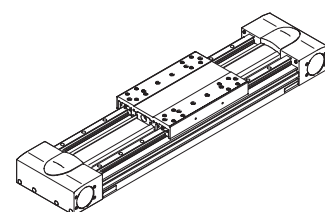
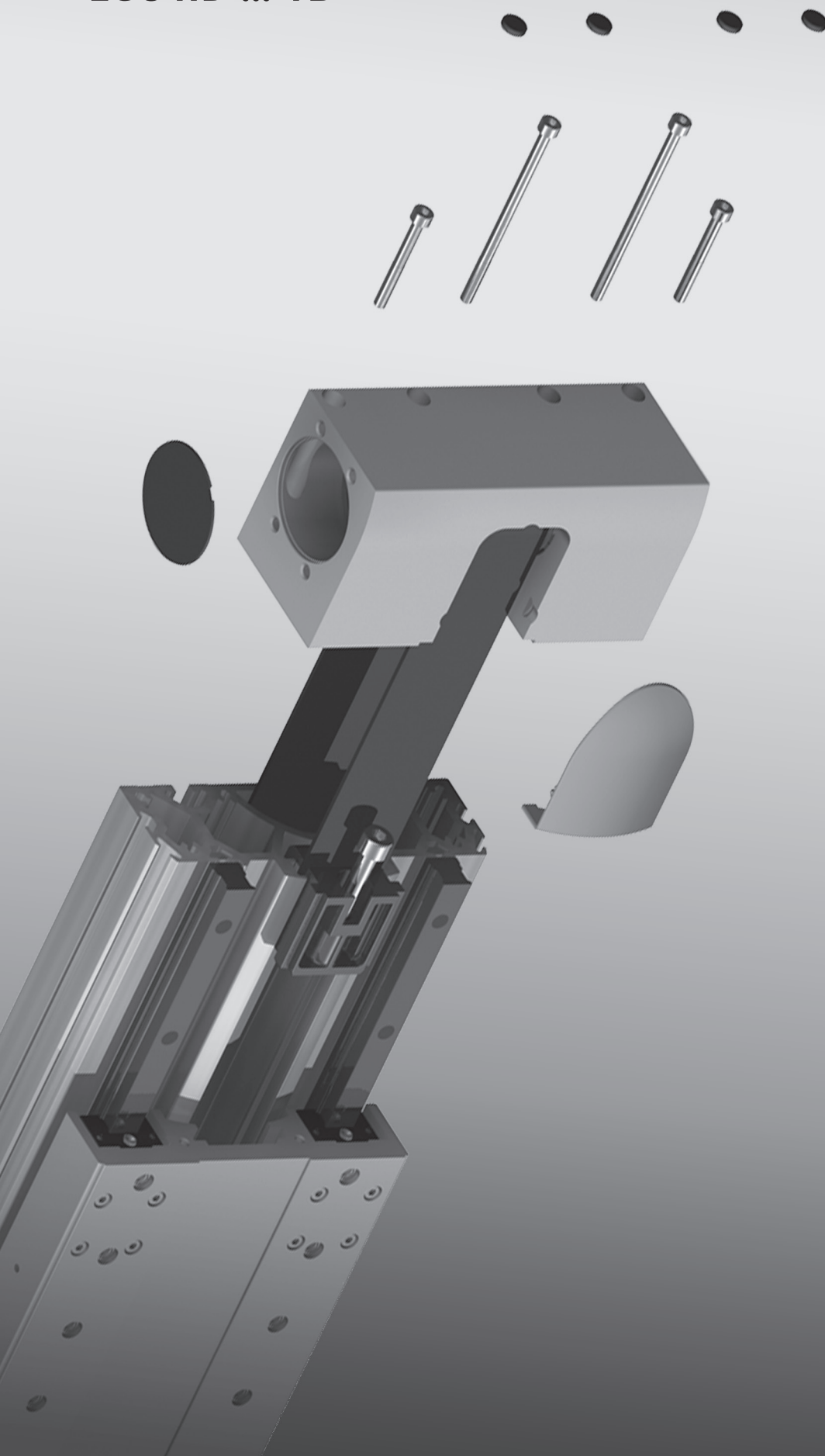


Toothed belt axis

EGC-HD-...-TB

FESTO

Repair
instructions (en)



Imprint

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All product designations and brand names used are the property of the owners and not explicitly identified as such.

All technical data are subject to change according to technical updates.

Foreword

These repair instructions are valid for the products listed on the title page to the exclusion of any liability claims.

Differences compared to the descriptions in these repair instructions can arise depending on the design and/or modification status of the products. The user must check this prior to carrying out the repair and take the deviations into consideration if necessary.

These repair instructions have been prepared with care.

Festo SE & Co. KG does not, however, accept liability for any errors in these repair instructions or their consequences. Likewise, no liability is accepted for direct or consequential damage resulting from incorrect use of the products.

Further information is given in [Chapter 8 on page 43](#).

The relevant regulations on occupational safety, safety engineering, and interference suppression as well as the stipulations contained in these repair instructions must be observed when working on the products.

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1 Important information

1.1 About these repair instructions

This document contains important information about proper repair of the products listed on the title page.

However, the costs of carrying out a repair must be considered in the case of larger defects.

Before carrying out a repair, the relevant chapter in these instructions must be read in full and followed consistently.

The toothed belt axis type EGC-HD-...-TB is also called the product in these repair instructions.

For reasons of clarity, these repair instructions do not contain all detailed information. The following documents should therefore also be available while carrying out repair work:

- **Toothed belt axis EGC-HD-...-TB operating instructions**

Contains information on the product's peripherals as well as its function, structure, application, installation, commissioning, maintenance and care, etc. (→ www.festo.com)



All available documents applicable to the product → www.festo.com.

- **Spare parts documentation**

Contains an overview of the spare and wearing parts as well as information on their installation. This can be found in the online spare parts catalogue on the Festo website (→ www.festo.com/spareparts).

- **“Tools and repair accessories” information brochure**

Contains an overview of available assembly aids (e.g. lubricants, locking agent), special tools, schematic diagrams, fixtures, measuring devices, etc. The information can be found in the online spare parts catalogue on the Festo website (→ [Tools and repair accessories.pdf](#)).

1.2 Pictograms used in these repair instructions

Danger categories

The following symbols identify text passages which draw attention to specific hazards.



Danger



Warning



Caution

Marking special information

The following symbols identify text passages which contain special information.



Note



Information



Documents



Environment

1.3 Text designations used in these repair instructions

- Activities that can be carried out in any order.
 - 1. Activities which should be carried out in the specified order.
 - General list
 - ➔ Result of an activity / references to further information
- Underlined, blue text indicates a cross-reference or hyperlink that you can click on in the PDF.

1.4 General safety instructions



Danger

Risk of fatal injury due to electric shock and uncontrolled movement of components.

- Before carrying out maintenance and repair work, shut down the product as described in the operating instructions (➔ www.festo.com).
- Disconnect the product from the power supply and depressurise it.
- Reliably secure the product against unauthorised restarting.
- Secure the components against uncontrolled movements or move them into a safe end position.

The control of the drive motors is still charged after the voltage has been switched off (capacitor voltage).

- After switching off the voltage, wait approx. 3 minutes before removing the motor cables. The capacitors discharge their voltage during this time.



Warning

Failure to comply with these safety instructions and information can result in serious injuries.

- Read and follow all safety instructions and information.
- Wear personal protective equipment, depending on the work situation.
- For information on the potential risks to humans when handling lubricating grease, oil, locking agent, cleaning agent and other chemicals, which are used for the repair, protection against these risks and first aid measures, refer to the safety instructions on the packagings of the named materials and the current safety data sheets (in accordance with Regulation (EC) No. 1907/2006) (➔ www.festo.com/en/msds, ➔ Website of the product manufacturer).
- Take into consideration the legal regulations for the respective destination.
- Repairs must only be carried out in conjunction with these repair instructions as well as the respective operating instructions of the device and the documents named in [Chapter 1.1 on page 6](#).



Caution

Lifting large loads can lead to permanent injury.

- Depending on their size and weight, the products must be lifted by several persons or using suitable lifting gear.

1.5 Product-specific notes and information



Note

- Observe the given tightening torques. If no special information is given the tightening torques given in the relevant standard apply to the screws, bolts and nuts used.
- Note the strength class of the screws, bolts and nuts!



In the event of damage caused by unauthorised manipulation, improper use or use of non-original spare parts, all warranty and liability claims against the manufacturer expire.

1.6 Service

Contact your regional Festo contact if you have any questions (→ www.festo.com).



Instead of carrying out the repair yourself, your local Festo sales office offers the option of having the repair carried out by Festo.

1.7 Qualification of personnel



Warning

Installation and repair of the product by unauthorised and untrained persons, repairs using non-original spare parts or without the technical documentation required for installation and/or repair are dangerous and therefore not permitted.

- The product may only be repaired by authorised and trained persons using original spare parts.
- Furthermore, they must have knowledge in the following areas:
 - the installation and operation of electrical control systems
 - the applicable regulations on the operation of safety systems
 - the applicable regulations on accident prevention and occupational safety.

1.8 Environment



- Components and equipment replaced during repair must be disposed of in accordance with the relevant local environmental protection regulations.
- When using lubricating grease, oil, screw locking agent, cleaning agents and other chemicals, the locally applicable environmental protection regulations must be followed.
- For environmentally relevant information on the lubricating greases, locking agents, cleaning agents, special oils and other chemicals, refer to the packaging of the named materials and the current safety data sheets (in accordance with Regulation (EC) No. 1907/2006) (→ www.festo.com/en/msds, → website of the product manufacturer).

1.9 Technical requirements



Note

The following instructions for safe and proper use must be observed:

- Comply with the connection and ambient conditions of the product and all connected components specified in the technical data. The product can only be operated in compliance with the relevant safety guidelines if it complies with the limit values and load limits (→ see documentation enclosed with the product).
- The product must be in perfect technical condition.
- The product may only be operated in its original condition and without unauthorised modifications.
- The product is designed for industrial use.

1.10 Standards and test values

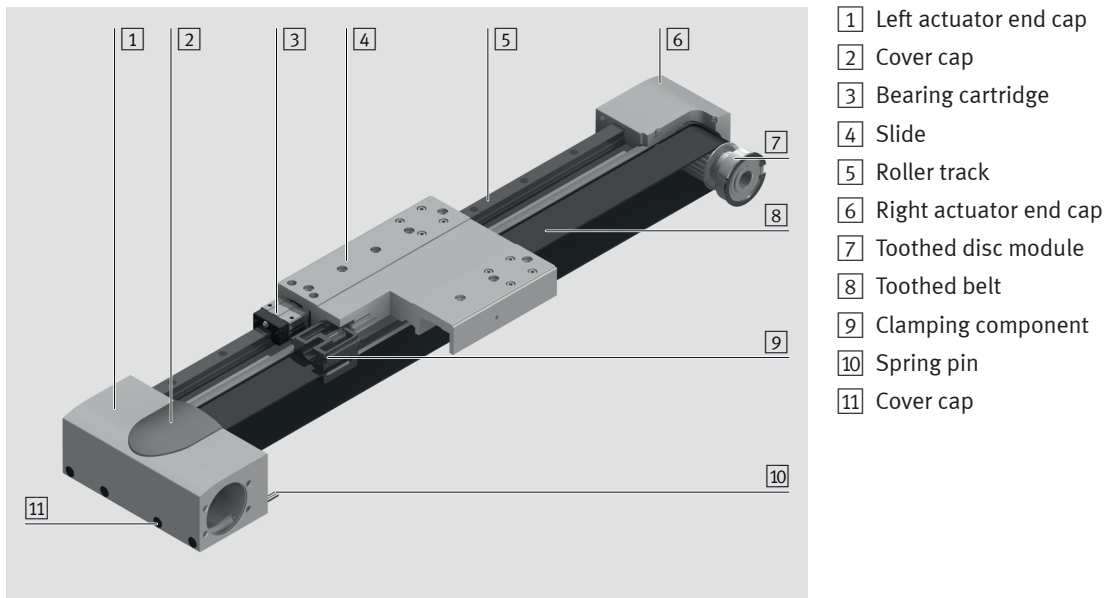


Standards and test values which the products comply with and fulfil can be found in the "Technical data" sections (→ documentation enclosed with the product).

