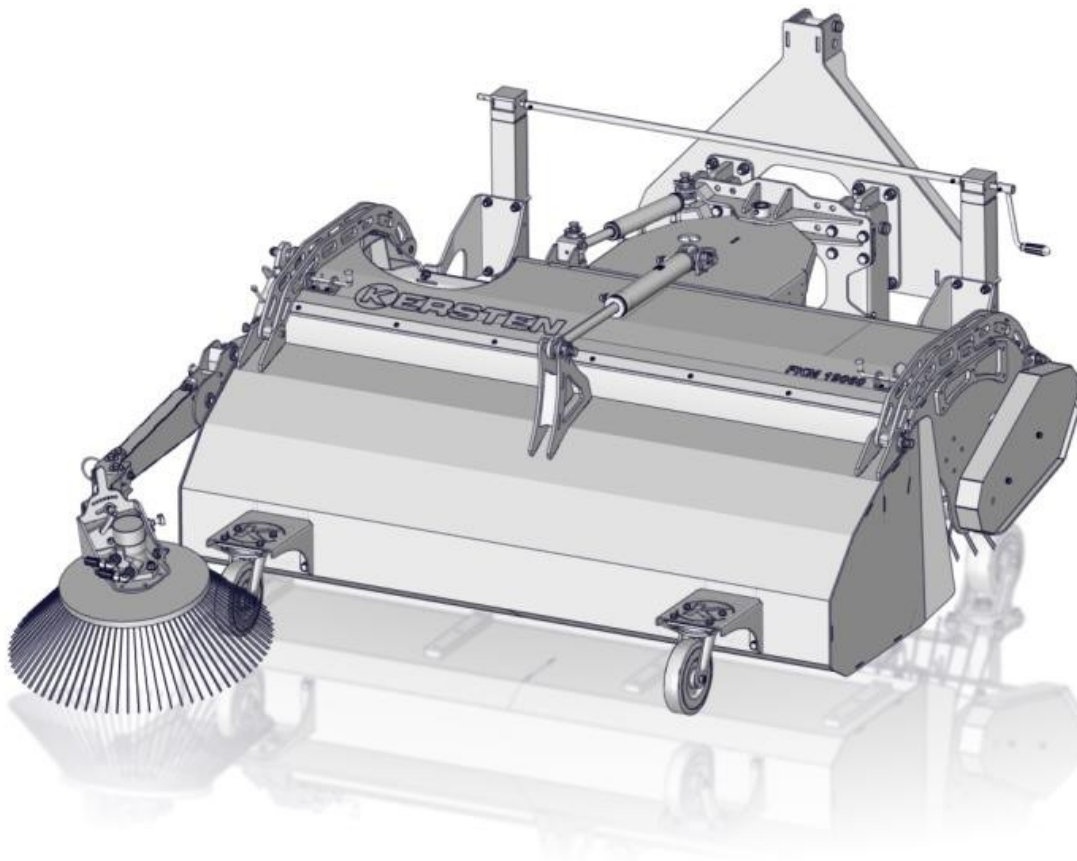




Original Operating Manual

Front Sweeping Machine FKM 60, FKM 60L



Order number: B00099

From machine no.: 61780

Rev.: R00

As of: 2018-12-18



Manufactured by
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Information about the operating instructions

This manual enables the safe and efficient handling of the machine. The instructions are part of the machine and must be kept accessible to the personnel in the immediate vicinity of the machine at all times.

The personnel must read and understand this manual carefully before beginning any work. The basic prerequisite for safe working is compliance with all specified safety instructions and instructions in this manual..



Risk of accident and property damage if used improperly!

As self-propelled implements and implements can cause serious accidents or hazards if used improperly, expert instruction and authorized personnel must be instructed during the initial commissioning of the Kersten implement. The best way to familiarize yourself with its basic functions and its handling is to choose a free and level terrain for your first trip.

- For further information and difficulties of any kind please contact the dealer, importer or directly to the manufacturer.
- Pass on all safety instructions to other users!

In addition, the local health and safety regulations and general safety regulations apply to the area of application of the machine.

Co-Applicable Documents

In addition to these instructions, the following documents and the safety instructions listed there are to be observed:

- Operating instructions of the component parts
- Operating instructions of the carrier vehicle

Customer service of the manufacturer

For technical information please contact the customer service of the machine manufacturer:

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Service phone	+ 49 2851 9234-10
Fax	+ 49 2851 9234-44
E-Mail	Info@kersten-maschinen.de
Internet	http://www.kersten-maschinen.de



For inquiries please have the following information ready:

- Machine / device type
- Order number of the machine
- In case of problems: exact description or exact error messages

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1 Foreword

Dear Customer,

Thank you for choosing a quality product from Kersten.

This product has been manufactured according to the latest manufacturing techniques and comprehensive quality assurance measures, because only when you are satisfied with your device, our goal is reached.

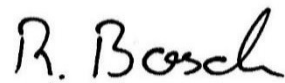
Before using this machine or implement for the first time, please read this manual thoroughly and thoroughly.

If you do not understand the information in this safety data sheet or the product-specific installation or operating instructions, please contact your salesperson or the machine manufacturer directly.

Keep this manual handy. If necessary, you can read important information and instructions.

Have fun with your Kersten - device wishes you

Dipl.- Ing. (FH) Robert Bosch Managing Director



Dipl.- Ing. (FH) Robert Bosch
Managing Director

1.1 Overview

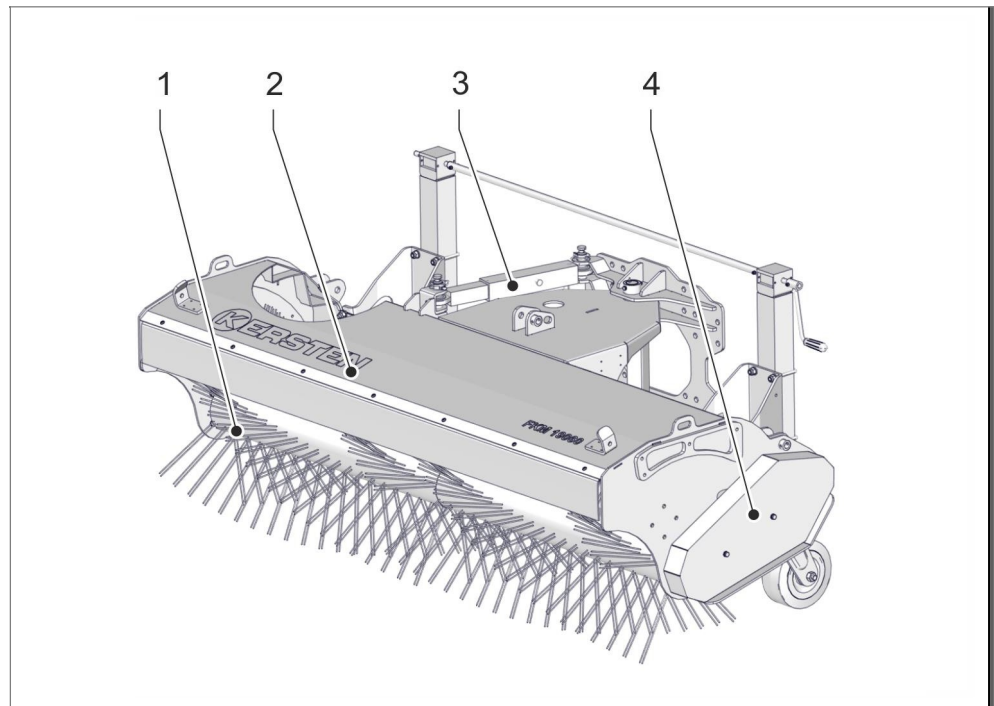


Fig. 1: Overview of the front view

- 1 Broom
- 2 Housing
- 3 Mechanical swivel device
- 4 Cover chain drive

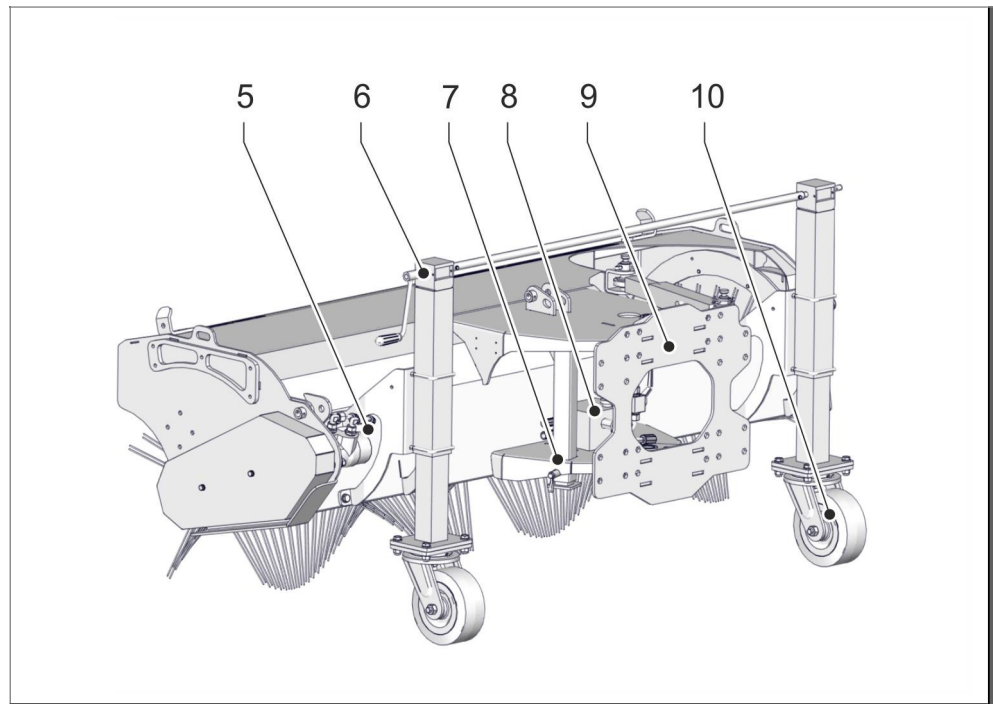


Fig. 2: Overview of the rear view

- 1 Hydraulic motor
- 2 Hand crank for height adjustment
- 3 Parking support
- 4 Hydraulic block
- 5 Mounting plate for mounting frame
- 6 Caster wheels

The front sweeper is used for area maintenance and is used for sweeping on paved areas, sidewalks and facilities. The sweeper is mounted on tractors or municipal vehicles. The various vehicle types can be adapted to the receiving plate (9) of the front sweeper vehicle-specific mounting frame.

By means of a hydraulic motor (5) with chain drive (4), the sweeping roller (1) is driven. The sweeping roller (1) rotates counter to the direction of travel. The sweeper is controlled via a multifunctional hydraulic block (8).

The multifunctional hydraulic block (8) offers safety-relevant functions such as a back-up safety device, an overpressure safety device and a load-sensing safety valve.

The height of the sweeping roller can be adjusted via the height-adjustable trailing wheels (10). The trailing wheels (10) are manually adjusted in height via a hand crank (6).

The angle of attack of the sweeping roller can be adjusted by $\pm 30^\circ$ by means of the mechanical pivoting device (3) (see chapter 6.1 Operating instructions sweeping roller on page 46).

2 Security

2.1 Symbols in this manual **Sicherheitshinweise**

The following occupational safety symbols stand for all safety instructions that indicate a danger to the life and limb of persons and are marked by a pictogram, a signal word and a signal color.

The documentation explains the hazardous situations at the relevant locations.

Follow these instructions!

Observe the locally valid safety and accident prevention regulations!

DANGER



Type and source of danger

This symbol warns of an imminent danger to the life and health of persons.

Failure to comply with these instructions will result in serious health effects, including life-threatening injuries and extensive damage to property.

- Action that must be avoided so that the danger does not occur

WARNING



Art und Quelle der Gefahr

This symbol warns of an imminent danger to the life and health of persons, as well as environmental and material damage.

Failure to comply with these instructions can result in serious health effects including life-threatening injuries or extensive environmental and material damage.

- Action that must be avoided so that the danger does not occur

ATTENTION



Type and source of danger

This symbol warns of an imminent danger to the health of persons as well as environmental and material damage.

Failure to comply with these instructions may result in moderate or slight health effects or even injury or result in extensive environmental and material damage.

- Action that must be avoided so that the danger does not occur

NOTE



Type and source of machine or plant damage

This symbol warns of a dangerous situation and serves to identify a note on the handling of the machine or system.

Failure to follow these instructions may result in extensive property damage.

- Action that must be avoided so that the machine or system damage does not occur



Tips and recommendations

This symbol highlights useful tips and recommendations, as well as information for efficient and trouble-free operation.

Further markings

To highlight instructions, results, listings, references, and other elements, this guide uses the following labels:

Marking	Explanation
1., 2., 3. ...	Step-by-step instructions
➔	Results of action steps
•	Listings without a specified order
[Button]	Operating elements (eg buttons, switches), display elements (eg signal lights)
"Display"	Screen elements (eg buttons, assignment of function keys)

2.2 Pictograms

Follow instructions



Do not use the marked machine until the instructions have been read.

Wear protective clothing



This label indicates that protective clothing must be worn in the area concerned. Protective clothing is tight-fitting workwear with low tear resistance, tight sleeves and no protruding parts.

Wear safety shoes



This sign indicates safety shoes must be worn in the area concerned. Safety shoes protect the feet from bruising, falling parts and slipping on slippery surfaces.

Wearing safety gloves



This label indicates that protective gloves must be worn in the area concerned. Protective gloves are used to protect hands from friction, abrasions, punctures, cuts or deeper injuries, as well as from contact with hot surfaces.

Wear safety glasses



This label indicates that protective goggles must be worn in the area in question. The safety glasses are used to protect the eyes from flying parts and liquid splashes.

Operating instructions and safety instructions



Before commissioning read and observe the operating instructions and safety instructions.



Never open or remove protective devices while the engine is running.



Follow the instructions in the technical manual.
Smudge!



Touch machine parts only when they have come to a complete stop.



Danger from passing parts while the engine is running.
Keep safety distance!

2.3 Intended Use

WARNING



Danger of injury / risk of environmental damage due to improper use of the machine!

Incorrect use of the machine can result in injury or risk of damage to the environment or property (on the machine or system)!

