

# Transport Installation Commissioning

**INDEX MS16-6, MS16-6Plus**  
**INDEX MS22-8**  
**INDEX MS24-6**  
**INDEX MS24-8**  
**INDEX MS32-6**  
**INDEX MS40-6**  
**INDEX MS40-8**  
**INDEX MS52-6**

**Control system INDEX C200-sl**

## 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 instructions

### Information on transport, installation, commissioning



**If the work area door is open, disconnecting the main power supply leaves the door interlock of the safety switch unlocked.**



Transport locks can be identified by their red color.

Improper transport, installation, or commissioning poses a risk of accidents and may cause damage or malfunctions to the machine. **INDEX** does not assume any liability or warranty for such damage.

Before the machine arrives, carefully plan unloading, transport to the installation site, setup, and commissioning, and be sure to follow the instructions in this document.

Separate units such as the chip conveyor, bar feeder, bar loading magazine, etc., are supplied with their own transport instructions. These special transport instructions must also be followed without fail.

### General hazards during on-site transport

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 load. 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 weights

The weight of the machine is specified in the "Technical specifications" section of the document "Structure and Functions of the Machine".

The weights of any separately supplied units, such as the chip conveyor, bar feeder, bar loading magazine, etc., can be found in the documentation for those add-on units or accessories.

### Transporting and lifting aids

Only use lifting and transport equipment with sufficient load capacity and platform size to move or lift individual units.

**MS16-6**  
**MS22-8**  
**MS24-6**  
**MS24-8**  
**MS32-6**  
**MS40-6**  
**MS40-8**  
**MS52-6**

## 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.

Take the size (dimensions) and weights 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-carrying 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!

## Suitable transporting and lifting aids

- Crane
- Truck-mounted crane
- Transport trolleys
- Transport rollers
- Tank rollers
- Hydraulic jacks
- Forklift, forklift truck (only for separate units; not suitable for machines).

## 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 floor plan in the chapter “Working documents” to determine the required space.

## Floor condition

A special foundation is not necessary. Only the load-carrying 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.
- Be sure to comply with all applicable guidelines and regulations of the country of use.

## Fastening/anchoring

Doweling of the machine is not necessary.

Bar guides, bar feeders, and bar loading magazines must always be anchored to the floor. (For details, see the relevant operating instructions and machine floor plan in the chapter “Working documents.”)

## Ambient conditions



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

Permissible ambient temperature ..... +10°C to +40°C

Maximum relative humidity ..... 50%

Maximum height of the installation location ..... 1000 m above sea level

## 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 operating voltage may fluctuate by no more than  $\pm 10\%$ .

The main power supply line must be installed in accordance with the regulations of the responsible electric utility company and with the applicable VDE standards. For further information, see the machine floor plan in the chapter "Working documents".

## Main circuit breaker



**Check whether the main power supply connection can accommodate the additional load corresponding to the required protective rating.  
Discuss any unclear conditions with your local electricity supplier.**

See the order confirmation for the precise electrical requirements. The electrical documentation supplied is definitive 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 mains 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 upstream transformer.

The values for:

- Machine connection,
- Operating voltage,
- Main circuit breaker

are indicated on the type plate or the circuit 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 maximum permissible connection pressure for the machine. See the pneumatic diagram in the chapter "Working documents".**

For operating pressure and capacity requirements for the compressed air supply, see the "Technical specifications" in the document "Structure and Functions of the Machine".

For the air supply on the machine, see the machine floor plan in the chapter "Working documents".

## Pressure accumulator

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

Before commissioning the machine, all pressure accumulators must be filled with nitrogen (N<sub>2</sub>) by a specialist. The specified pressures must be observed.

For the prescribed pressures, see the hydraulic diagrams in the chapter "Working documents".

## Equipment to be provided

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

For the required grades of hydraulic fluid and cooling lubricant, see the document "Information on Operating Materials".

For filling quantities, see "Technical specifications" in the chapter "Structure and functions of the machine".

<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 fine filter is required, and it must be used for this purpose only. See the chapter "Maintenance instructions".

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 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.

This will protect the environment and save costs.

## Disposal of used operating fluids

Decide in advance how to dispose of used equipment such as hydraulic fluid and cooling lubricant in an environmentally friendly manner.

## Observing the ground and wastewater regulations

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

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

### Possible preventive measures:

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



Be sure to comply with all applicable guidelines and regulations at the installation site.

## Delivery

### Machine

The machine is delivered by truck. It will rest either on planks or will be packed in a crate and then rest on a transport floor.

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

- The hydraulic fluid tank is full.
- The cooling lubricant tank is empty.
- Certain moving parts on the machine, such as sliding guards and the swiveling operating terminal, are secured by transport locks or were removed.
- Protruding machine parts hampering the transport have been removed.
- All blank parts of the machine were treated by spray-covering with an anti-rust agent.

### Other separate units

Certain add-on units and supplementary equipment such as chip conveyor, bar feeder, bar loading magazine, etc., are usually separate units.

Chip conveyors usually rest on a transport base for shipping.

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

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

## Transport gear

Transport gear is either packed separately or included with other units.

The transport gear is generally supplied at extra cost. Following the installation, the transport gear may be returned to **INDEX** for credit.



The transport gear also includes the transport hooks attached to the machine.

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

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

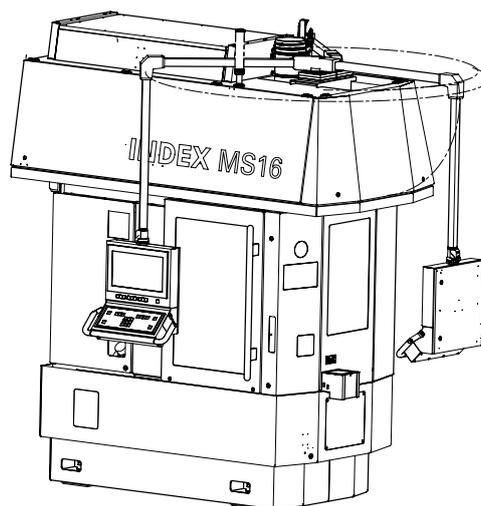
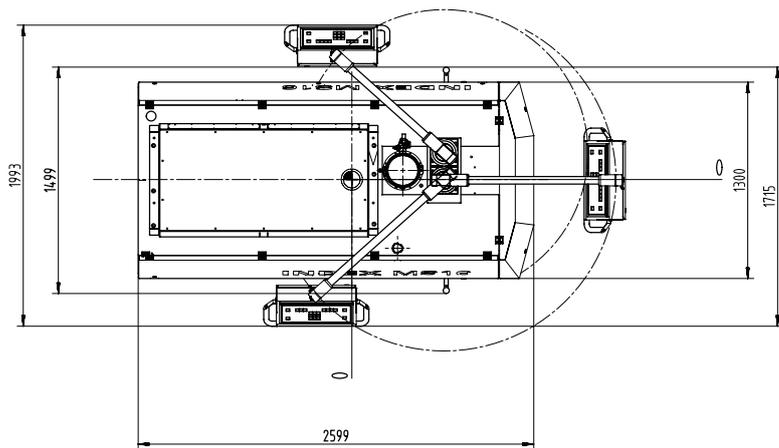
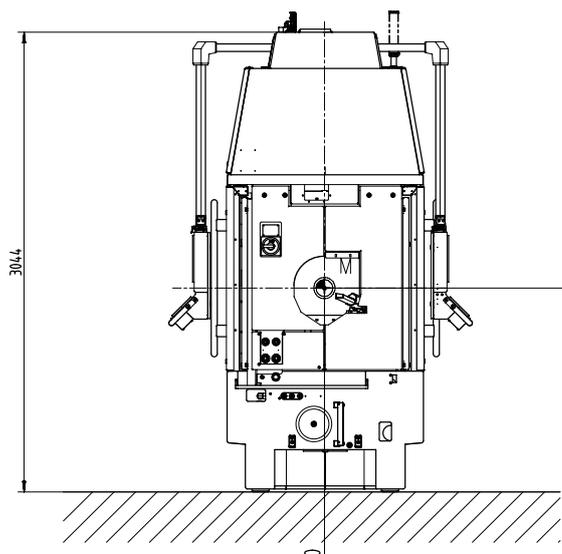
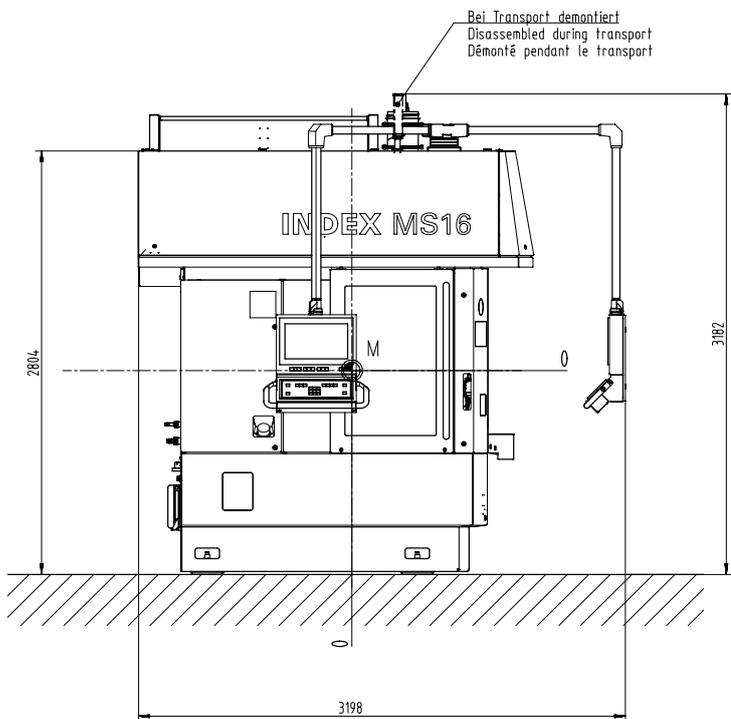
In the event of transport damage, it is recommended to photograph the damage for evidentiary purposes.

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

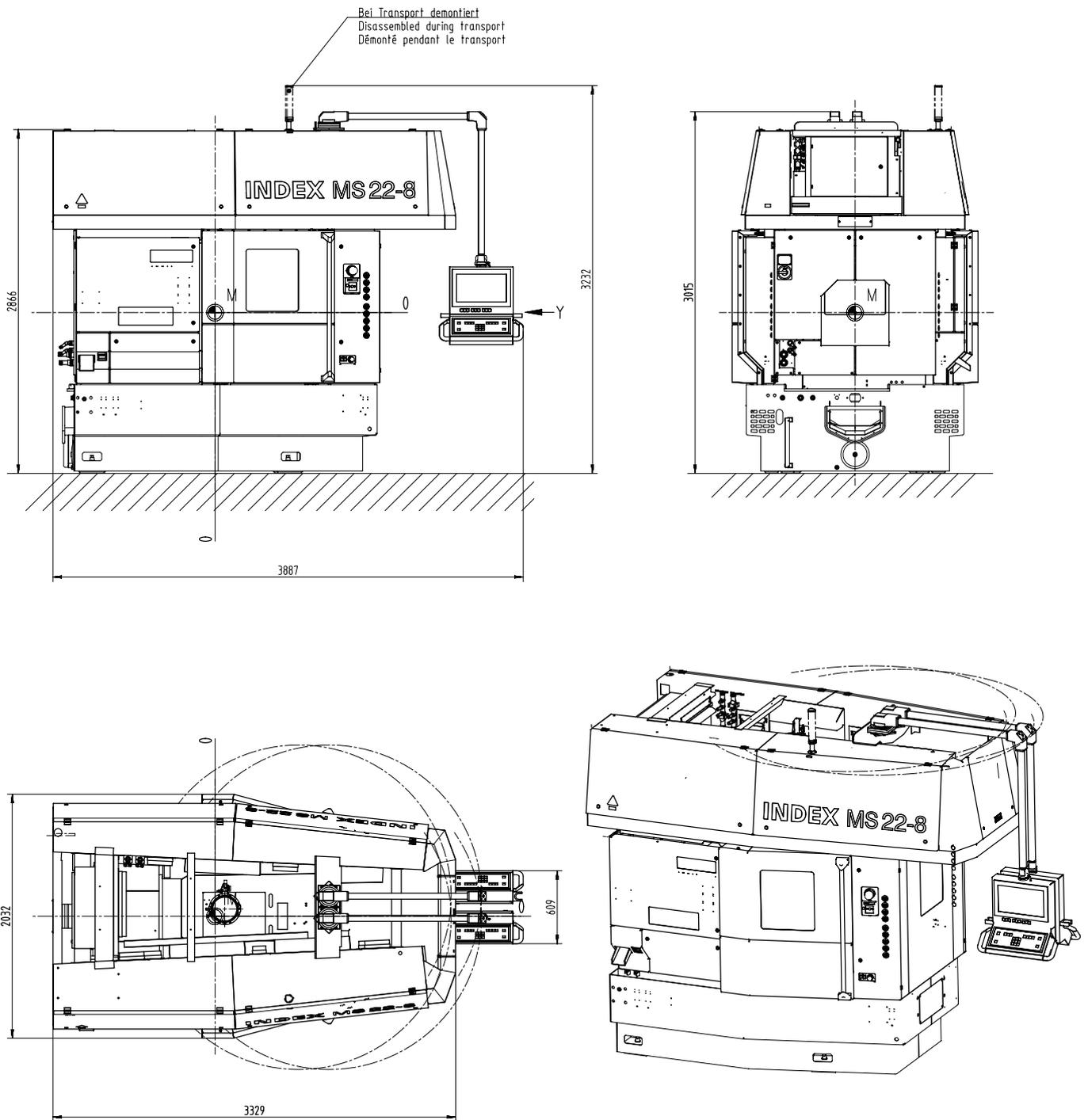
**Transport dimensions**

**MS16-6  
MS16-6 Plus**

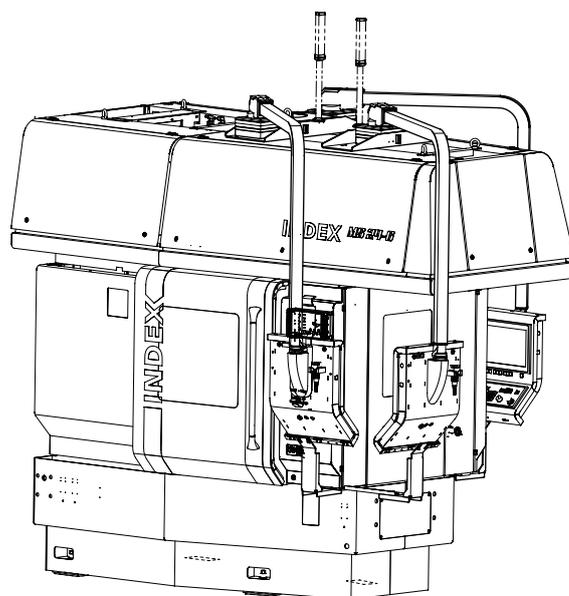
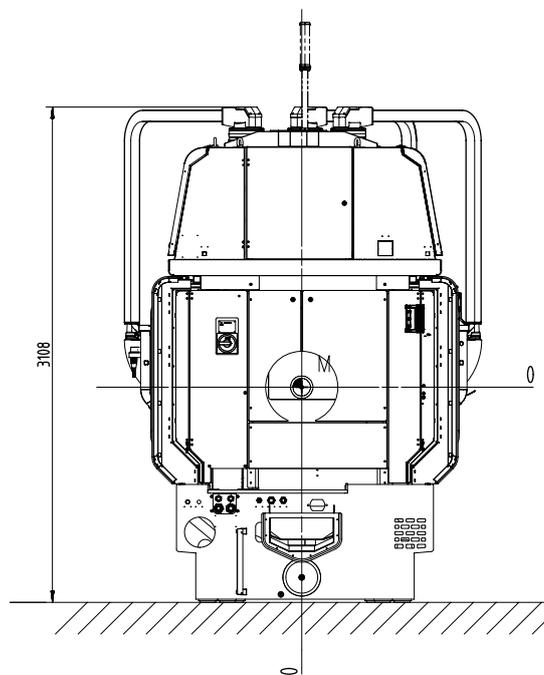
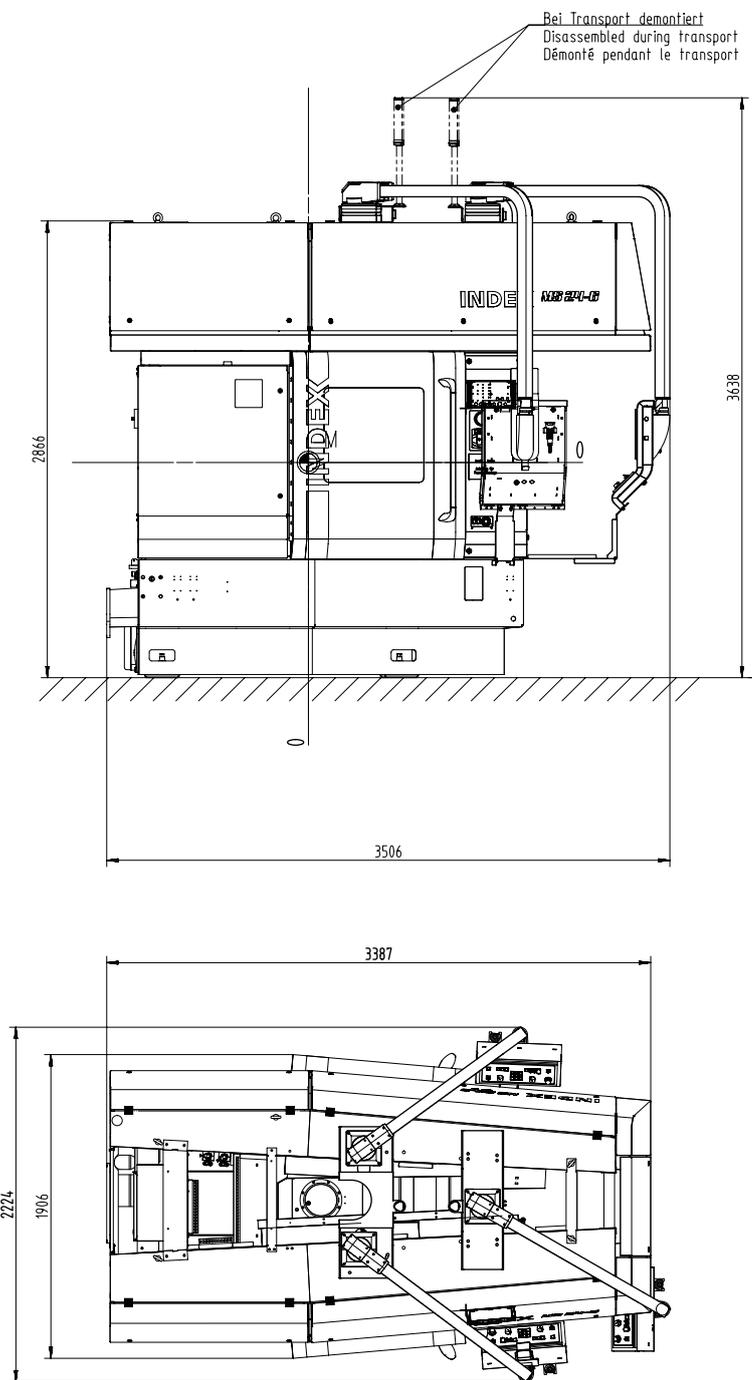
The simplified floor plans shown here include, in particular, the external dimensions of the machine to support transport planning and installation preparation.



