

Operation manual

STS-terminal block

STS-terminal block-01

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Contents

Introduction	5
1 Safety instructions	7
1.1 Classification of the safety instructions	7
1.2 Notes on proper handling	8
1.3 General safety instructions	8
1.4 Notes on proper handling	11
1.5 Intended use	12
2 Technical data	14
2.1 STS-terminal block	14
2.2 Locking post	14
2.3 Rail specification	14
3 Overview of the STS-terminal block	15
3.1 Views of the STS-terminal block mounted	15
3.2 Structure of the STS-terminal block	17
3.3 Loading instructions of the STS-terminal block	18
4 Emergency management	19
4.1 Pictograms	19
4.2 Hazardous substances	19
4.3 Action during emergencies	19
4.3.1 Fall of the hydraulic system during unload	20
4.3.2 Leakage of the hydraulic oil	20
5 Transport	21
5.1 Lift the STS-terminal block	21
5.2 Secure the STS-terminal block for transport	22
6 Assembly	23
7 Commissioning	23
8 Operation	24
8.1 Load the STS-terminal block	24
8.2 Unload the STS-terminal block	29
9 Cleaning and maintenance	32
9.1 Cleaning	32
9.2 Inspections	33
9.2.1 Inspect the STS-terminal block	33
9.2.2 Check the hydraulic system	33

9.3 Refill oil tank of the hydraulic system	34
10 Disposal	34
List of abbreviations	35
Tracking of modifications	36

Introduction

About this operation manual

The present operation manual contains important information regarding the safe and proper manner of operating and maintaining the STS-terminal block (STS = rail transport system).

The following chapters will inform us about the technical details, transport, assembly, operation and maintenance work.

Complying with the technical documentation will help you to:

- avoid dangers
- operate the STS-terminal block properly
- reduce repair costs
- increase the reliability and service life

Target group

This operation manual is intended for authorised and trained specialist staff. The staff must be acquainted with the operation and functioning of the STS-terminal block and should know the system-specific dangers and safety instructions.

Specialist staff means persons who can assess the work assigned to them and identify the potential dangers due to their professional training, knowledge and experiences as well as knowledge of the relevant provisions.

The specialist staff must ensure that no unauthorised persons are working on the STS-terminal block.

The operation manual must be available and handy for the specialist staff at all times.

Typographical conventions

7-digit numbers are part numbers of Vossloh Logistics GmbH (VLOG-part numbers):

3000099 (hydraulic oil PLANTOFLUX 46-AT-S)

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1 Safety instructions

The general safety instructions and the details regarding the intended use must be followed for using the STS-terminal block safely. Please also follow the supplementary safety instructions in the individual chapters of this operation manual.

1.1 Classification of the safety instructions

The present operation manual contains different categories of safety instructions. Signal words mark the severity of the occurring danger, if the measures for preventing the hazard are not followed. The safety instructions are classified as per the following categories in accordance with the signal words:

- Danger
- Warning
- Caution
- Notice

DANGER



Denotes a hazard with high risk, which leads to immediate death or severe physical injury if it is not avoided.

WARNING



Denotes a hazard with medium risk, which can possibly lead to death or severe physical injury if it is not avoided.

CAUTION



Denotes a hazard with low risk, which can lead to minor to medium physical injury if it is not avoided.

NOTICE

Denotes a hazard with low risk, which can lead to property damages if it is not avoided.

1.2 Notes on proper handling

Important information about handling and approaching the STS-terminal block is given below for using it properly.

NOTE



Denotes a note for proper handling.

Non-compliance with this note can lead to faults in the components or in the surroundings.

1.3 General safety instructions

DANGER



Danger of an electric shock caused by an overhead wire!

The loading and unloading process of the STS-terminal block involves the danger of reducing the safety distance to the overhead wire. A live overhead wire denotes the danger of a life-threatening electric shock.

- Load and unload the STS-terminal block only when the overhead wire is turned off
-

WARNING



Increased risk of injury if protective equipment is missing!

The missing protective equipment can lead to fatal or serious injuries.

- When performing any work on the STS-terminal block, always remember to wear safety shoes (S3, non-slip, ankle-high); wear a safety helmet when lifting the terminal block
 - Wear high-visibility clothing when performing any work on the STS-terminal block pursuant to the German Social Accident Insurance 78 § 7
 - Always wear air-tight safety glasses when working on the hydraulic system and when cleaning with the pressure washer
-

WARNING



Danger of slipping and falling in wet conditions, snow, frost!

In wet conditions, in snow and frost, there is a danger of slipping on the smooth base of the goods wagon and the smooth rail surface and falling from the goods wagon.

- Always remember to wear safety shoes (S3, non-slip, ankle-high) and gloves; wear a safety helmet when lifting the terminal block
 - If possible, hold with one free hand
-

WARNING



Danger of injury in insufficient light!

The goods wagons are not equipped with light.

- Ensure that embark points are adequately lighted
-

WARNING



The combination of multiple types of rails at a place is prohibited!

If there is a combination of multiple types of rails, then the rails with a low height are not clamped.

- Only one type of rail may be loaded per location
-

WARNING



Danger of crushing when moving rotary sleepers and clamping bars!

There is a danger of crushing when moving, put down and fixing rotary sleepers and clamping bars.

- Do not reach between the locking hooks of the locking blocks and rotary sleeper/clamping bar
 - Ensure that no third persons are located within the range of motion of the rotary sleepers and clamping bars when swivelling the rotary sleepers and clamping bars
 - Do not reach between the rail load and clamping bars/rotary sleepers
-

WARNING



Risk of injury due to uncontrolled moving rotary sleepers and clamping bars!

Unlocked clamping bars and rotary sleepers can move on their own. Risk of injury for persons in the range of motion.

- Always swivel and lock the clamping bars and rotary sleepers in the final positions on the clamping bar or locking post
-

DANGER



Risk of injury due to suddenly leaking hydraulic oil!

If the hydraulic wires are damaged, oil may leak suddenly under high pressure - potential consequences: Separation of limbs, penetration of hydraulic fluid in the skin, scalds due to hot hydraulic fluid, damage to the eyes.

- Work may be performed on the hydraulic wires only by trained, authorised and commissioned staff
 - Work only on depressurised hydraulic system
 - Always remember to wear the personal protective equipment when working on the hydraulic system
-

WARNING



Danger of slipping due to leaked hydraulic oil!

If the hydraulic system is leaky, hydraulic oil can reach outwards due to rainwater run-off on the trough of the clamping bar.

- Check the hydraulic system regularly for leakages
 - Check the rainwater run-off on the trough of the clamping bar regularly for oil leakage
-

NOTICE

Danger of environmental pollution due to leaking oil!

