LISSMAC

METAL PROCESSING

OPERATING MANUAL
DESLAGGING MACHINE

SBM-M 1000 D2
SBM-M 1500 D2

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Imprint

Operating manual for LISSMAC
Deslagging machine SBM-M 1000 D2
SBM-M 1500 D2

Issue date: 05-2013
Original operating manual

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Table of Contents

1. About this manual

1.1. Target group

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

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

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.

Along with the operating manual and the valid legal regulations for accident prevention in the country of use and the place of use, 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:

- Product Manual - TOSHIBA Frequency Converter Series VF S11 (Eugen Schmidt und Co. Getriebe und Antriebselemente GmbH)

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 under the danger symbol indicates the degree of danger:

DANGER — This signal word signifies an extremely dangerous situation. If the situation is not avoided, fatal injuries will result. The danger symbol can specify the danger.

WARNING — This signal word signifies a potentially dangerous situation. If the situation is not avoided, fatal or serious injuries can result. The danger symbol can specify the danger.

CAUTION — This signal word signifies a dangerous situation. If the situation is not avoided, medium to slight injuries will result. The danger symbol can specify the danger.

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, notes and important warnings are presented according to the following examples:

Important information is marked with a »i« in this operating manual.

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 of the figures are marked sequentially by numbers **(1)** in parentheses.

2. Safety

2.1. Safety instructions

The SBM-M 1000/1500 D2 deslagging 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, who are authorised to work on the machine, must have read and understood the operating manual and especially the Safety Instructions chapter 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.
- Use required or regulated personal protective clothing (e.g. work gloves, safety glasses).
- 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 specified or given in the operating manual.
- Ensure the availability of the shop equipment adequate for the maintenance and service work.

2.3. Personnel selection and qualifications

Only responsible and 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 may 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.
- 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.
- Even when moving the machine only for a short distance, disconnect the machine from the power mains!
- 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, floor load carrying capacity 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

- Have special work performed only by technicians authorized for it.
- 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 special and maintenance work. Name a surveillance person.
- If the machine is completely shut off during service and repair work, secure the machine against accidental start.
- When the machine is being cleaned of material residues, always disconnect the machine and the extraction system from the mains supply.
- Before cleaning the machine 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 in a safe and environmentally sound manner.

2.7. Safety instructions for special types of dangers

2.7.1. Electric power

- In case of problems with the electrical power supply, turn the machine off immediately.
- When changing fuses only use original fuses with specified amperage.
- Only electricians or trained personnel under the guidance and monitoring of an electrician perform work on electric equipment of the machine in accordance with electrical regulations.
- Regularly check the machine electrical equipment. Immediately correct deficiencies, such as loose connections or scorched cable.

2.7.2. Fire hazard

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

2.7.3. Explosion hazard

- Do not process aluminium or aluminium alloys on the machine. The machine has no explosion protection and is not approved for the processing of aluminium.
- Clean the slag capture boxes of scrap material and slag residues daily.

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 that there is a danger due to magnetic fields during operation.
	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.
	Wear safety glasses when working on the machine.
	Wear hearing protection when working on the machine.
	Transport with crane possible.
	Forklift transport is possible.

Notes:

3. Product description

The SBM-M 1000/1500 D2 deslagging machine is described below.

3.1. Appropriate usage

The deslagging machine SBM-M 1000/1500 D2 is exclusively for dry removal of slag residue deposits after flame cutting or autogenous cutting of steel and stainless steel sheets in compliance with the information contained in this operating manual. Workpieces up to a warpage of maximum 3mm can be processed.

Belonging to intended use are:

- Knocking off slag residues after flame, autogenous and plasma cutting

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 from +10° to +40°C
- Humidity 5 – 95 % (not condensing)

Non-intended use explicitly includes the machining of workpieces made of aluminium or aluminium alloys as well as melting of steel.

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

3.2. Structure

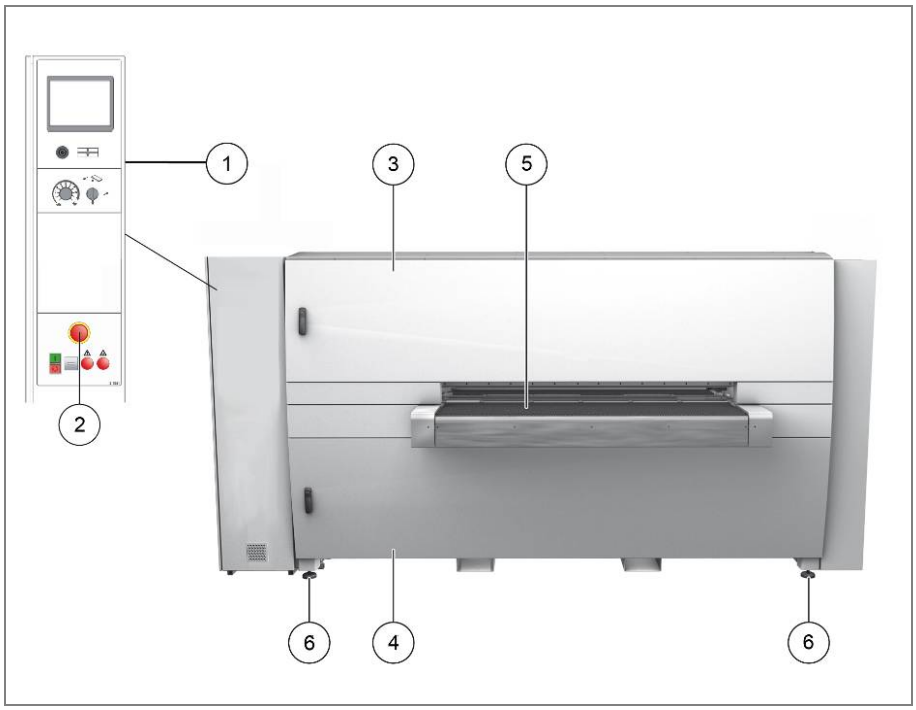


Abb. 1: Components of the machine, input side (front side closed)

1 Control and display elements
2 EMERGENCY STOP is used in emergency situations to immediately switch off the machine
3 Upper door on the input side
4 Lower door on the input side
5 Conveyor belt for input of workpieces
6 Adjustable machine feet

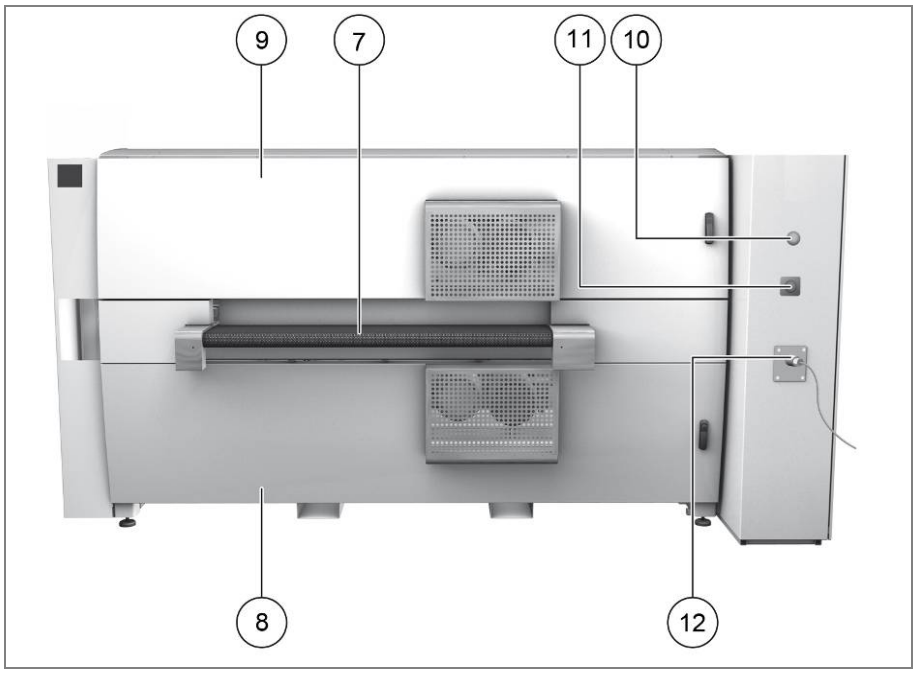


Abb. 2: Components of the machine SBM-M D2 1000 E/M, output side (back of)

7 Conveyor belt for output of workpieces
8 Lower door on the output side
9 Upper door on the output side
10 The EMERGENCY STOP button is used to switch off the machine immediately in emergency situations
11 Main switch for turning on/off the mains supply for the entire machine
12 Connection for power supply

