yamada

Doc. No.	NDP 541M-04

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.

These maintenance manuals cover 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 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.

Table of Contents

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.

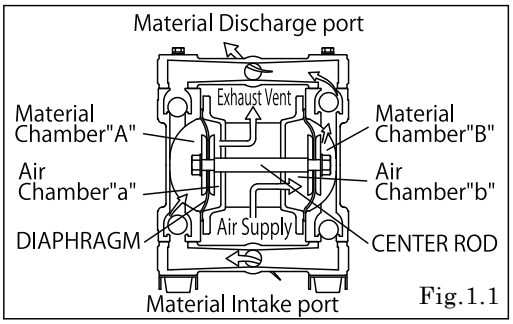

Fig.1.1

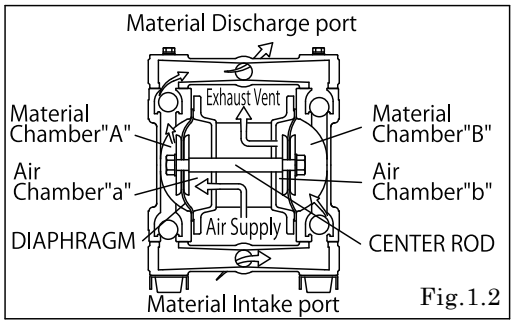

Fig.1.2

2. Maintenance and Tools

2.1 Maintenance

Since APDD (air powered double diaphragm pumps) can be used in many different applications varying in pressure, temperature, viscosity corrosiveness, and other properties, it is best to do a periodic inspection of the pump. Recording data on each installed pump during inspections will also serve as a record for any future maintenance. Typical maintenance involves inspection of the air valve, diaphragms, balls, valve seats and O-rings. BOTH diaphragms should be replaced if they show any sign of wear, abrading, or cracking. Refer to this manual for acceptable measurable working tolerances on other wearing components.

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

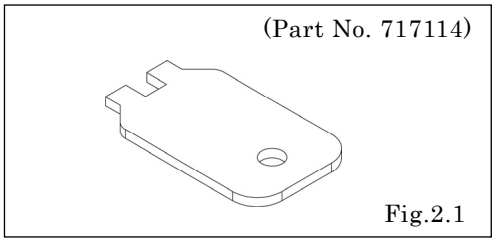

Fig.2.1

- Sleeve remover
  Purpose: For removing sleeves

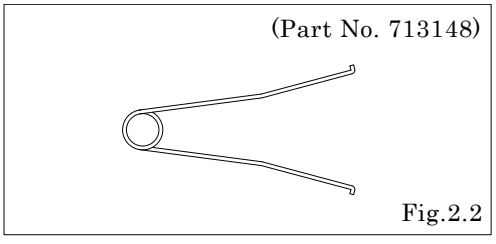

Fig.2.2

2.4 Misc.

- Assembly oil Turbine oil none addition class 1(equivalent ISO VG32 grade)
- Nuts M14×1.5 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

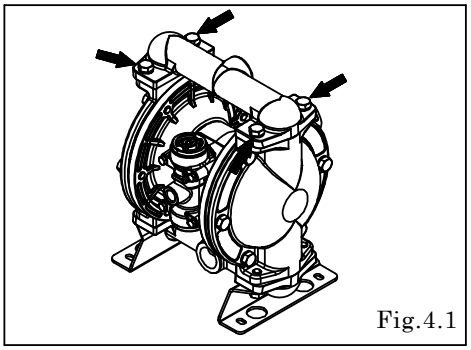

Fig.4.1

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

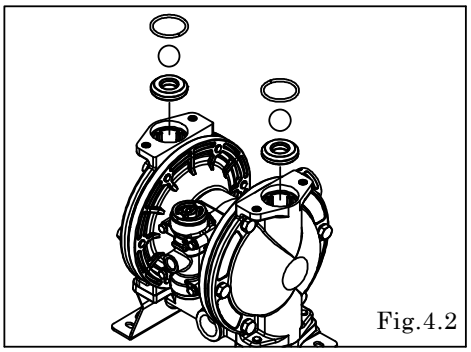

Fig.4.2

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

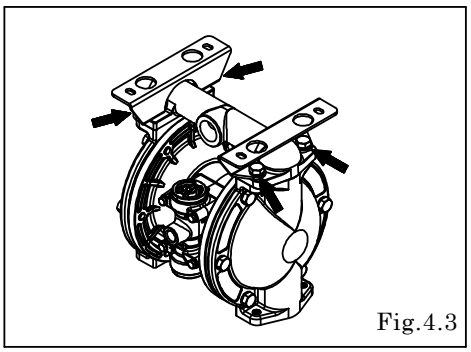

Fig.4.3

▪ 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]

