LISSMAC

METAL PROCESSING

OPERATING MANUAL
GRINDING MACHINE

SBM-M 1000 S2 ALU MIX
SBM-M 1500 S2 ALU MIX

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Imprint

Operating manual for LISSMAC
Grinding machine SBM-M 1000 S2 ALU MIX
SBM-M 1500 S2 ALU MIX

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1 About this manual

1.1 Target group

The operating manual is directed at the machine operator and the operating and maintenance personnel.

This operating manual contains important information on how to operate the machine safely, properly and economically.

Each person responsible for operating and maintenance work on the machine must have read and understood this operating manual.

The operating manual is to be supplemented by directives for accident prevention and environmental protection, according to national requirements.

In addition to this operating manual, country-specific regulations for accident protection and also recognised technical regulations for safety and proper work are to be observed

1.2 Additional documents

Additional documentation of the respective manufacturers of individual components of the machine are available as supplements to this operating manual:

- Dust extraction
- Operating manual BALLUFF

1.3 Presentation of warnings

In this operating manual warnings are presented according to the following examples:

⚠ SIGNAL WORD!

Type and source of danger

Consequences of non-compliance

➢ Actions to avert the danger

The signal word next to the danger symbol indicates the degree of danger:

DANGER This signal word signifies an extremely dangerous situation. If the situation is not avoided, fatal or serious injuries will result.

WARNING This signal word signifies a dangerous situation. If the situation is not avoided, fatal or serious injuries will result.

CAUTION This signal word signifies a dangerous situation. If the situation is not avoided, medium to slight injuries will result.

NOTE This signal word signifies a situation which presents risks to objects. If the situation is not avoided, property damage will result. The signal word is present without a danger symbol.

1.4 Additional representations

In this operating manual important information is presented according to the following examples:

Import information is denoted by »i«.

Requests and results
Texts, which request action, are marked by a triangle (➢). The immediate effect of this action is marked as result (↳).

Position numbers
The positions s of the figures are marked by numbers in parentheses (1).

2 Safety

2.1 Safety instructions

The SBM-M 1000/1500 S2 ALU MIX grinding machine is constructed according to the state of the art and recognised technical safety rules. However, during its use, danger for persons and property damage can occur.

- The machine is to be used only for intended use in technically faultless condition and in observance of safety instructions.

2.2 Organisational measures

Personnel authorised to work on the machine must have read and understood the operating manual before starting work. This applies notably to personnel who only work occasionally on the machine, e.g. for changeovers and service.

- The operating manual is to be kept permanently at the machine location and easily accessible.
- Perform checks for safe and hazard awareness work by operators while following the operating manual.
- If necessary or required by country-specific regulation, use personal protective clothing (e.g. work gloves, safety glasses, hearing protection).
- Observe all safety and danger instructions on the machine.
- Keep all safety instructions and danger warnings on the machine complete and in legible condition.
- No changes, removal or addition of parts to the machine without the written approval of the manufacturer!
- Only use original replacement parts from the manufacturer.
- Keep intervals for service work which are given in the operating manual.
- Employees must be trained at regular intervals about the dangers of grinding aluminium workpieces. This training must be documented in writing.
- The measures specified in the operating manual (cleaning measures, etc.) that must be taken when switching from steel workpieces to aluminium, or from aluminium to steel, must be observed and documented.
- Before starting the grinding machines, it must be ensured in the context of a commissioning inspection that the measures required by the operating manual have been implemented. The commissioning process must be documented.

2.3 Personnel selection and qualifications

Only authorised personnel of legal minimum age may work on the machine.

Personnel who are being trained or orientated on the machine may only work on the machine under continuous supervision of an experienced person.

- Only use trained or orientated personnel. Clearly establish responsibilities of the personnel for operating, maintaining and servicing.
- Establish a machine operator responsibility. The machine operator must refuse to follow instructions that are contrary to safety.

2.4 Transport

- Only use lifting gear and load carrying equipment with sufficient lifting capacity during loading work (see Technical Data for weights).
- Name an expert instructor for the lifting process!
- Only lift the machine properly with the lifting gear according to instructions in the operating manual. Only use the provided attachment points for the load carrying equipment.
- Only use suitable transport vehicles with sufficient load capacity.
- Reliably secure the machine during vehicle transport. Use suitable attachment points.
- Perform recommissioning after transport only according to the operating manual.

2.5 Normal operation

- Before beginning work become familiar with the operating location and working environment. The work environment includes, for example, work area obstructions and assistance options in case of accidents.
- Only operate the machine in a safe and functional condition.
- Refrain from working in any manner that is questionable in regard to safety.
- Immediately stop and secure the machine in case of malfunctions. Immediately correct malfunctions.
- At least once per shift check the machine for externally recognisable damage and deficiencies. Report any changes occurring (including operating behaviour) to the responsible department or person. If necessary, immediately stop the machine and secure it.

2.6 Maintenance, Service and Troubleshooting

- Adjustment, maintenance and service work may only be carried out by authorised technical personnel.
- Perform adjustment, maintenance and service work according to instructions in the operating manual. Keep the specified intervals for service work.
- Inform operating personnel before beginning adjustment, repair, or maintenance work. Name a supervisor.
- Always disconnect the machine from electrical power during maintenance and repair work (main switch in the 0 position).
- When the machine is being cleaned of material residues, always disconnect the machine and the extraction system from the mains supply (set main switch to 0).
- Before cleaning with cleaning agents, close all openings with suitable materials in which no water or cleaning agent can penetrate, for safety or functional reasons. Electric motors and switches are especially at risk.
- Do not perform any cleaning with high pressure cleaners.
- Openings which were sealed before cleaning, must be completely opened after cleaning.
- Always tighten loosened screw connections with the specified tightening torques during maintenance and service work.
- If safety equipment is dismantled during changeover, maintenance, service and repair, remount and check the safety equipment immediately after the work is completed.
- Dispose of operating and auxiliary materials and replacement parts safely and in accordance with country-specific regulations.

2.7 Safety instructions for special types of dangers

2.7.1 Electric power

- Work on the machine's electrical systems may only be carried out by electricians according to the rules of electronics.
- In case of problems with the electrical power supply, turn the machine off immediately.
- When changing fuses only use original fuses with specified amperage.
- Regularly check machine electrical equipment. Immediately correct deficiencies, such as loose connections or scorched cable.

2.7.2 Dust

- The machine may only be operated with two functional dust extraction systems approved pursuant to the EC Directives for aluminium and steel dust.
- All federal requirements for extraction systems for potentially explosive aluminium and steel dusts must be met.
- Please observe the separate operating manual of the dust extraction system.
- It must be guaranteed that the continued operation of machine is impossible if the dust extraction system fails.
- The volume flow rate of the extraction system must be at least 2900 m^3/hr.
- The flow velocity in the suction pipes must not be below 20m/s.
- No dust deposits should form in the suction pipes.

2.7.3 Fire hazard

- Do not process any workpieces which have been treated with a flammable corrosion resistant agent or flammable additive.
- Do not operate the machine near easily flammable materials.
- Make sure that the machine is always cleaned of machining residues according to the operating manual.

2.7.4 Explosion hazard

2.7.4.1 Description of explosion hazard

The machining of aluminium produces flammable dust by grinding that, when mixed with air, can form a potentially explosive atmosphere. This also applies to the machining of steel and stainless steel.

In a mixture of aluminium and steel dust, explosive gas can be produced from corrosion

Moreover, there is always the possibility that contact between water (e.g. air humidity) and aluminium dust can produce hydrogen gas, resulting in a gas explosion.

- During machining of aluminium, wet separators must always be used.
- During machining of steel, you must connect the dry vacuum.

2.7.4.2 Division of zones

The extraction of the aluminum or steel dust with a suitable extraction system (see 2.7.2) and performance of the cleaning intervals (see 7.3 and 7.4) prevents the formation of an explosive atmosphere within the machine or in the suction pipes.

Only if this is ensured may the machine be operated.

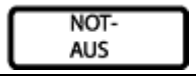
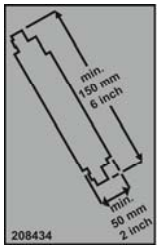
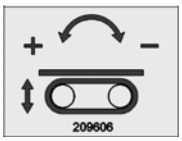
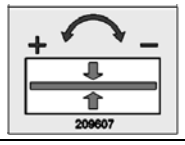
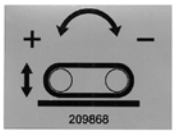
2.8 Symbols on the machine

The following symbols are located on the machine and warn of dangers coming from the machine:

Symbol	Meaning
	This symbol on both conveyor belts indicates the danger that hands or body parts can be pulled in and sheared off.
	This symbol on the control cabinet indicates dangerous electrical voltage.
	This symbol indicates the danger that hands or body parts can be pulled in and crushed.
	Read the operating manual and follow the information in the operating manual.
	Wear protective gloves when placing and removing workpieces.
	This symbol indicates that dust and splinter may be ejected from the machine during operation. Wear safety glasses.

2.9 Explanation of labels on the machine

The following labels are located on the machine and provide additional information.

Symbol	Meaning
	This symbol on the hydraulic tank indicates the hydraulic oil level.
	This symbol indicates the EMERGENCY STOP button.
	The symbol indicates the minimum length of the workpiece to be machined.
	Symbol, Hand wheel for moving bottom S-unit
	Symbol, Hand wheel for adjusting sheet thickness.
	Symbol, Hand wheel for moving top S-unit
	Lubricate here.
	Transport with crane possible.
	Transport with forklift possible.

3 Product description

The SBM-M 1000/1500 S2 ALU MIX grinding machine is described below.

3.1 Appropriate usage

The SBM-M 1000/1500 S2 ALU MIX grinding machine is intended exclusively for the two-sided deburring and edge rounding of punch, laser, and fine plasma cut workpieces.

Workpieces of 0.5 mm to 50 mm in thickness may be processed.

The SBM-M 1000/1500 S2 ALU MIX grinding machine may be used exclusively for the edge rounding of workpieces of aluminium or aluminium alloys as well as steel or stainless steel. Workpieces up to a warpage of maximum 3mm can be processed.

This machine may only be operated as a system with a dust extraction system that is provided and approved for it.

These materials may not be machined simultaneously.

When machining aluminium, the wet separator must always be connected, or the dry extractor when machining steel (see 5.4 + 5.5).

Always note the danger of explosion (see 2.7.4) and machine cleaning (7.3 and 7.4); only then is safe work possible.

Use for any other purposes is non-intended use.

The machine must only be installed in an indoor space, which meets the following conditions:

- Fortified, level floor with a load carrying capacity of at least 2.5 t.
- Temperature range +10° to 40 °C
- Humidity 5 – 95 % (not condensing)

Non-intended use particularly includes the machining of workpieces of composite materials in which both aluminium and steel dust could be produced simultaneously.

The manufacturer accepts no liability for damages which occur for use which is non-intended use.

3.2 Technical data

The following specifications apply to the
SBM-M 1000 S2 ALU MIX / SBM-M 1500 S2 ALU MIX grinding machine.

	SBM-M 1000 S2 ALU MIX	SBM-M 1500 S2 ALU MIX
Material throughput	Automatic	Automatic
Aperture width	1000 mm	1500 mm
Sheet thickness max.	50 mm	50 mm
Drive power, motor S	4x 3 kW	4x 3 kW
Speed, motor S	1405 U/min / 1705 U/min	1405 U/min / 1705 U/min
Voltage, motor S	400V/50Hz / 480V/60Hz	400V/50Hz / 480V/60Hz
Current consumption, motor S	6,3 A / 5,3 A	6,3 A / 5,3 A
Power consumption of feed motor	1,18 A	1,18 A
Noise power level	approx. 80 dB (A)	approx. 80 dB (A)
protection class	IP 42	IP 42
Feed	infinitely variable 0-4 m/min	infinitely variable 0-4 m/min
Sheet thickness adjustment	electrical	electrical
Medium adjustment	electrical	electrical
Medium	Grinding block	Grinding block
weight	2100 kg	2300 kg
width	2800 mm	3300 mm
Depth	1400 mm	1400 mm
height	1800 mm	1800 mm
Voltage	400V/50Hz / 480V/60Hz	400V/50Hz / 480V/60Hz
Network configuration	3~ PEN / 3~ PE+N	3~ PEN / 3~ PE+N
Rated current total (without suction)	28 A / 24 A	28 A / 24 A
Rated power total (without suction)	15,2 kW / 15,5 kW	15,2 kW / 15,5 kW
Power rating (without suction)	18,5 kVA / 19 kVA	18,5 kVA / 19 kVA

3.3 Type plate

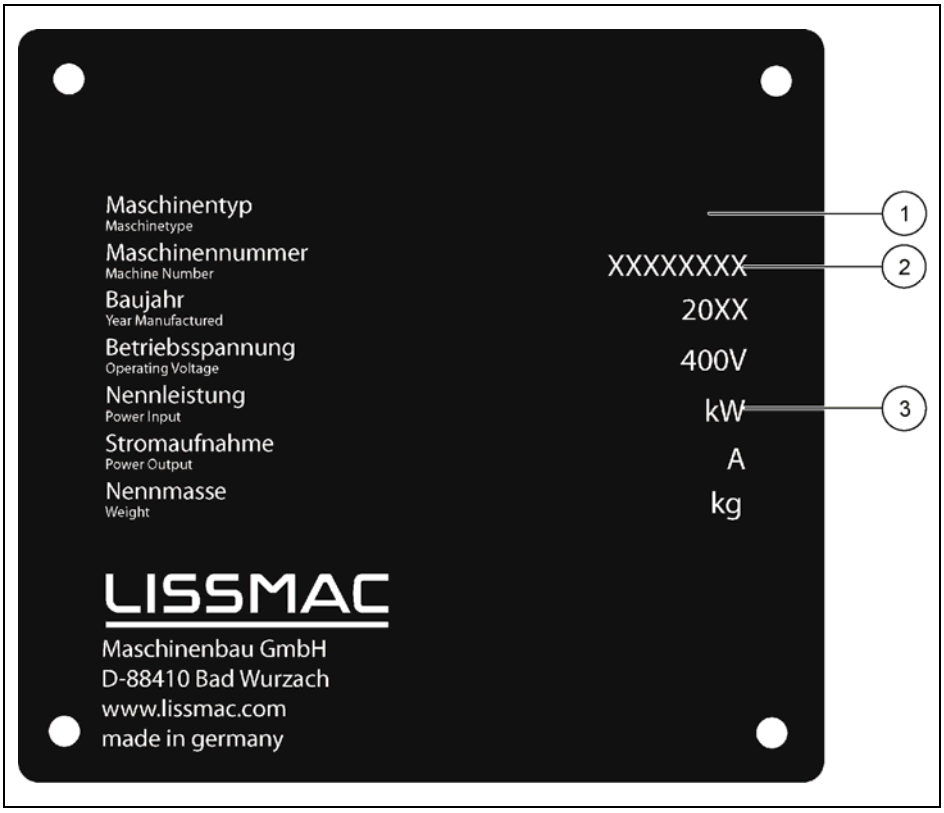


Abb. 1: Type plate

1 Name of machine
2 Machine number of the machine
3 Connection values and weights

The type plate is located on the left side of the back of the grinding machine.

