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## 1 Fundamentals

Dear customer,

You have purchased a high-quality scissors lift table from FLEXLIFT.

We would like to point out that the FLEXLIFT scissors lift table fully complies with the valid provisions of the European Machinery Directive and the European standards for scissors lift tables EN 1570.

### 1.1 About this Operating Manual

This manual introduces you with the characteristics of the lift table and contains the information required for safe use, commissioning, installation, operation, maintenance and repair of the system.

FLEXLIFT is not liable for damage resulting from improper, incorrect or careless operation.

If you have any questions, please contact the manufacturer or supplier!

As we generally do not know the exact application range of the scissors lift table and have not designed the control system for this appliance, we can only make suggestions in this manual for safe and EN-compliant operation. These operating instructions must be supplemented with a chapter on the safe operation of the machine after integration into a complete system. The information in the chapter operation must be observed at all times.

All information in this manual and the accompanying documents has been compiled with the greatest care, but errors can never be completely excluded. Should you notice any errors or inaccuracies, we would be grateful for feedback.

These operating instructions are an integral part of the lift table and must be provided with the machine when it is resold.

#### 1.1.1 Safety Messages in this Manual

In instructional texts, the following instructions (signal word with subsequent warning) are used to warn of dangers associated with an action.

**⚠ DANGER!** – warns of an imminent danger in the next step. Failure to observe this warning will likely result in serious or fatal injury.

**⚠ WARNING!** – warns of a possible danger in the next step. Failure to observe this warning may result in serious or fatal injury.

**⚠ CAUTION** – warns of a possible danger with the risk of minor injuries.

**NOTE** – Warns of possible damage to the lift table, load or other property if the warning is ignored.

#### 1.1.2 Who is this Manual Intended for?

These instructions are intended for specialist personnel who are entrusted with the assembly, commissioning, maintenance and repair of the lift table.

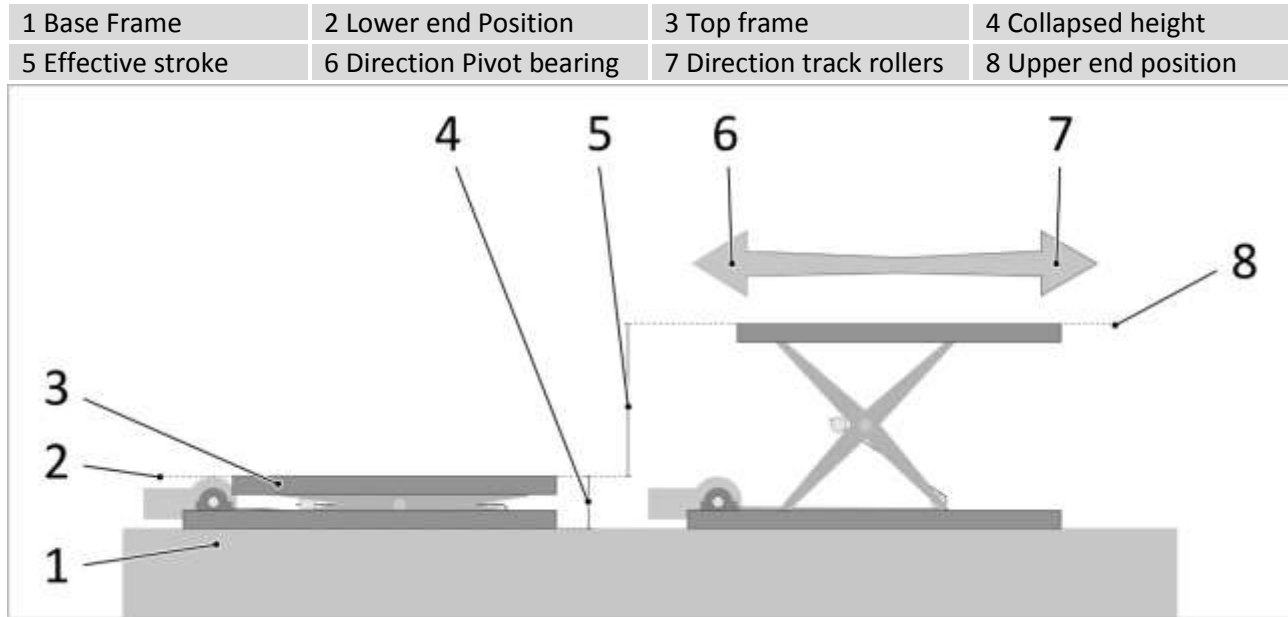
Every person who assembles, installs, maintains or repairs the lift table must be suitably qualified and have read and understood these operating instructions in their entirety.

### 1.1.3 Illustrations in this Manual

Since FLEXLIFT lifting tables are highly adapted to the respective project requirements and many construction details differ, illustrations in this manual can only serve as examples. The number and exact position of components and assemblies as well as their sizes and proportions may vary on the lift table. The technical data and the spare parts list are authoritative.

### 1.1.4 Frequently Used Expressions in this Manual

The following figure shows the meaning of special terms that are used repeatedly in this manual.



**Fig. 1: These general terms are used repeatedly in the manual**

## 1.2 Serial Number

To each lift table a factory number is assigned for its unique identification. This serial number is indicated on the cover page of these operating instructions and on the nameplate of the lift table.

If you have any queries, complaints, customer service requests or spare parts orders, please always provide the factory number to ensure fast processing.

The factory plate (type plate) is attached to the side of one of the lifting scissors.

1. Year of manufacture	2. Factory number	3. Lift table type	4. Manufacturer address
5. Contact Information	6. Payload	7. Net weight	8. Commission number

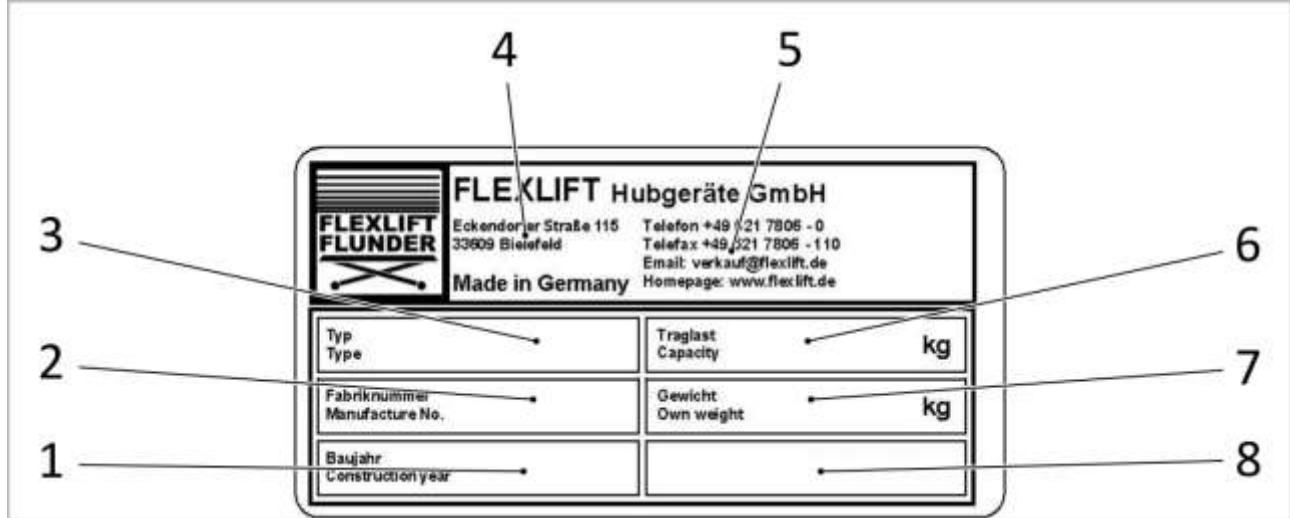
  


Fig. 2: The type plate, example

### 1.3 Conditions for Repair and Modifications

Constructive changes to the lift table may only be made after prior written clarification with and approval by the manufacturer.

Maintenance and repairs may only be carried out by authorized and trained personnel. Only use original spare parts or parts approved by the manufacturer for repairs.

Non-compliance will result in the immediate termination of all warranty and guarantee claims. The safe functioning of the lift table may also be at risk.

In the case of drive technology components (e.g. motor, gearbox, cardan shafts), we strongly recommend that repair work be carried out only by the manufacturer or by personnel trained by the manufacturer.

### 1.4 Industrial Property Rights

We would like to point out that various design principles of FLEXLIFT lifting devices or certain built-in parts are protected by patents. Copying and selling these systems as well as forwarding documents and drawings to third parties requires the permission of the manufacturer or will be prosecuted.

### 1.5 Manufacturers and Customer Service

FLEXLIFT Hubgeräte GmbH  
 Eckendorfer Straße 115  
 D – 33609 Bielefeld, Germany

☎ ++49 – 521-7806-0  
 Fax ++49 – 521-7806-110  
 Email: [verkauf@FLEXLIFT.de](mailto:verkauf@FLEXLIFT.de)

## **1.6 RFK Series**

The Flexlift RFK series comprise scissors lift tables, which are driven by a flat belt drive. They are available in numerous power variants, platform sizes and lifting heights and can be used in a wide range of applications.

The Flexlift scissors lift table RFK is to be used as an individual component in a complete system (e.g. inlet and outlet station in a transport device). Before commissioning, the safety must be checked in accordance with the safety requirements of the entire system.



## 2 Safety

The FLEXLIFT scissors lift complies with the valid provisions of the European Machinery Directive (2006/42/EG) and the European Standard for Scissors Lifts EN 1570. Every lift table is subjected to a thorough final inspection before delivery.

Since the main task of lift tables is to lift and lower loads and since there are considerable dangers from the movements and potential energy of lifted loads, all safety regulations must always be observed!

Safety devices, barriers and safety circuits must never be bridged or removed during operation. If safety devices have to be overridden for maintenance or repair work, this is clearly stated in these instructions.

FLEXLIFT safety components cannot compensate control errors caused by external controls, or only to a limited extent.

We would like to point out that incorrect and improper operation or any use of the device which does not comply with the specifications can lead to considerable risks for personnel, the device itself or other operating equipment!

Instructions given in this documentation do not release the user or operator of the lift table from his obligation to comply with Directive 2006/42/EC (Machinery Directive), EN 1570 and the applicable national machine, plant and safety regulations.

### 2.1 Safety Chapters on Transport, Assembly, Commissioning, Operation, Maintenance and Repair

As this manual is intended for qualified users in a professional working environment, action-related warnings have been reduced to the necessary minimum.

In order to minimize residual risks, the safety chapters must therefore be read and understood in full and the instructions contained therein implemented.

The instructional chapters are preceded by safety chapters. The warnings correspond to the times below:

- **This is a section safety message. It is imperative that this type of information be followed to ensure safe operation of the machine.**

### 2.2 Safety Markings on the Machine

The following labels are attached to the lift table. They must not be removed and must be replaced if they become less legible.

If necessary, contact the manufacturer to order replacement stickers. Specify the commission number or factory number of the lift table when ordering.



1. Reference to the operating instructions and safety instructions	2. Reference to the lubrication schedule	3. Reference to the use of the maintenance supports	4. Factory plate
5. Indication of load capacity	6. Prohibition sign: Ride, reach in, work below, Mandatory sign: Use maintenance supports	7. Note: Do not drive against mechanical end stops!	

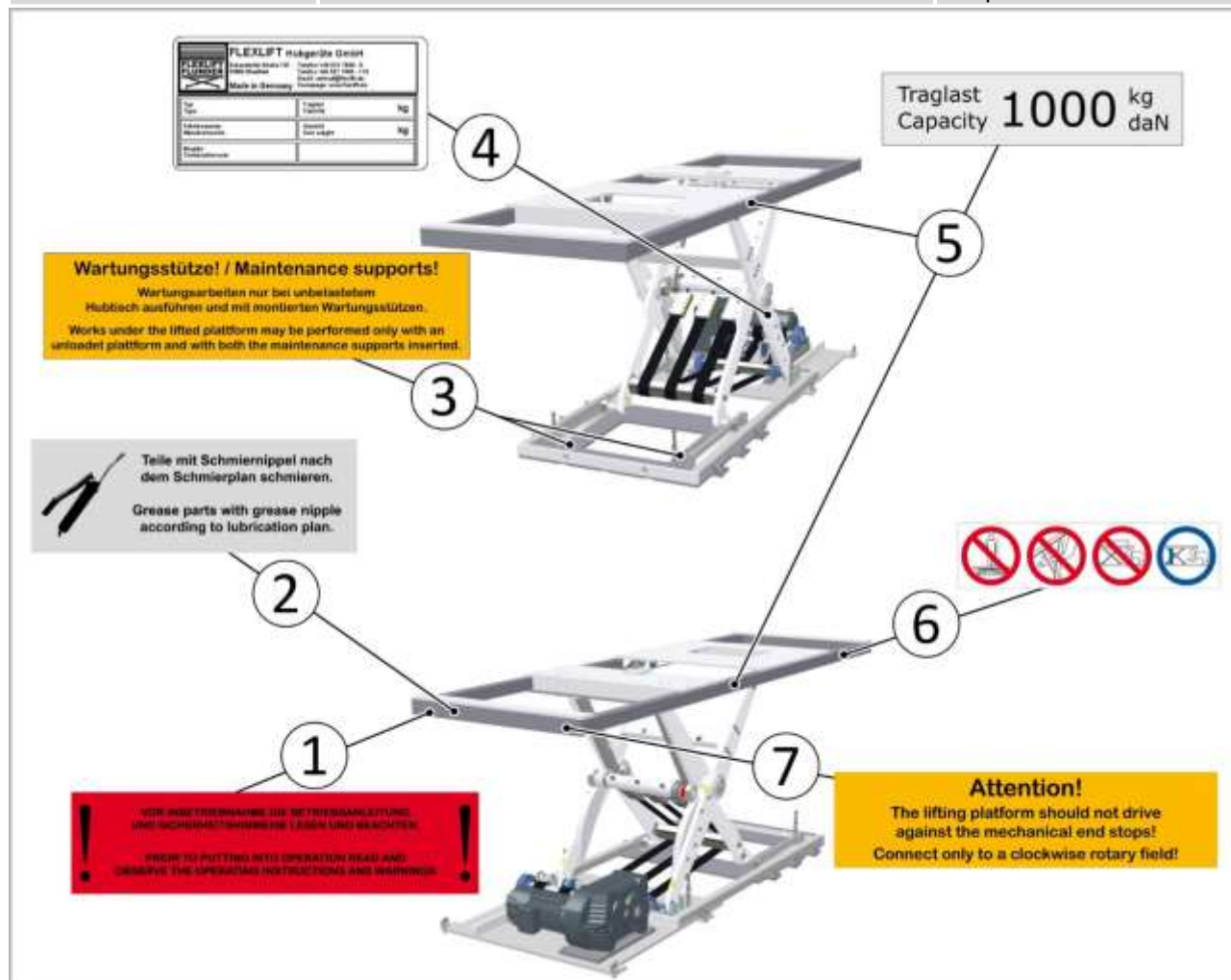


Fig. 3: These safety relevant markings must be legible at all times

### 2.3 Safety Regulations for Scissors Lift Tables

The following safety regulations must always be observed.

1. Only persons of legal age, who are competent and instructed are allowed to operate the lift table.
2. The operators must ensure that they do not endanger themselves or others during all movements of the lift table.
3. Lift table must not be loaded beyond the permissible limits. This also applies to the permissible number of cycles.
4. Observe the specified load type and load distribution.
5. Loads on the lift table must be secured against unintentional rolling, sliding and tilting.
6. During operation of the lift table, it is forbidden to:
  - a) Work on the load whilst the lift table is raising or lowering,

- b) Enter the load on the lift table when load is raised (exception: skilnet systems),
  - c) Being under the top frame, reach into the lift table, or tread under the lift table or the load stay under the upper frame or the load of the lift table, reach into the lift table, unless the lift table is secured by maintenance supports.
7. The presence of persons on the lift table during travel is not permitted.
  8. Operation of the lift table must be stopped immediately in the event of malfunctions or safety deficiencies.
  9. The surface on which the lift table is to be installed must be level, horizontal and designed for the weight and the forces occurring.
  10. The lift must be secured against unauthorized use.
  11. The function of the safety devices (with the exception of the safety cylinder) must be checked at regular intervals.
  12. Maintenance and repair operations:
    - a) May only be carried out by competent and trained personnel.
    - b) To be performed under an unloaded lift table when the maintenance brackets have been properly fitted. If the maintenance supports cannot be fitted (motor failure or broken belt, etc.), the lift table must be secured against unintentional lowering by other means.
    - c) The lift table must be secured against unintentional activation during maintenance and repair work.
    - d) They shall always be documented in an appropriate report.

The generally applicable safety regulations of Directive 2006/42/EC (Machinery Directive) and EN 1570 apply.

## 2.4 Safety Devices

**The general safety devices comply with the European standard EN 1570 (scissors lift tables).**

The lift table is equipped with the safety devices listed below. However, depending on the conditions of use and the requirements of the hazard analysis, the design may differ.

### Main switch

A main switch must be provided by the supplier of the controls.

### Safety limit switch upper/lower end position

Emergency limit switch – for stop position at top/bottom – if these positions are surpassed, the lift table may be seriously damaged. The slack-belt switches serve as lower safety limit switch.

### Maintenance supports, pluggable between upper and lower frame / locking pins for track rollers.

May only be used when the platform is unloaded and allow the lift table to be locked for maintenance and repair work on the scissors system and/or under the platform.

Supports are inserted onto the pins provided in the lower frame and the lift table is lowered onto them.

### Safety limit switch:slack belt switch/safety limit switch for bottom stroke:

If a belt breaks, the slack belt switch sends a signal to the controller unit of the lift table. Thereof the controller must stop all movement of the lift table immediately. This must be taken into account in the on-site control system.

**Anti-tilting bars**

The anti-tilting bars on the rollers prevent the lift table from "levering out", e.g. with an extremely one-sided load on the pedestal bearing side.

