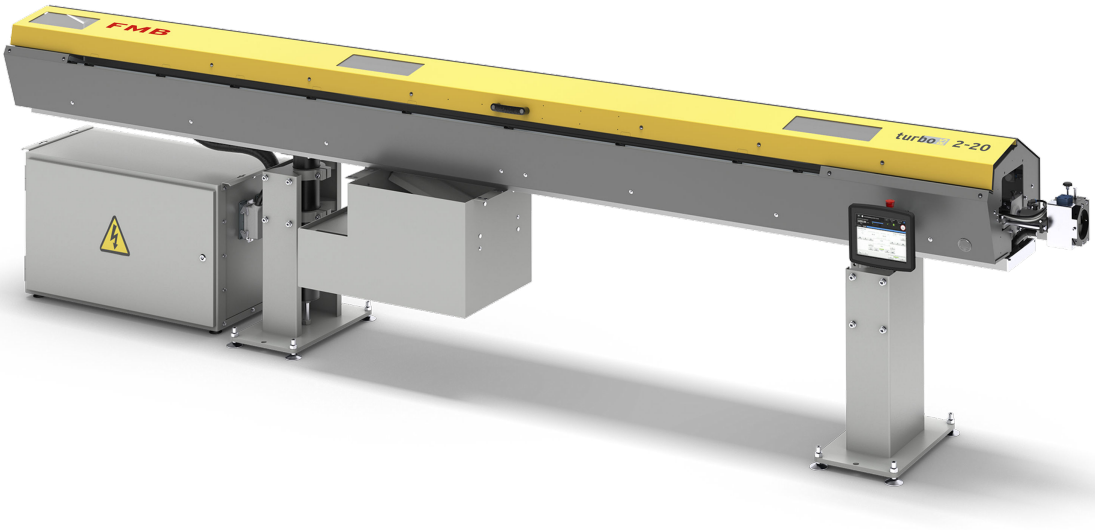
FMB
MASCHINENBAU

turbo RS 2-20

Operating instructions



Operating instructions

turbo RS 2-20, series 0

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Operating instructions

1, 2, en_US

Table of contents

1 General

1.1 Operating instructions

Product versions and special equipment

The operating instructions cover several versions of the described product. You can see which version of the product you have in the field "Type" on the name plate. ➚ *"Name plate" on page 8*.

The product versions differ with regards to the length of the loading magazine and therefore also with regards to the number of supports. In the chapters "Transport" and "Assembly" the respective product version is to be observed. Product versions over a certain length can be delivered in two pieces. Please find more precise information about the individual product versions from the respective dimension sheet. ➚ *"Other applicable documents" on page 5*.

The diagrams may vary from the actual product. The principle described does, however, apply to all versions.

The operating instructions also describe special equipment, which may not be installed on your product. The descriptions of special equipment state that they are optionally installed.

Special equipment with a greater scope is described in corresponding supplemental instructions, which can also be found in the technical documentation folder. The supplemental instructions are a supplement to the operating instructions, and are to be observed in connection with it. First familiarize yourself with the operating instructions, before you use the supplemental instructions.

Other applicable documents

The operating instructions are supplemented by the following documents, which are also kept in the technical documentation folder:

- Circuit diagram
- Pneumatics plan
- Dimension sheet (specific to the product version)
- Adapter set/attachment diagram (optional)
- Supplemental instructions (optional)

Explanation of symbols

Warning Hazard
Warns of a hazard with a high risk level which, if not avoided, will cause death or severe injury.

⚠ DANGER

Type and source of hazard

Consequences if the note is disregarded.

– Actions necessary to avert the hazard.

Warning Hazard
Warns of a hazard with a medium risk level which, if not avoided, could cause death or severe injury.

⚠ WARNING

Type and source of hazard

Consequences if the note is disregarded.

– Actions necessary to avert the hazard.

Warning Caution
Warns of a hazard with a low risk level which, if not avoided, could cause minor or moderate injury.

⚠ CAUTION

Type and source of hazard

Consequences if the note is disregarded.

- **Actions necessary to avert the hazard.**

Note (material damage)
A note that misuse could cause material damage.

NOTICE

Type and source of hazard

Consequences if the note is disregarded.

- **Actions necessary to avert the hazard.**

Useful information
Notes or additional information.

Useful information.

Instructions on use

These instructions require the user to take action.

Display text
Display text comprises terms or text which appear on the control panel of the product.
Example: Display text.

Menu pathway
The menu pathway shows the path for actions, where you have to navigate through more than one menu level.
Example: *'Start → Sub menu → Destination"*

Cross-reference
Cross-references refer to further information about a topic.
Example: ↗ *"Explanation of symbols" on page 5*.

Intended use

The loading magazine is intended for attachment to machine tools, and is only allowed to be operated if it has been installed on a machine tool in accordance with the specifications of these operating instructions. The loading magazine is exclusively intended for the supply of material bars to machine tools. These materials are round or have multiple edges. In individual cases, special profiles are allowed to be suppled, which have been agreed with FMB in advance.

Furthermore, the intended use of the loading magazine can be seen by observing the Technical Data chapter of these operating instructions ↗ *Chapter 1.3 "Technical data" on page 12*.

The applicable accident prevention guidelines and other generally-recognized technical safety regulations are to be observed.

Reasonably foreseeable misuse

- Non-observance of the requirements on the material bars.
  ↗ *"Requirements on the material bars" on page 56*.
- Operation with asymmetric profile bars without consultation with FMB.

- Operation with special profiles without consultation with FMB.
- Operation with non-homogenous material bars (imbalance).
- Processing outside of the permitted area (diameter, length). ➚ *"Technical data of the loading magazine" on page 12*.
- Use of unintended fuel. ➚ *"Lubricant" on page 13*.
- Operation without lubrication.
- Operation without a capacity adjustment set or with the wrong set.

  Operation without a clamping device or with the wrong clamping device.
- Transportation not done in accordance with the operating instructions. ➚ *Chapter 3.2 "Transporting the product" on page 21*.
- Operation outdoors.
- Manipulation of safety equipment.
- Performance of work without sufficient qualifications. ➚ *"Qualifications of the personnel" on page 7*.

Unauthorized alterations to the product are not permitted and exclude the liability of the manufacturer for any damage incurred as a result.

Qualifications of the personnel

The work described in these operating instructions is only allowed to be performed by personnel who have been qualified according to the table specified below.

Area of responsibility	Training by the manufacturer concerning assembly and start-up*	Product training**	Specific technical training***
Transport			X
Assembly / Start-up	X		
Operation		X	
Maintenance		X	X
Disposal			X

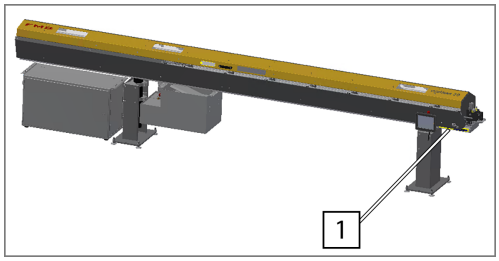
*Extensive qualification in the assembly and start up of FMB products. Qualification is done by FMB.

**Personnel who have received training for the product, are familiar with the functions and have been made aware of the risks. The training can be done by FMB or by a person who has already received training.

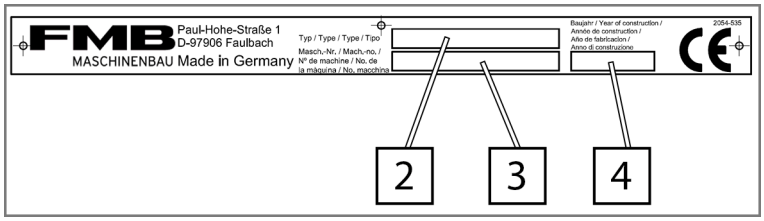
***Personnel who have received training in the respective area of responsibility, and have qualifications allowing them to perform the work correctly, to properly estimate risks and avoid hazards.

1.2 Information about the product

Name plate



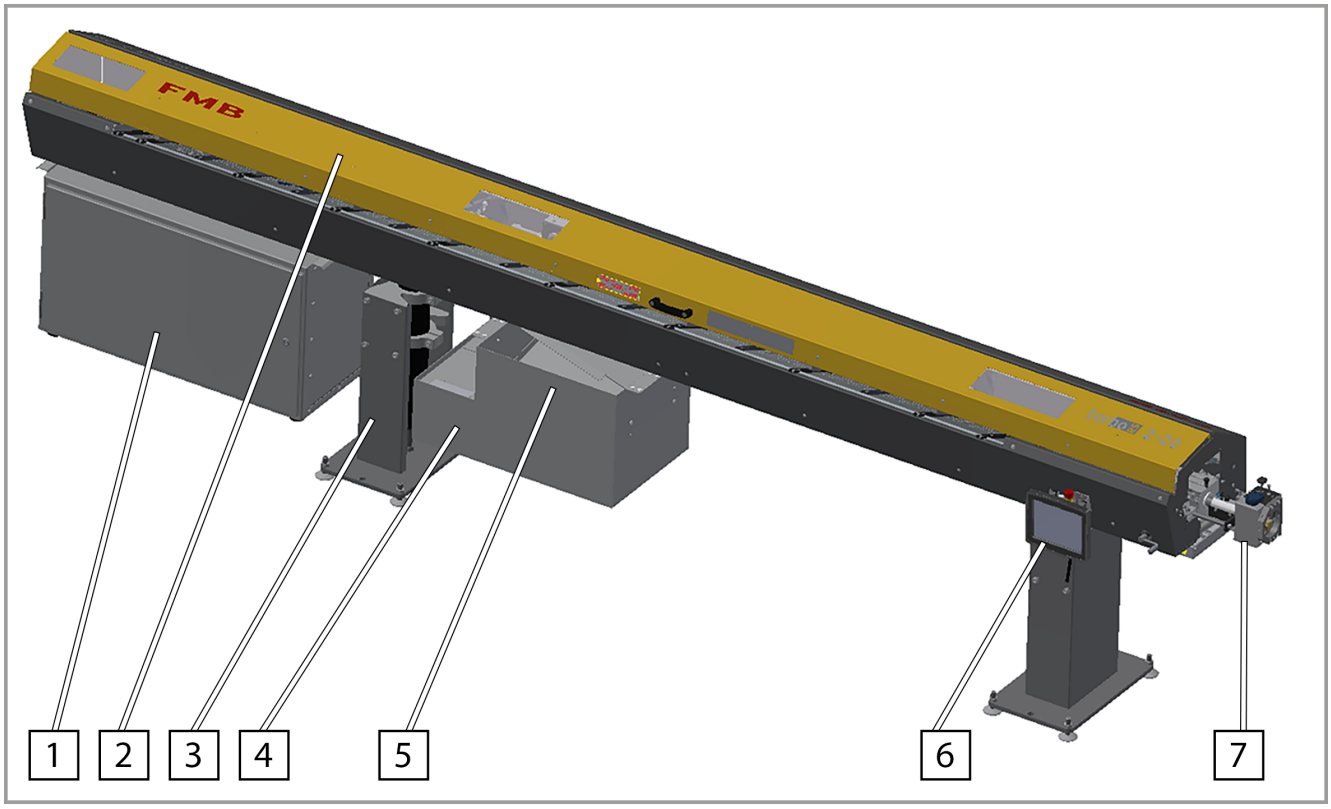
The name plate is attached to the loading magazine in position 1.



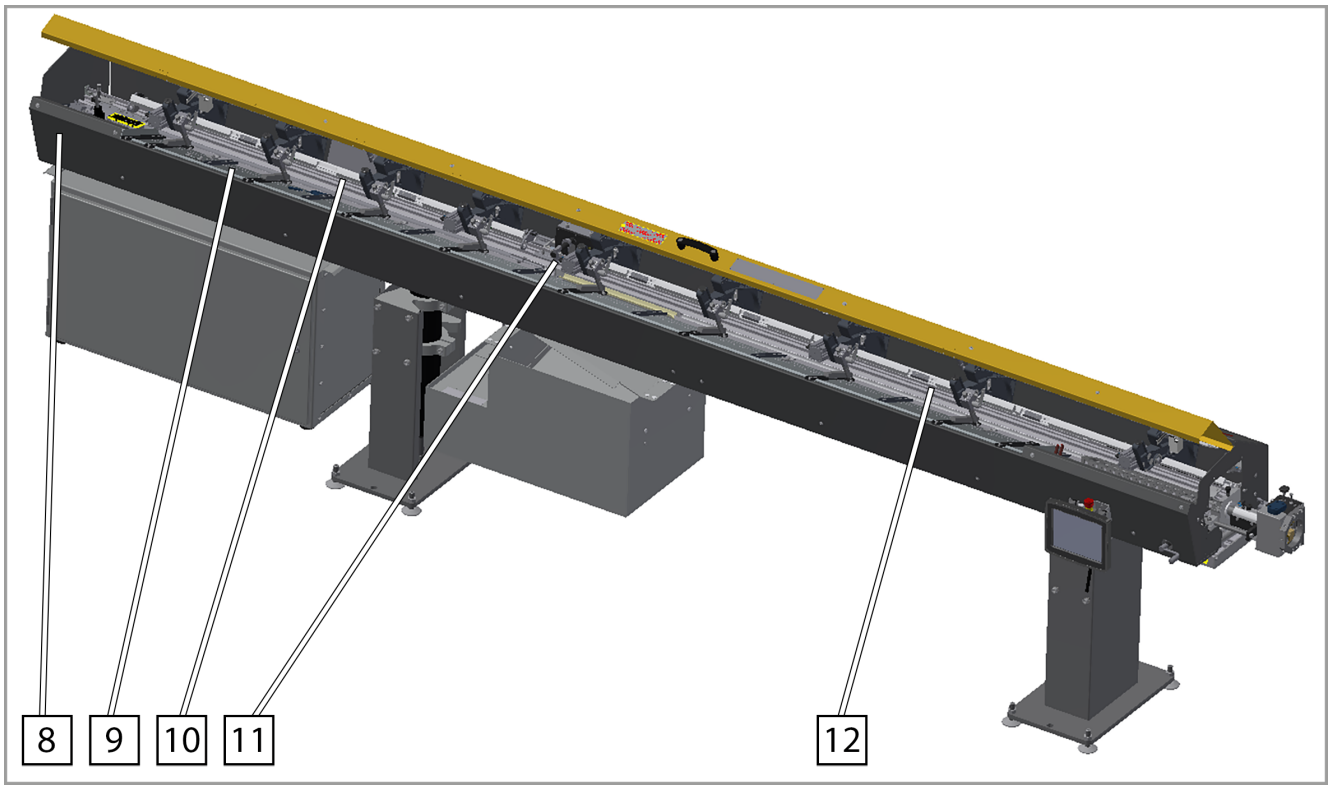
2	Types and lengths	3	Machine number
4	Year of construction		

The declaration of conformity (CE or UKCA) shall be added, if issued, to the name plate of the loading magazine.

Overview



1	Control cabinet	2	Cover
3	Support	4	Oil tank
5	Remnant bin	6	Control panel
7	Steady		



8	Drive	9	Lateral material storage with separation device
10	Guide channel, rear	11	Material gripper
12	Guide channel, front		

Functional description

The loading magazine supplies material bars and pushes them through the spindle into the processing area of the machine tool. The loading magazine works at the speed of the machine tool and thereby allows the automatic loading of the machine tool.

The collet of the machine tool closes and processing begins. The guide channel filled with oil and the steady placed between the machine tool and the guide channel ensure the exact bar guide required for processing. After a workpiece has been completed, the collet of the machine tool opens. The pusher of the loading magazine moves the material bar into the cut-off position, the collet of the machine tool closes and the next workpiece is processed.

If the material bar has been used up and the last possible part has been made, the working process of the machine tool is stopped. The collet of the machine tool opens and the pusher is moved back. The material gripper closes and holds the remnant of the material bar in position. The remnant is taken out of the clamping sleeve and is ejected into the remnant bin. The working process begins again.

Drive

The pusher is driven by a DC gear motor with a toothed belt. The reverse polarity protected connection is ensured by two different flat plugs. The shielded motor is operated via these voltage connections using an external control unit without position check.

Digital speed controller

The digital speed controller regulates the continuous speed of the drive motor. It is controlled by an external reference voltage, which is emitted by the PLC.

Material gripper

The material gripper is equipped with blades, allowing it to grab the material bar. The newly-inserted material bars are held by the material gripper and pressed into the clamping device using the force of the pusher. Remnants of processed material bars are held by the material gripper and removed from the clamping device using the force of the pusher.

Synchronizing unit

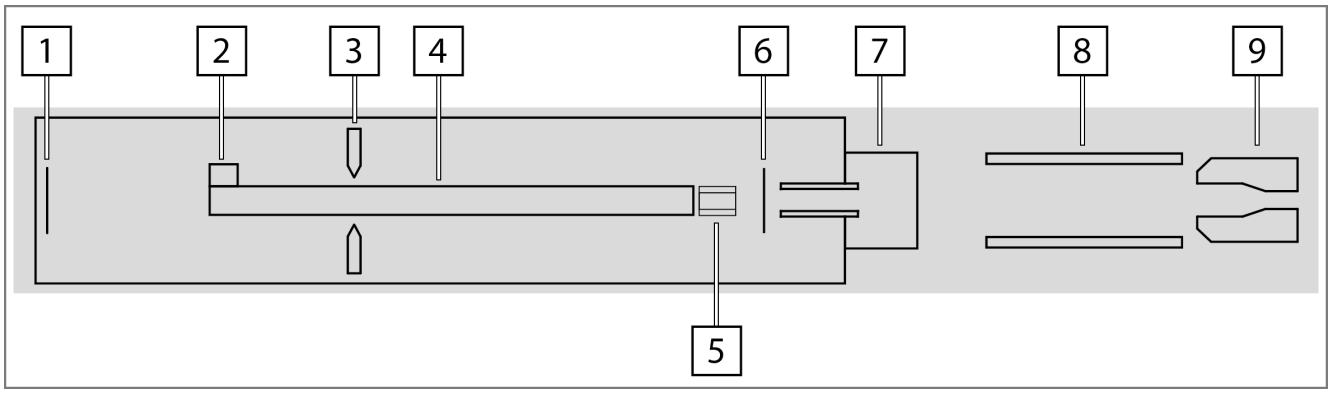
The synchronizing unit is only installed in loading magazines, which are intended for attaching to lathes with a moving headstock. The synchronizing unit ensures that the pusher of the loading magazine and the material bar also complete the traverse paths of the lathe headstock.

This is made possible by the synchronization bar, which is connected to the lathe headstock and transfers any movement of the lathe headstock to the pusher via the synchronization clutch.

During the processing by the lathe, the drive of the loading magazine is switched off and the synchronization clutch is closed. The movements of the lathe spindle are transferred to the pusher. The pusher and the material bar move at the speed of the lathe headstock.

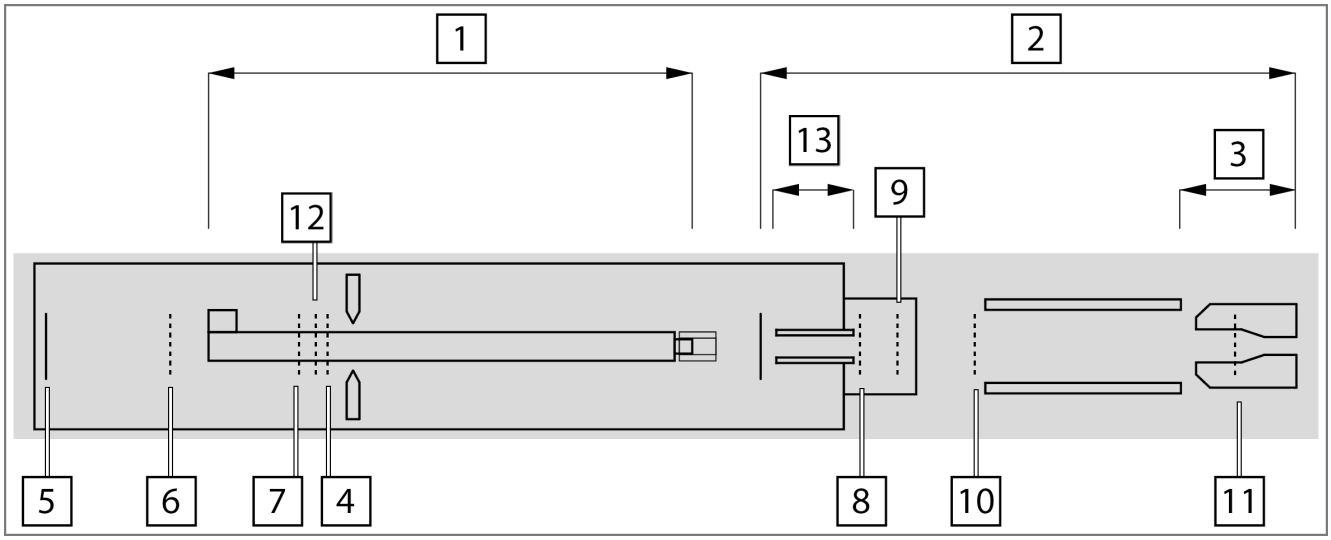
During the bar feed the drive of the loading magazine is switched on and the synchronization clutch is opened. The pusher is moved by the drive of the loading magazine. The material bar is pushed on.

Layout of the components



1	End stop	2	Pusher with short pusher flag
3	Material gripper	4	Pusher
5	Clamping sleeve	6	Starting switch
7	Guide module	8	Lathe spindle
9	Lathe collet		

Positions and traverse paths



1	Pusher length	The dimension for the parameter Pusher length is measured from the rear edge of the pusher to the front edge of the bearing insert.
2	Traverse path First insert travel	The first insert is performed after the material bar is changed. The traverse path First insert travel is the path from the starting switch in the loading magazine to the cut-off position in the working area of the lathe.
3	Traverse path Travel interval on	With interval insert active, an intermittent feed takes place in the area of Travel interval on .
4	Position draw off	At the position Position draw off the material gripper grips the material bar.
5	Position rear limit	The maximum rear position the pusher is able to reach. The position Position rear limit is reached when the remnant is removed or the pusher swings out.
6	Position storage	The position at which the short pusher picks up a new material bar. The pusher travels at high speed, just before the position Position storage it brakes, picks up the material bar and accelerates again.
7	Position Limit pos. short pusher front	The position to which the pusher moves the material bar, enabling the material gripper to grab the material bar.
8	Position open steady	During operation, the clamping sleeve must pass the steady. When the clamping sleeve is at the position Position open steady the steady opens to prevent damage.
9	Position close steady	During operation, the clamping sleeve must pass the steady. When the pusher passes the open steady and has reached the position Position close steady the steady closes.

10	Pos. reverse rotation return	When returning from the spindle of the lathe, the pusher moves from the position Pos. reverse rotation return at high speed.
11	Position front limit	The maximum front position the pusher is able to reach. The clamping sleeve is just before the collet of the lathe. The value Position front limit and the value Part length 1 are used to calculate when the last part will be fed in.
12	Position press on	The clamping sleeve is pressed on to the material bar up to this position.
13	Length of guide module	The dimension for the parameter Length of guide module is measured from the rear edge to the front edge of the guide tube and depends on the stroke of the guide module.

1.3 Technical data

Technical data of the loading magazine

Characteristic	Unit	Value
Material flow in the guide channel	mm	23
Bar length	mm	2200 / 3200 / 3800 / 4200
Maximum feed force	N	320
Insert speed	mm/s	600
Feed speed	mm/s	350
Return speed	mm/s	700
Maximum remnant length	mm	420
Weight [3] Length version 2200	kg	400
Weight [3] Length version 3200	kg	550
Weight [3] Length version 3800	kg	600
Weight [3] Length version 4200	kg	650
Weight of transport pallet	kg	200 - 500
Oil tank level	l	50

Characteristic	Unit	Value
Supply of compressed air	bar	6 - 10
Compressed air consumed per loading process	l	approx. 4
Compressed air consumed per double stroke of the steady	l	approx. 0.3
Noise emission during the bar change	dB(A)	48 +/- 5
Operating voltage [1, 4]	V	200 / 400 / other types
Power requirement	KW	1.5
Nominal frequency [2, 5]	Hz	50 / 60
Control voltage	V	24

1) According to DIN EN 60204 (VDE 0113), the continuous operating voltage must be within 100% ± 10% of the line voltage.

2) According to DIN EN 60204 (VDE 0113), the frequency must be between 0.99 and 1.01 of the nominal frequency.

3) Empty, without equipment and without transport pallets.

4) The operating voltage applicable for your product can be seen on the circuit diagram. ➚ *"Other applicable documents" on page 5*.

5) The product is rated for a nominal frequency of 50 Hz and 60 Hz.

Operating conditions

Characteristic	Unit	Value
Surrounding temperature	°C	+ 15 - + 40
Air humidity, non-condensing	%	30 - 75
Altitude about sea level	m	up to 1000

Storage conditions

Characteristic	Unit	Value
Surrounding temperature	°C	- 20 - + 65

The loading magazine is only allowed to be stored in dry rooms.

Lubricant

The lubricant used must comply with one of the following standards.

