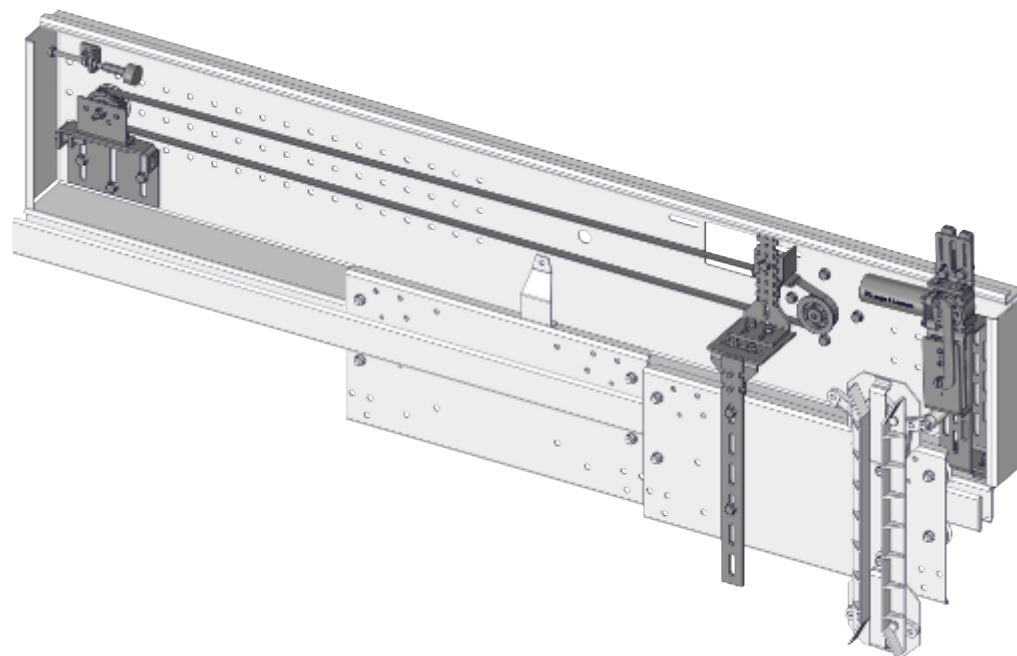




Conversion Instructions
Fermator Sinus Arm, TL, TR, ZT
to TSG V4

Shows **TL**. **ZT** like **TL**, **TR** mirror image.

Imprint

Manufacturer	Langer & Laumann Ing.-Büro GmbH
Address	Wilmsberger Weg 8 48565 Steinfurt Germany
Phone	+49 (2552) 92791 0
E-mail	info@lul-ing.de
Internet	www.lul-ing.de

Dokument **in Deutsch** durch Scannen des QR-Codes anfordern.



Obtenir le document **en français** en scannant le code QR.



1 About these instructions

1.1 Purpose

These conversion instructions contain important information and general mechanical assembly steps for the conversion of an existing system. These instructions must be observed to avoid hazards, repair costs and downtimes and increase the reliability and service life of the system.

1.2 Scope

These conversion instructions apply to the following conversion kit:

- Fermator Sinus Arm, TL, TR, ZT to TSG V4

1.3 Version information

The version number of these conversion instructions is shown on the front page and footer of each page.

Always retain and use the latest version of all documents.

Using an outdated version of this and any required and supplementary documentation can lead to incorrect assembly.

1.4 Contact information

See page 2.

1.5 Customers for whom these instructions are intended

These conversion instructions are intended for end customers of Langer & Laumann Ing.-Büro GmbH.

To ensure correct operation of the system, in addition to reading these conversion instructions, personnel must have the following qualifications and relevant technical knowledge:

- Extensive technical knowledge of these systems
- Thorough knowledge of the operating instructions of these systems
- Recognised as a qualified specialist

1.6 Other applicable documents

The following documents are required for work not described in these conversion instructions:

- Fitting instructions for the door control unit with information on electrical connection, fitting and commissioning
- Information on components not manufactured and supplied by Langer & Laumann

2 Safety

2.1 General safety instructions

Personnel must have carefully read and understood these conversion instructions before starting the conversion work.

The safety instructions and guidelines specified in these conversion instructions must be observed.

The accident prevention regulations applicable at the place of use and general safety regulations must be observed.

2.2 Personnel requirements

2.2.1 Personnel qualification and scope of work

The work described in these instructions places different demands on the qualifications of personnel. Insufficiently qualified personnel cannot correctly assess the potential risks and may expose themselves and others to the risk of injury. Insufficiently qualified personnel are not permitted to enter work areas/danger zones. Persons whose reactions are influenced, e.g. by drugs, alcohol or medication, must not work on the system.

Qualified personnel Only qualified personnel (lift fitters for specific activities in lift construction in accordance with DGUV 303-001) may work on mechanical components.

Qualified electricians Only qualified electricians or lift fitters with advanced training as qualified electricians for specific activities in lift construction may work on electrical components in accordance with DGUV 303-001.

2.2.2 Personal protective equipment

Personal protective equipment serves to protect personnel from health and safety risks at work. The prescribed protective equipment must be worn.

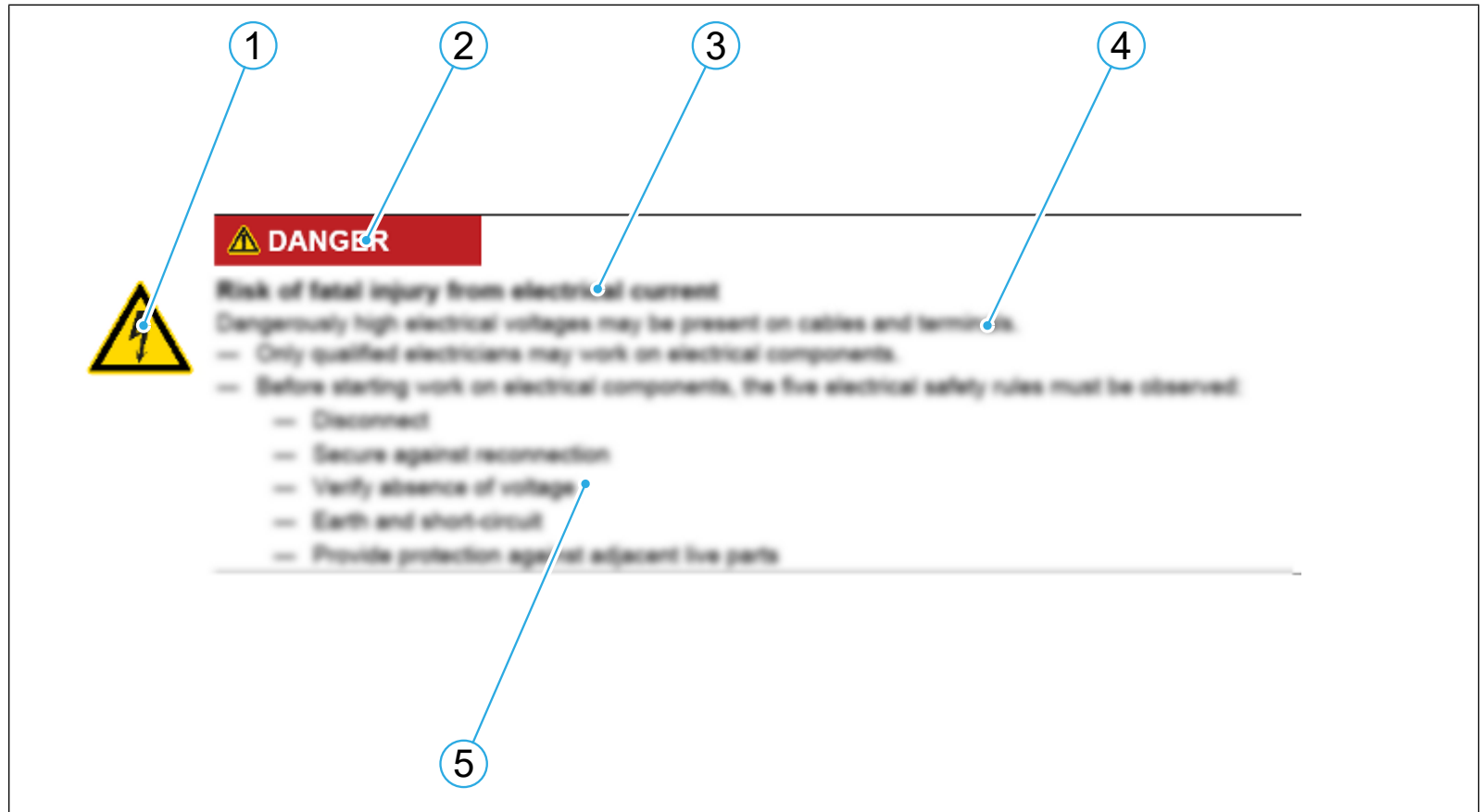
Symbol	Meaning
	Protective clothing must be worn to protect against hazards in the workplace.
	Non-slip safety footwear must be worn to prevent injuries to feet.
	Cut resistant and puncture resistant protective gloves must be worn to prevent hand injuries.
	Hard hats must be worn to prevent head injuries.
	Safety goggles must be worn to prevent eye injuries.
	Hearing protectors must be worn to protect against noise.
	Safety harnesses must be worn to protect against falls.

Table 1: Personal protective equipment

2.3 Warnings

2.3.1 Structure of warning notices

All warning notices in this document are structured as follows:



1	Hazard symbol	2	Signal word
3	Type and source of hazard	4	Possible consequences of non-observance
5	Procedure for hazard prevention		

2.3.2 Meaning of signal words and symbols

The following signal words are used in this document:

Signal word	Meaning, consequences if not prevented
DANGER	Warns of an imminent hazardous situation which results in death or serious injury.

Table 2: Meaning of signal words

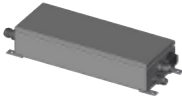
The following hazard symbols are used in this document:

Symbol	Designation
	Automatic start-up
	Electrical hazard

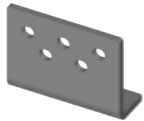
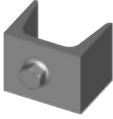
Table 3: Meaning of hazard symbols

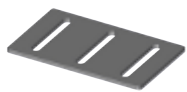
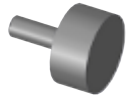
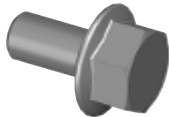
3 Scope of delivery

The conversion kit components are shown in the table. The position numbers are used in the following chapters to identify the individual components. For logistical reasons, the packaging can contain further components that are not required for actual use.

Pos.	Illustration	Item number	Description	Quantity
P001		8.20.xxxxx.04	TSG Electronics	1
P002		8.20.400xx.xx	TSG Motor	1

Pos.	Illustration	Item number	Description	Quantity
P003		8.20.831xx	TSG sinus drive	1
P004		1.20.60350	Motor bracket	1
P005		1.20.60160	Timing belt pulley D = 56 mm, 8M	1
P006		1.20.60003	Deflection pulley D = 56 mm, 8M	1
P007		x.20.xxxxx.xx	Timing belt 8M	1
P008		1.20.60005	Timing belt lock, L-shaped	1
P009		1.20.60070	L-shaped bracket	1
P010		1.20.59070	L-shaped bracket	1

Pos.	Illustration	Item number	Description	Quantity
P011		1.20.94100	L-shaped bracket	1
P012		1.20.94101	C-shaped bracket	1
P013		1.20.92020	L-shaped bracket	1
P014		1.20.60075	L-shaped bracket	1
P015		1.20.60013	L-shaped bracket	1
P016		1.20.60110	L-shaped bracket	1
P017		1.20.60020	U-shaped bracket	1
P018		1.20.60004	Rectangular plate	1

Pos.	Illustration	Item number	Description	Quantity
P019		1.20.30800	Rectangular plate	1
P020		1.20.91120	Bumper D = 30 mm, round	1
P021		1.36.00121	Spacer M8 x 40 mm	1
P022		1.36.00135	Locking screw M6 x 12 mm	1
P023		1.36.00710	Locking screw M8 x 16 mm	1
P024		1.36.00720	Locking screw M8 x 20 mm	15
P025		1.36.00725	Locking screw M8 x 25 mm	9
P026		1.36.00115	Hexagon head screw M8 x 40 mm	2

Pos.	Illustration	Item number	Description	Quantity
P027		1.36.00177	Hexagon head screw M8 × 100 mm	1
P028		1.36.00331	Countersunk screw M4 × 16 mm	1
P029		1.36.00360	Countersunk screw M6 × 16 mm	4
P030		1.36.00501	Nut M8	16
P031		1.36.00430	Nut M8	2
P032		1.36.00169	Spring washer M8	1
P033		1.36.01035	Washer M8	1

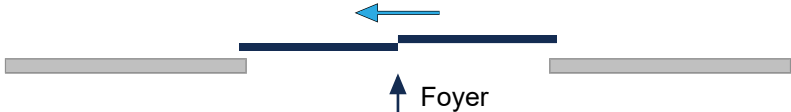
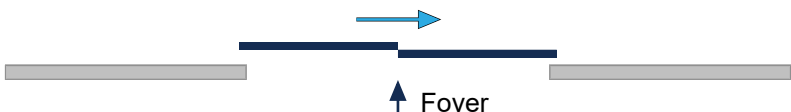
4 Required tools

The tools required for the conversion are shown in the table. The position numbers are used in the following chapters to identify the individual tools.

