

# Transport, Installation, Start-up

**G220**

## 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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## Safety information

### Notes on Transport, Installation, Start-up



Use only suitable hydraulic jacks or a forklift to lift the machine. Use appropriate transport or armored rollers with adequate carrying capacity for transport. Transporting by crane is not possible!



If the door to the work area is open, the door safety interlock will remain open after disconnecting the power supply line.



Transport locks can be identified by their red paint-coat.

**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.**

**They must not be sent back to INDEX.**

Before commissioning the machine all shipping brackets must be removed.

Save the brackets for future machine transport.

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 documents 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 stand under suspended loads.**

Machines must be transported by authorized and qualified personnel only.

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

Slopes and gradients (driveways, ramps, etc.) are particularly dangerous. Use extra care if such passage-ways 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 chart in Chapter "Working Documents".

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 options or accessories, or in the corresponding machine installation chart in Chapter "Working Documents".

### Transporting and Lifting Aids

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

## 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 chart applicable for this machine was already submitted for approval after contract award. Upon delivery of the machine, it is included in the working documents on the supplied documentation CD.

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

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

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?

Proper planning will pay off!

## Appropriate Transporting and Lifting Aids

- Forklift
- Transport trolley
- Transport casters
- Armored casters
- Hydraulic jack
- Forklift truck (only for separate units).

## 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 containers, chip trolleys, tool trolleys, etc.

Use the machine installation chart in Chapter “Working Documents” to determine the required space.

Chapter “Working Documents” also includes specific installation charts for additional equipment such as bar feeders, bar loading magazines, etc.

## Soil, Foundation

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

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

Bar guides, bar feeders, and bar loading magazines must generally be anchored in the foundation (for information, see the associated operating instructions and the machine installation chart in Chapter “Working Documents”).

## Environmental Conditions

See Environmental Conditions in the document “Safety instructions”



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

## Power Supply



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

The power supplies for the programmable logic controller (PLC) and the numerical control (NC) require stable mains conditions, i.e., the max. allowed operating voltage fluctuations are +10% or -10%.

The supply feeder must comply with the regulations of the responsible power supply company and the IEEE directives. For further information, see the machine installation chart in Chapter "Working Documents".



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

## 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 before the pre-transformer, i.e., on the primary side.

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

The values for:

- Machine connection,
- operating voltage,
- main circuit breaker

are indicated on the name plate or the wiring diagram.

## External Data Transfer



**Data lines must not be routed directly next to power lines.**

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

### Compressed-Air Supply



Observe the max. allowed connection pressure for the machine. See the pneumatic diagram in Chapter "Working Documents".

Machines equipped with pneumatically actuated components require a compressed-air supply with the following capacity:

- Operating pressure .....6-10 bar
- Air demand..... depending on the machine equipment
- Required air flow for window cleaning .....approx.. 1000 l/min – 60 m³/h



If the machine is equipped with window cleaning, ensure a sufficient cross-section of the compressed air supply lines on site due to higher compressed air consumption. Both pneumatic supplies on the machine can be used for this.

For the air supply on the machine, see the machine installation chart in Chapter "Working Documents".

### Pressure accumulator

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

Before start-up of the machine, all pressure accumulators must be filled with nitrogen (N<sub>2</sub>) by a specialist. The prescribed pressures must be observed.

For the prescribed pressures, see the hydraulic diagrams in Chapter "Working Documents".



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

## Operating Fluids to be Provided

- Hydraulic fluid <sup>1)</sup>
- Lubricating oil <sup>1)</sup>
- Approx. 1 kg of high-performance grease for chuck
- Cooling lubricant

For the appropriate types of lubricating oil, hydraulic fluid, grease, and cooling lubricant, see the Chapter “Notes on Operating Materials” and “Hydraulic Diagrams and Machine Installation Chart” in Chapter “Working Documents”.



**Caution:**

Be sure to use only hydraulic fluid according to ISO 4406 having a purity grade of 15/12 (10 µm absolute).

Hydraulic fluid: HLP 32; HLPD 32; VG 32.

Lubricating oil: CG 68; G 68

For cooling the spindles, only oil according to ISO VG 5 is used.

<sup>1)</sup> The machine is delivered with a full tank.

## Pumps and Tanks

Changing the hydraulic fluid and cooling lubricant is part of the periodic maintenance tasks.

To fill the machine's hydraulic fluid tank with hydraulic fluid, a pump with a 10 µm fine filter (absolute) is required that may be used for this purpose only.

A simple pump is sufficient to extract the used hydraulic fluid or 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.

## Chip Removal

If the machine is equipped with a chip conveyor, a chip trolley, its height matching the chip conveyor's dropping 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.

This will protect the environment and save cost.

## Disposal of Used Operating Materials

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 Waste Water Regulations



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

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.

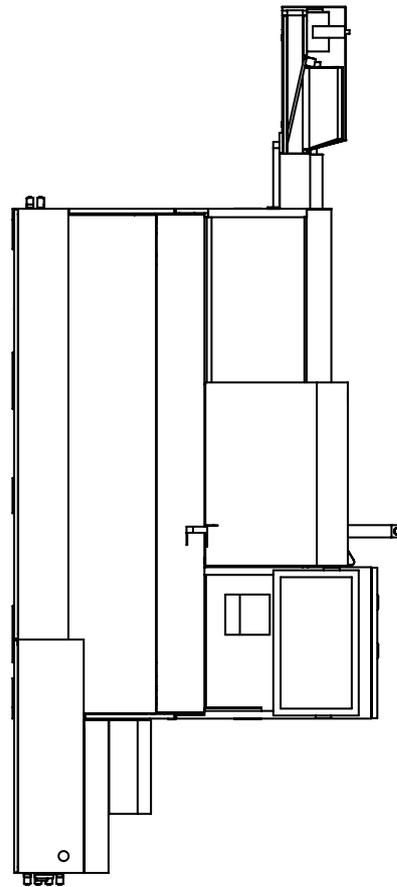
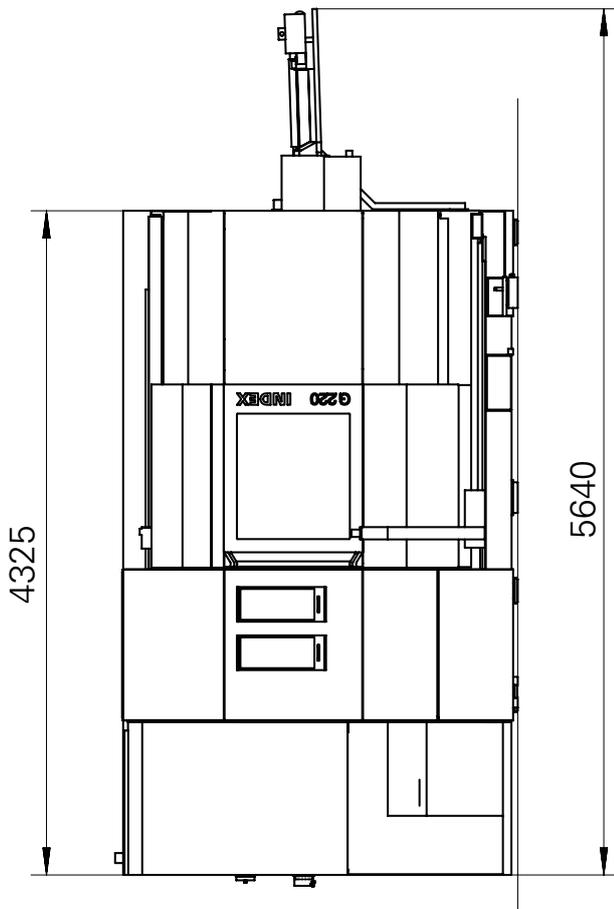
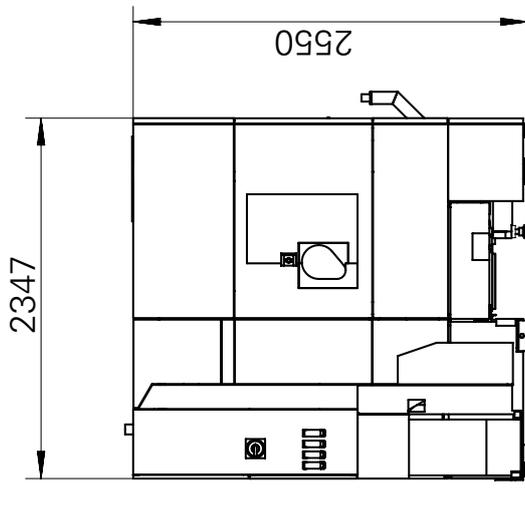
Therefore, the machine must be installed in a place that excludes any harm by these substances to waters or ground water.

### Possible preventive measures:

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

## Transport

### Transport Chart (Without Transport Means)



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Display of a machine in standard version.  
Check the currently valid installation chart!



## Delivery

### Machine

The machine will be delivered by a truck.

#### **The machine will be in the following condition when delivered:**

- The hydraulic fluid and lubrication oil tanks will be full.
- The cooling lubricant tank will be empty. (The machine has a chip conveyor with an integrated cooling lubricant tank or a separate coolant cleaning system. The chip conveyor and coolant cleaning system are separate units.)
- Certain moving parts on the machine, such as sliding covers and the swiveling operating panel, are secured by transport locks or were removed.
- Protruding machine parts hampering the transport may have been removed.
- All blank parts of the machine were treated by spray-covering with an anti-rust agent.

### Other Separate Units

Certain options or accessories such as chip conveyor, bar feeder, bar loading magazine, etc. are usually separate units.

Chip conveyors usually rest on a transport base for shipping.

The bar feeder and bar loading magazine are delivered in a special shipping crate.

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

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

Have the carrier confirm any damage or missing parts on the bill of lading or delivery note.

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

Inform **INDEX** or the **INDEX** representative.

# INDEX G220

## Transporting the Machine

# INDEX

Kunde: \_\_\_\_\_  
Projekt.-Nr.: \_\_\_\_\_ Masch. Nr.: \_\_\_\_\_

**Machine mass**  
**approx. 14,000 kg**

## Transporting With Transport Casters and Forklift



The machine is transported with a forklift and transport casters or armored rollers.

For internal transport, the machine is prepared and placed onto transport casters or armored rollers. Use adequate hydraulic jacks or a forklift to lift the machine.