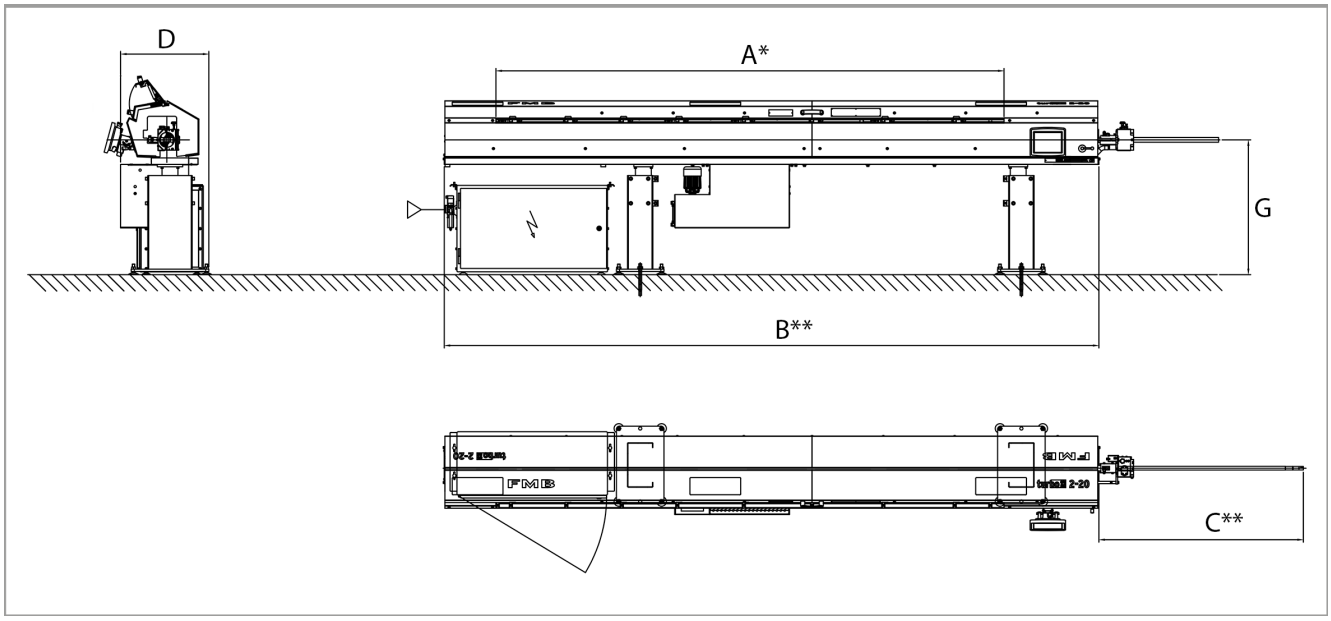
- DIN 51 517-2 CL 68,
- DIN 51 506 VBL 68,
- DIN ISO 3448 ISO VG 68.

The following lubricants are recommended for use in the loading magazine:

Manufacturer	Type
Aral	Motanol HE 68
Mobil / Esso	Vacuoline 1409
Shell	Morlina 68

Dimensions of the loading magazine

*Dimension A: Material bar length; **Dimensions B and C: Depending on the pusher



Stroke	400
Pusher length	1405
	B1
	C1

Table of dimensions

Loading magazine length	Dimensions in mm				
	A	B1	D	C1	G
2200	2200	3130	557	1290	850 - 1250 set to the spindle height
3200	3200	4130			
3800	3800	4730			
4200	4200	5130			

2 Safety

2.1 Safety measures

Personal safety equipment

The operator of the product must provide the following safety equipment and ensure they are used.

- Safety shoes
- Ear protection
- Safety gloves
- Eye protection
- Skin protection

2.2 Safety equipment

Emergency stop device

The loading magazine has an emergency stop device which complies with DIN EN 60204 (VDE 0113). The emergency stop button is mounted on the control panel ➚ *"Press the emergency stop button" on page 43*.

When the emergency stop button is pressed, the power is shut off for the safety-relevant PLC outputs. In addition, the power supply for the drive motor is shut off. The drive motor and hence the pusher cannot perform any more movements. The pressurization of the pneumatic valves remains for the function "Open / close guide channel", so that the guide channel remains shut. The pressurization of the rest of the pneumatic valves is interrupted. They go to their original position. An error message appears on the control panel of the loading magazine.

The emergency stop signal is transmitted to the machine tool and has to be processed there in accordance with DIN EN 23125.

If the emergency stop button of the machine tool is pressed, the emergency stop signal is forwarded to the loading magazine and also triggers an emergency stop there.

Lock

The cover of the loading magazine and the lid of the steady are monitored by the lock. In open position, the lock prevents the loading magazine operating. If the lock reports an "open" position, there is no power at certain PLC outputs and the drive is shut down. The lock helps ensure the loading magazine operates safely.

Safety door of the machine tool

If the safety door of the machine tool is opened during operation, the drive of the loading magazine is shut down. It is not possible to move the pusher of the loading magazine if the safety door of the machine tool is open. A risk to people due to the pusher of the loading magazine being in the working area of the machine tool is therefore excluded.

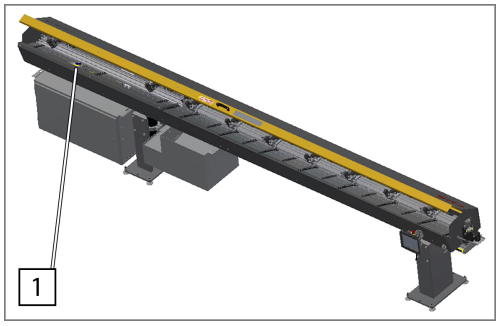
Working on the guide channel

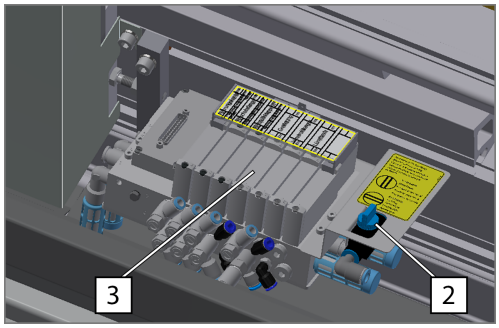
The guide channel is divided into the front guide channel and the rear guide channel. Both parts can be opened either separately or together. Safety bolts are attached to the lateral material storage.

They must be used when working on an open guide channel to secure the guide channel. ➚ *"Securing the guide channel with safety bolts" on page 70*.

Valve block

The valve block is located in position 1 on the loading magazine.





On the valve block, all valves are centrally supplied with compressed air. The compressed air for all valves can be shut off centrally at the stop valve 2.

After shutting off the compressed air, compressed air can be stored in the individual pneumatic cylinders. This can cause unforeseen movements of individual components of the loading magazine. The pneumatic cylinders can be vented separately via the valves 3 after shutting off the supply of compressed air.

This is the case in the event of certain repair work and with troubleshooting. The valve block is only allowed to be operated by personnel qualified to use it. In the event of questions please contact FMB. ➚ *"Service contact details" on page 109*.

3 Transport

3.1 Prepare for transportation

Preparing the loading magazine for transportation

⚠ DANGER

Movable guide channel/guide module can unexpectedly move forward out of the loading magazine

During transport, the movable guide channel/guide module can move forward out of the loading magazine due to its inertia caused by jerky movements. Personal injury from impact can result.

- **Do not loiter in the danger area.**
- **Install the transport lock for the guide channel/guide module before transport as described in the operating instructions.**

⚠ WARNING

Falling attachments/components

Loose attachments or components being transported by the loading magazine can fall and cause personal injury due to crushing and impact.

- **Secure loose attachments or components against slipping and falling before transport.**

Once the loading magazine has been raised, the pins extending out of the floor must be detached at ground level or removed from the floor using suitable means.

1. Completely remove any material bars. ➚ *"Removing the material bar from the loading magazine" on page 64* or ➚ *"Draw off and eject the remnant" on page 63*.
2. Press the ☰ button.
3. SETUP Opening.
4. Move the pusher all the way to the back using the ◂ button.
5. Leave the loading magazine at a standstill for at least 8 hours to allow the oil to drain out.
6. Turn off the main switch of the lathe.
7. Disconnect the power supply to the lathe (remove the connector).
8. Remove all the electrical connections from the loading magazine to the control cabinet.
9. Dispose of the oil / cooling lubricant in accordance with the legal provisions.
10. Depressurize the compressed air line to the loading magazine.
11. Switch off the compressed air supply.➚ *"Switch the supply of compressed air on/off" on page 98*

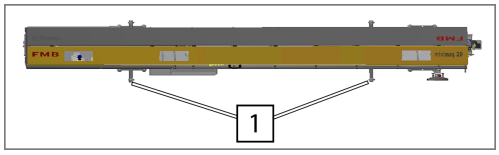
    ➧ The loading magazine is vented.
12. Fasten the control cabinet to the beam ➚ *"Removing the control cabinet from / attaching the control cabinet to the loading magazine" on page 32*.

13. Install the transport lock for the guide channel/guide module.
➚ *"Assembly/disassembly of guide module transport lock (steady with material passage 26 mm)" on page 19.*

14. Loosen the anchors on the floor.

➥ The loading magazine is ready for transportation.

Transport beams



Two transport beams [1] have to be attached to the loading magazine. The attachment points for the transport beams [1] are on the underside of the loading magazine.

Assembling the transport beams

⚠ DANGER

Falling loading magazine

Personal injury due to squashing and impact by the falling loading magazine.

If the transport beams are attached improperly to the loading magazine, they might come loose or the screw connections might break.

- **Observe the description about the assembly of transport beams in the operating instructions.**

⚠ DANGER

Falling transport beams

Personal injury due to squashing and impact by the falling transport beams.

If the raising of the loading magazine is not done by the transport beam, there is a danger that it might fall down if mounted improperly and hit people.

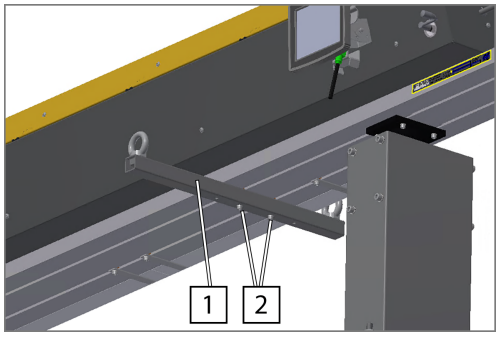
- **Do not stay in the danger area.**
- **Only install transport beams for the purpose of crane transportation and then remove them directly.**

⚠ CAUTION

Protruding transport beams

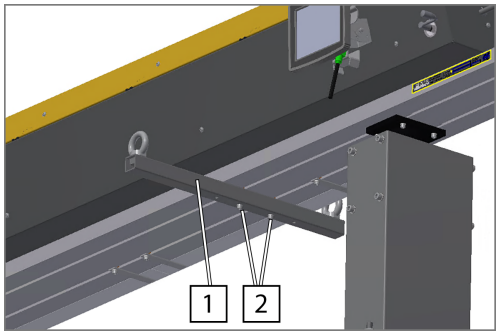
Personal injury because of impact due to protruding transport beams.

- **Remove the transport beams after the loading magazine has been transported.**



1. Position the transport beams [1].
2. Insert and tighten the screws [2].
3. Assemble the second transport beam in the same way.

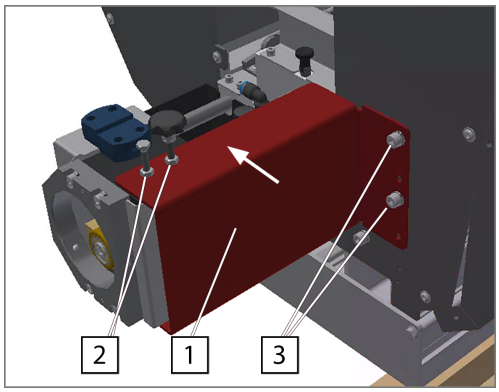
Removing the transport beams



1. Loosen the screws [2] and remove.
2. Removing the transport beams [1].
3. Remove the second transport beam in the same way.

Assembly/disassembly of guide module transport lock (steady with material passage 26 mm)

The described procedure refers to the steady with a material passage of up to 26 mm.



Assembly:

1. Loosen the lock nuts [2].
2. Insert the transport lock [1] in the direction of the arrow.
3. Tighten the lock nuts [2].
4. Insert and tighten the screws [4].

Disassembly:

- Disassemble in reverse order.

Angle of inclination of the load attachment gear

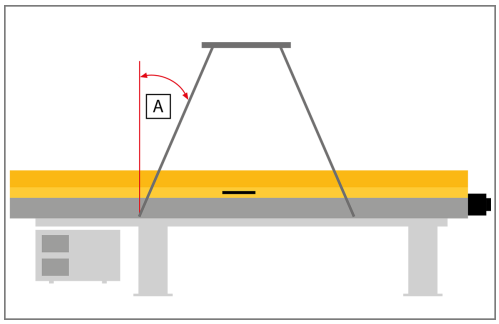
⚠ DANGER

Falling loading magazine

Personal injury due to crushing and impact by the falling loading magazine.

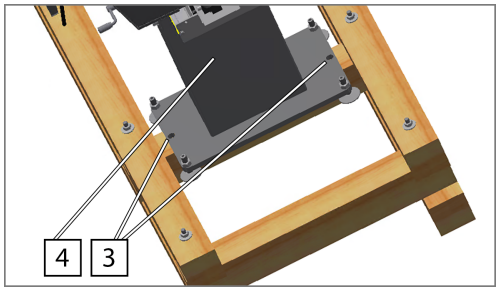
When lifting the loading magazine with the multi-chain load attachment gear, the specified maximum angle of the load attachment gear has to be observed. If this angle is exceeded, the attachments of the transport beams may break and the loading magazine could fall down.

- **Observe the specified maximum angle of inclination of the load attachment gear.**

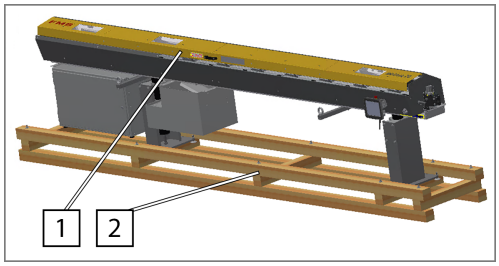


When using the multi-chain load attachment gear, the load attachment gear chosen must not exceed the angle of inclination of A 40°. Greater angles of inclination generate transverse forces that are beyond the rating of the attachment of the transport beams.

Detaching the loading magazine from the transport pallet



1. Secure the loading magazine to prevent tipping over.
2. Loosen and remove the screws in the attachment holes 3 of the support 4.
3. Loosen the rest of the supports from the transport pallet in the same way.



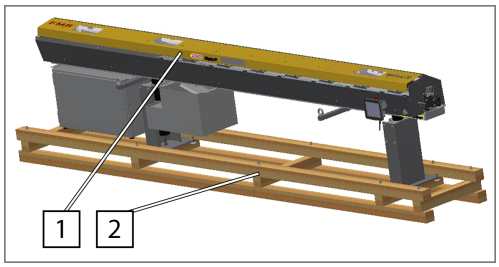
4. Using a crane, raise the loading magazine 1 from the transport pallet 2 and set down safely ↗ *"Transporting the loading magazine using the crane" on page 21*.

Fastening the loading magazine to the transport pallet

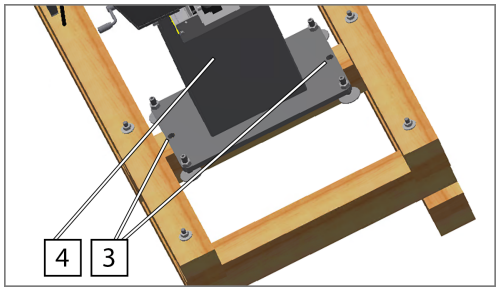
Fastening the loading magazine to the transport pallet serves only to prevent it from slipping or to raise the loading magazine and transport pallet over the transport beams of the loading magazine. For transportation, the loading magazine has to be additionally secured. Fastening it to the transport pallet is not sufficient.

The loading magazine must be fastened to the transport pallet using adequately dimensioned fasteners.

→ Pay attention to the weight of the transport pallet in the technical data. ↗ *"Technical data of the loading magazine" on page 12*.



1. Raise the loading magazine [1] onto the transport pallet [2] using a crane. *“Transporting the loading magazine using the crane” on page 21.*
2. Secure the loading magazine to prevent tipping over.



3. Drill through the attachment holes [3] in the transport pallet .
4. Insert the screws and washers through the attachment holes [3] of the support [4].
5. Attach and tighten the washers and nuts from the other side.
6. Fasten the rest of the supports to the transport pallet in the same way.

3.2 Transporting the product

Transporting the loading magazine using the crane

If the loading magazine is hoisted with the transport pallet, it must be ensured that the attachment screws of the pallet are adequately dimensioned to prevent the pallet coming loose from the loading magazine.

⚠ DANGER

Falling loading magazine

Personal injury due to squashing and impact by the falling loading magazine.

- **Do not stay in the danger area.**
- **Use hoisting equipment suitable for the weight of the loading magazine.**
- **Observe the weight of the loading magazine and, where applicable, the transport pallet in the technical data.**
- **Only hoist the loading magazine using a crane via the transport beams.**
- **Observe the description on hoisting the loading magazine in the operating instructions.**

⚠ DANGER

Falling transport pallets / Loose loading magazine

Personal injury due to squashing and impact as a result of a falling transport pallet.

If the loading magazine is secured insufficiently or incorrectly to the transport palette, this may come loose. The transport pallet may fall down. The loading magazine may be knocked over and fall down.

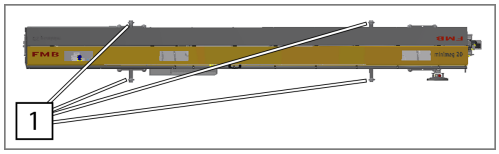
- **Do not stay in the danger area.**
- **Observe the description about the correct attachment of the loading magazine to the transport pallet in the operating instructions.**

⚠ DANGER

Falling control cabinet

Personal injury due to squashing and impact by the falling control cabinet.

- **Do not stay in the danger area.**
- **Observe the description on securing the control cabinet in the operating instructions.**



1. Assembling the transport beams ➚ *"Assembling the transport beams" on page 18*.
2. Fasten suitable hoists to all four eyebolts [1] of the transport beam.
3. Hoist the loading magazine and set it down securely.
4. Remove the hoists from the eyebolts [1] of the transport beams.
5. Remove the transport beams again after the loading magazine has been set down ➚ *"Removing the transport beams" on page 19*.

Transporting the loading magazine using the fork-lift truck

⚠ DANGER

Falling loading magazine

Personal injury due to squashing and impact by the falling loading magazine.

- **Do not stay in the danger area.**
- **Only hoist the loading magazine on a transport pallet using a fork-lift truck.**
- **Observe the description on the correct attachment of the loading magazine to the transport pallet in the operating instructions.**
- **Pay attention to the centre of gravity when hoisting with the fork-lift truck.**
- **Observe the weight of the loading magazine and, where applicable, the transport pallet in the technical data.**

⚠ DANGER

Falling transport pallets / Loose loading magazine

Personal injury due to squashing and impact as a result of a falling transport pallet.

If the loading magazine is secured insufficiently or incorrectly to the transport palette, this may come loose. The transport pallet may fall down. The loading magazine may be knocked over and fall down.

- **Do not stay in the danger area.**
- **Observe the description about the correct attachment of the loading magazine to the transport pallet in the operating instructions.**

⚠ DANGER

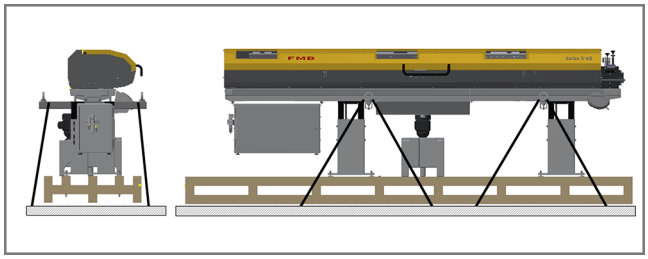
Falling control cabinet

Personal injury due to squashing and impact by the falling control cabinet.

- **Do not stay in the danger area.**
- **Observe the description on securing the control cabinet in the operating instructions.**

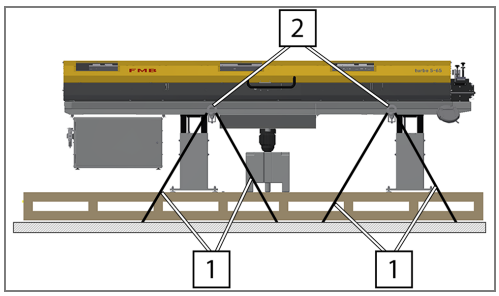
1. Fasten the loading magazine to a transport pallet ➚ *"Fastening the loading magazine to the transport pallet" on page 20*.
2. Calculate the center of gravity of the load.
3. Place the forks of the fork-lift truck beneath the center of gravity of the load.
4. Hoist the transport pallet with the loading magazine and set it down securely.
5. Detach the loading magazine from the transport pallet ➚ *"Detaching the loading magazine from the transport pallet" on page 20*.

Transport the loading magazine with means of transportation

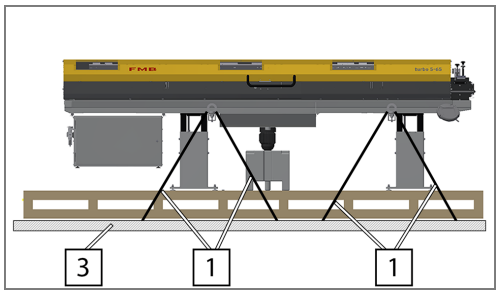


When transporting the loading magazine with means of transportation such as a truck, it is necessary to attach the loading magazine to a transport pallet ➚ *"Fastening the loading magazine to the transport pallet" on page 20*. The unit consisting of the transport pallet and the loading magazine must also be secured via the transport beams of the loading magazine to the floor of the means of transport, strapped diagonally. ➚ *"Attach the loading magazine to the means of transport" on page 23*.

Attach the loading magazine to the means of transport



1. Attach the loading magazine to a transport pallet ➚ *"Fastening the loading magazine to the transport pallet" on page 20*.
2. Attach suitable fasteners [1] to the end stop of the transport beams [2].
3. Raise the loading magazine and the transport pallet with a crane or fork-lift truck onto the means of transport ➚ *"Transporting the loading magazine using the crane" on page 21* or ➚ *"Transporting the loading magazine using the fork-lift truck" on page 22*.



4. Strap the loading magazine diagonally using suitable fasteners [1] to the floor of the means of transport [3].

5. Attach the opposite side of the loading magazine in the same way.

4 Assembly and start-up

4.1 Prepare for assembly

Assembly requirements

NOTICE

Damage to the floor

The floor on which the product is placed, must be designed to bear the loads. Non observance can lead to material damage.

- **Have the suitability of the floor checked by an expert.**

NOTICE

Damage to wires in the floor

When selecting the place to set the product down, you must make sure that there are no wires in the floor in the area under the product. They could be damaged when securing the product.

- **Have the suitability of the installation location checked by an expert.**

Delivery state

The loading magazine and all add-on parts and equipment are delivered together on a transport pallet. The entire consignment is covered with a protective film to prevent coarse contamination.

- The loading magazine is screwed to the transport pallet.
- The add-on set for fastening the loading magazine to the floor is packed and stored in the remnant bin.
- The adapter set is packed and stored in the remnant bin.
- Depending on the equipment, further equipment parts such as the telescopic tube set, steady, lathe, capacity adjustment set or lacquered parts are also supplied. They are all packed on the carton and secured to prevent them from slipping on the transport pallet.

Unpacking the product

Check the delivery:

1. Remove the protective film.
2. Remove the add-on parts and equipment from the transport pallet.
3. Take the add-on parts and equipment out of the remnant bin.
4. Unpack the add-on parts and equipment.
5. Check the delivery to make sure it is complete.

Detach the consignment from the transport pallet:

5. Detach the loading magazine from the transport pallet.
➚ *"Detaching the loading magazine from the transport pallet" on page 20*.

4.2 Aligning

Calculating the distance from the loading magazine to the machine tool

Attachment to machine tools with moving headstock:

1. Set up the loading magazine on the machine tool. ➚ *"Setting up the loading magazine" on page 26*.
2. Calculate the distance from the loading magazine to the machine tool using the order-specific adapter diagram.
3. Adjust the distance.

Setting up the loading magazine

⚠ DANGER

Falling loading magazine

Personal injury due to squashing and impact by the falling loading magazine.

The loading magazine has a high centre of gravity. When aligning the loading magazine there is a danger of it tipping over.

- **Do not stay in the danger area.**
- **Observe the description on aligning and setting up the loading magazine in the operating instructions.**

⚠ DANGER

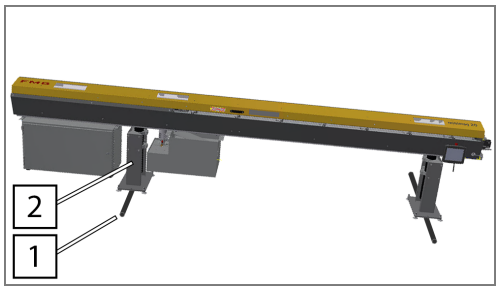
Moving the whole loading magazine during set-up

Personal injury due to squashing or impact due to moving the whole loading magazine.

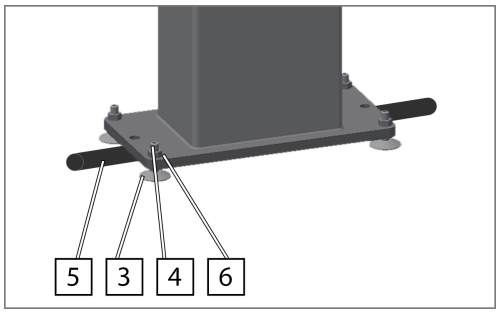
When setting up and aligning the loading magazine, the whole loading magazine has to be moved. People may be struck by the loading magazine or become stuck between the loading magazine and the lathe.

- **Do not stay in the danger area.**

For alignment, the loading magazine with the supports is placed on round material bars (diameter 18 mm - 22 mm).



