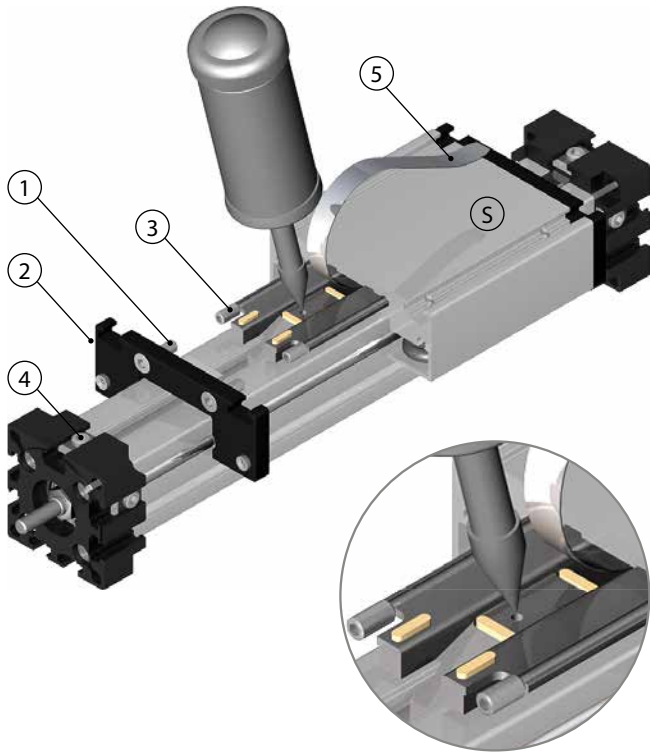


## Service manuals

Spindle lubrication EG 30 / EL 30



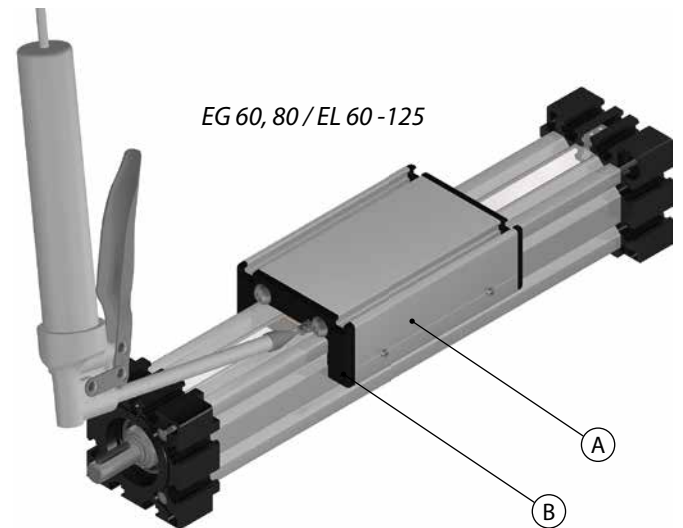
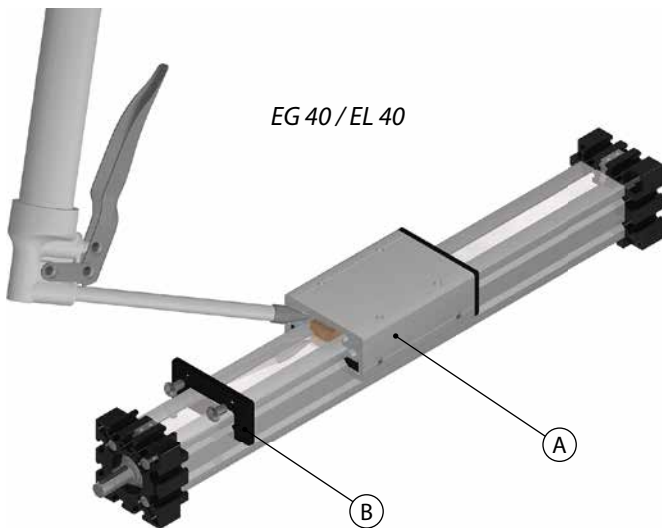
- Unscrew the cylindric screws (1) and push the wiper end plate (2) to the side.
- Unbend screws (3), push slide (S) to other side
- Unscrew the grub screw (4) and lift the coverband (5).
- Grease can be filled now with grease gun.

For mass of greasing look at table below.

Type	Pitch	Regreasing
30	Kg 08 x 2,5	0,1 g

5.2

Spindle lubrication EG 40, 60, 80 / EL 60, 80, 100, 125



Type	Pitch	Regreasing	Type	Pitch	Regreasing
30	Kg 08 x 2,5	0,1 g	60	Kg 20 x 05	3,00 g
40	Kg 16 x 05	1,33 g	80	Kg 25 x 25	3,00 g
40	Kg 16 x 10	0,84 g	80 / 100	Kg 32 x 05	3,00 g
60	Kg 25 x 05	2,00 g	80 / 100	Kg 32 x 10	4,00 g
60	Kg 25 x 10	3,00 g	100	Kg 32 x 32	4,00 g
60	Kg 20 x 20	3,00 g	125	Kg 40 x 10	4,00 g

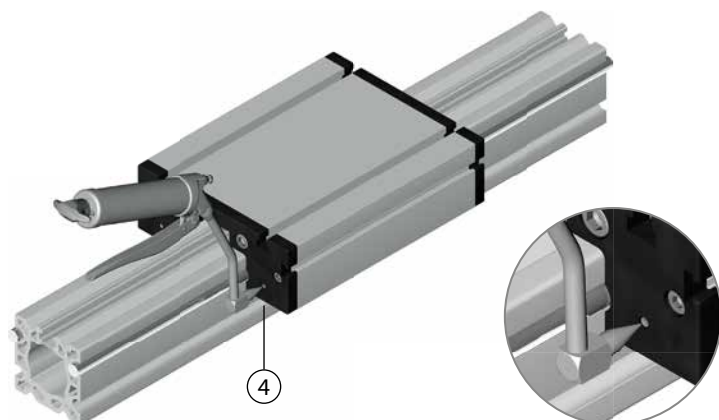
(A) carriage (B) wiper end plate

EG / EL 40 with greasing nipple behind the wiper end plate

EG 60, 80 / EL 60 - 125 with external greasing nipple

For mass of greasing look at table below. Spindle greasing every 500-1000 working hours.

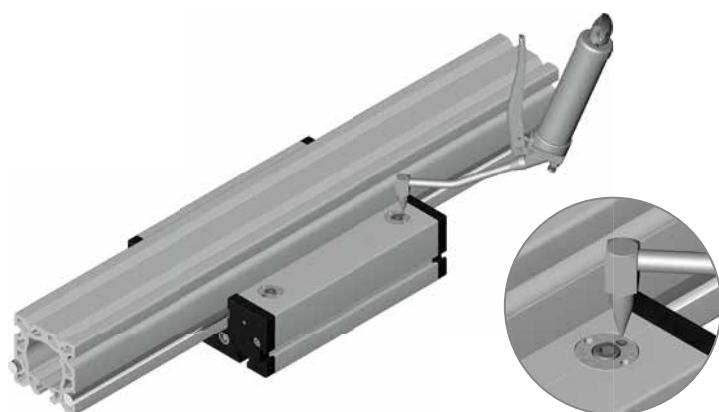
## Guiding rods lubrication EL | ML



Rods will be greased by the strippers of carriage. There are 2 oil nipples in each wiper end plate (4), where the tanks for the strippers can be filled with an oil gun.

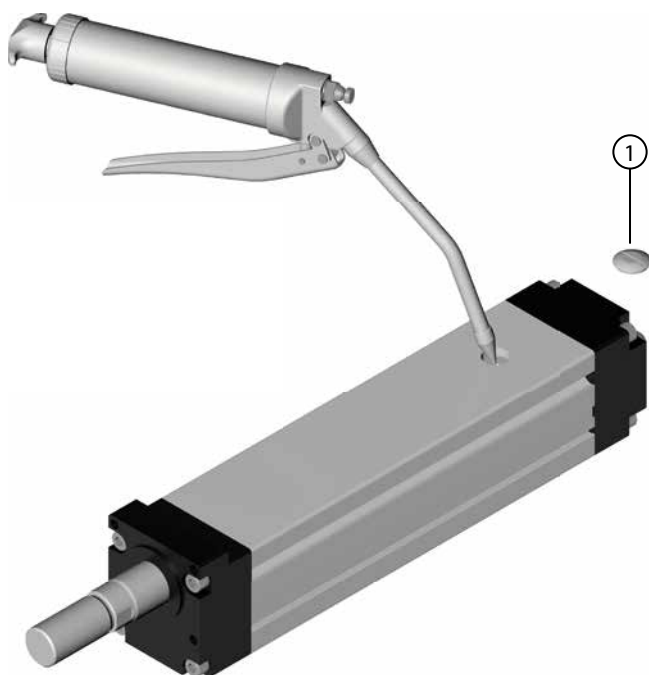
Viscosity of oil: 200 mm<sup>2</sup>/s, T= 40° C. Interval of greasing depends on environmental conditions, min. once a month. Minimum stroke must be same than length of slide.

## Rollers size lubrication EL 100, 125 | ML 100



Rollers should be greased each 1.000 working hours or each 6 months with a grease gun. For greaser nipple look at the eccentric at carriage bottom. Use roller grease.

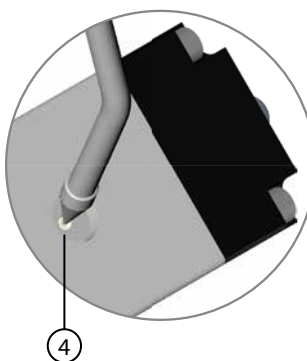
## Lubrication EHTX / EHKX 60, 80



① = cover cap                      ④ = greasing nipple

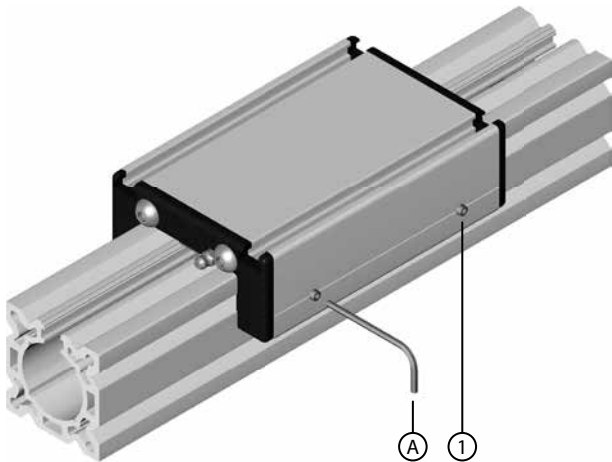
- Dismount cover cap (1).
- Drive the carriage to the service position until you can see the greasing nipple (4) in the lubrication hole.
- Re-greasing with grease gun.

For mass of greasing look at table below.  
Spindle greasing every 500-1000 working hours.



Type	Pitch	Regreasing
60	Tr 18 x 4	1,33 g
60	Tr 18 x 8	0,84 g
80	Tr 24 x 5	2,00 g
80	Tr 24 x 10	3,00 g
80	Kg 25 x 5	2,00 g
80	Kg 25 x 10	3,00 g

## Adjusting the carriage EG 30, 40, 60, 80

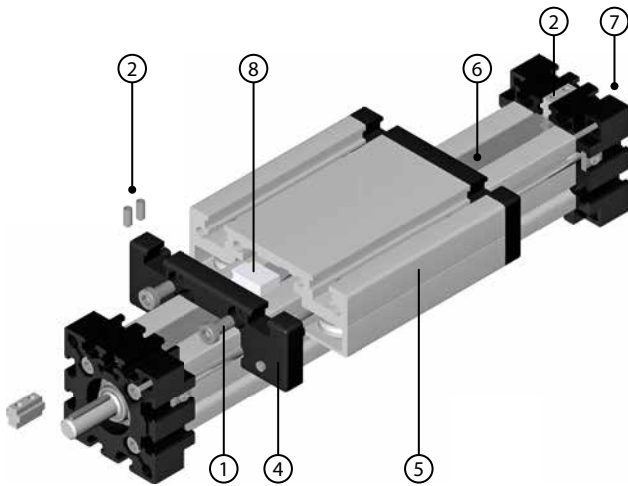


- Fix all 4 grub screws (1) with a hexagon socket wrench (A) at a centered position of the carriage.
- Loose all grub screws (1) about  $\frac{1}{8}$  rotation and hit the carriage carefully free by a soft-head hammer.
- Pay attention to a centered position of the carriage. (Check by a caliper.)

The grub screws (1) should be locked by bonding.

