

Original instructions

OPERATING INSTRUCTIONS BMS-220 ADB UC

VERSION 2.0

From serialnumber 28579B and up





Inspection comments

Inspection before initial operation on:	_____
By:	_____
Date of initial operation:	_____
Serial number & Year of manufacture:	_____

Recurring inspections / maintenance log

Date / Hour counter	Findings	Repairs / Cleaning	Test on	By*

*Competent person



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1. Introduction

Before use, operators must be provided with information, instruction and training for the use of the machine and the substances for which it is to be used, including the safe method of removal and disposal of the material collected. All persons who are working with or maintaining this machine must read the manual carefully and understand it fully. In case you sell the unit, hand it on to the next owner.

Keep this manual always with the machine, to enable it to be referred to at any time.

Any other work not covered by this operating manual must not be carried out.

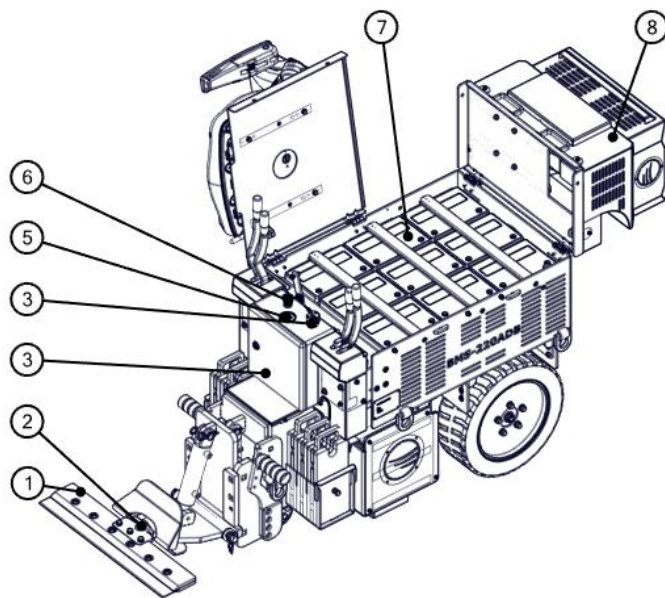
This machine is designed for industrial use by professionals. **Only authorized and trained personnel may operate this machine.** This machine is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge. **Blastrac BV** offers a course on the use of the machine in order to make the operating and maintenance personnel familiar with all elements of the machine.

2. Machine description

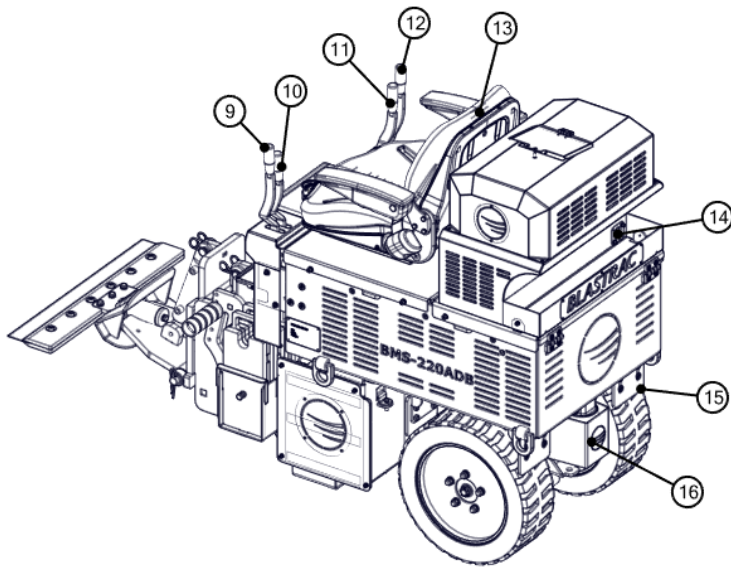
The Blastrac BMS-220ADB ride-on stripper is ideally suited for medium and large sized applications with the added benefit of being battery operated with build in charger for increased versatility. It is very maneuverable with zero turn radius, non-mark tires and complete hydraulic control.

Main assets of BMS-220ADB:

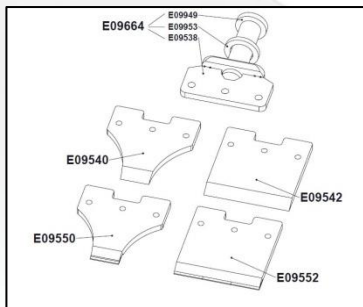
- fast and easy removal of all kinds of flooring material
- very compact, fits through standard doors & elevators
- zero turn radius, ergonomic design for safe maneuvering, non -marking tires
- very versatile, total freedom of movement, no electric cable.
- complete hydraulic control (drive and tool control)
- powered by a high-duty battery pack, running time up to 10 hours
- very high output compared to manual material removal.



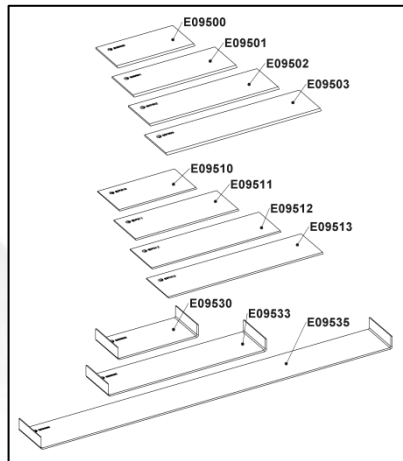
1	Blade holder	5	Battery discharge indicator / hour counter
2	Tool holder	6	Emergency shut down
3	Electro box	7	Batteries set
4	ON/Off key	8	Box with drive unit (motor with pumps)



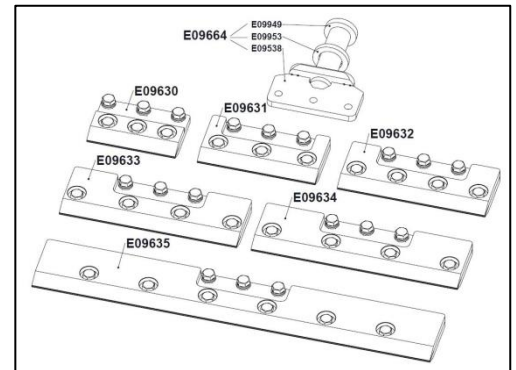
9	Left wheel handle
10	Tool angle handle
11	Tool pitch handle
12	Right wheel steer handle
13	Adjustable seat
14	Charger connection
15	Oil filter
16	Wheel scrapers



Chisels



Blades



Blade-holders



E10000

Toolbox E10000

- Contains:
- + ALL blades
 - + ALL chisels
 - + ALL blade-holders
 - + Professional tool set E10108

3. Safety



Warning!

Read all safety warnings and all instructions. Failure to follow the warnings and instructions may result in electric shock, fire, explosions and / or serious injuries.

It is the responsibility of the user to analyse the surface to be treated. The surface may not contain any substances which could pose a fire-, explosion- or health risk when treated. The user should make a risk assessment on the basis of the information obtained about the surface to be treated and take proper precautions for the work to be performed.

In case of any inappropriate usage, improper operation or repair, the producer shall be exempt from liability.

3.1 Work area safety

- a) Do not use the machine in rain, damp or wet locations.
- b) Avoid dangerous environments: do not work in the presence of explosive atmospheres, in the presence of flammable liquids, gases or dust. Remove materials or debris that may be ignited by sparks.
- c) Make sure there is enough ambient light on the work area. Cluttered or dark areas invite accidents.
- d) Keep children and bystanders away while operating the machine. They are likely not to foresee the potential dangers of the machine. Distractions could cause you to lose control of the machine.
- e) Persons who are not operating the machine must not be permitted to stay in the surrounding area of at least 5 meter from the machine.
- f) Never use the machine when the surface is not clear and if there is a risk of stumbling or tripping.
- g) Make sure that there is nothing standing or situated on the surface to be treated.
- h) Remove all objects from the surface that can damage the machine. Remove reinforcing steel or other objects protruding from the surface in order to prevent damage to the machine.
- i) **Warning! Make sure that the surface to be treated does not contain dangerous materials such as:**
 - combustible or explosive dusts or substances.
 - carcinogenic or pathogenic substances.

In these cases, additional safety measures should be used. Always mind the local safety requirements. Contact your dealer for additional options.
- j) Make sure that there are no cables or hoses in the driving direction of the machine.
- k) Effective organizational measures must be taken to prevent that employees are present in the work area of this machine. If this is not possible, effective traffic rules must be adopted.
- l) If the proper execution of the work requires the presence of workers in the work zone, it is mandatory to take effective measures to prevent them from being injured by the machine.
- m) It is forbidden to use/drive the machine on public roads, pavements, etc. unless they are closed off from the general public and other traffic.

3.2 Electrical safety

- a) Use only extension cables for extending the charger cable that are sized and marked in accordance with the overall power consumption of the machine. Do not use damaged extension cables.
- b) Electrical cables must be rolled entirely off of the reels.
- c) Any damage to the electric cables and/or electrical components is not permitted.
- d) The voltage on the identification plate must comply with the power supply.
- e) Use an electrical power supply connection with earth connection and earth leakage circuit breaker.
- f) **Keep the machine original; The machine is always equipped with an earthed connection, do not change this** and always use earthed cables with an earthed plug.
- g) Inspect and test the electrical components regularly. The electrical components have to satisfy with the requirements set out in the harmonised norm EN60204-1.
- h) Always call a skilled electrician or your distributor when you have questions about the safety of the electrical components.
- i) 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.
- j) Do not abuse the cord. Never use the cord for carrying, pulling or unplugging the machine. Keep cord away from heat, oil, sharp edges or moving parts. Damaged or entangled cords increase the risk of electric shock.
- k) Be careful with water on the treated surface. Electrical cables must not come into contact with water.
- l) Pull out the main plug of the charger and switch the contact to the OFF-position on the electrical panel during inspections and repairing on the machine.



3.3 Personal safety

- a) **Always wear Personal Protective Equipment while working with the machine.**
 - Dust mask class FFP2 or higher
 - Ear protection
 - Safety glasses with lateral protection
 - Protecting gloves
 - Safety shoes
- b) Dress properly. Do not wear loose clothing or jewellery. Keep your hair, clothing and gloves away from moving parts.
- c) Always wear the seatbelt when operating the machine.
- d) Stay alert, watch what you are doing and use common sense when operating the machine.
- e) Always seek professional medical attention immediately in case of injury.

3.4 Machine safety general

- a) Safety functions and operating functions must work correct.
- b) No loose bolts and nuts permitted.
- c) Never operate machine without the guards and/or safety devices in place.
- d) Never change anything on the safety devices on the machine!
- e) Make sure the machine is clean and that the footrests, seat and control levers are dry and free of grease and oil.
- f) Always disconnect on board charger before operating machine.
- g) All repair work has to be done by qualified Blastrac personnel, this guarantees a safe and reliable machine.
- h) Always use original Blastrac spare parts and cutting blades. This will ensure the best performance. Only original parts meet the factory specifications and quality. Otherwise Blastrac BV cannot guarantee the safety of the machine. The part numbers can be found in the Service Manual.

3.5 Maintenance safety

- a) Pull out the main plug of the charger before starting inspections, changing of the blades or repairing on the machine. Turn the contact key to OFF, remove the key and press Emergency shutdown.
- b) Wait for standstill of all drives before any inspections, adjustments and/or maintenance work is started.
- c) Block machine in stable position before doing any maintenance work.
- d) Failures due to inadequate or incorrect maintenance may generate very **high repair costs** and long standstill periods of the machine. **Regular** maintenance therefore is imperative.
- e) Operational safety and service life of the machine depends, among other things, on proper maintenance.
- f) Prevent premature wear by keeping the machine as dust free as possible. Clean the machine for this reason regularly with a dust collector and non-aggressive materials. Never use a high pressure water cleaner to clean the machine.
- g) It is advisable to stock all spare parts or wear parts that cannot be supplied quickly. As a rule, production standstill periods are more expensive than the cost for the corresponding spare part.

3.6 Hydraulic safety

- a) Make sure all hydraulic hose connections are tightened and there is no leakage of oil.
- b) Over tightening could damage O-rings. If a leak still persists, remove fitting and replace O-ring.
- c) Make sure the hydraulic hoses have no damages, signs of wear and tear or other defects.
- d) Hydraulic fluid under pressure is dangerous and can cause serious injury.
- e) The system runs at or below 130 bar. Never look for a leak when the unit is under pressure.
- f) Avoid leaks by keeping fittings and hoses tight, only check and service when not under pressure.
- g) Leaking hydraulic fluid is not only unsightly, it's dangerous. It could make workplace floors slippery, contaminate the environment and could create a possible fire/explosion hazard.
- h) Never change the oil pressure of the machine! Changing the oil pressure could cause serious damage to the machine and could result in very dangerous situations!
- i) Only work with the hydraulic oil in an area that is well-ventilated, otherwise you must wear suitable respiratory protection. Always wear Personal Protective Equipment when handling the oil:
 - Protecting gloves (preferably made of nitrile or neoprene.)
 - Safety goggles.
 - Hydrocarbon-proof clothing and safety shoes.
- j) Avoid long and repeated contact with the skin, after contact wash thoroughly with water and soap.



Contact with eyes: Immediately flush eyes with cold, fresh water for a minimum of 15 minutes. Seek professional medical attention.

