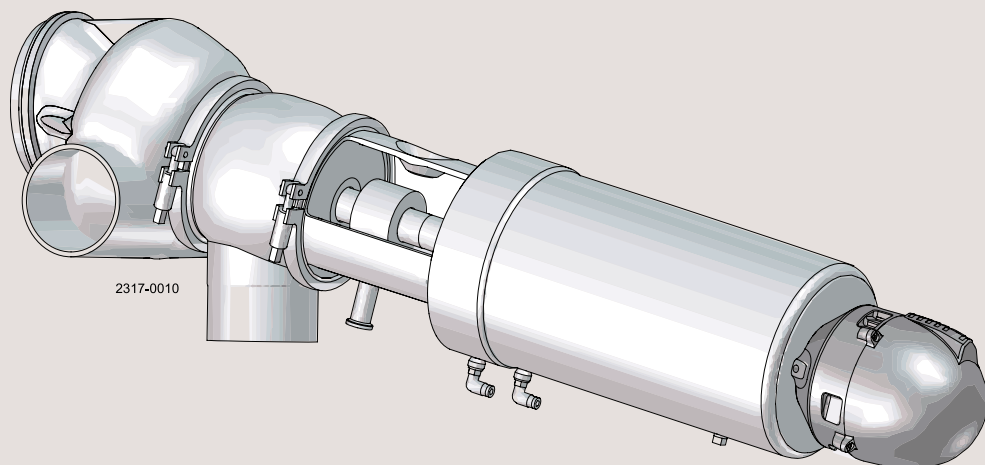




Instruction Manual

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



ESE02424-EN5

2022-10

Original manual

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

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1 Declarations of conformity

EU Declaration of Conformity

The Designated Company

Alfa Laval Kolding A/S, Albuen 31, DK-6000 Kolding, Denmark, +45 79 32 22 00
Company name, address and phone number

Hereby declare that

Valve
Designation


Unique HT
Type

Serial number from 1181354 to 9999999

is in conformity with the following directives with amendments:

- Machinery Directive 2006/42/EC
- The valve is in compliance with the Pressure Equipment Directive 2014/68/EC 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.

Global Product Quality Manager <small>Title</small>	Lars Kruse Andersen <small>Name</small>
Kolding, Denmark <small>Place</small>	2022-10-01 <small>Date (YYYY-MM-DD)</small>
	 <small>Signature</small>

This Declaration of Conformity replaces Declaration of Conformity dated 2016-06-01



1 Declarations of conformity

UK Declaration of Conformity

The Designated Company

Alfa Laval Kolding A/S, Albuen 31, DK-6000 Kolding, Denmark, +45 79 32 22 00

Company name, address and phone number

Hereby declare that

Valve

Designation

Unique HT

Type

Serial number from 1181354 to 9999999

is in conformity with the following directives with amendments:

- The Supply of Machinery (Safety) Regulations 2008
 - The Pressure Equipment (Safety) Regulations 2016 category 1 and subjected to assessment procedure Module A.
- Diameters \geq DN125 may not be used for fluids group 1

Signed on behalf of: Alfa Laval Kolding A/S

Global Product Quality Manager

Title

Lars Kruse Andersen

Name

Kolding, Denmark

Place

2022-10-01

Date (YYYY-MM-DD)



Signature

DoC Revision_01_102022

UK
CA



2 Introduction

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.

*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.

This Instruction manual is designed to provide the user with the information to perform tasks safely for all phases in the lifetime of the product supplied.

The user shall always read the safety section first. Hereafter the user can skip to the relevant section for the task to be carried out or for the information needed.

This is the complete manual for the supplied product.

Operators

The operators shall read and understand the instruction manual for the supplied product.

Maintenance personnel

The maintenance personnel shall read and understand the instruction manual.

The maintenance personnel or technicians shall be skilled within the field required to carry out the maintenance work safely.

Trainees

Trainees can perform tasks under the supervision of an experienced employee.

People in general

The public shall not have access to the supplied product.

How to contact Alfa Laval

Contact details for all countries are

continually updated on our website.

Please visit www.alfalaval.com to access the information directly.

3.2 Warning signs

General warning:



Caustic agents:



Cutting danger:



TD 449-303

3 Safety

*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

STORAGE

Ideally, as a guide Alfa Laval recommend:

- Store supplied product as supplied in original packaging
- Port opening should be protected against any ingress
- Bare steel (not stainless) should be lightly oiled/greased
- Store in a clean, dry place without direct sunlight or UV light
- Temperature range -5 to 40°C
- Relative humidity less than 60%
- No exposure to corrosive substances (also air contained).

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!

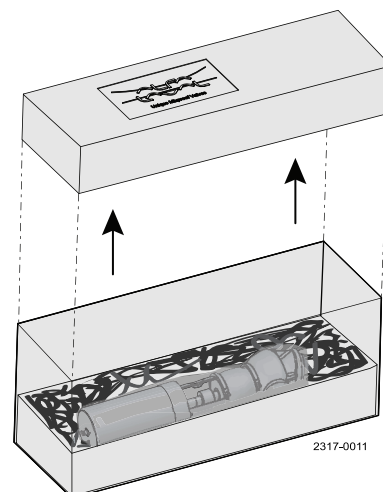
Alfa Laval cannot be held responsible for incorrect unpacking.

Check the delivery for:

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

Step 2

Remove upper support

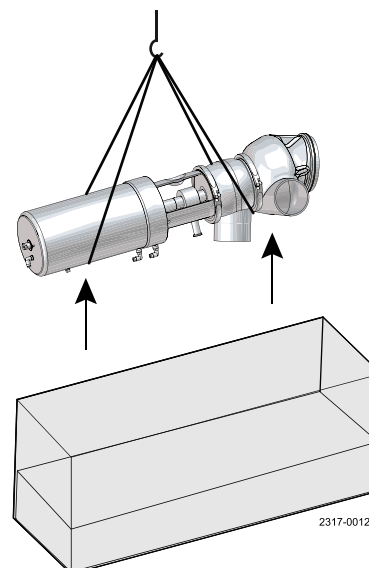


Step 3

Lift out the valve.

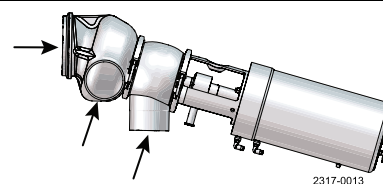
NOTE!

Please note weight of valve as printed on box.



Step 4

Remove possible packing materials from the valve ports.



4 Installation

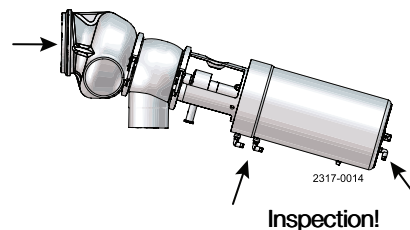
The instruction manual is part of the delivery.

Study the instructions carefully.

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

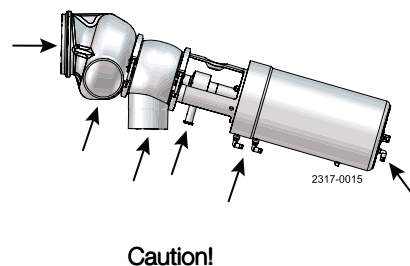
Step 5

Inspect the valve for visible transport damage.



Step 6

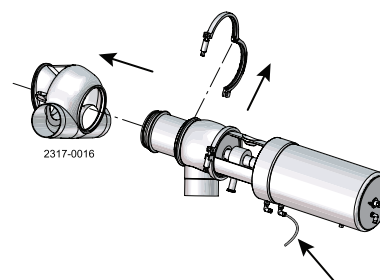
Avoid damaging the air connections, the leakage outlet, the valve ports and the CIP connections.



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.



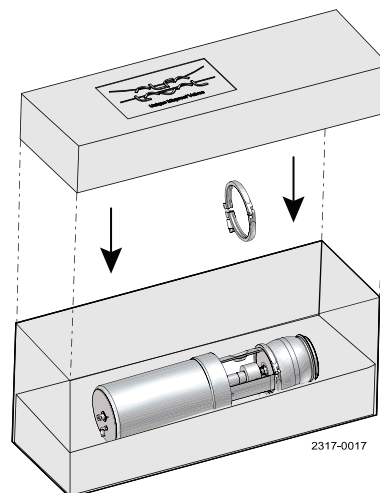
Step 8

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.



4.2 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
-

4 Installation

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).

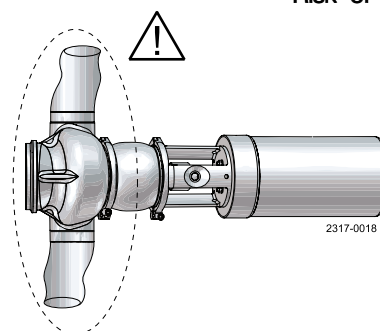
Pay special attention to:

- 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!

