

# Transport, installation, commissioning

**TNL12.2**

## **Note on applicability**

Illustrations in this publication may deviate from the product supplied. Errors and omissions due to technical progress expected.

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### Explanation of symbols

This chapter explains the symbols that are used in the user documentation to call attention to dangers and important notes.



This symbol warns against a direct, imminent danger to the life and health of individuals. Failure to observe this danger warning may result in severe health impairment such as perilous injury and even death.



This symbol warns against a direct, imminent danger from electricity. Failure to observe this danger warning may result in severe health impairment such as perilous injury and even death.



This symbol indicates important notes for the proper operation of the machine. Failure to observe this information may result in damage to or malfunction of the machine or its components.

### Safety instructions and technical specifications



The user documentation and, in particular, the document "*Safety instructions and technical details*" must be observed.



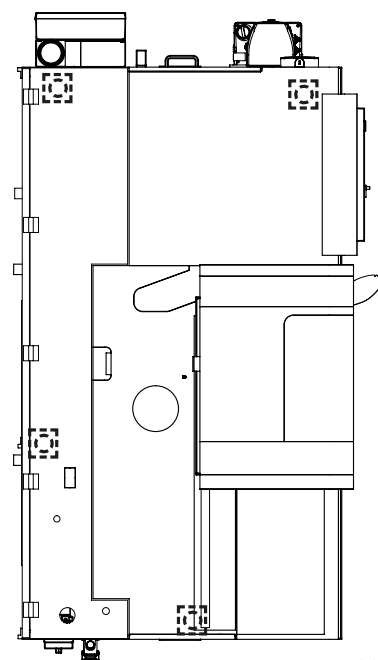
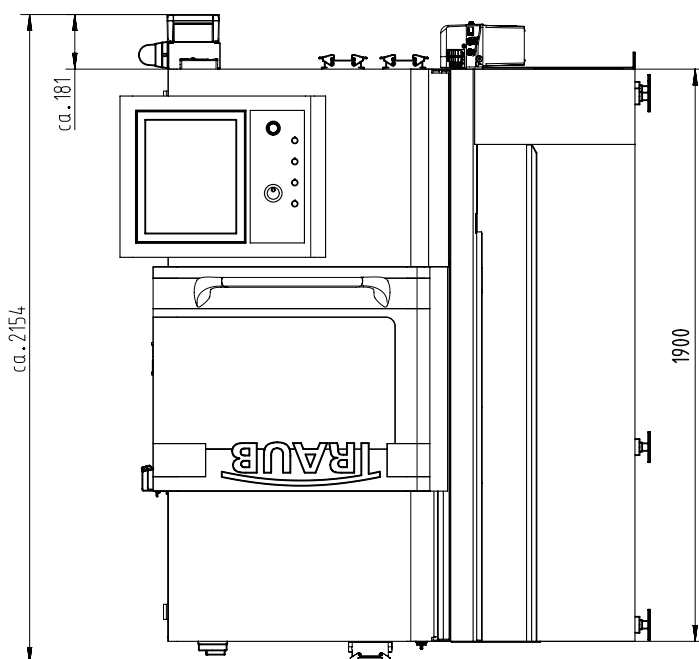
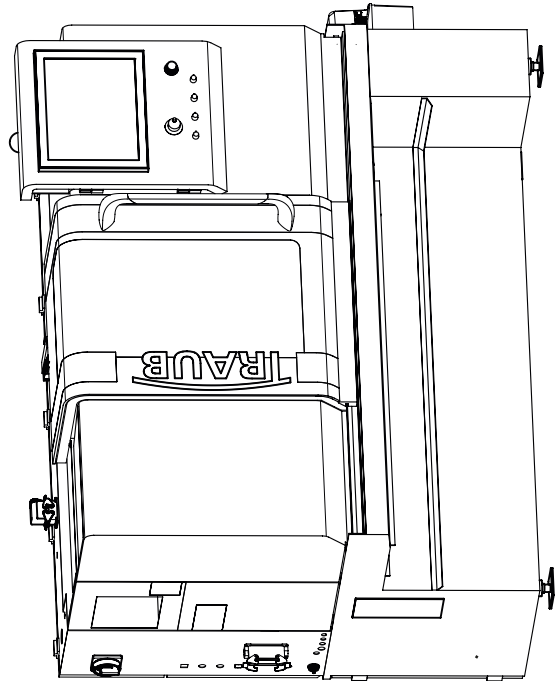
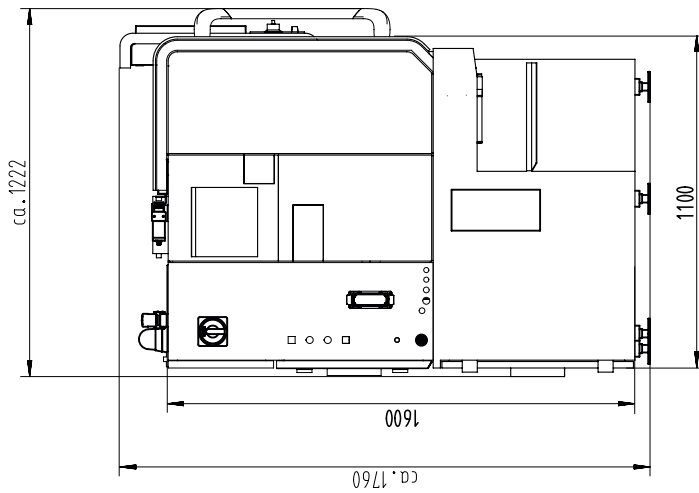


## Installation plan TNL12.2, simplified



The corresponding installation and layout plan must be requested before the machine is installed.

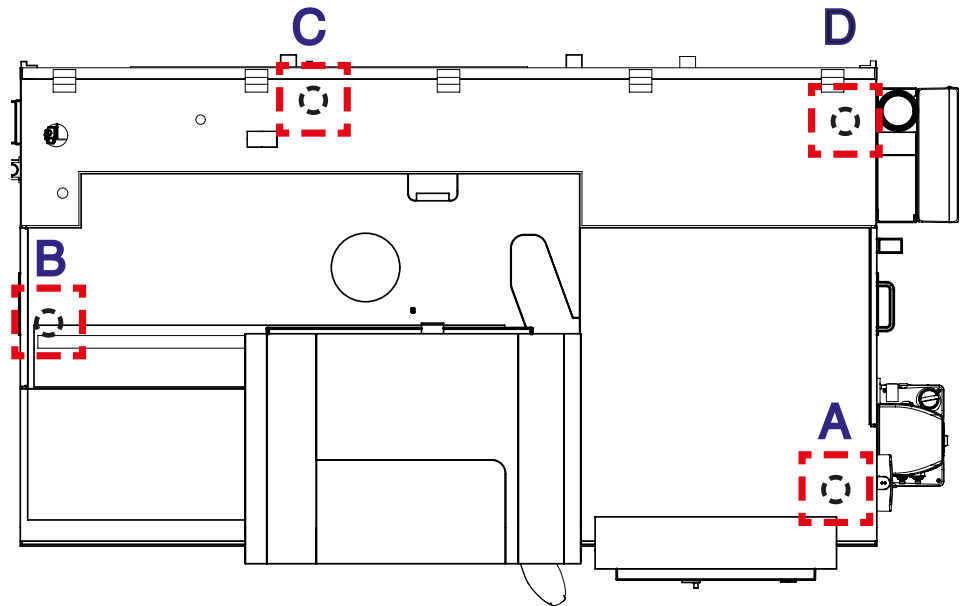
Example shown



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**Installation items - load distribution TNL12.2**

Installation items	A	B	C	D
Max. static load (kN)	5.0	9.7	3.5	6.9



**Information for transporting the machine**



**Danger from falling machine/parts**

No persons are allowed to remain under suspended loads!



**Transporting the machine**

Means of transport approved for transporting the machine:

- Crane (requires lifting device)
- Transport rollers
- Forklift



Shipping of the machines to countries with extreme climatic conditions is carried out by specialized logistics companies.

Be sure to carefully plan the delivery, unloading, and transporting of the machine from the unloading site to the installation site.

Take the size (dimensions) and weight of each unit into consideration.

Any obstacles along the transport route from the unloading site to the installation site must be eliminated before the machine is delivered.

Check the transport route for load capacity, levelness, damaged pavement, traverse grooves, slopes, gradients, etc.

**Lifting device**

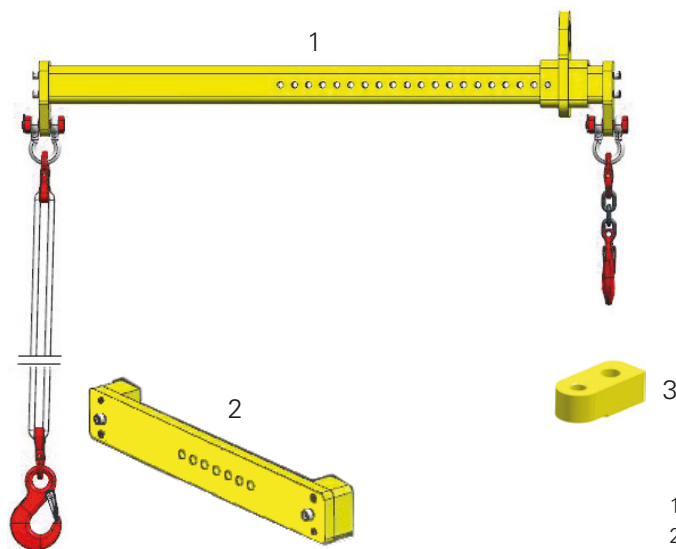
Lifting devices are either packed separately or included with other units.



The lifting device required for proper transport of the machine is supplied with the machine and must be returned to INDEX after the machine has been installed.



The lifting device must not be disassembled further.



- 1 Load beam, top
- 2 Load beam, side
- 3 Spacer

### Space requirements

The following must be ensured:

- Sufficient free space around the machine.
- Sufficient movement space for the operator.
- Sufficient space for maintenance and repair.
- It must be possible to open all doors of the machine completely.
- Space for placing blank and workpiece pallets, workpiece collectors, chip trolleys, tool trolleys, etc.

Use the machine installation plan to determine the required space.

There are special installation plans for add-on equipment such as bar feeders, bar loading magazines, etc.

### Floor condition

A special foundation is not necessary. Only the load capacity and strength of the floor area must be suitable for the machine weight based on constructional aspects.



Comply with the requirements set out in **DIN 18202:2019**. In particular, note the information regarding **“Flatness tolerance for finished floors”**.



There must be **no expansion joints** in the area of the machine footprint.



The guidelines and regulations applicable in the country of use must be followed.

### Fastening/anchoring



In any case, the machine must be doweled to the floor.

Bar guides, bar feeders, and bar loading magazines must be anchored to the floor.

When attaching a robot cell from a third-party manufacturer, be sure to observe the relevant manufacturer’s documentation.

### Ambient conditions

See *Ambient conditions* in the “Safety instructions and technical details”.



If the actual conditions at the installation site differ from these specifications, be sure to contact the **machine manufacturer** or **its representative**.

### Floor trough



If a floor trough is required, it must be designed according to the specifications “*Information on floor trough drawing*” so that extension of the corresponding chip conveyor is ensured.

The floor in the area of the floor trough must only be max. 5 mm convex, as flat or concave as possible. Exceeding the allowable unevenness may cause the floor trough to contact the machine base / machine components.

### Compressed-air supply

See Chapter *Pneumatic connection*.

### Operating material to be provided

See Chapters *Commissioning* and *Information on operating material*.

### Pumps and tanks

A simple pump is sufficient to extract the used cooling lubricant. The same pump may be used to fill the cooling lubricant tank; however, it must be thoroughly flushed with fresh cooling lubricant.

A robust container is required for collecting the extracted fluids. Suitable containers are metal barrels of sufficient capacity and with proper labels, which can be tightly closed.

### Connection to local exhaust system by customer



If a local exhaust system is attached to the machine, any existing fire extinguishing system available on the machine must be adjusted accordingly.

### Power supply



The guidelines and regulations applicable in the country of use must be followed.



The power supply cord to the machine should be as short as possible.  
Use a sufficient wire size.

The power supply for the machine requires stable mains conditions; the max. allowed operating voltage fluctuations are +10% or -10%.

The mains line must comply with the regulations of the local electricity supplier and the VDE directives.

### Main circuit breaker



Check that the building connection has sufficient capacity to cover the additional load to be protected.  
Discuss any unclear conditions with your local electricity supplier.

The main circuit breaker is not included in the delivery of the machine. It must be installed outside the machine according to DIN EN 60204-1. If a pre-transformer is required, the main circuit breaker must be installed after the pre-transformer, i.e., on the secondary side. The fuse protection on the primary side must be designed according to the connection data of the pre-transformer.

The loads to be protected depend on the existing operating voltage.

For the information on machine connection, operating voltage, main fuse, see the electrical diagrams or Chapter *Electrical connection*.

### External data transfer



Data cables must not be routed directly next to live cables.

For data transfer to/from external computers or servers/storage devices, suitable metal conduits must be installed for the data lines.

