

UNIMOTION



MAINTENANCE- AND ASSEMBLY INSTRUCTIONS

CTJ SERIES

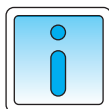
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GENERAL INFORMATION

USED SYMBOLS



Remark, note



Warning!



Danger!

Risk of coming into contact with power conducting parts! Cut off power supply!



Caution!

Keep Linear Unit clean!
Cover it, if necessary!



For more information see the catalogue



Do not use glue in current step



Use dedicated tools for the current step



Use a different tightening torque than in table on page 1.005.0

TIGHTENING TORQUES

The following tightening torques are recommended for screws of strength class 8.8

8.8	M2	M2,5	M3	M4	M5	M6	M8	M10	M12
M_{max} [Nm]	0.4	0.7	1.3	2.8	5.6	9.6	23	45	74



Screw



Tightening torque

GENERAL SAFETY INSTRUCTIONS

To ensure the right functionality of the CTJ Linear Unit, it must be handled with care. It is not allowed to put any tools or any other items which can cause damage to the linear unit on the linear unit.

The Linear Unit must be protected against any liquid that can cause damage to it.

The CTJ Linear unit must be placed in a dry, clean environment. For information on conditions in which the linear module can operate please contact us.

If the Linear Unit isn't in use, place it in a dry, clean environment and cover it to prevent any damage.

SAFE OPERATION

The linear unit must not be put into service until the final machinery into which it is installed has been declared in conformity with the provisions of the Machinery Directive, where appropriate.

Each operation of the Linear Unit that is not in compliance with its intended use can lead to the product being damaged, accidents and at the same time stoppages in production. To ensure a safe operation please refer to this Instruction Manual and the operating manual of other machinery where the Linear Unit is to be incorporated.

The linear unit satisfies the requirements of EC Machinery Directive 2006/42/EC according to the European or national standards of Safety of machinery:

- EN ISO12100-1
- EN ISO 12100-2

Checking the linear unit

In accordance with EU Health and Safety Directive 89/655/EEC article 4a, the operating company must subject the unit to thorough checking prior to putting it into operation, after carrying out repairs, and after malfunctions have occurred.

Requirements for personnel

The linear units may only be installed, operated, maintained, repaired or dismantled by appropriately qualified personnel in accordance with specification in this manual. All qualified personnel must have read and understood this instruction manual.

MODIFICATION OF THE LINEAR UNIT

The linear unit must not be modified without our written consent. Any such unauthorised modification will void our liability in respect of the unit. The operating company may only carry out the maintenance and repair work detailed in this Instruction manual.

LABELS AND NOTICES

All notices and labels attached to the linear unit must be fully visible and must not be removed. They must ensure compliance with all the instructions contained on them. Damaged or illegible notices and labels must be replaced.

WARRANTY

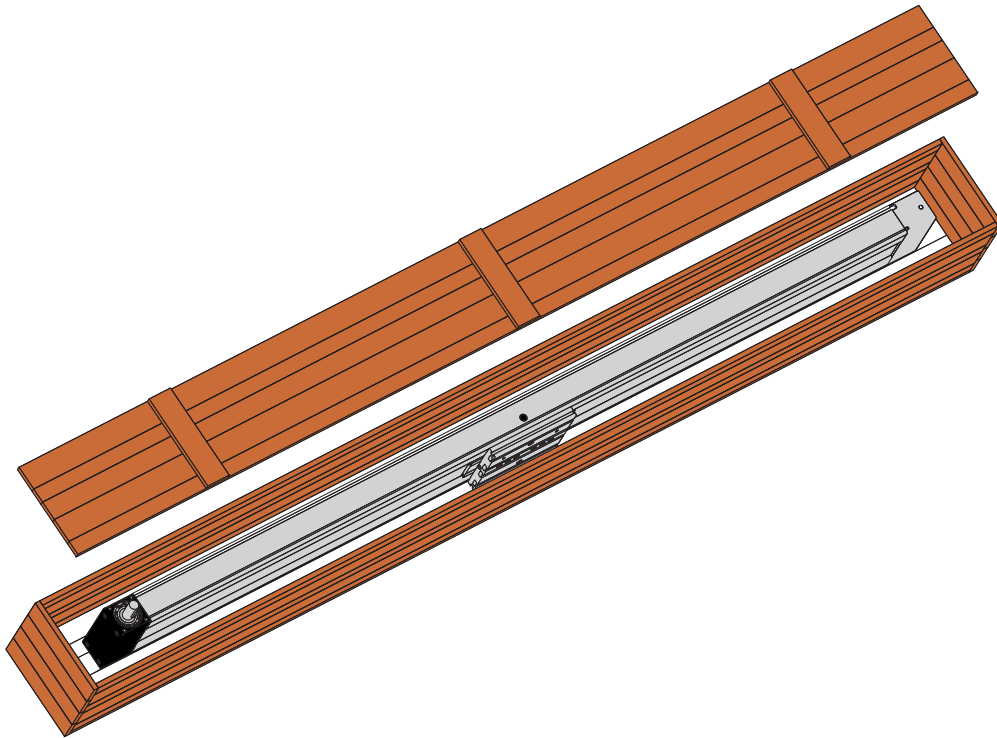
The warranty conditions are laid down in the terms and conditions of delivery and payment issued at the time of order. Warranty cover will be annulled if:

- the unit is not operated in accordance with the stipulated regulation use;
- the instructions set out in this operating manual are not followed;
- the unit is modified without the consent of the manufacturers;
- the screws sealed by locking varnish are unlocked.

The manufacturer's warranty in respect of maintenance and repair work applies only if original replacement parts are used.

HANDLING THE LINEAR UNIT

The Linear units are carefully packed in a HARD WOODEN BOX for a safe transportation.



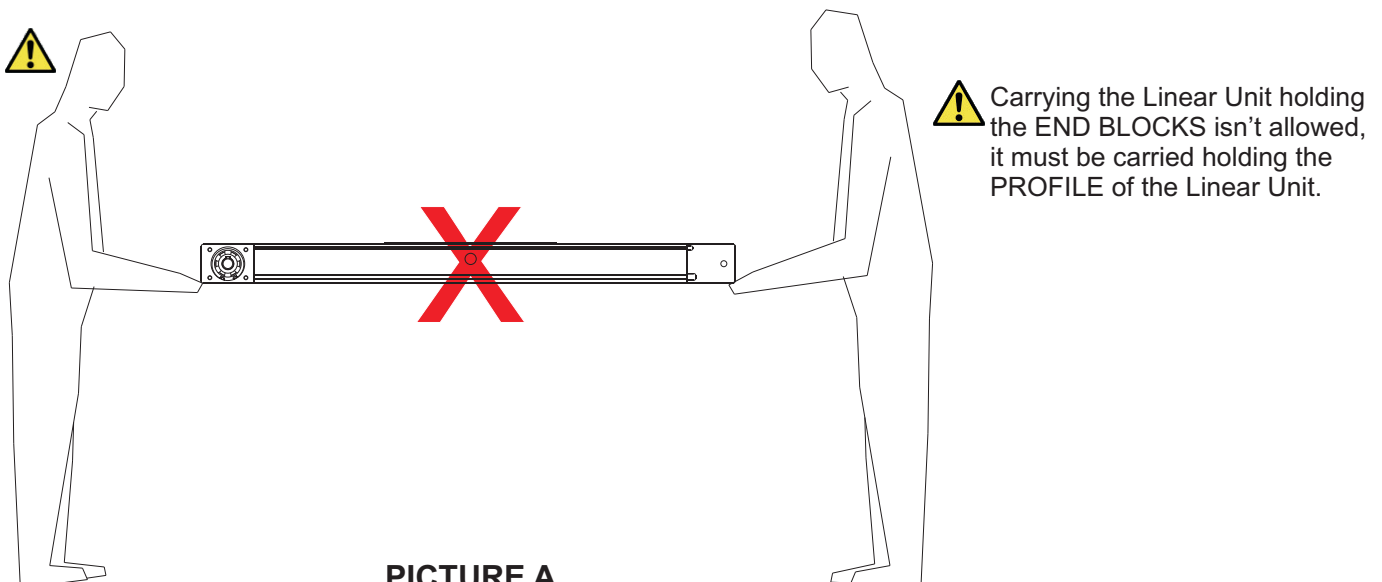
To take the Linear Unit out of the box, please consider the following handling instructions:

- Never lift the Linear Unit by the END BLOCKS - see PICTURE A
- Never grab for the TIMING BELT of the Linear Unit
- Never grab for the CARRIAGE or the CARRIAGE WITH CONNECTION PLATE

To take the Linear Unit out of the box, a suitable lifting tool is needed. Always lift and carry the Linear Unit by the main profile.

The Linear Unit must be supported all the time during the handling until it is fixed - mounted on the place, where it is meant to be. For correct handling please refer to page number 1.020.0

PICTURE A is showing, that handling with the Linear Unit in this position is wrong, because the profile, guides and other components might get deflected or damaged.

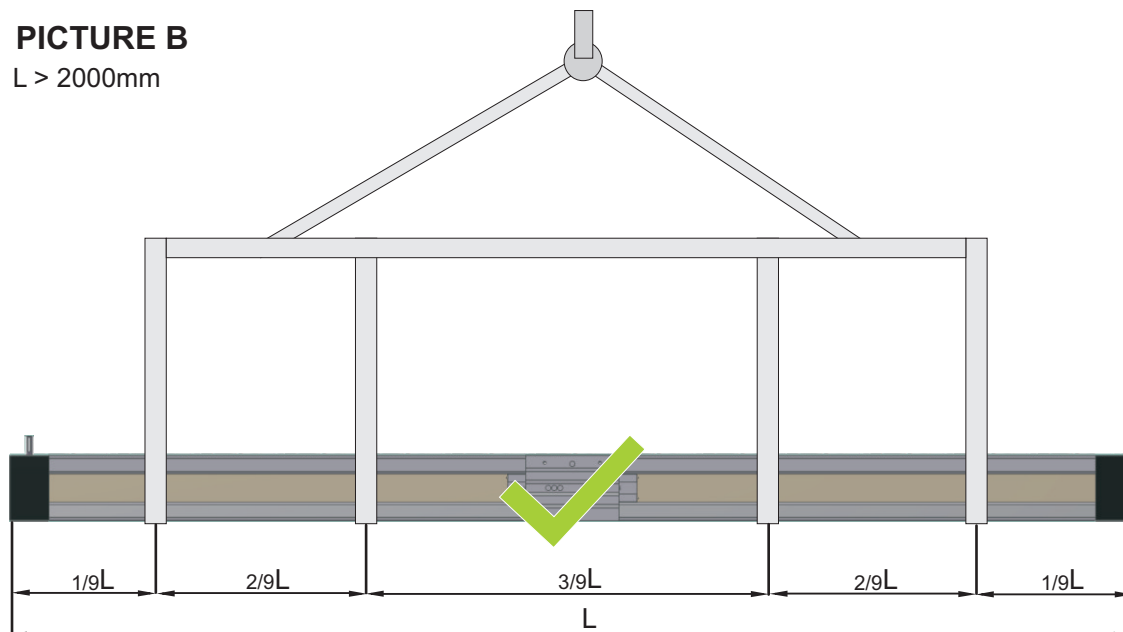


PICTURE A

PICTURE B is showing correct handling of the Linear Unit. The profile is more stiff in vertical alignment which prevents the deflection.

