

MAINTENANCE MANUAL

YAMADA AIR-OPERATED DIAPHRAGM PUMPS

NDP-40
NDP-50
NDP-80

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-40 series, NDP-50 and NDP-80 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:

WARNING



Before starting maintenance work, cut off the feed air and clean the pump. If air pressure or residue remains 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.

WARNING



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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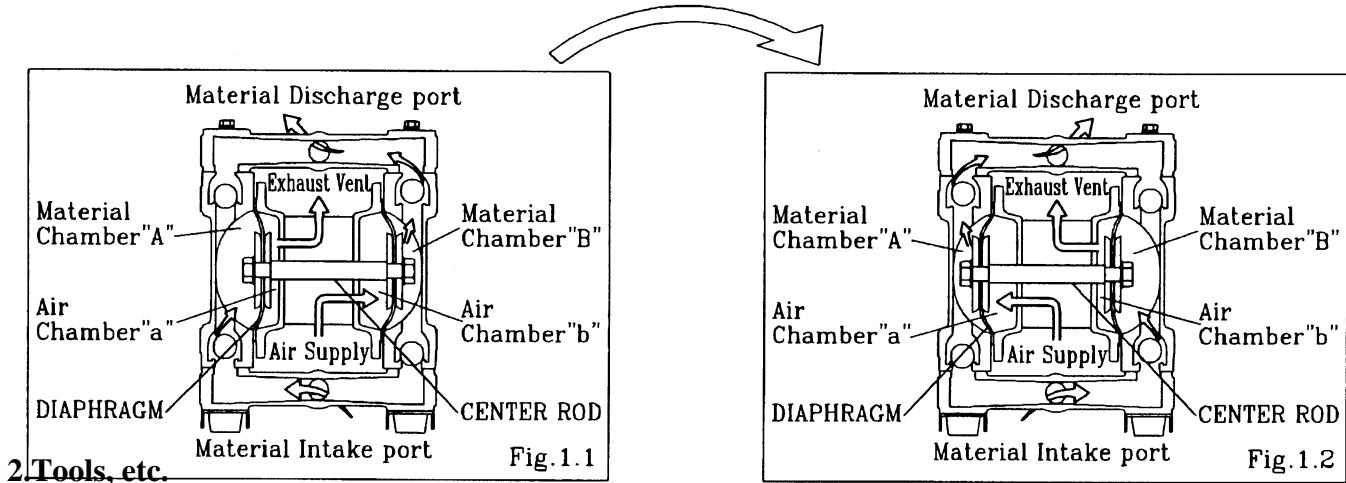
Jump Zone
Click topic to
enter



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 13mm, 17mm, 19mm (except with the NDP-40BP_) 24mm, (BA_, BS_, BF_)
- Hexagonal box wrenches 5mm, 6mm
- Small crowbars 2 (B_C, B_N, B_E, B_V)
- Open-end wrenches 17mm (NDP-40BP_), 19mm (BA_, BS_, BF_) 24mm (BA_, BS_, BF_)
- Plastic Hammer

2.2 Special tools

PP wrench (sold separately)
Purpose: Removing the center disk of BP_ and BV_ types

Sleeve remover (sold separately)
Purpose: For removing sleeves

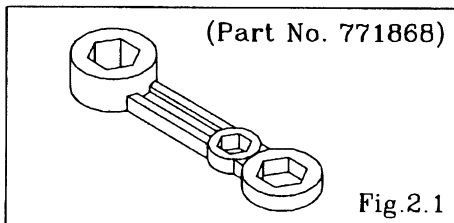


Fig.2.1

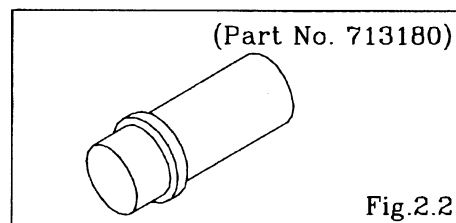


Fig.2.2

2.3 Misc.

- Lubricating oil Turbine oil none addition class 1 (equivalent ISO VG32 grade)
- Nuts M16X1.5
- Thread locker

3. Ordering Replacement parts

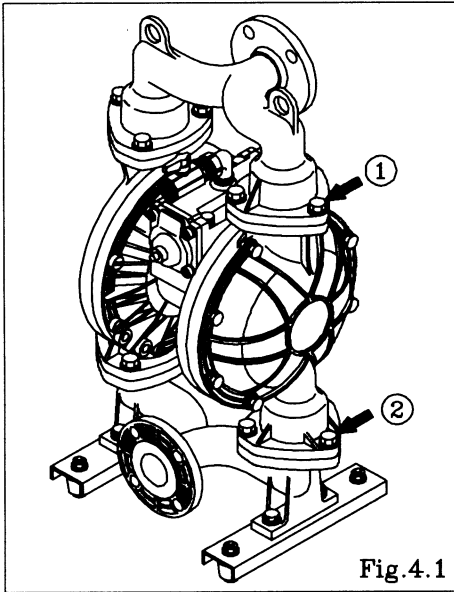
For accurate and speedy shipment of parts, be sure to order the right parts for your model to your distributor. Indicate the part numbers, descriptions and quantities.

4. Balls and Valve Seats

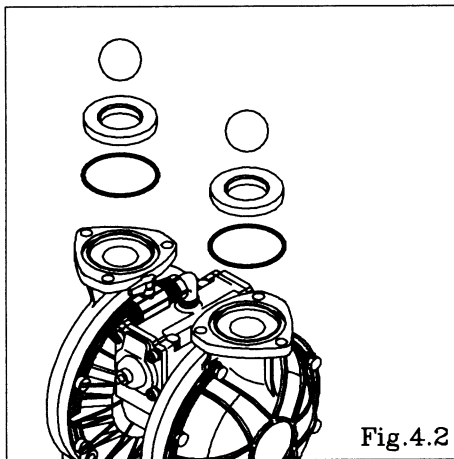
4.1 Removal

BA_, BS_, BF_, TYPES

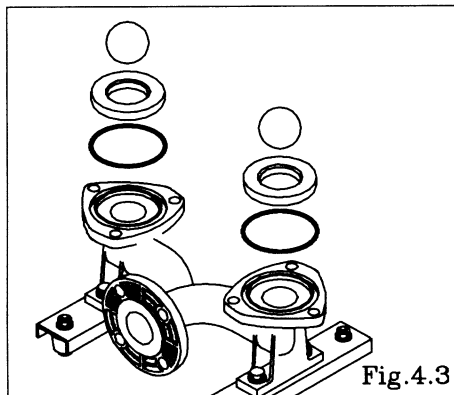
See [8. Exploded View] on after p.14 (fig. 4.1, 4.2 and 4.3 show the NDP-50BS_)



- Remove the 6 (8 on the NDP-80) retainer bolts ① from the out manifold, and remove the out manifold. [fig.4.1]



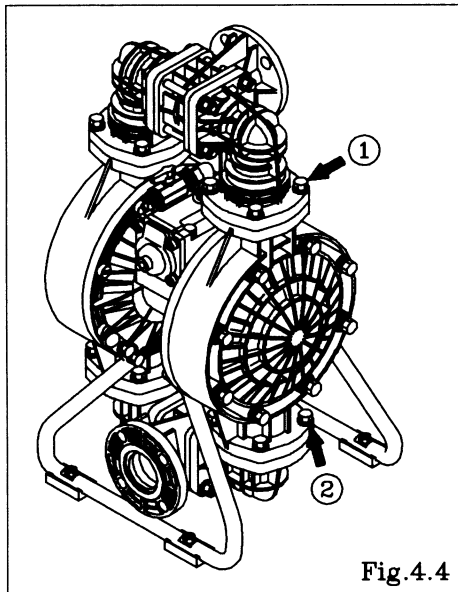
- Remove the ball, Valve seat and o'ring [fig. 4.2]



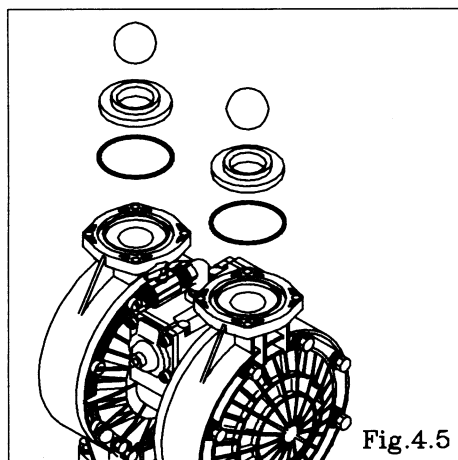
- Remove the 6 (8 on the NDP-80) retainer bolts ② from the in manifold, and remove the in manifold. [fig.4.1]
- Remove the ball, valve seat and o'ring. [Fig. 4.3]

NDP-40BP_type

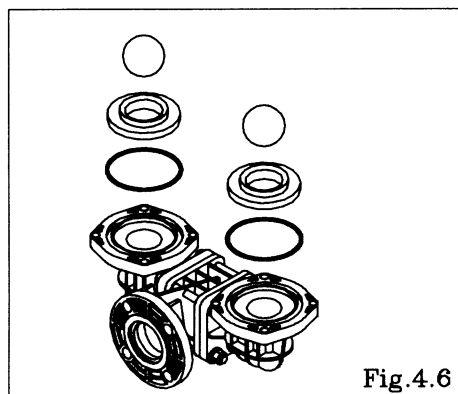
See [8. Exploded View] on after p.14



- Remove the 8 retainer bolts ① from the out manifold, and remove the out manifold. [fig.4.4]



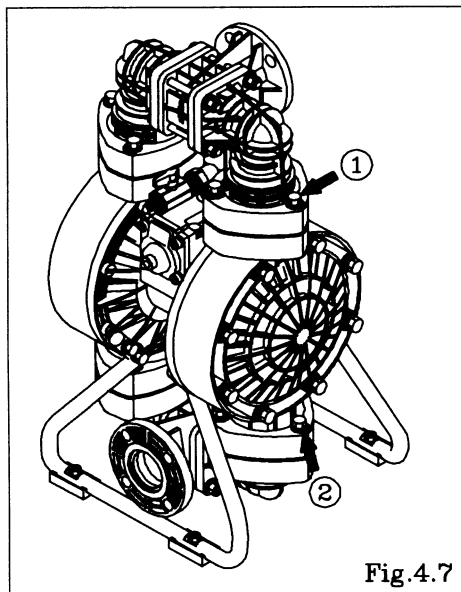
- Remove the ball, valve seat and o'ring [fig. 4.5]



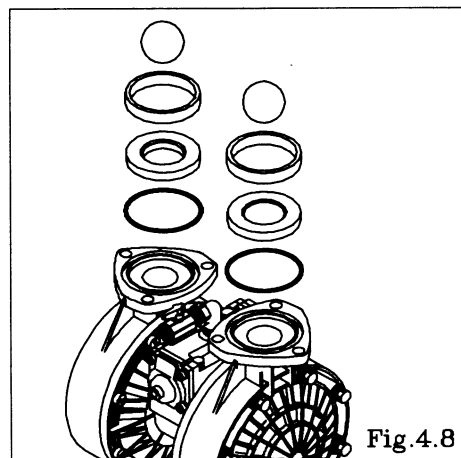
- Remove the 8 retainer bolts ① from the in manifold, and remove the protector and in manifold. [fig.4.4]
- Remove the ball, valve seat and o'ring [fig. 4.6]

NDP-50BP, BV_, NDP-80BP_types

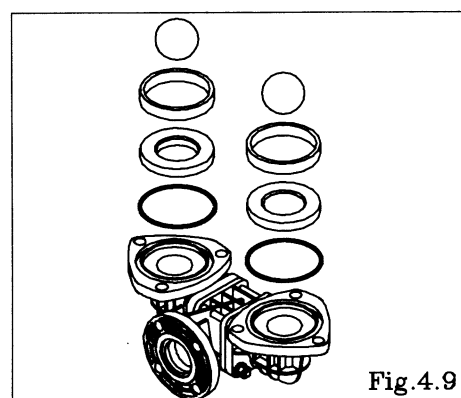
See [8. Exploded View] on after p.14 (fig. 4.7 4.8 and 4.9 show the NDP-50BP_.)