Pos.	Symbol	Description
T001		Soft face hammer
T002		Hammer
T003		Puller for bearings and pinions
T004		Pipe wrench
T005		Side cutters
T006		Circlip pliers
T007		Angle grinder
T008		Measuring tool (folding rule or measuring tape)
T009		Slotted screwdriver
T010		Phillips screwdriver
T110		Combination wrench, size 10
T111		Combination spanner, size 11
T113		Combination wrench, size 13
T204.0		Allen key, size 4
T608.5		Drill bit, Ø 8.5 mm

5 Definition of door opening directions

The possible door opening directions are shown in the following table in schematic form.

L: Left opening	
R: Right opening	
TL: Telescopic left opening	
TR: Telescopic right opening	
C: Center opening	
CT: Center telescopic opening	
FD: Folding door	

6 Disassembly of existing components

DANGER



Danger to life from rotating/moving system components

- Before starting work, switch off the system completely.
- Keep away from unsecured rotating/moving system components.

DANGER



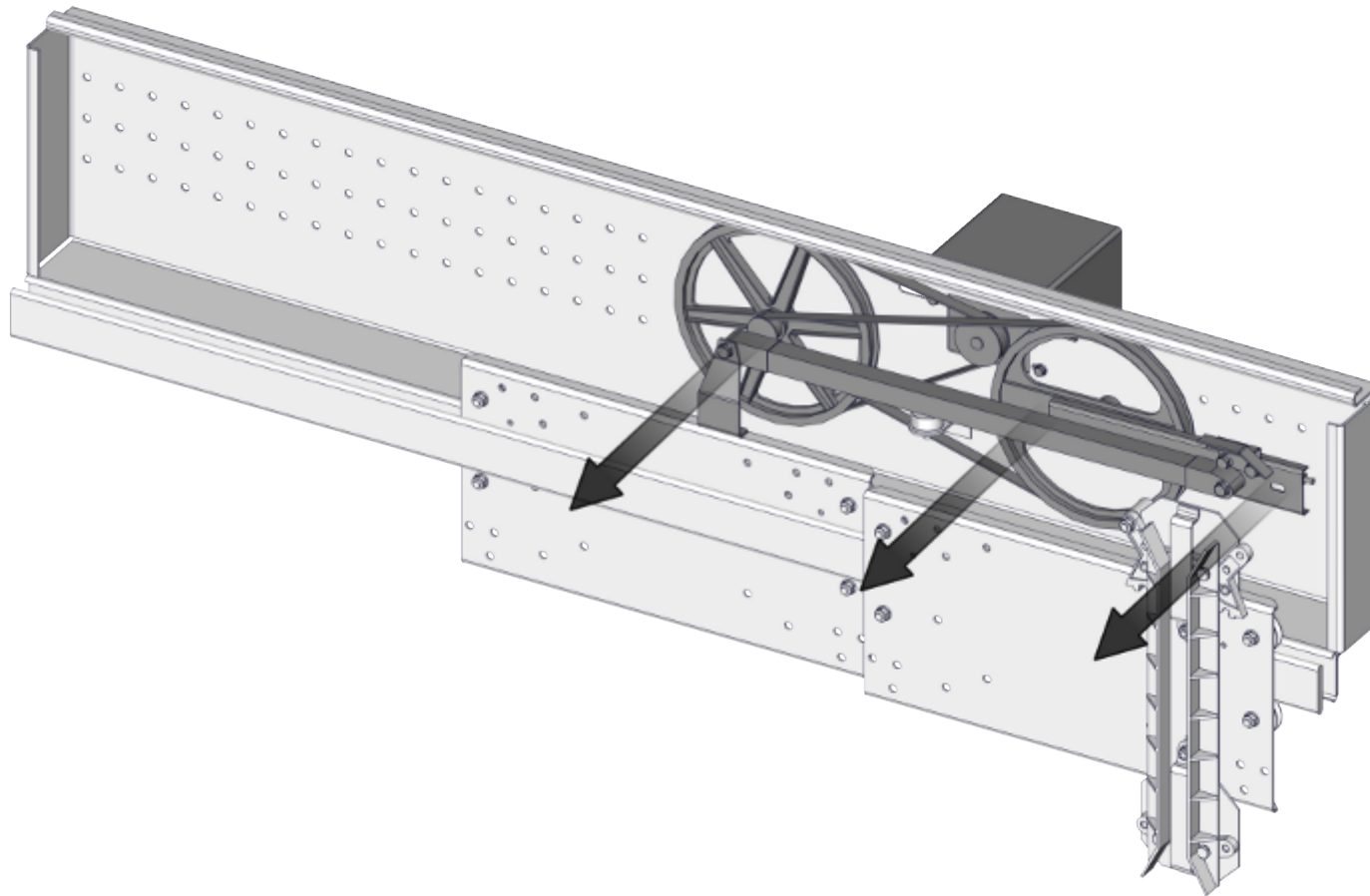
Risk of fatal injury from electrical current

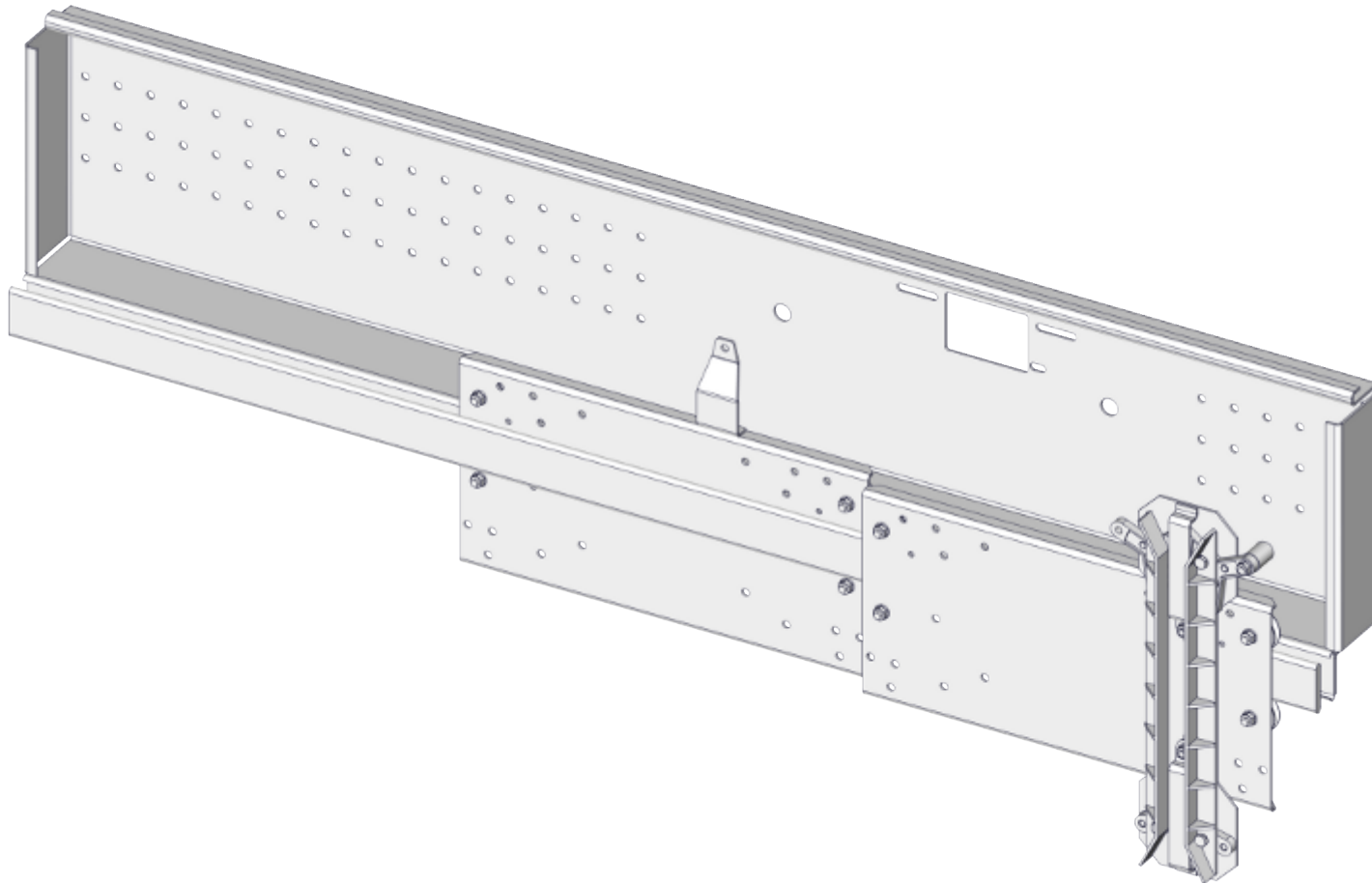
Dangerously high electrical voltages may be present on cables and terminals.

- Only qualified electricians may work on electrical components.
- Before starting work on electrical components, the five electrical safety rules must be observed:
 - Disconnect
 - Secure against reconnection
 - Verify absence of voltage
 - Earth and short-circuit
 - Provide protection against adjacent live parts

Tools

Pos.	Symbol	Description
T002		Hammer
T003		Puller for bearings and pinions
T004		Pipe wrench
T005		Side cutters
T006		Circlip pliers
T007		Angle grinder
T1xx		Combination spanners, as needed

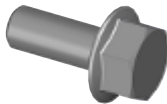




7 Assembly

7.1 Mounting the motor and bracket

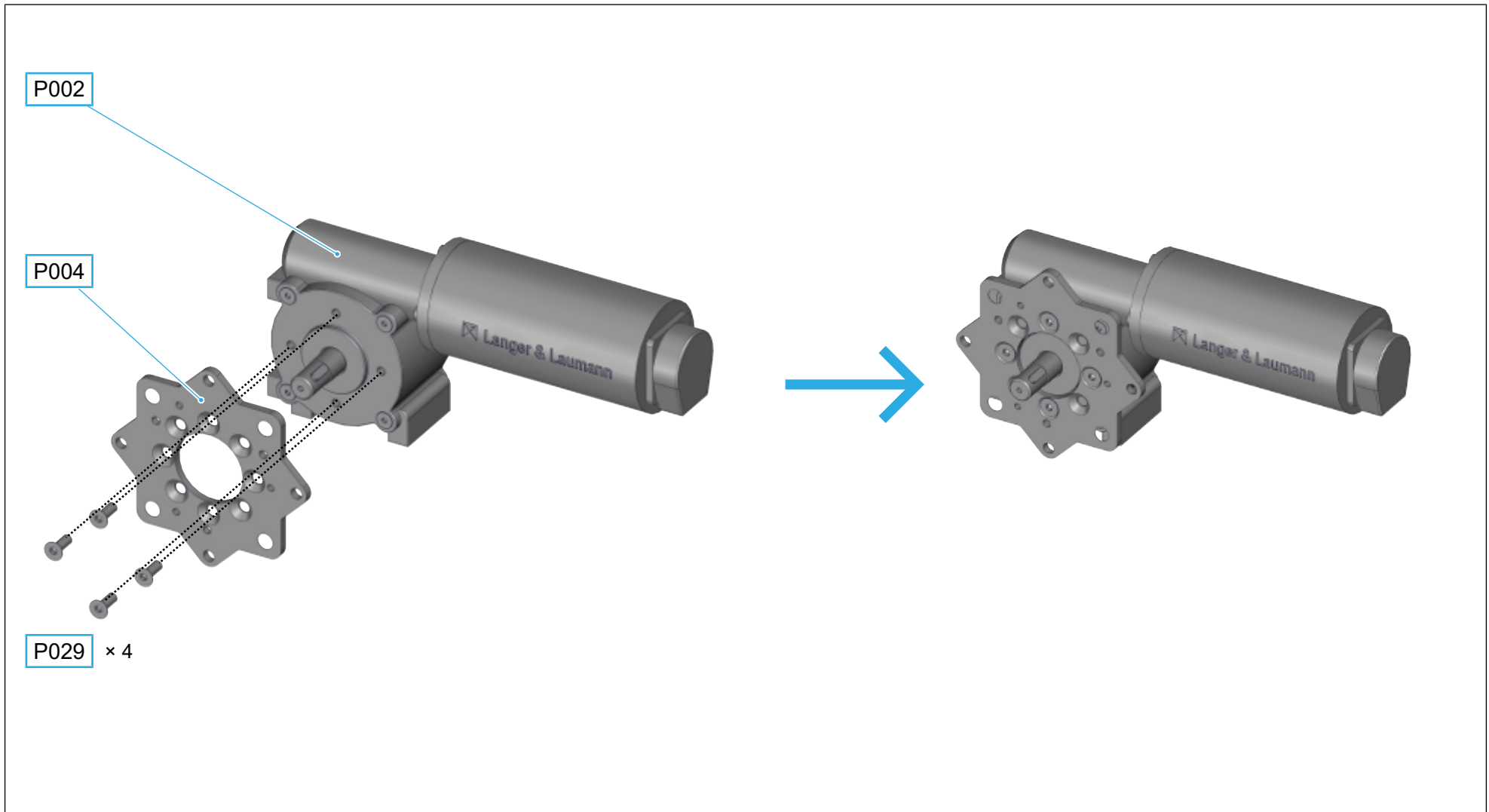
Components

Pos.	Illustration	Item number	Description	Quantity
P002		8.20.400xx.xx	TSG Motor	1
P004		1.20.60350	Motor bracket	1
P005		1.20.60160	Timing belt pulley D = 56 mm, 8M	1
P024		1.36.00720	Locking screw M8 × 20 mm	4
P028		1.36.00331	Countersunk screw M4 × 16 mm	1
P029		1.36.00360	Countersunk screw M6 × 16 mm	4