PICTURE B

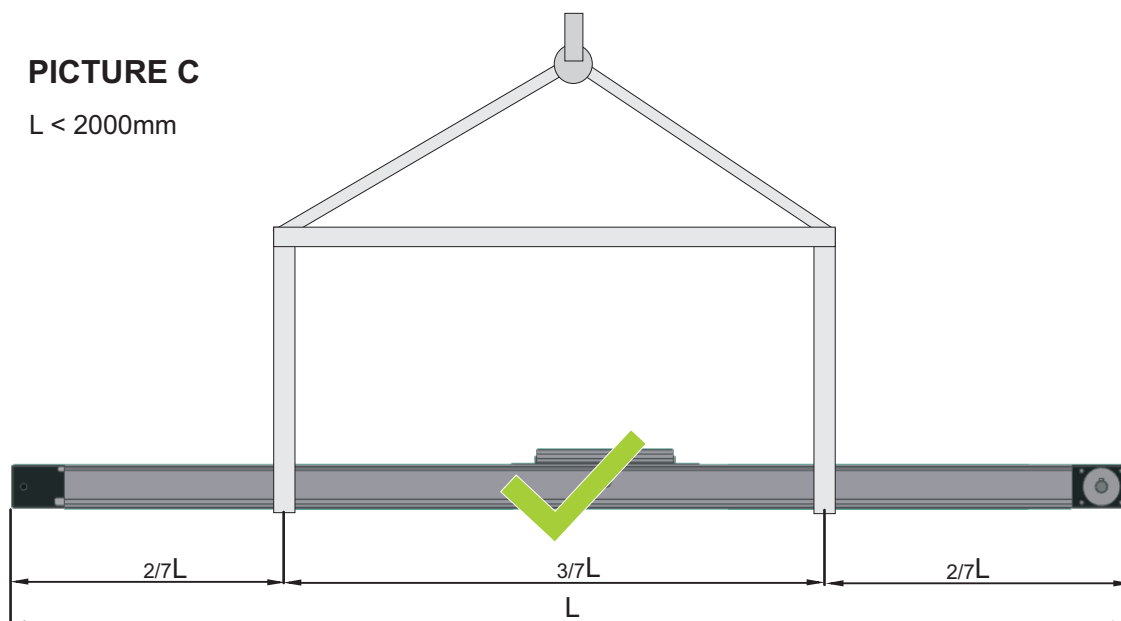
$L > 2000\text{mm}$



PICTURE C is showing correct handling of the Linear Unit.

PICTURE C

$L < 2000\text{mm}$



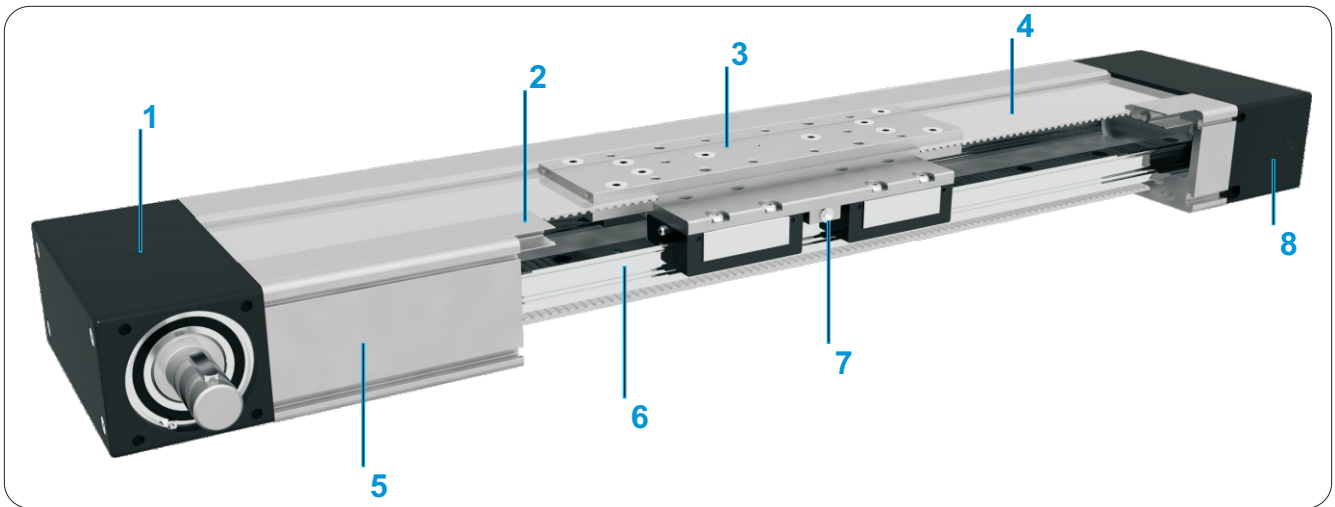
WARNING

Calculate the weight of the linear unit in order to choose the suitable lifting tool for the transportation of the Linear Unit.

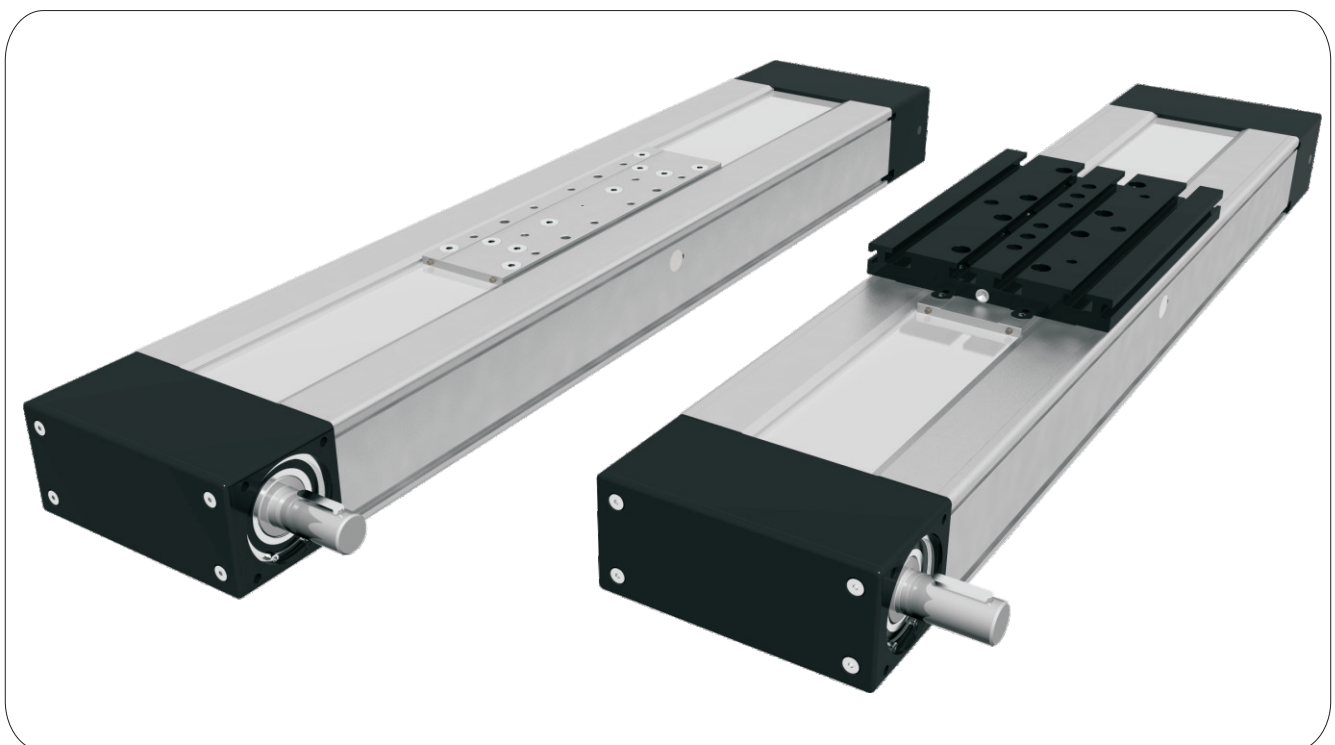
Please refer to the catalogue UNIMOTION - LINEAR UNITS for weight calculations.

Linear Unit needs to be stored in dry place and protected against corrosion. Make sure that there is no danger for the Linear Unit to get damaged.

PRODUCT DESCRIPTION




- 1 - Drive block with pulley
- 2 - Aluminum cover
- 3 - Carriage; with built in Magnets
- 4 - AT polyurethane toothed belt with steel tension cords
- 5 - Aluminium profile-Hard anodized
- 6 - Two integrated Linear Ball Guideways
- 7 - Central lubrication port; both sides
- 8 - Tension End with integrated belt tensioning system




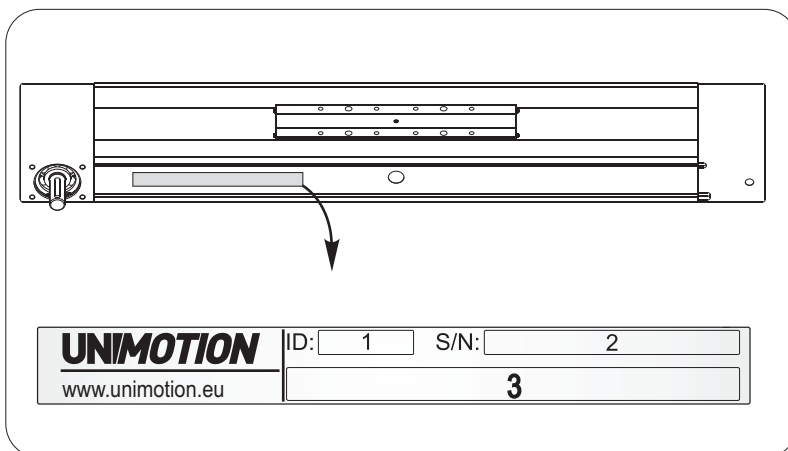
OVERVIEW

Identification label and additional or replacement parts of the Linear Unit

- 1 - ID number
- 2 - Serial number
- 3 - Type of Linear Unit (ordering code)

 In the case of ordering additional or replacement parts for the Linear Unit all data from the identification label must be given.


 The labels must be fully visible (in particular details of the serial number) and must ensure compliance with all the instructions contained on it. Damaged or illegible labels must be replaced.




MOUNTING

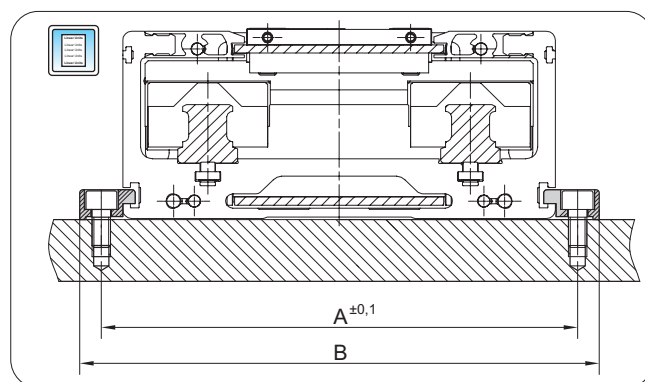
Fixing system



 **Linear Unit must be mounted by the aluminium profile with evenly distributed clamping fixtures along the entire length!**



 **Number of clamping fixtures:**
Please refer to our catalogue UNIMOTION Linear Units on page 7.000.0

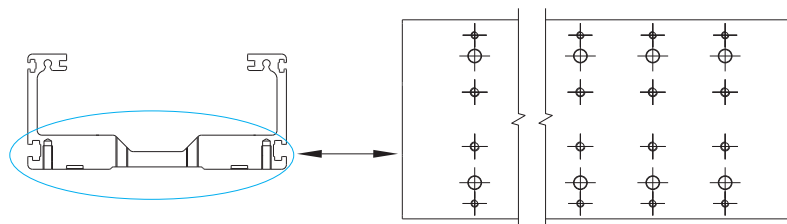



The modules are mounted by using fixtures which are placed in the slot on the side of the profile.

CTJ	A [mm]	B [mm]
90	102	112
110	126	140
145	161	175
200	222	240

Fixing system - TAP/PIN Holes

Fixing the Linear Unit can also be done at the bottom of the profile using TAP / PIN holes, which can be made on request.



 TAP/PIN holes can only be made based on the manufacturer's drawing of the position and depth of the TAP/PIN holes. For the drawings showing the position and depth of TAP/PIN holes, please contact us.