The connection to the internal network (DNC) requires an RJ45 network cable. An additional connection to the external network (IoT) must be made with a separate RJ45 network cable.

### Chip removal

If the machine is equipped with a chip conveyor, a chip trolley, its height matching the chip conveyor's discharge height, is required. The chip trolley should have a device for draining the accumulating cooling lubricant so it can be returned to the cooling lubricant tank.



#### Chip conveyor without discharge chute

The customer must provide a cover for the collection bin for the discharged chips when using a chip conveyor without a discharge chute.

The cover must be designed such that it is not possible to reach into the discharge chute.

### Disposal of used operating materials



The guidelines and regulations applicable in the country of use must be followed.

Decide in advance on how to dispose of used operating fluids such as hydraulic fluid, lubricating oil, and cooling lubricant in an environmentally friendly manner.

### Observing the ground and wastewater regulations



The guidelines and regulations applicable in the country of use must be followed.

The machine contains water-polluting substances such as water-miscible cooling lubricants and mineral oils. These substances may leak from the machine in case of adverse events.

Therefore, the machine must be installed in a place that excludes any harm by these substances to waters or groundwater.

### Possible preventive measures

- Place the machine inside a tight steel trough (floor trough).
- Seal the floor of the factory hall.



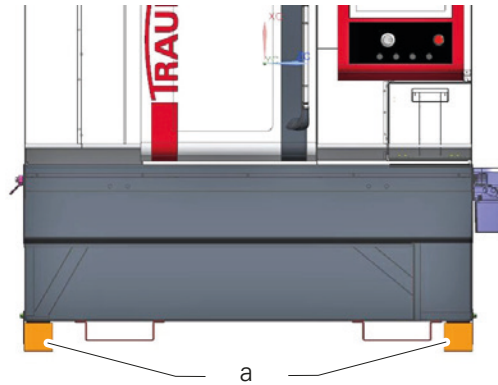


## Delivery of the machine

The machine is delivered by truck.

### The machine is in the following condition when delivered:

- Machine incl. control cabinet mounted on wooden planks (a).



- Certain moving parts on the machine, such as the work area door and the swiveling operating panel, are secured by transport locks or were removed.
- Protruding machine parts hampering the transport may have been removed.
- All blank parts of the machine were treated by spray-covering with an anti-rust agent.
- For operating material, see Chapter *Commissioning*.

### Other separate units

Certain equipment levels or add-on equipment such as chip conveyor, bar feeder, bar loading magazine, etc., are usually separate units. Chip conveyors usually rest on a transport base for shipping. The bar feeder and bar loading magazine are delivered in a special shipping crate.

Loose parts, such as keys, tools, and fittings, are supplied in a separate box, which may be included with a separate unit.

Before unloading, check the machine, the enclosed accessories, and any separate units for external damages and completeness (compare bill of lading with delivery form).

Have the carrier confirm any damages or missing parts on the bill of lading or delivery form.

In case of damages during transport, it is recommended to take photos of the damages for evidence.

Notify the machine manufacturer or the machine manufacturer's representative.



**The control cabinet contains:**

- The necessary logs such as geometry or safety log
- Installation plan
- Key for the operating panel
- Key for the fire extinguishing system (depending on the machine equipment)

**On a separate pallet are:**

- Accessories box
  - Screw-on brackets with threaded rods and mortar cartridge (2x)
  - Operator tools (such as special keys)
- User documentation
- Support feet
- For transporting with transport rollers
  - Mounting for the swivel plate of the steerable transport roller

**Dimensions and weights**

**Machine TNL12.2**



The weight specifications refer only to the basic machine, i.e., **without** cooling lubricant unit and workpieces.

<b>Length</b>		
- Basic machine	mm	1900
<b>Depth</b>		
- Basic machine	mm	1100
<b>Height</b>		
- Basic machine (without indicator lamp)	mm	1600
<b>Weight, approx.</b> (with control cabinet and max. configuration)		
- Basic machine	kg	2500

**Cooling lubricant unit**

<b>Compact belt filter variant</b>		
Length	mm	3123
Width	mm	1262
Height	mm	1828
Weight approx. (with max. configuration)	kg	900

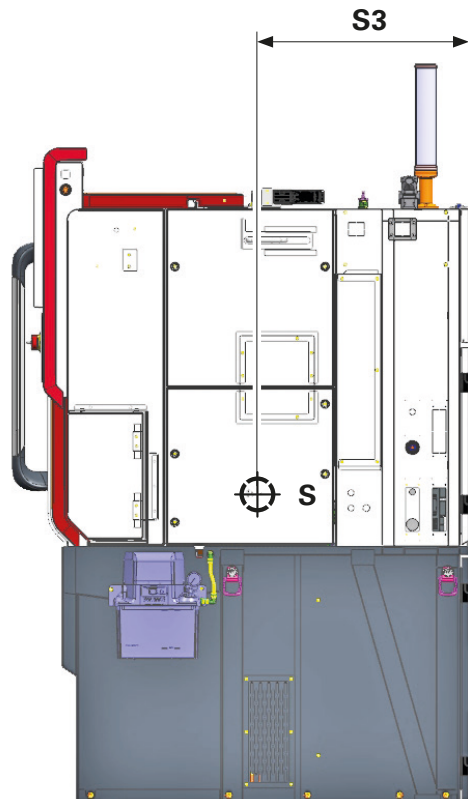
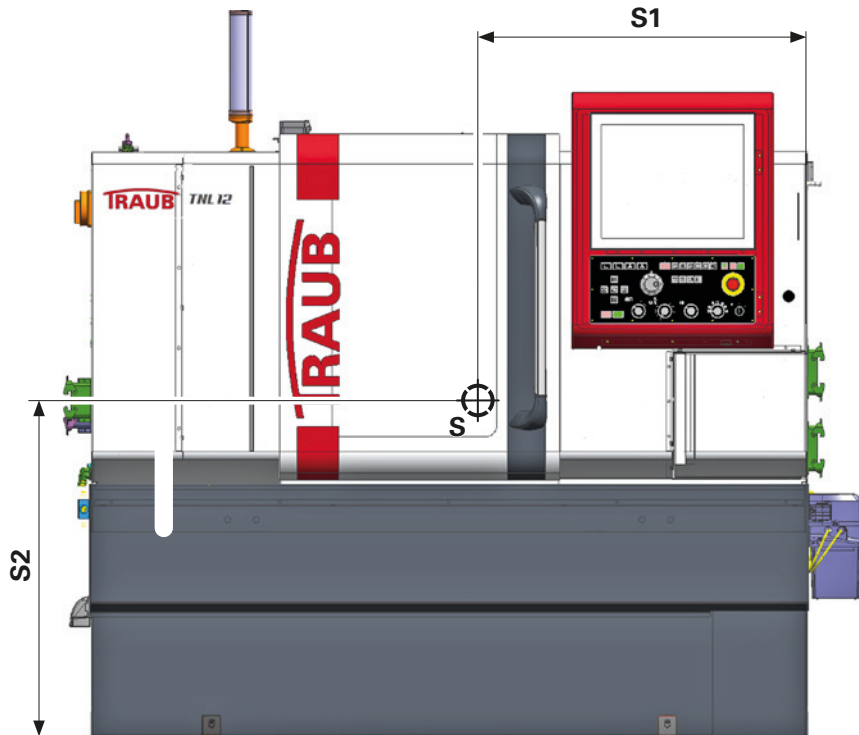
**Twin strainer basket variant**

Length		
- with chip conveyor	mm	2817
- with chip tray	mm	2500
Width	mm	1310
Height	mm	1800
Weight approx. (with max. configuration)	kg	900

**Machine center of gravity (S)**

Center of gravity S* Basic machine	mm	S1	S2	S3
		875	805	505

\* Values may vary slightly



**Transport by crane (min. 3 t capacity)**



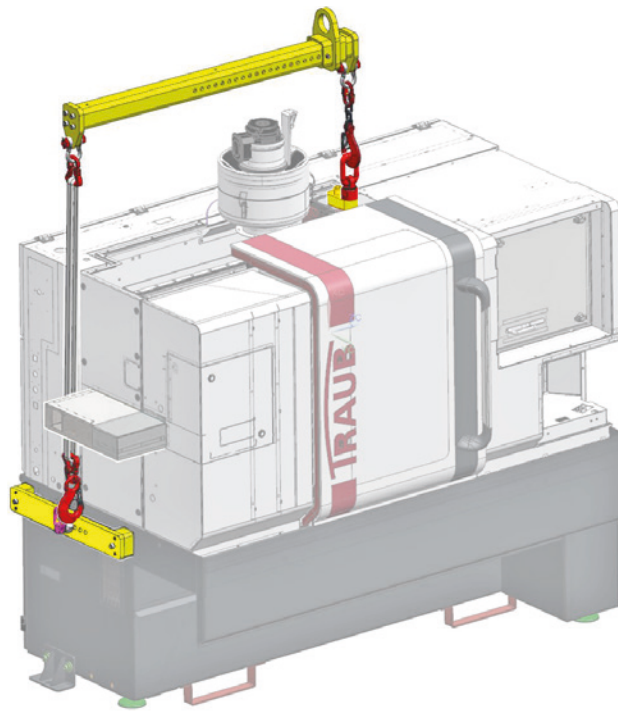
**Danger from falling machine/parts**

No persons are allowed to remain under suspended loads!

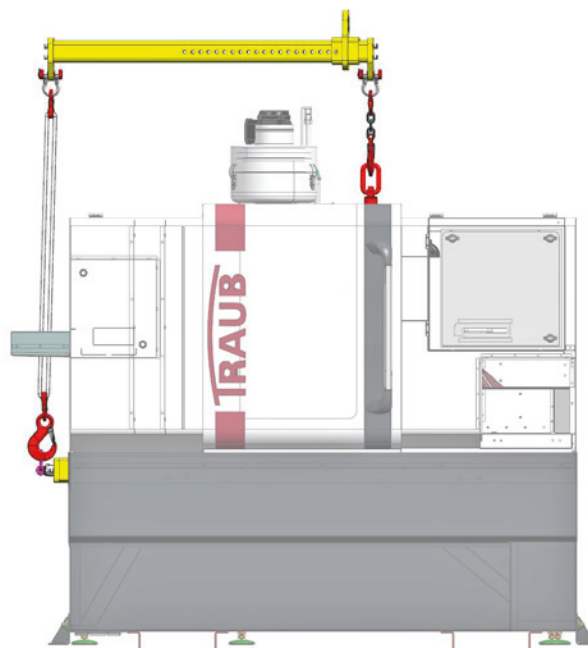


The lifting device required for proper transport of the machine is supplied with the machine and must be returned to INDEX after the machine has been installed.

Illustrations show examples



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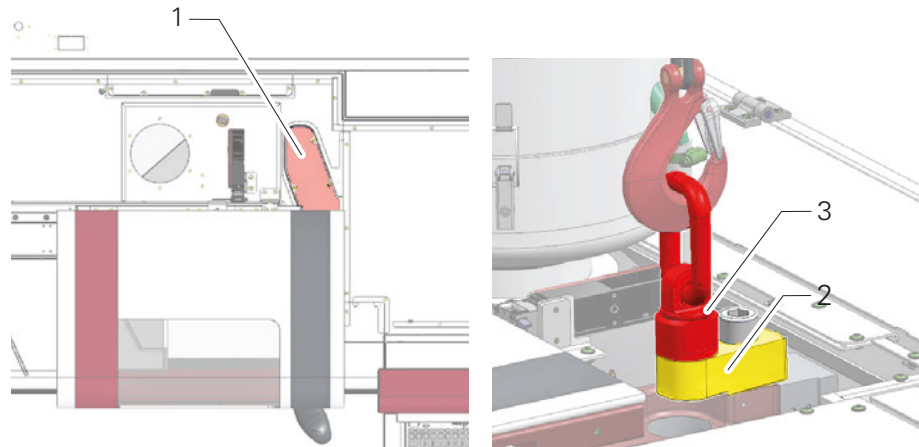


**Attaching the lifting device components**

For transport by crane, there is an M24 threaded hole under a cover on the top of the machine for screwing in a spacer, into which a load ring is mounted.

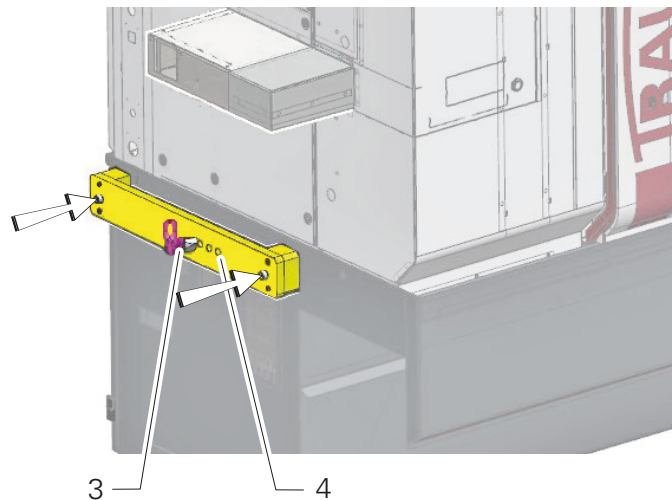
- If not yet installed, remove the cover (1) and screw in the spacer (2) and load ring (3).