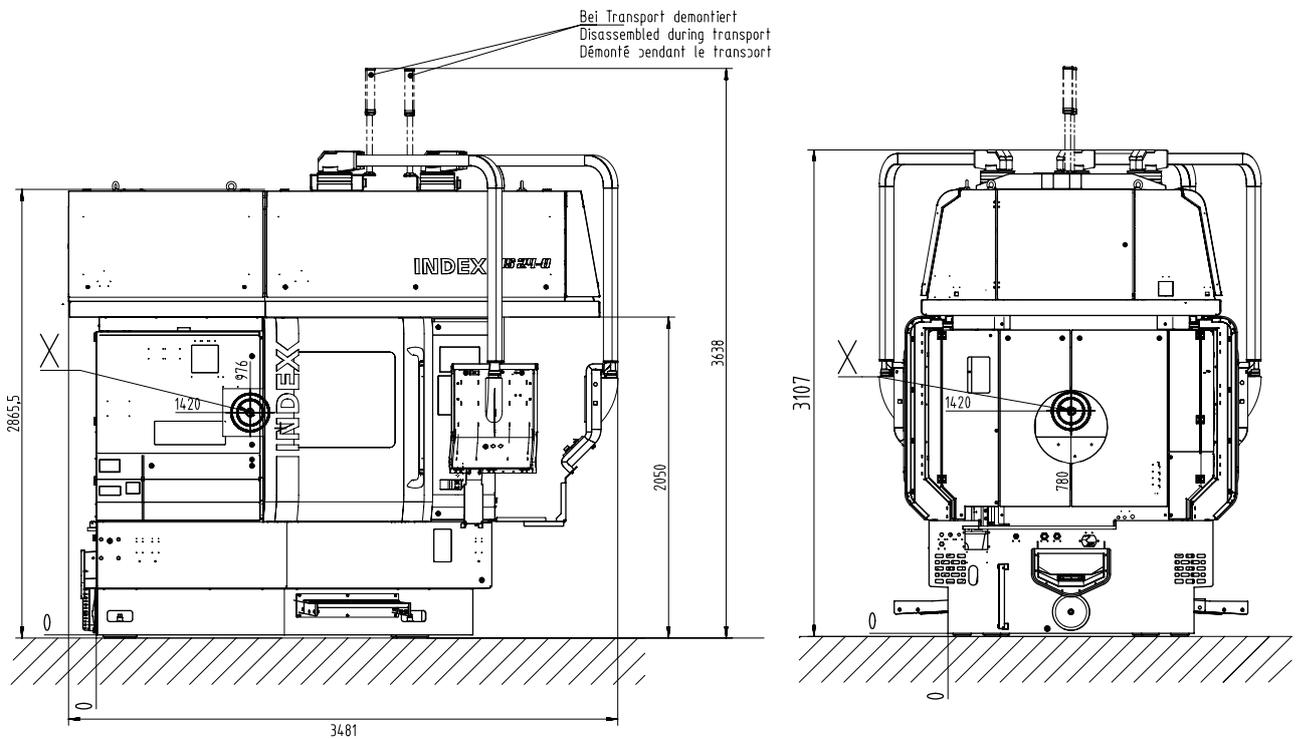
Transport dimensions – MS16-6, MS16-6 Plus



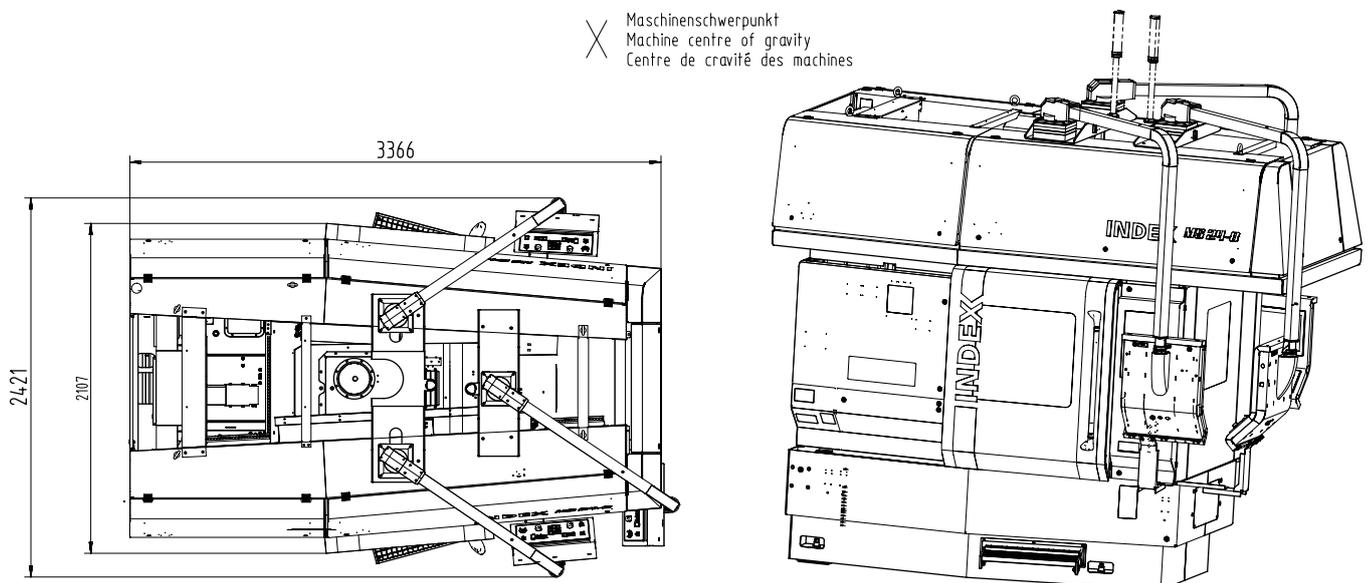
Transport dimensions – MS22-8



Transport dimensions – MS24-6

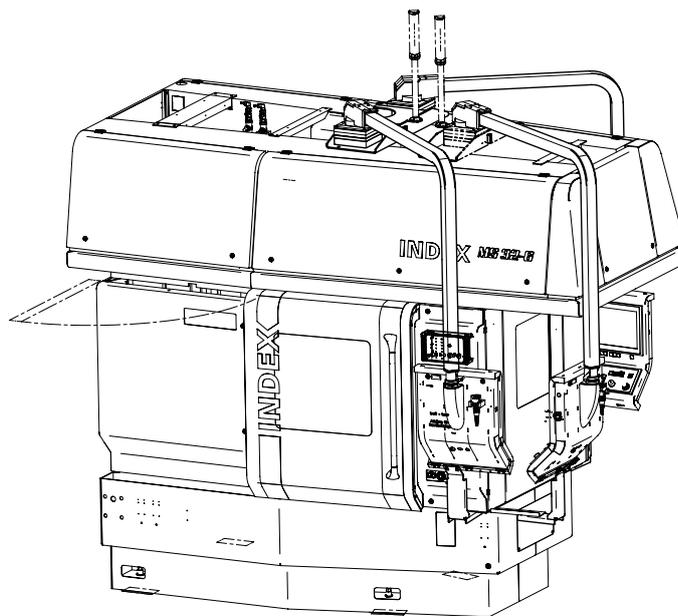
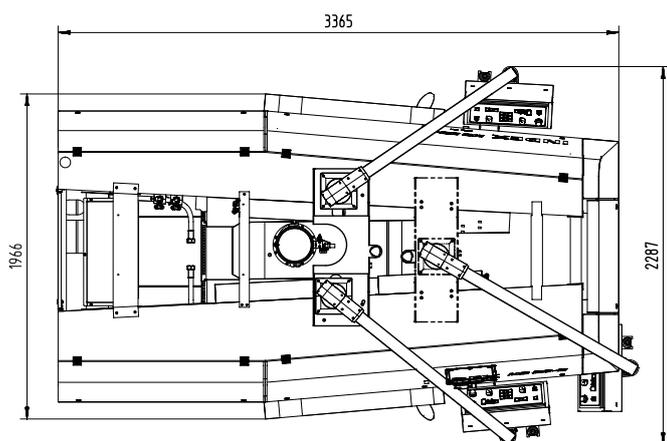
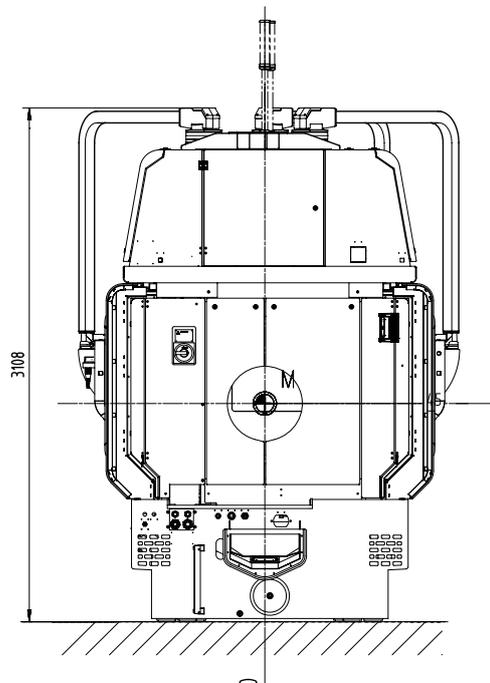
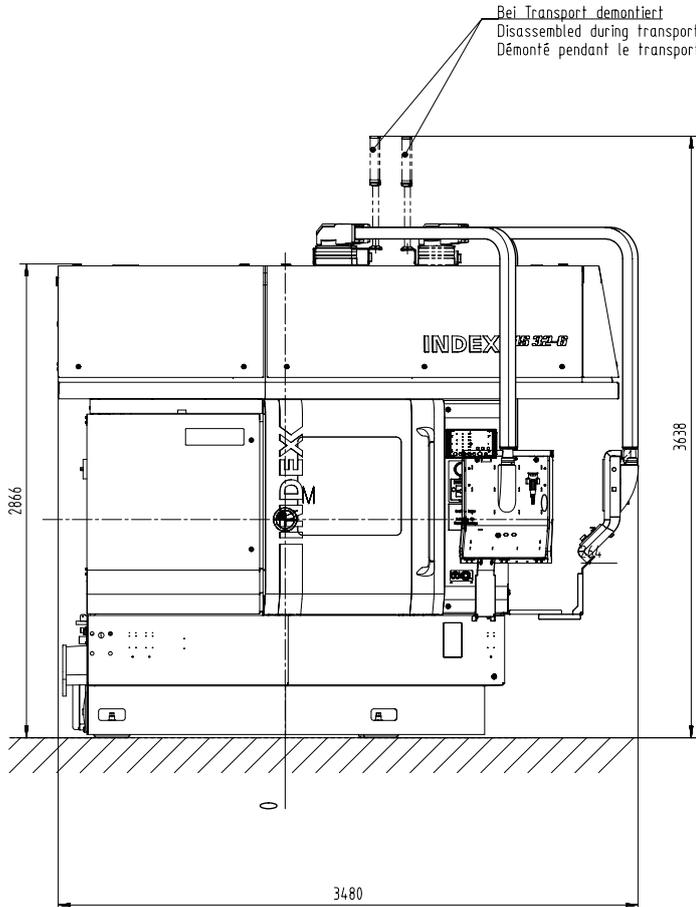


X Maschinenschwerpunkt  
Machine centre of gravity  
Centre de gravité des machines

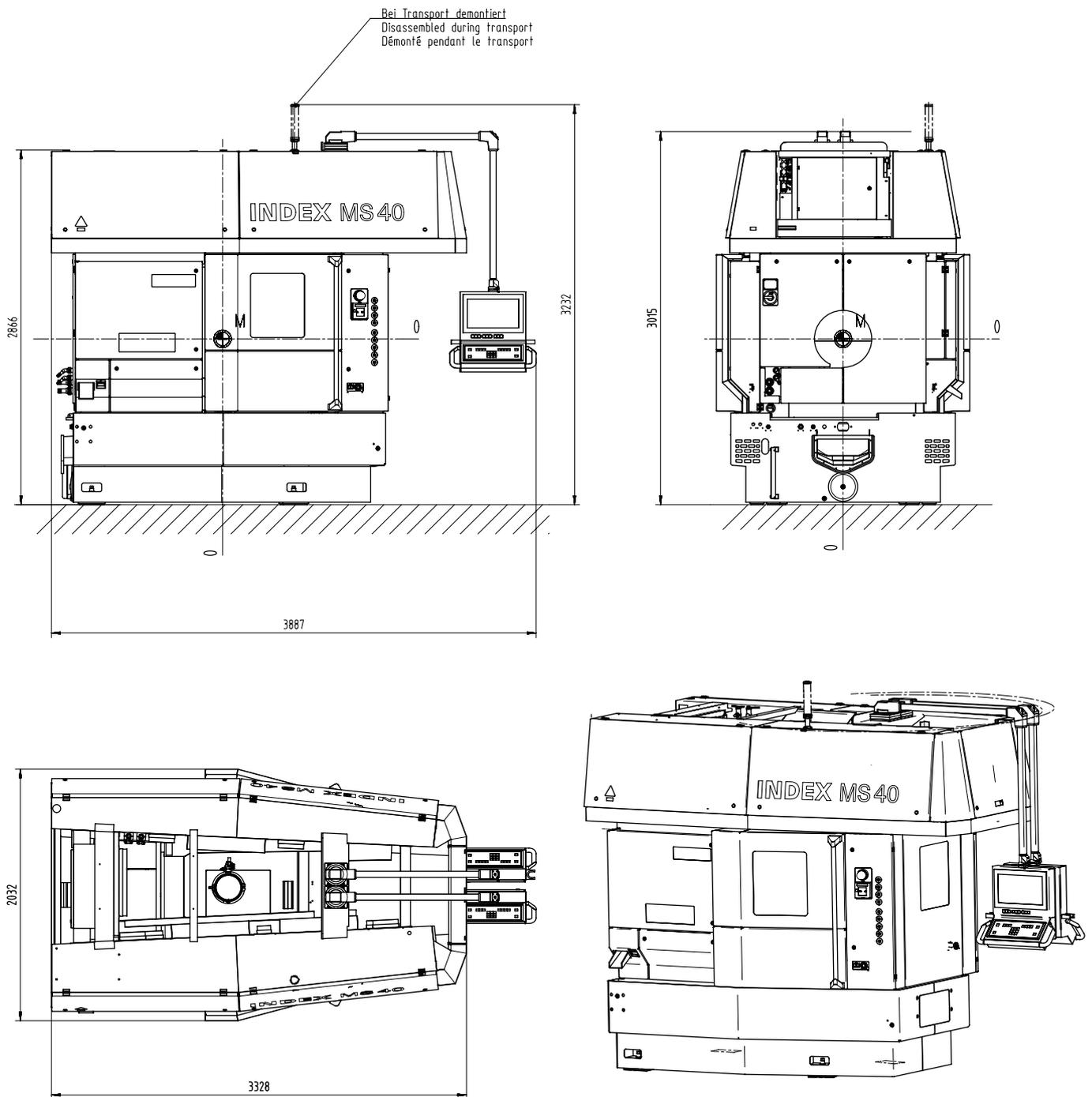


Transport dimensions – MS24-8

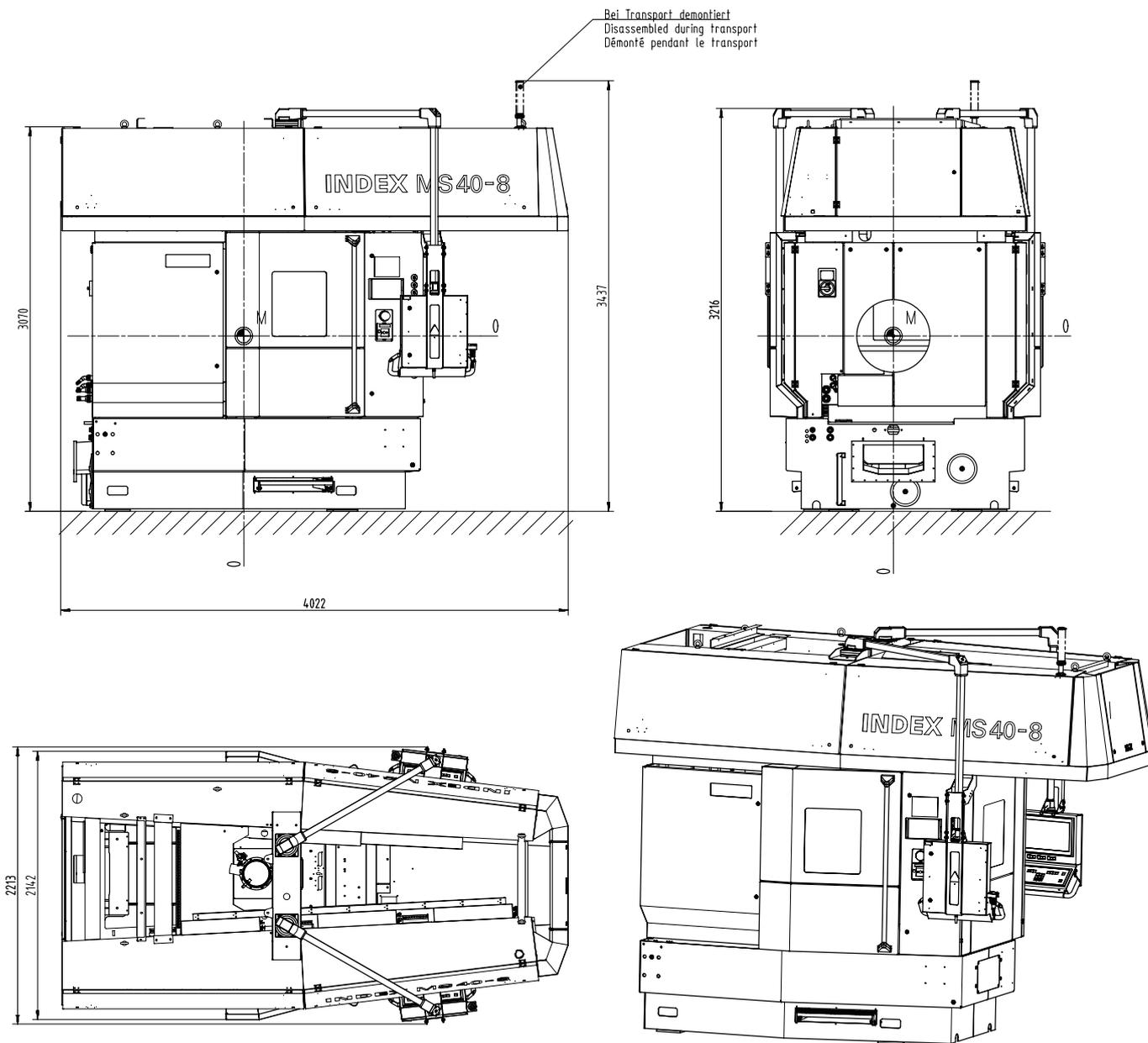
Bei Transport demontiert  
Disassembled during transport  
Démonté pendant le transport