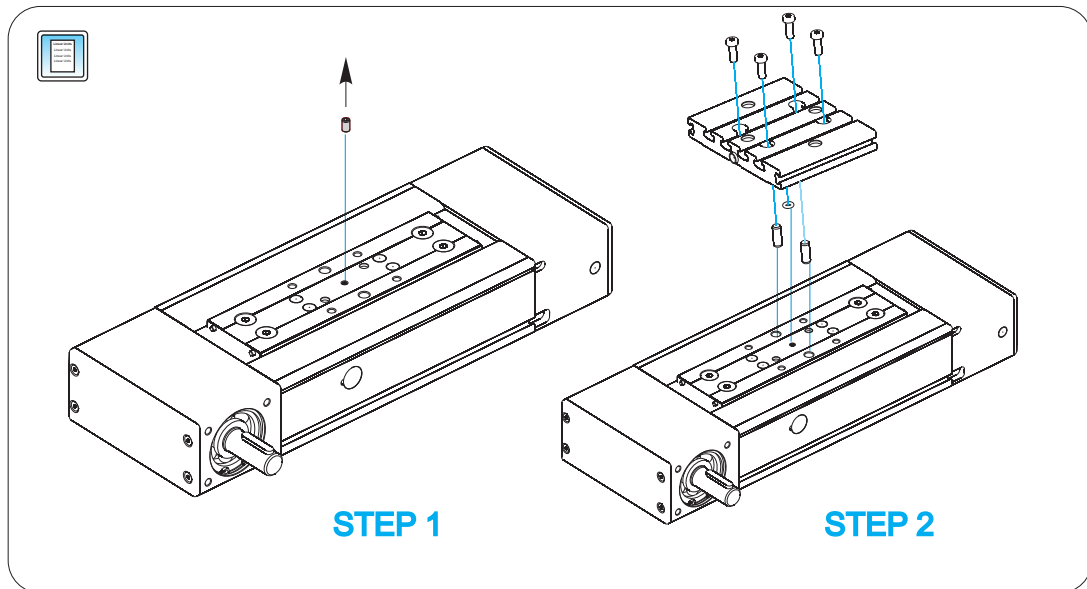
MOUNTING

Connection plates

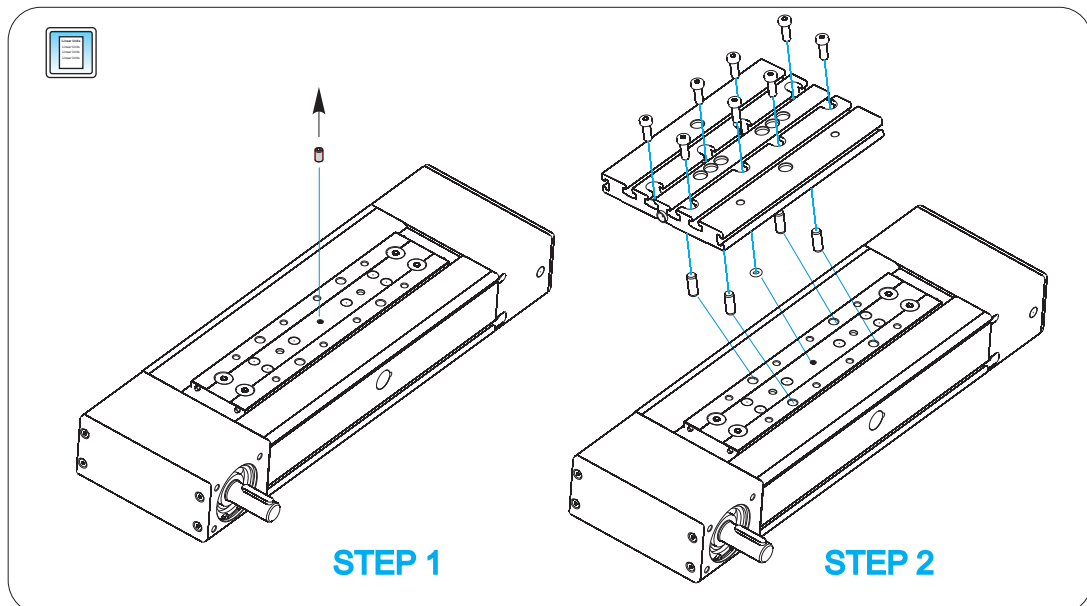


The connection plate contains two lubrication nipples DIN 3405D for the carriage. Before mounting the connection plate on the Linear Unit it must be fully filled with grease. The connection plate can be removed and replaced at any time.

Short Carriage version



Long Carriage version



STEP 1: The lubrication port is closed by a screw DIN 913. Untight the screw (DIN 913), which is placed on the carriage of the Linear Unit.

STEP 2: Insert the cylindrical pins (DIN 6325) in the connection plate.

Place the O-RING seal on the location where the connection plate has a recess for the O-ring seal.

O-RING type for: CTJ 90, CTJ 110 and CTJ 145: O-RING - 4 x 1 mm, PART NUMBER: 48373

O-RING type for: CTJ 200: O-RING - 4 x 2 mm

Attach connection plate to the module.

Insert the screws (DIN 7984) for attachment of the connection plate and tighten them.

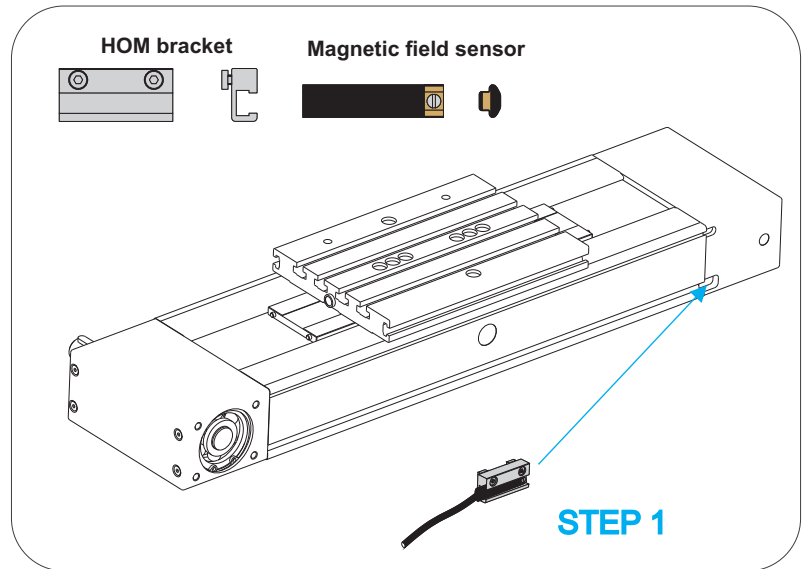


For the tightening torques for the screws please refer to page number 1.005.0

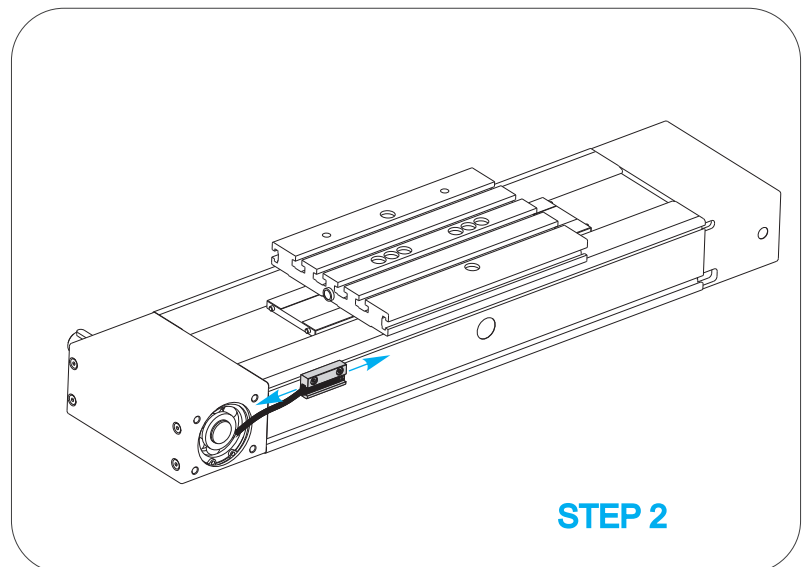
MOUNTING

Magnetic field sensor / REED Switch with the HOM bracket

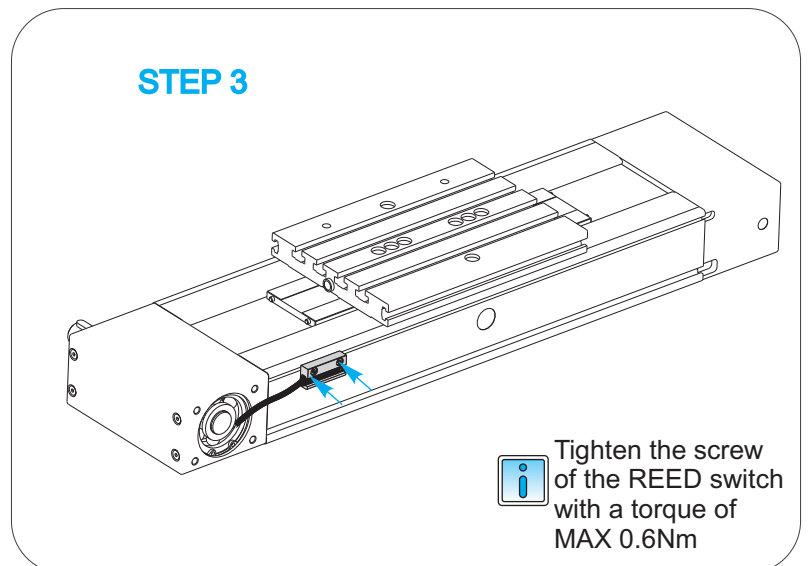
STEP 1: The magnetic field sensor must be first mounted on the HOM bracket. After mounting the switch on the HOM bracket place the HOM bracket with the switch into the slot, designed for the HOM bracket. Placing of the HOM bracket with the switch can be done on the left or right side of the Linear Unit.




STEP 2: After the HOM bracket has been inserted into the slot, position the HOM bracket with the switch in the desired location.



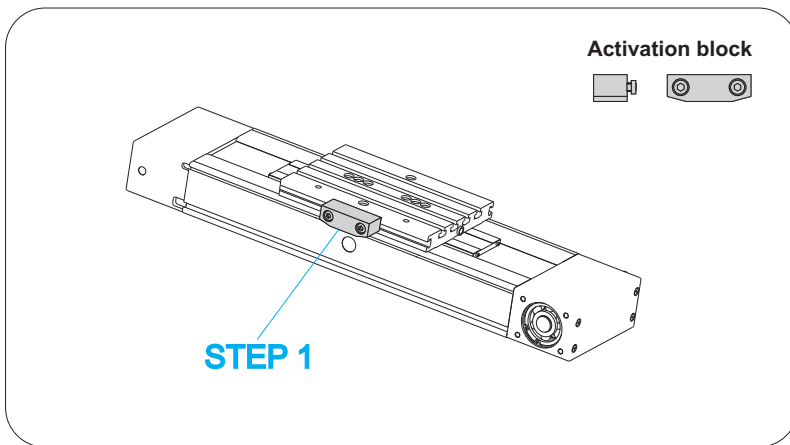
STEP 3: When the HOM bracket with the switch is in the desired location, tighten the HOM bracket screws to fix it.