To lift the machine with a forklift, use only the recesses (X in Figure 2) on the rear of the machine.

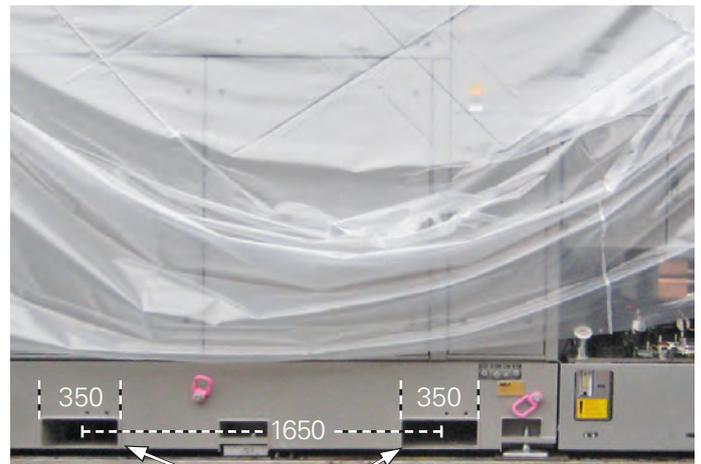
The steering caster of the transport casters or armored rollers are on the right side of the machine as viewed from the control panel.

Fig. 1



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Fig. 2



DIE012ZZ\_16\_2.tif

Fig. 3



DIE012ZZ\_16\_1.tif

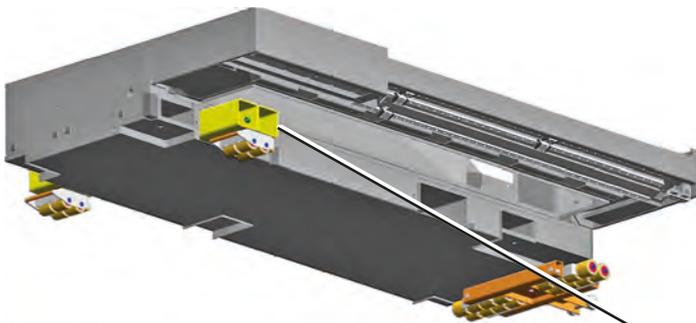


Due to the machine's high center of gravity, we stipulate transporting with transport casters only on absolutely even and horizontal ground.



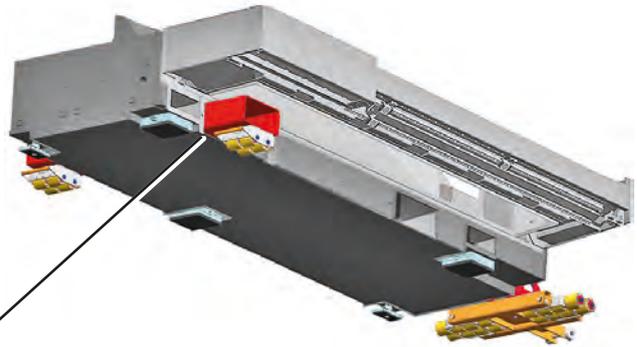
**INDEX** uses plastic plates or Teflon plates to bridge slightly uneven points and to reduce the rolling resistance. This applies in particular to transporting on irregular or soft grounds such as industrial parquet floors or rubber or PVC-based floor covers.

### Up to machine 15



DIE012ZZ\_03.tif

### Machine 16 and higher



DIE012ZZ\_40.tif

Y

## Working with Hydraulic Jacks



Always apply the hydraulic jacks only where indicated (Fig.). It may be necessary to remove the guide panels near the chip conveyor opening.

Be sure to provide for a three-point support when lifting or lowering the machine with hydraulic jacks: two transport casters or armored rollers or supporting on the floor on one side, hydraulic jacks on the other side.

Always lift the machine with hydraulic jacks on one narrow side only. The other narrow side must rest on the transport means or on the floor.

Do not lift the machine more than absolutely necessary.

As the center of gravity is not in the center of the machine, if 2 hydraulic jacks are used, each hydraulic jack should have a minimum capacity of 1/3 of the machine mass.

If only one hydraulic jack is used, it should have a capacity of at least 2/3 of the machine mass.

The locations shown for the hydraulic jacks must absolutely be observed. The supporting points for the transport casters can be recognized by additional welded steel plates.

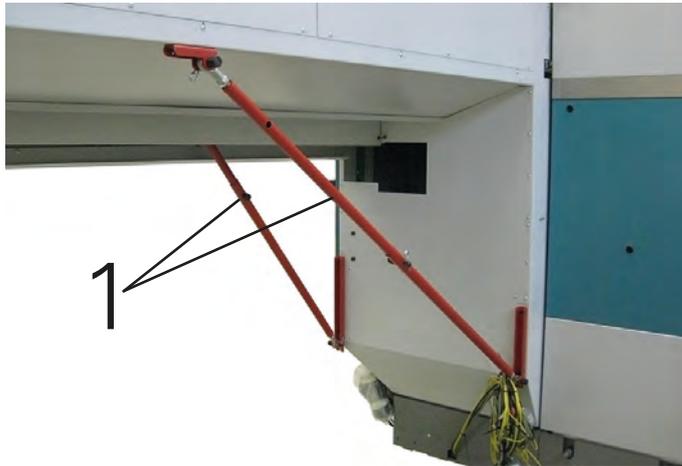
When attaching the transport carrier (Y), be sure to insert anti-slip mats between the insert location in the machine bed and the transport carrier.

## G220 with WHX



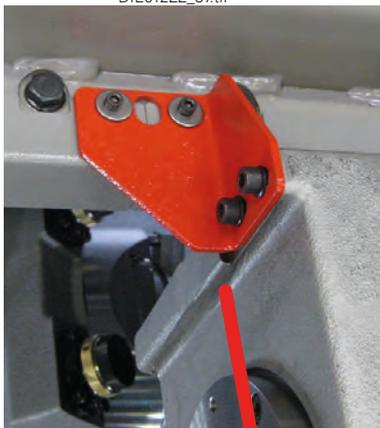
### Caution

When transporting the machine with a handling system, two supports (1) must be mounted. Only then, the support leg of the handling system is removed.

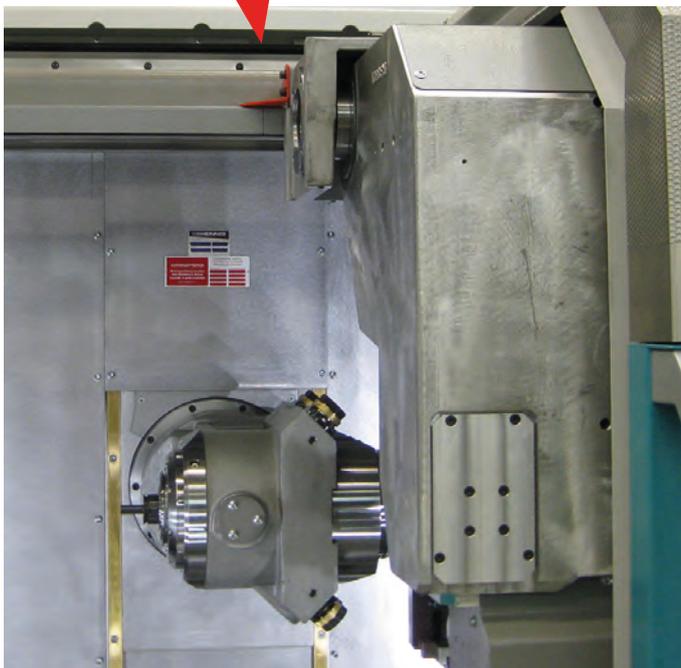


DIE012ZZ\_57.tif

### Transport lock WHX



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DIE01277\_60.tif



DIE012ZZ\_58.tif



DIE012ZZ\_59.tif

For transport on a truck, the support leg (2) must be installed as well.

## G220 with WHX from 05/2018



**Caution!**  
When transporting the machine again with a handling system, two transport supports (1) must be fitted using the brackets (2) before lifting the machine.  
The supports (3) of the handling system can then be removed.



Once the machine is in its final installation site and leveled, first fit the handling supports (3).  
Then remove the transport supports (1) and the corresponding brackets (2).

Fig.: 1

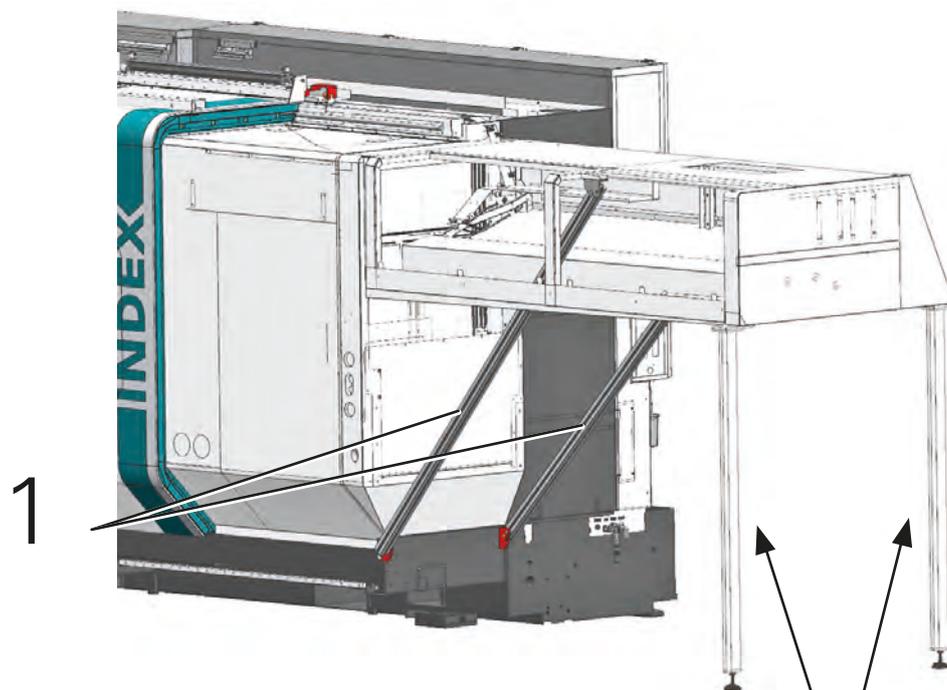
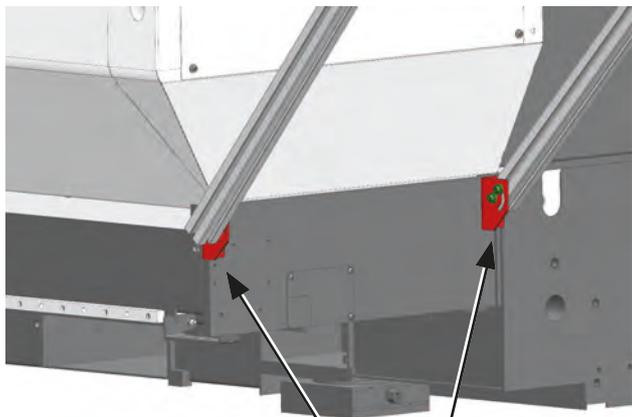


