



# **Roto AL** Designo

TiltSafe

Universal hardware for aluminium windows and  
balcony doors

## **Contact**

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|                                                                                     |          |                                                    |           |
|-------------------------------------------------------------------------------------|----------|----------------------------------------------------|-----------|
|    | <b>1</b> | <b>General information</b>                         | <b>5</b>  |
|                                                                                     | 1.1      | Version history                                    | 5         |
|                                                                                     | 1.2      | Additional information to be noted                 | 5         |
|                                                                                     | 1.3      | Instructions                                       | 5         |
|                                                                                     | 1.4      | Symbols                                            | 6         |
|                                                                                     | 1.5      | Product features                                   | 7         |
|                                                                                     | 1.6      | Abbreviations                                      | 7         |
|                                                                                     | 1.7      | Copyright protection                               | 7         |
|                                                                                     | 1.8      | Preserving the surface finish                      | 8         |
|                                                                                     | 1.9      | Limitation of liability                            | 9         |
|    | <b>2</b> | <b>Security</b>                                    | <b>10</b> |
|                                                                                     | 2.1      | Presentation and structure of warning instructions | 10        |
|                                                                                     | 2.2      | Security levels of warning instructions            | 10        |
|                                                                                     | 2.3      | Stipulated use for end users                       | 10        |
|                                                                                     | 2.3.1    | Misuse                                             | 11        |
|  | <b>3</b> | <b>Information on the product</b>                  | <b>12</b> |
|                                                                                     | 3.1      | General hardware characteristics                   | 12        |
|                                                                                     | 3.2      | Application ranges                                 | 12        |
|                                                                                     | 3.3      | Installation positions                             | 13        |
|                                                                                     | 3.4      | Space requirement for hardware                     | 13        |
|  | <b>4</b> | <b>Hardware overviews</b>                          | <b>14</b> |
|                                                                                     | 4.1      | Tilt&Turn hardware                                 | 16        |
|                                                                                     | 4.1.1    | T&T   TiltSafe   RC 2   150 kg                     | 16        |
|  | <b>5</b> | <b>Installation</b>                                | <b>20</b> |
|                                                                                     | 5.1      | Preparing for installation                         | 20        |
|                                                                                     | 5.1.1    | Preparing the connecting rods                      | 20        |
|                                                                                     | 5.1.2    | Opening the sash corners                           | 21        |
|                                                                                     | 5.1.3    | Corner drive CL – ECC-groove                       | 21        |
|                                                                                     | 5.2      | Drilling and routing dimensions                    | 22        |
|                                                                                     | 5.2.1    | Pivot rest / stay bearing                          | 22        |
|                                                                                     | 5.3      | Leaf                                               | 23        |
|                                                                                     | 5.3.1    | Installation sequence                              | 23        |

|                                                                                     |            |                                                 |           |
|-------------------------------------------------------------------------------------|------------|-------------------------------------------------|-----------|
|                                                                                     | 5.3.2      | SEC espagnolette protection                     | 24        |
|                                                                                     | 5.3.3      | Flush-encased gearbox                           | 25        |
|                                                                                     | 5.3.4      | Cam, insertable – Euro-groove                   | 26        |
|                                                                                     | 5.3.5      | Cam, insertable – ECC-groove                    | 27        |
|                                                                                     | 5.3.6      | Corner drives                                   | 28        |
|                                                                                     | 5.3.7      | TiltSafe SEC cam                                | 29        |
|                                                                                     | 5.3.8      | Scissor stay guide 500, 735                     | 30        |
|                                                                                     | 5.3.9      | Corner hinge                                    | 32        |
|                                                                                     | <b>5.4</b> | <b>Frame</b>                                    | <b>33</b> |
|                                                                                     | 5.4.1      | Strikers                                        | 34        |
|                                                                                     | 5.4.2      | TiltSafe components                             | 36        |
|                                                                                     | 5.4.3      | Pivot rest                                      | 38        |
|                                                                                     | 5.4.4      | Sash stay 500, 735                              | 39        |
|                                                                                     | <b>5.5</b> | <b>Joining the sash and frame</b>               | <b>41</b> |
|                                                                                     | 5.5.1      | Connecting the sash to the pivot rest           | 41        |
|                                                                                     | 5.5.2      | Mounting sash stay 500                          | 42        |
|                                                                                     | 5.5.3      | Mounting sash stay 735                          | 43        |
|                                                                                     | 5.5.4      | Checking the fit of the bottom TiltSafe SEC cam | 44        |
|                                                                                     | <b>5.6</b> | <b>Accessories</b>                              | <b>44</b> |
|                                                                                     | 5.6.1      | Drilling and routing dimensions                 | 44        |
|                                                                                     | 5.6.2      | Roto Handles                                    | 46        |
|                                                                                     | 5.6.3      | Load transfer                                   | 47        |
|  | <b>6</b>   | <b>Installation drawings</b>                    | <b>50</b> |
|                                                                                     | 6.1        | Explanation                                     | 50        |
|                                                                                     | 6.2        | T&T   150 kg   TiltSafe   RC 2                  | 51        |
|  | <b>7</b>   | <b>Adjustment</b>                               | <b>52</b> |
|                                                                                     | 7.1        | Gasket compression adjustment                   | 53        |
|                                                                                     | 7.1.1      | Cam, insertable                                 | 53        |
|                                                                                     | 7.2        | Tilt&Turn hardware                              | 54        |
|                                                                                     | 7.2.1      | Lateral adjustment                              | 54        |
|                                                                                     | 7.2.2      | Height adjustment                               | 55        |
|  | <b>8</b>   | <b>Maintenance</b>                              | <b>56</b> |
|                                                                                     | 8.1        | Care                                            | 56        |
|                                                                                     | 8.1.1      | TiltSafe SEC striker                            | 58        |



# 1 General information

## 1.1 Version history

| Version | Date       | Changes |
|---------|------------|---------|
| v0      | 30/06/2024 |         |

## 1.2 Additional information to be noted

For other mandatory components (locking side, frame components, etc.) and information (target groups, security, maintenance, transport, disposal), see the other applicable document.



### INFO

These instructions are incomplete.

The other applicable document for these instructions is:

- IMO\_386

Failure to observe this documentation discharges the hardware manufacturer from their liability.

Please request market-specific additional information and documents from your responsible Roto sales representative.

## 1.3 Instructions

This document contains important information, instructions and assembly guidelines for the installation and maintenance of hardware.

The information and instructions contained in this document refer to products belonging to the Roto hardware system named on the front page.

All steps must be completed in sequence.

A profile assessment to determine the application ranges must be carried out beforehand.

The following guidelines also apply:

### Gütegemeinschaft Schlösser und Beschläge e.V.

- Directive TBDK: Attachment of supporting fitting components for turn-only and tilt&turn fittings
- Directive VHBE: Hardware for windows and balcony doors – Guidelines/ advice for end-users
- Directive VHBH: Hardware for windows and balcony doors – Guidelines/ advice on the product and on liability

### VFF (German Window and Facade Association)

- TLE.01: Correct handling of ready-to-install windows and external doors during transport, storage and installation
- WP.01: Maintenance of windows, facades and external doors – Maintenance, care and inspection – Information for sales
- WP.02: Maintenance of windows, facades and external doors – Maintenance, care and inspection – Measures and documents
- WP.03: Maintenance of windows, facades and external doors – Maintenance, care and inspection – Maintenance agreement

### Additional guidelines

- Instructions and information issued by profile manufacturers, e.g. manufacturers of windows and balcony doors
- Instructions and information issued by screw manufacturers

- The applicable regulations, directives and national laws

### Storing the instructions

These instructions are an important part of the product. The instructions must be stored so that they are always to hand.

### Explanation of the markings

The manual uses the following markings for emphasis (e.g. in figures or instructions):

| Marking                                                                             | Meaning                                                       |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------|
|    | Optional / alternative components seated in the sash          |
|    | Sash / components seated in the sash                          |
|    | Optional / alternative components seated in the frame         |
|    | Frame / components seated in the frame                        |
|    | Drill holes, routing, screw positions                         |
|    | Unaffected components / indirectly affected components        |
|   | Components, arrows or movements that have just been described |
|  | Item number                                                   |
| [1]                                                                                 | Legend                                                        |
| [A]                                                                                 | Steps                                                         |



#### INFO

Any dimensions without a unit in the instructions are given in millimetres (mm). Other units of measurement are clearly indicated by the presence of the differing unit.



#### INFO

Figures are provided in the right-hand version (DIN 107).

## 1.4 Symbols

| Symbol | Meaning                    |
|--------|----------------------------|
| ■      | First-level list           |
| □      | Second-level list          |
| →      | (Cross-)reference          |
| ▷      | Result                     |
| ►      | Unnumbered step            |
| 1.     | Numbered step              |
| a.     | Numbered second-level step |
| ⇒      | Requirement                |

## 1.5 Product features

| Symbol                                                                            | Meaning         |
|-----------------------------------------------------------------------------------|-----------------|
|  | DIN             |
|  | Length          |
|  | Sash weight     |
|  | Tilt depth      |
| Nº                                                                                | Material number |
| #                                                                                 | Piece(s)        |
|  | Packaging unit  |

## 1.6 Abbreviations

| Abbreviation   | Meaning                                           |
|----------------|---------------------------------------------------|
| approx.        | approximately                                     |
| TR             | Turn restrictor                                   |
| T-O            | Turn-Only sash                                    |
| SW             | Sash width                                        |
| S.kg           | Sash weight                                       |
| SH             | Sash height                                       |
| sz             | Size                                              |
| IMO            | Installation instructions                         |
| kg             | Kilograms                                         |
| m              | Metres                                            |
| m <sup>2</sup> | Square metres                                     |
| Max.           | Maximum                                           |
| mm             | Millimetres                                       |
| CL             | Centre lock                                       |
| N              | Newtons                                           |
| Nm             | Newton metres                                     |
| STS            | Stainless steel                                   |
| HS             | Hexalobular socket                                |
| T1             | Connecting rod designation, e.g. connecting rod 1 |
| VTC            | Extended connecting rod groove                    |
| e.g.           | For example                                       |

## 1.7 Copyright protection

The contents of this document are copyright-protected. This content can be used when working with the hardware. Any other use is not permitted without written permission of the manufacturer.

## 1.8 Preserving the surface finish



### ATTENTION

#### **Surface treatments may cause property damage.**

Surface treatments (e.g. painting and varnishing) on elements can damage components or prevent them from working properly.

- ▶ For masking, only use adhesive tape that does not damage the paint coats. Consult the manufacturer if in doubt.
- ▶ Protect components against direct contact with the surface treatment.
- ▶ Protect components against contamination.



### ATTENTION

#### **Using incorrect cleaning agents and sealing compounds may cause property damage.**

Cleaning agents and sealing compounds may damage the surfaces of components and gaskets.

- ▶ Do not use aggressive or flammable liquids, acidic cleaners or abrasive cleaners.
- ▶ Only use mild, pH-neutral cleaning agents that have been diluted.
- ▶ Apply a thin protective film to the components, for example using a cloth soaked in oil.
- ▶ Avoid aggressive vapours (e.g. produced by formic acid, acetic acid, ammonia, amine compounds, ammonia compounds, aldehyde, carboric acid, chlorine, tannic acid) around the element.
- ▶ Do not use any acetic acid-crosslinking or acid-crosslinking sealing compounds or those with the aforementioned constituents as both direct contact with the sealing compound and its fumes can corrode the surface of the components.



### ATTENTION

#### **Contamination may cause property damage.**

Contamination prevents components working properly.

- ▶ Remove deposits and contamination caused by construction materials (e.g. plaster, gypsum).
- ▶ Keep components free of deposits and contaminants.



### ATTENTION

#### **(Permanently) damp room air may cause property damage.**

Damp room air can lead to mould growth and corrosion caused by condensation.

- ▶ Provide adequate ventilation for components, particularly during the construction phase.
- ▶ Intensively air out the room several times per day by opening all elements for approximately 15 minutes. If intensive airing is not an option, place the elements in the tilt position and provide airtight masking inside the room, e.g. if there is fresh screed that cannot be walked on or must not be exposed to draughts. Discharge any humidity present in the room air to the outside using condensation dryers.
- ▶ Establish a ventilation plan for more complex construction projects if necessary.
- ▶ Provide adequate ventilation during holiday periods as well.



## 1.9 Limitation of liability

All information and instructions contained in this document have been compiled in consideration of the applicable standards and regulations, the latest developments in technology and many years of knowledge and experience.

The hardware manufacturer assumes no liability for damage caused by:

- Failure to comply with this document and all product-specific documents and other applicable directives (see the chapters entitled “Security” and “Stipulated use”).
- Improper use / misuse (see the chapters entitled “Security” and “Stipulated use”).
- Insufficient invitation to tender, non-compliance with installation specifications and non-compliance with the application diagrams (where available).
- Increased contamination.

Claims made by third parties against the hardware manufacturer on account of damage resulting from misuse or failure to comply with the obligation to give instructions on the part of hardware dealers, window, door and balcony door manufacturers and building element dealers or the builder are passed on accordingly.

The obligations agreed in the delivery contract, the general terms and conditions, the hardware manufacturer’s terms and conditions of delivery and the legal provisions applicable when the contract was concluded shall apply.

The warranty only covers original Roto components.

We reserve the right to make technical changes as part of improvement to performance characteristics and further development.

## 2 Security

This manual contains instructions relating to safety. The principal safety information in this chapter includes information and instructions relevant to the safe use or maintaining the safe condition of the product. Warning instructions that relate to handling warn of residual risks and are located before steps that are relevant to safety.

- Follow all of the instructions in order to prevent personal injury and property and environmental damage.

### 2.1 Presentation and structure of warning instructions

The warning instructions relate to individual actions and are structured as follows with a warning symbol:



#### **DANGER**

##### **Nature and source of the danger.**

Explanation and description of the danger and the implications.

- Measures to take to avert the danger.

### 2.2 Security levels of warning instructions

The warning instructions that relate to handling are identified differently according to the severity of the associated danger. The signal words and the associated warning symbols used are clarified below.



#### **DANGER**

##### **Immediate risk of death or serious injuries.**

- Observe these warning instructions to avoid personal injuries.



#### **WARNING**

##### **Potential risk of death or serious injuries.**

- Observe these warning instructions to avoid personal injuries.



#### **CAUTION**

##### **Risk of injuries**

- Observe these warning instructions to avoid personal injuries.



#### **ATTENTION**

##### **Reference to property or environmental damage.**

- Observe these warning instructions to avoid property or environmental damage.

### 2.3 Stipulated use for end users

For windows or balcony doors with Turn-Only or Tilt&Turn hardware, windows or balcony door sashes can be moved to a turned position by operating a hand lever or to a tilt position restricted by the scissor stay version.

When closing a sash and locking the hardware, the gasket counter force must generally be overcome.



#### **WARNING**

##### **Opening and closing sashes in an uncontrolled manner may pose a risk of death!**

Opening and closing the sash in an uncontrolled manner may lead to serious injuries.

