The Drive & Control Company

Rexroth
Bosch Group

Chain conveyor system VarioFlow *plus*

Modules

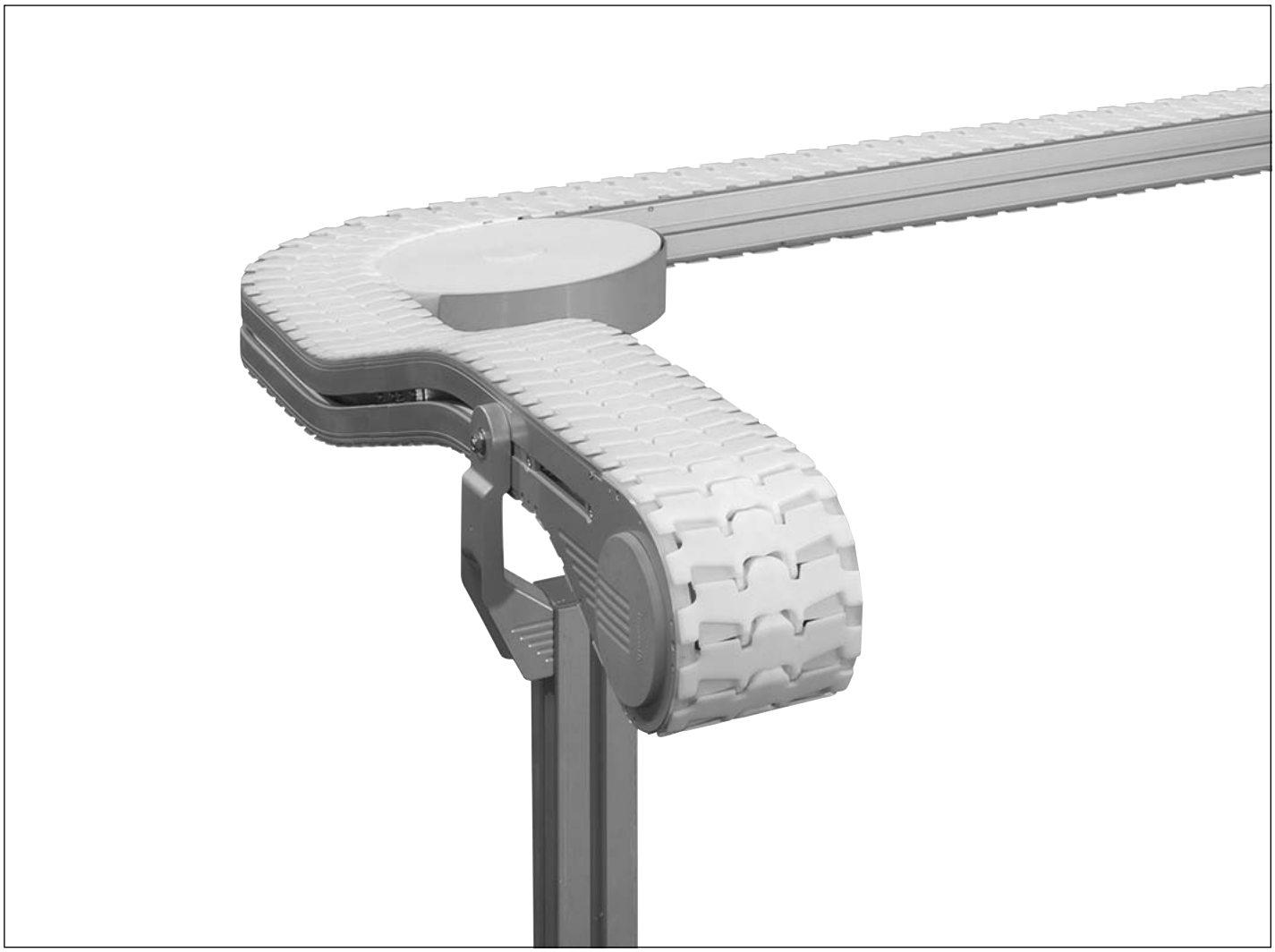
Applies to the following types:

3 842 998 291
3 842 998 742
3 842 546 120 – 125
3 842 547 522 – 527
3 842 547 712 – 713
3 842 547 380
3 842 547 381

Assembly instructions
3 842 549 802/2014-05

Replaces: –
ENGLISH

ENGLISH



The data specified only serve to describe the product. The information provided in the instructions on how to use the supplied product should only be considered application examples and suggestions. Catalog information is not binding. The information given does not release the user from the obligation of own judgment and verification. Our products are subject to a natural process of wear and aging.

An example configuration is shown on the title page. The delivered product may thus vary from the illustration.

The original assembly instructions were generated in German.

DE Die vorliegende Montageanleitung ist in den hier angebenen Sprachen verfügbar. Als gedruckte Version (print) oder als PDF-Datei (media) zum Download aus dem Medienverzeichnis: **www.boschrexroth.com/medienverzeichnis**
1. Geben Sie in die Suchmaske (oben rechts, unter „**Suche**“) **3 842 549 801** ein. 2. Klicken Sie auf „▶**Suche**“.

EN These assembly instructions are available in the languages indicated here. They come in a hard copy (print) or a PDF file (media) that can be downloaded at: **www.boschrexroth.com/mediadirectory**
1. Enter **3 842 549 802** in the search mask (at the top right, under “**Search**”). 2. Click “▶**Search**”.

FR Les présentes instructions de montage sont disponibles dans les langues mentionnées ici. Disponible au téléchargement en version imprimée (print) ou en fichier PDF (media) à partir du répertoire médias : **www.boschrexroth.com/mediadirectory**
1. Dans le masque de recherche (en haut à droite dans « **Search** »), saisissez **3 842 549 803**. 2. Cliquez sur « ▶**Search** ».

IT Le presenti istruzioni per il montaggio sono disponibili nelle lingue qui indicate, in versione stampata (print) o come file PDF (media) da scaricare dalla media directory: **www.boschrexroth.com/mediadirectory**
1. Nella maschera di ricerca (in alto a destra, sotto “**Search**”) immettere **3 842 549 804**. 2. Fate clic su “▶**Search**”.

ES Este manual de instrucciones está disponible en los idiomas aquí indicados como versión impresa o archivo PDF para descarga desde el directorio de medios: **www.boschrexroth.com/mediadirectory**
1. Indique en el cuadro de búsqueda (parte superior derecha, “**Search**”) **3 842 549 805**. 2. Haga clic en “▶**Search**”.

NL Deze documentatie is beschikbaar in de hier vermelde talen. Als gedrukte versie (print) of als pdf-bestand (media) om te downloaden uit de medialijst: **www.boschrexroth.com/mediadirectory**
1. Voer in het zoekvenster (rechtsboven, onder “**Search**”) **MTNL 549 801** in. 2. Klik op ‚▶**Suche**‘.

3 842 549 801	print	media	VarioFlow *plus* Baugruppen	DE Deutsch
3 842 549 802	print	media	Chain conveyor system VarioFlow *plus* Modules	EN English
3 842 549 803		media	Système de convoie par chaîne VarioFlow *plus* Modules	FR Français
3 842 549 804		media	Sistema di trasferimento a catena VarioFlow *plus* Moduli	IT Italiano
3 842 549 805		media	Sistema de transporte por cadenas VarioFlow *plus* Módulos	ES Español
MTNL 549 801		media	Kettingtransportsysteem VarioFlow *plus* Modules	NL Nederlands

Bosch Rexroth AG, MIT: VarioFlow plus, 3 842 549 802/2014-05

Contents

1 About this documentation

1.1 Scope of the documentation

This documentation applies to the following products:
- 3 842 998 291, drive kit: head drive, connection drive (VFPLUS VAR)
- 3 842 998 742, drive kit: head drive, curve wheel drive (VFPLUS CURVE VAR)

This documentation is intended for installers, operators, service technicians, and system owners.
This documentation contains important information on the safe and appropriate assembly, transportation, commissioning, operation, use, maintenance, disassembly, and simple troubleshooting of the product.

▶ Read this documentation completely, especially chapter 2 “Notes on Safety” and chapter 3 “General Notes on Equipment and Product Damage”, before working with the product.

1.2 Required and supplementary documentation

▶ Only commission the product once you have obtained the system documentation that is marked with a book symbol 🕮 and understood and complied with its contents.

Table 1: Required and supplementary documentation

	Title	Document number	Document type
	Instructions for employees on safety	3 842 527 147	
	MT*parts*	3 842 529 770	Spare parts list on CD

1.3 Presentation of information

Uniform safety instructions, symbols, terms, and abbreviations have been used in this documentation in order to ensure that you can get to work quickly and safely with your product. They are discussed in more detail in the following sections.

1.3.1 Notes on safety

This documentation contains safety instructions in section 2.6 “Product-specific safety instructions” and chapter 3 “General Notes on Equipment and Product Damage” and before any actions or steps whenever there is a danger of personal injury or damage to the equipment. The danger prevention measures described must be observed.

Safety instructions are set out as follows:

⚠ SIGNAL WORD

Hazard type and source

Consequences of non-observance

- ▶ Precautions to prevent danger
- ▶ ...

- **Safety sign:** draws attention to the risk
- **Signal word:** identifies the degree of hazard
- **Type and source of the risk:** identifies the type and source of the hazard
- **Consequences:** describes what occurs if the safety instructions are not complied with
- **Precautions:** states how the hazard can be avoided

Table 2: Hazard classes acc. to ANSI Z535.6-2006

Safety sign, signal word	Meaning
⚠ DANGER	Indicates an imminently hazardous situation which, if not avoided, will certainly result in death or serious injury.
⚠ WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION	Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.
NOTICE	Property damage: The product or surrounding area may be damaged.

1.3.2 Symbols

The following symbols identify information that is not relevant for safety, but which increases the comprehensibility of the documentation.

Table 3: Meaning of the symbols

Symbol	Meaning
	If this information is disregarded, the operating procedure may be impaired.
▶	Individual, independent action
1. 2. 3.	Numbered steps: The numbers indicate the order for the steps.

2 Notes on safety

2.1 About this chapter

The product has been manufactured according to the accepted rules of current technology. Even so, there is a risk of injury or damage if this chapter and the safety information in these instructions are not observed.

- ▶ Read these instructions completely and thoroughly before working with the product.
- ▶ Keep these instructions in a location where they are accessible to all users at all times.
- ▶ Always include the operating instructions when you pass the product on to third parties.

2.2 Intended use

This product is an incomplete machine.
The product may be used as follows:
• for installation in a VarioFlow*plus* Rexroth transfer system
• Maximum load/section load: see Technical data on page 83
• For ambient conditions, see page 83.

The product is only intended for the industrial sector and not designed for private use.
Intended use includes having read and understood these instructions, especially chapter 2 “Notes on Safety”.

2.3 Improper use

Any use other than described in chapter “Intended Use” is considered improper and is not permitted.
Bosch Rexroth AG is not liable for any damages resulting from improper use. The user alone bears the risks of improper use of the product.
The following foreseeable cases of misuse are also considered improper use:
• Transport of goods other than those specified.
• Persons riding on the product or on transported material.
• Persons climbing on the product.
  – Walking on the product is not permitted.
• Personal use of the product.

2.4 Personnel qualifications

The work described in this documentation requires basic mechanical, electrical, and pneumatics knowledge, as well as knowledge of the appropriate technical terms. Additional knowledge of the lifting device's usage and of the associated lifting equipment are necessary to transport and handle the product. In order to ensure operating safety, these activities may therefore only be carried out by qualified technical personnel or an instructed person under the direction and supervision of qualified personnel

Qualified personnel are those who can recognize possible hazards and institute the appropriate safety measures due to their professional training, knowledge, and experience, as well as their understanding of the relevant conditions pertaining to the work to be done. Qualified personnel must observe the rules relevant to the subject area and carry the necessary technical expertise.
For pneumatic products such expertise would, for example, involve:
- Being able to read and fully understand pneumatic diagrams,
- Especially understanding completely the complexity and interactions of safety equipment, and
- Having knowledge of the function and structure of pneumatic components.

Bosch Rexroth offers training support for special fields. You can find an overview of the training contents on the Internet at http://www.boschrexroth.de/didactic

2.5 General safety instructions

- Observe the regulations for accident prevention and environmental protection.
- Observe the safety instructions and regulations applicable in the country in which the product is used.
- Use Rexroth products exclusively in good technical order and condition.
- Follow all instructions printed on the product.
- Persons who assemble, operate, or disassemble Rexroth products must not consume any alcohol, drugs, or pharmaceuticals that may affect their ability to respond.
- To avoid injuries due to unsuitable parts, only use original accessories and spare parts from Rexroth.
- Comply with the technical data and ambient conditions listed in the product documentation.
- Only commission the product after verifying that the end product (e.g. machine or system) in which Rexroth products are installed complies with national regulations, safety guidelines, and norms.

2.6 Product-specific safety instructions

General
- You must not carry out any basic redesign or conversion on the product.
- Do not ever expose the product to any non-permitted mechanical loads. Never use the product as a handle or step. Do not place any objects on the product.
- Always secure the product to prevent toppling.

During transport
- Observe the transport instructions on the packaging.

During assembly
- Check the product for visible transport damage.
- Lay cables and lines so that they cannot be damaged and no one can trip over them.
- Make sure the relevant system component is not under pressure or voltage before assembling the product or when connecting and disconnecting plugs.
- Protect the system component against being switched on.
- Before commissioning, make sure that all the connection gaskets and plugs are installed correctly to ensure that they are leak-proof and fluids and foreign bodies are prevented from penetrating the product.

During commissioning

- Let the product acclimate itself for several hours before commissioning; otherwise water may condense in the housing.
- Make sure that all electrical and pneumatic connections are either used or covered.
- Check the safety requirements in accordance with DIN EN 619.
- Commission the product only if it is installed completely.
- Make sure that all safety equipment belonging to the product is present, has been installed properly and is fully functional. Do not displace, bypass, or disable the safety equipment.
- Do not reach into moving parts.
- Check the product for malfunctions.

During operation

- Ensure that only authorized personnel use the product within the scope of its intended use
  - Start or operate the system, or intervene in its normal functioning
  - Activate adjustment devices on components.
- Only allow persons who are authorized by the system owner to access the product's direct operating area. This also applies when the product is standing still.
- Make sure that
  - There are no obstacles preventing access to the EMERGENCY STOP command devices.
  - All delivery points, workstations and passages remain freely accessible.
- Do not use EMERGENCY STOP command devices for routine stops.
- Regularly check the proper functioning of the EMERGENCY STOP command devices.
- After an EMERGENCY STOP or in case of a fault or any other anomalies, switch off the product and protect it against being switched on again.
- Do not reach into moving parts.
- An idle system is not a safe system, as stored energy can be released unintentionally or through improper maintenance procedures.

EMERGENCY STOPS, malfunction

- After an EMERGENCY STOP or a malfunction, only switch on the system once the cause of the fault has been determined and the error resolved.

During maintenance and repair

- Make sure that there are no obstacles blocking access to maintenance and inspection points.
- Perform the prescribed maintenance work at the intervals specified in section 10.3 “Maintenance”.
- Make sure that no lines, connectors or components are disconnected as long as the system is under pressure and voltage. Protect the system against being switched on.

During disposal

- Dispose of the product in accordance with the currently applicable national regulations in your country.

2.7 Personal protective equipment

- Wear appropriate protective equipment (e.g. safety shoes, tight clothing, hairnets for those with long hair) when working with the product.
  As a plant operator, you are responsible for appropriate protective equipment when working with the product.
  All personal protective equipment must be intact.

2.8 Obligations of the system owner

- Perform a risk assessment in accordance with DIN EN ISO 12100 before initial commissioning or recommissioning of a conveyor system.
- Instruct operating personnel on safety before initial commissioning or recommissioning and afterwards regularly.

3 General Notes on Equipment and Product Damage

The warranty only applies to the delivered configuration.

- The warranty will not apply if the product is incorrectly assembled, commissioned, or operated, and/or if it is not handled or not used as intended.

During cleaning

- Prevent cleaning agents from entering the system.
- Never use solvents or aggressive detergents.
- Do not use a high-pressure cleaner for cleaning.

4 Scope of delivery

The scope of delivery includes:

- Various VarioFlow *plus* modular units, according to your order. Please consult the shipping documents to make sure that the delivery is complete.
- 1 Assembly instructions: “VarioFlow *plus* modules”

4.1 Condition on delivery

- Modules installed or partially installed

5 About This Product

5.1 Performance description

5.1.1 Use of VarioFlow *plus* modules

- Standardized modules for assembly for a conveyor system to use in the areas of food & packaging, health care, assembly lines in automotive & electronics or in machine linking.

5.1.2 Execution of VarioFlow *plus* modules

- Basic version in aluminum (System AL)
- In case of greater hygienic needs, there is the stainless steel version (STS system)
- Workpiece pallet system for parts that cannot be directly transported in the conveyor chain.

5.2 Product Description

A: Foot
B: Strut profile
E: Straight section
H: Holders
K: Curve wheel
M: Horizontal sliding curve
N: Roller curve
O: Vertical sliding curve
P: Assembly module
Q: Return unit
R: Basic unit
U: Conveyor chain
V: Lateral guide
W: Drive kit

[1]) Size shown

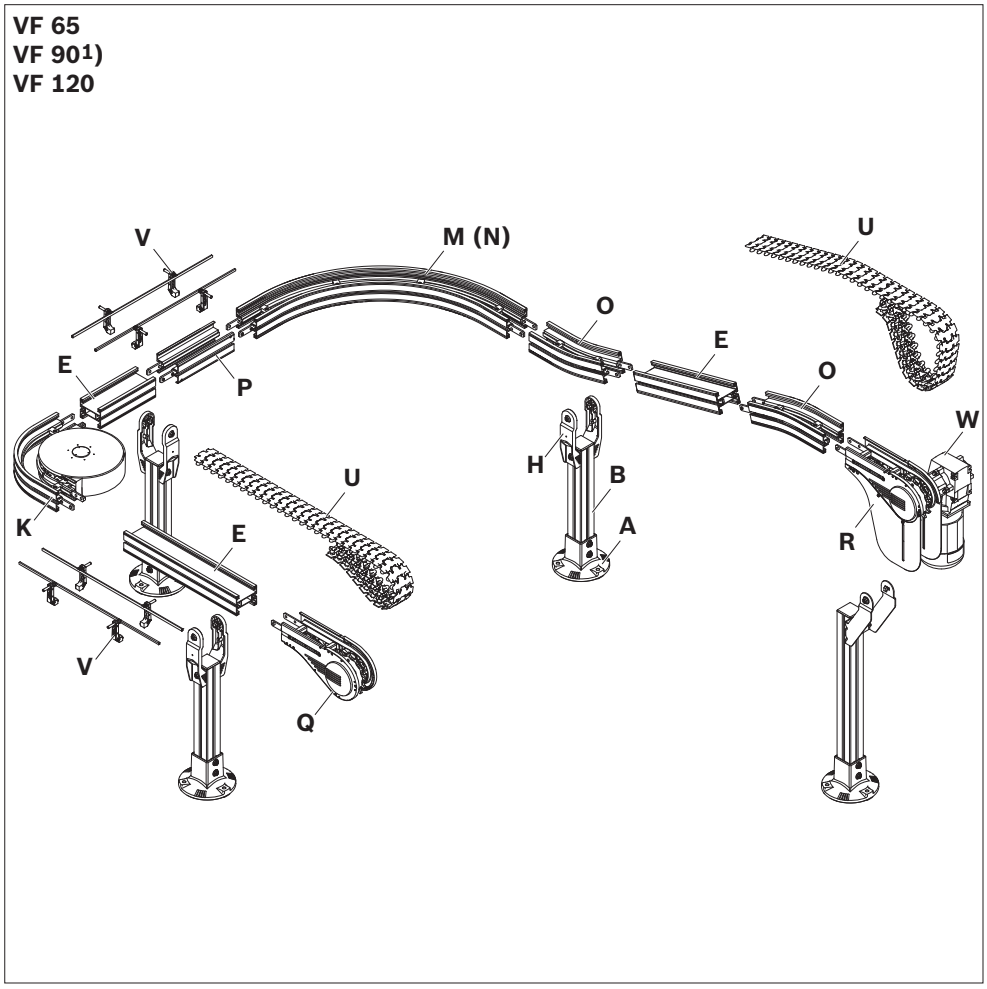


Fig. 1: VarioFlow *plus* modules

5.3 Product identification

A: Part number (order number)
B: Designation
C: Production date

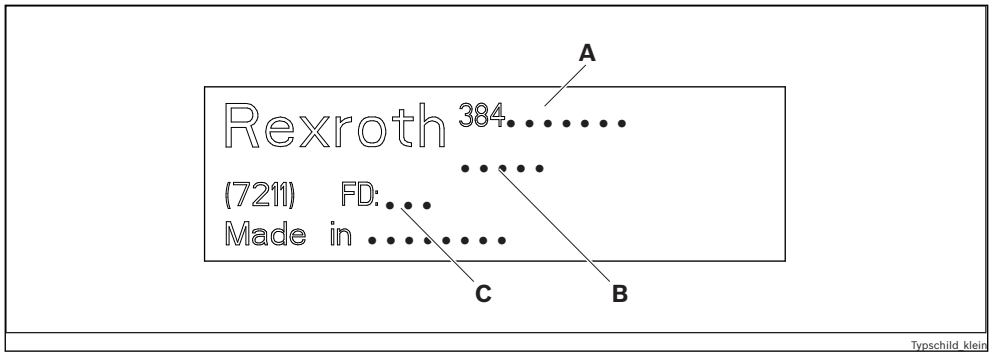


Fig. 2: Name plate

6 Transport and storage

- Observe the transport instructions on the packaging.
- See the shipping documents for transport weight.
- Secure the product to prevent toppling!
- When storing and transporting the product, always observe the ambient conditions, see page 83.

6.1 Transporting the product

⚠ WARNING

Lifted loads may fall!
Falling objects may result in severe injuries (or even death).
- ▶ Always use lifting equipment with a sufficiently high load bearing capacity (see the shipping documents for product weight).
- ▶ Before lifting the product, make sure that the carrying straps are correctly fastened!
- ▶ Secure the product to prevent toppling while lifting!
- ▶ Make sure that no one is in the danger area when raising and lowering, with the exception of the operator!

6.2 Storing the product

- Only store the product on a flat surface.
- Protect the product against mechanical influences.
- Protect the product against environmental influences such as contamination and humidity.
- Observe the ambient conditions, see page 83.
- Support the product so that suspended, there is no load on motors assembled.

7 Assembly

7.1 Unpacking

- ▶ Lift the product out of the packaging.
- ▶ Dispose of the packaging in accordance with the currently applicable national regulations in your country.

7.2 Installation requirements

- ▶ When installing the product, always observe the ambient conditions specified in the Technical Data (see page 83).

7.2.1 Mounting orientation

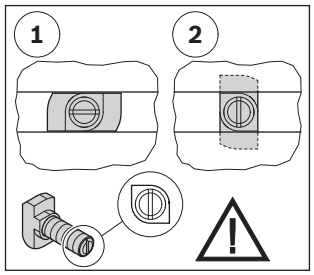
- ▶ The product should be aligned and level at right angles and parallel to the axis. This ensures correct functioning and prevents premature wear.

7.3 Required tools

- Hexagon wrench WS13
- Hex socket wrenches WS3, WS4, WS5
- Screwdriver for recessed head screws PZ2
- Hammer
- Water level

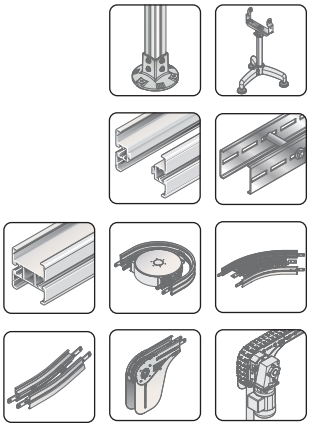
7.4 Symbols used

Table 4: Symbols used

	Connect with T-bolt and flange nut. Make sure the T-bolt is in the correct position when inserting and tightening in the slot. The notch at the end of the bolt indicates the T-bolt orientation. 1 = T-bolt insertion orientation in the slot. 2 = T-bolt clamping position in the slot. Tightening torque: 25 Nm
 $M_D = 20Nm$	Wrench for hexagonal screw SW = wrench size (WS) ... mm M_D = required tightening torque ... Nm
 $M_D = 8Nm$	Wrench for hex-socket screw SW = wrench size (WS) ... mm M_D = required tightening torque ... Nm
 	Screwdriver for recessed head screws PZ ... = Pozidriv recessed head, size ... PH ... = Phillips recessed head, size ...
   gleitmo 585 K Anti-Seize	Grease/grease with specified lubricant: • gleitmo 585 K: gleitmo 585 K, www.fuchs-lubritech.com • Anti-seize: Food Grade Anti-Seize/Loctite 8014, www.henkel.com
  Loctite 243 Loctite 601	Secure the screws with: • Loctite 243: medium strength adhesive (detachable), www.loctite.de • Loctite 601: high strength adhesive (permanent), www.loctite.de
	The identified parts are not required for the assembly situation described. Use the parts in another application or dispose of them.
1 2 3	Sequence of assembly steps in the graphics. The numbers correspond with the order of the assembly steps according to the instructions in the accompanying text.
A B C X	Designation of components in graphics. The letters identify the components specified in the instructions.
	Detailed view from another direction of vision, e.g. on the rear or the bottom of the product.

7.5 Installing the product

Order for installation of a VarioFlow *plus* system:



1. Pre-install the leg sets
   (AL system, see page 16, STS system, see page 33).

2. Pre-install the open section profiles
   (AL system, see page 17, STS system, see page 34).

3. Install the modules of the sections on supports.
   – Straight section
   (AL system, see page 19, STS system, see page 36).
   – Curve wheel (AL system, see page 20, STS system, see page 37).
   – Curve wheel drive (only for AL system, see page 31).
   – Horizontal curve
   (AL system, see page 21, STS system, see page 38).
   – Vertical curve (AL system, see page 23, STS system, see page 39).
   – Assembly module (AL system, see page 27, STS system, see page 43).
   – Return unit (AL system, see page 28, STS system, see page 44).
   – Basic unit (AL system, see page 29, STS system, see page 45).

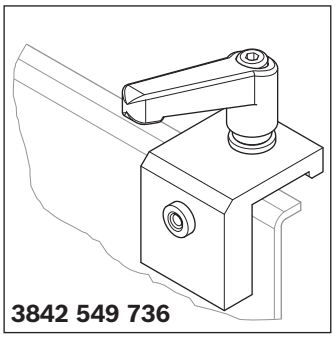


Fig. 3: Drilling jig

Please note:
During installation, drill holes are to be made in the sections and support profiles for later attachment of the slide rail by the user.
- With a section profile, you can drill before or after installation.
- You should drill before installation of the support profile.
- There is a groove in the section profile and support profile as a drilling aid for the AL system.
  You need a drilling template for the STS system, **3842 549 736**.

4. Only for VarioFlow *plus* 160, ..240, ..320:
   Install the support profile (see straight section, curves, return unit, head drive).
5. Install the slide rail (see page 48 and the following pages).
6. Install the conveyor chain (see page 54 and the following pages).
7. Install the lateral guide (see page 60 and the following pages).
8. Install the drive unit(see page 65 and the following pages).

7.5.1 AL system

Required accessories:
- Foot (A)
- Strut profile (B)
- Cap (C)

A_1: 3842 544 875
A_2: 3842 540 173
B_1: 3842 990 350/L
B_2: 3842 993 133/L
C_1: 3842 511 876
C_2: 3842 529 039
D: 3842 540 668

▶ Mount the supports.

Please note:
Until you have screwed the system onto the floor, secure the leg sets and the VarioFlow*plus* modules to prevent them from being knocked over during assembly.

AL system, installing the leg sets

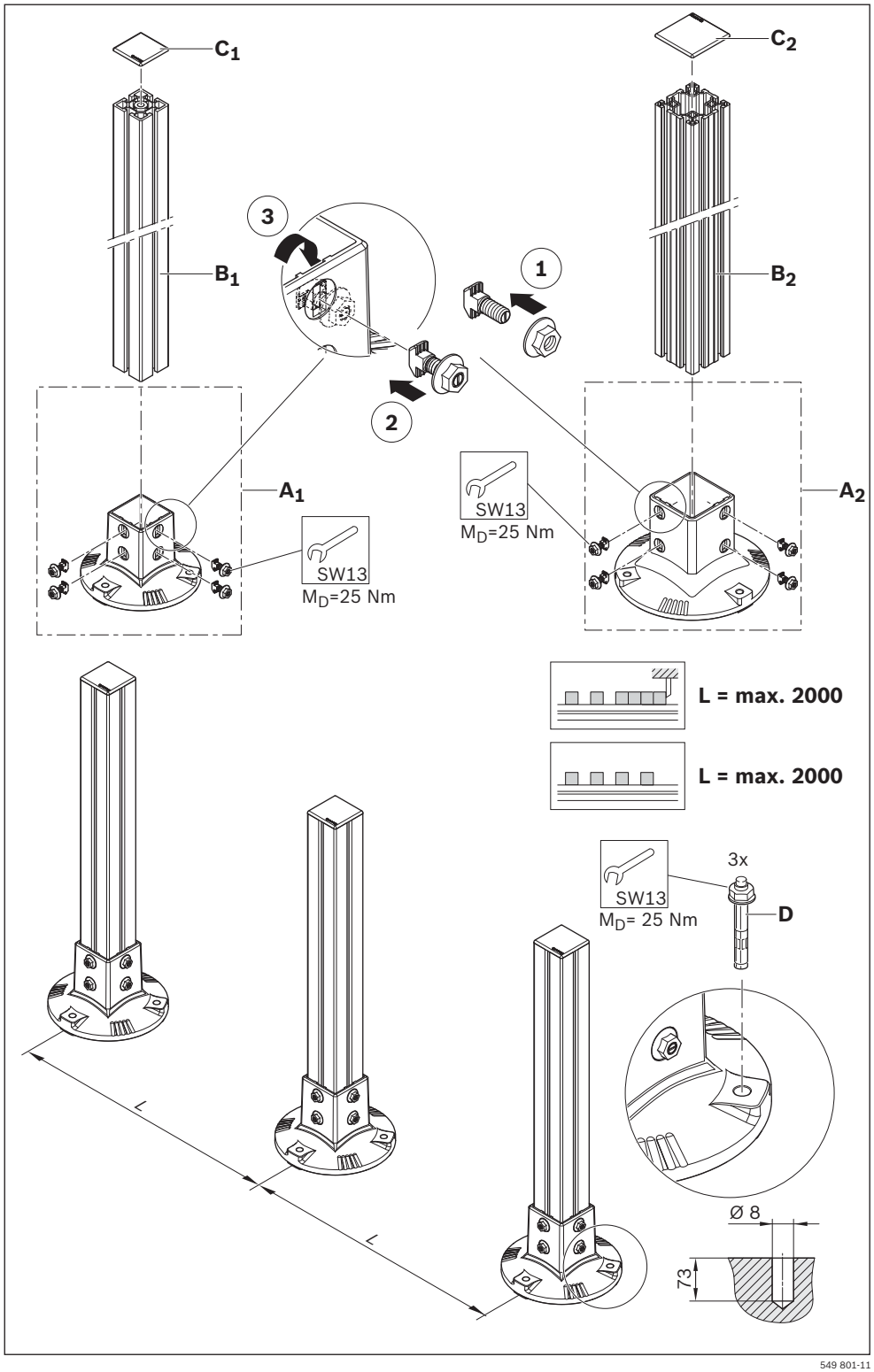


Fig. 4: AL system, installing the leg sets

AL system, pre-install open section profiles

Required accessories:
- Section profile (E)
- Cross connector (F)
- Support profile (G, only for VF 160/VF 240/VF 320)
  - Oval-head screw with flange in acc. with ISO 7380, MLF-M6X14-10.9-VZ (X, to be provided by user)
  - Hexagonal nut ISO 4035-M6-A2-70 (Y, to be provided by user)

E,
6070 mm: **3842 546 647**
3000 mm: **3842 546 670**
L mm: **3842 996 026/L**

F, VF 65: **3842 546 672**
F, VF 90: **3842 546 673**
F, VF 120: **3842 546 674**
F, VF 160: **3842 546 675**
F, VF 240: **3842 546 676**
F, VF 320: **3842 546 677**

▶ Preassemble the open section profiles.

Please note:
- Install the support profile (G) last after the curves, return unit and the drive.
- The support profile (G) protrudes into the curve; see pages 21, 23.
- To attach the slide rail, make drill holes in the support profile before the installation; for position, see pages 21, 23, 28.

G,
6070 mm: **3842 546 705**
3000 mm: **3842 547 904**
L mm: **3842 996 028/L**

[1]) Size shown

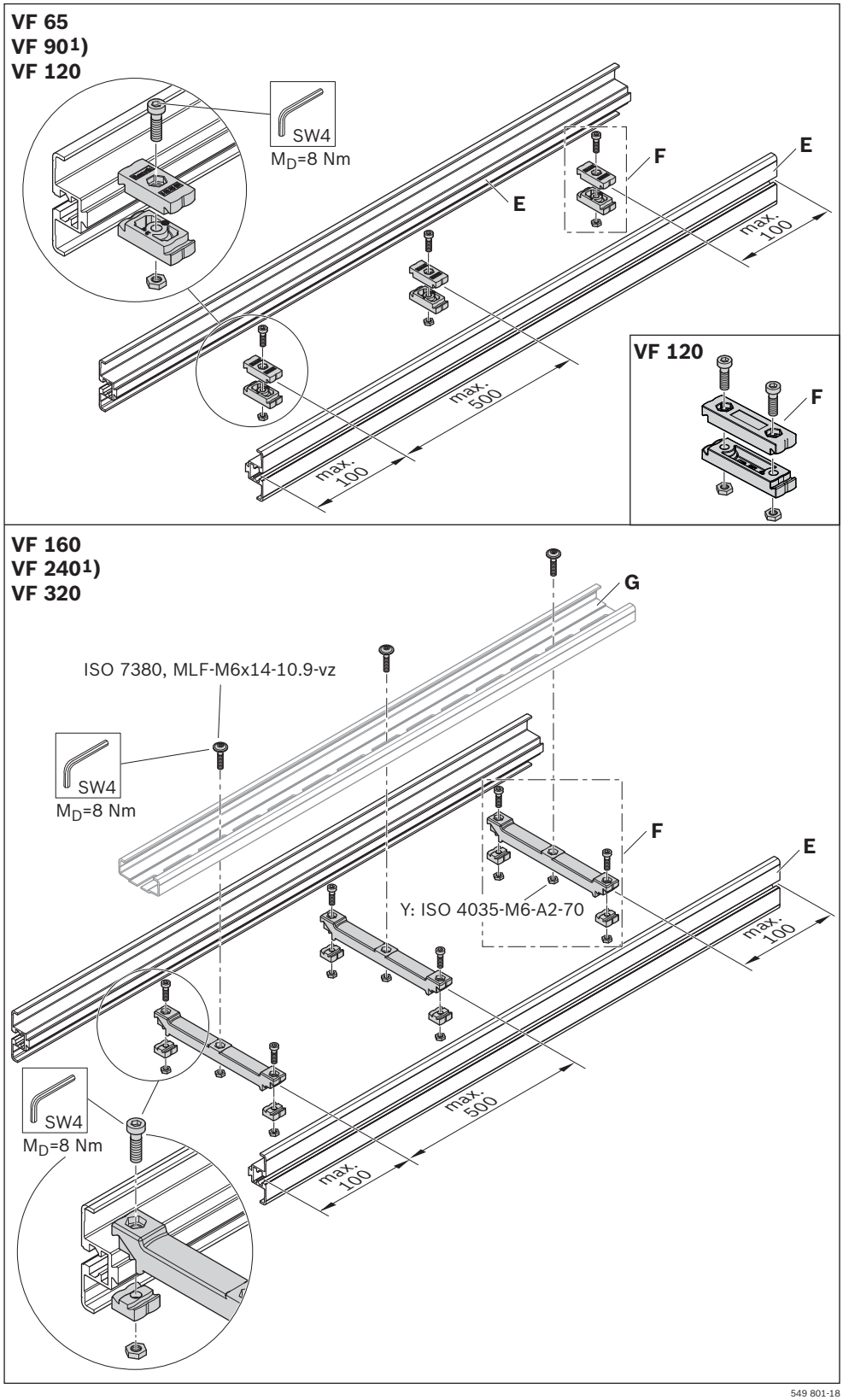


Fig. 5: AL system, pre-install open section profiles

Required accessories:
• Holder (H)

H, VF 65:	**3842 546 625**
H, VF 90:	**3842 546 626**
H, VF 120:	**3842 546 627**
H, VF 160:	**3842 546 628**
H, VF 240:	**3842 546 629**
H, VF 320:	**3842 546 630**

▶ Install the section profile onto the supports.