Leaking oil leads to environmental pollution, fire hazard and smears the tracks.

- Ensure that the oil binder is carried along
 - The operator must ensure that the oil binder is carried along
 - Collect the leaked oil immediately and dispose it of in an environmentally responsible way
-

NOTE



Apart from the operation manual, the applicable local regulations must be followed.

NOTE



Follow the safety data sheets of the operating materials (e.g. hydraulic oil PLANTOFLUX 46-AT-S, manufacturer: Fuchs, VLOG-part no.: 3000099).

1.4 Notes on proper handling

Due to the weather conditions in winter, special measures need to be adopted in order to use the STS-terminal block to its full extent.

NOTE



Adhesions of ice or snow and black ice affect the use of the STS-terminal block.

- Remove any kind of adhesion before loading
- Do not use defrosting or anti-slip grit

The shipping agent (user as per GCU) is responsible for laying the foundations for a proper loading.

NOTE



The trough can be lifted only hydraulically.

The push rod is moved with the hand wheel for mechanical locking and unlocking.

1.5 Intended use

Occupational safety is ensured only when using the STS-terminal block as intended.

Purpose

The STS-terminal block is designed for the following purpose:

When transporting railway rails on goods wagon, the loading of rails is secured against excessive shunting by the STS-terminal block.

The rails are laid on top of each other in 3 layers. The same rail profile is laid down for each layer. The topmost layer is fitted with at least 6 rails. See chapter 2 Technical data for the possible height of the rails. The loading is carried out according to the STS loading arrangement of Vossloh Logistics. A load different from the STS loading arrangement of Vossloh Logistics is not deemed as intended.

Purpose other than the one stated above is deemed as not intended.

If the STS-terminal block is used for a purpose other than that stated above, the warranty and liability of the manufacturer shall not be valid.

In case of faults that are caused by unauthorised changes, every warranty performance obligation and product liability on the part of Vossloh Logistics shall not be applicable.

Functionality

The STS-terminal block may be used only in a faultless and functional condition.

Operating staff

The staff must be trained specialist staff, must have acquired a safety training on rail operation, must be acquainted with the operation and functioning of the STS-terminal block and should know the system-specific dangers and safety instructions.

Specialist staff means persons who can assess the work assigned to them and identify the potential dangers due to their professional training, knowledge and experiences as well as knowledge of the relevant provisions.

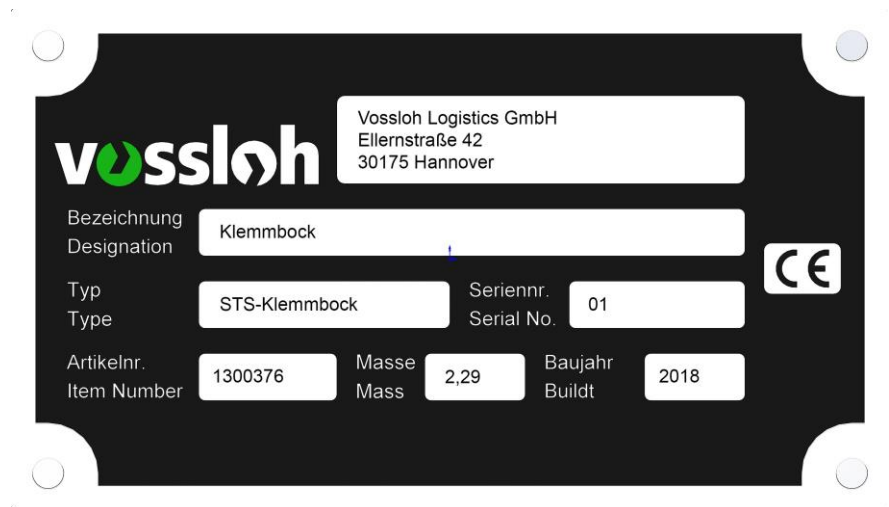
The specialist staff must ensure that no unauthorised persons are working on the STS-terminal block.

The operation manual must be available and handy for the specialist staff at all times.

Foreseeable misuse

There has been no known foreseeable misuse so far.

Identification plate



2 Technical data

This chapter provides a summary of the technical details of the STS-terminal block and of the locking post.

2.1 STS-terminal block

General data	Dimensions	
	Greatest width	2905 mm
	Greatest length	1900 mm
	Greatest height	approx. 1722 mm
	Weight	
	Total weight	2.29 t
	Clamping force	600 kN
Working materials	Hydraulic oil: PLANTOFLUX 46-AT-S (Manufacturer: Fuchs)	approx. 2 l

2.2 Locking post

General data	Dimensions	
	Greatest width	2783 mm
	Greatest length	approx. 226 mm
	Greatest height	1261 mm
	Weight	
	Total weight	80 kg

2.3 Rail specification

Dimensions	
Rail height	149 - 172 mm
Rail base	125 - 150 mm
(Rail type 49E1 and 60E1)	
Rail height	141 mm
Rail base	126 mm
(Rail type 45E2)	

3 Overview of the STS-terminal block

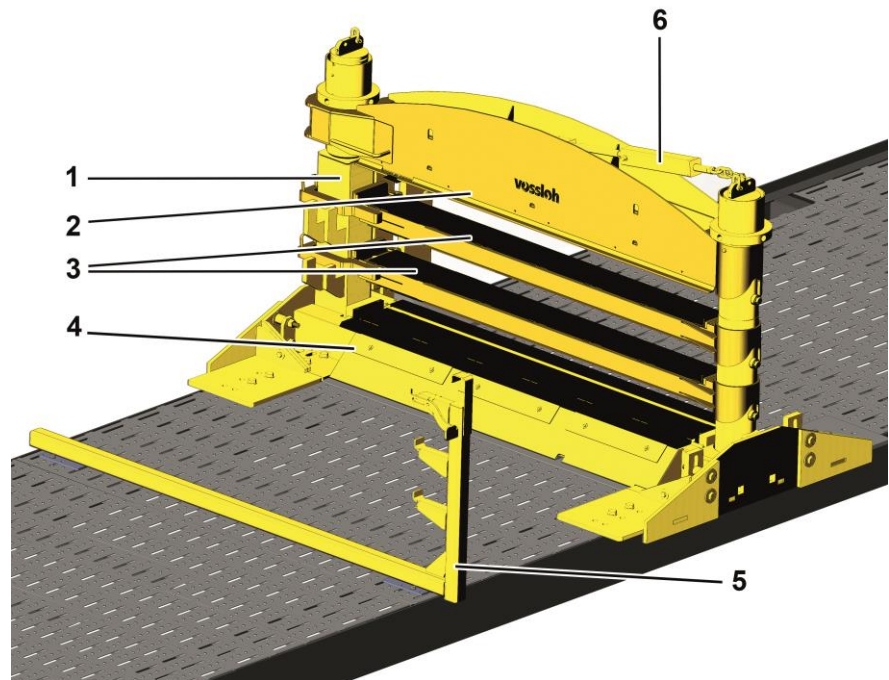
This chapter provides an overview of the structure of the STS-terminal block.