2 General product description

2.1 Functional description

The EGC-HD-...-TB is a toothed belt axis based on the operational principle of a circulating toothed belt for power transmission. The rotation of a servomotor translates a toothed belt deflected at both ends of the axis into a linear movement, which is transferred onto the roller-guided slide fixed onto the toothed belt.



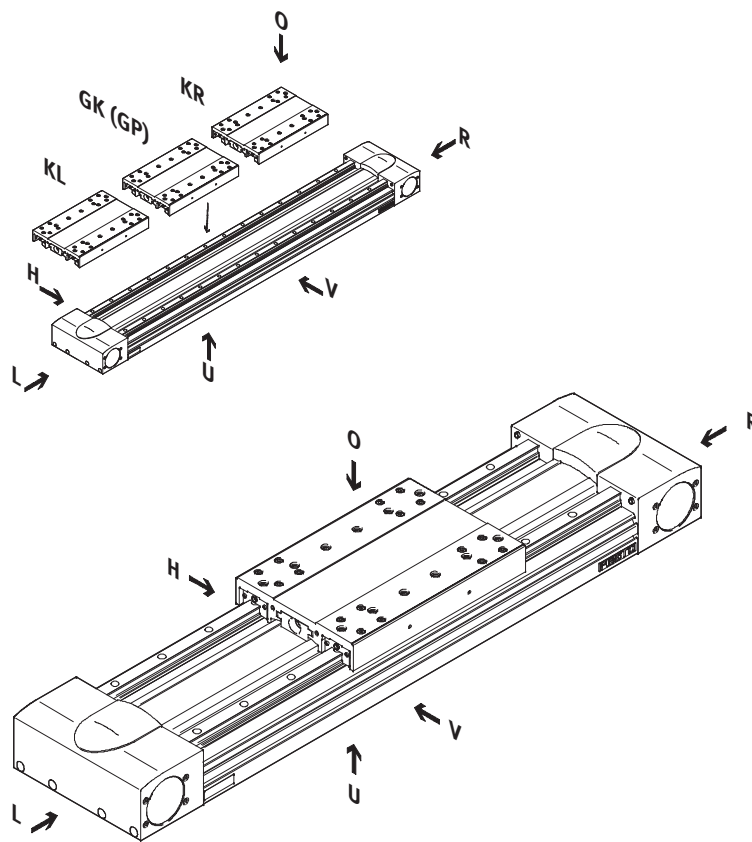
2.2 Types and part numbers

A complete overview of features, accessories, type codes, technical data and dimensions of the product can be found in the product catalogue or on the Festo website (→ www.festo.com).

Type	Part number
EGC-HD-125-...-TB	556823
EGC-HD-160-...-TB	556824
EGC-HD-220-...-TB	556825

2.3 Orientation designations

These illustration provide an overview of the orientation designations.



Versions:

- GK = Standard slide
- GP = Protected standard slide (not EGC-125)
- KL = Additional slide on left
- KR = Additional slide on right

Orientation:

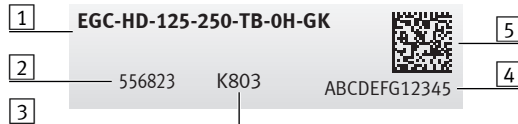
Festo=Product identification (rating plate) as reference point

- O = top
- U = bottom
- R = right
- L = left
- V = front
- H = rear

2.4 Type code

The precise product features can be determined with the help of the product labelling on the product. The order code describes the features, separated by a hyphen “-”.

Example:



- 1 Order code
- 2 Part number
- 3 Serial number
- 4 Product Key
- 5 Product Key Code
Data Matrix Barcode
(<http://pk.festo.com/+ Product Key>)

The type designation on this name plate provides the following information:

EGC	Linear drive type EGC
HD	Heavy-duty guide
125	Size 125 mm
250	Stroke 250 mm
TB	Toothed belt
0H	0 mm stroke reserve
GK	Standard slide

3 Components list



The data sheet contains a list and description of all possible equipment features of the product (→ www.festo.com).

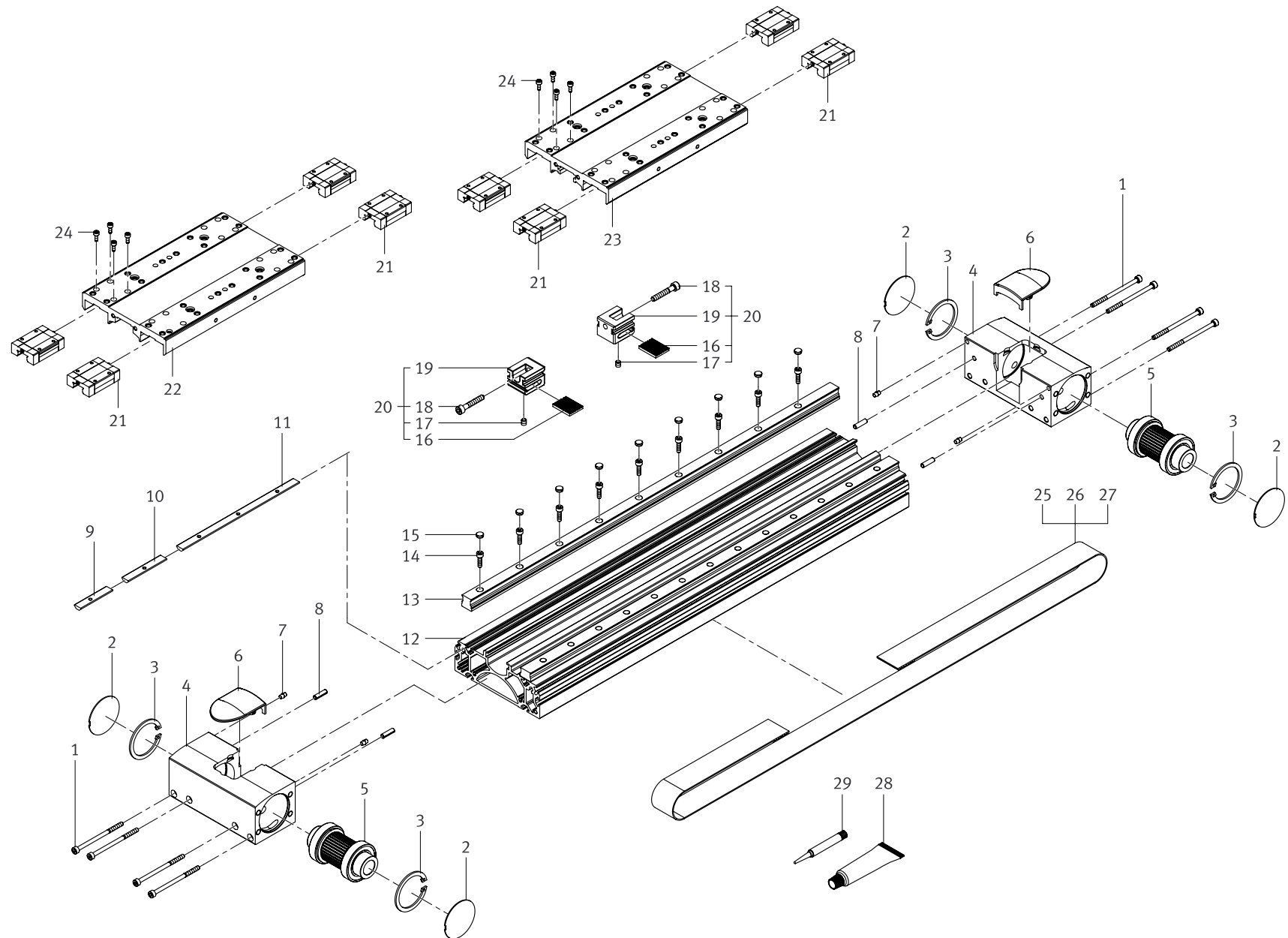
The component overviews with corresponding bills of materials for the following products are listed on the following pages:

Size	Part number	Components list	Bill of materials
EGC-HD-125-...-TB	556823	Chapter 3.1 on page 12	Chapter 3.1.1 on page 13
EGC-HD-160-...-TB	556824	Chapter 3.2 on page 14	Chapter 3.2.1 on page 15
EGC-HD-220-...-TB	556825	Chapter 3.3 on page 16	Chapter 3.3.1 on page 17



The following diagrams are intended only to provide an overview of the individual components. To order spare and wearing parts, use the online spare parts catalogue on the Festo website (→ www.festo.com/spareparts).

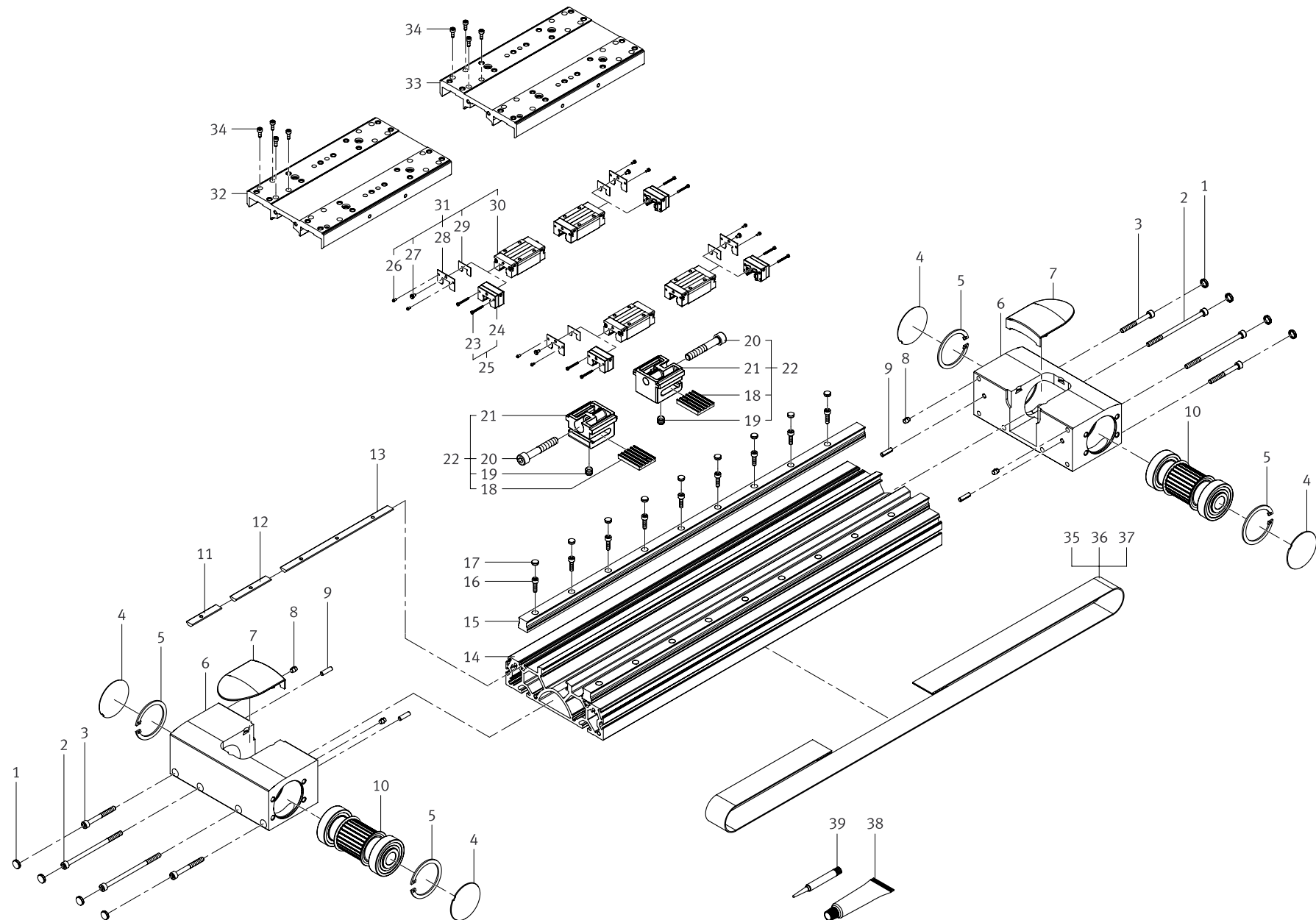
3.1 EGC-HD-125-...-TB



3.1.1 EGC-HD-125-...-TB bill of materials

Item	Designation
1	Socket head screw, ISO 4762-M4X65-8.8
2	Sealing disc
3	Retaining ring, DIN 472-42×1.75
4	Actuator end cap
5	Toothed disc assembly
6	Cover cap
7	Buffer element
8	Spring pin, DIN 7346-4.5×16
9	Slot nut
10	Slot nut
11	Slot nut
12	Cylinder barrel
13	Roller track
14	Socket head screw, ISO 4762-M3X12-12.9
15	Cover cap
16	Clamping plate
17	Threaded pin, ISO 4026-M5X6-45H
18	Socket head screw, ISO 4762-M5X30-10.9
19	Clamping component
20	Clamping component
21	Bearing cartridge
22	Slide module
23	Slide module, KL/KR
24	Socket head screw, ISO 4762-M3X8-12.9
25	Toothed belt
26	Toothed belt [], 5m piece
27	Toothed belt [PU2], 5m piece
27	Lubricating grease, LUB-KC1, silicone free
28	Locking agent (threadlocker)