- Remove the 6 (8 on the NDP-80) retainer bolts ① from the out manifold, and remove the protector out manifold. [fig.4.7]



- Remove the ball, valve guide (only NDP-80), valve seat and o'ring [fig. 4.8]



- Remove the 6 (8 on the NDP-80) retainer bolts ② from the in manifold, and remove the protector and in manifold. [fig.4.7]
- Remove the ball, valve guide (only NDP-80), valve seat and o'ring. [Fig. 4.3]

4.2 Inspection

- Ball [fig. 4.10]

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

Usable range of ball

NDP-40	SØ1.772~SØ2.028 in {SØ45.0~SØ51.5mm}
NDP-50	SØ2.232~SØ2.555 in {SØ56.7~SØ64.9mm}
NDP-80	SØ3.189~SØ3.650 in {SØ80.0~SØ92.7mm}

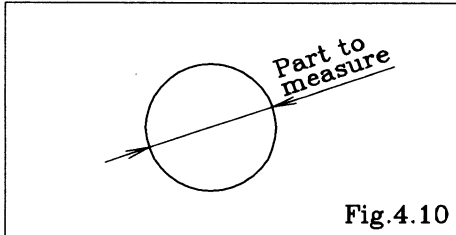


Fig.4.10

- Valve seat [fig. 4.11]

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

Usable range of valve seat

	B_C, B_N, B_E, B_V, B_H, B_S	B_T
NDP-40	0.181~0.453in {4.6~11.5mm}	0.067~0.161in {1.7~4.1mm}
NDP-50 NDP-80	0.197~0.492in {5.0~12.5mm}	0.067~0.161in {1.7~4.1mm}

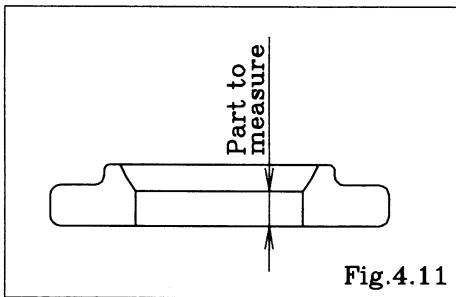


Fig.4.11

- 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.14, and install in the reverse order of disassembly.

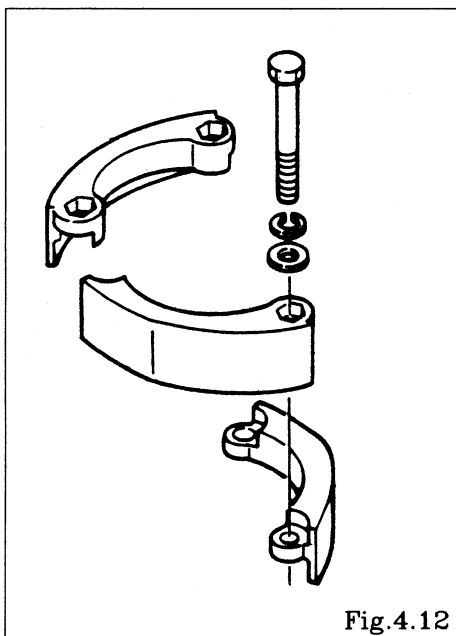


Fig.4.12

Tightening torque for manifold retainer bolts

15 lbf-ft {200 kgf-cm}

Note:

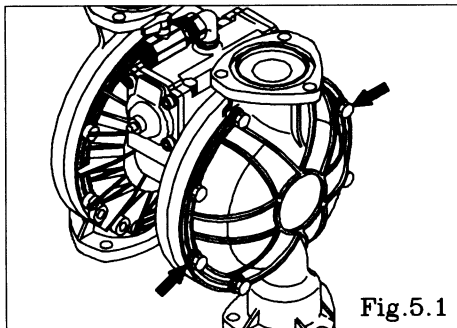
- Make sure there is no dust on the seal surface and the seal is not damaged.
- Replace the PTFE o'ring regardless of its condition
- Match the convex and concave parts of the protector. [Fig. 4.12] (NDP-50BP_, BV_, NDP-80BP_)

5. Diaphragm and Center rod

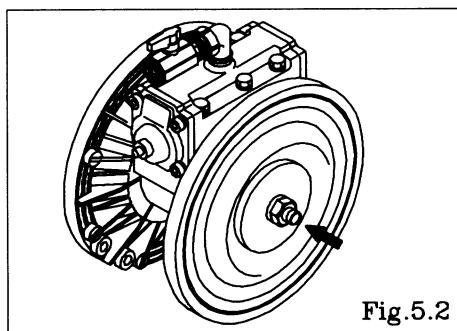
5.1 Removal

BA_, BS_, BF_ types

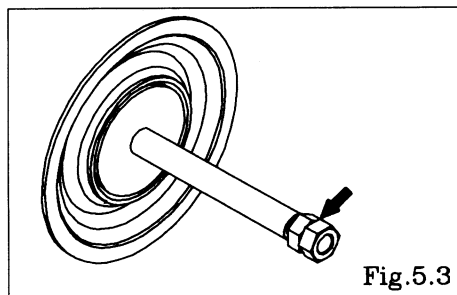
See [8. Exploded View] on after p.14 (fig. 5.1 shows the NDP-50BS_.)



- Remove the ball and valve seat (see [4.1 removal BA_, BS_, BF_, types] on p.4).
- Remove the 16 (20 on the NDP-80) retainer bolts from the out chamber, and remove the out chamber. [fig. 5.1]



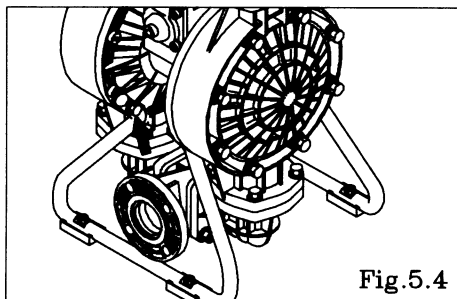
- Remove the nuts on both sides of the center rod. [fig. 5.2]
- After the nuts on one side have been removed, remove the center disk and diaphragm. Remove the Diaphragm, center disk and center rod from the opposite side of the main body.



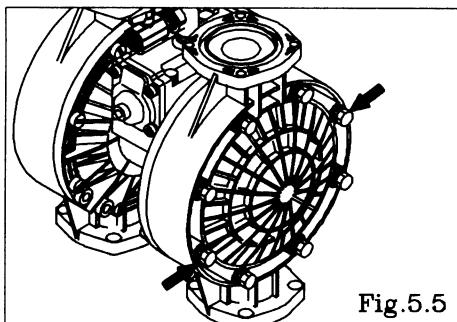
- Remove the nuts on the opposite side using the double nuts [fig. 5.3].
- Remove the coned disk spring, center disk and Diaphragm.

BP_, BV_ types

See [8. Exploded View] on after p.14 (fig. 5.4 shows the NDP-40BP_.)



- Remove the ball etc. (see [4.1 removal BP_, BV_ types] on p.5-6).
- Remove the 8 (4 on the NDP-80) retainer bolts from the out chamber, and remove the out chamber. [fig. 5.5]



- Remove the 16 (20 on the NDP-80) retainer bolts from the out chamber, and remove the out chamber. [Fig. 5.5]

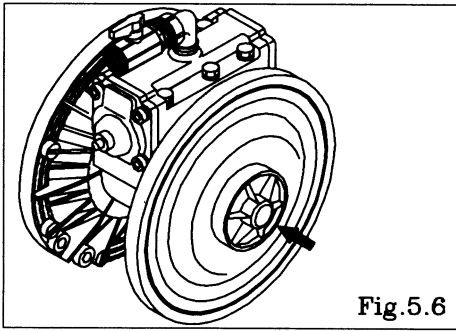


Fig. 5.6

- Remove the center disk from one side using the PP wrench (special tool: part No. 771868) [fig. 5.6]
- 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.

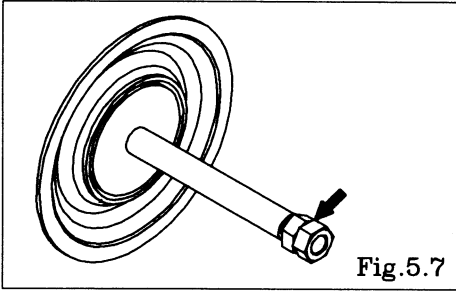


Fig. 5.7

- Fix a double nut to one end of the center rod and take the Diaphragm and center disk off the opposite end [fig. 5.9].

5.2 Inspection

- Diaphragm

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

Guideline of diaphragm (estimated) life

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

(When used with clean water at room temperature)

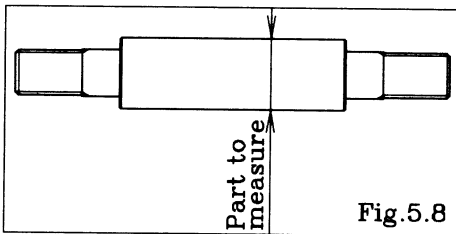


Fig. 5.8

- Center rod [fig. 5.8]

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

Usable range of center rod

Ø0.9815~Ø0.9843in {Ø24.93~Ø25.0mm}

5.3 Installation

B_C, B_N, B_E, B_V, B_H, B_S types

For installation, see [8. Exploded view] on after p. 14 and install in the reverse order of disassembly.

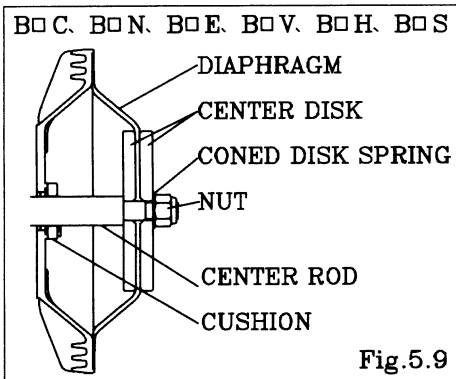


Fig. 5.9

- Apply lubricating oil to the center rod, and insert it into the main body.
- Insert the cushion (except with the NDP-80). (cf. Fig. 5.9)
- Keep the marking “outside to the 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 PP wrench (special tool: part No. 771868) for the BP_, BV_ types. Apply proper thread locker to the thread of center disk.

(No coned disk springs and nuts are needed.)

Tightening torque for center rod

BA_, BS_, BF_	43 lbf-ft. {600 kgf-cm}
BP_, BV_	36 lbf-ft. {500 kgf-cm}

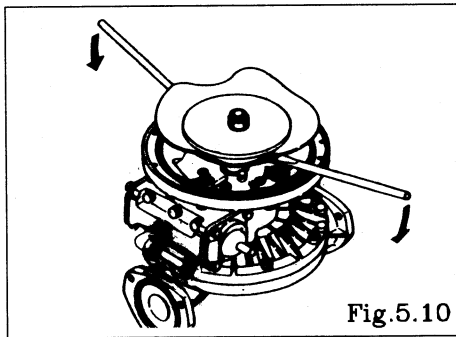


Fig.5.10

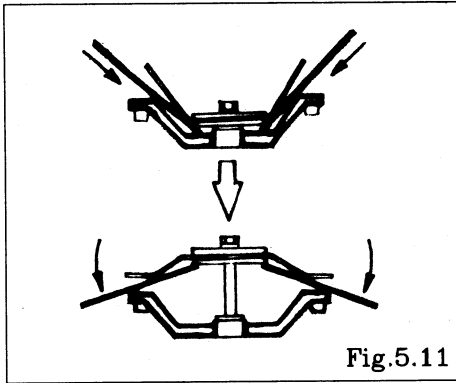


Fig.5.11

- Draw the center disk to one side (exclude B_H, B_S type cf. Fig. 5.9)
- And install the out chamber. Tighten the bolts temporarily
- Grip the inside center disk using crowbars and draw it to the opposite side, then turn the Diaphragm over. (exclude B_H, B_S type) [Fig. 5.10, 5.11]
- And install the out chamber. Tighten the bolt temporarily.
- After installation of the out chamber on both sides, place the on a flat surface and stand the pump upright for further assembly.

