



Additional Instructions

to the Alu-Line kit - assembly of the
second ball screw X-axis

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Introduction

These additional instructions contain supplementary information on the „Assembly instructions milling kit“ for installing or retrofitting a second ball screw on the X-axis. The supplied 2nd ball screw is intended exclusively for assembly on the CNC portal milling machines of the Alu-Line 0607, 0610, 1107 and 1110.

Scope of delivery

Illustration	Designation	Number	Illustration	Designation	Number
	Bracket Drag chain X	1		Angle 10 45 x 90 incl. mounting kit	1
	Recirculating ball nut 16x10	1		Timing belt cover X Double	1
	Ball screw 16x10 X-Achse Alu-Line 06XX: 1015 mm Alu-Line 11XX: 1515 mm	1		HTD-Timing belt 523 teeth	1
	Fixed bearing unit (Housing + 2 roller bearings) <small>22b with fastening threads</small>	1		Bearing unit toothed belt: 2 x ball-bearing 608 1 x fitting screw DIN 7379 2 x washer 8,4 1 x washer 6,4 1 x washer 6,4	2
	Floating bearing unit (Housing + 1 roller bearing)	1		Belt tensioner X	1
	Dirt scraper	2		Front plate drive side	1
	Clamping block for recirculating ball nut	1		HTD-Timing belt wheel 36 teeth	3
	Shaft nut M10x0,75	1		Standard parts / screws	div.

Assembly

i Note

The pre-assembly of the 2nd ball screw is to be carried out as described in the main instructions on page 13.

Identification numbers for parts outside the scope of delivery listed on page 2 (e.g. L3) refer to the main instructions.)

Supplement to the chapter „X-axis / base frame“

- Equip the front plate 64 on the drive side with flat-head screws M8x20 L3 and loosely screw on the T-nuts slot 10 M8 G2 on the inside.
- Position the front plate on the drive side, threading the hammer nuts into the T-slot of the aluminum profile. To turn the T-nuts 90° in the T-slot, tighten the screws slightly..
- Screw the face plate on the drive side to the aluminum profiles using flat-head screws M12x20 M; Slightly counter-tighten the screws.
- Screw the face plate on the drive side to the profiles with angle brackets 50 and 51 slot 10 T-head screws M8x20 I, flat-head screws M8x30 L4 and flange nuts M8 R Slightly counter-tighten the screws.
- Tighten all fastening screws (L3/L4/M) of the front plate drive side and the brackets 50/51.
- Slide two carriages onto the linear guides on both sides; the following must be observed:
 - Ground, blank surfaces on the long sides of the carriage point downwards to the work surface.
 - The lubricating nipples on the carriages point outwards and towards the work surface. If necessary, turn the lubricating nipples or screw them to the opposite end.
- Screw the fixed bearing units of the pre-assembled ball screws to the face plate on the drive side using cylinder screws M5x30 C4 and washers 5.3 U; Slightly counter-tighten the screws.