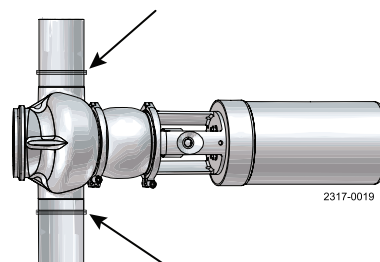


Step 3

Fittings

Ensure that the connections are tight.

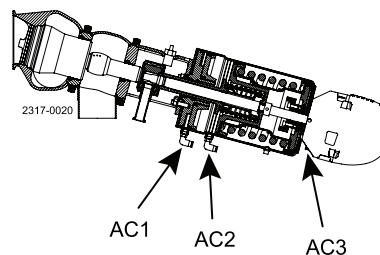
Remember seal rings!



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

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.

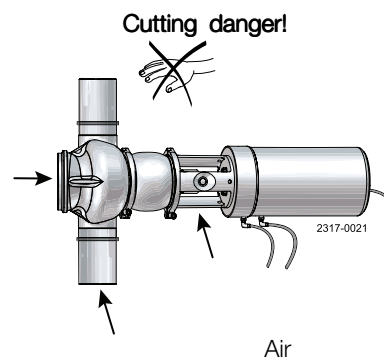
Check the valve for smooth operation after welding.

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

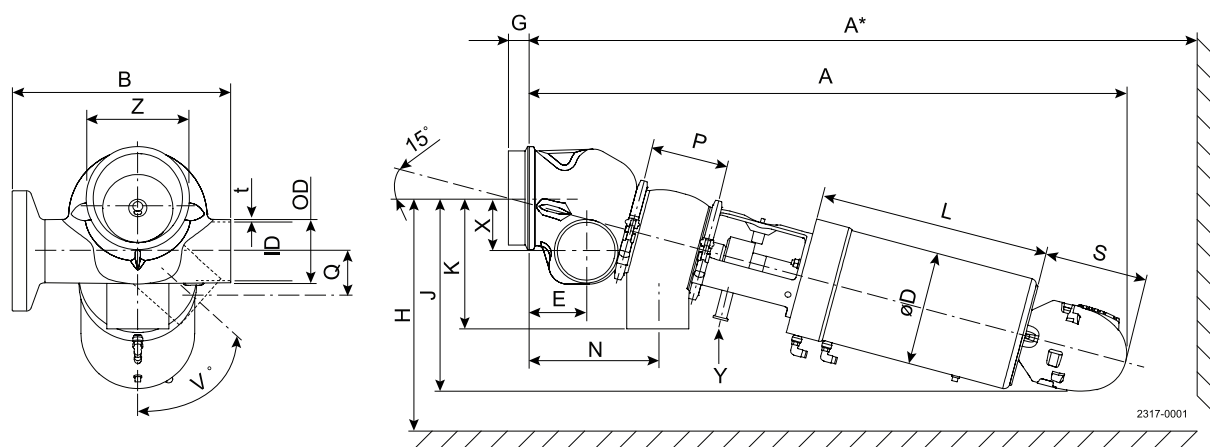


Before welding the flange into the tank please note:

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" (75 mm) stroke	6" (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).

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:

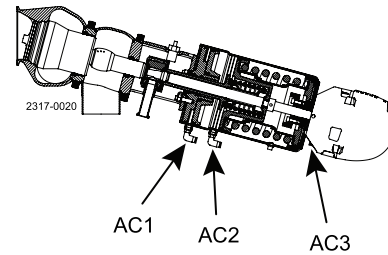
1. Supply compressed air to air connection 1, 2 and 3 one by one.
2. Operate the valve several times to ensure that it runs smoothly.

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



5 Operation

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!

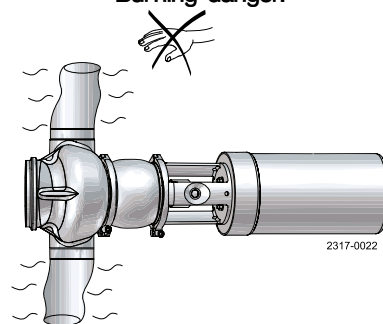
Alfa Laval cannot be held responsible for incorrect operation.

Step 2



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

Burning danger!



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

5.2 Troubleshooting and repair

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

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.

HNO₃ = Nitric acid.

5.3 Recommended cleaning

Step 1



Always handle lye and acid with great care.

Caustic danger!



Always use
rubber gloves!



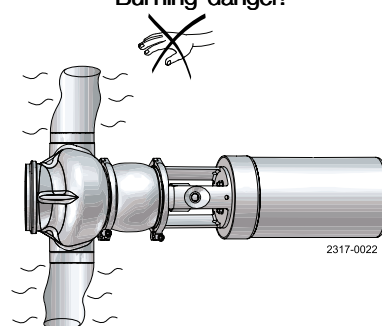
Always use
protective goggles!

Step 2



Never touch the valve or the pipelines when sterilising.

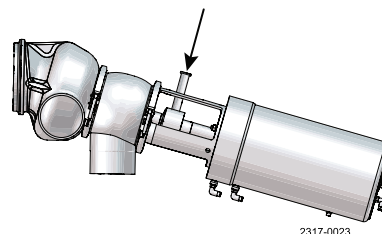
Burning danger!



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 33% NaOH	+	100 l water	=	Cleaning agent.
-------------------	---	----------------	---	-----------------

2. 0.5% by weight HNO₃ at 70° C

0.7 l 53% HNO ₃	+	100 l 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!**

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

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

NaOH = Caustic Soda.

HNO₃ = Nitric acid.

Step 6

Valve pneumatic operation during in-place cleaning

Each valve seat shall be lifted during the length of the cleaning cycle.

Seat lift durations shall not exceed 10 seconds.

These pneumatic functions include:

1. Upper valve seat lift (takes place during cleaning of upper valve body)
2. Lower valve seat push (takes place during cleaning of lower valve body)

The following chart presents an overview of these functions together with the recommended time durations at 21psi (1.5 bar) CIP pressure. It is recommended to do seat lift/push in the middle of each step in the CIP sequence.

CIP event @ length	Valve function	Valve solenoid no.	Solenoid mode	Actual opening time	Number of lifts/push in each CIP step
Warm pre-rinse @ 3 minutes	Upper seat lift	3	Energized	*0.5 sec	3
	Lower seat lift	2	Energized	*0.5 sec	3
	SpiralClean vent	-	-	*0.5 sec	3
	OD cleaning	-	-	*5 sec	2
Hot alkaline wash @ 10 minutes	Upper seat lift	3	Energized	*0.5 sec	3
	Lower seat lift	2	Energized	*0.5 sec	3
	SpiralClean vent	-	-	*0.5 sec	3
	OD cleaning	-	-	*5 sec	2
Cold post wash @ 3 minutes	Upper seat lift	3	Energized	*0.5 sec	3
	Lower seat lift	2	Energized	*0.5 sec	3
	SpiralClean vent	-	-	*0.5 sec	3
	OD cleaning	-	-	*5 sec	2
Cold acidified rinse @ 3 minutes	Upper seat lift	3	Energized	*0.5 sec	3
	Lower seat lift	2	Energized	*0.5 sec	3
	SpiralClean vent	-	-	*0.5 sec	3
	OD cleaning	-	-	*5 sec	2

*Time stated is the actual opening time for the valve. Programmed duration is depended on the access to compressed air and response time from PLC.

Variations caused by compressed air are typically:

- Long compressed air supply hoses.
- Small ID on air supply hoses.
- Limited availability of compressed air.

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.

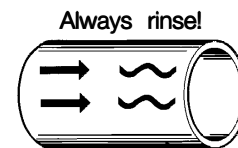
HNO₃ = Nitric acid.

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.



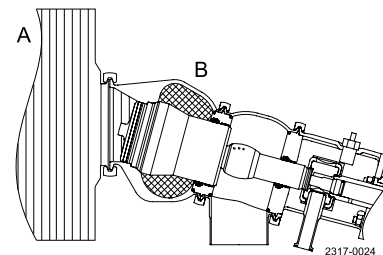
Clean water Cleaning agents

Step 8

1. Closed valve

A. = Product

B. = CIP



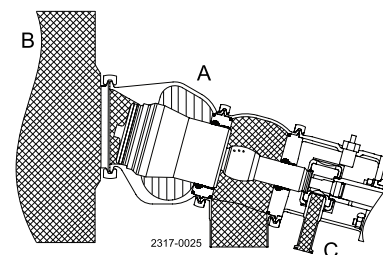
Step 9

2. Seat lift cleaning with tank plug (optional)

A. = Product

B. = CIP

C. = CIP out

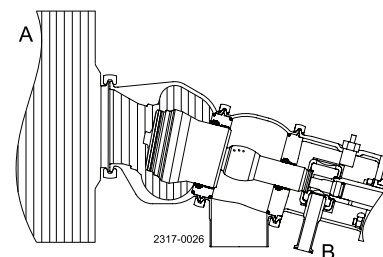


Step 10

3. Open valve

A. = Product

B. = Leakage dection



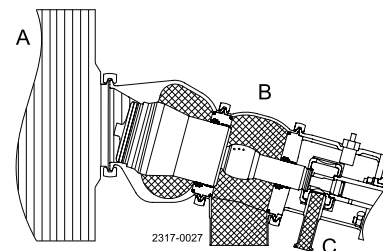
Step 11

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.

