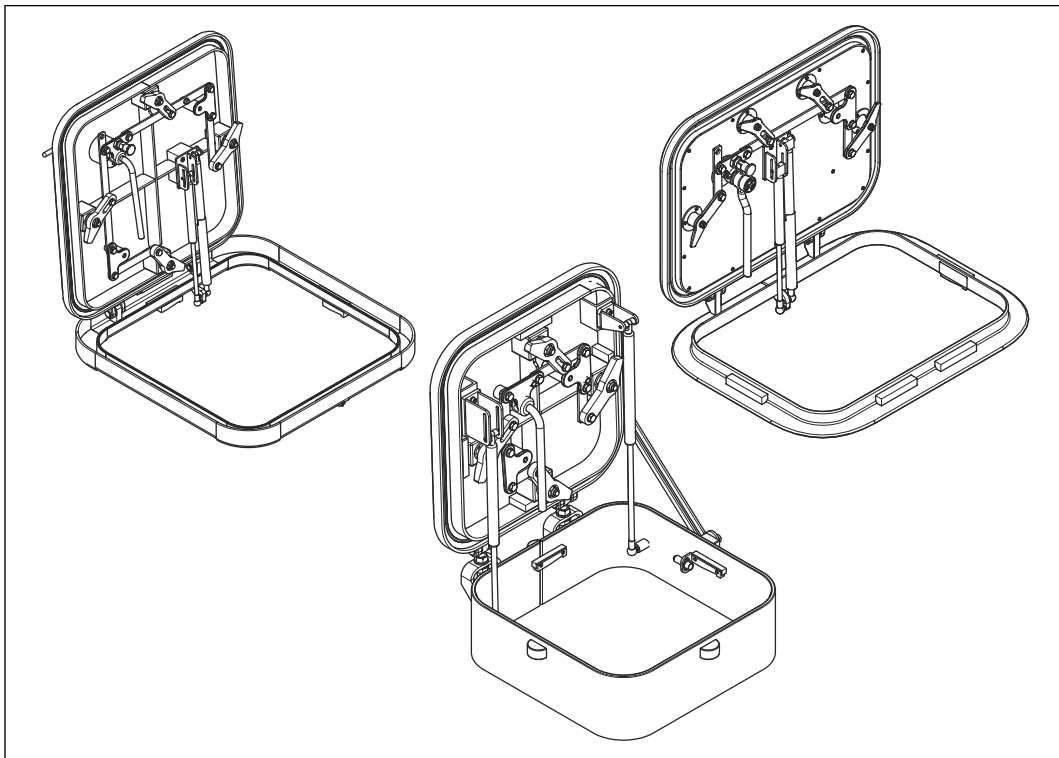




# Operation & Maintenance Manual

## Musketeer Hatch

with gas springs



Version: 2.0  
Date: March 2024

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## Contact information

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# 1 About this manual

## 1.1 Contents of this manual

This manual contains information about the operation and maintenance of the Winel Musketeer hatches with gas springs. This manual is applicable to the hatches with one of these coamings:

- Angle bar
- Flush coaming
- Raised coaming.

This manual refers to the Musketeer hatch as "the product".

## 1.2 Intended audience

This manual is intended for:

- Personnel that installs the product.
- Personnel that operates the product.
- Personnel that does maintenance and repairs on the product.



## 1.3 Copyright and disclaimer

© WINELOGO BV. All rights reserved.

No part of this document may be reproduced, distributed or transmitted in any form or by any means, electronically or mechanically, including photocopying and recording for any purpose, without the express written authorisation by WINELOGO BV.

WINELOGO BV continuously improves its products, therefore the designs and specifications in this manual are subject to change without prior notice.

## 1.4 Symbols used in this manual

Symbol	Type	Description
	Danger	This indicates a situation with a high level of risk which, if not avoided, can cause death or serious injury.
	Warning	This indicates a situation with a medium level of risk which, if not avoided, can cause serious injury or serious damage to the product.
	Caution	This indicates a situation with a low level of risk which, if not avoided, can cause minor to moderate injury or damage to the product.
	Note	This provides useful background information that is not hazard related.

## 1.5

**Related documents**

Document name	Version
Installation Manual Musketeer Hatch with gas springs	1.0

## 2 Safety and warranty

## 3 Revision history

Version	Date	History
1.0	January, 2021	Initial version (IOM)
2.0	March, 2024	Handle updated, procedure to replace the rubber updated. (Installation instructions removed: OM)

### 3.1 General safety instructions

- Always read the instructions of this product before you operate the product.
- Do not endanger people and the environment. Obey the safety instructions.
- The product must be operated by qualified personnel.
- Follow the maintenance instructions given by WINEL BV. This is in the interest of safety and reliability of the vessel and of its crew and passengers.
- No modification to the product is allowed without prior written approval and permission of WINEL BV and the certifying authorities.
- Disconnect all electrical wiring before welding activities near the product. The welding current can cause damage to the electrics and electronics of the product.
- If the system is not functioning properly, do not try to force the system. Never overrule or ignore safety features.
- Performing proper maintenance and service to the system will prevent most of the malfunctioning.
- Small malfunctions must be solved immediately, if not this might lead to severe damage to the system or injury to operating personnel.