3.4 Structure SBM-M 1000/1500 S2 ALU MIX grinding machine

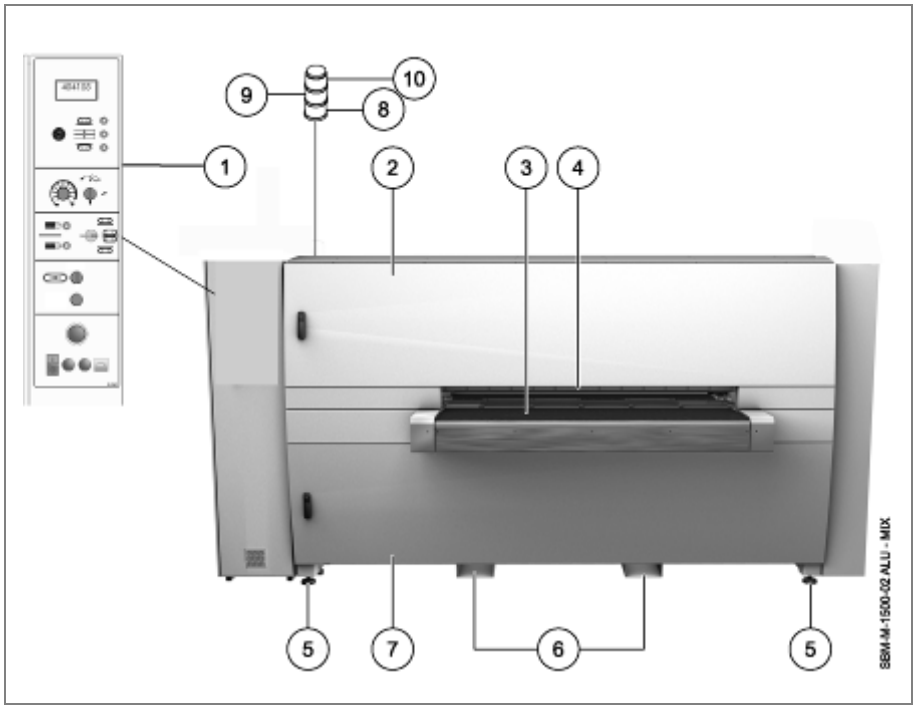


Abb. 2: Components of the machine, input side (front side of SBM-M S2 ALU MIX)

1 Control panel with selection switches
2 Upper device door
3 Transport belt for workpiece input
4 Safety flap
5 Adjustable machine foot
6 Support for transport with forklift
7 Lower device door
8 Steel machining indicator lamp
9 Aluminium machining indicator lamp
10 Extraction indicator not functional

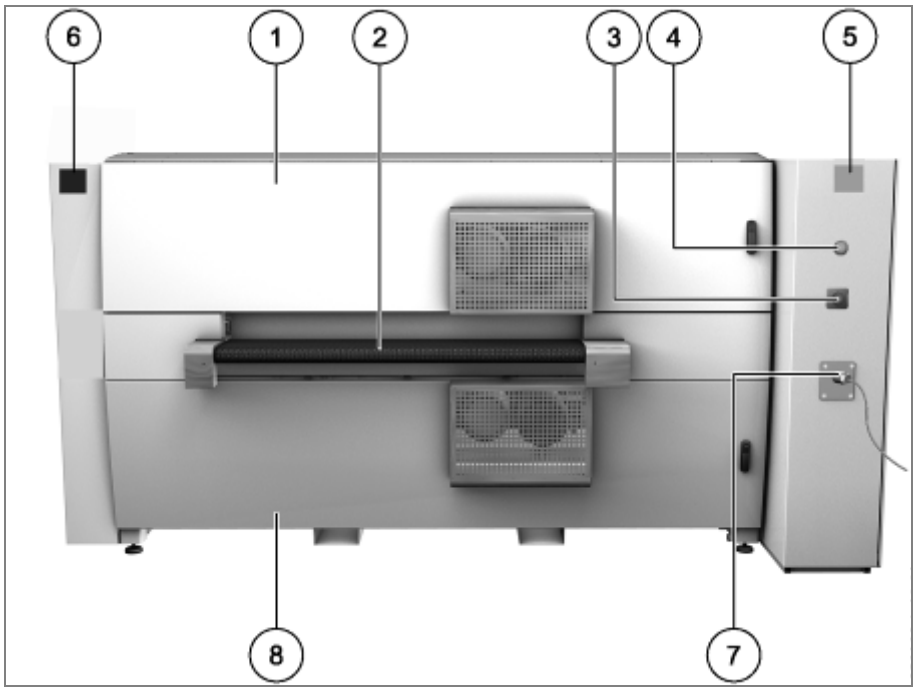


Abb. 3: Components of the machine, output side (back of SBM-M S2 ALU MIX)

1 Upper device door
2 Transport belt for workpiece outlet
3 Main switch OFF/ON for entire machine
4 EMERGENCY STOP switch for immediate shutdown of the entire machine
5 Ventilation grate on switching cabinet
6 Type plate
7 Electrical connection
8 Lower device door

3.5 Machining units

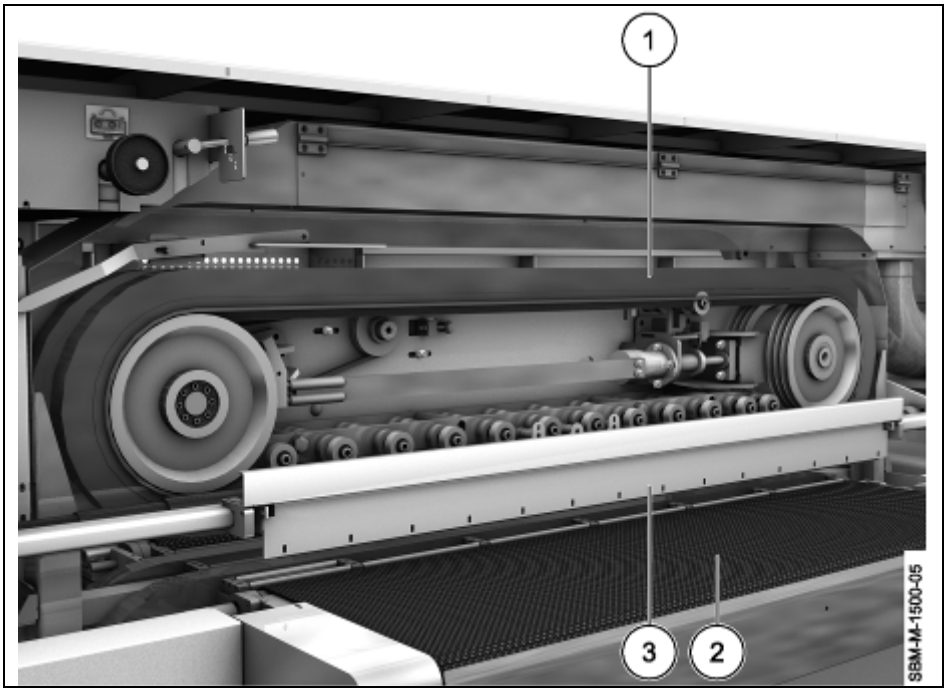


Abb. 4: Machining unit, top

1 Abrasive belt
2 Transport belt for workpiece input
3 Safety shutdown bar
(the transport belt will stop as long as it is actuated)

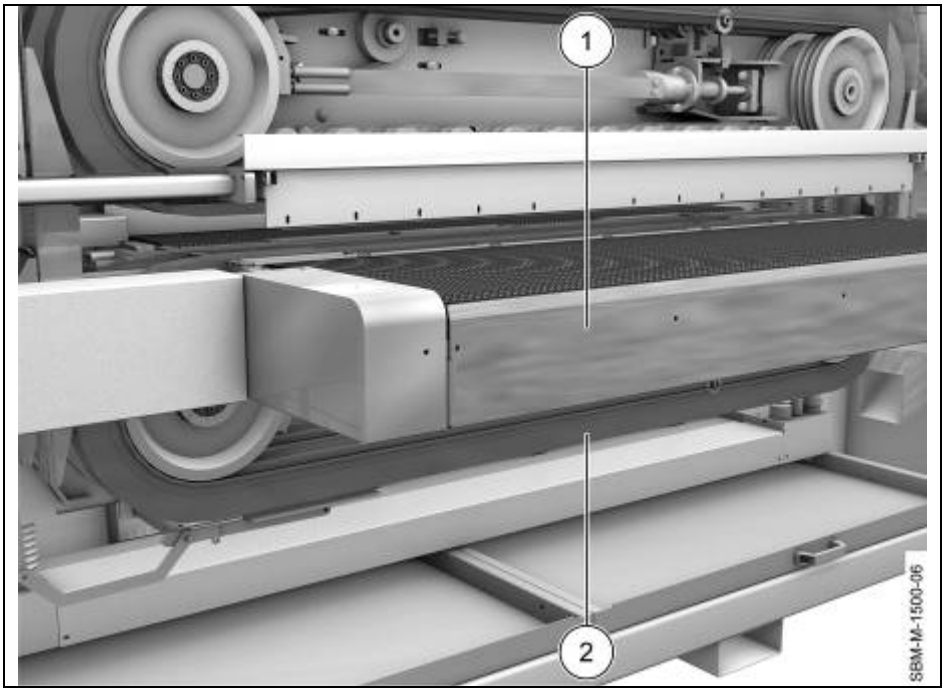


Abb. 5: Machining unit, bottom

1 Safety shutdown bar
(the transport belt will stop as long as it is actuated)
2 Abrasive belt

3.6 Control elements

3.6.1 Operating elements on the machine

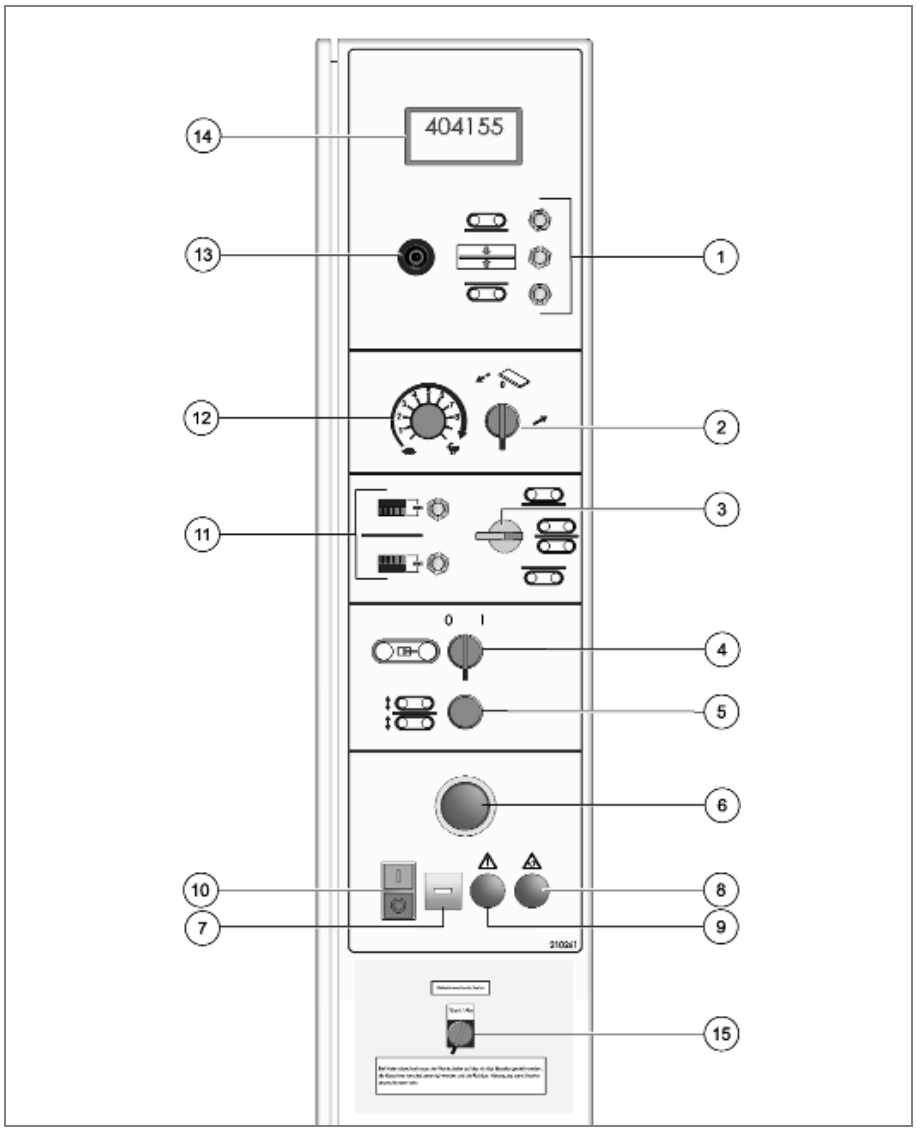


Abb. 6: Control and display elements (front side)

