

OPERATING MANUAL

ROMOVE

43.02/176

Rail Mover



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These operating instructions were produced in accordance with the current state of technology at the time of printing.
The right to change on the basis of further developments is reserved.
Dimensions and weights are approximated.
Photographs show special layouts in some cases.

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CE-Declaration of conformity

1. General Information

Staff operating and maintaining this product must have read and understood these operating instructions.

All those involved must have access to the operating instructions at all times.

1.1 About these instructions

The following symbols are used to mark operating procedures, lists and other elements of these instructions:

Symbol	Explanation
1. Action	Operating procedure - the sequence of actions must not be changed.
2. Action	
<ul style="list-style-type: none"> • List 1 <ul style="list-style-type: none"> – List 1.1 • List 2 	List - Sequence may be changed.
▶ Measure	Measure - the sequence must not be changed.
▶ Measure	

1.2 General Regulations

Appropriate legal requirements and accident prevention measures for use of this product must generally be observed. If they are not observed, the operator of the appliance takes responsibility for any legal consequences.

In the event of differences between prevailing regulations that apply to use of the product and the manufacturer's or sub-contractor's specifications, whichever limitations are the most stringent must apply.

The buyer must provide all necessary machinery, equipment and material resources for putting the delivered product into operation and training staff. He must also make available unrestricted, safe and sufficiently long track and work sections, on which staff can learn how to operate and use the delivered product and practise these tasks. Since the manufacturer or supplier of the product has no influence over the buyer's particular staffing and operating circumstances, no responsibility is accepted for the effectiveness of the instructions.

ROBEL Bahnbaumaschinen GmbH together with its customer service organizations are however happy to provide further advice, training or other consultative services. Further details and conditions can be obtained separately.

1.3 Intended Audience for this Operating Manual

This manual contains the information needed to use the product they describe correctly.

The manual has been written exclusively for technically qualified personnel. Qualified personnel in this context are:

- Personnel who can prove that they are qualified to use this product either through training or experience,
- Personnel familiar with the safety concepts that relate to machinery and equipment,
- Maintenance and service personnel who are specially trained to repair machines, appliances and its accessories.

Only persons who can read and understand this manual are allowed to use the product. They should sign to indicate that they have read and understood the manual.

Replacement, maintenance and operation of the product should only occur where official regulations are strictly followed for its use and safety, especially where they relate to safety and protection of the workplace and environment as well as the operating, maintenance and safety regulations or other instructions supplied by the manufacturer or supplier.

1.4 Liability Exclusions

The manufacturer declares himself to be exempt from any responsibility for damage arising when the product is not used in a designated way. This also includes use of the machine without safety mechanisms.

Any use of the product other than that specified above is not designated and endangers the lives and health of operating and maintenance personnel as well as the material property of the operator. The manufacturer of the product declares himself free from liability for damage to people or property belonging to the operator or a third party if:

- the product is not used as specified,
- operating and maintenance personnel have not read and understood the aforementioned directions and have used the product for other purposes,
- operating or maintenance personnel are not sufficiently qualified
- the product has been used under conditions exceeding limiting values,
- the product has not been serviced within the time specified,
- the product has not been serviced using other than original spare parts,
- product components or attachments have been altered without authorisation.

These exclusions from liability for damage to people or material property do not affect other exclusions.

1.5 Copyright

Specific characteristics and particular attributes of the product are the intellectual property of ROBEL Bahnbaumaschinen GmbH. The copyright on its use remains with ROBEL Bahnbaumaschinen GmbH. It may not be reproduced either in full or in part, published or otherwise exploited for competitive purposes, whether for payment or not. Its contents may not be passed by company employees to anyone outside the business.

1.6 Acceptance, Equipment and Operating Licence

It is the buyer's responsibility to check that the condition, fittings, performance and especially the safety features of the goods delivered match the relevant specifications agreed and to take account of the regulations specified in the contract.

The buyer must equip the goods delivered with all fittings necessary to meet relevant operational and safety regulations, norms, statutory regulations or other regulations, e.g. fire extinguisher, first aid box, signal and telecommunications equipment, additional warning devices, protective clothing, safety notices etc.

Unless otherwise agreed, no fittings of this nature are provided with the goods delivered.

Furthermore, it is the buyer's responsibility to demonstrate that the goods delivered have been accredited for use by the appropriate authority. Any documentation to be provided by the manufacturer or supplier (descriptions, proof, attestations, etc.) to enable this should be specified in the contract of supply.

Any additional measures and costs required to achieve operational accreditation must be borne by the buyer.

1.7 Validity of these instructions

These operating instructions apply to products with the following EDP nos.:

- EDP No 800 430 2008

2. Safety

2.1 Designated use

The ROMOVE 43.02 rail mover is for lifting and moving rails of any length longitudinally and laterally, with a permitted lifting capacity of 1,500 kg per device.

2.2 Foreseeable misuse

The rail mover must not be used to lift any objects other than rails.

The rail mover must be used only with the designated rail carrying tongs supplied by ROBEL.

2.3 Conventions of layout

These instructions make use of the following warning texts and symbols to keep the operator safe and injury-free and prevent damage to the material assets of the operating company:

DANGER



Indicates that non-compliance with the instructions will result in death or severe (irreversible) injuries of the operating personnel.

WARNING



Indicates that non-compliance with the instructions may result in death or severe (irreversible) injuries of the operating personnel.

CAUTION



Indicates that non-compliance with the instructions may result in minor (reversible) injuries of the operating personnel.


NOTICE

Points out that non-compliance with instructions may result in damage to the product or other assets of the operating company.



Contains important information about the product, its operation or about a section of the instructions on hand.

Structure of the warnings The warnings are structured as follows:

SIGNAL WORD	
	Type and source of danger!
	(Possible) consequences when ignoring the danger.
	► Measure to avoid the danger.

2.4 Design changes, original parts

The manufacturer will not be liable if any unauthorised changes to product components and attachments are made.

Original parts and accessories have been designed specifically for this product. The use of non-approved spare parts may result in structural features of the product being changed or impaired.

The manufacturer is not liable for any damage which is proven to be attributed to the use of such parts or inferior operating fluids.

2.5 Protective devices

Danger to life for the operator and others from manipulation of the safety devices!

- The operator is obliged to actually fit the designated protective devices during operation or to leave them in the predetermined factory position.
- The person commissioned to carry out maintenance must refit the protective devices after completing his work.

2.6 Safety regulations

The necessary requirements for protecting life, health, material property and the environment when handling the product must take precedence!

- Before using the product, make sure you can prove that all personnel affected have been made aware of the following relevant regulations and provisions:
 - Statutory national safety regulations
 - Provisions of the respective building code and works rules
 - Provisions of the respective professional and trade associations
 - Occupational and environmental health and safety regulations
 - Approvals regulations
 - Company-internal regulations
 - All other applicable regulations, in addition to and in concert with the manufacturer's safety and operating regulations

If necessary, the office in charge of operation must lay down additional regulations and measures geared to the special

tasks of the product to ensure that all safety requirements are met.

In addition to the information mentioned above the specific safety regulations must be observed and adhered to.

2.7 Qualifications of staff

Operator

The operator was trained by the operating company in the tasks assigned to him and informed of the potential dangers arising from inappropriate behaviour.

Requirements for the operator

- Comprehensive training on the product
- Knowledge of content of these operating and maintenance instructions
- Knowledge of content of operating and maintenance instructions of suppliers' and additional equipment
- Knowledge of national regulations and laws concerning the product and additional equipment
- Physical and mental fitness
- Power of concentration, sense of responsibility, reliability
- Necessary national requirements (qualifications, minimum age)
- No influence of alcohol, medicines, drugs or fatigue, etc.

2.8 Personal protective equipment

The approved personal protective equipment has to be used when operating and maintaining the product.

- ▶ Wear protective gloves.
- ▶ Wear steel-capped working shoes.

The protective equipment is determined by:

- These instructions
 - National safety rules
 - Rules of the professional trade associations
 - etc.
- ▶ If there are differences between the prevailing regulations within the operating company's scope of validity and those of the manufacturer and his suppliers, whichever regulations are the most stringent shall be applied.

2.9 Information on particular types of dangers

Danger due to manual handling

If the permissible per-person lifting weight is exceeded when lifting or carrying, there is a risk of injuring muscles, tendons, joints or bones.

- ▶ Prior to transportation, ensure that the pathway is free of obstructions or trip hazards.
- ▶ When lifting or carrying machinery or equipment, adhere to the permissible per-person lifting weight.

It is the responsibility of the operating company to ensure that the national safety regulations and guidelines of the trade associations in the respective countries are observed. The values stated in the warning notices of these operating instructions relate to regulations in Germany.

- ▶ Ensure that a risk assessment has been carried out and that the following aspects with regard to operators and the transport task have been considered:
 - Frequency of transport
 - Age
 - Gender
 - Operator's state of health
 - Uneven flooring
 - Poorly lit worksites
 - Bad weather
 - Working under time pressure
 - etc.
- ▶ Observe the relevant guidelines on lifting and transporting heavy machinery or equipment.
- ▶ Mechanical aids to lifting are always the preferred method of handling where possible, e.g. hoists, tail lift, rail trolleys etc.
- ▶ Always use the handles to lift the modules.
- ▶ Always use two hands and address the modules symmetrically.
- ▶ Do not twist the spine when handling.
- ▶ Do not carry any of the modules more than 10 meters without a rest, or without using a mechanical aid.
- ▶ Contact your Health and Safety Advisor for more information.

Danger due to unergonomic operation

With some activities there is a risk of injuring muscles, tendons, joints or bones if the necessary caution is not exercised with the controls. An example is starting the engine by means of the recoil starter.

- ▶ Pull the recoil starter vigorously but avoid jerky movements.
- ▶ Avoid adverse movements and poor posture.
- ▶ Avoid static postures of the thumb and hand when using the controls.

Risk of environmental damage

The majority of the components and parts used are subject to special regulations for collection and disposal.

- ▶ Dispose of components according to material groups (steel, plastics, oils, etc.).
- ▶ Collect waste oil in line with the relevant regulations and dispose of it accordingly.

Danger arising from unauthorised start-up

Unauthorised start-up and misuse can result in dangers and damage of any kind.

- ▶ Unauthorised start-up by unauthorised persons is strictly prohibited.
- ▶ It is up to the operating company to assess this risk.
- ▶ It is the responsibility of the operating company to implement appropriate measures against unauthorised start-up.

2.10 Accident prevention

The accident prevention regulations of the Civil Engineering association also find application in these operating instructions and are to be carefully read and adhered to.

- ▶ Always observe the general and internal accident prevention regulations.
- ▶ Consider the potential risks of accidents in association with the special tasks of the product and provide for appropriate training.
- ▶ Check that the product is in proper working order before putting it into service:
 - Equipment, devices, tools, accessories, safety equipment, etc. are complete and intact.
 - Inspection and maintenance work have been carried out professionally and on schedule.
 - Operating fluids have been topped up (fuel, lubricants, etc.)
 - All prerequisites for carrying out work safely have been met with regard to you and other persons, material property and the environment.
- ▶ Beware of the particular dangers of the product and your work area, especially:
 - persons and obstacles,
 - adherence to safety clearances,
 - traffic on adjacent tracks,
 - secure fitting of all protective equipment,
 - compliance with all operationally necessary safety measures.
- ▶ Leaking operating fluids (oil, grease, etc.) must be removed immediately to prevent a fire hazard or risk of slipping. Keep suitable oil binding agents and cleaning agents at hand.
- ▶ Before leaving the product perform the following checks:

- It has been shut down properly.
- It is secured against moving unintentionally.
- Tools and accessories are stowed away safely.
- ▶ Use only machines, appliances and tools that work properly.
- ▶ Rectify smaller faults straight away in order to avoid larger faults.

2.11 First Aid

Ensure the following to be able to provide First Aid in an emergency:

- ▶ Make sure that the First Aid kit is in proper condition, complete and clean at all times.
- ▶ Consult the medical service or doctor at your office regarding First Aid measures and appropriate equipment.
- ▶ Immediately replenish used up material.
- ▶ Store First Aid equipment (First Aid kit, blankets etc.) and fire extinguishers within easy reach.
- ▶ Carry material for securing accident sites.

2.12 Fire safety

Poisonous vapours are released when fuels, oils, paints or varnishes catch fire.

In addition, all measures required to prevent the development or spreading of a fire must be taken in individual cases.

With smouldering fires in electrical equipment toxic vapours are released from charring cables, also with fires of fuels, oil or paints.

- ▶ Everybody is obliged, as far as possible and reasonable to refrain from any actions that may cause a fire or favour the spreading of a fire. In addition, all measures required to prevent the development or spreading of a fire must be taken in individual cases.
- ▶ In general, any fires that occur are to be fought only with powder extinguishers.

General

The following fire safety measures must be adhered to.

- ▶ Use only approved fire extinguishers (powder-type extinguishers) of the prescribed fire protection class.
- ▶ Check the fire extinguishers periodically and ensure that they are provided with an inspection label (at least every 2 years, check the expiry date!).
- ▶ After using a fire extinguisher, replace it straight away.