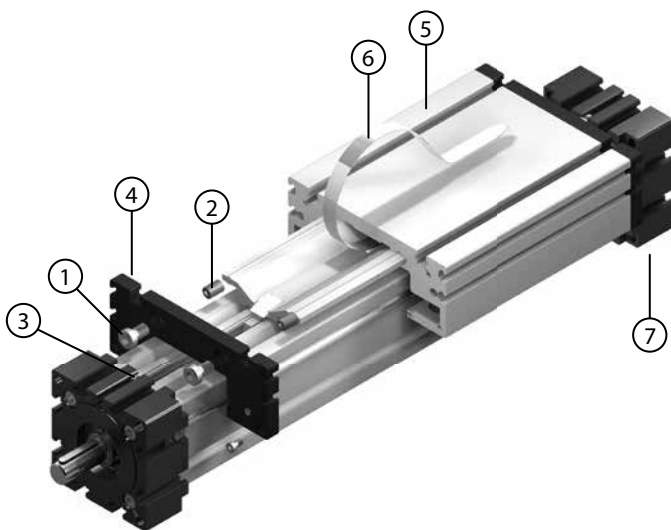
5.2

## Changing cover band EL | EG 30, 40

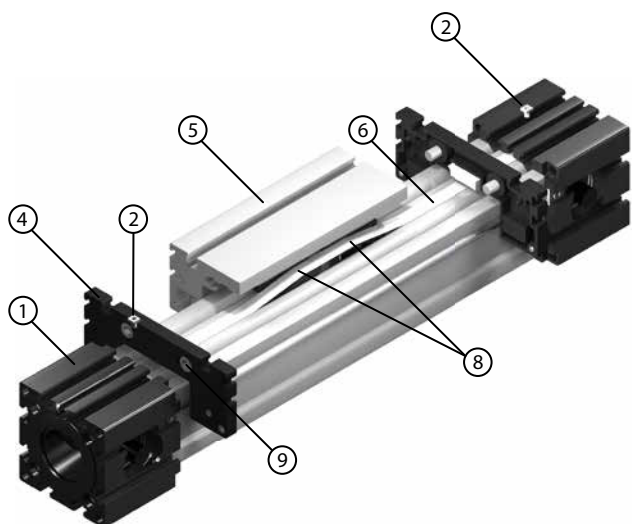


- Unscrew cylindric screws (1) on both sides of carriage (5).
- Push wiper endplate (4) to the side.
- Unscrew the screws (2) on both bearing parts and remove the cover band clamp (3).
- Pull out the coverband (6).
- Mount the new cover band and the cover band clamp (3). Then fix the screws (2) on one side of bearing block (7), tense the band with a pointed pliers and fix with the screws (2).
- Mount the wiper end plates (4) with the cylindric screws (1) on both sides of carriage (5). Pay attention to the seat of the slides (8).

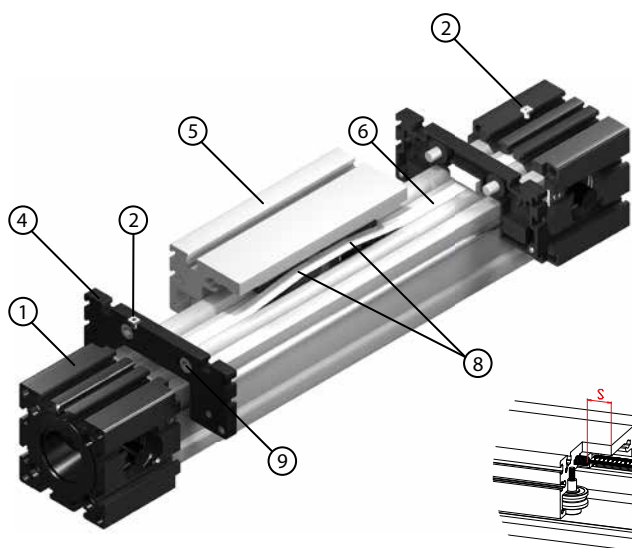
## Changing cover band EL 100, 125



- Unscrew cylindric screws (1), push plastic wiper endplate (4) to one bearing-block (7).
- Unbend grub screws (2), push carriage (5) to other side.
- Unscrew screws (3) and pull out the coverband (6).
- Mount the new coverband, fix the screws (3) at one side, tense the band with a pointed pliers and fix the screws (3).
- Fix the carriage (5) by the grub screws (2) and mount the wiper end plate (4).

**Changing cover band ELHZ / ELVZ 60, 80**

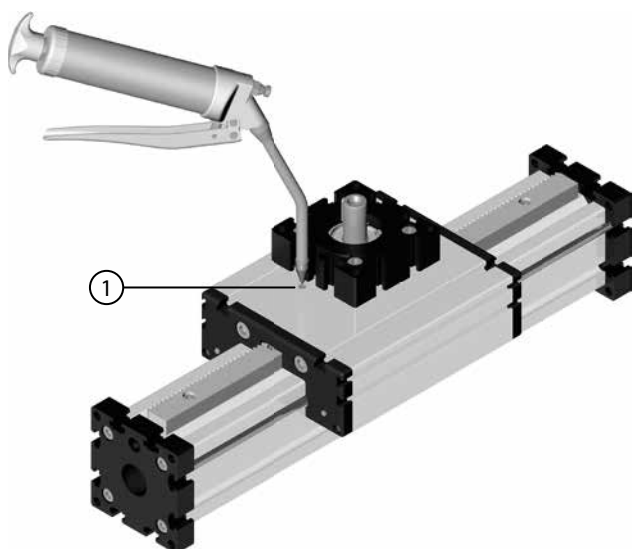
- Unscrew cylindric screws (9) on both sides of carriage (5).
- Push the wiper end plates (4) to the side.
- Unscrew the grub screws (2) and pull out the old coverband (6).
- Push the new coverband under both sliding block (8) in the carriage (5) and wiper end plates (4) into the bearing block (1).
- Fix the grub screw (3) on one side.
- Tense the coverband with a pointed pliers and fix the screws (3) on the opposite side.

**Changing cover band ELHZ / ELVZ 100, 125**

- Unscrew cylindric screws (9) on both sides of carriage (5).
- Push the wiper end plates (4) to the side.
- Unscrew the grub screws (2) and pull out the old coverband (6).
- Push the new coverband under both sliding block (8) in the carriage (5) and wiper end plates (4) into the bearing block (1).
- Fix the grub screw (3) on one side.
- Tense the coverband with a pointed pliers and fix the screws (3) on the opposite side.

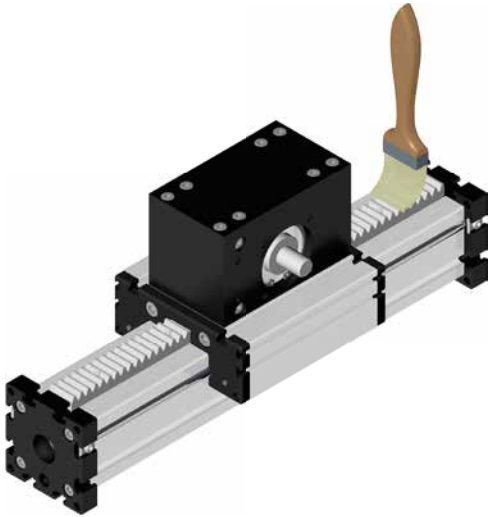
**Important:**

Measure the distance "s" between the corner of carriage and the head of the grub screw for belt-tension!

**Lubrication rack ELZQ**

- The rack can be relubricated through a lubricating nipple (1) in the carriage.
- Regrease with an oil gun.

## Lubrication rack ELZA / ELDZA

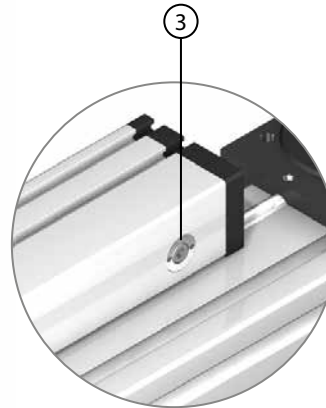
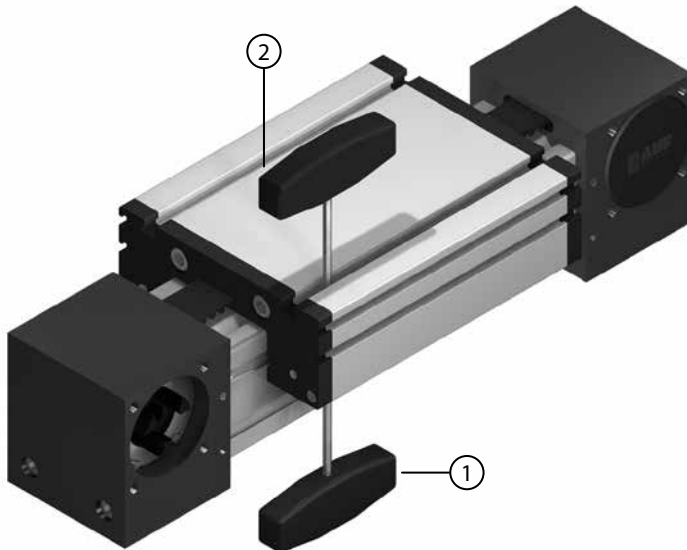


Lubrication is only necessary for steel- or stainless-steel racks and steel- or stainless-steel gears. All other material combinations are maintenance-free.

- Push the carriage close to one bearing-block.
- Grease the rack with a brush.  
Use SKF grease LGMT for this.
- After lubrication, move a few times over the entire stroke so that the lubricant can be distributed well over the entire rack.

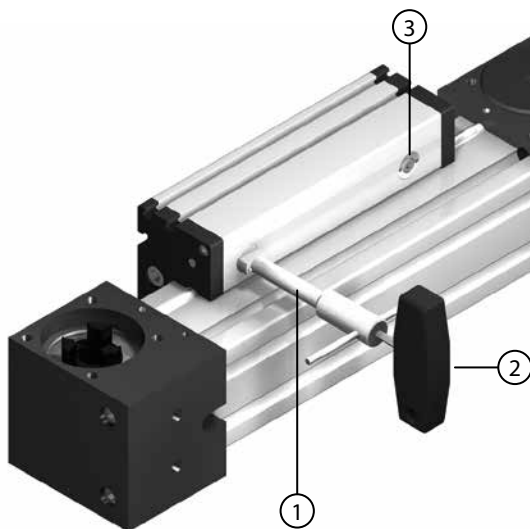
5.2

## Adjusting the rollers, sizes EL 40, 60

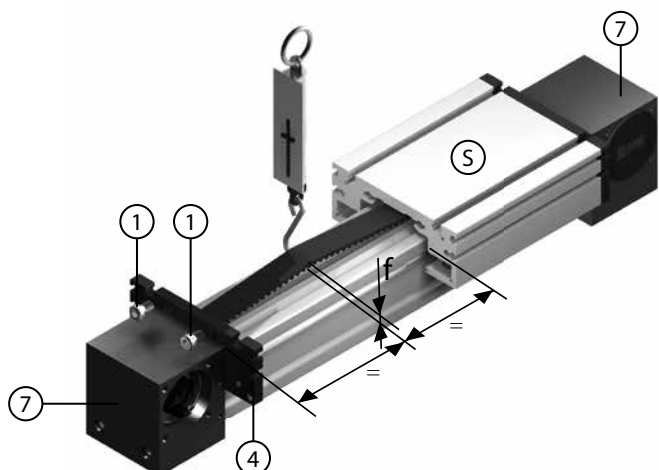


- Fasten eccentric bolt with screw key (1).
- Unscrew screw with hexagon socket screw key (2) as far as eccentric bolt can be turned, upper surface is stamped, broken line of stamp (3) must coincide with drawing groove of slide.
- Adjust at other side without initial tension.
- Stamps must be in same position and eccentric bolt must be adjusted into right direction.

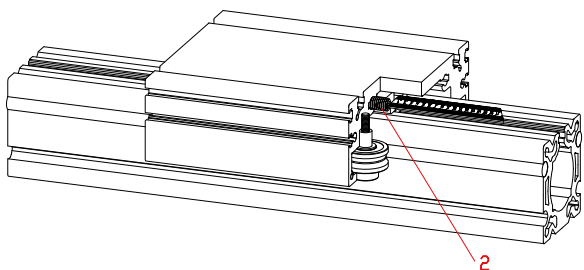
## Adjusting the rollers, sizes EL 30, 80, 100, 125



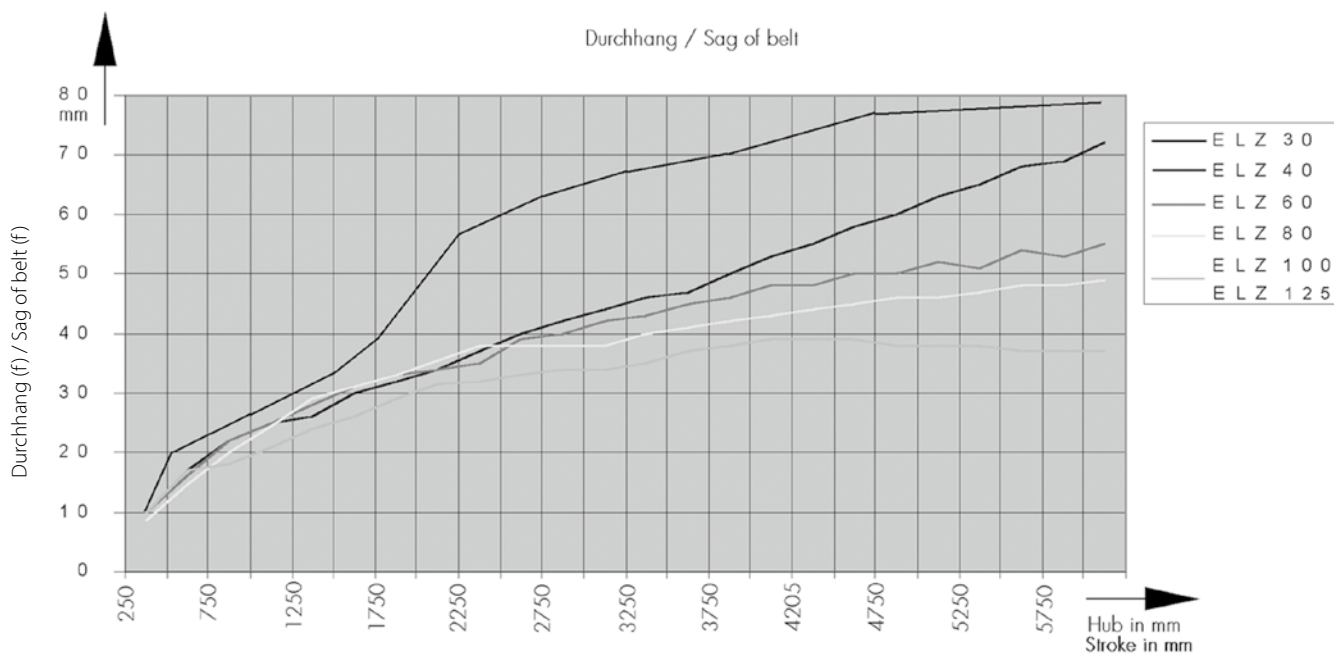
## Belt tension ELZ



- Push the carriage (5) close to one bearing-block (7).
- Unscrew grub screws (2) of the wiper endplate (4) and push it to the other bearing-block (7).
- Pull the spring balance with force of table and measure the sag (f) of the belt. Compare the measured value with the table.
- Tense or release the belt by the grub screws (2).
- Both grub screws (2) must have the same distance between the corner of the carriage (5) and the head of the grub screw (2).
- The grub screws (2) have to be secured by bonding.
- Measure the distance (s) with a metal rule.
- Mount the wiper endplate (4).

