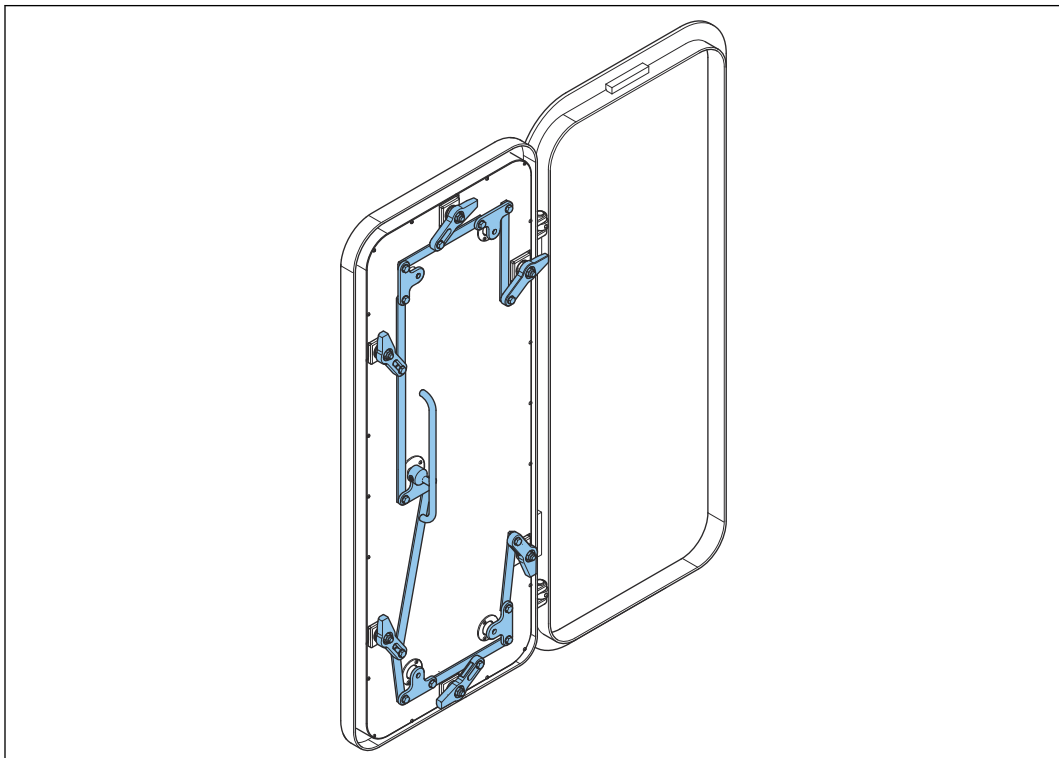




Installation, Operation & Maintenance Manual

Musketeer Door

Watertight



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1 About this manual

1.1 Contents of this manual

This manual contains information about the installation, operation and maintenance of the Winel Musketeer door. This manual often refers to the Musketeer door 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

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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 WINEL BV.

WINEL 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 or the product.
	Note	This provides useful background information that is not hazard related.

2 Safety and warranty

2.1 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 door(s) 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 welding or 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.

2.2 Specific safety instructions

- Do not use grease on the bearings of these parts:
 - Hinges
 - Handle
 - Cleats

2.3 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.