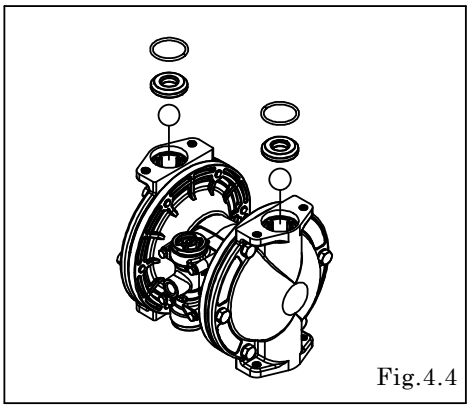

Fig.4.4

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

4.2 Inspection

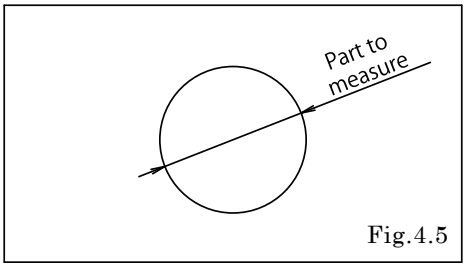

Fig.4.5

▪ Ball [Fig.4.5]
Measure the outside diameter, and if it is outside the usable range, replace the ball.

Usable range of Ball

Sø0.957 - Sø1.094 in. {Sø24.3 - Sø27.8 mm}

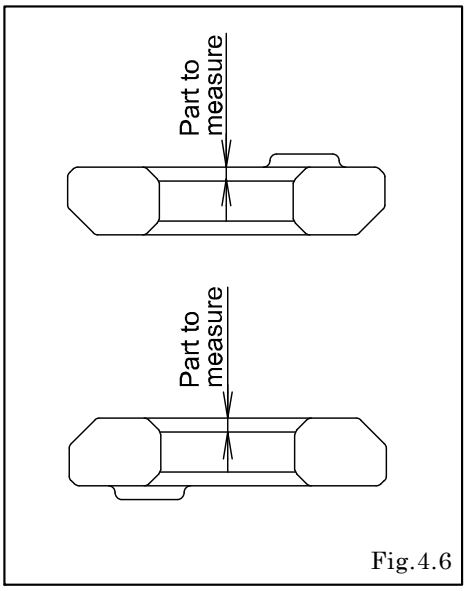

Fig.4.6

▪ 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

0.157in. or less {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	89 in-lbf {10 N-m}
AT	177 in-lbf {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

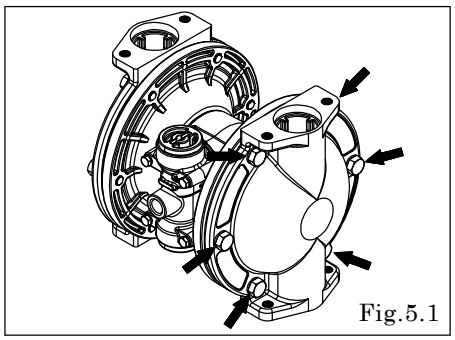

Fig.5.1

- 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]

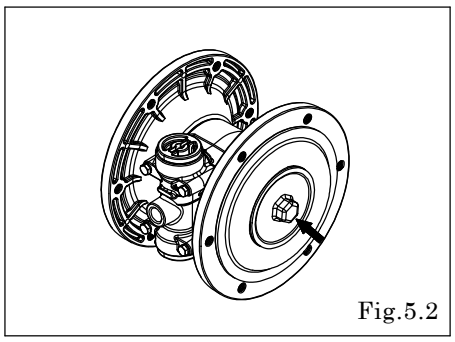

Fig.5.2

- 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.

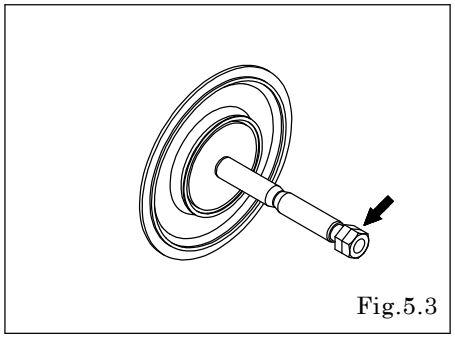

Fig.5.3

- 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.

