



**Technical Instruction
for the Installation and
Maintenance
of the low-maintenance clamp lock (EVZ)**

Free translation from

Deutsche Bahn AG
low 92.1034

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Responsible: DB Netz AG
Technologiemanagement Fahrwegtechnik I.NVT
41 Caroline-Michaelis-Str. 5-11, 10115 Berlin,
Tel. 030-297 57192

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A 02	01/14	Complete revision	
A 03	03/14	Side attachments	12
A 04	07/14	Hexagon socket screw key Screws corrected	3 14
A 05	06/15	Remarks for the locking box added Sliding insert	7 14
A 06	01/17	Chapters 5.2 and 5.3 added Assignment of side attachments revised	12 12ff

1 Requirement, Use

The low-maintenance clamp lock EVZ can be used in any type of turnouts and points, with rails S49, S54 and UIC60.

The basic adjustment of the eccentric bushing in the switch rail

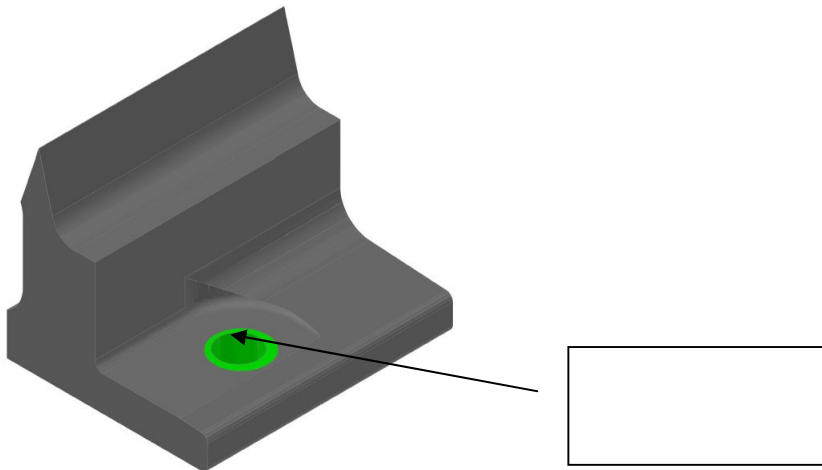



Fig. 1 Adjustment of the eccentric bushing

 Required tools for installation	
<ul style="list-style-type: none">• Torque Wrench with a setting range of 15 to 50 Nm (Wrench insert 13)• Torque Wrench with a setting range of 100 bis 300 Nm (Wrench inserts 24, 30 und 36)• Flat wrench or Ring wrench with wrench sizes: 2x13, 2x24, 1x30 und 1x36 mm• Hexagon socket screw key (14), shortened to 25 mm (Fig. 2)• Feeler gauge (0.5 mm), shims (4 / 5 mm),• Gauging tool for locking throw and overlapping• Nylon hammer	
<i>Hinweis: Aufgrund der beengten Einbaulage in Verschlusschwellen sowie an der Vks 6a bei Mittelverschlüssen sind Drehmomentschlüssel mit Ringschlüsseleinsatz zu verwenden (Bild 3).</i>	

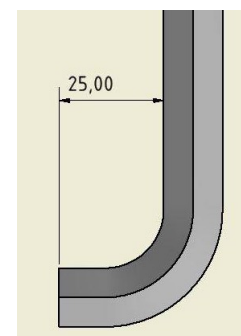


Fig. 2 Hexagon socket screw key



Fig. 3 Torque Wrench with insert

2 Installation of the Clamp Lock EVZ

- The low-maintenance clamp lock is delivered partly assembled in a wooden crate.

