MTE

SERIES LINEAR UNITS

USER AND MAINTENANCE MANUAL

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1. INFORMATION ABOUT THIS DOCUMENT

Thank you for purchasing our products and please read this manual carefully before using the product to ensure its best possible performance. You are, also, requested to keep the documentation for future reference.

Target audience: installers and end users.

Motus Tech srl reserves the right to modify this document at any time..

2. SYMBOLS FOR SAFETY/STANDARDS AND REQUIREMENTS

This section illustrates, for important indications related to personal protection and safe operation, the warning, danger and information symbols and signs.

Safety Warnings. 	indicates instructions that should be followed carefully to avoid injury to people and malfunction or damage to the product**.**
	indicates technical instructions to be followed to avoid damage and malfunction of the device.
WARNING	Indicates a precaution to be followed for safety or proper operation of the device

Standards and requirements

The product complies with the following regulations:

European Directives 2006/42/EC - Machinery Directive

and the Standardized Standards for the Machinery Directive of which a non-exhaustive list follows:

EN 12100:2010

The use of unsuitable materials for cleaning, lubrication, load securing, and securing the product may affect the safety and performance of the product.

This product is not intended for use by individuals (including children) whose physical, sensory, or cognitive abilities are limited or who lack relevant experience and/or knowledge, unless they are supervised by a person responsible for their safety or have received instructions from that person regarding the use of this equipment.

3. GENERAL SAFETY REQUIREMENTS

The following manual is intended for the end user. The following requirements must be followed in all cases and for permitted operations:

	The assembly, installation, and commissioning of the product inside a machine must be carried out by a qualified technician in full compliance with the relevant laws, regulations and directives, and in accordance with the assembly instructions
	The product is designed for mechanical connection to an electric motor. The user is responsible for all connection work, from fixing to electrical connection. No safety instructions for the electrical part are specified in this document.
	The unit must not be disassembled or opened for any reason. The safety prescriptions for permitted maintenance operations are in the following paragraphs.
	Never use abrasive substances or cleaning agents containing acids or chlorine on the surfaces of the appliance.
	Ensure that the attachment of the linear unit has been carried out in a safe position and manner, to prevent slipping or sliding during operation.
	If technical changes are made to the factory settings, MOTUS TECH accepts no liability for any consequential damage.
	MTE units must be stored in a dry and clean environment. If the environment does not meet the conditions, protect the linear unit by covering it or placing it inside a container.
	Any special operating conditions for environment and performance must be communicated in advance to our technical department to check feasibility.
	MTE units must be handled with care, also in view of their weight. Furthermore, it is not permitted to place tools or anything else on the unit that could impair its functionality.
	The linear unit may not be modified in relation to its condition of sale. In the event of unauthorized modifications, the user will be liable for any damage and injury caused by the modifications.
WARNING	Modifications to the linear unit are not permitted without the written consent of Motus Tech.
WARNING	All identification labels or warning signs may not be removed and must be legible. If damaged or unreadable they must be replaced.

Motus Tech s.r.l.

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4. GENERAL INFORMATION FOR OPERATION

The linear unit must not be put into operation until the machine in which it is intended (incorporated), has been declared in conformity with the Machinery Directive 2006/42/EC or at least until all safety precautions for the machine have been taken pending the Declaration of Conformity.

The machine installer or end user is responsible for the safeguarding of the linear unit following an appropriate risk assessment.

Any operation of the linear unit that is not in accordance with its intended use can lead to product damage, accidents and at the same time to production interruptions for which Motus Tech cannot be held responsible. To ensure safe operation, please refer to this operating manual and the operating instructions of other machines, in which the linear unit is to be incorporated.

5. FUNCTION AND APPLICATION

The MTE series linear units support a moving load. Due to the coupling with a motor axis, the unit moves the load back and forth according to the application conditions and load limits.

The unit is driven by a belt-pulley mechanism. The reference position can be detected by limit switch sensors. The unit is designed specifically for the development of Cartesian systems by means of motorized linear axes.

6. PREREQUISITES FOR EMPLOYMENT

WARNING Improper use may result in malfunction or injury. Ensure that the requirements set out in this document are always observed.

WARNING Compare the limit values in these operating instructions with the specific use case (maybe, moments, temperature loads, speed).

WARNING Mounting the load. The load must be mounted in such a way that the tilting torque resulting from the force parallel to the traversing axis is minimal.

WARNING Secure the load with screws and centering sleeves.

7. TRANSPORT AND MOVEMENT UNIT'.

The units are packaged according to internal standards that provide for different types depending on the quantities and types of units to be shipped.

Handling the unit does not require any special precautions; it is not necessary to grip it at any other point other than for safety reasons.

Handle the unit with care because the moving part, shown in the red rectangle in figure 1, could cause damage or injury.

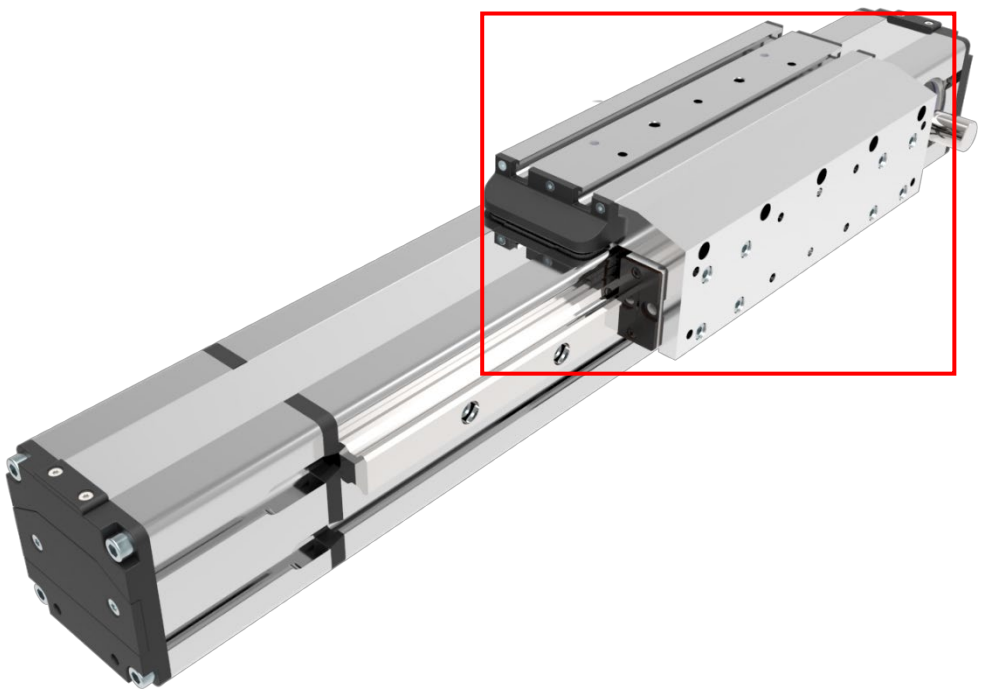


Fig. 1

8. DESCRIPTION OF THE LINEAR UNIT

Motus Tech MTE series linear units are linear actuators that transform the rotary motion of an electric motor into linear motion by means of a toothed belt drive and are designed for applications where the load must be moved predominantly horizontally.

