SM-7350-A/3

INSTRUCTION MANUAL

FOR

CYLINDER VALVE

NAB※ – 8 · 10 SERIES

GNAB※ SERIES

Prior to using the Product, it is essential to read this INSTRUCTION MANUAL, especially the description of safety-use issue.

For quick reference whenever necessary, keep this INSTRUCTION MANUAL in a good manner.

CKD Corporation

FOR SAFETY USE

The Product is to be used by those who has a basic knowledge about material, fluid, piping electricity regarding Control Valves (solenoid valves, motor valves, air operated valves and so on.)

Never use this Product by those who have no knowledge or are not well trained about Control Valves.

Should be any trouble or accident caused by a wrong selection and/or wrong use of the Product even by a person of basic knowledge about Control Valves, we are not responsible therefore.

Since any customer of the Product have a variety of its application, we are not in a position to get all the information on how and where the Product is used. There may be the cases where that the Product may not meet customers' requirement or may cause any trouble or accident, by fluid, piping or other condition that are not within the specifications of the Product.
Under such a circumstance, select with their responsibility the most suitable application and use of the Product according to the customers' requirements.

The Product incorporates a various safety arrangement, however miss-handling of the product may lead to any trouble or accident on customers side. **To avoid any possible trouble, read this INSTRUCTION MANUAL carefully and understand it fully.**

Pay your attention to the items described in this Text, as well as the items indicated below.

⚠ CAUTIONS

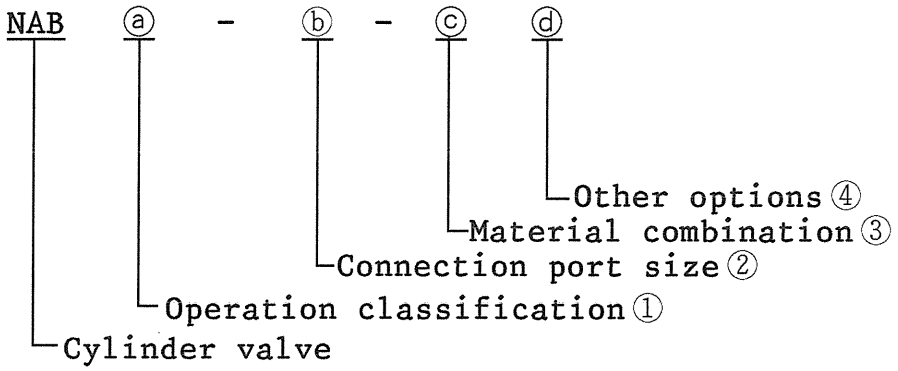
- **When energized, heat is generated at coil portion of solenoid valves and motor valves particularly "Class H" coil where may have a high temperature.**

- **There my have electric shock when wire connecting portion of solenoid valves or motor valves are touched. In case of disassembly or inspection, turn off power supply beforehand. Don't touch live portion by wet hands.**

- **Make piping so as not to have leakage and check for no leakage before use, because in case of control valves for high temperature fluid like steam, leakage may cause heat injury.**

1. METHOD TO SPECIFY THE MODEL

1.1 Single



① Operation classification

ⓐ	Operation classification
1	Normally closed type
2	Normally open type
3	Double action type

② Connection port size

ⓑ	Body end connection port size
8	Rc1/4
10	Rc3/8

③ Material combination

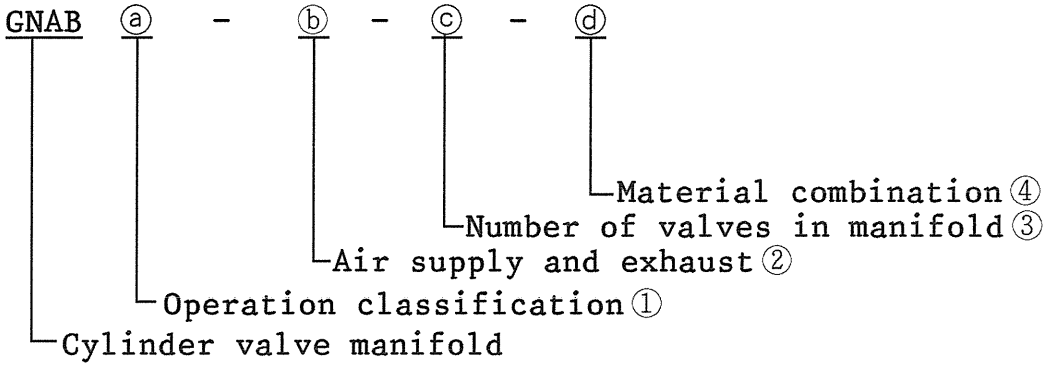
ⓒ	Material combination	
	Body	Seal
No symbol	Brass	Nitrile rubber
B	Brass	Fluoro rubber
D	Stainless steel	Nitrile rubber
E	Stainless steel	Fluoro rubber

NOTE
(1) When other options are provided, "0" is inserted where there is no symbol.