3.3. Control elements

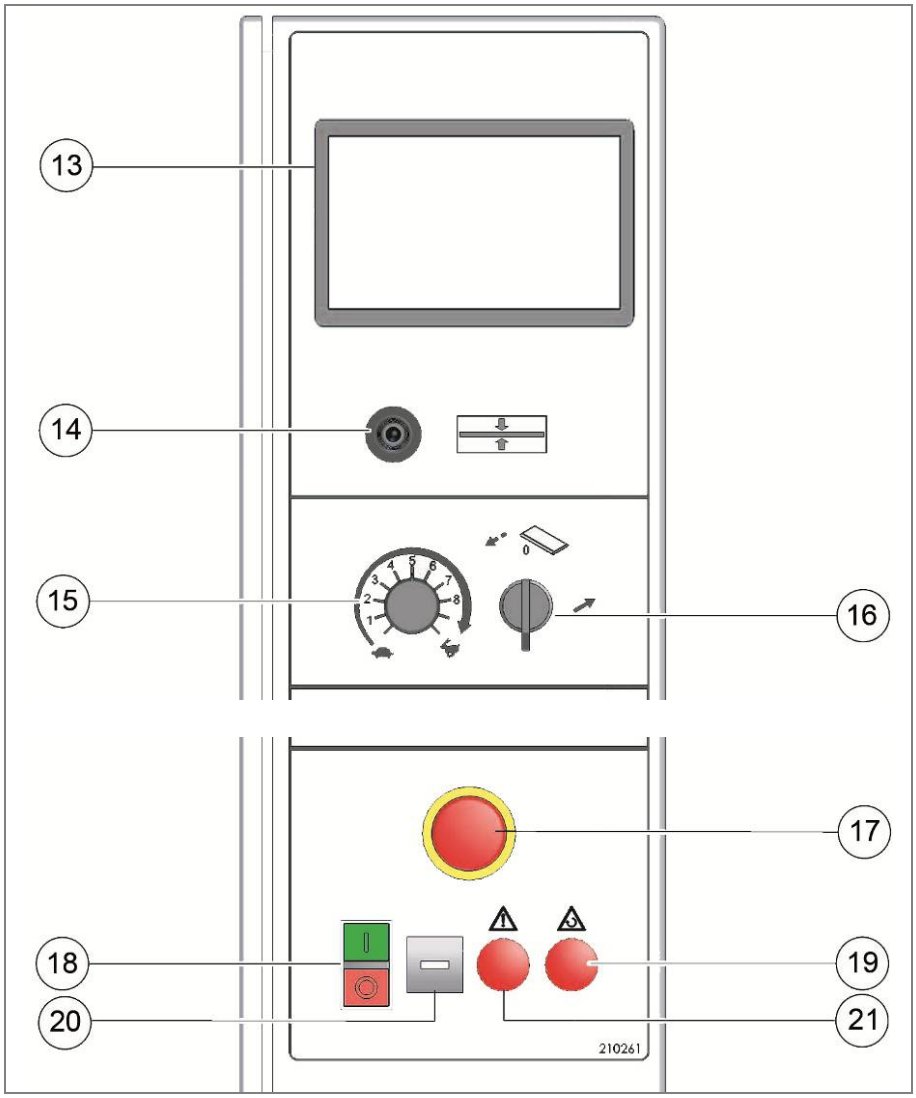


Abb. 3: Control and display elements (front side SBM-M 1000/1500 D2)

13	Screen (touchscreen monitor)
14	The positioning button is used to set the material thickness and for positioning the machining units (depending on the setting of the gear switch)
15	Feed speed controller for feed speed to set the speed of the conveyor belts
16	Feed switch to switch the conveyor belts on/off (right forwards, left reverse)
17	EMERGENCY OFF button
18	On switch (green) and off switch (red) for the impact motors
19	Display phase sequence incorrect (phase sequence incorrectly switched)
20	Operating hours counter
21	Display of motor malfunction (illuminates once the motor overload switch has been activated)

NOTE

Operating the hand wheels

Possible damages

- Before turning the hand wheels, ensure that the gear selection lever is in the respective position.
- The hand wheels are intended only for emergency operation and for possible fine adjustment.

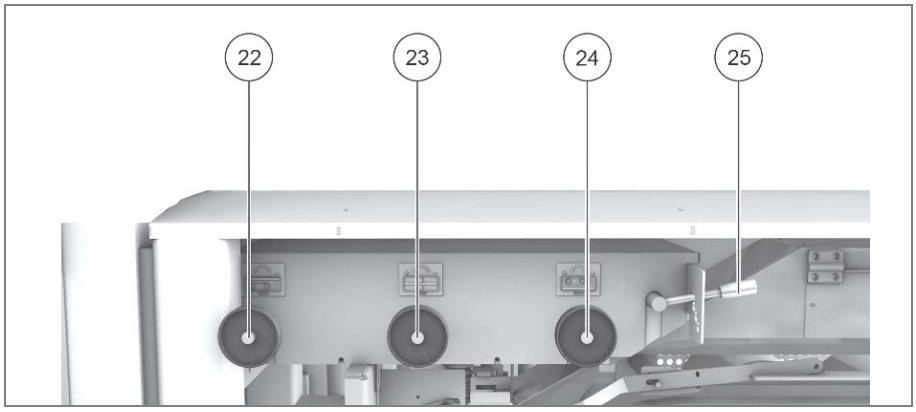


Abb. 4: Control elements of hand wheels (front side SBM-M 1000/1500 D2)

22 Hand wheel for the upper machining unit
23 Hand wheel for the sheet thickness
24 Hand wheel for the lower machining unit
25 Gear selector lever

3.4. Function

There are two machining units in the deslagging machine each with two oppositely rotating power-pin belts to remove the slag. The machining units with power-pin belts are placed above and below. 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 conveyor belt and transported between the machining units.

Material thickness and positioning of machining units

Material thickness is set by positioning the upper machining unit together with the feed roller. The machining units can also be positioned individually for maintenance, adjustment, and optimisation of processing.

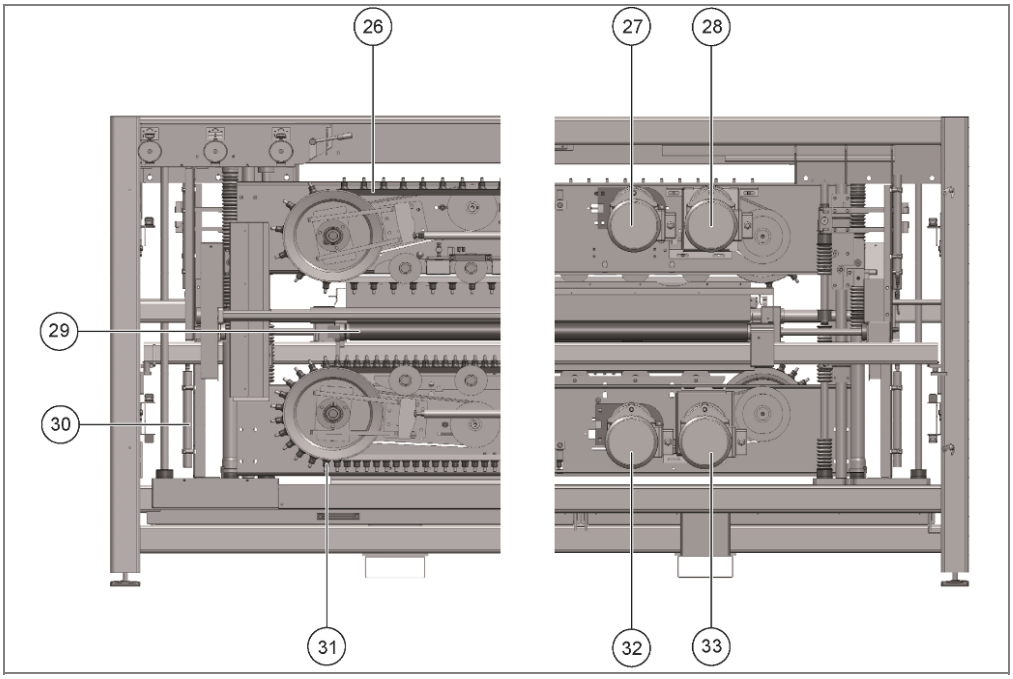


Abb. 5: Functional elements of the SBM-M 1000/1500 D2

26	Upper machining unit with power-pin belt
27	Drive for the rear power-pin belts
28	Rive for the front power-pin belts
29	Conveyor belt
30	Measurement system
31	Lower machining unit with power-pin belt
32	Drive for the rear power-pin belts
33	Rive for the front power-pin belts

Power-pin belts

The machining units each have two counter running power-pin belts mounted. The impact belts are guided transverse to the conveying direction over the surfaces of the workpieces. The workpiece is freed of slag with the help of the power-pins.

To exchange the abrasive power-pin belts (tool change) move the upper and lower machining units completely apart.

3.5. Technical data

The following specifications apply to the deslagging machine SBM-M 1000 D2 and SBM-M 1500 D2.

