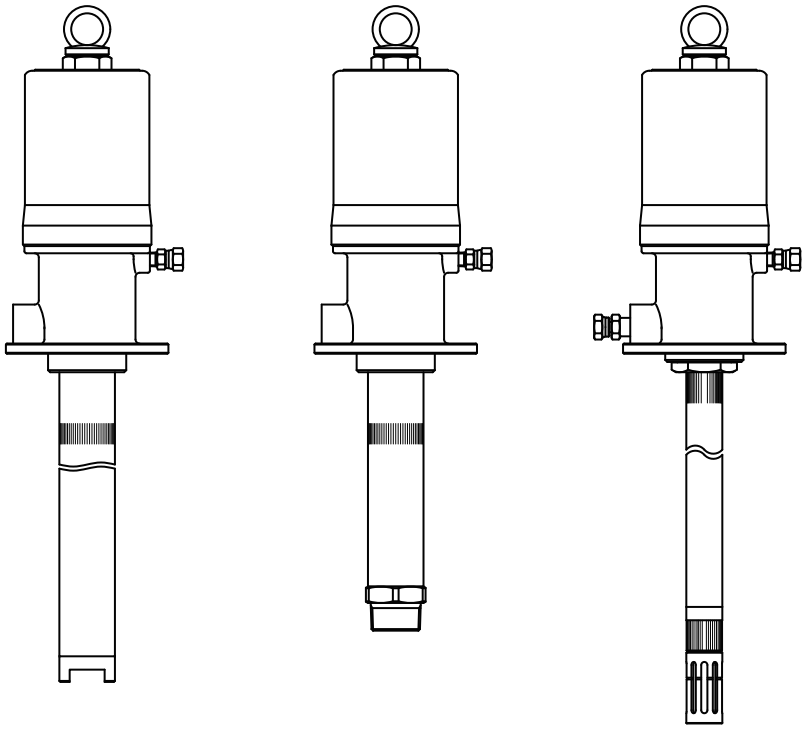
Doc. No.	APP 001M-07

Original Instructions CE

yamada

MAINTENANCE MANUAL

GREASE & OIL PUMP for 110 Type Series



⚠ WARNING

Prior to disassembling to repair this pump, be sure to read this maintenance manual for safety. After reading the manual, please keep it at hand any time for your quick reference.

YAMADA CORPORATION

⚠ WARNING

- For your own safety, be sure to read these procedures carefully before performing maintenance on this product. After reading this document, be sure to keep it handy for future reference.

This maintenance manual covers what you should know about maintenance of the Yamada Pumps (grease & oil pump for 110 type series).
This edition is based on the standards for the November 2024 production run. Remember, the specifications are always subject to change; therefore, some of the information in this edition may not apply to new specifications.

- Warnings and Cautions

To use this product safely, be sure to observe the contents of the following description. In this manual, warnings and cautions are indicated by using symbols. These symbols are intended to prevent death or serious injury that may be caused to the operator or those who are around the product and damage that may be caused to the articles that are around the product, as well as to use the product safely and correctly. Each symbol is indicated and has a meaning as shown below. Read the description with a good understanding of its contents.

⚠ WARNING : This indicates the existence of potential hazard which, if not avoided, will result in death or serious injury.

⚠ CAUTION : This indicates the existence of potential hazard which, if not avoided, may result in bodily injury or in physical damage.

To indicate the contents of danger and damage, the following symbols are used together with the above indications.

This symbol indicates an act that is prohibited (prohibition). The concrete contents of prohibition are indicated by the side of the indication.

This symbol indicates the contents that must be observed. The concrete contents of observance are indicated by the side of the indication.

The following warnings and cautions are very important. Be sure to observe them.

⚠ WARNING

- Always wear proper safety equipments (facemask, ear plugs, and safety shoes, etc.) when installing, operating, and disassembling this product.
- Before maintenance involving disassembly, be sure to shut off air supply to the pump and release residual air pressure and material pressure in the tubes and pump. Failure to do so may result in material gushing out.
- Gasoline is a high volatile fuel. Do not use it to clean the pump in any case, otherwise ignition or explosion may be caused.
- Keep your fingers away from each port to avoid injury from moving parts.
- Modification of this pump may lead to death, bodily injury, or a failure. Do not modify it in any case because it involves a risk.
- Do not discharge material directly onto the ground. Dispose of harmful materials according to the requirements specified in MSDS or local regulations. Also, dispose of this product according to the local regulations after removing residual material from inside this product. (Please contact industrial waste disposal service.)