3 Introduction to the product

3.1 Intended use

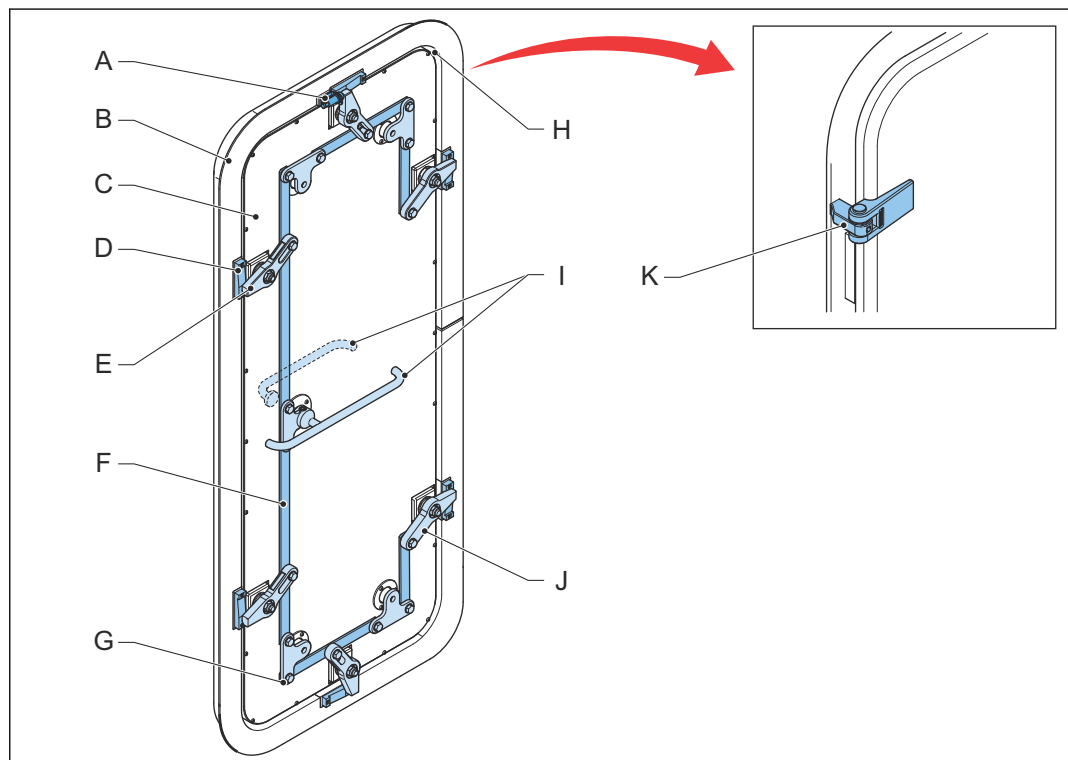
All doors produced by Winel BV are manufactured according to special customer requirements as well as to SOLAS and IMO regulations.

The doors are designed to allow the passage of people and goods through a watertight bulkhead when opened. When closed, the doors maintain the watertight integrity of the bulkhead in which the door is fitted.

Every door 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.

3.2 Product description

3.2.1 Overview of the product



A	Sensor (option)	G	Corner piece
B	Frame	H	Rubber gasket
C	Doorblade	I	Handle
D	Wedge	J	End cleat
E	Cleat	K	Hinge, with maintenance-free self-greasing bushes
F	Latching device		

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

3.2.2 Working principle

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

When the door is closed and latched correctly, the compression of the gasket makes the door watertight.

4 Installation

4.1 Delivery, insurance and acceptance

4.1.1 Delivery

The door frame including the door is placed on a pallet and strapped with bands. Depending on the scope of supply, the components are premounted on the door frame or are delivered separately.

4.1.2 Insurance

The responsibilities of transport and insurance are stated in the sales order confirmation and in the general conditions of sale of WINEL BV.

4.1.3 Acceptance

During acceptance of the delivery, WINEL BV recommends to proceed as follows:

Procedure

1. WINEL BV recommends to have an authorized official of the transportation company present during this procedure.
2. Check if the packing and all the pallets and/or boxes are undamaged and if all parts are present.
 - a) Compare the labels with the WINEL BV packing list and the order confirmation.
 - b) If there is damage or if parts are missing, immediately report this to the sales department of WINEL BV.

4.2 Recommendations for handling and unpacking

General

- Use a fork lift or a hoist to transport the pallets or the boxes as closely to the installation site as possible.
- Do not use hooks or other tools that may penetrate the packing and cause damage to the packed items.
- Only use lifting equipment with adequate capacity for the load.

For the weights and dimensions of the delivery, refer to the General Arrangement drawings enclosed.

- Only unpack the parts in the cardboard boxes just before you install them. This prevents parts from being lost.
- Use a sharp knife to open the cardboard boxes but take care not to cause damage to the parts inside the boxes.

Door assembly (door frame with door and components)



Danger:

- The door assembly is heavy.
- Use correct and certified lifting materials.
- Only authorized personnel are allowed to operate the lifting equipment.
- Follow the appropriate safety procedures.