### 3.2 Specific safety instructions

- Do not open the gas springs. Device is under high pressure.
- Avoid the hydraulic oil to come into contact with food or potable water.
- Do not overheat the gas springs, and do not expose the device to open fire.
- Test the gas springs regularly for safe operation.
- Do not use grease on the bearings of these parts:
  - Hinges
  - Handle
  - Cleats

### 3.3 Use of spare parts

- Only use original WINEL BV spare parts or spare parts that are recommended by WINEL BV.  
The use of other parts can result in unsafe operations and severe damage to the equipment, to personnel and to the environment.
- All damage resulting from the use of non-original spare parts is beyond the responsibility of WINEL BV.
- WINEL BV only accepts warranty claims if the maintenance instructions are carefully followed and if original WINEL BV spare parts have been used.

In case of neglected maintenance procedures and mounting non-WINEL BV parts, WINEL BV will not accept any responsibility.



## 4 Introduction to the product

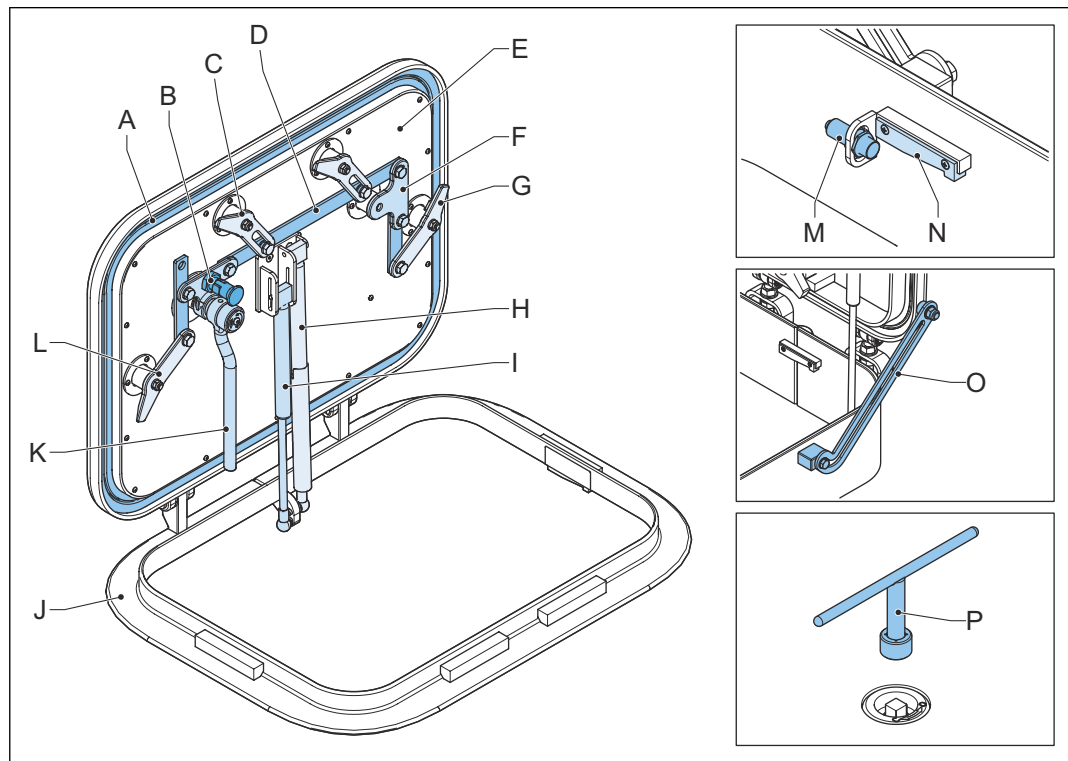
### 4.1 Intended use

All hatches produced by Winel BV are manufactured according to special customer requirements as well as to SOLAS and IMO regulations.

The hatches are designed to allow the passage of people and goods through a watertight or weathertight deck when opened. When closed, the hatches maintain the watertight or weathertight integrity of the deck in which the hatch is fitted.

Every hatch is factory tested and adjusted as far as possible. On site installation is therefore limited to welding of the frame into ship construction and adjustment of cleats/hinges.