Dimensions and weight of the machine

	SBM-M 1000 D2	SBM-M 1500 D2
Length	2600 mm	3100 mm
Width (incl. conveyor belt)	1400 mm	1400 mm
Height	1800 mm	1800 mm
Total weight	1800 kg	2100 kg

Machining units

Number of impact motors	4	4
Drive power per impact motor	1.5 kW	1.5 kW
Impact motor speed	1420 rpm	1420 rpm
Impact motor voltage	400 V, 50 Hz	400 V, 50 Hz
Power consumption of impact motor	14.5 A	14.5 A
Slag removal speed (Power-pin belts)	4.6 m/s	4.6 m/s

Feed

Number of feed motors	1	1
Drive power per feed motor	0.37 kW	0.37 kW
Feed motor speed	1410 rpm	1410 rpm
Feed motor voltage	400 V, 50 Hz	400 V, 50 Hz
Power consumption of feed motor	1.3 A	1.3 A
Feed speed	0 – 4 m/min	0 – 4 m/min

Actuator

Number of actuator motors	1	1
Drive power actuator motor	120 W	120 W
Actuator motor speed	420 rpm	420 rpm
Actuator motor voltage	24 / 48 V DC	24 / 48 V DC
Power consumption	5 A	5 A

Transport belt

Useful width	1000 mm	1500 mm
Length	560 mm	
Weight of conveyed material	300 kg/m Optional 750 kg/m	300 kg/m Optional 750 kg/m
Conveyor height	950 mm +/- 50 mm	950 mm +/- 50 mm
Temperature range	+10 °C to +40 °C	+10 °C to +40 °C

Electrical data of the entire machine

Voltage	400 V/50 Hz	400 V/50 Hz
Rated current (total)	15 A	15 A
Rated power (total)	6.4 kW	6.4 kW
Protection class	IP 42	IP 42

Environment

	SBM-M 1000 D2	SBM-M 1500 D2
Temperature range	+10° to +40 °C	+10° to +40 °C
Humidity	5 – 95 % (not condensing)	5 – 95 % (not condensing)

Noise pressure level

Emission noise pressure level at operator's place (average value, since it depends on the workpiece processed)	85 dB(A)	85 dB(A)

Workpieces

Material thickness (height of opening for workpieces)	5 – 120 mm	5 – 120 mm
Aperture width for workpieces	50 – 1000 mm	50 – 1000 mm
Minimum length of workpieces in the direction of travel	150 mm	150 mm
Maximum workpiece weight	300 kg per m	300 kg per m
Optional by increasing the load applied	750 kg per m	750 kg per m

Other data

Sheet thickness adjustment	electrical	electrical
Tool adjustment	electrical	electrical

3.6. Safety equipment

The deslagging machine has the following safety equipment:

- »EMERGENCY STOP« buttons **(10)** and **(17)** on the front and back of the machine for the immediate shutdown of the machine in case of emergency.

The »EMERGENCY STOP« buttons must be disengaged again after an emergency stop. If the machine is operated synchronously with an SBM-XL then an additional EMERGENCY STOP must be acknowledged on the SBM-XL.

- Safety strip on the input side of the conveyor belt turns off the feed (conveyor belt) to prevent pulling in of hands and other body parts.
- The upper switch bar on the input side switches off the feed to prevent hands, body parts as well as too much material being pulled into the machine.
- Motor overload switch prevents overloading of the motors.
- A phase circuit breaker prevents connection of electricity with an incorrect phase sequence.

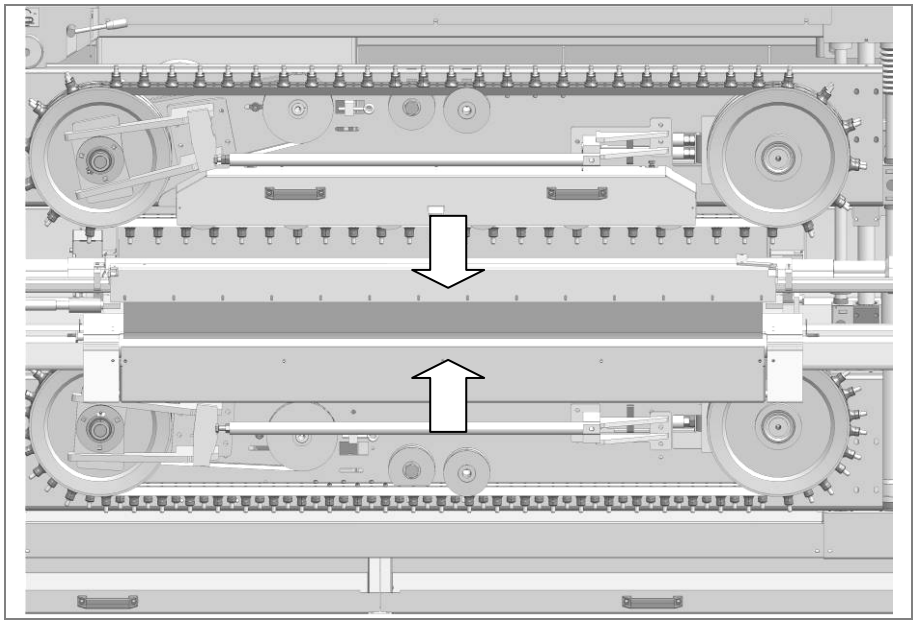


Abb. 6: Safety strips to stop the conveyor belt

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 **(34)**, to screw in the two steel carriers **(35)** and to reattach the top cover **(34)**. Both braces **(36)** are mounted between the steel carriers **(35)**. For transport by forklifts, there are appropriate supports built in under the grinding machine **(37)**.

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 with suitable lifting devices.
- Secure the machine by the four attachment points when transporting on a vehicle.
- Insert the forks into the beams provided when transporting using a forklift (maximum transport height 25 cm).

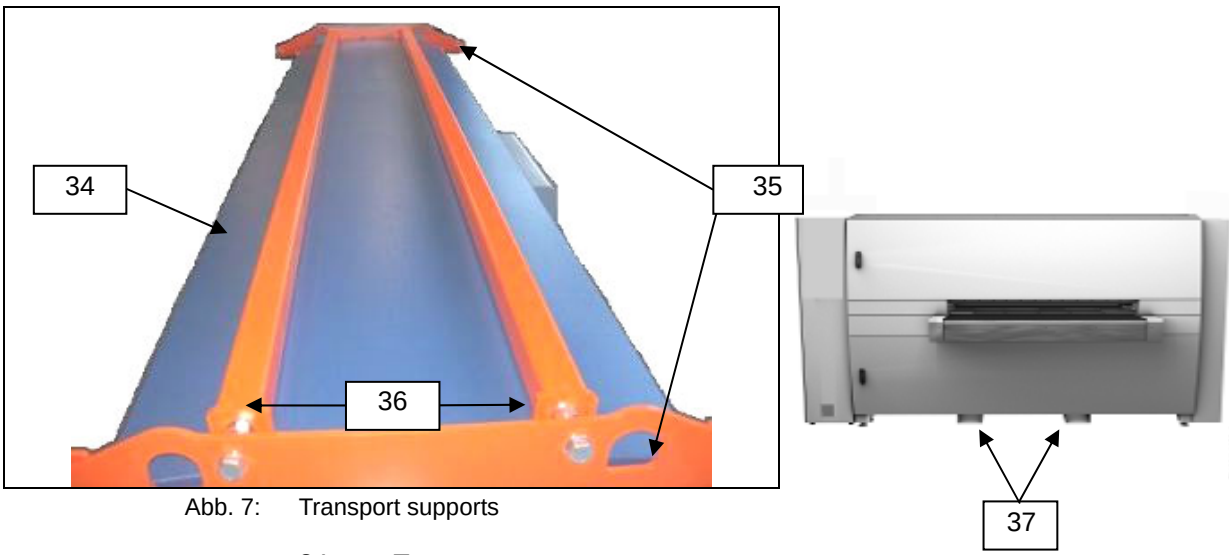


Abb. 7: Transport supports

34	Top cover
35	Steel carriers
36	Braces
37	Beams for forklift

4.2. Storing the machine

- Pack the machine in plastic film for storage.
- Only store the machine in an indoor space with a dry environment.

4.3. Installation and assembly

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)

4.3.1. Installing machine

- Fasten lifting equipment to the four connection points on the steel carriers**(35)** or lift with a forklift under the two lower beams **(37)**.
- Remove the packaging from the machine.
- Adjust the machine feet **(6)** until the machine is horizontally level.

4.3.2. Connecting the machine electrically

DANGER

High voltage

Death or injury from electric shock

- Make sure that the main switch **(11)** is in the »Off« position.
- Connect the machine to the power supply **(12)**.
- Place the main switch **(11)** on the back of the machine into the "On" position.
- Ensure that both »EMERGENCY STOP« **buttons (10)** and **(17)** are disengaged.

  ↳ 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 regarding the correct phase sequence. If the phase sequence is incorrect the LED "Incorrect phase sequence"**(19)** lights up, and the machine cannot be turned on. Use a connection cable with phase inverter for easier power connection with the correct phase sequence.

5. Operation

5.1. Operation

The central functions of the machine are controlled using control elements on the front of the grinding machine. The screen **(13)** provides information about the current settings and status of the machine.

5.2. Gear selector lever

When selecting the individual gears, the display and display functions switch to the function pertaining to that gear level.

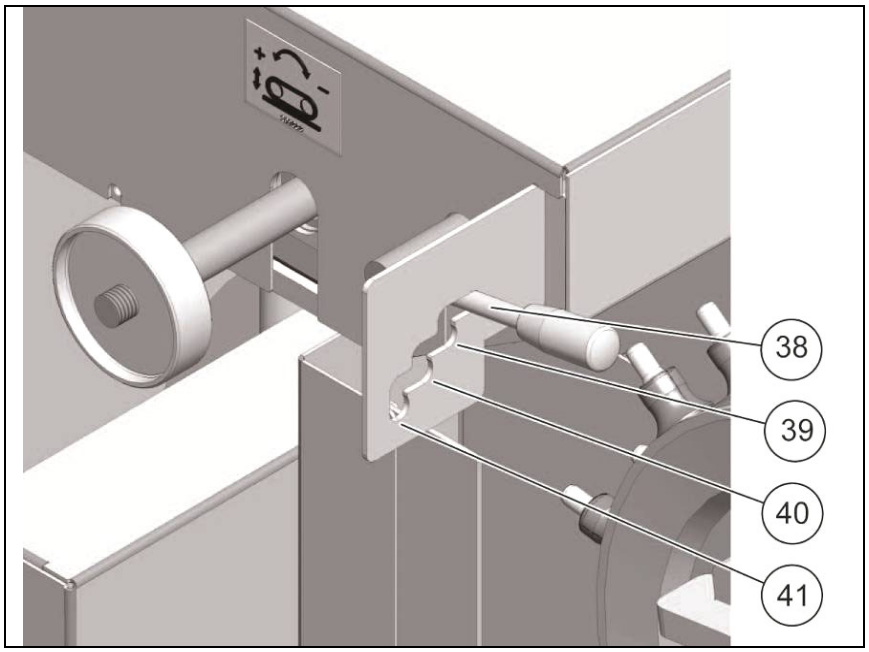


Abb. 8: Gear selector lever **(25)**

38		Lower unit
39		Upper and lower units
40		Top unit
41		Sheet thickness with the unit up

Here, the functions of the respective unit can be mechanically preselected. The selected functions are shown in the display and can be moved with the positioning button **(14)**.