2.1 Assembly of the tongue attachment with pushing rod

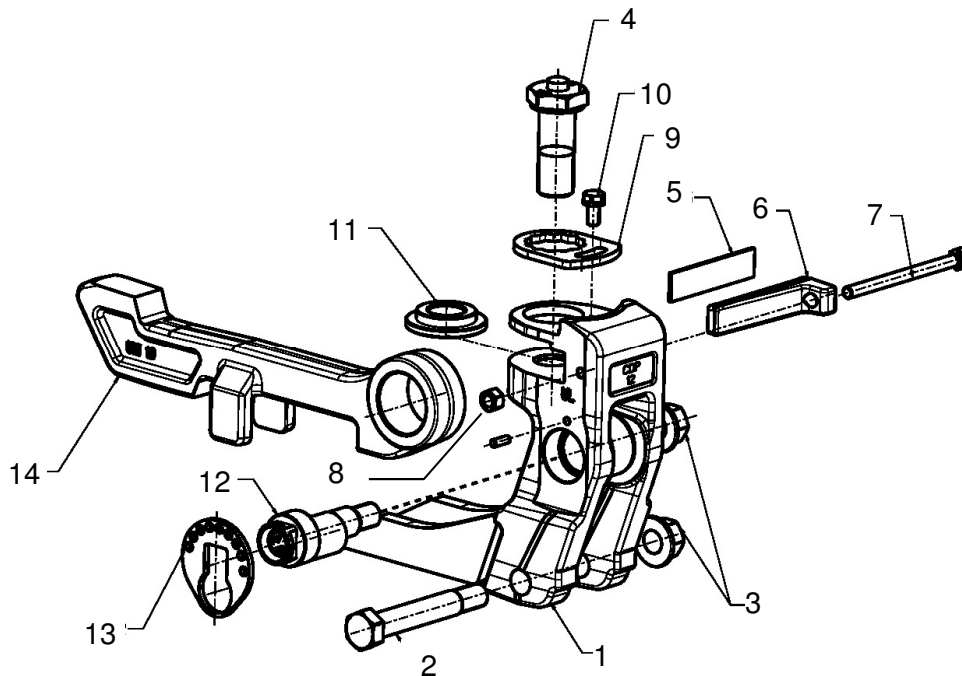


Fig. 4 Tongue attachment exploded view

- | | |
|---|-----------------------------------|
| 1. Tongue attachment | 7. Hexagonal screw |
| 2. Fitted bolt | 8. Safety nut M8 for wedge fixing |
| 3. Nut M16 | 9. Safety shim Sib 20 |
| 4. Locking bolt
First device: Vks 6
Second device: Vks 6a | 10. Safety screw |
| 5. Adjustment shim | 11. Collar bushing |
| 6. Wedge | 12. Eccentric bolt |
| | 13. Fixing shim |
| | 14. Locking clamp |

- Pre-assembled tongue attachment with clamp and pushing rod part* to be positioned on the tongue rail foot and the locking bolt Vks 6 (respectively Vks 6a) to be slightly fixed. The right assignment of the according side has to be considered. The fixing shim has to show in the direction of the beginning of the turnout.
- Correct adjustment shim to be chosen (5) and wedge to be driven by impact (6) for protection against turning
- Protection of the wedge by a hexagonal screw (7) and safety nut (8)
- Locking bolt to be fixed

- Assembly of the safety shim Sib 20 (9), the locking bolt (4) and the safety screw (10)

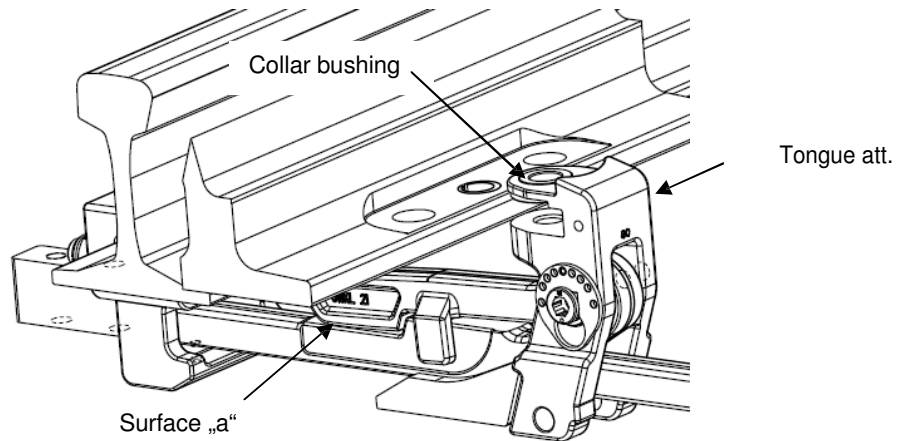


Fig. 5 Assembly of the tongue attachment

Remarks:

- The clamp must lay on the surface „a“ of the pushing rod, to push the clamp underneath the stock rail foot.
- In condition as delivered, the collar bushing (10) is glued to the tongue attachment (1) for easier assembly (Fig. 5)
- Wedge to be inserted maximum to the corner arc. If necessary, adjustment shims need to be used. The tip of the wedge does not need to overlap on the opposite side (Fig. 6).
- In case, the bolt of the wedge gets contact to the control rod, an additional bushing has to be installed (Fig. 6 – left hand).
- For disassembly of the wedge, an according tool has to be used (e.g. drill bit) at the angled end.
- Not used material (bushings, shims, socket screw key) has to be handed over to the maintenance team!