1. Position the round material bars [1] so that the loading magazine is as close as possible to the lathe.
2. Hoist the loading magazine using suitable equipment and together with the supports [2] place it on the round material bars [1].
3. Align the middle of the loading magazine roughly so that the side faces the lathe spindle.
4. Calculate the distance between the loading magazine and the lathe. ➚ *"Calculating the distance from the loading magazine to the machine tool" on page 25*.
5. Move the loading magazine along the round material bars and create the calculated distance to the lathe.



6. Position the foot plates [3] beneath the threaded pins [4].
7. Turn the threaded pins [4] to the right until the round material bars [5] are free.
8. Tighten the [6] nuts.
9. Remove the [5] round material bars.

4.3 Electrical connection

Electrical connection of the loading magazine and lathe

The electrical connection between the loading magazine and the lathe is shown in the order-specific electrical documents. The order-specific electrical documents are contained in the technical documentation of the product. The configuration of the plug and the operating voltage of the loading magazine are determined by the lathe. The configuration of the plug is done by FMB at the factory and is completed upon delivery. The contacts are configured according to the table below and have to be checked when starting up the loading magazine. If the contacts are not configured as described in the tables, please contact FMB.

- Contacts from the loading magazine to the lathe: ➚ *"Contacts from the loading magazine to the machine tool" on page 27*
- Contacts from the lathe to the loading magazine: ➚ *"Contacts from the machine tool to the loading magazine" on page 27*

Contacts from the loading magazine to the machine tool

Name	Explanation
-K30	Contact closed >> No fault reported by the loading magazine Contact open >> The loading magazine reports a fault In the event of a fault, the spindle of the tool machine can no longer turn
-K1	The material bar is pushed into the machine tool or Input release, Program - Start This signal is emitted, depending on the machine tool control system, as an impulse or permanent contact.
-K9	This signal indicates to the machine tool that the material bar has been processed. This signal is emitted, depending on the machine tool control system, as a normally closed or normally open contact.
-K91 (optional)	When working with two different part lengths, this signal is emitted when the bar end of the longer part Part length 1 is reached.
-K90	Contact closed >> The loading magazine is in automatic mode
-K44	This signal is emitted after the execution of the part length feed and continues until the moving signal (collet open) is removed. The signal is only emitted in the following cases: Operating mode Collet open, fixed speed.
Loading magazine emergency stop	Potential-free contact of the loading magazine. This contact is to be included in the emergency-stop circuit of the machine tool.

Contacts from the machine tool to the loading magazine

Signal from the machine tool	Loading magazine action
Collet open	The feed equipment of the loading magazine is switched on.

Signal from the machine tool	Loading magazine action
End of cycle, start bar change	On machine tools with a program skip in the bar starting program, the contact must be queued in front of "collet open". Contact triggers a bar change on the loading magazine.
Machine tool ready for operation, enable automatic mode	The loading magazine can be switched to automatic mode (for this to happen, this contact must be active).
Loading magazine on (option)	Contact starts automatic mode of the loading magazine.
Safety door closed	The feed movement through the loading magazine is executed only if this contact is active.
Follow-up with sub-spindle (optional)	M-command from the machine tool. If this signal is emitted before the collet is opened (push command), the next follow-up is converted to Part follow-up with sub-spindle .
Emergency stop of the machine tool	Potential-free contact of the lathe. This contact is included in the emergency-stop circuit of the loading magazine.
Approval of synchronization clutch (optional)	The synchronization (long turning mode) is only turned on if this contact is active.

4.4 Assembly

Establish the power supply to the loading magazine

⚠ DANGER

Live components of the control cabinet

Personal injury by electrical shock due to contact with live components of the control cabinet.

This work is only allowed to be performed by a qualified electrician.

- **Turn off the machine tool before starting work on the main switch.**

⚠ DANGER

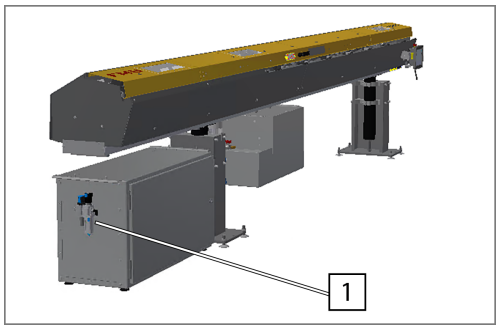
Damaged wires or plugs

Personal injury by electric shock due to damaged wires or plug-in connections.

- **Perform a visual check of wires and plug-in connections for damage before inserting them into the control cabinet.**

The main power supply of the loading magazine is connected to the loading magazine and attached to the front of the loading magazine.

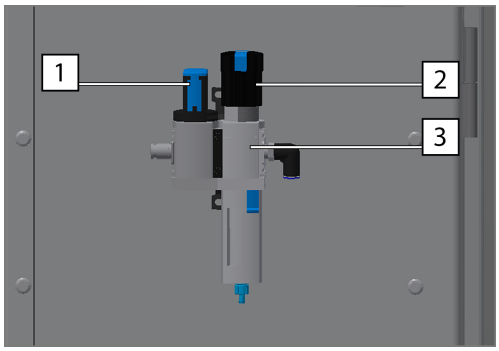
1. Turn off the machine tool before starting work on the main switch.
2. Check the electrical connection of the loading magazine and lathe. ↗ *"Electrical connection of the loading magazine and lathe" on page 27*



3. Insert the main power supply cable of the loading magazine into the control cabinet of the lathe.
4. Check the input voltage of the loading magazine.
5. Insert the connecting pipe for the compressed air supply to the loading magazine into the maintenance unit [1].

Setting the supply of compressed air

Values for the supply of compressed air: ➚ "Technical data of the loading magazine" on page 12.



1. Switch off the supply of compressed air on/off at the knob [1].
2. Set the supply of compressed air at the control unit [2].
3. Check the compressed air supply on the display [3].

Aligning the loading magazine

⚠ DANGER

Falling loading magazine

Personal injury due to squashing and impact by the falling loading magazine.

The loading magazine has a high centre of gravity. When aligning the loading magazine there is a danger of it tipping over.

- **Do not stay in the danger area.**
- **Observe the description on aligning and setting up the loading magazine in the operating instructions.**

⚠ DANGER

Moving pusher without protective equipment

Personal injury due to squashing and impact because of work on an unsecured pusher.

When aligning the loading magazine, it is necessary for technical reasons to move the pusher without the intended protective equipment. The danger area is not covered during this process. The moving pusher may catch extremities or people.

- **Do not stay in the danger area.**

⚠ CAUTION

Sharp knives of the material gripper

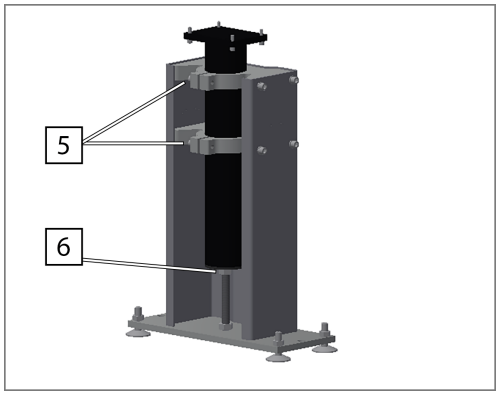
Cuts due to the sharp knives of the material gripper.

When working in the vicinity of the material gripper, there is a risk of cuts in the event of inattentiveness.

- **Wear safety gloves.**

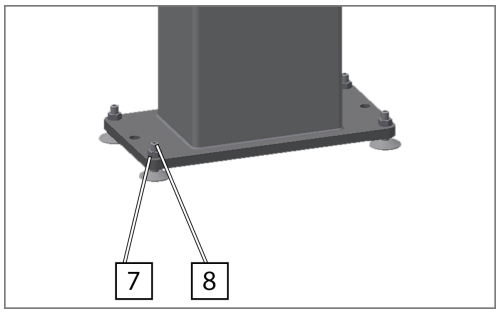
→ The centering hole on the pusher of the loading magazine must align with the lathe spindle. Set and verify the alignment with an optical alignment aid. If you have any questions about this, please contact FMB. ➚ *"Service contact details" on page 109*.

Correcting the height (roughly):



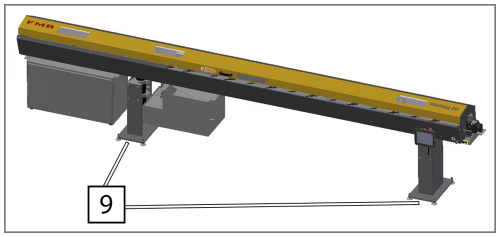
1. → Loosen the clamping screws [5].
2. → Correct the height of the loading magazine with the nuts [6].
3. → Tighten the clamping screws [5].

Correcting the position:



1. → Loosen the lock nuts [7] of the threaded pins [8].
2. → Correct the position of the loading magazine by adjusting the threaded pins [8].
3. → Tighten the lock nuts [7] of the threaded pins [8].

Correcting the lateral position:



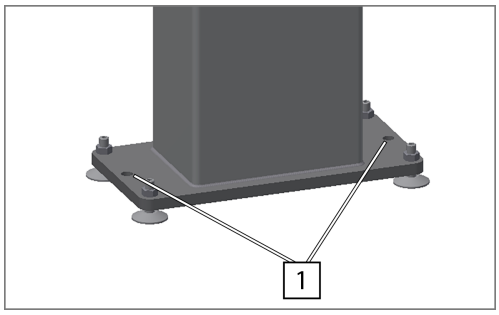
1. → Position the lever (e.g. crowbar) at the leverage points [9] and correct the side position.
2. → Remove the optical alignment aids again.

Attaching the loading magazine to the floor

The number of attachment points to be used depends on the condition of the floor and the equipment of the loading magazine. In the event of uncertainty, please consult FMB.

To attach the loading magazine to the floor, appropriately designed drop-in anchors or adhesive anchors must be used. In the event of uncertainty, please consult FMB.

1. → Aligning the loading magazine ➚ *"Aligning the loading magazine" on page 29*.



2. Drill the floor holes through the attachment points 1.
3. Fix attachment aids to the floor hole.
4. Screw the nuts to the attachment aid and tighten.

Attachment to machine tool

⚠ DANGER

Moving components of the loading magazine and the machine tool

Personal injury due to crushing, impact or entanglement by movements of the loading magazine and the machine tool.

When working on the unsecured interface (connection between loading magazine and machine tool released), the extremities may become trapped or entangled by the moving components of the loading magazine or machine tool.

- **Turn off the machine tool before starting work on the main switch.**

⚠ WARNING

Movement of the guide channel during assembly

Personal injury from crushing of upper limbs due to loose guide channel.

During commissioning, the movable guide channel is detached from the headstock of the lathe. This allows the movable guide channel to move freely. The high dead weight of the movable guide channel can present hazards for the operator.

- **Be aware that the guide channel is detached during assembly.**

⚠ CAUTION

Falling add-on parts

Personal injury due to squashing and impact by the falling add-on parts.

When setting up the loading magazine, various add-on parts have to be mounted at the interface between the loading magazine and the machine tool. They might fall down and hit body extremities.

- **Raise and secure add-on parts with suitable hoisting equipment.**

The attachment of the loading magazine to the machine tool is order-specific and dependent on the individual design of the interface between the loading magazine and the machine tool. Refer to the adapter set/attachment diagram for the precise procedure. ↗ *"Other applicable documents" on page 5*.

If you have any questions about how the loading magazine is attached to the machine tool, please contact FMB. ↗ *"Service contact details" on page 109*.

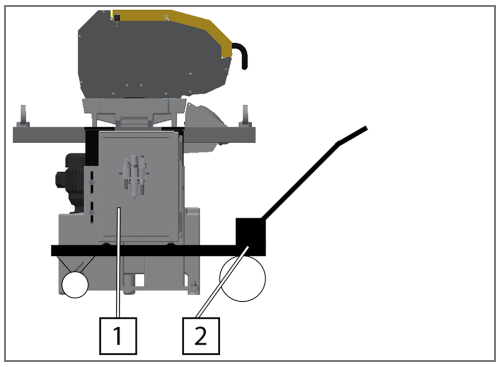
Removing the control cabinet from / attaching the control cabinet to the loading magazine

⚠ CAUTION

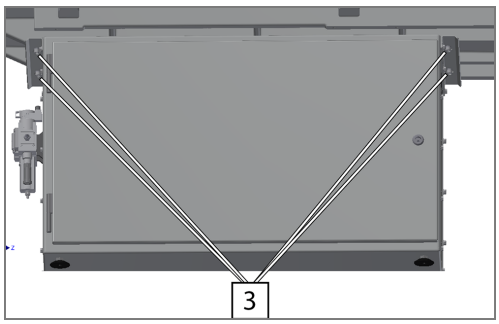
Falling control cabinet

Personal injury due to squashing and impact by the falling control cabinet.

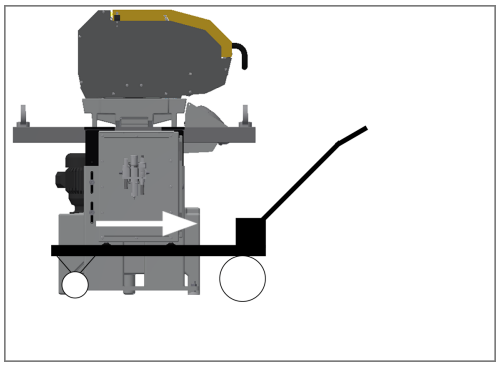
- **Observe the description on removing and fastening the control cabinet from the loading magazine in the operating instructions.**



1. Support the control cabinet [1] using suitable hoisting equipment [2].



2. Loosen the screws [3].



3. Shift the control cabinet in the direction indicated by the arrow and unhinge.
4. Lower the control cabinet and place it on the floor.
5. Attach the control cabinet to the loading magazine in reverse order.

Filling the oil tank

Fill the oil tank. ➚ *"Filling the oil tank of the loading magazine" on page 98*.

4.5 Adjustments

Positional values to be set

During start-up, positional values have to be set once for the parameter settings. This concerns certain positions, which can only be calculated from the perspective of the whole system (the loading magazine installed on a lathe).

The following positional values have to be set:

- First insert travel
- Position front limit

Determining value for First insert travel

1. Load a short material bar (approx. 1 m) ➚ *"Draw off remnant, eject it and draw on the new material bar" on page 65*.
2. Press the ☰ button.
3. SETUP Open .
4. Move the end of the material bar on the lathe side to the starting switch using the ▸ button.
5. Check and note the current position on the control panel.
6. **On lathes with a moving headstock:** Move the end of the material bar on the lathe side through the collet of the lathe until just before the guide sleeve of the lathe using the ▸ button.

   ℹ The position "just before the guide sleeve" has to be clarified, if necessary with FMB or with the lathe manufacturer.
7. **On lathes with a fixed headstock:** Move the end of the material bar on the lathe side through the collet of the lathe up to the cut-off position using the ▸ button.
8. Check and note the current position on the control panel.
9. Deduct the first position from the second position.
10. *ℹ The result is the value for the First insert travel.*
11. Press the ☰ button.
12. *'SETTINGS → Service settings → Position"*
13. Tap the First insert travel field.

    ➡ An input window opens.
14. Enter value for First insert travel .

    ➡ The value for First insert travel is determined.

Determining value for Position front limit

1. **Only for lathes with a moving headstock:** Move the headstock of the spindle towards the guide sleeve to the end position.
2. Close the collet of the lathe.
3. Press the ☰ button.
4. SETUP Open .
5. Move the pusher with the clamping sleeve towards the lathe using the ▸ button until the clamping sleeve of the loading magazine is queued on the collet of the lathe.
6. Press the ☰ button.
7. *'SETTINGS → Service settings → Position"*

8. Tap the Position front limit field.
   ➡ An input window opens.
9. Enter the recorded value, minus the safety distance of 5 mm for Position front limit .
   ➡ The value for Position front limit is determined.

4.6 Settings

Distanceview

Distanceview is a display on the control panel, which is active after a pre-set time and is ended by pressing the touchscreen. On the Distanceview display, only the information relevant for production is shown on an enlarged display. This makes it possible to see the current statuses of the loading magazine, even from a distance.

Set the Distanceview

The display Distanceview is active, if the touchscreen is not pressed within the pre-set time. The time is set in seconds. If the time has been set to "0", the function is deactivated.

1. Press the ☰ button.
2. *"SETTINGS → System settings"*
3. Click on the field TIME DISTANCEVIEW.
   ➡ An input field opens.
4. Enter the value for the activation of the display.
   ➡ Distanceview has been set and is active after the expiry of the entered time.

Set the date and time

1. Press the ☰ button.
2. *"SETTINGS → System settings"*
3. Click on the field SET DATE.
   ➡ An input field opens.
4. Enter the current date.
5. Click on the field SET TIME.
   ➡ An input field opens.
6. Enter the current time.

Changing language settings

1. Press the ☰ button.
2. *"SETTINGS → System settings"*
3. Click on the respective language.

Set the unit of measure

1. Press the ☰ button.
2. *‘SETTINGS → System settings”*
3. Click on the respective unit of measure in the field UNIT OF MEASURE.
   ➡ The status display on the button turns green. The unit of measure has been set.

Setting the oil feed

The setting of the oil feed must be done during operation for rotating material bars.

1. Set the ball value on the oil pump to "off".
2. Open the ball valve slowly, until the material bar runs slowly.
   ➡ The oil feed has been set.

Position oilpump on / Position oilpump off Setting

The oil pump keeps the oil flowing in the guide channel. The flow of oil is necessary to guide the material bar optimally in the guide channel of the loading magazine. If the end of the material bar is in the transition section from the guide channel to the spindle of the lathe, the oil pump can be switched off. This prevents oil getting into the working area of the lathe.

1. Press the ☰ button.
2. *‘SETTINGS → Basic settings → Parameter”*
3. Tap the Position oilpump on field.
   ➡ An input field opens.
4. Enter value for Position oilpump on .
5. Tap the Position oilpump off field.
   ➡ An input field opens.
6. Enter value for Position oilpump off .

4.7 Pre-set parameters

Pusher length Entering

Information about Pusher length: ➚ “Positions and traverse paths” on page 11.

This value is pre-set by the FMB. If necessary, the value can be adjusted.

1. Press the ☰ button.
2. *‘SETTINGS → Service settings → Position”*
3. Tap the Pusher length field.
   ➡ An input field opens.

4. Enter the value for Pusher length .

Position storage Entering

Information about Position storage: ➚ "Positions and traverse paths" on page 11.

This value is pre-set by the FMB. If necessary, the value can be adjusted.

1. Press the ☰ button.
2. *'SETTINGS → Service settings → Position"*
3. Tap the Position storage field.
   ➡ An input field opens.
4. Enter the value for Position storage .

Speed Acceleration Short pusher forward Entering

The value Speed Acceleration Short pusher forward describes the speed at which the pusher moves to the Position storage value to pick up the material bar and push it into the area of the material gripper.

1. Press the ☰ button.
2. *'SETTINGS → Service settings → Speed"*
3. Scroll to the next page using the ↷ button.
4. Tap the Speed Acceleration Short pusher forward field.
   ➡ An input field opens.
5. Enter the value for Speed Acceleration Short pusher forward .

Limit pos. short pusher front Entering

Information about Limit pos. short pusher front see: ➚ "Positions and traverse paths" on page 11.

1. Press the ☰ button.
2. *'SETTINGS → Service settings → Position"*
3. Tap the Limit pos. short pusher front field.
   ➡ An input field opens.
4. Enter the value for Limit pos. short pusher front .

Enter Speed First insert low

The value Speed First insert low describes the speed at which the pusher moves to the Position front limit position.

This value is pre-set by the FMB. If necessary, the value can be adjusted.

1. Press the ☰ button.
2. *'SETTINGS → Service settings → Speed"*
3. Click on the field Speed First insert low.
   ➡ An input field opens.
4. Enter the value for Speed First insert low.

Enter Position open steady

Information about Position open steady: ➚ "Positions and traverse paths" on page 11.

This value is pre-set by the FMB. If necessary, the value can be adjusted.

1. Press the ☰ button.
2. *'SETTINGS → Service settings → Position"*
3. Click on the field Position open steady.
   ➡ An input field opens.
4. Enter the value for Position open steady.

Enter Position close steady

Information about Position close steady: ➚ "Positions and traverse paths" on page 11.

This value is pre-set by the FMB. If necessary, the value can be adjusted.

1. Press the ☰ button.
2. *'SETTINGS → Service settings → Position"*
3. Click on the field Position close steady.
   ➡ An input field opens.
4. Enter the value for Position close steady.

Position B7 Entering

This value is pre-set by the FMB. If necessary, the value can be adjusted.

1. Press the ☰ button.
2. *'SETTINGS → Service settings → Position"*
3. Tap the Position B7 field.
   ➡ An input field opens.
4. Enter the value for Position B7 .

Enter the Speed Return from spindle

The value Speed Return from spindle describes the slower of the two speeds of the pusher when retracting. This is used if the pusher is in the area of the machine tool spindle.

This value is pre-set by the FMB. If necessary, the value can be adjusted.

1. Press the ☰ button.
2. *"SETTINGS → Service settings → Speed"*
3. Click on the field Speed Return from spindle.
   ➡ An input field opens.
4. Enter the value for Speed Return from spindle.

Enter the Pos. reverse rotation return

At the Pos. reverse rotation return position the speed of the pusher when returning out of the machine tool spindle is switched from Speed Return from spindle to the higher Speed Return high.

This value is pre-set by the FMB. If necessary, the value can be adjusted.

1. Press the ☰ button.
2. *"SETTINGS → Basic settings → Parameter"*
3. Click on the field Pos. reverse rotation return.
   ➡ An input field opens.
4. Enter the value for Pos. reverse rotation return.

Enter the Speed Return high

The value Speed Return high describes the faster of the two speeds of the pusher when retracting. This is used if the pusher is no longer in the area of the machine tool spindle.

This value is pre-set by the FMB. If necessary, the value can be adjusted.

1. Press the ☰ button.
2. *"SETTINGS → Service settings → Speed"*
3. Click on the field Speed Return high.
   ➡ An input field opens.
4. Enter the value for Speed Return high.

Enter the Position draw off

Information about Position draw off: ➚ "Positions and traverse paths" on page 11.

This value is pre-set by the FMB. If necessary, the value can be adjusted.

1. Press the ☰ button.
2. *'SETTINGS → Service settings → Position"*
3. Click on the field Position draw off.
   ➡ An input field opens.
4. Enter the value for Position draw off.

Position press on Entering

Information about Position press on: ➚ "Positions and traverse paths" on page 11.

This value is pre-set by the FMB. If necessary, the value can be adjusted.

1. Press the ☰ button.
2. *'SETTINGS → Service settings → Position"*
3. Tap the Position press on field.
   ➡ An input field opens.
4. Enter the value for Position press on .

Set the Collet Signal

This function is available as an option.

This value is pre-set by the FMB. If necessary, the value can be adjusted.

1. Press the ☰ button.
2. *'SETTINGS → Service settings → Mode"*
3. Click on the field Collet Signal.
   ➡ A selection window opens.
4. Click on the respective selection.
   ➡ The chosen selection is shown in the field.

Set the Feed Stop Signal

This function is available as an option.

This value is pre-set by the FMB. If necessary, the value can be adjusted.

1. Press the ☰ button.
2. *'SETTINGS → Service settings → Mode"*
3. Click on the field Feed Stop Signal.
   ➡ A selection window opens.

4. Click on the respective selection.
   ➡ The chosen selection is shown in the field.

Oil discharge time on Setting

This function is available as an option.

1. Press the ☰ button.
2. *"SETTINGS → Basic settings → Parameter"*
3. Tap the Oil discharge time on field.
   ➡ A selection window opens.
4. Enter the value for Oil discharge time on .

Length of guide module Entering

This value is pre-set by the FMB.

1. Press the ☰ button.
2. *"SETTINGS → Basic settings → Parameter"*
3. Tap the Length of guide module field.
   ➡ An input field opens.
4. Enter the value for Length of guide module .

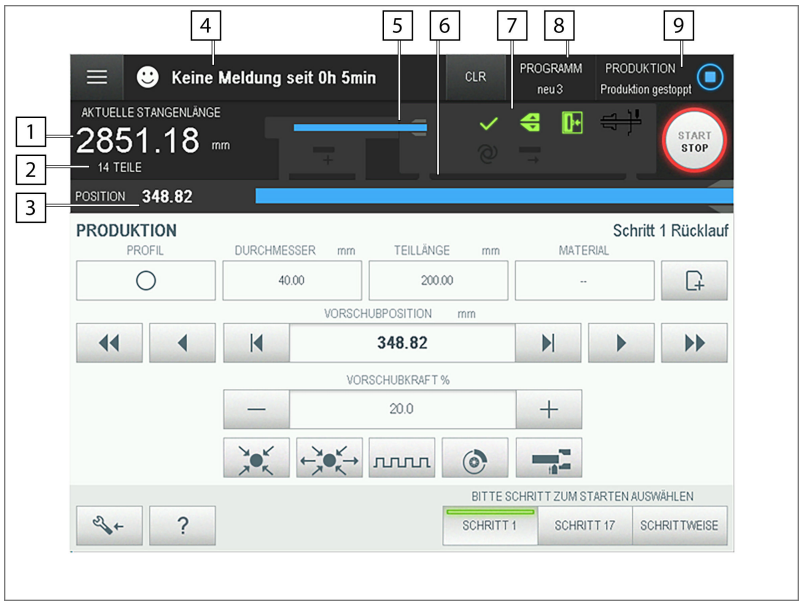
5 Control panel

5.1 Control panel, general

Layout

The control panel has a touchscreen, which is operated by touching it with a finger.

The upper, darker area of the screen provides information about the current statuses of the loading magazine and is visible in every menu. On the lower part of the screen the different menus are shown.



