Document collection		
Content: **Accompanying documents**		
Document name: DS-1-en	Rev./Date: 03/11_2025	page: 1 of 12

1. OPERATING INSTRUCTIONS

1.1 Installation lever ..... 2 - 4
1.2 Removal and transport Tool ..... 4 - 5
1.3 **pontiSTRAIL** kerbstone lifting tool ..... 5 - 6
1.4 **pontiSTRAIL** universal assembly tool ..... 6 - 7

2. WORK INSTRUCTIONS

2.1 Road connection 8
2.2 **STRAIL®** levelling set 8
2.3 **STRAIL®** kerbstone mortar 8
2.4 **pedeSOLAR** 8
2.5 Intervia 9
2.6 Sleeper protectors 9
2.7 Lubricant 9
2.8 Ratchet 9
2.9 Tie rod end piece 10
2.10 End restraint 10
2.11 End bracket 10
2.12 Shift protection compact 11
2.13 Shift protection for wooden sleepers 11
2.14 Shift protection for narrow turnout panels 12
2.15 Shift protection with rail hooks 12

Installation lever
Operating manual

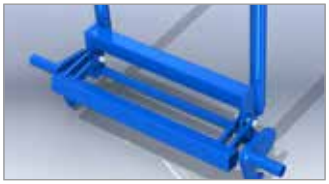
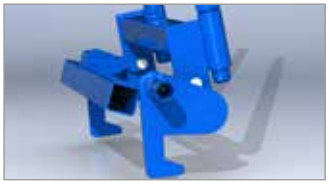
Subject to technical modifications / 03_2022

KRAIBURG STRAIL® GmbH & Co. KG | STRAIL® | STRAILastic | STRAILWAY
84529 Tittmoning | Goellstraße 8 | phone + 49 / (0) 86 83 / 7 01-0 | fax + 49 / (0) 86 83 / 7 01-126
info@strail.com | www.strail.com | www.strailastic.com | www.strailway.com

Read this operation manual carefully before use and adhere to it unconditionally during the application!
It has to be kept easily accessible for the user at all times!

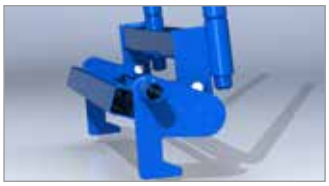
1 / INSTALLATION LEVER

Installation lever **STRAIL** 600 mm (flange groove 45 mm / 60 mm)

Installation lever **STRAIL** 1200 mm


Installation lever **pedeSTRAIL** (flange groove 45 mm / 60 mm)

Installation lever **innoSTRAIL** 900 mm / 1200 mm


2 / SECURITY ADVICE

- All people and workmen staying in the surroundings have to be warned against the crushing hazard.
- Two persons are required for the application (three persons for **STRAIL** 1 200 mm).
- Wear your personal protective equipment.
- A secure standing position is required when using the tool.
- To lift and move the tool, only take it on the designated handles and lever rods (two persons are required).
- Make sure that the tool lies stably under the rail head.
- When pressing together watch out for moving parts.
- To be used only by fit, qualified and instructed expert staff.

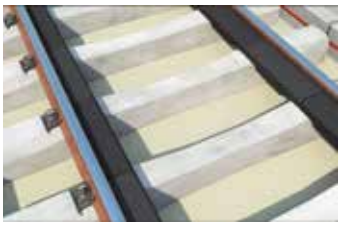
3 / GENERAL ADVICE

- Carry out a visual examination of the tool prior to use.
- Insert the lever rods into the installation lever and check their correct position prior to use. It is not necessary to take them out during the installation.
- Level crossing panels may only be installed separately.
- Grease the contact surface of the rubber panel at the installation lever thoroughly with the corresponding assembly paste to facilitate the sliding of the panel under the rail head.
- Make sure that both hooks are positioned correctly under the rail head.
- Remove the lever rods for transport and keep them separately.
- During the pressing only the operating workmen are allowed to stay in the danger zone.
- When discovering defects stop using the toll immediately.

4 / SERVICE AND MAINTENANCE

- When discovering defects renew the tool immediately or send it back to the manufacturer for repair. Further use is not allowed.
- Protect the tool against corrosion when it will not be used for a lengthier period of time.

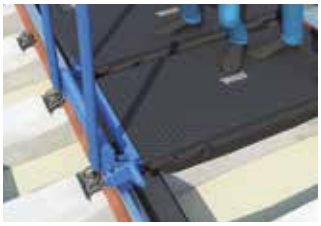
5 / CORRECT USE OF THE STRAIL® INSTALLATION LEVER (600 mm, FLANGE GROOVE 45 mm / 60 mm)



Inserting the filler blocks.

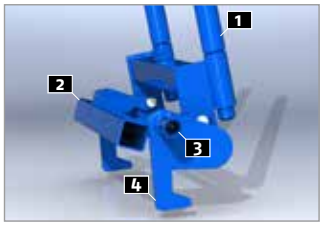
Insert the **STRAIL** inner panel on one side with its lip under the rail head and grease the lip on the other side with the assembly paste.

Open the installation lever and hook it in under the rail head.



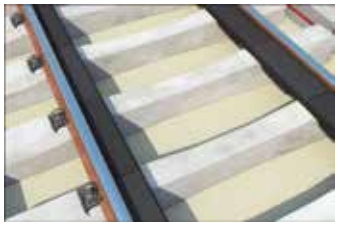
During installation find a secure standing position on the panel.

Press the edge of the panel against the installation lever until the lip slides under the rail head.



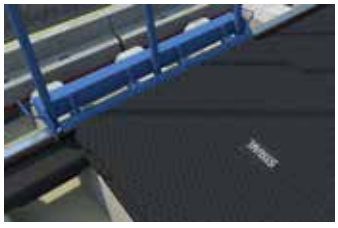
1 lever rod
2 pusher
3 handle
4 hook for rail head

6 / CORRECT USE OF THE STRAIL® INSTALLATION LEVER 1200 mm



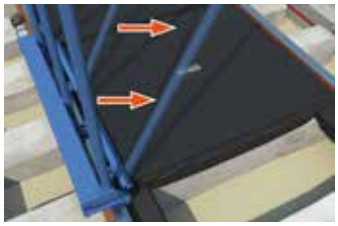
Inserting the filler blocks.

Insert the **STRAIL** inner panel on one side with its lip under the rail head and grease the lip on the other side with the assembly paste.

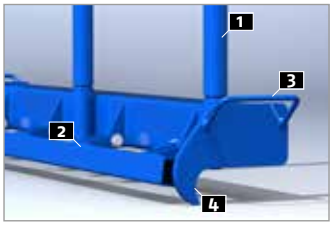


Open the installation lever and hook it in under the rail head.

During installation find a secure standing position on the panel.



Press the edge of the panel against the installation lever until the lip slides under the rail head.



