

Transport, installation, commissioning

TNL32 compact

TNL20.2

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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Symbols

Explanation of the symbols used in the user documentation.



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 caution may cause malfunctions on the machine.
This can result in damage to entire assemblies or parts thereof.



Reference to other documents.

Safety

Safety instructions and technical specifications



The user documentation, in particular, the document “Safety Instructions and Technical Specifications” must be observed.



Operating mode key switch position 2 (special operating mode)

Activation of special functions (key cannot be removed)



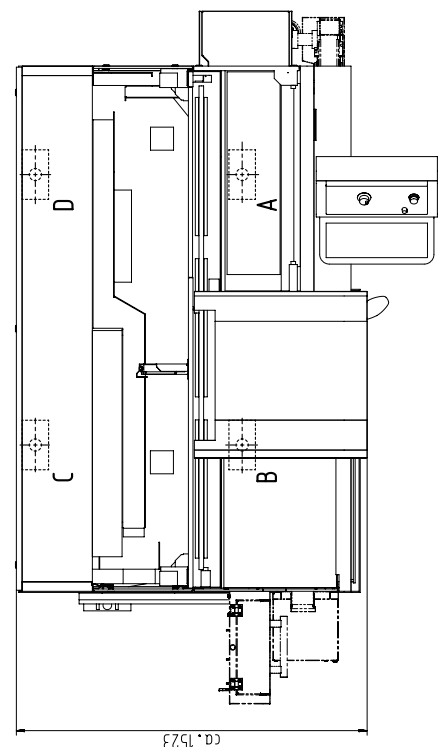
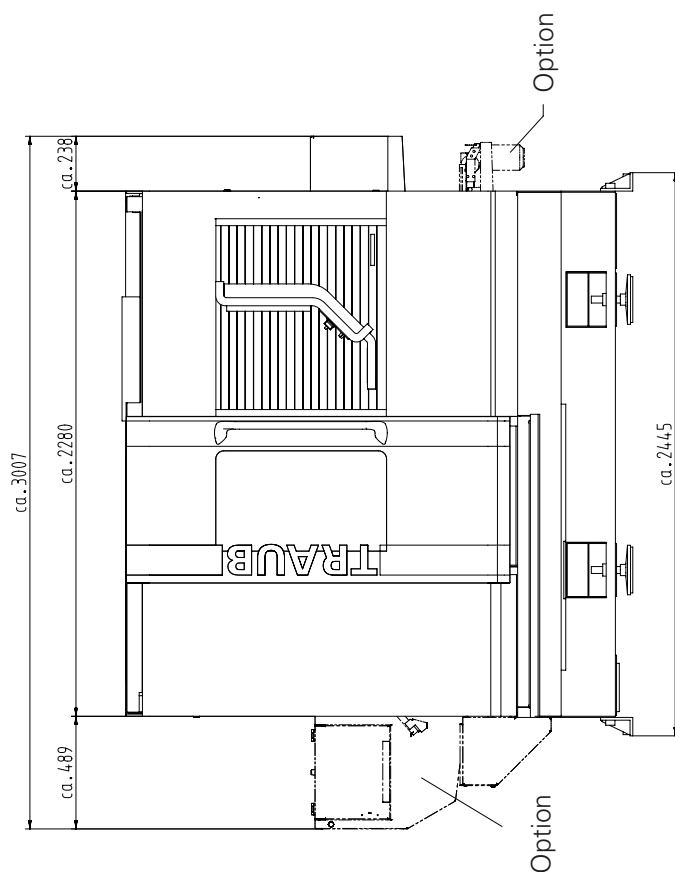
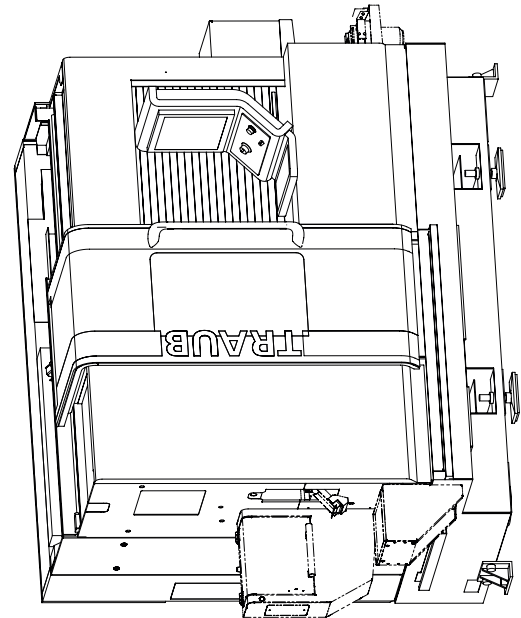
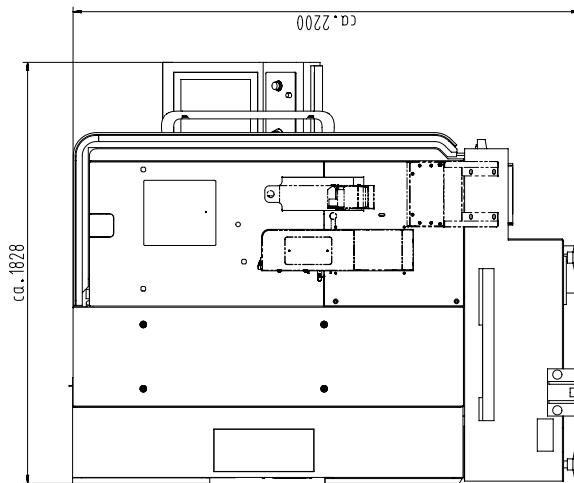
The key may only be placed in position 2 (special operating mode) by authorized persons, and the machine may not be left unattended. After finishing **or** interrupting the activity in this operating mode, the key must be immediately returned to position 1 or 0 and removed. The responsibility lies with the operator/owner.

TNL32 compact



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

Example shown

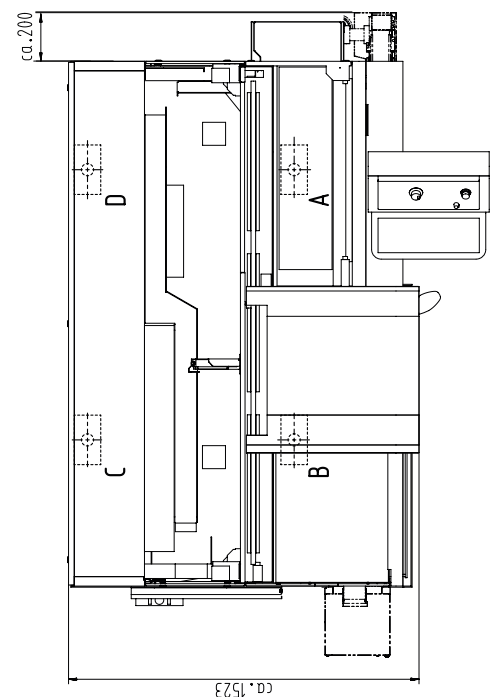
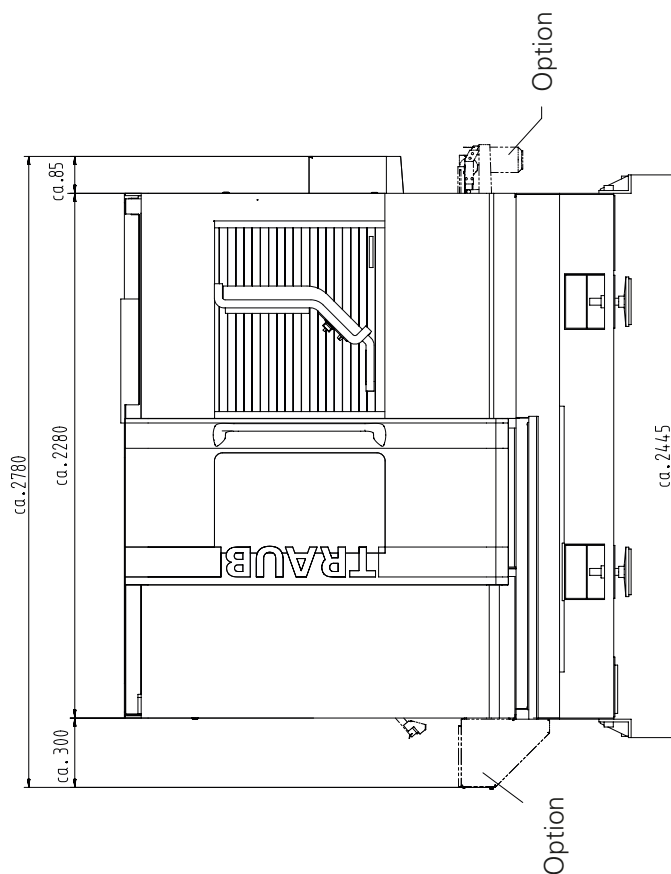
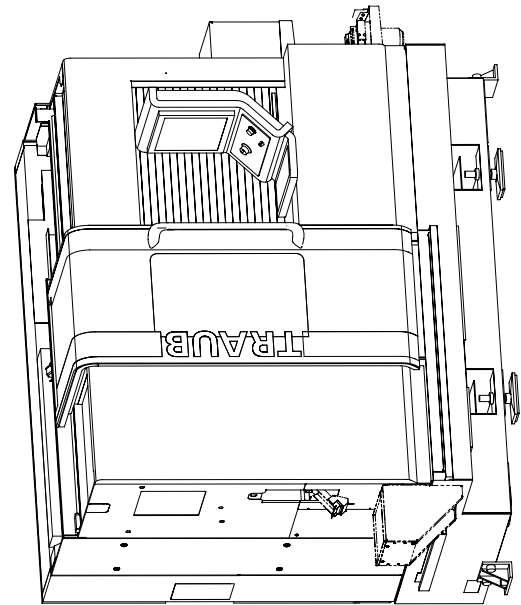
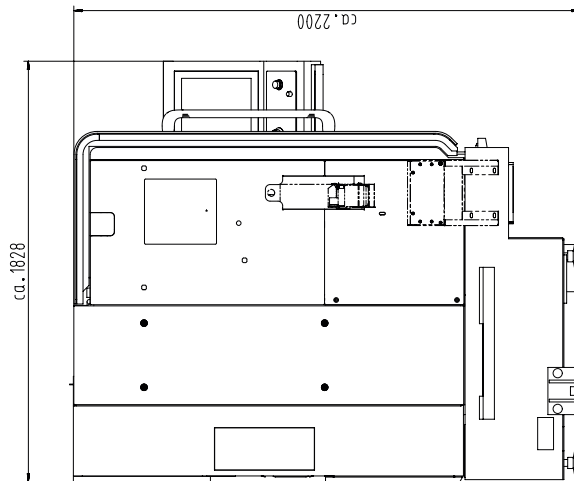


TNL20.2



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

Example shown



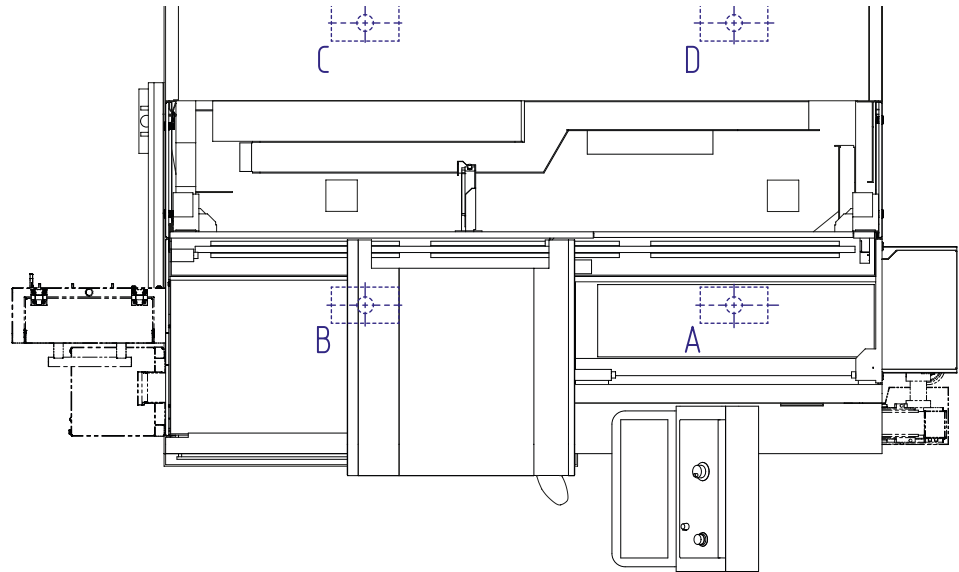
Installation items—load distribution

TNL32 compact/TNL20.2



The load distribution details can be found in the installation plan.

Example shown



Information for transporting the machine



Danger to life

Danger from falling machine/parts

Keep away from under suspended loads.



Transporting the machine

Approved means for transporting the machine:

- Forklift
Transport with a forklift **must** be carried out from the control cabinet side.
- Transport rollers
- Crane/truck-mounted crane



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

Information on transporting the machine with a truck

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

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 auxiliary units such as bar feeders, bar loading magazines, etc.

Floor condition

A special foundation is not necessary. Only the load-bearing capacity and strength of the installation surface must be designed according to construction principles to correspond to the machine's weight.



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 document "Safety instructions and technical specifications."