They mainly consist of:

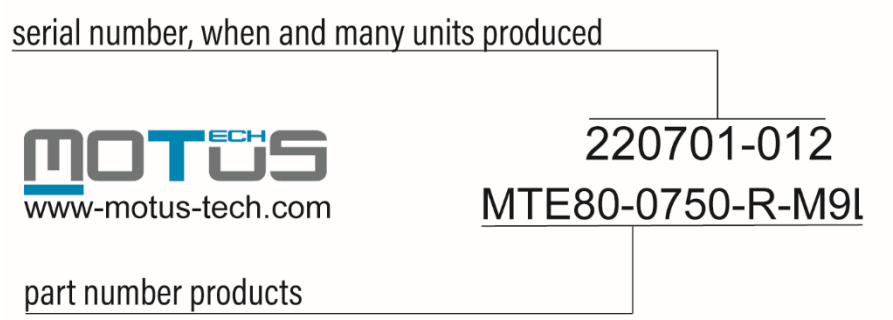
- One aluminum profile
- Two recirculating ball bearing guide with four or more runners.
- two heads, one for motor coupling and one with a belt tensioning system
- a carriage for drive transmission
- a toothed belt with AT profile

They are designed to minimize maintenance work.

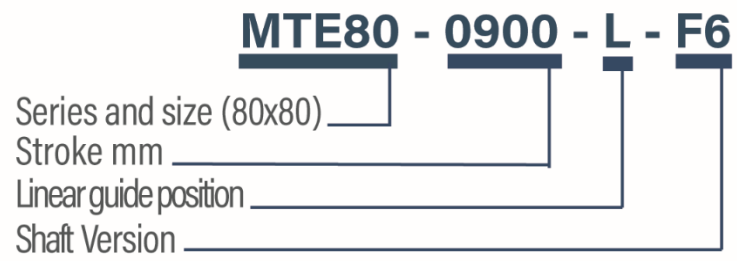
The units are equipped with a lubrication system that guarantees optimal operation for a service life of more than 10,000 km, i.e. guide pads with lubrication reservoirs with solid lubricant (based on paraffin oils) that ensure a good level of lubrication in any working position of the actuator (horizontal, vertical, etc.)

It is suggested, at very high speeds (>1 m/s) or high loads (depending on the size of the actuator) or in aggressive environments, to supplement the lubrication of the ball bearing guides once a year.

9. PRODUCT IDENTIFICATION



10. DESCRIPTION OF THE LINEAR UNIT



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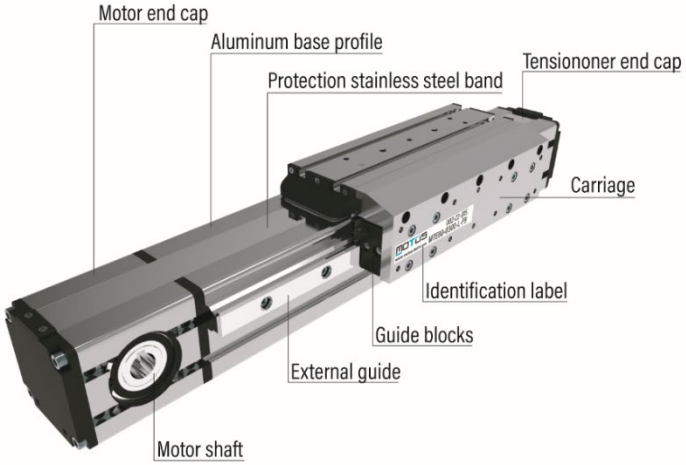
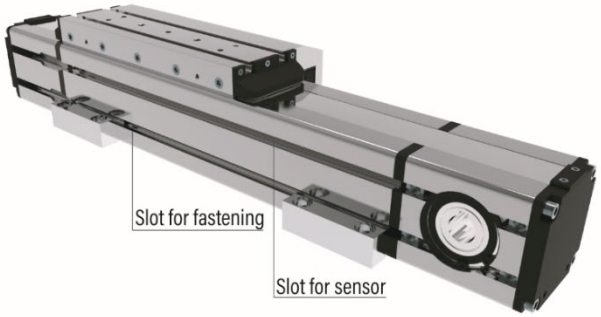
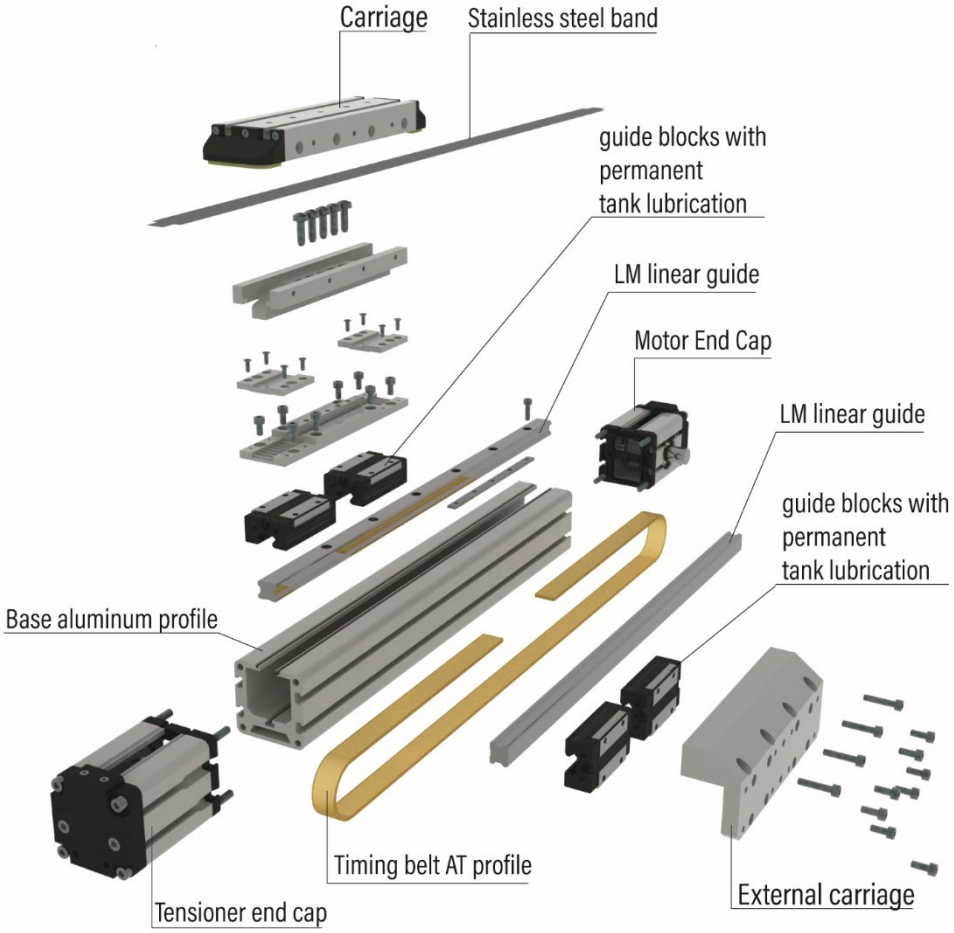
11. MAIN COMPONENTS





