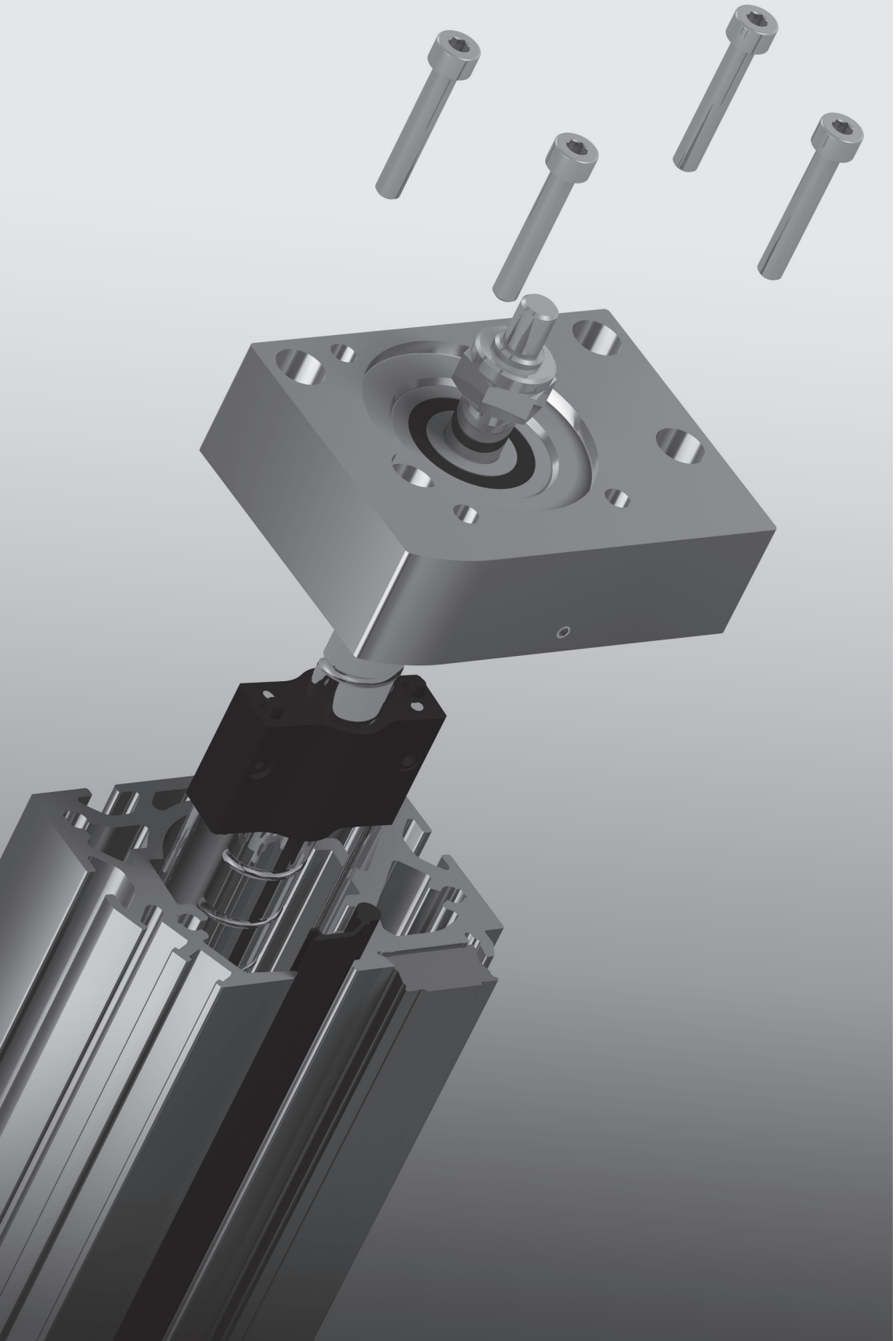
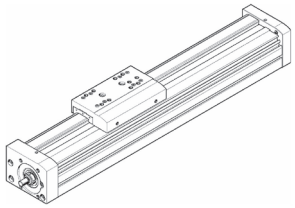
Spindle axis

EGC-...-BS-KF

FESTO

Repair instructions (en)





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Preface

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

Differences compared to the descriptions in these repair instructions may arise depending on the design and/or modification status of the spindle axis. The user must check this before carrying out the repair and take the differences into consideration if necessary.

These repair instructions have been prepared with care.

Festo SE & Co. KG does not, however, accept any 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 9 on page 34.

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

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Table of Contents

1 Important information

1.1 About these repair instructions

This document contains important information about professional repair of the spindle axis type EGC-...-BS-KF.

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.

For reasons of clarity, these repair instructions do not contain all detailed information. The following documents should therefore also be available when repairing the spindle axis:

- **Spindle axis EGC-BS-KF 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).
- **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 Symbols used in these repair instructions

Danger categories

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

Warning

Caution

Marking special information

The following symbols identify text passages which contain special information.

Note

Information

Environment

1.3 Text designations used in these repair instructions

- Indicates activities that can be carried out in any sequence.

1. Indicates activities that should be carried out in the specified sequence.

– Indicates a general list.

Underlined, blue text indicates a cross-reference or hyperlink that you can click on in the PDF.

1.4 General safety instructions

Warning

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

– The spindle axis must be de-energised, depressurised and reliably secured against unauthorised switching back on again before the maintenance and repair work begins.

Caution

The spindle axis may only be repaired by authorised and trained persons in accordance with the specifications in the technical documentation and using original spare parts.

Installation and repair 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.

Repairs must only be carried out in conjunction with these repair instructions and the respective device-specific operating instructions.

Caution

Unintended switching on can trigger unexpected movements and cause bruises.

– Ensure that the plant is protected against restarting before any modification or maintenance work or inspections are carried out. Loosened parts can make unexpected movements or fall off.

– Secure parts against accidental movements or move them into a safe end position.

Note

Carrying out repair work without the respective necessary technical documentation is dangerous, and therefore not permissible. Repairs may only be carried out in conjunction with these repair instructions and the respective operating instructions for the device, as well as the documents listed in Chapter 1.1 on page 5.

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.

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

Components and equipment replaced during repair must be disposed of in accordance with the relevant local environmental protection regulations.

1.5 Technical requirements

Note

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

- Observe the connection and ambient conditions specified in the technical data of the products and all the connected components. The product can only be operated in compliance with the relevant safety guidelines if you comply with the limit values and load limits (see enclosed documentation).
- The spindle axis gantries must be in faultless technical condition.
- The spindle axis may only be operated in its original condition and without unauthorised modifications.
- The spindle axis is designed for industrial use.

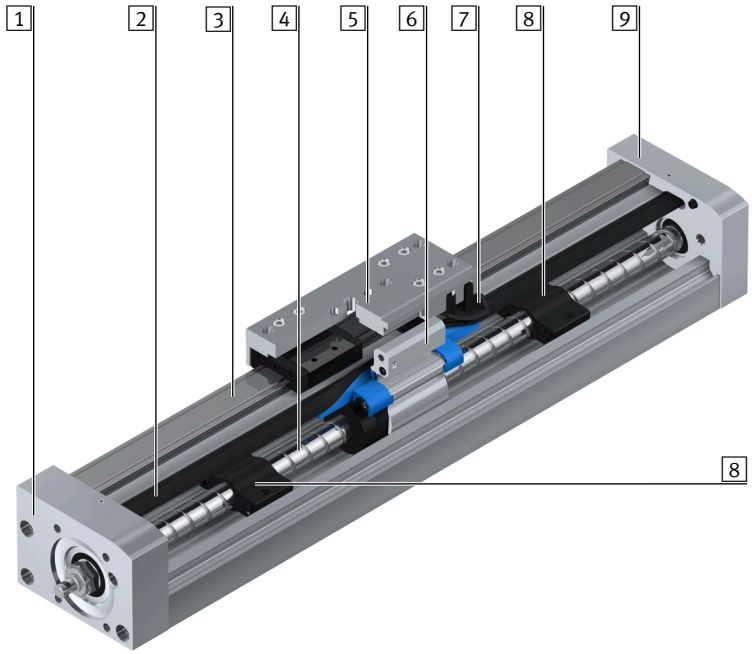
1.6 Standards and test values

Standards and test values which products comply with and fulfil can be found in the “Technical data” sections of the enclosed documentation.

2 General product description

2.1 Functional description

The EGC-...-BS-KF is a spindle axis, which is designed for movements with large forces and precise repetition accuracy. A rotating ball screw converts the rotational movement of a motor into linear motion. This causes the piston to move backwards and forwards. The mechanics of the spindle axis are not automatically locking. After the input torque is removed the slide module can move freely. The EGC-BS-KF is approved for slide and yoke operation.