### 4.2 Overview of the product



A	Rubber gasket	I	Gas spring
B	Locking pin / piracy lock (option)	J	Frame
C	Cleat	K	Handle
D	Latching device	L	End cleat
E	Hatch	M	Sensor (option)
F	Corner piece	N	Wedge
G	End cleat	O	open holder (option)
H	Gas spring with open holder (option)	P	Key (option, a handle on the upperside is standard)

Optional, the hatch can have one of these open holders:

- Open holder (type ESI) on one of the gas springs (H)
- Open holder on the outside (O). Only possible on models with a raised coaming.

For specific details about the hatch that is installed on the vessel, refer to the general arrangement drawings and the documentation enclosed.

### 4.3 Working principle

The user can open and close the hatch with the handle or hand wheel on the hatch from both sides. The handle or hand wheel operates the latching device.

When the hatch is closed and latched correctly, the compression of the gasket makes the hatch weathertight/watertight.

## 5 Operation

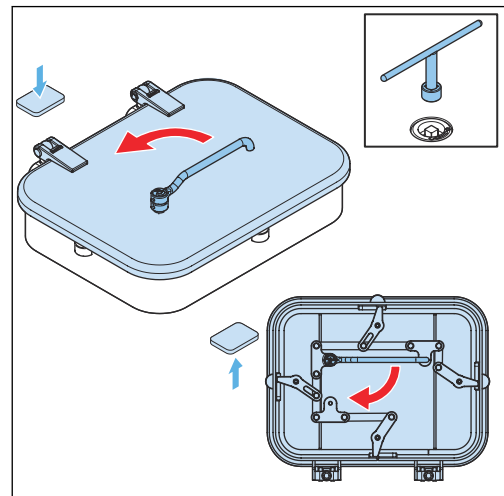
### 5.1 Open the hatch



**Caution:** Open the hatch carefully. Keep away from the opening area and the hinge. The hatch is spring loaded and partly opens itself.

#### Procedure

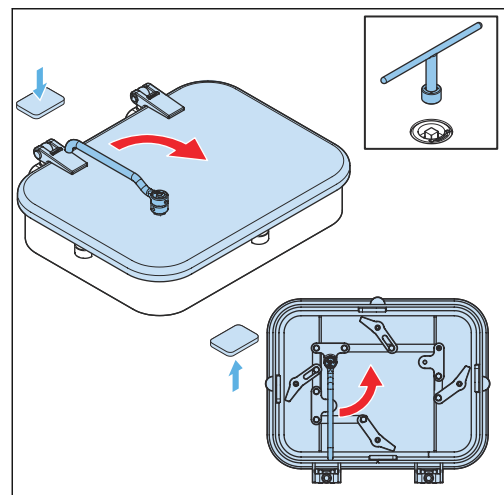
1. If applicable, use the key.
2. Set the handle or key in the open (O) position.
3. Open the hatch upwards.



### 5.2 Close the hatch

#### Procedure

1. Close the hatch, push/pull it downwards. Make sure that nothing gets trapped between the hatch and the frame.
2. Set the handle or key in the closed (C) position. If applicable, use the key.
3. Make sure that the hatch latches correctly.



## 6 Maintenance

Do the maintenance to keep the product safe and reliable. Refer to the maintenance schedule.



**Caution:**

Only use WINEL genuine spare parts or parts advised by WINEL



**Note:**

- All bushes used in hinges and/or cleats are maintenance-free bushes that do NOT require lubrication.
- WINEL BV can offer you a service contract. For example, the products can be examined and, when necessary, serviced every 3 – 5 years by a service engineer of WINEL BV.

### 6.1 Maintenance schedule

**Every week:**

- Do a visual check on every gas spring for damage on or deformation of the piston rod. If the gas spring is damaged or shows deformation, replace the gas spring. Refer to section [Remove the gas spring](#) on page 18.
- Test the gas spring on the loss of force. If the gas spring shows a significant loss of force, pressurize the device. Refer to section [Pressurize the gas spring](#) on page 20.

**Every month (depending on the frequency of use):**

- Examine the parts that follow. If any bearing bush is worn, replace it.
  - Hinges
  - Handle
  - Cleats
  - Wedges
- Examine the rubber gasket. If you see cracks or other visual damage, replace the rubber gasket.