EXPLODED VIEW OF THE MAIN COMPONENTS



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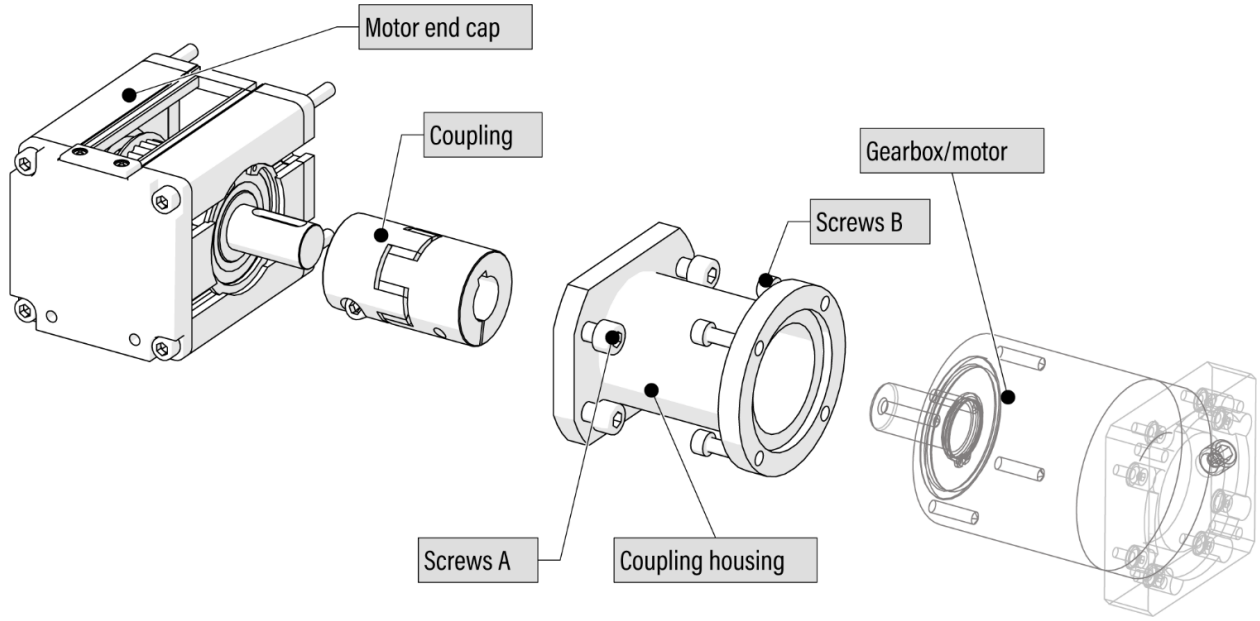
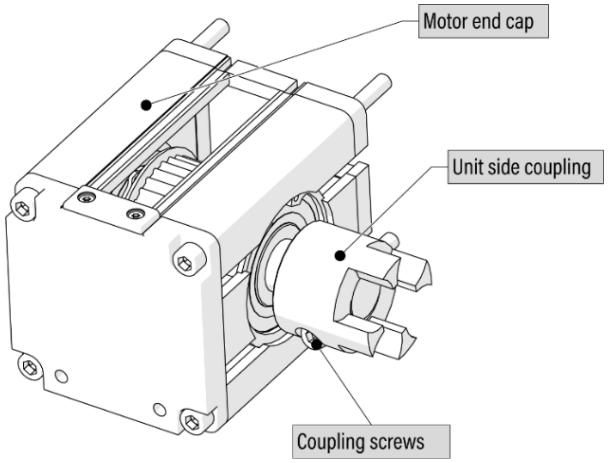
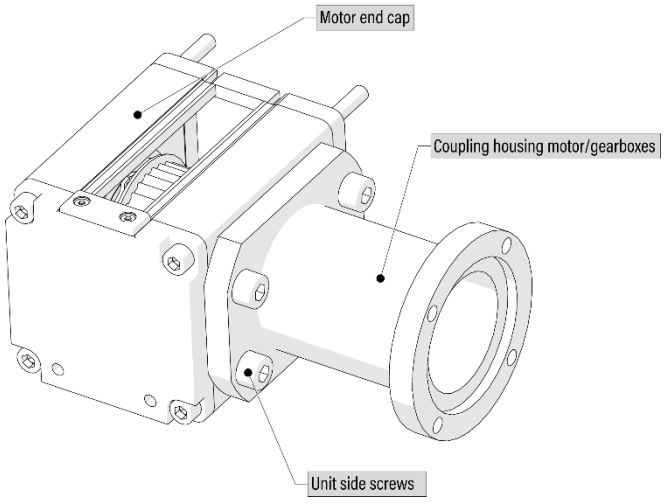
12. ASSEMBLY DISASSEMBLY MOTOR/GEARBOX COUPLING BELL