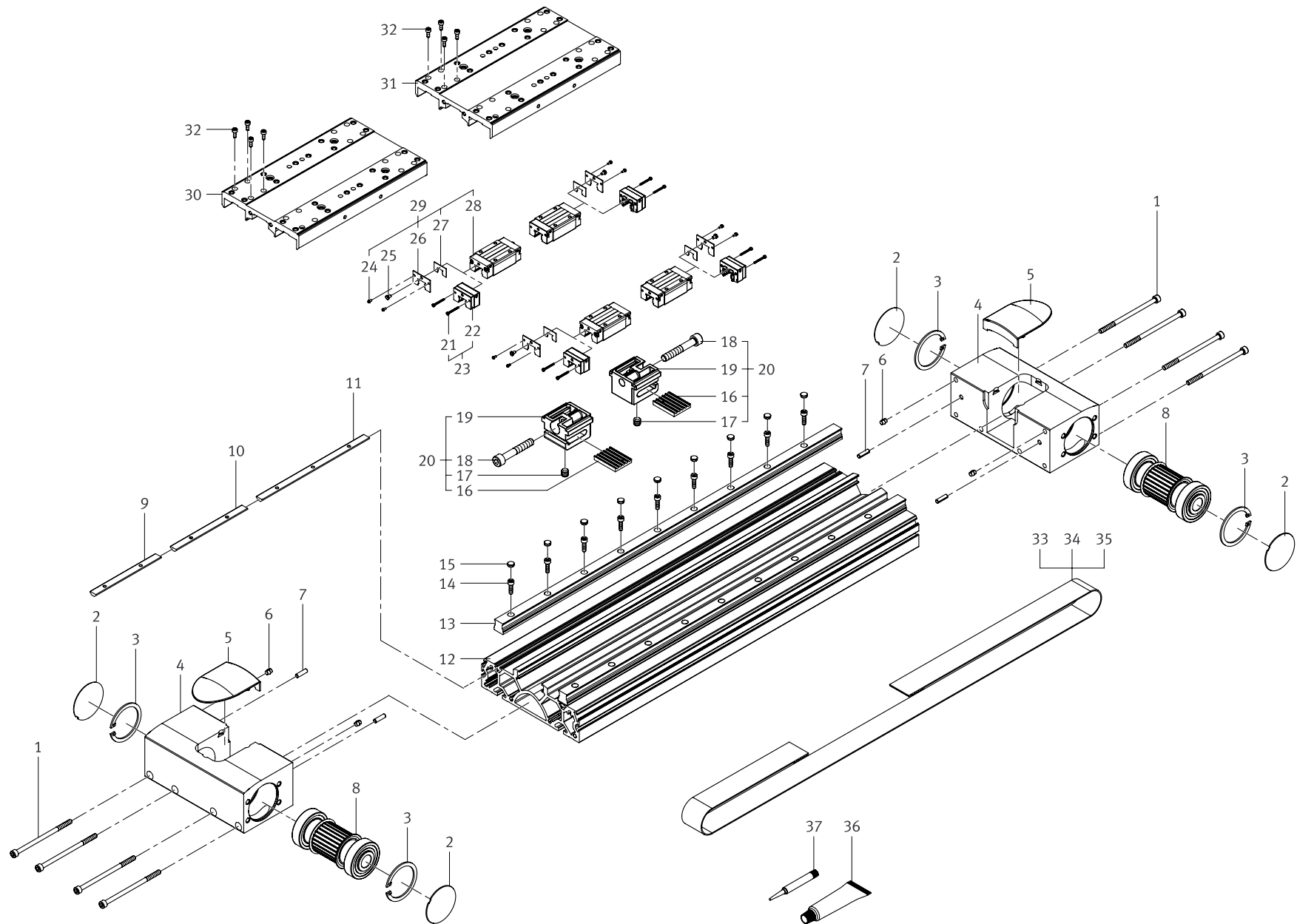
3.2 EGC-HD-160-...-TB-(GP)



3.2.1 EGC-HD-160-...-TB (GP) bill of materials

Item	Designation
1	Cover cap
2	Socket head screw, ISO 4762-M5X90-8.8
3	Socket head screw, ISO 4762-M5X45-10.9
4	Sealing disc
5	Retaining ring, DIN 472-47×1.75
6	Actuator end cap
7	Cover cap
8	Buffer
9	Spring pin, DIN 7346-4.5×16
10	Toothed disc assembly
11	Slot nut
12	Slot nut
13	Slot nut
14	Cylinder barrel
15	Roller track
16	Socket head screw, ISO 4762-M4X14-12.9
17	Cover cap
18	Clamping plate
19	Threaded pin, ISO 4026-M8X8-45H
20	Socket head screw, ISO 4762-M8X50-10.9
21	Clamping component
22	Clamping
23	Screw
24	Lubricating unit
25	Lubrication adapter
26	Screw
27	Lubrication nipple, M3-S16
28	Front cover
29	Scraper
30	Roller carriage
31	Bearing cartridge
32	Slide module, KL/KR
33	Slide module
34	Socket head screw, ISO 4762-M8X50-10.9
35	Toothed belt
36	Toothed belt [], 5m piece
37	Toothed belt [PU2], 5m piece
38	Lubricating grease, LUB-KC1, silicone free
39	Locking agent (threadlocker)

3.3 EGC-HD-220-...-TB-(GP)



3.3.1 EGC-HD-220-...-TB (GP) bill of materials

Item	Designation
1	Socket head screw, ISO 4762-M6X130-8.8
2	Sealing disc
3	Retaining ring, DIN 472-75×2.5
4	Actuator end cap
5	Cover cap
6	Buffer
7	Spring pin, DIN 7346-5×20
8	Toothed disc assembly
9	Slot nut
10	Slot nut
11	Slot nut
12	Cylinder barrel
13	Roller track
14	Socket head screw, ISO 4762-M6X20-12.9
15	Cover cap
16	Clamping plate
17	Threaded pin, ISO 4026-M12X12-45H
18	Socket head screw, ISO 4762-M8X40-10.9
19	Clamping component
20	Clamping component
21	Screw
22	Lubricating unit
23	Lubrication adapter
24	Screw
25	Lubrication nipple, AM 6 DIN 3405
26	Front cover
27	Scraper
28	Roller carriage
29	Bearing cartridge
30	Slide module KL/KR
31	Slide module
32	Socket head screw, ISO 4762-M6X12-10.9
33	Toothed belt
34	Toothed belt [], 5m piece
35	Toothed belt [PU2], 5m piece
36	Lubricating grease, LUB-KC1, silicone free
37	Locking agent (threadlocker)

4 Repair preparation

4.1 Determining the causes for the repair

If it is necessary to change the toothed belt, always investigate the cause of the failure in order to prevent premature and repeated failure. A toothed belt axis that has been used as intended and designed correctly will not normally exhibit any premature signs of failure.

This investigation is not necessary in the case of non-premature failure (fatigue time). However, the condition of the toothed belt pulley module (wear of the tooth surface/tooth geometry, radial clearance between bearing inner raceway and the bearing seat: interference fit when new) and also the condition of the deep-groove ball bearings (e.g. perceptible bearing clearance, disrupted, non-smooth rolling behaviour and increased running noise, etc.) should always be evaluated too. In case of uncertainty, we recommend replacing all the components mentioned to rule out reciprocal effects during later operation.

Possible visible signs of wear of the toothed belt:

- Cracks on the back of the toothed belt are signs of wear. For example, these can be caused by operation outside the permitted temperature range, impermissible chemical effects or possibly reaching the end of its fatigue life.
 - Wear of the nylon fabric (fabric cover) on the tooth side of the belt. This is indicated by lint and pilling, for example, and constitutes primary wear (abrasion of the fabric).
 - Visible individual glass fibre cords in the tooth gullet are secondary signs of wear due to primary wear of the nylon fabric. In this case, the toothed belt pulley module must be examined very carefully for wear, as visible glass fibre cords may have caused severe abrasive damage to the sides of the tooth tip of the toothed belt pulley.
- On replacing the toothed belt due to long operation, it is useful to replace the toothed belt pulley module including deep-groove ball bearings at the same time (→ [Chapter 5.2.2 on page 30](#)).

In the event of premature failure of the product, the operating conditions should be examined more closely.

The following possibilities should be considered, among other things:

– **Overloading**

Incorrect set values of the braking ramp in STOP states (e.g. EMERGENCY STOP, quick stop) result in overloading of the product and can irreparably damage it or reduce its life drastically.

The elasticity of the toothed belt delays the acceleration and braking performance of the product and results in greater acceleration and deceleration than set at the controller (spring effect).

Block-shaped acceleration and deceleration profiles (no jerk limitation) cause high peaks in the drive force that can lead to overloading of the drive. Positions outside of the permissible range can also occur. An acceleration and deceleration specification with jerk limitation reduces oscillations in the entire system and has a positive effect on the stresses to which the mechanical system is subjected.

- Check which closed-loop controller settings can be adjusted (e.g. jerk limitation, smoothing of the acceleration profile).
- Check the settings of all braking ramps in the controller or the higher-level control system (deceleration values and jerk).
- Make sure that the deceleration values (braking deceleration, deceleration times) of the speed, the load to be moved and the mounting position (horizontal / vertical) and the specified maximum drive torque or the feed force correspond to the allowable values of the product used.
- Use the Festo “Positioning Drives” design software to design the product (→ www.festo.com).

– **Ambient conditions/material resistance**

- Check whether the ambient temperature is within the permissible range.
- Check the chemical and physical ambient conditions for hazardous substances, such as dust, abrasive particles, cooling lubricants, solvents, ozone, radiation, water-soluble substances, greases and oils, etc.

4.2 Preparatory work



Danger

Risk of fatal injury from electric shock.

The control of the drive motors is still charged after the voltage has been switched off (capacitor voltage).

- As such, you must wait approx. 3 minutes after switching off the voltage before the motor cables can be removed. The capacitors discharge their voltage during this time.
- Reliably secure the product against unauthorised restarting.



Note

- Before starting the repair work, dismantle existing attachments as described in the instructions in the corresponding operating and assembly instructions (→ www.festo.com).

1. Remove the motor and encoder cables.
2. Dismantle the motor and axial kit.
3. Dismantle the shock absorber retainer (if mounted).



Note

- Where possible, we recommend completely removing the product from the system before carrying out the repair.
- The repair should preferably be carried out on a stable and flat work surface with storage for small parts.
- To prevent damage to the components, do not use pointed or sharp-edged assembly tools.
- Keep your working environment clean and tidy.