- Remove the bands that hold the door assembly to the pallet.
- Make sure that the door itself is secured in the closed position. This prevents that the door moves during the lifting operation.
- Use at least two steadying lines to guide the door assembly during the lifting operation.

4.3 Storage

4.3.1 Warehouse storage

- Store the parts in a safe, dry and dust free environment.
This prevents unnecessary damage and wear of the parts.
- If the parts were unpacked from their transport packing, repack the parts using appropriate packing materials.
- Use the original WINEL BV pallet to store the door assembly.
- Do NOT stack pallets with the products on top of each other.

4.3.2 On-board storage

- Store the parts as close as possible to the future position.
- Make sure to place the door assembly at the correct side of the bulkhead.
- Make sure to protect the parts from damage caused by work in the vicinity of the parts.
- Re-pack or cover the door assembly and the other parts in order to prevent damage by grinding or welding nearby.

4.4 Welding

4.4.1 General welding recommendations



Danger:

- Welding the door frame into or against the bulkhead must be done by a certified and qualified welder and according to the requirements of the shipyard and the applicable class society.
- WINEL BV cannot be held responsible if the welding recommendation and the advised welding procedures were not followed.

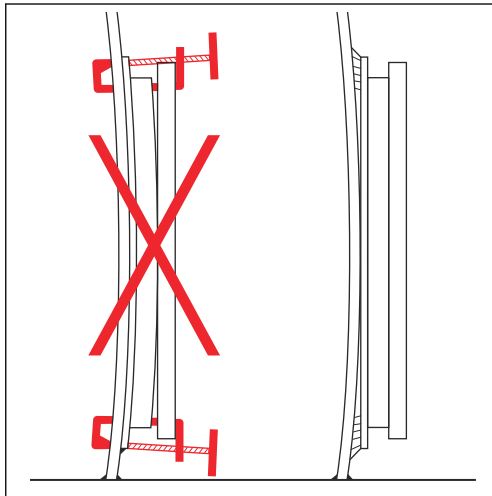
WINEL BV can only make welding recommendations with respect to the product, not with respect to the construction of the vessel to which the product is installed.

4.4.2 Welding instruction



Caution:

If you do not obey these instructions, you may cause damage to the product and the watertightness of the product is not guaranteed.