1	Display of the current material bar length
2	Number of possible parts
3	Display of the current position
4	Fault message display
5	Visualization of the current material bar length
6	Visualization of the current material bar length (enlarged image)
7	Display of the current status
8	Display of the loaded program
9	Product status (automatic mode)

Navigation

The contents of the control panel are split into several main menus. In the main menus you can reach the corresponding content page directly or via the sub-menus.

The way to reach the respective action in the control panel is described via a menu pathway in the guidelines of these operating instructions. The menu pathway shows the way via the menus to the content page which the action is on.

Example: *"Main menu → Sub menu 1 → Sub menu 2"*

If you selected the last menu, you are directly on the content page on which the action occurs. The guidelines then indicate the field which should be worked on, or the button which should be pressed.

Example: Field Click on the example field.

Some pages contain more content that can be shown on one page of the control panel. In this case the described field or button may be on one of the following pages. To reach any following pages, you have to scroll through the content page. The fact that content may be located on following pages is not considered in the operating instructions.

Scroll through content pages: ➚ *"Scroll through content page" on page 42*.

Scroll through content page

Access the following page

→ Access the following pages with .

Access the previous page

→ Access the previous page with .

Explanation of symbols

In the main menus PRODUCTION and SETUP there is a help page, which provides explanations of the symbols used.

Explanation of symbols Main menu PRODUCTION

1. Press the button.
2. Press PRODUCTION.
3. Press the ? button.

Explanation of symbols Main menu SETUP

1. Press the button.
2. Press SETUP.
3. Press the ? button.

6 Operation

6.1 Basic functions

Press the emergency stop button

The emergency stop button is located on the control panel. Pressing the emergency-stop button switches the outputs of the PLC output card off. The drive of the loading magazine is shut down. An error message appears on the display of the control panel.

→ Press the emergency stop button 1.

➡ The loading magazine stops.

Make the loading magazine ready for operation after the emergency stop

1. → Unlock the emergency stop button 1.
2. → Where necessary, cancel the emergency stop on the machine tool.

➡ The loading magazine is ready for operation

Switch on the loading magazine

→ Turn on the main switch of the machine tool.

➡ The loading magazine is ready for operation.

Switch off the loading magazine

During active production, the production can be stopped after the end of the machine tool's cycle, and the whole system can be switched off. When the system is switched on again, the processing is continued from the same place.

→ Turn off the main switch of the machine tool.

➡ The loading magazine is switched off.

Parts counter

The parts counter counts the number of parts produced. If a target value is reached, the parts counter stops the production. Product can only be restarted if the actual value has been reset. The target value of the parts counter can be adjusted ➚ *"Set the parts counter" on page 44*.

Set the parts counter

Once the target value has been reached, the parts counter stops production.

Production can only be restarted, if the actual value of the parts counter has been reset ➚ *"Reset the actual value of the parts counter" on page 44.*

Entering Parts counter Desired = "0" deactivates the parts counter.

1. Press the ☰ button.
2. *'SETTINGS → Basic settings → Parts counter"*
3. Click on the field Parts counter Desired.
   ➥ An input field opens.
4. Enter the value for the target number of units.
   ➥ The parts counter is activated with the entered target quantity.

Reset the actual value of the parts counter

1. Press the ☰ button.
2. *'SETTINGS → Basic settings → Parts counter"*
3. Click on the field Reset parts counter.
   ➥ The parts counter is reset.

6.2 Overview of selections

Selections

Selections are available for the functions and components of the loading magazine with several respective selection options. They can be selected if required to adjust the operation of the loading magazine.

Part follow-up

Selection	Selection option	Description
Part follow-up		
	Collet open, fixed speed	Push to the stop.

Remnant gripper

Selection	Selection option	Description
Remnant gripper		
	Standard	The remnant is removed and falls into the remnant bin.

With / without gripper

The selection With / without gripper allows the remnant to be removed from the working area of the lathe. For this purpose there are several operating modes available.

Selection	Selection option	Description
With / without gripper	with gripper	The material bar is clamped in a clamping sleeve on the loading magazine side. The remnant must be removed from the lathe side.
	without gripper	The material bar is moved by a centering sleeve on the loading magazine side. The material bar sits loosely in the centering sleeve. The remnant is pushed by the lathe spindle and removed from the working area of the lathe.
	without gripper with press upon	The material bar is clamped in a clamping sleeve on the loading magazine side. The remnant must be removed from the lathe side.
	with gripper with press upon + bar change	The material bar is clamped in a clamping sleeve on the loading magazine side. The remnant must be removed from the lathe side. During the processing of the last part a new material bar is loaded.

Interval insert

The interval insert improves the insertion of multi-sided material in the collet.

Selection	Selection option	Description
Interval insert	without return	Intermittent feed of short strokes.
	with return	Intermittent feed of short forward and backward strokes (recommended setting).

Steady

Selection	Selection option	Description
Steady		
	Steady roll. op. as push.pass.	During processing, the roller steady closes. When the pusher moves, the roller steady opens. As soon as the pusher is in the area of the roller steady, the roller steady remains open.
	Steady jaws op. as push.pass.	During processing, the jaw steady closes. When the pusher moves, the steady remains closed. As soon as the pusher is in the area of the jaw steady, the jaw steady remains open.
	Jaw steady closed when pushing	During processing, the jaw steady opens. When the pusher moves the jaw steady closes. As soon as the pusher is in the area of the jaw steady, the jaw steady remains open.
	R. steady on as pusher passes	During processing, the roller steady closes. When the pusher moves, the roller steady opens. As soon as the clamping sleeve of the pusher is in the area of the roller steady, the roller steady opens and remains open until the clamping sleeve is through the steady. After that, the roller steady closes during processing. When the pusher moves, the roller steady opens.
	J. steady on as pusher passes	During processing, the jaw steady closes. When the pusher moves, the jaw steady remains closed. As soon as the clamping sleeve of the pusher is in the area of the jaw steady, the jaw steady opens and remains open until the clamping sleeve is through the steady. The jaw steady then closes during processing. When the pusher moves, the jaw steady opens.

Mode sliding-fixed headstock

This selection is available only if the machine tool can be operated in both modes (Long turn and Short turn).

Selection	Selection option	Description
Mode sliding-fixed head-stock		
	Long turn	The parameters "First insert sliding head-stock turning" and "Position front end posi-tion sliding headstock turning" are used.

Selection	Selection option	Description
	Short turn	The parameters "First insert fixed headstock turning" and "Position front end position fixed headstock turning" are used.

Special insert

Selection	Selection option	Description
Special insert	On	The material bar is pushed forwards, with the guide channel open, to press on the area of the material gripper.
	Off	The material bar is pushed forwards, with the guide channel closed, to press on the area of the material gripper.

First insert

Selection	Selection option	Description
First insert	Standard	The pusher moves to the First insert travel position.
	To stop	The pusher moves to the First insert travel position and then goes on to a stop in the lathe.

Draw on bar

Selection	Selection option	Description
Draw on bar	without first insert	The material bar is loaded and pressed.
	with first insert	The material bar is loaded and pressed. Then the pusher moves to the position end First insert.

Separation

Selection	Selection option	Description
Separation		
	with channel opened (standard)	The material bar is separated if the guide channel is open and rolls directly into the guide channel.

Loading magazine

This function is available as an option.

Selection	Selection option	Description
Loading magazine	On	Normal work flow with the loading magazine.
	Off (chucker mode)	The loading magazine is switched off (collet mode).

6.3 Edit and manage programs

Program

Processing parameters are saved in the programs, which are valid for particular processing. During production, the program parameters of the loaded program are consulted.

For the creation of programs, a particular selection of program parameters is available, which can be set in the program editor. They are described under "Edit and manage programs".
↗ *Chapter 6.3 “Edit and manage programs” on page 48*.

In addition to the program parameters, general processing settings can be made which are not, however, saved in the programs. They are described under "Processing settings".
↗ *Chapter 6.4 “Processing settings” on page 52* .

Creating a new program

1. Press the ☰ button.
2. *‘PROGRAM → NEW”*
   ➡ PROGRAM EDITOR opens.
3. Enter the program parameters.
4. Scroll to page 2 using the ↷ button.
5. Press the 🖫 button.
6. Give the program a name.
7. Press the NEW button.
   ➡ A new program is created.

Editing a program

1. Press the ☰ button.
2. Select PROGRAM.
3. Click on the program to be edited in the list.
   ➡ The selected program is marked blue.
4. Press Edit.
5. Enter the program parameters.
6. Press the 🖫 button.

7. Press the Overwrite button.
   ➡ The changes are saved.

Load program

To use a program in automatic mode, it must be loaded.

1. Press the ☰ button.
2. Select PROGRAM.
3. Click on the corresponding program in the list.
   ➡ The selected program is marked blue.
4. Press Open and load.
   ➡ The selected program is loaded and is used in automatic mode.

Enter the profile of the material bar

1. Open the program in the program editor. ➚ *"Creating a new program" on page 48* or ➚ *"Editing a program" on page 48*.
2. Click on the field Profile.
   ➡ A list of profiles opens.
3. Click on the profile to be processed.
4. Save changes with the 🖫 button.

Entering the material to be processed

1. Open the program in the program editor. ➚ *"Creating a new program" on page 48* or ➚ *"Editing a program" on page 48*.
2. Click on the field Material.
   ➡ An input field opens.
3. Enter the material to be processed.
4. Save changes with the 🖫 button.

Enter the diameter of the material bar to be processed

1. Open the program in the program editor. ➚ *"Creating a new program" on page 48* or ➚ *"Editing a program" on page 48*.
2. Click on the field Diameter.
   ➡ An input field opens.
3. Enter the diameter to be processed.
4. Save changes with the 🖫 button.

Enter the Part length

The length dimension of the part to be produced is recorded under Part length. This is used by the control unit to automatically calculate the possible number of parts to be manufactured.

The length dimension of the part to be produced currently has to be adjusted.

1. Open the program in the program editor. ➚ *"Creating a new program" on page 48* or ➚ *"Editing a program" on page 48*.
2. Click on the field Part length 1.
   ➥ An input field opens.
3. Enter the part length.
4. Save changes with the button.

Enter the Feed force for part follow-up

The Feed force for part follow-up is the force with which the pusher moves the material bar.

This setting is also editable during production.

1. Open the program in the program editor. ➚ *"Creating a new program" on page 48* or ➚ *"Editing a program" on page 48*.
2. Click on the field Feed force.
   ➥ An input field opens.
3. Enter the feed force.
4. Save changes with the button.

Enter the Speed for part follow-up

The Speed for part follow-up is the speed with which the pusher moves the material bar.

1. Open the program in the program editor. ➚ *"Creating a new program" on page 48* or ➚ *"Editing a program" on page 48*.
2. Click on the field Speed.
   ➥ An input field opens.
3. Enter the speed.
4. Save changes with the button.

Enter the feed of the material bar

The pusher moves the material bar once per turned part by the set value in the working area of the lathe. The material bar is moved directly to the cut-off position.

1. Open the program in the program editor. ➚ *"Creating a new program" on page 48* or ➚ *"Editing a program" on page 48*.
2. Click on the field Feed 1.
   ➥ An input field opens.

3. Enter the feed of the material bar.
4. Save changes with the button.

Set the Selection option Part follow-up

1. Open the program in the program editor. ➚ *"Creating a new program" on page 48* or ➚ *"Editing a program" on page 48*.
2. Click on the field Part follow-up.
   ➡ A selection window opens.
3. Click on the selection option.
   ➡ The chosen selection option is shown in the field.
4. Save changes with the button.

Set the Selection option First insert

1. Open the program in the program editor. ➚ *"Creating a new program" on page 48* or ➚ *"Editing a program" on page 48*.
2. Click on the field First insert.
   ➡ A selection window opens.
3. Click on the selection option.
   ➡ The chosen selection option is shown in the field.
4. Save changes with the button.

Enter Feed force for first insert

Feed force for first insert is the force with which the pusher moves a new material bar into the working area of the lathe.

This value is pre-set by the FMB. If necessary, the value can be adjusted.

1. Open the program in the program editor. ➚ *"Creating a new program" on page 48* or ➚ *"Editing a program" on page 48*.
2. Click on the field Feed force for first insert.
   ➡ An input field opens.
3. Enter Feed force for first insert.
4. Save changes with the button.

Enter Feed force for press upon

The Feed force for press upon is the force with which the pusher presses the material bar against the clamping device.

This value is pre-set by the FMB. If necessary, the value can be adjusted.

1. Open the program in the program editor. ➚ *"Creating a new program" on page 48* or ➚ *"Editing a program" on page 48*.

2. Click on the field Feed force for press upon.
   ➡ An input field opens.
3. Enter Feed force for press upon.
4. Save changes with the button.

Enter Extension first insert

This function allows the extension of the First insert travel. The entered value is added to the First insert travel path.

This value is set to "0" (off) by FMB. If necessary, the value can be adjusted.

1. Open the program in the program editor. ➚ *"Creating a new program" on page 48* or ➚ *"Editing a program" on page 48*.
2. Click on the field Extension first insert.
   ➡ An input field opens.
3. Enter Extension first insert.
4. Save changes with the button.

Enter Speed sub-spindle

1. Open the program in the program editor. ➚ *"Creating a new program" on page 48* or ➚ *"Editing a program" on page 48*.
2. Click on the field Speed sub-spindle.
   ➡ An input field opens.
3. Enter Speed sub-spindle.
4. Save changes with the button.

Enter Feed force for sub-spindle

1. Open the program in the program editor. ➚ *"Creating a new program" on page 48* or ➚ *"Editing a program" on page 48*.
2. Click on the field Feed force for sub-spindle.
   ➡ An input field opens.
3. Enter Feed force for sub-spindle.
4. Save changes with the button.

6.4 Processing settings

Enter the selection option

1. Press the button.
2. *'SETTINGS → Basic settings → Selection option"*
3. Click on the field with the corresponding selection.
   ➡ A selection window opens.

4. Click on the selection option.
   ➡ The chosen selection option is shown in the field.

Enter Speed First insert

Speed First insert is the speed with which the pusher moves a new material bar into the working area of the lathe.

This value is pre-set by the FMB. If necessary, the value can be adjusted.

1. Press the ☰ button.
2. *'SETTINGS → Service settings → SPEED"*
3. Click on the field Speed First insert.
   ➡ An input field opens.
4. Enter the value for Speed First insert.

Enter the Max. bar return

If the material bar is clamped by the lathe collet, the pusher may be pressed back. This function reports a fault if the pusher is pressed back by more than the set value.

This value is set to "0" (off) by FMB. If necessary, the value can be adjusted.

1. Press the ☰ button.
2. *'SETTINGS → Basic settings → Parameter"*
3. Click on the field Max. bar return.
   ➡ An input field opens.
4. Enter the value for Max. bar return.

Enter the Max. part length follow-up

This function monitors the insert travel when pushing the material bar. If the set value is exceeded when pushing the part length, the loading magazine reports a fault.

This value is set to "0" (off) by FMB. If necessary, the value can be adjusted.

1. Press the ☰ button.
2. *'SETTINGS → Basic settings → Parameter"*
3. Click on the field Max. part length follow-up.
   ➡ An input field opens.
4. Enter the value for Max. part length follow-up.

Enter the Min. part length follow-up

This function monitors the insert travel when pushing the material bar. If the set value is not reached when moving the part length, the loading magazine reports a fault.

This value is set to "0" (off) by FMB. If necessary, the value can be adjusted.

1. Press the ☰ button.
2. *"SETTINGS → Basic settings → Parameter"*
3. Click on the field Min. part length follow-up.
   ➡ An input field opens.
4. Enter the value for Min. part length follow-up.

Max. remnant length Entering

This function limits the length of the remnant to the entered value. If this value is exceeded, an error message is output.

This value is set to "0" (off) by FMB. If necessary, the value can be adjusted.

1. Press the ☰ button.
2. *"SETTINGS → Service settings → Position"*
3. Tap the Max. remnant length field.
   ➡ An input field opens.
4. Determining the value for "Max. remnant length".

Enter the Collet open delay

This function delays the pushing of the material bar by the set value.

This value is set to "0" (off) by FMB. If necessary, the value can be adjusted.

1. Press the ☰ button.
2. *"SETTINGS → Basic settings → Parameter"*
3. Click on the field Collet open delay .
   ➡ An input field opens.
4. Enter the value for Collet open delay .

Enter the Collet close delay

This function delays the return of the material bar after being pushed by the set value. The pressure on the material bar is therefore maintained for longer.

This value is set to "0" (off) by FMB. If necessary, the value can be adjusted.

1. Press the ☰ button.
2. *"SETTINGS → Basic settings → Parameter"*
3. Click on the field Collet close delay.
   ➡ An input field opens.
4. Enter the value for Collet close delay.

Enter the Feed force for part follow-up with sub-spindle

1. Press the ☰ button.
2. *"SETTINGS → Service settings → Feed"*
3. Click on the field Feed force for part follow-up with sub-spindle.
   ➡ An input field opens.
4. Enter the value for Feed force for part follow-up with sub-spindle.

Enter the Speed for part follow-up sub-spindle

1. Press the ☰ button.
2. *"SETTINGS → Service settings → Speed"*
3. Click on the field Speed for part follow-up sub-spindle.
   ➡ An input field opens.
4. Enter the value for Speed for part follow-up sub-spindle.

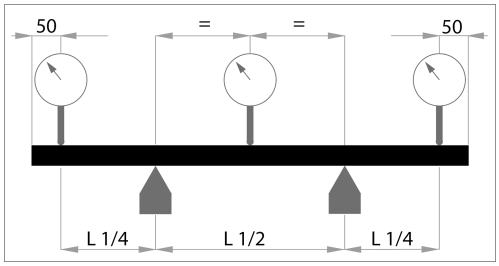
Switching on/off the headstock position determination

This function is optional and is only available if the shaft encoder -B4 is installed.

1. Press the ☰ button.
2. *"SETTINGS → Service settings → Mode"*
3. Tap the Rotary encoder -B4 field.
   ➡ A selection window opens.
4. Tap on the selection option.
   ➡ The chosen selection option is shown in the field.

6.5 Clamp material bars

Requirements on the material bars



The smooth running of the material bar depends on the material and the precise geometric shape. Straightness, roundness and imbalance are key for the possible speed. The importance of the straightness increases as the diameter gets bigger. In general, a deviation in the straightness of more than 0.5 mm / m has a negative effect on the smooth running.

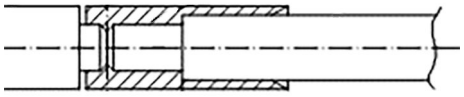
When measuring the straightness of the material bar proceed as shown in the following diagram. For the measurement, the material bar is rotated four times by 90°.

Requirements:

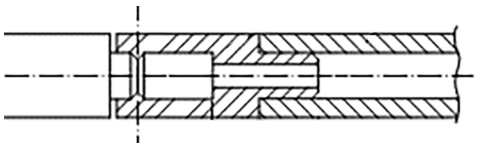
- The start of the material bar (on the lathe side) must be burr-free.
- The end of the material bar (on the loading magazine side) must not be bent or deformed.
- The material bar must be free of dirt.
- Bars with multiple sides must not have any circumferential chamfers on the lathe side.
- Material bars with a circular cross-section, whose diameter is closer to the pusher diameter, must be chamfered so that they can be interested easier into the clamping sleeve.

Clamping device

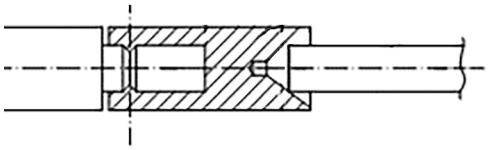
A clamping device is attached to the pusher to guide the end of the material bar. Depending on the application, either a clamping sleeve, a centering sleeve or a clamping mandrel is necessary. The size of the clamping device depends on the diameter of the material bar to be processed.



Clamping sleeve: Material bars are pushed into the clamping sleeve and clamped by a frictional connection to the external diameter.



Clamping mandrel: Raw material is pushed to the clamping mandrel and clamped o the inner diameter by a frictional connection.



Centering sleeve: Material bars are pushed onto the disc of the centering sleeve and moved without voltage.
The end of the material bar on the side of the loading magazine must have a centric chamfer. The chamfer must have minimum dimensions of 20% of the material bar diameter x 45° and a run-out accuracy of < 0.1 mm.

Changing the clamping device

⚠ WARNING

Falling material bar

Personal injury due to squashing and impact as a result of a falling material bar.

Material bars which are located on the lateral material storage, may fall down during conversion work.

- **Before conversion work, remove the material bars from the lateral material storage.**

⚠ CAUTION

Sharp knives of the material gripper

Cuts due to the sharp knives of the material gripper.

When working in the vicinity of the material gripper, there is a risk of cuts in the event of inattentiveness.

- **Wear safety gloves.**

⚠ CAUTION

Driven guide channel cover

Personal injury due to squashing and impact by the closing of the guide channel cover.

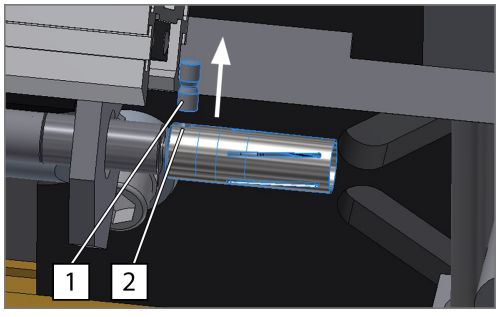
When working on the opened guide channel, the driven guide channel cover may squash extremities.

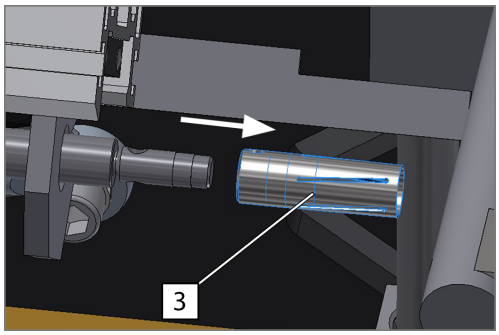
- **Insert the safety bolts when working on the open guide channel. Observe the description in the operating instructions.**

Clamping devices with a diameter < 25 mm are attached to the bearing insert with a cross pin.

Clamping device with a diameter < 25 mm:

1. Press the ☰ button.
2. SETUP Opening.
3. Move the pusher right to the back using the ◂ button.
4. Swing out the pusher with the button.
5. Press the emergency stop button. ↗ *"Press the emergency stop button" on page 43*.
6. Switch off the compressed air supply. ↗ *"Switch the supply of compressed air on/off" on page 98*
7. Where necessary, obtain release from the lathe to open the cover.
8. Open the cover.
9. Secure the guide channel with safety bolts. ↗ *"Securing the guide channel with safety bolts" on page 70*
10. Push the cross pin [1] out of the hole [2] in the direction indicated by the arrow.





11. Pull the clamping device [3] in the direction indicated by the arrow and take it out.
12. Mount and attach the clamping device in reverse order.
13. Remove the safety bolts in the guide channel.
14. Close the cover.
15. Switch on the compressed air supply. ➚ *"Switch the supply of compressed air on/off" on page 98*
16. Unlock the emergency stop button. ➚ *"Make the loading magazine ready for operation after the emergency stop" on page 43*
17. Swing in the pusher using the button.
18. Acknowledge the error message using the CLR button.

The material bar diameter is greater than the inner diameter of the clamping sleeve

To clamp material bars with a diameter which is greater than the inner diameter of the clamping sleeve, the end of the material bar has to be rotated. This is necessary, for example, to make full use of the nominal diameter of the capacity adjustment set.

Here the following applies:

- The diameter of the chamfer must be adjusted to the inner diameter of the clamping sleeve.
- The length of the chamfer must be adjusted to the clamping width of the clamping sleeves (the material bar must be moved up to the stop in the clamping sleeve).
- The chamfer must have a concentricity of < 0.1 mm.

6.6 Feed material bars

Set push part once:

The pusher moves the material bar once per turned part in the working area of the lathe. The material bar is moved directly to the cut-off position.

1. Open the program in the program editor. ➚ *"Creating a new program" on page 48* or ➚ *"Editing a program" on page 48*.
2. Set the option Part follow-up to selection option Part length internal. ➚ *"Set the Selection option Part follow-up" on page 51* or ➚ *"Enter the selection option" on page 52*.
3. Click on the field Feed 1.

   ➥ An input field opens.
4. Enter the length of the first processing.
5. Scroll to the next page using the button.
6. Save changes.

Pushing the material bar with the sub-spindle of the machine tool

If the lathe sends a signal for the sub-spindle to the loading magazine, the saved values for speed and feeding force are automatically used when pushing with the sub-spindle.

If the lathe sends no signal for the sub-spindle to the loading magazine, the saved values are automatically used when pushing with the sub-spindle for speed and feeding force, which are also used for standard pushing. It may be necessary to adjust these values when working with the sub-spindle.

The values of loading magazine and machine tool should generally be set so that the loading magazine can follow the machine tool. The technical data for the loading magazine must be taken into account.

All the settings for working with the sub-spindle have to be set in a program.

1. Enter values for Feed force for sub-spindle and Speed sub-spindle . *“Enter Feed force for sub-spindle” on page 52* and *“Enter Speed sub-spindle” on page 52*.
2. Set selection Part follow-up to selection option Collet open, fixed speed .

Process two different part lengths

This function is available as an option.

This function means it is possible to process two different long parts. The second part length can be used to process shorter parts from the remnant. Once the remnant is too short for the first part length, the second part length is pushed.

1. Open the program in the program editor. *“Creating a new program” on page 48* or *“Editing a program” on page 48*.
2. Scroll to the next page using the button.
3. Click on the field Feed 1 part 2.
   ➧ An input field opens.
4. Enter the value for the shorter part.
5. Save changes.