Tightening torque for the out chamber.

BA_, BS_, BF_	CR, NBR, EPDM, FPM	25 lbf ft {350 kgf cm}
	TPEE, TPO	29 lbf ft {400 kgf cm}
BP_, BV_	CR, NBR, EPDM, FPM	22 lbf ft {300 kgf cm}
	TPEE, TPO	25 lbf ft {350 kgf cm}

<NOTE>

- Make sure there is no dust on the seal surface in order to prevent seal damaged.
- Be careful not to damage the R portion of the air chamber using a crowbar, etc.
- Tighten the bolts that balance should be equal from both sides on diagonal line with even torque.

B_T type

For installation, see[8. Exploded view] on after p.14, and install in the reverse order of disassembly.

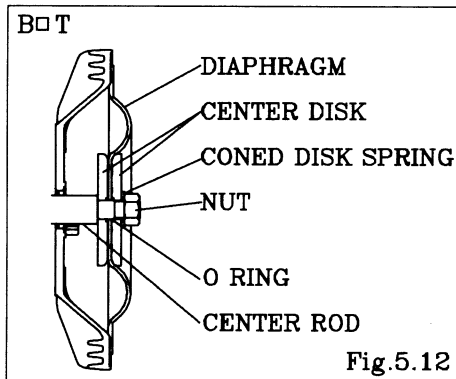


Fig.5.12

- Apply lubricating oil to the center rod, and insert it into the main body.
- Keep the convex side to the outside (cf. Fig. 5.12).
- Put the o'rings to both sides of the Diaphragm. (cf. Fig. 5.12)
- Tighten the center disk using the accessory tool (special tool: part No. 771868) for the BPT, BVT types. Apply proper thread locker to the thread of center disk.

(no coned disk springs and nuts are needed)

Tightening torque for center rod.

BAT, BST, BFT	43 lbf ft {600 kgf cm}
BPT, BVT	36 lbf ft {500 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.

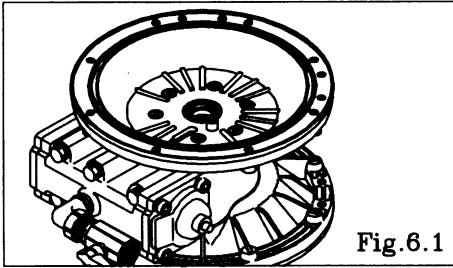
Tightening torque for out chamber.

BAT, BST, BFT	29 lbf in {400 kgf cm}
BPT, BVT	25 lbf in {350 kgf cm}

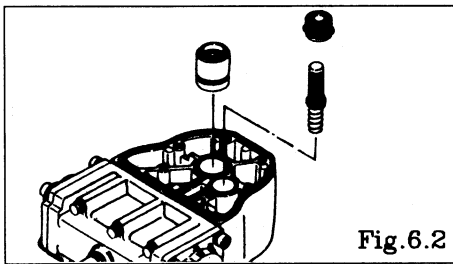
6. Throat bearing and pilot valve assembly

6.1 Removal

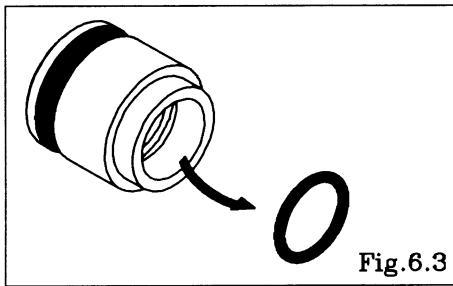
See [8. Exploded View] on after p.14



- Remove the Diaphragm and center rod etc. (see [5.1 removal] on p.8-9)
- Remove the 12 retainer bolt from the air chamber, and remove the air chamber and gasket. [Fig. 6.1]

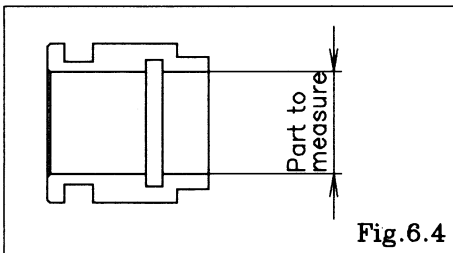


- Draw out the pilot valve assembly. [Fig. 6.2]
- Draw out the throat bearing. [Fig. 6.2]



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

6.2 Inspection



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

Usable range of bushing

$\text{Ø}0.9859 \sim \text{Ø}0.9894 \text{ in } \{ \text{Ø}25.04 \sim \text{Ø}25.13\text{mm} \}$

- O'rings
If O'rings are worn out or cracked, replace them.
- Pilot valve assembly
If the pilot valve is worn or cracker, replace it.

6.3 Installation

For installation, see [8. Exploded View] on after p. 14, and install in the reverse order of disassembly.

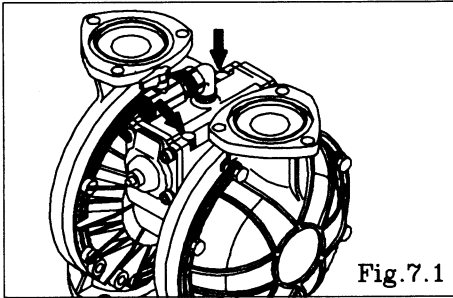
Tightening torque for air chamber retainer bolts

15lbf-ft {200kgf-cm}

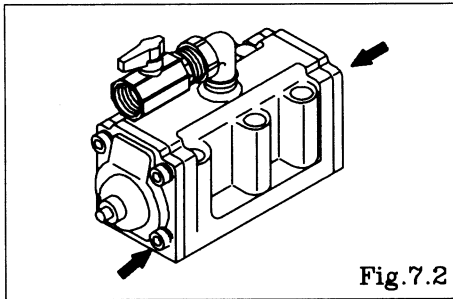
7. C spool valve assembly

7.1 Removal

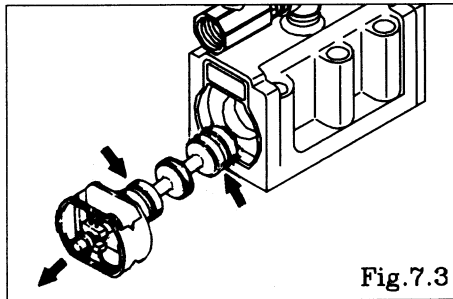
See [8. Exploded View] on after p.14.



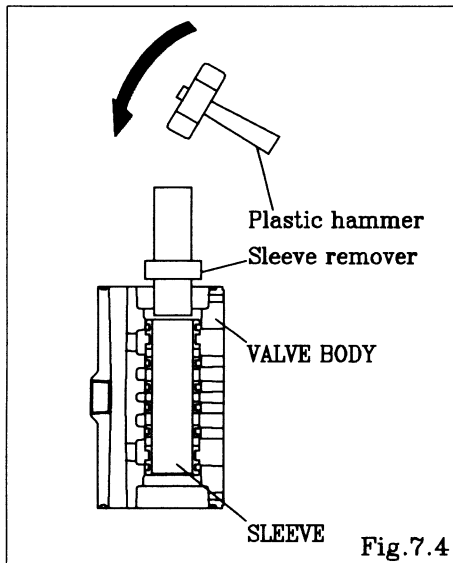
- Remove the out chamber (see 4.1 removal on pp. 4, 5-6).
- Remove the 6 retainer bolts from the valve body, and remove the valve body. [Fig. 7.1]



- Remove the 8 cap A and cap B retainer bolts, and remove cap A, cap B,. [Fig. 7.2]

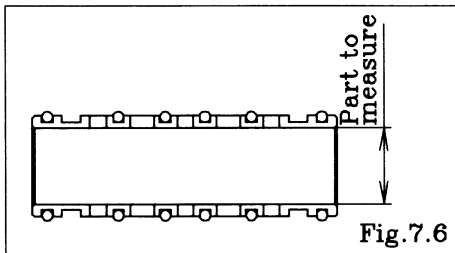
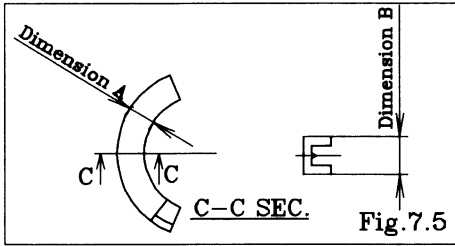


- Draw out the c spool valve assembly, and remove the seal ring from the c spool valve assembly.
- Remove the spring stopper. [Fig. 7.3]



- Remove the sleeve using the sleeve remover (special tool: part No. 713180). [Fig. 7.4]

7.2 Inspection



C Spool Valve Assembly

- Seal ring [Fig. 7.5]
Measure dimensions A and B, and if there is sufficient wear to require replacement, 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

Dimension A	More than 0.1988 in {5.05mm}
Dimension B	More than 0.2874 in {7.30mm}

- Sleeve Assembly [Fig. 7.6]
Measure the inside diameter, and if it is outside the usable range, replace the sleeve assembly.

Usable range of Sleeve

$\text{Ø}1.305\sim\text{Ø}1.313\text{in } \{\text{Ø}33.15\sim\text{Ø}33.35\text{mm}\}$
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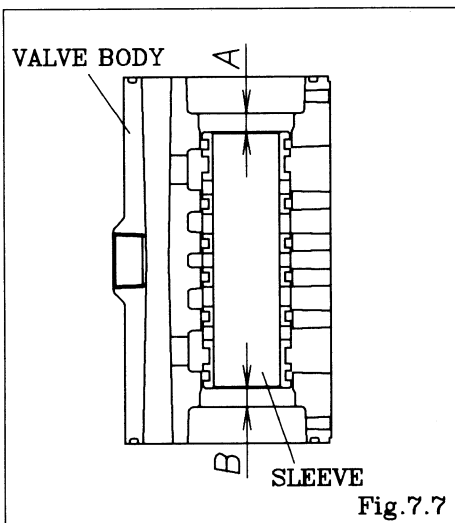
- O'ring
If O'rings are worn out or cracked, replace it.

<NOTE>

- C spool vavle assembly must be replaced in a complete set. Unable to replace individual components.

7.3 Installation

For installation, see [8. Exploded View] on after p. 14, and install in the reverse order of disassembly.



