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MAINTENANCE MANUAL

YAMADA AIR-OPERATED DIAPHRAGM PUMPS

NDP-20
NDP-25

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 NDP-20 series and NDP-25 series Diaphragm Pumps.

This edition is based on the standards for the March 2001 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 operating 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.

CAUTION



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



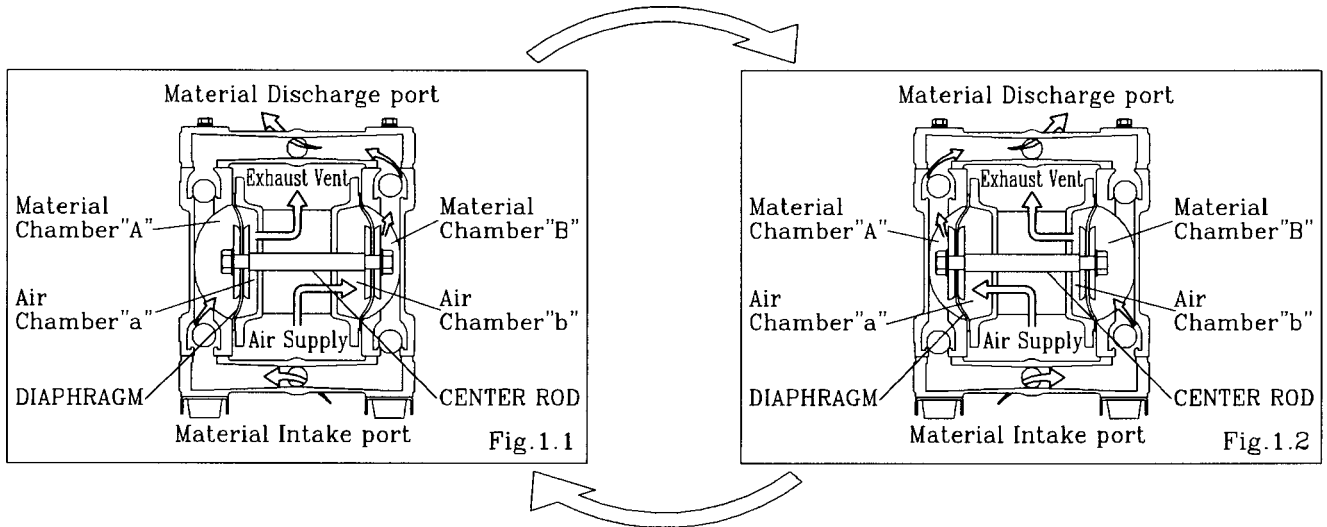
- Refer to 10.1 "Specifications" in the Operating Manual. Also, remember that the pump is heavy, and extreme care must be taken when lifting it.

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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.



2.Tools, etc.

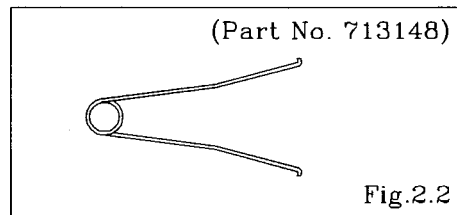
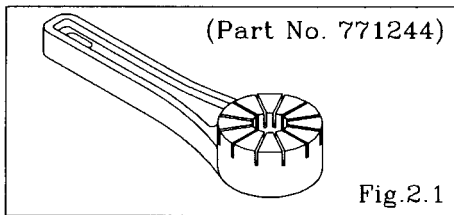
2.1 General tools

- Socket wrenches 10mm, 12mm, 13mm, 17mm, 22mm
- Hexagonal box wrenches 5mm
- Open-end wrenches 13mm(BP , BV), 22mm(BA , BS , BF , BA -D)

2.2 Special tools

- Accessory tool (Accessories)
- Purpose: Removing the center disk of BP and BV types

- Sleeve remover (sold separately)
- Purpose: For removing sleeves



2.3 Misc.

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

3.Ordering Replacement parts

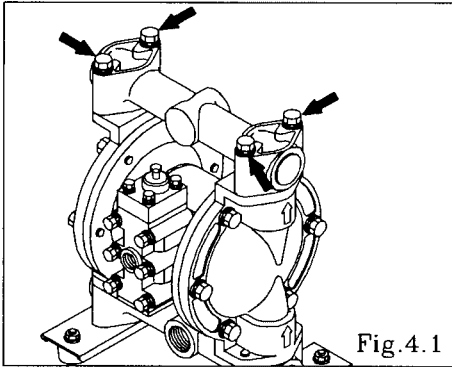
For accurate and speedy shipment of parts, be sure to order the right parts for your model to your dealer or one of our regional offices. Indicate the part numbers, descriptions, quantities and reasons for replacement, in as much in detail as possible.

4. Balls and Valve seats

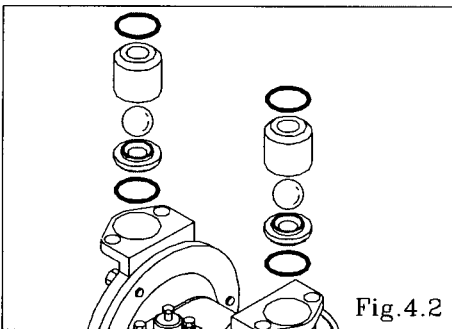
4.1 Removal

BA , BS , BF , BA -D types

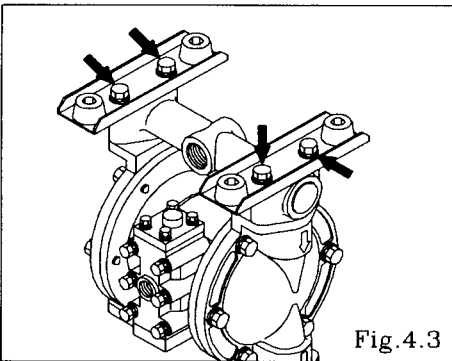
See [8. Exploded View] on after p. 12. (Fig. 4.1, 4.2, 4.3 and 4.4 show the NDP-20 BS.)



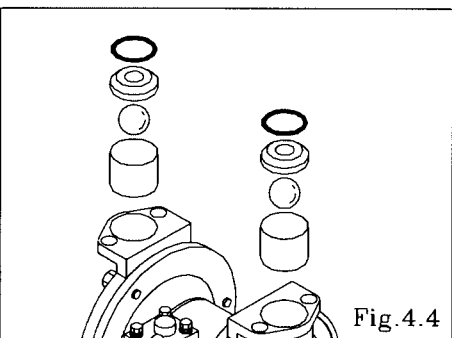
- Remove the 4 retainer bolts from the out manifold, and remove the out manifold. [Fig.4.1]



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



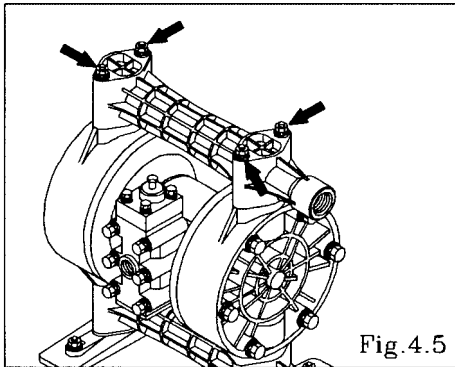
- Turn over the main body assembly. [Fig.4.3]
- Remove the 4 retainer bolts from the in manifold, and remove the in manifold and pump bases. [Fig.4.3] (The pump bases are not installed in BA -D types.)