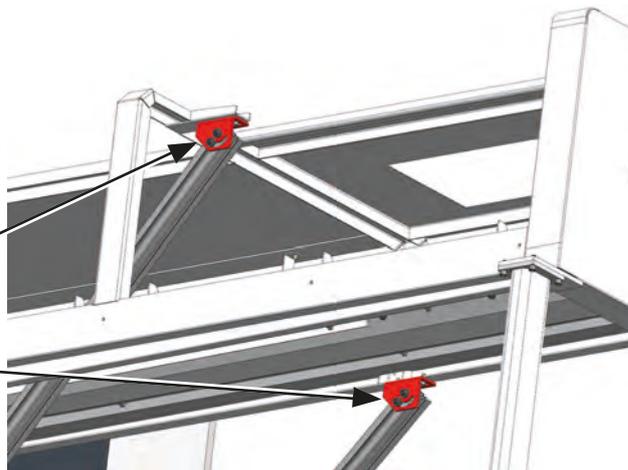
Fig.: 2

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DIE012ZZ\_68.tif

Fig.: 3



DIE012ZZ\_69.tif

2

3

## Lifting and Lowering the Machine with Hydraulic Jacks

The figure below shows the locations where the hydraulic jacks and transport casters must be positioned on the machine frame.

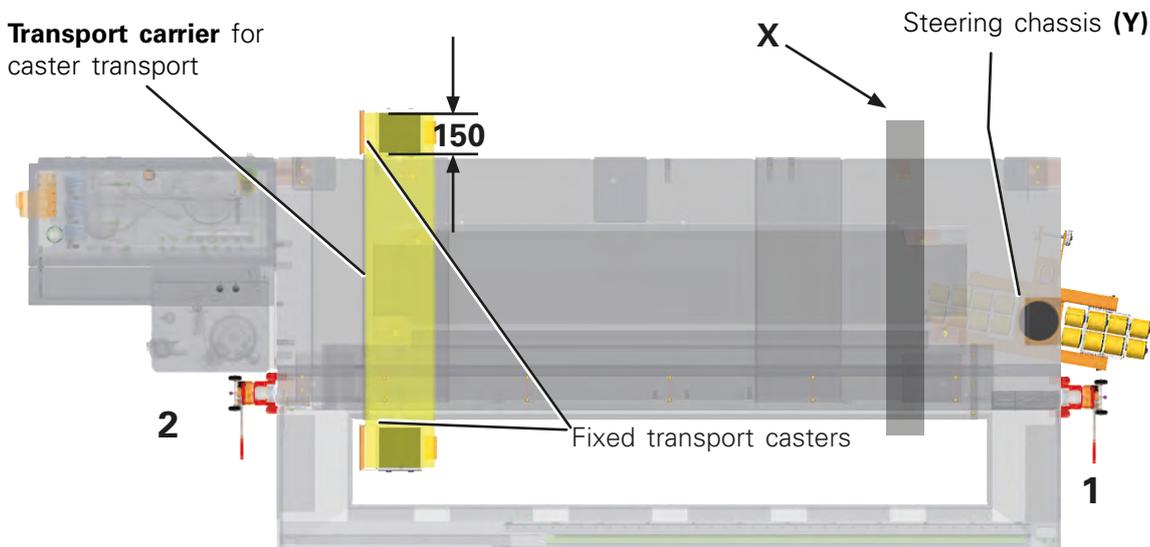
### Lifting:



This procedure applies in principle also to lowering the machine after the transport using casters - only in reverse order.  
Be sure to observe the respective figures "Up to Machine 15" and "Machine 16 and higher".

### Procedure:

- Attach jacks 1, 2 (Figure Positions for hydraulic jacks and transport casters)
- Insert transport carrier (pay attention to insert dimension 150)
- Lift jack 2 max. 50 mm and prop up transport carriers (place suitable timber underneath and secure)
- Lift jack 1 at least 100 mm
- Place wooden beams (X) (100 mm x 100 mm) underneath
- Lower jack 1
- Lift jack 2 and push fixed transport casters with quick-release axle into position
- Lower jack 2
- Lift jack 1 and move steering chassis into position (Y).  
(The steering chassis may have to be inserted at an angle due to the position of the hydraulic jack)
- Lower jack 1 again

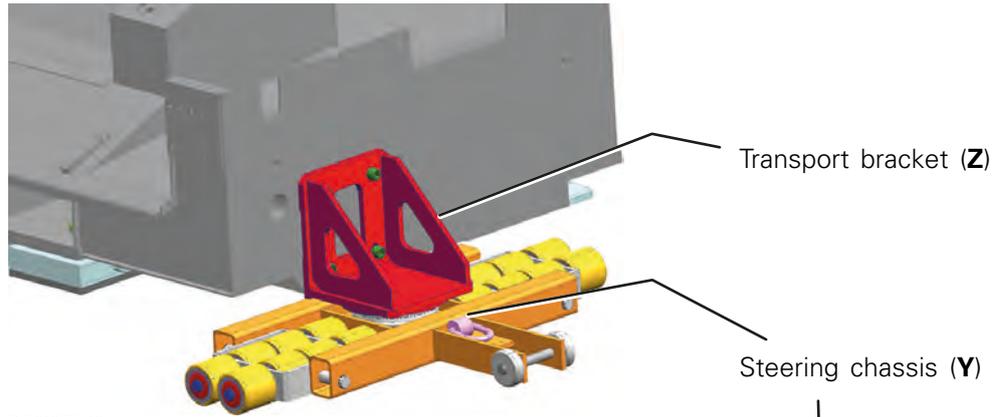


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Fig. Positions for hydraulic jacks and transport casters (Up to Machine 15)

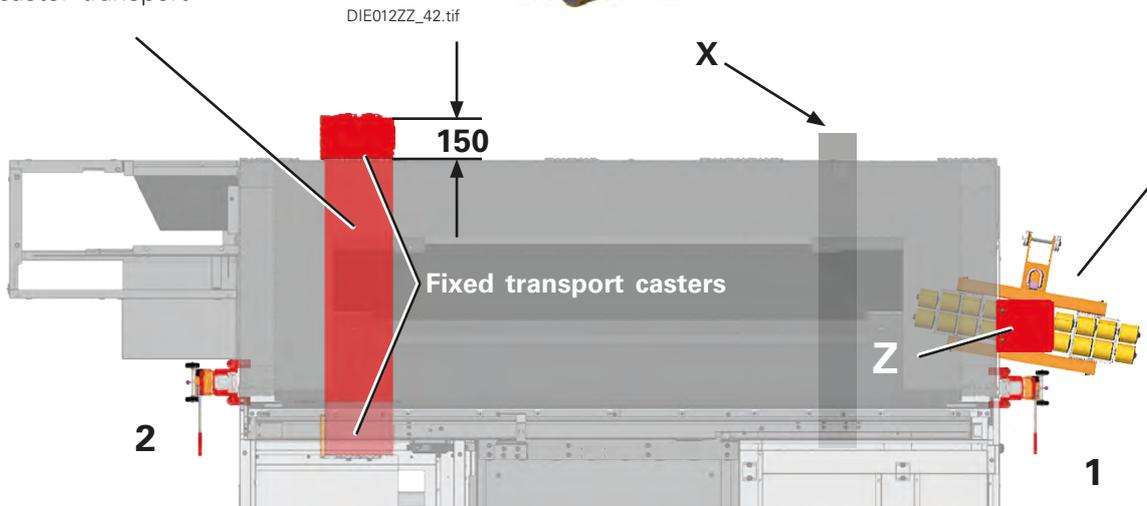


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The procedure for attaching the transport casters for Machine 16 and higher is identical. Only a transport bracket (Z) has to be screwed on before attaching the steering chassis (Y).



**Transport carrier** for  
caster transport



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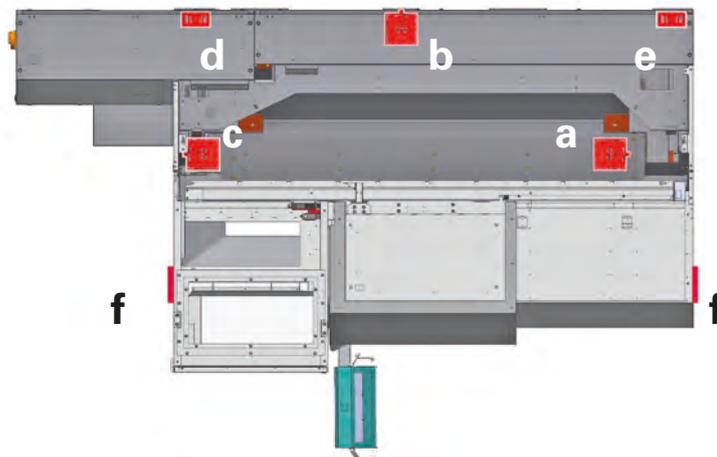
Figure Positions for hydraulic jacks and transport casters (**Machine 16 and higher**)

## Lowering

When lowering the machine at the installation site, lower it only on the machine feet **a,b,c**. After leveling the machine, the transport supports **d + e** are used only for supporting.

**When lowering on the loading platform of a trolley or truck, the adjusting feet d + e are not required and can therefore be turned freely.**

Before lashing the machine on the loading platform, it must be ensured, however, that the transport supports **VI** are adjusted. (See also Section "Suspension and Lashing Points")



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## Suspension and Lashing Points

Suspension and lashing points (Y) are used to secure the load (inclined/diagonal lashing) on the truck.