Position **(41)** is the operating position and also the delivery state.

5.3. User interface

Central functions and machine information is called up, displayed and can be changed using the touch screen.

The menus are selected by touching the fields on the surface of the touch screen.

5.4. Structure of the interface

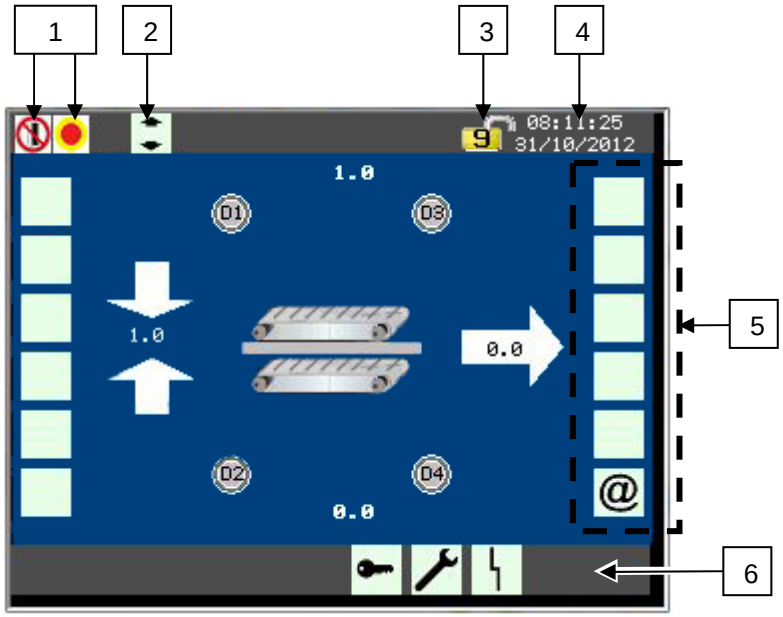


Abb. 9: User screen

Info area

1 Status display

2 Position of the gear selector lever **(25)**

3 Display of user level

4 Date / Time

Dependent upon user level

5 Option fields
> Automatically enabled as needed

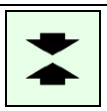
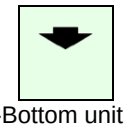
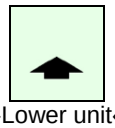
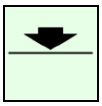
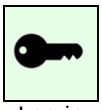
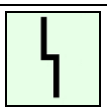
Main menu

6 Change of user, settings and malfunctions

5.5. Operation using the touch screen

The following list describes and gives an overview of the menus available from there, their information and input options. Functions are only available with the proper user log in.

Main menu

Menu	Functions and displays
 »Upper & lower unit«	Setting of the upper and lower machining units, Manual repositioning of the delivery, Tool change
 »Bottom unit «	Setting of the upper machining unit, Manual repositioning of the feed frame, Tool change
 »Lower unit«	Setting of the lower machining unit, Manual repositioning of the delivery, Tool change
 »Sheet thickness«	Setting the sheet thickness, Manual repositioning of the delivery, Change the sheet thickness during operation
 »Contact«	Contact data
 »Log in«	User identification
 »Service«	Operating hours counter Settings (time, date, language and screen) References (only adjustable by LISSMAC Service)
 »Error messages«	Display of error messages
 »Info«	Total overview of the machine

The menu of the SBM-M 1000/1500 D2 set up according to the user. Option fields are only enabled with the correct user log in. This prevents being affected by unauthorised persons.

The user levels are shown dependent on the user log in. The user level 0 is active when the machine is switched on.

	User level with the approved actions:
	User: Setting sheet thickness, Tool change, Wear position of machining units
	Only accessible by LISSMAC Service
	Status display in Info area (Pos. 1)
	Machine door not closed
	All machine doors are closed
	EMERGENCY STOP is activated
	General error / malfunction see »Error messages«

5.6. Service menu

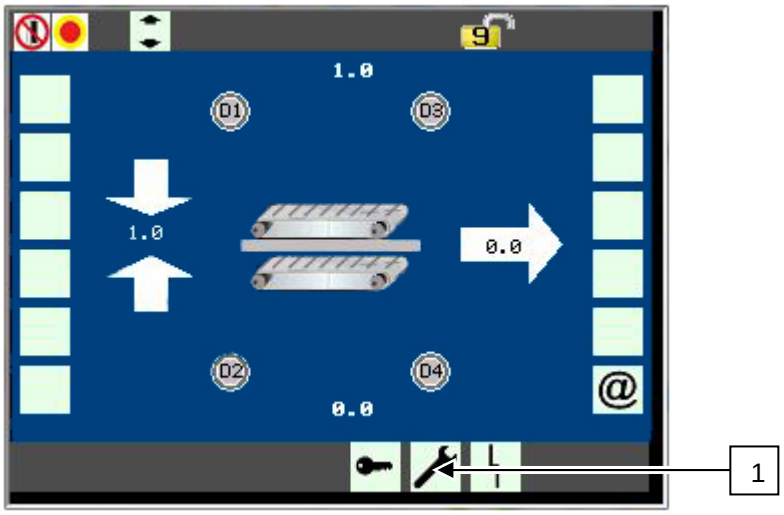
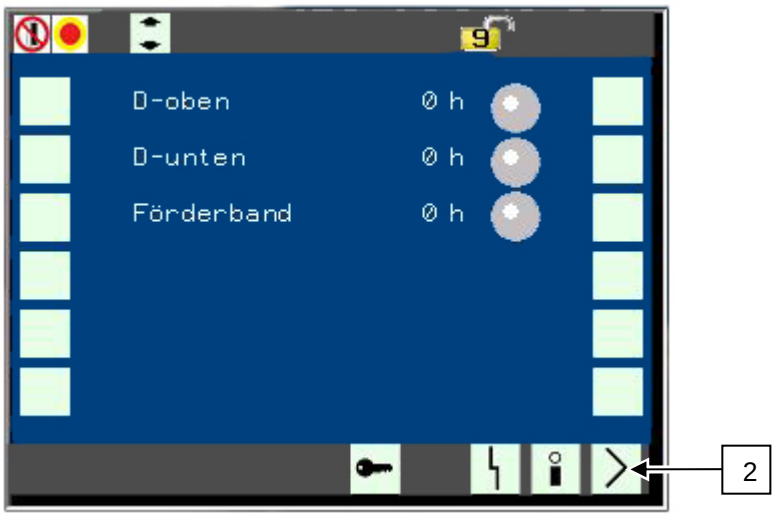


Abb. 10: User screen start view

➢ Select setting **(1)** in the main screen
↳ The operating hours overview is shown.



➢ Press the forwards button **(2)** to move the menu onwards

Abb. 11: User screen settings

1 Time setting
2 Date setting
3 Language setting
4 Set the screen brightness

Abb. 12: Compare axes and reference

Only adjustable by LISSMAC Service personnel.

5.7. Turning on the machine

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

- Acceptance of the workpieces at the output side of the machine is ensured.
- Contaminants (material residue) have been removed from the magnets.
- Workpieces remaining in the machine (visual inspection on the conveyor belt) have been removed.
- Power-pin belts are checked for damage (visual inspection).

➢ Place the main switch **(11)** on the back of the machine into the "On" position.

↳ The power supply for the drives is turned on.

➢ Make sure that all malfunctions are corrected.

➢ Ensure that both »EMERGENCY STOP« **buttons (10)** and **(17)** are disengaged.

↳ The machine is ready for operation.

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

- The sheet thickness of the workpiece is measured and set on the machine.
- Feed speed is set.
- Top and bottom machining units are correctly positioned.

5.8. Setting sheet thickness

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

The value for the sheet thickness is set with the upper unit. This means the upper feed rollers are moved with the upper units upward or downward.