3. Technical Data

3.1 Dimensions

Support width	2,240 mm
Max. carrying capacity	1,500 kg
Max. vertical travel	800 mm
Running distance of travelling crab	1,900 mm
Running distance of travelling crab	1,500 kg

3.2 Weight

Each support	approx. 16 kg
Cross beam	approx. 45 kg
Roller carrying tongs	approx. 16 kg
Travelling crab assembly	approx. 24 kg

3.3 Load

Permissible load per device	1,500 kg
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3.4 Carrying capacity when combined

Example: Lifting a Vignole rail: 3 devices in combination

Vignole rail profiles	115RE, S45, S49, UIC60
Vignole rail length	max. 26 metres
Max. rail weight per meter	65 kg

3.5 Environmental conditions

Operation	- 20 ° to 50 ° C
Transport	- 20 ° to 50 ° C
Storage	- 20 ° to 50 ° C

4. Description of appliance

4.1 Overview of appliance

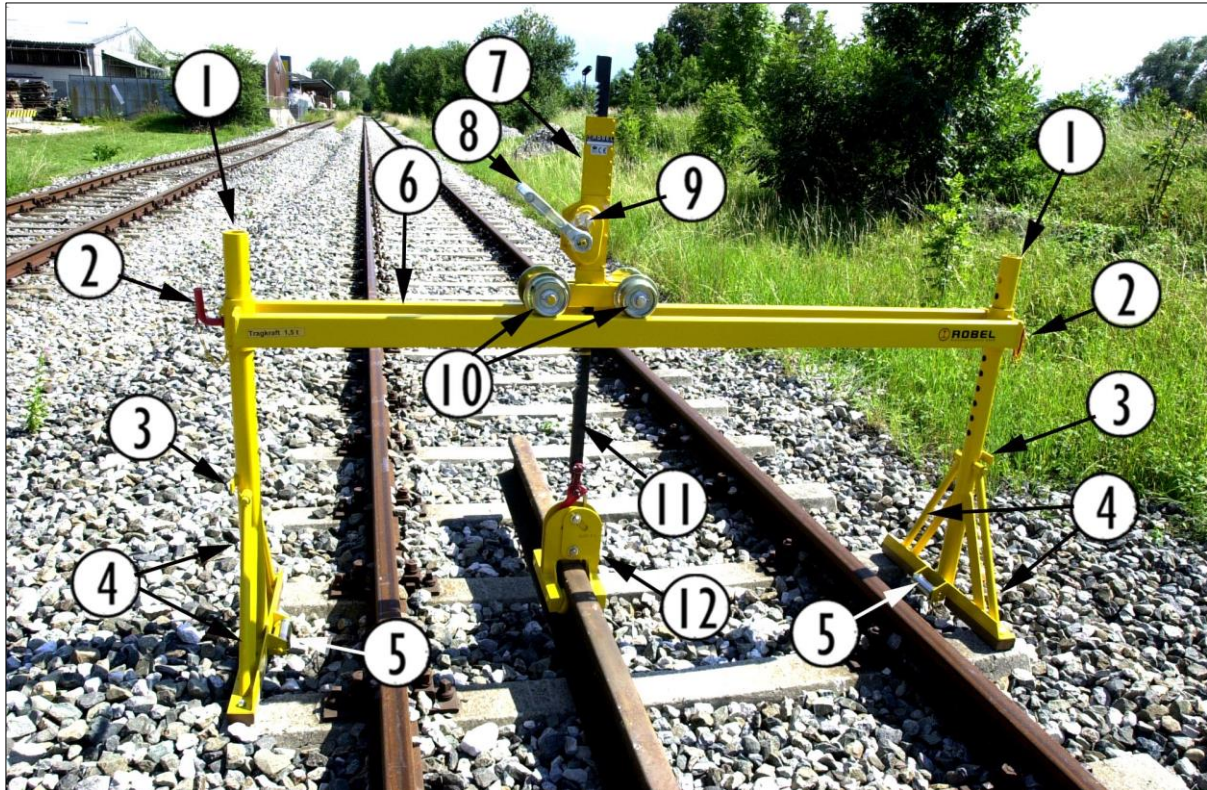


Fig. 1: Overview

- | | | | |
|---|-----------------------------|----|-----------------------|
| 1 | Supports | 7 | Travelling crab |
| 2 | Locking bolt for cross beam | 8 | Crank handle |
| 3 | Stop for carrying handle | 9 | Safety latches |
| 4 | Carrying handles | 10 | Running rollers |
| 5 | Transportation roller | 11 | Rack and pinion |
| 6 | Cross beam | 12 | Roller carrying tongs |

4.2 Control Elements

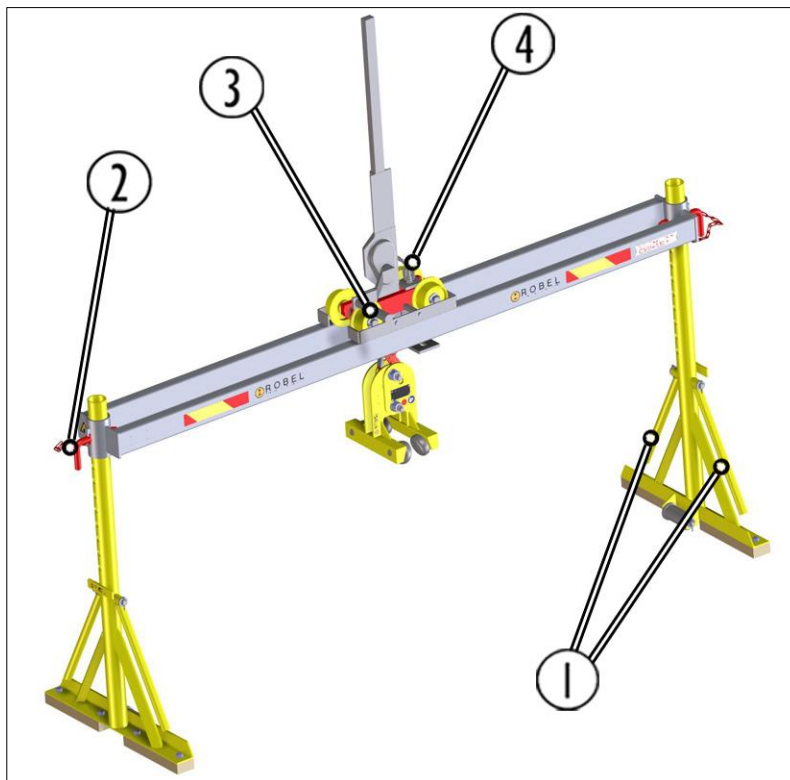


Fig. 2: Control Elements

- 1 Carrying handles (foldable)
- 2 Locking bolt for cross beam
- 3 Crank handle
- 4 Brake lever for travelling crab

4.3 Pawl mechanism

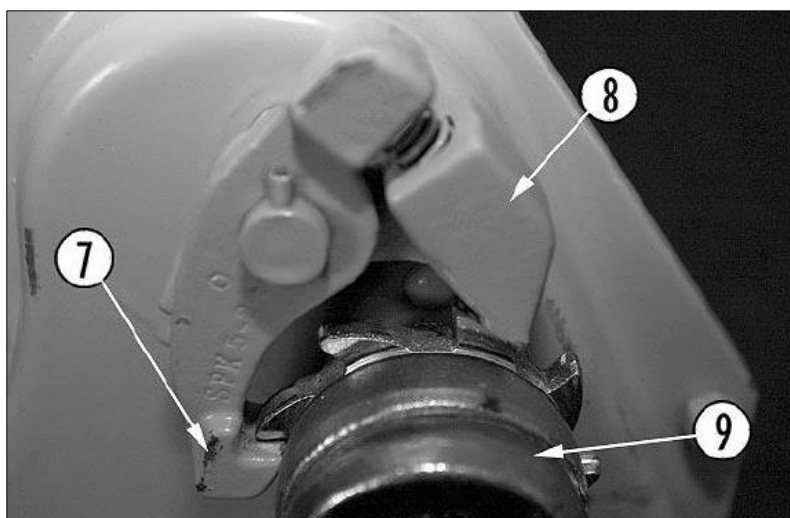


Fig. 3: Pawl Mechanism

- 7 Pawl
- 8 Safety Latch
- 9 Ratchet wheel

4.4 Carrying tongs

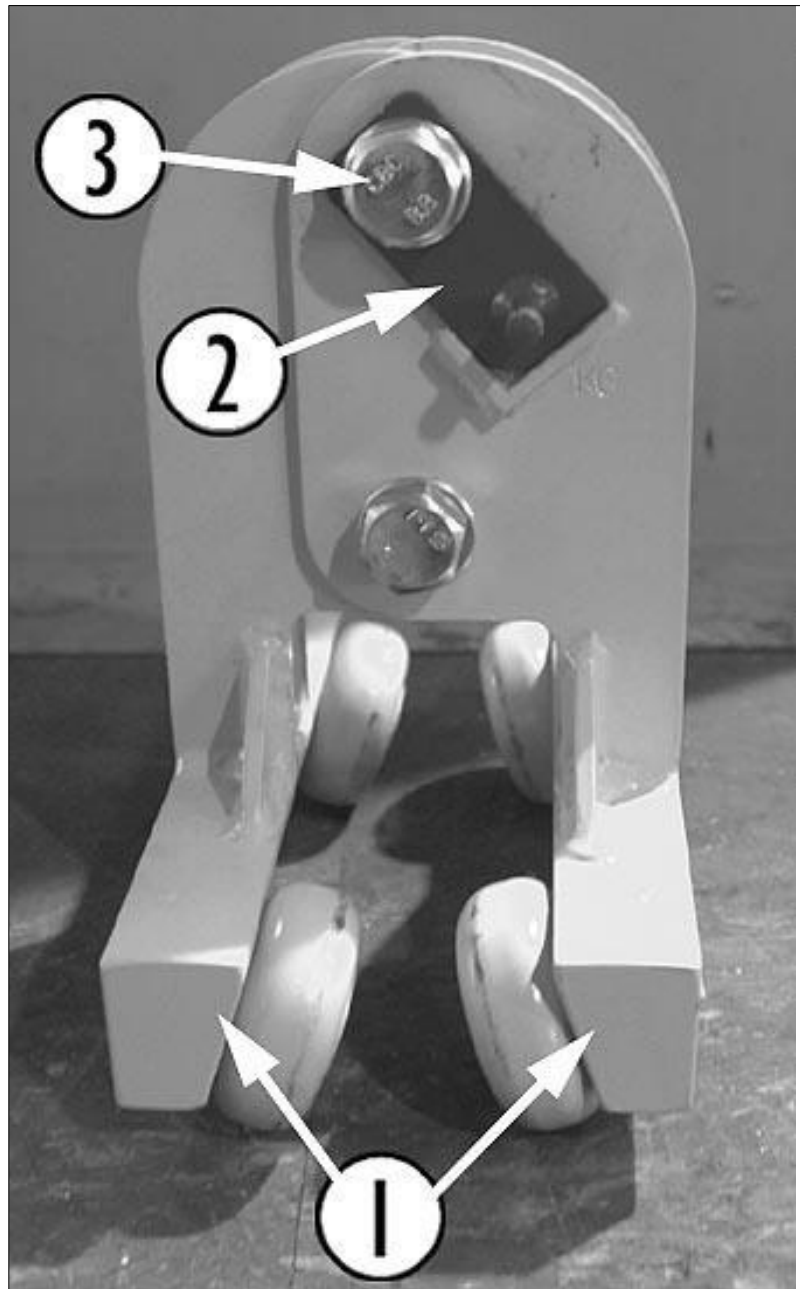


Fig. 4: Carrying Tongs

- 1 Tongs with carrying rollers
- 2 Safety locking plate
- 3 Lifting pin

Safety locking plate

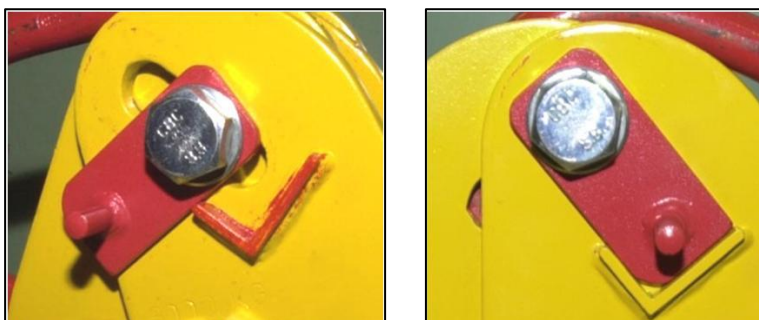


Fig. 5: Safety locking plate open (unsecured, left) and fully closed (secured, right)

4.5 Workplace

The operator is normally positioned within the manoeuvring range of the device and operates the lifting mechanism or moves the travelling crab.

4.6 Signs and Labels

4.6.1 Signs and Labels used



Fig. 6: Label "Crushing hazard"



Fig. 7: Label "Read and obey instructions"



Fig. 8: Label "Logo of manufacturer"

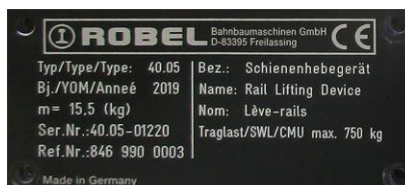


Fig. 9: Type label



Fig. 10: Sign "Lifting capacity 1,500 kg"



Fig. 11: Label "Wear Protective gloves"

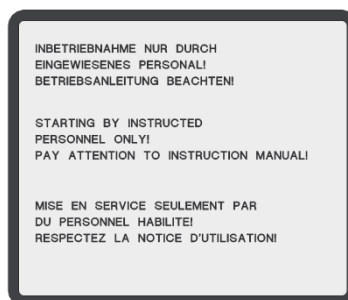


Fig. 12: Label "Instructed personnel only"



Fig. 13: Label "Testing label"



Fig. 14: Label "Reflective strip"

4.6.2 Position on the Product

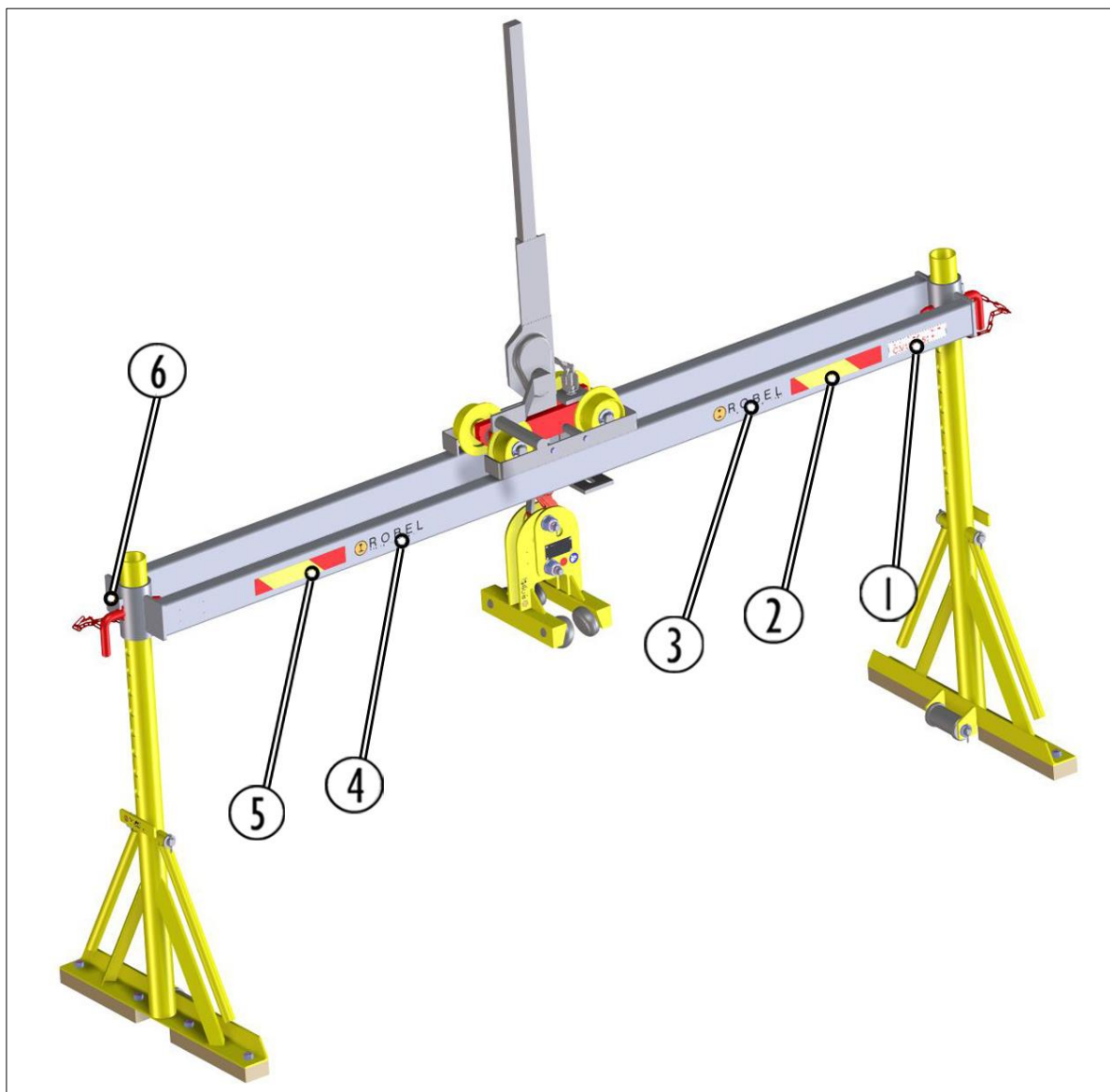


Fig. 15: Position on the Product (Front side)