- ▶ Ensure that the sash does not collide with the frame, opening restrictor (buffer) or other sashes when it is moved into the fully open or closed position.
- ▶ Ensure that the sash is slowly guided by hand throughout its entire movement range, until it has been brought into a fully closed or opening position.



#### **ATTENTION**

##### **Opening and closing sashes in an uncontrolled manner may result in property damage.**

Opening and closing the sash in an uncontrolled manner may cause the element to malfunction.

- ▶ Ensure that the sash does not collide with the frame, opening restrictor (buffer), reveal or other sashes when it is moved into the fully open or closed position.
- ▶ Ensure that the sash is slowly guided by hand throughout its entire movement range, until it has been brought into a fully closed or opening position.

Any use and processing of the products that goes beyond or differs from the stipulated use is considered misuse and can lead to hazardous situations.

No claims of any kind can be made on account of damage resulting from failure to comply with the stipulated use.

### **2.3.1 Misuse**

Any use and processing of the products that goes beyond or differs from the stipulated use is considered misuse and can lead to hazardous situations.



#### **WARNING**

##### **Misuse may pose a risk of death!**

Misuse and incorrect installation of hardware can lead to serious injuries.

- ▶ Only use hardware combinations that have been approved by the hardware manufacturer.
- ▶ Only use original accessories or those that have been approved by the hardware manufacturer.
- ▶ Note the product-related documentation → *from page 5*.

## 3 Information on the product

### 3.1 General hardware characteristics

#### TiltSafe

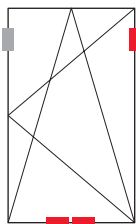
- Can be used with Roto AL Designo Tilt&Turn hardware in single-sashed windows.
- Burglary inhibition for RC 2 in the tilt position in accordance with DIN EN 1627 to DIN EN 1630.

### 3.2 Application ranges

#### General

- Sash width: 790 – 1300 mm
- Sash height: from 800 – 2700 mm (see profile assessment)
- Hardware axis: 10 mm
- Tilt depth: 70 – 95 mm
- Sash weight: max. 150 kg
- Installation depth: 26.5 mm

### 3.3 Installation positions

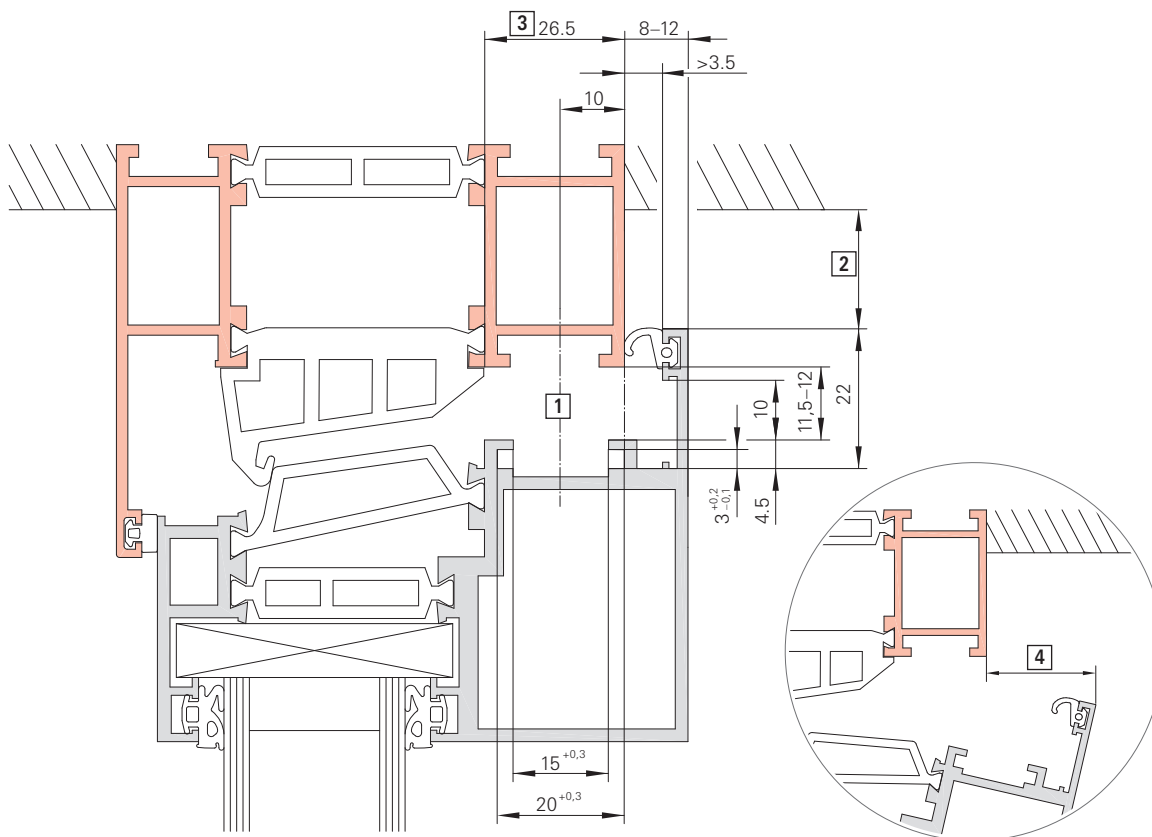


1 SEC striker for tilt ventilation, compl. with lock-in position

3 SEC strikers for tilt ventilation, compl. without lock-in position

### 3.4 Space requirement for hardware

Note the following space requirement.



- [1] Alignment of the sash and frame
- [2] Frame clearance
- [3] Required installation depth
- [4] Tilt depth



#### INFO

If the centre of gravity is unfavourable, the window may slam shut by itself.

## 4 Hardware overviews

The hardware overviews on the following pages are a recommendation on the part of Roto Frank Fenster- und Türtechnologie GmbH.

The basic page layout in the hardware overviews chapter firstly shows examples of the combination of individual hardware components, and the associated parts list can be seen on the following pages.

The item numbers in the squares link the hardware overview to the parts list.

The actual composition of the hardware depends on:

- the profile depth
- the width of the element
- the height of the element
- the weight of the element



### INFO

#### Profile properties

Design the profile optimally for the corresponding weights. Proper screw fixings for the TiltSafe components must be ensured by the profile manufacturer / fabricator.

The currently valid Roto profile assessment drawing for the specific profile and the applicable documents described in said drawing must be observed.

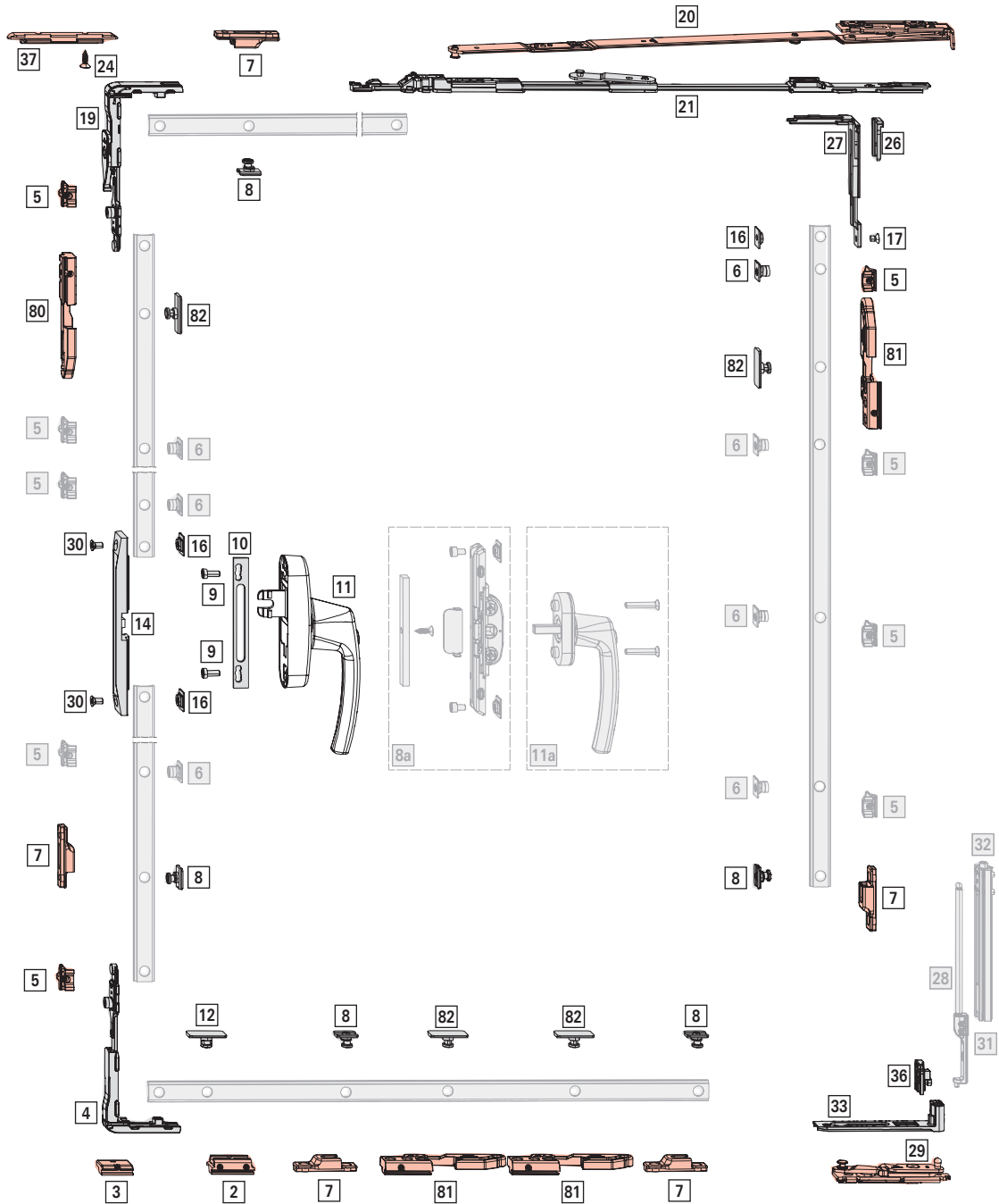
Please request these details from your assigned Roto sales representative.

---



## 4.1 Tilt&Turn hardware

#### 4.1.1 T&T | TiltSafe | RC 2 | 150 kg





Application range

**SW:** 790 – 1300 mm

**SH:** available upon request

**S.kg:** max. 150 kg



INFO

Only use bearings / clamp strips which have been approved for the profile.

Roto can assist with the generally required profile assessments if you contact the Roto sales representative in charge of this.

Basic set

[29] Pivot rest with clamp strip



|       |       |             | Nº     |
|-------|-------|-------------|--------|
| No. 1 | Left  | 10 Piece(s) | 624970 |
|       | Right | 10 Piece(s) | 624969 |
| No. 3 | Left  | 10 Piece(s) | 624972 |
|       | Right | 10 Piece(s) | 624971 |
| No. 4 | Left  | 10 Piece(s) | 624974 |
|       | Right | 10 Piece(s) | 624973 |

[\*] Corner hinge set



|       |             | Nº     |
|-------|-------------|--------|
| Left  | 10 Piece(s) | 739700 |
| Right | 10 Piece(s) | 739699 |

Contents:

| [*]  |                  | # |
|------|------------------|---|
| [33] | Corner hinge     | 1 |
| [36] | Adjustment piece | 1 |

[\*] TiltSafe locking components set



|      |             | Nº     |
|------|-------------|--------|
| V.01 | 10 Piece(s) | 891318 |
| V.02 | 10 Piece(s) | 891365 |

Contents:

| [*]  |                                                           | # |
|------|-----------------------------------------------------------|---|
| [2]  | TiltSafe tilt striker                                     | 1 |
| [3]  | Run-up wedge V.01 / V.02                                  | 1 |
| [4]  | Corner drive without blocking device, with retaining fork | 1 |
| [5]  | Striker V.01 / V.02                                       | 2 |
| [12] | SEC cam RC 3, insertable                                  | 1 |
| [19] | Corner drive with blocking device and retaining fork      | 1 |

[21] Scissor stay guide



|     |             | Nº     |
|-----|-------------|--------|
| 500 | 10 Piece(s) | 740836 |
| 735 | 10 Piece(s) | 740838 |



|       |     |
|-------|-----|
| ≤ 900 | 500 |
| ≥ 800 | 735 |

[20] Sash stay



|     |       |     |       |             | Nº     |
|-----|-------|-----|-------|-------------|--------|
| 500 | No. 1 | 130 | Left  | 10 Piece(s) | 624945 |
|     |       | 130 | Right | 10 Piece(s) | 624944 |
|     | No. 3 | 130 | Left  | 10 Piece(s) | 624951 |
|     |       | 130 | Right | 10 Piece(s) | 624950 |
|     | No. 4 | 130 | Left  | 10 Piece(s) | 624957 |
|     |       | 130 | Right | 10 Piece(s) | 624956 |
| 735 | No. 1 | 150 | Left  | 10 Piece(s) | 624947 |
|     |       | 150 | Right | 10 Piece(s) | 624946 |
|     | No. 3 | 150 | Left  | 10 Piece(s) | 624953 |
|     |       | 150 | Right | 10 Piece(s) | 624952 |
|     | No. 4 | 150 | Left  | 10 Piece(s) | 624959 |
|     |       | 150 | Right | 10 Piece(s) | 624958 |



|       |     |
|-------|-----|
| ≤ 900 | 500 |
| ≥ 800 | 735 |

[\*] TiltSafe set



|       |             | Nº      |
|-------|-------------|---------|
| Left  | 10 Piece(s) | 2031102 |
| Right | 10 Piece(s) | 2031099 |

Contents:

| [*]  |                                                                   | # |
|------|-------------------------------------------------------------------|---|
| [80] | SEC striker for tilt ventilation, compl. with lock-in position    | 1 |
| [81] | SEC striker for tilt ventilation, compl. without lock-in position | 3 |
| [82] | TiltSafe SEC cam                                                  | 4 |



INFO

Tamper-proof screws and inserts are not included in the scope of delivery.