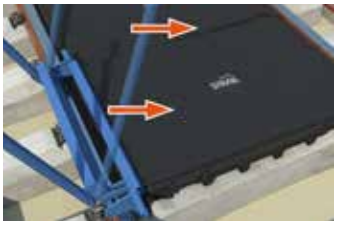
1 lever rod
2 pusher
3 handle
4 hook for rail head

7 / CORRECT USE OF THE pedeSTRAIL INSTALLATION LEVER (FLANGE GROOVE 45mm / 60mm)

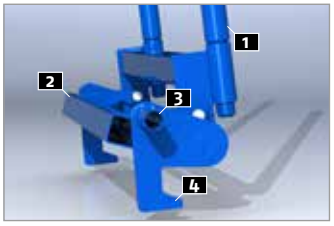
Insert the **pedeSTRAIL** inner panel on one side with its lip under the rail head and grease the lip on the other side with the assembly paste.

Open the installation lever and hook it in under the rail head.

During the installation find a secure standing position on the panel.



Press the edge of the panel against the installation lever until the lip slides under the rail head.

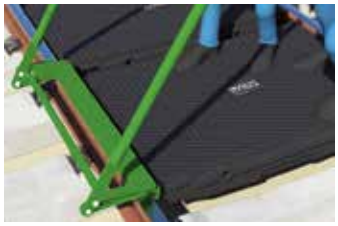


1 lever rod
2 pusher
3 handle
4 hook for rail head

8 / CORRECT USE OF THE innoSTRAIL INSTALLATION LEVER (900mm / 1200mm)

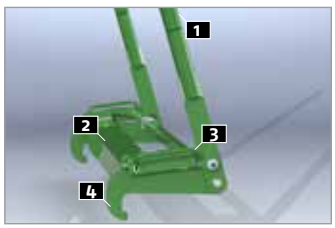
Insert the **innoSTRAIL** inner panel on one side under the rail head and grease the flange groove support on the other side with the assembly paste.

Open the installation lever and hook it in under the rail head.



During the installation find a secure standing position on the panel.

Press the edge of the panel against the installation lever until the flange groove support slides under the rail head.



1 lever rod
2 pusher
3 handle
4 hook for rail head

9 / LEGAL PROVISIONS

The German safety regulations (UVV) and the operation manual have to be put at the operator's disposal and have to be adhered to.

- **Examination prior to first use**
  Done by the manufacturer.
- **Visual examination prior to use**
  Carry out visual examinations before and after using the tool. When defects are discovered act according to **# 4** „Service and Maintenance".
- **Extraordinary examinations**
  The user is responsible for carrying out an extraordinary examination of the tool after events of damage or other events that may interfere with the proper functioning of the tool.

10 / EC DECLARATION OF CONFORMITY

EC Declaration of Conformity according to the EC machinery directive 2006/42/EC

Name and address of Manufacturer:
KRAIBURG STRAIL GmbH & Co. KG
Goellstr. 8
D-84529 Tittmoning

We declare that the following product complies with the safety and health requirements of the EC directives:

Type:	**Type no.:**
Installation lever STRAIL 600mm / flange groove 60mm	**00142100**
Installation lever STRAIL 600mm / flange groove 45mm	**00142200**
Installation lever STRAIL 1200mm	**01269800**
Installation lever pedeSTRAIL / flange groove 60mm	**00366900**
Installation lever pedeSTRAIL / flange groove 45mm	**00497600**
Installation lever innoSTRAIL 900mm	**01122300**
Installation lever innoSTRAIL 1200mm	**02363500**

Corresponding EC directives:

EG machinery directive 2006/42/EG

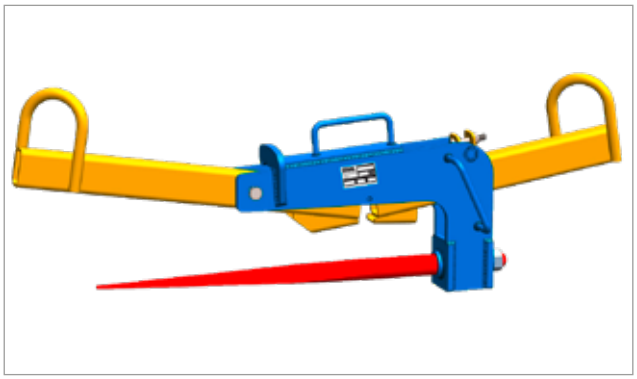
The following person is authorised to compile the technical documents:
Herbert Gfreiner
Goellstr. 8
84529 Tittmoning
Germany

This declaration becomes invalid when there is a change to the product which was not agreed upon.

Declarations of conformity and manufacturer's declarations are available where required.

Tittmoning, 02.03.2022

Günther Wagner
General Manager



STRAIL® Removal and Transport Tool
Operating Instructions

Subject to technical changes / 03_2022

KRAIBURG STRAIL® GmbH & Co. KG | STRAIL® | STRAILastic | STRAILWAY
84529 Tittmoning | Goellstraße 8 | phone + 49 / (0) 86 83 / 7 01-0 | fax + 49 / (0) 86 83 / 7 01-126
info@strail.de | www.strail.com | www.strailastic.com | www.strailway.com

The operating instructions must be read **carefully** before use and **strictly observed!**

The operating instructions have to be kept readily accessible for users of the product!

This device is exclusively intended for the transport and removal of **STRAIL®** level crossing panels!
Do not use this device for transporting people!

1 / TECHNICAL DATA

Type:	**STRAIL®** Removal and Transport Tool
Type no.:	02139400
Load-bearing capacity (kg):	480
Working width (mm):	up to 1200
Length of pin (mm):	575
Pin diameter (mm):	35
Dead weight (kg):	20.6
Eye rod diameter (mm):	18

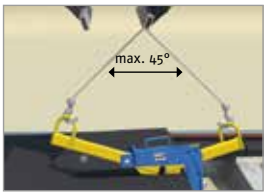
The lifting device consists of a base body with two pivoted square tubes with one retaining loop each for fastening the sling gear. For lifting the panel, there is a pin on the underside which is connected to the base body with a special nut.

2 / NOTES ON SAFETY

- All persons and workers standing close by must be advised of the risk of crushing.
- Erratic spinning of the lifting device – triggered by uncontrolled movements – can lead to injury.
- Tension in the parts can lead to components being spun around.
- To be used only by fit, qualified and instructed expert staff.

3 / GENERAL INFORMATION

Drawing 1



Drawing 2

- Prior to use, the lifting device has to be visually checked.
- **STRAIL®** level crossing panels must only be lifted and transported one at a time.
- The load must not exceed the specified load-bearing capacity.
- The lifting device must be stuck into the bore hole of the lock tight system of the **STRAIL®** level crossing panel as far as it will go.
- In order to remove the **STRAIL®** level crossing panels, the chain slings must be fastened at both retaining loops. When removing the panels, the tensile force must only be applied vertically upwards or from a maximum angle of +20°. Otherwise, it may lead to a destruction of the lifting device and the **STRAIL®** level crossing panel (see drawing 1)
- In order to transport the **STRAIL®** level crossing panels, the length of the chains has to be such that the pin hangs in a horizontal position.
- Avoid sudden movements while moving the load since that may break the lifting device or the **STRAIL®** level crossing panels.
- Avoid sudden changes of direction while moving the load since that may break the lifting device.
- When defects are noted, stop using the product immediately.
- Standing beneath the load is forbidden.
- Staying within the danger zone during removal and transport is forbidden.
- The chain strands' maximum tilt angle of 45° must not be exceeded (see drawing 2).