- | | | | |
|---|----------------------------------|---|------------------------------|
| 1 | Sign "Lifting capacity 1,500 kg" | 4 | Label "Logo of manufacturer" |
| 2 | Label "Reflective strip" | 5 | Label "Reflective strip" |
| 3 | Label "Logo of manufacturer" | 6 | Label "Crushing hazard" |

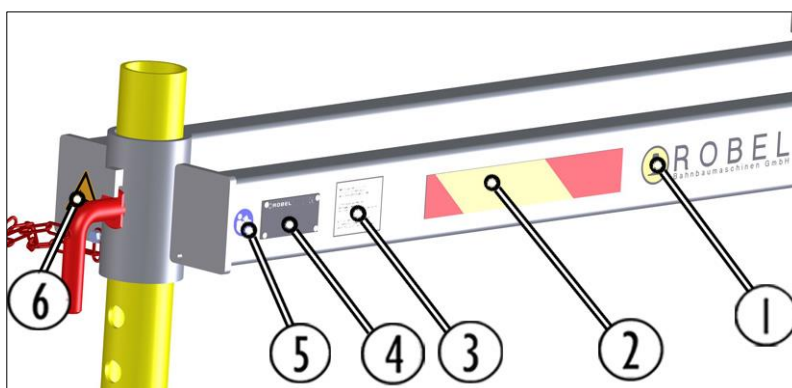


Fig. 16: Position on the Product (rear side)

- 1 Label "Logo of manufacturer"
- 2 Label "Reflective strip"
- 3 Label "Instructed personnel only"
- 4 Type label (appliance)
- 5 Label "Read and obey instructions"
- 6 Label "Crushing hazard"

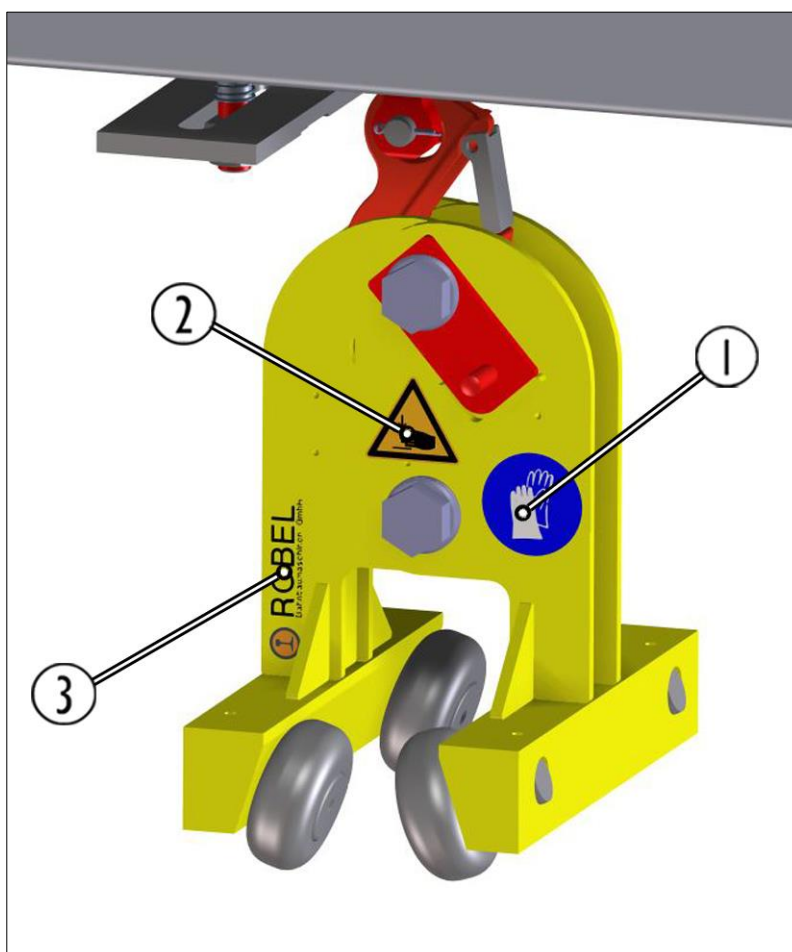


Fig. 17: Carrying tongs (front side)

- 1 Label "Wear protective gloves"
- 2 Label "Crushing hazard"
- 3 Label "Logo of manufacturer"

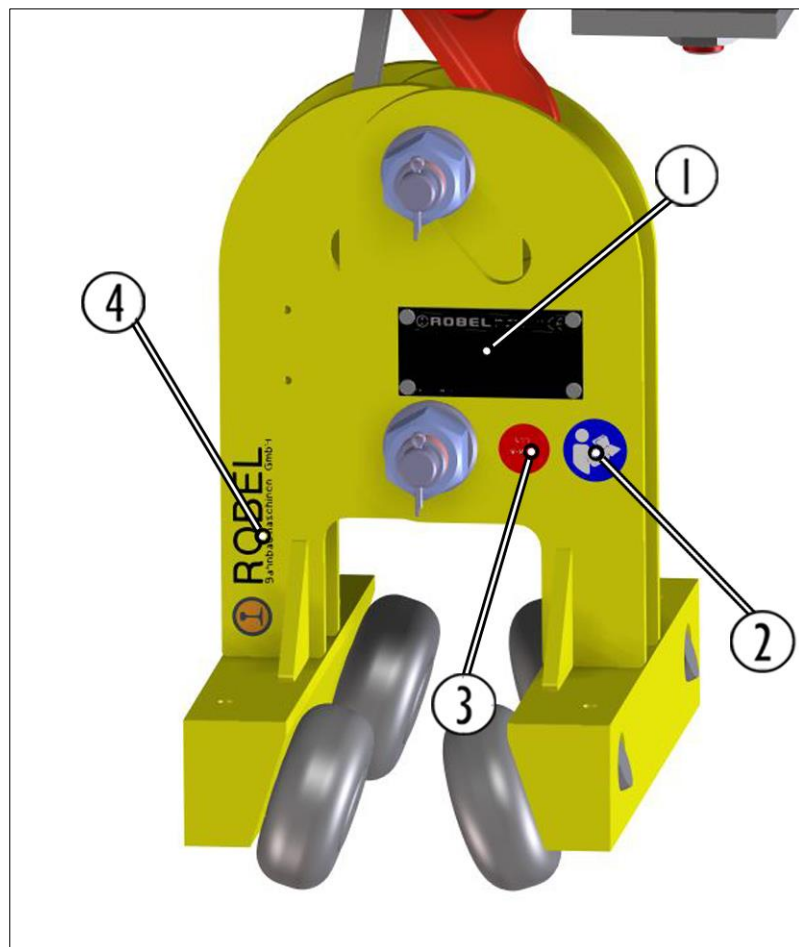


Fig. 18: Carrying tongs (rear side)

- 1 Type label (carrying tongs)
- 2 Label "Read and obey instructions"
- 3 Label "Testing label"
- 4 Label "Logo of manufacturer"

5. Commissioning and operation

WARNING



Crushing hazard!

- ▶ Wear the required safety clothing and protective gear (e.g. safety shoes and work gloves).

5.1 Checks prior to commissioning

1. Carry out a visual inspection:
 - The rail mover must not show any signs of damage
 - Any rail movers which are damaged must not be used.
 - Make sure the rack and pinion is fitted properly, the horizontal tooth flanks must lie underneath during operation.
 - Carrying tongs without a properly working safety device must not be used.
 - Ensure the running rollers, hand crank, safety latches and rack and pinion are clean and move freely.
 - Check the permissible lifting load.
- Roller carrying tongs**
 - Check that the carrying tongs are in proper working order before use. I.e., the tongs must not exhibit any mechanical defects and must move smoothly at the hinges (if necessary, make them move freely by greasing and repeated movement of the joints).
 - In particular, check the safety device for smooth movement of the safety locking plate.

5.2 Safety precautions

1. Keep well away from adjacent tracks.
2. It is best and safest if the operator with the rail mover stays within the rails of a train track.
3. Make sure the rail mover is placed on level ground that is not slippery.
4. All personnel who are working in the vicinity of the rail mover must be made aware of the potential dangers that it poses.

5.3 Setting up

WARNING



Risk of injury!

The product is too heavy for one person alone. An injury to the muscles, bones or tendons may result, particularly those in the back and shoulders. Various other types of injury are possible.

- ▶ Always transport the product with suitable equipment, e.g. suitable trolley.
- ▶ Lift the product with suitable lifting equipment e.g. crane, hoist, tail lift or at least a **four*) person team**.
- ▶ See Chap. 2 for further details on manual handling.

*) This value is conservative and has been determined following the demands of the standard DIN EN 13977:2011. However, the operating company is entitled to conduct a risk assessment and to allow less persons if this is the outcome of the risk assessment.

Working as a four-person team:



- Mounting the first support: one person holds the first support, three persons hold the cross beam.
- Mounting the second support: three persons hold the cross beam, one person fits the second support.

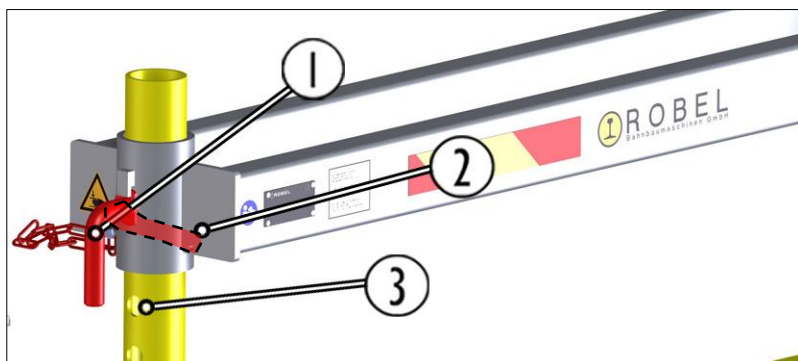


Fig. 19: Lock with locking bolt

- 1 Locking bolt
- 2 Open position (dashed)
- 3 Locked position

1. Place the cross beam over the supports so that the lettering is visible and the transportation rollers are opposite one another.

2. With the locking bolt pointing right push it as far as possible into the cross beam through the required hole then rotate it so that the locking bolt cannot be pulled out.

The locking bolt is locked in place.

Adjusting for uneven terrain

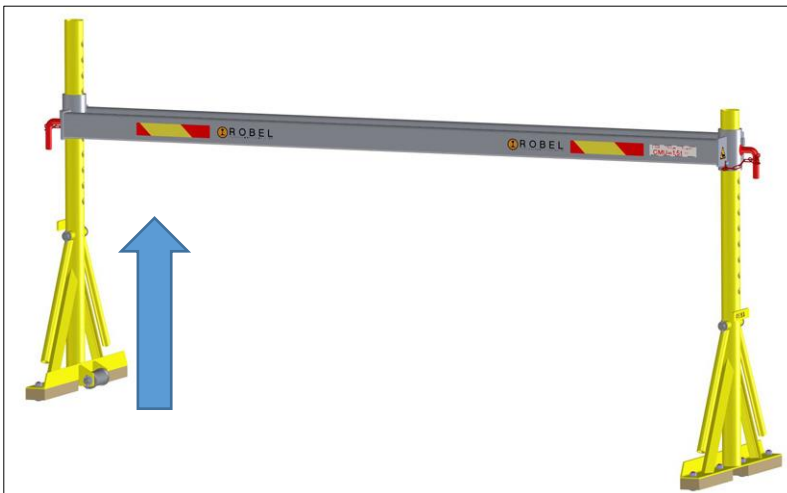


Fig. 20: Adjusting for terrain height

3. Fold up the support arm on each side of the rail mover as far as the stop.

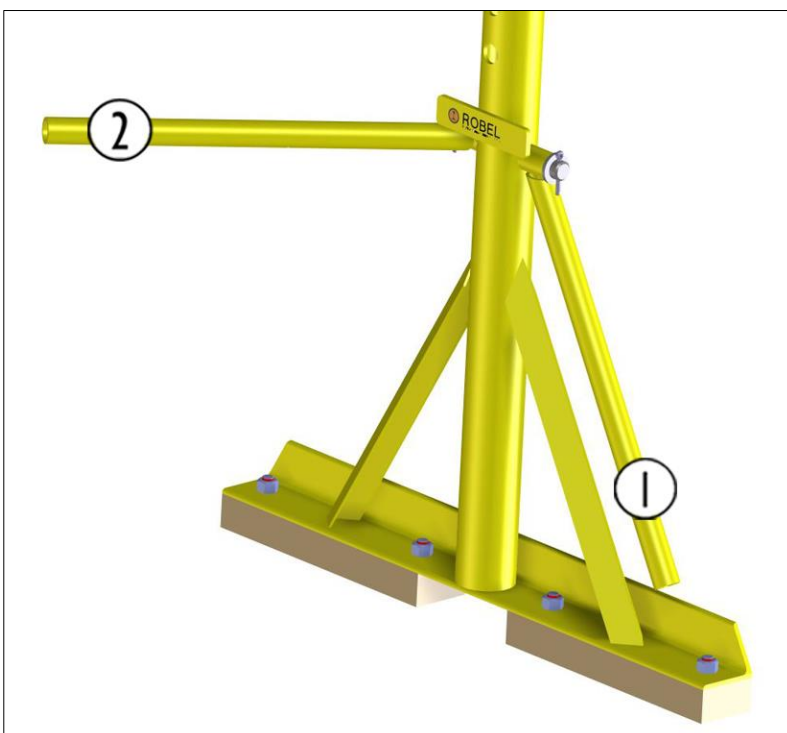


Fig. 21: Folding up the support arms

- 1 Folded-in position
- 2 Folded-up position
4. Use 4 people to position the appliance over the rails that are to be moved so that the required (or optimum) range can be reached.