The load must be secured to prevent slipping on the loading area using the lashing points (Y). In addition, anti-slip mats must be used between the loading platform and the 3 support points (machine feet) of the machine and the transport supports (f).



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DIE012ZZ\_22.tif



DIE012ZZ\_21.tif

Y



Before lashing the machine, the transport supports (f) must always be adjusted on the loading platform. **It is mandatory that these transport supports (f) remain on the machine during the entire transport. They may only be removed for orienting the machine at the installation location!**

Fig. 1



DIE012ZZ\_27.tif

Fig. 2



DIE012ZZ\_28.tif

Fig. 3



DIE012ZZ\_32.tif

Fig. 4



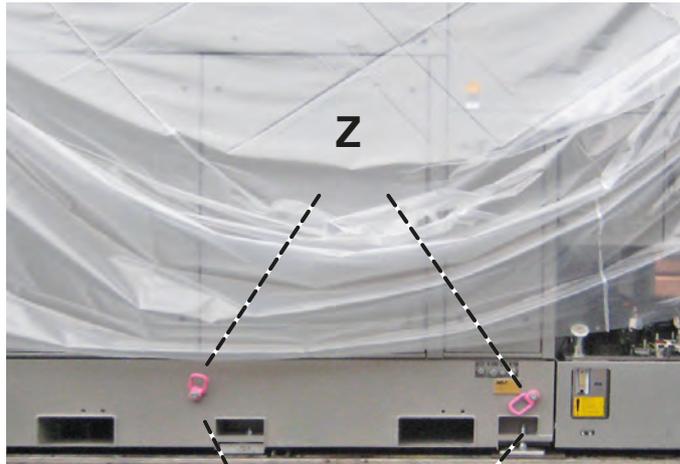
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f



The lashing points shown in Figure 5 must be used for lashing as in Figures 6 and 7. Be sure not to use only one strap through both lashing points (Z) for lashing. The lifting points (Z) and the lashing points (Q) must be as close as possible to each other on the loading platform.

Fig. 5



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Fig. 6



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Fig. 7



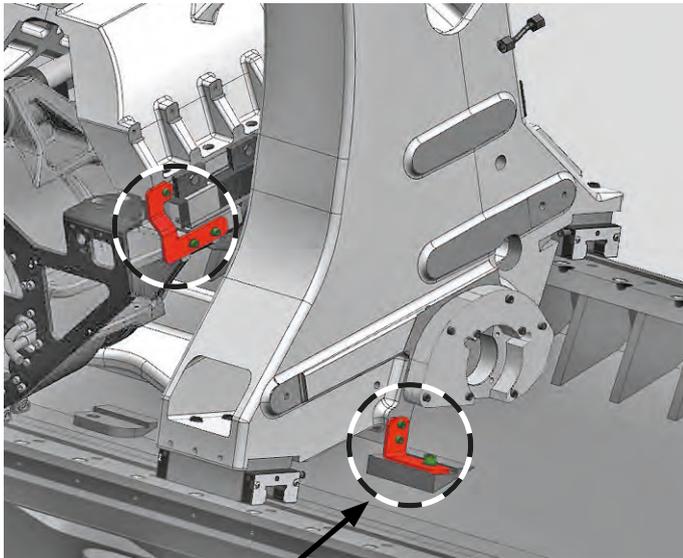
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Q

### Location of the Transport Locks on the Machine

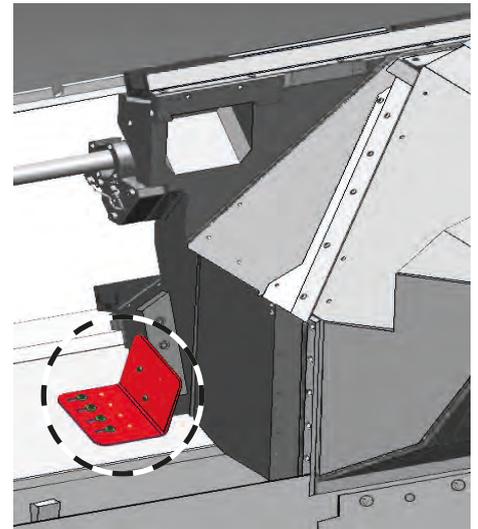
Y1

Z1

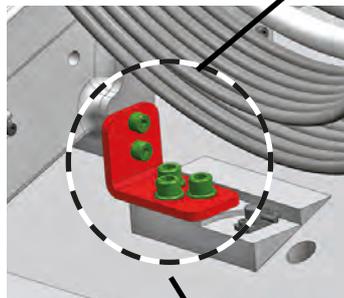


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Z2

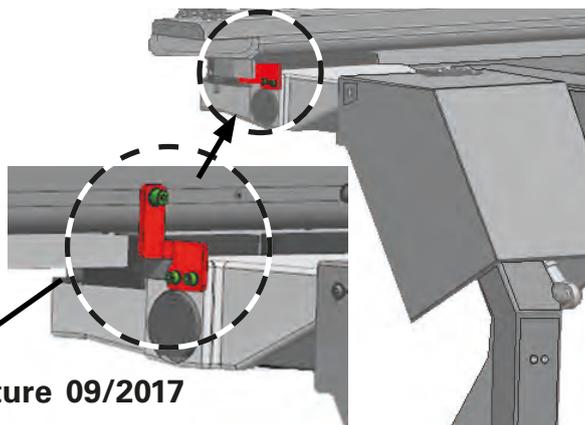


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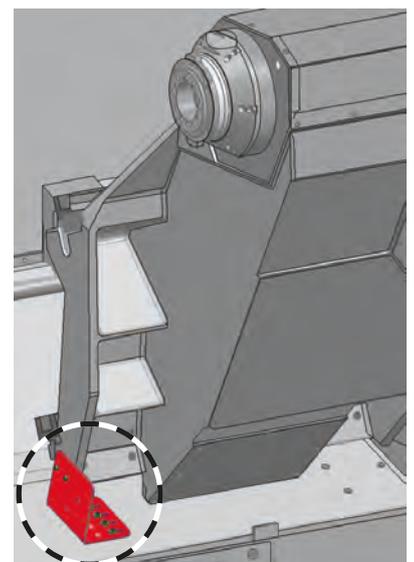
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Z8



DIE012ZZ\_66.tif

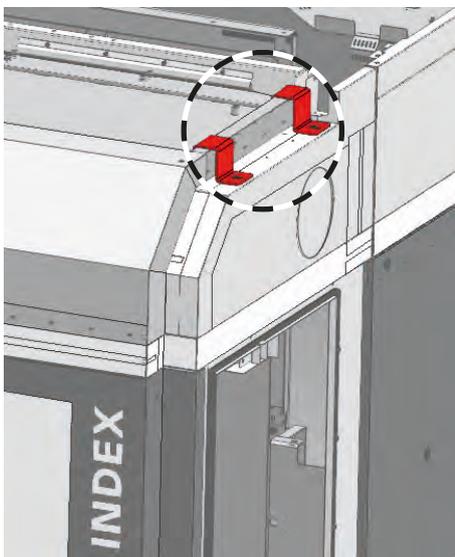
Z5



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from year of manufacture 09/2017

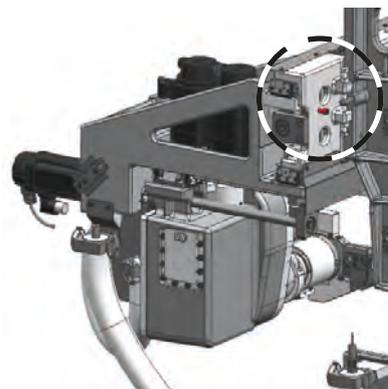
... Work area door



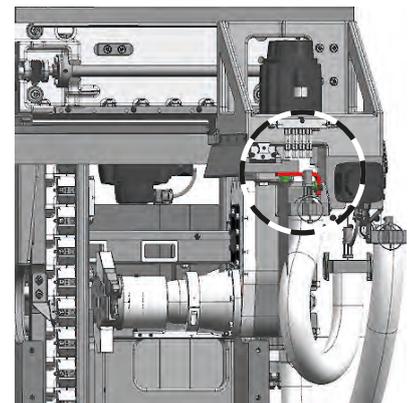
DIE012ZZ\_08\_1.tif

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... at the tool changer



DIE012ZZ\_12.tif



DIE012ZZ\_11.tif

## Location of the Transport Locks on the Machine

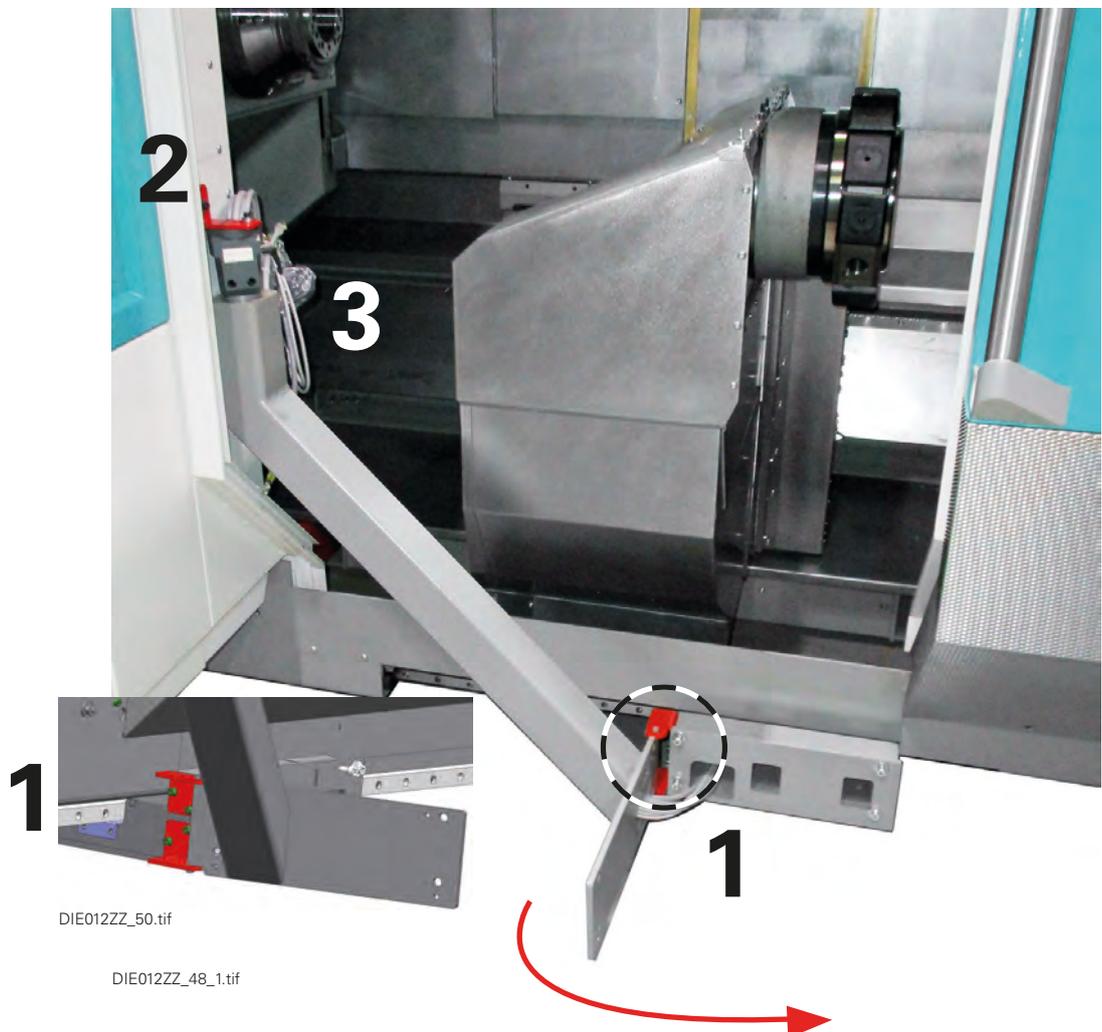
**Transport lock of the operating panel****Valid from machine series 511010**