- The machine must only be used for the usual or common use in plant care for weed removal on flat surfaces.
- The weed brush is designed to be used with a front lift carrier machine.
- Any further use is considered improper use. The manufacturer is not liable for damage resulting from this, the risk being solely borne by the operator.
- Proper use includes compliance with the operating, maintenance and service conditions prescribed by the manufacturer.
- The attachment may only be used, maintained and repaired by persons who are familiar with it and have been informed of the dangers.
- The relevant accident prevention regulations as well as the other generally recognized safety and occupational health rules must be observed.
- Unauthorized modifications to the machine lead to the exclusion of liability of the manufacturer for the resulting damage.

2.4 Work and danger areas

Free-running operation

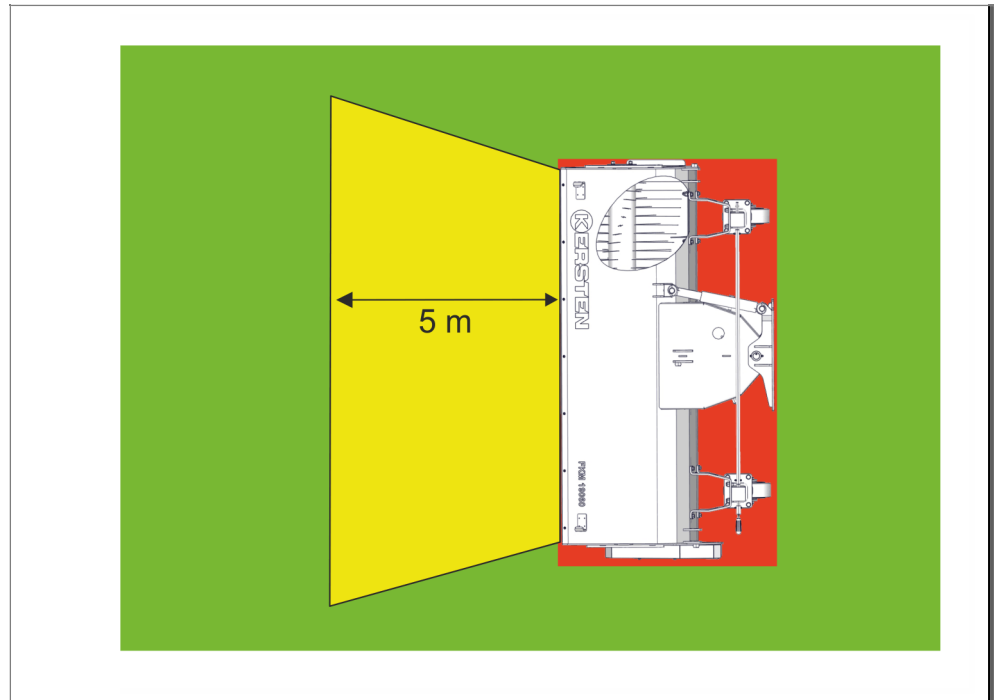


Fig. 3: Working and danger area in free-lance operation

- RET → danger area
- YELLOW → Security area (5 meters before brush ejection)
- GREEN → Workspace

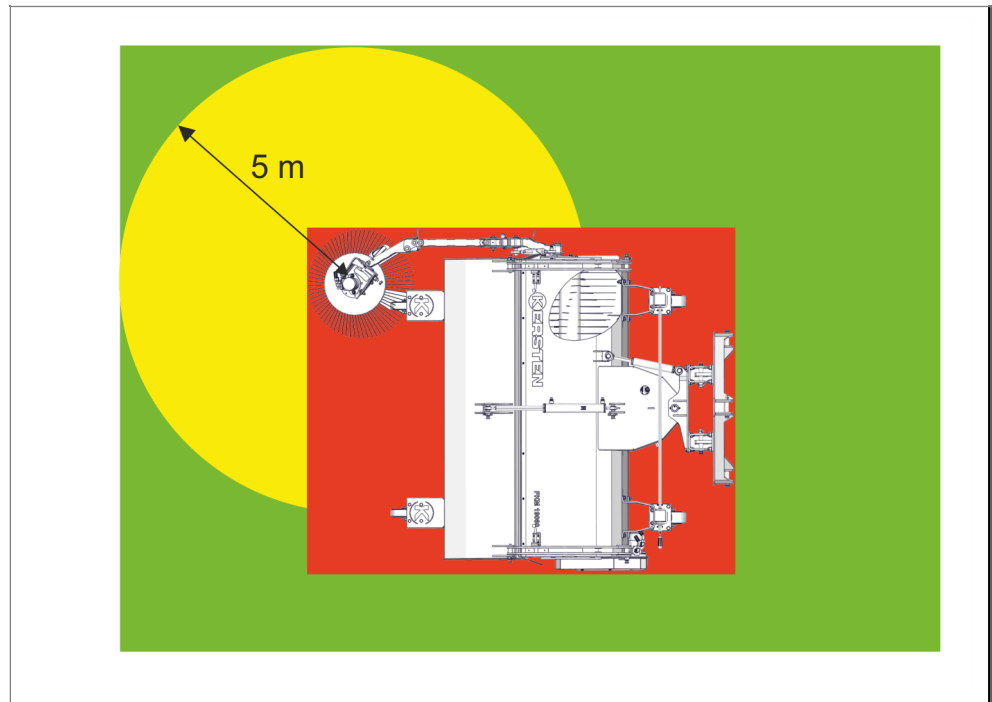
Collecting operation with side brush (option)

Fig. 4: Working and danger area in collecting operation with side brush

- RED → Danger area
- YELLOW → safety area (5 meters radially around brush ejection)
- GREEN → Wokspace

Collecting operation without side brush

In collecting operation without side brushes, the cover prevents the brush ejection, so that there is no safety area beyond the danger zone.

⚠ WARNING**Danger of injury / risk of environmental damage from working / staying in the danger area!**

Working / stopping in the danger zone poses a risk of injury or damage to the environment or property (on the machine or system)!

- The user is responsible towards third parties in the danger and safety area of the machine!
- Staying in the danger and safety area of the machine is prohibited! Refer all persons from the danger and security area. The security area has a radius of 5 m around the brush plate.
- When approaching people to the danger and safety area, the machine must be switched off.
- The operator must make sure that there are no persons or property in the ejection area (safety area).
- Check both the danger area and the safety area before switching on the implement and starting it up. Especially on children and animals is important. Make sure you have enough sight!
- Park the implement in hard-to-see areas and make sure that no one is in the area of danger and safety.
- Before starting work, remove foreign objects from the surface to be worked. Pay attention to other foreign objects during work and eliminate them in good time.
- When working in enclosed areas, the safety distance to the border must be maintained so as not to damage the machine or brushes.
- When working in the immediate vicinity of public roads and paths, these should not, if possible, be approached longitudinally, but as far as possible across. This minimizes the risk of injury to third parties due to flying objects.
- When working on public roads and squares or in the immediate vicinity, warning and danger signs should be set up to attract the attention of third parties.

2.5 Safety during the work process

Before starting work

WARNING



Risk of injury / risk of environmental damage due to non-compliance with the safety measures!

Failure to comply with the safety measures can result in injury or risk of damage to the environment and property (on the machine or the carrier vehicle)!

- Before starting work, you must familiarize yourself with all the equipment and actuators and their function; it must be ensured that all safety equipment is properly installed and in the protective position. It's too late during the work assignment!
- Check the machine for operational safety before each use!
- Before each use, check that the drive shaft is firmly seated on the drive stub on the carrier vehicle and on the implement.
- The hydraulic connections and hoses must be checked for leaks and replaced if necessary.
- Never operate the machine with defective or missing protective devices.

Während des Betriebes

WARNING



Risk of injury / risk of environmental damage due to non-compliance with the safety measures!

Failure to comply with the safety measures can result in injury or risk of damage to the environment and property (on the machine or the carrier vehicle)!

- If persons or vehicles approach the danger or safety area (radius 5 m), stop the implement immediately.
- Never leave the control room while driving!
- The operating station should not be left until the brushes of the attachment have come to a standstill!
- Do not make adjustments to the attachment during operation - risk of accident!
- The transport of persons and objects is prohibited!
- If, for example, the attachment has caught a foreign object and blocked it, stop the engine and clean the attachment with a suitable tool! Always switch off the engine and disconnect the spark plug connector when intervening or cleaning the attachment! The safety instructions of the self-propelled implement must be observed.
- In the event of damage to the self-propelled implement or attachment, stop the engine immediately and have the damage repaired.

Leaving the machine

WARNING



Risk of injury / risk of environmental damage due to non-compliance with the safety measures!

Failure to comply with the safety measures can result in injury or risk of damage to the environment and property (on the machine or the carrier vehicle)!

- Secure the carrier vehicle against rolling away when leaving the vehicle! Use wheel chocks or actuate the parking brake if necessary.
- Secure the device against unauthorized use!
- Never leave the appliance unattended while it is still in operation!

Coupling and uncoupling attachments

WARNING



Risk of injury / risk of environmental damage due to non-compliance with the safety measures!

Non-compliance with the safety measures can result in injury or danger to the environment or property (on the machine or system)!

- The corresponding instructions and safety regulations of the carrier vehicle must be observed.
- Use suitable tools and gloves when changing attachments and their parts.
- When mounting and dismounting, bring the required support devices into their respective position and ensure adequate stability.
- Secure the self-propelled working machine and the attachment against rolling away (parking brake, wheel chocks).
- When attaching attachments, there is a risk of injury (crushing). Special care is necessary.
- Attach implements according to regulations and fix in the prescribed places.

2.6 Safety devices

DANGER



Danger of life or injury due to non-functioning safety devices!

Failure to operate or disable the safety equipment can result in serious injury or even death.

- Before starting work, check that all safety devices are installed correctly and correctly.
- Never override or bypass safety devices.
- Make sure that all safety devices are always accessible.



Fig. 5: Splash guard with signal band
1 marker lights (optional)
2 warning flags
3 dirt collection

The dirt collector (3) separates the danger area of the machine and protects persons from foreign bodies, dirt and liquids. Warning flags (2) and marker lights (1) warn passers-by in front of the front sweeper.

2.7 Safety labeling

The following icons and signs are in the workspace.

They refer to the immediate environment in which they are installed.

WARNING



Danger of injury due to illegible or missing signs!

Missing and illegible labels and signs can cause serious health effects or life-threatening injuries.

- Keep all safety, warning and operating instructions in an always legible state.
- Replace damaged signs or labels immediately.

2.8 Residual dangers

The machine is designed according to the state of the art and according to current safety requirements. Nevertheless, residual risks remain, which require prudent action. The following lists the residual risks and the resulting behavior and measures.

Improper transport

NOTE



Property damage due to improper transport

If transported improperly, transport items may fall or fall over. This can result in material damage to a considerable amount.

- Take care when unloading the transport pieces on delivery as well as during in-house transport and observe the symbols and notes on the packaging.
- Use only the intended attachment points.
- Remove packaging only shortly before installation.

Dirt and surrounding objects

⚠ ATTENTION



Danger of injury by falling over dirt and surrounding objects!

Dirt and surrounding objects form slides and stumbling. In a fall, injuries can be caused.

- Always keep the work area clean.
- Remove objects that are no longer needed from the work area and especially from the ground.
- Mark unavoidable stumbling points with yellow-black marking tape.
- Remove tools or components from the work area and store in a suitable location outside the machine.

Cleaning supplies

⚠ WARNING



Risk of injury due to improper handling of cleaning agents or materials

Improper handling of cleaning agents or materials can result in serious health effects or life-threatening injuries.

- Read the material safety data sheets and manufacturer's instructions applicable to the cleaning materials or materials.
- Wear appropriate protective equipment (eg gloves, safety shoes, protective suit, respirator, goggles, etc.).
- Ensure adequate ventilation of the environment.
- Be careful when handling hot cleaning agents or substances. Touching it can cause burns and scalds.
- If necessary, clean parts, assemblies or components of adhering oils, greases and other contaminants.
- Avoid skin contact with cleaning agents or substances.
- Do not inhale vapors from cleaning agents or substances.
- Do not handle close to open fire and do not smoke.

Noise level

Valid noise protection regulations as well as the warnings of the complete documentation must be observed. The local noise level depends on the local ambient noise. The noise level must be checked at regular intervals by the operator.

WARNING



Risk of injury due to noise!

The noise level in the work area can cause severe hearing damage.

- Covers, insulating materials and other insulating equipment must not be removed and must be replaced if damaged.
- If the daily noise exposure level exceeds 85 dB (A), wear the ear protection in this case from the operator side.
- Only stay in the danger area as far as necessary.

Moving components

DANGER



Danger of life or injury due to moving components!

Improper handling of moving components can cause death or injury as well as material damage to the machine or system

- Do not interfere with moving components or handle moving components during operation.
- Never open covers during operation.
- Note after-run time: make sure that no components are moving before opening the covers.
- Wear tight-fitting work clothing with low tear resistance in the danger area.

Sharp edges and sharp corners

ATTENTION



Risk of injury due to sharp edges and sharp corners!

Sharp edges and sharp corners can lead to skin abrasions and cuts.

- Use caution when working near sharp edges and sharp corners.
- If in doubt wear protective gloves.

Hydraulic

DANGER



Danger of life or injury due to hydraulic energy!

By hydraulically driven moving components there is a risk of life or injury.

- Work on the hydraulic system should only be carried out by qualified hydraulics.
- Do not interfere with moving components or handle moving components during operation.
- Do not open covers during operation.
- Wear tight-fitting work clothing with low tear resistance in the danger area.

Operating resources / Lubricants / Oils

WARNING



Danger of injury due to improper handling of equipment or substances who!

Improper handling of equipment or materials can result in serious health effects or life-threatening injuries.

- Read the material safety data sheets and manufacturer's instructions applicable to the equipment and / or materials.
- Wear appropriate protective equipment (eg gloves, safety shoes, protective suit, respirator, goggles, etc.).
- After accidental eye contact, rinse eyes thoroughly with plenty of water and seek medical attention.
- After skin contact rinse thoroughly with plenty of water.
- Ensure adequate ventilation of the environment.
- Be careful when handling hot equipment or materials. Touching it can cause burns and scalds.
- If necessary, clean parts, assemblies or components of adhering oils, greases and other contaminants.
- Avoid skin contact with equipment or materials.
- Do not inhale vapors from equipment or materials.
- Do not handle close to open fire and do not smoke.

2.9 Personal protective equipment

Protective clothing



Protective clothing is tight-fitting workwear with low tear resistance, tight sleeves and no protruding parts.

Safety goggles



The safety glasses are used to protect the eyes from flying parts and liquid splashes.

Protective gloves



Protective gloves are used to protect hands from friction, abrasions, punctures, cuts or deeper injuries, as well as from contact with hot surfaces.

