

Transport, installation, commissioning

TNL20

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 Section 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 Precautions and Technical Details*" must be observed.

Information on transport, installation, commissioning

Use only suitable hydraulic jacks or forklift to lift the machine. When transporting with transport or armored rollers, ensure that the rollers used have the appropriate load-bearing capacity.



If the work area door is closed after disconnecting the machine from the power supply, it is locked in this position (locked without power). An emergency release is available.



Transport locks can be identified by their red color.

All transport devices and transport locks (painted red) that are described in this documentation are part of the machine equipment and remain on the machine or with the customer.

They must not be sent back to INDEX.

Remove all transport locks prior to commissioning.

Store the removed transport locks in a safe place, so they are available for another transport in the future.

Failure to follow proper procedures for transport, installation and start-up is prone to cause accidents and may induce damages to or malfunctions of the machine for which **INDEX** rejects any liability or warranty.

Prior to delivery of the machine, the procedures for unloading, transporting to the installation site, installation, and start-up must be carefully planned while absolutely observing the cautions below in this document.

Associated transport instructions and/or manufacturer documentation exist for separate units such as chip conveyor, bar feeder, bar loading magazine, and similar devices that must be observed as well.

General hazards during on-site transport



Danger to life!

Do not step under suspended loads.

Machines must be transported by authorized and qualified personnel only.

Act responsibly when transporting the system and always consider the consequences. Avoid dangerous and risky actions.

Slopes and gradients (driveways, ramps, etc.) are particularly dangerous. Use extra care if such passageways cannot be avoided.

Ensure secure and proper seating of the cargo. If necessary, use additional fixtures to ensure that the cargo is not able to slip.

The transport vehicles must be able to produce sufficient traction and braking forces for safe transport.

Dimensions and masses

The machine and control cabinet masses are indicated on the respective machine installation plan.

The masses of optional separate units, such as chip conveyor, bar feeder, bar loading magazine, and similar devices, can be found either in the specific transport instructions/manufacturer documentation for these equipment levels or accessories or in the corresponding machine installation plan.

Transporting and lifting aids

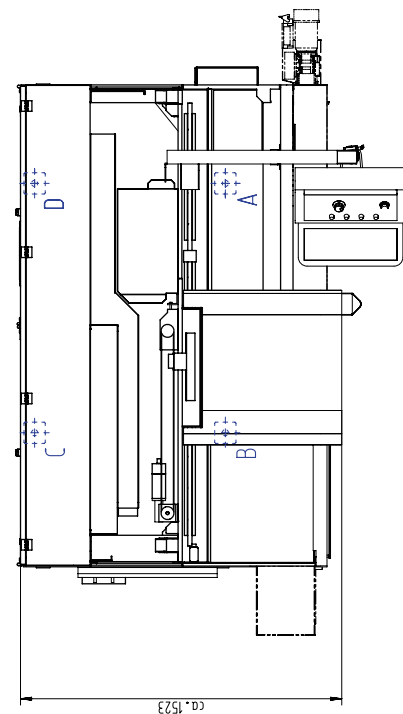
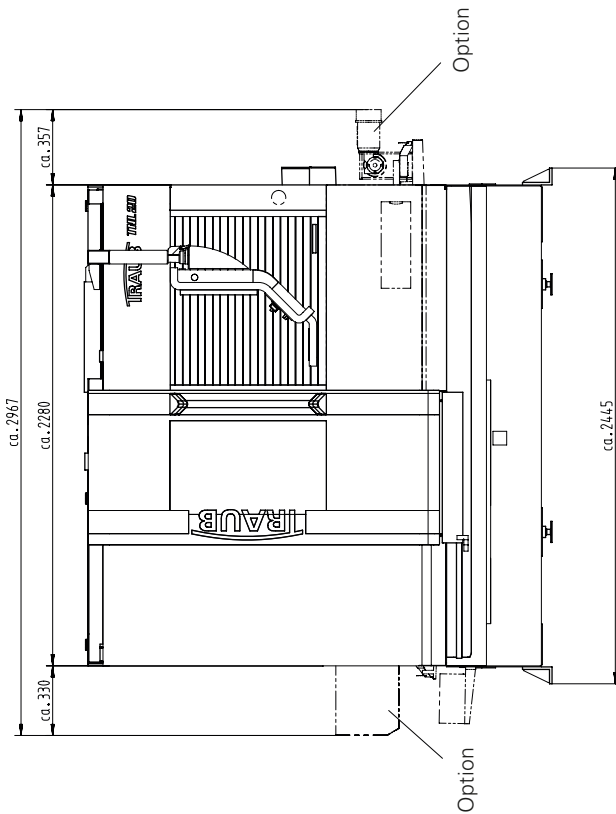
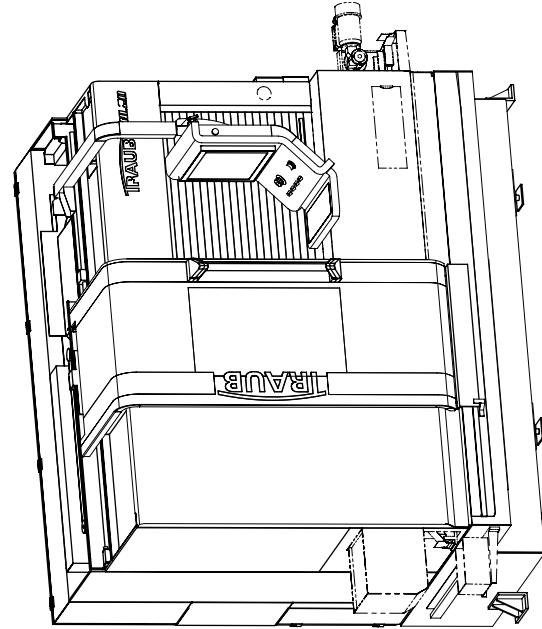
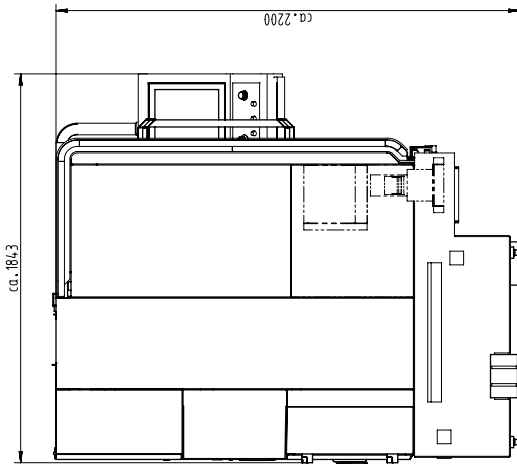
For lifting and transporting the individual units, only lifting and transporting aids having sufficient capacity and loading platform must be used.

Installation plan TNL20, simplified



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

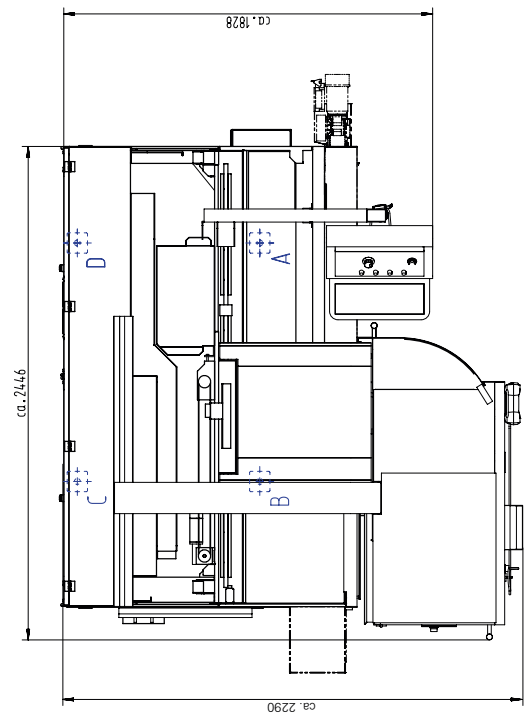
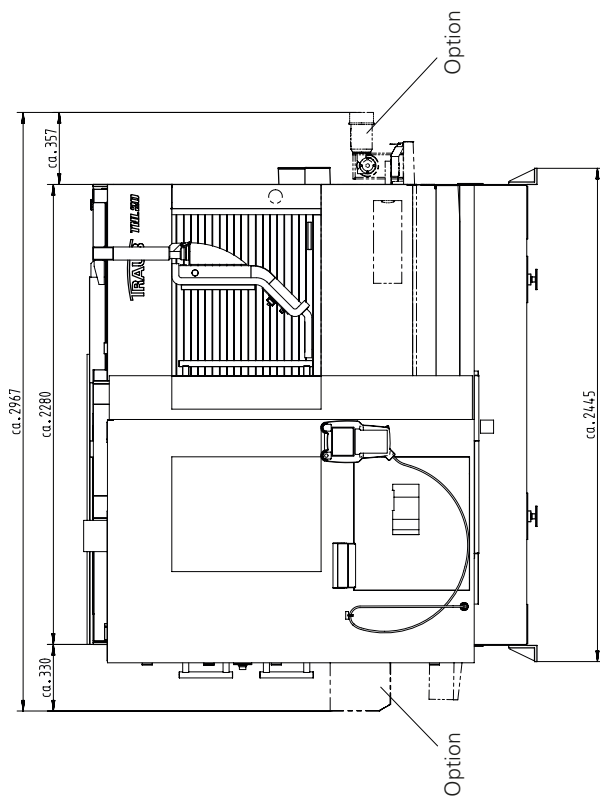
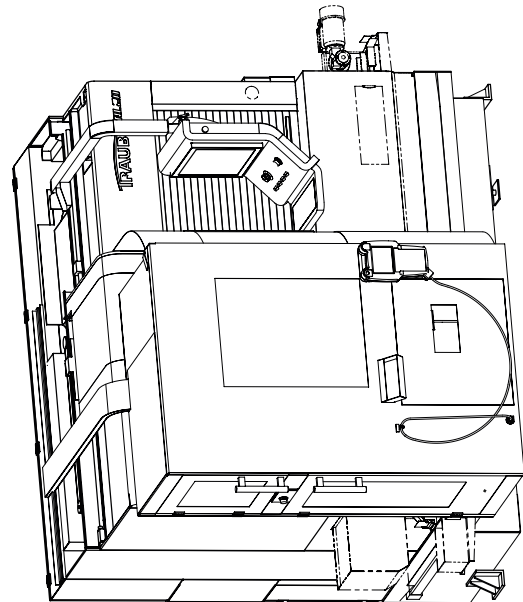
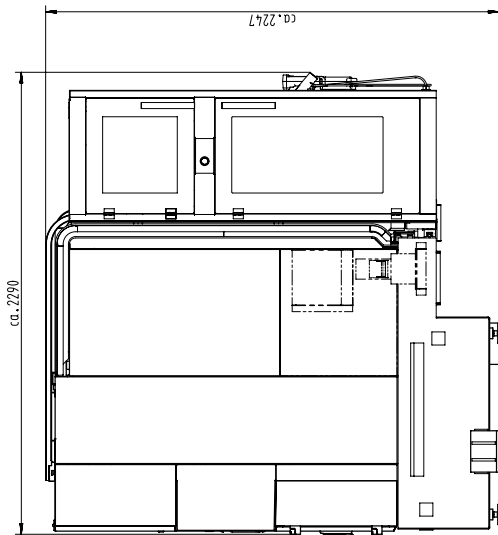
Example shown



10011013135

Installation plan TNL20 with iXcenter, simplified

Example shown



10011014149

Preparations

This section is addressed to the persons responsible for the installation and their staff.

The information provided here allows you to prepare the installation site and its surroundings such that the machine, when delivered, can be installed and put into operation immediately.

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



The installation plan applicable for this machine was already submitted for approval after the contract award. When the machine is delivered, it can be found in Chapter *Diagrams and drawings* on the supplied data carrier and the controller (iXpanel installation required).

Take the size (dimensions) and masses 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.

Is the width and height of entrances and gates sufficient?

If elevators are to be used, do they have sufficient capacities?

Suitable transporting and lifting aids

Suitable transporting and lifting means must be available when the machine is delivered

- Crane/truck-mounted crane (basic machine only).



The lifting device required for proper transport of the machine (part no. 12011692) is supplied with the machine on request and must be returned to INDEX after the machine has been installed. For more information, see Chapter "Transporting the machine" - Lifting device and crane traverse.

- Transport rollers
- Armored rollers
- Hydraulic jacks
- Forklift truck (only for separate units).

Information for transporting the machine



Danger to life
Danger from falling machine/parts

People must be kept away from under suspended loads.



Transporting the machine

Means of transport approved for transporting the machine:

- Crane/Truck-mounted crane (basic machine only)

The lifting device required for proper transport of the machine (part no. 12011692) is supplied with the machine on request and must be returned to INDEX after the machine has been installed. For more information, see chapter "Transporting the machine" - *Lifting device and crane traverse.*

- Transport rollers / armored rollers
- Trolley
- Forklift

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



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

Machine weight and machine dimensions



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

Dimensions and weights TNL20	-9	-9B	-11
Length			
- Basic machine		2280	
- with workpiece removal unit (option)	mm	2823	
- with iXcenter (option)		2967	
Depth			
- Basic machine		1540	
- with iXcenter (option)	mm	2290	
Height			
without indicator lamp (approx. 350 mm)			
- Basic machine		2220	
- with iXcenter (option)	mm	2247	
Weight approx.			
(with control cabinet with max. configuration)			
- Basic machine	kg	5000	5400
- Machine with iXcenter (optional)		5600	6000

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 locally valid guide lines and regulations must be taken into consideration.

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 Precautions 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 *Operating material* and *Notes on Operating Materials*

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 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 circuit breaker, 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.

Locations of the axes for attaching the transport locks



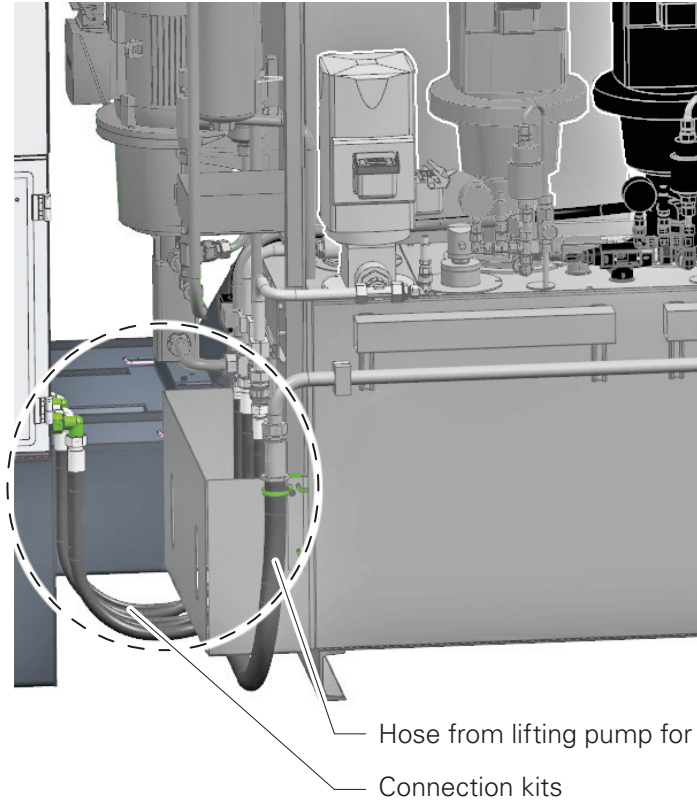
For transport, the tool carriers, main and counter spindles, the front working attachment and the workpiece removal unit must be moved to the specified positions so that the transport locks can be attached.

	Axis	Location
Main spindle		
Sliding headstock operation	Z1	+ 115.0
Sliding/fixed headstock operation	Z1	+ 70.0
Counter spindle		
	Z4	+ 281.0
	X4	+ 121.0
Upper tool carrier		
	V1	+ 93.0
	X1	+ 182.0
	Y1	+ 20.0
	H1	any station
Upper tool carrier with B axis		
	V1	+ 75.5
	X1	+ 182.0
	Y1	+ 20.0
	H1	any station
	B1	0°
Lower tool carrier		
	Z2	+ 93.0
	X2	+ 390.0
	Y2	- 20.0
	H2	any station
Front working attachment		
	Z3	+ 300.0
	X3	+ 33.7
	H3	Station 3
Workpiece removal unit		
	Z5	+ 421.0

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 **Notes on Operating Materials**.