For transporting the machine, the operating panel was removed and the operating panel bracket has been swung into the opening area of the sliding door and fixed there.



**Be sure to secure against tipping when removing the transport locks.**

- Loosen the transport lock (2) on the cover (2x M6 screws),
- and swing back the operating panel towards the operating panel slide.
- Fasten the operating panel bracket to the slide and remove the transport locks (1).



Then screw on the operating panel again and connect the plug-in connections (3) again.

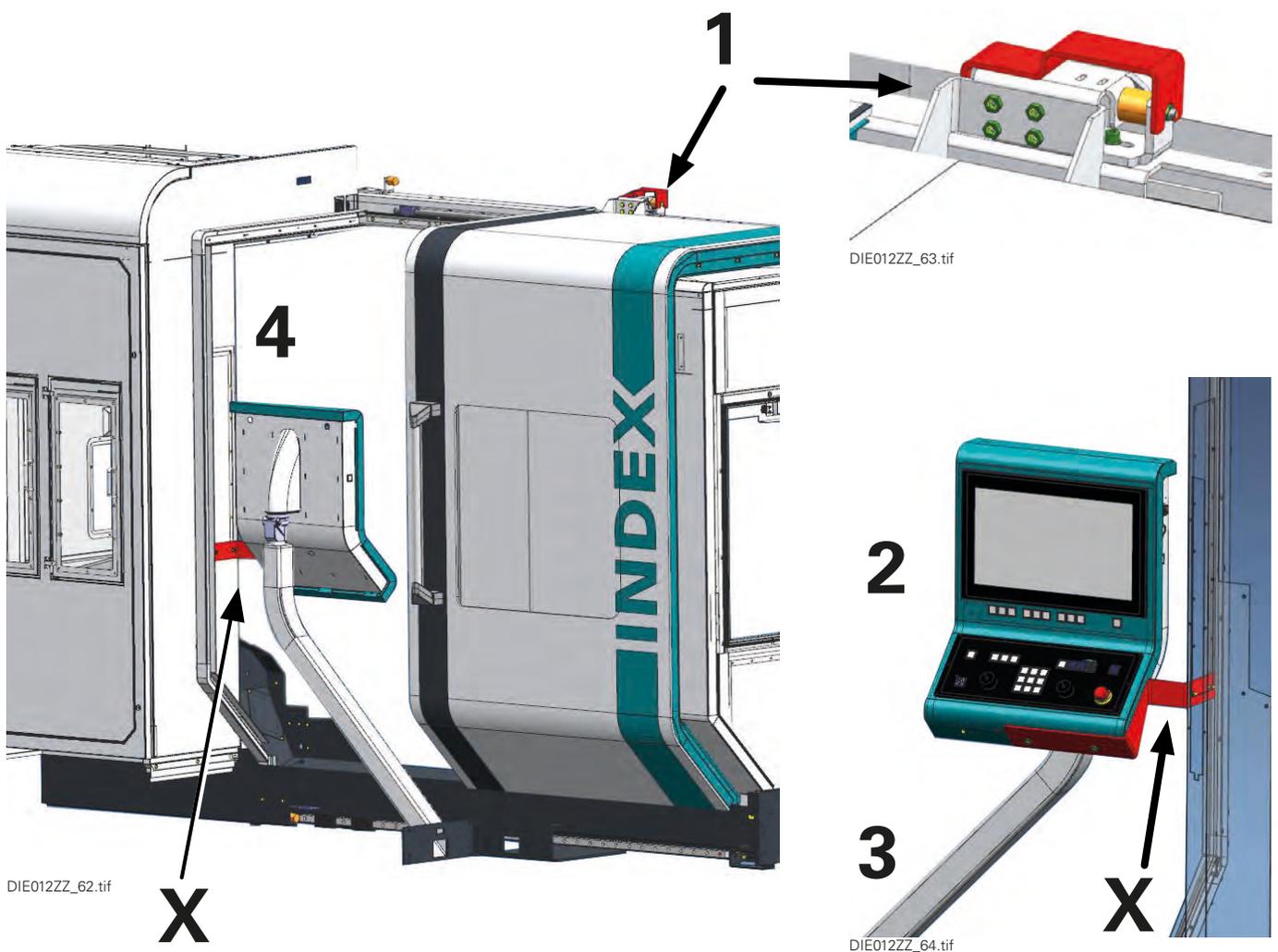
**Transport lock for operating panel and work area door  
from year of manufacture 05/2017**

For transporting the machine, the work area door was opened and secured (1).

The operating panel (2) and the operating panel carrier (3) were swung into the opening area of the work area (4) and secured there (X).