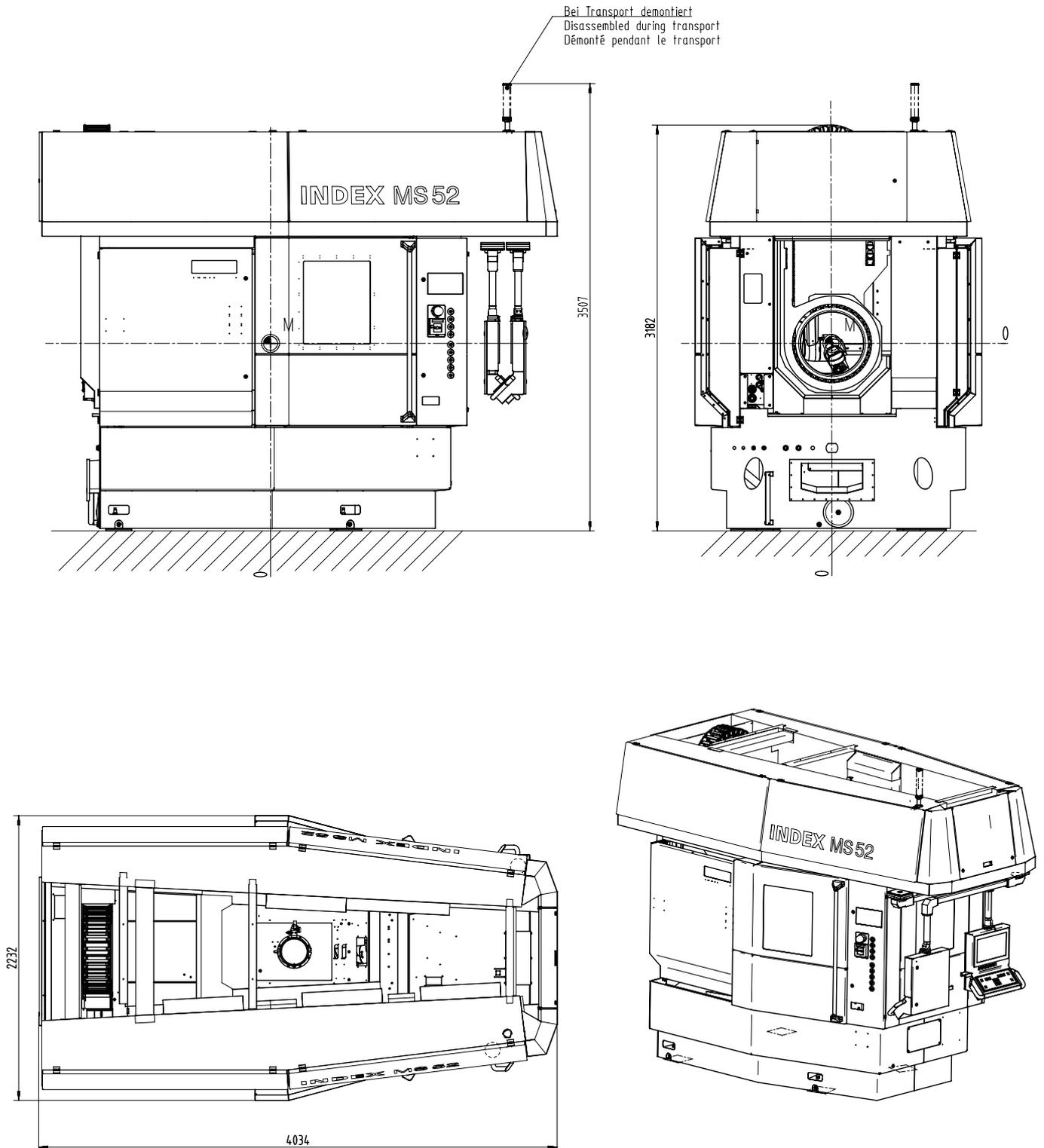
Transport dimensions – MS32-6



Transport dimensions – MS40-6



Transport dimensions – MS40-8



Transport dimensions – MS52-6

# INDEX MS16-6

## Transporting the machine



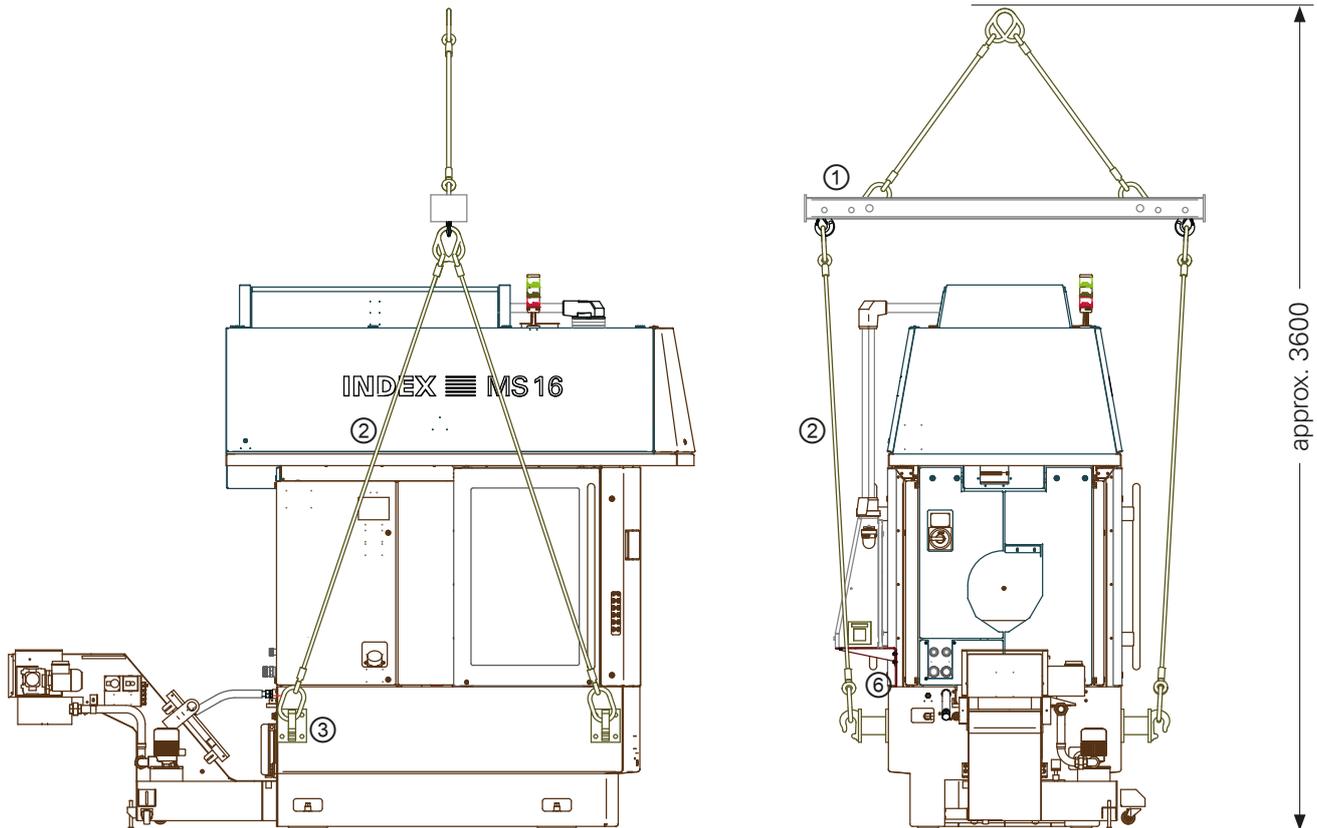
The machine is **not** suitable for transport with a forklift.

**Machine weight with chip conveyor: approx. 5200 kg**

The machine must be transported by crane with the chip conveyor mounted.

### Transport with crane – MS16-6, MS16-6 Plus

The load beam and the transport harness ropes required for the proper transport of the machine are generally supplied at a fee and can be returned to INDEX-Werke after the machine has been installed. If the machine is transported again at a later date, these lifting devices can be purchased from INDEX at cost.



	Item	Pcs.	Name	Order number	
Transport equipment	①	1	Load beam (cross), complete – 6.5 t	208 315.12	Overall machine
	②	4	Steel harness ropes – $\varnothing$ 18 2350 mm (min. load capacity 5 t)	208 113.1828	
	③	4 16	Mounting hook with base – 4 t + cylinder head screw M20x40 DIN 912-12.9	208 310.4613 410 260.2040	
Transport locks	⑥	1	Operating terminal angle bracket red	M90 991.80	Operating terminal
		2	+ cylinder head screw M8x30 DIN 912-12.9	410 260.0612	
		2	+ washer St 6.4	419 021.06	
		1	Strip red	M90 991.70	
		1	Retaining plate red	M90 991.60	
		4 4	+ washer St 6.4 + cylinder head screw M6x20 DIN 912-12.9	419 021.06 410 260.0620	
Other transport materials		1	PVC cover (4000 x 2200 x 2000 x 0.2)	398 572.1081	
		1	Anti-slip mat	288 000.0030	



**Cylinder head screws are intended for one-time use only.**  
Tightening torques for the screws must be taken from the relevant standard.

# INDEX MS22-8 INDEX MS32-6.2 INDEX MS40-6

## Transporting the machine

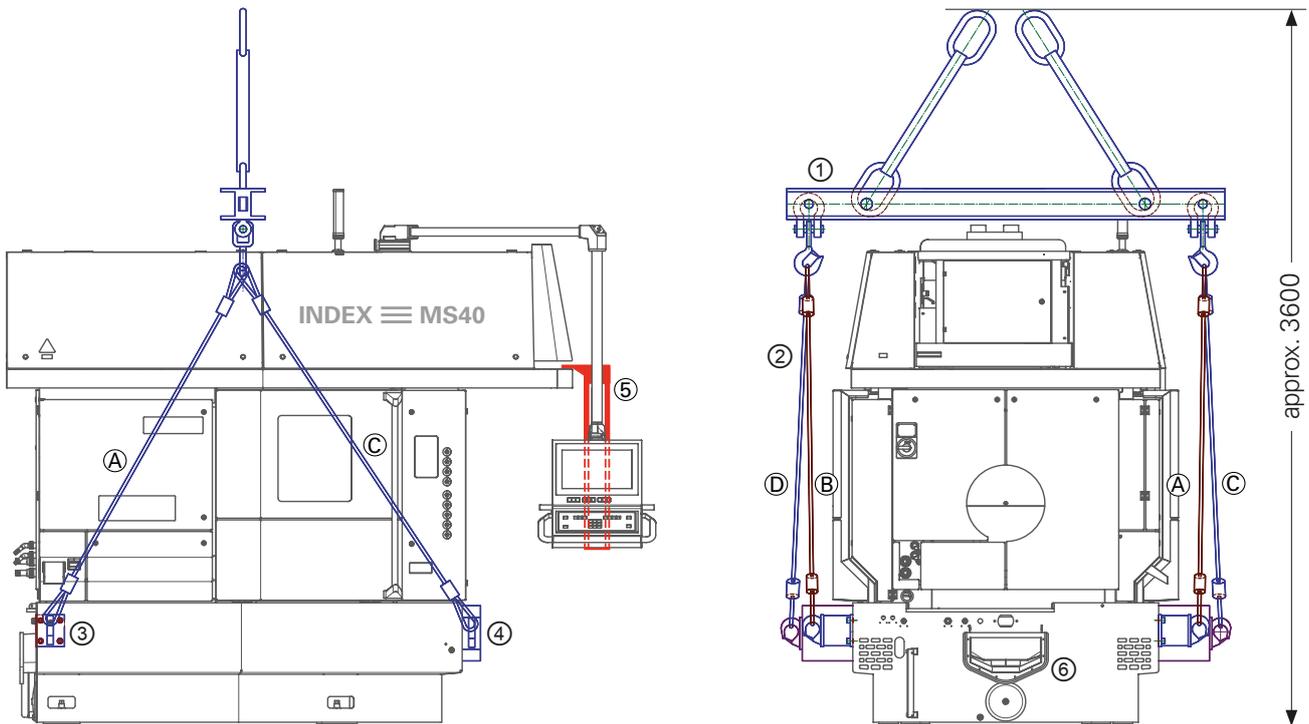


The machine is **not** suitable for transport with a forklift.

Machine weight  
approx. 7100 kg

### Transport with crane – MS22-8, MS32-6.2, MS40-6

The transport equipment required for the proper transport of the machine (load beam, harness ropes, and operating terminal transport lock) are generally supplied at a fee and can be returned to INDEX-Werke after the machine has been installed. If the machine is transported again at a later date, these lifting devices can be purchased from INDEX at cost.



	Item	Pcs.	Name	SAP order number	
Transport equipment	①	1	Load beam (cross), complete – 13 t	1018 7730	Overall machine
	②	(4)	Steel harness ropes – $\varnothing$ 22		
		1	(A) 2430 mm (min. load capacity 5 t)	1046 4780	
		1	(B) 2470 mm (min. load capacity 5 t)	1064 7607	
		2	(C/D) 2730 mm (min. load capacity 5 t)	1057 2230	
	③	2	Mounting hook with base – 4 t	1008 0445	
8		+ cylinder head screw M20x40 DIN 912-12.9	(410 260.2040)		
④	1	Front load beam – 6 t	1105 9762		
	4	+ cylinder head screw M24x60 DIN 912-12.9	1005 5673		
Machine transport locks	⑤	1	Operating terminal transport lock	(GM21 01.9615)	Machine base
	⑥	1	Steel plate, red (chip channel)	1049 5968	
		6	+ cylinder head screw M8x10 DIN 912-12.9	1026 4042	
Other transport materials		1	PVC cover (4000 x 2200 x 2000 x 0.2)	1053 0655	
		1	Anti-slip mat (200 x 200 x 8)	1007 8426	



Cylinder head screws are intended for **one-time use only**.  
Tightening torques for the screws must be taken from the relevant standard.

# INDEX MS24-6

## Transporting the machine

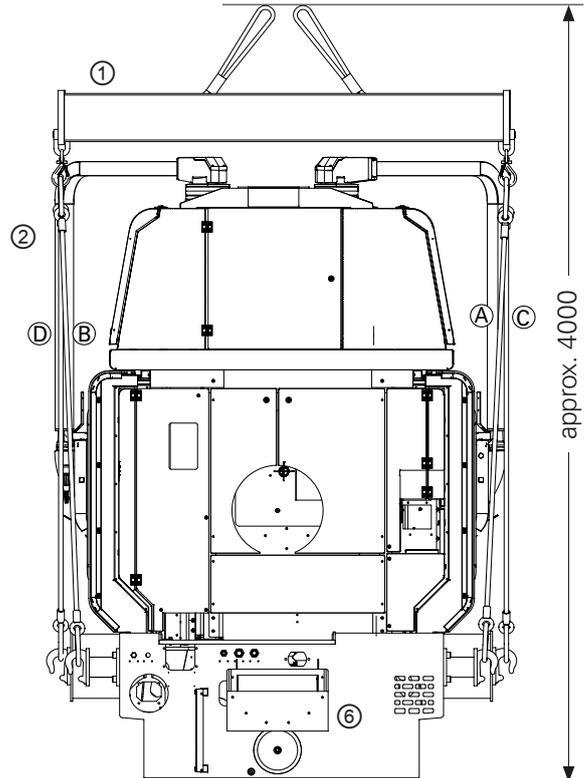
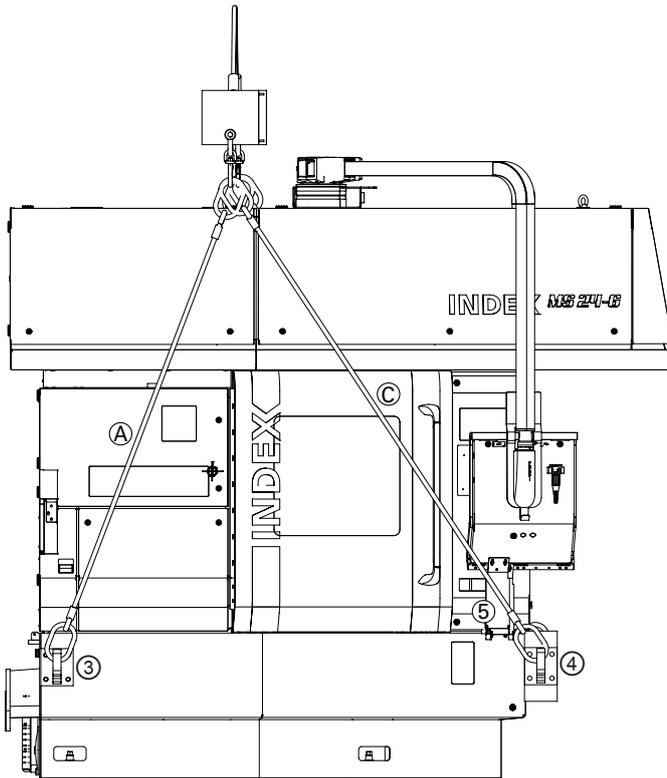


The machine is **not** suitable for transport with a forklift.

**Machine weight**  
approx. 6600 kg

### Transport with crane – MS24-6

The transport equipment required for the proper transport of the machine (load beam, harness ropes, and operating terminal transport lock) are generally supplied at a fee and can be returned to INDEX-Werke after the machine has been installed. If the machine is transported again at a later date, these lifting devices can be purchased from INDEX at cost.



	Item	Pcs.	Name	SAP order number	
Transport equipment	①	1	Load beam (cross), complete – 13 t	1018 7730	Overall machine
	②	(4)	Steel harness ropes – $\varnothing$ 22		
		1	Ⓐ 2430 mm (min. load capacity 5 t)	1046 4780	
		1	Ⓑ 2470 mm (min. load capacity 5 t)	1064 7607	
		2	Ⓒ/Ⓓ 2730 mm (min. load capacity 5 t)	1057 2230	
	③	2	Mounting hook with base – 4 t	1008 0445	
		8	+ cylinder head screw M20x40 DIN 912-12.9	1103 0816	
④	1	Front load beam – 6 t	1105 9762		
	4	+ cylinder head screw M24x60 DIN 912-12.9	1005 5673		
Machine transport locks	⑤	1	Operating terminal transport lock, front and rear	1205 8006	Machine base
		1	Operating terminal transport lock, front	1209 0038	
Other transport materials	⑥	1	Steel plate, red (chip channel)	1049 5968	
		6	+ cylinder head screw M8x10 DIN 912-12.9	1026 4042	
		1	PVC cover (4000 x 2200 x 2000 x 0.2)	1053 0655	
		1	Anti-slip mat (200 x 200 x 8)	1007 8426	



Cylinder head screws are intended for **one-time** use only.  
Tightening torques for the screws must be taken from the relevant standard.

