

MAINTENANCE MANUAL

GLOBAL SERIES

Air-Operated Double Diaphragm Pumps

G25

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 G25A□ Diaphragm Pumps.

This edition is based on the standards for the July 2022 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

For safe use of this product, be sure to note the following: In this document, warnings and cautions are indicated by symbols. These symbols are for those who will operate this product and for those who will be nearby, for safe operation and for prevention of personal injury and property damage. The following warning and caution symbols have the meanings described below. Be sure to remember their meanings.



WARNING: If you ignore the warning described and operate the product in an improper manner, there is danger of serious bodily injury or death.



CAUTION : If you ignore the caution described and operate the product in an improper manner, there is danger of personal injury or property damage.

Furthermore, to indicate the type of danger and damage, the following symbols are also used along with those mentioned above:



This symbol indicates a DON'T, and will be accompanied by an explanation on something you must not do.



This symbol indicates a DO, and will be accompanied by instructions on something you must do in a certain situation.

WARNING



- Before starting maintenance work, cut off the feed air and clean the pump. If air pressure or residue remain in the pump, there is danger of explosion, or possible poisoning resulting in serious injury or death if chemicals adhere to the skin or are accidentally swallowed. (For details on cleaning the pump, refer to Chapter 6 of the Operation Manual.)



- When replacing parts, be sure to use the recommended genuine parts or Equivalents. Use of other parts may cause a malfunction of the product. (Refer to Parts List the separate sheets.)

CAUTION



- When it is instructed that special tools must be used, be sure to use the specified tools. Otherwise, the pump may be damaged.



- Refer to “10.1 Specifications” in the Operation Manual. Also, remember that the pump is heavy, and extreme care must be taken when lifting it.

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1. Principles of operation

There are two diaphragms fixed to the center rod, one at each end. When compressed air is supplied to air chamber b (right side, see Fig.1.1), the center rod moves to the right, the material in material chamber B is pushed out, and at the same time material is sucked into material chamber A.

When the center rod is moved full-stroke to the right, the air switch valve is switched, compressed air is sent to air chamber a (left side, see Fig.1.2), and the center rod moves to the left. The material in material chamber A is pushed out, and at the same time material is sucked into material chamber B.

Through repetition of this operation, material is repeatedly taken in and discharged out.

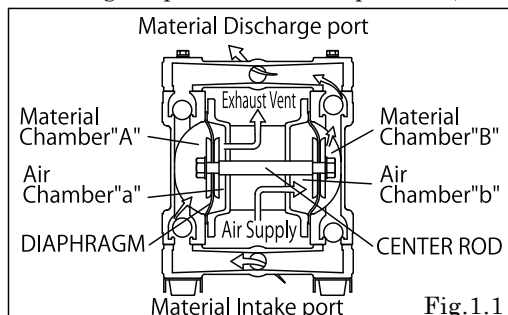


Fig.1.1

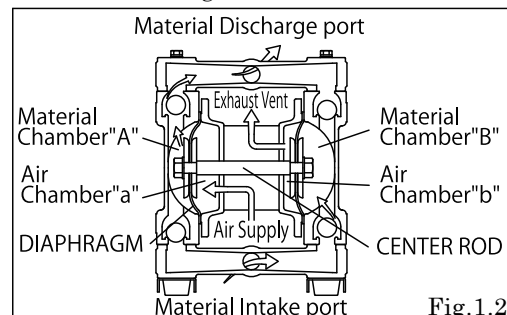
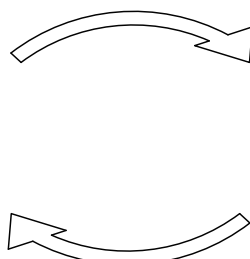


Fig.1.2

2. Maintenance and Tools

2.1 Maintenance

It is recommended that the pump should be regularly inspected, as this kind of diaphragm pump can be used in many different circumstances such as pressures, temperatures, viscosities, or corrosiveness. It's very useful for your future reference to keep records of the pump conditions for every inspection.

The regular inspection includes the air valve, diaphragms, balls, valve seats, or O-rings.