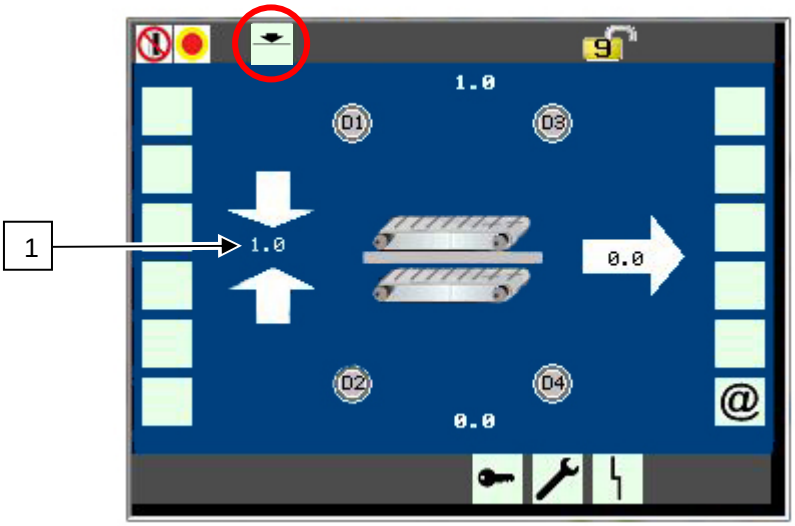


Abb. 13: Setting the sheet thickness

NOTE

Workpieces remaining in the machine

Damage to the machine

- Make sure that no workpieces are between the feed rollers or in the exhaust duct.

- Drive lever **(25)** must be put into the lowest position **(41)**.
  - The sheet thickness is shown on the screen
- The measured sheet thickness can be set using the positioning button **(14)**.

Firstly, switch on the processing machine **(18)** , once the positioning process has completely finished.

5.9. Setting feed

Feed speed

The slag removal result of the machining units depend among other things on the feed speed **(1)**of the conveyor belts. The feed speed should be set lower when there is more slag to be removed.

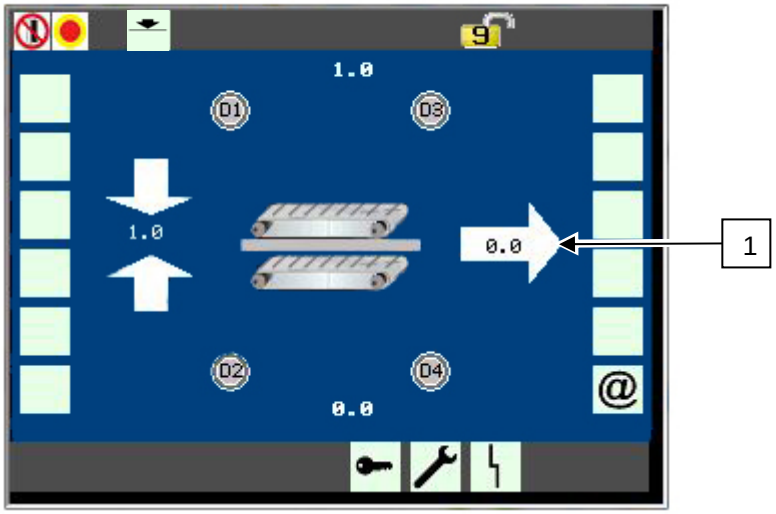


Abb. 14: Setting the feed

➢ Set the feed speed on the variable controller **(15)**.

↳ Slow feed speed: High slag removal output

↳ Fast feed speed: Low slag removal output

The direction and speed of the following components are set commonly:

- Conveyor belt on the input side of the machine
- Feed rollers in the machine
- Conveyor belt on the output side of the machine
- Feed capable of being turned on by customer (if available)

➢ Set the feed speed on the variable controller **(15)**.

➢ To switch on the feed, turn the feed switch **(16)** into position.

Feed is started along with the grinding units using the switch **(18)** .

➢ To turn off the feed, turn the variable controller **(16)** to the middle position.

5.10. Start and stop the slag removal function

⚠ CAUTION

Conveyor belt on the input side

Cutting of fingers when putting on the workpiece

- Wear protective gloves.
- Do not reach into the input opening for workpieces.
- Lay workpieces on the front edge of the conveyor belt.

⚠ CAUTION

Flying sparks

Eye injuries due to flying sparks

- Wear safety glasses.

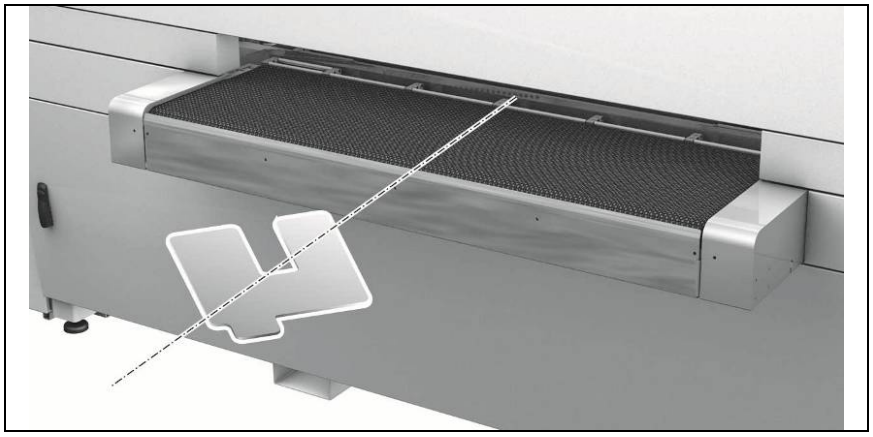


Abb. 15: Processing material

NOTE

Unsuitable workpieces

Damage to the machine, premature wear of the power-pin belts

- Only remove slag of workpieces with the corresponding minimum length (150 mm) and minimum width (50 mm) and minimum thickness (5 mm) and with the same thickness throughout.
- Adjust the material thickness value on the machine for workpieces of different thicknesses as required.
- Distribute workpieces evenly over the width of the conveyor belt and lay the outer edge of the workpieces as diagonally as possible on the conveyor belt.
- Allow hot workpieces to cool before removing slag.

- Switch the machine on at the main switch **(11).**
- Measure the sheet thickness of the workpiece and set on the machine
- Push the on switch **(18)** and place workpieces on the conveyor belt at the input side **(5)**.
  - ↳ The turned on grinding units start. Feed starts once the grinding motors have reached their maximum rotation speed.
- Set the feed speed using the feed speed controller **(15)**.
- The workpieces are automatically guided through the machine and processed.
- Take the workpieces from the conveyor belt **(7)** on the output side.

5.11. Change the position of the machining units

Typically the lower machining unit **(31)** position is set to 0 mm , the upper machining unit **(26)** is set to the material thickness. To optimise the slag removal result for tenacious slag, the distance of the upper and lower machining units can be reduced relative to the position of the conveying belt or transport rollers. This reduces the distance between the material and impact belt nipples. The pre-set material thickness then remains unchanged. Reducing the distances must be done in millimetre sized steps and then tested.

NOTE

Higher machining unit wear

Damage to the machine, premature wear of the impact belts

- Reducing the machining unit distance relative to conveyor belt or transport roller position by too much can lead to damage to the power-pin belts or to the machine.
- Each reduction in distance of the machining units relative to the conveyor belt or transport roller position increases the wear of the power-pin belts.
- The distance of the machining units relative to the conveyor belt or transport rollers may only be reduced in millimetre sized steps. The effectiveness of this must be tested after each reducing step.

To change the position of the machining units, the gear selection lever **(25)** must be set to the corresponding position. If the gear switch "catches" a little when adjusting it **(25)** it is recommended to turn the manual wheel **(24)** at the same time.

- Set the feed switch **(16)** to 0.
- Switch off the machine using the impact motor off switch **(18)**.

Adjustment machining unit, top

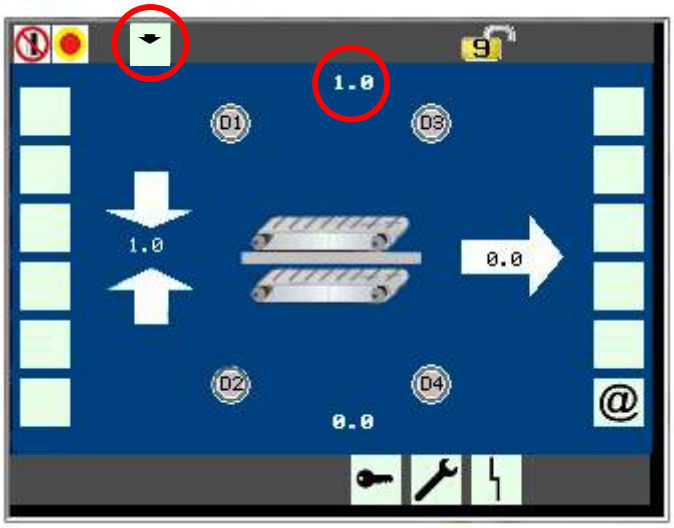


Abb. 16: Setting of the upper machining unit

- Place the gear switch **(25)** into position **(40)**.
- Move the machining unit up or down using the positioning button **(14)** until the desired position is displayed in the upper display.

Adjust the lower machining unit

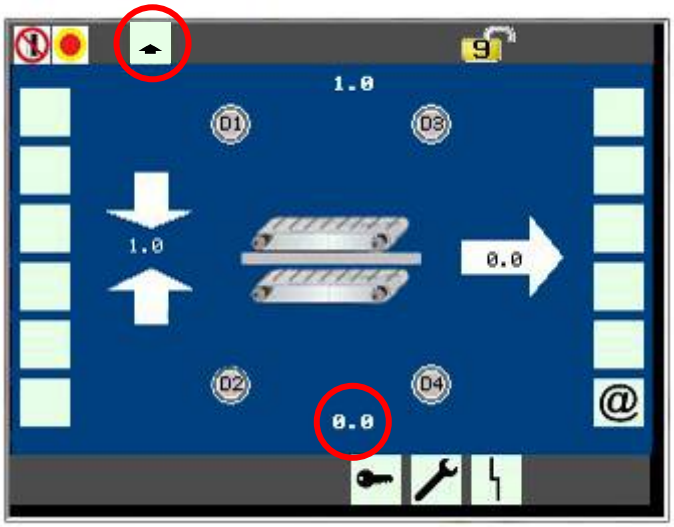


Abb. 17: Set the lower machining unit

- Place the gear switch **(25)** into position **(38)**.
- Move the machining unit up or down using the positioning button **(14)** until the desired position is displayed in the upper display.