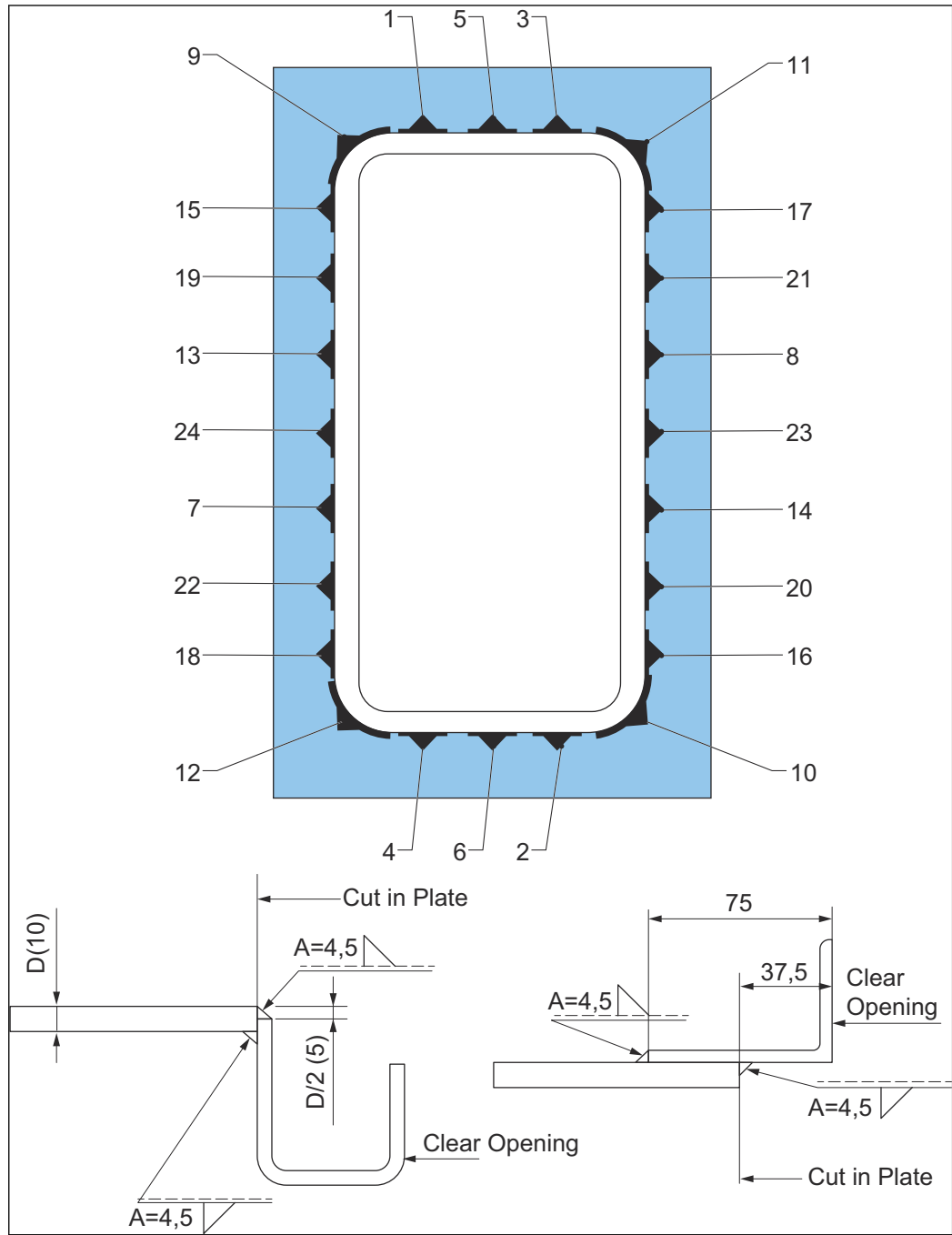
**Caution:**

Keep both door and frame straight. Do not force it towards the bulkhead. Do not force the doorframe, for example with clamp tools.

- Close and latch the door on the frame. Keep the door closed during the entire welding procedure.
- Welding must be done carefully to prevent thermal stresses in the door.
- Make sure that the heat-dissipation into the door is as little as possible.
- Refer also to the instruction on the door.
- Weld also the backside of the doorframe by interrupted welding.
- Refer to the illustration, start at position 1, interrupted welding (length \pm 100mm). Follow to position 2 – 3 – 4 etc.
- Complete the welding: Fill the open spaces between doorframe and wall.

Caution:

Max frame deflection after welding to ship construction: 1mm / mtr

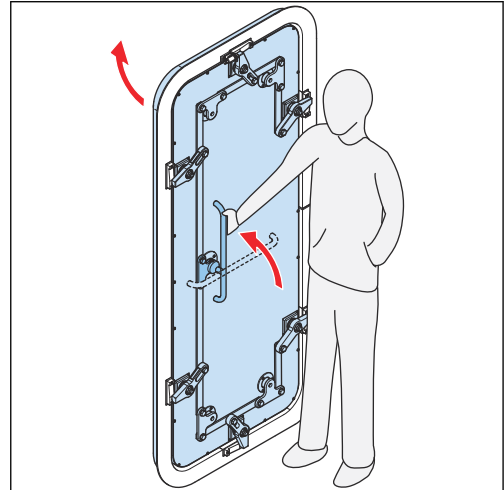


5 Operation

5.1 Open the door

Procedure

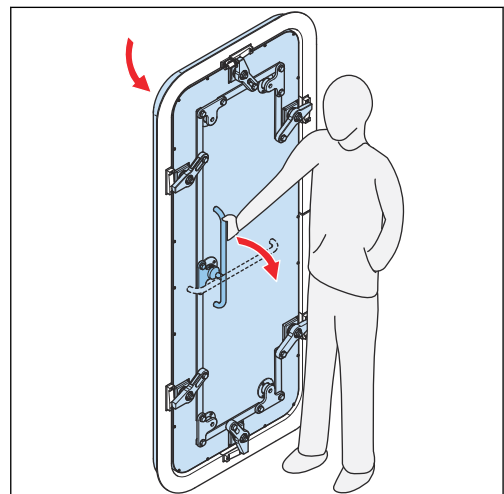
1. Set the handle in the vertical position.
2. Open the door.