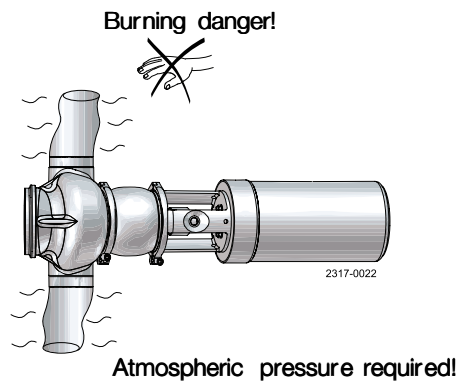
NOTE!

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

Step 2



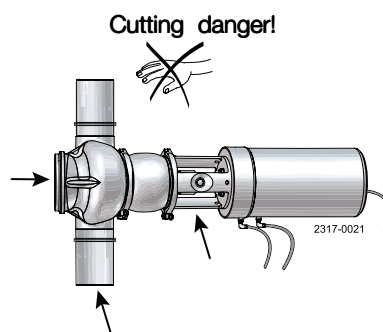
- **Never** service the valve when it is hot.
- **Never** service the valve with valve/actuator under pressure
- **Never** service the valve with fluid in the tank.



Step 3



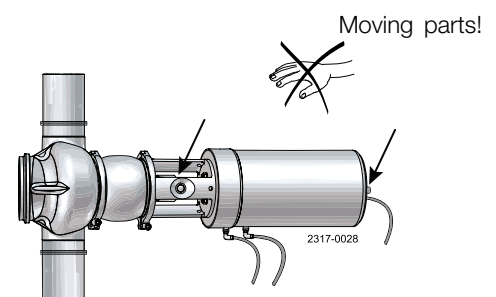
Never stick your fingers in operating parts of the valve if the actuator is supplied with compressed air.



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 (leakage normally starts slowly)	Replace after production cycle	Replace after production cycle	
Planned maintenance	<ul style="list-style-type: none">- Regular inspection for leakage and smooth operation- Keep a record of the valve- Use the statistics for inspection planning	<ul style="list-style-type: none">- Regular inspection for leakage and smooth operation- Keep a record of the valve- Use the statistics for inspection planning	Replace when required
Lubrication	When assembling Alfa Laval Silicon based Food-grade Lubricant USDA H1 approved grease	When assembling Alfa Laval Silicon based Food-grade Lubricant USDA H1 approved grease	None

NOTE!

Lubricate thread in valve plug parts with Alfa Laval Lubricant or similar.

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

(**) All products wetted seals.

Repairing of actuator:

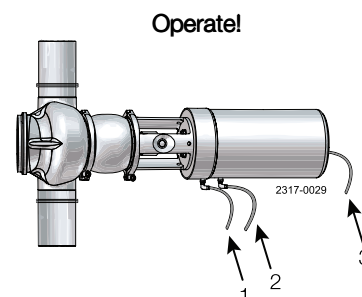
- The actuator is maintenance-free but repairable.
- If repair is required, replacing all actuator rubber seals is recommended.
- Lubricate seals with Alfa Laval Lubricant.
- To avoid possible black marks on pos. 1 and 29, Alfa Laval recommends Alfa Laval Lubricant for these two positions.

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!

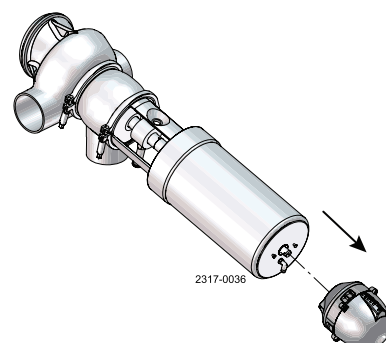
Always keep spare rubber seals and guide rings in stock. Store seals in closed bag.

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

6.2 Dismantling of valve (excluding actuator)

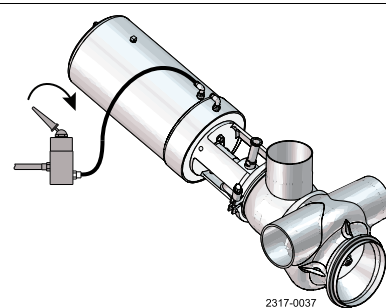
Step 1

Remove ThinkTop, if mounted.



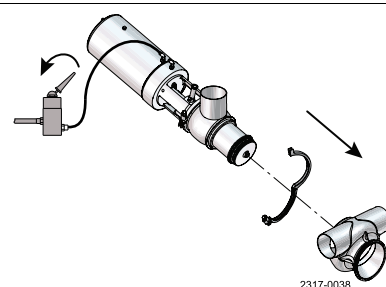
Step 2

Activate main stroke.



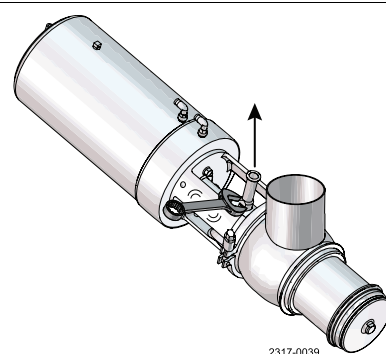
Step 3

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



Step 4

Remove flushing pipe using 19 mm wrench.



Maintain the valve/actuator regularly.

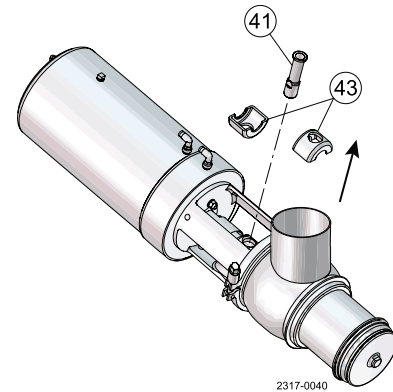
Study the instructions carefully and pay special attention to the warnings!

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.

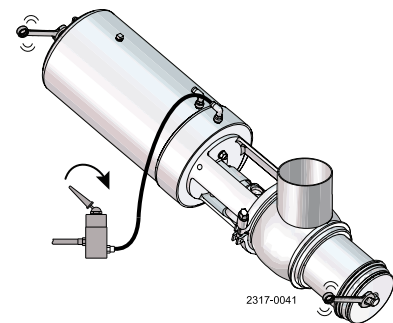
Step 5

Remove clamp rings (43).



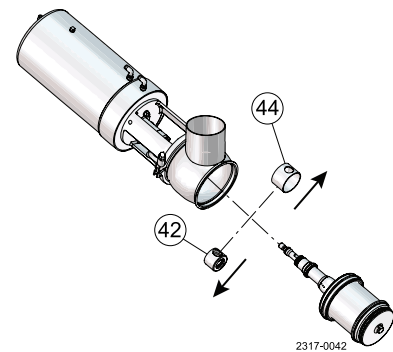
Step 6

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.

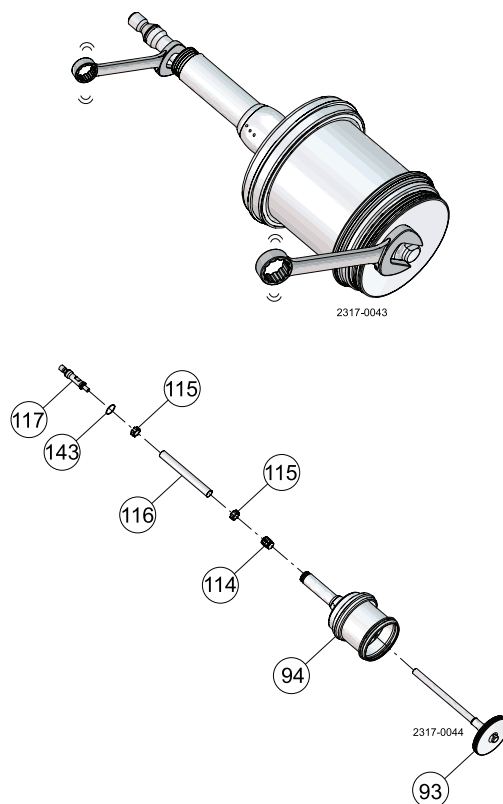
Study the instructions carefully and pay special attention to the warnings!

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.