5.12. Turning off the machine

NOTE

Remove all workpieces from the machine

Damage to the machine or the workpiece

- All workpieces must be removed from the machine before it is switched off.

- Set the feed switch **(16)** to 0.
  - The conveyor belt stops.
- Push the impact motor off switch **(18)**.
  - The impact motors stop and the power-pin belts also stop.
- To turn off the power supply for the entire machine, set the main switch **(11)** to the back of the machine into the »Off« position.

The machine must not be turned off directly using the main switch **(11)**.

6. Maintenance and Cleaning

6.1. Change of the power-pin belts

The upper and lower power-pin belts can be moved completely apart. This permits the lower and upper belt pairs to be rotated more easily or exchanged (tool change).

6.1.1. Turn or change the power-pin belts

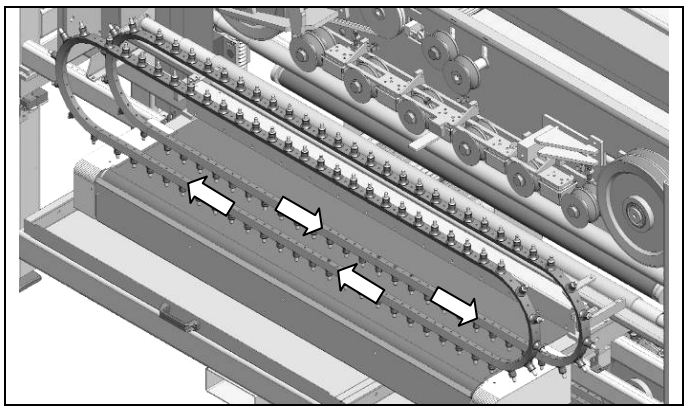
Power-pin belts must be turned after 500 operating hours (to avoid single-sided wear of the pins in the direction of travel) and replaced after 1000 operating hours.

Worn or damaged power-pin belts must be replaced immediately.

The following facts suggest worn power-pin belts:

- Increased power consumption of the impact motors
- Inadequate slag removal result
- Erratic machining noise

The power-pin belts should always be rotated or exchanged in pairs.



Move the machining units apart

➢ Push the impact motor off switch **(18)**.

➢ Set the sheet thickness to 10mm.

Move the upper and lower machining units to their end positions.

➢ Set the gear switch **(25)** into the desired position on the machining unit.

↳ The selected machining unit is displayed on the screen.

➢ Move the machining units apart to their maximum end position using the positioning button **(14)**.

↳ The feed motor automatically stops when the end position is reached.

↳

WARNING

Unintentional impact motor start during power-pin belt change.

Severe injuries due to rotating power-pin belts!

- Ensure that the machine power supply is off at the main switch. Secure the machine against accidental starting.
- Only entrust the work to authorised personnel.

Relax the impact belt

- Place the main switch **(11)** on the back of the machine into the "Off" position.
- Open all doors **(3)**, **(4)**, **(8)** and **(9)** of the machine.
- Loosen the counter nut **(35)** on the tensioning unit.
- Loosen screw **(36)** until the power-pin belts are relaxed.

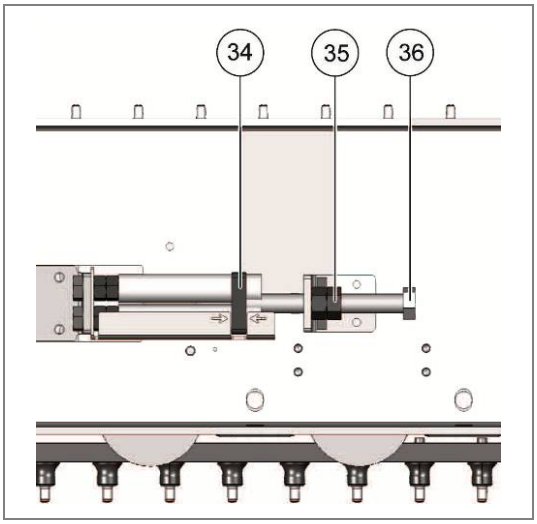


Abb. 18: Setting of the upper machining unit
Abb. 19: Relaxing the power-pin belts

- Remove the power-pin belts.

Clean the drive and deflection rollers after the power-pin belts have been removed and check them for damage and wear.

Insert the impact belts and tighten them

- Rotate the power-pin belts in the opposite direction to the running direction and either re-insert them or replace with new power-pin belts.
- Tighten the power-pin belts using screws **(36)** until the pressure plate is placed **(34)** between the arrows.
- Close the doors again.
- Check for functionality.
- Reset the standard settings for the machining units.

6.2. Cleaning

The machine must be cleaned after every shift (at least once per day) and material residues removed.

WARNING

Accidental starting of the impact motors during cleaning

Severe injuries due to rotating power-pin belts!

- Ensure that the machine power supply is off at the main switch.
- Only entrust the work to authorised personnel.

- Turn off machine using the main switch **(11)**.
- Open the doors on the front **(3)** and **(4)**.

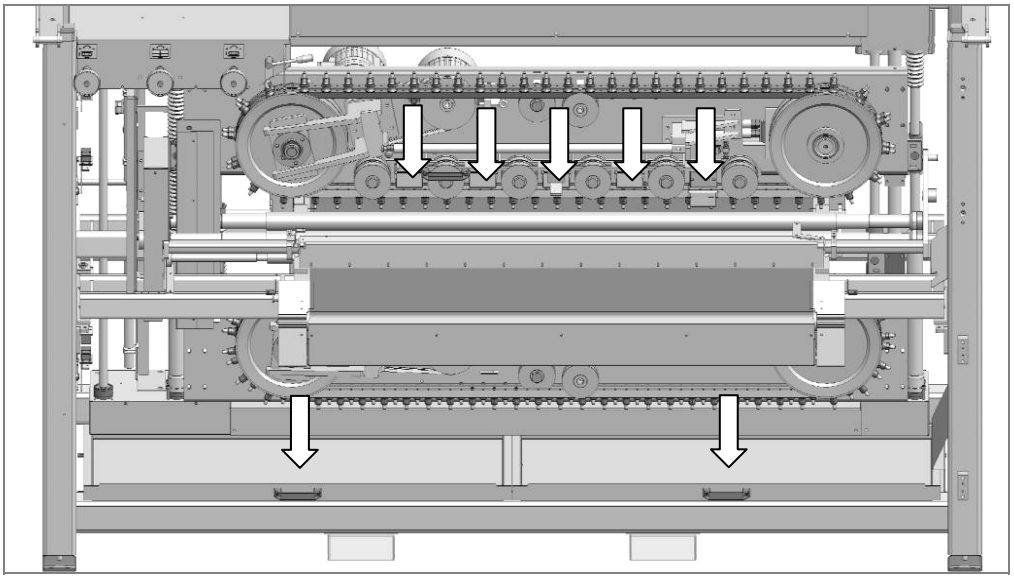


Abb. 20: Catch boxes and magnets

Cleaning the catch boxes

- At the bottom of the machine there are two catch boxes for slag and material residue, which can be removed for emptying.
- Pull out the capture boxes using the handles, and empty them of slag and residual materials.