### 6.2 Maintenance tasks

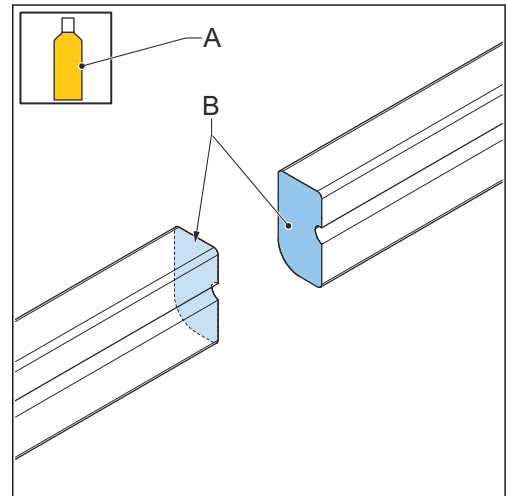
#### 6.2.1 Replace the rubber gasket

Supplies

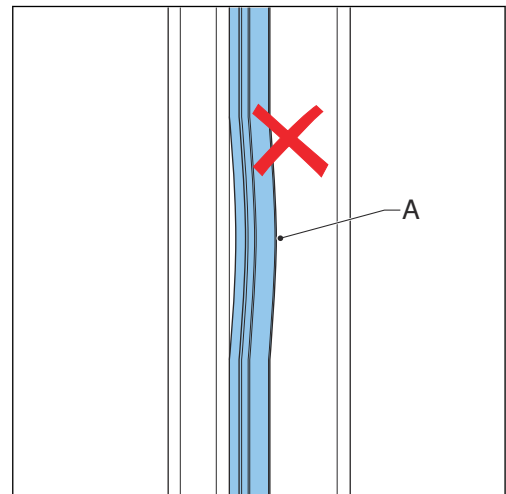
- Innotec glue

## Procedure

1. Remove the old rubber gasket.
2. Remove the remainder of the glue.
3. Apply Innotec glue (A) to the two sides (B) of the rubber to create the new rubber gasket.
4. Install the new rubber gasket. If necessary, pull the rubber to make it slimmer.



5. Make sure that there are no bumps (A) in the rubber gasket. If there are any bumps, correct this.
  - Make sure that the compression of the rubber gasket is correct to make sure that the hatch is watertight: Adjust the cleats. Refer to section [Adjust the cleats](#) on page 13.



## 6.2.2

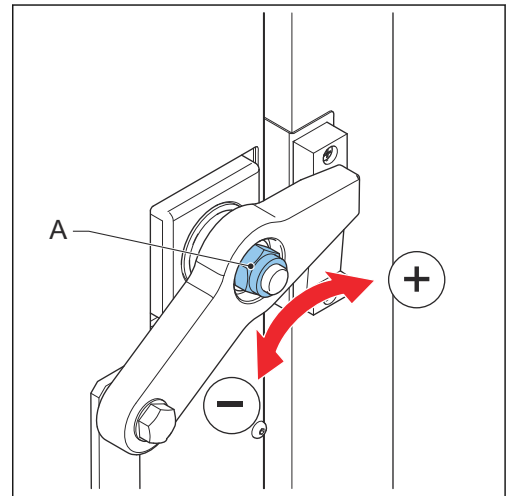
## Adjust the cleats



**Note:** The rubber gasket must be compressed 2-3 mm to make the door or hatch watertight.

## Procedure

1. On all cleats, turn the hexagonal nut (A) a quarter of a turn.
  - a) Clockwise to increase the compression of the rubber gasket.
  - b) Counterclockwise to decrease the compression of the rubber gasket.
2. Repeat the previous step until the compression of the rubber gasket is correct for all cleats.



## 6.2.3

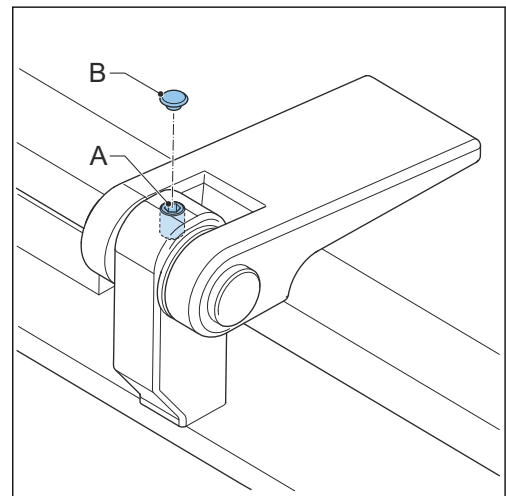
## Adjust the hinges

**Note:**

Do the procedure that is applicable to your hinges.

## Procedure

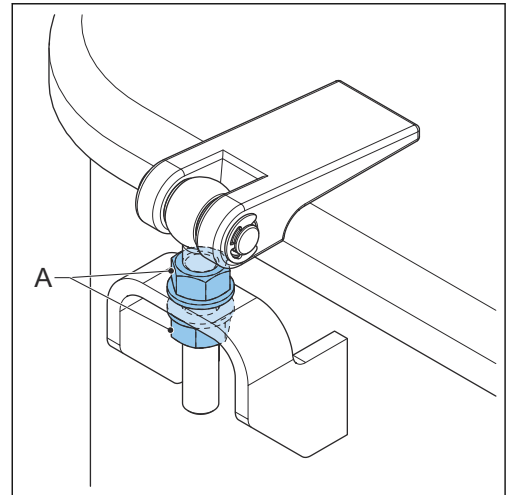
1. On all hinges, remove the plastic caps (B).
2. On all hinges, turn the socket screws (A) a  $\frac{1}{4}$  turn.
  - a) Clockwise to increase the hinge force.
  - b) Counterclockwise to decrease the hinge force.
3. Repeat the previous step as many times as necessary.
4. Install the plastic caps on all hinges.



