

# Vacuum Valve NVV, SVV Series

## MANUAL and Maintenance Book



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**Please read this manual before usage of vacuum valve.**

The information of this manual can be changed without prior notice

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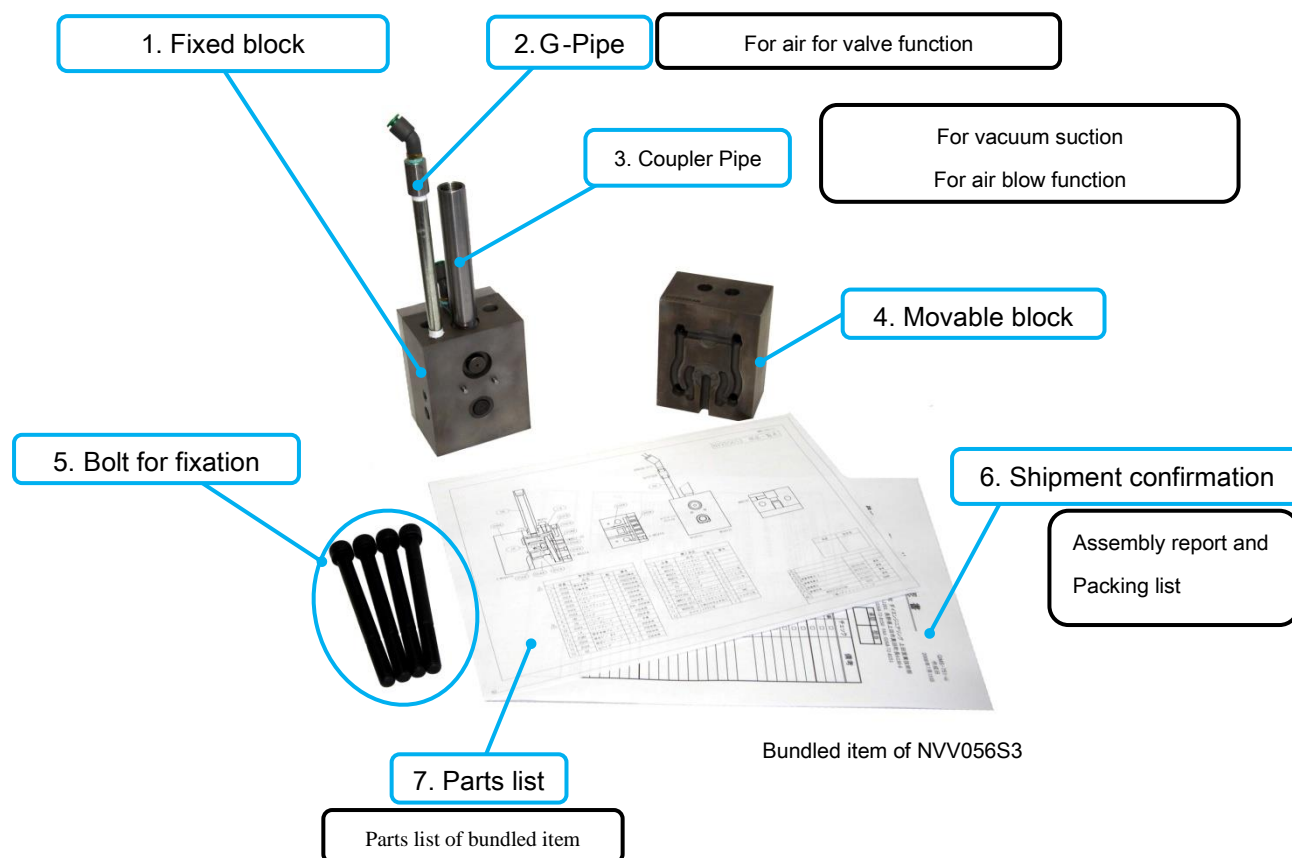
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## Chapter 1. Bundled item confirmation

### Standard bundled item



## Chapter 2. Function and operation

### 2-1. Function introduction

#### ◆ Vacuum suction

Gas of cavity is absorbed into vacuum tank through this pipe.

Valve is closed by the power of molten metal.

#### ◆ Air for valve function (Old name: **Low speed air function**)

This function starts to act during low speed or high speed without pressure intensification.

In order to avoid valve clog, air is supplied to close valve compulsorily.

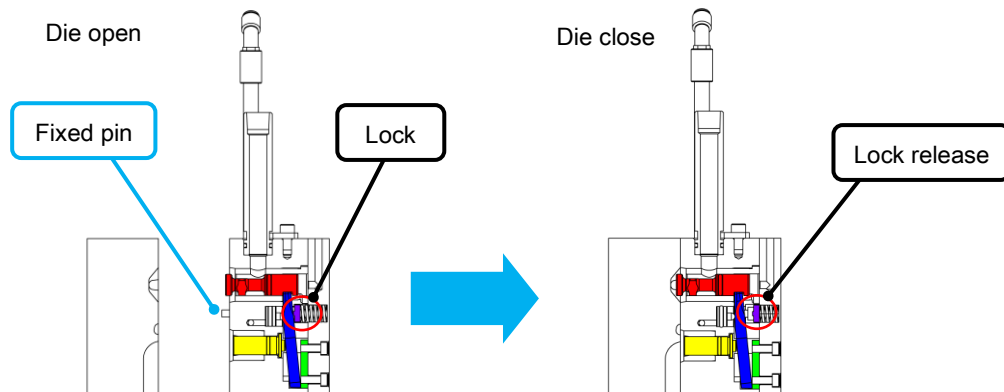
#### ◆ Stable air function

According to actual die casting environment, piston may act bluntly occasionally.

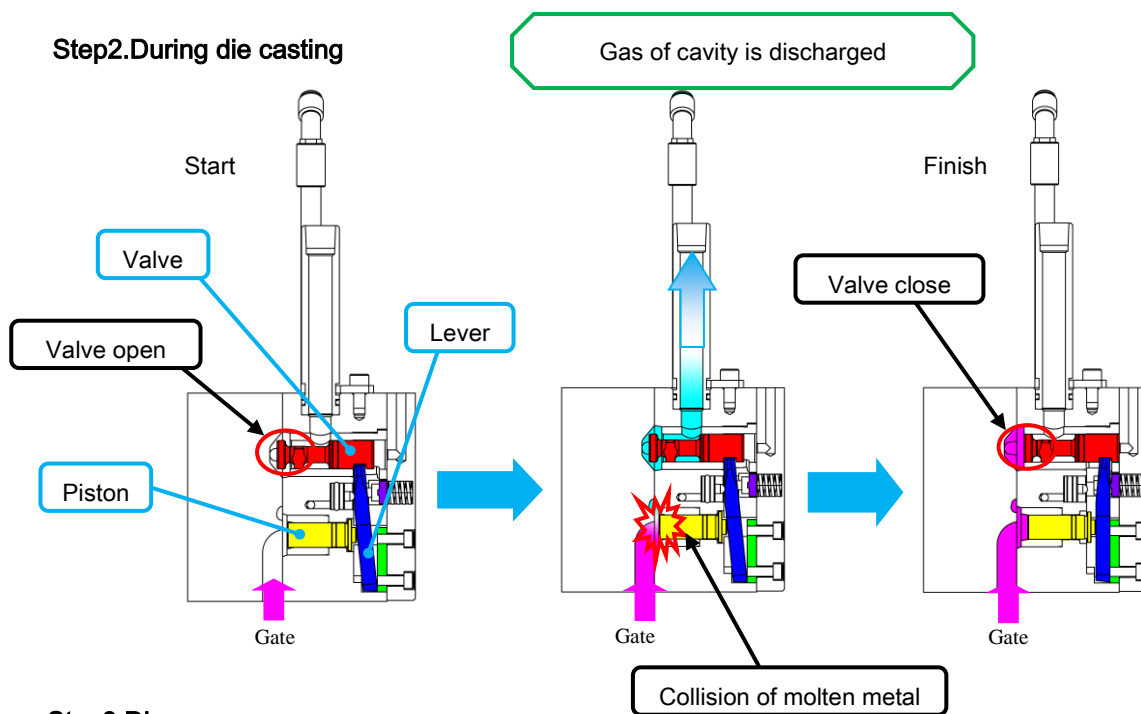
This function supply air to help piston extruding to get more lubricant during lubricant spray.