4 / SERVICE AND MAINTENANCE

- In case of defects, the lifting device must be replaced immediately or returned to the manufacturer for repair.
- When it is foreseeable that the tool will not be used for a longer period of time, it must be protected from corrosion.

5 / LEGAL REQUIREMENTS

The Accident Prevention Regulations (UVV; 'Load Suspension Gear on Crane Equipment – VBG 9a') as well as the operating instructions or maintenance instructions have to be kept readily accessible and observed unconditionally.

- **Pre-delivery check**
  Carried out by the manufacturer.
- **Regular checks**
  The user must ensure that the lifting device is checked by an authorised expert at least once a year.
- **Special checks**
  The user must ensure that the lifting device is checked by an authorised expert after each event of damage or other incidents that might influence the load-bearing capacity.
- **Test records**
  The user must ensure that the tests and checks carried out are documented.

For information on the correct handling of all lifting gear we recommend the German safety training paper 'Sicherheitslehrbrief für Anschläger' (Work Safety Regulations for Crane Loaders) published by the Study Group for Metal Industry Trade Associations.

6 / EC DECLARATION OF CONFORMITY

EC Declaration as defined by the EC Machinery Directive 2006/42/EG

Name and address of Manufacturer:
KRAIBURG STRAIL GmbH & Co. KG
Goellstr. 8
D-84529 Tittmoning

We declare that the following product complies with the safety and health requirements of the EC directives:

Type:	**STRAIL Removal and Transport Tool**
Type no.:	**02139400**

Corresponding EC Directives: EC Machinery Directive 2006/42/EG

Applied standards: DIN EN 13155 Cranes – Safety – Non-fixed load-carrying equipment

The following person is authorised to compile the technical documents:
Herbert Gfreiner
Goellstr. 8
84529 Tittmoning
Germany

If alterations are made to the product without prior consent, this declaration becomes invalid.
Manufacturer's declarations and/or declarations of conformity from suppliers are available where required.

Tittmoning, 02.03.2022

Günther Wagner
General Manager

STRAIL STRAILastic STRAILWAY

pontiSTRAIL kerbstone lifting device / Operating instructions

Subject to technical modifications / 03_2022

KRAIBURG

KRAIBURG STRAIL® GmbH & Co. KG | STRAIL® | STRAILastic | STRAILWAY
84529 Tittmoning | Goellstraße 8 | phone + 49 / (0) 86 83 / 7 01-0 | fax + 49 / (0) 86 83 / 7 01-126
info@strail.de | www.strail.com | www.strailastic.com | www.strailway.com

Read these operating instructions **thoroughly** before use and **adhere** to them unconditionally!

They are to be kept **easily accessible** for all operators!

This device is intended solely for transporting and setting **pontiSTRAIL** kerbstones.
This device has not been approved for the transportation of persons!

1 / TECHNICAL DATA

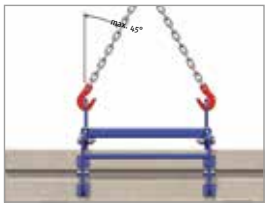
Type:	**pontiSTRAIL** Kerbstone Lifting device
Type number:	01611000
Capacity (kg):	250
Working width (mm):	up to 1800
Dead weight (kg):	16
Minimum opening of the chain suspension (mm):	20
Material thickness of the side plates (mm):	12

The **pontiSTRAIL** kerbstone lifting device is made up of several sheet metal parts and profiles, which have been screwed and welded together. A scissor mechanism is actuated by pulling on the eyelets located at the top of the device. This fixes the **pontiSTRAIL** kerbstone in the groove, while clamping its sides, thereby making it easy to lift the kerbstone. In addition, two support plates fit into a groove which have been cut into the kerbstone, adding additional support during lifting.

2 / SAFETY INSTRUCTIONS

- All persons and operators in the surrounding area must be advised of the risk of crushing.
- Erratic spinning of the kerbstone lifting device – triggered by uncontrolled movements – can lead to injury.
- Tension in the parts can lead to components being spun around.
- To be used only by fit, qualified and instructed expert staff.

3 / GENERAL INFORMATION



Drawing 1

- Visually inspect lifting gear before use.
- **pontiSTRAIL** kerbstones may only be lifted and transported **one at a time.**
- Place the lifting gear in the center of the kerbstone to create a uniform load distribution (equal distribution of weight between the two sides).
- Both chain strands have to have the same length so the load can be transported horizontally.
- Ensure that the kerbstones are loose (i.e. not connected to concrete or other fastening materials).
- The maximum overall length of kerbstones that may be transported is 1800 mm.
- Ensure that the lifting gear is properly positioned (check contact surfaces and groove).
- Load must not exceed the specified load capacity.
- Avoid uncontrolled movements while moving the load, since this can result in damaging the kerbstone lifting device, as well as the kerbstone.
- Avoid sudden changes of direction while carrying the load, as this can lead to the elements slipping and destroying the lifting device.
- Stop use of the product immediately in case of defects.
- Do not allow anyone to pass under a suspended load.
- It is prohibited to lift or transport loads while persons are within the danger zone.
- Do not exceed the chain strands' maximum tilt angle of 45° (see Drawing 1).

4 / MAINTENANCE AND SERVICING

- In case of defects, replace the kerbstone lifting device immediately or send it back to the manufacturer for repair.
- If it is foreseeable that the tool will not be used for a longer period of time protect it from corrosion.

5 / LEGAL REQUIREMENTS

The Accident Prevention Regulations (UVV in German) 'Load Suspension Gear on Crane Equipment – VBG 9a' as well as the operation and installation manuals have to be put at the workmen's disposal and have to be observed unconditionally.

- **Pre-delivery inspection**
  Carried out by manufacturer.
- **Periodic inspections**
  Operators must ensure that the load-bearing equipment is examined by an expert at least once a year.
- **Special inspections**
  Operators must ensure that the load-bearing equipment is subject to a special inspection by an expert, after any event of damage or special occurrence which may influence the load-bearing capacity of the equipment.
- **Inspection certificate**
  Operators must ensure that they are able to provide evidence of the inspection.

For information on the proper handling of all lifting gear we recommend the German safety training paper „Sicherheitslehrbrief für Anschläger", published by the Study Group for Metal Industry Trade Associations.

6 / EC DECLARATION OF CONFORMITY

EC Declaration as defined by the EC Machinery Directive 2006/42/EG

Name and address of Manufacturer:
KRAIBURG STRAIL GmbH & Co. KG
Goellstr. 8
D-84529 Tittmoning

We declare that the following product complies with the safety and health requirements of the EC directives:

Type: **pontiSTRAIL Kerbstone Lifting device**
Type number: **01611000**

Corresponding EC Directives: EC Machinery Directive 2006/42/EG

Applied standards: DIN EN 13155 Cranes – Safety – Non-fixed load-carrying equipment

The following person is authorised to compile the technical documents:
Herbert Gfreiner
Goellstr. 8
84529 Tittmoning
Germany

If alterations are made to the product without prior consent, this declaration becomes invalid.
Manufacturer's declarations and/or declarations of conformity from suppliers are available where required.