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

BP , BV types

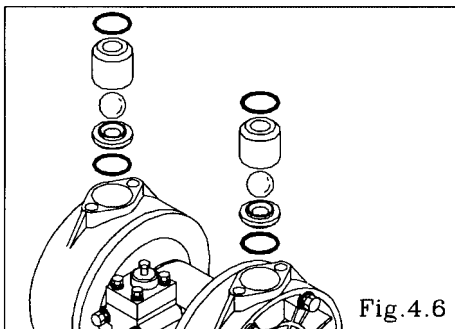
See [8. Exploded View] on after p. 12. (Fig. 4.5, 4.6, 4.7 and 4.8 show the NDP-20 BP .)



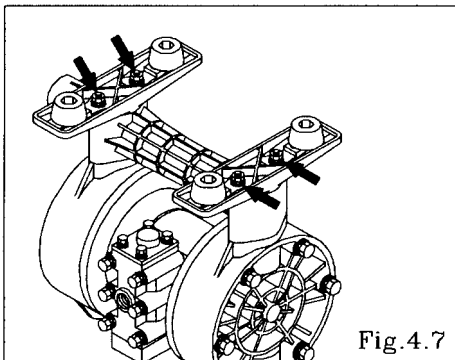
- Remove the 4 retainer nuts from the upper side of tie rods, and remove the out manifold. [Fig.4.5]

<NOTE>

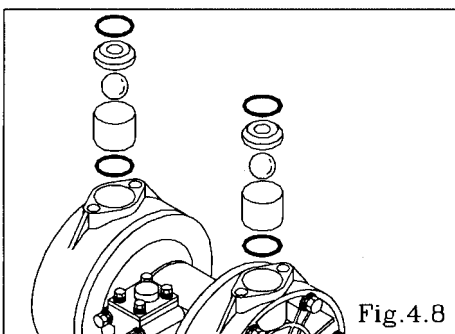
- When the retainer nuts both sides of the tie rod remove, the in manifold removes.



- Remove the O ring, valve stopper, ball and valve seat. [Fig.4.6]

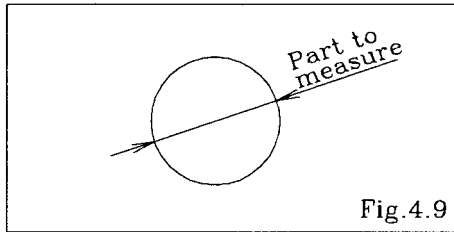


- Turn over the main body assembly. [Fig.4.7]
- Pull out the tie rod, and remove the base and in manifold. [Fig.4.7]



- Remove the O ring, valve seat, ball and valve stopper. [Fig.4.8]

4.2 Checking

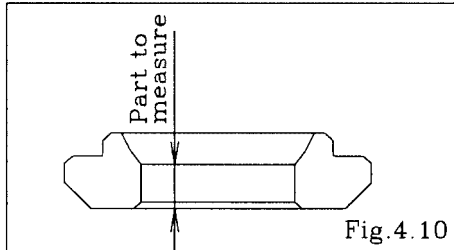


- Ball [Fig.4.9]

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

Usable range of Ball

NDP-20	S 24.3 ~ S 27.8 mm
NDP-25	S 31.5 ~ S 36.1 mm



- Valve seat [Fig.4.10]

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

Usable range of Valve seat

	BA , BS	BP , BV
NDP-20	3.4 ~ 8.5 mm	3.3 ~ 8.1 mm
NDP-25	3.8 ~ 9.5 mm	3.4 ~ 9.5 mm

- O ring (other than PTFE)

If O rings are worn out or cracked, replace them.

4.3 Installation

For installation, see [8. Exploded View] on after p. 12, and install in the reverse order of disassembly.

Tightening torque for manifold retainer bolts

		C, N, E, V, H, S	T
NDP-20	BA	10N·m{100kgf·cm}	20N·m{200kgf·cm}
	BA -D		35N·m{350kgf·cm}
	BS		
NDP-25	BA	10N·m{100kgf·cm}	35N·m{350kgf·cm}
	BS		
	BF		

Tightening torque for manifold retainer nuts

		C, N, E, V	T, H, S
NDP-20	BP	10N·m{100kgf·cm}	12N·m{120kgf·cm}
NDP-25	BP		
	BV		

<NOTE>

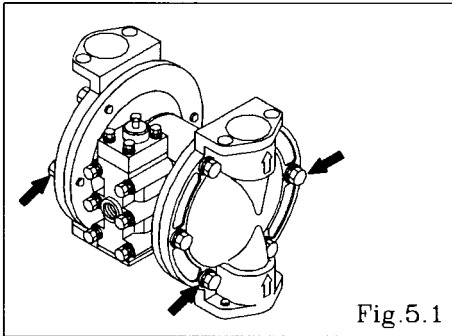
- Make sure there is no dust on the seal surface and the seal is not damaged.
- Replace the PTFE O ring regardless of its condition.

5. Diaphragm and Center rod

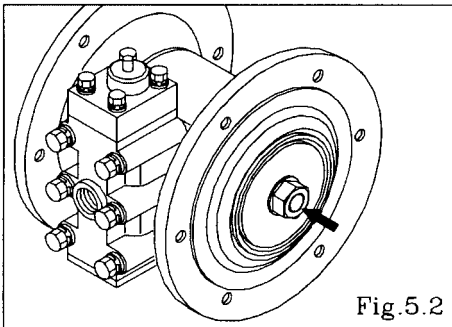
5.1 Removal

BA , BS , BF , BA -D types

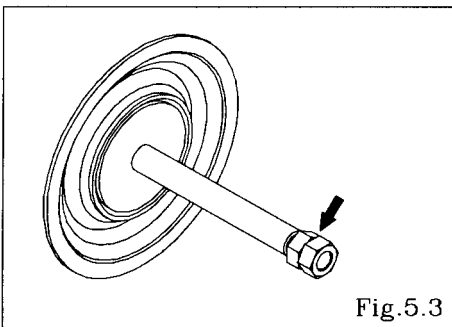
See [8. Exploded View] on after p. 12. (Fig. 5.1 shows the NDP-20 BS.)