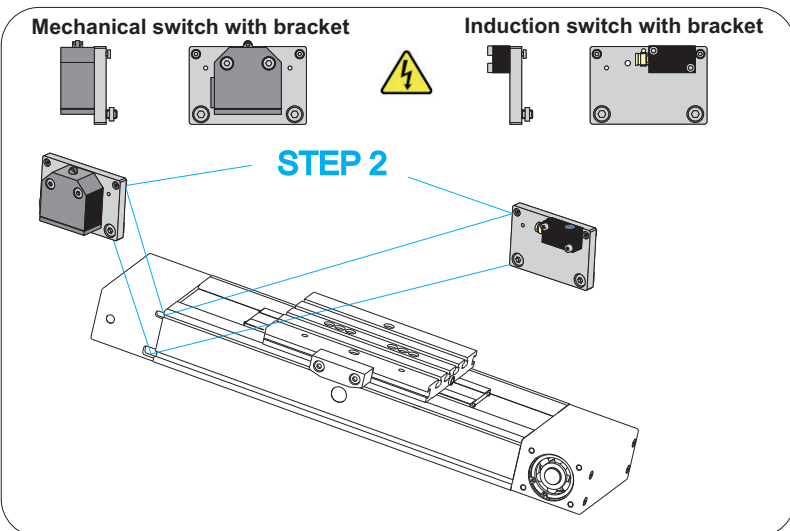
 For the tightening torques for the screws please refer to page number 1.005.0

MOUNTING

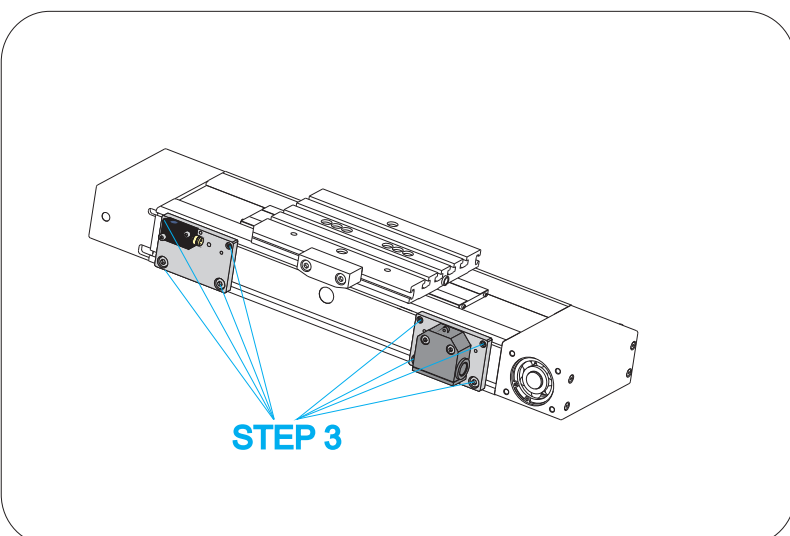
Mechanical and Inductive switch with the mounting bracket



STEP 1: Mount the activation block on the connection plate in a desired location. The activation block can be mounted in any location along the length of the connection plate on the left or right side. After the activation block is in place in the desired location, tighten the screws.



STEP 2: Place either the mechanical switch or the inductive switch with brackets in the slots and position them in the desired location. The mechanical or inductive switch with brackets can be placed in the slots either side of the profile of the Linear Unit.



STEP 3: After the mechanical or inductive switch with bracket is placed in the desired place in the slots, tighten the screws of the bracket.



For the tightening torques for the screws please refer to page number 1.005.0

MOUNTING

Motor with coupling

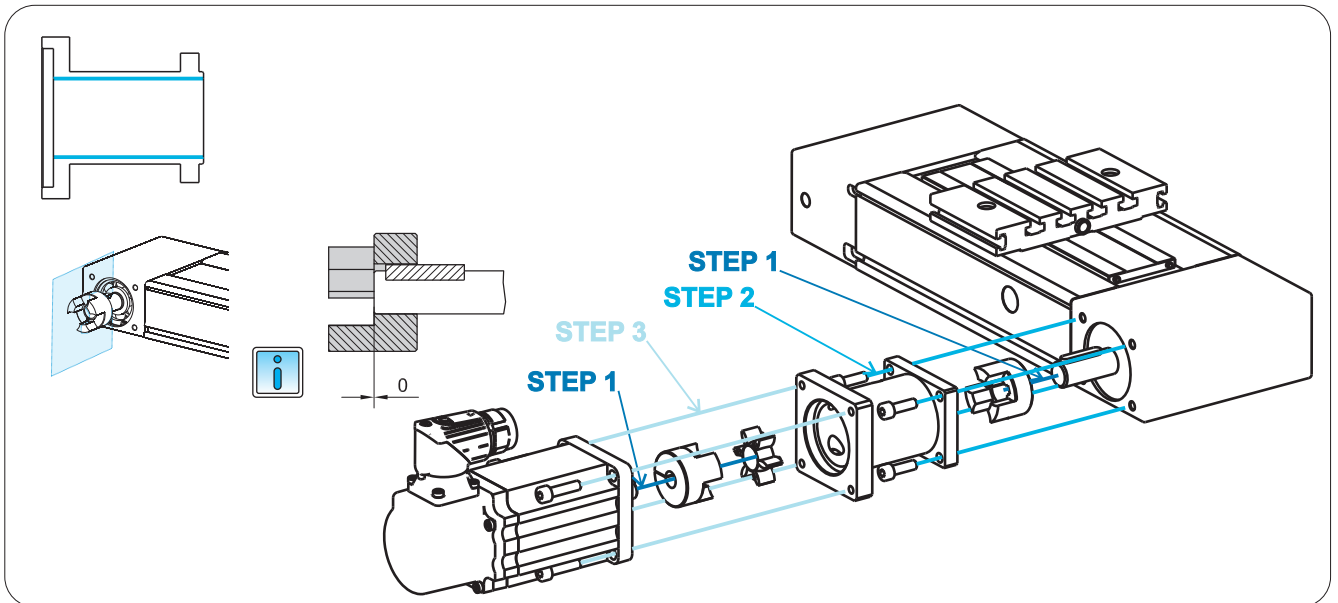
If motor adapter has inner through hole of the same size its entire length.

STEP 1: Attach one half of the coupling to the shaft of the linear unit and other to the shaft of the motor.

Insert coupling spider into one half of the coupling.

STEP 2: Attach motor adapter to the linear unit.

STEP 3: Attach motor to the motor adapter.

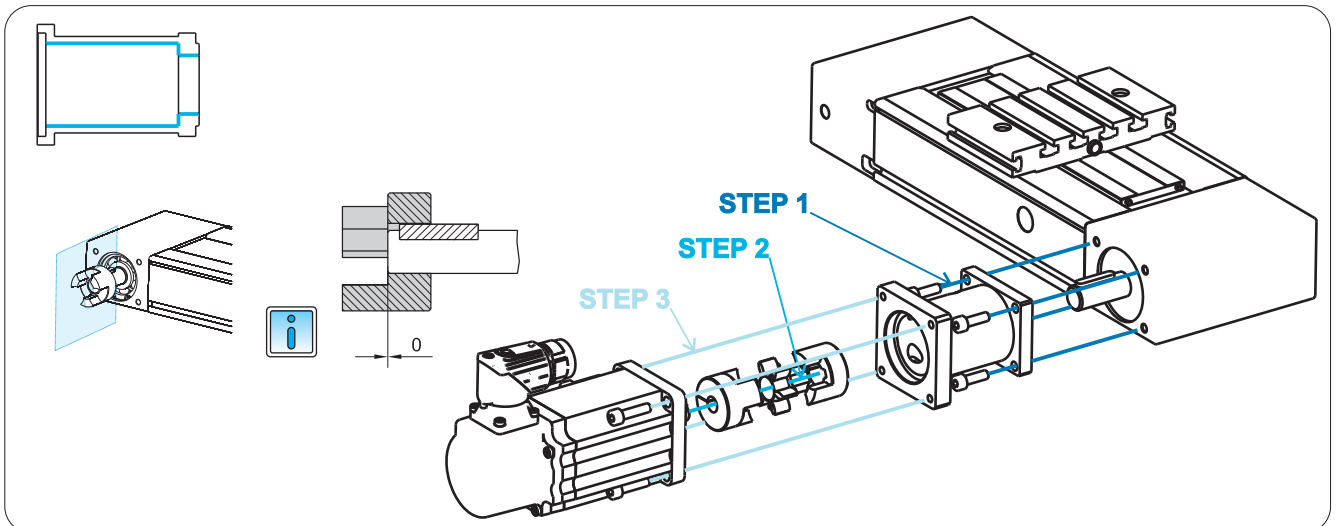


If motor adapter has inner through hole with the narrowing at one end.

STEP 1: Attach motor adapter to the side on which the through hole is narrower.

STEP 2: Attach complete coupling to the axle on the wider side of the hole.

STEP 3: Assemble two parts together and tighten the remaining screw on the coupling through appropriate hole in motor adapter.



Tighten the screws on the coupling halves with coupling tightening torque.

The maximum torque and maximum speed of the motor must never exceed the limits of the Linear Unit!

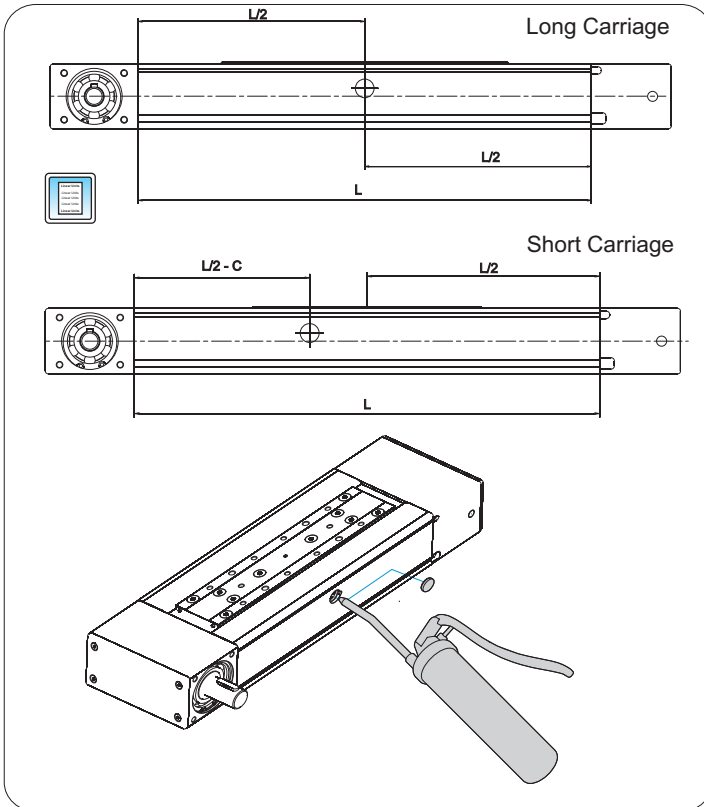
For the tightening torques for the screws please refer to page number 1.005.0

MAINTENANCE



For each Linear Unit the basic lubrication is done in the factory before shipment. All bearings of the belt pulleys have been lubricated for life and do not require any additional lubrication under normal operating conditions.

Lubrication of the carriage



The lubrication ports for Long and Short Carriage version are placed on both sides of the profile as it is shown on the picture.

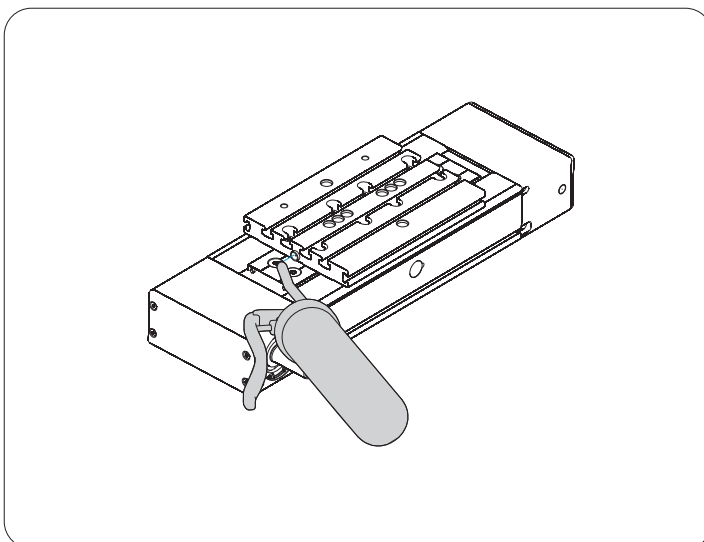
CTJ	C [mm]
90 S	23.7
110 S	42.5
145 S	47.5
200 S	56

For access to the lubrication nipples inside, the carriage must be moved to the middle position, i.e. L/2.

The lubrication ports have a cover, which must be removed in case of lubrication. The lubrication ports are central, which means you can lubricate the carriage through one lubrication port.

Place the cover back after lubrication.

Lubricating through the connection plate



Linear Unit with connection plate:

The connection plate has two lubrication nipples.

It is sufficient to lubricate through one of the two lubrication nipples only.

