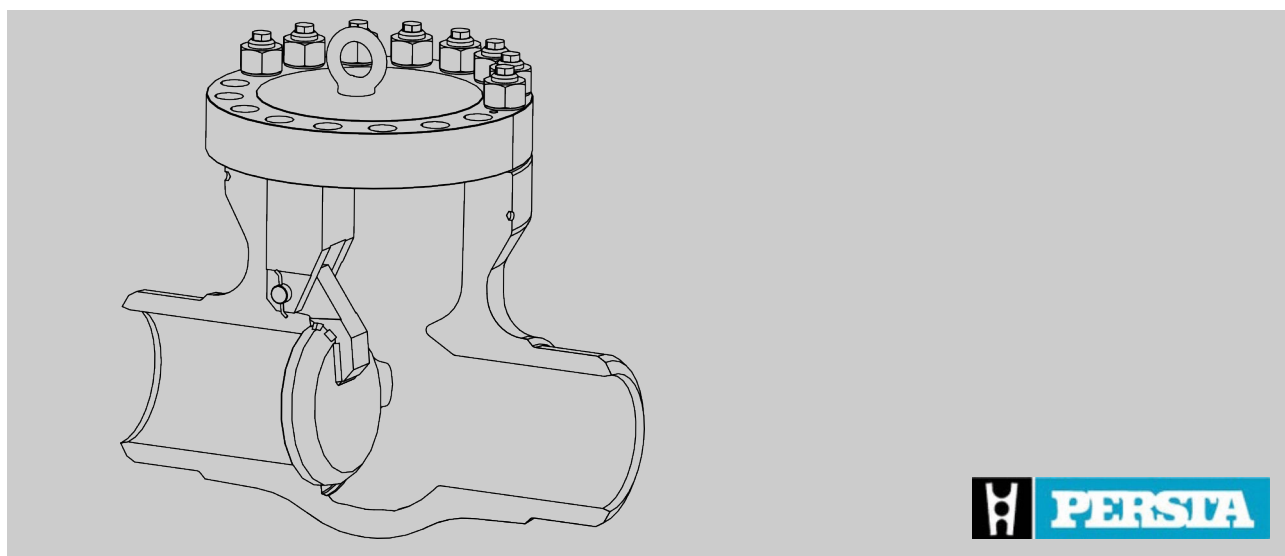


Operating instructions

Swing check valves

640 AA / 640 AE



Read the instructions prior to performing any task!

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Translation of the original operating instructions

Dok.-Nr. 6416.DE.STD.06.2015, 3, en_GB

Information about the operating instructions

These instructions enable the safe and efficient handling of the valve.

The instructions are an integral part of the valve and must be kept in the vicinity of the valve so that they are available to the personnel at all times.

The personnel must have carefully read and understood these instructions before performing any tasks. The basic prerequisite for safe work is compliance with all the specified safety and handling instructions.

Furthermore, the local occupational safety regulations and general safety requirements must be complied with for the area in which the valve is used.

The figures in these instructions are provided as examples only and may deviate from the actual version.



Although the size and pressure ratings of the valve types vary, the information in these instructions applies generally to all valves, provided nothing to the contrary is specified.

Scope of the document

These instructions apply to the following versions of the 640 AA series of the swing check valve:

Series	Nominal diameter (DN) [mm]	Pressure rate	Class*
640 AA/AE	50–250	PN 40	-
640 AA/AE	50–300/250	PD 18	900
640 AA/AE	300–500	PN 100	-
640 AA/AE	300–1000	PN 10 - PN 63	-

* Assignment number in the pipe construction

Other applicable documents

- Ignition hazard assessment GA004
- Risk analysis according to Pressure Equipment Directive
- Risk analysis as per the Machinery Directive
- Technical data sheet
- Bolt tightening torques according to the website: www.persta.com
- and other documents included in the delivery

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Revision overview

Revision number	Change/Supplemented information	Date
1	Updates to chapter <i>"Intended use"</i> .	05/05/2021

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1 Overview

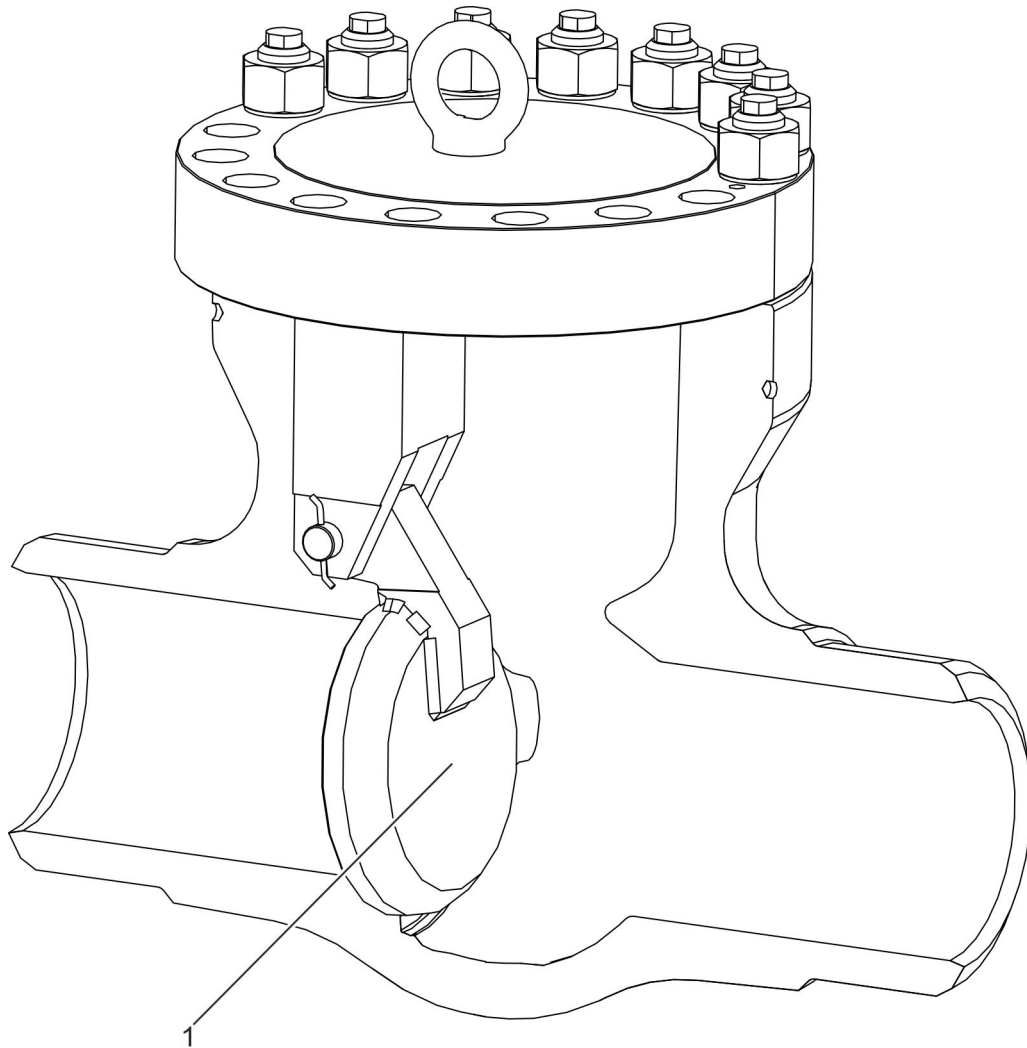


Fig. 1: Swing check valve

Brief description of the 640 AA swing check valve

The valve referred to as swing check valve has been designed for installation in pipes.

By using the swing check valve, a medium is only permitted to flow in one direction within the pipe.

From the other direction, the swing check plate (Fig. 1/1) within the valve is pressed into its seat by the medium flowing back and the return flow is thereby prevented.

Tools

The following tools are required for the tasks described in the operating instructions:

Forklift

Forklift with sufficient load-bearing capacity for transport of valves.

Hoist

Hoist with sufficient load-bearing capacity for transporting valves and components.

Knock-out tool

Pin-like tool for driving the valve shaft out of the body.

Packing extractor

Tool for removing gland packing elements.

Ring bolts

- For installation in the body cover
- Depending on the version, additionally for installation in the disc lever.
- They serve as attachment points of the valve to the hoist.
- Included in the scope of delivery of the valve.

Sling gear

Functional and approved gear for attaching valves and components on the hoist.

Snap ring pliers

Tool for fitting and removing snap rings.

Tools for machining sealing surfaces and slide faces

Grinding tools, such as fine emery cloth, plastic or wooden tools.

2 Safety

2.1 Symbols in this manual

Safety instructions

Safety instructions are indicated by symbols in this manual. The safety instructions are introduced by signal words that indicate the scope of the hazard.

**DANGER!**

This combination of symbol and signal word indicates a hazardous situation that, if not avoided, will result in death or serious injury.

**WARNING!**

This combination of symbol and signal word indicates a potentially hazardous situation that, if not avoided, may result in death or serious injury.

**CAUTION!**

This combination of symbol and signal word indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury.

**NOTICE!**

This combination of symbol and signal word indicates a potentially hazardous situation that, if not avoided, may result in damage to property.


**ENVIRONMENT!**

This combination of symbol and signal word indicates potential hazards for the environment.

Safety instructions in specific instructions

Safety instructions may refer to specific, individual instructions. Such safety instructions are integrated into the specific instruction, so that the flow of reading is not interrupted during performance of the task. The signal words described above are used.

Example:

1.  Loosen the bolt.

2. 



CAUTION!
Risk of getting trapped by the cover!

Close the cover carefully.

3.  Tighten the bolt.





Tips and recommendations



This symbol indicates useful tips and recommendations as well as information on efficient and trouble-free operation.

Additional symbols

The following symbols are used throughout these instructions to highlight specific instructions, results, lists, references and other elements:

Symbol	Explanation
	Step-by-step instructions
	Results of an action
	References to sections of these operating instructions and other applicable documents
	Lists without a defined sequence

2.2 Intended use

Valves of the specified series are designed for installation in pipes under the following conditions:

- Operation of the valve as an open/close valve.
- Installation in horizontal pipes with cover opening facing upwards.
- Installation in vertical pipes with flow direction from bottom to top.
- Operation of the valve with liquid or gaseous media, without particularly corrosive, chemical or abrasive effect.
- Temperature change speeds not exceeding 6 K/min (6 °C/min).
- Maximum number of 1000 load cycles between a depressurised state and the maximum permissible pressure PS.
- Any number of load cycles at pressure fluctuations of up to 10 % of the maximum permissible pressure PS.
- Generally used flow rates depending on the type of medium and the application for which the valve is used.
- Operation of the valve without additional external influences, such as pipe forces, vibrations, wind loads, earthquakes, corrosive environments, fires, traffic loads, decomposition pressures of unstable fluids.
- Operation of the valve only within the limits specified on the rating plate (☞ *“Rating plate” on page 12*).
- If the valve is operated in the creep range, the valve is designed for a maximum operating time of 100,000 h. The valve must be replaced afterwards.
- No temperature increases were considered. In case of use in the hot vapour area, temperature increases must be considered according to the regulations of the operating company.
- The test pressure for a recurring test must not exceed the maximum permitted pressure PS multiplied by 1.3.
- The valve may only be operated if internal pressure loading is predominantly dormant. Additional loads (e.g. stationary thermal stress, unsteady pressure and temperature loads in case of alternating loads or pipe loads) were not considered.

Intended use includes compliance with all the information contained in this manual.

Any use that deviates from the intended use or any other form of use constitutes misuse.

Misuse



WARNING!

Danger in the event of misuse!

Misuse of the valve can cause dangerous situations.

- Connect the pipes so that they are free of tension.
- Pay attention to the correct installation position of the valve.
- Do not exceed the number of permitted load cycles (☞ Chapter 2.2 “Intended use” on page 11).
- Do not use valves as an anchor point.
- Never operate valves at temperatures near or below the freezing point of the pipeline medium.

2.3 Safety signs

The following symbols and instruction signs are in the work area. These symbols and instruction signs refer to the immediate vicinity in which they are affixed.



WARNING!

Danger if signs are illegible!

Over time, stickers and signs can become fouled or can become illegible in some other manner, so that dangers are not recognised and necessary operating instructions cannot be complied with. This results in a danger of injury.

- Keep all safety, warning, and operating instructions that are affixed to the device in legible condition.
- Replace damaged signs or stickers immediately.

Rating plate

The rating plate is located on the valve. Depending on the version, the following information is given on the rating plate:

- Confirmation number
- Article number
- Year of manufacture
- Nominal diameter
- Nominal pressure / design data

Flow direction arrow

The flow direction is indicated by an arrow on the valve.

Pipeline medium flowing in the direction of the arrow opens the swing check valve and flows through the valve.

Customer-specific markings

Additional markings (e.g. max. temperature limits) are available on customer request.

2.4 Residual risks

The valve has been developed and manufactured to the state-of-the-art and in accordance with generally accepted rules of safety. Nevertheless residual risks remain that require careful handling. The residual risks and the resulting behaviours and measures are listed below.

2.4.1 Basic dangers at the workplace

Potentially explosive atmospheres**DANGER!**

Risk of fatal injury due to failure to comply with the rules of conduct specified for potentially explosive atmospheres!

Depending on the version, the valve can be used in potentially explosive atmospheres. There is danger to life if the rules of conduct are not complied with in these areas.

- Ensure that the tasks on the valve can be performed at the installation site.

Trip hazard**CAUTION!**

Danger of injury due to tripping up!

There is a danger of fall injuries in the area of use of the valve.

- Install cable and connection lines in such a manner that there are no trip hazards.

2.4.2 Mechanical dangers

Heavy weight of the valve



WARNING!

Danger of injury due to the heavy weight of the valve!

The heavy weight of the valve, and of its components, can result in severe injuries.

- Transport valves with a suitable hoist or forklift.
- Use approved and functional sling gear.
- Safeguard valves and components from falling over.

Moving parts



WARNING!

Risk of crushing and impact injuries on moving parts!

Depending on the version, there are moving parts on the valve (e.g. lever, weight).

There is a risk of injury in the motion range of the moving parts outside the body.

- Make sure presence is prohibited in the vicinity of the valve.
- Mark or cordon off the danger zone.
- Established a depressurised state before working on the valve.

2.4.3 Thermal hazards

Thermal dangers



WARNING!

Risk of injury due to high or low temperatures!

Depending on the application for which the valve or pipe is used, injuries may occur due to the high or low temperature of the components.

- When working on components or using adjusting equipment, wear protective equipment: protective gloves, safety goggles.
- Prior to performing work on these components, allow them to cool down or warm up to the ambient temperature.
- Have the thermal insulation provided by the operating company attached.

Risk of freezing

WARNING!
Risk of injury due to pipes shattering at freezing temperatures!

As a result of pipes shattering at freezing temperatures, severe injuries can be caused by fluid being expelled under high pressure.

- Make sure that the valve is drained completely before it is taken out of service.
- Never operate valves at temperatures near or below the freezing point of the pipeline medium.

2.4.4 Dangers due to hazardous substances and operating materials
Pipeline medium

WARNING!
Risk of injury due to pressurised pipeline medium!

Depending on the version of the valve, injuries can be caused by the medium escaping under high pressure, regardless of whether the system is in operation or not.

- Do not undo the threaded connections.
- If threaded connections are loose, inform the operating company and have the pipe section in question shut off.
- If threaded connections are loose, have the cause of this clarified and eliminated. If necessary, have the manufacturer check the valve.


WARNING!
Risk of impairing health due to the pumped medium!

Direct contact with the pumped medium can adversely affect your health.

- Handle the pumped medium in accordance with the instructions in the manufacturer's safety data sheet.
- Wear the following protective equipment: protective gloves, safety footwear, safety goggles, protective work clothing.
- Collect any pumped medium that has run out without delay and dispose of it in an environmentally responsible manner.

Pickling medium



WARNING!