- k) Do not eat, drink or smoke near the hydraulic oil.
- l) HV46 hydraulic oil holds no danger of intoxication.
- m) The hydraulic oil is stable at normal temperatures for storage, handling and use. However, the hydraulic oil is flammable when exposed to certain conditions. Empty containers may contain flammable or explosive vapors. Rags that are soaked with the product and paper or materials which have been used for absorbing the spilled product are inflammable. Make sure that no accumulation occurs. Remove safely after use.
- n) Avoid sparks, open flames, extremely high temperatures and other sources of ignition.
- o) Consult the Safety Data Sheets for additional information regarding the hydraulic oil.
- p) Oil-level should be half the glass of the level indicator. If you don't see the oil in the indicator, the level is too low. If the level is above the glass, the level is too high.
- q) Only use HV46 hydraulic oil (E00481), non-compatible fluids could cause damage to the unit or serious injury.
- r) Once a year the oil from the system and the filter should be replaced.
- s) Work on hydraulic equipment or operating materials may only be undertaken by a skilled hydraulic engineer or by trained persons under the guidance and supervision of a skilled hydraulic engineer as well as in accordance with the hydraulic engineering regulations.
- t) Hoses and pipe work can be under high hydraulic pressure. The temperature can be above 37° C. Use only hoses and pipe work that are sized and marked in accordance with the overall power consumption of the machine.
- u) A second person must be deployed who can disengage the hydraulics in an emergency if work on live parts is necessary. The work area must be sealed off using a red and white safety chain and a danger sign. For the electrical parts, use a tool that is insulated against voltages.
- v) Do not **open** or **remove protective guards** while driving gears are running.
- w) If safety-critical changes occur to the machine or its working method, the machine must be shut down immediately! The cause of the fault must be established, and rectified.
- x) In the event of operational malfunctions the machine must be shut down immediately and secured!

3.7 Battery safety

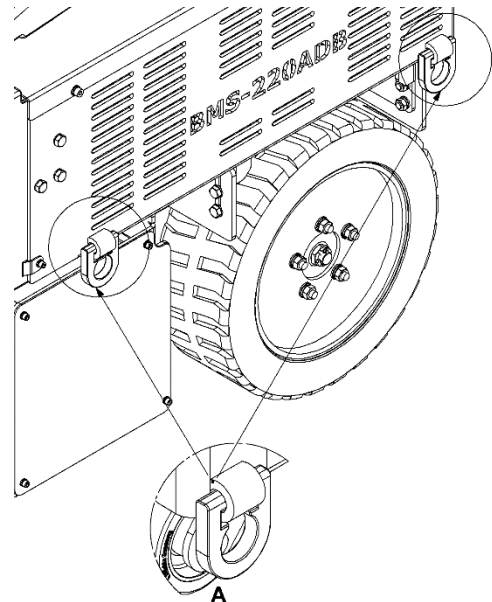
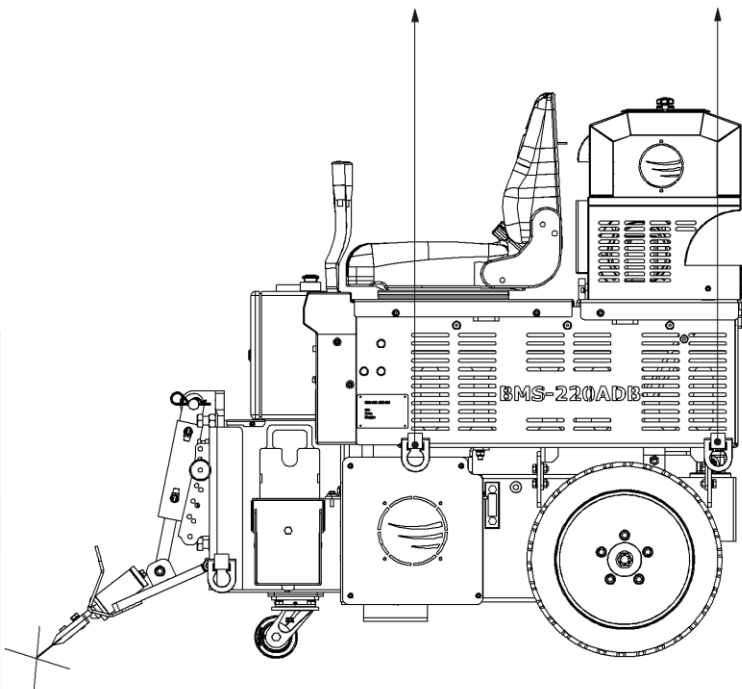
- a) Only use Blastrac approved batteries. Blastrac cannot guarantee the safety of the machine when other batteries are used.
- b) Every service work on batteries should only be done by trained personnel.
- c) The battery contains lead-acid, do not disassemble, heat above 60°C, or incinerate.
- d) Immediately flush eyes with cold, fresh water for a minimum of 15 minutes if electrolytic acid comes in contact with eyes. Seek professional medical attention immediately.
- e) For work with the battery you need to remove all metal jewelry like rings, watches, necklaces etc. They can be a cause of serious burns.
- f) The old battery should be recycled. Batteries contain harmful materials, like lead en sulphuric acid. These materials form an environmental and health hazard. Therefore it is imperative that they are recycled responsibly in accordance with local disposal and environmental regulations.

3.8 Transport safety

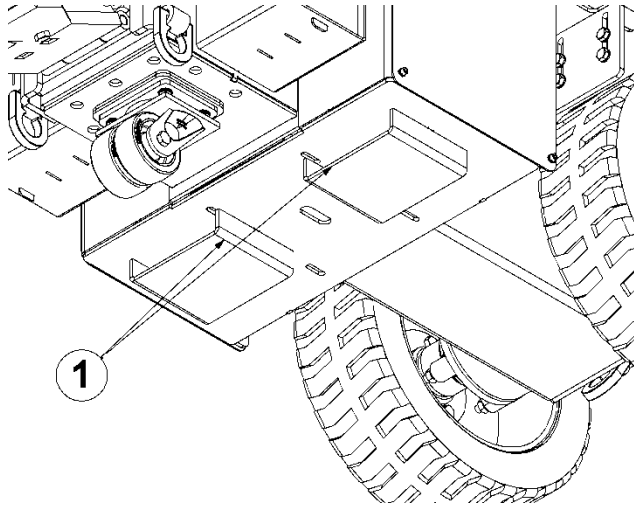
- a) NEVER lift machine with mounted tool! This sharp tool can be very dangerous!
- b) Be aware of your surroundings and machine operating level. Do not side hill, do not run on steep incline, this could cause machine to tip over.
- c) The weight of the BMS-220 is 1080 kilogram. Use preferably appropriate appliances as a lift, crane or forklift. Use the existing lifting points to lift the machine, use the brackets on the bottom when using a forklift.
- d) Before every use check the lifting eyes/lugs and welds for: deformation, damages, cracks, corrosion and wear.
- e) Each lifting lug has a WLL of 1500kg (3300 lbs.), only lift the machine as shown in the picture...
- f) When lifting the machine from the ground, always use the lowest lifting speed. The cables must first be tensioned at this speed; they must not be slack when the machine is lifted from the ground.
- g) During hoisting make sure to be at a safe distance from the machine with the most optimal view on the machine and working environment.
- h) Never stand directly below the machine.
- i) The lifting eyes/lugs can also be used to fasten the machine on a pallet or during transport.



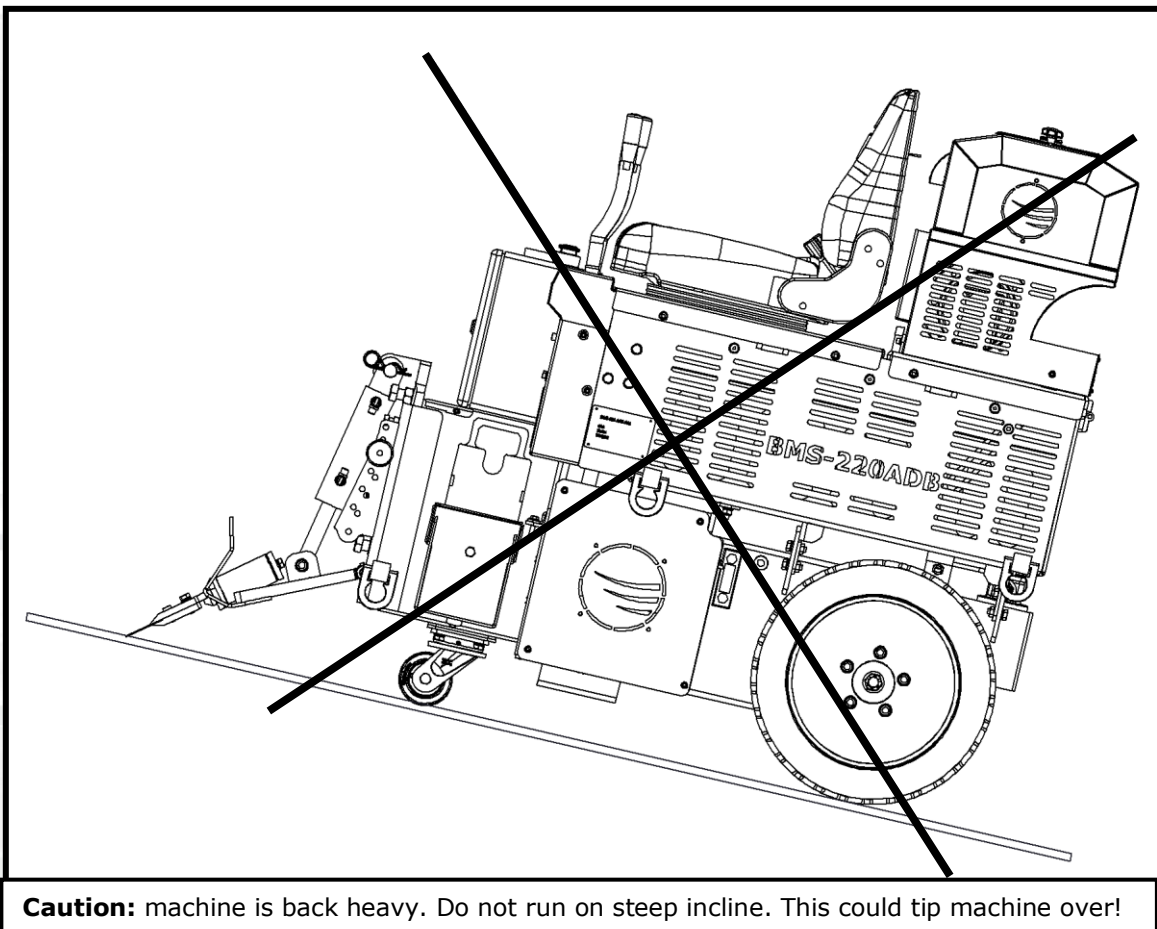
- j) Always drive backwards when driving up to a ramp or grade, and forwards when driving of the ramp.
- k) Chock wheels for transport and keep control handles in neutral position.
- l) Don't leave the machine unsecured on jobsites.
- m) Park the machine always on a flat horizontal and levelled surface.
- n) Store the cleaned and dry machine in a humid free room. Protect the machine from moisture, heat dust and shocks.
- o) Never use the machine for lifting persons or items.
- p) Turn key to OFF and press Emergency shut down when machine is parked.
 - Park the machine always on a flat horizontal and levelled surface.
 - Cover the sharp blade or remove it when the machine is parked.



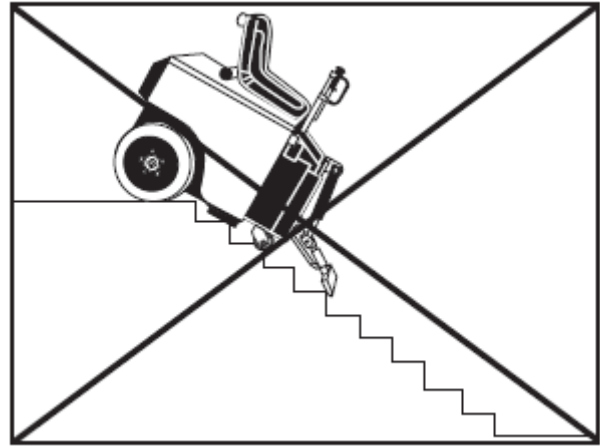
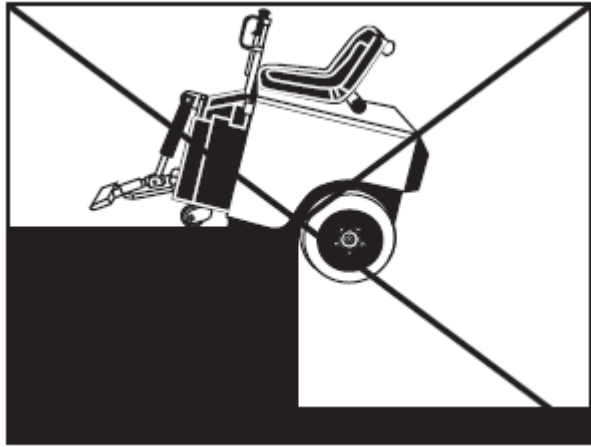
- The lifting eyes can be used to fasten the machine on a pallet or during transport.
- Chock wheels for transport and keep control handles in neutral position.
- Don't leave the machine unsecured on jobsites.
- Machine can be lifted by a forklift. Use the prepared bracket (1) on the bottom of the machine:



- Be aware of your surroundings and machine operating level. Do not side hill, do not run on steep incline, this could cause machine to tip over.
- Always drive backwards when driving up to a ramp or grade, and forwards when driving of the ramp.
- Do not run the machine in unsafe environments.



Caution: machine is back heavy. Do not run on steep incline. This could tip machine over!





3.9 Signs on the machine

The following stickers are placed on the machine. Meanings of these symbols are:



! Danger Hazardous voltage in motor even when solid state controller is OFF. Disconnect main power before servicing motor, controller or associated wiring.



Warning! Hot surface



Lifting point.



Wear a dust mask class FFP3 or higher.