Tittmoning, 02.03.2022

Günther Wagner
Managing Director

STRAIL STRAILastic STRAILWAY

pontiSTRAIL universal assembly tool / Operation Manual

Subject to technical modifications / 03_2022

KRAIBURG

KRAIBURG STRAIL® GmbH & Co. KG | STRAIL® | STRAILastic | STRAILWAY
84529 Tittmoning | Goellstraße 8 | phone + 49 / (0) 86 83 / 7 01-0 | fax + 49 / (0) 86 83 / 7 01-126
info@strail.de | www.strail.com | www.strailastic.com | www.strailway.com

Read this operation manual carefully before use and adhere to it unconditionally during the application!

It has to be kept easily accessible for the user!

This tool is exclusively meant for the moving and assembling of **pontiSTRAIL 713** and **pontiSTRAIL 910**.
This equipment is not approved for transporting people!

1 / TECHNICAL DATA

Type:	**pontiSTRAIL** universal assembly tool
Type no.:	01567700
Lifting force kg:	130
Working width mm:	1200
Proper weight kg:	80
Minimum opening of the chain suspension mm:	19

The **pontiSTRAIL** universal assembly tool consists of several screwed and welded square pipes and steel plates. The **pontiSTRAIL panel 713 or 910** is fixed with an iron rod to the scissor-like construction and bended by pressing and lifting the assembly tool. When the assembly tool is put down it relieves tension and opens in a neutral position where the position can be fixed.

2 / SECURITY ADVICE

- All people and workmen staying in the surroundings have to be warned against the crushing hazard.
- Sudden movements can cause the **pontiSTRAIL** universal assembly tool to spin around. This may lead to injuries.
- Tension in the parts can lead to construction parts spinning around.
- To be used only by fit, qualified and instructed expert staff.
- At trackages with multiple tracks it must be ensured that the **pontiSTRAIL** universal assembly tool does not enter into the minimum clearance of the adjoining track. The instructions of the safety staff must be observed in any case.

3 / GENERAL ADVICE

- Carry out a visual examination of the assembly tool prior to use.
- The **pontiSTRAIL** panels may only be lifted and transported separately.
- The load may not exceed the indicated lifting force.
- Avoid sudden movements of the load since they may lead to the destruction of the **pontiSTRAIL** universal assembly tool.
- Avoid sudden changes of direction with the load since they may lead to the destruction of the assembly tool.
- The levers may only be locked when empty to facilitate the transport without burden.
- Under load, the insertion rod must always be secured with the security splint on the chain provided.
- When discovering defects stop using the tool immediately.
- Staying under the load is not allowed.
- Staying in the danger zone is not allowed during the lifting and lowering process.
- Tension in the parts may result in construction parts spinning around.

4 / SERVICE AND MAINTENANCE

- When discovering defects renew the **pontiSTRAIL** universal assembly tool immediately and send it back to the manufacturer for repair.
- Protect the tool against corrosion when it will not be used for a lengthier period of time.

5 / LEGAL PROVISIONS

The Accident Prevention Regulations (UVV in German) 'Load Suspension Gear on Crane Equipment – VBG 9a' as well as the operation and installation manuals have to be put at the workmen's disposal and have to be observed unconditionally.

- **Examination prior to shipment**
  Done by the manufacturer.
- **Regular examinations**
  The user has to take care that the load-carrying equipment is tested in regular intervals of at least once a year by an authorised expert.
- **Extraordinary examinations**
  The user has to take care that an extraordinary examination of the load-carrying device is carried out by an authorised expert after an event of damage or other events that could possibly interfere with the lifting capacity.
- **Test record**
  The user has to make sure that examinations and tests are recorded.

For the correct handling of all lifting devices we recommend the brochure „Sicherheitslehrbrief für Anschläger", issued by the „Arbeitsgemeinschaft der Eisen- und Metallberufsgenossenschaften" (Written in German; currently no English translation available).

6 / EC DECLARATION OF CONFORMITY

EC Declaration as defined by the EC Machinery Directive 2006/42/EG

Name and address of Manufacturer:
KRAIBURG STRAIL GmbH & Co. KG
Goellstr. 8
D-84529 Tittmoning

We declare that the following product complies with the safety and health requirements of the EC directives:

Type: **pontiSTRAIL universal assembly tool**
Type no.: **01567700**

Corresponding EC Directives: EC Machinery Directive 2006/42/EG

Applied standards: DIN EN 13155 Cranes - Safety - Non-fixed load-carrying equipment

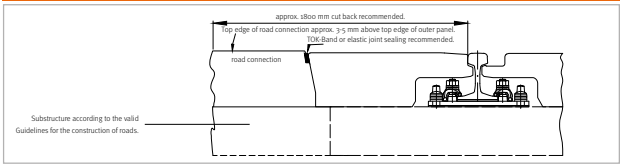
The following person is authorised to compile the technical documents:
Herbert Gfreiner
Goellstr. 8
84529 Tittmoning
Germany

If alterations are made to the product without prior consent, this declaration becomes invalid.
Manufacturer's declarations and/or declarations of conformity from suppliers are available where required.

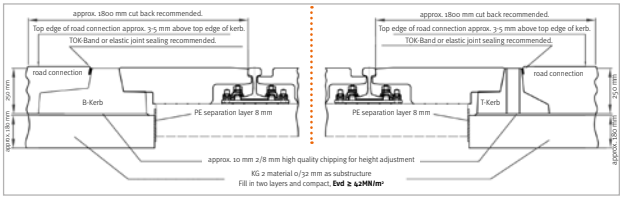
Tittmoning, 02.03.2022

Günther Wagner
General Manager

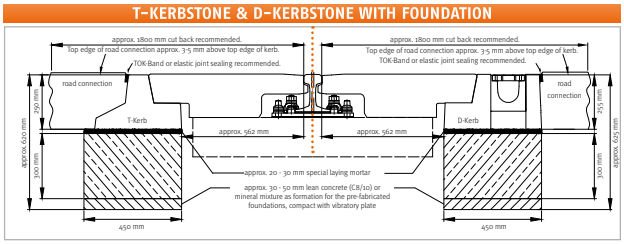
DIRECT ROAD CONNECTION



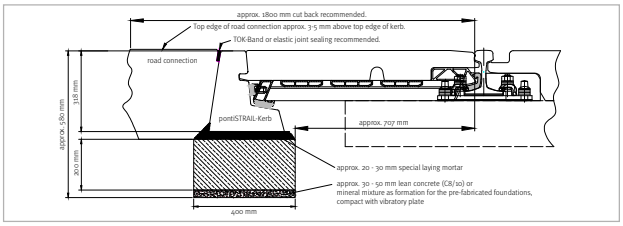
KERBSTONES WITHOUT FOUNDATION (T-Kerb without foundation only for pedestrian and cycle crossings)