## 6.2.4 Adjust the hinges

### Procedure

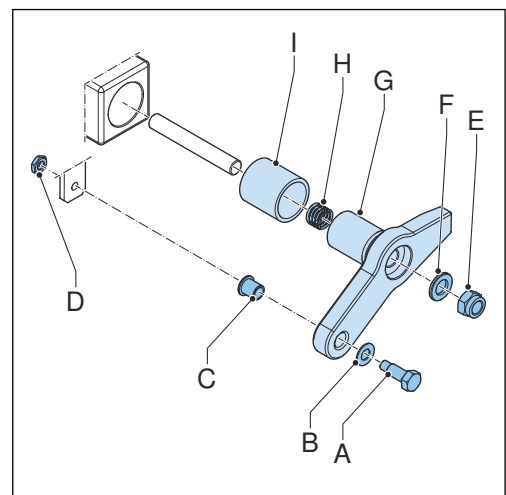
1. Close the hatch. Make sure that the hatch is latched.
2. On all hinges, loosen the nuts (A).
3. Make sure that the hinge height is correct and tighten the nuts.



## 6.2.5 Replace the cleat bearing

### Procedure

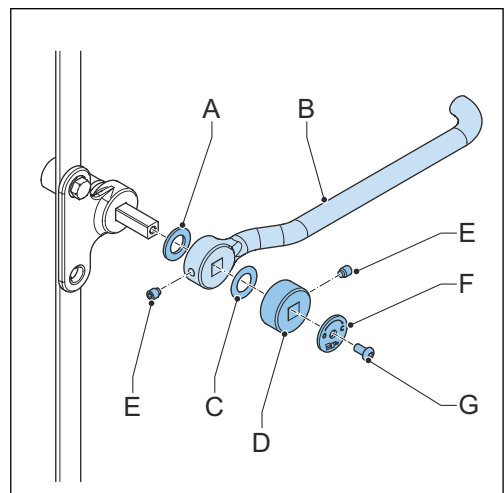
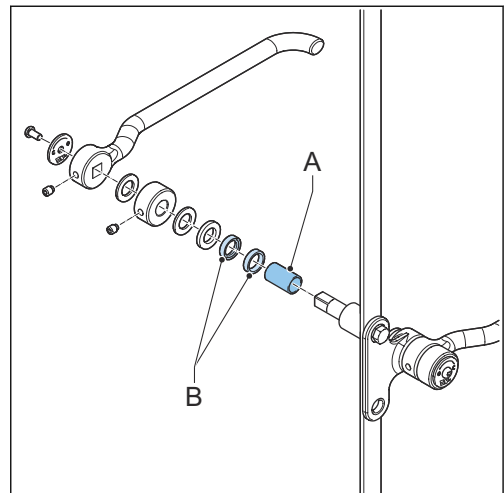
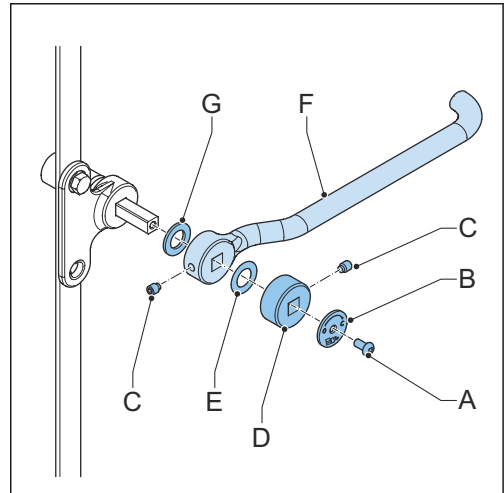
1. Secure the door or hatch in the open position.
2. Remove these parts:
  - a) Pillar bolt (A)
  - b) Nylon washer (B)
  - c) Nylon bush (C)
  - d) Hexagon nut (D)
3. Remove these parts:
  - a) Hexagon nut (A)
  - b) Washer (B)
  - c) Cleat (C)
  - d) Spring (D)
  - e) Cleat bearing (E)
4. Install these parts:
  - a) New cleat bearing
  - b) Cleat
  - c) Spring
  - d) Washer
  - e) Hexagon nut
5. Install these parts:
  - a) Hexagon nut
  - b) Nylon bush
  - c) Nylon washer
  - d) Pillar bolt
6. Adjust the cleats. Refer to section [Adjust the cleats](#) on page 13.