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, the document "Instructions for designing floor troughs" must be followed. The maneuverability of movable attachment parts must be 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



For all work in connection with operating fluids the information in the data sheets of the respective manufacturers and the information in the document "Information on operating fluids" must be followed.

The required quantities of operating fluids 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. 300 NI/min is set for a standard machine.



Operating material to be provided

See the chapters "Commissioning" and "Information on operating fluids."

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 extraction system by customer



If a local extraction 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 power 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.

The values for machine connection, operating voltage, and main circuit breaker can be found on the nameplate or in the electrical diagram.

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 fluids



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

Decide in advance 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 water or groundwater.

Possible preventive measures

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

Electrical connection

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 only be opened 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.

Indicator lamp

If the indicator lamp was removed for transportation, reconnect it to the machine.

Leveling the machine

The machine is equipped with four adjustable leveling elements. Only leveling elements **A**, **B**, and **C** are used to level the machine.



Turn back leveling element **D** as far as necessary so that it does not influence the alignment of the machine.

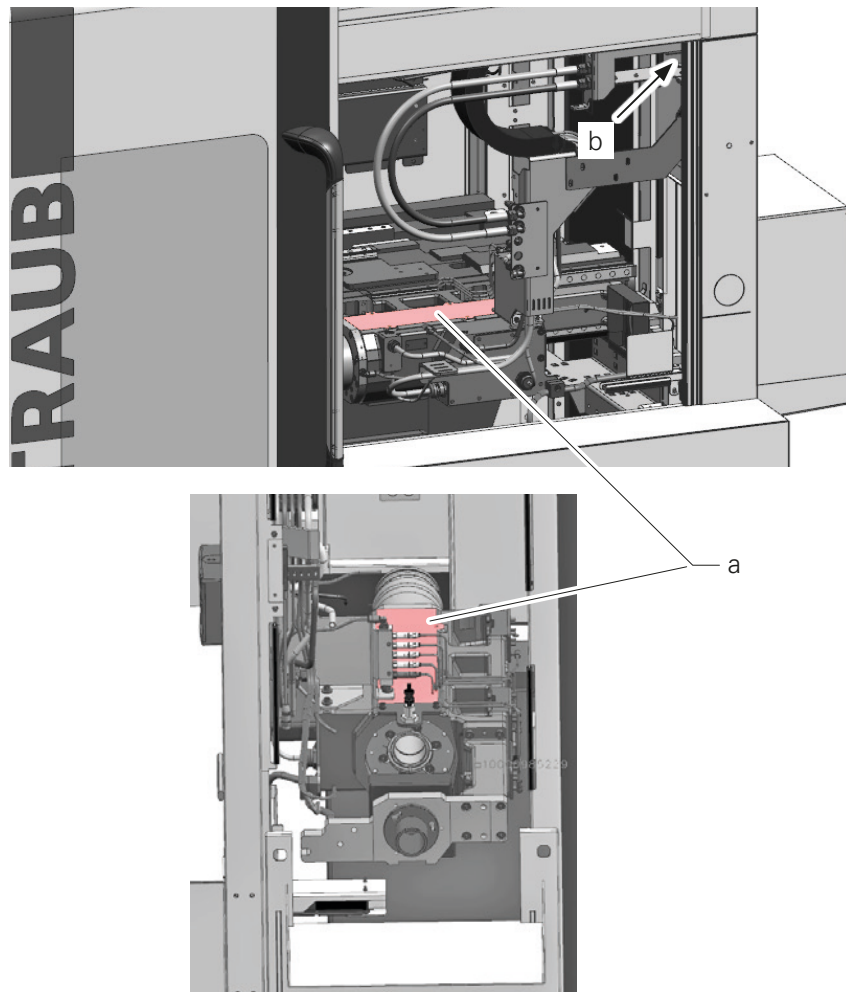
Two spirit levels with an accuracy of 0.10 mm/m are required to level the machine.



The machine must be set at a main spindle height of 1150 mm (tolerance +20 mm). The permissible inclination deviation on the spirit level is a maximum of 0.5 mm per 1000 mm.

- Open the roller shutters in the drive area.
- If necessary, also loosen and remove the side cover at the inner rotary handle (b).
- Place the spirit levels in the Z and Y directions on the support surface (a) at the main spindle.

Figure: spirit level support surface



- a Support surface
b Rotary handle

- Level the machine with the aid of leveling elements **A**, **B**, and **C**.
The machine must be absolutely level at a main spindle height of 1150 mm (tolerance +20 mm).
- Then, set and lock leveling element **D**.

Securing the machine to the floor

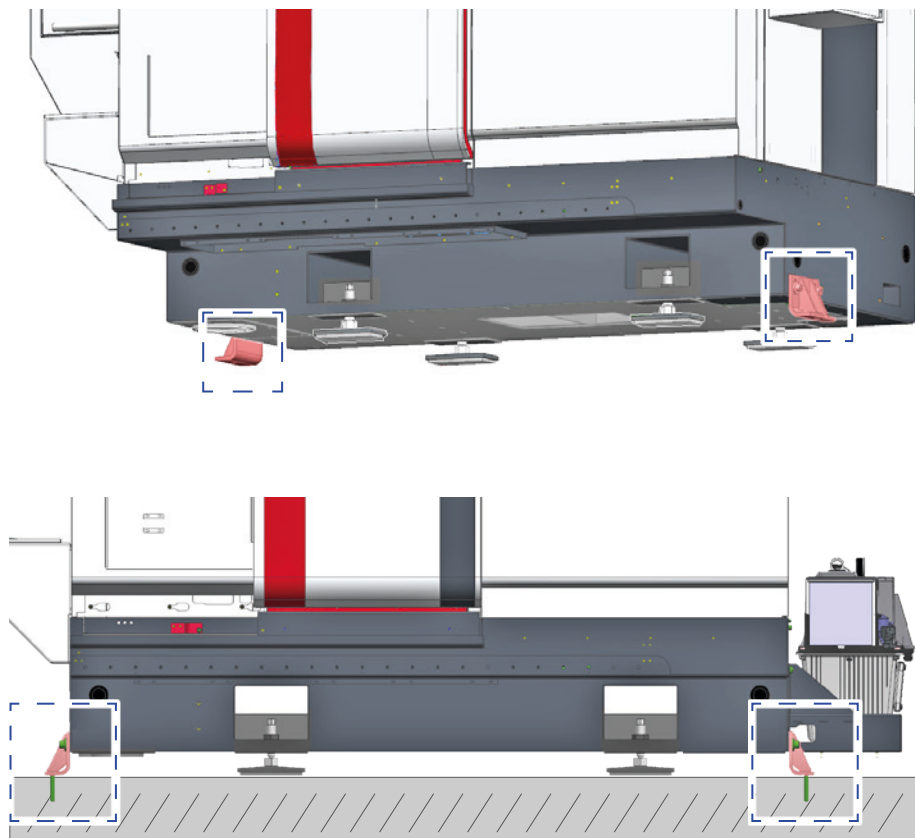
- Attach the two connection brackets (included in the machine accessories) to the designated positions on the machine base and screw them into the base.
M16x45 screws and washers (2x each),
tightening torque max. 80 Nm
- Use an 18 mm-diameter masonry drill to drill holes 125 mm deep in the foundation through the holes in each of the two connection brackets.
- Insert a mortar cartridge and threaded rod (M16x250) (included in machine accessories). The length of the threaded rod 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.

Examples shown



Removing the transport locks and the drip pan



For removal, see Chapter "Removing transport locks and drip pan".

The positions of the transport locks can also be found in Chapter 2, "Diagrams and drawings," on the data carrier.

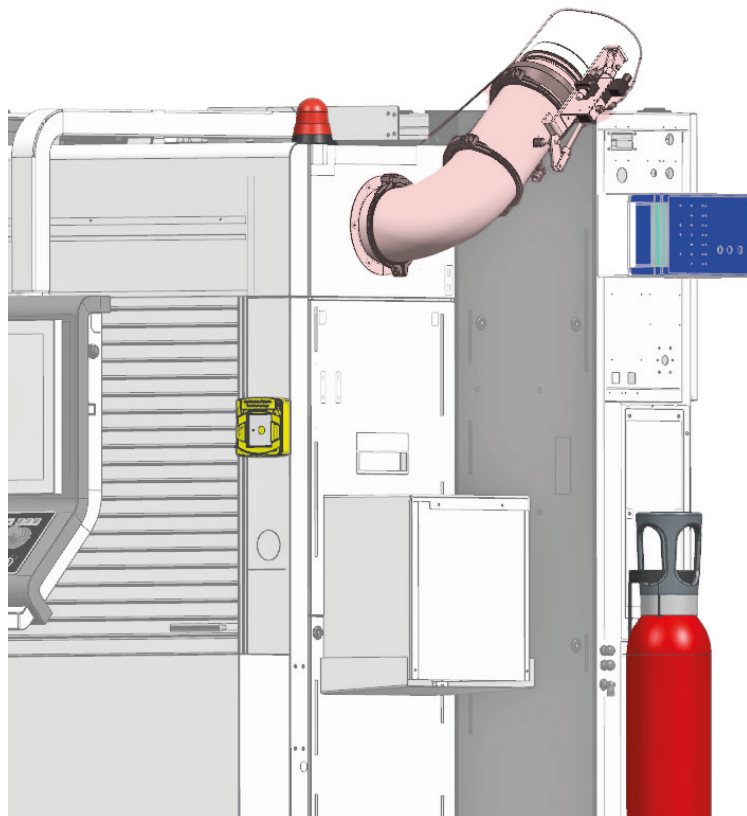
Connecting the machine to the central extraction unit

Shutoff damper for fire protection

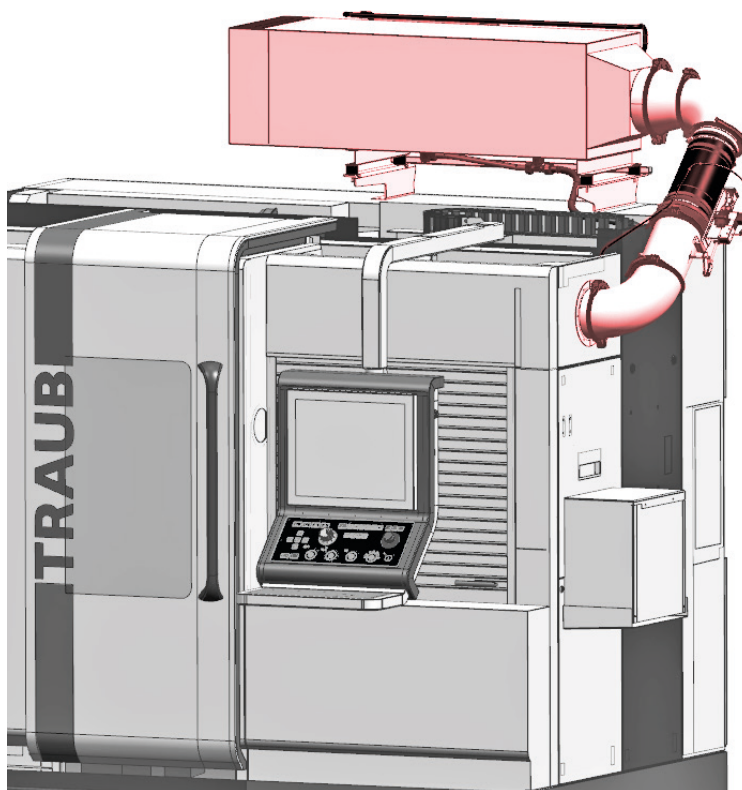


The machine is fitted as standard with a shutoff damper for fire protection.

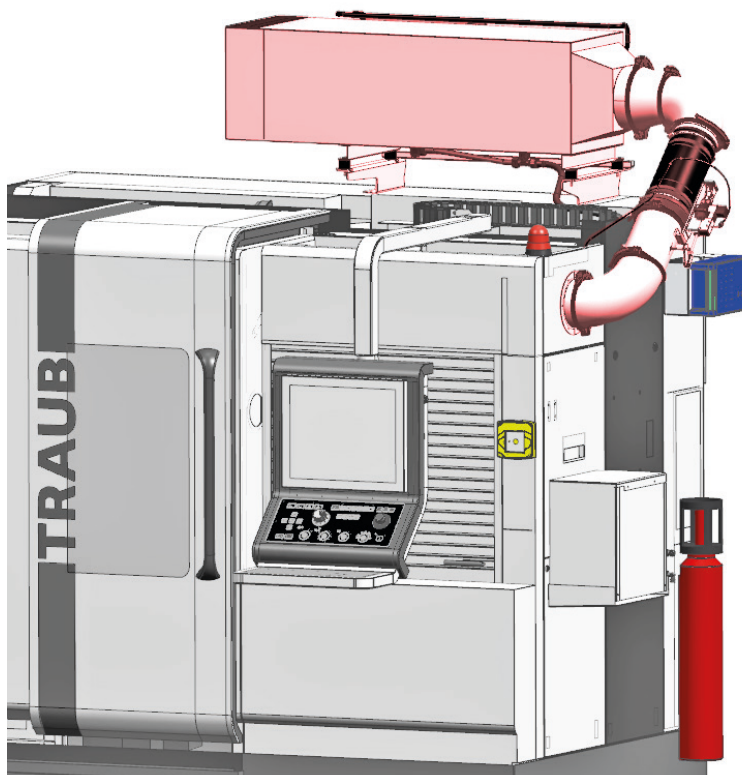
Mechanical preparation for central and for local extraction system with a shutoff damper/with a fire extinguishing system



Adding a local extraction system without a fire extinguishing system, with shutoff damper



Adding a local extraction system with a fire extinguishing system or shutoff damper



Transporting and Installing the chip conveyor/chip tray



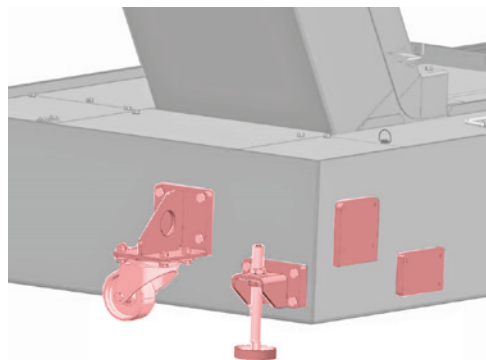
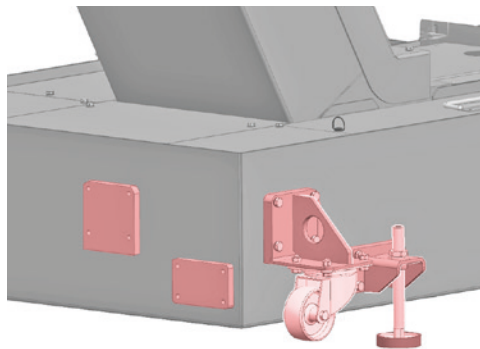
Follow the manufacturer's documentation.