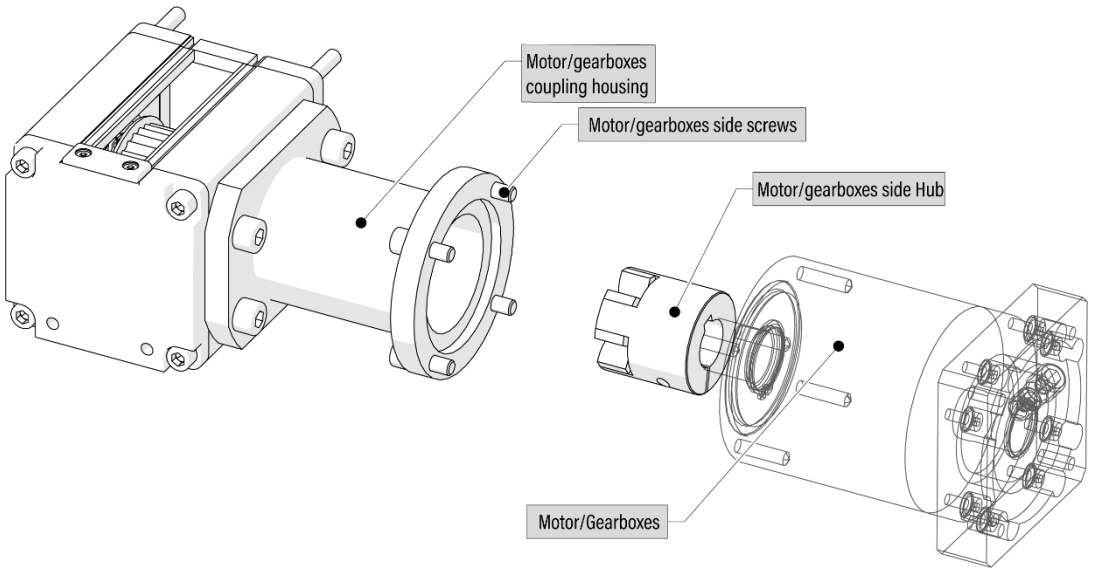
1. Insert the actuator side hub onto the shaft, the shaft end should coincide with the inner face of the hub, tighten the hub screw with the correct torque.



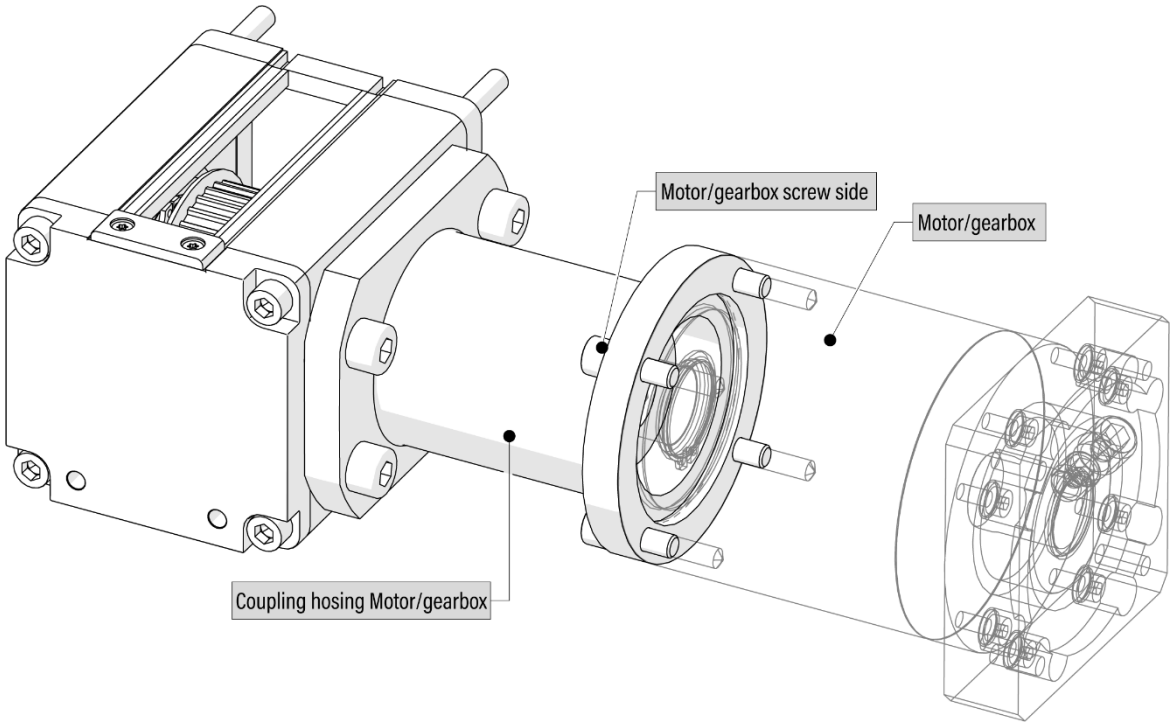
2. Connect the flange to the actuator (right or left side as needed) with the 4 screws A

