Installation Instructions
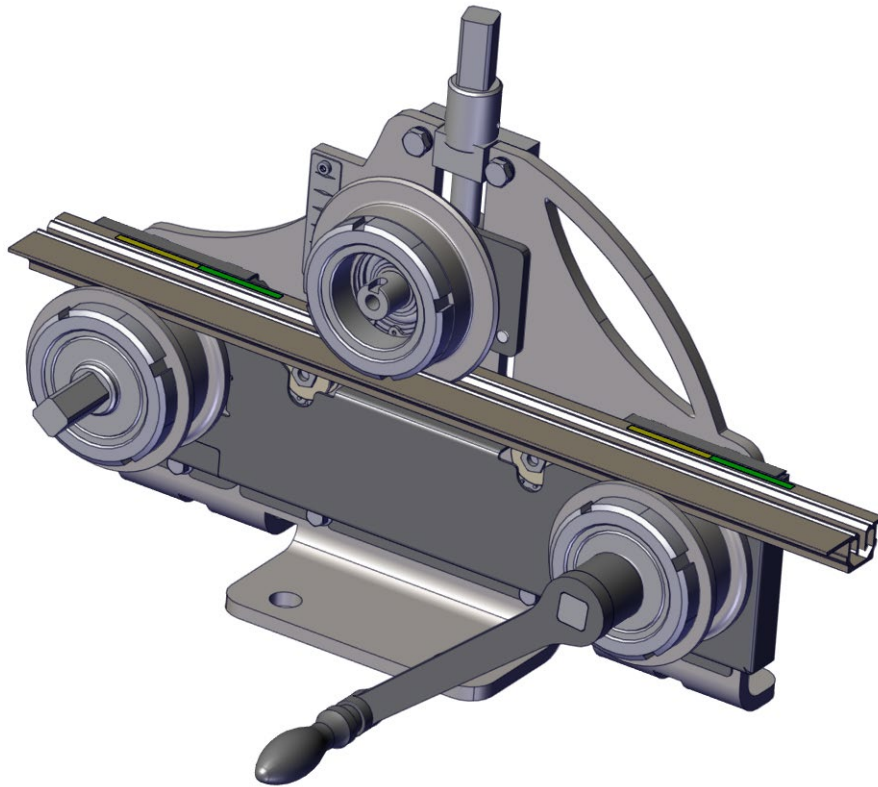
Bending Device
ProfiDAT®*compact* 0515

Order No.:
Bending Device: 08-V015-0504
Roller Sets: 05-V015-0021

Contents
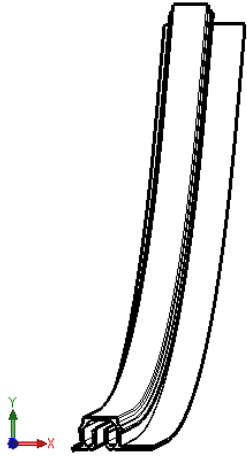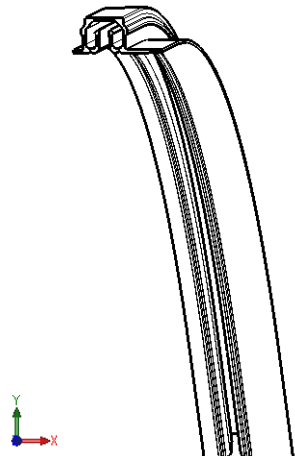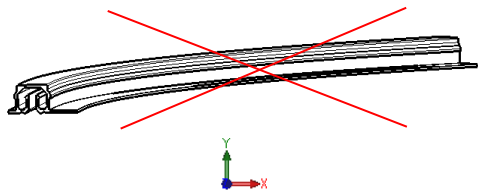
1   Bending Device Function

With this bending device, ProfiDAT® *compact* 0515 Data Rails as well as SinglePowerLine 0812 Conductor Rails can be bent horizontally and vertically (inner and outer radius) with the corresponding roller sets. A minimum radius of R = 2 m can be achieved in all.

These installation instructions explain how to handle the bending machine when bending ProfiDAT® compact 0515 Data Rails vertically (inner and outer radius). For the SinglePowerLine 0812 Conductor Rail, see MV0812-0019-EN.

0515			
	0515 Vertical outer bend	0515 Vertical inner bend	0515 Horizontal bend (inner positioning bar) (not producible with this bending device)

Vertical bend: direction of insertion (Y-axis) /bent around X-axis
Horizontal bend: direction of insertion (Y-axis) /bent around Y-axis

2 Notes

Risk of crushing!
There is a risk of crushing fingers if intentionally used to reach into the running machine.
$\rightarrow$ Wear protective clothing (safety gloves, safety shoes, etc.)!

$\rightarrow$ Do not reach into the running machine!

DANGER!

Risk of injury due to cutting and cutting off!
Cuts and cutting off can occur:
- on sharp edges of general components
- on sharp edges of data rails
- on cut edges when trimming data rails

$\rightarrow$ Wear protective clothing (cut protection gloves, arm protection, etc.)!

DANGER!

Maintain rotational speed!
The rotational speed at the crank must not exceed 60^{-1} ($1\,\text{sec}^{-1}$)!

CAUTION!

Set radius!
The radius may only set when there is no data rail between the rollers!

CAUTION!

3   Required Roller Sets

The Bending Device 08-V015-0504 is supplied **without** roller set.
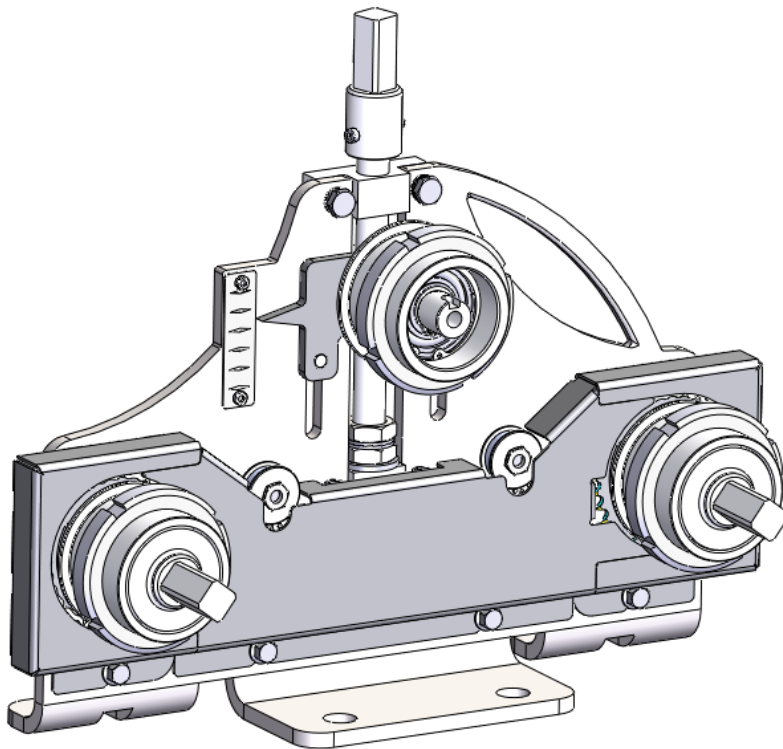

Fig. 1: Bending device

The corresponding roller sets must be ordered separately.