When it comes to diaphragms, in particular, both of the diaphragms should be replaced at one time, as they tend to be worn out or have some cracks on the surfaces. Please refer to 'usage range' in each section regarding the frequency of the replacement of the other spare parts.

2.2 General tools

- Socket wrenches 10 mm, 17 mm
- Open-end wrenches 10 mm, 17 mm, 22 mm
- Hexagonal box wrenches 5 mm

2.3 Special tools (sold separately)

- Cap remover
Purpose: Removing the cap

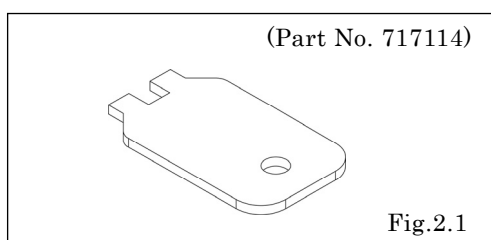


Fig.2.1

- Sleeve remover
Purpose: For removing sleeves

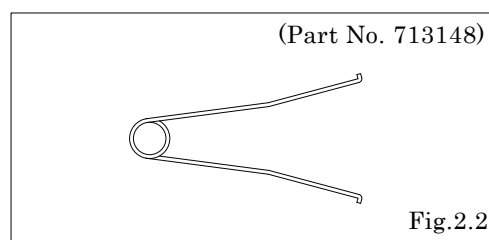


Fig.2.2

2.4 Misc.

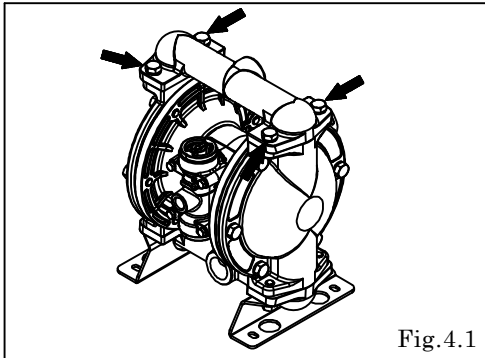
- Assembly oil Turbine oil none addition class 1(equivalent to ISO VG32 grade)
- Nuts M14 X 1.5 class 3
- Grease Urea grease grade (NLGI) No.2

3. Ordering Replacement parts

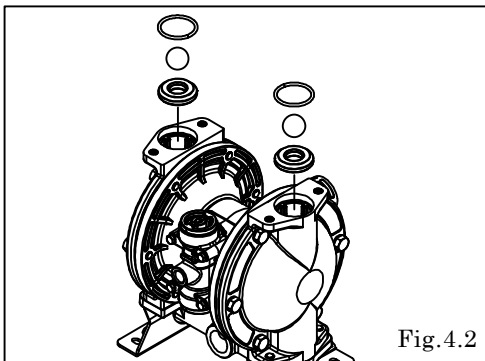
For accurate and speedy shipment of parts, be sure to order the right parts for your model to distributor. Indicate the part numbers, descriptions, and quantities.

4. Balls, Valve seats

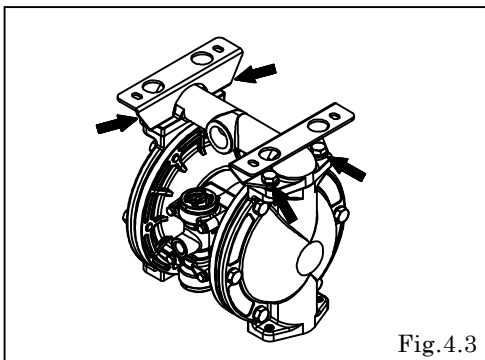
4.1 Removal



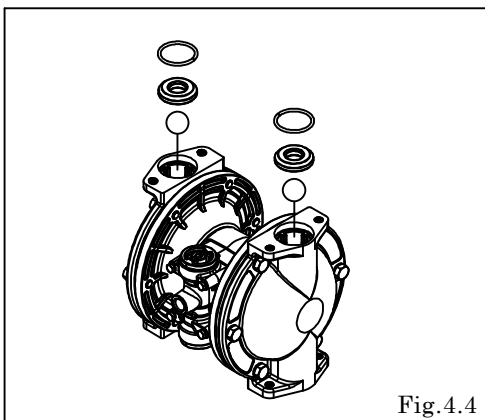
- Remove 4 mounting bolts from upper manifold and remove the manifold. [Fig.4.1]