Illustrations show examples



- Remove the two load stands on the left side of the machine and screw the lateral load beam (4) onto these threads. If necessary, screw in the lateral load ring (3).

Illustrations show examples



- 1 Cover
- 2 Spacer
- 3 Load ring
- 4 Lateral load beam

**Attaching the machine to the lifting device**

The machine must be suspended horizontally from the crane.

- Position the crane with the lifting device above the machine and attach the two safety hooks (5) to the load rings (3).



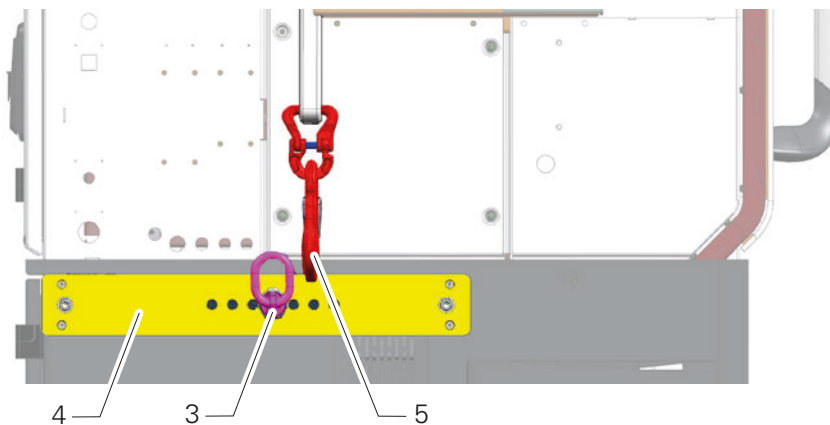
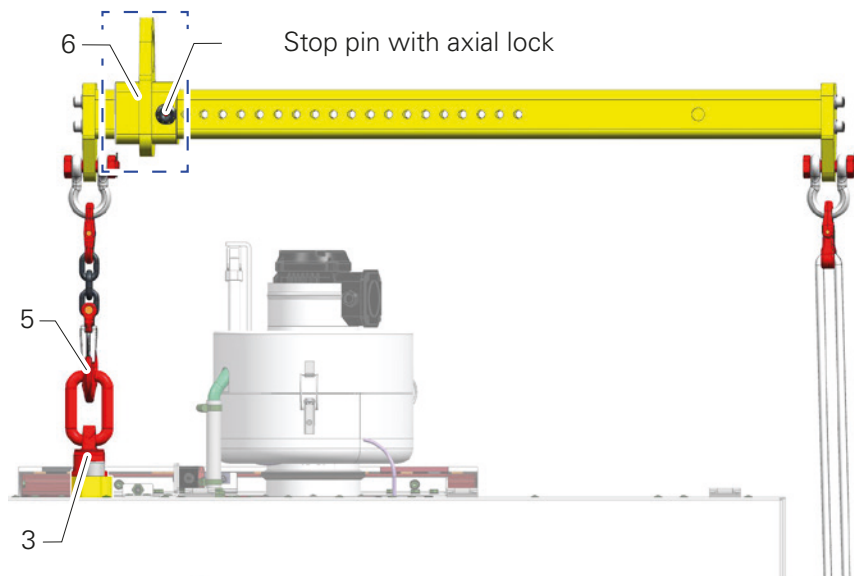
If necessary, the lifting device must be adjusted to match the machine (depending on the configuration level). For this purpose, the attachment position of the upper load beam (6) and the position of the load ring (3) on the lateral load beam (4) can be changed.



**Danger from falling machine/parts**

The lifting device may only be adjusted when it is not in use.

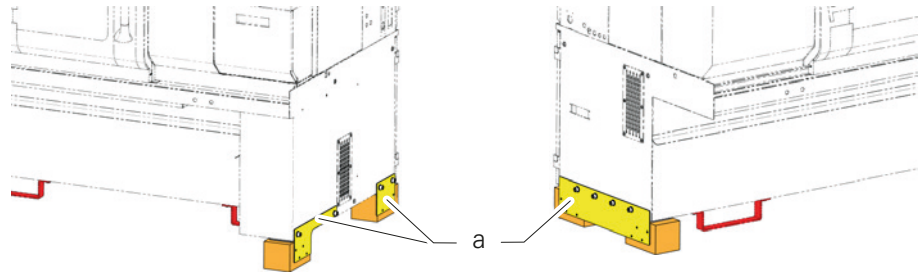
Lifting device default setup



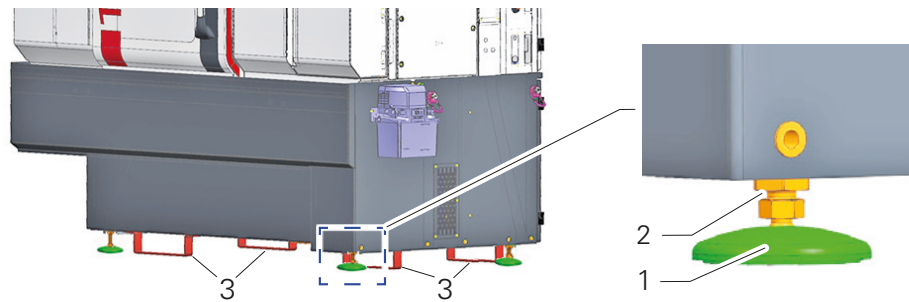
- 3 Load ring
- 4 Lateral load beam
- 5 Safety hook
- 6 Load beam

**Remove the transport supports/transport lugs and wooden planks**

- Slightly lift the machine and stabilize it with suitable supports.
- Dismantle the lateral retaining plates (a) for the wooden planks and remove the wooden planks and the anti-slip mats.



- Then screw in the 4 support feet (1) until they are in the same position and lock them slightly with the hexagonal lock nuts (2) so that the machine can be lowered onto the support feet (1) and the transport supports/transport lugs (3) are free.  
(The support feet are included in the machine accessories).



- Remove the transport supports/transport lugs (3).

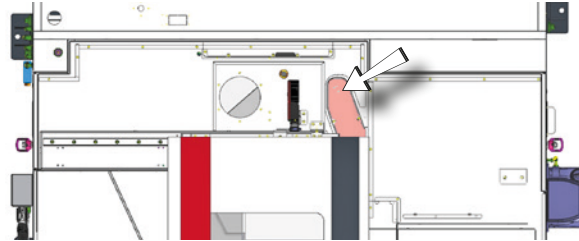


Keep the transport supports/transport lugs (3) after removal (e.g., for a new transport or decommissioning).

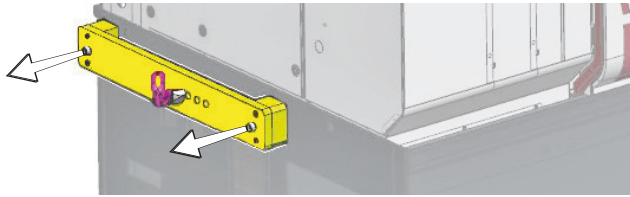
- Lower the machine slowly and evenly onto the support feet (1).

- a Retaining plate for wooden plank
- 1-2 Support foot; hex. lock nut
- 3 Transport support/transport lug

- Remove the spacer and load ring and install the cover.



- Remove the lateral load beam.





**Transporting with a forklift**



**Danger from falling machine/parts**

No persons are allowed to remain under suspended loads!



Transport with a forklift must be carried out from the control cabinet side.



**Danger from tilting of the machine!**

If the machine is transported by forklift, it must be secured against tipping!

Attention must be paid to the center of gravity of the machine.

Anti-slip mats should be placed on the fork arms when transporting the machine. Lift the machine from the control cabinet side using the transport supports/ transport lugs provided.

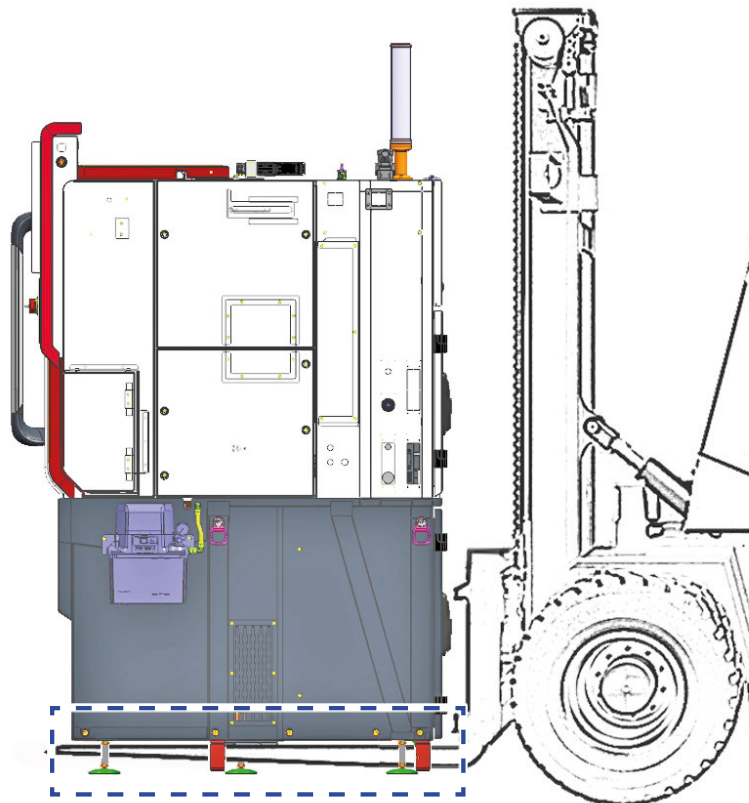
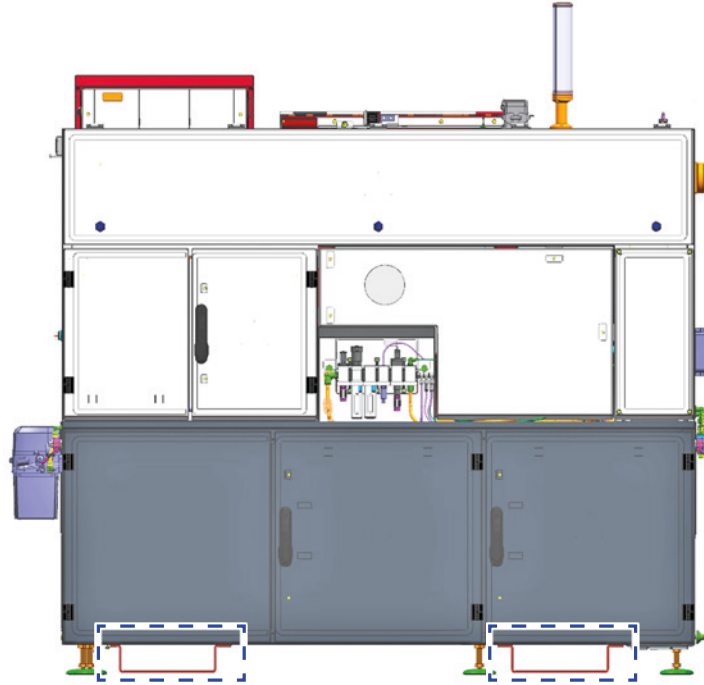
When setting down the machine, make sure that the forks are not tilted.

**Technical requirements – forklift**

Lifting force min. (depending on the machine configuration)	kg	3000
Min. fork length	mm	1400
Center of gravity of the load	mm	—
Max. width of forks	mm	250
Max. height of forks	mm	70

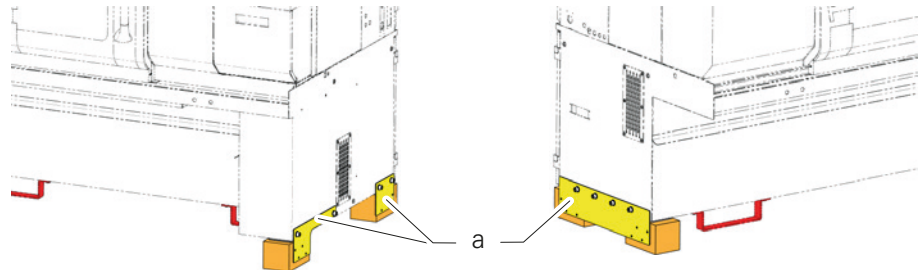
- Move the machine to the installation site by forklift and place it in the desired installation position.

Illustrations show examples

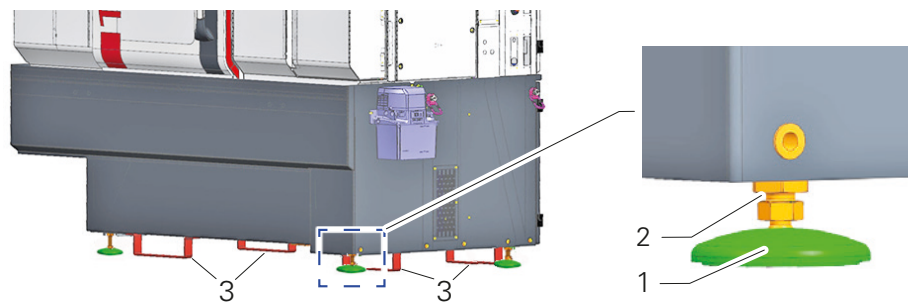


## Remove the transport supports/transport lugs and wooden planks

- Slightly lift the machine and stabilize it with suitable supports.
- Dismantle the lateral retaining plates (a) for the wooden planks and remove the wooden planks and the anti-slip mats.



