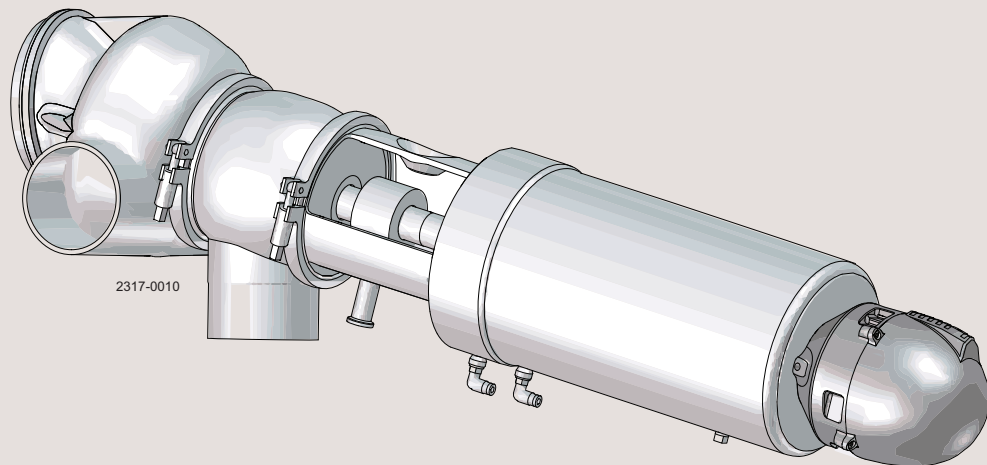




# Instruction Manual

Unique Mixproof Horizontal Tank Valve - sizes 2½", 3", 4" and 6"



ESE02424-EN2 2016-07

Original manual



The information herein is correct at the time of issue but may be subject to change without prior notice

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# 1 Declaration of conformity

The Designated Company

Alfa Laval Kolding A/S

Company Name

Albuen 31, DK-6000 Kolding, Denmark

Address

+45 79 32 22 00

Phone No.

hereby declare that

Valve

Designation

Unique HT

Type

From serial number 1181354 - 9999999

is in conformity with the following directive with amendments:

- Machinery Directive 2006/42/EC
- Regulation (EC) No 1935/2004
- The valve is in compliance with the Pressure Equipment Directive 2014/68/EU and was subjected to the following assessment procedure Module A. Diameters  $\geq$  DN125 may not be used for fluids group 1.

The person authorised to compile the technical file is the signer of this document

QHSE Manager, Quality, Health and safety & Environment

Title

Annie Dahl

Name

Kolding

Place

2013-03-07

Date



Signature





Thank you for purchasing an Alfa Laval product.

This manual has been provided to instruct you in how to operate and service this product correctly and safely. Make sure that you follow all directions and instructions; failure to do so could result in personal injury or equipment damage.

This manual should be considered part of this product and should remain with it at all times for reference. (If you sell it, please be sure to include this manual with it.) Warranty is provided as part of Alfa Laval's commitment to our customers who operate and maintain their equipment as this manual dictates. Failure to do so may result in loss of warranty.

Where defects appear on the product during the warranty period, Alfa Laval Inc. will take back the product and correct the problem. Should the equipment be modified or not kept in the manner prescribed within this manual, the warranty will become null and void.

### 3 Safety

---

*Unsafe practices and other important information are emphasised in this manual.  
Warnings are emphasised by means of special signs.*

---

#### 3.1 Important information

---

##### Important information

**Always read the manual before using the valve!**

##### **WARNING**

Indicates that special procedures must be followed to avoid serious personal injury.

##### **CAUTION**

Indicates that special procedures must be followed to avoid damage to the valve.

##### **NOTE**

Indicates important information to simplify or clarify procedures.

---

#### 3.2 Warning signs

---

General warning:



Caustic agents:



Cutting danger:



*Unsafe practices and other important information are emphasised in this manual.  
Warnings are emphasised by means of special signs.*

### 3.3 Safety precautions

#### Installation:

**Always** read the technical data thoroughly (see chapter 7.1 Technical data)

**Always** release compressed air after use

**Never** touch the clip assembly or the actuator piston rod if the actuator is supplied with compressed air (see warning label)

**Never** stick your fingers through the valve ports if the actuator is supplied with compressed air



#### Operation:

**Always** read the technical data thoroughly (see chapter 7.1 Technical data)

**Never** touch the clip assembly or the actuator piston rod when the actuator is supplied with compressed air (see warning label)

**Never** pressurise air connections (AC1, AC3) simultaneously as both valve plugs can be lifted (can cause mixing)

**Never** touch the valve or the pipelines when processing hot liquids or when sterilising.

**Never** throttle the leakage outlet

**Never** throttle the CIP outlet, if supplied



**Always** handle lye and acid with great care

#### Maintenance:

**Always** read the technical data thoroughly (see chapter 7.1 Technical data)

**Always** fit the seals correctly

**Always** release compressed air after use

**Always** remove the CIP connections, if supplied, before service.

**Never** service the valve when it is hot

**Never** pressurise the valve/actuator when the valve is serviced

**Never** stick your fingers through the valve ports if the actuator is supplied with compressed air

**Never** touch the clip assembly or the actuator piston rod if the actuator is supplied with compressed air (see warning label)

**Never** service the valve with valve and pipelines under pressure



#### Transportation:

**Always** ensure that compressed air are released

**Always** ensure that all connections is disconnected before attempting to remove the valve from the installation

**Always** drain liquid from valves before transportation

**Always** used predesigned lifting points if defined

**Always** ensure sufficient fixing of the valve during transportation - if specially designed packaging material is available, it must be used

## 4 Installation

---

*The instruction manual is part of the delivery.*

*Study the instructions carefully.*

*Fit the warning label supplied on the valve after installation so that it is clearly visible.*

---

### 4.1 Unpacking/intermediate storage

---

#### Step 1

##### CAUTION!

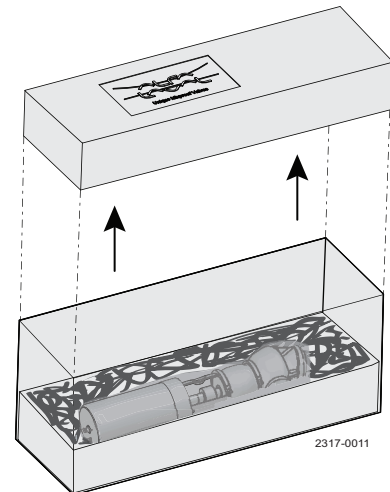
Alfa Laval cannot be held responsible for incorrect unpacking.

##### Check the delivery for:

1. Complete valve
  2. Delivery note
  3. Warning label
- 

#### Step 2

Remove upper support

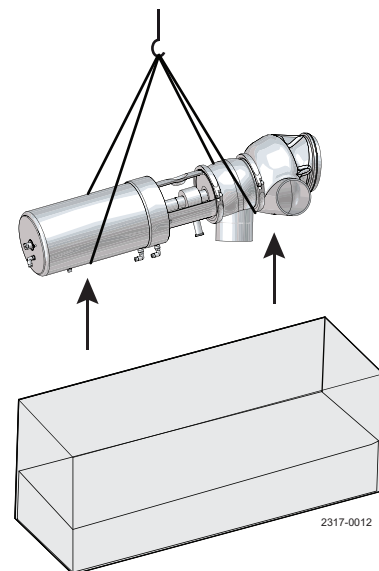


#### Step 3

Lift out the valve.

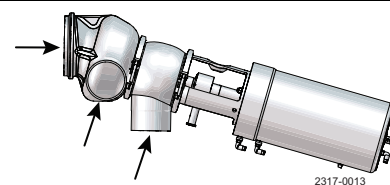
##### NOTE!

Please note weight of valve as printed on box.



#### Step 4

Remove possible packing materials from the valve ports.



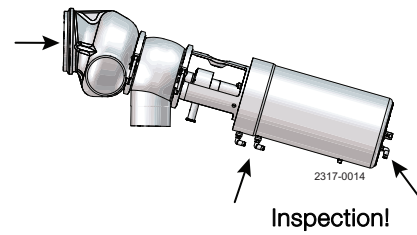
The instruction manual is part of the delivery.

Study the instructions carefully.

Fit the warning label supplied on the valve after installation so that it is clearly visible.

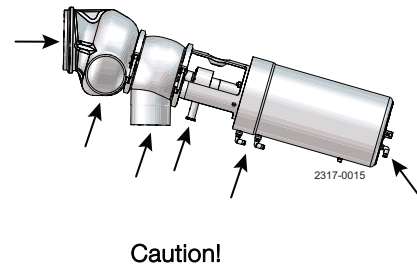
### Step 5

Inspect the valve for visible transport damage.



### Step 6

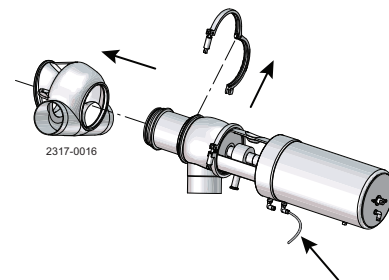
Avoid damaging the air connections, the leakage outlet, the valve ports and the CIP connections.



### Step 7

Disassemble according to illustrations 1 to 4 (please also see 6.2 Dismantling of valve (excluding actuator)).

1. Supply compressed air.
2. Remove clamp
3. Release compressed air.
4. Lift out actuator with plugs.



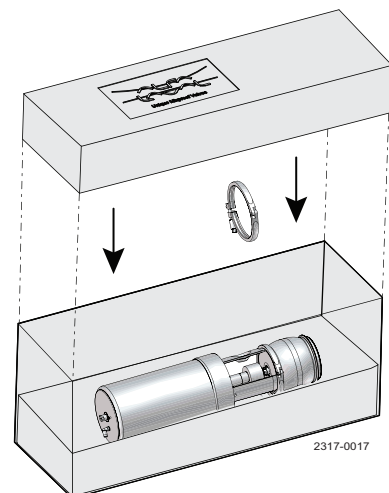
### Step 8

While valve body is welded, it is recommended to store the valve safely in the box together with valve parts.

1. Place actuator and valve parts in the box.
2. Add supports.
3. Close, re-tape and store the box.

### ADVICE!

Mark the valve body and box with the same number before intermediate storage.



## 4 Installation

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### 4.2 Recycling

---

- **Unpacking**

- Packing material consists of wood, plastics, cardboard boxes and in some cases metal straps
- Wood and cardboard boxes can be re-used, recycled or used for energy recovery
- Plastics should be recycled or burnt at a licensed waste incineration plant
- Metal straps should be sent for material recycling.

- **Maintenance**

- During maintenance, oil and wearing parts in the machine are replaced
- All metal parts should be sent for material recycling
- Worn out or defective electronic parts should be sent to a licensed handler for material recycling
- Oil and all non-metal wear parts must be disposed off in accordance with local regulations

- **Scrapping**

- At the end of use, the equipment must be recycled according to the relevant, local regulations. Besides the equipment itself, any hazardous residues from the process liquid must be considered and dealt with in a proper manner. When in doubt, or in the absence of local regulations, please contact your local Alfa Laval sales company
-

Study the instructions carefully and pay special attention to the warnings!  
The valve has ends for welding as standard but can also be supplied with fittings.

### 4.3 General installation

#### Step 1



- Always read the technical data thoroughly (see 7.1 Technical data).
- Always release compressed air after use.
- Never touch the clip assembly or the actuator piston rod if the actuator is supplied with compressed air (see the warning label)



#### CAUTION!

- Fit the supplied warning label on the valve so that it is clearly visible.
- Alfa Laval cannot be held responsible for incorrect installation

#### NOTE!

- The leakage outlet must be turned downwards!

#### Step 2

Avoid stresses to the valve as this can result in deformation of the sealing area and malfunction of the valve (leakage or faulty indication).

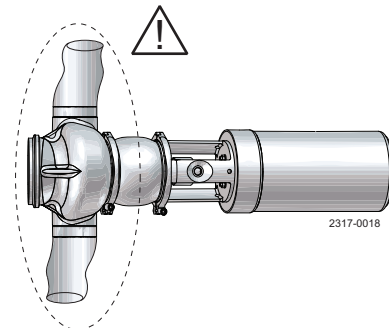
Pay special attention to:

- Vibrations
- Thermal expansion of the tubes (especially at long tube lengths)
- Excessive welding
- Overloading of the pipelines

#### NOTE!

Please follow Alfa Laval installation guidelines (literature code ESE00040).