1 Indicator lights - Grinding units
2 Feed direction of conveyor belt for workpiece input
3 S-unit selection switch
4 Switch "Hydraulic belt tensioner, S-unit"
5 Set up machine button (Machine operation with door open)
6 EMERGENCY STOP
7 Operating hours counter
8 Indicator light: phase sequence incorrect
9 Acknowledge EMERGENCY STOP
10 All motors OFF/ON
11 Indicator lights – wear display – abrasive belt
12 Adjustment of transport belt speed
13 Joystick for moving work elements
14 Display – sheet thickness
15 Material switch for steel and aluminium machining

WARNING

Rotating parts

Injury due to rotating hand wheels.

- ➢ Do not grasp rotating hand wheels during setup.
- ➢ Secure machine against unintended start.

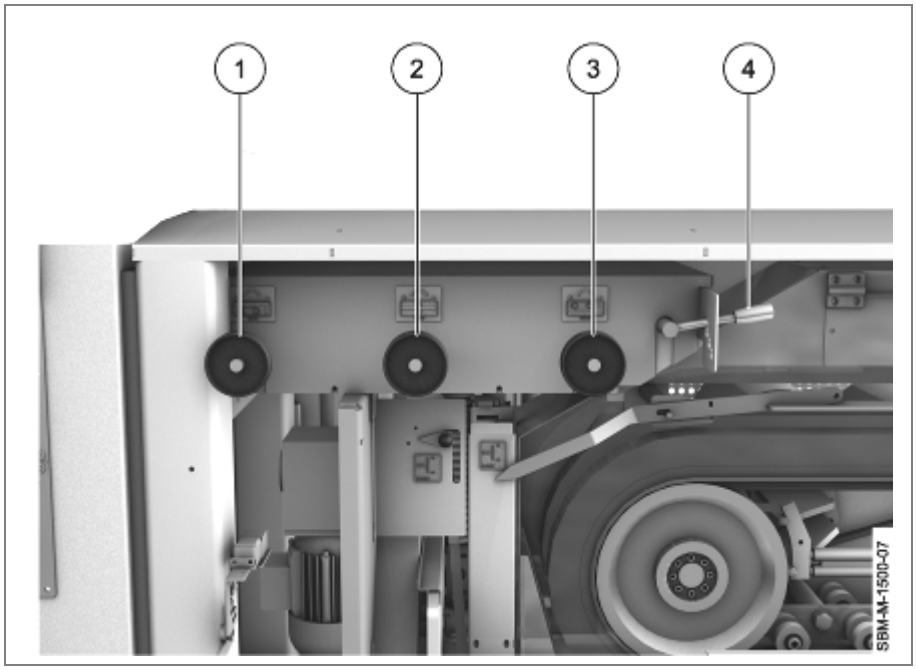


Abb. 7: Control elements of gear box (front side SBM-M 1000/1500 S2 ALU MIX)

1 Hand wheel for moving bottom S-unit
2 Hand wheel for adjusting sheet thickness.
3 Hand wheel for moving top S-unit
4 Gear selector lever

NOTE

Operating the hand wheels

Possible damages

- ➢ Before turning the hand wheels, ensure that the gear selection lever is in the respective position.
- ➢ See indicator lights – The selected unit is displayed!
- ➢ The hand wheels are intended only for emergency operation and for possible fine adjustment.

3.7 Function

There are two machining units built into the grinding machine. The two edge rounding units (1) and (4) are each equipped with two abrasive belts that travel in opposite directions. They are suitable for the edge rounding (deburring) of workpieces cut by punching, laser, or fine plasma. The grinding units are installed on both top and bottom. In this way the workpieces can be processed on both sides in one work step.

In the machine, workpieces are brought under the feed roller on the transport belt (3) and transported between the machining units.

Material thickness and positioning of machining units
The machining units can be positioned, along with the feed roller (2), using the sheet thickness adjustment. The machining units can also be positioned individually for the single-sided processing of workpieces. Each machining unit can also be positioned individually for maintenance, adjustment, and optimisation of processing.

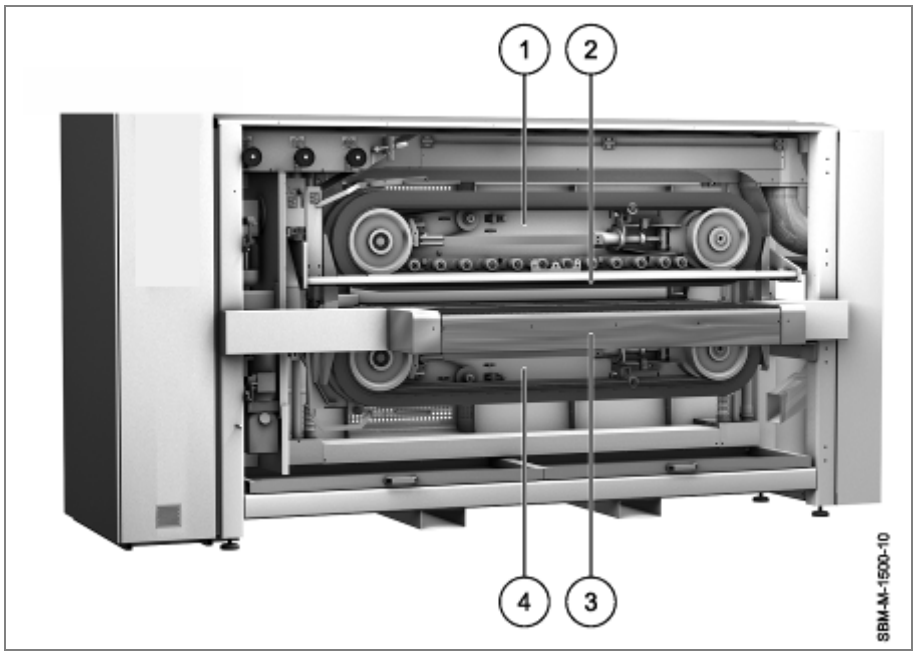


Abb. 8: Functional elements of the SBM-M 1000/1500 S2 ALU MIX

1 Upper grinding unit
2 Feed rollers
3 conveyor
4 Lower grinding unit

Abrasive belt
To exchange the abrasive belt (tool change) move the upper and lower machining units completely apart.

3.8 Safety equipment

The grinding machine has the following safety equipment:

EMERGENCY STOP switch (1) on the front and (6) on the back of the machine for the immediate shutdown of the machine in case of emergency.

The EMERGENCY STOP switches must be disengaged again after an emergency stop. To continue working with the machine, the disengagement of the EMERGENCY STOP function must be initiated with the EMERGENCY STOP acknowledgement button.

The safety shutdown bars (3) and (8) on the transport belt on the input side switch the feed (transport belt) off when touched.

The electrical contacts with magnetic holding of the interlock (2) and (4) on the front and (5) and (7) on the back of the machine hold the flaps closed and shut the machine down if the flaps are forced open.

A motor overload switch prevents overloading of the motors.

A phase circuit breaker and display prevent connection of electricity with an incorrect phase sequence.

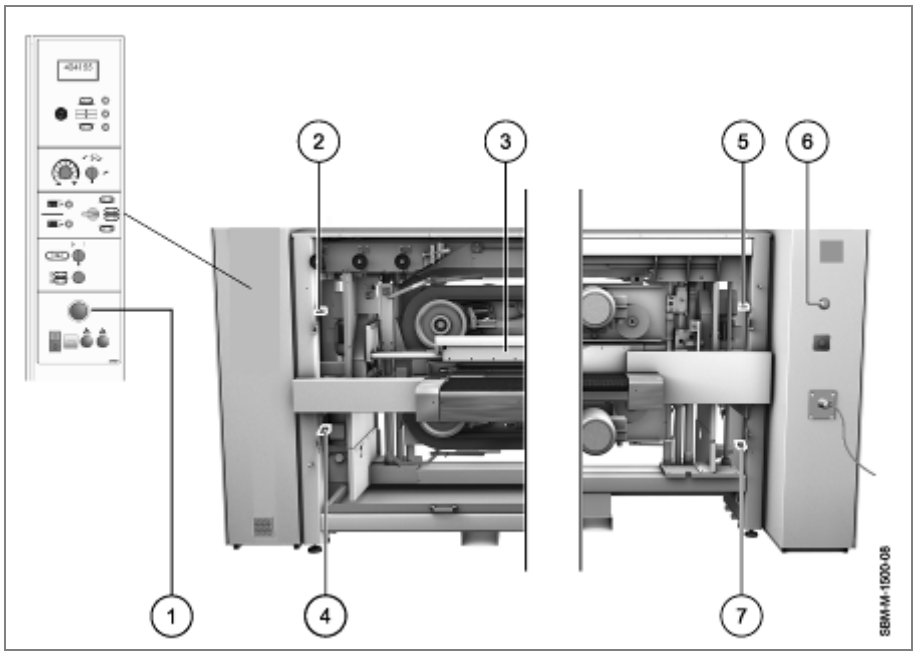


Abb. 9: Safety equipment of the grinding machine

1 EMERGENCY STOP switch
2 Electrical contacts
3 Safety switch-off bar
4 Electrical contacts
5 Electrical contacts
6 EMERGENCY STOP switch
7 Electrical contacts
8 Safety switch-off bar

4 Preparation for use

4.1 Transporting the machine

For transport of the machine by crane, there are two steel carriers fastened to the top of the machine with attachment points. To do this, it is necessary to unscrew the top cover (pos. 1), to screw in the two steel carriers (pos. 2) and to reattach the top cover (pos. 1). Both braces (pos. 3) are mounted between the steel carriers (pos. 2). For transport by forklift, there are appropriate supports (pos. 4) built in under the grinding machine (for tightening torques, see 8.3).

WARNING

Heavy loads

Injury from falling parts

- Do not stop under the lifted machine.
- Only use lifting gear and loading equipment with sufficient lifting capacity and length.

- To lift the machine, secure the lifting gear on the four attachment points (see pos. 2).
- Secure the machine by the four attachment points when transporting on a vehicle (see pos. 2).
- Insert the forks into the beams provided (pos. 4) when transporting using a forklift (maximum transport height 25 cm).

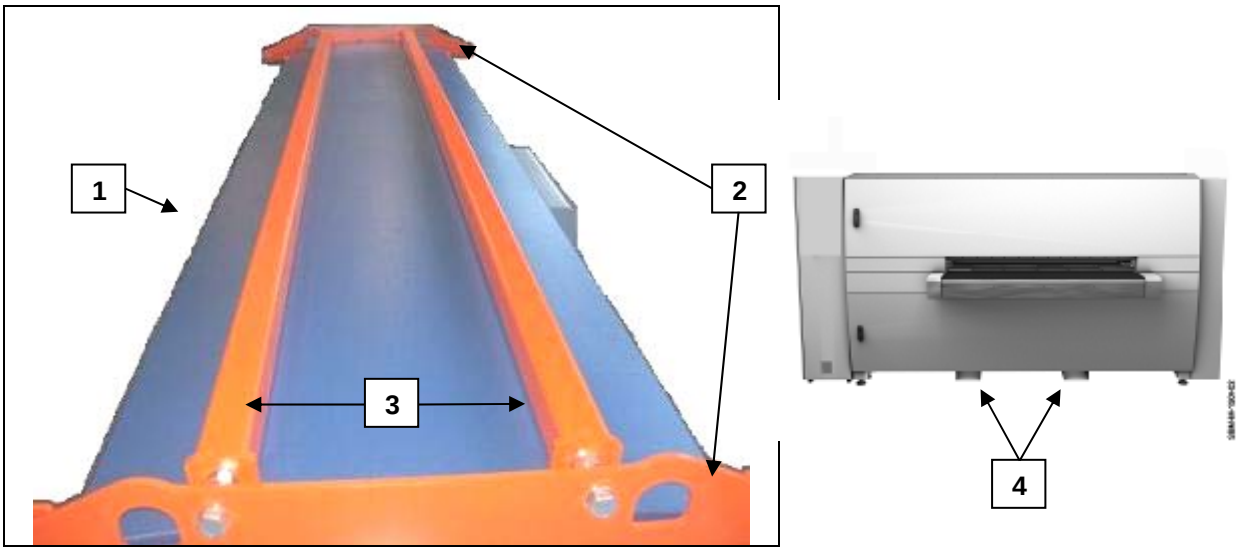


Abb. 10: Transport supports

1 Top cover
2 Steel carriers
3 Braces
4 Beams for forklift

4.2 Storing the machine

- Disconnect the electrical connection to the grinding machine.
- Thoroughly clean all grinding dust and material residue from the grinding machine.
- Clean the dust extraction shafts using an industrial vacuum cleaner.
- Completely grease the grinding machine.
- Pack the machine in plastic film for storage.
- Do not store the machine outdoors.
- Only store the machine in an indoor space with a dry environment.