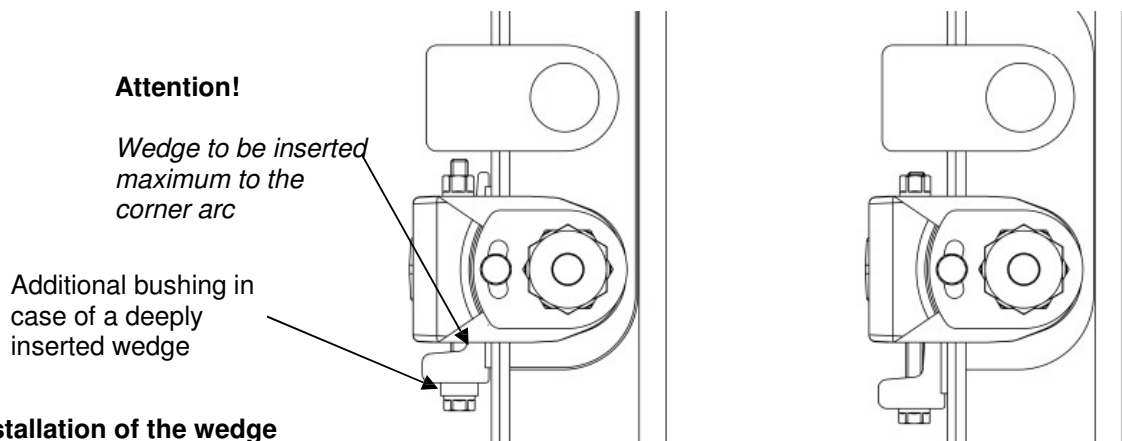




Fig. 6 Installation of the wedge

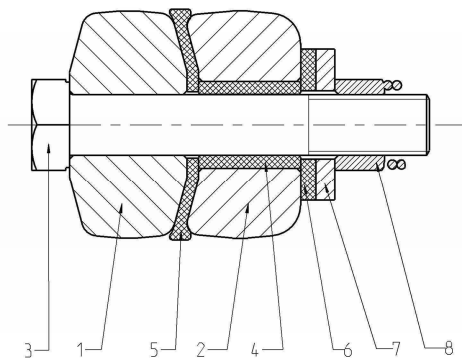
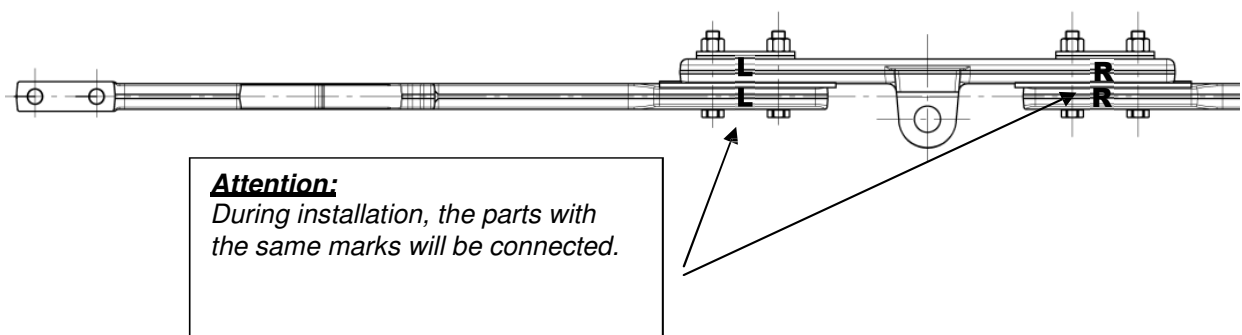
	Tightening torque	Tool
Safety nut M8 for wedge (Fig. 4, item 8)	20 Nm ± 2 Nm	Torque wrench SW 13
Safety screw M8 for safety shim Sib 20 (Fig. 4, item 10)	50 Nm ± 5 Nm	Torque wrench SW 13
Locking screw Vks 6 resp. Vks 6a (Fig. 4, item 4)	300 Nm ± 30 Nm	Torque wrench SW 36

2.2 Assembly of the pushing rod

- Bolting of the two parts of the pushing rod with the intermediate plate and according insulating material (Fig. 7).

Remarks:

- *Intermediate plate with connecting lug:*
 All first devices except installation in a hollow bearer
- *Intermediate plate without connecting lug:*
 All second devices and all first devices installed in a hollow bearer
- *Intermediate plates are always located in direction of the end of the turnout*
- *The connecting lug is located in direction of the beginning of the turnout*
- *The bolted connection can also be done in opposite direction as to the shown fig. 7*



1. Pushing rod part
2. Intermediate plate
3. Hexagonal screw M16 x 95 (SW24)
4. Insulating bushing UIB 1/1
5. Insulating plate ULP 1
6. Insulating plate ULP 2
7. Shim UUL 3
8. Safety nut M16 (SW24)

Fig. 7 Assembly of the pushing rod

	Tightening torque	Tool
Safety nut M 16 (Fig. 7, item 8)	100 Nm ± 10 Nm	Torque wrench SW 24

2.3 Assembly of the locking box

- Screws of the profile adjustment rod to be loosened and the profile adjustment rod to be pushed inside
- Locking boxes to be stuck to the outer sides of the rail feet
- Hook bolts of the locking boxes to be mounted and fixed with self-locking nuts and to be tightened for achieving a contact to the rail foot (Fig. 8)
- Locking boxes to be positioned centralized to the holes of the tongue rails (consider temperature during installation!)
- Fixing of the profile adjustment rod for achieving a contact between locking box and bottom side of the rail foot
- Hook bolts of the locking boxes to be tightened