Risk of damage!

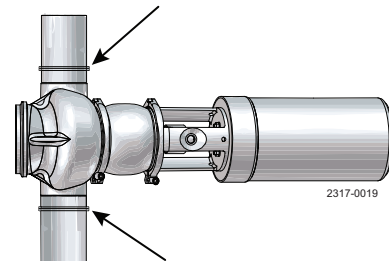


#### Step 3

Fittings

Ensure that the connections are tight.

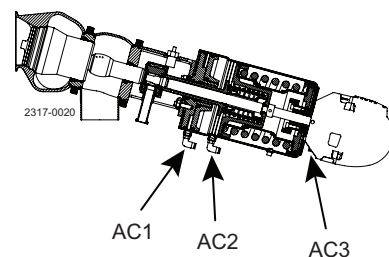
Remember seal rings!



#### Step 4

| Valve Pneumatic Connections |                           |
|-----------------------------|---------------------------|
| ThinkTop Fitting ID         | Actuator Fitting ID       |
| Out 1A                      | Air connection 2 (blue)   |
| Out 2                       | Air connection 3 (yellow) |
| Out 3                       | Air connection 1 (red)    |

Air connection: R 1/8" (BSP).



- AC1 = Air connection 1 (red) upper seat push
- AC2 = Air connection 2 (blue) open/close
- AC3 = Air connection 3 (yellow) lower seat push

## 4 Installation

---

Study the instructions carefully and pay special attention to the warnings!

The valve has ends for welding as standard.

**Weld carefully/aim at stressless welding to avoid deformation on sealing areas.**

**Check the valve for smooth operation after welding.**

---

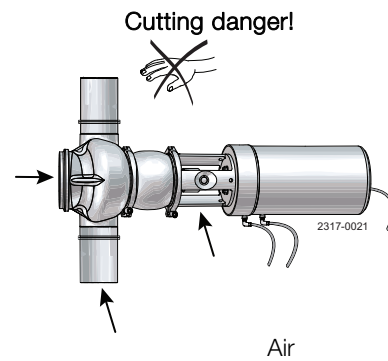
### 4.4 Welding

---

#### Step 1



**Never** stick your fingers in the operating parts of the valve if the actuator is supplied with compressed air.



#### Step 2

Dismantle the valve in accordance with the description of dismantling the valve, see 6.2 Dismantling of valve (excluding actuator)

---



## 4 Installation

Study the instructions carefully and pay special attention to the warnings!

The valve has ends for welding as standard.

**Weld carefully/aim at stressless welding to avoid deformation on sealing areas.**

**Check the valve for smooth operation after welding.**

### Step 3

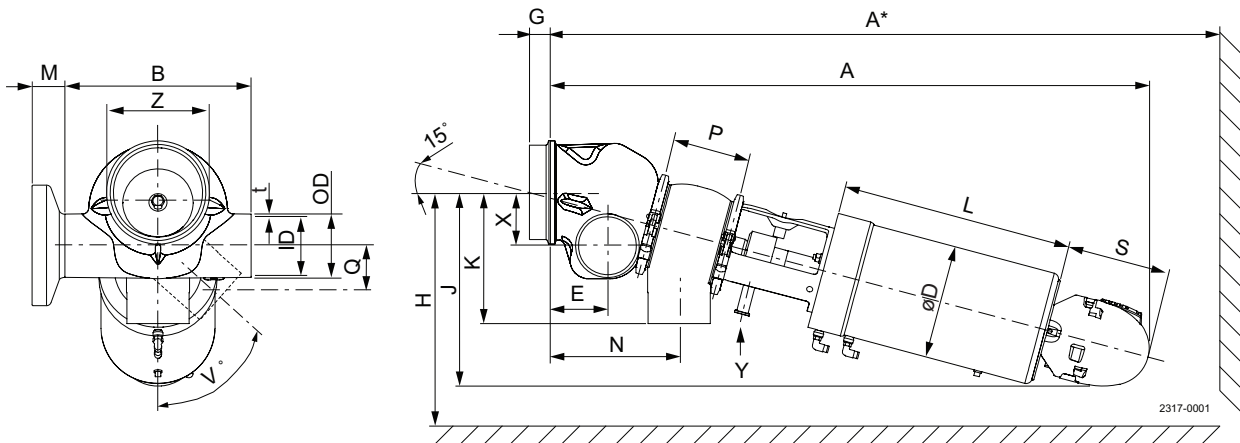


**Before welding the flange into the tank please note:**

1. Maintain the minimum clearances "A" so that the actuator with the internal valve parts can be removed - please see later on in this section!

If there is a risk of foot damage, Alfa Laval recommends leaving a distance of 120 mm below the valve (look at the specific built-in conditions).

**Dimension** (all measures in mm).



| Size           | 2.5"               | 3"                 | 4"                 | 6"<br>(75 mm) stroke | 6"<br>(59 mm) stroke |
|----------------|--------------------|--------------------|--------------------|----------------------|----------------------|
| A              | 735                | 759                | 977                | 1088                 | 1088                 |
| A*             | 867                | 904                | 1155               | 1329                 | 1329                 |
| B              | 220                | 220                | 300                | 420                  | 420                  |
| OD             | 63.5               | 76.1               | 101.6              | 154.2                | 154.2                |
| ID             | 60.3               | 72.9               | 97.6               | 146.86               | 146.86               |
| t              | 1.60               | 1.60               | 2.00               | 3.67                 | 3.67                 |
| øD             | 186                | 186                | 186                | 186                  | 186                  |
| E              | 70.9               | 77.2               | 92.2               | 129.5                | 129.5                |
| F1             | 38                 | 38                 | 75                 | 75                   | 59                   |
| F2 (Tank plug) | 10                 | 10                 | 10                 | 10                   | 10                   |
| G              | 15.9               | 15.9               | 38.1               | 44.5                 | 44.5                 |
| H              | 281                | 291                | 364                | 423                  | 423                  |
| J              | 246                | 252                | 317                | 359                  | 359                  |
| K              | 153                | 158                | 215                | 307                  | 307                  |
| L              | 252                | 252                | 379                | 379                  | 379                  |
| N              | 152                | 170                | 210                | 283                  | 283                  |
| P              | 89.3               | 101.9              | 126.6              | 180                  | 180                  |
| Q              | 15.9               | 15.9               | 38.1               | 44.5                 | 44.5                 |
| S              | 180                | 180                | 180                | 180                  | 180                  |
| V°             | 0-67°              | 0-60°              | 0-53°              | 0-49°                | 0-53°                |
| X              | 38.3               | 36.6               | 52.6               | 93.8                 | 96.8                 |
| Y              | 3/4" clamp ferrule | 3/4" clamp ferrule | 3/4" clamp ferrule | 3/4" clamp ferrule   | 3/4" clamp ferrule   |
| Z              | 4"                 | 4"                 | 6"                 | 10"                  | 10"                  |
| M/Tri-clamp    | 21                 | 21                 | 21                 | 38.56                | 38.56                |
| Weight (kg)    | 13.0               | 14.2               | 43.1               | 87.6                 | 87.6                 |

### Step 4

Assemble the valve in accordance with section 6.5 after welding.

**Pay special attention to the warnings and clamp torque (see section 6.5).**

## 4 Installation

---

*Study the instructions carefully and pay special attention to the warnings!*

*The valve has ends for welding as standard.*

*Weld carefully/aim at stressless welding to avoid deformation on sealing areas.*

*Check the valve for smooth operation after welding.*

---

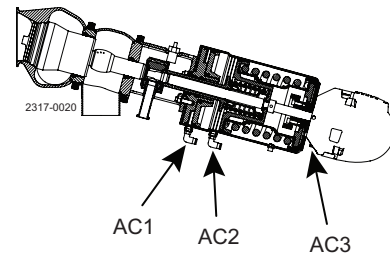
### Step 5

#### Pre-use check:

1. Supply compressed air to air connection 1, 2 and 3 one by one.
2. Operate the valve several times to ensure that it runs smoothly.

#### Pay special attention to the warnings!

- AC1 = Air connection 1 (red) upper seat push  
AC2 = Air connection 2 (blue) open/close  
AC3 = Air connection 3 (yellow) lower seat push
- 



The valve is tested before delivery.

Study the instructions carefully and pay special attention to the warnings!

Pay attention to possible faults.

The items refer to the parts list and service kits section.

### 5.1 Operation

#### Step 1



- **Always** read the technical data thoroughly (see chapter 7.1 Technical data).
- **Always** release compressed air after use.
- **Never** touch the clip assembly or the actuator piston rod if the actuator is supplied with compressed air (see the warning label).
- **Never** pressurise air connections (AC1, AC3) simultaneously as both valve plugs can be lifted (can cause mixing).

#### CAUTION!

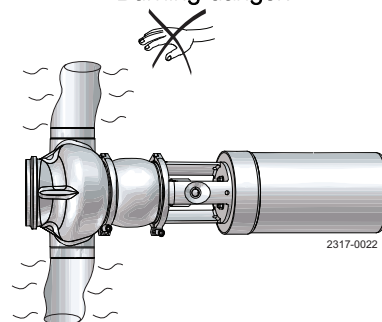
Alfa Laval cannot be held responsible for incorrect operation.

#### Step 2



**Never** touch the valve or the pipelines when processing hot liquids or when sterilising.

Burning danger!



## 5 Operation

Study the maintenance instructions carefully before replacing worn parts. - See "General Maintenance" section 4.1

### 5.2 Troubleshooting and repair

| Problem   | Cause/result   | Remedy  |
|---|--|---|
| Leakage at the vent port body (106)                             | <ul style="list-style-type: none"> <li>- Particles between valve seats and plug seals (56/74)</li> <li>- Worn/damaged plug seal rings (56/74)</li> <li>- Plug not assembled correctly</li> </ul> | <ul style="list-style-type: none"> <li>- Remove the particles</li> <li>- Check the plug seals</li> <li>- Replace the plug seals</li> <li>- Change rubber grade</li> <li>- Assemble plug, see section 6.5</li> </ul> |
| Leakage at sealing element (110)/balanced plug (94)             | Worn/damaged O-rings/lip seal (38/39/46/49)  | <ul style="list-style-type: none"> <li>- Replace the O-rings/lip seal</li> <li>- Change rubber grade</li> <li>- Clean and if necessary replace guide ring (45)</li> </ul>   |
| Leakage at clamp (64) and (65)<br>Leakage at spindle clamp (42) | <ul style="list-style-type: none"> <li>- O-rings (76 and 47) and valve body too old/damaged</li> <li>- Loose clamp (64) or (65)</li> </ul>   | <ul style="list-style-type: none"> <li>- Replace the O-rings</li> <li>- Change rubber grade</li> <li>- Tighten the clamp (max. 10 Nm)</li> </ul>  |
| CIP leakage   | <ul style="list-style-type: none"> <li>Worn O-rings (40/67)</li> <li>Damaged O-ring (39)</li> <li>Worn/damaged lip seal (57)</li> </ul>  | <ul style="list-style-type: none"> <li>Replace the O-rings</li> <li>- Replace the O-ring</li> <li>- Replace the plug seals</li> <li>- Change rubber grade</li> </ul>  |
| Tank plug not returning to closed position                      | <ul style="list-style-type: none"> <li>- Wrong rubber grade</li> <li>- Wrongly fitted gasket</li> <li>- Mounted incorrectly (see section 2.3)</li> </ul>   | <ul style="list-style-type: none"> <li>- Change rubber grade</li> <li>- Fit new gasket correctly</li> <li>- Correct installation</li> </ul>   |
| Plug returns with uneven movements (slip/stick effect)          | <ul style="list-style-type: none"> <li>- Wrong rubber grade</li> <li>- Wrongly fitted gasket</li> <li>- Mounted incorrectly (see section 2.3)</li> </ul>   | <ul style="list-style-type: none"> <li>- Change rubber grade</li> <li>- Fit new gasket correctly</li> <li>- Correct installation</li> </ul>   |

The valve is designed for cleaning in place (CIP).  
 Study the instructions carefully and pay special attention to the warnings!  
 NaOH = Caustic Soda.  
 HNO<sub>3</sub> = Nitric acid.