**Bellows**

A bellows serves as a physical barrier between the moving parts and the environment. It reduces the risk of serious injuries due to unintentional entry into the danger zone. The area under the lift table is nevertheless a danger zone and must not be entered.

**Anti fall device**

The catching cylinder is a anti fall device that prevents the lift table from falling in the event of a breakage of the load-bearing structure.

**Safety devices in the control system**

Other safety-relevant devices (e.g. emergency stop device, current limitation, main switch) must be provided by the control system.

All sensors of the lift table, in particular the safety limit switches (passage at the top, slack belt, etc.) must be safely evaluated in the control system.

### 3 Technical description

The scope of delivery includes all parts of the lift table as described below. Cabling and control unit is provided by the customer.

The scissors lift is designed as a frame structure. The scissors arms have been manufactured as a distortion-proof rectangular frame from tubular profiles or flat steel. They fold into each another when the platform is in the lowest position.

#### 3.1 Technical data

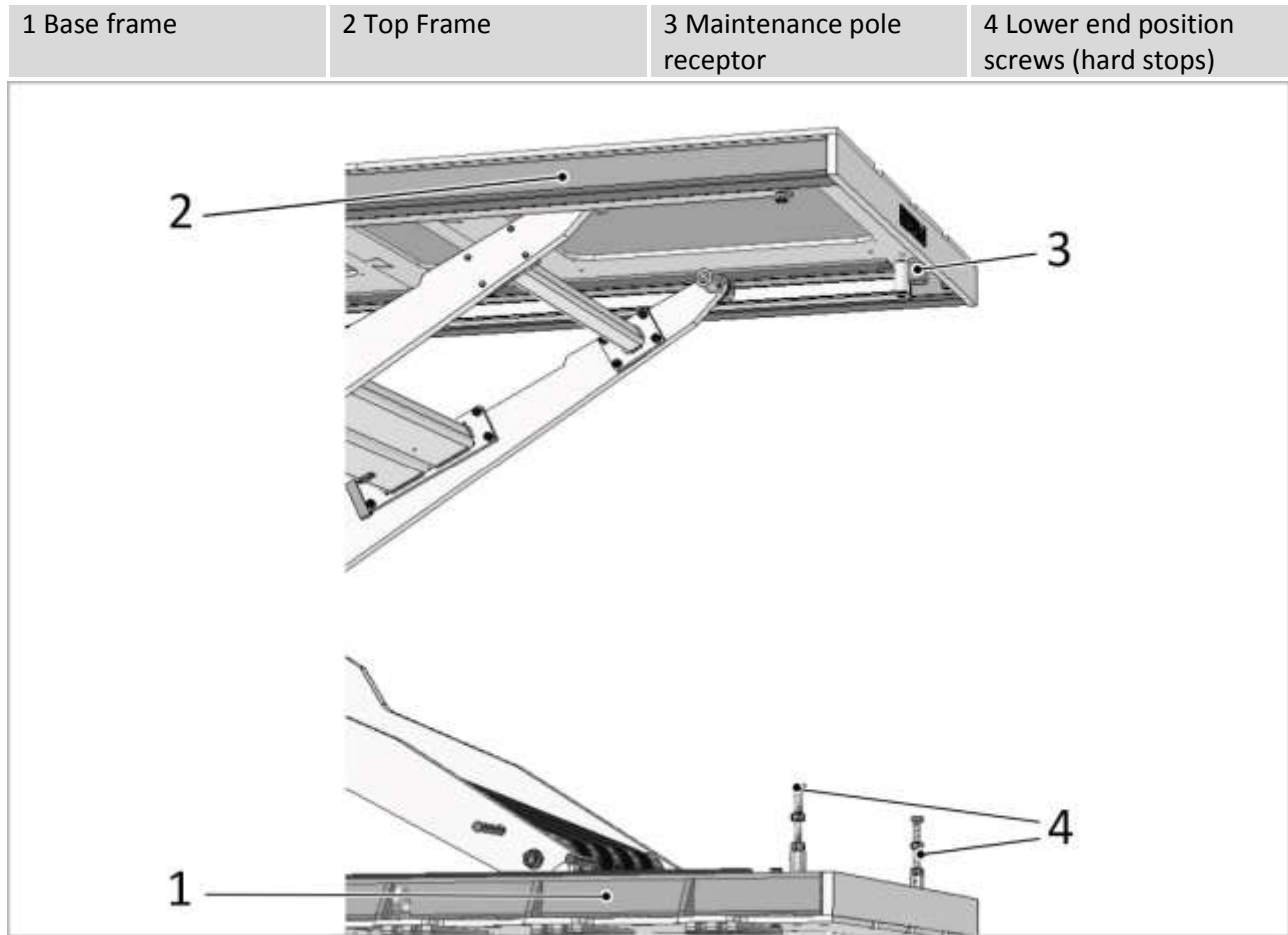
- + Included in scope of delivery.
- Not included in scope of delivery.
- o Prepared, on site.

Identification	
Table Designation	RFK-MA 2500/150
Serial No(s).	74137-74141
Motor type	K97 DRN132M4/BE11HR/IV/2W
Specifications	
Lifting speed	approx. 125 mm/s bei 60 Hz
Load type	Distributed load
Effective stroke	1500 mm
Color	RAL 2011
Load capacity	2500 kg/daN
Belts (number × type × length)	4 × 75F3 × 5250 mm
Measurements	
Top frame length	4300 mm
Top frame width	1100 mm
Base frame length	3300 mm
Base frame width	1100 mm
Collapsed height	285 mm
Mass	1900 kg
Equipment	
Automatic lubrication	Perma
Anti-fall-device	+
Top Frame cover	+
Safety edge	-
Bellows	+

#### 3.2 Lift table: parts and assemblies

The scissor lift table essentially consists of the assemblies described below.

### 3.2.1 Top Frame and Base Frame



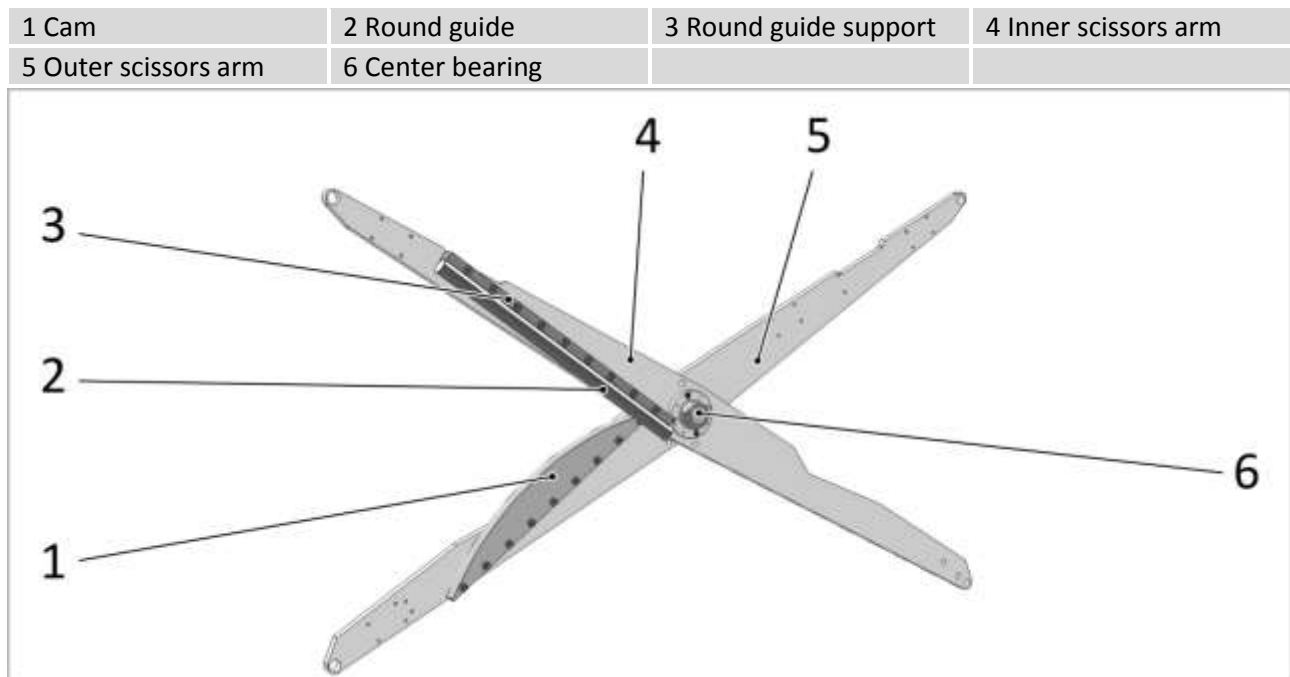
**Fig. 4: Example Top Frame and Lower frame (Belt Type Lift Table)**

The upper frame consists of a frame construction, depending on the lift table version with sheet metal covering. The frame construction includes two fixed bearings as pivot points of the scissors arms and two wear rails on which the track rollers of the inner pair of scissors arms move.

The base frame transfers the occurring vertical forces to the supporting sub structure. It consists of a profile frame with two fixed bearings, in which the inner scissors arms are mounted pivoted, and two roller tracks, in which the rollers of the outer pair of scissors arms move. The base frame is fixed on site in a skillet frame, on steel structure or on a stable subfloor e.g. made of concrete.

### 3.2.2 Scissors Arms

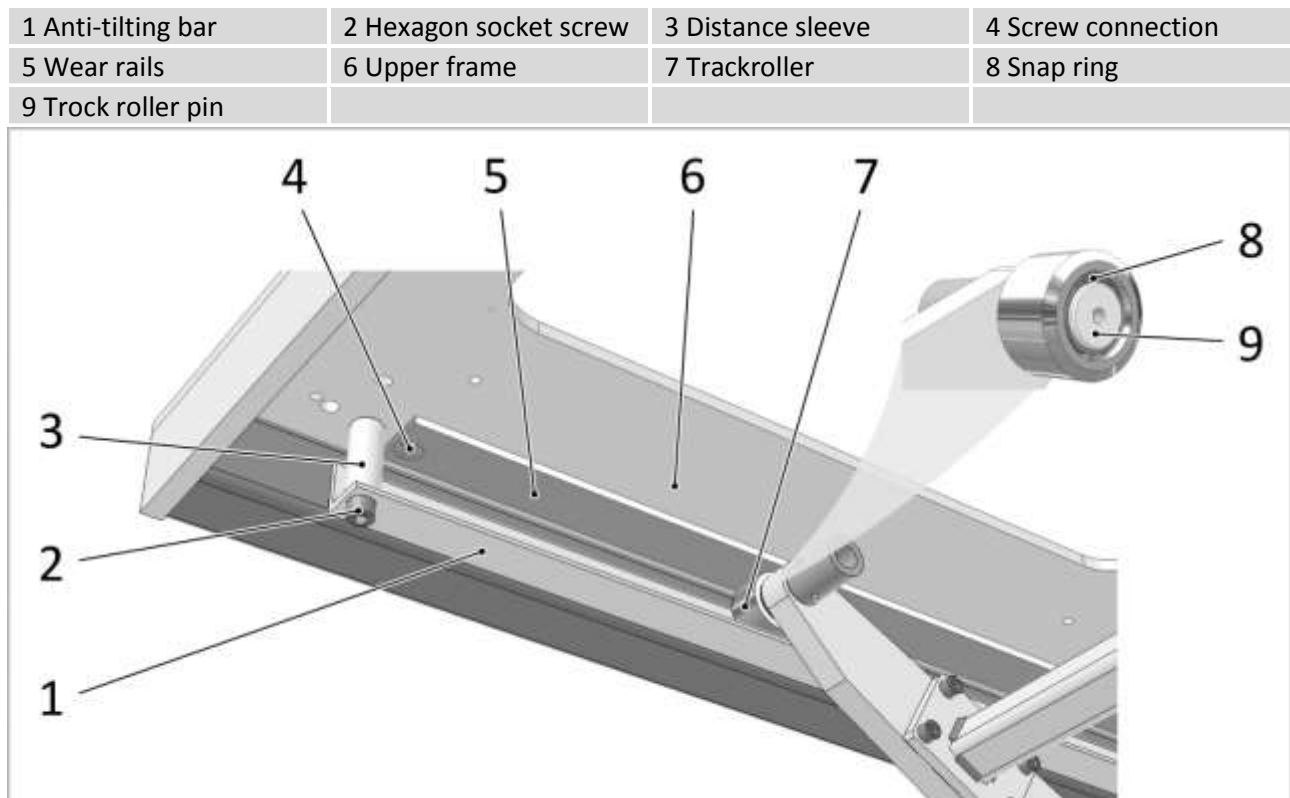
The scissors arms are made of torsion-resistant solid profiles. Two scissor arms form a circumferential frame with cross beams. During the lifting process, the track roller sides of the scissors arms are pulled by the belts towards the motor.



**Fig. 5: Example scissors arms**

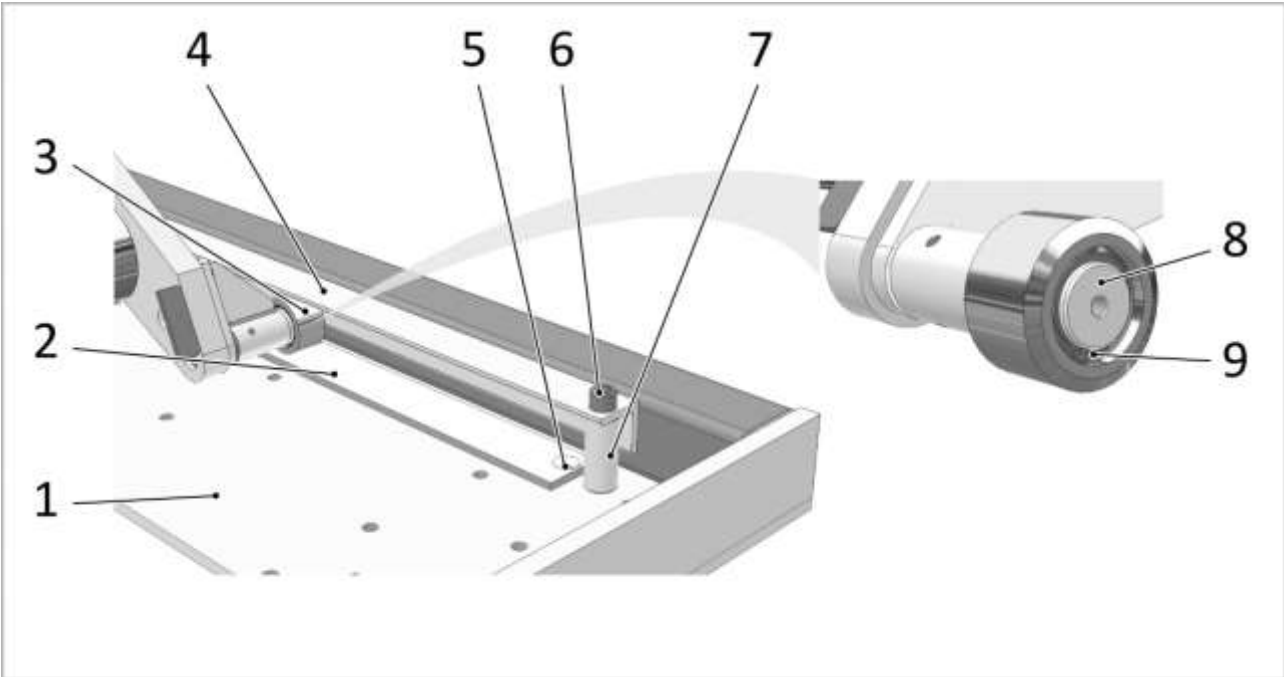
### 3.2.3 Track Rollers and Roller Tracks

Rollers at the ends of the scissors allow the floating bearing side to move. Replaceable wear rails in the upper frame and base frame protect the roller track frame material. Anti-tilting bars secure the track rollers against leaving the roller tracks.



**Fig. 6: Wear rails and track rollers in the upper frame**

1 Base frame	2 Wear rails	3 Track roller	4 Anti tilting bar
5 Screw connection	6 Hexagon socket screw	7 Distance sleeve	8 Track roller pin
9 Snap Ring			

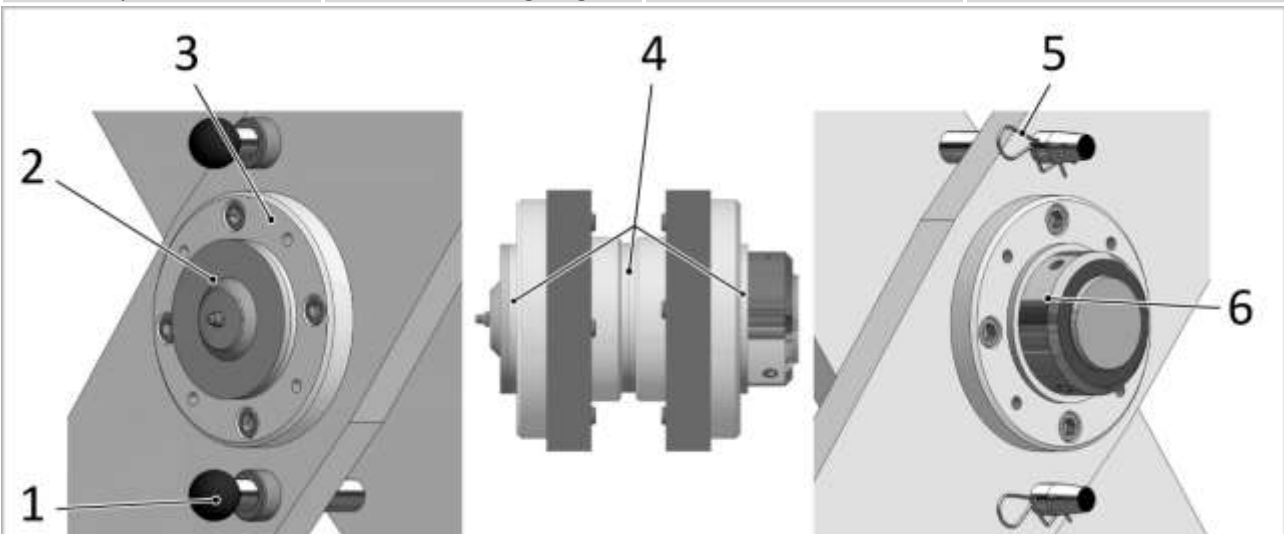


**Fig. 7: Wear rails and track rollers in the base frame**

### 3.2.4 Center Bearing

The two scissors arms are connected in the center bearing to form a pair of scissors.