4.3 Visual inspection

- Check the product for visible damage that can impair its function.
- The product must be completely replaced if significant damage exists.

5 Repair steps

The toothed belt axis EGC-HD-TB... comprises the following modules:

- Cylinder barrel with drive covers, two roller tracks and a slide driven by a toothed belt.

5.1 Replacing the toothed belt

On replacing the toothed belt due to long operation, it is useful to replace the toothed belt pulley module including deep-groove ball bearings at the same time (→ [Chapter 5.2.2 on page 30](#)).

Ideally, the new toothed belt can be threaded in, without dismantling the roller and toothed belt pulley module first.

The toothed belt is ordered from the online spare parts catalogue using the appropriate part number (depending on the size and version of the product) or it is ordered by the metre (5 m roll) (→ www.festo.com/spareparts).



Note

Do not bend or fold the toothed belt, as this can result in damage to the tensile members and shorten its service life by cracking it. Note the minimum bending radius for assembly and storage:

Type	Toothed belt material	Minimum bending radius R_{min}
EGC-HD-125	Neoprene NP	16 mm
EGC-HD-160	Neoprene NP	34 mm
EGC-HD-220	Neoprene NP	34 mm
EGC-HD-125-...-PU2	Polyurethane PU2, coated	60 mm
EGC-HD-160-...-PU2	Polyurethane PU2, coated	80 mm
EGC-HD-220-...-PU2	Polyurethane PU2, coated	130 mm

Ordering a precise fitting toothed belt:

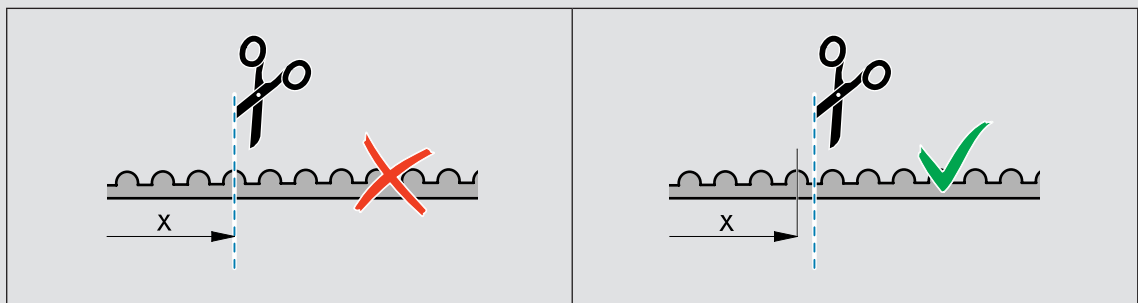
The part number of the toothed belt axis is a module number and is dependent on the size of the product. When ordering the toothed belt, in addition to the part number, the stroke and stroke reserve of the product must also be stated. The necessary information is given in the order code in the product labelling (→ [Chapter 2.4 on page 11](#)).

Cutting the toothed belt to size if ordered by the metre



Note

- Use sturdy general-purpose scissors or metal shears to cut through the toothed belt.
- Round down the cut length (L) to an integer multiple of the pitch “C” (→ table) to ensure that the belt can always be cut to size in a gap.



The precise length of the toothed belt is calculated as follows:

L (length of toothed belt in mm) = Multiplier “A” × (stroke + 2 × stroke reserve + factor “B”)

Values for multiplier “A” and factor “B” → table

Type	Multiplier “A”, depending on the stroke		Factor “B”	Pitch “C”
EGC-HD-125	≤4800	1,994	263	3
	>4800	1,992		
EGC-HD-125-...-PU2	all strokes	2,0	335.5	5
EGC-HD-160	all strokes	1,996		
EGC-HD-160-...-PU2		2,0	470	8
EGC-HD-220	≤1500	1,996		
	>1500	1,994		
EGC-HD-220-...-PU2	all strokes	2,0		

Example: EGC - HD - **220** - **485** - TB - **50H** - GK

↓
Size

↓
Stroke

↓
Stroke reserve

L (length of toothed belt in mm) = Multiplier “A” × (stroke + 2 × stroke reserve + factor “B”)

$L = 1.996 \times (485 + 2 \times 50 + 470) \text{ mm}$

$L = 2105.78 \text{ mm}$

rounded down to an integer multiple of the pitch “C” (in this example: 8)

$L = 2104 \text{ mm}$

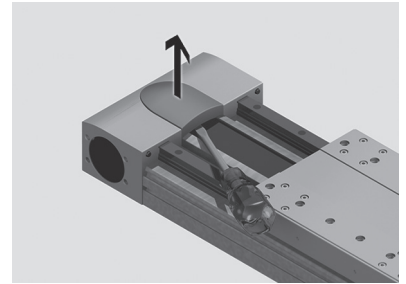
5.1.1 Removing and installing the toothed belt



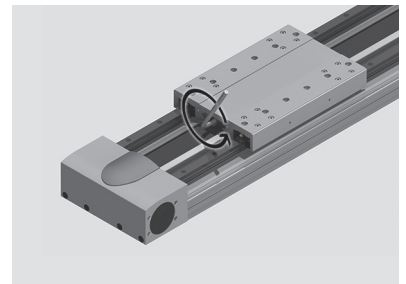
This description presupposes that the toothed belt is not torn or that the tear is located in the visible area. If the location of the tear is in the drive covers or the cylinder barrel, then the drive covers must be removed ([→ Chapter 5.2.1 on page 28](#)).

Do not pull the old toothed belt out of the axis before you have joined it with the new toothed belt. Otherwise the actuator end caps must be removed.

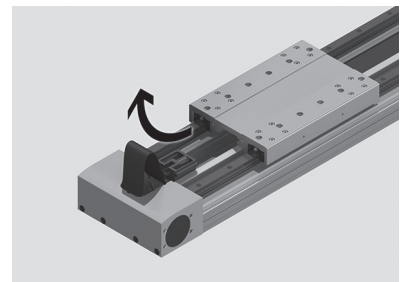
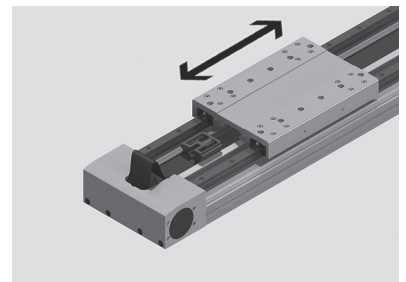
1. Place the toothed belt axis on the work surface as shown, with the slide unit facing upwards.
2. Lever off the cover caps at both ends from the actuator end caps.
3. Unscrew the socket head screw in the clamping components.



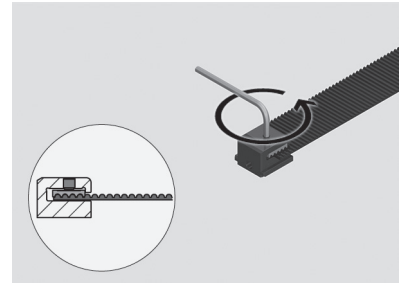
4. Push the slide to the left and right so you can pull the clamping components out of the slide.



5. Push both clamping components out of the cylinder barrel through the cut-out in the actuator end caps.

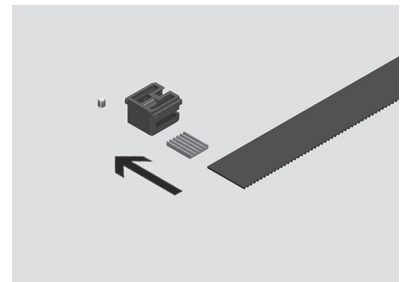


6. Unscrew the threaded pins in the clamping components at both ends of the toothed belt.



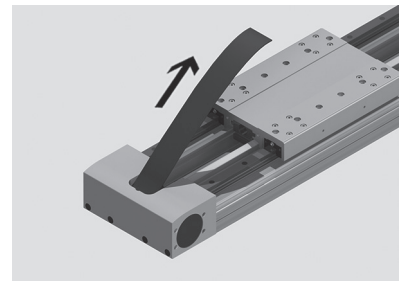
Take care to ensure that the clamping plate in the clamping component does not fall out.

7. Pull the clamping components sideways off the toothed belt.
8. Remove the clamping plate from the toothed belt.



Do not pull the old toothed belt out of the axis before you have joined it with the new toothed belt. Otherwise the actuator end caps must be removed.

9. Use adhesive tape to join the old and new toothed belts at one end.
10. Pull the old toothed belt carefully out of the axis until the new toothed belt is pulled through the axis.
11. Separate the old toothed belt from the new one.



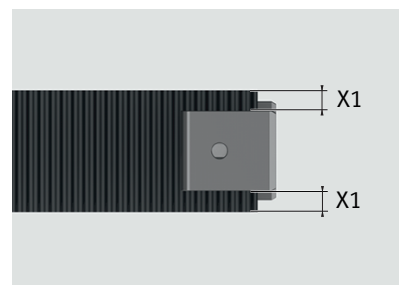
12. Place the clamping plate on the left end of the new toothed belt.



Note

The clamping plate must be positioned axially with the middle of the toothed belt to prevent damage to the toothed belt during operation.

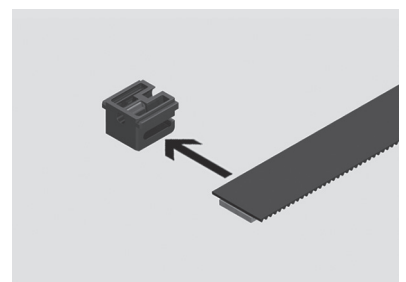
13. Align the clamping plate axially with the middle of the toothed belt.



Note

The threads of the clamping components must be recut before the threaded pins are screwed in. Residues of the old locking agent in the thread result in non-uniform and increased tightening torques of threaded pins, and correct tightening is thus not ensured.

14. Insert the left-hand end of the toothed belt together with the clamping plate into the clamping body.
15. Align the toothed belt axially with the middle of the clamping body.

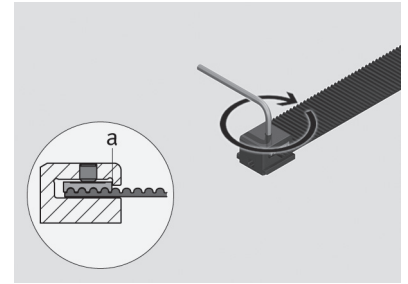


16. Wet the threaded pin with threadlocker and screw it into the clamping components.
17. Push the clamping plate against the stop (a) on the clamping component.



Note

The clamping plate must make contact with the stop, otherwise the toothed belt pretension will diminish during operation.



18. Tighten the threaded pin to the appropriate tightening torque (→ table).



Note

The tightening torques must always be observed. Excessive tightening torques will bend the clamping component.

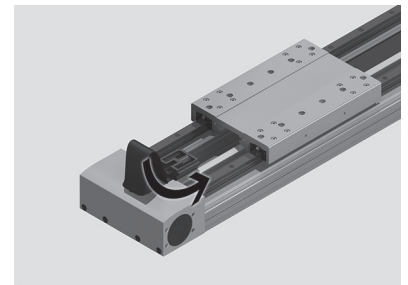
Type	Tightening torque
EGC-HD-125	0.5 Nm
EGC-HD-160	4.0 Nm
EGC-HD-220	5.0 Nm



Note

Do not bend or fold the toothed belt, as this can result in damage to the tensile members and shorten its service life by cracking it.

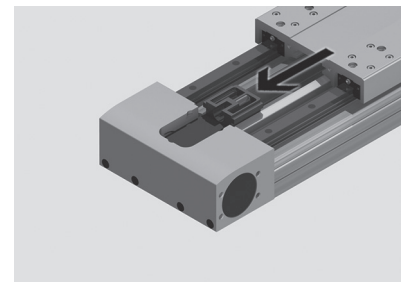
Note the minimum bending radius for assembly and storage (→ [Chapter 5.1 on page 19](#)).