⚠ CAUTION

- Clean up the work place. Slipping or stumbling could lead to injury. Secure the moving paths and the footholds in the workplace.
- When you disassemble the pump which handles a bad smelling or toxic material, you could be poisoned. Ventilate the workplace fully.
- Be very careful about the edge of the pump when you lift the pump. Your hands might be injured.
- Be very careful about your posture when installing the pump. Back injury may be caused by lifting the pump.
- If a warning label or nameplate is coming off or defaced, replace it with new ones. Order us when replacing them.

[When Checking the Air Motor for Activation]

- When you check the air motor for activation to determine whether it is the cause of the trouble, be sure to fix it with a vice and supply the air to check.
- If the air motor is activated, manually holding the pump, you may drop it onto your foot due to its vibrations, resulting in an injury.

<NOTE>

- The sealing tape are stuck to the threads of the disassembled pipes and hoses. Remove it completely and apply the new sealing tape to them when reassembling them.

Table of Contents

1. Disassembly and Inspection of Pump

In the event of a malfunction or stopped state, be sure to disassemble only the necessary portion, referring to “Troubleshooting and Corrective measures” note that the long-term operation will cause the packing or slide parts to be worn; thus, a regular overhaul is required.

⚠WARNING

- Gasoline is a high volatile fuel. Do not use it to clean the pump in any case, otherwise ignition or explosion may be caused.
- When washing parts, do not use such a liquid as corrodes aluminum, copper alloy, iron, etc.
- When disassembling and checking the pump, be sure to stop the supply air and open the outlet valve to release the internal pressure of the pump beforehand.

[Separating the air motor from the lower pump]

1) Shut off the air that is supplied to the pump and bleed the internal pressure of the pump.

2) Remove the high pressure hose and the air coupler from the pump.

＜For oil pump＞

Remove the material left in the suction tube by pushing up the ball in the foot valve by screwdriver.

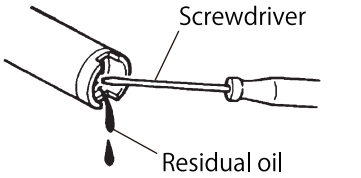


Fig. 1

3) Secure the air motor of the pump assembly in a vise. (Fig. 2)

＜NOTE＞

- The air cylinder is easily damaged. Do not fix it on the vise in any case.

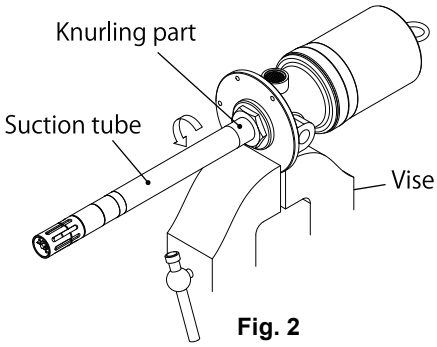


Fig. 2

4) Set a pipe wrench on the knurling section of the suction tube of the lower pump and unscrew it.

5) Pull out the suction tube, and the connecting stud that connects the piston rod of the air motor becomes visible. Pull out the spring pin of the connecting section and unscrew the connecting stud or the lower pump, and the air motor can be separated from the lower pump. (Fig. 3)

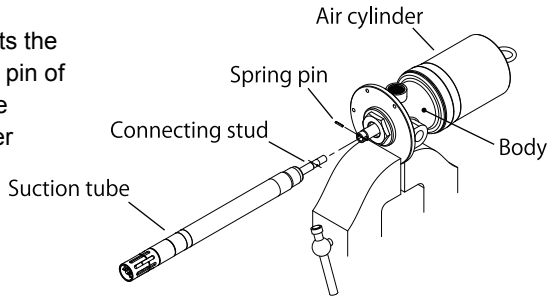


Fig. 3

2. Disassembling and Inspecting the Lower Pump (for Grease Pump)

1) Secure the suction tube in a vise.

2) Set a pipe wrench on the booster cover. Unscrew the suction tube and remove the spring pin, nut, and shovel. (Fig. 4)

3) Likewise, set a pipe wrench on the valve case and unscrew it. The valve stopper and the foot valve (a part of the plunger assembly) can be removed.

4) Pull out the plunger rod from the suction tube by holding it. The piston and connecting rod assembly can be pulled out. (Fig. 5)

5) Pull out the spring pin that connects between the connecting rod and the plunger, and take out the plunger. Wash the plunger and check it for blemish and wear. (Fig. 6)

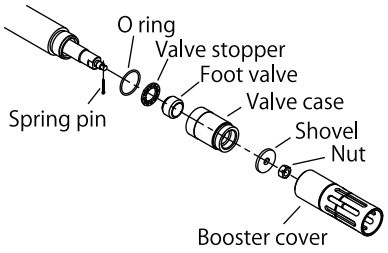


Fig. 4

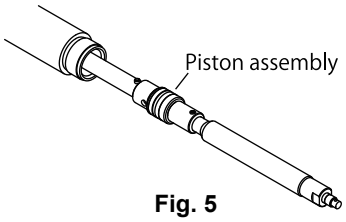


Fig. 5

＜NOTE＞

- The plunger is an assembly for mating with the valve. Insert the foot valve in the plunger, and check if it can smoothly slide. These two parts, if they are blemished, must be replaced as an assembly.