④ Other options

ⓓ	Other options
No symbol	No option
B	Installing board

1.2 Manifold



① Operation classification

ⓐ	Operation classification
1	Normally closed type
2	Normally open type
3	Double action type

② Air supply and exhaust

ⓑ	Air supply and exhaust
1	Centralized supply and individual exhaust (The Vacuum pump side with the port A)
5	Individual supply and centralized exhaust (The Vacuum pump side with the port C)

③ Number of valves in manifold

ⓒ	Number of valves in manifold
2	2 - valve
3	3 - valve
4	4 - valve
5	5 - valve
6	6 - valve
7	7 - valve
8	8 - valve
9	9 - valve
10	10 - valve
0	Actuator only

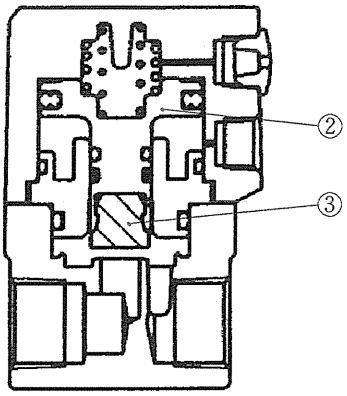
④ Material combination

ⓓ	Material combination	
	Subplate	Seal
No symbol	Brass	Nitrile rubber
B	Brass	Fluoro rubber
D	Stainless steel	Nitrile rubber
E	Stainless steel	Fluoro rubber
1	Aluminum	Nitrile rubber
2	Aluminum	Fluoro rubber

2. OPERATING PRINCIPLES

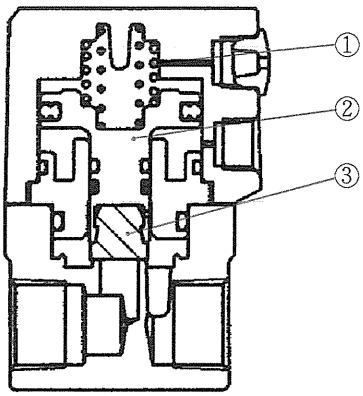
Normally closed type :

When opening :



Charging compressed air into port X raises the valve plate③(of the piston assembly②)which causes the valve seat to open, allowing the fluid to flow.

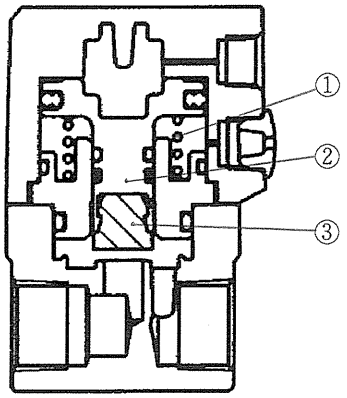
When closing :



Discharging compressed air charged in port X allows the spring ①to lower the valve plate③(of the piston assembly②) which closes the valve seat,sealing the fluid.

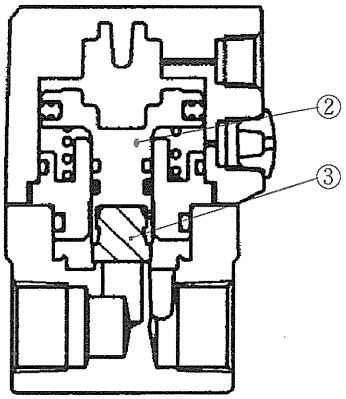
Normally open type :

When opening :



Removing air from port Y allows the spring①to raise the valve plate③(of the piston assembly②) which causes the valve seat to open, allowing the fluid to flow.

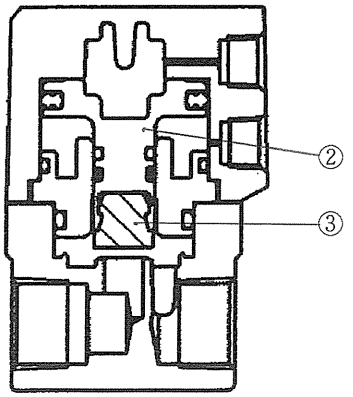
When closing :



Charging air into port Y lowers the valve plate③(of the piston assembly②) which causes the valve seat to close,sealing the fluid.