WARNING**Crushing hazard!**

Risk of crushing between the travelling crab and the support surface.

- ▶ Fix the travelling crab in place.
- ▶ Do not hold onto the cross beam with your hand.

1. Latch suitable roller carrying tongs (e.g. ROBEL 42.10) into the lifting hook of the rack and pinion.
2. Use additional rail movers if the loads to be lifted exceed 1,500 kg.
3. In this case, position the rail movers along the rail such that the load is distributed evenly over all of them.

The load must be aligned linearly and must only be raised or lowered vertically.

4. Place the travelling crab onto the cross beam from above such that it can be easily moved via the running rollers.
5. The folded-up crank handle can easily be folded out via a spring catch.

It clicks into place and can be returned to the rest position after the work has finished by simultaneously pulling and folding it up.

6. The rack and pinion is moved downwards by turning the crank handle counter clockwise.

When doing this, the latches remain engaged in their position.

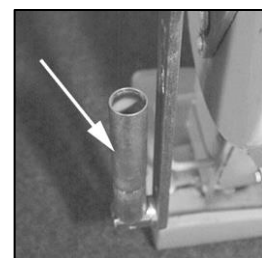
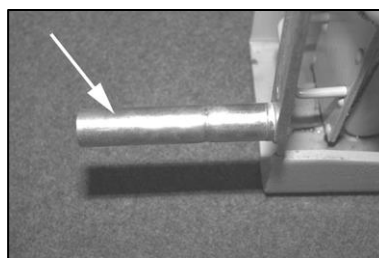


Fig. 22: Crank handle folded out (left) and folded in (right)

5.4 Lifting rails

1. When lifting and moving the rails, ensure that an unbalanced loading situation does not arise at any time.

WARNING

Risk of accident!

Loads may fall down unexpectedly resulting in crushed limbs.



- ▶ Distribute loads evenly.
- ▶ Lift all rail carrying tongs at exactly the same time.
- ▶ Lift the rail carrying tongs vertically.
- ▶ Ensure that all members of the team have agreed the same signals for raising or lowering the load.
- ▶ Ensure that no other persons are in the danger zone.



The rails are moved by several rail movers working together.

- ▶ Before the work begins, agree on the commands for the steps needed.

2. Hook the carrying tongs with the lifting pin (2) in the load hook (3) of the rack and pinion.

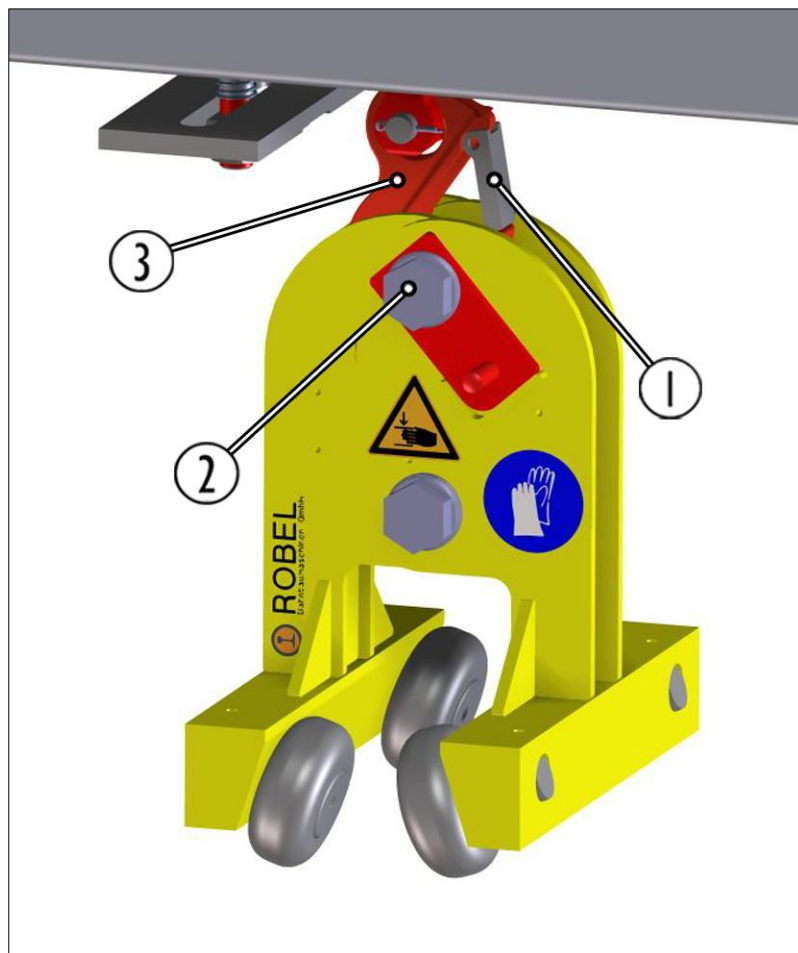


Fig. 23: Hooking in the carrying tongs

- 1 Securing bar
- 2 Lifting pin
- 3 Load hook

3. Position the carrying tongs vertically above the section of rail such that it can be grasped at its longitudinal centre of gravity.
4. Move the securing bar to the "open" position.
When setting down onto the rail head, the clamping piece opens by itself.
5. If necessary, assist this a little by hand.
6. Lower the carrying tongs further until the rail head is fully surrounded by the tongs.
When the carrying tongs are lifted, they close automatically.
7. Turn the securing bar clockwise as far as the stop.
The carrying tongs are locked in place.
The rail can now be lifted.

5.5 Moving and lowering the rail

- Lifting** 1. Turn the crank handle clockwise to lift the rail until it is above any obstacles.

In doing so, the pawls engage alternately in the ratchet wheel.



The load pressure brake holds the rail securely in any position, even if you let go of the crank handle.

- Moving** 2. Move the travelling crab by hand so you can bring the rail into the desired position.
3. Lock the travelling crab in place.

- Lowering** 4. Turn the crank handle counter clockwise to lower the rail.
The pawl and safety latch remain engaged in position during this process.
5. Once the rail has been fully lowered into the required position, lower the rack and pinion a little.
6. Open the securing bar of the rail carrying tongs by turning it counter clockwise.
7. Open and unhook the tongs.

5.6 Dismantling

WARNING



Risk of Injury!

The product is too heavy for one person alone. An injury to the muscles, bones or tendons may result, particularly those in the back and shoulders. Various other types of injury are possible.

- ▶ Always transport the product with suitable equipment, e.g. suitable trolley.
- ▶ Lift the product with suitable lifting equipment e.g. crane, hoist, tail lift or at least a **four^{*)} person team**.
- ▶ See Chap. 2 for further details on manual handling.

^{*)} This value is conservative and has been determined following the demands of the standard DIN EN 13977:2011. However, the operating company is entitled to conduct a risk assessment and to allow less persons if this is the outcome of the risk assessment.

-
1. Ensure that the rail mover is not under load.
 2. Unhook the roller tongs at the lifting hook after pressing the securing bar.

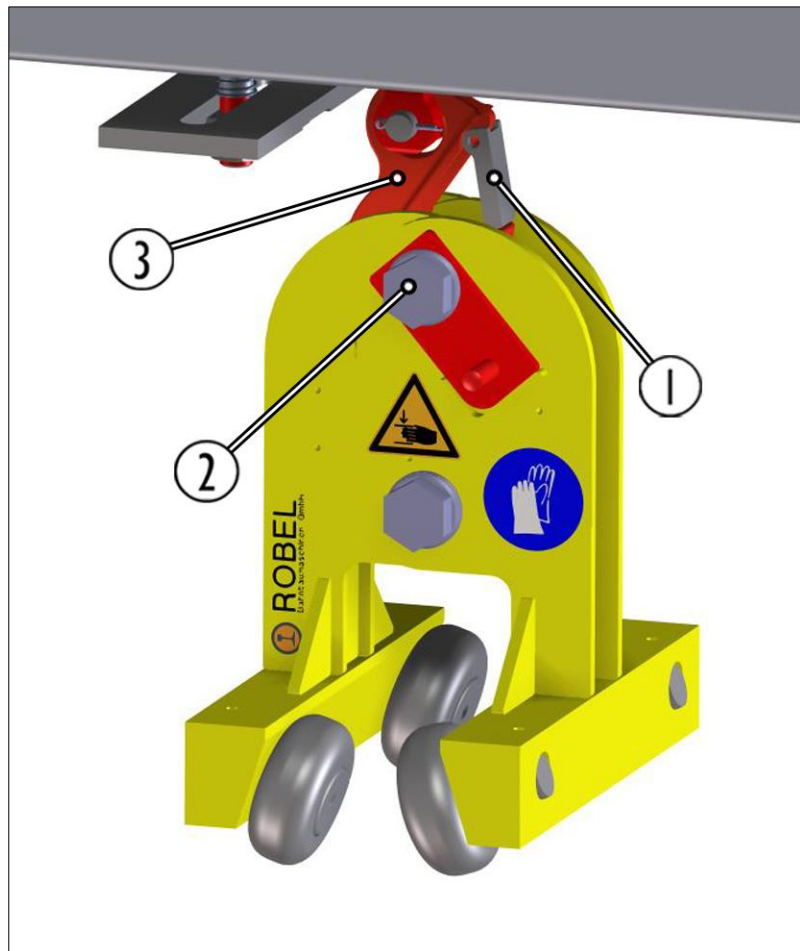


Fig. 24: Unhooking the carrying tongs

- 1 Securing bar
 - 2 Lifting pin
 - 3 Load hook
3. Remove the travelling crab upwards.
 4. Turn the locking bolt for the cross beam to the "pointing right" position.
 5. Pull out the locking bolt and remove the cross beam upwards.

6. Transport and Storage

WARNING



Risk of Injury!

The product is too heavy for one person alone. An injury to the muscles, bones or tendons may result, particularly those in the back and shoulders. Various other types of injury are possible.

- ▶ Always transport the product with suitable equipment, e.g. suitable trolley.
- ▶ Lift the product with suitable lifting equipment e.g. crane, hoist, tail lift or at least a **four^{*)} person team**.
- ▶ See Chap. 2 for further details on manual handling.

^{*)} This value is conservative and has been determined following the demands of the standard DIN EN 13977:2011. However, the operating company is entitled to conduct a risk assessment and to allow less persons if this is the outcome of the risk assessment.

6.1 Transport

6.1.1 From worksite to worksite

The temperature range for transporting the product is -20 °C to +50 °C.

WARNING



Crushing hazard!

- ▶ Wear the required safety clothing and protective gear (e.g. safety shoes and work gloves).

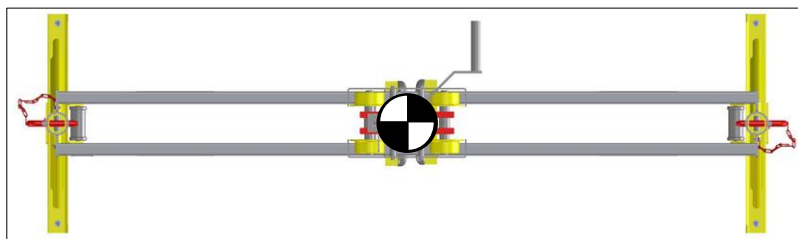


Fig. 25: Centre of gravity

The centre of gravity (COG) of the product lies at the position marked by the COG symbol.

6.1.2 Along the rail

The rollers allow the device to be moved along the rail with ease.



Fig. 26: Manual movement along the rail

6.2 Storage

The temperature range for storing the machine is -20°C to $+50^{\circ}\text{C}$.

1. Ensure that the place of storage is dry and dust-free
2. Grease the joints and securing system of the carrying tongs as described in section 7.3.
3. If safely possible: release the parking brake of the travelling crab.

7. Maintenance

1. Use only the recommended lubricants and, when carrying out repairs, use only original spare parts.

This is important, firstly for warranty cases and secondly to enhance the operational reliability of the product.

Correct ordering of spare parts is an essential contribution to a speedy delivery of spare parts and consequently to the economic viability of the product.

2. When ordering spare parts from us please provide the following information:
 - Type of machine
 - Number of the machine
 - Assembly
 - Description and number of spare part
 - Quantity
 - Shipping method
 - Dispatch address
3. Adhere to the prescribed service intervals!
4. Observe the country-specific safety and environmental regulations when performing maintenance work!

7.1 Maintenance schedule

Interval	Maintenance work
Every day	Check that the device is in perfect working order, see section 5.1
Every month	coupling parts and replace if necessary
	Check the carrying tongs (see section 5.1), ensure pivots and securing system move smoothly (grease)
	Signs and Labels, see Chap. 7.4
Every year	Lubricate
	Check the brake linings of the parking brake
	Perform checks in line with national accident prevention regulations
	-Shackle (at the lifting eyes) -Cable winch -Rail carrying tongs

7.2 Cleaning and care

NOTICE

Risk of damage!

Cleaning the product with solvents, aggressive or combustible cleaning agents may result in damage.

The use of high-pressure washers can result in damage caused by water getting into articulated joints of the product.

- ▶ Do not use any solvents or aggressive, combustible cleaning fluids!
- ▶ Do not use petrol for cleaning.
- ▶ Do not use a jet of water or a high pressure washer.

1. Clean the product regularly so that it does not suffer a production outage due to dirt.
2. Only use a damp cloth to clean the product. Only use water and, if necessary, a mild detergent without any chemical additives.

7.3 Lubrication

The rail mover is largely maintenance-free.