6) The portions with which the lower part of the piston and the connecting stud come into contact form a seat surface. Check them for blemish. (Fig. 6)

7) Wash and check each disassembled part. If any blemish or wear is found, replace the part with a new one.

8) For assembling, reverse the disassembling procedure.
In particular, perform assembling taking care about the directions of foot valve.

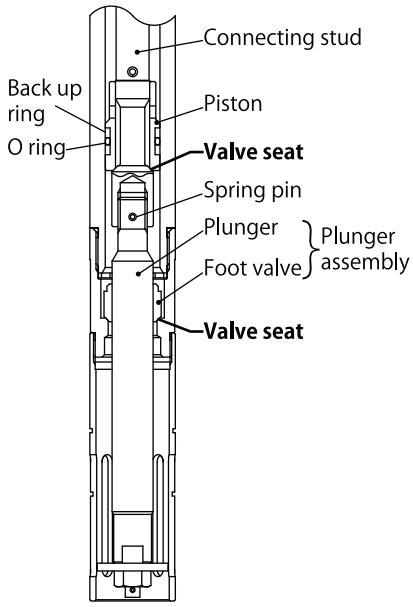
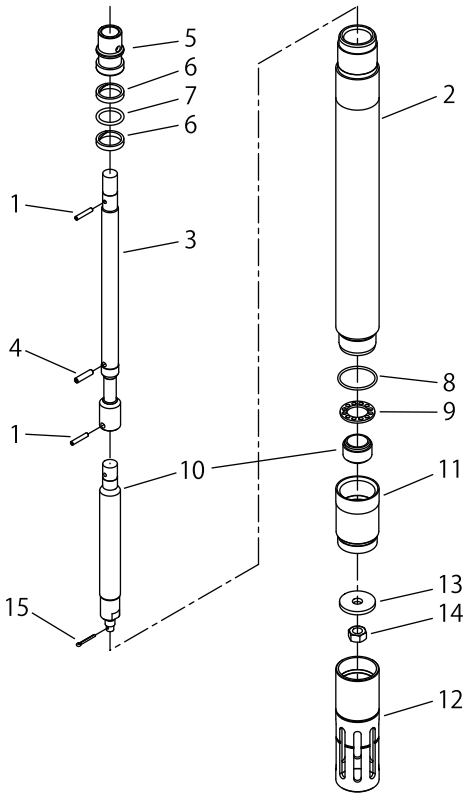


Fig. 6

*Pay attention to the direction of mounting the foot valve.
*When assembling the O ring and back up ring, apply oil or grease to them so as not to be twisted and damaged.

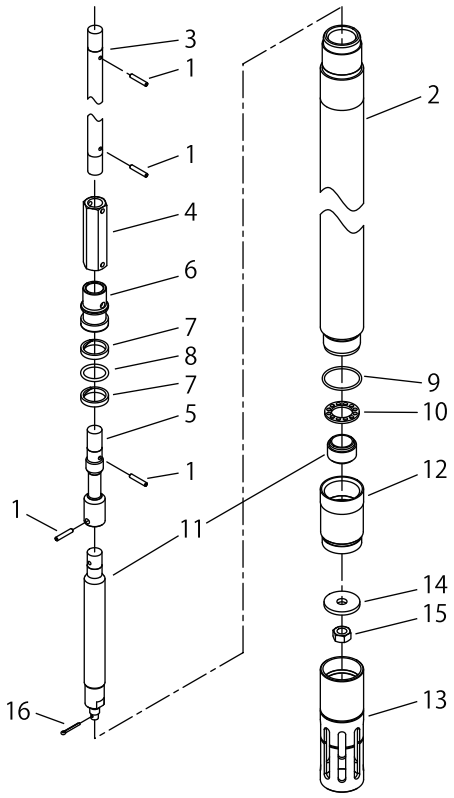
3. Parts Disassembly Drawing and Parts List (for Grease Pump)

3.1 802498 Lower pump assembly
802752 Lower pump assembly (for Silicone grease)



No.	Parts No.		Description	Q'ty
	802498	802752		
1	632773	←	Spring pin	2
2	710617	←	Cylinder tube	1
3	710618	←	Connecting stud	1
4	632792	←	Spring pin	1
5	710619	←	Piston	1
6	771367	←	Back up ring	2
7	682926	←	O ring	1
8	682922	←	O ring	1
9	701600	←	Valve stopper	1
10	802499	802751	Plunger assembly	1
11	710620	←	Valve case	1
12	710621	←	Booster cover	1
13	710622	←	Shovel	1
14	627012	←	Nut	1
15	632032	←	Split pin	1