Interval insert

The interval insert improves the insertion of multi-sided material into the lathe collet. During the first insert, the pusher performed intervals of short forward and backward strokes. The interval insert can be adjusted *“Set the Interval insert” on page 59*.

Set the Interval insert

The value Travel interval on determines the length of the intermittent movement.

The intermittent movement is set for the time of the forward and backward stroke.

Length of the intermittent movement:

1. Press the ☰ button.
2. *'SETTINGS → Service settings → Position"*
3. Click on the field Travel interval on.
   ➡ An input field opens.
4. Enter the value for Travel interval on.

Set the speed:

1. Press the ☰ button.
2. *'SETTINGS → Basic settings → Selection option"*
3. Click on the field Time on.
   ➡ A selection window opens.
4. Enter the value for Time on.
5. Click on the field Time off.
   ➡ A selection window opens.
6. Enter the value for Time off.

Set the interval insert selection:

1. Press the ☰ button.
2. *'SETTINGS → Basic settings → Selection option"*
3. Click on the field Interval insert.
   ➡ A selection window opens.
4. Click on the selection option.
   ➡ The chosen selection option is shown in the field.

Switching Interval insert on/off

1. Open the program in Programeditor. ↗ *"Creating a new program" on page 48* or ↗ *"Editing a program" on page 48*.
2. Click on the field Interval insert.
   ➡ A selection window opens.
3. Select a corresponding value.
   ➡ The selection is shown in the field.
4. Scroll to the next page using the ↷ button.
5. Save changes.

6.7 Processing phase

Loading the lateral material storage

⚠ WARNING

High weight of the material bar

Physical overloading when raising the material bar by a high weight.

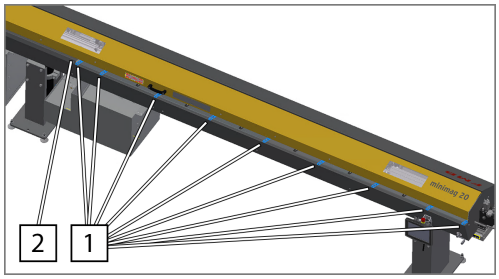
- **Observe the weight of the material bar.**
- **Use suitable hoisting equipment.**

⚠ WARNING

High weight of the material bar

Danger of squashing limbs when putting down the material bar.

- **Observe the weight of the material bar.**
- **Use suitable hoisting equipment.**



1. Store the material bar on the lateral material storage 1.
2. Move the material bar to the material stop 2.

Report of the last material bar

This function is available as an option.

If a signal light is build into the loading magazine, the yellow light flashes as soon as the report is displayed on the control panel.

If the last material bar has been loaded from the lateral material storage into the guide channel during production (automatic mode), a yellow light flashes on the control panel, with the text Last bar. This notifies the operator that the lateral material storage is empty.

Production

During production the automatic mode is active. The loading magazine works at the same speed as the lathe. The program flow is completed taking into account the set values.

Automatic mode can be started in two stages of the program flow. This requires the following conditions:

- Step 1: A remnant is in the clamping sleeve.
- Step 17: A material bar is drawn onto the clamping device and is located in the lathe, at the cut-off position.

If the requirements for automatic mode have not been met, they can be established by the following procedure:

- Remove remnant, eject it and draw on the new material bar
  ↗ *"Draw off remnant, eject it and draw on the new material bar" on page 65.*

Start/stop production

1. Observe the prerequisites for automatic mode ➚ *"Production" on page 61*.
2. Press the ☰ button.
3. Access PRODUCTION.
4. If there is a remnant in the clamping sleeve: press the S1 button.

   If a material bar is drawn onto the clamping device and is located in the cut-off position in the lathe, press the S17 button.
5. Start/stop production with the button.

Work flow for production (automatic mode)

Step	Description	Position
Step 1 Return	The pusher moves with the remnant from the lathe spindle into the area of the material gripper.	From position: Pos. reverse rotation return at high speed End: Position draw off
Step 2 Return slowly	The pusher moves past the area of the material gripper at low speed.	From the position: Internal PLC value before Position draw off End: Position draw off
Step 3 Close gripper blades	The material gripper closes and grabs the remnant.	-
Step 4 Remove the remnant	The pusher moves back again. The remnant is removed from the pusher.	End: Position rear limit
Step 5 Open gripper blades / remnant flap	The material gripper opens. The remnant flap opens. The remnant falls into the remnant bin.	-
Step 6 Close gripper blades / remnant flap	The remnant flap closes. The material gripper closes.	-
Step 7 Open gripper blades	The material gripper opens.	-
Step 8 Swing pusher out / open channel	The pusher swings out of the guide channel. The guide channel opens. The material bar falls into the open guide channel.	-
Step 9 Close guide channel, short pusher forward	Without special insert: The guide channel closes. The short pusher moves the material bars forward. With special insert: The guide channel remains open. The short pusher moves the material bar forward.	End: Limit pos. short pusher front

Step	Description	Position
Step 10 Short pusher return	Without special insert: The material bar remains in position. The short pusher moves back. With special insert: short pusher return, guide channel closes, blades of the material gripper closed.	End: Position rear limit
Step 11 Swing pusher in	The pusher swings into the guide channel.	-
Step 12 Press upon	The pusher moves forward. The material bar is pressed onto the pusher.	End: Position draw off
Step 13 Open gripper blades	The material gripper opens.	-
Step 14 First insert	The pusher moves the material bar into the working area of the lathe.	End: First insert travel
Step 15 Start lathe	The loading magazine reports "End of bar change – program start" to the lathe. The collet of the lathe closes. Machining begins.	-
Step 16 Material cut-off	The machined part is cut off. The collet of the lathe opens.	-
Step 17 Part production	The pusher moves the material bar until the end of the material bar is reached.	End: Position front limit - Part length 1
Step 18 Insert last part	The pusher moves the material bar for the last time.	-
Step 19 Machine last part	The lathe machines the last part.	-
Step 20 Stop lathe / start bar change	A transfer time switch into step 1 is activated	-

Position rear limit Approaching

Position "Position rear limit" is reached when the pusher stops automatically when moving backwards and is displayed on the control panel in field FEED POSITION a value in the range "0.00" (tolerance - 2.00 mm to + 1.00 mm) is displayed.

1. Press the ☰ button.
2. SETUP Calling.
3. Using the ◂ or ▸ button, move the pusher back until it stops.

Draw off and eject the remnant

The remnant is removed from the clamping sleeve and is ejected into the remnant bin.

1. Press the ☰ button.

2. Access SETUP.
3. Press the button.
   ➥ The status display on the button turns green during the action. Once the action has been completed, the status display on the button is switched off. The remnant lies in the remnant bin.

Removing the material bar from the loading magazine

This action is suitable for material bars, which cannot be removed from the remnant bin due to their length. When the action is performed, the material bar is removed from the clamping sleeve and placed in the guide channel. The material bar can then be removed from the guide channel.

⚠ WARNING

High weight of the material bar

Physical overloading when raising the material bar by a high weight.

- **Observe the weight of the material bar.**
- **Use suitable hoisting equipment.**

⚠ CAUTION

Driven guide channel cover

Personal injury due to squashing and impact by the closing of the guide channel cover.

When working on the opened guide channel, the driven guide channel cover may squash extremities.

- **Insert the safety bolts when working on the open guide channel. Observe the description in the operating instructions.**

⚠ CAUTION

Sharp knives of the material gripper

Cuts due to the sharp knives of the material gripper.

When working in the vicinity of the material gripper, there is a risk of cuts in the event of inattentiveness.

- **Wear safety gloves.**

1. Press the button.
2. Access SETUP.
3. Press the button.
   ➥ The status display on the button turns green during the action. Once the action has been completed, the status display on the button is switched off. The material bar is removed from the clamping device and lies in the guide channel.
4. Push the material out of the range of the material gripper with the button.
5. Move the pusher by pressing the button to Position rear limit.
6. Open the guide channel with the button.

7. Press the emergency stop button. ➚ *"Press the emergency stop button" on page 43*.
8. Switch off the supply of compressed air. ➚ *"Switch the supply of compressed air on/off" on page 98*
9. Where necessary, obtain release from the lathe to open the cover.
10. Open the cover.
11. Secure the guide channel with safety bolts. ➚ *"Securing the guide channel with safety bolts" on page 70*
12. If the material bar reaches into the working area of the lathe: pull the material bar by hand towards the loading magazine, until the material bar is fully on the loading magazine.
13. Remove the material bar from the loading magazine via the lateral material storage.
14. Remove the safety bolts in the guide channel.
15. Close the cover.
16. Switch on the compressed air supply. ➚ *"Switch the supply of compressed air on/off" on page 98*
17. Unlock the emergency stop button. ➚ *"Make the loading magazine ready for operation after the emergency stop" on page 43*
18. Close the guide channel with the button.
19. Acknowledge the error message by pressing the CLR button.

Draw off remnant, eject it and draw on the new material bar

When executing the action, the remnant is removed from the clamping sleeve, ejected into the remnant bin and then a new material bar is loaded from the lateral material storage and drawn onto the clamping device.

With this action, a first insert can be performed after the new bar has been drawn in. For this purpose, select the desired operating mode.

There must be a material bar in the lateral material storage.

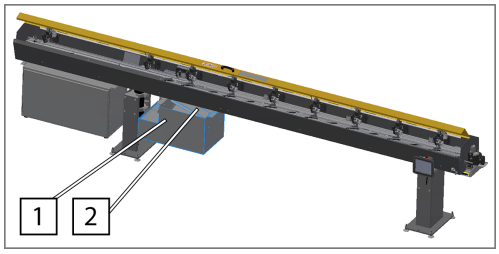
1. Press the button.
2. Access SETUP.
3. Press the button.

➡ The status display on the button turns green during the action. Once the action has been completed, the status display on the button is switched off.

Without first insert: The remnant is located in the remnant bin. The new material bar is drawn in and is in the working room of the lathe.

With first insert: The remnant is located in the remnant bin. The new material bar is drawn in and is in the working room of the lathe.

Remnant bin



The remnant bin [1] is located below the loading magazine and is accessible from the front. When the remnant flap [2] opens, the remnant lying on it falls down into the remnant bin and can be removed by the operator.

Removing the remnant

⚠ WARNING

Driven remnant flap

Personal injury due to squashing, impact or striking by the driven remnant flap.

When removing the remnant, the operator has to reach down into the remnant bin. If the operator reaches up, his/her hand would be in the area of the driven remnant flap.

- **When removing the remnants in the remnant bin, do not reach upwards.**

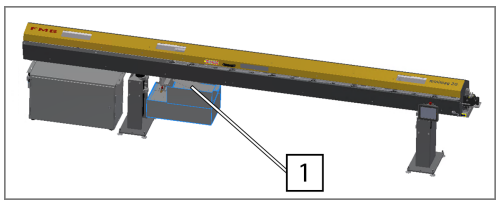
⚠ CAUTION

Further ejection of remnants into the remnant bin

Personal injury due to squashing and impact as a result of addition residual ejection.

When removing a remnant from the remnant bin, there may be a further ejection of remnants. The remnant may hit extremities in the remnant bin.

- **Do not reach into the remnant bin during the bar change.**
- **When removing a remnant, observe the current operating conditions of the loading magazine.**



→ Remove the remnant from the remnant bin [1].

Switching Steady on/off

1. Press the ☰ button.
2. Access PRODUCTION or SETUP.

Switch on:

1. Press the button.

   ➡ The status display on the button turns green. The steady is switched on.

Switch off:

1. Press the button.

   ➡ The status display on the button is off. The steady is switched off.

The steady as an insertion aid

If the steady is switched off or the selection option Steady closed to -B7 or Jaw steady closed when pushing is selected, the steady is not active at the first insert. When using the steady as an insertion aid, the steady is always active at the first insert.

Switch the steady on/off as a insertion aid

1. Press the ☰ button.
2. Access PRODUCTION.

Switch on:

- Press the button.
  - ➡ The status display on the button turns green. The steady function as an insertion aid is switched on.

Switch off:

- Press the button.
  - ➡ The status display on the button is off. The steady function as an insertion aid is switched off.

Switching Interval insert on/off

1. Press the ☰ button.
2. Access PRODUCTION.

Switch on:

1. Press the button.
   - ➡ The status display on the button turns green. The interval insert is switched on.

Switch off:

1. Press the button.
   - ➡ The status display on the button is off. The interval insert is switched off.

Switching the brake function on/off

The brake function holds the pusher in position during the processing of the machine tool and prevents the pusher being pressed back.

1. Press the ☰ button.
2. Access PRODUCTION.

Switch on:

1. Press the button.
   - ➡ The status display on the button turns green. The brake function is switched on.

Switch off:

1. Press the button.

➡ The status display on the button is off. The brake function is switched off.

Switching Oil pump on/off

1. Press the button.
2. Access SETUP.

Switch on:

1. Press the button.

➡ The status display on the button turns green. The oil pump is switched on.

Switch off:

1. Press the button.

➡ The status display on the button is off. The oil pump is switched off.

Eject the remnant

1. Press the button.
2. SETUP Opening.
1. Press and hold the button.

➡ The status display on the button turns green. The remnant flap is opened. The remnant falls down into the remnant bin.

2. Release the button.

➡ The status display on the button is off. The remnant flap is closed.

Close/open the material gripper

1. Press the button.
2. Access SETUP.

Close:

1. Press the button.

➡ The status display on the button turns green. The material gripper is closed.

Open:

1. Press the button.

➡ The status display on the button is off. The material gripper is opened.

Open/close the guide channel

1. Press the ☰ button.
2. Access SETUP.

Open:

1. Press the ▫ button.
   ➡ The status display on the button turns green. The front guide channel is opened.

Close:

1. Press the ▫ button.
   ➡ The status display on the button is off. The guide channel is closed.

Swing the pusher out/in

1. Press the ☰ button.
2. SETUP Opening.

Swing out:

Press the ▫ button.
➡ The status display on the button turns green. The pusher has been swung out.

Swing in:

Press the ▫ button.
➡ The status display on the button is off. The pusher has been swung in.

Switch discharge material bar oil on / off

This function is available as an option.

1. Press the ☰ button.
2. Access SETUP.

Switch on:

Press the ▫ button.
➡ The status display on the button turns green. The function discharging oil from the material bar is switched on.

Switch off:

Press the ▫ button.
➡ The status display on the button is off. The function discharging oil from the material bar is switched off.

7 Converting

7.1 General conversion

Capacity adjustment set

The loading magazine can process material bars of different diameters. Certain components of the loading magazine can be adjusted to the material bar diameter to be processed, to improve the guide of the material bar. These components are consolidated in a capacity adjustment set and can be exchanged if needed.

In the event of questions about the choice of the right capacity adjustment set, please contact FMB. ➚ *"Service contact details" on page 109*.

The capacity adjustment set includes:

- Inserts of the guide channel

The guide jaws of the steady and the telescopic tube/guide tube/guide module can also be adapted to the material diameter to be processed. However, these are not part of the capacity adjustment set.

Depending on the extension version and the type of lathe, further adjustments may be necessary during conversion to other diameters. For information about this, see the extension-specific adapter set/attachment diagram. ➚ *"Other applicable documents" on page 5*.

Move to the conversion position

1. Press the ☰ button.
2. Access SETUP.

Press the ⤮ button.

➥ The status display on the button turns green. The conversion position is moved to (duration approx. 10s).

7.2 Guide channel

Securing the guide channel with safety bolts

⚠ WARNING

Falling material bar

Personal injury due to squashing and impact as a result of a falling material bar.

Material bars which are located on the lateral material storage, may fall down during conversion work.

– **Before conversion work, remove the material bars from the lateral material storage.**

⚠ CAUTION

Sharp knives of the material gripper

Cuts due to the sharp knives of the material gripper.

When working in the vicinity of the material gripper, there is a risk of cuts in the event of inattentiveness.

– **Wear safety gloves.**

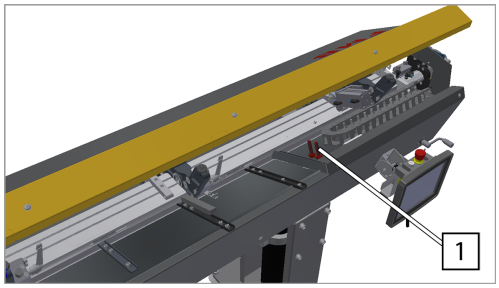
⚠ CAUTION

Driven guide channel cover

Personal injury due to squashing and impact by the closing of the guide channel cover.

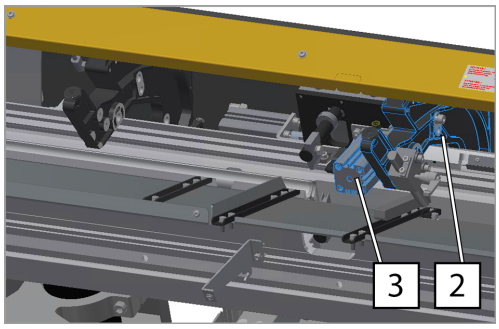
When working on the opened guide channel, the driven guide channel cover may squash extremities.

- **Insert the safety bolts when working on the open guide channel. Observe the description in the operating instructions.**



The safety bolts are in position 1 on the loading magazine. The guide channel can open at the front, at the rear or at the front and rear. The safety bolts must secure the respective open position when working on the open guide channel (front only, rear only or front and rear).

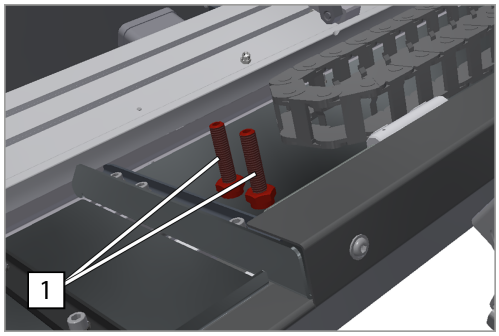
The procedure is described using the example of a guide channel. The securing of the rear guide channel is done in the same way.

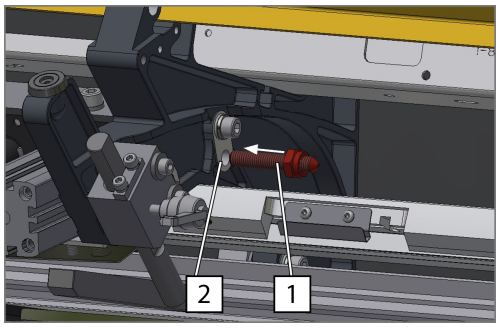


The safety bolt must be used on a bearing bracket 2 on which a channel opener 3 is also installed (channel openers are only installed on every second bearing bracket). The front guide channel is only secured by the safety bolt on bearing brackets with channel openers.

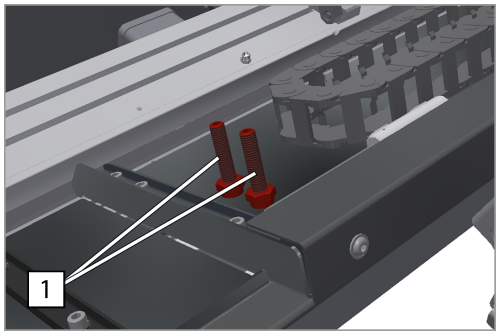
The safety bolt must be pushed with the long side into the intended hole up to the stop, to ensure the guide channel is secure.

1. Press the ☰ button.
2. SETUP press.
3. Open the front guide channel using the ▭ button.
4. Press the emergency stop button. ↗ *"Press the emergency stop button" on page 43*.
5. Switch off the compressed air supply. ↗ *"Switch the supply of compressed air on/off" on page 98*
6. Where necessary, obtain release from the lathe to open the cover.
7. Open the cover.
8. Unscrew the safety bolt 1 from the bracket.





9. Push the safety bolt [1] (with the long side) into the hole up to the stop [2].
10. After finishing work on the guide channel, remove the safety bolt [1] from the hole [2].



11. Screw the safety bolt [1] into the bracket.
12. Close the cover.
13. Switch on the compressed air supply. *“Switch the supply of compressed air on/off” on page 98*
14. Unlock the emergency stop button. *“Make the loading magazine ready for operation after the emergency stop” on page 43*
15. Close the front guide channel using the button.
16. Acknowledge the error message using the CLR button.

Pusher

The pusher is driven by the drive motor and moves the material bar into the working area of the lathe. The diameter of the pusher depends on the diameter of the material to be processed and must be changed when processing different material thicknesses.

Depending on the spindle diameter of the lathe, it may be necessary for the spindle diameter to also be adjusted. In the event of questions about this please contact FMB. *“Service contact details” on page 109*

Changing the pusher and lifting plates

⚠ WARNING

Falling material bar

Personal injury due to squashing and impact as a result of a falling material bar.

Material bars which are located on the lateral material storage, may fall down during conversion work.

- **Before conversion work, remove the material bars from the lateral material storage.**

⚠ CAUTION

Sharp knives of the material gripper

Cuts due to the sharp knives of the material gripper.

When working in the vicinity of the material gripper, there is a risk of cuts in the event of inattentiveness.

- **Wear safety gloves.**

⚠ CAUTION

Driven guide channel cover

Personal injury due to squashing and impact by the closing of the guide channel cover.

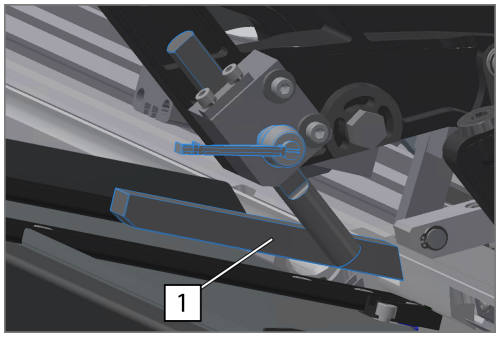
When working on the opened guide channel, the driven guide channel cover may squash extremities.

- **Insert the safety bolts when working on the open guide channel. Observe the description in the operating instructions.**

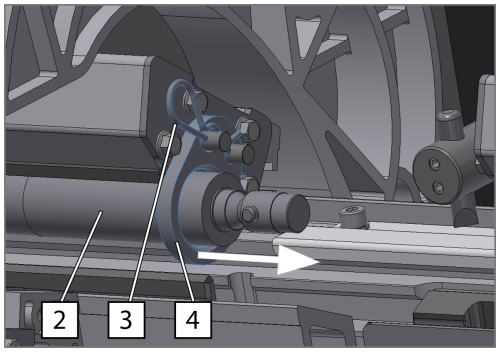
A second person is required to change the pusher, to support the work.

Removal:

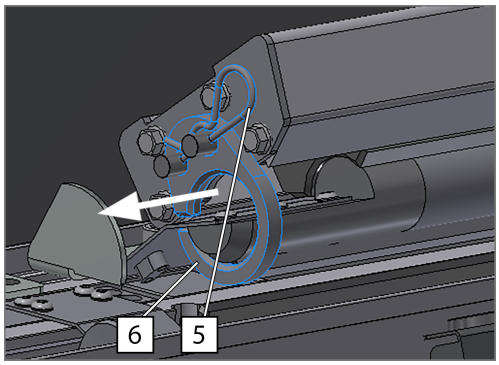
1. Press the ☰ button.
2. SETUP .
3. Approach the conversion position by pressing the ⤮ button. ➚ *"Move to the conversion position" on page 70*.
4. Press the emergency stop button. ➚ *"Press the emergency stop button" on page 43*.
5. Switch off the compressed air supply. ➚ *"Switch the supply of compressed air on/off" on page 98*
6. Where necessary, obtain release from the lathe to open the cover.
7. Open the cover.
8. Secure the front and rear guide channel with safety bolts. ➚ *"Securing the guide channel with safety bolts" on page 70*.



9. Set the holding-down device 1 in the area of the pusher to the highest position. ➚ *"Setting the height of the holding-down device" on page 92*.

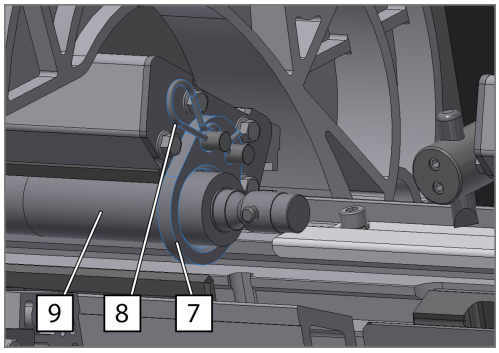


10. Hold the pusher 2 (second person).
11. Remove the safety device 3.
12. Remove the lifting plate (front) 4 in the direction indicated by the arrow.

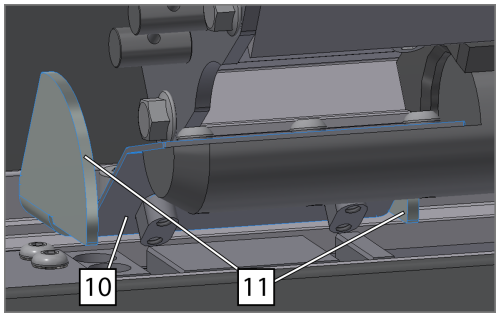


13. Remove the safety device [5].
14. Remove the lifting plate (rear) [6] in the direction indicated by the arrow.
15. Remove the pusher (second person).

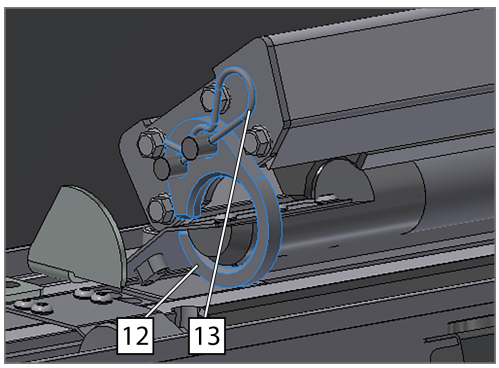
Installation:



1. Insert the lifting plate (front) [7].
2. Insert the safety device [8].
3. Insert the pusher [9] with the front end going into the lifting plate (front) [7] (second person).