Fit transport locks and drip pan

Locations of the transport locks	Transport locks
Main spindle	- Transport lock
Tool turret	- Blanking plugs (2x)
Lower tool carrier, front working attachment, and counter spindle	- Transport lock
Upper tool carrier	- Transport lock
Workpiece removal unit	- Transport lock
Operating terminal	- Bracket (axial transport lock) - Keyboard transport lock Lashing straps Transport lock and pins Composite foam
Work area door - top - bottom	- Bracket - Bracket
Drip pan	- Tray

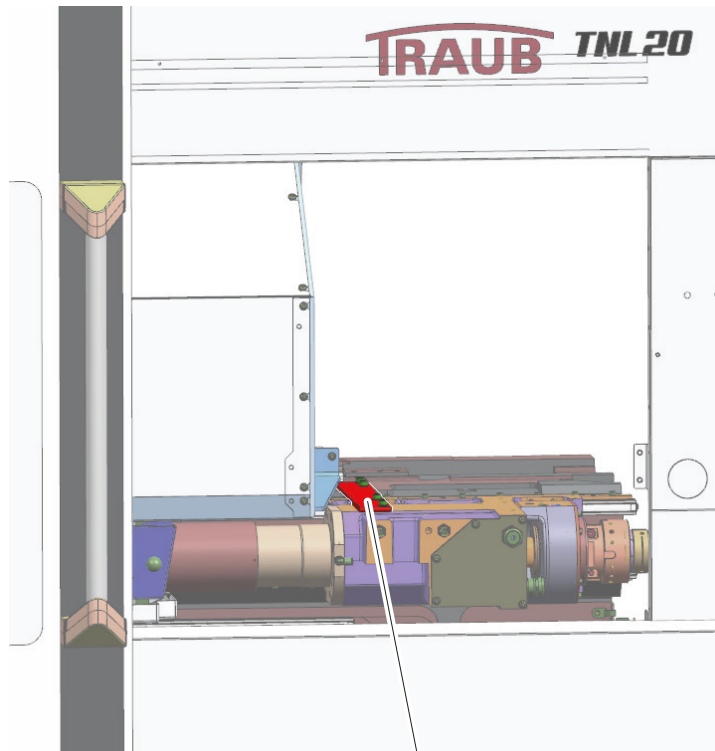
Transport locks, complete

- Drawing No. 11093453

iXcenter (optional)	- Bracket - Bar - Adjustable foot 2x Bracket 2x Screw spindle 2x
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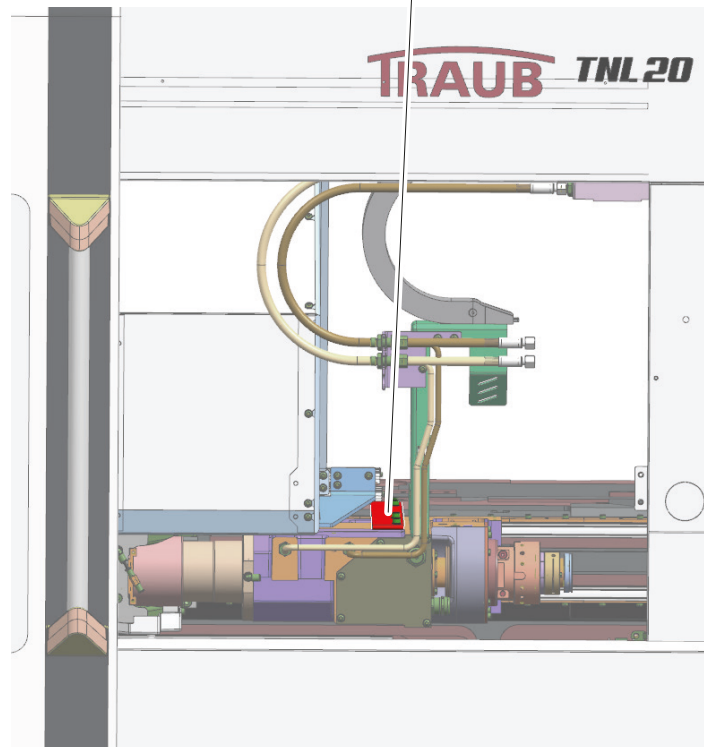
Transport lock – main spindle

Sliding headstock operation



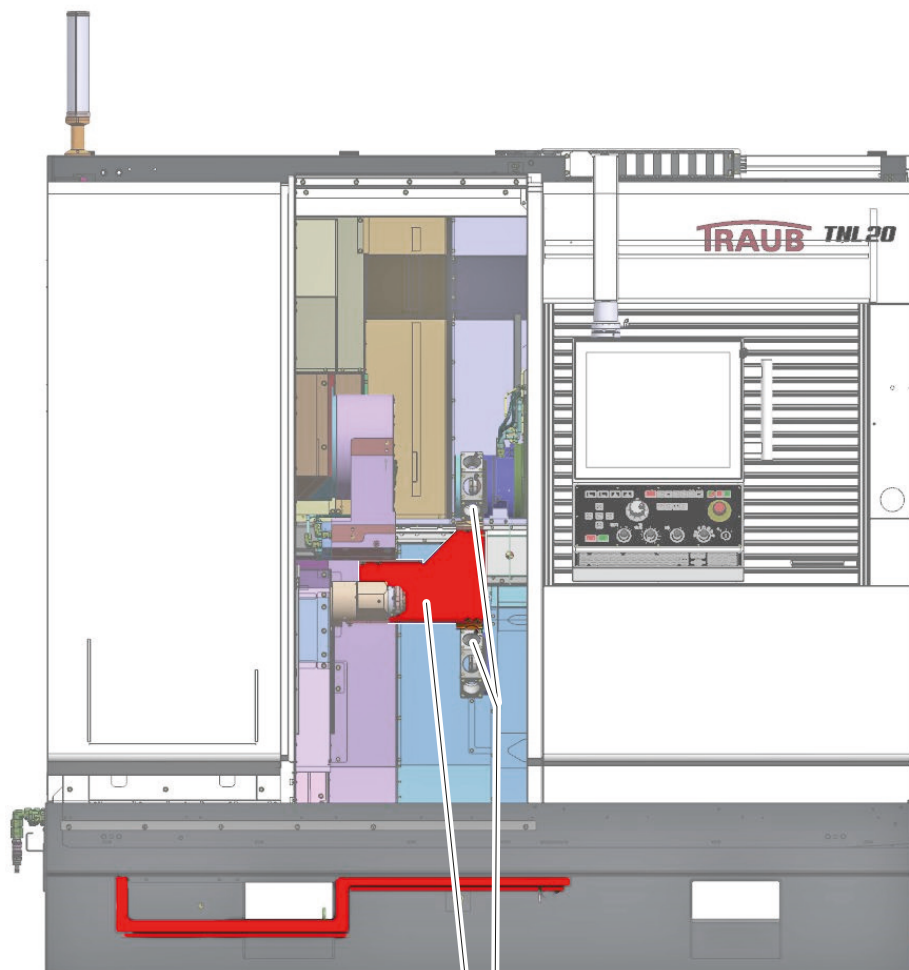
Transport lock

Sliding/fixed headstock operation



Transport lock – lower tool carrier, front working attachment, and counter spindle

(incl. 2x blanking plugs for tool mounting)



Transport lock

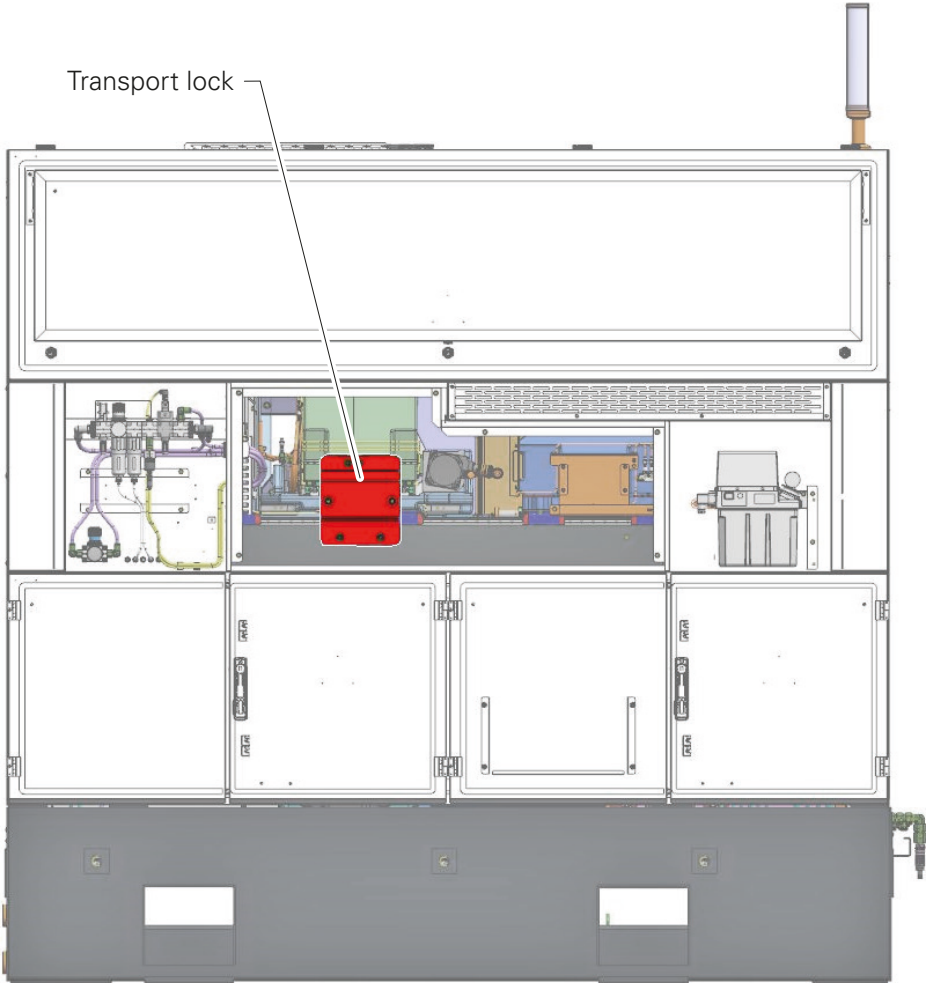
Blanking plugs 2x



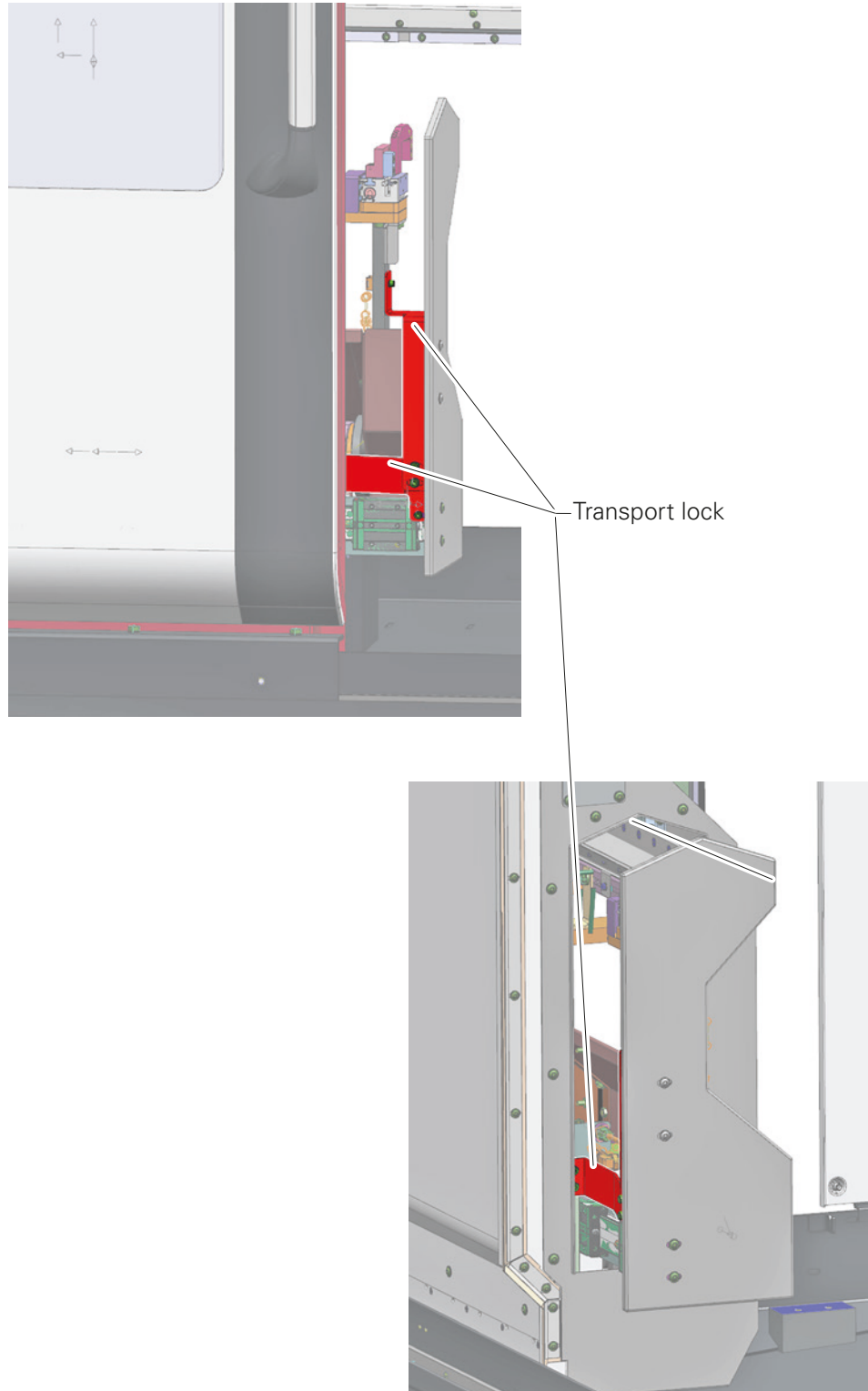
Removing the transport lock

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

Transport lock – upper tool carrier



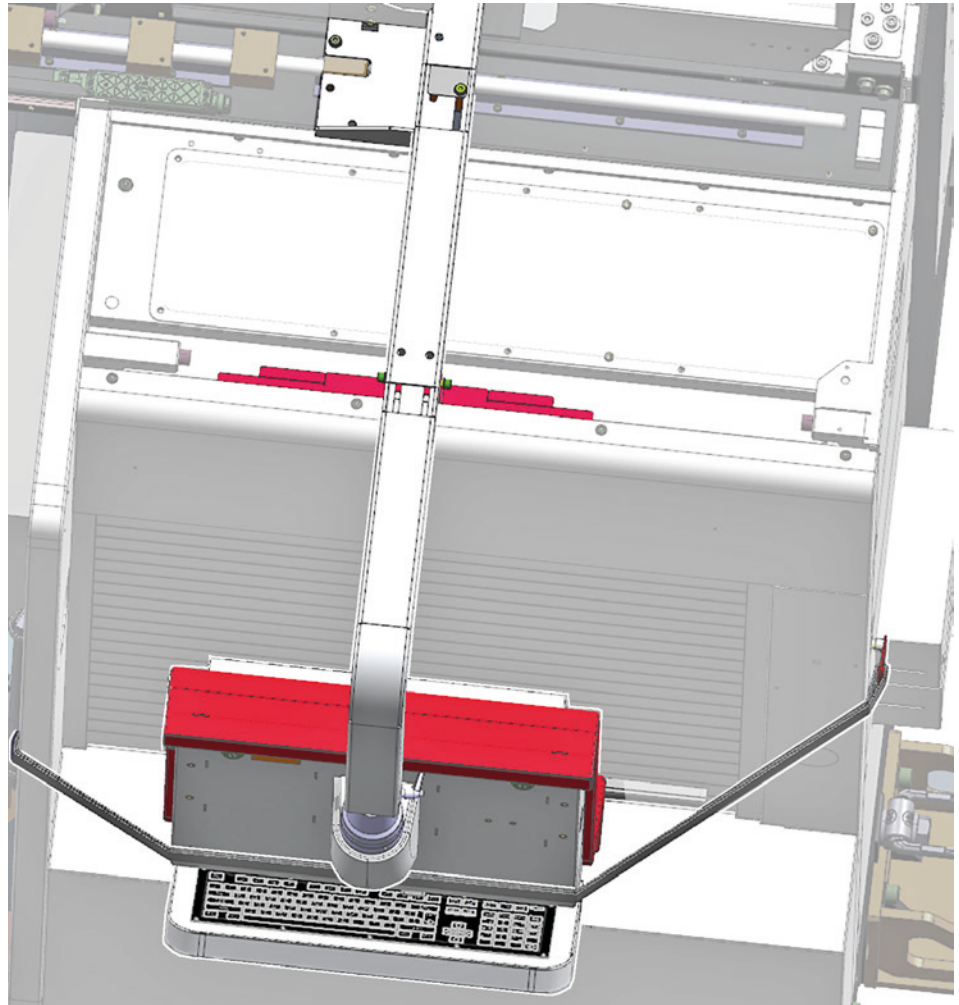
Transport lock – workpiece removal unit



Transport locks – operating terminal

For transport, the operating terminal with the display is swiveled towards the machine into the transport position and secured with transport locks and a lashing strap. The keyboard must be disassembled and also secured for this purpose.

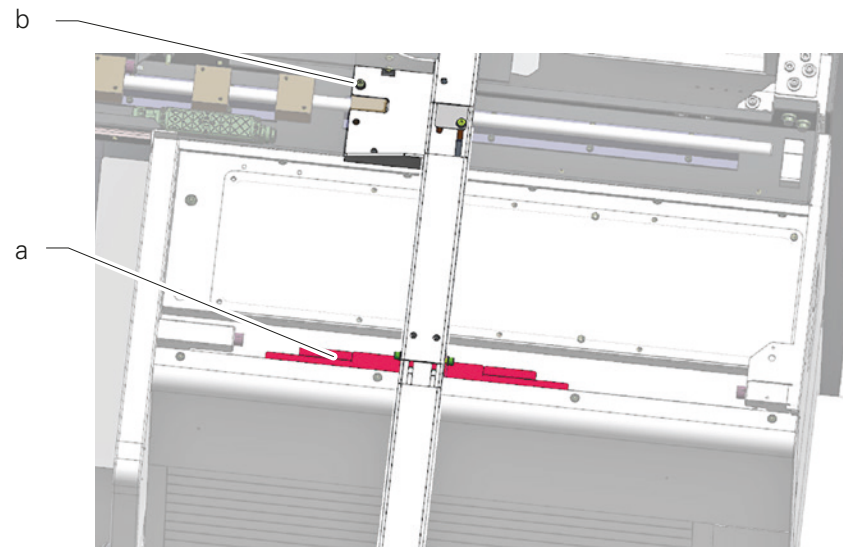
Figure: Transport lock of operating terminal complete



Transport locks – operating terminal

Axial transport locks

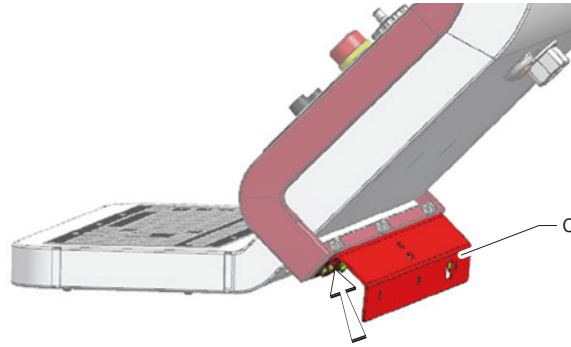
- Attach the bracket (a) to the machine for axial transport lock of the carrier.
- Secure the trolley against axial displacement by means of a screw (b)



Transport locks – operating terminal

Transport lock – keyboard

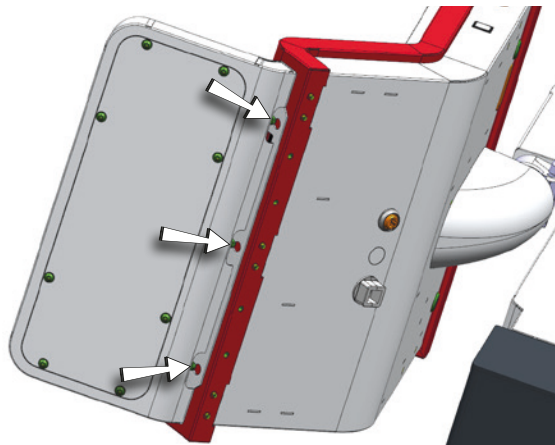
- Mount the transport lock (c) for the keyboard on the operating terminal using 4 hexagon head screws.