## 6.2.6 Replace the handle bearing

### Procedure

1. Secure the door or hatch in the open position.
2. Remove these parts:
  - a) Allen bolt (A)
  - b) Open/close indication plate (B)
  - c) Set screw (C)
  - d) Spacer (square hole) (D)
  - e) Nylon washer (E)
  - f) Handle (F)
  - g) Nylon washer (G)
3. Remove the internal mechanism.
4. Replace the bearing bush (A) and the seals (2x) (B).
5. Install the internal mechanism.
6. Install these parts:
  - a) Nylon washer (A)
  - b) Handle (B)
  - c) Nylon washer (C)
  - d) Spacer (square hole) (D)
  - e) Set screw (E)
  - f) Open/close indication plate (F)
  - g) Allen bolt (G)
7. Close the door or hatch.



## 6.2.7 Replace the hinge bushes



### Warning:

RISK OF INJURY - HEAVY OBJECT

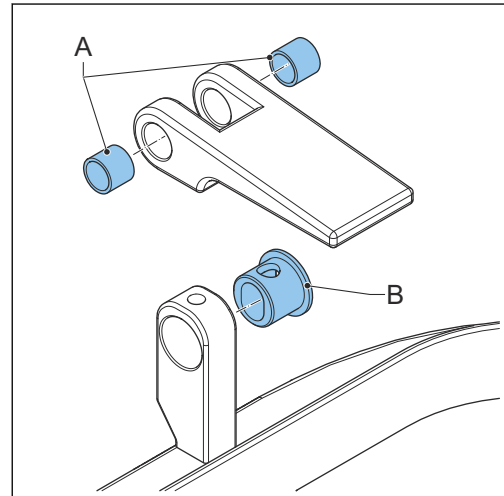
- Use correct and certified lifting materials.



- Do this task with two persons

Procedure

1. Remove the hatch. Refer to section [Remove the hatch](#) on page 17.
2. Remove the bushes (A and B).
3. Clean the bracket and the hinge plate.
4. Install the new bush (B) into the hinge part at the frame.
5. Install the new bushes (A) into the hinge part of the hatch.
6. Install the hatch. Refer to section [Install the hatch](#) on page 17.



### 6.2.8

#### Remove the hatch



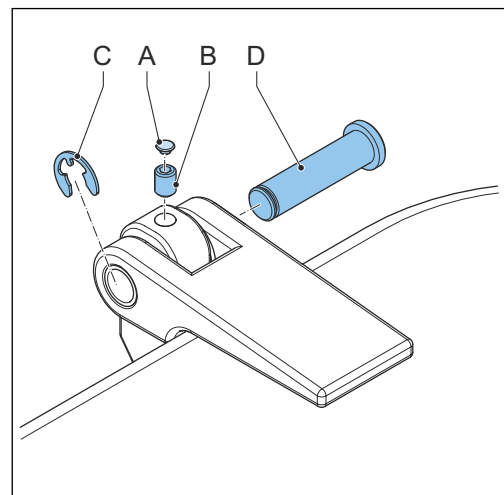
**Warning:**

RISK OF INJURY - HEAVY OBJECT

- Use correct and certified lifting materials.
- Do this task with two persons

Procedure

1. Remove the gas springs. Refer to section [Remove the gas spring](#) on page 18.
2. If applicable, release the open holder.
3. Close the hatch. Make sure that the hatch is latched.
4. Remove the parts that follow:
  - a) Plastic caps (A)
  - b) Socket screws (B)
  - c) Retainer rings (F). Use special pliers.
  - d) Hinge axles (E). Use a hammer with a nylon head.
5. Release the latches.
6. Lift the hatch.



### 6.2.9

#### Install the hatch



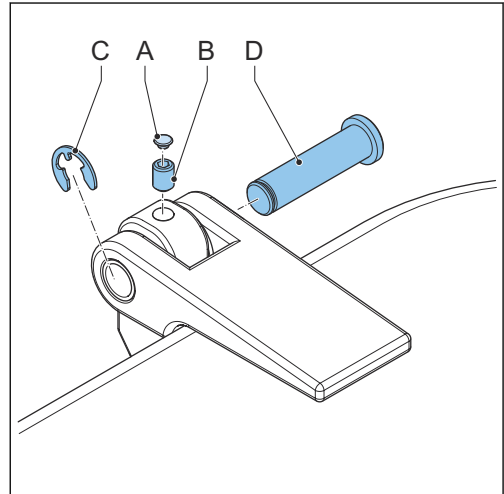
**Warning:**

RISK OF INJURY - HEAVY OBJECT

- Use correct and certified lifting materials.
- Do this task with two persons

Procedure

1. Carefully put the hatch in the correct position.
2. Install the hinge axle (D) and the retainer ring (C).
3. Install the socket screws (B). Apply Loctite 242.
4. Adjust the hinge. Refer to section [Adjust the hinges](#) on page 14.
5. Install the plastic caps (A).
6. Install the gas springs. Refer to section [Install the gas spring](#) on page 19.
7. If applicable, attach the open holder.