1. Keep the rack and pinion greased.
2. Keep the pivots and the securing system of the roller tongs moving freely.

7.4 Check signs and labels

1. Regularly check that all signs and labels are present and intact.
2. Replace signs and labels if necessary.

8. Troubleshooting

Error	Cause	Remedy
Carrying tongs are stiff	Insufficiently greased	► Grease the joints, make tongs move freely
Load sinks unintentionally	Load pressure brake fouled by grease or oil	► Clean load pressure brake and remove grease or oil ► Perform a functional test at maximum load: Load must not descend
Parking brake: not effective/effective enough	Worn brake linings	► Replace the brake linings
Parking brake cannot be opened	Spring is worn	► Replace the spring

9. Environmental protection and disposal

9.1 Environmental protection

- While working on or with the product, comply with the legal regulations for waste prevention and proper recycling/ disposal and also follow the environmental laws applicable in the user country.
- Particularly, make sure that during the repair and maintenance work, water polluting substances such as greases and oils do not pollute the ground or get into the drains.

9.2 Disposal

The disposal of the product (including machine parts, engine oil and fuel) will depend upon the local regulations for waste disposal.



If the product reaches the end of its life cycle, ensure a safe and proper disposal, particularly of parts or substances which are harmful for the environment. These include, among others, fuel, lubricants, and plastics.

- Since there is a risk of potential environmental pollution, have the product disposed of by an approved specialist firm.
- In any case, check which materials can be used for recycling. Have these disposed of by appropriate waste management companies.

10. Appendix

CE-Declaration of conformity



		EG-Konformitätserklärung (deutsche Originalfassung) EC Declaration of Conformity (English translation) Déclaration „CE“ de Conformité (Traduction française)
gemäß Maschinen-Richtlinie 2006/42/EG, Anhang II A as defined by the Machinery Directive 2006/42/EC Annex II A conformément à la directive „CE“ relative aux machines 2006/42/CE, Annexe II A		
Hersteller (Name und Anschrift): Manufacturer (name and address): Fabricant (nom et adresse):	ROBEL Bahnbaumaschinen GmbH Industriestraße 31 D-83395 Freilassing	
Hiermit erklären wir, dass die Herewith we declare that the model Par la présente, nous déclarons, que le modèle fourni par	REMOVE Schienenumsetzgerät Rail Mover Portique de substitution de rails Typ/type/type 43.02	
folgenden einschlägigen Bestimmungen entspricht: complies with the following provisions applying to it: correspond aux dispositions pertinentes suivantes:	2006/42/EG	
Angewandte harmonisierte Normen: Applied harmonized standards: Normes harmonisées appliquées:	DIN EN ISO 12100: 2011	
Bevollmächtigt für die techn. Dokumentation: Responsible person for technical documentation: Personne chargée pour la documentation technique:	Mag. Bernhard Lair Abt. Technische Dokumentation Industriestraße 31, D-83395 Freilassing	
Freilassing, 04.03.2020 Ort, Datum Place, date / Lieu, date	 Otto Widloither Leiter HMG/Head of HGM/ Direct. gestion de mach.	 Wolfgang R. Fally Geschäftsführer/Managing Director/ Gérant
Unterschrift, Angabe der Funktion im Unternehmen Signature, acting in the company / Signature, en qualité de		

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 Hypo Vereinsbank Freilassing
 (BLZ 710 200 72) 9 333 100
 IBAN: DE34 7102 0072 0009 333100
 SWIFT: HYVEDEMM410

www.robel.com

Fig. 27: CE-Declaration of conformity

产品说明书

ROMOVE

43.02/176

轨道搬运装置



德国 Robel 轨道机械有限公司

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产品说明书译文版

日期：2020 年 3 月 4 日

版本 2

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本产品说明书是按照

打印时的技术现状编制的。

Robel 公司保留在进一步发展的基础上进行修改的权利。

尺寸和重量都为近似值。

某些情况下，照片显示的为特殊布局。

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欧共体声明

1. 一般资料

操作和维护此产品的人员必须阅读并理解本说明书。

所有相关人员必须可随时查阅本说明书。

1.1 关于说明

下列符号用于标记操作程序、列表以及本说明书的其他要素：

符号	解释
1. 1.操作 2. 2.操作	操作程序 操作的顺序不得更改。
• 表 1 – 表 1.1 • 表 2	列表 – 可以更改顺序。
3. 度量 4. 度量	度量 顺序不得更改。

1.2 总则

一般情况下，使用本产品必须遵守适用法律要求和事故预防措施。如未遵守，设备操作人员承担任何法律后果的责任。

如果适用于产品使用的现行法规与制造商或分包商的规范之间存在差异，则以最严格的限制规定为准。

买方必须提供一切必要的机械、设备和材料资源，以便将交付的产品投入生产并培训员工。买方还必须提供无限制、安全和足够长的轨道和作业区段，在这些区段上，员工可以学习如何操作和使用交付的产品并进行实操训练。产品制造商或供应商对买方的特定人员配置和操作环境没有影响，因此，对本手册的有效性不承担任何责任。

但是，罗湃尔轨道机械有限公司及其客户服务部门乐于提供进一步的建议、培训或其他咨询服务。更多细节和条件可另行获取。

1.3 本说明书的阅读对象

本说明书包含正确使用他们所描述的产品必需的信息。

本说明书是专门为技术上合格的人员编写的。本文中合格人员包括：

- 能够通过培训或经验证明自己有能力使用本产品的人员，
- 熟悉与机械和设备有关的安全概念的人员，
- 受过专业培训，负责修理机器、器具及其附件的维修和服务人员。

只有能够阅读和理解本说明书的人才可以使用本产品。他们应该签名以表明他们已经阅读并理解了本说明书。

只有严格遵循产品使用和安全方面的官方规定、特别是涉及工作场所和环境的安全与保护以及制造商或供应商提供的操作、维护和安全规定或其他指示，才可以替换、维护和操作本产品。

1.4 责任免除

制造商声明，对于产品未按指定方式使用引起的任何损坏，包括在没有安全措施的情况下使用机器，制造商不承担任何责任。

本说明书并未指定除产品规定使用方式以外的、危及操作和维护人员的生命健康以及操作方的物质财产的任何使用。如果下列情况发生，该产品的制造商声明，对属于操作方或第三方的人员或财产的损害不承担任何责任：

- 该产品没有按照规定的方式使用，
- 操作和维护人员没有阅读和理解上述说明，并将该产品用于其他用途，
- 操作或维护人员不具备足够的资格
- 该产品已在超过限值的条件下使用，
- 该产品没有在规定的时间内进行保养，
- 使用非原装备件对产品进行了保养，
- 未经许可，对产品部件或附件进行了更改。

这些对人身或物质财产损害的责任免除并不影响其他免除责任。

1.5 版权

本产品的特殊特性和特质均为罗湃尔轨道机械有限公司的知识产权。其使用方面的版权归罗湃尔轨道机械有限公司所有。无论是否出于付款目的，本产品不得全部或部分复制、出版或以其他方式用于竞争性用途。公司员工不得将其内容传递给本企业以外的任何人。

1.6 验收、设备及经营许可证

买方有责任检查所交付货物的条件、配件、性能，特别是安全性能是否与所商定的有关规格以及合同中的规定相符。

买方必须为交付的货物配备一切必要的配件，以符合有关的操作和安全规程、规范、法规或其他规定，如灭火器、急救箱、信号和通讯设备、附加报警装置、防护服、安全告示等。

除非另有约定，货物交付时不提供此等性质的配件。

此外，买方有责任证明所交付的货物已通过认证，供有关当局使用。制造商或供应商为此目的需提供的任何文件（说明、证明、认证等），应在供应合同中加以规定。

为取得操作认证所需的任何额外措施和费用都必须由买方承担。

1.7 本说明书的有效性

本说明书适用于以下 EDP 编号的产品：

- EDP 编号 800 430 2008

2. 安全

2.1 指定用途

轨道移动架 ROMOVE 43.02 用于任何长度轨道的纵向和横向传送，每台设备可移动 1500 kg 的起重负载。

2.2 可预见的误用

轨道移动架不能用于提升轨道外部的其他物体。

轨道移动架只能与随附的 ROBEL 轨道钳一起使用。

2.3 布局惯例

本说明书利用下列警告文字及符号来保障操作人员的安全以及保护其不会受到伤害，并防止对运营公司的物质资产造成损害：

危险



该符号表明不遵守产品说明书将导致操作人员死亡或严重（不可逆的）伤害。

警告



该符号表示不遵守产品说明书可能导致操作人员死亡或严重（不可逆的）伤害。

小心



该符号表示不遵守产品说明书可能导致操作人员轻微（可逆的）伤害。

通知

该通知指出不遵守操作说明可能对运营公司的产品或其他资产造成损害。



该符号表示其包含关于产品及其操作或关于现有部分说明的重要信息。

预警结构 这些警告的结构如下：

警示词



危险的类型和来源！

忽视危险时的（可能）后果。

► 采取措施规避危险。

2.4 设计变更，原装零件

如擅自对产品部件和附件进行任何更改，制造商概不负责。

原装零件和配件是专门为产品设计的。使用未经批准的备件可能导致产品的结构特性发生变化或受损。

对于因使用此类零件或劣质操作液体而造成的任何损坏，制造商不负任何责任。

2.5 防护装置

操作安全装置会对操作人员和他人的生命构成危险！

- 操作者有义务在操作过程中切实安装好指定防护装置，或保持其预定出厂状态。
- 受委托进行维护的人员在完成工作后，必须重新安装防护装置。

2.6 安全规程

操作本产品时，必须优先考虑保护生命、健康、物质财产和环境的必要要求！

► 在使用本产品前，请确保你能证明所有受影响的人员均已知悉下列有关规例及条文：

- 国家安全法规
- 各建筑守则及工程规则的条文
- 各专业及行业协会的规定
- 职业与环境健康和安全条例
- 审批规程
- 公司内部规章制度
- 制造商的安全和操作规程之外并与之一致的所有其他适用规定

必要时，负责操作的办公室必须针对产品的特殊作业制定额外的规程和措施，以确保满足所有的安全要求。

除上述资料外，还必须遵守和符合具体的安全规则。

2.7 工作人员资质

操作人员 运营公司对操作人员就分配给他的作业任务进行了培训，并告知操作人员不适当的行为可能带来的危险。

- 对操作人员的要求**
- 产品综合培训
 - 了解操作和维护说明的内容
 - 了解供应商及辅助设备的操作和维护说明的内容
 - 了解有关产品和辅助设备的国家法律和法规
 - 身心健康
 - 具有专注力、责任感、可靠性
 - 必要的国家要求（资格、最低年龄）
 - 无酒精、药物、毒品、疲劳等影响。

2.8 人身防护设备

在操作和维护产品时，必须使用经批准的人身防护设备。

- ▶ 佩戴防护头盔
- ▶ 佩戴防护手套
- ▶ 佩戴护耳器
- ▶ 佩戴护眼装置
- ▶ 穿合适贴身的衣服，以防衣服被锯片的旋转机件夹住。
- ▶ 穿上钢头安全鞋
- ▶ 佩戴呼吸防护装置

防护设备根据下列项确定：

- 本产品说明书
- 国家安全规则
- 专业行业协会规则
- 等

如果运营公司现行有效的规定与制造商及其供应商的规定有差异，则适用最严格的规定。

2.9 关于特定类型危险的信息

手动操作危险 如果抬起或搬运时超过了允许的单人起重量，就会有损伤肌肉、肌腱、关节或骨骼的危险。

- ▶ 在运输之前，确保路上没有障碍或绊倒危险。
- ▶ 在抬起或搬运机械或设备时，应遵守允许的单人起重量。

运营公司有责任确保遵守其所在国家的安全条例和行业协会指南。本产品说明书的警告通知述及的价值观与德国法规有关。

- ▶ 确保已进行风险评估，并考虑到关于操作人员和运输作业的下列方面：

- 运输频率
- 年龄
- 性别
- 操作人员健康状况
- 地面不平整
- 作业现场照明不足
- 天气差
- 在时间压力下工作
- 等

- ▶ 遵守起重及运输重型机械或设备的有关指南。
- ▶ 在可能的情况下，机械起重工具始终是首选的搬运方法，如起重机、举升后厢板、轨道自动车等。
- ▶ 始终使用手柄来抬起模块。
- ▶ 始终使用两只手并对称地处理模块。
- ▶ 操作时不要扭转脊椎。
- ▶ 在没有休息的情况下，或在没有使用机械辅助设备的情况下，不得携带任何超过 10 米的模块。
- ▶ 联系您的健康和安全顾问，以获得更多信息。

不符合人体工程学操作的危险 在某些活动中，如果不通过控制装置采取必要的谨慎预防措施，则有可能损伤肌肉、肌腱、关节或骨骼。比如通过换向启动器来启动发动机。

- ▶ 用力拉换向启动器，但要避免急动。
- ▶ 避免不利的动作和不良的姿势。
- ▶ 当使用这些控制装置时，避免拇指和手静止不动。

环境损害风险 使用的大部分部件和零件都要遵守收集和处置的特别规定。

- ▶ 按物料类别（钢、塑料、油类等）对部件进行处置。
- ▶ 按照有关规定收集废油，并进行相应处置。

擅自启动导致的危险 擅自启动和误用可能导致任何形式的危险和损害。

- ▶ 严禁未经许可的人员擅自启动。
- ▶ 由运营公司来评估这种风险。
- ▶ 运营公司有责任对未经授权的启动实施适当的措施。

2.10 事故预防

土木工程师协会的《事故预防规例》亦适用于本说明书，并须仔细阅读和遵守。

- ▶ 始终遵守通用的和内部的预防事故的规定。
- ▶ 考虑与产品的特殊作业相关的潜在事故风险，并提供适当的培训。
- ▶ 在产品投入使用前，应检查产品是否处于正常工作状态：
 - 设备、装置、工具、附件、安全设备等都齐套且完好无损。
 - 检验和维护工作已按时以专业方式进行。
 - 工作液已加满（燃料、润滑剂等）
 - 满足你及其他人、物质财产和环境方面安全作业的所有先决条件。

- ▶ 注意产品和工作区域的特殊危险，特别是：
 - 人与障碍，
 - 符合安全间隙，
 - 邻近轨道上的交通，
 - 确保所有保护设备安装牢固，
 - 遵守所有操作上必要的安全措施。