3.2 802539 Lower pump assembly
802543 Lower pump assembly



No.	Parts No.		Description	Q'ty
	802539	802543		
1	632773	←	Spring pin	4
2	710739	710743	Cylinder tube	1
3	710745	710749	Connecting rod	1
4	710736	←	Socket	1
5	710737	←	Connecting stud	1
6	710619	←	Piston	1
7	771367	←	Back up ring	2
8	682926	←	O ring	1
9	682922	←	O ring	1
10	701600	←	Valve stopper	1
11	802499	←	Plunger assembly	1
12	710620	←	Valve case	1
13	710621	←	Booster cover	1
14	710622	←	Shovel	1
15	627012	←	Nut	1
16	632032	←	Split pin	1

4. Disassembling and Inspecting the Lower Pump (for Oil Pump)

1) Fix the knurling part of the suction tube on a vise, set a spanner on the foot valve, and unscrew it. (Fig. 7)

＜**NOTE**＞

- Be sure to apply a pipe wrench to the knurled part so as not to damage the inner face of the suction tube.

2) Remove the stopper pin of the foot valve and take out the ball. Clean and check the ball and the seat surface. If any flaw or abrasion is found, replace the ball or seat with a new one. (Fig. 8)

3) Fix the housing of the intake valve on a vise and unscrew the intake valve body. Then, the collar, U packing and ball can be disassembled. Clean and check each part. If any flaw or abrasion is found, replace the part with a new one. (Fig. 9)
(When replacing the U packing, make sure that the open end of the lip faces upward.)

4) Refrain from disassembling the housing and the connecting rod if possible. If they are disassembled, assemble them so that the clearance between the end of the connecting rod and the ball may be 3±0.5 mm, and lock them with a nut against looseness. (Fig.10)

5) For re-assembling the parts after inspection, reverse the assembling procedure.

Fig. 7

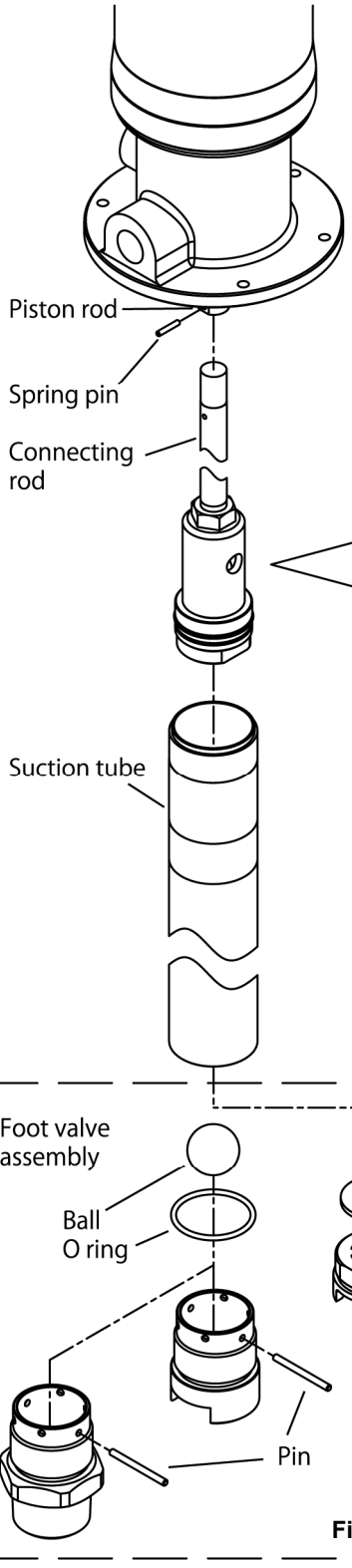


Fig. 8

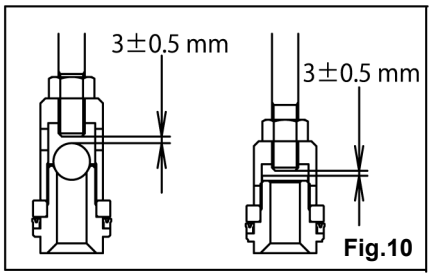
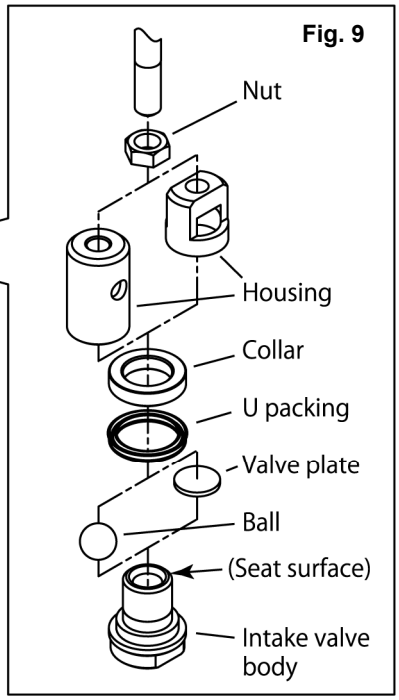