## 5.3 Recommended cleaning

### Step 1



**Always** handle lye and acid with great care.

**Caustic danger!**



**Always** use rubber gloves!



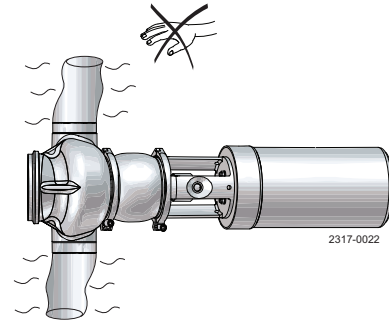
**Always** use protective goggles!

### Step 2



**Never** touch the valve or the pipelines when sterilising.

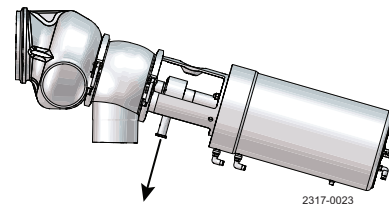
**Burning danger!**



### Step 3



- Never throttle the leakage outlet
- Never throttle the CIP outlet, if supplied.  
(Risk of mixing due to overpressure).



### Step 4

**Examples of cleaning agents:**

Use clean water, free from chlorides.

1. 1% by weight NaOH at 70° C

|           |   |             |   |                 |
|-----------|---|-------------|---|-----------------|
| 1 kg NaOH | + | 100 l water | = | Cleaning agent. |
|-----------|---|-------------|---|-----------------|

|                   |   |                |   |                 |
|-------------------|---|----------------|---|-----------------|
| 2.2 l<br>33% NaOH | + | 100 l<br>water | = | Cleaning agent. |
|-------------------|---|----------------|---|-----------------|

2. 0.5% by weight HNO<sub>3</sub> at 70° C

|                               |   |                |   |                 |
|-------------------------------|---|----------------|---|-----------------|
| 0.7 l<br>53% HNO <sub>3</sub> | + | 100 l<br>water | = | Cleaning agent. |
|-------------------------------|---|----------------|---|-----------------|

### Step 5

1. Avoid excessive concentration of the cleaning agent  
 ⇒ **Dose gradually!**
2. Adjust the cleaning flow to the process  
**Milk sterilisation/viscous liquids**  
 ⇒ **Increase the cleaning flow!**

## 5 Operation

The valve is designed for cleaning in place (CIP).

Study the instructions carefully and pay special attention to the warnings!

NaOH = Caustic Soda.

HNO<sub>3</sub> = Nitric acid.

### Step 6

Advisory seat lift cleaning periods

Cleaning periods of 1-2 seconds per CIP sequence.

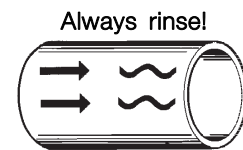
| Product   | Periods |
|-----------|---------|
| Milk      | 1-2     |
| Yoghurt   | 3-5     |
| Beer      | 2-5     |
| Cold wort | 5-10    |

### Step 7

**Always** rinse well with clean water after cleaning.

#### NOTE!

The cleaning agents must be stored/disposed of in accordance with current regulations/directives.



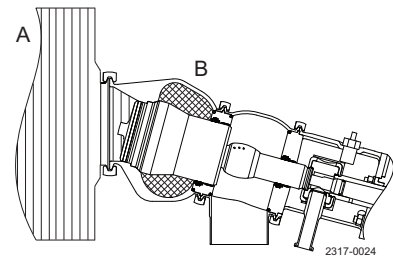
Clean water    Cleaning agents

### Step 8

#### 1. Closed valve

A. = Product

B. = CIP



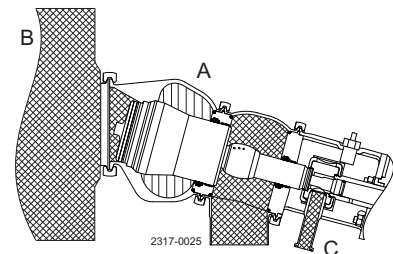
### Step 9

#### 2. Seat lift cleaning with tank plug (optional)

A. = Product

B. = CIP

C. = CIP out

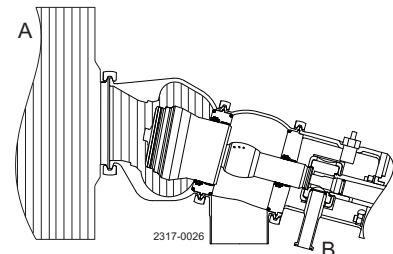


### Step 10

#### 3. Open valve

A. = Product

B. = Leakage dection



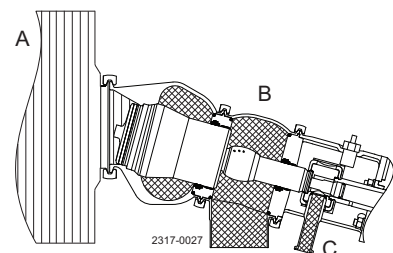
### Step 11

#### 4. Seat lift cleaning with balanced plug

A. = Product

B. = CIP

C. = CIP out



Maintain the valve/actuator regularly.  
 Study the instructions carefully and pay special attention to the warnings!  
 Always keep spare rubber seals and guide rings in stock. Store seals in closed bag.  
 The items refer to the parts list and service kits section.

### 6.1 General maintenance

#### Step 1



- **Always** read the technical data thoroughly (see 7.1 Technical data).
- **Always** fit the seals correctly (risk of mixing).
- **Always** release the compressed air after use.
- **Always** remove the CIP connections, if supplied, before service.

Replace all product wetted seals every 12 months.

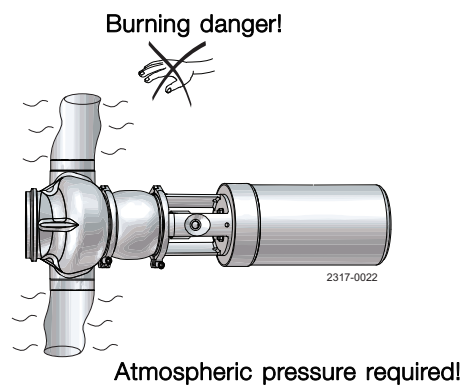
#### NOTE!

All scrap must be stored/disposed of in accordance with current regulations/directives.

#### Step 2



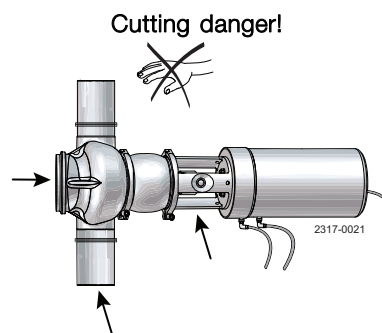
- **Never** service the valve when it is hot.
- **Never** service the valve with valve/actuator under pressure
- **Never** service the valve with fluid in the tank.



#### Step 3



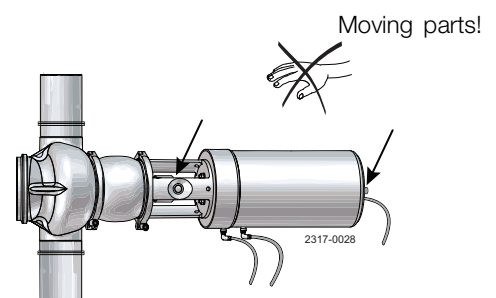
**Never** stick your fingers in operating parts of the valve if the actuator is supplied with compressed air.



#### Step 4



**Never** touch the clip assembly or the actuator piston rod if the actuator is supplied with compressed air (see the warning label).



## 6 Maintenance

Maintain the valve/actuator regularly.

Study the instructions carefully and pay special attention to the warnings!

Always keep spare rubber seals and guide rings in stock. Store seals in closed bag.

The items refer to the parts list and service kits section.

### Recommended spare parts: Service kits (see chapter 8)

Order service kits from the service kits section (see chapter 8)

Ordering spare parts: Contact the Sales Department.

|   | Valve rubber seals  | Valve plug seals  | Valve guide rings     |
|---|---|---|-----------------------|
| Preventive maintenance  | Replace after 12 months(*)  | Replace after 12 months(*)  | Replace when required |
| Maintenance after leakage<br>(leakage normally starts slowly) | Replace after production cycle  | Replace after production cycle  |                       |
| Planned maintenance   | <ul style="list-style-type: none"> <li>- Regular inspection for leakage and smooth operation</li> <li>- Keep a record of the valve</li> <li>- Use the statistics for inspection planning</li> </ul> | <ul style="list-style-type: none"> <li>- Regular inspection for leakage and smooth operation</li> <li>- Keep a record of the valve</li> <li>- Use the statistics for inspection planning</li> </ul> | Replace when required |
| Lubrication   | <b>When assembling</b><br>Klüber Paraliq or similar<br>USDA H1 GTE 703 approved<br>oil/grease (**) (suitable for<br>EPDM).  | <b>When assembling</b><br>Klüber Paraliq or similar<br>USDA H1 GTE 703 approved<br>oil/grease (**) (suitable for<br>EPDM).  | None                  |

### NOTE!

Lubricate thread in valve plug parts with Klüber Paste UH1 84-201 or similar.

(\*) Depending on working conditions! Please contact Alfa Laval.

(\*\*) All products wetted seals.

### Repairing of actuator:

- The actuator is maintenance-free but repairable.
- If repair is required, replacing all actuator rubber seals is recommended.
- Lubricate seals with Klüberplex BE31.
- To avoid possible black marks on pos. 1 and 29, Alfa Laval recommends Klüber Paraliq GTE703 (white) for these two positions.

### Pre-use check

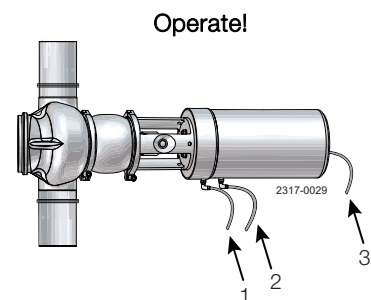
1. Supply compressed air to air connection 1, 2 and 3 one by one.
2. Operate the valve several times to ensure that it operates smoothly.

### Pay special attention to the warnings!

1 = air connection 1 (AC1)

2 = air connection 2 (AC2)

3 = air connection 3 (AC3)





*Maintain the valve/actuator regularly.*

*Study the instructions carefully and pay special attention to the warnings!*

*Always keep spare rubber seals and guide rings in stock. Store seals in closed bag.*

*The items refer to the parts list and service kits section.*

---

### **Tools required for valve service**

- 2 x 16 mm Wrench
- Strap wrench - 19 mm and 13 mm
- 8 mm wrench
- 17 mm wrench
- 2.5 mm Allen wrench
- Small knife
- Straight pick
- Small standard screw driver
- Air pilot switch (pos. 102)

### **Tools required for actuator service**

- 13 mm wrench
  - Long stem Phillips screw driver (#2 point)
  - Plastic hammer
  - Small blunt face punch
  - Small standard screw driver
-

## 6 Maintenance

---

Maintain the valve/actuator regularly.

Study the instructions carefully and pay special attention to the warnings!

Always keep spare rubber seals and guide rings in stock. Store seals in closed bag.

The items refer to the parts list and service kits section.

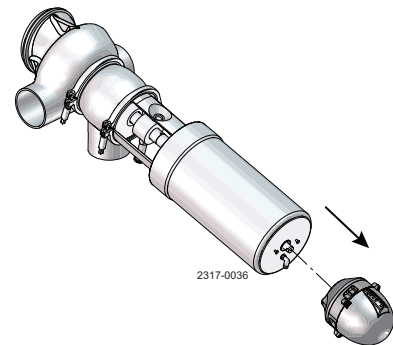
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### 6.2 Dismantling of valve (excluding actuator)

---

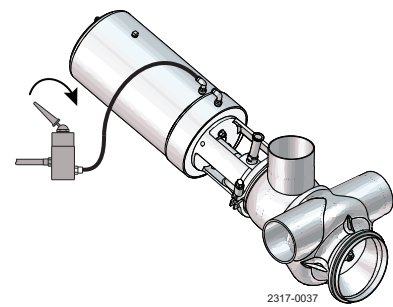
#### Step 1

Remove ThinkTop, if mounted.



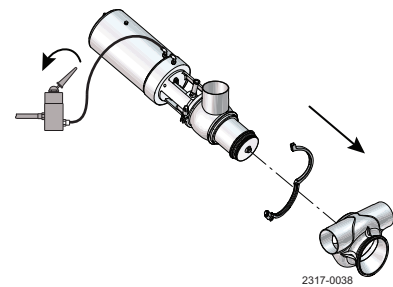
#### Step 2

Activate main stroke.