T-KERBSTONE & D-KERBSTONE WITH FOUNDATION



pontiSTRAIL 910 KERBSTONE WITH FOUNDATION

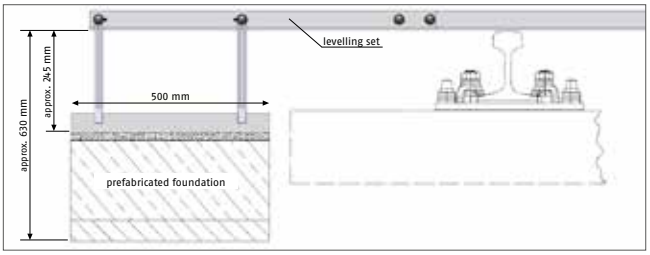


STRAIL® LEVELLING SET

When laying the kerbstones, make sure that the kerbstones are supported over their entire surface!
To do this, use the **STRAIL®** levelling set to level and smooth out the support layer and to adjust its height.

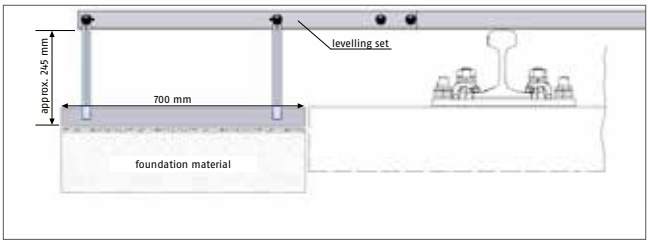
T-, D- AND pontiSTRAIL 910 KERBSTONE WITH PREFABRICATED FOUNDATION

For the laying level of the prefabricated foundation, create a smooth and even level of the lean concrete/ mineral mixture. Apply **STRAIL®** kerbstone mortar to the prefabricated foundation and use the **STRAIL®** levelling set to level and smooth it out.



B-KERBSTONE WITHOUT PREFABRICATED FOUNDATION

Fill with 2/8 mm high-quality chippings (grain size) as height compensation and use the **STRAIL®** levelling set to create an even and smooth surface up to the lower edge of the kerbstone.
(height adjustment levelling set 245 mm)



NOTES: If the **STRAIL®** levelling set is not used, do not leave it in the track area and never set it up vertically!
(Attention > overhead contact line/high voltage)

PROCESSING INSTRUCTION FOR KERBSTONE MORTAR

Composition
See description on the backside of the bundle (bag).

Characteristics
STRAIL® kerbstone mortar for laying **STRAIL®** kerbstones onto **STRAIL®** prefabricated foundations is used for compensating heights and for connecting both concrete elements.

Processing
Mix the mortar in a mortar trough using the amount of water written on the bundle (bag). Stir with an agitator at slow speed (250 rpm.) or a compulsory mixer for at least 2 minutes until a plastic consistency is reached. Wet the roughened surfaces of the kerbstones and prefabricated foundation before applying the mortar. The mortar must be processed within 35 minutes (the substrate must be pale damp, for layer thickness of mortar, see bundle (bag) (max. 30 mm)). Mix mortar only corresponding to the construction process. Close the joints of the placed kerbstones immediately with the mortar and smooth them out. Keep them wet in case of intense heat. After laying the kerbstones and sealing the joints with mortar, they must be protected against loads and agitation. The newly laid area can be reopened for traffic only after waiting for at least 12 hours. Processing temperature: +5° C to +30° C.

Consumption
40 kg of dry mortar make approx. 20 litres of wet mortar.
This amount is enough for 1 m² (strength of coating 20 mm).

Delivery
In paper bags, several layers on one pallet.

Storage
- Protected from the weather
- Shelf-life approx. 6 months
- Dry and cool on a pallet
- Close open bundles (bag) immediately

Note
- These technical data refer to +20 °C and 50 % relative air moisture.
  Deeper temperatures extend, higher temperatures reduce the given values.
- Clean containers, tools, etc. immediately with water.
  Once the mortar is cured it can only be removed mechanically.
- Contains cement.
- Reacts alkaline with moisture.
- Protect skin and eyes; in case of contact rinse thoroughly with water.
- For layer thickness of mortar, see bundle (bag).

INSTALLATION INSTRUCTIONS pedeSOLAR

1 / COMPONENTS

- Base body with LEDs, photovoltaics and battery
- Holding plate made from stainless steel
- 4 chipboard screws, **blade size T30**, stainless steel

2 / PROPERTIES

Technology:	LED with photovoltaics
LED colour:	yellow, red, white, green, blue (two colours per body are possible)
Temperature range:	– 20°C (–4°F) to 85°C (185°F)
Max. sight distance:	approx. 900 m, depending on the course of the road
Battery:	nickel-metal hybrid
Power when fully charged:	up to 240 hours with no additional insolation
Charge time:	3 hours at 100 klux (sunny day)
Service life:	more than 8 years

3 / INSTALLATION & REMOVAL

- Assembled in the factory and delivered as a finished product
- To be installed just like any other **STRAIL®** level crossing panel
- The lighting fittings can be removed by taking off the holding panel from the top or by pushing them out from the back when the panel had been removed (tie rod, screw driver, ...)

4 / SPECIALTIES

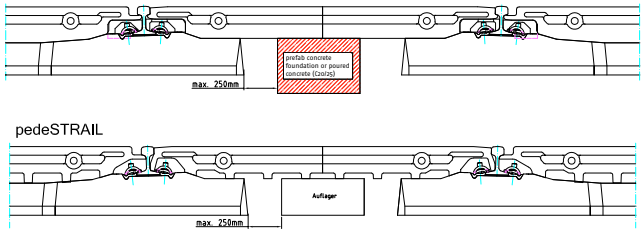
- **Align** the LEDs **always in the direction of traffic** (rail – rail) in order to not blind the train conductor
- Cars must not drive over them!
- Only for pedestrians and cyclists, in emergency also for rescue vehicles
- It is possible to use them as a lateral boundary for **STRAIL®** and **innoSTRAIL** or **veloSTRAIL** level crossings
  > BUT vehicles must not directly drive over them!
- 450 mm segments AP + IP with corresponding tie rods to refit existing level crossings
- The 450 mm segments have a **60 mm groove**
- Milled versions can be produced individually according to customer requests

STRAIL® – INTERVIA AREA (6FT AREA)

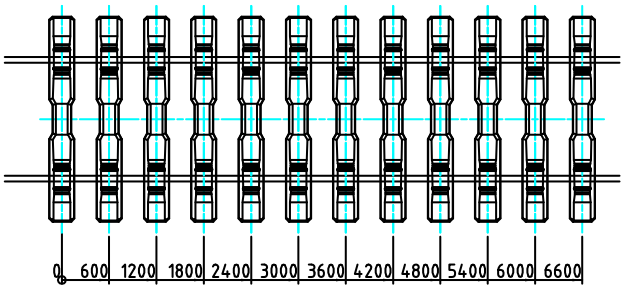
A sustainable, stable support as a roadbed has to be provided underneath the rubber panels at the intervia area – see sketch.

