Operating Manual
Blast machine
Model: S320E



Original instructions

Von Arx EOOD

Nedyalka Shileva 20
4000 Plovdiv (Bulgaria)

Tel.: +359 32 94 05 53

E-Mail: order@vonarx.com
Website: www.vonarx.com



TECHNICAL DATA 1

SAFETY INSTRUCTIONS 2

GENERAL 3

TRANSPORT 4

INITIAL OPERATION 5

OPERATION 6

MAINTENANCE 7

ELECTRICAL SYSTEM 8

FAULT DIAGNOSIS 9

SPARE PARTS 10

Changes to technical data reserved
Version: April 2024

Chapter 1

1.1 Rating PAGE 2

1.2 Unit specifications PAGE 2

1.3 Operative range and intended use PAGE 3

1.4 Reasonably foreseeable misuse PAGE 3

1.5 Stand-by power supply (generator) PAGE 3

1.6 Advice for operators of blast machines PAGE 4

1.7 Machine type designation PAGE 5

Technical Data

1.1 Rating

1

Machine: **Blast machine**

Machine-model: **S320E**

Manufacturer: IMPACTS GmbH
Zöllnerstrasse 7
51491 Overath, Germany

1.2 Unit – specifications

Dimensions:

	Machine	Dust collector (Optional)
	S320E	DC 3324
Length	1800 mm / 71 in	1350 mm / 53 in
Width	450 mm / 17.7 in	798 mm / 31.4 in
Height	1000 mm / 39.4 in	1210 mm / 47.6 in
Weight	330 kg / 727.5 lb	360 kg / 793.7 lb

Connected loads of the electrical system:

	Blast machine
Power	12 kW
Electrical connection	480 V, 60 Hz, 3-phase grid, max. power consumption 23 A

Recommended dust collector (Optional)

Dust collector	DC 3324
Power	6,4 kW
Electrical connection	480 V, 60 Hz, 3-phase grid, max. power consumption 15 A Incl. machine 38 A

Changes to technical data reserved

1.3 Operative range and correct usage

The blast machine S320E is designed to be used on clean, dry, horizontal surfaces without obstacles. The machine cannot be used for other purposes. The manufacturer will not be liable for damages resulting from such incorrect usage. In case of wrong usage, the user assumes all risks.



1.4 Reasonably foreseeable misuse

The machine may not be used for any other purposes than those described in these original instructions.

The machine shall only be operated by instructed and authorized persons.

The direction of the wheel drive rotation is wrong.

When starting to work, rear wheels are still in transport position.

Do not lift up the machine during operation.

The machine may only be used while in full working order. (Do not operate machine when for example: seals, protections or cables are damaged).

1.5 Stand-by power supply (generator)

If the blast machine S320E is operated using a generator, the generator must be operated in accordance with the current VDE directives. This applies in special to the protective earth conductor, in order to ensure that all safety devices are functioning and to be able to eliminate possible damage to electrical components.



1.6 Advice for operators of the blast machine



During the operation of the blast machine S320E it may be possible to exceed the acceptable noise level of 85 dB(A). This is dependent on the different locations and the local circumstances. When the noise level is 85 dB(A) or more, the machine operator and the persons working near the machine must wear sound-insulating devices.

Declared dual-number noise emission values in accordance with ISO 4871	**Idle**	**Load**
A-weighted middle enveloping surface sound pressure level L'_{pA} in dB	83,1	89,0
Uncertainty K_{pA} in dB	1,0	1,0
A-weighted sound power level L_{WA} in dB	98,5	104,4
Uncertainty K_{WA} in dB	1,0	1,0
The noise level was determinate in accordance with noise emission measuring DIN 45635, Part 1 – enveloping surface method. Idle: Machine on an outside concrete surface. Load: Blasting procedure with dust collector on an outside concrete surface.		



For the use of the machine the operator has to have a current task-based hazard assessment in place, based on the work protection law and industrial safety regulation.

Operator workplace:

During operation, the machine operator must stand behind the machine and move the machine by hand in the working direction. The operator can reach all operating and control devices from this position.

1.7 Machine model designation

1

Machine model:	**S320E**
Unit / designation:	**Blast machine**
Working width:	**320 mm / 12.6 in**
Drive:	**progressively adjustable 0-30 m/min 0-98.4 ft/min**
Blasting capacity:	**up to 200 m²/h / 2152 sq. ft/h on concrete**
Abrasive consumption:	**100 – 200 g/m² / 2.95 – 5.9 oz/sq. yd**
Dust hose connection:	**130 mm / 5.1 in**
Recommended dust collector:	**DC3324**

Technical Data

Notes



Chapter 2

2.1 Explanation of warnings and symbols	PAGE	2
2.2 Organizational measures	PAGE	4
2.3 Personnel selection and qualification	PAGE	5
2.4 Safety precautions applicable to different operating conditions	PAGE	6
2.5 Repair work, maintenance activities and default repair on the job site.	PAGE	7
2.6 Definition of the Safety off position	PAGE	9
2.7 Dangerous aspects of the machine	PAGE	9
2.8 Electrical engineering regulations	PAGE	10
2.9 For special attention	PAGE	11

Safety Instructions

2.1 Explanation of warnings and symbols

The following denominations and symbols are used in the operating manual to highlight areas of particular importance:

2



Symbol of operational safety.

This symbol will be shown in this operating manual next to all safety precautions that are to be taken in order to ensure prevention to life and injury. Follow always these instructions and take special care in these circumstances. In addition to these instructions, the general safety precautions and the local accident prevention guidelines are also to be followed. Please check, whether there are special regulations for the particular job site.





Information, instructions and restrictions with regards to possible risks to persons or extensive material damages.





Particular details regarding the economical use of the equipment.

Indications relating to protective devices of electrical equipment.	
Warning against dangerous voltages.	
Indications where consultation with the manufacturer is necessary.	
Instructions relating to periodical checks.	
Reference to important instructions contained in the operating manual.	

2.2 Organizational measures

2



The operating manual is to be kept near the location where the machine is located and must be reachable all the time!

In addition to the operating manual, general and legal regulations regarding accident prevention and environmental protection must be with and indicated every time!

Such duties may for example relate to the handling of hazardous substances or to the provision and wearing of personal protection equipment as well as compliance with local traffic regulations.

The operating manual must be supplemented by instructions including the duty to supervise and report relating to particular local working practices, for example work organisation, work procedures and personnel allocation.

Personnel entrusted with working with the machine must have read the **operating manual** before starting the work, in particular the chapter about **Safety Instructions**. This has to be done before starting any work with the machine. This particularly applies to incidental activities such as setting up the machine, carrying out maintenance work or training staff to work with the machine.

From time to time the working practices of the staff are to be checked regarding awareness of **safety and hazards**.

Personnel must tie back long hair and not wear loose clothing or jewellery rings. There is a risk of injury through getting stuck or being drawn into moving machinery.



Use **personal protection equipment** if necessary or required by regulations! Take notice of **all** safety and hazard notices on the machine!

All **safety and hazard notices on** the machine must be kept complete and **readable**! Replace them, if necessary.

If **safety-critical changes** occur to the machine or its performance**,** the machine must be **shut down immediately!** The cause of the fault has to be established immediately and has to be repaired before starting the work again!

Changes, add-ons or conversions of the machine which might have an influence to the safety of the machine must not be undertaken without the **permission of the manufacturer**!



This applies in particular to the fitting and adjustment of safety devices and to welding on major and load bearing parts.

Spare parts must always comply with the technical requirements and the specification of the manufacturer. This is always guaranteed with original spare parts of the manufacturer.

Inspection intervals and intervals for recurring checks specified in this operating manual must be complied with. At the same time, it is necessary to meet the legal requirements.



To perform maintenance work correctly it is important to be equipped with proper tools for the task in question.

The **location** and the operation of **fire extinguishers** must be made known on each building site!



Take note of the facilities for fire reporting and fighting fires!



2.3 Personnel selection and qualification

Fundamental duties:

Only reliable personnel are allowed to work on the machine.

Only trained personnel can be used to operate the machine. **Note the statutory minimum age!** Specify clearly the responsibilities of personnel for operation, set-up, service and maintenance work!

Make sure that only **authorised** personnel operate or work on the machine!

Select clearly the **machine operator**. Define his responsibilities also regarding to **traffic safety regulations** and empower him to decline instructions from third parties which are not complying with the safety requirements!

Personnel being trained or made acquainted with the equipment may only be deployed **under constant supervision of an experienced person**.



Work on the electrical parts of the equipment may only be undertaken by a **skilled electrician** or by a **trained** person under the **guidance** and **supervision** of a **skilled electrician** as well as in accordance with **the electrical engineering regulations**.

2.4 Safety precautions applicable to different operating conditions

Avoid any method of working that **impairs safety**!

All precautions have to be taken, that the machine will only be used in a safe and functional status!





Only operate the machine when all **safety devices** and related **safety equipment**, e.g. detachable **safety devices**, emergency stops and suction devices are present and **operational**!

The machine has to be checked visually at least once a day for any **damage** and **defects**!

In the event of **operational malfunctions,** the machine must be **shut down immediately** and secured. The fault must be rectified before starting the machine again!



Secure the **work area** around the machine in **public areas** providing a **safety distance** of at least 2 m around the machine.

Default must be rectified immediately!

Start-up and switch off operations and control devices have to be handled in accordance with the operating manual!

All persons in the proximity of the machine must wear safety glasses with lateral protection as well as safety shoes. Ear protection may be required. The operator is obliged to wear close fitting protective clothing.



Use only extension cables for extending the main cable that are sized and marked in accordance with the overall power consumption of the machine and the valid VDE and local guidelines.



Before starting the machine make sure that nobody can be endangered when the machine starts running!

Do not switch of or remove the exhaust and ventilation devices when the machine is running!

2.5 Repair work, maintenance activities, and default repair on the job site

Mechanical service work:

Before starting any servicing work on the machine, put the machine in the **safety off position** as described in chapter 2.6 in order to prevent the machine from being switched on accidentally**.**

Please follow any special **safety instructions** in the various chapters on servicing the machine. **See chapter 7**

Adjustments, servicing and inspection work and inspection intervals specified in this operating manual as well as any information on the replacement on parts and systems of the machine must be **undertaken and / or complied with**!

These activities can only be undertaken by **qualified personnel**.

Before starting any maintenance or repair work the **operator** of the machine has to **be informed** about it!

During all work related to the use, the modification or the adjustment of the machine and of the safety devices as well as inspection, maintenance and repair, the start-up and shut off procedures have to be done in accordance with the operating manual!



Has the machine been shut off completely for **repair or maintenance work** the plug has to be **disconnected** in order to prevent the machine from being switched on **accidentally. See Chap. 2.6 Safety off position**

The dust bin of a connected dust collector has to be emptied before transportation. Please handle in accordance with the regulation how to dispose the dust and make sure that you meet the local regulations.
Do not use any **aggressive cleaning materials**!
Use lint-free cleaning cloths!

Always tighten any screw connections that are undone during servicing and maintenance work.

If **safety devices** need to be **dismantled** during setting up, servicing and repair work, these **safety devices** must be **reinstalled** and inspected immediately after completion of the servicing and repair work.

Make sure that process materials and replacement parts are disposed of safely and in an environment-friendly manner!



Work on the electrical parts of the equipment may only be undertaken by a **skilled electrician** or by a **trained** person under the **guidance** and **supervision** of a **skilled electrician** as well as in accordance with **the electrical engineering regulations**.

Make sure that electrical components used for replacement purpose comply with the original parts and are correctly adjusted if necessary. Especially FI circuit breaker, motor protection switches and electronic components requires special attention.

2.6 Definition of the Safety off position

Definition:

The **safety off position** is the position of the machine when it cannot generate any hazard.

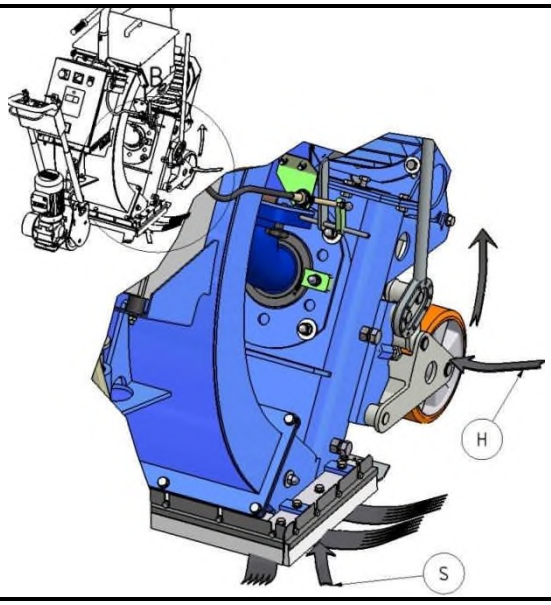
2

Putting the machine in the safety off position means:

- Ø **Switch off the machine**
- Ø **Switch off the dust collector**
- Ø **Wait for standstill of all devices**
- Ø **Pull out main plug and place with the machine**
- Ø **Secure the machine against unintended start up**

2.7 Dangerous aspects of the machine

Every machine, if it is **not used according to the regulations**, may be **hazardous** for operating, setting-up and service personnel. The **operating authority** is responsible for **compliance with the safety regulations** during operation and maintenance of **safety devices** supplied with the machine as well as the provision of appropriate additional safety devices!



Danger of injury!

Abrasive leaves housing with high speed!
Moving parts!

(S)

Lift and tilt the machine only when it is in safety off position.

(H)

It is not allowed to stay within the working radius of the machine.

2.8 Electrical engineering regulations

2



Work on the electrical parts of the equipment may only be undertaken by a **skilled electrician** or by a **trained** person under the **guidance** and **supervision** of a **skilled electrician** as well as in accordance **with the electrical engineering regulations**.



Use only extension cables for extending the main cable that are sized and marked in accordance with the overall power consumption of the machine and the valid local guidelines.

In case there is any question ask the manufacturer or a skilled electrician.



The electrical parts of the machine must be **inspected regularly**. Please note in particular the sp**ecified recurring inspections according DGUV V3 or local regulations.** Defects such as **loose** connections or **scorched** cables must be rectified immediately. **Call a skilled electrician or the dealer customer service.**

If work on **life** parts is necessary, a **second person** must be deployed who can pull out the plug in an emergency. The working area must be sealed with a red and white **safety chain** and a danger sign. Use tools that are **insulated against voltages**.

Only start work, once you are familiar with the **electrical engineering regulations** that apply to your area.

Only use voltage seekers that comply with the regulations when troubleshooting. From time to time check voltage seekers to ensure that they are operationally efficient.

Make sure that electrical components used for replacement purpose comply with the original parts and are correctly adjusted if necessary. Special attention with **ground fault interrupter, motor protection switches and electronic devices**.

2.9 For special attention

Use only proper and default free tools for your work. Damaged tools have to be repaired immediately or to be replaced.

While working, for your own safety, the required safety **equipment** and **safety cloths must be worn.** (e.g. safety glasses, safety shoes, safety gloves).

Please instruct your operators and the repair personnel about the following points:

- Greasing-, cleaning-, and repair work is only allowed if the machine is shut off. (**safety off position**)
- Make sure, that during the work on the machine, the machine cannot be started.
- It is not allowed to open or remove **safety devices** while the machine is **running**.
- Do not forget to bring all safety covers and safety devices in **place again** after cleaning, repair and maintenance work.
- Do not touch **moving parts** and do not walk into the working path of the machine.
- Please check after repair- cleaning- and maintenance work and before you start the machine again, that no person is in the working area and could be endangered by the machine.

Safety Instructions

Notes:



Changes to technical data reserved

Chapter 3

3.1	Operative range	PAGE	2
3.2	Scope of supply	PAGE	2
3.3	Description of the machine	PAGE	3
3.4	Operating elements	PAGE	4
3.5	The wheel kit	PAGE	9
3.6	The separator	PAGE	10
3.7	The traction drive	PAGE	11
3.8	The base seals	PAGE	12
3.9	Abrasive media	PAGE	13
3.10	Care and maintenance	PAGE	16

3.1 Operative Range

The blast machine **S320E** is a downward blasting machine with a closed abrasive circuit designed for the pre-treatment of horizontal surfaces. The bouncing impact of metallic abrasive onto the surface to be treated thoroughly removes surface contaminants, coats of paint, sealants and thin coatings.



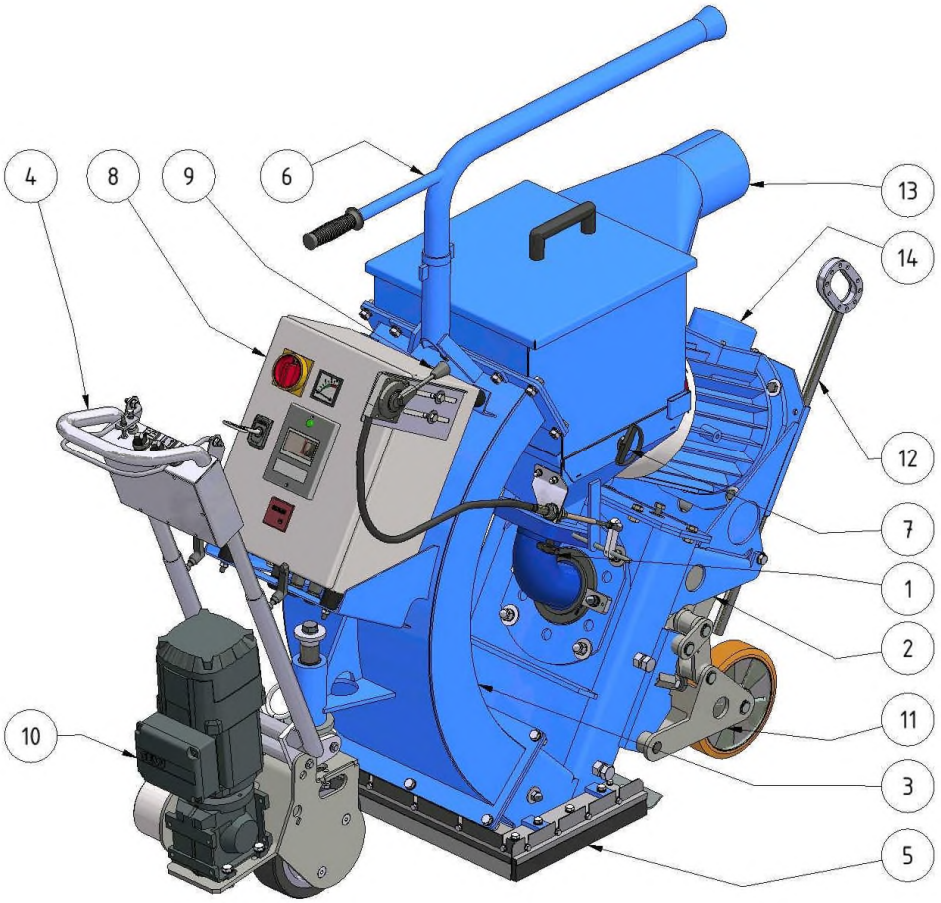
A suitable dust collector must be connected to the machine in order to separate the dust from the abrasive. A specially designed dust collection system ensures dust-free operation of the machine and clean air at the workspace. We recommend a DC3324.

3.2 Scope of supply

Scope of supply:

- Ø **Blast machine (S320E)**
- Ø **Operating Manual (1 x)**
- Ø **Dust collector (DC3324) (Option)**
- Ø **Dust hose (20 m / 65.6 ft) (Option)**
- Ø **Magnetic cart (Option)**
- Ø **Magnetic broom (Option)**

3.3 Description of the machine



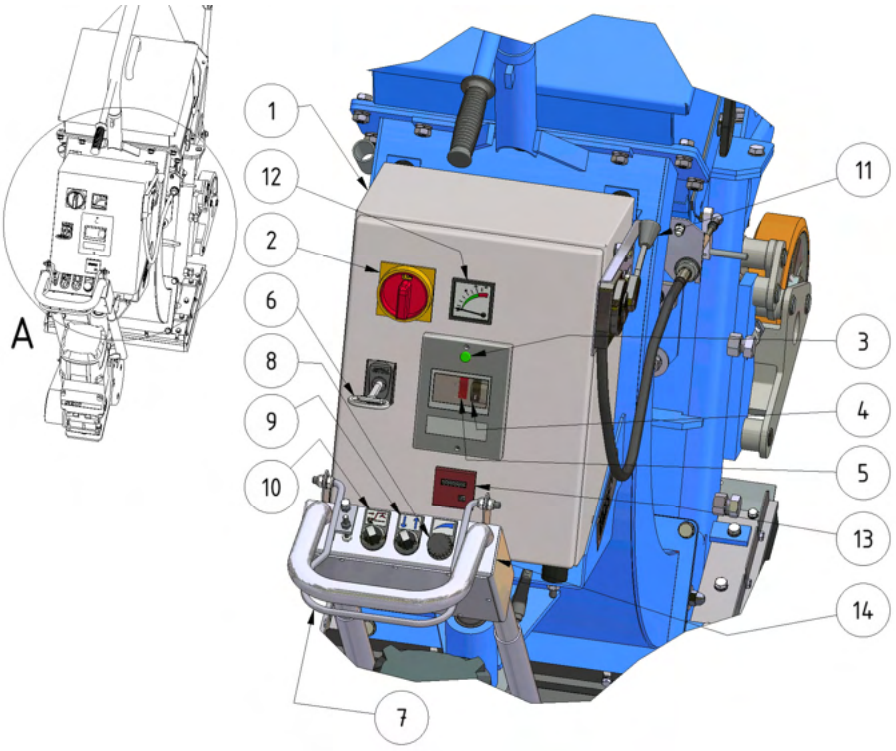
1	Abrasive feeding	8	Control panel
2	SIDE FORCE wheel housing	9	Abrasive control cable
3	Rebound	10	Traction drive
4	Comb. - Operation handle	11	Toggle lift
5	Base seal	12	Lever for toggle lift
6	Cable guide	13	Separator
7	Separator tray	14	Wheel motor

As revolutionary invention, the blast wheel method, based on a simple principle: After mechanical pre-acceleration, the abrasive is thrown onto the surface at high speed by the blast wheel. Once the abrasive has impacted the surface it rebounds into a rebound plenum. The rebound plenum deflects the abrasive into an air current separator. Here dust and other contaminants are removed from the abrasive so that only abrasive containing a very small amount of dust is falling back into the abrasive storage hopper to flow back again to the blast wheel.