Please note:
Until you have screwed the system onto the floor, secure the leg sets and the VarioFlow*plus* modules to prevent them from being knocked over during assembly.

[1]) Size shown

AL system, installing the section on the leg sets

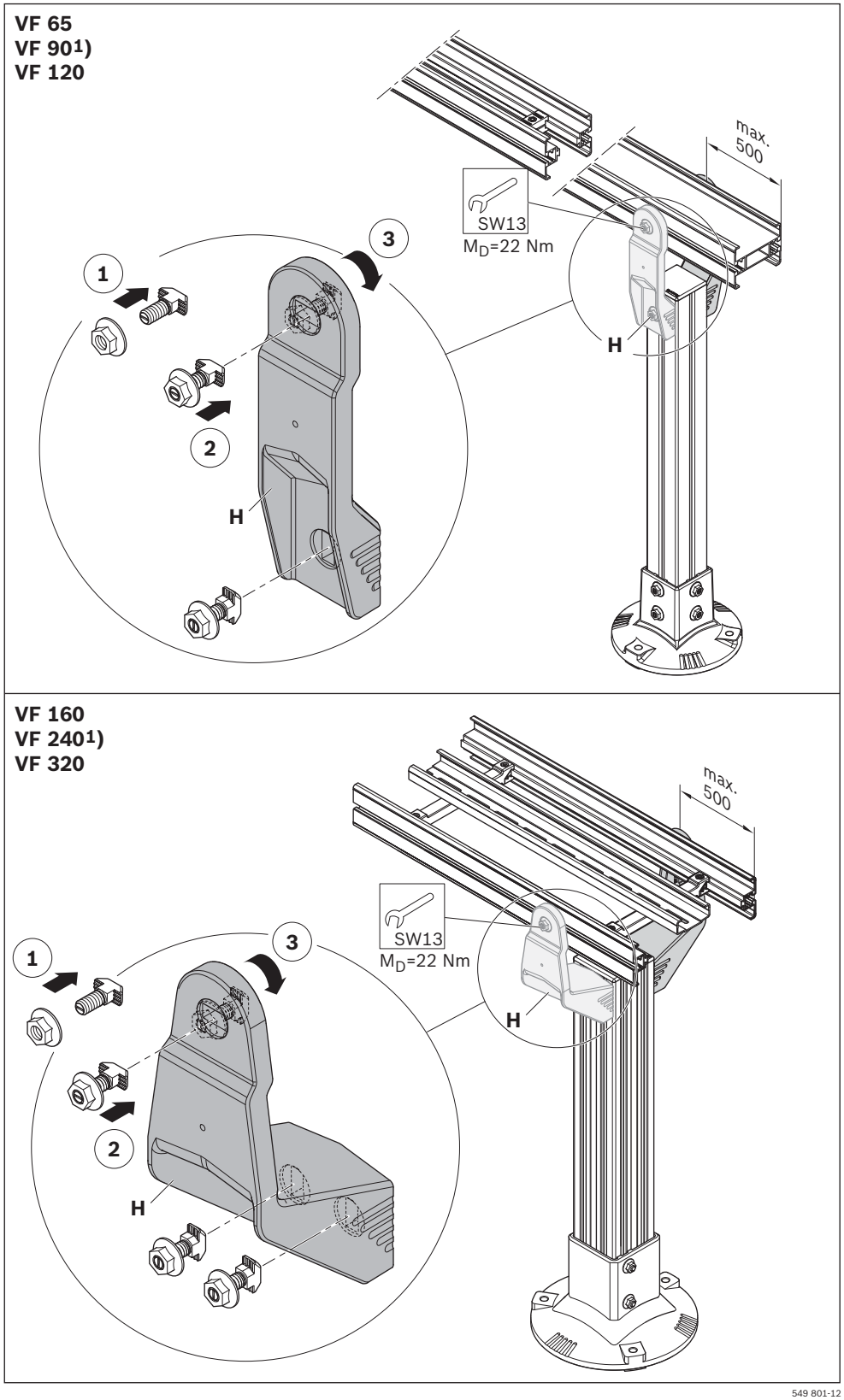


Fig. 6: AL system, installing the section on the leg sets

AL system, installing the section straight

Required accessories:
- Profile connector (J)

J: **3842 530 277**

[1]) Size shown

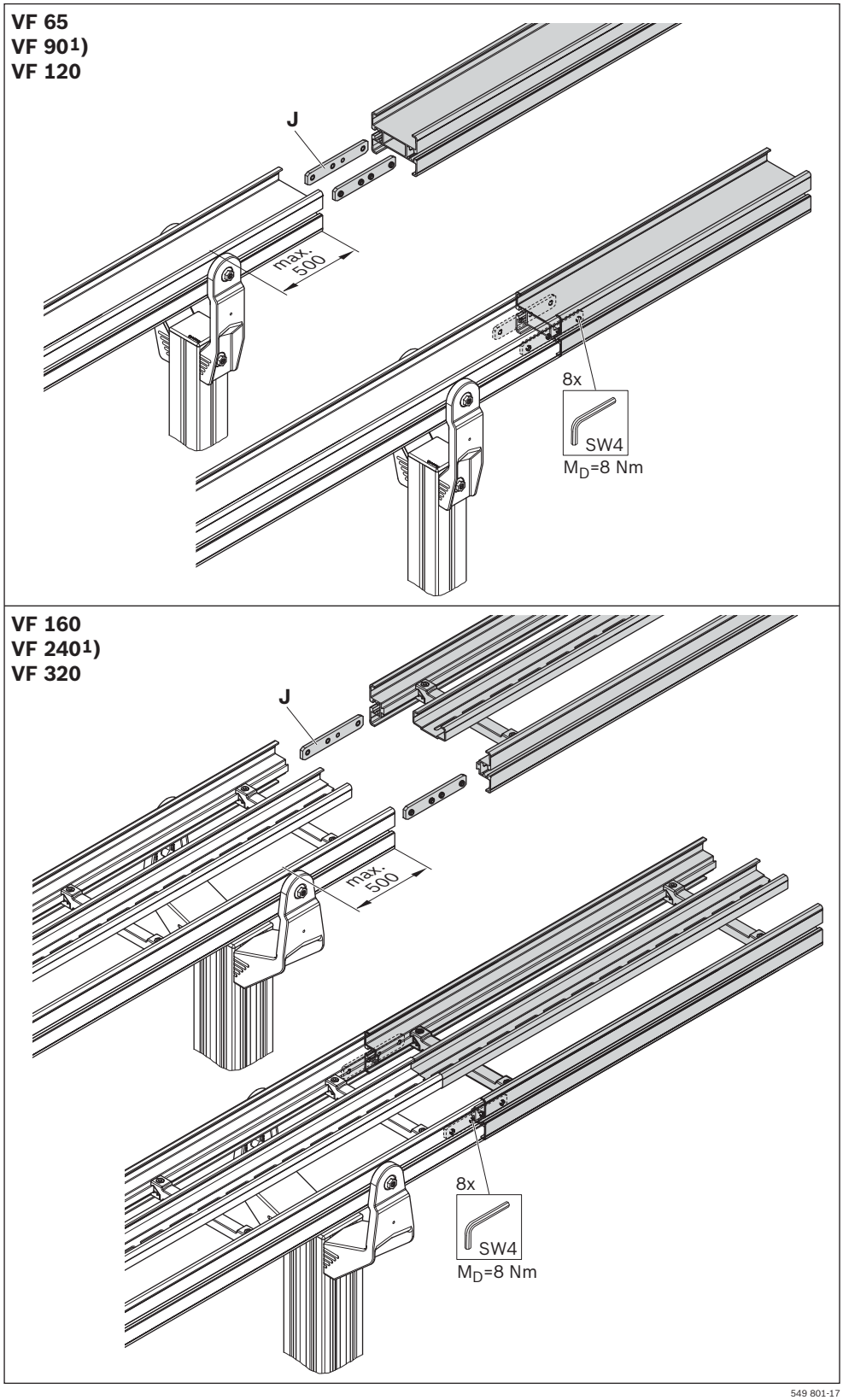


Fig. 7: AL system, installing the section straight

AL system, installing the curve wheel

Required accessories:
- Curve wheel (K)
- Only if needed: Protective cover (L)

K, VF 65,
30°: **3842 547 048**
45°: **3842 547 049**
90°: **3842 547 050**
180°: **3842 547 051**

K, VF 90,
30°: **3842 547 052**
45°: **3842 547 053**
90°: **3842 547 054**
180°: **3842 547 055**

K, VF 120,
30°: **3842 547 056**
45°: **3842 547 057**
90°: **3842 547 058**
180°: **3842 547 059**

L, VF 65,
30°: **3842 551 545**
45°: **3842 551 546**
90°: **3842 551 547**
180°: **3842 551 548**

L, VF 90,
30°: **3842 551 549**
45°: **3842 551 550**
90°: **3842 551 551**
180°: **3842 551 552**

[1]) Size shown
[2]) Drilled hole for attaching of the slide rail; see page 47 and the following pages.

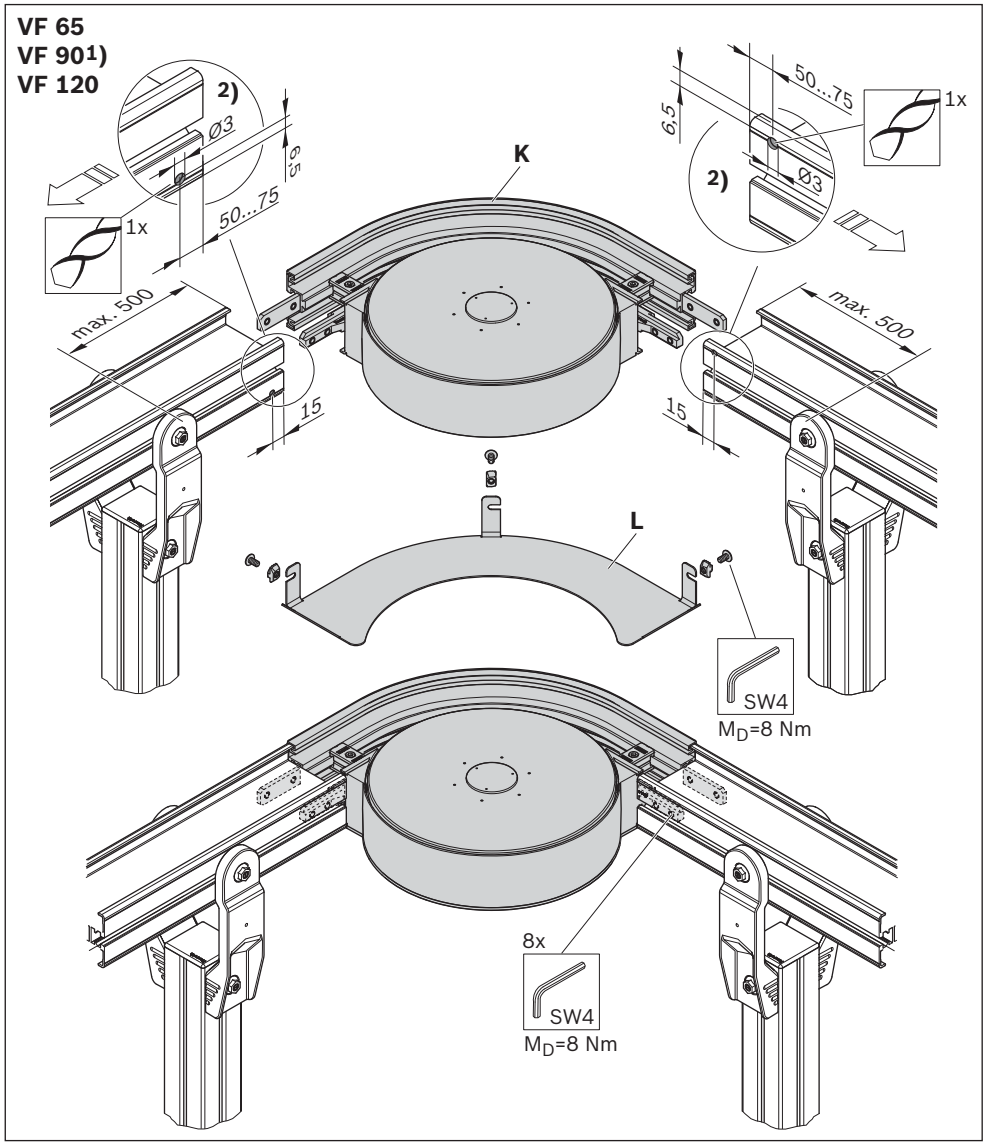


Fig. 8: AL system, installing the curve wheel

Please note:
Use the protective cover (L) and closed profiles for engagement protection from below for recirculating systems without returning chain in the lower run (when using a curve wheel or connection drive).

Required accessories:

- Horizontal sliding curve (M)

M, VF 65,
30°, R700: **3842 547 072**
45°, R700: **3842 547 073**
90°, R700: **3842 547 074**

M, VF 90,
45°, R500: **3842 547 075**
90°, R500: **3842 547 076**
30°, R700: **3842 547 077**
45°, R700: **3842 547 078**
90°, R700: **3842 547 079**

M, VF 120,
30°, R700: **3842 547 080**
45°, R700: **3842 547 081**
90°, R700: **3842 547 082**

[1]) Size shown

AL system, installing the horizontal sliding curve

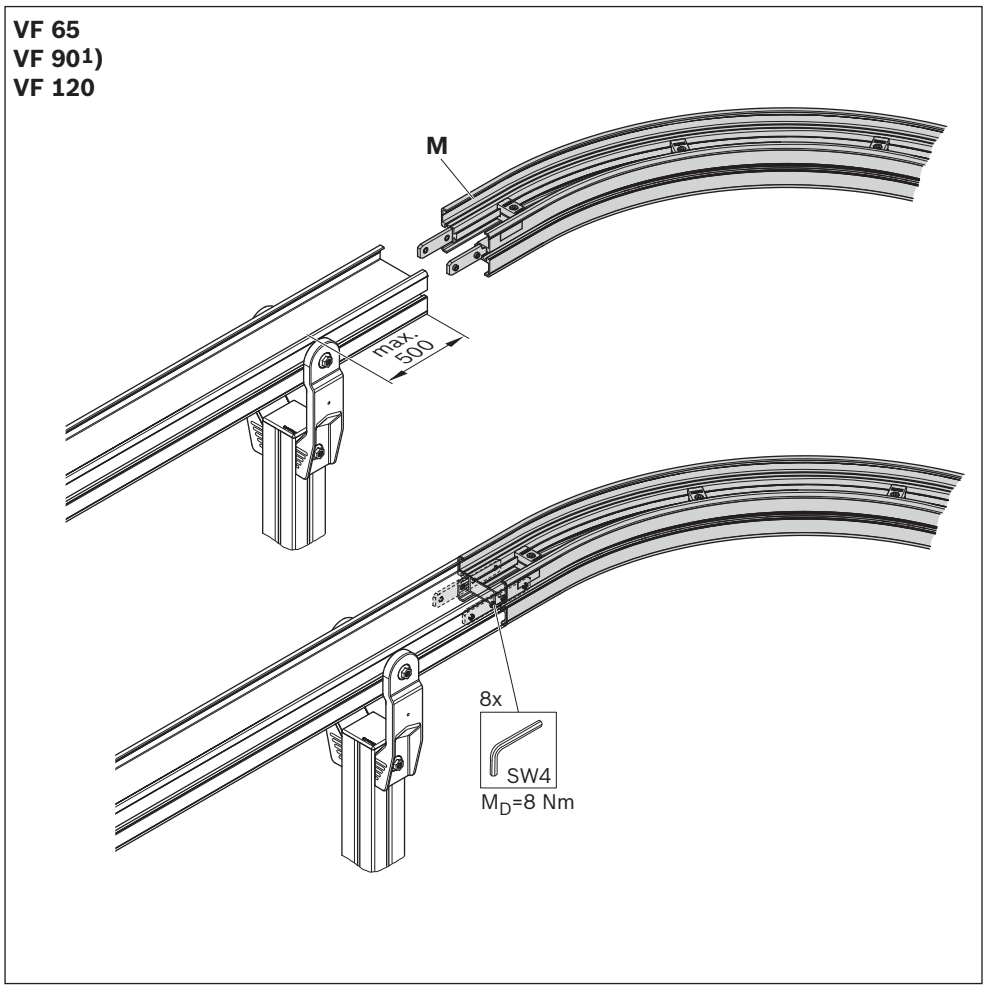


Fig. 9: AL system, installing the horizontal sliding curve

Please note:
The friction occurring at the sliding curves increases the required chain tensile force. For this reason, always use the PE-UHMW slide rail for sliding curves in the entire system.

ENGLISH

Required accessories:

- Horizontal roller curve (N)

N, VF 160,
30°: **3842 547 060**
45°: **3842 547 061**
90°: **3842 547 062**
180°: **3842 547 063**

N, VF 240,
30°: **3842 547 064**
45°: **3842 547 065**
90°: **3842 547 066**
180°: **3842 547 067**

N, VF 320,
30°: **3842 547 068**
45°: **3842 547 069**
90°: **3842 547 070**
180°: **3842 547 071**

Please note:
The chain guide must not touch the roller, ☞ [3])

[1]) Size shown
[2]) Drilled hole for attaching of the slide rail; see page 47 and the following pages.

AL system, installing the horizontal roller curve

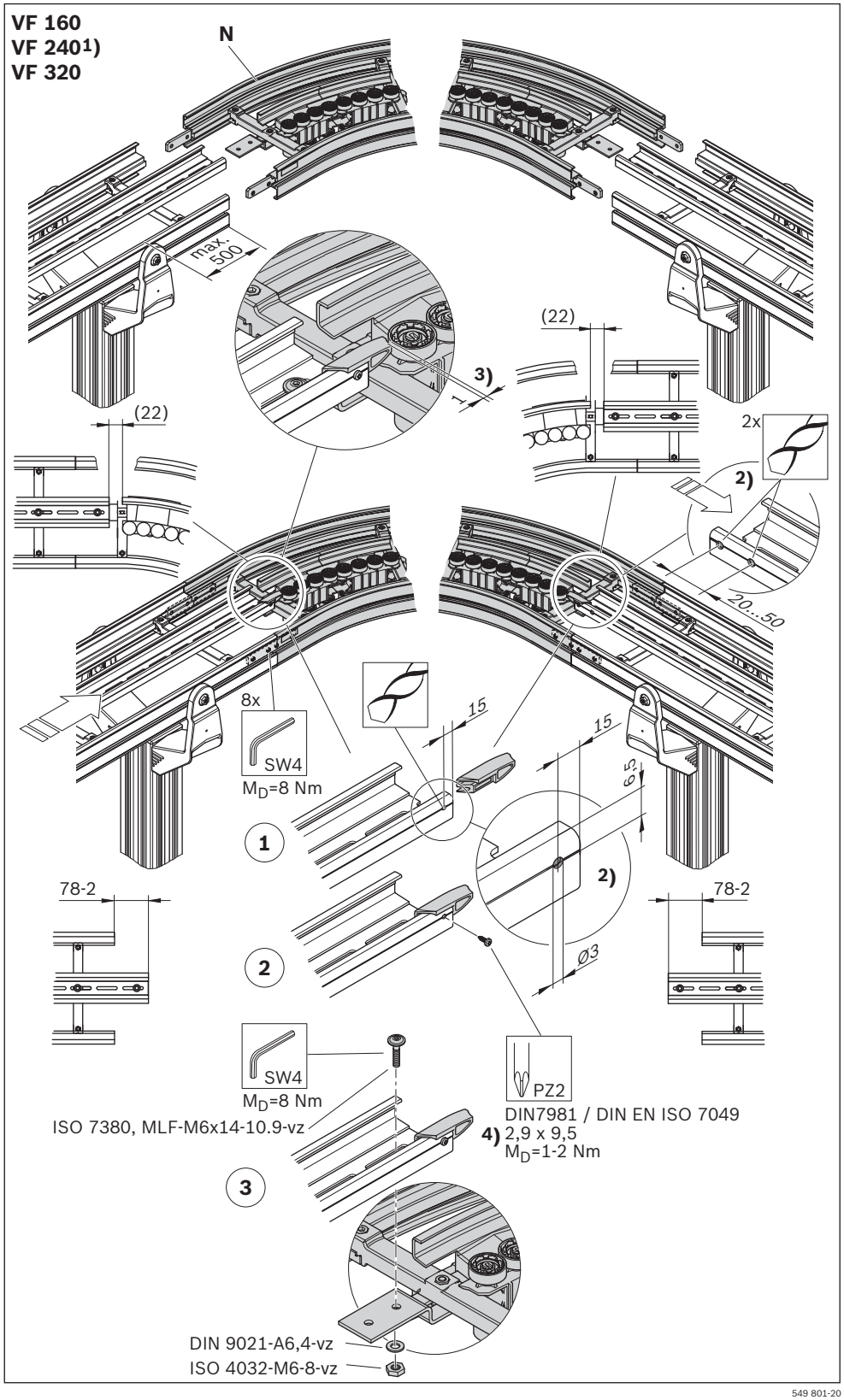


Fig. 10: AL system, installing the horizontal roller curve

Required accessories:

- Vertical sliding curve (O)

O, VF 65,
5°, R500: **3842 547 083**
7.5°, R500: **3842 547 084**
15°, R500: **3842 547 085**
30°, R500: **3842 547 086**
45°, R500: **3842 547 087**

O, VF 90,
5°, R500: **3842 547 088**
7.5°, R500: **3842 547 089**
15°, R500: **3842 547 090**
30°, R500: **3842 547 091**
45°, R500: **3842 547 092**

O, VF 120,
5°, R500: **3842 547 093**
7.5°, R500: **3842 547 094**
15°, R500: **3842 547 095**
30°, R500: **3842 547 096**
45°, R500: **3842 547 097**

Please note:
The friction occurring at the sliding curves increases the required chain tensile force. For this reason, always use the PE-UHMW slide rail for sliding curves in the entire system.
Installing the slide rail; see page 47 and the following pages

.

[1]) Size shown

AL system, installing the vertical sliding curve, VF 65/VF 90/VF 120

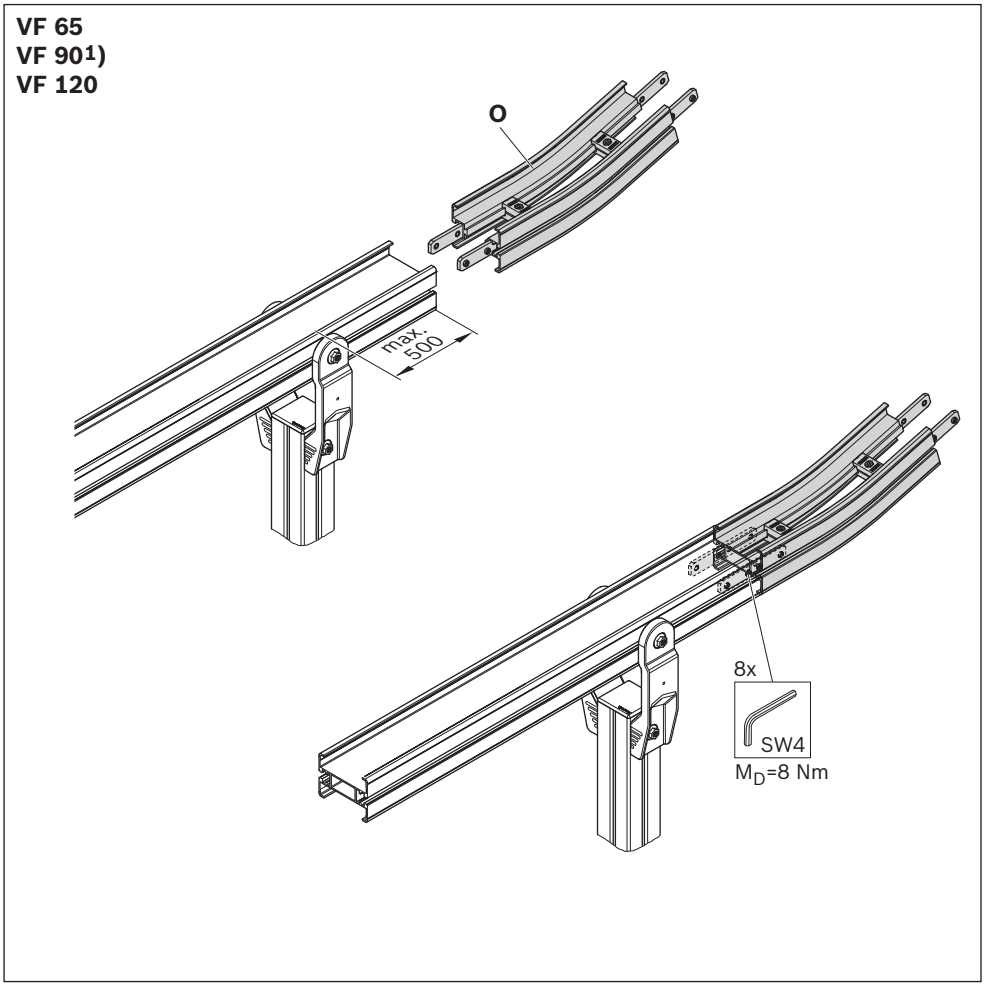


Fig. 11: AL system, installing the vertical sliding curve, VF 65/VF 90/VF 120

ENGLISH

Required accessories:
- Vertical sliding curve (O)
- Slide rail, PE-UHMW

3842 546 116

O, VF 160,
5°, R500: **3842 547 098**
7.5°, R500: **3842 547 099**
15°, R500: **3842 547 100**
30°, R500: **3842 547 101**
45°, R500: **3842 547 102**

O, VF 240,
5°, R500: **3842 547 103**
7.5°, R500: **3842 547 104**
15°, R500: **3842 547 105**
30°, R500: **3842 547 106**

O, VF 320,
5°, R500: **3842 547 107**
7.5°, R500: **3842 547 108**
15°, R500: **3842 547 109**
30°, R500: **3842 547 110**

1. Mount the chain guide.
2. Push on the slide rail (if need be, deburr sharp edges beforehand)
3. Mount the chain guide.

[1]) Size shown
[2]) Direction of running of the return chain on the bottom of the profile

AL system, installing the vertical sliding curve, VF 160/VF 240/VF 320

First mount the slide rails and chain guides for the chain return on the bottom of the curve.

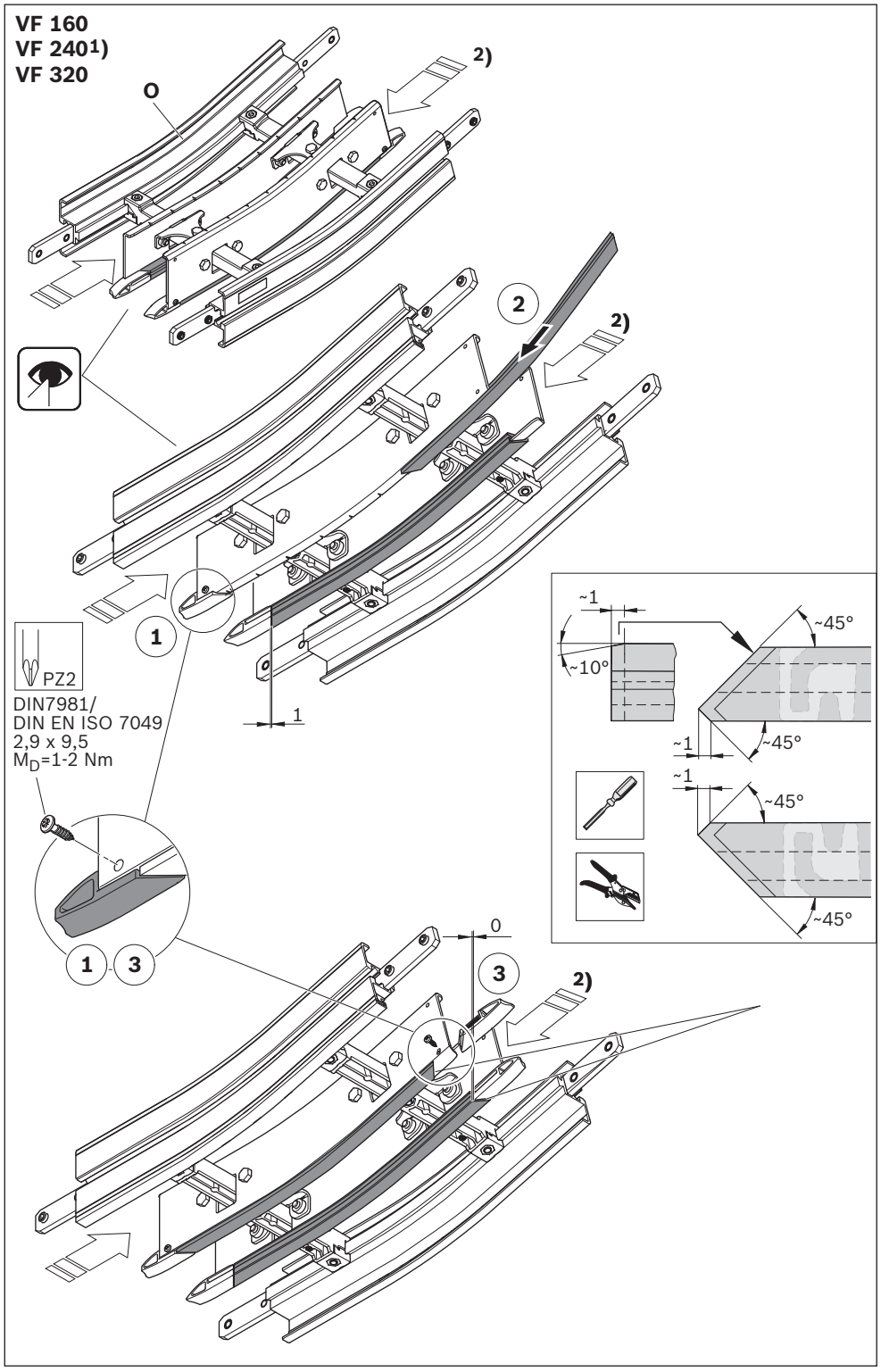


Fig. 12: AL system, vertical sliding curve, upwards: Installing the slide rail for the chain return

1. Mount the chain guide.
2. Push on the slide rail (if need be, deburr sharp edges beforehand)
3. Mount the chain guide.

[1]) Size shown
[2]) Direction of running of the return chain on the bottom of the profile

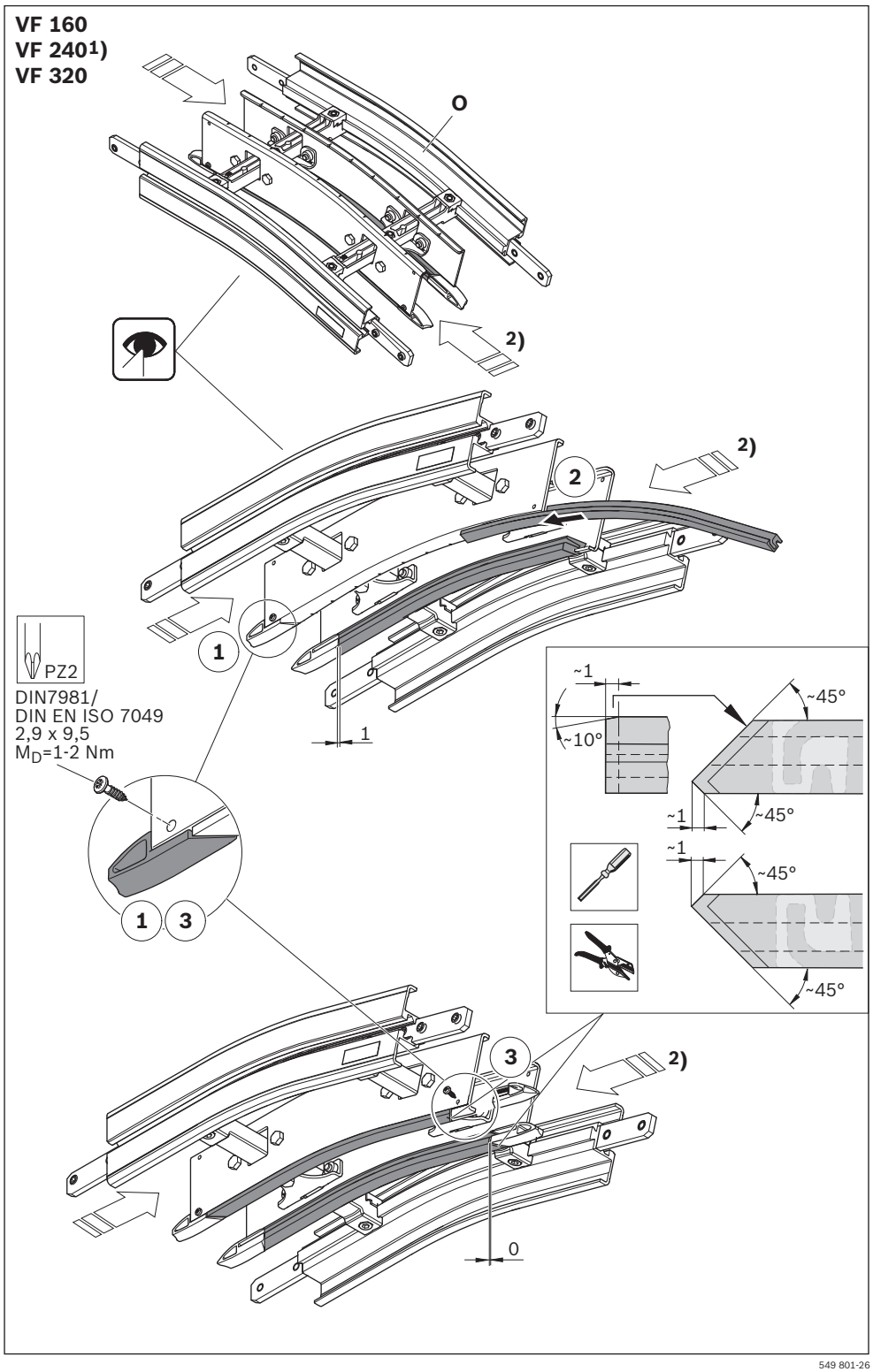


Fig. 13: AL system, horizontal sliding curve, downwards Installing the slide rail for the chain return

Please note:
The friction occurring at the sliding curves increases the required chain tensile force. For this reason, always use the PE-UHMW slide rail for sliding curves in the entire system.
Installing the slide rail; see page 47 and the following pages

[1]) Size shown

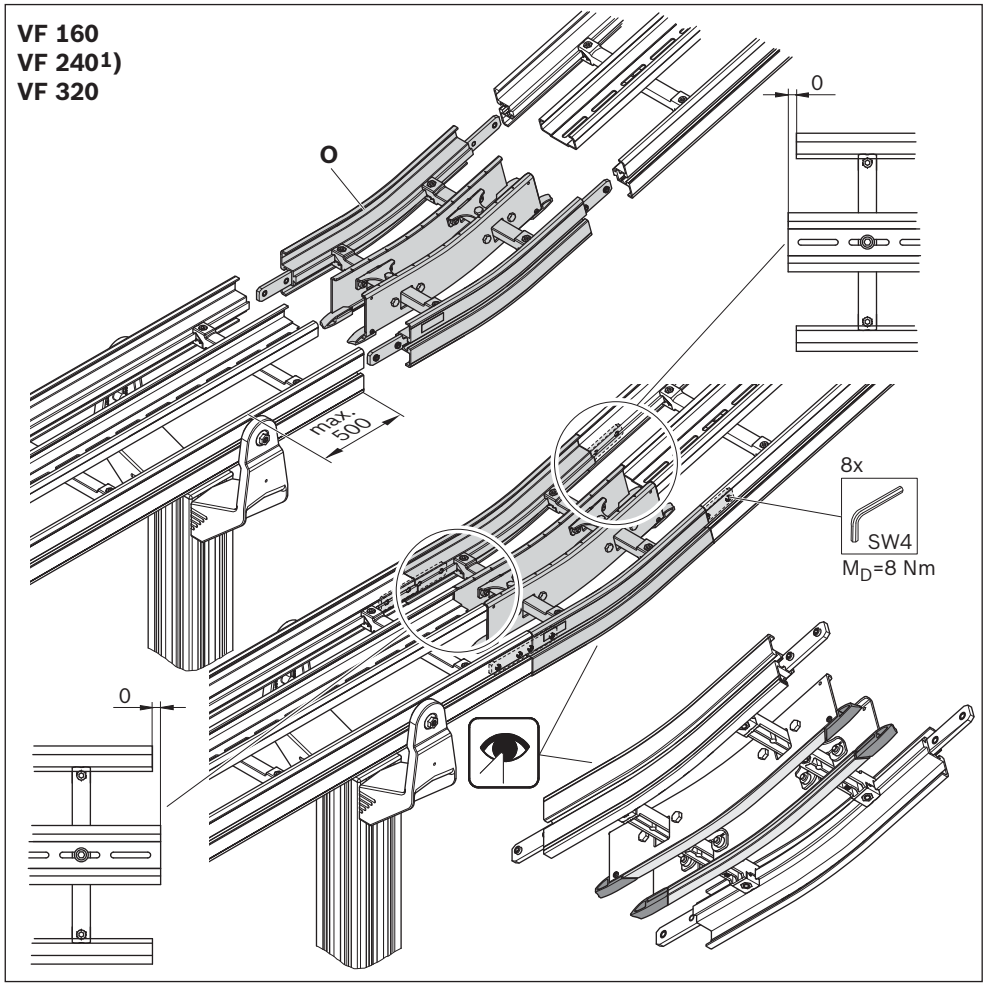


Fig. 14: AL system, installing the vertical sliding curve, VF 160/VF 240/VF 320

Required accessories

- Assembly module (P)

P: **3842 547 899**

Please note:

- Install the assembly module at an easily accessible location for later operation. That makes the installation, inspection and the replacement of the conveyor chain easier.
- The drill holes for attachment of the slide rail (see ☞ [2])) must be at the front in the transport direction.