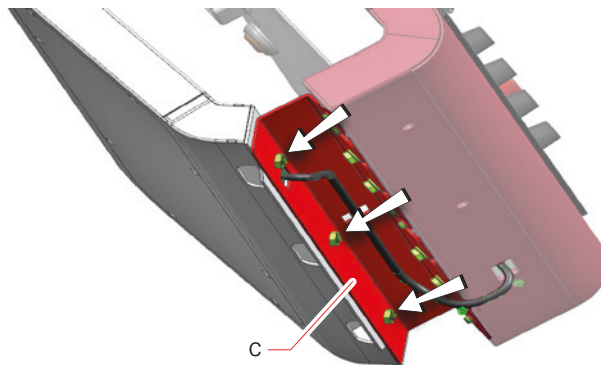
- Loosen the 3 hexagonal head screws of the keyboard, lift the keyboard slightly and remove it.



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

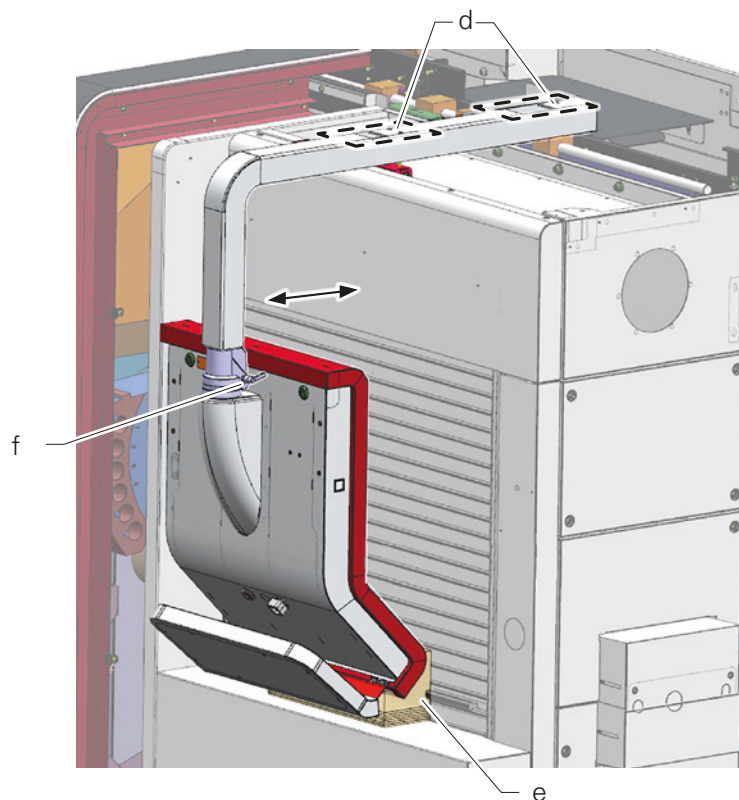


- Mount the keyboard to the transport lock (c) using the 3 hexagon head screws provided. Fix the cable and the PE wire using a cable tie.



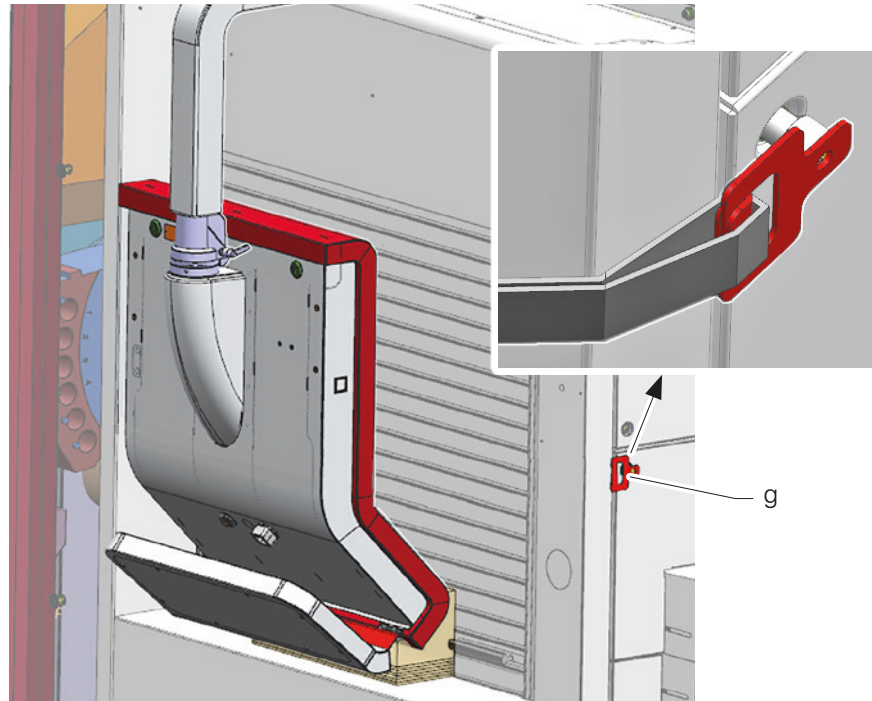
Transport locks – operating terminal

- 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 to the machine (to the shutter).
- 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

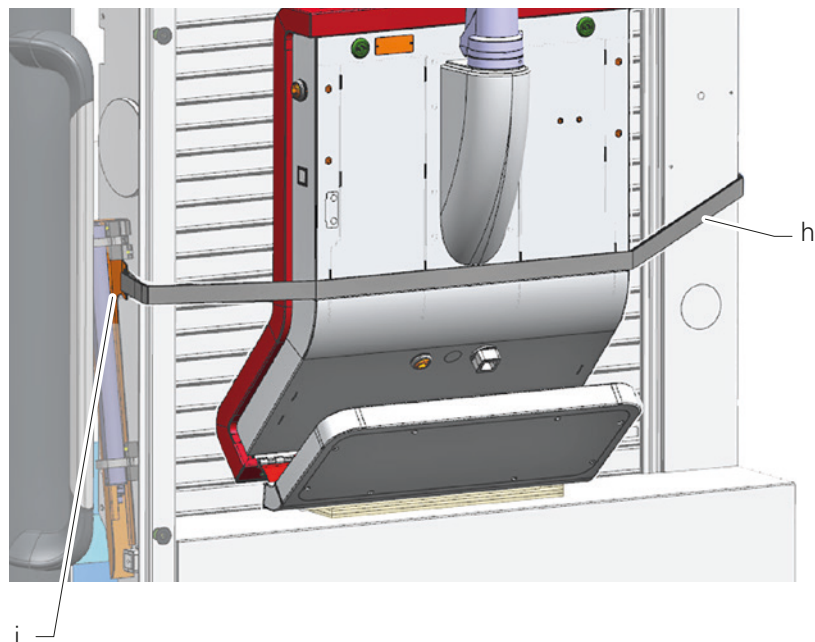


Transport locks – operating terminal

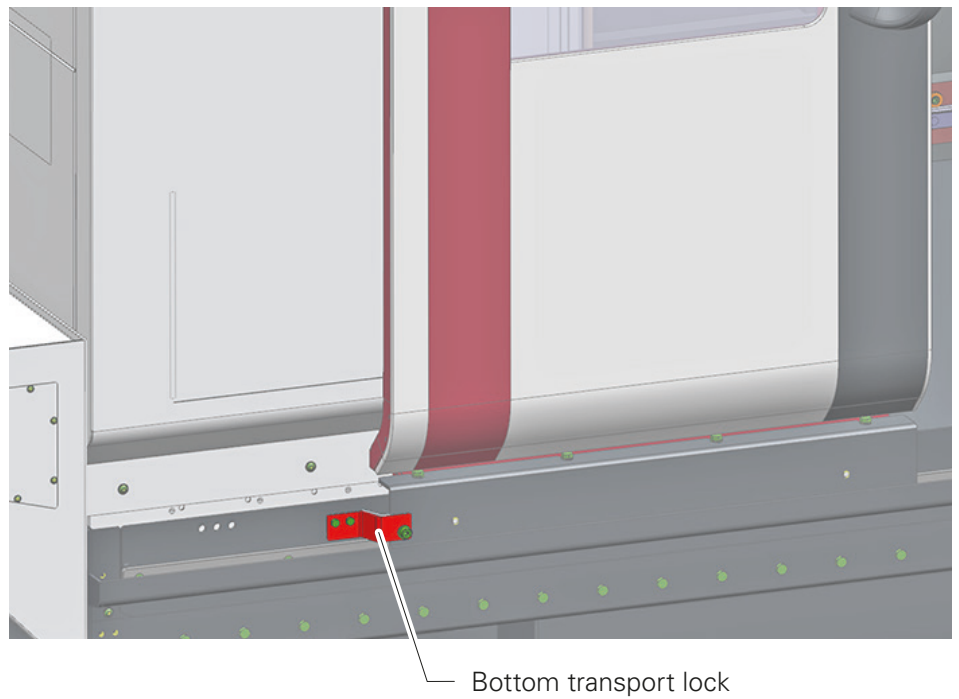
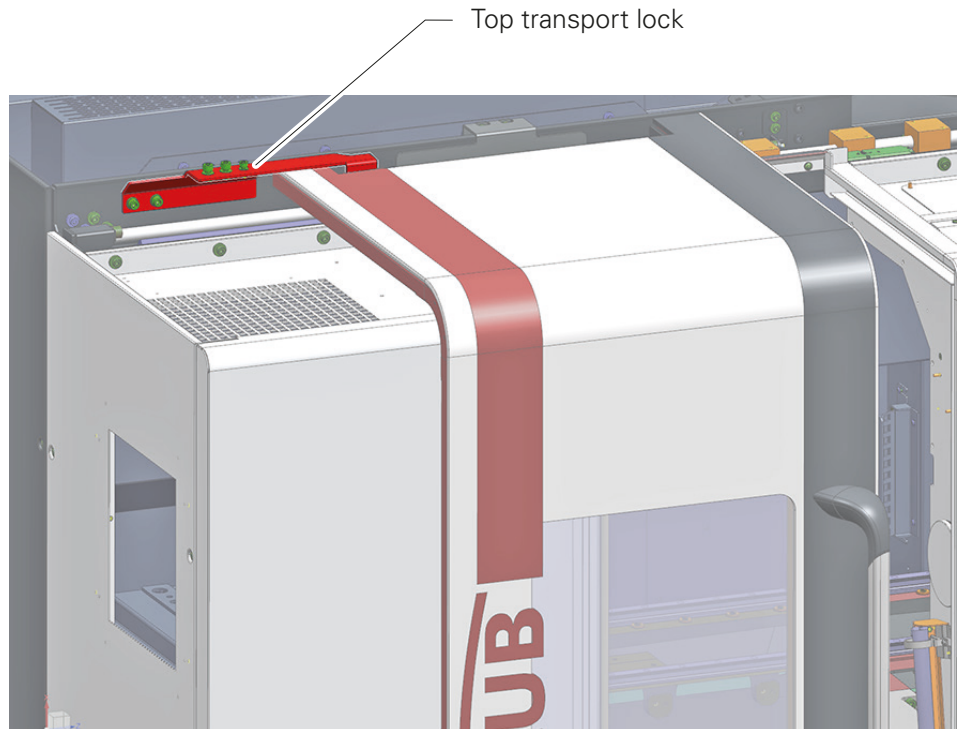
- Mount the pin and transport lock (g) on the right side of the machine.



- Guide the lashing strap (h) through the holder of the work lamp (i) and the transport lock (g) and fix the operating terminal with the lashing straps.

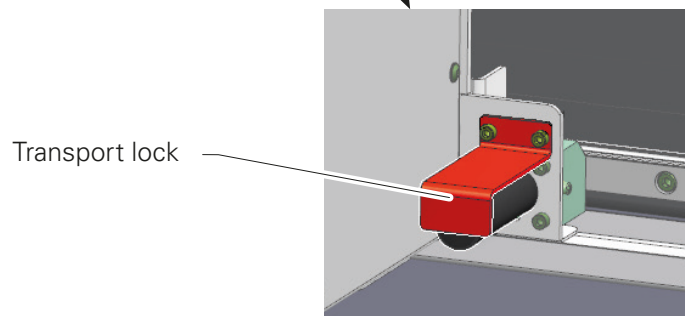
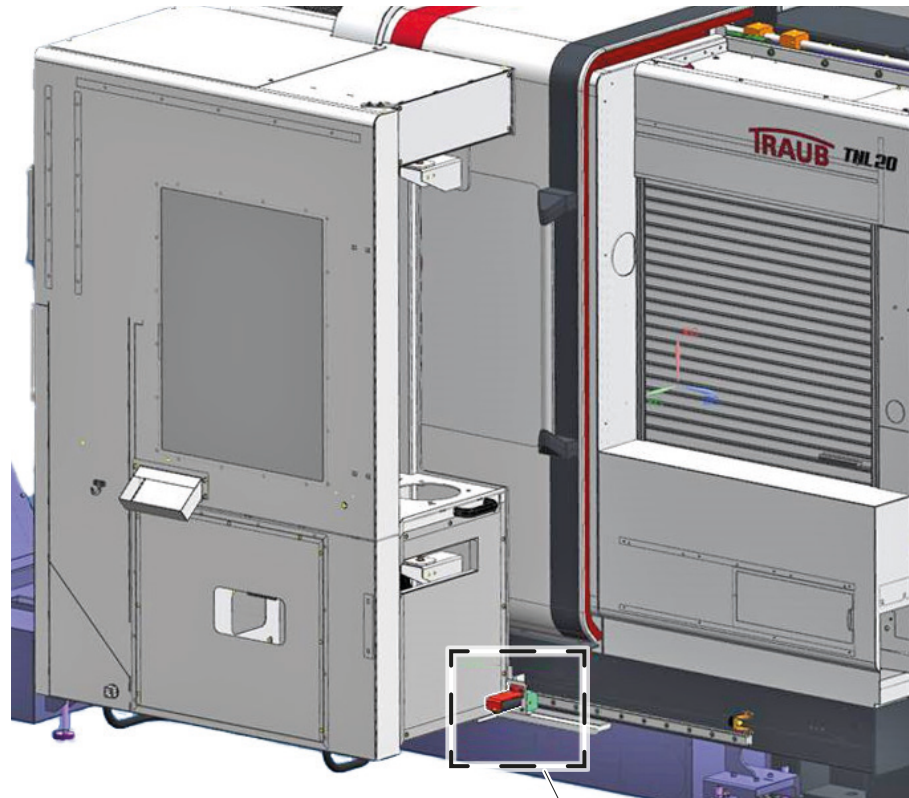


Transport locks – work area door

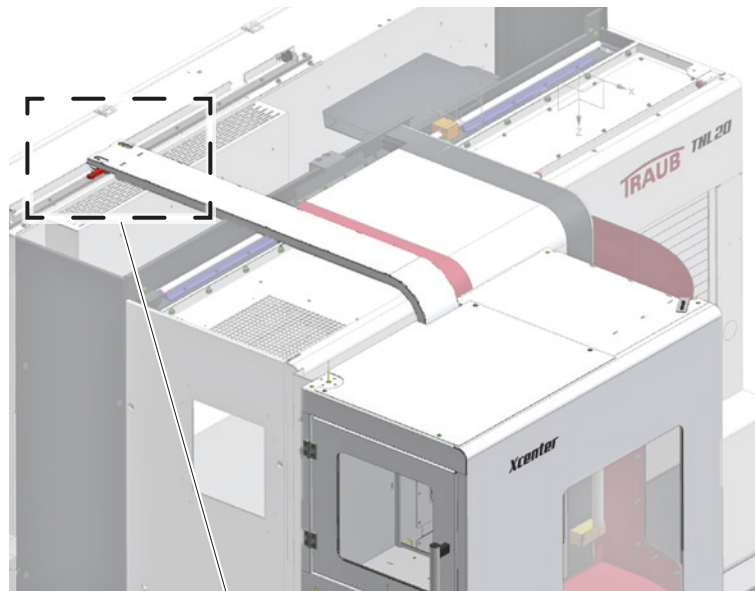


Transport lock – iXcenter (option)

- Move iXcenter to the required transport position and secure it with the locking pin.
- Affix the transport bracket above the locking pin.