4.3 Installation and assembly

4.3.1 Installing machine

WARNING

Heavy loads

Injury from falling parts

- Do not stop under the lifted machine.
- Only use lifting gear and loading equipment with sufficient lifting capacity and length.

- Fasten the lifting accessories to the four attachment points, or lift by the two supports with the forklift (see 4.1).
- Remove the packaging from the machine.
- Set up the machine on a fortified, level floor with at least 2.5 t load carrying capacity.
- Use the machine feet to level the machine in all directions.
- Remove the steel carriers again and reattach the top cover.

4.3.2 Connecting the machine electrically

DANGER

High voltage

Death or injury from electric shock

- Place the main switch on the back of the machine into the "0" position.
- Connect the machine to the power supply
- Place the main switch on the back of the machine into the "1" position.
- Disengage all "EMERGENCY STOP" buttons.
  - ↳ The machine is ready for operation.

The machine is delivered ready for connection to a right-hand power supply. A phase monitor checks the connection for the correct phase sequence. If the phase sequence is incorrect the LED "Incorrect phase sequence" lights up, and the machine cannot be turned on. If the phase sequence is incorrect, have an electrician connect the phases correctly.

5 Operation

5.1 Operation – overview

The central functions of the machine are controlled using control elements on the front of the grinding machine.

The following descriptions give an overview of the operating functions.

5.1.1 Control elements

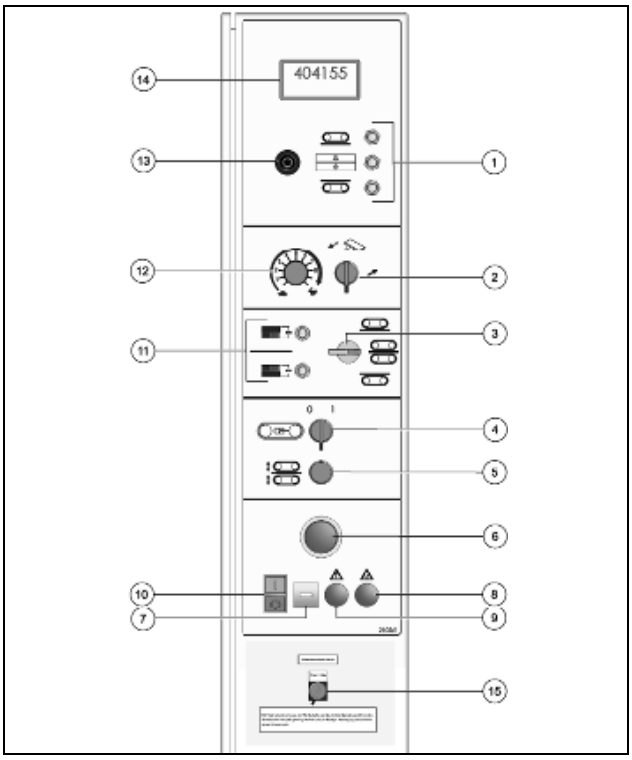


Abb. 11: Control elements

1 Indicator lights - Grinding units
2 Feed direction of conveyor belt for workpiece input
3 S-unit selection switch
4 Switch "Hydraulic belt tensioner, S-unit"
5 Set up button (Machine operation with door open)
6 EMERGENCY STOP
7 Operating hours counter
8 Indicator light: phase sequence incorrect
9 Acknowledge EMERGENCY STOP
10 All motors OFF/ON
11 Indicator lights – wear display – abrasive belt
12 Joystick for moving work elements
13 Adjustment of transport belt speed
14 Display – sheet thickness
15 Material switch for steel and aluminium machining

The control elements shown here are used to control and operate most of the functions of this grinding machine.

The functions are described below.

5.2 Operation

5.2.1 S-unit selection switch

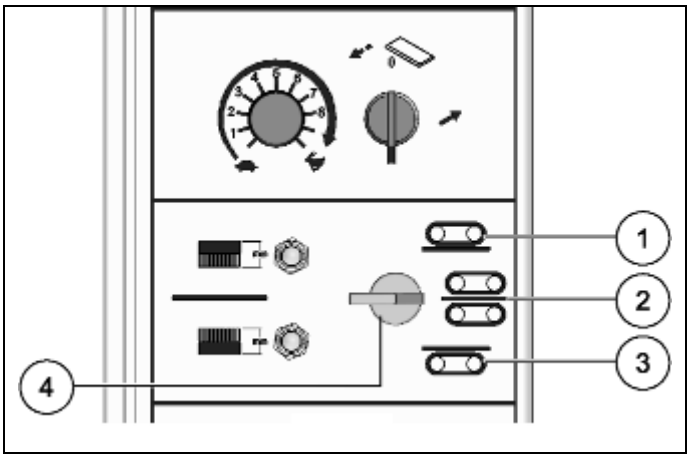


Abb. 12: S-unit selection switch

1 S-unit top
2 Both S-units
3 S-unit bottom
4 selection switch

The S-unit selection switch (4) can be used to select a specific S-unit.

Position (1): Here, the upper S-unit is selected.
Position (2): In this position, both S-units are selected.
Position (3): Here, the lower S-unit is selected.

The S-units can be moved independently of the position of the selection switch using the joystick (5.2.5).

The units selected with the selection switch are started/stopped using the ON/OFF switch of the machine.

NOTE

S unit or S units not needed

Damage to the tool and the workpiece

➢ If a unit is unselected, it must absolutely be ensured that this is manually moved away, otherwise the workpiece will run into the stopped tool.

5.2.2 Wear display

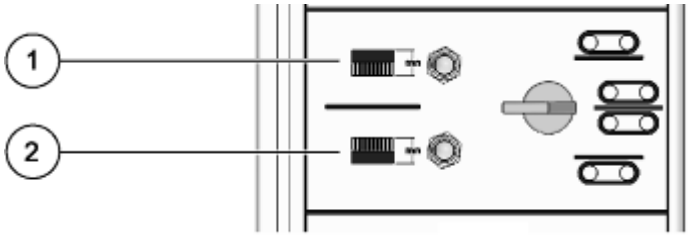


Abb. 13: Wear display

1 Wear display on top S-unit
2 Wear display on bottom S-unit

The abrasive belts must be replaced at least when the upper (1) or lower (2) wear display on the S-units lights up (see Chapter 6).

Brush units can no longer be advanced.

5.2.3 Transport belt speed and direction

The grinding results of the machining units depend among other things on the feed speed of the transport belts.

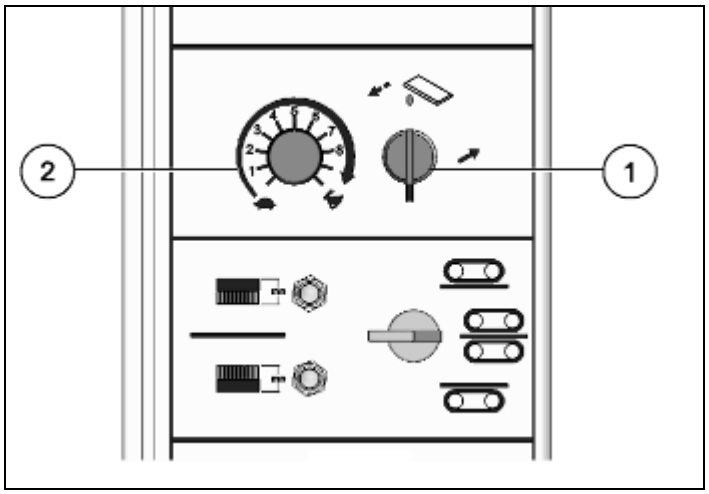


Abb. 14: Transport belt speed and direction

1 Transport belt direction selection switch
2 Transport belt speed rotary switch

- Select the transport belt direction on selection switch (1).
- Adjust the feed speed on the transport belt speed rotary switch (2).

5.2.4 Hydraulic belt tensioner

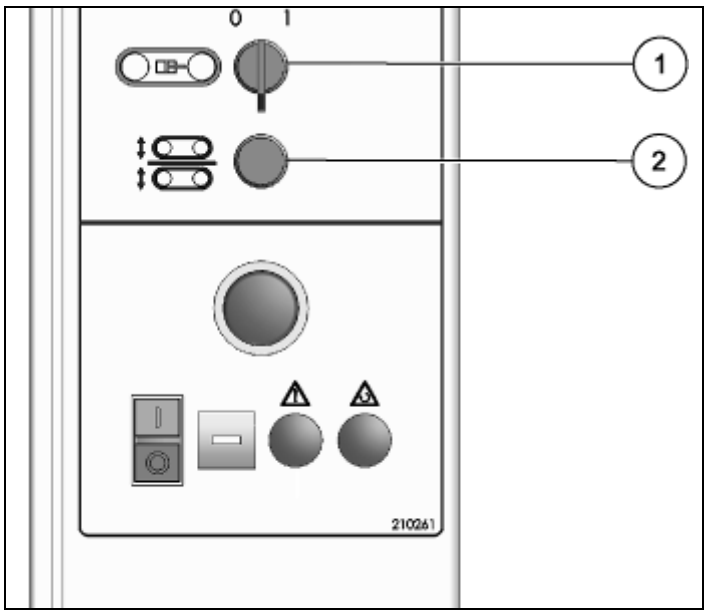


Abb. 15: Hydraulic belt tensioner

1 Rotary switch for hydraulic belt tensioner
2 "Machine setup" button

The belt tensioner of the S-unit can be operated with the button (1), and the belt will then automatically be correctly tensioned (see 6.2.1 and 6.2.3).

5.2.5 S-unit gear selection lever

When selecting the individual levels, the indicator lights on the grinding units (on the operating part) switch to the function belonging to that gear.

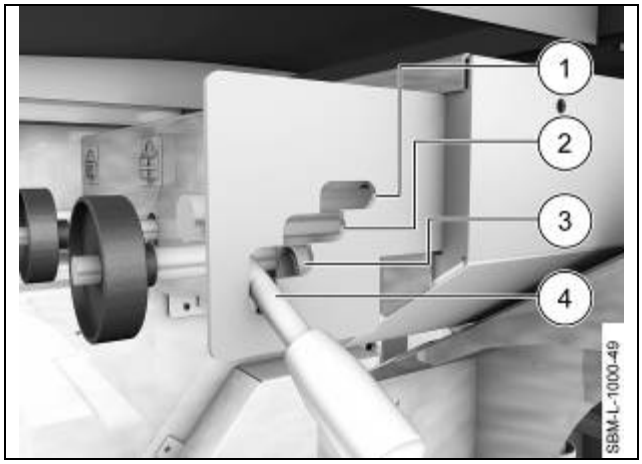


Abb. 16: Gear selector lever

1 S-unit bottom
2 S-unit top and bottom together
3 S-unit top
4 Operational position / sheet thickness

Here, the functions of the S-unit can be mechanically preselected. The selected functions are shown in the grinding unit indicator lights on the control panel and can be moved with the joystick.

Position (4) is the operating position and also the delivery state.

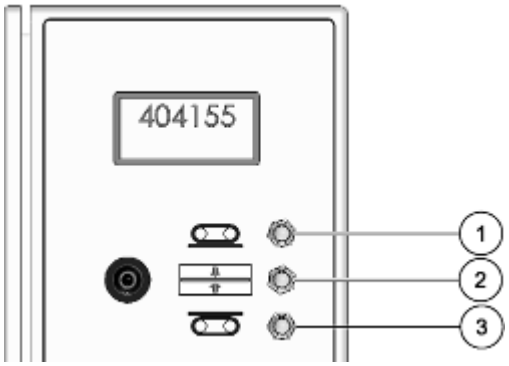


Abb. 17: Display gear selection lever

Gear selection lever position 1 → Indicator light (3) is illuminated

Gear selection lever position 2→ Indicator lights (1) and (3) light up

Gear selection lever position 3 → Indicator light (1) is illuminated

Gear selection lever position 4→ Indicator lights (1) and (2) light up

The S-units can be moved with the joystick, depending on the position of the gear selection lever.

The grinding unit indicator lights only show that the S-units can be moved.

The correct position of the abrasive belts must be determined using the wear display. (see Chapter 6.2)

5.2.6 Setting sheet thickness

Before processing, the sheet thickness of the workpieces must be measured and adjusted on the machine.