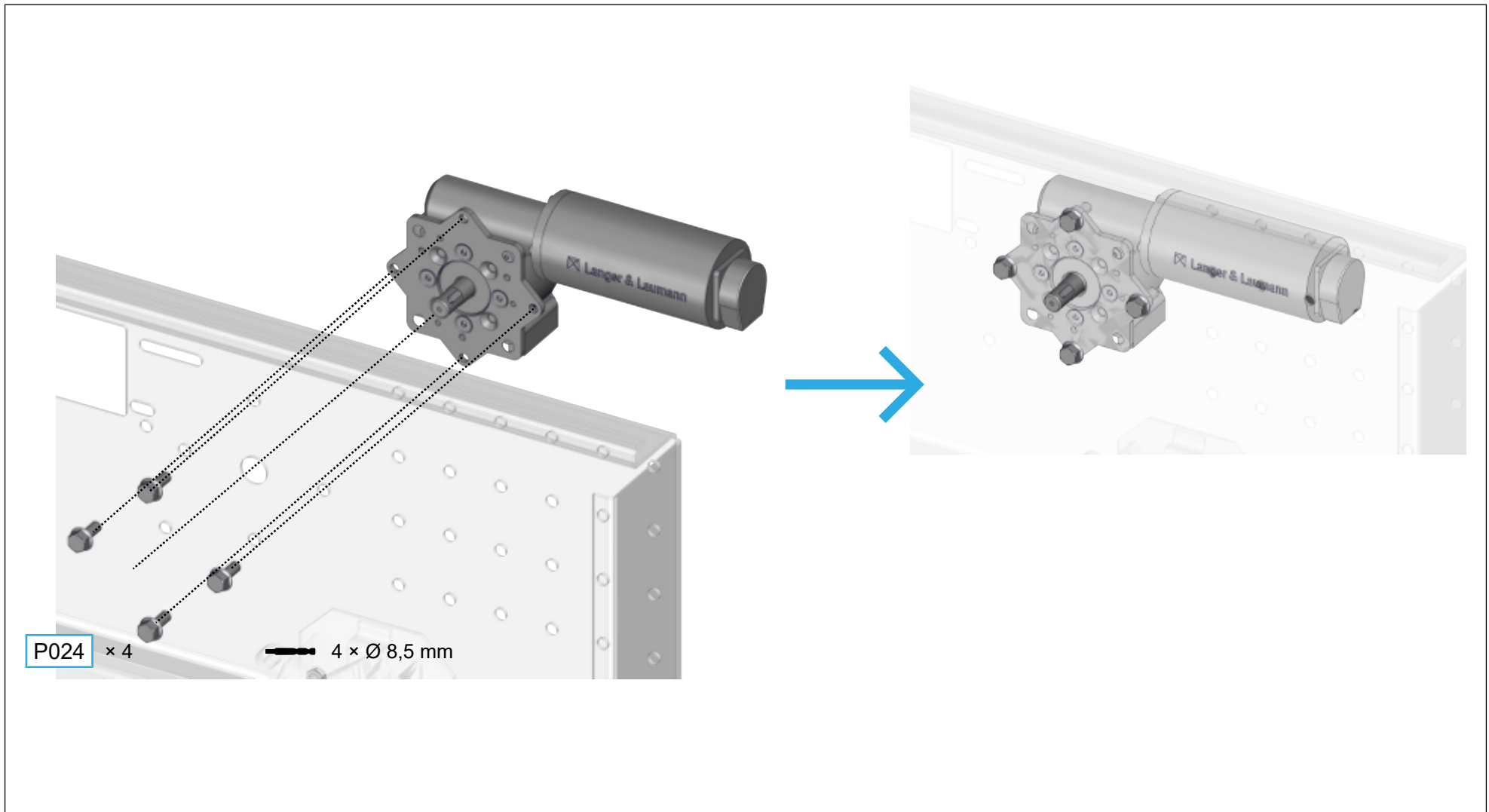
Tools

Pos.	Symbol	Description
T001		Soft face hammer
T010		Phillips screwdriver
T113		Combination wrench, size 13
T204.0		Allen key, size 4

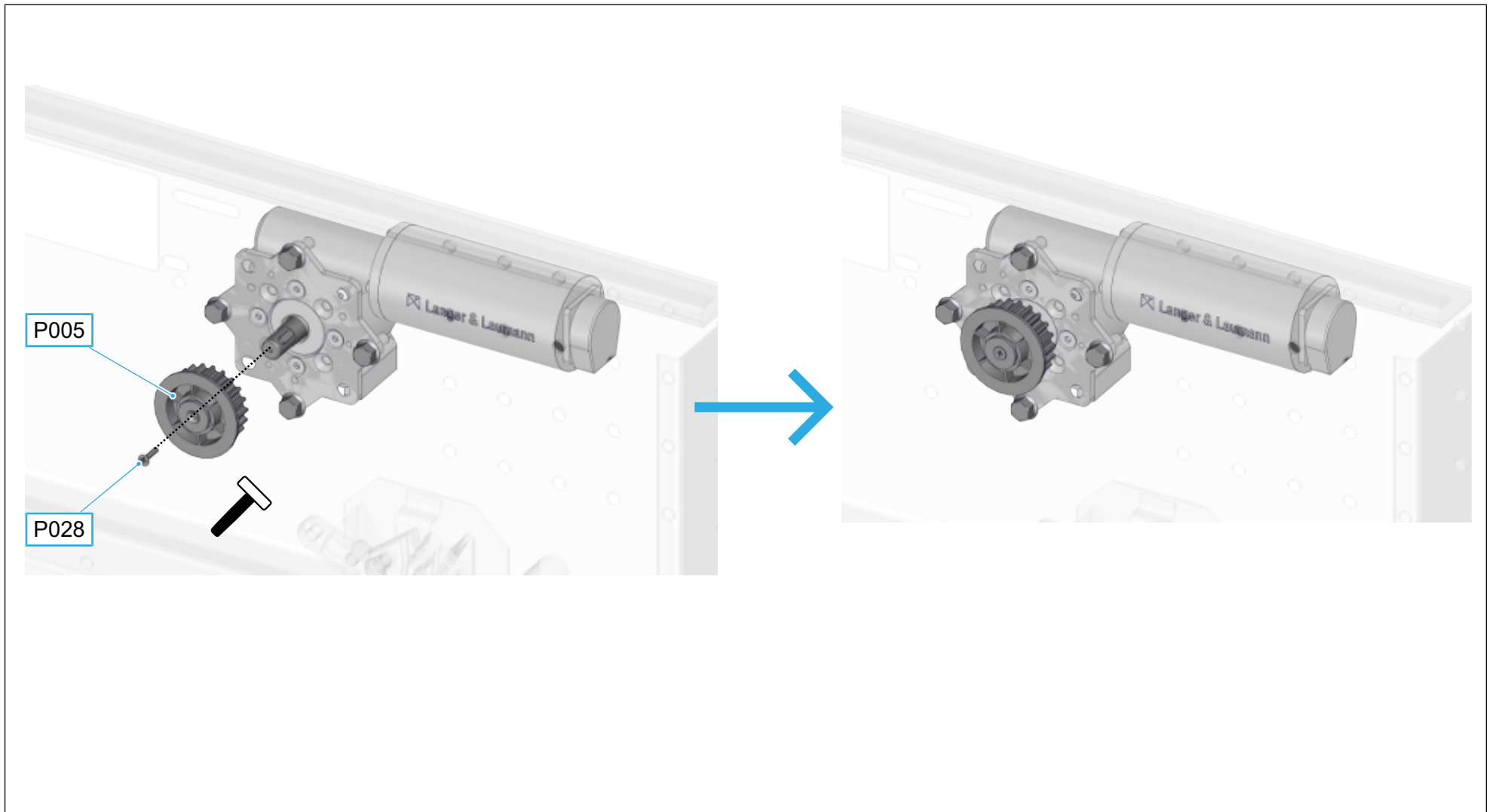
7.1.1 Mounting the bracket on the motor



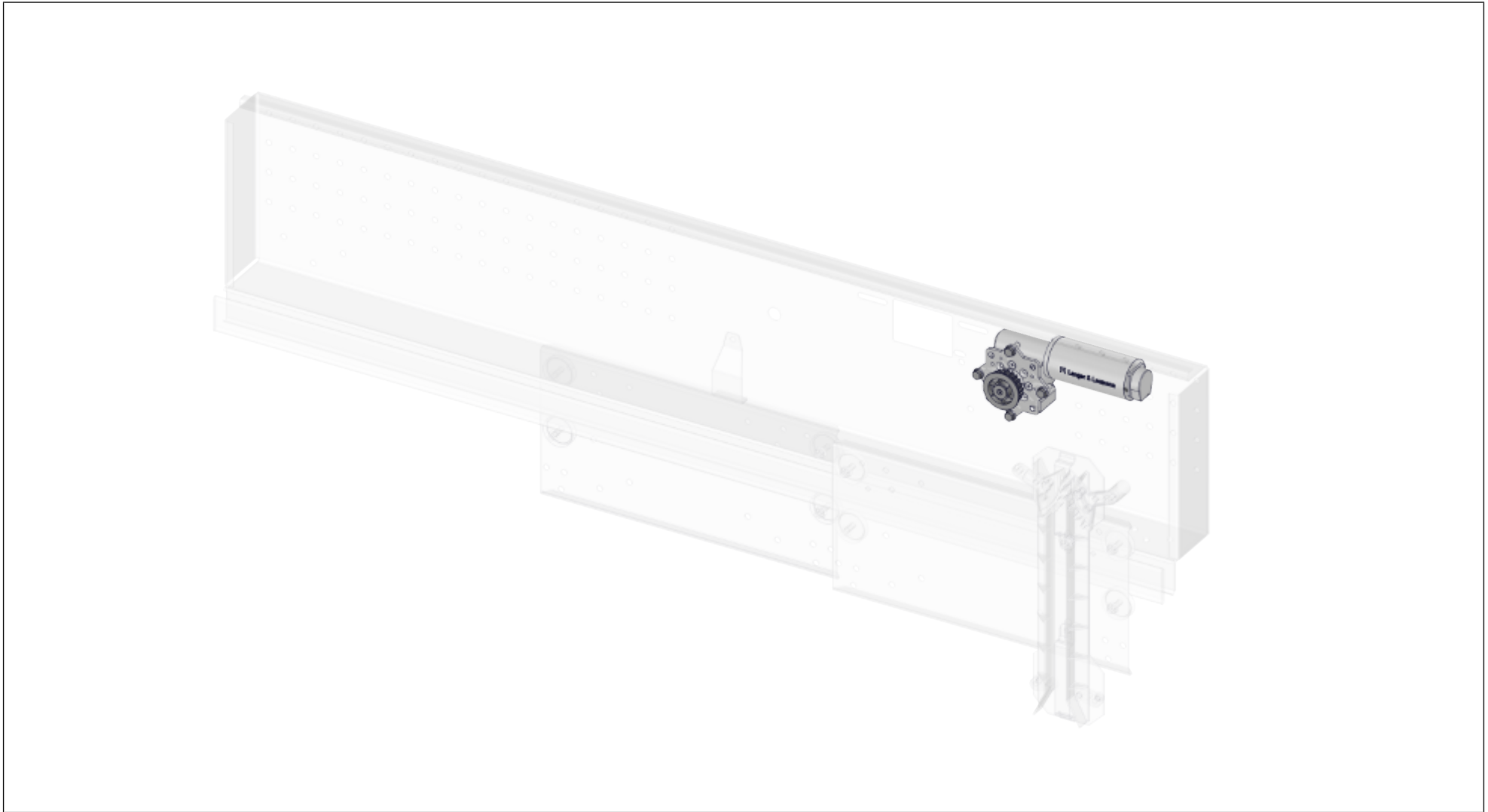
7.1.2 Mounting the motor with bracket on the door frame