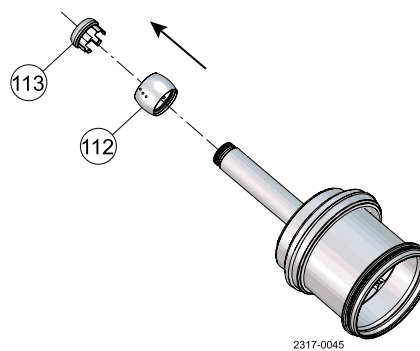
Step 8

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



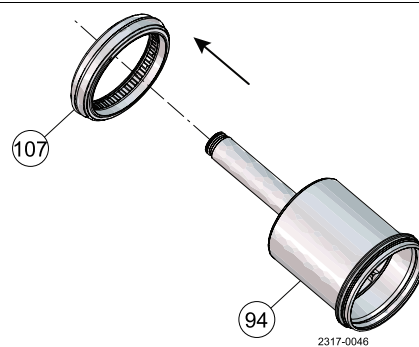
Step 9

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!

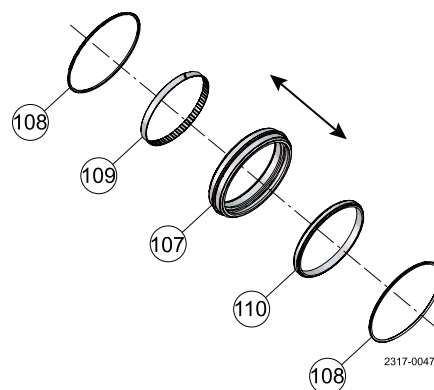
Always keep spare rubber seals and guide rings in stock. Store seals in closed bag.

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

Step 11

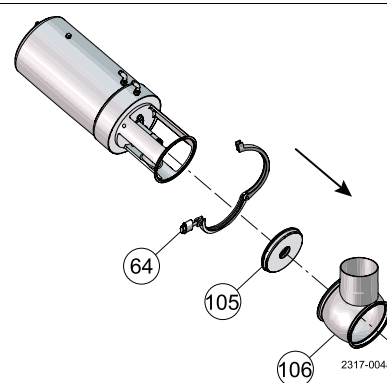
Sanitise guide ring (109).

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



Step 12

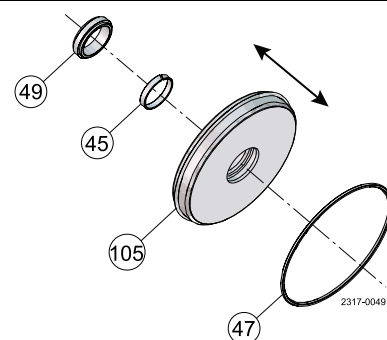
Remove clamp (64), vent body (106) and sealing element (105).



Step 13

Sanitise guide ring (45).

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



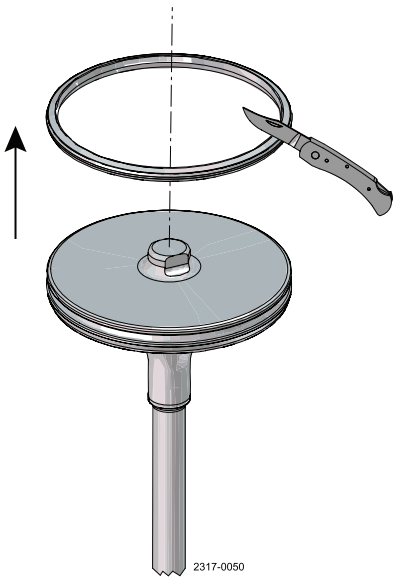
6 Maintenance

Study the instructions carefully. Handle scrap correctly.

6.3 Replacement of seal ring, tank plug

Step 1

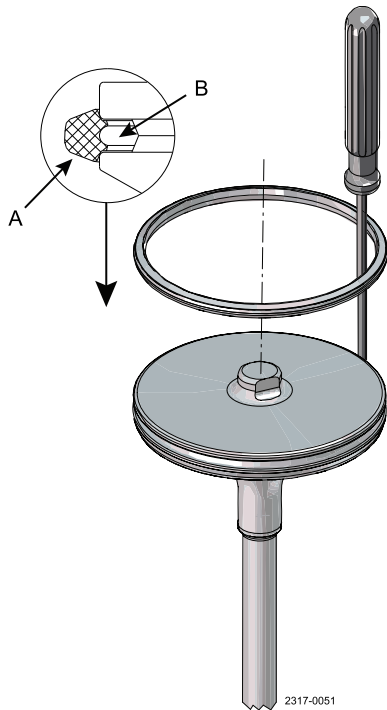
Cut and remove old seal ring (74) using a knife, screwdriver or similar. Be careful not to scratch the plug.



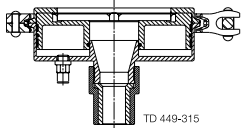
Step 2

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



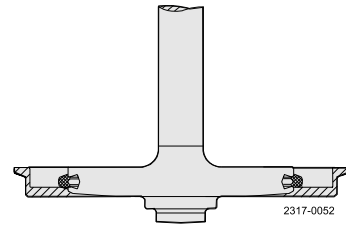
Step 3

Item No.				Tool for radial sealing, tank plug
2" + 2½" Seat ø81.3	3" Seat ø81.3	4" Seat ø115.3	6" Seat ø206.1	
9614-0788-01	9614-0788-01	9614-0788-02	9614-0788-03	 TD 449-315

Study the instructions carefully. Handle scrap correctly.

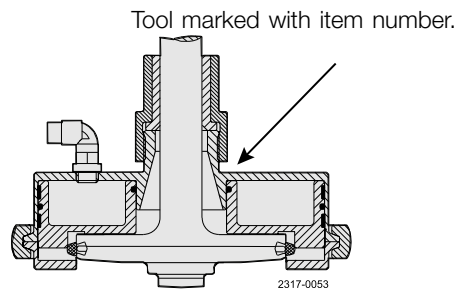
Step 4

Place lower tool part.



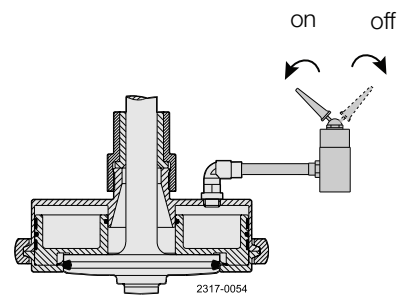
Step 5

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



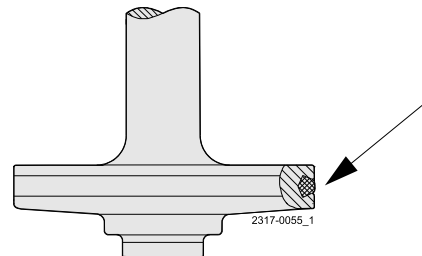
Step 6

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.



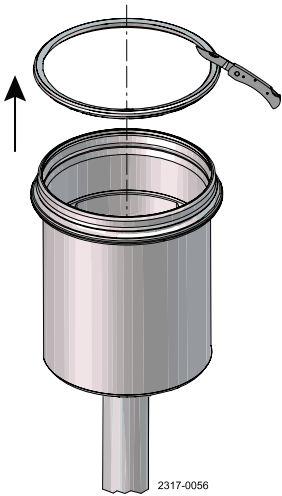
6 Maintenance

Study the instructions carefully. Handle scrap correctly.

6.4 Replacement of seal ring, balanced plug

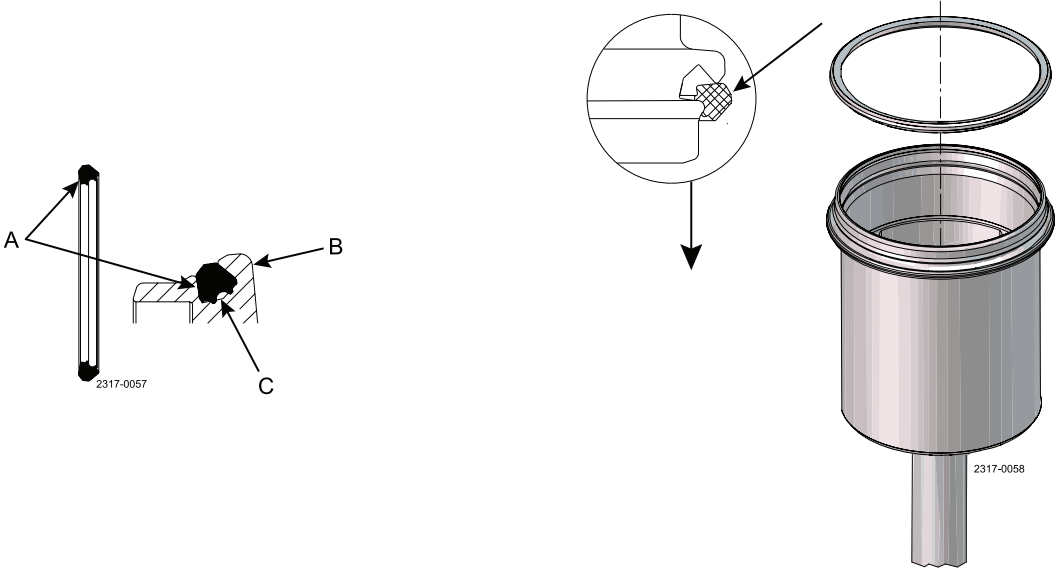
Step 1

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



Step 2

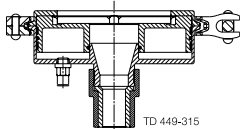
Pre-mount seal ring as shown on drawing.