# INDEX MS24-8

## Transporting the machine

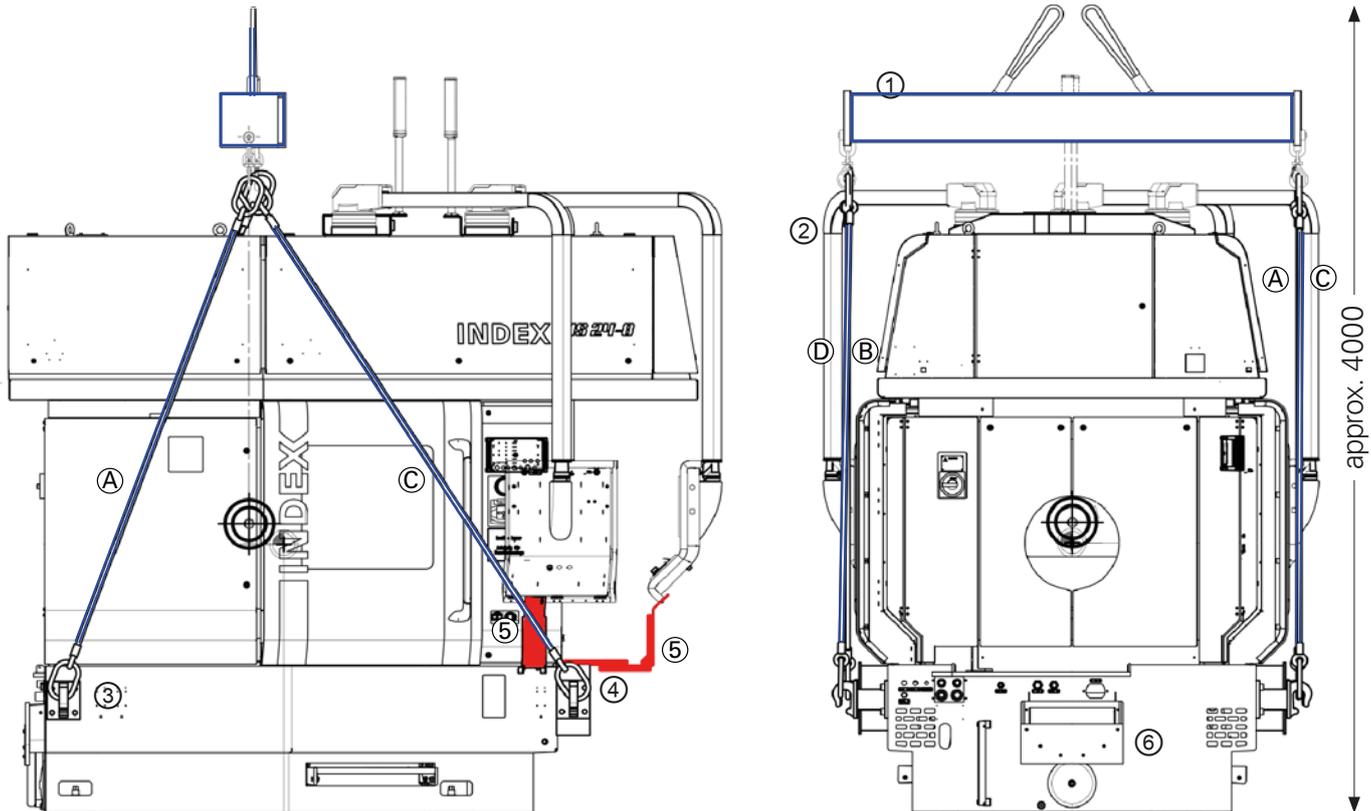


The machine is **not** suitable for transport with a forklift.

**Machine weight  
approx. 8000 kg**

### Transport with crane – MS24-8

The transport equipment required for the proper transport of the machine (load beam, harness ropes, and operating terminal transport lock) are generally supplied at a fee and can be returned to INDEX-Werke after the machine has been installed. If the machine is transported again at a later date, these lifting devices can be purchased from INDEX at cost.



	Item	Pcs.	Name	SAP order number	
Transport equipment	①	1	Load beam (cross), complete – 13 t	10187730	Overall machine
	②	(4)	Steel harness ropes – $\varnothing$ 22		
			① 2430 mm (min. load capacity 5 t)	10464780	
			② 2470 mm (min. load capacity 5 t)	10647607	
			③/④ 2730 mm (min. load capacity 5 t)	10572230	
	③	2	Mounting hook with base – 4 t	10080445	
+ cylinder head screw M20x40 DIN 912-12.9			11030816		
④	1	Front load beam – 6 t	11059762		
		+ cylinder head screw M24x60 DIN 912-12.9	10055673		
Machine transport locks	⑤	1	Operating terminal transport lock, front and rear	12058006	
			Operating terminal transport lock, front	12058004	
	⑥	1	Steel plate, red (chip channel)	10495968	Machine base
			6	+ cylinder head screw M8x10 DIN 912-12.9	
Other transport materials		1	PVC cover (4000 x 2200 x 2000 x 0.2)	10530655	
		1	Anti-slip mat (200 x 200 x 8)	10078426	



**Cylinder head screws are intended for one-time use only.  
Tightening torques for the screws must be taken from the relevant standard.**

# INDEX MS32-6.3

## Transporting the machine

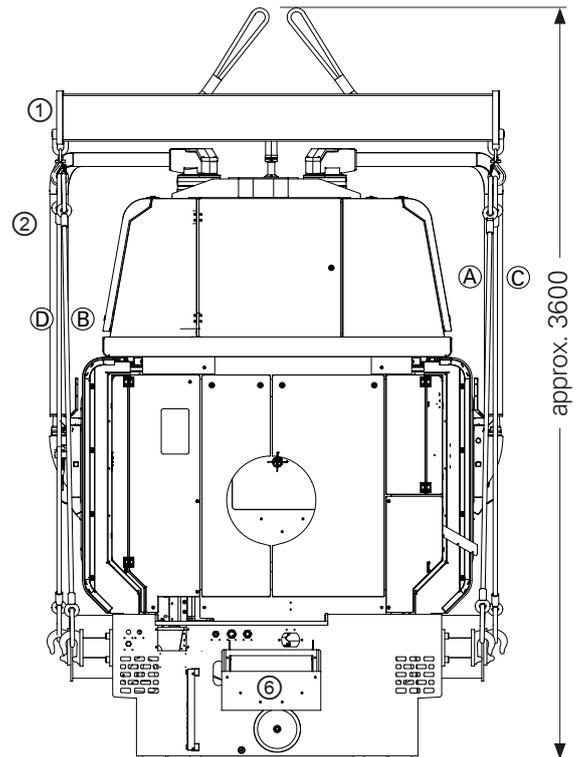
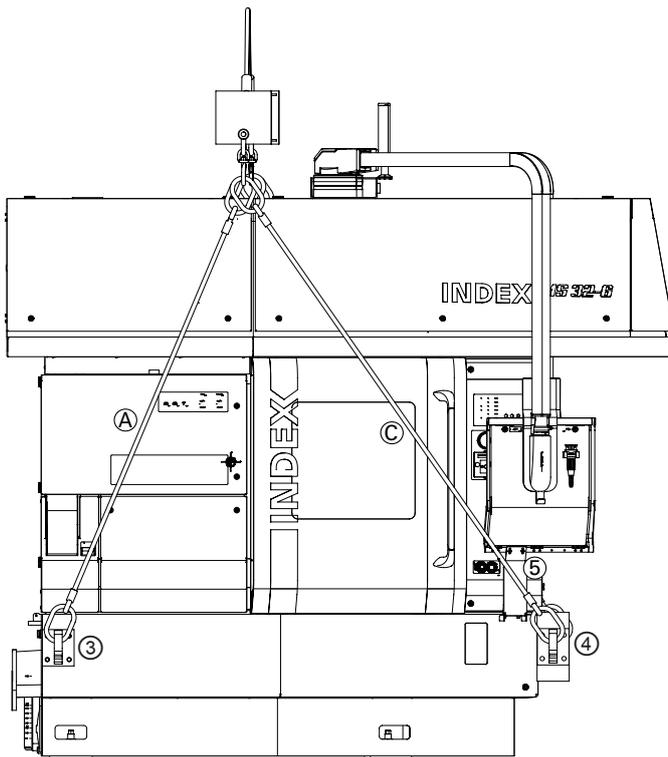


The machine is **not** suitable for transport with a forklift.

**Machine weight  
approx. 7100 kg**

### Transport with crane – MS32-6.3

The transport equipment required for the proper transport of the machine (load beams, harness ropes, and mounting hook) are generally supplied at a fee and can be returned to INDEX-Werke after the machine has been installed. If the machine is transported again at a later date, these lifting devices can be purchased from INDEX at cost.



	Item	Pcs.	Name	SAP order number	
Transport equipment	①	1	Load beam (cross), complete – 13 t	1018 7730	Overall machine
	②	(4)	Steel harness ropes – $\varnothing$ 22		
		1	(A) 2430 mm (min. load capacity 5 t)	1046 4780	
		1	(B) 2470 mm (min. load capacity 5 t)	1064 7607	
		2	(C/D) 2730 mm (min. load capacity 5 t)	1057 2230	
	③	2	Mounting hook with base – 4 t	1008 0445	
8		+ cylinder head screw M20x50 DIN 912-12.9	1103 0816		
④	1	Front load beam – 6 t	1105 9762		
	4	+ cylinder head screw M24x60 DIN 912-12.9	1005 5673		
Machine transport locks	⑤	1	Operating terminal transport lock, front and rear	1205 8006	Machine base
		1	Operating terminal transport lock, front	1205 8004	
	⑥	1	Sheet metal plate, red (chip channel)	1049 5968	
6		+ cylinder head screw M8x10 DIN 912-12.9	1026 4042		
Other transport materials		1	PVC cover (4000 x 2200 x 2000 x 0.2)	1053 0655	
		1	Anti-slip mat (200 x 200 x 8)	1007 8426	



**Cylinder head screws are intended for one-time use only.  
Tightening torques for the screws must be taken from the relevant standard.**

# INDEX MS40-8

## Transporting the machine

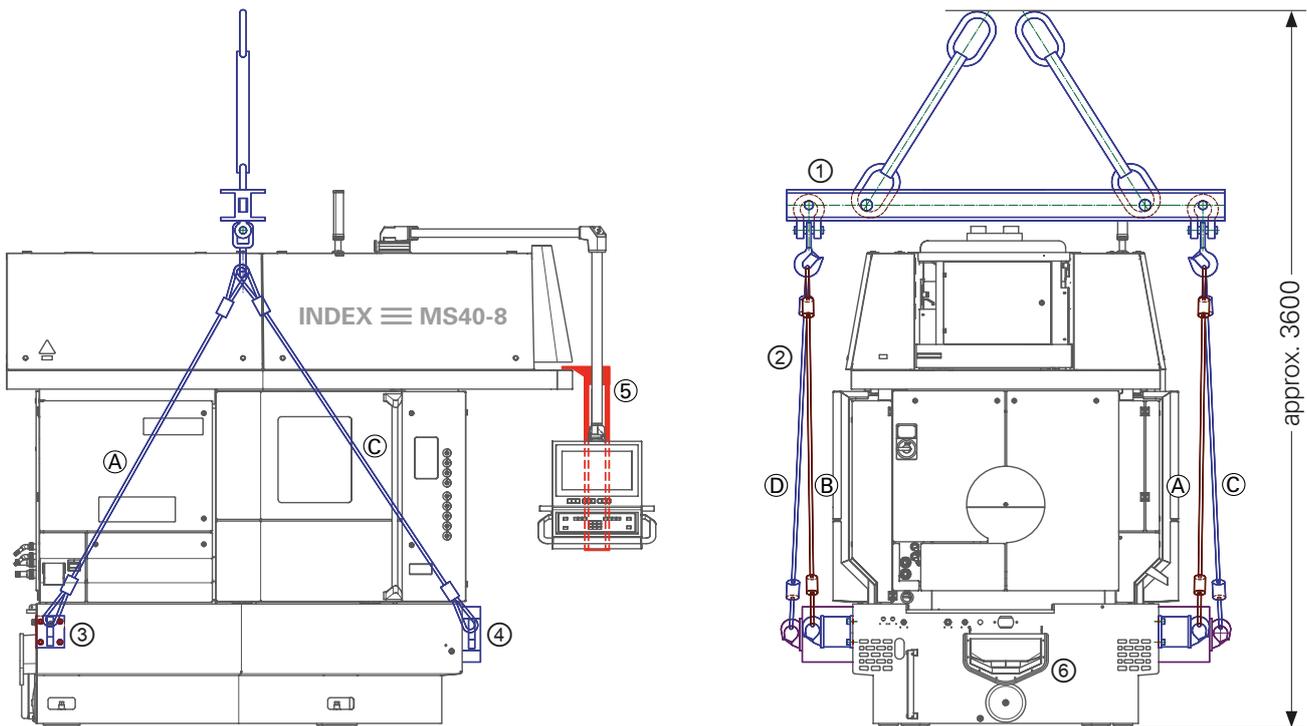


The machine is **not** suitable for transport with a forklift.

**Machine weight**  
approx. 11000 kg

### Transport with crane – MS40-8

The transport equipment required for the proper transport of the machine (load beam, harness ropes, and operating terminal transport lock) are generally supplied at a fee and can be returned to INDEX-Werke after the machine has been installed. If the machine is transported again at a later date, these lifting devices can be purchased from INDEX at cost.



	Item	Pcs.	Name	Order number		
Transport equipment	①	1	Load beam (cross), complete – 13 t	1018 7730	Overall machine	
	②	(4)	Steel harness ropes – $\varnothing$ 22			
			① (A)	2430 mm (min. load capacity 5 t)		1046 4780
			② (B)	2470 mm (min. load capacity 5 t)		1064 7607
			③/④ (C/D)	2730 mm (min. load capacity 5 t)		1057 2230
	③	2	Mounting hook with base – 5t	1034 7447		
+ cylinder head screw M24x60 DIN 912-12.9			1005 5673			
④	1	Front load beam – 6 t	1105 9762			
		+ cylinder head screw M24x60 DIN 912-12.9	1005 5673			
	⑤	1	Operating terminal transport lock	1200 8335		
Machine transport locks	⑥	1	Steel plate, red (chip channel)	1049 5968	Machine base	
		6	+ cylinder head screw M8x20 DIN 912-12.9	1099 7130		
		6	+ washer St 8.4-7349	1002 2427		
Other transport materials		1	PVC cover (4000 x 2200 x 2000 x 0.2)	1053 0655		
		1	Anti-slip mat (200 x 200 x 8)	1007 8426		



**Cylinder head screws are intended for one-time use only.**  
**Tightening torques for the screws must be taken from the relevant standard.**

# INDEX MS52-6

# Transporting the machine

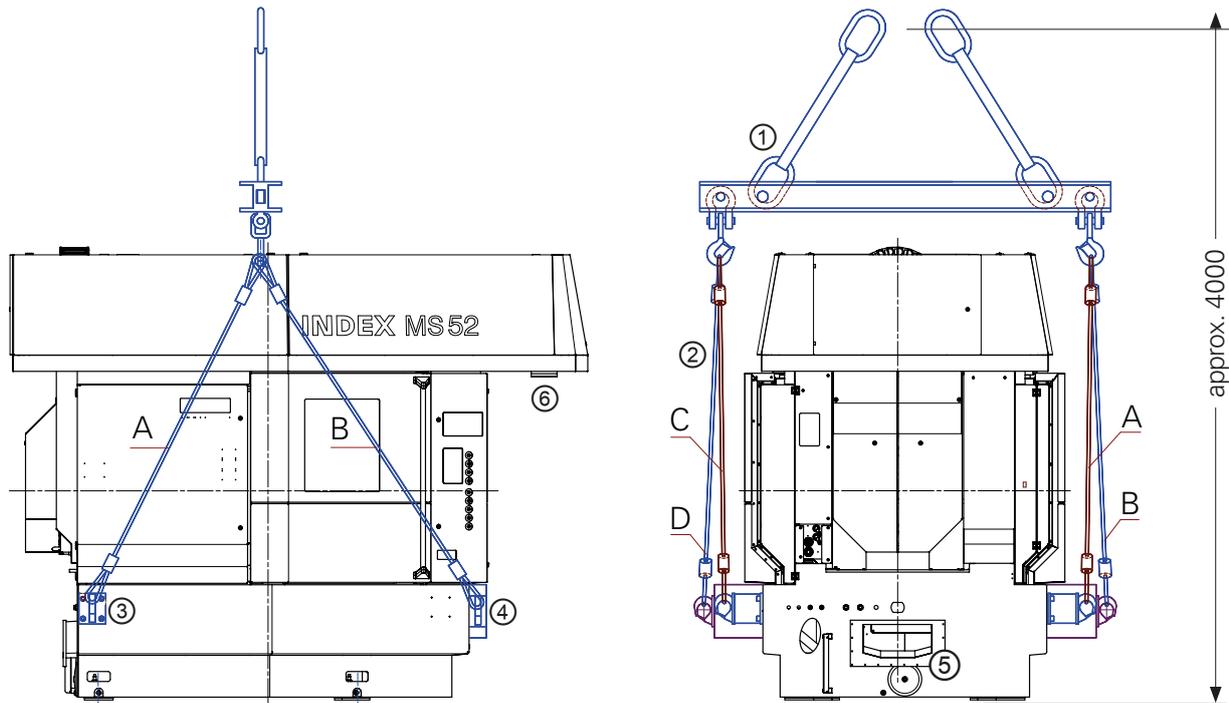


The machine is **not** suitable for transport with a forklift.

**Machine weight**  
approx. 12000 kg

## Transport with crane – MS52-6.3

The load beam and the transport harness ropes required for the proper transport of the machine are generally supplied at a fee and can be returned to INDEX-Werke after the machine has been installed. If the machine is transported again at a later date, these lifting devices can be purchased from INDEX at cost.