**Be sure to secure against tipping when removing the transport lock from the operating panel.**

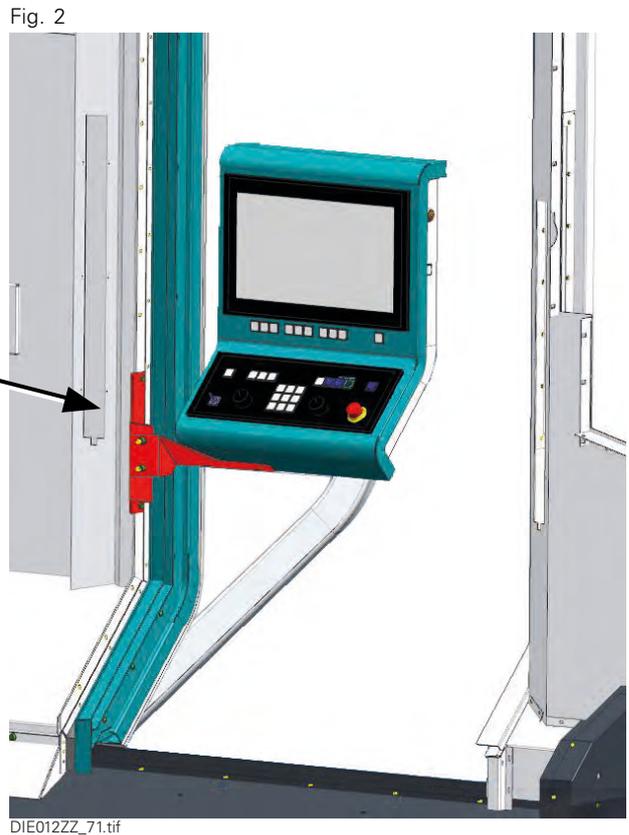
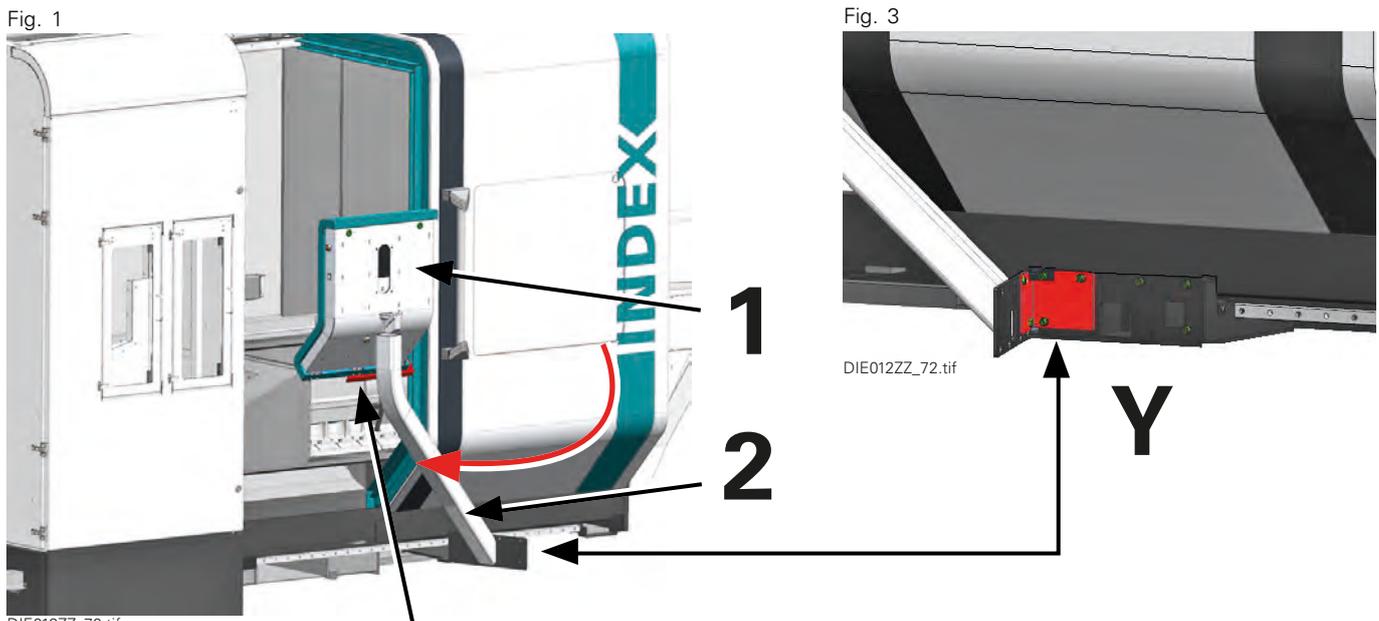
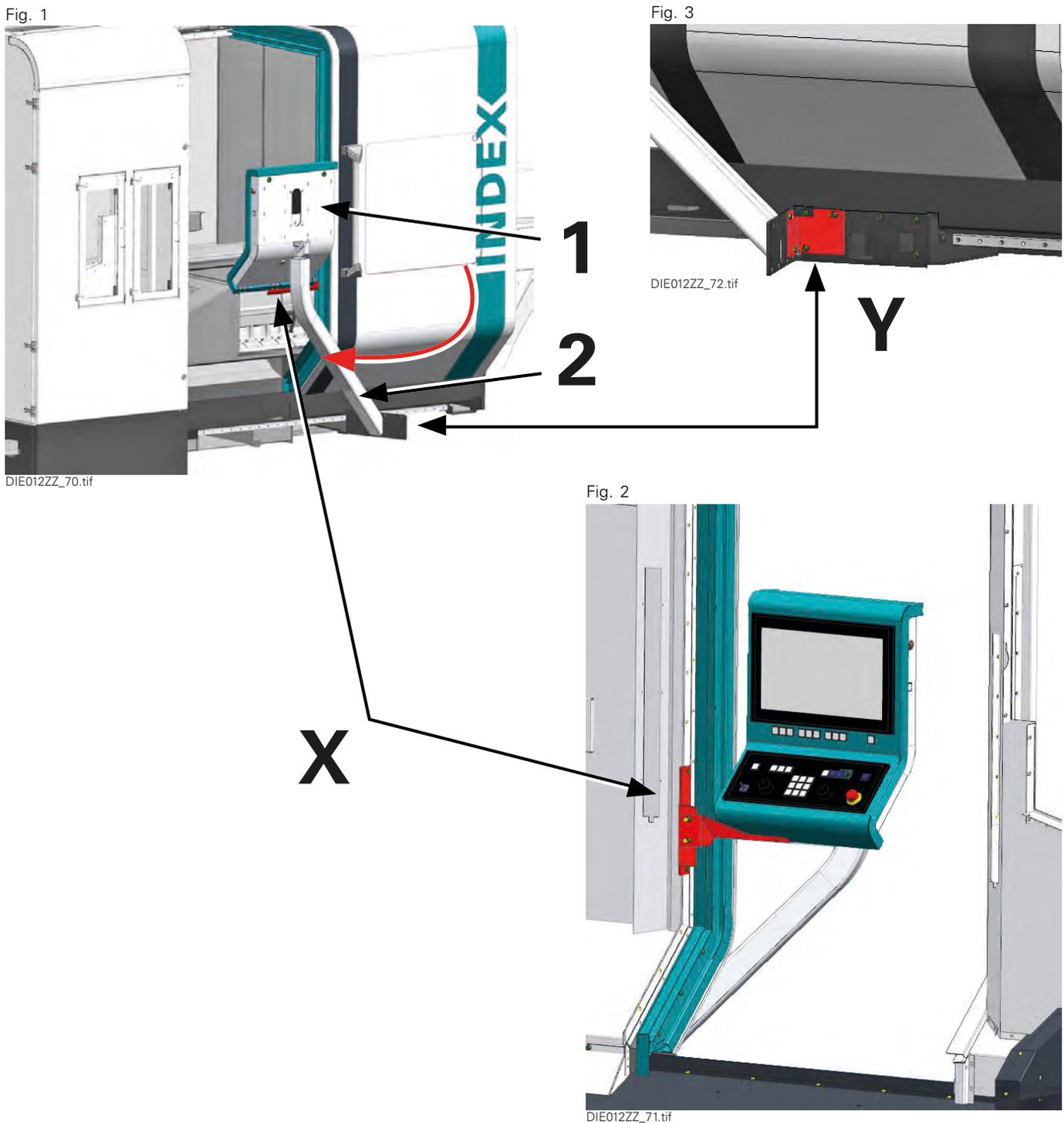


**Transport lock of the operating panel  
from year of manufacture 11/2018**

To transport the machine, the operating panel (1) and the operating panel bracket (2) were swiveled into the opening area of the work area and fixed there with the transport lock b (X,Y).



**When removing the transport lock (X,Y) of the operating panel, be sure to secure the panel against tipping over.**



## Transport of the Tool Changer



Be sure to observe the manufacturer's documentation from Wassermann.

The tool changer (**total weight without tools 1200 kg**) is delivered as a separate shipping unit on a pallet specially manufactured for this tool changer.

Before the tool changer is unloaded from the pallet, the angle brackets **2** (Figures 2 and 3) are removed and the two transport brackets **X** (Figure 1) for caster transport are mounted.

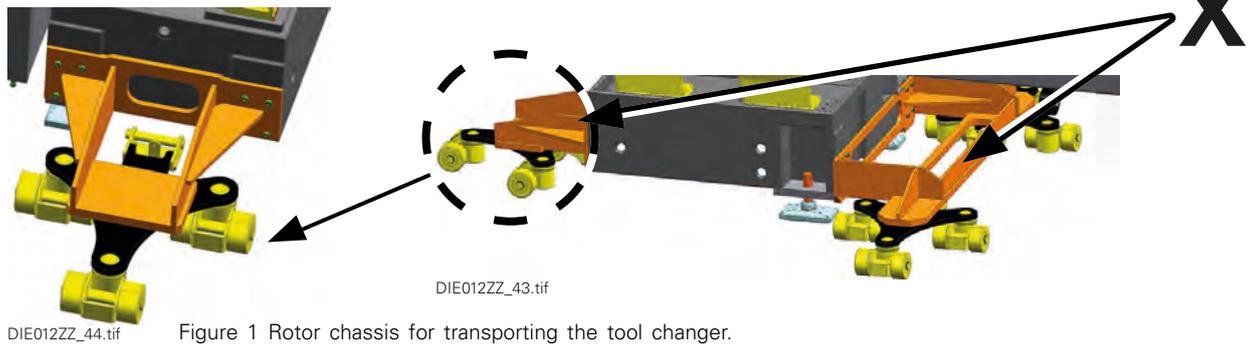


Figure 1 Rotor chassis for transporting the tool changer.

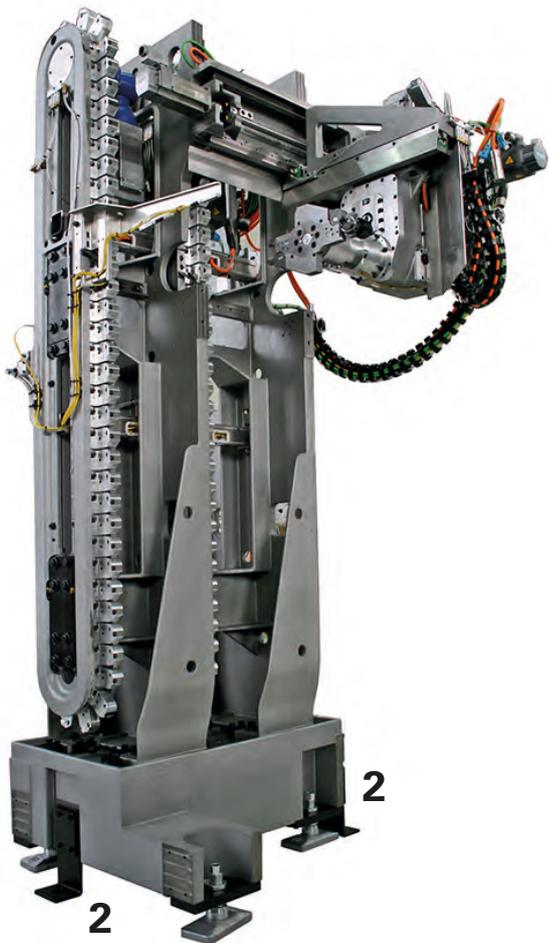
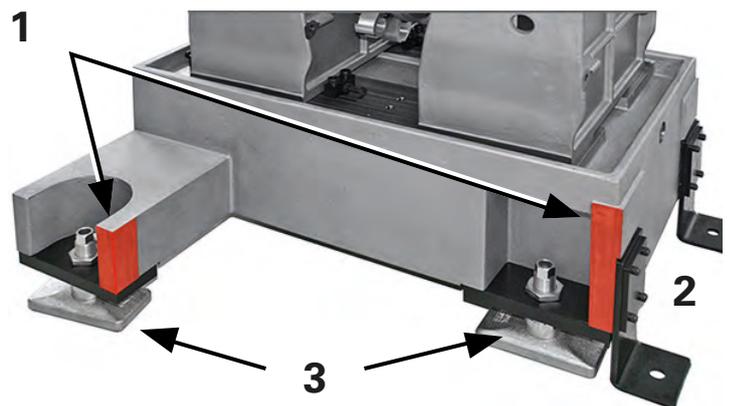


Fig. 2 Overall view of tool changer



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Fig. 3 Base rack of tool changer

1. Contact surfaces on the machine tool
2. Angle bracket
3. Height-adjustable machine foot

## Transporting With Transport Casters

Transport casters have the advantage of a low loading height so that the machine can be loaded and unloaded using hydraulic jacks. Disadvantages are, however, the relatively small wheels (casters), which require a solid, even floor of appropriate capacity and very slow, smooth movements during the transport.