- Remove the ball and valve seat etc. (see [4.1 Removal BA , BS , BF , BA -D types] on p.4)
- Remove the 12 retainer bolts from the out chamber, and remove the out chamber. [Fig.5.1]



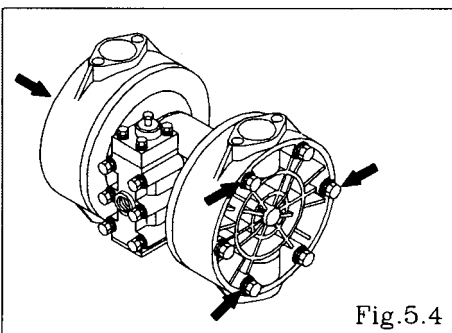
- Remove the nuts on both sides of the center rod. [Fig.5.2]
- After the nuts on one side have been removed, remove the center disk and diaphragm. Remove the diaphragm, center disk and center rod from the opposite side of the main body.



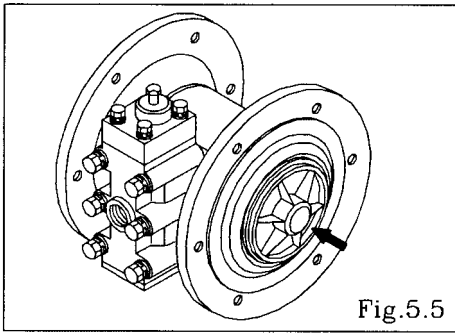
- Remove the nuts on the opposite side using the double nut. [Fig.5.3]
- Remove the coned disk spring, center disk and diaphragm.

BP , BV types

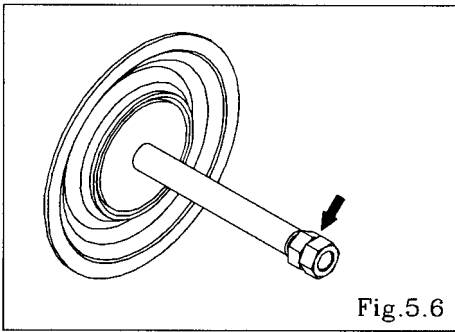
See [8. Exploded View] on after p. 12. (Fig. 5.4 shows the NDP-20 BP.)



- Remove the ball and valve seat etc. (see [4.1 Removal BP , BV types] on p.5)
- Remove the 12 retainer bolts from the out chamber, and remove the out chamber. [Fig.5.4]



- Remove the center disk from one side using the Accessory tool (special tool: Part No. 771244). [Fig.5.5]
- After the center disk (outside) has been removed, remove the diaphragm and the center disk (inside).
- Remove the center disk and center rod from the opposite side of the main body.



- Fix a double nut to one end of the center rod and take the diaphragm and center disk off the opposite end. [Fig.5.6]

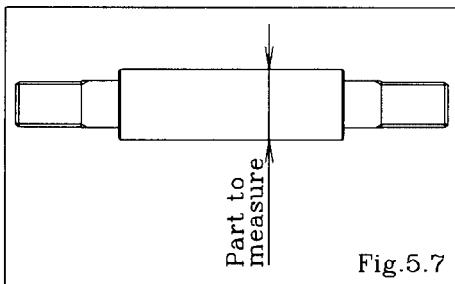
5.2 Checking

- Diaphragm
If the diaphragm is worn out or damaged, replace it.

Guideline of diaphragm life

CR, NBR, EPDM	10,000,000 cycle
FPM	2,500,000 cycle
PTFE	3,000,000 cycle
TPEE, TPO	15,000,000 cycle

(When used with clean water at room temperature)



- Center rod [Fig.5.7]
Measure the diameter, and if it is outside the usable range, replace the center rod.

Usable range of center rod

17.9 ~ 18.0 mm

5.3 Installation

B C, B N, B E, B V, B H, B S, BAC-D, BAN-D types

For installation, see [8. Exploded View] on after p. 12, and install in the reverse order of disassembly.

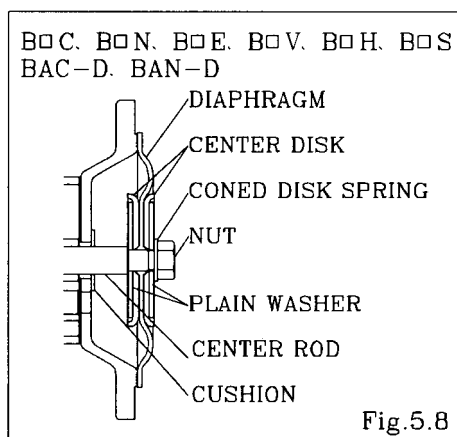


Fig.5.8

- Apply lubricating oil to the center rod, and insert it into the main body.
- Keep the marking " OUTSIDE" to liquid end for CR, NBR, EPDM, FPM diaphragms.
- Keep the convex side to the outside for TPEE, TPO diaphragms.
- Tighten the center disk using the Accessory tool(special tool: Part No.771244) for the BP , BV types.
(No coned disk springs and nuts are needed.)

Tightening torque for center rod

B C, B N, B E, B V	30 N•m { 300 kgf•cm }
B H, B S	40 N•m { 400 kgf•cm }

- Draw the center disk to one side, (cf. Fig.5.8)and install the out chamber. Tighten the bolts temporarily.
- Draw the center disk to the opposite side, then turn the diaphragm over (cf. Fig.5.8). And install the out chamber. Tighten the bolts temporarily.
- After installation of the out chambers on both sides, place the pump on a flat surface and stand the pump upright for further assembly.

Tightening torque for out chamber.

10 N•m { 100 kgf•cm }

<NOTE>

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

B T, BAT-D types

For installation, see [8. Exploded View] on after p. 12, and install in the reverse order of disassembly.

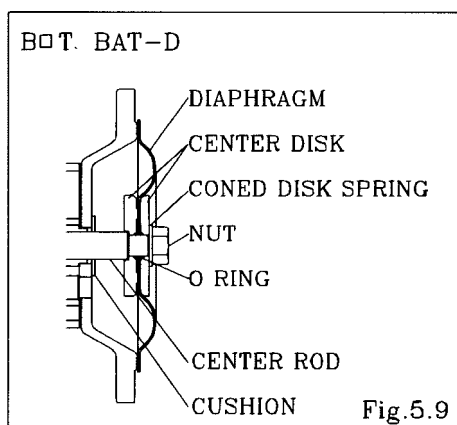


Fig.5.9

- Apply lubricating oil to the center rod, and insert it into the main body.
- Keep the convex side to the outside (cf. Fig.5.9).
- Put the O rings to both sides of the diaphragm. (cf. Fig.5.9).
- Tighten the center disk using the Accessory tool (special tool: Part No. 771244) for the BPT, BVT types.
(No coned disk springs and nuts are needed.)

Tightening torque for center rod

40 N•m { 400 kgf•cm }

- Tighten the out chamber temporarily at first.
- After installation of the out chambers on both sides, place the pump on a flat surface and stand the pump upright for further assembly.