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Roller Set for 0515 Vertical Bend (inner and outer bend)	Additional Guide Unit for 0515 Vertical Outer Bend (only to be used for outer bends)
05-V015-0021	These components are included in Roller Set 05-V015-0021

2x   2x

23,5   5,3

Ø82   Ø99,5   Ø86   114,33

1)   1 x Guide rollers   4)   1 x Cylinder screw
2)   1 x Socket   5)   1 x Threaded pin
3)   2 x Flat head screws   6)   1 x Nord-lock disc

For 0515 Vertical Inner Bend (VIB) required rollers from Roller Set 05-V015-0021	For 0515 Vertical Outer Bend (VOB) required rollers and guide unit from Roller Set 05-V015-0021

2x   2x   2x   2x and …

23,5   5,3

Ø82   Ø99,5   Ø86   114,33

…1x

4   Design
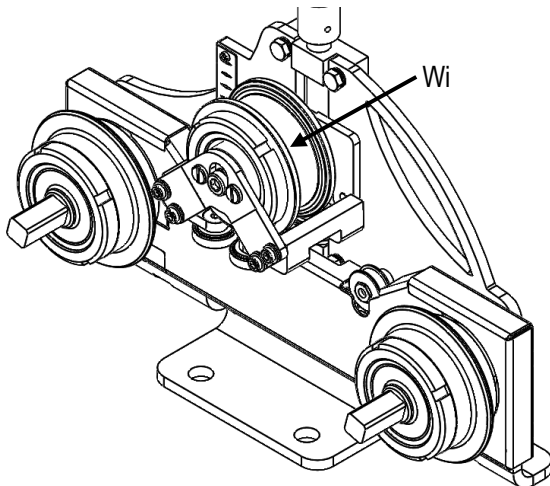

Fig. 2: Bending device with roller set
for **0515 Vertical outer bend**
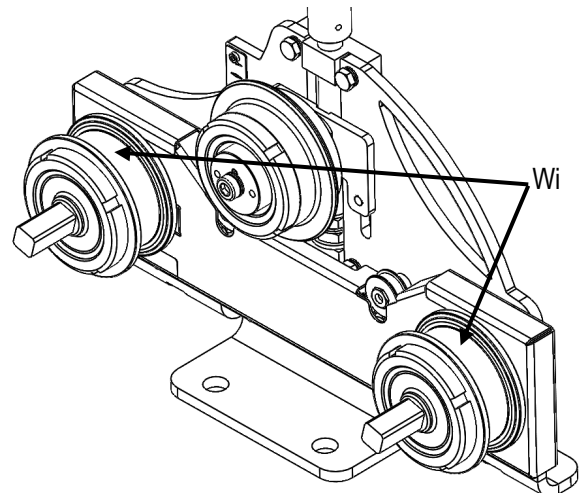- the upper roller (1x) has a groove with the width Wi=18.6 mm

Fig. 3: Bending device with roller set
for **0515 Vertical inner bend**
- the lower rollers (2x) have a groove with the width Wi=18.6 mm

5   Install Roller Set

Data rails can be bent vertically with this bending device. The bending device is supplied without a roller set. For installation of the separately ordered roller set, a hook wrench with nose may be required (suitable for size 80-90 mm – KM13), with which the groove nut can be opened.

Fig. 4: Hook wrench

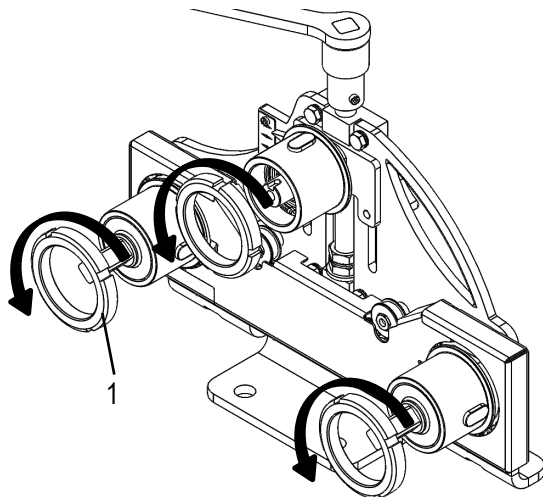|	
⚠️ **CAUTION!**	**Fix the bending device** Before starting work, fix the bending device on a solid surface!

Work steps:

→   Loosen groove nuts (1)

Fig. 5: Loosen 3 x groove nuts

→   Slide on the roller set for the vertical bend. Ensure that the feather key groove is correctly aligned.
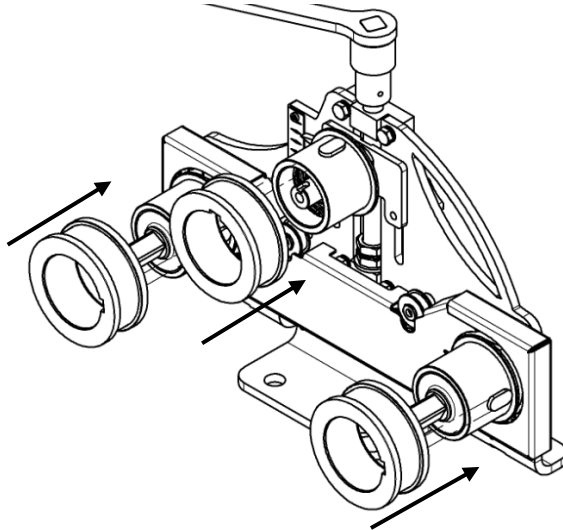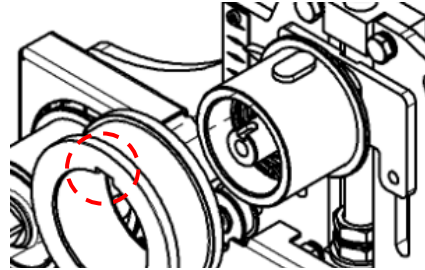
Fig. 6: Slide on roller set
(roller set for 0812 Horizontal bend shown here)