[1]) Size shown

AL system, installing the assembly module

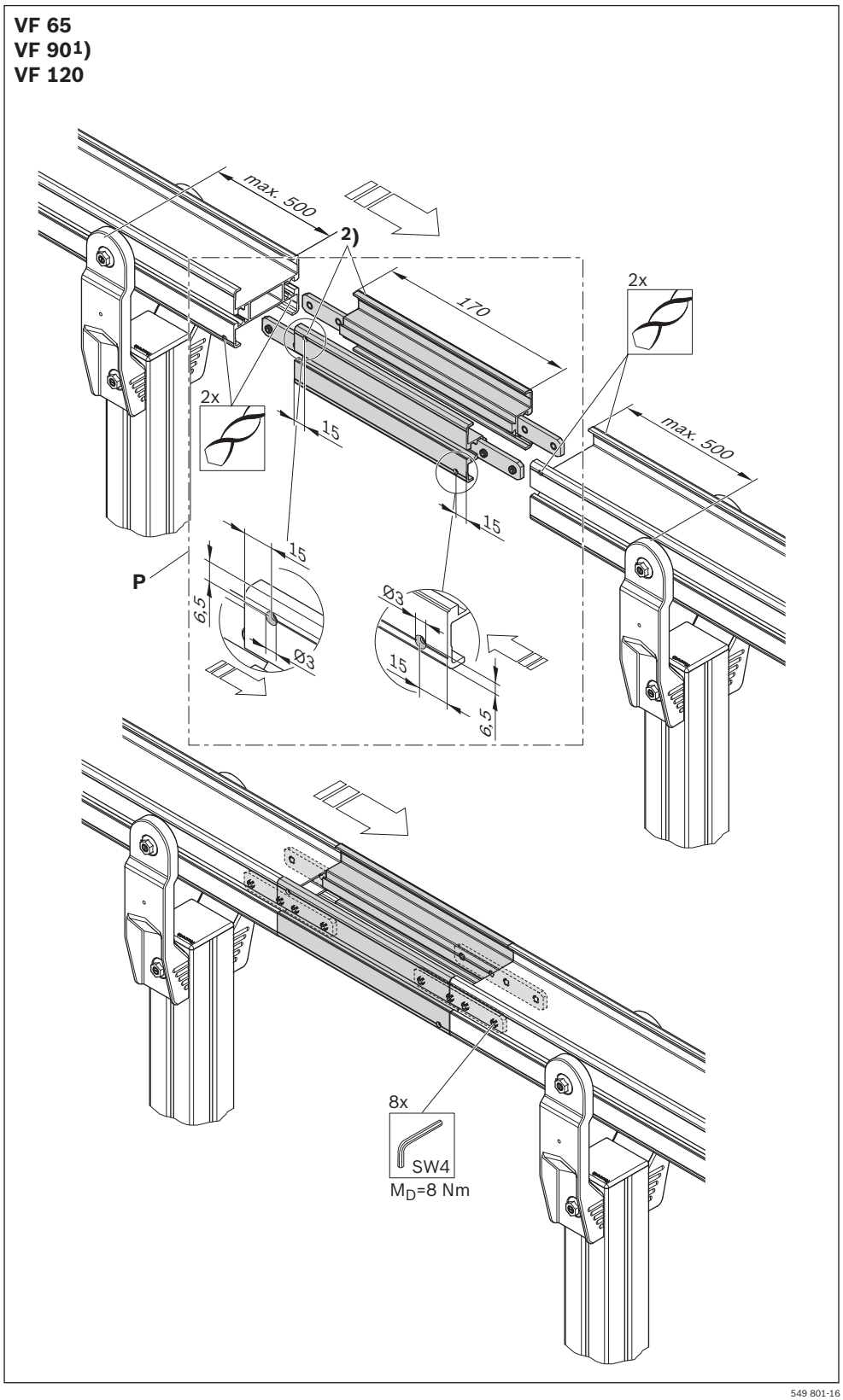


Fig. 15: AL system, installing the assembly module

Required accessories:

- Return unit (Q)

Q, VF 65:	**3842 547 516**
Q, VF 90:	**3842 547 517**
Q, VF 120:	**3842 547 518**
Q, VF 160:	**3842 547 519**
Q, VF 240:	**3842 547 520**
Q, VF 320:	**3842 547 521**

Please note:
Until you have screwed the system onto the floor, secure the leg sets and the VarioFlow*plus* modules to prevent them from being knocked over during assembly.

[1]) Size shown
[2]) Drilled hole for attaching of the slide rail; see page 47 and the following pages.

AL system, installing the return unit

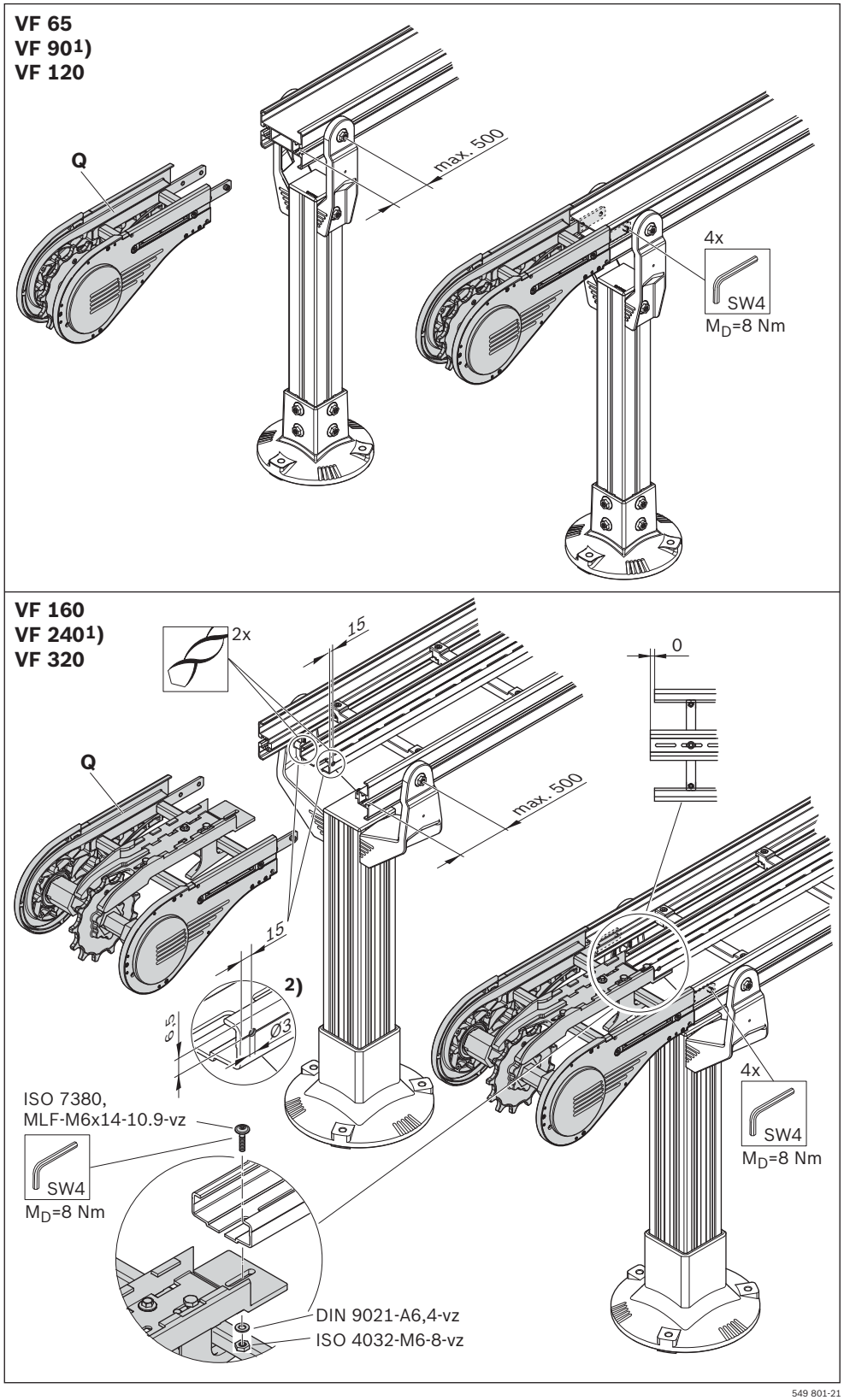


Fig. 16: AL system, installing the return unit

AL system, installing the basic unit

Required accessories:
- Basic unit (R), protective covers (x) not installed.
- Holder (S)

R, VF 65:	**3842 546 120**
R, VF 90:	**3842 546 121**
R, VF 120:	**3842 546 122**
S, VF 65:	**3842 547 442**
S, VF 90:	**3842 547 443**
S, VF 120:	**3842 547 444**

Please note:
- You can also install the protective covers (x) after closing the conveyor chain.
- Until you have screwed the system onto the floor, secure the leg sets and the VarioFlow*plus* modules to prevent them from being knocked over during assembly.

Continue on page 47, Installing the slide rail.

Installing the gear motor, see pages 65, 66.

[1]) Size shown
[3]) This lock washer meets the requirement of the Machinery Directive 2006/42/EC for captive screws on protective covers (x).

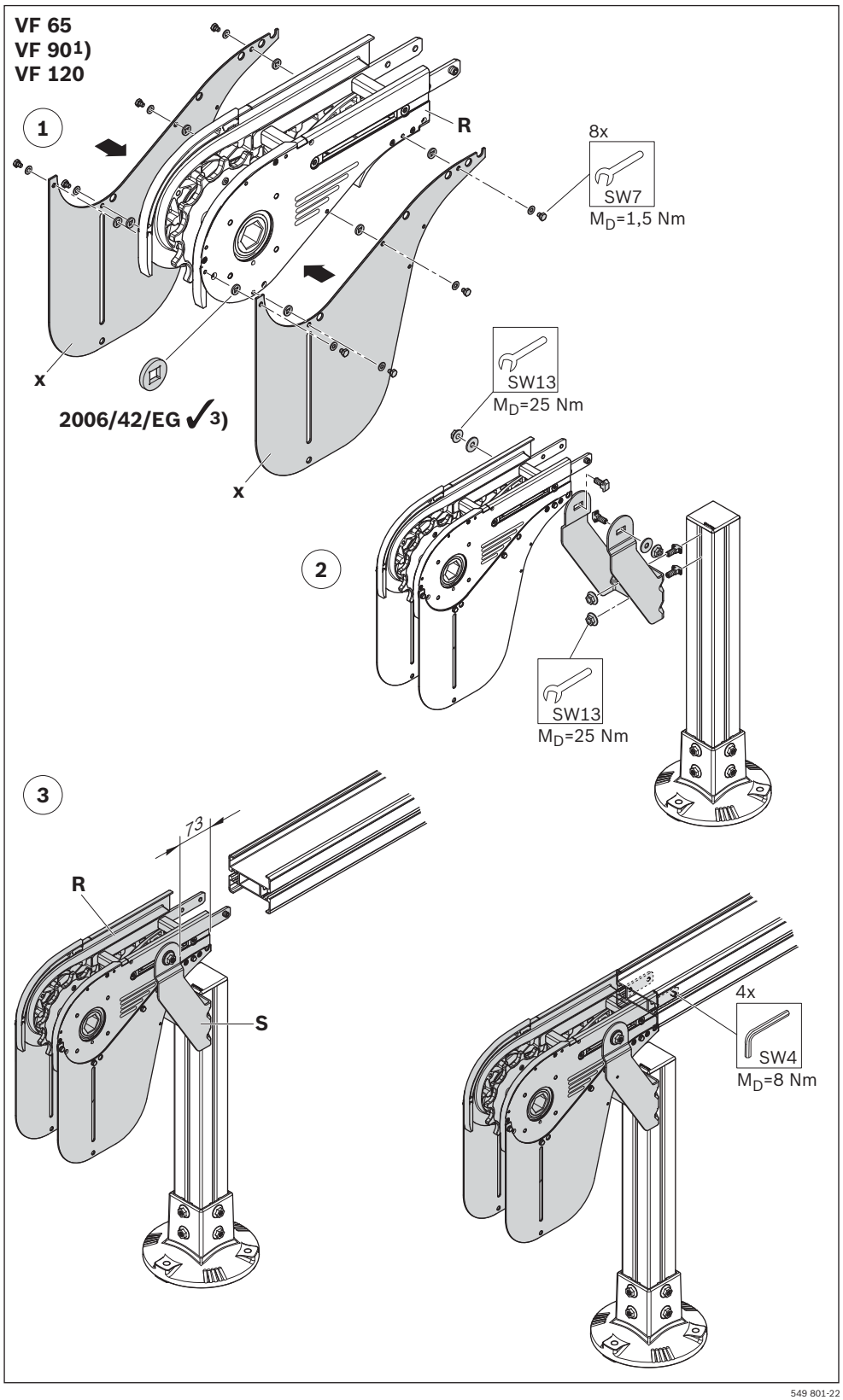


Fig. 17: AL system, installing the basic unit, VF 65/VF 90/VF 120

Required accessories:
- Basic unit (R), protective covers (x) not installed.
- Holder (S)

R, VF 160:	**3842 546 123**
R, VF 240:	**3842 546 124**
R, VF 320:	**3842 546 125**
S, VF 160:	**3842 547 445**
S, VF 240:	**3842 547 446**
S, VF 320:	**3842 547 447**

Please note:
- You can also install the protective covers (x) after closing the conveyor chain.
- Until you have screwed the system onto the floor, secure the leg sets and the VarioFlow*plus* modules to prevent them from being knocked over during assembly.

Continue on page 47, Installing the slide rail.

Installing the gear motor, see pages 65, 66.

[1]) Size shown
[3]) This lock washer meets the requirement of the Machinery Directive 2006/42/EC for captive screws on protective covers (x).

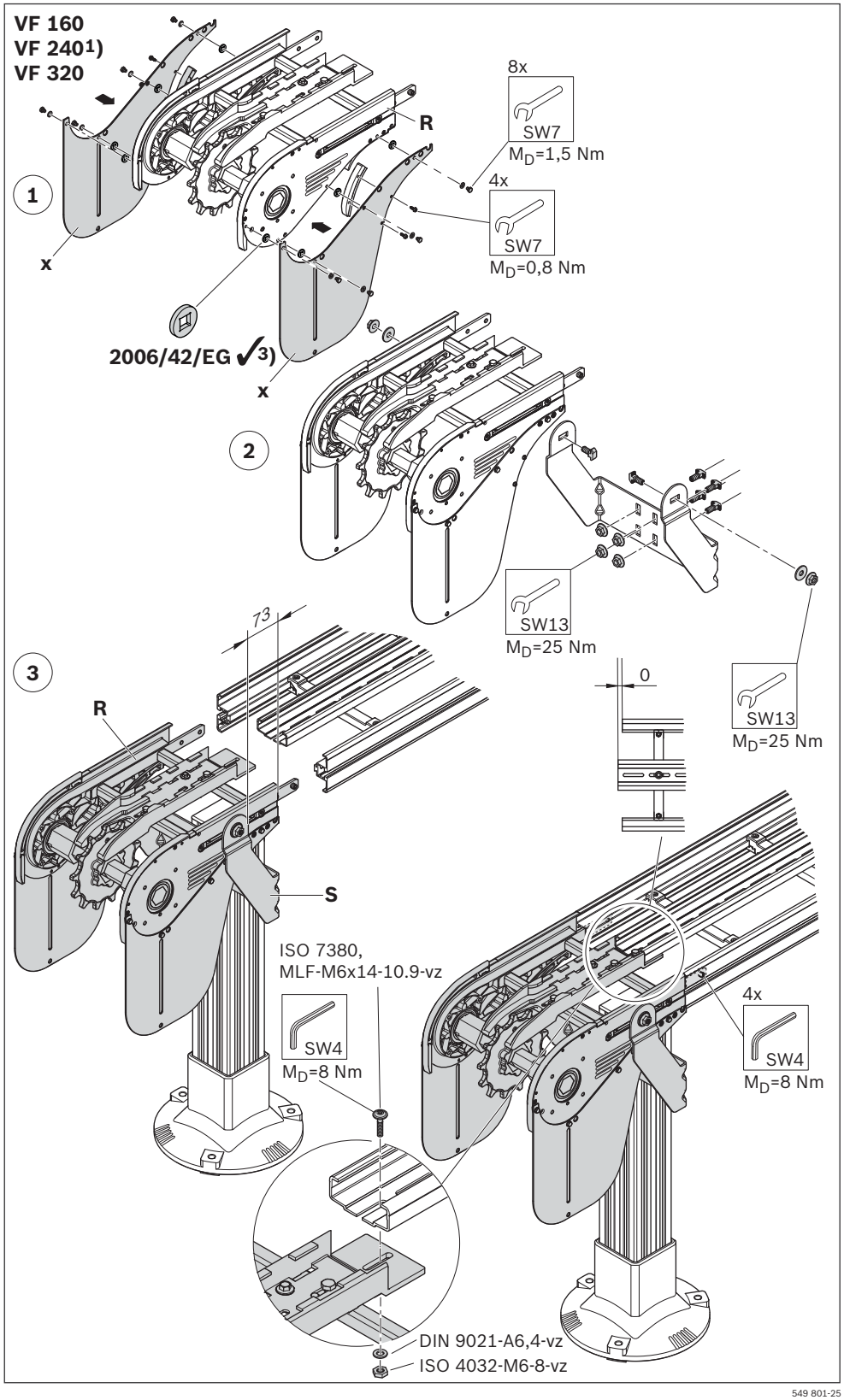


Fig. 18: AL system, installing the basic unit, VF 160/VF 240/VF 320

Required accessories:
- Curve wheel 180° (K)
- Drive kit (T), assembly of the gear motor; see page 68.

K, VF 65:	**3842 547 380**
K, VF 90:	**3842 547 381**
T:	**3842 998 742**

1. Install the curve wheel.
2. Mount the cover (x) on the mounting bracket (y).
3. Screw in the screws (z) so that they are flush on the outside.
4. Install the flange (T) in the right position (see ☞ [3]), the flange can only be installed in the correct position).

Please note:
- Support the curve wheel drive (leg set not in scope of delivery).
- Until you have screwed the system onto the floor, secure the leg sets and the VarioFlow*plus* modules to prevent them from being knocked over during assembly.

☞ Continue on page 32.

[1]) Size shown
[2]) Drilled hole for attaching of the slide rail; see page 47 and the following pages.

AL system, installing the curve wheel drive

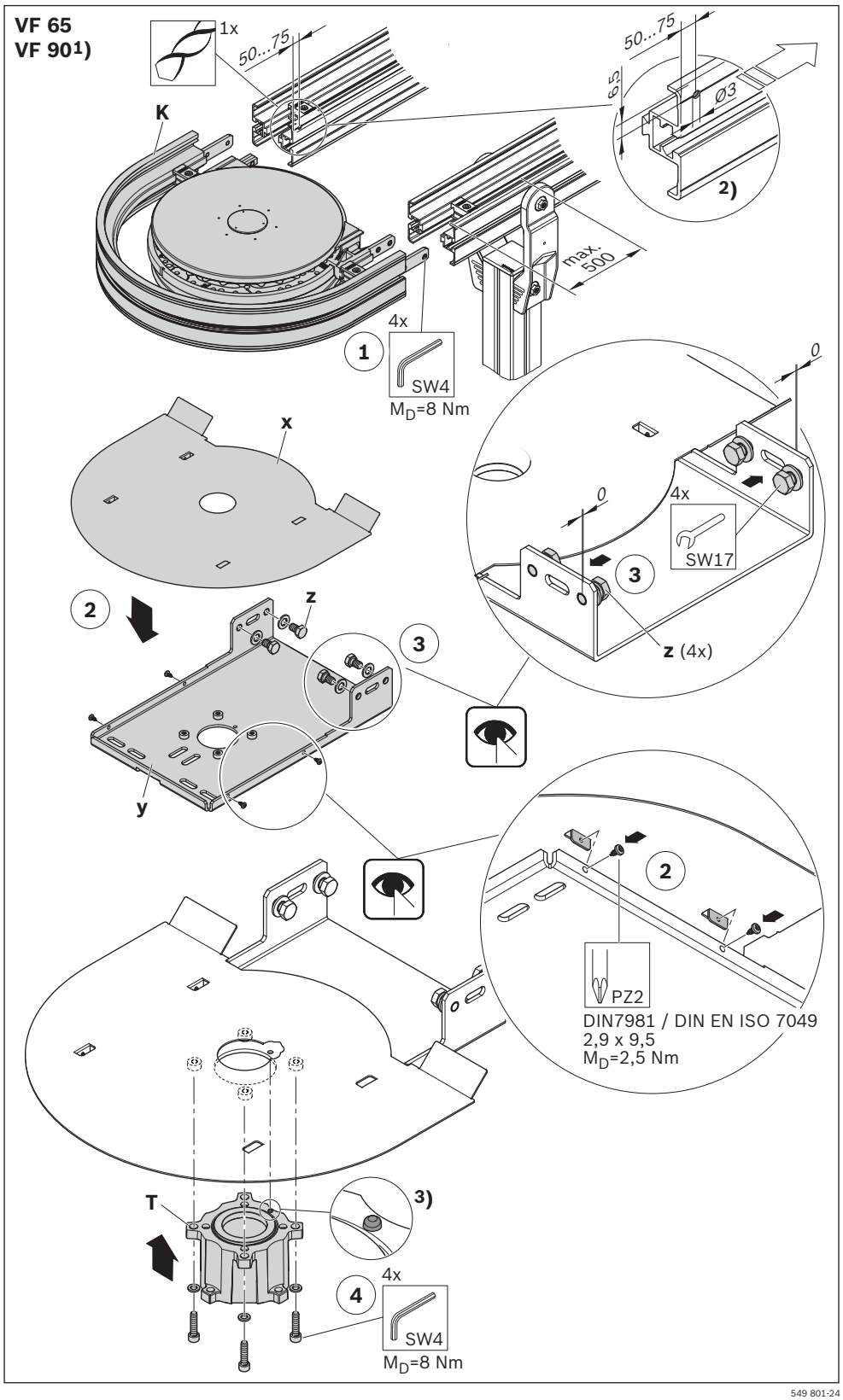


Fig. 19: AL system, installing the curve wheel drive

5. Install the preassembled mounting bracket (y).
6. Mount the support (v).
7. Install the leg set (U, not in scope of delivery).

☞ Continue on page 47, Installing the slide rail.

Installing the gear motor, see page, 68.

[1]) Size shown
[2]) Drilled hole for attaching of the slide rail; see page 47 and the following pages.

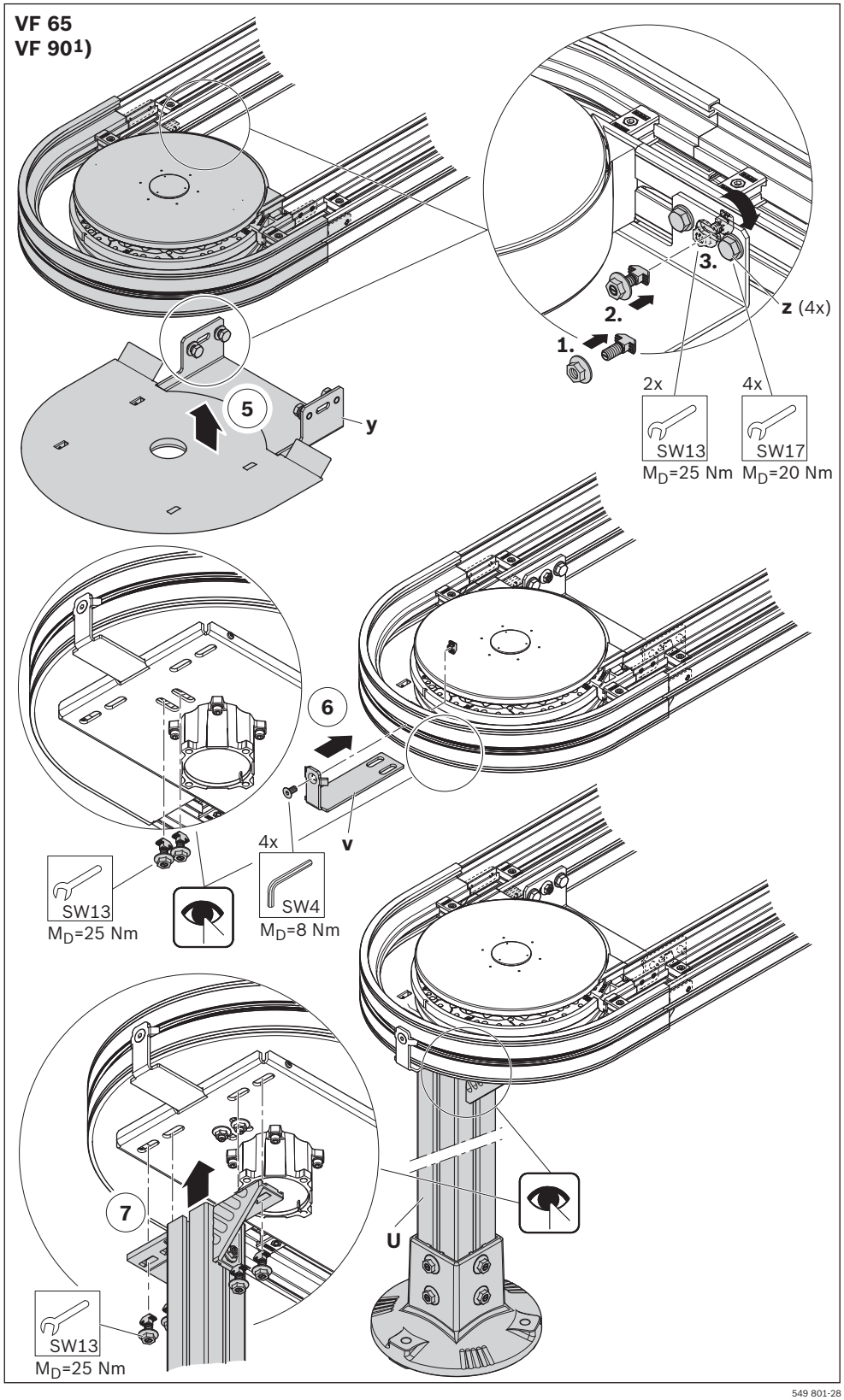


Fig. 20: AL system, installing the curve wheel drive

7.5.2 STS system

Required accessories:
- Foot (A)
- Tube (B)
- Flange (C)
- Holder (H); see page 35

A_1:	**3842 533 307**
A_2:	**3842 533 309**
B:	**3842 993 308/L**
C:	**3842 547 892**

▶ Mount the supports.

Please note:
Until you have screwed the system onto the floor, secure the leg sets and the VarioFlow*plus* modules to prevent them from being knocked over during assembly.

[1]) Size shown

STS system, installing the leg sets

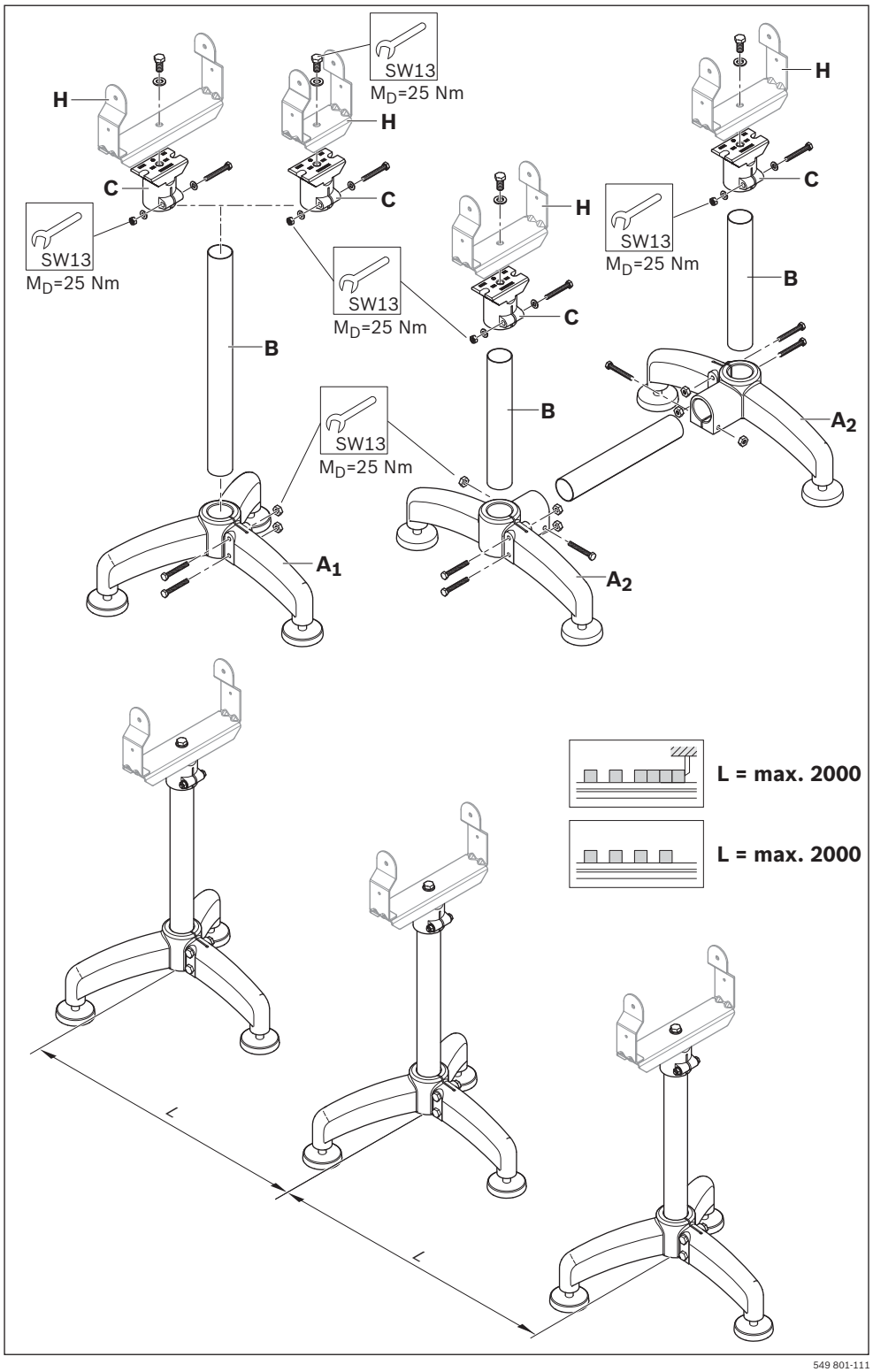


Fig. 21: STS system, installing the leg sets

STS system, pre-install section profiles

Required accessories:
- Section profile (E)
- Cross connector (F)
- Support profile (G, only for VF 160/VF 240/VF 320)
  - Hexagonal screw ISO 4017-M6X12-A2-70 (X, to be provided from user).

E,
3024 mm: **3842 546 649**
3024 mm: **3842 547 905**
L mm: **3842 996 027/L**
F, VF 65: **3842 546 684**
F, VF 90: **3842 546 685**
F, VF 120: **3842 546 686**
F, VF 160: **3842 546 687**
F, VF 240: **3842 546 688**
F, VF 320: **3842 546 689**

▶ Preassemble the open section profiles.

Please note:
- Install the support profile last after the curves, return unit and the drive.
- The support profile (G) protrudes into the curve; see pages 38, 39.
- To attach the slide rail, you have to drill holes in the support profile; for position, see pages 38, 39, 44.