## 2-2.Vacuum valve action

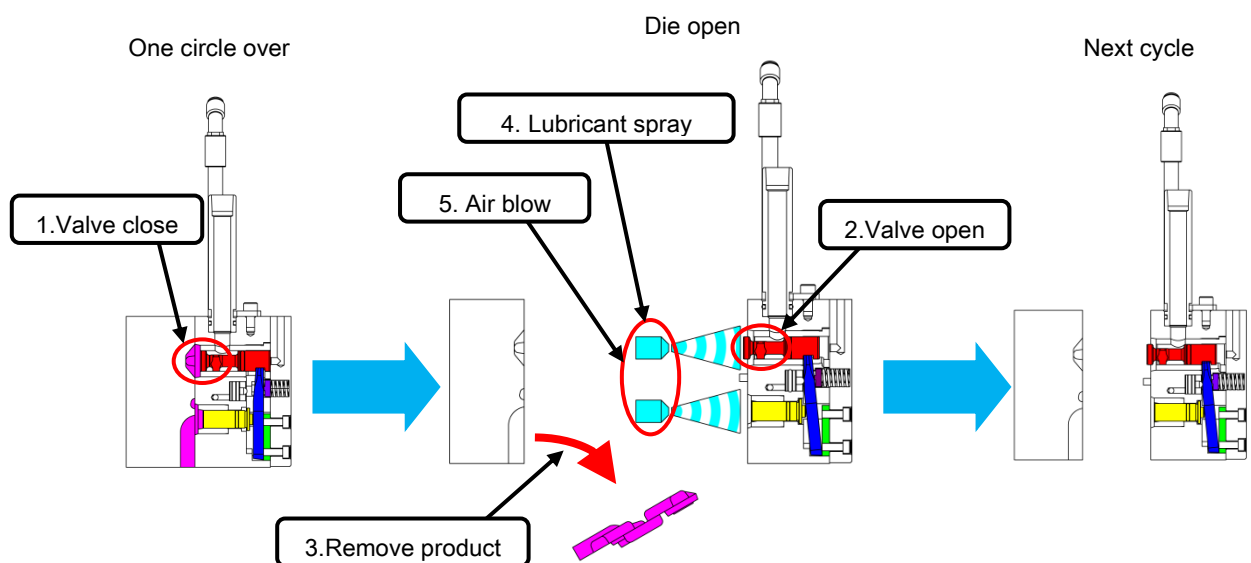
### Step1.Die close



### Step2.During die casting



### Step3.Die open

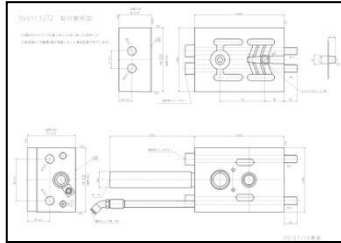


## Chapter 3. Installation and adjustment

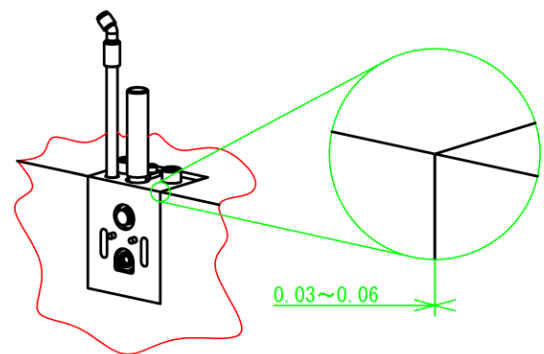
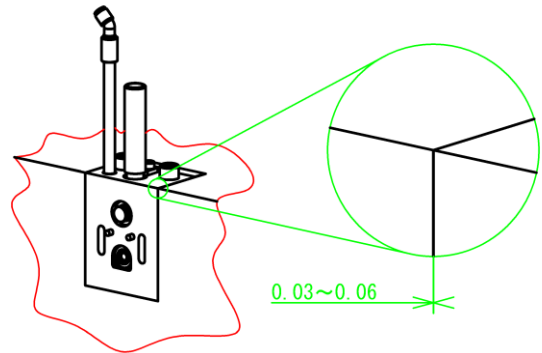
### 3-1. Attention of installation

#### ◆ Installation dimensions

Please refer to the installation drawing.



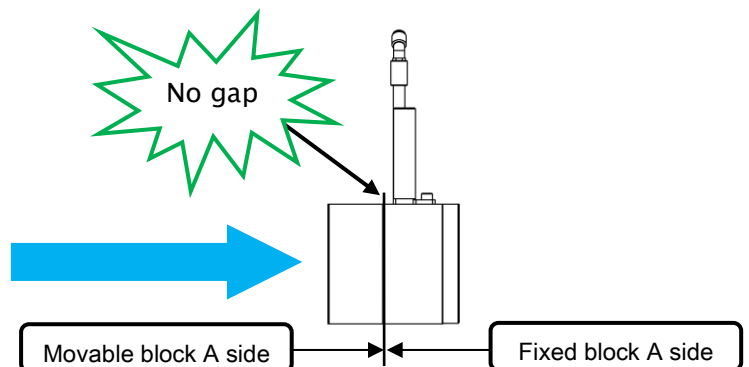
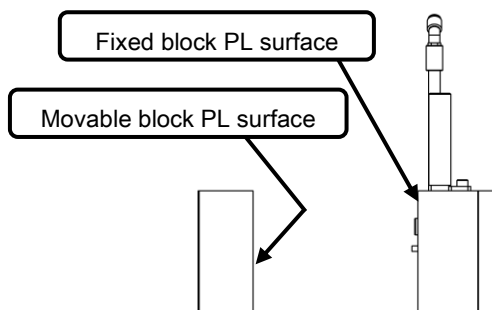
Example : NVV113JT2  
Installation drawing



#### ◆ PL surface






Vacuum suction has no effect if PL surface of valve is lower than PL surface of mold.

Please make sure PL surface of fixed block and movable block has no gap.