1 Clevis foot
2 Cover band
3 Guide rail
4 Ball screw
5 Slide module
6 Retainer module
7 Band reverser
8 Spindle support
9 Bearing cap

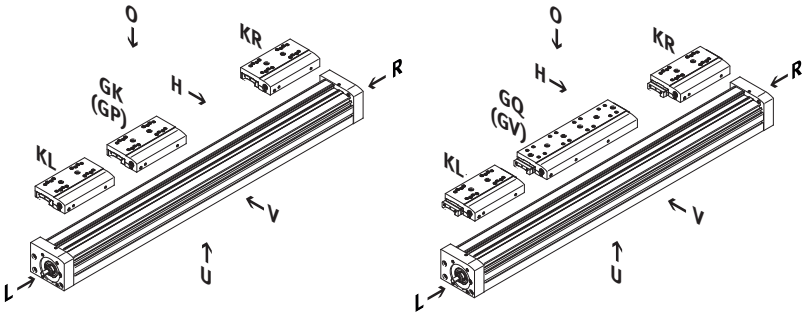
2.2 Types and part numbers

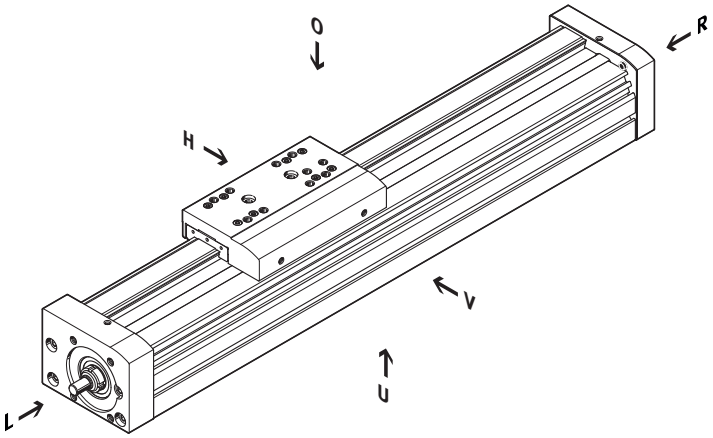
Type	Part number
EGC-70-...-BS-KF	556807
EGC-80-...-BS-KF	556808
EGC-120-...-BS-KF	556809
EGC-185-...-BS-KF	556811

The complete overview of features, accessories, type codes, technical data and dimensions of the EGC-... -BS-KF spindle axis can be found in the product catalogue or on the Festo website (➔ www.festo.com).

2.3 Slide variants and orientation definition

This illustration provides an overview of the orientation designations and slide variants of the spindle axis.





Versions:

GK = Standard slide
GV = Elongated slide
GP = Protected standard slide (not for EGC-185)
GQ = Protected elongated slide (not for EGC-185)
KL = Additional slide on left
KR = Additional slide on right

Orientation:

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

2.4 Type code

Example:

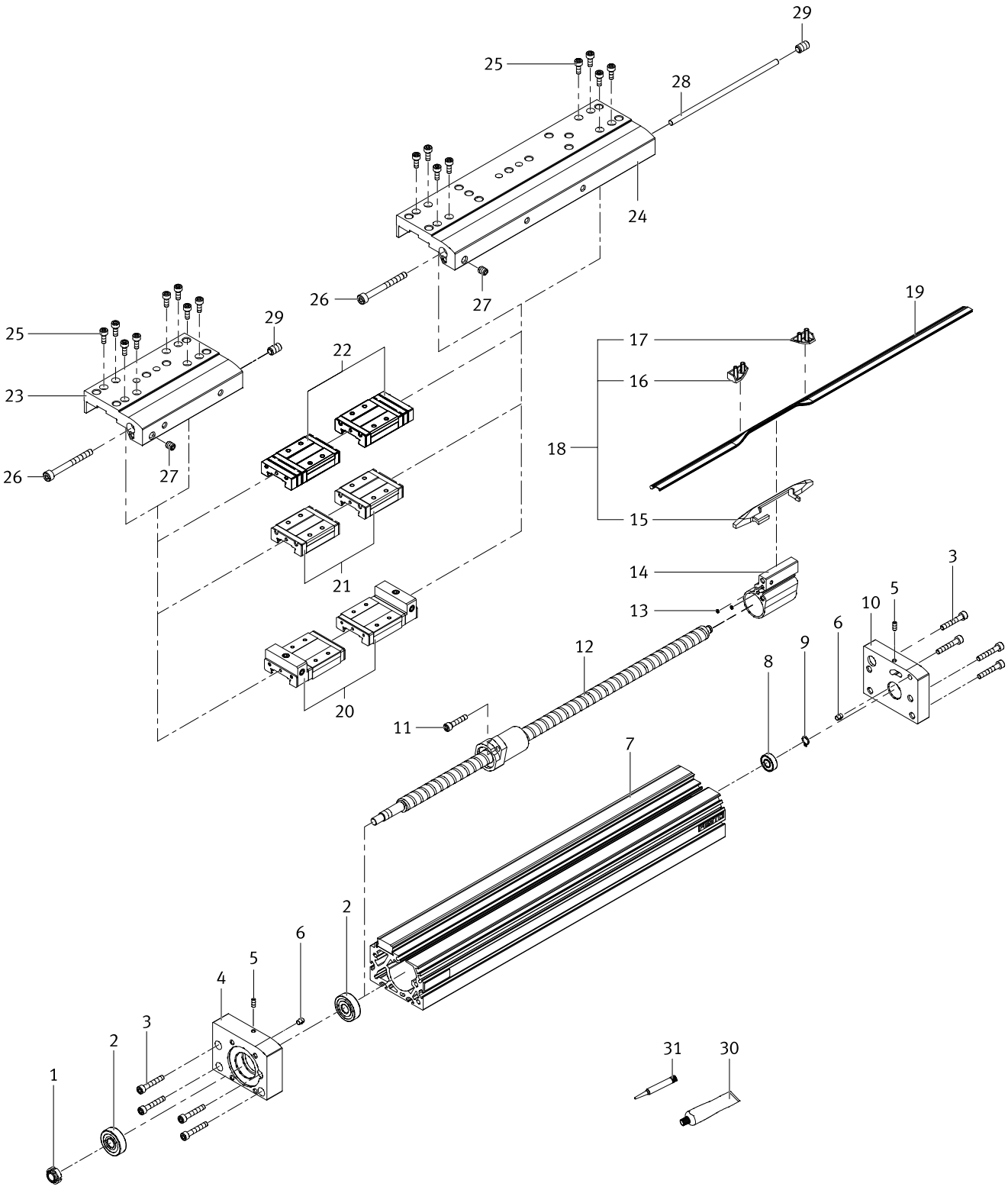
1 Type designation
2 Serial number
3 Part number

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

EGC	Electric linear axis
70	Size, axis width
90	90 mm stroke
BS	Spindle drive
10P	Spindle pitch, 10mm / spindle rotation
S	With spindle support
KF	Recirculating ball bearing guide
5H	Stroke reserve, 5 mm
ML	Motor attachment position, left
GK	Standard slide module
KL	Additional slide module, left
C	Central lubrication
M1	Displacement encoder, incremental resolution 2.5 µm
1HL	Clamping unit, single channel, left
PN	Pneumatic actuation

3 Components list

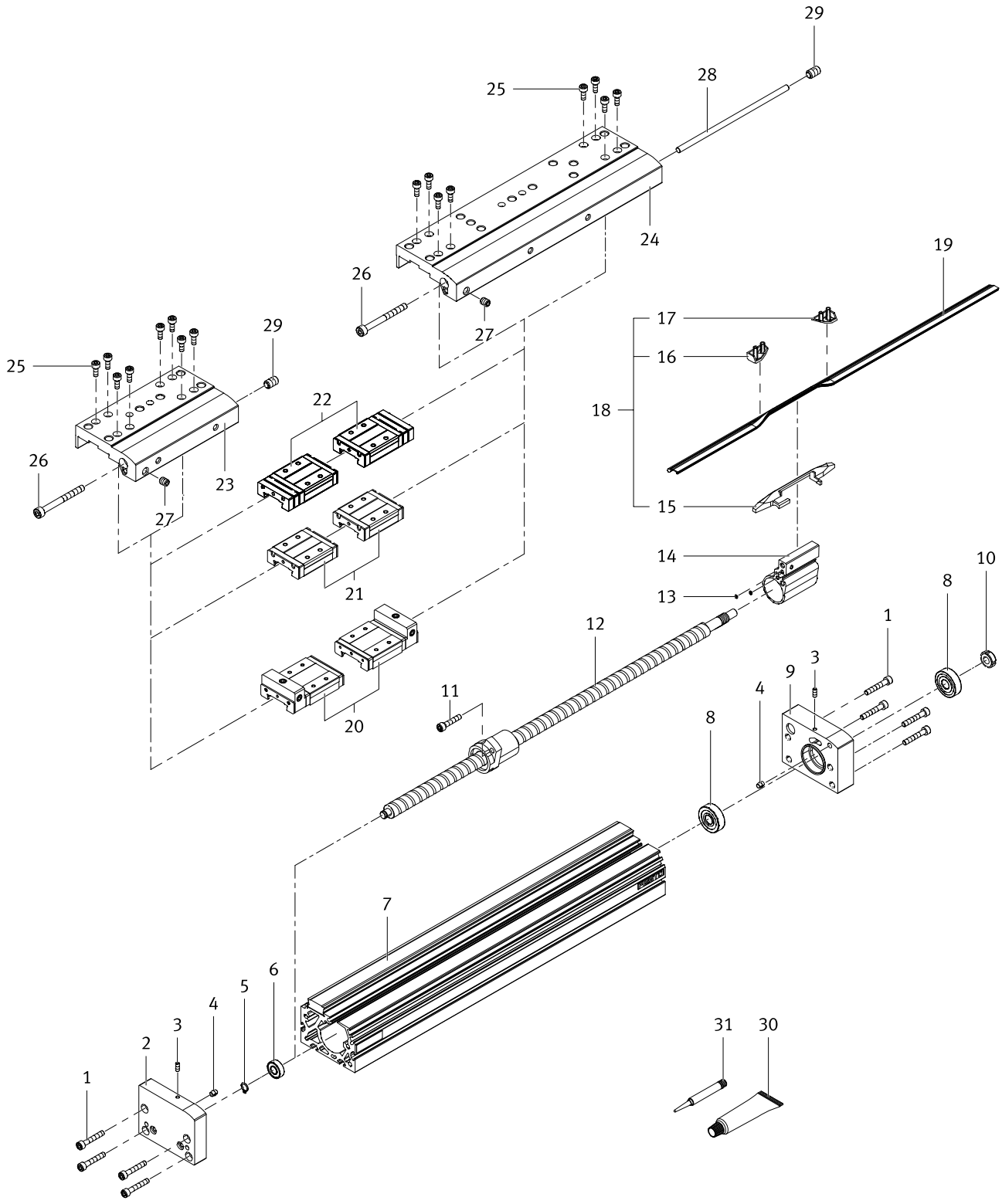
3.1 EGC-70 / 80 / 120-...-BS-KF-ML



This diagram is intended only to provide an overview of the individual components. To order spare and wearing parts, please use the online spare parts catalogue on the Festo website (➔ www.festo.com/spareparts).