3

3.4 Operating elements

The control panel (1) and the combined lifting and control handle (14) are carrying all controls and instruments used for supervision and control of the machine.



1) Control panel
2) Main switch
3) Control light rotating field (only 50Hz Version)
4) Switch wheel motor ON
5) Switch wheel motor OFF
6) Control panel key
7) Traction drive, dead man handle
8) Potentiometer traction drive
9) Switch forward, backward
10) Overdrive switch
11) Abrasive control lever
12) Amperemeter (21 Amp. Max)
13) Hour meter
14) Comb. lifting and control handle

Main switch

The main switch (2) is in the control panel door.

Switch on the machine: turn the main switch clockwise to 1/ON – position
Switch off the machine: turn the main switch counter clockwise to 0/OFF – position

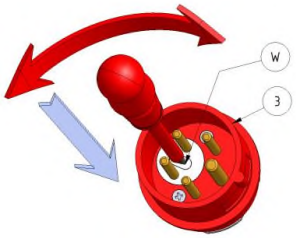
In case of an emergency: turn the main switch counter clockwise to 0/OFF – position

Control light rotating field (only 50Hz Version)

The control light green (3) indicates that the rotating field is correct.

Control light on: rotating field correct.
Control light off: rotating field wrong.

Change the rotating field: Turn the main switch counter clockwise to 0/OFF – position,
Pull out the power plug,
Turn the phase changer (W) in the plug (3) through 180º.



Switch wheel ON/OFF

Press the switch (4) (I) the wheel motor will start up.
Press the switch (5) (0) the wheel motor will stop.

Amperemeter

The amperemeter (12) shows the load consumption of the blast wheel motor. When switching on the motor the current value is high (starting current peak), for no-load current and operating current please see the following values.

Machine	Non-load current	Operating current
S320E	Approx. 7 A	max. 21 A

Hour meter

The hour counter (13) shows the sum of the actual working hours performed by the blast wheel.

Switch "Overdrive"



This switch (10) bypasses the drive speed control and the machine will move at max. speed.

Traction drive, dead man handle

The switch (7) lever below the control handle serves for controlling the drive motor. Actuating the switch lever upwards closes the power circuit to switch "ON" the drive motor. When the lever is released, the drive motor switches "OFF"
(Dead man's handle).

Speed control

The operation speed is set by a potentiometer (8).
Although this indication does not allow direct reading of the actual speed, it shows comparing numbers allowing the operator to set the appropriate speed.

Forward/backward switch traction drive

This switch (9) controls the direction of the blast machine.
Position "2" - Blast cleaning direction – movement is backwards.
Position "1" - Transport direction – movement is forward.

The abrasive control valve

To regulate the flow of abrasive to the blast-wheel there is a magnetic-valve (3) fitted between storage-hopper (1) and feed spout (2).

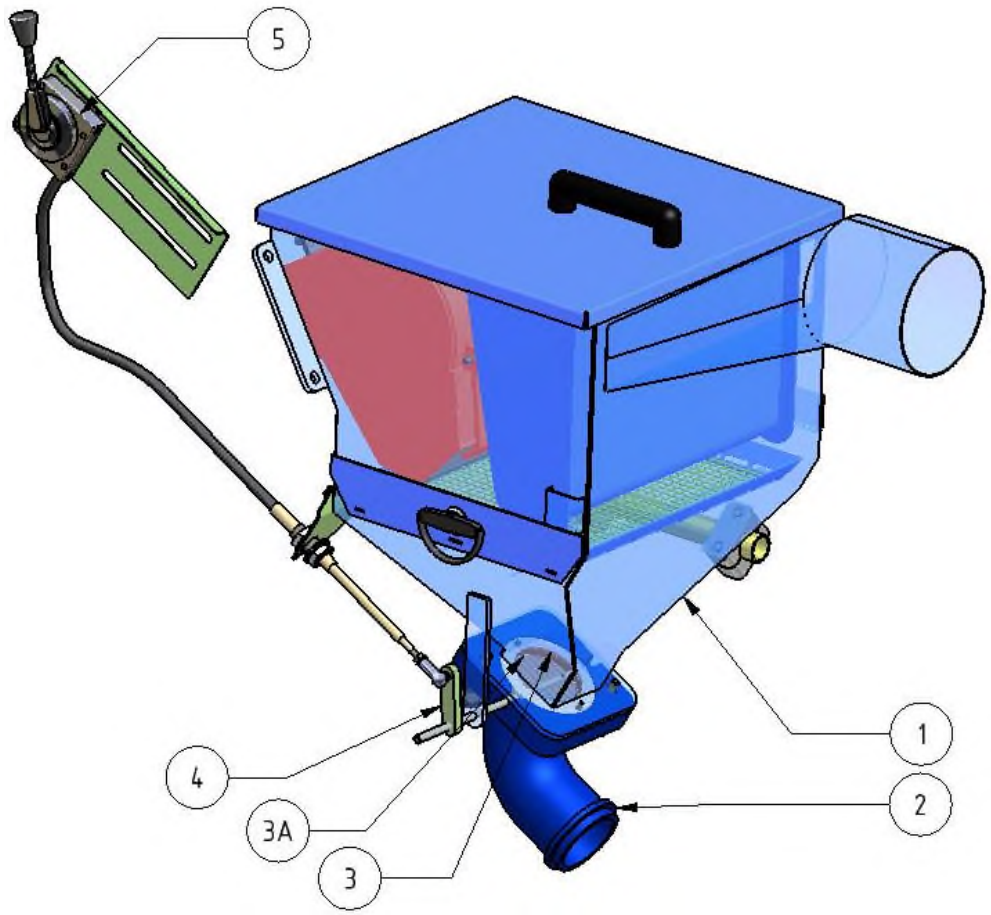
This valve has a turn able shutter (3A) that is linked to a lever (4) controlled by the control cable (5).

Changing the angle of the shutter position results in a different amount of abrasive flowing to the blast wheel. Feeding more abrasive is causing more work means higher load on the blast-wheel motor.

Load on the motor is indicated by the Amp meter.

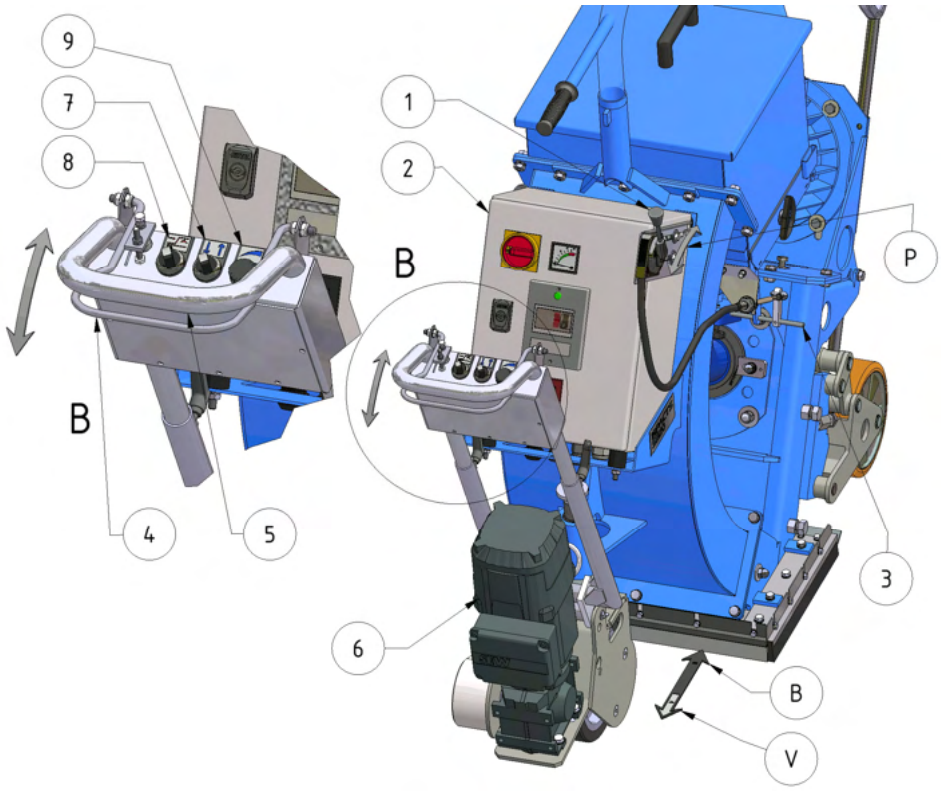
Do not load more abrasive than recommended for the S320E, the max load is at **21 Amp**.

Higher load will cause the **motor to fail** or damage of the motor.



Abrasive control lever

This lever (1) is located on the control panel (2) and regulates the magnetic valve (3) to control the flow of abrasive towards the blast wheel. The valve is hand-operated and can be set to each amount of abrasive throughput by changing the lever position. Pulling (P) it forward will open and pushing will close the magnetic valve. (Max. 21 Amp. allowed)

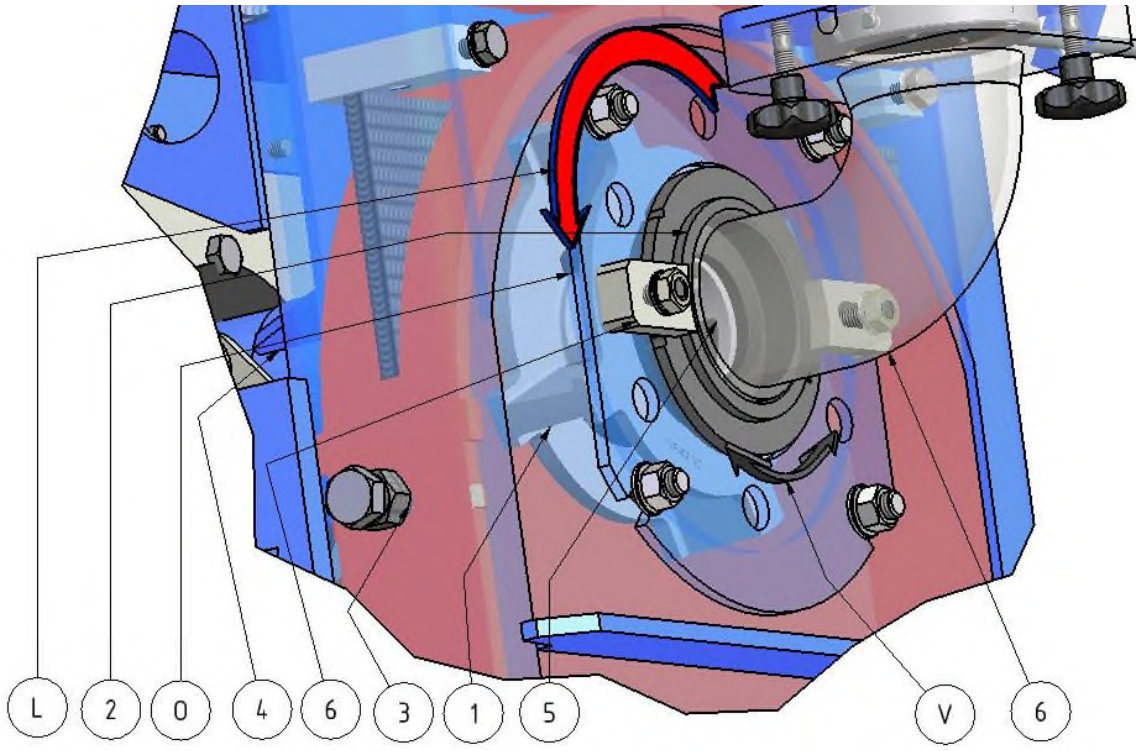


Traction drive, dead man handle

The switch lever (4) below the control handle (5) serves for controlling the drive motor. Actuating the switch lever upwards closes the power circuit to switch on the drive motor. Depending on the setting of the selection-switch (7) the machine will move forward or backward. The speed depends on the setting of the speed control (overdrive (8) not switched).
When this lever is released, the drive motor switches off (dead man's handle).
Blast operation direction is (V), (B) is used to move the machine but can't be used to blast the surface.

3.5 The wheel kit

The heart of every blast-machine is the blast wheel (1) this will throw the abrasive to the surface to treat, using centrifugal forces. The blast wheel is placed in a side force wheel housing (2) protected with replaceable wear plates (3). The blast wheel is driven by an electric motor via. a belt drive and mounted on a bearing unit (4). The correct rotation of the S320E blast wheel is CCW. (L)



The centre of the blast wheel shows a pre-accelerator, called impellor (5) feeding dosed quantities of abrasive onto the blades of the turning blast wheel. On top of this is the control cage (6) which, once it is carefully set, regulates the direction of the abrasive flow.

The abrasive goes through the opening (O) of the control cage onto the blades (1) of the turning blast wheel.

The control cage, held by two clamps (6) needs to be adjusted (V) so the blast pattern shows to the centre of the machine.

Turning the control cage CCW will move the blast pattern to the right and turning it CW will move the blast pattern to the left.

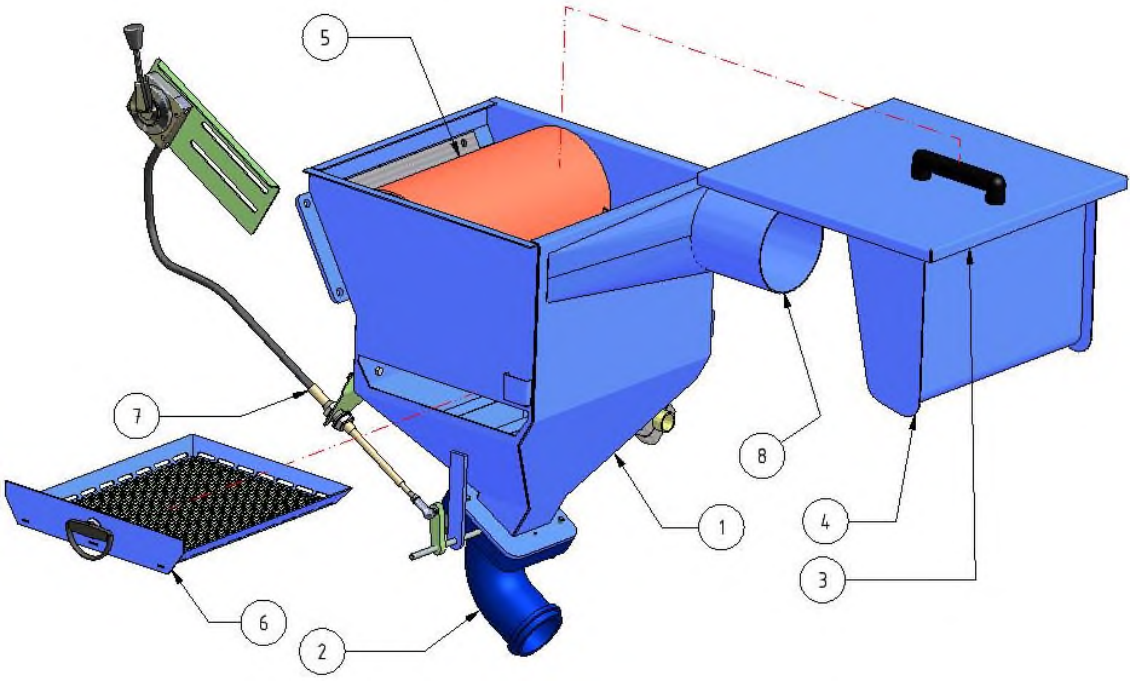
3.6 The separator

The separator (1) is mounted to the end of the rebound plenum. The deflector (5) and baffle plate (4) will stop the reflected abrasive. The dust collector, connected to the hose connector (8) will generate an appropriate airflow within the separator so this device will separate dust from abrasive.

3

The abrasive drops back to the storage where it has to pass a wire mesh tray (6). This tray (6), fitted to prevent any coarse contaminants from getting into the blast wheel. In order to clean the wire mesh tray, the separator lid (3) can be removed and the tray can be taken out from the side.

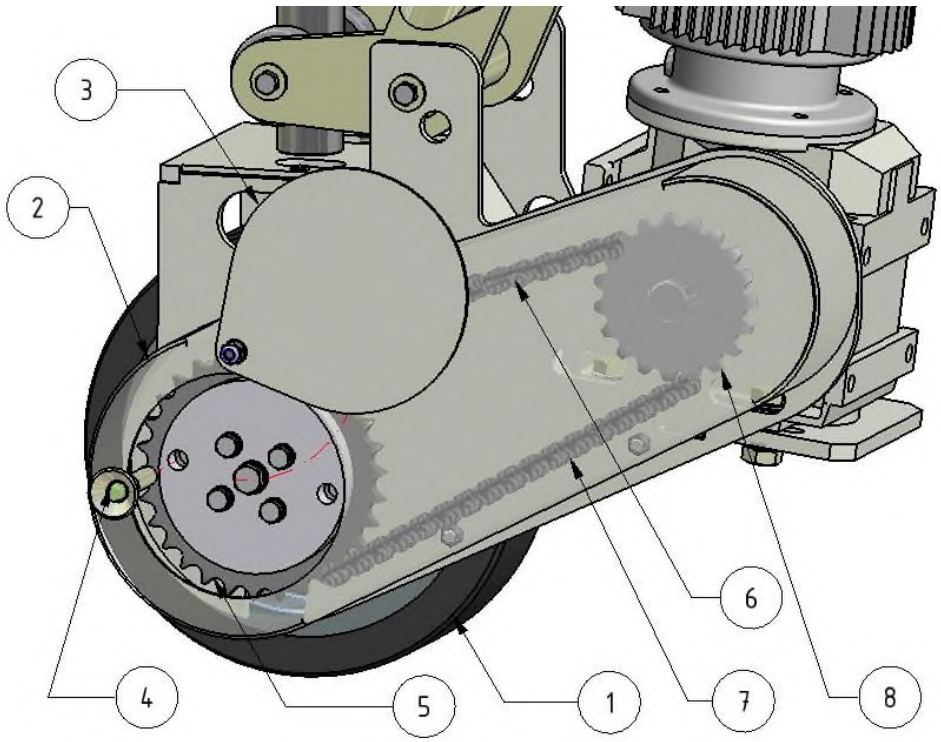
Out of this storage section, the abrasive runs via a magnetic control valve (7) and feed spout (2) into the blast wheel.



1	Separator housing	5	Deflector
2	Feed spout	6	Wire mesh tray
3	Separator lid	7	Abrasive control
4	Baffle plate	8	Hose connector

3.7 The traction drive

The S320E is driven by a 0.55 kW electric drive motor. The power is transmitted via a chain drive. The drive wheel (1) and the Drive Sprocket (5) are not linked rigidly. The transmission is built from the traction drive wheel (1), sprocket (5) and chain (7). Drive wheel and drive wheel sprocket are not linked direct, only the quick release pin (4) will link these parts so the energy gets to the drive wheel.

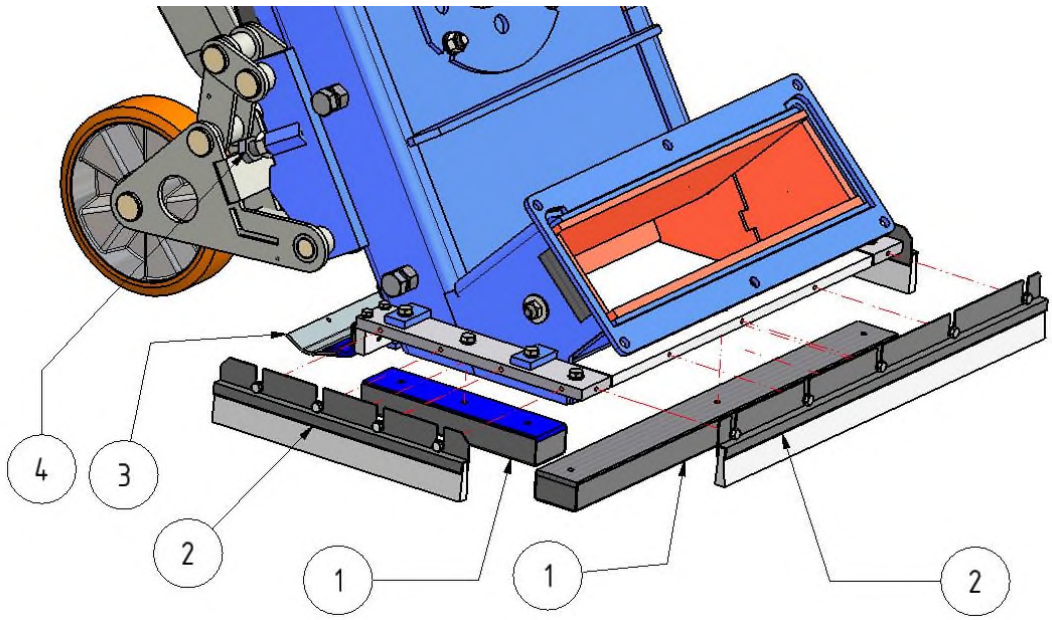


1	Traction drive wheel	5	Drive sprocket
2	Chain guard	6	Chain link
3	Chain guard cover	7	Chain
4	Quick release pin	8	Motor sprocket

3.8 The base seals

On the front and side are magnetic seals (1) surrounded by brush seals (2). On the rear you will find a seal called tail-seal (3) this seal slides over the surface and hinders abrasive getting out of the blast area.