- Remove the O ring, ball, valve seat. [Fig.4.2]

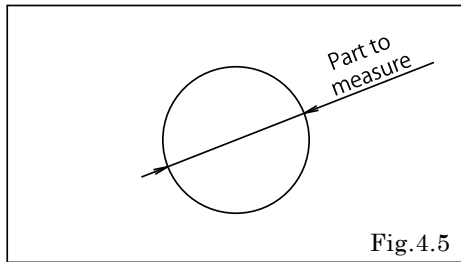


- Turn over the main body assembly. [Fig.4.3]
- Remove 4 mounting bolts from lower manifold and remove the base and the manifold. [Fig.4.3]



- Remove the O ring, valve seat, ball. [Fig.4.4]

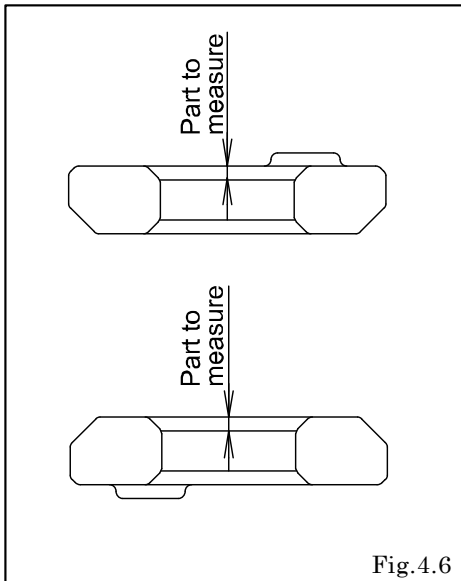
4.2 Inspection



▪ Ball [Fig.4.5]

Measure the outside diameter, and if it is outside the usable range, replace the ball.

Usable range of Ball
Sø 24.3 - Sø 27.8 mm



▪ Valve seat [Fig.4.6]

Measure the dimension shown at left, and if it is outside the usable range, replace the seat.

Usable range of Valve seat
4 mm or less

▪ O ring (other than PTFE)

If O ring is worn out or cracked, replace it.

4.3 Installation

For installation, see [Exploded View] on the separate sheet and install in the reverse order of disassembly.

Tightening torque for manifold retainer bolts or nuts

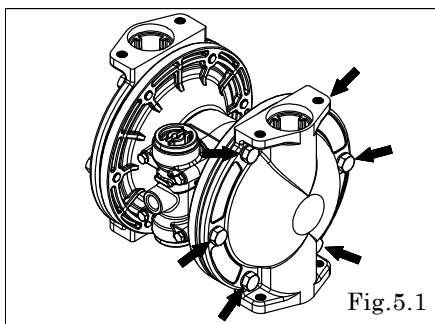
AN, AH, AS	10 N·m
AT	20 N·m

< NOTE >

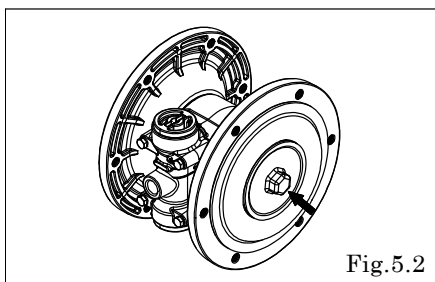
- Make sure there is no dust on the seal surface and the seal is not damaged.
- Replace the PTFE O ring regardless of its condition.

5. Diaphragm and Center rod

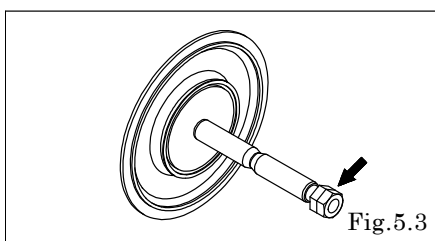
5.1 Removal



- Remove the O ring, ball, valve seat (see “4.1 Removal”).
- Remove the 12 retainer bolts from the out chamber, and remove the out chamber. [Fig.5.1]



- After the center disk on one side have been removed using the spanner 22 mm etc., remove the center disk and diaphragm. [Fig.5.2]
- Remove the center disk and center rod from the opposite side of the main body.