MAINTENANCE

Lubricant

Recommended grease for the lubrication

Lubcon TURMOGREASE LC 802 EP



For lubrication and re-lubrication of the linear units, a grease lubricant must only be used! Do not use the grease which contains any solid parts!

Lubricant quantities and intervals

CTJ	Travel path [km]	Grease - relubricating quantity [g]			
		Short Carriage		Long Carriage	
		Carriage	2nd Carriage	Carriage	2nd Carriage
90	5000	0.3	0.3	0.5	0.5
110	5000	0.7	0.7	1.4	1.4
145	5000	1.3	1.3	2.5	2.5
200	10000	2.5	2.5	5.1	5.1



The lubrication ports for Long and Short Carriage version are placed on both sides of the profile. The lubrication ports are central ports which means you can lubricate the carriage through one lubrication port.

The stated lubrication intervals in the table above are sufficient for normal operating conditions. If you have special operating systems please contact us.

The lubrication intervals are every 500 operating hours or after the specified travel path stated in the table above. It depends on which value is reached first.

Normal operating conditions

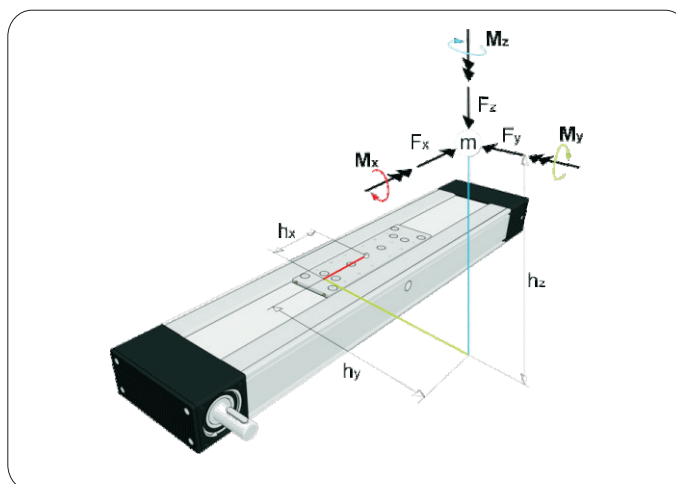
Temperature: 10 °C - 30 °C

Travel speed:

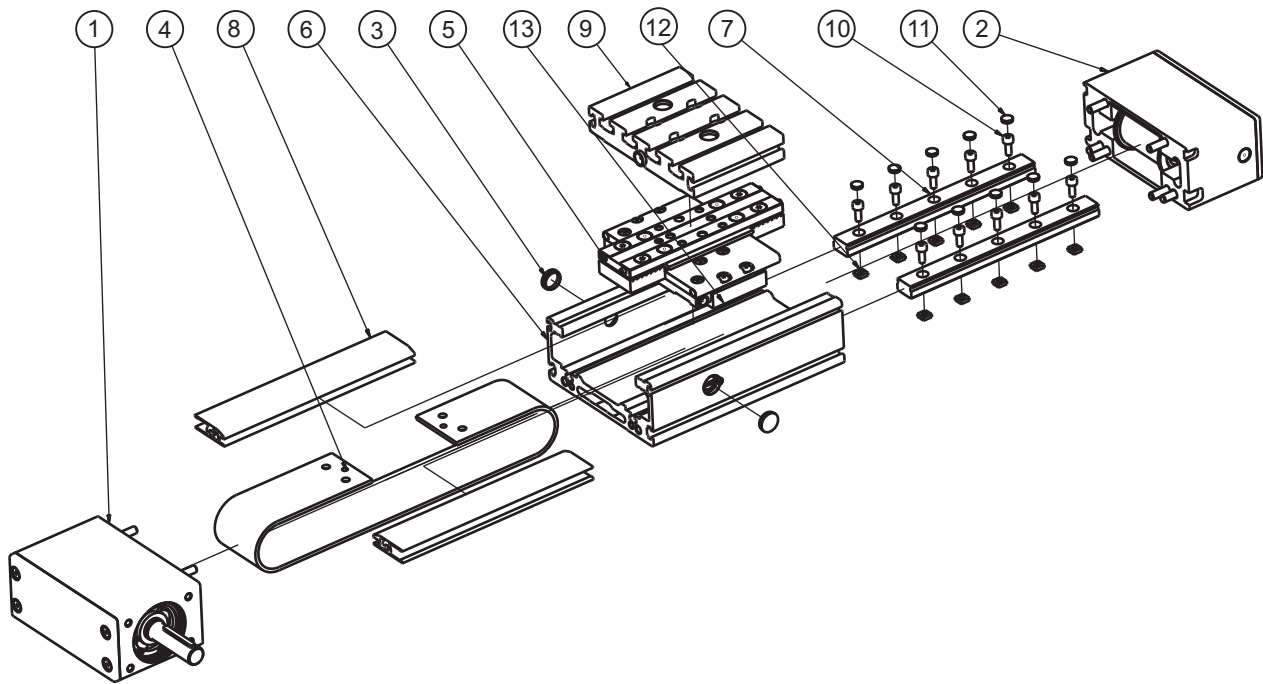
CTJ 90 = 3 m/s
 CTJ 110, CTJ 145, CTJ 200 = 5 m/s

Stroke: CTJ 90 > 40 mm
 CTJ 110 > 50 mm
 CTJ 145 > 60 mm
 CTJ 200 > 80 mm

Load: = 0.2 C

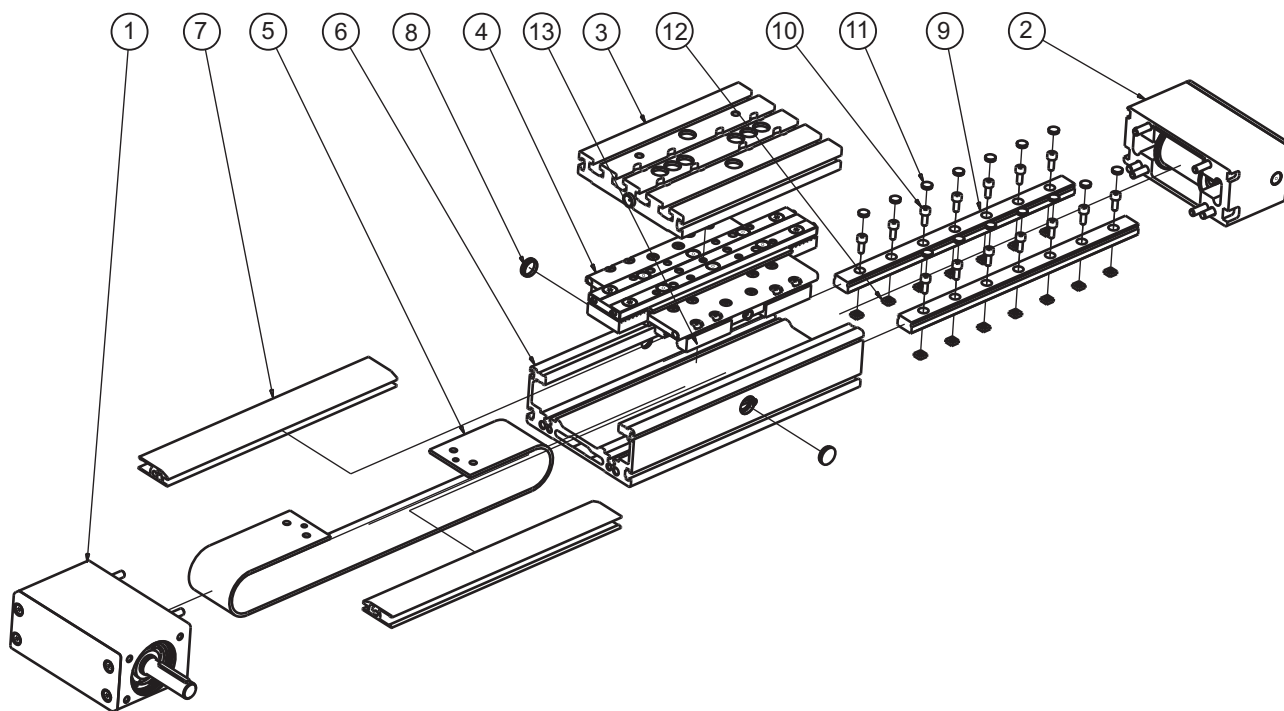


ASSEMBLY CTJ 90 S



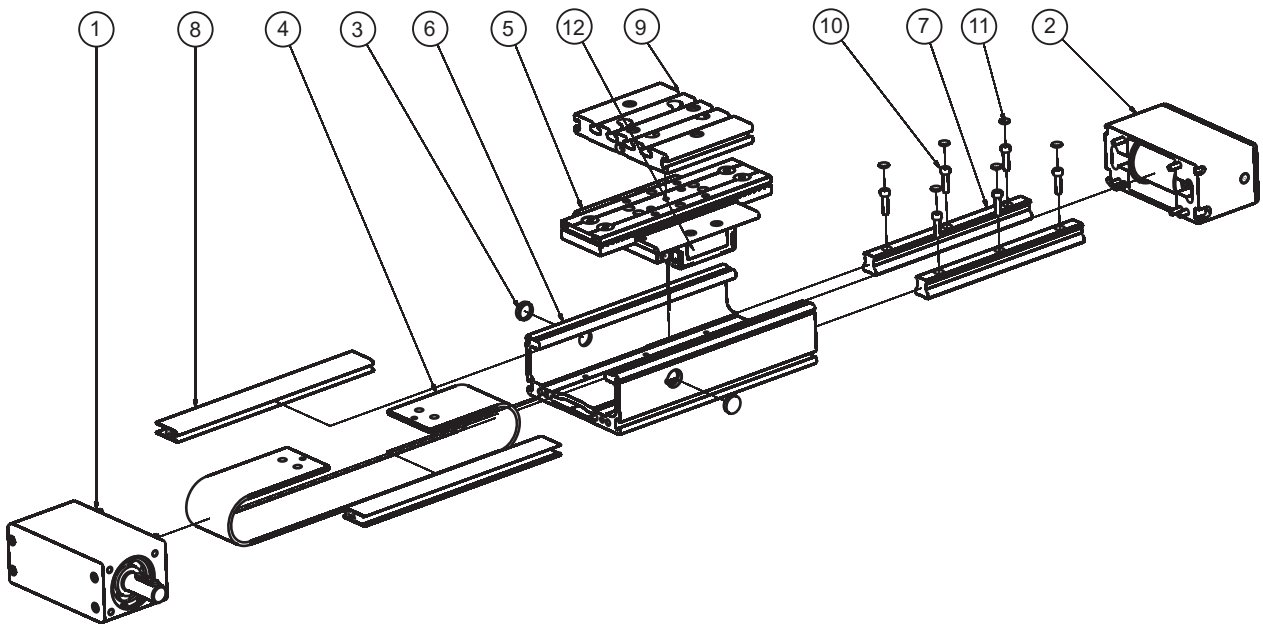
ITEM	QTY	PART NAME	LENGTH / QTY	ID
1	1	DRIVE BLOCK CTJ 90		
		TYPE 1R		48736
		TYPE 1L		48743
		TYPE 2		48744
		TYPE 10L		53958
		TYPE 10R		53957
		TYPE 20		53959
2	1	TENSION BLOCK CTJ 90		48735
3	2	COVER BGR 25 FOR PROFILE		-
4	1	TOOTHED BELT AT3x35	2 X STROKE + 376	49024
5	1	CARRIAGE CTJ 90 S		48742
6	1	PROFILE CTJ 90	STROKE + 127	48718
7	2	RAIL GUIDE MR 12	STROKE + 125	8207
8	2	GUIDE PROFILE CTJ 90	STROKE + 127	48719
9	1	CONNECTION PLATE CTJ 90 S		48853
10		ALLEN SCREW M3 x 8	(RAIL LENGTH/25)x2	52937
11		COVER FOR MR 12	(RAIL LENGTH/25)x2	-
12		SQUARE NUT M3	(RAIL LENGTH/25)x2	37303
13	2	CARRIAGE BLOCK MINI MR12 MNZZ V0-N		8208