Safety shoes



Safety shoes protect the feet from bruising, falling parts and slipping on slippery surfaces.

2.10 Environmental Protection

WARNING



Danger of environmental damage due to improper handling of operating materials or operating materials as well as cleaning agents or cleaning agents!

Improper handling of operating materials or materials as well as cleaning agents or materials can result in extensive environmental and material damage.

- Read the material safety data sheets and manufacturer's instructions applicable to the operating materials, cleaning agents and cleaning agents
- Store materials and operating fluids that are hazardous to water and soil, such as oil-contaminated parts, assemblies or components in secured areas or drip pans
- Bind worn equipment or operating materials as well as cleaning agents or cleaning agents with a binder and dispose of according to local regulations
- If necessary, clean parts, assemblies or components of adhering oils, greases and other contaminants
- Do not allow leaked equipment or operating materials as well as detergents or cleaning agents to seep into the ground or into drains

The following environmentally hazardous substances are used: lubricants

Lubricants such as fats and oils contain toxic substances. They must not get into the environment. Disposal must be carried out by a disposal specialist.

Oils

Oils (such as lubricating, hydraulic or cleaning oils) must not be released into the environment. Oils lead to longer-term harmful effects in waters. Disposal must be carried out by a disposal specialist.

Observe the safety data sheets of the manufacturer.

Electronic components

Elektronische Bauteile können giftige Substanzen enthalten. Sie dürfen nicht in die Umwelt gelangen. Die Entsorgung muss durch einen Entsorgungsfachbetrieb erfolgen.

Batteries

Batteries contain toxic heavy metals. They are subject to special waste treatment and must be delivered to municipal collection points or disposed of by a specialist company.

2.11 Safety instructions for maintenance / troubleshooting

Behavior in case of dangerous malfunctions

Basically:

1. Immediately initiate emergency stop in the case of faults that pose an immediate danger to persons or property.
2. Determine the cause of the fault.
3. If troubleshooting requires work in the hazardous area, switch off the machine and secure it against being switched on again.
4. Have them repaired or repaired by authorized service personnel, depending on the type of fault.



DANGER

Danger of life or injury due to improperly performed maintenance work / work for fault elimination!

Due to improper maintenance / work for fault elimination, there is a risk of death or injury as well as a risk of property damage to the machine or system!

- Observe all safety information in this chapter as well as the relevant local safety and accident prevention regulations.
- Only carry out interventions for troubleshooting and maintenance and cleaning work if it is ensured that the machine is stationary and secured against being switched on again.
- Release blocks only when it has been ensured that no dangerous movement of machine parts occurs due to loosening.
- Ensure adequate assembly freedom before starting work.
- Pay attention to order and cleanliness at the installation site! Loose components lying on or around each other and tools are accident sources.
- Wait until the oil has cooled to below 50 ° C before starting work.
- Before starting work, have a temperature-resistant collection container of the required capacity.
- Observe the following before restarting:
 - Ensure that all work has been carried out and completed in accordance with the instructions given in this manual.
 - Make sure that there are no persons in the danger zone.
 - Make sure all covers and safety devices are installed and working properly.
 - If components have been removed, ensure that they are correctly installed. Reinstall all fasteners.

⚠ WARNING**Risk of injury / risk of environmental damage due to lack of / faulty maintenance (general)!**

There is a risk of injury due to a lack of maintenance as well as a risk of damage to the environment and property (on the machine or system)!

- Maintenance and cleaning work must only be carried out with the drive stationary.
- Simple cleaning and adjustment work may be carried out by operating personnel. Maintenance and repair work may only be carried out by trained specialist personnel.
- Instructions and instructions from the original operating instructions of the installed components must be observed.
- If guards and working tools are subject to wear, these must be checked regularly and replaced if necessary.
- When replacing cutting tools, use appropriate tools and protective equipment.
- After maintenance and cleaning work, be sure to reinstall the guards and put them in the protective position!
- Only use original spare parts from the manufacturer, as these comply with the technical requirements and thus the risk of accidents is minimized!
- Cleaning with the high-pressure cleaner should be carried out so that the water jet is not held directly in bearings, turned parts, grease nipples, shaft seals, wheel hubs, etc. After each cleaning with the high-pressure cleaner, the lubrication points must be re-greased. In case of infringement, the right to guarantee expires!
- For the first time after 5 operating hours and as a result, regularly check that the nuts and bolts are tight and retighten if necessary.
- Install protective devices after maintenance and bring them into the protective position.
- When carrying out maintenance, cleaning and repair work on the lifted unit, always secure it with suitable support elements.
- Repairs such as welding, drilling, grinding etc. must not be carried out on supporting safety-related parts.

⚠ WARNING**Danger of injury / risk of environmental damage due to lack of / incorrect maintenance of the hydraulics!**

The lack of maintenance of the hydraulics poses a risk of injury as well as the risk of damage to the environment and property (on the machine or system)!

- Before carrying out any repairs, make sure that the hydraulic system is depressurized, because fluids under pressure can penetrate the skin and cause serious injuries! Therefore, seek medical attention immediately - risk of infection!
- Check hydraulic connections for the first time after 5 operating hours, tighten if necessary!

**Only tightening has no success!**

First loosen a leaking hydraulic screw connection, then move hose or screw connection. Subsequently, the screw can be tightened again.

- Inspect hydraulic hoses at regular intervals for damage and aging and replace if necessary.
- Hydraulic hose lines must be completely replaced every 6 years at the latest. The date of manufacture is stamped on the hose assembly.
- Recycle used oils and greases.
- Immediately remove excess oil with oil binder.
- Remove excess fat

NOTE**Incorrect amounts of oil or grease as well as contamination can cause damage to gears and components!**

Damage to components can shorten the life of components.

- The amount of oil and the position of the closing elements of gear units depends on their design and installation position.
- After removing the oil level screw, the oil level must not exceed 3 to 5 mm below the prescribed filling level.
- Close the gearbox again immediately after the oil level check or the oil change.
- Do not rinse components (gears, bearings, etc.) using cleaning agents until after consulting the manufacturer.
- When regreasing lubrication points via grease nipples, the lubricant must not be pressed in with high pressure or hard lubrication surges. The maximum permissible lubrication pressure is 15 bar.

2.12 Safety instructions for disassembly and disposal

WARNING



Risk of injury due to improper disassembly!

Stored residual energy, angular components, points and corners on or in the machine or on the required tools can cause injuries.

- Make sure there is enough space before starting work.
- Be careful with open sharp-edged components.
- Pay attention to order and cleanliness in the workplace! Loose components lying on or around each other and tools are accident sources.
- Disassemble components professionally. Note partially high dead weight of the components. If necessary, use lifting gear.
- Secure components so they do not fall or fall over.

3 Function Description

3.1 Overview

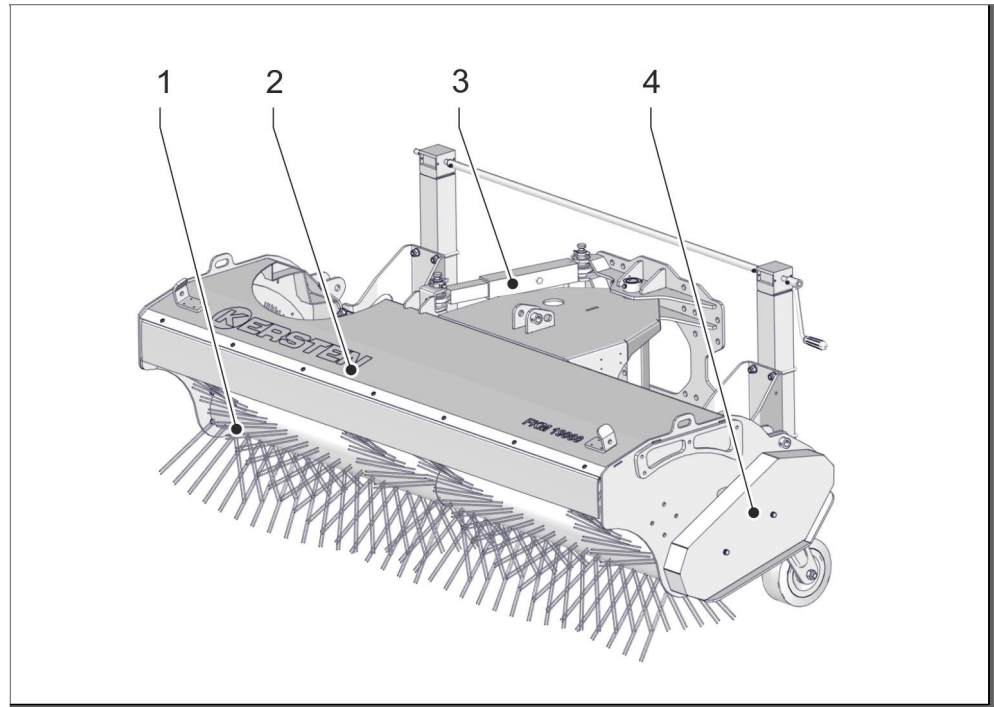


Fig. 6: Overview of the front view

- 1 Broom
- 2 Housing
- 3 Mechanical swivel device
- 4 Cover chain drive

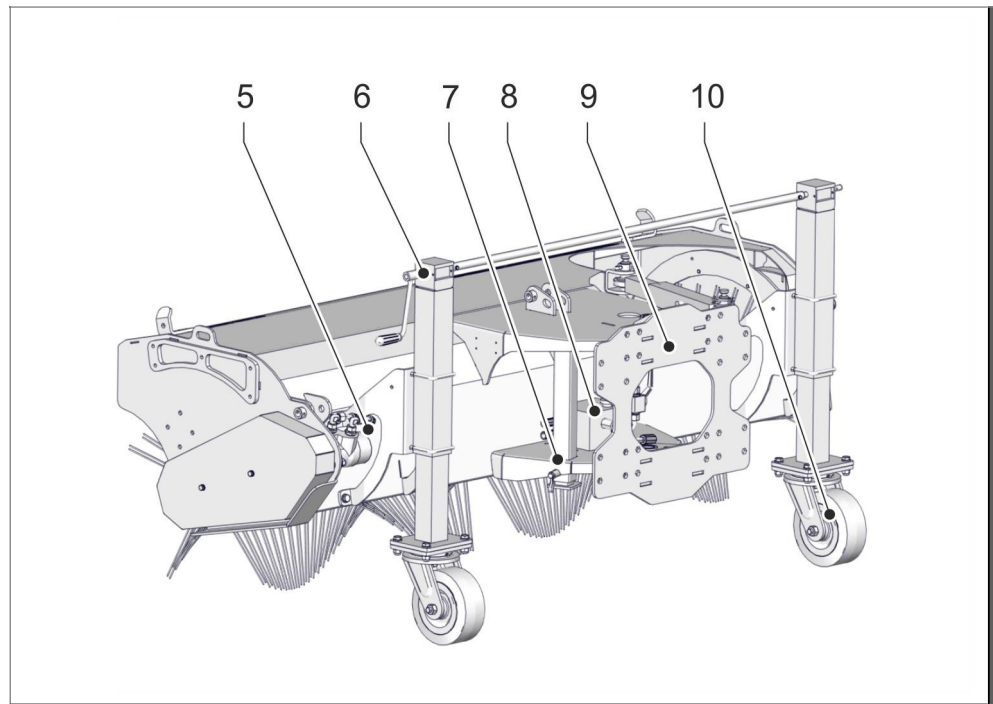


Fig. 7: Overview of the rear view

- 1 Hydraulic motor
- 2 Hand crank for height adjustment
- 3 Parking support
- 4 Hydraulic block
- 5 Mounting plate for mounting frame
- 6 Caster wheels

The front sweeper is used for area maintenance and is used for sweeping on paved areas, sidewalks and facilities. The sweeper is mounted on tractors or municipal vehicles. The various vehicle types can be adapted to the receiving plate (9) of the front sweeper vehicle-specific mounting frame.

By means of a hydraulic motor (5) with chain drive (4), the sweeping roller (1) is driven. The sweeping roller (1) rotates counter to the direction of travel. The sweeper is controlled via a multifunctional hydraulic block (8).

The multifunctional hydraulic block (8) offers safety-relevant functions such as a back-up safety device, an overpressure safety device and a load-sensing safety valve.

The height of the sweeping roller can be adjusted via the height-adjustable trailing wheels (10). The trailing wheels (10) are manually adjusted in height via a hand crank (6). The angle of attack of the sweeping roller can be adjusted by $\pm 30^\circ$ by means of the mechanical pivoting device (3) (see chapter 6.1 Operating instructions sweeping roller on page 46).

3.2 Drive sweeping roller

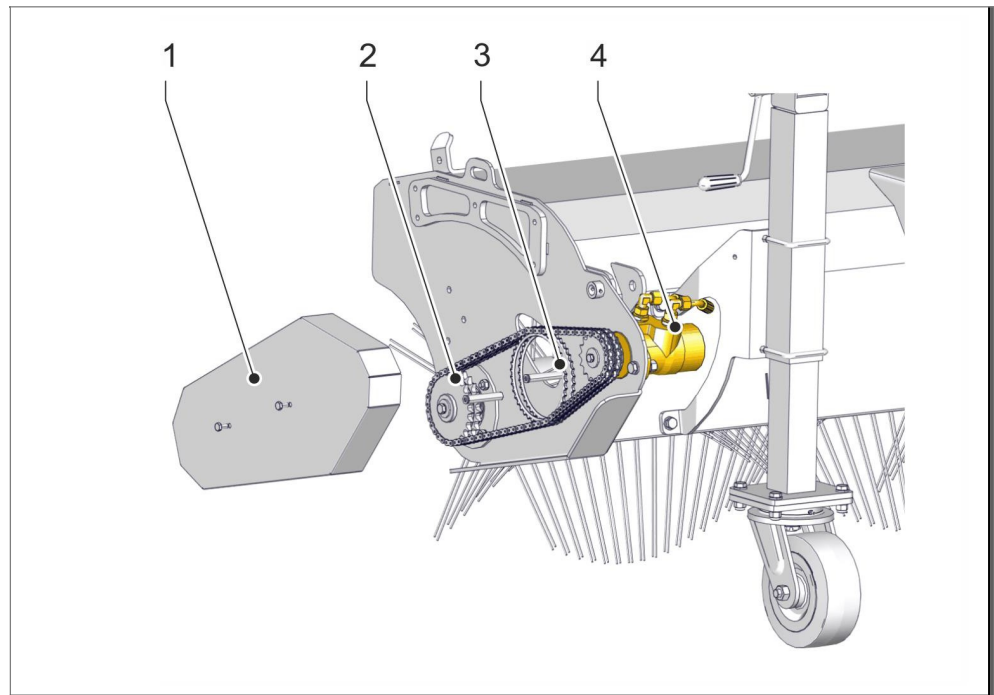


Fig. 8: Hydraulic components

- 1 Cover
- 2 Chain drive with gear
- 3 Chain tensioner
- 4 Hydraulic drive

An external hydraulic pump of the carrier vehicle provides for the circulation of the hydraulic oil. The system is supplied with hydraulic oil via an oil tank located on the carrier vehicle. A hydraulic drive (4) drives the sweeping roller via a chain drive (2). Free-running chain tensioners (3) ensure the tightness of the chain on the gears.