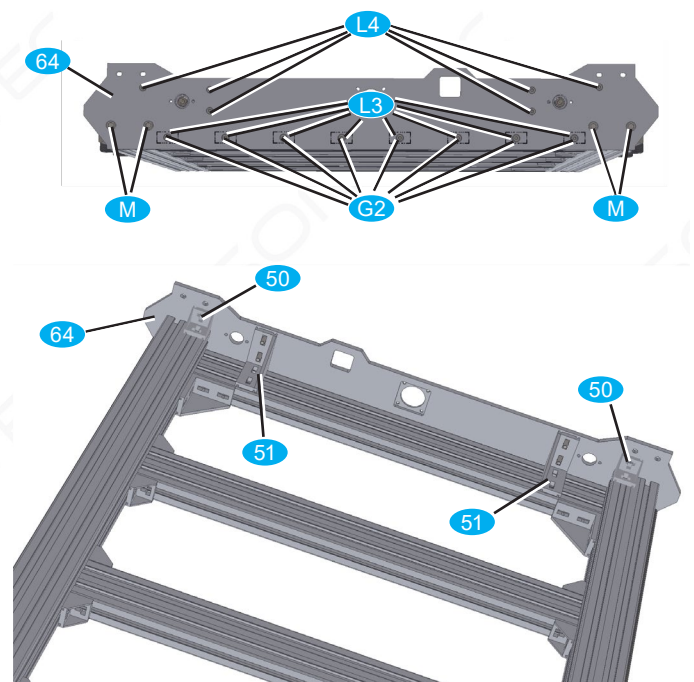


Fig. 1: Assembly of the front plate on the drive side

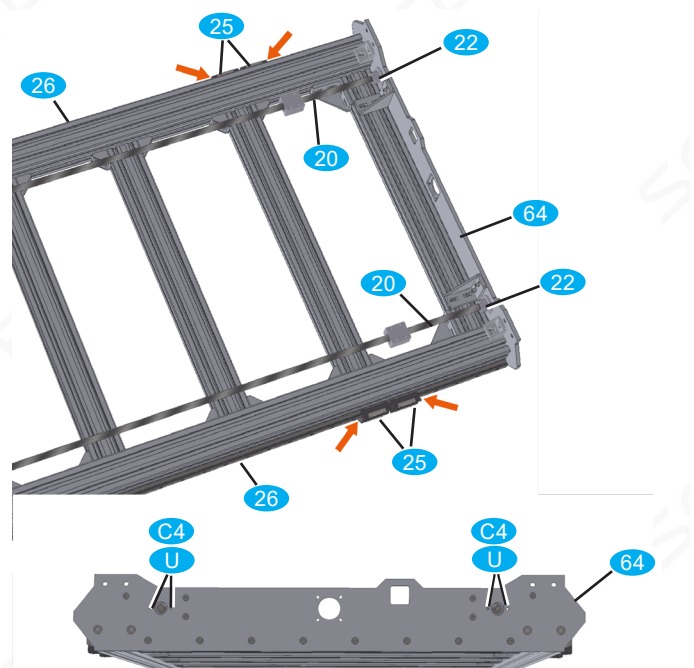


Fig. 2: Linear guides and fixed bearings

Additional Instructions

Alu-Line 2nd spindle X-axis

- Equip the front plate **48** on the floating bearing side with flat-head screws M8x20 **L3** and loosely screw on the T-nuts slot 10 M8 **G2** on the inside.
- Position the front plate on the floating bearing side, threading the hammer nuts into the T-slot of the aluminum profile. To turn the T-nuts 90° in the T-slot, tighten the screws slightly.
- Screw the floating bearing unit **23** to the end plate on the floating bearing side **48** with cylinder head screws M5x30 **C4** and washers 5.3 **U**; Slightly counter-tighten the screws.
- Screw the end plate on the floating bearing side to the aluminum profiles with flat-head screws M12x20 **M**; Slightly counter-tighten the screws.
- Screw the end plate on the floating bearing side to the profiles with two brackets **50**, slot 10 M8x20 T-head screws **I**, M8x30 flat-head screws **L4** and M8 flange nuts **R**. Slightly counter-tighten the screws.
- Tighten all fastening screws (**L3/L4/M**) of the end plate floating bearing side and the bracket. This does not apply to the fastening screws **C4**!
- Screw the flange plates of the X-nuts **8** to the aluminum profile **37** using flat-head screws M8x16 **L1** and the already inserted M8 sliding blocks **H**; Only tighten the screws so far that the flange plates of the X-nuts can still be moved.
- Move the portal until the clamping blocks **46** of the recirculating ball nuts are located over the flange plates of the X nut **8**.
- Screw clamping blocks to the flange plates of the X-nut with cylinder screws M5x30 **C4**. Anzugsmoment: 2 Nm. Tightening torque: 2 Nm. Furthermore with cheese head screws M5x40 **C6** and hammer nuts Nut 8 M5 **F**, tightening torque: 6 Nm. See also Fig. 4.

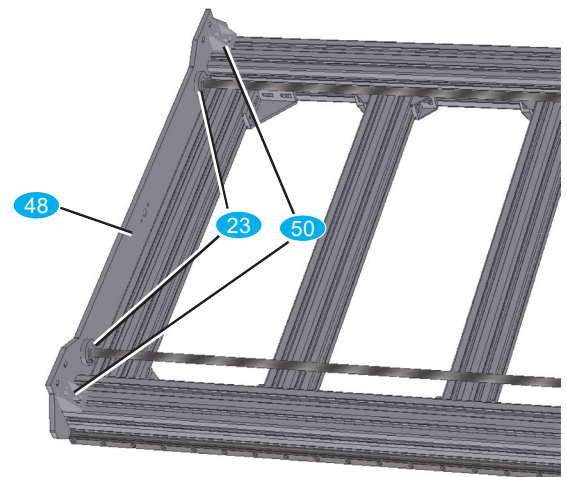
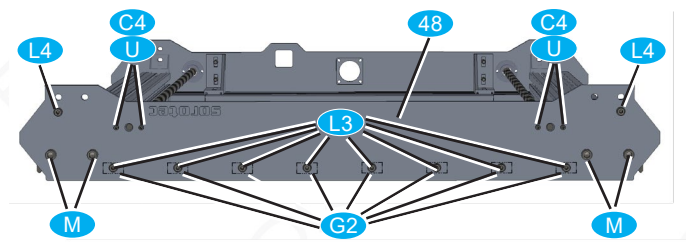