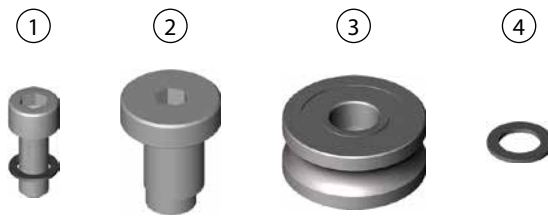
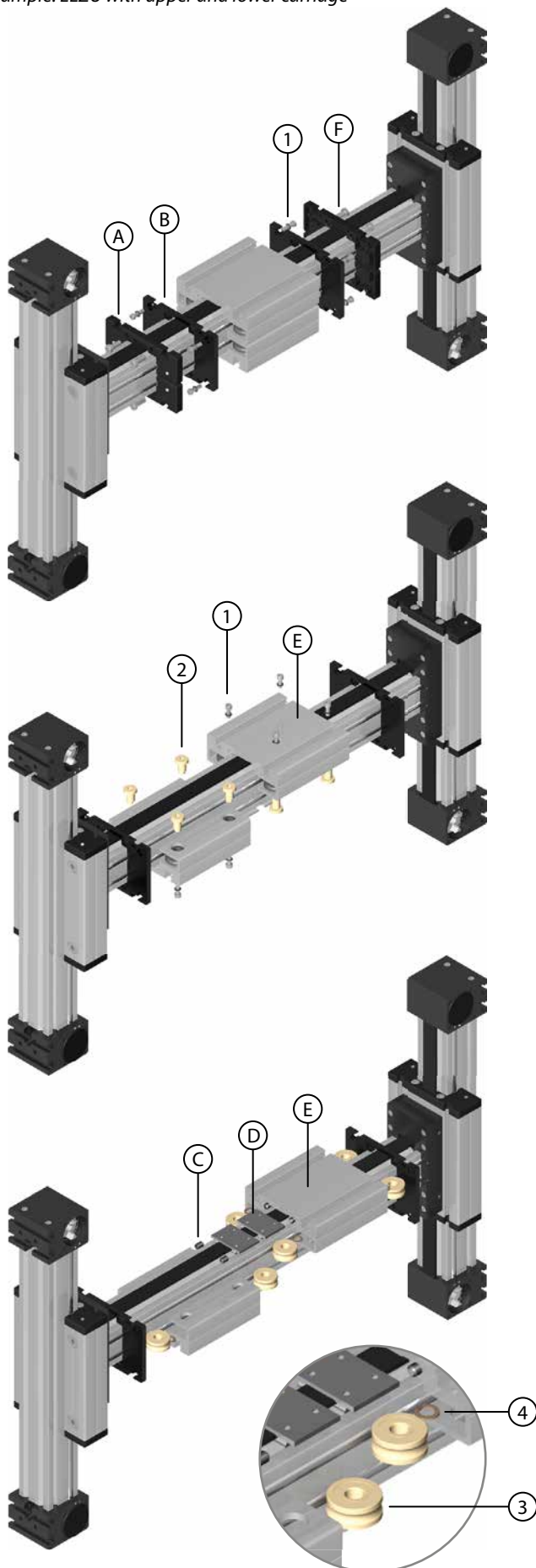


Size	Force
30	20 N
40	20 N
60	30 N
80	50 N
100	50 N
125	50 N



## Exchange of rollers ELZ

Example: ELZU with upper and lower carriage

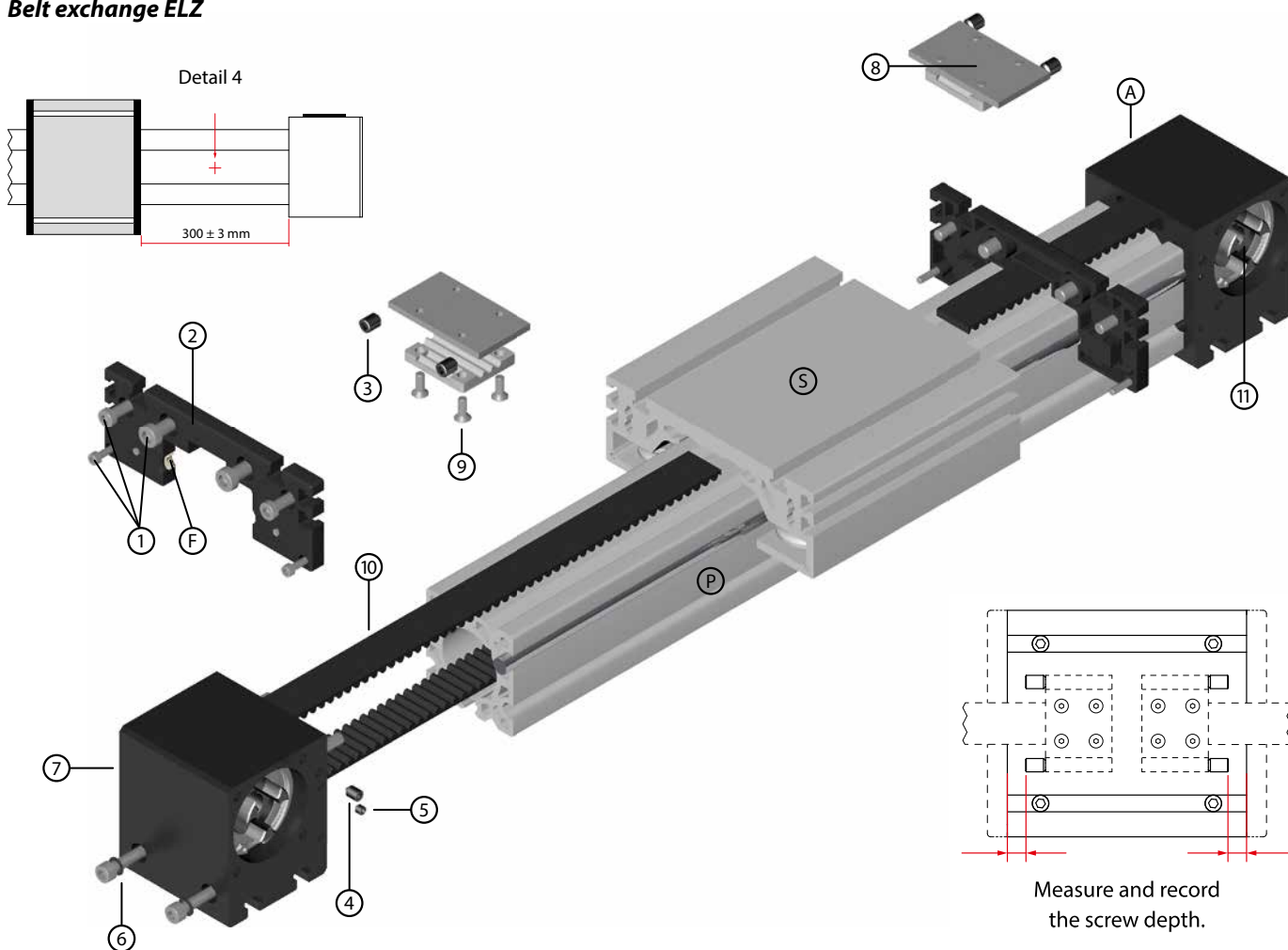


- ① Clamping screw with schnorr washer
- ② Eccentric bolt
- ③ Roller
- ④ Adjusting washer

- Unscrew clamping screws (F) and dismount the wiper end plates (A) and put them aside.
- Unscrew clamping screws (1) and push the connecting flange (B) to the side.
- Loosen the grub screws (C) from the belt tensioner (D). Now the carriage can be freely moved.
- Unscrew the clamping screws (1) in the carriage (E) and remove eccentric bolt (2).
- Remove rollers (3) and adjusting washers (4).
- Insert new rollers: Put the adjusting washer (4) into the existing milled opening. Place the roller (3) onto the adjusting washer (4) so that it accurately fits. Re-insert eccentric bolt (2). Tighten the clamping screws (1) carefully so that the eccentric bolt (2) is still freely movable.
- **Adjust the rollers!**
- After the rollers have been successfully adjusted, fix the clamping screws (1).



## Belt exchange ELZ



- Unscrew cylindrical screws (1) and dismount wiper end plates (2) on both sides of the carriage.  
*Take care, that the felt wipers (F) don't drop out.*
- The belt adjusters are fixed by grub screws (3) in the carriage (S); to reach the right belt tension measure the distance between the edge of the carriage and the head of the grub screws. **Notice: the distance must be the same on both sides in axial direction.**
- Unscrew the grub screws (3) and dismount the belt adjusters (8).
- Unscrew the grub screws (4 + 5) and the cylindrical screws (6) and separate the bearing-block (7) from the unit.
- Pull out the toothed belt (10). In most cases it is not necessary to separate both bearing blocks for inserting the new belt.

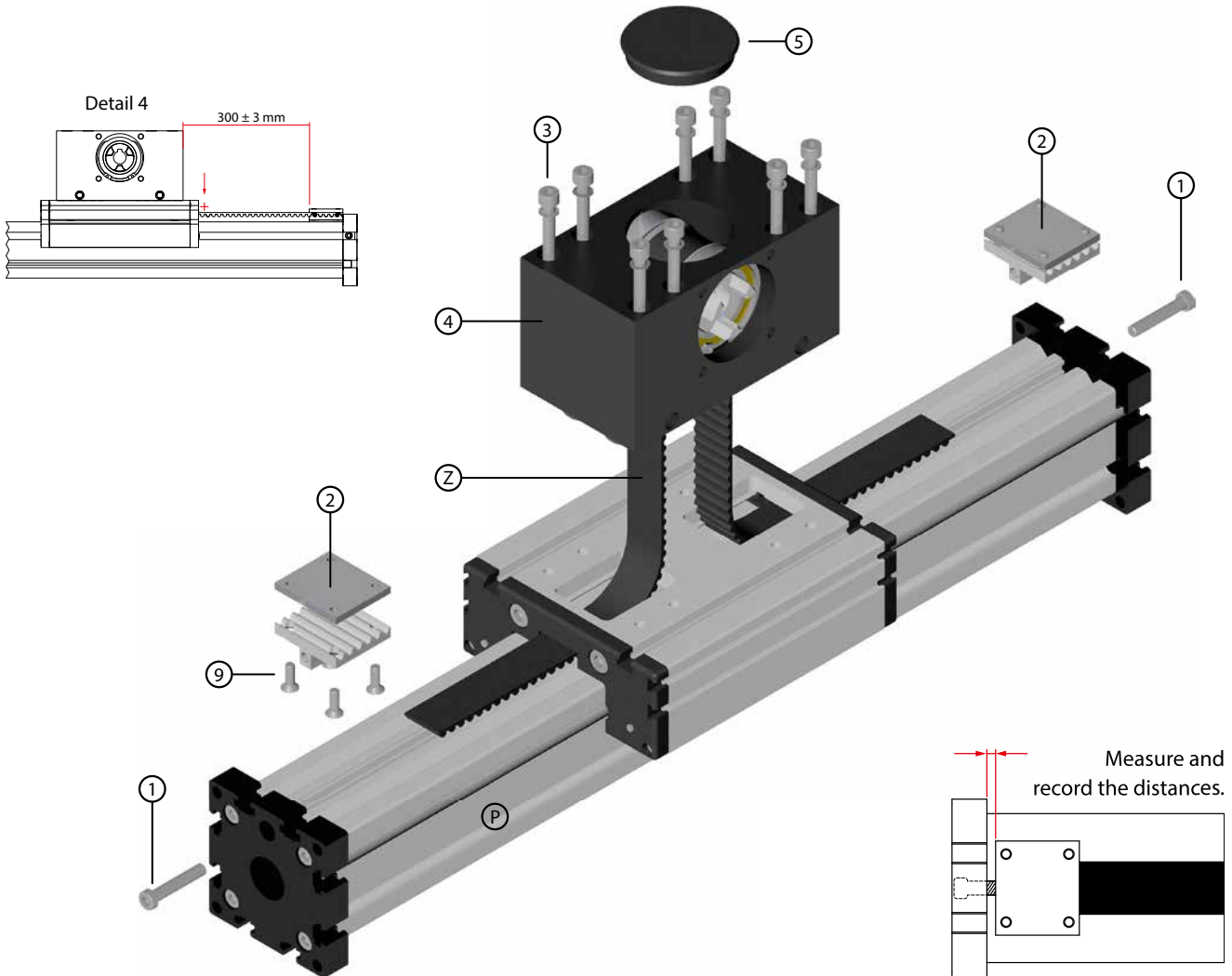
**The reconstruction of the unit takes place in opposite order.**

- Shorten the new belt to the length of the old one.
- Insert the toothed belt with the toothed side to the profile (P) into the not dismantled pulley block (A). Rotate the toothed pulley (11) until the toothed belt (10) appears at the end of the profile (P) and pull the belt through the dismantled pulley block (7).
- Mount the pulley block (7) on the profile (P) and tighten the grub screws (4 + 5) and the cylindrical screws (6).
- Mount the belt adjusters (8) on the ends of the toothed belt and secure the countersunk screws (9) by bonding.
- Insert the belt adjusters into the carriage (S) and secure the grub screws (3) by bonding.
- Tension the belt as per description above and finally mount the wiper end plates (2) on the carriage.