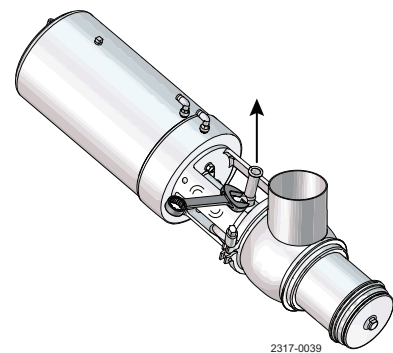
#### Step 3

1. Remove clamp.
2. Remove valve.
3. Release air.



#### Step 4

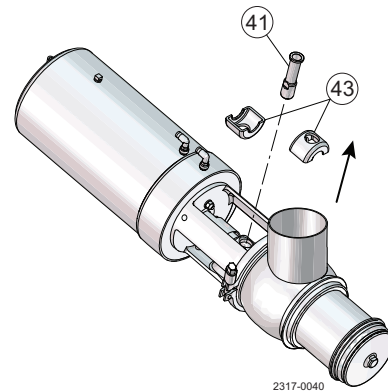
Remove flushing pipe using 19 mm wrench.



Maintain the valve/actuator regularly.  
Study the instructions carefully and pay special attention to the warnings!  
Always keep spare rubber seals and guide rings in stock. Store seals in closed bag.  
The items refer to the parts list and service kits section.

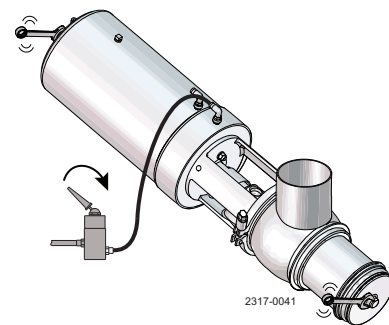
### Step 5

Remove clamp rings (43).



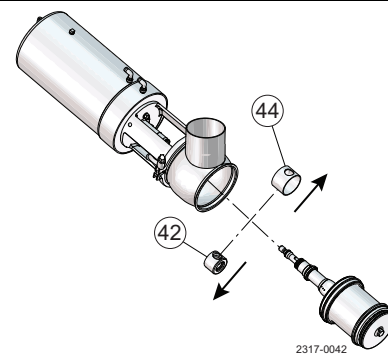
### Step 6

1. Activate upper seat lift.
2. Loosen tank plug by using two 16 mm wrenches.



### Step 7

1. Turn out tank plug by hand and remove plug assembly.
2. Remove spindle liner (42) and lock ring (44).



## 6 Maintenance

---

Maintain the valve/actuator regularly.

Study the instructions carefully and pay special attention to the warnings!

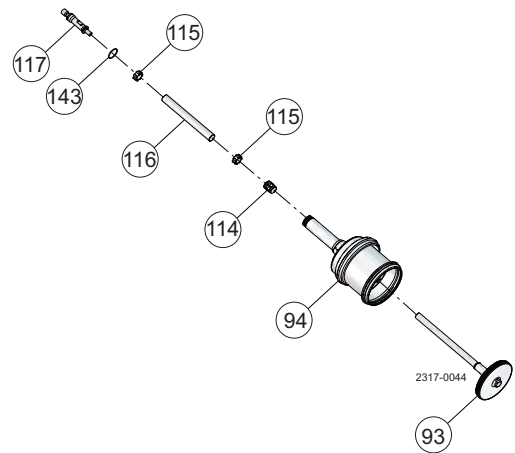
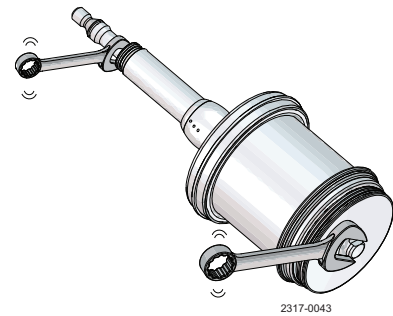
Always keep spare rubber seals and guide rings in stock. Store seals in closed bag.

The items refer to the parts list and service kits section.

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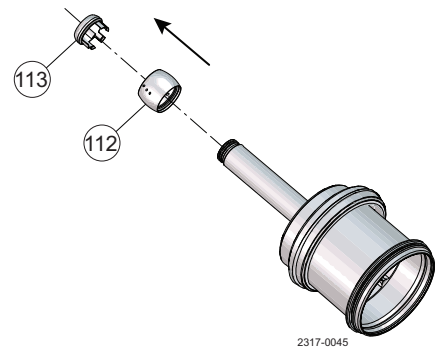
### Step 8

Remove upper stem (117) by using a 13 mm and a 16 mm wrench.



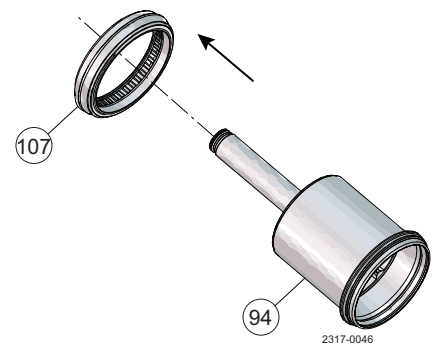
### Step 9

Remove lock ring (113) and rotating nozzle (112) by pulling upwards.



### Step 10

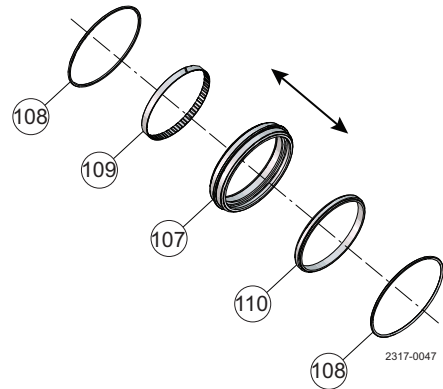
Remove valve body sealing element (107).



Maintain the valve/actuator regularly.  
Study the instructions carefully and pay special attention to the warnings!  
Always keep spare rubber seals and guide rings in stock. Store seals in closed bag.  
The items refer to the parts list and service kits section.

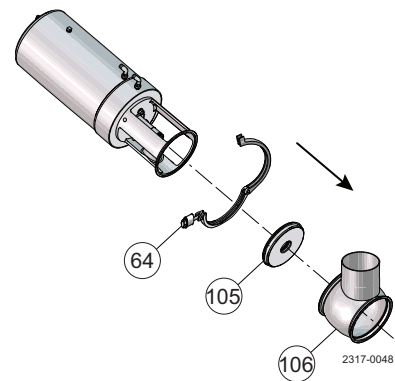
### Step 11

Sanitise guide ring (109).  
Remove O-rings (108) and lip seal (110).



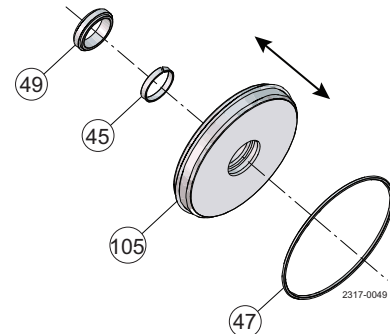
### Step 12

Remove clamp (64), vent body (106) and sealing element (105).



### Step 13

Sanitise guide ring (45).  
Remove O-ring (47) and lip seal (49).



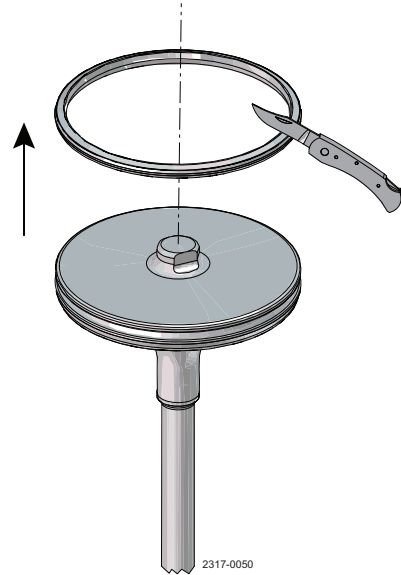
## 6 Maintenance

Study the instructions carefully. Handle scrap correctly.

### 6.3 Replacement of seal ring, tank plug

#### Step 1

Cut and remove old seal ring (74) using a knife, screwdriver or similar. Be careful not to scratch the plug.

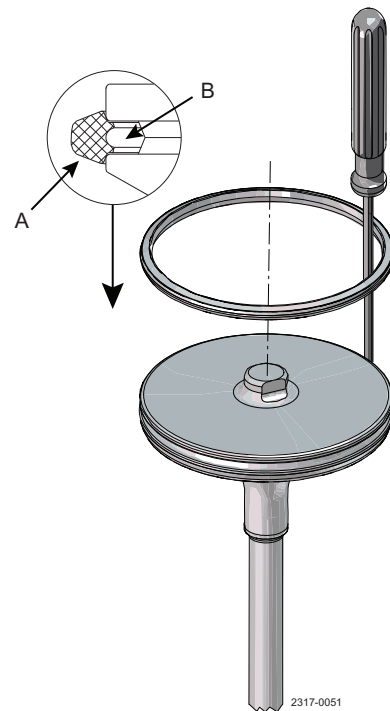


#### Step 2

Pre-mount seal ring as shown on drawing.

Rotate along circumference to fix gasket as shown in the picture

- A. Do not lubricate behind the sealing
- B. Carefully lubricate sealings with suitable lubricant, before pre-mounting

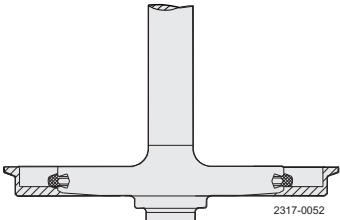


#### Step 3

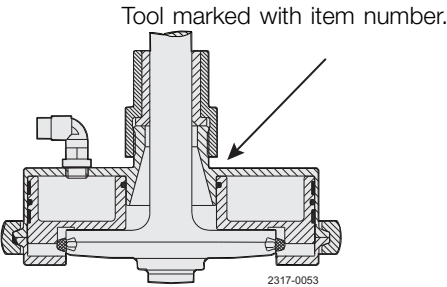
| Item No.               |                  |                   |                   | Tool for radial sealing,<br>tank plug |
|------------------------|------------------|-------------------|-------------------|---------------------------------------|
| 2" + 2½"<br>Seat ø81.3 | 3"<br>Seat ø81.3 | 4"<br>Seat ø115.3 | 6"<br>Seat ø206.1 |                                       |
| 9614-0788-01           | 9614-0788-01     | 9614-0788-02      | 9614-0788-03      |                                       |

Study the instructions carefully. Handle scrap correctly.

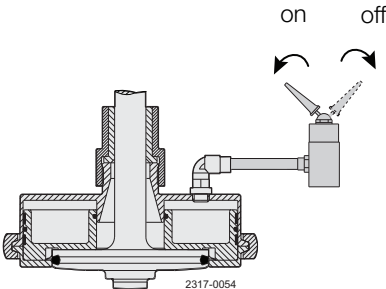
**Step 4**  
Place lower tool part.



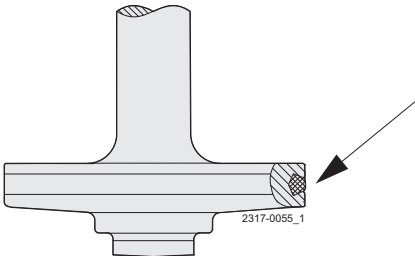
**Step 5**  
1. Place upper tool part including piston.  
2. Clamp the two tool parts together.



**Step 6**  
1. Supply compressed air.  
2. Release compressed air.  
3. Remove tool parts.



**Step 7**  
Inspect the seal to ensure it does not twist in the groove, and press in the 4 outsticking points with a screwdriver.



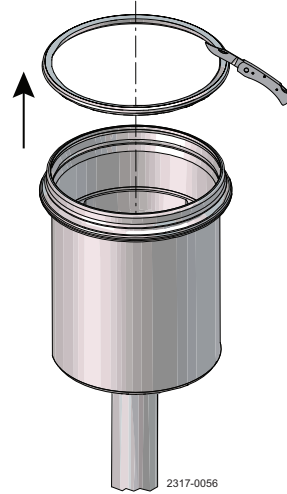
## 6 Maintenance

Study the instructions carefully. Handle scrap correctly.