[\*] CL SEC corner drive set



## Hardware overviews

### Tilt&Turn hardware

T&T | TiltSafe | RC 2 | 150 kg

#### Large packages

|                                             |                          | Nº     |
|---------------------------------------------|--------------------------|--------|
| SEC corner drive CL set with retaining fork | 10 Piece(s)              | 728944 |
| [*]                                         |                          | #      |
| [16]                                        | SEC connector            | 1      |
| [17]                                        | Countersunk screw M5 x 7 | 1      |
| [26]                                        | SEC retaining fork       | 1      |
| [27]                                        | CL SEC corner drive      | 1      |

#### [\*] SEC rebate-clearance reduction set

##### Large packages

|                                    |                                   | Nº     |
|------------------------------------|-----------------------------------|--------|
| SEC rebate-clearance reduction set | For corner drives 10 Piece(s)     | 728950 |
| [*]                                |                                   | #      |
| [24]                               | Countersunk screw ST4.8 x 16      | 1      |
| [37]                               | SEC rebate-clearance reduction CD | 1      |

#### [7] SEC striker

|      |   | Nº           |
|------|---|--------------|
| V.01 | 9 | 100 Piece(s) |
| V.02 | 9 | 100 Piece(s) |

#### [8] SEC cam

RC 2

|            |              | Nº     |
|------------|--------------|--------|
| Insertable | 100 Piece(s) | 447245 |

#### [5] Striker

|      |   | Nº           |
|------|---|--------------|
| V.01 | 9 | 100 Piece(s) |
| V.02 | 9 | 100 Piece(s) |

#### [6] Cam, insertable

|            |              | Nº     |
|------------|--------------|--------|
| Insertable | 100 Piece(s) | 334671 |

## Espagnolette and connector

#### [\*] SEC espagnolette protection set

##### Large packages

Alternatively:

|                                 |                               |        |
|---------------------------------|-------------------------------|--------|
| [8a]                            | SEC flush-encased gearbox set | 1      |
|                                 |                               | Nº     |
| SEC espagnolette protection set | 10 Piece(s)                   | 728952 |

#### Contents:

| [*]  |                             | # |
|------|-----------------------------|---|
| [14] | SEC espagnolette protection | 1 |
| [16] | SEC connector               | 2 |
| [30] | Countersunk screw M5 x 10   | 2 |

#### [9] Cylinder screw M5 x 12

|                |       | Nº           |
|----------------|-------|--------------|
| Cylinder screw | M5x12 | 100 Piece(s) |

#### [10] Espagnolette support

|                      |                                | Nº                |
|----------------------|--------------------------------|-------------------|
| Espagnolette support | For Roto Line AL geared-handle | 13.5 100 Piece(s) |

#### [11] Roto Line window handle – geared-handle, lockable

→ CTL\_1

Alternatively:

|     |                                   |   |         |
|-----|-----------------------------------|---|---------|
| [a] | Roto Line window handle, lockable | 1 | → CTL_1 |
|     | Countersunk screw M5 x 30         | 2 |         |

## Height-dependent components

#### [5] Striker

|      |   | Nº           |
|------|---|--------------|
| V.01 | 9 | 100 Piece(s) |
| V.02 | 9 | 100 Piece(s) |



|             |   |
|-------------|---|
| ≤ 1300      | – |
| 1301 – 1800 | 2 |
| 1801 – 2400 | 4 |
| > 2400      | 6 |

#### [6] Cam, insertable

|            |              | Nº     |
|------------|--------------|--------|
| Insertable | 100 Piece(s) | 334671 |



|             |   |
|-------------|---|
| ≤ 1300      | – |
| 1301 – 1800 | 2 |
| 1801 – 2400 | 4 |
| > 2400      | 6 |



Weight-dependent components

| [*] Load transfer set; S.kg > 100 kg  |                                                                                   |                                                                                   |        |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------|
|                                       |  |  | Nº     |
| V.01                                                                                                                   | Left                                                                              | 10 Piece(s)                                                                       | 739694 |
|                                                                                                                        | Right                                                                             | 10 Piece(s)                                                                       | 739693 |
| V.02                                                                                                                   | Left                                                                              | 10 Piece(s)                                                                       | 739696 |
|                                                                                                                        | Right                                                                             | 10 Piece(s)                                                                       | 739695 |

Contents:

| [*]  |  | # |
|------|-----------------------------------------------------------------------------------|---|
| [28] | Support rod                                                                       | 1 |
| [31] | Frame bearing V.01 / V.02                                                         | 1 |
| [32] | Sash component                                                                    | 1 |

## 5 Installation

### 5.1 Preparing for installation

#### 5.1.1 Preparing the connecting rods

##### Cropping



##### INFO

All connecting rod dimensions refer to an overlap width of 22 mm.

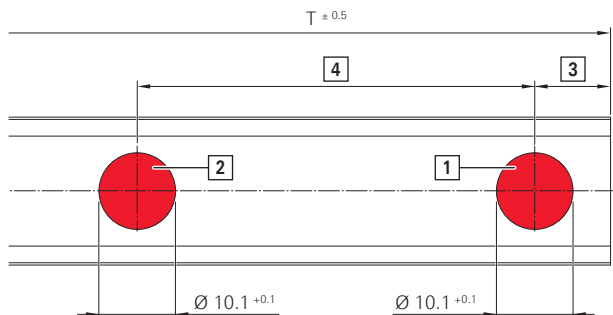
If the overlap width differs from this, adapt the connecting rod dimensions accordingly.

All connecting rod dimensions  $T \pm 0.5$  mm.

1. For the length of the connecting rods, see the installation drawing. → *from page 50*
2. Mark the length on the connecting rods.
3. Crop the connecting rods.

##### Drilling / punching

General dimensioning of all coupling points, unless otherwise specified.



| Position | Description                                               |
|----------|-----------------------------------------------------------|
| [1]      | Drill hole for coupling point of various components / cam |
| [2]      | Cam drill hole                                            |
| [3]      | Distance dimension from outside = 10 mm                   |
| [4]      | Distance dimension to the next cam                        |

1. For the position of the coupling points and cams in the connecting rods, see the installation drawing. → *from page 50*
2. Drill holes.

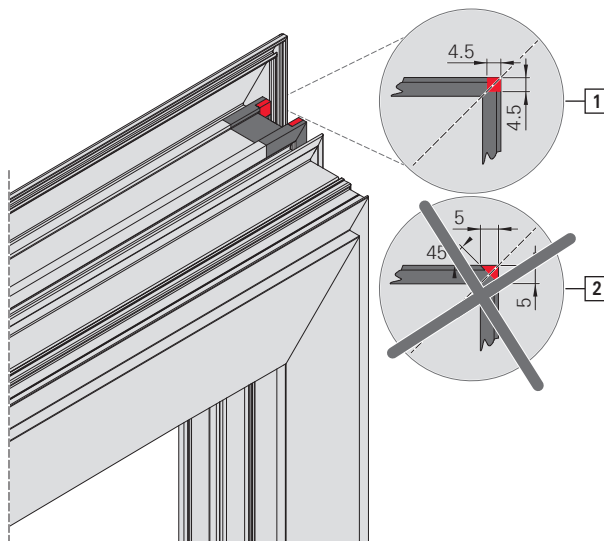


## 5.1.2 Opening the sash corners



1. Open the connecting rod groove at all sash corners.

| Position | Description                                             |
|----------|---------------------------------------------------------|
| [1]      | Connecting rod groove opening                           |
| [2]      | Alternative connecting rod groove opening not possible. |

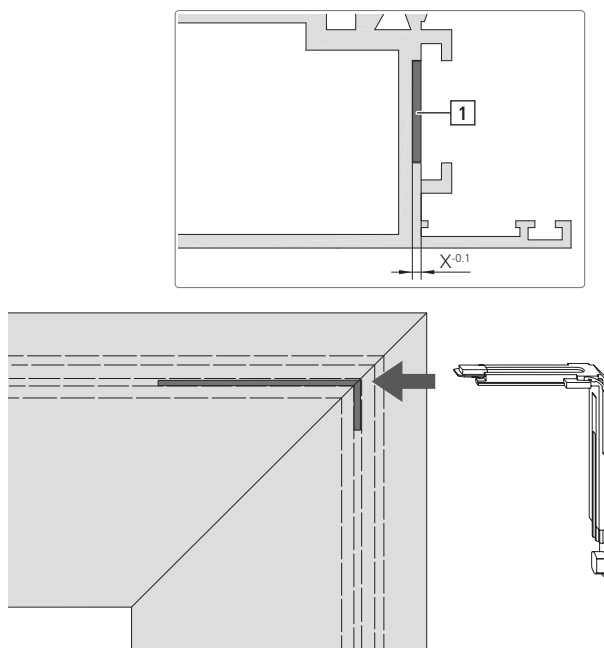


2. Deburr the edges.

## 5.1.3 Corner drive CL – ECC-groove

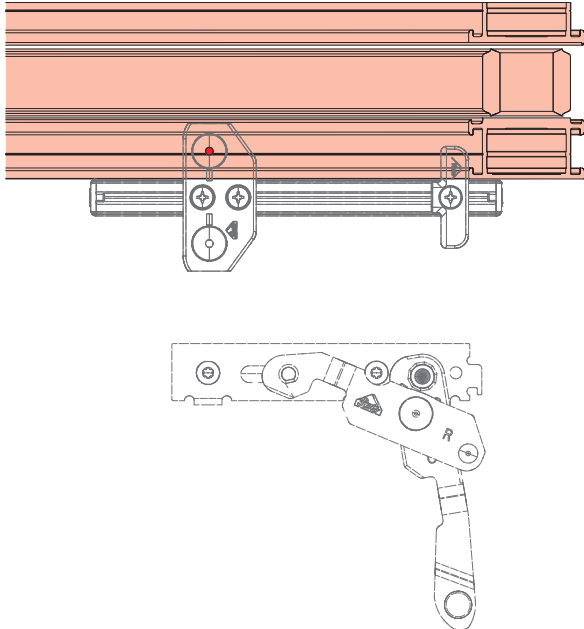
### Placing supports under the corner drive CL – ECC-groove

1. When the corner drive CL is used in a profile with extended connecting rod groove (ECC), use a profile-related bracket [1] as a packer. Dimension X must not be greater than the groove depth.



## 5.2 Drilling and routing dimensions

### 5.2.1 Pivot rest / stay bearing



Place the drilling jig on the frame as shown in the drawing.

Drill holes:

1 x Ø 2.5 mm, at least 4 mm deep.



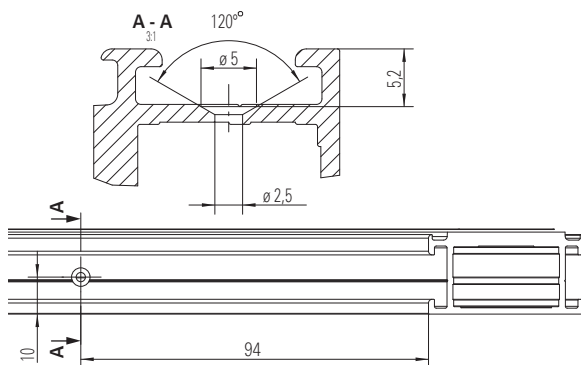
#### INFO

Drill holes if:

- The punched hole produced by the screw is not sufficient.
- The base of the groove is too thick (> 2 mm).

Alternative (for mechanical production):

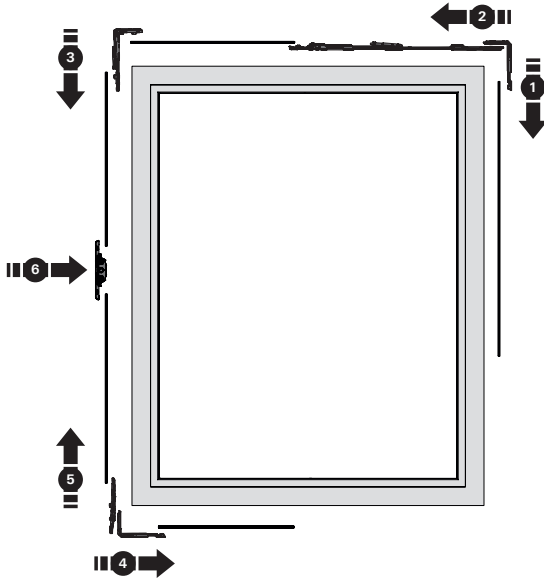
Drill the hole according to the drawing.





## 5.3 Leaf

### 5.3.1 Installation sequence



- [1] Connecting rod on the hinge side
- [2] Horizontal top connecting rods and components
- [3] Top connecting rods and components on the locking side
- [4] Horizontal bottom connecting rod and components
- [5] Bottom connecting rods and components on the locking side
- [6] Espagnolette on the locking side

#### Observing the installation sequence

1. Open the sash corners .
2. Crop and drill the connecting rods .
3. Install the insertable cam → *from page 26.*
4. Install the connecting rod on the hinge side .
5. Install the horizontal top connecting rods and components .
6. Install the connecting rods and espagnolette on the locking side .
7. Install the horizontal bottom connecting rod and components .
8. Install the handle → *from page 46.*

### 5.3.2 SEC espagnolette protection

for Roto Line AL lockable geared-handle

#### Installing the SEC espagnolette protection

⇒ The Roto Line AL geared-handle, lockable, is installed → *from page 47*.



#### INFO

Comply with the installation sequence for the aluminium sash .

1. For the position of the SEC espagnolette protection, see the installation drawings → *from page 50*.



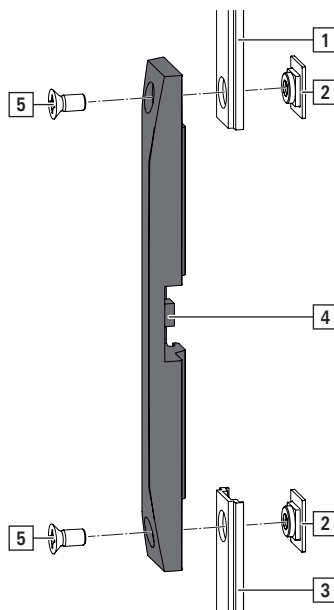
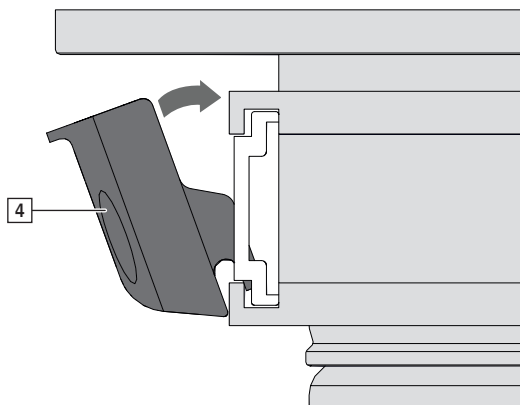
2. Install the Roto Line AL geared-handle, lockable, with espagnolette support → *from page 47*.



#### INFO

It is not possible to install the espagnolette support at a later point.

3. Screw down the SEC espagnolette protection onto the connecting rods as follows.
  - a. Insert the corner drive with connecting rod [1], SEC connector [2] and cam into the connecting rod groove from above on the locking side.
  - b. Insert the connecting rod [3], SEC connector [2] and cam into the connecting rod groove from below on the locking side.
  - c. Swing the SEC espagnolette protection [4] into the connecting rod groove on the locking side.
  - d. Fasten the SEC espagnolette protection on the connecting rods to the SEC connectors using screws.



4. Fix the corner drive to the sash using the retaining fork → *from page 28*.



### 5.3.3 Flush-encased gearbox

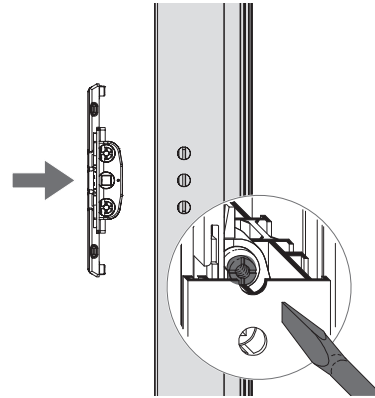
#### Installing the flush-encased gearbox

1. For the position of the flush-encased gearbox, see the installation drawings. → *from page 50*
2. Place the flush-encased gearbox in the delivery state in the routing provided as shown.