*(Notice: the easiest way for mounting the wiper end plates is to secure the wipers with a rubberband while mounting.)*

**Check for belt tension:** Set the distance between deflection unit and carriage to  $300 \pm 3$  mm (detail 4). Place the measuring device on the deflection unit or the carriage and position the sensor at 150 mm close to the toothed belt. Then use an Allen key to vibrate the belt. Adjust the belt tension to  $75 \pm 5$  Hz.

## Belt exchange ELSZ



Measure and record the distances on both sides between bearing block and belt tensioner.

- Unscrew the fastening screws (1) of the belt tensioners (2) and remove the screws on both sides.
- Disassemble the two belt tensioners (2) and remove them from the toothed belt (Z).
- Unscrew the fastening screws (3) of the omega deflection unit (4).
- Remove the cover cap (5).
- Pull the toothed belt (Z) out of the omega deflection unit (4).

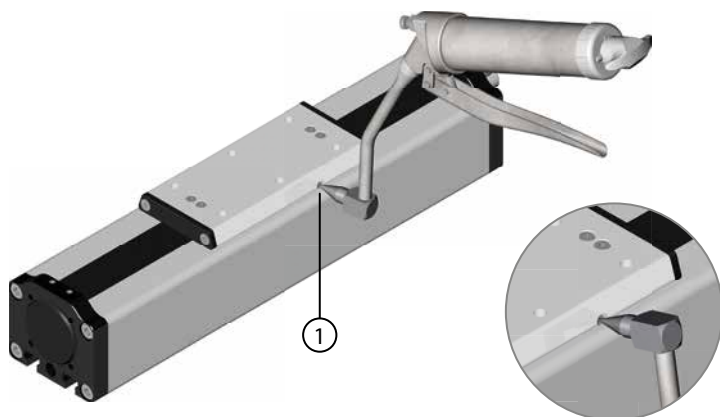
**To mount the new toothed belt please follow the steps in reverse order.**

- Cut the new toothed belt to the length of the old one.
- Thread the belt into the deflection unit, with the tothing towards the profile (P).
- Retighten the omega deflection unit (4) with the fastening screws (3).

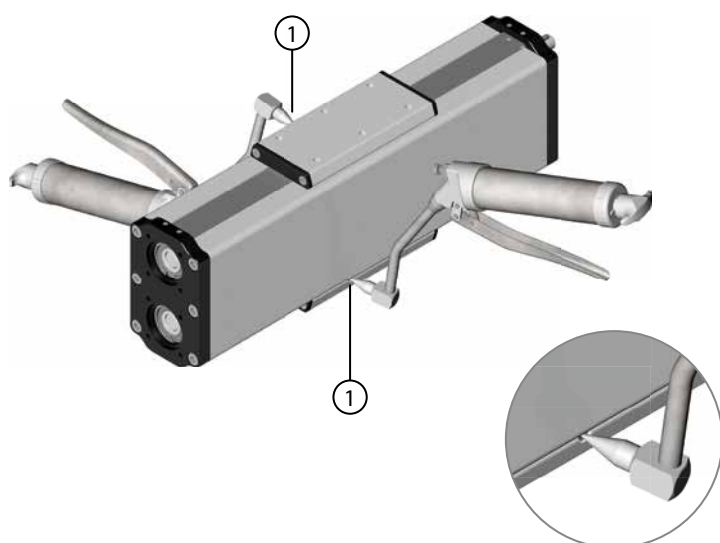
*The countersunk head screws (9) of the belt tensioners must be secured with screw locking devices.*

- Screw in the fastening screws (1) of the belt tensioners (2).
- The fastening screws (1) must be secured with screw locking devices.*
- Re-insert the (5) cover cap.

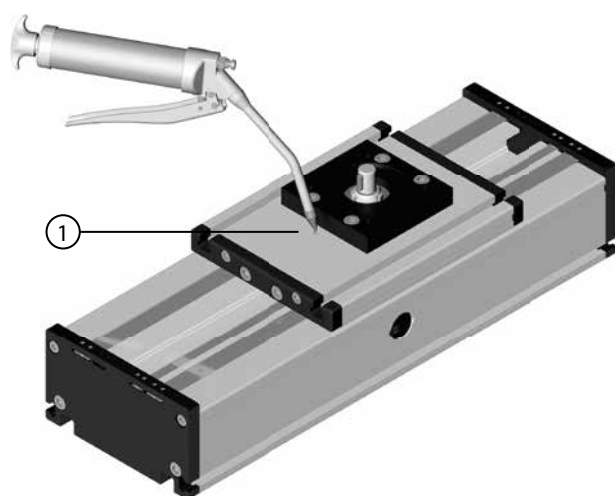
**Check for belt tension:** Set the distance between belt tensioner and omega deflection unit to  $300 \pm 3$  mm (detail 4). Place the measuring device on the carriage and position the sensor close to the carriage above the toothed belt. Then use an Allen key to vibrate the belt. Adjust the belt tension to  $75 \pm 5$  Hz.

**Lubrication spindle GG**

- The spindle can be relubricated through a lubricating nipple (1) in the carriage.
- Regrease with a grease gun.  
Grease volume 3g.  
Spindle greasing every 500 - 1000 working hours.

**Lubrication spindle GDG**

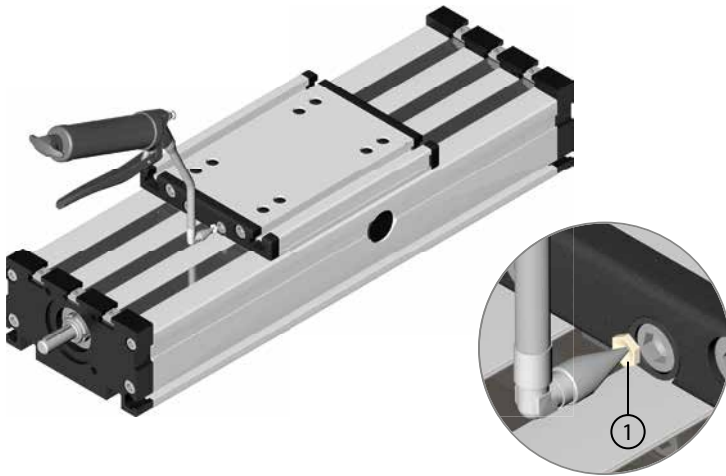
- All spindle can be relubricated through lubricating nipples (1) in the carriage.
- Regrease with a grease gun.  
Grease volume 3g.  
Spindle greasing every 500 - 1000 working hours.

**Lubrication rack DLZA**

- The rack can be relubricated through a lubricating nipple (1) in the carriage.
- Regrease with an oil gun.

**Lubrication leading-nut**

Applies to all positioning systems from 2017 onwards.

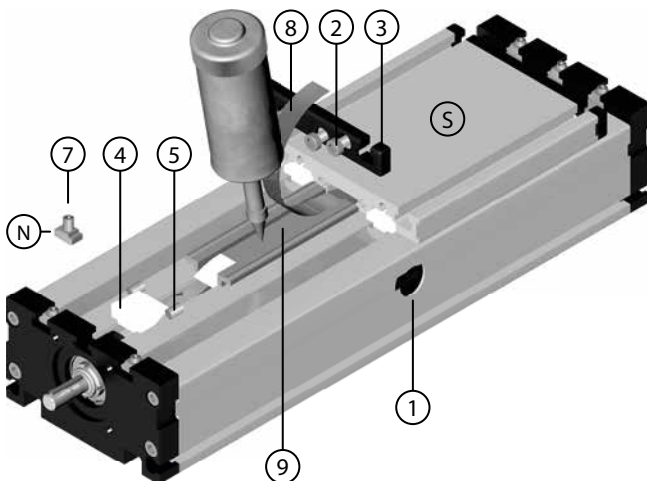


**DLK / DLT** 120, 160, 200  
**DSK / DST** 120, 160, 200

- The leading-nut can be relubricated through a lubricating nipple (1) in the carriage.
- Regrease with a grease gun.

For the quantity of grease see table below.  
Spindle greasing every 500 - 1000 working hours.

Type	Pitch	Quantity	Type	Pitch	Quantity
120	KG 16 x 05	1,33 g	120/160	KG 25 x 25	3,00 g
120	KG 16 x 10	0,84 g	200	KG 32 x 05	3,00 g
120	KG 16 x 16	1,00 g	200	KG 32 x 10	4,00 g
120/160	KG 20 x 20	3,00 g	200	KG 32 x 20	4,00 g
120/160	KG 25 x 05	2,00 g	200	KG 32 x 32	4,00 g
120/160	KG 25 x 10	3,00 g			

**Lubrication leading-nut**

**DLK / DLT** 120, 200  
**DSK / DST** 120, 200

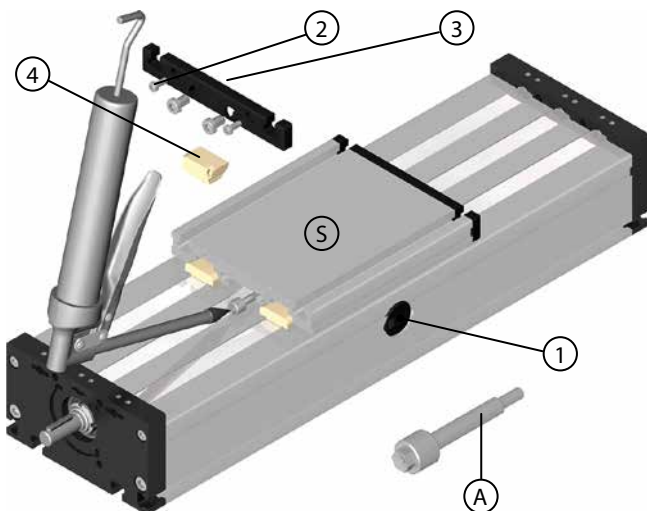
Applies to all positioning systems up to December 2016.

- Drive the carriage (S) to the service position (1).
- Remove the fillister head screws (2) and dismount cover cap (3).
- Remove the middle slider (4) and unscrew set screws (5).
- Push carriage (S) to the side.
- Release the set screw (7) and remove it using the sliding nut (N).
- Pull out and lift the cover band (8), now the lubrication hole is visible in the leading-nut receptacle (9).
- Regrease with grease gun.

For the quantity of grease see table below.

**DLT / DLK** 160  
**DST / DSK** 160

Applies to all positioning systems up to December 2016.

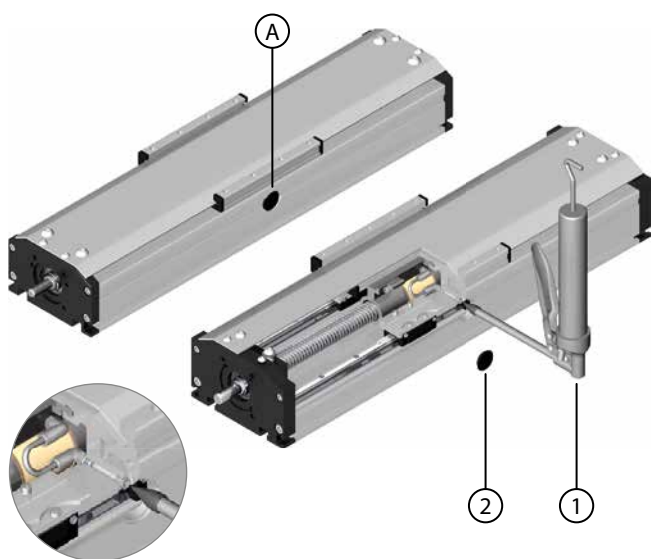


- Drive the carriage (S) to the service position (1).
- Remove the fillister head screws (2) and dismount cover cap (3).
- Remove the middle slider (4).
- Insert the regreasing adapter (A) into the lubrication hole of the leading-nut receptacle.
- Regrease now with grease gun. For the quantity of grease see table below.

Spindle greasing every 500 - 1000 working hours.