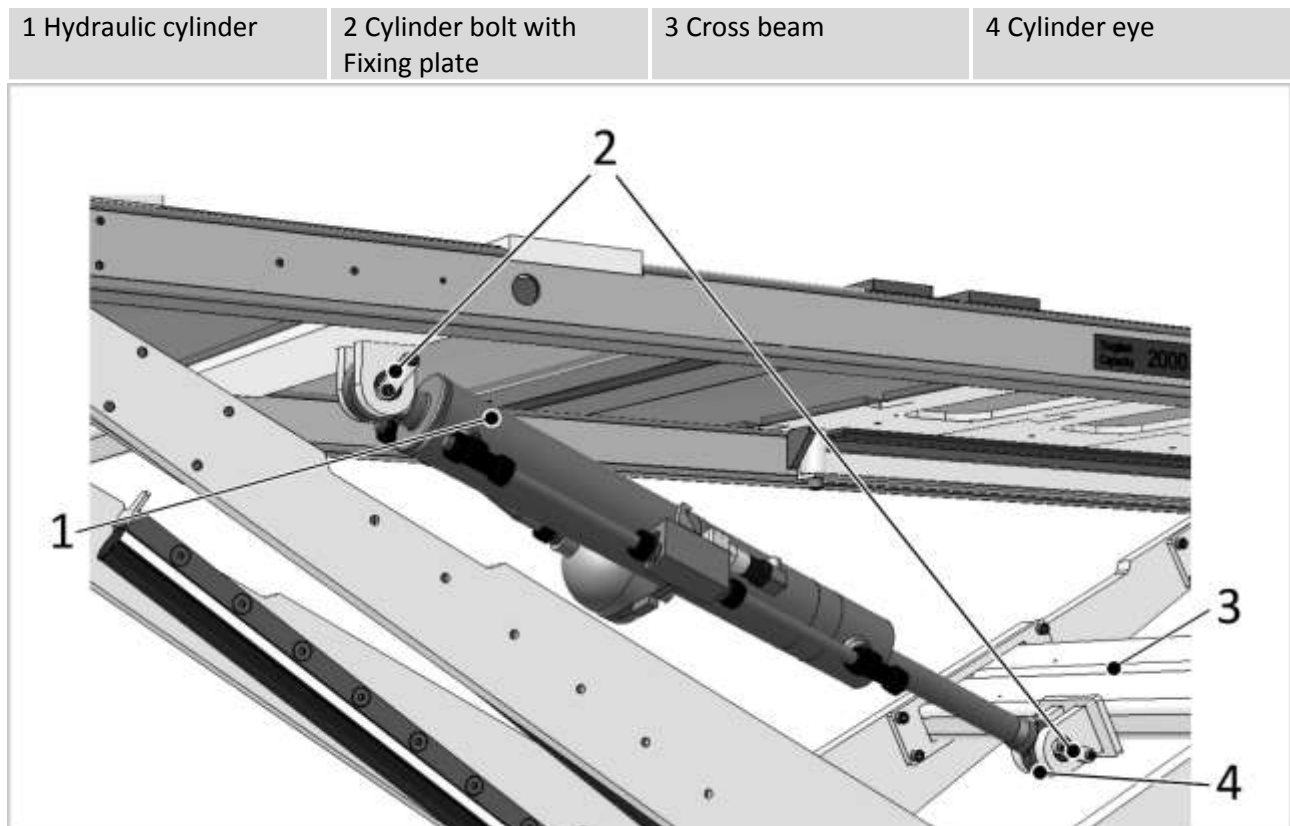
1 Maintenance pin (repair tool)	2 Center bearing pin	3 Center bearing cassette	4 Sliding discs
5 Cotter pin	6 Center bearing ring		



**Fig. 8: Center bearing**

### 3.2.5 Anti Fall Device

Prevents the lift table from falling in the event of a catastrophic failure, such as clutch failure or simultaneous breakage of all belts.



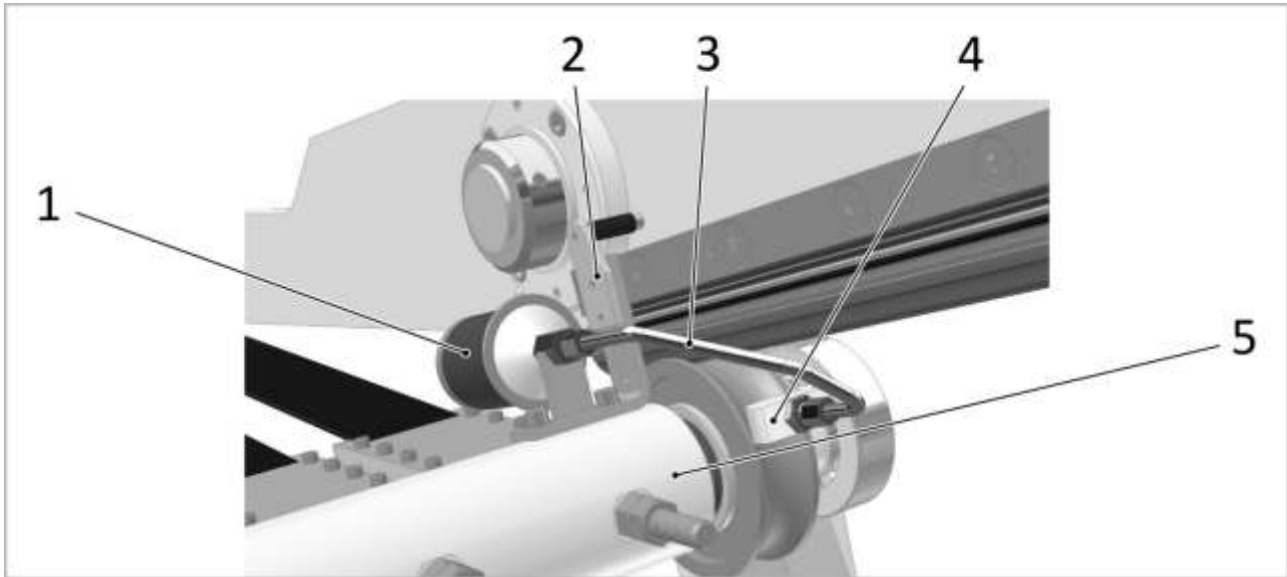
**Fig. 9: Anti fall device**

### 3.2.6 Automatic Lubrication

Automatic lubrication systems consist of a lube cartridge and an outlet brush or nozzle, the Applicator. The grease cartridge usually works with gas pressure or battery operated and continuously releases the lubricant.



1 Lube cartridge	2 Cam shaft bracket	3 Lube tubing	4 Applicator (Plastic piece or brush)
5 Cam roller shaft			



**Fig. 10: Automatic lubrication using the example of a profile roller**

Must be activated before commissioning and marked with the date of activation. The grease cartridge must be replaced regularly, otherwise the warranty on the components of the drive unit will be voided.

Refer to the manufacturer's documentation for further details and the Flexlift lubrication sheet.

### 3.3 Belt Drive Parts and Assemblies

The belt drive converts the torque of a gear motor into a lifting movement.

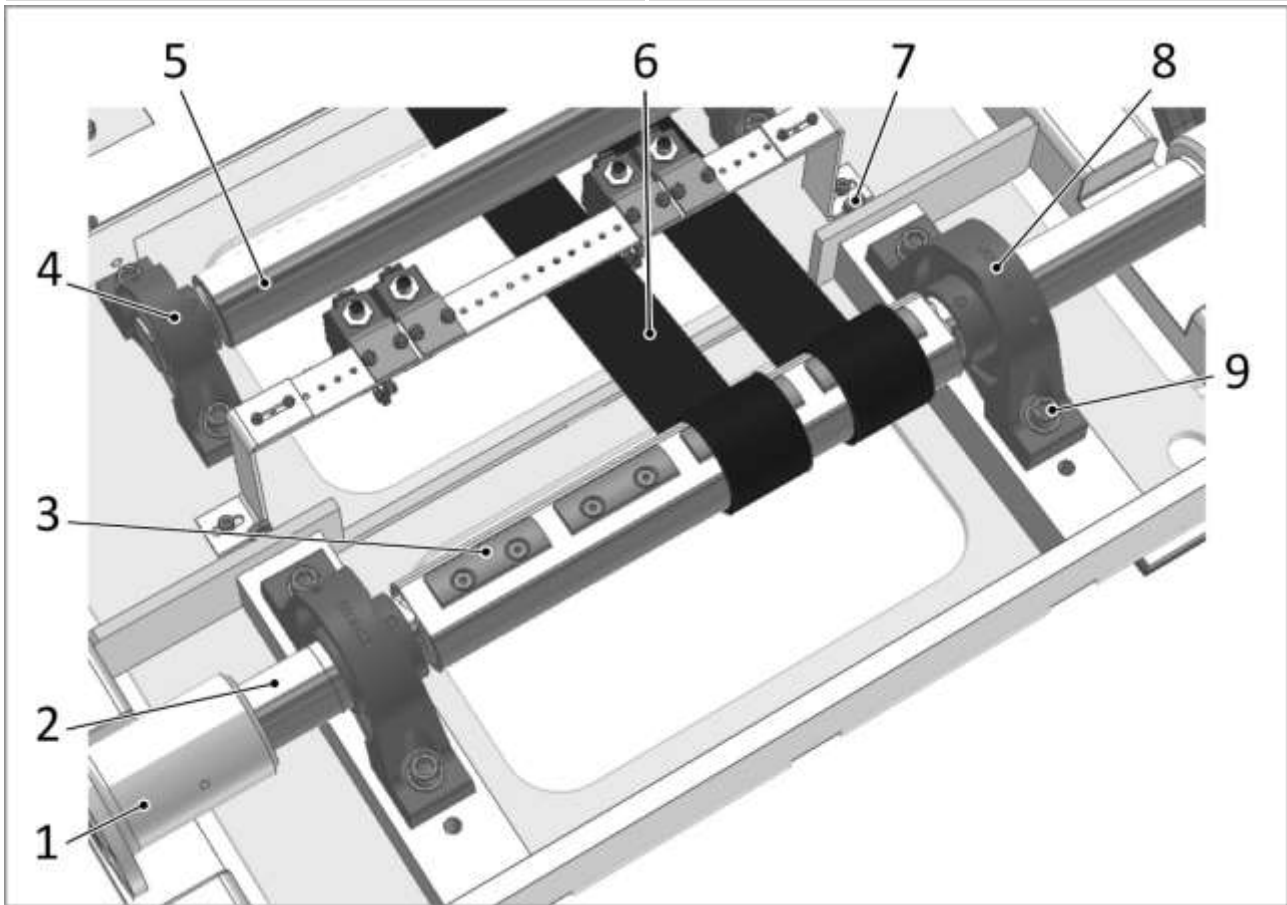
Depending on the application, and constructive design, the belt drive is equipped with various amounts of belts with a minimum of two.

Each belt is individually clamped onto the winding shaft and fixed with two initial windings. The holding torque is absorbed by a brake motor with gear. Additionally there may be a cardan shaft or roller chain for power transmission. The brake can be released manually for maintenance work.

#### 3.3.1 Winding Shaft

The brake can be released manually for maintenance work. A driven winding shaft winds up the belt and thus shortens the belt strand.

1 Flange	2 Winding shaft	3 Belt clamping plate	4 Pedestal bearing of the snub roller
5 Snub roller	6 Belt	7 Set screw	
8 Pedestal bearing, winding shaft		9 Hexagonal socket screw	



**Fig. 11: Winding shaft and snub roller (not installed in every lift table)**

### 3.3.2 Deviating Roller

The belts run around the deviating roller and thus pull the lower scissors ends towards the fixed point bearing during winding.

1 Lower end of scissors arm	2 Hexagon socket screw	3 Deviating roller	4 Belt
5 Track roller	6 Track roller pin		

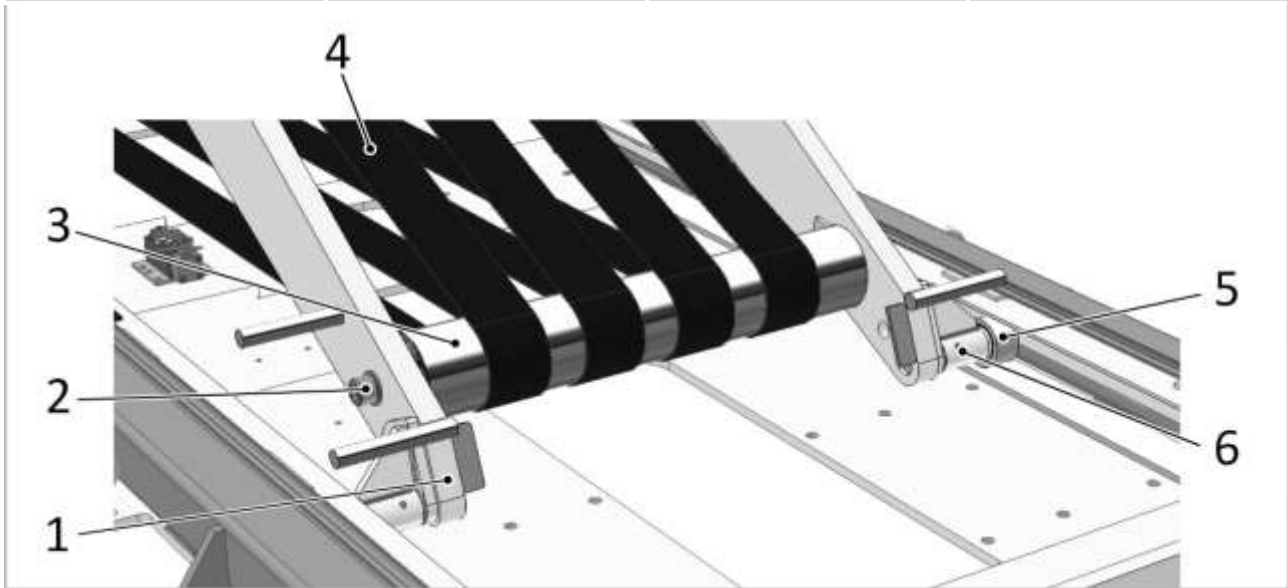
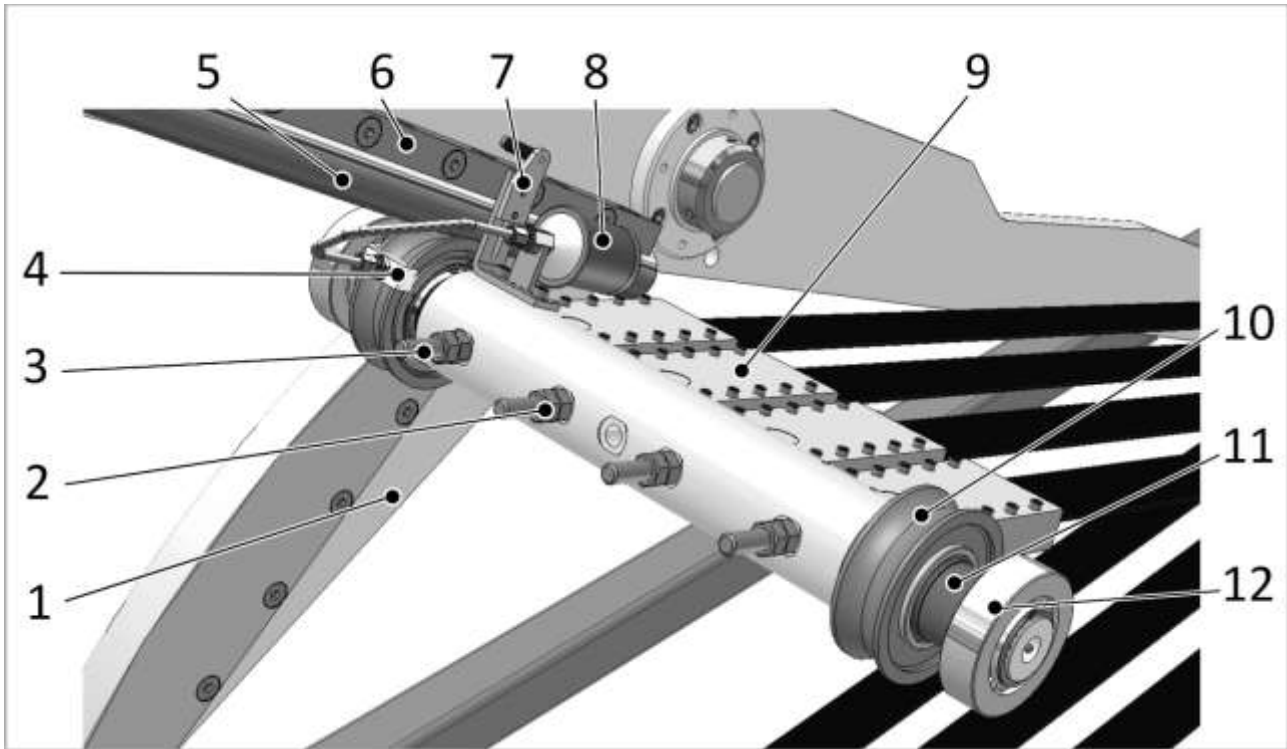


Fig . 12: Deviating roller

### 3.3.3 Cam Roller Shaft

The cam roller shaft is located inside the scissors and is connected to the second end of the belts. For lifting, the cam roller shaft is pulled between the scissors arms, thus spreading the scissors open. This lifts the upper frame.