- Transport the chip conveyor/chip tray to the machine, then lift them off the pallet and set them down with the aid of suitable lifting equipment.
- Remove the accessories and documentation from the chip conveyor or chip tray if this has not been done already.
- The positions of the outer steering roller and adjustable foot may be adjustable depending on the design of the chip conveyor. Installation here is possible on the longitudinal side or front of the chip conveyor.

**Risk of injury/crushing**

Before the steering roller and adjustable foot are removed, the chip conveyor must be secured accordingly to prevent it from tilting.

Example shown



Installation of chip conveyor

- Slide the chip conveyor under the machine from the operating side until it reaches stop (a), then slide it to the right until it reaches stop (b).

For custom applications on the left

For custom applications, the chip conveyor can be moved up to 600 mm to the left (e.g., for custom requirements near the workpiece removal unit to the left).



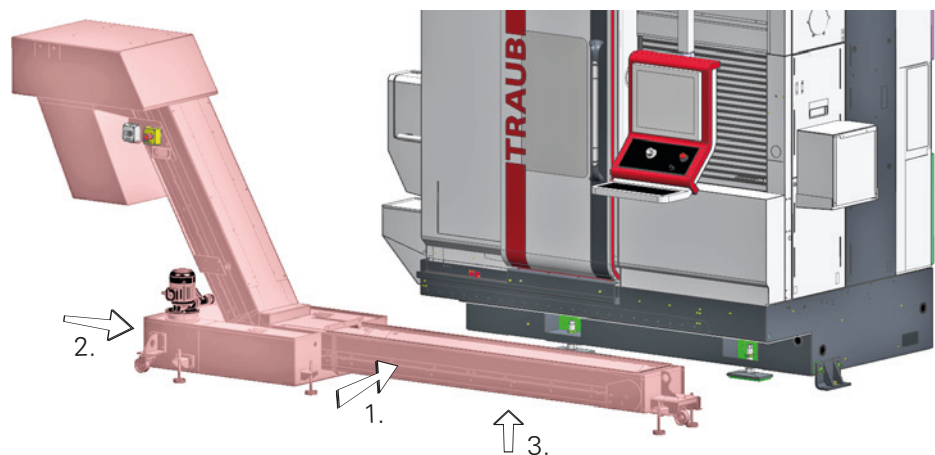
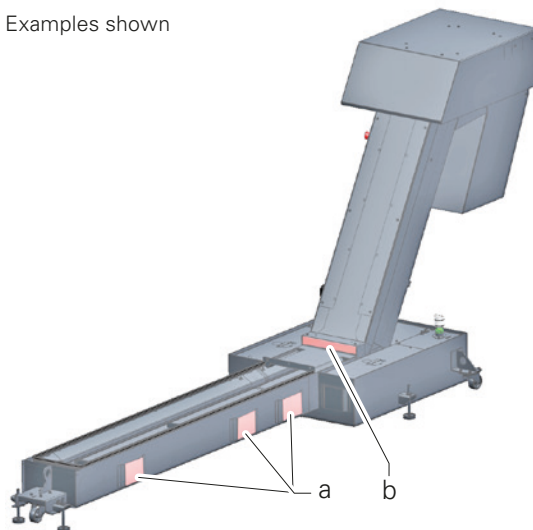
Risk of injury/crushing

A special cover and spacer plate (a) needs to be fitted on the resulting opening.

(See following page "Custom applications on the left.")

- Lift the chip conveyor at the four adjustable feet (approx. 35 mm) until the circumferential sealing tape presses against the machine base.
- Remove the blanking plugs from the hose lines and connect the hose lines.
- Connect the cooling lubricant pumps to the power supply.

Examples shown

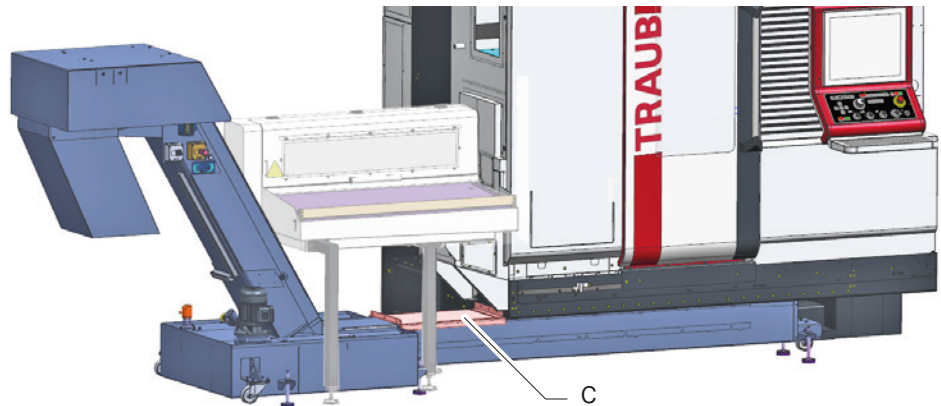


- a Side stop surface
- b Longitudinal stop surface

Custom applications on the left

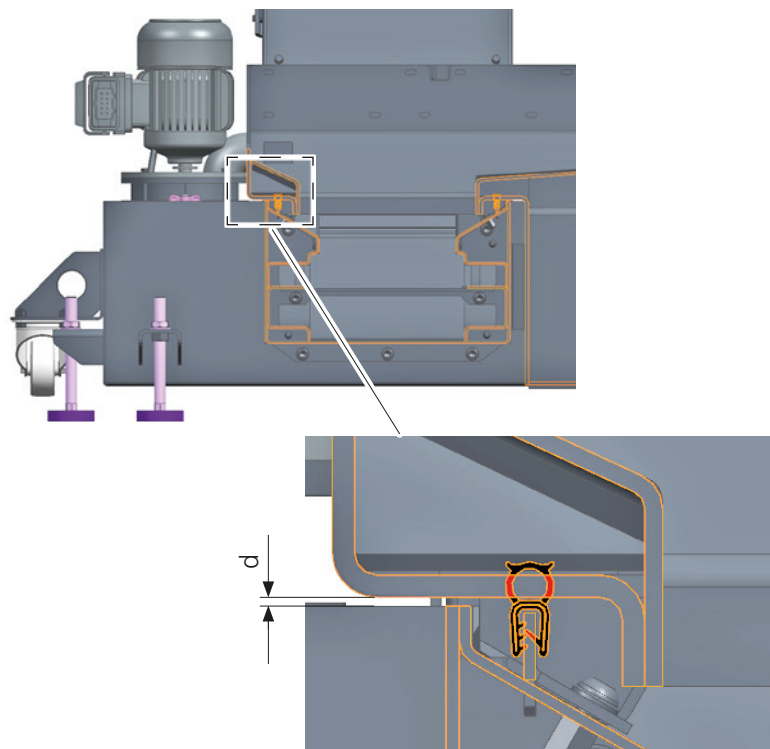
- The chip conveyor can be moved by up to 600 mm to the left (by 560 mm for configuration level "Workpiece removal through the counter spindle").
- Fit the cover and spacer plate (c) from above.

Figure of custom application on the left (example)



c Cover and spacer plate

Sealing between chip conveyor and machine



d Set clearance 3-5 mm

Fitting the chip tray (optional)

The chip tray is fitted onto the machine from the left as standard.



Fitting from the right is possible (custom installation). Special actions might be needed in the area of the bar loading magazine.

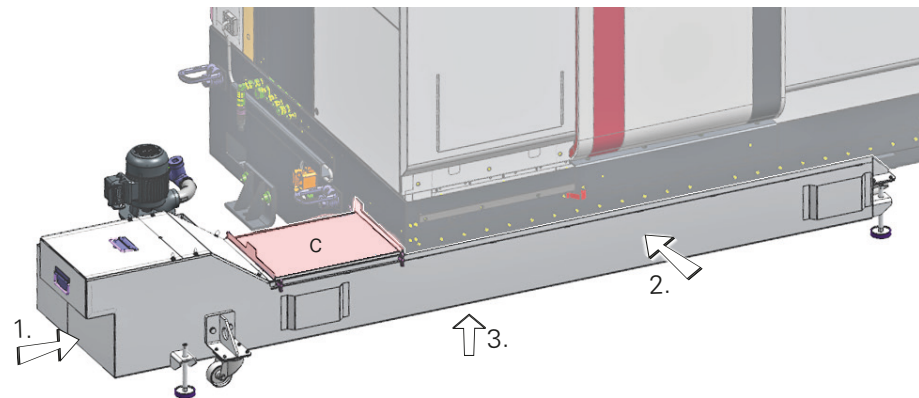
- Fitting the chip tray

From the left (standard)

Installation can also be with the cover and spacer plate (c), provided other fittings are provided on the left.

The cover and spacer plate (c) is fitted from above with four butterfly screws.

Example shown

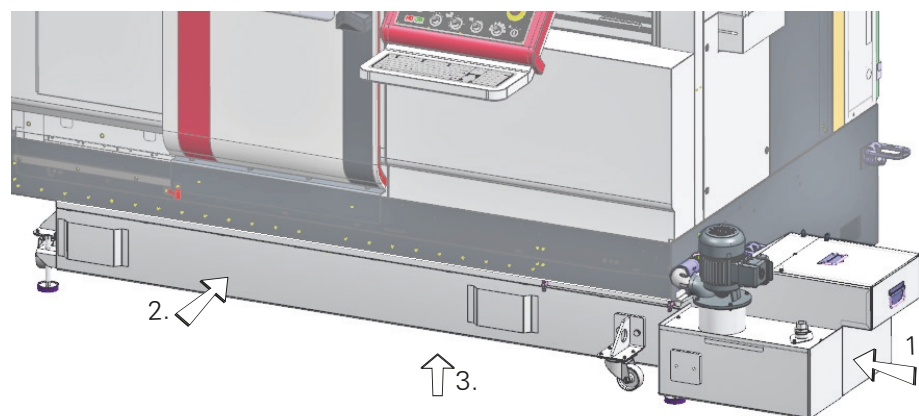


c Cover and spacer plate

From the right (custom installation)

Special actions may be needed in the area of the bar loading magazine. The cover and spacer plates are not fitted.

Example shown

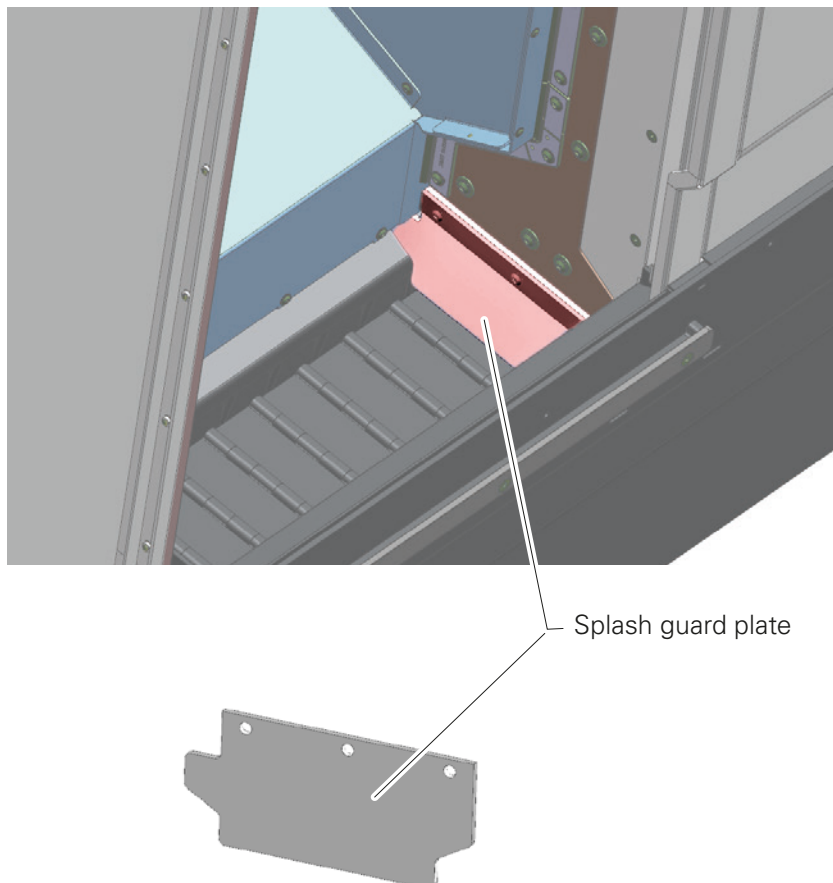


- Push the chip tray in up to the stop.
- Adjust the feet by the same amount until the gap between the machine and chip tray is 2 mm all the way round.

