



Safety Breakaway Coupling ASVL

Operating Instruction



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1 Introduction

These operating instructions describe how to safely assemble and operate the ASVL breakaway coupling.

- Read these operating instructions carefully prior to assembling and operating the product.
- These operating instructions must be retained for the entire service life of the breakaway coupling.
- Make sure that this instruction manual is accessible to the operator at all times.
- These operating instructions must be passed on to each subsequent owner or user of the breakaway coupling.
- Insert every supplement issued by the manufacturer.
- Note the other applicable documents..

1.1 Validity

These operating instructions apply exclusively to the assembly and operation of ASVL breakaway couplings manufactured by Stäubli Hamburg GmbH.

1.2 Target Group

These operating instructions for the ASVL breakaway coupling are aimed at the operators and planners of filling systems. The breakaway coupling is a safety component in a hose line/pipeline, which leads from a tanker facility to a mobile delivery and disposal unit.

1 Introduction

1.3 Warnings, symbols and markings

1.3.1 Warnings in this documentation

These operating instructions use warnings to prevent injuries to persons or damage to equipment.

→ Read and observe all warnings.

The warnings are identified by the following symbols and signal words:

 DANGER
Imminent danger! Failure to observe this warning may result in serious injury or death.

 WARNING
Possible danger! Failure to observe this warning may result in serious injury or death.

 CAUTION
Hazardous situation! Failure to observe this warning may result in minor injuries.

1.3.2 Symbols and markings

These operating instructions use symbols and markings to ensure easy and quick comprehension.

Symbol	Description
✓	A prerequisite that must be fulfilled before you begin an action.
→	An action involving one or more steps, the sequence of which is not relevant.
1. 2. 3. ...	An action involving multiple steps, the sequence of which is relevant and therefore specified.
	First level list
(see Chapter xx, p. xx)	Cross reference to a specific location in these operating instructions

Table 1-1: Symbols and signs

! Note
Important information for understanding or optimising the assembly sequences.

1 Introduction

1.4 Fields of application

The breakaway coupling is designed for use on hoses or pipelines. No specific flow direction is prescribed for the medium being conveyed.

1.4.1 Industries

- Plant engineering and construction
- Power plant construction
- Chemical industry
- Food processing industry
- Process technology
- Tank cleaning
- Filling systems for:
 - airfields
 - railroad tank waggons
 - tanker trucks
 - ships
 - tank containers
 - loading and unloading liquid gas

1.4.2 Media

- Lyes and acids
- Fuels and oils
- Gases
- Materials hazardous to the environment and water

2 Safety instructions

2.1 Intended use

ASVL series breakaway couplings are intended for use on hoses and pipelines as a piece of equipment with a safety function in accordance with the Pressure Equipment Directive.

They are provided to allow a hose line or pipeline to separate when a length defined by a load cable is exceeded and to seal both line ends to prevent any leakage of hazardous media.

The breakaway coupling may only be used after it has been correctly attached to the tank and hose line and after a leak test has been performed.

The connection of the cable for releasing the breakaway coupling must comply with the specified release force (*Table 6-4*; Chapter 6.6.2, p. 17) by offering a minimum safety factor of 5.

The breakaway coupling is provided exclusively to convey the approved media.

Any other use shall be regarded as improper use. Examples of misuse include:

- Use outside the specified pressure and temperature ranges.
- Inadequate attachment of the load cable

The standard breakaway coupling version described here is not suitable for permanent installation on a transportable pressure unit in accordance with TPED Directive 2010/35/EU.

The breakaway coupling shall not be used as a safety fitting for pressure-limiting.

2 Safety instructions

2.2 Safety regulations

The operator of the breakaway coupling is responsible for complying with all relevant legal regulations and directives.

- ➔ Breakaway couplings must only be commissioned, operated and maintained in accordance with the following regulations and standards.
 - Operating Instructions
 - Other applicable documents (country-specific ordinances on pressure equipment, operational safety, hazardous goods and environmental protection)
 - Regulations regarding hazardous substances and highly inflammable or combustible fluids
 - Regulations for systems in areas where there is a risk of explosion
This applies in particular to the prevention of sparking caused by static electricity, to the earthing of system components and the volume resistivity of the conductive hose line.
 - Use in explosive atmospheres only with undamaged impact ring.
 - System-specific regulations and requirements
 - Equipment and product safety legislation for pressure equipment
 - Valid international, national and regional regulations
 - Accident prevention regulations
- ➔ Ensure that the breakaway coupling, tank and hose line is accepted by suitably qualified personnel (experts, trained personnel, professional training, professional experience) and that acceptance is documented by these persons.
- ➔ Observe all approval procedures, required test regulations and test periods.
- ➔ Pre-commissioning and post-maintenance inspections must only be carried out by suitably qualified personnel (experts, trained personnel, professional training, professional experience). Take account of the certified specialist requirement in accordance with §62 WHG.