Pickling medium is a health hazard!

Direct contact with the pickling medium used can have health implications.

- Handle pickling medium in accordance with the instructions in the manufacturer's safety data sheet.
- Wear protective equipment: Protective gloves, safety footwear, protective goggles, protective work clothing.
- Soak up escaped pickling medium without delay and dispose of it in an environmentally responsible manner.

Anticorrosive



WARNING!

Anticorrosive is a health hazard!

Direct contact with the anticorrosive used can have health implications.

- Handle anticorrosive in accordance with the instructions in the manufacturer's safety data sheet.
- Wear protective equipment: Protective gloves, safety footwear, protective goggles, protective work clothing.
- Soak up escaped anticorrosive without delay and dispose of it in an environmentally responsible manner.

Damage to sealing surfaces and slide faces



NOTICE!

Risk of damage to sealing surfaces and slide faces due to metallic processing!

The metallic processing of sealing surfaces, slide faces and valve parts can cause damage and valves to malfunction.

- Sealing surfaces and slide faces of gaskets must not be
 - scratched with a scraper,
 - brushed with wire brushes.
- Sealing surfaces and slide faces must be
 - dressed using a fine emery cloth,
 - machined with suitable grinding tools or
 - scraped off with plastic or wooden tools.

2.5 Behaviour in the event of an emergency

1. ➤ Shut off the pipe sections affected.
2. ➤ Comply with the plant regulations.

2.6 Responsibility of the operating company

Operating company

The operating company is the company that operates the valve for commercial or economic purposes itself or that provides it to a third party for use, and that, during operation, bears the legal product responsibility for protection of the user, personnel or third parties.

Obligations of the operating company

The valve is used commercially. The operating company of the valve is therefore subject to the legal occupational health and safety obligations.

In addition to the safety instructions in this manual, the local occupational health and safety, accident prevention and environmental protection regulations that apply to the valve's area of application must be observed.

In this regard, the following applies in particular:

- The operating company is responsible for the installation and operation of the valve in the pipe.
- The operating company must ensure that any dangerous situations caused by the operating conditions are avoided by installing additional safety systems.
- The operating company must obtain information about the applicable occupational health and safety regulations and, in a hazard assessment, identify the additional hazards that may exist at the installation site of the valve due to the specific working conditions. The operating company must integrate this information into operating instructions for the operation of the valve.
- The operating company must ensure that the operating instructions it has drawn up comply with the currently applicable legislation throughout the operating period of the valve and, if necessary, adapt the operating instructions.
- The operating company must clearly specify and assign the responsibilities for installation, operation, fault correction, maintenance and cleaning.
- After the installation, the operating company must ensure the proper pickling of the valve.
- The operating company must provide devices that ensure the safe transition of the valve into a depressurised state.
- The operating company must provide equipment that can completely drain the pipe sections in which the valve is installed as well as the valve itself.
- The operating company must ensure that all personnel who are to handle the valve have read and understood this manual. In addition, the operating company must train the personnel and inform them of the hazards at regular intervals.

- The operating company must provide the required protective equipment for the personnel and instruct the personnel that wearing the required protective equipment is compulsory.
- The operating company must install additional protective devices around the valve if contact with the valve can result in injuries due to the medium in the pipe system.

The operating company is also responsible for keeping the valve in proper working order at all times. Therefore, the following applies:

- The operating company must ensure that the maintenance intervals described in these instructions are complied with.

In the case of valves with different pipe connections on the inlet and outlet ends, the operating company must ensure that when opening the valve the respective pipe connection is not exposed to impermissibly high pressure or an impermissibly high temperature.

2.7 Personnel requirements



WARNING!

Danger of injury due to inadequate personnel qualification!

If unqualified personnel perform tasks on the machine or are present in the danger zone, dangers occur that can cause severe injury and significant material damage.

- Only have activities performed by personnel who are qualified to perform these activities.
- Keep unqualified personnel away from the danger zones.

In this manual the qualifications of personnel for the various activity areas are cited below:

Disposal contractor

A disposal contractor is a company qualified in accordance with local regulations to collect, transport, store, handle, recycle or dispose of waste and recyclables.

Forklift truck driver

The forklift truck driver has demonstrated to the operator their skills in driving industrial trucks controlled by a sitting or standing operator and has been assigned to do this by the operator in writing.

Industrial mechanic (for valves within the normal pressure range)

Based on his or her specialised training, skill, experience and knowledge of the applicable standards and requirements, the industrial mechanic must be able to carry out the assigned work on installations and valves in the normal pressure range and to independently identify potential hazards and avoid them.

The operating company must have instructed the industrial mechanic on how to handle the plant and provide regular training for him or her.

The industrial mechanic must be able to independently maintain and repair installations and valves in the normal pressure range.

Pipeline engineer

Based on their specialised training, skills, experience and knowledge of the applicable standards and provisions, the pipeline engineer is able to carry out the work assigned to them and to independently identify potential hazards and avoid them.

The pipeline engineer is able to install valves safely and properly in the pipework.

Trained person (hoist)

The trained person (hoist) has been instructed, and can provide evidence of this, by the operator on how to handle the hoist and sling gear and the potential hazards associated with improper behaviour.

Trained person (operator)

The trained person (operator) has been instructed, and can provide evidence of this, by the operating company on how to handle the plant and the potential hazards associated with improper behaviour. This knowledge will be refreshed in regular training provided by the operating company. The trained person (operator) is familiar with the content of this manual.

The trained person (operator) is familiar with the operating company's plant and the associated hazards. They are assigned with operating the plant by the operating company.

Basic requirements

Only persons from whom it is expected that they reliably perform their work are approved as personnel. Persons whose capacity to react is impaired, for example, through drugs, alcohol, or medication are not approved as personnel.

Comply with the age-specific and job-specific regulations that apply at the site of implementation when selecting personnel.

Unauthorised persons



WARNING!

Risk of fatal injury for unauthorised persons due to hazards in the danger zone and work area!

Unauthorised persons who do not satisfy the requirements described here are not aware of the hazards in the work area. Consequently there is a danger of severe or fatal injuries for unauthorised persons.

- Keep unauthorised persons away from the danger zone and work area.
- If in doubt, speak to these persons and instruct them to leave the danger zone and work area.
- Interrupt tasks as long as unauthorised persons are present in the danger zone and work area.

Instruction

The operating company must instruct personnel on a regular basis. For better tracking an instruction log must be maintained with at least the following content:

- Date of the instruction
- Name of the instructed person
- Content of the instruction
- Name of the instructor
- Signatures of the instructed person and of the instructor

2.8 Personal protective equipment

Personal protective equipment is used to protect personnel from impairments to health and safety at work.

During the various tasks performed on and with the machine, personnel must wear personal protective equipment, to which special reference is made in the individual sections of this manual.

Description of the personal protective equipment



The personal protective equipment is described below:

Chemical resistant safety gloves

Chemical resistant safety gloves are intended to protect hands against aggressive chemicals.


Industrial hard hat

Industrial hard hats protect the head from falling objects, swinging loads and impacts on stationary objects.


Protective gloves

Protective gloves protect hands from friction, abrasion, puncture wounds, or deeper injuries, as well as from contact with hot surfaces.


Protective work clothing

Protective work clothing is tight-fitting work clothing with low resistance to tearing, with tight sleeves, and without projecting parts.


Safety footwear

Safety footwear protects the feet from crushing injuries, falling parts and slipping on a slippery substrate.


Safety goggles

The protective goggles protect the eyes from flying parts and liquid splashes.

2.9 Spare parts

Incorrect spare parts


WARNING!
Risk of injury if the wrong spare parts are used!

Using the wrong or defective spare parts may pose a hazard for personnel, or result in damage, malfunctions or even total failure.

- Only use genuine spare parts from Stahl-Armaturen PERSTA GmbH or spare parts approved by Stahl-Armaturen PERSTA GmbH.
- If you have any questions or if anything is unclear, always contact our customer service organisation (contact details on page 4).

Selecting spare parts




Spare parts recommendation in the scope of delivery

The spare parts recommendation is included in the scope of delivery of the valve.

Before installation



Storage of spare parts

Please see  Chapter 4.4 “Storage of spare parts” on page 36 for information on storing spare parts.

Ordering spare parts

Order spare parts from Stahl-Armaturen PERSTA GmbH, with specification of

- valve type,
- Year of manufacture,
- Nominal diameter,
- Nominal pressure,
- Material,
- Article number,
- Confirmation number,
- Consignment number

(if possible). See page 3 for contact details.

2.10 Environmental protection



ENVIRONMENT!

Hazards for the environment due to improper handling of environmentally-harmful substances!

If environmentally-harmful substances are handled incorrectly, particularly if they are disposed of incorrectly, significant environmental damage can occur.

- Always comply with the instructions cited below for handling and disposal of environmentally-harmful substances.
- Comply with the guidelines for disposal of environmentally hazardous substances issued by the operating company.
- If environmentally-harmful substances inadvertently get into the environment, immediately implement suitable measures. If in doubt, inform the responsible municipal authorities of the damage and ask about suitable measures that should be implemented.

Substances used

The following environmentally harmful substances are used:

- Residue of the pipeline medium
- Pickling medium
- Anticorrosive

3 Functional description

3.1 How the swing check valve works

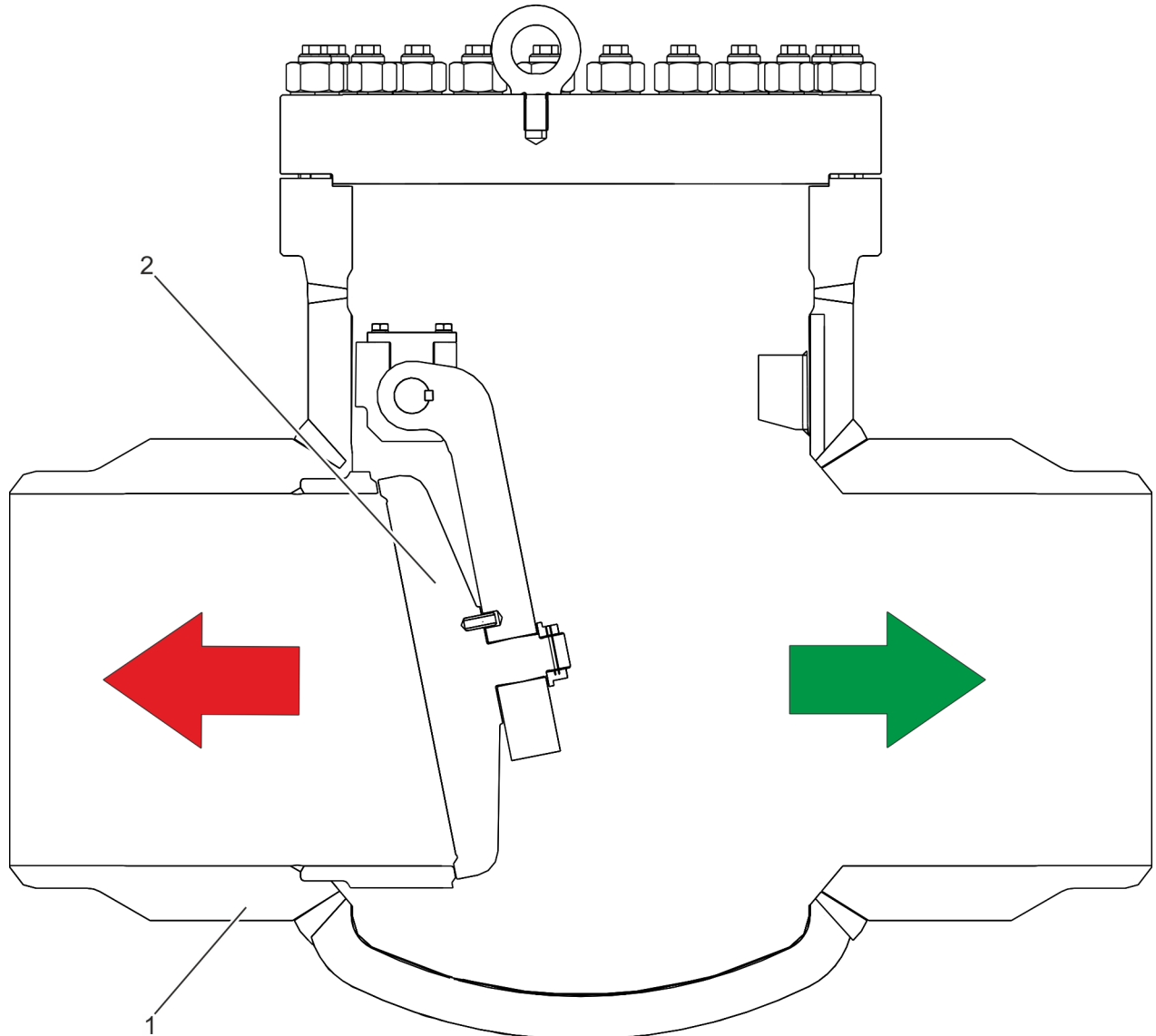






Fig. 2: Sectional view of the swing check valve

 Flow direction
 Return flow direction blocked

1 Body
 2 Swing check plate

In the body (Fig. 2/1), a swivelling swing check plate (Fig. 2/2) separates the inlet from the outlet end of the valve.

As soon as medium enters the valve in the flow direction () , it pushes the swing check valve upwards and medium flows through the entire body.

If the flow direction of the pipeline medium is reversed () , the swing check valve closes the valve.

3.2 Attachment of the swing check plate (type-specific)

Attachment in the body with retaining element

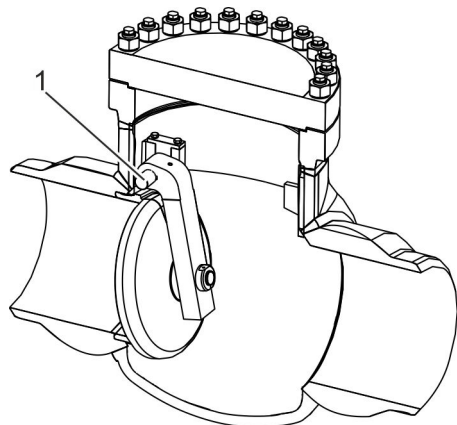


Fig. 3: Attachment in the body

The valve shaft (Fig. 3/1) is mounted in a retaining element in the body.

The retaining element can be opened to remove the swing check plate from the body (↪ “Version with valve shaft mounted in the body” on page 71).

Attachment in the body with retaining element guided through

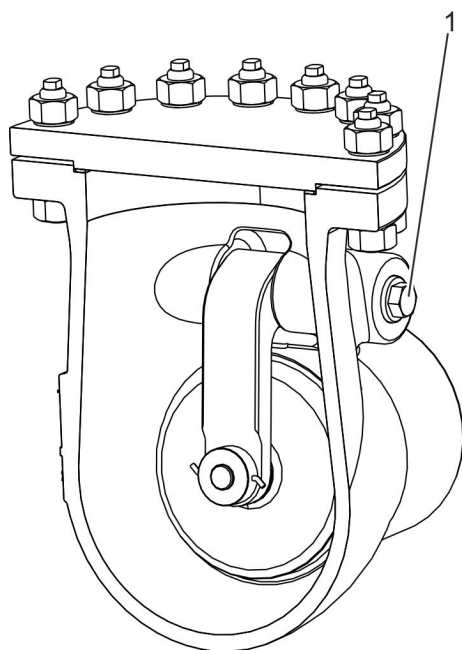


Fig. 4: Guided-through valve shaft

The valve shaft is suspended in the body at both ends.

To remove the swing check plate, locking bolts (Fig. 4/1) can be removed and the valve shaft can be driven out of the body.