Spindle axis		EGC-70-...-BS-KF-ML	EGC-80-...-BS-KF-ML	EGC-120-...-BS-KF-ML
Item	Designation	Type	Type	Type
1	Nut	DIN 985-M8×1-8	GUK 10×0,75	GUA 16×1
2	Roller bearing	DIN 625-629-2RS	DIN 628-7200-B-2RS	DIN 628-7203-B-2RS
3	Socket head screw	ISO 4762-M4X25-8.8	ISO 4762-M5X30-8.8	ISO 4762-M6X40-10.9
4	Clevis foot			
5	Grub screw	ISO 4026-M3X10-45H	ISO 4026-M4X10-45H	ISO 4026-M5X16-45H
6	Buffer			
7	Cylinder barrel module			
8	Deep-groove ball bearing	D616-698-2RS	D616-698-2RS	XF+DIN 625-6200-2RS
9	Retaining ring	DIN 471-8×0,8	DIN 471-8×0,8	DIN 471-10×1
10	Bearing cap			
11	Socket head screw	ISO 4762-M4X16-8.8	ISO 4762-M5X25-10.9	ISO 4762-M6X20-10.9
12	Ball screw			
13	O-ring	B-2×1-N-NBR70	B-2×1-N-NBR70	3×1-N-NBR70
14	Retainer module			
15	Band reverser			
16	Band reverser			
17	Band reverser			
18	Band reverser			
19	Cover band			
20	Roller carriage	for standard slide with lubrication adapter or extended slide with lubrication adapter	for standard slide with lubrication adapter or extended slide with lubrication adapter	for standard slide with lubrication adapter or extended slide with lubrication adapter
21	Roller carriage	for standard slide or extended slide	for standard slide or extended slide	for standard slide or extended slide
22	Roller carriage	**Not present**	for standard slide or extended slide protected	for standard slide or extended slide protected
23	Slide module	standard slide	standard or protected slide	standard or protected slide
24	Slide module	extended slide	extended slide or extended slide protected	extended slide or extended slide protected
25	Socket head screw	ISO 4762-M3X8-12.9	ISO 4762-M3X10-12.9	ISO 4762-M6X10-10.9
26	Socket head screw	ISO 4762-M4X40-8.8	ISO 4762-M5X45-10.9	ISO 4762-M6X80-10.9
27	Grub screw	ISO 4026-M6X6-45H	ISO 4026-M6X6-45H	ISO 4026-M6X6-45H
28	Rod			
29	Grub screw	ISO 4026-M6X10-45H	ISO 4028-M8X20-45H	ISO 4026-M10X10-45H
30	Lubricating grease	LUB-KC1, silicone-free	LUB-KC1, silicone-free	LUB-KC1, silicone-free
31	Locking agent (threadlocker)			

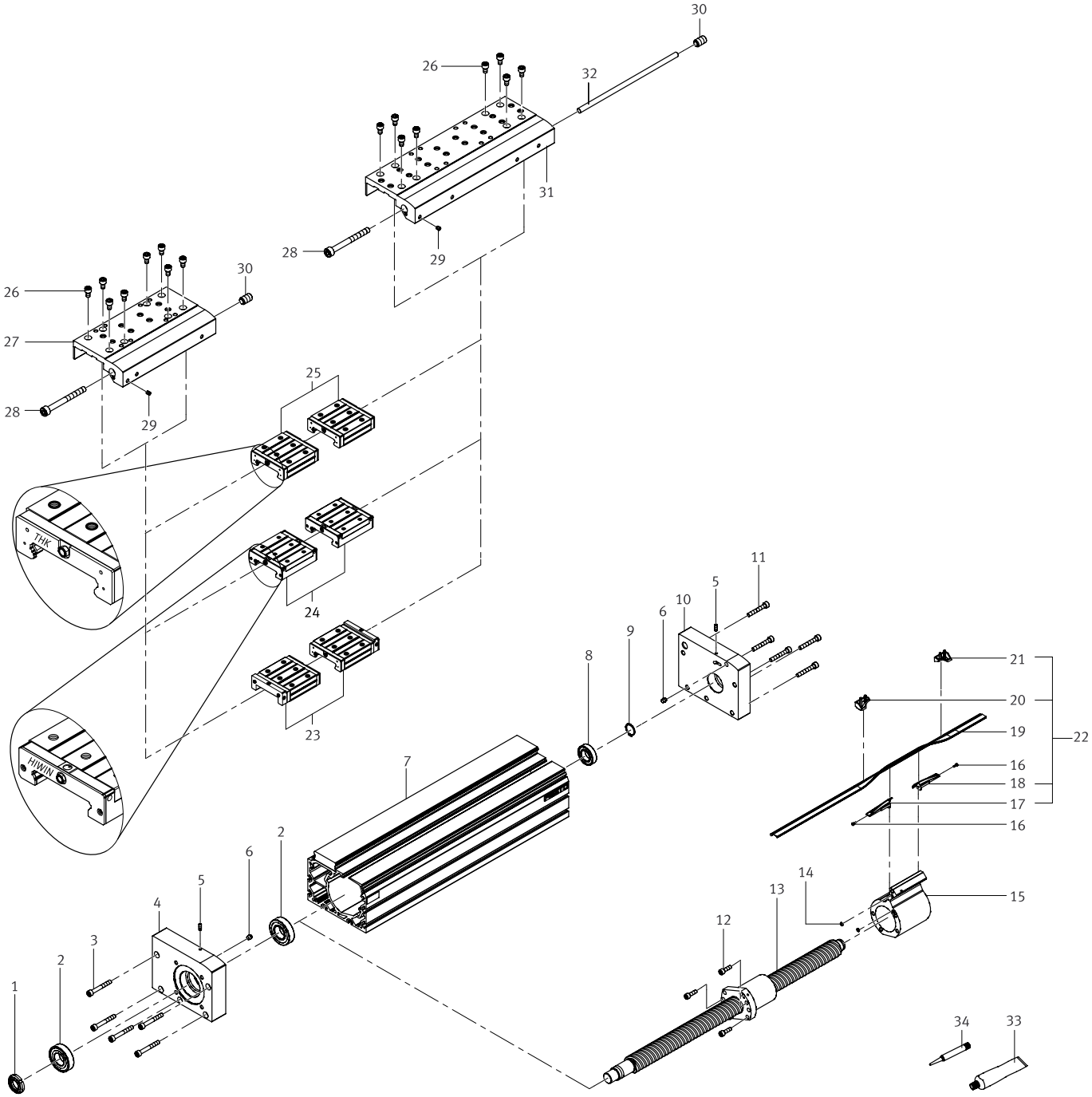
3.2 EGC-70 / 80 / 120-...-BS-KF-MR



This diagram is intended only to provide an overview of the individual components. To order spare and wearing parts, please use the online spare parts catalogue on the Festo website (➔ www.festo.com/spareparts).