- Implement all the necessary measures for inspection, maintenance and repair in accordance with the national regulations in the country of use.
- The maintenance and repair intervals are to be specified by the operator.
- Check the breakaway coupling at least once monthly to ensure that it is in proper condition and free of leaks. Document the results of the inspections.
- If the breakaway coupling is part of a system that requires testing, have the breakaway coupling checked by the expert during the first and all subsequent inspections.
- A risk analysis for the system and the media being conveyed is to be compiled by the operator.
 - Note the specifications of the professional association for the chemical industry.
- The operator must ensure that the breakaway coupling is suitable for transporting the medium. This applies in particular to aggressive or abrasive media that can damage the breakaway coupling or the components of a hose line by chemical reaction, corrosion or erosion.

2 Safety instructions

2.3 Personnel qualification

The operator is responsible for ensuring that assembly, maintenance, commissioning is only carried out by educated and trained specialists.

At this point, we would like to draw your attention to the certified specialist requirement in accordance with §62 WHG.

The operator must provide competent and trained personnel, who can demonstrate in their dealings with hose lines, breakaway couplings, a familiarity with the respective required medium and its potential hazards, the relevant safety regulations and the regulations of the relevant professional associations.

- ➔ Make sure that the personnel have understood and can implement these operating instructions.
- ➔ Make sure that the personnel know and comply with the relevant accident prevention and safety regulations.
- ➔ Make sure that the personnel are using suitable protective clothing/equipment.
- ➔ Make sure that the personnel have special qualifications in handling approved couplings in the Ex area.

2.4 Safe handling

- Before operating the breakaway coupling, check it to ensure that it functions properly and is free of leaks.
- Check that the control cable and cable tie mount are securely attached and of adequate strength.
 - The tensile strength of the anchorage must be at least 5 times greater than the release force of the breakaway coupling.
- Before filling or emptying tanks, attach the control cable to a suitable fixed anchorage close to the tap connection.
- When using the breakaway coupling in an elevated position, make certain that people cannot be injured by falling parts of the coupling.

3 Storage and transport

- Only transport or store the breakaway coupling in the cleaned condition.
- Cover openings with suitable seals to prevent any impairment of the surfaces/mating surfaces and to protect these against contamination.
- Make sure that no damage can occur at the storage location as a result of corrosion or extreme temperatures.

4 Scope of delivery

4 Scope of delivery

The ASVL breakaway coupling is supplied ready to use, with sealing caps for both openings and with a transport lock for the load cable.

5 Tools

For assembling the breakaway coupling:

Wrench with suitable width across flats (for information on nominal widths, see *Table 6-2*, p. 15). Wrench is not included in scope of delivery.