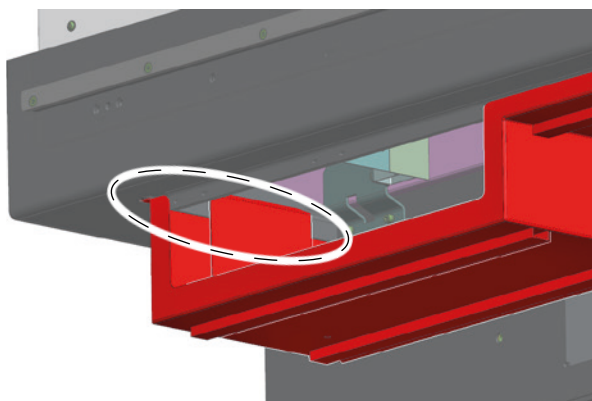
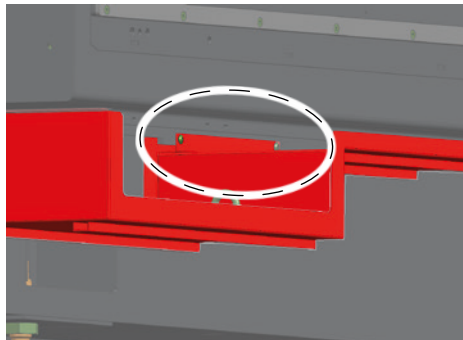
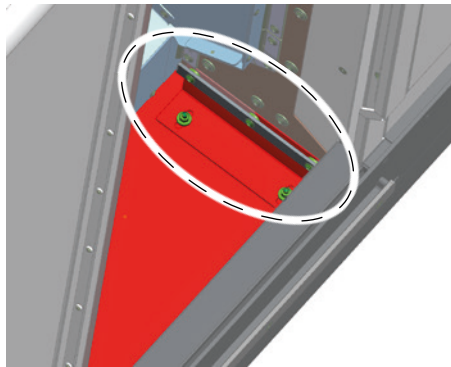
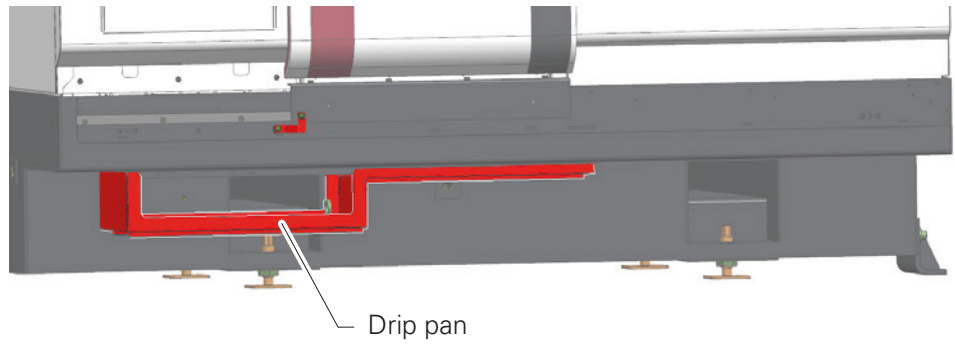
- Attach the transport bar



Transport lock

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.



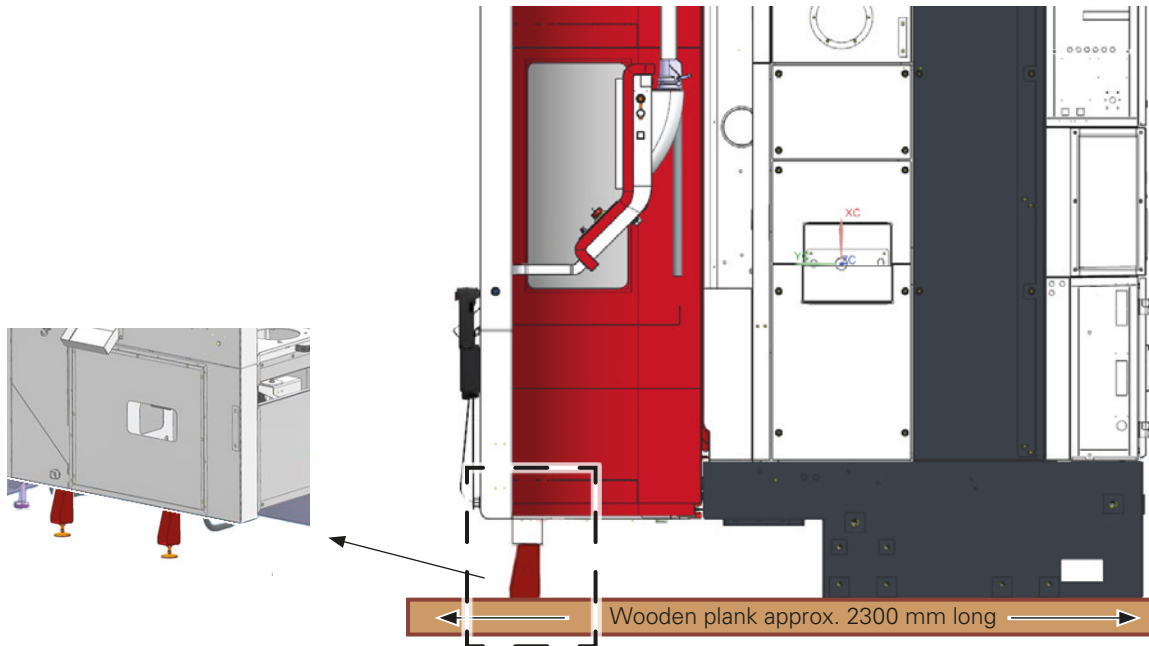
Packaging of the machine, the machine components and accessories

- Machine incl. control cabinet mounted on planks.
(The adjusting screws must be removed first)



For the TNL20 with the iXcenter option, 2 transport feet (P/N 12036622) need to be fitted in addition.

Illustrations show examples



- Machine components and accessories are placed and fastened on pallets



The control cabinet contains:

- The necessary logs such as geometry or safety log
- Installation plan
- Key for the operating terminal
- Key for the fire protection system
(depending on the machine configuration)

The chip conveyor or the chip tray contains:

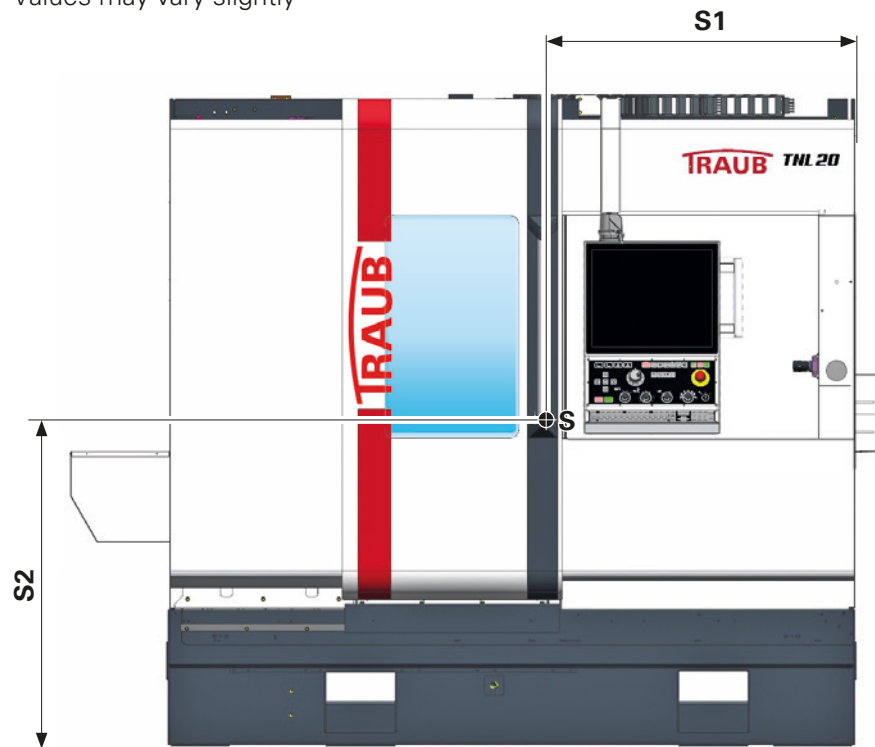
- Footplates (4x)
- Adjusting screws (4x)
- Screw-on brackets with threaded rods and mortar cartridge (2x)
- Operator tools (such as special keys)
- User documentation

Machine center of gravity (S)

Basic machine TNL20

Center of gravity S*		TNL20-9	TNL20-9B	TNL20-11
S1	mm	1105		1130
S2	mm	980		1020
S3	mm	648		657

* Values may vary slightly

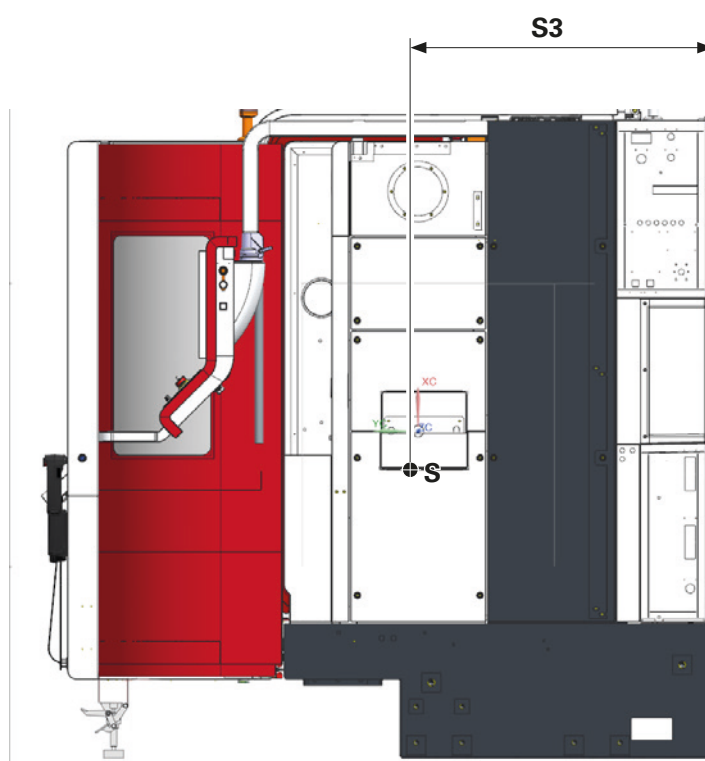
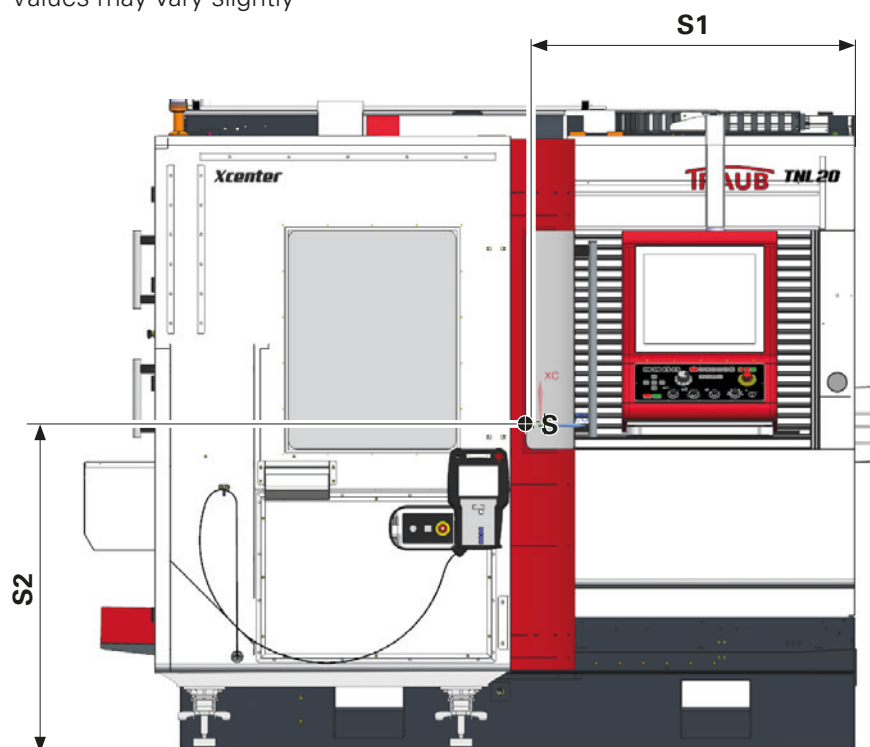


Machine center of gravity (S)

TNL20 with iXcenter

Center of gravity S*		TNL20-9	TNL20-9B	TNL20-11
S1	mm	1173		1197
S2	mm	966		1002
S3	mm	768		766

* Values may vary slightly



Machine ready for shipping

Machine mounted on wooden planks and covered with plastic sheeting.



The machine weights and dimensions refer exclusively to the basic machine (without chip conveyor, feed unit, fire protection, fan).

Dimensions and weights TNL20		-9	-9B	-11
Length approx. - Basic machine	mm	2970		
Depth - Basic machine - with iXcenter (option)	mm	2000 2300		
Height without indicator lamp (approx. 350 mm) - Basic machine - with iXcenter (option)	mm	2350 2380		
Weight, approx. (with control cabinet and max. configuration) - Basic machine - Machine with iXcenter (option)	kg	5300 5900	5700 6300	
Chip conveyor and accessories				
Length	mm	approx. 4210		
Width	mm	approx. 1100		
Height (without pallet)	mm	1670		
Packaging		on pallet		

Transport by crane/truck-mounted crane (min. 8 t capacity)

i Transport by crane/truck-mounted crane is only permitted for the basic machine.

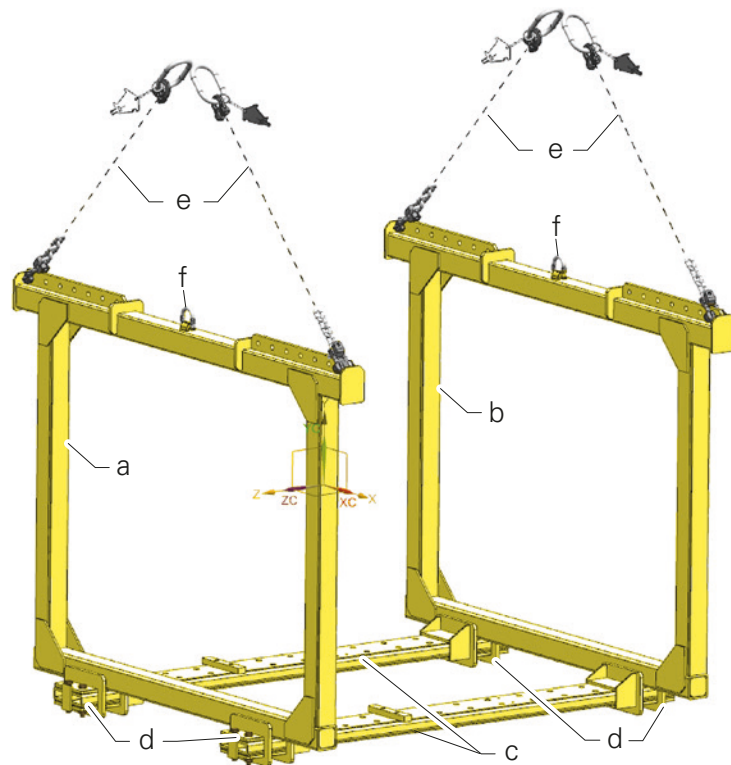
Crane/truck-mounted crane requirement

Load capacity min.	t	8
Basic machine		
+ Lifting device		
+ Crane traverse (by customer)		

Lifting device

i The lifting device required for proper transport of the machine (part no. 12011692) is supplied with the machine on request and must be returned to INDEX after the machine has been installed.

Lifting device part No. 12011692 for TNL20



- a Front mounting bracket
- b Rear mounting bracket
- c Slide-in rods with end stop
- d Mounting pocket with locking screws
- e Stop chain with oval link and shackle
- f Stop point for empty transport

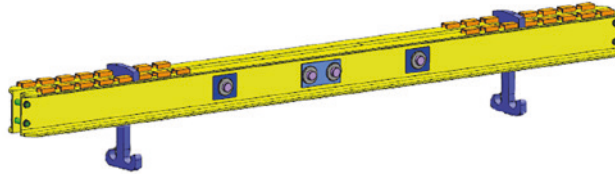
Crane traverse

The crane traverse required for transporting the machine in accordance with the regulations must be provided by the customer.



If required, the necessary crane traverse can be additionally requested from INDEX and must be returned to INDEX after the installation of the machine.

Example shown



Mounting the lifting device and transport



Danger from falling machine/parts

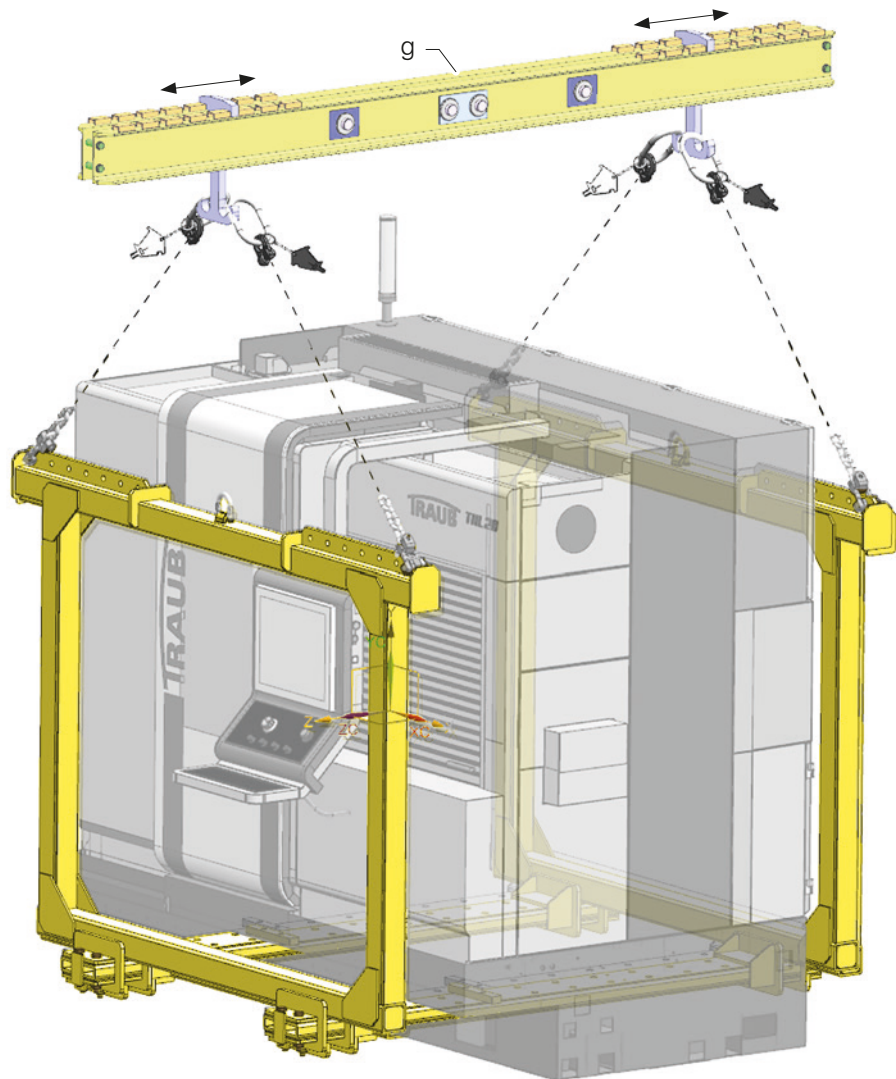
No persons are allowed to remain under suspended loads!