Type	Pitch	Regreasing	Type	Pitch	Regreasing
120	KG 16 x 05	1,33 g	120/160	KG 25 x 25	3,00 g
120	KG 16 x 10	0,84 g	200	KG 32 x 05	3,00 g
120	KG 16 x 16	1,00 g	200	KG 32 x 10	4,00 g
120/160	KG 20 x 20	3,00 g	200	KG 32 x 20	4,00 g
120/160	KG 25 x 05	2,00 g	200	KG 32 x 32	4,00 g
120/160	KG 25 x 10	3,00 g			

## Lubrication leading-nut



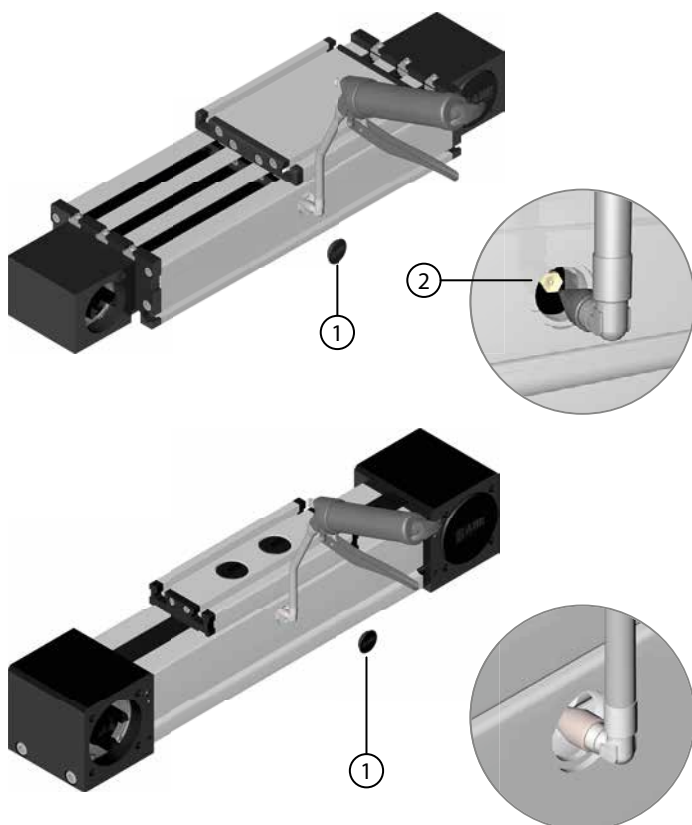
## DST/K 120 P, 160 P and 200 P

- Drive the carriage to the service position (A).
- Dismount the cover cap (2). Regrease with an grease gun (1). For the quantity of grease see table below.

Spindle greasing every 500 - 1000 working hours.

Type	Pitch	Regreasing	Type	Pitch	Regreasing
120	KG 16 x 05	1,33 g	120/160	KG 25 x 25	3,00 g
120	KG 16 x 10	0,84 g	200	KG 32 x 05	3,00 g
120	KG 16 x 16	1,00 g	200	KG 32 x 10	4,00 g
120/160	KG 20 x 20	3,00 g	200	KG 32 x 20	4,00 g
120/160	KG 25 x 05	2,00 g	200	KG 32 x 32	4,00 g
120/160	KG 25 x 10	3,00 g			

## Lubrication guiding rods

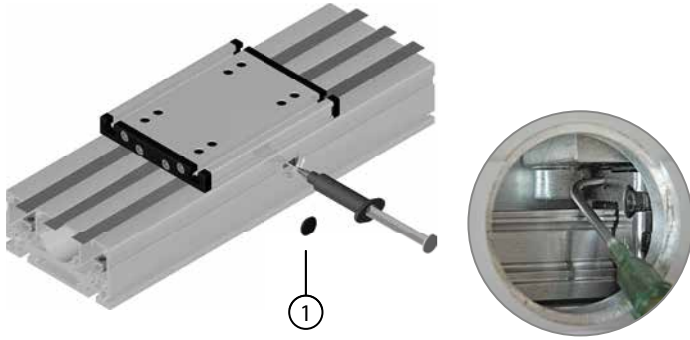
DL 120, 160, 200  
QL 60, 80, 100

Lubrication is effected by an oiled felt insert. The felt can be re-oiled through lubrication nipples attached laterally to the ends of the roller packs.

- Dismount cover cap (1).
- Drive the carriage through the service position until you can see the first lubricating nipple (2) in the lubrication hole.
- Re-oiled felt now with an oil gun.
- Move the carriage to the second lubricating nipple and re-oiled here as well.

Oils with a viscosity of approx. 200 mm<sup>2</sup>/s at T=40°C are recommended. The required regreasing intervals depend on environmental conditions, the standard recommendation is once per month. To ensure a sufficient lubrication, the minimum stroke must equal the carriage length, so that sufficient greasing is achieved also in the final positions.

**Lubrication runner blocks DS 120**

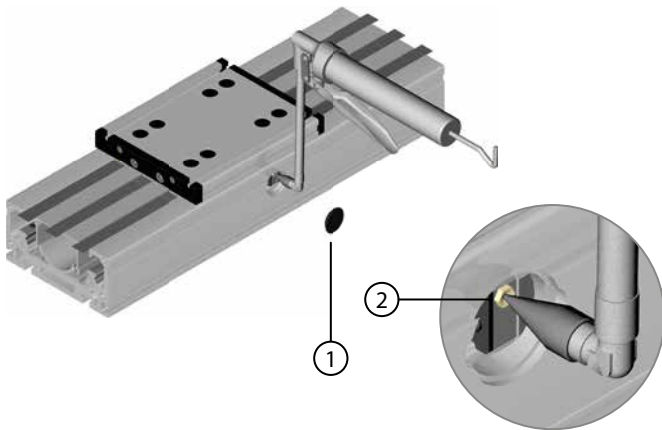


- Dismount cover cap (1).
- Drive the carriage through the service position until you can see the first runner block in the lubrication hole.
- Re-greasing with a cartridge with cannula.
- Move the carriage to the next runnerblock and re-grease here as well.



5.2

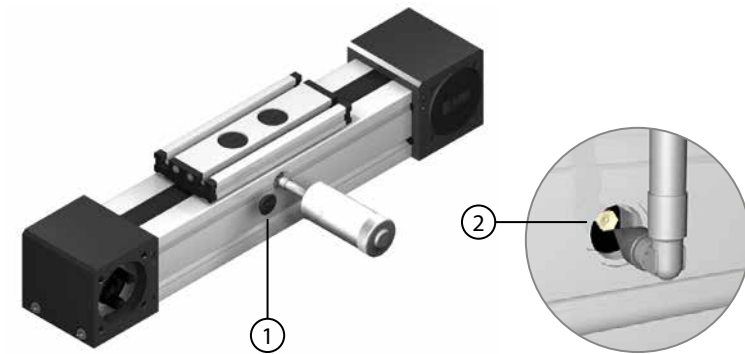
**Lubrication runner blocks DS 160, 200  
QS 60, 80, 100**



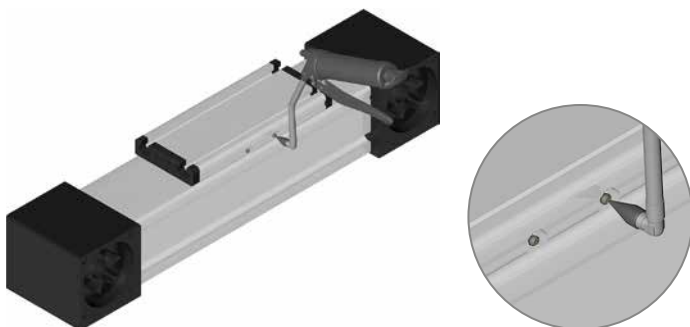
Runner blocks have to be regreased with high quality bearing grease.

- Dismount cover cap (1)
- Drive the carriage through the service position until you can see the first greasing nipple (2) in the lubrication hole.
- Re-greasing with grease gun.
- Move the carriage to the second greasing nipple and re-grease here as well.

*We recommend bearing grease based on DIN 51825. The required regreasing intervals depend on environmental conditions, the standard recommendation is once per 1.000 km\*. \*DS 120: 150 km*

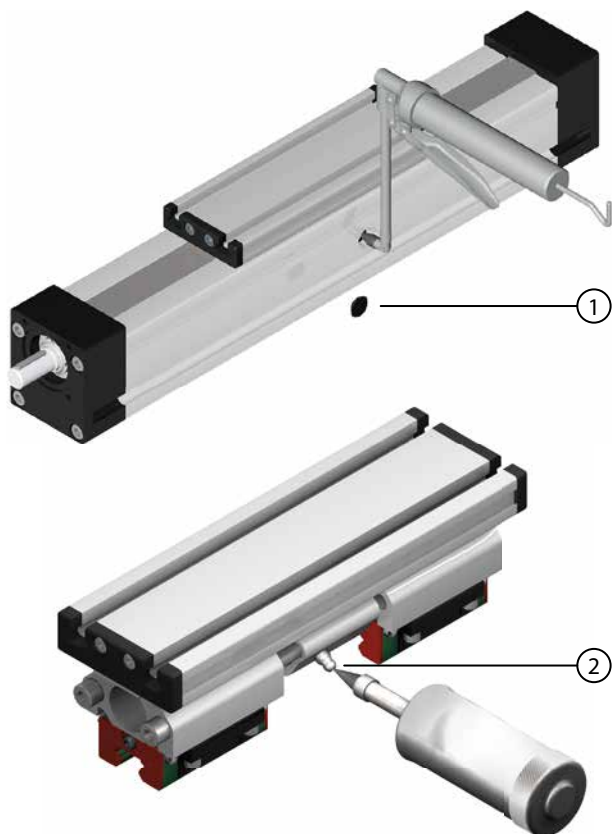


**Lubrication runner blocks QS 125**



Re-greasing with a grease gun directly at the carriage side.

Relubrication			
Type	Quantity	Type	Quantity
DS 120	0,3ml	QS 60	0,4ml
DS 160	0,4ml	QS 80	0,5ml
DS 200	0,8ml	QS 100	0,8ml
		QS 125	1,2ml

**Lubrication leading-nut QST / QSK 60, 80, 100**


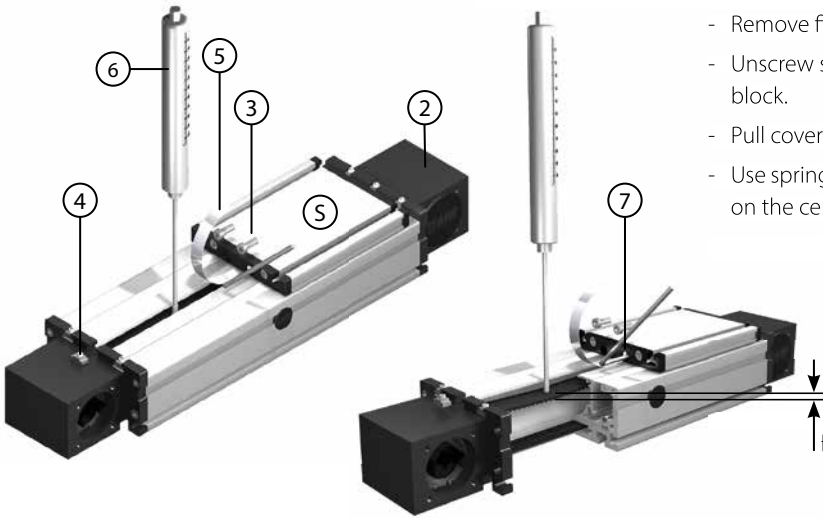
Leading-nuts have to be regreased with high quality bearing grease.

- Dismount cover cap (1).
- Drive the carriage through the service position until you can see the first greasing nipple (2) in the grease hole.
- Regrease felt now with an grease gun.
- Move the carriage to the second greasing nipple and re-grease here as well.

*We recommend bearing grease based on DIN 51825. The required regreasing intervals depend on environmental conditions, the standard recommendation is once per 1.000 km.*

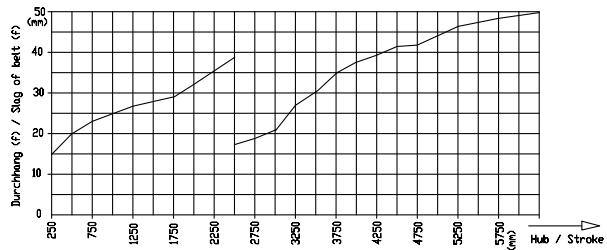
Type	Pitch	Regreasing	Type	Pitch	Regreasing
<b>60</b>	KG 16 x 05	1,33 g	<b>100</b>	KG 32 x 05	3,00 g
<b>60</b>	KG 16 x 10	0,84 g	<b>100</b>	KG 32 x 10	4,00 g
<b>60</b>	KG 16 x 16	1,00 g	<b>100</b>	KG 32 x 32	4,00 g
<b>80</b>	KG 20 x 20	3,00 g			
<b>80</b>	KG 25 x 05	2,00 g			
<b>80</b>	KG 25 x 10	3,00 g			

### Belt tension adjustment DLZ / DSZ 120, 160, 200

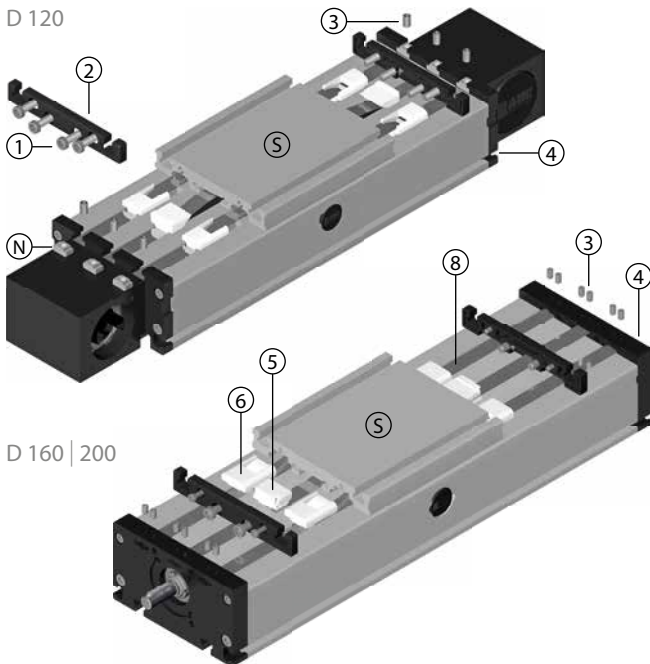


- Push the carriage (S) close to one bearing block (2).
- Remove fillister head screws (3).
- Unscrew set screws (4) for middle cover band (5) at the opposite bearing block.
- Pull cover band out of bearing block and turn it to the side.
- Use spring balance (6) to exert the applicable amount of force (see table) on the center of the belt and measure the sag (f).
- Compare the measured value with the diagram below, and tense of release belt as required by tightening or unscrewing the set screws (7).
- The set screws (7) must be bonded in place with screw locking device.
- Both screws (7) must be screwed in to exactly the same level. Check with sliding caliper.