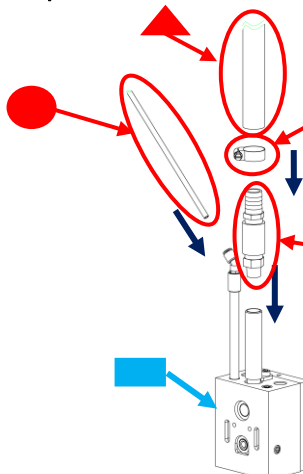


### 3-2. Tube and hose connection

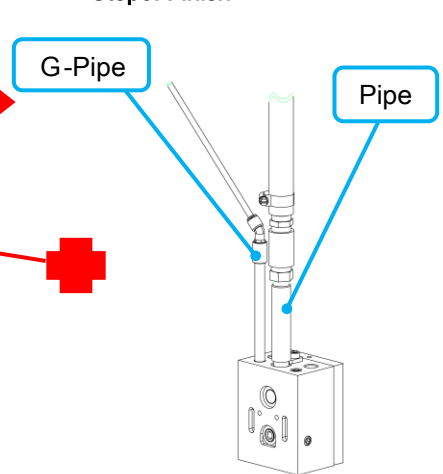
#### Step1. Preparation for connection

- ◆ Fixed block assembly 
- ◆ Tube (black)  
( Outside  $\phi 6$ , Inside  $\phi 4$ ) 
- ◆ Vacuum hose  
( Outside Free, Inside Over  $\phi 19$ ) 
- ◆ Hose band 
- ◆ Hose coupling  
(Hose and pipe) 

#### Step2. Connect

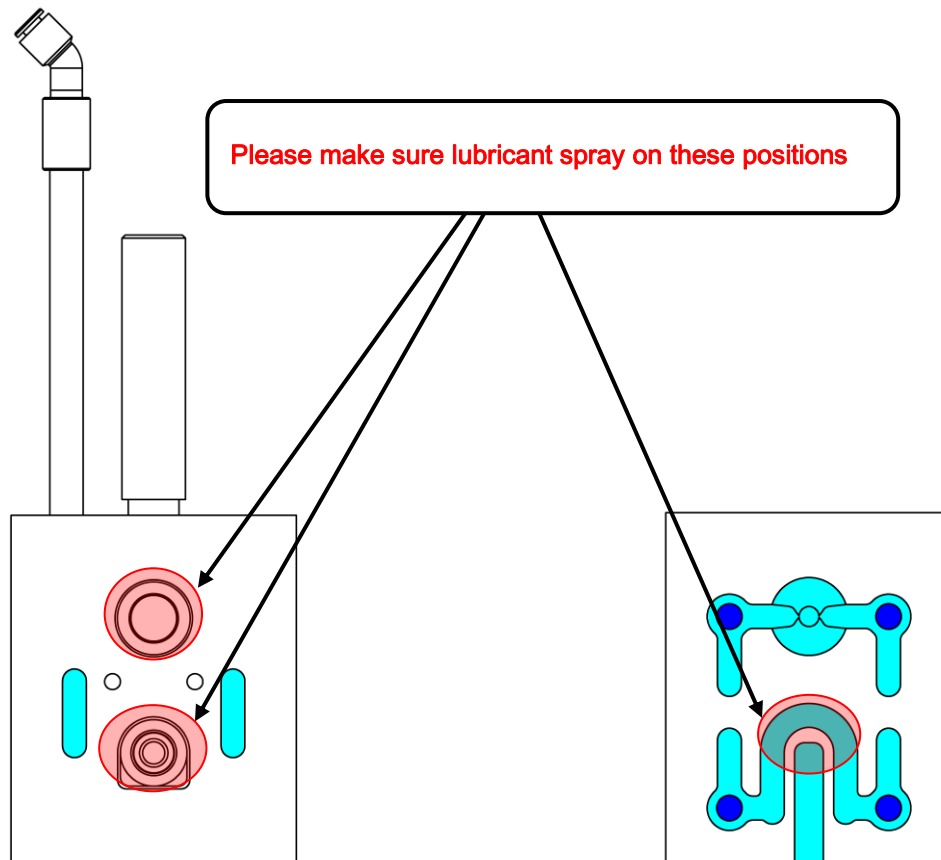




#### Step3. Finish



### 3-3.Attention before die casting

- ◆Adjustment of spray position and spray time.



Please also make sure lubricant spray on these positions too. (  and  )

Vacuum valve can act more smoothly and has more stable production.

#### ◆Burring of PL surface

If burring happens, please insert shim on the back of vacuum valve to ensure PL surface of blocks has no gap. After mold temperature rises, if thickness of burring is over 0.4mm, please insert more shim on the back of each block again.

#### ◆Product take off detection position

After product is taken off, please add detection position check of exhaust groove of block.

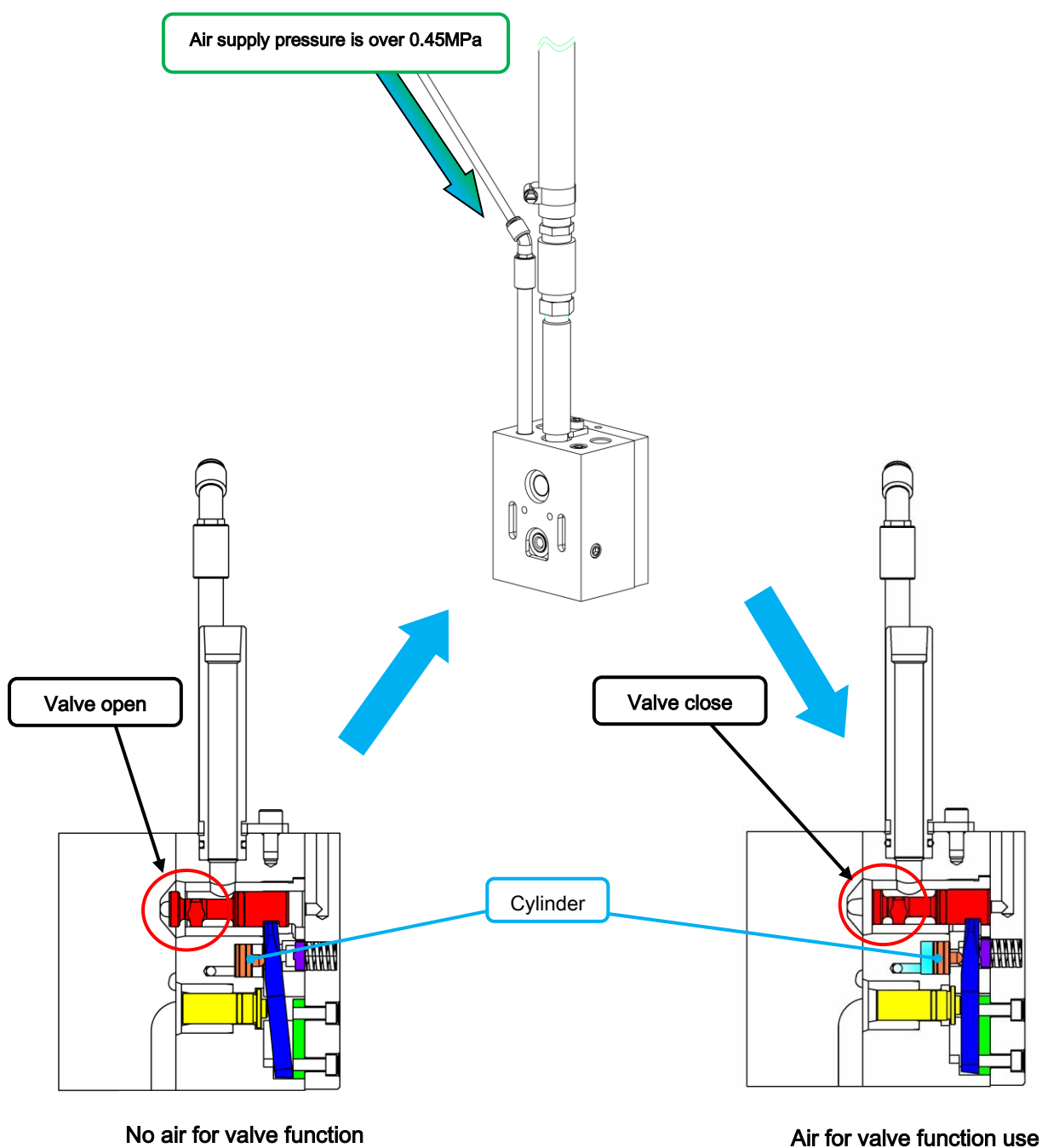
If parts of product left in the exhaust groove, it may cause damage of block in the next cycle of die close.