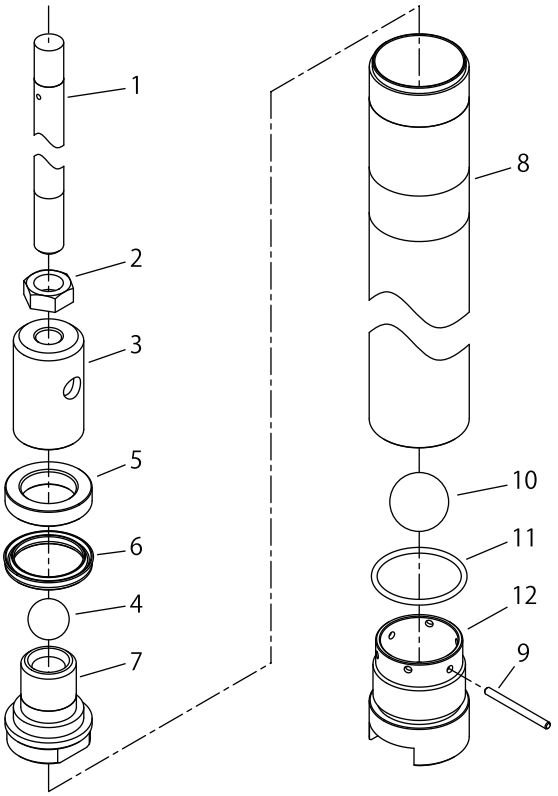
Fig.10

Fig. 9



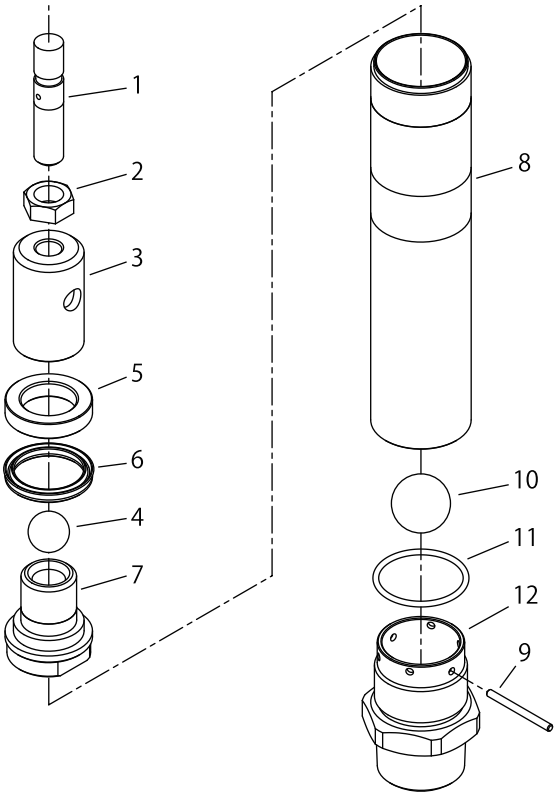
5. Parts Disassembly Drawing and Parts List (for Oil Pump)

5.1 800360 Lower pump assembly



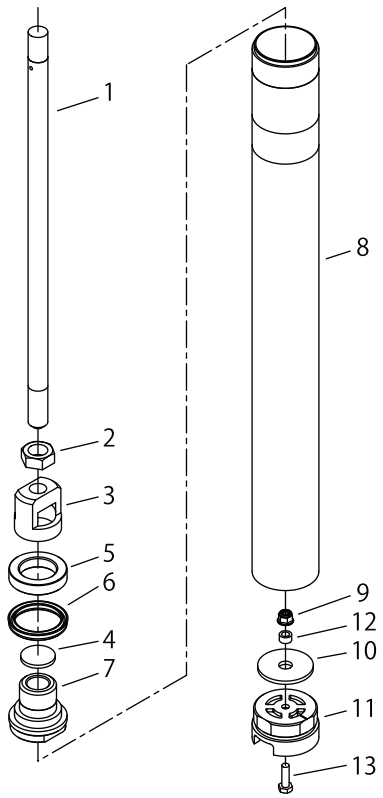
No.	Parts No.	Description	Q'ty
1	701560	Connecting stud	1
2	627016	Nut	1
3	701554	Housing	1
4	630334	Ball	1
5	710925	Collar	1
6	686404	U packing	1
7	710926	Valve seat	1
8	704580	Cylinder	1
9	701556	Pin	1
10	630341	Ball	1
11	640134	O ring	1
12	704587	Foot valve	1

