
Maintenance Manual

Booster Regulator

VBA11A

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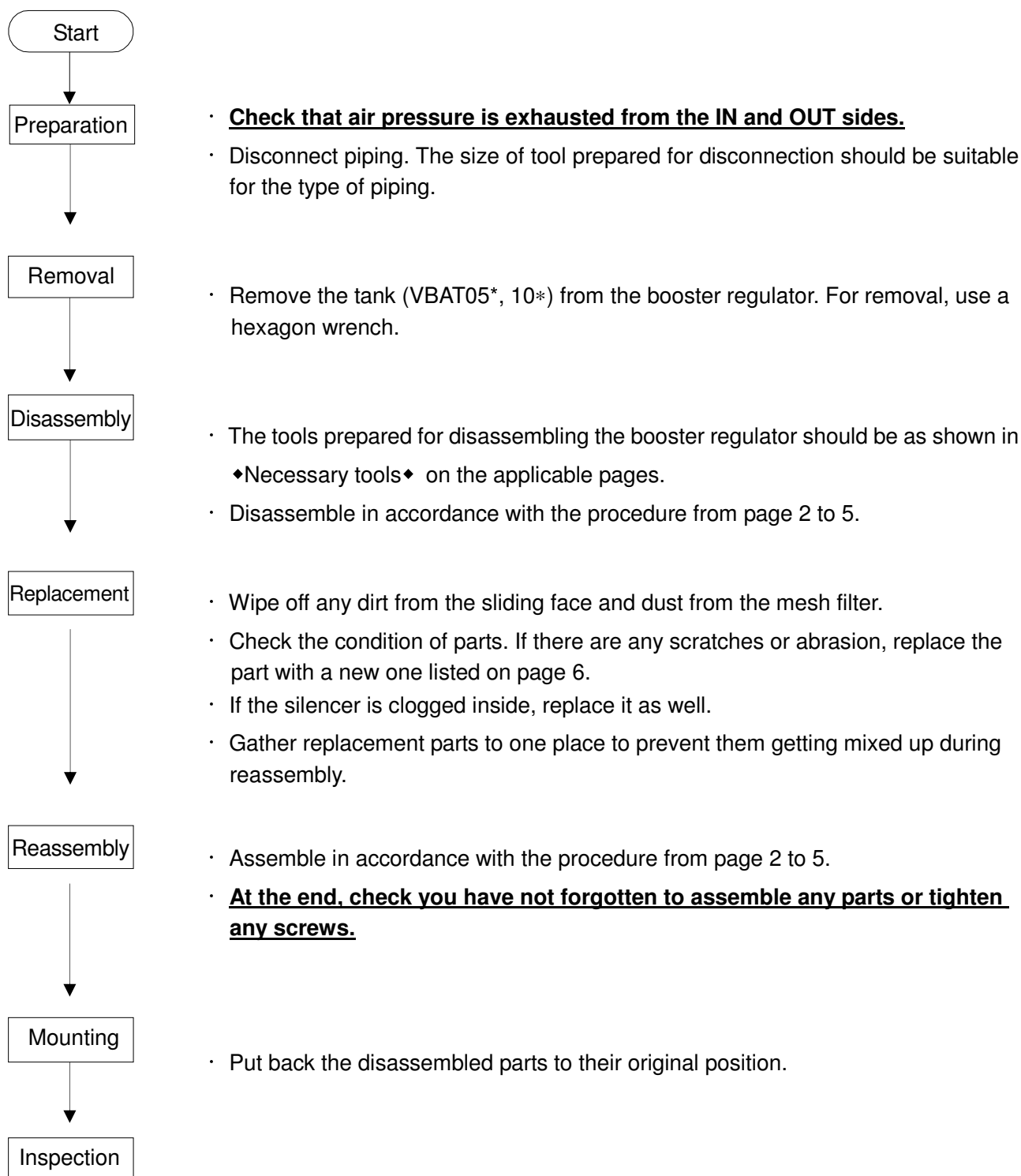
1. Foreword

When the booster regulator is disassembled and reassembled for maintenance, read and follow this manual.

The maintenance period depends on the air quality and operating conditions, but when either of the following situations occurs, the booster regulator should be considered to be reaching the end of its life, and maintenance should be performed sooner.