### 3-4. Air for valve function (=Low speed air function)

Vacuum valve of this series is closed by the collision of molten metal normally.

However, during try shot or high speed without intensification die casting, the power of molten metal is too weak to close the valve. On this occasion, air is supplied to help closing valve.

#### ◆Outline of operation

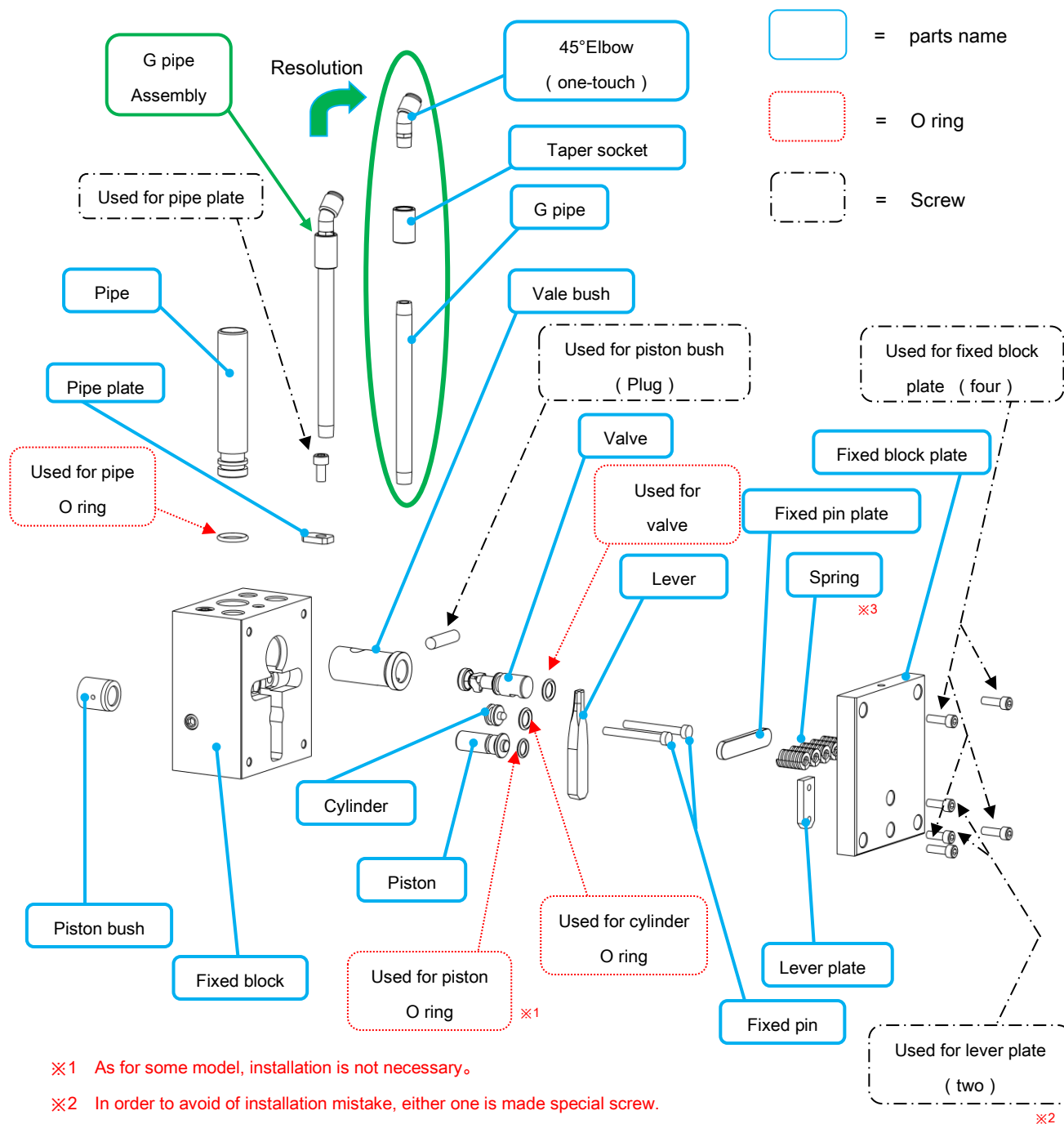


## Chapter 4. Maintenance

- ◆ Please maintain the vacuum valve every 48 hours.
- ◆ Maintenance is very important for stable action and prolong lifespan of vacuum valve.
- ◆ Maintenance for temporary nonuse  
If vacuum valve is not used for a short period, please remove it from mold and rub lubricant oil on each parts.

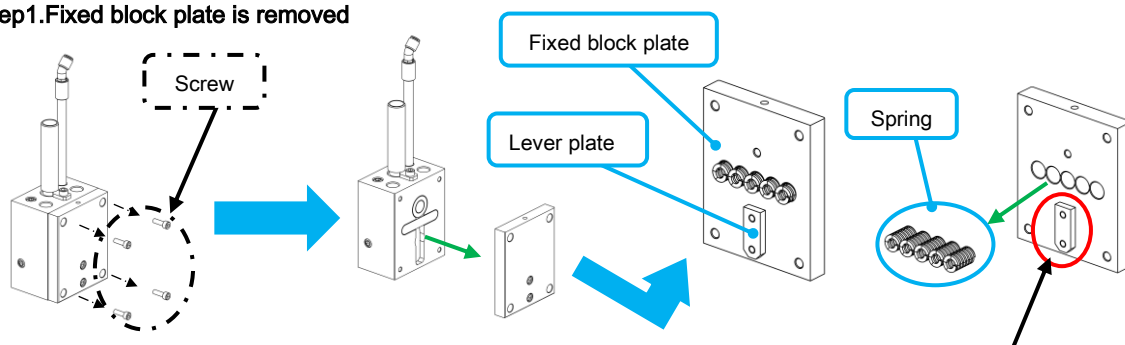
### 4-1. About fixed block assembly

#### 4-1-1. Complete part and name



## 4-1-2.Dismantlement

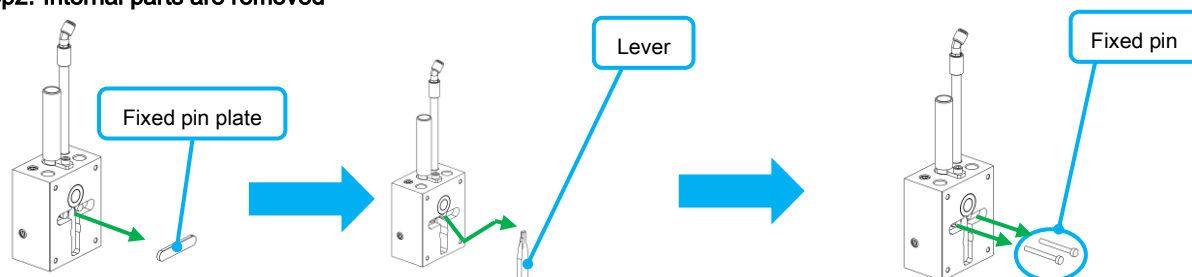
### Step1.Fixed block plate is removed



Note: When fixed block plate is removed, the spring may drops out easily, please pay attention to it.