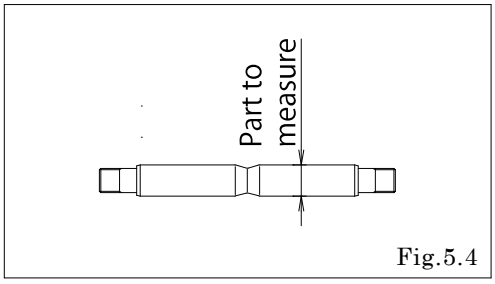

Fig.5.4

- 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

ø0.7067 - ø0.7087 in. {ø17.95 - ø18.00 mm}

5.3 Installation

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

■AN type

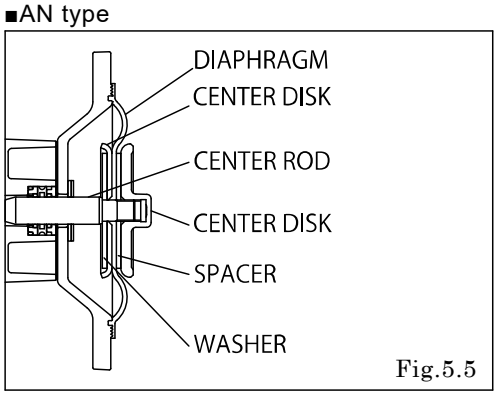

Fig.5.5

■AT type

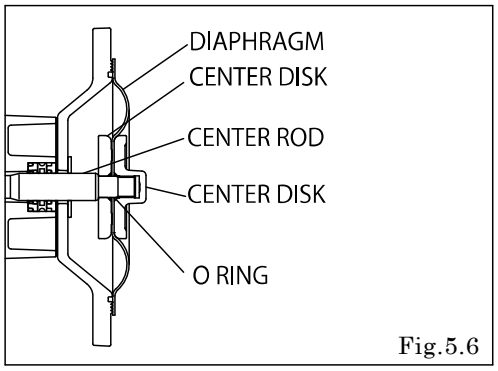

Fig.5.6

■AH, AS type

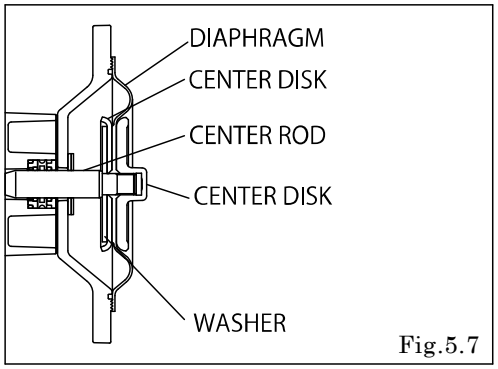

Fig.5.7

- 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	354 in-lbf {40 N-m}	89 in-lbf {10 N-m}
PTFE, TPO, TPEE		177 in-lbf {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

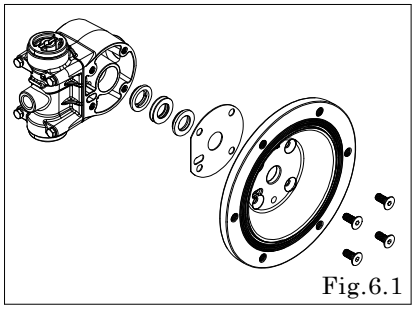

Fig.6.1

- 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

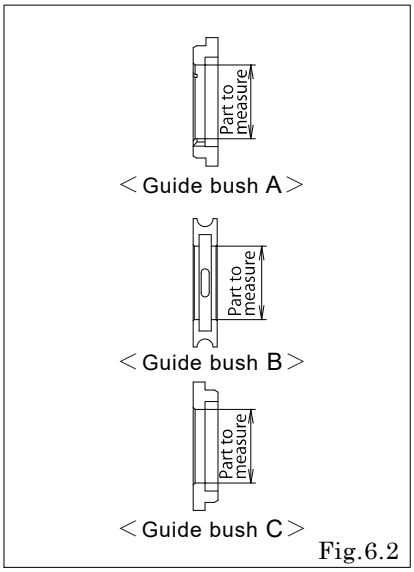

Fig.6.2

- 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	ø0.7244 - ø0.7362 in. {ø18.4 - ø18.7 mm}
Guide bush B	ø0.7205 - ø0.7323 in. {ø18.3 - ø18.6 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