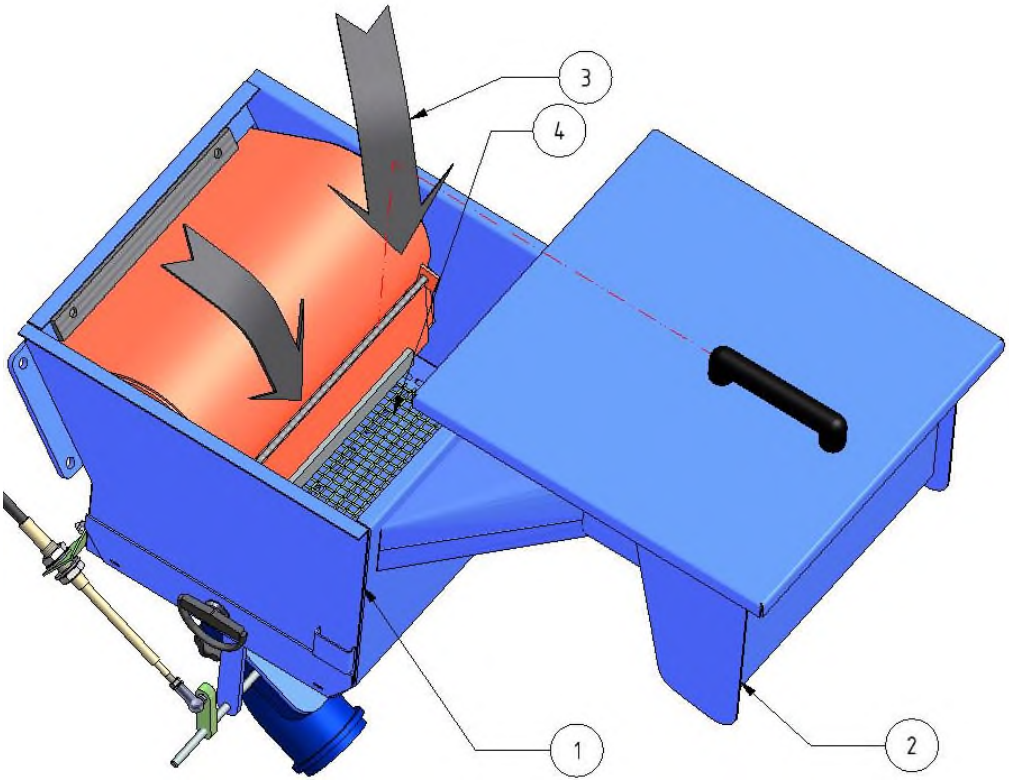
All seals should seal against abrasive spray. The correct setting of the magnets is 8 - 12 mm over floor depending on the application, also very important for the best function of the machine. The adjustment is done by set screws on the traction drive and the rear (4).



1	Magnetic seal	3	Tail seal (rear seal)
2	Brush seal	4	Adjuster screw

3.9 Abrasive media

In order to operate blast machine S320E you need hardened, spherical abrasive. The machine S320E has been especially designed to be operated with **S shot** abrasive.
Take of the lid (2) from the separator (1) assure wire mesh tray (4) is in place and fill up abrasive (3) distributed equal up to the bottom of the mesh. Check occasional function of the deflector shutter.
The **S shot** abrasive is of very high quality and owns the rebouncing ability required for the efficient use of model S320E. The selection of the abrasive is very important since this is the material to carry out the surface treatment.



Selecting Abrasive

Media S shot S 290: Applications:

- r creates fine profiles, e.g. on vacuum concrete and non-glazed tiles.
- r removes thin layers of paint.

Is often used when the surface is only subsequently sealed.



Media S shot S 330: Applications:

- r creates a fine to medium texture on concrete.
- r removes glazing from tiles prior to subsequently coating with antiskid floor sealing.
- r removes old impregnations and coatings about 1 mm thick.

Media S shot S 390: Applications:

Standard abrasive, suitable for about 50-60 % of all applications. Creates a medium profile on concrete. Fulfils the same purpose as Media Impactor S 330 when a higher speed of the machine is required, e.g. on asphalt, in order to keep the thermal load low.

- r removes laitance from new concrete.
- r roughening of smooth concrete or natural stone.
- r removes coatings with a thickness of 1-3 mm.
- r cleaning of steel surfaces.

Media S shot S 460: Applications:

Used to generate a rough profile and to improve work output.

- r removes laitance from new concrete.
- r removing thicker paints or rust from steel surfaces.
- r removing of flex coatings from parking deck.
- r removing painted road lines.
- r retexturing on asphalt surface and concrete roads.

3

Media S grit GL18: Applications:

Only as an addition to other Media with maximum 30% content.

- r removes polyurethane coatings
- r removes adhesive remnants
- r removes rubber deposits
- r penetrates coatings hard to remove
- r also, suitable to be used on steel.

Media S grit GL 18 should never be used without blending since otherwise the wear in the machine as a whole would increase disproportionately.



The effectiveness of the S320E depends on the rebound effect that ensures that the abrasive can be re-used.

Please take into account that the use of incorrect abrasive increases wear.

Our service engineers have the experience to select the appropriate abrasive for the individual cases of application.

Please consult your **dealer** customer service department if you have any questions about the selection of the best abrasive for your blast cleaning work.



3.10 Care and maintenance

Special attendance and regular maintenance of the machine and its parts are imperative for functioning and safety.

In order to prevent unnecessary downtimes, it is recommended to keep original spare and wear parts on stock as listed in the maintenance box.

3



All persons in the proximity of the machine in operation must wear safety glasses with lateral protection and safety shoes. The machine operator must wear close-fitting protective clothing.

Chapter 4

4.1 General notes	PAGE	2
4.2 Transport	PAGE	2
4.3 Transport of the machine by vehicles	PAGE	4
4.4 Operation conditions	PAGE	4
4.5 Machine specifications	PAGE	4

Transport

4.1 General notes

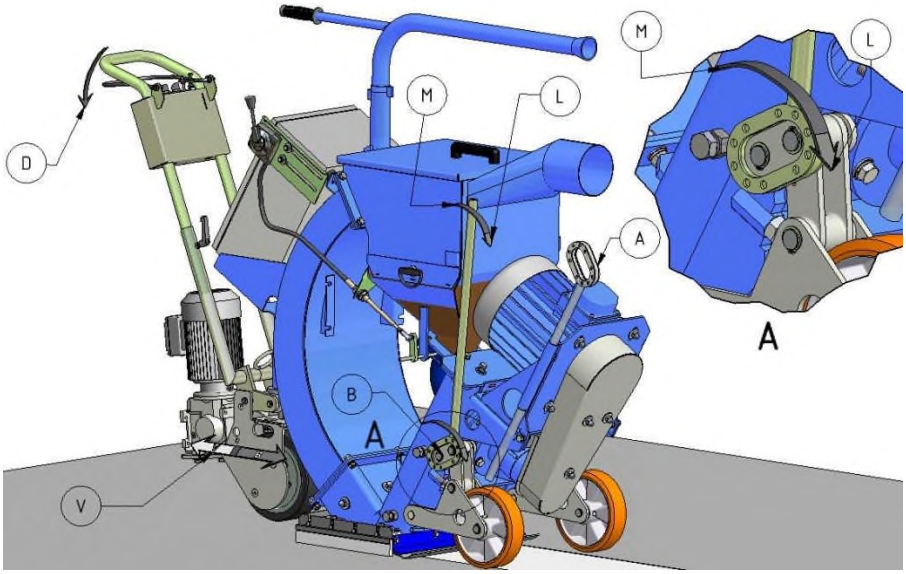


Before the machine used for the first time, authorised dealers offer a course to familiarise maintenance and operating personnel with all elements of the machine. We are not liable for damage caused by incorrect use of the machine by personnel not trained.

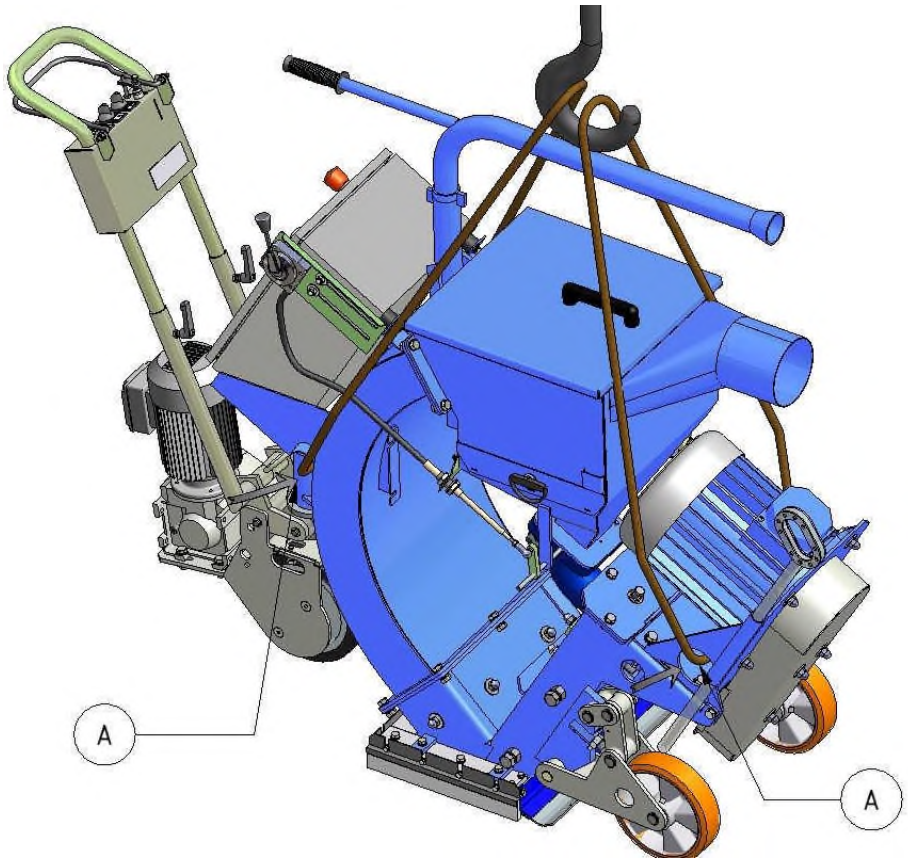
4.2 Transport

In order to transport the machine from a vehicle to the working area you need to lift the machine up. In order to do so use the Toggle Lever Lift at the rear. Push the handle (A) on the top linkage (B) and pull the lever (A) towards direction (L) until the linkage is touching the bracket. To reverse pull up the lever towards direction M.

After the rear Toggle Lever Lift has been set into its upwards position, push down the handle on the front and pull the machine towards direction V onto the jobsite. Never push the machine; this could cause the rear seals to become damaged.



When transporting the machine with hoisting equipment like a crane or a lift, check the total weight permitted. (See Chapter 1 dimensions)
Please use only appropriate, allowed and qualified hoisting equipment (A) as well as ropes and chains (A). You will find the weight of the equipment in chapter 1 or on the serial plate on the machine.
Do not fix any rope or chain (A) to the handle, fix ropes and chains only at locations as shown.
The handle is only fixed with two fixing screws and **cannot at all been used for transport or to fix ropes or hoisting equipment!**

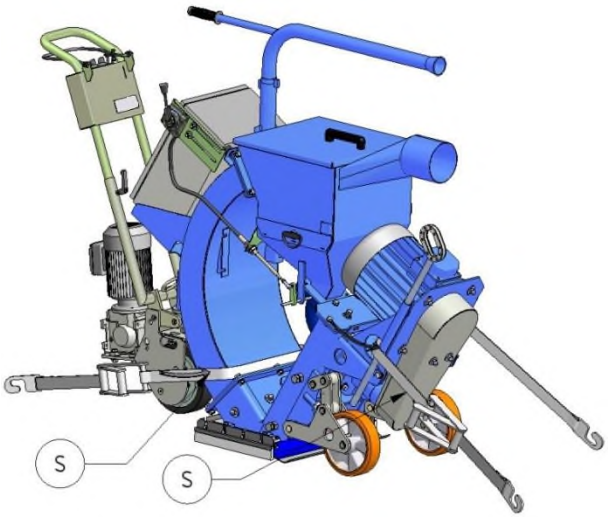


Remove all abrasives from the machine before transport. The machine may only be lifted as shown. Weight and dimensions of the machine shown in Chapter 1 "Technical data".

The machine transport is splitted in:

- Machine (S320E)
- Dust collector (DC3324)
- General accessories

4.3 Transport of the machine by vehicles



When transporting the machine with vehicles, proceed in such a manner that damage due to the effects of force or incorrect loading and unloading is avoided. Use straps (S) to tighten the machine to the cabin of the vehicle.

Use at least two straps or tighten the machine with one strap to the cabin wall of the vehicle. Make sure, that all parts of the machine are fixed.

To reduce the height of the machine, you can slide the handle down. In order to achieve this, you have to slacken the two fixing screws to slide the handle down. Do not forget to fix the fixing screws again, otherwise you will lose them.

4.4 Operation conditions

Check the surface to be treated for loose parts (stones, screws, etc.), these must be removed. Make sure that the machine can travel over all inequalities on the surface. Small inequalities like welding seams or floor joints are no barriers for the machine.

The machine must be operated in accordance with instructions given in Chapter 5: "Initial operation".



Whenever the machine is not used for blast cleaning, the abrasive valve must always be closed!

4.5 Machine specifications



Main dimensions and unit specifications of the machine assembly shown in Chapter 1: "Technical data".

Chapter 5

5.1 Preparing for initial operation PAGE 2

5.2 Initial operation PAGE 5

Initial Operation

5.1 Preparing for initial operation

Before start up ensure all existing protective housings fitted and the dust collector is connected correctly.



All persons in the proximity of the machine must wear safety glasses with lateral protection as well as safety shoes. The operator is obliged to wear close-fitting protective clothing.

Carefully handle all plugs, cables, hoses and operating devices. Avoid any contact with live wires.

Works on the electrical system have to be done only by qualified specialists.

5 Check the surface to be treated; it should be free of loose parts (nails, screws, etc.), these must be removed. Ensure that the machine can run over all inequalities on the surface. Small inequalities like welding seams or floor joints aren't a barrier for the machine.



In order to avoid downtimes a regular inspection is essential. Carry out the following checks before any start-up:

- þ Check whether all machine parts are assembled safely and correctly.
- þ Check all screws and other fasteners for tight seat.
- þ Check the abrasive storage hopper, the feed spout and the blast wheel parts for foreign bodies and remove them.
- þ Check the blast wheel blades, impeller, control cage, liners and fastening screws for damages and wear.
- þ Check the magnetic and brush seals for wear.
- þ Lubricate the wheel bearings of the drive wheel every 100 working hours.

þ Check the separator parts for wear and defects. Remove foreign bodies and dust deposits in order to prevent the separator from being blocked.

Remove any dust deposits by aspiration, do not use compressed air to remove dust.



þ Check the electrical connections for dirt and foreign body deposits.

þ Check the electrical motors for dirt and other contaminants.

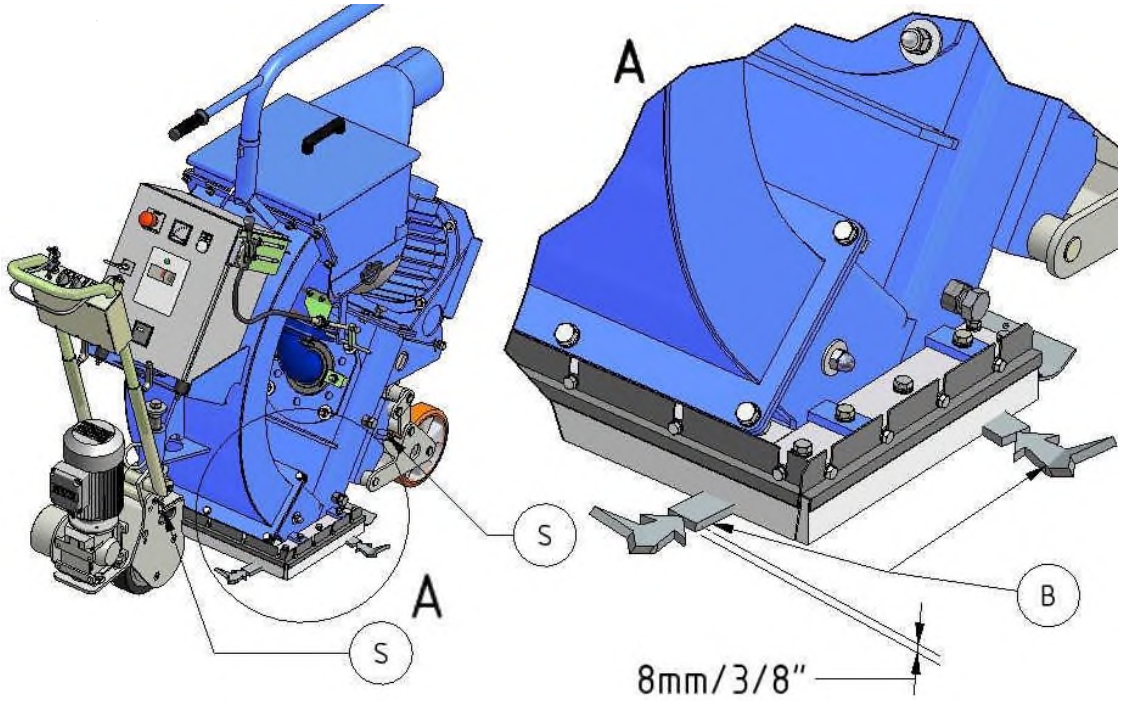
þ Check the level of abrasive in the storage hopper. Fill up if necessary.

Before start-up operators and other personnel must be familiar with the safety regulations given in this operating manual.



þ Place the blast-machine and the dust collector onto the surface to be treated. Remove the quick release pin in order to drive the machine manually.

þ Check the height adjustment (approx. 8-10 mm / 0.31-0.39 in max.) of the blast machine, this means distance between magnet and surface.



Initial Operation

- þ For the height adjustment, an 8 mm / 0.31 in steel strip is shifted below the magnetic sealing (B). In order to adjust it you need to set the Set screws (S). Also see chapter 7.
- þ Check the main power cable and the dust hose for damage. Replace or repair all damaged parts before starting the machine.
- þ Connect the blast machine and the dust collector with the dust hose. Use hose clamps at the connections.
- þ Connect the power supply cable of the blast machine with the dust collector.
- þ Connect the power supply cable of the dust collector with the site supply. Make sure that the correct electric supply is available. (480V, 60Hz, 3-phase grid).



Check the function of the ground fault interrupter pressing the key "Test"!

5

- þ Fill the separator equally with the selected abrasive (see Chapter 3) up to the bottom of the separator tray. The magnetic feed valve has to be closed whilst doing this.
- þ Check that the dust collector dustbin is empty. Comply with local waste treatment regulations considering the removed materials.

Changes to technical data reserved

5.2 Initial operation

All persons near the machine must wear safety glasses with lateral protection, ear protection as well as safety shoes. The operator is obliged to wear close fitted protective clothing.



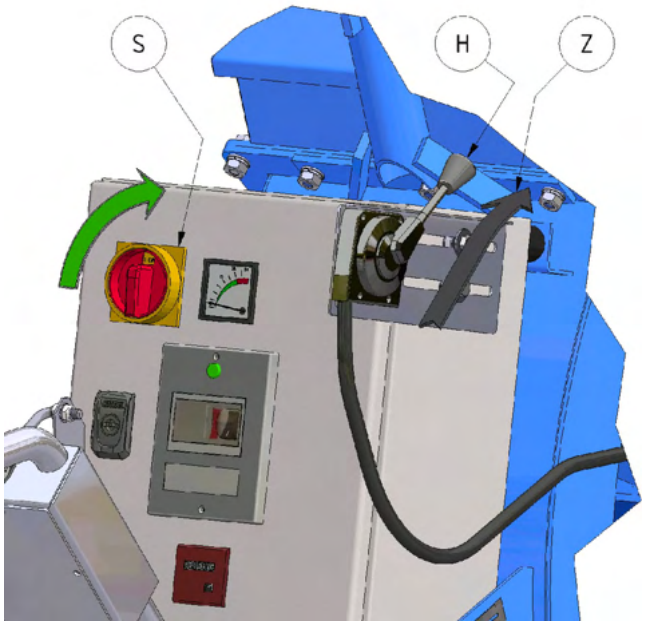
The start-up of the blast-cleaning machine and the dust collector should happen in the following order:

1) Switch on the dust collector
See operating instructions of the dust collector

Initial operation of the blast machine

1) Check that the magnetic valve is closed (black lever (H) in position (Z) ·"CLOSED"

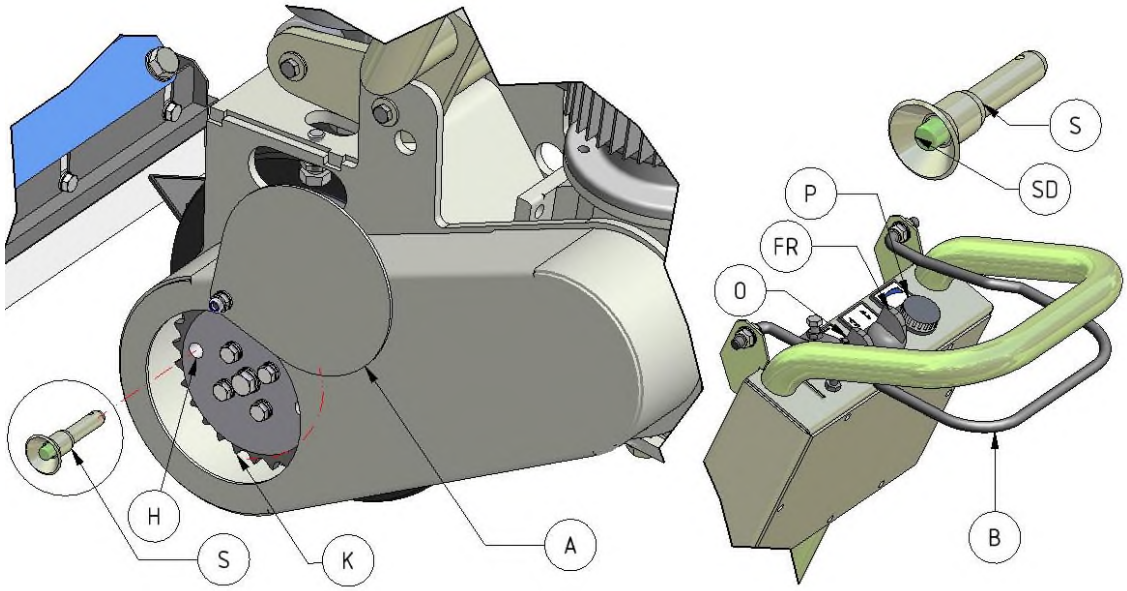
2) Turn the main switch (S) clockwise to 1/ON - position.