3.1 Views of the STS-terminal block mounted

The following illustrations show a mounted STS-terminal block. Every STS-terminal block contains one locking post for clamping bars and rotary sleepers.

The following illustration shows a closed and locked STS-terminal block. If the STS-terminal block is loaded with rails, then the terminal block is in the shown position. If the STS-terminal block is not loaded, then the STS-terminal block can also be locked as shown in the illustration.

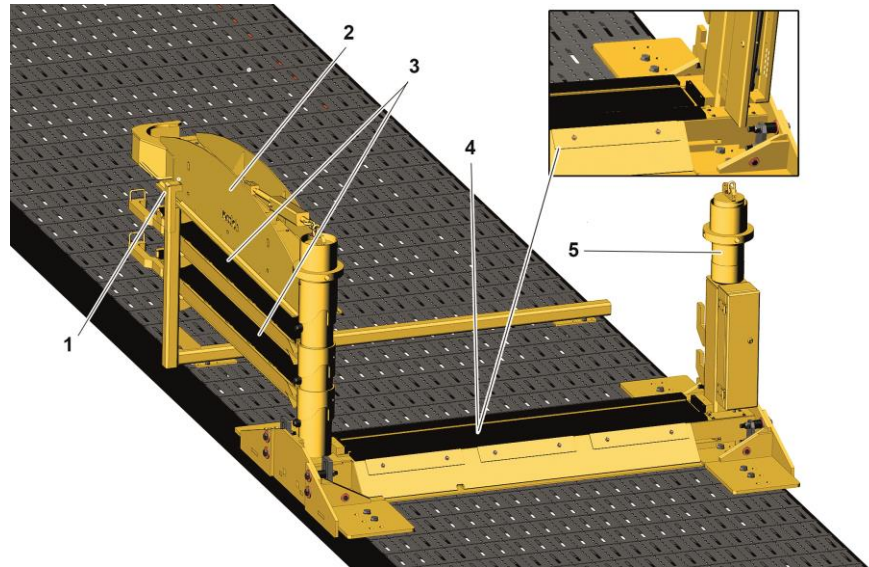
STS-terminal block closed



- | | | | |
|---|--------------------|---|----------------|
| 1 | STS-terminal block | 4 | Trough |
| 2 | Clamping bar | 5 | Locking post |
| 3 | Rotary sleeper | 6 | Spring support |

The following illustration shows an openly locked STS-terminal block. After unload or before loading, the terminal block is in the shown position.

STS-terminal block opened

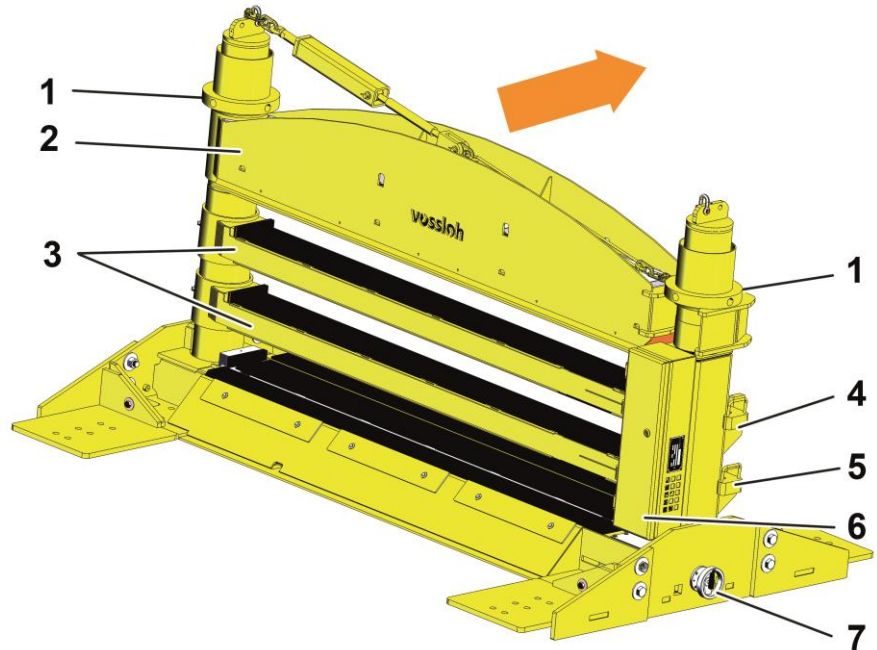


- 1 Locking post
- 2 Clamping bar
- 3 Rotary sleeper

- 4 Trough
- 5 STS-terminal block

3.2 Structure of the STS-terminal block

STS-terminal block closed



- | | | | |
|---|----------------------------|---|---|
| 1 | Hole nut | 5 | Lift-handle rotary sleeper |
| 2 | Clamping bar | 6 | Housing of the hand pump |
| 3 | Rotary sleeper | 7 | Hand wheel for locking the Push rod of the trough |
| 4 | Locking the rotary sleeper | | |

The STS-terminal block is opened in the direction of the orange arrow.

3.3 Loading instructions of the STS-terminal block

DANGER

Danger due to heavy loads!

Loading the rails with a crane involves the risk of injury by falling down or other unexpected movements of heavy loads.

- Staying under suspended loads is prohibited
 - Use permitted hoisting devices only
-

WARNING

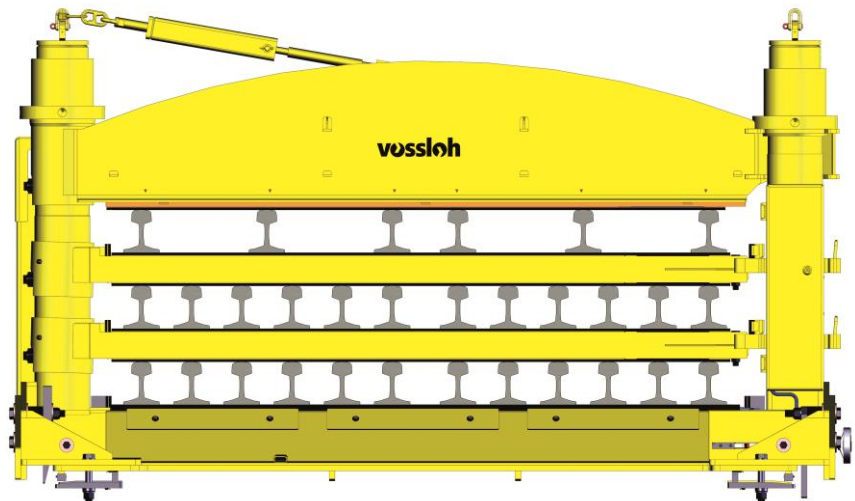
Danger due to unevenly distributed load!