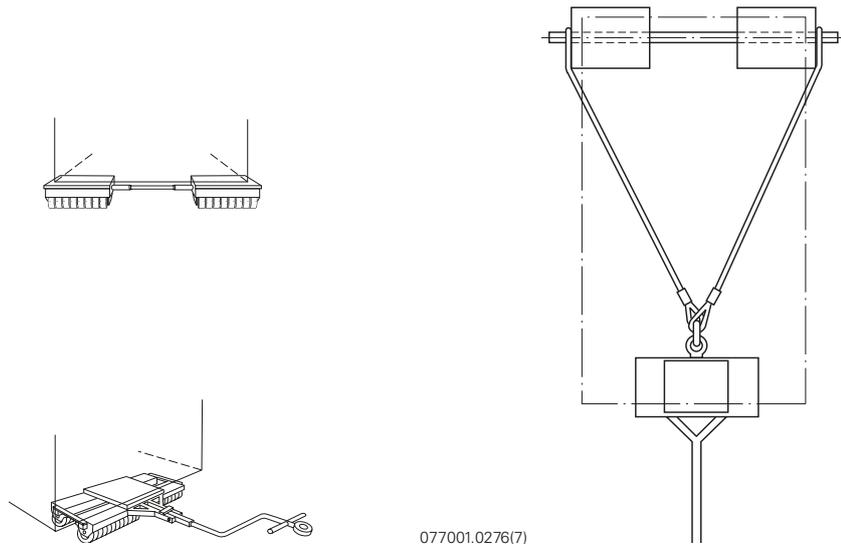
Depending on the size and mass of the machine, two or three transport casters are required for transport, one of which must be steerable.

The trolleys must always be parallel to the load to be lifted and in no case be oblique, because otherwise the casters would "rub out" causing the surfaces to be damaged by the load.



**Connect the steerable and fixed transport casters with steel cables (Fig.). This will prevent the casters from slipping when being pulling.  
Secure the load with suitable straps.**

Fig.



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## Unloading and Transporting of Separate Units

Options or accessories such as chip conveyors, bar feeders, bar loading magazines, etc. are separate units.

They have dedicated transport regulations that must be observed for unloading and transporting (see the manufacturer's documentation).



**Do not stand under suspended loads.**

Minor separate units do not have specific transport regulations. They either rest on a pallet or are included in the packaging of another unit.

Use suitable transport ropes or straps for unloading and transporting.

Attach the transport ropes or straps making sure they cannot slip and the load is securely suspended.

Attach the ropes or straps to any eyebolts that are provided for transport.

## Unpack the Accessories and Check them for Completeness

After unloading, unpack the machine accessories and check them against the information on the delivery note for completeness (compare with bill of lading or delivery note).

In case of discrepancies, contact **INDEX** or your **INDEX** representative.

## Installation

### Electrical Connection

#### Important notes



#### Caution! Danger of Life!

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



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

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



See the order confirmation for the precise electrical requirements. The electrical specifications provided are decisive and binding. They must be available to **INDEX/TRAUB**'s customer service at any time.

The machine must be connected to the electrical supply network via the main switch (multi-wire cable). Be sure to observe the clockwise phase sequence for the connection. The electrical connection is indicated in the wiring diagrams.

The machine is prepared for connection to three-phase power supplies (TN system).

Before connecting, check that the available line voltage matches the machine's operating voltage. If this is not the case, you will need an appropriate transformer connected in front of the machine.



In some cases (dependent on year of manufacture/machine number), the plug-in connections on the operating panel are disconnected for transport and the operating panel is unscrewed from the operating panel slide. Before the machine is switched on, the plug-in connections of the operating panel are connected again and the operating panel is screwed onto the operating panel slide again.



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

## Cooling

### Attaching Filling/Breathing Filter

The filler neck on the coolant tank (Fig. 3) was closed for transporting.

Reinsert the filling/breathing filter (a) before operating the machine.

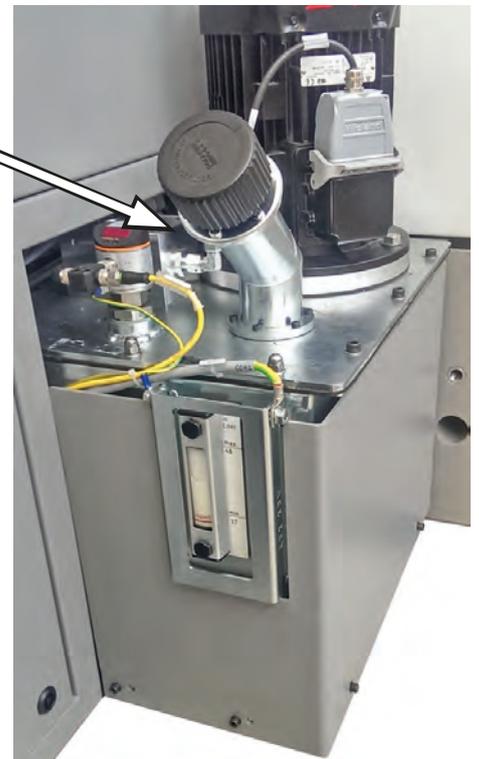
Hook the filling/breathing filter onto the safety chain and screw in.



**Caution!**

**Use only the oil type indicated on the oil tank.**

Fig. 1



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Fig. 2



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Fig. 3



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### Running Machines on an External Cooling Water System

To ensure reliable operation of one or more machines on an external cooling water system, the following points must be observed:

- Provide the cooling systems with frequency-controlled pumps. This will compensate for pressure fluctuations and excessive pressure due to differing usage quantities.  
Ensure trouble-free operation of the cooling system at partial loads.
- Install an overpressure relief device in the cooling line.
- Consider the pressure difference (see table) in the cooling water line between the supply and return sections.
- Reduce the cooling water amount to the prescribed amount via a control valve on each machine. This is to ensure an even supply to all machines.
- The supply lines should be routed to the machines as straight as possible. This avoids swirls due to pressure booster pumps or line redirections resulting in problems of the flow sensors. (See the installation chart for details.)
- Install thermometers and pressure gauges in the forward and return flows of each cooling water line to be able to assess the cause of failure in case of problems.
- Install filters (fineness <0.1mm) with shut-down valves in the forward flow of the cooling water line of all machines.
- Install shut-off valves or solenoid valve for each machine, so each machine can be disconnected separately if repairs are necessary.
- Disconnect the machine from the water circuit (e.g., via solenoid valves) at power-down (main switch), so cooling water will no longer flow through the control cabinet.
- When connecting older machines to the external cooling water supply, be sure to consult **INDEX**-Werke or a representative beforehand.

### Technical Data of the Cooling Water Supply

Machine	Water temperature [°C]	Cooling water flow $Q_{\min}/Q_{\max}$ [l/min]	Differential pressure $P_{\text{supply}}$ and $P_{\text{return}}$ [bar]	Required cooling capacity [kW]	Pressure in the cooling system [bar]
G220	20°C±2°K	40 - 52	4,5	15	8

## Hydraulic System

### Attaching Filling/Breathing Filter

The filler neck on the hydraulic tank (Fig. 3) was closed for transporting.

Reinsert the filling/breathing filter (a) before operating the machine.

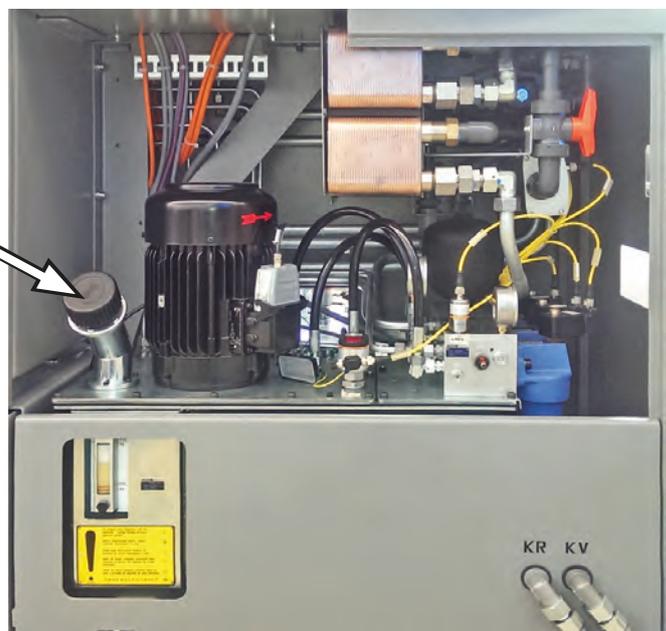
Hook the filling/breathing filter onto the safety chain and screw in.



**Caution!**

**Use only the oil type indicated on the oil tank.**

Fig. 1



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Fig. 2



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Fig. 3



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## Installing the Machine

The G220 machines are equipped with five adjustable feet as standard (see Figure "Leveling the entire machine" and "Adjustable machine foot"). However, only the feet **1-3** are used here to level the machine.



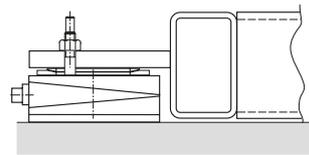
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Fig. 1 Hydraulic jacks



Before placing the machine on the ground, screw the machine feet (4) and (5) away and adjust machine foot 3 (Figure 5) to a height of 72 mm. As a counter check, the spindle height must be 1350 mm after leveling the machine (observe installation chart). This dimension is also important for installation of a chip conveyor or bar feeder. Always support the leveling process with suitable hydraulic jacks (Figure 1). Be sure to observe the positions of the hydraulic jacks (Figure 4 - See pictures in "Transport of the Machine").

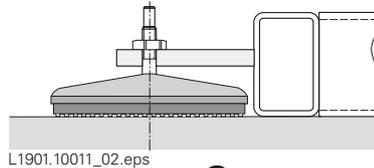
After leveling, the machine feet (4) and (5) are only adjusted to the floor for support so that the indications on the spirit levels do not change.