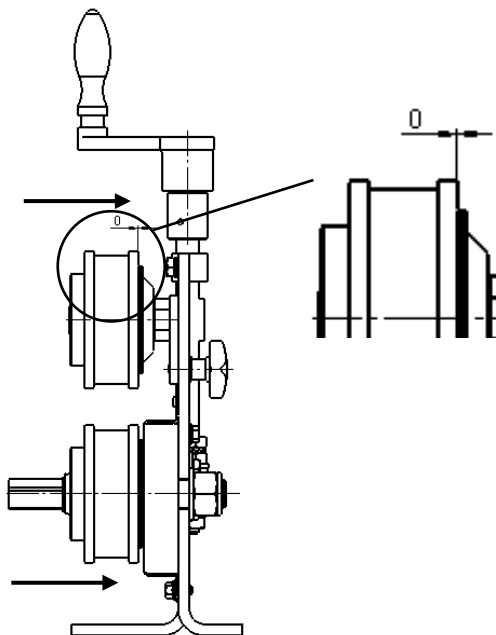→ Slide the rollers up to the mechanical stop.

Fig. 7: Slid-on roller set
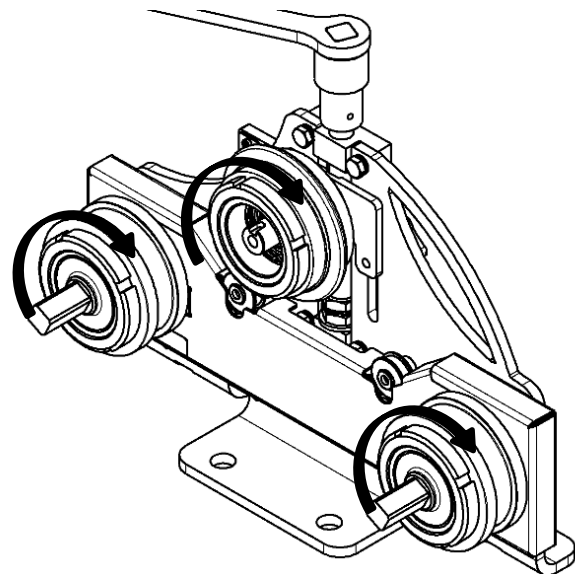(roller set for 0812 Horizontal bend shown here)

Fig. 8: Rollers fixed with groove nuts
(roller set for 0812 Vertical inner bend shown here)

→ Tighten the groove nuts manually.

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For the production of vertical bends outer, a guide unit must also be mounted on the upper bending roller.
Work steps:

→ Slide the socket (2) onto the axis of the upper roller. Screw in the threaded pin (5) to align the socket (2) flush, and mount the socket (2) with the Nord-lock washer (6) and cylinder screw (4) (see Fig. 9 to Fig. 11). These parts may remain on the bending device after installation has occurred. They do not interfere with the production of other bends.
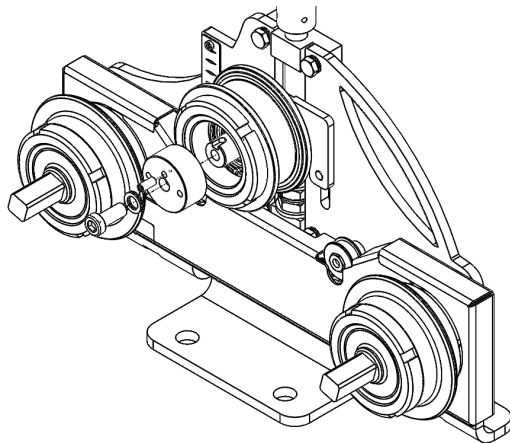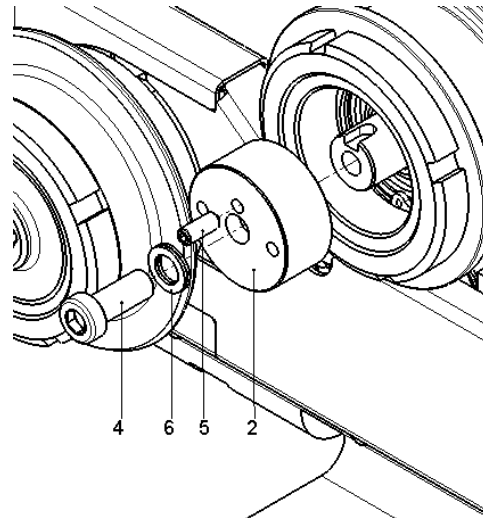
Fig. 9: Installation of additional guide unit socket

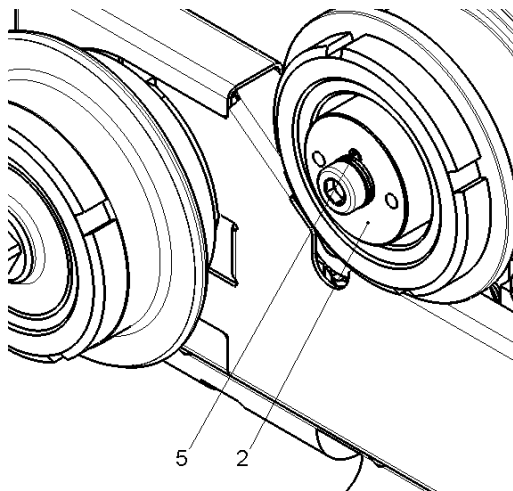Fig. 10: Installation of additional guide unit socket

Fig. 11: Grub screw (5) flush with socket (2)