Splash guard plate on the chip conveyor/chip tray

Mount the splash guard plate between the chip conveyor/chip tray and the inside of the machine.

Example shown

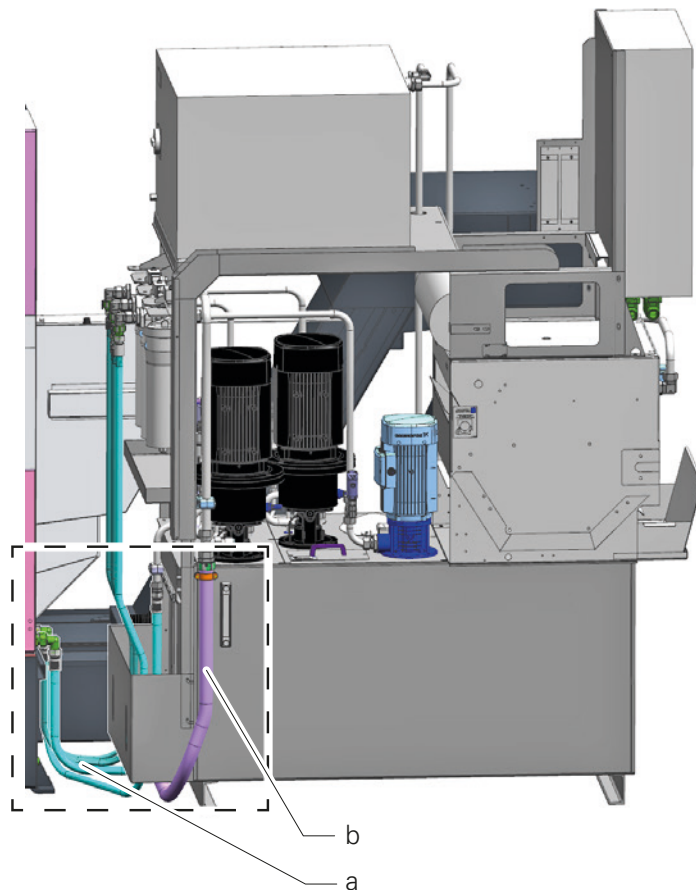


Installing the cooling lubricant system

**Follow the manufacturer's documentation.**

- Transport the cooling lubricant system to the machine and lift it off the pallet using suitable lifting equipment.
- Position the cooling lubricant system at the machine according to the machine installation plan.
- Remove the blanking plugs from the connection kits (a) and connect the connection kits to the machine and cooling lubricant system according to the marking.
- Connect the hose (b) of the chip conveyor's lifting pump.
- Connect the cooling lubricant system to the power supply.

Example shown



- a Connection kits
- b Hose from lifting pump for chip conveyor

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 Chapter "Removing transport locks and drip pan".
The positions of the transport locks can also be found in Chapter 2, "Diagrams and drawings," on the data carrier.

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 cooling lubricant 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 working media levels and replenish, if necessary

For all work in connection with operating fluids the information in the data sheets of the respective manufacturers and the information in the document "Information on operating fluids" must be followed.



Information on the quality of operating fluids: lubricating oil, hydraulic fluid, cooling lubricant and cooling, as well as information on filling quantities and filling positions, can be found in the respective fluid diagrams.

Hydraulic system:

Fluid level check

Cooling lubricant system:

Replenish cooling lubricant

Central lubrication system:

Fluid level check

Add-on equipment:

Fluid level check

Cooling:

Level check

Pressure accumulator

If the machine was shipped by plane, all pressure accumulators attached to the machine are depressurized.

Before commissioning the machine, a specialist must fill all pressure accumulators with nitrogen (N₂). The prescribed pressures must be observed.

Prescribed pressures can be obtained from the relevant hydraulic diagrams.

**Data loss due to prolonged downtime**

The machine is functional only after all data have 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.

Switching on the machine

See document "Operating the machine."



Preparing the machine for transport

Transport locks and drip pan

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

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



The positions of the transport locks can be found in Chapter "Installing transport locks and drip pan," as well as in Chapter 2 "Diagrams and drawings" on the supplied data carrier.

Be sure to clean the contact surfaces of oil and grease before reattaching the transport locks.

Locations of the axes for attaching the transport locks

		TNL32 compact	TNL20.2
	Axis	Position	
Main spindle			
Sliding headstock operation	Z1	+ 37	+45
Sliding/fixed headstock operation	Z1	+ 70	
Counter spindle	Z4	+ 328	+ 281
	X4	+ 121	
Upper tool carrier	V1	+ 93	
	X1	+ 182	
	Y1	+ 20	
	H1	Any station	
Upper tool carrier with B axis	V1	+ 93	
	X1	+ 182	
	Y1	+ 20	
	H1	Any station	
	B1	0°	
Lower tool carrier	Z2	+ 93	
	X2	+ 390	
	Y2	- 20	
	H2	Any station	
Front working unit	Z3	+ 300	
	X3	+ 32	
	H3	Station 4	Station 3
Workpiece removal	Z5	+ 421	

Draining the hydraulic tank before transport

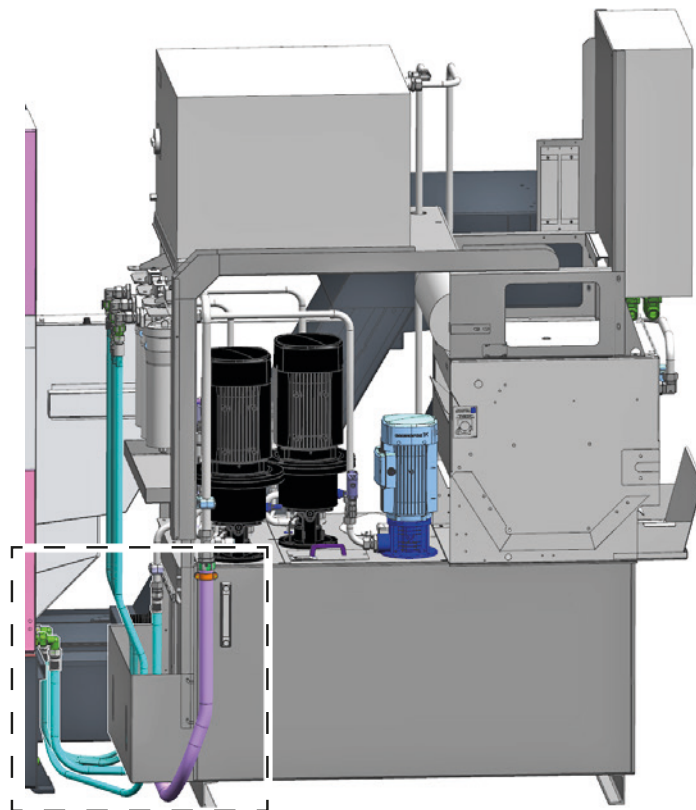


When carrying out work on fluid systems (hydraulic, lubrication, and pneumatic systems), make sure before starting the work that the respective system has been depressurized (accumulator drain valve/ manual slide valve/emergency stop).

Sealing 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 fluids."

Transporting the machine by truck

Machine preparation for transport by truck

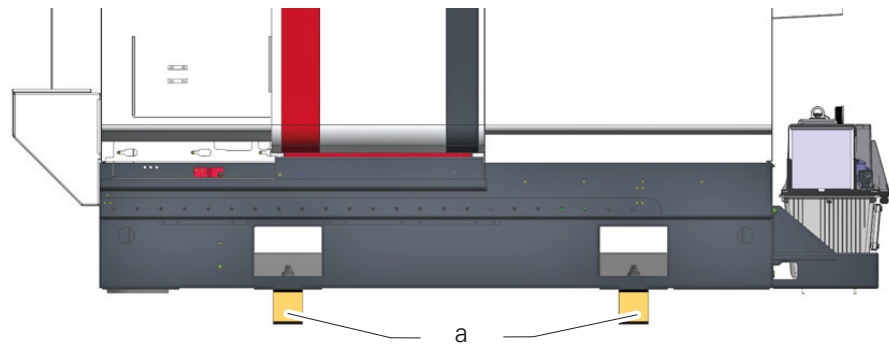
For truck transport, the machine must be placed on two wooden planks (a). The wooden planks are bolted into the position of the leveling elements.

The wooden planks and the associated fastening materials are included with the machine upon delivery.



If no pre-prepared wooden planks are available, see the section "Information on fastening materials and preparation of wooden planks."

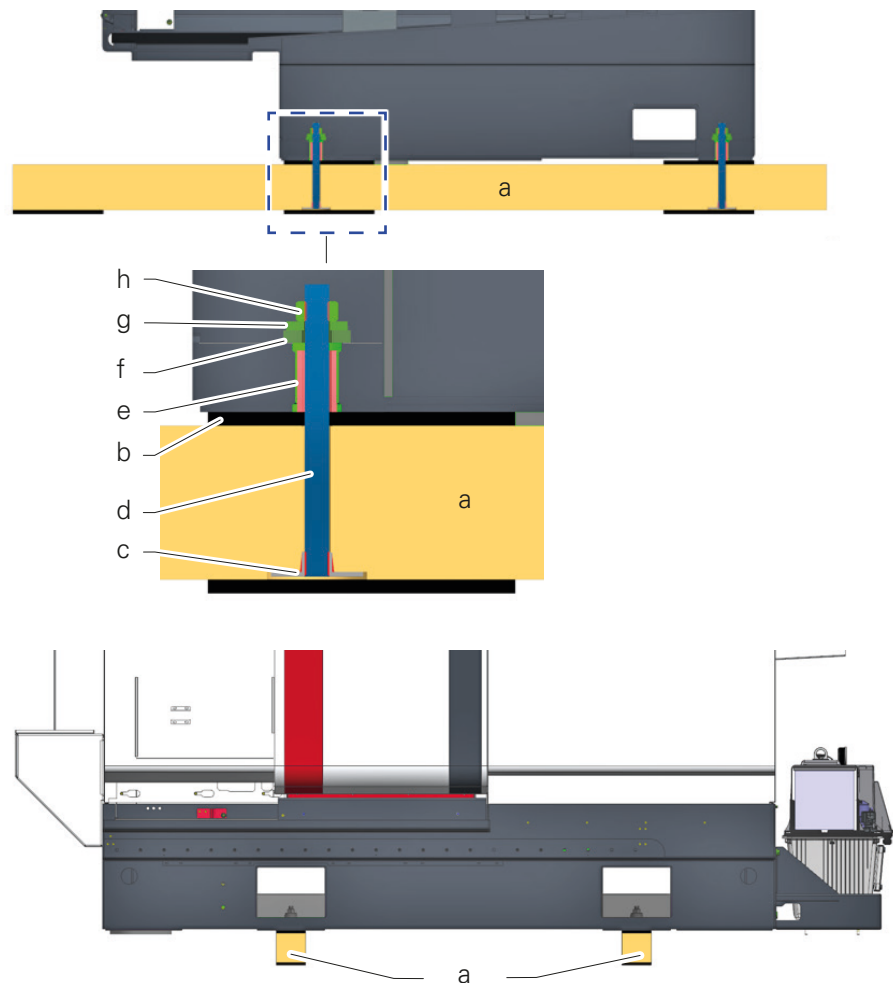
Example: Machine on wooden planks



Mounting the wooden planks

- Using an approved transport method (see chapter "Transporting the machine"), slightly lift the machine to insert the two wooden planks (a) and support it.
- Remove the leveling elements.
- Slide the prepared wooden planks (a) under the machine and position them accordingly.
- Slowly lower the machine onto the prepared wooden planks (a).
- Secure the wooden planks (a) to the machine base using the threaded rods (d), washers (f, g, impact nuts (c)), and nuts (h).

Examples shown



- | | | |
|---|----|---|
| a | 2x | Wooden plank 100 x 100 mm, minimum length 1800 mm |
| b | 4x | Anti-slip mat, thickness 9 mm |
| c | 4x | Impact nut M16 |
| d | 4x | Threaded rod M16x190 |
| e | 4x | Rubber hose piece, 40 mm long (protection for threads in the base). |
| f | 4x | Washer D20/D44, DIN7349 |
| g | 4x | Washer D17/D40, DIN7349 |
| h | 4x | Nut M16 |

Transporting the machine by truck

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



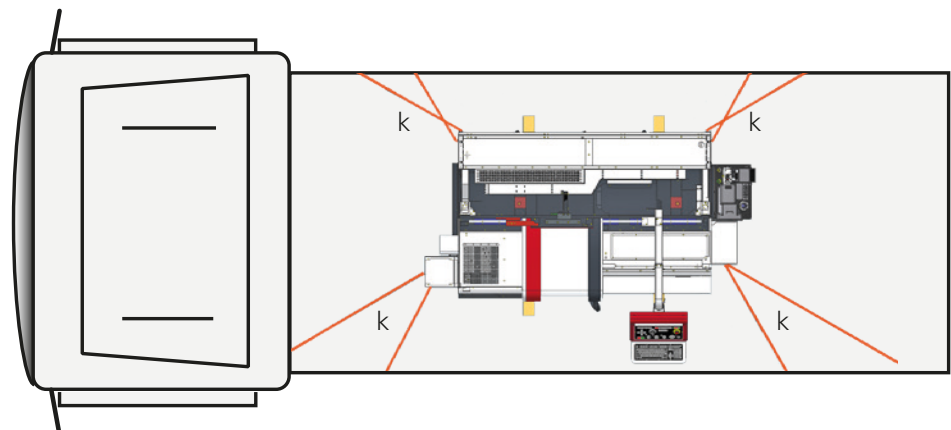
Transport the machine with the control cabinet side facing left (in the direction of travel), see figure "Example of transporting on a truck loading platform."