Recommendations:

Prefabricated slabs or in-situ concrete foundation, heavy duty road traffic



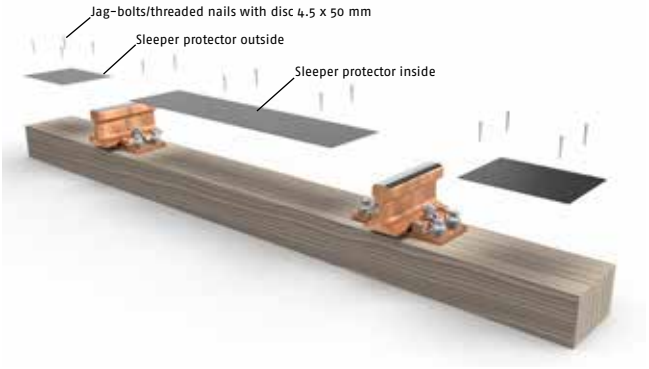
Closed chain dimensioning must be guaranteed!



INSTALLATION INSTRUCTIONS SLEEPER PROTECTOR

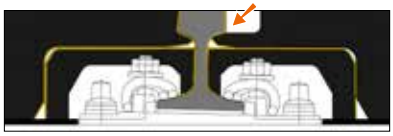
To avoid that wooden sleepers are damaged when the panels and filler blocks are installed, polyethylene panels (sleeper protectors) that are put on the sleepers are included in the delivery.

Before installing the panels and filler blocks, the sleeper protectors must be nailed flush at all sides in the respective contact areas (see installation drawing: use at least 6 of the supplied jag-bolts/threaded nails on the inside and at least 4 of the supplied steel nails on the outside).

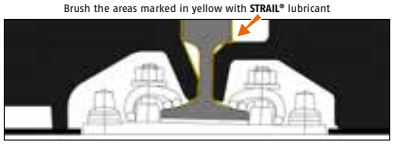


Protect the material from strong sunlight and lay and nail it as construction progresses.

APPLICATION OF THE STRAIL® LUBRICANT



Brush the areas marked in yellow with **STRAIL®** lubricant



Use the **STRAIL®** lubricant to facilitate installation of the level crossing systems (included in delivery).

Procedure:

- Clean the rails and remove dirt, foreign objects, etc.
- Brush with the **STRAIL®** lubricant:
  - rail web
  - rail head (inner and outer side)
  - outer panels on the support flank facing the kerbstone and at groove and tongue
  - filler blocks (top side and inner side)
  - with inner panel: rail head flank as well as the sides of the panels (groove and tongue)
- Install the panels according to the installation instructions.

RATCHET WRENCH WITH 27 MM ALLEN KEY INSERT

The ratchet wrench is used to tightly connect the lock tight system.
When interlocking the panels, beat onto the panel surface with a plastic hammer to release possible tensions in the **STRAIL®** rubber panel > this way the panels can be connected more easily.

PLEASE NOTE >> **Elongating the lever arm to tighten the lock tight system is NOT allowed!**

INSTALLATION INSTRUCTIONS TIE ROD END PIECE

Insert tie rod end pieces (when there are neither end restraints nor end brackets) to avoid that the last tie rod comes loose.

Installation process:

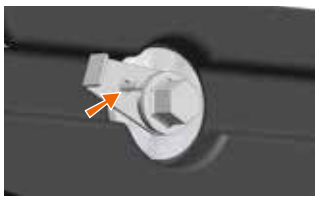
1. Adjust the last tie rod so that the pin of the tie rod can be connected to the angle plate of the tie rod end piece.

2. Adjust the angle plate:

> Groove side: crank points away from the panel

> Tongue side: crank points toward the panel

3. Pre-install angle plate on to the tie rod end piece as shown above and then screw in the tie rod end piece to the last tie rod (reverse thread).
> The pin has to be inserted in the designated opening of the angle plate.



> Groove side > installed state

> Tongue side > installed state

4. The tightening torque is 300 Nm

PLEASE NOTE > Make sure that you use the tie rod end piece with the longer screw (length: 210 mm, part number 019937-00) with tie rods that have a long support bushing (e.g. **innoSTRAIL**).
Use the tie rod end piece with the shorter screw (SW41) (length: 120 mm, part number 019936-00) with tie rods (SW41) that do not have a long support bushing (e.g. **STRAIL**, **veloSTRAIL**, **pedeSTRAIL**).

MOVEMENT PREVENTION WITH END RESTRAINT

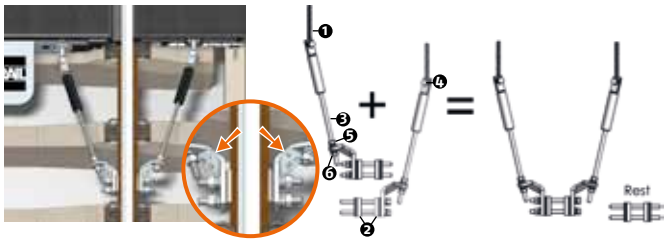
Diagonal traffic or turning traffic cause sliding forces. Those are effectively absorbed by end restraints at the beginning and the end of the level crossing.

This system has considerable advantages

- Sliding forces are directed through the lock tight tie rod system over the end restraints into the rail (and not into the sleeper which could move).
- Every row of tie rod end pieces is connected on both ends to the rail under tensile strength and thus avoids movement of decking.
- Insulators avoid current flow.
- Avoids last tie rod from becoming loose.

End restraints can be used when the end of the level crossing is staggered and also when the end of the level crossing is straight.
They are delivered pre-assembled for the right **(R)** and the left **(L)** side.
When the level crossing does not have a straight end, it might be necessary to cut out a small part of a **STRAIL®** filler block or a **STRAIL®** outer panel to make room for the clamp jaw.
When the level crossing does have a straight end then two normal end restraints can be assembled to a double end restraint.

PLEASE NOTE: If using the **pontiSTRAIL** system, end restraints are **mandatory**.



Sequence of work (installation)

- Screw the screw-in part ❶ into the thread of the last tie rod as far as it will go.
- Position the end restraint between two sleepers on the rail foot and slightly tighten the nut (SW36).
- The entire end restraint is installed when the nuts are still untightened.
- Screw the clamp jaws ❷ to the rail foot (approx. 300 N m)
- Where the fork rod meets the screw-in part, the nut must be placed in a way that the head of the nut always looks up! ❹
- Loosen nut ❺ and tighten nut ❻ so that the thread bar of the end restraint ❸ is slightly tensioned.
- Finally, tighten nut ❺.

SHIFT PROTECTION WITH END BRACKET

Forces caused by diagonal or turning traffic or at turnouts make the panels shift. However, these forces are effectively absorbed by the end bracket at the end of the level crossing panels.