7.1.3 Mounting the timing belt pulley on the motor

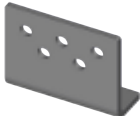


7.1.4 Motor, bracket and timing belt pulley are mounted



7.2 Mounting the deflection pulley and bracket

Components

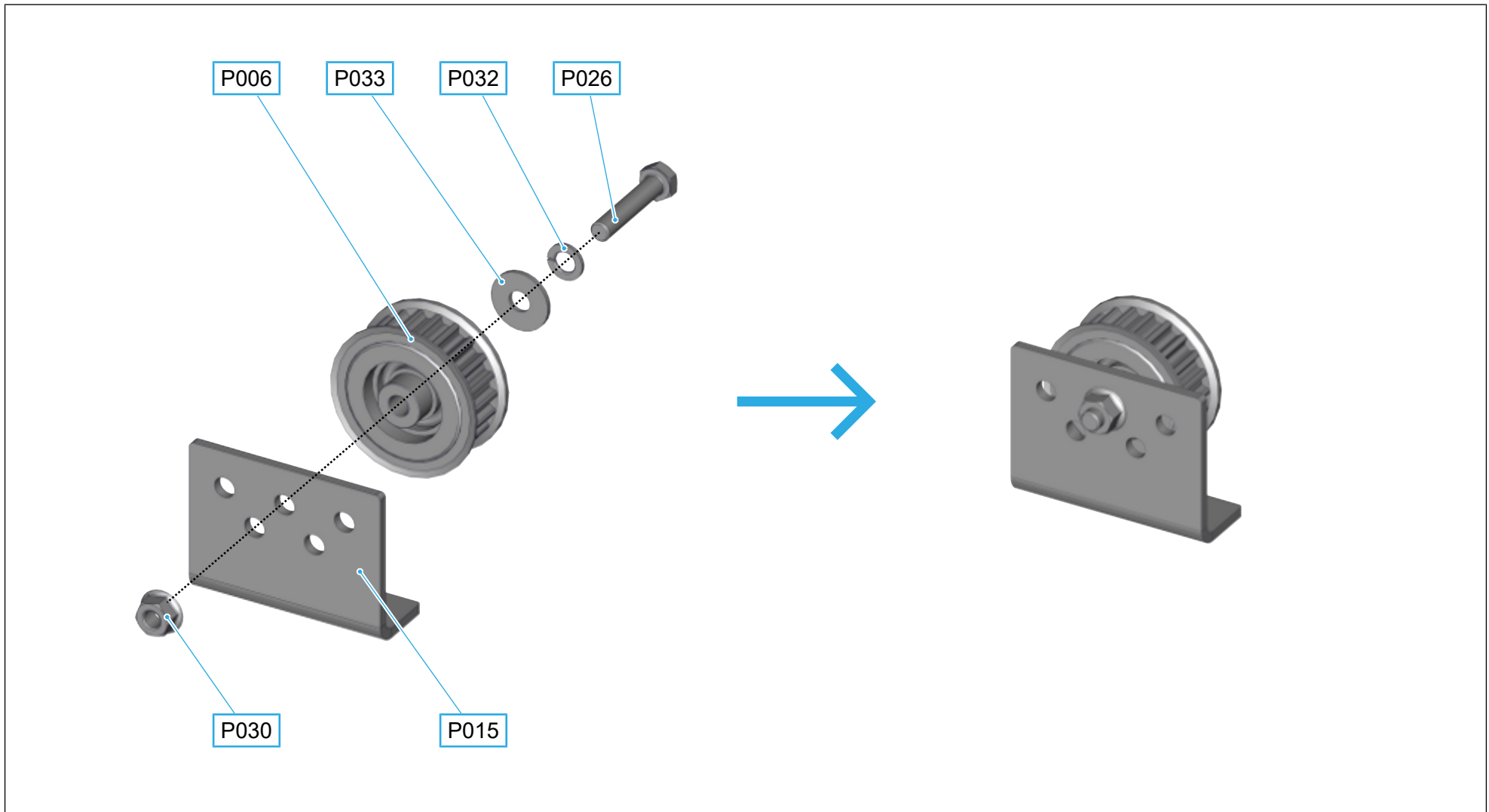
Pos.	Illustration	Item number	Description	Quantity
P006		1.20.60003	Deflection pulley D = 56 mm, 8M	1
P015		1.20.60013	L-shaped bracket	1
P016		1.20.60110	L-shaped bracket	1
P024		1.36.00720	Locking screw M8 × 20 mm	5
P026		1.36.00115	Hexagon head screw M8 × 40 mm	2
P030		1.36.00501	Nut M8	4
P032		1.36.00169	Spring washer M8	1

Pos.	Illustration	Item number	Description	Quantity
P033		1.36.01035	Washer M8	1

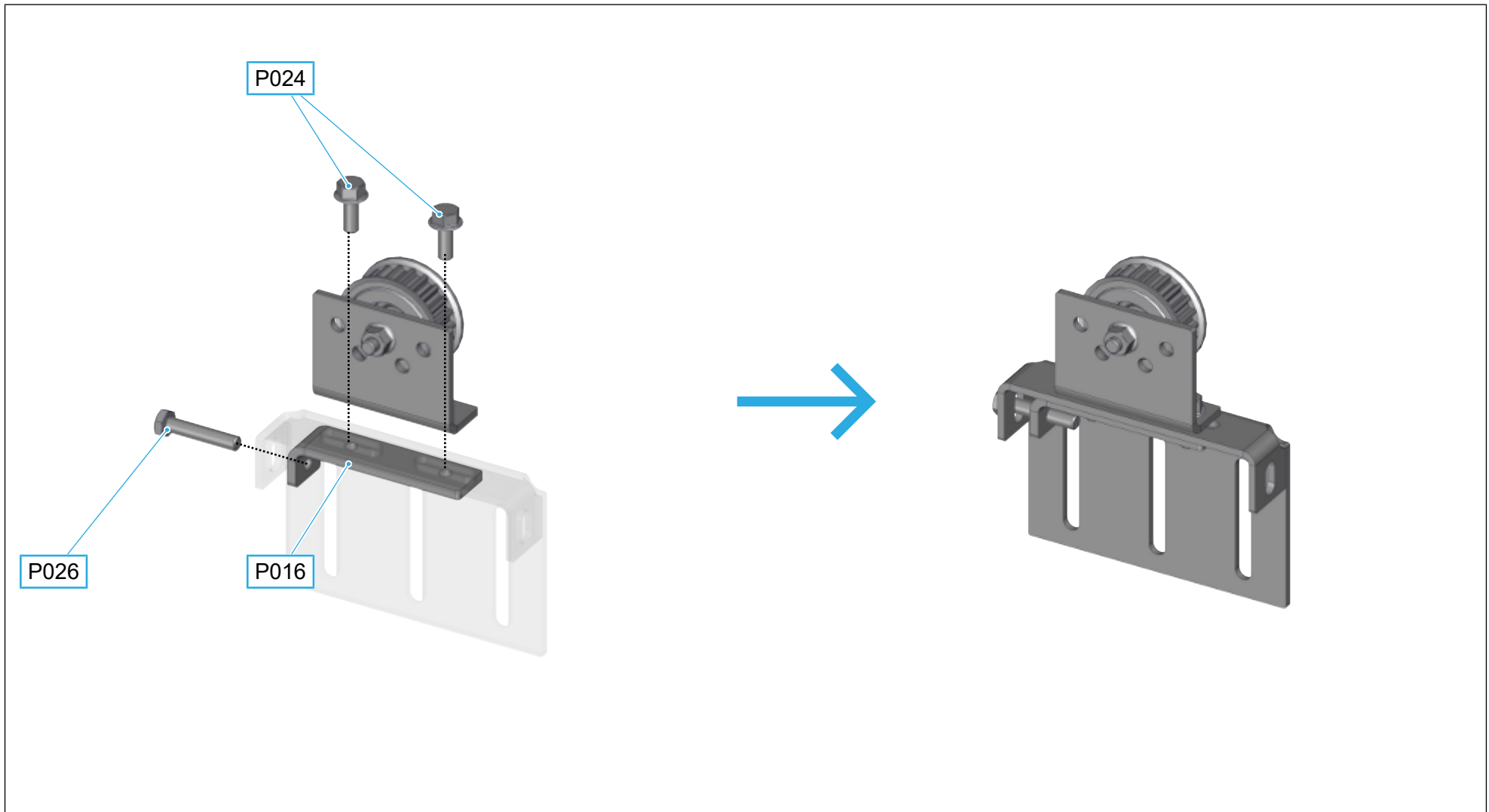
Tools

Pos.	Symbol	Description
T113		Combination wrench, size 13
T608.5		Drill bit, Ø 8.5 mm

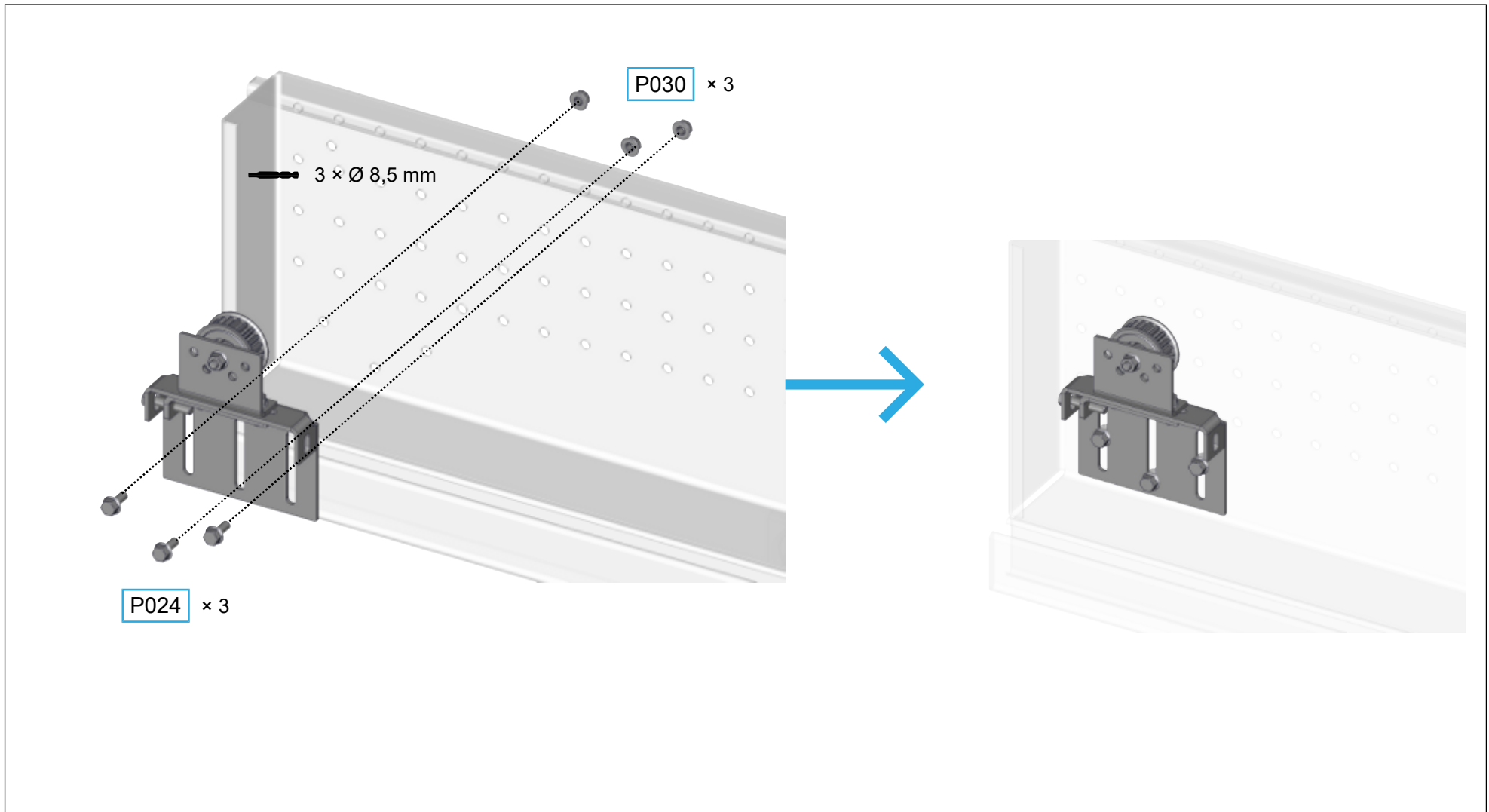
7.2.1 Mounting the deflection pulley



7.2.2 Mounting the deflection pulley on the bracket



7.2.3 Mounting the deflection pulley with bracket on the door frame

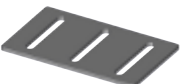


7.2.4 Deflection pulley with bracket mounted on the door frame



7.3 Mounting the door panel coupler and timing belt lock

Components

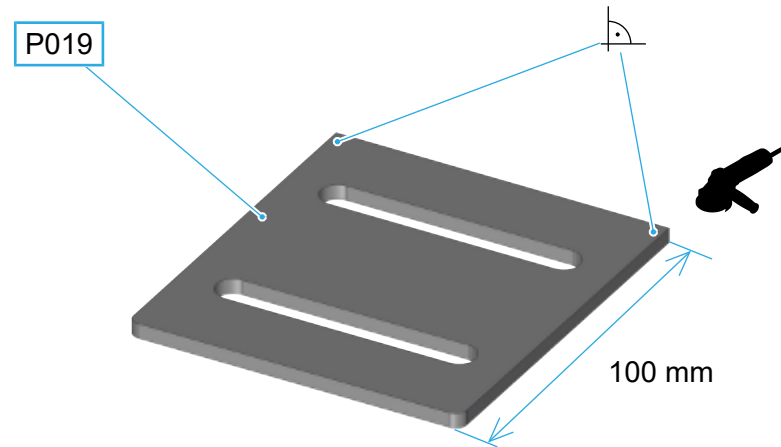
Pos.	Illustration	Item number	Description	Quantity
P008		1.20.60005	Timing belt lock, L-shaped	1
P013		1.20.92020	L-shaped bracket	1
P014		1.20.60075	L-shaped bracket	1
P018		1.20.60004	Rectangular plate	1
P019		1.20.30800	Rectangular plate	1
P024		1.36.00720	Locking screw M8 × 20 mm	5
P025		1.36.00725	Locking screw M8 × 25 mm	4