Tightening torque for out chamber

NDP-20	13 N•m{ 130 kgf•cm }
NDP-25	20 N•m{ 200 kgf•cm }

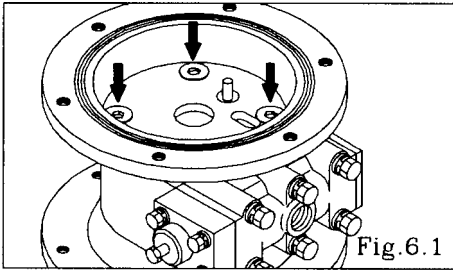
<NOTE>

- 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.

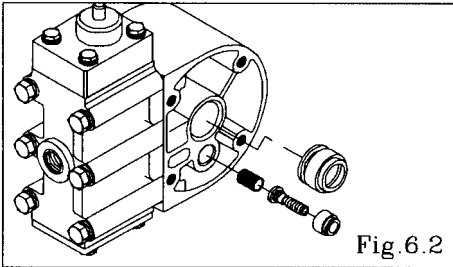
6. Throat bearing and Pilot valve Assembly

6.1 Removal

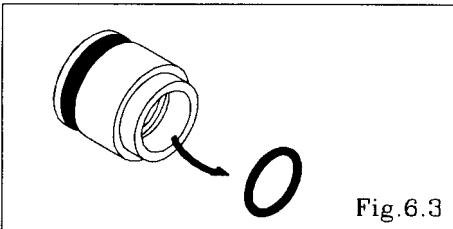
See [8. Exploded View] on after p. 12.



- Remove the diaphragm and center rod (see [5.1 Removal] on p.7).
- Remove the 8 retainer bolts from the air chamber, and remove the air chamber and gasket. [Fig.6.1]

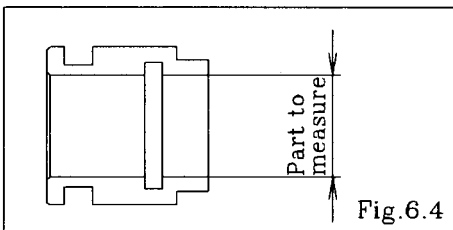


- Draw out the pilot valve assembly. [Fig.6.2]
- Draw out the throat bearing. [Fig.6.2]



- Remove the O ring from the throat bearing. [Fig.6.3]

6.2 Checking



- Throat bearing [Fig.6.4]
Measure the inside diameter, and if it is outside the usable range, replace the throat bearing.

Usable range of throat bearing

18.06 ~ 18.10 mm

- O rings
If the O ring is worn out or cracked, replace it.
- Pilot valve assembly
If the pilot valve is worn out or cracked, replace it.

6.3 Installation

For installation, see [8. Exploded View] on after p. 12, and install in the reverse order of disassembly.

Tightening torque for air chamber retainer bolts

18 N•m { 180 kgf•cm }

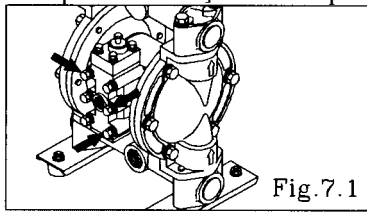
<NOTE>

- Make sure there is no dust on the seal surface and the seal is not damaged.

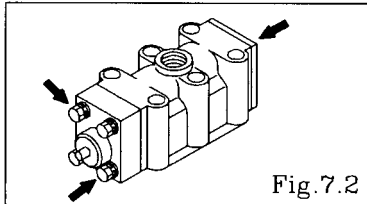
7. C Spool Valve Assembly and Sleeve Assembly

7.1 Removal

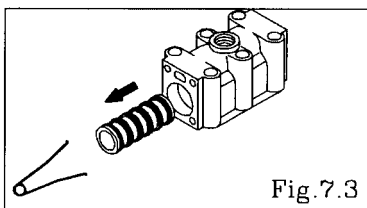
See [8. Exploded View] on after p. 12.



- Remove the 6 retainer bolts from the valve body, and remove the valve body. [Fig.7.1]

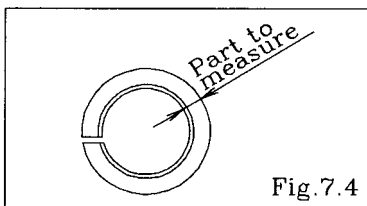


- Remove the 8 cap A and cap B retainer bolts, and remove cap A, cap B, packing, plain washer, cushion and gasket. [Fig.7.2]
- Draw out the C spool valve assembly, and remove the seal ring from the C spool valve assembly.



- Remove the sleeve using the sleeve remover (special tool: Part number 713148). [Fig.7.3]

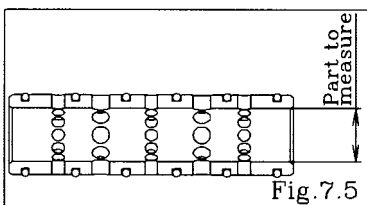
7.2 Checking



- C Spool Valve Assembly
- Seal ring [Fig.7.4]
Measure the inside thick diameter, and if it is outside the usable range, replace the C Spool Valve Assembly.
If the seal ring is worn out or cracked, replace C Spool Valve Assembly .

Usable range of Seal ring

2.95 ~ 3.00 mm



- Sleeve Assembly [Fig.7.5]
Measure the inside diameter, and if it is outside the usable range, replace the sleeve assembly.

Usable range of Sleeve

18.45 ~ 18.65 mm

- O rings
If the O ring is worn out or cracked, replace it.
- <NOTE>
- C Spool Valve Assembly and Sleeve Assembly must be replaced complete set. Unable to replace individual component

7.3 Installation

For installation, see [8. Exploded View] on after p. 12, and install in the reverse order of disassembly.