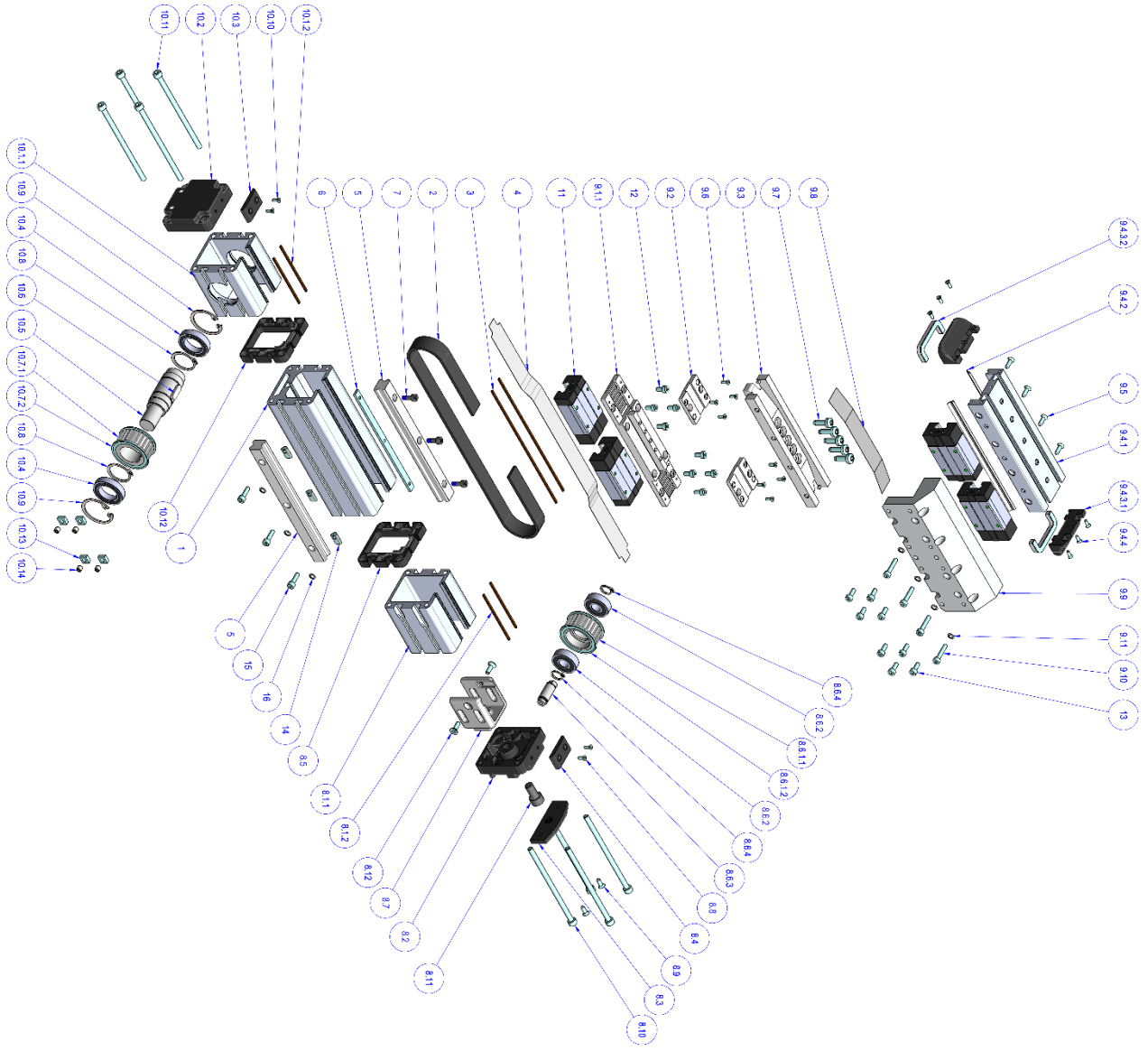


2. Insert the motor/gearbox side hub onto the shaft, the shaft end should coincide with the inner face of the hub, tighten the hub screw with the correct torque.



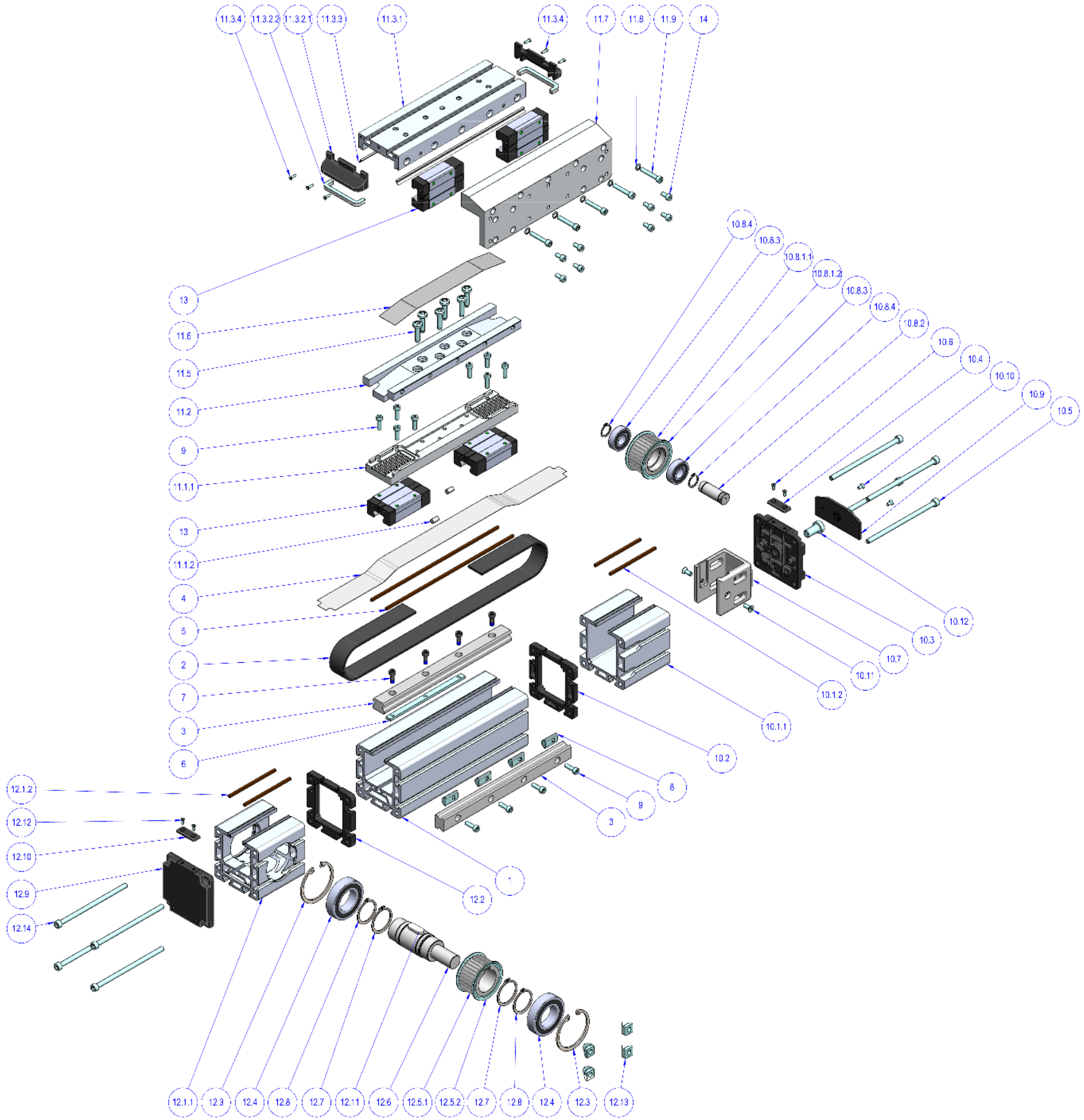
3. Insert the motor/gearbox into the bell housing by first matching the coupling and then the mounting holes, fasten with screws B and tension to the proper torque.