1 Scissors arm	2 Adjustment of belt tension	3 Threaded rod of the belt attachment	4 Lube applicator
5 Round guide	6 Round guide support	7 Cam shaft bracket	8 Lube cartridge
9 Belt attachment	10 Profile roller	11 Cam roller shaft, axle	12 Cam roller



**Fig. 13: Cam roller shaft with automatic lubrication**

This lifting principle enables a compact, open design and guarantees a relatively even force distribution during the lifting process.

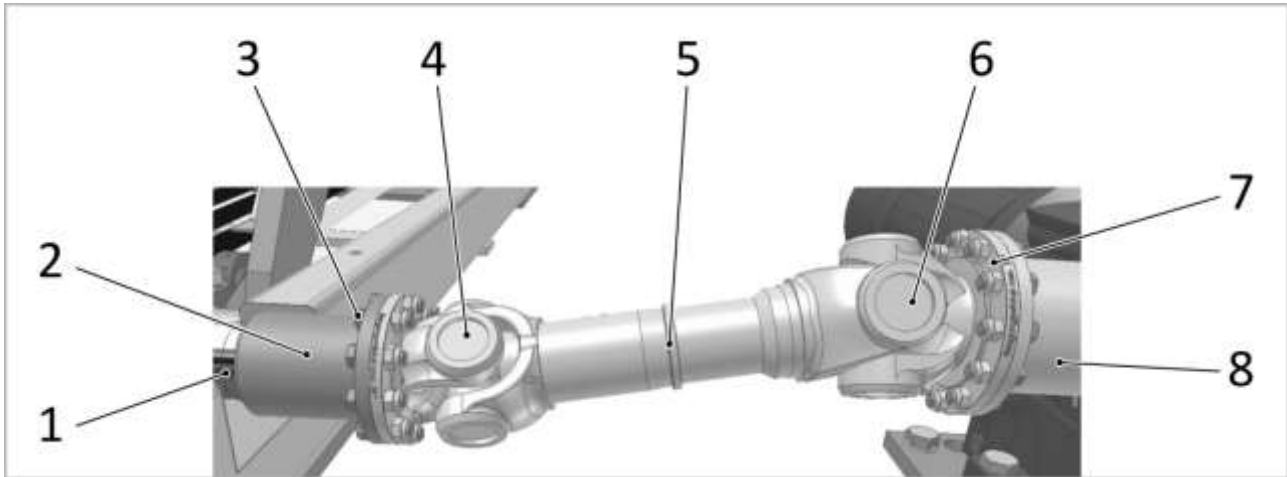
### 3.3.4 Slack Belt Switches

The belts are equipped with slack belt switches (mechanical roller lever switches). They serve as safety switches for belt slackness and as a safety limit switch for the lower end position.

### 3.3.5 Cardan shaft

The power transmission from the motor to the winding shaft is positive locking (according to EN 1570) via a cardan shaft.

1 Winding shaft	2 Winding shaft flange	3 Screw connection	4 Universal joint to winding shaft
5 Sliding joint	6 Cardan joint to motor shaft	7 Cardan shaft Flange motor side	8 Motor shaft flange



**Fig . 14 Cardan shaft**

The cardan shaft must not be bent (angled) more than intended. The angle shown in the approval drawing is decisive here. Here not only the angle in the horizontal direction is to be considered, but also in the vertical direction.

## 4 Intended Use

Lift table with two or more fixed stops for lifting and lowering loads in automatic or manual operation. Load transition can take place in raised or lowered position. The lift table can be equipped with customer-supplied devices (superstructure), such as conveyors. If the lift table is used as an individual component in an overall system (e.g. entry and exit station in a transport system), safety must be checked in accordance with the safety requirements of the overall system before commissioning. The lifting table is designed for operation inside buildings under usual conditions; operation outdoors is not permitted.

The presence of persons in the vicinity during lifting and lowering is only permitted during commissioning, inspection and maintenance with dead man's control by qualified maintenance personnel.

The lift table must not be used in areas accessible to persons without additional safety devices.

Operation in wet areas is not permitted.

Operation in hazardous areas is not permitted.

When using the lift table in environments with potentially corrosive substances, compatibility with the drive belts must be checked.

Overhanging loads on the longitudinal sides of the lift table must be designed in consultation with the manufacturer and neutralized by means of counterweights. Non-compliance can cause considerable damage to the bearings and drive system in the lift table!

Please contact the manufacturer or supplier if you have any questions regarding intended use!



## 5 Transportation

This chapter covers transportation to and from the installation site. In addition, these regulations apply for internal transports, such as for example for installation in another factory hall.

### 5.1 Safety during transport

The following points must be implemented to avoid personal injury and damage to the system.

- **Transport and unloading of the lift table only by qualified personnel. Prevent access to the installation site for unauthorized persons.**
- **The energy supply systems must be disconnected from the lift table before each transport.**
- **Transportation/loading is carried out by industrial trucks or crane.**
- **For loading and unloading, call in a second person for instruction and observation.**
- **If slings are used for crane transport, they must be connected to the lift table using the lifting eyes or dedicated hoisting points provided. Use proper and tested slings.**
- **Consider the weight of the lift table and only use appropriate hoisting equipment.**
- **Do not step under suspended loads!**
- **Wear personal protective equipment (PPE).**
- **Observe the regulations applicable at the place of installation. The information in these instructions cannot override them.**

### 5.2 Unpacking the unit

**NOTE** Risk of damage to the lift table during commissioning due to transport locks (e.g. cable ties). Remove the transport locks immediately after transport and final positioning of the unit.

### 5.3 Seaworthy packaging

Please note that the lift table and its accessories for sea transport have been treated with lubricants and preservatives. The materials used are compatible with the colors and lubricants of the lift table and its accessories.

Data sheets for these lubricants and preservatives are available on request.



## 6 Assembly and Commissioning

Proper assembly and commissioning is a basic prerequisite for the safe functioning of the lift table over its entire service life.

The installation and commissioning of the lift table may on request be surprised by the manufacturer or by personnel trained by the manufacturer, against surcharge!

### 6.1 Safety during Installation and Commissioning

During installation and commissioning of the lift table there are special risks for persons involved, as the hazard area under the platform must be entered. The following points must be observed during installation.

- **Always insert the maintenance supports before working below the platform.**
- **Only have assembly work carried out by personnel qualified for this work.**
- **The prerequisites for installation (→ Chapter 6.2 Prerequisites for Assembly) must be fulfilled.**
- **The general safety regulations (→ Chapter 2.3 Safety Regulations for Scissors Lift Tables) must be observed!**
- **To set up a temporary manual control, never connect the motor directly to the mains, instead use an inverter.**
- **Before connecting the lift table to power, check the live parts for damage. Lay cables only in accordance with applicable regulations.**
- **When assembling and commissioning the lift table, the direction of rotation and thus the winding direction of the winding shaft must be checked before starting the motor. Only start the motor briefly for this purpose.**
- **Never wind the belts on the winding shaft in the opposite direction as this could seriously damage the belts and might require a complete exchange of the entire set of belts.**
- **The lift table must not be operated without activated safety limit switches ("upper position" limit switch and slack belt switch)!**
- **Integrate the safety limit switch into the control system in order to bring about an immediate stop when the switches are actuated.**

### 6.2 Prerequisites for Assembly

The conditions described in the following chapters must be fulfilled to ensure safe and professional assembly.

#### 6.2.1 The Underground at the Assembly Location

The surface on which the lift table is built must be flat and sufficiently stable.

When erecting in an existing steel structure, reinforcements are usually required, for example additional girders on which the lower frame rests.

Please coordinate this with our design department.

When calculating the substructure, take into account the dynamic forces from a possible free fall of the lift table. Those calculations must be performed by a structural engineer.



### 6.2.2 Personnel Requirements for Assembly

Assembly and commissioning may only be carried out by suitably trained specialist personnel qualified for the respective work.

At least one experienced mechanical fitter and an assistant (preferably two mechanical fitters) are required to assemble a lift table.

In addition, a control specialist and an electrician are required.

### 6.2.3 Control of the Lift Table during Assembly

A lift table control must be available for assembly, as the lift table must be moved by its drive during some assembly steps. We recommend using the machine control intended for the final operation with a maintenance mode for manual control. Alternatively, a special control can be used for assembly.

A manual control mode (maintenance mode) is required for lifting and lowering in hold-to-run mode at slow speed. We recommend a safely reduced speed ( $\leq 33$  mm/s). The controller must already be completely programmed according to the FLEXLIFT terminal diagram (submitted with the release documents). All sensors of the lift table, in particular the safety limit switches and, if applicable, the stop valve of the safety cylinder must be integrated into the control system.

### 6.2.4 Frequency Converter and Ramps

**NOTE** Risk of damage to the lift table and its components due to operation without or with incorrectly set frequency inverter. At speeds above 33 mm/s, the lift table may only be operated with a suitable frequency inverter.

#### Starting and Braking Ramps

The inverter must be equipped with starting and braking ramps for starting and stopping the lift table at the end positions and, if necessary, intermediate positions.

#### Acceleration Values for the Ramps:

Start ramps for lifting:	$\leq 0,1$ m/s <sup>2</sup>
Start ramps for lowering:	$\leq 0,2$ m/s <sup>2</sup>
Brake ramps for lifting:	$\leq 0,2$ m/s <sup>2</sup>
Brake ramps for lowering:	$\leq 0,1$ m/s <sup>2</sup>

### 6.2.5 Safety Limit Switch

The switching points of the safety limit switches must not be overrun.

The lift table must not move against the mechanical end stops!

### 6.2.6 Lifting Equipment, Tools, Material

#### Means of Transport, Lifting Equipment

Forklift, crane etc. for transporting the lift table and positioning at the assembly site.

#### Tools

- Laser levelling device, alternatively spirit level and long steel straightedge
- Tape measure, caliper gauge, plumb bob

- Drill
- Set of common locksmith tools
- Torque wrench
- Welding machine
- Steel jack, chain hoists

**Material**

Appropriate fastening material for the respective sub-structure.

Shims with different thicknesses (1, 2, 3 and 5 mm).

**6.3 How to Avoid Damage to the Lift Table during Assembly**

The assembly of lift tables must be carried out with extreme precision, since errors in the adjustment add up and quickly lead to critically increased wear with the strong forces acting. The following points must be known and taken into account.

**Obey Flexlifts Installation Instructions**

1. Positioning of the lift table.
2. Level and align the lift table.
3. Shim the lift table.
4. Set up and connect motor and drive system.
5. Attach and align the superstructure on the lift table.
6. Determine the lower end position of the upper frame.

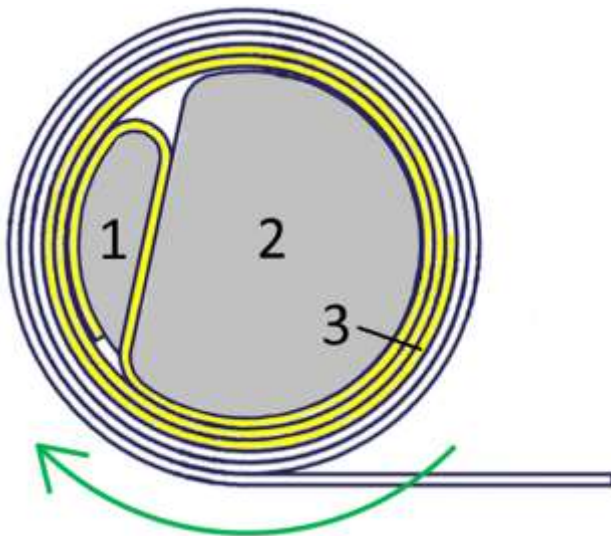
**Do not Change the Factory Mechanical Settings.**

On delivery, the lift table is completely mechanically adjusted (position of the fixed bearings and shafts, belt tension, etc.).

The safety limit switches are also correctly set (top travel, slack belts) and sealed. Breaking the seal leads to loss of warranty.

**Ensure Correct Winding of the Belts on the Winding Shaft.**

Before lifting the table for the first time, make sure that the belts on the winding shaft are wound in the correct direction!



**Green arrow:** Correct winding direction.

(1) Belt clamping piece

(2) Winding shaft

(3) Initial windings

**2 to 2.5 windings (yellow) must always remain on the winding shaft.**

**Fig. 15: Cross section: winding of the belts on the winding shaft**

If the belts are completely unwound from the winding shaft and rewound upside down backwards due to incorrect motor running direction or non-activated slack belt switch, considerable damage occurs to the belts caused by bending to the opposite side.

Belts that have been wound backwards can spontaneously tear under load and are no longer to be used. They must be completely replaced, even if there is no visible damage on the outside!

#### **Maintaining the Maximum Permissible End Positions**

If the maximum permissible upper end position is exceeded, considerable mechanical damage can occur to the lift table, up to a fall of the lift table!

If the lower end position is exceeded, the belts on the winding shaft may be wound in the wrong direction.

The safety limit switch "Upper position" is permanently set and lacquered on delivery. The setting of this switch must not be changed. Under no circumstances may the switch be used as a position limit switch!

### **6.4 Positioning and Assembling the Lift Table**

The following chapters contain specific instructions for safe and professional installation and must be read before installing the lift table.

#### **6.4.1 Setting up the Lift Table at the Place of Use**

As a standard, the bottom and fixing lugs are equipped with levelling screws and through holes for screw fixing.

Screw in the levelling screws on the floor before setting down the lift table so that they protrude downwards for later level adjustment.

1. Set down and position the lift table (with crane or fork lift truck) on the ground.
2. Ensure that cables and belts are not damaged.
3. Place sheet metal pieces (min. thickness 4 mm) under the levelling screws so that the screws do not press into the floor.
4. Separate the lifting means from the lifting eyes.
5. If applicable, remove any cable ties from the belts.

6. Remove any anti-rotation device on the winding shaft only after the connection to the motor has been established.

### 6.4.2 Setting up the Lower Frame

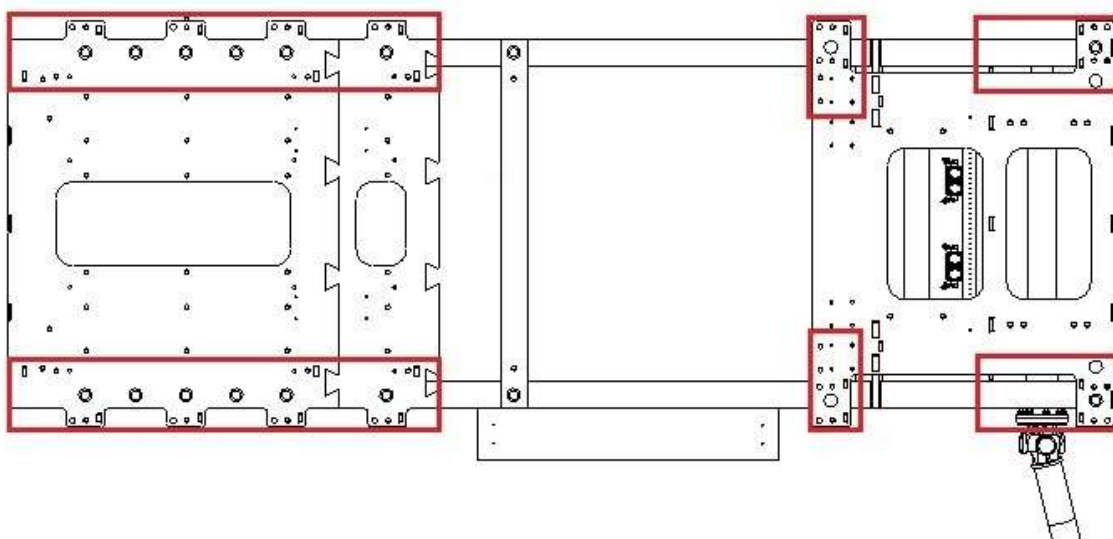
**NOTE** Risk of shortening the service life of bearings and drives due to unclean running. The lower frame must be aligned very precisely horizontally in longitudinal and transverse direction! The maximum permissible deviation is 1 mm for the total lower frame length.

Exact alignment is a prerequisite for the clean running of the lift table and thus also for achieving the planned service life of the bearings and the drive!

1. Align the lower frame exactly horizontally:
  - a) We recommend the fixed bearing housings and the running rails of the lower frame as measuring points.
  - b) Using a laser levelling device, or a ruler and spirit level, check in which areas the lower frame is too high and gradually lower the frame with the adjustment screws.
2. If the track rollers are designed as "double rollers" (2 rollers per scissors arm), all four running rails must be flat to each other, i.e. each "pair" and the "pairs" to each other. All four rollers must constantly have contact to the wear rails of the roller tracks.
3. After levelling, fix the base frame to the substructure with suitable fasteners.
4. Do not tighten the fixing screws yet, first continue with step (→ Chapter 6.4.3 Shimming the Lower Frame)!

### 6.4.3 Shimming the Lower Frame

The lower frame must be permanently shimmed in the area of the roller tracks and the pivot bearings of the scissors. The pivot bearings of the scissors must also be shimmed in the transverse direction.



**Fig. 16: The red marked areas of the lower frame must be shimmed.**

1. Form packages with the shims and insert them between the base frame and substructure so that the packages fit properly between the floor and the sub frame.

2. Weld the shims of the shim packs together (to prevent the individual shims from slipping later due to vibrations). However, do not weld the package to the lower frame.
3. After lining, tighten all fixing screws of the lower frame.
4. After approx. 20 hours of operation, re-check the flatness of the lower frame and check all floor screws on tightness.