G,
3024 mm: **3842 546 700**
3024 mm: **3842 547 906**
L mm: **3842 996 029/L**

[1]) Size shown

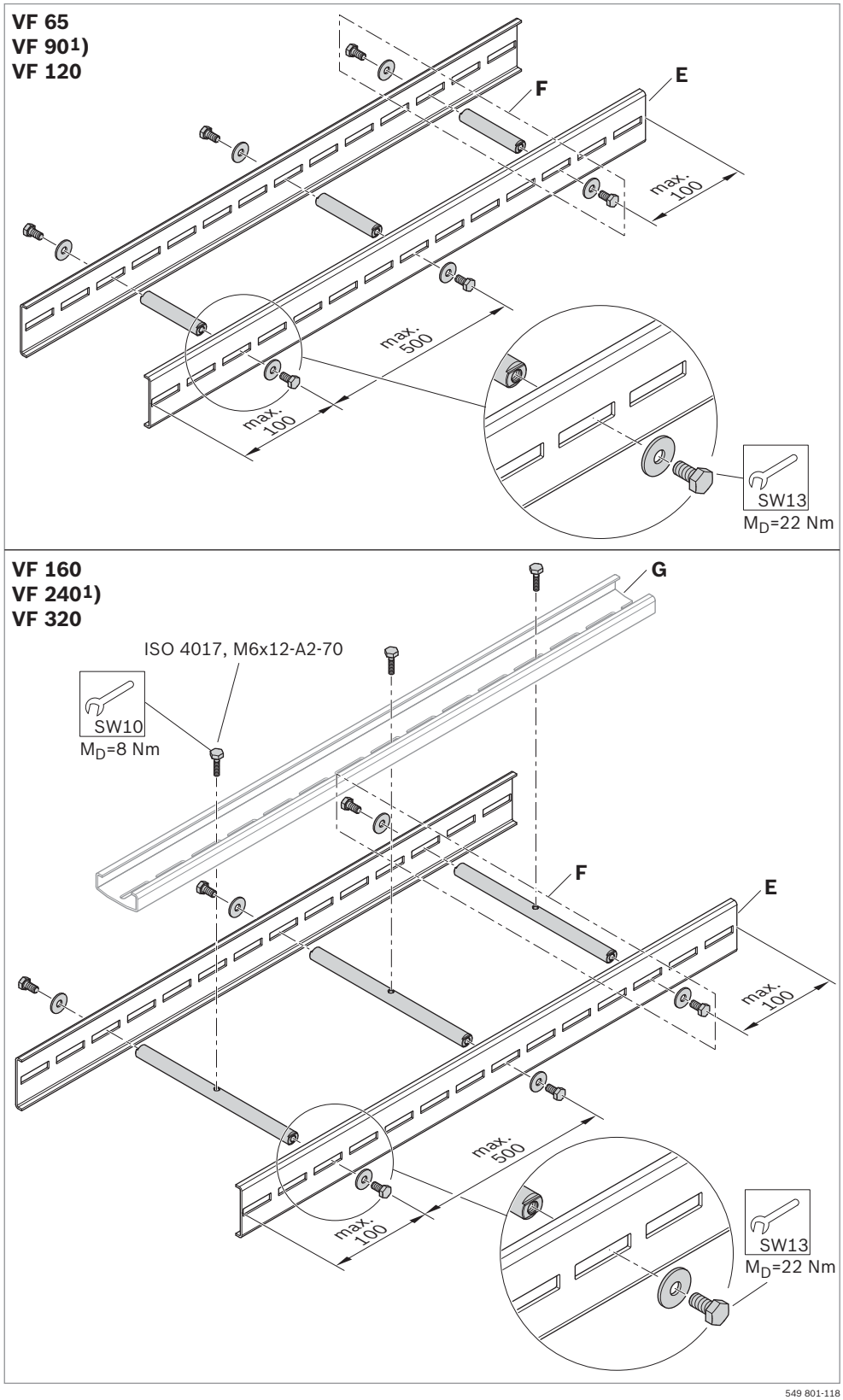


Fig. 22: STS system, pre-install section profiles

STS system, installing the section on the leg sets

- ▶ Install the section profile onto the supports.

H, VF 65: **3842 546 658**
H, VF 90: **3842 546 659**
H, VF 120: **3842 546 660**
H, VF 160: **3842 546 661**
H, VF 240: **3842 546 662**
H, VF 320: **3842 546 663**

Please note:
Until you have screwed the system onto the floor, secure the leg sets and the VarioFlow*plus* modules to prevent them from being knocked over during assembly.

[1]) Size shown

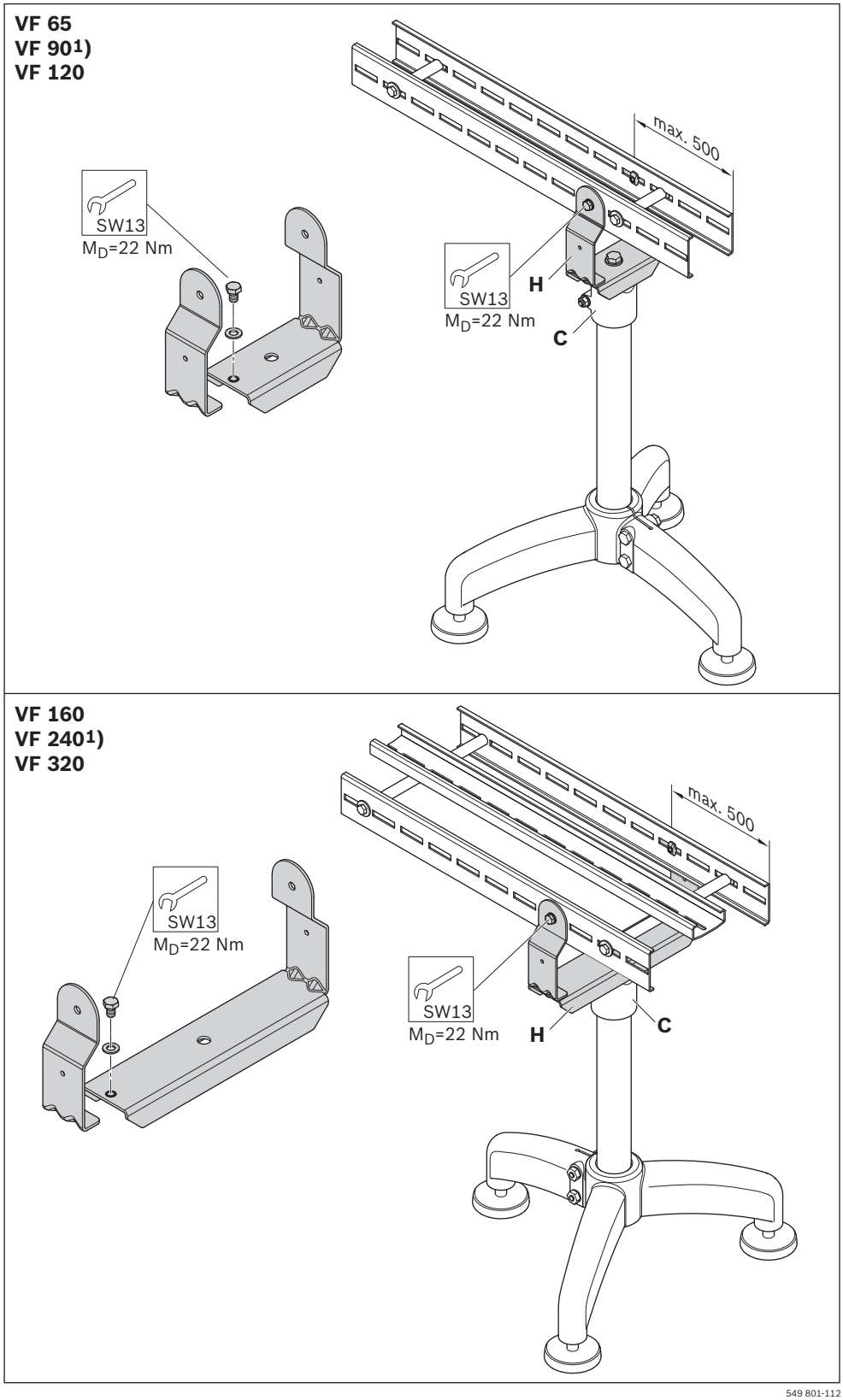


Fig. 23: STS system, installing the section on the leg sets

STS system, installing the section straight

Required accessories:
- Profile connector (J)

J: 3842 547 895

[1]) Size shown

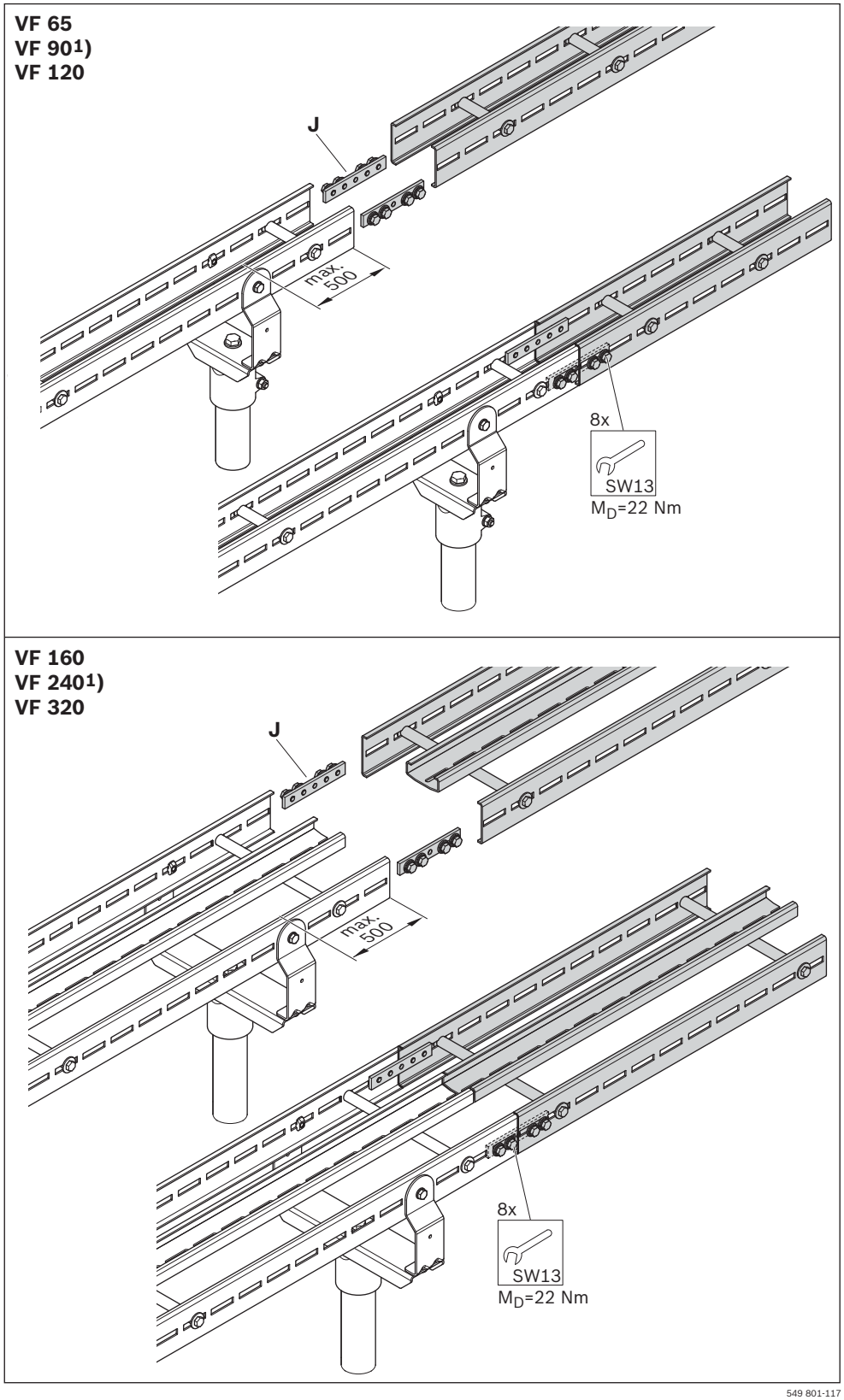


Fig. 24: STS system, installing the section straight

Required accessories:

- Curve wheel (K)

K, VF 65,

30°: **3842 547 111**
45°: **3842 547 112**
90°: **3842 547 113**
180°: **3842 547 114**

K, VF 90,

30°: **3842 547 115**
45°: **3842 547 116**
90°: **3842 547 117**
180°: **3842 547 118**

K, VF 120,

30°: **3842 547 119**
45°: **3842 547 120**
90°: **3842 547 121**
180°: **3842 547 122**

[1]) Size shown
[2]) Drilled hole for attaching of the slide rail; see page 47 and the following pages.

STS system, installing the curve wheel

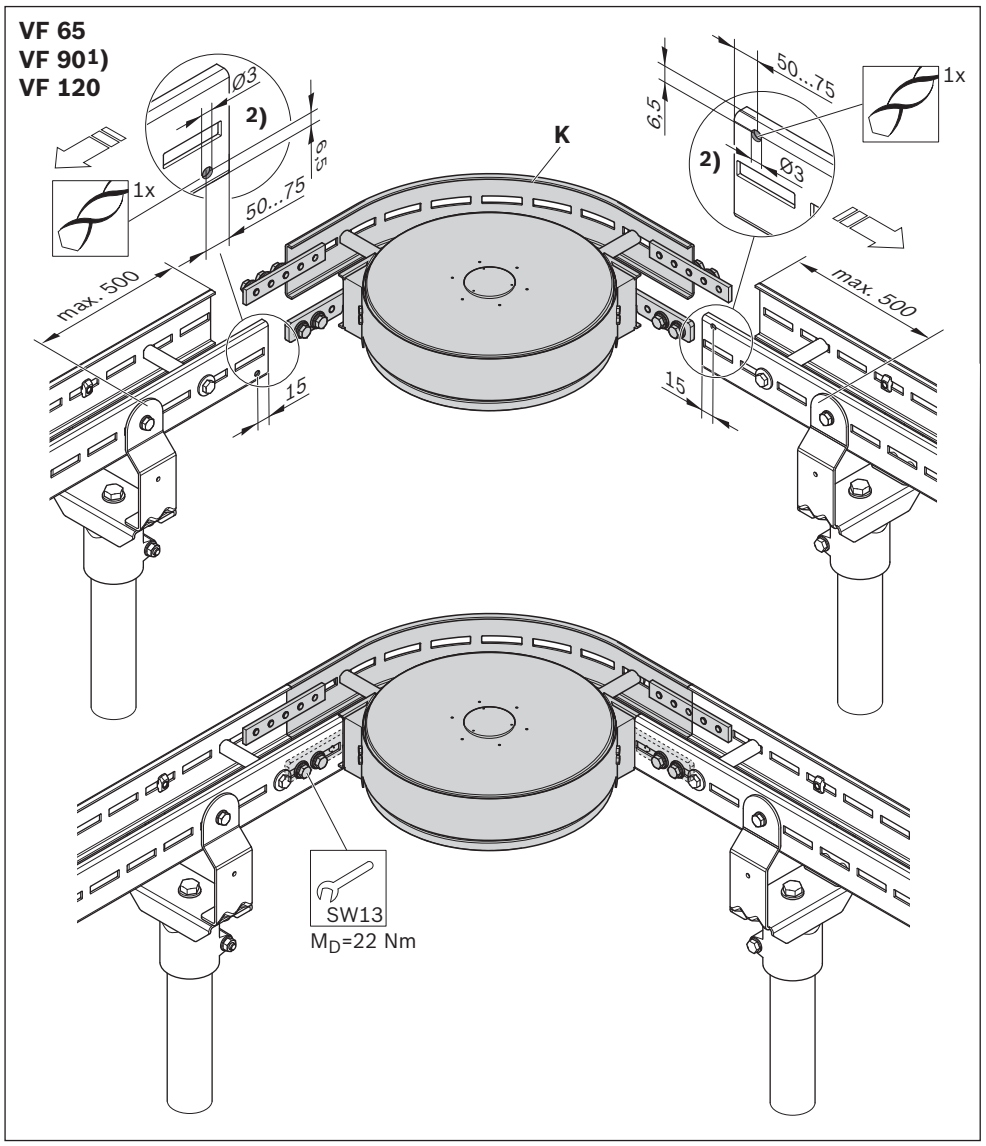


Fig. 25: STS system, installing the curve wheel

Required accessories:

- Horizontal roller curve (N)

N, VF 160,
30°: **3842 547 123**
45°: **3842 547 124**
90°: **3842 547 125**
180°: **3842 547 126**

N, VF 240,
30°: **3842 547 127**
45°: **3842 547 128**
90°: **3842 547 129**
180°: **3842 547 130**

N, VF 320,
30°: **3842 547 131**
45°: **3842 547 132**
90°: **3842 547 133**
180°: **3842 547 134**

Please note:
The chain guide must not touch the roller, ☞ [3])

[1]) Size shown
[2]) Drilled hole for attaching of the slide rail; see page 47 and the following pages.

STS system, installing the horizontal roller curve

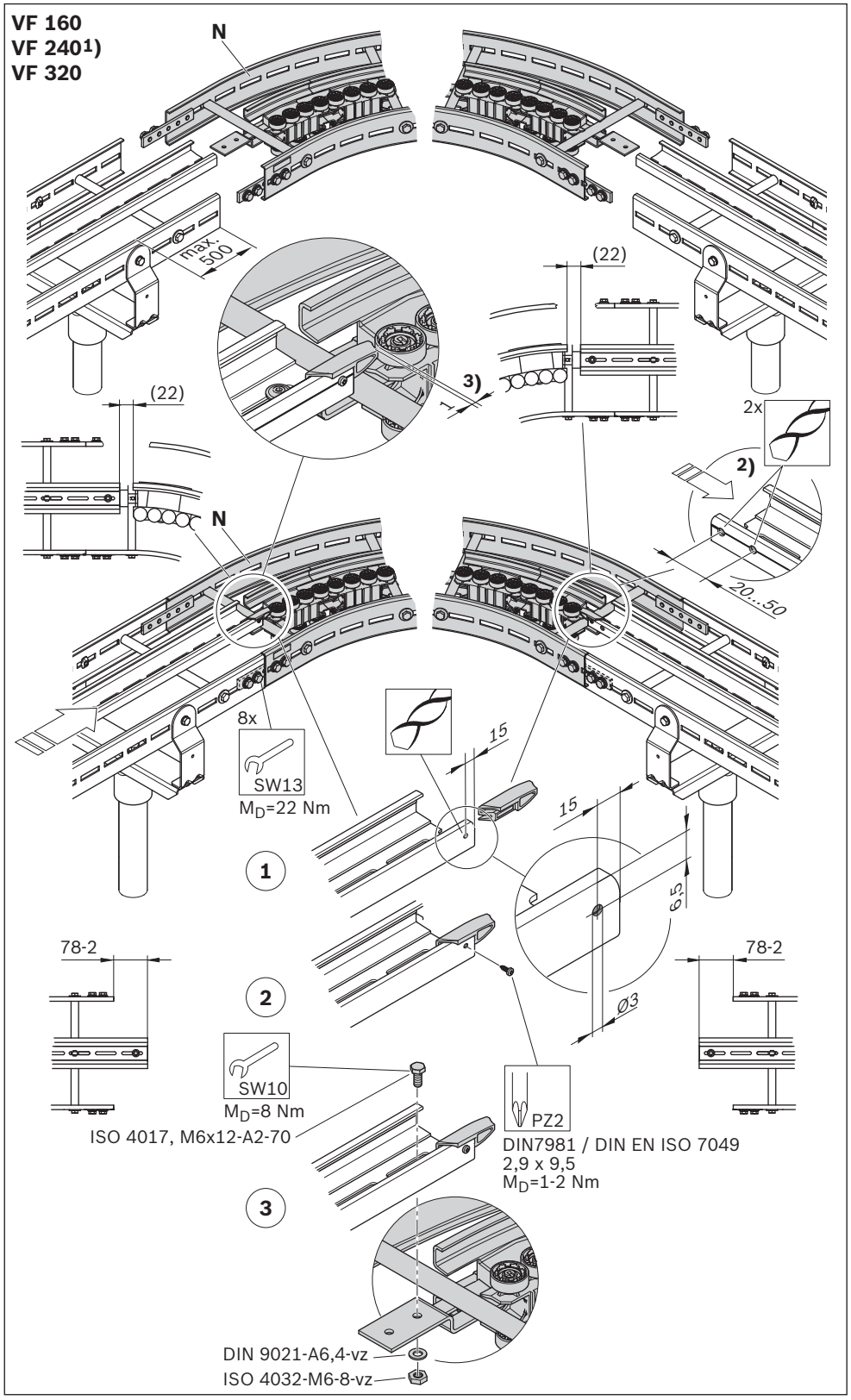


Fig. 26: STS system, installing the horizontal roller curve

Required accessories:

- Vertical sliding curve (O)

O, VF 65,
5°, R500: **3842 547 135**
15°, R500: **3842 547 136**
30°, R500: **3842 547 137**
45°, R500: **3842 547 138**

O, VF 90,
5°, R500: **3842 547 139**
15°, R500: **3842 547 140**
30°, R500: **3842 547 141**
45°, R500: **3842 547 142**

O, VF 120,
5°, R500: **3842 547 143**
15°, R500: **3842 547 144**
30°, R500: **3842 547 145**
45°, R500: **3842 547 146**

Please note:
The friction occurring at the sliding curves increases the required chain tensile force. For this reason, always use the PE-UHMW slide rail for sliding curves in the entire system.
Installing the slide rail; see page 47 and the following pages

[1]) Size shown

STS system, installing the vertical sliding curve, VF 65/VF 90/VF 120

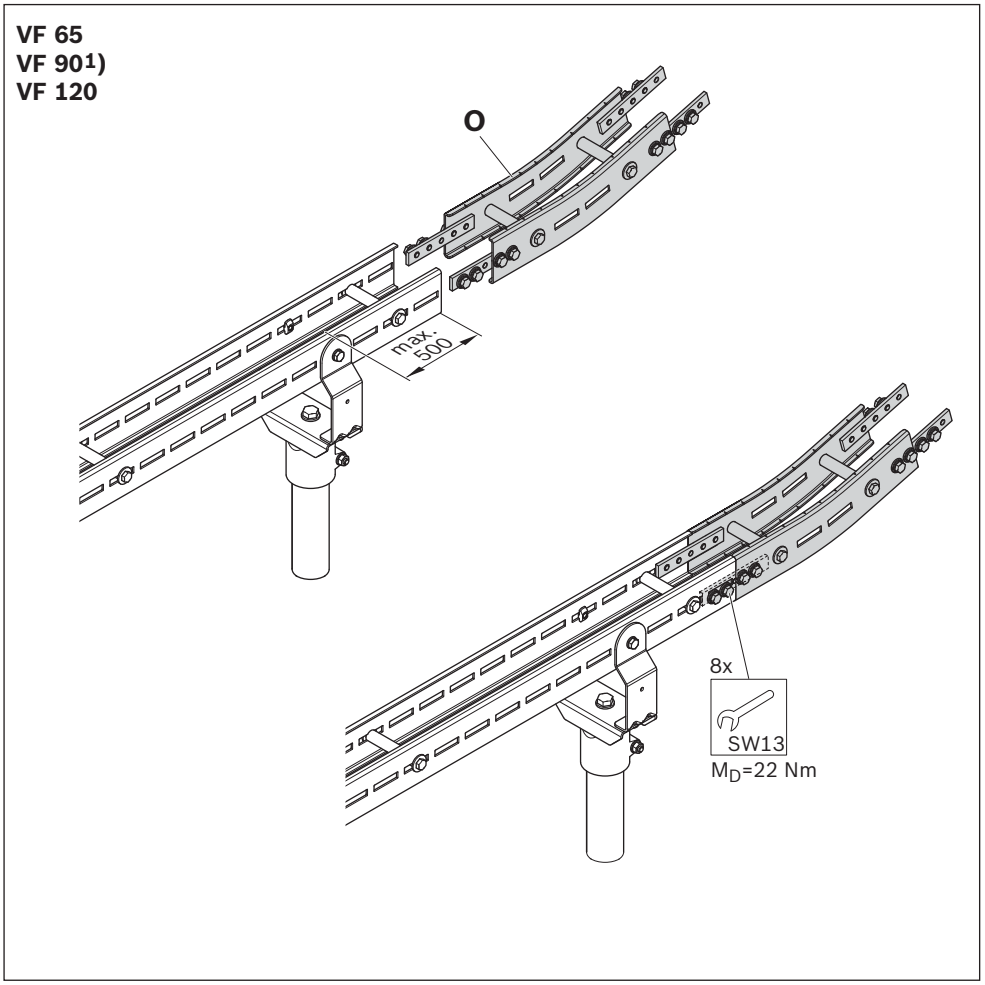


Fig. 27: STS system, installing the vertical sliding curve, VF 65/VF 90/VF 120

Required accessories:
- Vertical sliding curve (O)
- Slide rail, PE-UHMW

3842 546 116

O, VF 160,
5°, R500: **3842 547 147**
15°, R500: **3842 547 148**
30°, R500: **3842 547 149**
45°, R500: **3842 547 150**

O, VF 240,
5°, R500: **3842 547 151**
15°, R500: **3842 547 152**
30°, R500: **3842 547 153**

O, VF 320,
5°, R500: **3842 547 154**
15°, R500: **3842 547 155**
30°, R500: **3842 547 156**

1. Mount the chain guide.
2. Push on the slide rail (if need be, deburr sharp edges beforehand)
3. Mount the chain guide.

[1]) Size shown
[2]) Direction of running of the return chain on the bottom of the profile

STS system, installing the vertical sliding curve, VF 160/VF 240/VF 320

First mount the slide rail and entries for the chain return [2]) on the bottom of the curve.

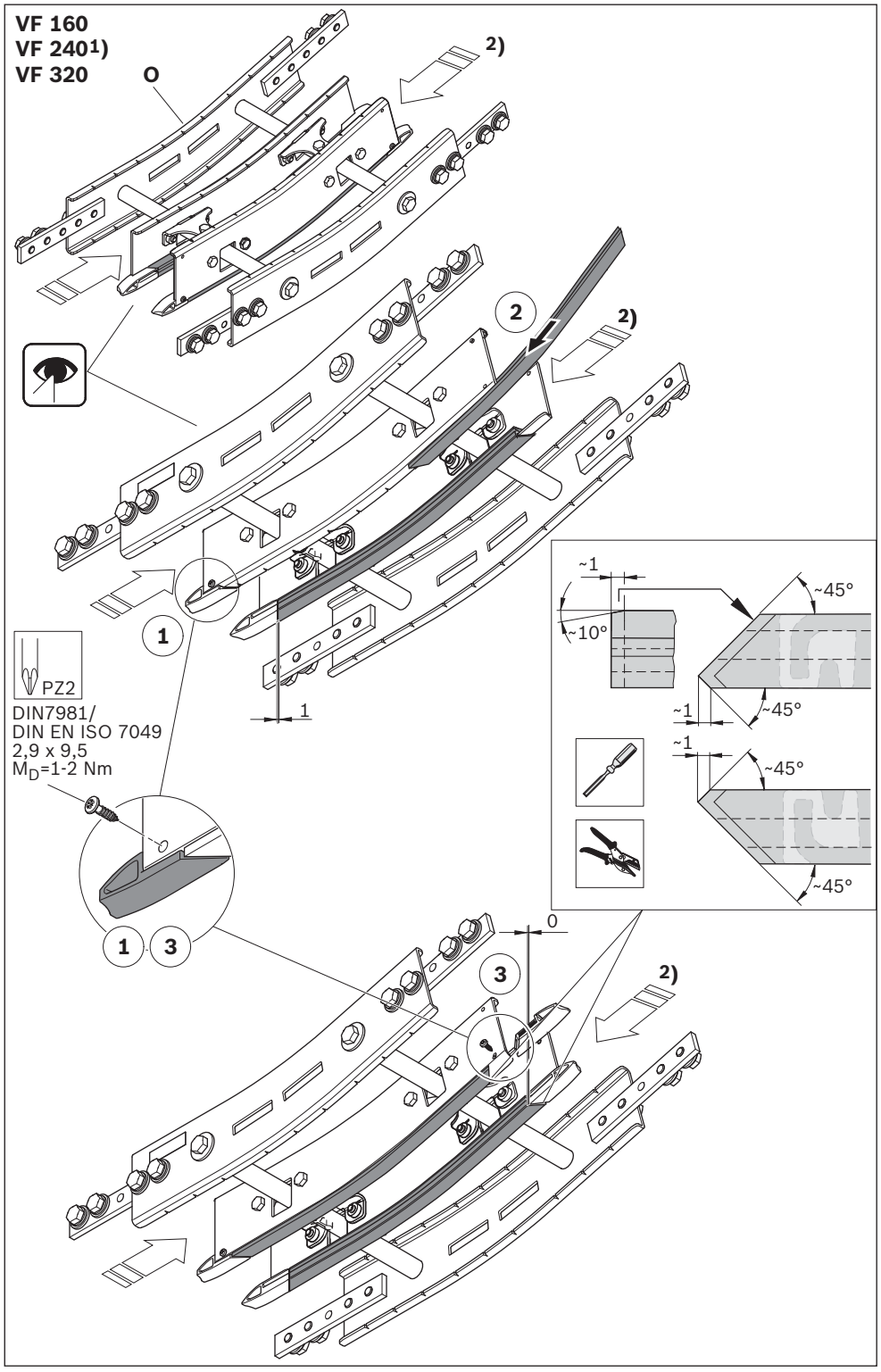


Fig. 28: STS system, vertical sliding curve, upwards: Installing the slide rail for the chain return

1. Mount the chain guide.
2. Push on the slide rail (if need be, deburr sharp edges beforehand)
3. Mount the chain guide.

[1]) Size shown
[2]) Direction of running of the return chain on the bottom of the profile

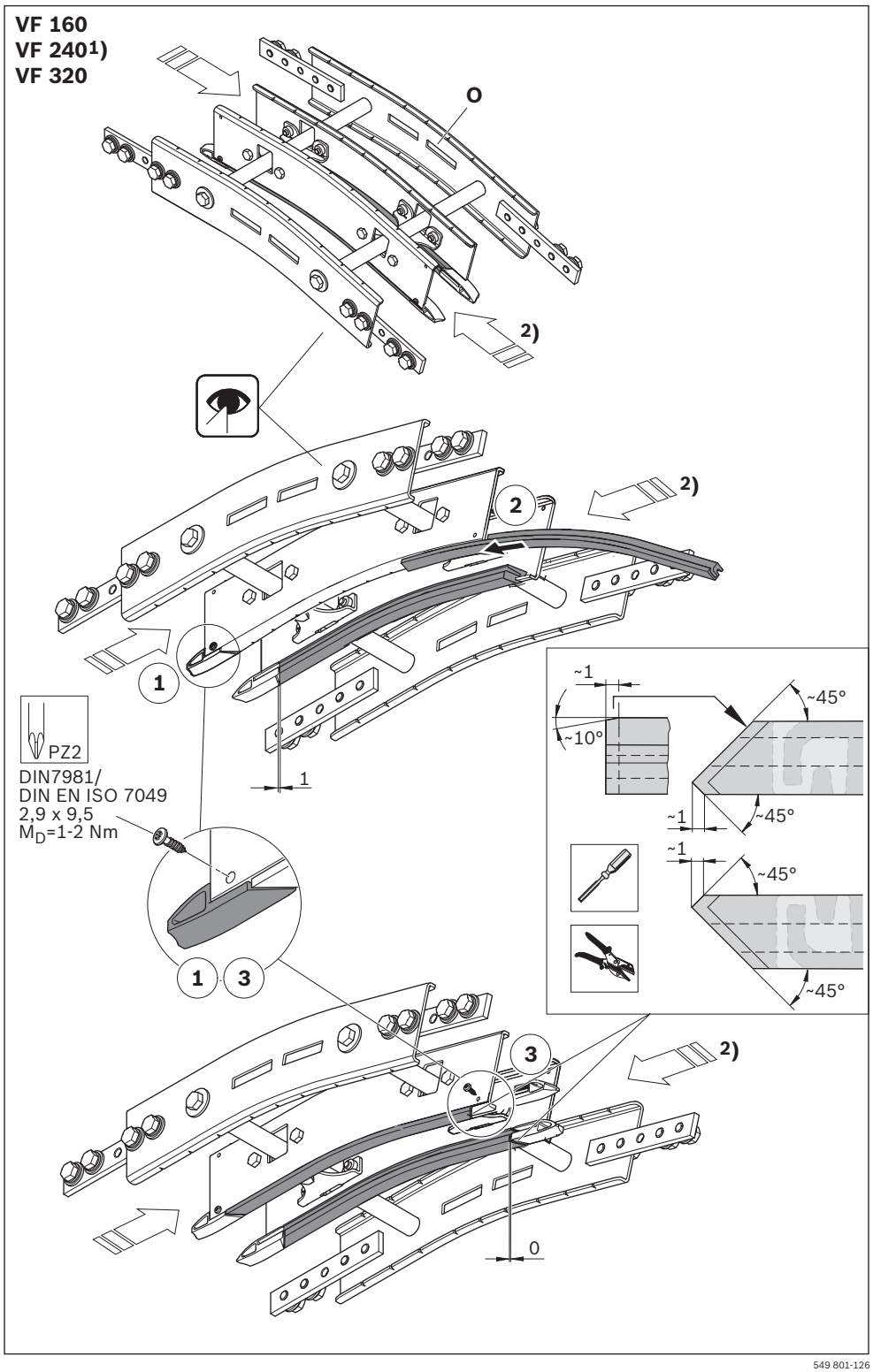


Fig. 29: STS system, vertical sliding curve, downwards: Installing the slide rail for the chain return

Please note:
The friction occurring at the sliding curves increases the required chain tensile force. For this reason, always use the PE-UHMW slide rail for sliding curves in the entire system.
Installing the slide rail; see page 47 and the following pages

[1]) Size shown

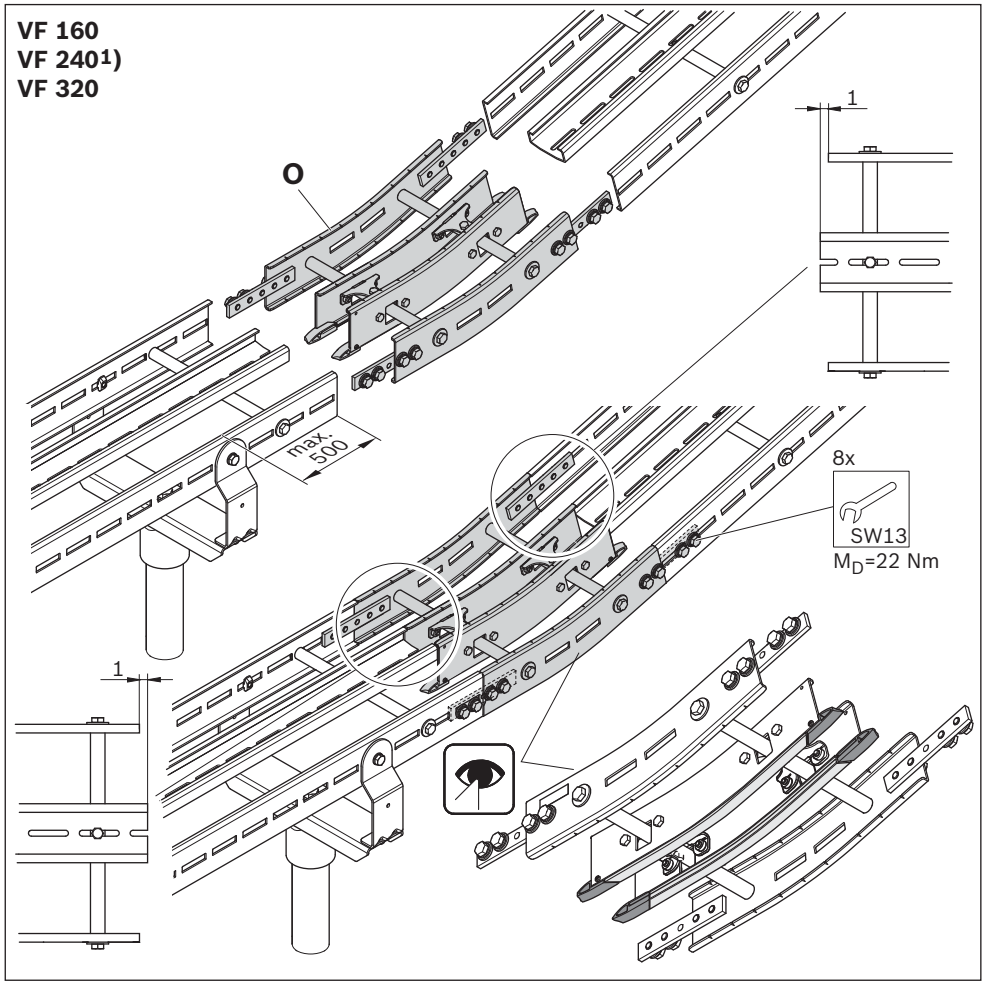


Fig. 30: STS system, installing the vertical sliding curve, VF 160/VF 240/VF 320

Required accessories

- Assembly module (P)

P: **3842 547 900**

Please note:

- Install the assembly module at an easily accessible location for later operation. That makes the installation, inspection and the replacement of the conveyor chain easier.
- The drill holes for attachment of the slide rail (see ☞ [2])) must be at the front in the transport direction.