- ▶ 操作液体（油、润滑脂等）泄漏必须立即去除，以防止发生火灾或滑倒的危险。手边应备有适当的油粘合剂和清洗剂。

- ▶ 离开产品前进行下列检查：
 - 已正确关机。
 - 已固定，以防止无意间移动。
 - 工具和附件已安全存放。

- ▶ 只使用工作正常的机器、器具和工具。

- ▶ 立即对较小的故障进行整改，以避免较大的故障。

2.11 急救

确保下列各项，以便能够在紧急情况下提供急救：

- ▶ 确保急救箱处于良好状态，在任何时候都是齐备和干净的。
- ▶ 向贵方办事处的医疗服务机构或医生咨询急救措施和相应设备。
- ▶ 立即补充已用完的材料。
- ▶ 储存急救设备（急救箱、毯子等）和容易取到的灭火器。
- ▶ 携带保护事故现场的材料。

2.12 消防安全

燃料、机油、油漆或清漆着火时会释放出有毒气体。

此外，必须根据具体情况采取一切必要的措施，防止火灾的发生或蔓延。

电气设备闷烧以及燃料、机油或油漆起火时，会从烧焦的电缆中释放出有毒的蒸气。

- ▶ 每个人都有义务尽可能合理地避免进行任何可能引起火灾或有利于火灾蔓延的操作。此外，必须根据具体情况采取一切必要的措施，防止火灾的发生或蔓延。
- ▶ 一般来说，任何发生的火灾都只能用干粉灭火器来扑灭。

一般要求 必须遵守下列消防安全措施。

- ▶ 只使用经批准的防火级别的灭火器（粉末型灭火器）。
- ▶ 定期检查灭火器，并确保其配有检验标签（至少每 2 年一次，检查失效日期！）。
- ▶ 使用完灭火器后，立即更换。

3. 技术参数

3.1 尺寸

支撑跨度	2,240 mm
最大支撑负载	1,500 kg
最大纵向行程	800 mm
移动式起重机的移动行程	1,900 mm
移动式起重机的最大起重负载	1,500 kg

3.2 重量

每件支架	约 16 kg
横向支架	约 45 kg
托辊舌	约 16 kg
移动式起重机整体	约 24 kg

3.3 起重负载

每台设备的允许起重负载	1.500 kg
-------------	----------

3.4 联合起重能力

示例：使用 3 台设备抬起宽轨底钢轨

宽轨底钢轨外形	115RE, S45, S49, UIC60
宽轨底钢轨长度	最大 26 米
每米的最大钢轨重量	65 kg

3.5 环境条件

操作	-20°至 50°C
运输	-20°至 50°C
储存	-20°至 50°C

4. 设备简介

4.1 设备概览

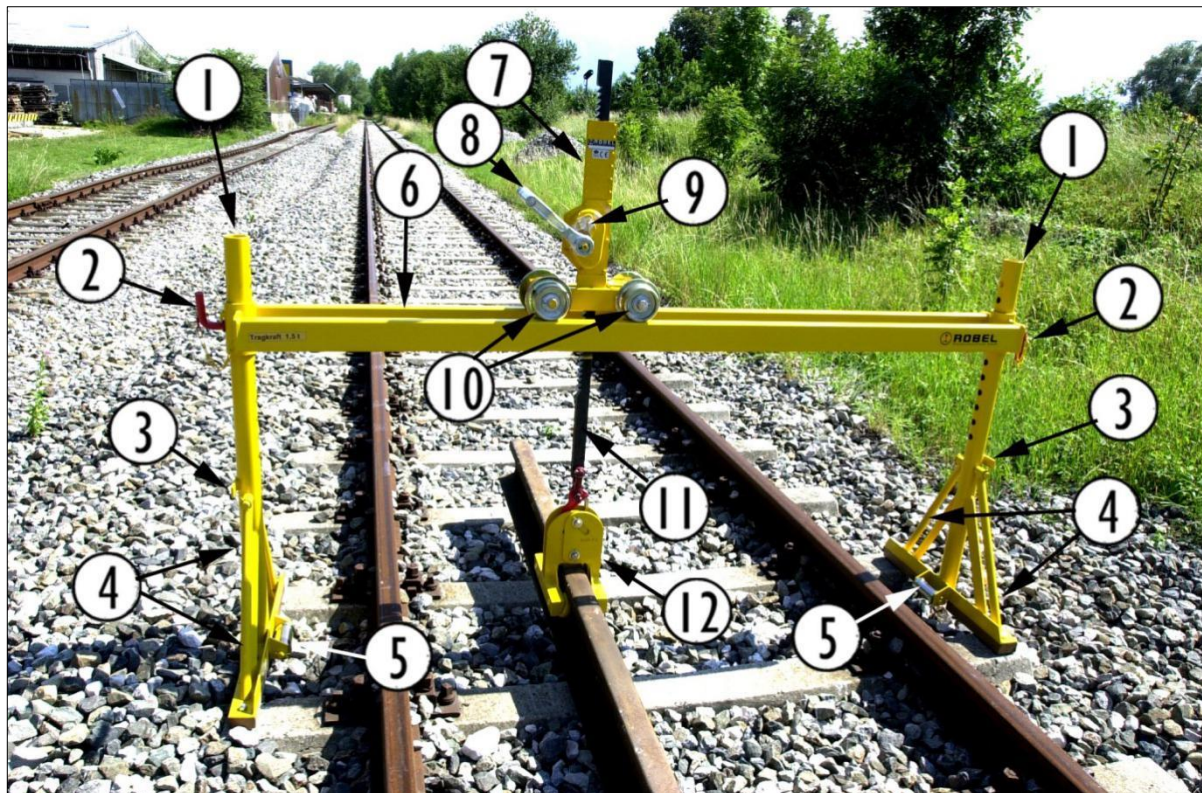


图 1 概览

- | | |
|----------|-----------|
| 1 支撑架 | 7 移动式起重机 |
| 2 横梁锁紧螺栓 | 8 曲柄执手 |
| 3 提手制动块 | 9 安全门 |
| 4 提手 | 10 导辊 |
| 5 运输辊 | 11 齿条及小齿轮 |
| 6 横梁 | 12 滚轮支撑钳 |

4.2 控制元件

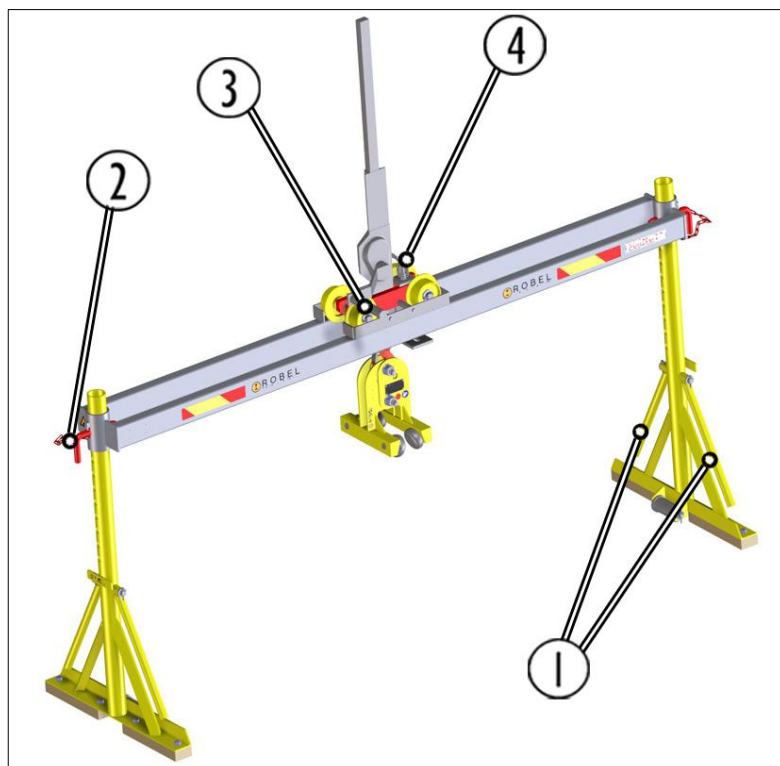


图 2 控制元件

- 1 提手（可折叠）
- 2 横梁锁紧螺栓
- 3 曲柄执手
- 4 移动式起重机制动杆

4.3 棘爪机构

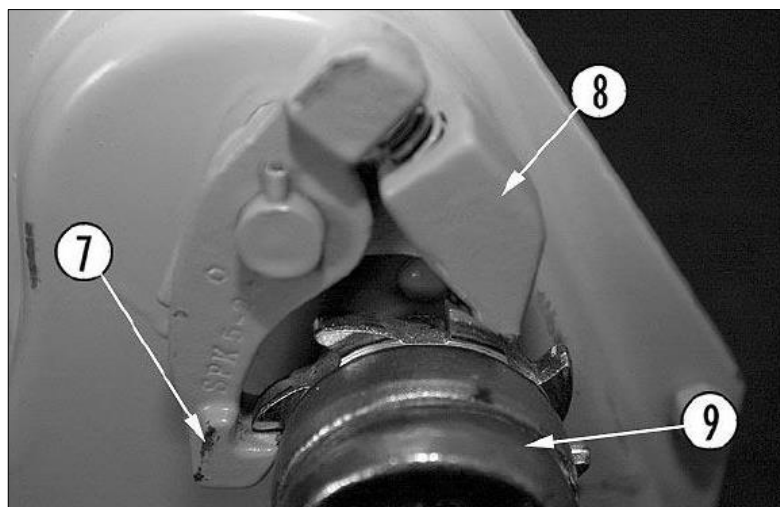


图 3 棘爪机构

- 7 棘爪
- 8 保险门
- 9 棘轮

4.4 支撑钳

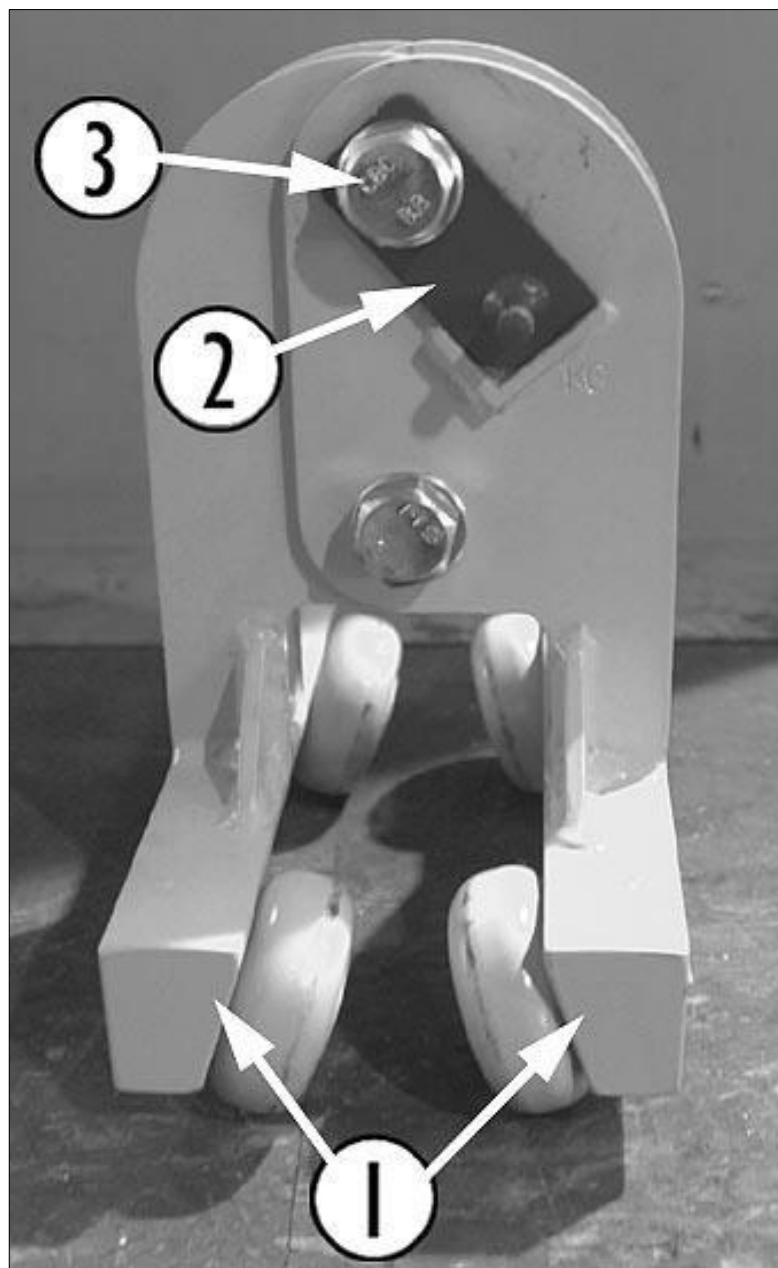


图 4 夹钳

- 1 带托辊钳
- 2 安全锁定板
- 3 提升销

安全锁定板

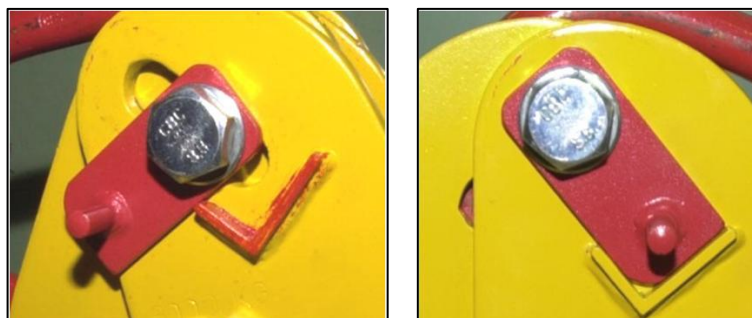


图 5 固定锁销打开（未锁紧左侧）以及完全锁紧状态（已锁紧，右侧）

4.5 工作场所

通常操作者处于设备的行驶范围内操作起重装置或者运行移动式起重机。

4.6 标志和标签

4.6.1 使用的标志和标签



图6 “压伤危险” 标签



图7 “阅读和服从指示” 标签



图8 标签 “制造商徽标”

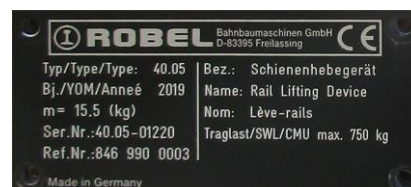


图9 类型标签



图10 “起重能力 1,500 公斤” 标志



图11 “戴防护手套” 标签

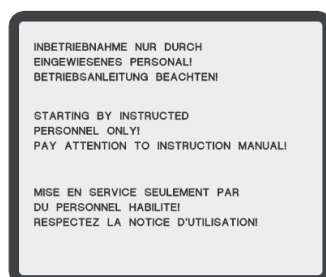


图12 “仅限专业人员” 标签



图13 “测试标签” 标签



图14 “反光条” 标签

4.6.2 在产品上的位置



图 15 在产品上的位置（正面）

- | | | | |
|---|--------------------|---|------------|
| 1 | “起重能力 1,500 公斤” 标志 | 4 | “制造商徽标” 标签 |
| 2 | “反光条” 标签 | 5 | “反光条” 标签 |
| 3 | “制造商徽标” 标签 | 6 | “压伤危险” 标签 |