The manufacturer's documentation must be observed.

- Mount the lifting device according to the manufacturer's instructions and attach it to the machine.
- Adapt the crane traverse (g) to the lifting device.

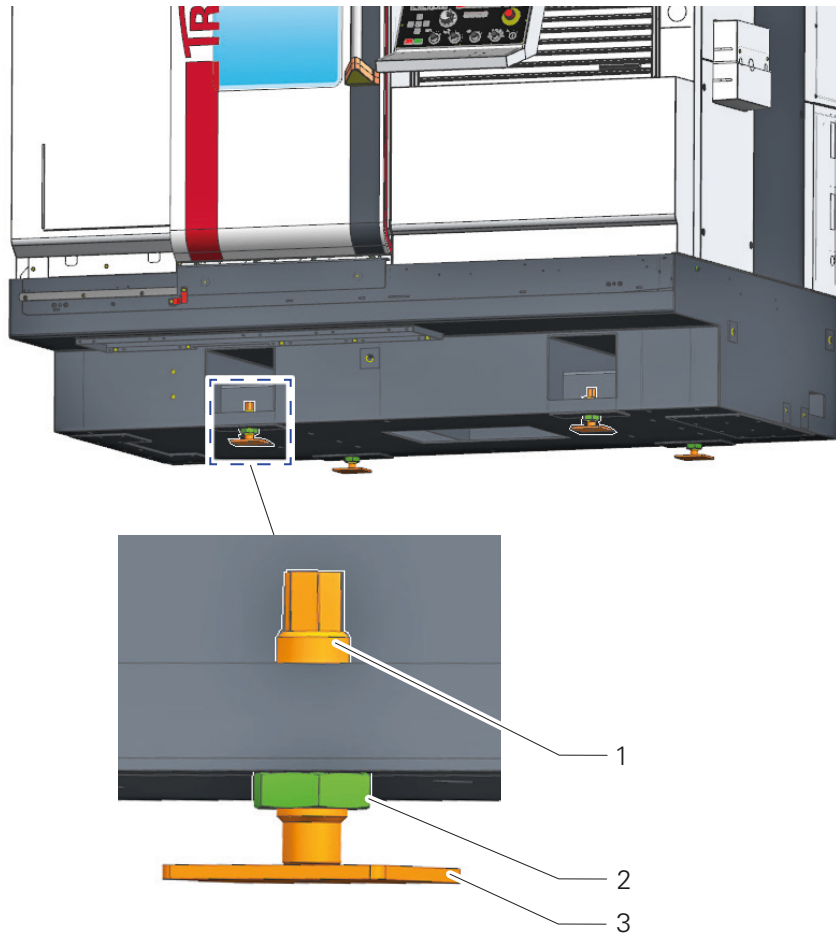
Example illustration of the crane traverse



g Crane traverse (by customer)

- Lift the machine with the crane/truck-mounted crane, transport it to the installation site by crane and place it in the desired installation position.
- Lower the machine so that the 4 footplates (3) can just be pushed under the 4 bearing points. Ensure that the adjusting screws (1) are lined up with the recesses in the footplates.
- Lower the machine slowly and evenly onto the footplates (3).
- Unscrew the hexagon lock nuts (2) from the adjusting screws (1).

Example shown



See **“Installation of the machine”** for further information.

Openings for inserting the fork arms of the fork lift truck

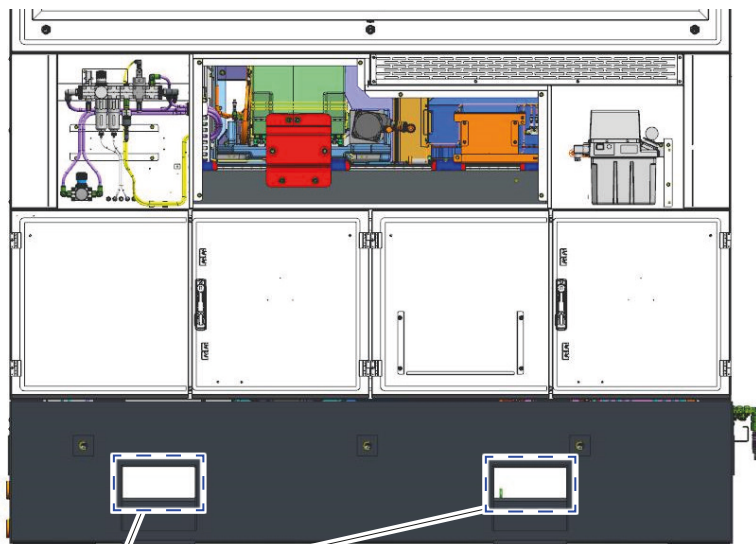


The machine must be lifted from the control cabinet side when transported by a fork lift truck.

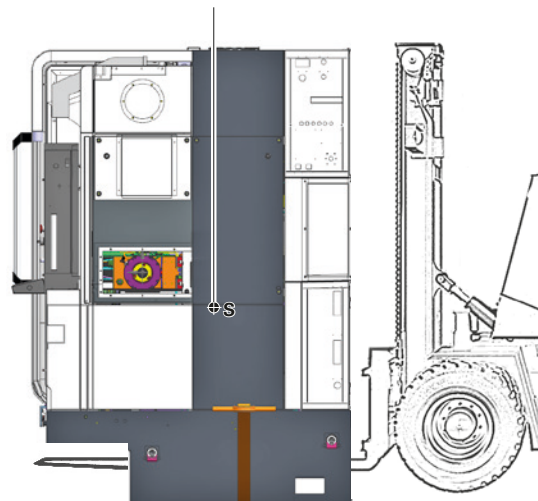
Non-slip rubber mats should be placed over the fork arms of the fork lift truck when transporting the machine.
 The fork arms must be inserted in the openings on the control cabinet side to lift the machine.
 When setting the machine down, ensure that the fork arms are not tilted, otherwise the planks will break.

Forklift requirement

Lifting force min. (depending on the machine configuration)	kg	5300 - 6300
Min. fork length	mm	1400
Center of gravity of the load	mm	—
Max. width of forks	mm	210
Max. height of forks	mm	90




Openings for inserting the fork arms



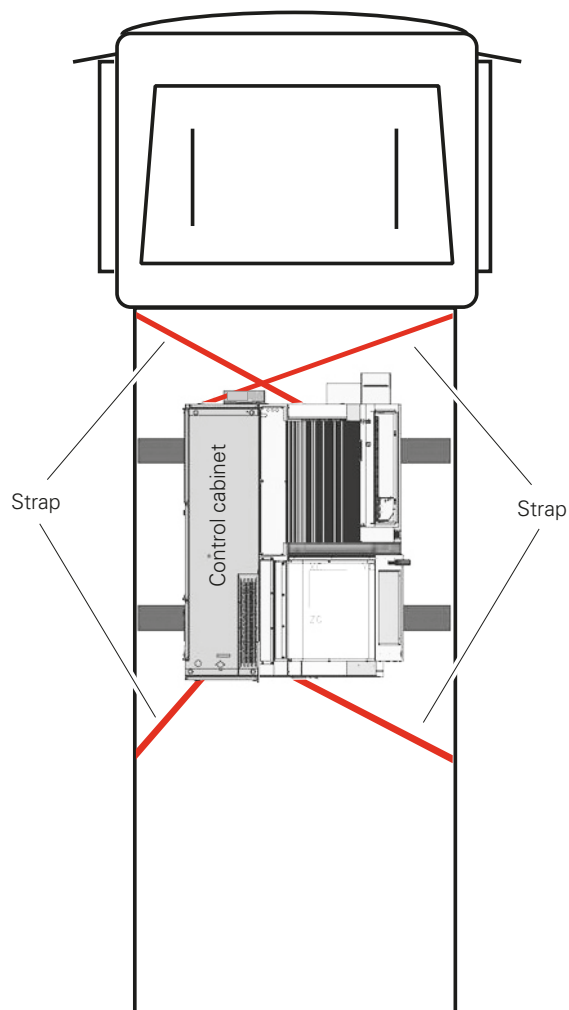
Transporting the machine by truck

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

Example of transporting on a truck loading platform

 Transport the machine with the control cabinet side on the left (in the direction of travel) (see illustration).

Example shown



Loading guard



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



Non-slip rubber mats

- The load must be secured against slipping using anti-slip rubber mats (thickness 9 mm) between the loading platform and wooden planks at the 4 (or 6) support points of the machine.

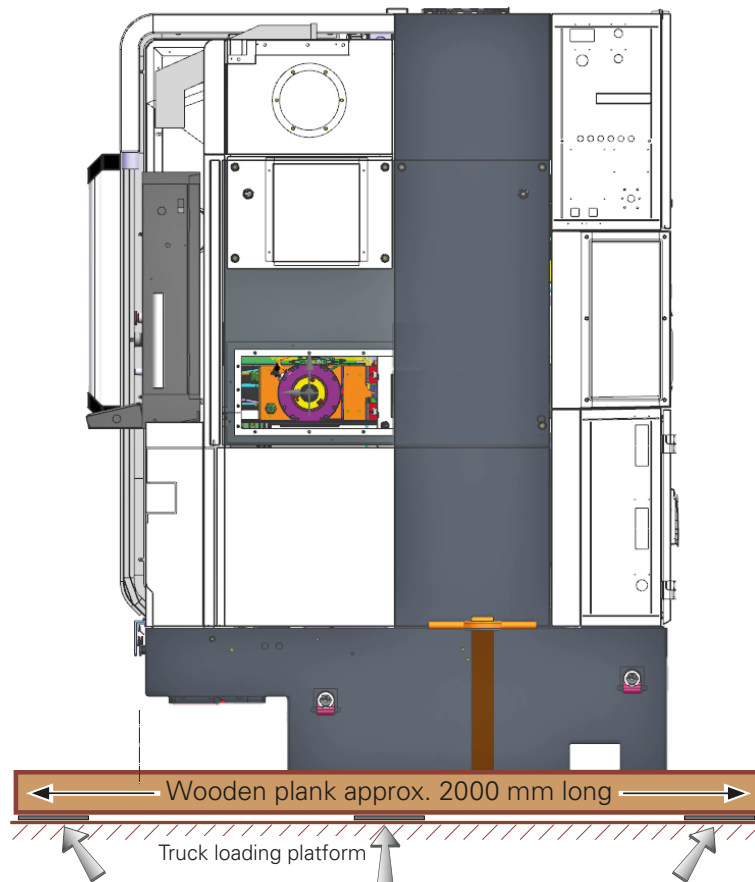


Wooden planks

- The two wooden planks (2000 mm long) must be wider than the machine to improve its stability.
- The two wooden planks should only rest on the anti-slip rubber mats at the outer bearing points of the machine. The wooden planks should not rest on the loading platform in the middle. If the wooden planks sag in the middle and rest on the loading platform, nonslip rubber mats must also be fitted there.

TNL20-9 / TNL20-11

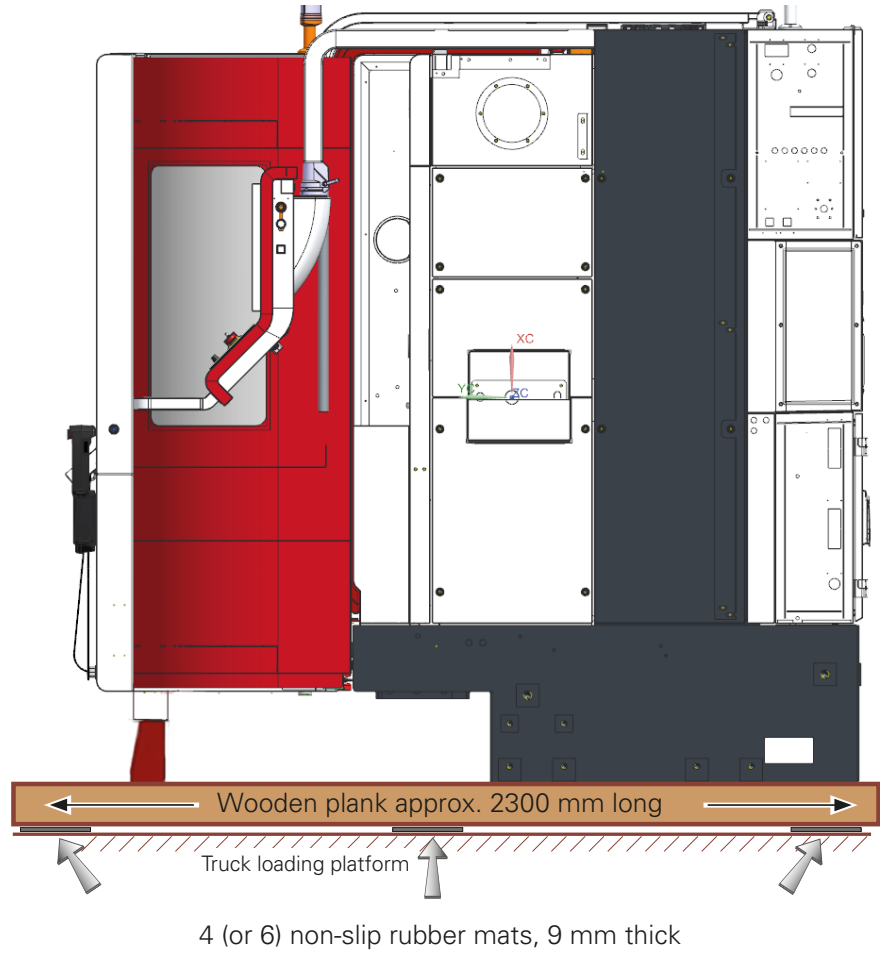
Illustrations show examples



4 (or 6) non-slip rubber mats, 9 mm thick

TNL20 with iXcenter (optional)

Illustrations show examples

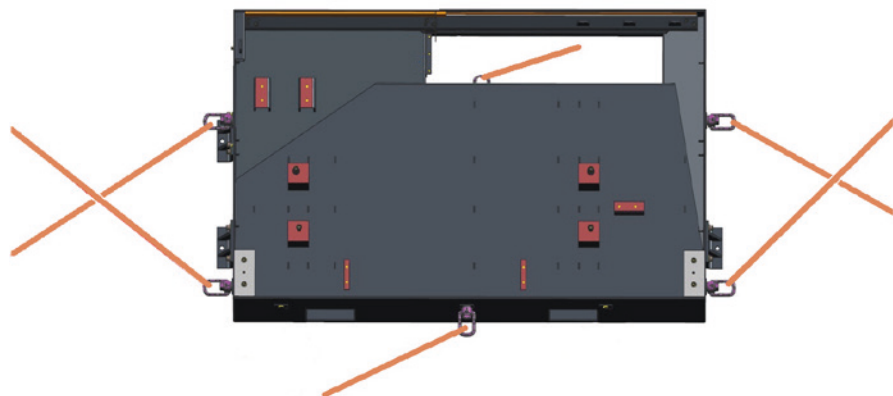
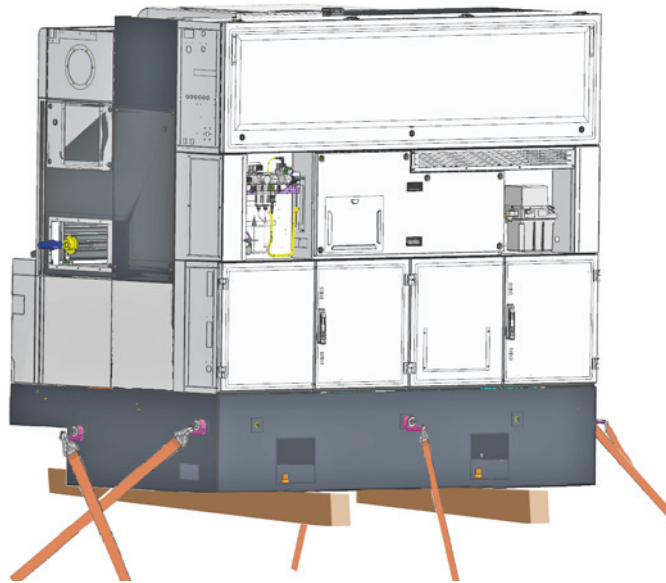


- **Diagonal lashing**

The machine must be diagonally lashed to the loading platform with suitable straps.

For this purpose, 6 rotatable load brackets are to be screwed into the (M24) thread intended for them on the machine base.

Illustrations show examples



Unloading and transporting the machine by forklift



Danger from falling machine/parts

No persons are allowed to remain under suspended loads!



Danger from tilting of the machine!

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

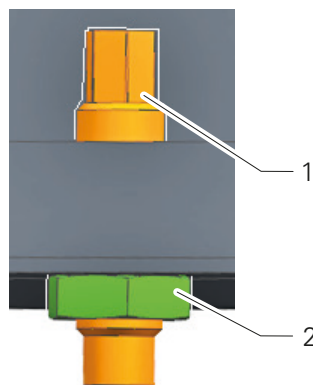
Attention must be paid to the center of gravity of the machine.

- Non-slip mats should be placed on the fork arms when transporting the machine.
- Insert the fork arms in the openings on the control cabinet side of the machine and unload it from the truck.
When setting the machine down, ensure that the fork arms are not tilted, otherwise the planks will break.