4. Insert the rear end of the pusher with the short pusher flag [10] into the guide [11] and hold it (second person).



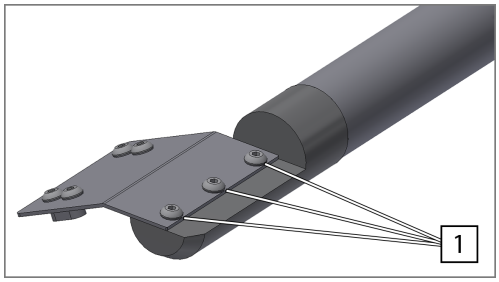
5. Insert the lifting plate (rear) [12].
6. Insert the safety device [13].

   ➥ The pusher is now installed.
7. Remove the safety bolts in the guide channel.
8. Close the cover.
9. Switch on the compressed air supply. ↗ *"Switch the supply of compressed air on/off" on page 98*
10. Unlock the emergency stop button. ↗ *"Make the loading magazine ready for operation after the emergency stop" on page 43*
11. Swing in the pusher using the button.
12. Close the guide channel using the button.
13. Acknowledge the error message using the CLR button.

Changing the short pusher flag

When changing the pusher, the flag from the old pusher is mounted onto the new pusher.

1. Detach the pusher. *"Changing the pusher and lifting plates" on page 72*.



2. Loosen and remove the screws 1 in the short pusher flag.
3. Remove the flag.
4. Attach the flag in reverse order.
5. Insert the pusher. *"Changing the pusher and lifting plates" on page 72*.

Changing the insert of the top rear guide channel

⚠ WARNING

Falling material bar

Personal injury due to squashing and impact as a result of a falling material bar.

Material bars which are located on the lateral material storage, may fall down during conversion work.

- **Before conversion work, remove the material bars from the lateral material storage.**

⚠ CAUTION

Sharp knives of the material gripper

Cuts due to the sharp knives of the material gripper.

When working in the vicinity of the material gripper, there is a risk of cuts in the event of inattentiveness.

- **Wear safety gloves.**

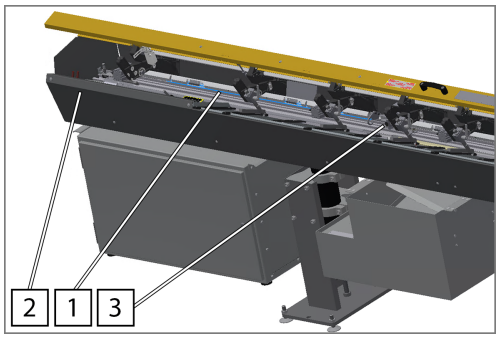
⚠ CAUTION

Driven guide channel cover

Personal injury due to squashing and impact by the closing of the guide channel cover.

When working on the opened guide channel, the driven guide channel cover may squash extremities.

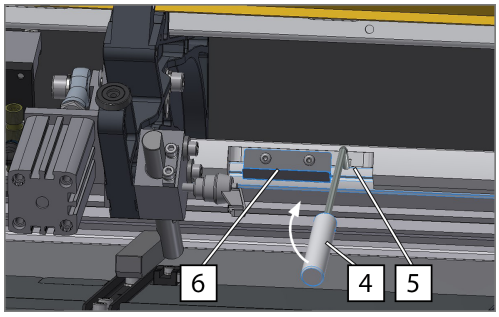
- **Insert the safety bolts when working on the open guide channel. Observe the description in the operating instructions.**



The top rear guide channel insert 1 is located in the area between the drive motor 2 and the material gripper 3. The insert consists of several parts. The change is described using the example of one part of the insert, but has to be done for all the parts.

1. Press the ☰ button.
2. SETUP press.
3. Approach the conversion position by pressing the ⤮ button. *"Move to the conversion position" on page 70*.

4. Press the emergency stop button. ↗ *"Press the emergency stop button" on page 43*.
5. Switch off the compressed air supply. ↗ *"Switch the supply of compressed air on/off" on page 98*
6. Where necessary, obtain release from the lathe to open the cover.
7. Open the cover.
8. Secure the guide channel with safety bolts. ↗ *"Securing the guide channel with safety bolts" on page 70*



9. Place the insert tool [4] into the hole [5] in the upper guide channel.
10. Press and hold the insert safeguard [6] and move the insert tool [4] in the direction indicated by the arrow.

    ➥ The insert is now detached.
11. Remove the insert with the insert tool.
12. Place the new insert into the top front guide channel and press in firmly by hand.
13. Remove the safety bolts in the guide channel.
14. Close the cover.
15. Switch on the compressed air supply. ↗ *"Switch the supply of compressed air on/off" on page 98*
16. Unlock the emergency stop button. ↗ *"Make the loading magazine ready for operation after the emergency stop" on page 43*
17. Swing in the pusher using the button.
18. Close the guide channel using the button.
19. Acknowledge the error message using the CLR button.

Changing the insert of the bottom rear guide channel

⚠ WARNING

Falling material bar

Personal injury due to squashing and impact as a result of a falling material bar.

Material bars which are located on the lateral material storage, may fall down during conversion work.

- **Before conversion work, remove the material bars from the lateral material storage.**

⚠ CAUTION

Sharp knives of the material gripper

Cuts due to the sharp knives of the material gripper.

When working in the vicinity of the material gripper, there is a risk of cuts in the event of inattentiveness.

- **Wear safety gloves.**

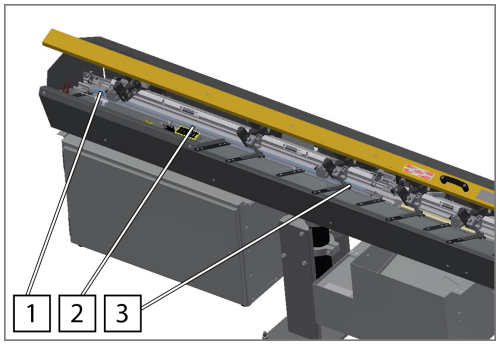
⚠ CAUTION

Driven guide channel cover

Personal injury due to squashing and impact by the closing of the guide channel cover.

When working on the opened guide channel, the driven guide channel cover may squash extremities.

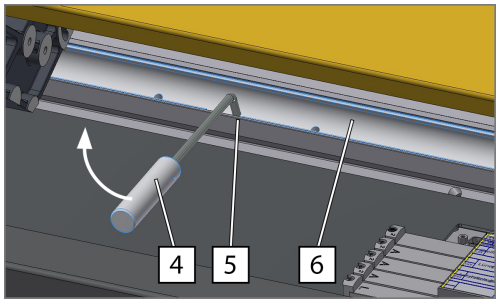
- **Insert the safety bolts when working on the open guide channel. Observe the description in the operating instructions.**



The insert of the bottom rear guide channel consists of the front insert, the rear insert and the middle insert.

1. Press the ☰ button.
2. SETUP press.
3. Approach the conversion position by pressing the ⤮ button. ➚ *"Move to the conversion position" on page 70*.
4. Press the emergency stop button. ➚ *"Press the emergency stop button" on page 43*.
5. Switch off the compressed air supply. ➚ *"Switch the supply of compressed air on/off" on page 98*
6. Where necessary, obtain release from the lathe to open the cover.
7. Open the cover.
8. Secure the guide channel with safety bolts. ➚ *"Securing the guide channel with safety bolts" on page 70*

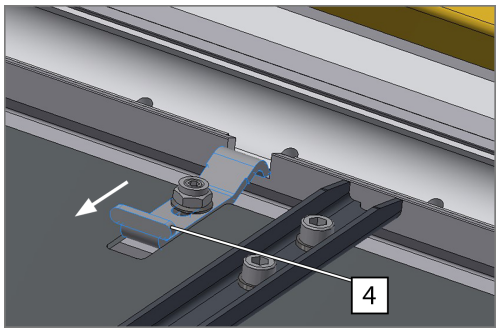
Changing the front and rear insert



1. Place the insert tool [4] into the hole [5] (middle hole) in the lower guide channel.
2. Move the insert tool [4] in the direction indicated by the arrow.

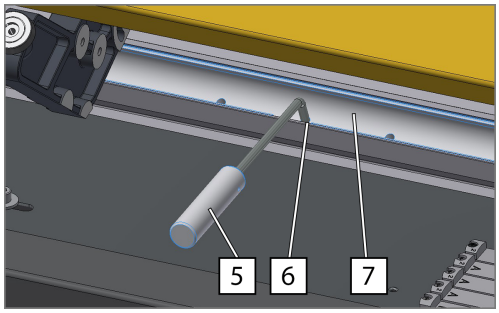
   ➧ The insert is now detached.
3. Remove the insert [6] with the insert tool.
4. Place the new insert into the bottom rear guide channel and press in firmly by hand.

Changing the middle insert

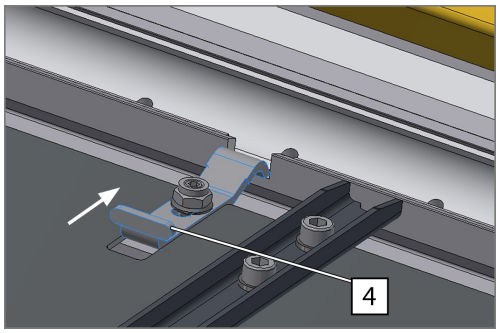


1. Move the insert safeguard [4] in the direction indicated by the arrow up to the stop.

   ➡ The insert is now unlocked.



2. Place the insert tool [5] into the hole [6] in the lower guide channel.
3. Remove the insert [7] with the insert tool.
4. Place the new insert into the bottom front guide channel and press in firmly by hand.



5. Move the insert safeguard [4] in the direction indicated by the arrow up to the stop.

   ➡ The insert is secured.

1. Remove the safety bolts in the guide channel.
2. Close the cover.
3. Switch on the compressed air supply. ↗ *"Switch the supply of compressed air on/off" on page 98*
4. Unlock the emergency stop button. ↗ *"Make the loading magazine ready for operation after the emergency stop" on page 43*
5. Swing in the pusher using the  button.
6. Close the guide channel using the  button.
7. Acknowledge the error message using the CLR button.

Changing the insert of the top front guide channel

⚠ WARNING

Falling material bar

Personal injury due to squashing and impact as a result of a falling material bar.

Material bars which are located on the lateral material storage, may fall down during conversion work.

- **Before conversion work, remove the material bars from the lateral material storage.**

⚠ CAUTION

Sharp knives of the material gripper

Cuts due to the sharp knives of the material gripper.

When working in the vicinity of the material gripper, there is a risk of cuts in the event of inattentiveness.

- **Wear safety gloves.**

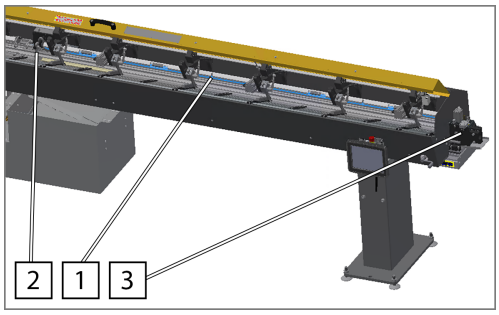
⚠ CAUTION

Driven guide channel cover

Personal injury due to squashing and impact by the closing of the guide channel cover.

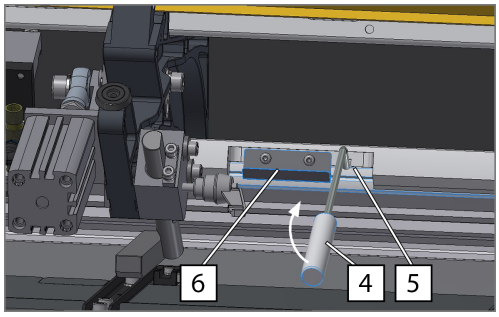
When working on the opened guide channel, the driven guide channel cover may squash extremities.

- **Insert the safety bolts when working on the open guide channel. Observe the description in the operating instructions.**



The top front guide channel insert 1 is located in the area between the material gripper 2 and the steady 3. The insert consists of several parts. The change is described using the example of one part of the insert, but has to be done for all the parts.

1. Press the ☰ button.
2. SETUP press.
3. Approach the conversion position by pressing the ⤮ button. ↗ *"Move to the conversion position" on page 70*.
4. Press the emergency stop button. ↗ *"Press the emergency stop button" on page 43*.
5. Switch off the compressed air supply. ↗ *"Switch the supply of compressed air on/off" on page 98*
6. Where necessary, obtain release from the lathe to open the cover.
7. Open the cover.
8. Secure the guide channel with safety bolts. ↗ *"Securing the guide channel with safety bolts" on page 70*



9. Place the insert tool 4 into the hole 5 in the upper guide channel.
10. Press and hold the insert safeguard 6 and move the insert tool 4 in the direction indicated by the arrow.

    ➡ The insert is now detached.
11. Remove the insert with the insert tool.
12. Place the new insert into the top front guide channel and press in firmly by hand.
13. Remove the safety bolts in the guide channel.
14. Close the cover.

15. Switch on the compressed air supply. ➚ *"Switch the supply of compressed air on/off" on page 98*
16. Unlock the emergency stop button. ➚ *"Make the loading magazine ready for operation after the emergency stop" on page 43*
17. Swing in the pusher using the button.
18. Close the guide channel using the button.
19. Acknowledge the error message using the CLR button.

Changing the remnant flap insert

⚠ WARNING

Falling material bar

Personal injury due to squashing and impact as a result of a falling material bar.

Material bars which are located on the lateral material storage, may fall down during conversion work.

- **Before conversion work, remove the material bars from the lateral material storage.**

⚠ CAUTION

Sharp knives of the material gripper

Cuts due to the sharp knives of the material gripper.

When working in the vicinity of the material gripper, there is a risk of cuts in the event of inattentiveness.

- **Wear safety gloves.**

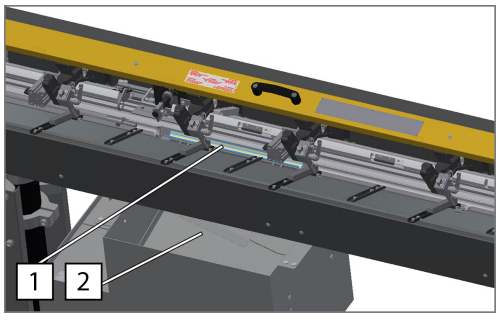
⚠ CAUTION

Driven guide channel cover

Personal injury due to squashing and impact by the closing of the guide channel cover.

When working on the opened guide channel, the driven guide channel cover may squash extremities.

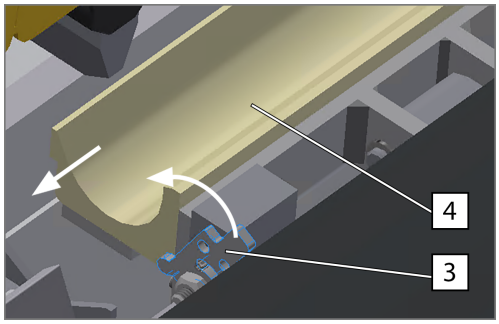
- **Insert the safety bolts when working on the open guide channel. Observe the description in the operating instructions.**



The remnant flap insert 1 is located above the remnant bin 2.

1. Press the button.
2. SETUP press.
3. Approach the conversion position by pressing the button. ➚ *"Move to the conversion position" on page 70.*
4. Press the emergency stop button. ➚ *"Press the emergency stop button" on page 43.*

5. Switch off the compressed air supply. ↗ *"Switch the supply of compressed air on/off" on page 98*
6. Where necessary, obtain release from the lathe to open the cover.
7. Open the cover.
8. Secure the guide channel with safety bolts. ↗ *"Securing the guide channel with safety bolts" on page 70*



9. Open the insert safeguard 3 in the direction indicated by the arrow.
10. Push the remnant flap insert in the direction indicated by the arrow and remove it.
11. Insert the new insert.
12. Close the insert safeguard 3.
13. Remove the safety bolts in the guide channel.
14. Close the cover.
15. Switch on the compressed air supply. ↗ *"Switch the supply of compressed air on/off" on page 98*
16. Unlock the emergency stop button. ↗ *"Make the loading magazine ready for operation after the emergency stop" on page 43*
17. Swing in the pusher using the button.
18. Close the guide channel using the button.
19. Acknowledge the error message using the CLR button.

Changing the insert of the bottom front guide channel

⚠ WARNING

Falling material bar

Personal injury due to squashing and impact as a result of a falling material bar.

Material bars which are located on the lateral material storage, may fall down during conversion work.

- **Before conversion work, remove the material bars from the lateral material storage.**

⚠ CAUTION

Sharp knives of the material gripper

Cuts due to the sharp knives of the material gripper.

When working in the vicinity of the material gripper, there is a risk of cuts in the event of inattentiveness.

- **Wear safety gloves.**

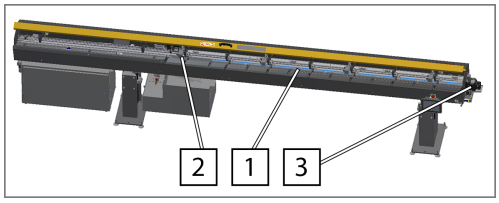
⚠ CAUTION

Driven guide channel cover

Personal injury due to squashing and impact by the closing of the guide channel cover.

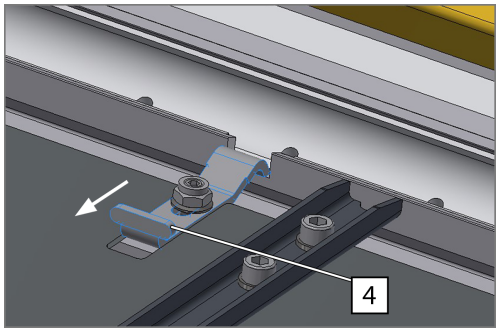
When working on the opened guide channel, the driven guide channel cover may squash extremities.

- **Insert the safety bolts when working on the open guide channel. Observe the description in the operating instructions.**



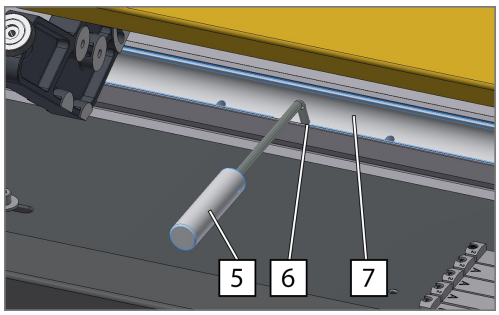
The bottom front guide channel insert 1 is located in the area between the material gripper 2 and the steady 3. The insert consists of several parts. The change is described using the example of one part of the insert, but has to be done for all the parts.

1. Press the ☰ button.
2. SETUP press.
3. Approach the conversion position by pressing the ⤭ button. ↗ *"Move to the conversion position" on page 70*.
4. Press the emergency stop button. ↗ *"Press the emergency stop button" on page 43*.
5. Switch off the compressed air supply. ↗ *"Switch the supply of compressed air on/off" on page 98*
6. Where necessary, obtain release from the lathe to open the cover.
7. Open the cover.
8. Secure the guide channel with safety bolts. ↗ *"Securing the guide channel with safety bolts" on page 70*

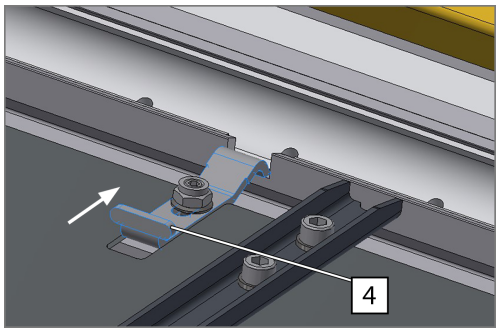


9. Move the insert safeguard 4 in the direction indicated by the arrow up to the stop.

   ➡ The insert is now unlocked.



10. Place the insert tool 5 into the hole 6 in the lower guide channel.
11. Remove the insert 7 with the insert tool.
12. Place the new insert into the bottom front guide channel and press in firmly by hand.



13. Move the insert safeguard [4] in the direction indicated by the arrow up to the stop.

    ➡ The insert is secured.

14. Remove the safety bolts in the guide channel.

15. Close the cover.

16. Switch on the compressed air supply. ↗ *"Switch the supply of compressed air on/off" on page 98*

17. Unlock the emergency stop button. ↗ *"Make the loading magazine ready for operation after the emergency stop" on page 43*

18. Swing in the pusher using the button.

19. Close the guide channel using the button.

20. Acknowledge the error message using the CLR button.

Changing the guide module

1. Press the button.

2. SETUP .

3. Approach the conversion position by pressing the button. ↗ *"Move to the conversion position" on page 70*.

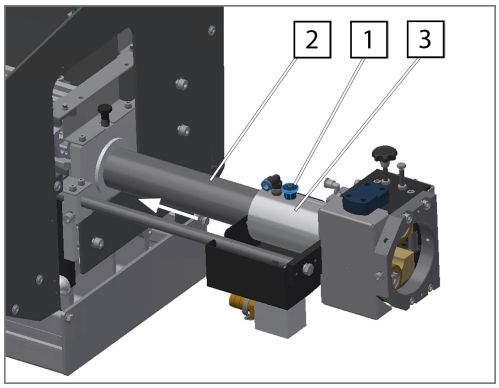
4. Press the emergency stop button. ↗ *"Press the emergency stop button" on page 43*.

5. Switch off the compressed air supply. ↗ *"Switch the supply of compressed air on/off" on page 98*

6. Where necessary, obtain release from the lathe to open the cover.

7. Open the cover.

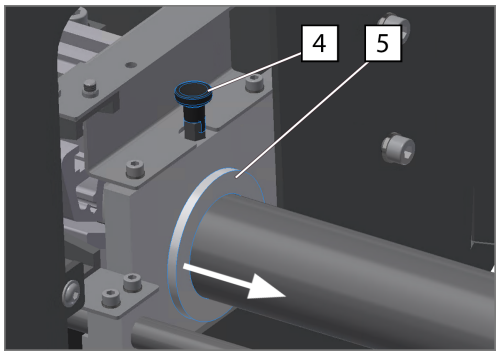
8. Secure the front and rear guide channel with safety bolts. ↗ *"Securing the guide channel with safety bolts" on page 70*



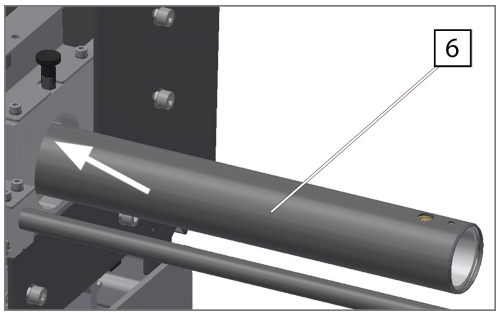
9. Pull the index pin [1] and rotate through 30°.

    ➡ The index pin is in the open position

10. Pull the guide module [2] out of the adapter set [3] in the direction of the arrow.



11. Pull the index pin [4] and rotate through 30°.
    ➡ The index pin is in the open position
12. Remove the guide sleeve [5] in the direction of the arrow.



13. Remove the guide module [6] in the direction of the arrow.
14. Attach the guide module in reverse order. It must be ensured that the locking points for the index pins are in the correct position to ensure that the index pins lock.
15. Remove the safety bolts in the guide channel.
16. Close the cover.
17. Switch on the compressed air supply. ↗ *"Switch the supply of compressed air on/off" on page 98*
18. Unlock the emergency stop button. ↗ *"Make the loading magazine ready for operation after the emergency stop" on page 43*
19. Swing in the pusher using the  button.
20. Close the guide channel using the  button.
21. Acknowledge the error message using the CLR button.

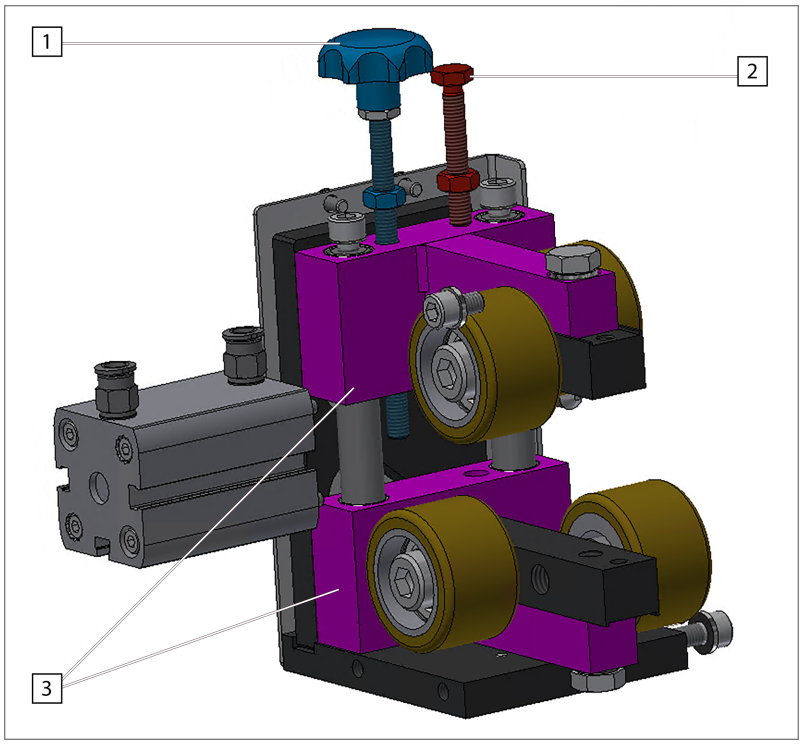
7.3 Reduction

Reduction, general

The transition area between the loading magazine and the machine tool and the machine tool spindle can be reduced. The procedure is order-specific. The information on "Attachment to the machine tool" must be observed here. ↗ *"Attachment to machine tool" on page 31*.