Fig. 3: Mounting of front plate floating bearing side



Fig. 4: Connection of portal and recirculating ball nuts

Supplement to the chapter „Y-axis / Portal“

- Move the gantry as far as possible towards the front plate on the drive side **64** by turning the ball screws **20** in parallel.
- Tighten the fastening screws of the flange plates X-nuts **8** / aluminum profile **37** (see above).
- Tighten the fastening screws **C4** of the fixed bearing units. Tightening torque: 6 Nm
- Move the gantry as far as possible towards the end plate on the floating bearing side **48** by turning the ball screws in parallel.
- Tighten the fastening screws **C4** of the floating bearing units. Tightening torque: 6 Nm

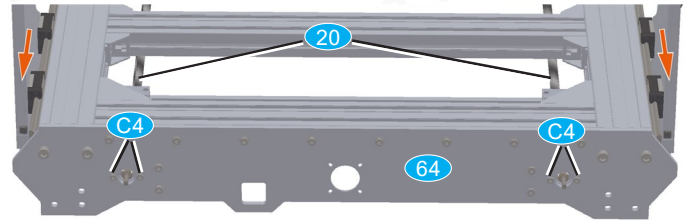


Fig. 5: Tightening the fixed bearing units

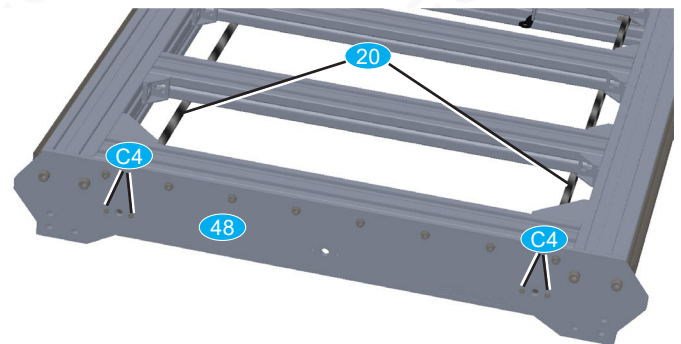


Fig. 6: Tightening the floating bearing units

Supplement to the chapter „Mounting the axis drives“

- To assemble the bearing units for the toothed belt **62** slide the components onto the fitted screw in the following order:
 - Washer DIN 125 8.4
 - Ball-bearing 608
 - Washer DIN 125 8.4
 - Ball-bearing 608
 - Washer DIN 125 6.4
 - Washer ISO 7098 6.4
- Screw both bearing units **62** to the belt tensioner X **63**. Tightening torque: 10 Nm

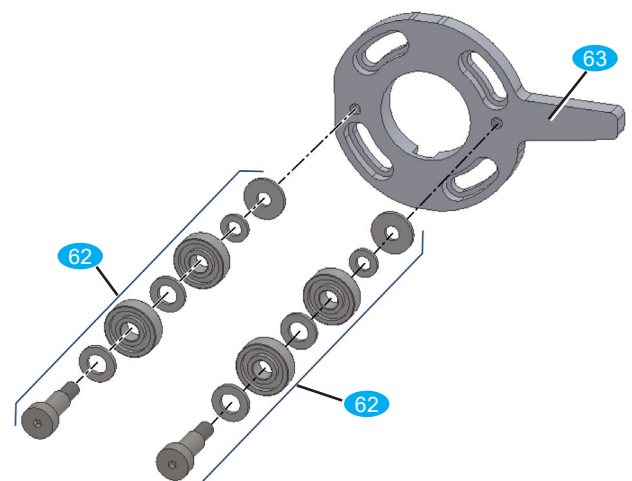


Fig. 7: Bearing units for toothed belts, belt tensioners

- Insert the stepper motor from the inside into the recess in the front plate on the drive side **64**.
- Put on the belt tensioner X **63** from the outside and insert 4 cylinder screws M5x25 **N** with washers 5.3 **U** through the holes in the belt tensioner X, the front plate drive side and the stepper motor.
- Screw on hexagon nuts **U** on the inside; Slightly counter-tighten the screws so that the belt tensioner X can still be turned.