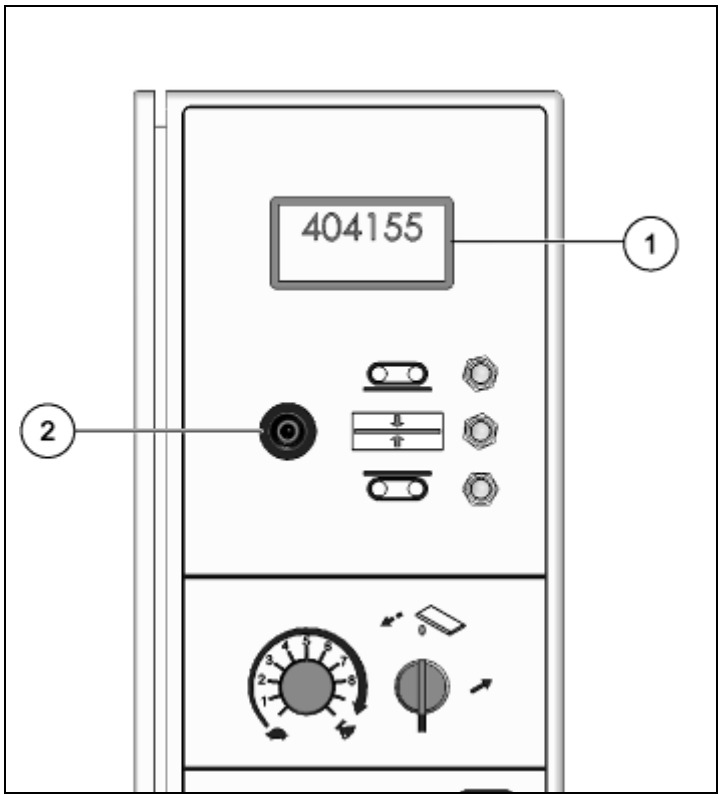


Abb. 18: Setting sheet thickness

1 Display
2 Joystick

NOTE

Workpieces remaining in the machine

Damage to the machine.

- Ensure that no workpieces are in the machine.
- The sheet thickness cannot be set correctly.

- Move the gear selection lever to the lowest position (see 5.2.5).
  ↳ The sheet thickness information is shown in the display (1).
- Adjust the sheet thickness to the measured value using the joystick (2). During operation of the joystick, hold the Set up machine button down (see 3.6.1) (with door open).

5.2.7 Turn on motors in the grinding units

Before turning on the motors, the following conditions must be checked:

- Acceptance of the workpieces at the output side of the machine is ensured.
- Contamination such as material residue and dust deposits are removed.
- All abrasive belts are checked for damage (visual inspection).
- Place the main switch on the back of the machine into the "1" position.
- Make sure that all malfunctions are corrected.
- Be sure that both EMERGENCY STOP switches are disengaged.

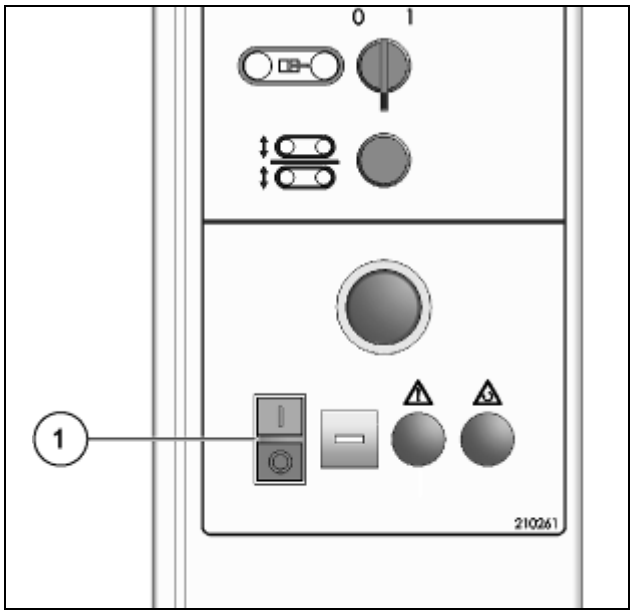


Abb. 19: Turn on motors

1 ON/OFF switch

Turn on the motor with the ON/OFF switch (selected grinding units and transport belt are started).

Before grinding can begin, the following pre-requisites must be met:

- The plate thickness of the workpiece is measured and set on the machine (see Chapter 5.2.6).
- Feed speed is set (see Chapter 5.2.3).
- Top and bottom machining units are correctly positioned.

5.3 Processing material

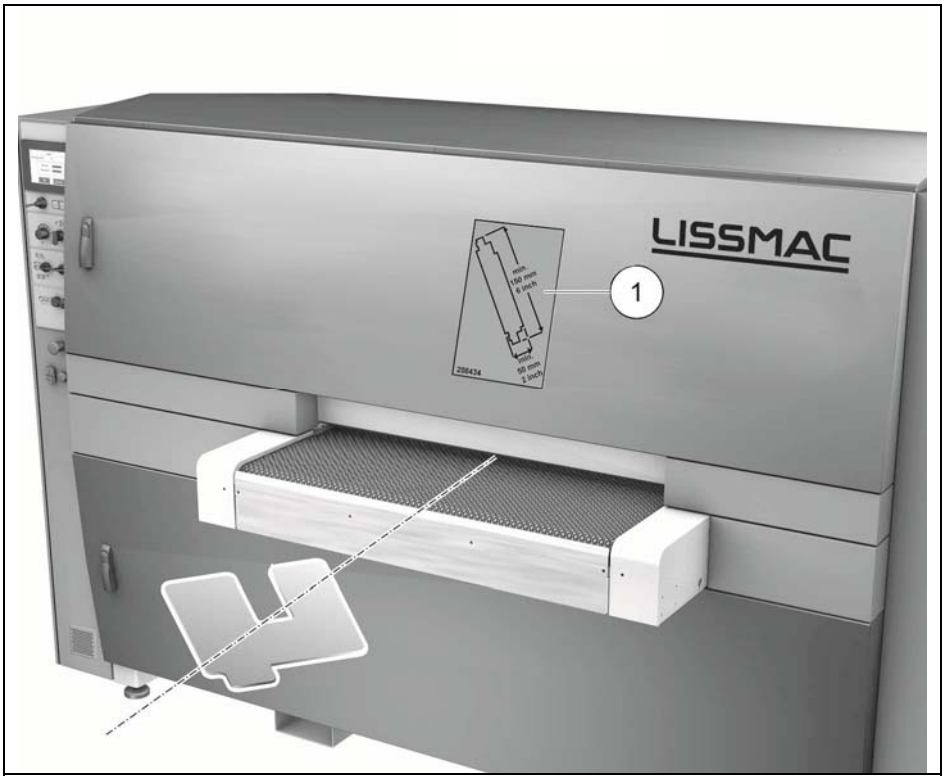


Abb. 20: Processing material

1 Pictogram on the machine

➢ Place sheets onto the conveyor belt as shown.

To achieve even edge rounding, the sheets should be placed diagonally to the abrasive belt.

NOTE

Minimum dimensions of the workpiece

Damage to the machine, the workpiece

➢ The minimum dimensions of a workpiece are 150x50x0.5 mm.

➢ It must be ensured with short workpieces that the passage length is at least 150 mm. Place short workpieces parallel to the conveyor belt if necessary.

5.4 Connecting the extractor

⚠ WARNING

In a mixture of aluminium and steel dust, explosive gas can be produced from corrosion.

For each material change, the machine

- must be cleaned completely
- Fixed piping must be exchanged
- Remaining dust deposits must be removed from pipes

Not intended use especially includes the machining of composite materials in which both aluminium and steel dust are simultaneously generated.

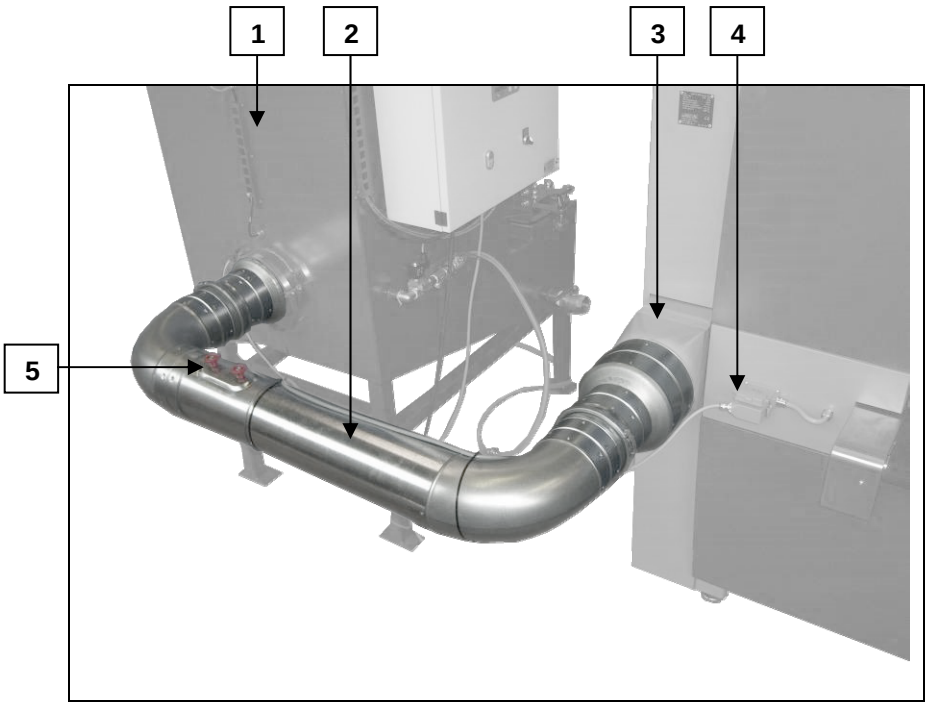


Abb. 21: Connecting the wet separator

1 Dust extraction
2 Fixed pipes for aluminium and steel processing
3 Suction nozzles
4 Connector plugs

- Fixed piping for aluminium or steel processing is to be connected (pos. 2) to the extraction supports (pos. 3) of the machine.
- Insert the connection plug (pos. 4)
- The machine detects the material to be processed via the connection plug (pos. 4).

➢ Place the material switch (also see 3.6 Operating elements on the machine) on the front side of the machine to aluminium or steel.
  ↳ The cleaning interval of the machine is set automatically.
  ↳ The indicator lamp (see 3.4 Grinding machine assembly) for aluminium or steel must be illuminated.

The material switch setting and fixed piping must match otherwise there is a mode conflict.
  ↳ The material switch and the fixed piping are not matched to each another.

5.4.1 "Fault" lamp (see 3.4 Grinding machine structure) lights

➢ The material switch and the extraction system are not connected to one another.

5.5 Switching machining material

➢ Switch off the main switch (see 3.4).
➢ Remove the fixed piping and plug in the connection plug for dust extraction.
➢ Remove all dust and metal residue from the plumbing, machine interior and suction nozzles.

Danger of explosion / fire!
In a mixture of aluminium and steel dust, explosive gas can be produced from corrosion, so this cleaning is of utmost importance.

➢ Switch on the main switch (see 3.4) again

5.6 Changing abrasives

WARNING

Accidental starting of the grinding motors during replacement of abrasives

Severe injuries due to rotating abrasive belts.

- Turn off the main switch each time the S-unit is moved.
- Only entrust the work to authorized personnel.

5.7 Replacing S-unit abrasive belt

5.7.1 Preparing to replace the abrasive belt

The abrasive belts on the S-unit differ according to the material to be processed.

The abrasive belts have opposite operating directions in both the upper and the lower S-unit.

Since the abrasive belts depend on the operating direction, the direction of the abrasive belts must be logged.

NOTE

To prevent damage to the abrasive belts, the operating direction for the S-units (top or bottom) must be logged.

5.8 Measuring wear / setting wear display to "zero".

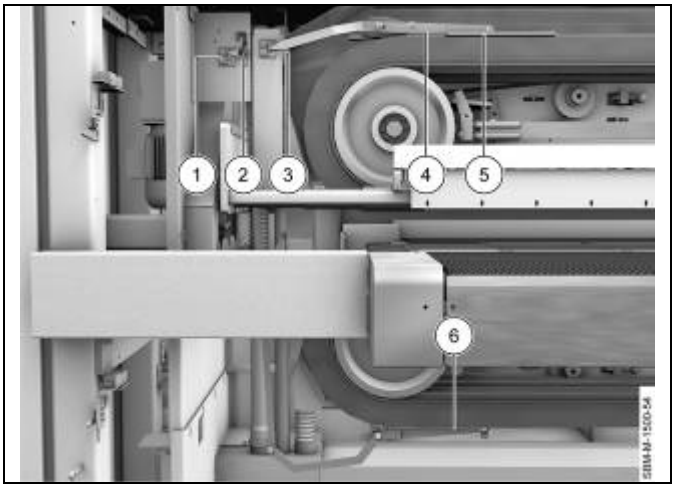


Abb. 22: Mechanical wear display

1 Wear display on bottom S-unit
2 Hand lever to apply display of lower wear measurement
3 Wear display on top S-unit
4 Lever for wear display
5 Base plate for upper abrasive belt
6 Base plate for lower abrasive belt

Both abrasive belts can be measured independently of one another.

Measuring the wear on the upper abrasive belt

- To measure the upper abrasive belts, lift the lever (4) out of its interlock and pull it back.
- Place the base plate (5) onto the abrasive belt.
- Read the wear on the wear display (3).
- Bring the lever (4) back into initial position.

Measuring the wear on the lower abrasive belt

- To measure the lower abrasive belts, left the lever (2) out of its interlock and move it downwards until the base plate (6) is on the abrasive belt.
- Read the wear on the wear display (1).
- Bring the lever (2) back into initial position.