- 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.

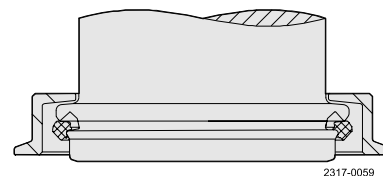
Step 3

Item No.				Tool for axial sealing, balanced plug
2" + 2½" Seat ø81.3	3" Seat ø81.3	4" Seat ø115.3	6" Seat ø206.1	
9613-0505-02	9614-0792-01	9613-0505-03	9613-0505-10	 TD 449-315

Study the instructions carefully. Handle scrap correctly.

Step 4

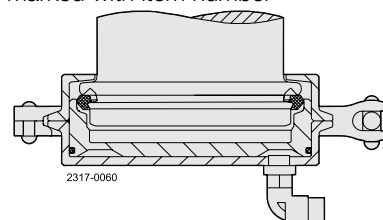
Place tool part 1.



Step 5

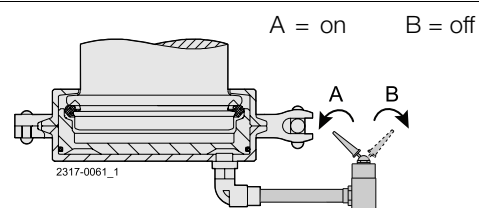
1. Place tool part 2 including piston.
2. Clamp the two tool parts together.

Tooling marked with item number



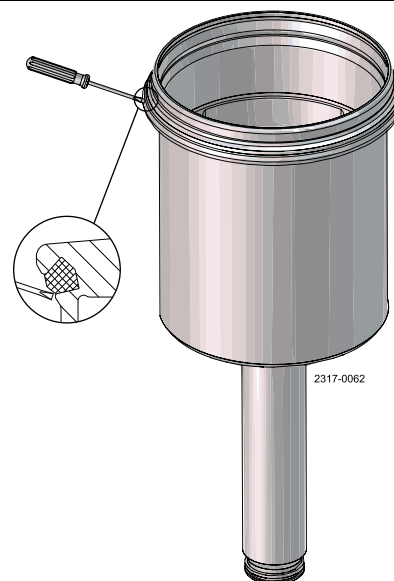
Step 6

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

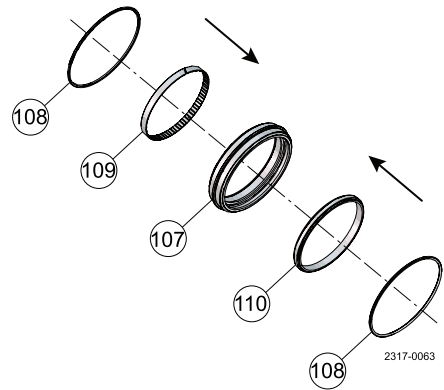
Study the instructions carefully. Handle scrap correctly.

6.5 Valve reassembly (excluding actuator)

Step 1

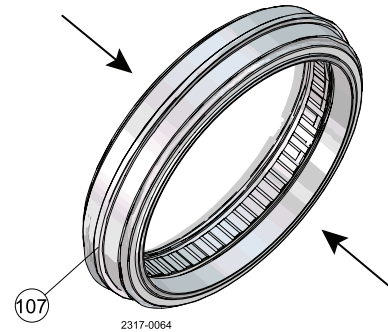
Assembling valve body sealing element:

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



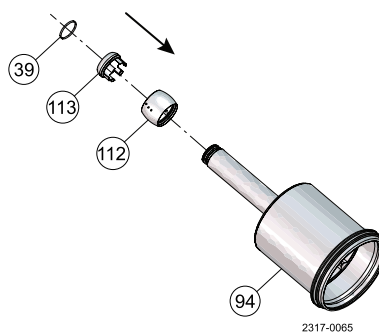
Step 2

Mount all components in sealing element (107).



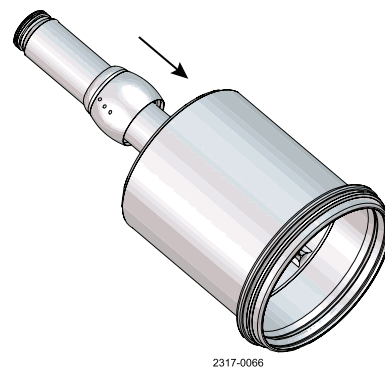
Study the instructions carefully. Handle scrap correctly.

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



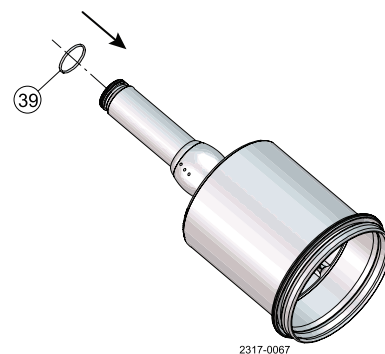
Step 3

Nozzle and lock ring slides over spindle.



Step 4

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



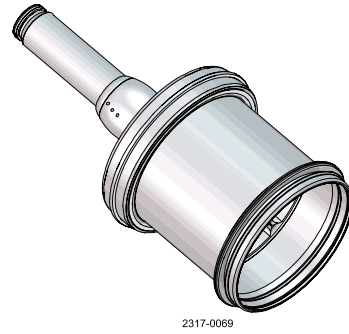
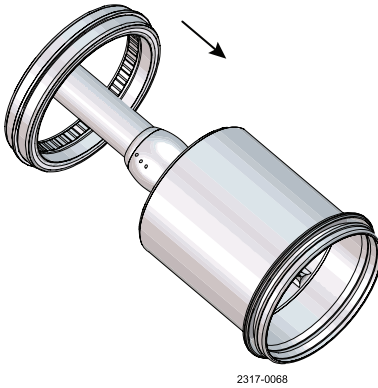
6 Maintenance

Study the instructions carefully. Handle scrap correctly.

Mounting valve body sealing element on balanced plug:

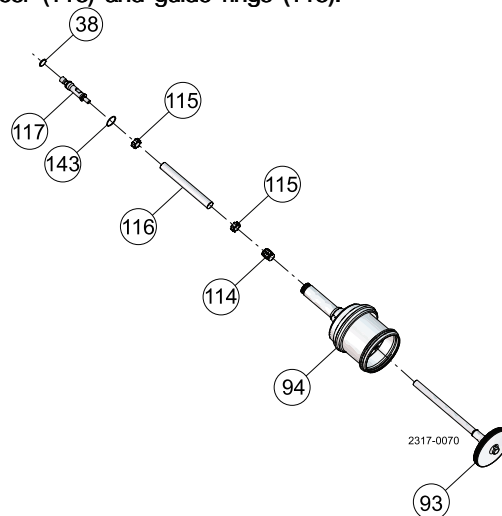
Step 5

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



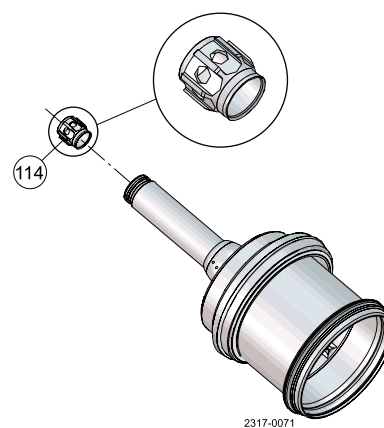
Study the instructions carefully. Handle scrap correctly.

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



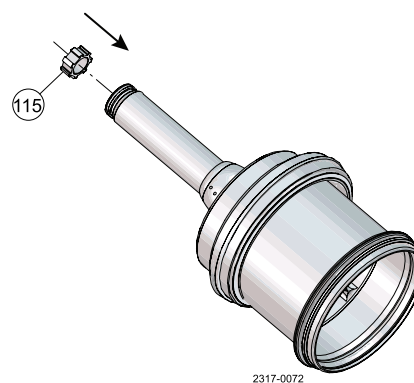
Step 6

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



Step 7

Insert first guide ring (115).

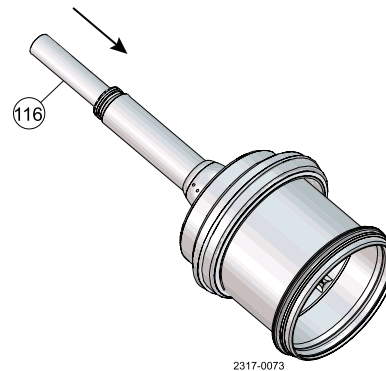


6 Maintenance

Study the instructions carefully. Handle scrap correctly.