Note: Do not use it except exchange of this part.

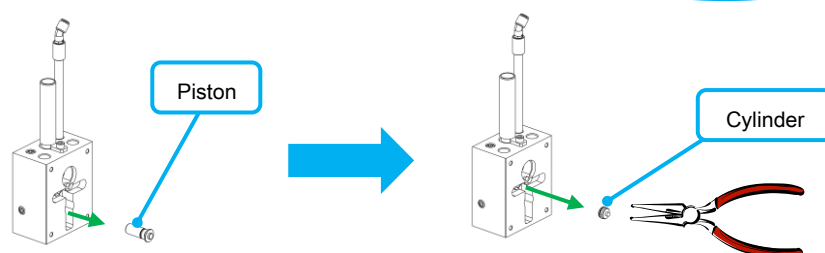
### Step2. Internal parts are removed



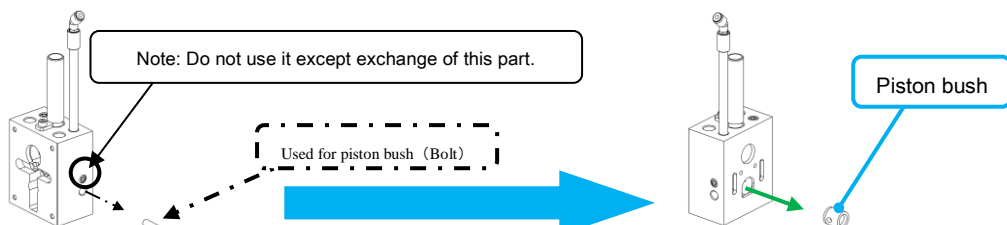
### Step3. Valve and Valve bush is removed



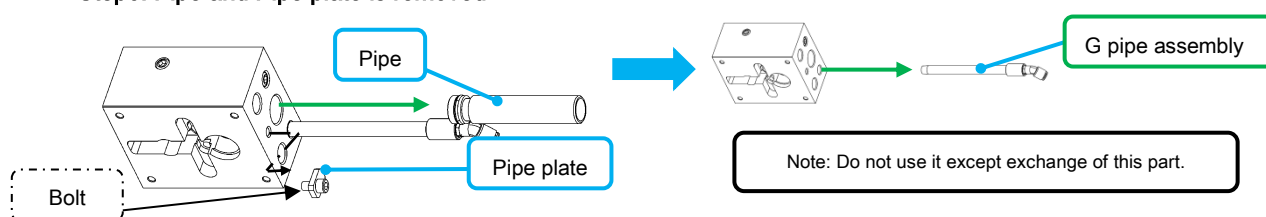
### Step4. Piston and Cylinder is removed



### Step5.Piston bush is removed

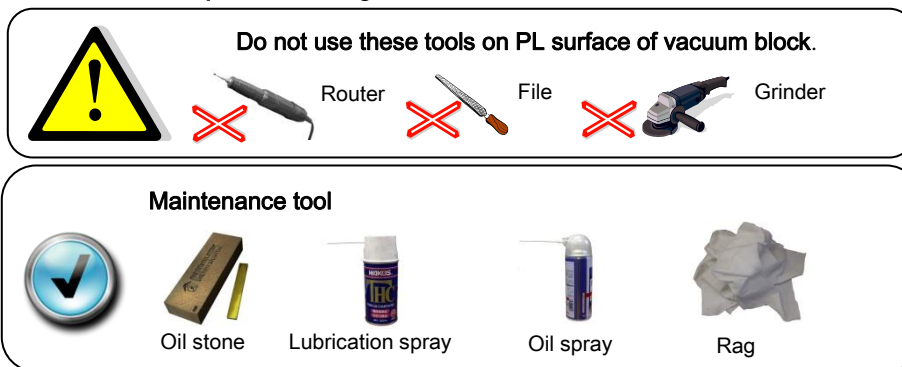


### Step6. Pipe and Pipe plate is removed





## 4-1-3. Confirmation and parts exchange



## 1. Fixed block

Exchange standard: 50,000 shots

Check 1. Air for valve hole

Put air into A and comes out from B

NG→1. "Plug" is removed.

2. No air comes out.

A

Hole for pipe

Clean it with the oil spray and rag.

PL surface

B

Plug

Hole for cylinder

Clean it with the oil spray and rag.

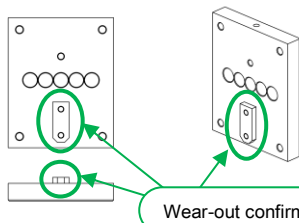
Hole for valve bush and piston bush

Clean it with the oil spray and rag.

Check 2. State of PL surface

No distortion and crack.

## 2. Fixed block plate ( include lever plate )

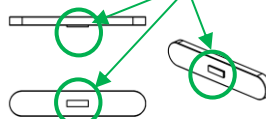


Check point

No distortion and crack.

## 3. Fixed pin plate

Wear-out confirmation

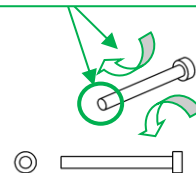


Check point

No distortion and crack.

## 4. Fixed pin

Bending and collapse confirmation

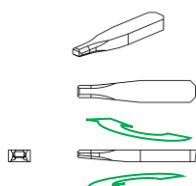


Check point

Can you insert it into fixed block?

Do they move smoothly?

## 5. Lever



Check point

No distortion and crack.

## 6. Spring

Exchange standard: 50,000 shots

Check point

1. "L" is measured.

2. The specification of the part list in spring is confirmed.

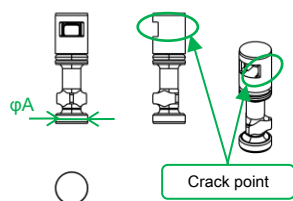
3. If length decreases more than -0.5mm, exchange it.



Spring spec = SWM 12 - 15

="L"

## 7. Valve



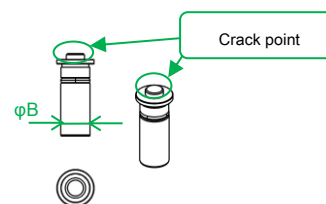
Exchange standard: 50,000 shots.

## Check point

1. Confirmation of crack point.
2. Confirmation of dimension of A.
3. Damage on O rings or not.

〔Please exchange the valve and valve bush as one set.〕

## 8. Piston



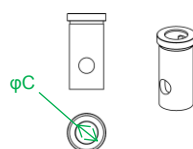
Exchange standard: 50,000 shots.

## Check point

1. Confirmation of crack point.
2. Confirmation of dimension of B.
3. Damage on O rings or not.

〔Please exchange piston and piston bush as one set.〕

## 9. Valve bush



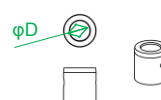
Exchange standard: 50,000 shots.

## Check point

1. Confirmation of dimension of C.
2. Crack of externals or not.

〔Please exchange valve and valve bush as one set.〕

## 10. Piston bush



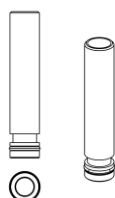
Exchange standard: 50,000 shots.