The machine must be secured on the truck loading platform with straps (k) in conjunction with anti-slip mats in a diagonal lashing configuration.

Example of transporting on a truck loading platform

Example shown



k Strap

Loading guard

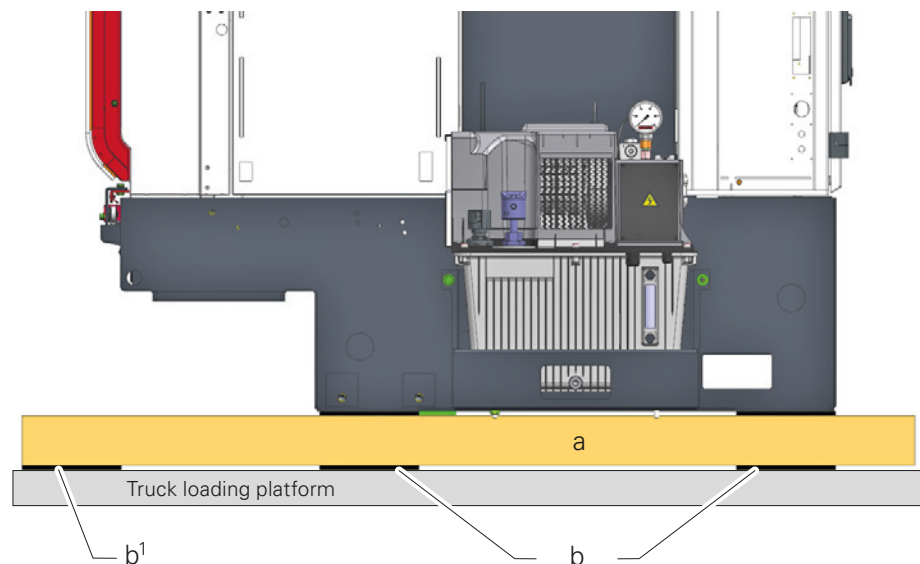
The load must be secured against slipping by the methods listed below.

Anti-slip mats between the machine and the truck loading platform

- When placing the machine on the truck loading platform, it must be secured with three anti-slip mats (b) (thickness 9 mm) between the wooden planks (a) of the machine and the truck loading platform.

If needed, the outer anti-slip mat (b¹) can be fixed to the wooden plank with a nail.

Example: Position of anti-slip mats



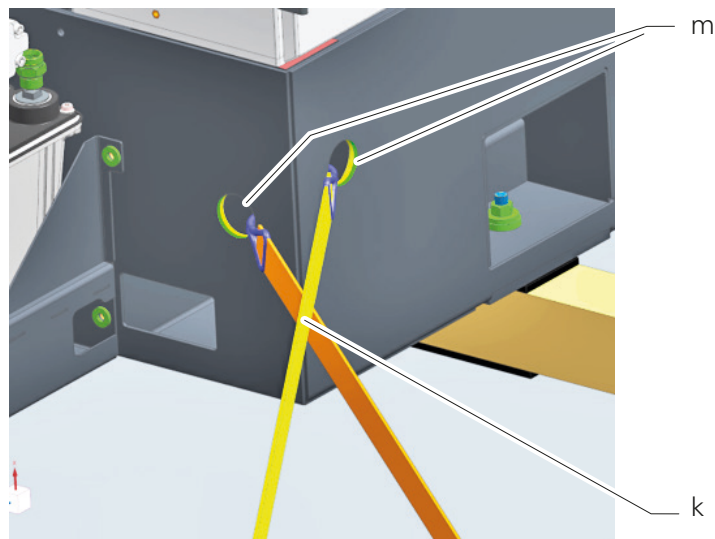
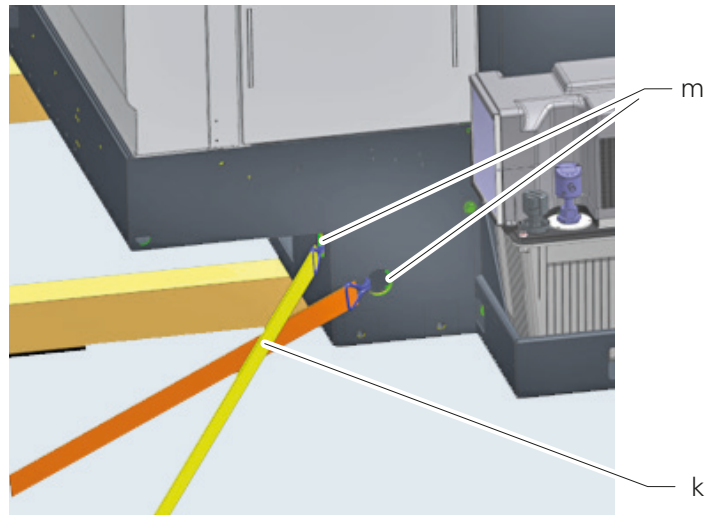
- b Anti-slip mats, thickness 9 mm
b¹ Outer anti-slip mat, thickness 9 mm

Diagonal lashing

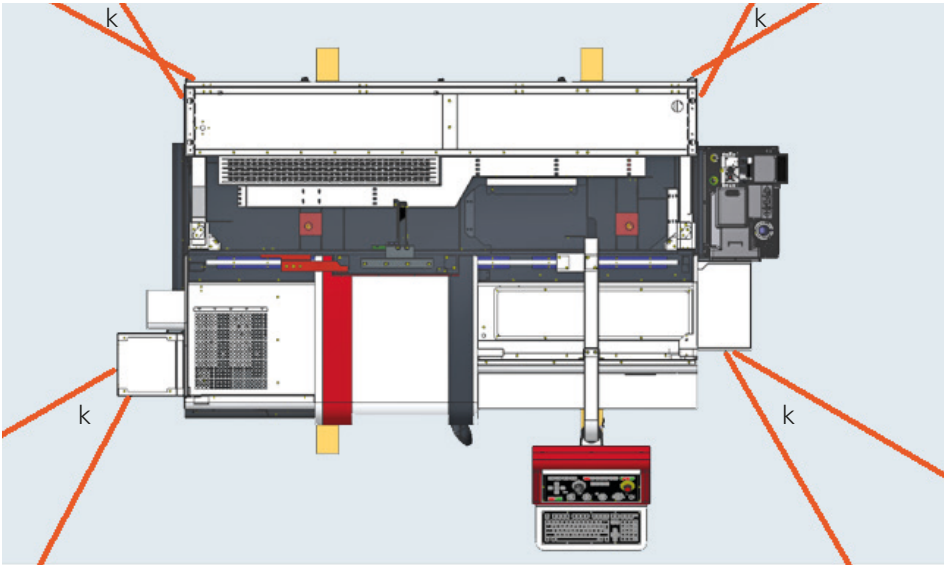
The machine must be diagonally lashed to the truck loading platform with suitable straps (see also "Example of transporting on a truck loading platform").

- Remove the covers (8x) from the fastening openings (m) on the machine base. Store the covers with the machine accessories for later use.
- Hook the pointed hooks of the straps (k) into the fastening openings (m) and diagonally lash the machine on the truck loading platform.

Examples shown



k Strap
m Fastening opening



k Strap

Information on fastening materials and preparation of wooden planks

- a 2x Wooden plank 100 x 100 mm, minimum length 1800 mm
- b 4x Anti-slip mat, thickness 9 mm
- c 4x Impact nut M16x190
- d 4x Threaded rod M16
- e 4x Rubber hose piece, 40 mm long (protection for threads in the base).
- f 4x Washer D20/D44, DIN7349
- g 4x Washer D17/D40, DIN7349
- h 4x Nut M16

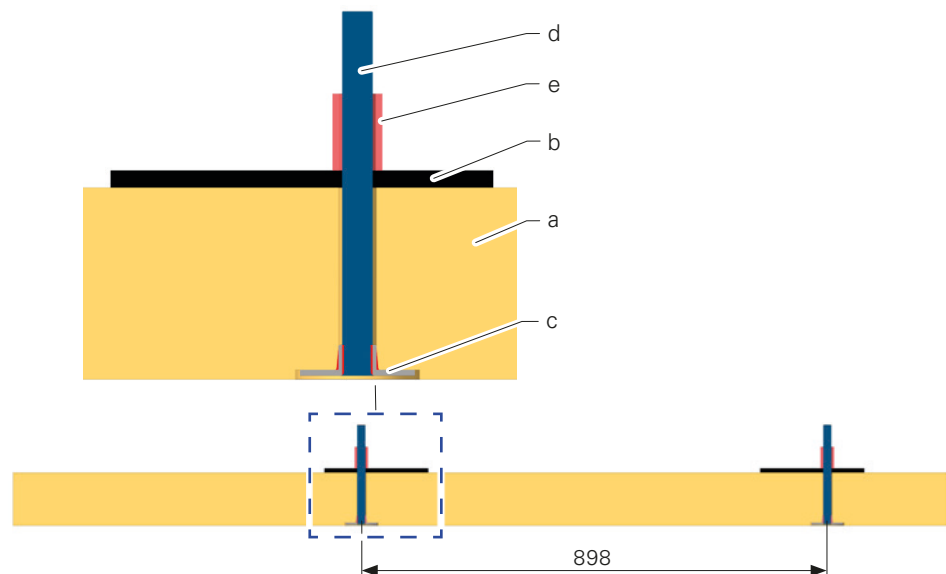
- On the underside of each wooden plank, make two countersunk holes with a diameter of 65 mm and a depth of 5-10 mm for the M16 impact nut (c), spaced 898 mm apart.



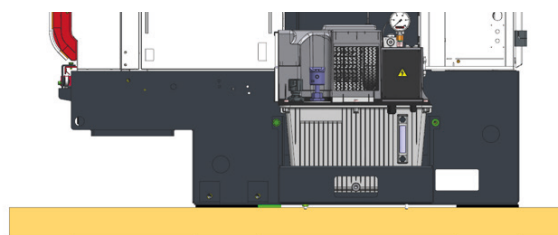
Pay attention to the position of the holes; the wooden planks must extend beyond the edges of the machine on both sides (see figure "Position of wooden plank").

- Drill through the countersunk holes with a diameter of 20 mm.
- Insert the impact nuts into the countersunk holes and secure them with nails if necessary.
- Screw in the threaded rods and create 1-2 notches (e.g., with a center punch) between the impact nut and the threaded rod as an anti-twist lock.
- Place 9 mm-thick anti-slip mats and slide the rubber hose pieces onto the threaded rods.

Preparing the wooden plank



Wooden plank position





Be sure to clean the contact surfaces of oil and grease before re-attaching the transport locks.

Locations of the transport locks on the machine

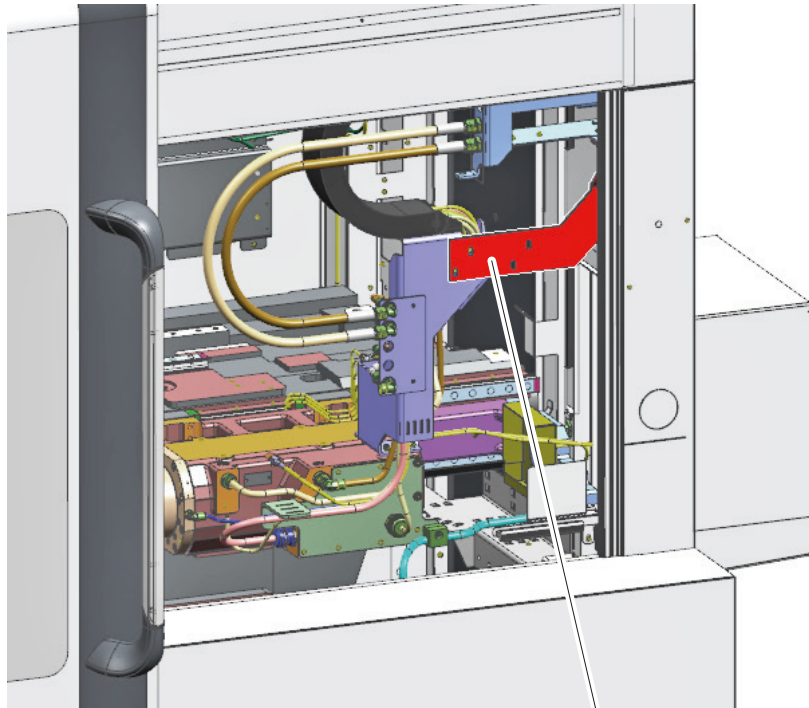
Position	Transport lock
Main spindle	- Plate
Lower tool carrier, front working unit, counter spindle	- Plate
Upper tool carrier	- Plate
Workpiece removal unit	- Plate
Work area door	
- top	- Bracket
- bottom	- Bracket
Drip pan	- Pan
Tool turret	- Blanking plugs 2x
Operating terminal	- Bracket - Plate 3x



The positions of the transport locks can also be found in Chapter 2, "Diagrams and drawings," on the data carrier.