5.2 800359 Lower pump assembly



No.	Parts No.	Description	Q'ty
1	711250	Rod	1
2	627016	Nut	1
3	701554	Housing	1
4	630334	Ball	1
5	710925	Collar	1
6	686404	U packing	1
7	710926	Valve seat	1
8	704582	Cylinder	1
9	701556	Pin	1
10	630341	Ball	1
11	640134	O ring	1
12	704586	Foot valve	1

5.3 801190 Lower pump assembly



No.	Parts No.	Description	Q'ty
1	705577	Rod	1
2	627016	Nut	1
3	705579	Housing	1
4	705580	Valve plate	1
5	710925	Collar	1
6	686404	U packing	1
7	710927	Valve seat	1
8	712018	Cylinder	1
9	683503	Nut	1
10	710912	Valve seat	1
11	712175	Adapter	1
12	712168	Collar	1
13	611101	Bolt	1

6. Disassembling and Inspecting the Air Motor

The air motor does not touch the materials directly and it hardly breaks down, thus, requiring no disassembly. When necessary, disassemble only the necessary part, referring to “Troubleshooting and Corrective measures”.
Possible causes are:
*Difference between the right and left gaps caused by looseness of a suction valve (Fig.13)
*Looseness of a nut of a trip rod (Fig.14)
*Poor switching due to fatigue of a C spring (Fig.12)
*Abrasion of a piston and O ring
*Leakage of oil due to abrasion of a U packing and back up ring (Fig.16)
*Poor switching due to abrasion of an O ring of a guide bushing. (Fig.15)

[Disassembling the Switching Valve]

1) Fix the air motor on a vise to remove an eye bolt. At this time, the packing and bushing may pop out. Take care not to lose them. (Fig.11)

2) Pull out a trip rod to remove lock nuts.

3) Apply a wrench to the hexagonal head of the air motor cylinder and unscrew it.

4) Pull the piston proper out of the body for smooth disassembly work. (Fig.12)

5) Before disassembling, make sure that the gaps between the right and left suction of valves are same in size. (The gap at the time of factory assembly is about 2 mm.)
Check four bolts securing the guide bushing for possible looseness. The looseness of these bolts may contribute to malfunction. (Fig.13 & Fig.14)

6) Remove a C spring from the piston groove. (Fig.12)

7) The switching valve assembly can be dismounted by removing four bolts securing the guide bushing. (Fig.15)

8) After loosening and removing the valve stem nuts, wash each part and check it for possible damage, wear or tear.

[Precaution in Assembly of Switching Valve]
- After washing each disassembled part, if there are any defective parts, replace them with new ones and assemble each part with care to the order and orientation.
  Adjust the gap between the valve stems (the suction valve) and the valve seat of the packing to be the specified size. (Fig.13)

9) Turn the groove on the top of the valve stem by a slotted screwdriver so that the gap between the valve stem (the suction valve) and the valve seat may be about 2 mm, and then lock the nuts. In this case, both gaps must be the same. (Fig.13)

10) Assemble the trip rod and lock nuts so that the top of a rod may be flush with the top of a nut. (Fig.14)
(Disassembling the Piston Assembly, O ring and U packing)

Fig.11

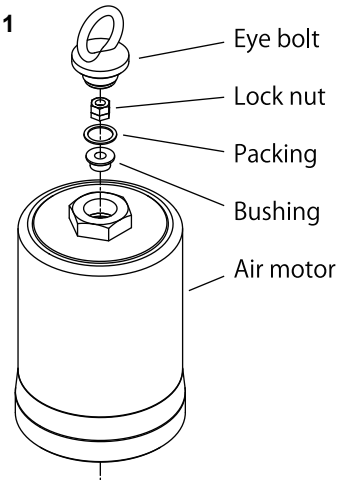
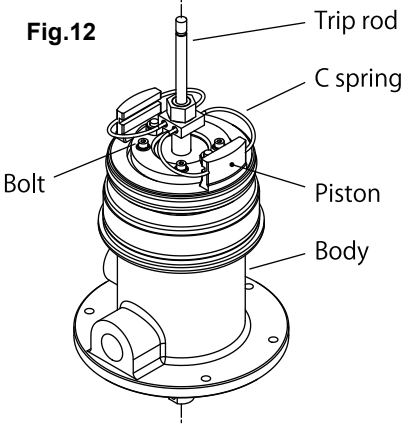