Tightening torque for installation Cap A, Cap B

6 N•m { 60kgf•cm }

Tightening torque for Valve body installation bolts

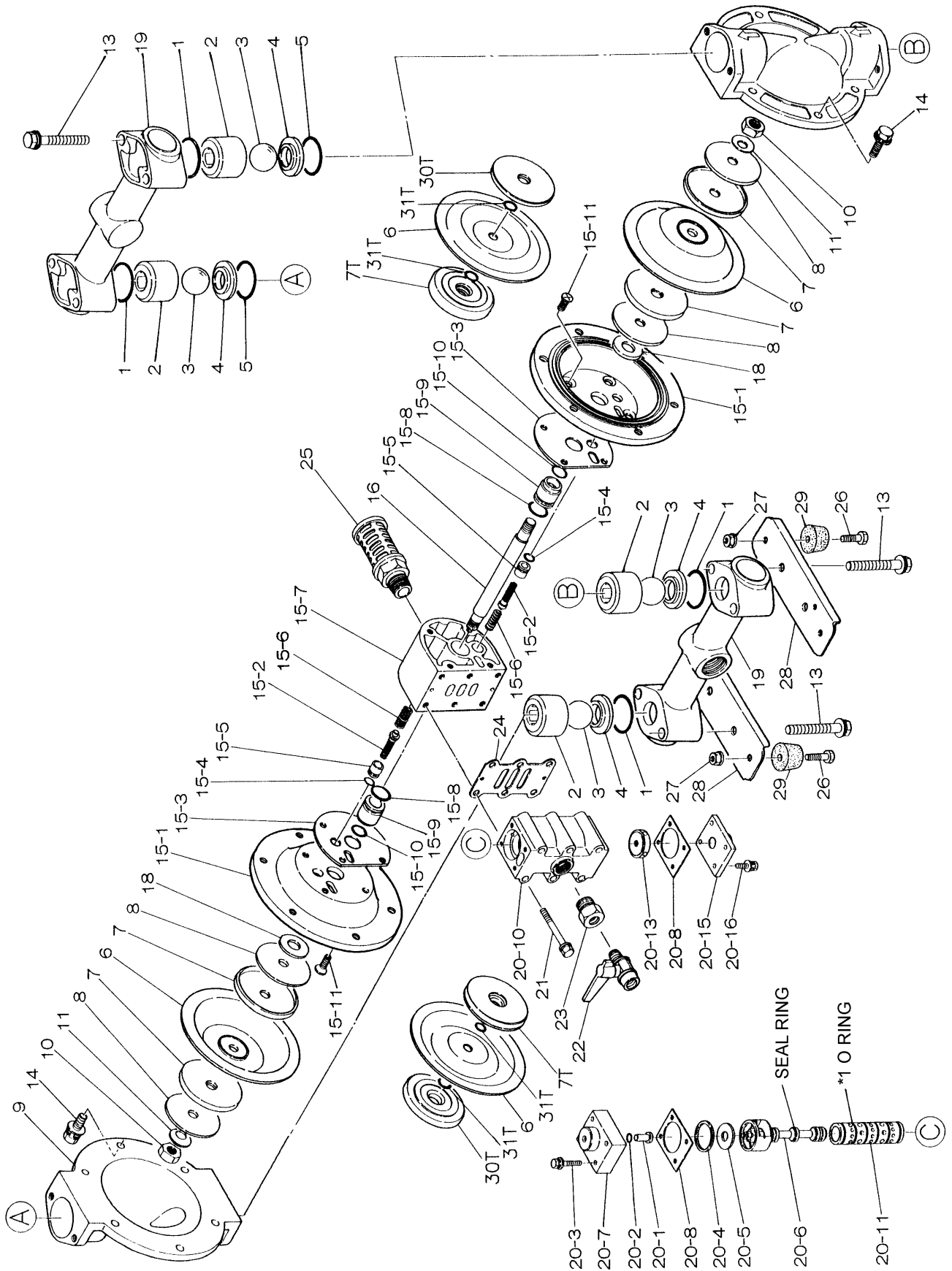
7.5 N•m { 75kgf•cm }

<NOTE>

- Make sure there is no dust on the seal surface and it is damaged.
- Install the sleeve at the center of the valve body. At this point, apply lubricating oil around the sleeve and O ring.

8.1 Exploded

NDP-20 25BA ,BS ,BF



8.2 Parts List

NDP-20 25BA BS BF

NO.	20BA□	20BS□	25BA□	25BS□	25BF□	DESCRIPTION	Q'TY	NOTE
1	Tab.1	←	←	←	←	O RING	4	
2	711700	711701	711702	711703	←	VALVE STOPPER	4	
3	Tab.4	←	←	←	←	BALL	4	
4	590086	←	590087	←	←	VALVE SEAT	4	
5	Tab.5	←	Tab.6	←	←	O RING	2	
6	Tab.7	←	←	←	←	DIAPHRAGM	2	
7	709153	←	709151	←	←	CENTER DISK	4	
7T	709456	←	709459	←	←	CENTER DISK	2	
8	709152	←	709150	←	←	PLAIN WASHER	4	EXCLUDED B□T
9	711686	711693	711687	711694	711695	OUT CHAMBER	2	
10	682263	←	←	←	←	NUT	2	M14×1.5
11	682730	←	←	←	←	CONED DISK SPRING	2	M14
13	682264	682727	682267	682728	682267	BOLT	8	M8×1.25×60
						BOLT	8	M10×1.5×72
14	682724	682722	682725	682723	682725	BOLT	12	M8×1.25×30
						BOLT	12	M10×1.5×35
15	802051	←	802052	←	←	BODY ASSEMBLY	1	
16	709163	←	709162	←	←	CENTER ROD	1	
17 ^{*1}	790912	←	←	←	←	NAME PLATE	1	
17 ^{*2}	790910	←	←	←	←	NAME PLATE	1	
18	771054	←	←	←	←	CUSHION	2	
19	831243	831245	831244	831250	831249	MANIFOLD ASSEMBLY	2	
20	802361	←	←	←	←	VALVE BODY ASSEMBLY	1	
21	682265	←	←	←	←	BOLT	6	M8×1.25×75
22	682771	←	682772	←	←	BALL VALVE	1	1/4"
						BALL VALVE	1	3/8"
23	634596	←	←	←	←	BUSHING	1	3/8"×1/4"
24	771056	←	←	←	←	GASKET	1	
25	680913	←	←	←	←	SILENCER	1	3/4"
26	611148	←	←	←	←	BOLT	4	M8×1.25×22
27	682276	←	←	←	←	NUT WITH FLANGE	4	M8×1.25
28	709157	←	709156	←	←	PUMP BASE	2	
29	770551	←	←	←	←	CUSHION	4	
30T	709314	709326	709327	709331	←	CENTER DISK	2	
31T	643013	←	←	←	←	O RING	4	P-14