Pos.	Code	Description	Qta
1	A1A001-0156	PROFILO ALL. MASCHIATURA PER INLL.IATURA M55 L=CORSA+156 MM	1
2	A1B101-0A95	CINGHIA DENTATA LGW/ AR4MM/D PAZ VERDE A75/10 L=2XCORSA+485 MM	1
3	A1M001-0156	PLASTIMAG RFI 2X1.5XL=CORSA+156 MM	2
4	A1L001-0036	NASTRO ACCIAIO INTESTATURA 20XSPC.1.5SXL=CORSA+336 MM	1
5	A1G006-0195	GUIDA W/CN TG.15 L=195	2
6	BAUX135	BARRETTA FILETTATA MTB55 M4X135	1
7	V7CEN0.40A012FF	VITE T.C.E. ISO4762 FRENAFILETTO - M4X12 N	3
8	A1PRM02	PREMONTATO TESTATA TENDICINGHIA MTB55	1
8.1	A1PR000	PREMONTATO CORPO TESTATA TENDICINGHIA MTB55	1
8.1.1	A1M001-0063	PLASTIMAG RFI 2X1.5XL=82.5 TESTATA MOTORE/TENDICINGHIA MTB55	1
8.1.2	A1PK00L	TERMINALE TESTATA LATO TENDICINGHIA LAVORATO MTB55	2
8.2	A1PK00L	TERMINALE TESTATA LATO TENDICINGHIA LAVORATO MTB55	1
8.3	A1PD009V	PIASTRA BLOCCA VITE TENDICINGHIA VERNICIATO MTB55	1
8.4	A1PD009V	PIASTRA BLOCCA MASTRO DI PROTEZIONE VERNICIATO MTB55	1
8.5	A1PD72V	DISTANZIALE TENDICINGHIA VERNICIATO MTB55	1
8.6	A1PR003	PREMONTATO PULEGGIA TENDICINGHIA MTB55	1
8.6.1	A1PR002	PREMONTATO PULEGGIA TENDICINGHIA MTB55	1
8.6.1.1	A1PR10L	PULEGGIA TENDICINGHIA ATS 5+24 LAVORATO MTB55	1
8.6.1.2	A1Y001	FLANGIA PULEGGIA D40XD30 7XSP=1.5 MTB55	2
8.6.2	CSR.08800.285	CUSCINETTO RADIALE A SFERE D28XD10X8	2
8.6.3	A1Y001	ALBERO TENDICINGHIA MTB55	1
8.6.4	SGA10	CIRCLIP PER ALBERI DIN471 - 10X1	2
8.7	A1R001L	CORPO MICROFUSO TENDICINGHIA LAVORATO MTB55	1
8.8	V7STI40.30-008	VITE T.S. TORX AUTOFORMANTE DIN7500M - M3X8	2
8.9	V7STI40.40-010	VITE T.S. TORX AUTOFORMANTE DIN7500M - M4X10	2
8.10	V7CEZ0.50-100	VITE T.C.E. ISO4762 - M5X100 Z	4
8.11	V7CEN0.60A016	VITE T.C.E. ISO4762 - M6X16 N	1
8.12	V7STI40.40A012	VITE T.S. TORX METRICA ISO14581 - M4X12	2
9	A1PRM04	PREMONTATO CARRELLO MTE55	1
9.1	A1PR005	PREMONTATO CARRELLO INT. INFERIORE MTB55	1
9.1.1	A1PK00B-0150	CARRELLO INT. INFERIORE BURATTATO MTB55	1
9.1.2	A1M001	MAGNETE NEODIMIO 6X6X3	2
9.2	A1PK00B	PIASTRA BLOCCA CINGHIA BURATTATO MTB55	2
9.3	A1PK04B	CARRELLO INTERNO SUPERIORE BURATTATO MTB55	1
9.4	A1PR001-0150	PREMONTATO CARRELLO ESTERNO MTB55	1
9.4.1	A1S004	CARRELLO SUPERIORE ALL. LAVORATO MTB55	1
9.4.2	A1T001-0150	GUARNIZIONE CARRELLO POLIURETANO L=150MM MTB55	2
9.4.3	A1PR004	PREMONTATO PORTA RASOI/MOTORE MTB55	2
9.4.3.1	A1F001	PORTA RASOI/MOTORE VERNICIATO MTB55	1
9.4.3.2	A1F001	FELTRO 45X11.5X6 MTB55	1
9.4.4	V7STI40.30-008	VITE T.S. TORX AUTOFORMANTE DIN7500M - M3X8	6
9.5	V7STI40.40-012	VITE T.S. TORX AUTOFORMANTE DIN7500M - M4X12	4
9.6	V7STI40.30-008	VITE T.S. TORX AUTOFORMANTE DIN7500M - M3X8	8
9.7	V7STI40.50-016	VITE T.S. TORX AUTOFORMANTE DIN7500C - M5X16	5
9.8	A0TT19-0150	NASTRO TEFLON 19X5PCI 1.5 MTB55	1
9.9	A1W008	CARRELLO SUPERIORE LAVORATO MTE55	1
9.10	V7CEZ0.40-020	VITE T.C.E. ISO4762 - M4X20 Z	4
9.11	SGHZ-4	SCHNORR M4	4
10	A1PRM01-MTRNCK	PREMONTATO TESTATA MOTORE SINGOLO MASCHIO 6/16 NO SEDE CHIAVETTE MTB55	1
10.1	A1PR024	PREMONTATO CORPO TESTATA MOTORE MTB55	1
10.1.1	A1S001	CORPO TESTATA MOTORE LAVORATO MTB55	1
10.1.2	A1M001-0063	PLASTIMAG RFI 2X1.5XL=82.5 TESTATA MOTORE/TENDICINGHIA MTB55	2
10.2	A1PD009L	TERMINALE TESTATA LATO MOTORE LAVORATO MTB55	1
10.3	A1PD009V	PIASTRA BLOCCA MASTRO DI PROTEZIONE VERNICIATO MTB55	1
10.4	CSR-61604-2RS	CUSCINETTO RADIALE A SFERE D22XD20X7	2
10.5	A1Y002-M16WCK	ALBERO MOTORE SINGOLO MASCHIO 6*16 NO SEDE CHIAVETTE MTB55	1
10.6	C=PR06X18	CHIAVETTA PARALLELA D6N885 6X6X18	1
10.7	A1PR01I	PREMONTATO PULEGGIA FLANGIE MOTORE MTB55	1
10.7.1	A1PD11G	PULEGGIA MOTORE ATS 2+24 GREZZA MTB55	1
10.7.2	A1K001	FLANGIA PULEGGIA D40XD30 7XSP=1.5 MTB55	2
10.8	SGA12	CIRCLIP PER ALBERI DIN471 - 22X1.2	2
10.9	SGF32	CIRCLIP PER FORI DIN472 - 32X1.2	2
10.10	V7STI40.30-008	VITE T.S. TORX AUTOFORMANTE DIN7500M - M3X8	2
10.11	V7CEZ0.50-100	VITE T.C.E. ISO4762 - M5X100 Z	4
10.12	A1PD011V	DISTANZIALE MOTORE VERNICIATO MTB55	1
10.13	SDM65	DADO QUADRO M5/SW3.5	4
10.14	V5TTCE0.60-005	GRANO CAVA ESAGONALE ISO4026 M5X5	4
11	A1G006-F	PATTINO W/CN S1/PSU/LCCN 1 LF	4
12	V7CEZ0.40-008	VITE T.C.E. ISO4762 - M4X8 Z	4
13	V7CEZ0.40-010	VITE T.C.E. ISO4762 - M4X10 Z	8
14	DTM05-04	DADO A T.7,7X4 CAVA 5 M4	3
15	V7CEZ0.40-014	VITE T.C.E. ISO4762 - M4X14 Z	3
16	SGHZ-4	SCHNORR M4	3