Size	Stroke (mm)	Force (N)
120	< 2500	20
	2500 - 6000	10
160	< 2500	20
	2500 - 6000	10
200	< 2500	40
	2500 - 6000	20



### Changing cover band



### DLZ / DSZ 120, 160, 200

### DLT / DLK / DST / DSK 120, 160, 200

- Drive the carriage (S) to servicing position.
- Remove fillister head screws (1) and wiper end plate (2).
- **Size 160 and 200:** Unscrew set screws (3) at both bearing-block plates (4) and pull the cover band out of the bearing block.
- **Size 120:** Unscrew set screws (3) and remove them with T-nut (N).
- Remove the sliders (5) and (6) from both sides of the carriage (S).
- Pull the cover bands (8) out of the carriage (S).
- Insert the new cover bands into the carriage (S).
- Thread the lateral sliders (6) onto the cover band and insert it into the carriage with middle slider (5).
- **Size 160 and 200:** Tighten cover bands on one side of the bearing block with set screws (3), tense cover band (8) at the other bearing block using pliers and tighten with set screws (3).
- **Size 120:** Insert T-nut together with set screw into the bearing block plates (4) and tighten cover band (8) with set screw (3).

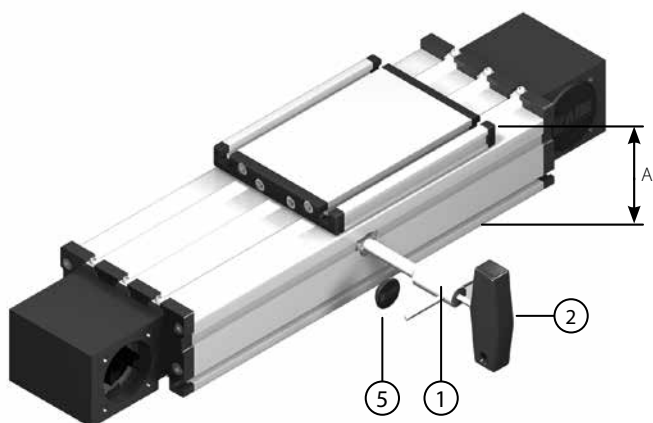


## D / Q - units

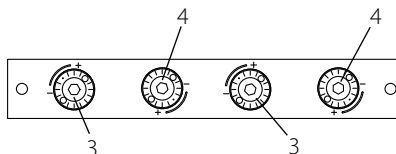
## ADJUSTING THE ROLLERS

### Adjusting the rollers

DL 120, 160, 200

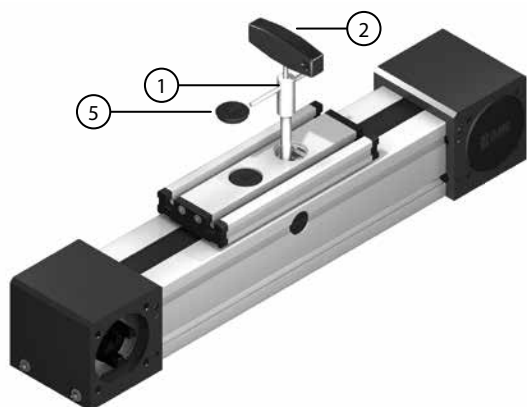


- Dismount cover cap (5) from servicing hole.
- Fasten eccentric bolt with screw key (1).
- Release screws with hexagon socket screw key (2) until the eccentric bolt can be turned.
- Adjust the gap dimension (A) between top of the carriage and body ground of guiding profile by turning the eccentric bolts (3). Turning towards + will increase the dimension A.  
DL 120: A=79 mm; DL 160: A=106 mm; DL 200: A=129 mm
- Turn the eccentric bolts (4) to adjust the carriage free of play by the touch (without initial tension).
- Ensure that the eccentric bolts are adjusted to the right.



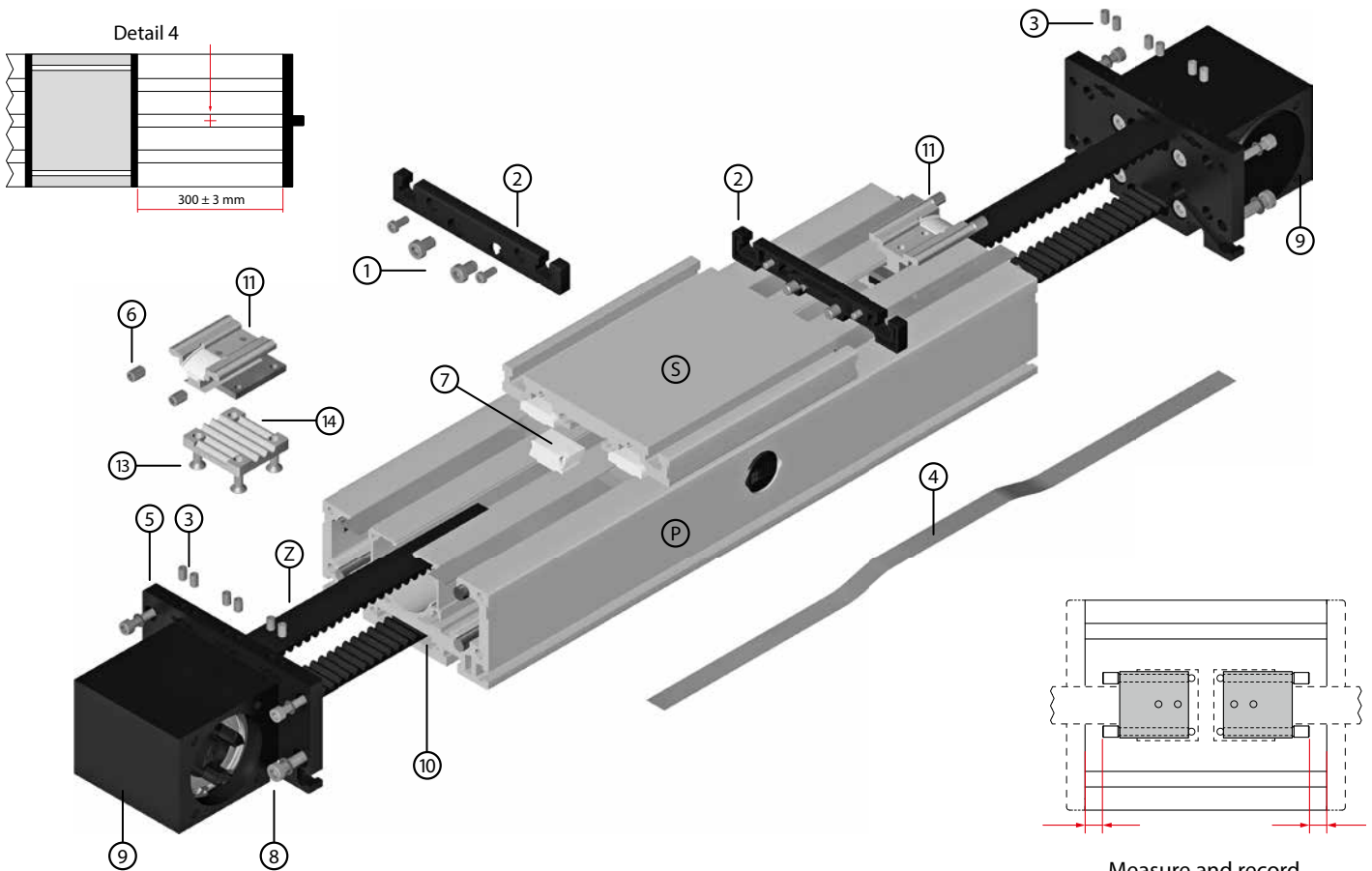
### Adjusting the rollers

QL 60, 80, 100



- Dismount cover cap (5) from servicing hole.
- Fasten eccentric bolt with screw key (1).
- Release screws with hexagon socket screw key (2) until the eccentric bolt can be turned.
- Turn the eccentric bolts to adjust the carriage free of play (without initial tension).
- Ensure that the eccentric bolts are adjusted to the right.

## Belt exchange DL / DS 120, 160, 200



Measure and record the screw depth.

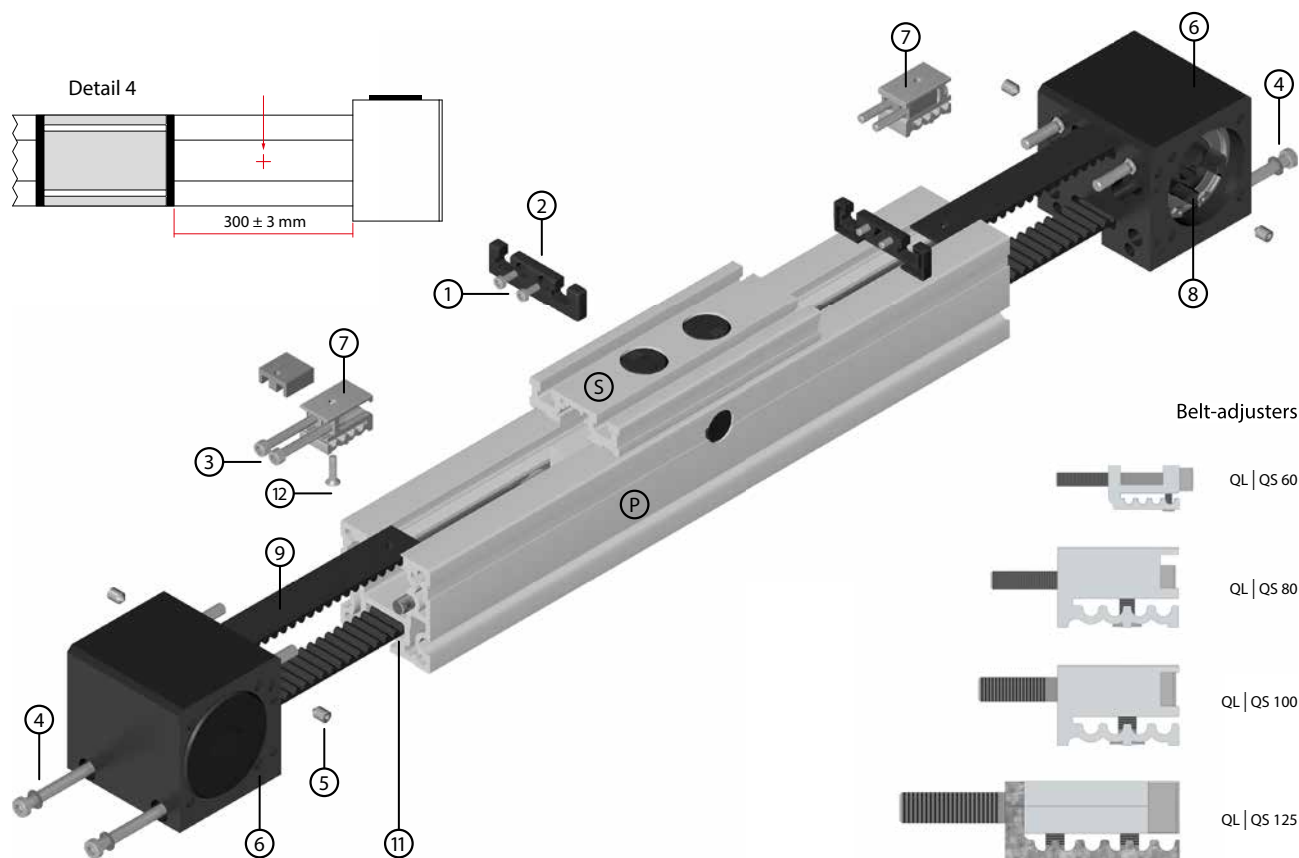
- Unscrew cylindric screws (1) and dismount the wiper end plates (2) on both sides of the carriage.
- Unscrew grub screws (3) on both sides of the unit and pull out only the middle cover band (4) of the bearing-block plate (5).
- Pull only the middle sliding block (7) out of the carriage.
- The belt adjusters are fixed by grub screws (6) in the carriage (S); to reach the right belt tension, measure the distance between the edge of the carriage (S) and the head of the grub screws (6).
- Unscrew grub crews (6) on both sides of the carriage (S).
- Unscrew cylindric screws (8) at the bearing-block plates (5) and dismount them completely with the bearing-blocks (9) at both ends of the unit.
- Pull out the belt-adjusters (11) completely with the belt out of the carriage (S) and the guiding-profile (P).
- Unscrew the countersunk head screws (13) and dismount the belt-adjuster (11,14).