→ "Hang" the guide rollers (1) for the outer bend over the cylinder screw (4) and push them upward in order to fasten them to the socket (2) with the two flat head screws (3) (see Fig. 12 to Fig. 15).
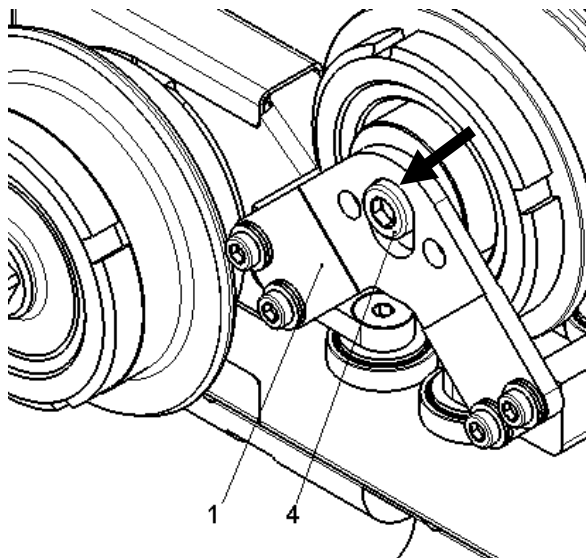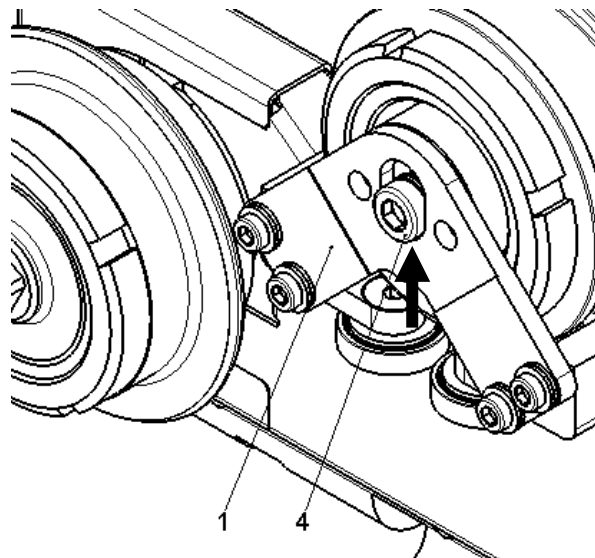

Fig. 12: Installation of guide rollers (1)

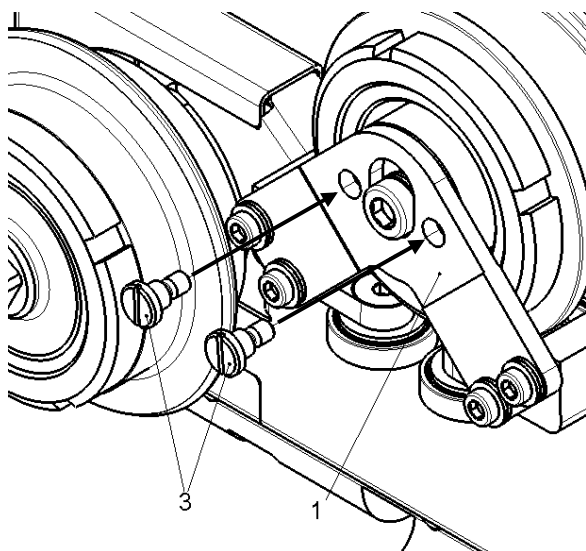Fig. 13: Installation of guide rollers (1)
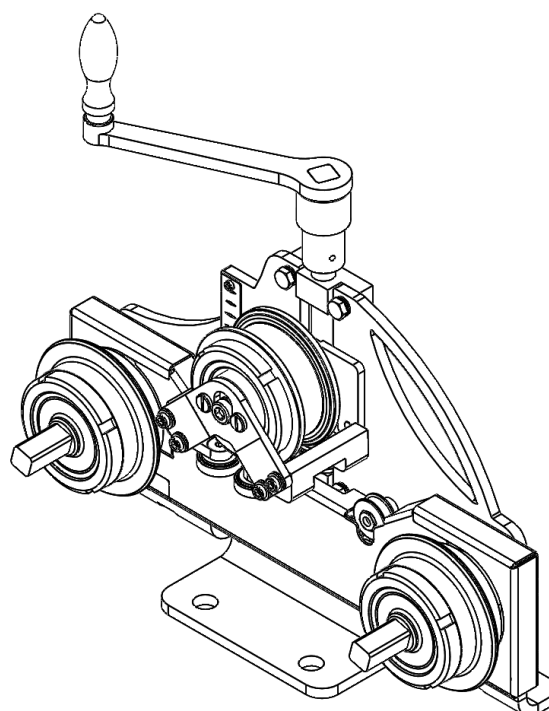

Fig. 14: Fix guide rollers (1) with flat head screws (3)

Fig. 15: Bending device with additional guide unit for the production of vertical outer bends.

6   Produce Bend

Although the profile is roughly symmetrical, slight twisting cannot be completely ruled out.
By installing the data rail bend in the hanger clamp, the data rail is generally well aligned, so that the passage of the collector is not impeded.

CAUTION!

The data rail may deform during bending!
In the case of a deformed profile cross-section, there is a risk of the sliding contact jumping out of the grooves or the antenna jamming in the gap.
It is essential to use the guide unit provided for vertical outer bends (see Fig. 9 to Fig. 15) in order to counteract deformation of the profile cross-section!

Before starting to bend the data rail, it must be cut to the correct length.

The length L is calculated as follows:

$$L = 2 * Rx * \pi * \alpha/360 + 300$$

Rx= Bend radius R + 11 mm for vertical outer

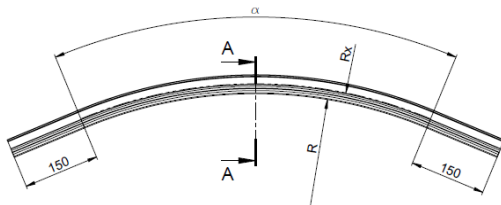Rx= Bend radius R - 11 mm for vertical inner

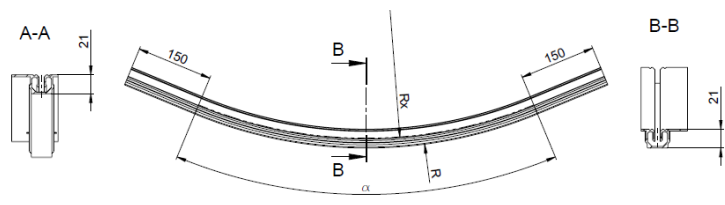α= Angle of bend

Fig. 16: Vertical outer bend

Fig. 17: Vertical inner bend

At the beginning, the arrow on the diamond scale (to the left of upper roll) should be placed between the 3rd and 4th diamond (see Fig. 18 and Fig. 19).

For setting up vertical inner bends, the data rail to be bent can also be placed on the two lower rollers, and the upper roller can be turned down until it rests on the data rail (see Fig. 20).