ASSEMBLY CTJ 90 L



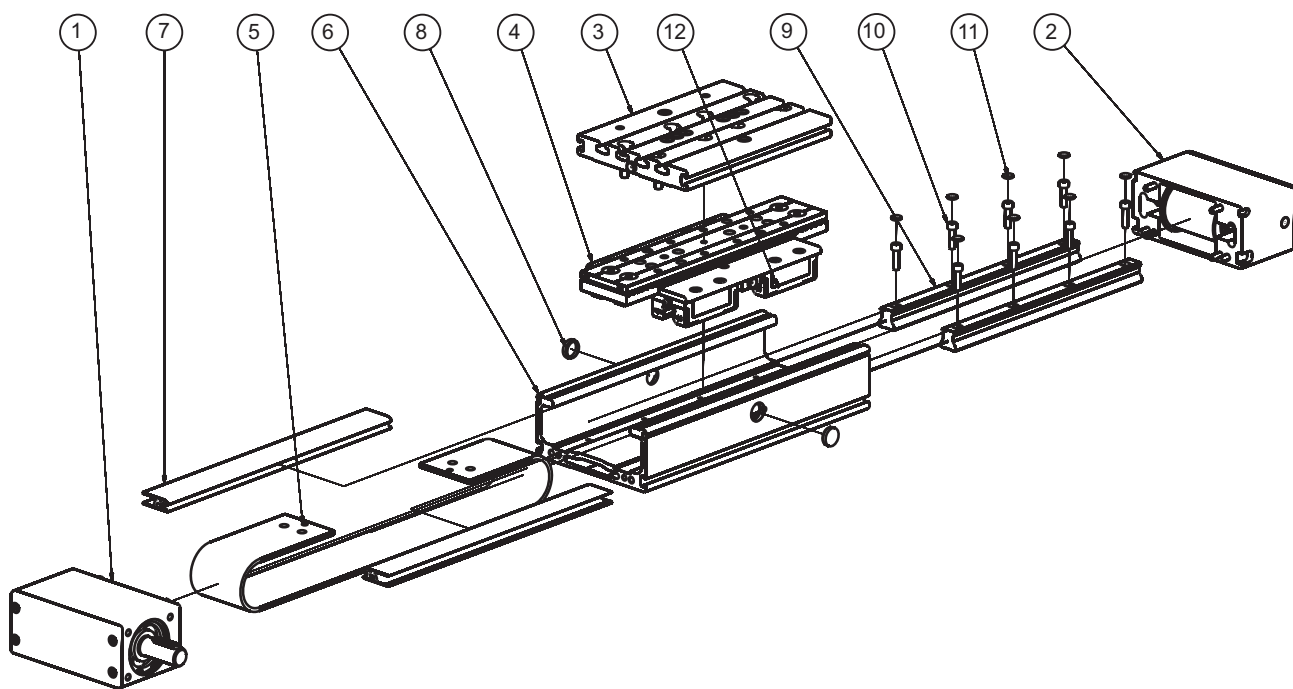
ITEM	QTY	PART NAME	LENGTH / QTY	ID
1	1	DRIVE BLOCK CTJ 90		
		TYPE 1R		48736
		TYPE 1L		48743
		TYPE 2		48744
		TYPE 10L		53958
		TYPE 10R		53957
		TYPE 20		53959
2	1	TENSION BLOCK		48735
3	1	CONNECTION PLATE CTJ 90 L		48854
4	1	CARRIAGE CTJ 90 L		48734
5	1	TOOTHED BELT AT3x35	2 X STROKE + 430	49024
6	1	PROFILE CTJ 90	STROKE + 181	48718
7	2	GUIDE PROFILE CTJ 90	STROKE + 181	48719
8	2	COVER BGR 25 FOR PROFILE		-
9	2	RAIL GUIDE MR 12	STROKE + 179	8207
10		ALLEN SCREW M3x8	(RAIL LENGTH/25)x2	52937
11		COVER FOR MR 12	(RAIL LENGTH/25)x2	-
12		SQUARE NUT M3	(RAIL LENGTH/25)x2	37303
13	4	CARRIAGE BLOCK MINI MR12 MNZZ V0-N		8208

ASSEMBLY CTJ 110 S



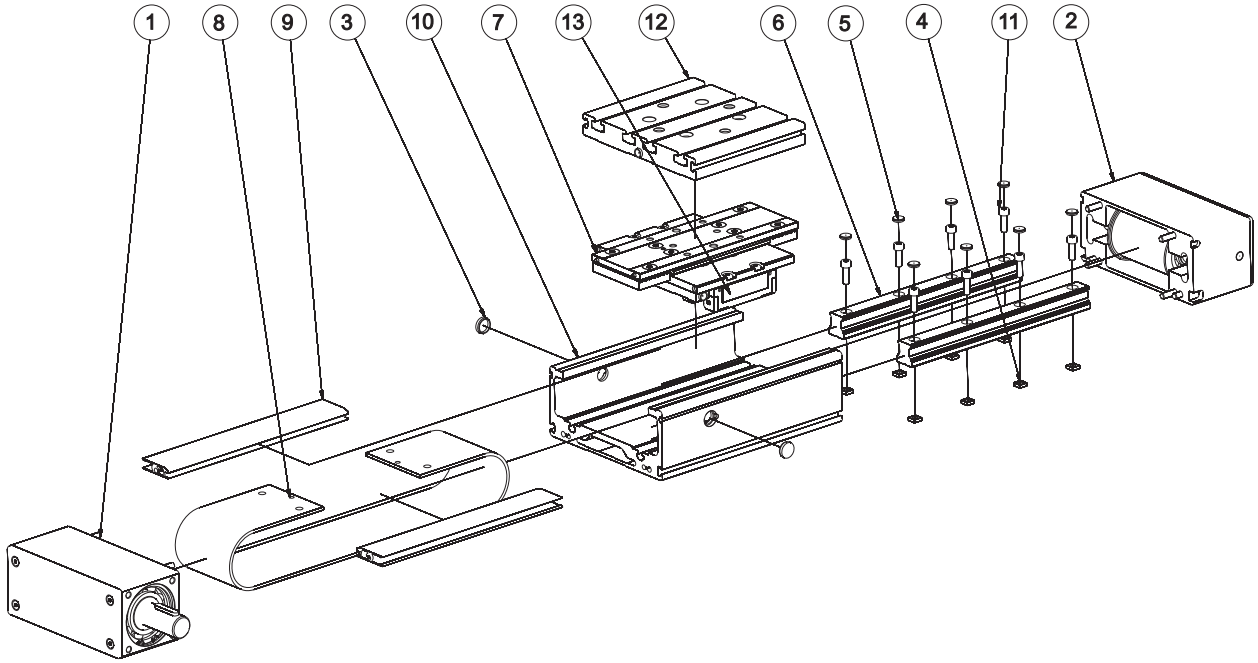
ITEM	QTY	PART NAME	LENGTH / QTY	ID
1	1	DRIVE BLOCK CTJ 110		
		TYPE 1R		48471
		TYPE 1L		48478
		TYPE 2		48479
		TYPE 10L		53502
		TYPE 10R		53501
		TYPE 20		53503
2	1	TENSION BLOCK CTJ 110		48470
3	2	COVER BGR 30 FOR PROFILE		-
4	1	TOOTHED BELT At5x50	2 X STROKE + 518	36892
5	1	CARRIAGE CTJ 110 S		48477
6	1	PROFILE CTJ 110	STROKE + 195	48024
7	2	RAIL GUIDE AR/HR 15	STROKE + 155	41518
8	2	GUIDE PROFILE CTJ 110	STROKE + 195	48027
9	1	CONNECTION PLATE CTJ 110 S		48525
10		ALLEN SCREW M4 x 16	(RAIL LENGTH/60+0,5)x2	47079
11		COVER FOR AR / HR 15	(RAIL LENGTH/60+0,5)x2	-
12	2	CARRIAGE BLOCK AR15MN S V1 N		45195

ASSEMBLY CTJ 110 L



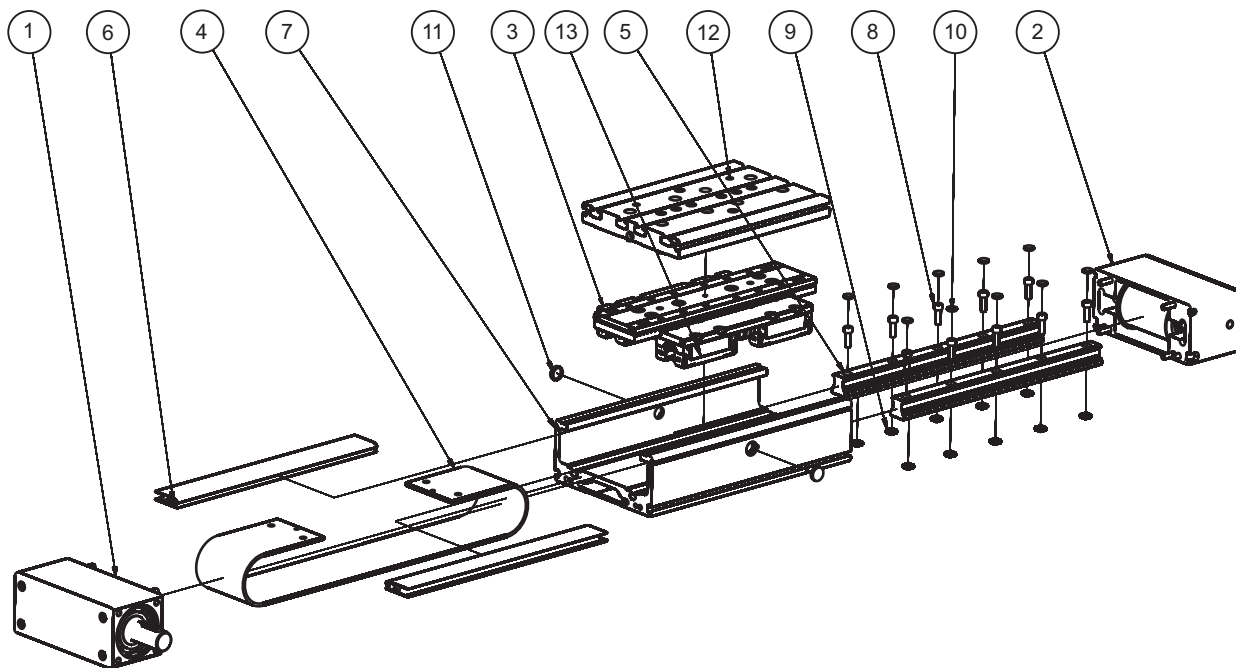
ITEM	QTY	PART NAME	LENGTH / QTY	ID
1	1	DRIVE BLOCK CTJ 110		
		TYPE 1R		48471
		TYPE 1L		48478
		TYPE 2		48479
		TYPE 10L		53502
		TYPE 10R		53501
		TYPE 20		53503
2	1	TENSION BLOCK		48470
3	1	CONNECTION PLATE CTJ 110 L		48480
4	1	CARRIAGE CTJ 110 L		48469
5	1	TOOTHED BELT AT5x50	2 X STROKE + 562	36892
6	1	PROFILE CTJ 110	STROKE + 240	48024
7	2	GUIDE PROFILE CTJ 110	STROKE + 240	48027
8	2	COVER BGR 30 FOR PROFILE		-
9	2	RAIL GUIDE AR / HR 15	STROKE + 200	41518
10		ALLEN SCREW M4x16	(RAIL LENGTH/60+0,5)x2	47079
11		COVER FOR AR / HR 15	(RAIL LENGTH/60+0,5)x2	-
12	4	CARRIAGE BLOCK AR15MN S V1 N		45195