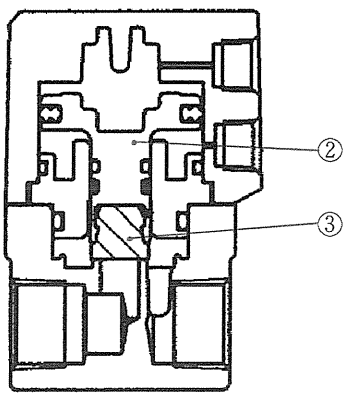
Double action type :

When opening :



Charging compressed air into port X and,at the same time,discharging air from port Y, raises the vaive plate③(of the piston assembly②)which causes the valve seat to open, allowing the fluid to flow.

When closing :

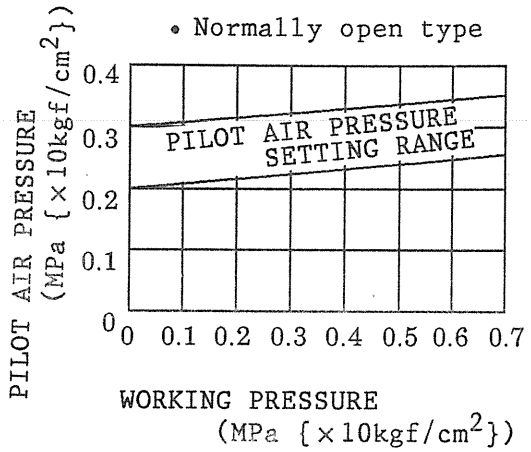


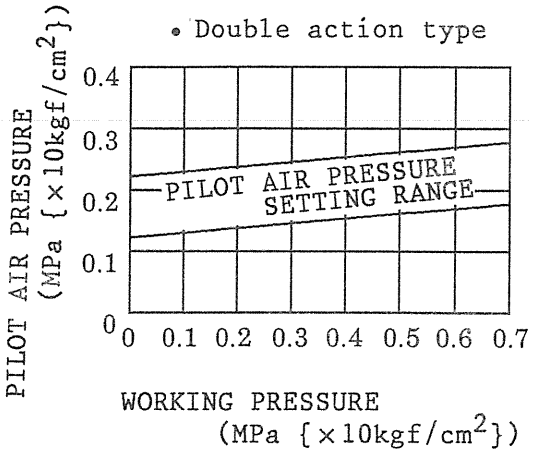
Charging compressed air into port Y and,at the same time,discharging air from port X, lowers the valve plate③(of the piston assembly②)which causes the valve saet to close, sealing the fluid.

3.PRECAUTIONS

3-1. Precautions Prior to Operation

(1) The working pressure must be within the normal operating range. If your application exceeds the specified range,poor operation and/or external leakage may result. Particularly with the normally open type or double action type valve,the pilot control pressure must be as graphed below.





(2) Pilot air can be supplied without lubrication. If in any circumstances it should require lubrication,a class 1 ISO VG32 (#90) turbine oil or its equivalent should be used. In this case,use a filter having an element of 5μm or less.

(3) The ambient and fluid temperatures must be within the normal operating range. If conditions exist where frozen fluid might possibly result, insulation must be provided.

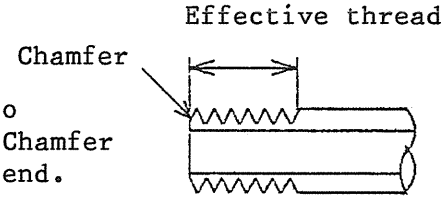
(4) A suitable filter must be mounted at the inlet side of the valve if dust and/or foreign matter might possibly get in,or in cases where rust might possibly result in the piping.80-100 mesh shall be used as a guideline.

(5) If the main body is subject to being splashed by large amounts of water,oil,etc.,it should be suitably protected,such as by enclosing with a panel or cover. Especially for the types normally closed and normally open, the ports with no pilot air supply are released to the atmosphere and, therefore, requires careful handling to prevent the intrusion of water, etc.

(6) Even if fluororubber is used as the seal material, the permissible highest temperature is 60°C. Make a separate consultation with our company for use in higher temperatures that listed above.