- Then screw in the 4 support feet (1) until they are in the same position and lock them slightly with the hexagonal lock nuts (2) so that the machine can be lowered onto the support feet (1) and the transport supports/transport lugs (3) are free.  
(The support feet are included in the machine accessories.)



- Lower the machine slowly and evenly onto the support feet (1).
- Remove the transport supports/transport lugs (3).



Keep the transport supports/transport lugs (3) after removal (e.g., for a new transport or decommissioning).

- a Retaining plate for wooden plank
- 1-2 Support foot; hex. lock nut
- 3 Transport support/transport lug

**Transporting with transport rollers**



**Risk of crushing on ramps or uneven floors!**

Secure the machine against unintentional rolling away.



**Danger from tilting of the machine!**

If the machine is transported with transport rollers, it must be secured against tipping!



**Pay attention to the machine's lateral center of gravity**

Due to the machine's high center of gravity, we recommend transporting with transport rollers only if the ground is absolutely even and horizontal.

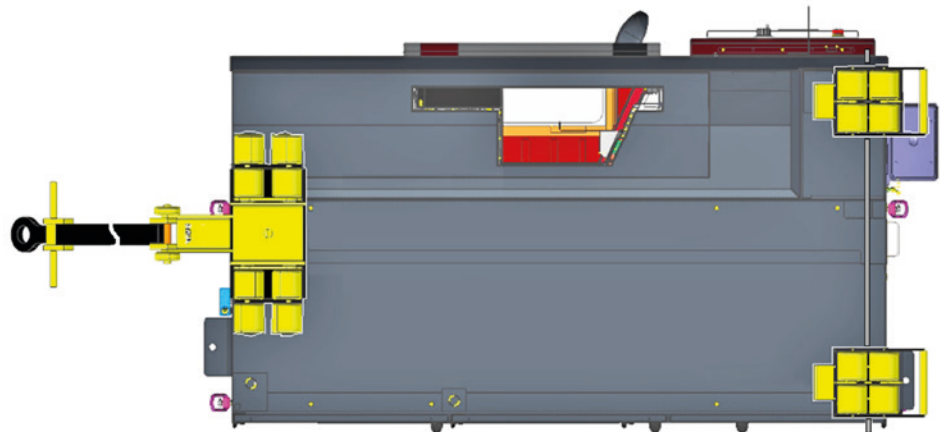


**Attaching the transport rollers**

For transport with transport rollers, the support feet must be removed.

The trolleys must always be parallel to the load.

Connect the rigid transport rollers with a rod.



Plastic plates or Teflon plates can be used to bridge smaller unevennesses and to reduce rolling resistance.

This applies in particular to transporting on irregular or soft grounds such as industrial parquet floors or rubber or PVC-based floor covers.

To transport the machine, 3 transport rollers are required, one of which must be steerable.

**Technical requirements – transport rollers**

Height	mm	max. 110
Rotary table	mm	max. dia. 150
Capacity	kg	up to 6000

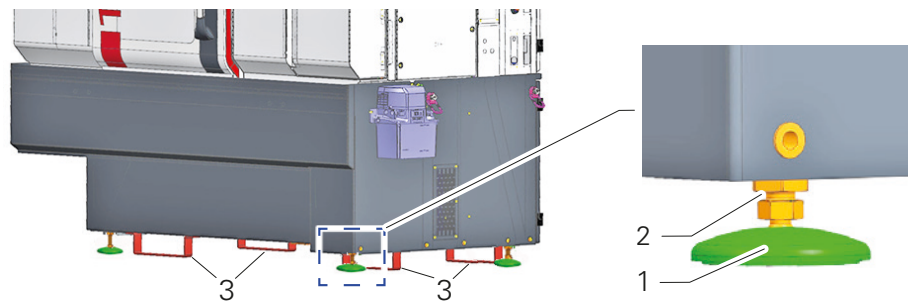
e.g., transport rollers type JLB 3 K, JFB 3 K, for loads up to 6 t

**Remove transport supports/transport lugs and wooden planks**

After removing the transport supports/transport lugs and wooden planks, the machine can be set down on transport rollers with hydraulic jacks and transported to the installation site and/or moved to the desired installation position.

- If necessary, lift the machine evenly by means of the 4 support feet (1) until the transport supports/transport lugs can be (3) removed.
- Lock the support feet and remove the transport supports/transport lugs (3).

Example shown

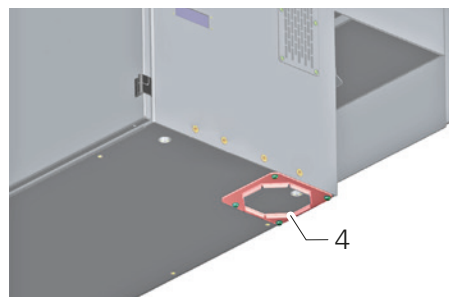


- Remove the transport supports/transport lugs (3).



Keep the transport supports/transport lugs (3) after removal (e.g., for a new transport or decommissioning).

- Mount the holder (4) for the swivel plate of the steerable transport roller in the position provided.  
(The mounting (4) is included in the machine accessories.)



- 1-2 Support foot; hex. lock nut
- 3 Transport support/transport lug
- 4 Mounting for swivel plate of steerable transport roller

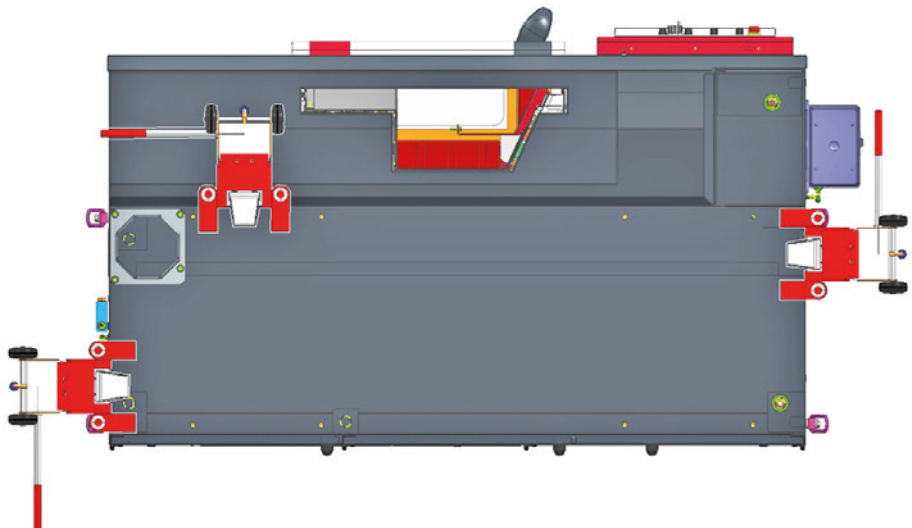
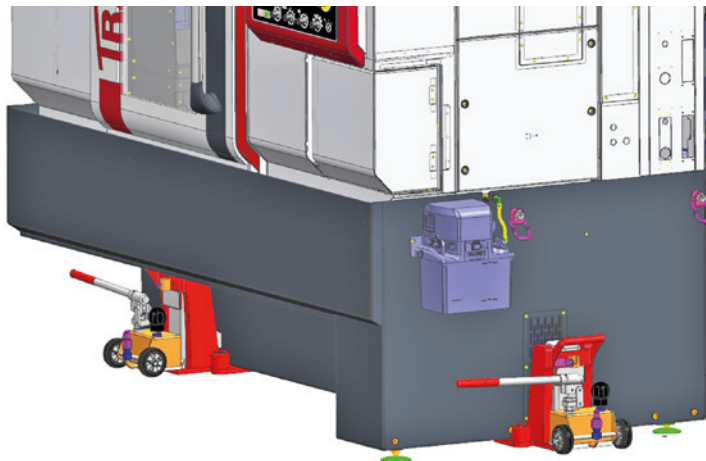
**Positioning the hydraulic jacks**



**Risk of crushing on ramps or uneven floors!**  
Secure the machine against unintentional rolling away.

2-3 hydraulic jacks are needed to lift the machine.

- Attach the hydraulic jacks as shown.



**Placing the machine on transport rollers**



**Risk of crushing on ramps or uneven floors!**

Secure the machine against unintentional rolling away.

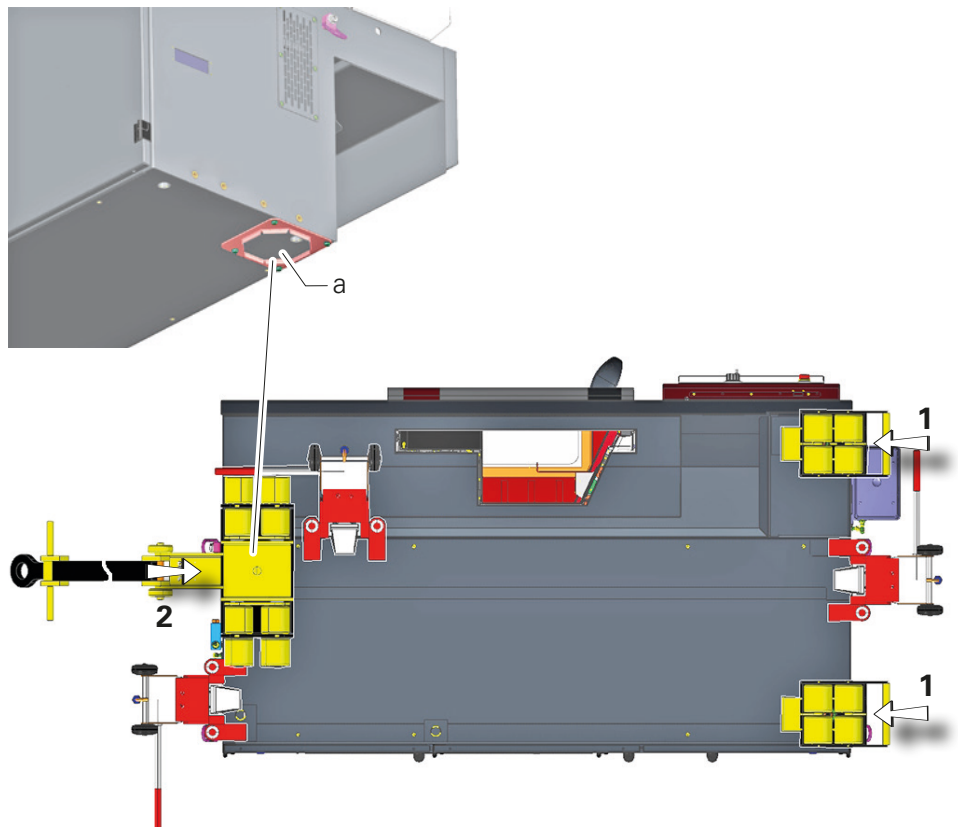
- Evenly lift the machine with the hydraulic jacks.
- Remove the 4 support feet.
- Position the rigid transport rollers under the machine as indicated (1), then carefully lower the machine onto the rigid transport rollers.
- Then place the steerable transport roller (2) in the position (a) provided for this purpose under the machine and carefully lower the machine. Make sure that the steerable transport roller rests positively in the center of the turntable.



**Using 2 hydraulic jacks**

When using two hydraulic jacks, lift the machine sides in small steps alternately and always secure the machine by supporting it (e.g., with wood).

First position the rigid transport rollers, then position the swivel plate of the steerable transport roller positively in the holder (a).



- Remove the hydraulic jacks.

- Transport the machine to its installation site or move it into the position required for installation and secure it so that it cannot roll away inadvertently.



### Electrical connection

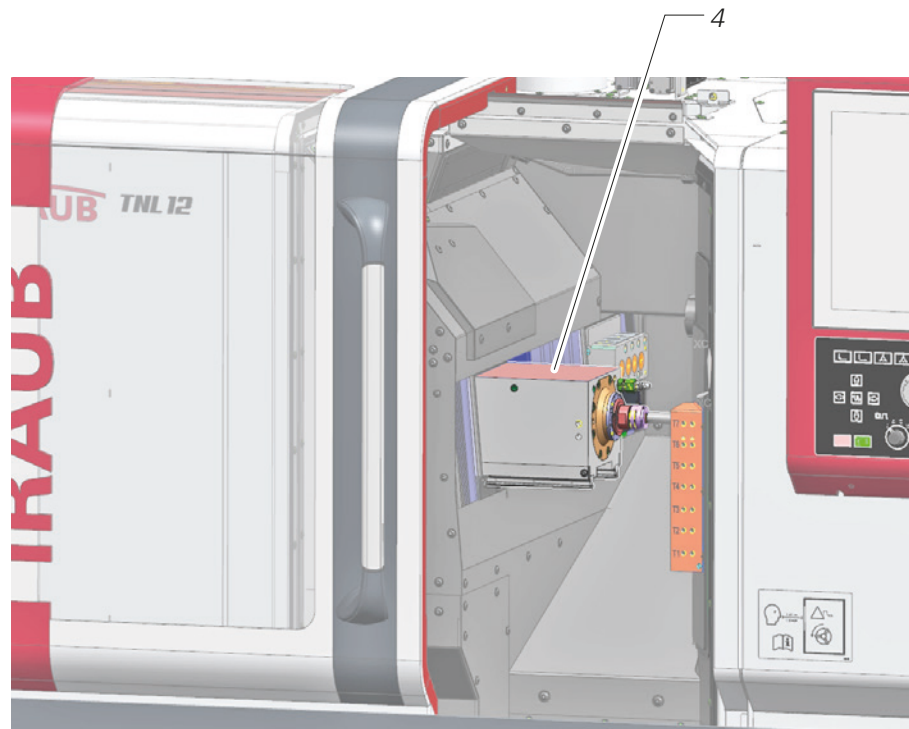
Check the connected load according to the data and conditions in Chapter *Electrical connection*.