#### Reconstruction of the unit in opposed order.

- Shorten the new belt to the length of the old one.
- Push the belt with teeth side up to the carriage (S) into the slot of the guiding-profile (10) and push it with the ends through each bearing-block (9).
- Mount the belt-adjusters (11,14) by the countersunk head screws (13). **Secure the countersunk head screws (13) by bonding.**
- Push them again together with the belt (Z) into the guiding-profile (P) and then into the carriage (S).
- Mount the bearing-block plates (5) again together with the bearing-blocks (9) at the ends of the unit.
- Screw the grub screws (6) into the carriage (S) as far as the recorded screwing depth. **Secure the grub screws (6) by bonding.**
- Pull the middle cover-band (4) through the carriage (S).
- Pull in the middle sliding block (7) into the slot of the carriage (S).
- Mount the grub screws (3) on one side of the unit and tension the 3 cover-bands from the other side and fix them too by the grub-screws (3).
- Finally mount the wiper end plates (2) on the carriage.

**Check for belt tension:** Set the distance between deflection unit and carriage to  $300 \pm 3$  mm (detail 4). Place the measuring device on the deflection unit or the carriage and position the sensor at 150 mm close to the toothed belt. Then use an Allen key to vibrate the belt. Adjust the belt tension to  $75 \pm 5$  Hz.

## Belt exchange QL / QS



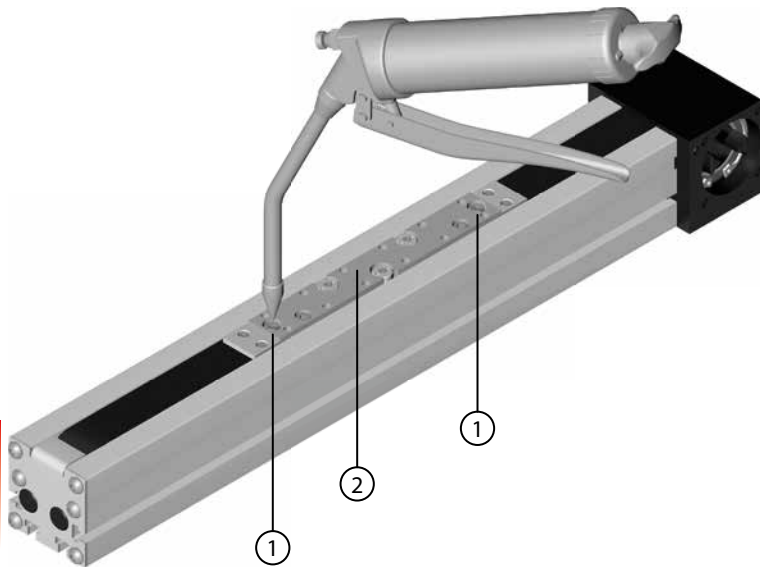
- Unscrew cylindric screws (1) and dismount the wiper end plates (2) on both sides of the carriage.
- Unscrew cylindric screws (3) on both sides of the carriage (S).
- Unscrew cylindric screws (4) and the grub screws (5) at the bearing-block (6) and dismount them completely at both ends of the unit.
- Pull out the belt-adjusters (7) completely with the belt out of the carriage (S) and the guiding-profile (P).
- Dismount the belt-adjusters. Unscrew the countersunk screws (12) from the belt-adjusters. Press the belt sideways out of both belt-adjusters (7).
- Pull the belt (9) completely out of the bearing-blocks (6).

**Reconstruction of the unit in opposed order.**

- Shorten the new belt to the length of the old one. The pre-existing holes must be drilled into the new toothed belt in the flank diameter of the screw (12).
- Push the belt with teeth side up to the carriage (S) into the slot of the guiding-profile (11) and push it with the ends through each bearing-block (6). **Tip:** rotate the toothed pulley (8) until the toothed belt appears through the bearing-block (6).
- Press the belt again into the belt-adjusters (7). **Secure the countersunk screws (12) by bonding.**
- Push them again together with the belt into the guiding-profile (P) and then into the carriage (S).
- Mount the bearing-blocks (6) again.
- Mount both belt-adjusters (7) into the carriage (S). **Secure the cylindric screws (3) by bonding.** You have to tension the belt with dosed force and test the soft running of the pulleys by turning them.
- Mount the the wiper end plates (2) again.

**Check for belt tension:** Set the distance between deflection unit and carriage to  $300 \pm 3$  mm (detail 4). Place the measuring device on the deflection unit or the carriage and position the sensor at 150 mm close to the toothed belt. Then use an Allen key to vibrate the belt. Adjust the belt tension to  $75 \pm 5$  Hz.

## Lubrication LLZ / LLZE



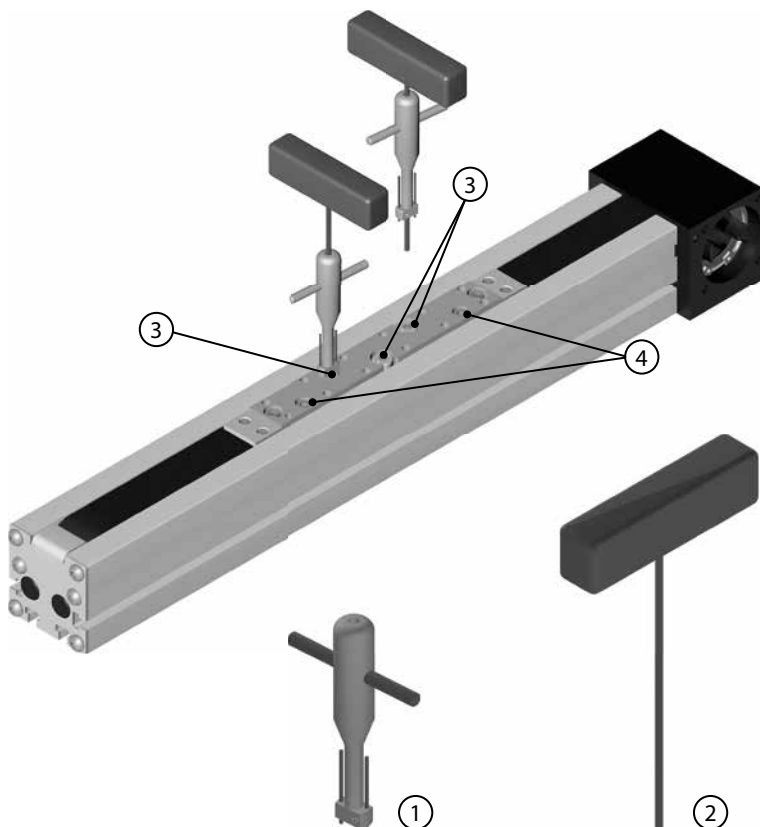
Rods will be greased by the strippers of carriage.

There are 2 oil nipples (1) in the carriage (2), where the tanks for the strippers can be filled with an oil gun.

Viscosity of oil:  $200 \text{ mm}^2/\text{s}$ ,  $T = 40^\circ \text{ C}$ . Interval of greasing depends on environmental conditions, min. once a month. Minimum stroke must be same than length of slide.

5.2

## Adjusting the rollers LLZ / LLZE



① Eccentric key for tightening the 2-hole counter nut.

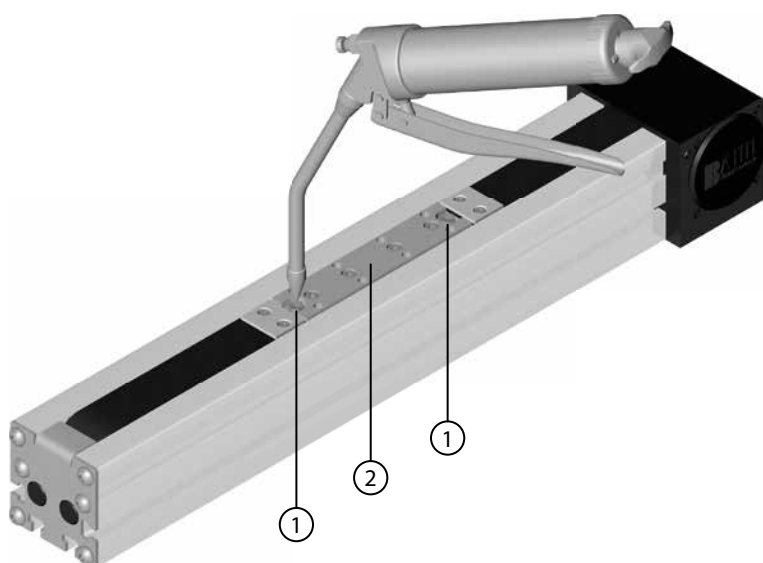
② Hexagon socket for adjusting the eccentric.

③ Adjustable rollers

④ Non adjustable rollers

- Loose the 2-hole counter nut with the eccentric key (1).
- Try to turn the eccentric with the hexagon socket (2). The eccentric must be movable.
- Turn the eccentric with the hexagon socket closely and delicately to the right, until the eccentric is playless.
- Now fix the eccentric with the hexagon socket (2) and tighten the 2-hole nut by a turn to the right.

## Lubrication LSZ / LSZE

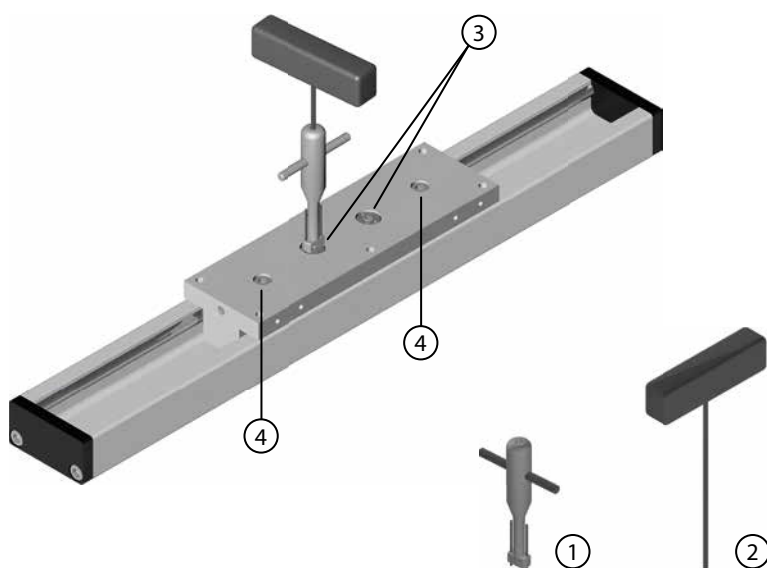


In the carriage (2) are two greasing nipples (1), where the runner blocks can be filled with an grease gun.

We recommend bearing grease based on DIN 51825. The required regreasing intervals depend on environmental conditions, the standard recommendation is once per 1.000 km\*.

Relubrication	
Type	Quantity
LS 60	0,4 ml
LS 80	0,5 ml

## Adjusting the rollers UL



① Eccentric key for tightening the 2-hole counter nut.

② Hexagon socket for adjusting the eccentric.

③ Adjustable rollers

④ Non adjustable rollers

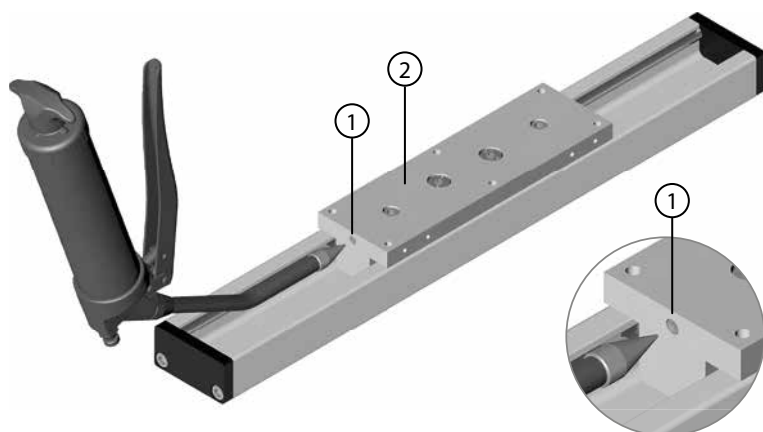
- Loose the 2-hole counter nut with the eccentric key (1).

- Try to turn the eccentric with the hexagon socket (2). The eccentric must be movable.

- Turn the eccentric with the hexagon socket closely and delicately to the right, until the eccentric is playless.

- Now fix the eccentric with the hexagon socket (2) and tighten the 2-hole nut by a turn to the right.