	Item	Pcs.	Name	Order number			
Transport equipment	①	1	Load beam (cross), complete – 13 t	208 315.1455	Overall machine		
	②	(2)	Steel harness ropes – $\varnothing$ 22			208 162.0003	
			1	A 2500 mm (min. load capacity 5 t)			208 162.0004
			1	B 2920 mm (min. load capacity 5 t)			
			1	C 2590 mm (min. load capacity 5 t)			
	③	2	Mounting hook with base – 5t	208 310.4612			
	8	+ cylinder head screw M24x60 DIN 912-12.9	410 260.2460				
	④	1	Front load beam – 6 t	208 315.1456			
		4	+ cylinder head screw M24x60 DIN 912-12.9	410 260.2460			
Transport locks	⑤	1	Steel plate, red (chip channel)	M72 601.90	Machine base		
		12	+ cylinder head screw M8x12 DIN 912-12.9	410 260.0812			
	⑥	2	Holder	M71401.30	Operating terminal		
		2	Strip	M71401.40			
	4	+ cylinder head screw M6x12 DIN 912-12.9	410 260.0612				
	4	+ hex nut M6-10	415 610.06				
	12	+ washer St B 6.4 blued	419 010.06				
	4	+ cylinder head screw M6x16 DIN 912-12.9	410 260.0616				
Other transport materials		1	PVC cover (4000 x 2200 x 2000 x 0.2)	398 572.1081			
		1	Anti-slip mat	288 000.0030			



**Cylinder head screws are intended for one-time use only.**  
**Tightening torques for the screws must be taken from the relevant standard.**

MS16-6  
MS22-8  
MS24-6  
MS24-8  
MS32-6  
MS40-6  
MS40-8  
MS52-6

## Unloading the machine with a crane or mobile crane



**Use a crane with sufficient capacity.**  
**Unload the machine as close as possible to the installation site. Short transport distances reduce the risk of accidents.**  
**Use only the dedicated transport gear for lifting the machine by means of a crane.**

### Clearance of the crane hook:

Height of the transport unit (e.g., machine, control cabinet, etc.) .....	see illustration
+ transport gear or rope length above the transport unit .....	see illustration
+ truck loading height .....	approx. 1.3 m
+ lift-off height.....	0.2 m

---

Remove all transport locks used for truck transport.

---

If the machine is packaged in a crate, remove the crate top and side panels.

---

Position the crane hook so that the ropes become evenly taut.



**Ensure that the ropes do not contact any part of the machine.**  
**Do not step under or next to the suspended machine.**

Slowly and carefully lift the machine.



**Make sure that the machine remains in a horizontal position. The center of gravity is not exactly in the center of the machine.**  
**If necessary, set the machine down again and check the rope arrangement. The rope lengths differ and must not be interchanged.**

Lift the machine from the truck or drive the truck away from under the machine.

---

Move a transport aid under the machine.



**Select transport aids with sufficient capacity. They must match at least the mass of the machine.**  
**When using a trolley, the loading area should be larger than the base area (footprint) of the machine.**

Slowly and carefully place the machine down onto the transport aid and move it to the installation site. Remove the transport gear beforehand.

## Setting the machine down at the installation site

Once the final location has been determined and properly prepared (see the section "Preparation"), the machine can be carefully guided to that location and set down.

### Setting the machine down ...

#### ... with a crane or mobile crane

Using a suitable crane, lift the machine slowly until it is fully clear of the ground. Observe the relevant instructions in the section "Unloading the machine with a crane or mobile crane".

If the machine was moved to the installation site with a trolley or with transport rollers, pull them out from under the machine.

#### ...with hydraulic jacks

Hydraulic jacks are required if a crane cannot be used at the installation site. Because forklift transport is not permitted, a transport method must be selected whose loading height matches the lifting height of the hydraulic jacks for moving the machine to the installation site.

INDEX recommends using transport rollers in this case, as they have a low loading height. (See the section "Transporting with transport rollers".)

Only use special machinery hydraulic jacks with the following properties:

- The hydraulic jacks must have a sufficient capacity.
- The jacks must be stable and secured against tilting when lifting and lowering.
- The lifting load must not be able to slip off the jack.
- Sensitive and continuous lowering must be possible.
- The lifting load must not be damaged during lifting and lowering.



**Be sure to provide three-point support when lifting or lowering the machine with hydraulic jacks:**



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

**Do not lift the machine more than absolutely necessary.**

**Because the center of gravity is not located at the center of the machine, if two hydraulic jacks are used simultaneously, the load capacity of each jack should be at least one-third of the machine's weight.**

**If only one hydraulic jack is used, its load capacity should be at least two-thirds of the machine's weight.**

**Lift the machine in increments and place adequate wooden boards under the machine after each step. Use the same approach when setting the machine down.**

## Transporting with transport rollers

Use transport rollers when an appropriate crane is not available at the installation site.

Transport rollers 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 (rollers), which require a solid, even floor of appropriate load capacity and very slow, smooth movements during the transport.

You will need both fixed and swivel transport rollers. The load capacity of each transport roller can be smaller than the weight of the machine. For further details, refer to the descriptions on the following pages.

### Procedure for transporting the machine

- Push the transport rollers under the narrow sides of the machine base: the fixed rollers on the spindle end, and the swivel rollers on the opposite end.
- If the machine is on a transport base (in the case of crate packaging) or on planks that are firmly attached to the machine, the rollers may also be positioned under these planks.
- Lower the machine slowly until it rests on the transport rollers.



**Connect the fixed rollers using a steel bar, and connect the fixed and swivel rollers using steel cables. This prevents the transport rollers from slipping while the machine is being pulled.**



**Transport rollers may only be positioned under the machine feet. Any other placement will cause severe damage to the machine.**

## Use of tank rollers

The use of tank rollers allows the machine to be maneuvered in tight spaces. If you place turntables on top of the tank rollers, they become steerable.

Use tank rollers only if a crane cannot be used.

Prerequisites: Solid, flat, and preferably smooth floor with sufficient bearing capacity. (If necessary, place steel rails with sufficient capacity below.)

Armored casters are not suitable for transport over longer distances.

You should use armored casters with the highest load capacity possible, because they have much better rolling properties due to their larger caster diameter.

You will need at least four tank rollers, which must be positioned under the machine's feet as described on the following pages.

To place the tank rollers, you must lift the machine using hydraulic jacks. (See the section "Setting the machine down at the installation site".)



**Be sure to provide at least for a three-point support when lifting or lowering the machine with hydraulic jacks: One side of the machine must always rest either on the floor or on two tank rollers.**

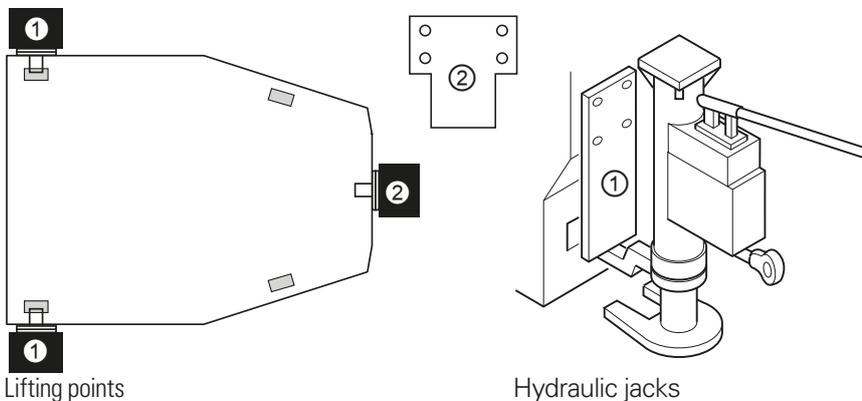
Place sturdy wooden boards, preferably of hardwood, between the machine and the tank rollers. The boards need to have a sufficient size:

- Width = about four times the width of the tank rollers
- Thickness = at least 30 mm
- Length = corresponding to the width of the machine foot

MS22-8  
MS24-6  
MS24-8  
MS32-6  
MS40-6  
MS40-8  
MS52-6

## Lifting/lowering the machine with hydraulic jacks

Item	Name	MS22-6 ... MS40-8	MS52-6	Order number
①	Lifting device	2	2	208315.1477
②	Lifting device	1	1	208315.1478
	Cylinder head screws:			
	• M20x60 DIN 912-12.9	8	-	410260.2060
	• M24x60 DIN 912-12.9	4	12	410260.2460



- Required: Two hydraulic jacks (each with a load capacity of at least two-thirds of the machine's weight)

To lift the machine, lifting devices (steel plates) ① and ② must be screwed to the designated lifting points. Position the hydraulic jacks under the lifting devices.

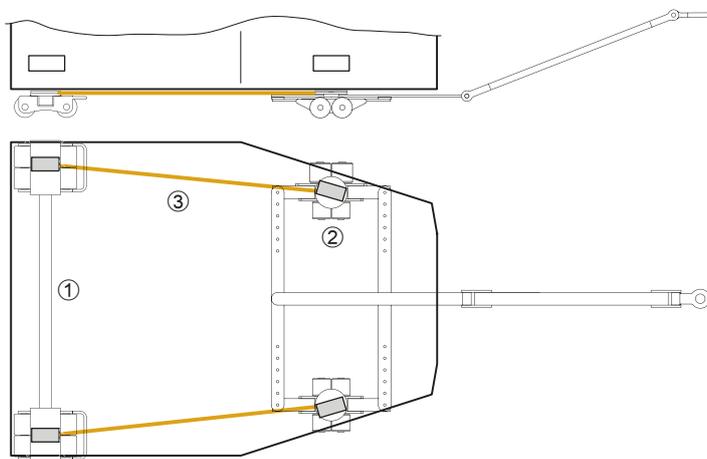


Only lift or lower the machine using the lifting devices approved by INDEX.

## Transport with transport rollers or tank rollers



Transport rollers may only be placed under the machine feet.  
The design of the machine base does not allow any other placement.



### Transport with transport rollers

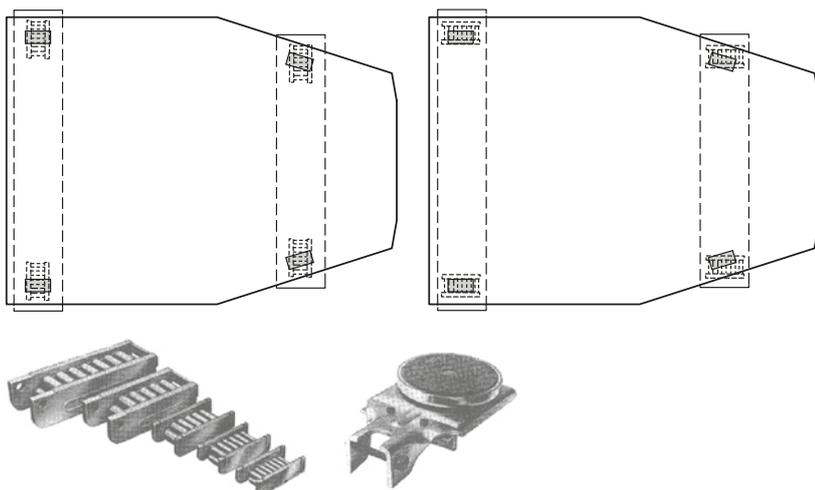
Required:

- Two fixed transport rollers ①, firmly connected to each other with a steel bar. Load capacity of each roller: at least one-third of the machine's weight.
- Two swivel transport rollers ②, firmly connected to each other. Load capacity of each roller: at least one-third of the machine's weight.
- Steel cables ③ for connecting the transport rollers.

### Transport with tank rollers

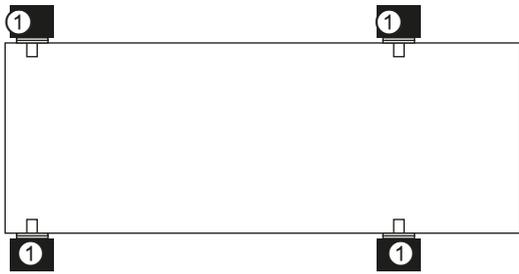
Required:

- At least four tank rollers, positioned under the machine feet.
- Sturdy hardwood boards between the machine and the tank rollers.  
Width = about four times the width of the tank rollers  
Thickness = at least 30 mm  
Length = corresponding to the width of the machine foot
- Turntables (to make the tank rollers steerable)

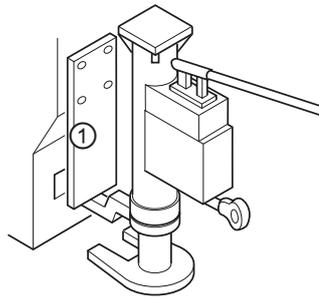


## Lifting/lowering the machine with hydraulic jacks

Item	Name	MS16-6	MS40P	Order number
①	Lifting device	4	4	208315.1477
	Cylinder head screw M20x60 DIN 912-12.9	16		410260.2060
	Cylinder head screw M24x60 DIN 912-12.9		16	410260.2460



Lifting points



Hydraulic jacks

### Lifting/lowering the machine with hydraulic jacks

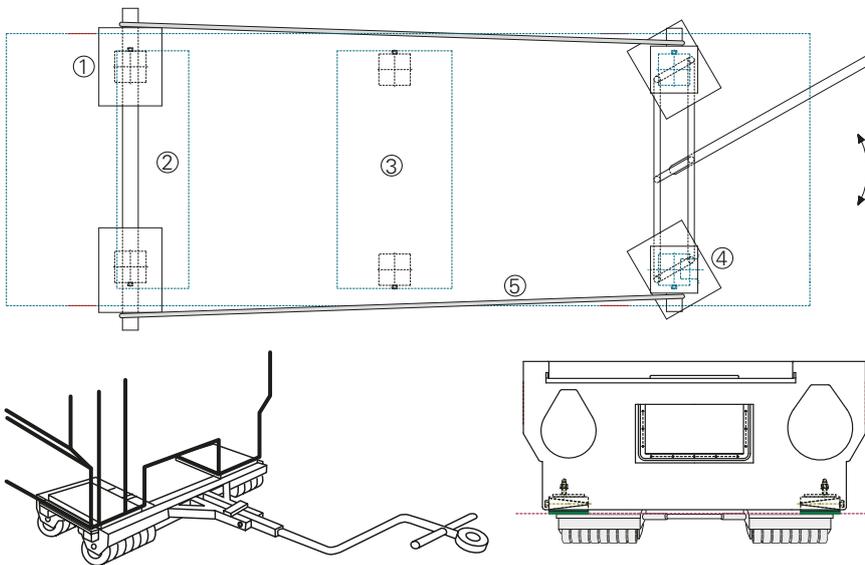
- Required: Two hydraulic jacks (each with a load capacity of at least one-third of the machine's weight)

To lift the machine, steel plates must be screwed to the designated lifting points. Position the hydraulic jacks under the steel plates.

**Only lift or lower the machine using the lifting devices approved by INDEX.**

## Transport with transport rollers or tank rollers

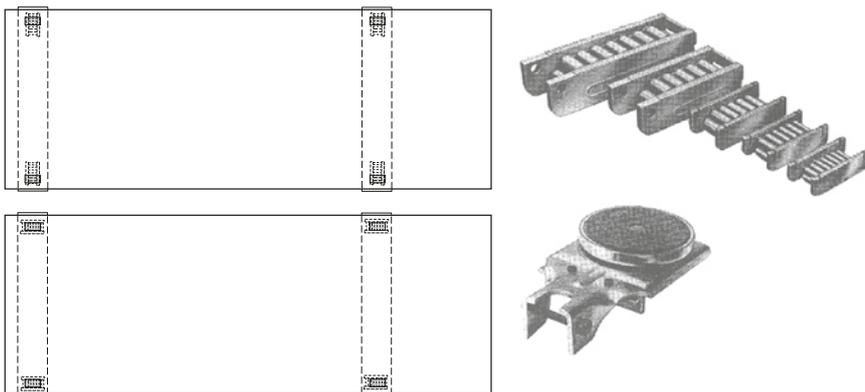
**Transport rollers may only be placed under the machine feet. The design of the machine base does not allow any other placement.**



### Transport with transport rollers

- Required:
- Two fixed transport rollers ① (each with a load capacity of at least one-third of the machine's weight), firmly connected to each other with a steel bar, on the chip conveyor side
  - Two swivel transport rollers ④ (each with a load capacity of at least one-third of the machine's weight) on the opposite side
  - Steel cables ⑤ for connecting the transport rollers
- ② Headstock 1  
③ Headstock 2 (quillstock)

### Transport with tank rollers



- Required:
- At least four tank rollers, positioned under the machine feet.
  - Sturdy hardwood boards between the machine and the tank rollers.
    - Width = about four times the width of the tank rollers
    - Thickness = at least 30 mm
    - Length = corresponding to the width of the machine foot
  - Turntables (to make the tank rollers steerable)

**MS16-6**  
**MS22-8**  
**MS24-6**  
**MS24-8**  
**MS32-6**  
**MS40-6**  
**MS40-8**  
**MS52-6**

## Unloading and transporting separate transport units

Add-on units or supplementary equipment such as chip conveyors, bar feeders, bar loading magazines, etc. are separate transport units.

They have their own transport requirements that must be observed during unloading and transport (see the tag at the relevant transport unit or the relevant chapter in the corresponding separate operating instructions).

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

Use suitable transport ropes or lifting straps for unloading and transporting these units.

Position the ropes or straps so that they cannot slip and the transport unit hangs securely.

If ring bolts are provided for transport, attach the ropes or straps to these points.



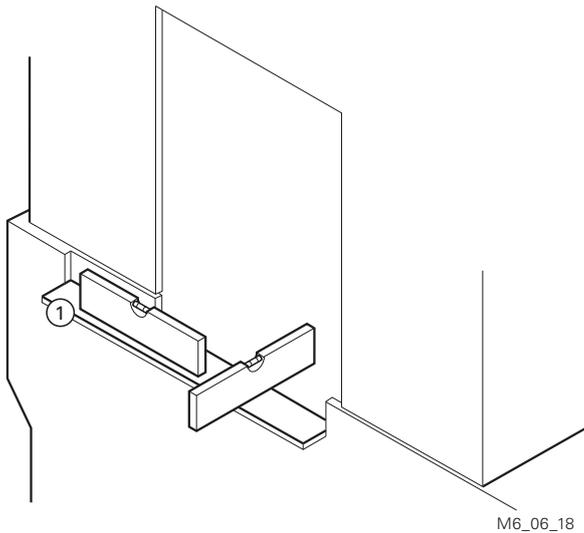
**Do not step under or next to suspended transport units.**

## Unpacking accessories and checking for completeness

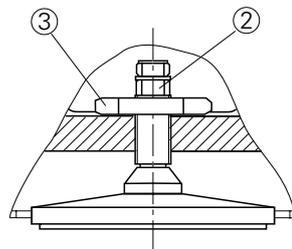
After unloading, unpack the machine accessories and check them against the information on the delivery form for completeness (compare with the bill of lading or delivery note).

If there are discrepancies, please notify your INDEX representative.

