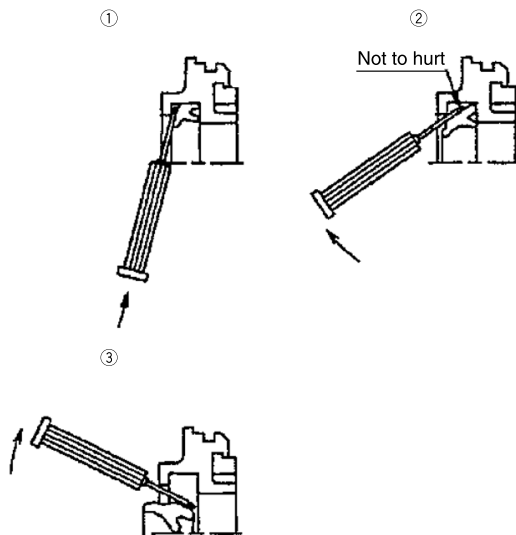


Fig. 2 How to remove rod seal

Actuators

Modular F.R.L.
Pressure Control Equipment

Air Preparation
Equipment

Industrial Filters

Replacement
Procedure

Actuators

Modular F.R.L.
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Industrial Filters

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2-2. Piston seal

Wipe off grease around piston seal first to make removal easier.

Hold piston seal with one hand and push it into groove so that piston seal can be lifted off and pulled out without using a watchmakers screw driver. (Fig. 3)

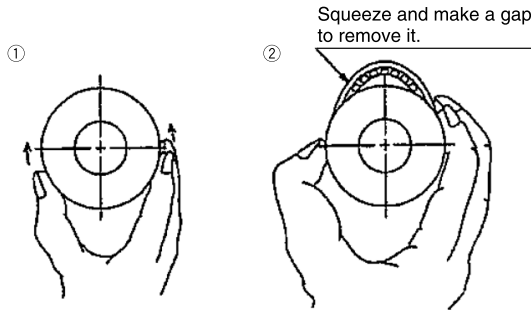


Fig. 3 How to remove piston seal

2-3. Gasket

Pull out the collar and the head cover outer rim or the gasket inside of the body (ø32 or larger) with precision driver.

2-4. Cushion seal (With air cushion only)

- a. Tool: Watchmakers screw driver, etc.
- b. As shown in Fig.4, pull out the cushion seal by inserting the precision screwdriver from the back of the seal and the head cover. Take care not to damage the seal groove at this time.

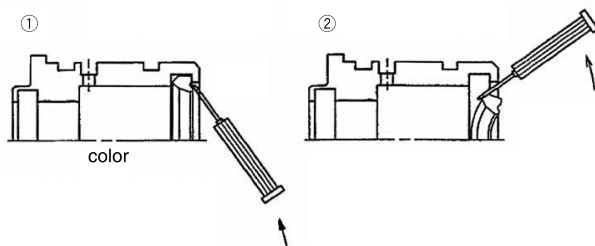


Fig. 4 Removing the cushion seal

3. Application of Grease

Use grease pack in table or lithium soap base grease JIS2, or equivalent.

Table Grease pack no.	
10 g type	GR-S-010
20 g type	GR-S-020

3-1. Rod seal

Apply grease slightly to outer circumference of new seal for replace. This helps the seal to accustom to the collar. For the groove, fill it with grease. This is necessary for operation.

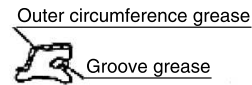


Fig. 4

3-2. Piston seal

Apply grease to outer/inner circumference of seal slightly and evenly to make mounting this to the piston easier.

3-3. Gasket

Apply grease slightly. Provide better sealing and stop falling.

3-4. Cushion seal (With air cushion only)

Apply grease to outer/inner circumference of seal slightly and evenly to make mounting this to the seal groove.

3-5. Cylinder parts

Apply grease to cylinder parts including the guide.