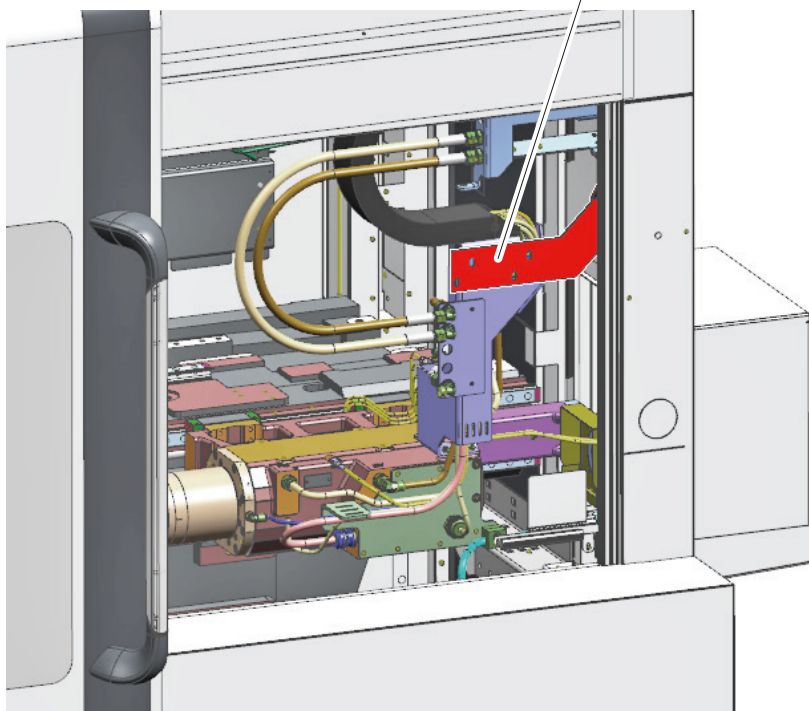
Transport lock—main spindle

Sliding headstock operation



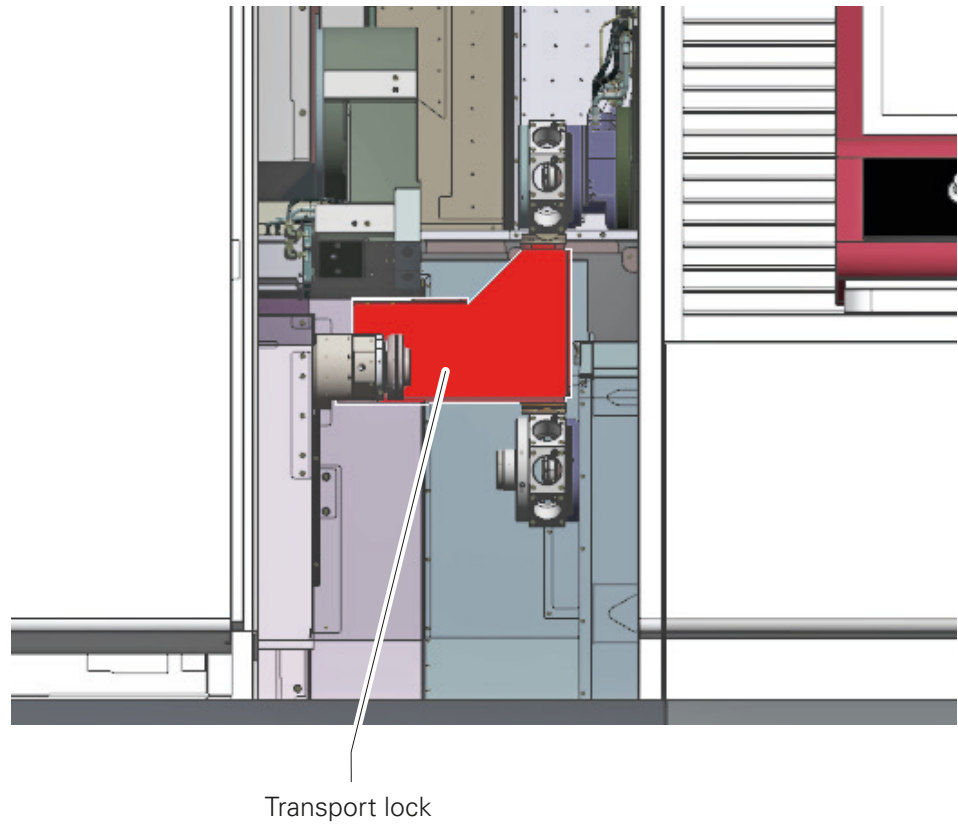
Transport lock

Sliding/fixed headstock operation



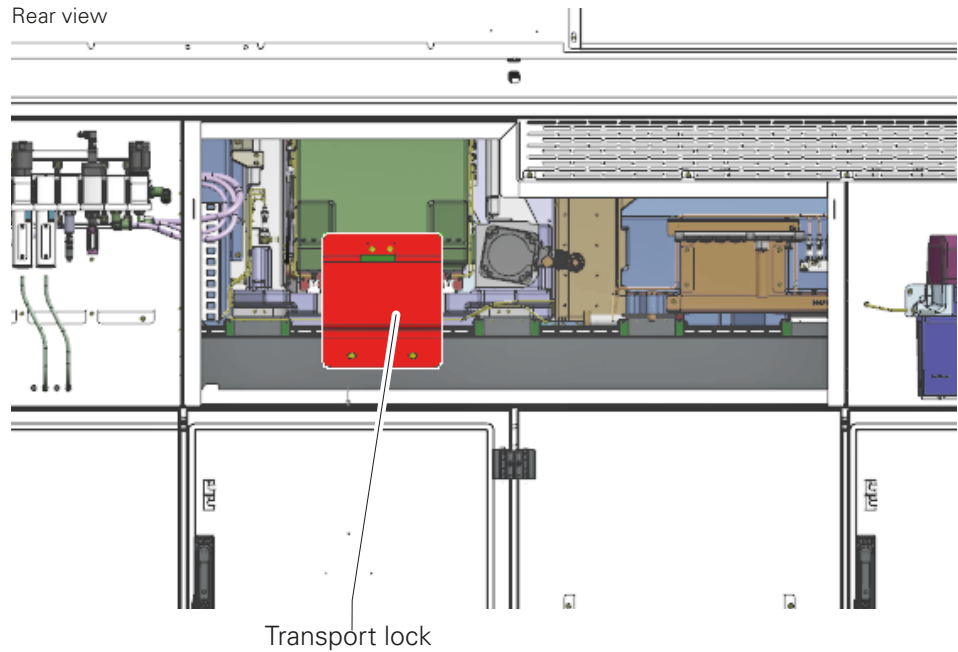
Transport lock—lower tool carrier, front working unit, counter spindle

Front view

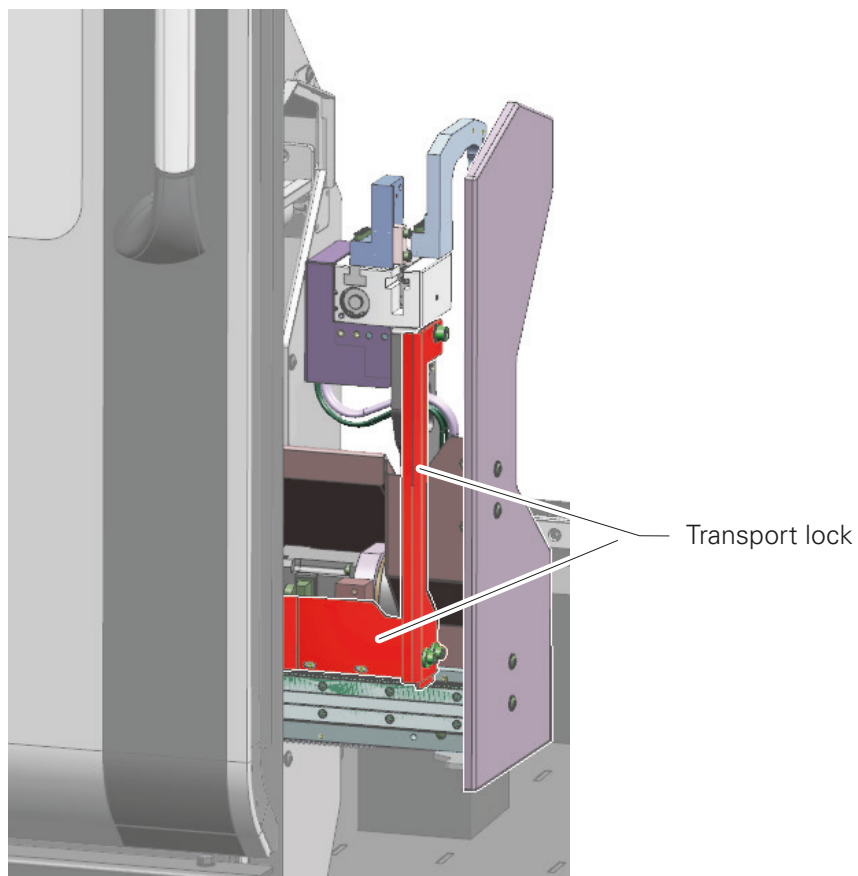


Transport lock—upper tool carrier

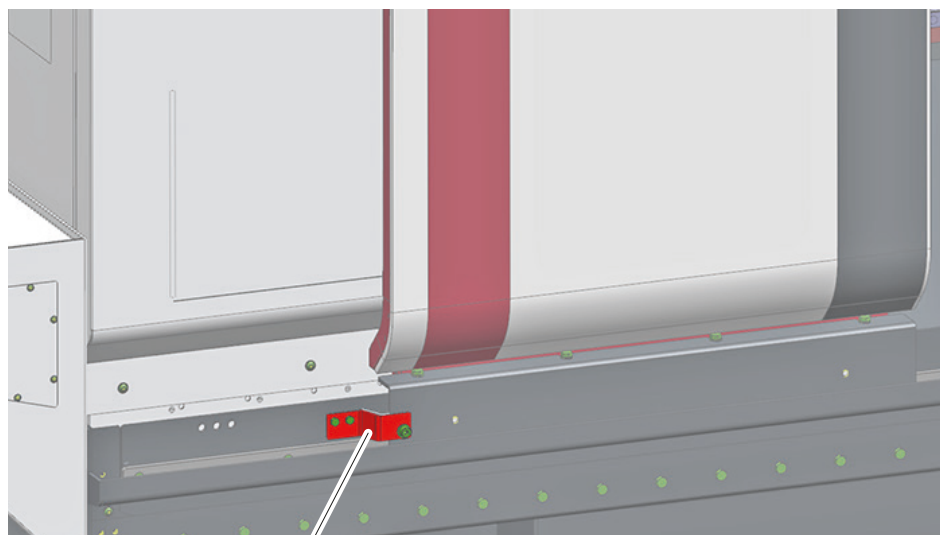
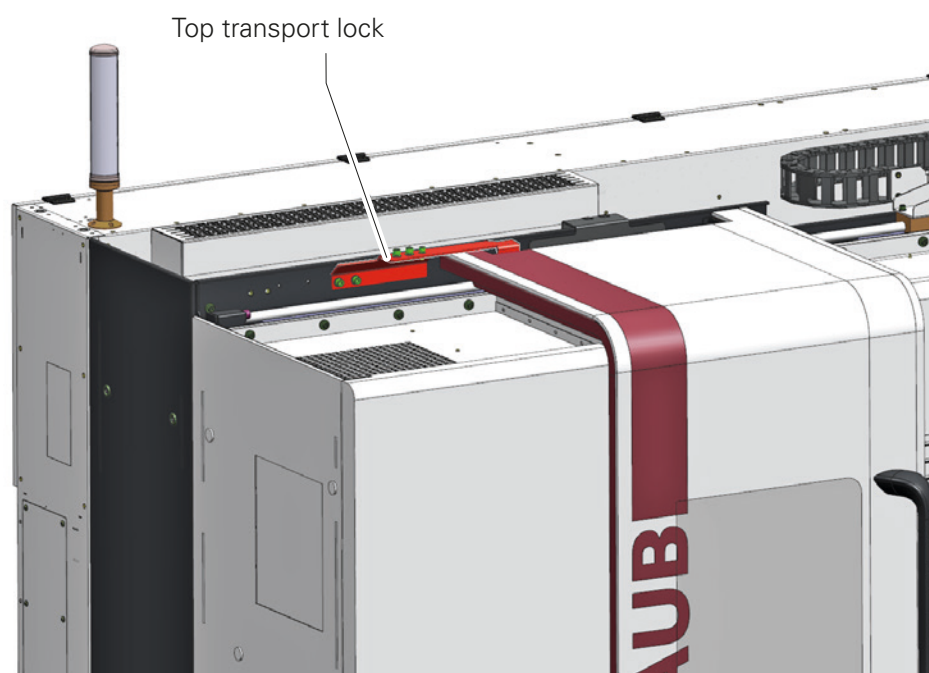
Rear view