1. The handle is bleeding all the time.

2. Exhaust sound can be heard at intervals of 10 to 20 seconds without air consumption on the secondary side.





Finish

- Supply air, rotate the handle clockwise and set the pressure.
- Check for external leakage with soapy water.
- If any abnormal phenomenon is seen, please contact SMC sales branch.

2. Maintenance of cylinder and body

2.1 Maintenance of cylinder

◆Necessary tools◆

Socket wrench, Nominal 10mm (2pcs)
Hexagon wrench, Nominal 5mm
Looseness preventive adhesive (Loctite 263, etc.)
Grease package (Multi-purpose2, etc.)

◆Disassembly procedure◆


- 1) **Check air pressure is exhausted from the IN and OUT sides.**
- 2) Remove the pressure gauge and the silencer first if they are mounted.
- 3) Remove the eight hexagon socket head cap screws (8) on the left and the right with a hexagon wrench.
- 4) Remove the cover (6) and the cover C assembly (9).
- 5) Loosen one of the piston nuts (7) or (15) with a socket wrench, and remove one of the pistons (4) or (10).
(Remove only one of the piston nuts either on the left hand side or the right hand side.)

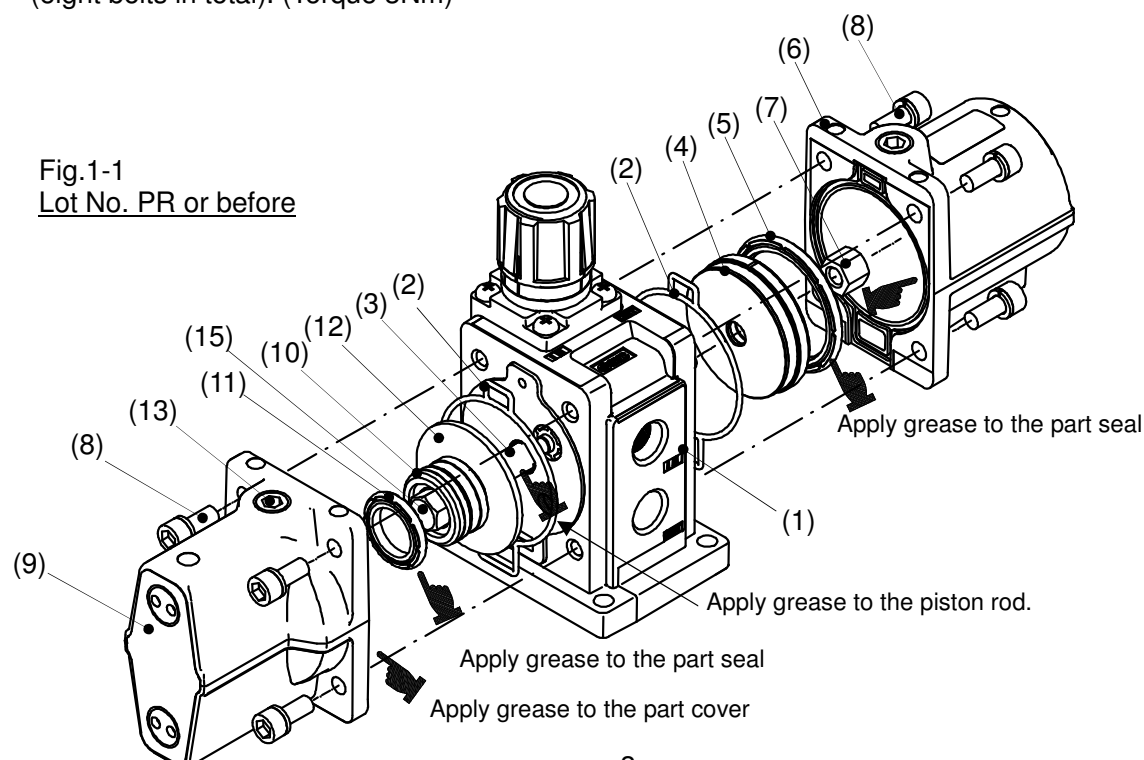
◆Maintenance and check◆

- 1) Check there is no abrasion, deterioration and deformation of any part. If there is, replace it with new one.
- 2) If there is any part whose motion is not smooth, wipe off dirt and apply grease.
- 3) If you move onto maintenance of the body, refer to 2.2 Maintenance of body (P.3).


◆Reassembly◆ ! Caution! Assembly parts are different depending on lot.