14. BOM MTE80



Pos.	Code	Descrizione	Q.tà
1	A2A001L-0230	PROFILO ALL. MASCHIATURA PER RULLATURA M8 L=CORSA+230 MM	1
2	A2B101-0675	CINGHIA DENTATA CAVI ARAMID PAZ VERDE AT5/25 L=2XCORSA+675 MM	1
3	A2G006-0230	GUIDA WON TG.20 L=230	2
4	A2L001-0442	NASTRO ACCIAIO INTESTATURA 32XSP0,25XL=CORSA+442 MM	1
5	A2M001-0230	PLASTIMAG RP1 3X3XL=CORSA+230 MM	2
6	BA05X135	BARRETTA FILETTATA MTB80 M5X135	1
7	VTCEN0,50-014-FF	VITE T.C.E. ISO4762 FRENAFILETTO - M5X14 N	4
8	DTW08-M5	DADO A T 13,5X7,2 CAVA 8 M5	4
9	VTCEZ0,50-016	VITE T.C.E. ISO4762 - M5X16 Z	12
10	A2PRM02	PREMONTATO TESTATA TENDICINGHIA MTB80	1
10.1	A2PR009	PREMONTATO CORPO TESTATA TENDICINGHIA MTB80	1
10.1.1	A2S002	CORPO TESTATA TENDICINGHIA LAVORATO MTB80	1
10.1.2	A2V001-0083	PLASTIMAG RP1 3X3XL=82,5 TESTATA TENDICINGHIA MTB80	2
10.2	A2P012V	DISTANZIALE TENDICINGHIA VERNICIATO MTB80	1
10.3	A2P007L	TERMINALE TESTATA LATO TENDICINGHIA LAVORATO MTB80	1
10.4	A2P008V	PIASTRA BLOCCA NASTRO DI PROTEZIONE VERNICIATO MTB80	1
10.5	VTCEZ0,60-120	VITE T.C.E. ISO4762 - M6X120 Z	4
10.6	VTSTA0,30-008	VITE T.S. TORX AUTOFORMANTE DIN7500M - M3X8	2
10.7	A2R001L	CORPO MICROFUSO TENDICINGHIA LAVORATO MTB80	1
10.8	A2PR003	PREMONTATO PULEGGIA TENDICINGHIA MTB80	1
10.8.1	A2PR002	PREMONTATO PULEGGIA FLANGE TENDICINGHIA MTB80	1
10.8.1.1	A2P010L	PULEGGIA TENDICINGHIA AT5 Z=32 LAVORATO MTB80	1
10.8.1.2	A2V001	FLANGIA PULEGGIA D55XD43XSP1,5 MTB80	2
10.8.2	A2Y001	ALBERO TENDICINGHIA MTB80	1
10.8.3	CSR-06002-2RS	CUSCINETTO RADIALE A SFERE D32XD15X9	2
10.8.4	SGA15	CIRCLIP PER ALBERI DIN471 - 15X1	2
10.9	A2P009V	PIASTRA BLOCCA VITE TENDICINGHIA VERNICIATO MTB80	1
10.10	VTSTA0,40-008	VITE T.S. TORX AUTOFORMANTE DIN7500M - M4X8	2
10.11	VTSTV0,50-012	VITE T.S. TORX METRICA ISO14581 - M5X12	2
10.12	VTREZ10-020	VITE T.R.E. DIN7984 - M10X20 Z	1
11	A2PRM04	PREMONTATO CARRELLO MTE80	1
11.1	A2PR005	PREMONTATO CARRELLO INT. INFERIORE MTB80	1
11.1.1	A2W002	CARRELLO INT. INFERIORE MTB80	1
11.1.2	A2N001	MAGNETE NEODIMIO Ø6XL10	2
11.2	A2A003	CARRELLO INTERNO SUPERIORE MTB80	1
11.3	A2PR007	PREMONTATO CARRELLO ESTERNO MTB80	1
11.3.1	A2S004	CARRELLO SUPERIORE ALL. LAVORATO MTB80	1
11.3.2	A2PR004	PREMONTATO PORTA RASCHIATORE MTB80	2
11.3.2.1	A2P006V	PORTA RASCHIATORE VERNICIATO MTB80	1
11.3.2.2	A2F001	FILTRO 63X16X5 MTB80	1
11.3.3	A1T001-0230	GUARNIZIONE CARRELLO POLIURETANO L=230MM MTB80	2
11.3.4	VTSTA0,30-010	VITE T.S. TORX AUTOFORMANTE DIN7500M - M3X10	8
11.4	VTSTV0,50-016	VITE T.S. TORX METRICA ISO14581 - M5X16	5
11.5	VTBTA0,60-025	VITE T.B. TORX AUTOFORMANTE DIN7500C - M6X25	6
11.6	A2TT29-0200	NASTRO TEFLON 29XSP0,3 MTB80	1
11.7	A2W026-0230	CARRELLO SUPERIORE LAVORATO MTE80	1
11.8	SCHZ-5	SCHNORR M5	5
11.9	VTCEZ0,50-030	VITE T.C.E. ISO4762 - M5X30 Z	5
12	A2PRM01-M19WOK	PREMONTATO TESTATA MOTORE SINGOLO MASCHIO Ø19 NO SEDE CHIAVETTE MTB80	1
12.1	A2PR008	PREMONTATO CORPO TESTATA MOTORE MTB80	1
12.1.1	A2S001	CORPO TESTATA MOTORE LAVORATO MTB80	1
12.1.2	A2V001-0084	PLASTIMAG RP1 3X3XL=82,5 TESTATA MOTORE MTB80	2
12.2	A2P001V	DISTANZIALE MOTORE VERNICIATO MTB80	1
12.3	SGF55	CIRCLIP PER FORI DIN472 - 55X2	2
12.4	CSR-06006-2RS	CUSCINETTO RADIALE A SFERE D55XD30X13	2
12.5	A2PR001	PREMONTATO PULEGGIA FLANGE MOTORE MTB80	1
12.5.1	A2P011G	PULEGGIA MOTORE AT5 Z=32 GREZZA MTB80	1
12.5.2	A2V001	FLANGIA PULEGGIA D55XD43XSP1,5 MTB80	2
12.6	A2Y002-M19WOK	ALBERO MOTORE SINGOLO MASCHIO Ø19 NO SEDE CHIAVETTE MTB80	1
12.7	SGA32	CIRCLIP PER ALBERI DIN471 - 32X1,5	2
12.8	SGA30	CIRCLIP PER ALBERI DIN471 - 30X1,5	2
12.9	A2P005L	TERMINALE TESTATA LATO MOTORE LAVORATO MTB80	1
12.10	A2P008V	PIASTRA BLOCCA NASTRO DI PROTEZIONE VERNICIATO MTB80	1
12.11	CHP10X8X25	CHIAVETTA PARALLELA DIN6885 10X8X25	1
12.12	VTSTA0,30-008	VITE T.S. TORX AUTOFORMANTE DIN7500M - M3X8	2
12.13	DQM08S	DADO QUADRO M8X13X6,5 + MOLLA	4
12.14	VTCEZ0,60-120	VITE T.C.E. ISO4762 - M6X120 Z	4
13	A2D006LF	PATTINO WON S20RUU CON 1 LF	4
14	VTCEZ0,50-010	VITE T.C.E. ISO4762 - M5X10 Z	6