#### 6.4.4 Mounting Motors

1. Place the motors in the intended positions (approval drawing) and connect both flanges the winding shafts of the lift table.
  - a) In the case of direct connection to the winding shaft (e.g. rigid or curved tooth coupling), the gear shaft and winding shaft must be exactly aligned.
  - b) When connecting via cardan shaft, align motor/motor plate according to approval drawing - changes only with the manufacturer's approval in written!
  - c) Screw the motor/gear unit, universal joint shaft and winding shaft together with the supplied screws at all fixing holes using a torque wrench.
2. Fasten the motor plates to the surface with appropriate anchors. The lift table must not be raised until the motor plates have been fastened!

#### 6.4.5 Mounting of a Limit Switch Column (if applicable)

A limit switch column with adjustable proximity switches is used for height positioning of the lift table, which interrogate a switching flag on the upper frame of the lift table.

1. Position the limit switch column at the planned position (according approval drawing) and fasten it to the floor.
2. Adjust the switch flag on the upper frame to match the column.
3. **NOTE** Risk of endpoints being overrun due to missed signals. Upper limit switch columns or those mounted on steel structures must additionally be braced to suitable adjacent components in order to minimize swaying.

#### 6.4.6 First Connection to the Control Unit and Test Drive

A first test drive should be carried out at this time.

1. **NOTE** Risk of damage to the lift table due to belt rupture after bending belts against the intended winding direction! After connecting the control unit, make sure that the belts are wound in the correct direction when entering the "Up" command for the first time.
2. Lift and lower the lift table about 10 times, but do not move near to the end positions.
3. Test the safety limit switch "Overtravel up": Operate from a safe distance from the outside, e.g. by means of a rod.
4. Test the slack belt switch: Insert the maintenance supports and place the upper frame on the supports until the belts become slightly slack. The slack belt switches must respond.

#### 6.4.7 Mounting of Attachments on the Upper Frame

The lifting table is almost always completed with on-site attachments on the upper frame, in most cases conveyors.

1. After aligning the lower frame, carefully place the surface-mounted component on the upper frame and align it.

2. When adjusting the body component vertically, use the upper frame (or its crossmembers) as the reference plane - do not align with the floor or lower frame!
3. An unbalanced load of the lifting table in transverse direction resulting from the design (e.g. laterally protruding drive of a conveyor) must, if necessary, be compensated by a corresponding counterweight on the opposite side. Consider maximum capacity.

#### 6.4.8 Determine and Set Lower End Position

The lower end position should be set in such a way that the belts are slightly de-tensioned after the upper frame is lowered and resting on the lower end stops. The slack belt switches must not respond during this process.

1. Move the lift table to the zero position.
2. Very slightly screw the end position screws against the top frame by hand.
3. Mark screw positions.
4. Lift the table and insert maintenance poles.
5. Turn the screws half a turn further.
6. Ensure that all end position screws are touched simultaneously by the frame when the lift table is lowered.

#### 6.4.9 Lubrication

1. In the standard version of the lift table, all bearings are maintenance-free.
2. Lightly grease the tracks and the running surfaces of the lifting cams. Recommendation for high performance applications: Chesterton® Spraflex® Gold.
3. The profile rollers of the cam roller shaft and their guide profiles must be lubricated.
  - b) The color of the activation screw indicates the application time: red = 6 months, grey = 12 months. Note the date of activation on the designated labelling field of the lubricator and enter it in the maintenance book of the lift table.
  - c) For versions without automatic lubrication, the round profiles of the profile rollers must be lubricated by hand.

#### 6.4.10 Final inspection

Finally, check the lift table again completely for proper installation and operational readiness. If no defects are found during this check, the lift table is ready for operation.

### 6.5 Commissioning

After assembly and final inspection, the lifting table may be put into operation. For commissioning, the table must be integrated into the overall system in terms of control technology.

#### 6.5.1 Wiring diagram

The terminal diagram can be found in the appendix.

#### 6.5.2 Activate the Automatic Lubricator

Automatic lubrication must be activated before the lift table is put into operation and provided with the commissioning date. The duration of lubrication depends on the respective color of the activation screw

1. Screw the activation screw into the cartridge.

2. Tighten the eyebolt further until the ring breaks off at the predetermined breaking point.
3. Note the date of activation on the cartridge

### 6.5.3 Set the Lower End Position

The height of the lower end position is adjusted by adjusting the corresponding encoders. This setting must be made with the lift table unloaded.

1. The conveying level of the discharging conveyor should be set 1 mm lower than that of the receiving conveyor.
2. The lifting table has screws as mechanical end limits in the lower frame. These screws must be set to a gap of approx. 1 mm between the screw head and the stop.
3. **NOTE** Risk of destruction of the machine. The specified minimum overall height of the lift table must not be undershot. If a horizontal adjustment in transverse direction between a lift table conveyor and a subsequent stationary conveyor is necessary, this must be done on the stationary conveyor.

### 6.5.4 Set the Upper End Position and Intermediate Positions

1. The upper end position and intermediate positions are set by setting the corresponding encoders.
2. The conveying level of the discharging conveyor should be set 1 mm lower on the discharge side than that of the conveyor to which it is being fed.
3. Here, too, horizontal adjustment of the conveyors in the transverse direction may only be carried out on the stationary conveyor.

### Notices

- During the start-up phase of the lift table, abrasion or slight chip formation may occur in the area of the rollers and their running surfaces due to surface compaction. This is a normal process.
- In the area of the cam roller, material discoloration can occur due to point loads between the profile roller and round guide.
- Cantilevered or overhanging loads on the longitudinal sides of the lift table must be agreed in design with the manufacturer and neutralized by means of counterweights or guides. Non-compliance can lead to considerable damage to the lift table bearings and drive system.
- Avoid impact loads on the lift table! This can cause damage to the lift table, in particular to the cam roller and the cam.

## 7 Operation

The lifting table is designed for integration into a complete system. Manual operation is intended only for maintenance and repair works.

### 7.1 Safety during Operation

- **The basic condition for operation is compliance with the general safety regulations (→ Chapter 2.3 Safety Regulations for Scissors Lift Tables).**





## 8 Servicing and Repairing the Lift Table

The following chapters contain a chart with regularly performed maintenance work, the lubrication schedule and a troubleshooting chart. Detailed instructions for replacing defective parts and assemblies follow.

### 8.1 Safe Maintenance of the Lift Table

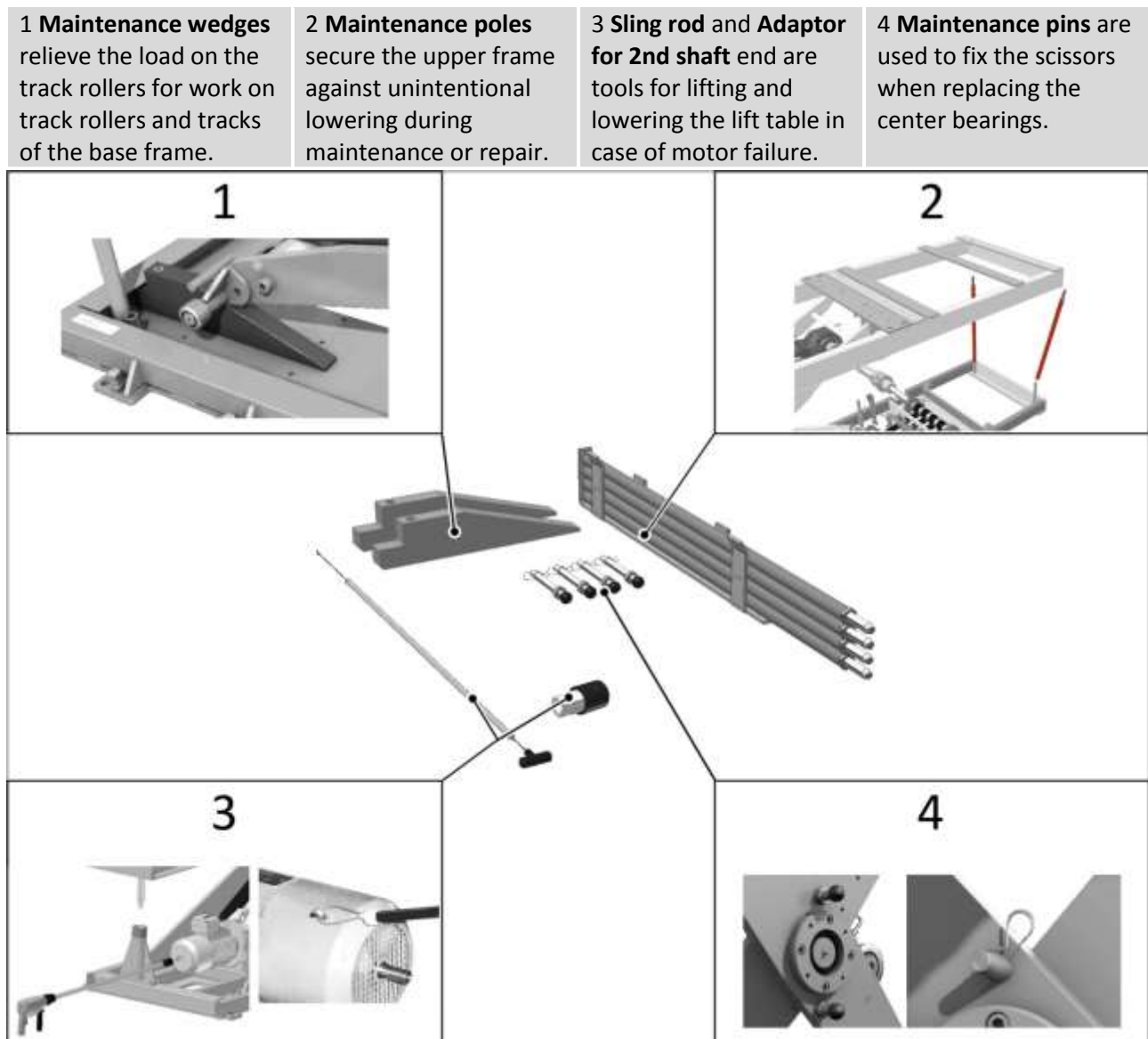
- During maintenance works, there is a risk that persons may be injured by moving machine parts. Switch off main switch and secure the system against unintended or unauthorized re-powering.
- There is also an increased risk of possible unforeseeable situations during repair works. Secure the area against the access of persons not involved.
- When working under the lift table or the upper frame of the lift table, there is a considerable risk of serious injury due to unintentional lowering of the lift table. Work under the Lift Table may only be carried out with the upper frame unloaded and the maintenance supports inserted (→ 8.3 Using Maintenance Supports for Safe Maintenance of the Lift Table).
- Repair and maintenance work may only be carried out by competent, trained and instructed personnel.
- Switch off the main switch and secure it against being switched on again.
- Never mix different types of lubricant.
- The safety regulations for working with lifting tables (→ 2.3 Safety Regulations for Scissors Lift Tables) must be known and implemented.

#### 8.1.1 Securing and Unloading the Lift Table before Repairs

- If the drive system is defective, the lift table may no longer be able to be relieved in the usual manner. In this case, the lift table must be temporarily secured (forklift or similar, mind the load capacity) and then relieved.
- Observe and implement the action-related warnings during maintenance work.

### 8.2 Tools for Repairing Scissors Lift Tables

The following tools serve to secure repair work on scissors lifts:

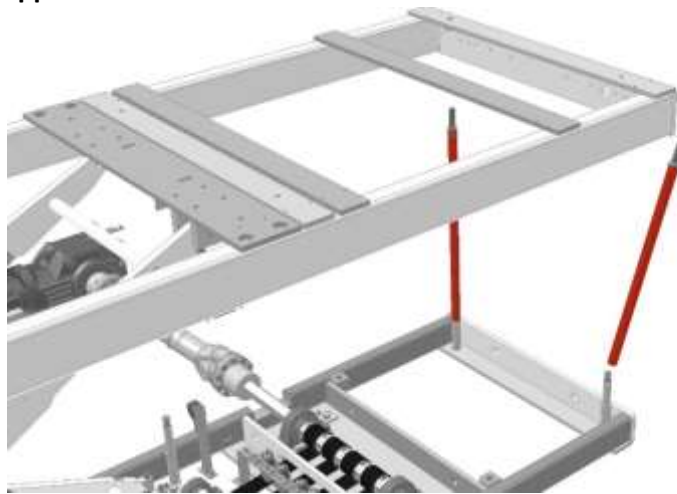


**Fig. 17: Special tools for repair of lifting tables**

### 8.3 Using Maintenance Supports for Safe Maintenance of the Lift Table

Before any maintenance work is carried out, the lift table must be locked and mechanically secured against lowering. Use Maintenance supports between the upper and lower frames or locking pins in the roller tracks for blocking lift table movement.

### Insert Maintenance Supports



**Fig. 18: Maintenance poles (pluggable between upper and lower frame)**

1. Ensure that the lift table is unloaded.
2. Lift the lift table to its full height.
3. Insert the maintenance supports onto the pins provided in the lower frame.
4. Lower the top frame until it rests on the maintenance supports and the belts get slightly untensioned.
5. The lift table is now mechanically secured against further lowering.

### 8.4 Torque Values for Screw Connections

Screws (unlubricated) of strength class 10.9 (DIN 267) are used to fasten load-bearing parts that are bolted to the lift table (e.g. round guides, cam roller shafts, cams).

Screws of strength class 8.8 are sufficient for fastening the pedestal bearings. However, in order to avoid confusion, we recommend using screws of strength class 10.9 here as well.

All screws are tightened with a torque wrench and secured with Loctite 243 (blue, medium strength).

**NOTE** Risk of Damage to the drive train. A reduced torque applies to the screws of the pedestal bearings (cast housings).

#### Tightening Torques

Bolt size	Standard-Torque	Torque pedestal bearings
M8	37 Nm	
M10	75 Nm	35 Nm
M12	128 Nm	65 Nm
M16	314 Nm	150 Nm
M20	615 Nm	290 Nm
M24	1060 Nm	500 Nm

### 8.5 Cleaning Recommendations

For polyurethane flat belts made of TPU-ST1 – 3, TPU-FD1, TPU-AU1, TPU-KF1, TPU-AS1, see documentation for reference.


The belts used for this lifting table must be cleaned regularly to remove any dirt. If there are oils, waxes or similar substances in the air which settle on the belts, the belts may lose their adhesion to each other during the winding process. This can lead to improper winding packages and a greatly reduced service life.

**Well suited:**

- Water
- Soapy water (household cleaners)

**Alternatives:**

- Cleaner's solvent

 **CAUTION** When cleaning with volatile substances, there is a risk of irritation of the respiratory tract and poisoning by solvent vapours. Ensure good ventilation. Fire protection precautions may have to be taken.

Do not immerse the belts, clean them with a damp cloth only. Lightly run over the surface, do not rub. Let the belt dry immediately afterwards.

## 8.6 Lubrication and Maintenance of Pedestal Bearing Housings

The pedestal bearing inserts are filled with the required amount of grease at the factory. No relubrication is required under normal operating conditions.

Under difficult conditions, such as continuous operation at high speeds, high temperatures (above +70°C operating temperature), heavy loads and very damp or dirty environments, regular relubrication is necessary.

### Relubrication

The plummer block housings are equipped with a lubrication groove within the spherical bore. The inserts have four lubrication holes in the outer ring, which are offset.

- Always insert maintenance supports before working under the platform!
- The relubrication quantities depend on the size of the insert.
- We recommend relubrication in multiple steps with intermediate rotations.
- Press suitable grease (bearing grease) into the unit until a fresh grease collar forms on the seals.
- The grease must be able to escape unhindered from the insert.
- Do not use pneumatic or automatic grease guns to avoid dislocation of sealing disc.

## 8.7 Storage of Spare Parts

Spare parts are sensitive to damage and dirt. They must be stored in a clean and dry environment.

Belts can be stored for up to 10 years under the following conditions:

- Room temperature (appr. 20°C)
- Normal humidity
- Protected from UV radiation
- Protected from harmful chemical substances
- Belts must not be bent during storage
- Maximum stacking height of five layers on a flat surface.

## 8.8 Supporting Repair Videos, Displayable with Smartphone or Tablet-PC

Signs with QR codes are attached to the replaceable assemblies on the machine. The codes can be scanned with a smartphone or tablet PC with a corresponding app and lead to the website showing the tutorials. All safety regulations must be followed when carrying out repairs using the videos. In addition to the repair procedures described in the following chapters, the following chapters also describe partial steps, such as replacing a track roller or wear rails.

To view the videos, an Internet connection with sufficient bandwidth is required. You can access the tutorial overview at the following address:



Fig. 19: Leads to the overview page of the videos - <https://www.flexlift.de/service/tutorials/>

## 8.9 Emergency Lifting and Lowering of the Lift Table

In the event of a power failure or motor failure, the lift table can be driven with the aid of an electric drill. For safety reasons, only use a two-hand drill. **⚠ WARNING!** Risk of injury from unplanned opening or closing of the motor brake during emergency lifting. Carry out this work with two persons! One person is required to operate the two-hand drilling machine and one person for the specific opening and closing of the brake.

This work may only be carried out by suitably trained and experienced personnel.

### Accessories at an extra charge:

Designation	Type	Article No	Manufacturer/Supplier
Adapter for 2nd shaft end	19x40 mm	EFRT-0021/2.WE	FLEXLIFT
Sling rod for releasing the brake		EFRT-0021/ANGEL	FLEXLIFT

### Emergency Lifting

1. Attach the adapter to the electric drill and the second motor shaft.
2. Attach the sling rod to release the brake on the brake motor.
3. **⚠ CAUTION** Risk of injury from uncontrolled movement of the drilling machine when the motor brake is blocked! Keep the brake released during the emergency lifting procedure. Release the brake and at the same time carefully raise the lifting table with the electric drill.

### Emergency lowering

1. Attach the sling rod to release the brake on the brake motor.
2. Release the brake carefully while watching movements of the lift table.