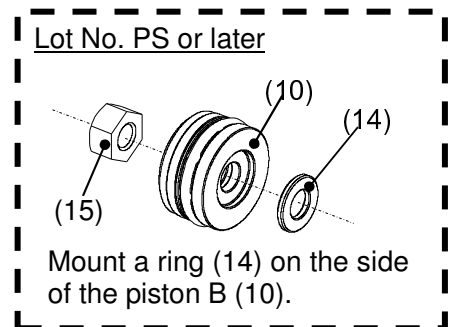
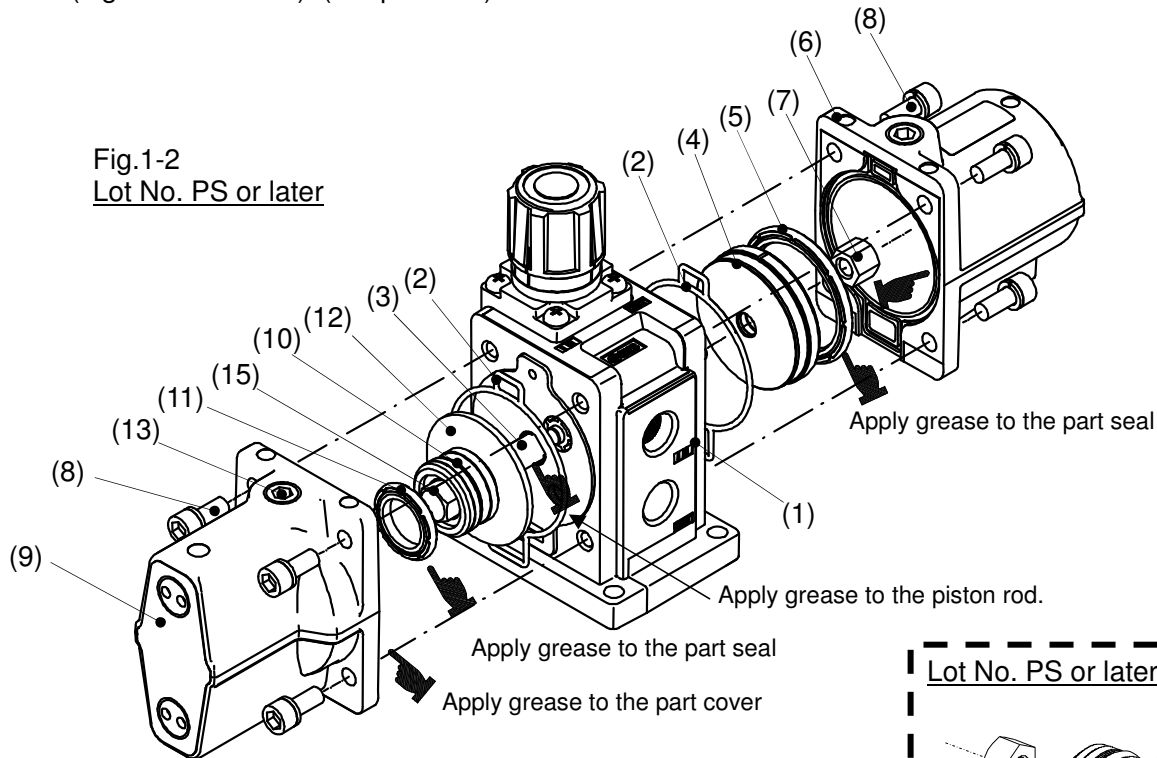
Lot No. PR or before (Fig. 1-1)

- 1) Apply grease to the part marked with  in Fig. 1-1.
- 2) Put the piston rod (3) through the body (1), and mount the piston (4) and the piston B (10) with the plate (12) inserted to the piston with the smaller diameter (piston B) (10).
- 3) Apply one drop of Loctite to the thread of the piston nuts (7) and (15), and tighten it with a socket wrench. (Torque 3.9Nm) **The piston is not fixed completely (idles) if it is assembled correctly. Do not tighten it over the necessary torque.**
- 4) Mount the cover (6) and the cover C assembly (9) to the body (1) after the cover gasket (2) is mounted to the cover (6) and the cover C assembly (9).
- 5) Fix the cover (6) by tightening four hexagon head bolts (8) on each side of the cover C assembly (9) (eight bolts in total). (Torque 3Nm)