Attachment to the body cover

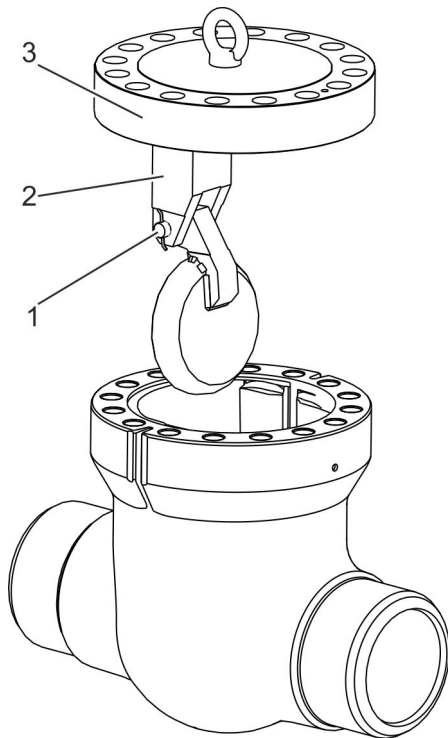


Fig. 5: Attachment to the cover

The valve shaft (Fig. 5/1) is mounted in a retaining element (Fig. 5/2) on the body cover (Fig. 5/3).



Removing the body cover

When the body cover is removed, the swing check plate is also removed from the body (↪ "Version with valve shaft attached to the body cover" on page 64.

3.3 Optional equipment

Spring (closing support)

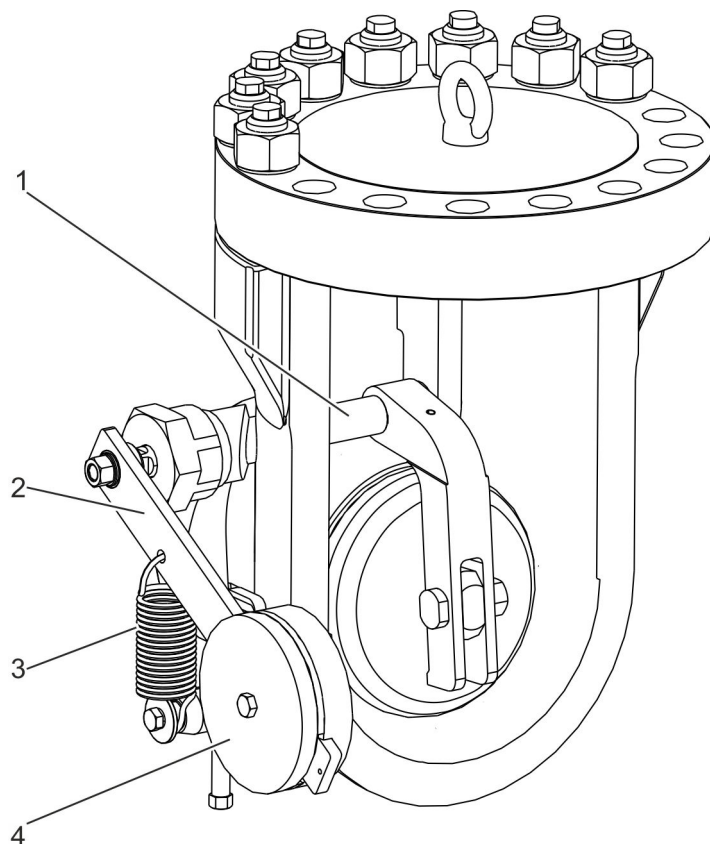


Fig. 6: Closing support by spring force

The valve shaft (Fig. 6/1) is guided outwards by the body.

There is a lever (Fig. 6/2) on the end of the valve shaft. A spring (Fig. 6/3) between the lever and an adjustable retaining element (adjustment of the preliminary spring tension) prevents the swing check valve from opening too soon and supports its closing.

In addition, a weight (Fig. 6/4) can be fitted on the end of the lever. The weight also supports closing.

To adjust the closing support, the preliminary spring tension can be changed (↪ "Version with spring" on page 44).

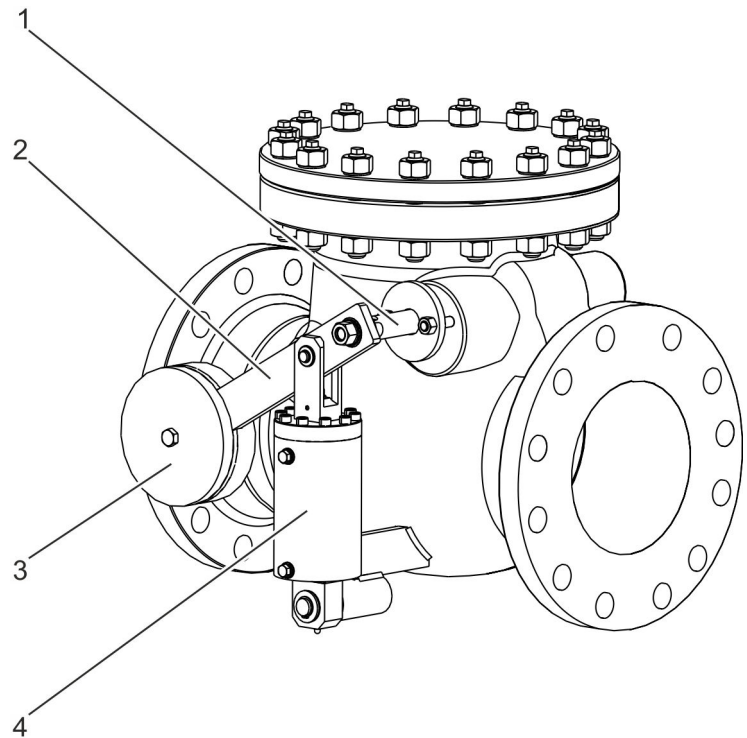
Damper


Fig. 7: Damper

The valve shaft (Fig. 7/1) is guided outwards by the body.

There is a lever (Fig. 7/2) on the end of the valve shaft. A damper (Fig. 7/4) between the lever (Fig. 7/2) and a mounting point on the body prevents the swing check valve from opening and closing suddenly.

In addition, a weight (Fig. 7/3) can be fitted on the end of the lever. The weight also supports closing.

Weight (closing support)

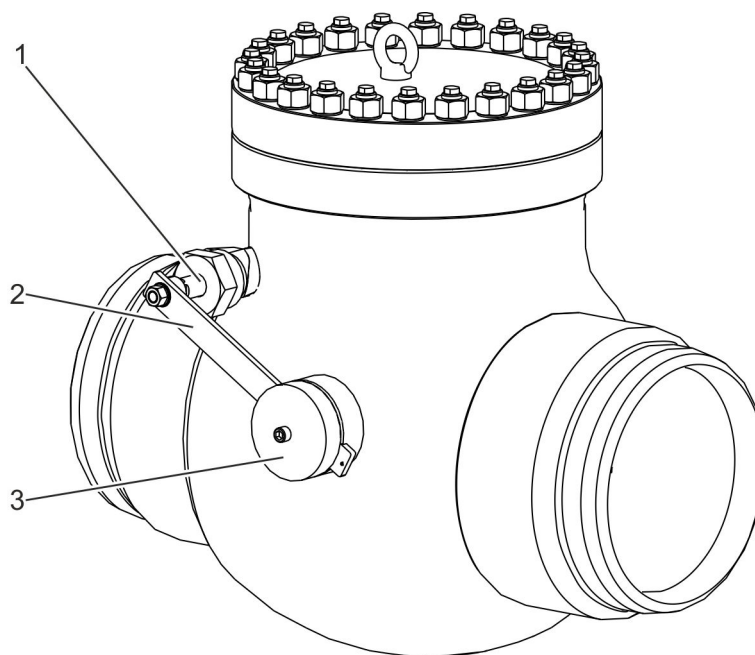


Fig. 8: Closing support by weight

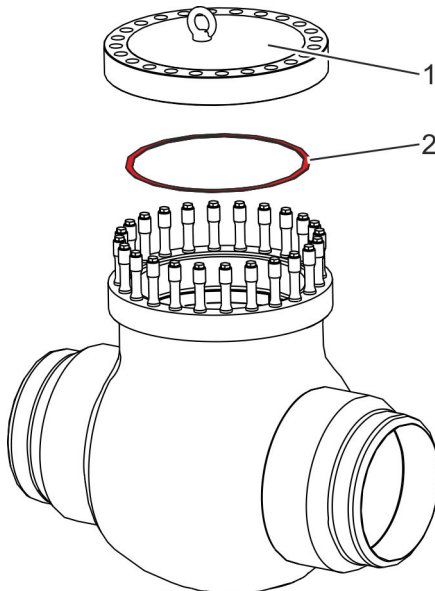
The valve shaft (Fig. 8/1) is guided outwards by the body.

There is a lever (Fig. 8/2) on the end of the valve shaft. A weight (Fig. 8/3) attached to the end of the lever supports closing.

To adjust the closing support, the position of the weight on the lever can be changed (☞ "Version with weight" on page 43).

3.4 External seal

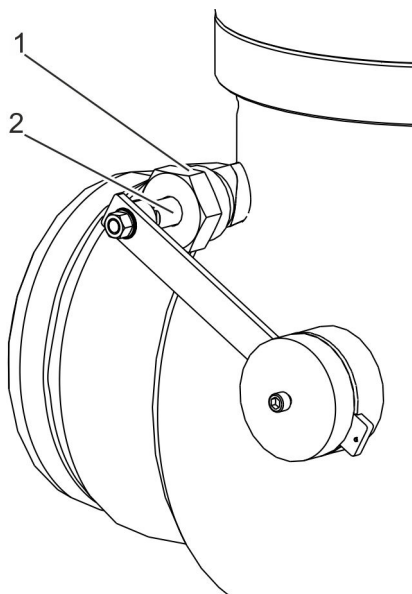
Cover gaskets



There is a sealing element (Fig. 9/2) between the body and the body cover (Fig. 9/1) to prevent the pipeline medium from escaping from the body. If leaks occur, the sealing element can be replaced by employees of the operating company (↪ *Chapter 8.3.1 "Replacing the body cover gasket" on page 61*).

Fig. 9: Cover gasket

Gland packing (for version with valve shaft guided outwards)



The gland packing seals the valve shaft (Fig. 10/2) from the environment.

Depending on the version, the gland follower is pressed on to the sealing packing rings by a union nut (Fig. 10/1).

The resulting lateral deformation and the axial tension of the packing rings seals the valve shaft (Fig. 10/2) from the environment.

The gland packing can be replaced by employees of the operating company (↪ *Chapter 8.3.3 "Replacing the gland packing" on page 75*).

Fig. 10: Gland packing

3.5 Connections

Connection in the pipe

Depending on the version, the swing check valve can be fitted in the pipe as a:

- Butt-weld valve,
- Flanged valve,
- Special connection valve

4 Transport and storage

4.1 Safety notices for transport and storage

Heavy weight of the valve

**WARNING!****Danger of injury due to the heavy weight of the valve!**

The heavy weight of the valve, and of its components, can result in severe injuries.

- Transport valves with a suitable hoist or forklift.
- Use approved and functional sling gear.
- Safeguard valves and components from falling over.

Suspended loads

**WARNING!****Danger of injury due to suspended loads!**

Suspended loads can cause dangerous situations that can result in severe injuries.

- Do not step under suspended loads.
- Wear protective equipment: Industrial hard hat, safety footwear.
- Transport loads as close to the ground as possible.
- Only use approved sling gear and hoists.
- Ensure that hoist and sling gear have sufficient load-bearing capacity.

Improper transport

**NOTICE!****Material damage due to improper transport!**

Valves can fall or tip over if transported improperly. This can cause considerable material damage.

- When unloading valves at delivery, as well as for inner-company transport, proceed carefully and pay attention to the symbols and instructions on the packaging.
- If present: Use the provided ring bolts and ring nuts.
- Protect valves from impacts.
- Do not touch valves.
- Only remove the packaging just before installation.

4.2 Transport of packed items

Depending on the size, valves are delivered individually or loaded on a pallet.

Transporting individual valves: Version with welded-on attachment points

- | | |
|-----------------------|--------------------------|
| Personnel: | ■ Trained person (hoist) |
| Protective equipment: | ■ Industrial hard hat |
| | ■ Protective gloves |
| | ■ Safety footwear |
| Special tool: | ■ Sling gear |
| | ■ Hoist |

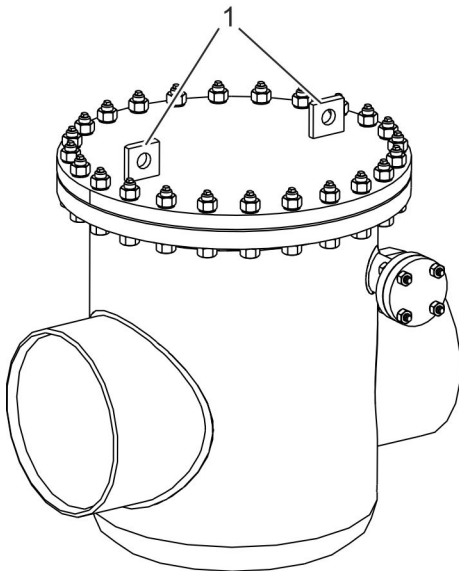


Fig. 11: Welded-on attachment points

1. ➤ Fasten hoist to the attachment points (Fig. 11/1) using suitable sling gear.
2. ➤ Slowly lift the valve and identify the position of the centre of gravity.
3. ➤ Transport the valve as close to the ground as possible.
4. ➤ After setting down the valve, secure it against falling over.

Transporting individual valves: Version without welded-on attachment points

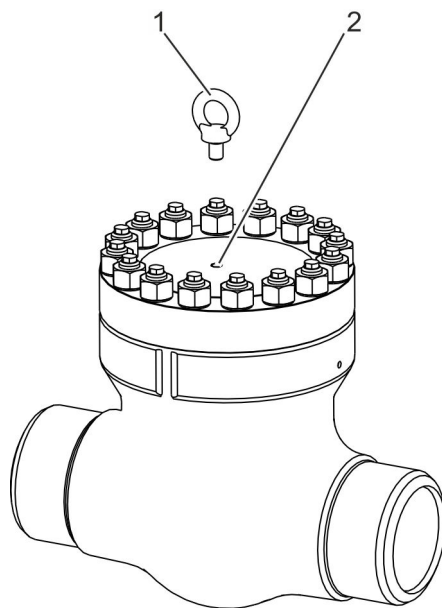


Fig. 12: Attaching the ring bolt

Personnel:	■ Trained person (hoist)
Protective equipment:	■ Industrial hard hat
	■ Protective gloves
	■ Safety footwear
Special tool:	■ Sling gear
	■ Hoist
	■ Ring bolts

1. ➤ Insert the supplied ring bolt (Fig. 12/1) into the thread opening (Fig. 12/2) of the body cover.
2. ➤ Make sure that the thread of the ring bolt (Fig. 12/1) is fully inserted into the body cover.
3. ➤ Fasten the ring bolt (Fig. 12/1) to the hoist with suitable sling gear.
4. ➤ Slowly lift the valve and identify the position of the centre of gravity.
5. ➤ Transport the valve as close to the ground as possible.
6. ➤ After setting down the valve, secure it against falling over.

Transport on a pallet

Personnel:	■ Forklift truck driver
	■ Trained person (hoist)
Protective equipment:	■ Industrial hard hat
	■ Protective gloves
	■ Safety footwear
Special tool:	■ Sling gear
	■ Hoist
	■ Forklift

1. ➤ Make sure that the valve is fixed in place on the pallet.
2. ➤ Transport the pallet to the installation location.
3. ➤ Unload and continue transporting heavy valves from the pallet with a suitable hoist.

4.3 Storage of the valve

Store valves under the following conditions:

- Do not store them outdoors.
- Store them in a dry and dust-free environment.
- Do not expose them to any aggressive media.
- Protect them from direct sunlight.
- Avoid mechanical vibrations.
- Storage temperature: 15–35 °C.
- Relative humidity: max. 60%.
- Check the condition of the protective caps attached at the factory. If necessary, replace the protective caps.
- When storing valves for longer than 3 months, check the general condition of all parts and the packaging on a regular basis. Touch up or reapply preservation agent as required.