3.3 Cultivation frame

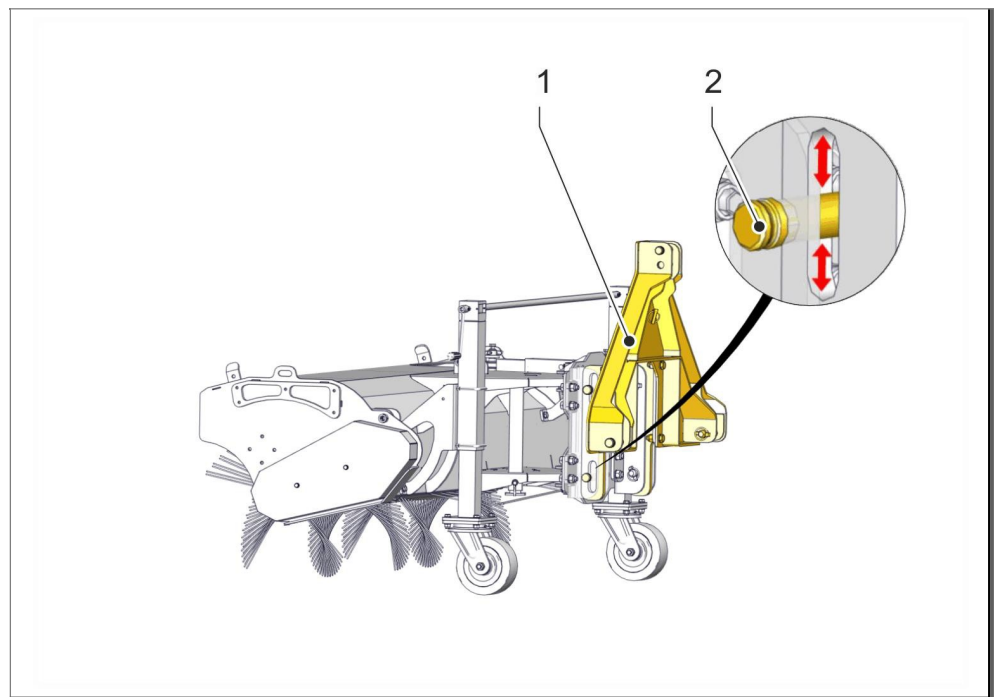


Fig. 9: Mounting frame

1 Mounting frame

2 Fastening bolts with clearance

The front sweeper is mounted on tractors or municipal vehicles. For the respective carrier vehicle corresponding mounting frame (1) are mounted. The mounting frames are connected to the front sweeper via bolts and slots (2). A vertical clearance in the slots (2) allows compensation of bumps while driving.

3.4 Options

3.4.1 Dirt collecting container (option)

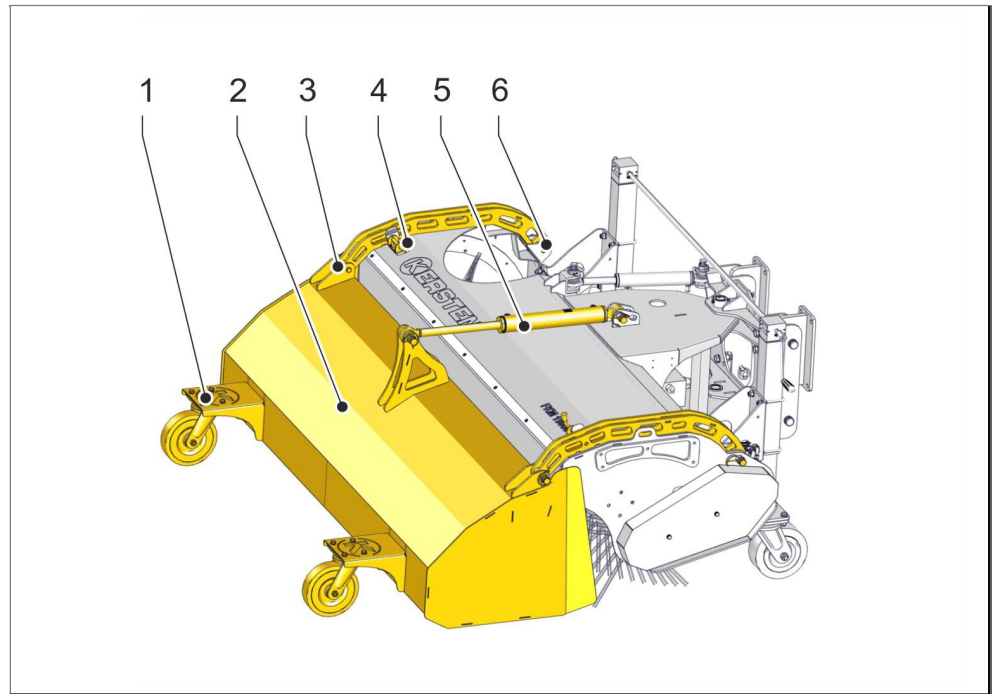


Fig. 10: Dirt collecting container (collecting operation)

- | | |
|---|---------------------|
| 1 | Lead rollers |
| 2 | Dirt collection |
| 3 | Front pivot |
| 4 | Locking |
| 5 | Hydraulic cylinders |
| 6 | Rear pivot |

During operation, the broom moves the dirt into a dirt collector (2), which is carried along on feed rollers (1). The dirt collecting container (2) is pivotable via a hydraulic cylinder (5) and allows emptying of the container.

The dirt collector (2) is floating, i. while driving, the dirt collecting container (2) can move up and down independently of the front sweeping machine. The lock (4) is opened to allow rotation about the rear pivot (6). A start of ramps or the compensation of bumps is possible during the sweeping operation.

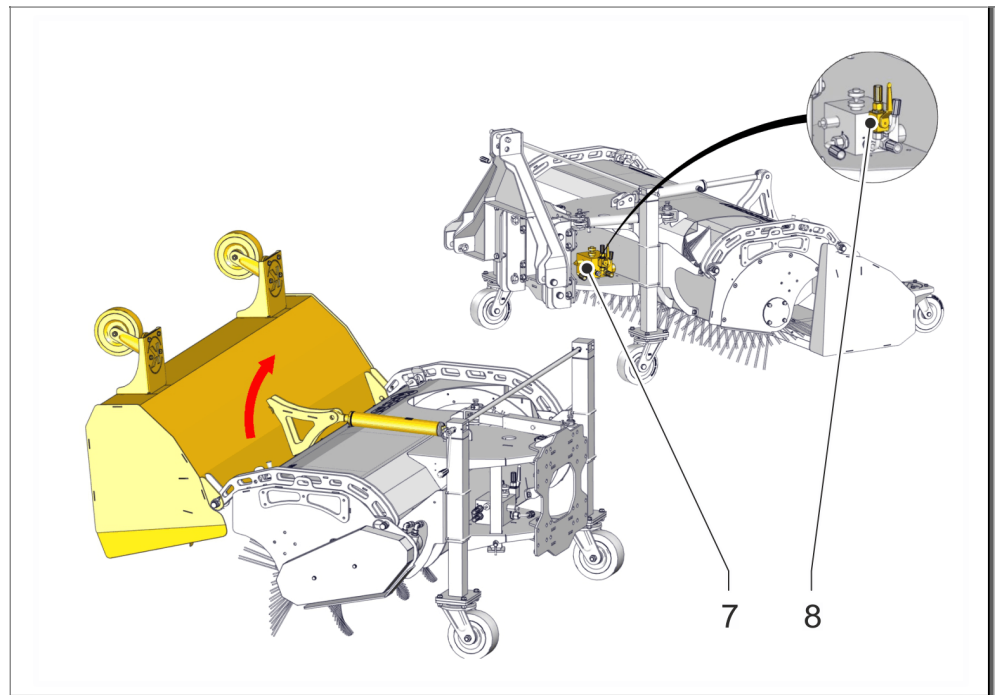


Fig. 11: Dirt collecting container (free-running operation)

- 1 Hydraulic block
- 2 Shut-off valve

The protective container can be pivoted with closed lock around the front pivot. In order to operate the dirt collector in free-running operation, the shut-off valve (8) on the hydraulic block (7) closed when open.

3.4.2 Hydraulic swivel device (option)

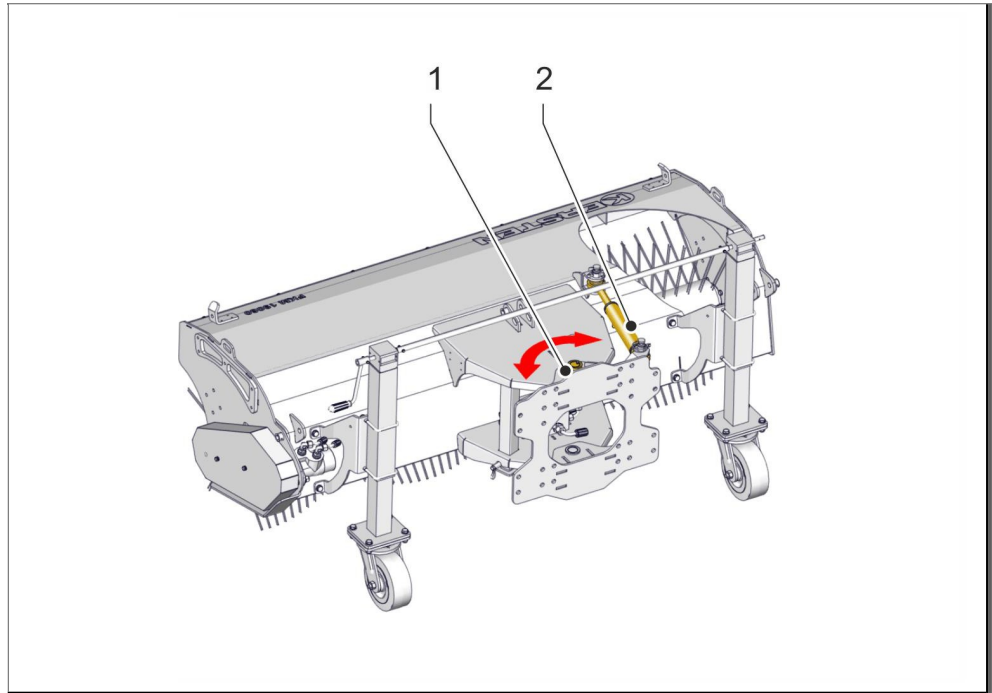


Fig. 12: Dirt collecting container with swivel device (collecting operation)

- | | |
|---|---------------------|
| 1 | Pivot |
| 2 | Hydraulic cylinders |

The sweeper can be swung laterally to the left or right according to the resulting work. This pivoting device is intended in particular for free-lance operation. The pivoting can be done manually, by the hydraulics of the sweeper or by an optional hydraulics on the pivoting device. The front sweeping machine can be swiveled by $\pm 30^\circ$ about the center pivot (1) by means of an optional hydraulic cylinder (2).

(See chapter 6.1.3 Pivoting the sweeping roller on page 48)

The sweeper can be swung laterally to the left or right according to the resulting work. This pivoting device is intended in particular for free-lance operation.

The pivoting can be done manually, by the hydraulics of the sweeper or by an optional hydraulics on the pivoting device. The front sweeping machine can be swiveled by $\pm 30^\circ$ about the center pivot (1) by means of an optional hydraulic cylinder (2).

(See chapter 6.1.3 Pivoting the sweeping roller on page 48)

3.4.3 On scratch bar with hydraulic actuation (option)



Fig. 13: On scratch bar (collecting operation)

1 On scratch bar

On the scratch bar (1) can be switched hydraulically via an actuator. The scraper bar (1) is mounted in front of the machine and solves persistent game growth from the ground.

3.4.4 Attachment brush (option)

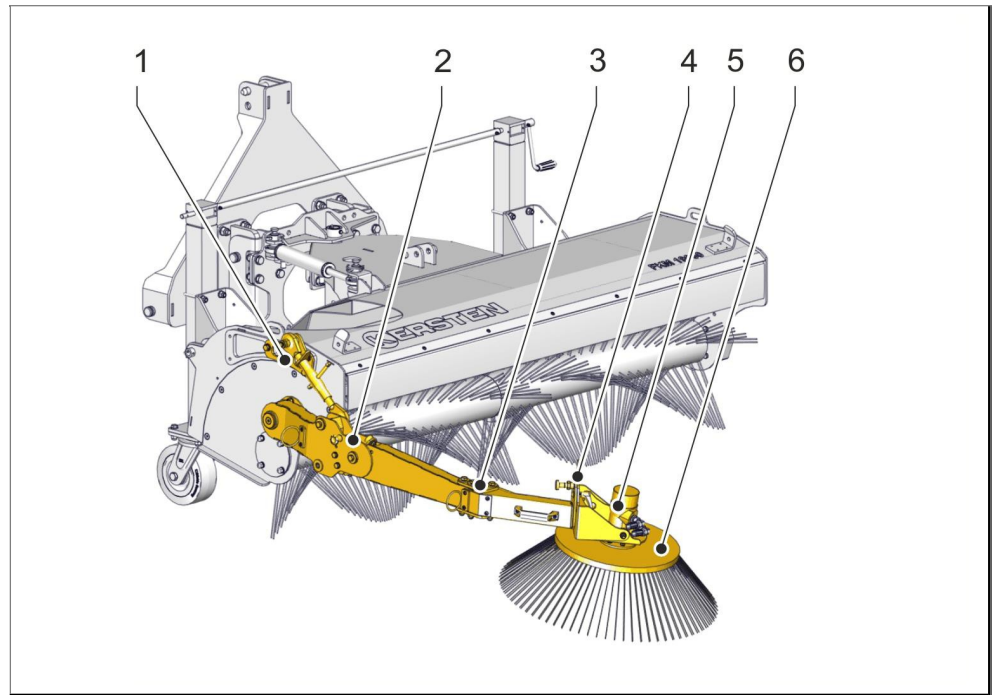


Fig. 14: Attachment side brush

- | | |
|---|----------------------------|
| 1 | Turnbuckle |
| 2 | Joint with lock |
| 3 | Spring joint with stop |
| 4 | Adjustment plate with lock |
| 5 | Hydraulic drive |
| 6 | Brush |

The mounted side brush returns leaves, dirt and weeds to edge strips and allows cleaning with the front sweeper. The mounted side brush can be swiveled by hand or by means of a hydraulic cylinder around the joint with lock (2) and thus be connected to the process. The working height can be adjusted via the turnbuckle (1). Furthermore, the brush (6) can be adjusted in two axes by means of an adjustment plate with lock (4) (see chapter 6.3.1 Setting the extension side brush on page 51).