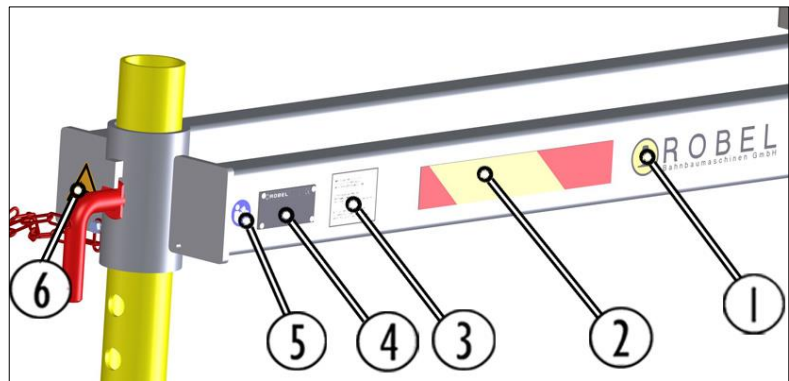


图 16 在产品上的位置（背面）

- 1 “制造商徽标” 标签
- 2 “反光条” 标签
- 3 “仅限受专业人员” 标签
- 4 型式标签（设备）
- 5 “阅读及服从指示” 标签
- 6 “压伤危险” 标签

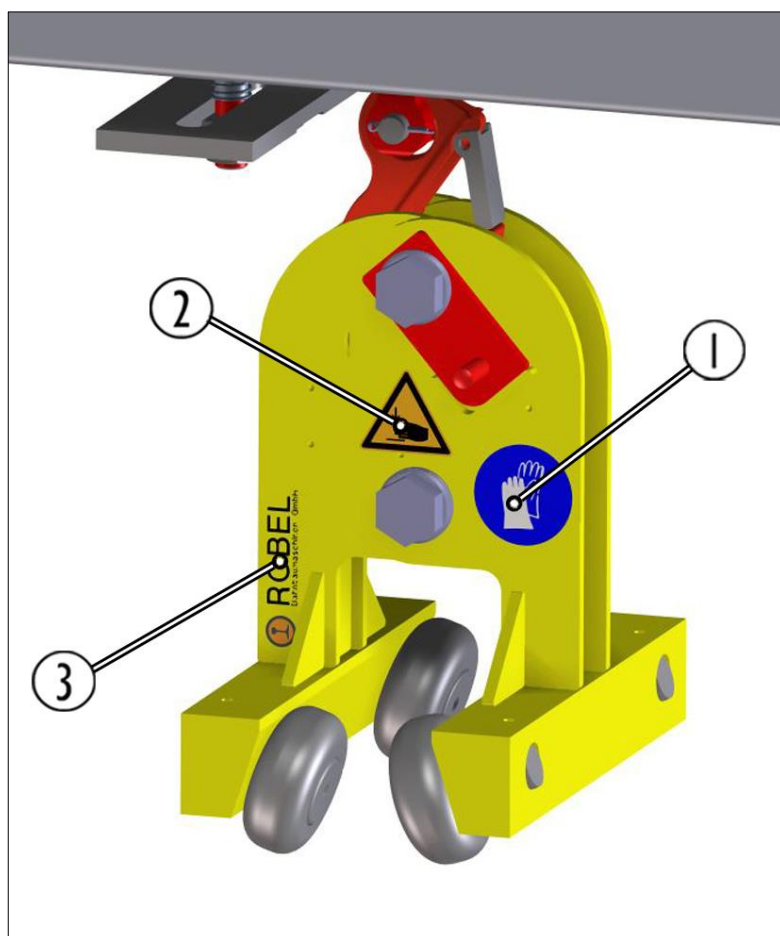


图 17 支撑钳（前侧）

- 1 “戴防护手套” 标签
- 2 “压伤危险” 标签
- 3 “制造商徽标” 标签

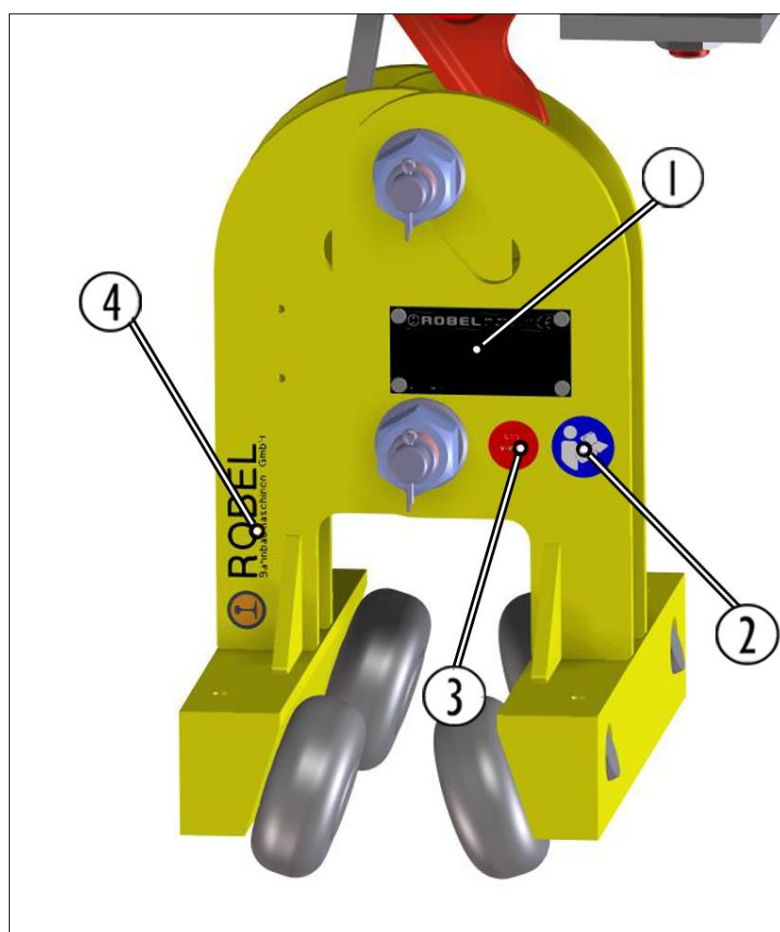


图 18 支撑钳（后侧）

- 1 型式标签（支撑钳）
- 2 “阅读及服从指示” 标签
- 3 “测试标签” 标签
- 4 “制造商徽标” 标签

5. 调试与运行

警告



压伤危险！

- ▶ 穿戴所需的安全服和防护装备（如安全鞋和工作手套）。

5.1 运行前检查

1. 检查外观：

- 轨道移动架不得显示任何可见的损坏。
- 禁止使用有缺陷的轨道移动架。
- 确保正确安装齿条，操作过程中水平齿侧面必须朝下。
- 不得使用无安全锁紧装置的支撑钳。
- 滚轮、手摇曲柄、锁爪和齿条的清洁度和移动自由度
- 检查允许的起重负载。

滚轮支撑钳

- 在使用前，检查支撑钳的状态是否良好。这表示，支撑钳不得有任何机械缺陷，并且必须能够在铰链中轻松移动（如有必要，必须给支撑钳涂抹润滑油脂并反复移动连杆使之更加顺畅）。
- 特别是，检查锁紧装置以确保锁销移动顺畅。

5.2 安全措施

1. 与远离轨道保持距离。
2. 操作员与轨道移动架在铁路路基轨道内部是最好和最安全的。
3. 确保导轨移动架在水平防滑的地基上。
4. 在使用轨道移动架时，必须向所有在轨道移动架附近工作的人员说明可能存在的危险。

5.3 设置

警告



有受伤的危险！

这个产品对单个人来说太重了。肌肉、骨骼或肌腱可能会受伤，特别是背部和肩部。可能造成其他不同形式的受伤。

- ▶ 始终用合适的设备运输产品，例如，合适的手推车。
- ▶ 用合适的起重设备将产品吊起，如起重机、升降机、举升后厢板或至少一个四人团队。
- ▶ 参见第 2 章关于手动操作的更多细节。

*) 此值为保守值，根据 DIN EN 13977:2011 标准的要求确定。但是，运营公司有权进行风险评估，如果这是风险评估的结果，也有权允许减少参与人员。

四个人工作：



- 组装第一个支架：一个人握住第一个支架，三个人握住横梁。
 - 组装第二个支架：三个人握住横梁，一个人组装第二个支架。
-

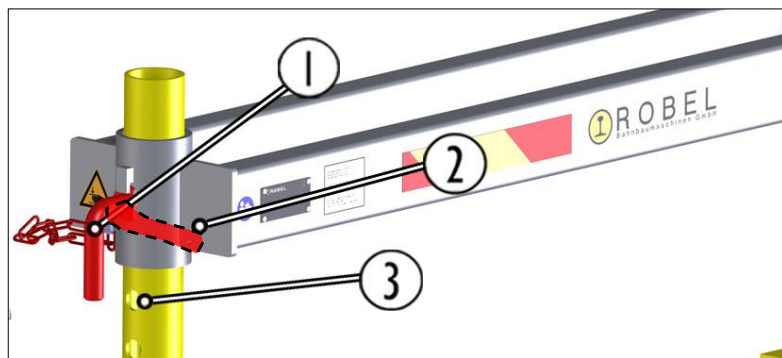


图 19 用锁紧螺栓锁紧

- 1 锁紧螺栓
- 2 开启位置（虚线）
- 3 锁定位置

1. 将横梁置于支撑架上，使字迹清晰可见，运输辊彼此相对。
2. 锁紧螺栓指向右侧，通过所需的孔尽可能将其推入横梁，然后旋转它，使锁定螺栓无法拔出。

锁销锁紧。

补偿地面的不平整度

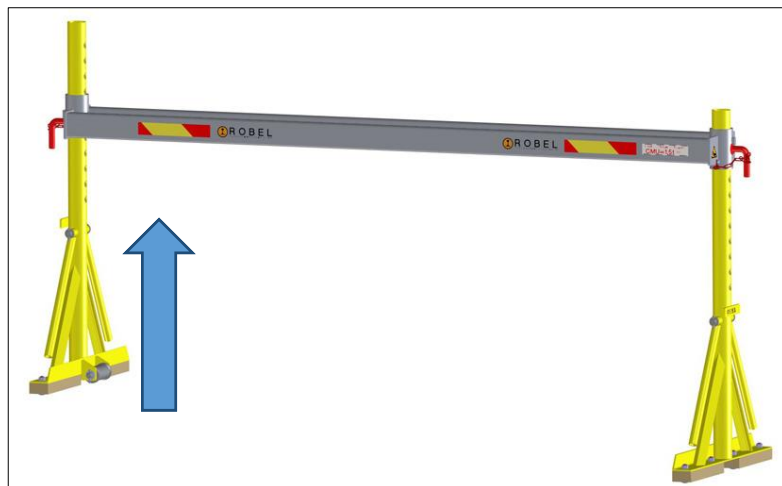


图 20.调节支架高度

3. 向上抬起转移动架两侧的支撑杆，上翻直到接触到挡块位置。

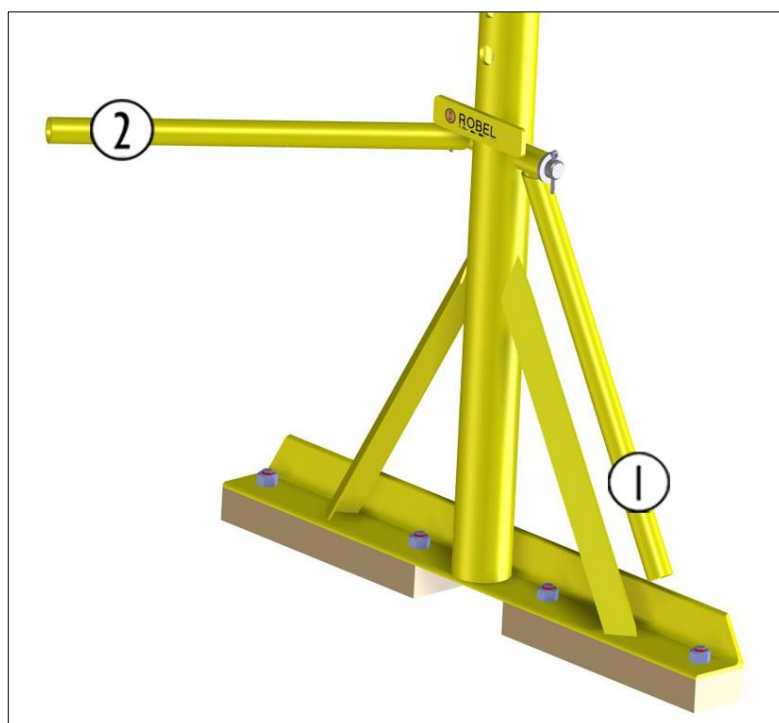


图 21 上翻摇柄

- 1 下翻位置
- 2 上翻位置

- 4. 4 个人一起将设备放置在将要移动的轨道之上，以便能够达到所需的（或最佳的）范围。

警告**压伤危险！**

行车钳和支撑面之间存在压伤的风险。

- ▶ 讲行车钳固定。
- ▶ 不用个手抓横梁。

- 5. 将合适的滚支撑钳（例如 ROBEL 42.10）插入到齿条升降钩中。
- 6. 使用额外的轨道移动架抬起超过 1500 千克的负载。

7. 滑轨移动架沿着轨道定位，以使起重负载均匀地分布在所有轨道移动架。

负载必须保持直线并只能垂直抬起或落下。

8. 将移动式起重机从上方放在横梁上，以便在滚轮上可轻松移动。

9. 上翻曲柄可以通过弹簧锁轻松向外翻折。

卡入锁紧，在工作结束后可通过拉动并同时上翻到静止位置。

10. 逆时针旋转手动曲柄，让齿条向下运行。

棘爪保持锁定在位置上。

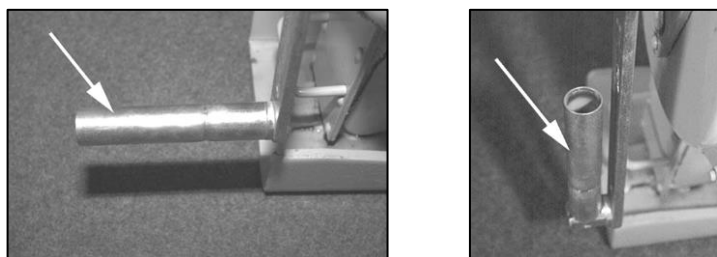


图 22 手摇曲柄翻开（左）和翻回（右）

5.4 抬起轨道

1. 提起和移动导轨时，请确保绝对不会出现强烈的非对称负载情况。

警告

**事故危险！**

负载可能会非受下降，从而造成挤压四肢

- ▶ 均匀分配负载。
- ▶ 同步提起所有轨道支撑钳。
- ▶ 垂直抬起轨道支撑钳。
- ▶ 所有操作员确定提升或落下负载的同时信号。
- ▶ 确保危险区域中没有其他人员。