With end Lock

Use lithium soap radical grease JIS2 corresponding to such as "Nippon Oil Corporation multipurpose grease No. 2", "Idemitsu Daphne coronex No. 2", "Kyoseki lisonix grease No. 2".

4. Assembly

4-1. Mount seal

a. Rod seal

Mind the seal direction. Apply grease all over the seal and inner surface of the bush as Fig. 8. You may use a precision screw driver to apply grease when small bore diameter.

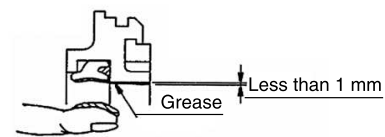


Fig. 8 Rod seal

b. Piston seal

Apply grease rubbing to seal groove and outer circumference.



Fig. 9 Piston seal

- c. Gasket (With rubber bumper)

Mount to the groove of the collar and the head cover. For $\phi 32$ or larger, mount to the inner groove of the body, not to the head cover.

This case, the gasket of the body is large type.
- d. Gasket (With air cushion)

Mount to the groove of the collar and the head cover. For $\phi 32$ or larger, mount to the inner groove of the head cover and the body.

This case, the gasket of the body is large type.

Do not mount the gasket on the air passage (through hole groove) as in Fig.10.

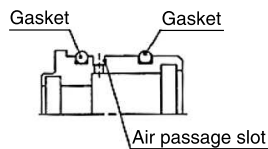


Fig. 10 Gasket mounting position

- e. Cushion seal (With air cushion only)

Mount the seal in the correct direction. Apply grease thinly and evenly to the inner circumference of the seal. As the seal has a floating mechanism, it is normal to have some play.

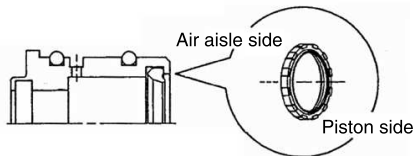


Fig. 11 Cushion seal mounting position

- 4-2. Assemble cylinder
 - a. Insert the head cover to the body to fix with a retaining ring.
 - b. Insert the collar to the piston rod.

Apply grease to the piston rod end or 30 degree of slope at the end of spanner flat, and insert the collar gently so that the piston seal is not hurt.
 - c. Insert the piston and the collar to the tube and fix it with a retaining ring.

Apply grease to the inlet of the tube and insert the piston and the collar gently so that the piston seal and the gasket are not hurt by the retaining ring groove.
 - d. Guide rod assembly assembling

Apply glue to the plate mounting bolt when mounting the guide rod assembly. Then tighten the bolt with tightening torque in table 1.

After assembling, ensure manually that work properly operate smoothly.
Check the air leakage.

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With End Lock

1. Mount end lock

Apply grease to the lock piston surface, lock holder inner surface to insert the gasket and lock holder. Then, fix them with new hexagon socket head cap screws included in accessories.

Insert the end lock unit and fix it with new hexagon socket head cap screws included in accessories. (See drawing 12, 13, 14, 15)

After assembling, ensure manually that end lock work properly and cylinder operate smoothly with lock released.

Cap and lock holder bolt tightening torque

Hexagonal bolt	Bore size (mm)	Tightening torque (N)
M3	ø20 to ø63	0.71 to 0.86
M5	ø80, ø100	2.65 to 3.24

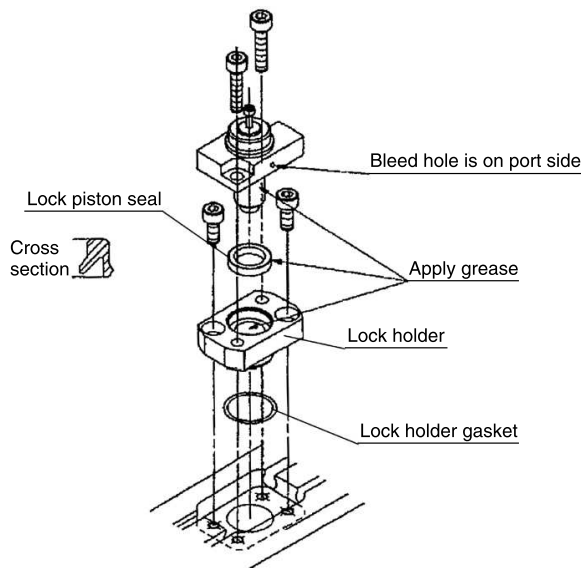


Fig. 12 End lock reassembled (ø20, ø25)