15. BELT TENSION ADJUSTMENT

The units are already supplied with the belt with the correct tension, the instrument used, Trummeter, is an instrument based on infrared light reader, that reads the vibration of the belt and through software transforms it into Newton (thrust force).

In case it is necessary to adjust the belt act as described table following figure.

There is another way of adjusting the belt that is based on a known force applied to the belt and how much the belt must yield (in mm)

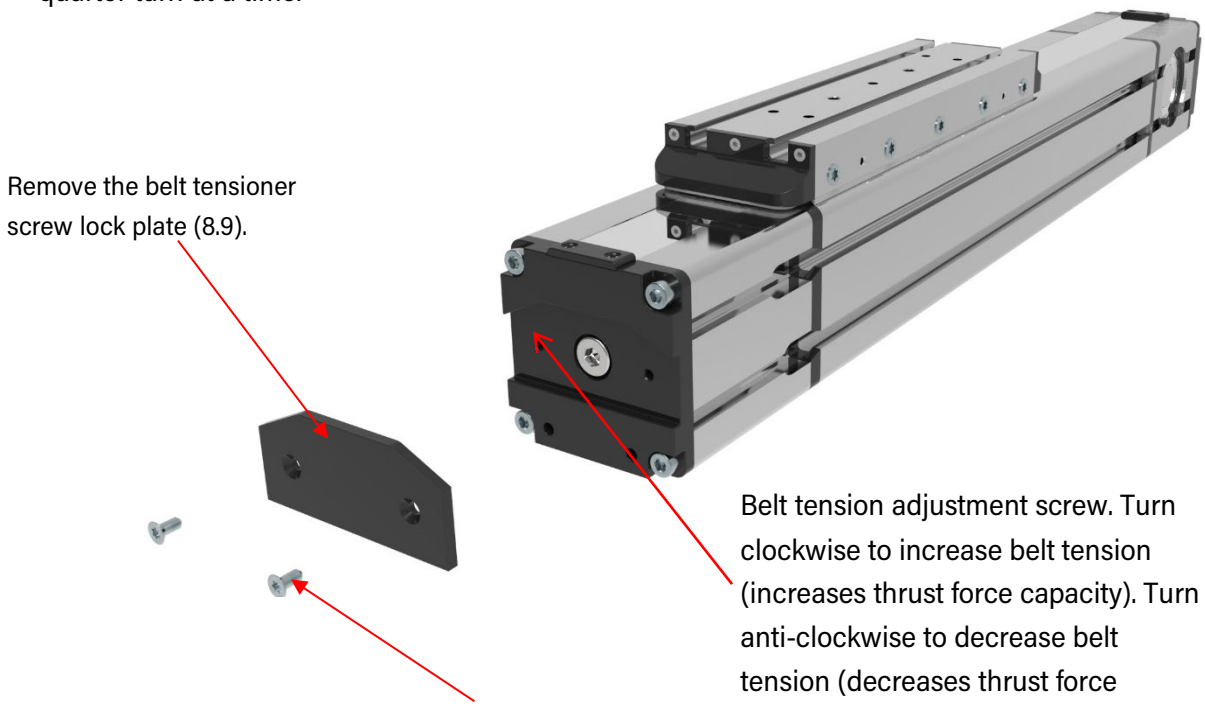
In the case of MTE Series actuators proceed as follows.

- Bring the carriage about 200 mm from the head, apply a force at about 80 Newtons in the middle part of the 200 mm, act on the adjusting screw so that the applied force does not cause the belt to yield about 3 mm.

Proper operation of the linear unit depends on the required thrust force and belt tension ratio.

Remember that:

- A belt with too high a tension leads to increased friction and mechanical stress on the bearings and the belt itself, in which case reduce the tension.
- A belt with too little "tension" can lead to loss of precision and in case of sudden acceleration can blow out the pulley teeth, in this case increase the tension. We recommend acting on the screw a quarter turn at a time.



16. LUBRICATION

The units are all supplied with LF-type lubrication reservoirs, a solid lubricant that maintains the correct lubrication of the guideways regardless of mounting and orientation. This type of lubrication allows for a longer service life and combined with the fact that the guideway is protected reduces lubrication maintenance to a minimum.

17. WARRANTY CONDITIONS

The guarantee conditions are set out in the terms and conditions of delivery and payment issued at the time of the order.

Warranty coverage shall be voided if:

- the unit is not used in accordance with the appropriate use of the unit.
- the instructions in this manual are not followed.
- the unit is modified without the manufacturers consent.
- the screws sealed with paint are unlocked.

The manufacturer's warranty for maintenance and repair applies only if original spare parts are used.

18. MAINTENANCE CONTACTS

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