Spindle axis		EGC-70-...-BS-KF-MR	EGC-80-...-BS-KF-MR	EGC-120-...-BS-KF-MR
Item	Designation	Type	Type	Type
1	Socket head screw	DIN 985-M8×1-8	GUK 10×0,75	GUA 16×1
2	Bearing cap	DIN 625-629-2RS	DIN 628-7200-B-2RS	DIN 628-7203-B-2RS
3	Grub screw	ISO 4762-M4X25-8.8	ISO 4762-M5X30-8.8	ISO 4762-M6X40-10.9
4	Buffer			
5	Retaining ring	ISO 4026-M3X10-45H	ISO 4026-M4X10-45H	ISO 4026-M5X16-45H
6	Deep-groove ball bearing			
7	Cylinder barrel module			
8	Roller bearing	D616-698-2RS	D616-698-2RS	XF+DIN 625-6200-2RS
9	Clevis foot	DIN 471-8×0,8	DIN 471-8×0,8	DIN 471-10×1
10	Nut			
11	Socket head screw	ISO 4762-M4X16-8.8	ISO 4762-M5X25-10.9	ISO 4762-M6X20-10.9
12	Ball screw			
13	O-ring	B-2×1-N-NBR70	B-2×1-N-NBR70	3×1-N-NBR70
14	Retainer module			
15	Band reverser			
16	Band reverser			
17	Band reverser			
18	Band reverser			
19	Cover band			
20	Roller carriage	for standard slide with lubrication adapter or extended slide with lubrication adapter	for standard slide with lubrication adapter or extended slide with lubrication adapter	for standard slide with lubrication adapter or extended slide with lubrication adapter
21	Roller carriage	for standard slide or extended slide	for standard slide or extended slide	for standard slide or extended slide
22	Roller carriage	**Not present**	for standard slide or extended slide protected	for standard slide or extended slide protected
23	Slide module	standard slide	standard or protected slide	standard or protected slide
24	Slide module	extended slide	extended slide or extended slide protected	extended slide or extended slide protected
25	Socket head screw	ISO 4762-M3X8-12.9	ISO 4762-M3X10-12.9	ISO 4762-M6X10-10.9
26	Socket head screw	ISO 4762-M4X40-8.8	ISO 4762-M5X45-10.9	ISO 4762-M6X80-10.9
27	Grub screw	ISO 4026-M6X6-45H	ISO 4026-M6X6-45H	ISO 4026-M6X6-45H
28	Rod			
29	Grub screw	ISO 4026-M6X10-45H	ISO 4028-M8X20-45H	ISO 4026-M10X10-45H
30	Lubricating grease	LUB-KC1, silicone-free	LUB-KC1, silicone-free	LUB-KC1, silicone-free
31	Locking agent (threadlocker)			

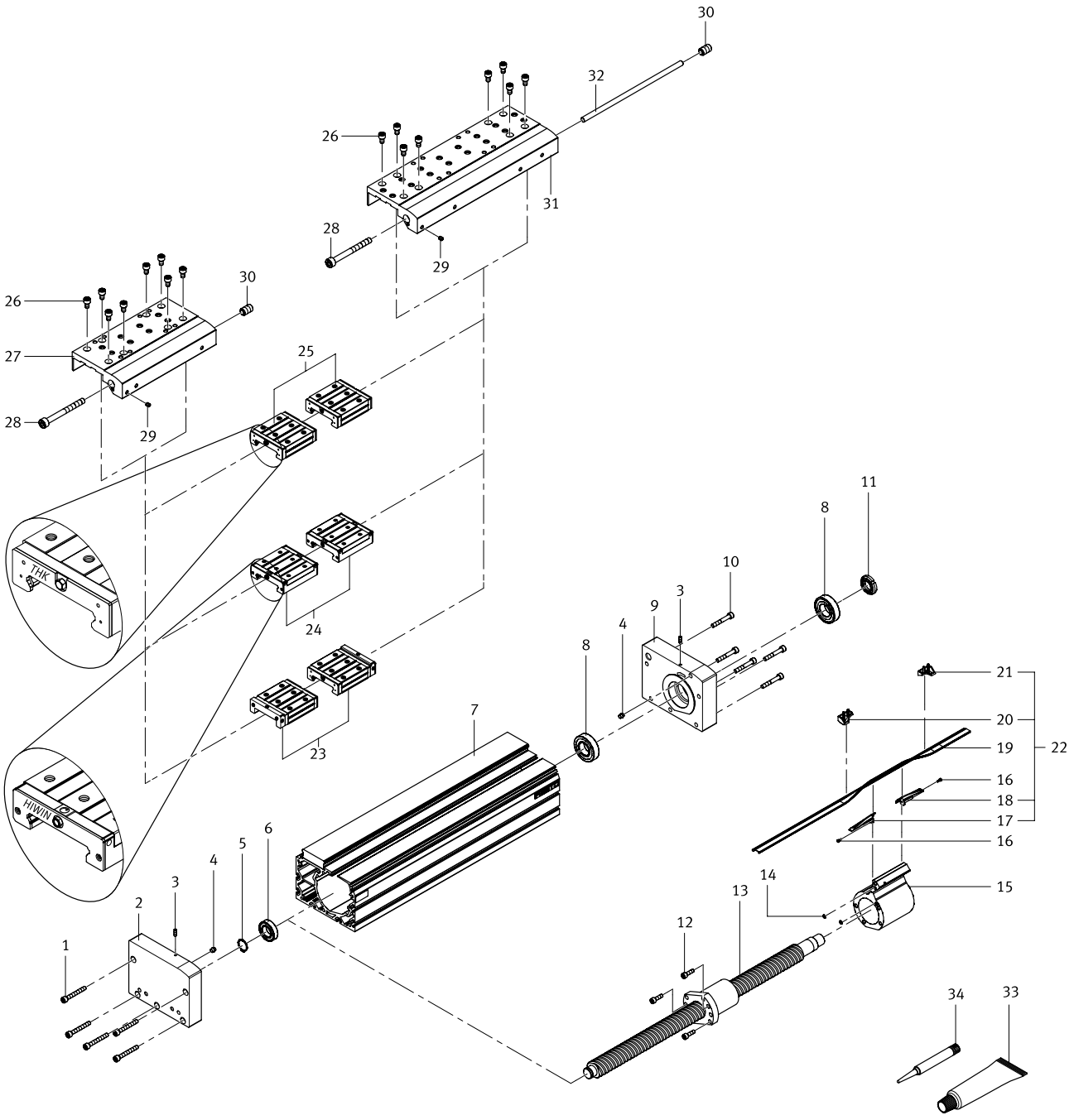
3.3 EGC-185-...-BS-KF-ML



This diagram is intended only to provide an overview of the individual components. To order spare and wearing parts, please use the online spare parts catalogue on the Festo website (➔ www.festo.com/spareparts).

Spindle axis		EGC-185-...-BS-KF-ML
Item	Designation	Type
1	Grooved nut	GUK 30×1,5
2	Angular ball bearing	DIN 628-7206-B-2RS
3	Socket head screw	ISO 4762-M8X50-10.9
4	Clevis foot	
5	Threaded pin	ISO 4026-M6X16-45H
6	Buffer	
7	Cylinder barrel module	
8	Deep-groove ball bearing	D625-6005-2RS
9	Retaining ring	DIN 471-25×1,2
10	Bearing cap	
11	Socket head screw	ISO 4762-M8X50-10.9
12	Socket head screw	ISO 4762-M8X30-10.9
13	Ball screw	
14	O-ring	B-5×1,5-N-NBR75
15	Retainer module	
16	Socket head screw	ISO 4762-M3X8-8.8
17	Belt reversal	
18	Belt reversal	
19	Cover strip	
20	Belt reversal	
21	Belt reversal	
22	Belt reversal	
23	Roller carriage	for standard slide with lubrication adapter or extended slide with lubrication adapter
24	Roller carriage (HIWIN)	for standard slide or extended slide
25	Roller carriage (THK)	for standard slide or extended slide
26	Socket head screw	ISO 4762-M8X14-10.9
27	Slide modul	
28	Socket head screw	M8×100 8.8
29	Threaded pin	ISO 4026-M6X6-45H
30	Threaded pin	ISO 4026-M12X14-45H
31	Slide module	
32	Rod	
33	Lubricating grease	LUB-KC1, silicone-free
34	Locking agent (threadlocker)	

3.4 EGC-185-...-BS-KF-MR



This diagram is intended only to provide an overview of the individual components. To order spare and wearing parts, please use the online spare parts catalogue on the Festo website (➔ www.festo.com/spareparts).

Spindle axis		EGC-185-...-BS-KF-MR
Item	Designation	Type
1	Socket head screw	ISO 4762-M8X50-10.9
2	Bearing cap	DIN 628-7206-B-2RS
3	Threaded pin	ISO 4026-M6X16-45H
4	Buffer	
5	Retaining ring	DIN 471-25×1,2
6	Deep-groove ball bearing	D625-6005-2RS
7	Cylinder barrel module	
8	Angular ball bearing	DIN 628-7206-B-2RS
9	Clevis foot	
10	Socket head screw	ISO 4762-M8X60-8.8
11	Grooved nut	GUK 30X1,5
12	Socket head screw	ISO 4762-M8X30-10.9
13	Ball screw	
14	O-ring	B-5×1,5-N-NBR75
15	Retainer module	
16	Socket head screw	ISO 4762-M3X8-8.8
17	Belt reversal	
18	Belt reversal	
19	Cover strip	
20	Belt reversal	
21	Belt reversal	
22	Belt reversal	
23	Roller carriage	for standard slide with lubrication adapter or extended slide with lubrication adapter
24	Roller carriage (HIWIN)	for standard slide or extended slide
25	Roller carriage (THK)	for standard slide or extended slide
26	Socket head screw	ISO 4762-M8X14-10.9
27	Slide modul	
28	Socket head screw	M8×100 8.8
29	Threaded pin	ISO 4026-M6X6-45H
30	Threaded pin	ISO 4026-M12X14-45H
31	Slide module	
32	Rod	
33	Lubricating grease	LUB-KC1, silicone-free
34	Locking agent (threadlocker)	

4 Repair steps

Where possible, it is advisable to dismantle the spindle axis from the system entirely before carrying out the repair.

Before starting the repair, dismantle any attachments in accordance with the instructions in the accompanying operating instructions.

Keep your working environment clean and tidy.