#### INFO

Turn the clampable lug to secure the flush-encased gearbox for transport.



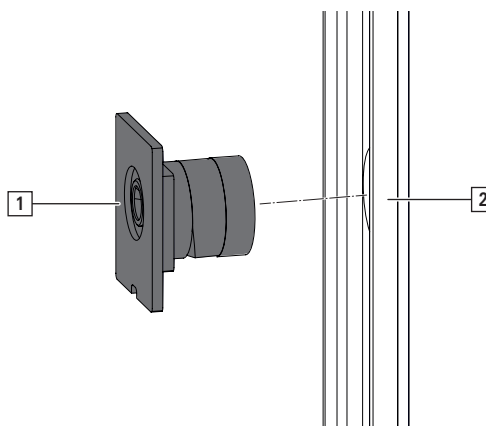
### 5.3.4 Cam, insertable – Euro-groove

#### Installing the cam, insertable

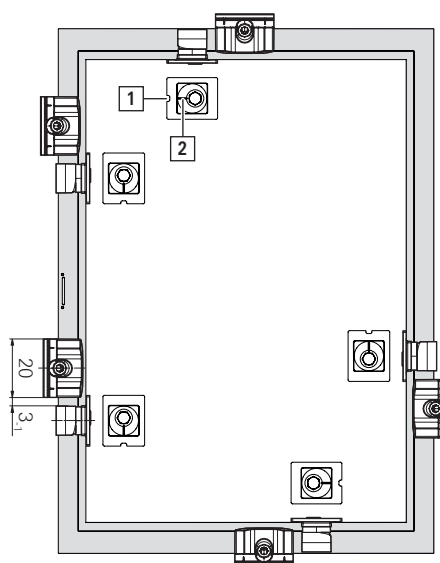
**INFO**

Comply with the installation sequence for the aluminium sash .

1. For the number and position of cams, see the installation drawings. → *from page 50*
2. Insert the cam [1] into the connecting rod [2].



- a. The recess [1] on the cam points away from the striker.



- b. Adjust the marking [2] for adjusting the cam horizontally or vertically in relation to direction of travel  
→ 7.1.1 "Cam, insertable" from page 53.



### 5.3.5 Cam, insertable – ECC-groove

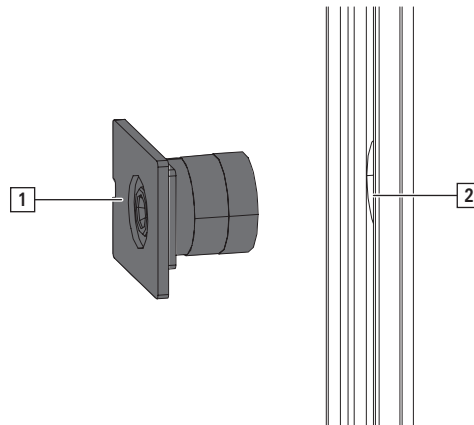
#### Installing the cam, insertable – ECC-groove



#### INFO

Comply with the installation sequence for the aluminium sash .

1. For the number and position of cams, see the installation drawings. → *from page 50*
2. Insert the cam [1] into the connecting rod [2].



- a. The recess [1] on the cam points either towards the sash overlap or away from the sash overlap at every position.

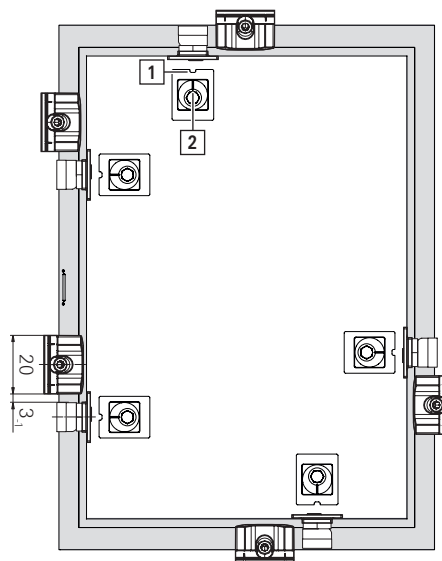


#### INFO

Depending on the alignment of the cam, it is now only possible to increase or reduce the gasket compression.

The recess points towards the sash overlap = reduce the gasket compression.

The recess points away from the sash overlap = increase the gasket compression.



- b. Adjust the marking [2] for adjusting the cam horizontally or vertically in relation to direction of travel  
 → 7.1.1 "Cam, insertable" from page 53.

### 5.3.6 Corner drives

#### Installing the corner drives

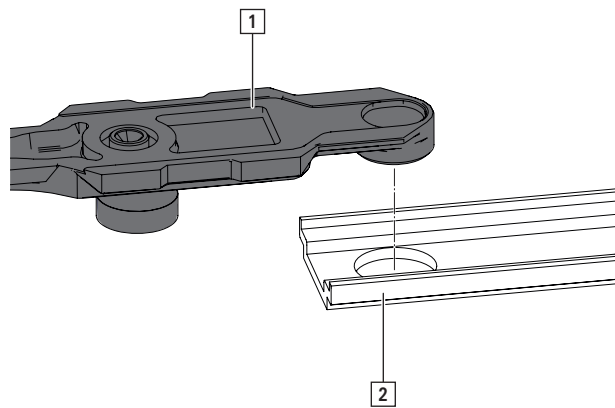
- ⇒ Drill holes created in the handle → *from page 22*
- ⇒ Espagnolette cutout routed → *from page 22*
- ⇒ Sash corners opened
- ⇒ Connecting rods prepared
- ⇒ Cam installed → *from page 26*



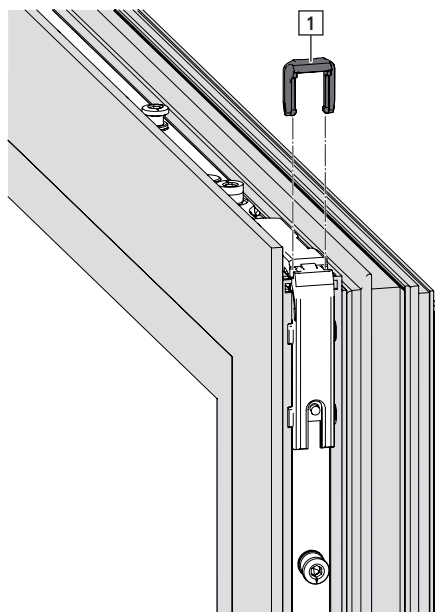
#### INFO

Comply with the installation sequence for the aluminium sash .

1. Connect the corner drive [1] to the connecting rod [2] and additional components at the coupling point.



2. Insert everything jointly into the connecting rod groove.
3. Fix the corner drive to the sash using the retaining fork [1].





### 5.3.7 TiltSafe SEC cam

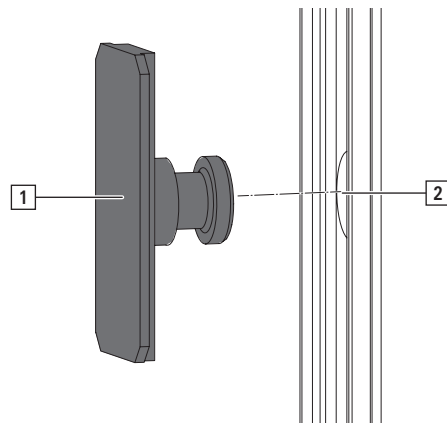
#### Installing the TiltSafe SEC cam



#### INFO

Comply with the installation sequence for the aluminium sash .

1. For the number and position of SEC cams, see the installation drawing. → *from page 50*
2. Insert the SEC cam [1] into the connecting rod [2].



### 5.3.8 Scissor stay guide 500, 735



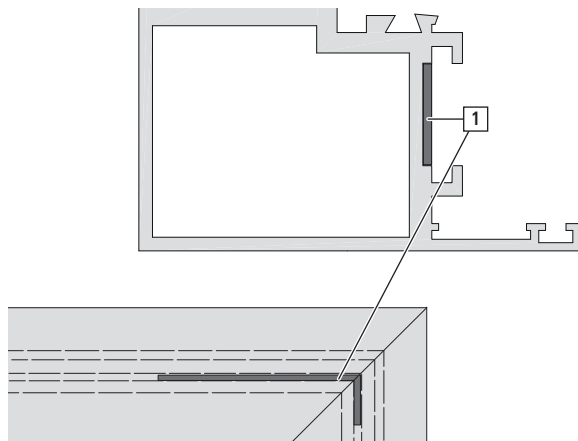
#### INFO

The installation of scissor stay guide 735 is shown here

#### Installing scissor stay guide 500, 735

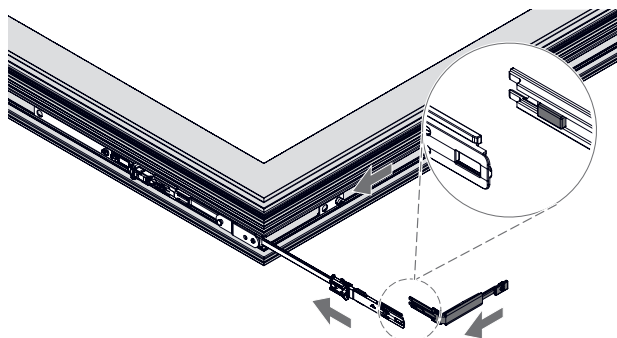
⇒ Connecting rods CR3 and CR4 prepared (see installation drawing → 6 "Installation drawings" from page 50).

1. For a profile with extended connecting rod groove (ECC), use a profile-related bracket [1] as a support.

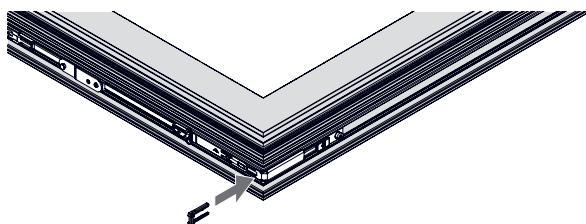


2. Insert connecting rod CR4 with components in the Euro-groove on the hinge side.

Link connecting rod CR3 and the CL corner drive to the scissor stay guide and insert the entire assembly at the top, starting from the hinge side.  
Link connecting rod CR4 to the CL corner drive.



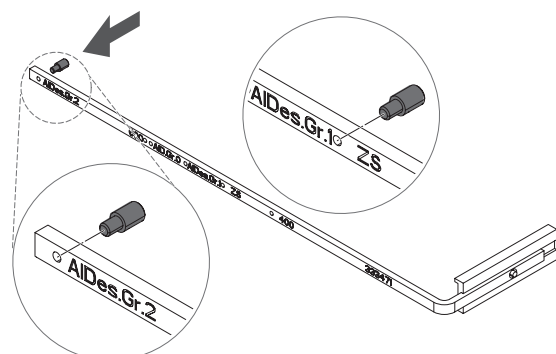
3. Secure the CL corner drive with the retaining fork.



4. Prepare the jig for the scissor stay guide by inserting the positioning pin into the corresponding drill hole (depending on the scissor stay guide selected).

Scissor stay guide 500 = AIDes. size 1

Scissor stay guide 735 = AIDes. size 2





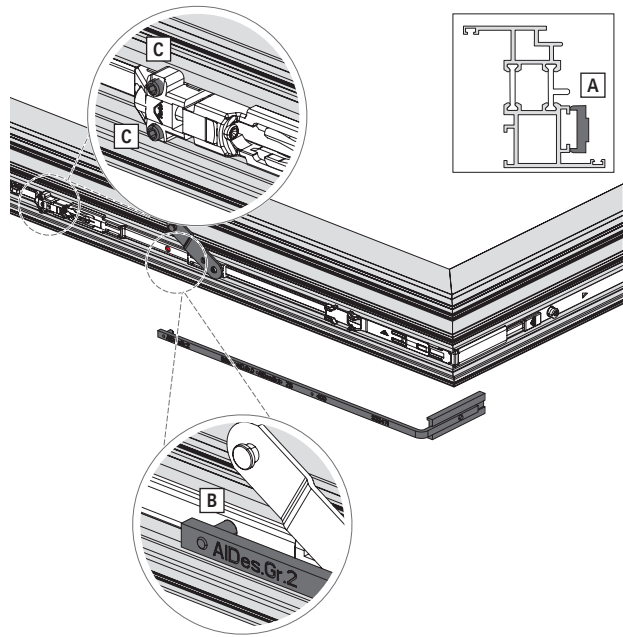
5. Position the jig on the Euro-groove so that it is level [A].

Open the scissor stay guide link and insert the jig positioning pin into the drill hole provided [B].

Secure the scissor stay guide in position with two piercing screws [C].

Tool: T10 hexalobular socket

Torque: 2 – 2.5 Nm



### 5.3.9 Corner hinge

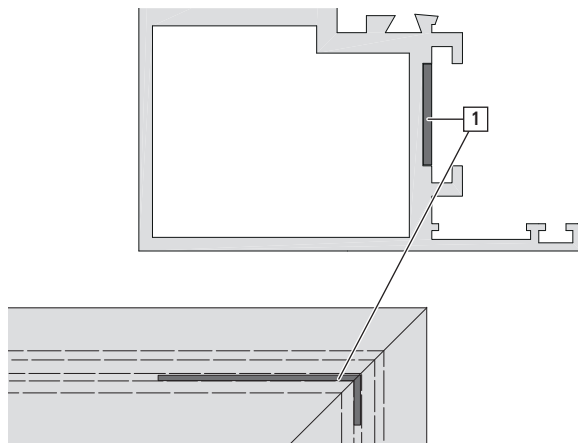


#### INFO

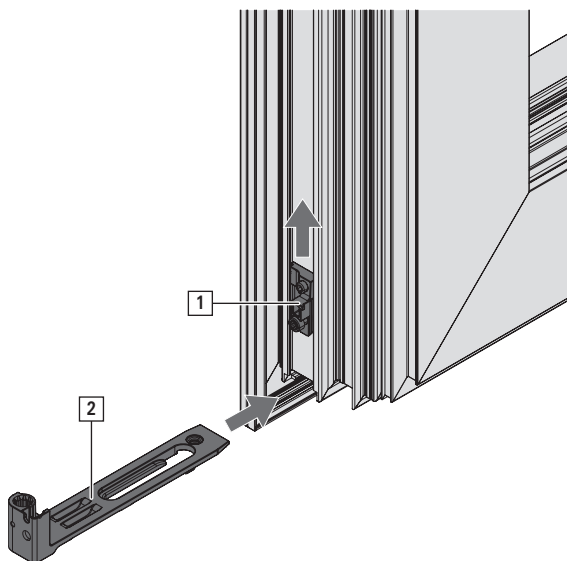
The 180 kg adjustment piece does not feature lateral adjustment.