## 8.10 Regular Maintenance Work

Work to be carried out	Cycle	Remarks
Visual check	Weekly	
Inspection of the safety devices	12 months	Prior to each commissioning
Pillow block bearing on the winding shaft	Basically maintenance-free	
Cleaning the belts	Regularly	Consider compatibility of belt and cleaning agent. (→ 8.5 Cleaning Recommendations)
Checking the belt tension	12 months	→ 8.14.4 Checking and Adjusting the Belt Tension
Replacing the belts	10 years	Total belt life 10 years, including storage time. (According to manufacturer's instructions)
Visual Inspection of the belts	12 months	Visual inspection for damage and clean belt winding.
Motor brake check	12 months or after 3000 operating hours	See manufacturer's operating instructions
Inspection of bevel gears	12 months	Instruction manual of the motor manufacturer
Oil level control gearbox	6 months	Refill oil
Gearbox oil replacement	24 months 36 months	<60 cycles/h - 3-shift operation >60 cycles/h - 3-shift operation according manufacturer's instructions
Inspection of the anti-fall-device	12 months	Treat spherical plain bearing according to the lubrication schedule. Check for oil leakage and tightness of fitting.
Inspection of bearings	6 months	Spherical bearing (GE): Remove cover, if applicable. Check, regrease if necessary ARALUB HL2 (type K2 K-30). Plain bearing (DU): Check, replace if bearing is offsetblack dust is formed.
Inspection of cam roller shaft Complete wear part	6 months	Clean first then lubricate. Lubricate manually using a grease gun.
Profile roller/round guide	6 months automatic lubrication by means of Perma socket	First clean then lubricate, according to lubrication schedule. Replace the lubricator.
Cams	12 months	First clean then lubricate with Spraflex Gold.
Lubricating cylindrical roller bearings	6 months	High performance rolling bearing grease: Klüberplex BEM41-141 (Klüber brand) Klüberlub BE 41-542 (Klüber brand)
Lube cartridge	Regularly, note the color of the activation screw.	Observe the ambient temperature and compare it with the manufacturer's specifications for dispensing time. Each time the Lube cartridge is changed, the milling must be cleaned.
Expert inspection	12 Months	Test certificate →10 Test certificate
Initial lubricant generally used: make ARALUB HL2 (Type K2 K-30)		
The operating instructions of the respective manufacturers are contained in the appendix to the lift table documentation.		

## 8.11 Lubrication Schedule

**NOTE** Wear rails, track rollers and cams must be lubricated. Non-compliance with the maintenance intervals voids the warranty claim! Do not mix different types of lubricant!

Initial lubricant generally used: make ARALUB HL2 (type K2 K-30)

Initial lubricant used Perma lubrication: Make Staburags SF32

Component	Remark	Maintenance intervals in months at cycle frequency									Grease
		<30 cycles/h 3-shift			<60 cycles/h 3-shift			>60 cycles/h 3-shift			
Track rollers	lubricate	3 Mon.			2 Mon.			1 Mon.			Bearing grease
Pedestal bearing	maintenance-free										
Center bearing	maintenance-free										
Pedestal bearing/ Winding shaft	→ Chapter 8.6 Lubrication and Maintenance of Pedestal Bearing Housings										
Geared motor	Lubricant check	12 Mon			6 Mon			3 Mon			Gear oil according manufacturer's requirement
	Lubrication time	36 Mon			24 Mon			12 Mon			
Motor brake	check	12 Mon			6 Mon			3 Mon			
Cam roller technology	Wear part Automatic lubrication by means of Perma cartridge (depending on activation screw color)	green	red	grey	green	red	grey	green	red	grey	Replace Lube cartridge <b>Staburags® NBU 12</b> <b>(Fabr. Klüber)</b>
		3	6	12	3	6	12	3	6	12	
Grease cartridge replacement		The milled recess of the nozzle must be cleaned every time the grease cartridge is changed. Note the color of the activation screw! <b>Standard: grey, for cycle times below 60 s : red. Observe temperature dependence of the lubrication duration.</b> Refer to the documentation of the lubricator.									
Perma Star automatic lubrication		The grease cartridge must be replaced and activated according to the manufacturer's documentation..									
Cams	lubricate	3 Mon.			2 Mon.			4-6 Weeks			Bearing grease
Track rollers, Cam rollers, Profile rollers	lubricate	12 Mon.			6 Mon.			3 Mon.			Roller bearings High performance grease Klüberplex BEM41-141 (Klüber brand) Klüber Lub BE 41-542 (Klüber brand)
Anti-fall-device (if available)											Hydraulic oil HISPIN SP 46 (Castrol) or Hydraulic oil VG 46 (Shell Tellus 46)
Spherical bearing on the anti fall device	lubricate	3 Mon.			2 Mon.			1 Mon.			Bearing grease

### Automatic Lubrication

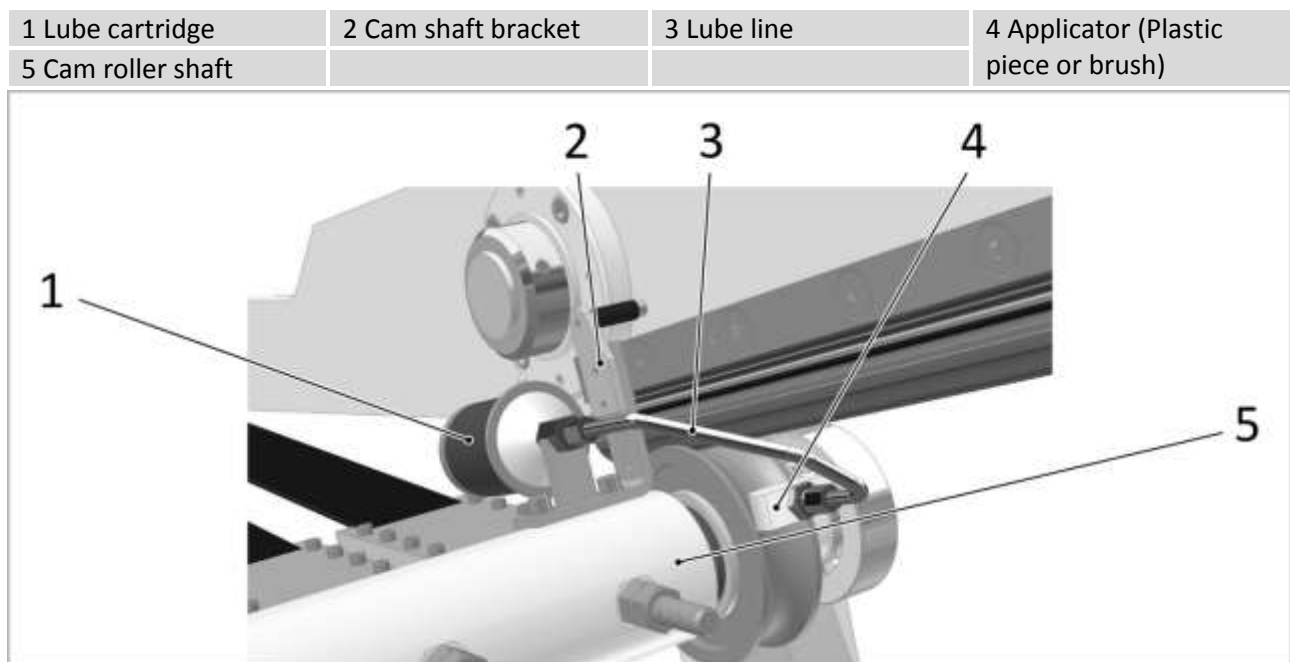
The filling level of the grease cartridge should be checked regularly. It is important to ensure that there are no air bubbles in the supply line.

If the permissible number of cycles is exceeded, the lubricating film may tear, resulting in damage to the profile rollers and round guides, among other things.

## 8.12 Replacing the lubricator cartridge

### Required tools

- Set of metric wrenches
- Replacement lube cartridge



**Fig. 20: Seat of the automatic lubrication system**

**Exchange procedure**

1. Ensure that the lift table is unloaded.
2. Insert maintenance supports.
3. Lower the lift table onto the maintenance supports.
4. Disconnect the scissors lift table from the electrical mains and secure it against unintentional or unauthorized reconnection.
5. Clean applicator and tubing to ensure proper and free flow of grease.
6. Pre-fill the line with grease.
7. Replace the lube cartridge.
8. Activate the cartridge.
9. Connect the scissors lift table to the electrical mains.
10. Carry out a function test.
11. Carry out commissioning.

**NOTE** – Risk of lubrication running dry. Ensure that there are no air bubbles in the feed line. The filling level of the lubricator cartridge should be checked **regularly**.

**8.13 Works on Scissors and Frame**

**8.13.1 Replacing Track Rollers and Wear Rails in the Upper Frame**

Preferably replace the track rollers and wear rails in the upper frame as a set.

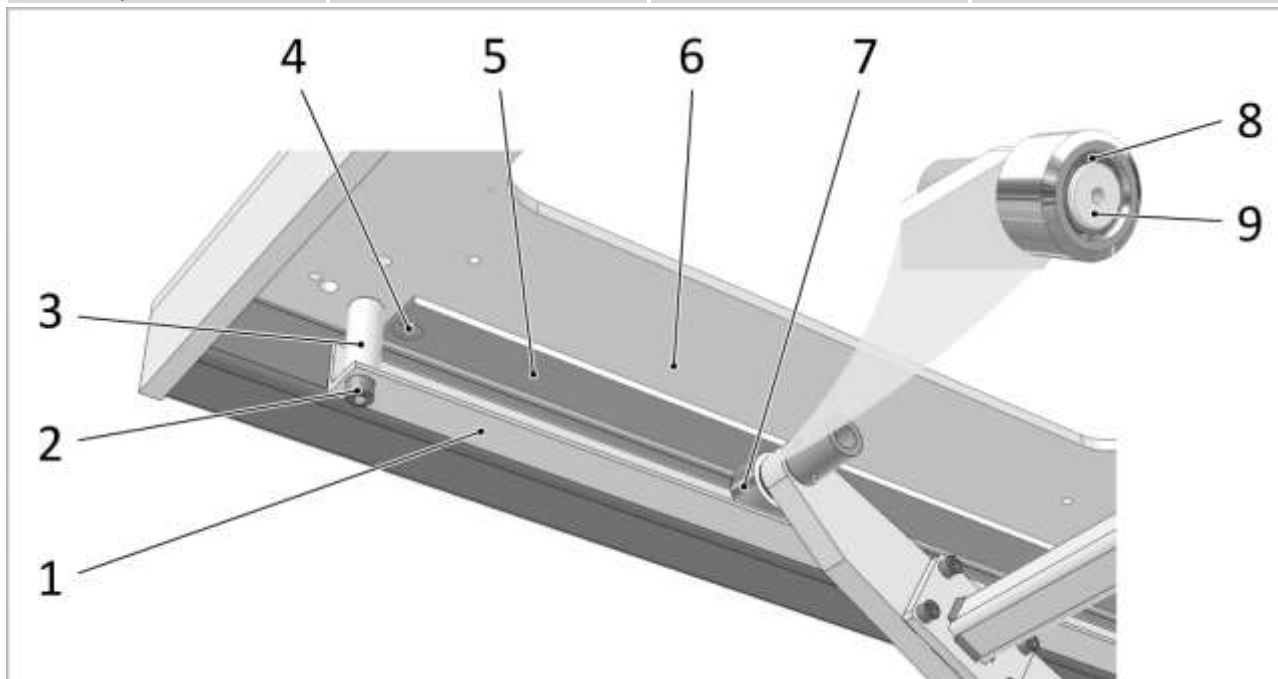


**Required tools**



- Snap ring pliers
- Puller
- Hexagon socket wrench

1 Anti-tilting bar	2 Hexagon socket screw	3 Distance sleeve	4 Screw connection
5 Wear rails	6 Upper frame	7 Trackroller	8 Snap ring
9 Roller pin			



**Fig. 21: Wear rails and track rollers in the upper frame**

### Replacement procedure

1. Ensure that the lift table is not loaded.
2. Insert maintenance supports.
3. Lower the lift table onto the maintenance supports.
4. Loosen screw connection and spacer sleeves on the anti tilting bar and remove it.
5. Lift the upper frame and remove the maintenance supports on the pillow block side.
6. Slowly lower the lift table until the track rollers leave the wear rails.
7. Replace track rollers:
  - a) Loosen snap ring and discard.
  - b) Remove track roller with the aid of a puller.
  - c) Fit replacement track roller.
  - d) Insert new snap ring.
8. Replacing wear rails:
  - a) Loosen the fastening screws of the wear rail.
  - b) Replace wear rail.
9. Lift the top frame and insert the maintenance supports.
10. Lower the lift table onto the maintenance supports and fit the locking rail.
11. Carry out function test.
12. Carry out commissioning.

### 8.13.2 Replacing Track Rollers and Wear Rails in the Lower Frame

Preferably track rollers and wear rails should be replaced as a set.



#### Required tools

- Snap ring pliers
- Maintenance wedges
- Hexagon socket key set

#### Accessories at an extra charge:

Designation	Manufacturer/Supplier
Maintenance wedges	FLEXLIFT

1 Base frame	2 Wear rails	3 Track roller	4 Anti tilting bar
5 Screw connection	6 Hexagon socket screw	7 Distance sleeve	8 Roller pin
9 Snap ring			

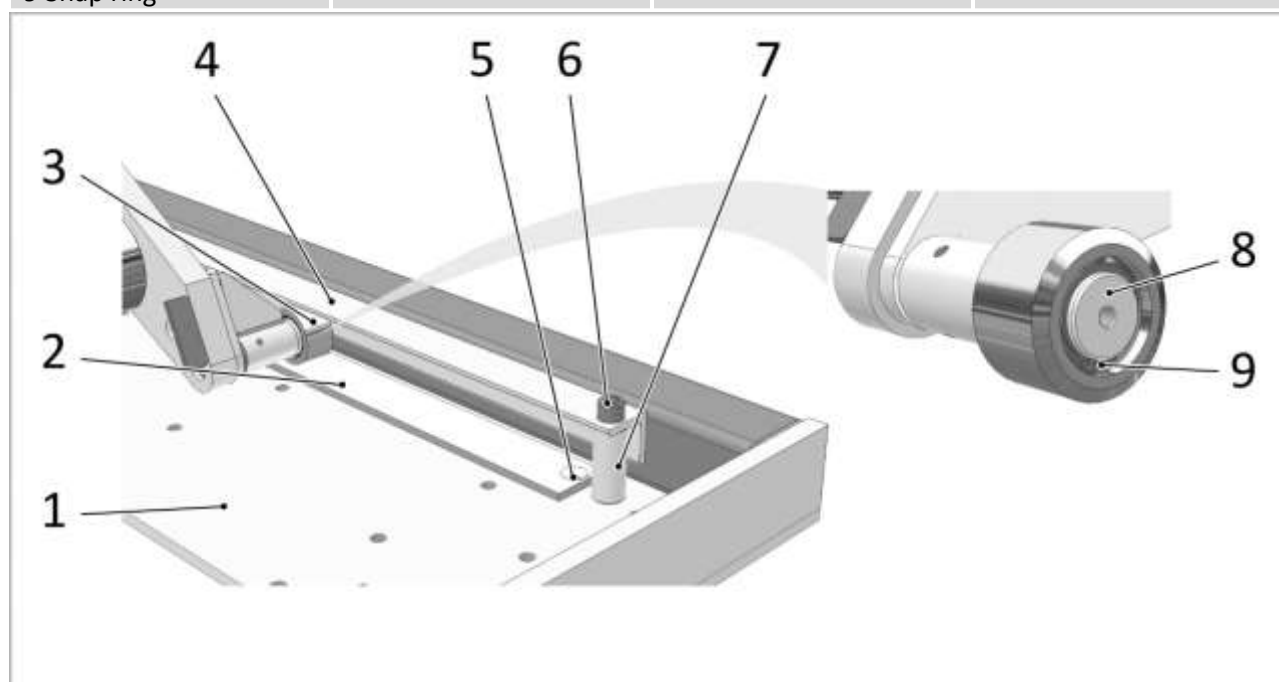


Fig. 22: Wear rails and track rollers in the base frame

#### Replacement procedure

1. Ensure that the lift table is unloaded.
2. Insert maintenance supports and lower the upper frame onto the maintenance supports.
3. Loosen the fastening screws of the anti-tilting-bar and remove it.
4. Lift table to clear space for the maintenance wedges.
5. Insert maintenance wedges and screw them tight.



**Fig. 23:** For maintenance purposes, maintenance wedges relieve the load on the rollers and rails

6. Lower the lifting table and let the ends of the scissors arms slide onto the wedges.
7. Replace the track rollers.
  - a) Loosen snap ring. and discard.
  - b) Remove track roller with the aid of a puller.
  - c) Fit replacement track roller.
  - d) Insert new snap ring.
8. Replace the wear rails.
  - a) Loosen the screws of the wear rails.
  - b) Replace the wear rails.
9. Lift the lift table and insert maintenance supports.
10. Unscrew and remove maintenance wedges.
11. Insert and fasten anti-tilting-bar.
12. Remove maintenance supports.
13. Carry out function test and commissioning.

### 8.13.3 Replacing the Center Bearing of the Scissors

Irrespective of the type of center bearing, the replacement procedures are essentially the same.