NOTE 1) T: BAT/BST/BFT

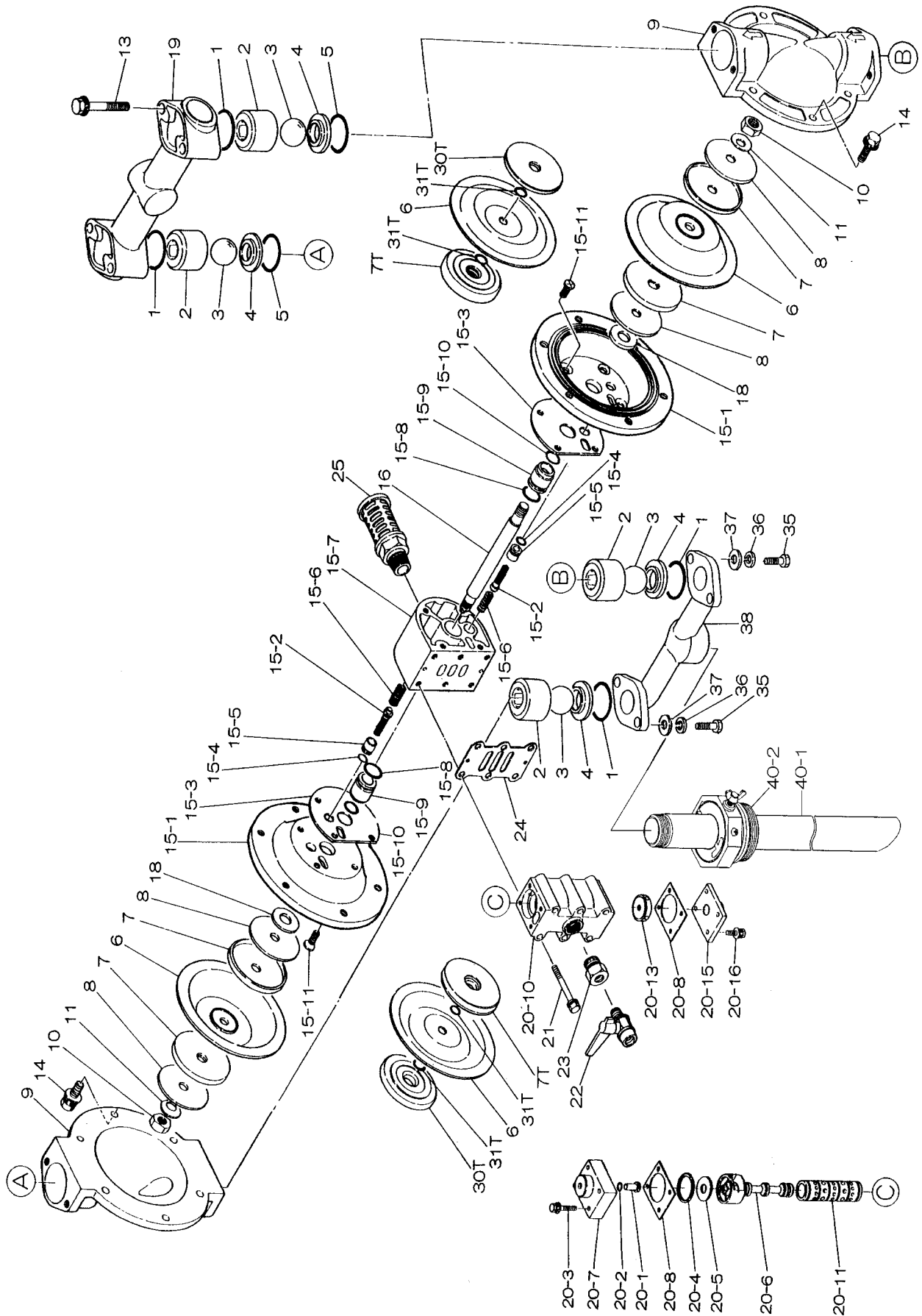
2) Tab.1~Tab.7: SEE [8.4 Parts List ■COMMON PARTS] ON P.18.

3) NO.17(NAME PLATE) IS NOT INDICATED IN EXPLODED VIEW

4)* 1:E.C. COUNTRIES * 2:OTHER COUNTRIES

8.2 Exploded View

NDP-20BA -D



8.2 Parts List

NDP-20BA -D

NO.	BA□-D	DESCRIPTION	Q'TY	NOTE
1	Tab.1	O RING	4	
2	711700	VALVE STOPPER	4	
3	Tab.4	BALL	4	
4	590086	VALVE SEAT	4	
5	Tab.5	O RING	2	
6	Tab.7	DIAPHRAGM	2	
7	709153	CENTER DISK	4	
7T	709456	CENTER DISK	2	
8	709152	PLAIN WASHER	4	EXCLUDED BAT-D
9	711686	OUT CHAMBER	2	
10	682263	NUT	2	M14×1.5
11	682730	CONED DISK SPRING	2	M14
13	682264	BOLT	4	M8×1.25×60
14	682724	BOLT	12	M8×1.25×30
15	802051	BODY ASSEMBLY	1	
16	709163	CENTER ROD	1	
17* ¹	790912	NAME PLATE	1	
17* ²	790910	NAME PLATE	1	
18	771054	CUSHION	2	
19	831243	MANIFOLD ASSEMBLY	1	
20	802361	VALVE BODY ASSEMBLY	1	
21	682265	BOLT	6	M8×1.25×75
22	682771	BALL VALVE	1	1/4"
23	634596	BUSHING	1	3/8"×1/4"
24	771056	GASKET	1	
25	680913	SILENCER	1	3/4"
30T	709314	CENTER DISK	2	
31T	643013	O RING	4	P-14 PTFE
35	611149	BOLT	4	M8×1.25×25
36	631420	SPRING LOCK WASHER	4	M8
37	631013	PLAIN WASHER	4	M8
38	709405	MANIFOLD	1	
40	804000	SUCTION PIPE SET	1	

NOTE 1)T:BAT-D

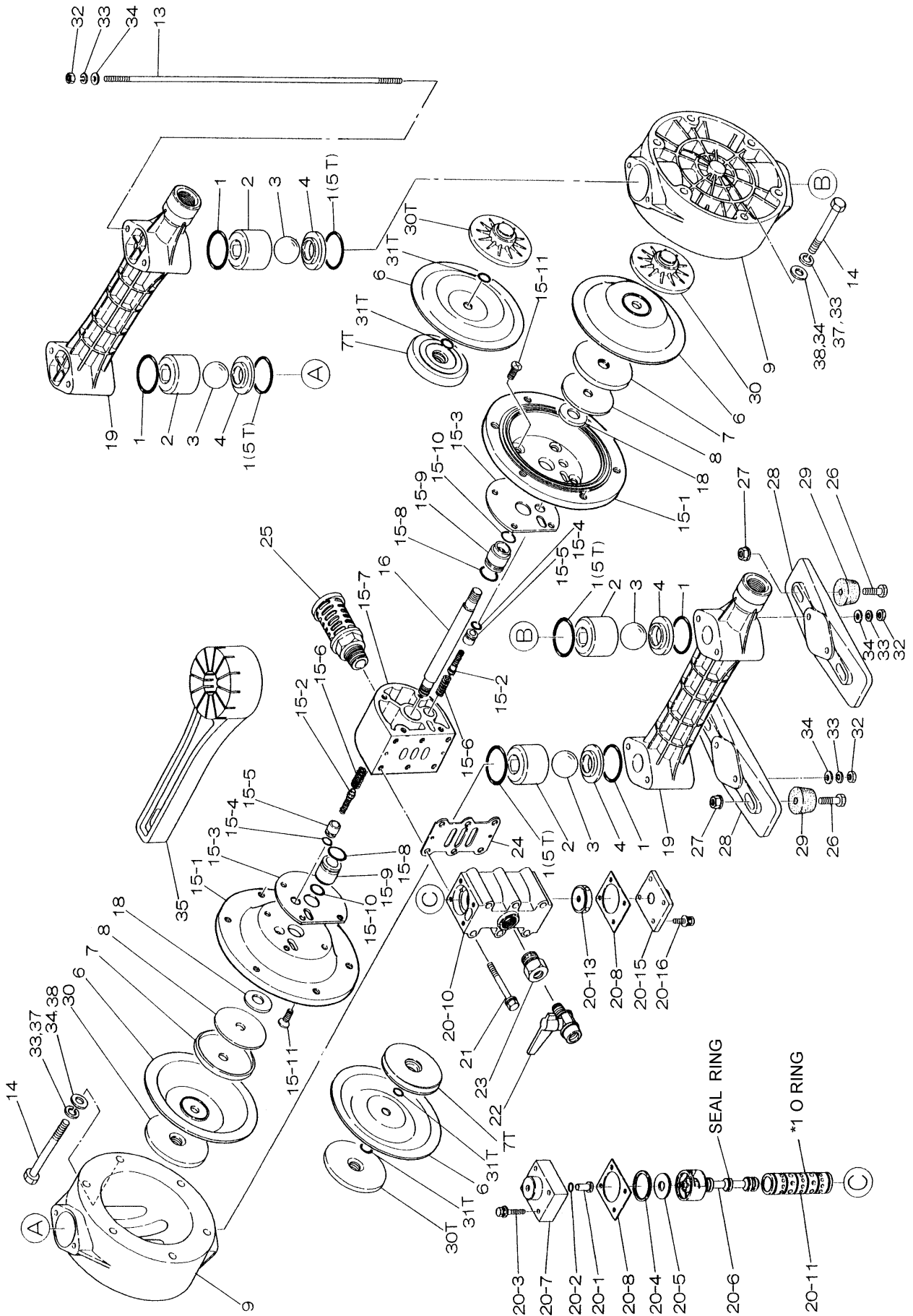
2)Tab.1~Tab.7:SEE [8.4 Parts List ■COMMON PARTS] ON P.18.