6 Design and mode of operation

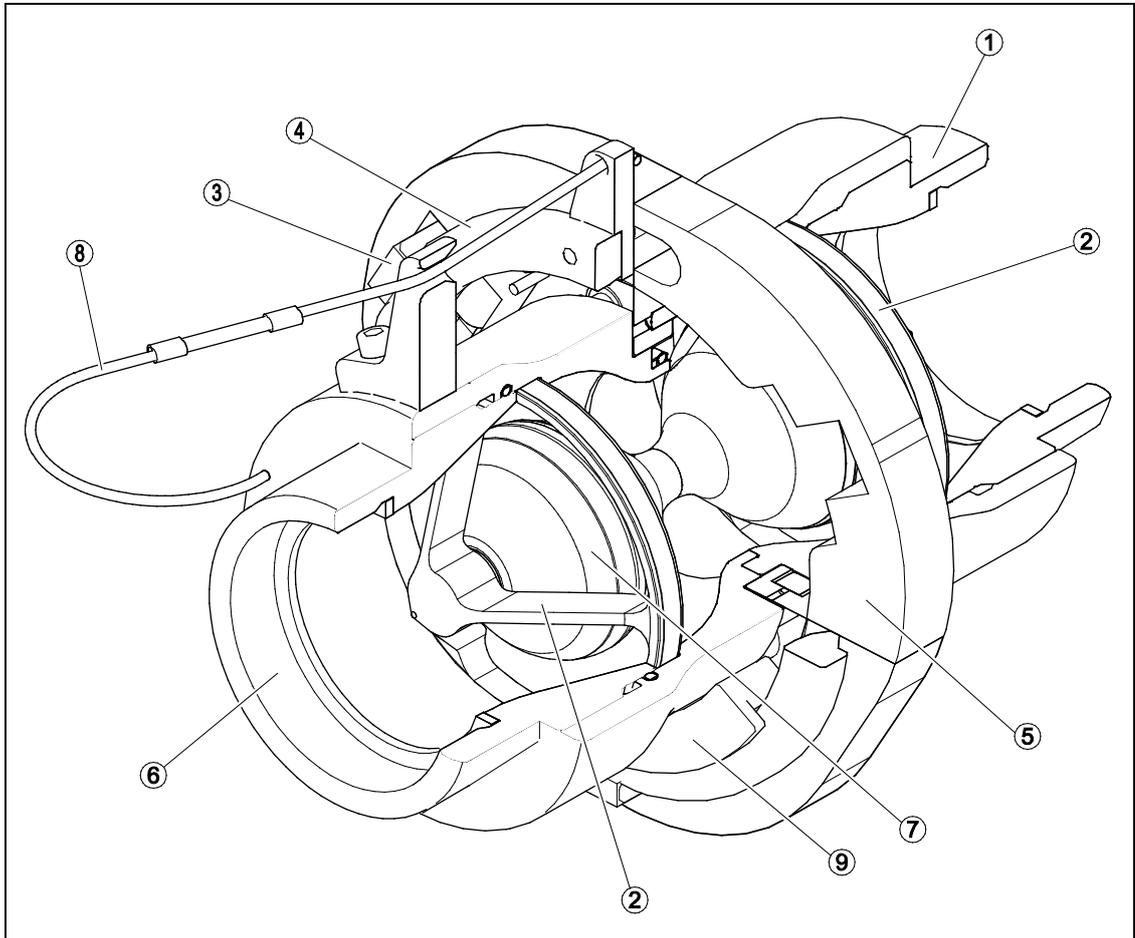


Figure 6-1: Breakaway coupling ASVL with threaded connection

- | | |
|--------------------|--------------------|
| 1 Tank thread ASVL | 6 Hose thread ASVL |
| 2 Spider | 7 Non-return valve |
| 3 Rocker arm | 8 Trigger cable |
| 4 Support ring | 9 Transport lock |
| 5 Impact ring | |