### Aligning and anchoring the machine

#### Spirit level and support surface

- Place the spirit level on the support surface on the counter spindle (4).

The position of the counter spindle corresponds to the position with a transport lock.  
If necessary, move the counter spindle to the position, see *Axis positions for attaching the transport locks*.



### Installation items



For installation items **A-D**, see Chapter *Installation plan*.  
The machine is aligned exclusively with the installation items **A**, **B** and **D**.

- Fully relieve installation item **C**.

## Aligning

- Align the machine to the height position of 1150 mm of **main spindle height** by turning the adjusting screws **A**, **B** and **D**.

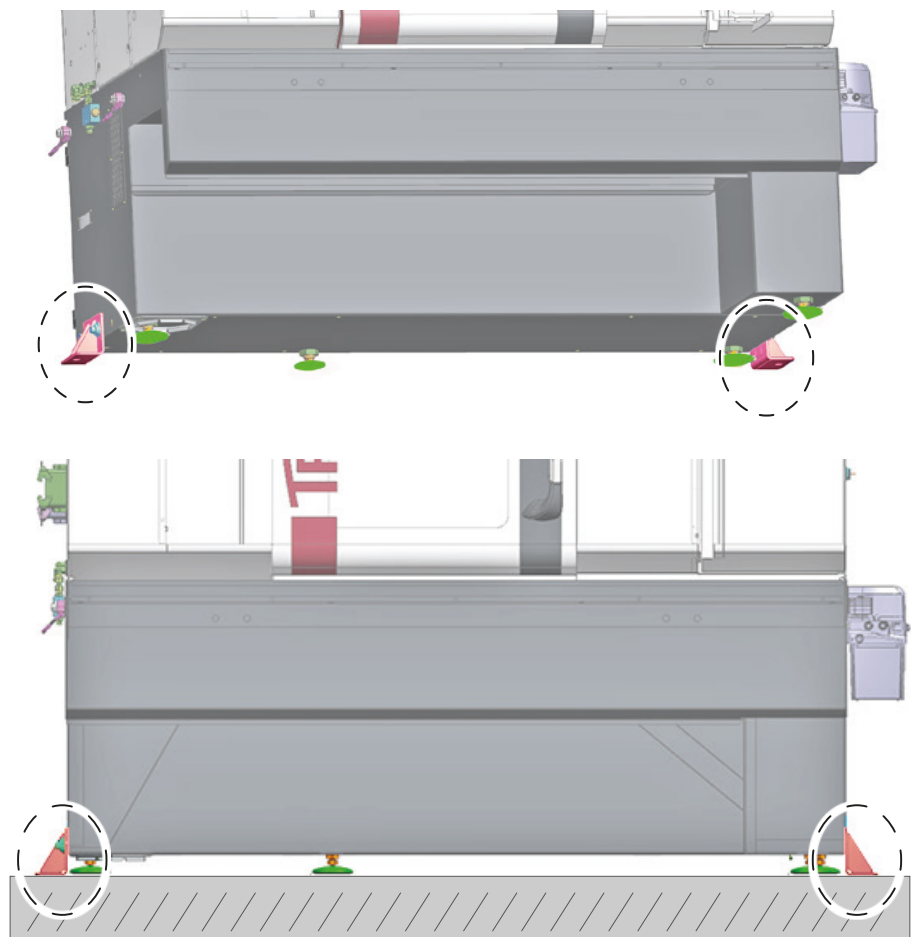


The machine must be adjusted exactly to **1150 mm main spindle height** so that the chip conveyor can be inserted. The maximum permissible deviation is 0.5 mm per 1000 mm.

- Only tighten adjusting screw **C**.
- Secure the adjusting screws with the hexagonal nuts.

## Fastening to the floor

- Screw the two connection brackets to the machine base positions provided for this purpose; the connection brackets must be adjusted at the bottom. M16x45 screws and washers (2x each)  
Tightening torque max. 80 Nm



- Use an 18 mm dia. masonry drill to drill a 125 mm deep hole in the foundation through the holes in each of the two connection brackets.
- Insert a mortar cartridge and threaded bar (M16x250) (included in machine accessories). The length of the threaded bar may need to be adjusted.



Follow the documentation of the manufacturer of the mortar cartridge.

- After the mortar cartridge curing time specified by the manufacturer, secure the machine to the threaded rods using the hex nuts and washers. Tightening torque max. 80 Nm.

**Removing the transport locks from the machine**



All transport locks must be removed before installing the cooling lubricant unit or before commissioning the machine.



**Removing the transport lock**

During removal, all screws of the transport lock must be removed.

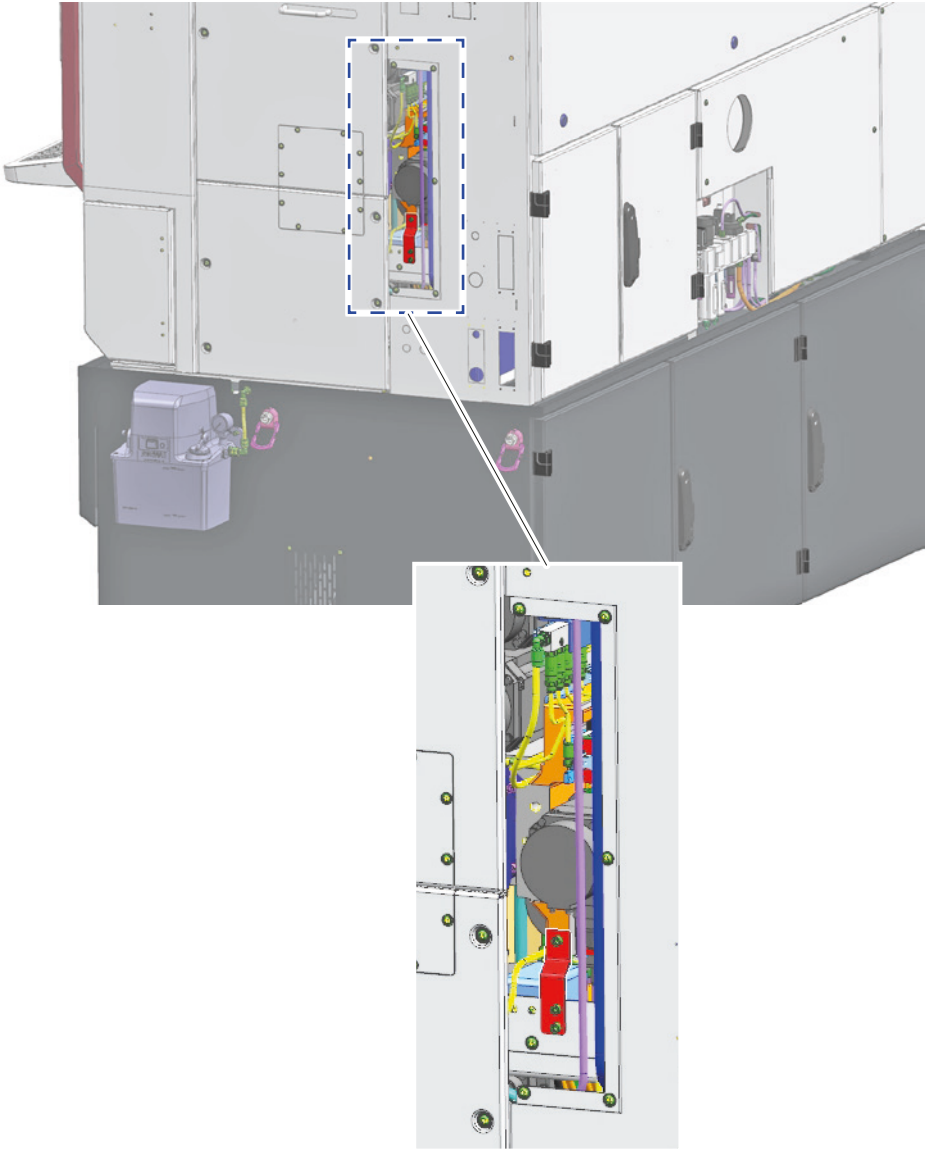


Keep the transport locks after removal (e.g., for renewed transport or decommissioning).

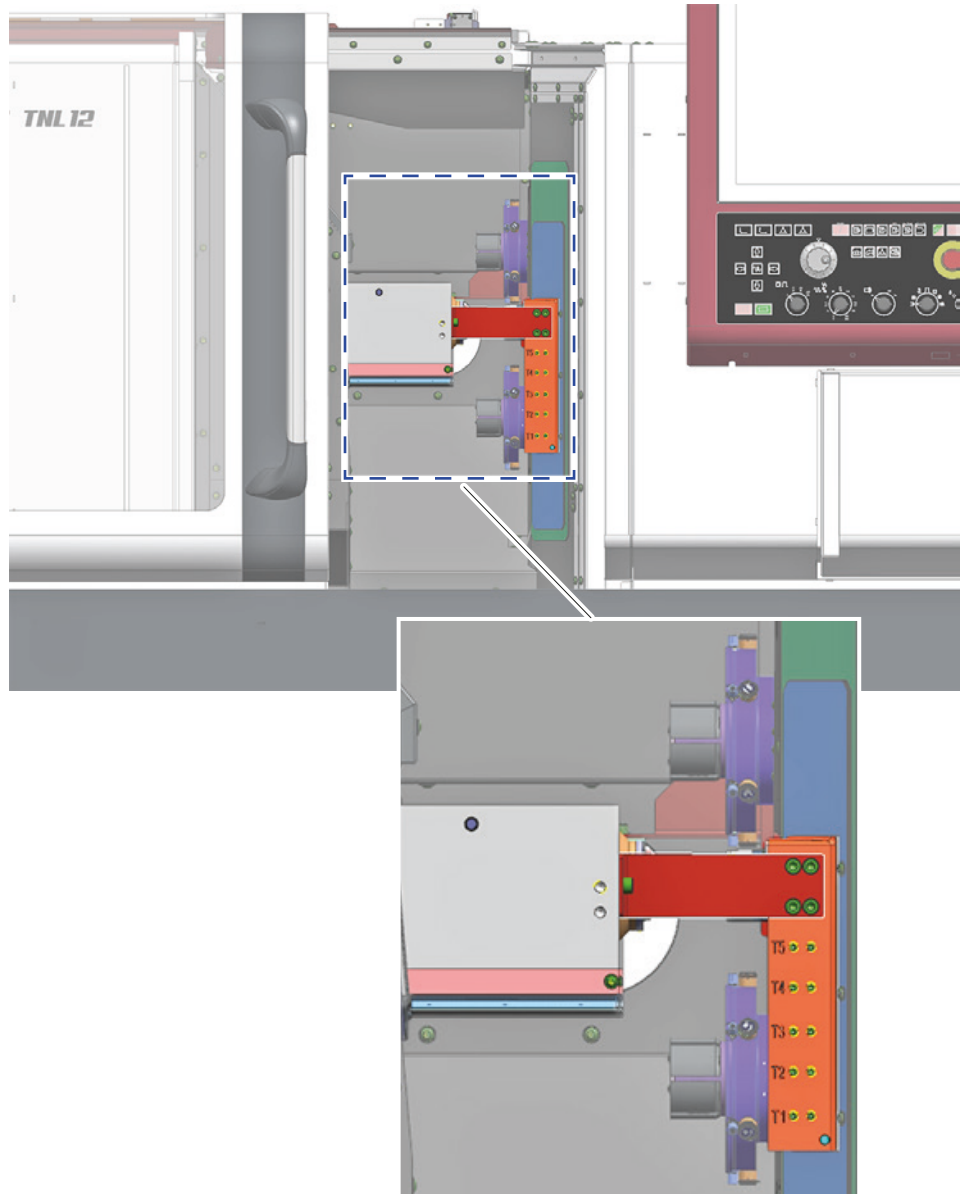
**Locations of the transport locks on the machine**

Location	P/N of the transport lock	
Main spindle	12069162	Bracket
Counter spindle and back working attachment	12069161	Bracket
Upper tool carrier and front working attachment	12069130	Bracket
Operating panel	12080287	Bracket
Work area door	12069118	Bracket