3)NO.17(NAME PLATE) IS NOT INDICATED IN EXPLODED VIEW

4)* 1:E.C. COUNTRIES * 2:OTHER COUNTRIES

8.3 Exploded View

NDP-20 25BP ,BV



8.3 Parts List

NDP-20 25BP BV

NO.	20BP□	25BP□	25BV□	DESCRIPTION	Q'TY	NOTE
1	Tab.2	←	Tab.3	O RING	-	
2	771216	771231	780141	VALVE STOPPER	4	
3	Tab.4	←	←	BALL	4	
4	780137	780138	780139	VALVE SEAT	4	
5T	780137	780138	643041	O RING	4	P-42 PTFE
6	Tab.7	←	←	DIAPHRAGM	2	
7	709153	709151	←	CENTER DISK	2	
7T	709456	709459	←	CENTER DISK	2	
8	709152	709150	←	PLAIN WASHER	2	EXCLUDED B□T
9	780134	780135	780136	OUT CHAMBER	2	
13	710122	710207	←	TIE ROD	4	
14	621163	621189	←	BOLT	12	M8×1.25×80
	621163	621189	←	BOLT	12	M10×1.5×90
15	802807	802701	←	BODY ASSEMBLY	1	
16	710252	710271	←	CENTER ROD	1	
17 ^{*1}	790912	←	←	NAME PLATE	1	
17 ^{*2}	790910	←	←	NAME PLATE	1	
18	771054	←	←	CUSHION	2	
19 ^{*1}	780172	780173	780174	MANIFOLD	2	(BSP)
19 ^{*2}	780009	780011	780056	MANIFOLD	2	(Rc)
20	802700	←	←	VALVE BODY ASSEMBLY	1	
21	682265	←	←	BOLT	6	M8×1.25×75
22	682771	682772	←	BALL VALVE	1	1/4"
	682771	682772	←	BALL VALVE	1	3/8"
23	634596	634596	←	BUSHING	1	3/8"×1/4"
24	771056	←	←	GASKET	1	
25	680913	←	←	SILENCER	1	3/4"
26	611151	611153	←	BOLT	4	M8×1.25×30
	611151	611153	←	BOLT	4	M8×1.25×35
27	682276	←	←	NUT WITH FLANGE	4	M8×1.25
28	771219	771235	771749	PUMP BASE	2	
29	770551	←	←	CUSHION	4	
30	780123	780125	780127	CENTER DISK	2	
30T	780124	780126	780128	CENTER DISK	2	
31T	643013	←	←	O RING	4	P-14
32	683635	←	←	NUT	8	M8×1.25
33	681300	681300	←	SPRING LOCK WASHER	20	M8
	681300	681300	←	SPRING LOCK WASHER	8	M8
34	631329	631329	←	PLAIN WASHER	20	M8
	631329	631329	←	PLAIN WASHER	8	M8
35	771244	←	←	ACCESSORY TOOL	2	
37	680257	680257	←	SPRING LOCK WASHER	12	M10
38	631330	631330	←	PLAIN WASHER	12	M10

NOTE 1) T: BPT/BVT

2) Tab.1~Tab.7: SEE [8.4 Parts List ■ COMMON PARTS] ON P.18.

3) NO.17(NAME PLATE) IS NOT INDICATED IN EXPLODED VIEW

4) * 1: E.C. COUNTRIES * 2: OTHER COUNTRIES

8.4 Parts List

COMMON PARTS

Tab.1 O RING

TYPE	20BA/BS□ P-36	20BA□-D P-36	25BA/BS/B□ P-46	MATERIAL
B□C	640036	←	640044	NBR
B□N	640036	←	640044	NBR
B□E	684118	↗	683997	EPDM
B□V	642036	↗	642044	FPM
B□T	643036	←	643044	PTFE
B□H	640036	←	640044	NBR
B□S	684118	↗	683997	EPDM
B□H/T	*1643036 *2640036	↗	*1643044 *2640044	PTFE NBR

Tab.2 O RING

TYPE	20BP□ P-34	25BP□ P-44	Q'TY	MATERIAL
BPC	640033	640042	8	NBR
BPN	640033	640042	8	NBR
BPE	684116	684119	8	EPDM
BPV	642033	642042	8	FPM
BPT	643033	643042	8	PTFE
BPH	640033	640042	8	NBR
BPS	684116	684119	8	EPDM
BPH/T	*1643033 *2640033	*1643042 *2640042	8	PTFE NBR

Tab.3 O RING

TYPE	25BV□ P-44	Q'TY	MATERIAL
BVC	↗		
BVN	↗		
BVE	684119	8	EPDM
BVV	642042	8	FPM
BVT	643042	4	PTFE
BVH	↗		
BVS	↗		

Tab.4 BALL

TYPE	20BA/BS□	20BA□-D	20BP□	25BA/BS/B□	25BP□	25BV□	MATERIAL
B□C	770705	←	←	770556	←	↗	CR
B□N	770720	←	←	770581	←	↗	NBR
B□E	770723	↗	770723	770590	←	←	EPDM
B□V	770726	↗	770726	770599	←	←	FPM
B□T	770736	←	←	770691	←	←	PTFE
B□H	770720	←	←	770581	←	↗	NBR
B□S	770723	↗	770723	770590	←	↗	EPDM
B□H/T	770736	↗	770736	770691	←	↗	PTFE