Before dismantling the spindle axis the cause of the failure must be investigated to prevent repeated and premature failure. A spindle axis that has been used as intended will not normally show any signs of premature failure.

This investigation is not necessary in the case of non-premature failure (fatigue time). However, the condition of the spindle axis (general condition, etc.) must always be checked.

In case of uncertainty, it is recommended to replace all the components mentioned so as to rule out reciprocal effects during later operation.

In the event of premature failure of the spindle axis the operating conditions should be examined more closely.

The following possibilities should be considered, among other things:

- **Overloading**
  - In case of overloading, the application parameters (load, speed) should be adjusted accordingly.
- **Ambient conditions/material resistance**
  - Check whether the ambient temperature is within the permissible range.

  Check the chemical and physical ambient conditions for harmful substances, such as dust, abrasive particles, cooling lubricants, solvents, ozone, radiation, water-soluble substances, greases and oils, etc.

Note

The repair should preferably be carried out on a stable and flat work surface with storage for small parts.

To prevent damage to the guide rail and other components, do not use pointed or sharp-edged assembly tools.

4.1 Preparatory steps

Warning

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.

1. Disconnect the spindle axis from the power supply and secure it from being switched on again accidentally.
2. Remove the motor and encoder cables.

4.2 Visual inspection

Check the spindle axis for visible damage that can impair its function, such as major defects in the guide rail. The entire spindle axis must be replaced if significant damage exists.

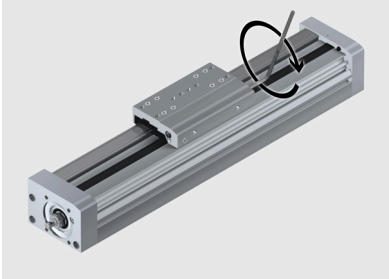
4.3 Dismantling the spindle axis

1. Place the spindle axis on the work surface with the slide module facing upwards.

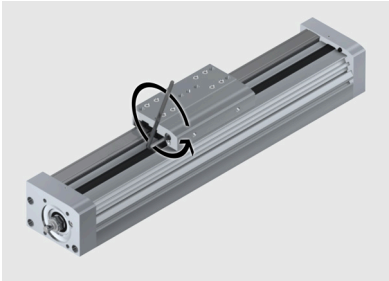
2. Unscrew the grub screw on the right-hand side of the slide module.

   For slide module GV

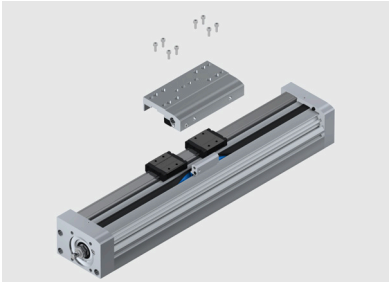
   Remove the rod from the slide module.



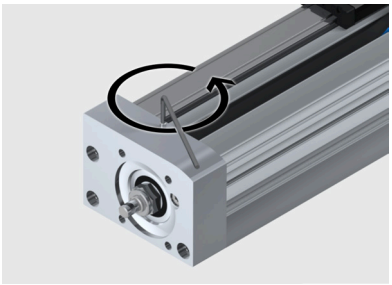
3. Completely unscrew the socket head screw on the left-hand side of the slide module.



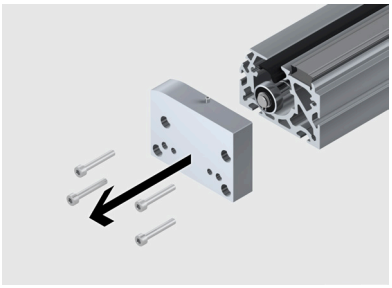
4. Completely unscrew the socket head screws for fixing the slide on the roller carriage.
5. Remove the slide module from the roller carriage from above.



6. Unscrew the grub screws of the cover band clamp so that they are flush with the clevis foot / bearing cap.



7. Unscrew the socket head screws from the bearing cap.

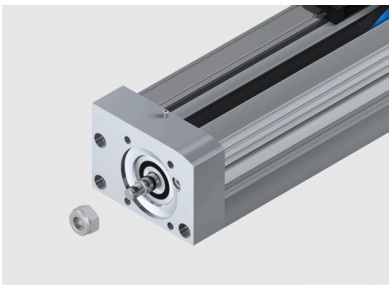


Note

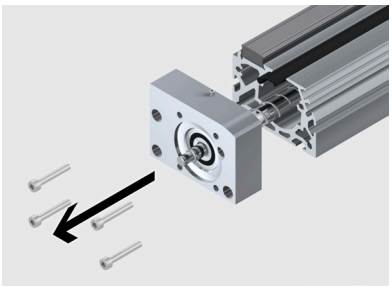
When pulling off the bearing cap from the cylinder barrel module the bearing seat of the roller bearing is also pulled off the ball screw. After pulling off the bearing cap the ball screw must be supported so that torque / tilting moments do not damage the roller bearing on the opposite side of the ball screw.

8. Carefully pull the bearing cap off the cylinder barrel.

9. Unscrew the slotted nut from the ball screw.

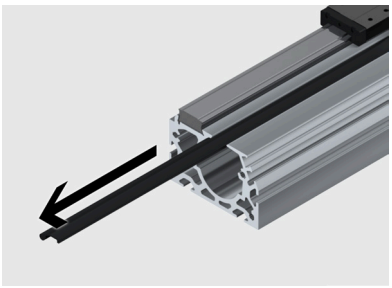


10. Unscrew the socket head screws from the clevis foot.
11. Pull the clevis foot together with the ball screw carefully out of the cylinder barrel.
12. Carefully pull the clevis foot off the ball screw.



The roller bearings are pressed onto the ball screw. A certain amount of force is required when pulling it off.

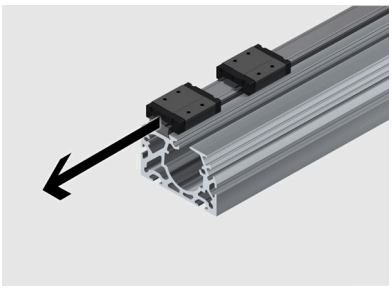
13. Carefully pull the cover band out of the cylinder barrel.
14. Check the cover band for damage and renew if necessary.



4.3.1 Replacing the roller carriage

Dismantling the roller carriage

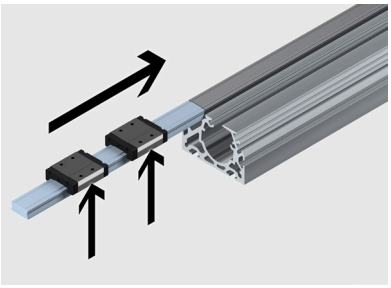
1. Push the roller carriages off the guide rail.
2. Clean the cylinder barrel and guide rail with compressed air and a cloth.



Installing the roller carriage

Note

Pay attention to the installation position when positioning the new roller carriages. The partially ground side (stop side) of the roller carriage must face the front side of the spindle axis.



1. Position the transport rail with the new roller carriages on the guide rail.
2. Slowly push the new roller carriages onto the guide rail, ensuring that no ball bearings fall out of the roller carriages.

Balls that have sprung out of the roller carriages must be re-inserted in the relevant roller carriages.

4.3.2 Lubricating the recirculating ball bearing guide

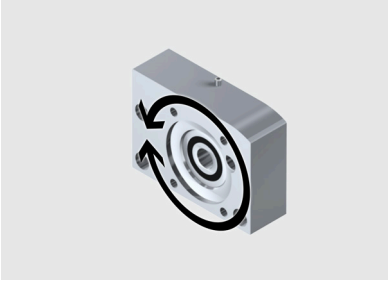
The recirculating ball bearing guides must be lubricated using a grease gun before commissioning and at certain intervals as. (➔ Chapter 7.2 on page 31)

Festo offers a one-hand high-pressure grease gun with a suitable pinpoint nozzle for greasing the lubricating holes. (➔ 8.2 “Special tools”)

4.3.3 Checking and replacing the roller bearing with seat in the clevis foot

The rolling behaviour of the roller bearing in the clevis foot and the roller bearing on the ball screw must be checked with each repair. If the rolling behaviour of one of the two roller bearings is no longer perfect, e.g. due to increased scratching noises, both roller bearings must always be replaced.

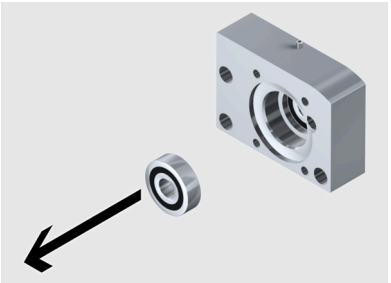
1. Check the rolling behaviour of the roller bearing in the clevis foot and the roller bearing on the ball screw.



Replacing the roller bearing

Note

When driving out the roller bearing ensure that the bearing seat in the clevis foot is not damaged.

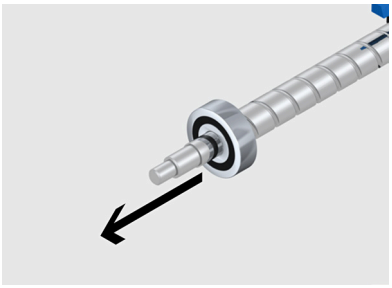


2. Drive the roller bearing out of the clevis foot.

Note

Ensure that the seat of the roller bearing is not damaged when it is pulled off the ball screw.