Setting wear display to "zero".

- To set the wear display to "zero", proceed as with the respective wear measurement (up to reading wear display).
- Set gear selection lever to upper or lower S unit (5.2.5).
- Hold the Set up machine button down and move the S-unit with the joystick until the wear display shows zero.
- Bring lever (2) or lever (4) into the initial position.

- After the wear measurement the "Acknowledge EMERGENCY STOP" switch on the control panel must be activated (see 3.6.1 Control elements on the machine), otherwise the motors of the grinding units do not start.
- Setting to “zero” is used for a rough orientation; the fine adjustment is determined either via the workpiece or the test plate, as desired.

5.8.1 Releasing/removing the tension on the S-unit abrasive belt

The abrasive belts in the S-units are hydraulically released/tensioned; actuation is carried out from the operating unit.

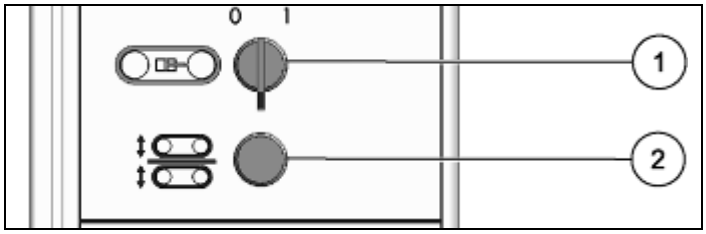


Abb. 23: Hydraulic belt tensioner

1 Rotary switch for hydraulic belt tensioner
2 "Machine setup" button

- Move the S-units entirely apart, setting the gear selection lever (see 5.2.5) on the upper S-unit. With the doors open, press and hold the Set up machine button (2) and move the S-unit with the joystick. Place the gear selection lever to the lower S-unit, and repeat steps.
- Switch the hydraulic belt tensioner (1) from Position "1" (belt is tensioned, switch lights up), move it to position "0", and release the S-unit (lighting of switch goes out).

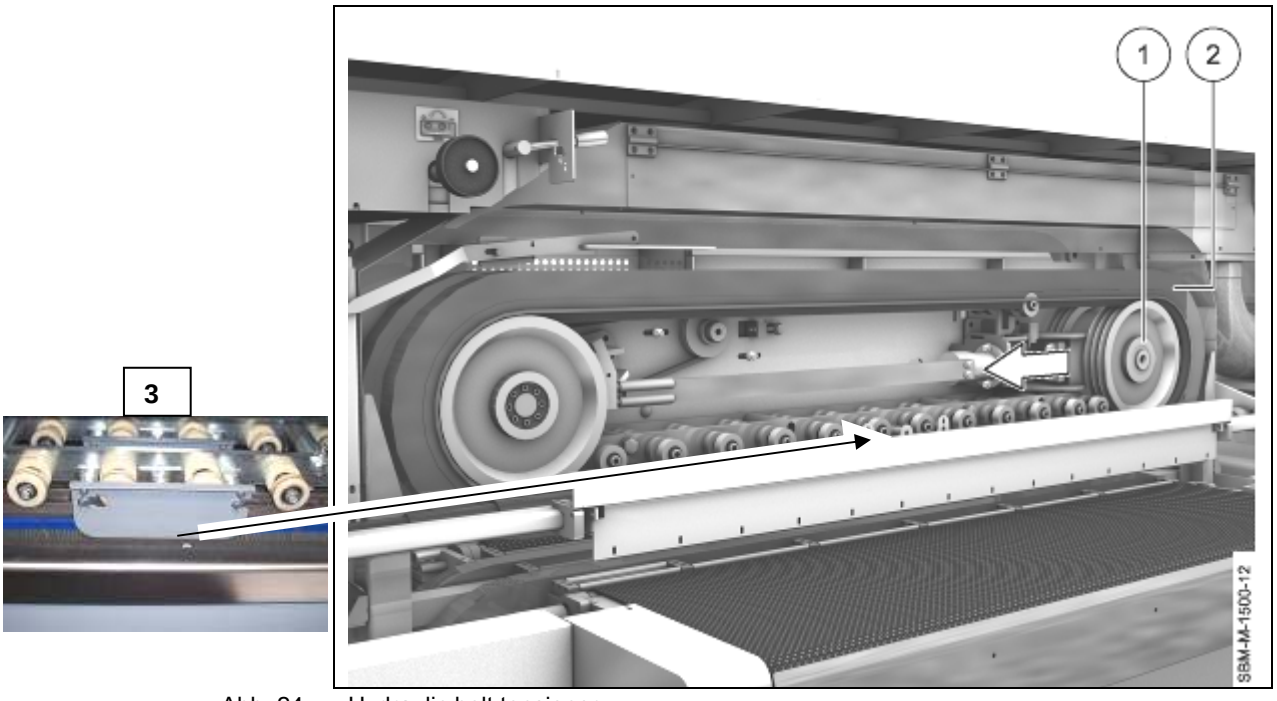


Abb. 24: Hydraulic belt tensioner

1 Tensioning unit
2 Abrasive belt
3 Belt guide

↳ Move tensioning unit (1) back.

- For the SBM-M 1000+ 1500 S2 ALU MIX, remove two belt guides (3) on the upper S-unit (loosen screws and remove belt guide by pushing it).
- Remove the abrasive belt (2) from the pulley.

5.8.2 Place the abrasive belt on the S-unit

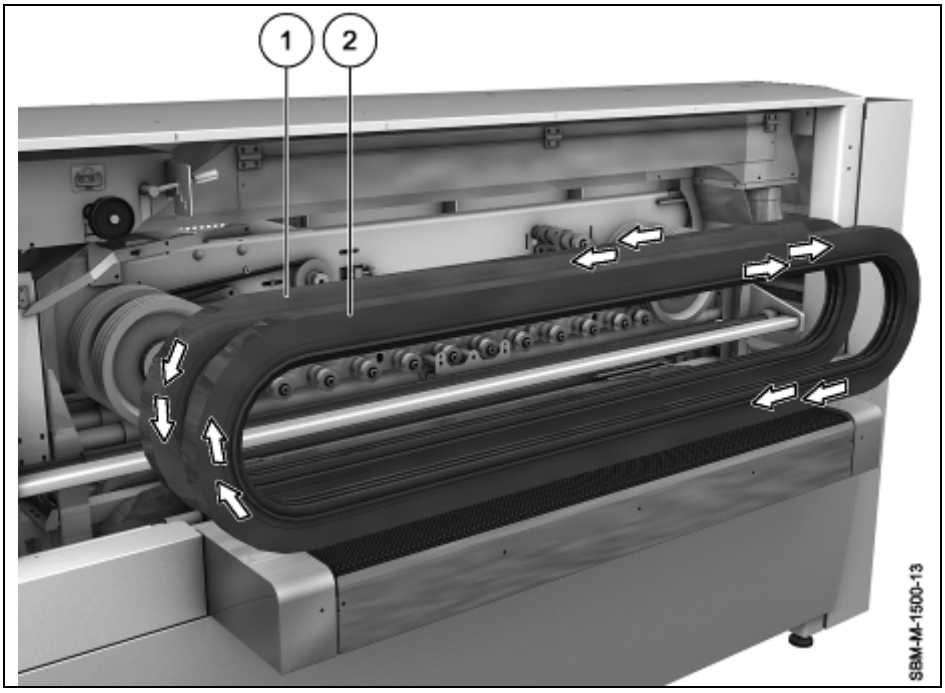


Abb. 25: Abrasive belt

1 Back abrasive belts
2 Front abrasive belt

- Replace the abrasive belts onto the pulleys according to their labels (S-unit, position, and operating direction).
- After replacing a grinding belt, always adjust the S-unit so that the wear display is on "Zero" (6.2).

5.8.3 Tensioning the S-unit abrasive belt

The hydraulic belt tensioner has an automatic shutoff using an end switch. This ensures that the abrasive belts are always correctly tensioned.

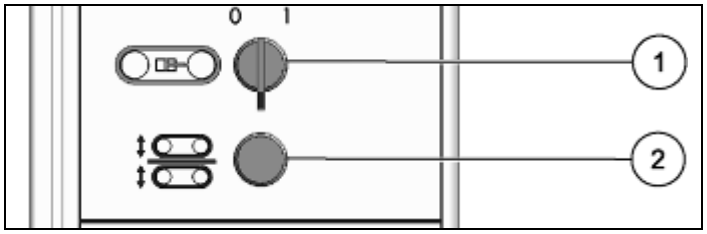


Abb. 26: Hydraulic belt tensioner

1 Rotary switch for hydraulic belt tensioner
2 "Machine setup" button

- Remount 2 belt guides on the upper S-unit (see 6.2.1, Fig. 23)
- Switch the hydraulic belt tensioner (1) from Position "0" (belt released, switch is not illuminated), move it to position "1", and tension the S-unit (switch is illuminated).

The hydraulic tensioning unit ensures that the abrasive belt is always correctly tensioned and need not be adjusted.

6 Service/Repair

6.1 Replacing S-unit drive belts

To be able to replace the V-belts on the inner side of the S-units, the abrasive belts must first be removed; see Chapter 6.2.

6.1.1 Remove support bar

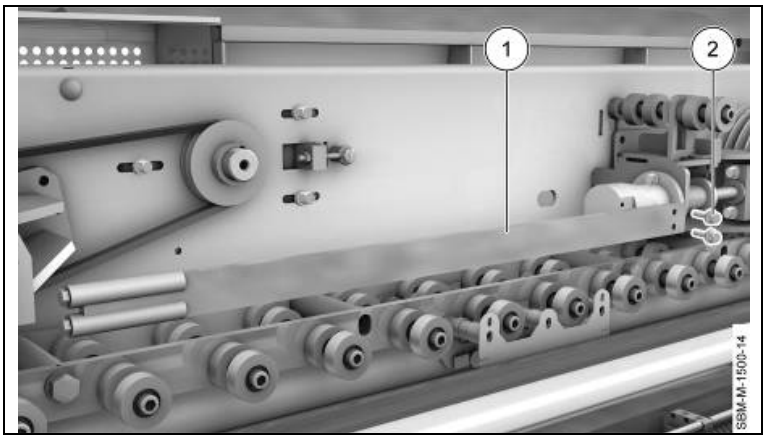


Abb. 27: Remove support bar

1 Support bar
2 Screw fasteners

- Unscrew the screw fasteners (2).
- Remove the support bar (1).

6.1.2 Removing the V-belts

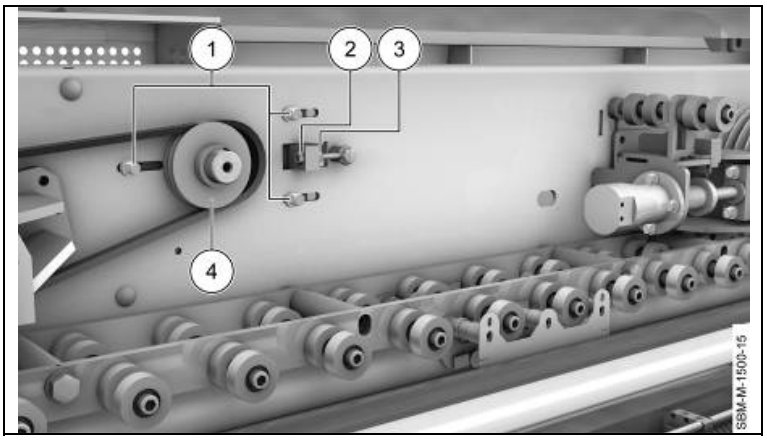


Abb. 28: Removing the V-belts

1 Drive motor screw fasteners
2 Counter nut
3 Counter nut
4 Drive motor V-belt pulley

- Loosen screw fasteners (1), but do not remove.
- Loosen counter nut (2) and move back a good distance.
- Use counter nut (3) to push the belt pulleys (4) and drive motor back.
- Remove the V-belt.

6.1.3 Installing the V-belt

NOTE

Always replace the V-belts in pairs.

If V-belts are replaced individually, secure drive is no longer possible.

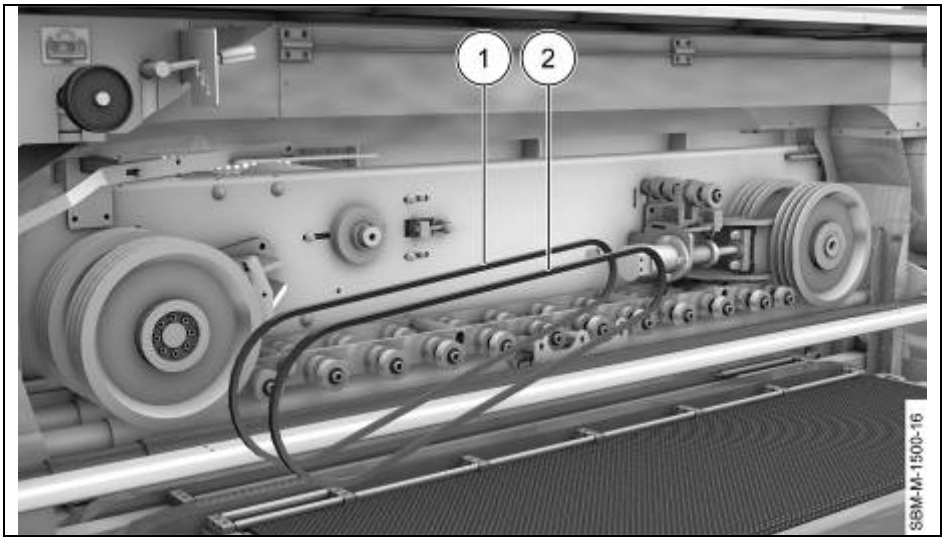


Abb. 29: Installing the V-belt

1 Inner V-belt
2 Outer V-belt

➢ Place both V-belts (1) and (2) onto the pulley.