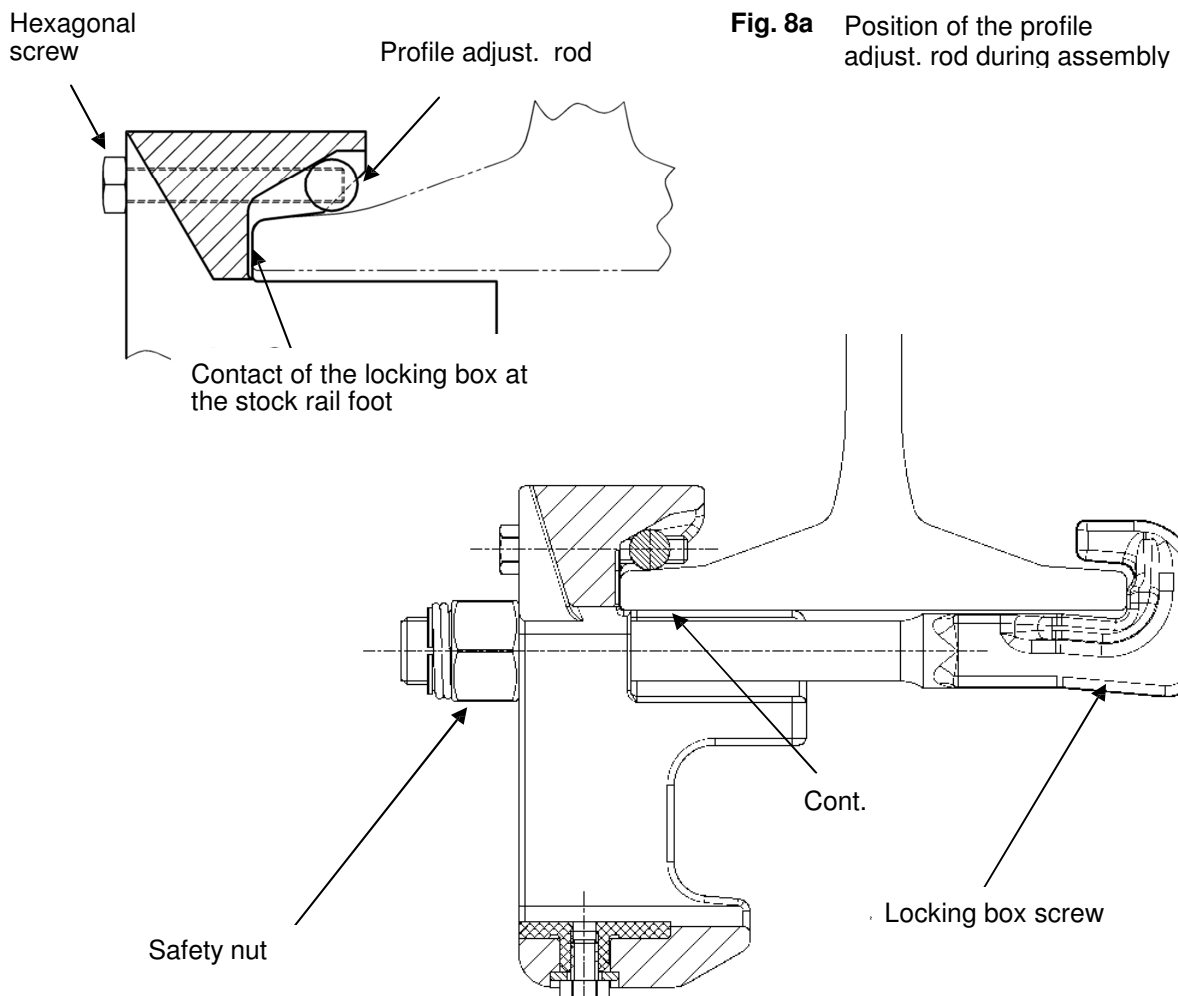


Fig. 8b Assembly of the locking box

	Tightening torque	Tool
Safety nuts M 20 of the locking box screws	200 Nm ± 20 Nm	Torque wrench SW 30
Screws M 8 of the profile adjustment rod	20 Nm ± 2 Nm	Torque wrench SW 13

3 Adjustment of the clamp lock

- Bolting of the eccentric bolt to be released, until the fixing shim is positioned outside of the interference of the cotter pin (Fig. 9)
- Pushing rod to be positioned in one end position
- Adjustment of the clamp length by turning the eccentric bolt with Hexagon socket screw key 14 mm
- Fine adjustment to the next hole in the fixing shim (Fig. 10) and tightening the nut of the eccentric bolt

Hinweise:

- The correct longitudinal position of the clamp is achieved, as soon as the clamp pushes against the locking box (noticeable resistance of the eccentric bolt) during a given gap of 0.5 mm between stock and tongue rail.
- The flat shaped side of the eccentric bolt avoids an adjustment outside of 180° (maximum adjustment).
- Using the reverse side of the fixing shim, further hole positions can be used.