Pos.	Illustration	Item number	Description	Quantity
P030		1.36.00501	Nut M8	6

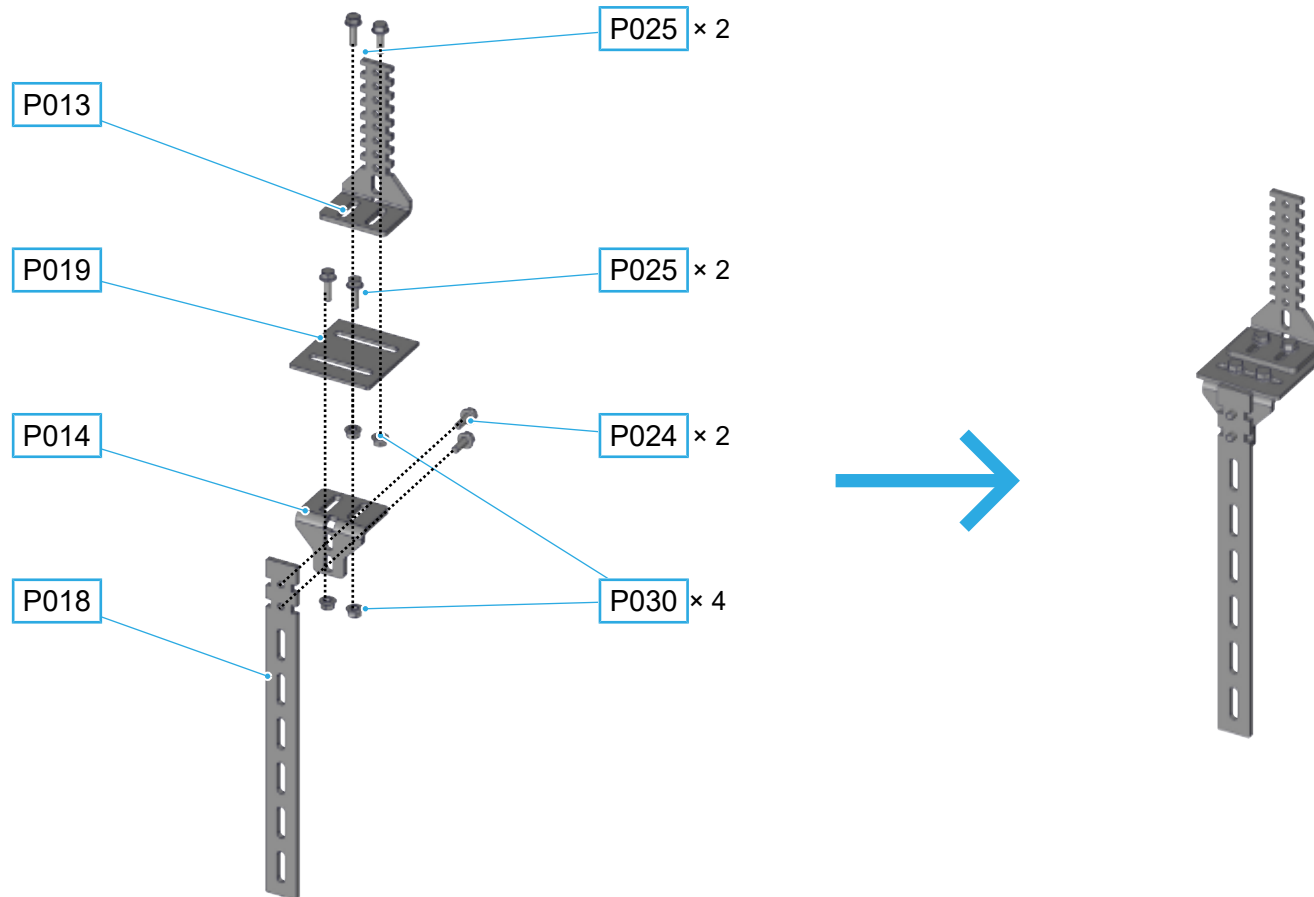
Tools

Pos.	Symbol	Description
T007		Angle grinder
T008		Measuring tool (folding rule or measuring tape)
T113		Combination wrench, size 13

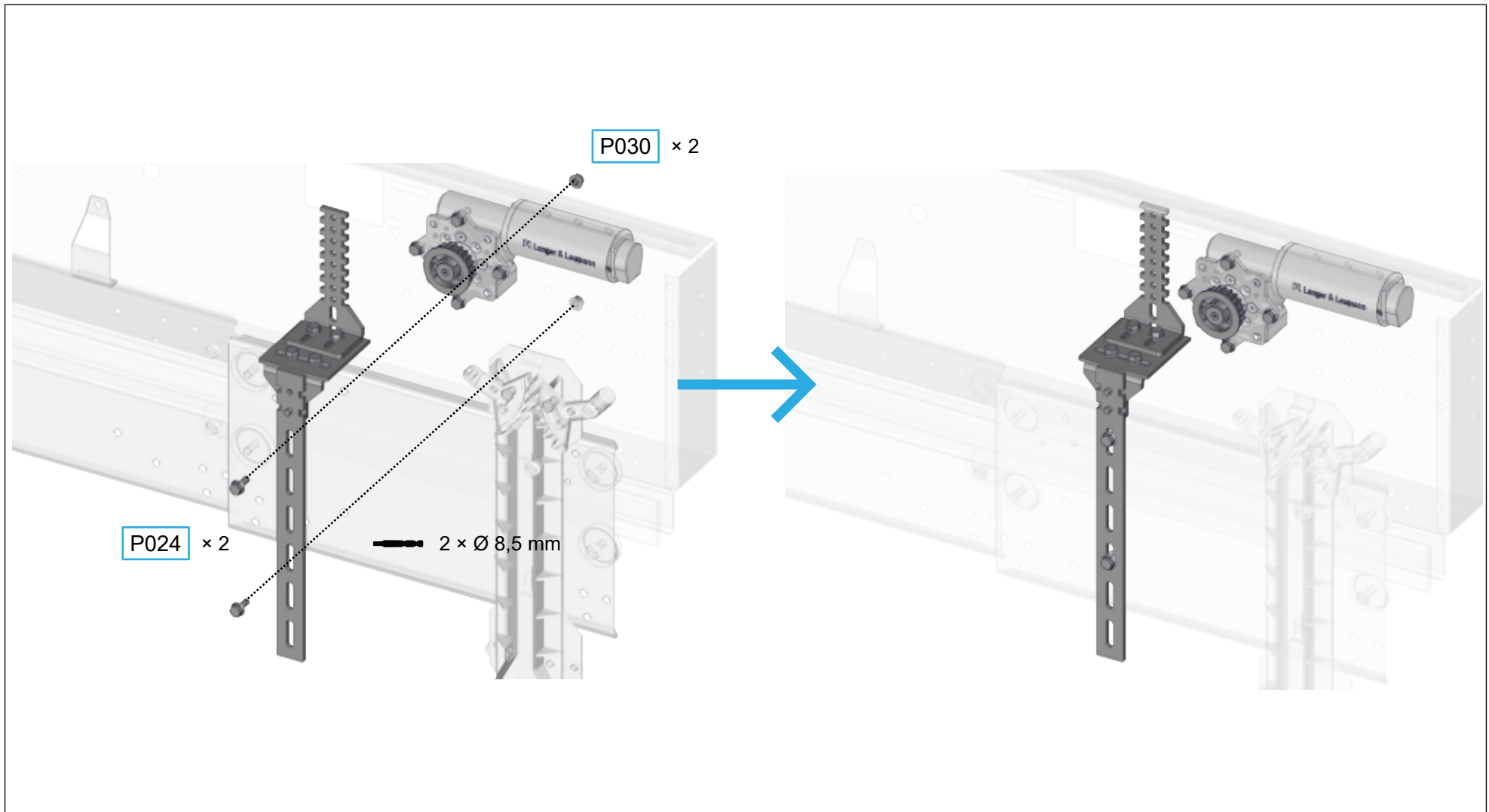
7.3.1 Cutting to size the right-angled connection plate