Do not create any pressure on the data rail!
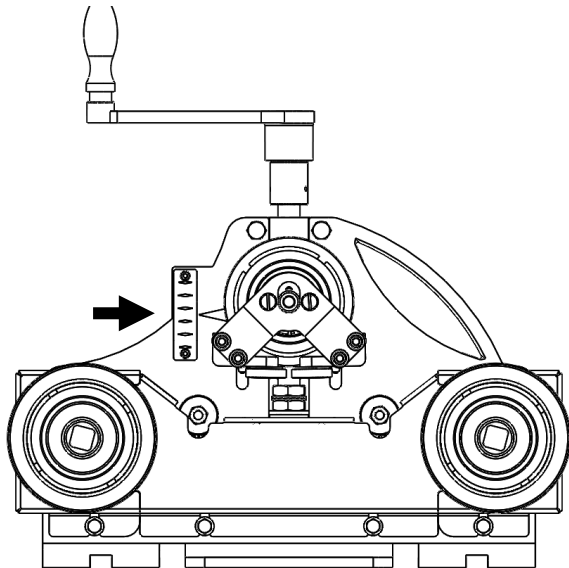
Fig. 18: Adjustment at start of bending (for inner and outer bends)

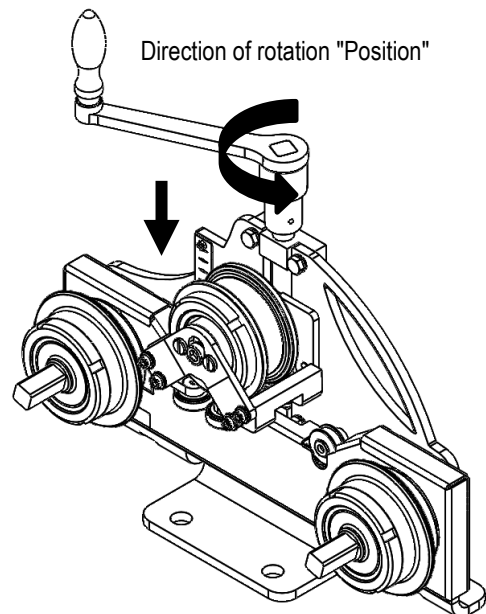Direction of rotation "Position"

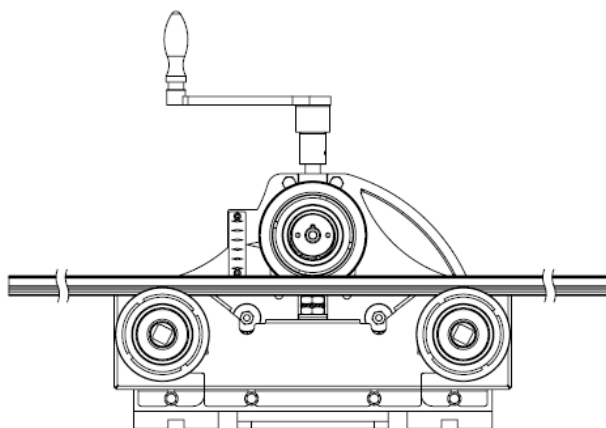Fig. 19: Illustration "Position" (for vertical outer bend shown here)

Fig. 20: Position upper roller until it comes into contact with the data rail (in case of vertical inner bend)
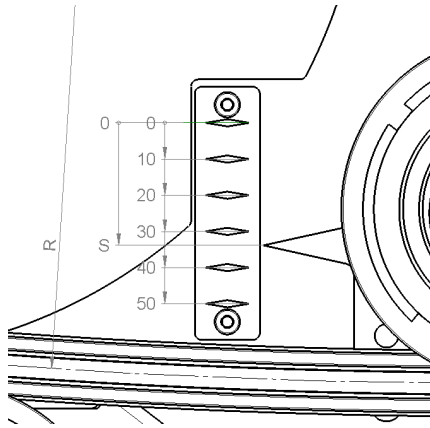
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ProfiDAT® *compact* 0515				
	Vertical Inner Bend		Vertical Outer Bend	
	Radius R [m]	Dimension S [mm]	Radius R [m]	Dimension S [mm]
	~ 2.5	~ 3.5	~ 2	~ 3.7
	~ 3	~ 3.3	~ 3	~ 3.4
	~ 4	~ 3.1	~ 5	~ 3.2

Table 1: Adjusting the diamond scale for ProfiDAT® compact 0515

Work steps:

→ Place the data rail in front of the bending device (e.g. roller blocks).

→ The desired radius is achieved by the gradual positioning of the bending roller. For radii larger than 4 m, positioning is possible with approx. one crank rotation, for radii smaller than 4 m with max. ½ crank rotation (see Fig. 18 and Fig. 19).

CAUTION!   **Positioning the roller with the data rail inserted can destroy the bending device!**

→ Insert the data rail and position upper roller until it comes into contact.

→ Pull out the data rail and, after adjusting, make approx. 2 rotations once and fix the upper roller with a star knob screw on the back of the bending device (see Fig. 21).
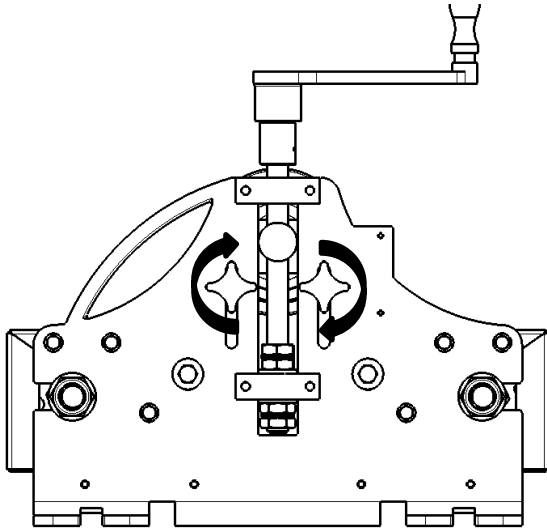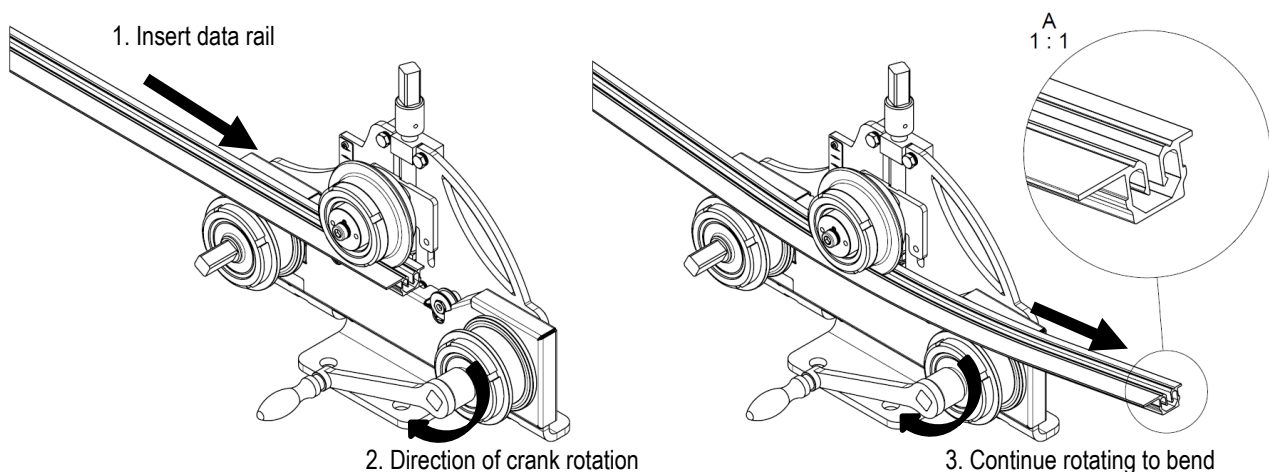
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Fig. 21: Fix upper roller

To bend the data rail, always insert it from the left and execute it on the right.