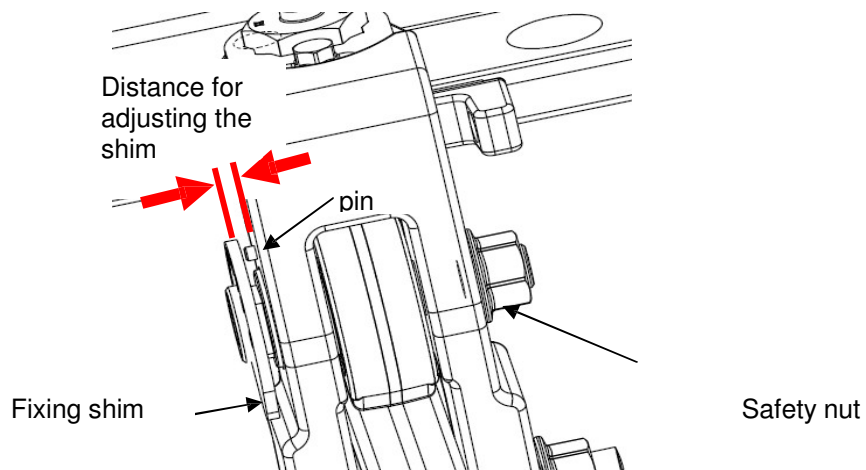


Fig. 9 Release of the eccentric bolt for adjustment of clamp length

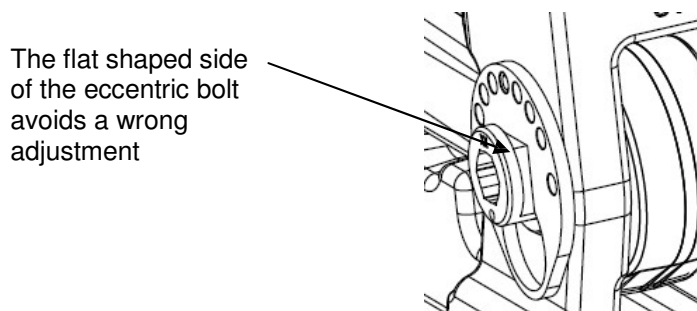


Bild 10 Fine adjustment of the eccentric bolt

	Tightening torque	Tool
Safety nut M 16 (Bild 9)	100 Nm ± 10 Nm	Torque wrench SW 24
Eccentric bolt	-	Hexagon socket screw key 14

Assembly of the safety shim:

- Side openings to snap over the head of the eccentric bolt and the flange of the safety nut (Avoids losing fixing shim, eccentric bolt and safety nut; fig. 11)
- Protection of the locking screw by snapping of upper hole over the pin of the locking screw (Fig. 12)