19. Insert the clamping component into the groove in the cylinder barrel through the cut-out in the actuator end cap.

20. Pull on the other end of the toothed belt to push the clamping component at the left end of the cylinder barrel.

21. Repeat the described steps at the other end of the axis to insert the second clamping component.



22. Push the clamping components into the guide in the slide unit.

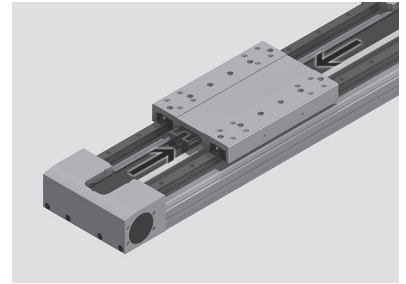


Note

The clamping effect can damage the thread profile of the adjusting screw. As such, the use of new adjusting screws for assembly is recommended.

The use of the threaded inserts with SCREWLOCK® and the dynamic load on the adjusting screw call for the use of only original spare parts from Festo with the appropriate strength class. Otherwise the screws can break prematurely.

The clamping components must not touch the slide when they are being screwed in as otherwise the toothed belt could become overstretched and the service life of the toothed belt would be reduced. Slowly increase the toothed belt pretension up to the correct value.



Note

Overstretching the toothed belt shortens its service life. Slowly increase the toothed belt pretension up to the correct value.

If the toothed belt is cut to the correct length, the clamping components should be at least flush with the cut-out in the slide.

If the clamping components protrude beyond this point, the socket head screws will not reach the minimum screw-in depth and could be torn out.

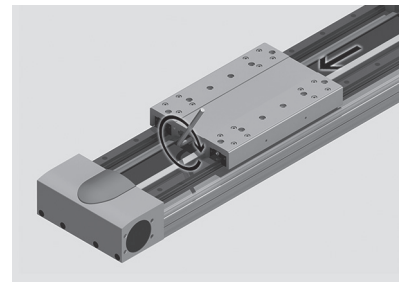
23. Screw the socket head screws uniformly through the clamping components and into the slide.

24. Pretension the toothed belt by uniformly tightening the socket head screws by feel.



If the toothed belt is cut to the correct length, the clamping components should lie flush with the slide unit.

If the clamping components protrude, the socket head screws will not reach the minimum length of engagement and could be pulled out.



5.1.2

General information on the toothed belt pretension

A pulse is applied to the toothed belt to make it oscillate. The resulting natural frequency of the toothed belt is recorded using a measuring device and displayed as a frequency value in hertz.



Note

Correct toothed belt pretension is essential for the service life of the toothed belt as well as the positioning accuracy and operating performance of the toothed belt axis. The toothed belt pretension must therefore be checked extremely carefully.

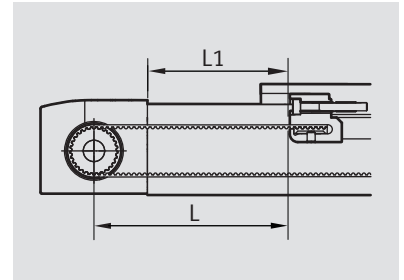


A conventional method for measuring the toothed belt pretension using the deflection force is too inaccurate, and therefore cannot be used. Accurate results are achieved by measuring the oscillation frequency. The natural frequency of a belt is based on its tension (strand force), mass and strand length.

The strand length is the oscillating length of the belt.

Since the freely oscillating strand length (L) cannot be measured directly, the distance from the clamping component to one of the actuator end caps (L1) is set as an alternative by moving the slide.

The toothed belt pretension is thus determined by measuring the fundamental component (natural frequency) of the toothed belt with a fixed and freely oscillating strand length (L).



The frequency value is calculated using the specified values for strand force (pretension force), belt mass and length of the free belt strand according to the following formula:

$$f = \sqrt{\frac{F_v}{4 \times m \times L^2}}$$

f Natural frequency of the freely oscillating strand [Hz]
 L Freely oscillating strand length [m]
 F_v Pretension force [N]
 m Weight per metre of the toothed belt [kg / m]

The frequency that needs to be set can be calculated using the data from the following table:

Type	Weight per metre m	Freely oscillating strand length L	Pretension force F _v
EGC-HD-125	0,072 kg / m	30 mm + L1	461 – 476 N
EGC-HD-125-...-PU2	0,0897 kg / m	30 mm + L1	461 – 477 N
EGC-HD-160	0,15 kg / m	48 mm + L1	1020 – 1054 N
EGC-HD-160-...-PU2	0,1917 kg / m	48 mm + L1	1022 – 1060 N
EGC-HD-220	0,273 kg / m	65 mm + L1	1820 – 1884 N
EGC-HD-220-...-PU2	0,415 kg / m	65 mm + L1	1848 – 1928 N

Alternative values for toothed belt axes with very short strokes:

Type	Weight per metre m	Freely oscillating strand length L	Pretension force F _v
EGC-HD-125	0,072 kg / m	30 mm + L1	460 – 476 N
EGC-HD-125-...-PU2	0,0897 kg / m	30 mm + L1	461 – 473 N
EGC-HD-160	0,15 kg / m	48 mm + L1	1021 – 1051 N
EGC-HD-160-...-PU2	0,1917 kg / m	48 mm + L1	1019 – 1052 N
EGC-HD-220	0,273 kg / m	65 mm + L1	1830 – 1892 N
EGC-HD-220-...-PU2	0,415 kg / m	65 mm + L1	1834 – 1910 N

Note on measurement using the acoustic frequency measuring device:

If the toothed belt is excited by means of a force pulse, the strand oscillates with its natural frequency; this decays more or less quickly depending on damping.

The frequency measuring device measures the natural frequency generated (transverse oscillation) using the acoustic operating principle. In addition to the fundamental frequency (natural frequency), harmonics can also occur. From experience it is always the 1st harmonic. In other words, a further node is generated and therefore, in addition to the fundamental frequency, values that are twice the natural frequency can also be measured.

For this reason, several measurements should always be taken in order to differentiate between the necessary fundamental (natural frequency) and the harmonic. Only this frequency can be used to conclude the force acting in the strand.

5.1.3 Checking the toothed belt pretension



Before the toothed belt pretension can be measured, the slide must be moved back and forth a number of times so that the toothed belt can fully settle and differences in tension can be compensated.



The easiest way to check the toothed belt pretension is using a test device (→ [Chapter 7.3 on page 41](#)).

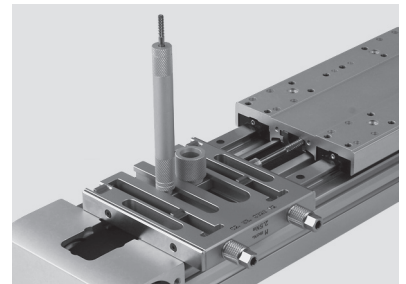
Measuring the toothed belt pretension using a test device



The distance between the actuator end cap and clamping component does not need to be set if the toothed belt pre-tensioning is measured using a test device (→ [Chapter 7.3 on page 41](#)). The correct strand length is achieved using the supplied spacers.



The exact procedure for checking the toothed belt pretension can be found in the operating instructions "Test device for toothed belt pretension TB-TE-EQ12" (→ [TB-TE-EQ12_en.pdf](#)).

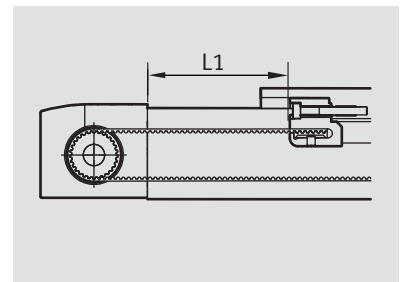


Measuring the toothed belt pretension without a test device

1. Set the distance L1 between the drive cover and clamping component (→ table).

Type	Distance L1
EGC-HD-125	290 mm / 50 mm ¹⁾
EGC-HD-160	290 mm / 50 mm ¹⁾
EGC-HD-220	290 mm / 50 mm ¹⁾

¹⁾ Alternatives for toothed belt axes with very short strokes.



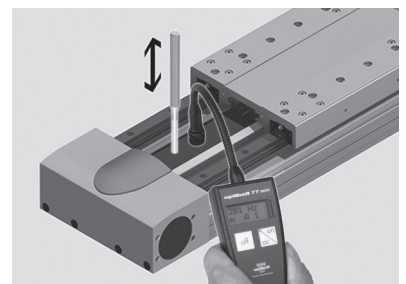
The larger strand length should be set if possible. A longer, freely oscillating strand length reduces variation in the measurement results.

2. Align the acoustic frequency meter centrally on the toothed belt as described in the accompanying operating instructions.
3. Make the toothed belt oscillate by striking it with a thin, heavy object, such as an Allen key or punch.



Several measurements should be taken to compensate for measurement tolerances.

The belt must be able to oscillate freely.



Example representation

4. Compare the measurements with the specified values (→ table).

For normal strokes

Type	Minimum frequency (f)	Maximum frequency (f)
EGC-HD-125	125 Hz	127 Hz
EGC-HD-125-...-PU2	112 Hz	114 Hz
EGC-HD-160	122 Hz	124 Hz
EGC-HD-160-...-PU2	108 Hz	110 Hz
EGC-HD-220	115 Hz	117 Hz
EGC-HD-220-...-PU2	94 Hz	96 Hz

For short strokes

Type	Minimum frequency (f)	Maximum frequency (f)
EGC-HD-125	500 Hz	508 Hz
EGC-HD-125-...-PU2	448 Hz	454 Hz
EGC-HD-160	421 Hz	427 Hz
EGC-HD-160-...-PU2	372 Hz	378 Hz
EGC-HD-220	356 Hz	362 Hz
EGC-HD-220-...-PU2	289 Hz	295 Hz

5.1.4 Setting the toothed belt pretension



Note

The pretension of the toothed belt is not an indicator of wear!

The values specified here are relate to a new toothed belt.

The toothed belt is set to the specified value in the factory, and is thus maintenance-free for its entire service life.

The pretension of the toothed belt reduces due to storage time and operation. This is not an indication of wear; it is a normal process that must not be changed by retensioning the toothed belt.

The toothed belt pretension may therefore only be set after renewing the toothed belt.



The socket head screws must be screwed in at least far enough that the clamping components are flush with the cut-outs in the slide.

If both clamping components are touching the inside of the slide but the measured frequency is still below the set-point frequency, the toothed belt must be shortened by one tooth on one side. This process must be repeated until the setpoint frequency can be set.

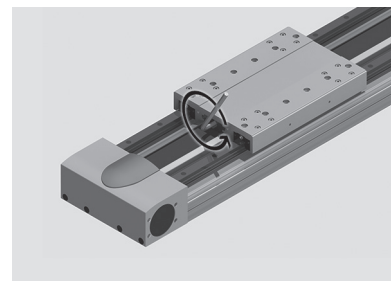
If the measured natural frequency of the toothed belt is outside the specified range, the toothed belt pretension must be adjusted as follows.

1. Adjust the toothed belt pretension by turning the socket head screws.
2. Before you measure the toothed belt pretension again, the slide must be moved back and forth a number of times so that the toothed belt can fully settle and differences in tension are compensated.



Turning the socket head screw clockwise increases the tension of the toothed belt, and thus its oscillation frequency.

Turning the socket head screw anticlockwise decreases the tension of the toothed belt, and thus its oscillation frequency.



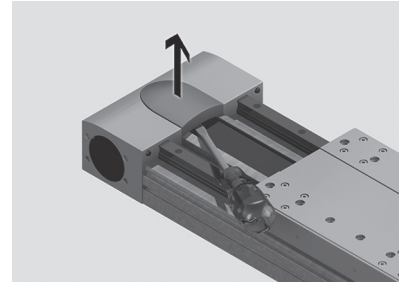
5.2 Dismantling the toothed belt axis

The toothed belt axis EGC-HD-...-TB comprises the following modules:

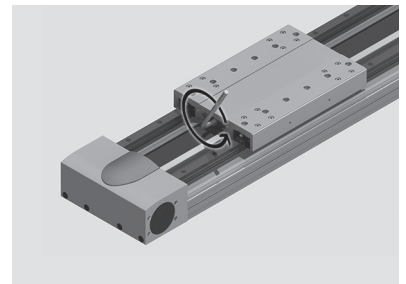
- Cylinder barrel with slide with recirculating ball bearings on two guide rails, driven via clamping components on the toothed belt.
- Two actuator end caps with toothed-belt pulley and drive.