Hearing protection is obliged.



Safety glasses with lateral protection are obliged.



CE-mark on this machine.



Wear protecting gloves.

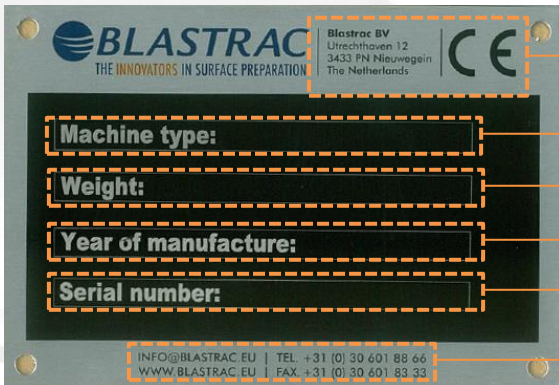


Safety shoes obliged.



Consult the manual before operating the machine.

Type plate:



- Name, address and CE mark.
- The machine type.
- The net weight of the machine in kilogram.
- The year of manufacture.
- The serial number of the machine.
- Email address, Website, Telephone & fax number.

EU Declaration of Conformity:





4. Initial operation

Before using the machine it is essential to inspect the machine every day. It is not permitted to use the machine if the machine safety is not according to the checkpoints below.

4.1 Checkpoints of electrical safety:

- Check if the power supply cable of the charger is unplugged and the cable is stored into the machine.
- Any damage to electric cables is not permitted.

4.2 Checkpoints of machine safety:

Check if:

- Control levers should be in neutral position.
- All hydraulic hose connections are tightened and there is no leakage of oil.
- The safety functions and operating functions work correct.
- There are not any loose nuts or bolts.

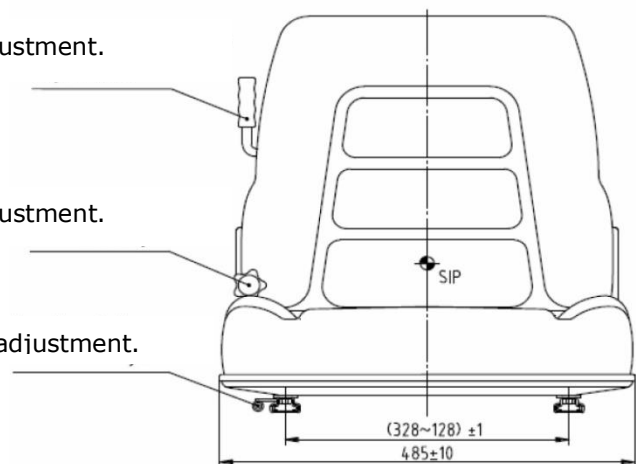
4.3 Seat adjustment and proper seatbelt use:

Adjust the seat as needed and sit up straight and well back in the seat.

Handle of the weight adjustment.

Knob of the backrest adjustment.

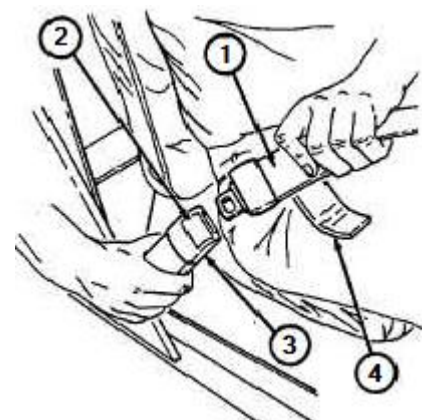
Handle of the forward/backward adjustment.



To fasten your seat belt, pull the webbing (1) out of the retractor and insert the metal tongue into the buckle (3). There will be an audible "click" when the tab locks into the buckle. Pull on the strap (4) to tighten the lap belt across your hips. The lap belt should be worn snugly and as low as possible over the hips, do not wear it over your belly.

To release the belt, press the buckle release button (2) and allow the belt to retract. If the belt does not retract smoothly, pull it out and check for kinks or twists. Then make sure it remains untwisted as it retracts.

Periodically check the seat belt to be sure it remains snug and in position. If there is a sudden stop or impact, the belt will lock into position. It will also lock (restrict) if you try to lean forward too quickly.





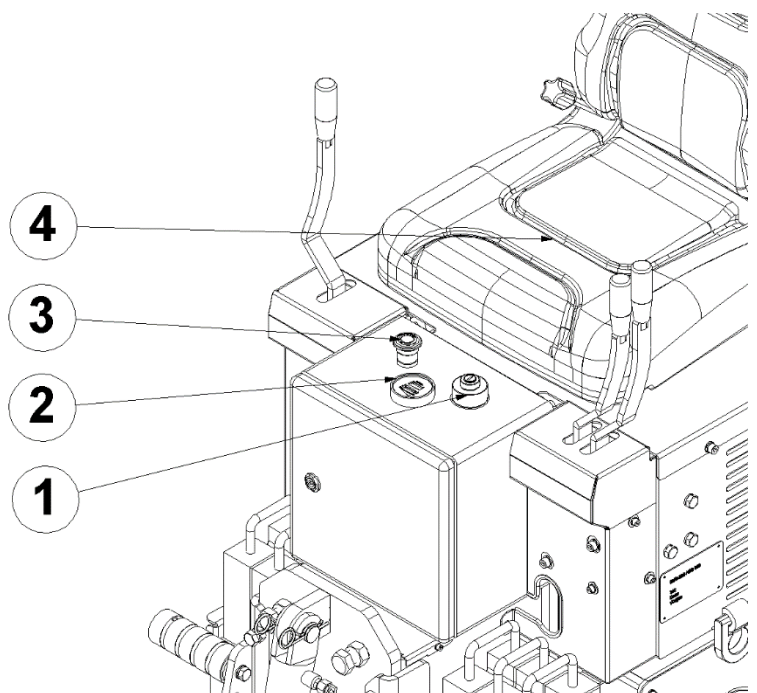
Seat belt usage is necessary to:

- Reduce the possibility of being thrown from the machine.
 - Reduce the possibility of injuries to the body during an accident or collision.
 - Hold the driver in a position which allows better control of the machine.
- The operator should always wear the seat belt no matter how short the trip in order to minimize the risk of severe injury in the event of a crash or an emergency stop. In an accident, an un-belted operator becomes a projectile, and can cause serious injury to himself.
 - The belt must always be flat against your body and not twisted in any way. Nothing, such as an arm rest, a phone, or any external objects should be between you and the seat belt. Improper wearing of a seat belt will reduce the protection in an accident or collision.
 - Seat belts should be adjusted as tightly as possible, consistent with comfort to properly secure the wearer in the seat.
 - Do not use any accessories on the seat belt or modify in any way the seat belt system.
 - An accident or emergency stop, can damage your seat belt system, even if the accident is "minor". Please inspect the seat belt system after an accident.
 - Never use a damaged seat belt system. A damaged seat belt will not provide protection in an accident, resulting in serious injury.
 - Seat belt systems can be prone to abuse. They are not indestructible. They must be handled with care to avoid damage.
 - Keep the belts clean and dry. Belt retraction may become difficult if the belts and webbing are soiled. If they need cleaning, use a mild soap solution or lukewarm water. Never use bleach, dye, or abrasive cleaners. These chemicals will severely weaken the belts.
 - Never wear twisted seat belts. Excessive forces will be transferred from the belt to the wearer, in a collision, resulting in serious personal injury.
 - At least once each month, inspect the seat belt webbing for any cuts, tears, or other signs of wear (such as fraying along the edges). Also inspect the anchor, retractor, and buckle to be sure they are tight and operational.

5. Operation

During operating the BMS-220 ADB, the following additional safety instructions must be followed closely. Before switching on the machine make sure that no-one can be endangered when the machine starts up.

4	Seat including presence switch and seatbelt.
3	Red mushroom-shaped emergency shutdown push button.
2	Battery power meter and hour-counter.
1	Contact switch.





5.1 Switching the machine on

- Take place on the seat (4) and put your feet on the footrests. Fasten the seatbelt.
- Operating the machine when you are not sitting in the operator seat is not possible because of the safety switch inside the seat.
- Pull out the emergency switch (3).
- Turn the key contact switch (1) to the right.
- Check battery power on discharge meter.

5.2 Driving the machine

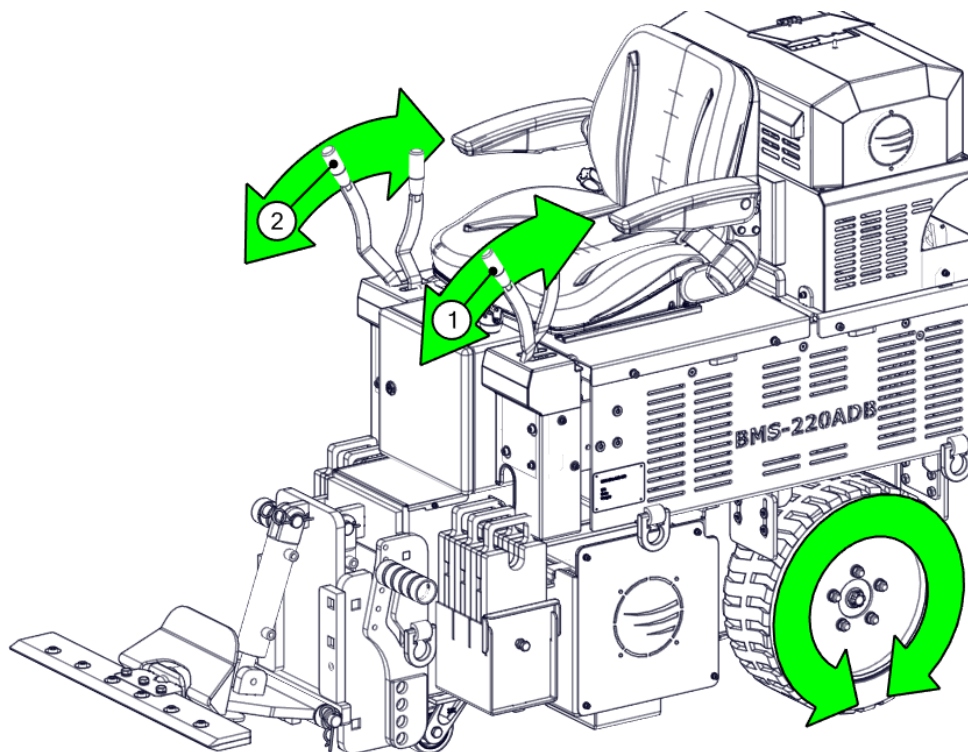
Driving of the machine is controlled by the two outside handles (1 and 3).

- Pushing both handles forwards, the machine drives forwards.
- Pulling both handles backwards, the machine drives backwards.

The driving speed depends on the position of the handles.

- Pushing the right handle forwards the machine turns to the left.
- Pushing the left handle forwards the machine turns to the right.

Pushing one handle forwards and pulling another handle backwards the machine will turn around its axis. Correcting direction while moving is accomplished by slightly reducing pressure on one handle or the other while moving.



- 1) Left wheel control handle. **Forward / Reverse** Neutral=Brake
- 2) Right wheel control handle. **Forward / Reverse** Neutral=Brake

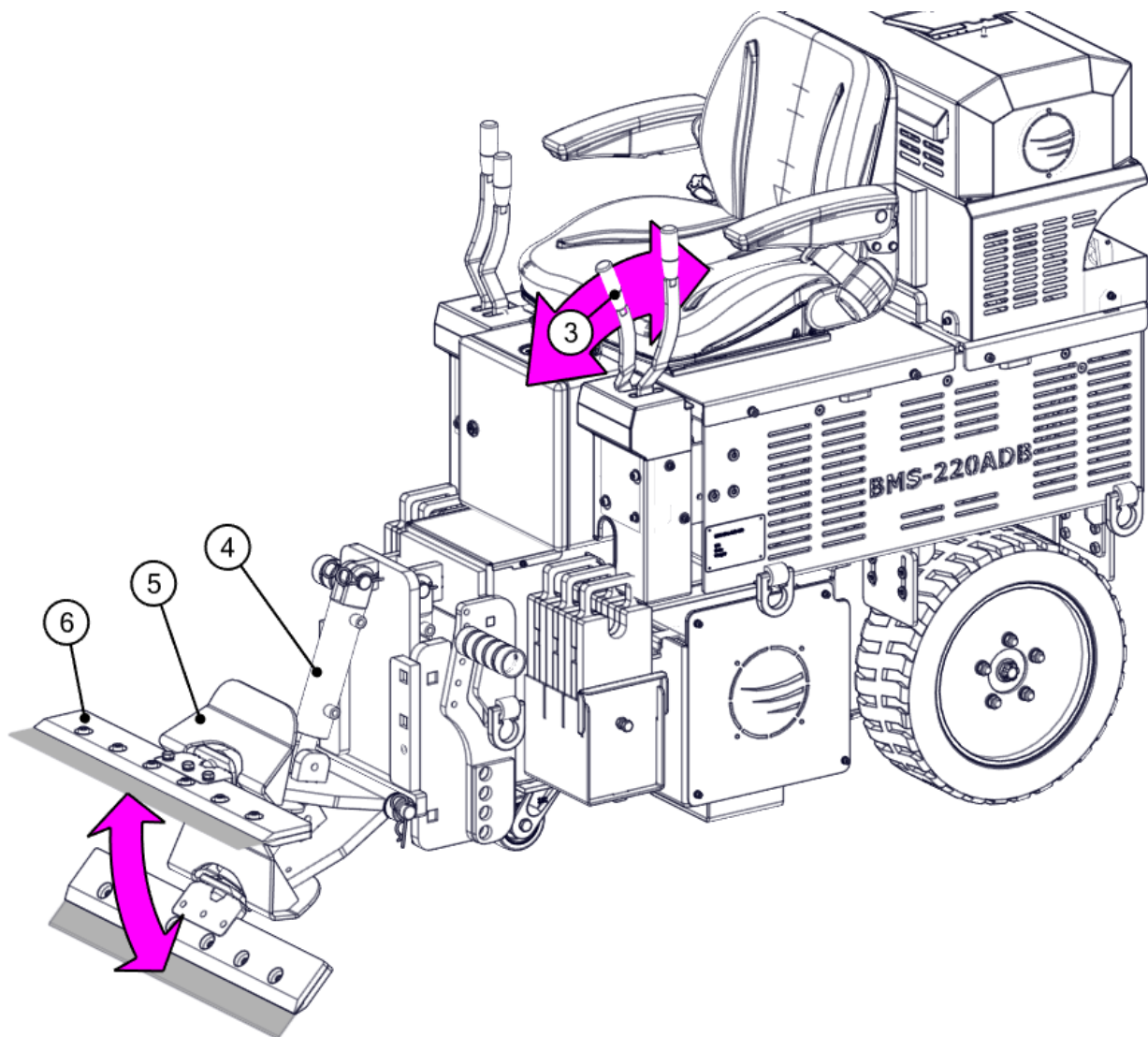


5.3 Controlling tool angle cylinder

The tool angle cylinder is controlled by left inner handle.