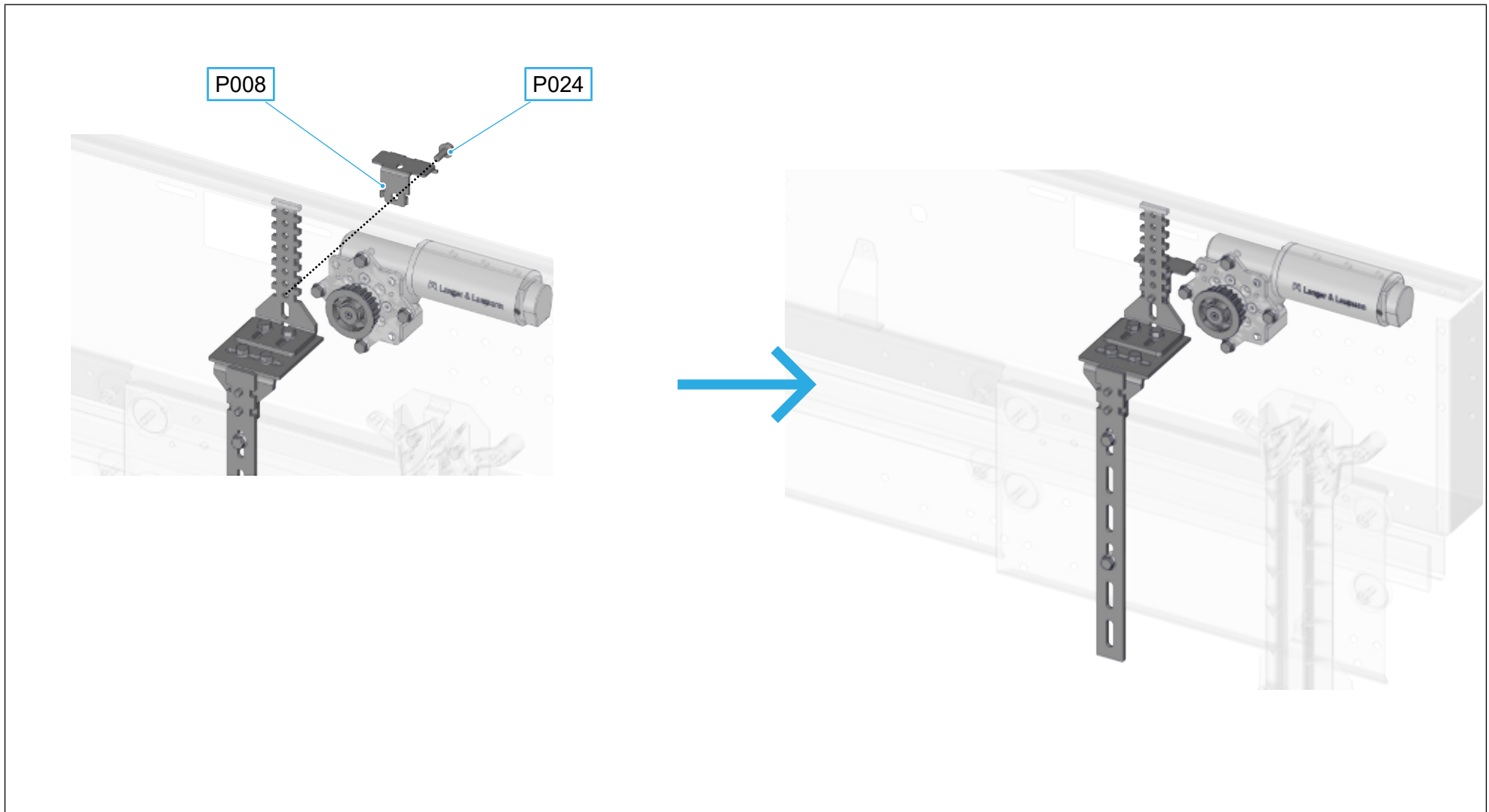
7.3.2 Assembling the door panel coupler



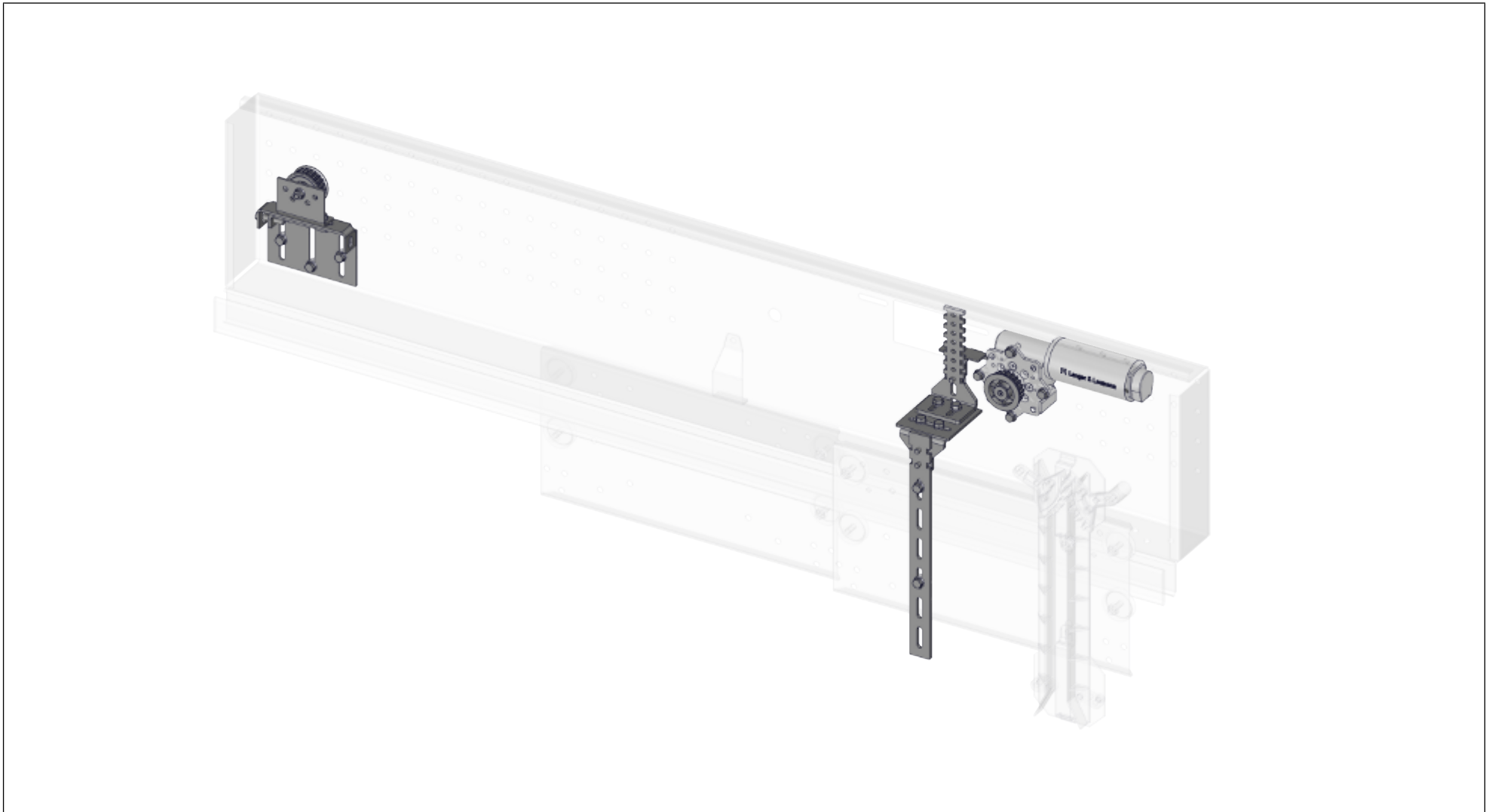
7.3.3 Mounting the door panel coupler on the door panel



7.3.4 Mounting the timing belt lock T1 on the door panel coupler

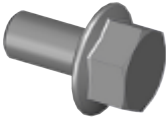


7.3.5 Door panel coupler and timing belt lock are mounted



7.4 Fitting the timing belt and timing belt lock

Components

Pos.	Illustration	Item number	Description	Quantity
P007		x.20.xxxxx.xx	Timing belt 8M	1
P008		1.20.60005	Timing belt lock, L-shaped	1
P022		1.36.00135	Locking screw M6 × 12 mm	1

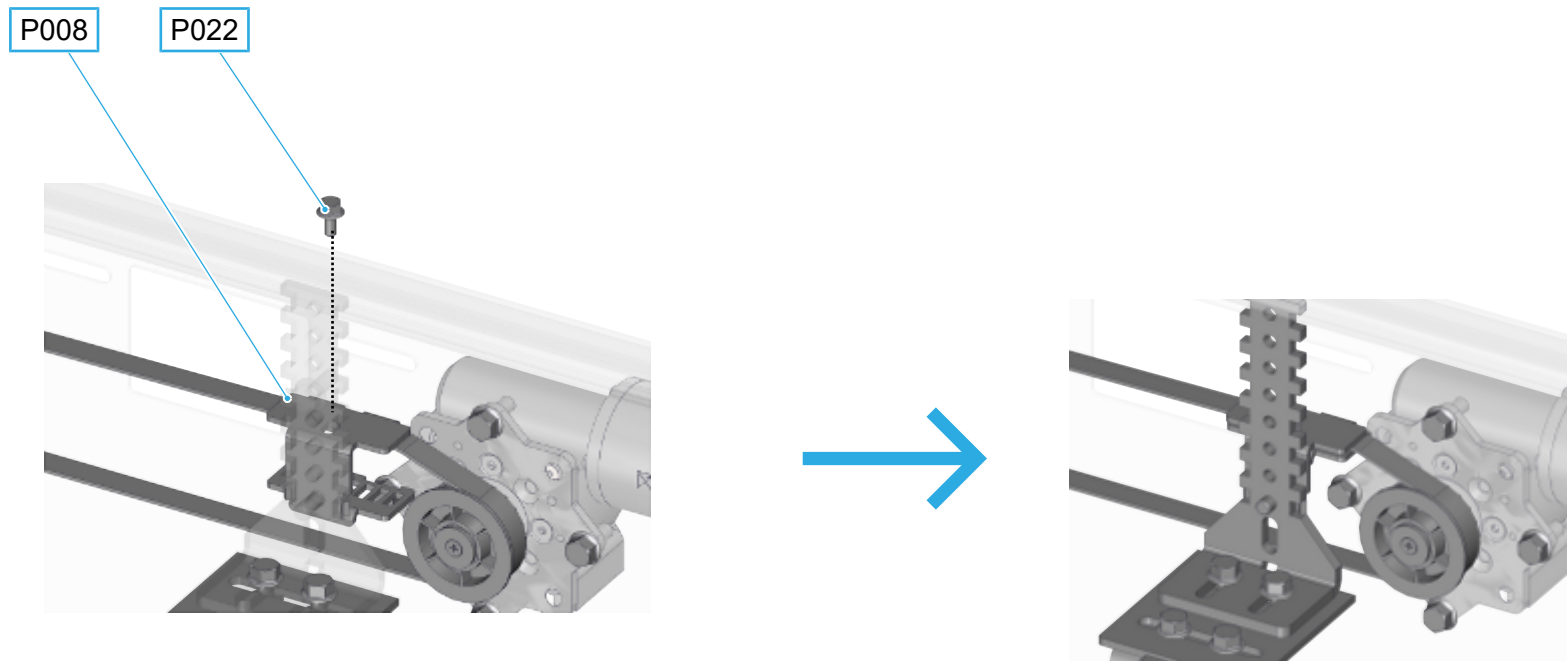
Tools

Pos.	Symbol	Description
T110		Combination wrench, size 10
T113		Combination wrench, size 13

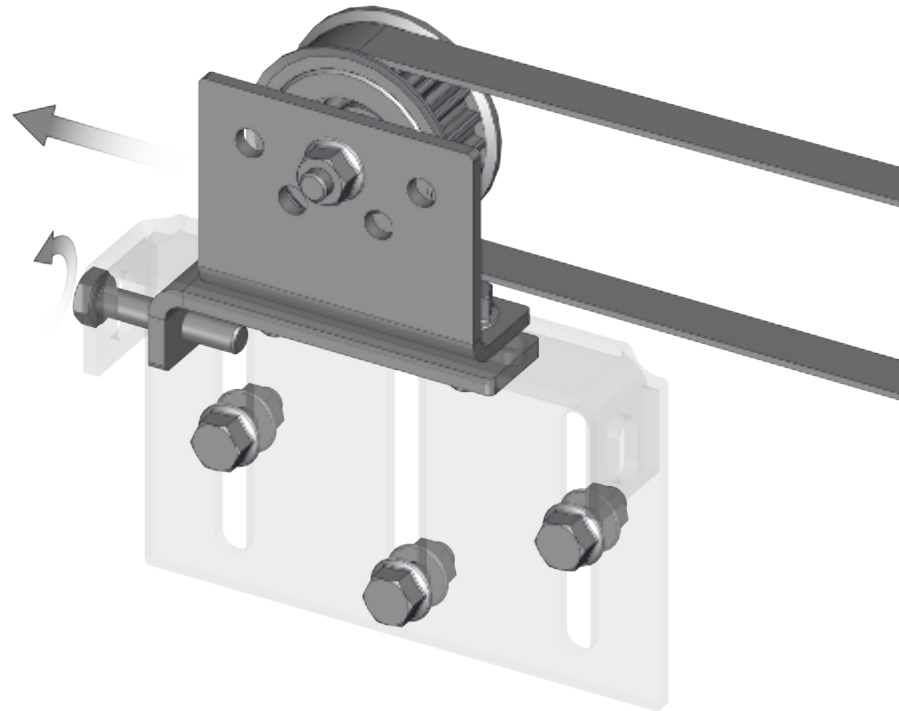
7.4.1 Mounting the timing belt



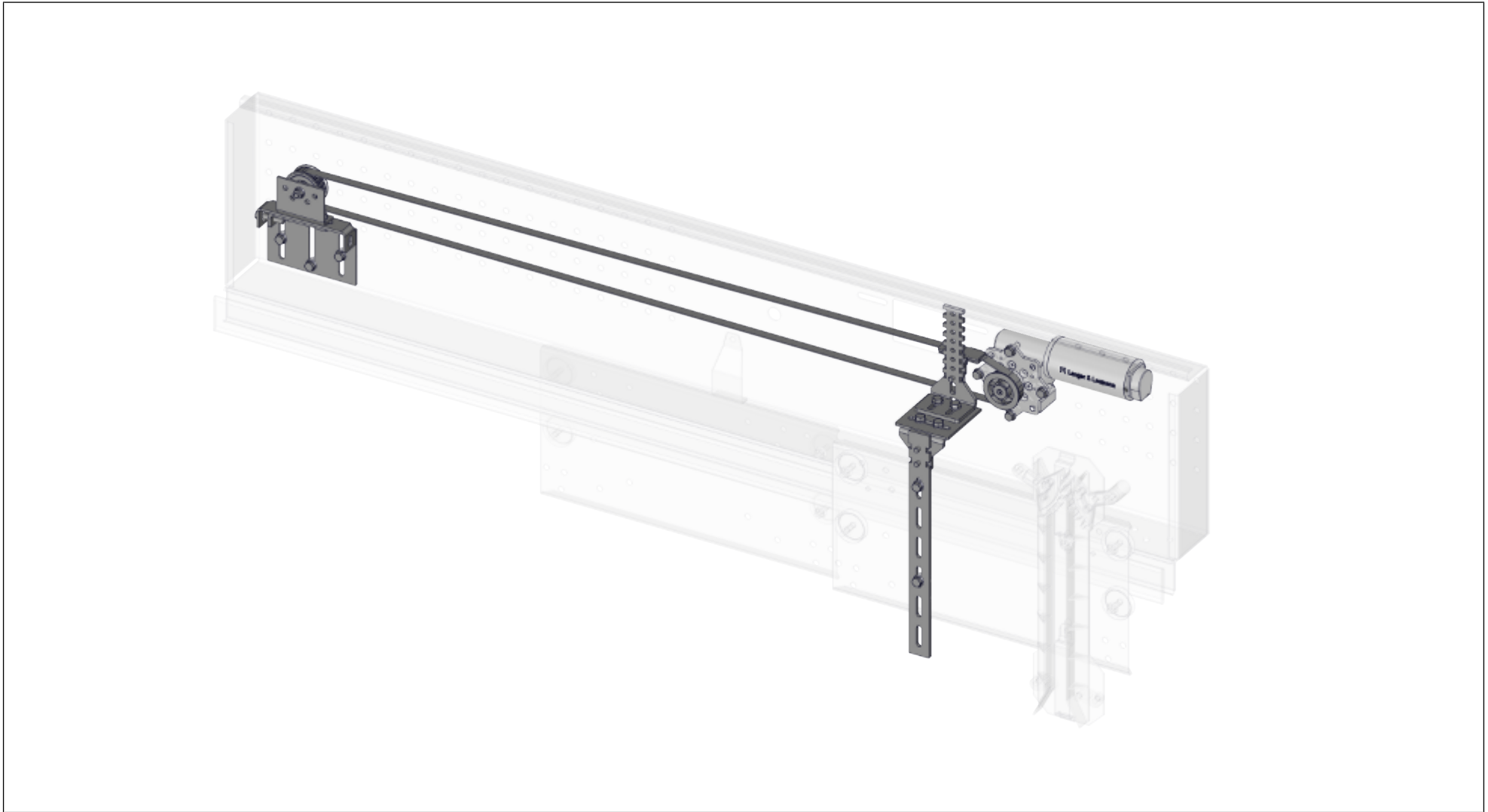
7.4.2 Mounting the timing belt lock T2 on the door panel coupler