7.4 Steady

Steady



The steady moves the material bar during the machining operation. For this purpose, the material guide of the steady can be equipped with jaws (jaw steady) or rollers (roller steady). To guide the material bar, the steady is closed. When opened, the material bar and pusher can pass.

The open and closed position can be adjusted via the end stops. When closing, the steady moves to the desired material bar diameter and guides the material bar. When opening, the steady moves the guide jaws apart so that the pusher can pass. The stop screw 1 limits the guide jaws 3 on closing. The stop screw 2 limits the guide jaws 3 on opening ➚ *"Setting the steady (material passage 26 mm) to the material bar diameter" on page 85*.

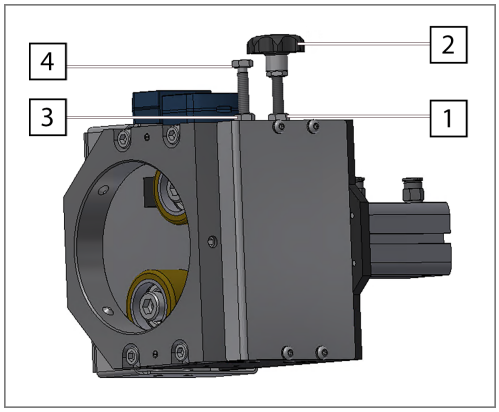
The steady can also be set so that the material guide can be adjusted to the current material thickness when closed. For this purpose, the pressure is reduced at the pressure control valve of the steady. With the right setting, the material guide can adjust itself automatically. In this case the steady opens and closes to the maximum. When closing, the steady stops as soon as the material guide 3 reaches the surface of the material bar. The material bar is then guided without excessive wear. The stop screws 1 and 2 have no function and are set so that the material guide can close or open to the maximum..

Setting the steady (material passage 26 mm) to the material bar diameter

The described procedure refers to the steady with a material passage of up to 26 mm.

The steady can be used as a roller steady or a jaw steady. Depending on the application, rollers or jaws have to be installed to guide the material.

To be able to manually open and close the steady, the following setting must be made for the duration of the set-up process, regardless of the later use: selection Steady, Selection option Jaw steady.



The path of the rollers when the steady is closed is set using the stop screw [2].

The path of the rollers when the steady is opened is set using the stop screw [4]. This is only necessary in case of pusher vibrations ➚ *"Guide the pusher with the steady (material passage 26)" on page 87*. In all other cases, the stop screw [4] is completely unscrewed, so that the steady opens fully in the open position.

1. Draw the material bar with the respective diameter onto the clamping sleeve. ➚ *"Draw off remnant, eject it and draw on the new material bar" on page 65*.
2. selection Steady, Selection option Jaw steady set. ➚ *"Enter the selection option" on page 52*.
3. Press the ☰ button.
4. SETUP .
5. Close the steady by pressing the button.
   ➥ The status display on the button turns green. The steady is closed.
6. Loosen the lock nut [3].
7. Turn the stop screw [4] to the left until the stop screw [4] is completely unscrewed.
8. Open the steady using the button.
   ➥ The status display on the button is off. The steady is open.
9. Turn the stop screw [4] to the right until you feel resistance.
10. Tighten the lock nut [3]
    ➥ The end stop for the open position is set
11. Loosen the lock nut [1].
12. Turn the stop screw [2] to the left until the stop screw [2] is completely unscrewed.
13. Move the material bar into the lathe using the button.
14. Clamp the material bar in the lathe.
15. Close the steady by pressing the button.
    ➥ The status display on the button turns green. The steady is closed.
16. Turn the stop screw [2] to the right until you feel resistance.
    ➥ The stop screw [2] is touching the end stop.

17. Open the steady using the button.

    ➡ The status display on the button is off. The steady is open.

18. Turn the stop screw [2] approx. half a turn clockwise.

19. Tighten the lock nut [1].

    ➡ The end stop for the closed position is set.

20. **When used as a roller steady:** selection Steady, Selection option Roller steady set. ➚ *"Enter the selection option" on page 52*.

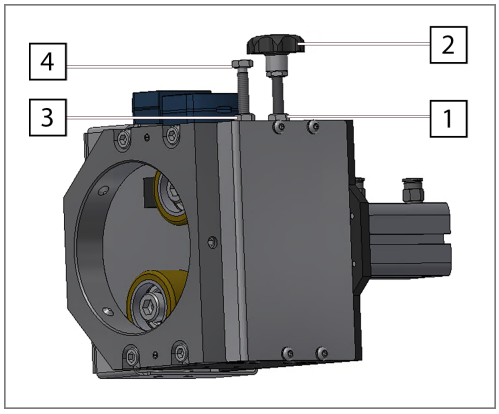
21. **When used as a jaw steady:** selection Steady, Selection option Jaw steady set. ➚ *"Enter the selection option" on page 52*.

Guide the pusher with the steady (material passage 26)

The described procedure refers to the steady with a material passage of up to 26 mm.

If the pusher vibrates, the steady can be set so that it guides the pusher in the open position.

To be able to manually open and close the steady, the following setting must be made for the duration of the set-up process, regardless of the later use: selection Steady, Selection option Jaw steady.



1. selection Steady, Selection option Jaw steady set. ➚ *"Enter the selection option" on page 52*.

2. Press the button.

3. SETUP .

4. Close the steady by pressing the button.

   ➡ The status display on the button turns green. The steady is closed.

5. Loosen the lock nut [3].

6. Turn the stop screw [4] to the left until the stop screw [4] is completely unscrewed.

7. Open the steady using the button.

   ➡ The status display on the button is off. The steady is open.

8. Move the pusher into the lathe using the button until the pusher is in the steady area.

9. Loosen the lock nut [1].

10. Turn the stop screw [2] to the left until the stop screw [2] is completely unscrewed.

11. **Condition for closing the steady on the pusher:** selection Steady, Selection option Roller steady set. ➚ *"Enter the selection option" on page 52*.

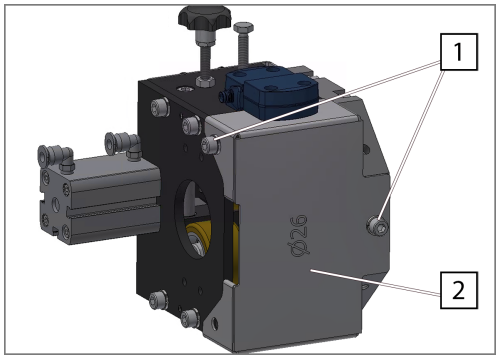
12. **Condition for closing the steady on the pusher:** close the collet of the lathe.

13. Close the steady by pressing the button.
    ➡ The status display on the button turns green. The steady is closed.
14. Turn the stop screw [4] to the right until you feel resistance.
15. Turn the stop screw [4] approx. half a turn counterclockwise.
16. Tighten the lock nut [3].
    ➡ The end stop for the open position is set
17. Open the steady using the button.
    ➡ The status display on the button is off. The steady is open.
18. **When used as a roller steady:** selection Steady, Selection option Roller steady set. ↗ *"Enter the selection option" on page 52*.
19. **When used as a jaw steady:** selection Steady, Selection option Jaw steady set. ↗ *"Enter the selection option" on page 52*.

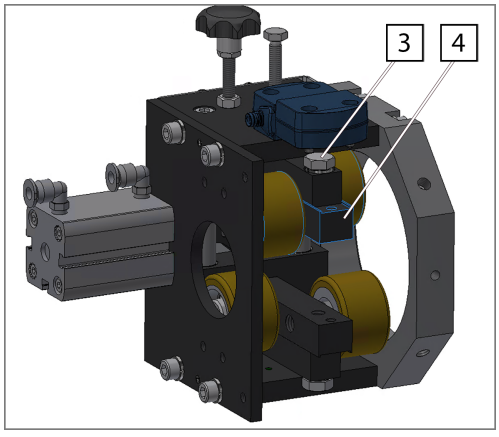
Installing/removing rollers with holder (steady with material passage 26 mm)

The described procedure refers to the steady with a material passage of up to 26 mm.

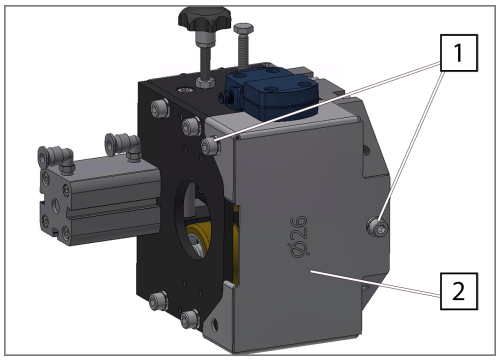
1. Press the emergency stop button. ↗ *"Press the emergency stop button" on page 43*.
2. Switch off the compressed air supply. ↗ *"Switch the supply of compressed air on/off" on page 98*



3. Loosen the screws [1] and remove.
4. Remove the lid [2].



5. Loosen and remove the screw [3].
6. Remove top rollers [4] with holder upwards.
7. Remove bottom rollers with holder in the same way.
8. Insert the rollers with holder in reverse order.

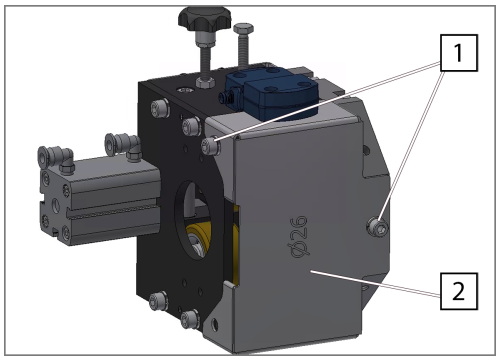


9. Position the cover [2].
10. Insert and tighten the screws [1].
11. Switch on the compressed air supply. ↗ *"Switch the supply of compressed air on/off" on page 98*
12. Unlock the emergency stop button. ↗ *"Make the loading magazine ready for operation after the emergency stop" on page 43*
13. Acknowledge the error message by pressing the CLR button.

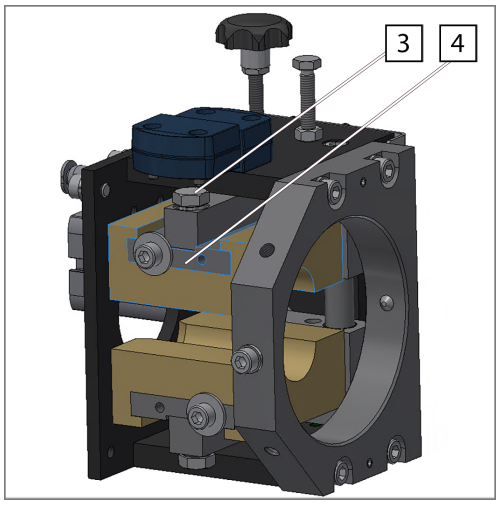
Installing/removing guide jaws with holder (steady with material passage 26 mm)

The described procedure refers to the steady with a material passage of up to 26 mm.

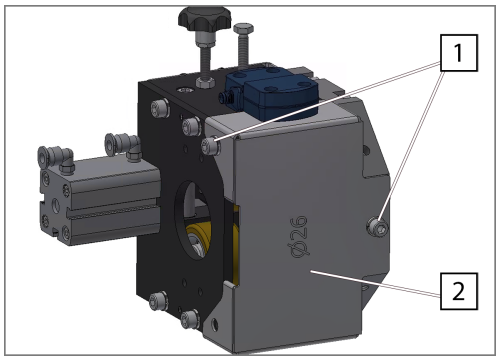
1. Press the emergency stop button. ↗ *"Press the emergency stop button" on page 43*.
2. Switch off the compressed air supply. ↗ *"Switch the supply of compressed air on/off" on page 98*



3. Loosen the screws [1] and remove.
4. Remove the lid [2].



5. Loosen and remove the screw [3].
6. Remove top guide jaws [4] with holder.
7. Remove bottom guide jaws with holder in the same way.
8. Insert the guide jaws with holder in reverse order.

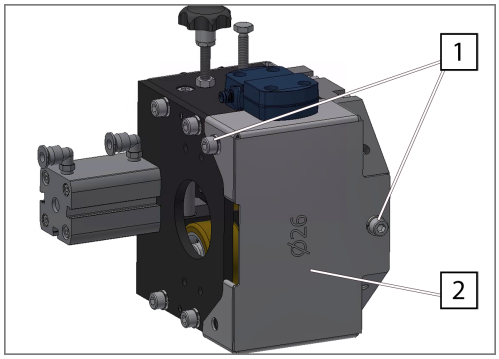


9. Position the cover [2].
10. Insert and tighten the screws [1].
11. Switch on the compressed air supply. ➚ *"Switch the supply of compressed air on/off" on page 98*
12. Unlock the emergency stop button. ➚ *"Make the loading magazine ready for operation after the emergency stop" on page 43*
13. Acknowledge the error message by pressing the CLR button.

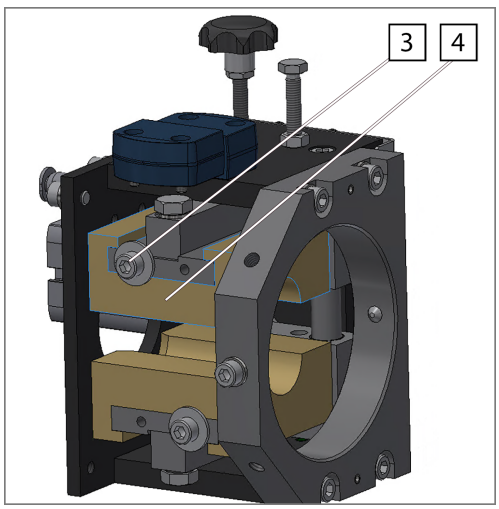
Changing the guide jaws (steady with material passage 26 mm)

The described procedure refers to the steady with a material passage of up to 26 mm.

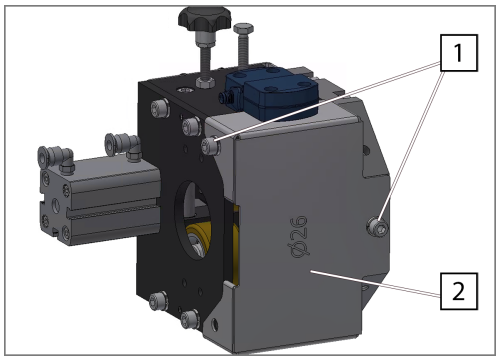
1. Press the emergency stop button. ➚ *"Press the emergency stop button" on page 43*.
2. Switch off the compressed air supply. ➚ *"Switch the supply of compressed air on/off" on page 98*



3. Loosen the screws [1] and remove.
4. Remove the lid [2].



5. Loosen and remove the screw [3].
6. Remove top guide jaw [4].
7. Remove bottom guide jaw in the same way.
8. Install the guide jaws in reverse order.



9. Position the cover [2].
10. Insert and tighten the screws [1].
11. Switch on the compressed air supply. → *"Switch the supply of compressed air on/off" on page 98*
12. Unlock the emergency stop button. → *"Make the loading magazine ready for operation after the emergency stop" on page 43*
13. Acknowledge the error message by pressing the CLR button.

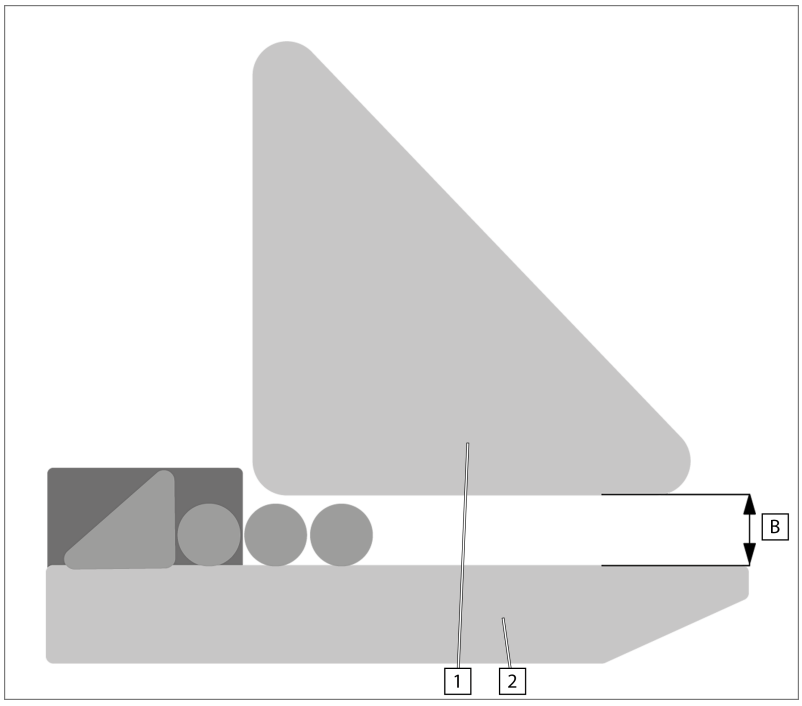
7.5 Separating device

Separation device, general

The material bars are supplied on the lateral material storage. The adjustable holding-down device limits the height of the lateral material storage, and thereby prevents the material bars rolling over each other.

When the guide channel opens, a material bar slides into the guide channel. A pre-stressed pressure plate prevents a second material bar also sliding into the guide channel.

Height of the holding-down device



The holding-down devices are set via the dimension [B]. The dimension [B] is measured from the lower edge of the holding-down device [1] to the storage area of the lateral material storage [2].

For the dimension [B]:

- The diameter of the current material bar to be processed + 1 mm.

Setting the height of the holding-down device

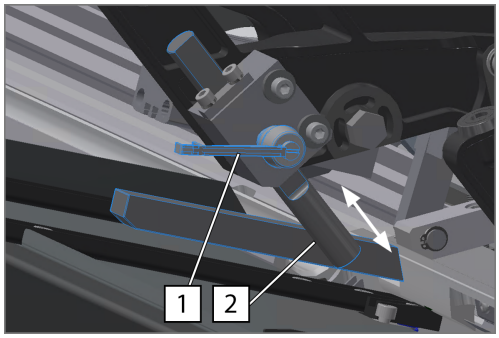
⚠ WARNING

Falling material bar

Personal injury due to squashing and impact as a result of a falling material bar.

Material bars which are located on the lateral material storage, may fall down during conversion work.

- **Before conversion work, remove the material bars from the lateral material storage.**



1. Press the emergency stop button. ↗ *"Press the emergency stop button" on page 43*.
2. Switch off the compressed air supply. ↗ *"Switch the supply of compressed air on/off" on page 98*
3. Where necessary, obtain release from the lathe to open the cover.
4. Open the cover.
5. Loosen the clamping lever [1].
6. Move the holding-down device [2] to the desired height.
7. Close the clamping lever [1].
8. Set the rest of the holding-down devices in the same way.
9. Close the cover.
10. Switch on the compressed air supply. ↗ *"Switch the supply of compressed air on/off" on page 98*
11. Unlock the emergency stop button. ↗ *"Make the loading magazine ready for operation after the emergency stop" on page 43*
12. Acknowledge the error message using the CLR button.

8 Maintenance

8.1 Maintenance actions

Maintenance plan

Chap.	Task to perform	Every month	Every 6 months	Every 36 months	If necessary	Page
	Check the drive belt		X			93
	Checking the synchronizing unit belt		X			94
	Replace the relay insert in the control cabinet			X		95
	Check the blades of the material gripper		X			95
	Check the lubricant in the oil tank				X	98
	Check the air gap of the feed coupling	X				99
	Checking the air gap of the synchronization clutch	X				100

Check the drive belt

⚠ DANGER

Moving components of the loading magazine and the tool machine with the cover open

Personal injury due to squashing, impact or striking by movements of the loading magazine and the machine tool with the cover open.

During maintenance work on the loading magazine, there may be unexpected movements of the components of the loading magazine and the machine tool.

- **Turn off the machine tool at the main switch, before performing maintenance work. Observe the sequence of the working steps according to the descriptions listed below.**

⚠ CAUTION

Sharp knives of the material gripper

Cuts due to the sharp knives of the material gripper.

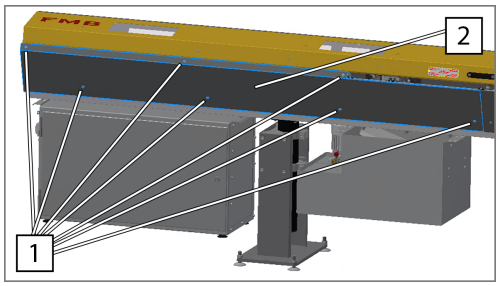
When working in the vicinity of the material gripper, there is a risk of cuts in the event of inattentiveness.

- **Wear safety gloves.**

Condition of the drive belt:

If the drive belt has cracks or is missing teeth, it must be replaced. Contact FMB. ➚ "Service contact details" on page 109.

1. Press the emergency stop button. ➚ *"Press the emergency stop button" on page 43.*
2. Switch off the compressed air supply. ➚ *"Switch the supply of compressed air on/off" on page 98*



3. Where necessary, obtain release from the lathe to open the cover.
4. Open the cover.
5. Loosen the screws [1] and remove.
6. Remove the cladding [2].
7. Check the condition: Check the drive belt visually for missing teeth.
8. Fit the cladding [2].
9. Insert and tighten the screws [1].
10. Close the cover.
11. Switch on the compressed air supply. → *"Switch the supply of compressed air on/off" on page 98*
12. Unlock the emergency stop button. → *"Make the loading magazine ready for operation after the emergency stop" on page 43*
13. Acknowledge the error message by pressing the CLR button.

Checking the synchronizing unit belt

⚠ DANGER

Moving components of the loading magazine and the tool machine with the cover open

Personal injury due to squashing, impact or striking by movements of the loading magazine and the machine tool with the cover open.

During maintenance work on the loading magazine, there may be unexpected movements of the components of the loading magazine and the machine tool.

- **Turn off the machine tool at the main switch, before performing maintenance work. Observe the sequence of the working steps according to the descriptions listed below.**

⚠ CAUTION

Sharp knives of the material gripper

Cuts due to the sharp knives of the material gripper.

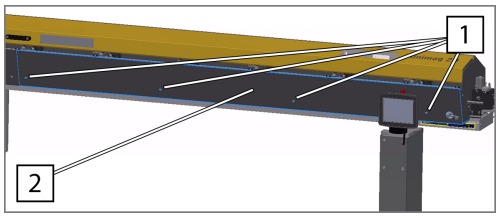
When working in the vicinity of the material gripper, there is a risk of cuts in the event of inattentiveness.

- **Wear safety gloves.**

Condition of the synchronizing unit belt:

If the synchronizing unit belt has cracks or is missing teeth, the synchronizing unit belt must be replaced. Contact FMB. → *"Service contact details" on page 109.*

1. Press the emergency stop button. → *"Press the emergency stop button" on page 43.*
2. Switch off the compressed air supply. → *"Switch the supply of compressed air on/off" on page 98*
3. Where necessary, obtain release from the lathe to open the cover.
4. Open the cover.



5. Loosen the screws [1] and remove.
6. Remove the cladding [2].
7. Check the condition: Check the synchronizing unit belt visually for cracks and missing teeth.
8. Fit the cladding [2].
9. Insert and tighten the screws [1].
10. Close the cover.
11. Switch on the compressed air supply. → *"Switch the supply of compressed air on/off" on page 98*
12. Unlock the emergency stop button. → *"Make the loading magazine ready for operation after the emergency stop" on page 43*
13. Acknowledge the error message by pressing the CLR button.

Replace the relay insert in the control cabinet

⚠ DANGER

Live components of the control cabinet

Personal injury by electrical shock due to contact with live components of the control cabinet.

This work is only allowed to be performed by a qualified electrician.

- **Turn off the machine tool before starting work on the main switch.**

The relay insert for changing signals with the lathe must be replaced regularly. In the event of uncertainty, please contact FMB. → *"Service contact details" on page 109.*

1. Turn off the machine tool before starting work on the main switch.
2. Disconnect the relay insert in the control cabinet of the loading magazine.
3. Insert the new relay insert in the control cabinet of the loading magazine.

Check the blades of the material gripper

⚠ DANGER

Moving components of the loading magazine and the tool machine with the cover open

Personal injury due to squashing, impact or striking by movements of the loading magazine and the machine tool with the cover open.

During maintenance work on the loading magazine, there may be unexpected movements of the components of the loading magazine and the machine tool.

- **Turn off the machine tool at the main switch, before performing maintenance work. Observe the sequence of the working steps according to the descriptions listed below.**

⚠ CAUTION

Sharp knives of the material gripper

Cuts due to the sharp knives of the material gripper.

When working in the vicinity of the material gripper, there is a risk of cuts in the event of inattentiveness.

- **Wear safety gloves.**

1. Press the emergency stop button. *“Press the emergency stop button” on page 43*.
2. Switch off the supply of compressed air. *“Switch the supply of compressed air on/off” on page 98*
3. Where necessary, obtain release from the lathe to open the cover.
4. Open the cover.
5. Turn off the machine tool at the main switch.
6. Check the material gripper visually for breaks.
7. If the blades of the material gripper break off, the blades of the material gripper must be replaced. *“Replacing the blades of the material gripper” on page 96*.
8. Close the cover.
9. Turn on the machine tool at the main switch.
10. Switch on the compressed air supply. *“Switch the supply of compressed air on/off” on page 98*
11. Unlock the emergency stop button. *“Make the loading magazine ready for operation after the emergency stop” on page 43*
12. Acknowledge the error message by pressing the CLR button.