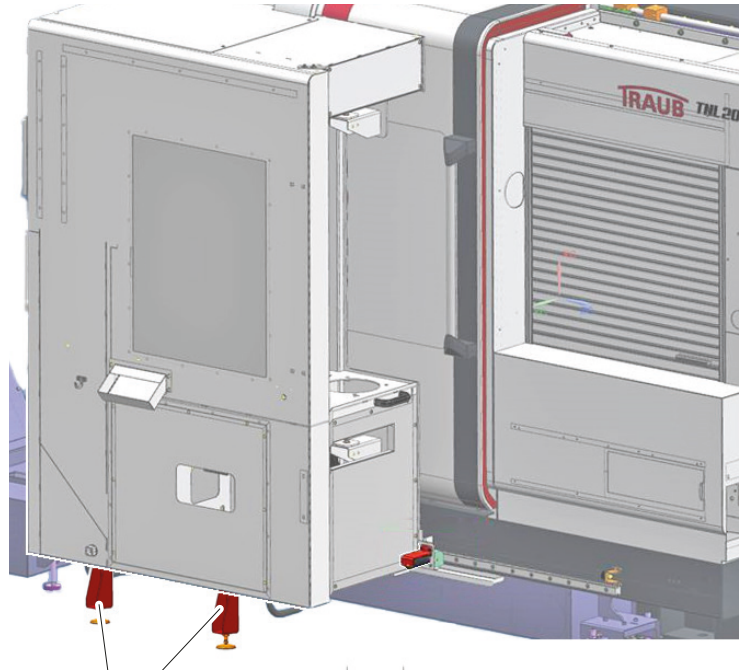
It is advisable to remove the planks from the machine before transporting it further.

- For this purpose, lift the machine slightly with the fork lift truck and support it as appropriate.
- Take out the screws in the planks and remove the planks.
- Next, screw the 4 adjusting screws (1) back in and lightly counter them with the hex head lock nut (2) (the adjusting screws can be found in the accessories in the chip conveyor or the chip tray).



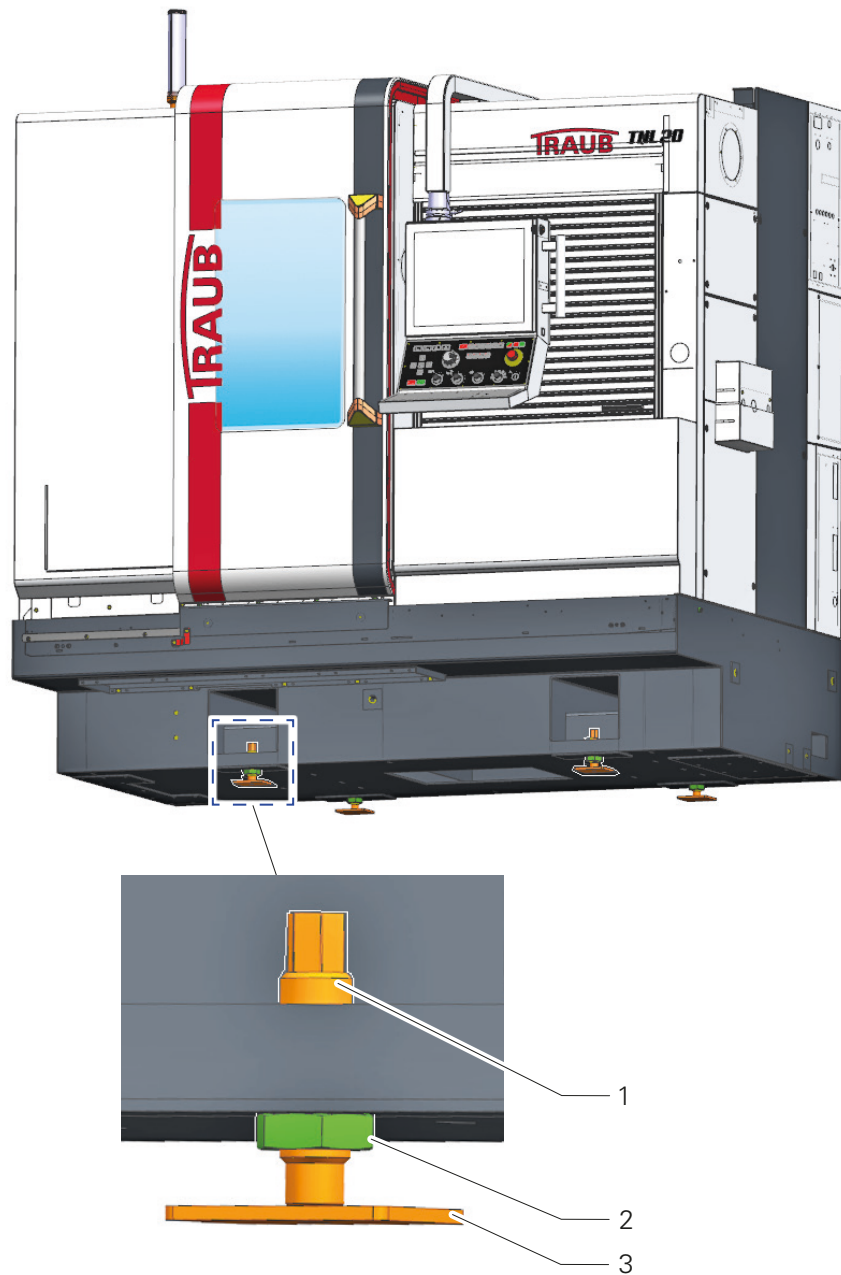


For the TNL20 with iXcenter extension, the 2 transport feet (transport locks) need to be removed.



Remove the tool transport lock P/N 12036622

- Move the machine to the installation site by forklift and place it in the desired installation position.
- Lower the machine so that the 4 footplates (3) can just be pushed under the 4 bearing points. Ensure that the adjusting screws (1) are lined up with the recesses in the footplates.
- Lower the machine slowly and evenly onto the footplates (3).
- Unscrew the hexagon lock nuts (2) from the adjusting screws (1).



See **"Installation of the machine"** for further information.

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 casters only if the ground is absolutely even and horizontal.



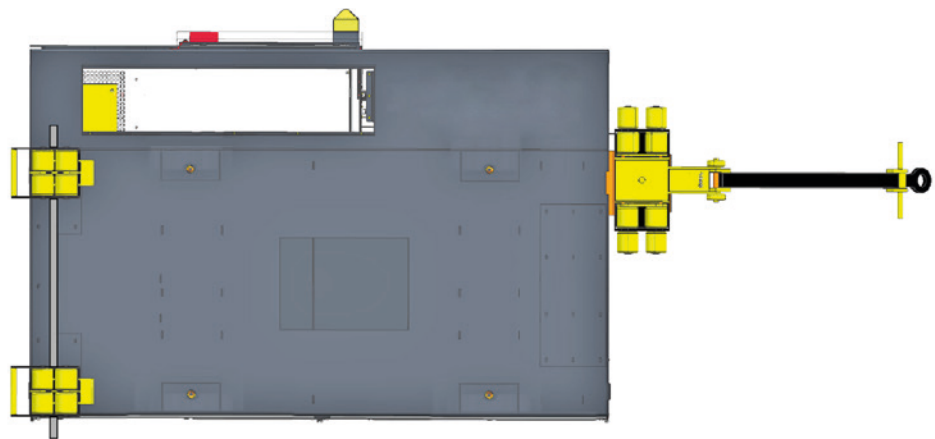
Attaching the transport rollers

The trolleys must always be parallel to the load. Connect the rigid transport rollers with a rod. This will prevent the rollers from slipping when being pulling. Secure the load with suitable straps.



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

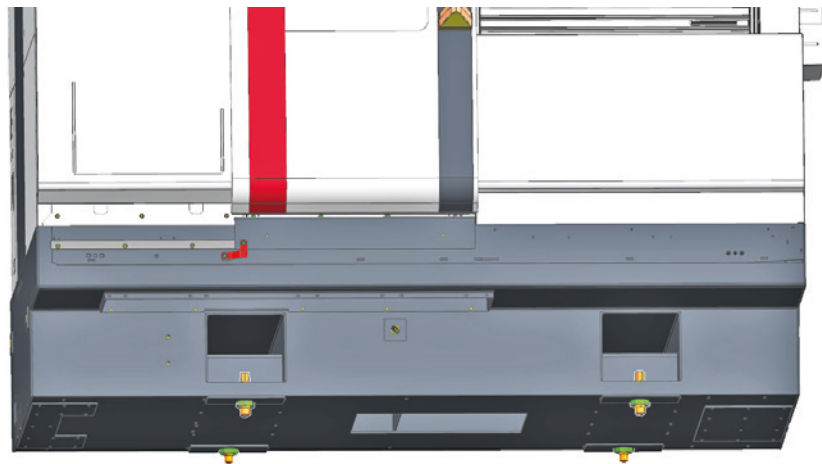
Height	mm	max. 110
Steerable	mm	max. 610 x 520
Capacity	kg	up to 12000

e.g., transport rollers type F6 and L6, by GKS, for loads up to 12 t

After removing the planks, the machine can also be lowered onto rollers and transported to its installation site and/or moved into the position required for installation.

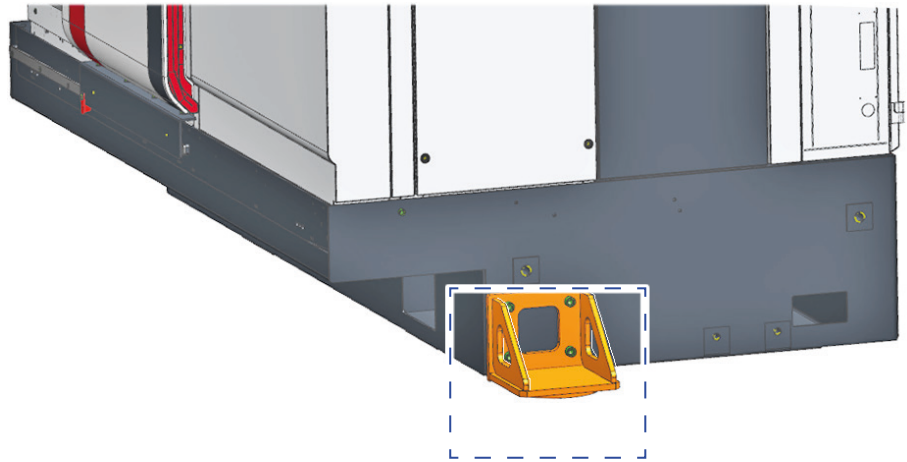
The transport supports necessary for this can be found in the accessories to the machine.

- Screw the 4 adjusting screws (1) in to the same depth and lightly counter them with hex head lock nuts (2) (the adjusting screws can be found in the accessories in the chip conveyor or the chip tray).
Set the machine down onto the adjusting screws (the transport supports must fit under the machine for mounting).
The adjusting screws can be found in the accessories in the chip conveyor or the chip tray.



Mounting transport support

- Attach the transport support with its screws to front right side of the machine.



The transport support is fitted with a profile on its underside for form fitting with the rotary plate of the steering roller.



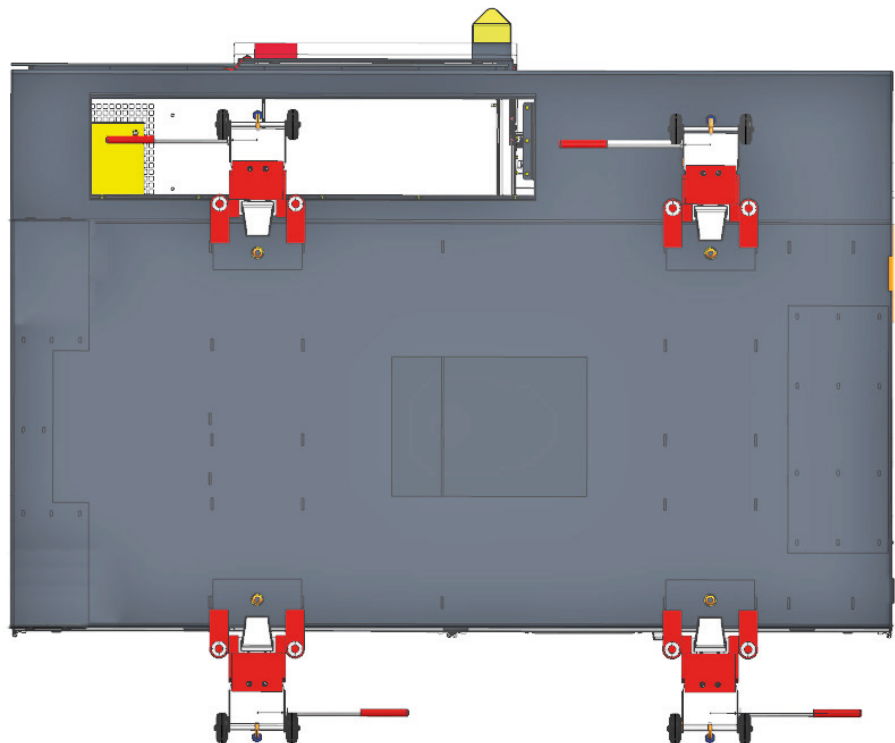
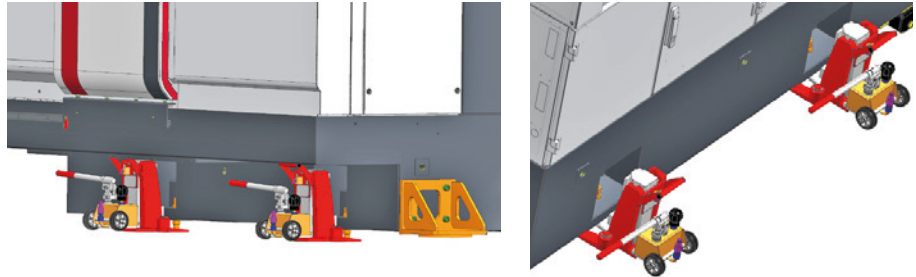
Placing the machine on transport rollers



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

2 or 4 hydraulic jacks are needed to lift the machine.

- Apply the hydraulic jacks in the area of the adjusting screws because the machine base is reinforced there.



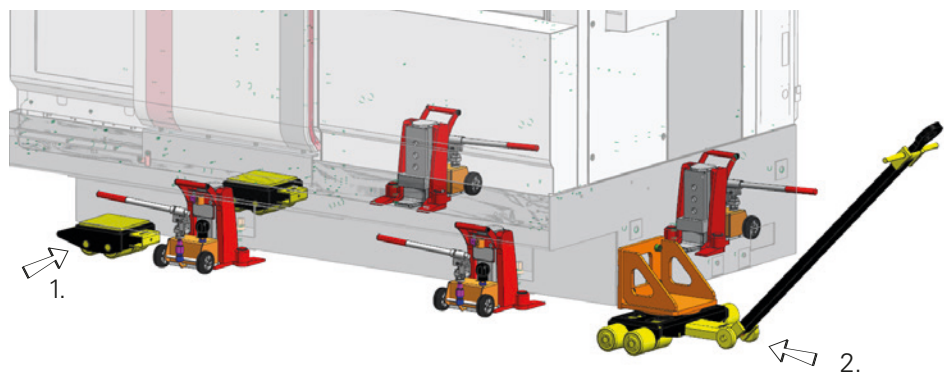
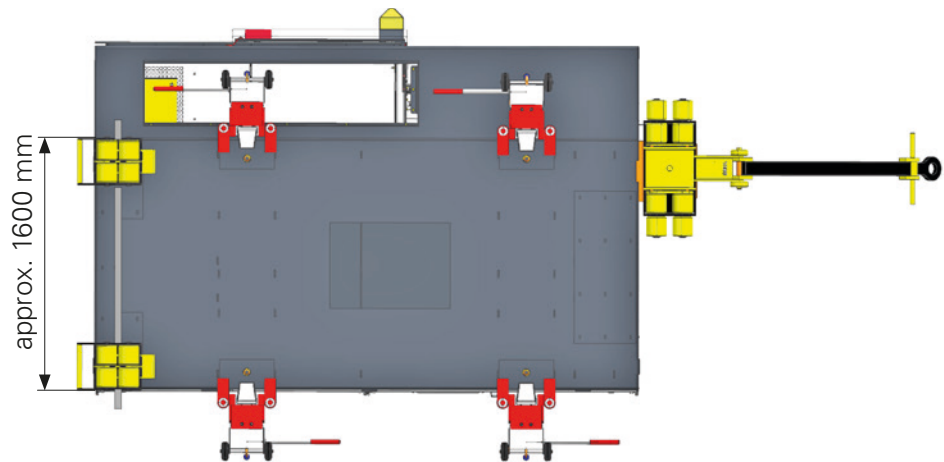
- Lift the machine with the hydraulic jacks..

- First place the rigid transport rollers under the outer corner points of the machine base, then carefully let the machine down onto the transport rollers.



Ensure that the adjusting screws do not make contact with the floor nor graze the floor during transport. Correct the position of the adjusting screws if needed.

- Next, place the steerable transport roller at the appropriate position under the transport support. Carefully let the machine down onto the transport rollers and ensure that the transport support has a form fit with the rotary plate at the center.
- Remove the hydraulic jacks.



Transporting the machine to the installation site

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.

- Apply the hydraulic jacks to the machine as described earlier.
- Evenly lift the machine with the hydraulic jacks.