6 Design and mode of operation

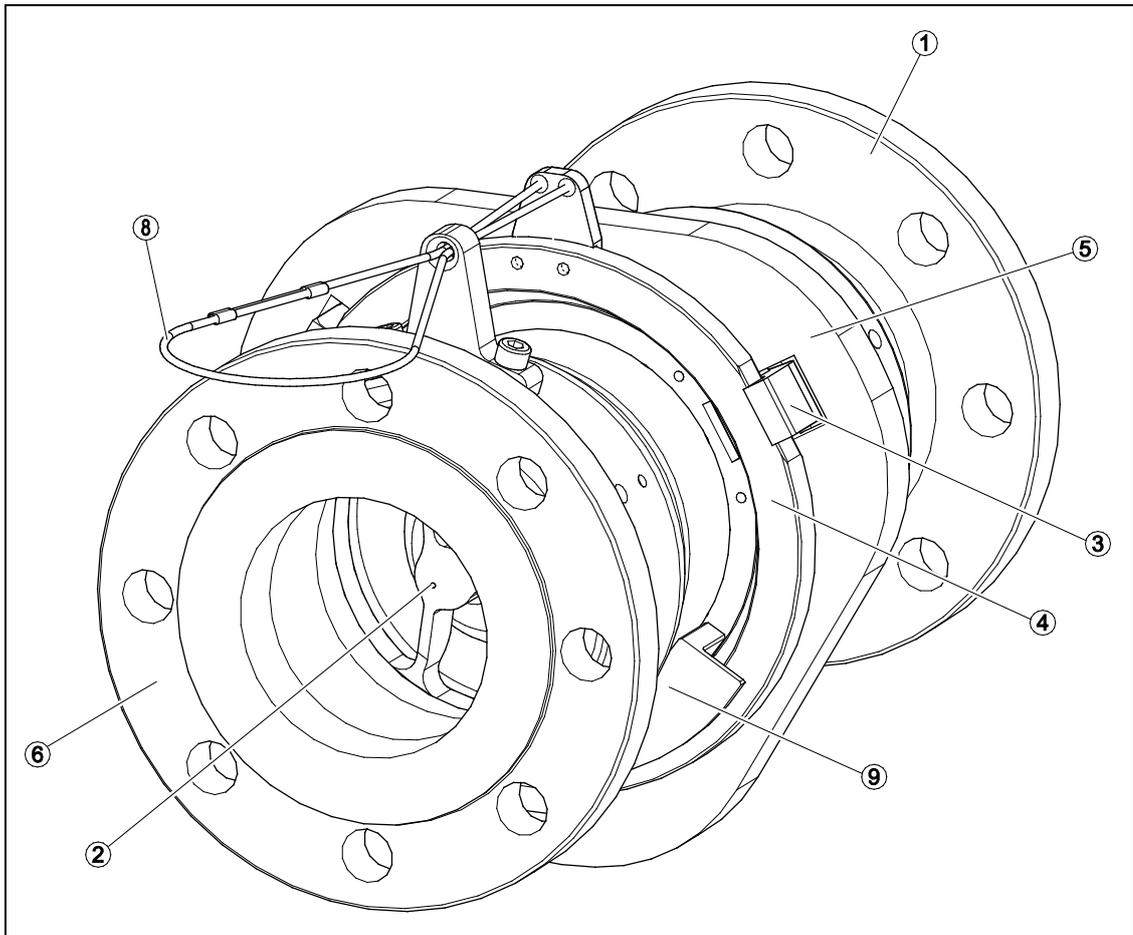


Figure 6-2: Breakaway coupling ASVL with flanged connection

- | | |
|--------------------|--------------------------------|
| 1 Tank flange ASVL | 6 Tank flange ASVL |
| 2 Spider | 7 Non-return valve (not shown) |
| 3 Rocker arm | 8 Trigger cable |
| 4 Support ring | 9 Transport lock |
| 5 Impact ring | |

6.1 Mode of operation

The ASVL breakaway coupling consists of two coupling halves, each of which is equipped with a non-return valve. The coupling halves are held together in the operating state by three rocker arms and a support ring. The two non-return valves brace each other in the operating state and keep the flow cross-section open.

Separation of the breakaway coupling is initiated, for example, if the tank wagon /tanker truck rolls away or if the product line was not disconnected before the tanker truck drives off.

Before the product line is strained by an impermissible action of force, the support ring is pulled from under the arms by means of a control cable attached to the system. The arms then release the casing halves.

In the event of a separation, the non-return valves abruptly close both line ends. One coupling half remains attached to the tank wagon/tanker truck, the second coupling half remains attached to the product line.

Uncontrolled leakage of fluids or gases from the two product-conveying line ends is prevented.

6 Design and mode of operation

6.2 Marking

Each coupling half is provided with a marking.

The marking contains the following information:

Marking	Meaning
TÜ.AGG.214-94	Component marking
CE 0575 II 2G c TX	CE marking with the ID number of the certification body, Ex marking
Manufacturer's code: Stäubli Hamburg	Manufacturer identification
ASVL.080300.120-01	Item number to identify the product
Nr.1038/11	Serial number/year of manufacture
Consecutive Nr. 74865/1.4571	Consecutive no. / material name (housing)
Ü	Conformity identifier for construction products Z-38.4-254
DN PN TS	Nominal width, pressure stage, temperature range

Table 6-1: Marking on the casing

6.3 Nominal widths and pressure stages

Nominal width	Connection variants	Pressure stage	Width across flats Connection
DN 50	G2" IG/AG	PN 25	70
DN 80	G3" IG/AG	PN 25	100
DN 100	G4" IG/AG	PN 25	125
	Flange ASA 300 Flange EN 1092-1	PN 16 PN 25	–
DN 150	Flange ASA 150	PN 10	–
	Flange ASA 300 Flange EN 1092-1	PN 16 PN 25	
DN 200	ANSI 150 PSI	PN 10	–
	ANSI 300 PSI	PN 16	
	Flange EN 1092-1	PN 25	

Table 6-2: Nominal widths and pressure stages

6.4 Temperature range

The breakaway coupling is approved for temperatures between –40 °C and +150 °C. The permissible temperature range is dependent on the sealing material used and the medium conveyed and must be tested for the specific application.