- Install the sleeve using the sleeve remover (special tool: part No. 713180). At this point, apply lubricating oil around the sleeve and o'ring.
- Install the sleeve at the center of the valve body. (A=B)

Tightening torque for installation cap A, cap B 8 lbf-ft {100kgf-cm}

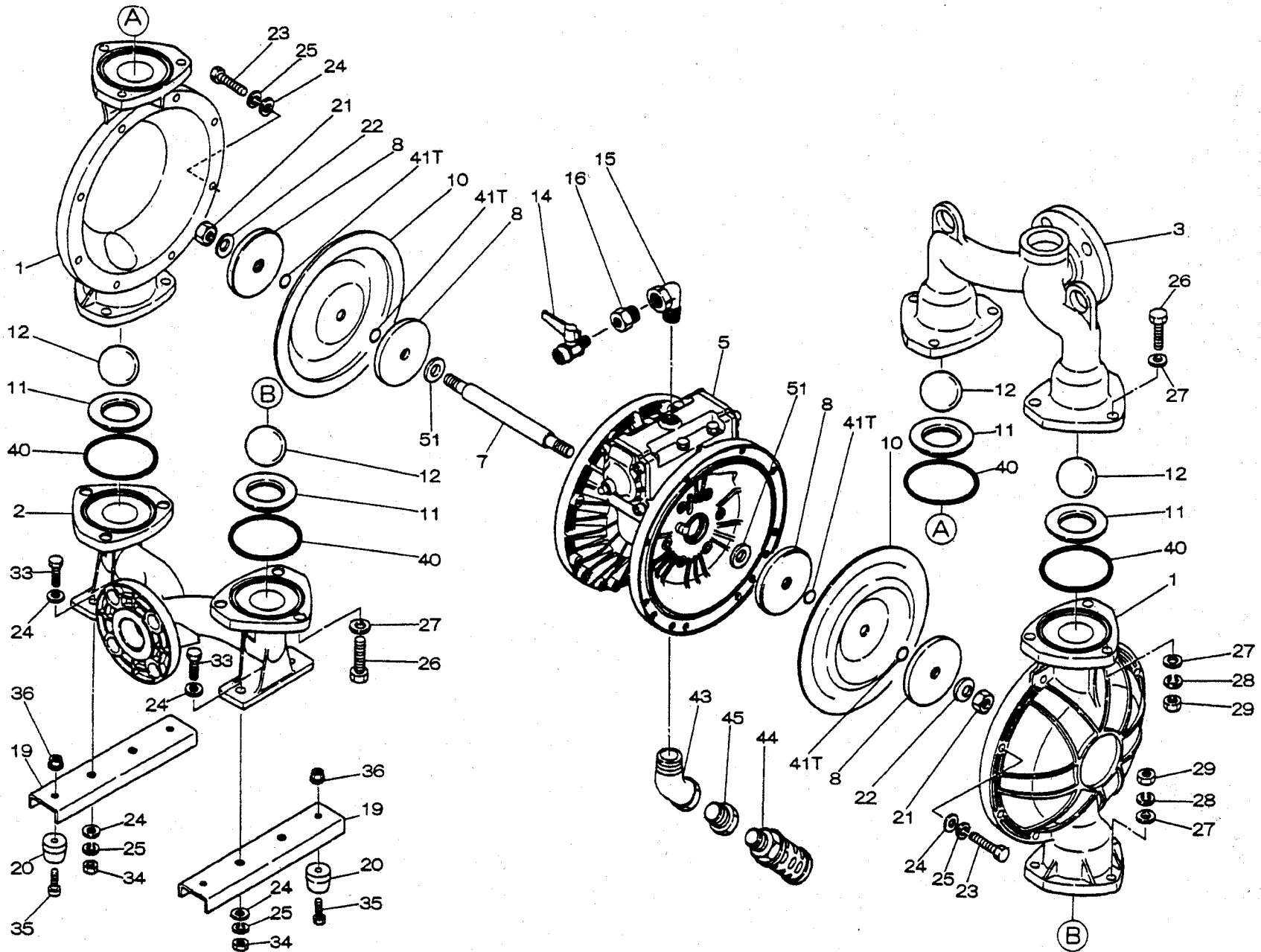
Tightening torque for valve body installation bolts 12 lbf-ft {170kgf-cm}
--

<NOTE>

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

8.1 Exploded View

NDP-40-50BA_



Parts List

[Link to Tables 1-6 & 7-10](#)

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8.1 Parts List

NDP-40-50BA_

NO.	40BA_	50BA_	DESCRIPTION	Q'TY	NOTE
1	580960	580961	OUT CHAMBER	2	
2	714366	714369	IN MANIFOLD	1	581048
				1	581049
3	714360	714363	OUT CHAMBER	1	581045
				1	581046
5	803111	803112	BODY ASSEMBLY	1	
7	711900	711900	CENTER ROD	1	
7T	711939	711939	CENTER ROD	1	
8	711902	711904	CENTER DISK	4	
8T	707817	707822	CENTER DISK	4	
10	Tab.1	Tab.1	DIAPHRAGM	2	
11	Tab.3	Tab.3	VALVE SEAT	4	
12	Tab.4	Tab.4	BALL	4	
14	684321	684322	BALL VALVE	1	1/2"
15	682523	682523	ELBOW	1	3/4"
16	684339		BUSHING	1	3/4x1/2"
19	711911	711928	PUMP BASE	2	
20	771402	770402	CUSHION	4	
21	Tab.6	Tab.6	NUT	2	
22	682740	682740	CONED DISK SPRING	2	M16
23	684203	684203	BOLT	16	M10x1.5x65
24	631014	631014	PLAIN WASHER	24	M10
25	631421	631421	SPRING LOCK WASHER	12	M10
26	611203	611203	BOLT	12	M12x1.75x50
27	631015	631015	PLAIN WASHER	24	M12
28	631422	631422	SPRING LOCK WASHER	12	M12
29	627014	627014	NUT	12	M12x1.75
33	611177	611177	BOLT	4	M10x1.5x35
34	627013	627013	NUT	12	M10x1.5
35	611149	611149	BOLT	4	M8x1.25x25
36	682276	682276	NUT WITH FLANGE	4	M8x1.25
40	Tab.8	Tab.8	O'RING	4	
41T	643015	643015	O'RING	4	P-16 PTFE
43		684300	ELBOW	1	1"
44	TM-8	682518	SILENCER	1	1"
50	790911	790911	NAME PLATE	1	
51	770582	770582	CUSHION	2	EXCLUDED BAT

NOTE 1)T : BAT

2. Tab. 1~ Tab.8 : SEE [8.8 PARTS LIST—COMMON PARTS] ON PAGE P.28, P. 29.

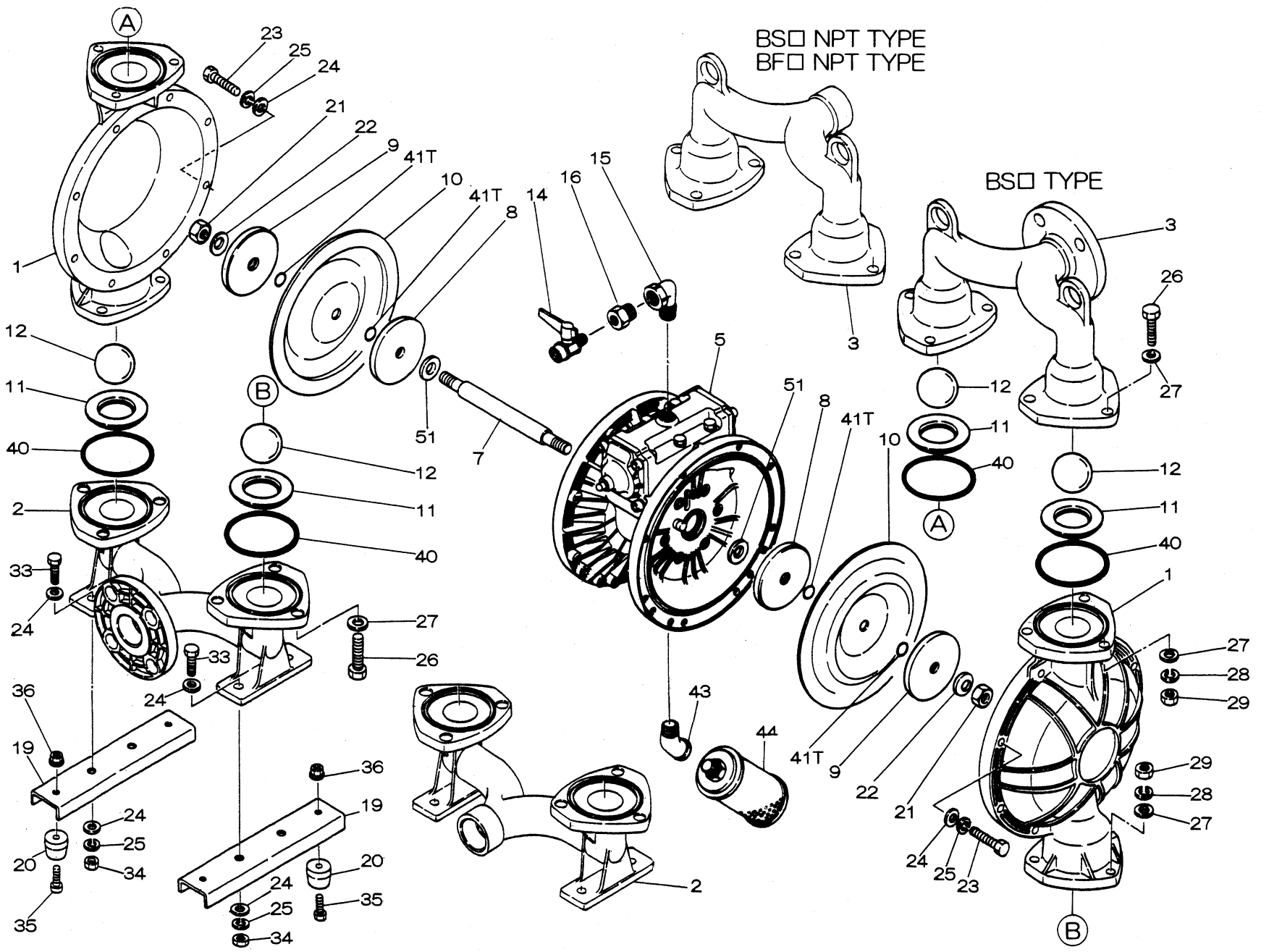
3. NO. 50 (NAME PLATE) IS NOT INDICATED IN EXPLODED VIEW

8.2 Exploded View

NDP-40-50BS_, BF_

BS□ NPT TYPE
BF□ NPT TYPE

BS□ TYPE



Parts List

[Link to Tables 1-6 & 7-10](#)

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8.2 Parts List

NDP-40-50BS_, BF_

NO.	40BS	40BS_NPT	40BF_NPT	50BS	50BS_NPT	50BF_NPT	DESCRIPTION	Q'TY	NOTE
1	712931	712931	713156	712932	712932	713157	OUT CHAMBER	2	
2	712599	712601	713168	712557	712559	713169	IN MANIFOLD	1	
3	712598	712600	713165	712556	712558	713166	OUT MANIFOLD	1	
5	803117	803117	803111	803118	803118	803112	BODY ASS'Y	1	
7	711900	711900	711900	711900	711900	711900	CENTER ROD	1	
7T	711939	711939	711939	711939	711939	711939	CENTER ROD	1	
8	711902	711902	711902	711904	711904	711904	CENTER DISK	2	
8T	707817	707817	707817	707822	707822	707822	CENTER DISK	2	
9	711903	711903	711903	711905	711905	711905	CENTER DISK	2	
9T	707818	707818	707818	707823	707823	707823	CENTER DISK	2	
10	Tab.1	Tab.1	Tab.1	Tab.1	Tab.1	Tab.1	DIAPHRAGM	2	
11	Tab.3	Tab.3	Tab.3	Tab.3	Tab.3	Tab.3	VALVE SEAT	4	
12	Tab.4	Tab.4	Tab.4	Tab.4	Tab.4	Tab.4	BALL	4	
14	684321	684321	684321	/	/	/	BALL VALVE	1	1/2"
	/	/	/	684322	684322	684322	BALL VALVE	1	3/4"
15	682523	682523	682523	682523	682523	682523	ELBOW	1	3/4"
16	684339	684339	684339	/	/	/	BUSHING	1	3/4"x1/2"
19	711911	711911	711911	711928	711928	711928	PUMP BASE	2	
20	771402	771402	771402	771402	771402	771402	CUSHION	4	
21	Tab.6	Tab.6	Tab.6	Tab.6	Tab.6	Tab.6	NUT	2	
22	682740	682740	682740	682740	682740	682740	CONED DISK SPRING	2	M16
23	621180	621180	611180	/	/	/	BOLT	16	M10x1.5x45
	/	/	/	621181	621181	611181	BOLT	16	M10x1.5x50
24	631174	631174	631014	631174	631174	631014	PLAIN WASHER	24	M10
25	680257	680257	631421	680257	680257	631421	SPRING LOCK WASHER	20	M10
26	621202	621202	611202	/	/	/	BOLT	12	M12x1.75x45
	/	/	/	621203	621203	611203	BOLT	12	M12x1.75x50
27	631175	631175	631015	631175	631175	631015	PLAIN WASHER	24	M12
28	680607	680607	631422	680607	680607	631422	SPRING LOCK WASHER	12	M12
29	628014	628014	627014	628014	628014	627014	NUT	12	M12x1.75
33	621175	621175	611175	621175	621175	611175	BOLT	4	M10x1.5x30
34	628013	628013	627013	628013	628013	627013	NUT	4	M10x1.5
35	611149	611149	611149	611149	611149	611149	BOLT	4	M8x1.25x25
36	682276	682276	682276	682276	682276	682276	NUT WITH FLANGE	4	M8x1.25
40	Tab.8	Tab.8	Tab.8	Tab.8	Tab.8	Tab.8	O'RING	4	
41T	643015	643015	643015	643015	643015	643015	O'RING	4	P-16 PTFE
43	/	/	/	684300	684300	684300	ELBOW	1	1"
44	TM-8	TM-8	TM-8	682518	682518	682518	SILENCER	1	1"
50	790911	790911	790911	790911	790911	790911	NAME PLATE	1	
51	770582	770582	770582	770582	770582	770582	CUSHION	2	EXCLUDED B_T