There may be storage instructions affixed to the packed items that exceed the requirements set out in these instructions. Comply with the terms of those instructions.

4.4 Storage of spare parts



NOTICE!

Material damage due to reduced service life if stored incorrectly!

Due to incorrect storage of soft-sealing spare parts, the service life may be reduced.

- Store soft-sealing elements, plastics or lubricants in a dry location at room temperature where they are protected against light.

5 Installation

5.1 Safety instructions for installation

Faulty installation

**WARNING!****Risk of injury due to incorrectly installed valve!**

A faulty installation can result in injuries due to a malfunction of the valve.

- Pay attention to the flow direction of valves.
- Pay attention to the permitted installation position (☞ *Chapter 2.2 “Intended use” on page 11*).
- For butt-weld valves
 - Fasten the welding counterpole on the body, if possible in the vicinity of the welding point.
 - Perform welding and subsequent heat treatment in compliance with the applicable welding regulations
 - Perform partial thermal treatment.

Wrong tightening torques

**WARNING!****Hazard risk due to wrong tightening torques!**

The tightening torques for the threaded connections on the valve have been calculated and applied by the manufacturer. Hazards may occur due to unscrewing and subsequent tightening if the wrong tightening torques are used.

- Do not undo the threaded connections on the valve.
- For maintenance work or if the threaded connections have become loose, request the tightening torques by:
 - contacting Stahl-Armaturen PERSTA GmbH customer service (contact details on page 4) specifying the serial number, or
 - refer to the manufacturer’s website (address on page 2).

Heavy weight of the valve



WARNING!

Danger of injury due to the heavy weight of the valve!

The heavy weight of the valve, and of its components, can result in severe injuries.

- Transport valves with a suitable hoist or forklift.
- Use approved and functional sling gear.
- Safeguard valves and components from falling over.

Moving parts



WARNING!

Risk of crushing and impact injuries on moving parts!

Depending on the version, there are moving parts on the valve (e.g. lever, weight).

There is a risk of injury in the motion range of the moving parts outside the body.

- Make sure presence is prohibited in the vicinity of the valve.
- Mark or cordon off the danger zone.
- Established a depressurised state before working on the valve.

5.2 Before the installation

- Personnel: ■ Pipeline engineer
- Protective equipment: ■ Protective work clothing
■ Protective gloves
■ Industrial hard hat
■ Safety footwear

1. ▶ Check the design parameters and material.
2. ▶ Remove any protective caps and preserving agents from the valve.
3. ▶ Pay attention to the flow direction (↺ “Flow direction arrow” on page 12).
4. ▶ Make sure that there are no objects or materials in the interior of the valve.

5.3 Installing the valve

- Personnel:
- Pipeline engineer
 - Trained person (hoist)
- Protective equipment:
- Protective work clothing
 - Protective gloves
 - Industrial hard hat
 - Safety footwear
- Special tool:
- Sling gear
 - Hoist

1. ➤ Prepare the respective pipe section for the installation.
2. ➤ Use a hoist (☞ *“Transporting individual valves: Version with welded-on attachment points” on page 34*) to bring the valve into the installation position.
3. ➤ Make sure that the on-site pipes are free of tension.
4. ➤ Make sure that the on-site pipes are free of external forces and torques.
5. ➤ Check butt-welding ends and flange sealing surfaces for damage and cleanness.
6. ➤ Centre the connection flanges.
7. ➤ Use connection elements and sealing elements made of approved materials.

8. ➤



For the correct installation position of the valve, see .

Depending on the type of connection, weld in or flange on the valve in the correct flow direction and installation position.

9. ➤ Bolt all the flange bores together with the connection elements using the permissible tightening torque.
10. ➤ Make sure that the pipe and valve do not leak.

5.4 After the installation

Harmful substances



WARNING!

Pickling medium is a health hazard!

Direct contact with the pickling medium used can have health implications.

- Handle pickling medium in accordance with the instructions in the manufacturer's safety data sheet.
- Wear protective equipment: Protective gloves, safety footwear, protective goggles, protective work clothing.
- Soak up escaped pickling medium without delay and dispose of it in an environmentally responsible manner.



WARNING!

Gloss paint is a health hazard!

Direct contact with the gloss paint used can have health implications.

- Handle gloss paint in accordance with the instructions in the manufacturer's safety data sheet.
- Wear protective equipment: Protective gloves, safety footwear, protective goggles.



WARNING!

Anticorrosive is a health hazard!

Direct contact with the anticorrosive used can have health implications.

- Handle anticorrosive in accordance with the instructions in the manufacturer's safety data sheet.
- Wear protective equipment: Protective gloves, safety footwear, protective goggles, protective work clothing.
- Soak up escaped anticorrosive without delay and dispose of it in an environmentally responsible manner.

5.4.1 Pickling the valve



There are several ways to pickle the valve.

Pickle the valve according to the operating company's specifications.

- Personnel: ■ Pipeline engineer
- Protective equipment: ■ Safety goggles
 ■ Protective work clothing
 ■ Chemical resistant safety gloves
 ■ Safety footwear

1. ➤ Pickle the valve correctly.
2. ➤ Completely remove the pickling medium by flushing it out.
3. ➤ Ensure that the pickling medium is completely flushed out of the dead spaces in the valve.

5.4.2 Painting the valve



Paint the valve according to the operating company's specifications.

Use suitable (compatible) painting systems.

5.4.3 Executing the system pressure test and leak test

- Personnel: ■ Pipeline engineer
- Protective equipment: ■ Industrial hard hat
 ■ Safety goggles
 ■ Protective work clothing
 ■ Protective gloves
 ■ Safety footwear

1. ➤ Execute tests in accordance with local regulations.
2. ➤ Release the pipe after successful tests.
3. ➤ For longer idle periods after the hydrostatic pressure test, completely open the valve.
4. ➤ For longer idle periods after the hydrostatic pressure test, replace the anticorrosive in consultation with the manufacturer.

5.4.4 Applying thermal insulation



Plant-specific equipment

Depending on the plant, it may be necessary to equip the pipe and/or the valve with a thermal insulation.

- Personnel: ■ Pipeline engineer
- Protective equipment: ■ Safety goggles
■ Protective work clothing
■ Protective gloves
■ Safety footwear

1. ➤ If necessary have the thermal insulation fitted by the operating company.
2. ➤ For valve shaft guided outwards: Make sure that the function of all moving
 - components is not impaired and that
 - they remain permanently accessible and capable of being monitored.

Valve shaft guided outwards (optional)

5.4.5 Setting the closing support (optional)

Version with weight

- Personnel: ■ Pipeline engineer
- Protective equipment: ■ Protective work clothing
 ■ Safety footwear

1. ➤ Undo the threaded connection (Fig. 13/1).

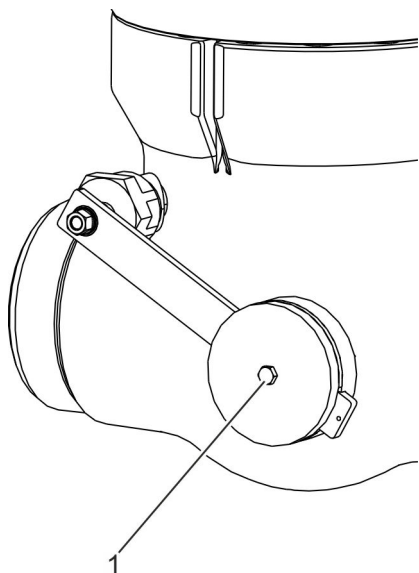


Fig. 13: Undoing the threaded connection

- 2.** ➤ Shift the weight (Fig. 14/1) on the lever arm:
- Weight towards hub (Fig. 14/2): reduces the closing support
 - Weight towards the end of the lever arm (Fig. 14/3): increases the closing support

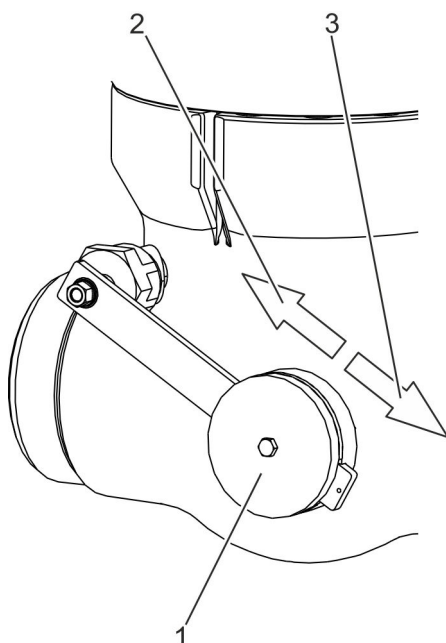
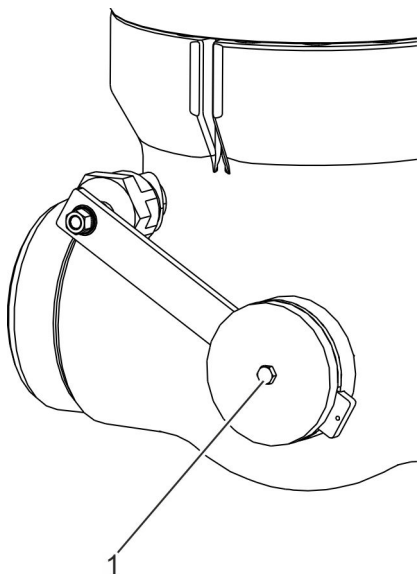


Fig. 14: Setting the weight

After the installation > Setting the closing support (optional)

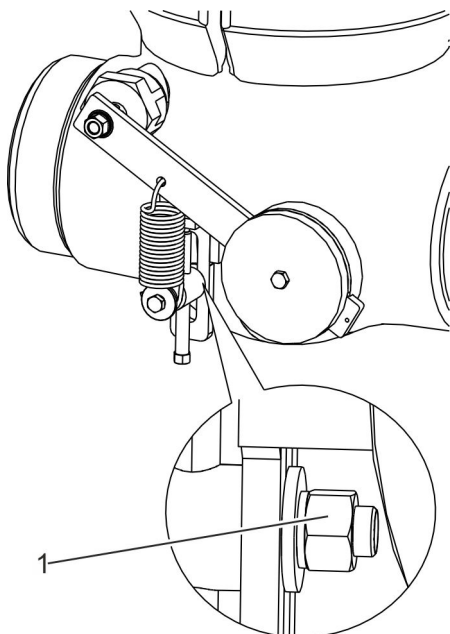


3. Tighten the threaded connection (Fig. 15/1) in the desired weight position.

Fig. 15: Tightening the threaded connection

Version with spring

- Personnel: ■ Pipeline engineer
- Protective equipment: ■ Protective work clothing
■ Safety footwear



1. Undo the nut (Fig. 16/1) of the tensioning device.

Fig. 16: Undoing the nut

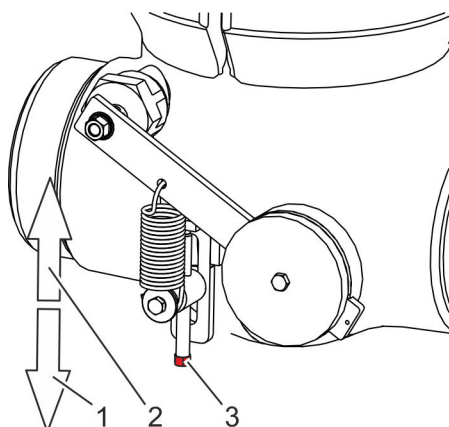


Fig. 17: Setting the preliminary spring tension

- 2.** Turn the adjusting screw (Fig. 17/3) with a suitable wrench:
 - Undoing the adjusting screw (screwing it in (Fig. 17/1)): reduces the closing support (lower preliminary spring tension)
 - Tightening the adjusting screw (screwing it out (Fig. 17/1)): increases the closing support (higher preliminary spring tension)

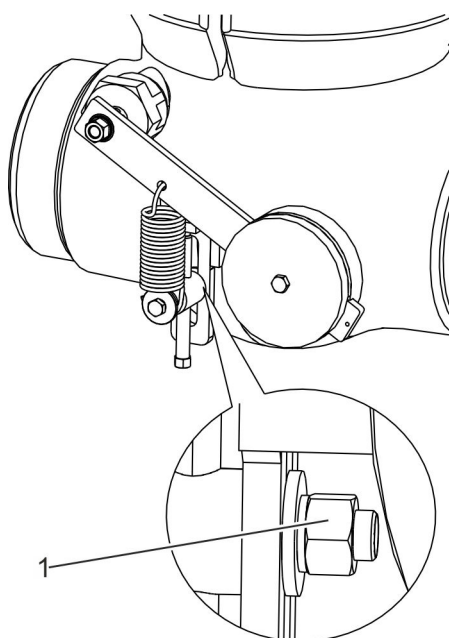


Fig. 18: Tightening the nut

- 3.** Tighten the nut (Fig. 18/1) of the tensioning device.

After the installation > Setting the closing support (optional)

6 Commissioning

6.1 Safety instructions for commissioning

Risk of freezing


WARNING!
Risk of injury due to pipes shattering at freezing temperatures!

As a result of pipes shattering at freezing temperatures, severe injuries can be caused by fluid being expelled under high pressure.

- Make sure that the valve is drained completely before it is taken out of service.
- Never operate valves at temperatures near or below the freezing point of the pipeline medium.

Pipeline medium


WARNING!
Risk of injury due to pressurised pipeline medium!

Depending on the version of the valve, injuries can be caused by the medium escaping under high pressure, regardless of whether the system is in operation or not.

- Do not undo the threaded connections.
- If threaded connections are loose, inform the operating company and have the pipe section in question shut off.
- If threaded connections are loose, have the cause of this clarified and eliminated. If necessary, have the manufacturer check the valve.


WARNING!
Risk of impairing health due to the pumped medium!

Direct contact with the pumped medium can adversely affect your health.

- Handle the pumped medium in accordance with the instructions in the manufacturer's safety data sheet.
- Wear the following protective equipment: protective gloves, safety footwear, safety goggles, protective work clothing.
- Collect any pumped medium that has run out without delay and dispose of it in an environmentally responsible manner.

Failure to comply with the heating-up times/cooling times



WARNING!

Danger of injury due to failure to comply with the heating-up times/cooling times!

Insufficient heating-up times/cooling times may lead to impermissible deformations of the valve and reduction of the total service life.

- Comply with the heating-up times/cooling times (max. 6 K/min (6 °C/min)).
- If in doubt consult with the manufacturer.

Thermal hazards



WARNING!

Risk of injury due to high or low temperatures!

Depending on the application for which the valve or pipe is used, injuries may occur due to the high or low temperature of the components.

- When working on components or using adjusting equipment, wear protective equipment: protective gloves, safety goggles.
- Prior to performing work on these components, allow them to cool down or warm up to the ambient temperature.
- Have the thermal insulation provided by the operating company attached.

Moving parts



WARNING!

Risk of crushing and impact injuries on moving parts!

Depending on the version, there are moving parts on the valve (e.g. lever, weight).

There is a risk of injury in the motion range of the moving parts outside the body.

- Make sure presence is prohibited in the vicinity of the valve.
- Mark or cordon off the danger zone.
- Established a depressurised state before working on the valve.

Faulty alignment of the valve



NOTICE!

Malfunction of the valve by failure to observe the flow direction!

An incorrect alignment can result in the entire plant malfunctioning.

- Install the valve in accordance with the flow direction arrow (☞ “Flow direction arrow” on page 12) and the flow direction in the pipe.

6.2 Prior to commissioning

- | | |
|-----------------------|----------------------------|
| Personnel: | ■ Pipeline engineer |
| Protective equipment: | ■ Industrial hard hat |
| | ■ Safety goggles |
| | ■ Protective work clothing |
| | ■ Protective gloves |
| | ■ Safety footwear |

➔ Make sure that the entire plant has been released for start-up.