### 6.2.10 Remove the gas spring



**Warning:**

- Secure the hatch in open position. Make sure that the hatch cannot close accidentally. Pinch hazard.
- The hatch is heavy. The hatch is not held by the gas springs.

Support equipment

- 2 mm Allen key
- 13 mm open-end wrench
- Hammer
- 6 mm diameter pin punch

Procedure

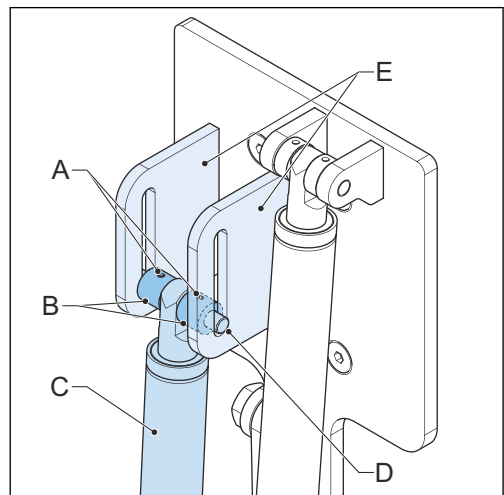
1. Secure the hatch in the open position
2. Remove the two bolts (A) from the two spacers (B).
3. Remove the axle (D) from the brackets (E).

Use a hammer and a pin punch.

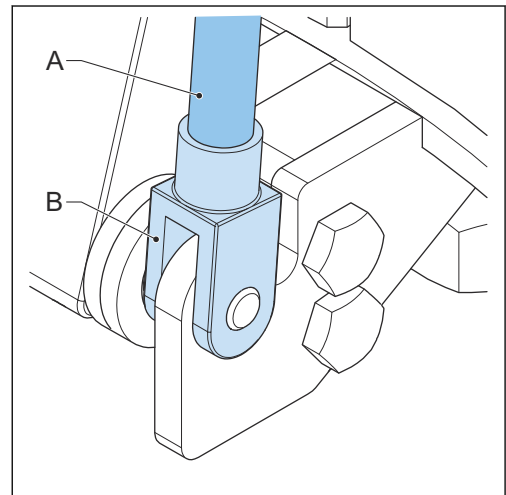


**Caution:** Hold the gas spring (C) as it may fall over.

4. Remove the spacers (B).



5. Turn the gas spring to remove the piston rod (A) from the clevis fork (B).



### 6.2.11 Install the gas spring



**Warning:**

- Secure the hatch in open position. Make sure that the hatch cannot close accidentally. Pinch hazard.
- The hatch is heavy. The hatch is not held by the gas springs.

Support equipment

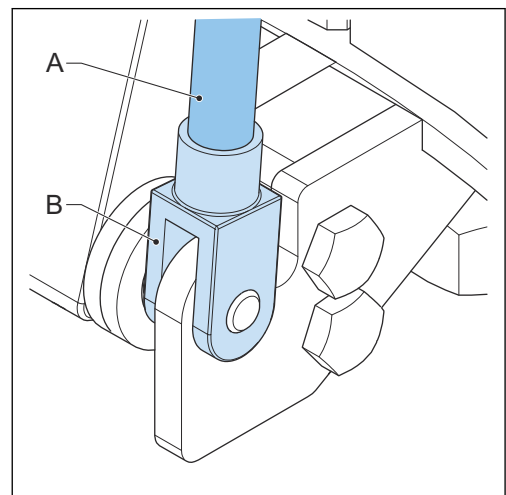
- Loctite 243
- 2 mm Allen key
- 13 mm open-end wrench
- Hammer
- 6 mm diameter pin punch

Procedure

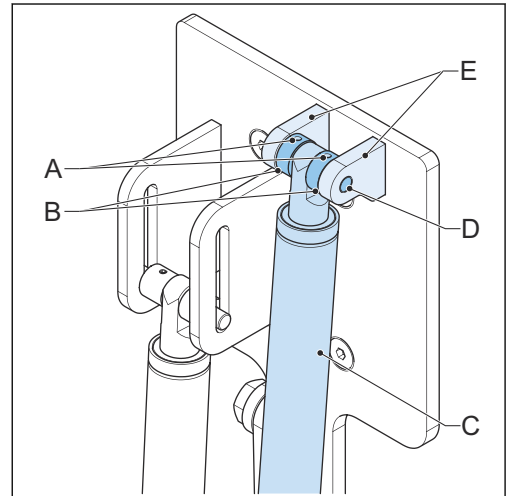
1. Secure the hatch in the open position.
2. If applicable, make sure that the open holder (type ESI) is installed on the gas spring.
3. Screw the piston rod of the gas spring (A) into the joint (B). Apply Loctite 243. Make sure that the thread of the piston rod is used completely.