INSTALLATION PROCEDURE FOR WOODEN SLEEPERS

- Lay the end bracket for the inner panels against the middle of the panels.
- Pre-drill 4 holes on two sleepers (14 mm drill) and fix with wooden screws (16 mm / SW24).
- Afterwards, tighten the adjusting screws (SW36) of the end bracket so that the components are pressed together.
- Position the end bracket for the outer panel (see images) and fix with 2 wooden screws (SW24).
- Tighten the adjusting screws of the end bracket so that the components are pressed together.

INSTALLATION PROCEDURE FOR CONCRETE SLEEPERS

- To be able to fixate the end brackets, 2 sleeper bays must be cleared out up until the bottom edge of the sleeper (at the inner panels and outer panels).

Installation inner panel:

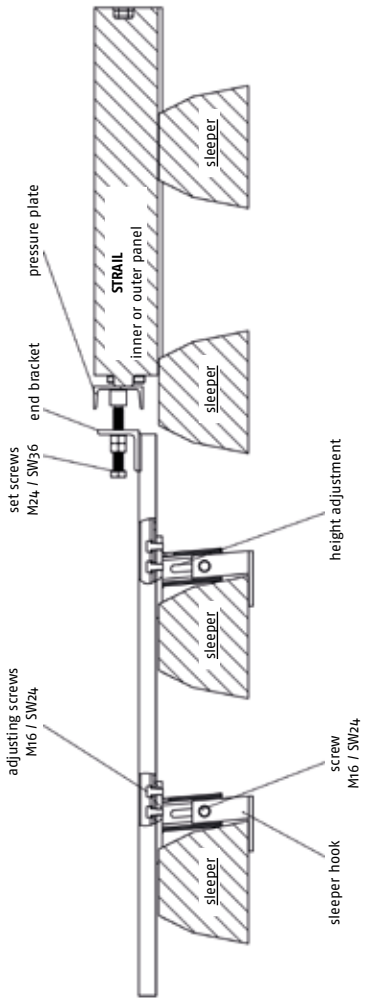
- Place 2 sleeper hooks to every sleeper and adjust them to the sleeper via the height adjustment (SW24) (see images).
- Tighten the screw (SW24) of the height adjustment.
- Find the middle of the inner panel and lay the end bracket against it.
- Fixate the end bracket with 8 fastenings screws (SW24) to the sleeper hook.

Installation outer panel:

- Place 1 sleeper hook to every sleeper and adjust it to the sleeper via the height adjustment.
- Tighten the screw (SW24) of the height adjustment.
- Place the end bracket for the outer panel and fixate it with 4 fastening screws (SW24).

PLEASE NOTE > Tighten the adjusting screws (SW36) (at inner and outer panels) of the end bracket so that the components are pressed together.

*(Please note the drawing on page 2)



SHIFT PROTECTION COMPACT

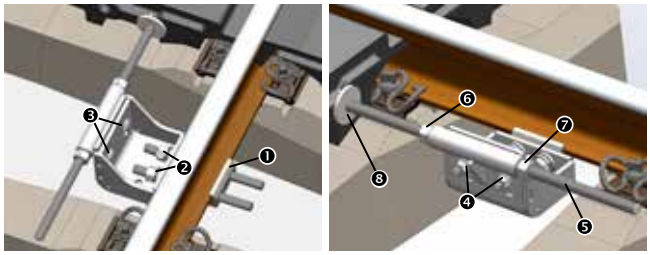
Alternative to the end bracket.
The Shift Protection Compact is compatible with the **STRAIL®**, **innoSTRAIL** and **pedeSTRAIL** Systems.

Advantages:
- The panels are pressed together via a pressure disc
- Fastening directly to the track with clamping jaws > good load transfer
- No fastening to the sleepers
- It is not necessary to dig out ballast
- Quick installation
- Universal component: The height can be regulated individually > adjustable to local conditions (structure height – sleeper – rail)

INSTALLATION INSTRUCTIONS

1. Put the Shift Protection Compact between two sleepers. Place the clamping jaws ❶ to the rail foot and tighten the nuts (SW36) ❷ on the clamping jaw (approx. 300 Nm).
2. Use the height adjustment (the two elongated holes) ❸ to adjust it to the local conditions and then tighten the nuts (SW24) ❹ accordingly.
3. Push the threaded rod (M24) ❺ with the pressure disc ❽ forward until it reaches the **STRAIL®** panel. Then, mount it under pressure using the front nut ❻. This will push the mandrels into the rubber panel. The threaded rod ❺ is locked by tightening the rear nut (SW36) ❼.

The upper edge of the pressure disc must never project beyond the panel surface.



Two shift protections compact can also be mounted onto one pair of clamping jaws:

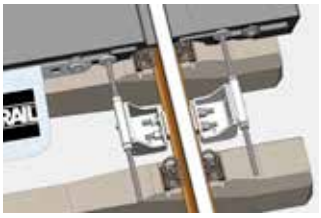


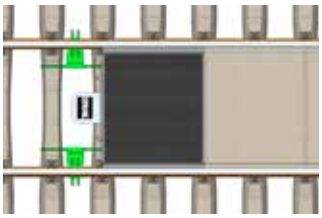
Figure 1: Level crossing flush at the end

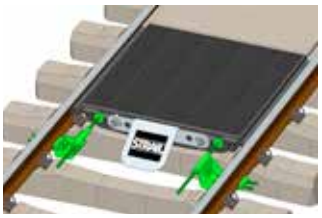
Figure 2: Level crossing offset at the end

If the outer panel at the end is not flush with the inner panel (see Figure 2), the clamping jaws ❶ must absolutely be installed before the installation of the outer panel.

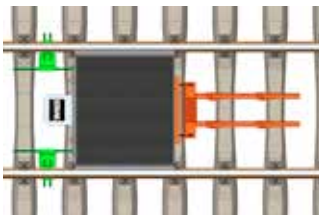
EXAMPLES FOR APPLICATION

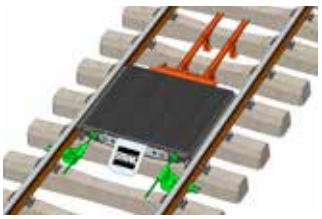
Connection to a non-ballast track with STRAIL®:





Comparison between the new Shift Protection Compact and an existing end bracket:





SHIFT PROTECTION FOR WOODEN SLEEPERS / STRAILWAY PLASTIC SLEEPERS

Shift protection for **STRAIL®** level crossing systems to be used on wooden sleepers and **STRAILWAY** plastic sleepers. This shift protection for wooden sleepers is compatible with the **STRAIL®**, **innoSTRAIL** and **pedeSTRAIL** systems.

Advantages:
- The panels are pressed together via the pressure disc
- Fastening rail with bore holes that can be used over the entire length > extremely flexible positioning on the sleepers
- Installation directly on the wooden sleepers / **STRAILWAY** plastic sleepers > it is not necessary to dig out ballast
- Quick and easy to install
- The height can be regulated individually > adjustable to local conditions (structure height sleeper – rail)

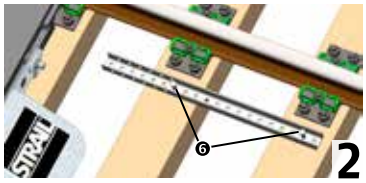
INSTALLATION INSTRUCTIONS

CAUTION >
When installed, the shift protection for wooden sleepers / STRAILWAY plastic sleepers must not touch the STRAIL® deflection plate!