- Remove the center disk on the opposite side using the double nuts. [Fig.5.3]
- Remove the center disk and diaphragm.

5.2 Inspection

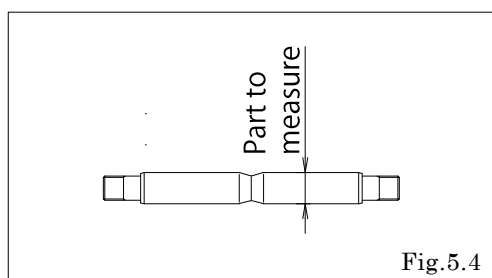
- Diaphragm
If the diaphragm is worn out or damaged, replace it.
Never replace just one diaphragm.

Frequency of inspecting the diaphragms
(Transferring water at room temperature)

NBR	7,000,000 cycle
TPO, TPEE	10,000,000 cycle
PTFE	2,000,000 cycle

*The standard in our facility is ‘Air supply pressure 0.5 MPa with no discharge pressure.

*It's recommended to conduct an inspection, if 3 months have passed since you start using the pump, or if the number of cycles reaches the above.



- Center rod [Fig.5.4]
Measure the diameter, and if it is outside the usable range, replace the center rod.

Usable range of center rod

ϕ 17.95 - ϕ 18.00 mm

5.3 Installation

For installation, see [Exploded View] on the separate sheet and install in the reverse order of disassembly.

■ AN type

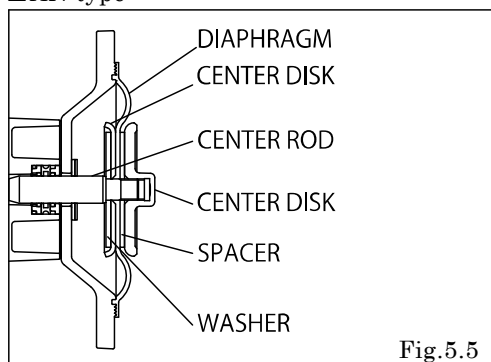


Fig.5.5

■ AT type

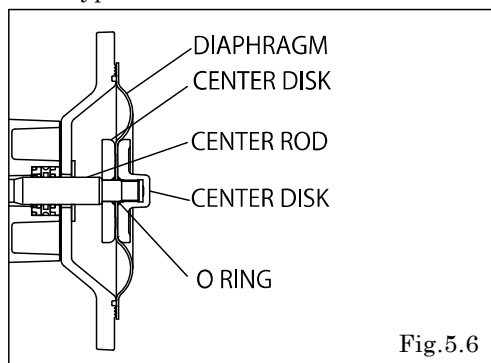


Fig.5.6

■ AH, AS type

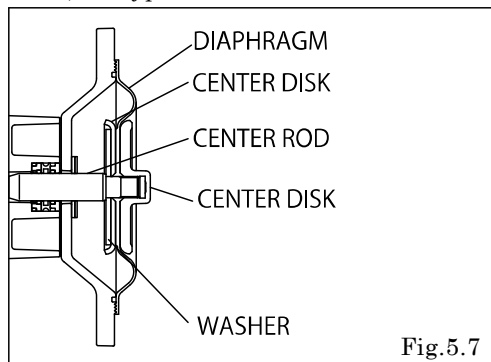


Fig.5.7

- Apply grease to the center rod, and insert it into the main body.
- Keep the convex side to the outside for diaphragm.
- For the model with NBR diaphragm, put the spacer into outside of the diaphragms. (cf. Fig.5.5).
- For the model with PTFE diaphragm, put the O rings into both side of the diaphragms. (cf. Fig.5.6).
- Pull out the diaphragm to one side and assemble the out chamber with Fig. 5.5、 5.6、 5.7 condition. Bolts should not be fully tightened at this point.
- Pull out the diaphragms to the other side and assemble the out chamber with Fig. 5.5、 5.6、 5.7 condition. Bolts should not be fully tightened at this point.
- Place the pump on flat surface, stand the pump upright and tighten all the bolts fully.