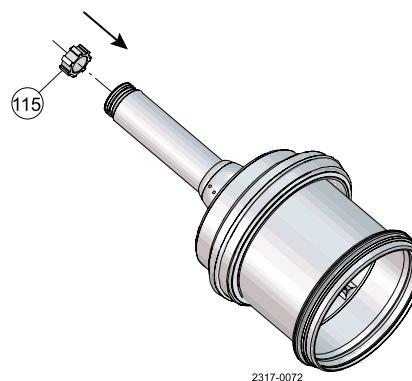
Step 8

Insert spacer (116).



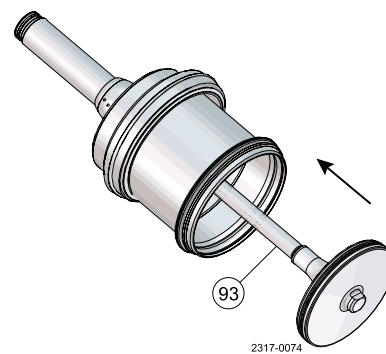
Step 9

Insert last guide ring (115).



Step 10

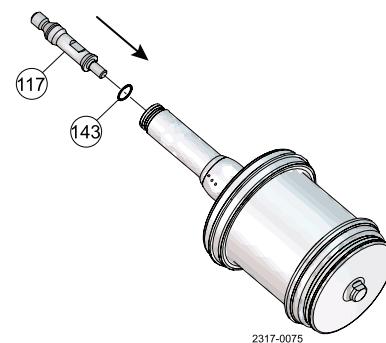
Insert tank plug (93) from the bottom of balanced plug.



Step 11

Lubricate O-ring (143).

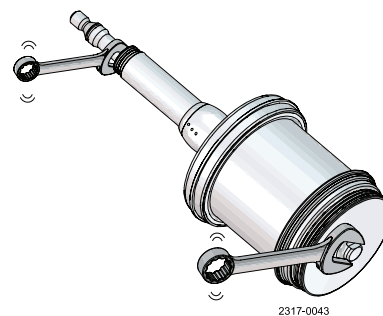
Mount O-ring in stem and mount stem for tank plug



Study the instructions carefully. Handle scrap correctly.

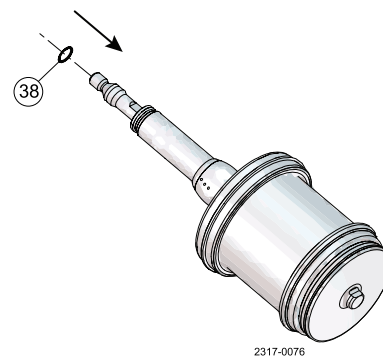
Step 12

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



Step 13

Mount O-ring (38).



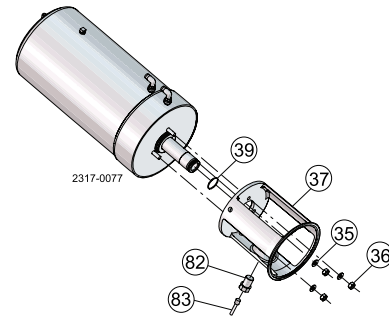
6 Maintenance

Study the instructions carefully. Handle scrap correctly.

Mounting yoke on actuator:

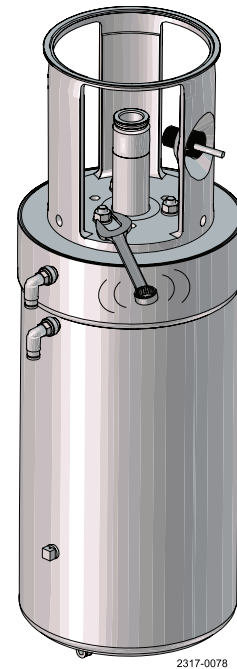
Step 14

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).

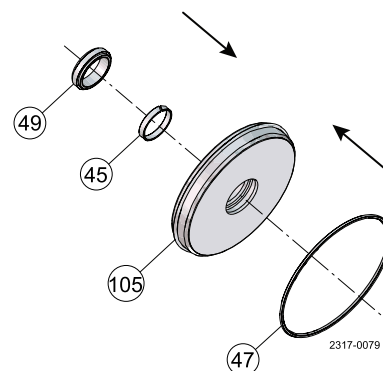


Study the instructions carefully. Handle scrap correctly.

Assembling vent body sealing element:

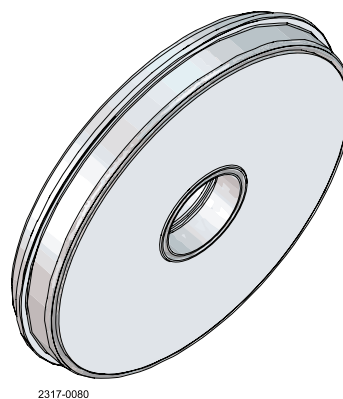
Step 16

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



Step 17

Mount all components in sealing elements (105).



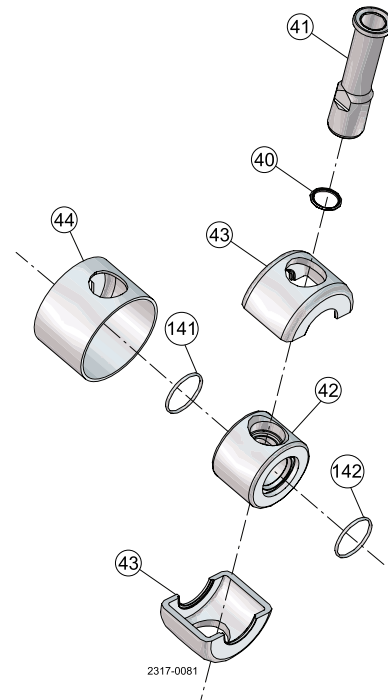
6 Maintenance

Study the instructions carefully. Handle scrap correctly.

Assembling valve:

Step 18

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

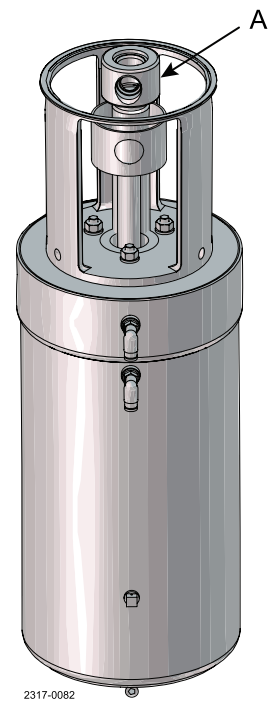


Step 19

Mount lock ring (44).

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

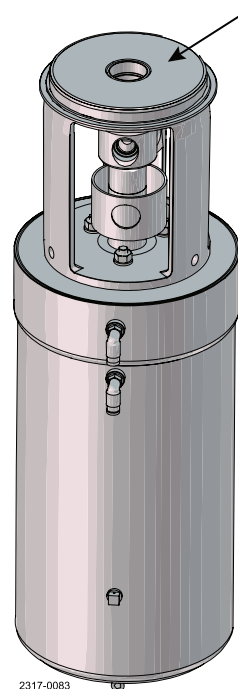
A. Spindle liner can be turned both ways except 6°



Study the instructions carefully. Handle scrap correctly.

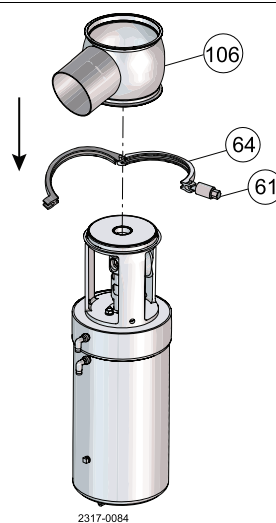
Step 20

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



Step 21

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



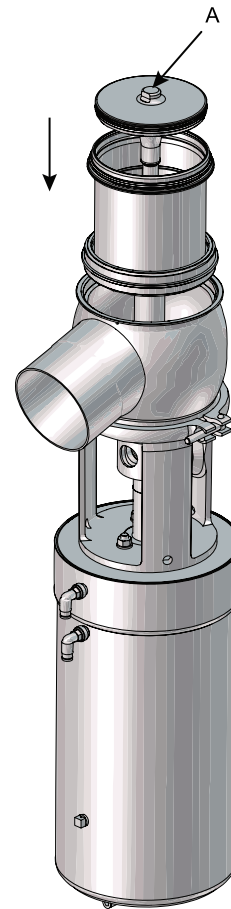
6 Maintenance

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.