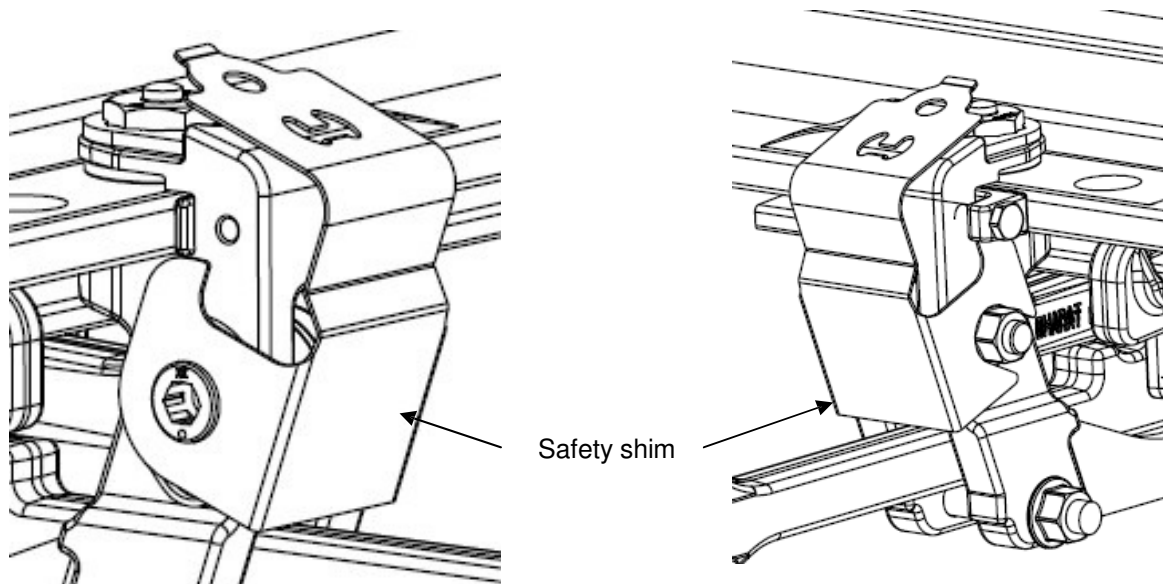


Fig. 11 Assembly of safety shim

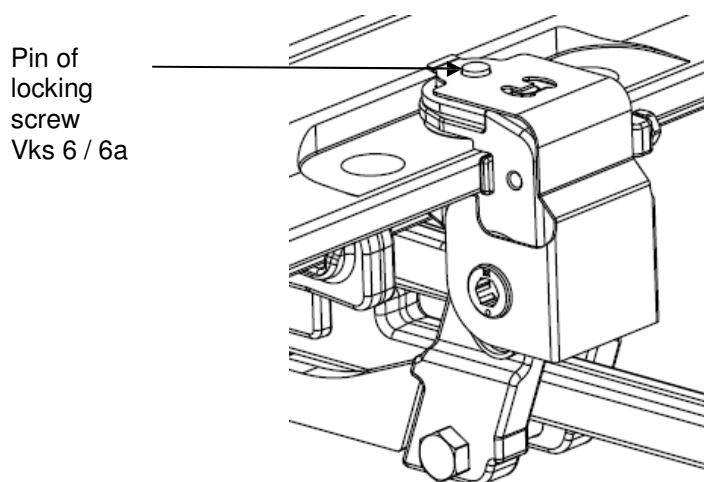


Fig. 12 Fixing by snapping over the pin of the locking screw

Attention!

The safety shim has to snap over the pin of the locking screw until it lays firmly on the head of the locking screw. In case it does not, the shim can be slightly bended.

4 Verification of the correct adjustment

4.1 Symmetrical tongue opening

- The tongue opening shall be approx. The same on both sides.

4.2 4 mm-test (First device) respectively 5 mm-test (Second device)

- With positioning of a 4 mm thick obstacle between stock and switch rail, the locking device must not achieve the locked end position after operation. (If necessary, the longitudinal position of the clamp needs to be shortened.)

4.3 Overlap and idle stroke

- Verification of the overlap and idle stroke measure will be executed by using a measuring gauge according to DB-drawing S414.09 Bl.2.

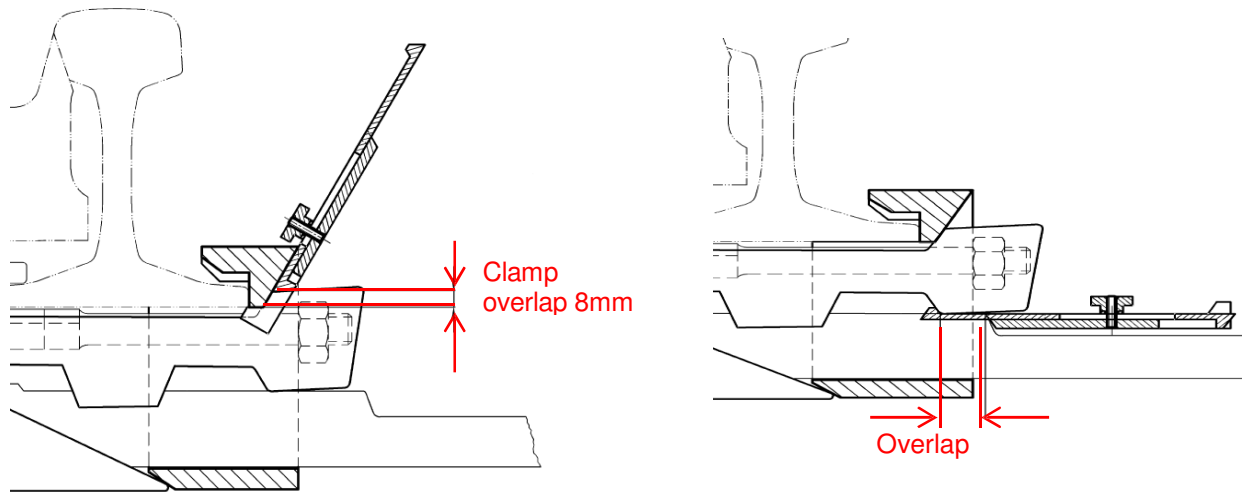


Fig. 13 Using gauges

5 Special features for curved switches and diamond crossings:

5.2 Curved switches

The offset of the switch blade hole in curved switches must be compensated for by packing 3 mm thick intermediate plates in the valve rod (Fig. 14). The clamp and valve rod must be aligned with each other.

If using intermediate plates (shims) the standard M16x95 bolts must be replaced with M16x100 bolts. The equalization kits are supplied by the turnout manufacturer together with the points, according to the information on the layout drawing and are to be taken into account when installing the guide rods.