### 6.4 Replacement of seal ring, balanced plug

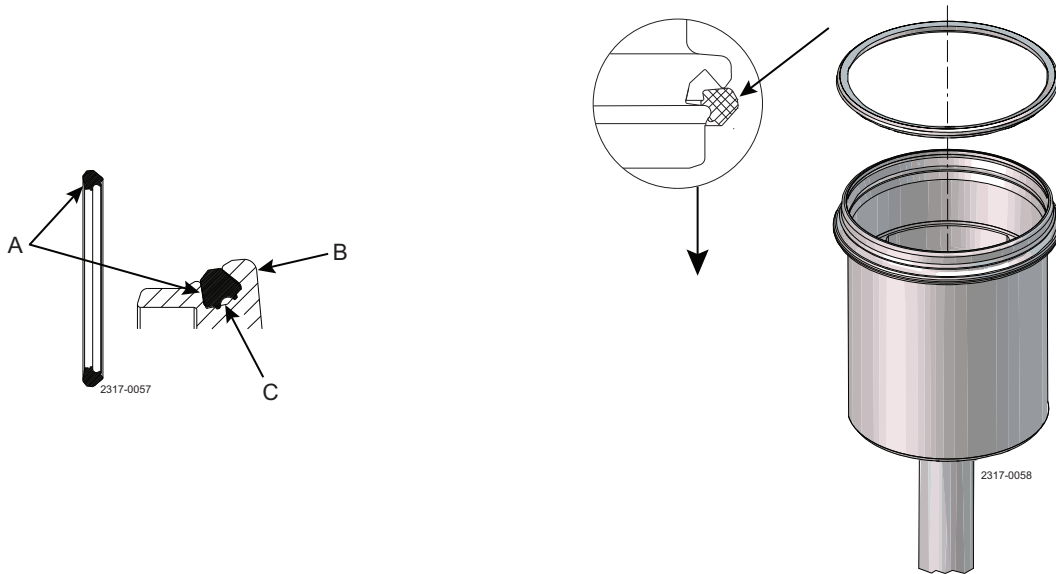
#### Step 1

Remove old seal ring (56) using a knife, screwdriver or similar. Be careful not to scratch the plug.



#### Step 2

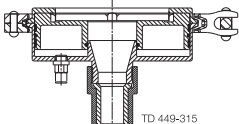
Pre-mount seal ring as shown on drawing.



- A. = Flat side of the sealing
- B. = Balanced plug
- C. = Do not lubricate behind the sealing.

Carefully lubricate sealings with suitable lubricant, before pre-mounting.

#### Step 3

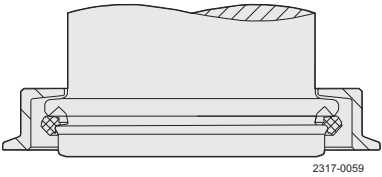
| Item No.               |                  |                   |                   | Tool for axial sealing,<br>balanced plug  |
|------------------------|------------------|-------------------|-------------------|---|
| 2" + 2½"<br>Seat ø81.3 | 3"<br>Seat ø81.3 | 4"<br>Seat ø115.3 | 6"<br>Seat ø206.1 |   |
| 9613-0505-02           | 9614-0792-01     | 9613-0505-03      | 9613-0505-10      |  |



Study the instructions carefully. Handle scrap correctly.

**Step 4**

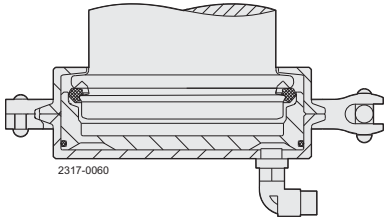
Place tool part 1.



**Step 5**

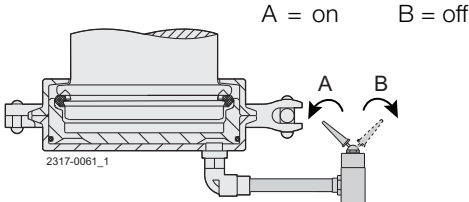
- 1. Place tool part 2 including piston.
- 2. Clamp the two tool parts together.

Tooling marked with item number



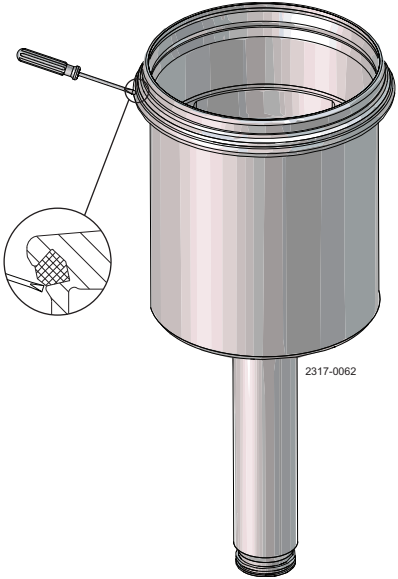
**Step 6**

- 1. Supply compressed air.
- 2. Release compressed air.
- 3. Rotate the tool 45° in relation to the plug.
- 4. Supply compressed air.
- 5. Release compressed air and remove tool.



**Step 7**

- 1. Inspect the seal.
- 2. Release air at 3 different positions of the circumference.



## 6 Maintenance

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Study the instructions carefully. Handle scrap correctly.

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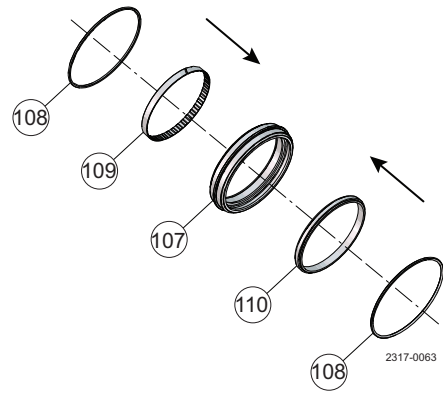
### 6.5 Valve reassembly (excluding actuator)

---

#### Step 1

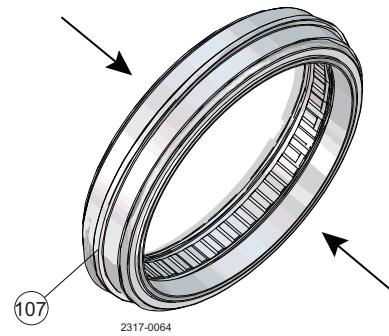
##### Assembling valve body sealing element:

Lubricate O-rings (108) and lip seal (110).



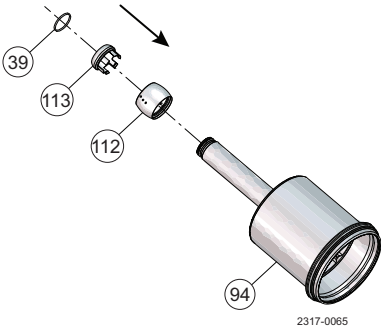
#### Step 2

Mount all components in sealing element (107).

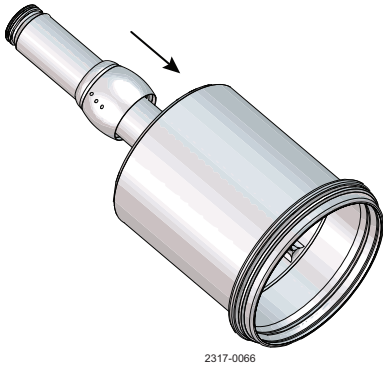


Study the instructions carefully. Handle scrap correctly.

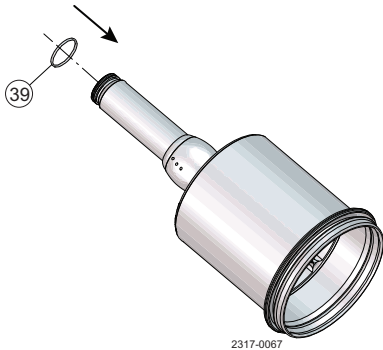
Mounting rotating nozzle (112 + 113) and O-ring (39) on balanced plug:



**Step 3**  
Nozzle and lock ring slides over spindle.



**Step 4**  
Lubricate O-ring (39) and mount O-ring on balanced plug.



## 6 Maintenance

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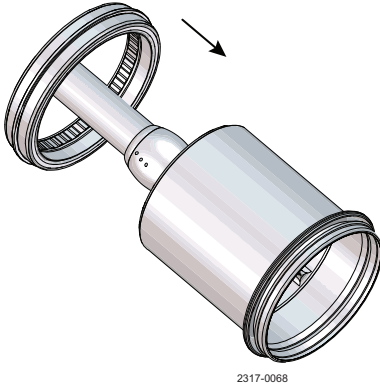
Study the instructions carefully. Handle scrap correctly.

---

### Mounting valve body sealing element on balanced plug:

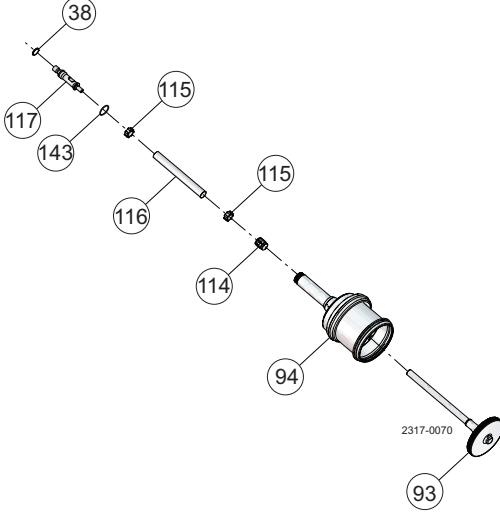
#### Step 5

Ensure sealing element is orientated so the white guide ring is upwards.

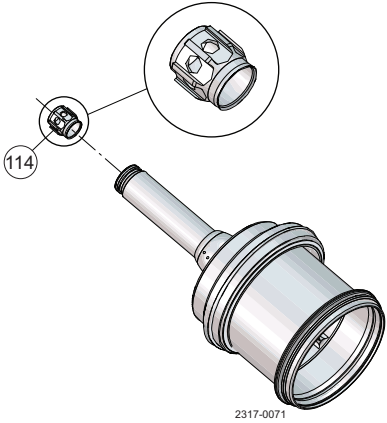


Study the instructions carefully. Handle scrap correctly.

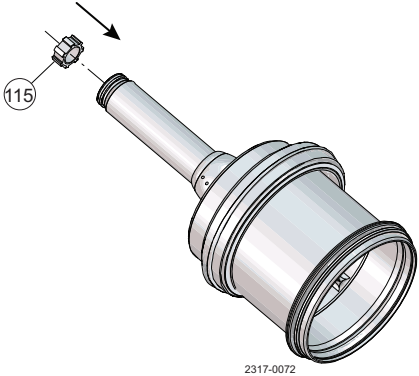
Mounting two-way nozzle (114), spacer (116) and guide rings (115):



**Step 6**  
Insert nozzle, ensure that it is inserted as shown on picture.



**Step 7**  
Insert first guide ring (115).



## 6 Maintenance

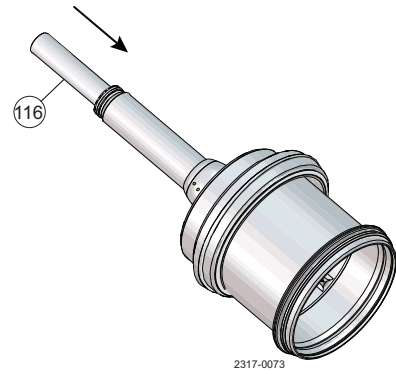
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Study the instructions carefully. Handle scrap correctly.

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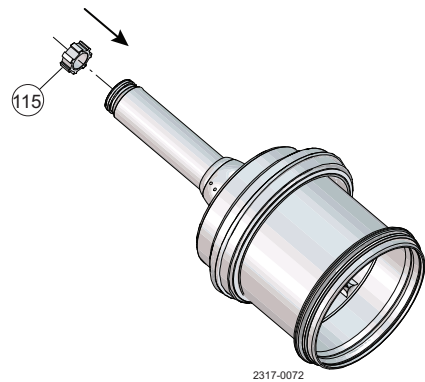
### Step 8

Insert spacer (116).