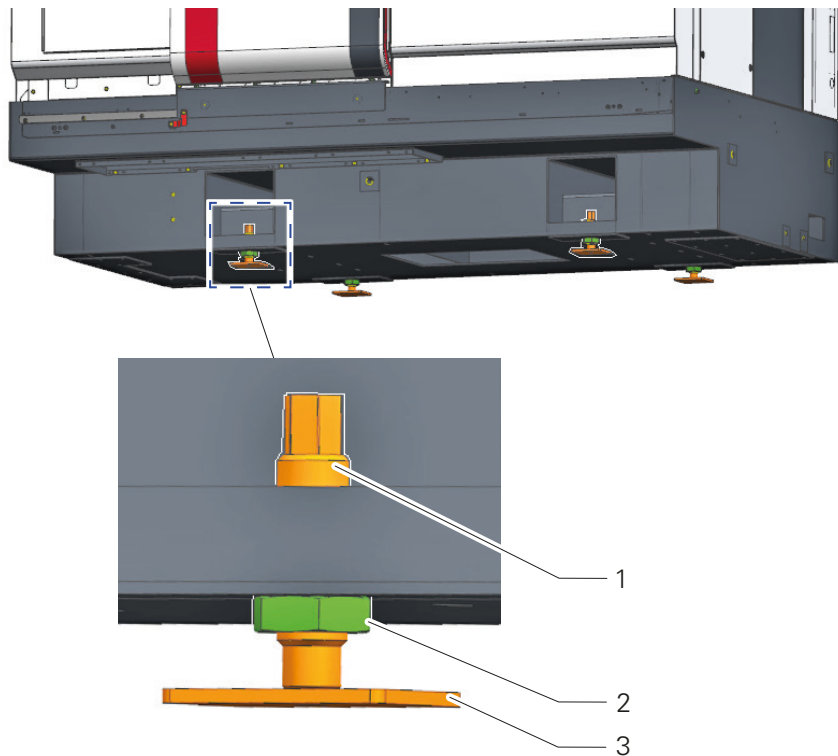


If using 2 hydraulic lifts, first evenly lift the side of the machine with the steerable transport roller until the transport roller can be pulled out.

Set the machine down to the point that the footplates (3) can still be slid under the bearing points / adjusting screws (1).

Ensure that the adjusting screws are lined up with the recesses in the footplates.

- Lower the machine slowly and evenly onto the footplates (3).



If using 2 hydraulic jacks, repeat the process on the side of the machine with the rigid transport rollers.

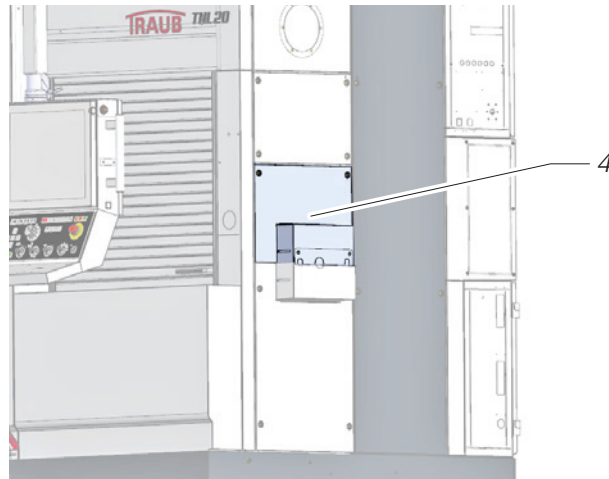
- Unscrew the hexagon lock nuts (2) from the adjusting screws (1).
- Detach transport supports and keep them for any later transport.

Electrical connection

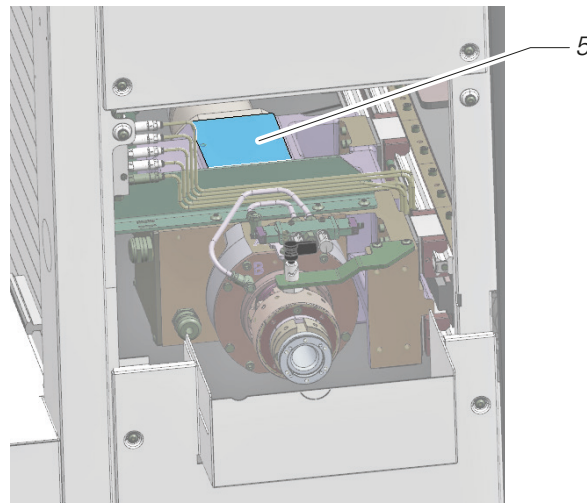
Check the connected load according to the data and conditions in Chapter "Electrical connection".

Aligning and anchoring the machine

- Screw the adjusting screw **D** (bearing points **A-D** see layout and installation plan) upward until it lifts completely off of the footplate.
- Loosen and remove the cover (4).



- Place a spirit level on the bearing surface (5) provided on the main spindle.



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



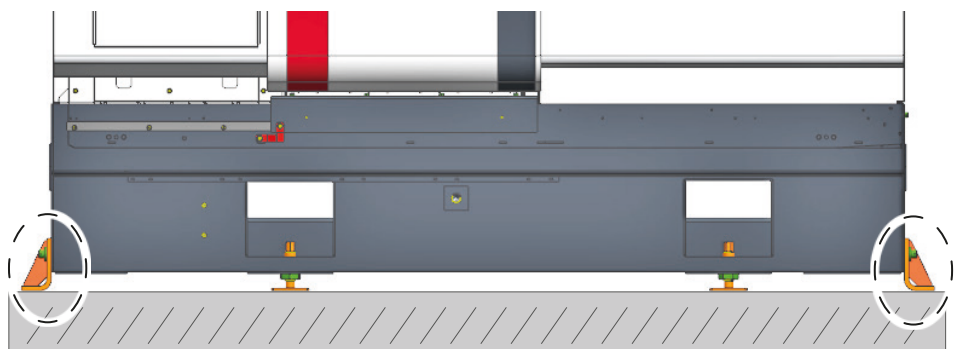
The machine must be adjusted exactly to **1150 mm main spindle height** so that the chip conveyor can be inserted. The maximum permissible deviation is 0.5 mm per 1000 mm

- Tighten the adjusting screw **D**.
- Secure the adjusting screws with the hexagonal nuts
- 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 and drip pan from the machine



All transport locks and the drip pan must be removed before installing chip conveyor or before commissioning the machine.

For the locations of the transport locks, see Chapter **“Preparing the machine for transport”**.



Removing the transport lock, P/N 11096850

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

After removing the transport locks and drip pan, they should be stored in a safe place so that they can be reused (e.g., when transporting the machine again or for decommissioning).

Indicator lamp

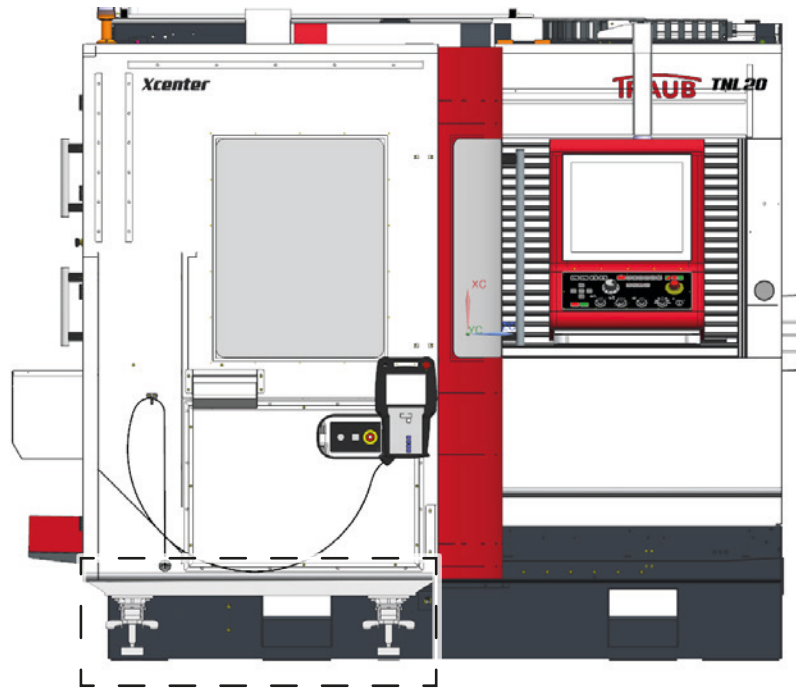
Connect the indicator lamp to the control cabinet if it has been removed during transport.

Operating material

For operating material, see Chapter **Operating material**.

TNL20 with iXcenter (optional)

- Position the iXcenter as required and place it on the floor with the 2 locking feet.



Connecting the machine to central extraction unit

Shutoff damper for fire protection



Operating the machine with cutting oil

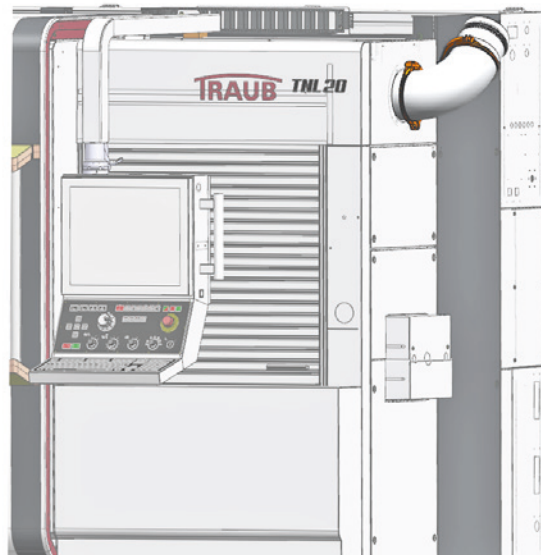
When operated with cutting oil, the machine is fitted as standard with a shutoff damper for fire protection.



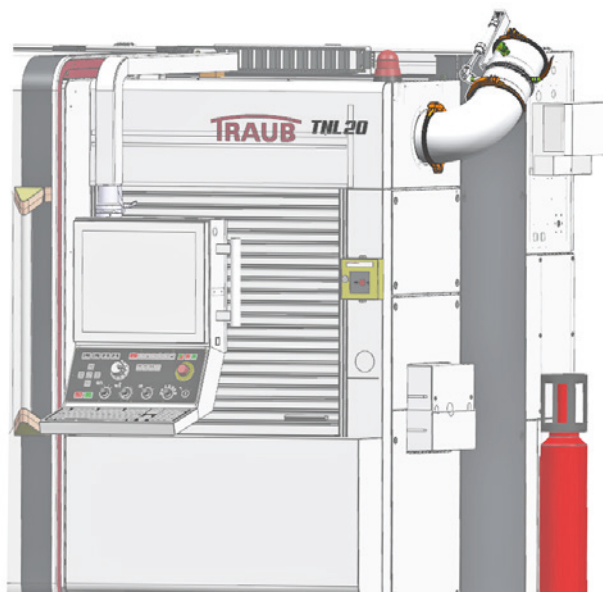
Operating the machine with emulsion

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

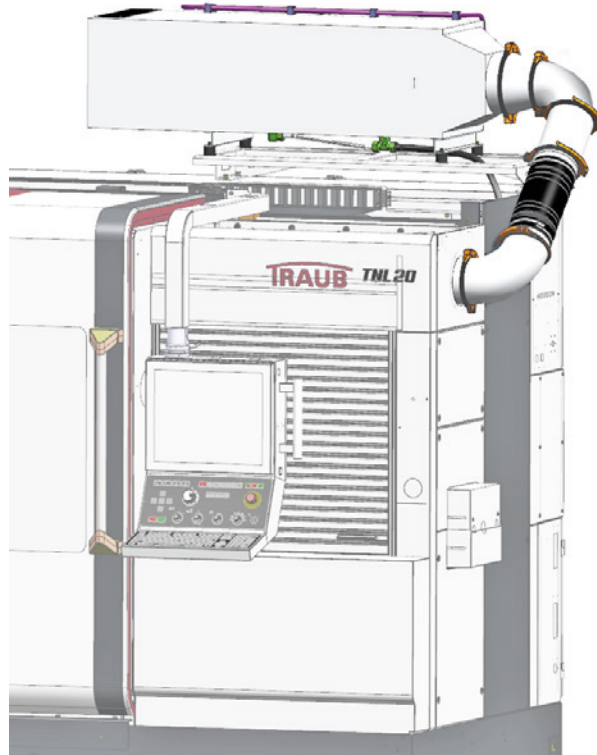
Mechanical preparation for central and decentralized extraction system without a shutoff damper / without a fire protection system



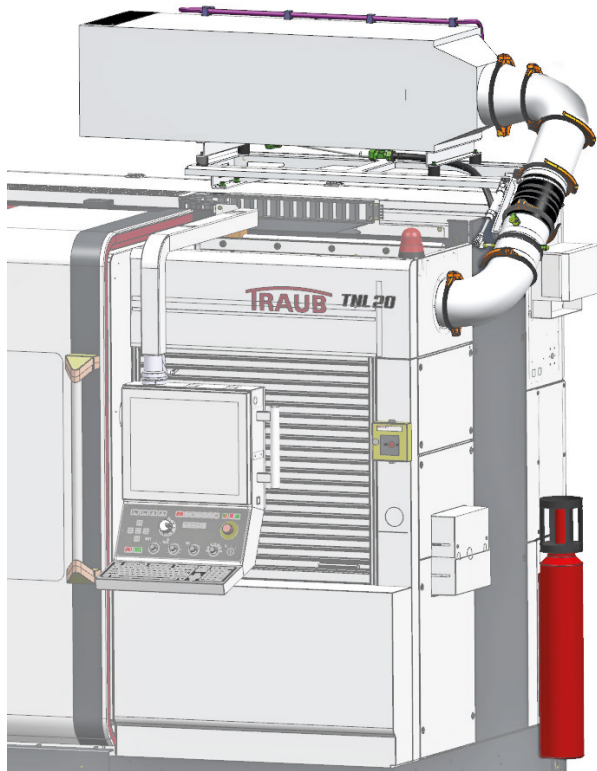
Mechanical preparation for central and decentralized extraction system with a shutoff damper / with a fire protection system




Attachment of decentralized extraction system without fire protection system




Attachment of decentralized extraction system with fire protection system / shutoff damper

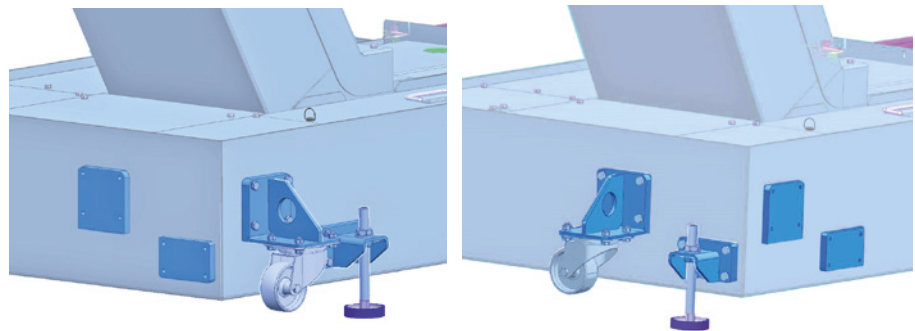


Transport and installation of the chip conveyor and chip tray

 **Follow the manufacturer's documentation.**

- Transport the chip conveyor and chip tray to the machine, then lift them off the pallet and set them down with the aid of suitable hoisting gear.
- 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 might be changeable depending on the variant 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.




Installation of chip conveyor

(Refer to the illustrations overleaf)

- From the operating side, push the chip conveyor under the machine as far as possible, then slide it to the right as far as possible.

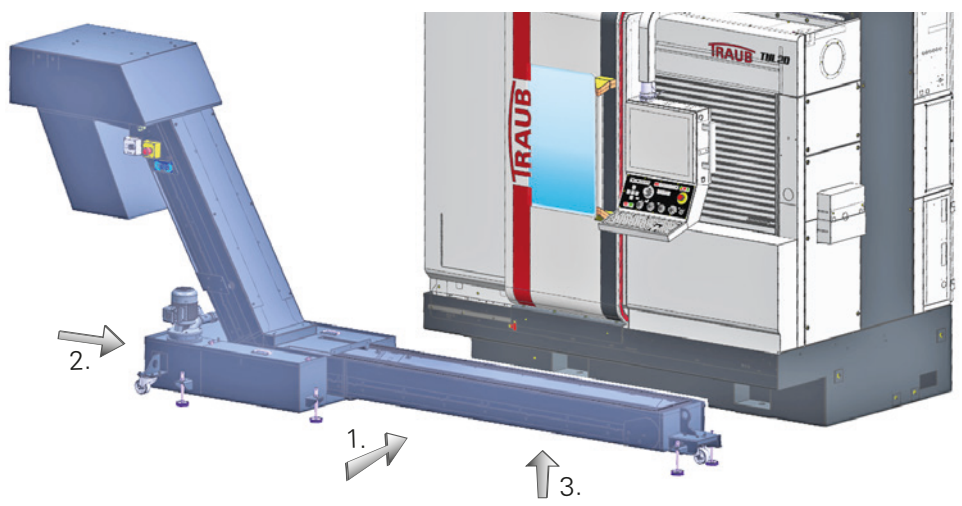
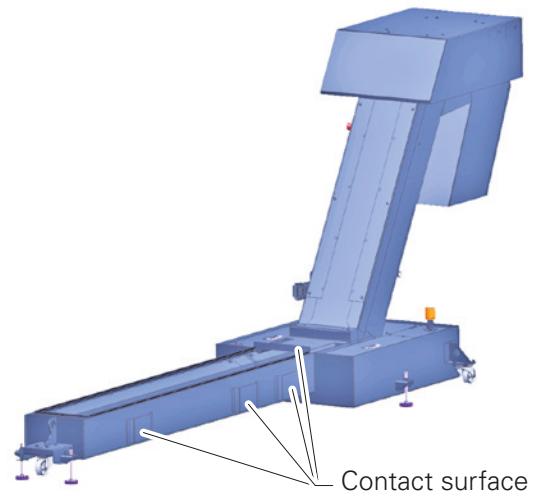
For custom applications on the left

For custom applications, the chip conveyor can be moved up to 600 mm to the left (such as 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 resultant opening.

- Lift the chip conveyor at the 4 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.