Tab.5 O RING (G-35: EXCLUDED B□T)

TYPE	20BA/BS□	20BA□-D	MATERIAL
B□C	640132	←	NBR
B□N	640132	←	NBR
B□E	684117	↗	EPDM
B□V	642132	↗	FPM
B□T	771131	←	PTFE
B□H	640132	←	NBR
B□S	684117	↗	EPDM
B□H/T	*1771131 *2640132	↗	PTFE NBR

Tab.6 O RING (G-45: EXCLUDED B□T)

TYPE	25BA/BS/B□	MATERIAL
B□C	640134	NBR
B□N	640134	NBR
B□E	683996	EPDM
B□V	642134	FPM
B□T	771130	PTFE
B□H	640134	NBR
B□S	683996	EPDM
B□H/T	*1771130 *2640134	PTFE NBR

Tab.7 DIAPHRAGM

TYPE	20BA/BS□	20BA□-D	20BP□	25BA/BS/B□	25BP□	25BV□	MATERIAL
B□C	771254	←	←	771258	←	↗	CR
B□N	771255	←	←	771259	←	↗	NBR
B□E	771256	↗	771256	771260	←	←	EPDM
B□V	771257	↗	771257	771261	←	←	FPM
B□T	771083	←	←	771110	←	←	PTFE
B□H	771362	←	←	771363	←	↗	TPEE
B□S	771973	↗	771973	771974	←	↗	TPO
B□H/T	771362	↗	771362	771363	←	↗	TPEE

NOTE)* 1: E.C. COUNTRIES * 2: OTHER COUNTRIES

8.5 Parts List

BODY ASSEMBLY

802051 BODY ASSEMBLY

[20BA□,BS□,BA□-D]

NO.	PART NO.	DESCRIPTAION	Q'TY	NOTE
15-1	710275	AIR CHAMBER	2	
15-2	802360	PILOT VALVE ASSEMBLY	2	
15-3	771057	GASKET	2	
15-4	640009	O RING	2	P-11 NBR
15-5	709158	VALVE SEAT	2	
15-6	708666	SPRING	2	
15-7	709154	BODY	1	
15-8	640020	O RING	2	P-22A NBR
15-9	709160	THROAT BEARING	2	
15-10	640016	O RING	2	P-18 NBR
15-11	682486	FLAT HEAD BOLT	8	M8×1.25×20

802052 BODY ASSEMBLY

[25BA□,BS□,BF□]

NO.	PART NO.	DESCRIPTAION	Q'TY	NOTE
15-1	710276	AIR CHAMBER	2	
15-2	802360	PILOT VALVE ASSEMBLY	2	
15-3	771057	GASKET	2	
15-4	640009	O RING	2	P-11 NBR
15-5	709158	VALVE SEAT	2	
15-6	708666	SPRING	2	
15-7	709154	BODY	1	
15-8	640020	O RING	2	P-22A NBR
15-9	709160	THROAT BEARING	2	
15-10	640016	O RING	2	P-18 NBR
15-11	682486	FLAT HEAD BOLT	8	M8×1.25×20

802807 BODY ASSEMBLY

[20BF□]

NO.	PART NO.	DESCRIPTAION	Q'TY	NOTE
15-1	711504	AIR CHAMBER	2	
15-2	802360	PILOT VALVE ASSEMBLY	2	
15-3	771057	GASKET	2	
15-4	640009	O RING	2	P-11 NBR
15-5	709158	VALVE SEAT	2	
15-6	708666	SPRING	2	
15-7	711217	BODY	1	
15-8	640020	O RING	2	P-22A NBR
15-9	709160	THROAT BEARING	2	
15-10	640016	O RING	2	P-18 NBR
15-11	682486	FLAT HEAD BOLT	8	M8×1.25×20

802701 BODY ASSEMBLY

[25BF□,BV□]

NO.	PART NO.	DESCRIPTAION	Q'TY	NOTE
15-1	711220	AIR CHAMBER	2	
15-2	802360	PILOT VALVE ASSEMBLY	2	
15-3	771057	GASKET	2	
15-4	640009	O RING	2	P-11 NBR
15-5	709158	VALVE SEAT	2	
15-6	708666	SPRING	2	
15-7	711217	BODY	1	
15-8	640020	O RING	2	P-22A NBR
15-9	709160	THROAT BEARING	2	
15-10	640016	O RING	2	P-18 NBR
15-11	682486	FLAT HEAD BOLT	8	M8×1.25×20

8.6 Parts List

VALVE BODY ASSEMBLY

802361 VALVE BODY ASSEMBLY

[2025BA□,BS□,BF□,BA□-D]

NO.	PART NO.	DESCRIPTION	Q'TY	NOTE
20-1	709161	RESET BUTTON	1	
20-2	640005	O RING	1	P-8 NBR
20-3	682704	BOLT	4	M6×1×32
20-4	771241	PACKING	1	
20-5	710270	PLAIN WASHER	1	
20-6	802400	C SPOOL VALVE ASSEMBLY	1	
20-7	710221	CAP	1	
20-8	771240	GASKET	2	
20-10	711638	VALVE BODY	1	
20-11	803931	SLEEVE ASSEMBLY	1	* 1(771080)
20-13	771914	CUSHION	1	
20-15	709305	CAP	1	
20-16	682262	BOLT	4	M6×1×16

802700 VALVE BODY ASSEMBLY

[2025BP□,BV□]

NO.	PART NO.	DESCRIPTION	Q'TY	NOTE
20-1	709161	RESET BUTTON	1	
20-2	640005	O RING	1	P-8 NBR
20-3	682704	BOLT	4	M6×1×32
20-4	771241	PACKING	1	
20-5	710270	PLAIN WASHER	1	
20-6	802400	C SPOOL VALVE ASSEMBLY	1	
20-7	711219	CAP	1	
20-8	771240	GASKET	2	
20-10	711641	VALVE BODY	1	
20-11	803931	SLEEVE ASSEMBLY	1	*1(771080)
20-13	771914	CUSHION	1	
20-15	711212	CAP	1	
20-16	682262	BOLT	4	M6×1×16

NOTE)* 1: PARTS NUMBER MENTIONED ON O RING FOR SLEEVE ASSEMBLY ONLY.

8.7 Parts List

SUCTION PIPE SET

804000 SUCTION PIPE SET

NO.	PART NO.	DESCRIPTION	Q'TY	NOTE
40-1	709406	SUCTION PIPE	1	R1"×L927
40-2	803667	BUNG ADAPTER ASSEMBLY	1	

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