6.3 Performing the commissioning process

- | | |
|-----------------------|----------------------------|
| Personnel: | ■ Pipeline engineer |
| Protective equipment: | ■ Industrial hard hat |
| | ■ Safety goggles |
| | ■ Protective work clothing |
| | ■ Protective gloves |
| | ■ Safety footwear |

Prerequisite:

- The entire plant has been released for start-up.

1. ➔



WARNING!

Failure to comply with the heating/cooling times!

Fill the pipe or open the shut-off pipe section in accordance with the plant-specific heating or cooling speed.

2. ➔ Check the pressure sealing bonnet for leaks.
3. ➔ Examine the pipe connection flanges for leaks.
4. ➔ If necessary, recheck the tightening torques in accordance with the manufacturer’s specifications.

7 Maintenance

7.1 Safety instructions for maintenance

Improperly executed maintenance tasks

**WARNING!****Danger of injury due to improperly executed maintenance tasks!**

Improper maintenance can cause severe injury or significant material damage.

- Before starting tasks:
 - ensure that there is adequate free space for installation,
 - ensure that the valve is depressurised,
 - ensure that the valve is cooled-down/ warmed-up to ambient temperature,
 - Ensure that the upstream and downstream system for the valve are reliably sealed.
- Ensure order and cleanliness at the installation location! Loosely stacked components or components and tools that are lying about can cause accidents.
- Comply with the following before restarting the system:
 - Ensure that all maintenance tasks have been properly executed and concluded in accordance with the instructions in this manual.
 - Ensure that nobody is in the danger zone.
 - Ensure that all covers and protective devices are installed correctly and that they function properly.

Pressurised components

**WARNING!****Danger of injury due to pressurised components!**

Tasks on pressurised components can result in serious injuries.

- Establish depressurised status before working on the valve.

Heavy weight of the valve



WARNING!

Danger of injury due to the heavy weight of the valve!

The heavy weight of the valve, and of its components, can result in severe injuries.

- Transport valves with a suitable hoist or forklift.
- Use approved and functional sling gear.
- Safeguard valves and components from falling over.

Moving parts



WARNING!

Risk of crushing and impact injuries on moving parts!

Depending on the version, there are moving parts on the valve (e.g. lever, weight).

There is a risk of injury in the motion range of the moving parts outside the body.

- Make sure presence is prohibited in the vicinity of the valve.
- Mark or cordon off the danger zone.
- Established a depressurised state before working on the valve.

Thermal hazards



WARNING!

Risk of injury due to high or low temperatures!

Depending on the application for which the valve or pipe is used, injuries may occur due to the high or low temperature of the components.

- When working on components or using adjusting equipment, wear protective equipment: protective gloves, safety goggles.
- Prior to performing work on these components, allow them to cool down or warm up to the ambient temperature.
- Have the thermal insulation provided by the operating company attached.

Wrong tightening torques

**WARNING!****Hazard risk due to wrong tightening torques!**

The tightening torques for the threaded connections on the valve have been calculated and applied by the manufacturer. Hazards may occur due to unscrewing and subsequent tightening if the wrong tightening torques are used.

- Do not undo the threaded connections on the valve.
- For maintenance work or if the threaded connections have become loose, request the tightening torques by:
 - contacting Stahl-Armaturen PERSTA GmbH customer service (contact details on page 4) specifying the serial number, or
 - refer to the manufacturer's website (address on page 2).

Wrong spare parts

**WARNING!****Risk of injury if the wrong spare parts are used!**

Using the wrong or defective spare parts may pose a hazard risk for personnel, or result in damage, malfunctions or even a total failure.

- Only use genuine spare parts from Stahl-Armaturen PERSTA GmbH or spare parts approved by Stahl-Armaturen PERSTA GmbH (☞ *Chapter 2.9 "Spare parts" on page 21*).
- Always contact Stahl-Armaturen PERSTA GmbH customer service (contact details on page 4) if anything is unclear.

**Spare parts recommendation in the scope of delivery**

The spare parts recommendation is included in the scope of delivery of the valve.

Pipeline medium



WARNING!

Risk of injury due to pressurised pipeline medium!

Depending on the version of the valve, injuries can be caused by the medium escaping under high pressure, regardless of whether the system is in operation or not.

- Do not undo the threaded connections.
- If threaded connections are loose, inform the operating company and have the pipe section in question shut off.
- If threaded connections are loose, have the cause of this clarified and eliminated. If necessary, have the manufacturer check the valve.



WARNING!

Risk of impairing health due to the pumped medium!

Direct contact with the pumped medium can adversely affect your health.

- Handle the pumped medium in accordance with the instructions in the manufacturer's safety data sheet.
- Wear the following protective equipment: protective gloves, safety footwear, safety goggles, protective work clothing.
- Collect any pumped medium that has run out without delay and dispose of it in an environmentally responsible manner.

Damage of sealing surfaces and slide faces



NOTICE!

Damage of sealing surfaces and slide faces due to the metallic processing of sealing surfaces and slide faces!

The metallic processing of sealing surfaces and slide faces and valve parts can cause material damage and valve malfunction.

- Sealing surfaces and slide faces of gaskets must not be
 - scratched with a scraper,
 - processed with wire brushes.
- Sealing surfaces and slide faces must be
 - pulled off with emery cloth,
 - processed with suitable abrasive tools or
 - scraped off with plastic tools/wooden tools.

7.2 Maintenance schedule

The maintenance tasks that are required for optimum and trouble-free valve operation are described in the sections below.

If regular inspections indicate increased wear, the required maintenance intervals must be reduced in accordance with the actual signs of wear. Contact Stahl-Armaturen PERSTA GmbH customer service (contact details on page 4) if you have any questions concerning maintenance work and intervals.

Interval	Maintenance work	Personnel
Depending on frequency of actuation, operating and ambient conditions/ specified by the operating company	Check the valve visually and for tightness (☞ <i>Chapter 7.3 "Visually checking the valve" on page 55</i>)	Trained person (operator)
	Replace the cover gasket (☞ <i>Chapter 8.3.1 "Replacing the body cover gasket" on page 61</i>)	Industrial mechanic (for valves within the normal pressure range)
	Examine the swing check plate for wear (☞ <i>Chapter 8.3.2 "Detaching and attaching the swing check plate" on page 64</i>)	Industrial mechanic (for valves within the normal pressure range)

7.3 Visually checking the valve

Personnel: ■ Trained person (operator)

Protective equipment: ■ Industrial hard hat
 ■ Safety goggles
 ■ Protective work clothing
 ■ Protective gloves
 ■ Safety footwear

1. ➤ Examine the body cover for leaks. If necessary, replace the gasket (☞ *Chapter 8.3.1 "Replacing the body cover gasket" on page 61*).

2. ➤ Examine the pipe connection flanges for leaks.

7.4 After maintenance

Performing final checks

- Personnel:
- Industrial mechanic (for valves within the normal pressure range)
- Protective equipment:
- Industrial hard hat
 - Safety goggles
 - Protective work clothing
 - Protective gloves
 - Safety footwear

Prerequisite:

- The maintenance tasks have been completed.
1. ▶ Subject the valve to the permissible test pressure.
 2. ▶ Make sure that the valve does not leak.
 3. ▶ If necessary, recheck tightening torques in accordance with the manufacturer's specifications.
 4. ▶ Carry out the work for commissioning (↪ *Chapter 6.3 "Performing the commissioning process" on page 49*).

8 Faults and fault correction

8.1 Safety instructions for fault correction

Safeguard against restart

**DANGER!****Life-threatening danger due to unintended restart!**

The unauthorised switch-on of the energy supply during work poses a danger of severe or fatal injuries for persons in the danger zone.

- Prior to beginning work, switch off all energy supplies and safeguard them from being switched on again.
- Safeguard the system area.

Improperly executed fault correction tasks

**WARNING!****Danger of injury due to improper fault correction!**

Improperly executed fault correction tasks can cause severe injury and significant material damage.

- For faults that require intervention, only correct them after you have ensured that
 - the system area in question is secured
 - the valve is depressurised
 - the valve has cooled-down/warmed-up to ambient temperature.
- If in doubt, obtain the assistance of experienced persons or contact Stahl-Armaturen PERSTA GmbH Customer Service.
- Comply with the following before restarting the system:
 - Ensure that all fault correction tasks have been properly executed and concluded in accordance with the instructions in this manual.
 - Ensure that nobody is in the danger zone.
 - Ensure that all covers and protective devices are installed correctly and that they function properly.

Thermal hazards



WARNING!

Risk of injury due to high or low temperatures!

Depending on the application for which the valve or pipe is used, injuries may occur due to the high or low temperature of the components.

- When working on components or using adjusting equipment, wear protective equipment: protective gloves, safety goggles.
- Prior to performing work on these components, allow them to cool down or warm up to the ambient temperature.
- Have the thermal insulation provided by the operating company attached.

Pipeline medium



WARNING!

Risk of injury due to pressurised pipeline medium!

Depending on the version of the valve, injuries can be caused by the medium escaping under high pressure, regardless of whether the system is in operation or not.

- Do not undo the threaded connections.
- If threaded connections are loose, inform the operating company and have the pipe section in question shut off.
- If threaded connections are loose, have the cause of this clarified and eliminated. If necessary, have the manufacturer check the valve.



WARNING!

Risk of impairing health due to the pumped medium!

Direct contact with the pumped medium can adversely affect your health.

- Handle the pumped medium in accordance with the instructions in the manufacturer's safety data sheet.
- Wear the following protective equipment: protective gloves, safety footwear, safety goggles, protective work clothing.
- Collect any pumped medium that has run out without delay and dispose of it in an environmentally responsible manner.

Behaviour if there are dangerous faults

The following always applies:

1. ➔ For faults that pose an imminent danger to personnel or material assets, immediately trigger the emergency stop function.
2. ➔ Determine the fault cause.
3. ➔ If correction of the fault requires work in the danger zone, secure the system area in question, and depressurise the valve.
4. ➔ Have faults that affect the safe operation of the valve corrected by the manufacturer.

8.2 Fault table

Fault description	Cause	Remedy	Personnel
Leakage of the swing check plate	Solid matter in the medium that has damaged the seat	Grind the seat, if necessary have damaged components replaced.	Industrial mechanic (for valves within the normal pressure range)
	Deformation of the seat surface due to an impermissibly high tension on the valve or due to thermal tension	Grind the seat, if necessary have damaged components replaced. Determine the cause of the deformation and have it eliminated.	Industrial mechanic (for valves within the normal pressure range)
	Erosion or corrosion, e.g. due to the wrong selection of valve nominal diameter or valve material	Have the design of the valve checked.	Industrial mechanic (for valves within the normal pressure range)
	Swing check plate does not close/does not close tight	Detach the swing check plate and have the cause of the malfunction determined and eliminated by Stahl-Armaturen PERSTA GmbH customer service (contact details on page 4) or an external specialist company (↪ Chapter 8.3.2 "Detaching and attaching the swing check plate" on page 64).	Industrial mechanic (for valves within the normal pressure range)
Swing check plate does not open	Set-up of swing check plate defective	Detach the swing check plate and have the cause of the malfunction determined and eliminated by Stahl-Armaturen PERSTA GmbH customer service (contact details on page 4) or an external specialist company (↪ Chapter 8.3.2 "Detaching and attaching the swing check plate" on page 64).	Industrial mechanic (for valves within the normal pressure range)

Fault table

Fault description	Cause	Remedy	Personnel
Body cover leaking	Body cover gasket defective	Replace the gasket (↪ <i>Chapter 8.3.1 "Replacing the body cover gasket" on page 61</i>).	Industrial mechanic (for valves within the normal pressure range)
Valve shaft feed-through leaking (for version with valve shaft suspended in the body)	Gasket of valve shaft feed-through defective	Replace the gasket (↪ <i>"Version with valve shaft suspended in the body" on page 67</i>).	Industrial mechanic (for valves within the normal pressure range)
Valve shaft feed-through leaking (for version with valve shaft guided outwards)	Gland packing not tight	Replace the gland packing (↪ <i>Chapter 8.3.3 "Replacing the gland packing" on page 75</i>).	Industrial mechanic (for valves within the normal pressure range)

8.3 Fault correction work

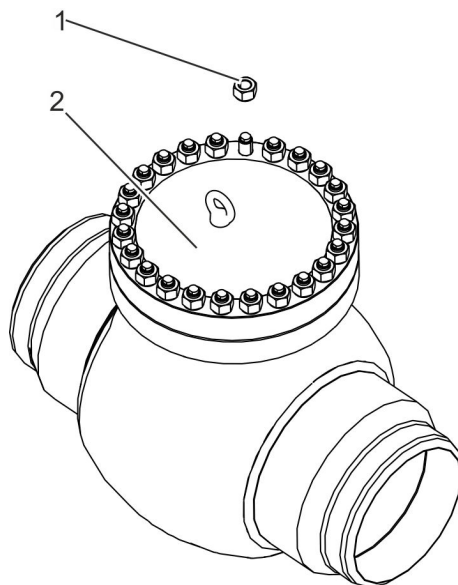
8.3.1 Replacing the body cover gasket

- | | |
|-----------------------|---|
| Personnel: | <ul style="list-style-type: none"> ■ Industrial mechanic (for valves within the normal pressure range) ■ Trained person (hoist) |
| Protective equipment: | <ul style="list-style-type: none"> ■ Industrial hard hat ■ Safety goggles ■ Protective work clothing ■ Protective gloves ■ Safety footwear |
| Special tool: | <ul style="list-style-type: none"> ■ Hoist ■ Sling gear ■ Tools for machining sealing surfaces and slide faces |

Prerequisites:

- The valve must have cooled down/heated up to ambient temperature.
- A depressurised state must have been established.

Detaching the body cover



1. Undo and remove the nuts (Fig. 19/1) on the body cover (Fig. 19/2).

Fig. 19: Undoing the nuts on the body cover

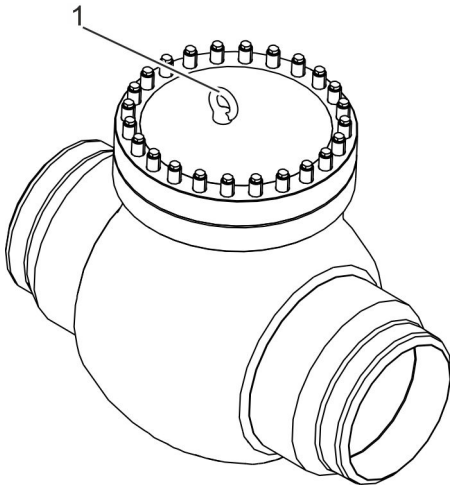


Fig. 20: Attaching the body cover

2. ➤



Depending on the version, there are one or more ring bolts on the body cover.

Make sure that the ring bolt (Fig. 20/1) is fully inserted into the body cover.

3. ➤

Drive ring bolt (Fig. 20/1) onto the hoist.

4. ➤

Remove the body cover upwards and place it next to the valve.

Replacing the gasket

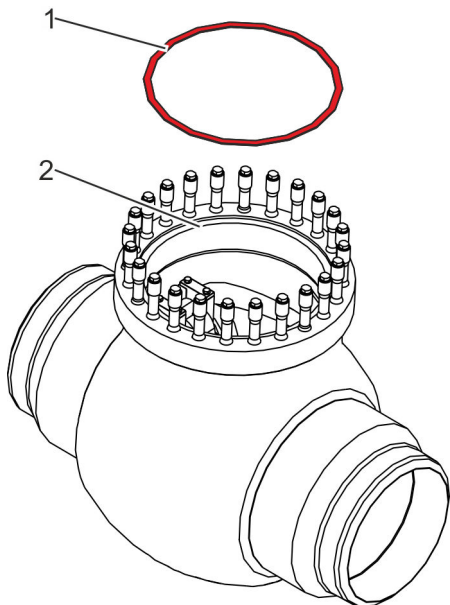


Fig. 21: Replacing the gasket

5. ➤

Remove the gasket (Fig. 21/1) from the groove (Fig. 21/2) in the body.