Replacing the blades of the material gripper

⚠ DANGER

Moving components of the loading magazine and the tool machine with the cover open

Personal injury due to squashing, impact or striking by movements of the loading magazine and the machine tool with the cover open.

During maintenance work on the loading magazine, there may be unexpected movements of the components of the loading magazine and the machine tool.

- **Turn off the machine tool at the main switch, before performing maintenance work. Observe the sequence of the working steps according to the descriptions listed below.**

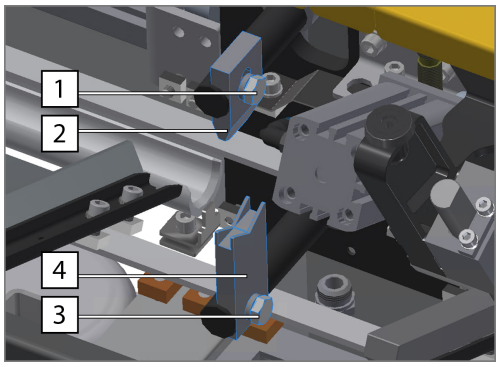
⚠ CAUTION

Sharp knives of the material gripper

Cuts due to the sharp knives of the material gripper.

When working in the vicinity of the material gripper, there is a risk of cuts in the event of inattentiveness.

- **Wear safety gloves.**



1. Press the emergency stop button. ↗ *"Press the emergency stop button" on page 43*.
2. Switch off the compressed air supply. ↗ *"Switch the supply of compressed air on/off" on page 98*
3. Where necessary, obtain release from the lathe to open the cover.
4. Open the cover.
5. Turn off the machine tool at the main switch.
6. Loosen and remove the screw [1].
7. Change the top blade [2].
8. Insert and tighten the screw [1].
9. Loosen and remove the screw [3].
10. Change the bottom blade [4].
11. Insert the screw [3] and hand-tighten.
12. Close the cover.
13. Switch on the compressed air supply. ↗ *"Switch the supply of compressed air on/off" on page 98*
14. Unlock the emergency stop button. ↗ *"Make the loading magazine ready for operation after the emergency stop" on page 43*
15. Acknowledge the error message using the CLR button.
16. Close the material gripper using the button.
17. Press the emergency stop button. ↗ *"Press the emergency stop button" on page 43*.
18. Switch off the compressed air supply. ↗ *"Switch the supply of compressed air on/off" on page 98*
19. Open the cover.
20. Check whether the material gripper is aligned with the pusher.
21. Correct the alignment of the pusher and the material gripper, where applicable, via the bottom blade.
22. Tighten the screw [3].
23. Close the cover.
24. Switch on the compressed air supply. ↗ *"Switch the supply of compressed air on/off" on page 98*
25. Unlock the emergency stop button. ↗ *"Make the loading magazine ready for operation after the emergency stop" on page 43*
26. Turn on the machine tool at the main switch.
27. Acknowledge the error message using the CLR button.

Check the lubricant in the oil tank

⚠ WARNING

Leaking fuel

Personal injuries due to slipping on leaking fuel.

Leaking fuel causes a slipping hazard in the working area.

- **Remove leaking fuel immediately.**
- **Observe the description in the operating instructions about filling / emptying the oil tank.**
- **Only fill fuel in the intended containers.**

1. Check the lubricant in the oil tank for the formation of foam.
2. Check the lubricant in the oil tank for severe contamination.
3. If the lubricant forms foam in the oil tank, or is severely contaminated, the lubricant in the oil tank must be replaced. .

Filling the oil tank of the loading magazine

⚠ WARNING

Leaking fuel

Personal injuries due to slipping on leaking fuel.

Leaking fuel causes a slipping hazard in the working area.

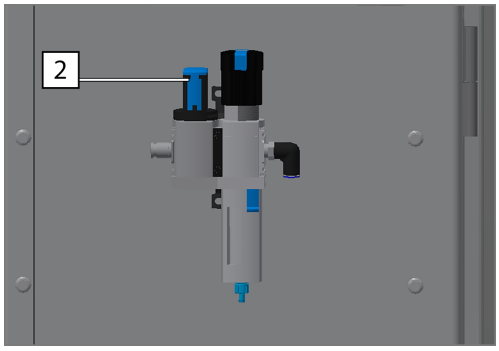
- **Remove leaking fuel immediately.**
- **Observe the description in the operating instructions about filling / emptying the oil tank.**
- **Only fill fuel in the intended containers.**

Observe the oil tank level.

Observe the stated oil grades.

→ Fill the stated quantity of oil from above into the oil tank.

Switch the supply of compressed air on/off



The supply of compressed air is switched on/off at the maintenance unit [1].

→ Switch the supply of compressed air on/off at the knob [2].

Check the air gap of the feed coupling

⚠ DANGER

Moving components of the loading magazine and the tool machine with the cover open

Personal injury due to squashing, impact or striking by movements of the loading magazine and the machine tool with the cover open.

During maintenance work on the loading magazine, there may be unexpected movements of the components of the loading magazine and the machine tool.

- **Turn off the machine tool at the main switch, before performing maintenance work. Observe the sequence of the working steps according to the descriptions listed below.**

⚠ WARNING

Moving components of the loading magazine without a safety cover

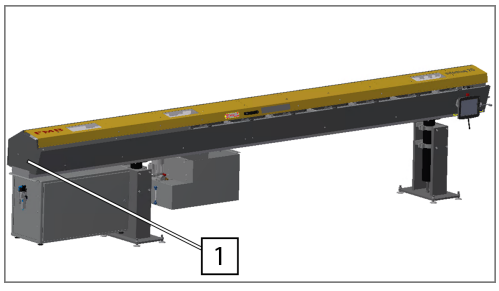
Personal injury due to squashing and impact due to freely-accessible, driven components of the loading magazine.

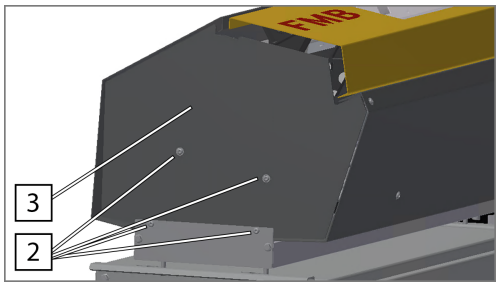
With maintenance work on the loading magazine, it may be necessary for technical reasons to remove screwed-on safety covers. Screwed in safety covers are not electrically locked. That means that the loading magazine is not automatically shut down when these safety covers are removed, and driven components may still move.

- **Before removing safety covers, press the emergency stop button.**
- **After the end of the maintenance work, reattach the safety covers directly.**
- **Maintenance work is only to be performed if the person holds the respective qualification described in these operating instructions.**

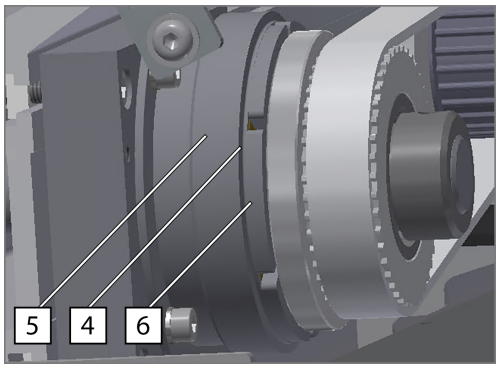
The air gap between the rotor and the anchor of the feed coupling must be at least 0.2 mm. If the air gap is greater than 0.2 mm, it must be readjusted by removing the spacer washers. In the event of questions please contact FMB. *↗ "Service contact details" on page 109.*

1. Press the emergency stop button. *↗ "Press the emergency stop button" on page 43.*
2. Switch off the compressed air supply. *↗ "Switch the supply of compressed air on/off" on page 98*
3. Turn off the machine tool at the main switch.
4. The feed coupling is located in position 1 behind the front plate.





5. Loosen the screws [2] and remove.
6. Remove the front plate [3].



7. Check the air gap [4] between the rotor [5] and anchor [6].
8. Attach the front plate [3] in reverse order.
9. Switch on the compressed air supply. → *"Switch the supply of compressed air on/off" on page 98*
10. Unlock the emergency stop button. → *"Make the loading magazine ready for operation after the emergency stop" on page 43*
11. Turn on the machine tool at the main switch.
12. Acknowledge the error message by pressing the CLR button.

Checking the air gap of the synchronization clutch

⚠ DANGER

Moving components of the loading magazine and the tool machine with the cover open

Personal injury due to squashing, impact or striking by movements of the loading magazine and the machine tool with the cover open.

During maintenance work on the loading magazine, there may be unexpected movements of the components of the loading magazine and the machine tool.

- **Turn off the machine tool at the main switch, before performing maintenance work. Observe the sequence of the working steps according to the descriptions listed below.**

⚠ WARNING

Moving components of the loading magazine without a safety cover

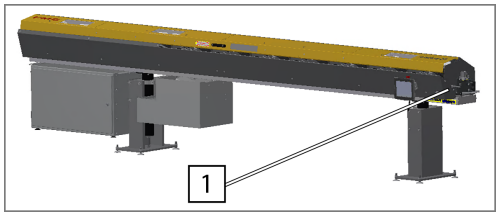
Personal injury due to squashing and impact due to freely-accessible, driven components of the loading magazine.

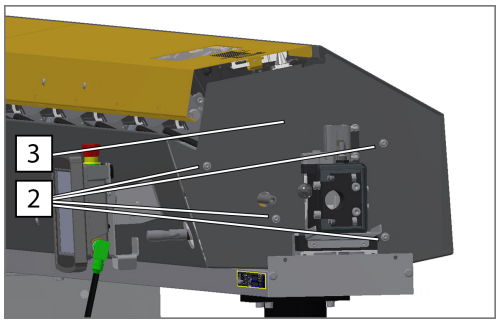
With maintenance work on the loading magazine, it may be necessary for technical reasons to remove screwed-on safety covers. Screwed in safety covers are not electrically locked. That means that the loading magazine is not automatically shut down when these safety covers are removed, and driven components may still move.

- **Before removing safety covers, press the emergency stop button.**
- **After the end of the maintenance work, reattach the safety covers directly.**
- **Maintenance work is only to be performed if the person holds the respective qualification described in these operating instructions.**

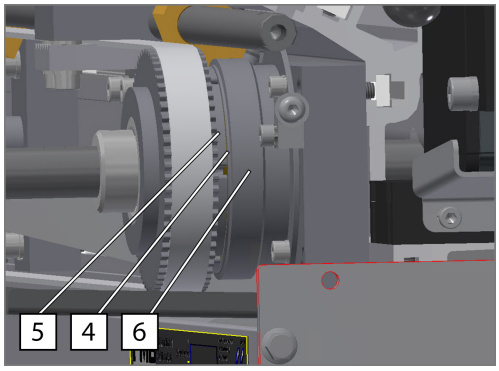
The air gap between the rotor and the anchor of the synchronization clutch must be at least 0.2 mm. If the air gap is greater than 0.2 mm, it must be readjusted by removing the spacer washers. In the event of questions please contact FMB. ➚ "Service contact details" on page 109.

1. Press the emergency stop button. ➚ *"Press the emergency stop button" on page 43*.
2. Switch off the compressed air supply. ➚ *"Switch the supply of compressed air on/off" on page 98*
3. Turn off the machine tool at the main switch.
4. The synchronization clutch is located in position [1] behind the front plate.





5. Loosen the screws [2] and remove.
6. Remove the front plate [3].

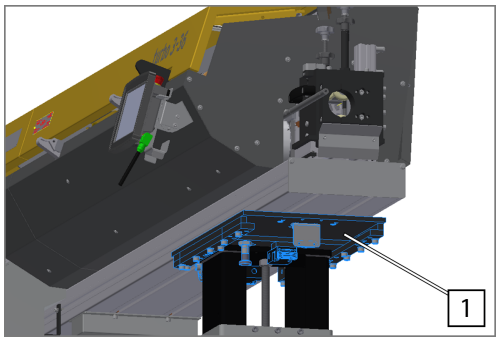


7. Check the air gap [4] between the rotor [5] and anchor [6].
8. Attach the front plate [3] in reverse order.
9. Switch on the compressed air supply. ➚ *"Switch the supply of compressed air on/off" on page 98*
10. Unlock the emergency stop button. ➚ *"Make the loading magazine ready for operation after the emergency stop" on page 43*
11. Turn on the machine tool at the main switch.
12. Acknowledge the error message by pressing the CLR button.

8.2 Auxiliary equipment

Shifting the loading magazine

This function is available as an option.



The shifting device [1] is located between the support and the beam of the loading magazine. The procedure is described using the example of a support. To shift the loading magazine, the shifting device must be activated on each support.

The screws [2] must be used in alternating positions depending on the shifting positions. Several drill holes are intended for this.

1. Press the emergency stop button. ➚ *"Press the emergency stop button" on page 43*.
2. Switch off the compressed air supply. ➚ *"Switch the supply of compressed air on/off" on page 98*
3. Loosen the screws [2] and remove.
4. Pull and hold the locking pin [3].
5. Shift the loading magazine up to the stop.
6. Release the locking pin [3].
7. Insert and tighten the screws [2].
8. Switch on the compressed air supply. ➚ *"Switch the supply of compressed air on/off" on page 98*
9. Unlock the emergency stop button. ➚ *"Make the loading magazine ready for operation after the emergency stop" on page 43*
10. Acknowledge the error message using the CLR button.

Moving the drive with the crank handle

⚠ WARNING

Hand crank moved by the drive of the loading magazine

Personal injury due to squashing and impact due to the crank handle used.

The crank handle also turns due to the push movement of the loading magazine while in operation, and may be flung off or strike people.

- **Remove the crank handle immediately after the pressing the loading magazine.**
- **Observe the procedure for moving the drive with the crank handle in the operating instructions.**

NOTICE

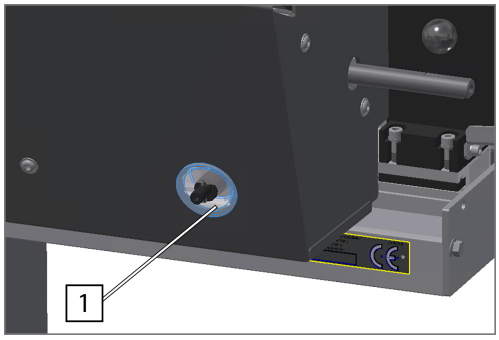
Loss of position of the PLC control unit

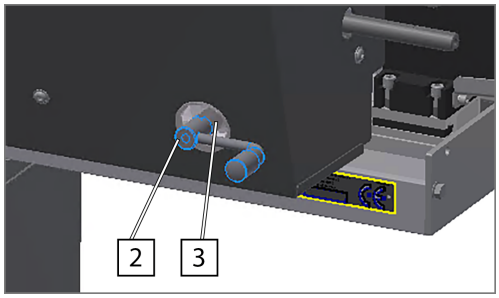
Damage to the loading magazine and the machine tool due to the loss of position of the PLC control unit.

If the drive of the loading magazine is moved with the crank handle, the position of the PLC control unit may be lost.

- **Perform a reference run after moving the drive with the crank handle.**

1. Press the emergency stop button. ➚ *"Press the emergency stop button" on page 43*.
2. Switch off the compressed air supply. ➚ *"Switch the supply of compressed air on/off" on page 98*
3. Where necessary, obtain release from the lathe to open the cover.
4. Open the cover.
5. Remove the cover cap [1] (where necessary from inside using the auxiliary equipment).





6. Insert the crank handle [2] into position [3].
7. Operate the crank handle.
8. Remove the crank handle.
9. Insert the cover cap.
10. Close the cover.
11. Switch on the compressed air supply. ➚ *"Switch the supply of compressed air on/off" on page 98*
12. Unlock the emergency stop button. ➚ *"Make the loading magazine ready for operation after the emergency stop" on page 43*
13. Acknowledge the error message using the CLR button.
14. Perform a reference run. ➚ *"Performing a reference run" on page 103*.

Performing a reference run

If the drive of the loading magazine is moved manually in switched-off condition, it causes the position of the PLC control unit to be lost. In this case, a reference run must be performed.

1. Press the ☰ button.
2. *'SETTINGS → Service settings → Position diagnosis"*
3. Press the ✥ button.
4. Press the Reference run button.
   ➥ The status display on the button flashes yellow. The reference run is performed. The status display on the button turns green. The reference run is ended.

9 Faults

9.1 Fault messages

Display the current fault message

The current fault message is shown in the upper area of the control panel.

Delete the current fault message

→ Press the CLR button.

Display of pending fault messages in the fault list

1. → Press the ☰ button.
2. → *"DIAGNOSIS → Fault list"*

Delete fault messages in the fault list

1. → Press the ☰ button.
2. → *"DIAGNOSIS → Fault list"*

Delete an error message:

1. → Click on error message.
2. → Delete the error message with the Quittieren button.

Delete all error message:

1. → Click on error message.
2. → Delete the error message with the Quittieren (Alle) button.

Access the fault history

1. → Press the ☰ button.
2. → *"DIAGNOSIS → Fault list"*
3. → Press the Historie button.

Display the position of the current fault on the loading magazine

1. → Press the ☰ button.
2. → *"DIAGNOSIS → Fault list"*
3. → Press the Störungshilfe button.

9.2 Fault table

Fault message and possible cause

Fault message of the loading magazine	Possible cause	Switch / position
Axis 1 fault, code: xx	The servo drive issues a fault message.	
Starting switch -B7 not in home position -KK5/B7	The starting switch is not back in its home position. ■ Air flow disrupted ■ Solenoid valve -KK5 not working	Starting switch not in the home position. Switch -B7 not actuated.
Starting switch -B7 not in the home position -KK9/B7	The starting switch is not back in its home position. ■ Air flow disrupted ■ Solenoid valve -KK9 not working	Starting switch not in the home position. Switch -B7 not actuated.
Press upon not correct; Pos. material draw-off not reached	The clamping sleeve was not pressed, or not pressed completely, onto the material bar. ■ Feed force for press upon too low. ■ Incorrect clamping sleeve. ■ New clamping sleeve.	Position Position draw off has been reached.
Storage empty! No new bar reloaded -B80	There is no material bar in the lateral material storage.	Switch -B80 not actuated.
Diameter setting of channel -M3	The monitoring time has expired. The diameter setting was not performed. The desired value of the channel diameter setting does not agree with the actual value.	
Diameter setting of separation M4/B8	The monitoring time has expired. The diameter setting was not performed. The desired value of the separation diameter setting does not agree with the actual value.	
Motor speed controller not ready for operation -TA1/K3	Fault on the drive motor speed controller.	
Guide channel not closed; Check guide channel -KK01/B6/B26/B28	The guide channel is not closed. ■ Solenoid valve -KK01 not working. ■ Air flow disrupted.	Switch -B6 or -B26 not actuated.
Opening – closing of guide channel not correct -KK1/KK01/B5/B6/B26/B28	Guide channel not opened or closed correctly. ■ Solenoid valve -KK1 or -KK01 not working. ■ Air flow disrupted.	Switch -B5, -B6, or -B26 not actuated.
No stop in the lathe	Caution selection First insert To stop set! The material bar was not stopped by an end stop in the working area of the lathe.	

Fault message of the loading magazine	Possible cause	Switch / position
No return of remnant -B13	Remnant remains in the lathe. The material gripper did not grab any remnant when removing the remnant. ■ The lathe collet does not open correctly. The remnant fell out of the clamping sleeve when returning. The material gripper did not grab any remnant when removing the remnant. ■ Clamping sleeve pressure too low.	Switch -B13 was actuated.
No new bar in guide channel -B13	The material gripper does not grab any material bars when drawing on ■ No material bar was loaded from the lateral material storage.	Switch -B13 was actuated.
No air pressure! -B11 Check air pressure min. 5 bar	The compressed air is too low, or is lacking, on the maintenance unit. ■ Air supply disturbed	Switch -B11 not actuated.
Magazine not in start position; Start position step 1,15,17 or 19	The loading magazine is not in one of the possible starting positions: step 1, step 15, step 17 or step 19.	
Material on the lateral storage -B80	Material bars are located in the lateral material storage.	Switch -B80 actuated.
Material bar loaded in test run	Test mode active. In test mode, there must be no material bars on the lateral material storage.	
Max fill level of the loading magazine lubricant container reached	The maximum fill level of the lubricant container was reached.	
Motor protection -F1 tripped! -M1/F1 Check -M1, switch -F1 on	The drive motor of the loading magazine was overloaded.	Motor protection switch -F1 was triggered.
Motor protection -F2 tripped! -M2/F2 Check -M2, switch -F2 on	The motor of the oil pump was blocked or overloaded.	Motor protection switch - F2 was triggered.
Motor overload switch F3 triggered! check -M3/F3 -M3, activate F3	Drive motor of the pilgrim step separation was overloaded.	Motor protection switch -F3 was triggered.
Neg.software end position was overrun. Release with manual forward function	The negative software stop was overrun.	
Emergency Stop lathe	The emergency stop button of the lathe was actuated.	
Emergency Stop loading magazine -S69	The emergency stop button on the loading magazine was actuated.	

Fault message of the loading magazine	Possible cause	Switch / position
Pilgrim step separation not in position / not empty -B83/B81/B82	The pilgrim step separation is not in position. ■ Pilgrim step separation was lowered without authorization. ■ Pilgrim step separation was raised without authorization. ■ The pilgrim step separation cycle was interrupted.	
Pos.software end position was overrun. Release with manual return function	The positive software stop was overrun.	
Profibus/Profinet - No live signal from the lathe	The connection of Profibus / Profinet to the machine tool is defective.	
Relay tumbler -K225	Malfunction of the channel lock module. Relay -K225 not working.	
Remnant jammed in clamping sleeve -B13	The remnant was not correctly extracted from the clamping sleeve and is still in the gripping area. The material gripper closes to check the remnant ejection and then grabs the available remnant. ■ The clamping sleeve pressure is not right. ■ The blades of the material gripper are worn. ■ The pressure of the material gripper is too low. The remnant did not fall correctly into the remnant bin and is still in the gripping area. The material gripper closes to check the remnant ejection and then grabs the remaining remnant. ■ The remnant flap is oily. The remnant remains stuck on the remnant flap.	Switch -B13 was not actuated.
Remant flap not closed -KK010/B17	The remnant flap does not close. ■ Solenoid valve -KK010 does not switch. ■ Air flow disrupted.	Switch -B17 not actuated.
Remnant to long	The "Maximum remnant length" function is active. The length of the remnant exceeds the entered value.	
Pushing signal not ok; Check signal from lathe	The signal "collet open" is transferred by the lathe in an unstable way to the loading magazine (the signal bounces). ■ Defective connection ■ Relay worn (on the lathe side)	

Fault message of the loading magazine	Possible cause	Switch / position
Sensor of the pilgrim step separation support contaminated -B83	■ The light reflection for the stable detection of a material bar is not sufficient. ■ Sensor head (light guide) of switch -B83 is damaged or dirty.	
Signal sliding-fixed headstock lathe mode does not match shifting device -B71/B76	The external signal of the machine tool (long or short turning mode) does not agree with the position of the shifting device.	
Collet in the lathe closed	Caution selectionDraw on bar with first insert set! The collet of the lathe is not open. First insert cannot be performed. The collet position signal is not available in manual mode.	
Collet closed too long	Collet monitoring time expired.	
Collet opened too long	Collet monitoring time expired.	
Bar has been pushed back	Caution Max. bar return active. The material bar was moved back past the set value when closing the collet. ■ Lathe clamping system not OK.	
Part follow-up too short	Caution Min. part length follow-up active. The entered value was not reached when pushing the material bar. ■ Feed force too low. ■ The collet signal is unstable.	
Part follow-up too long	Caution Max. part length follow-up active. The entered value was exceeded when pushing the material bar. ■ End stop in the lathe overrun.	
Cover not closed -B76/B77/B78/B79/K20/K21	The cover (guide channel cladding) or the lid of the steady is not closed.	Switch -B71, -B76, -B77, -B78, or -B79 not actuated.
Shifting device -B71/B76	The shifting device is in a non-permitted position.	Switch -B71 and -B76 not actuated.
Pusher not swung in correctly -KK08/B23	Pusher incorrectly swung in. ■ Solenoid valve -KK08 does not switch. ■ Air flow disrupted.	Switch -B23 does not switch.

Fault message of the loading magazine	Possible cause	Switch / position
Pusher out of position	Caution Part length internal or Part length external active. The pusher was moved during processing. ■ Vibrations to the material bar. ■ Lathe clamping system not OK. ■ Brake not switched on. ■ Braking force too low.	
Z-axis collision	The entered value for rotary encoder B4 was not met.	
Monitoring time motor expired	The moving signal is constantly on. The motor pushes against resistance. ■ Problem with the lathe work flow.	
The monitoring time of motor -M3 pilgrim step separation has expired -B81	The motor did not end the single cycle after approx. 10 seconds.	Switch -B81 does not switch.
Monitoring time bar change expired; Fault at bar change	The bar change was unable to be performed correctly. Monitoring time expired.	

9.3 Service

Service contact details

Service telephone no.	+49 9392 801 801
Telephone no. of the headquarters	+49 9392 801 0
Fax	+49 9392 801 220
Email	info@fmb-machinery.de

9.4 Technical problems

Behavior of the loading magazine in the event of a power failure

In the event of a power failure, the operation of the loading magazine is interrupted. The pressurisation of the pneumatic valves is interrupted. All parameters are saved and are available again once the power supply is reestablished.

Material bar stuck in the guide channel

It may be the case that the material bar does not lie completely in the guide channel when the guide channel is closed, and becomes stuck. This is caused by the usually bad material quality or an incorrect setting of the separation device. The correct procedure to loosen a stuck material bar depends on different factors. If the material bar is stuck, please contact FMB. ➚ *"Service contact details" on page 109*.

10 Index

R

S

T

U

V