In the case of data rails with a flange for positioning strips, this always points toward the worker.

→ The data rail is gradually bent into ever smaller radii. The direction of rotation in which the deformation occurs should always be the same, i.e. after reaching an intermediate radius, first position again and then reinsert the data rail. The upper roller must always be fixed during bending.

→ Repeat this process until the desired radius is reached. The approximate settings are shown Table 1.
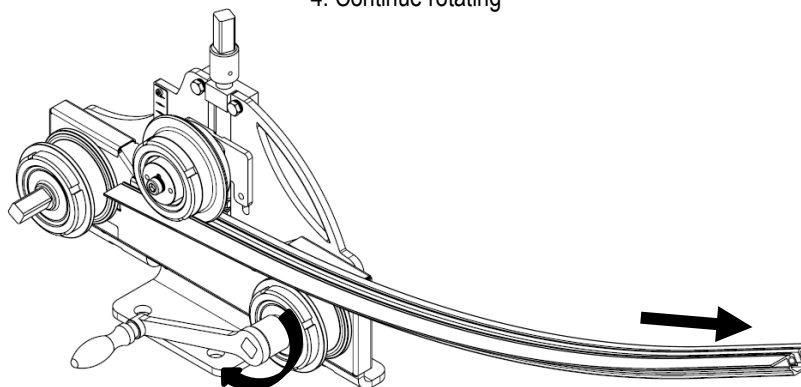

1. Insert data rail

2. Direction of crank rotation

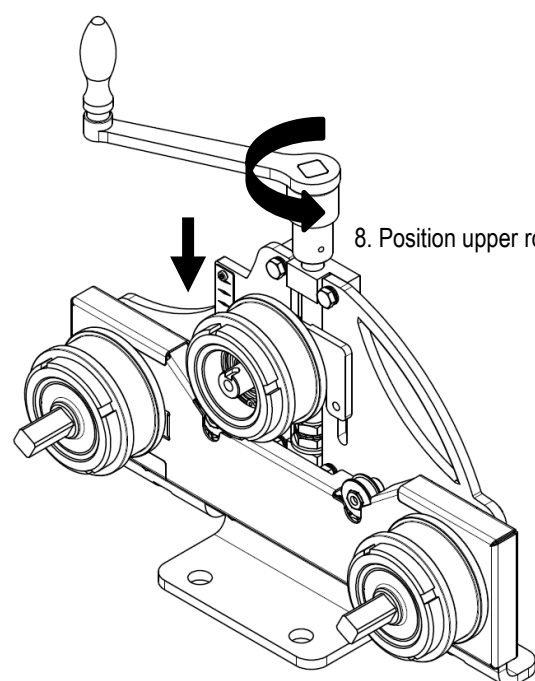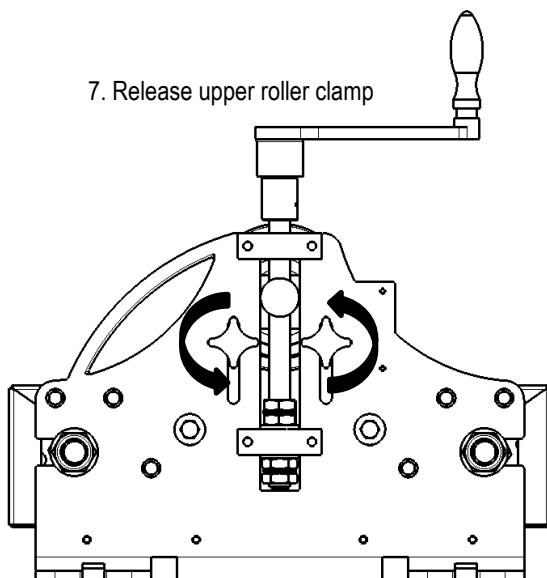3. Continue rotating to bend