#### Installing the corner hinge

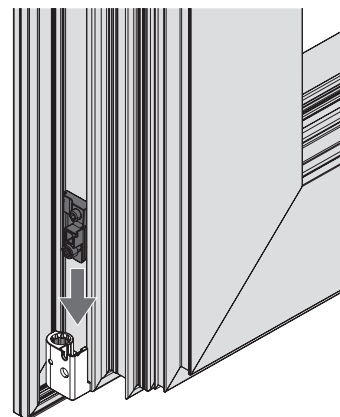
1. For a profile with extended connecting rod groove (ECC), use a profile-related bracket [1] as a support.



2. Insert the adjustment piece [1] into the connecting rod groove on the hinge side.  
Insert the corner hinge [2] into the connecting rod groove at the bottom.



3. Push the adjustment piece into the corner hinge.



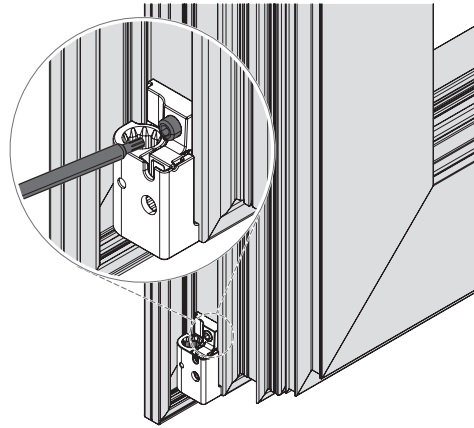


4. Secure the adjustment piece with a preassembled threaded pin.

Tool: T10 hexalobular socket

Torque: 2 – 2.5 Nm

Check that the hinge is fitted securely.



## 5.4 Frame



### INFO

Install the frame components when the frame is horizontal (workshop).

Once the frame is fitted, the reveal may prevent frame components from being installed correctly.

### 5.4.1 Strikers

Position the strikers in accordance with the installation drawings or using positioning jigs.

Striker positions in installation drawings correspond to cams in the turned, open position.

#### Test distance from (standard / SEC) striker to cam

- 3<sub>-1</sub> mm in turned, open position

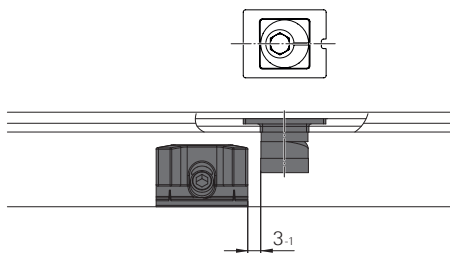


#### INFO

Check all dimensions during demo assembly prior to series production.

#### Installing standard strikers

1. Determine the striker position.

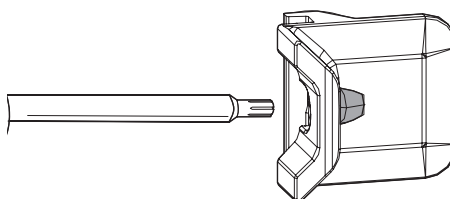


2. Fasten the striker with a preassembled threaded pin.

Tool: T10 hexalobular socket

Torque: 2 – 2.5 Nm

Check that the striker is fitted securely.



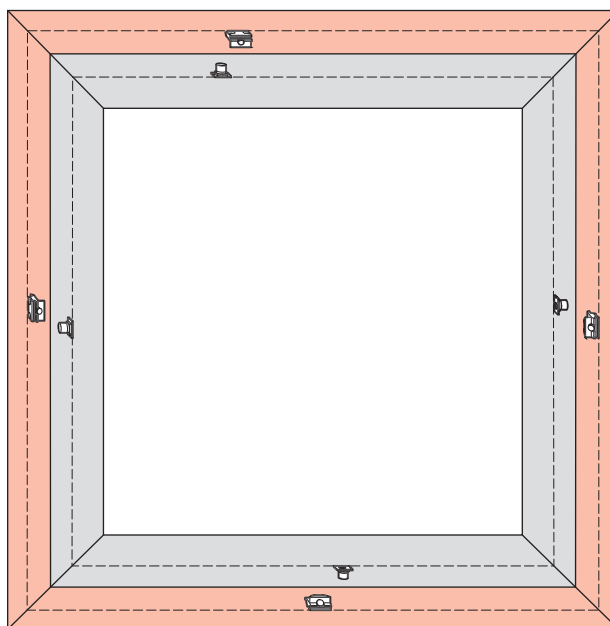
#### Installing standard strikers as centre locks

1. Depending on the profile stability and leaktightness requirements, the centre locks may have to be positioned at smaller sash widths and lower sash heights.



#### INFO

From 0.5 kN/m<sup>2</sup> wind load or SH > 1800 mm, place additional centre locks on the hinge side and locking side.





### Installing SEC strikers

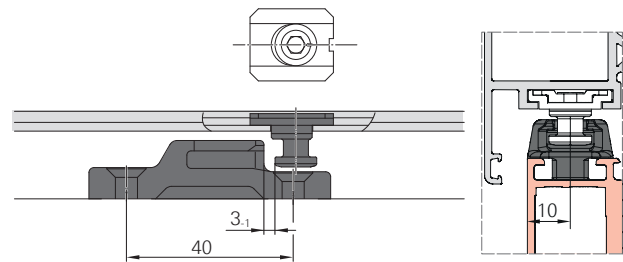
1. Determine the striker position.



#### INFO

Security locking points must not collide with standard locking points.

#### RC 2



2. Fasten the SEC striker with two screws.  
Check that the striker is fitted securely.



#### INFO

It must be ensured that the SEC strikers are securely fitted (in accordance with RC classification) for security hardware.

## 5.4.2 TiltSafe components



### ATTENTION

**Incorrect installation of the SEC strikers for tilt ventilation may cause property damage!**

Improper installation of the SEC strikers for tilt ventilation may damage the components. Protection against burglary will no longer be ensured.

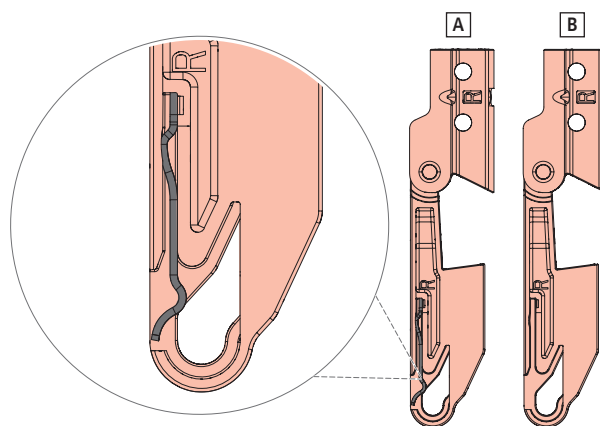
1. Install the specified number of SEC strikers for tilt ventilation according to the weight → *from page 13*.
2. Observe the specified position for SEC strikers with and without lock-in position → *from page 13*.
3. Use inserts to achieve a minimum screw-in depth of 10 mm.
4. Use tamper-proof M5 x ... countersunk screws from strength class 10.9. Tamper-proof screws cannot be undone again.

### Installing the TiltSafe set



### INFO

- Install the SEC striker for tilt ventilation with lock-in position [A] on the handle side.
- Install the SEC striker for tilt ventilation without lock-in position [B] at the bottom and on the hinge side.

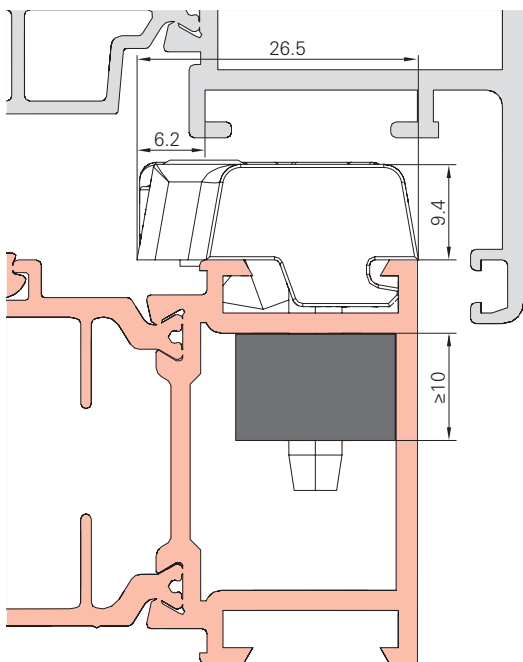


⇒ Suitable inserts prepared (see profile assessment for dimensions, minimum screw-in depth 10 mm).

⇒ Free installation space (min. 9.4 x 26.5 mm) in the SEC striker area for tilt ventilation tested.

⇒ Screw length determined to suit the frame profile and insert.

⇒ Frame profile predrilled.



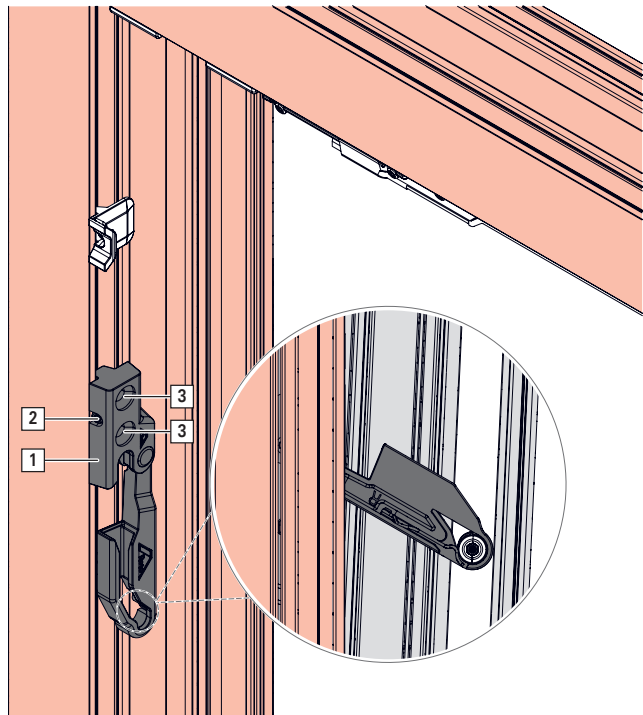


1. Swing the SEC striker for tilt ventilation [1] into the frame at the specified position (see installation drawing → 6 "Installation drawings" from page 50).

Pre-position the SEC striker with threaded pin [2].

Tool: T10 hexalobular socket

Torque: 2 – 2.5 Nm



2. Fasten with two tamper-proof M5 x ... counter-sunk screws [3] together with the insert.

Torque: 2 – 2.5 Nm

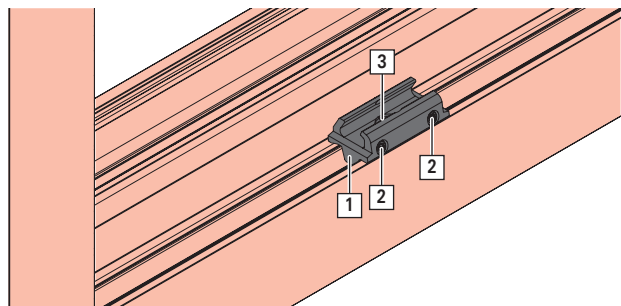
#### Installing the TiltSafe tilt striker

1. Swing the TiltSafe tilt striker [1] into the frame at the specified position (see installation drawing → 6 "Installation drawings" from page 50).

Pre-position the tilt striker with two threaded pins [2].

Tool: T10 hexalobular socket

Torque: 2 – 2.5 Nm



2. Fasten with one screw [3].  
Check that the tilt striker is fitted securely.

Tool: T25 hexalobular socket

Torque: 2 – 2.5 Nm



#### INFO

It must be ensured that the tilt striker is securely fitted (in accordance with RC classification) for security hardware.

### 5.4.3 Pivot rest

#### Installing the pivot rest

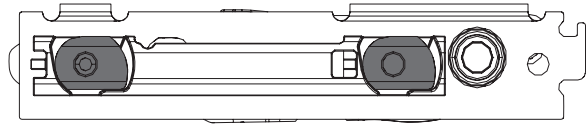
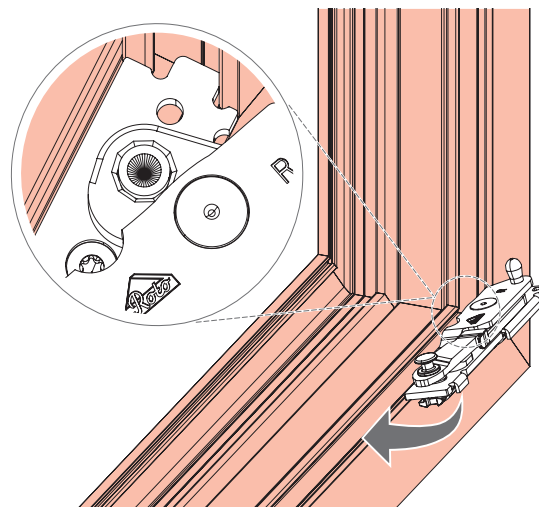
1. Align the clamping blocks.



#### INFO

For selecting the clamp strip version depending on the clamp strip dimensions = C (profile leg thickness) + J (groove inside width), .

2. Open the bearing and swing it into the profile so that the baseplate engages behind it.



3. Push the baseplate onto the profile so that it is level and tighten the preassembled screw [1].

Check that the bearing is fitted securely.

Tighten the screw [2].

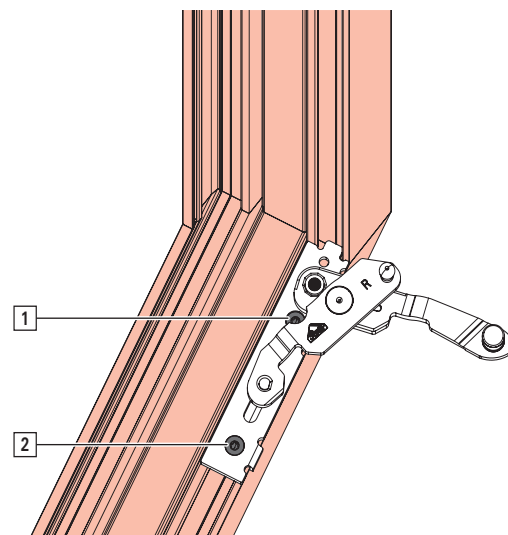
Tool: T20 hexalobular socket

Torque: 4.5 – 5.5 Nm



#### INFO

- Depending on the strength of the profile, or with a base groove thickness > 2 mm, it may be necessary to predrill the area of the screw [2]. To do so, use the pivot rest / stay bearing jig or create the corresponding drilling pattern in mechanical production ().
- Note the screw sequence [1], [2].
- Install and remove the bearing a maximum of two times.

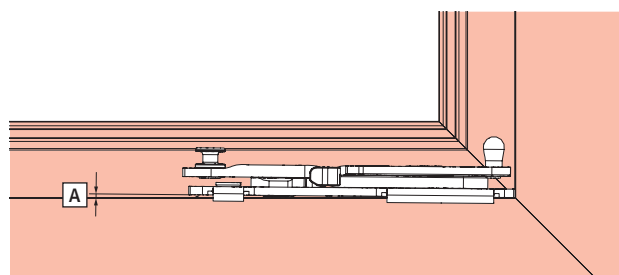


4. Close the bearing.



#### INFO

Do not leave a gap between the baseplate and profile [A].