Inserting the Quick Release Pin

(1) Open the chain-guard cover (A).
(2) Turn the potentiometer (P) in lower 1-2 (low speed).
(3) Check the overdrive (O) is not selected.
(4) Switch the direction switch (FR) into forward or reverse.
(5) Move the quick release pin (S), button (SD) pushed, into the bore (H) of the sprocket hub, keep the button (SD) pushed.
(6) Pull the lever (B) upwards. The sprocket (K) starts to turn. Push the quick release pin (S) further inwards, still keeping the button (SD) pushed.
(7) Push inwards until the front ring of the pin (S) is touching the sprocket hub. The machine is now driven by the traction drive motor
(8) Close the chain guard cover (A) of the traction drive.

5



Changes to technical data reserved

(1) Press the switch (SE) "WHEEL ON" on the front of the panel. The wheel motor starts up.

(2) Watch the Ammeter (A), to control the load of the wheel-motor. During start-up, the motor will need its starting current until max. speed of the motor is reached.

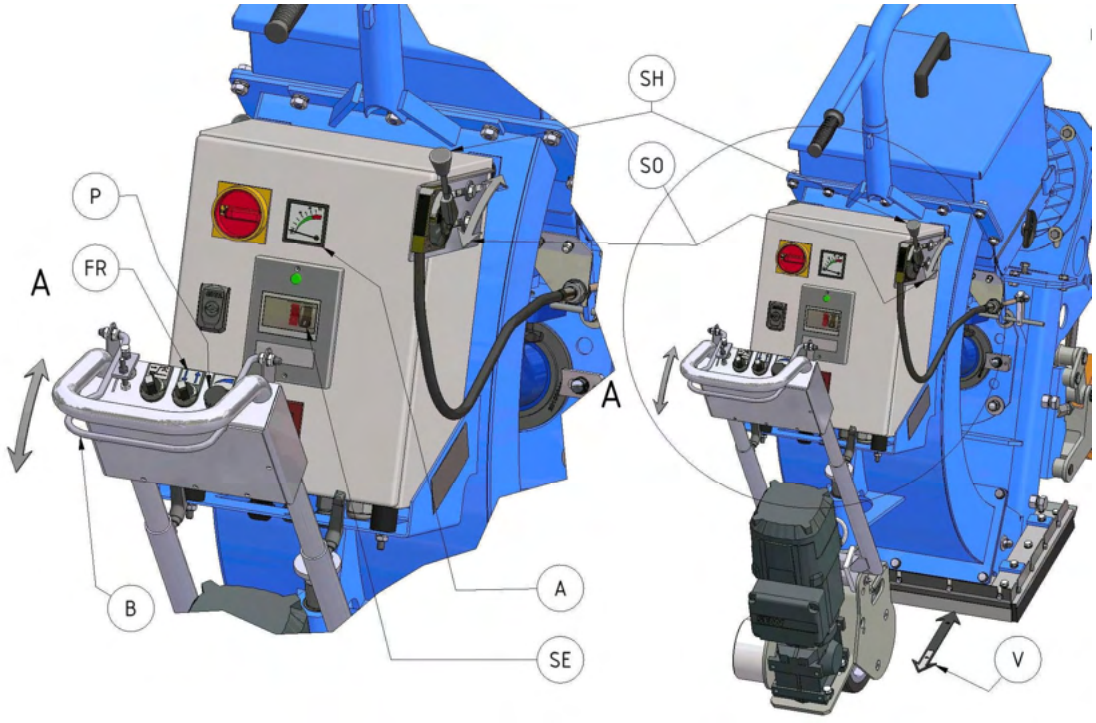
(3) When the motor reaches max. speed the amperage drops down to no-load-current.

(4) If the ammeter indicates a high load consumption after having reached the idle-run speed, the magnetic valve may be partially open or another disturbance.

(5) Find out the cause of the disturbance and, if necessary, contact your **dealer** customer service engineer.

(6) Set the direction switch (FR) to "Reverse" (Blast Direction (V). Adjust speed by the Potentiometers (P).

(7) Pull lever (B) upwards to start up the traction-drive.



Initial Operation



When blasting concrete, the abrasive feed valve only may be opened when the blast-machine is in forward motion! If the machine is at a standstill and the valve is opened deep grooves are blasted into the concrete surface within seconds.

When the machine is moving, pull the abrasive control lever (SH) to operate the feed-valve. Observe the ammeter. It may indicate the full load amperage (depending on the selected abrasive up to the operating current 21 Amp max.).

An indication exceeding the full load value means overloading of the motor, whereas an indication below the full load value shows that there is not enough abrasive fed to the blast wheel. If necessary, re-adjust the cable to the magnetic valve or refill the hopper with abrasive.

After having approx. 1-2 m / 3 – 6 ft blasted, close the abrasive valve, stop the machine and check the blasted surface.

5 If the blast pattern is irregular, it may be necessary to re-adjust the blast pattern (see Chapter 7 “Setting the blast pattern”) or select different speed for the machine.



When the blast head is lifted from the floor, abrasive will spurt out of the sides of the blast head at high speed. If the machine is moved, the blast head raised, the abrasive feed valve must be fully closed.



Alter the travel direction only while the feed valve closed.



The dustbin of the dust collector needs regular dumping.

Do not overfill the bin to avoid dust exposure when opening the bin.

Comply with the local waste treatment regulations considering the removed material.

Chapter 6

6.1	Daily operation	PAGE	2
6.2	Information about the feed speed	PAGE	3
6.3	Recommended blast paths	PAGE	4
6.4	Turn Off the machine	PAGE	5
6.5	Failure occurs	PAGE	6
6.6	Safety shutdown	PAGE	7
6.7	Restart	PAGE	7
6.8	Proceedings prior and after longer stoppage	PAGE	8

6.1 Daily Operation



This operating manual has to be always with the machine at the working site!



Use only educated and trained personnel. **Take note of the legal minimum age.** Clearly define the responsibility of the personnel for operating, repair and maintenance! Make sure that only those people work on the machine who have been empowered to do so.

For daily operation of the **blast machine S320E** please consider the following points:

Check daily before starting the operation whether all machine parts are assembled safely and correctly.

Before switching on the machine, check that all safety covers are in the right position and that the filter unit is connected correctly.

We hardly recommend, to use only a dust collector which has the right suction power and offers an optimal dust separation.



Using the dust collector make sure to comply with the health and safety regulations and the local waste treatment regulations considering the removed material.

Check the surface to be treated; it should be free of loose parts (nails, screws, etc.), these must be removed. If they will be picked up by the machine, they can damage the blast wheel or bearing.



Regular inspections are important in order to avoid downtimes of your blast machine. Chapter 7 maintenance

All persons in the proximity to the machine must wear safety glasses with lateral protection as well as safety shoes. The operator of the machine is obliged to wear close-fitting protective clothing.



Treat all plugs, cables, hoses, and operating devices with special care. Avoid any contact with live wires.

Make sure that no vehicles, such as forklifts, trucks and other equipment run over the electric cable and the dust hose.

In case of doubt please read Initial operations Chapter 5.2.



6.2 Information about the feed speed

The selection of the correct feed speed of the blast machine is essential for a good result.

The feed speed depends on the material of the surface to be blasted and the desired profiling.

The correct feed speed will be found out by observing the blasted surface and varying the speed during the blast cleaning process.

Slight profiling on concrete requires a higher speed (6 – 10) than coarse profiling (4 - 5).

Blasting on steel requires a very low feed speed (1 - 3).

6.3 Recommended blast paths

Position the dust collector near to a power supply source.

Place the blast machine near to the dust collector and spread out the hose as shown in following picture. Connect blast machine and dust collector with the dust hose.

Watch the max length of cable and dust hose during operation.

Carry out blast operation in parallel tracks away from the dust collector, in a way that the dust hose and electric cable do not become twisted.

Turn around the blast machine by closing the feed valve, then turn the machine to the right and guide it back in an arc to get back to the last blasted path.

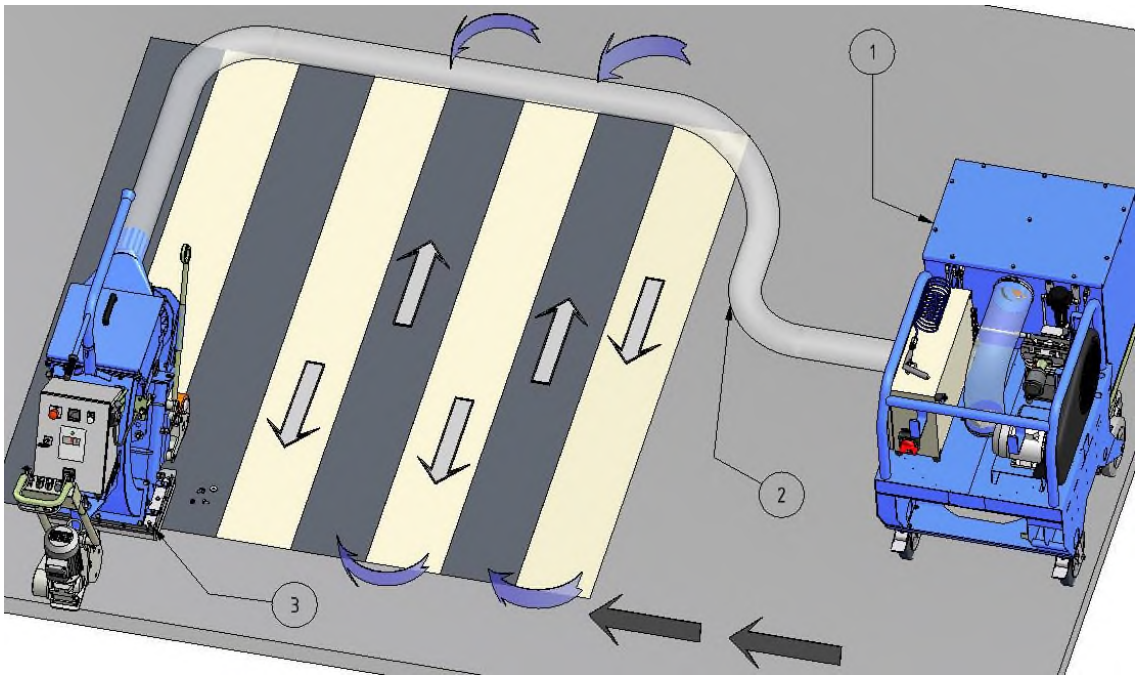
Repeat this in order to complete the surface move away from the dust collector towards the open surface

Picture shows the recommended blast paths leading away from the dust collector.

Finally move the dust collector to the surface already blasted and finish the area where the dust collector was located before.

6

1) Dust collector
2) Dust hose
3) Blast machine



Changes to technical data reserved

6.4 Turn Off the machine

1) First close the feed valve by the handle (H), push this forward towards direction (Z).

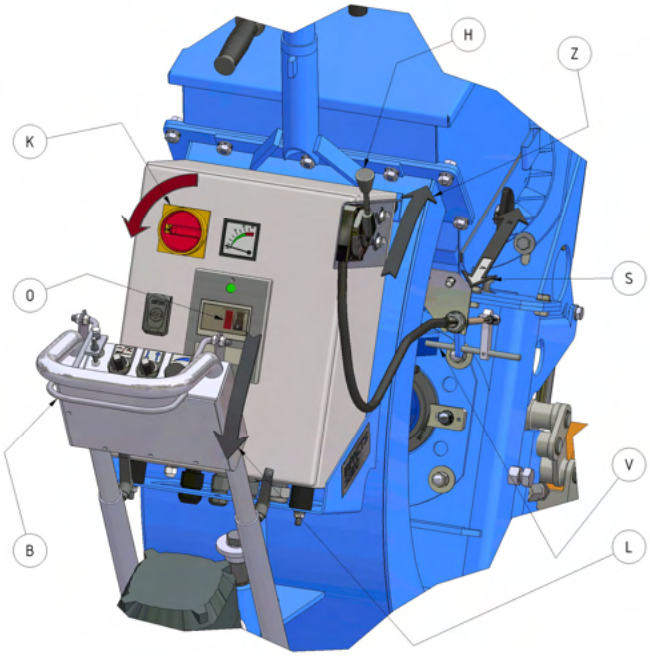
2) Keep the traction drive switched on so the machine moves towards (S) as long as the feed valve (V) is not fully closed to assure no grooves blasted into the surface.

3) Release the traction drive actuator (B) so it swings back into its previous position (L). The traction drive switches off and the machine stops.

4) Press the switch wheel motor Off (O).

5) During longer breaks, turn the main switch counter clockwise to 0/OFF – position

6) Finally switch off compressor and blower on the dust collector.

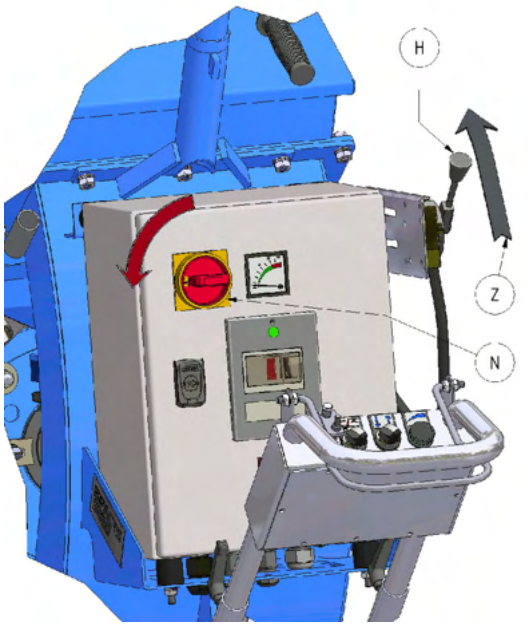


In case the blast machine S320E machine is not used for a while pull out the main plug, store it at the machine and cover all by a tarpaulin or foil.

6.5 Failure Occurs

In a case of emergency, you can stop the machine immediately by turning the main switch (N) counter clockwise to 0/OFF - position.

In an emergency turn immediately, the RED MAIN SWITCH (N) counter clockwise to 0/OFF - position and afterwards close the feed valve pushing lever (H) towards (Z).





Irrespective of the following information, the local safety regulations are valid in any case for the operation of the machine.



Assure all rotating machine parts have come to standstill before inspection or maintenance work starts. Always arrange the Safety Off Position of the machine as described in Chapter 2.6

6.6 Safety switch Off

The machine must be set into its "Safety Off Position" before starting any kind of maintenance or repair work.



See Chapter 2.6 "Safety instructions".

6.7 Restart

After a fault, ensure that you find the reason of the fault before you restart the machine. Leave the Emergency-Switch pushed down and bring the machine in the **Safety-Off Position** before you start to find out the fault.

If you can't find the fault or if you are unsure about the reason for the fault, please contact your manufacturer contact person and ask for help.



Please consider in special the regulations for electric equipment such as DGUV V3 and VDE-0701. These regulations describe the necessary considerations and actions after repair and changes on electrical Equipment



6

For the start-up of the machine see chapter 5.



All persons in the proximity to the machine must wear safety glasses with lateral protection as well as safety shoes. Ear protection may be required. The operator is obliged to wear close fitting protective clothing.



6.8 Proceedings prior and after longer stoppage

Stoppage longer 3 months.

Prior long stoppage



Switch off the machine, see chapter 6

Remove all abrasive out of the machine.

Remove all abrasive from magnets.

Clean the machine and cover it with a foil.

Motors, cable and plugs need to be protected against moisture, dust heat and shock.

Protect bright parts of the machine and power pack with WÜRTH “SA BESTO“ 0893 055 40 for example, or a similar preservative oil.

6



Remove any dust deposits by aspiration, do not use compressed air to remove dust.

After longer Stoppage



See Chapter 5 Initial Operation

Chapter 7

7.1	Recommendations	PAGE	3
7.2	Maintenance and inspection list	PAGE	4
7.3	Maintenance	PAGE	5
7.4	The blast pattern	PAGE	5
7.5	Adjusting the blast pattern and control cage	PAGE	6
7.6	Adjusting magnets and seals	PAGE	10
7.7	The belt	PAGE	11
7.8	Fitting belts	PAGE	11
7.9	Belt tension	PAGE	12
7.10	Taper-lock bushes	PAGE	12
7.11	The chain drive	PAGE	14
7.12	Fitting sprockets	PAGE	14
7.13	Fitting the chain	PAGE	15
7.14	Maintenance and repair of the chain	PAGE	15
7.15	Adjust chain tension of the traction drive	PAGE	16
7.16	Wear parts	PAGE	17
7.17	Replacing the wheel kit	PAGE	18
7.18	Replacing liners	PAGE	20

Chapter 7



Changes to technical data reserved

7.1 Recommendations

Prior to any repair work on the machine and its drives, secure the machine against unintentional switch-on. Put the machine to its Safety Off Position as described in chapter 2.6



Failures due to inadequate or incorrect maintenance may generate very high repair costs and long stoppage periods of the machine. **Regular maintenance is essential**.



Safety and service life of the machine depend, among other things, on proper maintenance.

The following table will show recommendations about time, inspection and maintenance for the normal use of the machine.

The time indications are based on uninterrupted operation. When the indicated number of working hours is not achieved during the corresponding period, the period can be extended. However, a full overhaul must be carried out at least yearly.

Due to different working conditions, it cannot be foreseen how frequently inspections for wear checks, inspection, maintenance and repair works ought to be carried out. Prepare a suitable inspection schedule considering your own working conditions.

Our specialists will be pleased to assist you with more advice.

Sub-Supplier's operating and maintenance instructions should be followed during service and maintenance. Highest attention should be paid when replacing electric parts and components.



7.2 Maintenance and inspection list

Operating hours/ time period	Inspection points, maintenance instructions
12 h after repairing	Check function of all safety devices. Check all accessible screw connections for tight seat.
Every 3 h	Check whether there is any foreign matter in the hopper, the feed spout or in the blast wheel unit.
Daily prior operation	Check the hose connections for tightness and fixed seat. Check the hose to the dust collector for damages. Make sure that the dustbin of the dust collector has been dumped. Check blast wheel, feed spout, liners and fasteners for wear and damage. Check the separator parts for wear and defects. Remove foreign bodies and dust deposits. Check the level of abrasive in the storage hopper. Refill to bottom of wire mesh if necessary. Check the magnetic and seals for wear and replace if necessary. Check the electric connections for sediments of dirt or foreign bodies. Check the electric motor for dirt and other contaminants.
Yearly	Fully overhaul and clean the complete machine.



Remove any dust deposits by aspiration, do not use compressed air to remove dust.

7.3 Maintenance

As already mentioned in Chapter 5 “Initial operation” we recommend accomplishing the first repair works on the machine with the help of **dealer** personnel. Using this option, your maintenance personnel will have the opportunity to get an intensive training.

Only those repair works are described which occur within the context of maintenance or which are required to replace wear parts.

If you replace parts yourself for specific reasons, the following instructions and work sequence have to be observed.

You should also stock all spare or wear parts that you need at the job site. As a rule, production standstill periods are more expensive than the cost for the corresponding spare part.



Screws that have been removed must be replaced with those of the same quality (strength, material) and design.

Prior to any repair works on the machine and its drives, secure the machine against unintentional switching-on. Pull out the mains plug in order to do this. Store the plug near the machine to avoid accidents.



7.4 The blast pattern

Abrasive leaving the blast wheel blades is not thrown in all directions. Scatter is restricted to an angle of about 50°. This is achieved through the use of a control cage which surrounds the impeller. The position of the window in the control cage determines the direction and **HOT ZONE** of the blast pattern.

Correct adjustment of the control cage and thus of the blast pattern is the most important factor for optimum working with the blast machine S320E.

Incorrect adjustment of the control cage results in very high wear and premature blasting-through of the liners in the blast wheel housing, as well as reduced blasting performance and a possible loss of the rebounce energy of the abrasive.



Each time the wheel kit cage is replaced, the thread of the blast wheel fastening screw should be checked. Make sure that this screw will be tightened up correctly. In addition, absolute care must be taken to clean the thread from dust and abrasive.

After each blast wheel repair work switch on the blast wheel motor for a short period (without feeding abrasive) in order to find out whether the rotating parts turn freely and without vibration. After that, the blast cleaning procedure can be continued.



The blast wheel motor is designed for a long service life. Damages to the blast wheel motor can be detected by unusual noises or functional failure of the electric motor. In this case notify our service department.

7.5 Adjusting the blast pattern and control cage

In order to get an uniform and perfect blast pattern on the surfaces to be treated, the correct adjustment of the blast pattern is most important.



Prior to any maintenance or repair work on the machine and its drives, secure the machine against unintended switch-on. Put the machine to its Safety Off Position. Chapter 2.6



Incorrect adjustment of the blast pattern results in:

- Uneven cleaning (shadows on the right or left-hand side).
- Extreme high wear (wheel kit and the liners).

Following four factors affect the blast pattern:

Rotation direction of the blast wheel:

- The rotation direction of the blast wheel must correspond to the instructions on the housing (arrow indicating the turning direction).

Worn tune-up kit:

r With increased wear of the wheel-kit (impellor, control cage) the blast pattern will change.

Size of abrasive:

r The size of the abrasive affects the blast pattern. Every change of abrasive requires the blast pattern to be set or to be re-adjusted.

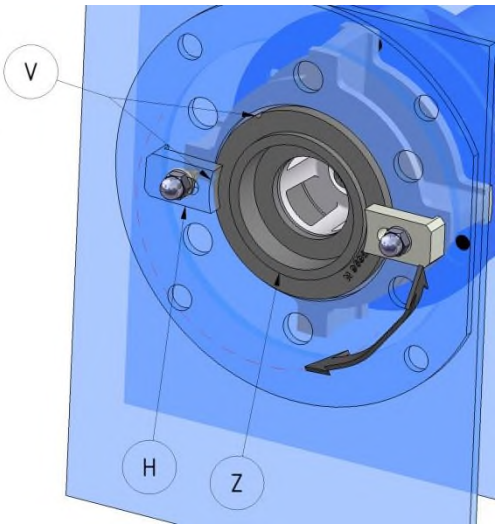
Position of the control cage:

r The correct adjustment of the control cage is most important to obtain an optimum blast pattern. The control cage has a lateral window. The position of this window determines where the abrasive is fed on the blast wheel blades, therefore where it hits the surface to be treated.

r After changing the wheel-kit, the adjustment of the control cage must be checked and re-adjusted. To do so you need to create a blast pattern. The same applies for blasting on another type of surface.