[1]) Size shown

STS system, installing the assembly module

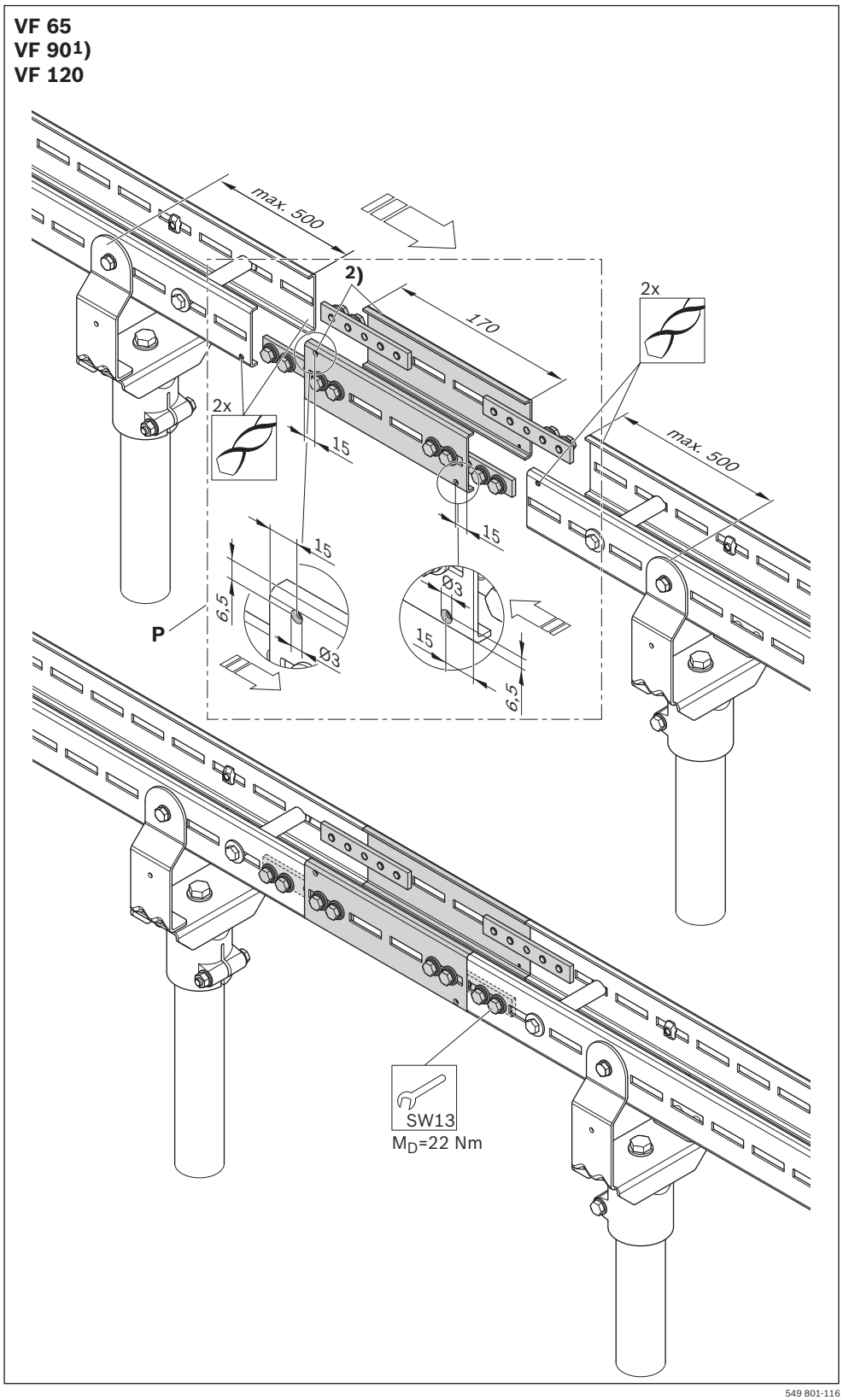


Fig. 31: STS system, installing the assembly module

Required accessories:
- Return unit (Q)

Q, VF 65:	**3842 547 528**
Q, VF 90:	**3842 547 529**
Q, VF 120:	**3842 547 530**
Q, VF 160:	**3842 547 531**
Q, VF 240:	**3842 547 532**
Q, VF 320:	**3842 547 533**

Please note:
Until you have screwed the system onto the floor, secure the leg sets and the VarioFlow*plus* modules to prevent them from being knocked over during assembly.

[1]) Size shown
[2]) Drilled hole for attaching of the slide rail; see page 47 and the following pages.

STS system, installing the return unit

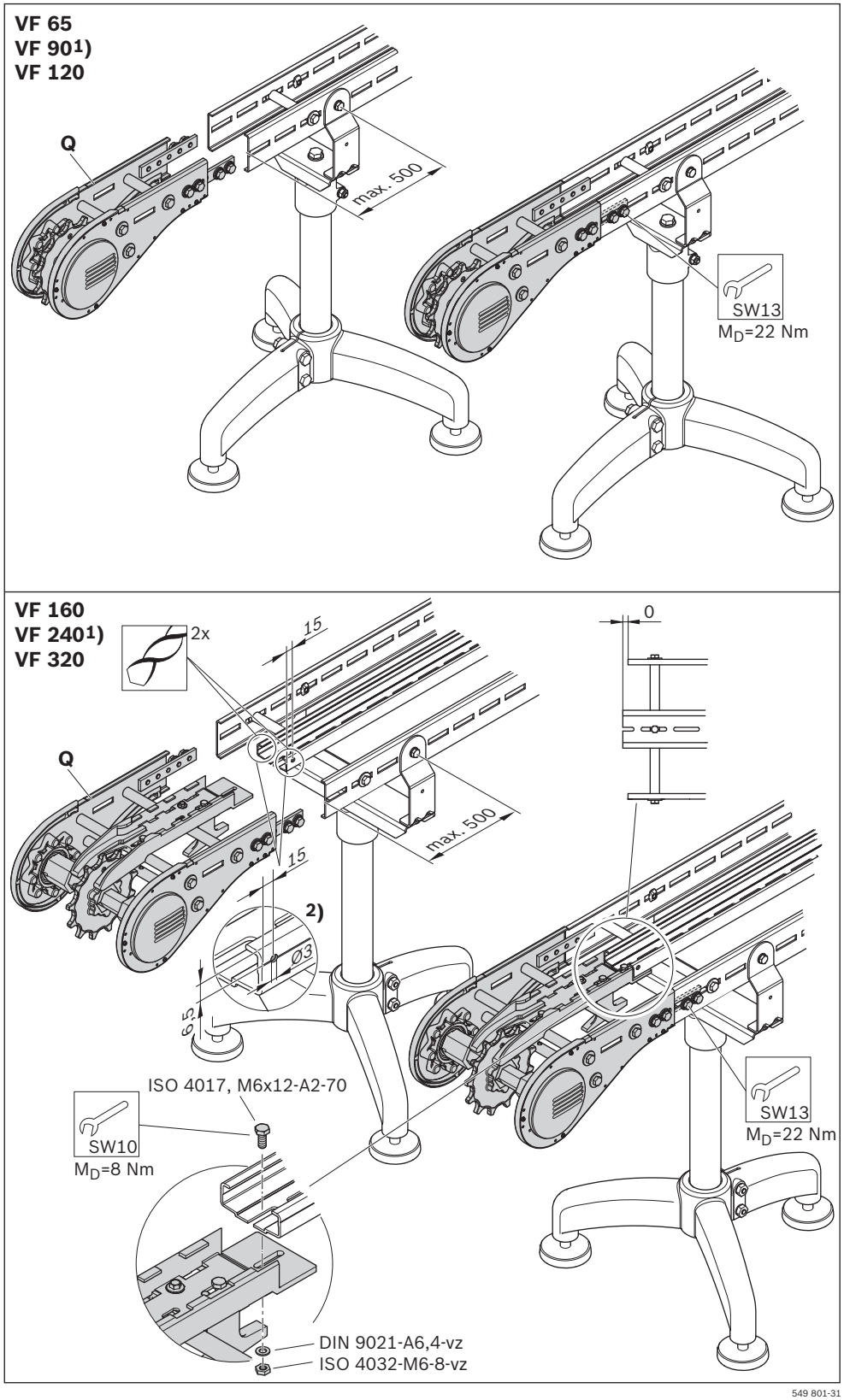


Fig. 32: STS system, installing the return unit

Required accessories:
- Basic unit (R), protective covers (x) not installed.

R, VF 65:	**3842 547 522**
R, VF 90:	**3842 547 523**
R, VF 120:	**3842 547 524**
R, VF 160:	**3842 547 525**
R, VF 240:	**3842 547 526**
R, VF 320:	**3842 547 527**

Please note:
- You can also install the protective covers (x) after closing the conveyor chain.
- Until you have screwed the system onto the floor, secure the leg sets and the VarioFlow*plus* modules to prevent them from being knocked over during assembly.

Continue on page 47, Installing the slide rail.

Installing the gear motor, see pages 65, 66.

[1]) Size shown
[3]) This lock washer meets the requirement of the Machinery Directive 2006/42/EC for captive screws on protective covers (x).

STS system, installing the basic unit

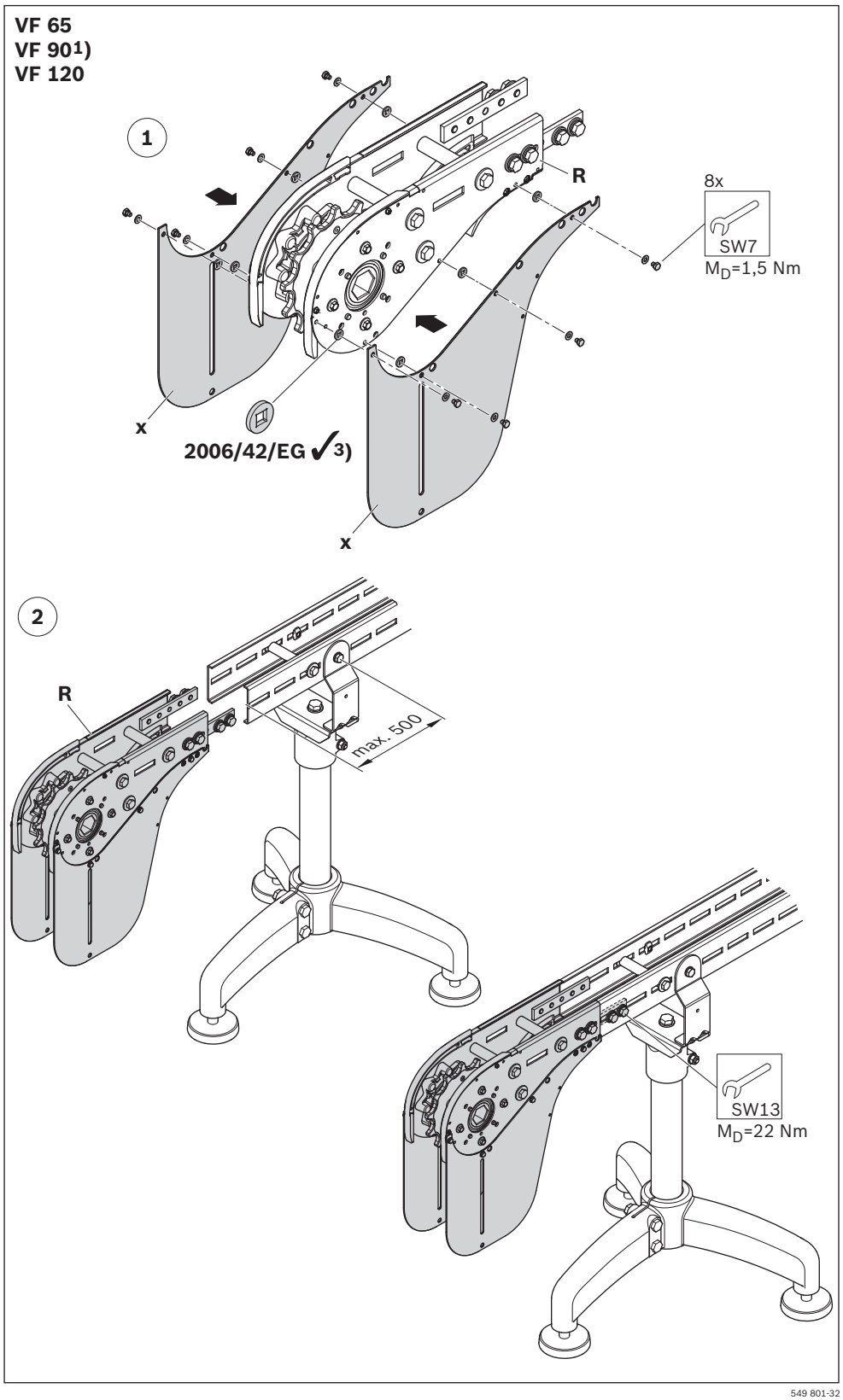


Fig. 33: STS system, installing the basic unit, VF 65/VF 90/VF 120

Required accessories:
- Basic unit (R), protective covers (x) not installed.

R, VF 65:	**3842 547 522**
R, VF 90:	**3842 547 523**
R, VF 120:	**3842 547 524**
R, VF 160:	**3842 547 525**
R, VF 240:	**3842 547 526**
R, VF 320:	**3842 547 527**

Please note:
- You can also install the protective covers (x) after closing the conveyor chain.
- Until you have screwed the system onto the floor, secure the leg sets and the VarioFlow*plus* modules to prevent them from being knocked over during assembly.

Continue on page 47, Installing the slide rail.

Installing the gear motor, see pages 65, 66.

[1]) Size shown
[3]) This lock washer meets the requirement of the Machinery Directive 2006/42/EC for captive screws on protective covers (x).

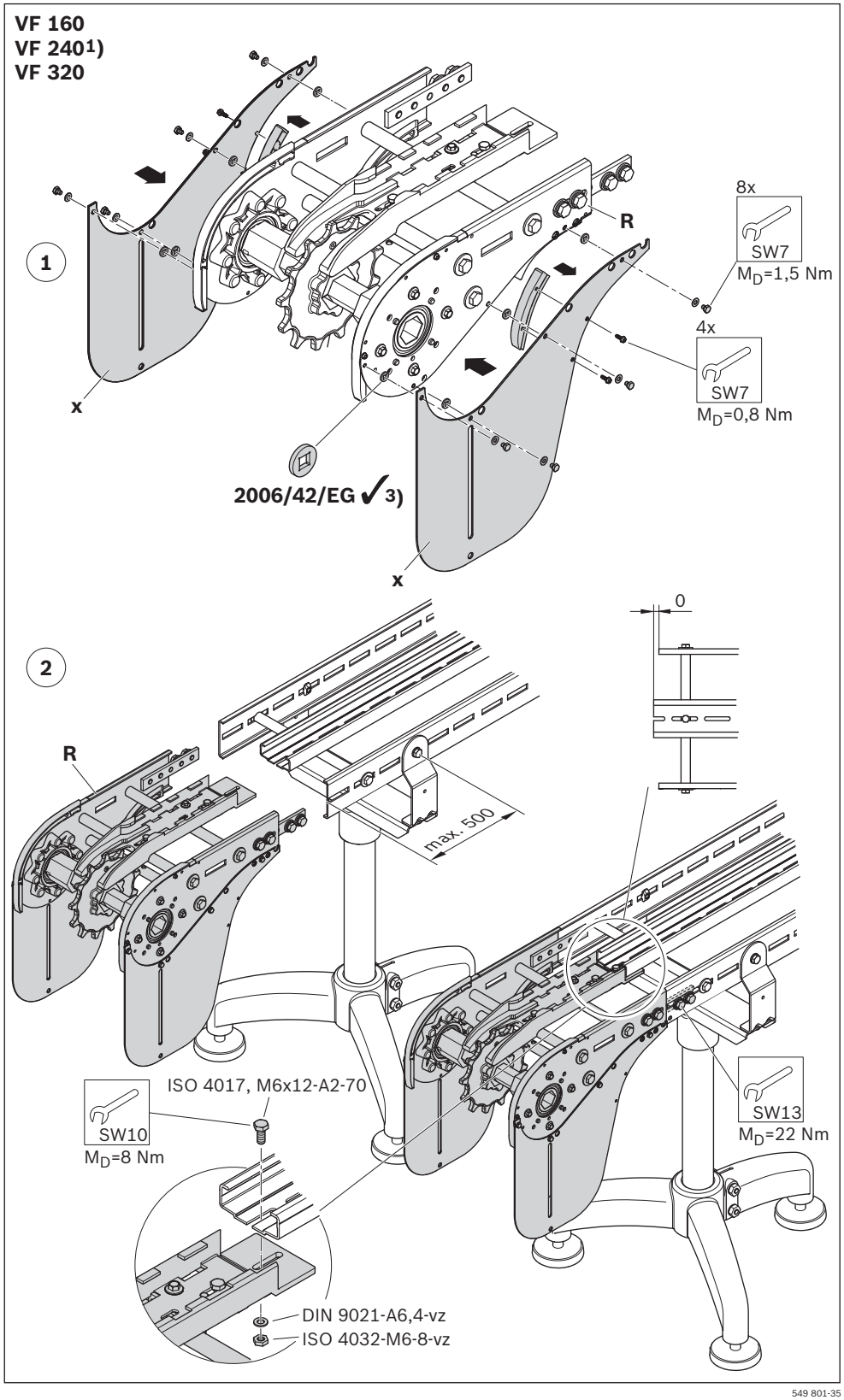


Fig. 34: STS system, installing the basic unit, VF 160/VF 240/VF 320

7.5.3 Slide rail

Please note:

- If possible, install the slide rail without interruptions in a single piece[1])[2]) over all assemblies.

[1]) The length depends on the temperature fluctuations of the range of application:
≤ 5°C: max. 15 m
> 5°C: max. 10 m

[2]) If an interruption is necessary, **never** interrupt at the assembly interface but rather always overlap the interface by at least 150 mm.

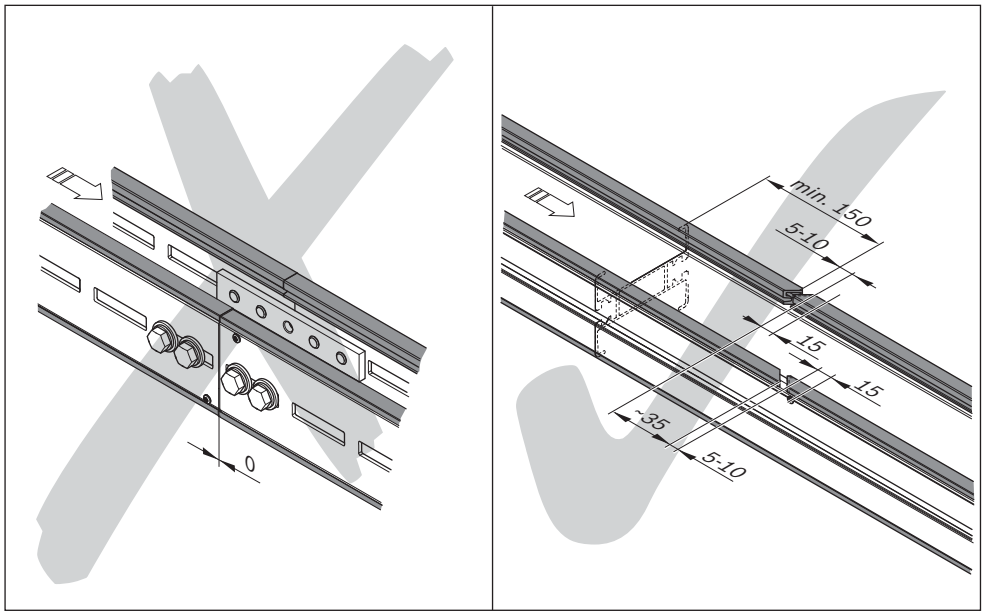


Fig. 35: Interface Slide rail

- Always install the slide rail in the direction the chain moves.
  – For the transport side, start at the return unit.
  – For the chain return, start at the bottom of the basic unit.
  "Start of the chain" = zero gap
- Attach every start of the slide rail.
  Transport side:
  – after the return unit (sections and support profile)
  – after a curve wheel (inner side of the section profile)
  – after a roller curve (inner side of the support profile)
  Chain return:
  – after the basic unit
  – after a curve wheel (inner side of the section profile)

Installing the slide rail (section profile)

Required accessories

- Slide rail (A), PE-UHMW/HDPE
- Assembly tool for slide rail (B)
- Screw (C) for attaching the slide rail.

A,	
PE-UHMW:	**3842 546 116**
HDPE:	**3842 547 909**
B:	**3842 547 463**
C, AL:	**3842 547 908**
STS:	**3842 533 915**

1. Cut the start of the slide rail to the right size.
2. Press the start of the slide rail onto the section profile.
3. Apply the assembly tool and slide the section profile along it and you will shape the slide rail to the section profile.
4. Secure the start of the slide rail by screwing it on (AL: countersunk screw, STS: oval-head screw).

[1]) Size shown

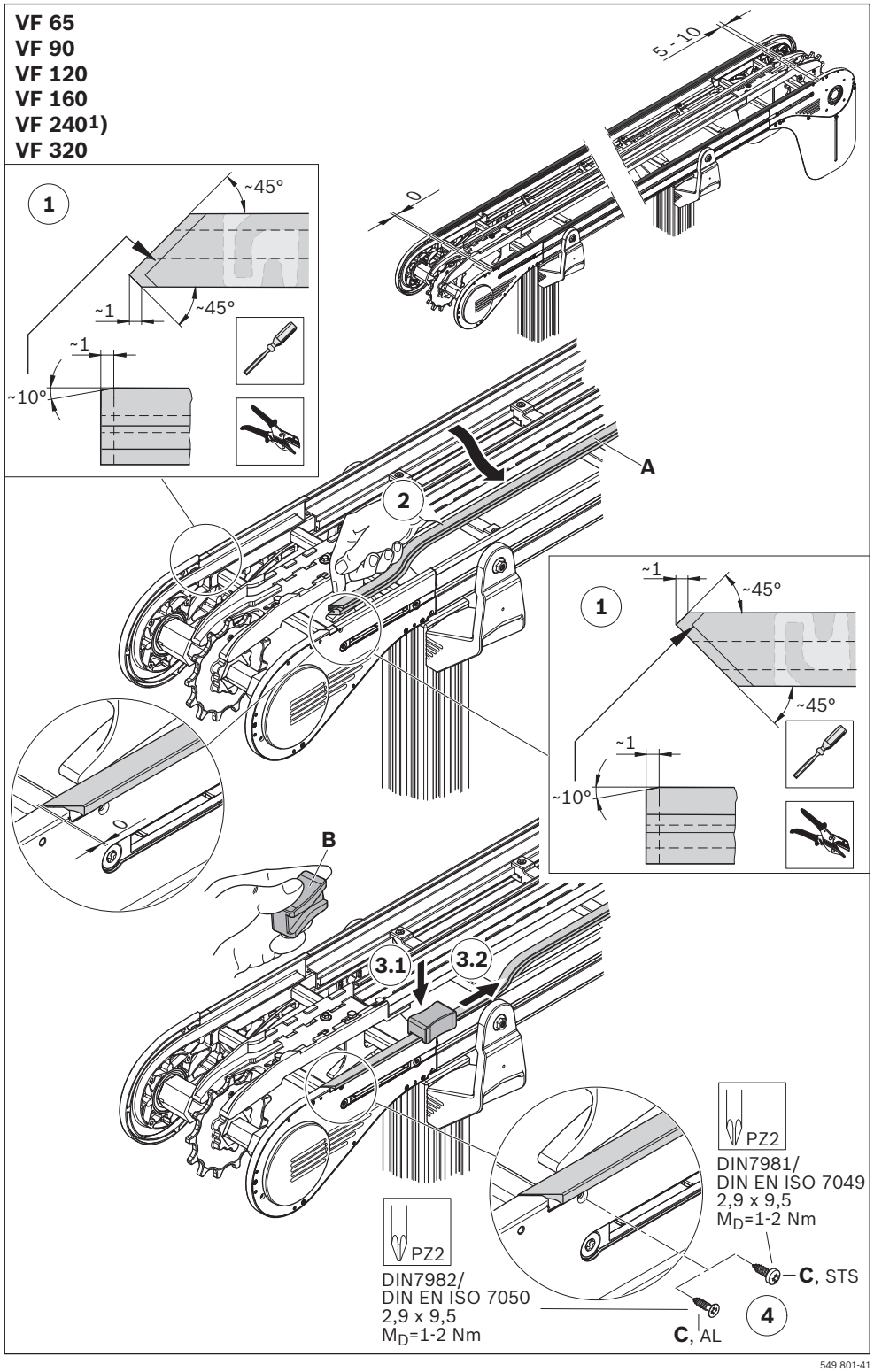


Fig. 36: Installing the slide rail (section profile)

Installing the slide rail (section profile, chain return)

1. Cut the start of the slide rail to the right size.
2. Press the start of the slide rail onto the section profile.
3. Apply the assembly tool and slide the section profile along it and you will shape the slide rail to the section profile.
4. Secure the start of the slide rail by screwing it on (AL: countersunk screw, STS: oval-head screw).

[1]) Size shown

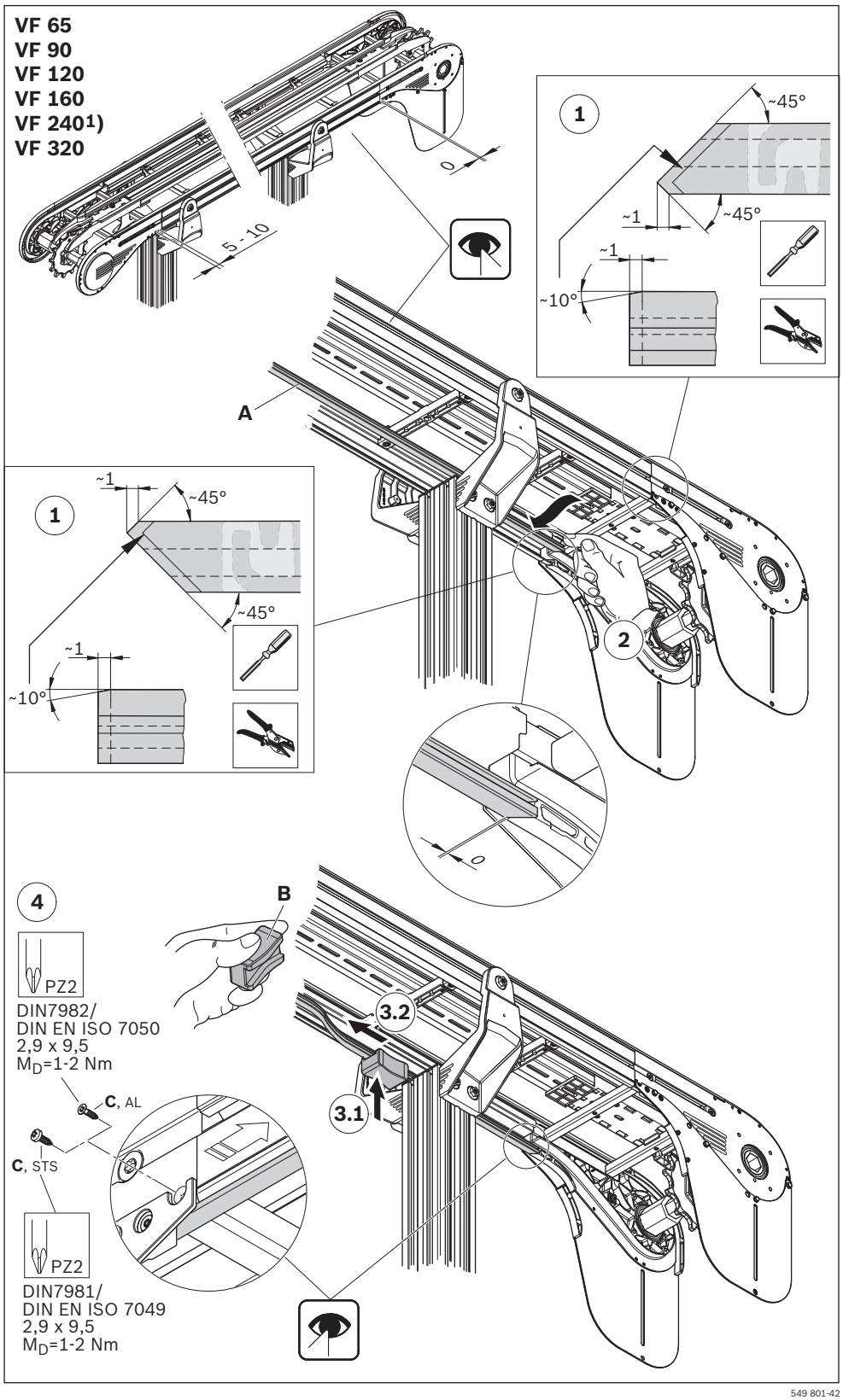


Fig. 37: Installing the slide rail (section profile, chain return)

Installing the slide rail (support profile), only for VF 160/VF 240/VF 320

Required accessories

- Slide rail, PE-UHMW/ HDPE (A)
- Assembly tool for slide rail (B)
- Screw (C) for attaching the slide rail.

A,	
PE-UHMW:	**3842 546 116**
HDPE:	**3842 547 909**
B:	**3842 547 463**
C, STS:	**3842 533 915**

1. Cut the start of the slide rail to the right size.
2. Press the start of the slide rail onto the section profile.
3. Apply the assembly tool and slide the section profile along it and you will shape the slide rail to the section profile.
4. Secure the start of the slide rail by screwing it on (AL/STS: oval-head screw).

[1]) Size shown

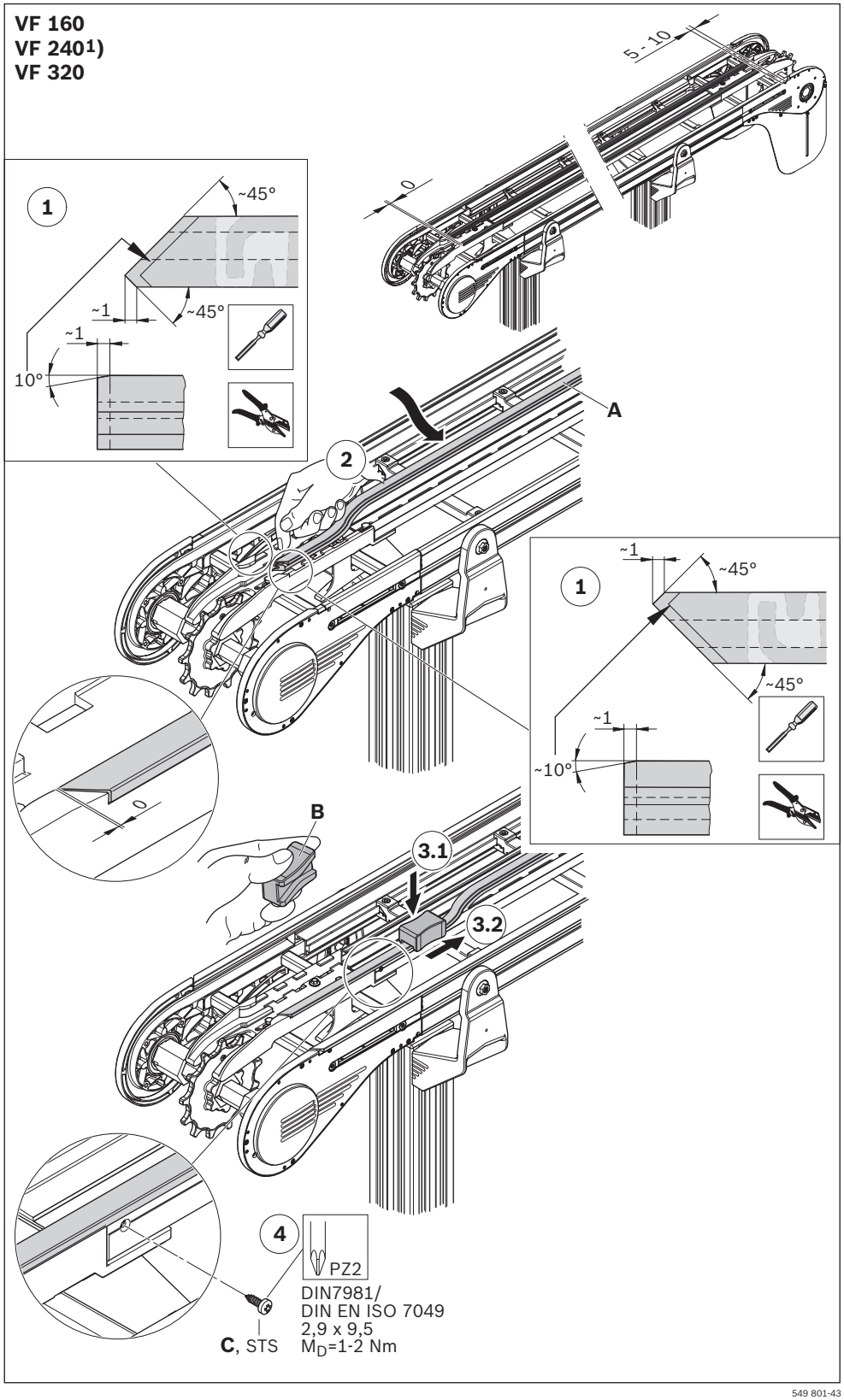


Fig. 38: Installing the slide rail (support profile)

Required accessories

- Slide rail, PE-UHMW/ HDPE (A)
- Assembly tool for slide rail (B)
- Screw (C) for attaching the slide rail.

A,	
PE-UHMW:	**3842 546 116**
HDPE:	**3842 547 909**
B:	**3842 547 463**
C, AL:	**3842 547 908**
STS:	**3842 533 915**

1. Cut the start of the slide rail to the right size.
2. Press the start of the slide rail onto the section profile.
3. Apply the assembly tool and slide the section profile along it and you will shape the slide rail to the section profile.
4. Secure the start of the slide rail by screwing it on (AL: countersunk screw, STS: oval-head screw).