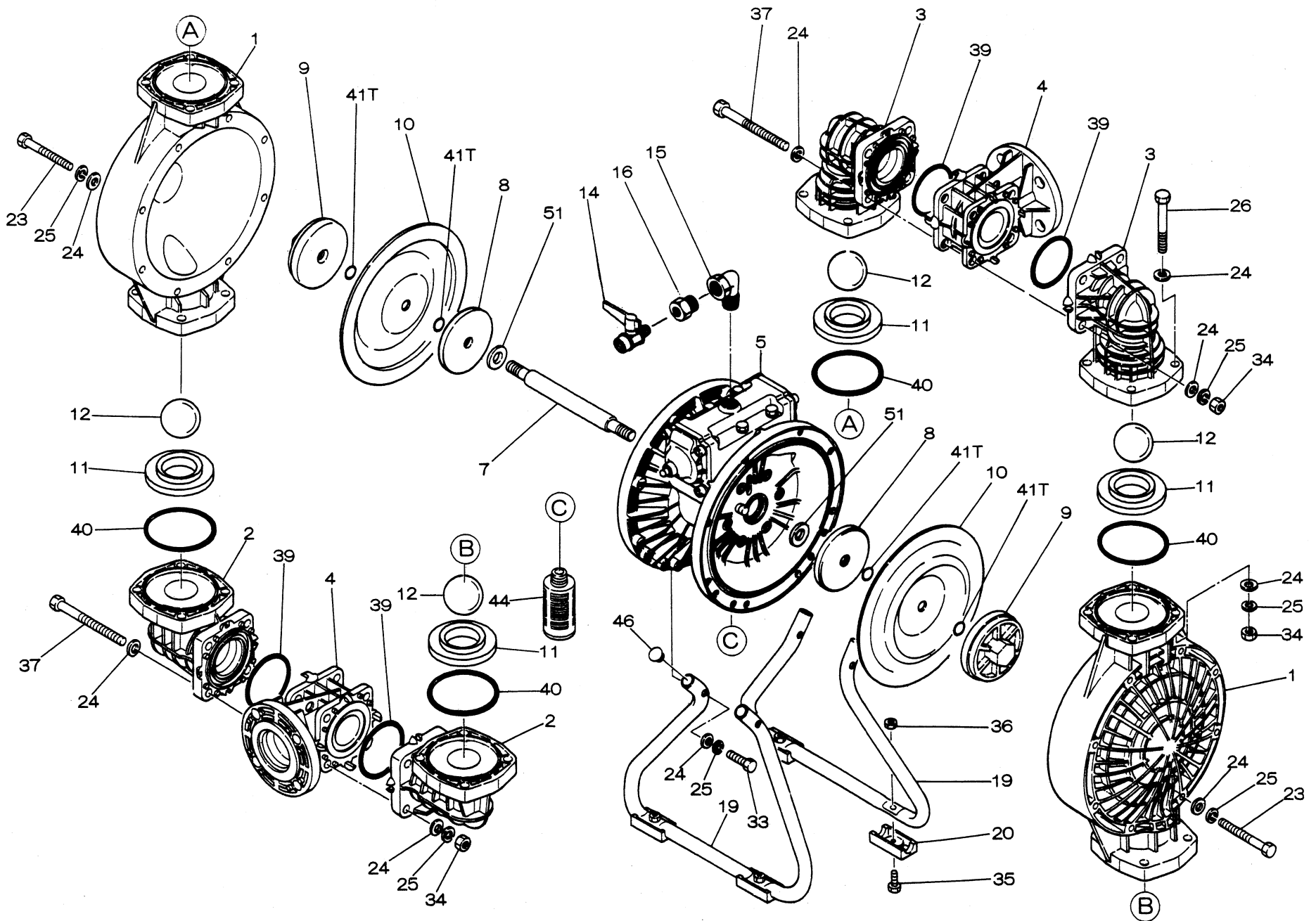
NOTE 1)T : BST/BFT

2. Tab. 1~ Tab.8 : SEE [8.8 PARTS LIST—COMMON PARTS] ON PAGE P.28, P. 29.

3. NO. 50 (NAME PLATE) IS NOT INDICATED IN EXPLODED VIEW

8.3 Exploded View

NDP-40BP_



Parts List

[Link to Tables 1-6 & 7-10](#)

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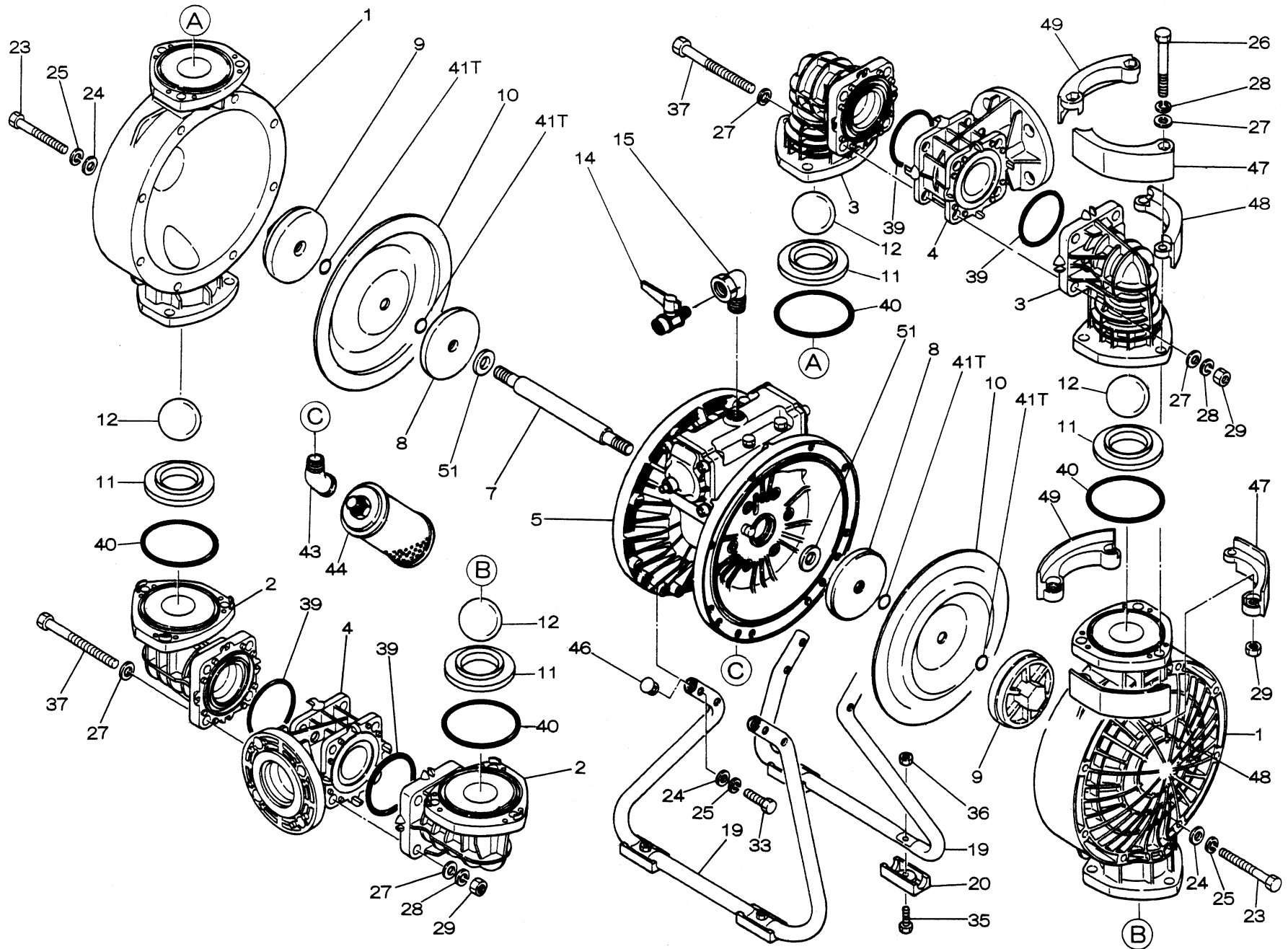
NO.	BP_	DESCRIPTION	Q'TY	NOTE
1	772076	OUT CHAMBER	2	
2	772079	IN MANIFOLD	2	
3	780150	OUT MANIFOLD	2	
4	771722	CENTER MANIFOLD	2	
5	803117	BODY ASSEMBLY	1	
7	711900	CENTER ROD	1	
7T	711939	CENTER ROD	1	
8	711902	CENTER DISK	2	
8T	707817	CENTER DISK	2	
9	771725	CENTER DISK	2	
9T	771726	CENTER DISK	2	
10	Tab.1	DIAPHRAGM	2	
11	772096	VALVE SEAT	4	
12	Tab.4	BALL	4	
14	684321	BALL VALVE	1	1/2"
15	682523	ELBOW	1	3/4"
16	684339	BUSHING	1	3/4"x1/2"
19	711925	STAND BODY	2	
20	771865	CUSHION	4	
23	683541	BOLT	16	M10x1.5x110
24	631330	PLAIN WASHER	68	M10
25	680257	SPRING LOCK WASHER	44	M10
26	621183	BOLT	16	M10x1.5x60
33	621179	BOLT	4	M10x1.5x40
34	628013	NUT	24	M10x1.5
35	621149	BOLT	4	M8x1.25x25
36	683837	NUT WITH FLANGE	4	M8x1.25
37	683542	BOLT	8	M10x1.5x120
39	Tab.7	O'RING	4	
40	Tab.8	O'RING	4	
41T	643015	O'RING	4	P-16 PTFE
44	TM-8	SILENCER	1	1"
46	683641	CAP	4	
50	790911	NAME PLATE	1	
51	770582	CUSHION	2	EXCLUDED BPT

NOTE:

1. T: BPT
2. Tab. 1~Tab. 8: see [8.8 parts list * common parts] on p. 28, P.29.
3. NO. 50 (NAME PLATE) IS NOT INDICATED IN EXPLODED VIEW

8.4 Exploded View

NDP-50BP_, BV_



Parts List

[Link to Tables 1-6 & 7-10](#)