Push the handle to angle the tool downwards and pull the handle to angle the tool upwards to the proper cutting angle.

Continuing to push the handle will jack up the front of the machine. This will need to be done when doing maintenance on the machine. When doing the machine maintenance, place blocks under the machine. Never use the cutting head only.



- 3) Left inner handle
- 4) Hydraulic cylinder
- 5) Debris deflector
- 6) Blade holder – set

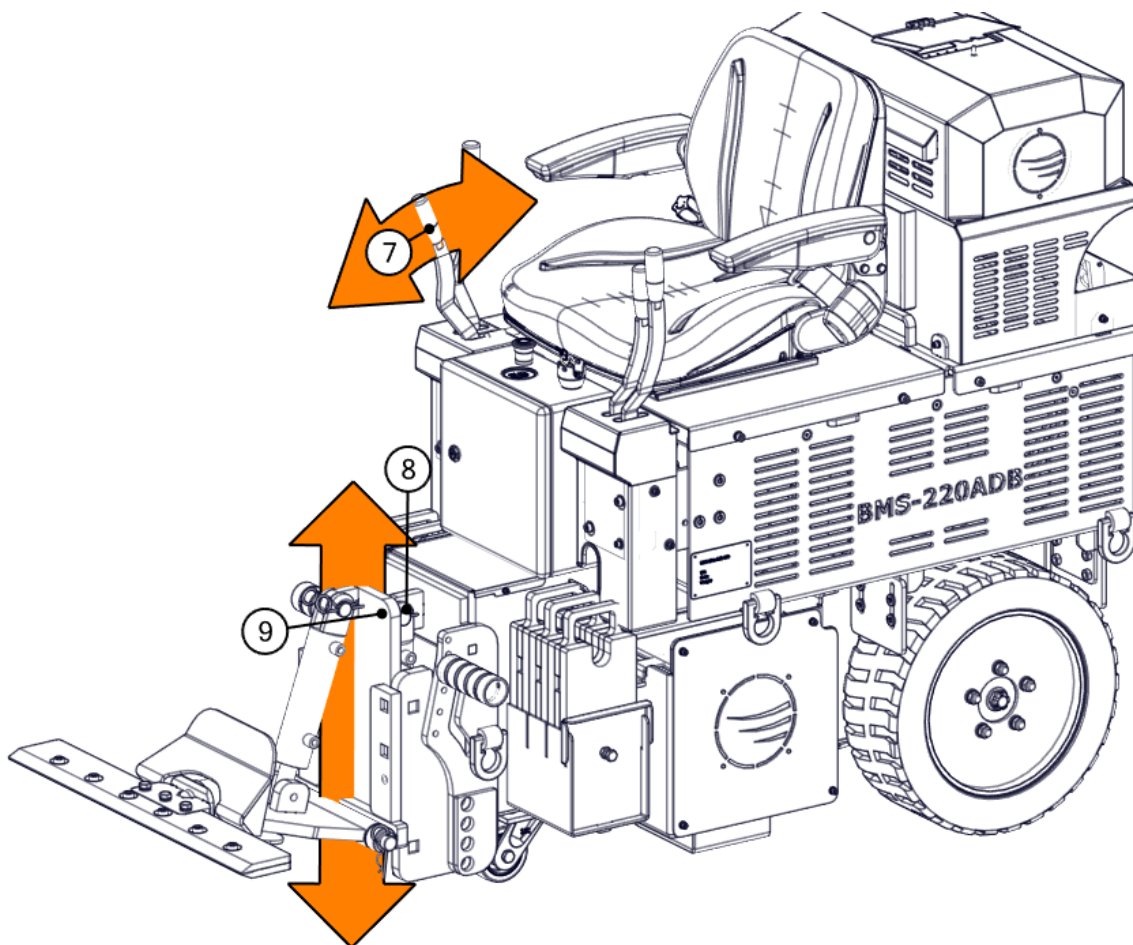


5.4 Tool pitch cylinder

The BMS-220ADB machines are standard with dual lift system from Serial number 30340B and up.

This allows the operator to adjust the blade pitch while remaining seated, this to have the best blade angle during the work.

Move the right-hand inner handle forwards or backwards to move the pitch up or down.



- 7) Right-hand inner handle
- 8) Hydraulic cylinder
- 9) Sliding plate



5.5 Drive adjustment system

It could be possible that after intensive usage the machine has a tendency to turn slightly to the left, or turn slightly to the right when driving.

The drive adjustment system allows the user to adjust the rotation speed of the left or right driving wheel so the machine will drive in a straight line again.

These reducing valves can be used to choke the hydraulic driving motors a little bit when they are not turning equally fast.

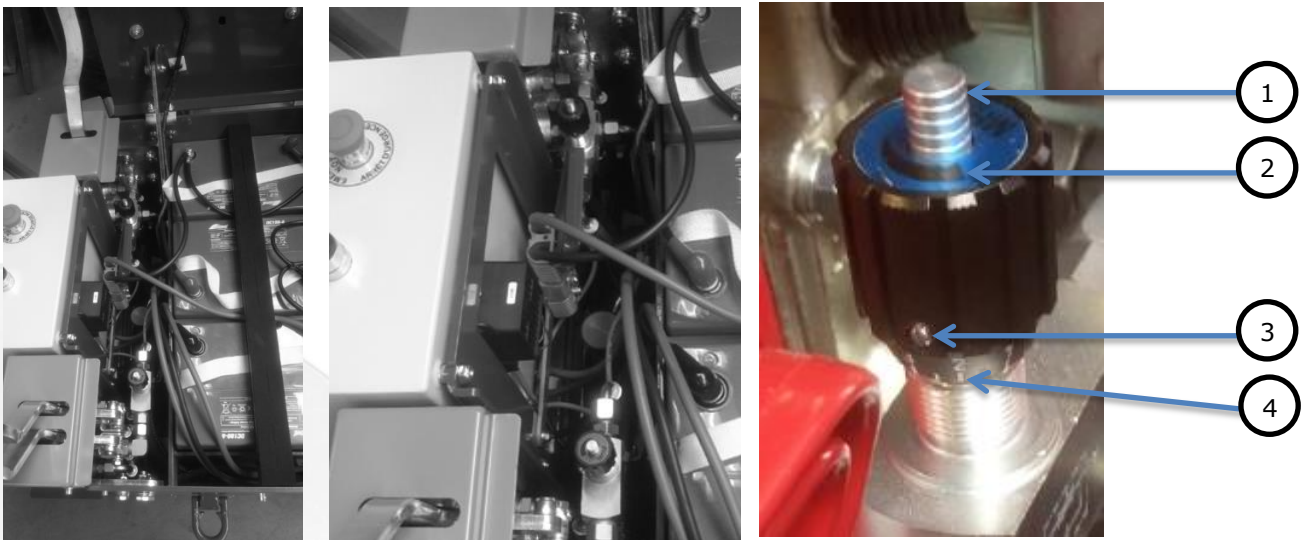
Standard are these valves completely open. (factory setting)

1 Shows the completely open position of the valve.

2 Shows the turning direction to open or close the valve.

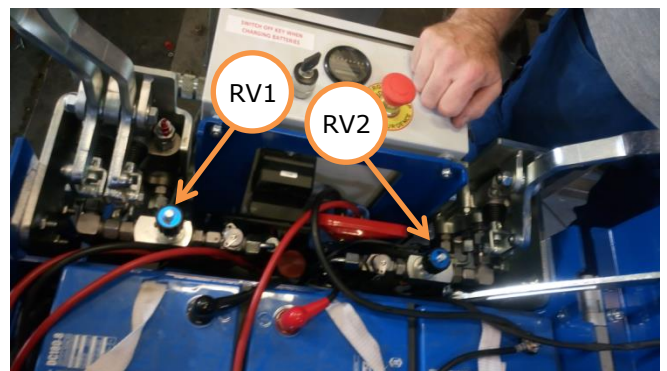
3 After adjustment this screw should be fastened to lock the position of the valve.

4 Scale for accurate adjustment.



Adjusting the valves:

- Turn both the knobs (RV1) and (RV2) COUNTER-CLOCKWISE: until they go no further.
- To make the machine drive to the LEFT:
Turn knob (RV1) CLOCKWISE: one complete rotation.
- To make the machine drive to the RIGHT:
Turn knob (RV1) CLOCKWISE: one complete rotation.
- Lock the position by fastening the locking screw (3).



Closing a reducing valve will result in less flow of hydraulic fluid and thus a slower driving speed.

This system is also able to put on existing machines;
E12163 Adjustment set for drive wheels BMS-220ADB

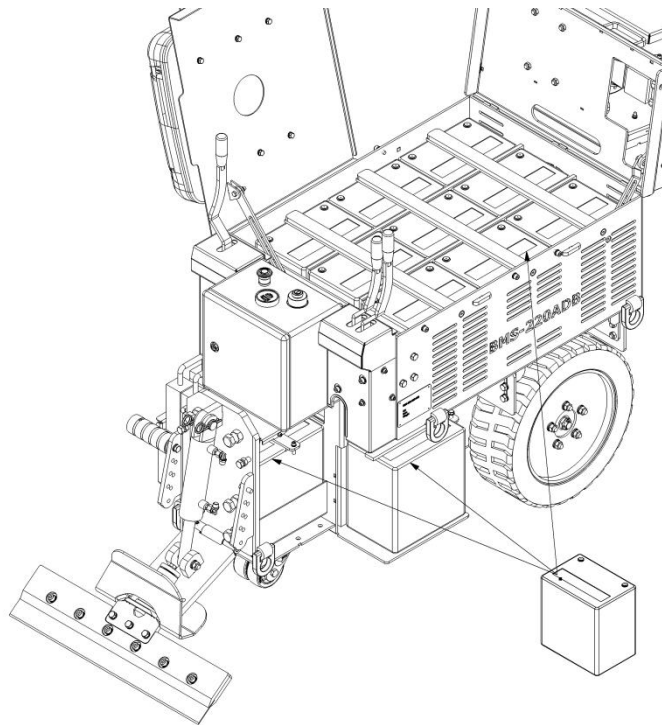


6. Battery operation

Machine is equipped with twelve batteries 4GBV 180 EV 8Volt, 180 Ah.

They are sealed, maintenance-free batteries that are non-hazardous, non-spillable and are made from ~80% recycled materials. During normal operation our batteries will not release any harmful gasses and will not leak any acidic electrolyte into the environment.

Only use Blastrac approved batteries. Blastrac cannot guarantee the safety of the machine when other batteries are used.



Part number: E09174

BMS-220 battery

Batteries do not take a memory allowing recharge at any state. Do not over discharge, this could cause damage to batteries.

To ensure the longest possible battery life it is recommended to have a small brake after charging. In this time the batteries can cool down to room temperature.

IMPORTANT Every service work on batteries should only be done by trained personnel. High amperage exist and can cause serious injury or death. Immediately flush eyes with cold, fresh water for a minimum of 10 minutes if electrolytic acid comes in contact with eyes. Seek professional medical attention immediately.

For work with the batteries you need to remove all metal jewelry like rings, watches, necklaces etc. They can be a cause of serious burns. Batteries are heavy (around 37kg) so when removing them it would be smart to ask for help or use a lifting device. Do not drop.

If the batteries need to be replaced make sure to use the wiring diagram in the service manual. Try to avoid mixing new batteries with old batteries in the machine, it is recommended to replace all batteries at the same time. The batteries contain lead-acid, do not disassemble, heat above 60°C, or incinerate. The old battery should be recycled. Batteries contain harmful materials, like lead and sulphuric acid. These materials form an environmental and health hazard. Therefore it is imperative that they are recycled responsibly in accordance with local disposal and environmental regulations.



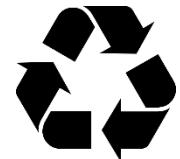
6.1 Information about safety and maintenance from producer:

Parameter which is important for batteries is the temperature in which they work. Optimum range is from -10° C to 45° C . Batteries may not be left in minimum temperature for a long time. The low temperature can cause the batteries to freeze which can damage them. More characteristics are shown in the table below.