**Note:** The joint (B) can be a clevis fork, as shown, or a ball joint.



4. Move the top of the gas spring (C) between the brackets (E) on the hatch.
5. Put the spacers (B) and the axle (D) in place.  
Make sure that the axle (D) goes through the two spacers (B) and brackets (E).  
Use a small hammer.
6. Attach the two screws (A) to keep the axle (D) in place.



### 6.2.12 Pressurize the gas spring

- Only personnel with proper training is allowed to perform this task.

#### Support equipment

- Use the Hahn filling tool.

#### Safety

1. Be aware that a gas spring is a device under pressure. It can explode if handled incorrectly.

#### Procedure

1. Make sure that the gas spring has a valve.
2. To pressurize the gas spring use the Hahn filling tool. Refer to section [Annex](#) on page 22.

## 7 Troubleshooting



**Warning:**

Always read the safety instructions in section *Safety and warranty* on page 6 before trouble shooting.

Do not endanger people and the environment. Obey the safety instructions.

Fault	Possible cause	Check	Remedy
The hatch is heavy to open.	The gas spring has no force at all.	Check the gas spring for damage and deformation.	If you see damage or deformation, replace the gas spring.
	The gas spring has a reduction in force.	Gas spring	Pressurize the gas spring.
Hatch cannot be opened or closed with handle	Bolts in cleating system come loose	Cleating system	Place new bolts/nuts (apply locking fluid)
	Safety bolt of handle is broken	Safety bolt operating handle	Place new bolt (apply locking fluid)
Hatch does not close well	Damage on frame, hatch, rubber gasket, musketeer system, frame is bent	Complete system, hatch, rubber gasket and frame	Repair and/or replace damaged pieces and/or parts. Then adjust cleating system and hinges
Hatch is leaking	Rubber gasket is compressed too little	Rubber gasket, cleating and hinges	Replace rubber gasket and/or adjust cleating system and hinges
	Damage on frame, hatch, rubber gasket, musketeer system, frame is bent	Complete system, hatch, rubber gasket and frame	Repair and/or replace damaged pieces and/or parts. Then adjust cleating system and hinges
Handle not operating correct and/or too heavy	Rubber gasket is compressed too much	Compression of the rubber gasket when the hatch is closed and latched	Adjust cleating system and hinges
	No grease on wedges	Wedges	Apply grease to wedges
	Sticking of handle in bush	Handle	Disassemble handle and clean or replace handle and/or bushes
	Cleating rod is bended	Cleating system	Repair or replace damaged parts
	Damage on frame, hatch, rubber gasket, musketeer system, frame is bent	Complete system, hatch, rubber gasket and frame	Repair and/or replace damaged pieces and/or parts. Then adjust cleating system and hinges
	Paint on system parts	Parts that should not be painted for paint	Remove the paint

If the problems cannot be solved using the instructions in the manual, contact WINEL After-sales department.

## 8 Annex

### Pressurize the gas spring



**Danger:** A gas spring is a device under high pressure. It can explode if handled incorrectly.

A gas spring can be filled when it does not operate correctly. Only qualified personnel with a Winel training are allowed to fill the gas spring. Use the correct filling tool to pressurize the gas spring. Follow the instructions that come with the filling tool.

Contact Winel in case of doubt.

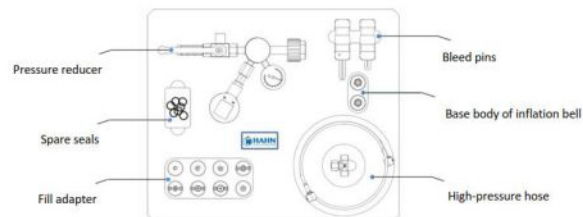
#### Filling case for gas springs with valve



With the HAHN filling case, we offer you the opportunity to fill your gas springs with the desired force on-site.

To ensure our products are used in a proper way, we provide training with our service technicians. Thus we can show you on site how to use our HAHN filling case equipment correctly.

The HAHN filling case includes the following accessories, which you need to fill your gas springs:



Please keep in mind that, to fill your gas springs, apart from our filling case, you will need a nitrogen gas bottle with DIN 477 cylinder valve number 10, purity 5.0.

You can fill all HAHN gas springs with a valve or cross valve.

#### Valve:

- Allows exact adjustment of the extension force of a HAHN spring to the desired conditions
- Is installed in the threaded pin of the fixed end of the compression spring
- Is installed as valve top on the piston rod of the tension spring

#### Cross valve:

- Is installed laterally at the end of cylinder on the fixed end side
- Allows filling in assembled condition
- Cross valves shall be considered in the length calculation of the gas spring

Stand 03/2017