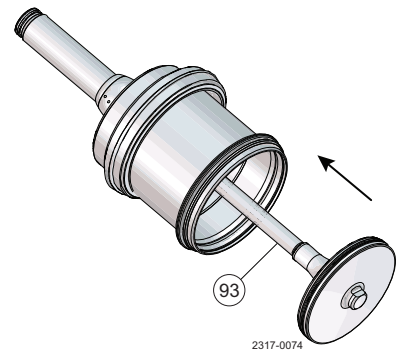
### Step 9

Insert last guide ring (115).



### Step 10

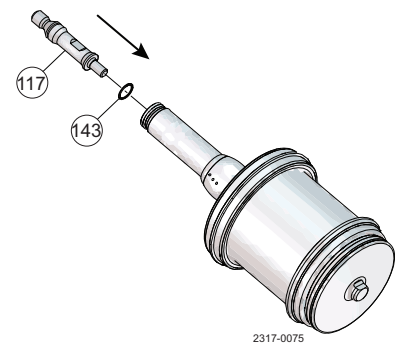
Insert tank plug (93) from the bottom of balanced plug.



### Step 11

Lubricate O-ring (143).

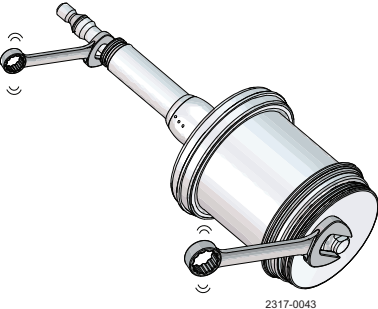
Mount O-ring in stem and mount stem for tank plug



Study the instructions carefully. Handle scrap correctly.

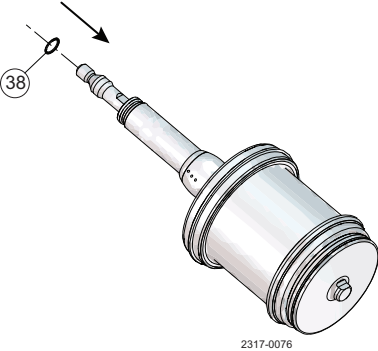
**Step 12**

Tighten. Use a 13 mm and 16 mm wrench. Torque 20 Nm.



**Step 13**

Mount O-ring (38).



## 6 Maintenance

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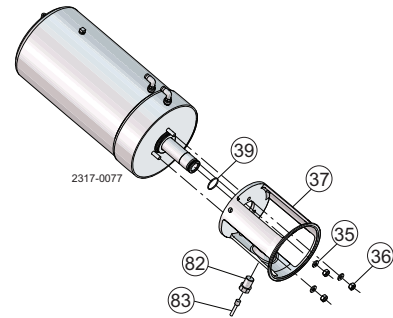
Study the instructions carefully. Handle scrap correctly.

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### Mounting yoke on actuator:

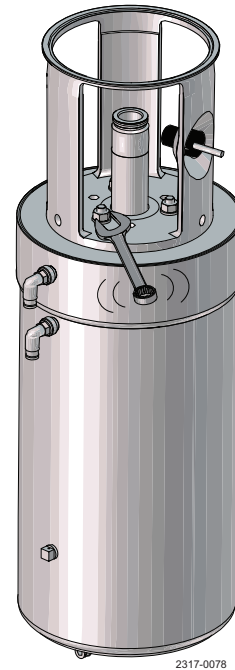
#### Step 14

Lubricate O-ring (39).



#### Step 15

1. Mount yoke (15) and the 3 nuts (36) and washers (35).
2. Use a 13 mm wrench. Tighten nuts to 12 Nm.
3. Mount O-ring (39) on actuator spindle.
4. Mount plastic bolt (82) and sensor (83) (if sensor is used).



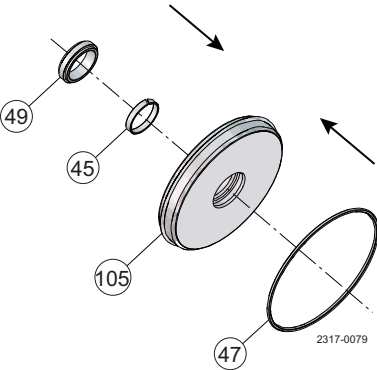


Study the instructions carefully. Handle scrap correctly.

Assembling vent body sealing element:

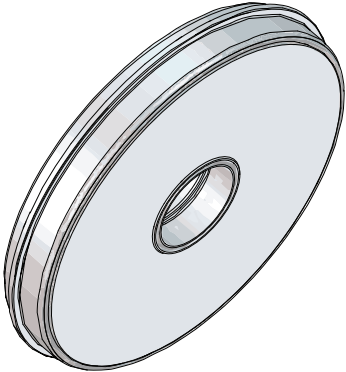
Step 16

Lubricate O-ring (47) and lip seal (49).



Step 17

Mount all components in sealing elements (105).



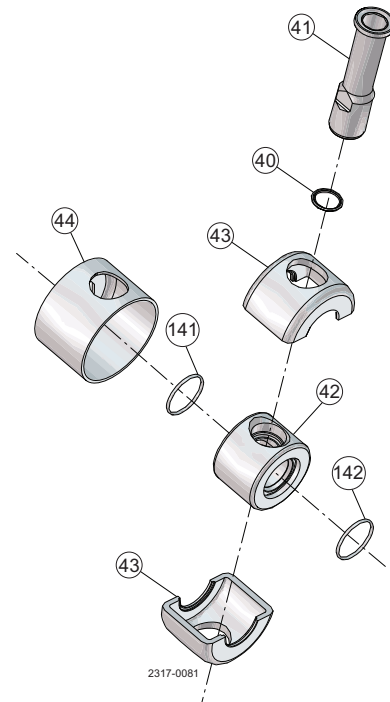
## 6 Maintenance

Study the instructions carefully. Handle scrap correctly.

### Assembling valve:

#### Step 18

Lubricate O-rings (40 + 141 + 142).

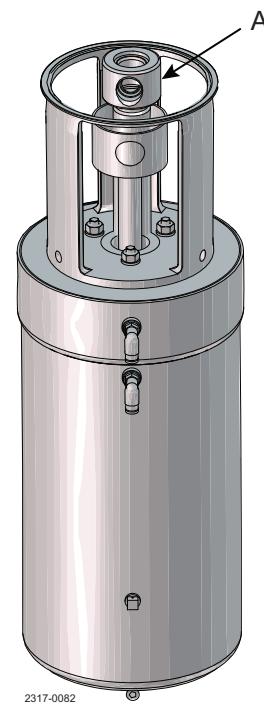


#### Step 19

Mount lock ring (44).

Mount spindle liner (42) with O-rings (141 + 142)

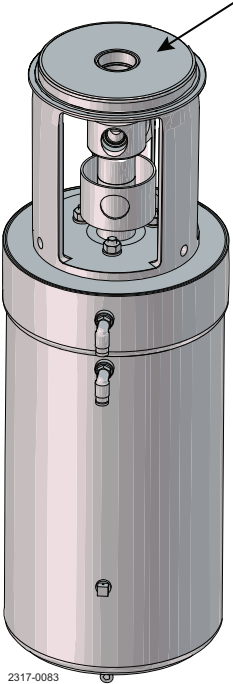
A. Spindle liner can be turned both ways except 6°



Study the instructions carefully. Handle scrap correctly.

**Step 20**

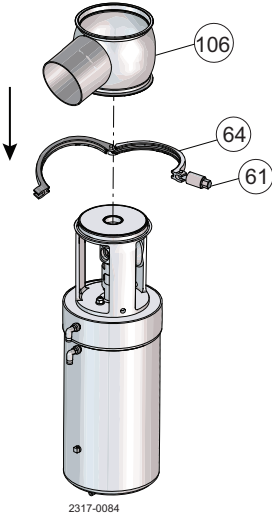
Place sealing element with O-ring and lip seal upwards.



2317-0083

**Step 21**

- 1. Mount vent body (106).
- 2. Mount clamp (64 + 61).



2317-0084

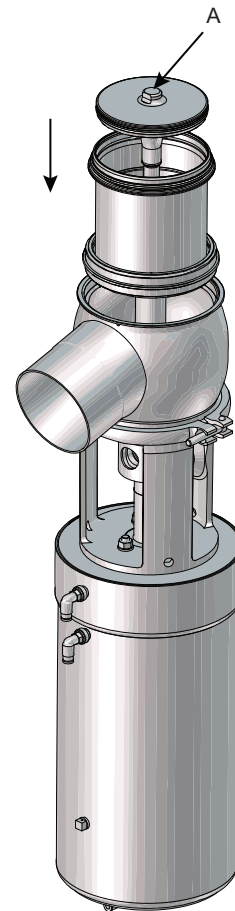
## 6 Maintenance

Study the instructions carefully. Handle scrap correctly.

### Step 22

1. Activate compressed air on lower seat push (yellow air fitting placed on top of actuator).
2. Insert valve plug assembly through vent sealing element.
3. Tighten tank plug by hand.

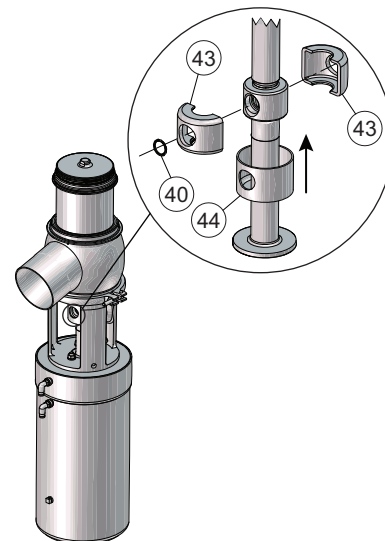
A = tank plug



2317-0085

### Step 23

1. Mount clamp rings (43), ensure that hole in clamp and spindle liner are aligned.
2. Push up the lock ring (44).
3. Align hole in lock ring with the other holes.
4. Insert O-ring (40)

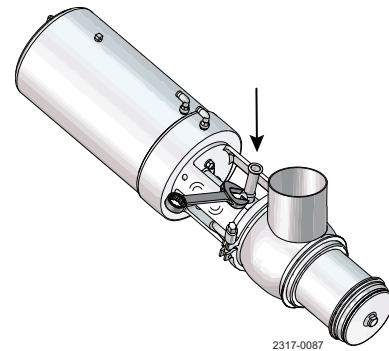


2317-0086

Study the instructions carefully. Handle scrap correctly.

### Step 24

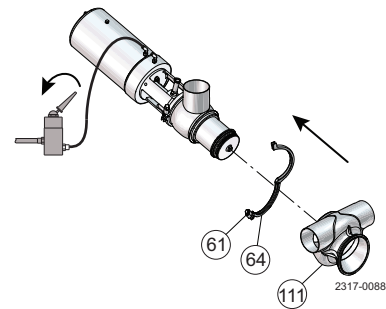
1. Mount flushing pipe (41), tighten with 19 mm wrench.
2. Deactivate lower seat push.



### Step 25

Activate compressed air on main stroke. (Blue air fitting placed mid on actuator).