Shifting unevenly distributed load involves risk of injury. Unevenly distributed load influences the drivability of the entire STS unit.

- Loading only as per the loading instructions of Vossloh Logistics along with the present operation manual
-

The STS-terminal block is loaded according to the loading instructions of Vossloh Logistics. As a general rule:

- Load only one rail profile for each layer
- Always arrange the rails symmetrically in a layer
- Assemble the topmost layer with at least 6 rails



4 Emergency management

4.1 Pictograms



Danger of crushing

Warns against risk of injury around movable parts

4.2 Hazardous substances

Hazardous substances are available in the following quantities:

- Hydraulic oil PLANTOFLUX 46-AT-S: approx. 2 l
(observe the manufacturer's safety data sheet, VLOG-part no.: 3000099)

4.3 Action during emergencies

DANGER



Danger to life!

Danger to life on the line due to passing trains on the neighbouring tracks.

- Observe the general principles of conduct for conduct on the track

DANGER



Danger of an electric shock caused by an overhead wire/live rail!

Entering or climbing on components that are not meant for inspection involves the danger of reducing the safety distance to the overhead wire. A live overhead wire denotes the danger of a life-threatening electric shock.

- Enter only those areas of the STS-terminal block, which are provided for inspection

This chapter provides instructions on the conduct in the following situations:

- Fall of the hydraulic system during unload
- Leakage of the hydraulic oil

4.3.1 Fall of the hydraulic system during unload

If the hydraulic system fails, the lifted STS-terminal block can no longer be lowered. It is necessary to lower the terminal block during unload. If the hydraulic system fails, proceed as follows:

- Refill oil tank of the hydraulic system (see chapter 9.3)

If the terminal still cannot be lowered:

- Loosen the hole nuts on the clamping bar with a hook spanner (see chapter 8.1 for hook spanner) uniformly and alternately.
- Open clamping bar

4.3.2 Leakage of the hydraulic oil

NOTE



In order to be able to adopt initial measures in case of oil leakage, Vossloh Logistics recommends carrying an oil spill kit along.

The oil spill kit should contain oil absorption tarpaulins, an oil trough and oil absorption grit.

If a large amount of oil leaks due to an accident, proceed as follows:

- Stop the oil leakage immediately
- Absorb the leaking oil with the help of oil absorption tarpaulins, so that the oil does not reach the track bed and ground
- Collect the already leaked oil with the oil absorption grit

Comply with the locally valid operational and statutory requirements.

5 Transport

5.1 Lift the STS-terminal block

DANGER



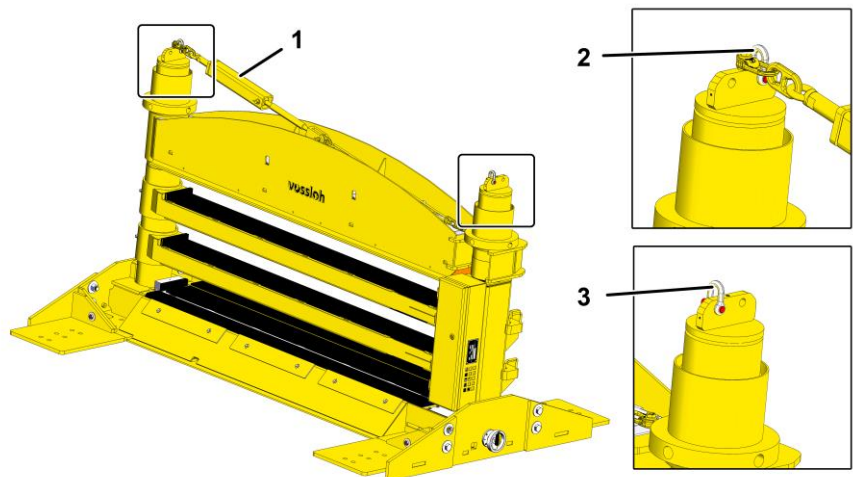
Danger due to heavy loads!

Risk of injury by falling down or other unexpected movements of heavy loads.

- Staying under suspended loads is prohibited

The STS-terminal block must be equipped with two lifting points for lifting with a crane.

Lifting points



- 1 Spring support
- 2 Lifting point

- 3 Lifting point

Requirement

- Use appropriate, permitted and inspected sling gear

Procedure

- Dismantle the spring support at both ends
- Remove the spring support and store safely
- Use a suitable shackle at the pivot point (as at lifting point 2)
- Hook in the hook at the two pivot points for lifting

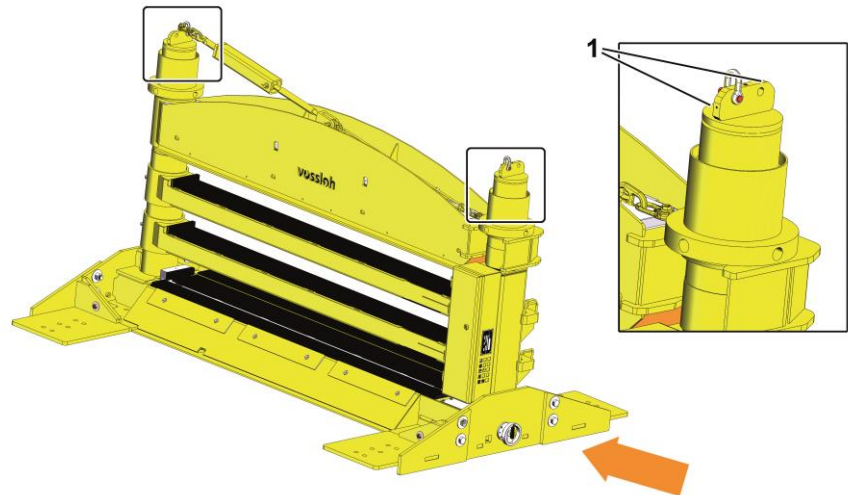
The STS-terminal block is ready for lifting.