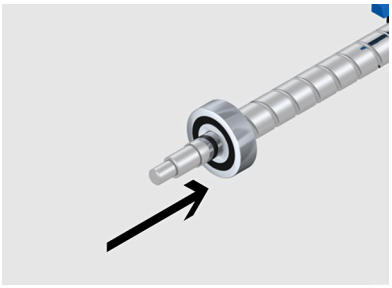
3. Pull roller bearing off the spindle.



4. Apply a thin layer of grease to the inner raceway of the roller bearing.

Note

When installing the roller bearing (size EGC-80 / 120 / 185-...-BS-KF), ensure that the wider outer raceway face is **always** pointing in the direction of the clevis foot.



Note

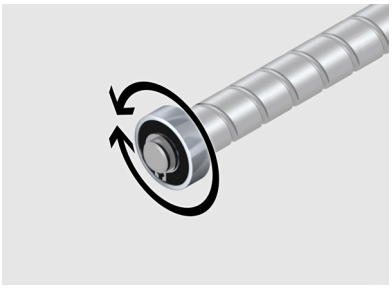
When pressing on the roller bearing, ensure that it does not tilt and become damaged.

5. Press the roller bearing over the inner raceway onto the spindle.

4.3.4 Checking and replacing the roller bearing with seat in the bearing cap

The rolling behaviour of the roller bearing on the ball screw must be checked with each repair. If the rolling behaviour is no longer perfect, e.g. due to increased scratching noises, the roller bearing on the ball screw must be replaced.

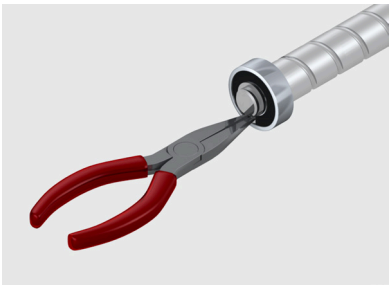
1. Check the rolling behaviour of the roller bearing on the ball screw.



Replacing the roller bearing

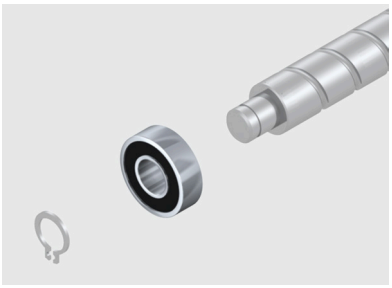
Note

Ensure that the seat of the roller bearing is not damaged when it is pulled off the ball screw.



2. Use pliers to remove the retaining ring from the ball screw.
3. Pull the roller bearing off the ball screw.

4. Apply a thin layer of grease to the inner raceway of the roller bearing.
5. Press the roller bearing over the inner raceway onto the spindle.
6. Use pliers to insert the retaining ring in the ball screw.



4.3.5 Checking and replacing the ball screw

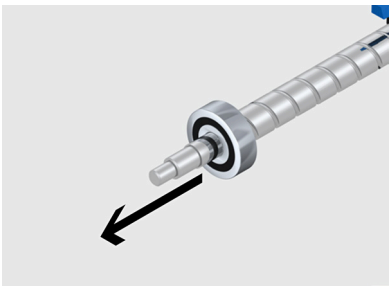
The ball screw converts the rotational movement of the motor into a linear movement. The backlash free bearing enables very high repetition accuracy to be achieved.

If the rolling behaviour is no longer faultless, the ball screw must be replaced.

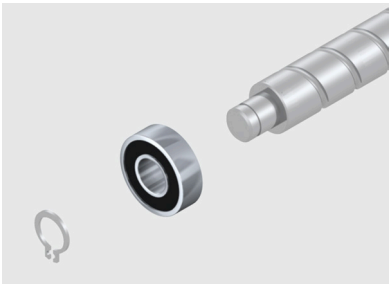
Note

Ensure that the seat of the roller bearing is not damaged when it is pulled off the ball screw.

1. Pull roller bearing off the spindle.



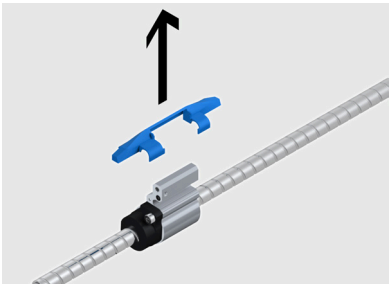
2. Dismantle the roller bearing as described in Chapter 4.3.4 on page 22.



3. Remove the band reverser from the retainer module.

   For size EGC-185-...-BS-KF

   The band reverser does not have to be dismantled from the retainer module.



4. Unscrew the socket head screw from the retainer module.

For size EGC-185-...-BS-KF

Unscrew all four socket head screws from the retainer module.

5. Pull the retainer module off the ball screw.

The retainer module is pressed onto the ball screw. A certain amount of force is required when pulling it off.

Note

On pressing on, ensure that the retainer module does not tilt. Otherwise the seat could be damaged.

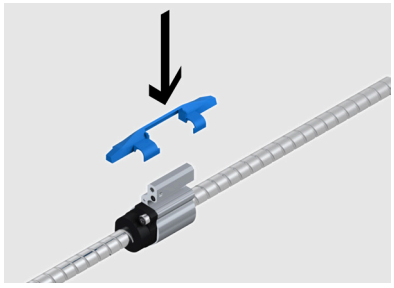
6. Press on the retainer module carefully.
7. Clean the socket head screw to remove the threadlocker.
8. Wet the socket head screw with threadlocker.
9. Screw in the socket head screw and tighten with the appropriate tightening torque.

For size EGC-185

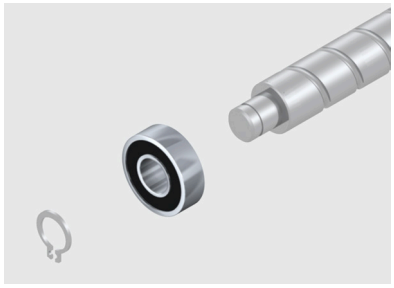
Screw all four socket head screws into the retainer module and tighten with the appropriate tightening torque.

Type	Tightening torque
EGC-70-...-BS-KF	2.5 Nm
EGC-80-...-BS-KF	5 Nm
EGC-120-...-BS-KF	3.5 Nm
EGC-185-...-BS-KF	7 Nm

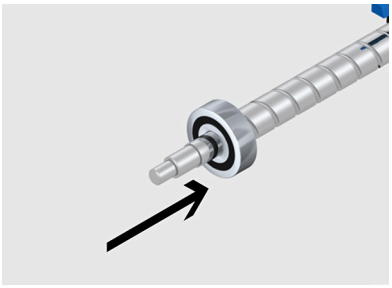
10. Position the band reversers onto the retainer module.



11. Mount the roller bearing as described in Chapter 4.3.4 on page 22.



12. Apply a thin layer of grease to the inner raceway of the roller bearing.



Note

When installing the roller bearing (size EGC-80 / 120 / 185-...-BS-KF), ensure that the wider outer raceway face is **always** pointing in the direction of the clevis foot.

Note

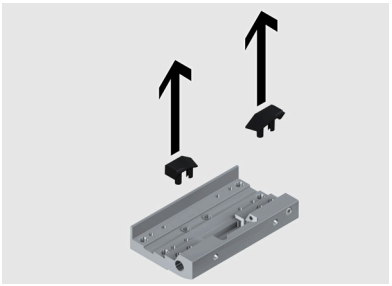
When pressing on the roller bearing, ensure that it does not tilt and become damaged.

13. Press the roller bearing over the inner raceway onto the spindle.

4.3.6 Replacing the band reverser

Slide module band reverser

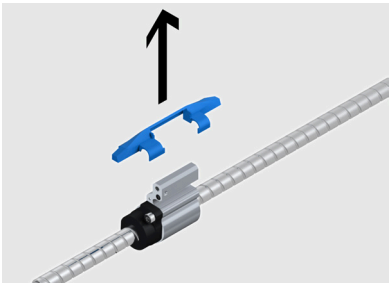
1. Lever both band reversers out of the slide module.
2. Check both band reversers for damage and replace if necessary.
3. Insert both band reversers.



Retainer module band reverser

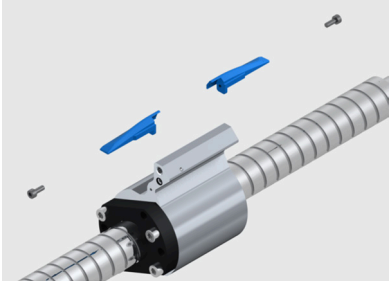
For size EGC-70 / 80 / 120-...-BS-KF

1. Remove the band reverser from the retainer module.
2. Check the band reverser for damage and replace if necessary.
3. Position the band reversers onto the retainer module.



For size EGC-185-...-BS-KF

1. Unscrew both socket head screws from the retainer module.
2. Remove the band reversers.
3. Check the band reverser for damage and replace if necessary.
4. Position the band reversers on the retainer module.
5. Screw both socket head screws into the retainer module and tighten with tightening torque 0.5 Nm.



4.3.7 Replacing the retainer module

1. Unscrew the socket head screw from the retainer module.

   For size EGC-185-...-BS-KF

   Unscrew all four socket head screws from the retainer module.
2. Pull the retainer module off the ball screw.
3. Clean the socket head screw to remove the threadlocker.
4. Wet the socket head screw with threadlocker.
5. Push the retainer module onto the ball screw.
6. Screw in the socket head screw and tighten with the appropriate tightening torque.