6. ➤



NOTICE!

Risk of damage due to mechanical work on the contact surfaces!

Completely remove any residue from the gasket (Fig. 21/1) using suitable tools.

7. ➤

Make sure that all contact surfaces are metallically bright and undamaged.

8. ➤

Insert the new gasket (Fig. 21/1) into the groove (Fig. 21/2) in the body.

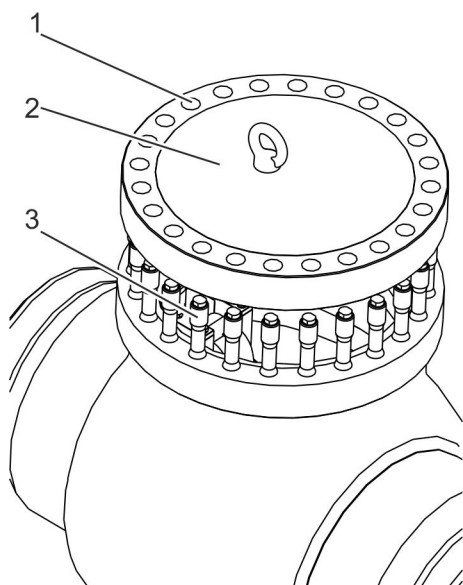


Fig. 22: Attaching the body cover

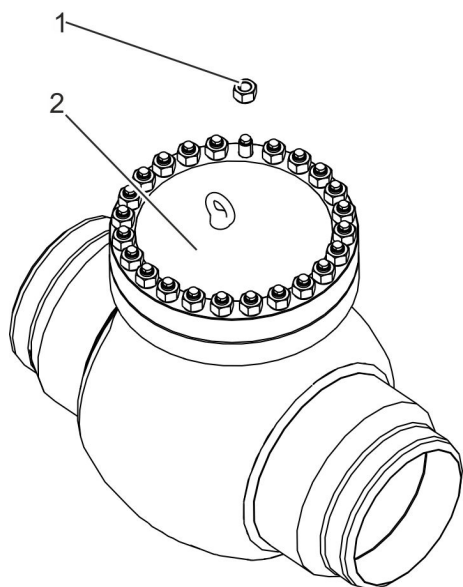


Fig. 23: Bolting on the body cover

9. ➤ Lift the body cover (Fig. 22/2) with a hoist over the body.
10. ➤ Make sure that the holes (Fig. 22/1) in the body cover are aligned with the stud bolts (Fig. 22/3) in the body.

11. ➤



NOTICE!
Damage to the threads of the stud bolts!

Lower the body cover (Fig. 22/2) slowly with a hoist on to the stud bolts in the body.

12. ➤ Make sure that the body cover rests on the body without any play.
13. ➤ Remove the hoist.

14. ➤ Loosely bolt the body cover (Fig. 23/2) with the nuts (Fig. 23/1) on to the stud bolts of the body.

15. ➤



WARNING!
Hazard risk due to wrong tightening torques!

Tighten the nuts (Fig. 23/1) to the prescribed tightening torque crosswise.

8.3.2 Detaching and attaching the swing check plate

Version with valve shaft attached to the body cover

- | | |
|-----------------------|---|
| Personnel: | ■ Industrial mechanic (for valves within the normal pressure range) |
| Protective equipment: | ■ Industrial hard hat
■ Safety goggles
■ Protective work clothing
■ Protective gloves
■ Safety footwear |
| Special tool: | ■ Hoist
■ Ring bolts |

Prerequisites:

- The valve must have cooled down/heated up to ambient temperature.
- A depressurised state must have been established.

1. ▶ Detach the body cover as described in ↗ *Chapter 8.3.1 "Replacing the body cover gasket" on page 61/steps 1–4.*
 ⇨ When the body cover is removed, the swing check plate is also removed from the body.

2. ▶ Examine the swing check plate for wear.

3. ▶ If necessary, replace the old components with new components or have them reprocessed by a specialist external company.

Replacing the body cover gasket

4. ▶ Replace the body cover gasket as described in ↗ *Chapter 8.3.1 "Replacing the body cover gasket" on page 61/steps 5–8.*

Attaching the body cover

5. ▶ Attach the body cover as described in ↗ *Chapter 8.3.1 "Replacing the body cover gasket" on page 61/steps 9–15.*

6. ▶ Carry out the work for commissioning (↗ *Chapter 6.3 "Performing the commissioning process" on page 49.*)

Version with valve shaft guided outwards

- | | |
|-----------------------|---|
| Personnel: | ■ Industrial mechanic (for valves within the normal pressure range) |
| Protective equipment: | ■ Industrial hard hat |
| | ■ Safety goggles |
| | ■ Protective work clothing |
| | ■ Protective gloves |
| | ■ Safety footwear |
| Special tool: | ■ Hoist |
| | ■ Packing extractor |
| | ■ Ring bolts |

Prerequisites:

- The valve must have cooled down/heated up to ambient temperature.
- A depressurised state must have been established.

1. → Detach the body cover as described in ↗ *Chapter 8.3.1 "Replacing the body cover gasket" on page 61/steps 1–4.*
 2. → Detach the lever arm and gland packing as described in ↗ *Chapter 8.3.3 "Replacing the gland packing" on page 75/steps 1–16.*
 3. → If there is a bore (Fig. 24/3) in the disc lever (Fig. 24/2): Insert the ring bolt into the bore in the disc lever.
 4. → Fasten the ring bolt to the hoist with suitable sling gear.
 5. →

NOTICE!
Damage to the swing check plate!
- Apply a hoist is such a way that the swing check plate cannot fall into the body after pulling out the valve shaft (Fig. 24/1).
6. → Pull the valve shaft (Fig. 24/1) out of the retaining element (Fig. 24/4) in the body and the disc lever (Fig. 24/2).

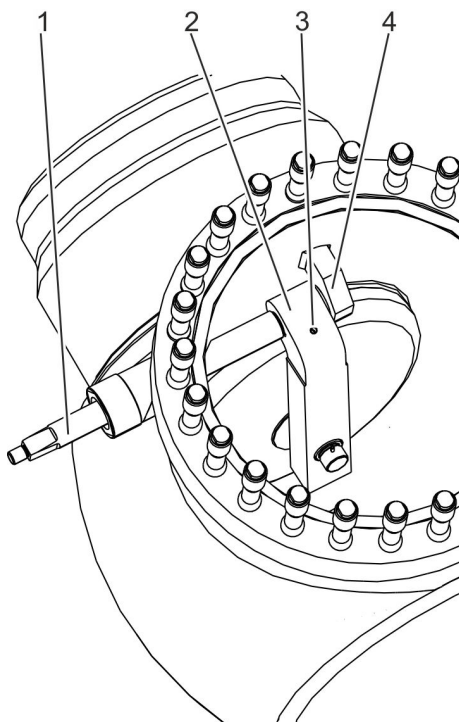


Fig. 24: Detaching the valve shaft

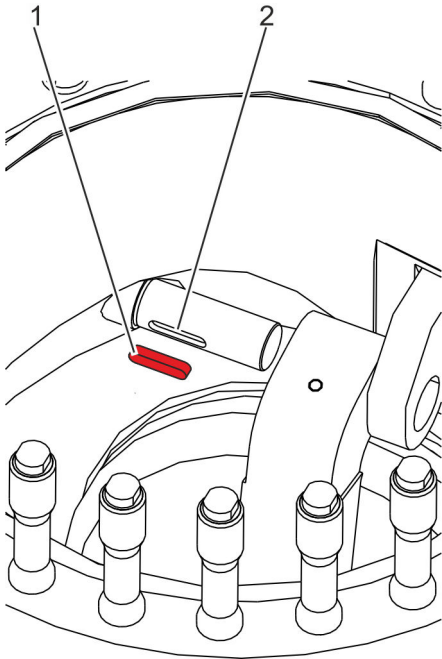


Fig. 25: Feather key

7. ➤ Remove the feather key (Fig. 25/1) from the groove (Fig. 25/2) of the valve shaft.
8. ➤ Lift the swing check plate attached to the hoist including disc lever out of the body and set it down, protected against damage.
9. ➤ Examine the swing check plate for wear.
10. ➤ If necessary, replace the old components with new components or have them reprocessed by a specialist external company.
11. ➤ Insert the feather key (Fig. 25/1) in the groove (Fig. 25/2) of the valve shaft.
12. ➤ Carefully insert the swing check plate attached to the hoist including disc lever into the body.

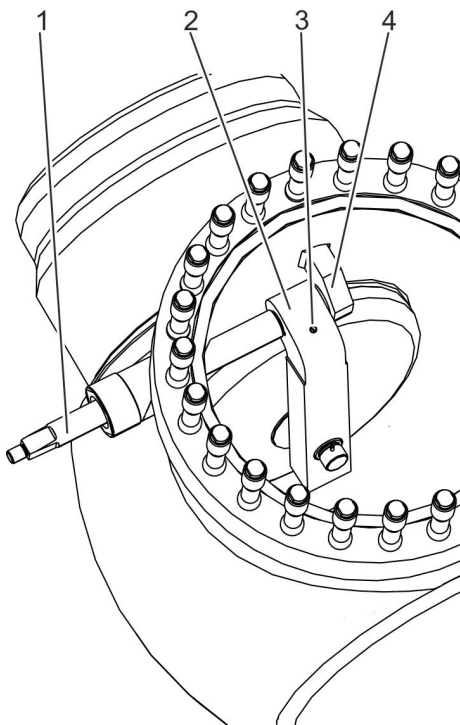


Fig. 26: Attaching the valve shaft

13. ➤ Insert the valve shaft (Fig. 26/1) in the disc lever (Fig. 26/2) and the retaining element (Fig. 26/4) in the body.
14. ➤ Remove the ring bolt from the bore (Fig. 26/3) in the disc lever.
15. ➤ Make sure that the swing check plate is properly seated in the body.

Replacing the body cover gasket

16. ➤ Replace the body cover gasket as described in [Chapter 8.3.1 "Replacing the body cover gasket"](#) on page 61/steps 5–8.

Attaching the body cover

- 17.** ▶ Attach the body cover as described in ↗ *Chapter 8.3.1 “Replacing the body cover gasket” on page 61/*steps 9–15.

Replacing the gland packing

- 18.** ▶ Replace the gland packing and attach the lever arm as described in ↗ *Chapter 8.3.3 “Replacing the gland packing” on page 75/*steps 17–29.

- 19.** ▶ Carry out the work for commissioning (↗ *Chapter 6.3 “Performing the commissioning process” on page 49*).

Version with valve shaft suspended in the body

- Personnel: ■ Industrial mechanic (for valves within the normal pressure range)

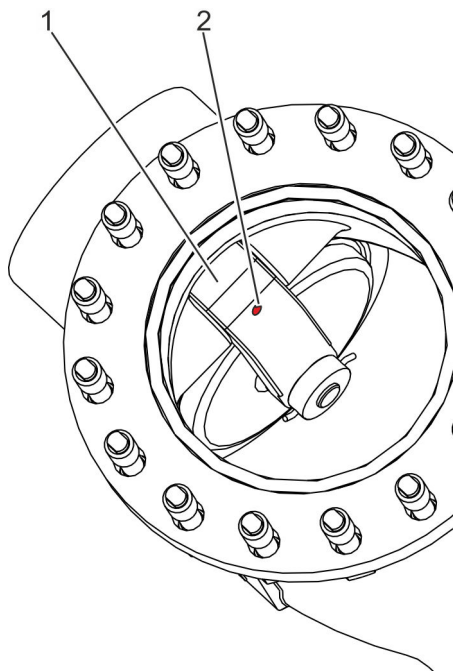
- Protective equipment: ■ Industrial hard hat
 ■ Safety goggles
 ■ Protective work clothing
 ■ Protective gloves
 ■ Safety footwear

- Special tool: ■ Hoist
 ■ Ring bolts
 ■ Knock-out tool

Prerequisites:

- The valve must have cooled down/heated up to ambient temperature.
- A depressurised state must have been established.

- 1.** ▶ Detach the body cover as described in ↗ *Chapter 8.3.1 “Replacing the body cover gasket” on page 61/*steps 1–4.



3. ➤ If there is a bore (Fig. 27/2) in the disc lever (Fig. 27/1): Insert the ring bolt into the bore in the disc lever.

4. ➤ Fasten the ring bolt to the hoist with suitable sling gear.

5. ➤

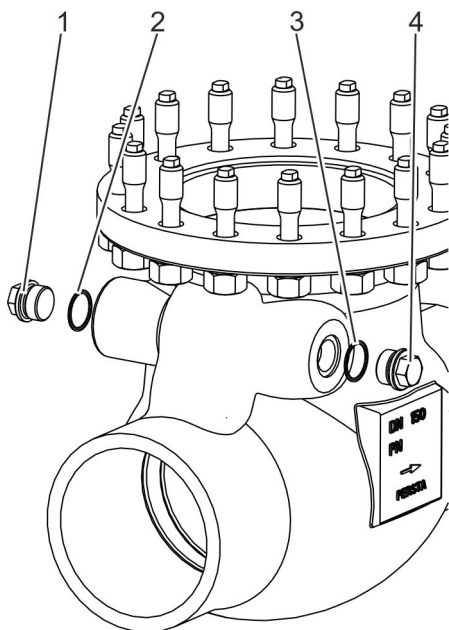


NOTICE!

Damage to the swing check plate!

Apply a hoist in such a way that the swing check plate cannot fall into the body after pulling out the valve shaft.

Fig. 27: Detaching the valve shaft



6. ➤ Undo and remove the locking bolts (Fig. 28/1 und 4) on both sides of the body.

7. ➤ Remove the sealing elements (Fig. 28/2 und 3) from the grooves in the body.

Fig. 28: Undoing the locking bolts

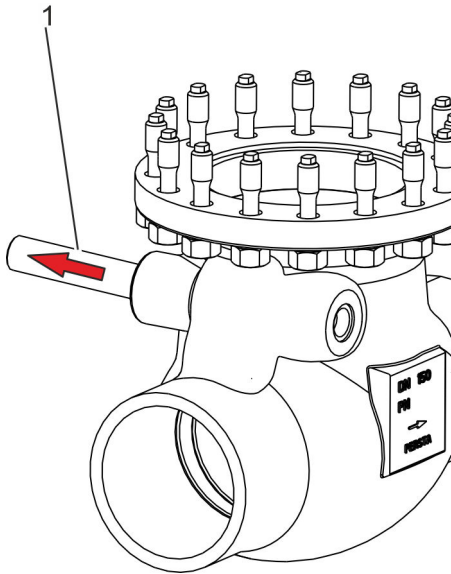


Fig. 29: Driving out the valve shaft

8. Carefully drive the valve shaft (Fig. 29/1) out of the body and the disc lever.
9. Lift the swing check plate attached to the hoist including disc lever out of the body and set it down, protected against damage.
10. Examine the swing check plate for wear.
11. If necessary, replace the old components with new components or have them reprocessed by a specialist external company.
12. Carefully insert the swing check plate attached to the hoist including disc lever into the body.
13. Make sure that the openings for the valve shaft in the body and in the disc lever are in alignment.