1. First, the cotter pins ❶ and the bolts ❷ must be removed, then the carriage ❸ incl. the threaded rod (M24) ❹ can be removed from the fastening rail ❺ **(Image 1)**

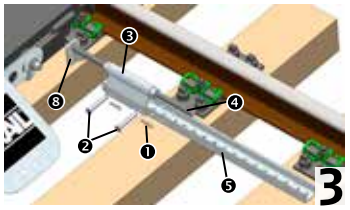
1

2. Place the mounting rail ❹ onto the sleepers in such a way that it rests on two sleepers and that the M16 wood screws ❺ can be screwed into the sleepers as centrally as possible. **(Image 2)**
3. Use two M16 wood screws ❺ to screw (SW24) the fastening rail ❹ onto two sleepers. **(Image 2)**



2

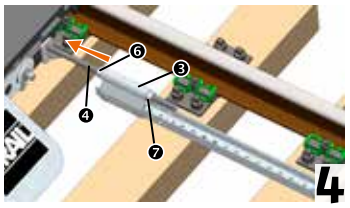
4. Place the carriage ❸ incl. the threaded rod (M24) ❹ back on the fastening rail ❺ and insert the two bolts ❷. Fasten the two cotter pins ❶ to secure the bolts. **(Figure 3)**
NOTE > The carriage ❸ can be placed in three different positions on the fastening rail ❺ to allow flexible adjustment to local conditions.



3

5. The pressure disc ❽ on the threaded rod ❹ can be set to the desired height position by turning it.
   - choose the lowest height setting for panels with a height from **130 mm** up to **max. 174 mm**
   - choose the highest height setting for panels with a height of at least **175 mm**

6. Push the threaded rod (M24) ❹ forward until it reaches the **STRAIL®** panel. Then, mount it under pressure using the front nut ❻. This will push the mandrels into the rubber panel. The threaded rod is locked by tightening the rear nut ❼. **(Figure 4)**



4

The upper edge of the pressure disc must never project beyond the panel surface.

In the inner panel area, always 2 shift protections for wooden sleepers / **STRAILWAY** plastic sleepers are installed, in the outer panel area always 1 at each side. **(Figure 5)**

5

SHIFT PROTECTION FOR NARROW TURNOUT PANELS

This shift protection for narrow turnout panels is compatible with the **STRAIL®**, **innoSTRAIL** and **pedeSTRAIL** systems. Especially for very narrow turnout spikes, where other anti-shift devices cannot be used due to their dimensions.

This shift protection device may only be installed in the level crossing area without a flange groove.

SHIFT PROTECTION FOR PEDE-/PROFILSTRAIL, 3-/4-RAIL TRACK

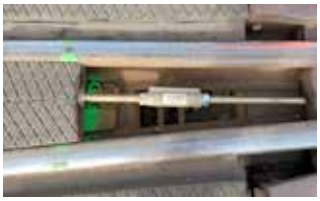
The shift protection device for **pede-/profilSTRAIL, 3-4-rail** track can be used as an alternative to the end restraint, end bracket or rail hook.

The pressure disc of the shift protection device pede-/profilSTRAIL, 3-/4-rail track must be positioned centrally on the nut or centrally above the groove of the rubber panel.

Advantages:

- the panels are pressed together via the pressure disc
- Fastened directly to the rail with clamping jaws > good load transference
- No fastening to the sleepers
- No ballast digging required
- Quick installation
- Universal component: height can be adjusted individually (type of sleeper – rail)

EXAMPLES OF USE

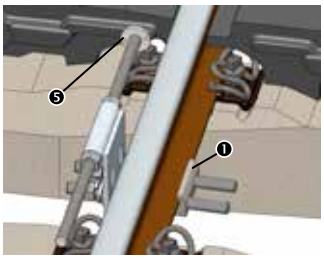


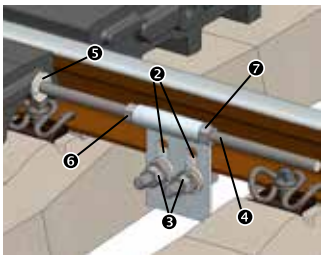
INSTALLATION INSTRUCTIONS

1. Put the shift protection for narrow turnout panels between two sleepers with the clamping jaws ❶ against the rail foot.
2. Use the height adjustment (slot holes) ❷ to adjust the height and tighten the nuts (SW24) ❸ at the slot holes accordingly.
3. Push the threaded rod (M24) ❹ with the pressure disc ❺ forward until it reaches the rubber panel. Then, mount it under pressure using the front nut (SW36) ❻. This will push the mandrels into the rubber panel. The threaded rod is locked by tightening the rear nut (SW36) ❼.

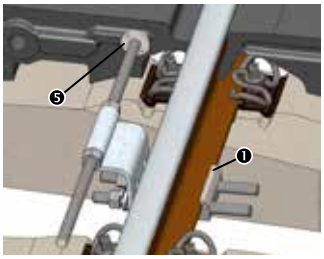
The upper edge of the pressure disc must never project beyond the panel surface.

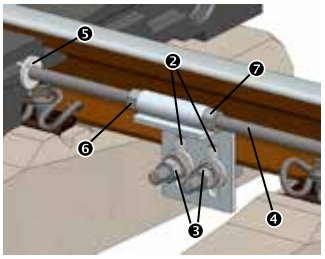
SHIFT PROTECTION FOR NARROW TURNOUT PANELS





SHIFT PROTECTION PEDE-/PROFILSTRAIL, 3-/4-RAIL TRACK





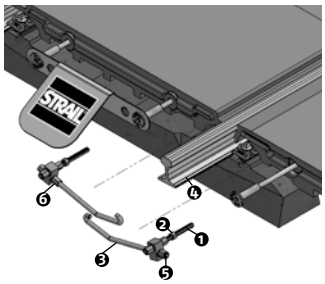
SHIFT PROTECTION WITH RAIL HOOKS

When the crossing is driven over by road and/or train traffic, the crossing needs to withstand the occurring pushing forces. Those forces can be effectively absorbed by rail hooks at the beginning and/or end of the level crossing.

This system offers significant advantages

- Pushing forces are directed by the lock tight system via the rail hook into the rail and not into the sleeper, which could give way.
- Insulator blocks prevent current flows.
- Prevents untwisting of the last tie rods.
- Not fastened at the sleepers > not necessary to dig up ballast.

The rail hooks can be used for level crossings which end straight and also for those which have a staggered end.



Installation process:

- Insert screw ❶ into the thread of the last tie rod so that the connecting rod still maintains sufficient distance to the sleeper.
- Counter with the lock nut ❷.
- Pass the connecting rod ❸ underneath the rail base ❹ and hook it in.
- Then tighten with the nut ❺ under tension and counter with the second nut ❻.