5.2 Close the door

Procedure

1. Close the door. Make sure that nothing gets trapped between the door and the frame.
2. Set the handle in the horizontal position.
3. Make sure that the door latches correctly.



6 Maintenance

Do the maintenance to keep the door 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 doors can be examined and, when necessary, serviced every 3 – 5 years by a service engineer of WINEL BV.

6.1 Maintenance schedule

Monthly (depending on the frequency of use):

Examine the parts that follow. If any bearing bush is worn, replace it.

- Hinges
- Handle
- Cleats

Examine the rubber gasket. If you see cracks or other visual damage, replace the rubber gasket.

6.2 Maintenance tasks

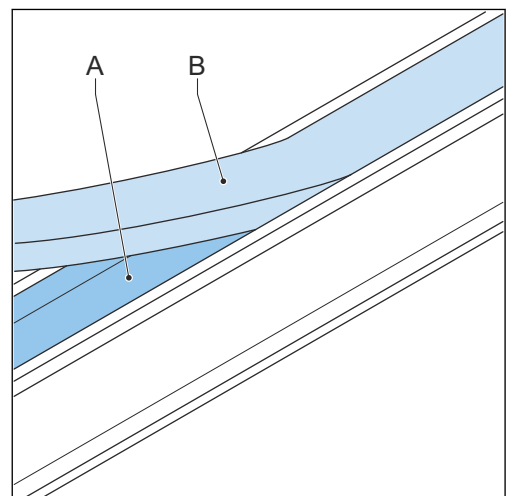
6.2.1 Replace the rubber gasket

Procedure

1. Remove the old rubber gasket.
2. Remove the remainder of the glue.
3. Apply glue to the gutter (A) and the new gasket (B). Refer to the instructions of the glue manufacturer.
4. Install the new rubber gasket.

Closing requirements

1. Make sure that the hinges and cleats are adjusted correctly to make sure that the door is watertight:
 - a. Adjust the hinges. Refer to section [Adjust the hinges](#) on page 14.
 - b. Adjust the cleats. Refer to section [Adjust the cleats](#) on page 14.



6.2.2 Adjust the hinges

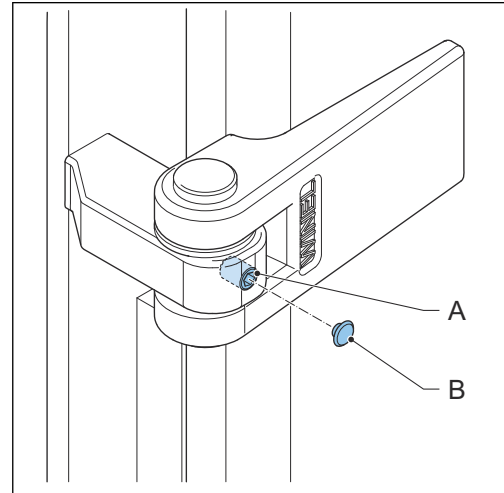


Note:

If the door has two cleats on the hinge side, do not adjust the 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.



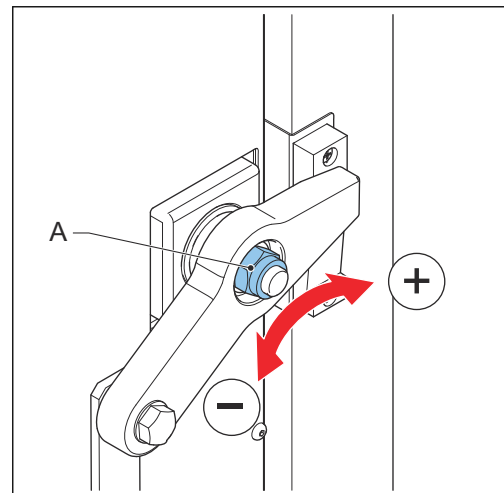
6.2.3 Adjust the cleats



Note: The rubber gasket must be compressed 3-4 mm to make the door 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.