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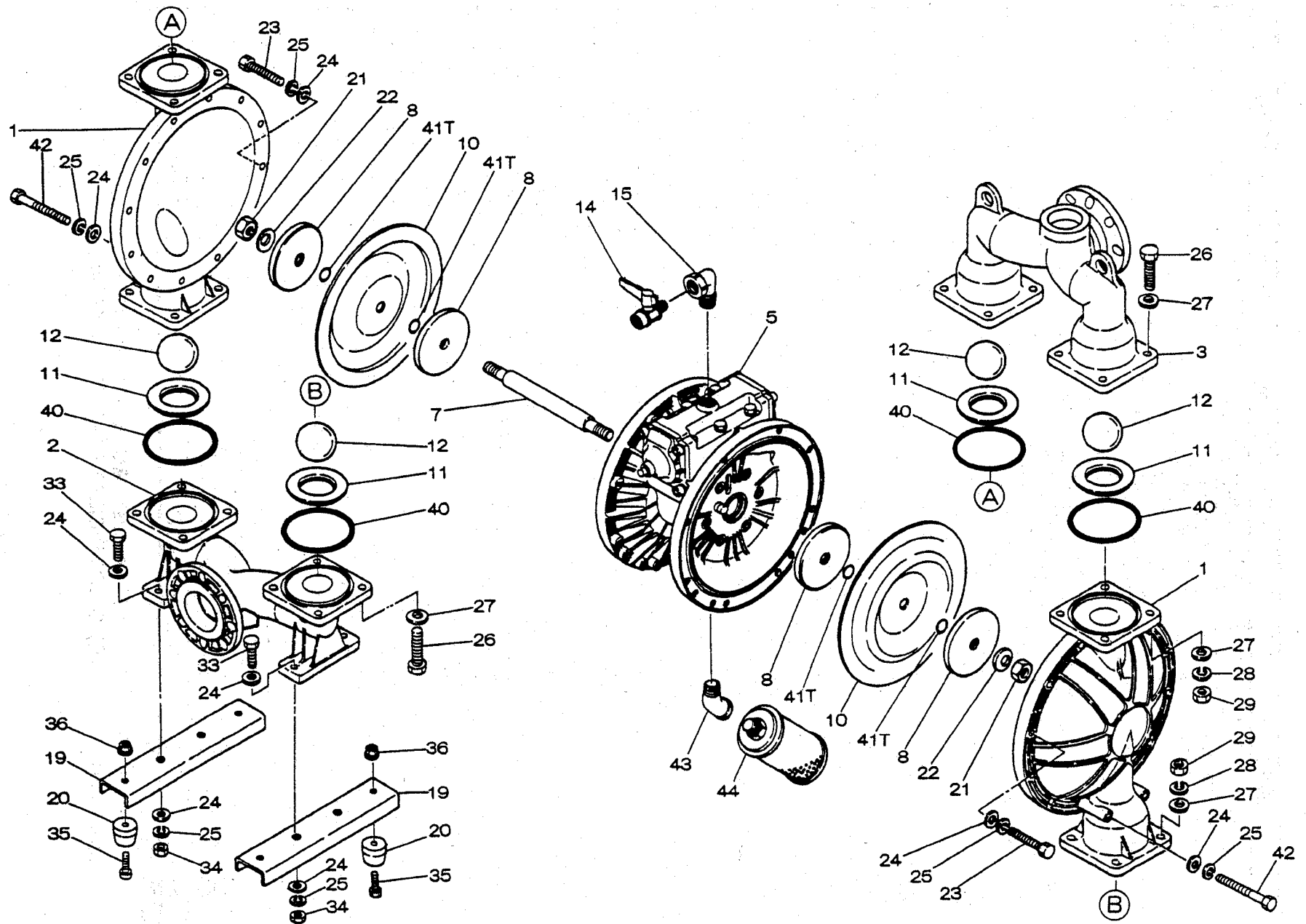
NO.	BP_	BV_	DESCRIPTION	Q'TY	NOTE
1	780148	780153	OUT CHAMBER	2	
2	772080	772086	IN MANIFOLD	2	
3	780151	780154	OUT CHAMBER	2	
4	771723	780115	CENTER MANIFOLD	2	
5	803118	803118	BODY ASSEMBLY	1	
7	711900	711900	CENTER ROD	1	
7T	711939	711939	CENTER ROD	1	
8	711904	711904	CENTER DISK	2	
8T	707822	707822	CENTER DISK	2	
9	771727	771901	CENTER DISK	2	
9T	780063	780116	CENTER DISK	2	
10	Tab. 1	Tab.2	DIAPHRAGM	2	
11	772097	772100	VALVE SEAT	4	
12	Tab.4	Tab.5	BALL	4	
14	684322	684322	BALL VALVE	1	3/4"
15	682523	682523	ELBOW	1	3/4"
19	711926	711926	STAND BODY	2	
20	771865	771865	CUSHION	4	
23	683541	683541	BOLT	16	M10x1.5x110
24	631330	631330	PLAIN WASHER	24	M10
25	680527	680527	SPRING LOCK WASHER	24	M10
26	621213	621213	BOLT	12	M12x1.75x100
27	631331		PLAIN WASHER	28	M12
		631331	PLAIN WASHER	32	M12
28	680607	680607	SPRING LOCK WASHER	20	M12
29	628014	628014	NUT	20	M12x1.75
33	621179	621179	BOLT	8	M10x1.5x40
35	621149	621149	BOLT	4	M8x1.25x25
36	683837	683837	NUT WITH FLANGE	4	M8x1.25
37	684592	684592	BOLT	8	M12x1.75x137
39	Tab.7	Tab.9	O'RING	4	
40	Tab.8	Tab.10	O'RING	4	
41T	643015	643015	O'RING	4	P-16 PTFE
43	684300	684300	ELBOW	1	1"
44	682518	682518	SILENCER	1	1"
46	683641	683641	CAP	4	
47	771786	771786	PROTECTOR A	8	
48	771787	771787	PROTECTOR B	8	
49	771788	771788	PROTECTOR C	8	
50	790911	790911	NAME PLATE	1	
51	770582	770582	CUSHION	2	EXCLUDED B_T

NOTE:

1. T: BPT/BVT
2. Tab. 1~Tab. 10: see [8.8 parts list * common parts] on p. 28, P.29.
3. NO. 50 (NAME PLATE) IS NOT INDICATED IN EXPLODED VIEW

8.5 Exploded View

NDP-80BA_



Parts List

[Link to Tables 1-6 & 7-10](#)

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8.5 Exploded View

NDP-80BA_

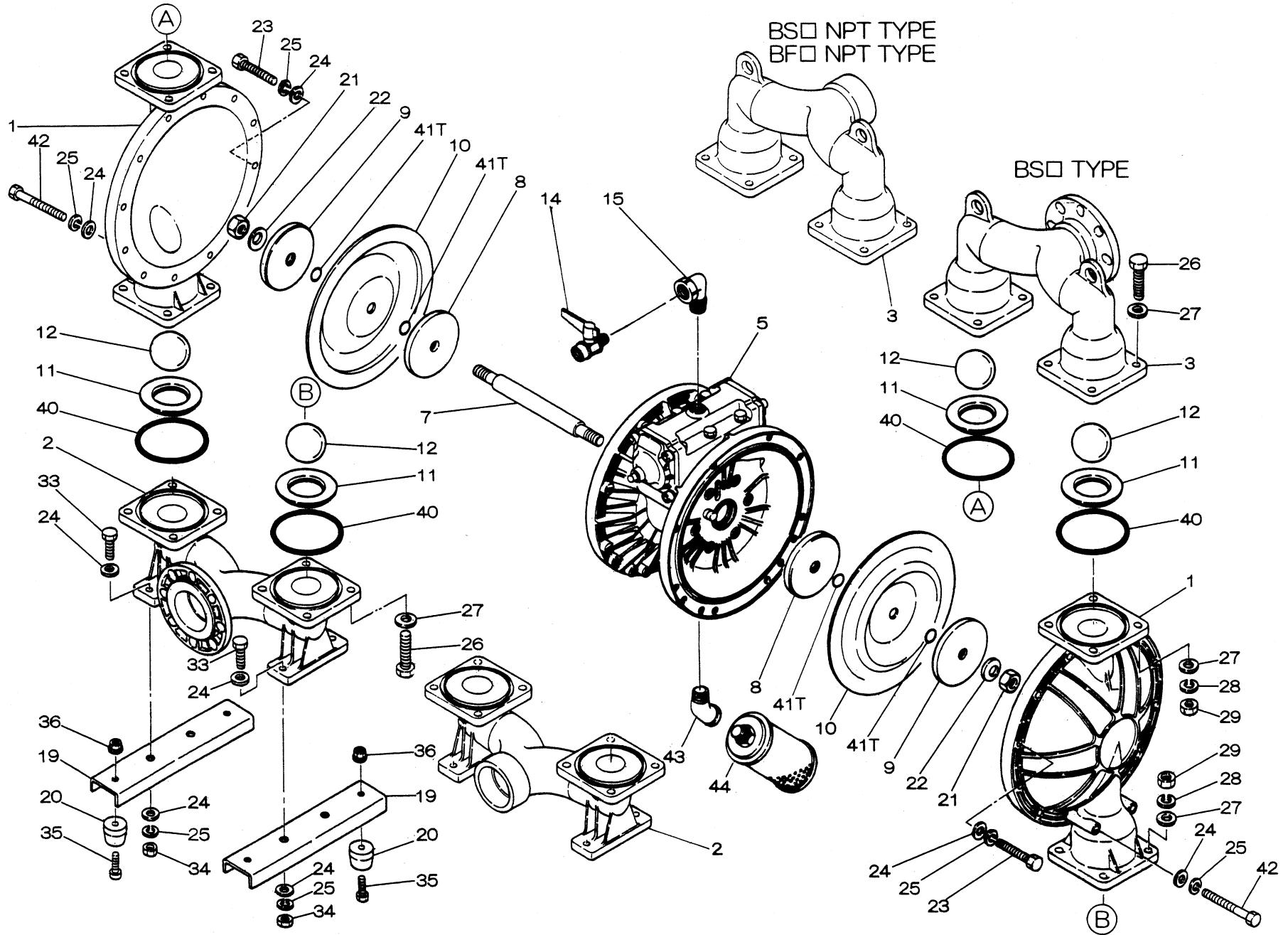
NO.	BA_	DESCRIPTION	Q'TY	NOTE
1	580962	OUT CHAMBER	2	
2	714371	IN MANIFOLD	1	581050
3	714365	OUT MANIFOLD	1	581047
5	803113	BODY ASSEMBLY	1	
7	711901	CENTER ROD	1	
7T	711940	CENTER ROD	1	
8	711906	CENTER DISK	4	
8T	711041	CENTER DISK	4	
10	Tab.1	DIAPHRAGM	2	
11	Tab.3	VALVE SEAT	4	
12	Tab.4	BALL	4	
14	684322	BALL VALVE	1	3/4"
15	682523	ELBOW	1	3/4"
19	711912	PUMP BASE	2	
20	771402	CUSHION	4	
21	Tab.6	NUT	2	
22	682740	CONED DISK SPRING	2	M16
23	611186	BOLT	20	M10x1.5x75
24	631014	PLAIN WASHER	32	M10
25	631421	SPRING LOCK WASHER	28	M10
26	611204	BOLT	16	M12x1.75x55
27	631015	PLAIN WASHER	48	M12
28	631422	SPRING LOCK WASHER	24	M12
29	627014	NUT	24	M12x1.75
33	611177	BOLT	4	M10x1.5x35
34	627013	NUT	4	M10x1.5
35	611149	BOLT	4	M8x1.25x25
36	682276	NUT WITH FLANGE	4	M8x1.25
40	Tab.8	O'RING	4	
41T	643015	O'RING	4	P-16 PTFE
42	683546	BOLT	4	M10x1.5x130
43	684300	ELBOW	1	1"
44	682518	SILENCER	1	1"
50	790911	NAME PLATE	1	