In general, two intermediate plates maximum must be used, the overhang of the thread (at least 1.5 thread turns) must be met.

Up to 5 shim plates may be used for adjustment; in this case, M16x115 bolts must be used.

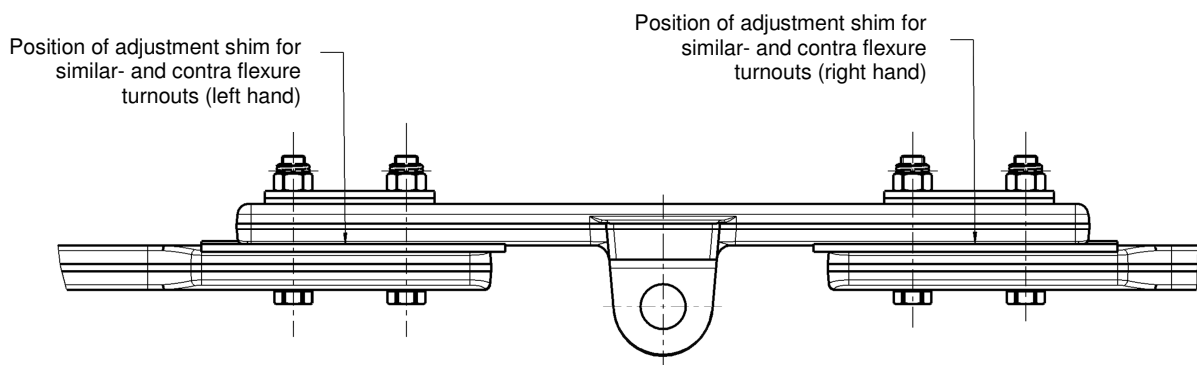
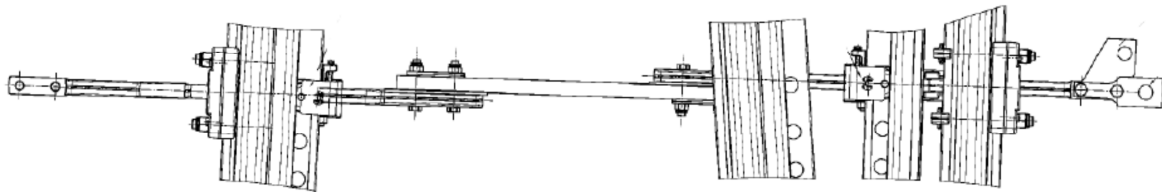


Bild 14 Installation of adjustment shims for curved switches

Turnout geometry	Radius of main track	Adjustment height
ABW 54-190	$1410 \text{ m} \geq R_s \geq 705 \text{ m}$	3 mm
	$705 \text{ m} \geq R_s > 470 \text{ m}$	6 mm
IBW... - 300	$1500 \text{ m} \geq R_s \geq 840 \text{ m}$	3 mm
	$840 \text{ m} \geq R_s > 560 \text{ m}$	6 mm
IBW... - 500	$1500 \text{ m} \geq R_s \geq 968 \text{ m}$	3 mm
	$968 \text{ m} \geq R_s > 645 \text{ m}$	6 mm
IBW... - 760	$1500 \text{ m} \geq R_s \geq 1178 \text{ m}$	3 mm
	$1178 \text{ m} \geq R_s > 785 \text{ m}$	6 mm
IBW... - 1200	$1500 \text{ m} \geq R_s \geq 1155 \text{ m}$	3 mm
	$1155 \text{ m} \geq R_s > 770 \text{ m}$	6 mm

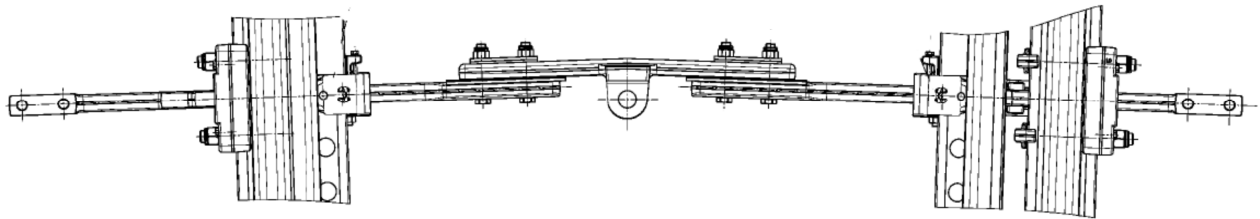
5.2 Slip diamond crossing

Within single or double slip diamond crossing EKW 49/54-190 / DKW 49/54-190, the offset of the holes in the tongue rail foot are compensated by a relocation of the outer parts of the valve rod related to the intermediate part.