6.1.4 Tensioning the V-belts

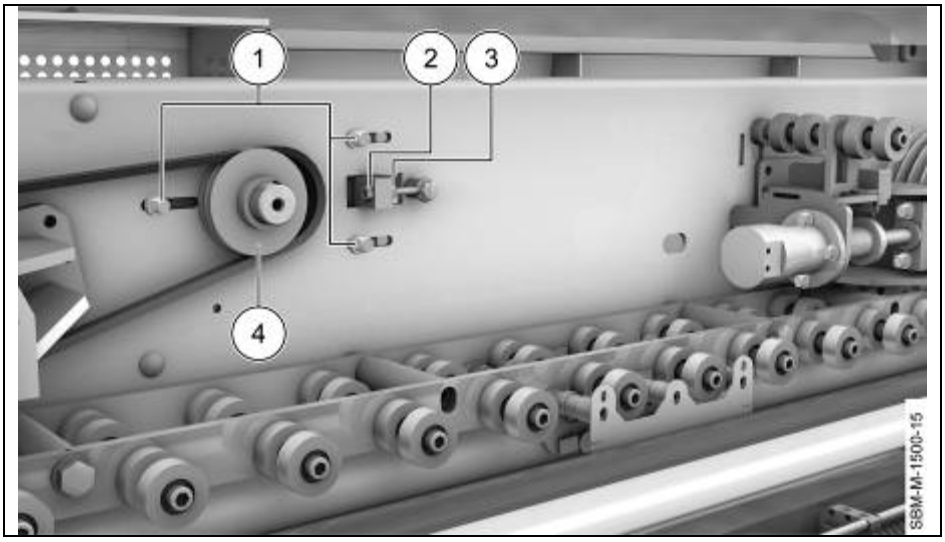


Abb. 30: Tensioning the V-belts

1 Drive motor screw fasteners
2 Counter nut
3 Counter nut
4 Drive motor V-belt pulley

- Turn counter nut (3) all the way back.
- Use counter nut (2) to tension the drive motor V-belt pulley (4) until the V-belt can still be pushed in about 1 cm on its longest segment. Counter the counter nuts.
- Tighten the screw fasteners (1) with the tightening torque (see Chapter 7.3).

6.1.5 Installing the support bar

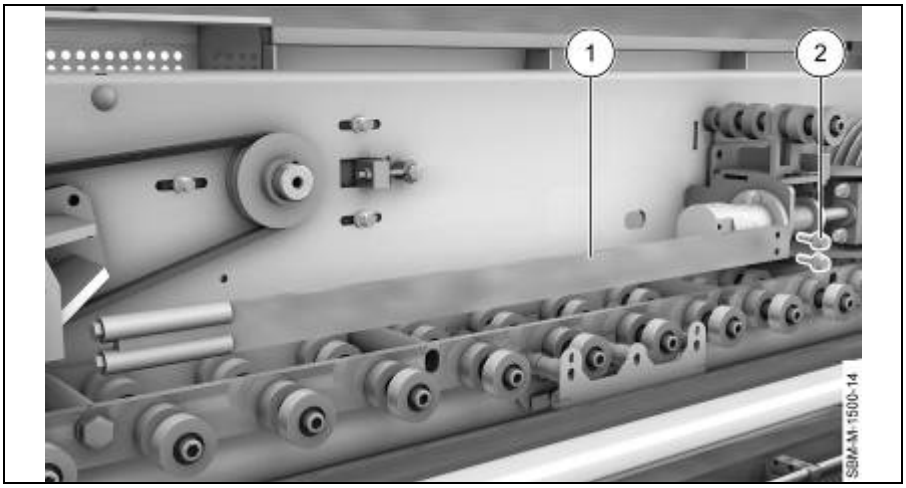


Abb. 31: Installing the support bar

1 Support bar
2 Screw fasteners

- Place the support bar (1) between the hydraulic belt tensioner and the belt pulley bracket.
- Tighten the screw fasteners (2) with the tightening torque (see Chapter 7.3).

6.1.6 Replacing the V-belt on the back of the S-unit

NOTE

Always replace the V-belts in pairs.

If V-belts are replaced individually, secure drive is no longer possible.

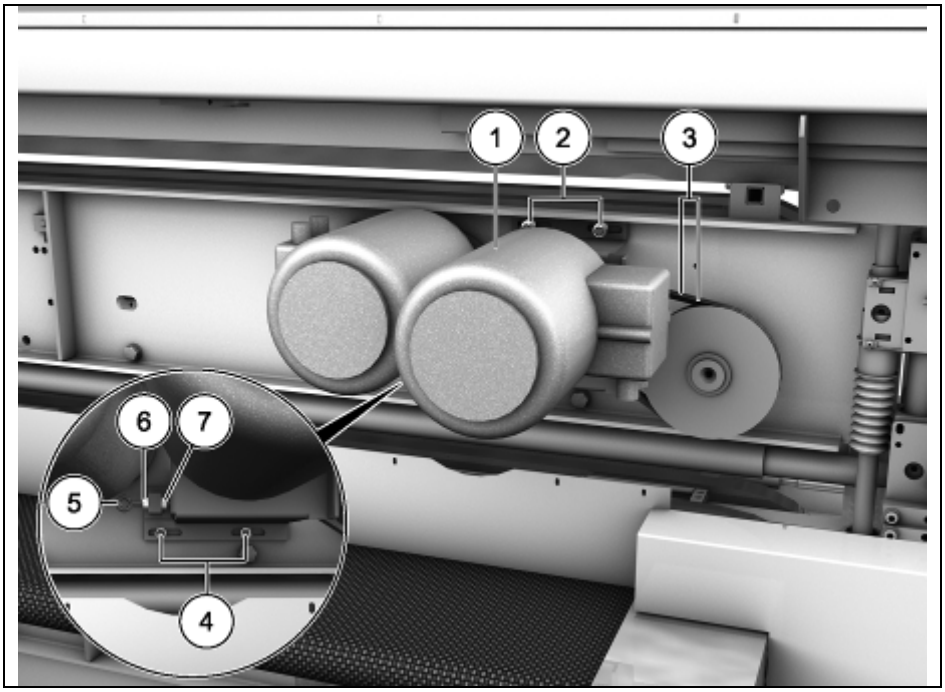


Abb. 32: Outer V-belt

1 Drive motor
2 Fastening nuts
3 V-belts
4 Fastening nuts
5 Tensioning screw
6 Counter nut
7 Counter nut

- Loosen fastening nuts (2) and (4).
- Loosen counter nuts (7) and turn back.
- Use counter nut (6) to turn the drive motor (1) back and release the tension on the V-belt (3).
- Remove the V-belt (3).

6.1.7 Tensioning the V-belt on the back of the S-unit

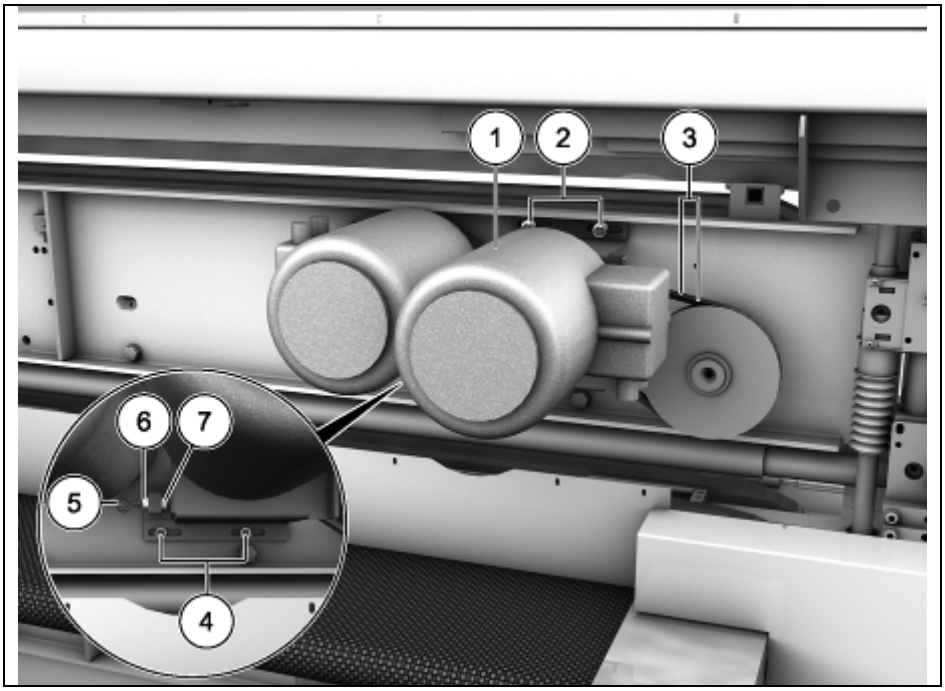


Abb. 33: Tensioning the V-belts

1 Drive motor
2 Fastening nuts
3 V-belts
4 Fastening nuts
5 Tensioning screw
6 Counter nut
7 Counter nut

- Put new V-belt (3) into place.
- Turn counter nut (6) back.
- Use counter nut (7) to tension the drive motor (1) until the V-belt (3) can still be pushed in about 1 cm on its longest segment. Counter the counter nuts.
- Tighten fastening nuts (2) and (4) with the tightening torque (see Chapter 7.3).

6.2 Lubrication points/ Hydraulic oil

6.2.1 Lubrication points, left rear

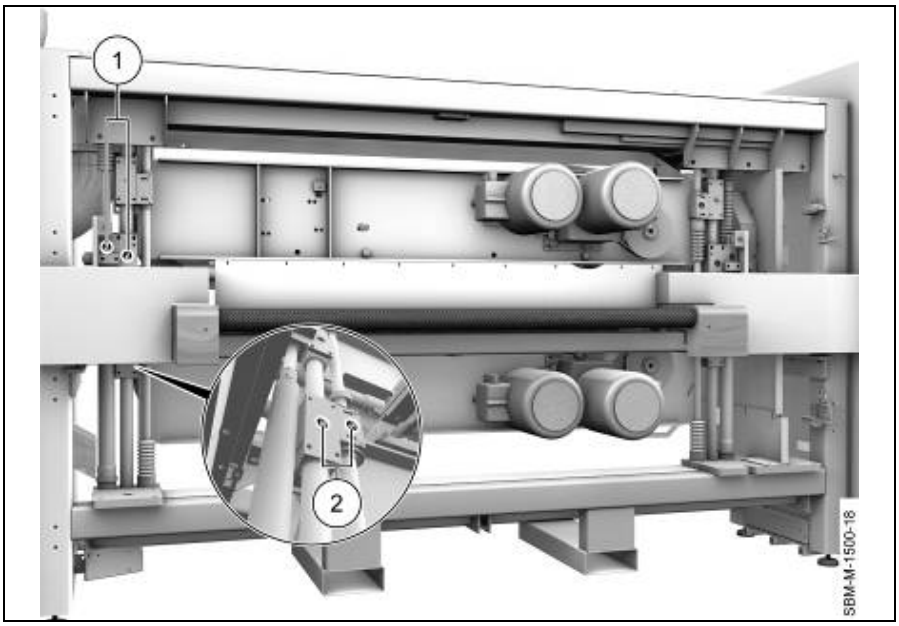


Abb. 34: Left guide shaft lubrication point

1 Upper left lubrication points (4x)
2 Lower left lubrication points (2x)

➢ Lubrication points (1) and (2) according to the service schedule.

6.2.2 Lubrication points, right rear

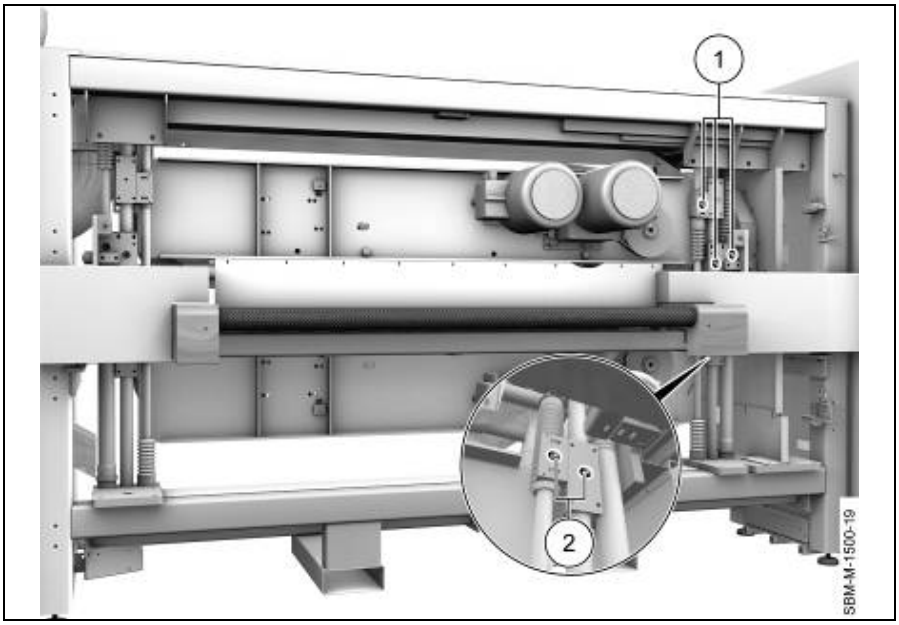


Abb. 35: Right guide shaft lubrication points

1 Upper right lubrication points (4x)
2 Lower right lubrication points (2x)

➢ Lubrication points (1) and (2) according to the service schedule.