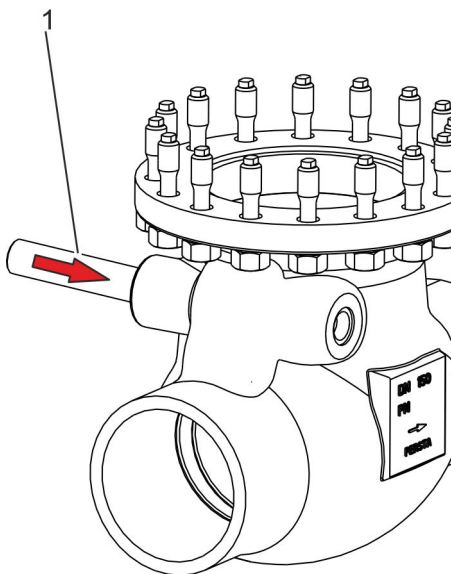


Fig. 30: Driving in the valve shaft

14. Carefully drive the valve shaft (Fig. 30/1) through the mount in the disc lever into the opening on the opposite side in the body.

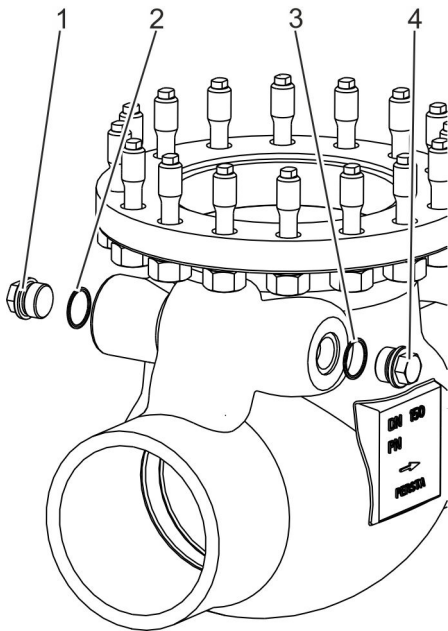


Fig. 31: Attaching the locking bolt and sealing elements

- 15.▶ Insert new sealing elements (Fig. 31/2 und 3) into the grooves in the body.
- 16.▶ Attach locking bolts (Fig. 31/1 und 4).

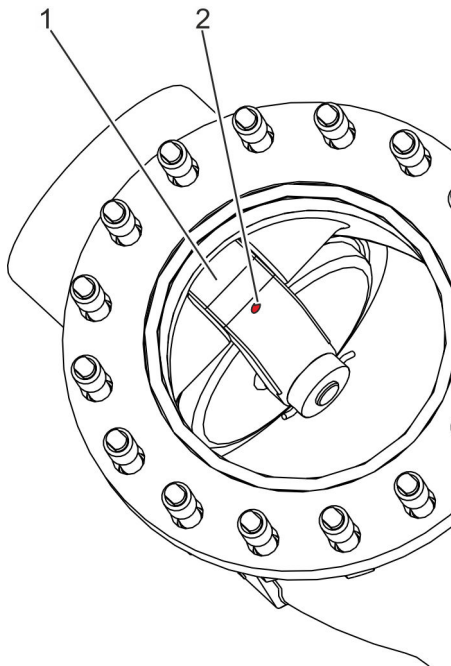


Fig. 32: Removing the ring bolt

- 17.▶ Remove the ring bolt from the bore (Fig. 32/2) in the disc lever (Fig. 32/1).
- 18.▶ Make sure that the swing check plate is properly seated in the body.

Replacing the body cover gasket

- 19.▶ Replace the body cover gasket as described in [Chapter 8.3.1 "Replacing the body cover gasket"](#) on page 61/steps 5–8.

Attaching the body cover

- 20.▶ Attach the body cover as described in [Chapter 8.3.1 "Replacing the body cover gasket"](#) on page 61/steps 9–15.

- 21.** Carry out the work for commissioning (☞ *Chapter 6.3 “Performing the commissioning process” on page 49*).

Version with valve shaft mounted in the body

- | | |
|-----------------------|---|
| Personnel: | ■ Industrial mechanic (for valves within the normal pressure range) |
| Protective equipment: | ■ Industrial hard hat |
| | ■ Safety goggles |
| | ■ Protective work clothing |
| | ■ Protective gloves |
| | ■ Safety footwear |
| Special tool: | ■ Hoist |
| | ■ Ring bolts |

Prerequisites:

- The valve must have cooled down/heated up to ambient temperature.
- A depressurised state must have been established.

- 1.** Detach the body cover as described in ☞ *Chapter 8.3.1 “Replacing the body cover gasket” on page 61/steps 1–4*.
- 2.** If there is a bore (Fig. 33/2) in the disc lever: Insert the ring bolt into the bore in the disc lever.
- 3.** Undo and remove the threaded connections (Fig. 33/1, 4 pieces) of the valve shaft’s bracket (Fig. 33/3).
- 4.** Remove the brackets (Fig. 33/3, 2 pieces).
- 5.** Fasten the ring bolt to the hoist with suitable sling gear.

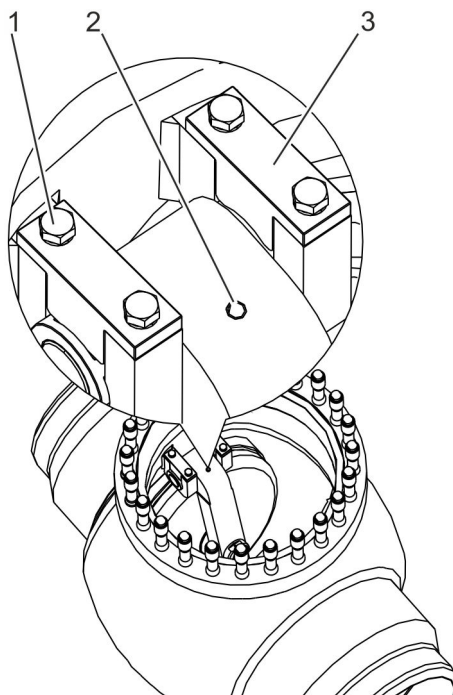


Fig. 33: Attaching the disc lever

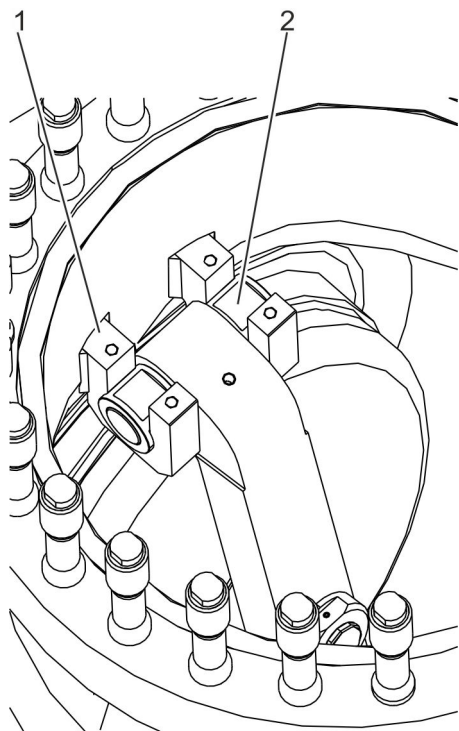


Fig. 34: Pay attention to the correct alignment of the bearing bushings

6. ➤



NOTICE!
Jamming bearing bushings!

Make sure that the end faces (Fig. 34/2) of the bearing bushings face upwards.

7. ➤

Lift the disc lever attached to the hoist, together with the swing check plate and valve shaft out of the retaining elements (Fig. 34/1) in the body.

8. ➤

Set disc lever down together with the swing check plate and the valve shaft, protected from damage.

9. ➤

Examine the swing check plate for wear.

10. ➤

If necessary, replace the old components with new components or have them reprocessed by a specialist external company.

11. ➤

Lift the disc lever attached to the hoist, together with the swing check plate and bearing bushings fitted carefully over the body.

12. ➤



NOTICE!
Jamming bearing bushings!

Align bearing bushings so that the end faces (Fig. 34/2) face upwards.

13. ➤

Insert the bearing bushings into the retaining elements (Fig. 34/1) in the body.

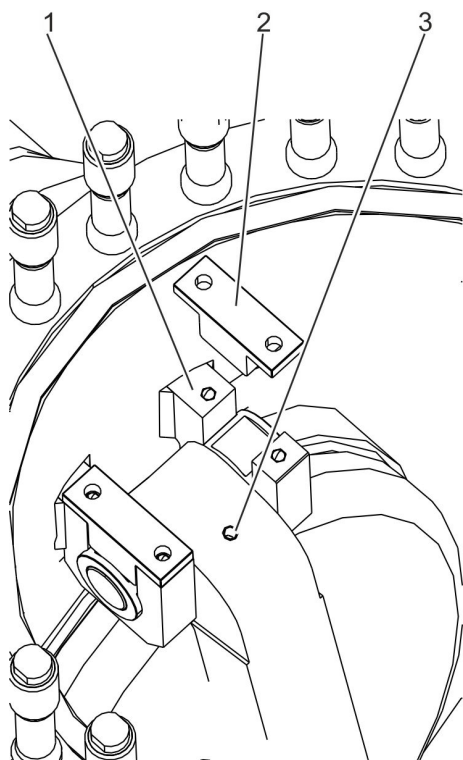


Fig. 35: Attaching the brackets

- 14.** Remove the ring bolt from the bore (Fig. 35/3) in the disc lever.
- 15.** Fit brackets (Fig. 35/2) on the retaining elements (Fig. 35/1).

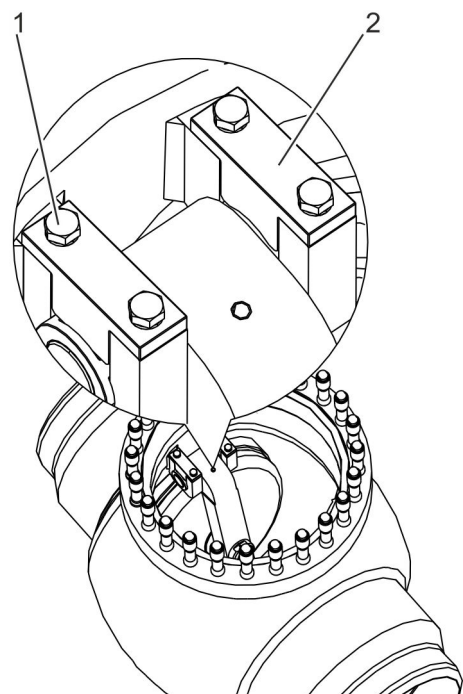


Fig. 36: Bolting brackets in place

- 16.** Use bolts and washers (Fig. 36/1) to fasten brackets (Fig. 36/2) in the retaining elements.
- 17.** Make sure that the swing check plate is properly seated in the body.

Replacing the body cover gasket

- 18.** Replace the body cover gasket as described in [Chapter 8.3.1 "Replacing the body cover gasket"](#) on page 61/steps 5–8.

Attaching the body cover

- 19.** ▶ Attach the body cover as described in [↗ Chapter 8.3.1](#) “Replacing the body cover gasket” on page 61/steps 9–15.
- 20.** ▶ Carry out the work for commissioning ([↗ Chapter 6.3](#) “Performing the commissioning process” on page 49).

8.3.3 Replacing the gland packing

Personnel:	■ Industrial mechanic (for valves within the normal pressure range)
Protective equipment:	■ Industrial hard hat
	■ Safety goggles
	■ Protective work clothing
	■ Protective gloves
	■ Safety footwear
Special tool:	■ Hoist
	■ Packing extractor
	■ Snap ring pliers

Prerequisites:

- The valve must have cooled down/heated up to ambient temperature.
- A depressurised state must have been established.

Version with spring

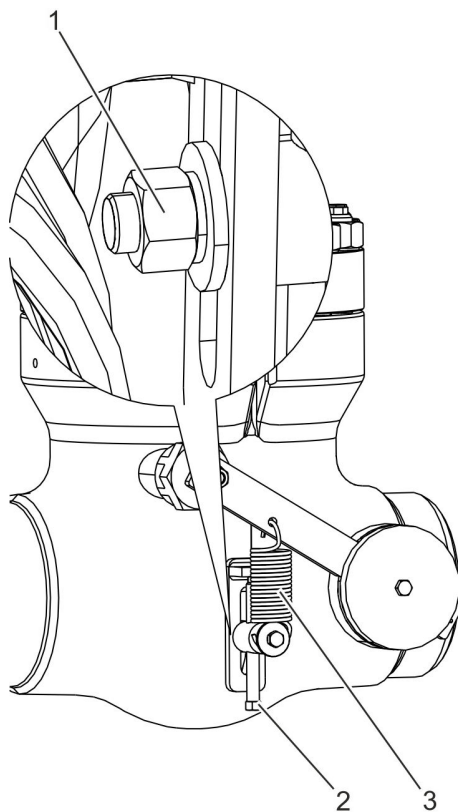


Fig. 37: Detaching the spring

1. → Carefully undo the retaining pin's fastening nut (Fig. 37/1).



Do not remove the fastening nut (Fig. 37/1) from the retaining pin.

2. → Undo the adjusting screw (Fig. 37/2) until the spring (Fig. 37/3) tension is released completely.

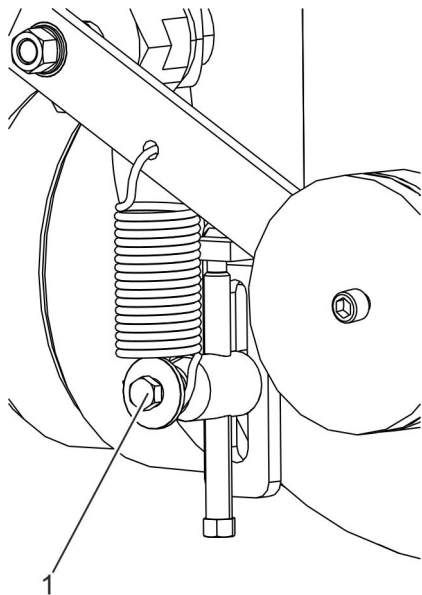


Fig. 38: Bolt on retaining pin

3. ➔



CAUTION!
Spring jumping off!

Carefully undo the bolt (Fig. 38/1) on the retaining pin.

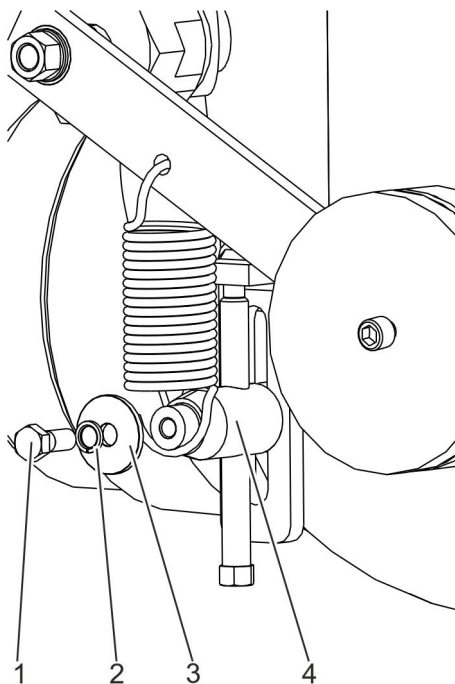


Fig. 39: Removing the bolt

4. ➔ Remove bolt (Fig. 39/1) together with lock washer (Fig. 39/2) and washer (Fig. 39/3).
5. ➔ Carefully pull the spring off the retaining pin (Fig. 39/4).



The spring may get caught on the lever arm.



See step 8 for subsequent procedure.

Version with damper

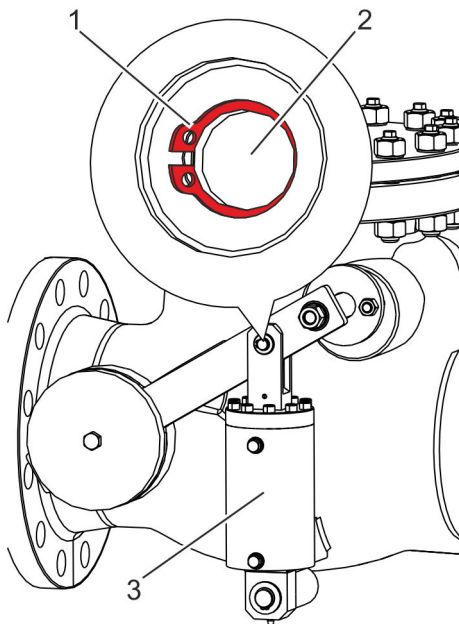


Fig. 40: Detaching the damper

6. →



CAUTION!
Snap ring under tension!