5.2.1 Removing the actuator end caps

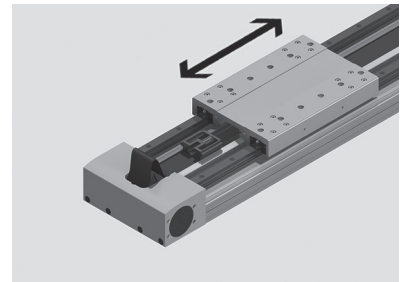
1. Place the toothed belt axis on the work surface as shown, with the slide unit facing upwards.
2. Lever off the cover caps at both ends from the actuator end caps.



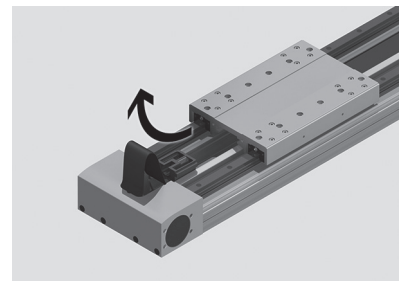
3. Unscrew the socket head screw in the clamping components.



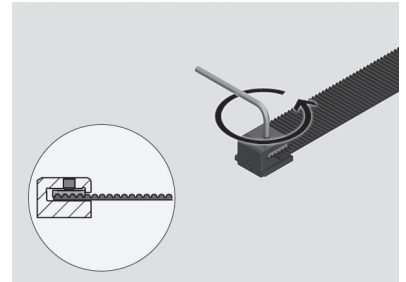
4. Move the slide to the left and right so you can pull the clamping components out of the slide.



5. Push both clamping components out of the cylinder barrel through the cut-out in the actuator end caps.

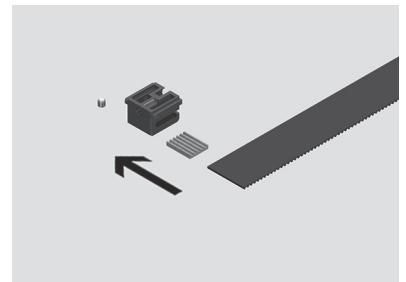


6. Unscrew the threaded pins in the clamping components at both ends of the toothed belt.

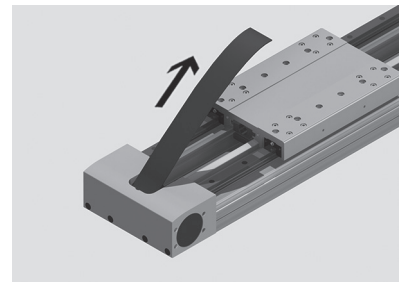


Take care to ensure that the clamping plate in the clamping component does not fall out.

7. Pull the clamping components sideways off the toothed belt.
8. Remove the clamping plates from the toothed belt.

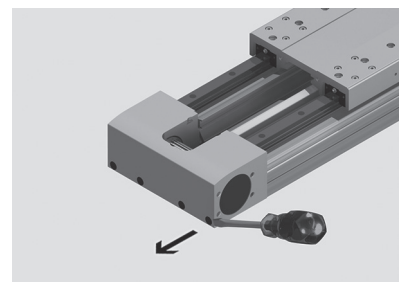


9. Carefully pull the toothed belt out of the axis.

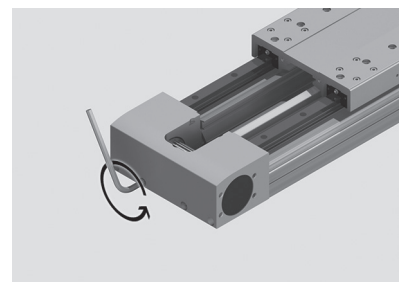


EGC- HD-160 only

- Lever out the socket head screw cover caps.



10. Unscrew the socket head screws in the actuator end cap.

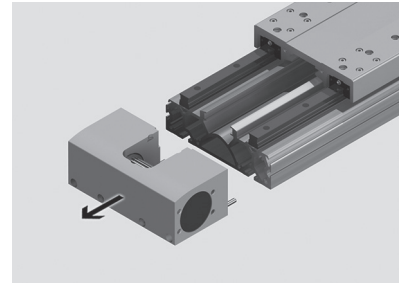




11. Pull the actuator end caps off the cylinder barrel.

The actuator end caps are connected to the cylinder barrel by spring pins. A certain amount of force is required to pull it off.

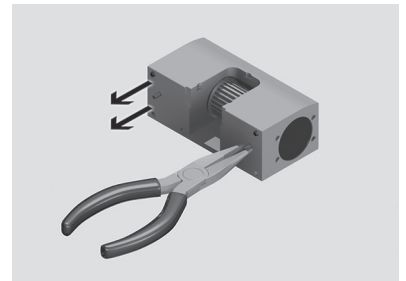
12. Repeat the steps on the other end of the axis to remove the second actuator end cap.



5.2.2 Repairing the actuator end caps

Spring pins and elastomer buffers

The spring pins and elastomer buffers are inserted into the actuator end caps. However, the spring pins may also be located in the cylinder barrel after dismantling the actuator end caps. To carry out an exchange, pull the parts out using pliers and replace them.

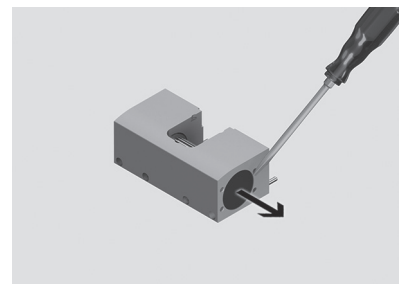


Toothed belt pulley module

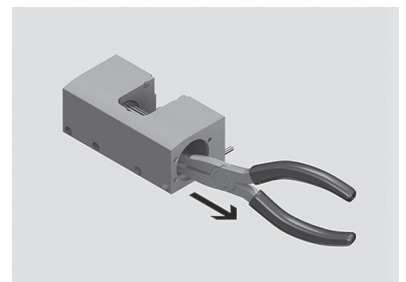
The toothed belt pulley module sits with clearance fit of the actuator end cap with two pressed-on deep-groove ball bearings, and is clamped axially by a retaining ring.

Removing the toothed belt pulley module

1. Lever the sealing discs out of the actuator end cap.



2. Remove the left and right retaining rings.

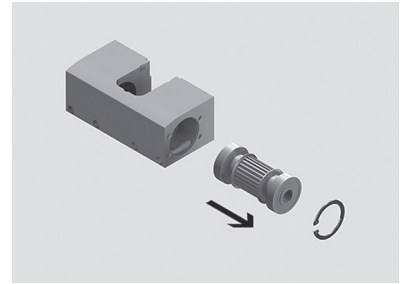


3. Remove the toothed belt pulley module with the two deep-groove ball bearings from the actuator end cap.



It is not necessary to pull off the deep-groove ball bearings, as the spare part includes both bearings and the shaft.

4. Check that the deep-groove ball bearings are seated securely on the toothed belt pulley module. If a bearing is not seated securely, the entire module will need to be replaced.



Installing the toothed belt pulley module

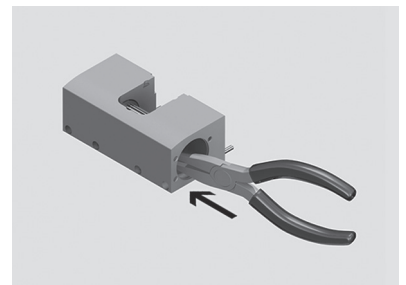
5. Apply a light coating of grease to the outside of the deep-groove ball bearings.
6. Push the deep-groove ball bearings into the actuator end cap.



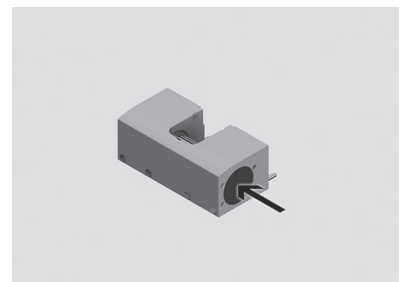
7. Insert the left and right retaining rings.



Check that both retaining rings are positioned correctly.



8. Press the sealing discs into the actuator end cap to provide extra protection from contamination.



5.3

Linear recirculating ball bearing guide system

The linear recirculating ball bearing guide system consists of a guide rail and the associated four rows of recirculating ball bearing units (roller carriages) with caged ball guide. The guiding system is set based on the ball bearing size with the preload class V1 and cannot be changed subsequently.

If there is a fault in the guide rails, please contact Festo.



Festo recommends, as a basic principle, that you always replace the entire drive if a defect occurs in the linear recirculating ball bearing guide system.

Replacement of the roller carriages is undertaken by users at their own risk.

Replacement of the toothed belt axis may be necessary under the following circumstances, for example:

The end of the linear recirculating ball bearing guide system's useful life has been reached as a result of material fatigue

and wear. Signs of fatigue appear on the areas of material that are rolled over. If the roller bodies have fine cracks, pores and pits (depending on the level of wear) or show signs of deformation. Pitting on the bearing surface of the guide rail can be observed visually, as the bearing surface is noticeably uneven. This can result in perceptible bearing clearance, impaired roll-off and increased operating noise, etc.



The application must be checked for the following causes in the event of premature failure due to increased wear:

- Poor lubrication; lubrication intervals not adhered to (unlubricated operation).
- Use of a lubricating grease not contained in the specification.
- Dirty and corrosive ambient conditions (dust, etc.).
- Impact and vibration.
- Technical limit data exceeded (torques, forces, speed, temperature range, etc.).
- Flatness of the attachments screwed onto the slide, setpoint value <0.01 mm (distortion).
- When using parallel axes, the following must be checked:
 - Parallelism of the guide rails with one another
 - Height misalignment between the slides

Deviations can lead to tension in the recirculating ball bearing guide, thus overloading the guiding system. It is not possible to evaluate the parallelism and vertical offset using the displacement force. The alignment should be performed based on measurement. If needed, use additional adjusting devices to align the axes of the linear drives with one another.



Note

Incorrect set values of the braking ramp for STOP statuses (e.g. EMERGENCY OFF, quick stop) result in overloading of the toothed belt axis and can irreparably damage it or reduce its service life drastically.

- Check the settings for all braking ramps in your controller or the higher-order control system (deceleration values and jerk).
- Make sure that the deceleration values (braking deceleration, deceleration times) for the speed, the load to be moved and the installation position (horizontal/vertical) as well as the specified maximum drive torque or the feed force correspond to the permissible values for the toothed belt axis used.
- Use the Festo "Positioning Drives" design software, available via the Festo website (→ www.festo.com), to design the toothed belt axis.



Block-shaped acceleration profiles (without jerk limitation) cause high peaks in the drive force that can lead to overloading of the drive. Positions outside of the permissible range can also occur.

An acceleration specification with jerk limitation reduces vibrations in the entire system and has a positive effect on the stresses in the mechanical system.

- Check which closed-loop controller settings can be adapted (e.g. jerk limitation, smoothing of the acceleration profile).

5.3.1 Renewing the roller carriages



Festo recommends, as a basic principle, that you always replace the entire drive if a defect occurs in the linear recirculating ball bearing guide system.

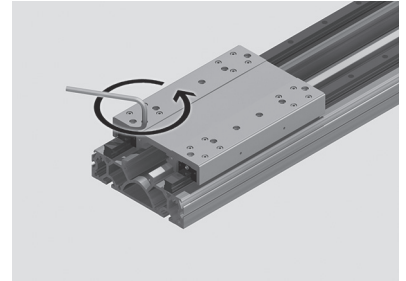
Replacement of the roller carriages is undertaken by users at their own risk.