Tightening torque for center rod and out chamber

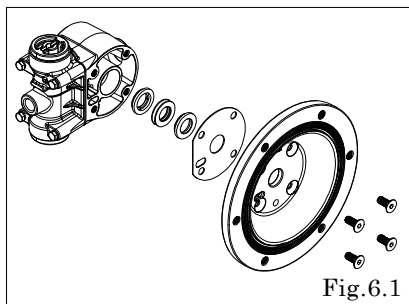
	Center rod	Out chamber
NBR	40 N·m	10 N·m
PTFE, TPO, TPEE		20 N·m

< NOTE >

- Make sure there is no dust on the seal surface in order to prevent seal damaged.
- Replace the PTFE O ring by new one.
- Tighten the bolts that balance should be equal from both side on diagonal line with even torque.

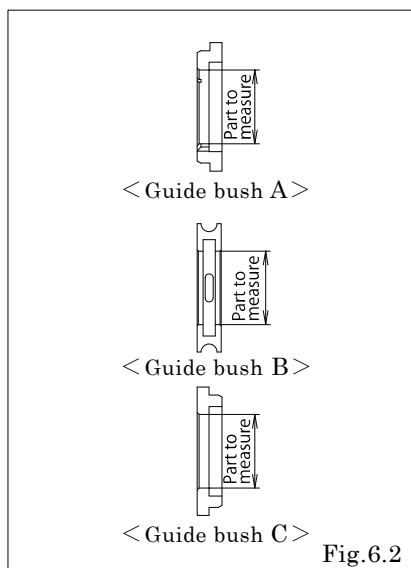
6. Guide Bush

6.1 Removal



- Remove the diaphragm and center rod etc. (see “5.1 Removal”).
- Remove 8 mounting bolts from the air chamber and remove the air chamber and the gasket. [Fig.6.1]
- Draw out the guide bush A, B, C. [Fig.6.1]

6.2 Inspection



- Guide bush [Fig.6.2]
Measure the inside diameter, and if it is outside the usable range, replace the guide bush.

Usable range of guide bush

Guide bush A, C	$\phi 18.4 - \phi 18.7 \text{ mm}$
Guide bush B	$\phi 18.3 - \phi 18.6 \text{ mm}$

- O ring
If the O ring is worn out or cracked, replace it.

6.3 Installation

For installation, see [Exploded View] on the separate sheet and install in the reverse order of disassembly.

Tightening torque for air chamber retainer bolts

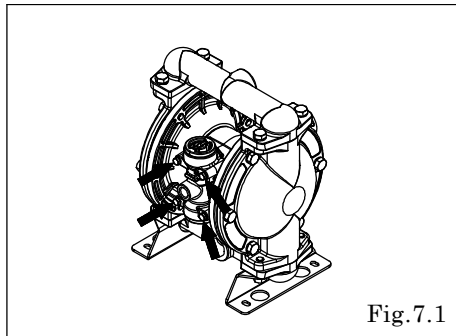
18 N·m

<NOTE>

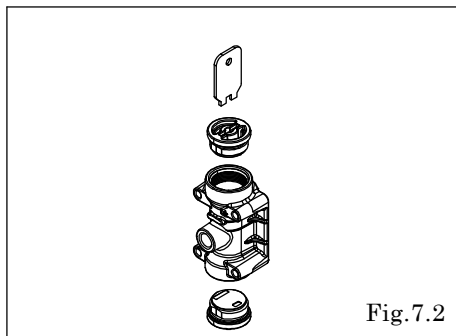
- Make sure there is no dust on the seal surface and the seal is not damaged.
- Apply grease to O ring.
- Fill the inside diameter groove of the guide bush B with grease.