6.2.4 Replace the hinge bushes



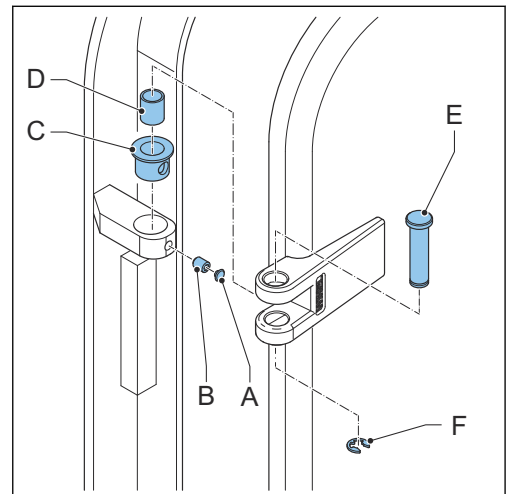
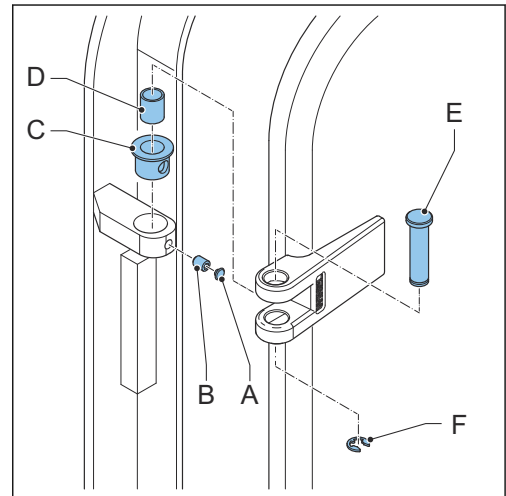
Warning:

RISK OF INJURY - HEAVY OBJECT

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

Procedure

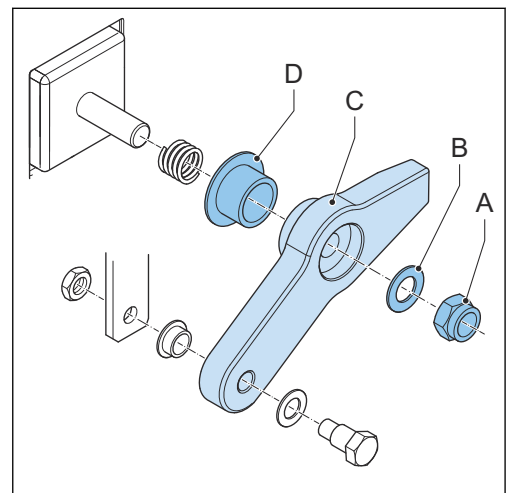
1. Close the door. Make sure that the door is latched.
2. Attach hoisting slings to the door.
3. Use the hoist to slowly lift the door until the weight of the door is taken off the hinges.
4. Remove the parts that follow:
 - a) Plastic caps (A)
 - b) Socket screws (B)
 - c) Retainer ring (F). Use special pliers.
 - d) Hinge axle (E). Use a hammer with a nylon head.
5. Release the latches and lift the door out of the door frame.
6. Remove the bush (C and D).
7. Clean the bracket and the hinge plate.
8. Install the new bush (C) into the hinge part at the frame.
9. Place the new bushes (D) into the hinge part of the door.
10. Carefully place the door in the correct position to assemble the door and frame parts of the hinges.
11. Install the hinge axle, the retainer ring and the socket screws.
12. Adjust the hinge. Refer to section [Adjust the hinges](#) on page 14.
13. Install the plastic caps.