[1]) Size shown

Installing the slide rail (butt joint connection, slide rail)

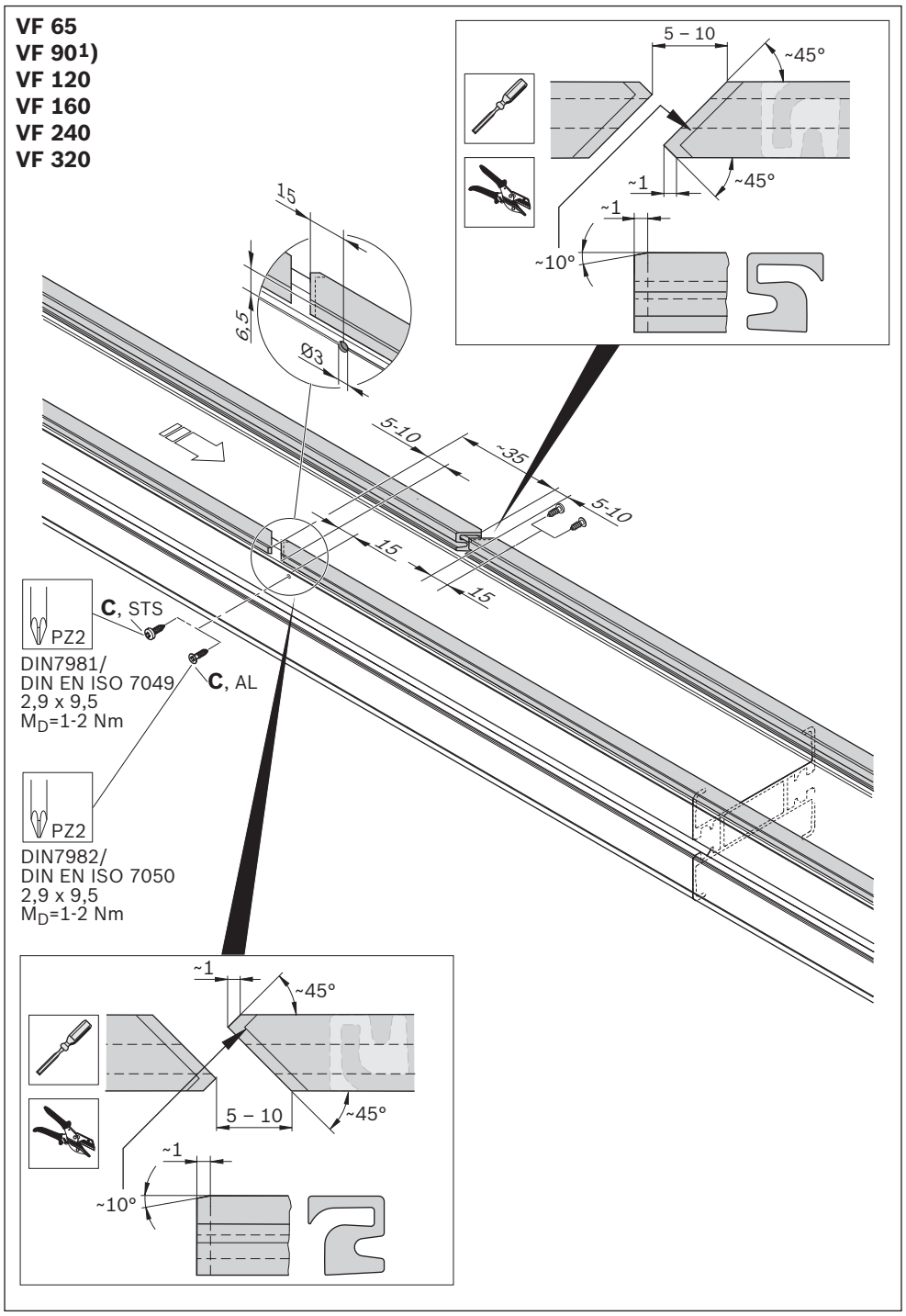


Fig. 39: Installing the slide rail (butt joint connection, slide rail)

Installing the slide rail (AL system assembly module), only for VF 65/VF 90/VF 120

Required accessories

- Slide rail, PE-UHMW/ HDPE (A)
- Assembly tool for slide rail (B)
- Screw (C) for attaching the slide rail.

A,	
PE-UHMW:	**3842 546 116**
HDPE:	**3842 547 909**
B:	**3842 547 463**
C, AL:	**3842 547 908**
STS:	**3842 533 915**

Please note:

- Only interrupt the slide rail on the opening side.
- Attach the slide rail at the front in the transport direction.

[1]) Size shown

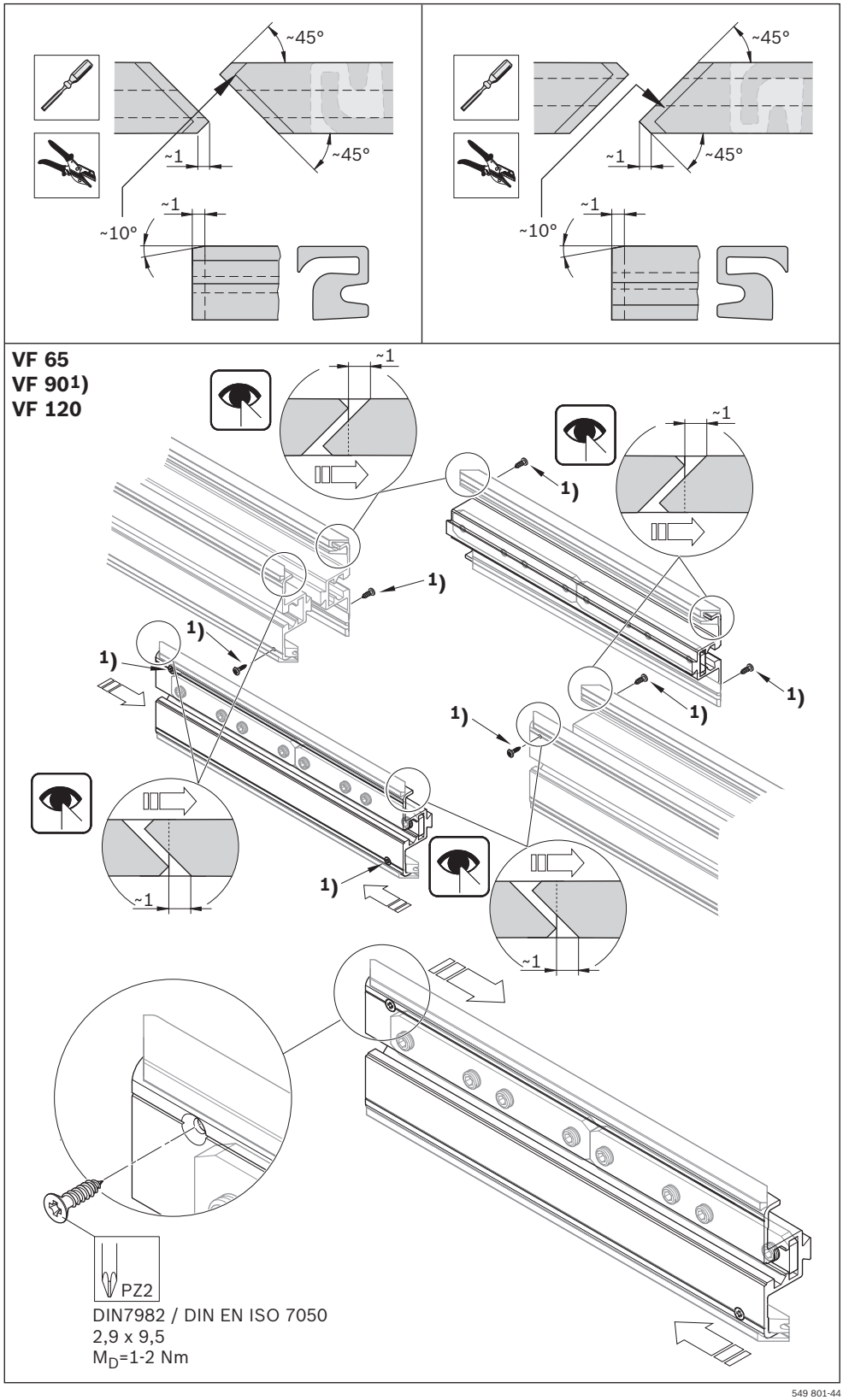


Fig. 40: Installing the slide rail (AL system assembly module)

Installing the slide rail (AL system assembly module), only for VF 65/VF 90/VF 120

Required accessories

- Slide rail, PE-UHMW/ HDPE (A)
- Assembly tool for slide rail (B)
- Screw (C) for attaching the slide rail.

A,	
PE-UHMW:	**3842 546 116**
HDPE:	**3842 547 909**
B:	**3842 547 463**
C, AL:	**3842 547 908**
STS:	**3842 533 915**

Please note:

- Only interrupt the slide rail on the opening side.
- Attach the slide rail at the front in the transport direction.

[1]) Size shown

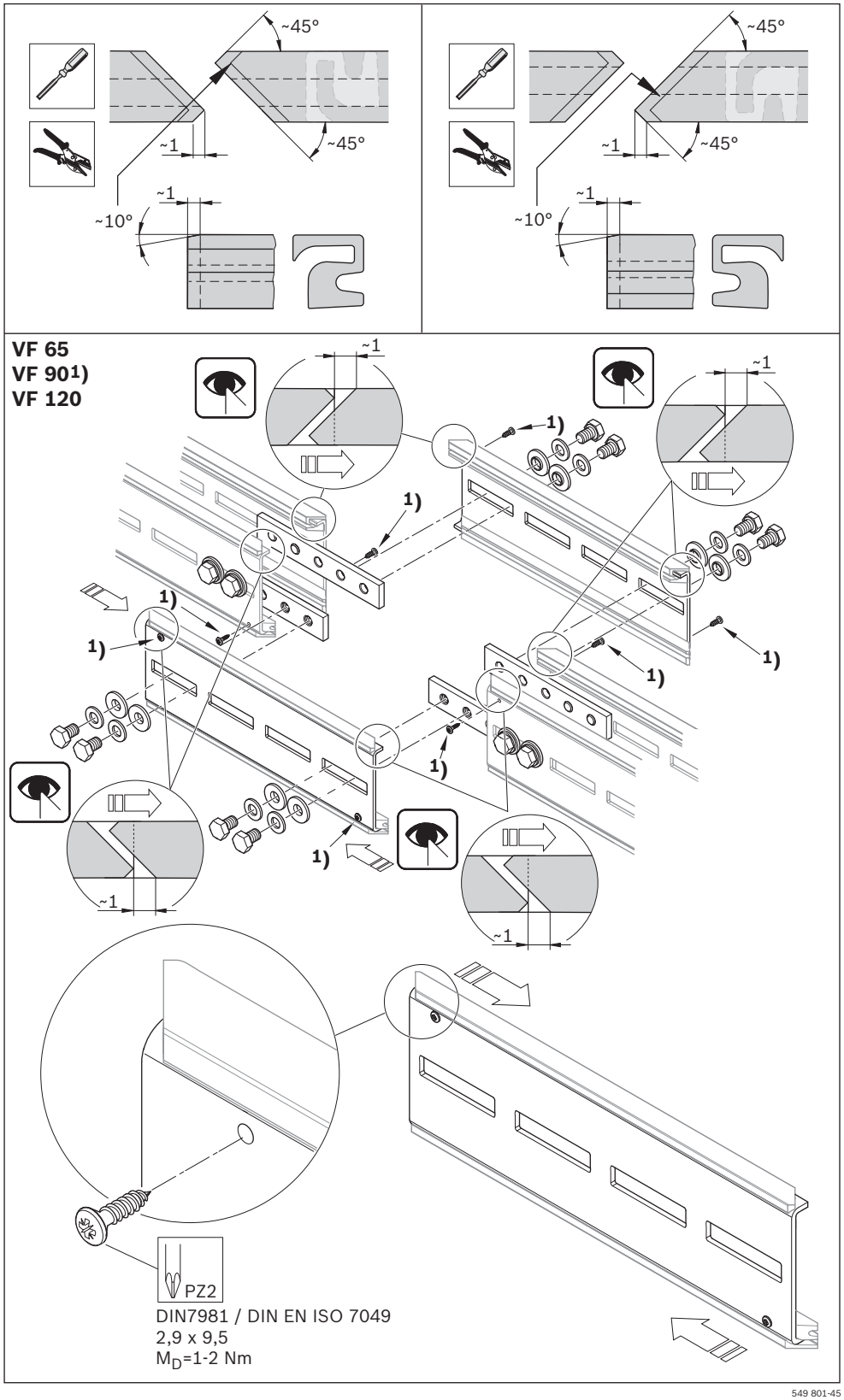


Fig. 41: Installing the slide rail (STS system assembly module)

7.5.4 Conveyor chain

Installing the conveyor chain, VF 65/VF 90/VF 120

Required accessories

- Assembly tool conveyor chain, **3842 549 835**.

1. Insert the conveyor chain at the bottom of the basic unit in the section.
2. Push/pull the conveyor chain over the basic wheel's drive wheel.
3. Combine the ends of the chain and close the chain with the assembly tool (see page 56). To do this, swing the conveyor chain's chain bag out of the protective panels. (Alternative to swinging out: remove the basic unit's protective panels.)

Please note: The conveyor chain elongates the longer it in operation (the chain bag becomes larger and hangs out below the protective panels.)

- ▶ Remove some chain links from the conveyor chain (see page 58) after a running time of about 40 hours.

[1]) Size shown

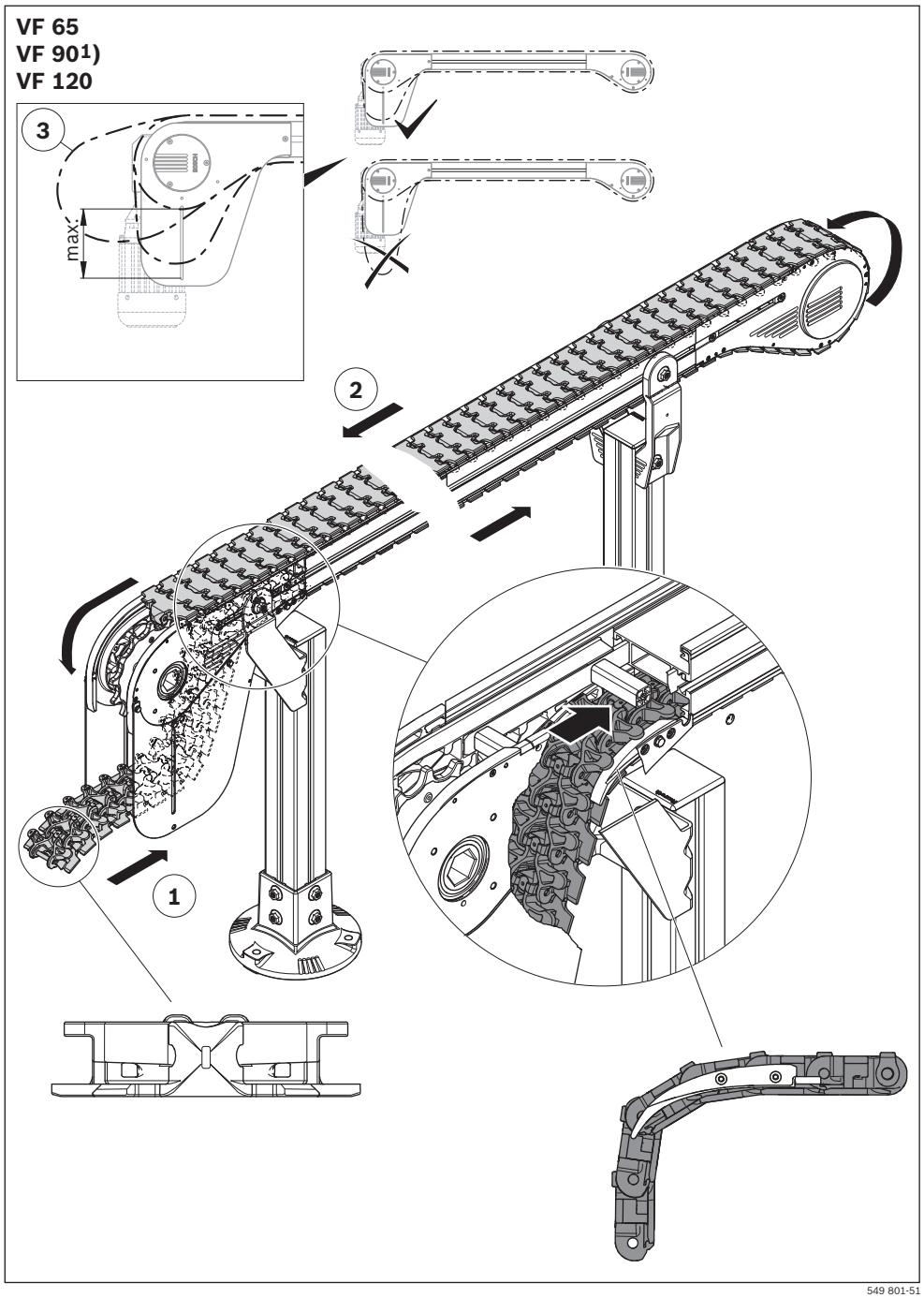


Fig. 42: Installing the conveyor chain, VF 65/VF 90/VF 120

Required accessories

- Assembly tool conveyor chain, **3842 549 835**.

1. Insert the conveyor chain at the bottom of the basic unit in the section.
2. Push/pull the conveyor chain over the basic wheel's drive wheel.
3. Combine the ends of the chain and close the chain with the assembly tool (see pages 57 + 56). To do this, swing the conveyor chain's chain bag out of the protective panels. (Alternative to swinging out: remove the basic unit's protective panels.)

Please note:
The conveyor chain elongates the longer it in operation (the chain bag becomes larger and hangs out below the protective panels.)

- ▶ Remove some chain links from the conveyor chain (see page 58) after a running time of about 40 hours.

[1]) Size shown

Installing the conveyor chain, VF 160/VF 240/VF 320

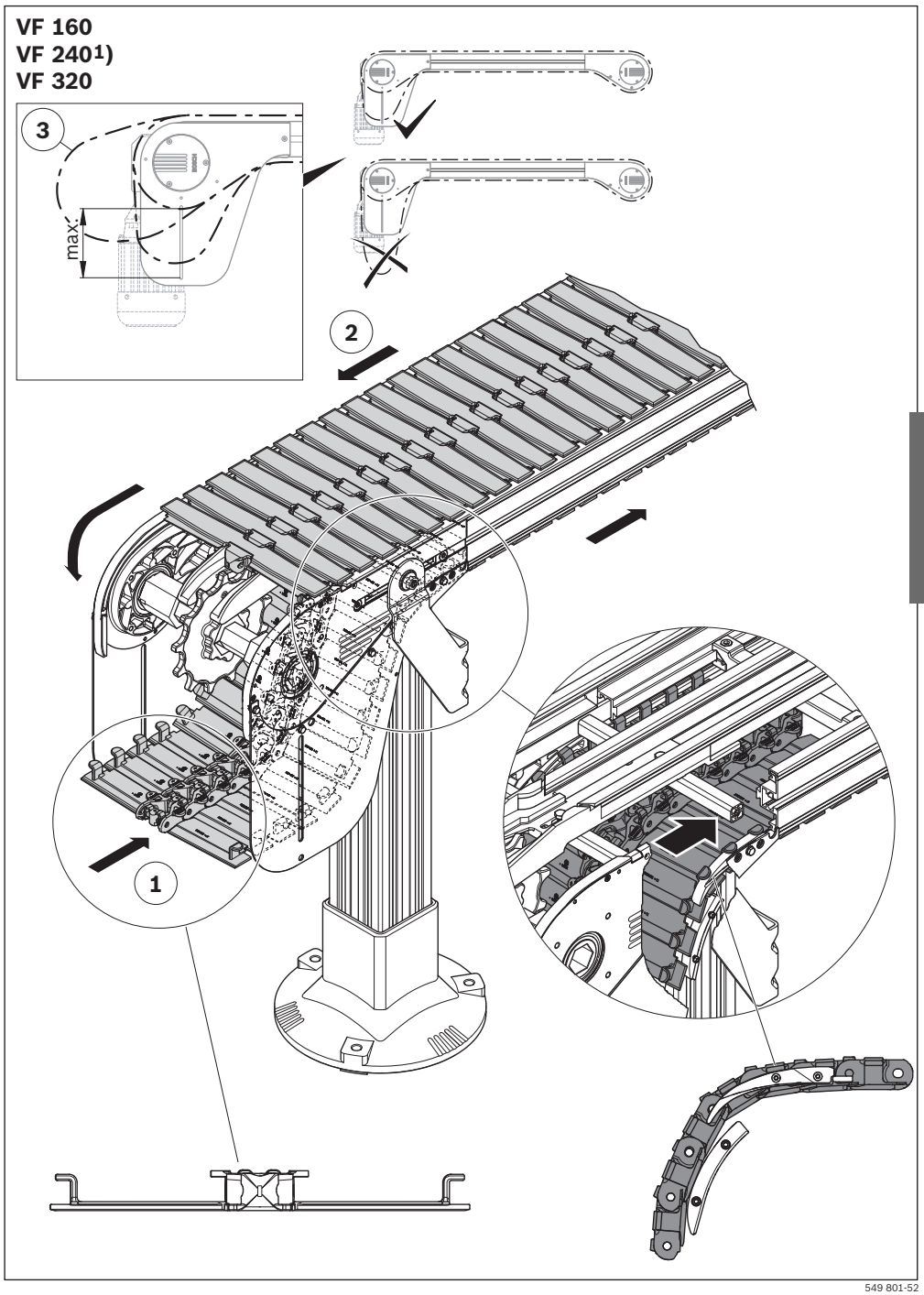


Fig. 43: Installing the conveyor chain, VF 160/VF 240/VF 320

ENGLISH

Closing the conveyor chain (extending), VF 65/VF 90/VF 120

Required tools

- Assembly tool conveyor chain, **3842 549 835**.

▶ Equip the assembly tool with:
– Stop (C)
– Clamping sleeve (B) [1])
– Chain pin (A) [1])

Please note:
[1]) For conveyor chain VF 120:
Only put on the clamping sleeve (B) and the chain pin (A) after step 1 onto the mandrel (D) of the assembly tool.

▶ Open the assembly tool as far as possible.

1. Put the chain ends (X, Y) and the hinge bolt (Z) onto the stop (C).
2. Press the chain pin into the chain links (X, Y) and the hinge bolt (Z).

Please note:
Press the chain pin into the chain links as far as it will go: only then is the chain pin correctly seated.

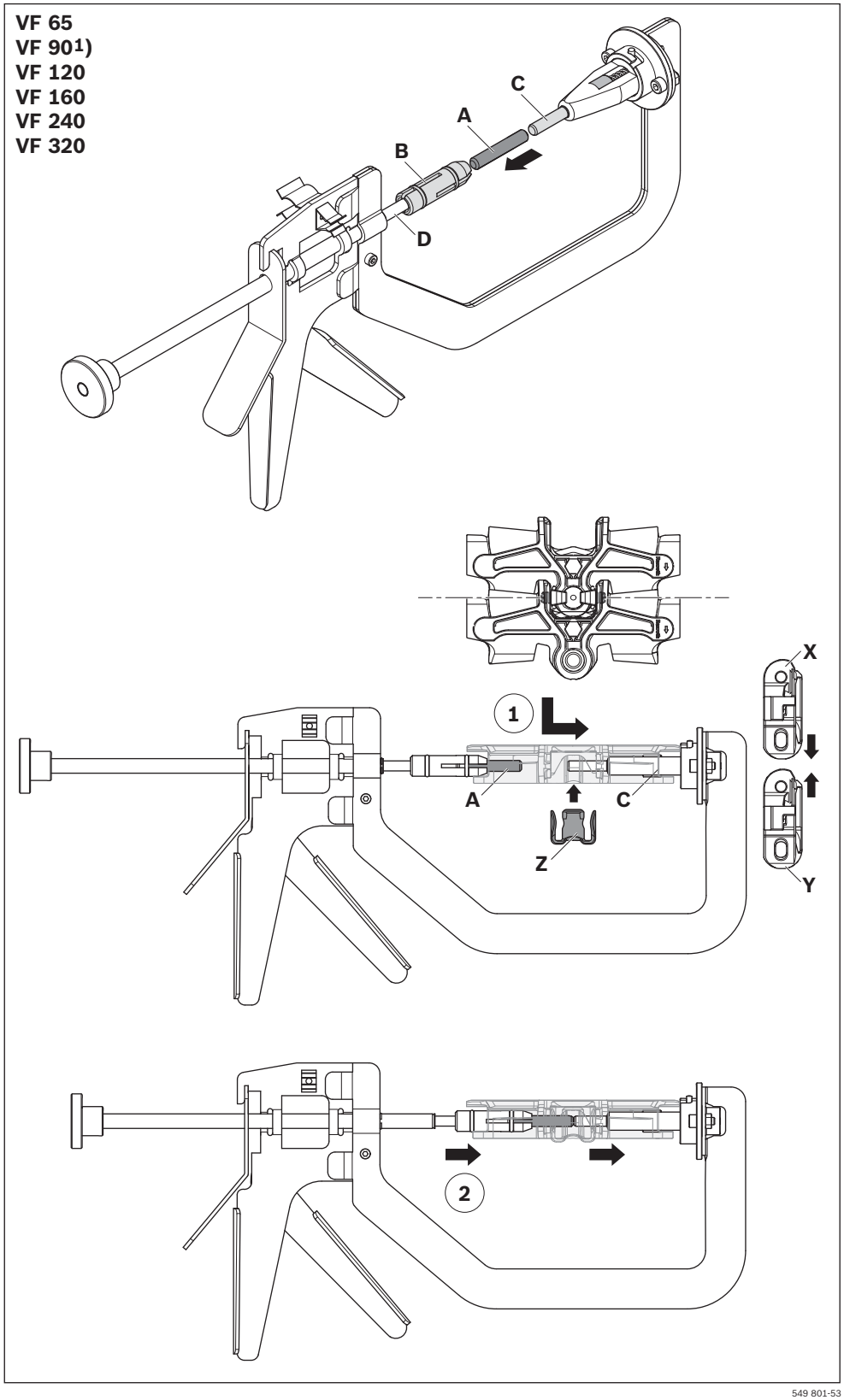


Fig. 44: Closing the conveyor chain (extending), VF 65/VF 90/VF 120

Closing the conveyor chain (extending), VF 160/VF 240/VF 320

Required accessories

- Screwdriver size 2
- Assembly tool for conveyor chain, **3842 536 310**.

1. If need be, remove the first and last chain plates.
2. Close the conveyor chain; see page 56.
3. Mount the missing chain plates.

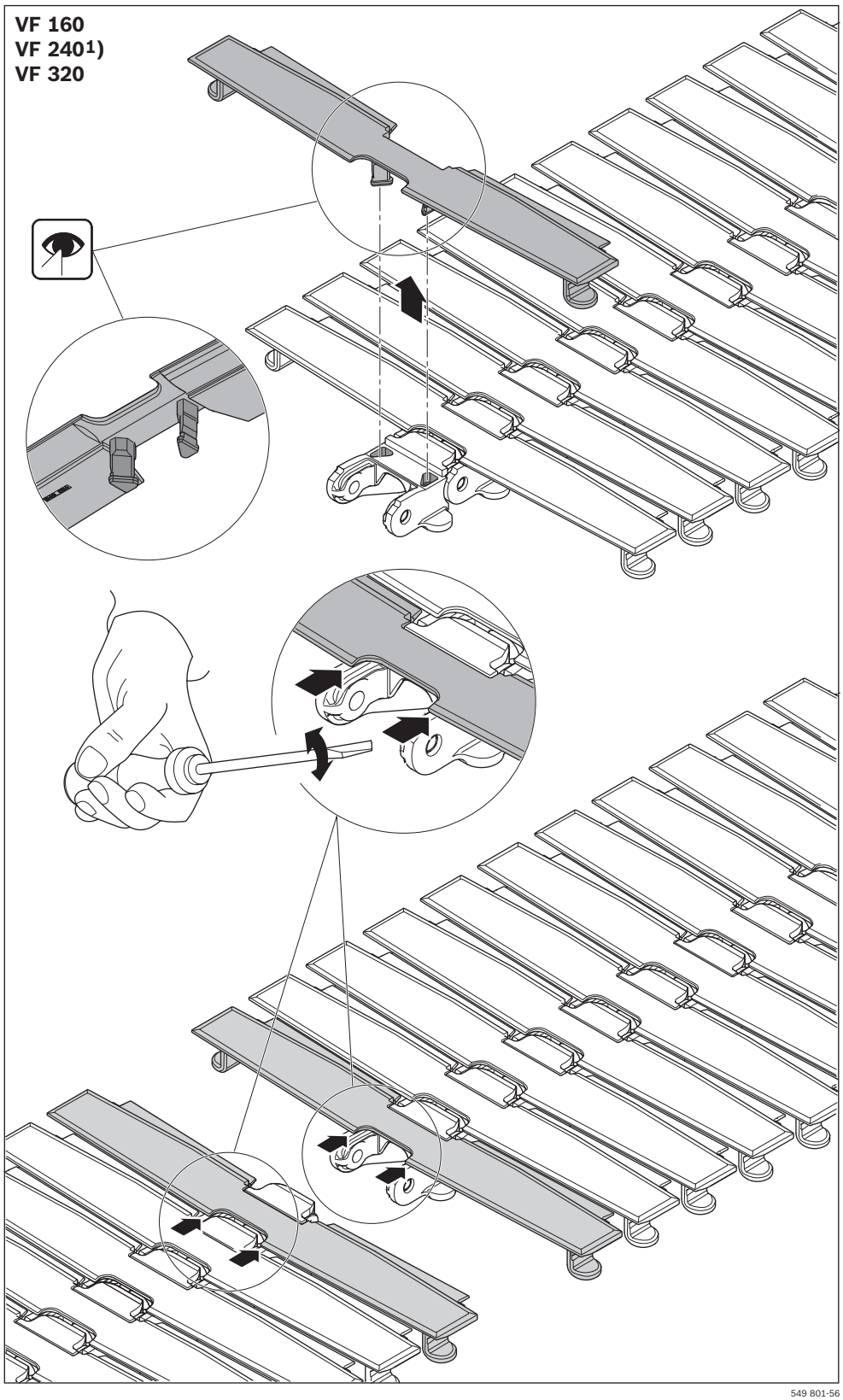


Fig. 45: Closing the conveyor chain (extending), VF 160/VF 240/VF 320

Opening the conveyor chain (shortening), VF 65/VF 90/VF 120

Required tools

- Assembly tool conveyor chain, **3842 549 835**.

▶ Re-equip the assembly tool with:
– Remove the stop (C).
– Remove the clamping sleeve (B).

▶ Open the assembly tool as far as possible.

1. Position the chain with the chain pin (A) between the mandrel (D) and the receptacle (E).
2. Press the chain pin out of the chain links into the receptacle (E).

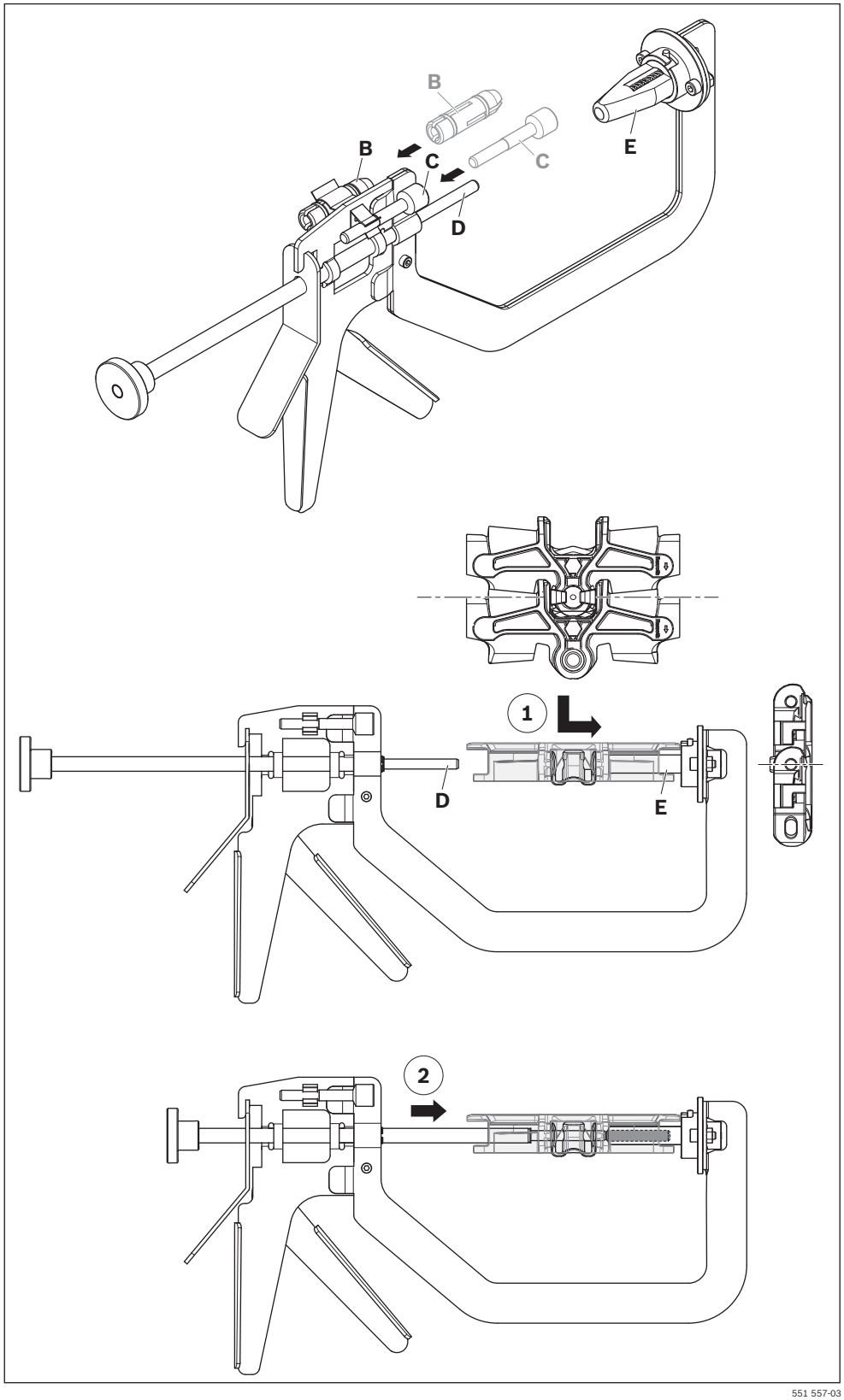


Fig. 46: Opening the conveyor chain (shortening), VF 65/VF 90/VF 120

Opening the conveyor chain (shortening), VF 160/VF 240/VF 320

Required accessories

- Screwdriver size 2
- Assembly tool conveyor chain, **3842 536 310**.