#### 5.4.4 Sash stay 500, 735

##### Installing sash stay 500, 735

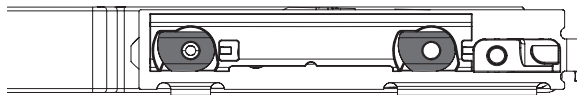
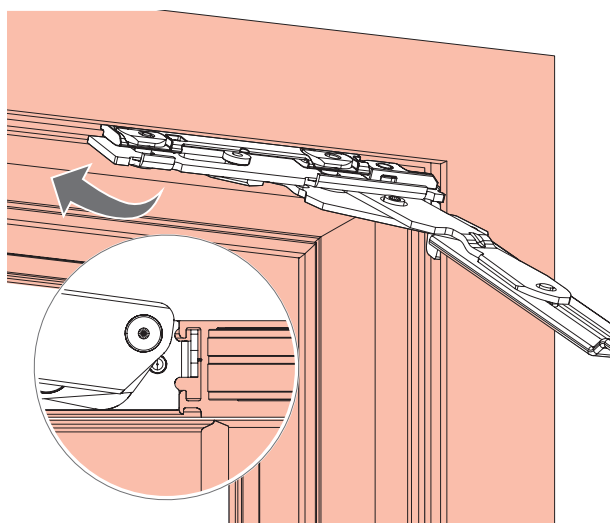
1. Align the clamping blocks.



##### INFO

For selecting the clamp strip version depending on the clamp strip dimensions = C (profile leg thickness) + J (groove inside width), .

2. Open the sash stay and swing the bearing into the profile so that the baseplate engages behind it.



3. Push the baseplate onto the profile so that it is level and tighten the preassembled screw [1].

Check that the sash stay is fitted securely.

Tighten the screw [2].

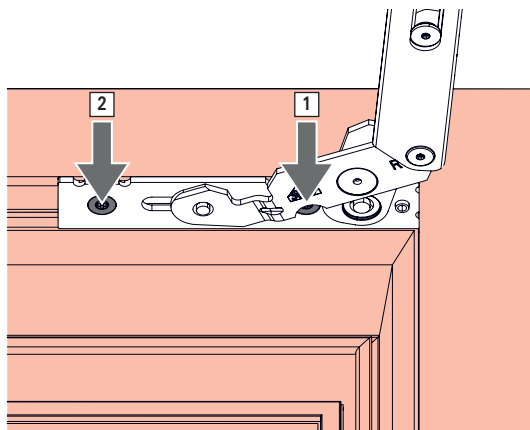
Tool: T20 hexalobular socket

Torque: 4.5 – 5.5 Nm



##### INFO

- Depending on the strength of the profile, or with a base groove thickness > 2 mm, it may be necessary to predrill the area of the screw [2]. To do so, use the pivot rest / stay bearing jig or create the corresponding drilling pattern in mechanical production ().
- Note the screw sequence [1], [2].
- Install and remove the sash stay a maximum of two times.

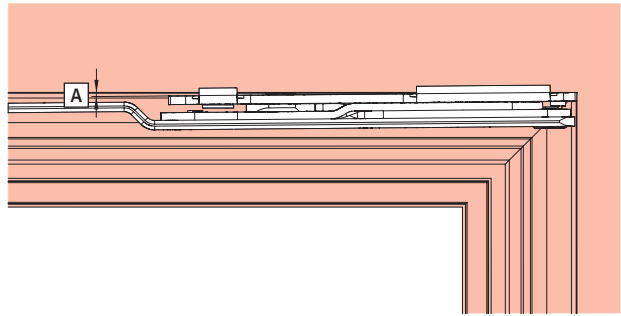


4. Close the sash stay.



**INFO**

Do not leave a gap between the base-plate and profile [A].





## 5.5 Joining the sash and frame



### CAUTION

#### Heavy loads pose the risk of injury and property damage.

Lifting and carrying heavy loads in an uncontrolled manner may lead to physical injury and property damage.

- ▶ Transport and installation must be carried out by at least two people.
- ▶ Use transportation means.

### 5.5.1 Connecting the sash to the pivot rest



### WARNING

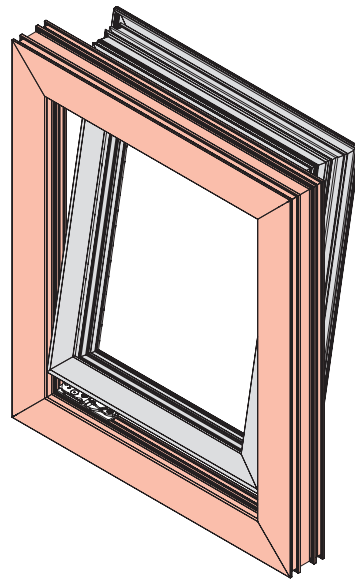
#### An unsecured sash may pose a risk of death!

The sash may fall during installation if it is not securely connected to the frame.

- ▶ Secure the sash to prevent it from falling, e.g. by using two people.

⇒ Pivot rest and sash stay closed

1. Move the handle to the turn position.
2. With the sash slightly tilted inwards, guide it along the frame in a downwards direction until you feel the hinge engage in the bearing.



3. Close the sash.
4. Turn the sash, which is placed against the frame edge on the hinge side, open by approx. 35° to 50°.
5. Push down on the mishandling device at the corner drive and move the handle to the tilt position.

## 5.5.2 Mounting sash stay 500



### WARNING

#### Potential risk of death caused by an unsecured sash!

The sash may fall if the sash stay is not correctly connected to the scissor stay guide.

- Check correct mounting.

⇒ Connect the sash to the pivot rest → *from page 41*.

1. Mount the cam in the guide groove in the scissor stay guide [A].

Mount the bolt in the hole in the scissor stay guide [B].

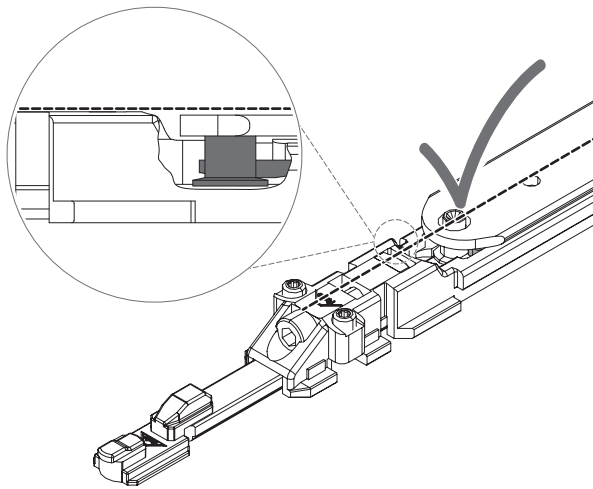


Fig. 5.2: Correct mounting (no projection from the sash stay to the scissor stay guide).

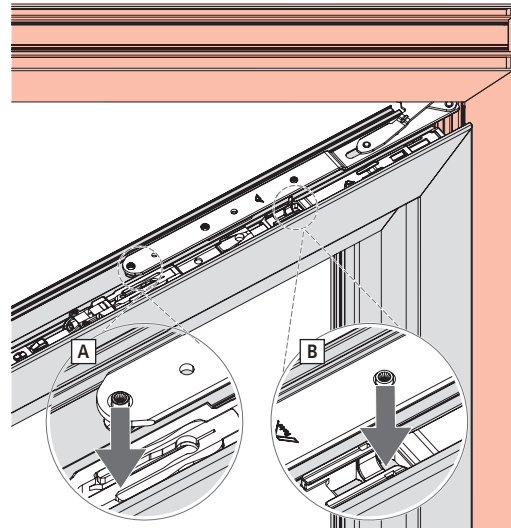
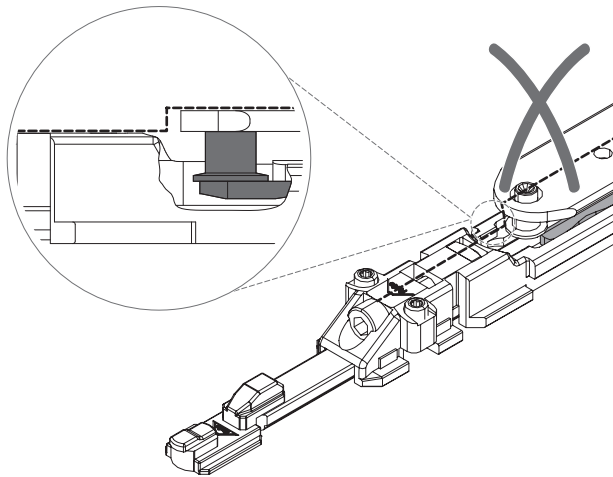


Fig. 5.3: Incorrect mounting (projection from the sash stay to the scissor stay guide impermissible).

2. Push down on the mishandling device at the corner drive and move the handle to the turn position.  
Close the sash and test the operating sequence.



### 5.5.3 Mounting sash stay 735



#### **WARNING**

#### **Potential risk of death caused by an unsecured sash!**

The sash may fall if the sash stay is not correctly connected to the scissor stay guide.

- Check correct mounting.

⇒ Connect the sash to the pivot rest → *from page 41.*

1. Mount the cam in the guide groove in the scissor stay guide [A].

Mount the bolt in the stay arm without bending the locking plate [1] [B]. The locking plate must lie flat on the stay arm.

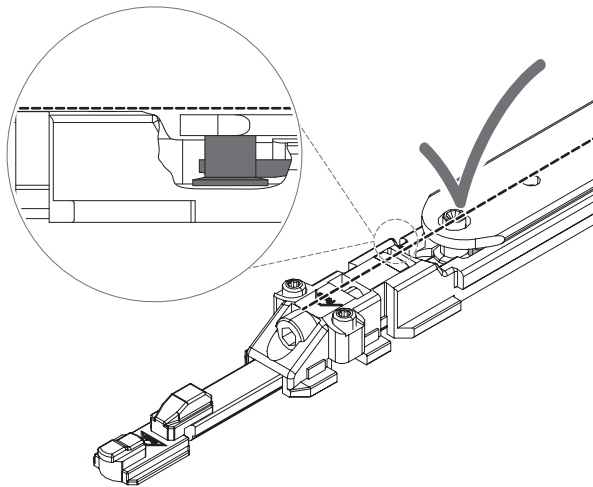


Fig. 5.4: Correct mounting (no projection from the sash stay to the scissor stay guide).

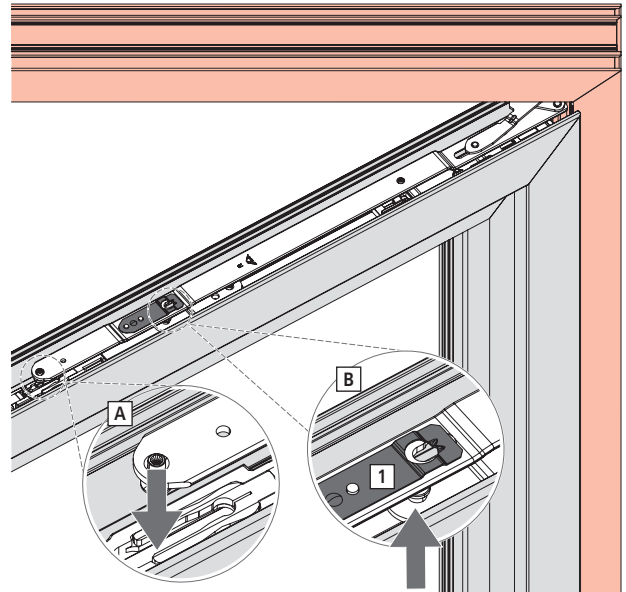
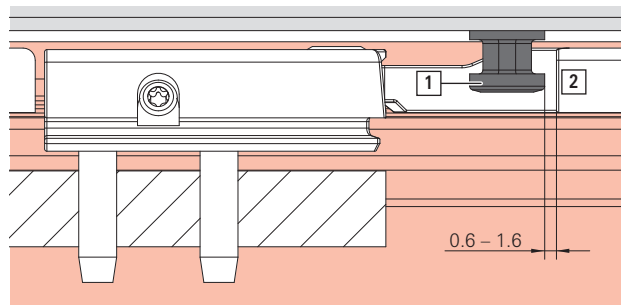


Fig. 5.5: Incorrect mounting (projection from the sash stay to the scissor stay guide impermissible).

2. Push down on the mishandling device at the corner drive and move the handle to the turn position.  
Close the sash and test the operating sequence.

### 5.5.4 Checking the fit of the bottom TiltSafe SEC cam

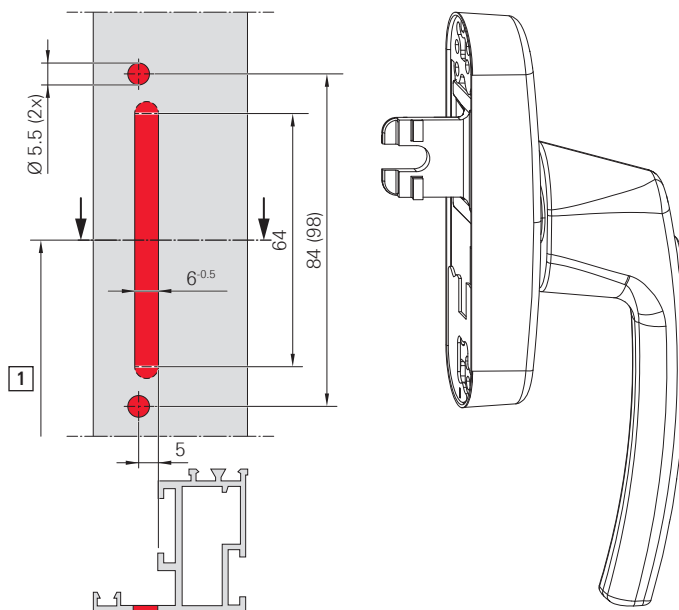
1. Check the position of the bottom TiltSafe SEC cam [1] relative to the TiltSafe SEC striker. Distance to the point of entry [2] between 0.6 and 1.6 mm.