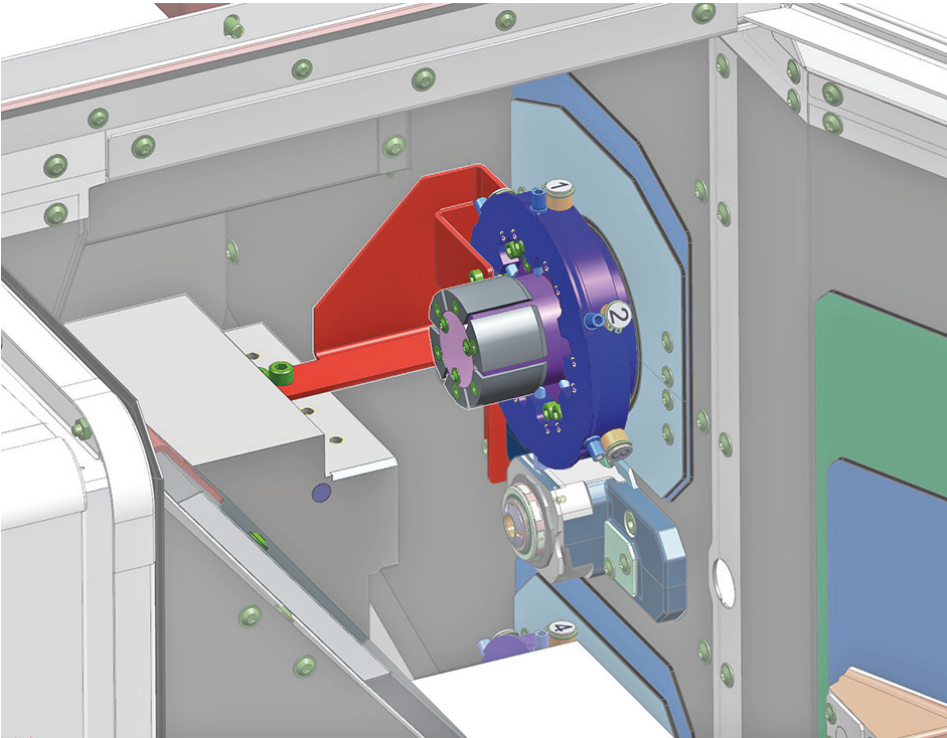
Transport lock – main spindle



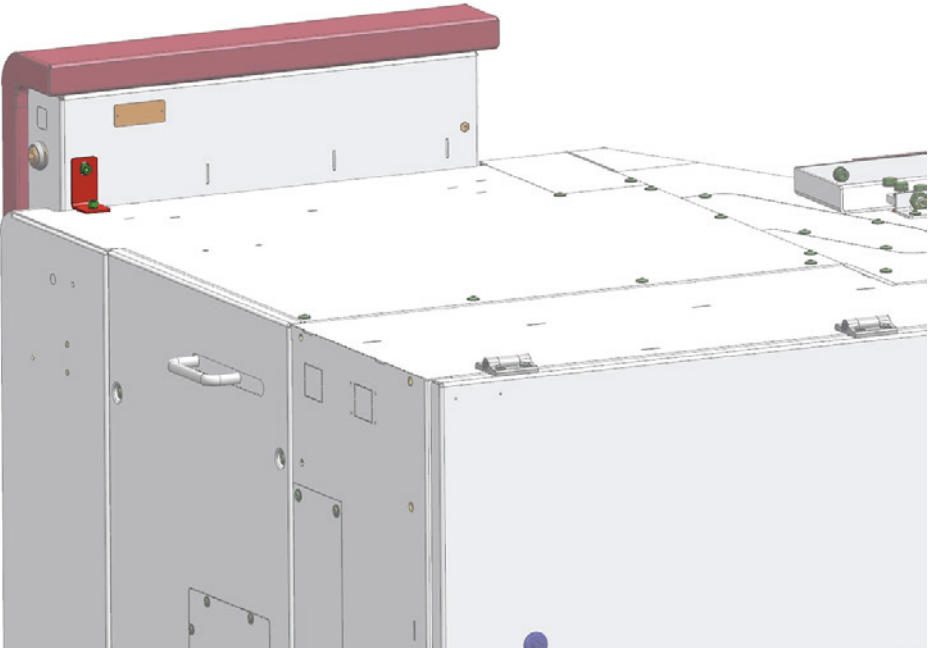
Transport lock at counter spindle and back working attachment



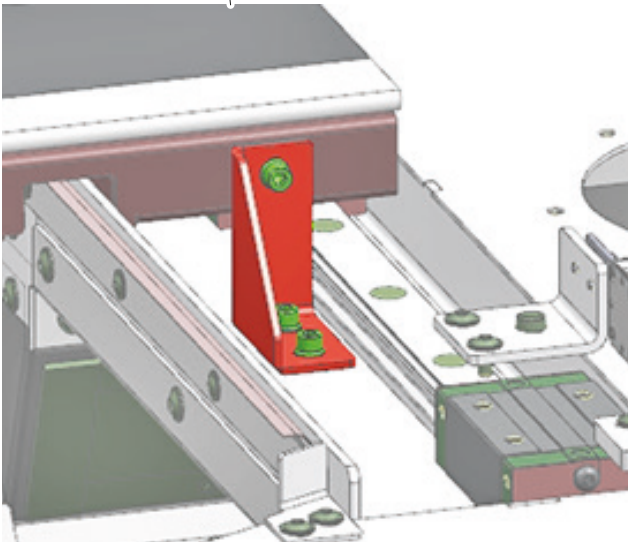
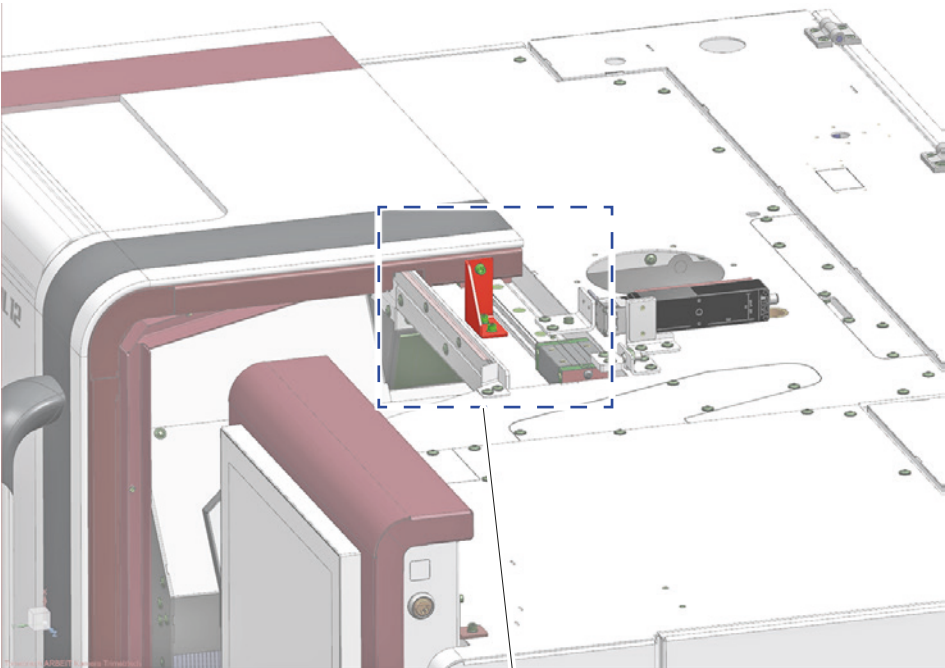
Upper tool carrier and front working attachment



Transport lock at operating panel



Transport lock at work area door





## Connecting the machine to central exhaust system

### Shutoff damper for fire protection



#### Operating the machine with cutting oil

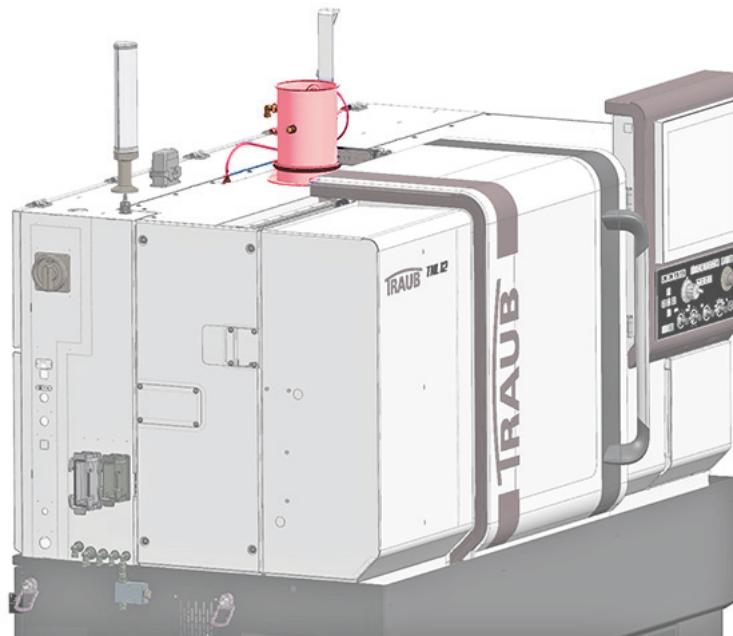
When operated with cutting oil, the machine is fitted as standard with a shutoff valve for fire protection.



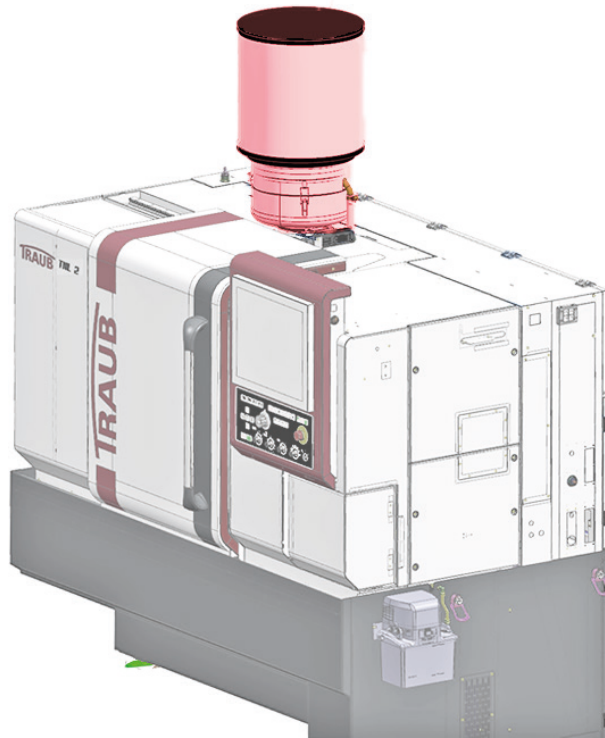
#### Operating the machine with emulsion

If the operator/owner does not have a shutoff valve for fire protection in the central exhaust system, it must be installed by the machine manufacturer's service personnel when the machine is installed.

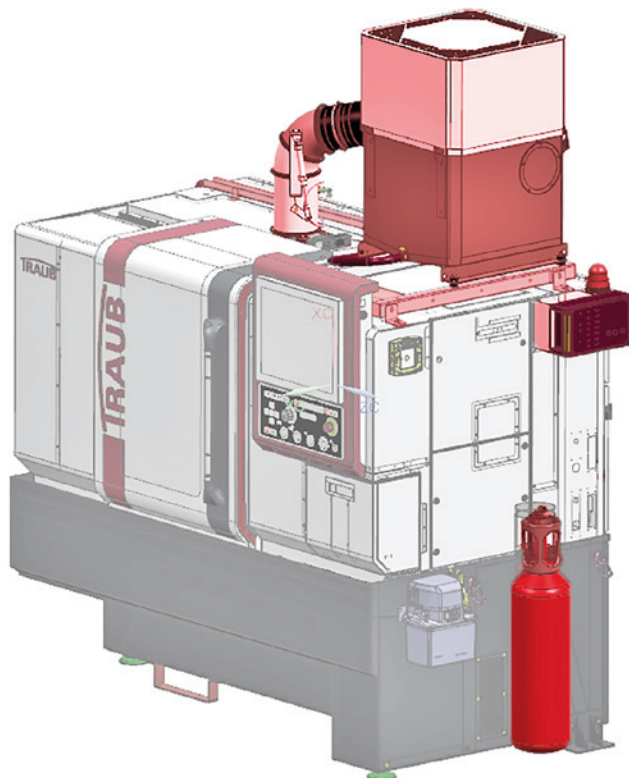
Mechanical preparation for central and local exhaust system.



Adding a local exhaust system without a fire extinguishing system



Adding a local exhaust system with a fire extinguishing system or shutoff valve



### Indicator lamp

Connect the indicator lamp to the control cabinet if it has been removed during transport.