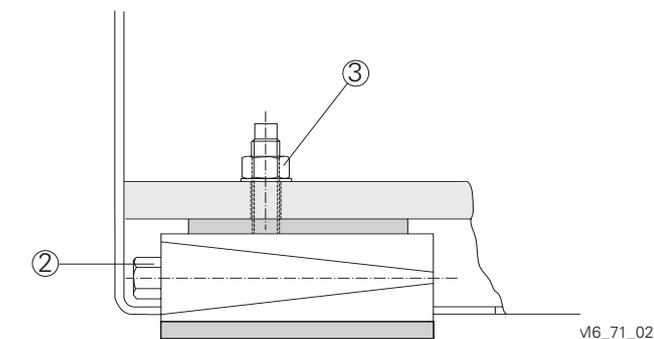
- MS16-6
- MS22-8
- MS24-6
- MS24-8
- MS32-6
- MS40-6
- MS40-8
- MS52-6



Mounting location for machinist's level  
(rough leveling only)



Machine foot with adjusting screw



Adjustable machine foot (wedge mounts)

## Installation and leveling

### Installing the machine

1. Transport the turning machine to the site.
2. If a crane cannot be used at the installation site, the machine must be lifted using hydraulic jacks at the designated lifting points.
  - Unscrew the adjusting screws of the machine feet until the thread is just barely visible above the lock nut.
3. Set the turning machine down.
4. Check the orientation of the machine relative to its surroundings (supply connections, cable ducts, other machines).
5. If necessary, reposition the turning machine.

### Leveling the machine

The turning machine has four adjustable feet (P and G machines have six) with adjusting screws or wedge mounts. These are used to align the machine in both the longitudinal and transverse directions.

Due to the high weight, the machine must be relieved by a crane or hydraulic jacks during leveling.



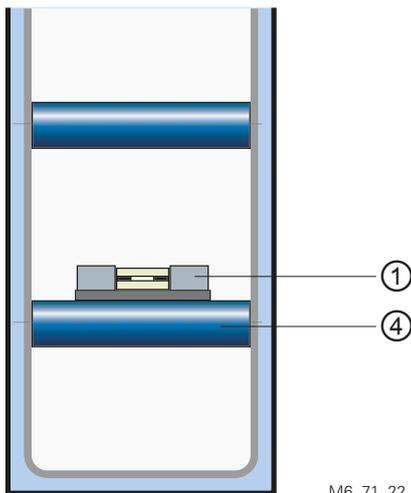
#### Caution

**The machine must rest only on its feet. The machine base must not rest directly on the floor.**

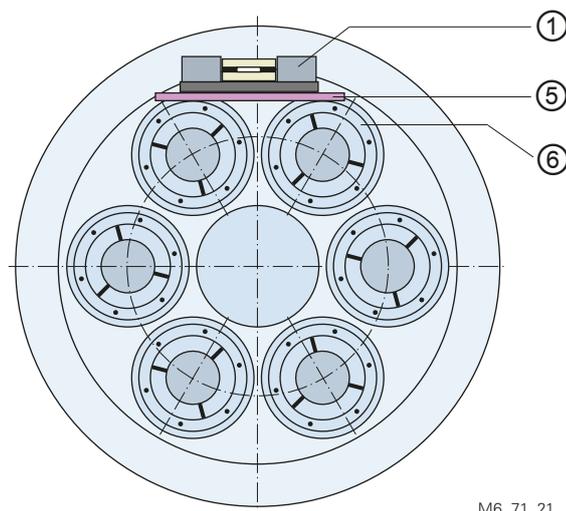
**Risk of machine deformation.**

### Rough leveling of the machine

6. Place a machinist's level on the mounting surface for the bar feeder (1) for alignment.
7. Loosen the lock nuts (3) on the feet.
8. Level the turning machine using the adjusting screws (2).
9. Tighten the lock nuts (3) on the feet.



Contact surface for machinist's level for longitudinal alignment



Contact surface for machinist's level for transverse alignment  
(Image – example of a six-spindle turning machine)

**Precise leveling of the machine**

This method is more time-consuming but is recommended by INDEX because it provides higher accuracy.

1. Aligning the machine in the longitudinal direction:  
Place the machinist's level (1) on the shaft (4) for the left support arm inside the headstock.  
  
Aligning the machine in the transverse direction:  
Using a measuring bridge (5), place the machinist's level (1) on the ground spindle noses of the collet mountings (6) of spindle positions 4 and 5.
2. Loosen the lock nuts (3) on the feet.
3. Level the turning machine using the adjusting screws (2).  
**P and G machines:** Check the leveling again on the B-side in both longitudinal and transverse directions and readjust if necessary.
4. Tighten the lock nuts (3) on the feet.

**Leveling add-on units**

Align any add-on units (if present) and level them in the longitudinal and transverse directions using a machinist's level if required.

**Anchoring the turning machine**

Do **not** anchor the turning machine to the floor.

**Installation and leveling of add-on units and supplementary equipment**

The bar guide, bar feeder, and bar loading magazine have leveling elements that allow them to be aligned flush with the work spindle or spindle drum 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's axis of rotation with  $\pm 0.1$  mm/m accuracy.

Refer to the floor plans in the chapter "Working documents" and to the documentation of the corresponding add-on units.

**MS22-8**  
**MS24-6**  
**MS24-8**  
**MS32-6**  
**MS40-6**  
**MS40-8**  
**MS52-6**

## Setting up the chip conveyor and cooling lubricant supply

1. Push the chip conveyor on rollers underneath the bar loading magazine.
2. Bolt the chip conveyor to the turning machine flange (the seal is already adhered to the flange).
3. Push the cooling lubricant supply system on rollers underneath the bar loading magazine.
4. Bolt the cooling lubricant supply system to the chip conveyor flange.

The chip conveyor and the cooling lubricant supply system do not need to be leveled.



**For MS16-6, see the separate document.**

MS16-6  
MS22-8  
MS24-6  
MS24-8  
MS32-6  
MS40-6  
MS40-8  
MS52-6

## Transport locks

Movable parts of the turning machine are secured with red-painted transport locks.



Before commissioning the turning machine, remove all transport locks and retain them for future transport.

## Removing the transport locks

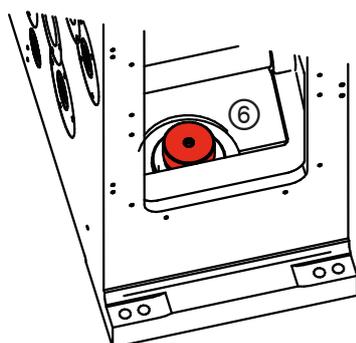
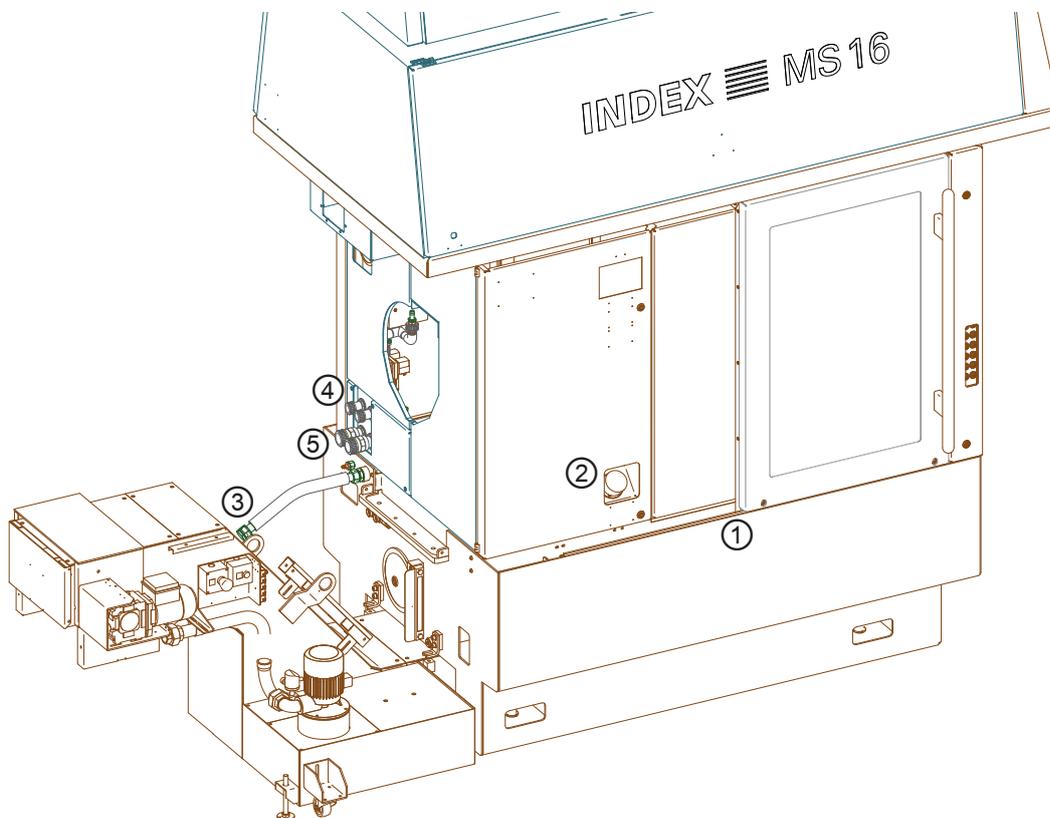
(Images on the following pages)

1. If present: Remove the safety cable.
2. Remove the operating terminal transport locks.
3. Remove the transport locks of the sliding guards and open the sliding guards.
4. Unscrew the blanking plug from the oil filler neck, screw the protective cap onto the oil filler neck, and attach the safety chain.
5. Remove the plastic plug from the coolant lubricant supply line of the coolant cleaning system.
6. Remove the plastic plug from the cooling water system.
7. **MS40:** Remove the end cover from the drop tube between the headstock and the oil tank.
8. Remove the pipe plug from the oil return hose between the main headstock and the lower housing.
9. **MS52:** Remove the sealing cone and union nut from the fittings on the lower housing.
10. Remove the operating terminal transport locks (see the relevant sections).
11. Connect the oil return hose to the threaded fitting of the main headstock using hose clamps, ensuring an oil-tight connection.
12. Remove the plate from the chip channel on the lower housing.
13. Remove the transport locks inside the work area (see the relevant sections on the following pages).

**MS16-6**

**Transport locks on the outside of the machine**

Before commissioning the turning machine, remove all transport locks and retain them for future transport.



Oil return line between main headstock and oil tank

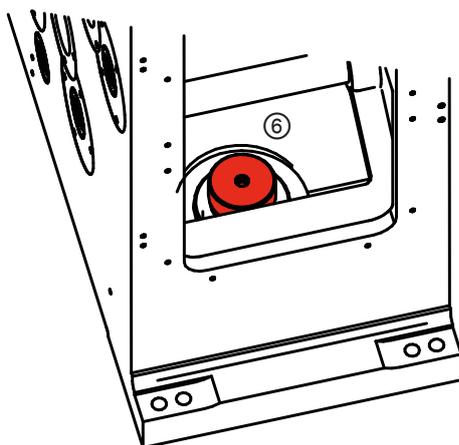
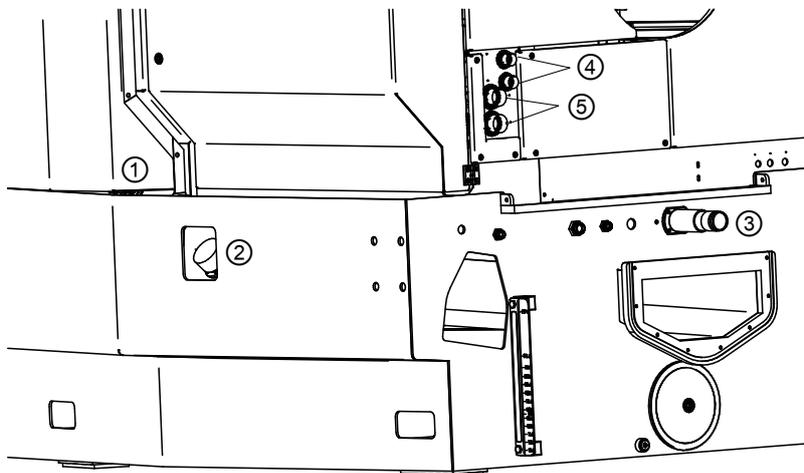
**Transport locks**

Item	Name	MS16-6	Order number
①	Hood lock + hexagon head screw M6x20-10.9	2 2	K80381.70 410620.0620
②	Blanking plug (oil filler neck)	1	410770.4220
③	Pipe plug	1	471078.28
④	F26 blanking plug	2	401842.33
⑤	F19 blanking plug	2	401842.20
⑥	End cover + O-ring	1 1	M90321.108 325773

**MS22-8**  
**MS24-6**  
**MS32-6**  
**MS40-6**  
**MS40-8**  
**MS52-6.3**

**Transport locks on the outside of the machine**

Before commissioning the turning machine, remove all transport locks and retain them for future transport.



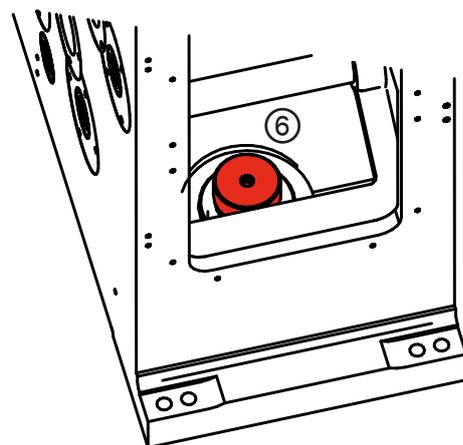
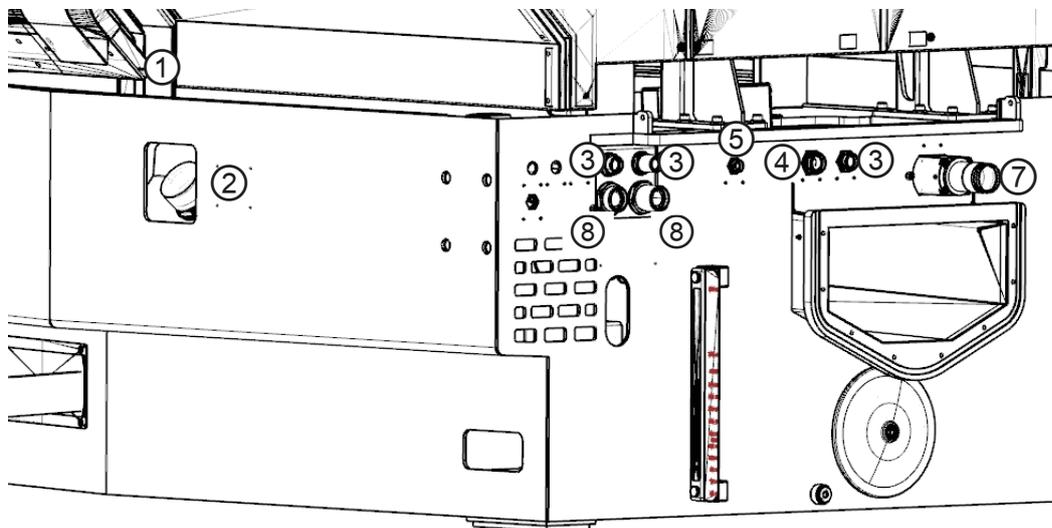
Oil return line between main headstock and oil tank

Transport locks	Item	Name	Number	Order number
	①	Hood lock + hexagon head screw M6x20-10.9	2 2	10874076 10834761
	②	Blanking plug (oil filler neck)	1	10582619
	③	F32 blanking plug	1	10301228
	④	F26 blanking plug	2	401842.33
	⑤	F19 blanking plug	2	401842.20
	⑥	End cover	1	1097367

**MS24-6**  
**MS24-8**  
**MS32-6.3**

**Transport locks on the outside of the machine**

Before commissioning the turning machine, remove all transport locks and retain them for future transport.



Oil return line between main headstock and oil tank

**Transport locks**

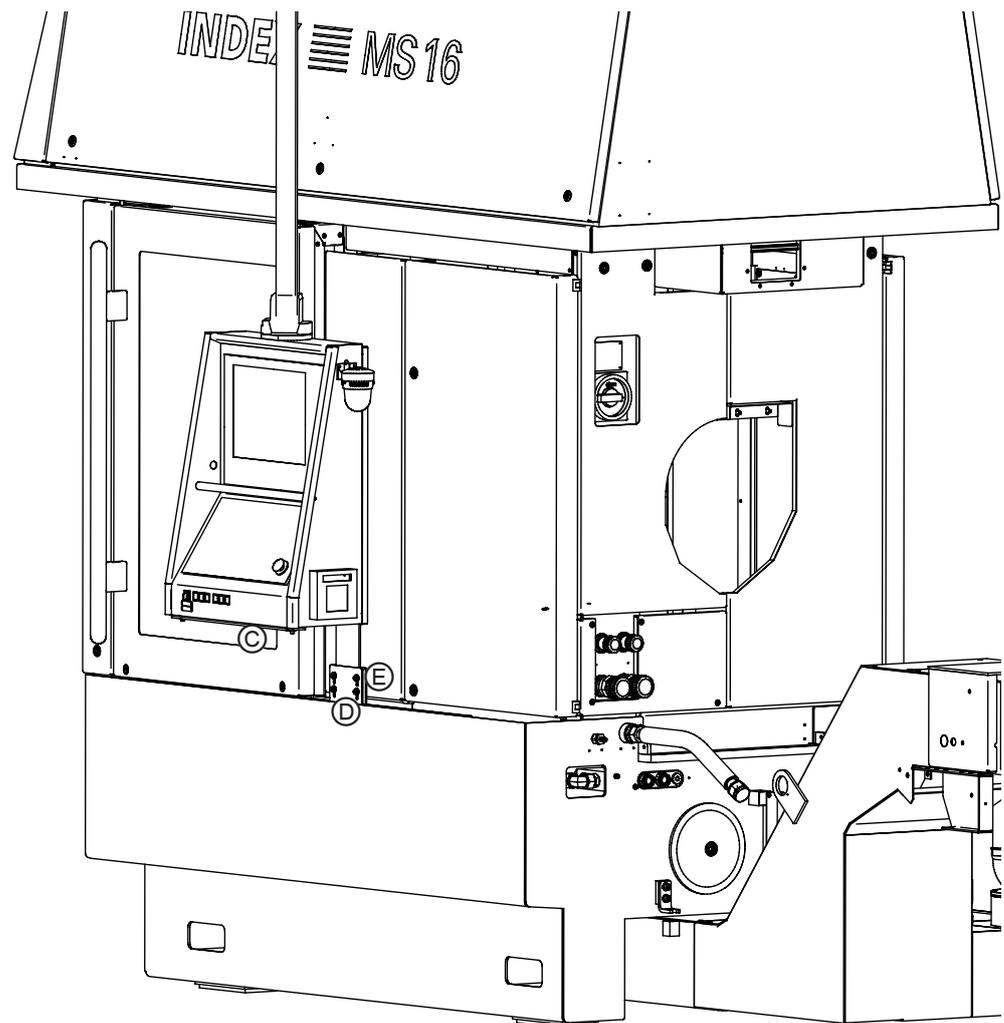
Item	Name	Number	Order number
①	Hood lock + hexagon head screw M6x20-10.9	2	10874076
		2	10834761
②	Blanking plug (oil filler neck)	1	10582619
③	Blanking plug PLO-L22 Union nut N-L22	3	10846409
		3	10865868
④	Blanking plug PLO-L28 Union nut N-L28	1	10253763
		1	10663066
⑤	Blanking plug PLO-L15 Union nut N-L15	2	10406697
		2	10989814
⑥	End cover	1	10972367
⑦	Blanking plug F32	1	10301228
⑧	Other transport locks	2	-

## MS16-6

**Operating terminal transport locks****Operating terminal transport locks MS16-6, MS16 Plus**

The operating terminal is secured to the machine using an angle bracket ©, a strip ©, and a retaining plate ©.