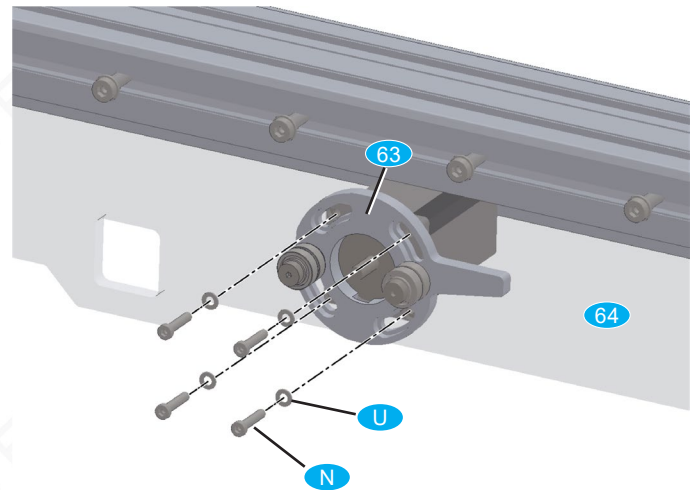


Fig. 8: Assembly of the belt tensioner

- Slide the HTD timing belt wheels **65** onto the shoulders of the ball screws **20** as far as possible; Do not tighten the locking screws yet!
- Push the HTD timing belt wheel **65** onto the output shaft of the stepper motor, align it with the HTD toothed belt wheels on the ball screws and fix it with the locking screw.

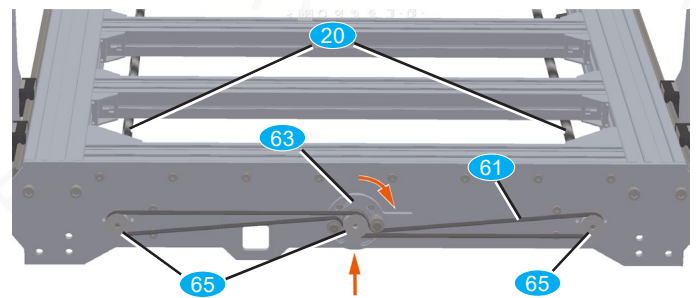


Fig. 9: Assembly of the X-drive

i Note

The belt tensioner X **63** has a recess on the underside (red arrow in Fig. 9) for reaching the locking screw.

- Fit the HTD timing belt **61** as shown and tension it by turning the belt tensioner X clockwise; Tighten the fastening screws of the belt tensioner / stepper motor.
- Check the parallelism of the portal to the front plate on the drive side and, if necessary, correct it by turning a ball screw; Tighten the locking screws of the HTD toothed belt wheels of the ball screws.

- Loosen the screws **L3** a few turns (see Fig. 10), slide the X Double toothed belt cover **60** under the screw heads and tighten the screws.

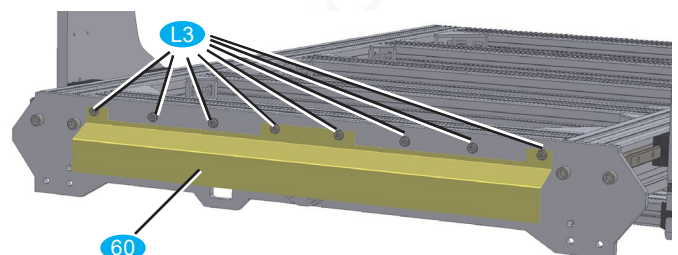


Fig. 10: Assembly of the belt cover

Supplement to the chapter „Drag chain X-axis“ of Supplementary instructions for the electrical assembly kit

- Equip the drag chain bracket X **13** with two flat-head screws M8x16 **L1** and loosely screw on two T-nuts Nut 10 M8 **G2** on the inside.
- Position the bracket for the drag chain X, threading the hammer nuts into the T-slots of the aluminum profiles. To turn the T-nuts 90° in the T-slots, tighten the screws slightly.
- Equip the ends of the drag chains **71** with connection kits **72** with countersunk screws M5x10 **V1** and screw them to the drag chain brackets X **13**.
- Align the drag chain bracket X so that the drag chain is straight.
- Tighten flat head screws **L1**.

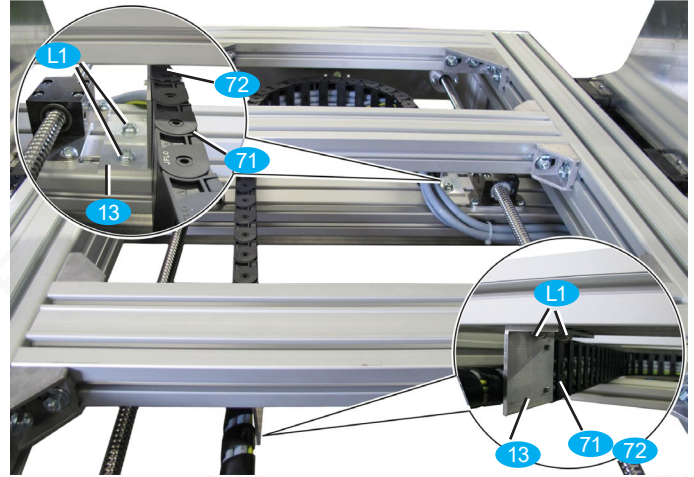


Fig. 11: Assembly of the drag chains