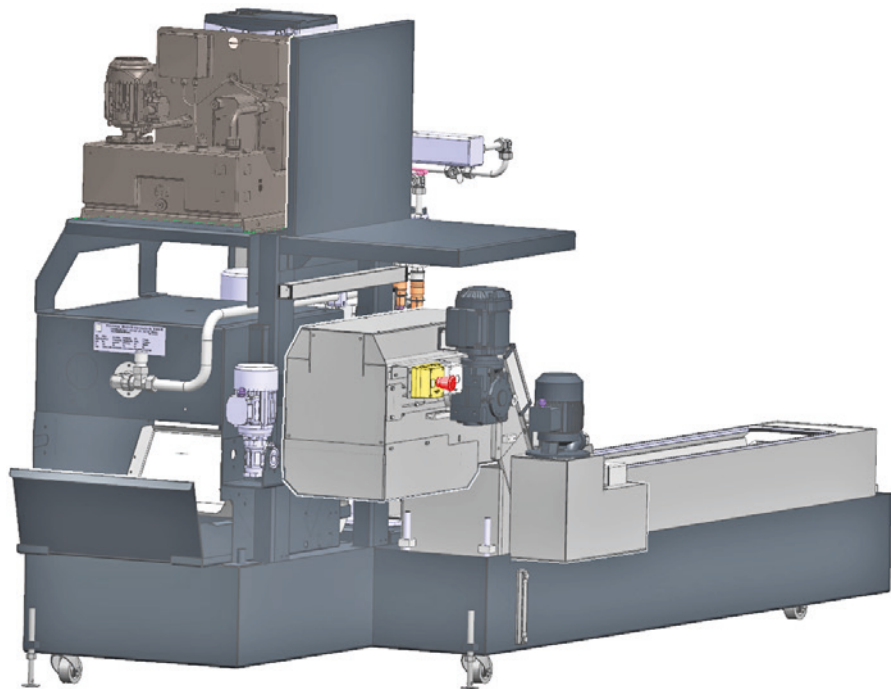
**Transporting and installing the cooling lubricant unit**



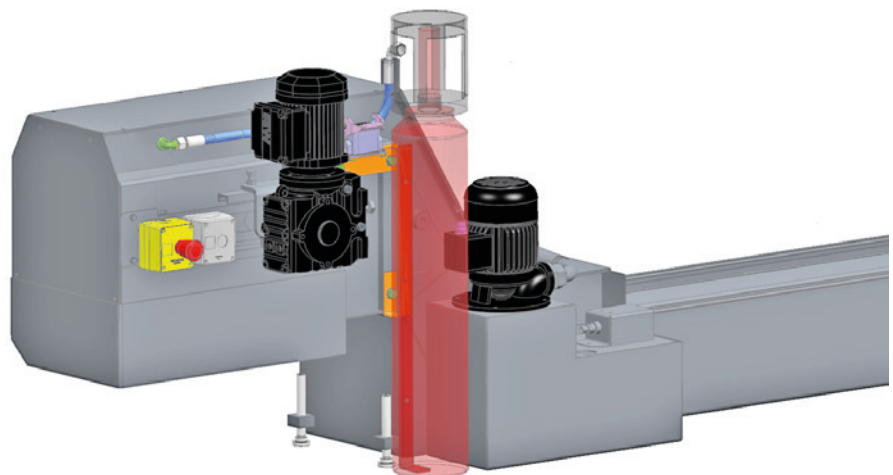
**Follow the manufacturer's documentation**

- Move the cooling lubricant unit to the machine location and lift it off the pallet using suitable lifting equipment and place it on the rollers.

Illustrations show examples



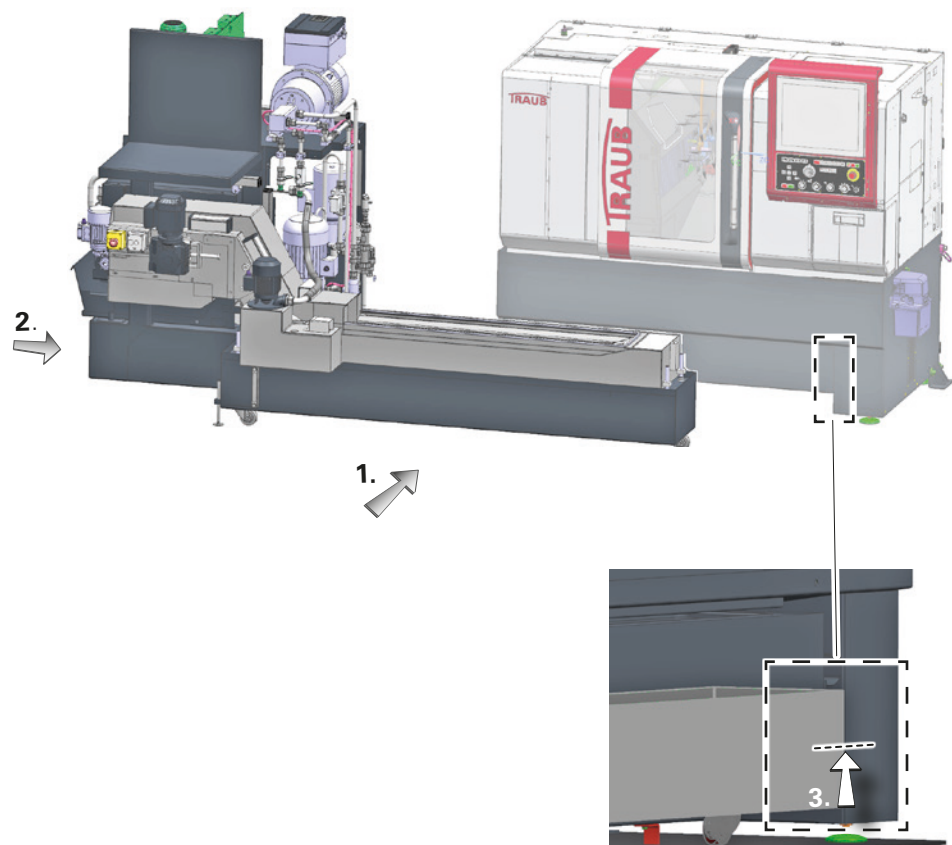
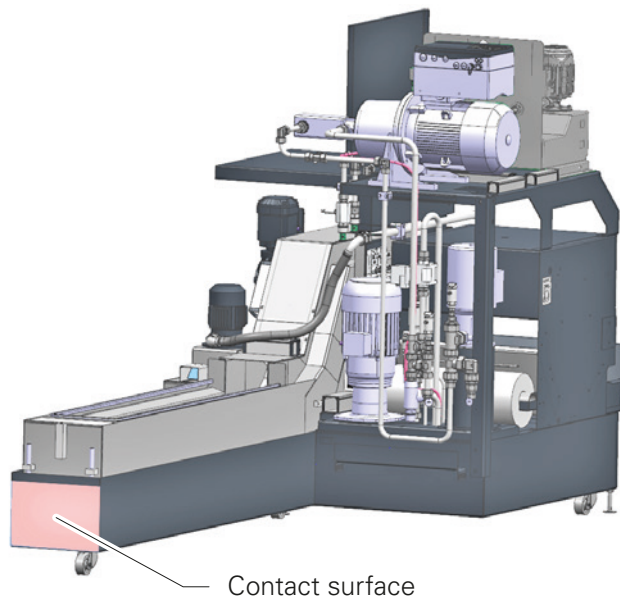
Optional  
chip conveyor with extinguishing nozzle and CO<sub>2</sub> tank



**Installing the cooling lubricant unit**

- Push the cooling lubricant unit from the left side of the machine under the machine (1.), then push it to the right until it stops (2). Make sure that the front of the chip conveyor is flush with the base of the machine (3).

Illustrations show examples  
(cooling lubricant unit with compact belt filter)

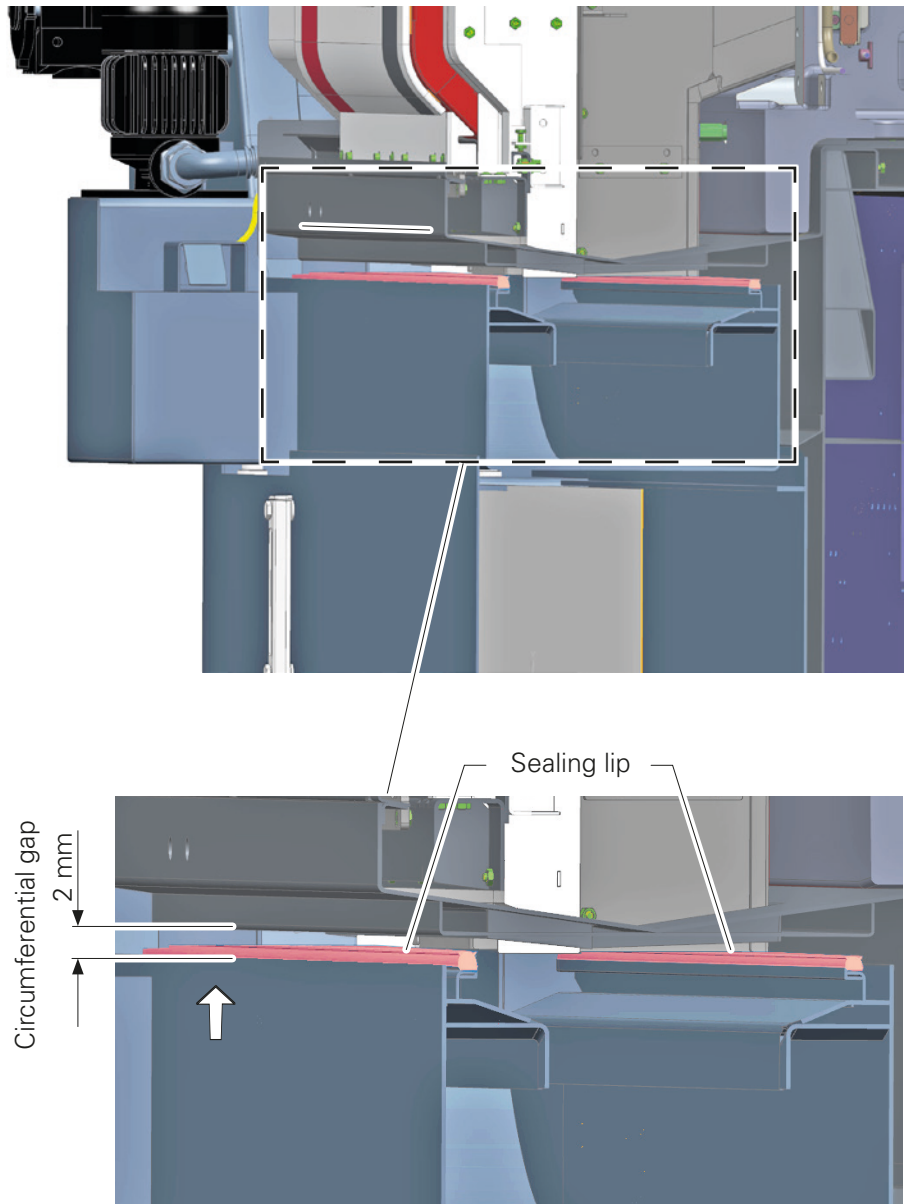


**Sealing of cooling lubricant unit / machine**

Seal the joint between the cooling lubricant unit and the machine through a sealing lip.

- Adjust the cooling lubricant unit evenly by means of the adjustable feet, except for a circumferential gap of 2 mm between the machine and the chip tray.

Illustrations show examples



- Fix the adjustable feet using the lock nuts.

### Connecting the cooling lubricant unit



If the spindle cooling (water-water cooling) is realized through a central cooling system, the hose connection should be provided with a stopcock or a quick-connect coupling to allow cleaning of the chip conveyor

- Remove the blanking plugs from the connection kits and connect the connection kits to the machine and cooling lubricant unit according to the marking.
- Electrical connection of the cooling lubricant system



## Important notes

**Caution! Danger to Life!**

**All work on the electrical equipment must be carried out exclusively by properly trained qualified personnel.**



The control voltages are connected on one side with PE according to EN 60204-1. See the information on the wiring diagram.

The control cabinet may be opened only when the main switch is switched off. While the main switch is switched on, the control cabinet must be secured according to valid safety standards.



See the order confirmation for the precise electrical requirements. The electrical documentation supplied is definitive and binding. They must be available to **INDEX**'s customer service at any time.

The machine must be connected to the electrical supply network via the main switch (multi-wire cable). The connection must be made with a clockwise rotating field.

The power connection is indicated in the wiring diagrams.

The machine is prepared for connection to three-phase power lines (TN-S network).

Before connecting the machine, check that the existing power settings and network form of the respective power supply company match the ratings defined for the machine.

If this is not the case, an upstream transformer is required.



The guidelines and regulations applicable in the country of use must be followed.



### Provision of compressed air



For all work in connection with operating media, observe the information in the data sheets from the respective manufacturers and the information in the document *Notes on Operating Materials*.

The required amount of the operating materials to be filled can be obtained from the relevant fluid diagrams.

The required compressed air is conditioned in a maintenance unit that requires no adjustments.

Pressure gauges are available to check normal functionality.

### Air consumption

Air consumption is influenced by the machine configuration and cycle time. On average, approx. 100 NI/min is set for a standard machine.



This section lists all the actions that must be carried out in the order given before the machine is ready for start-up.

Only then is the machine ready for operation.