6.2.3 Lubricating the flanged bearing of the S-unit

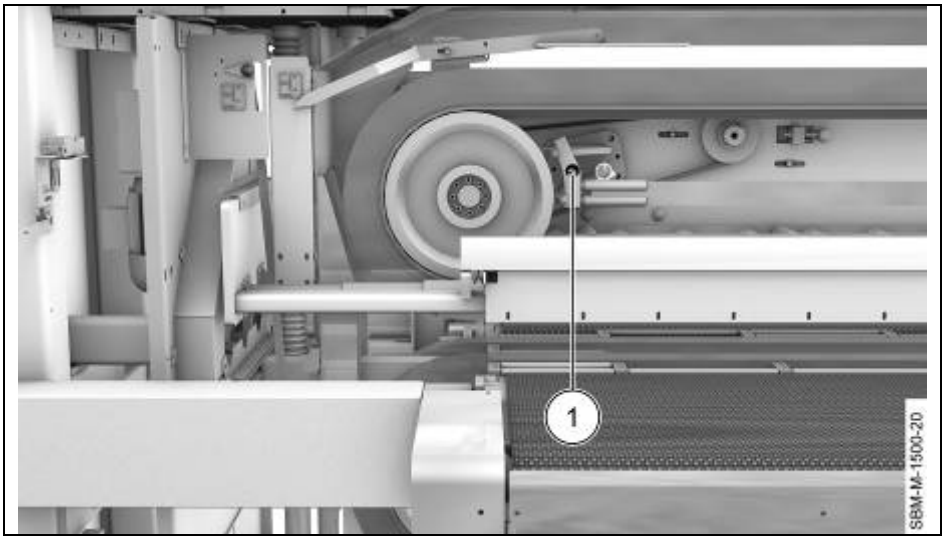


Abb. 36: Lubricating the flanged bearing

1 Lubrication nipple

- Lubricate the lubrication nipple (1) of the flanged bearing.
- Lubrication nipple (1) is also installed for lower S-unit.

6.2.4 Check hydraulic oil level

NOTE

If the hydraulic oil level is too low, the hydraulic belt tensioner for the S-unit cannot work correctly, and belt tension is not assured.

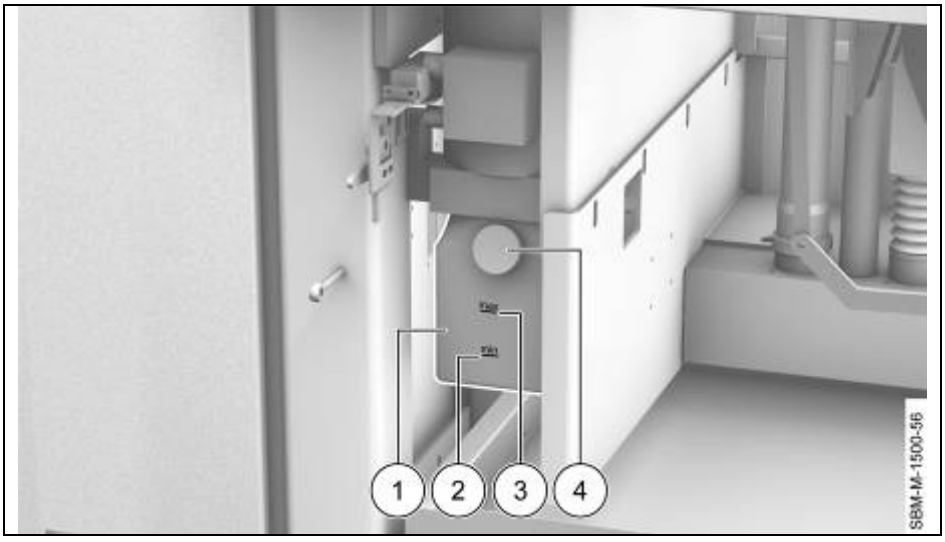


Abb. 37: Hydraulic oil level

1 Hydraulic oil container
2 Minimum mark
3 Maximum mark
4 Filling cap

- Check hydraulic oil level, fill if necessary.
- Replace hydraulic oil; see service schedule.

6.3 Cleaning

WARNING

Accidental starting of the grinding motors during cleaning

Severe injuries due to rotating abrasive belts

- Disconnect electrical power to the machine; turn off main switch.
- Only entrust the work to authorized personnel.
- Do not use compressed air

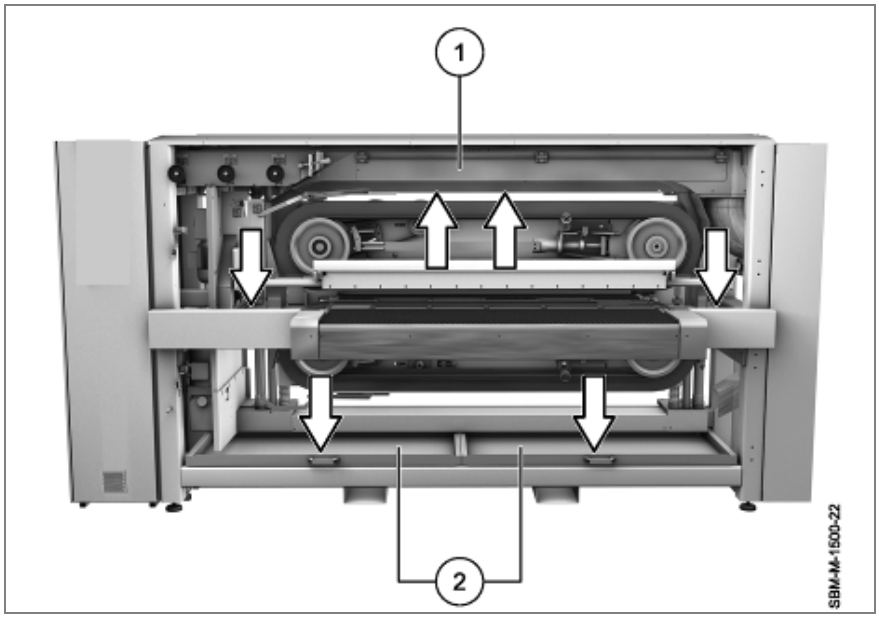


Abb. 38: Catch boxes and dust extraction shaft

1 Cleaning flap
2 Catch boxes

- Turn off main switches of machine and extractor.
- Open the doors on the front and back.
- Open cleaning flap (1)
- The grinding dust may not come into contact with ignition sources.

Clean the interior and suction pipes completely

- Remove all dust deposits and other residues (work pieces, tool wear, sheet metal auxiliary materials, etc.) from the interior of the entire machine.
- Also look in hidden corners and angles.
- For convenience use an industrial vacuum for this cleaning.
- Clean both dust boxes (pos. 2) on the grinding machine, as well as the suction pipes for extraction.
- Close doors again

Grinding dust and material residue must be disposed of in accordance with applicable country-specific law.

6.4 Cleaning interval

Machining of aluminium	The machine must be cleaned completely every eight hours (see 6.3)
When machining aluminium, the colour of the catch boxes can no longer be seen	The machine must be cleaned completely (siehe 6.3)
Material switch from steel (stainless steel) to aluminium or vice versa	The machine must be cleaned completely (siehe 6.3) Switching the suction pipes of the machine fo extraction

These daily cleaning tasks and cleaning after material changes on the machine must be logged in writing in the cleaning log.

Work instructions must ensure that after changes to operational parameters, such as higher throughput, the cleaning intervals must be adapted.

7 Service

7.1 Service intervals

The following service work must be performed regularly in the specified intervals.

The intervals are shortened corresponding to multiple-shift operation.

Service work	Interval
Clean interior of the machine and dust collection box (see 6.3 and 6.4)	daily/once per shift each 8 hrs.
Lubricate the lubrication nipple of the flanged bearing (see 6.2.3)	every 100 hrs.
Clean filter mats (switching cabinet)	weekly
Check drive belts and deflection rollers for wear	daily/once per shift each 8 hrs.
Lubricating the spindle threads for the height adjustment	every 250 hrs.
Tensioning and lubricating the chains	every 1500 hrs.
Check fan belt tension	every 250 hrs.
Check hydraulic oil level	every 250 hrs.
Change hydraulic oil	every 3000 hrs.

7.2 Maintenance material

Consumables	Designation
Roller bearing lubricant – spindle axes, etc.	Multi-purpose grease (NLGI-Class EP 2)
Hydraulic oil	HV 46

7.3 Tightening torques

All the torques specified here assume steel screw connections.

Hex screw / nut	8.8	10.9	12.9
M4	2,5	4	4,5
M5	5	7,5	9
M6	9	13	15
M7	14	20	25
M8	22	30	35
M10	45	65	75
M12	75	105	125
M14	115	170	200
M16	180	260	310
M18	260	370	430
M20	360	520	600
M22	490	700	820
M24	620	890	1040

7.4 Troubleshooting

If the machine is not working or is not working correctly, the following causes may pertain.

Error	*Display/behaviour*	*Cause*	*Solution*
1	Indicator lamp »Phase sequence incorrect« is lit	Phase sequence of the power supply does not match that of the machine	➢ Turn phases
		Motor overload switch has responded	➢ Inform electrician
2	Machine does not start	EMERGENCY STOP pushed in front, in back, or on operating console	➢ Disengage EMERGENCY STOP
		Main switch set to 0	➢ Set main switch to 1
		Door contact switch defective	➢ Inform electrician
		Base plate for abrasive belt is still located on the abrasive belt	➢ Return base plate to initial position (see 6.2.8)
3	Digital display off		➢ Notify customer service
4	Feed is not running	Feed speed controller set to 0	➢ Increase feed speed
		Feed switch set to 0	➢ Turn feed switch to the right
		Top switch bar is responding	➢ Material too high or incorrect material thickness set
		Switch bar on conveyor belt is pressed	➢ Free switch bar

7.5 Customer service

If malfunctions occur which cannot be remedied by the customer themselves, contact the following customer service address:

LISSMAC
Maschinenbau GmbH
Lanzstraße 4
D-88410 Bad Wurzach
Telephone: +49 (0) 7564 / 307 - 0
Fax: + 49 (0) 7564 / 307 - 500
E-mail: lissmac@lissmac.com
Web: www.lissmac.com

8 Wear parts and consumables

8.1 SBM-M 1000/1500 S2 ALU MIX grinding machine

Order number	Wear part
825265	Abrasive belt -24KO-S1000
825266	Abrasive belt -40KO-S1000
825267	Abrasive belt -60KO-S1000
825268	Abrasive belt -120KO-S1000
825270	Abrasive belt -40SI-S1000
825269	Abrasive belt -60SI-S1000
825258	Abrasive belt -24KO-S1500
825259	Abrasive belt -40KO-S1500
825260	Abrasive belt -60KO-S1500
825261	Abrasive belt -120KO-S1500
825262	Abrasive belt -40SI-S1500
825263	Abrasive belt -60SI-S1500
825264	Abrasive belt -120SI-S1500
	We reserve the right of changes without previous notification in the course of further technical development.

9 Taking out of operation and disposal

If the machine should be dismantled after the end of its service life, it must be properly disassembled and the individual parts delivered to recycling and disposal.

The following parts of the machine contain environmentally hazardous substances:

- Electronic components of the controls
- Gears (lubricant)

➢ Disconnect the machine from the power supply.
➢ Disassemble the machine into individual parts and dispose of parts which contain environmentally hazardous substances according to the applicable national regulations.
➢ Recycle the other machine parts according to their materials.

10 Warranty conditions

The warranty for this machine is 12 months. For the following listed wear parts the warranty only applies if the wear is not caused by operation.

- Feed and drive elements, such as toothed racks, gears, pinions, spindles, spindle nuts, spindle bearing, cables, chains, chain wheels, belts
- Seals, cable, hoses, collars, connectors, couplings and switches for pneumatics, hydraulics, water, electrical, fuel
- Guide elements, such as guide strips, guide bushings, guide rails, rollers, bearings, anti-slide plating
- Tension elements from quick-coupling systems
- Plain and roller bearings, which do not run in oil bath
- Shaft sealing rings and sealing elements
- Friction and overload couplings, braking equipment
- Carbon brushes, collectors
- Easily dissolvable rings
- External potentiometer and manual switching elements
- Fuses and lamps
- Auxiliary and operating materials
- Fastening elements, such as pegs, anchors and screws
- Lamella
- Diaphragms
- Sealing brushes, sealing rubber, splash guard cloths
- All types of filters
- Drive and deflector rollers and bracings
- Running and drive wheels
- Transport belt
- Rubber scrapers
- Needle felt protection
- Energy storage
- Abrasive belts/grinding belts

Wear parts are parts that with intended use of the machine have limited operational wear. The wear time is not uniformly specified, it differs according to intensity of use. Wear parts must be serviced, adjusted, and replaced as needed corresponding to the specific device's operating manual provided by the manufacturer.

Wear caused by operation does not qualify for warranty claims.