6.2.5 Replace the cleat bearing

Procedure

1. Secure the door in the open position.
2. If the door has insulation, remove the cover plate and the insulation.
3. Remove these parts:
 - a) Hexagon nut (A)
 - b) Ring (B)
 - c) Cleat (C)
 - d) Bearing bush (D)
4. Install these parts:
 - a) New bearing bush
 - b) Cleat
 - c) Ring
 - d) Hexagon nut

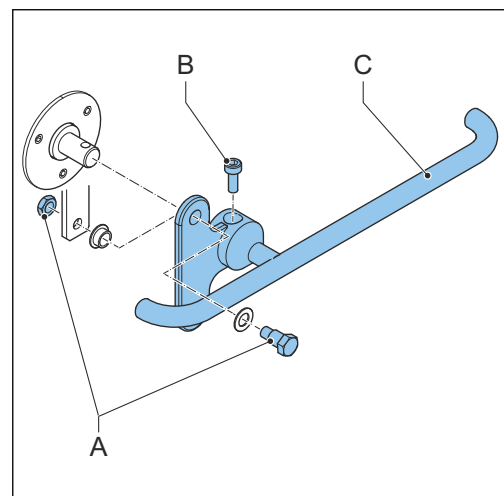
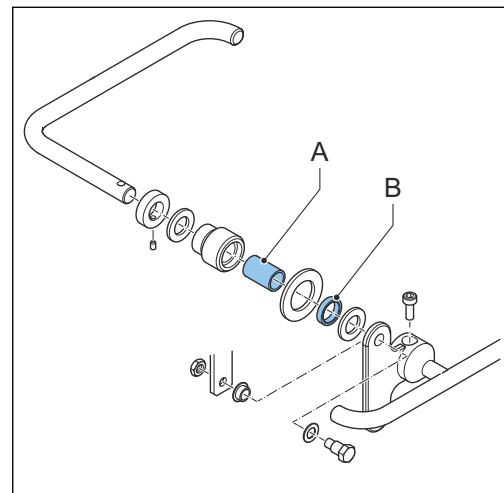
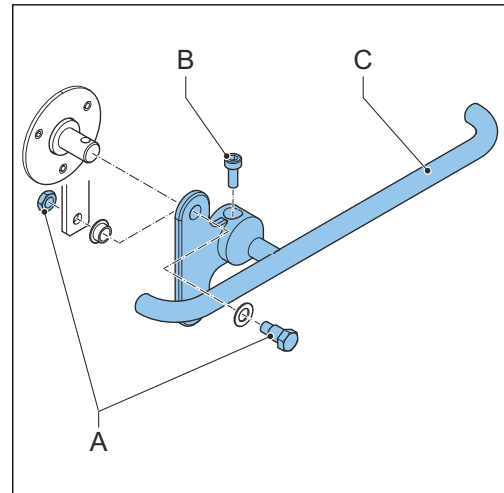


5. If applicable, install the insulation and the cover plate.
6. Adjust the cleats. Refer to section [Adjust the cleats](#) on page 14.

6.2.6 Replace the handle bearing

Procedure

1. Secure the door in the open position.
2. If the door has insulation, remove the cover plate and the insulation.
3. Remove these parts:
 - a) Pillar bolt (A)
 - b) Socket bolt (B)
 - c) Handle (C)
4. Remove the internal mechanism.
5. Replace the bearing bush (A) and the seal (B).
6. Install the internal mechanism.
7. Install these parts:
 - a) Handle (C)
 - b) Socket bolt (B)
 - c) Pillar bolt (A)
8. If applicable, install the insulation and the cover plate.
9. Close the door.



7 Trouble shooting



Warning:

Always read the safety instructions §2 of the manual before trouble shooting.

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

Fault	Possible cause	Check	Remedy
Door 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)
Door does not close well	Damage on frame, door, rubber gasket, musketeer system, door frame is bent	Complete system, door, rubber gasket and frame	Repair and/or replace damaged pieces and/or parts. Then adjust cleating system and hinges
Door 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, door, rubber gasket, musketeer system, door frame is bent	Complete system, door, rubber gasket and frame	Repair and/or replace damaged pieces and/or parts. Then adjust cleating system and hinges
Door not operating correct and/or too heavy	Rubber gasket is compressed too much	compression of the rubber gasket when door 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, door, rubber gasket, musketeer system, door frame is bent	Complete system, door, 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.