- **In order to rule out an impairment of stability, always replace the scissor centre bearings one after the other.**

Plain Bearing  
(DU)



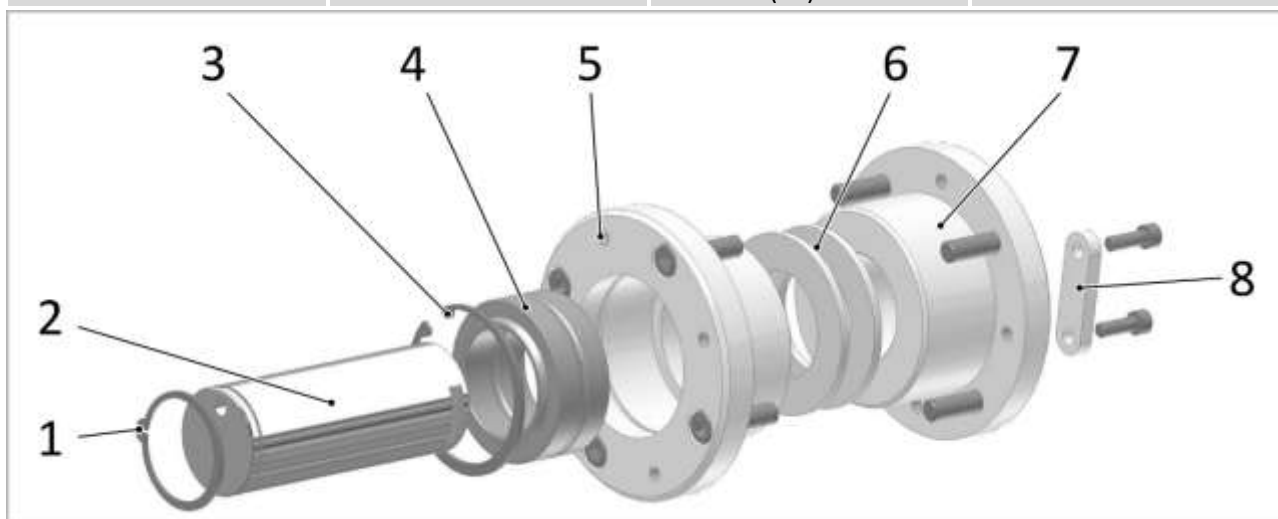
Spherical  
bearings (GL)



#### Required tools

- Hexagon socket key set

1 Snap ring, pin	2 Center bearing pin	3 Snap ring, bearing	4 Spherical bearing
3 Threaded hole	6 Sliding disc (×4)	7 Center bearing cassette (×2)	8 Bolt lock



**Abb. 24: Exploded view spherical bearing**

### Replacement Procedure

1. Ensure that the lift table is unloaded.
2. Raise the lift table and insert maintenance supports.
3. Continue to raise the lift table until the holes for the maintenance bolts are aligned.
4. Insert maintenance bolts and secure with snap ring.
5. Loosen the screw connection of the centre bearing cassettes.
6. Loosen bolt lock.
7. Pull out the center bearing bolt.
8. Remove the center bearing cassettes. If the cassettes do not come loose, screws can be screwed into the M10 threaded holes to loosen the center bearing ring from the scissor leg.
9. Remove the sliding discs.
10. The components are installed in reverse order.
11. Remove maintenance bolts, remove maintenance supports.
12. Perform a test drive.
13. Perform commissioning.

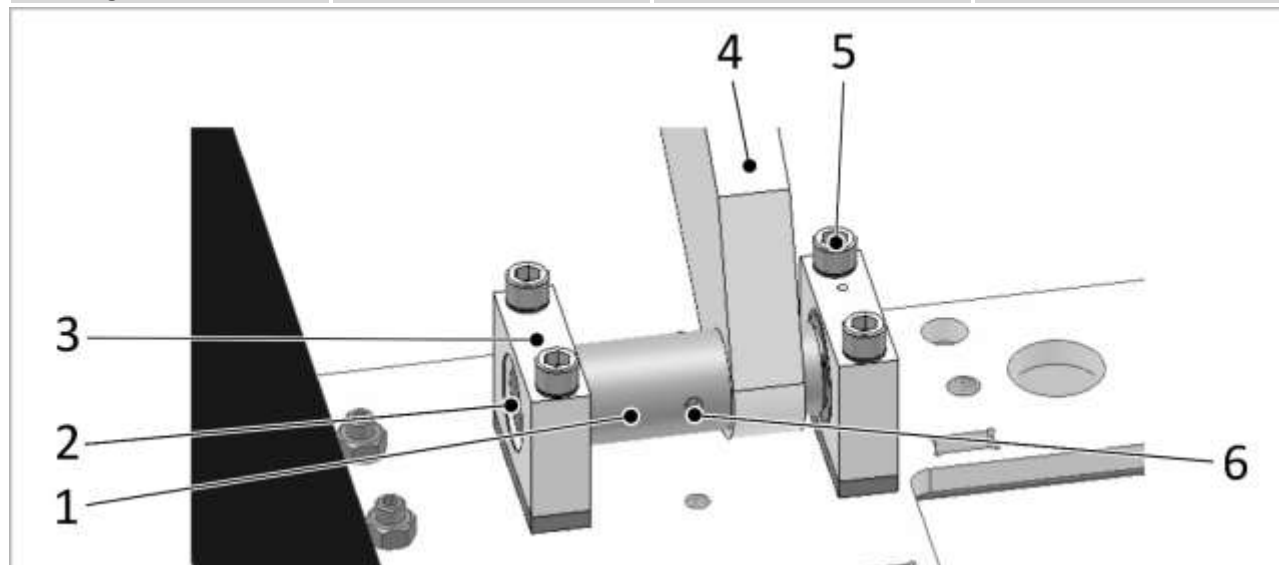
#### 8.13.4 Replacing pivot bearing

- **If all fixed bearings are released at the same time, the scissors will collapse, regardless of whether the upper frame is supported. This can cause serious injury. The top and bottom pivot bearings may only be changed one after the other.**
- **After replacing the bearings, the track rollers must run exactly in their track again, mark positions and carry out a test run after replacement.**

#### Required tools

- Hexagon socket key set
- Torque wrench

1 Distance sleeve	2 Pivot bearing bolt	3 Pivot bearing	4 Scissors arm
5 Hexagon socket screw	6 Set screw		



**Abb. 25: Pivot bearing**

#### Replace pivot bearing on upper frame

1. Ensure that the lift table is unloaded.
2. Raise the lift table and insert maintenance supports.
3. Lower the scissors lift table onto the maintenance supports.
4. Release anti-tilting-bar.
5. Loosen screw connection of the pivot bearing.
6. Slowly lower the scissors by command "Lift table lowering" until the pivot bearings come free.
7. Replace pivot bearing.
8. Slowly raise the scissors and make sure they are correctly positioned.
9. Tighten screw connection of the pivot bearing with a torque wrench.
10. Install anti-tilting-bars.
11. **NOTE** – Risk of damage to the lift table due to misalignment of the pivot bearing side. Ensure that the track rollers run exactly in their previous track. Perform a test drive.
12. Perform commissioning.

#### Replace pivot bearing on lower frame

1. Ensure that the lift table is unloaded.
2. Raise the lift table and insert maintenance supports.
3. Lower the scissors lift table onto the maintenance supports.
4. Loosen the anti-tilting bar on the upper frame.
5. Lock the rollers in the lower frame.
6. Loosen the screw connection of the pivot bearing.
7. **WARNING!** – Risk of bruising, crushing, blunt injuries due to collapsing scissors. Secure scissors against falling down after lifting! Loosen the cam shaft bracket and release the cam roller shaft with the command "Lower lift table".
8. The scissor arms can now be moved. Lift and secure the pivot bearings.

9. Replace pivot bearing.
10. Lower the scissors arms again until the pivot bearings touch the base console.
11. Tighten the pivot bearing using a torque wrench.
12. Mount anti-tilting bars.
13. **NOTE** – Risk of damage to the lift table due to misalignment of the pivot bearing side.  
Perform a test drive. Ensure that the rollers run exactly in their previous track.
14. Perform commissioning.

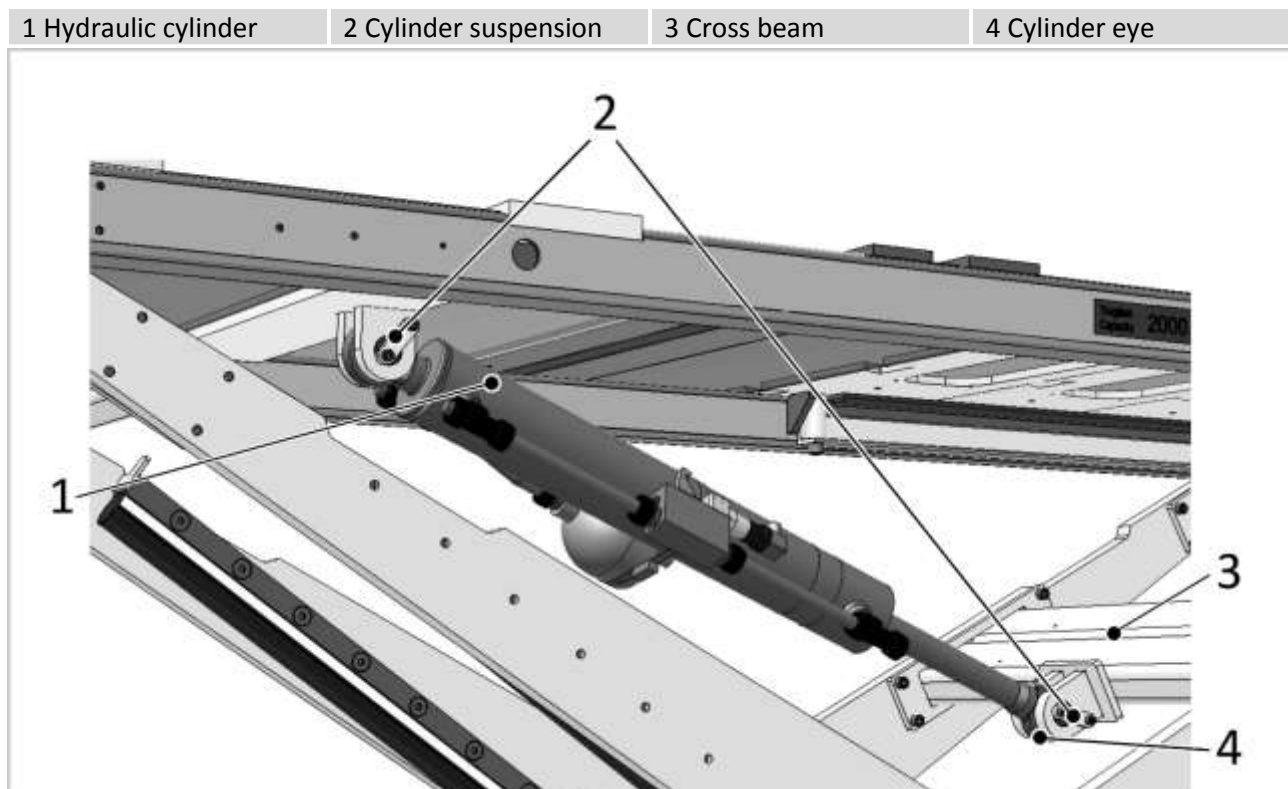
### 8.13.5 Replacing the Anti-Fall-Device

This safety equipment must be replaced each time it was triggered.



#### Required tools

- Hexagon socket wrench
- Set of metric wrenches
- Grease gun



**Fig. 26: Anti-fall-device**

#### Replacement procedure

1. Ensure that the lift table is unloaded.
2. Insert the maintenance supports and lower the lifting table onto the maintenance supports.

3. Disconnect the lift table from the electrical mains and secure it against unintentional or unauthorized reconnection.
4. Remove the plug of the control cables (pressure switch, solenoid valve) from the safety cylinder.
5. Loosen the safety plates of the bearing bolts.
6. Remove the bearing bolts.
7. Pull out the cylinder.
8. Installation in reverse order.
9. Grease joint bearings equipped with grease nipples.
10. Reconnect the scissors lift table to the electrical mains.
11. Raise the lifting table so that the maintenance supports are free and remove the supports.
12. **NOTE** **No catching attempt may be carried out, this leads to damage and unusability of the anti-fall-device!** Lift and lower the lift table several times and make sure that the lift table and the safety cylinder run smoothly.
13. Carry out commissioning.

## 8.14 Works on the Drive Train

For certain operations, the drive train must be disassembled as described in the following chapters.

### 8.14.1 Replacing the Bevel Gear Motor Completely

#### Required Tools

- Set of wrenches

#### Replacement procedure

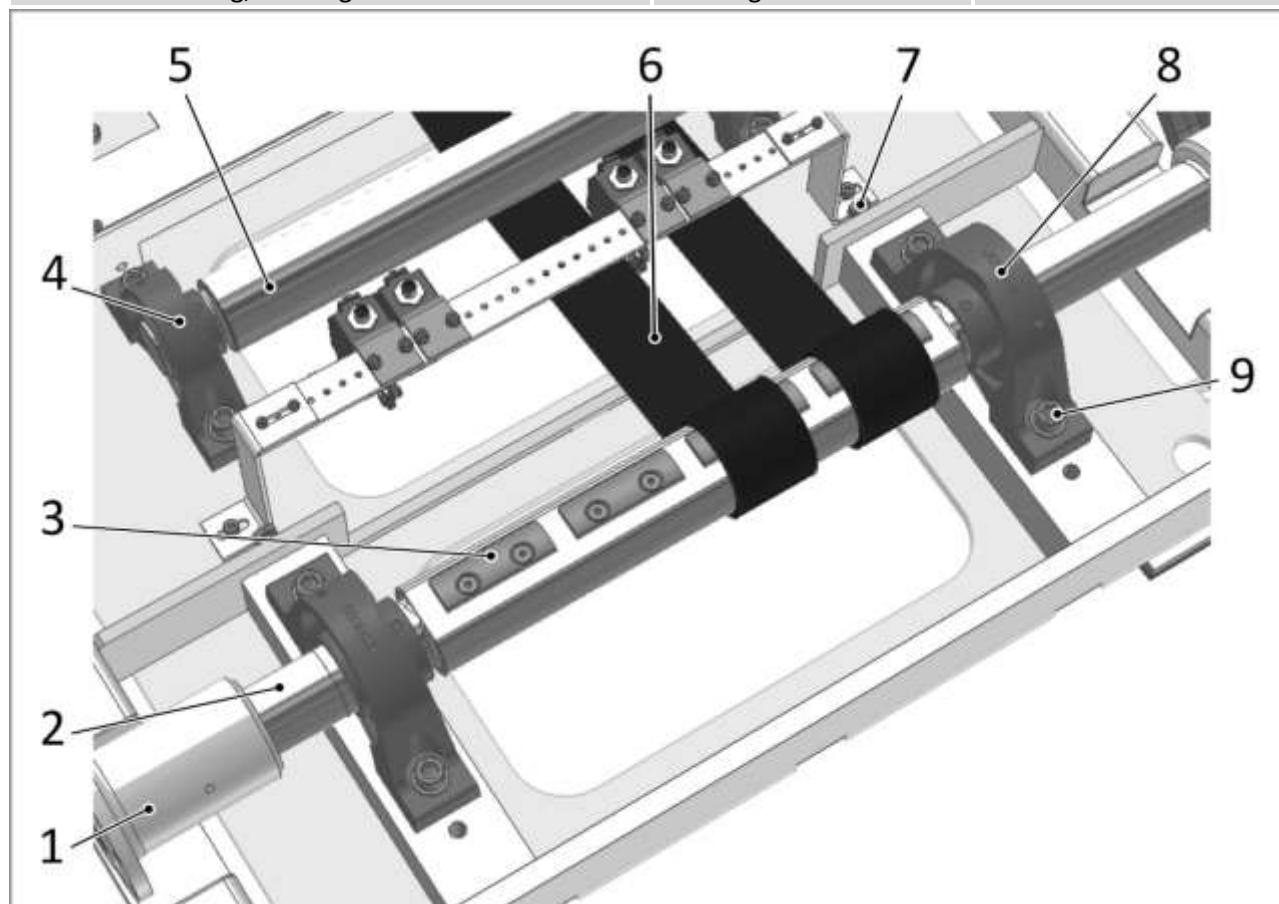
1. Ensure that the lift table is unloaded.
2. Insert maintenance supports and lower the lift table onto maintenance supports.
3. Disconnect the scissors lift from the electrical mains and secure it against unintentional or unauthorized reconnection.
4. Disconnect the electrical plug connection/motor cable from the geared motor.
5. Unbolt motor flange from joint shaft flange.
6. Loosen 4 screws from the motor plate.
7. The motor can be completely replaced.
8. Plug/screw the electrical plug connection/motor cable into the gear motor.
9. Connect the scissors lift table to the electrical mains.
10. Carry out a function test.
11. Check belt tension using a frequency meter → Chapter 8.14.4 Checking and Adjusting the Belt Tension.
12. Carry out commissioning.

### 8.14.2 Replacing the Winding Shaft

#### Required tools

- Hexagon socket wrench set
- Puller

1 Flange	2 Winding shaft	3 Belt clamping plate	4 Pedestal bearing of the snub roller
5 Snub roller	6 Belt	7 Adjusting screw	
8 Pedestal bearing, winding shaft		9 Hexagon socket screw	



**Fig. 27: Winding shaft and snub roller (not installed in every lift table)**

**Replacement procedure**

1. Ensure that the lift table is unloaded.
2. Insert maintenance supports and lower the lifting table onto maintenance supports.
3. Unwind the belt completely from the drive shaft during manual operation.
4. Disconnect the scissors lift table from the electrical mains and secure it against unintentional or unauthorized reconnection.
5. Loosen the Belt clamps.
6. Mark the position of the pedestal bearings.
7. Remove the screws from the pedestal bearings of the winding shaft.
8. Remove the chain from the chain sprocket.
9. Remove complete winding shaft.
10. Replace with new premounted shaft.
11. **NOTE** Risk of damaging the belts due to incorrect loading. Ensure that the winding shaft is aligned exactly parallel to the deflection roller to avoid damage due to excessive wear.  
Further re-installation is carried out in reverse order.
12. Connect the scissors lift table to the electrical mains.
13. Carry out a functional test.



14. **NOTE** After working on the drive, check the belt tension, it must be within the tolerance range for each belt (→ 8.14.4 Checking and Adjusting the Belt Tension)! Carry out commissioning.