6.5 Release angle

The maximum angle of force application at which emergency separation is guaranteed is 90° to the longitudinal axis of the coupling, rotationally symmetric to all sides.

6 Design and mode of operation

6.6 Technical data

6.6.1 Materials

Component	Material no./ short description	Material	Temperature
Body, pressure-loaded parts	1.4571	X6CrNiMoTi17122 (AISI 316 Ti)	-40/150°C
	2.4602	NiCr21Mo14W (Hastelloy C22)	-40/150°C
	2.4610	NiMo16Cr16Ti (Hastelloy C4)	-40/150°C
Spring/standardised components	1.4401, 2.4602, 2.4600	X12CrNi177NiCr21Mo14W	-40/150°C
O-ring seals	FKM	Viton™	-20/150°C
	Ethylene-propylene-diene monomer EPDM	Sodium-butadiene AP	-40/150°C
	NBR	Perbunan	-20/100°C
	Perfluorelastomer FFKM	Kalrez™ Chemraz™	-40/150°C
Thread seal	PTFE	Teflon™	-40/150°C

Table 6-3: Materials

¹ Kalrez™, Viton™, Teflon™ = registered trademarks of DuPont

Note

Other materials for casing and seals available on request.

6.6.2 Release force and residual amounts

Nominal width	Release force in KN at 25 bar nominal pressure Pulling direction 0°	Release force in KN at 25 bar nominal pressure Pulling direction 90°	Residual amount cm ³
DN 50	0,5	0,7	140
DN 80	0,7	0,8	450
DN 100	1,2	2,0	830
DN 150	2,8	5,0	2000
DN 200	4,3	6,5	5100

Table 6-4: Release force and residual amounts

The system-side cable connection must be designed with 5-fold safety.

Values for the Maximum leakage, including 2-fold safety.

7 Installation/assembly

- ➔ Before commissioning/assembly, read and follow the instructions in Chapter 2
- ➔ During assembly, avoid the introduction of additional forces, bending moments or vibrations at the connection coupling.

Tools required for assembly:

- ➔ Use a suitable tool for the wrench flats provided on the breakaway coupling.
Nominal widths, see Table 6-2, p. 15.

The breakaway coupling is installed directly in a product line (between the hose line and pipeline). The breakaway coupling is ready for use once the transport lock has been removed.

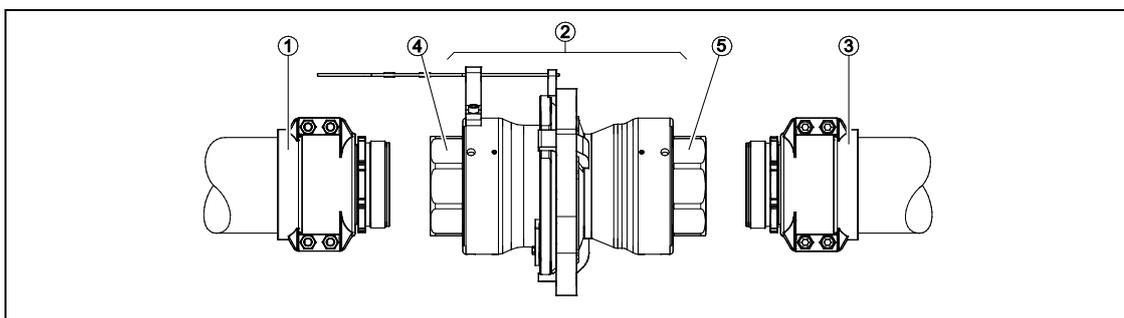


Figure 7-1: Assembling the breakaway coupling

- | | |
|---------------------------|-----------------------------|
| 1 Hose line/pipeline 1 | 4 Connection 1 |
| 2 Breakaway coupling ASVL | 5 Connection 2 |
| 3 Hose line/pipeline 2 | 6 Screw-on caps (not shown) |

7.1 Fitting the breakaway coupling

⚠ Caution

Risk of injury from sharp edges and burrs!

→ Wear protective gloves.

⚠ Caution

Risk of injury due to escaping fluids and danger of environmental damage!

→ Wear protective clothing.

→ Completely drain the product-conveying lines.

→ Use a suitable collecting vessel

⚠ Caution

Risk of injury with wider nominal widths of the breakaway coupling!