5.2 Secure the STS-terminal block for transport

The STS-terminal block is equipped with four eyes for rigging. In addition, an anti-slip mat is laid below the base frame of the terminal block.

For transport, the VDI 2700 Directive must be followed for securing the load.

Lashing points

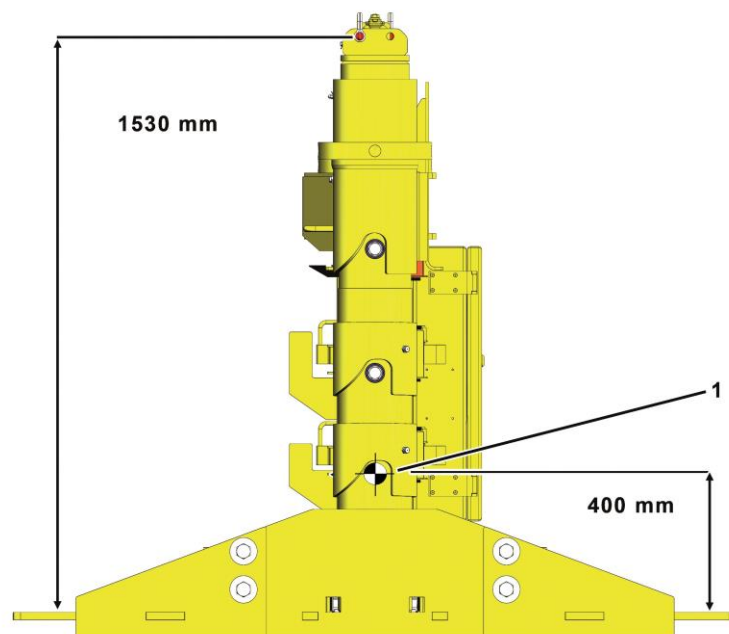


1 Lashing point



Place the anti-slip mat underneath

Centre of gravity STS-terminal block



1 Centre of gravity

6 Assembly

The assembly is carried out according to Drawing 1300376.

7 Commissioning

After assembly and before first commissioning, the following tests must be carried out:

- Check if the locks on the locking post are working
- Check if the clamping bars and rotary sleepers can be locked on the base frame of the STS-terminal block:
 - Locking of the rotary sleepers by placing them in the hook provided on the terminal block
 - Locking of the clamping bar using hole nuts above the clamping bar

Check if the function of the hydraulic system is given:

- Close the valve of the hand pump
- Actuate the hand pump

The trough is lifted.

- Open the valve of the hand pump

The trough is lowered.

Check the mechanical locking of the push rod:

- Lock the push rod with a hand wheel when the trough is lifted
- Loosen the push rod again

There must be ease of movement.

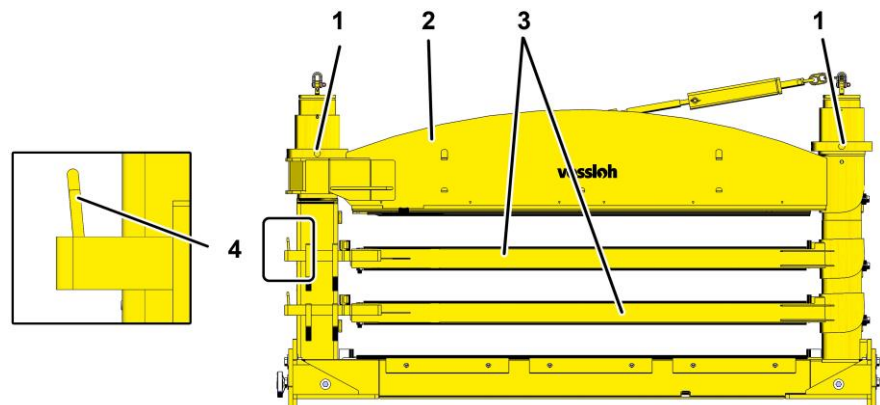
8 Operation

This chapter describes the operation of the STS-terminal block while loading and unloading the rails.

8.1 Load the STS-terminal block

The STS-terminal block is loaded as follows:

STS-terminal block closed



- | | | | |
|---|--------------|---|----------------------------|
| 1 | Hole nut | 3 | Rotary sleeper |
| 2 | Clamping bar | 4 | Lift-handle rotary sleeper |

WARNING

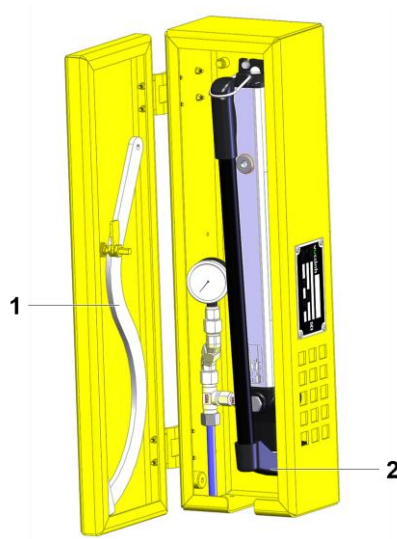


Uncontrolled movements of clamping bars and rotary sleepers lead to risk of injury!

Unlocked clamping bars and rotary sleepers can move on their own. Risk of injury for persons in the range of motion.

- Always swivel and lock the clamping bars and rotary sleepers in the final positions on the clamping bar or locking post
- Do not keep clamping bars and rotary sleepers in a half-open position

Hook spanner

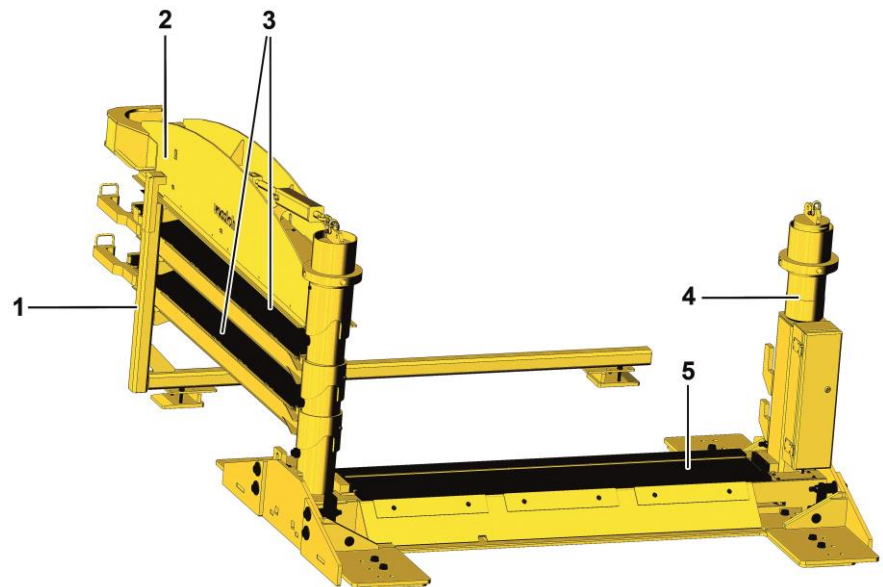


- | | |
|--------------|-----------|
| 1 | 2 |
| Hook spanner | Hand pump |

Open the STS-terminal block

- Uniformly loosen the hole nuts on the clamping bar with a hook spanner and turn approx. 80 - 100 mm
- Open clamping bar
- Pivot the clamping bar to the locking post until the clamping bar latches in the lock
- Lift the rotary sleepers on the lifting handle and pivot to the locking post (see the following illustration) until the rotary sleeper latches in the lock