Before commissioning the machine, unscrew all transport locks (**recognizable by their red color**) and keep them for another transport in the future.

**See also the section "Locations of the transport locks on the machine".**

### Cleaning the machine

All blank parts of the machine were treated by spray-covering with an anti-rust agent. Usually, this protective cover is flushed away by the coolant during the operation of the machine.



**To prevent solvent splashes from entering the eyes when cleaning the machine, be sure to wear suitable safety goggles.**

**For cleaning the inside of the machine's work area, protect your hands and arms by wearing clothes with long sleeves and suitable gloves.**


**Risk of injury by sharp machine parts and cutting edges!**

The anti-rust agent must be washed off if the machine is put into operation after a long time and the protective layer has become very tough.

The mounting surfaces for tool holders and add-on equipment must also be cleaned.

For this purpose, only solvents may be used that do not affect the machine paint. Suitable solutions are turpentine, petroleum, or benzene.


**Check the operating fluid levels and replenishing, if necessary**

 For all work in connection with operating media, observe the information in the data sheets from the respective manufacturers and the information in the document *Notes on Operating Materials*.

The required amount of the operating materials to be filled can be obtained from the relevant fluid diagrams.

- Cooling lubricant unit: ..... Replenish cooling lubricant
- Central lubrication system: ..... Check fill level
- Cooling (spindle): ..... Check fill level
- Add-on equipment: ..... Check fill levels

**Data loss due to prolonged downtime**

 The machine is functional only after all data has been entered.

After a prolonged downtime of the machine, data may be lost in the RAM. In such a case, the lost data must be re-entered or re-loaded before the machine can be put back into operation.

The data are recorded in the start-up report and backed up on a storage medium. The start-up report and the storage medium are located in the document pocket in the door of the control cabinet.

**Switch on the machine**



Before switching on the machine, the key switch must be in the **“Production mode”** position to prevent unexpected starting or unexpected movement.



Before initial commissioning, the machine operator/owner is required to check the safe condition of the machine, including its safety devices. This must also be done during operation at reasonable regular intervals, but at least after each repair and maintenance.

Example shown



- Turn on from the main switch on the control cabinet.



- Switch on the NC controller from the machine control panel.



- Press *Reset* key (any internally pending error messages will be cleared).

- Open and close the work area door.



The operability of the door switches must be checked by opening and closing the work area door. Only if the safety devices respond can the machine be started.



Lock the work area door by pressing the *GUARD* key. (The work area door must be manually locked and unlocked when setting up the machine.

In automatic mode, the work area door can be locked with the *GUARD* or *AUTOMATIC START* key.)

LED	Status
On	The work area door is locked
Off	The work area door is unlocked
Flashing	The safety switch is blocked, or a secured cover/protective door is not closed.



- Switch on the drives.





## Preparing the machine for transport

### Transport locks on the machine

Certain moving parts/assemblies on the machine, such as the work area door and the swiveling operating panel, must be secured for transport by transport locks.

The transport locks are included in the delivery of the machine.



See section “Locations of the transport locks on the machine”.

Before refitting the transport locks, make sure that the respective screw-on surfaces are free of oil and grease.

### Locations of the axes for attaching the transport locks

	Axis	Location
<b>Main spindle</b>		
Sliding/fixed headstock operation	Z1	+ 233.9
<b>Counter spindle</b>	Z4	+ 8.8
	Y4	+ 317.0
<b>Upper tool carrier</b>	Z2	- 13.5
	X2	+ 115.0
	H2	any station
<b>Lower tool carrier</b>	X1	+ 153.1
	H1	any station
<b>Front working attachment</b>	Z3	+ 50.0
	X3	+ 64.0
<b>Workpiece discharge unit</b>	Z5	retracted
<b>Back working attachment</b>	X4	+ 182.5
<b>Work area door</b>	Z	+ 439 (completely open)
<b>Operating panel</b>		folded

### Drain the hydraulic tank before transport

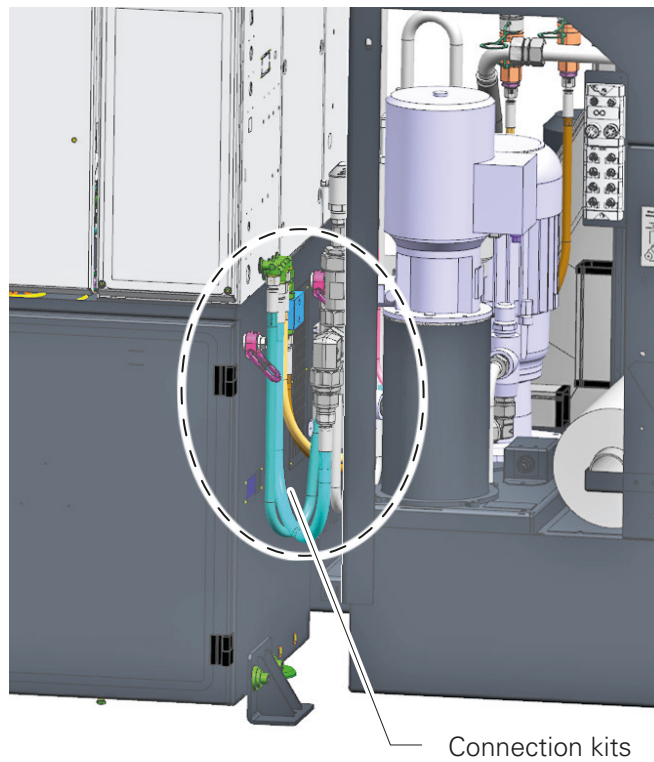


When carrying out work on fluid systems (hydraulic, lubrication, and pneumatic systems), make sure before starting the work that the respective system has been depressurized (accumulator drain valve / manual slide valve / emergency stop).

### Seal disconnected hose lines or pipelines

To prevent leakage of the remaining cutting oil or cooling lubricant from the lines, the disconnected connection kits or pipelines must be sealed with plugs.

Example shown



### Corrosion protection

Before delivery, all machines are provided with corrosion protection. For every further transport, the corresponding corrosion protection must be renewed.



Details on corrosion protection can be found in the documentation *Information on operating materials*.

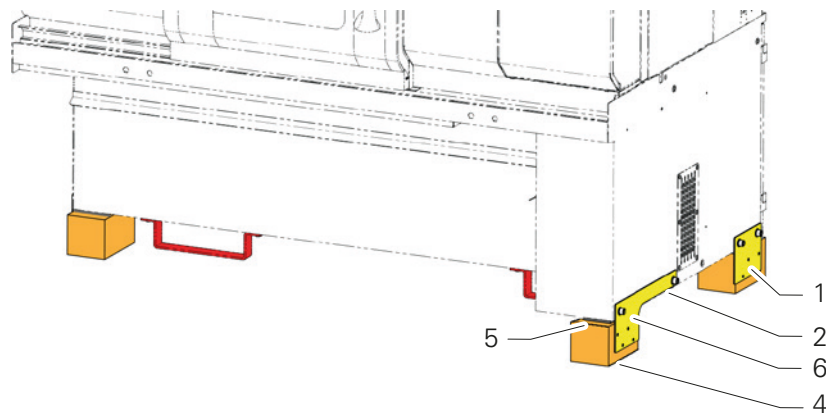
**Transporting the machine by truck**

**Machine preparation for transport by truck**

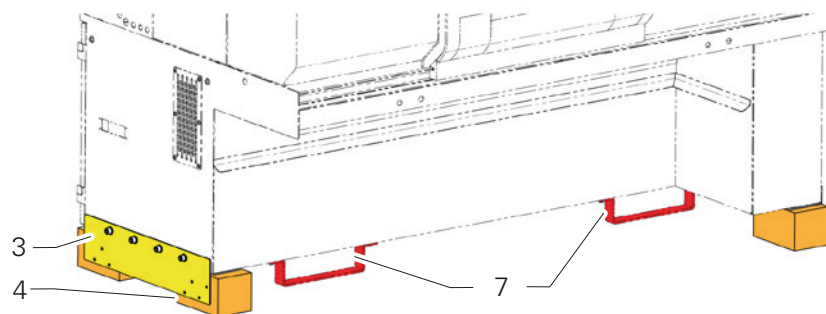
For truck transport, the machine must be placed on wooden planks. The “Wooden planks, retaining plates, and screws” fastening set is included in the delivery condition of the machine.

- To do this, lift the machine slightly with a transport means approved for transporting the machine (see Chapter *General*) and support it to secure it.
- Remove the support feet and, if mounted, the mounting for the swivel plate of the steerable transport roller.
- Reinstall the transport supports/transport lugs.
- Place anti-slip mats (5) on the wooden planks (4) and fasten the wooden planks (4) to the machine using the retaining plates (1-3).

Illustrations show examples, right side view





Left side view



- 1-3 Retaining plate for wooden plank
- 4 4x wooden plank 120x120x200 mm Alternatively: 2x wooden plank 120x120x1000 mm (wooden planks fastened to the retaining plates with wood screws)
- 5 4x anti-slip mat (thickness 8, 9, or 10 mm), e.g., 100x100x8 mm
- 6 4x cylinder-head screw M12x20, 4762 with washers
- 7 Transport supports/transport lugs

**Transporting the machine by truck**

To avoid heavy impact during transport, the truck should have air suspension!

-  Transport the machine with the control cabinet side on the left (in the direction of travel) (see illustration).
-  The machine must be lashed diagonally to the truck loading platform using **approved straps (a)** in conjunction **with anti-slip mats (coefficient of friction 0.6μ)**.

**Approved straps (a)**

One-part strap with ratchet LC (Lashing Capacity)	Number of workpieces daN	4 1500
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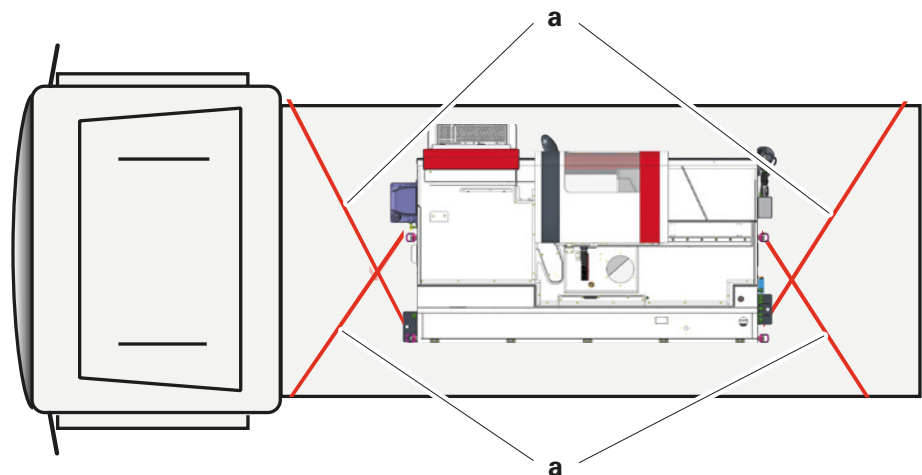
**Strap bias load**

Hand force SHF	daN	approx. 50
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Illustrations show examples of straps (Source: ESSKA.de GmbH)



Example of transporting on a truck loading platform  
Example shown



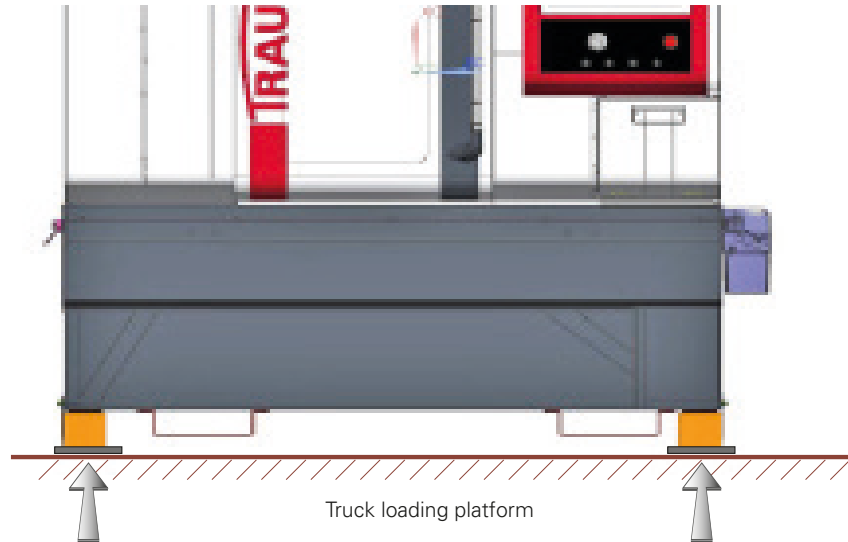
**Loading guard**

 The load must be secured against slipping by the methods listed below.

**Anti-slip mats**

- Secure the load by placing anti-slip mats (9 mm thick) between the loading platform and the wooden planks of the machine.

Illustrations show examples



**Inclined lashing**

Lashing the machine at an angle on the loading platform with suitable straps (see "Example of transporting on a truck loading platform").

For this purpose, screw four rotating load rings into the designated threads (M24) on the base of the machine.

Illustrations show examples







# INDEX

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