CHARACTERISTICS		
Capacity 77°F (25°C)	20 Hour Rate (8A to 7.0 Volts)	160AH
	10 Hour Rate (14.4A to 7.0 Volts)	144AH
	5 Hour Rate (26.2A to 6.8 Volts)	131AH
Internal Resistance	Full charged Battery 77°F (25°C)	2.4m Ω
Capacity Affected by Temperature (20 Hour Rate)	104°F (40°C)	102%
	77°F (25°C)	100%
	32°F (0°C)	85%
	5°F (-15°C)	65%
Self-Discharge 77°F(25°C)	Capacity after 3 month storage	91%
	Capacity after 6 month storage	82%
	Capacity after 12 month storage	64%
Max. Discharge Current 77°F (25°C)	2000A (5s)	
Terminal	Standard	M8
Charging (Constant Voltage)	Cycle	Initial Charging Current $\leq 0.2 \times C20$ 9.67 V ~ 9.93 V/77°F (25°C)
	Float	9.06 V ~ 9.2 V/77°F (25°C)



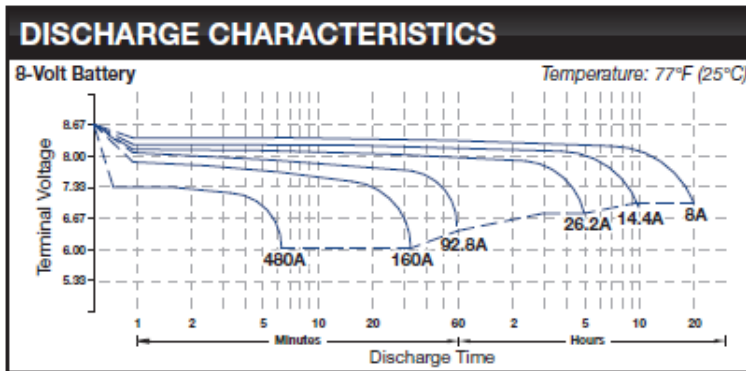
NONSPILLABLE



Pb



Pb



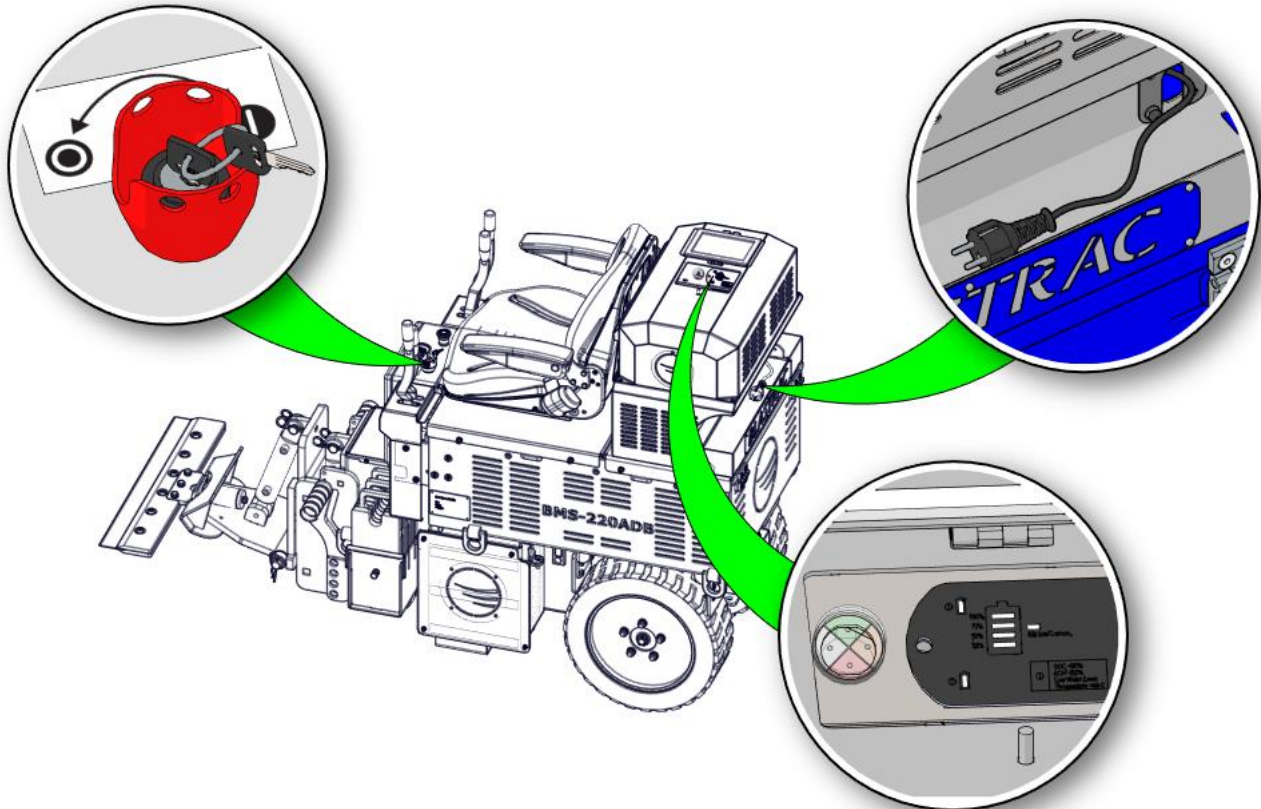
CONSTANT CURRENT DISCHARGE (Amps)											
CUT OFF VOLTAGE V/cell	30M	45M	1H	2H	3H	5H	8H	10H	12H	20H	24H
1.75V	150	110	90.2	56.1	39.2	25.7	17.4	14.4	12.3	8.0	6.8

RESERVE CAPACITY	
@25 AMPS	@56 AMPS
315 Minutes	112 Minutes



7. Charger operation

The BMS-220 is equipped with an On-board battery charger. It is mounted on the back of the machine to have a easy access. Machines are built with a 60A charger E14536 From serial number 31509B & up. Turn the contact switch to 'OFF' for charging. Batteries will not charge when contact switch is in 'ON' position. Put the charger plug into a grounded outlet. If the plug will not fit the outlet, have a proper outlet installed by a qualified electrician. Never alter the A/C cord or plug provided.



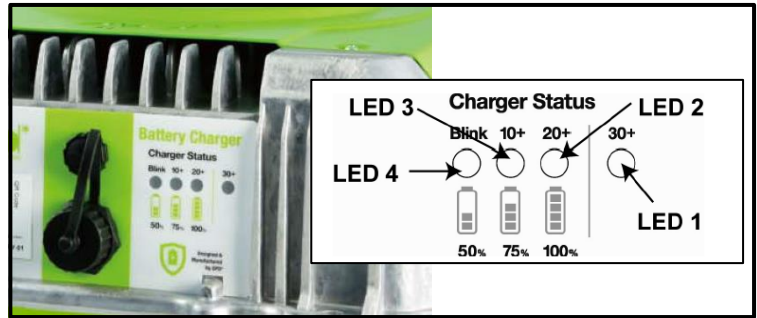
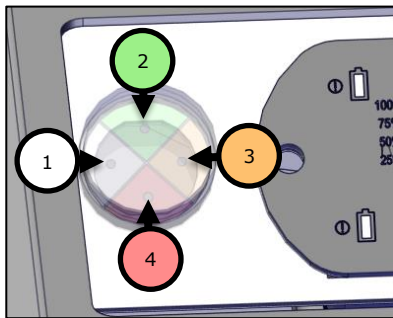
The charger starts and stops automatically when the contact switch is off and the plug is in. You can charge the batteries all night long, when the batteries are full the charger stops automatically. **WARNING!** Always disconnect on board charger before operating the machine.

Capacity	LED 2 (100%)	LED 3 (75%)	LED 4 (50%)
< 50%	○	○	☼ (Blinking)
> 50%	○	☼ (Blinking)	●
> 75%	☼ (Blinking)	●	●
100%	●	●	●



7.1 Fault indicators

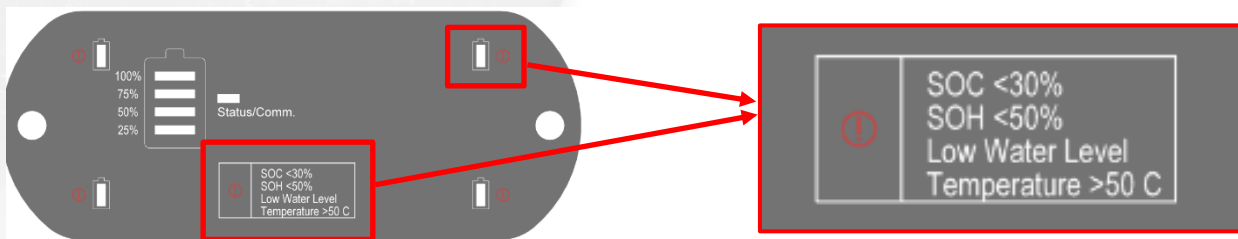
When a fault occurs, LED2(100%) + LED3(75%) + LED4(50%) will blink at the same time.



When a fault occurs, LED2(100%)/LED3(75%)/LED4(50%) will blink at the same time.

Blinking Frequency	Fault cause	Solution
1	The batteries are not connected, or The battery voltage is too low	1) Check battery connection is correct. 2) Check charger connection is correct. 3) Check each battery is good.
2	Abnormal AC Power Input (Voltage)	1) Check AC input cord is connected between charger and AC outlet. 2) Make sure AC plug is tightly inserted into AC outlet.
3	Charger High Temperature Protection	1) Charger shuts down and enters protection mode due to charger/environmental temperature is too high. Please place the charger in a well-ventilated environment. 2) Disconnect the charger and wait for 15-20mins before reconnecting for charging.
4	Battery High Temperature Protection	1) Charger will reduce current and will even stop charging to prevent the battery from overheating when battery temperature exceeds the preset value. 2) When the battery temperature drops, the charger will restart automatically.
5	Output Current is too large	Return to the factory for repairing.
6	Battery Voltage is too high	Check and assure that the correct output battery voltage is connected.

The panel below shows the status of charging of the batteries and a red light if a fault occurs.



SOC = State of charge is the level of charge of an electric battery relative to its capacity.
SOH = State of health will be 100% at the time of manufacture and will decrease over time and use.



7.2 Charging profile

After connecting charger with battery, connect charger with AC outlet using AC cable. The charger will go into charging mode.

In order to find out the preselected charging profile, disconnect the charger with the battery set. Reconnect the charger to AC outlet, the LED's will show the number of the chosen charging profile.

LED's will be showing Battery Charging Profile as below:

LED 1 (30+)	LED 2 (20+)	LED 3 (10+)	LED 4 ()
30 (something)	20 (something)	10 (something)	# of blinking = (something)

If the charging profile is #35, what would happen is: LED1 will be ON to represent the charging profile is 30, and LED 4 will blink 5 times, while LED2 and LED3 will remain off. This means 30 plus 5, showing the charging profile is #35.

Another example is if charging profile is #18, what would happen is LED3 will be ON to represent charging profile is 10 plus LED4 will blink 8 times to represent 8, which means #18.



The USB port is a service port to be used only for programming the charging parameters and downloading of historical data and graphs.

Charger Specifications

AC Input	
Voltage-Range(V)	100-240V
Frequency(Hz)	50-60Hz
Current-max(A)	16A
Operating Temperature	-40°C ~ +65°C
DC Output	
Voltage-max(V)	68V
Current-max(A)	60A

The charger can be used on 110V and 230V. Only the AC powercord has to be changed for 110V or 230V. You don't have to change any settings in the charger.

E14536_230V_EU 230V EU powercable
 E14536_110V_UK 110V UK powercable
 E14536_110V_US 110V US powercable

7.3 Maintenance instructions

1. Use pressurized air to blow the charger clean from accumulated dust.
2. The enclosure of the charger has been tested successfully to IEC 60529, meeting IP66.
3. Do not expose charger to oil, dirt, mud or direct heavy water spray.
4. If the detachable input power supply cord set is damaged, replace with a cord that is a safety approved detachable cord, 3 conductor, 1.5 mm² minimum, and rated appropriate for use in the country of destination and, on the other end, an output grounding type IEC 60320 C14 plug.

Never open the charger without permission from a Blastrac technician. Opening the charger without permission will void the warranty.



7.4 Proper battery charging & long term storage

For a healthy battery life, always keep the charger plugged in when the machine is not in use.



Do not worry about over-charging the batteries because the special program in the on-board chargers prevents over-charging. The charger can stay plugged in all the time, this will lengthen your battery life.

NEVER work with the BMS-220 while the charger is still plugged in. This will cause irreversible damage to the charger.

Long term storage

The best way:

Keep the charger plugged in all the time during storage.

This way the charger will keep the batteries full and healthy. (even if the machine is stored for months)

This is the preferred way to treat the BMS-220 for long term storage.

The second best way:

Make sure the batteries are completely charged.

Disconnect the lightblue connector with the red handle.

Recharge the machine for 24 hours every 2-3 months.

The third best way

Charge the BMS-220 every 2 weeks for 24 hours.



8. Sound and vibration data

Sound level: 77 dB(A) relative to 20 μ Pa.

Ear protection is recommended with the use of this equipment.

Vibration level:

Declared hand- arm vibration emission in accordance to EN 12096

The total vibration value to which the hand-arm system is subjected, does not exceed 2,5 m/s².

Vibration test code EN-ISO 20643

The total vibration value to which the whole body is subjected, does not exceed 0,5 m/s².

Uncertainty K = 0,1 m/s²

Surface: smooth concrete

Declaration in conformance with EN 12096: 1997

Measurement in conformance with EN-ISO 2631-1 and EN 1032 as far as applicable.

IMPORTANT NOTES:

The indicated values are measured on new machines. Noise and vibration levels will vary in different circumstances. Area influences like open outside or closed inside space, ambient temperature, different surfaces to be treated, daily use, different tools or accessories, poor maintenance, etc. will give different values at all time and could increase the exposure level over the total working period.