Use suitable pliers to remove the snap ring (Fig. 40/1).

7. →

Pull the retaining pin (Fig. 40/2) out of the fork head on the damper (Fig. 40/3) and lever arm.

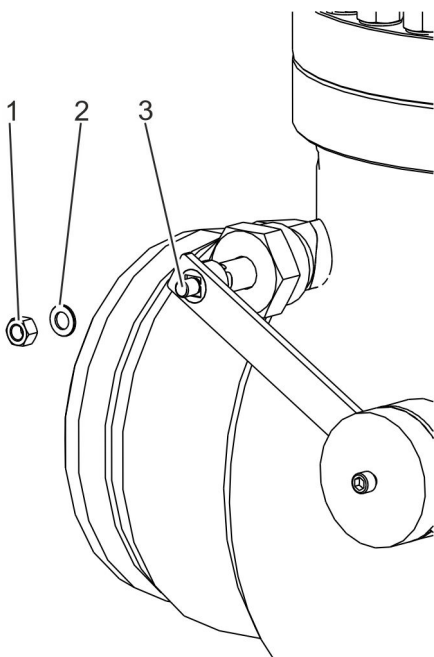


Fig. 41: Undoing the lever arm

8. →

Undo the nut at the end of the valve shaft and remove it together with the washer.

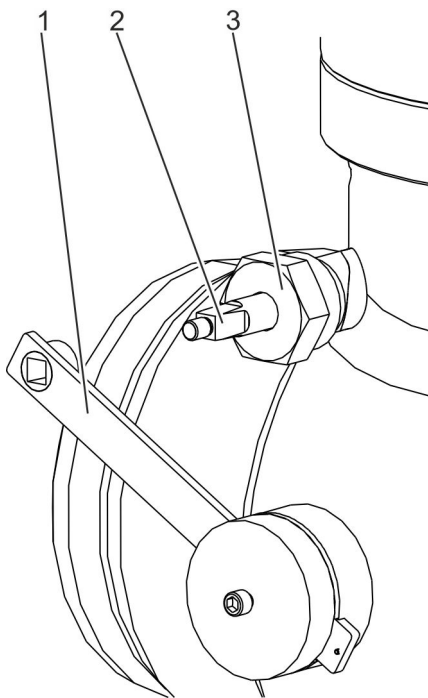


Fig. 42: Detaching the lever arm

9. ▶



Note down the installation position of the lever arm for subsequent installation.

Pull the lever arm off the valve shaft's square.

10. ▶



WARNING!

Risk of injury due to escaping medium!

Carefully undo the union nut.

11. ▶

Pull the union nut off the valve shaft.

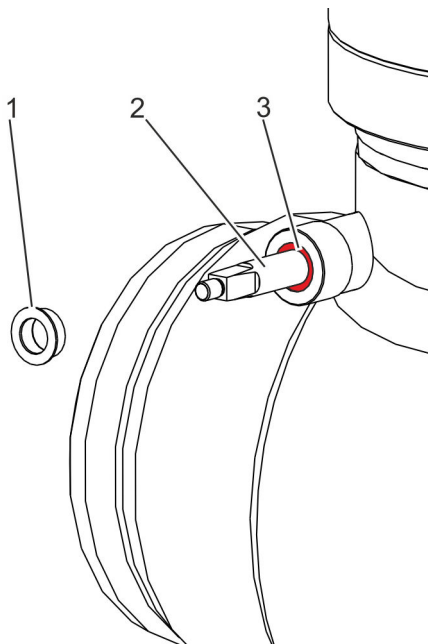


Fig. 43: Removing the gland packing

13. ▶

Pull the gland follower (Fig. 43/1) off the valve shaft (Fig. 43/2).

Replacing the gland packing

14. ▶

Use a packing extractor to remove the gland packing (Fig. 43/3).

15. ▶

Completely remove any residue from the gland packing.

16. ▶

Carefully clean the emptied packing chamber and the gland contact parts.

17.▶



WARNING!
Risk of injury due to the use of previously used sealing elements!

Attach the new gland packing (Fig. 43/3) to the valve shaft (Fig. 43/2).

18.▶

Attach the gland follower (Fig. 43/1) to the valve shaft (Fig. 43/2).

19.▶



WARNING!
Risk of injury due to wrong tightening torques!

Attach the union nut (Fig. 44/3) to the valve shaft (Fig. 44/2) and tighten it as specified by the manufacturer.

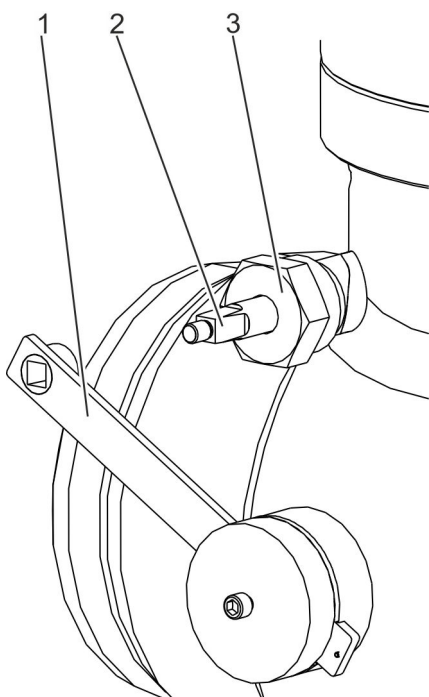


Fig. 44: Attaching the lever arm

Attaching the lever arm

20.▶



NOTICE!
Malfunction due to wrongly attached lever arm!

Attach the lever arm (Fig. 44/1) in its original position on the square of the valve shaft (Fig. 44/2).

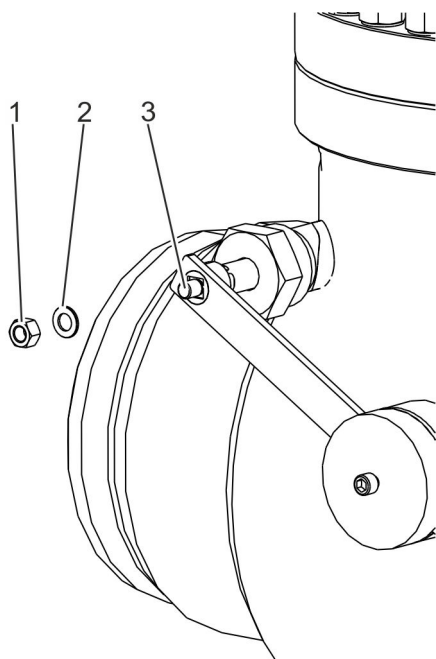


Fig. 45: Fastening the lever arm

- 21.** ▶ Fasten the lever arm with washer (Fig. 45/2) and nut (Fig. 45/1) to the valve shaft (Fig. 45/3).

Version with spring

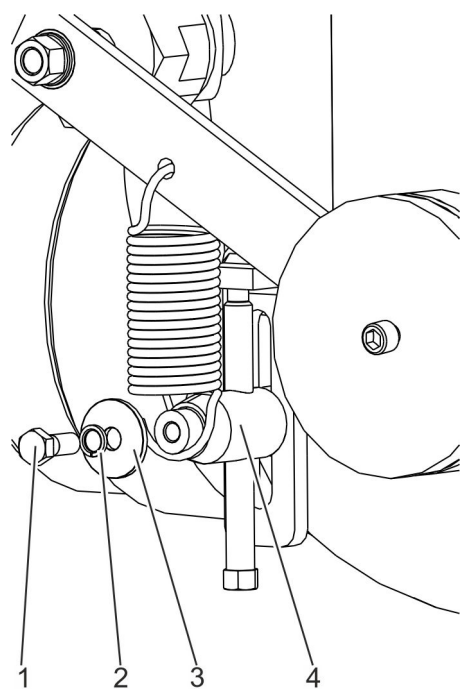


Fig. 46: Fastening the spring to the retaining pin

- 22.** ▶ Make sure that the spring is correctly engaged in the lever arm.

23. ▶



CAUTION!
Spring jumping off!

- Carefully engage the spring on the retaining pin (Fig. 46/4).
- 24.** ▶ Fasten the spring with washer (Fig. 46/3), snap ring (Fig. 46/2) and bolt (Fig. 46/1) to the retaining pin (Fig. 46/4).
- 25.** ▶ Make sure that the spring is correctly engaged in the lever arm and retaining pin.

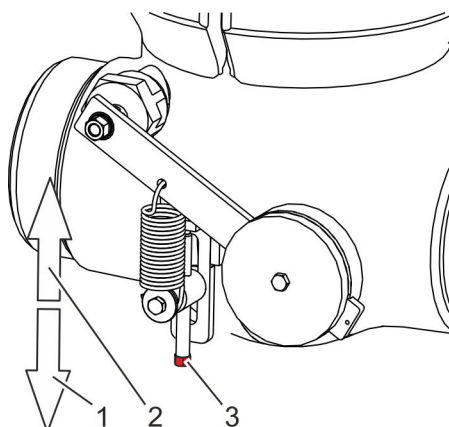


Fig. 47: Setting the preliminary spring tension

26. Use the adjusting screw (Fig. 47/3):

- Undoing the adjusting screw (screwing it in (Fig. 47/1)): reduces the closing support (lower preliminary spring tension)
- Tightening the adjusting screw (screwing it out (Fig. 47/1)): increases the closing support (higher preliminary spring tension)

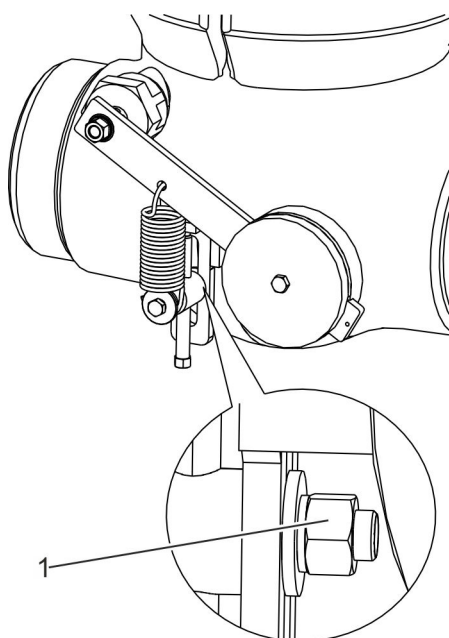


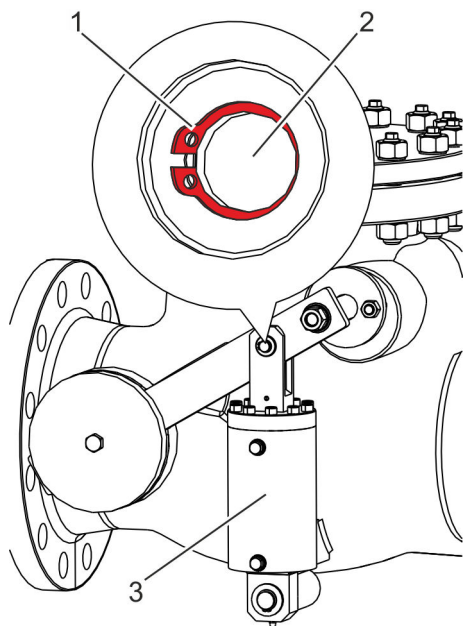
Fig. 48: Tensioning the spring

27. Tighten the retaining pin's fastening nut (Fig. 48/1).



See step 30 for subsequent procedure.

Version with damper



- 28.** ▶ Insert the retaining pin (Fig. 49/2) into the bores of the fork head on the damper (Fig. 49/3) and lever arm.
- 29.** ▶ Use suitable pliers to secure the retaining pin with snap ring.
- 30.** ▶ Carry out the work for commissioning (↪ Chapter 6.3 “Performing the commissioning process” on page 49).

Fig. 49: Attaching the damper

9 Removal, disposal

9.1 Safety instructions for dismantling

Pipeline medium

**WARNING!****Risk of injury due to pressurised pipeline medium!**

Depending on the version of the valve, injuries can be caused by the medium escaping under high pressure, regardless of whether the system is in operation or not.

- Do not undo the threaded connections.
- If threaded connections are loose, inform the operating company and have the pipe section in question shut off.
- If threaded connections are loose, have the cause of this clarified and eliminated. If necessary, have the manufacturer check the valve.

**WARNING!****Risk of impairing health due to the pumped medium!**

Direct contact with the pumped medium can adversely affect your health.

- Handle the pumped medium in accordance with the instructions in the manufacturer's safety data sheet.
- Wear the following protective equipment: protective gloves, safety footwear, safety goggles, protective work clothing.
- Collect any pumped medium that has run out without delay and dispose of it in an environmentally responsible manner.

Improper dismantling



WARNING!

Risk of injury due to improper dismantling!

Stored residual energy, sharp-edged components, points and corners on or in the valve, or on the required tools can cause serious injuries.

- Prior to starting work ensure that there is sufficient free space.
- Handle open, sharp-edged components carefully.
- Make sure that the working area is clean and tidy! Loosely stacked components or components and tools that are lying about may cause accidents.
- Dismantle components properly. Pay attention to the high dead weight of some of the components. If necessary, use hoists.
- Secure the components so that they do not fall down or fall over.
- Always consult Stahl-Armaturen PERSTA GmbH customer service (contact details on page 4) if anything is unclear.

Heavy weight of the valve



WARNING!

Danger of injury due to the heavy weight of the valve!

The heavy weight of the valve, and of its components, can result in severe injuries.

- Transport valves with a suitable hoist or forklift.
- Use approved and functional sling gear.
- Safeguard valves and components from falling over.

Suspended loads

WARNING!
Danger of injury due to suspended loads!

Suspended loads can cause dangerous situations that can result in severe injuries.

- Do not step under suspended loads.
- Wear protective equipment: Industrial hard hat, safety footwear.
- Transport loads as close to the ground as possible.
- Only use approved sling gear and hoists.
- Ensure that hoist and sling gear have sufficient load-bearing capacity.

9.2 Removal

Personnel:	<ul style="list-style-type: none"> ■ Industrial mechanic (for valves within the normal pressure range) ■ Forklift truck driver ■ Trained person (operator) ■ Trained person (hoist) ■ Disposal contractor
Protective equipment:	<ul style="list-style-type: none"> ■ Industrial hard hat ■ Safety goggles ■ Protective work clothing ■ Protective gloves ■ Safety footwear
Special tool:	<ul style="list-style-type: none"> ■ Hoist ■ Sling gear

Requirements:

- The relevant pipe section is shut off.
 - Valve is in depressurised state.
 - Valve has been drained.
- 1.** ➤ Hold the valve in position with a suitable hoist (☞ *“Transporting individual valves: Version with welded-on attachment points” on page 34*).
 - 2.** ➤ Disconnect pipes on inlet side and outlet side from the valve.
 - 3.** ➤ Remove any supports, if necessary.
 - 4.** ➤ Use a suitable hoist to remove the valve from the pipe and set it down so that it is secured against falling over.

5. Clean the assemblies and components as required, and take them apart.

In doing so, comply with local occupational health and safety regulations.

9.3 Disposal

If a return or disposal agreement has not been concluded, then recycle dismantled components:

- Scrap metals.
- Recycle plastic elements.
- Sort and dispose of all other components according to material condition.



ENVIRONMENT!

Hazards for the environment due to improper disposal!

Hazards for the environment can occur due to improper disposal.

- Have electrical scrap and electronic components, lubricants and other auxiliary materials recycled or disposed of by approved specialist companies.
- If in doubt, contact the local authorities or specialist disposal companies for information regarding the environmentally compatible disposal.

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