A spring joint with stop (3) exerts a constant pressure against the edge strip during the working process. The brush (6) is driven by a hydraulic cylinder (5).

3.4.5 Solenoid valve (option)

The optional solenoid valve is used to switch the hydraulic circuit. In this case, the single-circuit hydraulic flow can be switched from the sweeping roller drive to the hydraulic pivoting device. The control can be carried out via the driver's cab using the KM-Control remote control (see chapter 6.4 KM-Control operating instructions (option) on page 53).

3.4.6 Water Splash Device (Option)

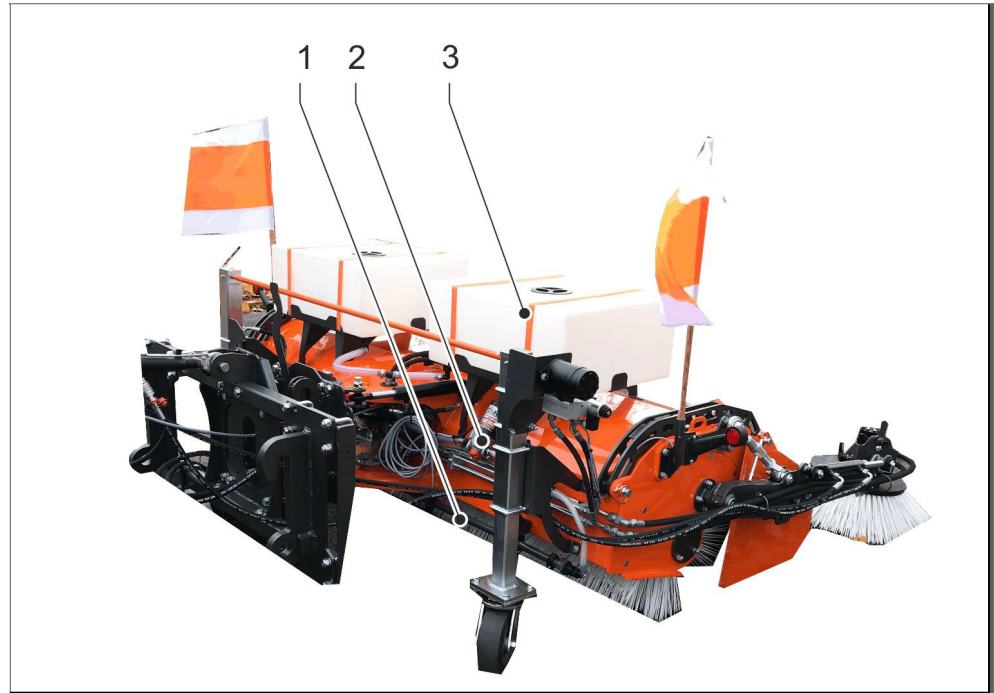


Fig. 15: Front sweeper with water sprinkler

- 1 Sprinkler line
- 2 Electric submersible pump
- 3 Water tank

The optional water blasting device prevents dust formation on dry surfaces. An electric submersible pump (2) pumps water from the tanks (3) into a sprinkler line (1) above the sweeping roller

3.4.7 Warning flags and marker lights (option)



Fig. 16: Front sweeper with warning flags and marker lights

- 1 Marker lights red-white
- 2 Warning flags

Optionally, the front sweeper can be equipped with warning flags (2) and marker lights (1)

1 Transport, packaging and storage



Assembly, installation and commissioning are carried out exclusively by employees of the dealer or by persons authorized by him.

Nevertheless, it may happen that operators or maintenance personnel of the operator are entrusted with the handling of packages during the installation and further use.

The following notes be sure to pay attention.

1.1 Safety



It is essential to observe all the safety instructions listed in the chapter Safety!

(See chapter 2 Safety on page 9)

1.2 Transport inspection

Upon receipt, check the delivery for completeness and shipping damage.

For externally visible transport damage, proceed as follows:

- Do not accept delivery or only with reservations.
- Note the extent of damage on the transport documents or on the delivery note of the transporter.
- Initiate a complaint.



Claim any shortcoming as soon as it is recognized. Claims for damages can only be asserted within the applicable complaint period.

1.3 Package

Handling of packaging materials

The packaging material must be disposed of in accordance with the applicable legal regulations and local regulations.

NOTE



Danger to the environment through incorrect disposal!

Packaging materials are valuable raw materials and in many cases can continue to be used or sensibly processed and recycled. Incorrect disposal of packaging materials can be hazardous to the environment.

- Dispose of packaging materials in an environmentally friendly manner.
- Observe the locally applicable disposal regulations. If necessary, commission a specialist company with disposal.

1.4 Transport of the machine

The machine is usually transported together with the required carrier vehicle.

NOTE



Property damage due to improper handling!

Improper handling of the machine can lead to damage.

- Do not tilt the machine or turn the horizontal axis.
- Vehicles, aids and lifting gear must be suitable for the weight of the transport units.
- The driver must be authorized to drive the vehicle.

Protective gear

- Protective clothing
- Protective gloves
- Safety shoes

The following points must be observed when transporting the machine / carrier vehicle:

- Charging, unloading and transport are carried out using suitable public transport vehicles and trailers.
- The transport vehicles must be suitable for the transport weight and the dimensions of the machine / carrier vehicle combination to be transported.
- The machine and carrier vehicle must be attached to the marked attachment points.
- Sufficiently dimensioned lifting gear / lashing must be used.
- The slings / lashings must not be damaged.
- For transport, only functionally correct, safety-relevant and load-compliant vehicles and aids or lifting tackle / lashing must be used.
- Do not stack the individual transport units!

2 Assembly / installation, installation, commissioning

2.1 Safety



It is essential to observe all the safety instructions listed in the chapter Safety!
(See chapter 2 Safety on page 9)

2.2 Mechanical coupling / uncoupling

ATTENTION



Risk of injury / risk of environmental damage during coupling and uncoupling!

By coupling and uncoupling, there is a risk of injury from crushing and risk of damage to the environment and property (on the machine or system)!

- Observe the information from the operating instructions of the carrier vehicle!
- Switch off the carrier vehicle, make sure that the hydraulic system is depressurised and remove the ignition key.
- Special care is required!

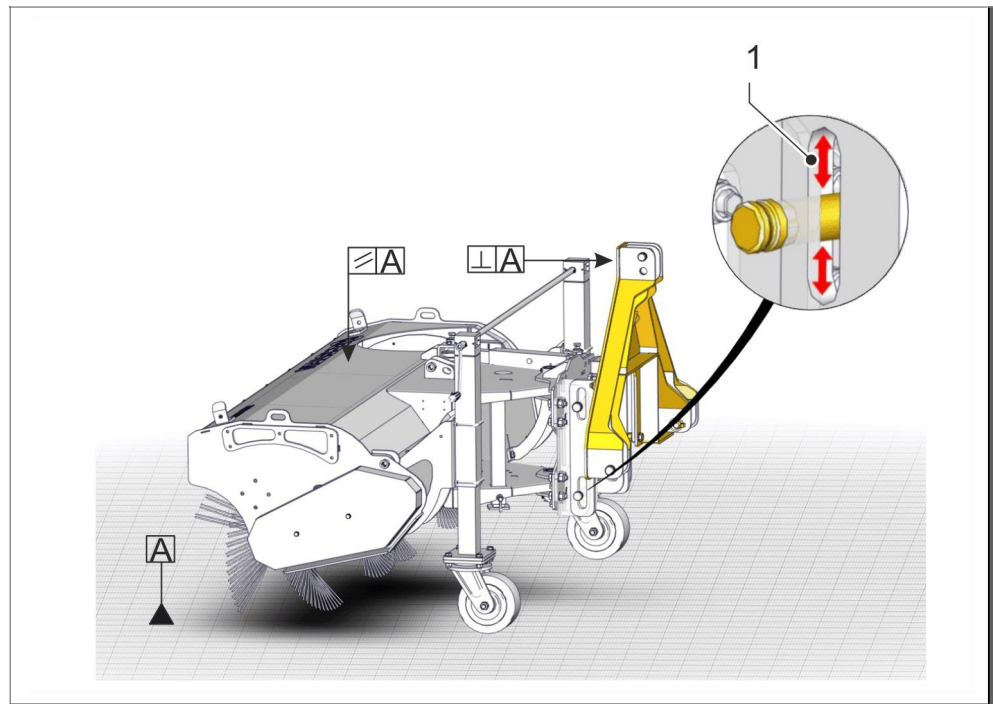


Fig. 17: Coupling and uncoupling of the front sweeper

1 Clearance

Coupling

The following points should be observed when coupling the attachment:

1. Hook the attachment frame of the sweeper into the front hydraulics or into the interchangeable holder of the carrier vehicle.
2. Align the mounting frame perpendicular to the ground.
3. Align the front sweeping machine so that the base housing is parallel to the ground.
4. Couple the mounting frame to the front sweeper. Make sure that the bolts have clearance (1) in both directions.
5. If necessary, plug the electrical connection into the 3-pin socket of the carrier vehicle.

Uncouple

Uncoupling is done in the reverse order.

2.3 Connecting / disconnecting hydraulic hoses

When connecting or disconnecting hydraulic hoses with thread, the following points should be noted:

- Stop the engine of the carrier machine!
- Move hydraulic controls back and forth to relieve any overpressure.
- Before connecting or disconnecting hydraulic hoses, make sure that the hydraulic system of the carrier vehicle is not under pressure. The entire machine must not be under pressure
- Make sure all connections are clean before connecting. Impurities in the hydraulic oil cause severe damage to the hydraulic system.
- When connecting hydraulic hoses, remove the protective covers from the couplings and make the hydraulic connection.
- When disconnecting hydraulic hoses, clean and clean joints before installing the protective covers. Always protect free junctions with protective covers.

Insert hydraulic hoses with plug-in coupling into the carrier vehicle or separate it from the carrier vehicle

3 Operation

3.1 Operating instructions Sweeping roller

6.1.1 Height adjustment of the sweeping roller

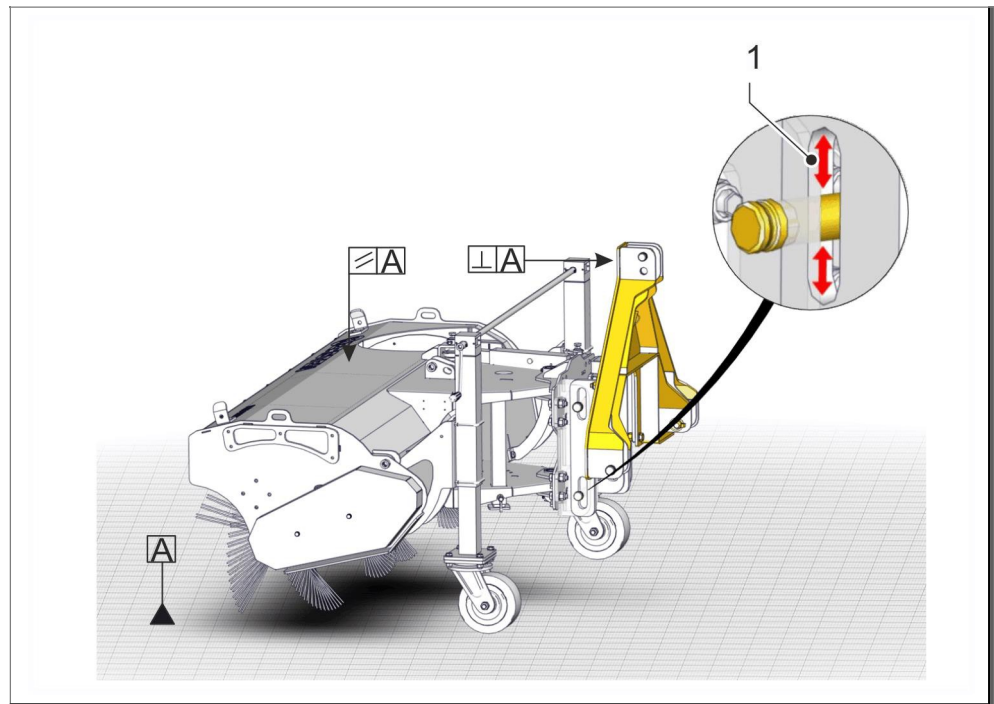


Fig. 18: Height adjustment of the mounting frame

- 1 Clearance mounting frame

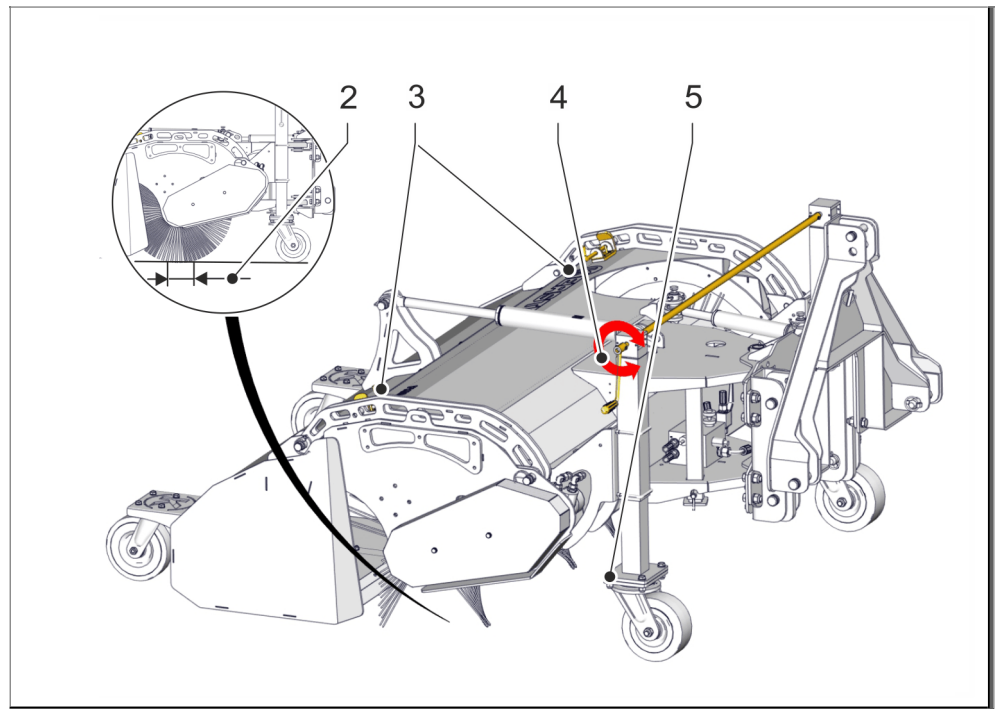


Fig. 19: Adjustment of the brush plate

- 2 Sweeping track
- 3 Locking dirt collector
- 4 Hand crank for height adjustment
- 5 Caster wheels

The sweeping roller is firmly mounted in the basic housing. The height of the sweeping roller can be adjusted via the height-adjustable trailing wheels (5). From the height of the sweeping roller results in the width of the cleaning surface. The width of the cleaning surface is referred to as sweeping mirror (2). The sweeping mirror (2) is decisive for the wear and the sweeping result. To adjust the height of the sweeping roller, first release the lock (3) of the optional dirt collector. The machine is adjusted by means of the hand crank (4) so that a sweeping mirror (2) of 10-12 cm is set.