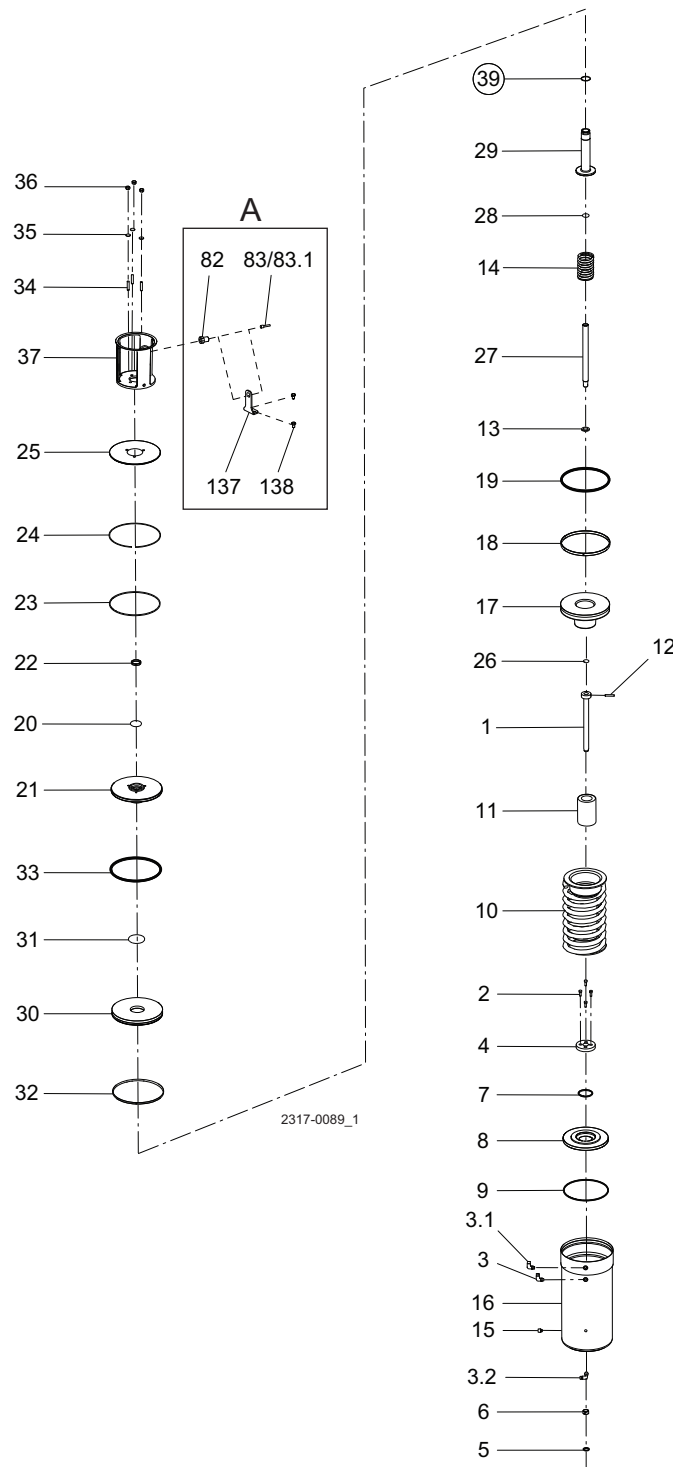
1. Mount valve body (111) and clamp (64 + 61).
2. Deactivate main stroke.



# 6 Maintenance

Study the instructions carefully. Handle scrap correctly.

## 6.6 Dismantling of actuator



A = Only for sensor

*Study the instructions carefully. Handle scrap correctly.*

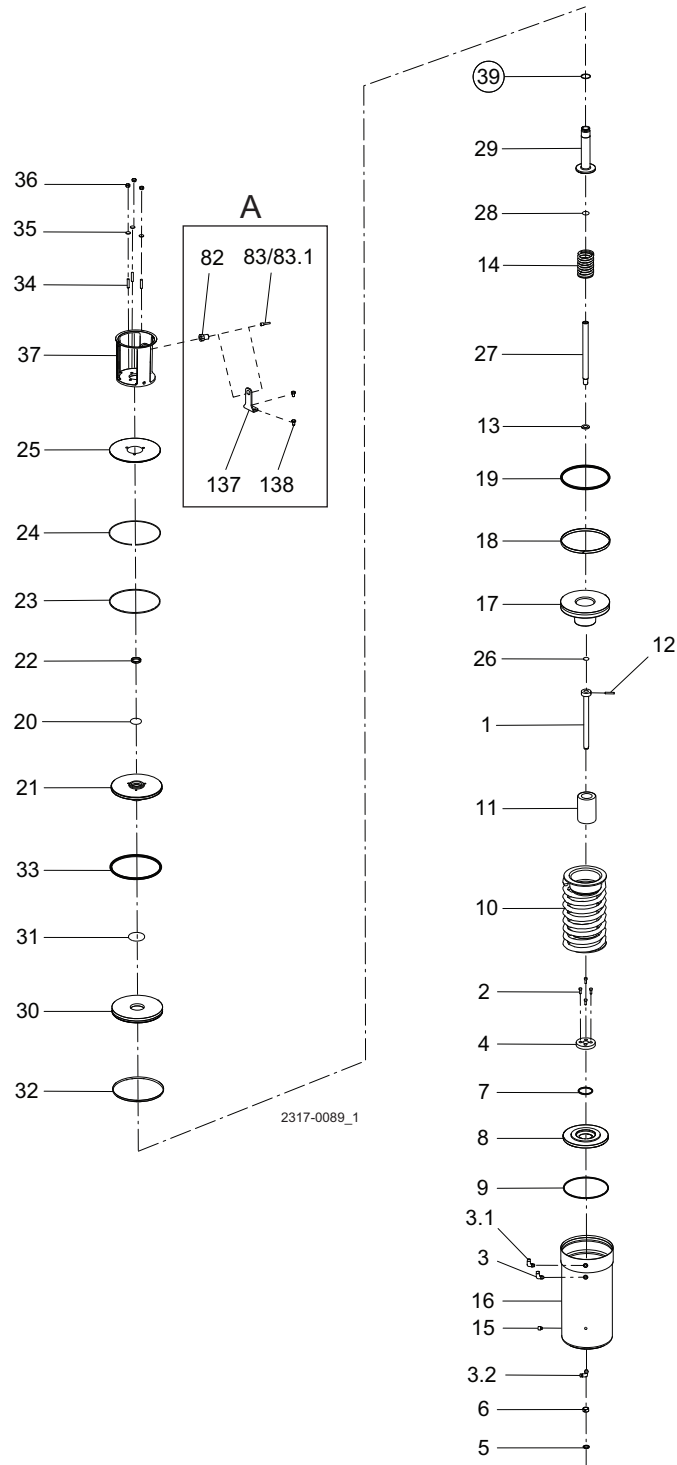
---

1. Remove nuts (36) and washers (35).
2. Pull out intermediate piece (37) from the actuator.
3. Remove cover disk (25).
4. Remove retaining ring (24).
5. Remove piston rod (29), bottom (21) and lower piston (30).
6. Separate the three parts.
7. Remove O-rings (20, 22 and 23) from bottom, O-rings (33 and 31) and guide ring (32) from lower piston as well as O-ring (28) from piston rod.
8. Remove spring assembly (14).
9. Remove inner stem (27), main piston (17) and distance spacer (11) if present. Remove guide ring (18) and O-ring (19).
10. Remove spring assembly (10).
11. Unscrew screws (2).
12. Remove stop (4).
13. Remove upper piston (8). Remove O-rings (7 and 9).
14. Remove O-ring (5) and guide ring (6).

# 6 Maintenance

Study the instructions carefully. Handle scrap correctly.

## Actuator exploded view



A = Only for sensor



*Study the instructions carefully. Handle scrap correctly.*

---

### 6.7 Actuator re-assembly

---

1. Fit guide ring (6) and O-ring (5).
  2. Fit O-rings (7 and 9). Place upper piston (8).
  3. Fit stop (4).
  4. Tighten screws (2).
  5. Place spring assembly (10).
  6. Fit O-ring (19) and guide ring (18). Mount distance spacer (11), main piston (17) and inner stem (27).
  7. Fit spring assembly (14).
  8. Fit O-ring (28) in piston rod, fit O-rings (33 and 31) and guide ring (32) in lower piston and fit O-rings (20, 22 and 23) in bottom.
  9. Fit piston rod (29), lower piston (30) and bottom (21).
  10. Mount the three parts.
  11. Fit retaining ring (24).
  12. Fit cover disk (25).
  13. Mount intermediate piece (37) on actuator.
  14. Fit and tighten nuts (36) and washers (35).
-

## 7 Technical data

*It is important to observe the technical data during installation, operation and maintenance.  
Inform personnel about the technical data.*

### 7.1 Technical data

This Unique Mixproof HT Valve is specially designed for horizontal mounting on the side of a tank or as a space-saving alternative at the bottom of a cone-formed tank.

Based on the well proven and exceptionally versatile principle of the Unique Mixproof valves, this horizontal mixproof tank valve features many of the same components, such as the actuator, yoke and seals, and therefore the same spare parts.

| Data                               |  |
|------------------------------------|--|
| Max. product pressure in pipeline: | 1000 kPa (10 bar)                            |
| Min. product pressure:             | Full vacuum                                  |
| Temperature range:                 | -5°C to +125°C (depending on rubber quality) |
| Air pressure:                      | Max. 800 kPa (8 bar)                         |

| Size<br>ISO/DIN                  |            | DN/OD |      |      |      | Longstroke<br>DN/OD<br>6" |
|----------------------------------|------------|-------|------|------|------|---------------------------|
|                                  |            | 2½"   | 3"   | 4"   | 6"   |                           |
| <b>Kv-value</b>                  |            |       |      |      |      |                           |
| Upper Seat-lift                  | [m³/h]     | 2.5   | 2.5  | 3.1  | 7.1  | 7.1                       |
| Lower Seat-lift (tank seat lift) | [m³/h]     | 11.5  | 11.5 | 34.1 | 80.5 | 80.5                      |
| <b>Air consumption</b>           |            |       |      |      |      |                           |
| Upper Seat-lift                  | *[n litre] | 0.4   | 0.4  | 0.62 | 0.62 | 0.62                      |
| Lower Seat-lift                  | *[n litre] | 0.13  | 0.13 | 0.21 | 0.21 | 0.21                      |
| Main Movement                    | *[n litre] | 1.62  | 1.62 | 3.54 | 3.54 | 3.54                      |
| <b>Kv-value - SpiralClean</b>    |            |       |      |      |      |                           |
| External CIP in leakage chamber  | [m³/h]     | 1.52  | 1.52 | 1.52 | 1.52 | 1.52                      |

**Formula to estimate CIP flow during seat lift** (for liquids with comparable viscosity and density to water):

$$Q = K_v \cdot \sqrt{\Delta p}$$

$$Q = \text{CIP - flow (m}^3/\text{h)}$$

$$K_v = \text{Kv value from the above table.}$$

$$\Delta p = \text{CIP pressure (bar)}$$

| Materials                   |                                |
|-----------------------------|--------------------------------|
| Product wetted steel parts: | 1.4404 (316L)                  |
| Other steel parts:          | 1.4301 (304)                   |
| External surface finish:    | Semi-bright (blasted)          |
| Internal surface finish:    | Bright (polished), Ra < 0.8 µm |
| Product wetted seals:       | EPDM                           |
| Other seals:                | CIP seals: EPDM                |
| Actuator seals:             | NBR                            |
| Guide strips:               | PTFE                           |

## 7 Technical data

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*It is important to observe the technical data during installation, operation and maintenance.  
Inform personnel about the technical data.*

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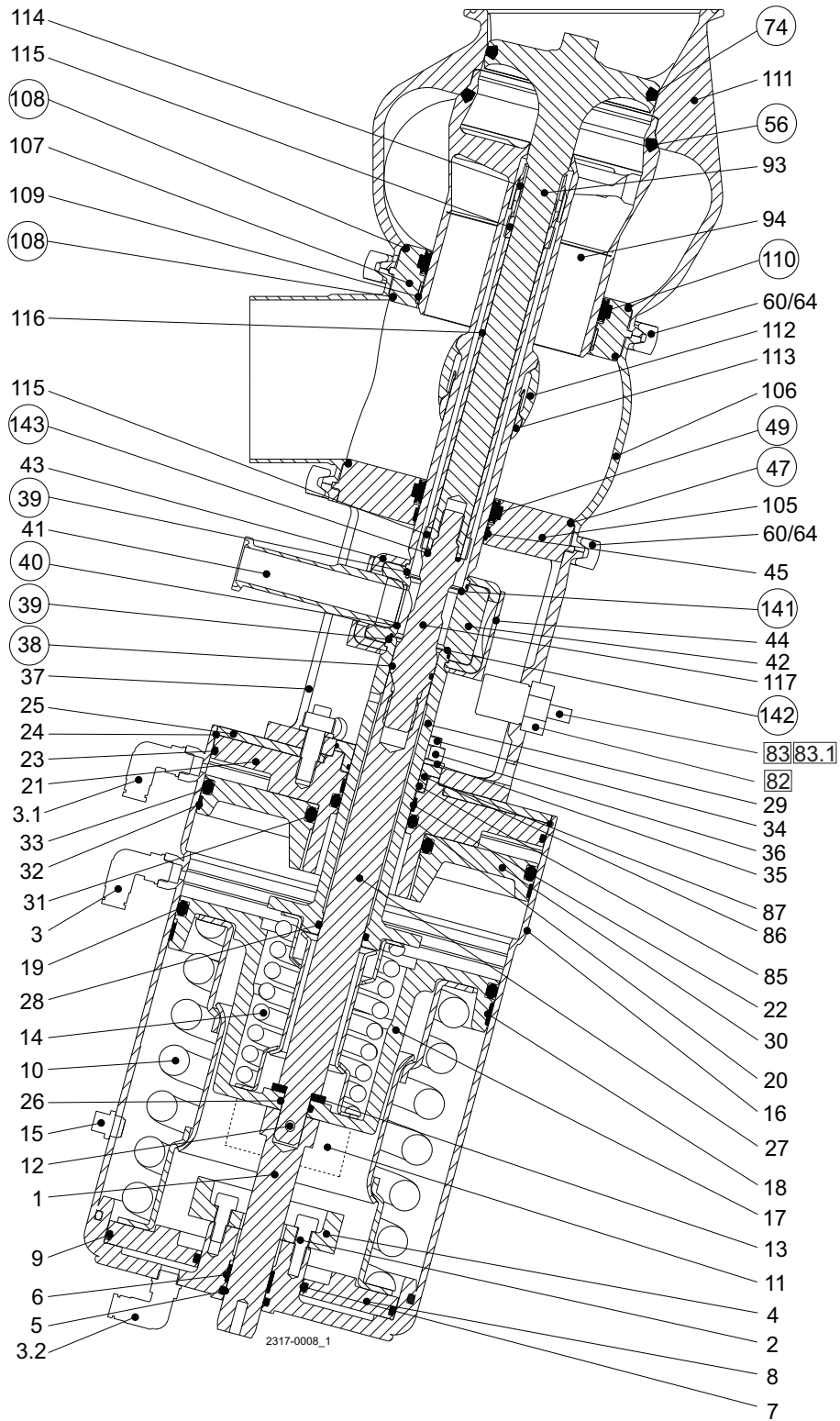
### Weight (kg)