- Unscrew the strip © and retaining plate ©.
- Install the end stops on the pivot joint on the machine.
- Unscrew the angle bracket ©.

**For subsequent transport**

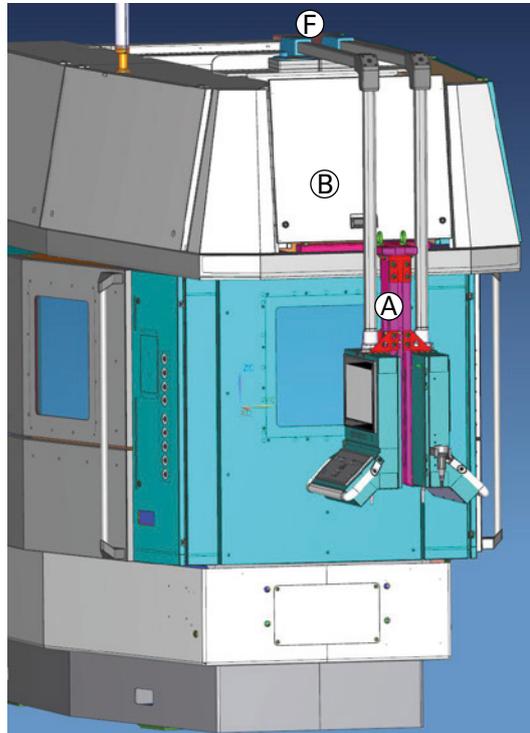
1. Screw the angle bracket © to the bottom of the operating terminal.
2. Remove the end stops from the pivot joint on the machine.
3. Install the strip © and retaining plate © on the angle bracket ©.
4. Use the retaining plate © to secure the operating terminal in the guide rail of the rear sliding door.

**MS22-8  
MS24-6  
MS32-6  
MS40-6  
MS52-6.3**

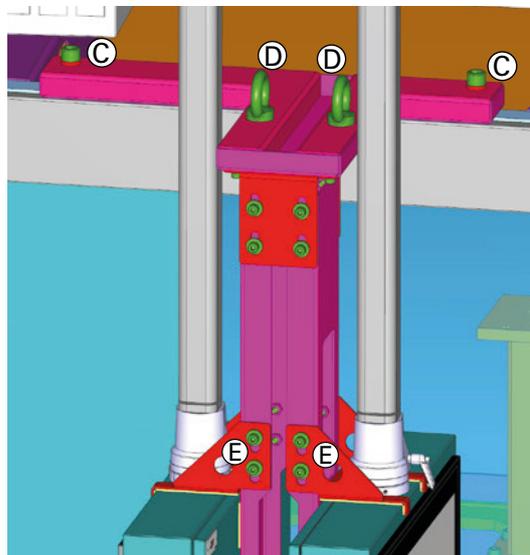
**Operating terminal transport locks MS22-8, MS24-6, MS32-6, MS40-6, MS52-6.3**

The operating terminal is secured using the operating terminal transport lock (A).

**Removing the transport lock**



- Remove the cover (B) from the control cabinet.



- Loosen the screws (E) on the brackets that clamp the operating terminals to the transport lock. The operating terminals can now be swung out of the way.
- Remove the screws (C) and remove the transport lock (A).
- Unscrew the eyebolts (D) from the transport lock and install them in the threaded holes provided (positions of screws (C)).



**The eyebolts (D) serve as fall protection for attaching ladders and must therefore be mounted on the machine again.**

**Do NOT remove these screws or return them to INDEX!**



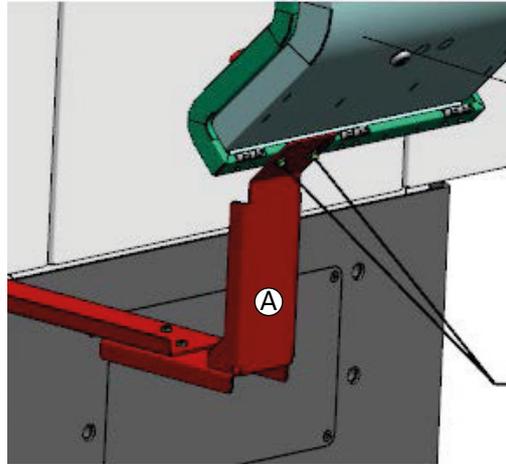
For machines with two operating terminals, the swing-angle limiters (F) must be adjusted so that the operating terminals cannot collide.

**MS24-6**  
**MS24-8**  
**MS32-6.3**  
**MS40-8**

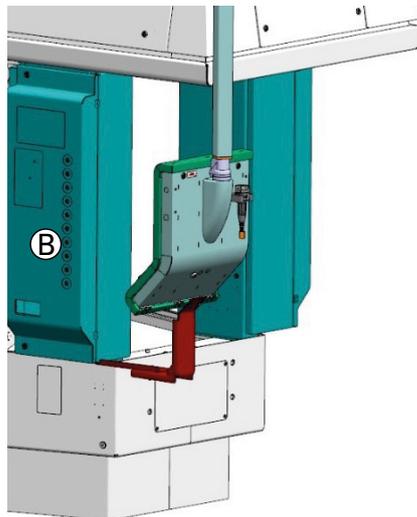
**Operating terminal transport lock MS24-8**

The operating terminal is secured using the operating terminal transport lock (A).

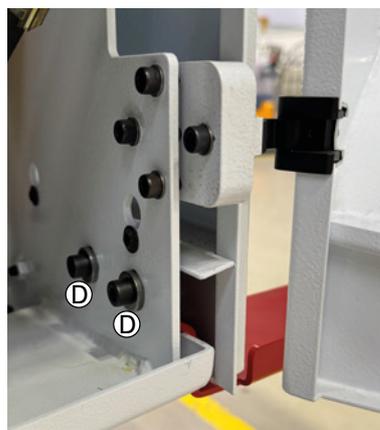
Procedure for removing the operating terminal transport lock:



- Loosen the screws (E) on the operating terminal transport lock (A).



- Open the door (B).

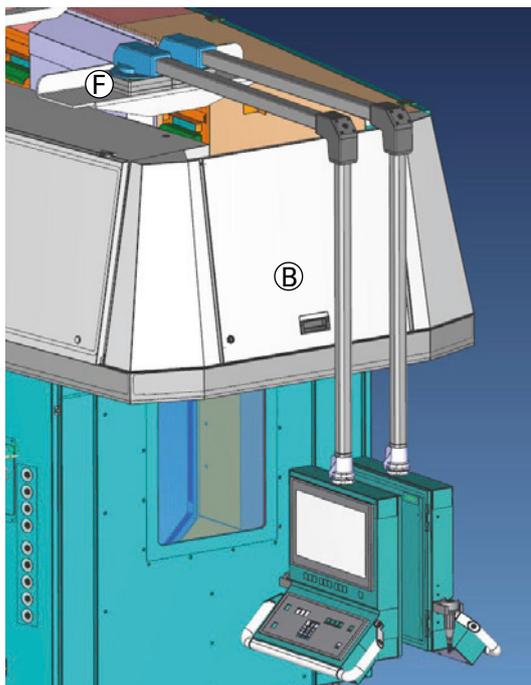


- With the door open, loosen the screws (D) and remove the operating terminal transport lock (A).

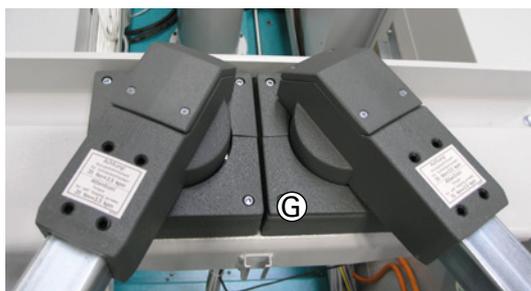


The same procedure applies to machines equipped with two operating terminals.  
 To reinstall the operating terminal transport lock, carry out the steps in reverse order.

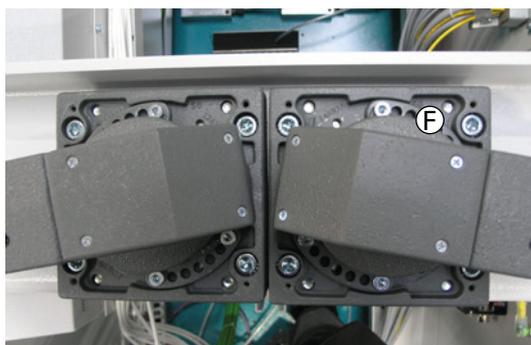
**Adjusting the swing-angle limiters on machines with two operating terminals**



Ⓕ Swing-angle limiters on machines with two operating terminals



– After removing the two covers Ⓖ on top of the control cabinet, the discs for the swing-angle limiters Ⓕ are freely accessible.



– Finally, reinstall the cover Ⓖ on the control cabinet.



The operating terminal transport lock may be returned to INDEX together with the other transport equipment or purchased from INDEX.

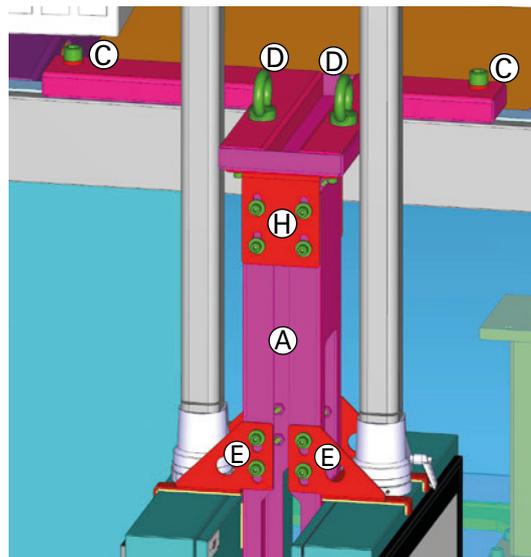
**For subsequent transport** For future machine transport, a special operating terminal transport lock can be rented or purchased from INDEX (available even for machines built before 2015).

**Operating terminal transport lock (A)**

See the section “Transport with crane”.

**Preparing the operating terminal transport lock for renewed transport**

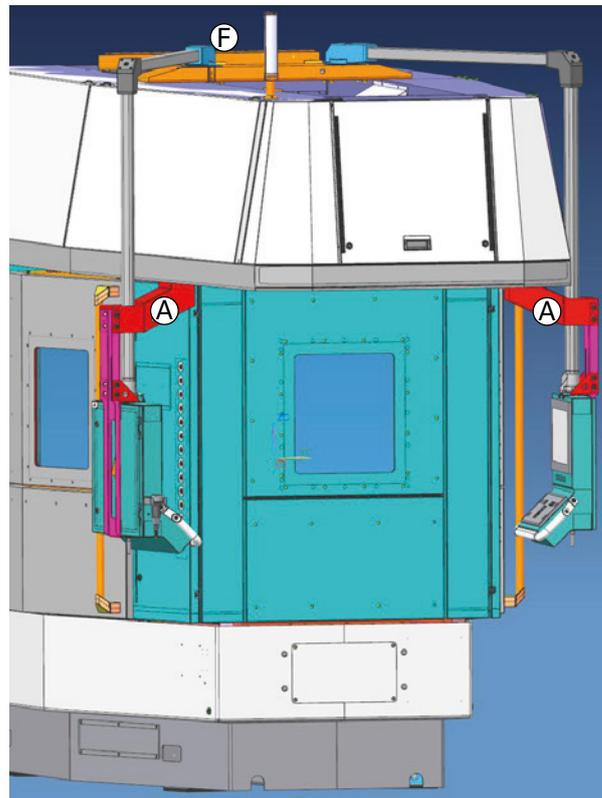
(The figure labels refer in part to the previous pages.)



- Remove the cover (B) from the control cabinet.
- **On machines with two operating terminals**, adjust the swing-angle limiters (E) so that both operating terminals can swing forward until they touch at the front of the machine.
- Unscrew the eyebolts (D) from the threaded holes on the machine and screw them into the designated threaded holes on the transport lock.
- Fasten the transport lock from above to the threaded holes in the machine’s intermediate ceiling using screws (C).
- Swing the operating terminal(s) into the transport lock (A), with the rear side of the terminal leading.
- Clamp the two adjustable, padded brackets onto the operating terminal in a vise-like manner and tighten them using the screws (E).
- To relieve the load on the terminal support arm, push the operating terminal upward together with its height-adjustable bracket and tighten the upper four screws (H) on the transport lock.

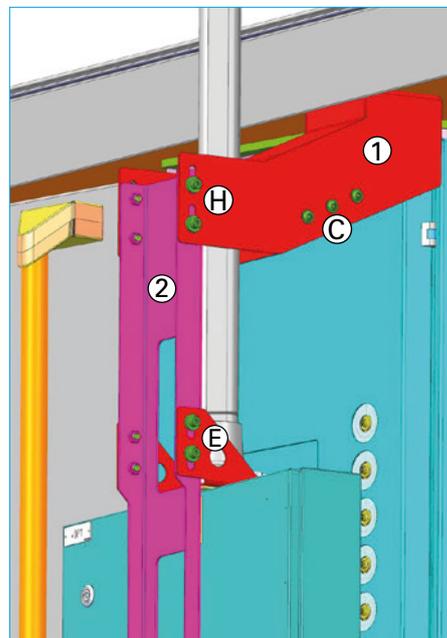
**MS40-8**

**Operating terminal transport locks MS40-8**



Each of the two operating terminals is secured with an operating-terminal transport lock (A). These are screwed to the underside of the machine's intermediate ceiling.

**Removing the transport lock**

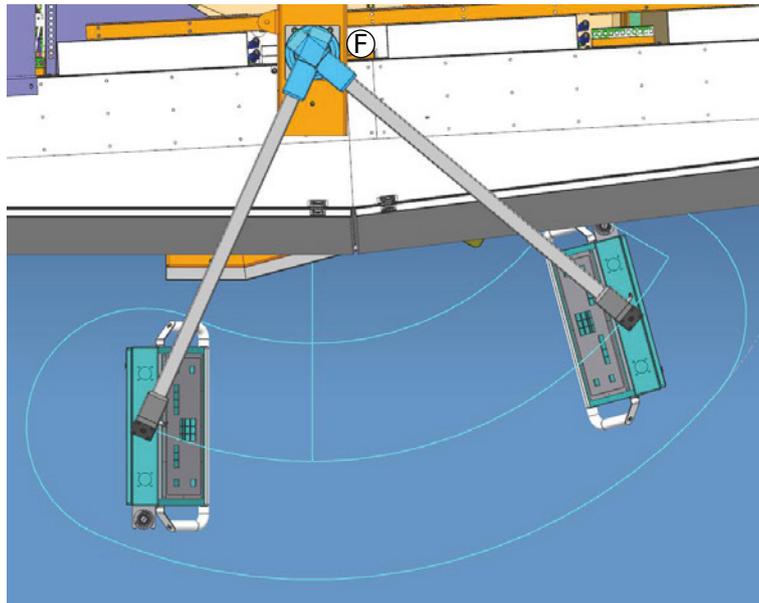


- Loosen the screws (E) on the brackets that clamp the operating terminals to the transport lock.
- Loosen the screws (H) and remove bracket (2) (= lower part of the transport lock).
- Swing the operating terminal out of the way.
- Unscrew the upper part (1) of the transport lock from the intermediate ceiling.
- Close the threaded holes on the underside of the intermediate ceiling again using the correct screws. These screws (C) are stored on the upper part of the transport lock during transport.

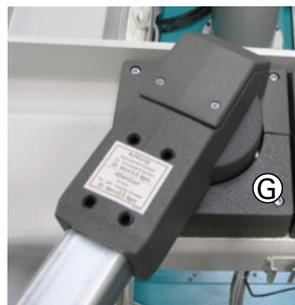


After removing the transport locks, adjust the swing-angle limiters (F) so that the operating terminals cannot touch the outside of the machine.

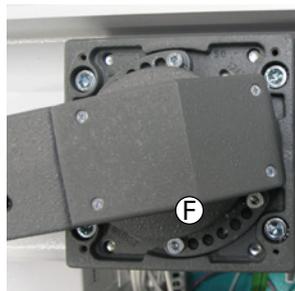
### Adjusting the swing-angle limiters



Swing-angle limiters MS40-8



- After removing the covers (G) on top of the control cabinet, the discs for the swing-angle limiters (F) are freely accessible.



- Adjust the swing-angle limiters so that the operating terminals cannot make contact with the outside of the machine.



The operating terminal transport lock may be returned to INDEX together with the other transport equipment or purchased from INDEX.

**Preparing the operating terminal transport locks for renewed transport**

(The figure labels refer to the previous pages.)

- Loosen the swing-angle limiters **(F)**.
- Remove the screws from the threaded holes on the underside of the intermediate ceiling and screw them into the designated threaded holes **(C)** on the transport lock.
- If the transport lock is assembled: Remove screws **(H)** and separate parts **(1)** and **(2)** of the transport lock.
- Screw the upper part **(1)** of the transport lock to the intermediate ceiling of the machine.
- Swing the operating terminal forward, front side first, into the upper part of the transport lock **(A)**.
- Attach the lower part of the transport lock **(2)** to the upper parts using screws **(H)**, but do not tighten them yet.
- Clamp the two adjustable, padded brackets onto the operating terminal in a vise-like manner and tighten them using the screws **(E)**.
- To relieve the load on the terminal support arm, push the operating terminal upward together with the lower part of the transport lock **(2)**, then tighten the upper four screws **(H)** on the transport lock.

MS16-6

MS22-8

MS24-6

MS24-8

MS32-6

MS40-6

MS40-8

MS52-6

## Transport locks in the work area

Movable parts of the turning machine are secured with **red**-painted transport locks. INDEX part numbers can be found in the corresponding drawings of the transport locks in the chapter "Working documents".



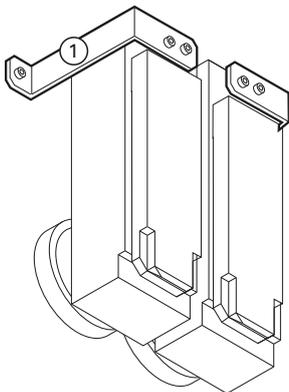
Before commissioning the turning machine, remove all transport locks and retain them for future transport.