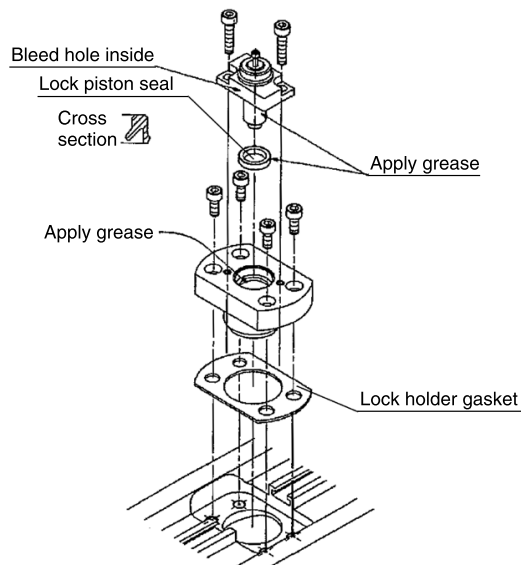


Fig. 14 End lock reassembled (ø50, ø63)

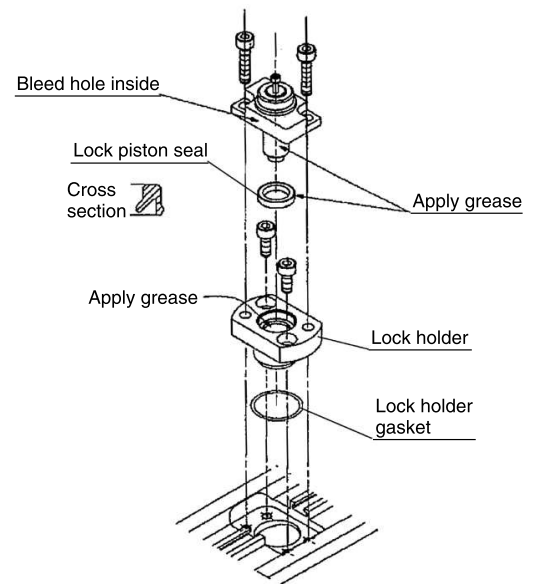


Fig. 13 End lock reassembled (ø32, ø40)

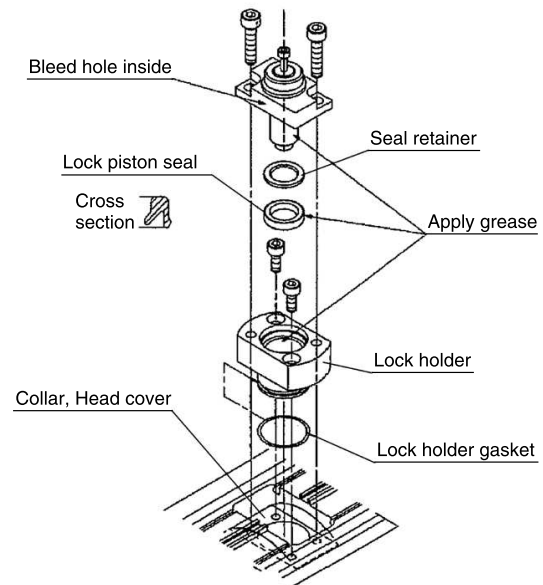


Fig. 15 End lock reassembled (ø80, ø100)

⚠ Caution

Replace the hexagon socket head bolt with a new one included in the packing set to avoid air leakage.

Tighten the hexagon socket head bolt evenly to avoid air leakage.