ASSEMBLY CTJ 145 S



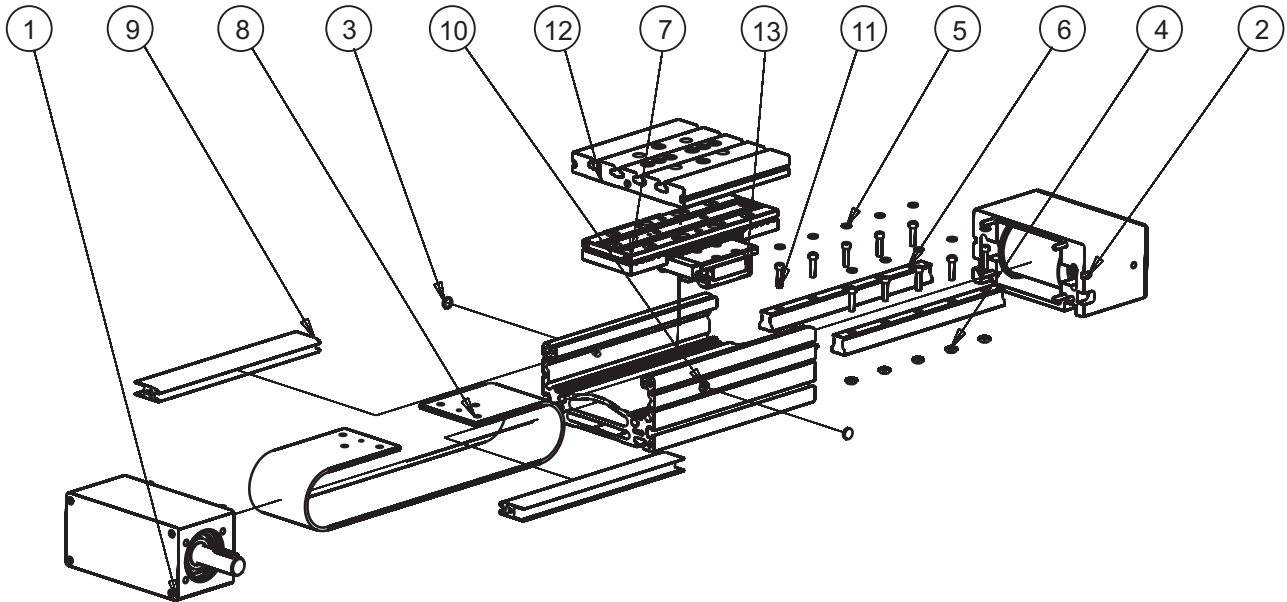
ITEM	QTY	PART NAME	LENGTH / QTY	ID
1	1	DRIVE BLOCK CTJ 145		
		TYPE 1R		48345
		TYPE 1L		48358
		TYPE 2		48359
		TYPE 10L		53497
		TYPE 10R		53496
		TYPE 20		53498
2	1	TENSION BLOCK CTJ 145		48344
3	2	COVER BGR 30 FOR PROFILE		-
4		NUT SQUARE M5 DIN 562	(RAIL LENGTH/60+0,5)x2	40768
5		COVER FOR AR / HR 20	(RAIL LENGTH/60+0,5)x2	-
6	2	RAIL GUIDE AR / HR 20	STROKE + 203	41515
7	1	CARRIAGE CTJ 145 S		48368
8	1	TOOTHED BEL AT 5x70	2 X STROKE + 585	48329
9	2	GUIDE PROFILE CTJ 145	STROKE + 205	46319
10	1	PROFILE CTJ 145	STROKE + 205	46318
11		ALLEN SCREW M5x18	(RAIL LENGTH/60+0,5)x2	53299
12	1	CONNECTION PLATE CTJ 145 S		46776
13	2	CARRIAGE BLOCK AR20MN S V1 N		45196

ASSEMBLY 145 L



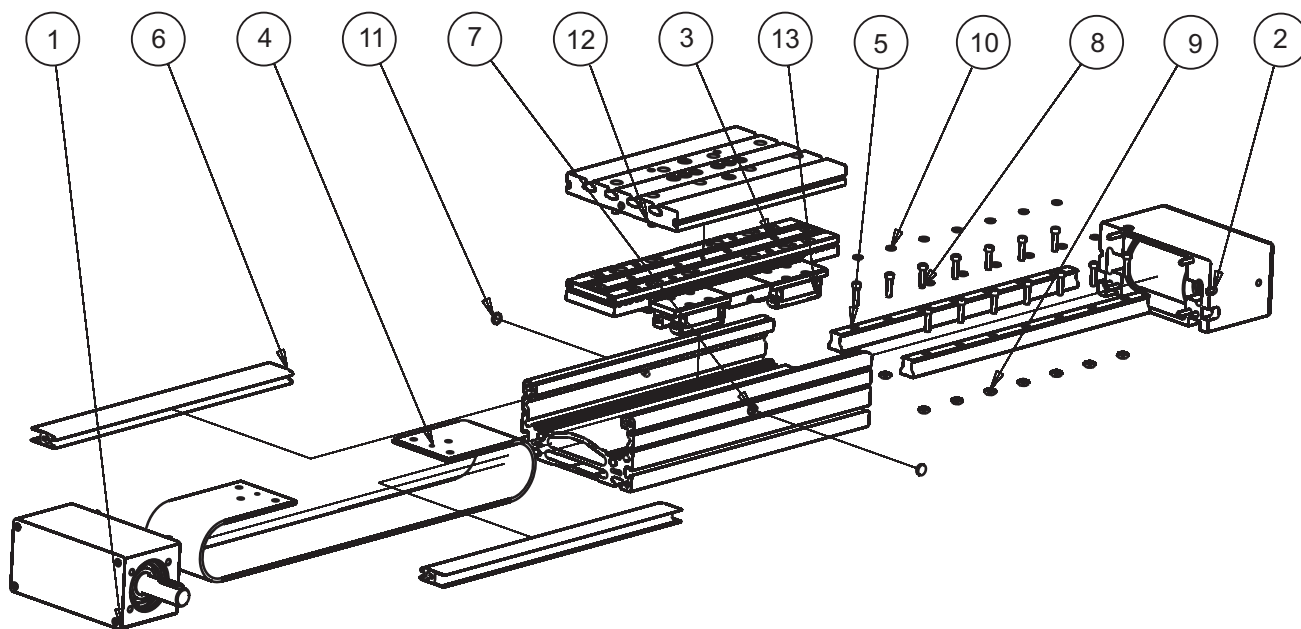
ITEM	QTY	PART NAME	LENGTH / QTY	ID
1	1	DRIVE BLOCK CTJ 145		
		TYPE 1R		48345
		TYPE 1L		48358
		TYPE 2		48359
		TYPE 10L		53497
		TYPE 10R		53496
		TYPE 20		53498
2	1	TENSION BLOCK CTJ 145		48344
3	1	CARRIAGE CTJ 145 L		48343
4	1	TOOTHED BELT AT 5 x 70	2 X STROKE + 645	48329
5	2	RAIL GUIDE AR-HR 20	STROKE + 263	41515
6	2	GUIDE PROFILE CTJ 145	STROKE + 265	46319
7	1	PROFILE CTJ 145	STROKE + 265	46318
8		ALLEN SCREW M5 x 18	(RAIL LENGTH/60+0,5)x2	53299
9		SQUARE NUT M5	(RAIL LENGTH/60+0,5)x2	40768
10		COVER FOR AR / HR 20	(RAIL LENGTH/60+0,5)x2	-
11	2	COVER BGR 30 FOR PROFILE		-
12	1	CONNECTION PLATE CTJ 145 L		46775
13	4	CARRIAGE BLOCK AR20MN S V1 N		45196

ASSEMBLY CTJ 200 S



ITEM	QTY	PART NAME	LENGTH / QTY	ID
1	1	DRIVE BLOCK CTJ 200		
		TYPE 1R		52102
		TYPE 1L		52105
		TYPE 2R		52106
		TYPE 2L		52311
		TYPE 10L		53302
		TYPE 10R		53303
		TYPE 20L		53304
		TYPE 20R		53305
2	1	TENSION BLOCK CTJ 200		52101
3	2	COVER BGR 30 FOR PROFILE		51800
4		SQUARE NUT M6 DIN 557	(RAIL LENGTH/60)x2	44454
5		COVER FOR AR / HR 25	(RAIL LENGTH/60)x2	-
6	2	RAIL GUIDE AR / HR 25	STROKE + 288	42972
7	1	CARRIAGE CTJ 200 S		55174
8	1	TOOTHED BEL AT 10 x 100	2 X STROKE + 895	52491
9	2	GUIDE PROFILE CTJ 200	STROKE + 290	51829
10	1	PROFILE CTJ 200	STROKE + 290	51832
11		ALLEN SCREW M6x25	(RAIL LENGTH/60)x2	47070
12	1	CONNECTION PLATE CTJ 200 S		52483
13	2	CARRIAGE BLOCK AR25MN S V1 N		44932

ASSEMBLY CTJ 200 L



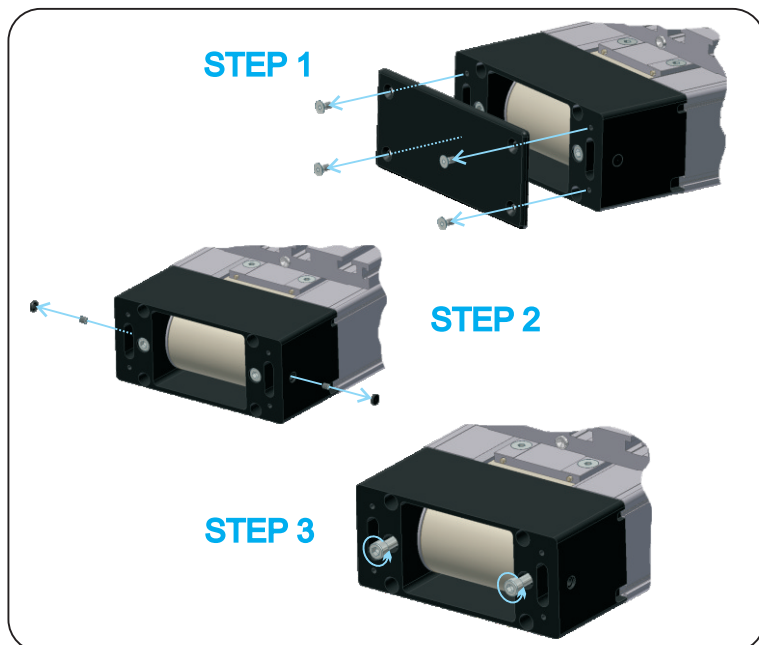
ITEM	QTY	PART NAME	LENGTH / QTY	ID
1	1	DRIVE BLOCK CTJ 200		
		TYPE 1R		52102
		TYPE 1L		52105
		TYPE 2R		52106
		TYPE 2L		52311
		TYPE 10L		53302
		TYPE 10R		53303
		TYPE 20L		53304
		TYPE 20R		53305
2	1	TENSION BLOCK CTJ 200		52101
3	1	CARRIAGE CTJ 200 L		55173
4	1	TOOTHED BELT AT 10 x 100	2 X STROKE + 1035	52491
5	2	RAIL GUIDE AR-HR 25	STROKE + 428	42972
6	2	GUIDE PROFILE CTJ 200	STROKE + 430	51829
7	1	PROFILE CTJ 200	STROKE + 430	51832
8		ALLEN SCREW M6 x 25	(RAIL LENGTH/60)x2	47070
9		SQUARE NUT M6 DIN 557	(RAIL LENGTH/60)x2	44454
10		COVER FOR AR / HR 25	(RAIL LENGTH/60)x2	-
11	2	COVER BGR 30 FOR PROFILE		51800
12	1	CONNECTION PLATE CTJ 200 L		52482
13	4	CARRIAGE BLOCK AR25MN S V1 N		44932

REPLACEMENT OF ASSEMBLIES - CTJ SERIES



- any furthermentioned modifications, without our written consent, will void our liability in respect of the linear unit.
- before any operation make sure that the module is disconnected from the power grid to prevent possible injuries caused by the electrical current or moving parts.
- CTJ 90: due to the precise fit between railguide MR 12 and carriage block Mini MR 12 both need to be replaced at the same time even if only one of them fails.