## 5.6 Accessories

### 5.6.1 Drilling and routing dimensions

#### 5.6.1.1 Roto Line AL geared-handle

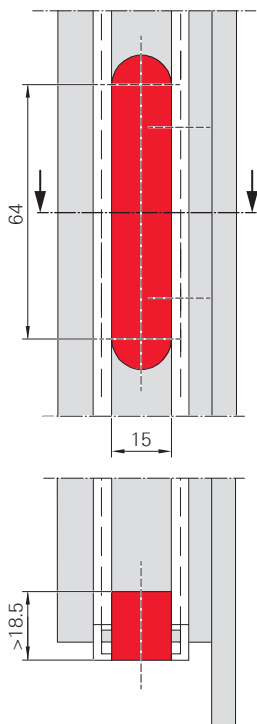
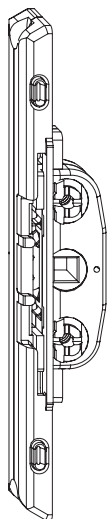


Drill holes for the handle's fork and attachment

[1] Handle height HH ≥ 260 mm

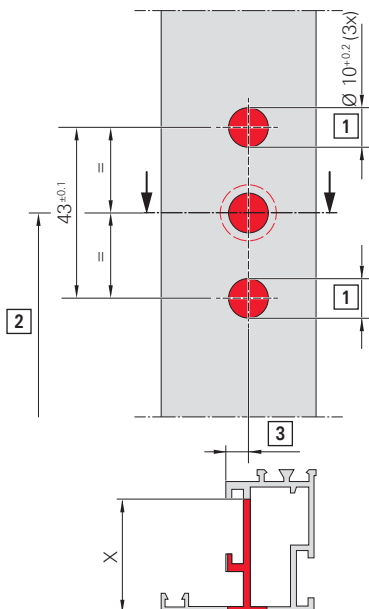
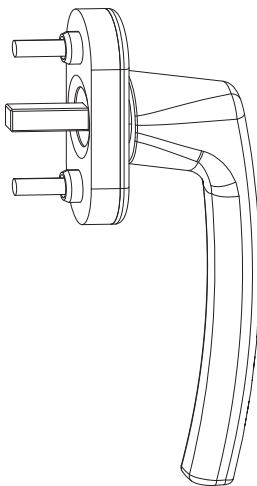


### 5.6.1.2 Flush-encased gearbox with / without mishandling device



Routing for the gearbox

### 5.6.1.3 Roto Line handle – standard



Drill holes for the handle's square spindle and lugs

[1] Only drill through the first profile wall.

[2] Handle height = HH ≥ 260 mm

[3] Backset

X = drilling depth for square spindle

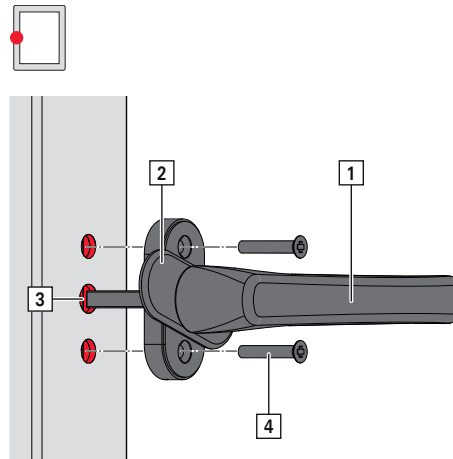
## 5.6.2 Roto Handles

### 5.6.2.1 Roto Line | window handle, standard

#### Installing the handle

⇒ The flush-encased gearbox must be installed → *from page 25*.

1. Move the handle [1] to the turn position.
2. Rotate the cover [2] on the handle 90°.



3. Insert the handle into the sash [3].
4. Fasten the handle with two screws [4].  
Overcome the resistance of the transport safety device while doing so.
5. Rotate the cover on the handle 90°.



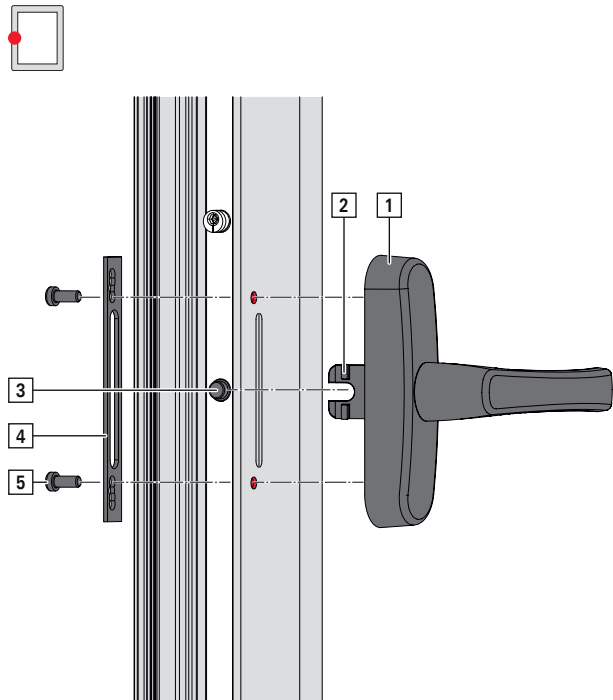
### 5.6.2.2 Roto Line | window handle for geared-handle

#### Installing the handle

⇒ The connector must be installed .

⇒ With a lockable handle, the SEC espagnolette protection must be installed → *from page 24.*

1. Move the handle to the turn position.
2. Place the espagnolette [1] on the sash from the inside of the sash.  
The fork [2] engages in the connector bolt [3].  
Fit the espagnolette support [4] from the outside of the sash on the sash to the espagnolette.
- a. Align the espagnolette support on the drill holes.
- b. Fasten the espagnolette with screws [5].



3. Turn the handle to check that it runs smoothly.
4. Move the handle to the closed position.

### 5.6.3 Load transfer

The spring in the load transfer permanently takes a load of approximately 60 to 80 kg off the pivot rest. For this, it is necessary to pre-tension the spring to a certain length. This applies regardless of the set height of the sash. The load

is relieved from the pivot rest over the entire service life of the hardware components, also taking account of settlement and wear.

### Installing the load transfer



#### INFO

Sash installation with load transfer (S.kg 80 kg (T-O) / 100 kg (T&T) up to 180 kg).

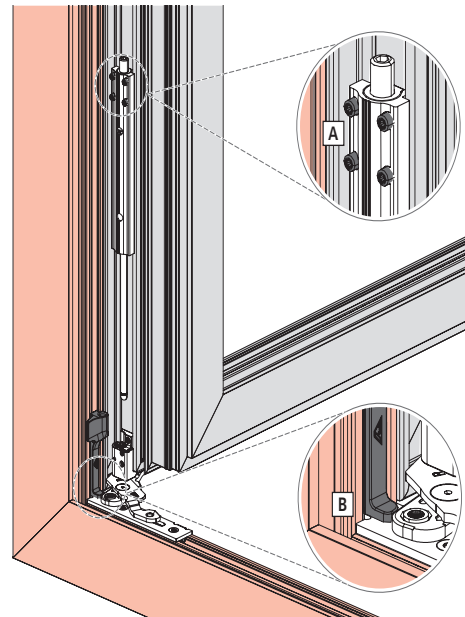
Do not use load transfer with S.kg  $\leq$  80 kg.

1. Insert the load transfer sash component (see installation drawing → 6 "Installation drawings" from page 50) into the sash groove and fasten it with four preassembled threaded pins [A].

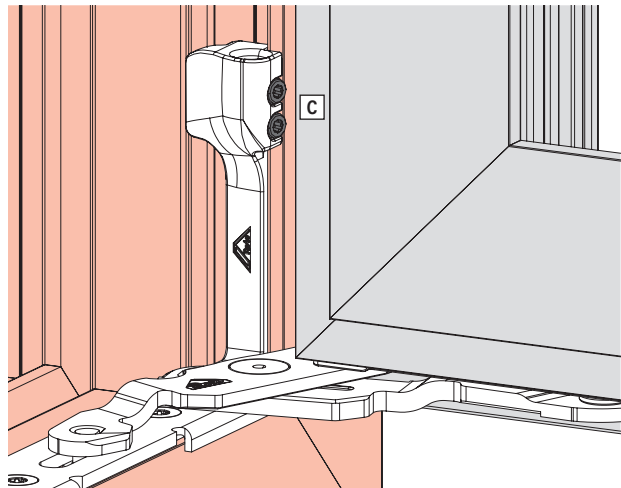
Tool: T10 hexalobular socket

Torque: 2 – 2.5 Nm

Place the load transfer frame bearing onto the pivot rest baseplate without leaving a gap [B].



2. Fasten the load transfer frame bearing with two preassembled threaded pins [C].

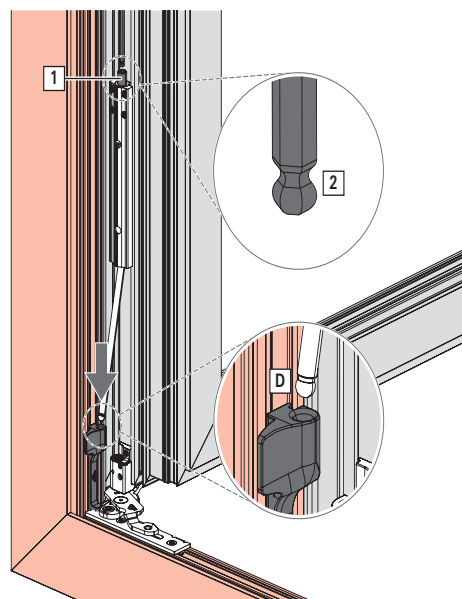




3. Position the load transfer support rod over the recess in the installed frame bearing [D].

Use the adjusting screw [1] to lower the support rod clockwise, until it is securely seated in the recess of the frame bearing.

Tool: hex key (with ball-shaped head [2]) size 4



4. Adjust the load transfer pre-tensioning. To do so, use a 4 mm hex key to adjust the load transfer at the adjusting screw with the sash in the open position (90°).

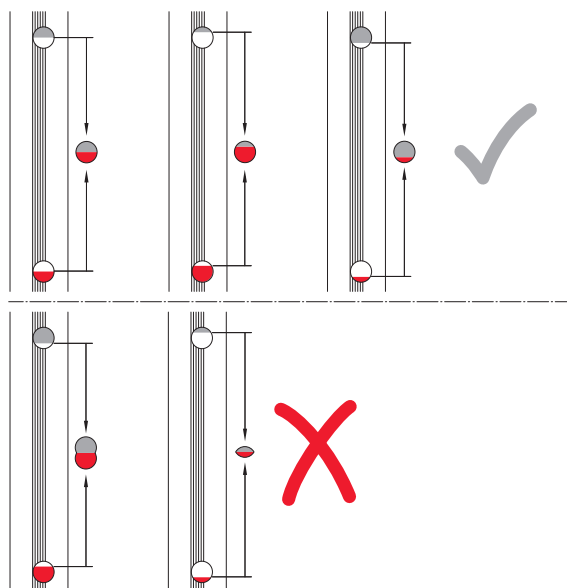
Adjust the adjusting screw so that a whole circle is produced by adding together the red and silver partial circles. Check at the view windows.



#### INFO

Only set and adjust the load transfer after the window has been installed on the construction site.

If the load transfer is adjusted before the window is installed, the window may only be transported upright and with the glazing installed.



## 6 Installation drawings

### 6.1 Explanation



#### INFO

For positioning additional hardware components, see IMO\_386 in the “Installation drawings” chapter.

The following installation drawings relate to the application ranges in these instructions .

The following markings are used in the installation drawings to emphasise references and other elements:

| Marking                 | Translation                                                |
|-------------------------|------------------------------------------------------------|
| Axer                    | Sash stay                                                  |
| FB                      | Sash width                                                 |
| FH                      | Sash height                                                |
| Garnitur-Positionierung | Set positioning                                            |
| GH                      | Handle height                                              |
| kg                      | Kilograms                                                  |
| RBi                     | Frame width, internal                                      |
| RHi / RHI               | Frame height, internal                                     |
| Standard                | Standard                                                   |
| T1 / T2 / T3 / T4 / T5  | Connecting rod 1 / connecting rod 2 / etc.                 |
| Treibstangenmaße        | Connecting rod dimensions                                  |
| TS1 R                   | TiltSafe SEC striker with lock-in position on the right    |
| TS2 R                   | TiltSafe SEC striker without lock-in position on the right |

Technical drawing of a room layout with dimensions and furniture specifications. The drawing includes a floor plan with various furniture items and their dimensions, as well as detailed views of the furniture components.

**Room Dimensions:**

- Overall width: 624 (FH=1800)
- Overall depth: 300 (1)
- Room width: 660 (FH=1800)
- Room depth: 220

**Furniture and Dimensions:**

- TS1 R:** Dimensions: 170, 174, 110, 624 (FH=1800), 146, 225, 134, 193, 120, 180, 385, 180, 220.
- TS2 R:** Dimensions: 170, 174, 110, 624 (FH=1800), 146, 225, 134, 193, 120, 180, 385, 180, 220.
- TS1 R (Detailed View):** Dimensions: 170, 174, 110, 624 (FH=1800), 146, 225, 134, 193, 120, 180, 385, 180, 220.
- TS2 R (Detailed View):** Dimensions: 170, 174, 110, 624 (FH=1800), 146, 225, 134, 193, 120, 180, 385, 180, 220.
- TS1 R (Detailed View):** Dimensions: 170, 174, 110, 624 (FH=1800), 146, 225, 134, 193, 120, 180, 385, 180, 220.
- TS2 R (Detailed View):** Dimensions: 170, 174, 110, 624 (FH=1800), 146, 225, 134, 193, 120, 180, 385, 180, 220.
- TS1 R (Detailed View):** Dimensions: 170, 174, 110, 624 (FH=1800), 146, 225, 134, 193, 120, 180, 385, 180, 220.
- TS2 R (Detailed View):** Dimensions: 170, 174, 110, 624 (FH=1800), 146, 225, 134, 193, 120, 180, 385, 180, 220.

**Technical Details:**

- TS1 R:** Dimensions: 170, 174, 110, 624 (FH=1800), 146, 225, 134, 193, 120, 180, 385, 180, 220.
- TS2 R:** Dimensions: 170, 174, 110, 624 (FH=1800), 146, 225, 134, 193, 120, 180, 385, 180, 220.
- TS1 R (Detailed View):** Dimensions: 170, 174, 110, 624 (FH=1800), 146, 225, 134, 193, 120, 180, 385, 180, 220.
- TS2 R (Detailed View):** Dimensions: 170, 174, 110, 624 (FH=1800), 146, 225, 134, 193, 120, 180, 385, 180, 220.
- TS1 R (Detailed View):** Dimensions: 170, 174, 110, 624 (FH=1800), 146, 225, 134, 193, 120, 180, 385, 180, 220.
- TS2 R (Detailed View):** Dimensions: 170, 174, 110, 624 (FH=1800), 146, 225, 134, 193, 120, 180, 385, 180, 220.

**Technical Details:**

- TS1 R:** Dimensions: 170, 174, 110, 624 (FH=1800), 146, 225, 134, 193, 120, 180, 385, 180, 220.
- TS2 R:** Dimensions: 170, 174, 110, 624 (FH=1800), 146, 225, 134, 193, 120, 180, 385, 180, 220.
- TS1 R (Detailed View):** Dimensions: 170, 174, 110, 624 (FH=1800), 146, 225, 134, 193, 120, 180, 385, 180, 220.
- TS2 R (Detailed View):** Dimensions: 170, 174, 110, 624 (FH=1800), 146, 225, 134, 193, 120, 180, 385, 180, 220.
- TS1 R (Detailed View):** Dimensions: 170, 174, 110, 624 (FH=1800), 146, 225, 134, 193, 120, 180, 385, 180, 220.
- TS2 R (Detailed View):** Dimensions: 170, 174, 110, 624 (FH=1800), 146, 225, 134, 193, 120, 180, 385, 180, 220.