1. Remove the two chain plates.
2. Open the conveyor chain; see page 58.

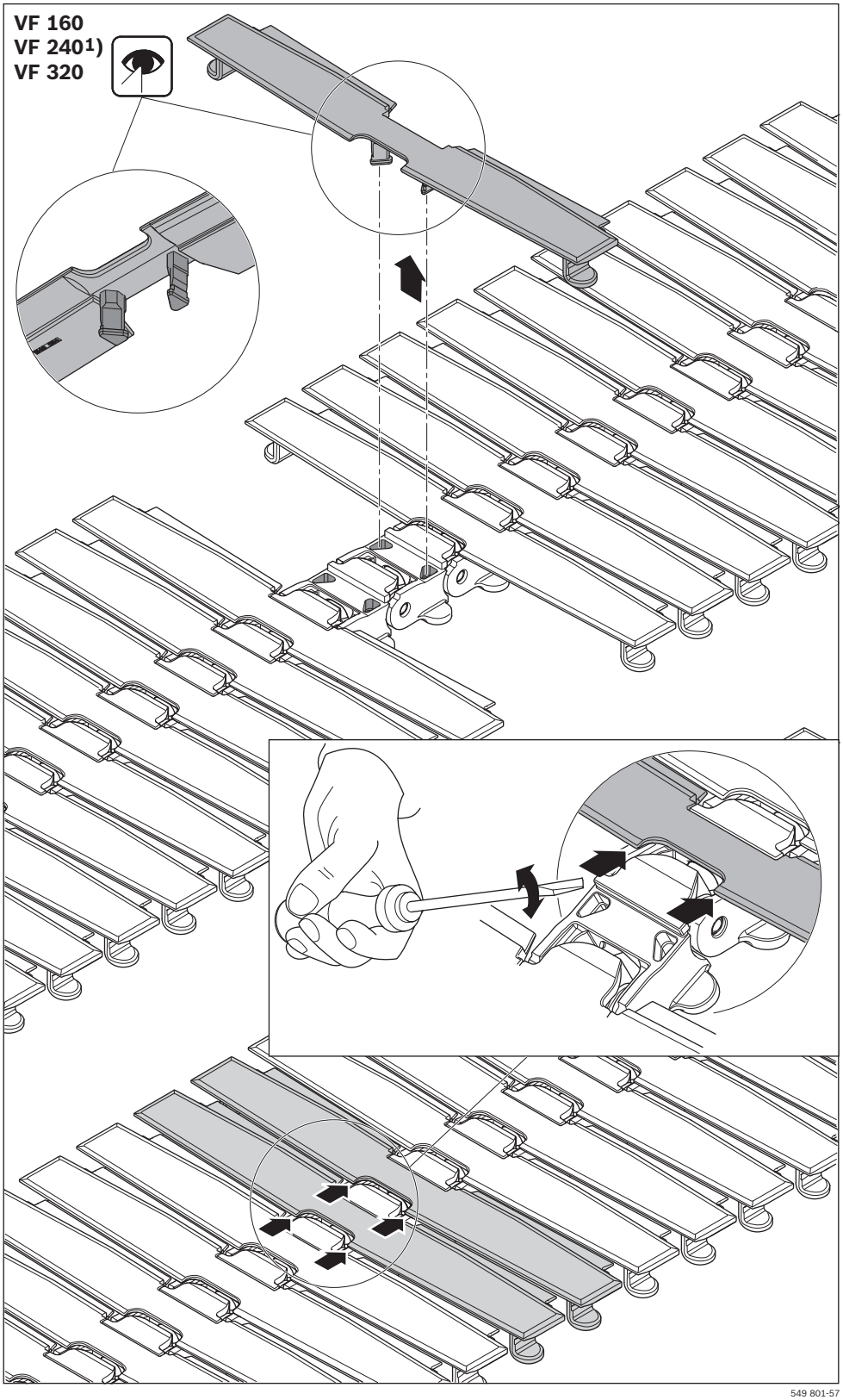


Fig. 47: Opening the conveyor chain (shortening), VF 160/VF 240/VF 320

7.5.5 Lateral guide

Installing the lateral guide

- Mount the lateral guide.

[1]) Size shown

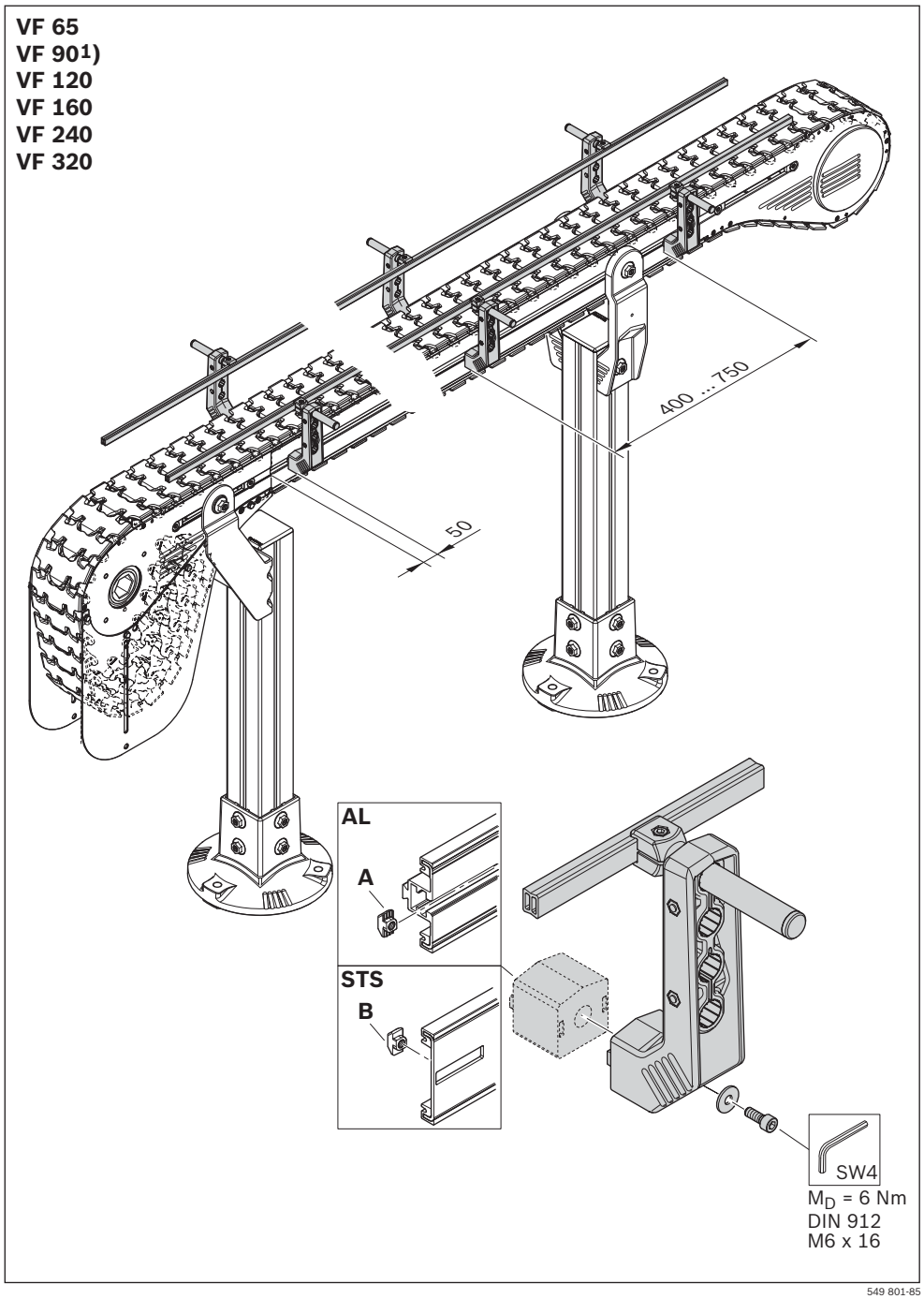


Fig. 48: Installing the lateral guide

Lateral guide accessories

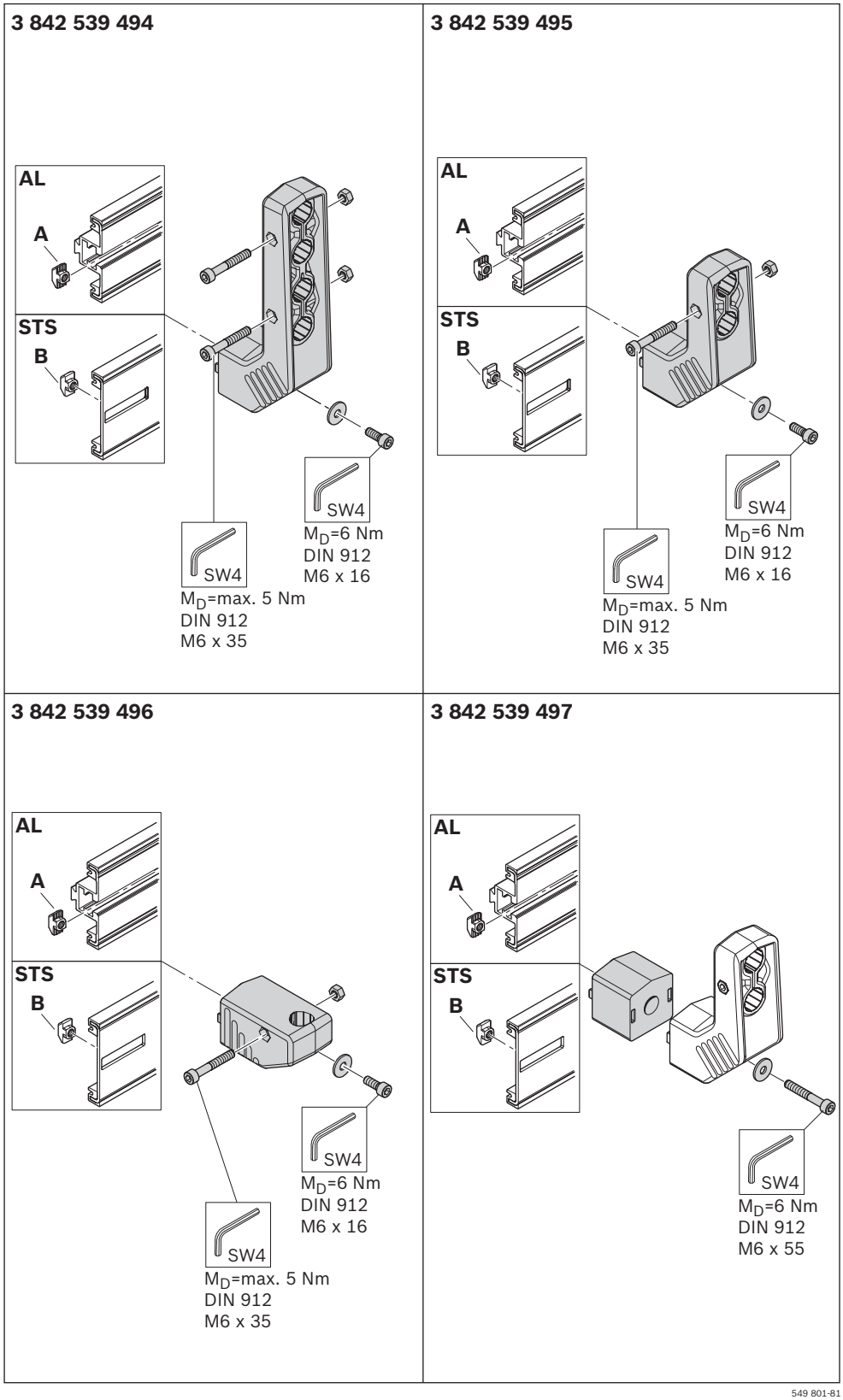


Fig. 49: Lateral guide accessories (1/4)

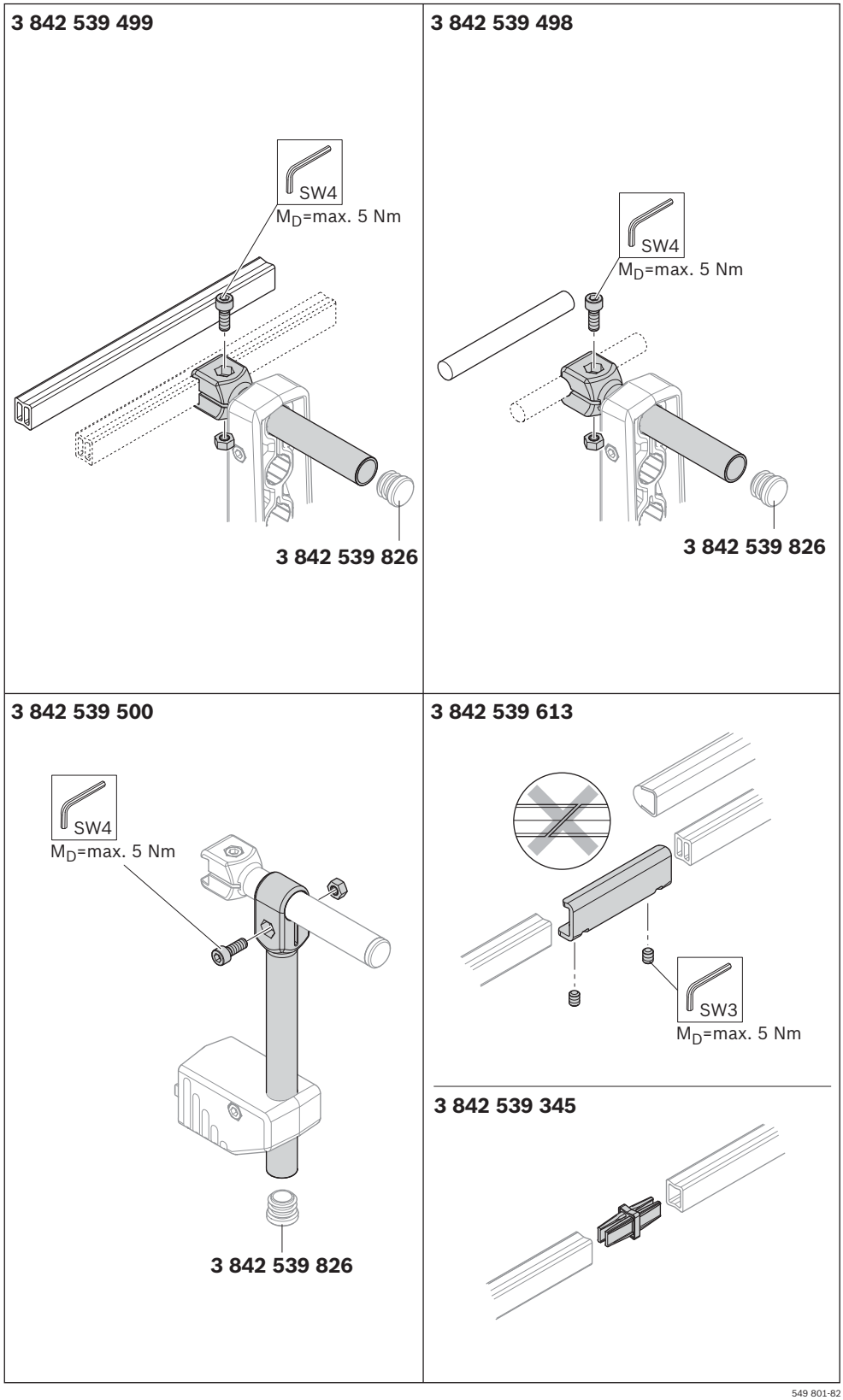


Fig. 50: Lateral guide accessories (2/4)

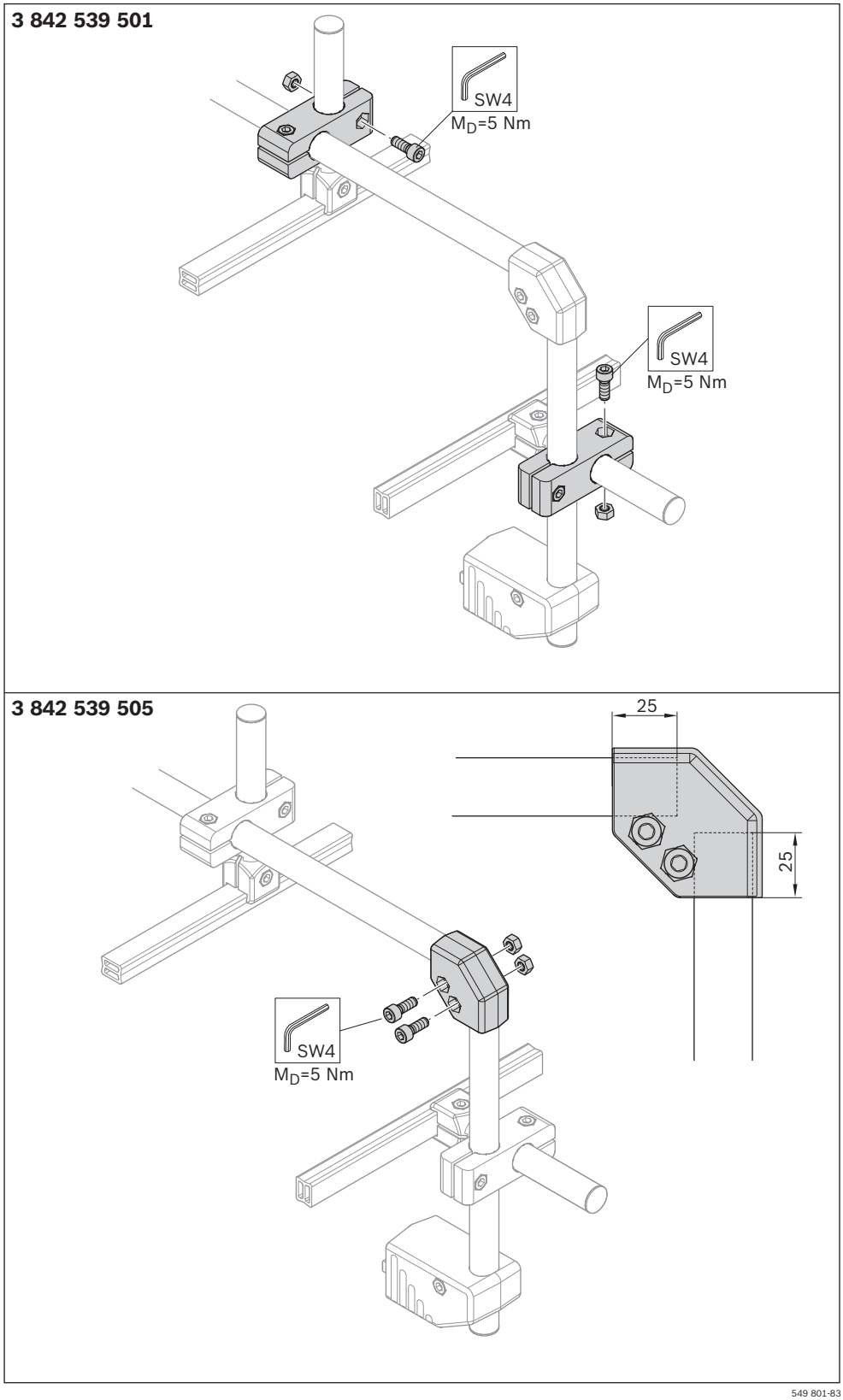


Fig. 51: Lateral guide accessories (3/4)

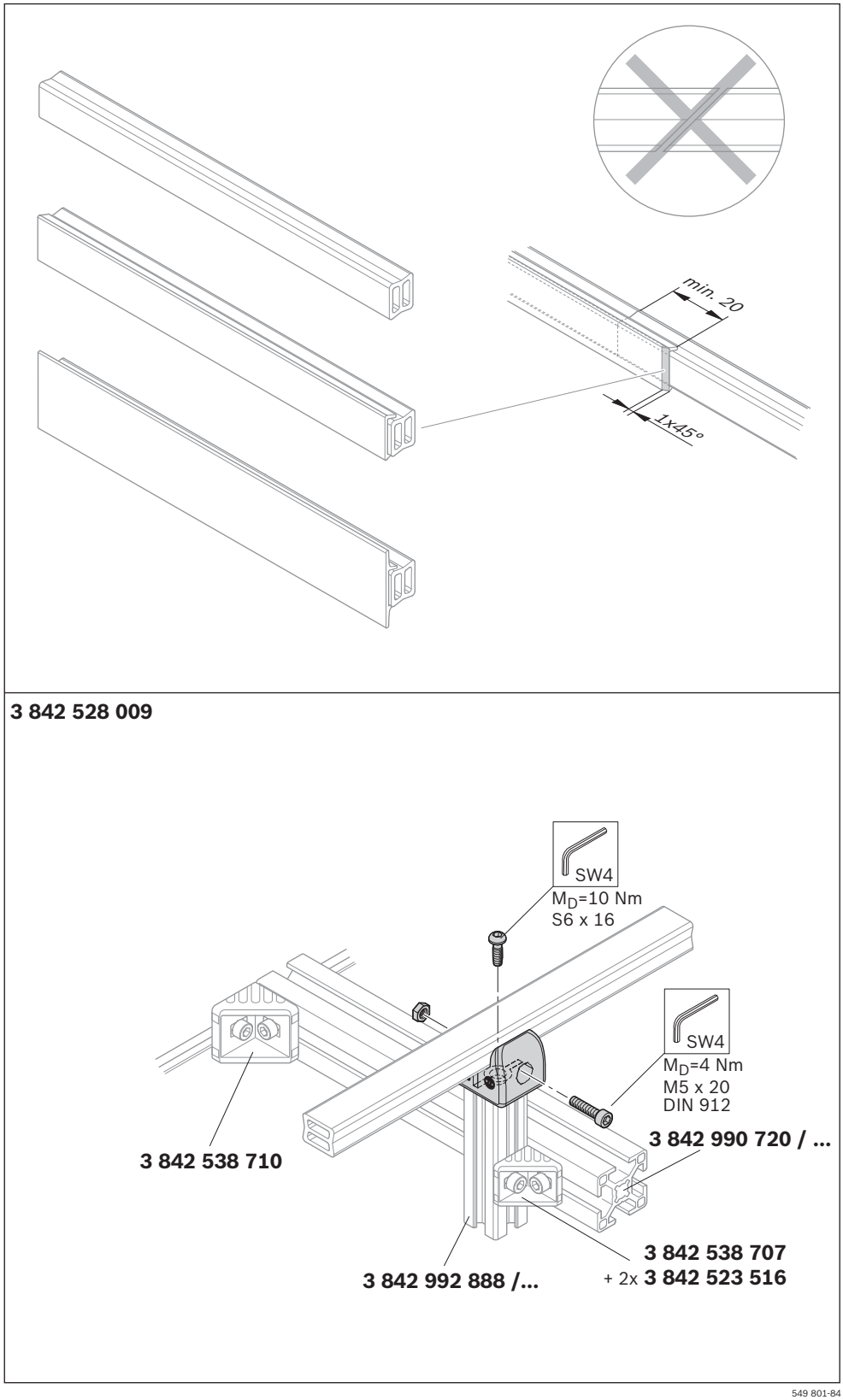


Fig. 52: Lateral guide accessories (4/4)

7.5.6 Gear motor

Required accessories

- Drive kit without (A) or with (B) safety coupling.

A/**B**: **3842 998 291**

Please note:
The VarioFlow *plus* modules are not designed for reversible operation. Electrically connect the gear motor **before** installation (see page 70) and check the direction of rotation.

▶ Mount the gear motor.

Adjust the triggering torque of the safety coupling; see page 69.

[1]) Size shown
[2]) The flange can only be installed in the correct position (opening downwards).
[3]) Basic unit's scope of delivery

Basic unit, AL system, installing gear motor GM = 1

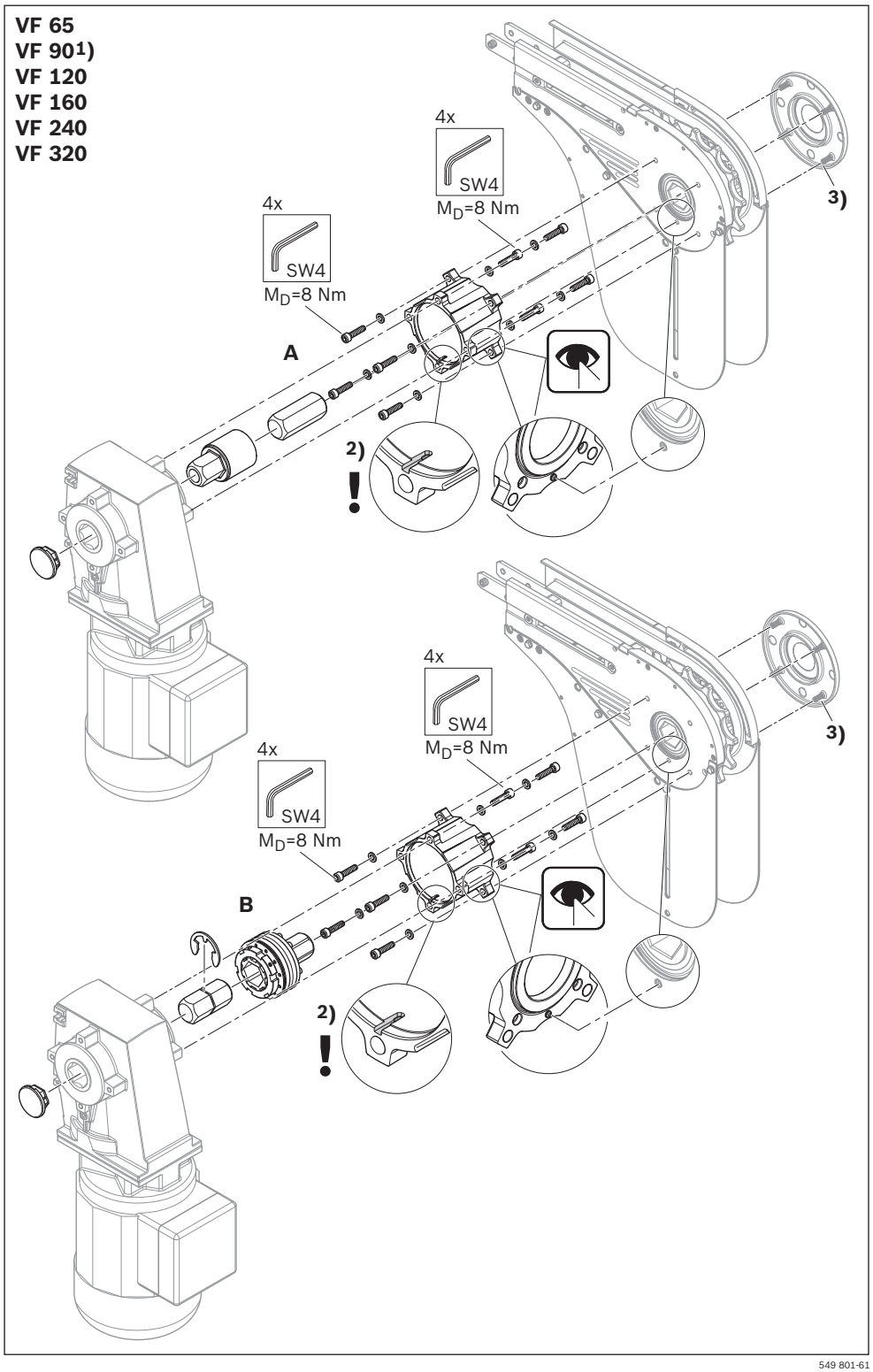


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Fig. 53: Basic unit, AL system, installing gear motor GM = 1

Basic unit, AL system, installing gear motor GM = 2

Required accessories

- Drive kit without (A) or with (B) safety coupling.

A/**B**: **3842 998 291**

Please note:
The VarioFlow *plus* modules are not designed for reversible operation. Electrically connect the gear motor **before** installation (see page 70) and check the direction of rotation.

▶ Mount the gear motor.

Adjust the triggering torque of the safety coupling; see page 69.

[1]) Size shown
[2]) The flange can only be installed in the correct position (opening downwards).
[3]) Basic unit's scope of delivery

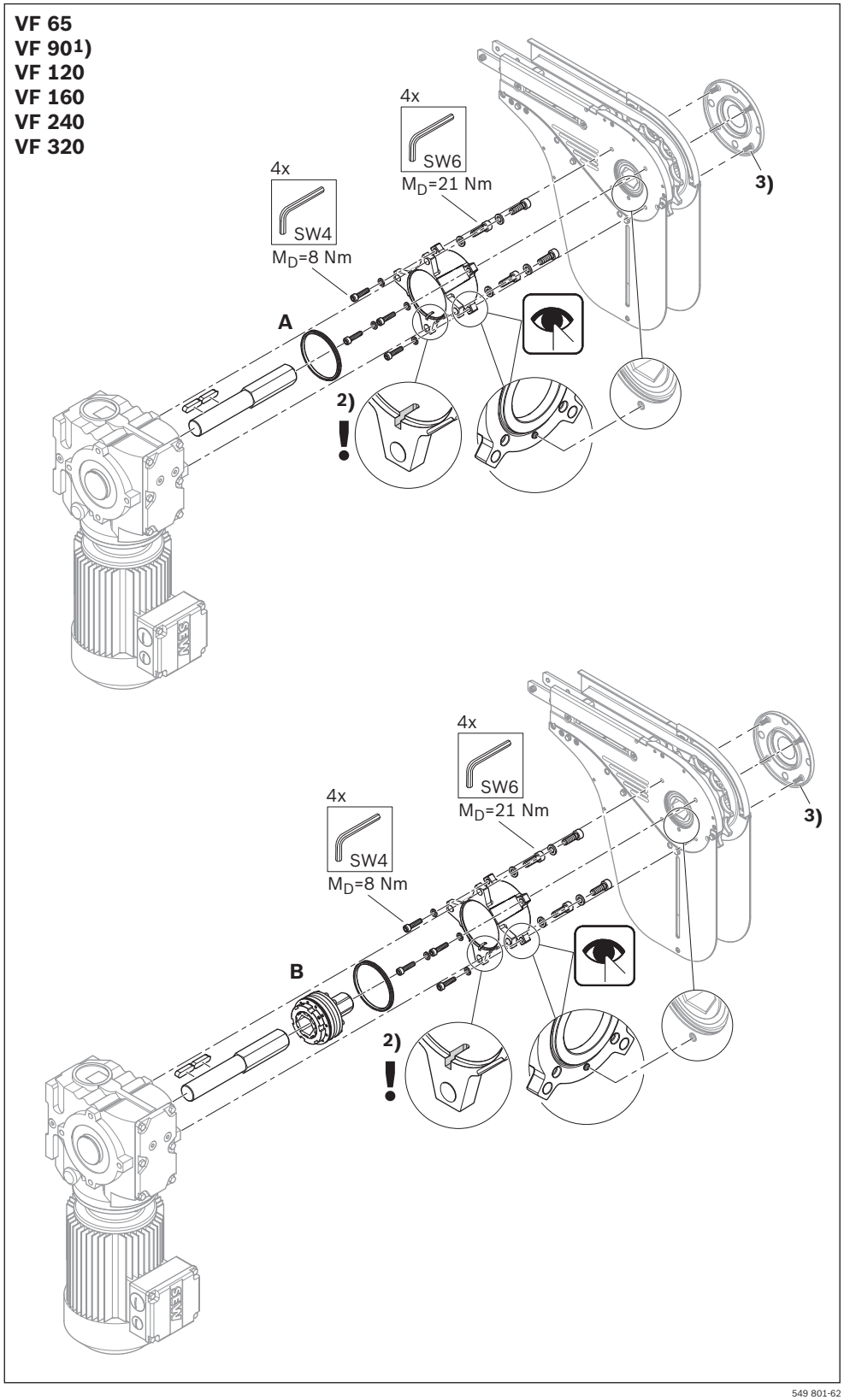


Fig. 54: Basic unit, AL system, installing gear motor GM = 2

Required accessories

• Drive kit

3842 998 291

Please note:
The VarioFlow *plus* modules are not designed for reversible operation. Electrically connect the gear motor **before** installation (see page 70) and check the direction of rotation.

▶ Mount the gear motor.

[1]) Size shown
[3]) Basic unit's scope of delivery

Basic unit, STS system, installing gear motor

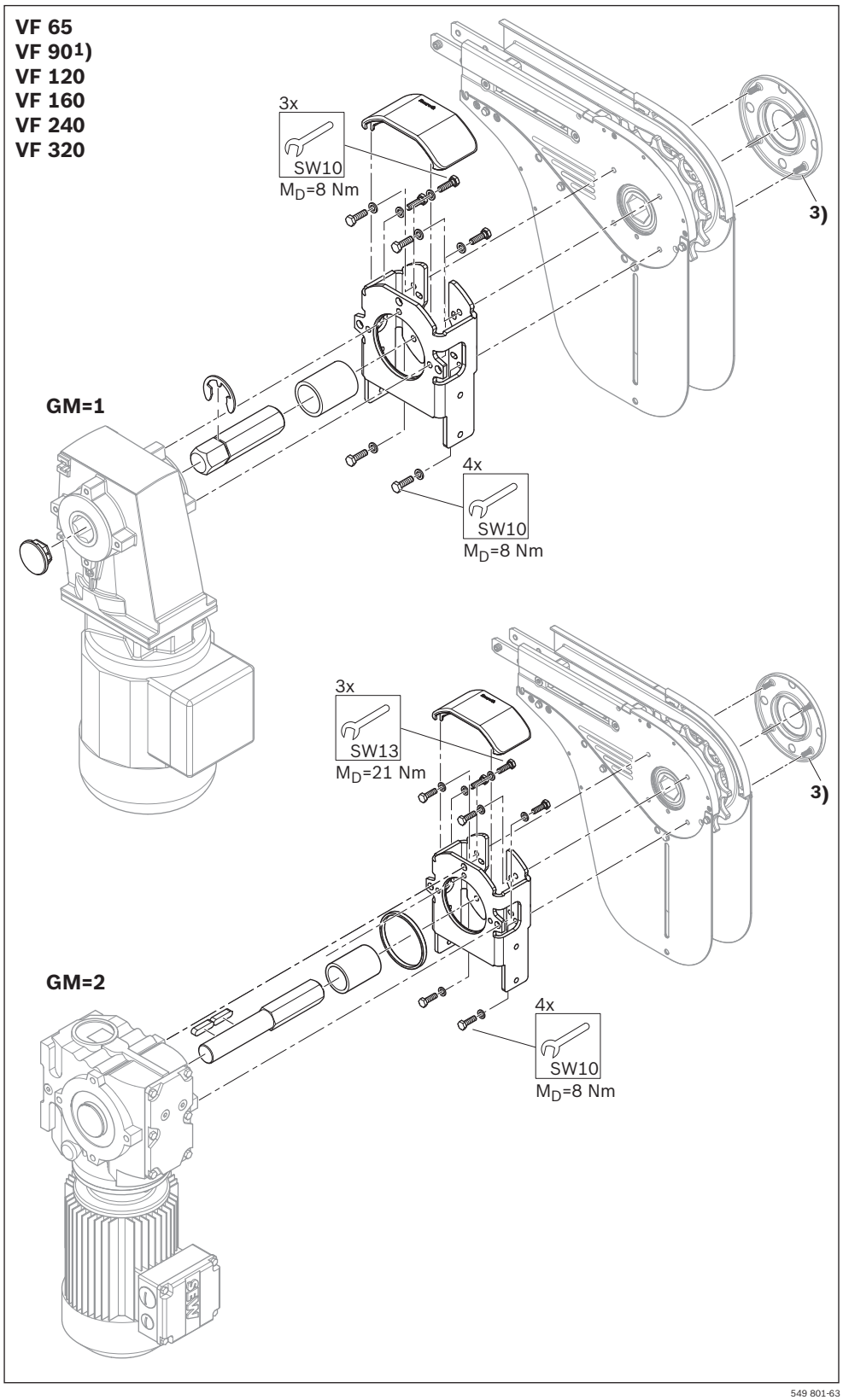


Fig. 55: Basic unit, STS system, installing gear motor

Curve wheel drive, installing gear motor

Required accessories

• Drive kit

3842 998 742

Please note:
The VarioFlow *plus* modules are not designed for reversible operation. Electrically connect the gear motor **before** installation (see page 70) and check the direction of rotation.