Lot No. PS or later (Fig. 1-2)

- 1) Apply grease to the part marked with  in Fig. 1-2.
- 2) Put the piston rod (3) through the body (1), and mount the piston (4), ring (14) and the piston B (10) with the plate (12) inserted to the piston with the smaller diameter (piston B) (10).
- 3) Apply one drop of Loctite to the thread of the piston nuts (7) and (15), and tighten it with a socket wrench. (Torque 3.9Nm) **The piston (4) should be firmly fixed when correctly assembled. The piston B (10) should be loosely mounted when correctly assembled. Do not tighten piston B (11) over the correct torque setting.**
- 4) Mount the cover (6) and the cover C assembly (9) to the body (1) after the cover gasket (2) is mounted to the cover (6) and the cover C assembly (9).
- 5) Fix the cover (6) by tightening four hexagon head bolts (8) on each side of the cover C assembly (9) (eight bolts in total). (Torque 3Nm)



◆Check◆


- 1) Check the bolts and nuts are tightened to adequate torque.
- 2) Supply air and check pressure setting can be performed.
- 3) Check there is no leakage from connected parts with soapy water.

Replacement of the Piston and Piston Rod (Fig. 1-3)

1) Prepare the piston parts kit (KT-VBA11A-28).

2) Replace the rod seal with a new seal.

Replacement procedure of the rod seal, refer to section **2.2 Maintenance of body.**

3) Apply grease to the cover (6), cover C assembly (9) and piston rod (3) (the part indicated by  in Fig. 1-3).

4) Put the piston rod (3) through the body (1), and mount the piston (16), and piston B (17) with the plate (12) inserted to the piston with the smaller diameter (17) (piston B).

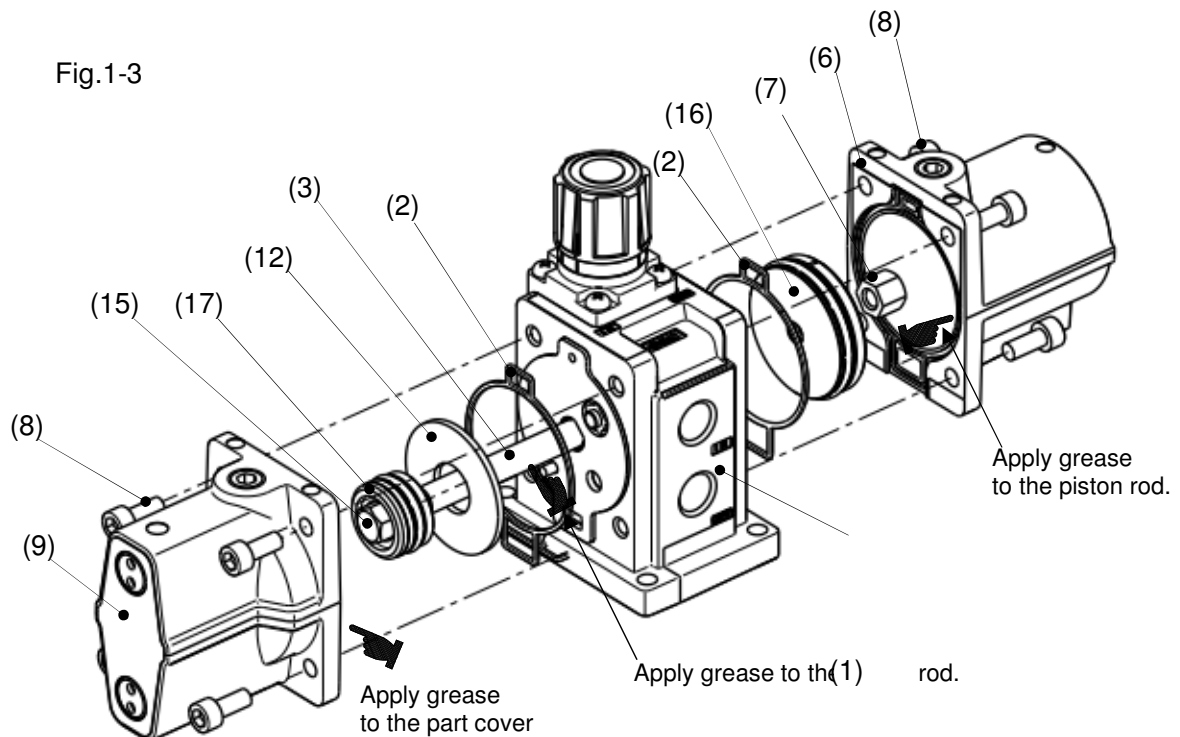
(Piston B (17) is shipped in the state that installed in a piston rod (3).)