   For size EGC-185

   - Screw all four socket head screws into the retainer module and tighten with the appropriate tightening torque.

Type	Tightening torque
EGC-70-...-BS-KF	2.5 Nm
EGC-80-...-BS-KF	5 Nm
EGC-120-...-BS-KF	3.5 Nm
EGC-185-...-BS-KF	7 Nm

4.4 Mounting the spindle axis

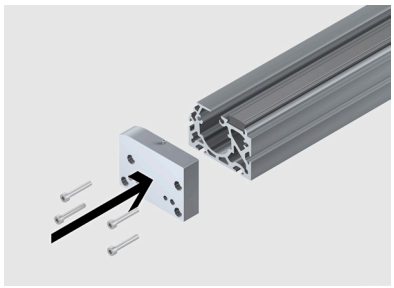
4.4.1 Greasing whilst assembling

- Grease the following parts as described.

Component	Lubricant	Greasing instructions
Cylinder barrel	Festo LUB-KC1[1)]	Apply a layer of grease to the slot.
Cover band	Festo LUB-KC1[1)]	Apply a layer of grease all around and along the entire length.
Ball screw	Festo LUB-KC1[1)]	Grease all round.
Band reverse on slide module	Festo LUB-KC1[1)]	Grease in the deflection area.
Band reverser on retainer module	Festo LUB-KC1[1)]	Grease in the deflection area.
Roller carriage	Festo LUB-KC1[1)]	➔ Chapter 7.2 on page 31.

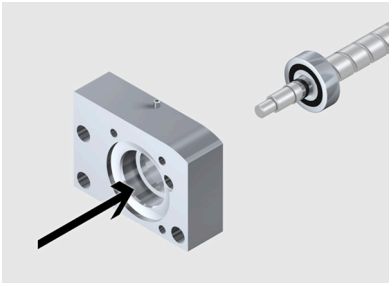
[1)] Further information on the lubricant is included in the information brochure **“Tools and repair accessories”**. The brochure can be found in the online spare parts catalogue on the Festo website (➔ Tools and Repair Accessories.pdf).

4.4.2 Assembling the spindle axis



1. Clean the socket head screws of the bearing cap to remove threadlocker.
2. Wet the socket head screws with threadlocker.
3. Screw in the socket head screws loosely.

4. Apply a thin layer of grease to the ball screw on the outer raceway of the roller bearing.

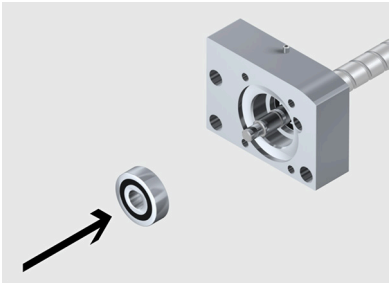


Note

After the ball screw has been driven into the roller bearing in the clevis foot, the ball screw must be supported. The self-weight and resulting torque / tilting moments can damage the roller bearings.

5. Drive the ball screw carefully into the clevis foot and support the ball screw.

6. Apply a thin layer of grease to the outer and inner raceway of the roller bearing.

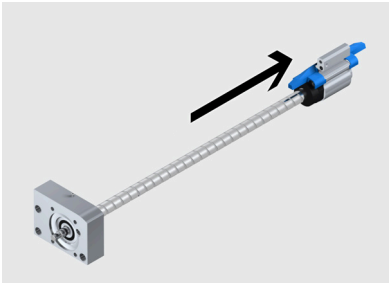


Note

When installing the roller bearing (size EGC-80 / 120 / 185-...-BS-KF), ensure that the wider outer raceway face is always pointing inwards, in the direction of the stop face in the clevis foot.

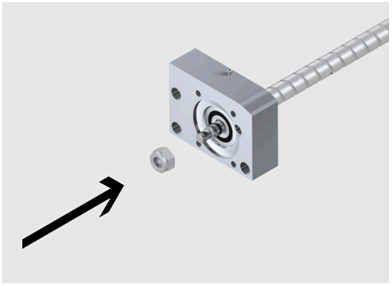
7. Drive the roller bearing into the clevis foot carefully above the outer and inner raceway.

8. Push the retainer module onto the ball screw in the direction of the preassembled roller bearing until it stops.



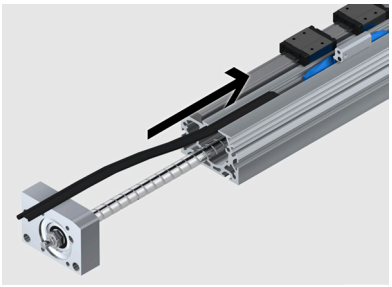
Note

The axial clearance of the roller bearing is adjusted by tightening the slotted nut. Overtightening reduces the life of the roller bearing. The correct tightening torque is chosen at the discretion of the skilled personnel.

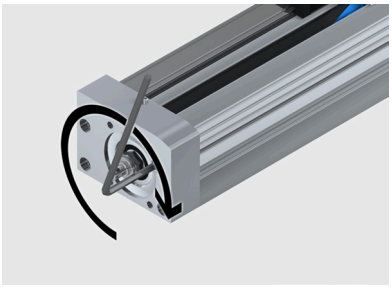


9. Screw the slotted nut onto the spindle and adjust the roller axially so that it free from backlash.

10. Guide the ball screw into the cylinder barrel module until the retainer module is roughly in the middle of the cylinder barrel module.
11. Push the cover band into the slot in the cylinder barrel from the clevis foot side and guide it over the band reverser into the bearing cap until it stops.
12. Guide the preassembled roller bearing onto the ball screw in the bearing cap.

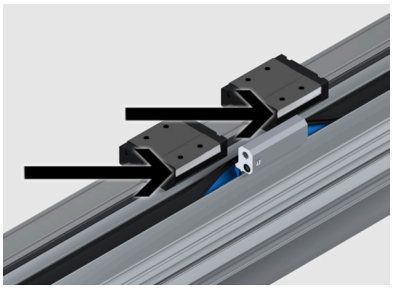


13. Knock the clevis foot onto the cylinder barrel module.
14. Clean the socket head screws to remove the threadlocker.
15. Wet the socket head screws with threadlocker.
16. Screw in the socket head screws loosely.



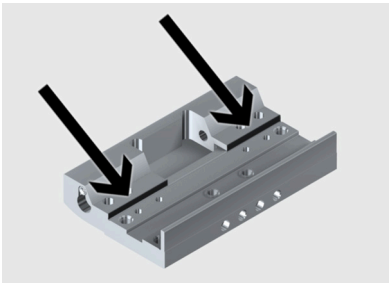
The roller bearings have a ground surface on one side as a stop face for the slide module. The ground stop face must not have any surface defects such as burrs, chips, faults, etc. and no threadlocker residue.

17. Clean the stop face of the roller carriage.

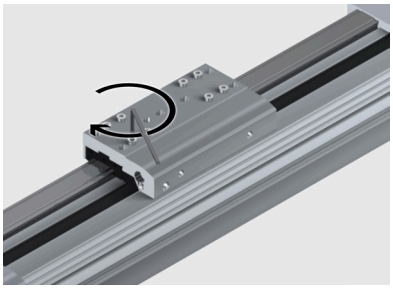


The milled stop face and mounting surface of the slide module for the roller carriages must not have any surface defects such as burrs, chips, faults, etc. and no threadlocker residues.

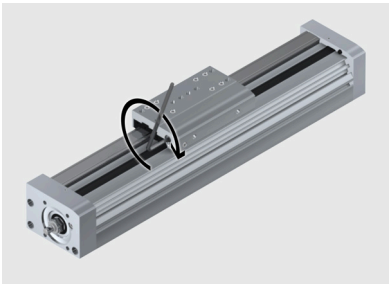
18. Clean the stop face ad mounting surface of the slide module.



19. Position the slide module carefully on the roller carriage.
20. Clean the socket head screws to remove the threadlocker.
21. Wet the socket head screws with threadlocker.
22. Loosely screw in the socket head screws of the roller carriage lose.

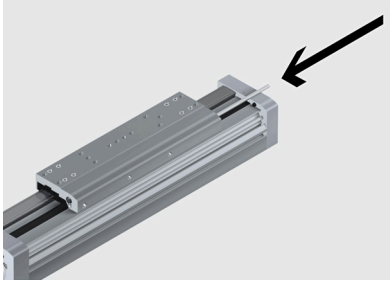


23. Clean the socket head screw to remove the threadlocker.
24. Wet the socket head screws with threadlocker.
25. Guide the socket head screw into the slide module.
26. Screw in the socket head screw loosely.

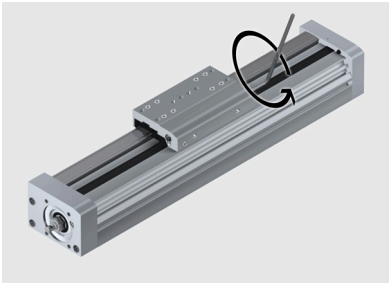


For slide module GV

Guide the rod into the slide module

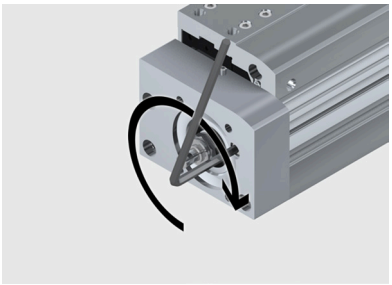


27. Clean the grub screw to remove threadlocker.
28. Wet the grub screw with threadlocker.
29. Screw the grub screw loosely into the slide module.