Fig.12



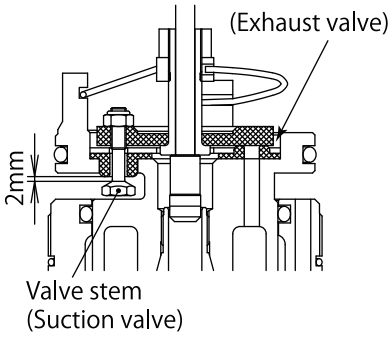


Fig.13

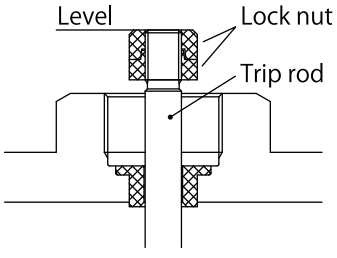


Fig.14

11) Pull out the piston assembly and check the slide part for possible damage. (Fig.16)
12) After washing each O ring, check it for possible abrasion.

13) Remove the U packing and back up ring for washing and check them for possible abrasion. If worn, replace them with new ones. (Fig.17)

＜NOTE＞

- When assembling packings, apply oil or grease to them so as not to be twisted or loosened. Pay attention to the direction of mounting the U packing.

Fig.15

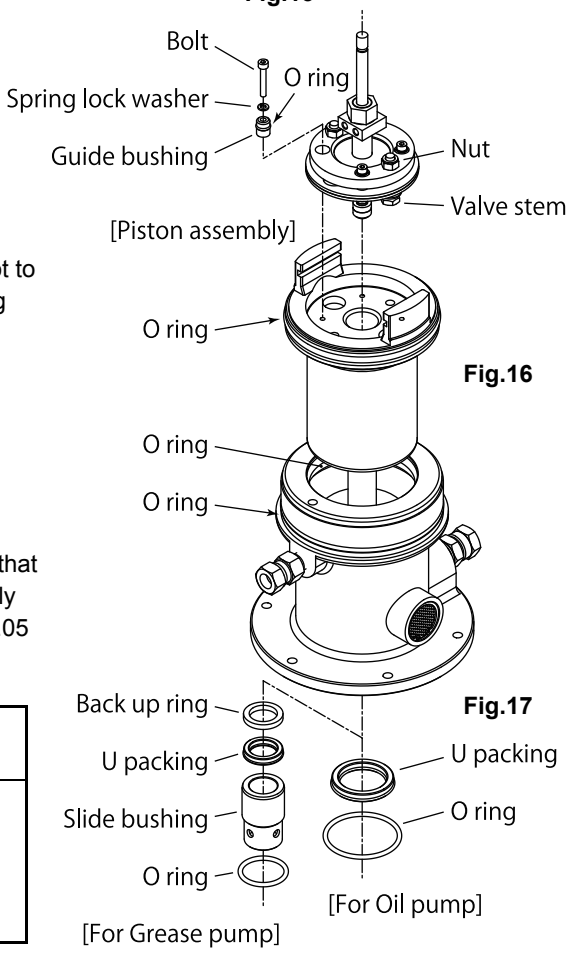


Fig.16

Fig.17

7. Inspection after Assembly

1) Make sure the disassembled parts are assembled completely.

2) Before placing in the system, idle the pump proper to make sure that the stable operation is performed. At this time, regulate the supply air by the regulator so that the operation is performed at about 0.05 to 0.15 MPa.

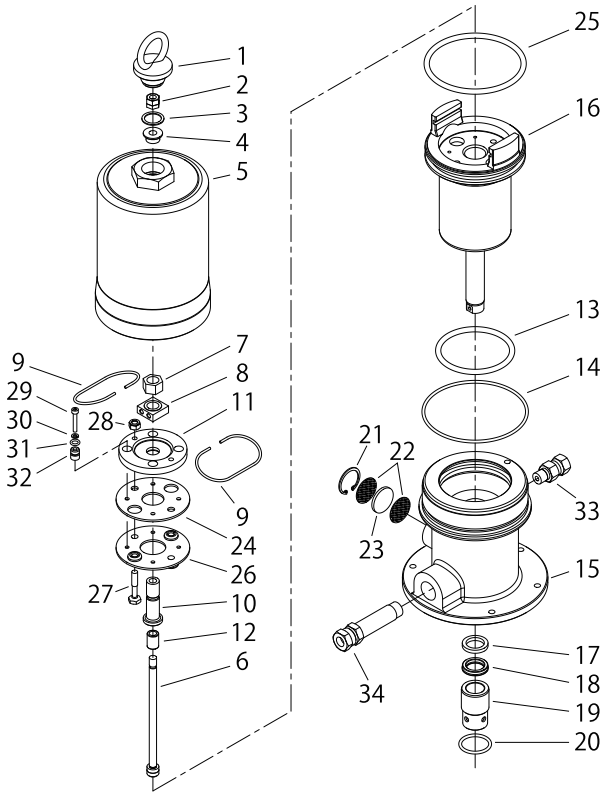
⚠ WARNING

- Generally, as soon as the materials in the pump are exhausted, the pump speed is accelerated abruptly causing the pump to be damaged. Therefore, avoid idling the pump in ordinary situation.