NOTE:

1. T: BAT
2. Tab. 1~Tab. 8: see [8.8 parts list * common parts] on p. 28, P.29.
3. NO. 50 (NAME PLATE) IS NOT INDICATED IN EXPLODED VIEW

8.6 Exploded View

NDP-80BS_, BF_



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Parts List

Link to Tables [1-6](#) & [7-10](#)

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8.6 Exploded View

NDP-80BS_, BF_

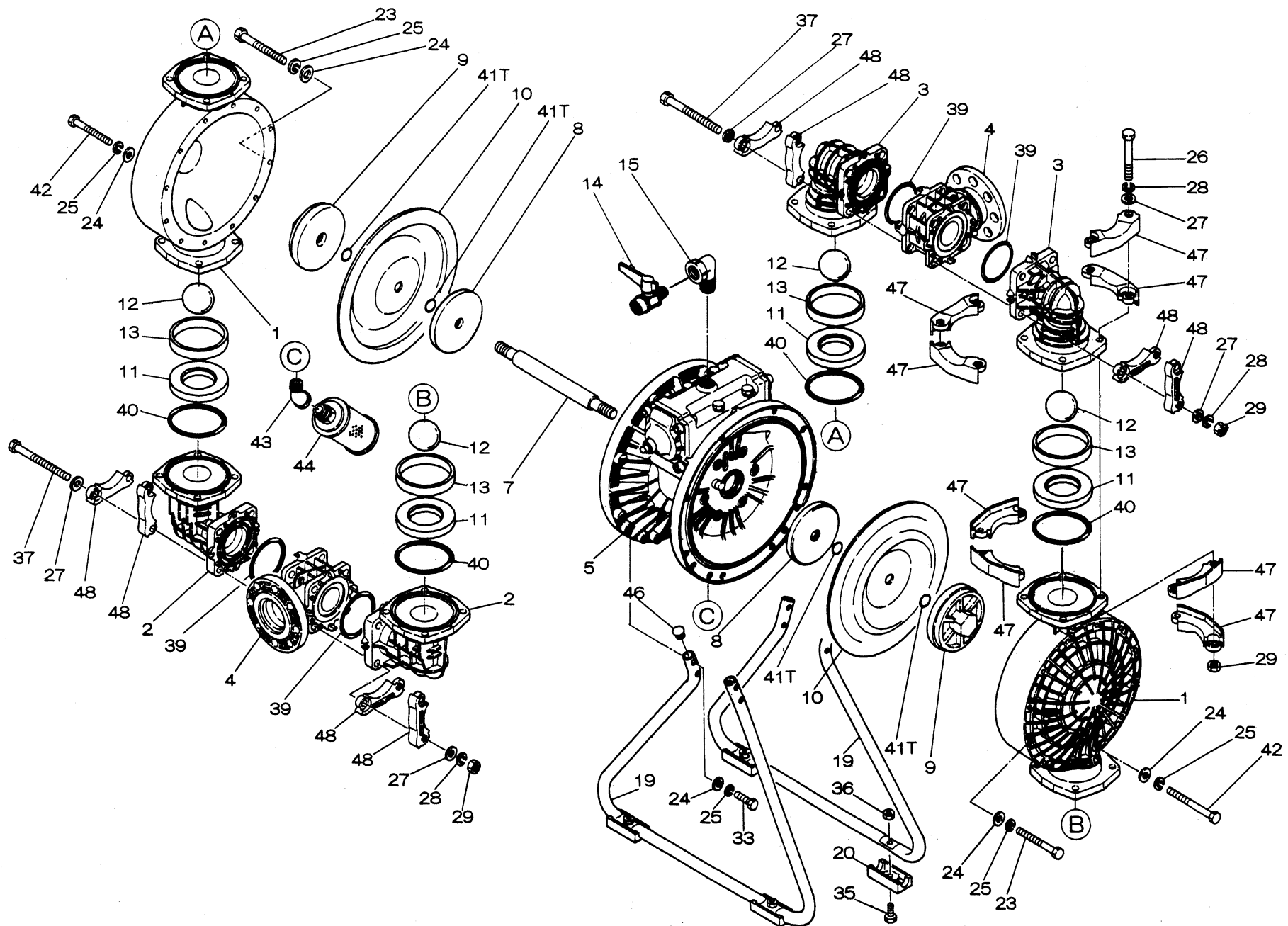
NO.	BS_	BS_NPT	BF_NPT	DESCRIPTION	Q'TY	NOTE
1	712933	712933	713158	OUT CHAMBER	2	
2	712603	712605	713170	IN MANIFOLD	1	
3	712602	712604	713167	OUT MANIFOLD	1	
5	803119	803119	803113	BODY ASSEMBLY	1	
7	711901	711901	711901	CENTER ROD	1	
7T	711940	711940	711940	CENTER ROD	1	
8	711906	711906	711906	CENTER DISK	2	
8T	711041	711041	711041	CENTER DISK	2	
9	711907	711907	711907	CENTER DISK	2	
9T	711039	711039	711039	CENTER DISK	2	
10	Tab.1	Tab.1	Tab.1	DIAPHRAGM	2	
11	Tab.3	Tab.3	Tab.3	VALVE SEAT	4	
12	Tab.4	Tab.4	Tab.4	BALL	4	
14	684322	684322	684322	BALL VALVE	1	3/4"
15	682523	682523	682523	ELBOW	1	3/4"
19	711912	711912	711912	PUMP BASE	2	
20	771402	771402	771402	CUSHION	4	
21	Tab.6	Tab.6	Tab.6	NUT	2	
22	682740	682740	682740	CONED DISK SPRING	2	M16
23	621183	621183	621183	BOLT	20	M10x1.5x60
24	631174	631174	631014	PLAIN WASHER	32	M10
25	680257	680257	631421	SPRING LOCK WASHER	28	M10
26	621203	621203	611203	BOLT	16	M12x1.75x50
27	631175	631175	631015	PLAIN WASHER	32	M12
28	680607	680607	631422	SPRING LOCK WASHER	16	M12
29	628014	628014	627014	NUT	16	M12x1.75
33	621177	621177	611177	BOLT	4	M10x1.5x35
34	628013	628013	627013	NUT	4	M10x1.5
35	611149	611149	611149	BOLT	4	M8x1.25x25
36	682276	682276	682276	NUT WITH FLANGE	4	M8x1.25
40	Tab.8	Tab.8	Tab.8	O'RING	4	
41T	643015	643015	643015	O'RING	4	P-16 PTFE
42	683543	683543	683546	BOLT	4	M10x1.5x130
43	684300	684300	684300	ELBOW	1	1"
44	682518	682518	682518	SILENCER	1	1"
50	790911	790911	790911	NAME PLATE	1	

NOTE:

1. T: BST/BFT
2. Tab. 1~Tab. 8: see [8.8 parts list * common parts] on p. 28, P.29.
3. NO. 50 (NAME PLATE) IS NOT INDICATED IN EXPLODED VIEW

8.7 Exploded View

NDP-80BP_



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Parts List

[Link to Tables 1-6 & 7-10](#)

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8.7 Exploded View

NDP-80BP_

NO.	BA_	DESCRIPTION	Q'TY	NOTE
1	780149	OUT CHAMBER	2	
2	772081	IN MANIFOLD	2	
3	780152	OUT MANIFOLD	2	
4	771724	CENTER MANIFOLD	2	
5	803119	BODY ASSEMBLY	1	
7	711901	CENTER ROD	1	
7T	711940	CENTER ROD	1	
8	711906	CENTER DISK	2	
8T	711041	CENTER DISK	2	
9	780064	CENTER DISK	2	
9T	771730	CENTER DISK	2	
10	Tab.1	DIAPHRAGM	2	
11	772098	VALVE SEAT	4	
12	Tab.4	BALL	4	
13	772099	VALVE GUIDE	4	
14	684322	BALL VALVE	1	3/4"
15	682523	ELBOW	1	3/4"
19	711927	PUMP STAND	2	
20	771865	CUSHION	4	
23	683543	BOLT	20	M10x1.5x130
24	631330	PLAIN WASHER	32	M10
25	680257	SPRING LOCK WASHER	32	M10
26	621213	BOLT	16	M12x1.75x100
27	631331	PLAIN WASHER	32	M12
28	680607	SPRING LOCK WASHER	24	M12
29	628014	NUT	24	M12x1.75
33	621179	BOLT	8	M10x1.5x40
35	611149	BOLT	4	M8x1.25x25
36	683837	NUT WITH FLANGE	4	M8x1.25
37	683544	BOLT	8	M12x1.75x220
39	Tab.7	O'RING	4	
40	Tab.8	O'RING	4	
41T	643015	O'RING	4	P-16 PTFE
42	683552	BOLT	4	M10x1.5x150
43	684300	ELBOW	1	1"
44	682518	SILENCER	1	1"
46	683641	CAP	4	
47	771789	PROTECTOR A	32	
48	771790	PROTECTOR B	24	INCLUDED 8 PIECES ACCESSORIES
50	790911	NAME PLATE	1	

NOTE:

1. T: BPT
2. Tab. 1~Tab. 8: see [8.8 parts list * common parts] on p. 28, P.29.
3. NO. 50 (NAME PLATE) IS NOT INDICATED IN EXPLODED VIEW

TAB. 1 DIAPHRAGM [BA BS BF BP]				
TYPE	NDP-40	NDP-50	NDP-80	MATERIAL
B_C	771853	771855	771857	CR
B_N	771700	771702	771704	NBR
B_E	771854	771856	771858	EPDM
B_V	771799	771800	771801	FPM
B_T	770814	770815	770934	PTFE
B_H	771701	771703	771705	TPEE
B_S	771975	771976	771977	TPO

TAB. 2 DIAPHRAGM		
TYPE	BV_	MATERIAL
BVC	/	CR
BVN	/	NBR
BVE	771856	EPDM
BVV	771800	FPM
BVT	770815	PTFE
BVH	771703	TPEE
BVS	771976	TPO

TAB. 3 VALVE SEAT [BA BS BF]							
TYPE	NDP-40		NDP-50		NDP-80		MATERIAL
	BA_	BS/BF_	BA_	BS/BF_	BA_	BS/BF_	
B_C	771956	771956	771957	771957	771958	771958	CR
B_N	771994	771994	771995	771995	771996	771996	NBR
B_E	771921	771921	771949	771949	771999	771999	EPDM
B_V	771997	771927	771987	771987	771998	771998	FPM
B_T	712382	/	712383	/	712384	/	A5056
	/	711908	/	711909	/	711910	SS316
B_H	771793	771793	771794	771794	771795	771795	TPEE
B_S	772003	772003	772004	772004	772005	772005	EPDM

TAB. 4 BALL [BA BS BF BP]				
TYPE	NDP-40	NDP-50	NDP-80	MATERIAL
B_C	770550	770627	770559	CR
B_N	770584	770630	770587	NBR
B_E	770593	770633	770596	EPDM
B_V	770602	770636	770605	FPM
B_T	770692	770693	770694	PTFE
B_H	770584	770630	770587	NBR
B_S	770593	770633	770596	EPDM

TAB. 5 BALL		
TYPE	BV_	MATERIAL
BVC	/	CR
BVN	/	NBR
BVE	770633	EPDM
BVV	770636	FPM
BVT	770693	PTFE
BVH	770693	PTFE
BVS	770693	PTFE

TAB. 6 NUT (M16x1.5) [BA BS BF]				
TYPE	NDP-40	NDP-50	NDP-80	MATERIAL
B_C	683408	683408	683408	PA,SS316
B_N	683408	683408	683408	PA,SS316
B_E	683408	683408	683408	PA,SS316
B_V	706128	706128	706144	SS316
B_T	706128	706128	706144	SS316
B_H	683408	683408	683408	PA,SS316
B_S	683408	683408	683408	PA,SS316