Transport lock—workpiece removal unit

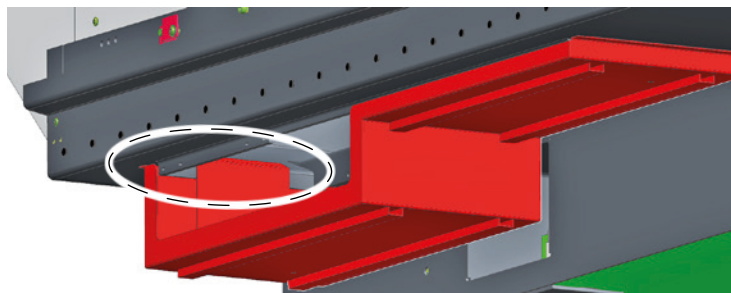
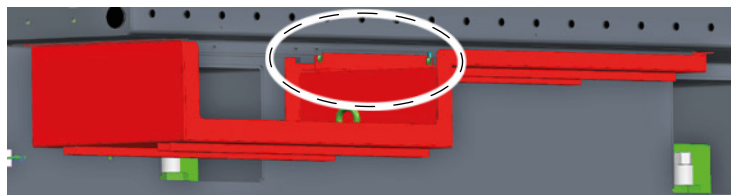
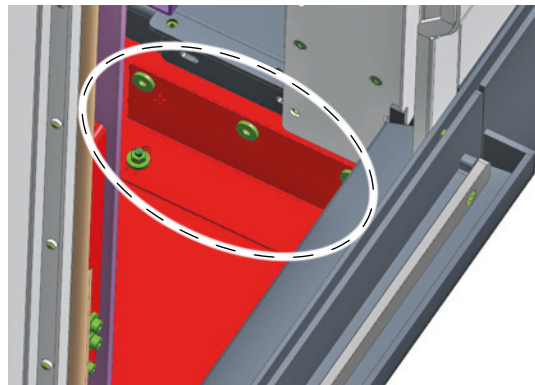
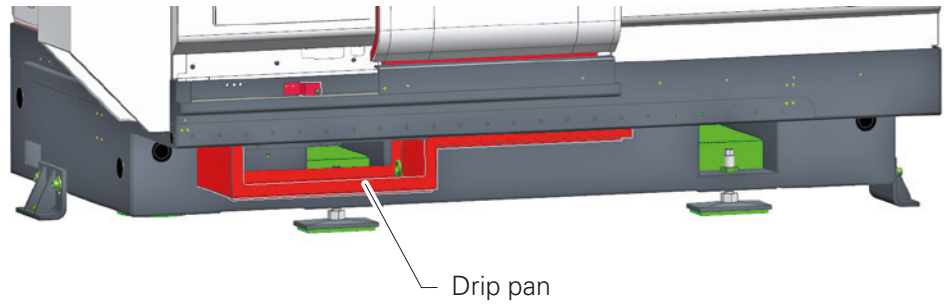


Transport lock at work area door



Attaching the drip pan

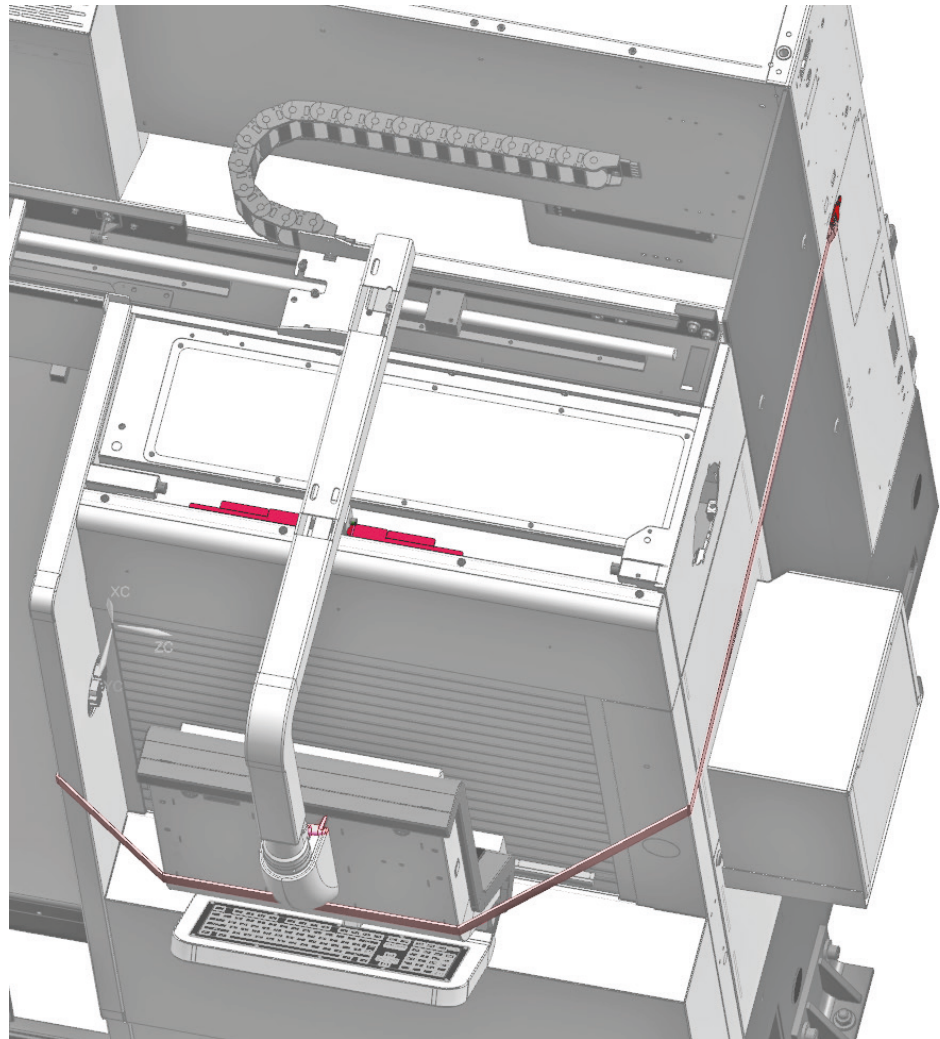
Fasten the drip pan to the underside of the machine with screws.
The drip pan can be mounted on the eyebolt for installation/detachment.



Transport locks—operating terminal

For transport, the operating terminal with the display has been swiveled towards the machine into the transport position and secured with transport locks and a lashing strap. The keyboard has been removed and also secured for this purpose.

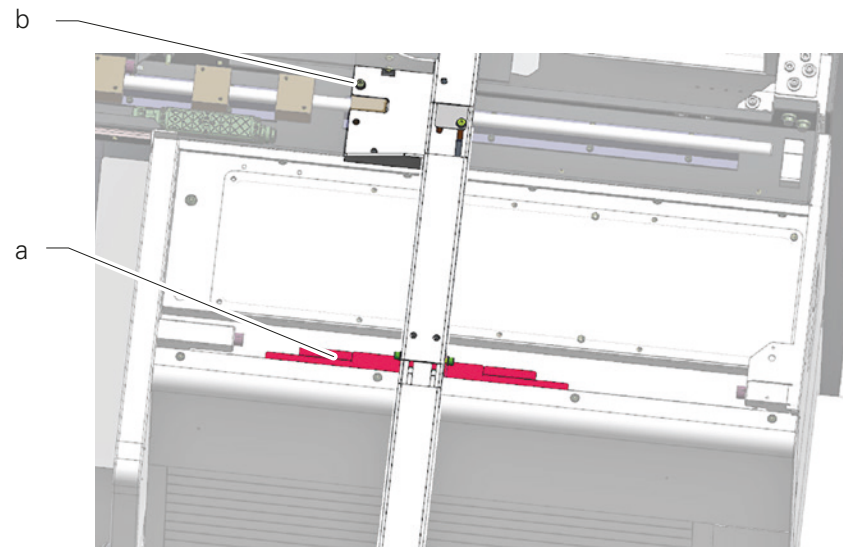
Figure: Transport lock of operating terminal complete



Transport locks—operating terminal

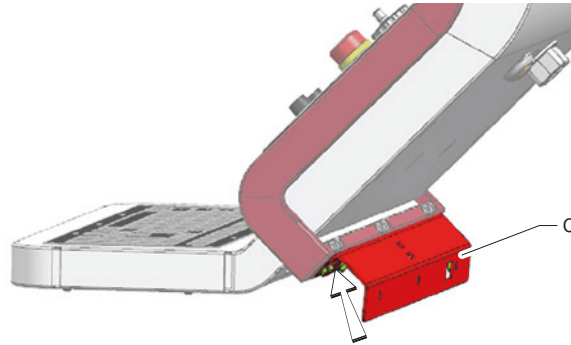
Axial transport locks

- Attach the bracket (a) to the machine for axial transport lock of the carrier.
- Insert and tighten screw (b) to secure the guide cart (axial).



Transport locks—operating terminal**Transport lock – keyboard**

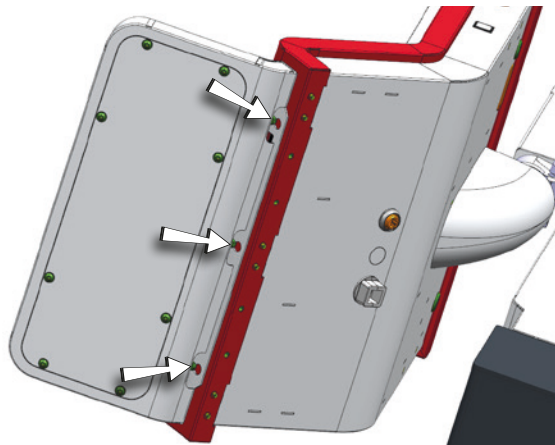
- Mount the transport lock (c) for the keyboard on the operating terminal using 4 hexagon head screws.



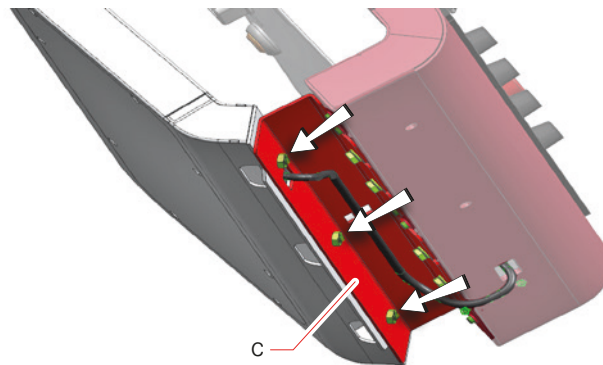
- Loosen the 3 hexagonal head screws of the keyboard, lift the keyboard slightly and remove it.



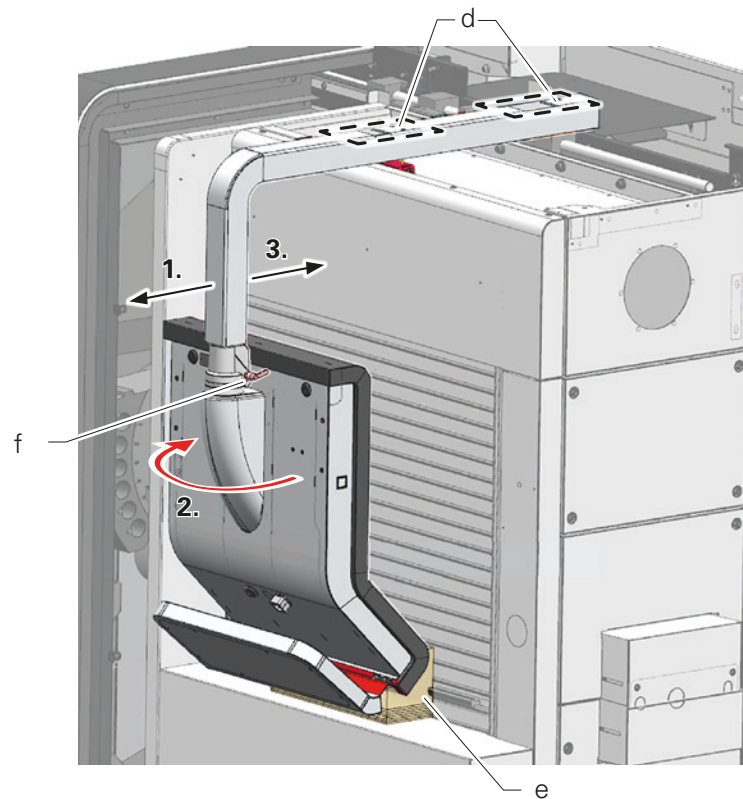
Make sure that the cable and the PE wire of the keyboard are relieved.



- Mount the keyboard to the transport lock (c) using the 3 hexagon head screws provided. Fix the cable and the PE wire using a cable tie.



Transport locks—operating terminal



- Slightly loosen the screws of the 4 slotted holes (d) in the carrier of the operating terminal.
Pull the operating terminal forward and swivel it with the display clockwise towards the machine (towards the shutter).