3) After placing the pump in the line or each system, operate it. The air in the pump is mixed with oil sucked up. In case of the pump which pumps out through the pipe, therefore, discharge oil to release air before connecting the connecting hose to the pipe.

8. Parts Disassembly Drawing and Parts List

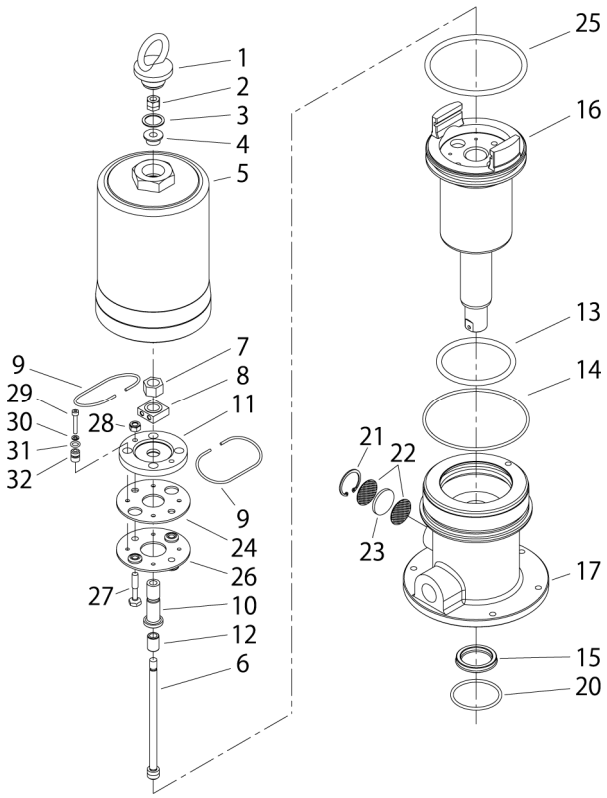
8.1 802497 Air motor assembly (for Grease pump)



No.	Parts No.	Description	Q'ty
1	701736	Eye bolt	1
2	681886	Lock nut	1
3	770169	Packing	1
4	710603	Bushing	1
5	710604	Air cylinder	1
6	831492	Trip rod assembly	1
7	711007	Lock nut	1
8	711008	Spring holder	1
9	710607	C spring	2
10	711009	Striker	1
11	711010	Valve plate	1
12	710610	Collar	1
13	640062	O ring	1
14	640147	O ring	1
15	831494	Body assembly	1
16	831493	Air piston assembly	1
17	772354	Back up ring	1

No.	Parts No.	Description	Q'ty
18	681167	U packing	1
19	710612	Slide bushing	1
20	640131	O ring	1
21	630611	Retaining ring	1
22	710613	Plate	2
23	771364	Muffler	1
24	710614	Packing retainer	1
25	640067	O ring	1
26	771366	Packing	1
27	710615	Valve stem	2
28	682921	nut	2
29	619046	Bolt	4
30	631415	Spring lock washer	4
31	640004	O ring	4
32	710768	Guide bushing	4
33	680080	Union adapter	1
34	830087	Adapter assembly	1

8.2 802520 Air motor assembly (for Oil pump)



No.	Parts No.	Description	Q'ty
1	701736	Eye bolt	1
2	681886	Lock nut	1
3	770169	Packing	1
4	710603	Bushing	1
5	710604	Air cylinder	1
6	831492	Trip rod assembly	1
7	711007	Lock nut	1
8	711008	Spring holder	1
9	710607	C spring	2
10	711009	Striker	1
11	711010	Valve plate	1
12	710610	Collar	1
13	640062	O ring	1
14	640147	O ring	1
15	773145	U packing	1
16	831512	Air piston assembly	1
17	710673	Body	1

No.	Parts No.	Description	Q'ty
18	-	-	-
19	-	-	-
20	640135	O ring	1
21	630611	Retaining ring	1
22	710613	Plate	2
23	771364	Muffler	1
24	710614	Packing retainer	1
25	640067	O ring	1
26	771366	Packing	1
27	710615	Valve stem	2
28	682921	nut	2
29	619046	Bolt	4
30	631415	Spring lock washer	4
31	640004	O ring	4
32	710768	Guide bushing	4

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