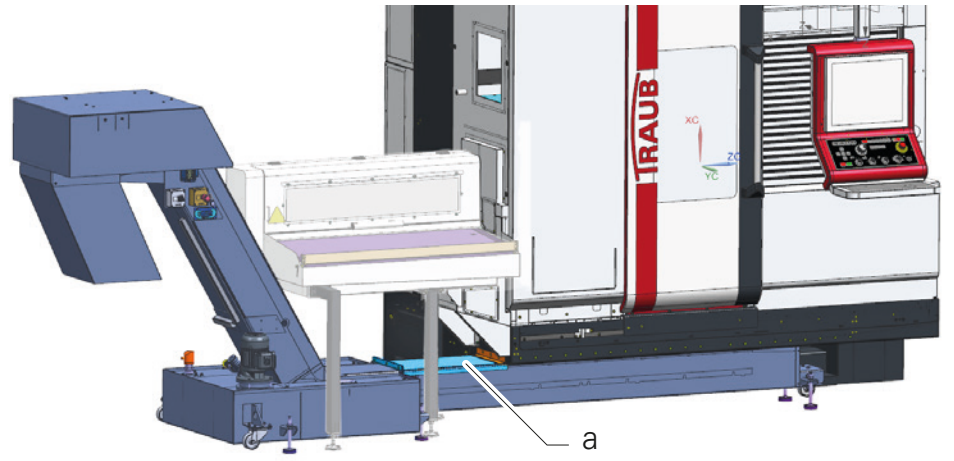
Installation of chip conveyor



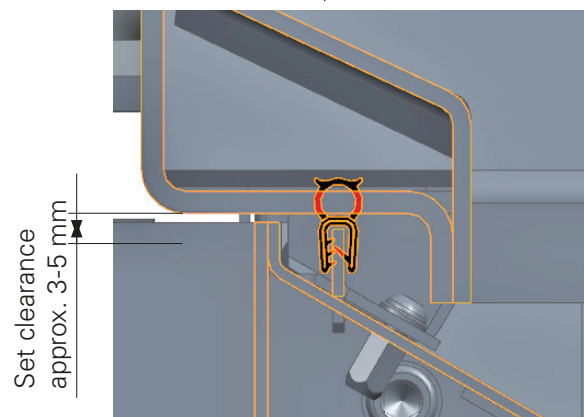
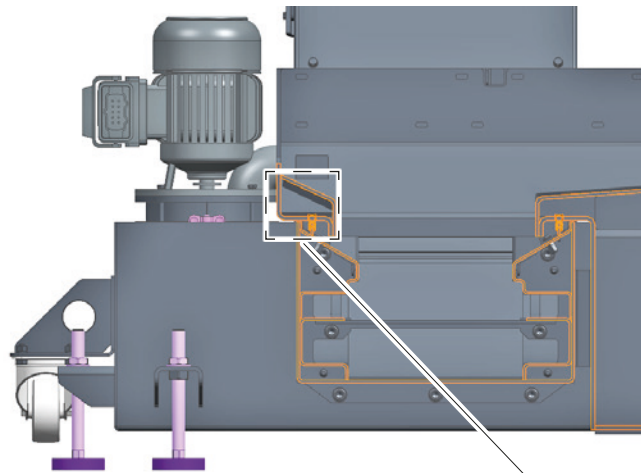
For custom applications on the left

- 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 (a) from above.

Example shown



Sealing between chip conveyor and machine



Fitting the chip tray (optional)

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

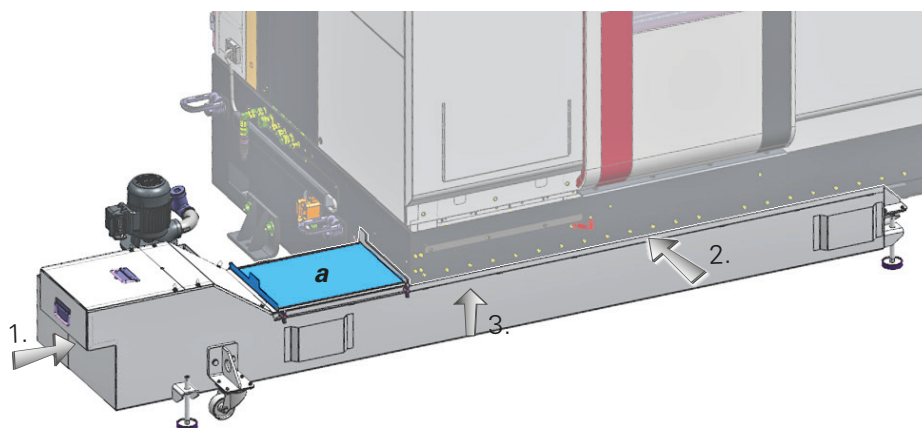


Fitting from the right is possible (custom installation). Special actions might be needed in the area of the bar loading magazine.

- Fitting the chip tray

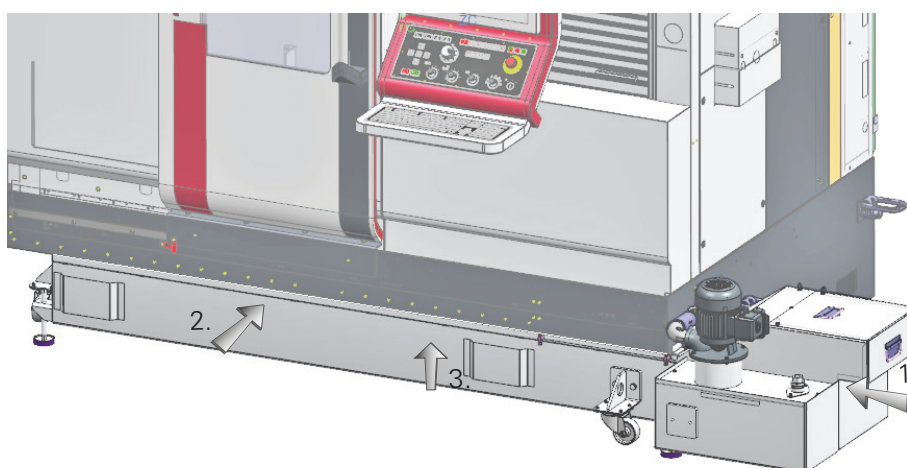
From the left (standard)

Installation can also be with the cover and spacer plate (a) fitted provided other fittings are provided on the left. The cover and spacer plate (a) is fitted from above with 4 butterfly screws.



From the right (custom installation).

Special actions might be needed in the area of the bar loading magazine. The cover and spacer plate is not fitted.

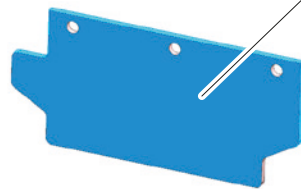
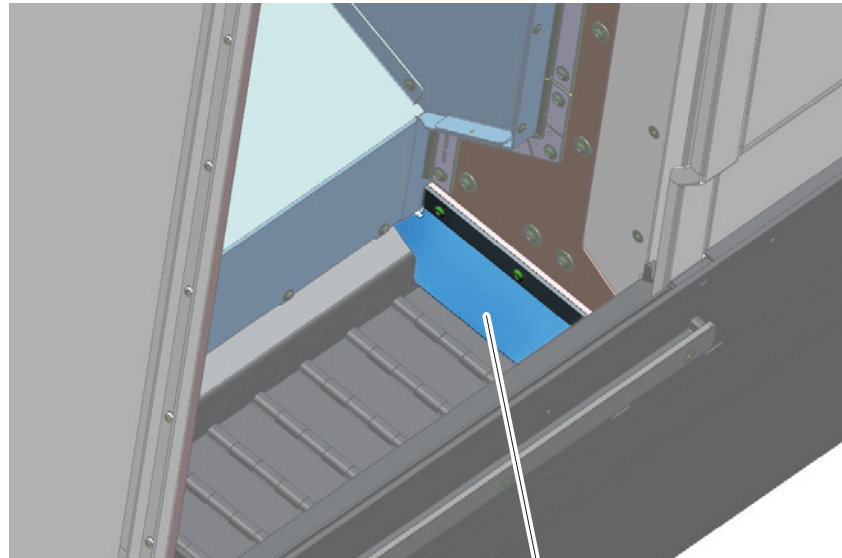


- Push the chip tray in as far as it goes.
- Adjust the feet by the same amount until the gap between the machine and chip tray is 2 mm all the way round.

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



Splash guard plate

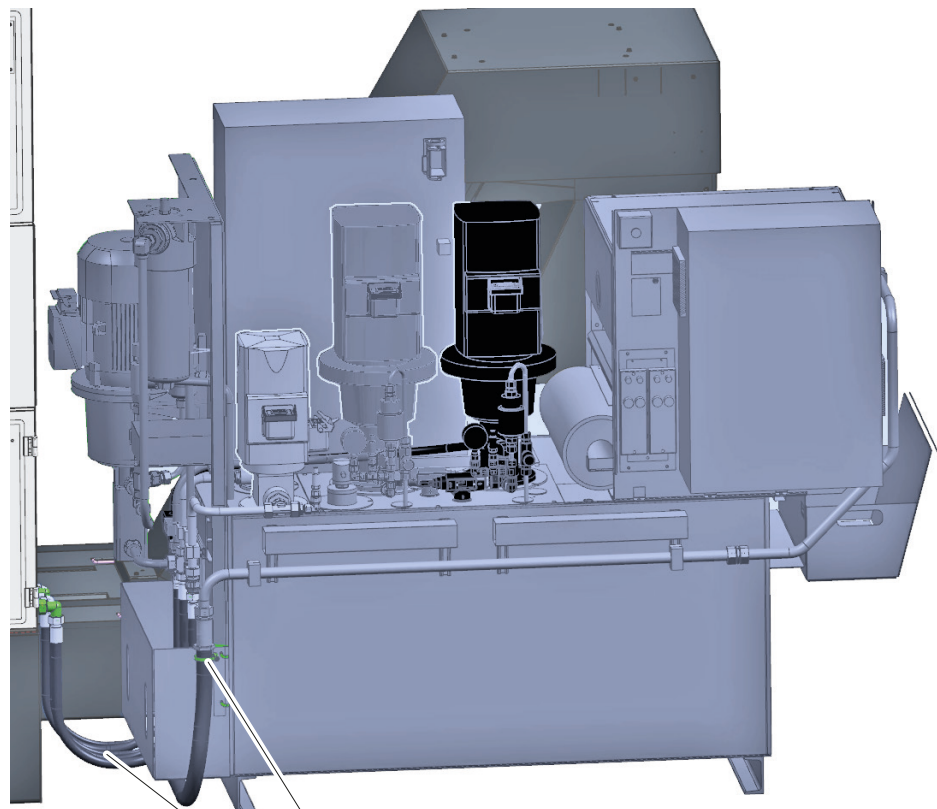
Installing the cooling lubricant system



Follow the manufacturer's documentation.

- Transport the cooling lubricant system to the machine and lift it off the pallet using suitable lifting gear.
- Position the cooling lubricant system at the machine according to the installation plan.
- Remove the blanking plugs from the connection kits and connect the connection kits to the machine and cooling lubricant system according to the marking.
- Connect the hose of the lifting pump of the chip conveyor.
- Electrical connection of the cooling lubricant system

Example shown

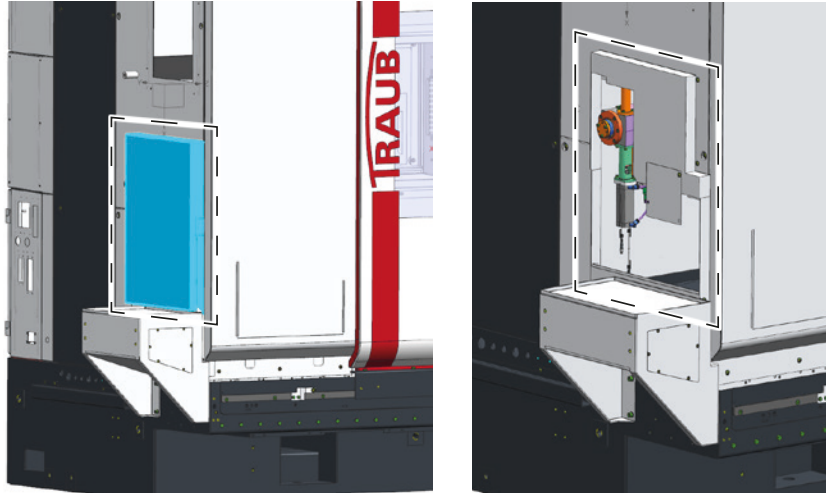


Hose from lifting pump for chip conveyor

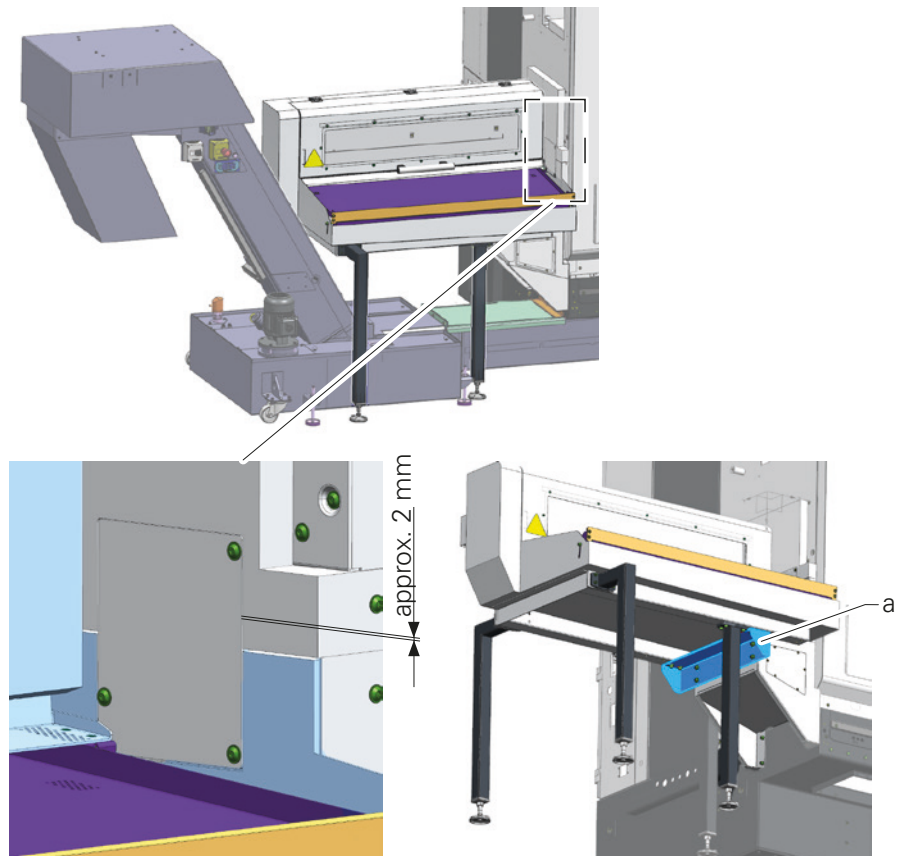
Connection kits

Workpiece removal through counter spindle

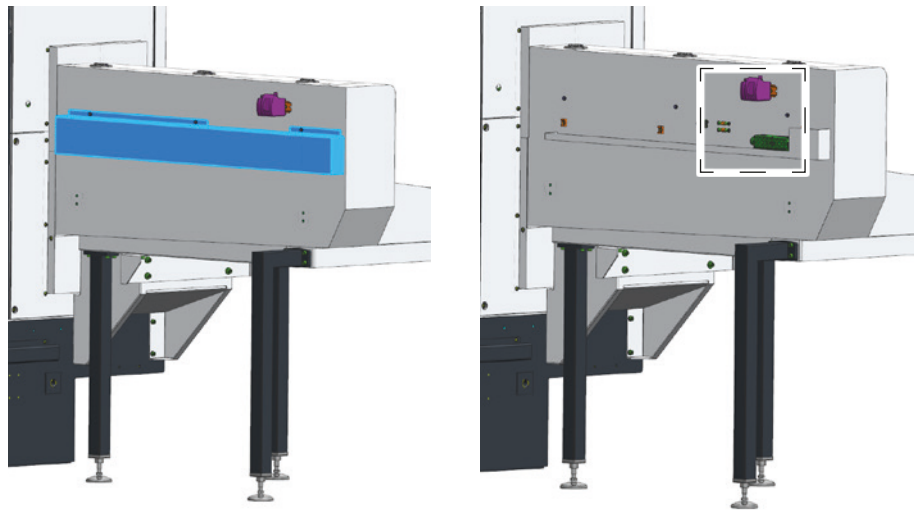
- Move the workpiece removal unit for removing workpieces through the counter spindle to the machine and lift it from the pallet using suitable lifting gear.
- Detach the cover from the side of the machine.



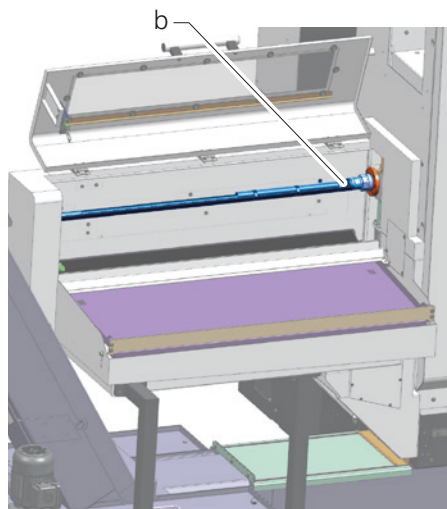
- Position the workpiece removal unit through the counter spindle at the machine as in the installation plan, align it and screw it onto the machine at angle (a).



- Remove the cover on the back and establish the pneumatic and electrical connections of the workpiece removal unit at the interface provided.



- Remove the cover on the back and establish the electrical connection of the workpiece removal unit at the interface provided.
- Fit the half-shell (b) required for the workpiece removal unit (refer to documentation "*Workpiece removal through the counter spindle*").



The two front adjustable feet of the finished part chute can be removed for a short time to fit and remove the chip conveyor / chip tray (for cleaning work, for example).

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 electrical 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 feeder to the main switch on the control cabinet can be routed from above or through a duct in the base of the control cabinet.



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

Overview of operating materials



For all work in connection with operating fluids, the information in the datasheets of the respective manufacturers and the information in the document **Notes on Operating Materials** must be observed.

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

	Amount [liter]	Description	Initial start-up
Central lubrication	3		Prefilled by the machine manufacturer at the factory
Cooling (spindle)	5.5 - 7.5		Prefilled by the machine manufacturer at the factory
Compressed air	See Chapter "Pneumatic connection".		To be provided by the customer

Provision of compressed air



For all work in connection with operating fluids, the information in the datasheets of the respective manufacturers and the information in the document **Notes on Operating Materials** must be observed.

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. 300 NI/min is set for a standard 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.



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



- Switch on the NC controller from the machine operating 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.



- Switch on the drives.

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