5) Apply one drop of Loctite to the thread of the piston nut (7), and tighten the piston nut (7) onto the piston (16) side, and piston nut (15) onto the piston B (17) side with a socket wrench. (Tightening torque: 3.9 Nm)

The piston (16) should be firmly fixed when correctly assembled. The piston B (17) should be loosely mounted when correctly assembled. Do not tighten piston B (17) over the correct torque setting.

6) Mount the cover (6) and the cover C assembly (9) to the body (1) after the cover gasket (2) is mounted to the cover (6) and the cover C assembly (9).

7) Fix the cover (6) by tightening four hexagon head bolts (8) on each side of the cover C assembly (9) (eight bolts in total). (Torque 3 Nm)



◆Check◆

1) Check the bolts and nuts are tightened to adequate torque.

2) Supply air and check pressure setting can be performed.

3) Check there is no leakage from connected parts with soapy water.

2.2 Maintenance of body

◆Necessary tools◆

Flat blade screwdriver
Pair of tweezers
Turbine oil (Turbine oil 32 class 2, Exxon Mobile or similar)
Grease package (Multi-Purpose 2, etc)

◆Disassembly◆

- 1) Remove the side plate (2) and the side plate D (19) on the left and right .
- 2) Remove the side plate insert C (3) and the side plate insert D (4) on the left and right with a flat blade screwdriver.
- 3) Take out the check valves (5) through (7) from the body (1).
- 4) Take out the switch valves (9) through (13) from the body (1).
- 5) Take out the rod seal (14) from the body (1) with a pair of tweezers.

◆Maintenance and check◆

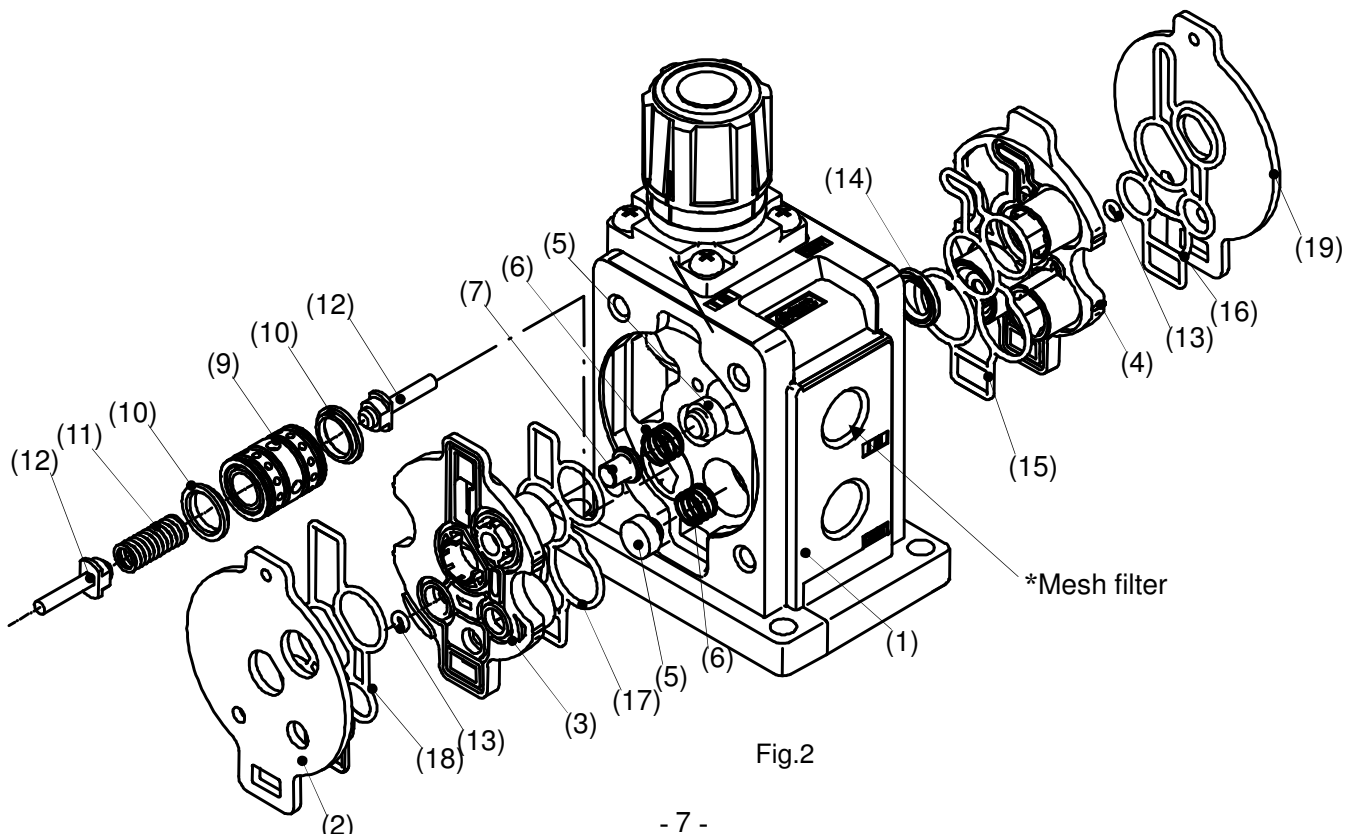
- 1) Check there is no abrasion, deterioration and deformation of any part. If there is, replace it with new one.
- 2) The end of IN port has a mesh filter built in. Remove dust from the filter by air blowing.
- 3) If there is any part whose motion is not smooth, wipe off dirt and apply grease. Apply one drop of Turbine oil to the switch valve.