Adjustment of the control cage

The adjustment is done as follows, slack the cage clamps (H) and turn the control cage (Z) into a pre-setting position. The cast grooves (V) on the control cage show the position of the control cage opening. The feed spout remains in its former position. The following adjustment standard value is valid: the control cage opening is approximately turned 90 degrees to the throwing angle. The abrasive grain size plays an important role here. Different types of abrasive have different throwing characteristics due to their different weights and frictional resistance. This explains why the blast-pattern needs to be adjusted after pre-setting and testing





After fitting new spares, always check the blast pattern in order to get best performance. This is the only way to grant economical work and to avoid unnecessary wear and repair costs.

The adjustment can be carried out as follows:

- Determine the upper (OK) and lower (UK) window edges of the Control Cage (1).
- Set the upper window edge (OK) of the control cage to imaginary 11.00 of a dial (Figure A). Place the cage clamps (3) and fix them with nuts (2). Finally replace the feed spout (5) onto the control cage and fix it with the knurled nuts (5).

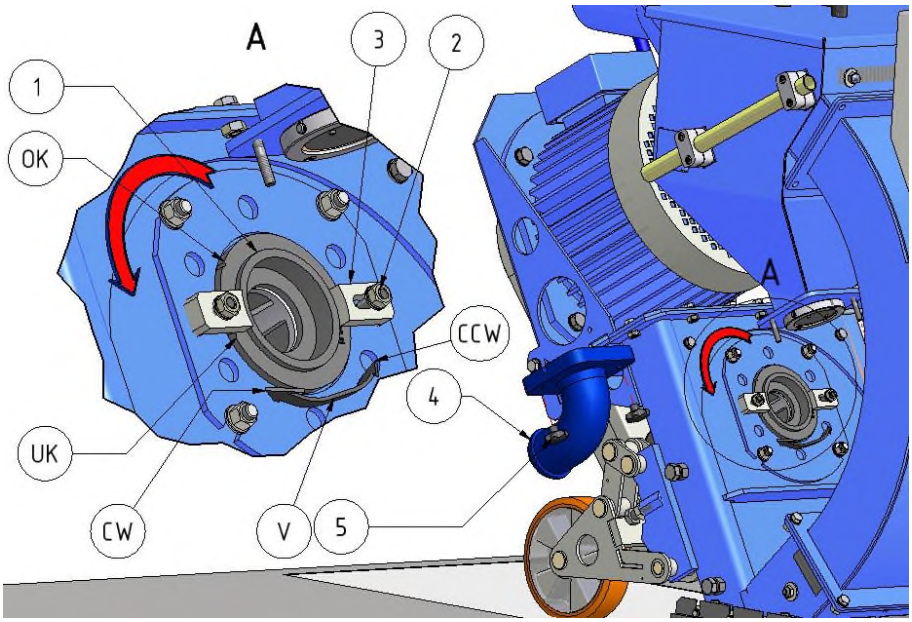


Figure A

- Move the blast machine on in direction (V) a 5-8 mm / 0.2-0.31 in thick steel plate and blast for 45 seconds at full amperage without moving the machine. (Figure B)
- Move the machine from the blast zone (R) and carefully inspect the steel plate.

You will find the **HOT ZONE** on the blasted surface where the machine has developed the highest blast intensity. This ZONE is normally a little lighter and warmer than the rest of the blast cleaned area due to the heat that is generated by the impacts of abrasive.

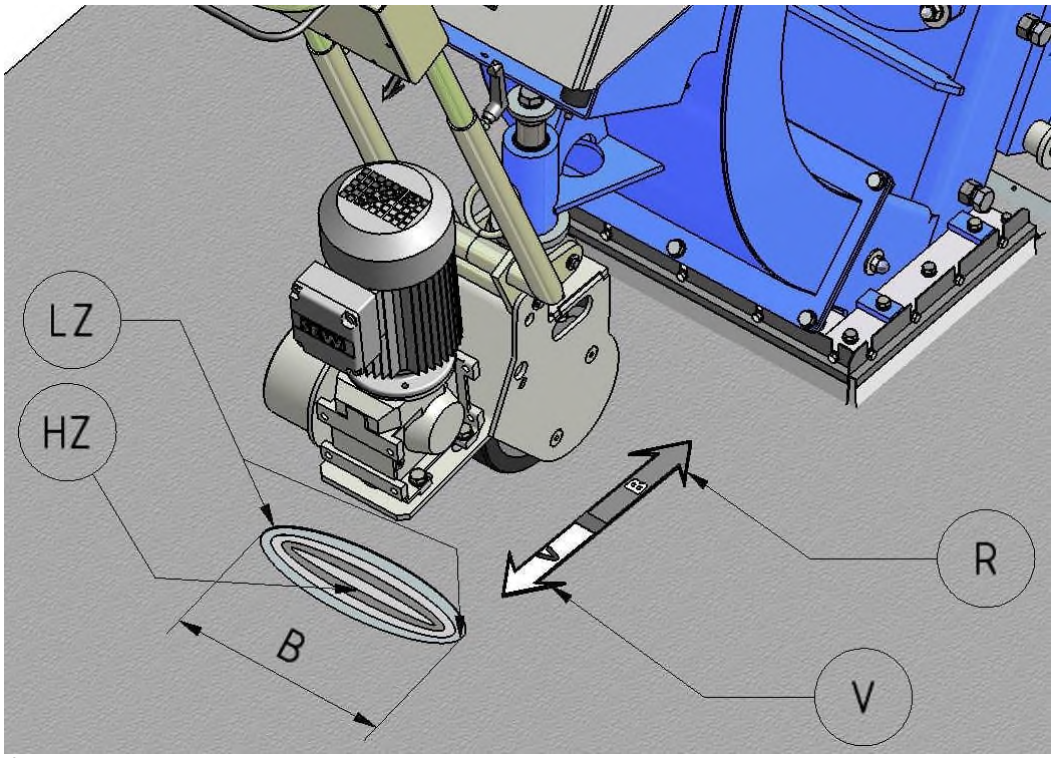


Figure B

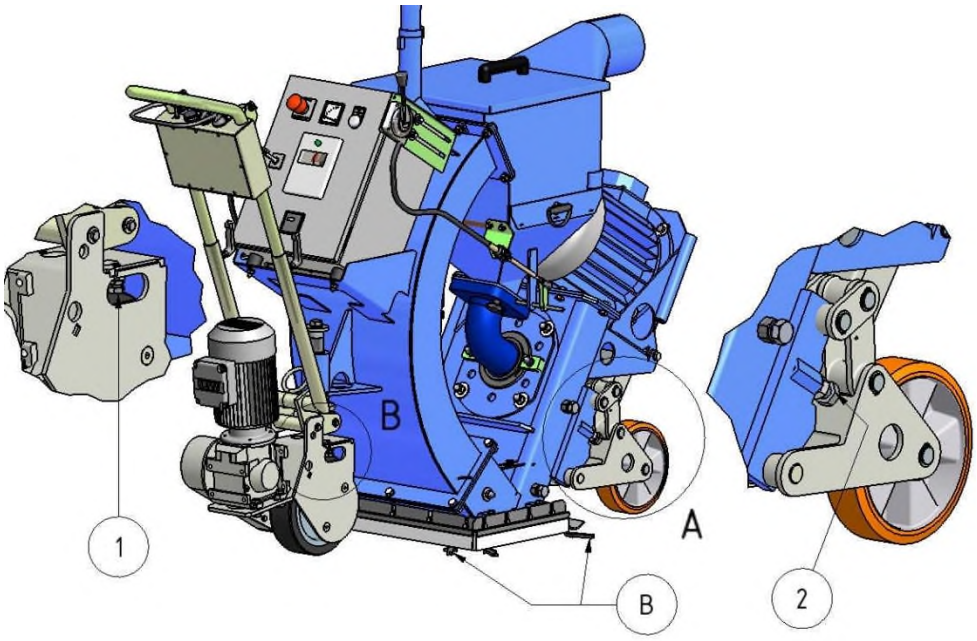
- Adjust the control cage until the **HOT ZONE** (HZ) is exactly in the middle of the blast pattern. (B).
- Now the blast procedure can be started. When a concrete surface to be blasted, check the blast pattern again after some meters and re-adjust slightly if necessary. The blast pattern will change with and increased wear of the wheel kit and when the size of the abrasive is changed.
- If the blast result shows strong blasting on the right-hand side and weak blasting on the left-hand side (shadows), turn the upper edge of the control cage clockwise (CW) for 2-4 mm / 0.08-0.16 in.
- If the blast result shows strong blasting on the left-hand side and weak blasting on the right-hand side (shadows), turn the upper edge of the control cage anti-clockwise (CCW) for 2-4 mm / 0.08-0.16 in.

Note: All description seen from the front into the blast wheel.

Never slacken cage clamps or try to adjust the control cage when the machine is in operation.

7.6 Adjusting magnets and Seals

The adjusted height of the magnetic seals, parallel to the surface to be treated, should be set equal at about 8-12 mm / 0.31-0.47 in.



For the height adjustment an 8mm stainless-steel strip (B) is shifted below the magnetic sealing.

7

On the **blast machine** S320E the adjustment is done by 4 setting screws (one screw (2) each at the rear wheels and two (1) on the inner side of the traction drive bracket.

Front setscrew (1) QTY: 1 RH / 1 LH
Rear setscrew (2) QTY: 1 RH / 1 LH

Adjust the height with the setting screws until the correct distance of 8-12 mm / 0.31-0.47 in has been set.

The setting depends on the structure of the surface to be treated, in general the rougher the surface the lower the setting.

Working on steel means to set it down as far as possible.

The height of the brush seals should be maximum 1 mm / 0.04 in above the surface. The adjustment is possible within the slots of the seal elements.

7.7 The belt

The V-belt is designed for the installed drive power. Forcing the drive to grant a higher output by over tensioning the V-belt results in belt breaks, bearing damage and thus to lower efficiency. A low V-belt tension results in slippage causing an increased belt temperature and thus to premature destruction of the V-belts. Temperatures exceeding 70°C for a long period reduce the service life and performance of the V-belts. The grooves of the V-belt pulleys have to be free from rust, grease, dirt and damages. The use of belt wax or similar substances to increase the friction coefficient is unnecessary and damages the V-belts. Avoid any contaminations by oil, grease or chemicals.

In order to grant a perfect output transmission, the V-belt drive needs continuous observation.

Belt data: See chapter 10 Spare Parts

7.8 Fitting belts

Remove the belt guard only when the blast wheel motor is at a standstill and the main switch of the blast machine is in Safety Off Position as described in chapter 2.6



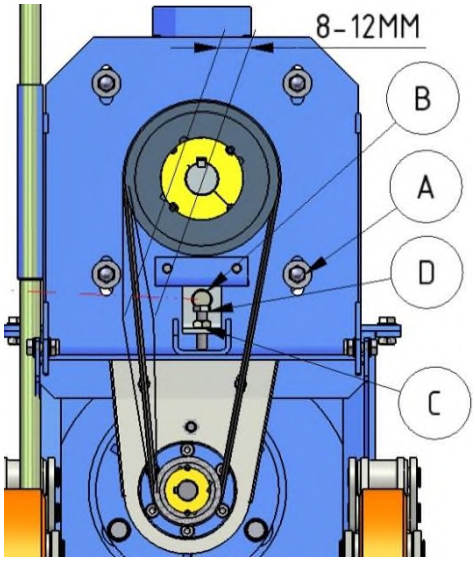
Release the tension of the V-belt drive by reducing the distance between the shafts of the blast wheel motor and wheel-bearing unit.

Insert the V-belt in the V-belt pulley grooves manually without forcing the belt.

Tension the V-belt by increasing the distance between the shafts of the blast wheel motor and the wheel-bearing unit as described next.

Fasten the required protection equipment as has been fitted before.

7.9 Belt tension



To achieve a maximum power transfer and live time the correct setting of the belt tension is essential. Often belts are set with the wrong tension and fail before normal service time. Belts that are set with too much tension causing bearing problems on motors or bearing units.

Check the correct pre-tension in accordance with the figure by pressing down the belt. The distance the belt can be pressed down should be 8-12 mm / 0.31-0.47 in. To adjust the correct belt tension, slacken the motor fixing screws (A) and (B) and the locknut (C). Adjust the belt tension by the adjuster screw (D) and tighten afterwards the locknut. Final draw up the motor screws (A) and (B) and fit the belt guard again.

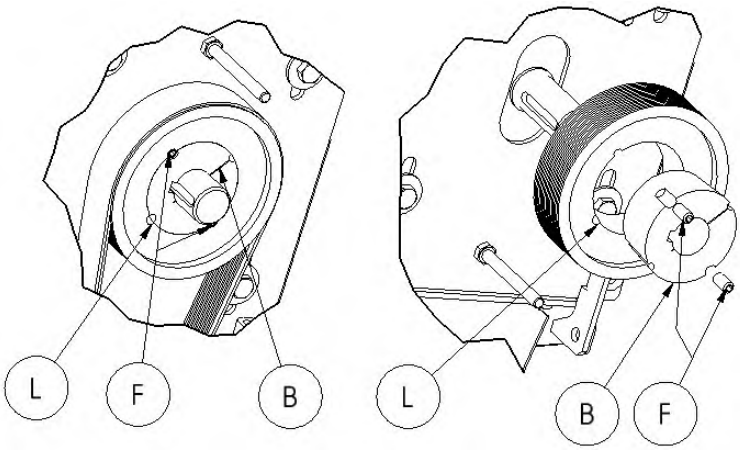
7.10 Taper-Lock bushes

7

Taper locks are used to shrink-fit hubs on shafts. Mounting and demounting only requires a screw driver DIN 911 (Allan key). Tightening and loosening is affected with the same threaded pins or screws.

Taper locks are cylindrical on the inside, tapered on the outside and slit longitudinally. The smaller bushes have in the large face their two cylindrical blind holes in parallel to the axis, which are only placed half in the bush material. The other halves of these blind holes are threaded and are placed inside the hub.

Threaded pins or screws are screwed to the stop in the boreholes using an Allan key. When the screws are tightened further using a certain amount of force the hub is drawn up to the tapered bush which is pressed onto the shaft with great force.



Disassembly

Demount the screws (F) in the belt pulley, lubricate the thread and the tip of the screw and turn it into the bore (L) as shown.

Turn the screw until the taper lock (B) gets loose inside the pulley and, thus, the assembly is loose on the shaft. Take the pulley and the taper lock from the shaft.

Assembly

Be sure that all contact surfaces are free from dirt and oil. Place the taper lock into the pulley. Lubricate the screws slightly and insert them into the respecting threaded holes.

Clean the shaft, shift the pulley with the taper lock, as one unit, onto the shaft, and position the assembly. Note, that first the taper lock is fixed on the shaft before the pulley reaches its final position on the bush.

Use an Allan key to fit the screws. Knock the frontal face of the bush lightly with a hammer to make sure that the bush is seated in the centre of the pulley (use a mandrel to avoid any damages).

Now tighten the screws. Repeat the alternating hammering and tightening until all screws fully tightened.

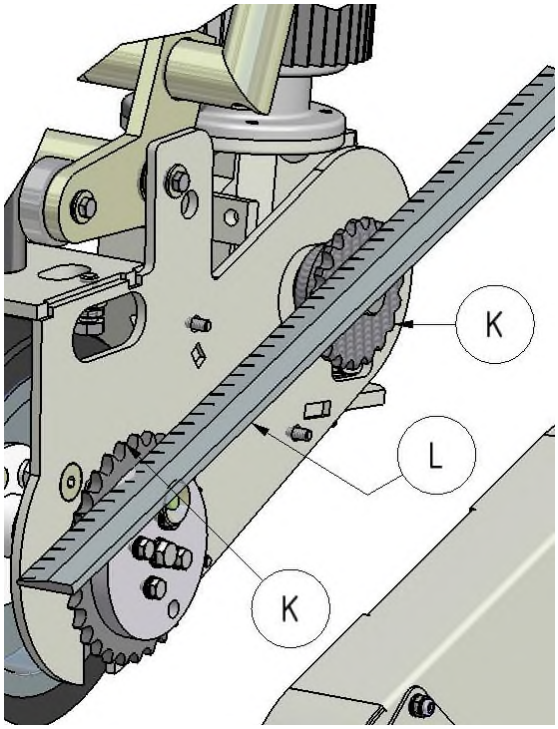
7.11 The chain drive

The mounting, demounting and repair work needs always to be done with appropriate tools. With these works the prevailing safety regulations must be strictly observed.

The mounting, demounting and repair work needs always to be done with appropriate tools. With these works the prevailing safety regulations must be strictly observed.

Remove the chain guard only when the drive motor is at a standstill and the main switch of the blast cleaning machine is locked ("Safety off position" see chapter 2.6)

7.12 Fitting sprockets

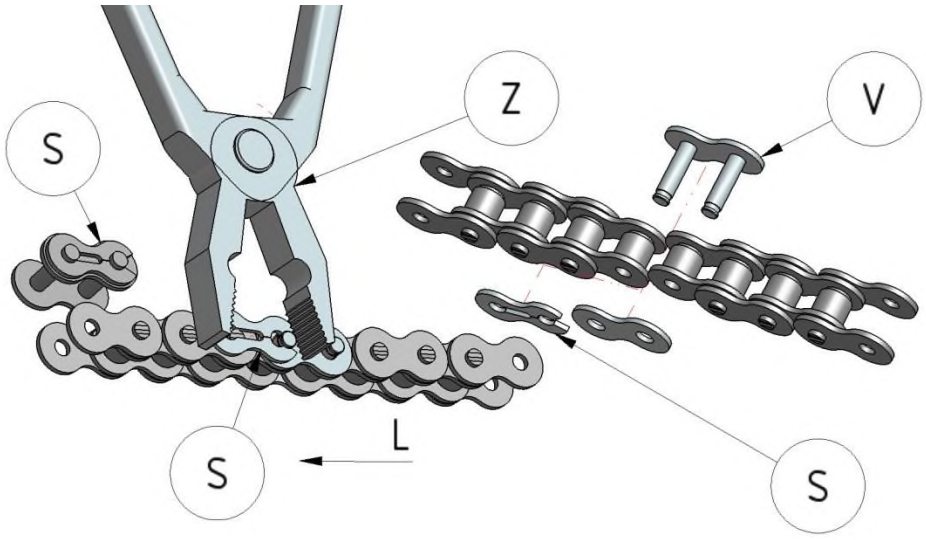


Chain sprockets must be aligned. In order to achieve this both shafts and the chain sprockets must be parallel and dimensioned according the load. Check the mounting precision by a ruler (L) putted to the chain wheels (K). This has to be done several times with different chain wheel positions. Incorrect mounting makes the internal chain link plates press against the external link plates and, thus, accelerates the chain wear or even causes the chain wheels to lock up.

7.13 Fitting the chain

Before mounting the chain, it must be degreased to prevent any abrasive or abrasive particles from adhering.
The chain is supplied as a chain string and has to be prepared during mounting. This is done as follows: Place the chain on the chain wheels so that the links lie in tow adjacent gaps between the teeth. Now close the chain using a chain link. With heavy chains or big distances between the shafts use a pre-stressing tool in order to bring the two-end links so close together that the coupling link can be inserted without being deformed.

Chain Links with springs, their closed sides should point to the running direction (L) of the chain (S). Slide in the link adapter (V) and place the link plate opposite place the spring onto the link plate and press it over the pin into the ring groove by means of a pair of tongs. Demount the spring in the reverse order.



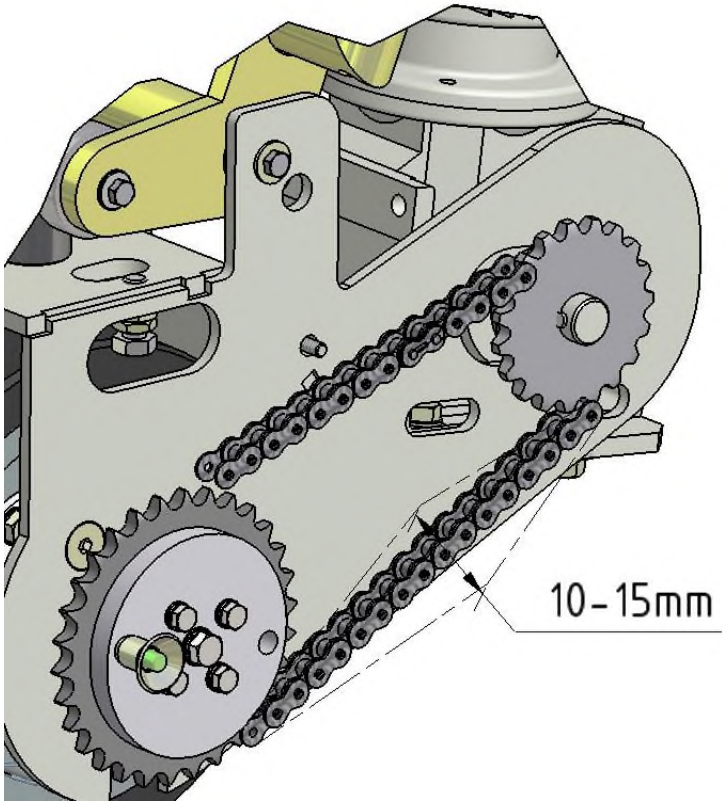
7.14 Maintenance and repair of the chain

A chain drive needs little maintenance only if the correct chain has been selected, is mounted correctly, for the application and is not lubricated with grease. A chain guard protects the drive chain. The chain guard prevents excessive contamination and prevents accidents.
The chain drive needs to be cleaned every three months. On these occasions, check the alignment of the chain sprockets and the chain tension.