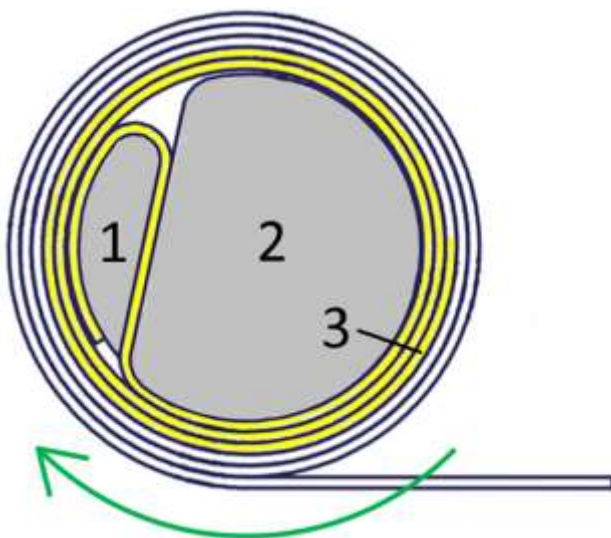
### 8.14.3 Replacing the Belts

The belts must be replaced after 10 years (manufacturer's instructions).



#### Required tools

- Hexagon socket wrench set



**Green arrow:** Correct winding direction.

(4) Belt clamping piece

(5) Winding shaft

(6) Initial windings

**2 to 2.5 windings (yellow) must always remain on the winding shaft.**

Fig. 28: Cross section: winding of the belts on the winding shaft

**NOTE** Danger of belt breakage and fall of the lift table. Always replace the complete belt set coming from one production batch.

**NOTE** Loss of holding force due to grease or oil on the belts. Ensure that new belts are free of dirt, grease and oil.

#### Replacement procedure

1. Ensure that the lifting table is unloaded.
2. Insert maintenance supports.
3. Lower lifting table onto maintenance supports.
4. Unwind the belts completely from the winding shaft.
5. Disconnect the lift table from the electrical mains and secure it against unintentional or unauthorized reconnection.
6. Loosen the belt clamping plate.
7. Loosen the nuts on the tension fork/threaded rod and pull the complete pre-assembled belt out of the cam roller shaft.
8. Pull the belt out of the lifting table and dispose.

9. Ensure that new belts are of correct dimensions. Compare to old belts.
10. Set the nuts on the threaded rods of the clamping forks to a distance of approx. 20 mm.
11. Guide the threaded rods through the wedge roller shaft and screw tight.
12. Guide the belts around the deviating roller and fasten to the winding shaft using the clamping plates.
13. Bend back end flaps of the belts over the clamping plates with a plastic mallet. Refer to drawing above for details.
14. After installing the belts adjust the belt tension → Chapter 8.14.4 Checking and Adjusting the Belt Tension.
15. **NOTE** Risk of damage to the lifting table due to destruction of the lifting mechanism. Ensure that the wedge roller shaft fits exactly in the track of the guides.
16. Connect the scissors lift table to the electrical mains.
17. Carry out a function test.
18. Carry out commissioning

#### 8.14.4 Checking and Adjusting the Belt Tension

Trouble-free and safe operation of a belt drive is only possible if all belts are loaded evenly. The belt tension of each belt can be adjusted individually with a hexagon nut on the belt connection.

To determine the load distribution, we recommend using a frequency meter. The tension of each belt can be determined via its vibration frequency after it has been struck by an object. Use only rounded objects, such as the handle of a screwdriver, for this purpose.

The belt frequency of each belt must not differ by more than  $\pm 10\%$  from the average value of all belts.

#### Accessories at an extra charge

Designation	Type	Article No	Manufacturer/Supplier
Frequency measurement device	VSM-1	WRZG-0960	Contitech/FLEXLIFT

#### Procedure

1. Ensure that the lift table is unloaded.
2. Lift the lift table, insert the maintenance supports and lower the lift table onto the maintenance supports.
3. Tension the belts by lifting the lift table to a lifting height of approx. 50 mm above the maintenance supports.
4. Determine the belt tension of all belt runs between the winding shaft and the deviating roller using the frequency measuring device:
  - a) Position the measuring head of the frequency meter at a distance of approx. 10 - 20 mm from the belt.
  - b) Generate vibration by striking the belt with a suitable tool (screwdriver handle, plastic mallet).
  - c) Note the frequency displayed on the meter, repeat 3-4 times to rule out measurement errors.
5. If the measured frequencies of all belts are within a tolerance range of  $\pm 10\%$  of the average value, the belt drive is ready for operation.
6. If the frequency of a belt strand deviates more than  $\pm 10\%$  from the average frequency, the belt tension must be adjusted:
  - a) Lower the lift table onto the maintenance supports.

- b) Adjust the belt tension of the belt with the greatest deviation at the belt connection. To do this use the nuts on the threaded rods.
- 7. Raise top frame, remove maintenance supports and raise and lower the top frame for five complete strokes.
- 8. Repeat steps 2 to 7 until frequency deviation is less than  $\pm 10\%$ .

An exactly defined specification of the frequency to be set is not entirely possible as this depends on the weight of the lift table including the superstructure and the respective run length and is not clearly known to the manufacturer prior to delivery.

### 8.14.5 Replacing the Cam Roller Shaft

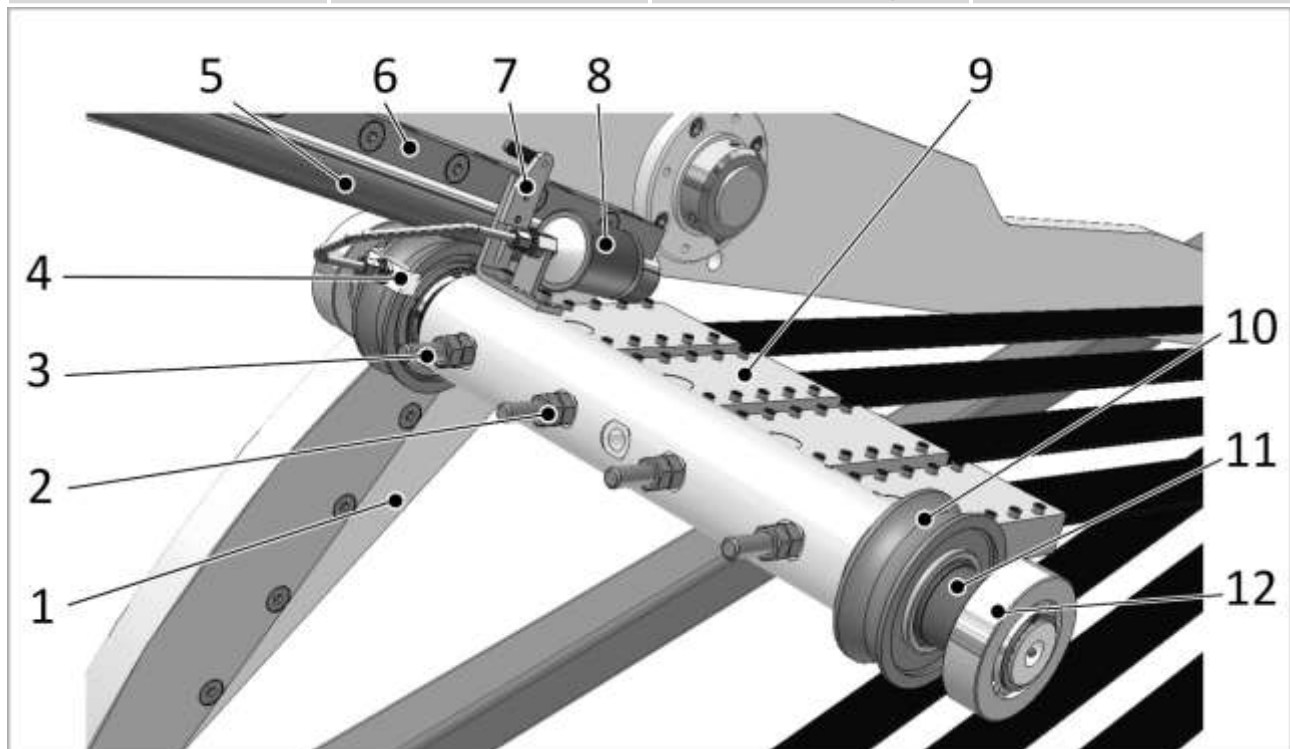
The replacement of the cam roller shaft as a whole is described below. The replacement of the round guide and the wedges is shown on the tutorial website.



#### Required tools

- Wrench

1 Scissors arm	2 Adjustment of belt tension	3 Threaded rod of the belt attachment	4 Lube applicator
5 Round guide	6 Round guide support	7 Cam shaft bracket	8 Lube cartridge
9 Belt attachment	10 Profile roller	11 Cam roller shaft, axle	12 Cam roller



**Fig. 29: Cam roller shaft with automatic lubrication**

#### Exchange procedure

1. Ensure that the lift table is unloaded.

2. Insert the maintenance supports and lower the lift table onto the maintenance supports.
3. Mark the position of the belts on the deviating roller.
4. Disconnect the scissors lift table from the electrical mains and secure it against unintentional or unauthorized reconnection.
6. Remove the M16 nuts at the end of the clamping forks.
7. Remove the belt attachments from the cam roller shaft.
8. Pull the cam roller shaft off the guide by hoisting it out.
9. Before installing a replacement part, ensure it is facing in the right direction. Use the cam shaft brackets for reference.
9. Install the replacement parts in reverse order.
10. Ensure that the profile rollers fit exactly on the guide rails.
11. In the cam roller shaft, make sure that the profile rollers fit exactly onto the round guides.
13. Connect the scissors lift table to the electrical mains.
14. Carry out function test.
15. **NOTE** After working on the drive, check the belt tension, it must be within the tolerance range for each belt. (→ 8.14.4 Checking and Adjusting the Belt Tension)!
16. Carry out commissioning.

### 8.14.6 Replacing the Deviating Roller

The replacement of the deflection roller is described below.

#### Required tools

- Hexagon socket wrench

1 Lower end of scissors arm	2 Allen screw	3 Bend axle	4 Belt
5 Track roller	6 Track roller pin		

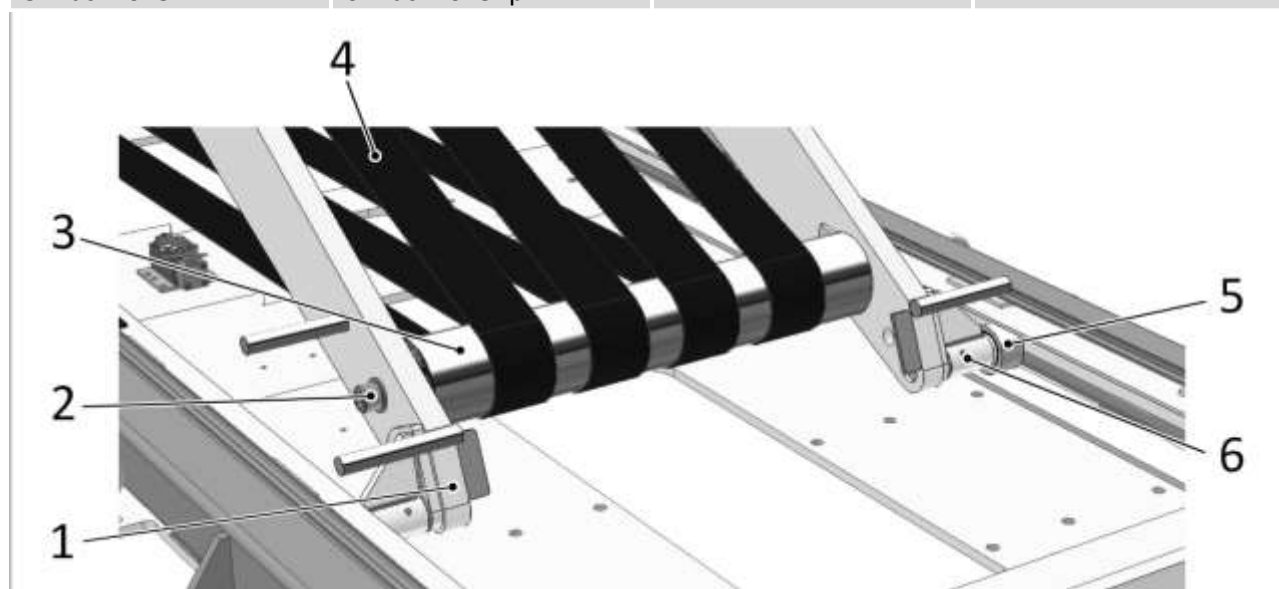


Fig . 30: Deviating roller

#### Exchange procedure

1. Ensure lift table is unloaded.

2. Lift and insert maintenance supports.
3. Lower the lifting table onto the maintenance supports.
4. Unwind the belt completely from the winding shaft during manual operation.
5. Disconnect the scissors lift table from the electrical mains and secure it against unintentional or unauthorized reconnection.
6. Disconnect/unscrew the electrical plug connection/motor cable from the geared motor.
7. Loosen the M20 screws on the inner scissors arms.
8. Remove the bend roller.
9. Install the components in reverse order.
10. Plug/screw the electrical plug connection/motor cable into the geared motor.
11. Ensure an evenly distributed seat of the belts on the deviating roller.
12. Connect the scissors lift table to the electrical mains.
13. Carry out function test.
14. **Note** Risk of damage to the drive due to unequal belt tension. After working on the drive train, check the belt tension and readjust if necessary. (→ Chapter 8.14.4 Checking and Adjusting the Belt Tension)!
15. Carry out commissioning.

### 8.14.7 Replace cardan shaft

#### Required tools

- Hexagon socket key
- Spanner set
- Grease gun

1 Winding shaft	2 Winding shaft flange	3 Screw connection	4 Cardan joint to the winding shaft
5 Sliding joint	6 Cardan joint to the drive shaft	7 Cardan shaft flange	8 Drive shaft flange

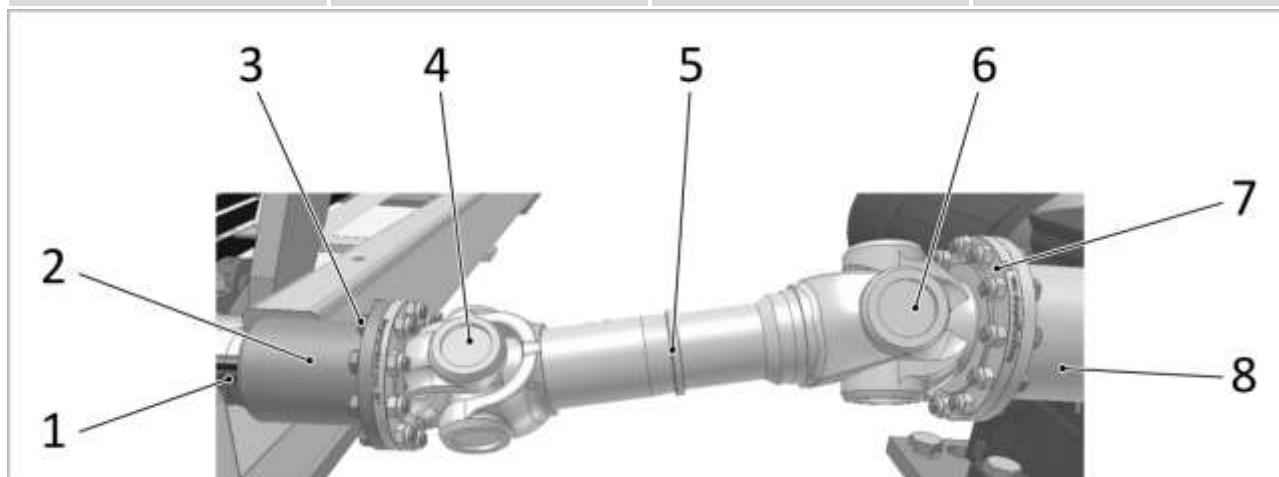


Fig. 31: A cardan shaft connects motor shaft and winding shaft

#### Exchange procedure

1. Ensure that the lift table is not loaded.

2. Insert maintenance supports.
3. Lower the lift table onto the maintenance supports.
4. Disconnect the lift table from the electrical supply and secure it against unintentional or unauthorized reconnection.
5. Loosen the screw connections of the two connecting flanges.
6. Compress and remove the cardan shaft.
7. Insert a new cardan shaft and bolt to flanges.
8. Lubricate the new cardan shaft.

**NOTE** – Risk of damage to the new spare part. The cardan shaft must not be completely pushed together after installation. The sliding joint must have at least 10 mm play.

9. Reconnect the scissors lift to the electrical mains.
10. Raise the lift table so that the maintenance supports are free and remove the supports.
11. Carry out commissioning.



## 9 Declaration of Incorporation

According to EC directive 2014/35/EU on machinery, (annex II B).

Name and address of the manufacturer:

**FLEXLIFT Hubgeräte GmbH**

Eckendorfer Straße  
D-33609 Bielefeld

We herewith declare, that the partly completed machinery described below:

Product denomination:	<b>Electro-mechanical scissors lift table FLEXLIFT</b>
Type:	RFK-MA 2500/150
Commission no.:	V2020205061
Serial no.:	74137-74141
Year of manufacture:	2020

complies with all essential requirements of the Machinery Directive 2014/35/EU, as far as the scope of delivery allows.

In addition, we declare that the specific technical documentation has been prepared in accordance with Annex II Part B of this Directive.

The partly completed machinery is conforming to the EC Directives 2014/35/EU relating to electrical equipment and 2014/30/EU relating to electromagnetic compatibility.

We commit ourselves to transmit, in response to a reasoned request by the market surveillance authorities, specific technical documentation has been prepared in accordance with Annex II Part B of this Directive.

The partly completed machinery must not be put into service until the final machinery into which it is to be incorporated has been declared in conformity with the provisions of Directive 2006/42/EC on Machinery, where appropriate, and until the EC Declaration of Conformity according to Annex II A is issued.

Bielefeld, 06.08.2020

Carsten Heide, CEO

**Place, Date**

**Name and function of signatory**

**Signature**