Fig. 2  
Adjustable machine feet 1-3

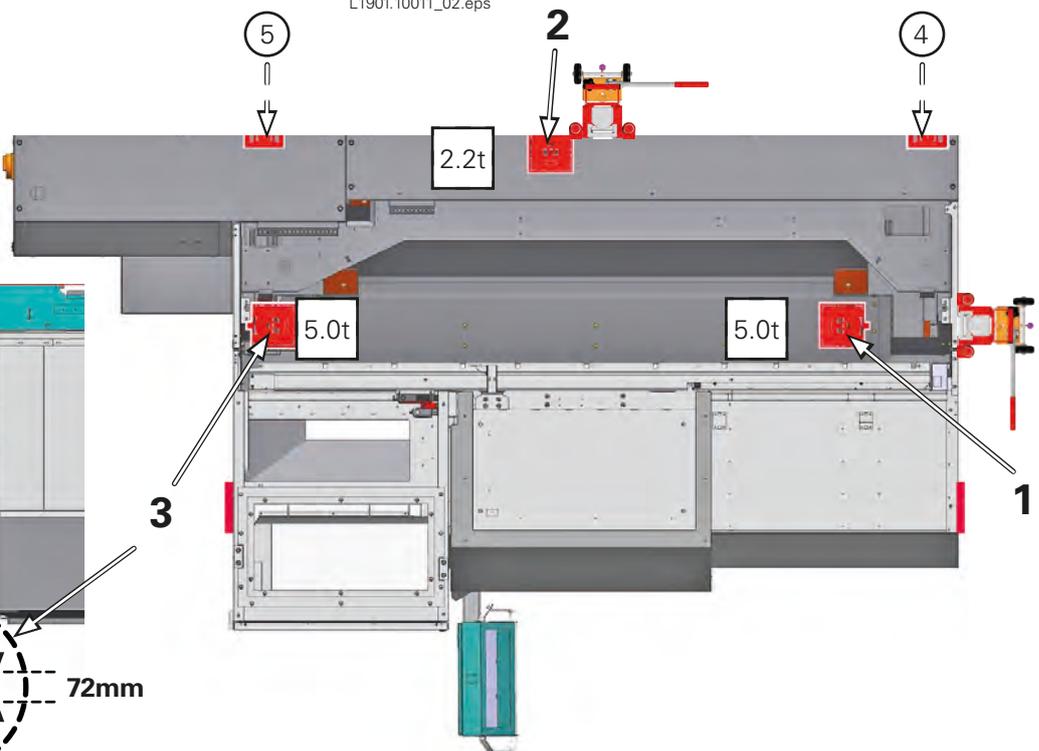


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Fig. 3  
Adjustable machine feet 4-5

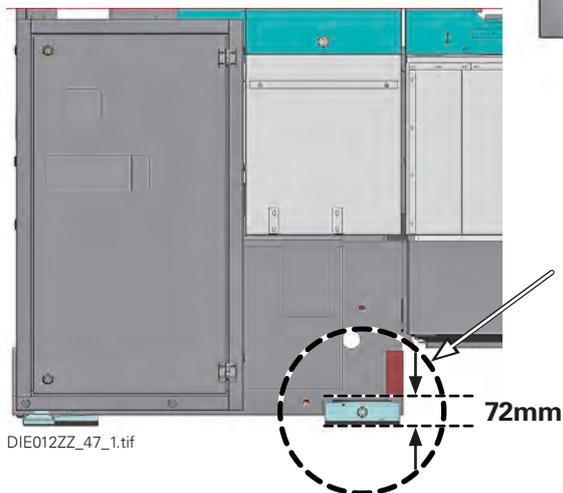


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Figure 4 "Leveling the entire machine"



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Fig. 5

## Leveling the Machine

(Accuracy 0.1 mm/m - also by inverting the level)

### Leveling in the Y- and Z-Directions

To level the machine, place precision spirit levels at certain points. (See Fig. 1-3)

Now level the machine by adjusting the machine feet 1, 2, and 3. (See Section "Installing the Machine", Figure "Leveling the entire machine")

### Leveling in the Y-Axis

- Place precision spirit level in the Y-direction as shown in Figure 1 or 2.



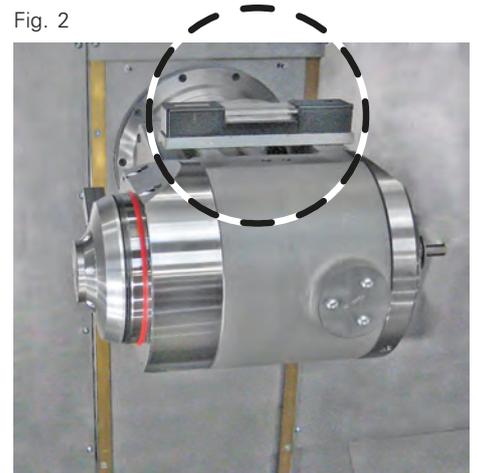
The support shown in Figure 2 can be used only in the 180° position and when the machine is switched on.

Fig. 1



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Fig. 2



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### Leveling in the Z-Axis

- Place precision spirit level on the ball screw drive in the Z-direction as shown in Figure 3.

- After the machine has been leveled, place only machine feet 4 and 5 on.  
(See Section "Installing the Machine", Figure "Leveling the Entire Machine")  
Take care not to change the position of the machine.

Fig. 3



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### Installation and Leveling of Expansion Stages and Accessories

A bar feeder or bar loading magazine must be fastened to the machine using dowels. The dowels are included with the machine.

The bar guide, bar feeder or bar loading magazine have leveling elements that allow them to be aligned flush with the working spindle with  $\pm 0.1$  mm/m accuracy.

The workpiece conveyor belt, pallet station, etc. also have leveling elements that allow them to be aligned longitudinally and laterally to the main spindle rotating axis with  $\pm 0.1$  mm/m accuracy.

(For further information, see the corresponding installation chart in Chapter "Working Documents")

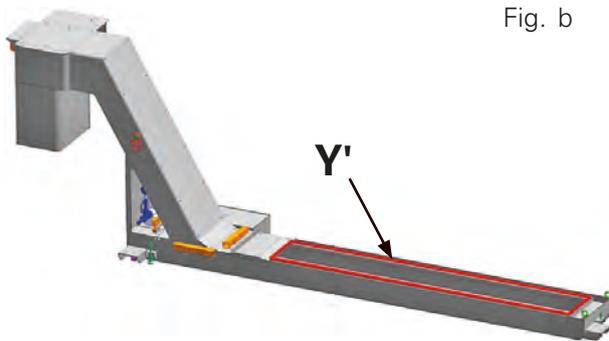
### Installation and Leveling of the Chip Conveyor

Observe the following when installing the chip conveyor in the machine: After pushing the chip conveyor into the machine, ensure that it is raised high enough - using the adjusting screws (X) - so that the chip conveyor's peripheral seal (Y') is positioned on the contact surface (Y) below the machine and therefore provides a seal (Fig. a and Fig. b).



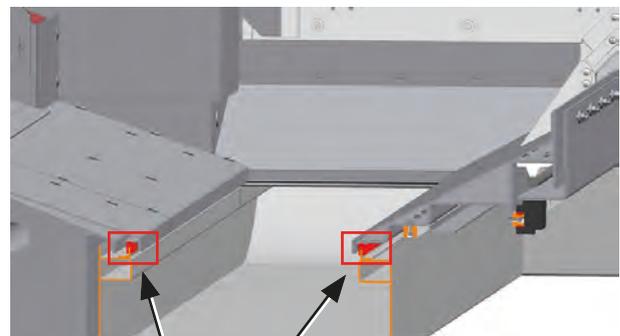
Before removing the chip conveyor from the machine, be sure to lower it back onto the rollers again using the adjusting screws (X).

Fig. a

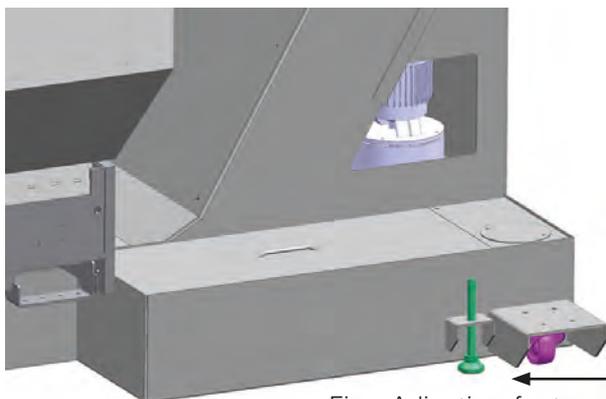


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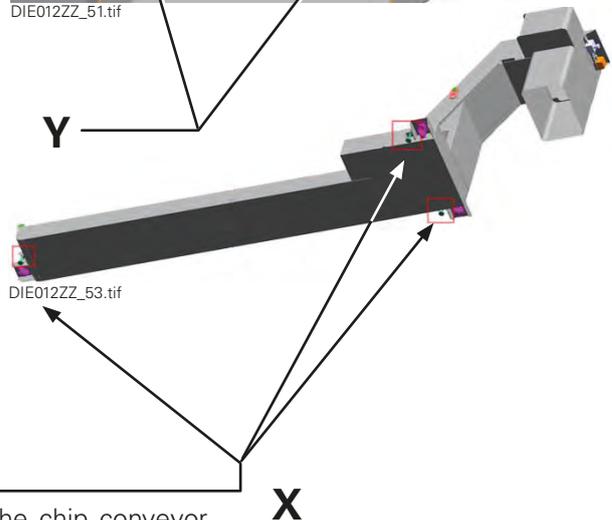
Fig. b



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Fig.: Adjusting feet on the chip conveyor

## Start-up

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.

## Cleaning the Machine

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



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

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

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

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

The mounting surfaces for tool holders and accessories must also be cleaned.

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

## Check the Operating Fluid Levels and Replenish, if Necessary

Hydraulic system: ..... Fluid level check

Cooling lubricant unit: ..... Replenish cooling lubricant

Centralized lubrication: ..... Fluid level check

Auxiliary equipment: ..... Fluid level check



For information on the lubricating oil, hydraulic fluid and cooling lubricant grades, as well as on volumes and filling positions, see Document "Notes on Operating Materials" and the machine installation chart in Chapter "Working Documents".

## 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 the document "Operating the Machine".

## Relocation



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

See also Section "Location of Transport Locks".



Replace filling/breathing filters on the hydraulic and cooling unit with a blanking plug.

(See also Section "Attaching Filling/Breathing Filter".)

### Only for Machines Equipped With Chip Conveyor

Unscrew the coolant hose from the screw connection above the coolant tank and loosen the power line connections to the chip conveyor's coolant motor and drive motor.

Pull out the chip conveyor and clean it.

### Only for Machines Equipped With Blank Feeder

Disconnect the energy supplies, and close the connections, if applicable.



For transport by air, all accumulators attached to the machine must be depressurized by a specialist.

Provide the appropriate transport gear for the blank feeder.







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