In order to clean thoroughly first remove the dirt adhering to the outside of the chain drive using a hard or wire brush. Then wash the chain in petroleum ether or similar. After this, clean the dirt from the internal parts of the chain. To do this put the chain for approx. 24 hours in petroleum ether, diesel or another solvent in order to soften the dirt in the chain joints and the hardened lubricant remnants. Move the chain several times back and forward in the bath to clean the joints.

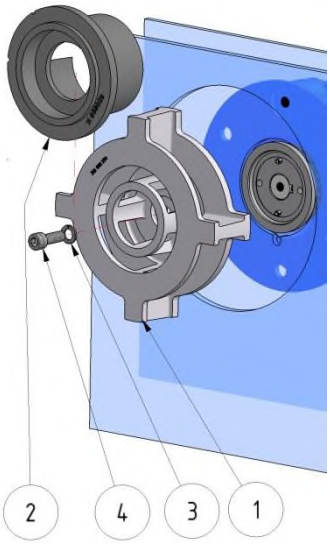
7.15 Adjust Chain tension of the traction drive

The traction drive motor is mounted on a slotted plate. If necessary to re-tense the chain, it can be done by shifting the motor along the slots. In order to adjust the chain tension, loosen the fixing screws and shift the motor in the direction needed to correct the chain tension. The correct chain tension is set when the chain allows to be dislocated for about 10-15 mm / 0.39-0.59 in between the chain sprockets.



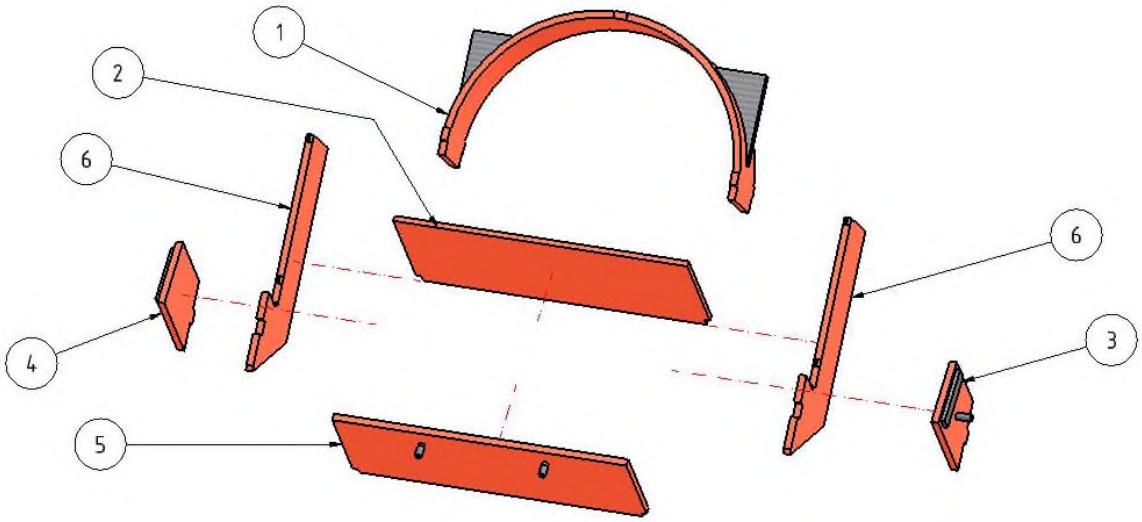
7.16 Wear parts

The wheel kit



1 Blast wheel
2 Control cage
3 Lock washer
4 Bolt

Liners



Pos.	Description	Pos.	Description
1	Top liner	4	Side liner rebound LH
2	Top liner rebound	5	Bottom liner rebound
3	Side liner rebound RH	6	Side Liner RH/LH

7.17 Replacing the wheel kit

The wheel kit consists of blast wheel, control cage, lock washer and bolt.

Disassembly:

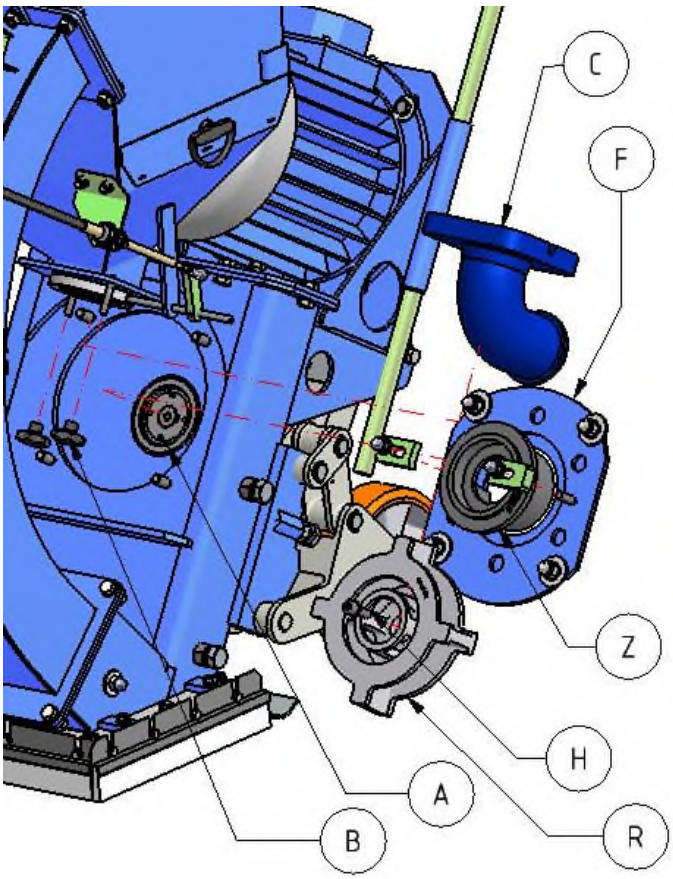
1 Remove the feed spout (C) loosening the knurled-nuts (B), and move the feed spout out of the housing.

2 Loosen the cage clamps and remove the control cage (Z).

3 Unscrew the 4 screws of the front cover plate (F) and take it off.

4 Unscrew the fixing screw (H) of the blast wheel (R) while holding the blast wheel still. Take the blast wheel out of the housing.

5 Check the wheel adapter (A) for wear and replace if necessary.



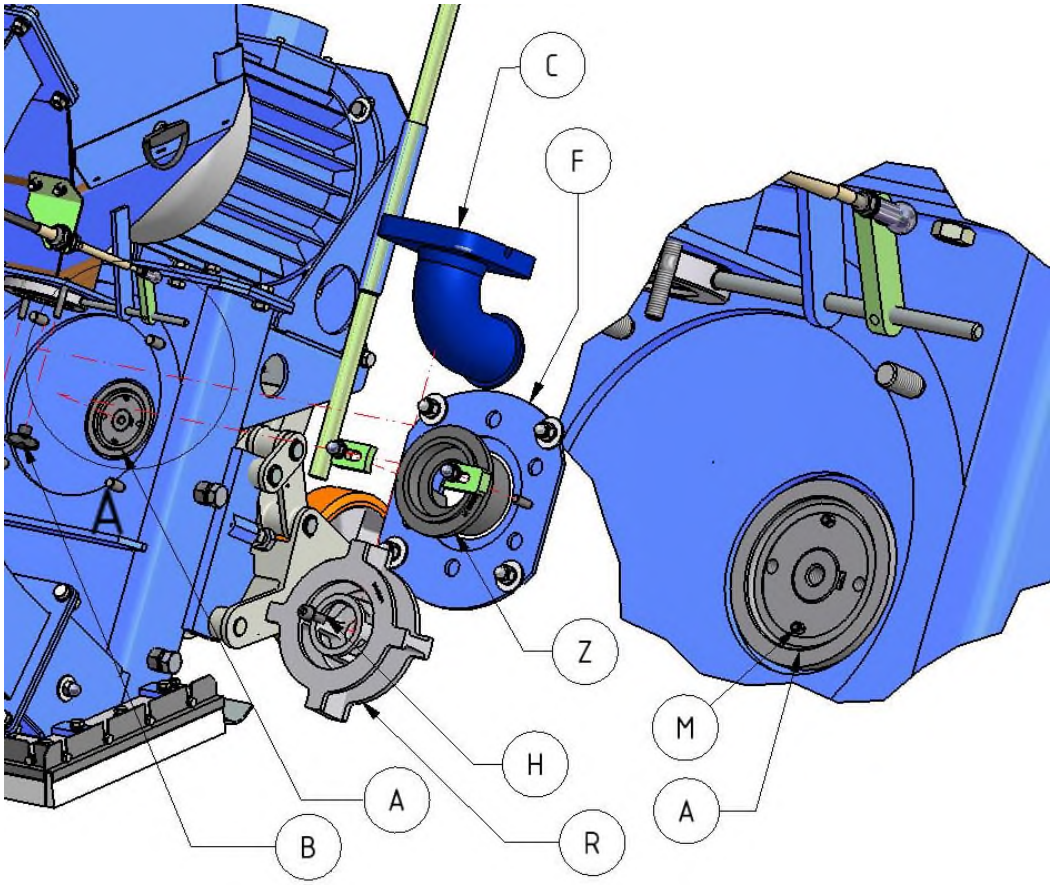
Assembly:

1) Clean all threads and use a new blast wheel fixing screw. Place the blast wheel (R) on the wheel hub (A) through the blast housing opening assure the blast wheel fit with the adapter pins (M) in line. Tighten the blast wheel by the fixing screw (H).

2) Fix the front cover plate (F) using the 4 washer and nuts.

3) Insert the control cage (Z) in the centre (observe Chapter 7.5 "Setting the blast pattern") and clamp the control cage with the cage clamps so that the blast wheel can rotate freely. Turn the blast wheel manually. It must rotate free.

4) Place the feed spout (B) in the housing and fix it with the knurled-nuts.



7.18 Replacing Liners

Disassembly:

1) Take of the belt guard (R). Take of the screws (B) fitted on the inner side of the motor bracket (A)and swing the bracket with the handle (H) carefully forward. Take of the belt.

2) Remove the front-plate and wheel-kit (G).

3) Slacken the setscrews (F) of the top liner. Take of the screws of the cover (E) and remove the cover.

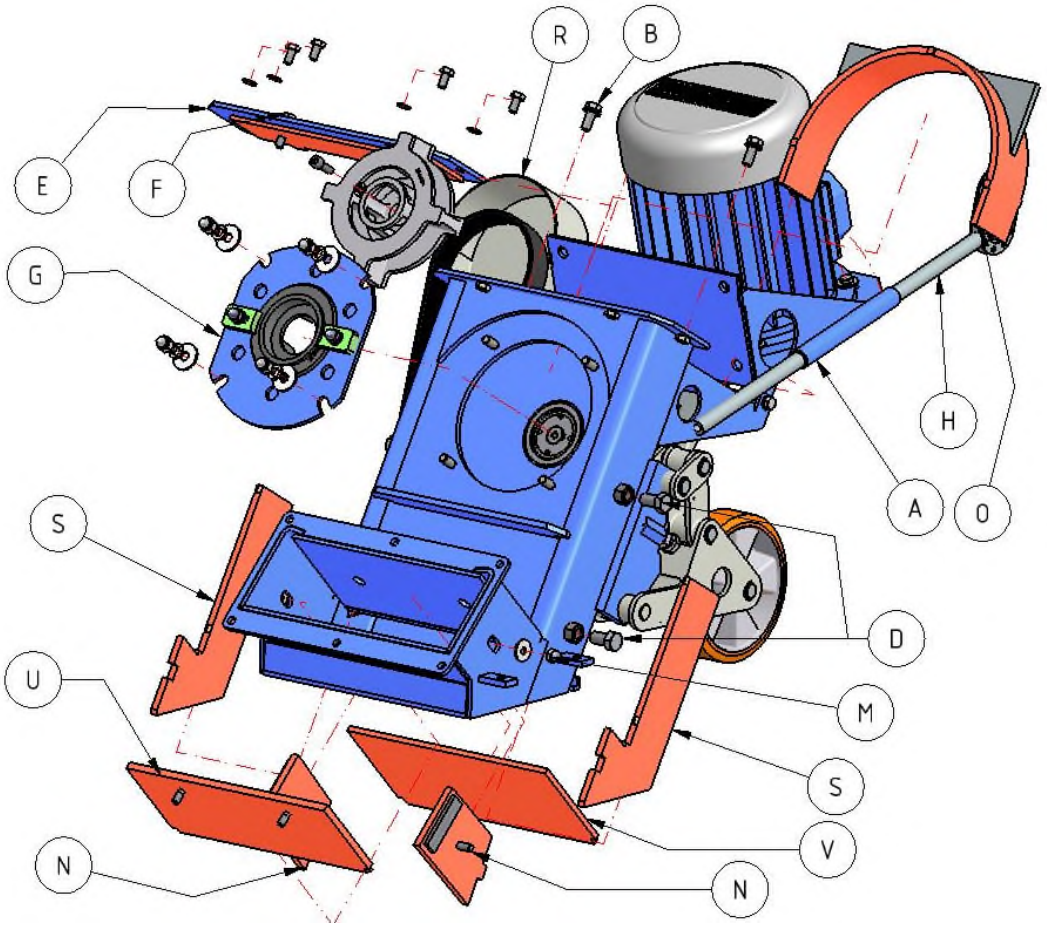
4) Slacken the setscrews (D) of both side-liner.

5) Remove the top liner (O) towards the top.

6) Slacken the nuts (M) of the rebound side-liners (N) push the liners inwards. Fully take of the nuts (M) and move both liners (N) downward away from the housing.

7) Push both side-liner (S) towards the bottom out of the housing.

8) To remove the rebound bottom (U) and top liner (V), take off the nuts and pull both downwards out of the housing.



Changes to technical data reserved

Assembly:

1) Before fitting any new liner, check all threads being clean off dirt and abrasives. Clean where necessary.

2) First place the bottom (U) and top rebound liner (V), put the nuts on, but do not tighten them.

3) Place both side liner (S) into the housing.

4) Afterwards place both side liner (N) in the rebound area. Put the nuts on but do not tighten them.

5) Place the top liner (O) to the top.

6) Close the cover (E) and fit the screws, set the setscrews (F) on the cover so the top liner is supported in the centre.

7) Slightly tighten the setscrews (D) of the side liners.

8) Force the side liners (S) upwards so there is no gap between top and side liners. If necessary, adjust top liner with the set screws (F) to the RH or LH side.

9) Tighten up the set screws (D).

10) Tighten up the nuts (M) both sides of the rebound area.

11) Tighten up the nuts of the top and bottom rebound liners.

12) Fit the wheel kit and front plate as described in 7.17.

13) Swing back the motor bracket, fit belt and belt guard (R).

Maintenance

Notes:

Changes to technical data reserved

Chapter 8

8.1 Hints for the electrics PAGE 2

8.2 Electric wiring diagram PAGE 4-5

8.1 Hints for the electrics



Shut off completely the machine for **repair or maintenance work.** All plugs have to be **disconnected,** keep all cables and plugs near the machine in order to prevent the machine from being switched on **accidentally. Chapter 2.6**



Electric spares need to be ordered with reference to the electric circuit diagram within this chapter. If there is any doubt about it, you need to call your local **dealer** service technician.



The electrical parts of the machine must be **inspected regularly**. Please note in particular the sp**ecified recurring inspections according DGUV V3 or other local regulations.** Defects such as **loose** connections or **scorched** cables must be rectified immediately. **Call a skilled electrician or the manufacturer customer service**.



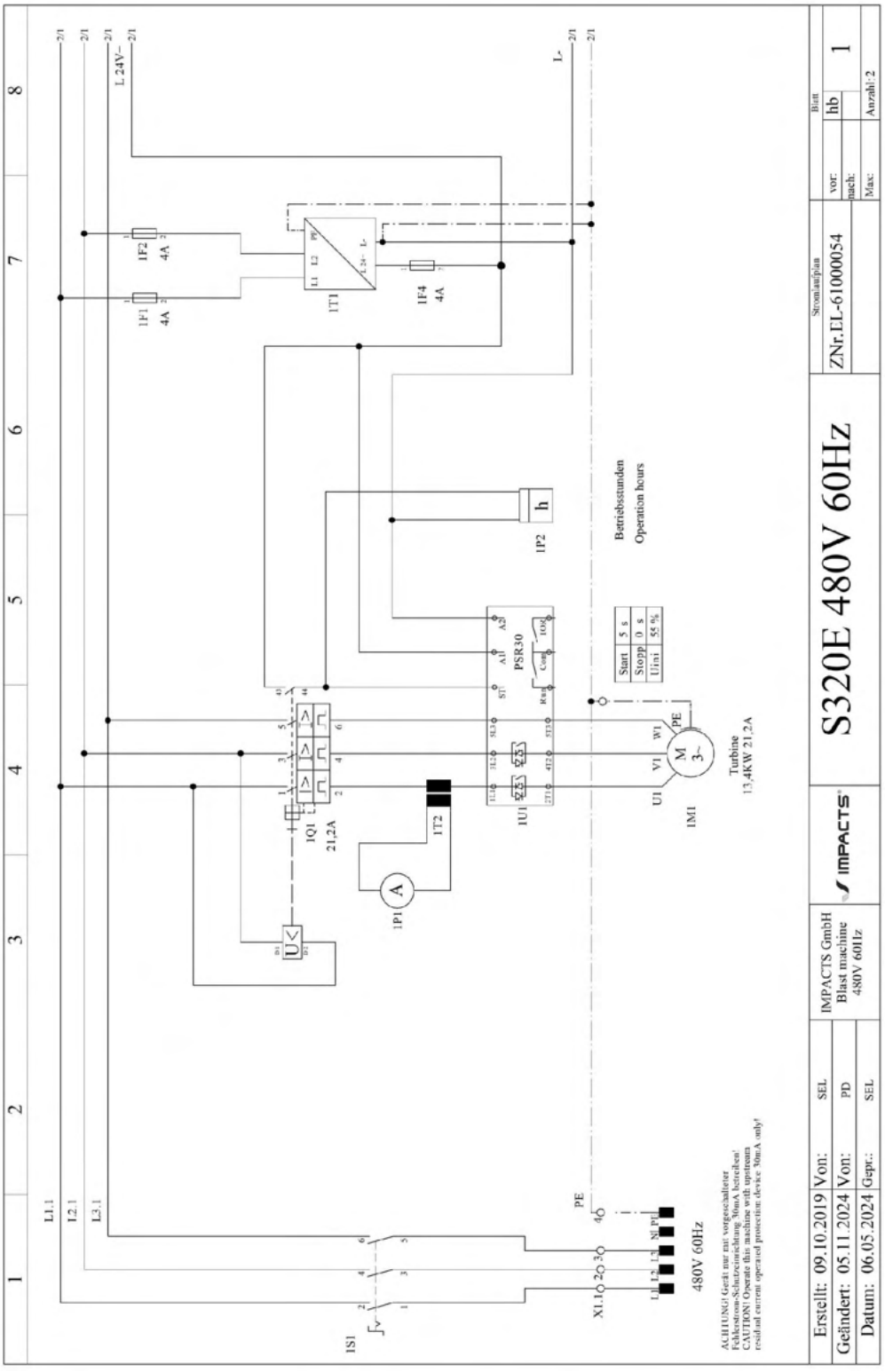
8

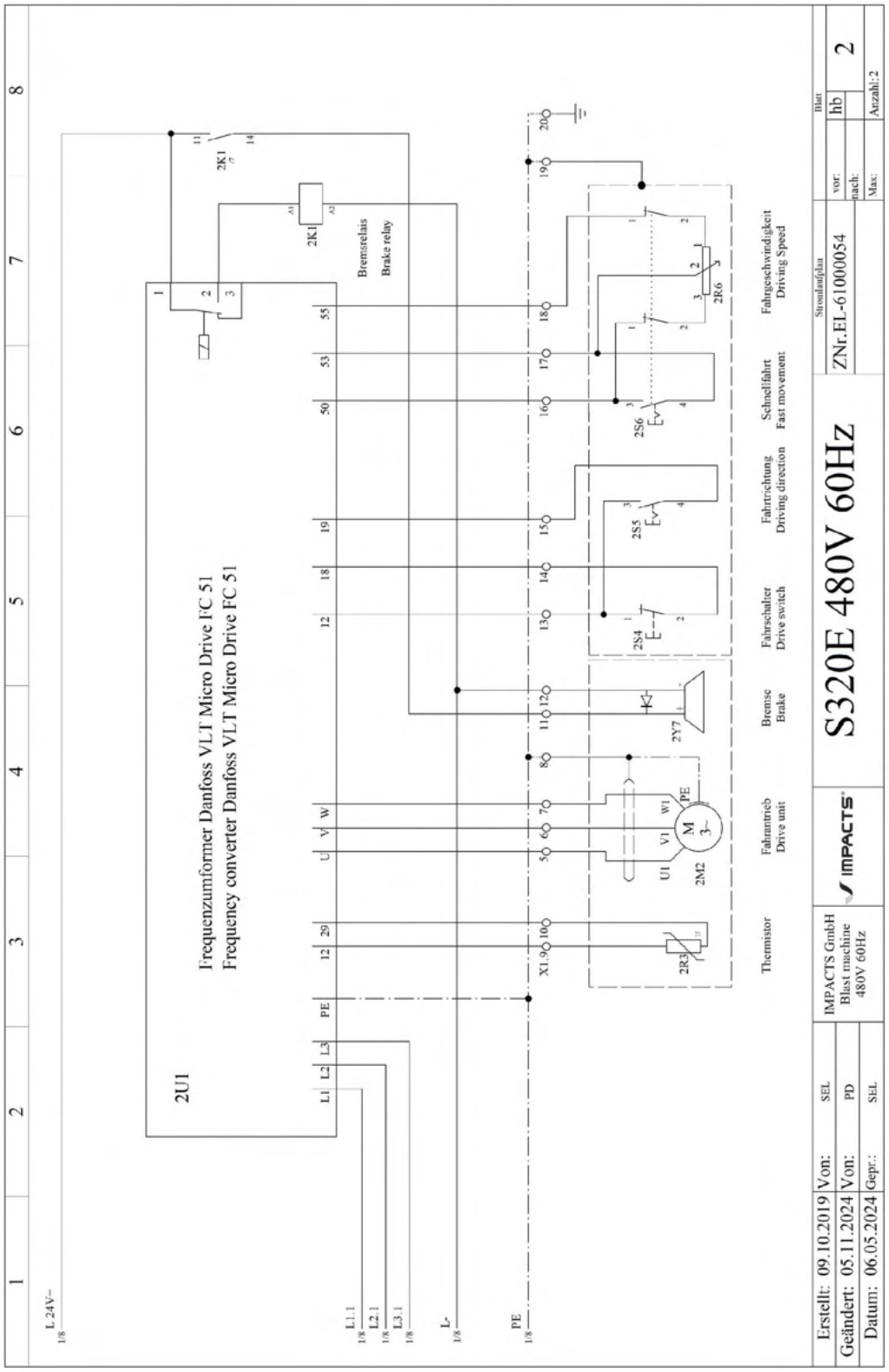


Work on **electrical** equipment or operating materials may only be undertaken by a **skilled electrician** or by **trained** persons under the **guidance** and **supervision** of a **skilled electrician** as well as in accordance with the **electrical engineering regulations**.