5.3 Diamond crossing

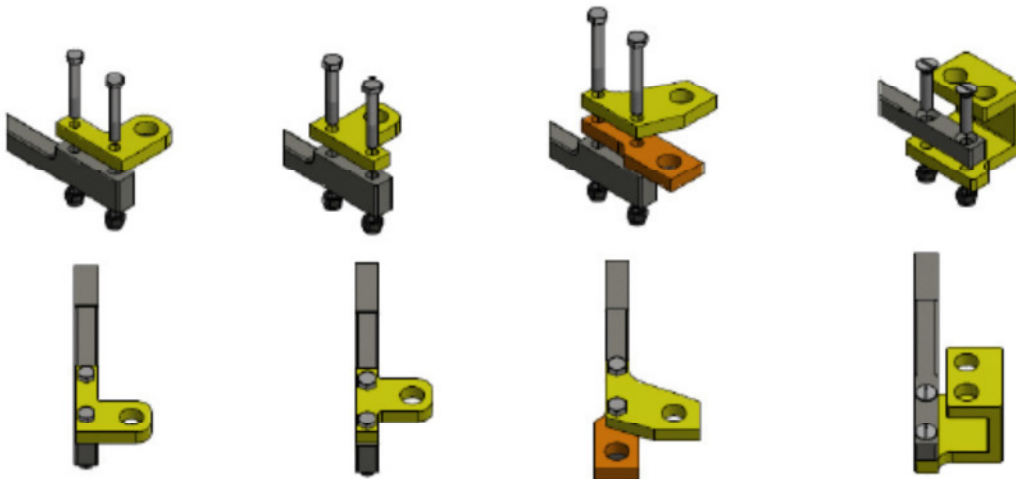
Within diamond crossings, locking devices with curved valve rods will be installed at moveable obtuse crossings.



6 Assembly of the side attachments for pushing rods

- For achieving the connection sizes to transmission parts (position of connection holes in the valve rod of the claw lock) the first and second locks need to be equipped with according side attachments.
- Side attachments for lever rods have to be positioned in the direction of the end of the switch. Side attachments for the pushing rod (only for first devices in hollow bearer) have to be positioned in the direction of the tip of the switch.
- The side attachments have to be bolted in according position with hexagonal screws M16x100 and safety nuts M16. In case of switches, mechanically operated from distance, flat head screws have to be used.
- Side attachments for setting lever connection rod for turnouts without hollow bearer will be delivered together with the claw lock device (Fig. 16).
- Side attachments for switches with hollow bearers have to be ordered separately (Fig. 17).

Spitzen- verschluss EW, EKW/DKW 500	Mittel- verschlüsse	Kreuzungs- weichen DKW/EKW 190 Antrieb fernliegend	mechanisch ferngestellte Weichen
Seitenangriff EVZ 1	Seitenangriff EVZ 2	Seitenangriff EVZ 3 + EVZ 4	Seitenangriff EVZ 5R (Bild) EVZ 5L



← **Beginning of turnout**

Fig. 16 Assembly of side attachments in turnouts without hollow bearers



← **Beginning of turnout**

Fig. 17 Assembly of side attachments in turnouts with hollow bearers

	Tightening torque	Tool
Safety nut M 16	100 Nm ± 10 Nm	Torque wrench SW 24

7 Maintenance

7.1 Maintenance

The device is nearly lubrication free. Lubrication has to be done only during regular inspection.

7.2 Inspection and repair

7.2.1 Inspection

Inspection has to be executed according to 892.9302A20.

7.2.2 Repair

In case of wear and tear the sliding insert in the locking box can be exchanged by release of the bolting at the bottom side (Fig. 18).

Therefore the pushing rod has to be dismantled.

Together with a new sliding insert, a new bolting has to be used.

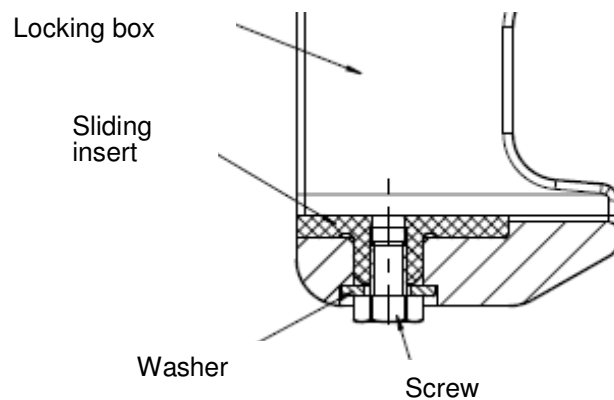


Bild 18 Exchange of the sliding insert in the locking box

Remark

The sliding insert needs to be exchanged before wear and tear occurs at the pushing rod or the locking box.

	Tightening torque	Tool
Screw M 8	20 Nm \pm 2 Nm	Torque wrench SW 13

8 Demounting of the locking device

The demounting Die Demontage des Verschlusses erfolgt in umgekehrter Reihenfolge der vorseitig auf- geführten Montage.