Note

Too tight set sweeping roller brings no better sweeping results, but worsens the sweeping effect and leads to significantly higher wear of the sweeping roller. Depending on the wear of the sweeping roller, be sure to adjust the height setting of the trailing wheels. In order to achieve a better sweeping result when heavily soiled, if the sweeping roller is set correctly, only the speed of the sweeping roller can be increased or the driving speed reduced.

6.1.2 Setting the speed of the sweeping roller

The speed of the sweeping roller can be adjusted via the flow control valve on the hydraulic block. (Exception: with the additional option "KM-Control" the speed setting is not possible!)

6.1.3 Pivoting the sweeping roller

The sweeper can be swung laterally to the left or right according to the resulting work. This pivoting device is intended in particular for free-lance operation. Depending on the equipment of the machine, this is done mechanically by hand or hydraulically

Manual adjustment

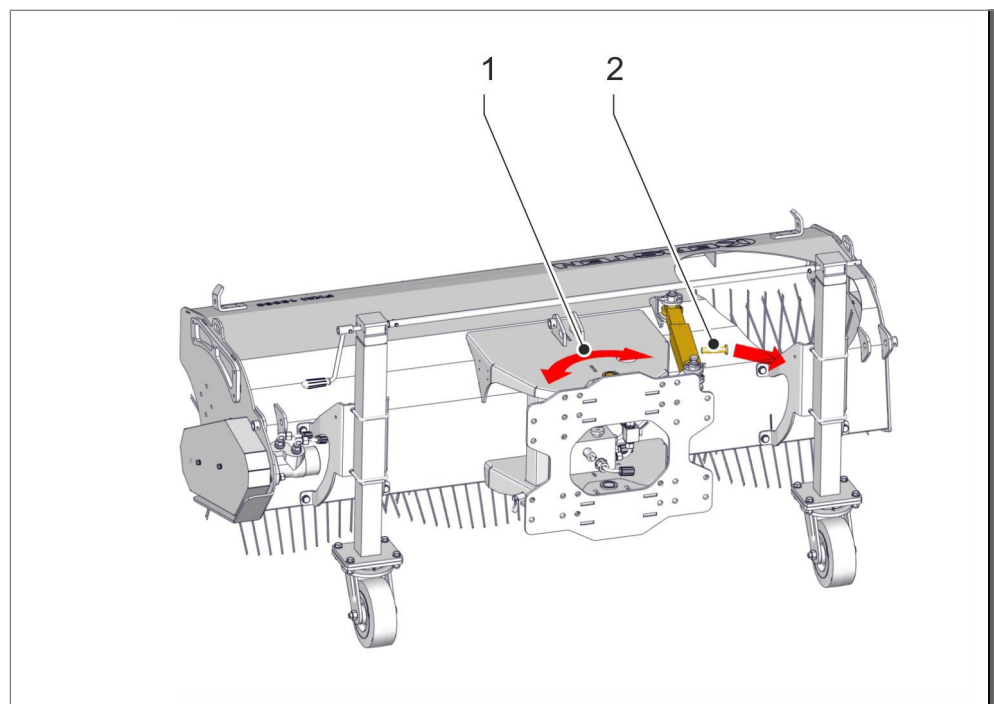


Fig. 20: Swing sweeper

- 1 Pivot
- 2 Socket pins

The sweeper can be swiveled by $\pm 30^\circ$ around the swivel joint (1). Remove the locking pin (2) from the manual adjustment. Swing the sweeper into the desired position and secure the manual adjustment again with the locking pin (2).

Hydraulic side adjustment without solenoid changeover valve

Actuate the appropriate hydraulics of the host vehicle to pivot the machine to the desired position.

Hydraulic side adjustment with solenoid changeover valve (option)

Interrupt the work and stop the hydraulic supply to drive the sweeping roller. Only now activate the switch for the solenoid changeover valve and use the hydraulics of the carrier vehicle to swing the machine into the desired position. Continue working without activating the switch for the solenoid changeover valve.

6.2 Operating instructions Dirt collecting container (option)



NOTE

When storing the sweeper, the locks of the swing arms are too Close (See chapter 3.4.1 Dirt collecting container (option) on page 34).

6.2.1 Collective or free-lance operation

The optional dirt collector can be used in collecting or free-lance operation.

Free-running operation

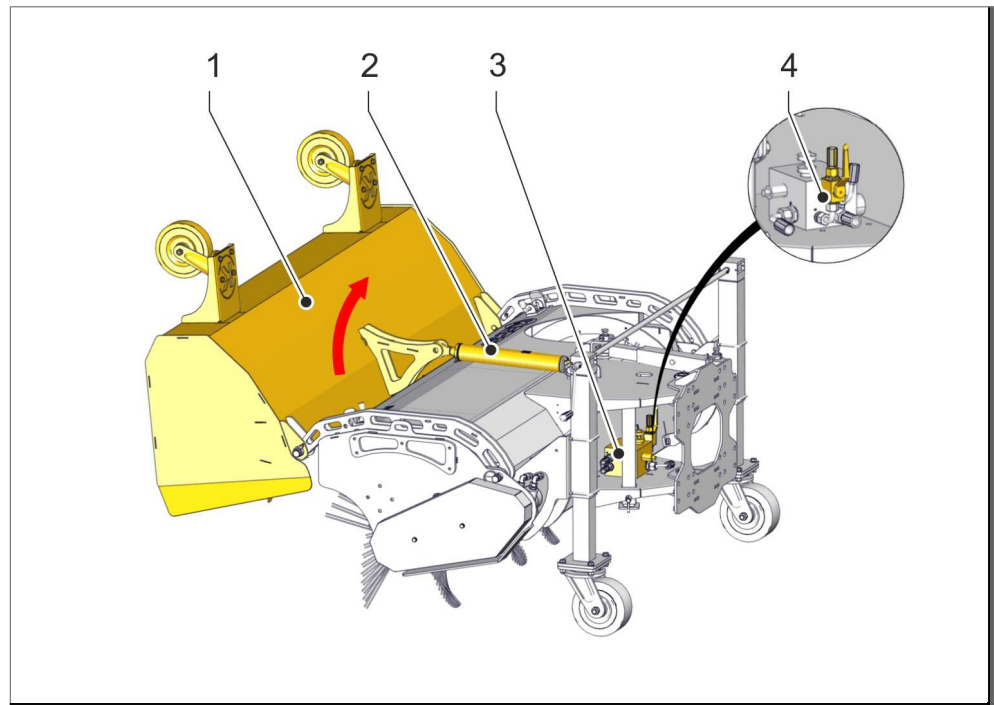


Fig. 21: Dirt collecting container in free-lance operation

- | | |
|---|---------------------|
| 1 | Dirt collection |
| 2 | Hydraulic cylinders |
| 3 | Hydraulic block |
| 4 | Shut-off valve |

The dirt collecting container (1) can be swung over the return line of the hydraulic cylinder (2). By closing the shut-off valve

(4) On the hydraulic block (3), the dirt collecting container (1) remains in position so that the free-running operation is ensured.

Collecting operation

If pressure is applied to the supply line under the open shut-off valve (4), the dirt collector (1) closes. If pressure is applied to the return connection of the sweeper, the collecting container (1) opens and the dirt picked up is released.

6.3 Operating instructions mounted side brush (option)

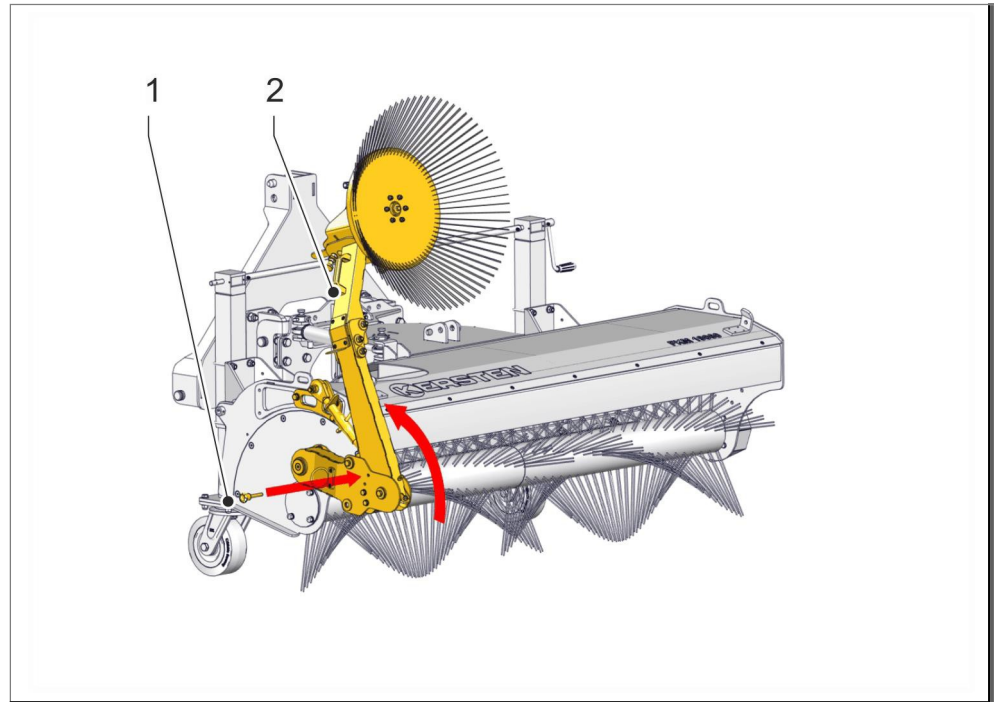


Fig. 22: Sweeping roller with mounted side brush

- | | |
|---|-------------|
| 1 | Socket pins |
| 2 | Handle |

The mounted side brush is driven by a distributor valve on the hydraulic block. As soon as the sweeping roller is driven, the mounted side brush runs along. For storage and transport, the extension brush can be folded up. The operator can pivot the broom by means of the handle (2) and lock by means of a plug pin (1) in the upper position.

6.3.1 Setting the mounted side broom

**Note**

Before adjusting the mounted side broom, adjust the sweeping mirror (see chapter 3.4.4 Hinged side brush (option) on page 38).

The broom should be approx. 10-15 ° outwards and inclined slightly forward in the direction of travel. On the inside towards the collecting tank, the bristles should stand about 3 cm above the ground.

Adjusting the height

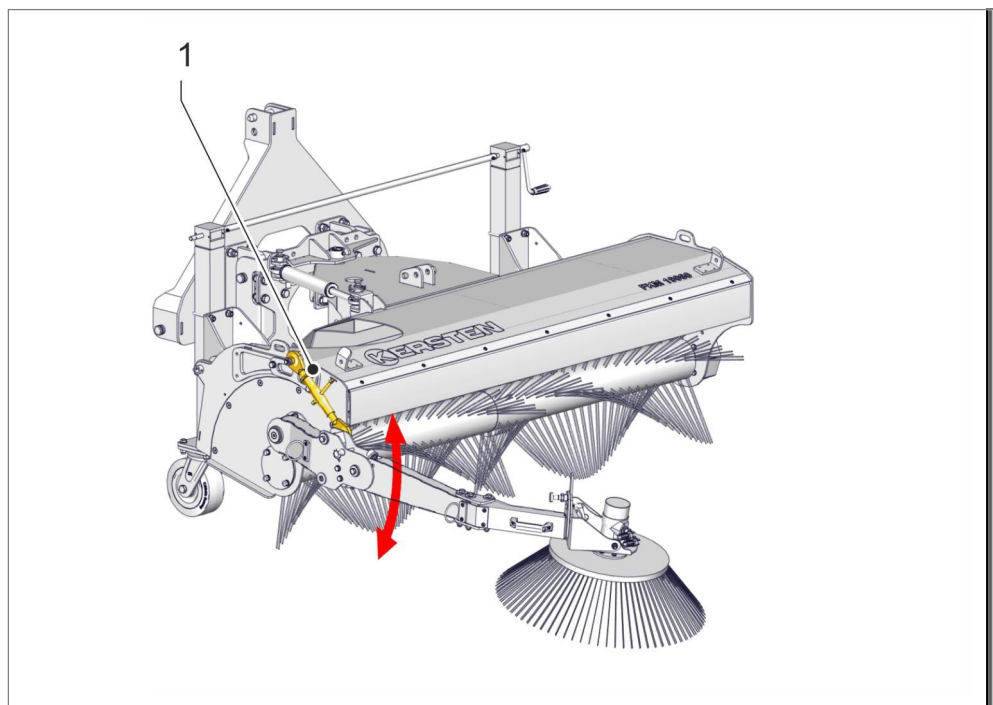


Fig. 23: Height of mounted side brush

1 Turnbuckle

The height of the attachment side broom can be made via the turnbuckle (1).