NDP-40-50BA_
NDP-40-50BS_, BF_
NDP-40BP_
NDP-50BP_, BV_
NDP-80BA_
NDP-80BS_, BF_
NDP-80BP_

Jump to Drawing

Jump to Tables 7-10

TAB. 7 O'RING

TYPE	NDP-40	NDP-50		NDP-80	MATERIAL
	BA/BP	BA_	BP_	BA/BP_	
	P-70	P-80	P-85	P-110	
B_C	640060	640063	640064	640070	NBR
B_N	640060	640063	640064	640070	NBR
B_E	683998	684120	684121	684123	EPDM
B_V	642060	642063	642064	642070	FPM
B_T	643060	643063	643064	643070	PTFE
B_H	640060	640063	640064	640070	NBR
B_S	683998	684120	684121	684123	EPDM

TAB. 8 O'RING

TYPE	NDP-40		NDP-50	NDP-80		MATERIAL
	BA/BS/BF	BP_	BA/BS/BF/BP	BA/BS/BF	BP_	
	P-90	P-85	P-105	P-140	P-150	
B_C	640065	640064	640069	640078	640080	NBR
B_N	640065	640064	640069	640078	640080	NBR
B_E	683999	684121	684122	684124	684125	EPDM
B_V	642065	642064	642069	642078	642080	FPM
B_T	643065	643064	643069	643078	643080	PTFE
B_H	640065	640064	640069	640078	640080	NBR
B_S	683999	684121	684122	684124	684125	EPDM

TAB. 9 O'RING

TYPE	BV_	MATERIAL	NOTE
B_C			
B_N			
B_E	684121	EPDM	P-85
B_V	642064	FPM	P-85
B_T	771899	PTFE	
B_H	771899	PTFE	
B_S	771899	PTFE	

TAB. 10 O'RING

TYPE	BV_	MATERIAL	NOTE
B_C			
B_N			
B_E	684122	EPDM	P-85
B_V	642069	FPM	P-85
B_T	772063	PTFE	
B_H	772063	PTFE	
B_S	772063	PTFE	

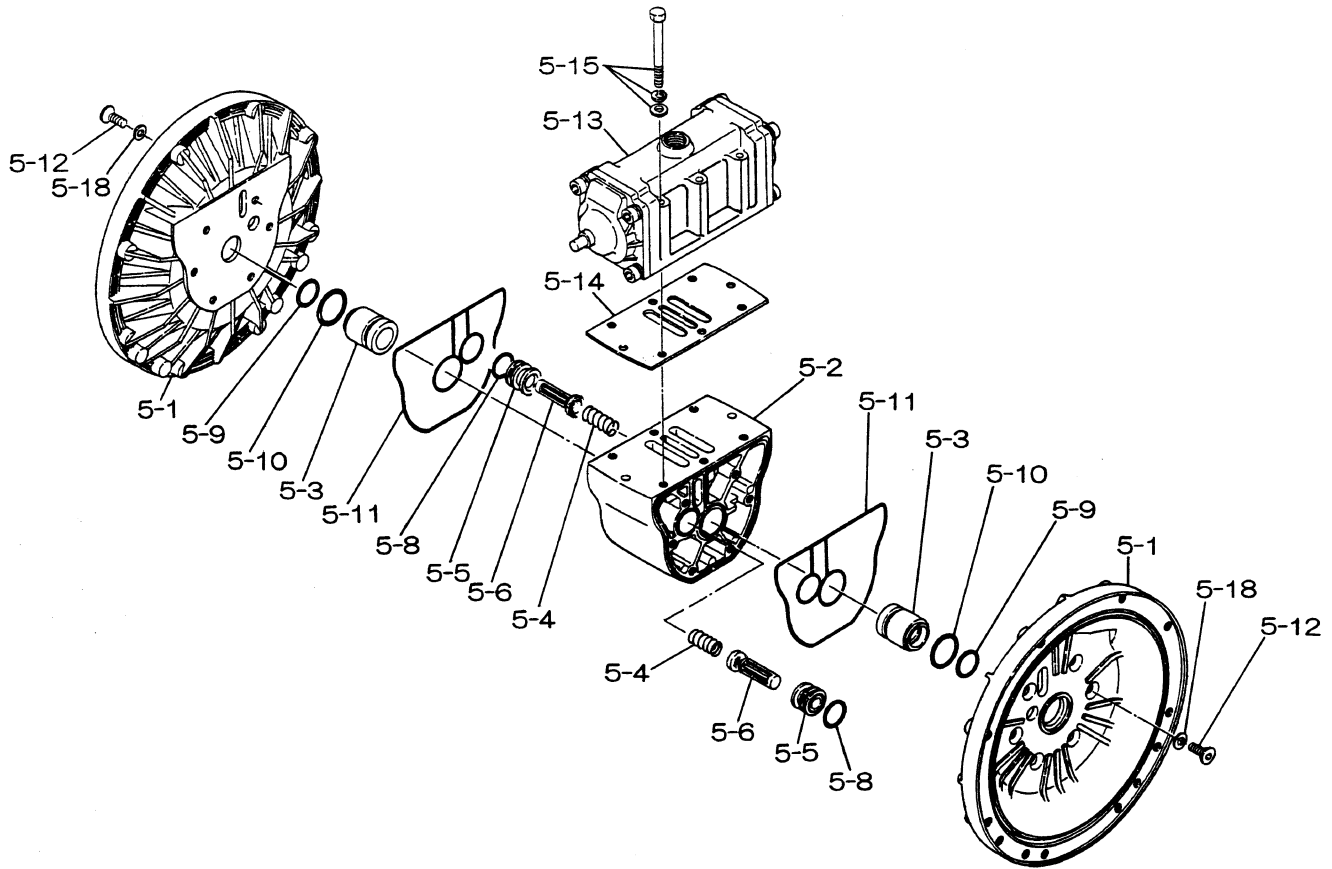
NDP-40-50BA_
 NDP-40-50BS_, BF_
 NDP-40BP_
 NDP-50BP_, BV_
 NDP-80BA_
 NDP-80BS_, BF_
 NDP-80BP_

Jump to Drawing

Jump to Tables 1-6

8.9 Exploded View

BODY ASSEMBLY



8.9 Parts List

BODY ASSEMBLY

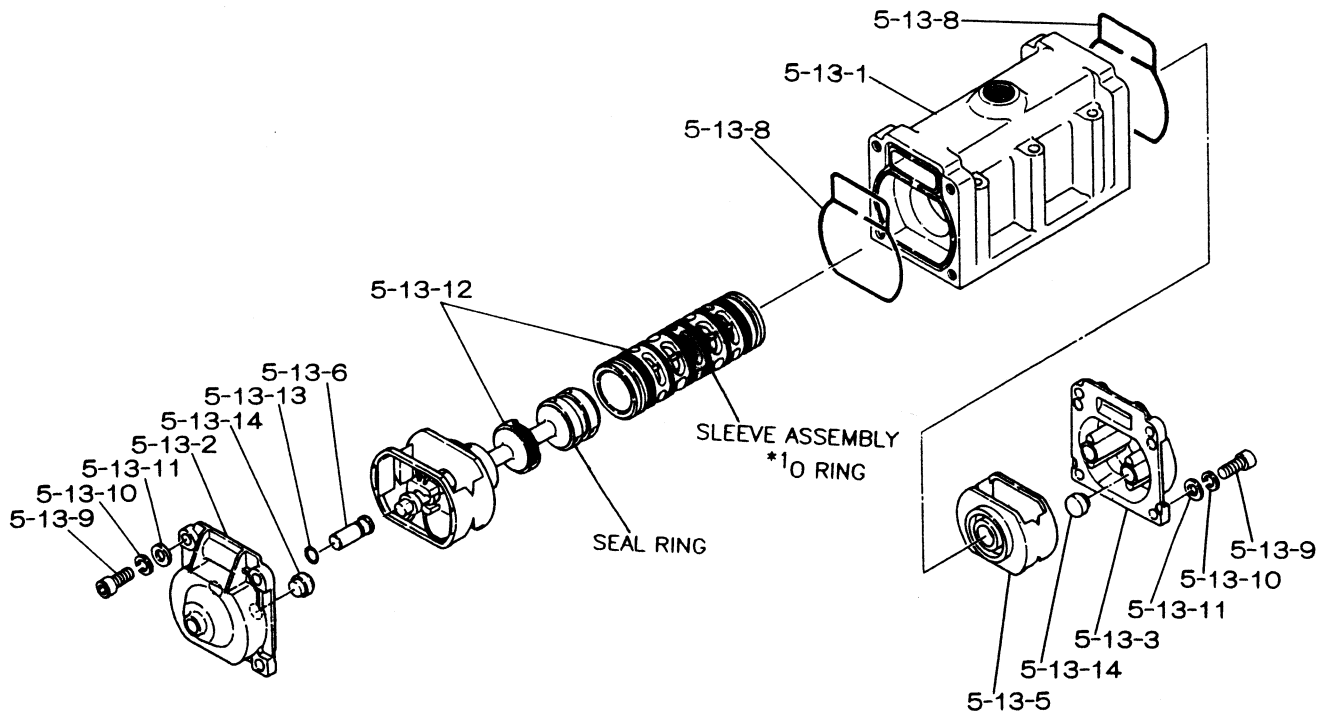
NO.	NDP-40 803111 *1 803117 *2	NDP-50 803112 *1 803118 *2	NDP-80 803113 *1 803119 *2	DESCRIPTION	Q'TY	NOTE
5-1	711933	711934	711935	AIR CHAMBER	2	
5-2	711936	711936	711936	BODY	1	
5-3	711938	711938	711938	THROAT BEARING	2	
5-4	711937	711937	711937	SPRING	2	
5-5	771740	771740	771740	VALVE SEAT	2	
5-6	832162	832162	832163	PILOT VALVE ASSEMBLY	2	
5-8	640020	640020	640020	O-RING	2	P-22A NBR
5-9	640023	640023	640023	O-RING	2	P-25 NBR
5-10	640029	640029	640029	O-RING	2	P-30 NBR
5-11	771742	771742	771742	GASKET	2	
5-12	683812	683812	683812	FLAT HEAD BOLT	12	M8x1.25x20
5-13	802971	802971	802971	VALVE BODY ASSEMBLY	1	
5-14	771712	771712	771712	GASKET	1	
5-15	684240	684240	684240	BOLT	6	M8x1.25x85
5-18	684987	684987	684987	PLAIN WASHER	12	

NOTE: *1: NO PAINT, *2: PAINTED

Air Kit Contents

8.10 Exploded View

VALVE BODY ASSEMBLY



8.11 Parts List

VALVE BODY ASSEMBLY

802971 VALVE BODY ASSEMBLY

NO.	PART NO.	DESCRIPTION	Q'TY	NOTE
5-13-1	711931	VALVE BODY	1	
5-13-2	580999	CAP A	1	
5-13-3	581000	CAP B	1	
5-13-5	771735	SPRING STOPPER	1	
5-13-6	712976	RESET BUTTON	1	
5-13-8	771738	GASKET	2	
5-13-9	685036	HEXAGON SOCKET HEAD BOLT	8	M8x1.25x20
5-13-10	803115	C SPOOL VALVE ASSEMBLY	1	*1 (640036)
5-13-11	640005	O'RING	1	P-8 NBR
5-13-12	684128	CUSHION	4	

NOTE: *1: PART NUMBER MENTIONED ON O'RING FOR SLEEVE ASSEMBLY ONLY.

NDP-40-50BA_
 NDP-40-50BS_, BF_
 NDP-40BP_
 NDP-50BP_, BV_
 NDP-80BA_
 NDP-80BS_, BF_
 NDP-80BP

Jump to Drawing



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