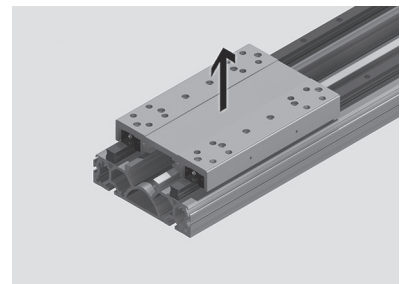
Before replacing the roller carriages, check the guide rail for wear and damage. Defective or worn guide rails **cannot** be replaced. It is the responsibility of the user to assess the wear and damage to the guide rail.

A drive cover must be removed in order to renew the roller carriages (→ [Chapter 5.2.1 on page 28](#)).

1. Unscrew the socket head screws in the slide.

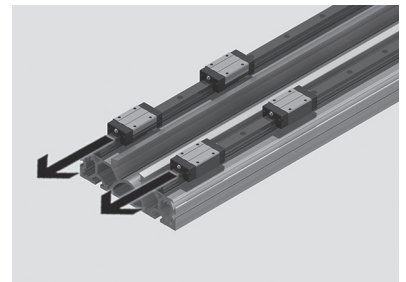


2. Lift the slide off the four roller carriages.



The recirculating ball bearing guide system is pretensioned. Individual bearings can therefore easily fall out and get lost when pushing the roller carriage from the guide rail. Only separate the roller carriages from the guide rail when replacing them.

3. Carefully push the roller carriages off the guide rail.



Pay attention to the installation position when positioning the new roller carriages. The slotted side of the roller carriage should face the opposite roller carriage.



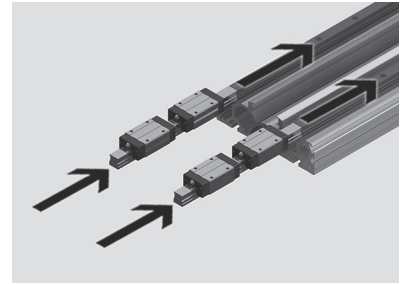
Note

New roller carriages must be greased before commissioning the toothed belt axis (→ [Chapter 6.2 on page 39](#)). Non-compliance can lead to unlubricated operation, and thus failure of the toothed belt axis before the next specified lubrication.

4. Position the transport rail with the new roller carriages directly on the guide rail of the toothed belt axis.
5. Slowly push the new roller carriages onto the guide rail, ensuring that no ball bearings fall out of the roller carriages.



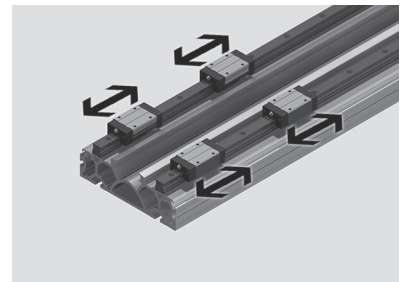
Balls that have come out of the roller carriages must be replaced in the corresponding bearing.



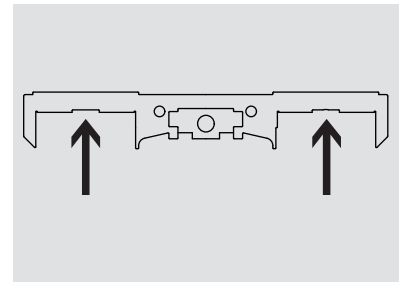
6. Check the guide backlash and the displacement resistance by moving the roller carriages several times.
The roller carriages must move along the guide rail smoothly and without jerking.
There must be **no** guide backlash.



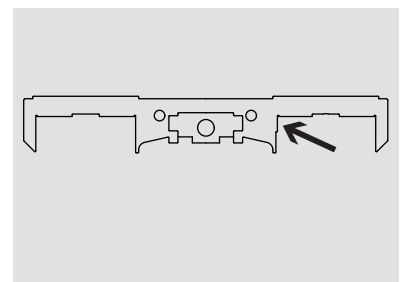
The backlash of the roller carriages is not adjustable. If the operating behaviour is not correct, check the guide rail and replace the entire toothed belt axis if necessary.



The mounting surfaces of the slide for the roller carriages must not show any surface defects such as burr, chips, blemishes etc. and no residue from screw locking agents.



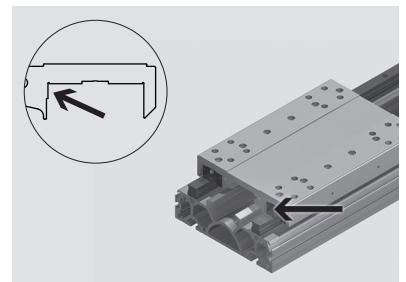
The milled contact surface of the slide for the roller carriages must not show any surface defects such as burrs, chips, blemishes etc. and no residue from screw locking agents.



7. Place the slide on the roller carriages with the slide's contact surface against the inward-facing, slotted surfaces of the two roller carriages.

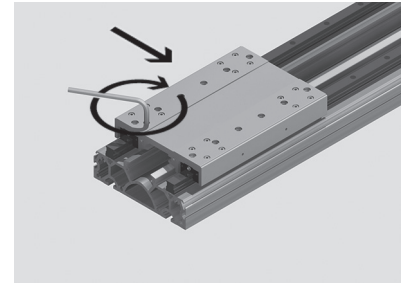


The contact surface of the slide must be touching the two roller carriages that run on the guide rail closest to the Festo logo.



8. Wet the socket head screws with threadlocker.
9. Screw the socket head screws through the slide and into the roller carriages.
10. Press the contact surface of the slide in the direction of the arrow against the slotted surface of the roller carriages.
11. Tighten the socket head screws slightly and evenly.
12. Tighten the socket head screws to the appropriate torque (→ table).

Type	Tightening torque
EGC-HD-125	2.5 Nm
EGC-HD-160	5 Nm
EGC-HD-220	18 Nm



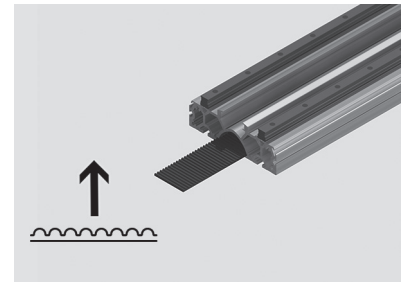
5.4 Assembling the toothed belt axis

5.4.1 Preparing the cylinder barrel

- Clean the cylinder barrel with compressed air and a soft cloth.

5.4.2 Installing the actuator end caps

1. Guide the toothed belt through the toothed belt guide in the cylinder barrel as shown. The toothed profile must be facing upwards.

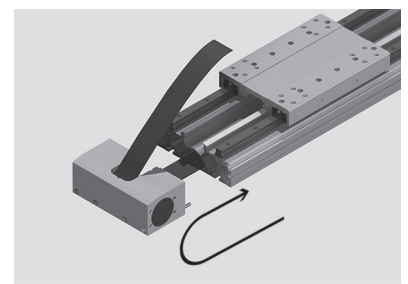


Note

Do not bend or fold the toothed belt, as this can result in damage to the tensile members and shorten its service life by cracking it.

Note the minimum bending radius for assembly and storage (→ [Chapter 5.1 on page 19](#)).

2. Guide the left end of the toothed belt through the prepared actuator end cap for the left-hand side as shown.



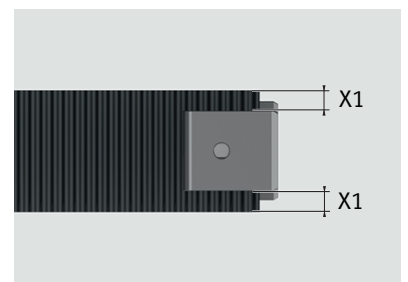
3. Place the clamping plate on the left end of the new toothed belt.



Note

The clamping plate must be positioned axially with the middle of the toothed belt to prevent damage to the toothed belt during operation.

4. Align the clamping plate axially with the middle of the toothed belt.

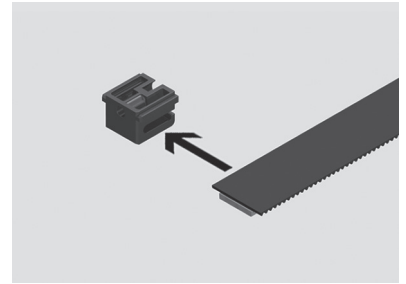




Note

The threads of the clamping components must be recut before the threaded pins are screwed in. Residues of the old locking agent in the thread result in non-uniform and increased tightening torques of threaded pins, and correct tightening is thus not ensured.

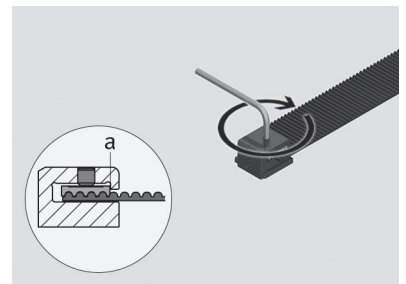
5. Insert the left-hand end of the toothed belt together with the clamping plate into the clamping body.
6. Align the toothed belt axially with the middle of the clamping body.
7. Wet the threaded pin with locking agent.
8. Screw the threaded pin into the clamping component.
9. Push the clamping plate against the stop (a) on the clamping body.



Note

The clamping plate must make contact with the stop, otherwise the toothed belt pretension will diminish during operation.

10. Tighten the threaded pin using the appropriate torque (→ table).



Note

It is critical that the tightening torques be observed. Excessive tightening torques will bend the clamping component.

Type	Tightening torque
EGC-HD-125	0.5 Nm
EGC-HD-160	4.0 Nm
EGC-HD-220	5.0 Nm

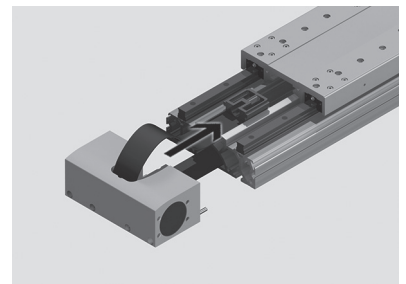


Note

Do not bend or fold the toothed belt, as this can result in damage to the tensile members and shorten its service life by cracking it.

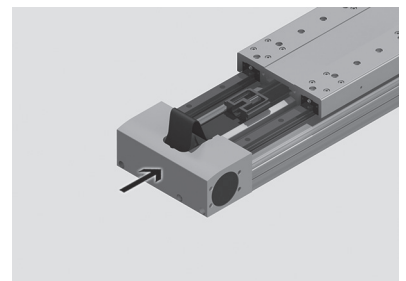
Note the minimum bending radius for assembly and storage (→ [Chapter 5.1 on page 19](#)).

11. Insert the clamping component into the groove in the cylinder barrel.



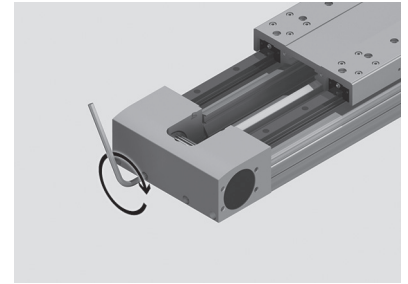
The actuator end cap is centred by means of two spring pins. A certain amount of force may need to be applied for assembly.

12. Place the left actuator end cap on the cylinder barrel.



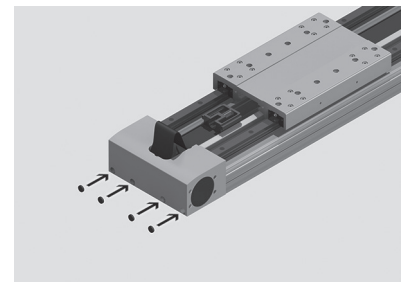
13. Wet the socket head screws with threadlocker.
14. Screw the socket head screws into the cylinder barrel through the actuator end cap.
15. Tighten the socket head screws to the appropriate torque (→ table).