STS-terminal block opened



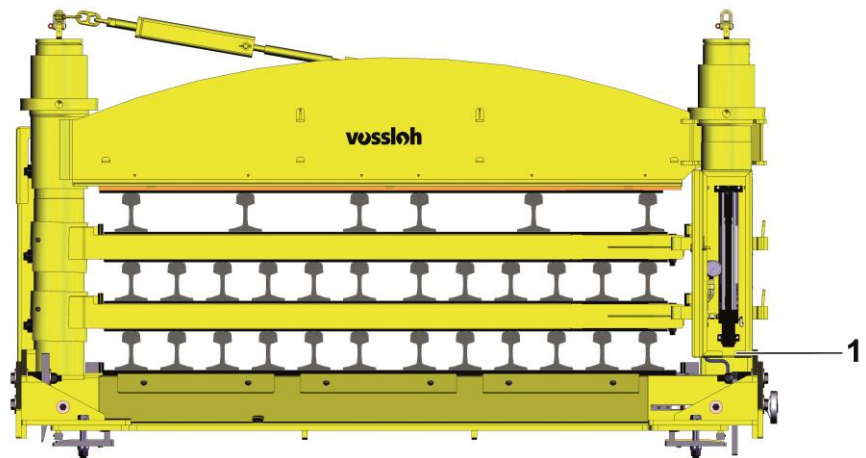
- | | | | |
|--|--------------|----------------|--------------------|
| 1 | 2 | 3 | 4 |
| Locking post for
Rotary sleepers and clamping
bars | Clamping bar | Rotary sleeper | STS-terminal block |
| | | 5 | |
| | | Trough | |

Store and secure the rails

- Load the lower layer with rails according to the loading arrangement of Vossloh Logistics
- Close rotary sleeper:
Pivot the rotary sleeper till the lock on the terminal block
- Insert the rotary sleeper in the lock
- Load the middle layer with rails according to the loading arrangement of Vossloh Logistics
- Close rotary sleeper:
Pivot the rotary sleeper till the end stop on the base frame of the terminal block
- Insert the rotary sleeper in the lock
- Load the top layer with rails according to the loading arrangement of Vossloh Logistics
- Close clamping bar
- Turn the hole nuts on the clamping bars downward until the hole nuts are tightened firmly by hand.

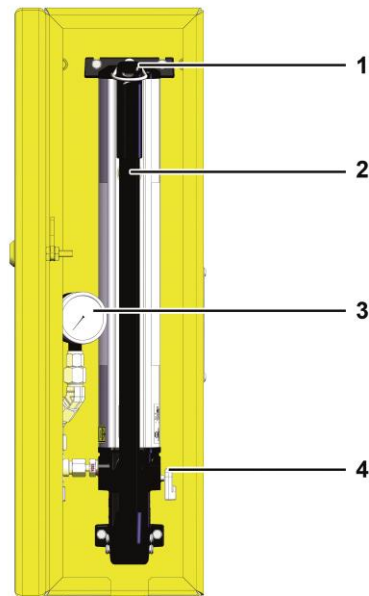
Lift the trough

If the STS-terminal block is completely loaded, then the trough is lifted by means of a hand pump. The rails are clamped by lifting the trough.



1 Hand pump lift trough

Hand pump



- | | | | |
|---|-------------------|---|----------------------------|
| 1 | Safety loop | 3 | Hydraulic system-manometer |
| 2 | Lever lift trough | 4 | Valve |

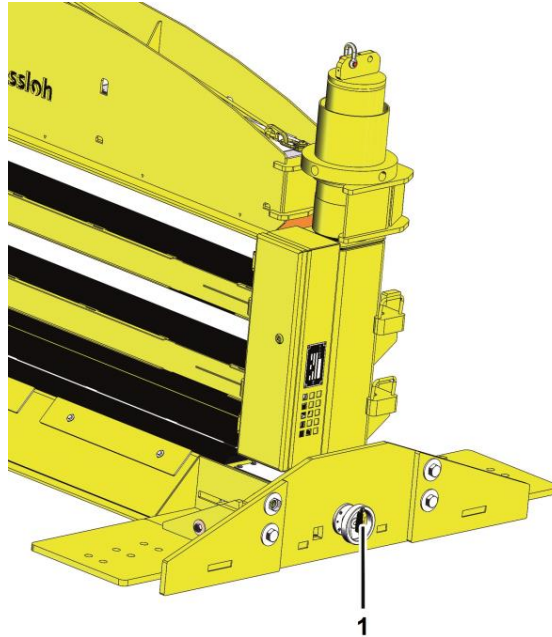
Clamp rails

- Open the housing of the hand pump
- Loosen the lever of the hand pump from the safety loop
- Close the valve: Turn the valve lever rearward (in the direction of the back panel of the hand pump's housing)
- Turn the valve lever till sluggish (multiple turns are possible)
- Actuate the hand pump

The trough is lifted.