## Check point

1. Confirmation of dimension of D.
2. Crack of externals or not.

〔Please exchange the piston and piston bush as one set.〕

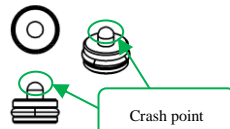
## 11. Pipe



## Check point

1. Crack and distortion confirmation.
2. Damage on O rings or not.

## 12. Cylinder



## Check point

1. Confirmation of crash point
3. Damage on O rings or not.

## 13. Pipe plate



## Check point

1. Crack of externals.

## 14. G Pipe assembly



## Check point

1. Blocking of hole
2. Crack of externals.

※After dismantlement of parts, please rub lubricant oil on it.

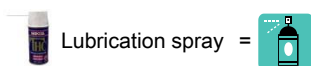
※Do not put parts with O rings into solvent liquid.

※Cut the old O ring first and then exchange new one.

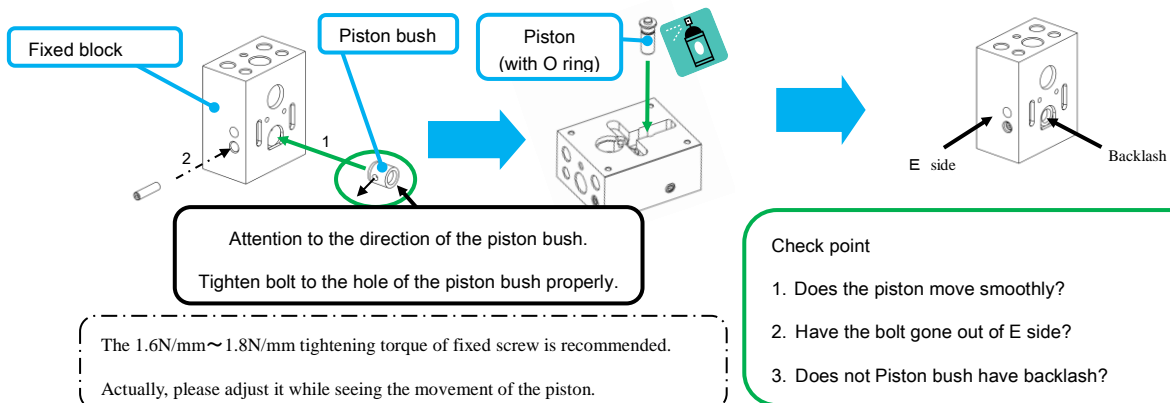
※Please rub more oil on parts for fearing of rust.

※If it is hard to judge whether parts need exchange or not, please send it to our company.

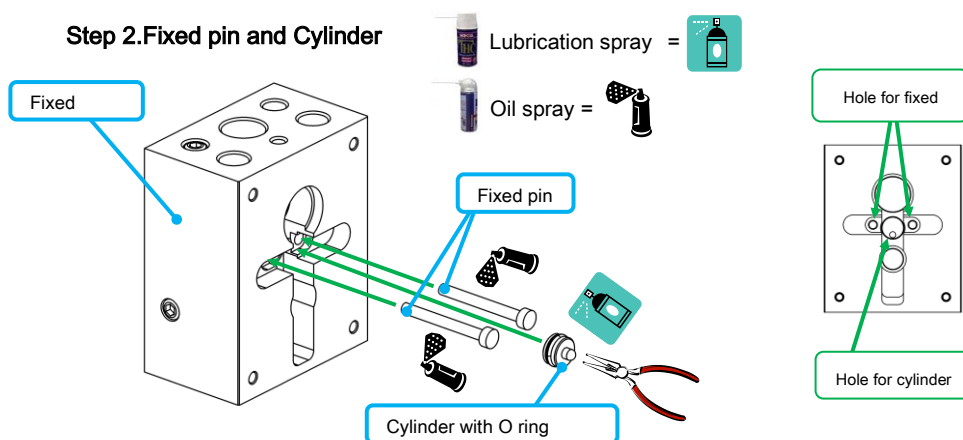
## 4-1-4. Installation and confirmation



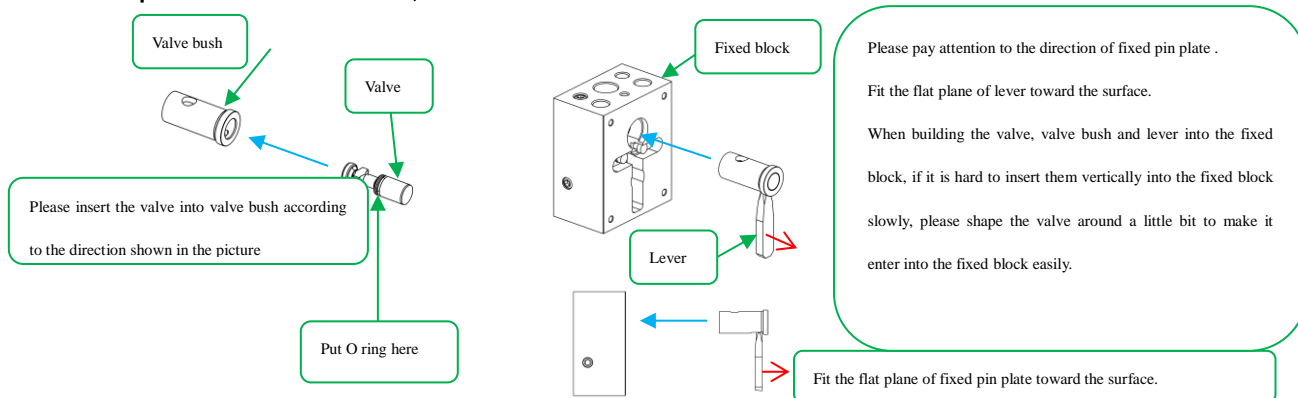
## Step 1. Piston bush and Piston



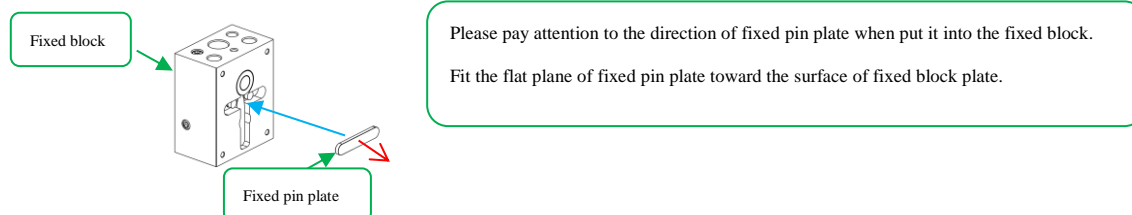
## Step 2. Fixed pin and Cylinder



## Step 3. Valve and Valve bush, Lever

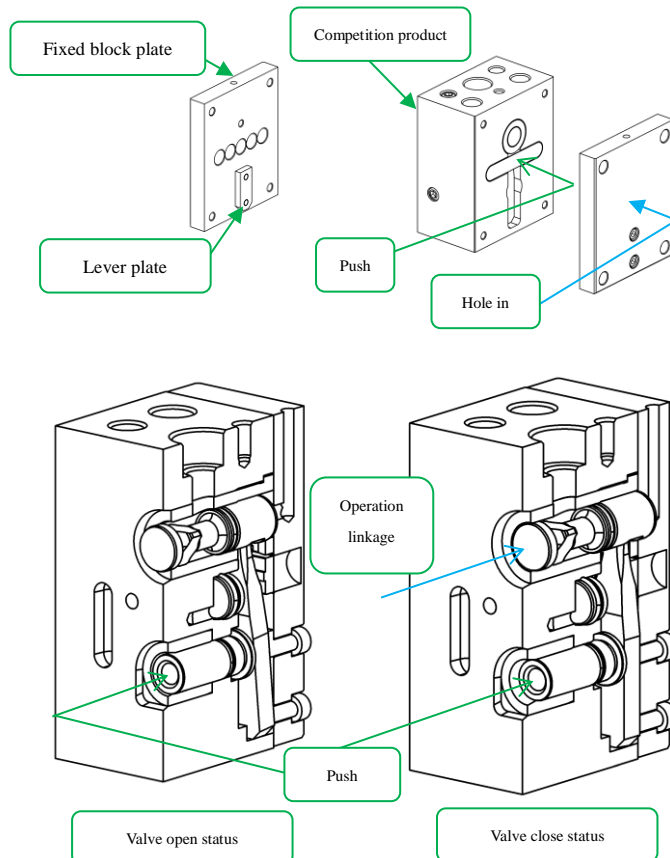


## ④ Please fit the fixed pin plate.



### ⑤ Easy operation confirmation

It is possible to confirm the easy operation until step four.