7. Spool valve assembly and Sleeve

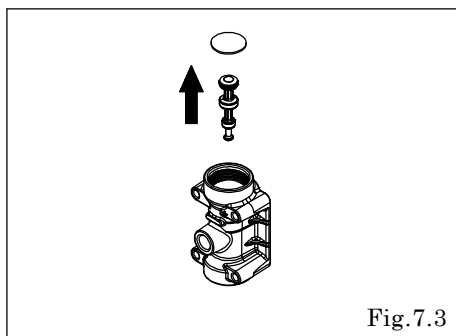
7.1 Removal



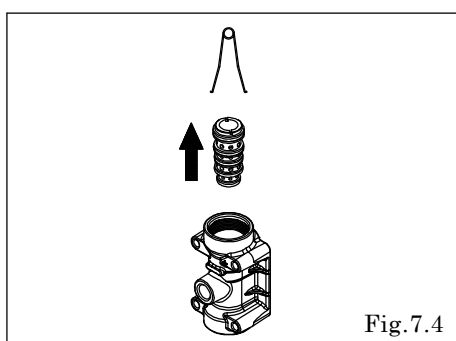
- Remove 4 bolts fixing the valve body assembly and draw out the valve body assembly from the main body. [Fig.7.1]



- Remove the cap A using the cap remover. (special tool: Part No. 717114). [Fig.7.2]



- Remove the cushion, and then push out the spool valve assembly from opposite side. [Fig.7.3]



- Remove the sleeve using the sleeve remover (special tool: Part number 713148). [Fig.7.4]

7.2 Inspection

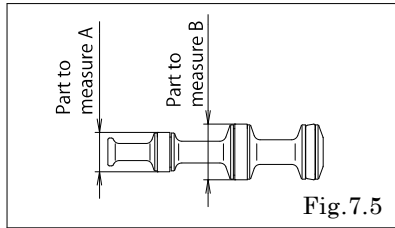


Fig. 7.5

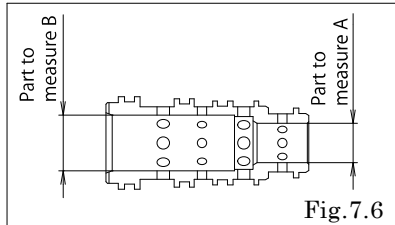


Fig. 7.6

▪ Spool valve assembly

Seal ring [Fig. 7.5]

Measure the outside diameter of the seal ring, and if it is outside the usable range, replace the spool valve assembly. If the seal ring is worn out or cracked, replace spool valve assembly.

Usable range of seal ring

Part to measure A	ϕ 12.58 mm and over
Part to measure B	ϕ 17.88 mm and over

▪ Sleeve [Fig. 7.6]

Measure the inside diameter, and if it is outside the usable range, replace the Sleeve.

Usable range of sleeve

Part to measure A	ϕ 12.66 - ϕ 12.79 mm
Part to measure B	ϕ 17.96 - ϕ 18.09 mm

▪ O ring, Packing

If the O ring is worn out or cracked, replace it.

<NOTE>

- Spool valve assembly and sleeve must be replaced complete set. Unable to replace individual component.

7.3 Installation

For installation, see [Exploded View] on the separate sheet and install in the reverse order of disassembly.

Tightening torque for valve body assembly attaching

5 N·m

<NOTE>

- Make sure there is no dust on the seal surface and it is not damaged.
- Fill the packing mounting part of the spool with grease and reinstall the packing.

8. Retightening of Tie rods

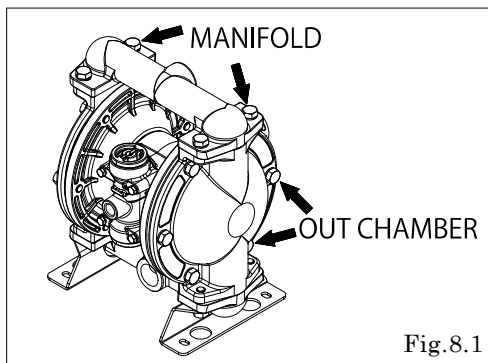


Fig. 8.1

- The torque should be applied on the occasion of

- (1) Right before the pump to use.
- (2) There are any leaks of material on daily inspecting a pump.

	Retainer bolts from the out chamber	Retainer bolts from the manifold
AN	10 N·m	
AT	20 N·m	
AH, AS	20 N·m	10 N·m

<NOTE>

- Tighten the bolts that balance should be equal from both side on diagonal line with even torque.
- Retighten the Out chamber and then the manifold in this order. [Fig. 8.1]

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