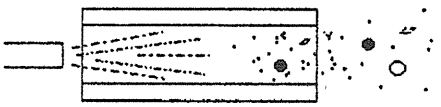
(7) Oil prohilition treatment must not be done since a grease layer has been applied to the piston seal section. When using a special flow material consult with our company before use and follow directions for the type of grease.

3-2. Piping Precautions

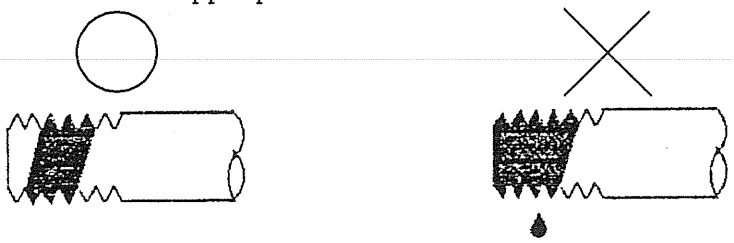


(1) The gas piping should be threaded to cover the effective thread length. Chamfer about a half pitch at the thread's end.

(2) Always blow the piping with air to remove any foreign matter,chips,etc., before connecting.



(3) Avoid getting any selant,sealing tape, etc.,in the piping. The amount of sealant and the location of taping should be suitable and appropriate.



(4) The piping should be provided with a bypass circuit. This facilitates storage and maintenance.

(5) The piping should be such that the supply ports on the body end and pilot control end are as indicated in the table below.

Operation classification	Body end supply port			Pilot control end supply port
	NAB	GNAB		
		Centralized supply type	Individual supply type	
Normally closed type	A or B	C	A	X
Normally open type	A or B	C	A	Y
Double action type	A or B	C	A	X and Y

Caution : Connect the normally pressurized side with the port A for the NAB.

(6) For the normally closed or normally open type valves,any port to which no pilot pressure will be applied should be left open to the air.
Also,it should be appropriately portected from dust,such as by installing a silencer or elbow joint with its opening facing down,if a large amount of dust is present in the ambient air. Also,if you do not want to allow the valve to intake or discharge air directly from its surroundings—in cases where air around the valve is contaminated,or where the scattering of dust in the surrounding atmosphere must be avoided,etc.,the NAB/GNAB should be provided with piping leading to a place where no such problem is anticipated.

(7) Use the three or four—way solenoid valve for pilot control available from CKD Corporation.
Recommended solenoid valve:
(a)For normally closed and normally open types : AG31—02—1 Multilex valve,1.5 times orifice diameter
(b)For double action type : 4KA110 Selex valve
(For details please refer to the relevant catalogs.)

(8) The peripheral devices(tube,joint,etc)for the related pilot port should be suitable to the specifications and applications of the solenoid valve for pilot control.
(For details please refer to the relevant catalogs.)

(9) When the piping is connected,make sure that no leakage is possible from connections. Also,introduce the fluid and perform several test runs to see that it operates normally.

4 MAINTENANCE AND INSPECTION

4.1 Periodic Inspection

(1) To ensure that the NAB/GNAB provides an optinal operation perform periodic inspection once or twice year.

(2) Inspection items

(a) No dust and foreign matter is accumulated in the NAB/GNAB. Also,no highly sticky matter has adhered inside. If any abnormality is detected,disassemble the valve and remove it.

(b) No abnormal wear or bruising is present on the valve seat of the NAB/GNAB, including the valve plate. If any abnormality is detected,disassemble the valve and remove it.

(c) The following are repair parts and are to be replaced when abnormality occur.

Repair parts	Nomber of the disassembly figure
Valve plate	⑤
PSD−packing	⑥
O−ring	⑦⑨⑩
MY−packing	⑧

4.2 Disassembly, Reassembly, Inspection

4.2.1 Disassembly

(1) Before disassembling, be sure to turn off the power and remove the pilot air, fluid, and pressure.

(2) First remove four cross recessed head machine screw with spring washer ①.
Then remove cylinder cover ②,spring ③,piston ④,adapter ⑪.and body ⑫ in that order.
(But that the spring is mounted below the piston in the normally open type valve.)

<Note>
When loosening the cross recessed head machine screw with spring washer for normally closed type and normally open type valves,be sure to hold the cylinder cover securely since the reaction force of the inserted spring is large and dangerous.

4.2.2 Reassembly

(1) Reverse the assembly procedure. No parts should be left unassembled.

(2) Before housing the piston assembly into the cylinder cover, apply grease inside it.