A
1 : 1
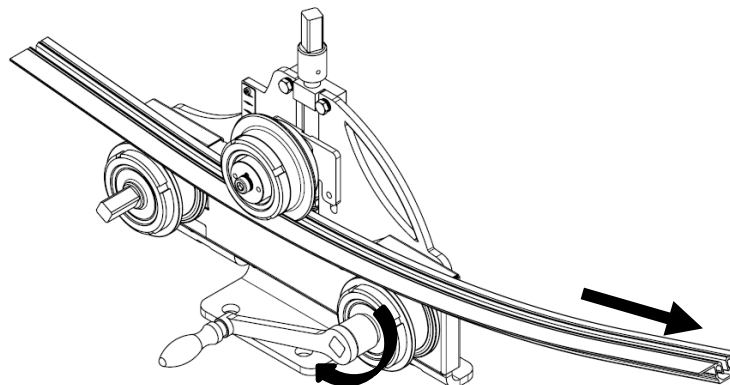
4. Continue rotating

5. Rotate until the conductor bar rolls from the left roller

6. Remove rail and set aside

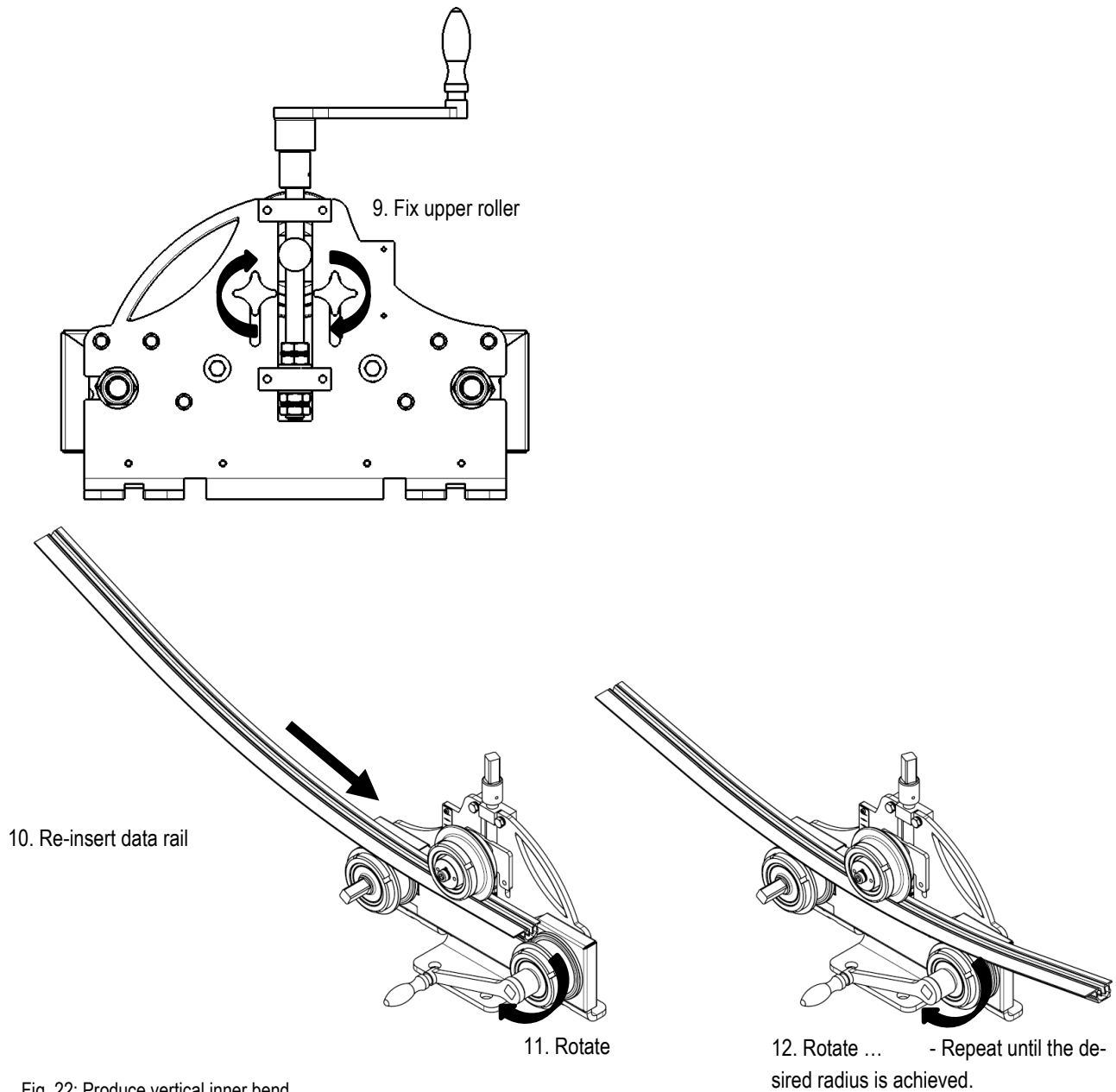7. Release upper roller clamp

8. Position upper roller

9. Fix upper roller

10. Re-insert data rail

11. Rotate

12. Rotate …   - Repeat until the desired radius is achieved.

Fig. 22: Produce vertical inner bend

For the production of a vertical outer bend, install the additional guide unit supplied. (for installation, see Fig. 9 to Fig. 15). During bending, the data rail is additionally guided in the guide unit in order to limit the widening of the slot.
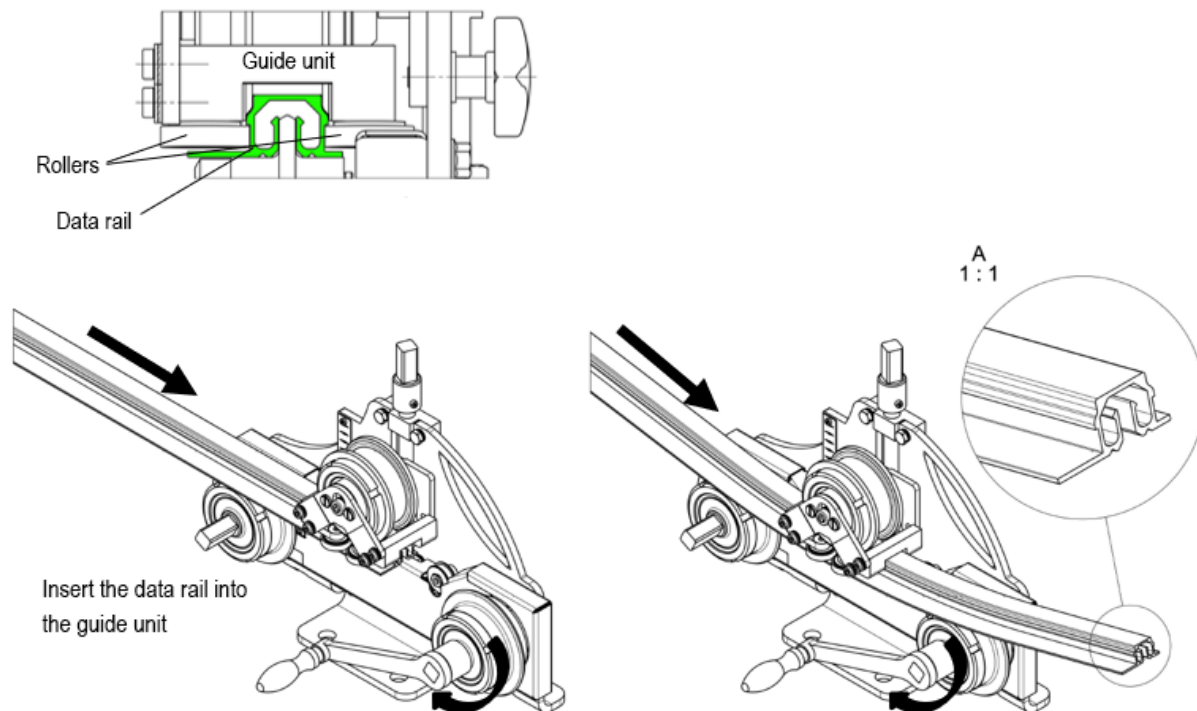

Fig. 23: Produce vertical outer bend (data rail is additionally guided between the rollers of the guide unit)

7   Trim Bend

The ends of the bends remain straight during each bending operation to a length of approx. 140-160 mm before a slight kink forms, depending on the radius. For radii > 2500 mm, the "Kink" is not yet visible.

Fig. 24: 0515 straight piece with kink (test bending to R=1100 mm)

The straight piece is now correspondingly shortened, depending on the use.