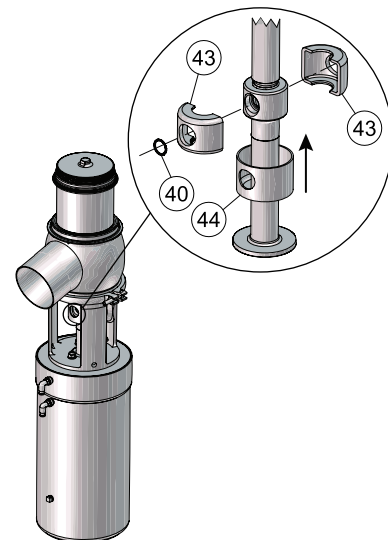
A = tank plug



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)

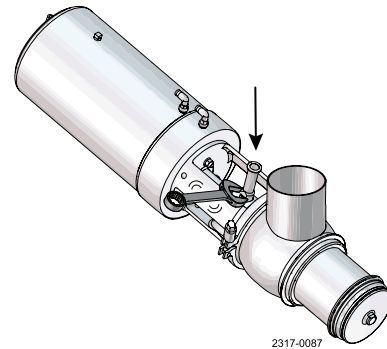


2317-0086

Study the instructions carefully. Handle scrap correctly.

Step 24

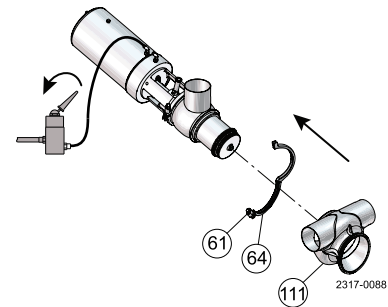
1. Mount flushing pipe (41), tighten with 19 mm wrench.
2. Deactivate lower seat push.



Step 25

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

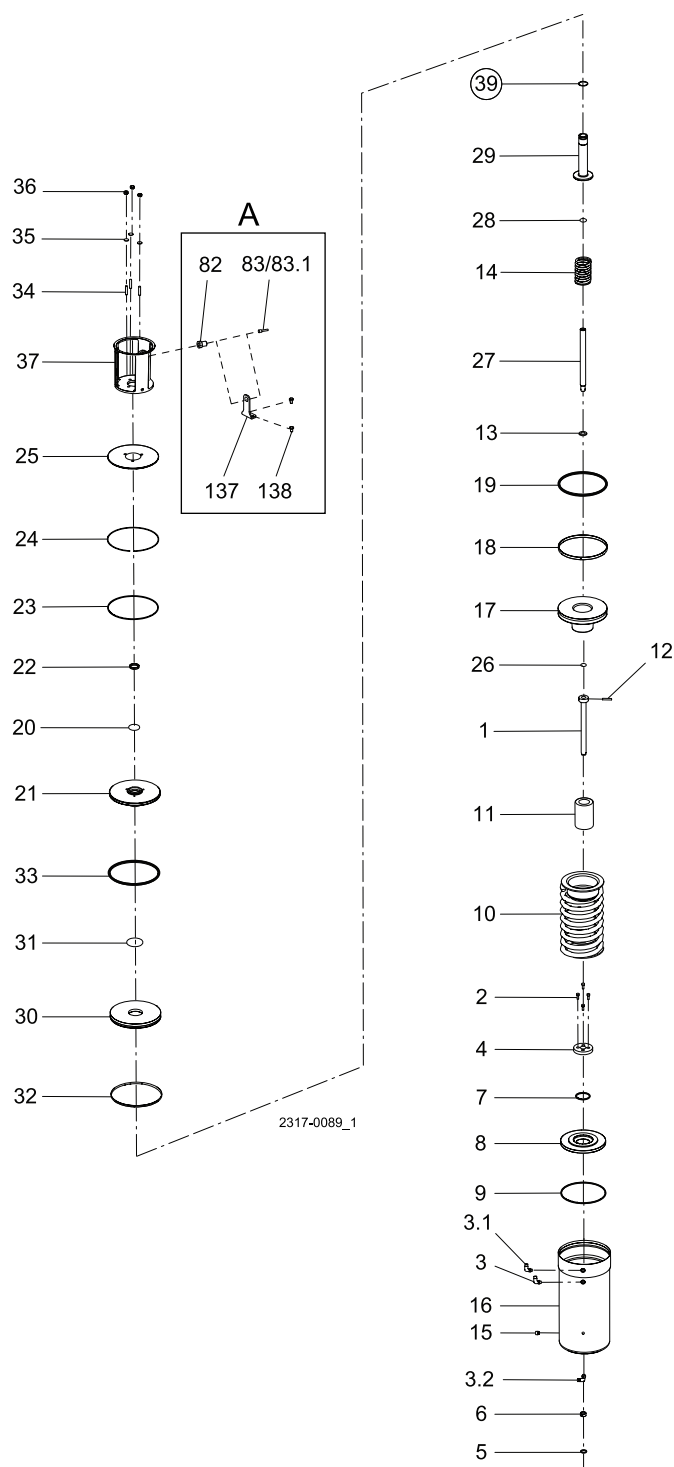
1. Mount valve body (111) and clamp (64 + 61).
2. Deactivate main stroke.



6 Maintenance

Study the instructions carefully. Handle scrap correctly.

6.6 Dismantling of actuator



A = Only for sensor

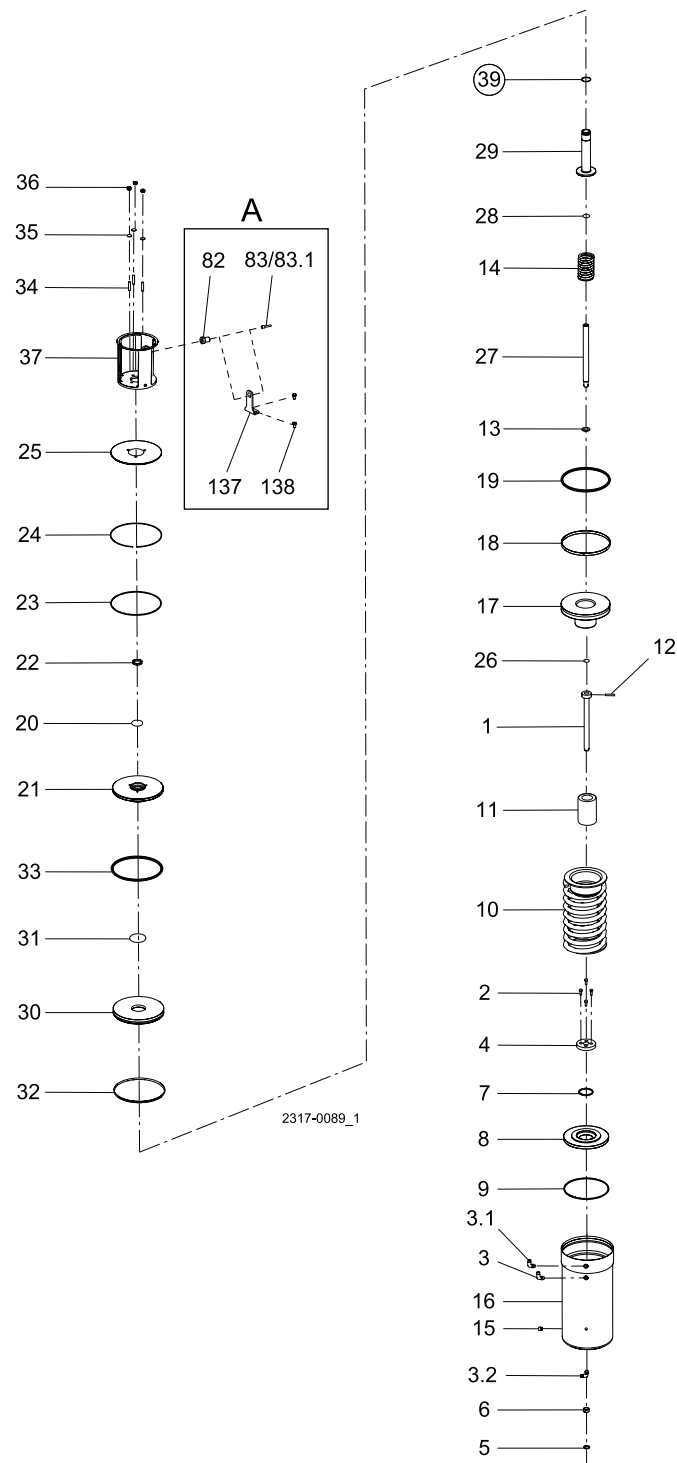
Study the instructions carefully. Handle scrap correctly.

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 ISO/DIN	DN/OD				Longstroke DN/OD	
	2½"	3"	4"	6"	6"	
Kv-value						
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
Air consumption						
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
Kv-value - SpiralClean						
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):

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

Q = CIP - flow (m³/h).

Kv = Kv value from the above table.

Δp = 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

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

Weight (kg)

Size	2.5"	3"	4"	6" (75 mm) stroke	6" (59 mm) stroke
Weight (kg)	1.6	1.3	2.1	2.9	5.0

Safety check

A visual inspection of any protective device (shield, guard, cover or other) on the supplied product shall be carried out at least every 12 months.

If the protective device is lost or damaged, especially when this leads to deterioration of safety performance, it shall be replaced. The fixing of the protective device should only be replaced with fixings of the same or an equivalent type.