→ Use suitable lifting equipment.

→ Carry out the assembly with a second person.

→ Wear protective clothing.

1. Remove all packaging and screw-on caps.
2. Check the breakaway coupling for signs of damage.

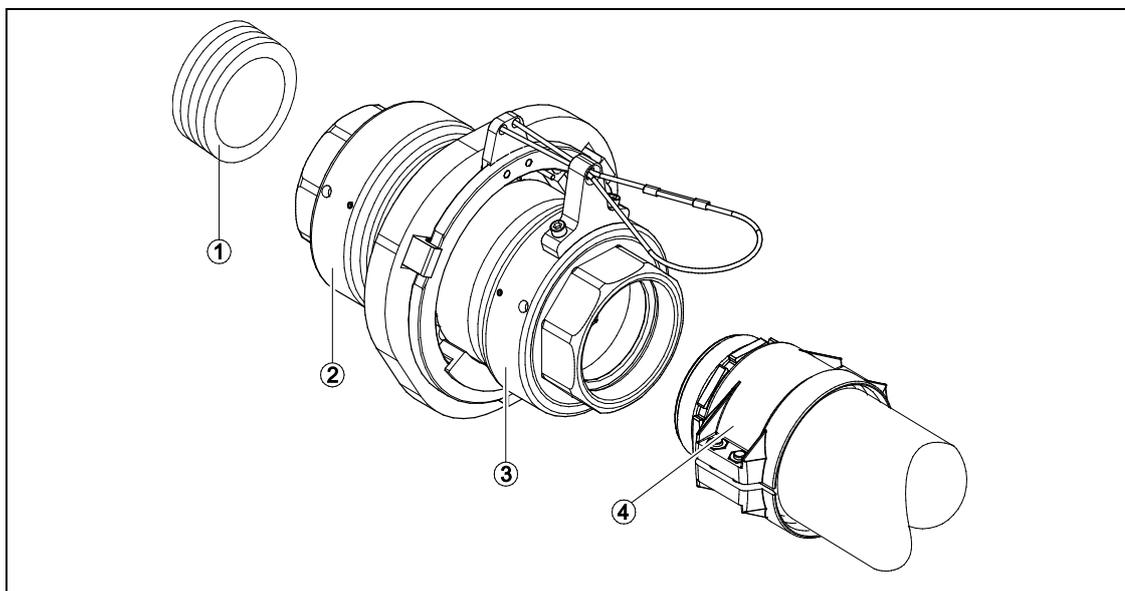


Figure 7-2: Attaching the hose line

3. Tightly screw the coupling end without the cable guide 2 to the tank wagon/tanker truck 1.
4. Tightly screw the hose line end 4 to the coupling end with the cable guide 3.
 - Take care that the hose is not twisted in the process.
 - Do not use sealing aids (such as PTFE tape).

! Note

The coupling end with the cable guide must always point in the direction where the loose end of the cable is to be attached.

We recommend connecting the control cable as described above. Connection in the reverse direction is possible following consultation with the manufacturer.