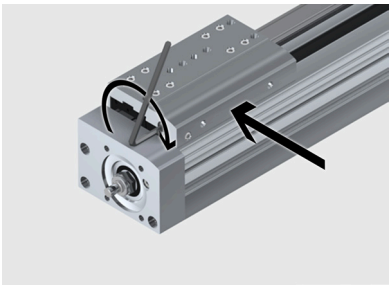
30. Move the slide in the direction of the clevis foot until it stops.
31. Tighten the socket head screws using the appropriate torque.

Type	Tightening torque
EGC-70-...-BS-KF	2.5 Nm
EGC-80-...-BS-KF	5 Nm
EGC-120-...-BS-KF	12 Nm
EGC-185-...-BS-KF	20 Nm



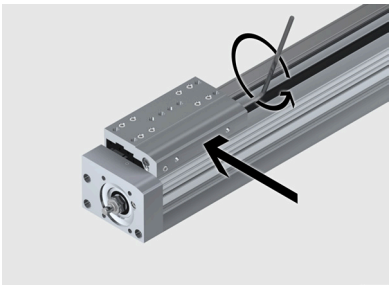
32. Push the slide back against the ground surface of the roller carriage and tighten the socket head screws with the appropriate tightening torque.

Type	Tightening torque
EGC-70-...-BS-KF	2.5 Nm
EGC-80-...-BS-KF	8.5 Nm
EGC-120-...-BS-KF	14 Nm
EGC-185-...-BS-KF	24 Nm



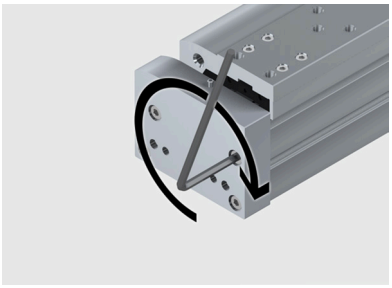
33. Push the slide backwards against the ground face of the roller carriage and tighten the grub screw with the appropriate tightening torque.

Type	Tightening torque
EGC-70-...-BS-KF	1 Nm
EGC-80-...-BS-KF	2.5 Nm
EGC-120-...-BS-KF	3.5 Nm
EGC-185-...-BS-KF	7 Nm



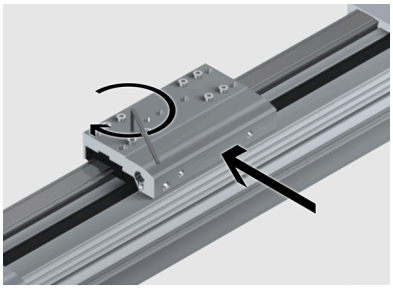
34. Push the slide in the direction of the bearing cap until it stops.
35. Tighten the socket head screws using the appropriate torque.

Type	Tightening torque
EGC-70-...-BS-KF	2.5 Nm
EGC-80-...-BS-KF	5 Nm
EGC-120-...-BS-KF	12 Nm
EGC-185-...-BS-KF	20 Nm



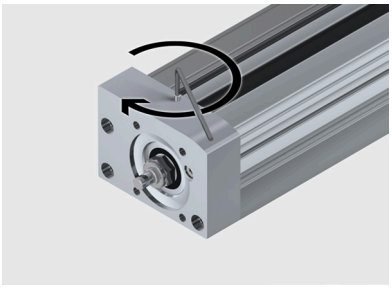
36. Push the slide back against the ground surface of the roller carriage and tighten the socket head screws with the appropriate tightening torque.

Type	Tightening torque
EGC-70-...-BS-KF	2.5 Nm
EGC-80-...-BS-KF	2.5 Nm
EGC-120-...-BS-KF	15 Nm
EGC-185-...-BS-KF	30 Nm



37. Clean the grub screws to remove threadlocker.
38. Wet the grub screws with threadlocker.
39. Tighten the grub screws of the cover band clamping to the appropriate tightening torque.

Type	Tightening torque
EGC-70-...-BS-KF	0.1 Nm
EGC-80-...-BS-KF	0.3 Nm
EGC-120-...-BS-KF	0.5 Nm
EGC-185-...-BS-KF	0.5 Nm



5 Assembly and functional test

After completing the assembly work on the spindle axis, check that it functions faultlessly.

5.1 Idling torque

It must be possible to move the idling slide module, with no attached drive or coupled load, without much resistance or jerking.

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

5.2 Commissioning

Commission the repaired spindle axis as per the operating instructions (enclosed with the spindle axis or available on the Festo website (➔ www.festo.com)).

6 Cleaning

Note

If other cleaning products are used, ensure that they do not corrode the non-metal parts of the spindle axis.
If in doubt, check the resistance of the non-metal parts with the help of the information on the Festo website (➔ www.festo.com).

- Use a soft cloth and a gentle cleaning product to clean the spindle axis as and when necessary.
- Use a mild cleaning product to clean the cover strip and the roller track as and when necessary.

7 Maintenance

7.1 Check the reversing backlash

Note

The reversing backlash (reversing clearance) must be checked with each maintenance. Increased reversing backlash results in increased noise in the long term and ultimately to blocking of the lead screw or fracturing of the spindle nut.

	EGC-70-...-BS-KF	EGC-80-...-BS-KF	EGC-120-...-BS-KF	EGC-185-...-BS-KF
max. reversing backlash	0,1 mm	0,1 mm	0,2 mm	0,2 mm

- Check the reversing backlash of the slide.

7.2 Greasing the belt system and roller track

- Grease the belt system and roller track with Festo LUB-KC1 as and when required, 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).

7.3 Relubricating the roller carriage and ball screw

The roller carriages and the ball screw should be relubricated after a load-dependent lubrication interval Sint. To determine the lubrication interval, the load comparison factor fv must be calculated using the formula for combined loads, see operating instructions Spindle axis **EGC-BS-KF, -EGC-HD-BS** (➔ www.festo.com).

Note

The lubrication interval Sint depends on the load acting on the product.

Load factors:

- dusty and contaminated environment
- Nominal stroke , 2000 mm
- Speed , 2 m/s
- Travel profile Z 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 Sint.
- If several factors apply at the same time, divide the lubrication interval by four.
- We recommend that you lubricate the ball screw and the roller carriage at the same time. In this case lubrication should take place according to the shorter lubrication interval.

Note

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

For notes and information on greasing, refer to the **Spindle axis EGC-BS-KF, EGC-HD** operating instructions (➔ www.festo.com).

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.

Lubricant quantity for bearing cartridges with GK and GV slide variant

Always insert the lubricant in **both** lubrication nipples on the two end faces of the slide, as there is no lubricant connection between the bearing cartridges. Half the quantity of grease is to be inserted in each lubrication nipple, in different slide positions, whose distance apart is equal to twice the slide length. (➔ table)

	EGC-70-...-BS-KF	EGC-80-...-BS-KF	EGC-120-...-BS-KF	EGC-185-...-BS-KF
Grease quantity	0,3 g	0,6 g	1,2 g	3,6 g

Festo offers a one-hand, high-pressure grease gun with a suitable pointed nozzle for greasing the lubrication holes.
(➔ Chapter 8.2 on page 33)

Lubricant quantity for ball screw

The spindle nut is lubricated on the right via a grease nipple or optionally via a central lubrication hole from the front.

Type	Spindle pitch	Grease quantity
EGC-70-...-BS-KF	10 mm/rev.	2,0 g
EGC-80-...-BS-KF	10 mm/rev.	2,5 g
EGC-80-...-BS-KF	10 mm/rev.	2,5 g
EGC-120-...-BS-KF	10 mm/rev.	3,0 g
EGC-120-...-BS-KF	10 mm/rev.	3,0 g
EGC-185-...-BS-KF	10 mm/rev.	15,0 g

Festo offers a one-hand, high-pressure grease gun with suitable pointed nozzle for greasing the lubrication holes.
(➔ Chapter 8.2 on page 33)

8 Tools

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

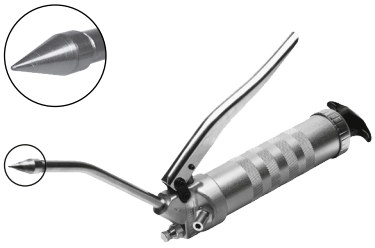
8.1 Standard tools

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

- Plastic hammer
- Pliers for retaining rings (inner retainer for bore)
- Ruler
- Allen key
- Torque wrench
- Torque screwdriver
- Flat pliers
- Sturdy general purpose scissors or metal shears
- Open-end wrench (only EGC-70-BS-KF)
- Slotted nut wrench

8.2 Special tools

The following special tools are required for repair and maintenance of the spindle 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	
Lubrication adapter LUB-1-TR-L	Lubrication adapter (nozzle pipe Ø 6x200 lateral)	647960	

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

Further information on the special tools is included in the information brochure **“Tools and repair accessories”**. The brochure can be found in the online spare parts catalogue on the Festo website (➔ Tools and Repair Accessories.pdf).

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