Easy operation confirmation can be done by using the vacuum valve and

fixed block plate (include lever plate)

First, push the fixed pin plate and make the valve open.

Under such condition, the fixed block plate is made to stick and the piston is pushed from the parting respect while suppressed.

At this time, if the linkage operation of valve is normal, there is no problem.

Please repeat the operation for several times and confirm whether there are abnormal voice and catching sound.

Spring is not used for this confirmation.

If the inside and surface of lever are oppositely, the valve can not be closed completely. If the inside and surface of fixed pin plate are opposite, the valve can not be opened completely.

Standard of open status

The piston projects a little bit or in the same respect with piston bush.

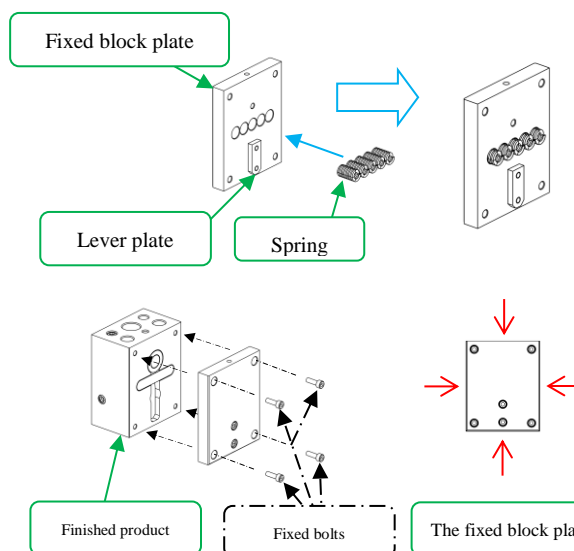
The valve projects a little bit compared with valve bush

Standard of close status

The piston withdraws a little bit compared with piston bush.

The valve withdraws a little bit or in the same respect with valve bush

### ⑥ Please build the spring into the fixed block plate, then fitting to the fixed block.



Please confirm the height of the spring before put it into the fixed block plate. Please do not drop out the spring when fitting it into the fixed block.

Wrong number or spec. spring may cause poor action of vacuum valve. Please confirm it.

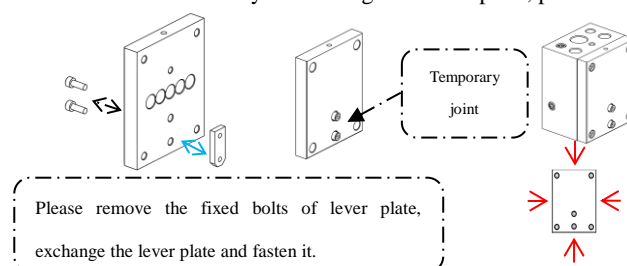
When fastening the fixed block plate to the fixed block by fixed bolts, make

sure the fixed block plate can not be derived from the side of the fixed block.

The fixed block plate should not be derived from the arrow of the fixed block.

Reference : Exchange of lever plate

If it is necessary to exchange the lever plate, please exchange it according to the following procedures.



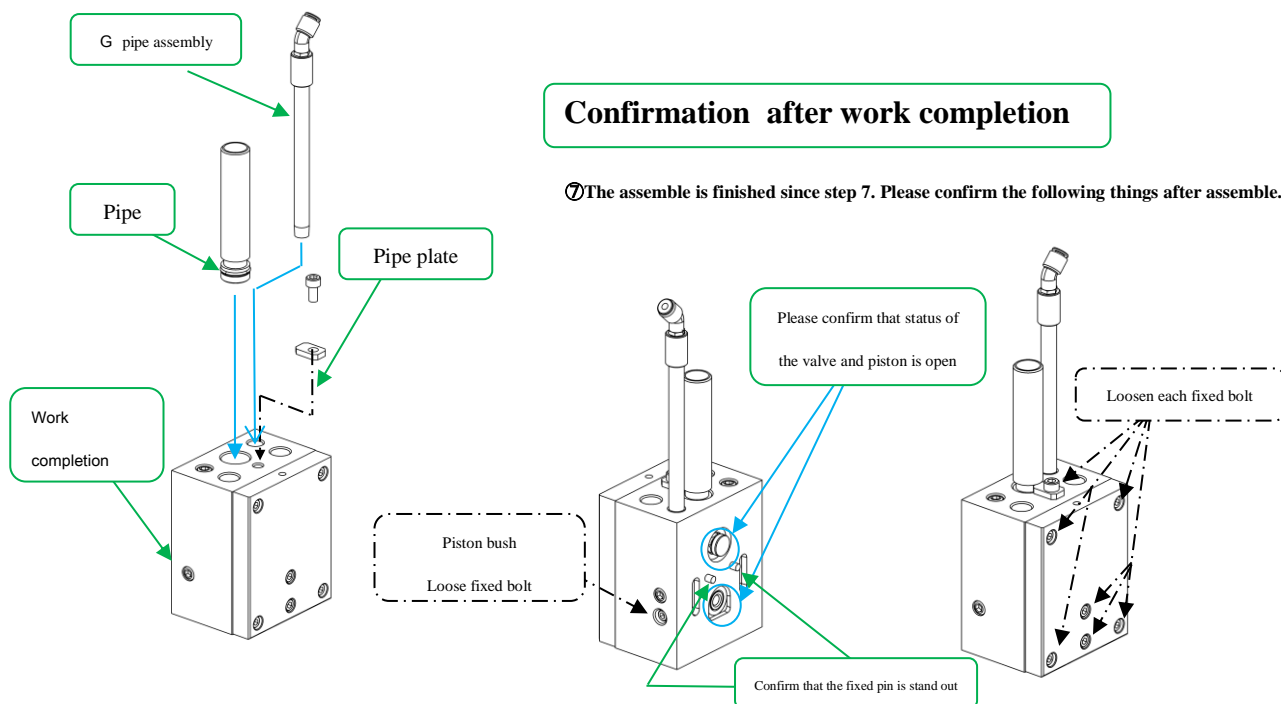
Please put the fixed block plate on the center position of the fixed block and fasten the fixed block plate to the fixed block.

Then tighten the fixed bolts of the lever plate.

Please tighten the lever plate with the torque of 11N/mm

### ⑦ Jointing of Pipe and G pipe.

Please do the jointing according to the following procedures.



If the valve and piston are not in the open status, maybe the inside and surface of lever and pin plate is opposite, please confirm it again.

If the fixed pin is not project or the projection amount of the left and right fixed pin are different, please confirm the numbers and the specification of the spring.