5. Check that the connections are free of leaks.

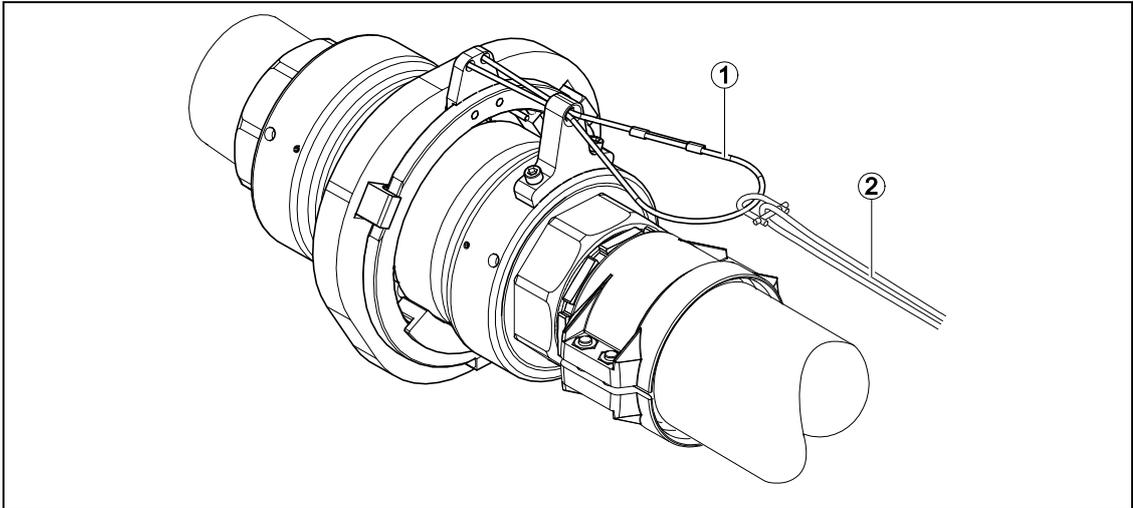


Figure 7-3: Attaching the control cable

6. Attach the release cable 1 on the breakaway coupling to a suitable control cable 2.

⚠ Warning

Risk of injury due to escaping fluids and danger of environmental damage!

- ➔ Make sure that the control cable is shorter than the product line.
- ➔ Make sure that the minimum tensile strength of the entire cable connection has a safety margin of at least 5 times the maximum release force (see Table 6-4, p. 17).
- ➔ Do not exceed the maximum release angle of 90°.

7. Attach the control cable to a tie bar.
8. Position the tie bar on the system side so that the control cable is tensioned earlier than the hose line for every conceivable type of release.

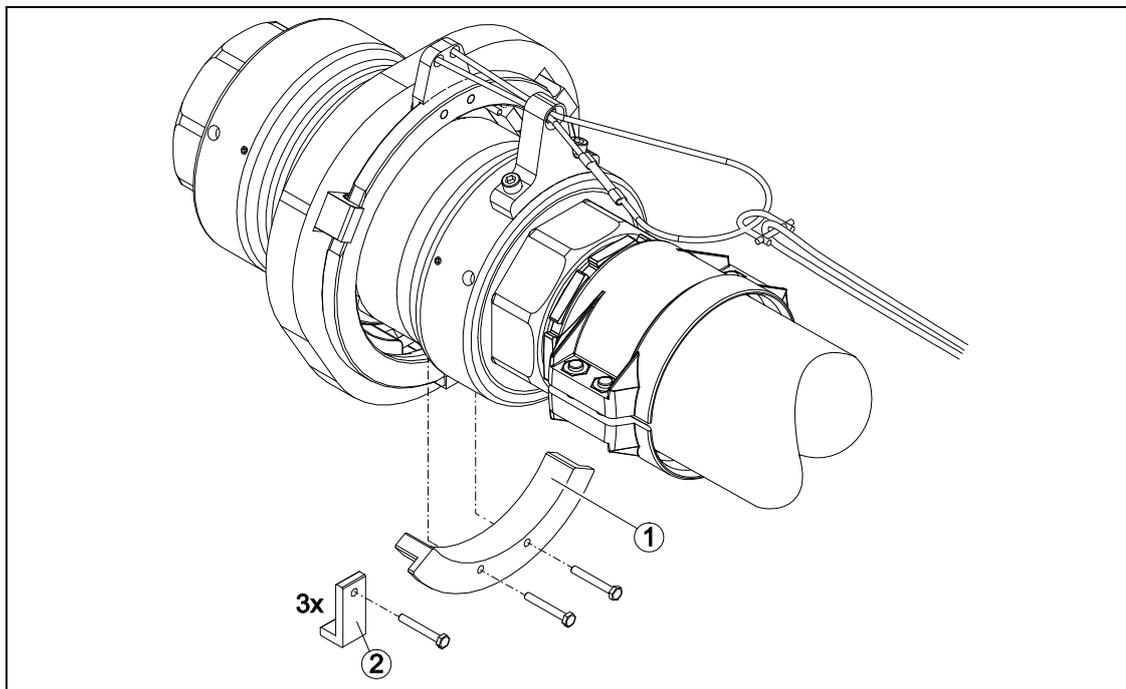


Figure 7-4: Removing the transport lock

9. Remove the transport lock 1 or 2.
 - DN 50 – DN 80 loosen the 2 hexagon bolts and remove the red ring 1 on the extension ring.
 - DN 100 – DN 200 loosen the 3 hexagonal bolts and remove the 3 red spacers 2.