| Size        | 2.5" | 3"  | 4"  | 6"<br>(75 mm) stroke | 6"<br>(59 mm) stroke |
|-------------|------|-----|-----|----------------------|----------------------|
| Weight (kg) | 1.6  | 1.3 | 2.1 | 2.9                  | 5.0                  |

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8.1 Wear parts



- = wear parts
- = sensor kit

## 8 Parts list

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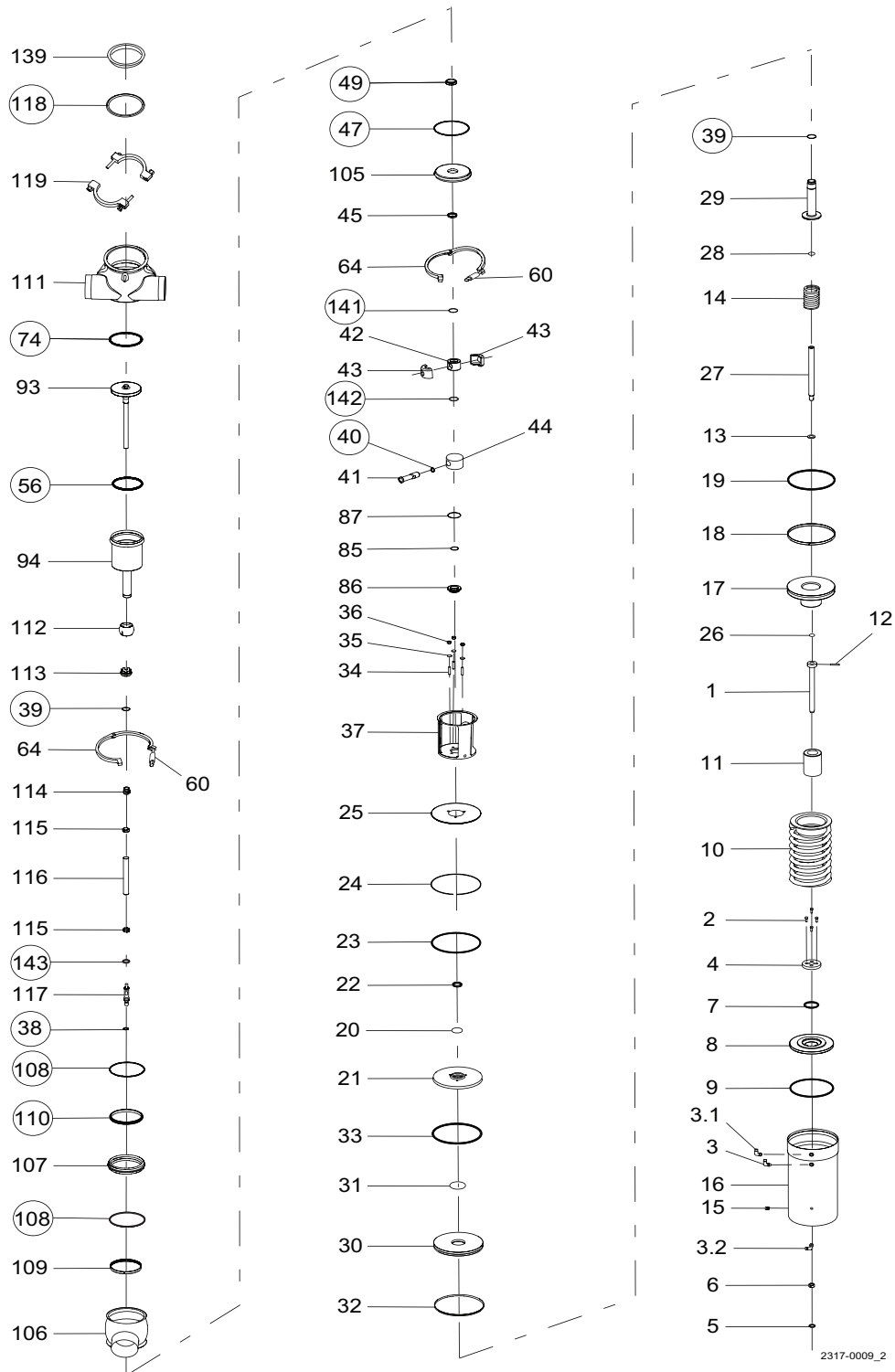
### Parts list

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| Pos. | Qty | Denomination  |
|------|-----|---------------|
| 38   | 1   | O-ring        |
| 39   | 2   | O-ring        |
| 40   | 1   | O-ring        |
| 47   | 1   | O-ring        |
| 49   | 1   | Lip seal      |
| 56   | 1   | Seal ring     |
| 74   | 1   | Seal ring     |
| 108  | 2   | O-ring        |
| 110  | 1   | Lip seal      |
| 118  | 1   | Clamp packing |
| 141  | 1   | O-ring        |
| 142  | 1   | O-ring        |
| 143  | 1   | O-ring        |

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8.2 Parts



2317-0009\_2

## 8 Parts list

### Parts list

| Pos. | Qty | Denomination          |
|------|-----|-----------------------|
| 1    | 1   | Cpl. Actuator         |
|      |     | Upper stem            |
| 2    | 4   | Screw                 |
| 3    | 1   | Air fitting           |
| 3.1  | 1   | Air fitting           |
| 3.2  | 1   | Air fitting           |
| 4    | 1   | Stop for upper piston |
| 5    | 1   | O-ring, NBR           |
| 6    | 1   | Guide ring, Turcite   |
| 7    | 1   | O-ring, NBR           |
| 8    | 1   | Upper piston          |
| 9    | 1   | O-ring, NBR           |
| 10   | 1   | Spring assembly       |
| 11   | 1   | Distance spacer       |
| 12   | 1   | Pin                   |
| 13   | 1   | Washer                |
| 14   | 1   | Spring assembly       |
| 15   | 1   | Plug                  |
| 16   | 1   | Cylinder              |
| 17   | 1   | Main piston           |
| 18   | 1   | Guide ring, Turcite   |
| 19   | 1   | O-ring, NBR           |
| 20   | 1   | O-ring, NBR           |
| 21   | 1   | Bottom                |
| 22   | 1   | Guide ring, Turcite   |
| 23   | 1   | O-ring, NBR           |
| 24   | 1   | Retaining ring        |
| 25   | 1   | Cover disk            |
| 26   | 1   | O-ring, NBR           |
| 27   | 1   | Inner stem            |
| 28   | 1   | O-ring                |
| 29   | 1   | Piston rod            |

### Parts list

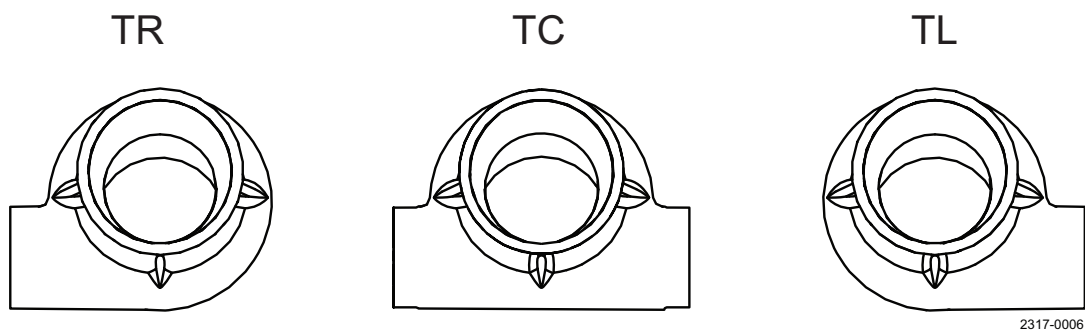
| Pos. | Qty | Denomination              |
|------|-----|---------------------------|
| 30   | 1   | Lower piston              |
| 31   | 1   | O-ring, NBR               |
| 32   | 1   | Guide ring, Turcite       |
| 33   | 1   | O-ring, NBR               |
| 34   | 3   | Bolt                      |
| 35   | 2   | Washer                    |
| 35.1 | 1   | Washer                    |
| 36   | 3   | Nut                       |
| 41   | 1   | Flushing tube             |
| 42   | 1   | Spindle liner             |
| 43   | 2   | Clamp                     |
| 44   | 1   | Lock                      |
| 45   | 1   | Guide ring, PTFE          |
| 60   | 2   | Hexnut                    |
| 64   | 2   | Clamp without nut         |
| 85   | 1   | O-ring                    |
| 86   | 1   | Plug for actuator         |
| 87   | 1   | O-ring                    |
| 93   | 1   | Tank plug                 |
| 94   | 1   | Balance plug              |
| 105  | 1   | Upper sealing element     |
| 107  | 1   | Sealing element           |
| 109  | 1   | Guide ring, PTFE          |
| 112  | 1   | Rotating nozzle           |
| 113  | 1   | Lockring rotating nozzle  |
| 114  | 1   | Rotating nozzle           |
| 115  | 2   | Guidering rotating nozzle |
| 116  | 1   | Pipe                      |
| 117  | 1   | Spindle                   |
| 119  | 1   | Clamp                     |
| 139  | 1   | Clamp ferrule             |



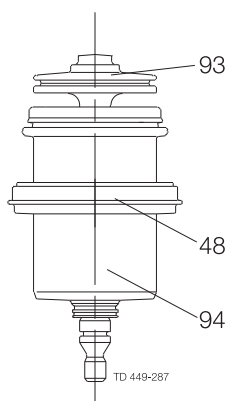
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8.3 Service kits

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Service kits



## 8 Parts list

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### Parts list

| Pos. | Qty | Denomination       |
|------|-----|--------------------|
| 37   | 1   | Intermediate piece |
| 106  | 1   | Vent body          |
| 111  | 1   | Valve body         |

### Service kits

#### 2½" + 3"

|                        |            |
|------------------------|------------|
| Service kit, EPDM..... | 9611926881 |
| Service kit, NBR ..... | 9611926882 |
| Service kit, HNBR..... | 9611926883 |
| Service kit, FPM.....  | 9611926884 |

#### 4"

|                        |            |
|------------------------|------------|
| Service kit, EPDM..... | 9611926885 |
| Service kit, NBR ..... | 9611926886 |
| Service kit, HNBR..... | 9611926887 |
| Service kit, FPM.....  | 9611926888 |

#### 6"

|                        |            |
|------------------------|------------|
| Service kit, EPDM..... | 9611926889 |
| Service kit, NBR ..... | 9611926890 |
| Service kit, HNBR..... | 9611926891 |
| Service kit, FPM.....  | 9611926892 |

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