▶ Mount the gear motor.

Adjust the triggering torque of the safety coupling; see page 69.

[1]) Size shown

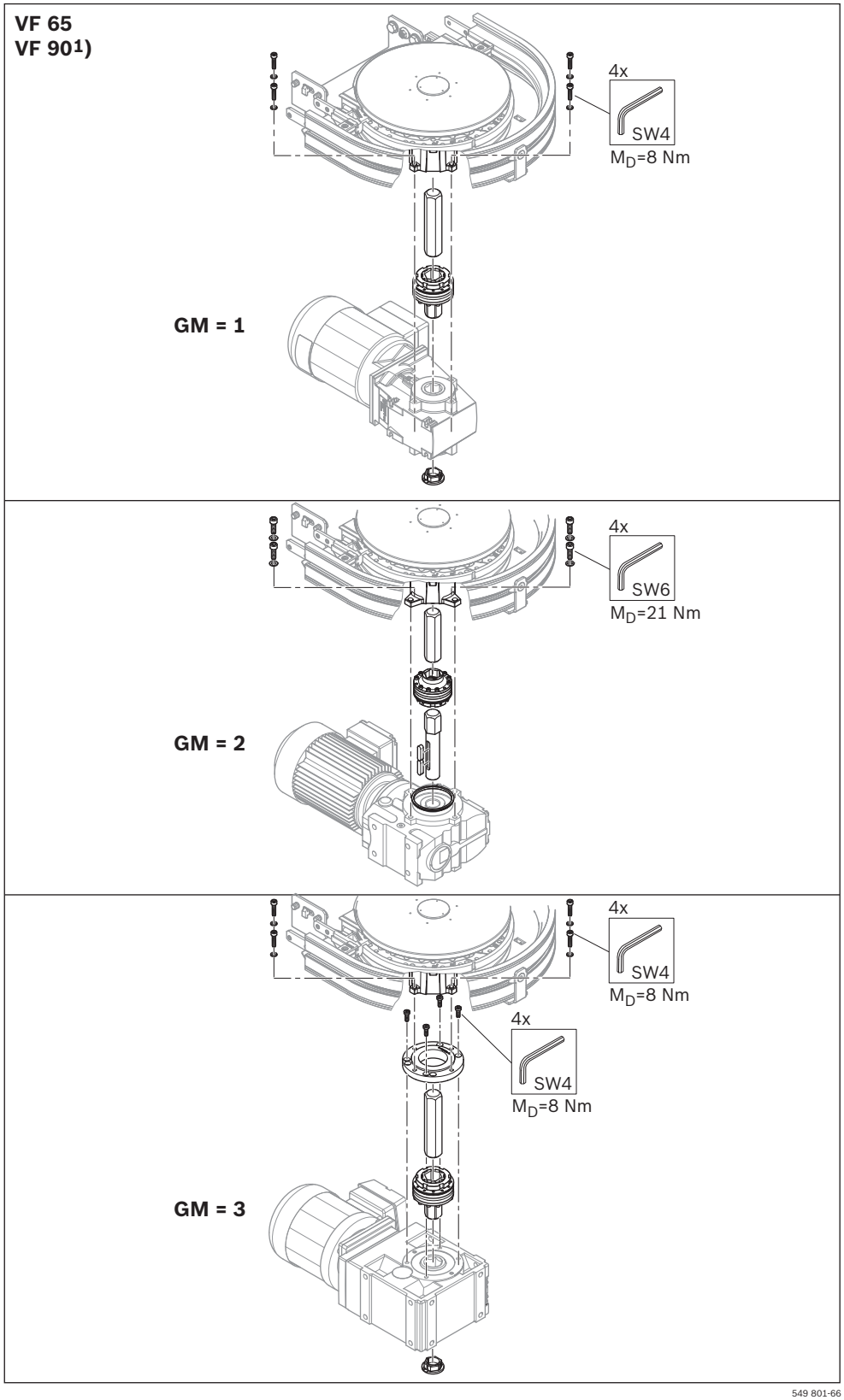


Fig. 56: Curve wheel drive, installing gear motor

Required accessories

- Tool VFPLUS SAFETY CLUTCH, consisting of:
  - Hook wrench (X_1)
  - Hexagonal shaft (X_2)
  - Lock washer (X_3)

  3842 549 388

Please note:
Factory settings for the safety coupling:

- **3842 998 291**: 120 Nm/1250 N chain tensile force
- **3842 998 742**: 90 Nm/400 N chain tensile force

[1]) Factory setting marked with sealing wax.

1. Remove the adapter (Y).
2. Remove the threaded pin.
3. Adjust the triggering torque by turning the setting nut.

- ▶ To increase the triggering torque, turn in the "**+**" direction.
- ▶ To decrease the triggering torque, turn in the "**–**" direction.

4. Use the counter pin to lock the set value.
   To do this, select a tapped hole which meets a slot.
5. Mount the adapter (Y).

Adjusting the safety coupling

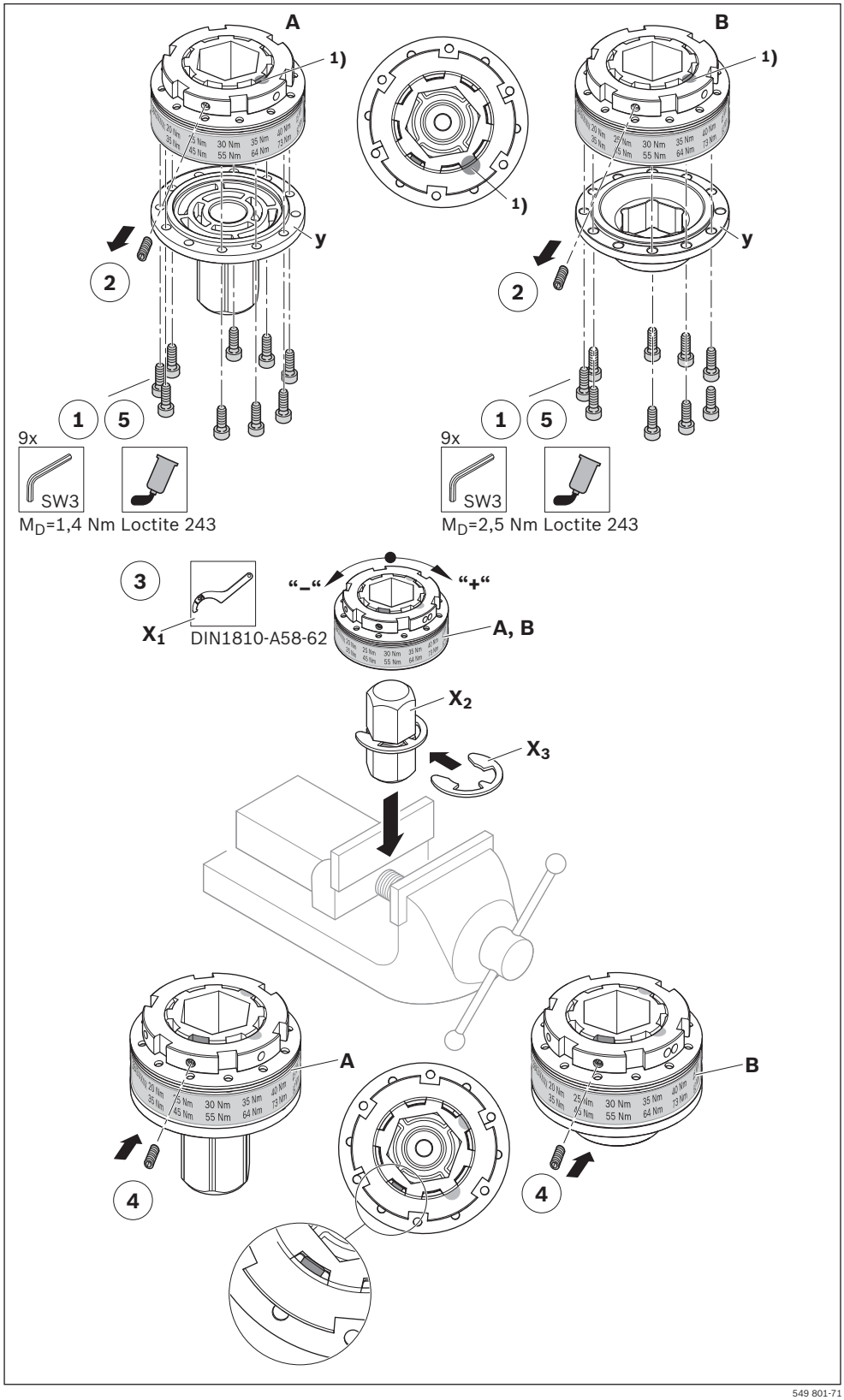


Fig. 57: Adjusting the safety coupling

7.6 Electrically connecting the product

⚠ WARNING

High electrical voltage!

Danger of severe injuries or death due to electric shock.

- ▶ Make sure the relevant system component is not under pressure or voltage before performing any maintenance or repair work.
- ▶ Protect the system against being switched on.

- Select the control and sensor elements in accordance with EN ISO 13849. Observe the load to be conveyed and the transportation speed.
- Only trained specialists are permitted to connect the motor!
- Observe regulation VDE 0100 for Germany or the appropriate regulations for the country where the product is used.

Motor connection

- Note the existing line voltage!
- Note the electrical connection parameters on the motor rating plate, see Fig. 58 on page 71.
- Connect the motor as a Y-connection or a delta connection in accordance with the connection plans, see Fig. 59 on page 71 and the connection plan in the terminal box.
- The motor is equipped with a bi-metal switch (potential-free thermal contact, 230 V AC, 300 mA) to monitor the temperature. Connect the motor in such a manner that it becomes powerless when the switch is actuated.
- Select a cable entry that prevents damage to the cable during operation.

Checking the motor's rotational direction

- Start the system for a maximum of 2 s and check that the motor is rotating in the correct direction.
- Exchange any two wires (U1, V1, or W1, see Fig. 59 on page 71) to change the motor's rotational direction.

Please note:
In motors with a factory-installed plug, correct the rotational direction in the switch cabinet or at the plug coupling (socket side). This will simplify the replacement.

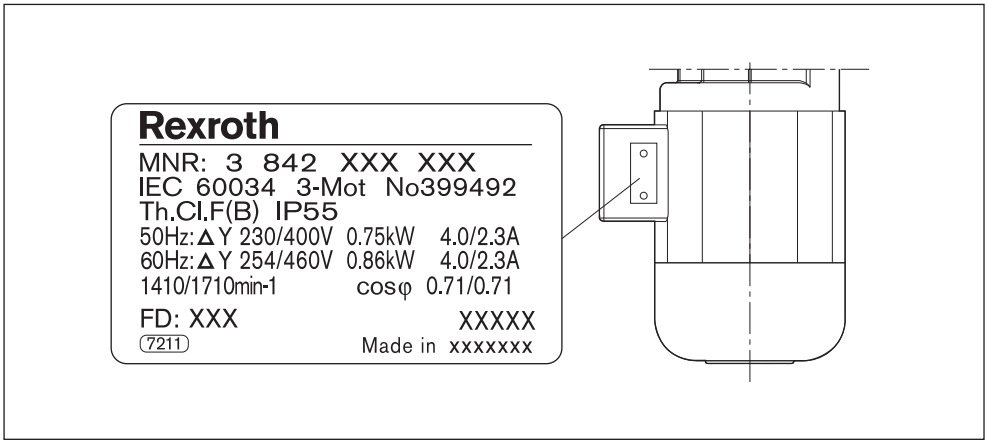


Fig. 58: Motor rating plate (example)

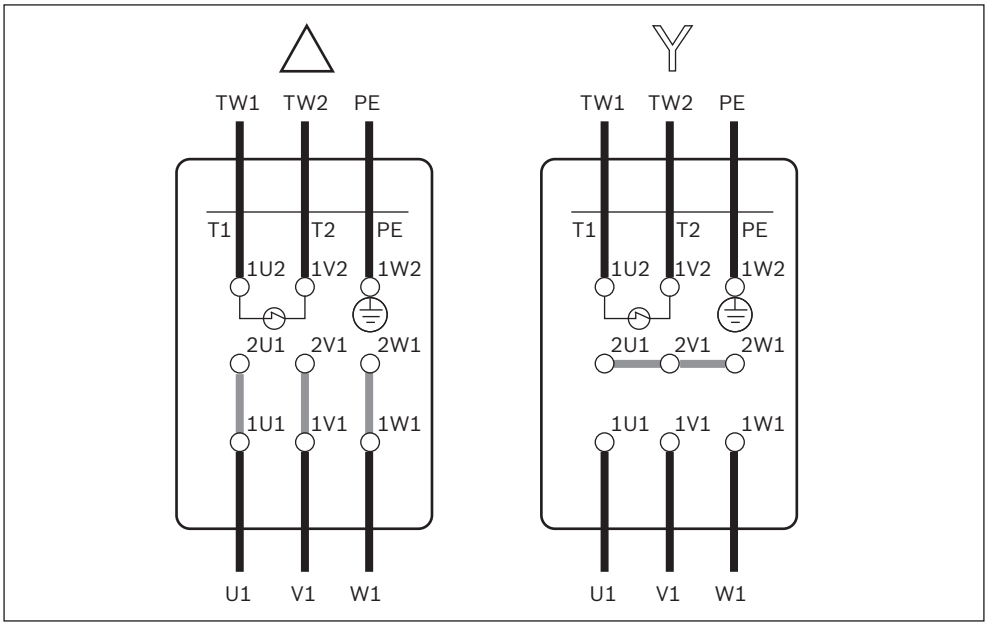


Fig. 59: Connection plans: delta connection/Y-connection

ENGLISH

8 Commissioning

8.1 Commissioning for the first time

⚠ CAUTION

Unexpected movements, falling workpiece pallets

- ▶ Injuries due to falling objects
- ▶ Before commissioning, make sure that the product has been correctly assembled by qualified personnel (see page 7).

NOTICE

Malfunctions due to incorrect assembly and commissioning

The product may be damaged or its service life shortened.

- ▶ Commissioning requires basic mechanical, pneumatic, and electrical knowledge.
- ▶ The product may only be commissioned by qualified personnel (see page 7).

- Perform a risk assessment in accordance with DIN EN ISO 12100 before initial commissioning or recommissioning of a conveyor system.
- According to EU Machinery Directive 2006/42/EC, you must provide the transfer system with an EMERGENCY STOP command device.
- The surfaces of motors and gears can reach temperatures of over 65°C under certain load and operating conditions. In such cases, the valid accident prevention regulations (in Germany: UVV) must be met by corresponding constructive measures (safety devices) or safety warning signs!
- Make sure that all electrical and pneumatic connections are either used or covered. Make sure that all screwed connections and plugs are properly connected. All of the relevant protective covers must be assembled.
- Continuous conveyors that are in motion or operation may only be inspected or adjusted if protective devices are present and correctly positioned.
- Observe EN ISO 13857 when removing or replacing protective devices and/or deactivating safety devices.
- Test runs with open housings are only permitted when they are performed by skilled workers using hold-to-run controls and when the influence of all other switching devices can be excluded.
- Only commission the product if all safety devices have been installed in the system and are functional.
- Commission the product only if it is installed completely.

8.2 Recommissioning after shutdowns

- Follow the same procedure used for initial commissioning.

9 Operation

⚠ CAUTION

Hot electric motor surfaces during operation!
Possible burns if the hot surface (over 65°C) is touched.
- ▶ Provide appropriate safety devices to seal off the motors.
- ▶ Let the system cool off for at least 30 min. before performing any maintenance or repair work.

9.1 Notes on operation

9.1.1 Wear

- Wear is caused by the basic principle of this system and cannot be avoided on individual components. Through design measures and the selection of proper materials, we strive to ensure that functional safety lasts for the lifetime of the system. However, wear also depends on the operating, maintenance, and ambient conditions of the system and the location (resistance, contamination).
- Overloading the conveyor sections may damage the conveying medium and cause the motor and gears to fail.
- Function cannot be guaranteed if the pneumatic components are overloaded.

9.1.2 Measures to reduce wear

The following measures reduce wear:
- Switch off conveyor sections when the system is not running, e.g. during breaks, overnight, on the weekend.
- Only select speeds that correspond with the particular function.
- Especially important: avoid contamination by abrasive media (for example, metal chips, construction dust, but also fine dust or sugar). Reduce contamination through regular cleaning.

9.1.3 Ambient influences

- Resistant to many common media used in production such as water, mineral oil, grease, and detergents. Contact your Rexroth representative if you have any doubts about resistance to specific chemicals, such as test oil, doped oils, aggressive detergents, solvents, or brake fluid.
- Avoid long-term contact with strong acidic or basic reacting materials.
- Wear may increase dramatically if the system is contaminated due to environmental factors, such as metal chips, construction dust, but also fine dust or sugar. In such circumstances, you should significantly reduce the maintenance intervals.
- Resistance to media and contamination does not mean that functional safety is guaranteed in every case.

– Liquids that thicken on evaporation and are highly viscous or adhesive (sticky) could lead to a disruption in function.
– Media with lubricating properties may reduce the driving power that is caused by friction if they are carried over onto systems with rollers.

Such cases require special attention when planning the system and the maintenance intervals need to be shortened accordingly.

10 Maintenance and repair

⚠ WARNING

High electrical voltage!
Danger of severe injuries or death due to electric shock.
- ▶ Make sure the relevant system component is not under pressure or voltage before performing any maintenance or repair work.
- ▶ Protect the system against being switched on.

High pneumatic pressure!
Danger of severe injuries or death.
- ▶ Switch off the compressed air supply on the relevant system component before performing any maintenance or repair work.
- ▶ Protect the system against being switched on.

⚠ CAUTION

Hot electric motor surfaces during operation!
Possible burns if the hot surface (over 65°C) is touched.
- ▶ Provide appropriate safety devices to seal off the motors.
- ▶ Let the system cool off for at least 30 min. before performing any maintenance or repair work.

- Continuous conveyors that are in motion or operation may only be inspected or adjusted if protective devices are present and correctly positioned.
- Observe DIN EN ISO 13857 when removing or replacing protective devices and/or deactivating safety devices.
- Test runs with open housings are only permitted when they are performed by skilled workers using hold-to-run controls and when the influence of all other switching devices can be excluded.

10.1 Cleaning and care

NOTICE

Bearing malfunctions
Moistening of the bearings with grease-dissolving substances, e.g. for cleaning purposes, will lead to bearing malfunctions. There is a danger of damage to property; the service life may be shortened.
- ▶ Keep grease-dissolving or aggressive cleaning agents away from the bearings!
- ▶ Only use a slightly damp cloth to clean the product.

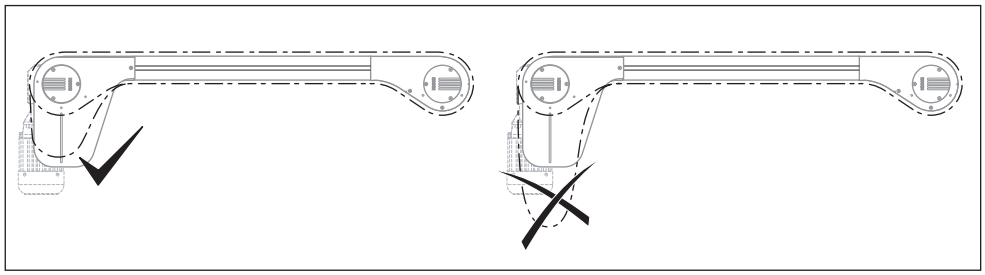
Bearing conveyor chain
Moistening of the conveyor chain with grease-dissolving substances, e.g. for cleaning purposes, will lead to conveyor chain malfunctions. There is a danger of damage to property.
- ▶ Keep grease-dissolving or aggressive cleaning agents away from the conveyor chain!
- ▶ Only use a slightly damp cloth to clean the product.

10.2 Inspection

Conveyor chain

- During the run-in phase and afterwards as well, the conveyor chain will lengthen with increasing operating time (the chain bag becomes larger and hangs out under the protective panels; see Fig. 60). If the chain bag it too large, it leads to increased noise emission and wear on the entry point of the conveyor chain in the drive unit.

▶ Remove some chain links from the conveyor chain after a running time of about 40 hours.



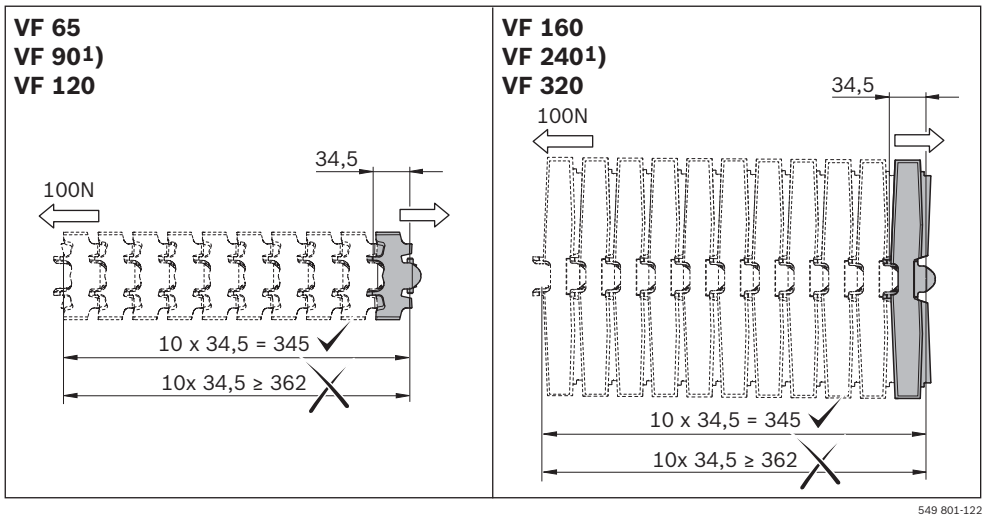
549 801-123

Fig. 60: Elongation of the conveyor chain

- Further inspections of the chain bag after 200 h, after 400 h, after 600 h and then every 1000 h.
- The maximum elongation of the conveyor chain is 5%.

▶ Replace the conveyor chain once this value has been reached.

Conveyor chains are wear parts.



549 801-122

Fig. 61: max. elongation of the conveyor chain (5%).

Slide rails

- Every 2000 h (about 83 days in 3-shift operation) visually inspect the slide rails and the bottom of the chain plates (in the chain bag of the head drive) for grooves and clean abrasion dust out of the system. There will be increased wear on the chain conveyor during the run-in period of about three weeks. Please plan to clean more often.
  Maximum permissible wear of slide rail and chain plate is no more than 0.7 mm.

  Slide rails are wear parts.

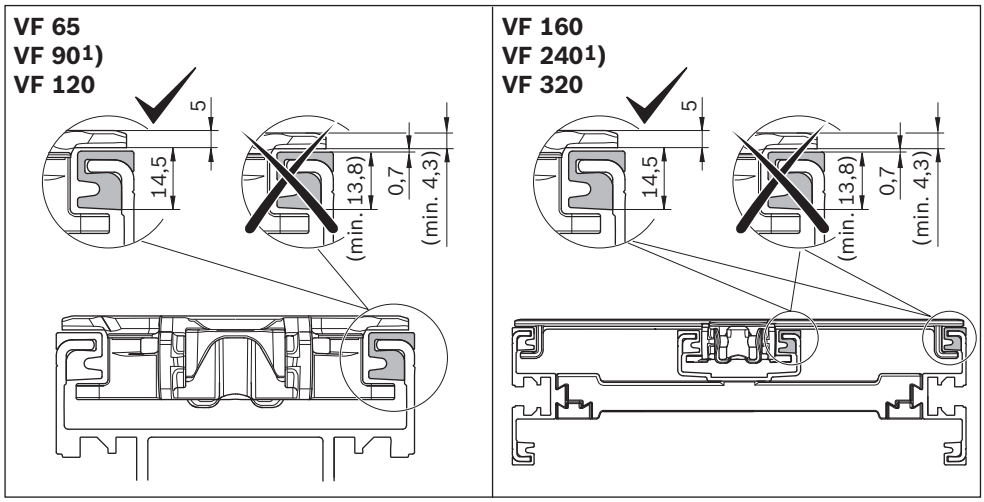


Fig. 62: max. permitted wear (total of 0.7 mm) of the slide rail and chain plate

Sliding curves

- Every 250 operating hours, visually inspect the slide rails for grooves in the horizontal or vertical sliding curves.
  Maximum permissible wear of slide rail and chain plate is no more than 0.7 mm.

  Slide rails are wear parts.

Roller curves

- In horizontal curves, check the rolling bearings for smooth running. Replace worn-out slide rails.
  Maximum permissible wear of slide rail and chain plate is no more than 0.7 mm.

  Slide rails are wear parts.

Entire system

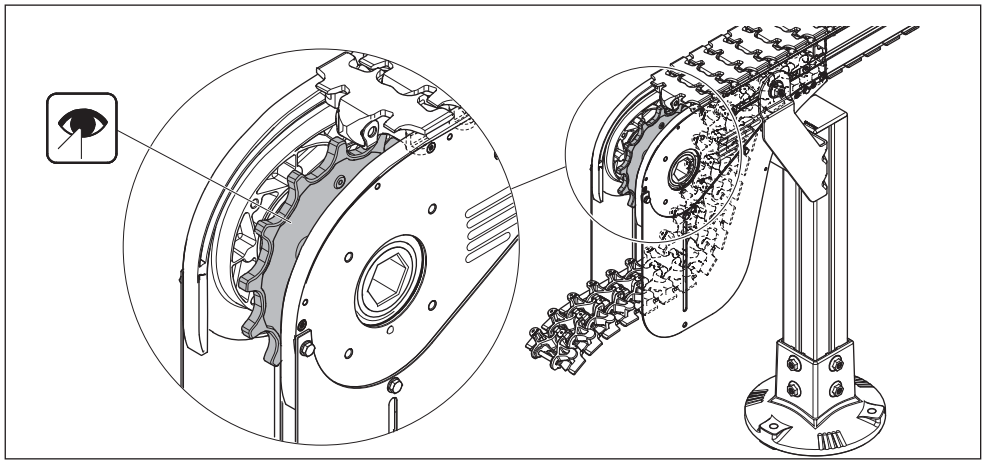
- Every 2000 operating hours (or every 500 hours when using horizontal or vertical sliding curves), remove the conveyor chain from the chain conveyor and inspect the slide rails and the bottom of the chain plates for grooves. When doing this, pay attention to correct fitting and wear.

Wear of conveyor chains

At the prescribed maintenance intervals (every 2000 h at the latest, earlier in abrasive environments), open the conveyor chain and measure the wear with a measurement tool.

- Thickness of the slide rail (see page 77 for permissible wear)
- Wear groove on the bottom of the chain (see page 77 for permissible wear)
- Elongation of the chain (permissible elongation 5%, see page 76)
- Drive wheel: touch and visually check the teeth when the chain is open
  - The height of the teeth must be maintained.
  - The teeth must not show any points.

  Drive wheels are wear parts.



549 801-124

Fig. 63: Drive wheel: touch and visually check the teeth when the chain is open

Accumulation operation:

Please note:

Sliding friction results in increased temperatures and greater wear. This means the maintenance intervals are reduced.

- Visually inspect the slide rails and the bottom of the chain plates in the accumulation area every 500 hours for grooves.
  Maximum permissible wear of slide rail and chain plate is no more than 0.7 mm.

  Continual checks of the system are recommended during accumulation operation.

10.3 Maintenance

Bearings

All bearings are provided with lifelong lubrication and are maintenance-free under normal conditions.

Gear

The gear is maintenance-free.

Motor

To ensure adequate motor cooling, dirt and dust must be removed at regular intervals from the:

- Motor surface
- Fan housing inlets
- Interior surfaces of the cooling fins

The cleaning intervals are based on the ambient conditions and operating conditions.

10.4 Replacing wear parts

Required tools

- Hexagon wrench WS13
- Hex socket wrenches WS3, WS4, WS5
- Screwdriver for recessed head screws PZ2
- Vernier caliper, 500 mm
- Plastic hammer
- Tapered punch

Conveyor chain

Replace the conveyor chain, see “Installing the conveyor chain”, page 54 and the following pages.

Slide rails

Replace the slide rails, see “Installing the conveyor chain”, page 48 and the following pages.

Remove the basic unit, see “Installing the basic unit,” page 29 (AL)/page 45 (STS).

Drive wheels

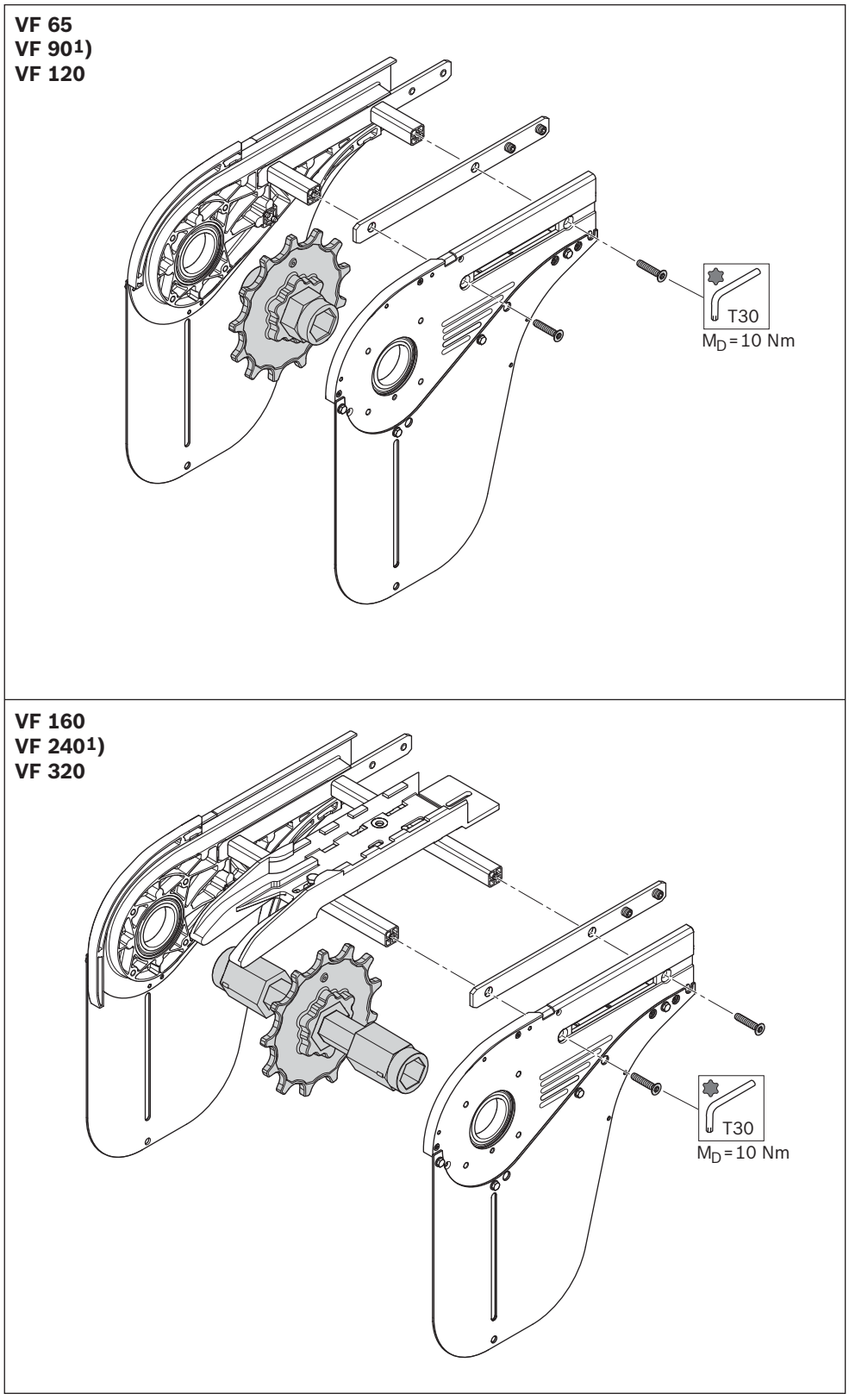


Fig. 64: Replacing drive wheels

10.5 Spare parts

For spare parts, see the MT*parts* spare parts list, **3 842 529 770**.

11 Decommissioning

The product is a component that does not have to be decommissioned. As a result, this chapter in these instructions does not contain any information.

12 Disassembly and exchange

⚠ WARNING

High electrical voltage!

Danger of severe injuries or death due to electric shock.

- ▶ Make sure the relevant system component is not under pressure or voltage before performing any maintenance or repair work.
- ▶ Protect the system against being switched on.

High pneumatic pressure!

Danger of severe injuries or death.

- ▶ Switch off the compressed air supply on the relevant system component before performing any maintenance or repair work.
- ▶ Protect the system against being switched on.

Lifted loads may fall!

Falling objects may result in severe injuries (or even death).

- ▶ Always use lifting equipment with a sufficiently high load bearing capacity (see the shipping documents for product weight).
- ▶ Before lifting the product, make sure that the carrying straps are correctly fastened!
- ▶ Secure the product to prevent toppling while lifting!
- ▶ Make sure that no one is in the danger area when raising and lowering, with the exception of the operator!

12.1 Preparing the product for storage/further use

- Only store the product on a flat surface.
- Protect the product against mechanical influences.
- Protect the product against environmental influences such as contamination and humidity.
- Observe the ambient conditions, see page 83.
- For products with mounted motor: Support the product so that the motor is not subjected to mechanical stress.

13 Disposal

- The materials used are environmentally sustainable.
- It is intended that recycling or reusing (if components are converted or replaced) should be possible. Recyclability is ensured by the selection of material and the possibility to take the components apart.
- Careless disposal of the product may pollute the environment.
- Dispose of the product in accordance with the currently applicable national regulations in your country.

14 Extension and conversion

- Do not convert the product.
- The Bosch Rexroth warranty only applies to the delivered configuration and extensions taken into account in the configuration. The manufacturer can accept no warranty claims if the system is converted or extended in a manner not listed in these instructions.

15 Troubleshooting

- If you are unable to remedy the error, please get in touch with one of the contact addresses listed at www.boschrexroth.com.

16 Technical data

See the sales catalog VarioFlow *plus*

16.1 Ambient conditions

- The transfer systems have been designed for stationary use in a location that is protected from the elements.
- Operating temperature: +0°C to +60°C (See BKBsoft about the effect of temperature on the load limit of the conveyor chain.)
- Storage temperature: –25°C to +70°C
- Relative humidity: 5% to 85%, non-condensing
- Air pressure: > 84 kPa, appropriate height < 1400 m above sea level
- Permissible floor load: 1000 kg/m^2
- The load values of the electrical drives are reduced by 15% when the system is set up in a location with an altitude > 1400 m.
- Avoid molds, fungi, rodents, and other vermin.
- Do not install or operate near industrial systems with chemical emissions.
- Do not install or operate near sandy or dusty sources.
- Do not install or operate in areas that are regularly jarred by high forces caused by e.g. presses or heavy machinery.
- Resistant to many common media used in production such as water, mineral oil, grease, and detergents. Contact your Rexroth representative if you have any doubts about resistance to specific chemicals, such as test oil, doped oils, aggressive detergents, solvents, or brake fluid.
- Avoid long-term contact with acidic or basic reacting materials.

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