轨道同时通过多个轨道移动架移动。

- ▶ 在开始工作之前，确定必要工作步骤的统一口令。

2. 使用起重螺栓（2）将支撑钳悬挂在齿条的载重钩（3）中。
。

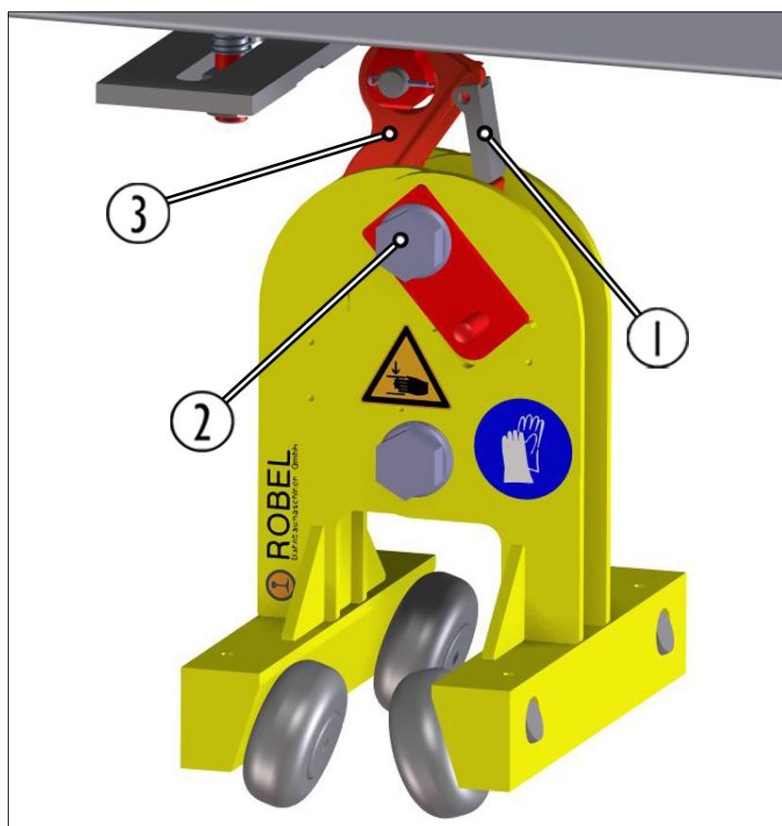


图 23 悬挂支撑钳

- 1 安全扣
- 2 起重螺栓
- 3 负载钩

3. 将支撑钳垂直定位在轨道部件上方，确定导轨部分在长度方向上指向重心。

4. 将安全锁扣设置到“打开”位置上。

在放置到轨道头上时，夹紧部件会自动打开。

5. 在必要情况下用手辅助。

6. 继续落下支撑钳，直到轨道头完全被夹钳包围住。

在抬起支撑钳时，钳子自动闭合。

7. 顺时针旋转安全锁扣，直至在挡块位置上停止。

锁紧支撑钳。

现在可以抬起轨道。

5.5 移动和落下轨道

- 抬起**
1. 顺时针转动手摇曲柄，直到将轨道抬起并越过障碍物。
同时棘爪交替啮合到棘轮上。



即使松开手摇曲柄，也可以通过负载压力制动器将轨道牢固地保持在任何位置上。

- 移动**
2. 用手移动移动式起重机，直到轨道进入到预设的位置中。
 3. 锁紧移动式起重机

- 落下**
4. 逆时针转动手动摇柄落下轨道。
在此过程中，棘爪和安全门应保持适当啮合。
 5. 一旦轨道已完全降低到所需的位置，稍微降低齿条和小齿轮。
 6. 逆时针打开轨道支撑钳的固定销。
 7. 打开并取下钳子。

5.6 拆卸

警告



有受伤的危险！

这个产品对单个人来说太重了。肌肉、骨骼或肌腱可能会受伤，特别是背部和肩部。可能造成其他不同形式的受伤。

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- ▶ 用合适的起重设备将产品吊起，如起重机、升降机、举升后厢板或至少一个四人团队。
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^{*)} 此值为保守值，根据 DIN EN 13977:2011 标准的要求确定。但是，运营公司有权进行风险评估，如果这是风险评估的结果，也有权允许减少参与人员。

1. 确保导轨移动架没有负载。
2. 向下按起重钩上的固定销，取下辊支撑钳。

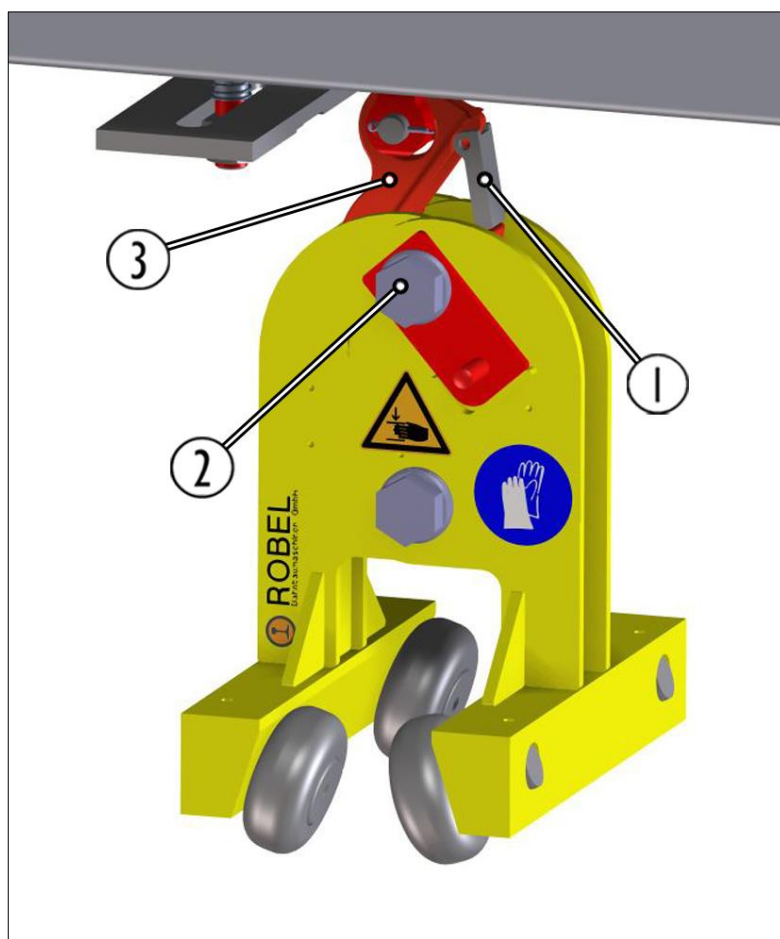


图 24 取下支撑钳

- 1 固定销
- 2 起重销
- 3 载重钩

- 3. 向上卸下移动式起重机。
- 4. 将横梁的锁紧螺栓转到“指向右侧”的位置
- 5. 拉出锁紧螺栓，然后向上取下横梁。

6. 运输与储存

警告



有受伤的危险！

这个产品对单个人来说太重了。肌肉、骨骼或肌腱可能会受伤，特别是背部和肩部。可能造成其他不同形式的受伤。

- ▶ 始终用合适的设备运输产品，例如，合适的手推车。
- ▶ 用合适的起重设备将产品吊起，如起重机、升降机、举升后厢板或至少一个四人团队。
- ▶ 参见第 2 章关于手动操作的更多细节。

*) 此值为保守值，根据 DIN EN 13977:2011 标准的要求确定。但是，运营公司有权进行风险评估，如果这是风险评估的结果，也有权允许减少参与人员。

6.1 运输

6.1.1 安装现场之间的转换

产品的运输温度范围是-20°C到+50°C。

警告



挤压危险!

- ▶ 穿戴适合的安全服和设备（例如安全鞋和工作手套）。

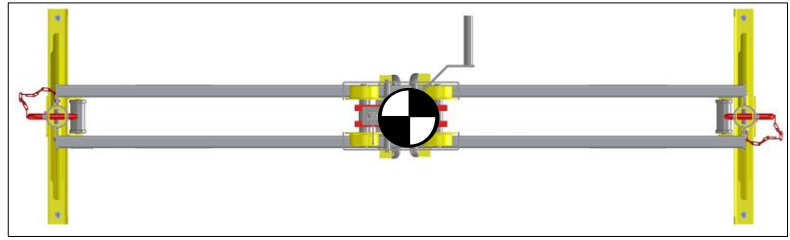


图 25 重心

产品重心位于有重心符号的位置。

6.1.2 沿着轨道

通过滚轮可轻松地沿着导轨移动设备。



图 26 沿着轨道手动移动

6.2 储存

存放机器的温度范围为-20°C至+50°C。

1. 确保储存处干燥且没有灰尘。
2. 润滑支撑钳接头和固定系统，参见第 7.3 章。
3. 如果确认没有危险：可松开移动式起重机的驻车制动器。

7. 保养维护

1. 只使用推荐的润滑剂，在进行维修时，只使用原装备件。
这一点首先对于质保很重要，其次也有助于提高产品的运行可靠性。

正确订购备件无论对于快速交付备件，还是对于实现产品的经济可行性，都必不可少。

2. 订购备件时，请提供以下资料：

- 机器类型
- 机器编号
- 组装
- 备件描述和编号
- 数量
- 运输方法
- 发货地址

3. 遵守规定的保养间隔周期！

4. 维修作业时，要遵守相应国家规定的安全和环保规程。

7.1 维护计划表

间隔时间	维护工作
每天	检查状况是否正常，请参阅第 5.1 章
每月	检查联轴器零件，必要时更换
	检查支撑钳（请参阅第 5.1 章），保持车轴和安全系统运行顺畅（润滑脂）
	标志和标签，参见第 7.4 章。
每年	润滑
	检查驻车制动片
	根据国家事故预防法规（DE：UVV）检查
	-卸扣（吊耳上） -电缆绞车 -轨道支撑钳

7.2 清洁与护理

留意

有损坏的风险！

用溶剂、腐蚀性或易燃的清洗剂清洁产品可能会造成损坏。
使用高压清洗器可能会导致水进入产品的铰接接头而造成损坏。

- ▶ 不要使用任何溶剂或腐蚀性、易燃的清洗液！
- ▶ 不要用汽油清洗。
- ▶ 不要使用喷水或高压清洗器。

1. 定期清洁产品，使其不会因污垢而造成生产中断。
2. 只能用湿布来清洁产品。只使用水，如有必要，使用不添加任何化学添加剂的温和清洁剂。

7.3 润滑

轨道移动架基本上无需维护。

1. 保持润滑齿条。
2. 保持轴和辊支撑钳的固定系统顺畅。

7.4 检查标志和标签

1. 定期检查所有的标志和标签是否存在且完好无损。
2. 必要时更换标志和标签。

8. 故障措施

故障描述	原因	补救措施
支撑钳运行不畅	润滑脂太少	► 润滑接头保持移动顺畅
负载意外下落	负载压力制动器上加油或被油脂污染	► 清理负载压力制动器，保持不含油脂或油。 ► 使用最大负载测试功能：负载自动下落
驻车制动器：无/效果太弱	刹车片磨损	► 更换刹车片
驻车制动器无法打开	弹簧磨损	► 更滑弹簧

9. 环境保护与处置

9.1 环境保护

- 产品作业或使用产品时，遵守有关废物预防和适当回收/处置的法律规定，并遵守使用者所在国家适用的环境法。
- 特别要注意的是，在维修和保养工作中，水污染物质，如油脂和油，不得污染地面或进入下水道。

9.2 处置

该产品（包括机械零件、发动机油和燃料）的处理将取决于当地的废物处理条例。



如果产品的生命周期结束，应确保进行安全和适当的处理，特别是对环境有害的部件或物质的处理。其中包括燃料、润滑剂和塑料

。

-
- 由于存在潜在的环境污染风险，请将机器交由经批准的专业公司处理。
 - 在任何情况下，检查哪些材料可用于回收利用。并将这些材料交由适当的废物管理公司处理。

10. 附录

欧共体声明



CE

EG-Konformitätserklärung (deutsche Originalfassung)
 EC Declaration of Conformity (English translation)
 Déclaration „CE“ de Conformité (Traduction française)

gemäß Maschinen-Richtlinie 2006/42/EG, Anhang II A
 as defined by the Machinery Directive 2006/42/EC Annex II A
 conformément à la directive „CE“ relative aux machines 2006/42/CE, Annexe II A

Hersteller (Name und Anschrift): Manufacturer (name and address): Fabricant (nom et adresse):	ROBEL Bahnbaumaschinen GmbH Industriestraße 31 D-83395 Freilassing
Hiermit erklären wir, dass die Herewith we declare that the model Par la présente, nous déclarons, que le modèle fourni par	REMOVE Schienenumsetzgerät Rail Mover Portique de substitution de rails Typ/type/type 43.02
folgenden einschlägigen Bestimmungen entspricht: complies with the following provisions applying to it: correspond aux dispositions pertinentes suivantes:	2006/42/EG
Angewandte harmonisierte Normen: Applied harmonized standards: Normes harmonisées appliquées:	DIN EN ISO 12100: 2011
Bevollmächtigt für die techn. Dokumentation: Responsible person for technical documentation: Personne chargée pour la documentation technique:	Mag. Bernhard Lair Abt. Technische Dokumentation Industriestraße 31, D-83395 Freilassing

Freilassing, 04.03.2020


 Otto Widroither
Leiter HMG/Head of HGM/
Direct. gestion de mach.


 Wolfgang R. Fally
Geschäftsführer/Managing Director/
Gérant

Ort, Datum
 Place, date / Lieu, date

Unterschrift, Angabe der Funktion im Unternehmen
 Signature, acting in the company / Signature, en qualité de

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图 27 欧共体声明