Adjustment of inclination

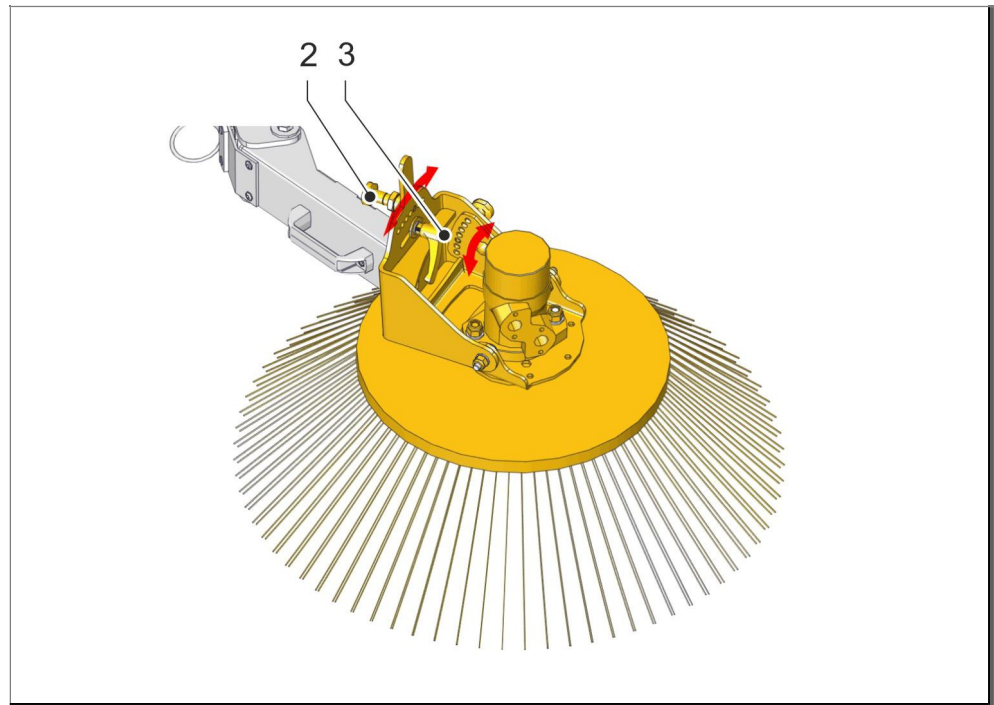


Fig. 24: Tilt mounted side brush

- 2 Locking bolts
- 3 Clamping lever

The mounted side brush can be adjusted via two axes in its inclination. The broom can be adjusted at fixed intervals by a locking pin (2) and secured by a clamping lever (3).

6.4 Operating instructions KM-Control (option)



Fig. 25: KM-Control

- 1 Pushbutton - operation solenoid changeover valve
- 2 Illuminated pushbutton switches - automatic height adjustment, strong
- 3 Illuminated pushbutton switch - automatic height adjustment, weak
- 4 Buttons - Manual height adjustment, Ab
- 5 Buttons - manual height adjustment, up

The control panel KM-Control allows the operator to control the sweeping roller from the driver's cab. The control panel provides three basic functions: sweeping of the sweeping roller, automatic height adjustment and manual height adjustment.

Panning via KM-Control

The button (1) switches a solenoid switching valve, which redirects the hydraulic circuit to the hydraulic swing cylinder of the sweeping roller. To operate, proceed as follows:

1. Stop work and stop the hydraulic supply to drive the sweeping roller.
2. Press the button (1) and keep the button (1) depressed to activate the solenoid changeover valve.
3. Swing the machine into the desired position.
4. Release the button (1).

Automatic height adjustment

The automatic height adjustment ensures the optimum sweeping level during operation and thus ensures a good sweeping result with low wear.

The KM-Control can adjust the sweeping roller height by a hydraulic drive on the height adjustment (see chapter 6.1.1 Adjusting the height of the sweeping roller on page 46).

Two modes can be switched on via the illuminated pushbuttons (2, 3) of the KM-Control. The green illuminated pushbutton (3) activates an automatic system with low pressure on the sweeping roller. The red illuminated pushbutton (2) can also be activated and increases the pressure on the sweeping roller.

Manual height adjustment



Note

Only when both switches for automatic height adjustment (2, 3) are switched off. If necessary, the height of the sweeping roller can be adjusted manually.

About the two buttons (4, 5), the sweeping roller can be moved manually in height.

7 Maintenance

7.1 Safety



It is essential to observe all the safety instructions listed in the chapter Safety!

(See chapter 2 Safety on page 9)

7.2 Parts

Wrong spare parts

 **DANGER**



Danger of life or injury due to the use of incorrect spare parts!

This symbol warns of an imminent danger to the life and health of persons.

The use of incorrect or faulty spare parts can cause death or injury as well as the risk of property damage to the machine or system!

- Use only original spare parts from the manufacturer or replacement parts approved by the manufacturer.
- If in doubt, contact our customer service / customer service (see manufacturer's service on page 3).

Procurement of spare parts

Replacement and wear parts must be ordered through Customer Service (see Customer Service on page 3).

7.3 Maintenance

7.3.1 Daily check

Staff:

- Private and commercial operators

Protective gear:

- Protective clothing
- Protective gloves
- Safety goggles

The planning, execution and documentation of tests must be carried out in consideration of the valid regulations and laws by the operator.

To ensure safe operation of the machine, the safety devices must be checked regularly.

The following things should be checked daily on the machine:

- Check the safety elements and moving parts for wear before each use.
- Check sweeping roller for wear and replace if necessary.
- Remove wraps of brush elements (such as wire).
- Check the smooth running of the moving parts.
- Clean the device after each use.
- Check the hydraulic connections for leaks before each use.
- Lubricate the grease nipple before use.
- Carry out a test run before each use..

7.3.2 Maintenance after 20 hours of operation / prolonged downtime

DANGER



Danger of life or injury due to a machine in operation!

An operating machine poses a risk of life or injury as well as a risk of material damage to the machine or system!

- Before carrying out any maintenance work, disconnect the machine from the power supply and secure it against being switched on again.

The planning, execution and documentation of tests must be carried out taking into account the applicable regulations and laws.

To ensure safe operation of the machine, the safety devices must be checked regularly.

At intervals of no more than 20 operating hours, as well as at the beginning and end of the season, all moving parts of the unit must be greased or oiled.

Smudges

Staff:

- Private and commercial operators

Protective gear:

- Protective clothing
- Protective gloves
- Safety goggles

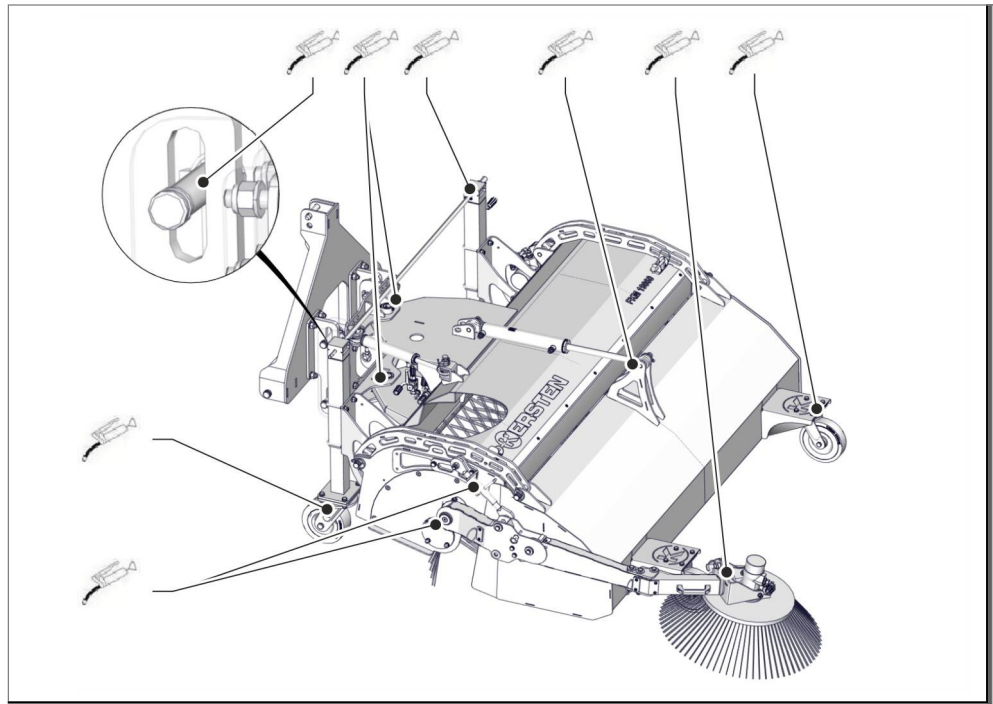


Fig. 26: Lubrication points FKM 60

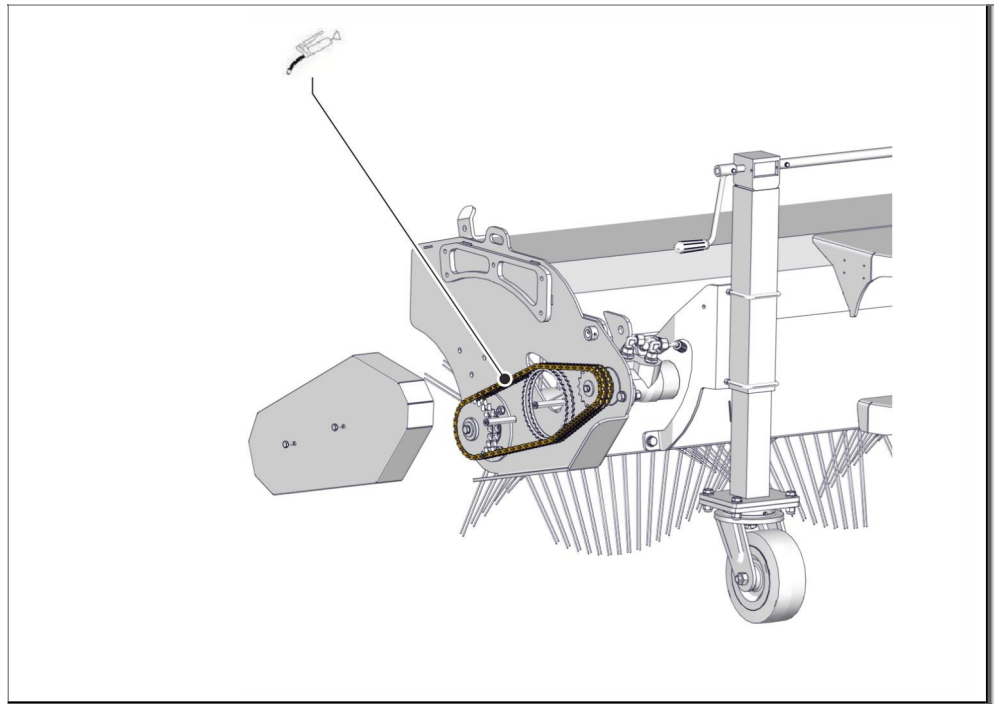


Fig. 27: Lubrication points Drive FKM 60

The machine must be lubricated at intervals of 20 operating hours at the points shown.

7.3.3 Replacing the sweeping roller

⚠ DANGER



Danger of life or injury due to a machine in operation!

An operating machine poses a risk of life or injury as well as a risk of material damage to the machine or system!

- Before changing the brush elements, disconnect the machine from the power supply and secure it against being switched on again.

Staff:

- Trained specialist personnel

Protective gear:

- Protective clothing
- Protection gloves
- Safety goggles

The following describes how to change the sweeping roller:

1. Open the dirt collector (see chapter 3.4.1 Dirt collector (option) on page 34).
2. Settling the sweeping roller on the ground.

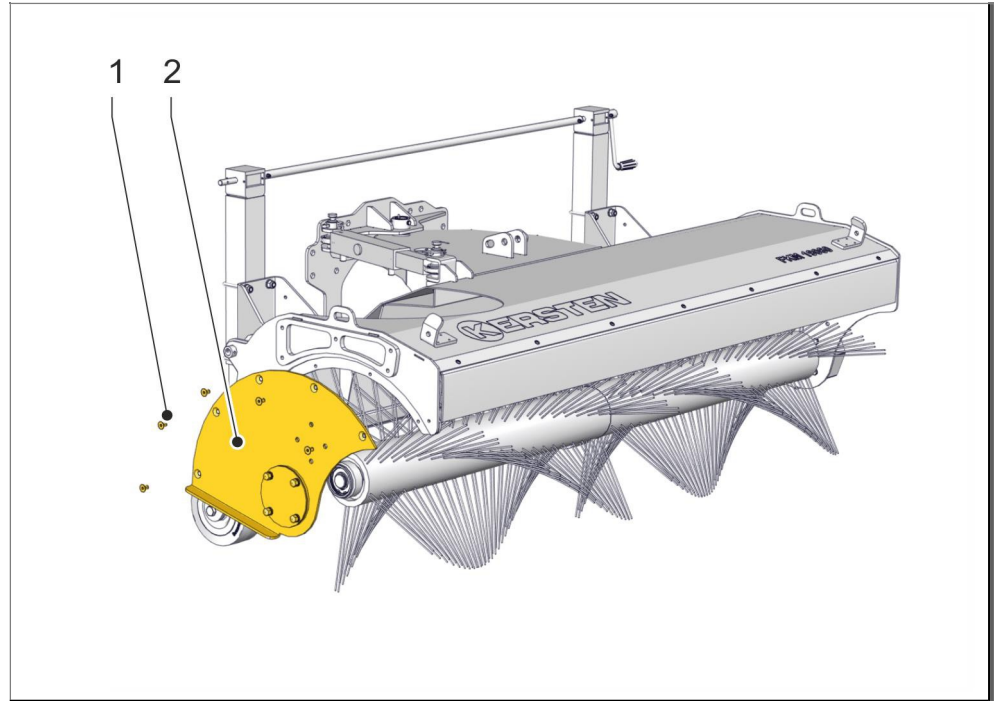


Fig. 28: Dismantling the side panel

- 1 Countersunk screws
 - 2 Side panel
3. Remove the 5 hexagon bolts (1) and remove the side panel (2).