※ For grease

Material combination	0 , D , 1	: Lithium soap base grease
(Body · Seal)	B , E , 2	: Silicon base grease

(3) The MY−packing⑧is mounted into piston correctly oriented.

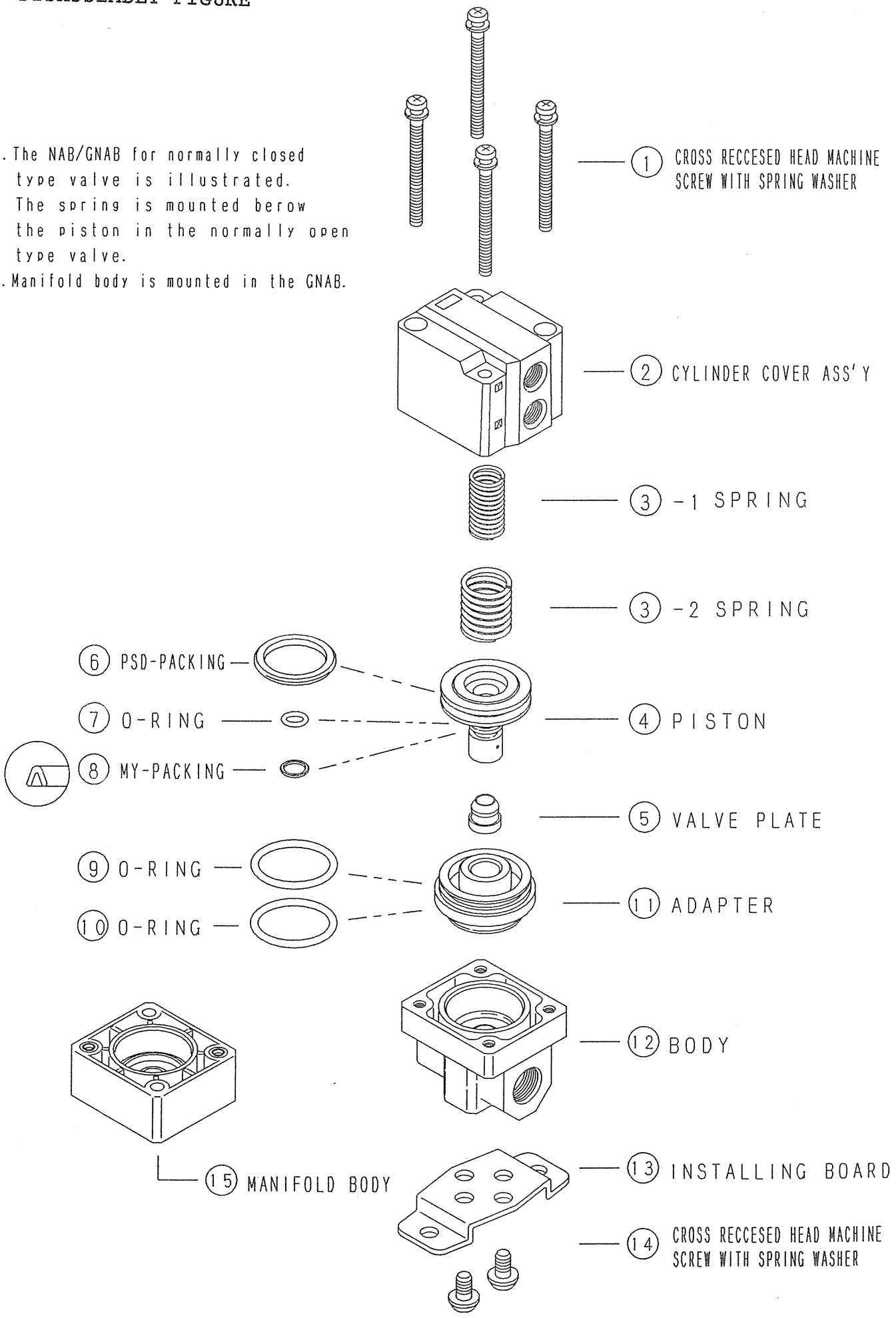
4.2.3 Inspection

(1) Apply a pressure equivalent to that of the fluid used. Check that no interior and exterior leakage occurs from the NAB/GNAB.

(2) Next,apply the pilot pressure and send an electrical signal to confirm that the valve opens closes normally.

DISASSEMBLY FIGURE

1. The NAB/GNAB for normally closed type valve is illustrated. The spring is mounted berow the piston in the normally open type valve.
2. Manifold body is mounted in the GNAB.



4.3 Troubleshooting