## Lubrication UL

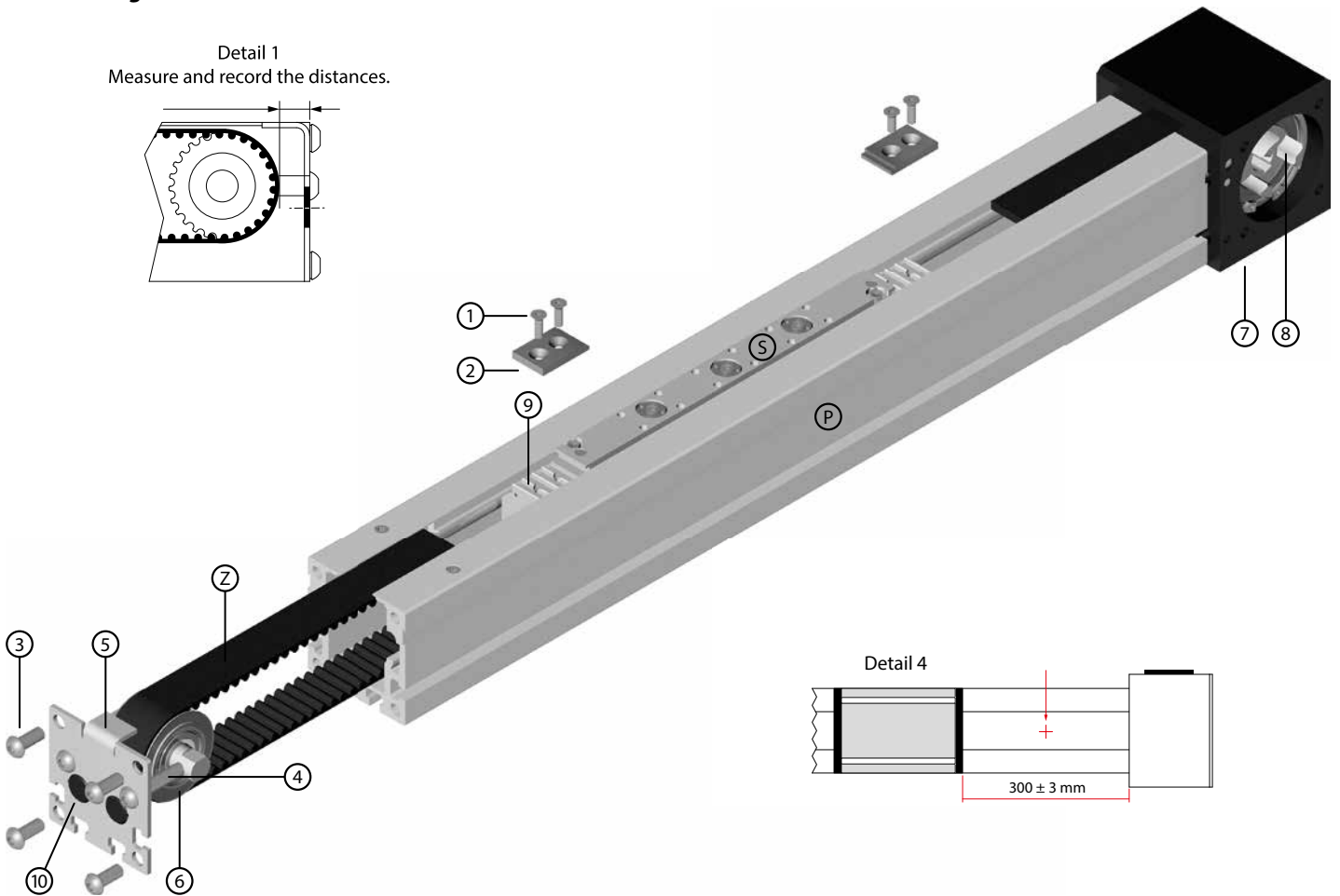


Rods will be greased by the strippers of carriage.

There are 2 oil nipples (1) in the carriage (2), where the tanks for the strippers can be filled with an oil gun.

Viscosity of oil: 200 mm<sup>2</sup>/s, T= 40° C. Interval of greasing depends on environmental conditions, min. once a month. Minimum stroke must be same than length of slide.

## Belt exchange LL / LS



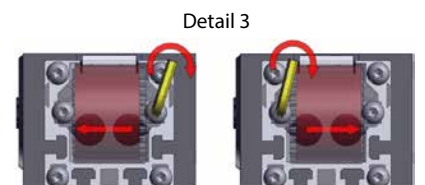
Remove the cover caps (10). Measure and record the distance between bearing block and belt (Detail 1).

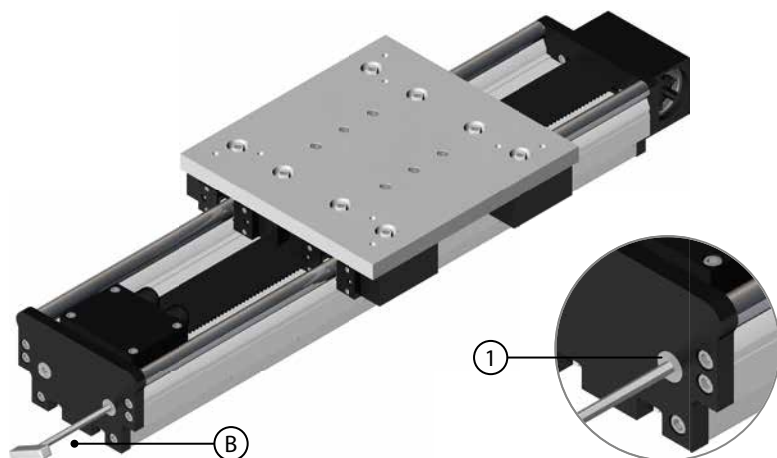
- Unscrew the fastening screws (2 pcs.) (4) and remove the bearing block (5).
- Unscrew the countersunk screws (1) and remove the fixing plates for the belt (2).
- Unscrew the fastening screws (4 pcs.) (3).
- Pull the toothed pulley (6) with timing belt (Z) out of the guide profile (P).

**To mount the new toothed belt please follow the steps in reverse order.**

- Cut the new toothed belt to the length of the old one. The pre-existing holes must be drilled into the new toothed belt in the flank diameter of the screw (1).
- Push the belt with teeth side up to the carriage (S) into the guiding-profile (P) and push it with the ends through each bearing-block (7). (Tip: rotate the toothed pulley (8) until the toothed belt appears through the bearing-block (7).
- Reposition the toothed pulley (8).
- Press the belt again into the belt-adjusters (9), remove the fixing plates (2) and screw in with the countersunk screws (1).  
**Secure the countersunk screws (1) by bonding.**
- Screw the fastening screws (3) of the bearing plate back in place.
- Screw fastening screws (4) back in place to tension the toothed belt. Pay attention to the recorded screw-in depth (Detail 3).  
**Secure the countersunk screws (4) by bonding.**
- The timing belt can be adjusted with the aid of the fastening screws (4). **Attention, you have to push the carriage by hand.**
- Re-insert the (10) the cover caps.

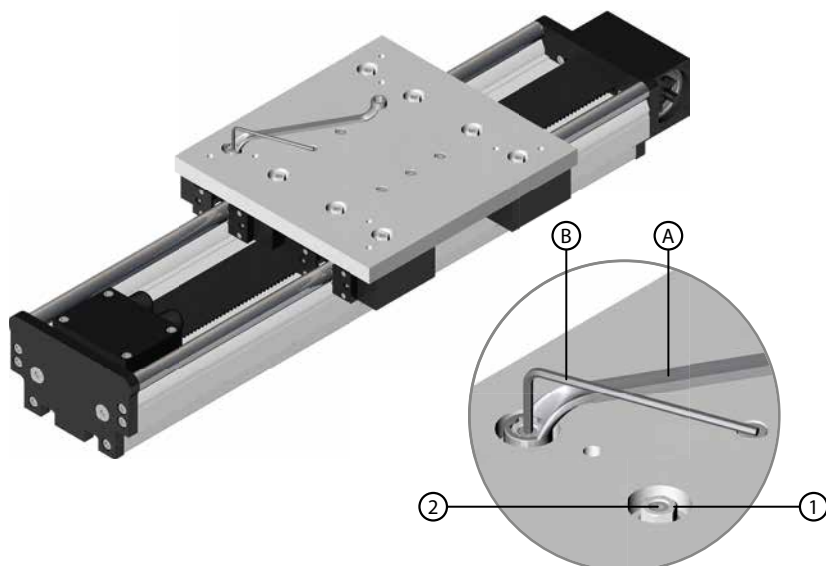
**Check for belt tension:** Set the distance between deflection unit and carriage to  $300 \pm 3$  mm (detail 4). Place the measuring device on the deflection unit or the carriage and position the sensor at 150 mm close to the toothed belt. Then use an Allen key to vibrate the belt. Adjust the belt tension to  $75 \pm 5$  Hz.



**ALLZ 203, 204 belt tension adjustment**

- (B) Hexagon socket wrench SW 10  
for belt adjustment screw (1)

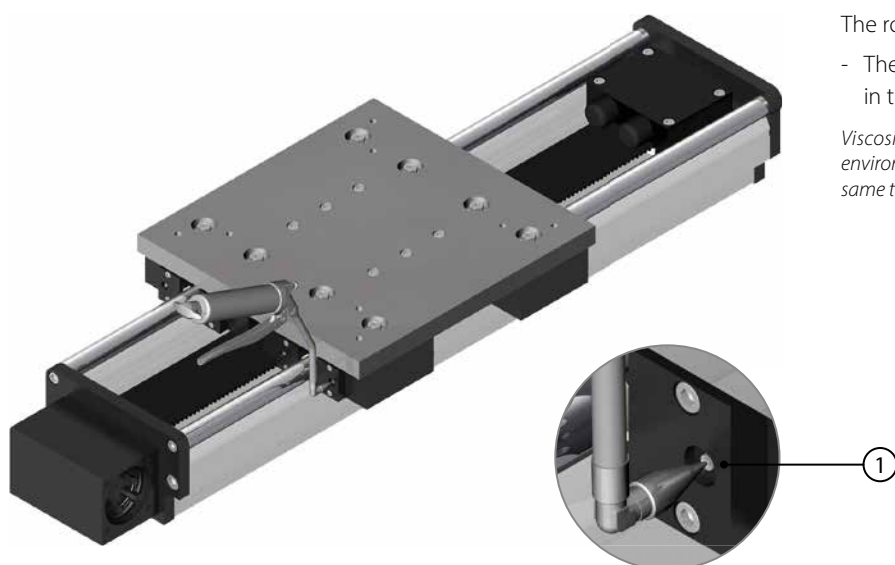
Adjust the belt adjustment screws (1) evenly and in accordance with the respective application.

**ALLZ 203, 204 roller adjustment**

- (A) Ring wrench (cranked)  
for tightening and fixing the hexagon nut.

- (B) Hexagon socket wrench  
for adjusting the eccentrics.

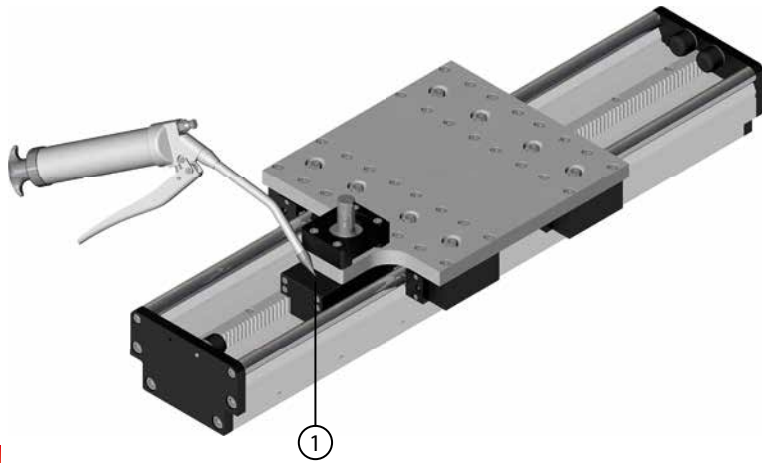
- Loosen the hexagon screw (1), so that the eccentric can be rotated.
- Adjust the carriage without backlash by rotating the eccentrics (2) in small increments.
- After the eccentrics have been adjusted, fix the eccentric using the hexagon socket wrench (B) and tighten the hexagon socket (1) using the cranked ring wrench (A).

**ALL roller lubrication**

The rollers are lubricated by means of an oiled felt insert.

- The felt can be relubricated through lubricating nipples (1) in the carriage.

Viscosity of oil: 200 mm<sup>2</sup>/s, T= 40° C. Interval of greasing depends on environmental conditions, min. once a month. Minimum stroke must be same than length of slide.

**Lubrication rack ALLZQ**

- The rack can be relubricated through a lubricating nipple (1) in the carriage.
- Regrease with an oil gun.



# Lubricants

## Lubricants



09006



09013

09014

09007

09002



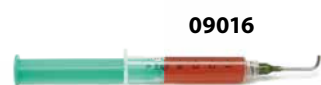
09003



09004



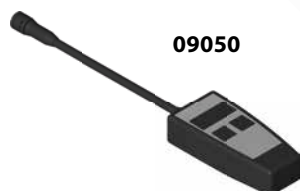
09009



09016



09001



09050

Code-No.	Name
09001	Molyduval, 1 litre, ISO-VG 220, range of temperature -30 °C bis 120 °C
09003	Steel oil gun for carriage rollers
09010	One hand oil gun 125cm <sup>3</sup> (with cone tip und angle adapter*) **
09004	Steel grease gun for ballscrew
09009	regreasing adapter DLT/K 160
09012	One hand grease gun 125cm <sup>3</sup> (with cone tip und angle adapter*) ***
09002	SKF grease LGMT 2/1 (1 kg)
09006	Grease gun filling device LAGF 5 (for 5 kg canister)
09007	SKF grease LGMT 2/5 (5 kg)
09013	Grease gun filling device LAGF 18 (for 18 kg canister)
09014	SKF grease LGMT 2/18 (18 kg)
09016	Grease cartridge with cannula (5ml) for DS 120
09050	Tension Tauges VSM-1

\* for from outside difficult to reach nipples

\*\*0,5 cm<sup>3</sup> per stroke\*\*\*0,4 cm<sup>3</sup> per stroke

09012



09010