For use with rings, a straight piece of 85 mm on both sides or 50mm to the right and left of the infeed is required.
For EMS applications, the profile can be used without shortening. The preceding and following straight rails are trimmed accordingly.
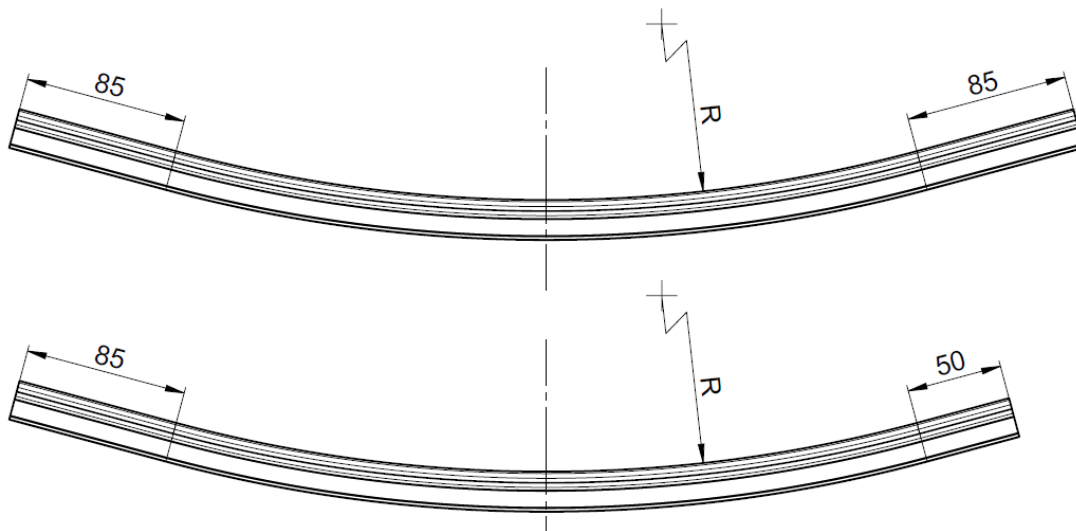

Fig. 25: Vertical outer bend for use with rings. Top: Standard bend – Bottom: Bend to the left of a line feed

⚠️ **CAUTION!**   **When used in EMS systems: The supplied standard bends have a straight end of 300 mm! The bends produced with this bending device are only approx. 150 mm!**
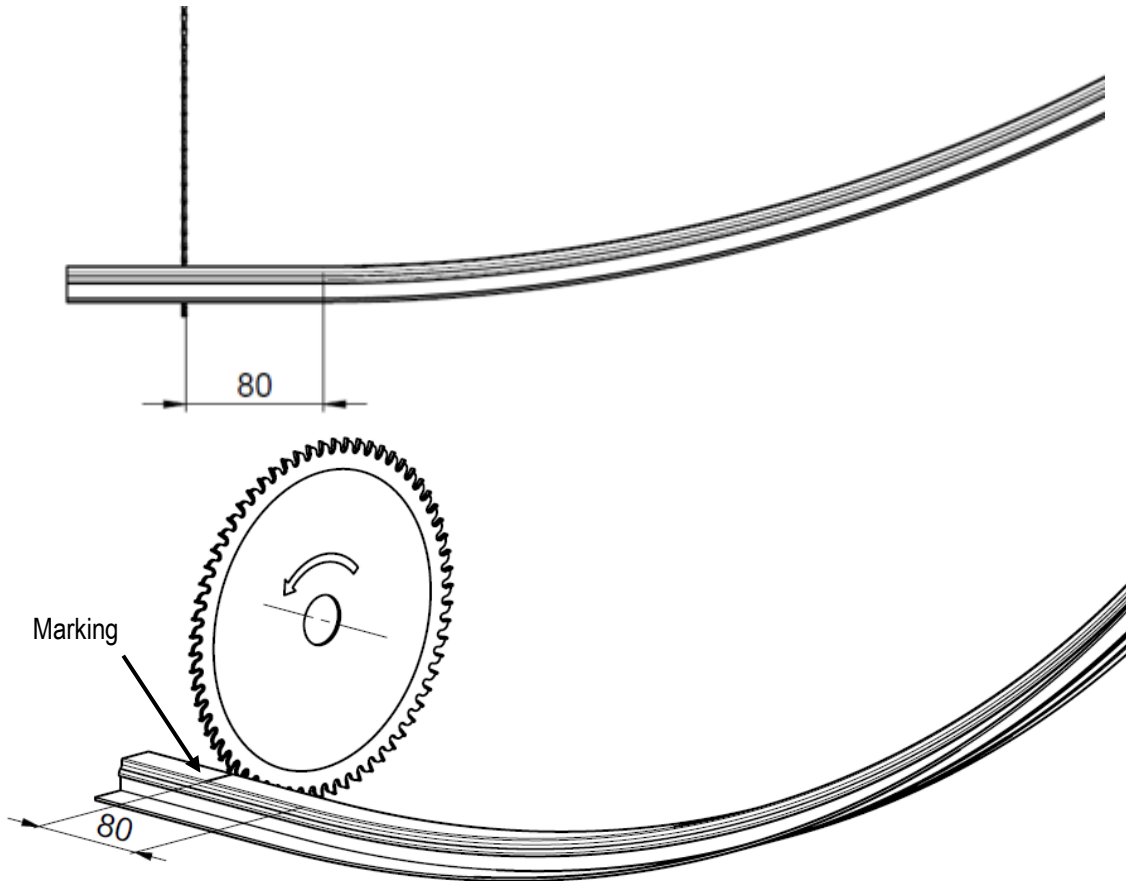
Fig. 26: Trim ProfiDAT® *compact* bend (length of the straight end for use with rings)

The cutting direction must be from the closed rail side!

The cut must be made at right angles to the surface!

The connection points between the ProfiDAT®compact profiles have a great impact on the damping of the system. In order for the damping to be as low as possible, the profiles must be precisely machined and connected at the connection points. We therefore recommend that the installation only be carried out by Conductix-Wampfler personnel.

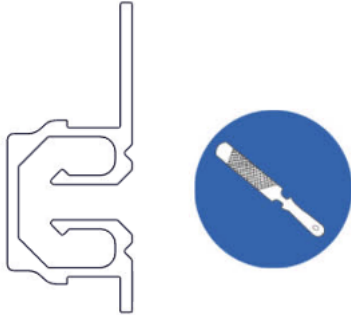→ Deburr and clean the data rail and insulation profile all around!

Fig. 27: Debur data rail

It must be ensured that there are no chips in the data rail after trimming!

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