The declared vibration and noise emission levels represent the main applications of the machine. The values may be measurements from a representative sample of technically comparable machinery. The values may be used for a preliminary assessment of exposure.

A precise estimation of the level of exposure to vibration and noise should also take in account the times when the machine is switched off or even running, but not actually in use. This may significantly decrease the exposure level over the total working period.

Identify additional safety measures to protect the operator from the effects of vibration and noise such as: proper and regular maintenance of the machine and the accessories, keeping the hands warm, organization of work patterns for example by using rotation schedules. The use of anti-vibration gloves could also decrease the effects of the vibrations transmitted.

Although the sound pressure level at the operators position does not exceed 80 dB(A), ear protection is still strongly recommended when working with this machine.



9. Maintenance

Pay attention to Chapter 3 "**Safety**" during maintenance and repair works.

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

Operational safety and service life of the stripper depends, among other things, on proper maintenance.

The following table shows recommendations about time, inspection and maintenance for the normal use of the stripper.

Operating hours/ time period	Inspection points, maintenance instructions
12 h after repairing	Check all accessible screw connections for tight seat.
Daily and prior to starting work	Check that all safety devices are working adequate. Check the function of the residual current operated device. Check the hose connections for tightness and fixed seat. Check the electric connections for sediments of dirt or foreign bodies. Check the motors for dirt and other contaminants.
Weekly	Use pressurized air to blow the inside of the charger clean from accumulated dust. Check the frontwheels for damages and wear.
Monthly	Inspect the seat belt for any cuts, tears, or other signs of wear.
Annually	Full overhaul and cleaning of the complete 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 once a year.

Due to different working conditions it can't be foreseen how frequently inspections for wear check's, inspection, maintenance and repair works ought to be carried out. Prepare a suitable inspection schedule considering your own working conditions and experience.

Pay attention to unusual noises or strong vibrations. Check for the cause of every big change. Call a technician if you have doubts about the cause or when a repair without a technician seems not possible without damages. Only use genuine Blastrac spare parts.

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

Prior to any repair works on the stripper and its drives, secure the machine against unintentional switching on. Put the stripper to its safety off position.

Follow additional operating and maintenance instructions of Original Equipment Manufacturers if included during your service and maintenance work.

Further is advised:

Store the cleaned and dry machine in a dry and humid free room. Protect the electrical motors from moisture, heat, dust and shocks.

All repair work must to be done by qualified Blastrac personnel, this to guarantee a safe and reliable machine.

Any guarantee on the machine expires when:

- Non original Blastrac parts have been used
- Repair work is not done by qualified Blastrac personnel
- Changes, add one's or conversions are undertaken without written permission from Blastrac BV



9.1 Hydraulic system instruction

To refill the oil you need HV46 hydraulic oil. (Part number E00481 – Hydraulic oil)

Only work with the hydraulic oil in an area that is well-ventilated, otherwise you must wear suitable respiratory protection. Always wear Personal Protective Equipment when handling the oil:

- Protecting gloves (preferably made of nitrile or neoprene.)
- Safety goggles.
- hydrocarbon-proof clothing and safety shoes.

Avoid long and repeated contact with the skin, after contact with the skin wash with water and soap. Contact with eyes: Immediately flush eyes with cold, fresh water for a minimum of 15 minutes. Seek professional medical attention. Do not eat, drink or smoke near the hydraulic oil. HV46 hydraulic oil holds no danger of intoxication.

The hydraulic oil is stable at normal temperatures for storage, handling and use. However, the hydraulic oil is flammable when exposed to certain conditions. Empty containers may contain flammable or explosive vapors. Rags that are soaked with the product and paper or materials which have been used for absorbing the spilled product are inflammable. Make sure that no accumulation occurs. Remove safely after use. Avoid sparks, open flames, extremely high temperatures and other sources of ignition.

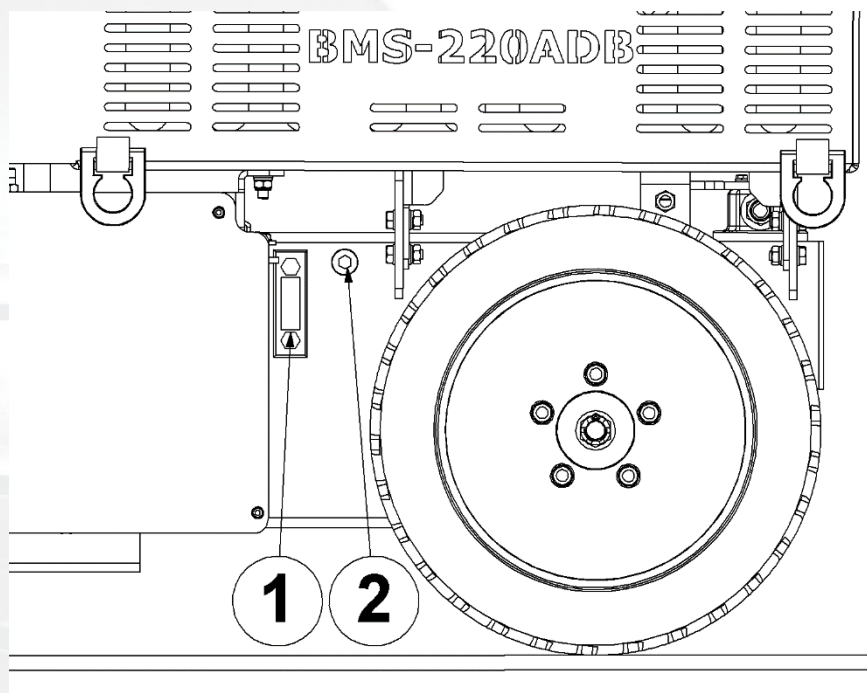
Please read the Safety Data Sheets at the back of the Service Manual for additional information regarding the hydraulic oil.

To check the oil level an indicator is installed on the side of tank.

Level should be half the glass of the level indicator. If you don't see the oil in the indicator, the level is too low. If the level is above the glass, the level is too high.

Next to the indicator is a mounted plug which closes the hole by which oil can be refilled.

Only use HV46 hydraulic oil (E00481), non-compatible fluids could cause damage to the unit or serious injury.

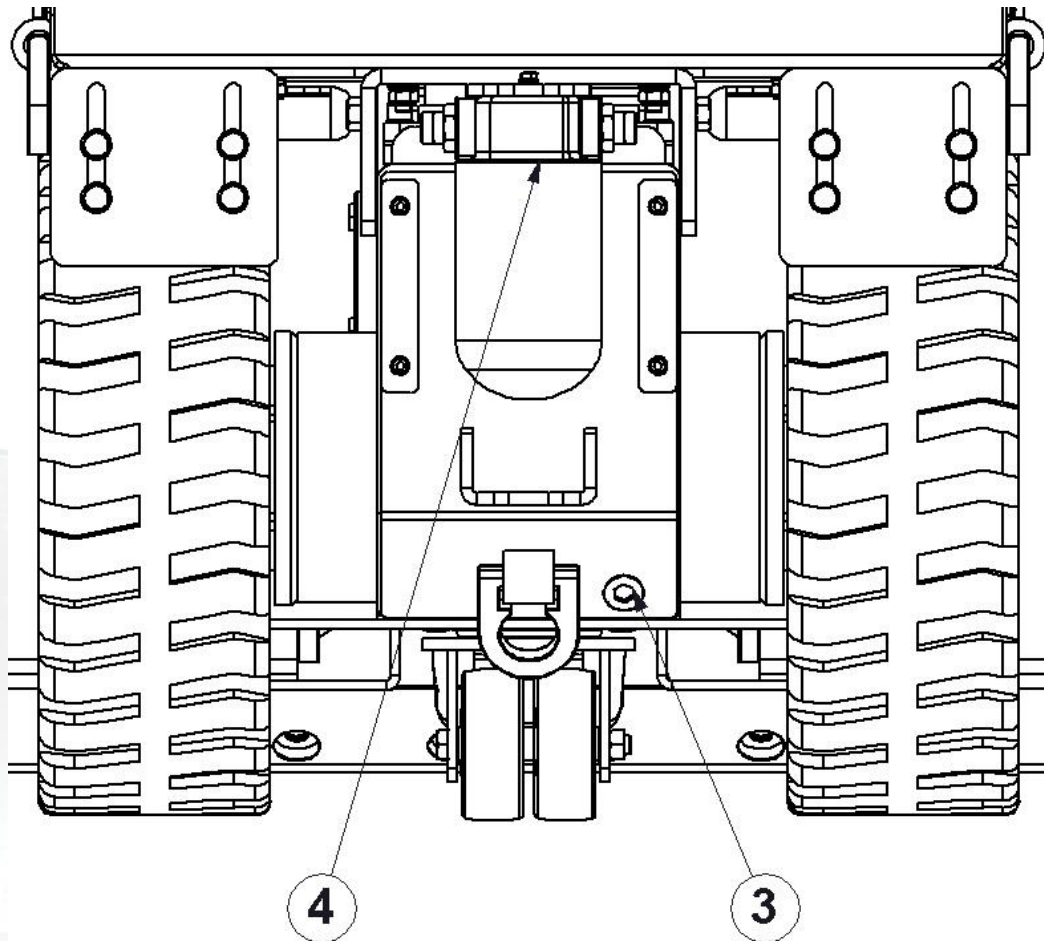


- 1) Oil level indicator
- 2) Plug to refill oil in tank



9.2 Oil change

The oil in the system and the filter should be replaced at least annually. For this operation the charger needs to be disconnected from the power source and the machine should be turned off. To remove the oil, the drain plug (3) needs to be removed. It is located at the bottom of the oil tank at the backside of the machine. The machine contains about 35 liters of hydraulic oil, so make sure to have the proper amount of containers to catch the fluid.



3) Drain plug

4) Oil filter (Part number E10773 – Oil filter)

For all standard job with hydraulic system like:

- Hose
- Pump
- Motor
- Valve
- Filter
- Cylinder



9.3 Leak at thread end/seat

Before doing any maintenance disconnect the power and block the machine in a stable position. Because most of the fittings in the machine are O-ring style, it is important to know how to solve O-ring leaks. Fittings should be tightened with the proper wrench size. Over tightening could damage the O-rings. If a leak still persists, remove fitting and replace O-ring.

10. Cutting head & blades

Weight vs. sharpness

The most common way to compensate for a dull blade is to add more weight and raise the blade angle (see re-scrape setting). Weight allows dull blades to be used to a point. Weight also causes blades to dull and break easier. Blades of any thickness tend to catch cracks and expansion joints and will bend or break the blade if set at a high angle. For best results, run a small ditching blade at a low angle to identify as many cracks and joints as possible. If blades are breaking, you are misunderstanding the conditions.

Cutting head pitch

Set the cutting head angle to where the material comes up the easiest. The lowest is usually the best.

Steep cutting head pitch

The cutting head pitch can be adjusted by simply placing the cutting head axle in 1 of the 4 holes, or use the Right-hand inner handle (for dual-lift machines from S.nr.30340 & up).

A steep angle is only used for re-scraping. The cutting head has to be raised to the highest hole.

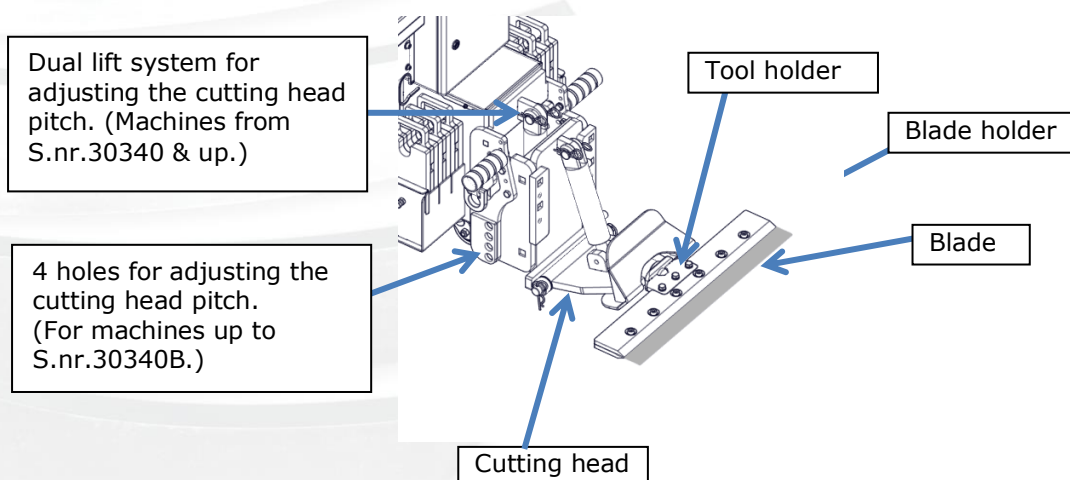
Not raising the cutting head when operating the machine at a steep angle will cause the machine to jump and buck. It does not give the operator a clear vision of the cutting head and it raises the machine to operate at a unsafe operating height. Failure to raise the cutting head could cause machine damage and/or bodily injury.

Swiveling tool holder

The swiveling tool holder keeps the blade in contact with the floor even when the floor is uneven. When using a flat blade, by swiveling the head over 180° allows you to use the other sharp edge on the blade without having to replace the blade.