Inspection acceptance criteria:

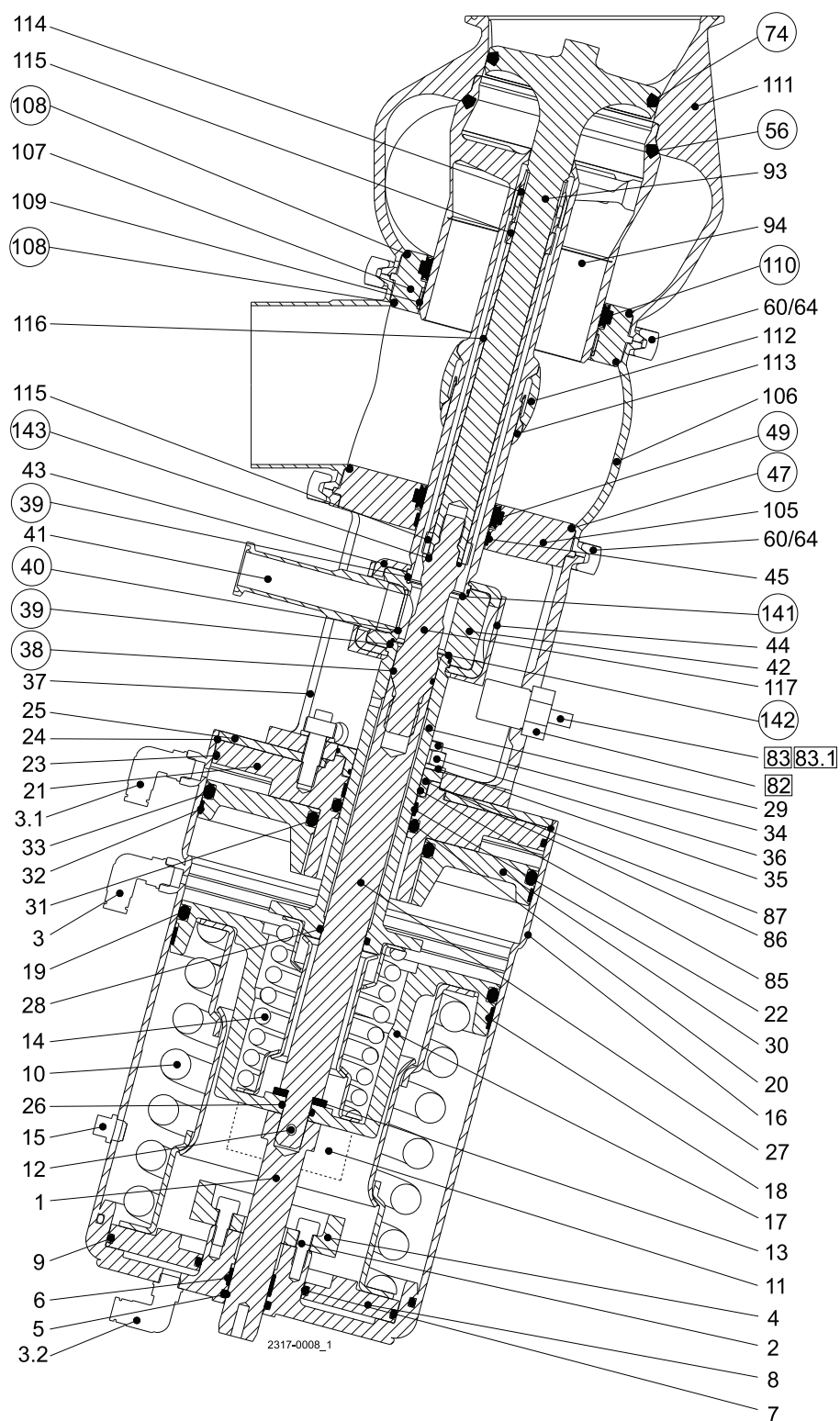
- It should not be possible to reach moving parts originally protected by a protective device.
- The protective device must be securely mounted.
- Ensure that screws for the protective device are securely tightened.

Procedure in case of non-acceptance:

- Fix and/or replace the protective device.
-

8 Parts list

8.1 Wear parts

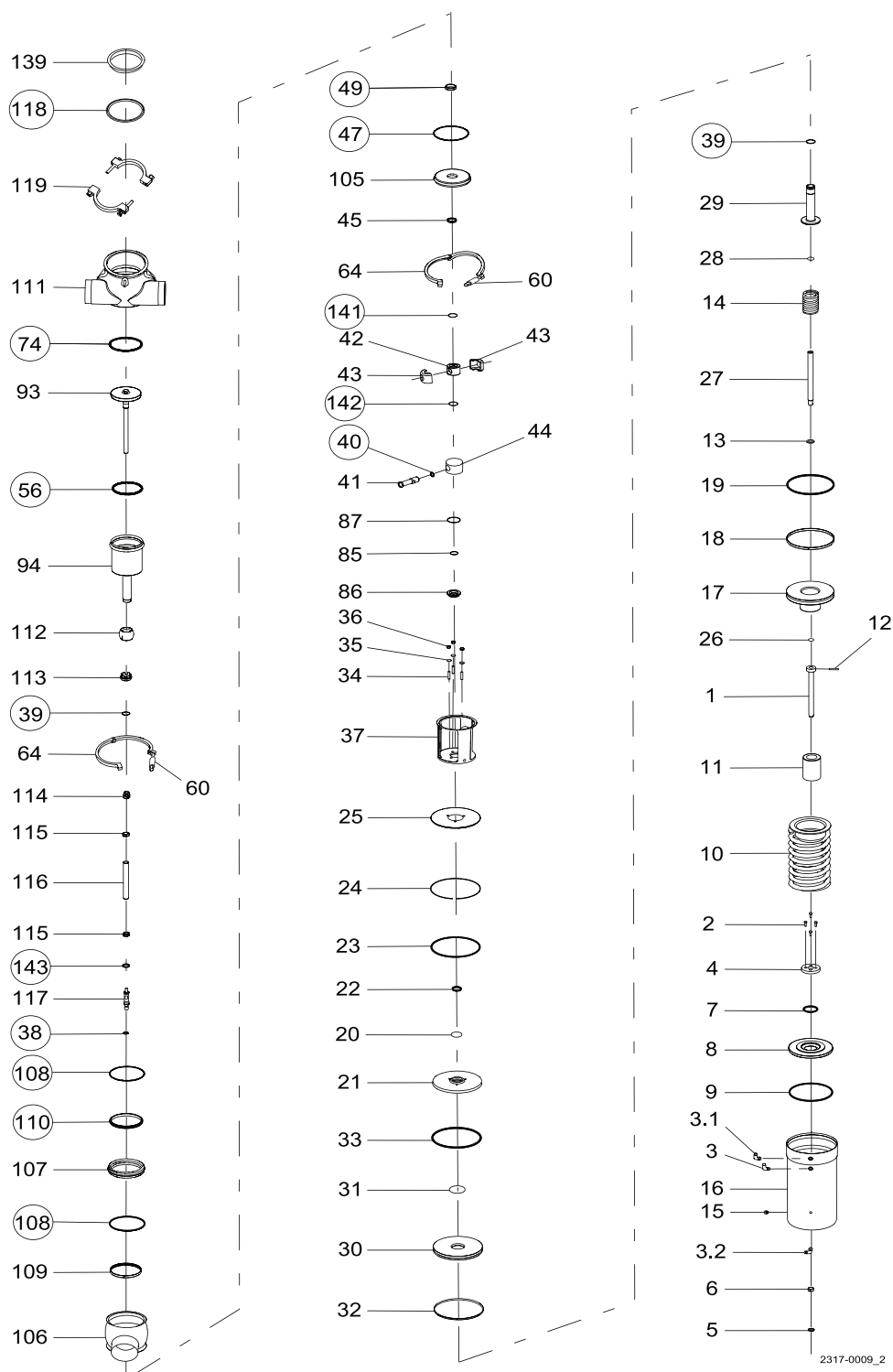


Parts list

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

8 Parts list

8.2 Parts



Parts list

Pos.	Qty	Denomination
1	1	Cpl. Actuator
2	4	Upper stem
3	1	Screw
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

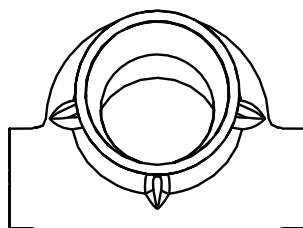
Parts list

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	Guiding rotating nozzle
116	1	Pipe
117	1	Spindle
119	1	Clamp
139	1	Clamp ferrule

8 Parts list

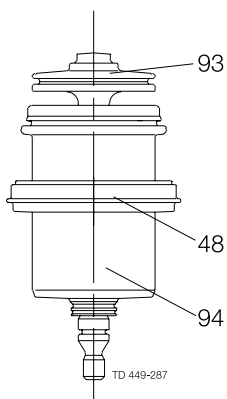
8.3 Service kits

TC



2317-0100

Service kits



TD 449-287

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

How to contact Alfa Laval

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