◆Reassembly◆

- 1) Mount the switch valves (9) through (13). (These are precision parts and should be handled with care.)
- 2) Mount the check valves (5), (6) and (7) on the left when facing to the front of Figure 2, and mount the side plate insert C (3) with the side plate gasket C (17) and the side plate gasket D (18) mounted, then mount the side plate (2) on them. **The mounting directions of the check valves (5) are different. Mount them in the correct orientation.**
- 3) Mount the side plate insert D (4) on the right when facing to the front of Figure 2, with the side plate gasket A (15) and the side plate gasket B (16) mounted, then mount the side plate D (19) on them.

◆Check◆

- 1) Check the springs are mounted in place and the check valve (5) and switch valve (9) move smoothly.



3. Maintenance of governor

◆Necessary tools◆

Phillips screwdriver
Pair of needle nose pliers

◆Disassembly◆

- 1) **Check air pressure is exhausted from the IN and OUT sides.**
- 2) Rotate the handle counterclockwise back to the end (in the negative direction).
- 3) Remove four cross recessed round head screws (12) with the Phillips driver.
- 4) Remove the bonnet assemblies (10) and (11), the regulating screw assembly (9), the regulating spring (8), the regulating piston assembly (7), the relief spring (6) and the relief valve (5).
- 5) Remove the governor chamber assembly (4), the valve assembly (3) and the valve spring (2) with a pair of needle nose pliers.

◆Maintenance and check◆

- 1) Check there is no abrasion, deterioration and deformation of any part. If there is, replace it with new one.
- 2) If there is any part whose motion is not smooth, wipe off dirt and apply grease.

◆Reassembly◆

- 1) Mount the valve spring (2) and the valve assembly (3) to the body (1), and then fit the governor chamber assembly (4) to the body.
- 2) Mount the relief spring (6) and the relief valve (5) to the regulating piston assembly (7), and then, put them into the governor chamber assembly (4). Put the regulating spring (8) and the regulating screw assembly (9) on them.
- 3) Put on the bonnet assemblies (10) and (11) and tighten them with four cross recessed round head screws (12) using the Phillips screwdriver. (Torque 0.76Nm)

◆Check◆

- 1) Check the cross recessed round head screws (12) are tightened and supply air.
- 2) When air pressure is supplied, it will start to relieve air. Quickly rotate the handle in the clockwise direction (in the positive direction) until it stops relieving air.
- 3) Check pressure setting to the necessary pressure can be performed with the handle.
- 4) Check there is no leakage from connected parts with soapy water.

* Maintenance of the governor can be performed without removing the cover part.