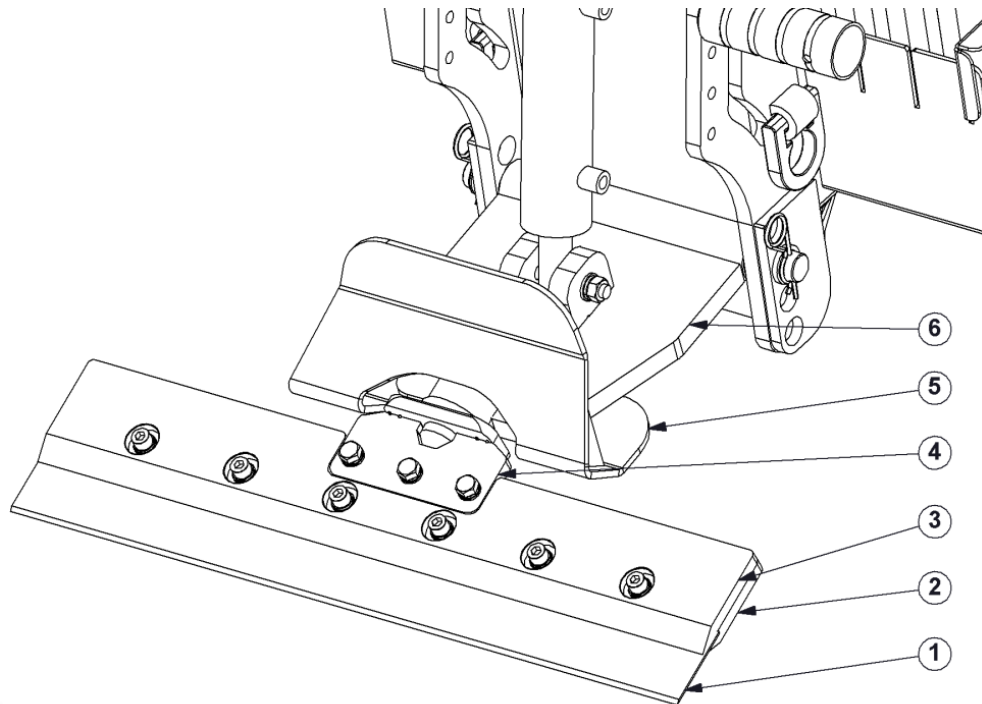
Saving time with extra blades, blade holders and tool holders

The machine is supplied with one tool holder. Having additional tool holders, blade holders and blades will save time on the job. When the blade is dull, instead of taking the time to replace it or sharpen it on the job, replace it with another prepared set. Or, when a different type or size of blade is needed, you have them ready to use.





10.1 Cutting head



- 1) Blade – depending on the needs
- 2) Blade holder – lower part
- 3) Blade holder – upper part
- 4) Tool holder
- 5) Debris deflector – new holder shape
- 6) Universal lower cutting head support



Always wear protective gloves before handling the blades.

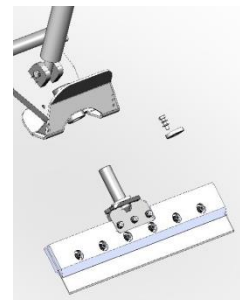
Sharp blades can cause serious injury!

Tool insertion

With the machine turned off, insert the desired tool into the cutting head. Secure with the plate and bolt.

Chisel insertion

Chisels do not require a blade holder. Attach the desired chisel onto the tool holder. Secure with the bolts.





10.2 Blade setting

- Dull blades greatly reduce the cutting ability. Re-sharpen or replace as needed.
- Proper blade size and placement, depending on material and sub-floor type, affects performance.
- The harder a job comes up, for best results, use a smaller blade.
- Start with a narrow blade, then increase blade size to optimize cutting pass. Narrower blades work easier than wider blades and usually clean the floor better. Wider is not always better or faster.
- Normally bevel on blade is up for concrete. Bevel down for wood and shoe blades for soft sub-floors.
- **KEEP BLADES SHARP.**
- Dull blades greatly affect the performance of the machine and reduce cutting ability, re-sharpen or replace as needed.
- Keep your work area clean and clear of debris.
- After you have removed a portion of material, remove it out of the way. This will give the machine maximum performance and will help to keep the work area safe.
- Always wear gloves when handling blades.
- Everyone in the work area should wear eye protection.



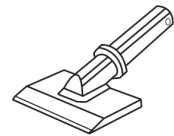
**BEVEL UP
CONCRETE FLOORS**



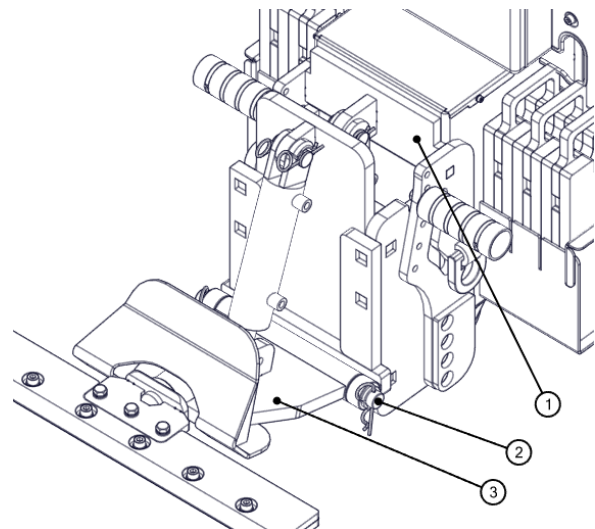
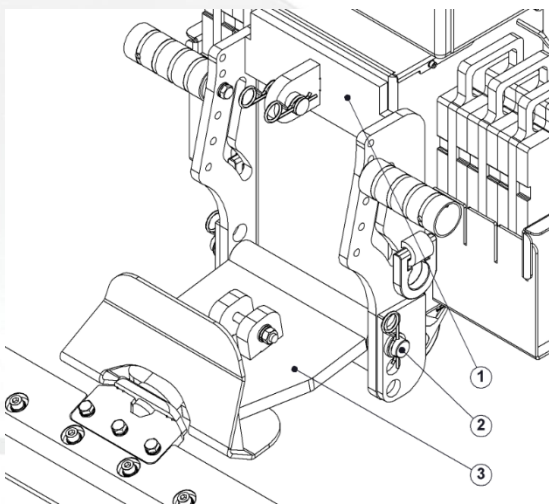
**BEVEL DOWN OR
SHOE BLADES
WOOD FLOORS**



**SHOE BLADE
SOFT SUB-FLOORS**



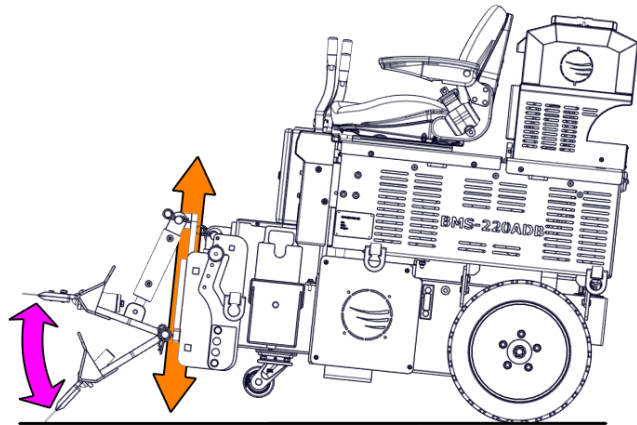
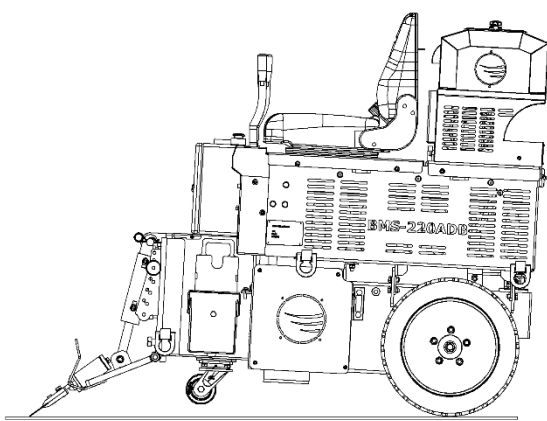
10.3 Cutting head support



- 1) Main frame BMS-220
- 2) Cutting head axle
- 3) Lower cutting head

11. Blades application

Efficient and fast work can be achieved when you use the correct blades and settings. The operator must remember to prepare the correct angle and also keep the blade sharp. During work the blade will become dull. To reduce this process the operator can add extra weights to the front or change the angle between the blade and the ground. CAUTION! That action makes blades more potential to break. Important is to understand that when the blades are breaking, some of the conditions of usage or settings are not correct. In many cases the angle between tool and ground can't be too big because the machine can jump and even takeover to the back.



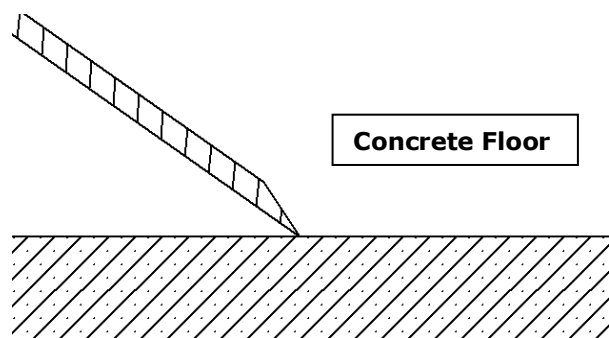
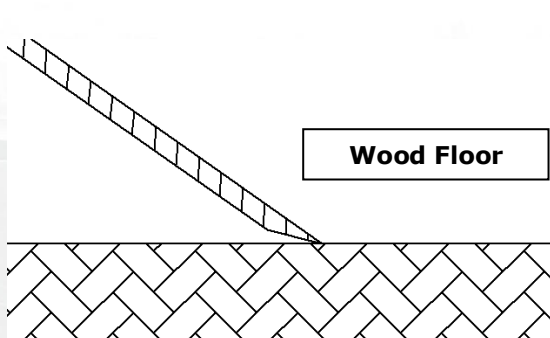
When the blade is dull it is necessary to sharpen or replace it. Having a second cutting head will be helpful, and it will save you important time and money. When the machine is running on the second set of tools, the first set can be serviced.

Different thicknesses and characteristics of the coat or material will need different blades to remove it efficiently. For example a small blade is perfect for the hard job. But when the material is soft you can use a wide blade.

The best solution is to start with a narrow blade and during work, try if it is possible to change to a wider blade.

About the geometry of blades: we need to mention that for removing wooden floors, usually the bevel of the blade should be on the down side.

On concrete floors the bevel of the blade usually must be faced upward.

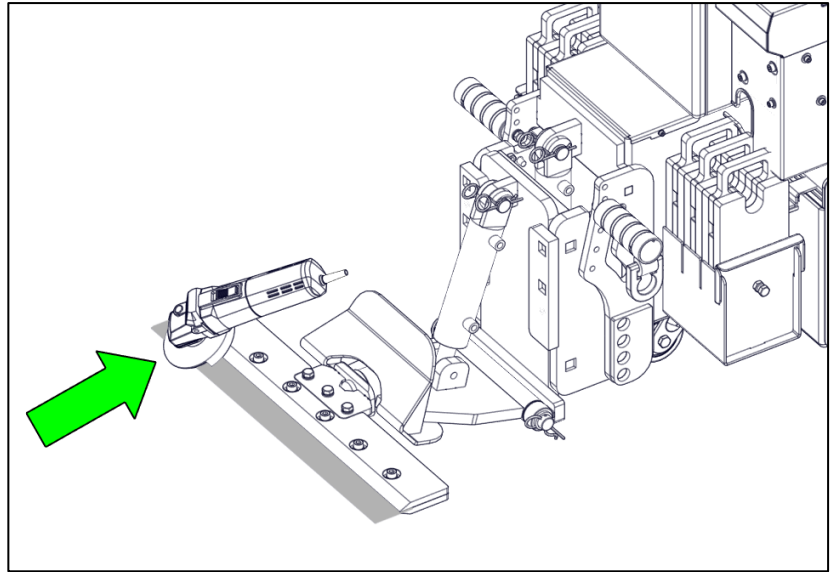


The work area should be kept clean. When a portion of material is removed on the first run, it is always better to clean the floor before starting the second run. Debris and dirt can make the blade dull really quick.

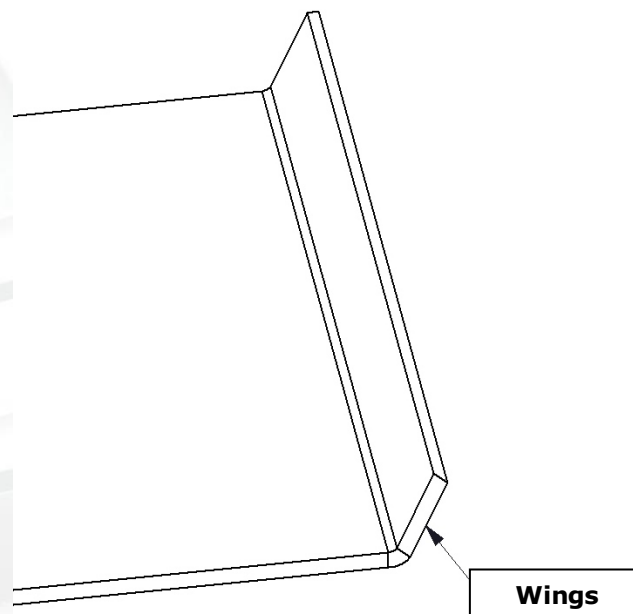


Re-sharpening blades

Dull blades can be sharpened by using an electric grinder with disc 120 grit (or finer). Also a tooth hand file can be used. Caution is required during sharpening, always wear Personal Protective Equipment during these activities. Always mind your surroundings, and work with caution.