## 4.2 About movable block

Usually, movable block can be used for 50,000 shots.

When problem occurs, please confirm the following items.

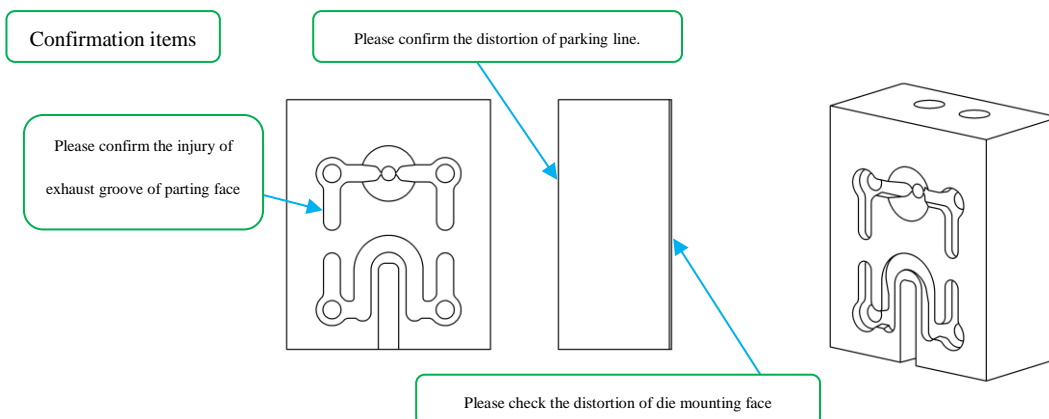
As for cleaning, please remove the affiliated things and do lubricant to it after air-blow.

Please rub enough oil on it for temporary nonuse.

Note : Please do not use the file or wood router, as it causes trouble if the Nitrided element on the surface lost.

When polishing the surface, please use ultrasonic cleaning and polish lightly with sandpaper.

If it is damaged in the process that grinding is necessary such as dent, please exchange it.



## 5. Guidance

## 5.1 General consumable goods list

Model	O ring /Materials : Red silicone /Manufacturer : AIR WATER MACH INC.				Fixed pin	Spring
	Piston	Valve	Cylinder	Pipe		
012Z1	-	P6	P5	-	φ3 L=29	SWL 8-10
020Z1	-	P7	P7	-	φ3 L=35	SWL 8-10
020	P5	P6	P7	P10	φ3 L=41.8	SWL 8-15
038	P9	P8	P7	P16	φ4 L=46	SWL 8-15
056	P9	P10	P10	P16	φ4 L=46.5	SWM 12-20
079	P9	P10A	P10A	P16	φ5 L=51	SWM 12-20
113	P10A	P12.5	P10A	P21	φ5 L=56	SWM 12-20
154	P9	P16	P12	P24	φ5 L=61	SWM 12-20
201	P9	P18	P12	P24	φ5 L=66	SWM 12-20
-	-	-	-	-	-	-

A part of special O ring is being adopted even in the same model.


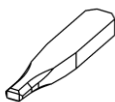








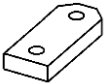

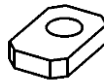

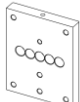
Please order the parts according to the parts list.

After exchanging the O ring, please spread the lubricant spray.

Super heat-resistant lubricant is recommended which is produced by Waka Kagaku Industry Corporation.

## 5.2 Standard exchange parts list

Please inform your model when you order to us.

Name	Figure	Name	Figure	Name	Figure
Fixed block		Lever		Fixed pin	
Movable block		Pipe		Fixed pin plate	
Piston		Cylinder		G pipe assembly	
Piston bush		Lever plate		<p>The figures are just the schematic of each product.</p> <p>According to the model and the specification, the shape of the parts are different.</p>	
Valve		Pipe plate			
Valve bush		Fixed block plate			

### 5.3 Maintenance service

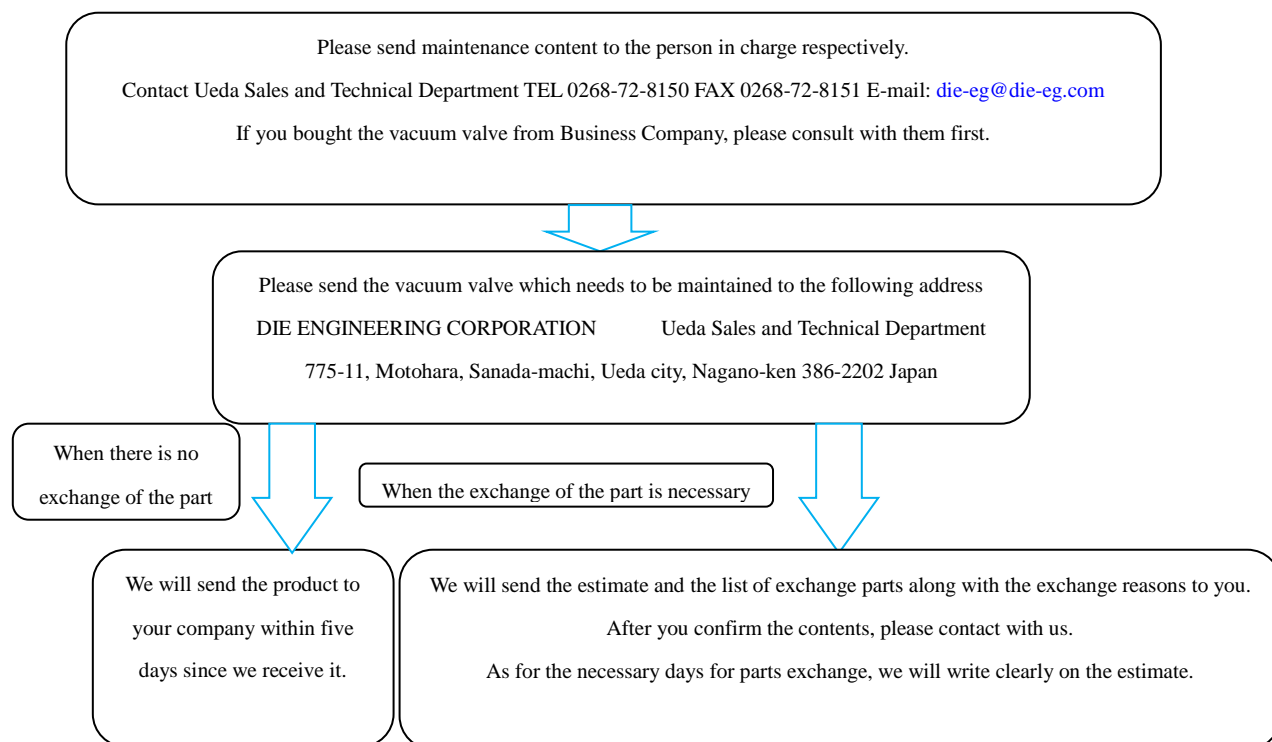
The content of the maintenance service are shown as follows:

■ Cleaning the dissembled parts (free of charge)    ■ Exchange each consumption part (estimate)

■ Exchange each part after confirming the status and size of it. (estimate)

Regular maintenance will extend the longevity of the vacuum valve, please use it effectively.

Please utilize the maintenance services according to the following procedures:



### 5.4 Models list of vacuum valve

The vacuum valves, which are produced by our company are equipped with abundant lineup which covers 100-2000ton die casting machine. (The data of the mode is represented on the sectional area of exhaust groove)