This page has been intentionally left blank / space for notes.

8.2 Electric wiring diagram




Frequenzumformer Danfoss VLT Micro Drive FC 51
Frequency converter Danfoss VLT Micro Drive FC 51
2U1
Bremsrelais
Brake relay
Fahrgeschwindigkeit
Driving Speed
Schnellfahrt
Fast movement
Fahrtrichtung
Driving direction
Fahrschalter
Drive switch
Bremse
Brake
Fahrantrieb
Drive unit
Thermistor
S320E 480V 60Hz
ZNr.EL-61000054
IMPACTS GmbH
Blast machine
480V 60Hz
Erstellt: 09.10.2019 Von: SEL
Geändert: 05.11.2024 Von: PD
Datum: 06.05.2024 Gepr.: SEL
Blatt 2
Anzahl: 2

Notes:



Chapter 9

9.1 Diagnosis of blast machine failures PAGE 2

9.2 Diagnosis of electrical failures PAGE 4

9.1 Diagnosis of blast machine failures



Prior to any repair works on the machine or its drives, the machine has to be secured against unintentional switch-on. Put the machine to its Safety off position as described in Chapter 2.6.

Failure	Possible reasons for failure	Failure corrective actions
Unusual vibrations	Uneven wear of the blast wheel	Replace blast wheel set
	Unbalance due to broken parts or blades.	Check separator and all other sections of the machine. Remove all broken parts.
	Wheel hub worn out	Replace wheel hub
	Drive shaft bended	Replace shaft or complete bearing unit.
Unusual Noise	Low clearances or bad adjustments of turning parts	Check parts adjustments (Blast wheel and control cage).
	Loose or lost screws.	Check screws and bolts to be fitted correctly, tighten where necessary
	Shrieking wheels	Apply oil or grease, replace if worn
	Motor Bearings worn	Replace Bearings
Reduced performance or no performance.	Insufficient flow of abrasive in front of the blast wheel	Clean wire mesh Check feed spout to be clean.
	Not enough abrasive in storage	Fill up abrasive
	Loose valve lever	Tighten up set screw
	Valve adjustment	Adjust valve lever and valve disk.
	Too much dust and sand in the circuit	Check all seals, dust hose Check dust collector to be sealed properly (Dust bin)

Changes to technical data reserved

Failure	Possible reasons for failure	Failure corrective actions
Reduced performance or no performance.	Blast wheel or control cage.	Blast wheel or control cage worn out. Replace worn items.
	Belt tension	Check and adjust
	Valve does not close properly and abrasive is blocking the blast wheel when switch on.	Close Valve, stop motor. Readjust Valve.
	Too much abrasive admitted when switched on.	Ensure motor got max speed before opening the valve.
	Feed motion too fast.	Reduce speed.
Loosing abrasive.	Bad seals	Check base seals readjust and replace when worn.
	Elevation adjustment of magnets	Check elevation not to be higher than 8 mm / 0.31 in.
	Magnets lost field	Replace magnets
	Dust collector	Adjust reducing damper
Dumping or loosing abrasive.	Poor Abrasive quality	Use quality abrasives
	Blast Wheel worn.	Replace blast wheel
	Worn Seals	Replace seals
	Elevation adjustment of magnets	Readjust elevation of magnets and adjust seals
	Too much dust and sand in system.	Check dust collector
Too much dust and other particles in storage	Insufficient air flow towards dust collector	Check rated performance of the dust collector connected. Check all seals Check dust hose Check differential pressure and replace filter elements if pressure too high.
Excessive wear in blast housing and rebound	Wrong control cage position	Adjust blast pattern.
Machine remained stationary.	Quick release pin not inserted	Insert quick release pin
	Drive speed to low.	Adjust drive speed.
	Blast head scraped along the ground.	Adjust distance between magnets and surface.

9.2 Diagnosis of electrical failures



Prior to any repair works on the machine or its drives the machine must be secured against unintentional switching-on. Put the machine to its Safety off position.

Failure	Possible reasons for failure	Failure corrective actions
Motor does not start up.	Missing phase	Check power supply
	Faulty switch or relays	Diagnosis and replacement by electrician
	Emergency Stop.	Unlock Emergency Stop button
Motor stops during operation.	current too high power supply circuit breaker disengaged	Disconnect plug Reset circuit breaker or replace fuse. Adjust max. abrasive feeding.
	Motor is damaged.	Check motor
Traction drive motor stops during operation.	Supply cable damaged.	Diagnosis and replacement by electrician.
	Frequency inverter overload or damaged.	Reset frequency inverter, or replacement by electrician.
	Potentiometer damaged.	Replacement by electrician.
	Overheated.	Wait until cooled down.





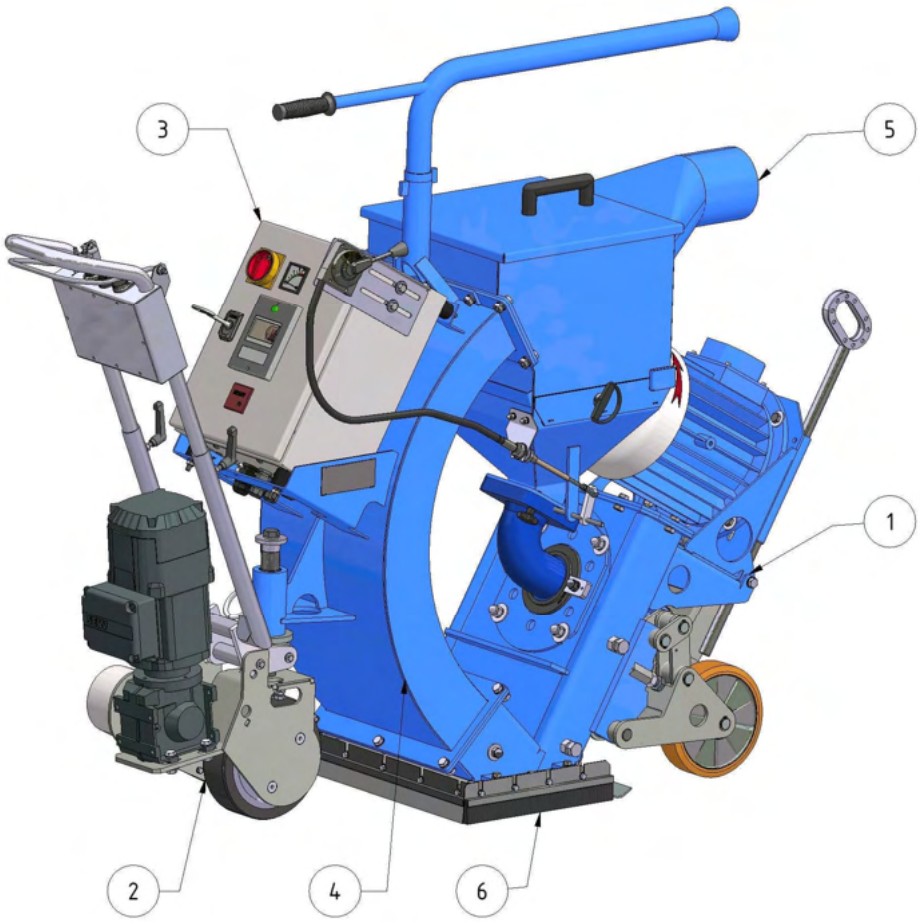
When overload circuit breaker has been released: Switch off the power supply external and wait for approximately one minute for the circuit breaker to cool down then switch on the power supply again. If a circuit breaker continues to release, wait a longer time to cool down or the cause of the electrical overload should be found and corrected**.**

Chapter 10

Overview	**PAGE**	**2**
Base seals ASSY	**PAGE**	**3**
Wheel drive ASSY	**PAGE**	**4**
Wheel housing ASSY	**PAGE**	**6**
Rebound ASSY	**PAGE**	**8**
Toggle lever ASSY	**PAGE**	**9**
Separator ASSY	**PAGE**	**10**
Traction drive ASSY	**PAGE**	**12**
Blast wheel and bearing unit	**PAGE**	**14**

Spare Parts

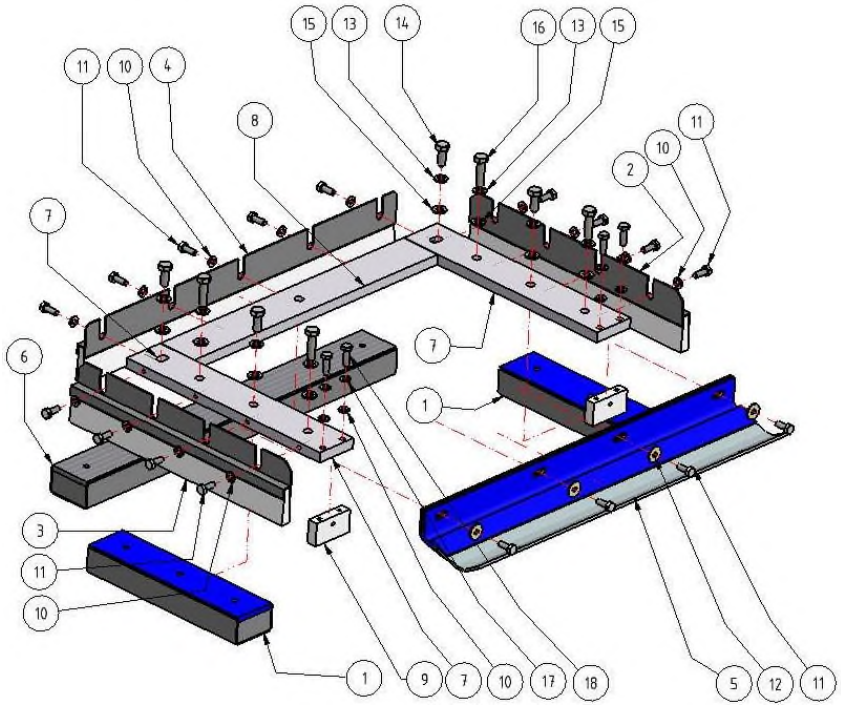
Overview:



POS	QTY	DESCRIPTION	PART No.
1	1	WHEEL HOUSING ASSY	---
2	1	TRACTION DRIVE ASSY	---
3	1	CONTROL PANEL ASSY	---
4	1	REBOUND ASSY	---
5	1	SEPARATOR ASSY	---
6	1	BASE SEAL ASSY	---

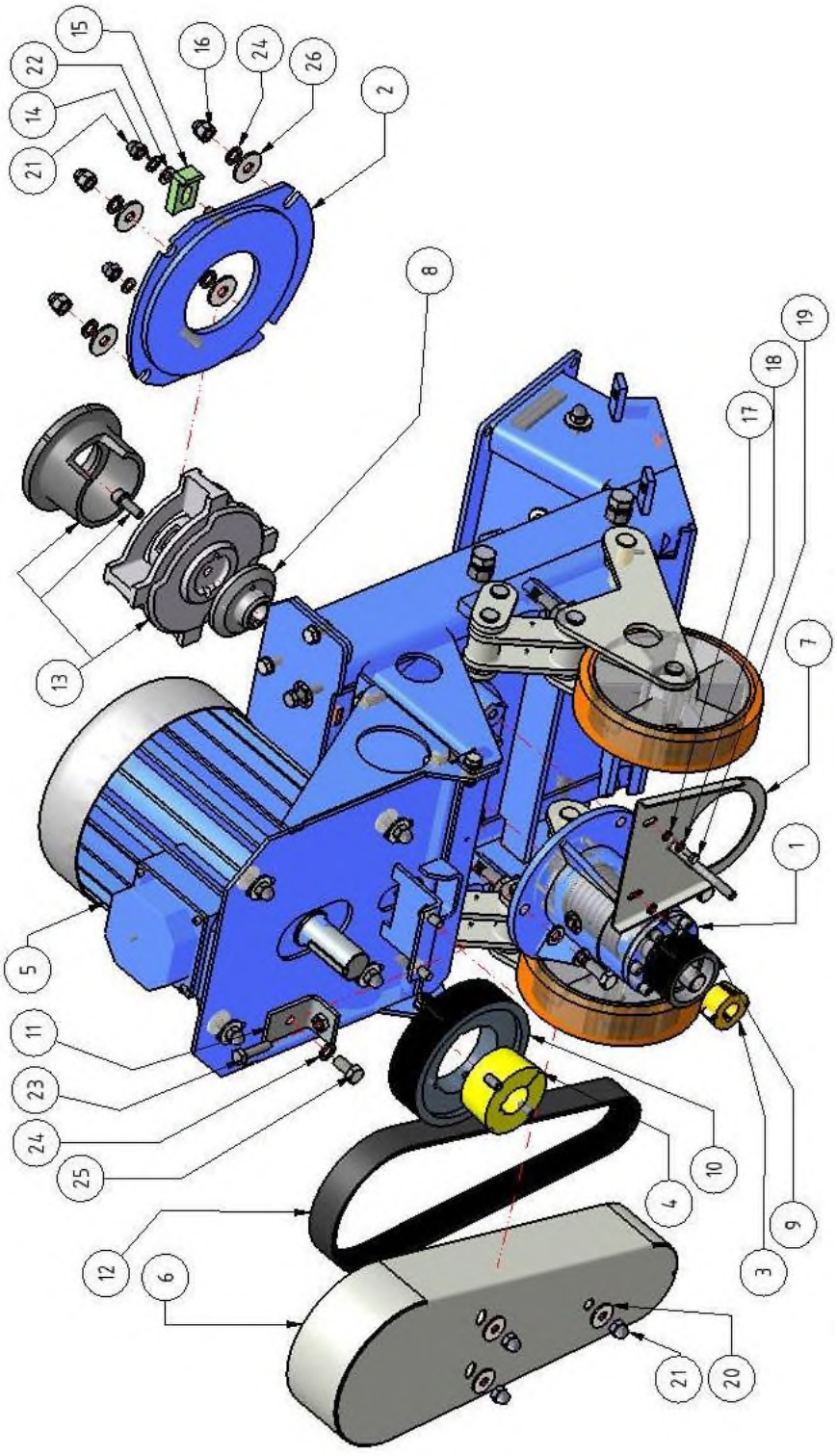
Changes to technical data reserved

Base seals ASSY:



POS	QTY	DESCRIPTION	PART No.
1	2	SIDE MAGNET	201 000 175
2	1	BRUSH LH	201 000 024
3	1	BRUSH RH	201 000 027
4	1	FRONT BRUSH	201 000 503
5	1	REAR SEAL	201 000 494
6	1	FRONTMAGNET	201 000 502
7	2	ISOLATOR SIDE MAGNET	201 000 194
8	1	ISOLATOR FRONT MAGNET	201 000 501
9	2	ISOLATOR REAR SPACER	201 000 195
10	17	WASHER	DIN 125-1 B6 Zn
11	17	HEX HEAD BOLT	EN 24018 M6x16 Zn
12	4	WASHER	DIN 9021 6,4 Zn
13	8	LOCK WASHER	DIN 128 A8 Zn
14	4	HEX HEAD BOLT	EN 24018 M8x20 Zn
15	8	WASHER	DIN 125-1 B8,4 Zn
16	4	HEX HEAD BOLT	EN 24018 M8x30 Zn
17	4	LOCK WASHER	DIN 128 A6 Zn
18	4	HEX HEAD BOLT	EN 24018 M6x20 Zn

Wheel drive ASSY:

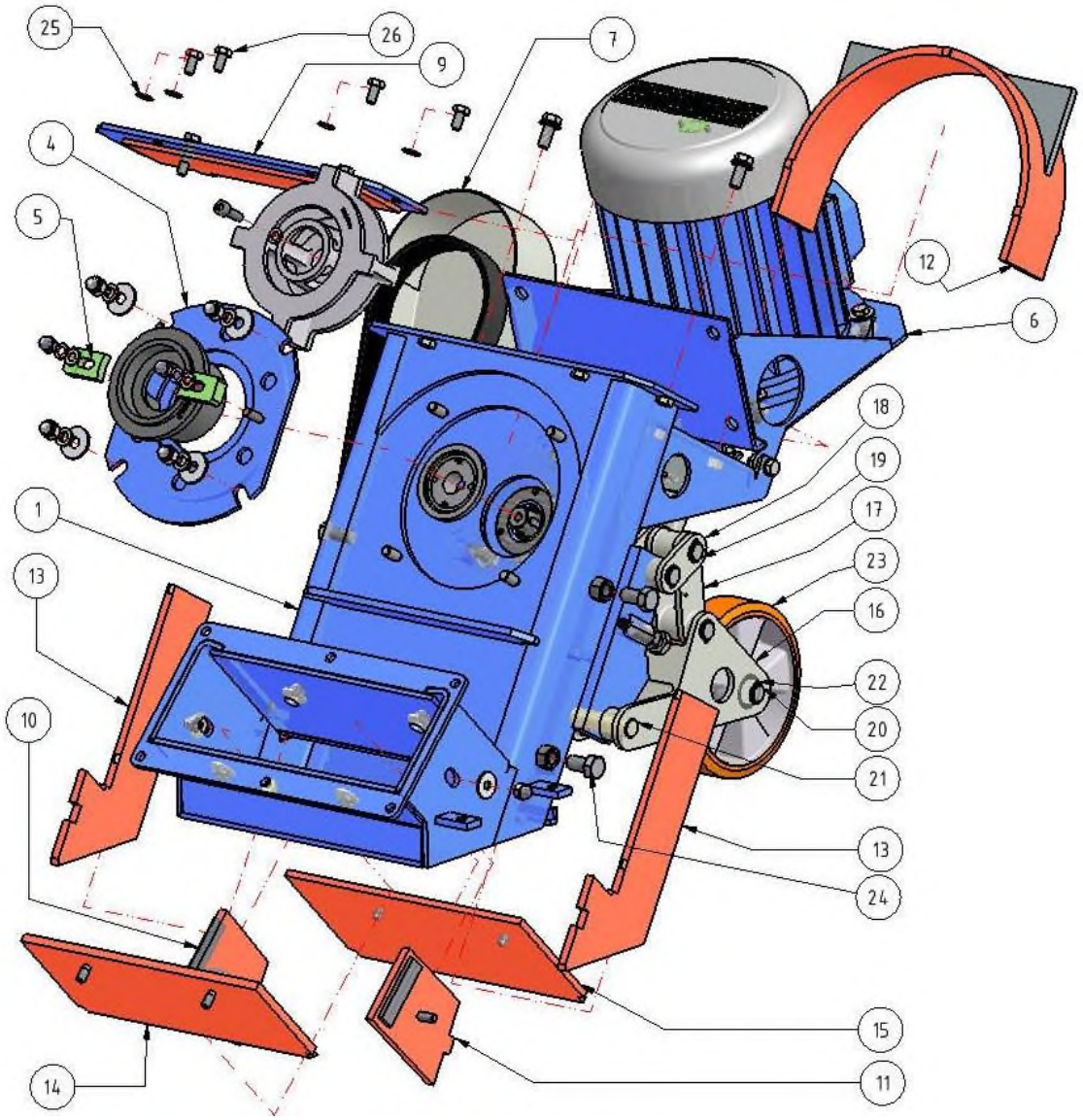


10

Changes to technical data reserved

POS	QTY	DESCRIPTION	PART No.
1	1	BEARING UNIT	201 000 043
2	1	FRONT PLATE	201 000 302
3	1	TAPER-LOCK BUSH	303 000 005
4	1	TAPER-LOCK BUSH	303 000 014
5	1	MOTOR 11 kW	601 000 022
6	1	BELT GUARD	201 000 489
7	1	REAR PROTECTION BELT GUARD	201 000 488
8	1	WHEEL HUB	201 000 051
9	1	BELT PULLEY SMALL 60Hz	302 000 028
10	1	BELT PULLEY LARGE 60Hz	302 000 027
11	1	MOTOR PULL BRACKET	201 000 482
12	1	V BELT	301 000 007
13	1	BLAST WHEEL KIT	201 000 001
14	3	LOCK WASHER	DIN 128 A10 Zn
15	2	CONTROL CAGE CLAMP	201 000 313
16	4	HEAD NUT	DIN 986 M12 Zn
17	2	WASHER	DIN 125-1 B6 Zn
18	2	LOCK WASHER	DIN 128 A6 Zn
19	2	HEX HEAD BOLT	EN 24018 M6x16 Zn
20	17	WASHER	ISO 7093 ST 10
21	13	HEAD NUT	DIN 1587 M10
22	10	WASHER	DIN 125 B10,5 Zn
23	3	HEX HEAD BOLT	EN 24018 M10x40 Zn
24	12	LOCK WASHER	DIN 128 A12 Zn
25	1	HEX HEAD BOLT	EN 24018
26	4	WASHER	

Wheel housing ASSY:

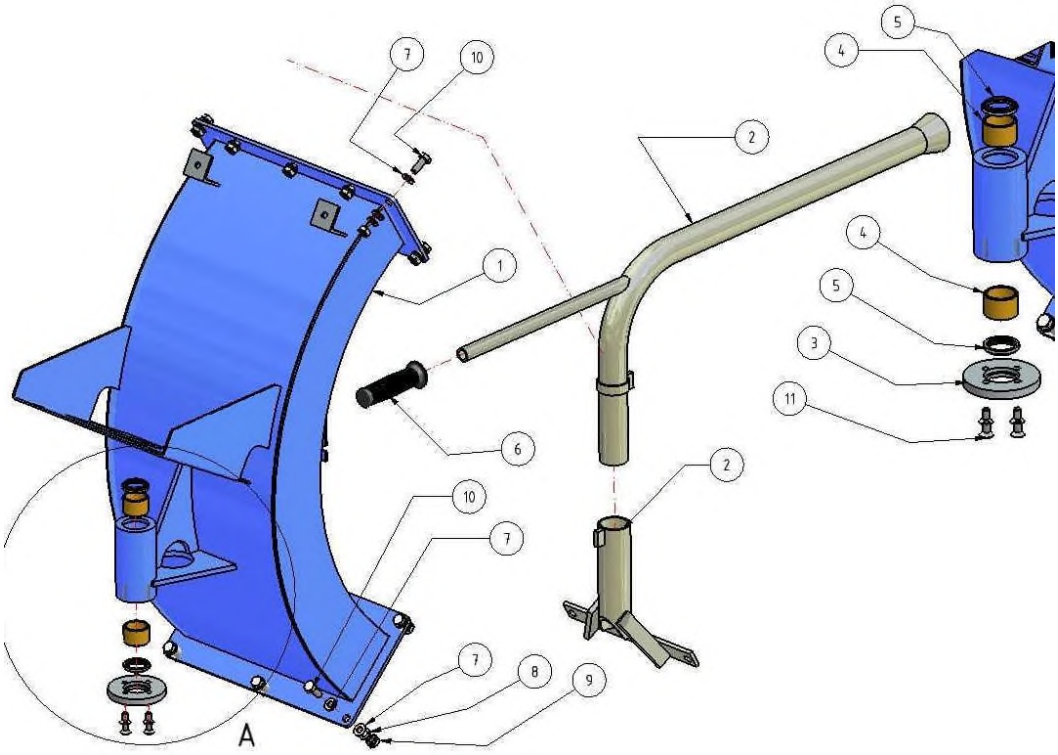


10

Changes to technical data reserved

POS	QTY	DESCRIPTION	PART No.
1	1	WHEEL HOUSING	201 000479
4	1	FRONT PLATE	201 000 302
5	2	CONTROL CAGE CLAMP	201 000 313
6	1	MOTOR BRACKET	201 000 480
7	1	BELT GUARD	201 000 489
9	1	COVER WHEEL HOUSING	201 000 481
10	1	LH SIDE LINER RBC	201 000 257
11	1	RH SIDE LINER RBC	201 000 258
12	1	TOP LINER	201 000 530
13	2	SIDE LINER	201 000 233
14	1	BOTTOM LINER RBC	201 000 532
15	1	TOP LINER RBC	201 000 531
16	2	IDLERWHEEL ARM	201 000 136
17	2	MIDDLE LEVER	201 000 137
18	4	TOP LEVER	201 000 138
19	4	LEVER PIN	201 000 465
20	4	IDLER WHEEL ARM PIN	201 000 464
21	2	BOLT LINK WHEEL HOUSING	201 000 128
22	16	SHAFT RING	DIN 471 20x1,2 Zn
23	2	WHEEL	304 000 006
24	4	HEX HEAD BOLT	EN 24018 M16x30
25	4	WASHER	DIN 125 B10,5 Zn
26	4	HEX HEAD BOLT	EN 24018

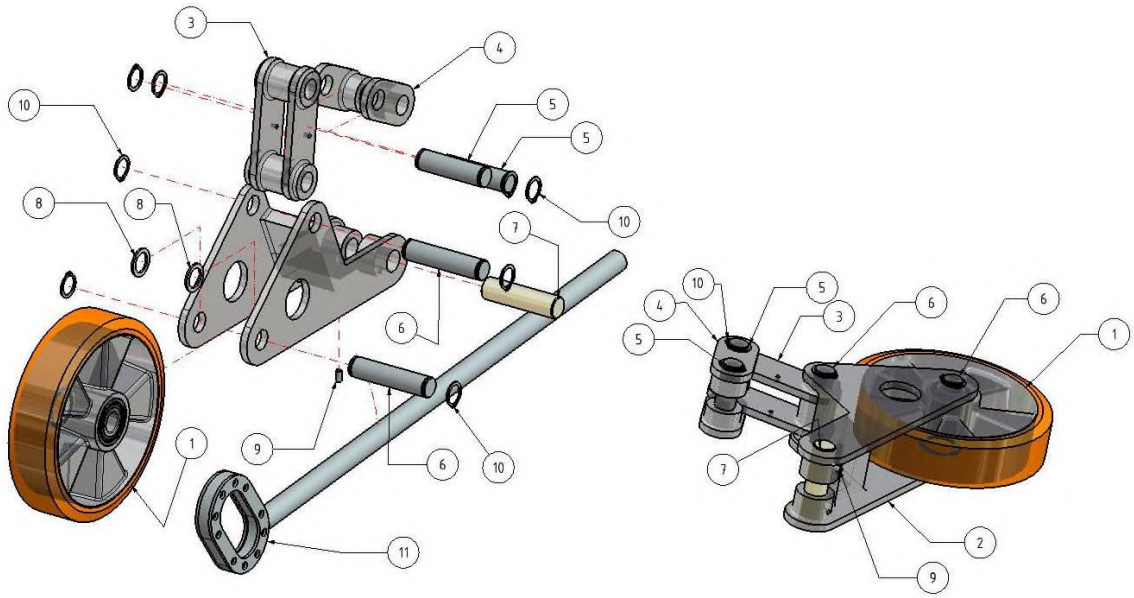
Rebound ASSY:



POS	QTY	DESCRIPTION	PART No.
1	1	REBOUND	201 000 478
2	1	CABLE GUIDE COMPLETE	201 000 505
	1	PIPE ANGLE	201 002 576
	1	PIPE ANGLE SUPPORT	201 000 535
3	1	PIVOT PLATE	201 000 556
4	2	BRASS BUSH	314 000 005
5	2	SEAL RING	403 760 006
6	1	PLASTIC HANDLE	310 000 001
7	25	WASHER	DIN 125 B10,5 Zn
8	14	LOCK WASHER	DIN 128 A10 Zn
9	14	HEX NUT	DIN 934 M10
10	11	HEX HEAD BOLT	EN24018 M10x25
11	4	C. SINK HEAD SCREW	DIN7991 M8x16 Zn

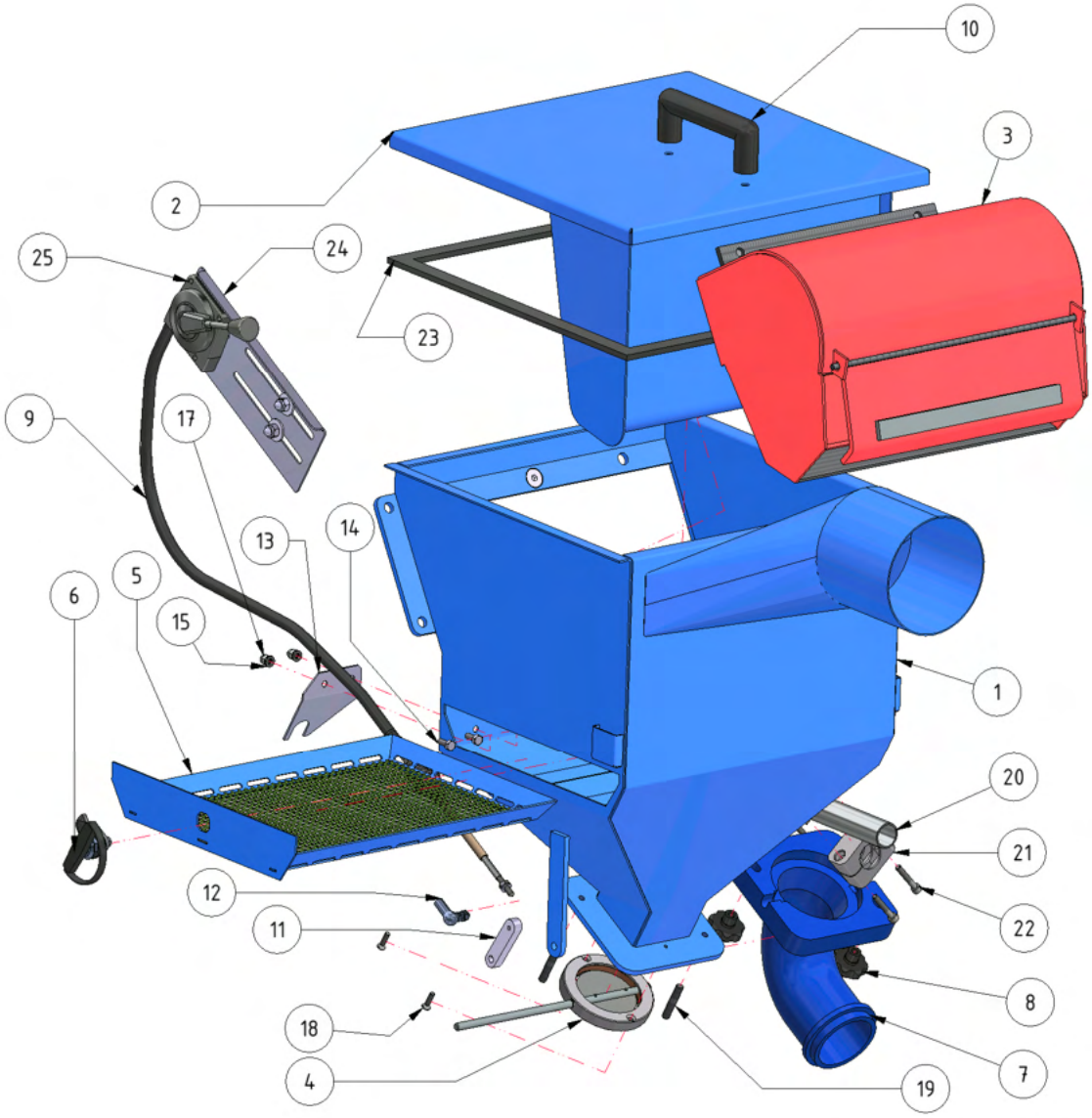
Changes to technical data reserved

Toggle lever ASSY:



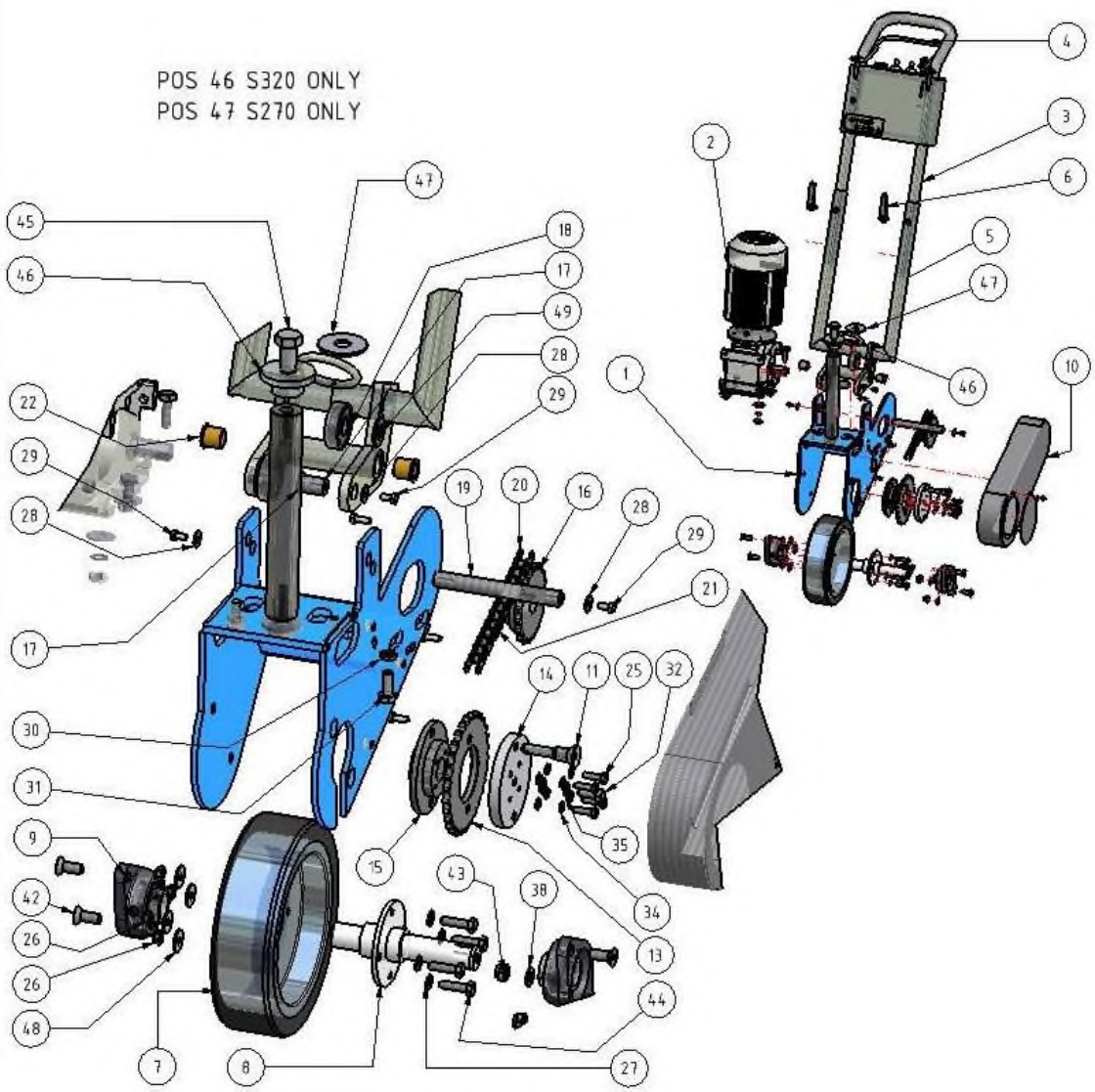
POS	QTY	DESCRIPTION	PART No.
1	1	WHEEL	304 000 006
2	1	IDLER WHEEL ARM	201 000 136
3	1	MIDDLE LEVER	201 000 137
4	2	TOP LEVER	201 000 138
5	2	LEVER PIN	201 000 465
6	2	IDLER WHEEL ARM PIN	201 000 464
7	2	BOLT LINK WHEEL HOUSING	201 000 128
8	2	SPACER	DIN 988 S 20x28x2
9	1	SET SCREW	DIN 913 M6x12 Zn
10	8	SHAFT RING	DIN 471 20x1,2 Zn
11	1	LIFTING LEVER	201 000 139

Separator ASSY:



POS	QTY	DESCRIPTION	PART No.
1	1	SEPARATOR HOUSING	201 000 483
2	1	SEPARATOR LID	201 000 484
3	1	DEFLECTOR	201 000 467
4	1	ABRASIVE FEED VALVE	201 000 165
5	1	SEPARATOR TRAY	201 000 485
6	1	CAM LATCH	310 000 009
7	1	FEED SPOUT	201 000 159
8	2	STAR KNOB	310 000 005
9	1	ABRASIVE CONTROL CABLE	201 000 250
10	1	HANDLE	310 000 002
11	1	VALVE LEVER	201 000 315
12	1	BALL JOINT	471 802 004
13	1	CONTROL CABLE BRACKET	201 000 500
14	2	HEX HEAD BOLT	EN 24018 M6x16 Zn
15	2	WASHER	DIN 125-1 B6,4 Zn
17	2	CAP NUT	DIN 986 M6 Zn
18	2	C.SUNK HEADSCREW SLOTTED	ISO 2009 M5x20
19	2	BOLT	DIN 835 M8x30
20	1	PIPE	---
21	2	PIPE CLAMP AL	---
22	4	HEX SOCK HEAD CAP SCREW	DIN 912 M6x35 Zn
23	1	LID SEAL 1600 mm / 63 in long	308 000 003
24	1	LEVER BRACKET	201 000 546
25	1	LEVER CONTROL CABLE	201 000 083

Traction drive ASSY:

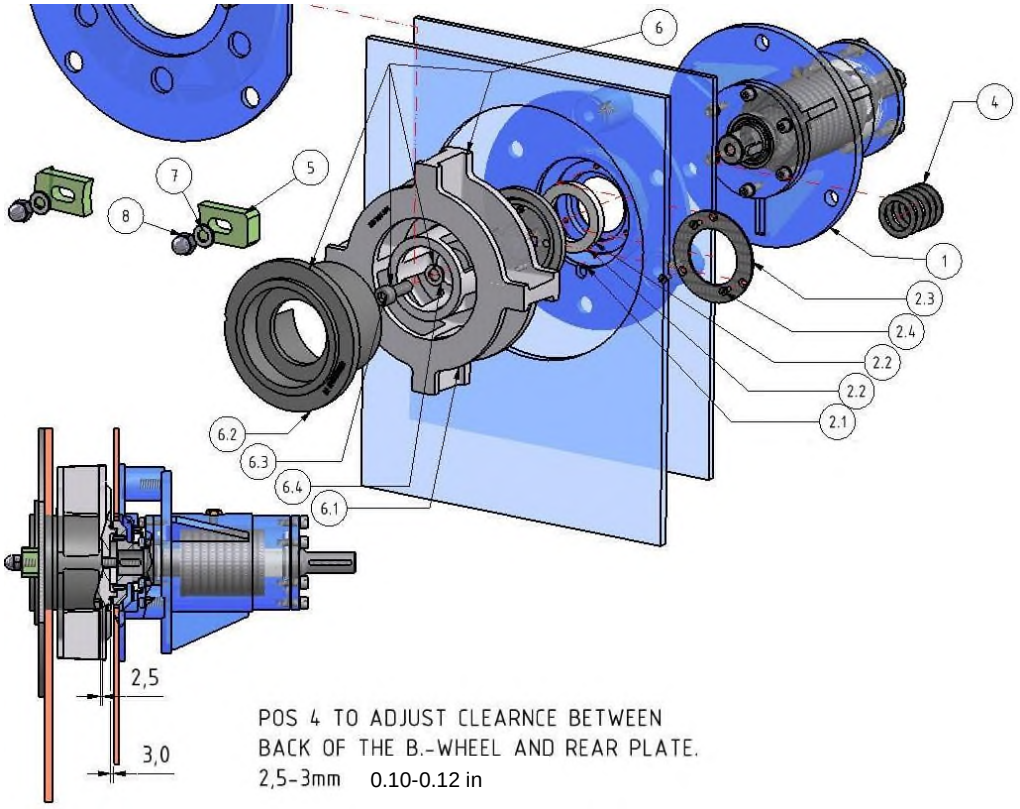


POS	QTY	DESCRIPTION	PART No.
1	1	TRACTION DRIVE BRACKET	201 000 371
2	1	GEARED MOTOR	601 000 025
	1	GEARED MOTOR WITH BRAKE	601 000 045
3	1	TOP HANDLE	201 001 196
4	1	SWITCH LEVER	201 000 429
5	1	PUSH IN LEVER	201 000 375
6	2	STAR KNOB	310 000 007

Changes to technical data reserved

POS	QTY	DESCRIPTION	PART No.
7	1	TRACTION DRIVE WHEEL	304 000 003
8	1	TRACTION DRIVE SHAFT	201 000 370
9	2	FLANGE BEARING	400 626 003
10	1	CHAIN GUARD	201 000 372
11	1	LOCK PIN	314 000 001
13	1	SPROCKET	201 000 833
14	1	SPROCKET RETAINER	201 000 057
15	1	SPROCKET RETAINER	201 000 374
16	1	MOTOR SPROCKET	309 000 009
17	2	BOLT	201 000 060
18	2	BALL BEARING	400625 016
19	1	BOLT HANDLE LEVER	201 000 377
20	1	CHAIN	309 000 003
21	1	CHAIN LINK	309 000 004
22	2	BRASS BUSHING	314 000 012
25	5	HEX HEAD BOLT	EN 24018 M6x20 Zn
26	8	LOCK NUT	ISO 7040 M8 Zn
27	9	WASHER	DIN 125-1 B8,4 Zn
28	4	WASHER	DIN 9021 6,4 Zn
29	4	HEX HEAD BOLT	EN 24018 M6x12 Zn
30	2	FLAT NUT	EN 24035 M10 Zn
31	2	HEX HEAD BOLT	EN 24018 M10x25
32	1	HEX HEAD BOLT	EN 24018 M8x20 Zn
34	4	LOCK WASHER	DIN 128 A6 Zn
35	1	LOCK WASHER	DIN 128 A8 Zn
38	8	WASHER	DIN 125 B10,5 Zn
42	4	COUNTER SINK HEX SCREW	DIN 7991 M10x25
43	4	HEX NUT	DIN 985 M10 Zn
44	4	HEX HEAD BOLT	EN 24018 M8x30 Zn
45	1	HEX HEAD BOLT	EN 24018 M16x30
46	1	LIFT STOP	201 000 504
47	1	WASHER	DIN 9021 17 Zn
48	4	WASHER	DIN 9021 8,4 Zn

Blast wheel and bearing unit:



POS	QTY	DESCRIPTION	PART No.
1	1	BEARING UNIT	201 000 043
2.1	1	FLANGE FOR BEARING UNIT	201 000 061
2.2	1	SEAL	201 000 073
2.3	1	SEAL CLAMP PLATE	201 000 062
2.4	3	SLTD. COUNT.SINK HEAD SCREW	DIN 963 M4x10 Zn
4		SPACER RING	---
5	2	CONTROL CAGE CLAMP	201 000 313
6	1	BLAST WHEEL KIT	201 000 001
6.1	1	BLAST WHEEL	---
6.2	1	CONTROL CAGE	---
6.3	1	HEX SOCK HEAD CAP SCREW	DIN 912 M10x30
6.4	1	LOCK WASHER	DIN 128 A10 Zn
7	2	WASHER	DIN 125 B10,5 Zn
8	2	CAP NUT	DIN 1587 M10

Changes to technical data reserved