- Actuate the hand pump till the manometer shows 350 bar

Hand wheel mechanical locking



1 Hand wheel for push rod for locking the trough

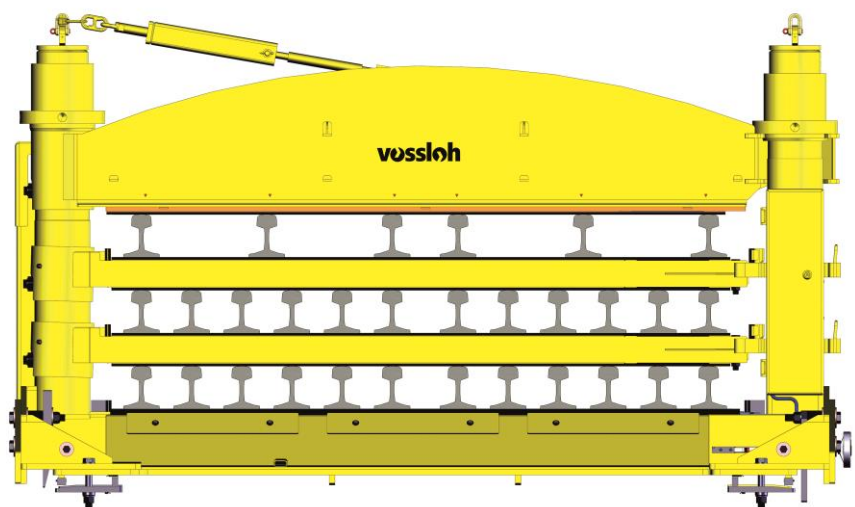
- Turn the crank handle clockwise till the end stop, then turn back $\frac{1}{2}$ a rotation
- Push the hand pump lever back into the safety loop
- Turn the valve lever back to the front

The valve opens.

- Close the housing of the hand pump

The loading of the STS-terminal block including clamping, is complete.

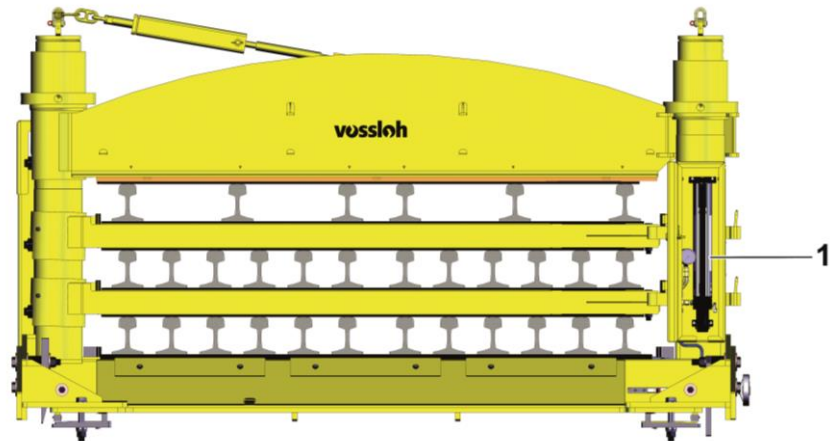
Loaded STS-terminal block rails are clamped



8.2 Unload the STS-terminal block

The STS-terminal block is unloaded as follows:

Loaded STS-terminal block rails
are clamped

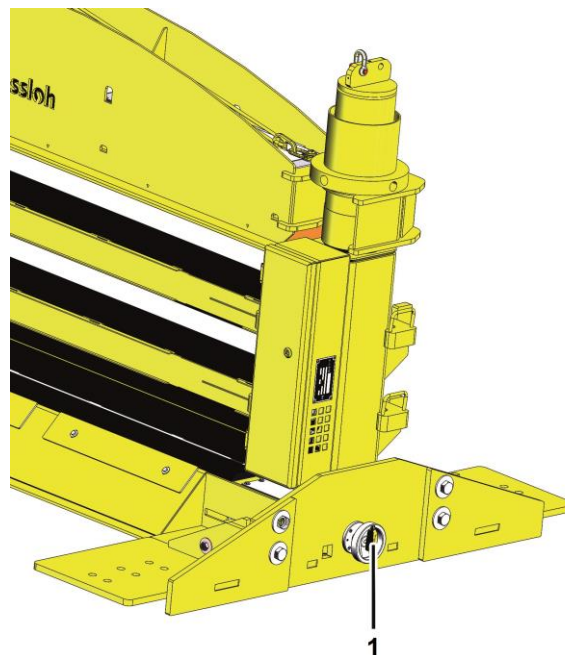


1 Hand pump lift trough

Lower the STS-terminal block

- Open the housing of the hand pump
- Loosen the lever of the hand pump from the safety loop
- Close the valve: Turn the valve lever rearward (in the direction of the back panel of the hand pump's cladding)
- Press the hand pump a few times until the hand wheel is moving freely

Unlock the mechanical locking



1 Hand wheel for mechanical locking

- Turn the hand wheel anti-clockwise till the end stop, then turn back ½ a rotation
- Open the valve: Turn the valve lever forward
- Wait until the trough has sunk

WARNING

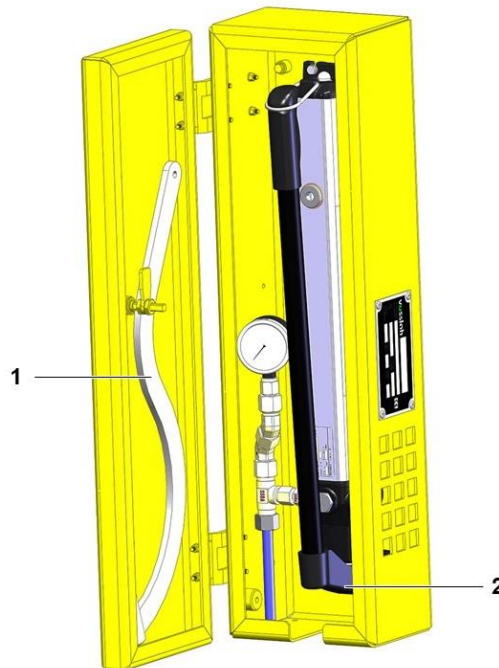


Uncontrolled movements of clamping bars and rotary sleepers lead to risk of injury!

Unlocked clamping bars and rotary sleepers can move on their own. Risk of injury for persons in the range of motion.

- Always swivel and lock the clamping bars and rotary sleepers in the final positions on the clamping bar or locking post
- Do not keep clamping bars and rotary sleepers in a half-open position