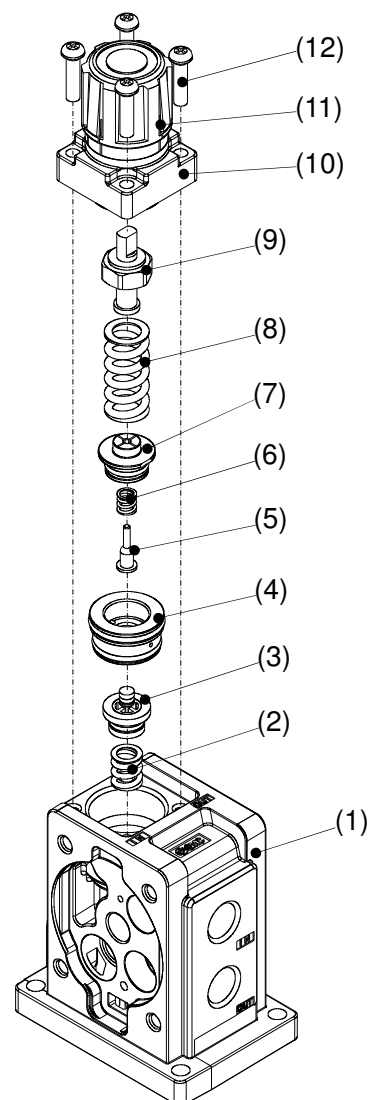


Fig.3

4. Replacement parts list

The replacement parts can be ordered with the following part numbers.

Each set includes the components shown on the right of this table. Refer to the drawing number and item number in this manual to check each part.

Part	Description	Component			
		Description	Qty.	Drawing No.	Item No.
KT-VBA11A-20	Booster regulator maintenance parts set	Piston seal	1	Fig.1	(5)
		Piston seal	1	Fig.1	(11)
		Rod seal	1	Fig.2	(14)
		Cover gasket	2	Fig.1	(2)
		Valve assembly	1	Fig.3	(3)
		Governor chamber assembly	1	Fig.3	(4)
		Check valve	2	Fig.2	(5)
		Valve spring	1	Fig.3	(2)
		Cover C assembly	1	Fig.1	(9)
		Plug	1	Fig.1	(13)
		Grease package	1	-	-
KT-VBA11A-2	Switch valve set	Switch valve assembly	1	Fig.2	(9)
		Exhaust sleeve	2	Fig.2	(10)
		Travel spring	1	Fig.2	(11)
		Push rod	2	Fig.2	(12)
		O-ring	2	Fig.2	(13)
KT-VBA10A-3	Governor chamber set	Governor chamber assembly	1	Fig.3	(4)
		Valve assembly	1	Fig.3	(3)
		Valve spring	1	Fig.3	(2)
		Regulating piston assembly	1	Fig.3	(7)
		Relief valve	1	Fig.3	(5)
		Relief spring	1	Fig.3	(6)
KT-VBA11A-4	Seal kit	Piston seal	1	Fig.1	(5)
		Piston seal	1	Fig.1	(11)
		Rod seal	1	Fig.2	(14)
		Cover gasket	2	Fig.1	(2)
		Grease package	1	-	-
KT-VBA11A-5	Check valve set	Check valve	2	Fig.2	(5)
		Check valve	2	Fig.2	(6)
		Check valve spring	1	Fig.2	(7)
		Plunger	1	Fig.2	(3)
		Side plate insert C	1	Fig.2	(4)
		Side plate insert D	1	Fig.2	(15)
		Side plate gasket A	1	Fig.2	(16)
		Side plate gasket B	1	Fig.2	(17)
		Side plate gasket C	1	Fig.2	(18)
		Side plate gasket D	1	Fig.2	(18)
KT-VBA10A-6	Bonnet set	Grease package	1	-	-
		Bonnet	1	Fig.3	(10)
		Handle	1	Fig.3	(11)

Part	Description	Component			
		Description	Qty	Drawin g No.	Item No.
KT-VBA11A-28	Piston parts kit	Piston A assembly	1	Fig.1-3	(16)
		Piston nut	1	Fig.1-3	(7)
		Piston rod	1	Fig.1-3	(3)
		Piston B assembly	1	Fig.1-3	(17)
		Ring (Included in the piston B assembly)	1	Fig.1-2	(14)
		Piston nut	1	Fig.1-3	(15)
		Cover gasket	1	Fig.1-3	(2)
		Rod seal	2	Fig.2	(14)
		Grease package	1	-	-