## Examples of transport locks

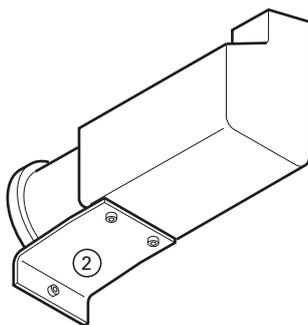
Transport locks may be installed on the machine in different configurations. Therefore, only typical examples can be presented here.

### Transport locks

- Securing a cross unit
  - Locking plate ①
  - 2 x cylinder head screws
  - 1 x cylinder head screw (or threaded rod with safety nuts)



- Securing a longitudinal unit
  - Locking plate ②
  - 2 x cylinder head screws
  - 1 x cylinder head screw (or threaded rod with safety nuts)



MS16-6  
 MS22-8  
 MS24-6  
 MS24-8  
 MS32-6  
 MS40-6  
 MS40-8  
 MS52-6

## Commissioning

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.



**Solvent may splash into the eyes when cleaning the machine. Protect your eyes by wearing suitable safety goggles. For cleaning the inside of the machine's work area, protect your hands and arms by wearing clothes with long sleeves and suitable gloves. Risk of injury by sharp machine parts and cutting edges.**

The anti-rust agent must be washed off if the machine is put into operation after a long time and the protective layer has become very tough. The mounting surfaces for tool holders and add-on equipment must also be cleaned. For this purpose, only solvents may be used that do not affect the machine paint. Suitable solutions are turpentine, petroleum, or benzene.

## Check the operating fluid levels and replenish, if necessary

Hydraulic system: ..... Oil level check  
 Cooling lubricant unit: ..... Replenish cooling lubricant



For information on the hydraulic fluid and cooling lubricant grades, as well as on volumes and filling positions, see the chapter "Maintenance instructions" and the machine floor plan in the chapter "Working documents".

## Pressure accumulator

For instructions, see the section "Preparations".

# Water cooling

## INDEX Multi-spindle turning machines

### Function

Water cooling is used to cool the control cabinets, the hydraulic fluid, and the cooling lubricant.

The system comprises a cooling circuit on the machine side and either

1. a water recoler located next to the machine  
or
2. an external cooling water circuit provided by the machine operator.



All information regarding coolant types, water quality, and water treatment can be found in the document "Information on Operating Materials".

When using a water recoler, be sure to follow the manufacturer's instructions.

### Requirements for external cooling water supply

Machine	Water temperature [°C]	Cooling water amount $Q_{min}/Q_{max}$ [l/min]/[l/min]	Pressure difference $P_{inlet} - P_{return}$ [bar]	Required cooling capacity [kW]
MS16-6/MS16-6 Plus	20°C ±2°K	71/99	> 2	> 27
MS18	20°C ±2°K	71/99	> 2.2	> 27
MS22-6	20°C ±2°K	71/99	> 2.2	> 27
MS22-8/MS24-8	20°C ±2°K	106/140	> 2.3	> 37
MS24-6	20°C ±2°K	106/140	> 2.3	> 37
MS32C/-P/-G	20°C ±2°K	71/99	> 2.8	> 27
MS32-6 (.2/.3)	20°C ±2°K	106/140	> 2.3	> 37
MS40-6	20°C ±2°K	106/140	> 2.3	> 37
MS40-8	20°C ±2°K	115/140	≥ 2.5	≥ 55
MS52-6.2	20°C ±2°K	80/99	> 3	> 27
MS52-6.3	20°C ±2°K	110/140	> 2.3	> 44
A200	20°C ±2°K	32/40	> 2.6	> 8

Table 1

Ambient temperature: Max. 40°C.

**The values specified in Table 1 apply to machines equipped with the standard coolant cleaning system.**



**These values (Table 1) must be strictly adhered to.  
Deviating from these values will not ensure sufficient cooling of the machine.  
The maximum operating pressure must not exceed 8 bar.**

# External cooling water supply

## INDEX Multi-spindle turning machines

### Connecting several machines to an external cooling water supply

To ensure reliable operation of several machines on an external cooling water system, INDEX specifies the following rules:

1. Provide the cooling system with frequency-controlled pumps. This compensates for pressure fluctuations caused by varying demand and prevents overpressure.  
For atmospherically open systems, the frequency-controlled pumps must be regulated using constant-pressure control. For closed systems with an expansion tank, differential-pressure control is required.  
Pump control based on temperature or differential temperature is **NOT** permitted. This interferes with the machine's internal flow monitoring and cooling control.
2. INDEX machines are equipped with internal switching valves that regulate water flow to the respective heat exchangers according to demand. Therefore, be aware that the cooling water volume drawn from the central system may fluctuate significantly.
3. Install an overpressure relief device in the cooling water line.
4. Observe the minimum pressure differential between the supply and return lines at the machine (see *Table 1*).
5. Reduce the cooling water amount to the prescribed amount via a flow control valve on each machine (see *Table 1*). This is to ensure an even supply to all machines.
6. Install supply lines to the machines with a minimum of bends. This avoids swirls due to pressure booster pumps or line redirections resulting in problems of the flow sensors.
7. 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.
8. Install filters (fineness < 0.1 mm) with shut-down valves in the forward flow of the cooling water line of all machines.
9. Install shut-off valves or solenoid valve for each machine, so each machine can be disconnected separately if repairs are necessary.
10. Disconnect machines 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.
11. If machines not listed in Table 1 are to be connected to the external cooling-water supply, INDEX Service must be consulted in every case.



**INDEX is not liable for damage resulting from deactivating the monitoring devices on the machine.**

# Central cooling lubricant supply

## INDEX Multi-spindle turning machines

### Required properties of the cooling lubricant

- ➔ INDEX MS machines are approved exclusively for operation with non-water-miscible coolants (mineral-oil-based cutting oils).
- ➔ The cooling lubricant must not contain abrasive residues from grinding materials such as corundum or cubic boron nitride.
- ➔ Particle size in the cooling lubricant: < 80 µm
- ➔ Viscosity: 5 to 32 mm<sup>2</sup>/s at 40°C
- ➔ Temperature: 25 to 35°C

### Required cooling lubricant pressures and flow rates to the machine

		MS16-6	MS22-6 ... MS40-6	MS40-8, MS52-6
<b>LP</b>	Pressure	3-8 bar	3-8 bar	3-8 bar
	V	max. 65 l/min	max. 300 l/min	max. 300 l/min
	H-Rec	60 l/min at 7 bar	280 l/min at 4 bar	260 l/min at 4 bar
<b>LP flushing</b>	Pressure	–	–	3-8 bar
	V	–	–	30-60 l/min
	H-Rec	–	–	40 l/min at 4 bar
<b>HP</b>	Pressure	max. 16 bar	max. 40 bar	max. 40 bar
	V	15-30 l/min	55-110 l/min	60-115 l/min
	H-Rec	20 l/min at 16 bar	55 l/min at 40 bar	60 l/min at 40 bar
<b>CL syn</b>	Pressure	max. 16 bar	max. 20 bar	max. 20 bar
	V	5 - 10 l/min	10-15 l/min	10-15 l/min
	H-Rec	Filtering to < 60 µm 10 l/min at 16 bar	Filtering to < 60 µm 10 l/min at 20 bar	Filtering to < 60 µm 10 l/min at 20 bar
<b>HP-Z</b>	Pressure	max. 80 bar	max. 80 bar	max. 80 bar
	V	max. 25 l/min	max. 25 l/min	max. 25 l/min
	H-Rec	25 l/min at 80 bar	25 l/min at 80 bar	25 l/min at 80 bar
<b>Σ</b> 1)	V	max. 115 l/min	max. 400 l/min	max. 400 l/min
<b>RFP</b> 2)		0.8 bar at 120 l/min	0.8 bar at 410 l/min	0.8 bar at 410 l/min

Table 2

- 1) Coolant supply to the pressure booster system  
The total of high-pressure system area, low-pressure system area, low-pressure system area for flushing, cooling lubricant synchronization circuit, and high-pressure system central circuit must not exceed the V<sub>max</sub> value.
  - 2) When using the standard return pump RFP in the chip conveyor, the pressure drop in the return line must not exceed 0.2 bar.
- ➔ Use of other pumps with different pressures and flow rates may only be used after consultation with and approval by INDEX.

### Abbreviations

CL	Cooling lubricant
HP	High pressure
LP	Low pressure
Flush	Flushing unit
Syn	Synchronizing device
HP-A	Additional high pressure (option)
V	Volume flow
M-Rec	Manufacturer recommendation
RP	Return pump

MS16-6  
MS22-8  
MS24-6  
MS24-8  
MS32-6  
MS40-6  
MS40-8  
MS52-6

## Electrical connection



**Caution: danger to life**

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



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

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

## Switching on the machine

See chapter “Machine operation”.



Be sure to fill the cooling lubricant tank before switching on the machine. The cooling lubricant pump will be damaged by running dry.

MS16-6  
MS22-8  
MS24-6  
MS24-8  
MS32-6  
MS40-6  
MS40-8  
MS52-6

## Checks

After connecting, check the direction of rotation of one of the following motors below:

Motor for	check
<b>Hydraulic pump</b> (three-phase AC motor)	Motor should rotate in the specified direction (note direction arrow on the motor). The check can be easily performed by checking the hydraulic pressure, because there would be no pressure in the hydraulic system if the motor turns in the wrong direction.
	 <b>The hydraulic pump can be damaged when operating in the wrong direction.</b>
<b>Coolant pump</b> (three-phase AC motor)	Motor should rotate in the specified direction (note direction arrow on the motor).
MS machines: <b>Fan</b> for spindle motors and/or main drive motor (three-phase AC motors)	Air should be drawn in at the filter.

## Data loss due to prolonged downtime



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

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

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

MS16-6  
MS22-8  
MS24-6  
MS24-8  
MS32-6  
MS40-6  
MS40-8

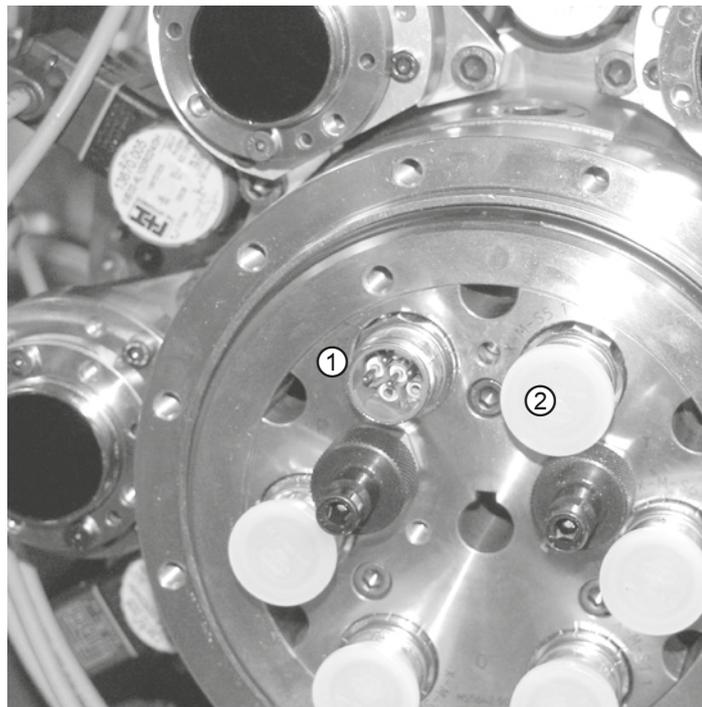
## Electrical plug connections between spindle and feeder

### Installing the motor connector



Contamination with dirt or oil residues in the electrical plug connections between the spindle and the feeder can, under unfavorable conditions, lead to damage (connector burn-out) and production downtime.

- When assembling the plug connections between spindle and feeder, ensure absolute cleanliness. Remove oil residues from the contacts and inside the connectors immediately.
- Use only Rivolta SLX 500 for cleaning (supplied with the machine accessories). Flush out any oil residues.
- Each time the plug connections are removed, protect the connector contacts from contamination. Fit the plastic protective caps.



M6\_71\_28

- ① Connector without protective cap
- ② Plastic protective cap

MS16-6  
MS22-8  
MS24-6  
MS24-8  
MS32-6  
MS40-6  
MS40-8  
MS52-6

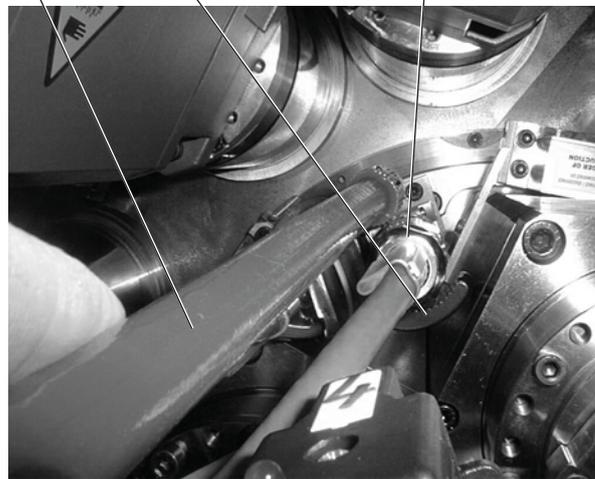
## Connecting the encoder cable (outlet cable)

- When plugging in the encoder cable, ensure the correct orientation of the connector housing (pin) relative to the angled socket (keyway). Insert the contact pins carefully **without applying force**.
- Then screw the connector into the angled socket by hand, turning the union nut on the encoder cable continuously.
- Tighten the union nut by hand by moving the connector housing back and forth.
- Finally, tighten the union nut using the special tool\* (see illustration).



**To prevent oil or liquid ingress, ensure that the outlet connector sits absolutely securely in the angled socket.**

Tool with drive pins for connector engagement



M6\_71\_28

Figure: Tightening the encoder cable with the tool

## Motor temperature monitoring (general)



**If oil or moisture enters the encoder connection or the temperature-monitoring connection, e.g., due to damage to the cable jacket of the temperature sensor, exacerbated by capillary action, the encoder and/or the temperature monitoring of the spindle motor may fail.**

- Therefore:
- Replace cables with damaged outer jackets immediately.
  - Clean any connectors or sockets contaminated with oil or moisture before re-use.

\*) The tool can be ordered from

- INDEX (Part No. 203016.4000), or from
- WÜRTH Industrie Service GmbH & Co. KG, Drillberg, 97980 Bad Mergentheim, phone: 07931/91-0  
Manufacturer: WÜRTH, Art. No. 0715 43 015 (cost under 50 euros)

MS16-6  
MS22-8  
MS24-6  
MS24-8  
MS32-6  
MS40-6  
MS40-8  
MS52-6

## Grease distribution program



Due to the effects of transport on the built-in spindles (main spindle, counter spindle, synchronous spindles), a grease distribution program must be started during initial commissioning and **after each subsequent transport of the machine.**

This predefined INDEX program is stored in the control system's work-piece directory.

For additional information on grease distribution, a separate service manual is available on request through INDEX Service.

MS16-6  
MS22-8  
MS24-6  
MS24-8  
MS32-6  
MS40-6  
MS40-8  
MS52-6

## Preparing for renewed transport

### Slide and synchronous spindle positions for transport

	Direction	Unit	MS16-6	MS22-6	MS22-8	MS24-6	MS24-8	MS32-6.3	MS40-6	MS40-8	MS52-6.3
<b>Headstock 1</b>											
Cross units in	Z	mm	135	98	98	104	104	128.5	150	150	174
MS24-6 – cross drilling unit position 6.1/6.2						24					
MS32-6 – cross drilling unit position 6.2								58.5			
MS24-8 – cross drilling unit position 7.1/8.2							24				
Cross drilling unit in	X	mm	90.5	120	120		127.3		140	137	178
MS16-6 – cross drilling unit position 6.0	X	mm	123								
MS16-6/MS32-6 – grooving slide	X	mm	101					93.5			
Longitudinal units in	Z	mm		98	98	104		124	150	150	1)
<b>Synchronous spindle/counter spindle</b>											
	Z	mm	182.5								
<b>Back end slide position 7.3/8.3</b>											
	X						35.5				
<b>Synchronous swivel spindle</b>											
	Z	mm		196	196	212	225	242	243.5	203	195
Swivel angle position 5.2/7.2		deg.		120°	90°	121°	90°	123°	130°	180°	0°
Swivel angle position 6.1/8.1		deg.		-120°	-90°	-61°	-90°	-63°	-120°	178°	0°

Table 3

1) Position optional due to transport lock with threaded rod

#### Cross and longitudinal units, synchronous spindles

1. Remove any tool holders or auxiliary equipment that may interfere with transport.
2. Move the cross units, longitudinal units, and synchronous spindles into the positions required for mounting the locking plates (see Table 3).
3. Fasten the locking plates securely.

- Operating terminal transport locks** – See the corresponding notes in the section “Transport locks”.
- Oil filler neck**
1. Unscrew the protective cap from the oil filler neck.
  2. Close the oil filler neck using the blanking plug.
- Oil return hose**
1. Between the main headstock and the lower housing: Remove the hose clamps on the oil return hose and pull the oil return hose off the hose fitting. (For P and G machines, also at the quillstock or counter spindle head.)
  2. Close the oil return hose with a blanking plug.
- MS40: Oil return between headstock 1 and oil tank** – Close headstock 1 with the end cover.
- Oil sight glass** – Protect the oil sight glass against damage.
- Sliding guards** – Screw on the hood locks for the sliding guards.
- Electrical plug connections between spindle and feeder** – When disconnecting the electrical plug connections between spindle and feeder, protect the connector contacts from contamination. Fit the plastic protective caps. (See the section “Electrical plug connections between spindle and feeder”.)

- MS16-6**      **Transport equipment**      – See the section “Transporting the machine”.
- MS22-8**
- MS24-6**
- MS24-8**
- MS32-6**
- MS40-6**
- MS40-8**      **Cooling water system**      – Close the cooling water system with blanking plugs.  
**Caution Press the blanking plug into the opening – do NOT screw it onto the thread!**
- MS52-6**

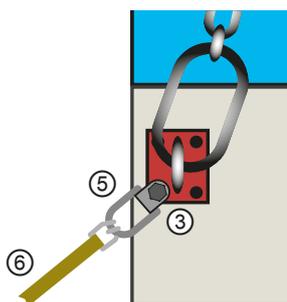
**Pressure accumulator**



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

**Set the main switch to OFF and lock it against powering on.**

**Depressurize the hydraulic system by opening the accumulator drain valves.**



**Securing the machine on the truck**

- Install mounting lugs ⑤ with cylinder head screws M20x100 to the steel plates of the mounting hooks ③.
- Attach lashing straps ⑥ to the mounting lugs ⑤ and to the mounting lugs on the front load beam.



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