7.4.3 Tensioning the timing belt

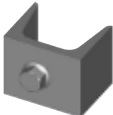
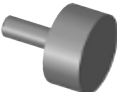
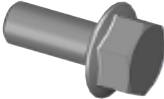


7.4.4 Timing belt and timing belt lock are mounted



7.5 Mounting the bumper and stop on the door frame

Components

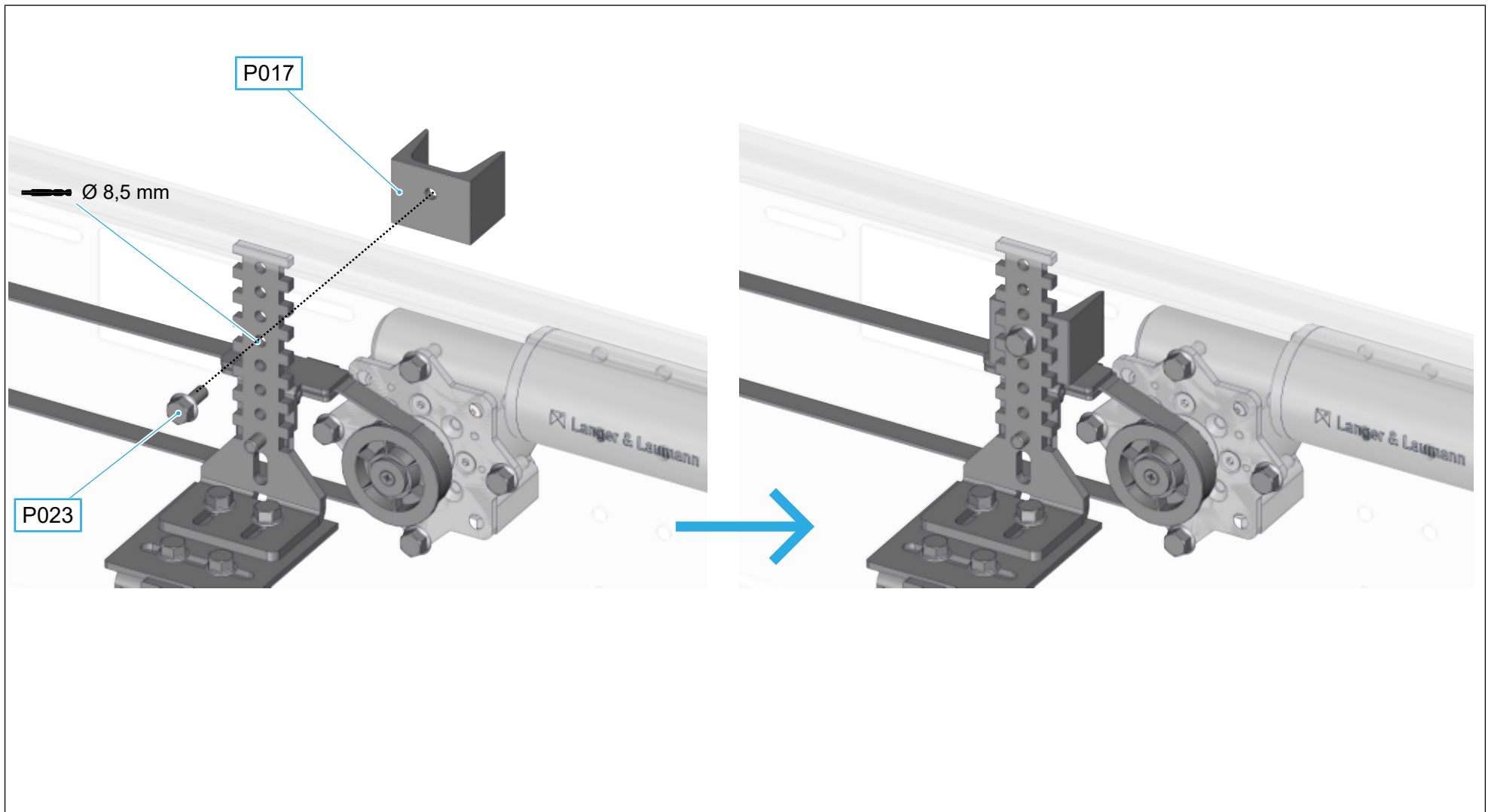
Pos.	Illustration	Item number	Description	Quantity
P010		1.20.59070	L-shaped bracket	1
P017		1.20.60020	U-shaped bracket	1
P020		1.20.91120	Bumper D = 30 mm, round	1
P021		1.36.00121	Spacer M8 × 40 mm	1
P023		1.36.00710	Locking screw M8 × 16 mm	1
P024		1.36.00720	Locking screw M8 × 20 mm	1
P027		1.36.00177	Hexagon head screw M8 × 100 mm	1

Pos.	Illustration	Item number	Description	Quantity
P030		1.36.00501	Nut M8	1
P031		1.36.00430	Nut M8	2

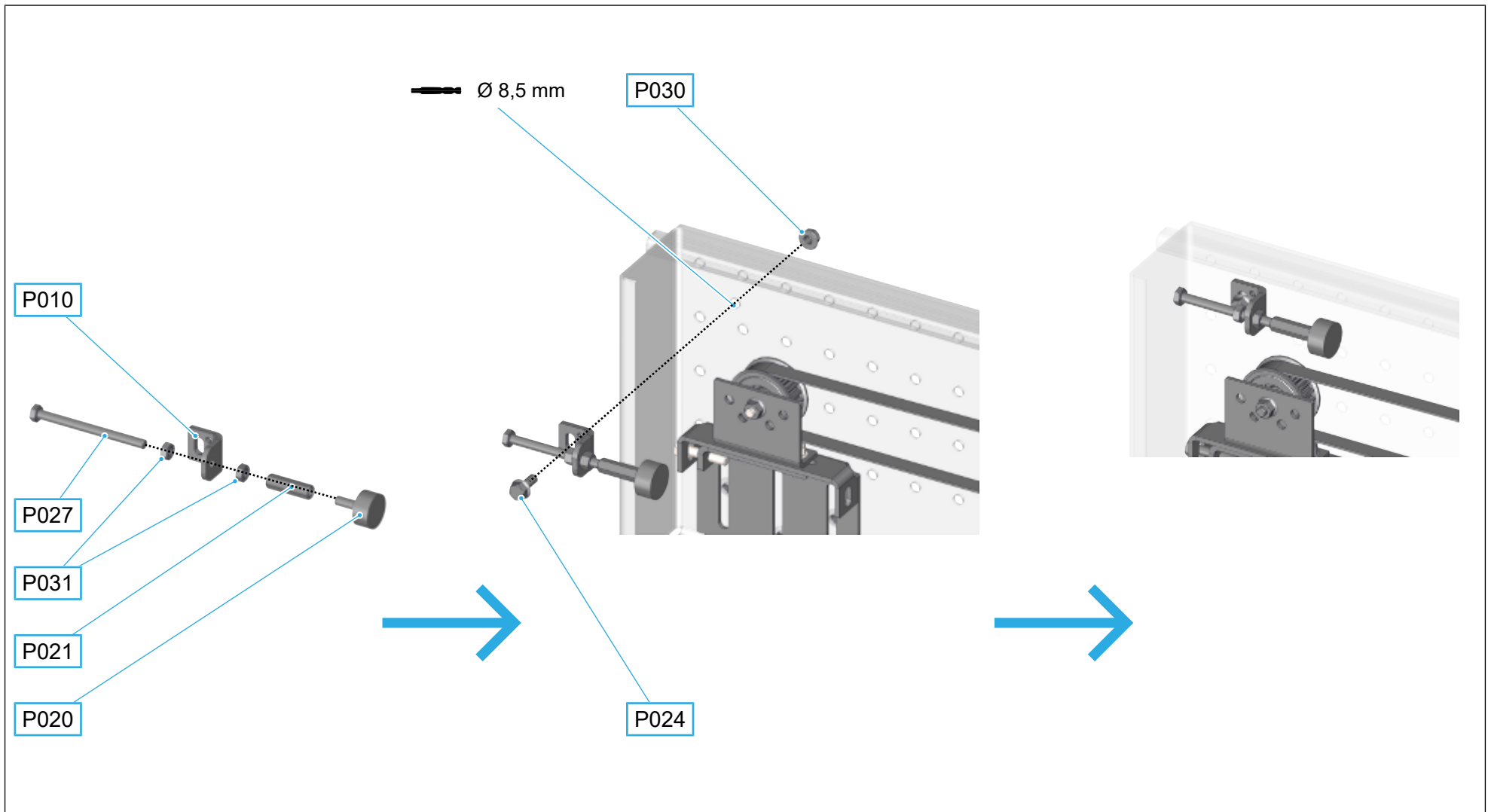
Tools

Pos.	Symbol	Description
T111		Combination spanner, size 11
T113		Combination wrench, size 13
T608.5		Drill bit, Ø 8.5 mm

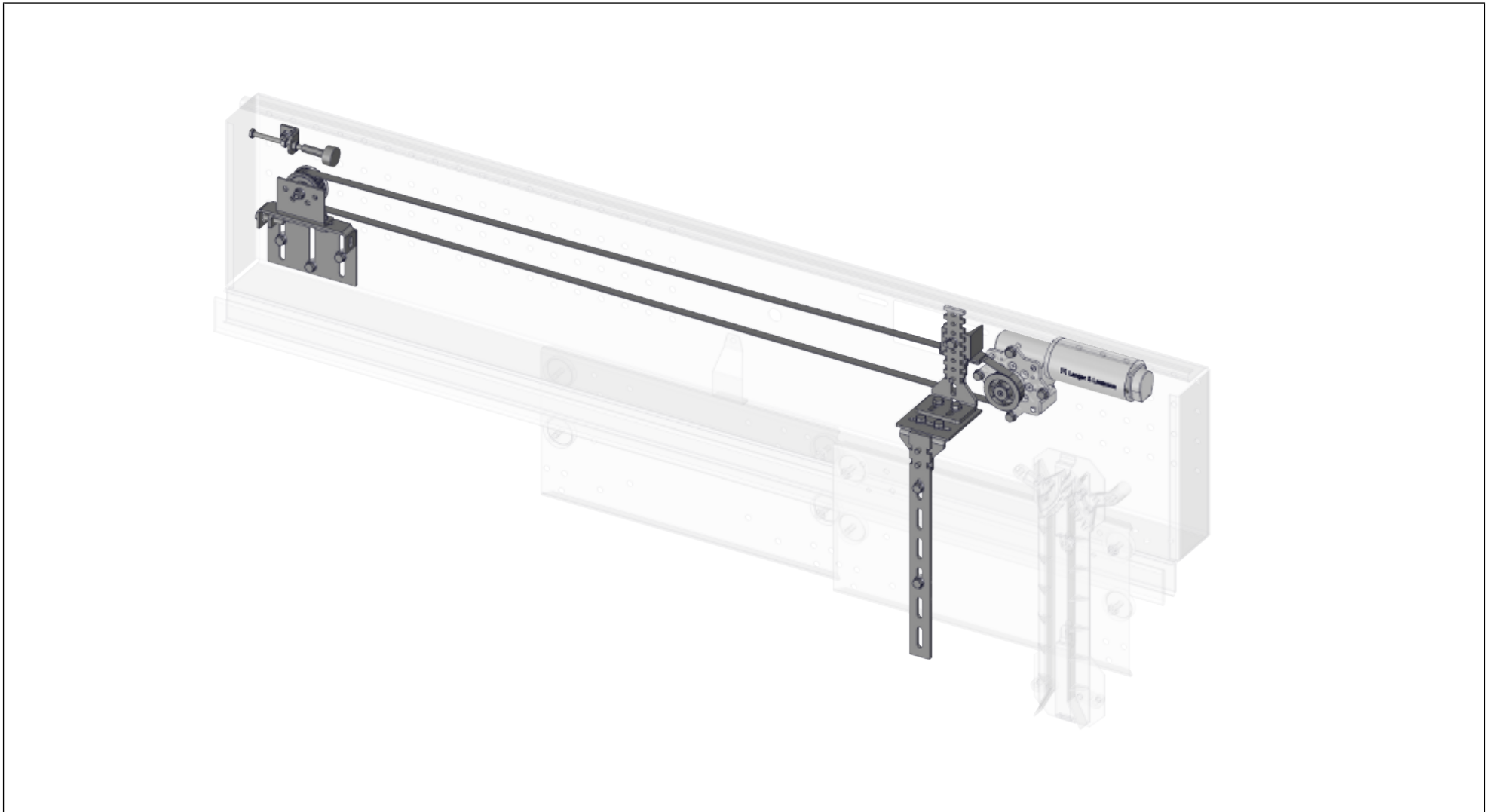
7.5.1 Mounting the stop on the door panel coupler