Hook spanner



1 Hook spanner

2 Hand pump

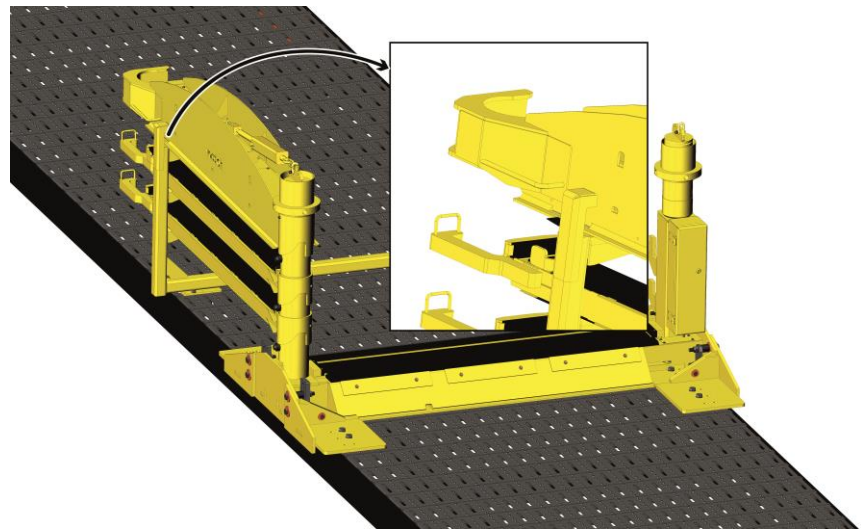
- Uniformly loosen the hole nuts on the clamping bar with a hook spanner and turn approx. 80 - 100 mm
- Open the clamping bar and latch in the locking post
- Unload the rails of the upper layer
- Open the middle rotary sleeper and latch in the locking post
- Unload the rails of the middle layer

- Open the lower rotary sleeper and latch in the locking post
- Unload the rails of the lower layer

Clamping bars and rotary sleepers can remain on the locking post while driving with unloaded wagons. Clamping bars and rotary sleepers must be latched in the locking post.

- Check if the rotary sleepers are latched in the locking post

Unloaded STS-terminal block



WARNING!



Increased risk of accident due to damaged locking post!

The STS-terminal block can knock out and swing towards the neighbouring track.

- Always check the intactness of the locking post before usage

9 Cleaning and maintenance

This chapter provides an overview of the work processes of cleaning and maintenance.

WARNING



Training obligation!

Only trained staff is allowed to work on the STS-terminal block. The staff must:

- Have obtained a safety training for rail operation
- Be acquainted with the operation of the STS-terminal block
- Know the system-specific hazards and safety instructions

WARNING



Increased risk of accident if protective equipment is missing!

The missing protective equipment can lead to fatal or serious injuries.

- When performing any work on the STS-terminal block, always remember to wear safety shoes (S3, non-slip, ankle-high)
- Always wear air-tight safety glasses when working on the pressure wash

9.1 Cleaning

This chapter informs about the cleaning measures after transportation.

WARNING



Risk of injury!

Foreign bodies can hit the eye when working with the pressure wash.

- Always wear air-tight safety glasses when working on the pressure wash
- Never align the pressure jet towards persons

Procedure

- Ensure that the housing of the hand pump is closed
- Clean the STS-terminal block with the pressure wash
- Apply grease to the thread of the hole nuts over the clamping bar after cleaning

9.2 Inspections

9.2.1 Inspect the STS-terminal block

Visual inspection

- Check the hole nuts over the clamping bar and the thread of the hole nuts for damages
- Check the rotating link of the clamping bars and rotary sleepers for cracks
- Check the plastic inserts for damages, replace if damaged
- Check the screw connections of the STS-terminal block and of the locking post before departure; loosened screw connections must be fixed only by the staff that is trained for screw connections as per DIN 25201; if required, provide feedback to Vossloh Logistics
- Check welded joints of the STS-terminal block and of the locking post before departure; provide feedback to Vossloh Logistics in case of damages, cracks etc.

9.2.2 Check the hydraulic system

The hydraulic system must be inspected regularly as follows:

Visual inspection

- Visual inspection for oil leakage on the rain drain and under the hand pump of the STS-terminal block

Hand pump

- Observe the supplier documentation: Operation manual and maintenance manual of the hydraulic hand pump (manufacturer: Bahco)

Complete the maintenance

- Ensure that the tool and other objects are cleared away properly

9.3 Refill oil tank of the hydraulic system

NOTE

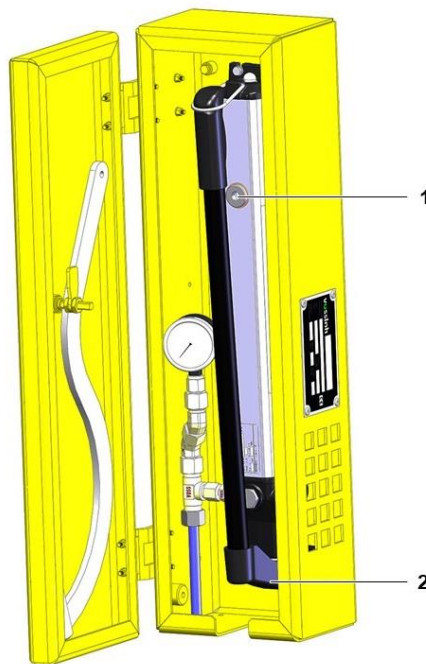


Make sure you use the type of oil that is already used in the system!

Oils of different manufacturers or oils of different types must not be mixed.

Follow the safety data sheets of the operating materials (e.g. hydraulic oil PLANTOFLUX 46-AT-S, manufacturer: Fuchs, VLOG-part no.: 3000099).

Oil filler screw



1 Oil filler screw

2 Hand pump

- Observe the supplier documentation for refilling the hydraulic oil: Operation manual and maintenance manual of the hydraulic hand pump (VLOG part number: 5002534)

10 Disposal

The STS-terminal block may be disposed of by a specialised company.

List of abbreviations

GCU	General Contract of the Use of Wagons
DIN	German Institute for Standardization
ISO	International Organization for Standardization
PSA	Personal protective equipment
STS	Rail transport system
VDI	Association of German Engineers

Tracking of modifications

Rev.	Date	Description	Created Checked Released
01	26/05/2016	First issue	Schmidt (VHSG) Hansmann (VRS), Dorn (VLOG) Wülpern (VLOG)
02	10/06/2016	Chapter 4.3.2: Action steps added; chapter 7: Note on red-green-indicator added; chapter 8.1 Clamp rails: Sequence of the action steps changed; chapter 8.2 Lower STS-terminal block: Sequence of the action steps changed; Terms in the entire document are changed: Nuts for locking the clamping bar = hole nuts, rotary sleepers on the terminal block are locked using: Hexagon screw; Declaration of conformity added	Schmidt (VHSG) Hansmann (VRS) Viets (VRS)
02.1	07/04/2017	Manufacturer's address is updated; illustrations are updated (lever is removed, crank handle is added); all chapters updated in view of lifting the trough with the crank handle	Schmidt (VHSG)
03	12/03/2019	Technical data is updated; illustrations are updated; all chapters updated	Schmidt (VHSG), Urnau (VHSG) Wülpern (VLOG) Wille (VRS)

Note: Version 02.1 of the operation manual was initially a draft for the field test concerning the changes noted under Rev. 02.1. Thus, there is no entry for examiners and reviewers.