## 7 Adjustment

---



### INFO

Roto hardware components may only be adjusted by authorised professionals when the element is installed.

---



## 7.1 Gasket compression adjustment

### 7.1.1 Cam, insertable

Tool: size 4 hex key

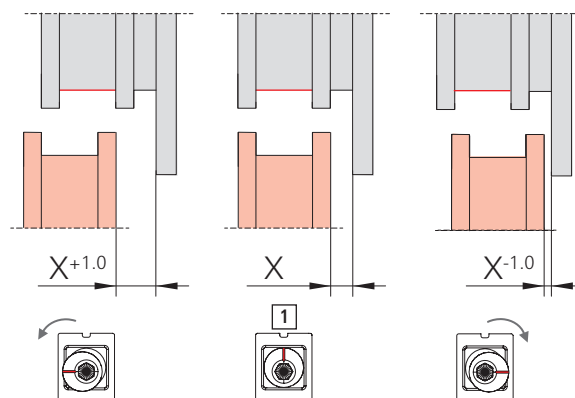
#### Euro-groove

⇒ On all cams, the recess points in the opposite direction to the direction of travel all the way round → *from page 26.*

When the locking cam is in the neutral position [1], the notch points towards the recess.

1. Turn the cam anticlockwise to reduce the gasket compression. This increases the distance between the sash and frame by 1.0 mm.

Turn the cam clockwise to increase the gasket compression. This reduces the distance between the sash and frame by 1.0 mm.



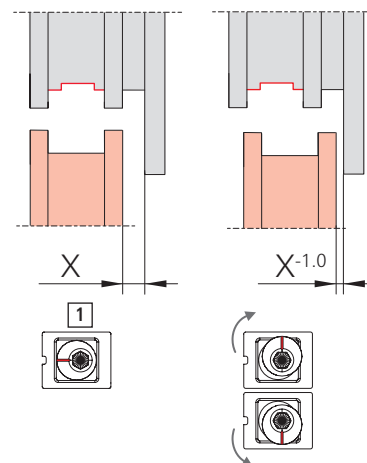
#### ECC-groove

⇒ On all cams, the recess points away from the sash overlap / towards the sash overlap all the way round → *from page 27.*

When the locking cam is in the neutral position [1], the notch points towards the recess.

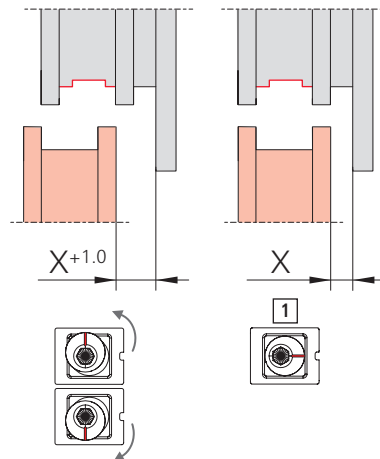
1. **Increasing the gasket compression**

Turn the cam to increase the gasket compression. This reduces the distance between the sash and frame by 1.0 mm.



## 2. Reducing the gasket compression

Turn the cam to reduce the gasket compression.  
This increases the distance between the sash and frame by 1.0 mm.



## 7.2 Tilt&Turn hardware

### 7.2.1 Lateral adjustment

#### 7.2.1.1 Sash stay 500, 735



#### **DANGER**

#### **Risk of death caused by incorrect adjustment!**

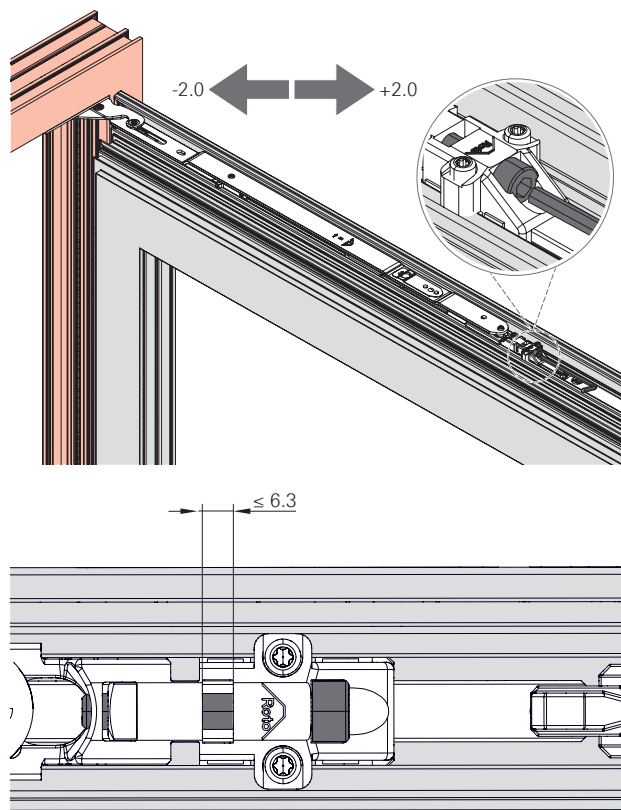
Unscrewing the screw too far may lead to hazardous situations and cause serious or fatal accidents.

- ▶ Roto hardware components may only be adjusted by authorised professionals.
- ▶ The gap must be smaller than 6.3 mm.

1. Open the window sash.

2. Lateral adjustment  $\pm 2$  mm.

Tool: size 4 hex key





### 7.2.1.2 Corner hinge

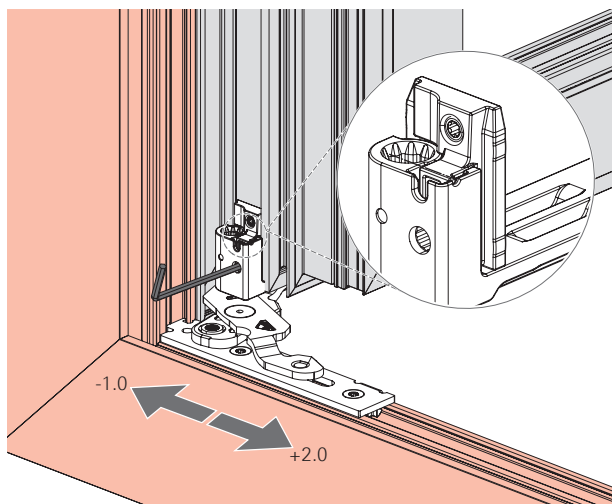


#### INFO

The 180 kg adjustment piece does not feature lateral adjustment.

#### Adjusting the corner hinge

1. Open the window sash.
2. Lateral adjustment -1 mm / +2 mm.  
Tool: size 4 hex key



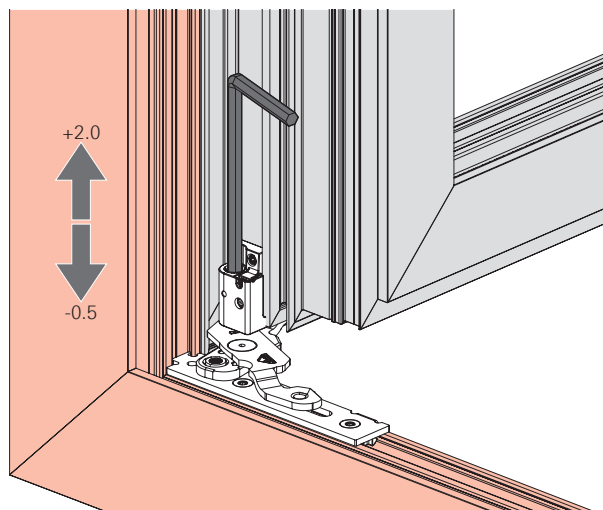
3. When using the CL set, ensure a collision-free closing process between the CL frame component and CL sash component.

### 7.2.2 Height adjustment

#### 7.2.2.1 Corner hinge

##### Adjusting the corner hinge

1. Open the window sash.
2. Height adjustment +2 mm / -0.5 mm via screw in the corner hinge.  
Tool: size 4 hex key



## 8 Maintenance



### CAUTION

#### Performing maintenance work incorrectly can lead to injuries.

Performing maintenance incorrectly can lead to injuries.

- ▶ Ensure that there is sufficient space for installation before starting work.
- ▶ Ensure that the installation site is clean and tidy.
- ▶ Always have hardware adjustment and replacement work performed by a specialist company.
- ▶ Secure the sash against unintentionally opening or closing.
- ▶ Do not unhinge the sash for maintenance.



### ATTENTION

#### Incorrect or improper testing may cause property damage.

Incorrect or improper testing of the hardware may cause the element to malfunction.

- ▶ Have the hardware checked by a specialist company when installed.
- ▶ If defects need to be remedied, have the element unhinged and remounted by a specialist company.



### INFO

The manufacturer must draw the attention of builders and end consumers to these maintenance instructions.

Roto Frank Fenster- und Türtechnologie GmbH recommends the manufacturer conclude a maintenance agreement with their end users.

No legal claims can be derived from the following recommendations; their application is to be based on the specific individual case.

|                                                    | Responsibility           |                |
|----------------------------------------------------|--------------------------|----------------|
| <b>Maintenance interval</b>                        | <input type="checkbox"/> |                |
| <b>Cleaning</b>                                    |                          |                |
| Clean hardware                                     | <input type="checkbox"/> |                |
| <b>Care</b>                                        |                          | → from page 56 |
| Lubricate movable parts                            | <input type="checkbox"/> |                |
| Lubricate locking points                           | <input type="checkbox"/> |                |
| <b>Performance test</b>                            |                          |                |
| Check that hardware components are fitted securely | <input type="checkbox"/> |                |
| Inspect hardware components for wear               | <input type="checkbox"/> |                |
| Check that movable parts work properly             | <input type="checkbox"/> |                |
| Check that locking points work properly            | <input type="checkbox"/> |                |
| Check ease of movement                             | ■                        |                |
| <b>Repair</b>                                      |                          |                |
| Retighten screws                                   | ■                        |                |
| Replace damaged components                         | ■                        |                |

☐ = May be carried out by a specialist company or the end user

■ = **Must** be carried out by a specialist company

### 8.1 Care



### ATTENTION

#### Using incorrect lubricants may cause property damage.

Substandard lubricants can prevent the hardware from working properly.

- ▶ Use high-quality lubricants.
- ▶ Only use resin-free and acid-free lubricants.
- ▶ Use appropriate lubricant in more challenging climatic conditions. Note the manufacturer specifications.



### ATTENTION

#### Cleaning agents and lubricants may pollute the environment.

Leaking or excess cleaning agents and lubricants may pollute the environment.

- ▶ Remove any leaking or excess cleaning agents and lubricants.
- ▶ Dispose of cleaning agents and lubricants separately and properly.
- ▶ Observe the applicable directives and national laws.

Ease of movement can be improved by lubricating or adjusting the hardware. All functional hardware components must be lubricated on a regular basis.

### Recommended lubricants

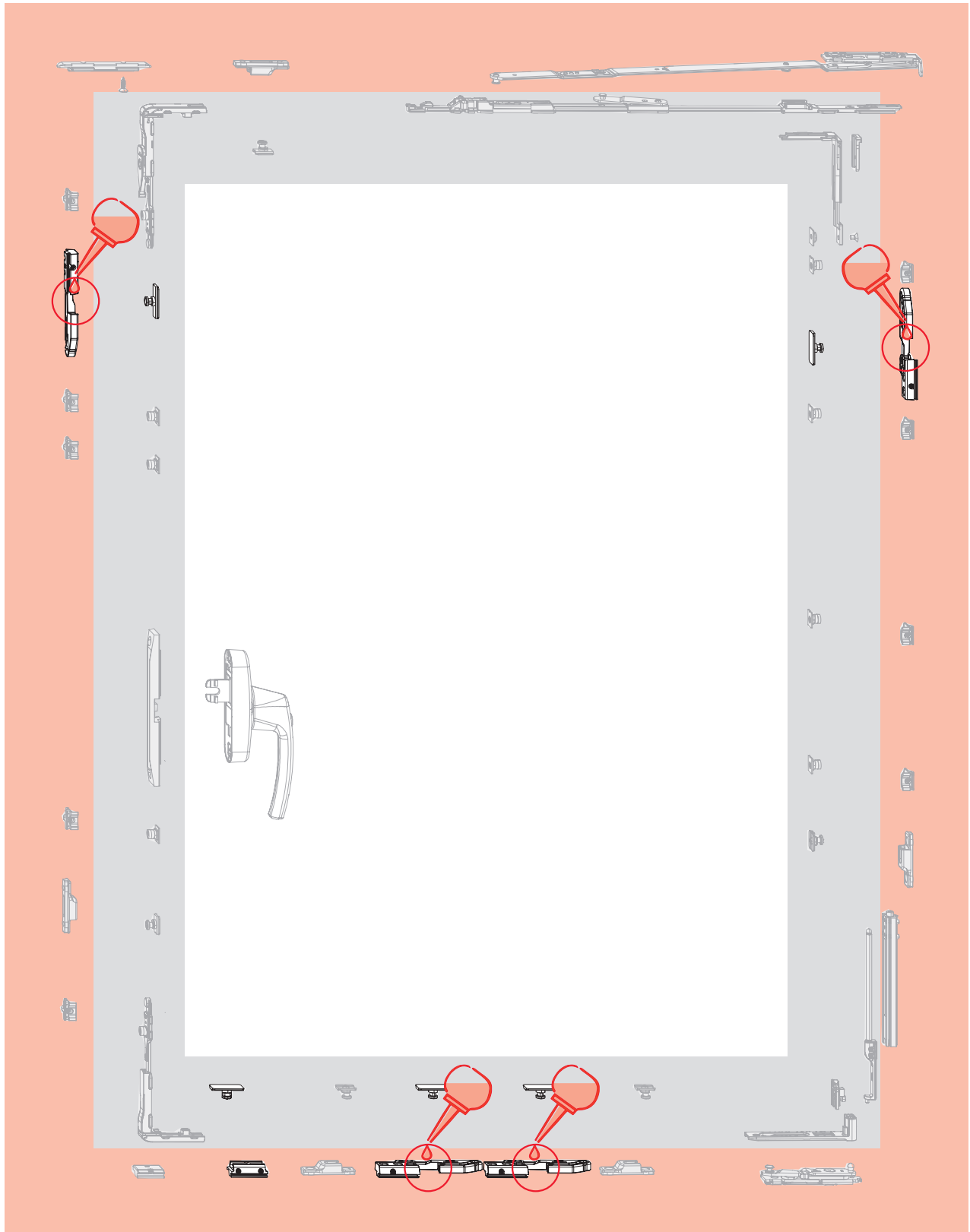
- Roto NX / NT grease  
Material number: 782881



### INFO

The figure displays the positioning of potential lubrication points. The figure does not necessarily match the installed hardware. The quantity of lubrication points varies depending on the size and design of the element.

### 8.1.1 TiltSafe SEC striker





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**Optimum hardware systems to meet all challenges.**

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