7.5.2 Mounting the bumper on the bumper bracket

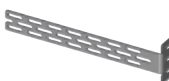


7.5.3 Bumper and stop are mounted on the door frame



7.6 Mounting the sinus drive on the door frame

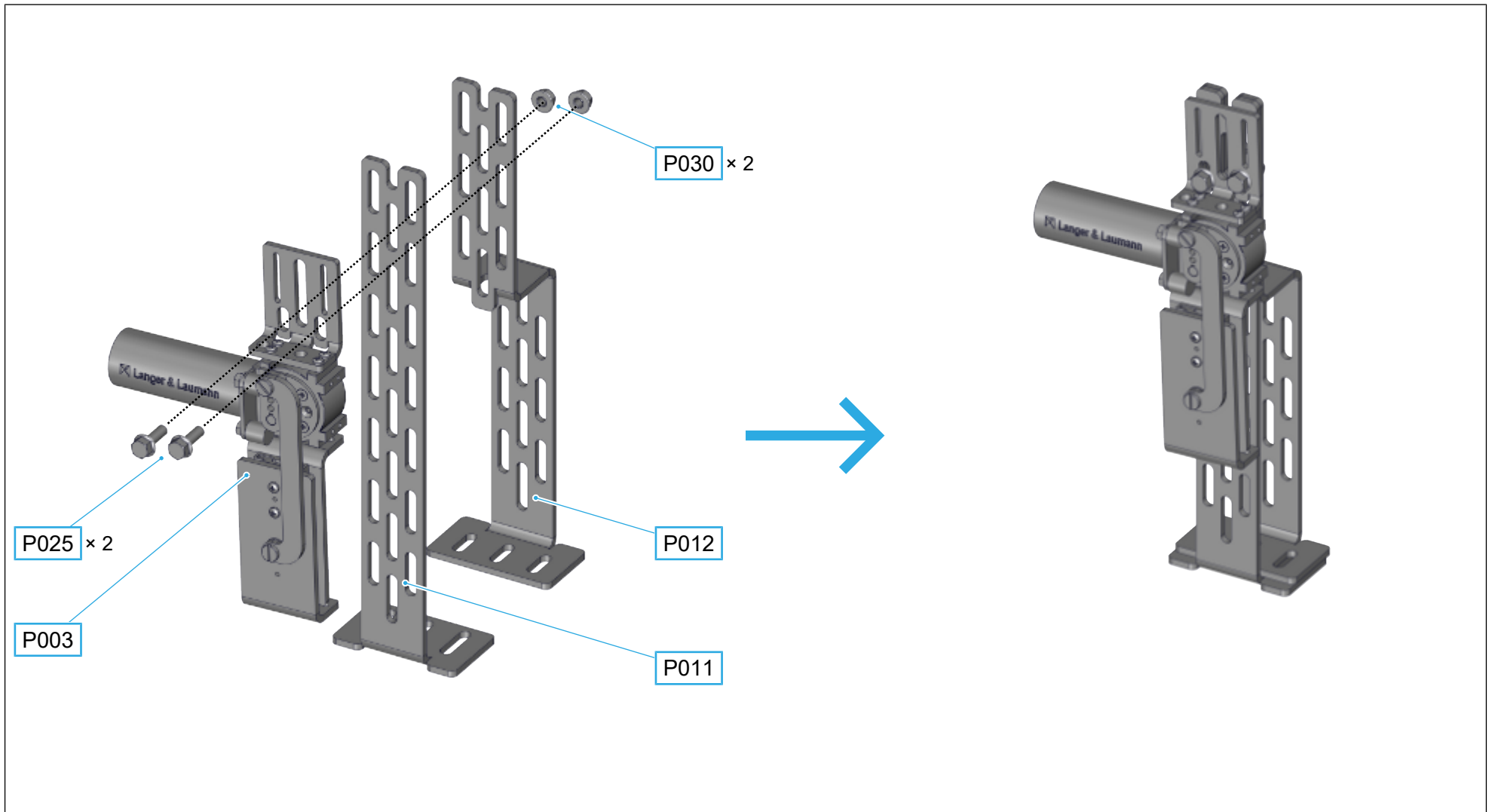
Components

Pos.	Illustration	Item number	Description	Quantity
P003		8.20.831xx	TSG sinus drive	1
P011		1.20.94100	L-shaped bracket	1
P012		1.20.94101	C-shaped bracket	1
P025		1.36.00725	Locking screw M8 × 25 mm	5
P030		1.36.00501	Nut M8	5

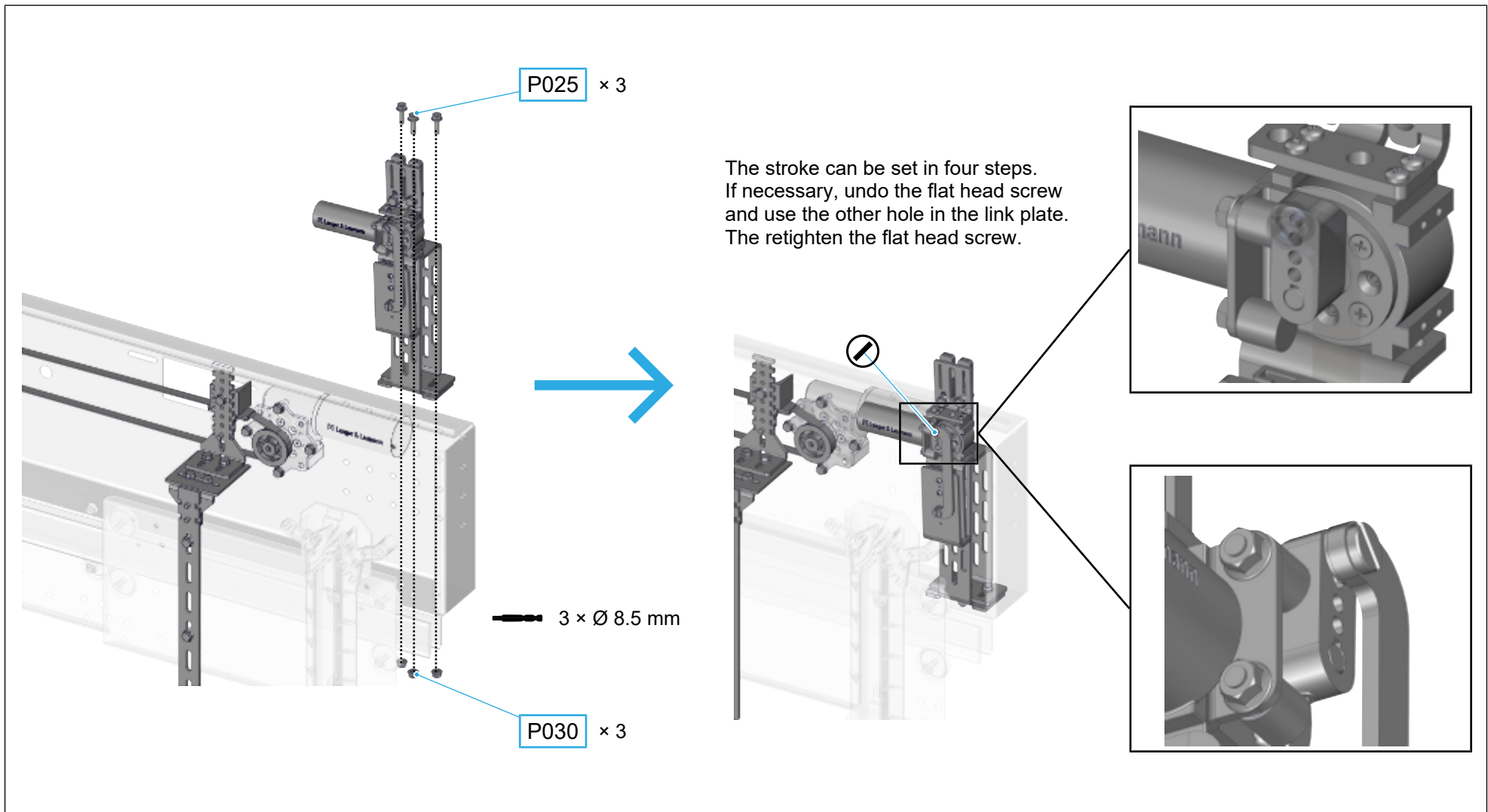
Tools

Pos.	Symbol	Description
T113		Combination wrench, size 13
T608.5		Drill bit, Ø 8.5 mm

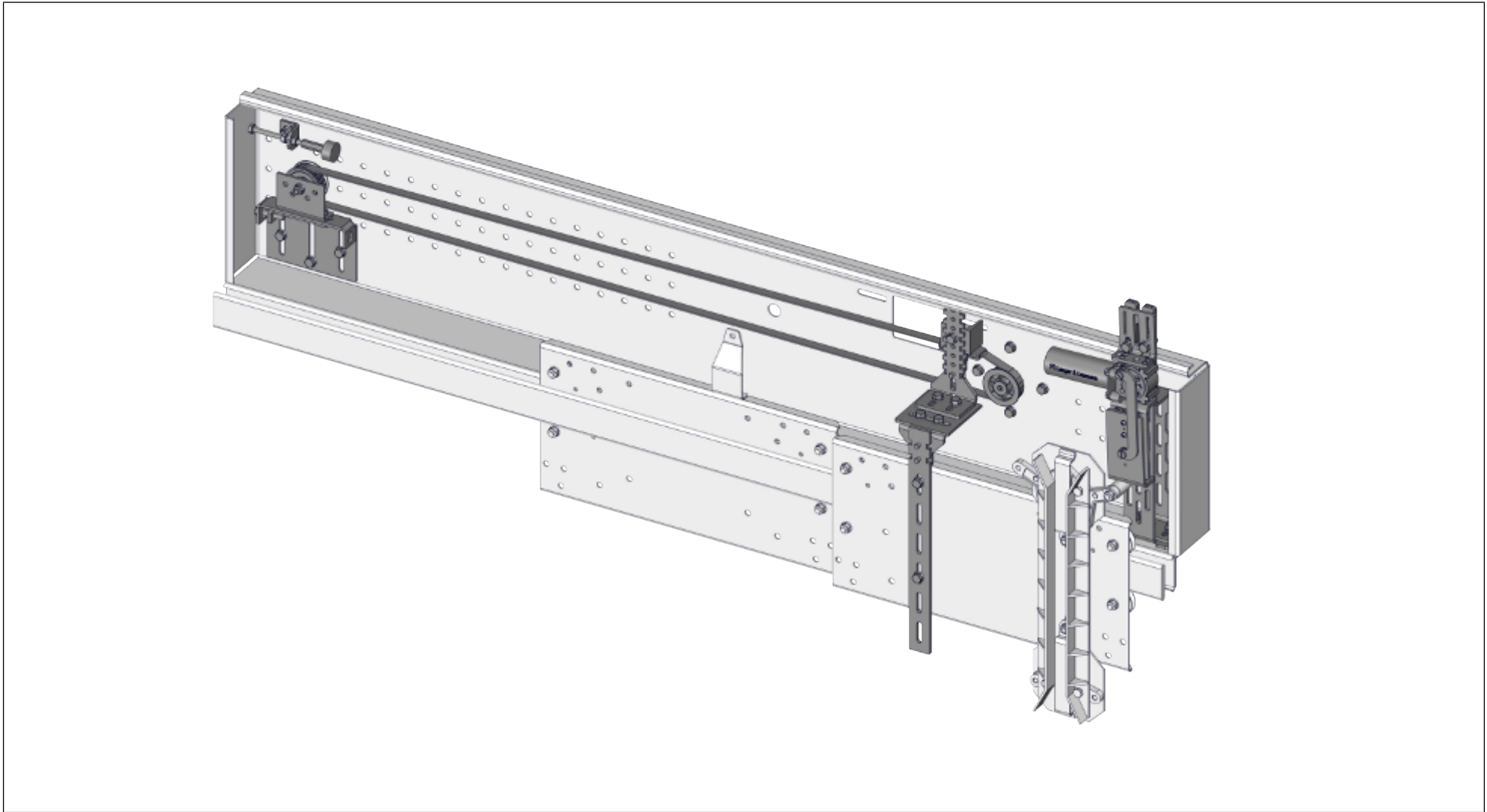
7.6.1 Mounting the sinus drive on the bracket



7.6.2 Mounting the sinus drive with bracket on the door frame



7.6.3 Sinus drive is mounted on the door frame



7.7 Fitting, connecting and commissioning the door control unit

Fitting, connecting and commissioning the door control unit are described in detail in the **assembly instructions** supplied with the door control unit.



Innovation meets Technology