Type	Tightening torque
EGC-HD-125	2.5 Nm
EGC-HD-160	5.0 Nm
EGC-HD-220	11.0 Nm

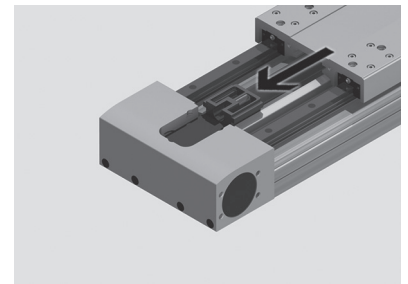


EGC- HD-160 only

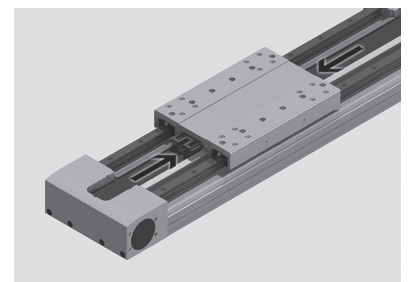
- Insert the socket head screw cover caps.



16. Pull on the other end of the toothed belt to move the clamping component to the left end of the cylinder barrel.
17. Repeat the steps on the other end of the axis to install the second actuator end cap.



18. Push the clamping components into the guide in the slide unit.



Threaded inserts with SCREWLOCK® are screwed into the slides. These have an incorporated screw-clamping area that serves as a screw lock. Multiple windings have a clamping effect on the edges of the screwed-in adjusting screws for the toothed belt pretension. The result is flexible frictional locking. This prevents adjustment of the set toothed belt pretension (automatic unscrewing).



Note

The clamping effect can damage the thread profile of the adjusting screw. As such, the use of new adjusting screws for assembly is recommended.

The use of the threaded inserts with SCREWLOCK® and the dynamic load on the adjusting screw call for the use of only original spare parts from Festo with the appropriate strength class. Otherwise the screws can break prematurely.

The clamping components must not touch the slide when they are being screwed in as otherwise the toothed belt could become overstretched and the service life of the toothed belt would be reduced. Slowly increase the toothed belt pretension up to the correct value.

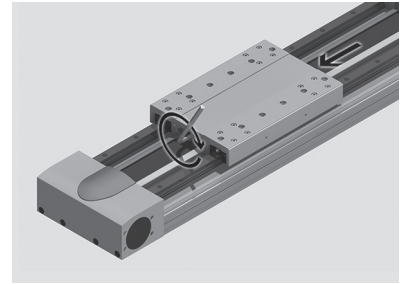
19. Screw the socket head screws evenly through the clamping components and into the slide.
20. Pretension the toothed belt by uniformly tightening the socket head screws by feel.



If the toothed belt is cut to the correct length, the clamping components should lie flush with the slide unit.

If the clamping components protrude, the socket head screws will not reach the minimum length of engagement and could be pulled out.

Adjust the toothed belt pretension as described (→ [Chapter 5.1.4 on page 27](#)).



5.5 Assembly and functional test

After completing the assembly work on the toothed belt axis, check that it function correctly.

5.5.1 No-load torque

It must be possible to move the slide unit without much resistance or jerking when it is idle without a drive attached or load connected.

This check is based on the technician's instinct and experience. It is not possible to specify precise test values.

5.5.2 Start-up

Start-up the repaired toothed belt axis as described in the operating instructions (enclosed with the toothed belt axis or available on the Festo website (→ www.festo.com)).

6 Maintenance

This chapter contains the most important technical information about the maintenance work to be carried out on the toothed belt axis. A detailed description of the steps for care and maintenance can be found in the operating instructions. Further information on the assembly aids and lubricants can be found on the Festo website (→ www.festo.com).

6.1 Cleaning and greasing the toothed belt axis

Clean the guide rail using a soft cloth and a gentle detergent if necessary.

Grease the surface of the guide rail if there is no longer any sign of lubrication.

Lubricants for assembly and maintenance of the toothed belt axis

Application	Designation
Assembly	Festo LUB-KC1 ¹⁾
Maintenance	Festo LUB-KC1 ¹⁾

¹⁾ See "Tools and repair accessories" information brochure. The brochure can be found in the online spare parts catalogue on the Festo website (→ [Tools and repair accessories.pdf](#)).

6.2 Relubricating the recirculating ball bearing guide

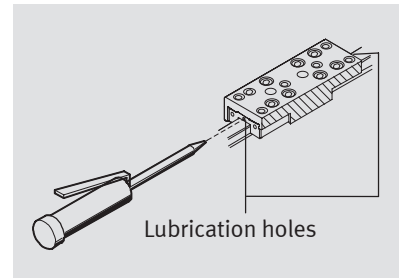
The recirculating ball bearing guide of the roller carriage must be relubricated at specific intervals (→ Note on lubrication interval).



There are two different designs of roller carriage.

The slide variants GK and GV have lubrication holes on both end faces of the slide. The lubricant must be inserted in both holes, as the two roller carriages do not have a lubricant connection.

The slide variants GP and GQ have an integrated lubricating system that ensures a continuous supply of lubricating oil for the raceways. These designs cannot be regreased.



The recirculating ball bearing guide of the roller carriage should be relubricated after a load-dependent lubrication interval S_{int} . To determine the lubrication interval, the load comparison factor f_v must be calculated using the formula for combined loads operating instructions (→ EGC-HD-TB operating instructions: www.festo.com).



Note

The lubrication interval S_{int} depends on the load acting on the product.

Load factors:

- dusty and contaminated environment
 - Nominal stroke, 2000 mm or . 300 mm
 - Speed, 2 m/s
 - Travel profile Δ triangular operation (frequent acceleration and braking)
 - Ambient temperature, 40 °C
 - Product's time in operation, 3 years
 - If one of these factors applies, halve the lubrication interval S_{int} .
 - If several factors apply at the same time, divide the lubrication interval by four.
- Introduce the lubricant via the front lubrication hole at both ends of the slide. Half the amount of grease must be applied to different carriage positions, corresponding to twice the carriage length.



Note

The slide must be moved forwards and backwards on the guide rail during relubrication so that the grease penetrates all the spaces in the roller carriages.

	EGC-HD-125	EGC-HD-160	EGC-HD-220
Quantity of grease per lubrication hole	1 g	0,6 g	1,5 g



Festo offers a one-hand, high-pressure grease gun with suitable pointed nozzle for lubricating the lubrication holes (→ [Chapter 7.2 on page 40](#)).

6.3 Toothed belt pretension



Note

The toothed belt pretension is set to a specified value in the factory and is thus maintenance-free for its entire lifetime. The pretension of the toothed belt reduces due to storage time and operation. This is a normal process and not an indication of wear.

Retensioning the toothed belt means increased wear and can lead to breaking of the toothed belt.

- Do not retension the toothed belt.

7 Tools

This chapter provides an overview of the tools and aids required to repair and maintain the toothed belt axis.

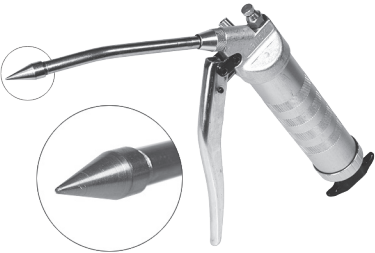

7.1 Standard tools


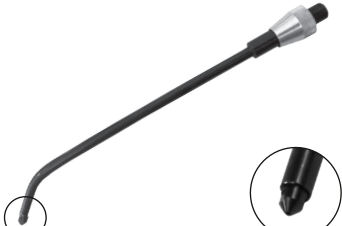
The following standard tools are required for repair and maintenance of the toothed belt axis:

- Pliers for retaining rings (inner retainer for bore)
- Allen key
- Torque wrench
- Screwdriver, flat
- Flat pliers

7.2 Special tools

The following special tools are required for repair and maintenance of the toothed belt axis:

Designation	Additional information	Festo order no.	Figure
One-hand grease gun LUB-1	Pinpoint nozzle for miniature, funnel-shaped lubrication nipples and lubricating holes	647958	
Lubrication adapter LUB-1-TR-I	Lubrication adapter (nozzle pipe Ø 6x200 axial)	647959	


Designation	Additional information	Festo order no.	Figure
Lubrication adapter LUB-1-TR-L	Lubrication adapter (nozzle pipe Ø 6x200 lateral)	647960	
Lubrication adapter LUB-1-TR-W	Lubrication adapter LUB-1-TR-W (nozzle pipe Ø 6x200, 45° angled)	8073388	

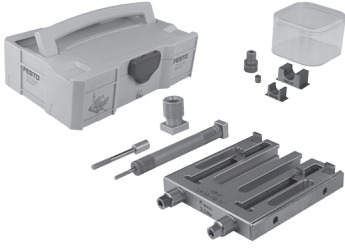


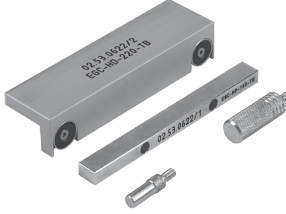


For further information on the fixtures and measuring devices, refer to the **“Tools and repair accessories”** information brochure. It can be found in the online spare parts catalogue on the Festo internet site (→ [Tools and Repair Accessories.pdf](#)).

7.3 Equipment and measuring devices

The following test devices and measuring devices can be used to check checking the toothed belt pretension:

Designation Order No.	Description	Figure
TB-TE-EQ10	<p>Content:</p> <ul style="list-style-type: none"> – Test device for checking the toothed belt pretension in the Systainer with foam insert. Suitable for the following toothed belt axes: <ul style="list-style-type: none"> – DGE-25 / 40 / 63-ZR(-KF) – DGE-25 / 40 / 63-ZR-RF – EGC-50 / 70 / 80 / 120 / 185-TB-KF – EGC-HD-125 / 160 / 220-...-TB-...(-GP) – ELGA-TB-G-70 / 80 / 120 – ELGA-TB-RF / KF-70 / 80 / 120-...(-F1) – ELGA-TB-KF-150 – DGEA-18 / 25 / 40-ZR – Acoustic frequency meter type TB-TE-EQ13. – Clamping component for DGE-25-ZR-RF – Clamping component for DGE-40-ZR-RF – Round magnet (L = 6 mm) for DGE-63 – Plastic box for small parts <p>The exact procedure for checking the toothed belt pretension can be found in the operating instructions “Test device for toothed belt pretension TB-TE-EQ12” (→ TB-TE-EQ12_en.pdf).</p>	

Designation Order No.	Description	Figure
TB-TE-EQ12	<p>Content:</p> <ul style="list-style-type: none"> – Test device for checking the toothed belt pretension in the Systainer with foam insert. Suitable for the following toothed belt axes: – DGE-25 / 40 / 63-ZR(-KF) – DGE-25 / 40 / 63-ZR-RF – EGC-50 / 70 / 80 / 120 / 185-TB-KF – EGC-HD-125 / 160 / 220-...-TB-...(-GP) – ELGA-TB-G-70 / 80 / 120 – ELGA-TB-RF / KF-70 / 80 / 120-...(-F1) – ELGA-TB-KF-150 – DGEA-18 / 25 / 40-ZR – Clamping component for DGE-25-ZR-RF – Clamping component for DGE-40-ZR-RF – Round magnet (L = 6 mm) for DGE-63 – Plastic box for small parts <p>The exact procedure for checking the toothed belt pretension can be found in the operating instructions “Test device for toothed belt pretension TB-TE-EQ12” (→ TB-TE-EQ12_en.pdf).</p>	
TB-TE-EQ13	Acoustic frequency meter for measurement with and without a test device.	
O-ring 10x1 Order No. 200926	<p>Mounts the acoustic test probe in the test device by means of clamping friction.</p> <p>Included in the scope of delivery of the frequency meter TB-TE-EQ13.</p>	
TB-TE-EQ7	<p>Mounting kit for EGC-HD-...-TB-...(-GP).</p> <p>Additionally requires the basic device of the type TB-TE-EQ2 for checking the toothed belt pretension.</p>	



For further information on the fixtures and measuring devices, refer to the **“Tools and repair accessories”** information brochure. It can be found in the online spare parts catalogue on the Festo internet site (→ [Tools and Repair Accessories.pdf](#)).



To order the equipment and measuring devices, please **contact** your **local support**.

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