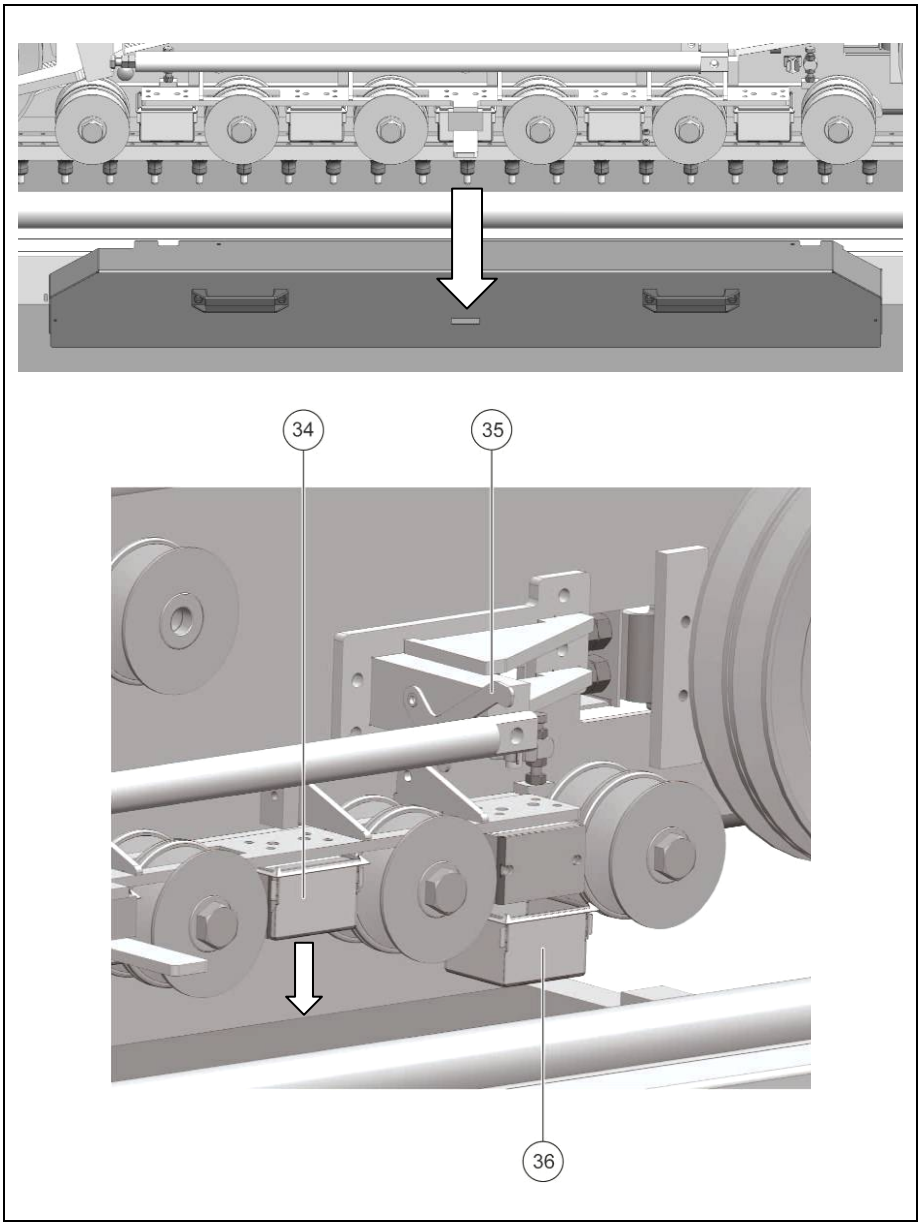


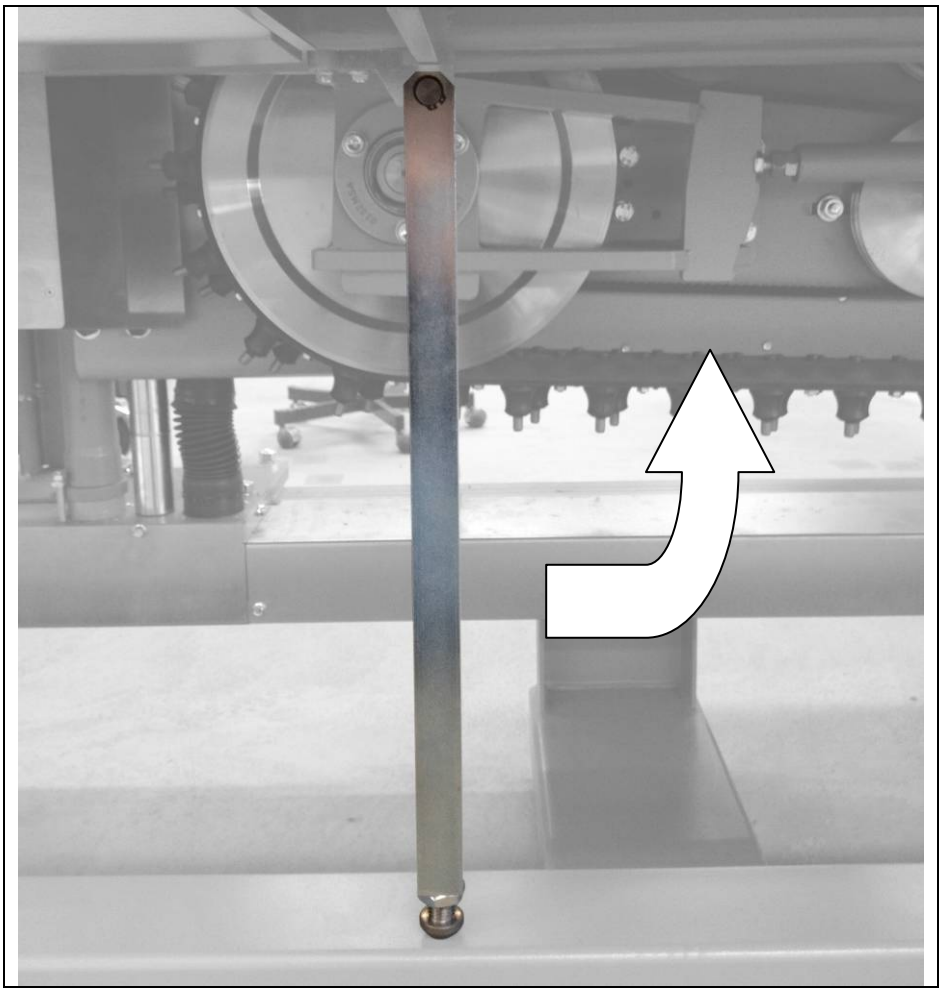
Abb. 21: Cleaning of the magnets

Cleaning the interior and magnets

- Remove safety cover of the magnets.
- Tip up the magnetic holder and secure it using the lever **(35)** ,then remove any slag material attached to the magnets. The magnetic sleeve **(36)** can be pulled down and removed.
- Vacuum out slag and residual material on and around the magnets **(34)** with an industrial vacuum cleaner.
- Close doors again.

Slag and material residue must be disposed of in accordance with applicable law.

6.3. Optional load capacity increase



6.3.1. Load capacity increase using supports

To increase the load bearing capacity for workpieces, the conveyor belt is supported by beams.

The supports can be flipped upwards on the front side.

- When the lower power-pin belts are changed, both supports must be moved upwards and hung into the holding fixture.

The supports must be permanently fixed on the back side.

6.4. Replace filter pads

NOTE

Dirty filter pads

Overheating and damage to the motors

- Replace filter pads once per week.

- Remove both covers of the filter pads on the control cabinet on the input side and the output side.
- Remove filter pads and clean or replace with new filter pads.
- Place covers on with slight pressure until they engage.

7. Service

7.1. Service intervals

The following service work should be performed regularly in the specified intervals (8 h). The intervals are shortened corresponding to multiple-shift operation.

Service work	Interval
Clean the interior space of the machine and the slag / slag capture boxes	daily/once per shift
Clean magnets	daily/once per shift
Replace filter pads	weekly
Rotate the power-pin belts	after 500 operating hours
Change power-pin belts	after 1000 operating hours
Check drive belts and deflection rollers for wear	daily/once per shift
Lubricating the spindle threads for the height adjustment	monthly
Tensioning and lubricating the chains	quarterly

7.2. Maintenance material

Consumables	Designation
Roller bearing lubricant – spindle axes, etc.	Multi-purpose grease (BP Energrease LS3)

7.3. Tightening torques

All the torques specified here assume steel screw connections.

hexagon head 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. Lubricate the spindle thread for positioning the machining units

The lubrication points of the machine are centrally located at two locations. They are easily accessible via the doors on the back of the machine.

WARNING

Accidental starting of the impact motors during lubrication

Severe injuries due to rotating power-pin belts!

- Ensure that the machine power supply is off at the main switch.
- Only entrust the work to authorised personnel.

- Turn off machine using the main switch **(11)**.
- Open doors **(8)** and **(9)** on the back of the machine.

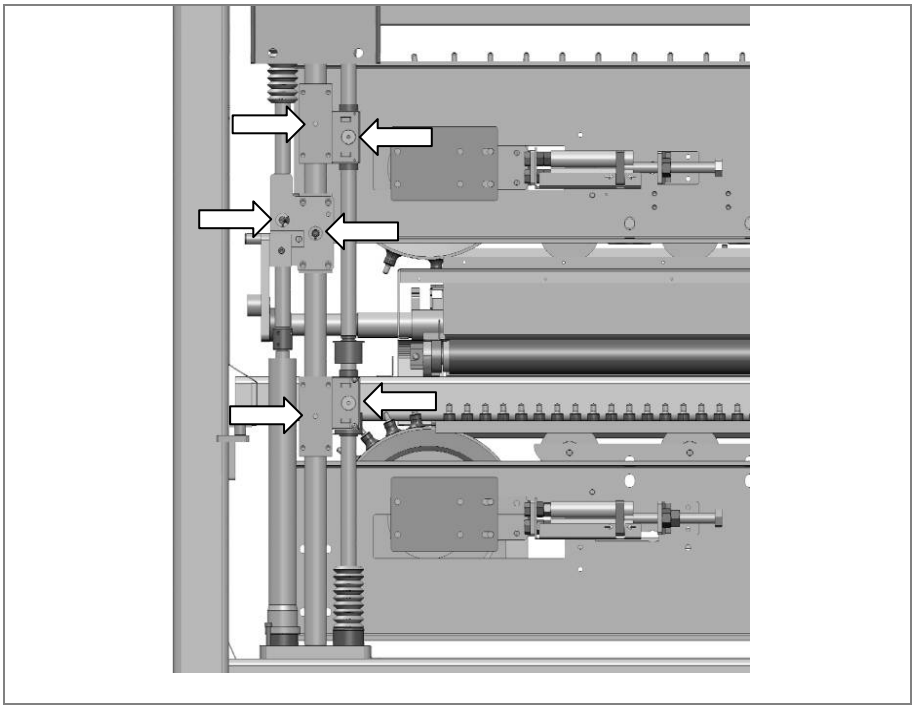


Abb. 22: Lubrication nipples (back of the machine)

- Fill with suitable multi-purpose lubricant using a grease gun on the lubrication nipples.
- Close the doors on the rear side of the machine.