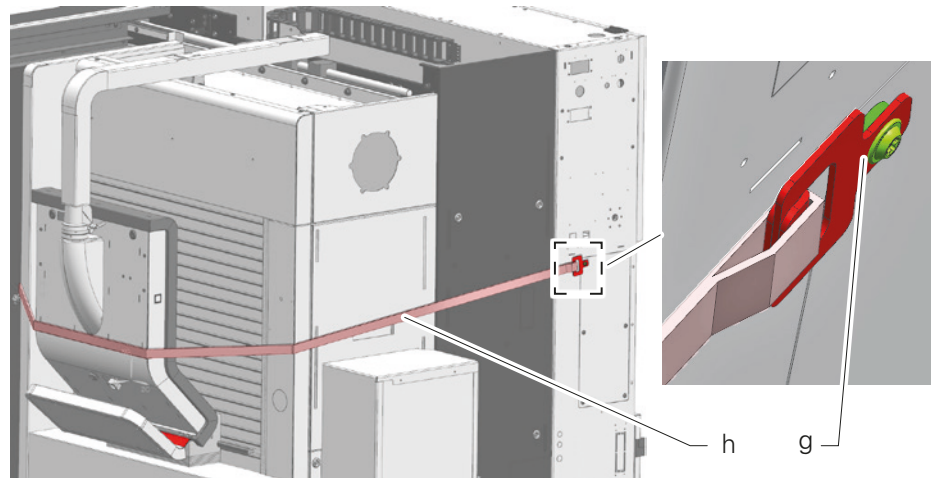


Observe the operating terminal's direction of rotation.
Rotate the operating terminal **clockwise**.

- Place the composite foam (e) on the shutter and push the operating terminal back into the composite foam (e) in the transport position.
Retighten the 4 screws (d) in the slotted holes of the carrier.
- Secure the operating terminal (f) against rotation by locking the clamping lever

Transport locks—operating terminal

- Mount the pin and transport lock (g) at the control cabinet.



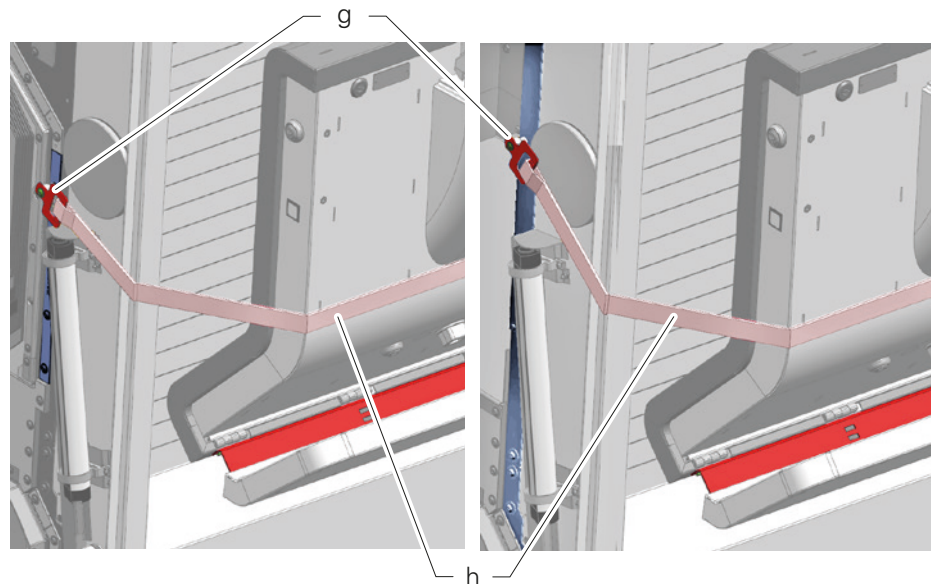
- Install the pin and transport lock (g) in the work area, paying attention to the fastening point depending on the machine version.

TNL20.2-9 / TNL20.2-11 /
TNL32-9 compact /
TNL32-11 compact

Fastening point
-> screw connection on the wiper.

TNL20.2-9B
TNL32-9B compact

Fastening point
-> screw connection on the cover plate.



- Guide the lashing strap (h) through the transport lock (g) and fix the operating terminal with the lashing strap.



All transport locks and the drip pan must be removed before installing the cooling lubricant system or commissioning the machine.



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

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

Locations of the transport locks on the machine

Position	Transport lock	Removal
Main spindle	- Plate	See figures in Chapter: "Installing transport locks and drip pan"
Lower tool carrier, front working unit, counter spindle	- Plate	
Upper tool carrier	- Plate	
Workpiece removal unit	- Plate	
Work area door	- Bracket	
- top	- Bracket	
- bottom	- Bracket	
Drip pan	- Pan	
Tool turret	- Blanking plugs 2x	
Operating terminal	- Bracket	See the description below.
	- Plate 3x	

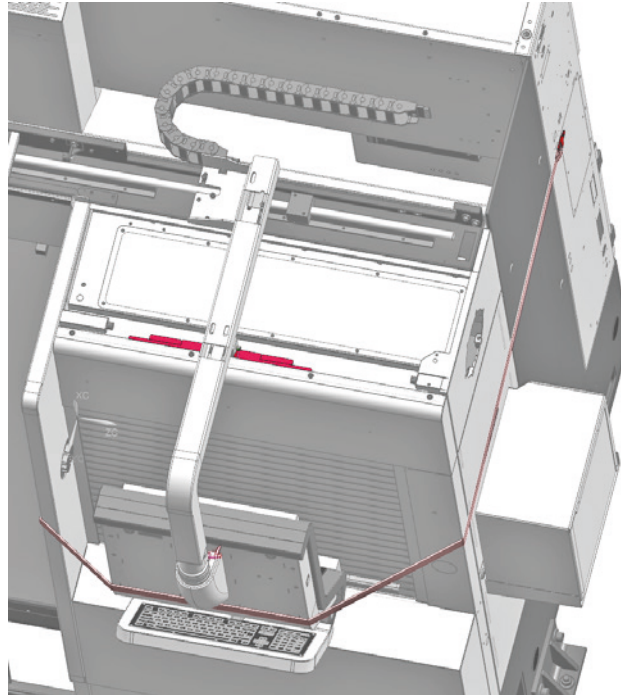


The positions of the transport locks can also be found in Chapter 2, "Diagrams and drawings," on the data carrier.

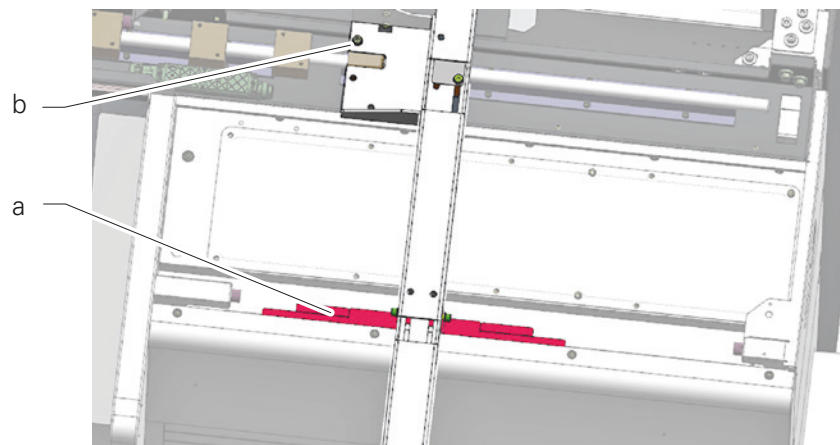
Removing transport locks from operating terminal

For transport, the operating terminal with the display has been swiveled towards the machine into the transport position and secured with transport locks and a lashing strap. The keyboard has been removed and also secured for this purpose.

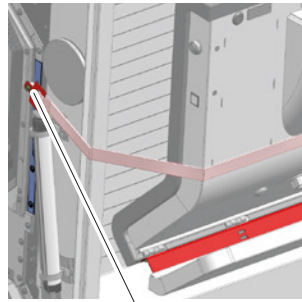
Figure: Transport lock of operating terminal complete



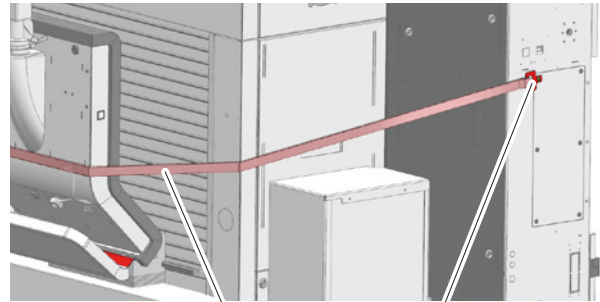
- Remove bracket (a) for axial transport lock of the carrier on the machine.
- Remove screw (b) for securing the guide cart (axial).



- Remove the lashing strap (h) and the pins and transport lock (g). Refit the screws on the control cabinet and the wiper/cover plate.



g



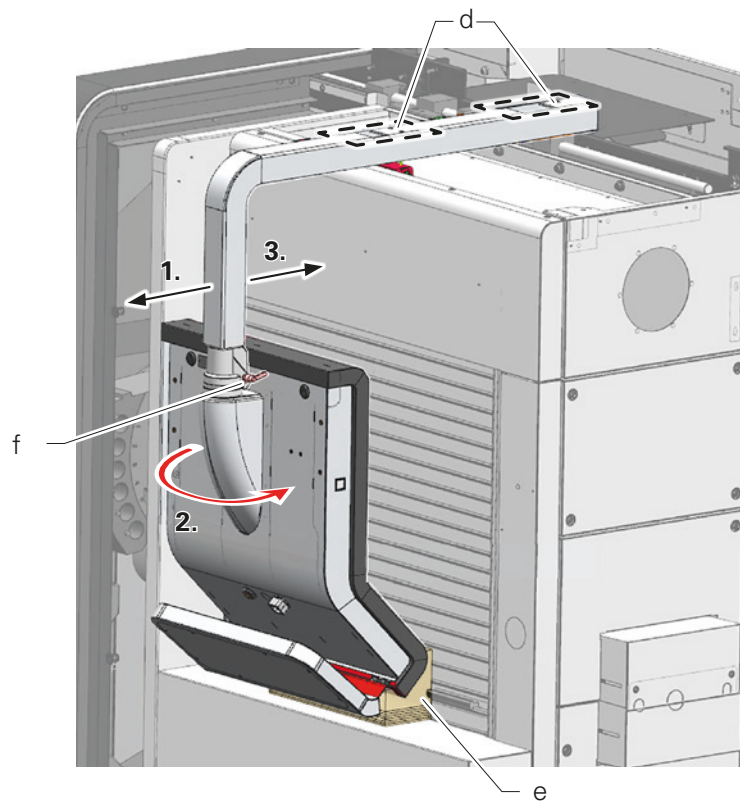
h

g

- Slightly loosen the 4 screws in the slotted holes (d) in the carrier of the operating terminal.
- Release the clamping lever (f) on the operating terminal.
- Pull the operating panel forward, remove the composite foam (e) and swivel the operating terminal with the display counterclockwise to the operator side.



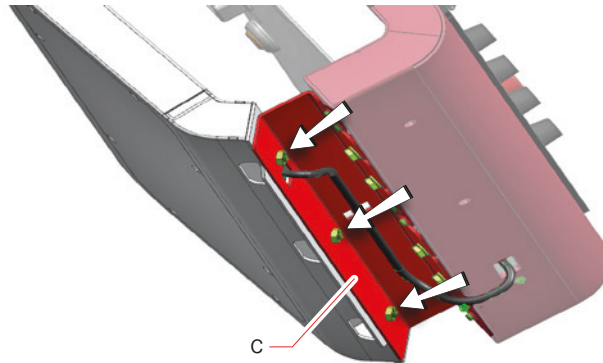
Observe the operating terminal's direction of rotation. Rotate the operating terminal **counterclockwise**.



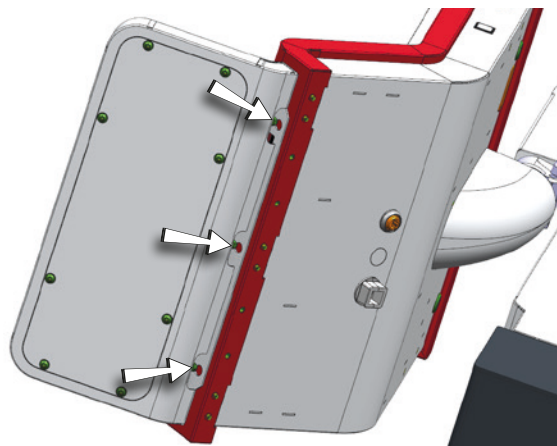
- Remove the cable ties to fix the cable and PE wire and remove the keyboard (3 hexagon head screws), while holding the keyboard firmly.



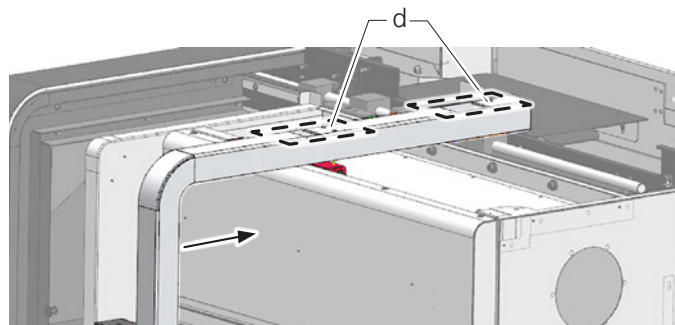
Make sure that the cable and the PE wire of the keyboard are relieved.



- Mount the keyboard to the operating terminal with the 3 hexagon head screws removed and remove the transport lock (c).



- Push the operating terminal back into the required working position and re-tighten the 4 screws (d) in the slotted holes of the carrier.



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