13 ft-lbf {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

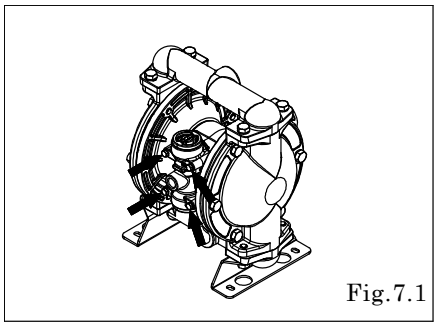

Fig.7.1

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

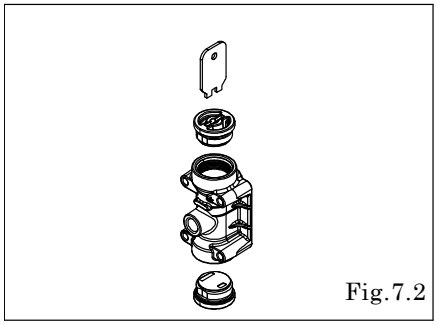

Fig.7.2

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

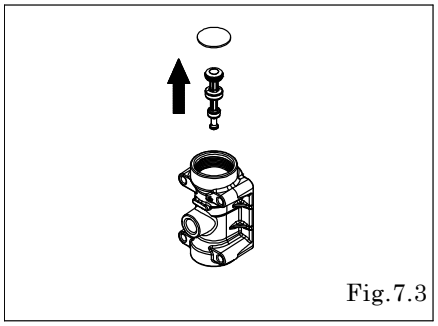

Fig.7.3

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

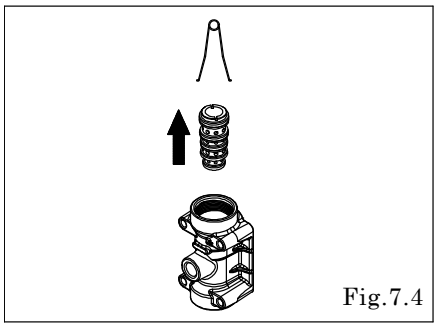

Fig.7.4

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

7.2 Inspection

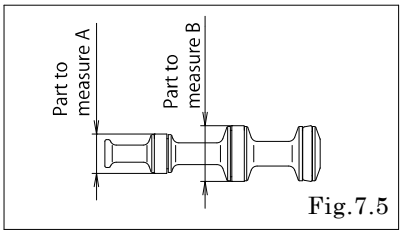

Fig.7.5

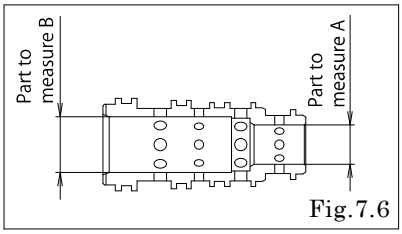

Fig.7.6

▪ 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	0.4953 in. and over {ø12.58 mm and over}
Part to measure B	0.7039 in. and over {ø17.88 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	ø0.4984 - ø0.5035 in. {ø12.66 - ø12.79 mm}
Part to measure B	ø0.7071 - ø0.7122 in. {ø17.96 - ø18.09 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

44 in-lbf {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

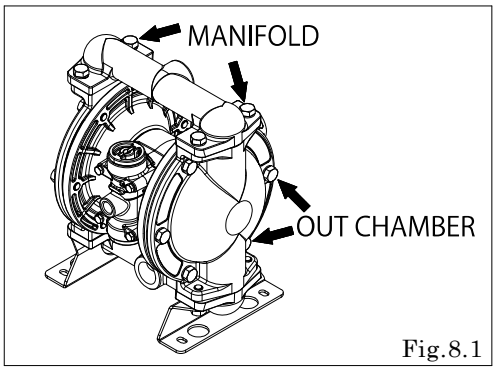

Fig.8.1

▪ 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	89 in-lbf {10 N-m}	
AT	177 in-lbf {20 N-m}	
AH, AS	177 in-lbf {20 N-m}	89 in-lbf {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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