7.5. Replacing the V-belt on the front side of the unit

NOTE

Always replace the V-belts in pairs.

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

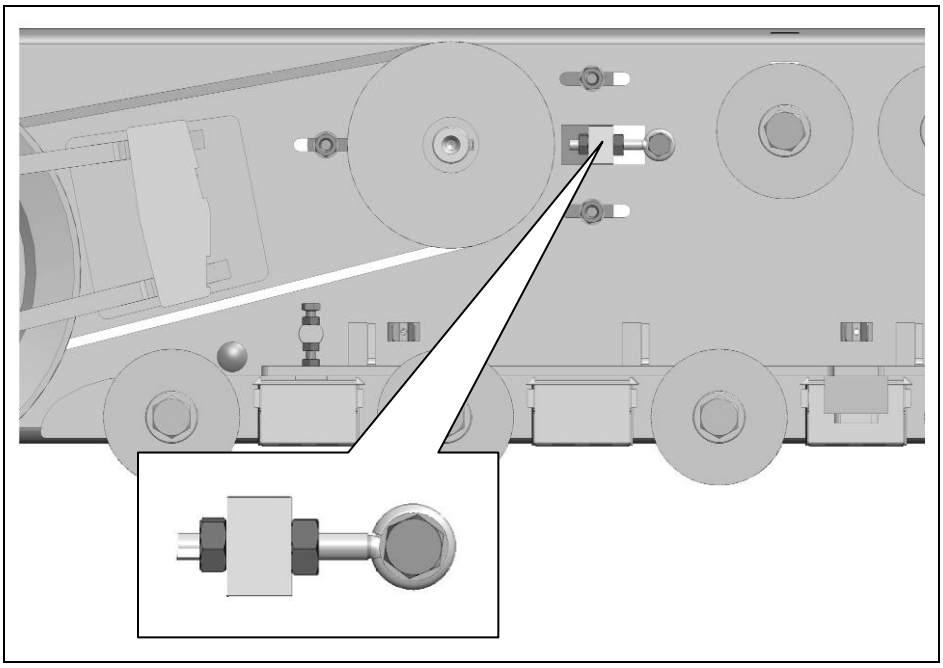


Abb. 23: Front side v-belts

- Lightly loosen the fastening nuts of the tensioning plate.
- Loosen counter nuts of the tension device and turn back.
- The v-belt can be relaxed using the tensioning device.
- Remove the V-belt.
- Put new V-belt into place.
- Re-tension and secure using the tensioning device.
- Tighten the fastening nuts on the tensioning plate again.
- Check the belt tension.

7.6. Replacing the V-belt on the back of the unit

NOTE

Always replace the V-belts in pairs.

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

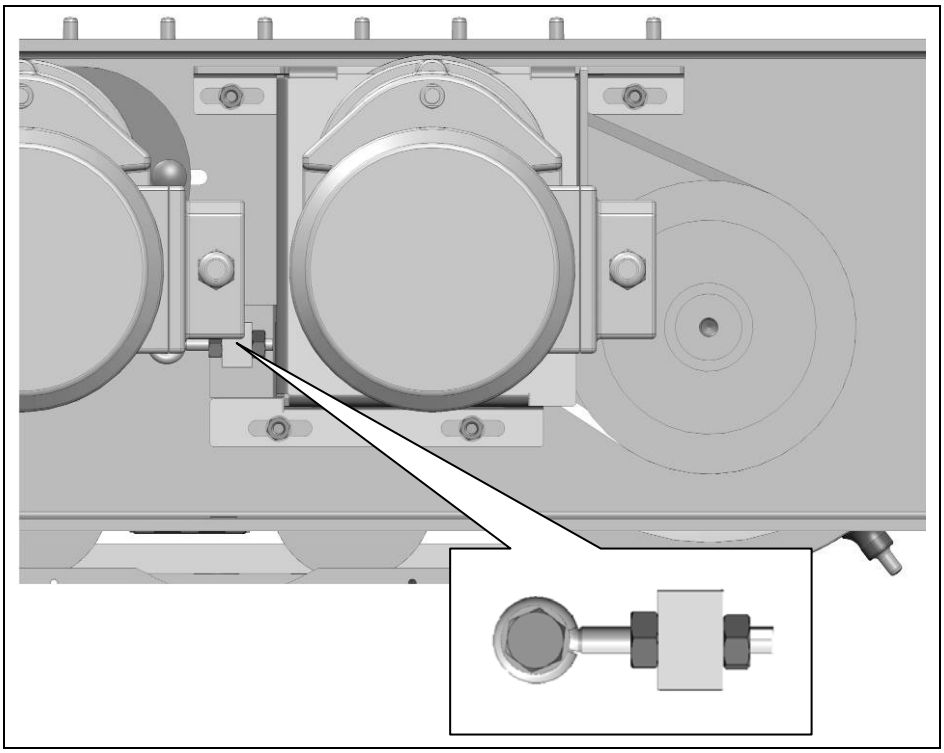


Abb. 24: Back of V-belt.

- Lightly loosen the fastening nuts of the tensioning plate.
- Loosen counter nuts of the tension device and turn back.
- The v-belt can be relaxed using the tensioning device.
- Remove the V-belt.
- Put new V-belt into place.
- Re-tension and secure using the tensioning device.
- Tighten the fastening nuts on the tensioning plate again.
- Check the belt tension.

8. Troubleshooting

8.1. Messages

The various operating states of the machine are displayed by messages on the touch screen.

Some messages inform about malfunctions on the machine. These are displayed as text displays in the »Error messages« menu.

Error Status	Description	Cause	Solution
0001	EMERGENCY STOP	EMERGENCY STOP engaged	➢ Reset Emergency stop
0002	Motor protection axes	Motor overloaded	➢ Check motor protection
0010	Door open	Upper front door opened	➢ Close door
0011	Door open	Door open front bottom	➢ Close door
0012	Door open	Upper rear door opened	➢ Close door
0013	Door open	Lower rear door opened	➢ Close door
0050	Motor protection exhaust system	Motor protection (external) triggered	➢ Reset motor protection ➢ Restart ➢ see operating instructions for exhaust system
0100	Safety strip	Safety strip triggered	➢ Release safety strip ➢ Restart
0101	Motor protection conveyor belt	Motor overloaded	➢ Check motor protection
0102	Converter conveyor belt	Malfunction in frequency converter	➢ See operating manual for frequency converter

Sheet thickness

Error Status	Description	Cause	Solution
0201	Max. end position sheet thickness	End position of sheet thickness reached	➢ Move from the end position
0202	Min. end position sheet thickness	End position of sheet thickness reached	➢ Move from the end position
0203	Sheet thickness plausibility error	No movement Wrong direction	➢ Check motor control ➢ Check for free movement of the axes ➢ Check direction of rotation of motor ➢ Check measurement system
0204	Lower distance to adjacent axis (sheet thickness)	Collision protection	➢ Move with the axes out of the area
0207	Converter sheet thickness	Malfunction in frequency converter	➢ See operating manual for frequency converter

UPPER D-unit

Miscellaneous

Error Status	Description	Cause	Solution
1601	Max. end position D upper	End position D reached	➢ Move from the end position
1602	Min. end position D upper	End position D reached	➢ Move from the end position
1603	Plausibility error D upper	No movement Wrong direction	➢ Check motor control ➢ Check for free movement of the axes ➢ Check direction of rotation of motor ➢ Check measurement system
1604	Lower distance to adjacent axis D upper	Collision protection	➢ Move with the axes out of the area
1606	Unit open D upper		➢ Close units ➢ Check wires
1607	Converter D upper	Malfunction in frequency converter	➢ See operating manual for frequency converter
1700	Motor protection D1	Motor overloaded	➢ Check motor protection
1750	Motor protection D3	Motor overloaded	➢ Check motor protection

LOWER D-unit

Miscellaneous

Error Status	Description	Cause	Solution
1801	Max. end position D lower	End position D reached	➢ Move from the end position
1802	Min. end position D lower	End position D reached	➢ Move from the end position
1803	Plausibility error D lower	No movement Wrong direction	➢ Check motor control ➢ Check for free movement of the axes ➢ Check direction of rotation of motor ➢ Check measurement system
1804	Lower distance to adjacent axis D lower	Collision protection	➢ Move with the axes out of the area
1806	Unit open D lower		➢ Close units ➢ Check wires
1807	Converter D lower	Malfunction in frequency converter	➢ See operating manual for frequency converter
1900	Motor protection D2	Motor overloaded	➢ Check motor protection
1950	Motor protection D4	Motor overloaded	➢ Check motor protection

8.2. Customer service

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

LISSMAC
Maschinenbau u. Diamantwerkzeuge 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

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
- Flushing head seals
- 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
- Bowden cables
- Lamella
- Diaphragms
- Spark plugs, glow plugs
- Parts of reversing starters, such as crank cable, crank handle, crank roller, crank spring
- Sealing brushes, sealing rubber, splash guard cloths
- All types of filters
- Drive and deflector rollers and bracings
- Cable laying protection elements
- Running and drive wheels
- Water pumps
- Cut goods transport rollers
- Drilling, separating and cutting tools
- Transport belt
- Rubber scrapers
- Needle felt protection
- Energy storage
- Brush 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.