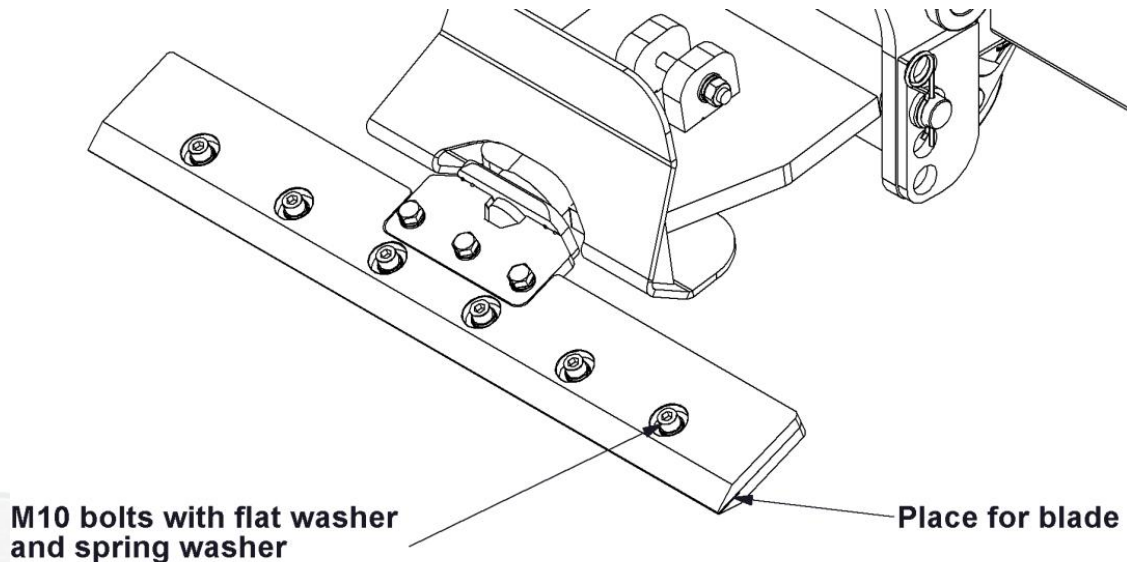
For soft materials like carpet vinyl, membrane it is possible to use self-scoring blades:



It's important to keep the "wings" sharp. They can be sharpened in the same way like the other blades. Sometimes it will happen that the work needs to be done quite quick. To save time on the jobsite it is helpful to have multiple sets of tools. Than it will be easy and quick to just replace the first (dull) set with a second (sharp) set. All service (sharpening) of the dull blades can be done in the workshop while working with the second set of blades.



The cutting heads are used to mount the blades. They are made in different sizes to adjust them to the material which we want to remove. Changing the blade inside the cutting head is easy and quick:



The top and bottom part are screwed together with M10 bolts. The cut-out on the lower plate ensures an accurate and reliable fixation of the blade.

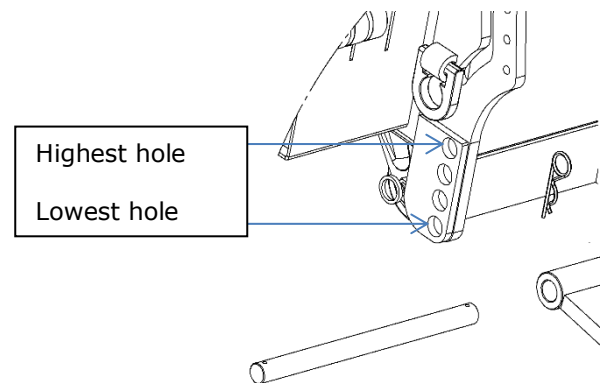
11.1 Types of blades

For different materials special tools need to be mounted. The shape and width are defined by many years of experience. Below are a few types described :

- **Self-scoring blades** used for vinyl, carpet tiles, soft to medium PVC, soft cork, linoleum, enhancer and universal bound hot melts. With this type of blades scoring is made automatically by the "wings".
- **Premium blades** are designed to work on wood, thin ceramic, tiles, VCT, VAT, re-scraping thin set, glued ceramic, elastomeric coating, rubber epoxy. After some work period the blades need to be sharpened.
- **Heavy duty blades** are designed for wood, VCT, VAT, thin ceramic, re-scraping, all carpets, elastomeric coatings, cork, rubber and urethane coatings. They are thicker than Premium blades.
- **Premium chisels** for ceramic, thin set, wood, decorative concrete, mud set.
- **Heavy duty chisel (carbide tips)** for wood, ceramic, elastomeric coatings and epoxy. These blades have carbide tips to give them a long life-time.



Using the correct blades is only half of the success. The second most important thing is to put the tool in the optimal geometry to the ground. Below you will find information about the most popular materials:

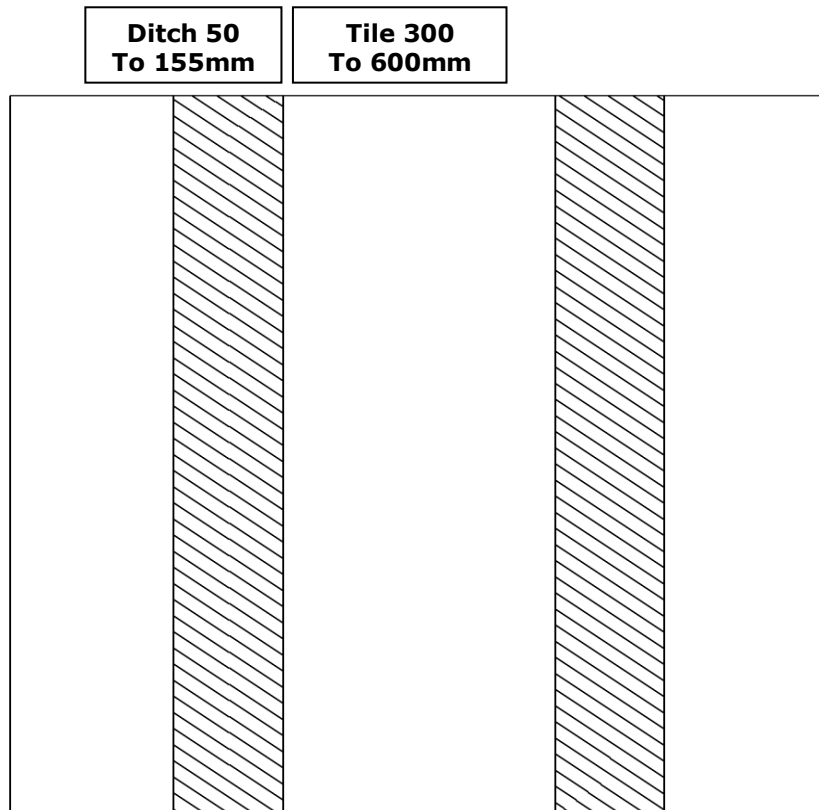


- **VCT tiles** : Cutting head in the lowest hole. It's better to start with a narrow cutting head. The best option should be Heavy Duty blades.
- **Foam back carpet set-up** : Cutting head in the lowest hole. It is possible to use a blade from 250 to 350mm. But in some situations a good choice can also be using a blade from 350 to 700mm.
- **Ceramic set-up** : Cutting head in the lowest hole. Usually Premium or Heavy Duty chisels will be the best for this job.
- **Secondary backing carpet set-up** : Cutting head in the lowest hole. Proposed settings are a blade-width from 255 to 685mm with Heavy Duty Blades or Self Scoring Blades.
- **Double stick carpet set-up** : Cutting head in the lowest hole. In this case it is good to start with a blade-width (255 to 355mm) with Self Scoring Blades. It is important to have sharp blades.
- **Wood set-up** : Cutting head in the lowest hole. Preferred are Premium or Heavy Duty chisels or a blade width (150 to 205mm) with Heavy Duty Blades. The machine needs to have an angle of 45° to the grain of the wood.
- **Thin coating set-up** : Cutting head in the highest hole for the floor or in the lowest hole for wood. The correct distance needs to be set after tests. Preferred application is a width (200 to 685mm) with Premium Blades.
- **Re- scraping set-up** : Cutting head in the highest hole. A blade width (200 to 685mm) with Premium Blades can be used. Good to remember that the blade should be one step bigger than the blade holder.
- **Working over concrete** : the most important thing is to install the blade bevel up. Because this kind of material is hard to remove. The best way is to test different settings with Heavy Duty blades.
- **Working over soft sub-floor** : Cutting head in the lowest hole. Preferred are a Heavy Duty Blade or a Premium blade. Blades need to be installed with bevel up and the position needs to be as flat as possible.
- **Working over wood** : in this case it is important to know if the floor is strong enough to put the machine on it. Otherwise it is better to take out the weights. Cutting head in the lowest hole. Preferred are Heavy Duty Blades or Premium blades.



11.2 Ditching

Cross room ditching



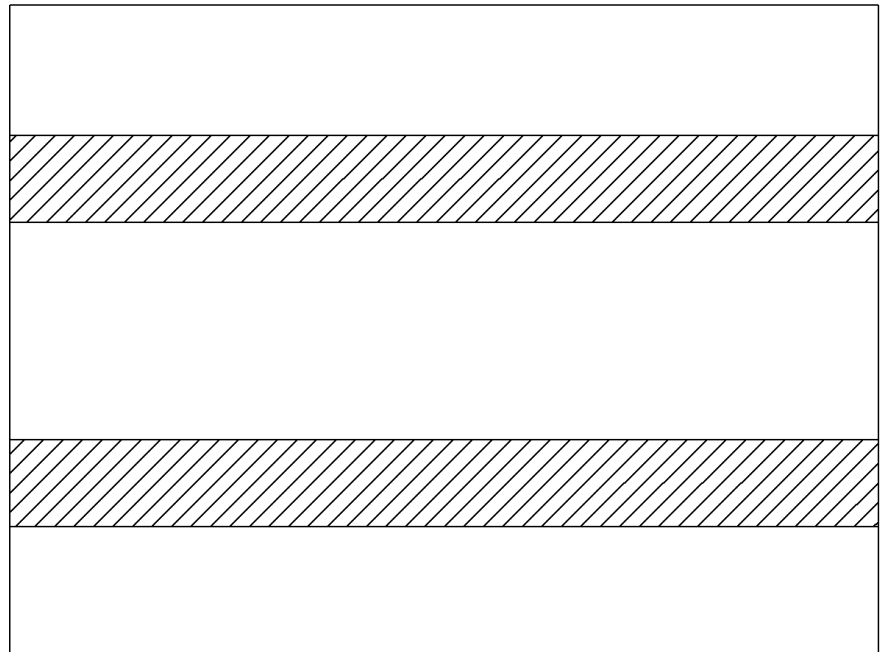
Run the machine in the same direction as the ditches are made

When removing hard to remove ceramic, VCT or VAT, cross-room ditching will help to make the removal easier. Using a blade 50 to 155mm in width, make ditches 300 to 600mm apart in the same direction as the machine will be removing the goods. This "relieves" the pressure holding the tiles together. If ditching helps and the material is coming up easy, try using a wider blade to ditch with.

Checker board ditching

**Ditch should be wide
As much is possible**

**Carpet width
between
1200 to 1800mm**



**Run the machine
crossways from the
directions that the
ditches are made**

To make carpet removal and debris cleanup easier, checker board ditching is very helpful. Using as wide of a self-scoring blade as possible, make ditches apart crossways from the way the machine will be removing the goods. Running the machine crossways from the ditches will make smaller pieces of debris to be hauled away. Instead of large gummy rolls of carpet, there are small squares that can be rolled, palletized, put on a dolly or folded with the sticky side in. This makes removing the debris faster, easier and reduces the amount of debris.

For more information or questions contact us at www.Blastrac.eu

12. Technical data

	BMS-220ADB	BMS-220ADB from S.nr. 28579B to 30339B	BMS-220ADB from S.nr. 30340B and up
Working width	50-686mm (depending of type of blade)		
Motor power	4,0kW		
Battery power	12x 8V batteries / Running time up to 10 hours		
Drive system/ Speed	Electrical / Up to 23 m/min		
Hydraulic pressure	130 bar		
Machine type	Ride-on		
Application	Hardwood parquet / ceramics / linoleum / vinyl / carpet / adhesives / glue / tiles etc...		
Length	1550 mm		
Width	685 mm		
Height	1350 mm		
Weight	960 kg / 1080 kg	960 kg / 1080 kg	1022 kg / 1142 kg

Design and specifications are subject to change without notice by Blastrac B.V.

Extension cables

Cable length	Cross section			
	≤ 16 A	≤ 32 A	≤ 63 A	≤ 125 A
Calculated at a pre-fuse GG:	16amp*	32amp*	63amp*	125amp*
> 20m	1.5 mm ²	2.5 mm ²	10 mm ²	25 mm ²
20m > 50m	2.5 mm ²	4 mm ²	10 mm ²	25 mm ²
50m > 75m	4 mm ²	6 mm ²	16 mm ²	35 mm ²

*The cross-sections need to be re-calculated when using any other type or size pre-fuse than mentioned.

Old equipment contains valuable materials which are valuable for re-processing. **The machine parts must not be thrown away in the normal household waste**, but should be disposed of at a suitable proper collection system, e. g. via your communal disposal location. This way the materials can be re-used in an environmentally responsible manner.

Despite the fact that this guide is made with care, Blastrac takes no liability for errors in the manual and the possible consequences. We are naturally very interested in your findings and additions. No part of this publication may be reproduced and / or published in print, photocopy, or other form without prior permission by Blastrac.



12.1 Long term storage of a BMS-220:

The best way:

Keep the charger plugged in all the time during storage. (24/7)



This way the charger will keep the batteries full and healthy.
(even if the machine is stored for months)
This is the preferred way to treat the BMS-220 for long term storage.

The second best way:

Make sure the batteries are completely charged.
Disconnect the lightblue connector with the red handle:



Recharge the machine for 24 hours every 2-3 months.

The third best way

Charge the BMS-220 every 2 weeks for 24 hours.



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WE'RE READY TO ASSIST YOU!

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