8 Commissioning

- ✓ Breakaway coupling properly fitted in a system
- ✓ Functional tests as well as leak tests inspected by approved bodies
- ✓ Proper state of the control cable and its anchorage checked by competent personnel

- ➔ Always check the following points before commissioning:
 - Condition of the control cable
 - Connection of the control cable
 - Correct position of the release mechanism
 - Seal of the breakaway coupling
 - Seal of the connection from the system (product line, tank/tanker truck) to the breakaway coupling
 - Conductivity of the entire product line
 - Electrical volume resistivity ($R \leq 10 \Omega$) complied with?

- ➔ If the breakaway coupling is damaged or if you are aware of pre-existing damage which could lead to a malfunction, do not use the breakaway coupling.

- ➔ Start up the system, start conveying and/or pump operation.
Observe the operating instructions for the system.

9 Operation

Warning

Risk of injury due to falling coupling casing!

If using the breakaway coupling in an elevated position, persons may be injured if part of the casing falls.

→ Make sure that no persons are standing directly beneath the breakaway coupling.

Warning

When released, the breakaway coupling separates abruptly!

The conveyed medium may spray into the eyes.

→ Wear protective goggles.

Caution

Emergency separation cannot be guaranteed if the release angle is exceeded!

→ Do not exceed the maximum release angle of 90°.

- ✓ Both product line ends properly connected and ready for use
- ✓ Breakaway coupling closed
- ✓ Control cable secured

The breakaway coupling separates if the maximum travel (tension of the control cable) is exceeded.

10 Procedure after release of the breakaway coupling

Warning

Risk of injury due to escaping fluids and danger of environmental damage!

Fluids may escape when the breakaway coupling is released or if closures are opened.

→ Wear suitable personal protective equipment.

Note

Once released, the breakaway coupling cannot be reused.

The coupling must be repaired by the manufacturer or an authorised service agent.

→ Clean the breakaway coupling of product residues.

→ Send the breakaway coupling for repair to Stäubli Hamburg GmbH or to an authorised service agent.

11 Cleaning

- ➔ Each time before cleaning, check the breakaway coupling and connections for leaks.
- ➔ Only use suitable cleaning agents for cleaning.
- ➔ When adhesive or setting products are used, produce residues must be cleaned from the breakaway coupling after each use.
- ➔ Clean the breakaway coupling (regardless of the conveyed medium) prior to disassembly.
- ➔ Remove any cleaning agent residues.

12 Dismantling

Warning

Risk of injury due to escaping fluids and danger of environmental damage!

Fluids may escape when the breakaway coupling is released or if closures are opened.

- Wear suitable personal protective equipment.
- Make sure that the coupling halves are unpressurised and that the hose line is completely drained.
- Use suitable tools.

→ Clean the coupling before dismantling it, see Chapter 11, p. 26.

→ Use a suitable wrench to unscrew both coupling halves.

13 Maintenance/repair

- The operator must specify the maintenance and repair measures and intervals in accordance with the operating conditions. These include:
 - Checking the breakaway coupling for signs of damage or defects.
 - Checking that the breakaway coupling is in a functional state and free of leaks.
 - Water pressure tests with 1.5 times overpressure
- Do not use a damaged breakaway coupling.
- Carry out regular maintenance, at the latest after one year.
- Do not reuse the breakaway coupling once it has released. Repair by the manufacturer is required in every case.
- Have maintenance and repairs to the breakaway coupling carried out by Stäubli Hamburg GmbH or by companies/persons authorised by Stäubli Hamburg GmbH.
- Perform visual inspections at regular intervals.
 - Checking the breakaway coupling for signs of damage or defects.
 - Checking that the breakaway coupling is in a functional state and free of leaks.
- Eliminate identified faults immediately or permanently decommission the breakaway coupling.
- Adhere to and document the specified maintenance intervals.

 Note

Damage to the breakaway coupling caused by repairs carried out by unauthorised persons.
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- | |
|--|
| <ul style="list-style-type: none">→ Do not attempt to carry out repairs yourself.→ A defective breakaway coupling may only be repaired by Stäubli Hamburg GmbH or companies/persons authorised by Stäubli Hamburg GmbH. |
|--|

14 Disposal

- ➔ Observe the relevant national and regional regulations when disposing of or recycling the breakaway coupling or its components.
- ➔ Should you have any questions on how to dispose of the breakaway coupling, please contact the manufacturer or an authorised specialist..

15 Warranty

Stäubli Hamburg GmbH accepts no responsibility for damages due to faulty installation, faulty handling, as well as negligent or incorrect maintenance.

The operator is solely responsible for the installation, operation, and maintenance of the coupling.



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