Loosening the belt



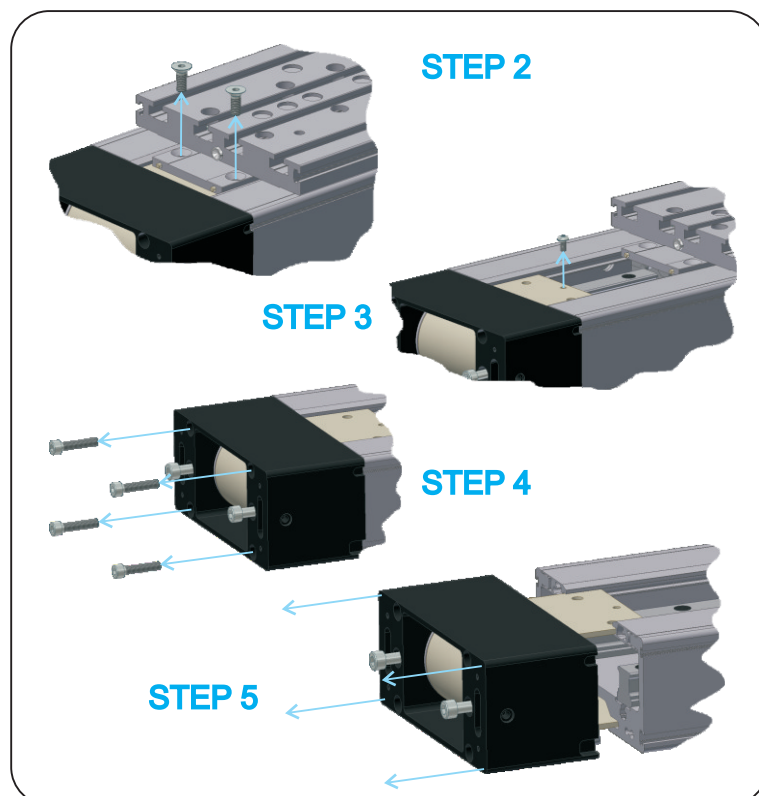
STEP 1: remove cover plate by unscrewing four countersunk screws.

STEP 2: remove two plugs and loosen the set screws holding the tensioning screws.

STEP 3: loosen the toothed belt by unscrewing two tensioning screws. Do not unscrew them completely; leave one or two threads in the axle. Count how many turns you made when loosening the belt, you will need this data when tensioning the belt.

Note: when loosening the belt do not unscrew one screw completely and then the other. Unscrew each screw little by little or the axle may get wedged.

Removing the end blocks



STEP 1: Loosen the belt as described in chapter "Loosening the belt".

STEP 2: detach the belt from the carriage by unscrewing the two bolts on the side of the block that will be removed.

STEP 3: unscrew and detach the toothed bar from the belt.

STEP 4: remove four screws from the block that will be removed.

STEP 5: remove the block.

Note: procedure of removing the end blocks is the same regardless of which block we wish to remove.

Note: all the screws (except set screws) must be glued (Loctite 243) and screwed with the torque specified in the table on page 1.005.0 unless written otherwise at individual steps.

Replacing the toothed belt

STEP 1: remove the end block covers on both sides of the profile, remove the plugs and loosen the set screws locking the tensioning screws.

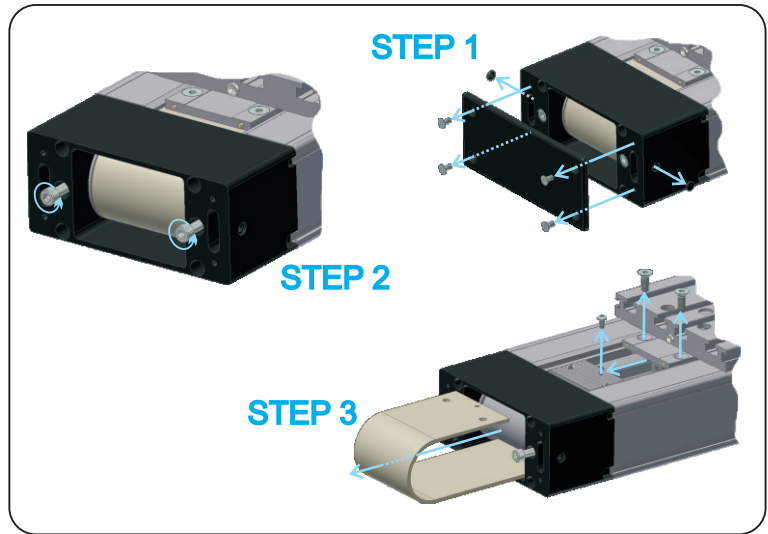
STEP 2: loosen the belt as described in the chapter "Loosening the belt".

STEP 3: detach the belt from the carriage. Detach the toothed bar from the belt and remove the belt from the module through a hole in one of the end blocks.

STEP 4: insert new belt through a hole in one of the end blocks. Slide new belt into the grooves of the leading profiles.

STEP 5: attach the toothed bar to the belt and belt to the carriage. Glue all screws.

STEP 6: tighten the belt and finish according to the instructions in the chapter "Tensioning the belt".



STEP 1

STEP 2

STEP 3

Replacing the carriage

STEP 1: remove the tensioning block by following the procedure described in "Removing the end blocks".

STEP 2: remove the two screws on the other side of the carriage that are attaching belt to the carriage.

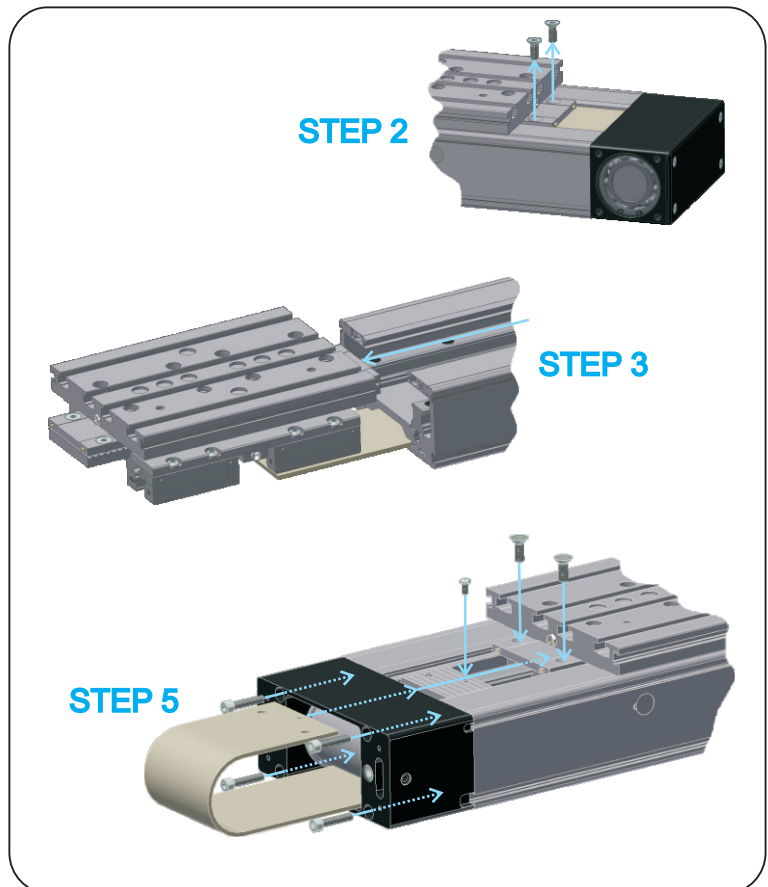
STEP 3: slide the whole carriage assembly out of the profile and change it with new one. Turn it so that the magnets are closer to the drive block.

MA **STEP 4:** attach the toothed belt to the carriage on the side on which the end block is still on the profile. Tighten the belt holding bolts to torque of:
 CTJ 90 - 1.5 Nm
 CTJ 110 - 2.75 Nm
 CTJ 145 - 2.75 Nm
 CTJ 200 - 3 Nm

STEP 5: attach removed end block back to the profile. Glue four screws. Attach the belt to the other side of the carriage.

STEP 6: tighten the belt and finish replacing the carriage by following the instructions in the chapter "Tensioning the belt".

Note: if the rail guide blocks are damaged it is very likely that the rail guides are damaged too. We recommend that along with replacing the carriage you also replace the rail guides.



STEP 2

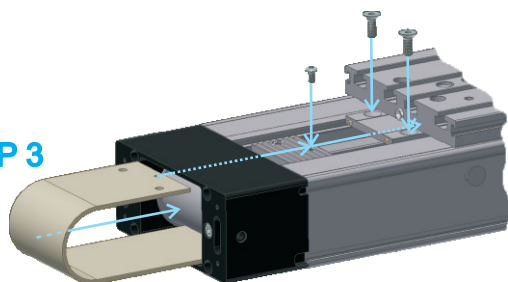
STEP 3

STEP 5

Note: all the screws (except set screws) must be glued (Loctite 243) and screwed with the torque specified in the table on page 1.005.0 unless written otherwise at individual steps.

Replacing the end blocks

STEP 3



STEP 1: loosen the belt on the tensioning block.

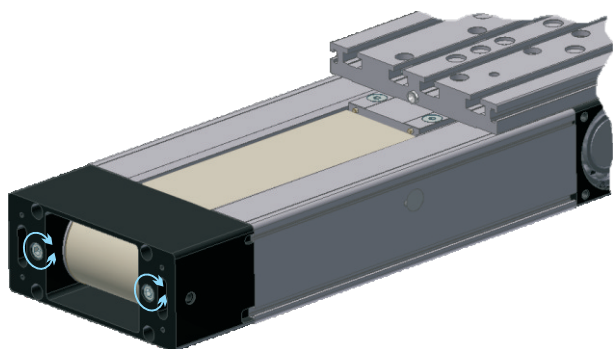
STEP 2: remove the end block which you wish to replace by following steps in “Removing the end blocks”.

STEP 3: take new block and attach it to the profile with four screws.

STEP 4: attach the toothed bar to the belt and the belt to the carriage.

STEP 5: finish by following steps described in “Tensioning the belt”.

Tensioning the belt



STEP 1: Tighten the belt by screwing in tensioning screws. Turn tensioning screws the same number of turns as when loosening the belt.

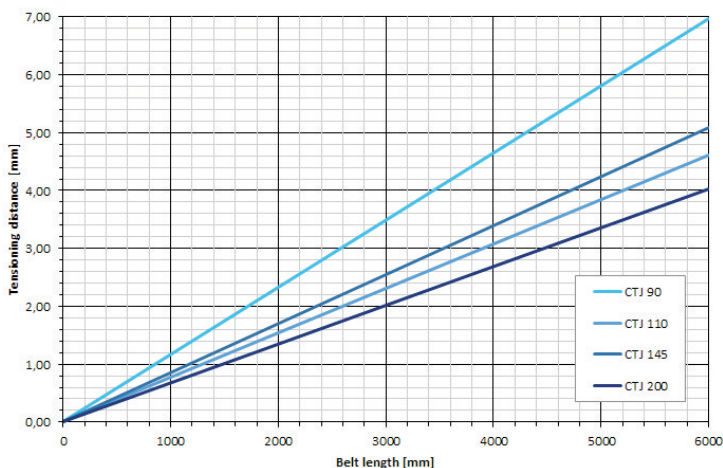
Note: turn the screws by small amount alternately otherwise the pulley may wedge.

STEP 2: make sure that the belt is running at the middle of the pulley. Check the gap between the belt and flange of the pulley and tighten or loosen one of the tensioning screws by small amount if needed.

Note: for this step the carriage needs to be moving up and down the profile.

STEP 3: lock the tensioning screws by tightening two set screws on each side of the tensioning block. Plug the holes of the set screws with the plastic plugs and screw the cover on the end block.

Alternative for step 1: turn the tensioning screws until the belt starts to tension. Check the tensioning distance from the chart and calculate number of turns the screws must be turned. Tension the belt by turning the screws.



Module size	Screw lead [mm]
90	0.7
110	0.8
145	1
200	1.5

$$\text{Number of turns} = \frac{\text{Tensioning distance [mm]}}{\text{Screw lead [mm]}}$$

Note: all the screws (except set screws) must be glued (Loctite 243) and screwed with the torque specified in the table on page 1.005.0 unless written otherwise at individual steps.