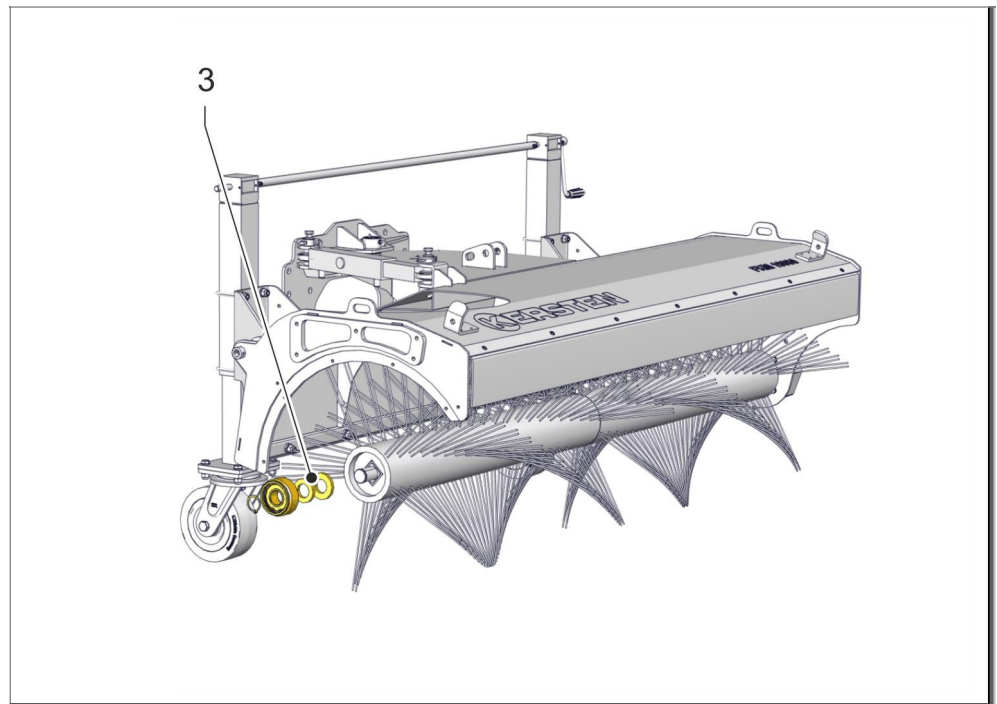


Fig. 29: Dismantling the bearing

3 Bearings with bushes

4. Remove the bearing with bushings (3) from the broom carrier.

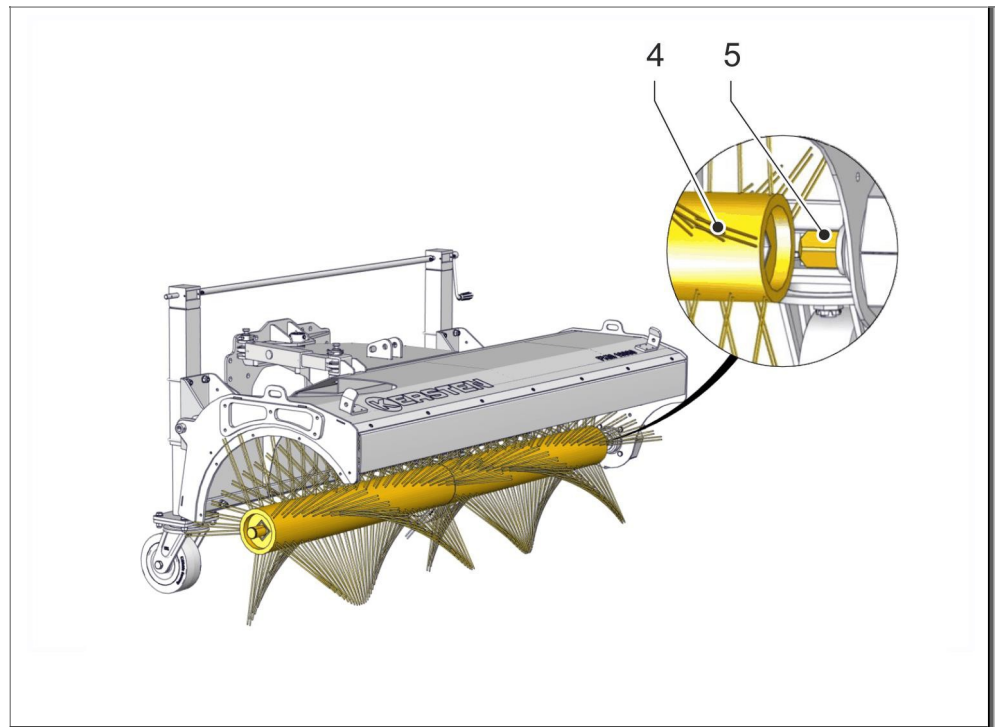


Fig. 30: Pull off broom carrier

- 4 Broom
 - 5 Broom carrier
5. Pull the broom carrier (5) to the right so that it releases from the left-hand bearing point of the sweeping roller (4).

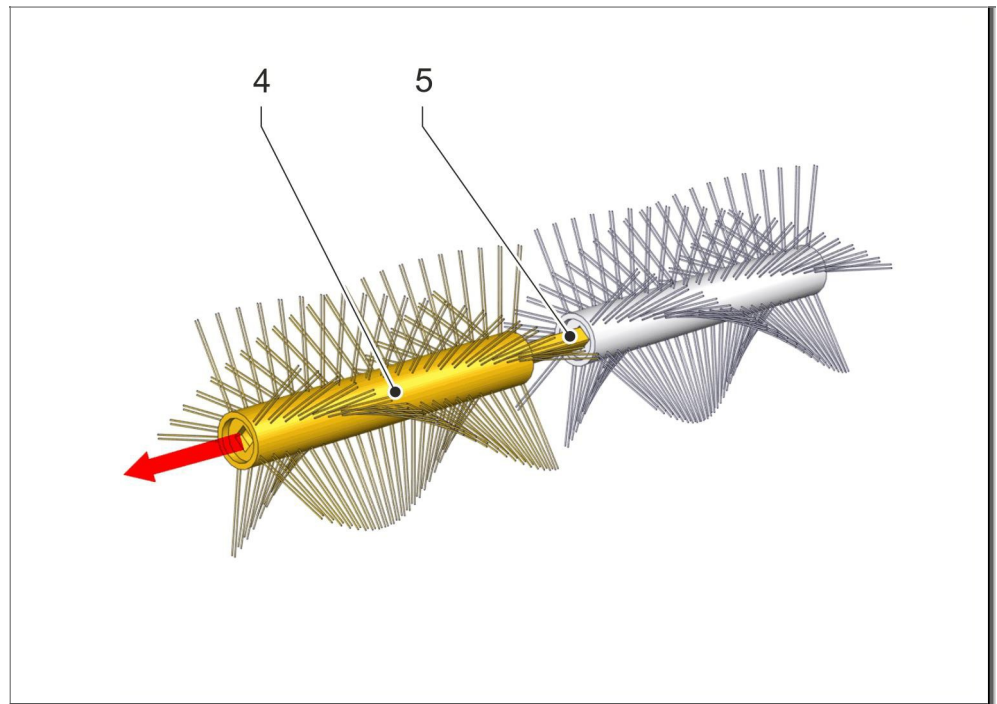


Fig. 31: Disassemble the sweeping roller

- 4 Broom
- 5 Broom

- 6. Pull the sweeping roller (4) off the broom carrier (5).
- 7. Proceed in the reverse order for installation.

7.3.4 Check safety features

Staff:

- Operators

Protective gear:

- Protective clothing
- Protective gloves

The planning, execution and documentation of tests must be carried out in consideration of the valid regulations and laws by the operator.

To ensure safe operation of the machine, the safety devices must be checked:

Separating guards (covers)	
interval	During commissioning, when switching on the machine
scope	Visual inspection for integrity
tester	operator
Measures for errors	<ul style="list-style-type: none"> • Lock the danger area • Repair

7.4 Measures after maintenance

Staff:

- Private and commercial operators

After completing the maintenance and before turning on the machine, perform the following steps:

1. Check all previously loosened screw connections for tightness.
2. Verify that all previously removed guards and covers are properly reinstalled.
3. Make sure all tools, materials and other equipment used have been removed from the work area.
4. Clean work area and any leaked substances such. As liquids, processing material or the like remove.
5. Make sure that all safety devices of the machine are working properly.

7.5 Procedure for malfunctions

Basically:

1. Immediately initiate emergency stop in the case of faults that pose an immediate danger to persons or property.
2. Determine the cause of the fault.
3. If troubleshooting requires work in the hazardous area, switch off the machine and secure it against being switched on again.
4. Have them repaired or repaired by authorized service personnel, depending on the type of fault.



The fault table provides information about who is entitled to correct the fault

8 Faults / Troubleshooting

The following chapter describes possible causes of malfunctions and how to eliminate them.

If there are more faults, shorten the maintenance intervals according to the actual load.

In the event of faults which can not be eliminated by the following instructions, contact the manufacturer.

8.1 Safety instructions for troubleshooting

Incorrectly performed work for fault elimination

DANGER



Danger of life or injury due to improper troubleshooting!

Incorrectly carried out work for the elimination of malfunctions can lead to danger of life or injury as well as a risk of material damage to the machine or system!

- Only remedy malfunctions that require intervention if it is ensured that the machine is at rest and secured against being switched on again.
- Release blocks only when it has been ensured that no dangerous movement of machine parts occurs due to loosening.
- If in doubt, contact your experienced colleague or Customer Service (See manufacturer's manufacturer service on page 3).
- Observe the following before restarting:
- Ensure that all troubleshooting work has been completed and completed in accordance with the instructions given in this manual.
- Make sure that there are no persons in the danger zone.
- Make sure all covers and safety devices are installed and working properly.

Save against reconnection

DANGER



Danger of life or injury due to unauthorized restarting!

Unauthorized reconnection of the power supply during troubleshooting and troubleshooting may expose persons in the danger zone to serious injury or even death.

- Before starting work, switch off all power supplies and secure against being switched on again.

Hydraulically operated components

DANGER



Danger of life or injury due to work on hydraulic components

Working on the hydraulic units and on hydraulic components during troubleshooting may result in danger of death or injury, as well as a risk of property damage to the machine or system!

- When working on hydraulic components, wear Personal Protective Equipment (PPE) in the form of suitable safety shoes, protective clothing, gloves and goggles.
- Switch off all power supplies before starting work.
- Depressurise before starting work on the hydraulic system. This is especially important when using pressure accumulators.
- Accelerate, absorb and dispose of spilled hydraulic fluid as quickly as possible using suitable means.
- When contacting the hydraulic fluid with the body, then clean the contacted area.
- When eye contact with hydraulic fluid, rinse affected eyes as soon as possible. Afterwards necessarily in medical treatment go.

Behavior in case of dangerous malfunctions

Basically:

1. Immediately initiate emergency stop in the case of faults that pose an immediate danger to persons or property.
2. Determine the cause of the fault.
3. If troubleshooting requires work in the hazardous area, switch off the machine and secure it against being switched on again.
4. Have them repaired or repaired by authorized service personnel, depending on the type of fault.



The fault table provides information about who is entitled to correct the fault.

8.2 Fault cause and remedy

This chapter describes in more detail the most important faults which can occur during operation on the self-propelled implement. Malfunctions which require a major intervention must always be remedied by a specialist workshop.

8.3 Fault table sweeper

Fault	Possible causes	Remedy
Hydraulic motor does not turn	Vehicle does not run.	Start carrier vehicle.
	Hydraulic power take-off not switched on.	Switch on hydraulic auxiliary drive.
	Hydraulic hoses not connected.	Connect hydraulic hoses.
	Hydraulic connector not engaged.	If necessary, plug in the hydraulic connector until it clicks into place.
	No hydraulic fluid in the hydraulic tank.	Top up hydraulic fluid in the hydraulic tank.
Sweeping roller turns too slowly	Speed set too low.	Increase the speed at the flow control valve.
	Hydraulic fluid level too low.	Top up hydraulic fluid in the hydraulic tank.
	Leakage on the hydraulic hoses.	Replace hydraulic hoses.
	Leakage at the hydraulic connectors.	Release hydraulic connector and insert again until it clicks into place. If leakage continues, check the hydraulic connector and replace if necessary.
	Leakage at the hydraulic screw connection.	Slightly loosen the hydraulic screw connection, move the hose slightly and tighten the hydraulic screw connection again.
	Contact pressure on the ground too large.	Align the machine higher so that the sweeping roller is relieved.
	Carburetor adjusted.	Adjust carburetor.
Height adjustment stiff	Wheel supports not greased.	Lubricate the wheel supports at the lubrication points. If necessary, additionally use creep oil and grease the threaded spindle.
Sweepings remain lying / does not sweep clean	Driving speed too high.	Reduce driving speed
	Broom speed too high / too low.	Reduce or increase broom speed.
	Sweeping roller height set too high.	Adjust the sweeping roller height according to the specifications.
	Collecting container set too high.	Set the collection container to the correct height.
	Side brush set incorrectly.	Adjust the side brush properly.

8.4 Procedure after troubleshooting

After troubleshooting, proceed as follows:

1. When the fault has been rectified, acknowledge the fault.
 - The fault is acknowledged, the machine can - if no further fault message is present - be put back into operation
2. Make sure that no persons are in the danger zone.

WARNING



Risk of injury by staying in the danger area!

Staying in the danger zone during troubleshooting can result in serious health effects or even life-threatening injuries.

3. If a maintenance specialist has completed the fault clearance, obtain the release for re-commissioning from this maintenance specialist.

9 Disassembly, Disposal

9.1 Safety



It is essential to observe all the safety instructions listed in the chapter Safety!

(See chapter 2 Safety on page 9)

9.2 Disassembly

Before the dismantling begins:

- Switch off the machine and secure it against being switched on again.
- Physically disconnect all power from the machine, discharge stored residual energy.
- Remove operating and auxiliary materials as well as the remaining processing materials and dispose of them in an environmentally sound manner.

Then clean the assemblies and components professionally and disassemble them in compliance with the applicable local health and safety and environmental protection regulations.

9.3 Disposal

Unless a return or disposal agreement has been made, disassembled components should be recycled:

- Scrap metals.
- Give plastic elements for recycling.
- Dispose of other components sorted according to material condition.

ATTENTION



Danger to the environment through incorrect disposal!

Incorrect disposal can be hazardous to the environment.

- Have electronic waste, electronic components, lubricants and other additives disposed of by authorized specialist companies.
- In case of doubt, obtain information on environmentally sound disposal from the local municipal authority or specialist waste disposal companies.

Batteries and rechargeable batteries

ATTENTION



Danger to the environment through batteries and rechargeable batteries!

Components of batteries and rechargeable batteries are poisonous and pose a danger to the environment..

- Never dispose of batteries and rechargeable batteries as household waste and have them disposed of according to the local regulations.



Components of the machine marked with the adjacent symbol must never be disposed of with household waste. Disposal of these components may only be carried out by specialist companies authorized on site.

Lubricants

ATTENTION



Danger to the environment through lubricants

Lubricants such as fats and oils contain toxic substances. They must not get into the environment.

- Disposal must be carried out by a disposal specialist.

10 Technical data

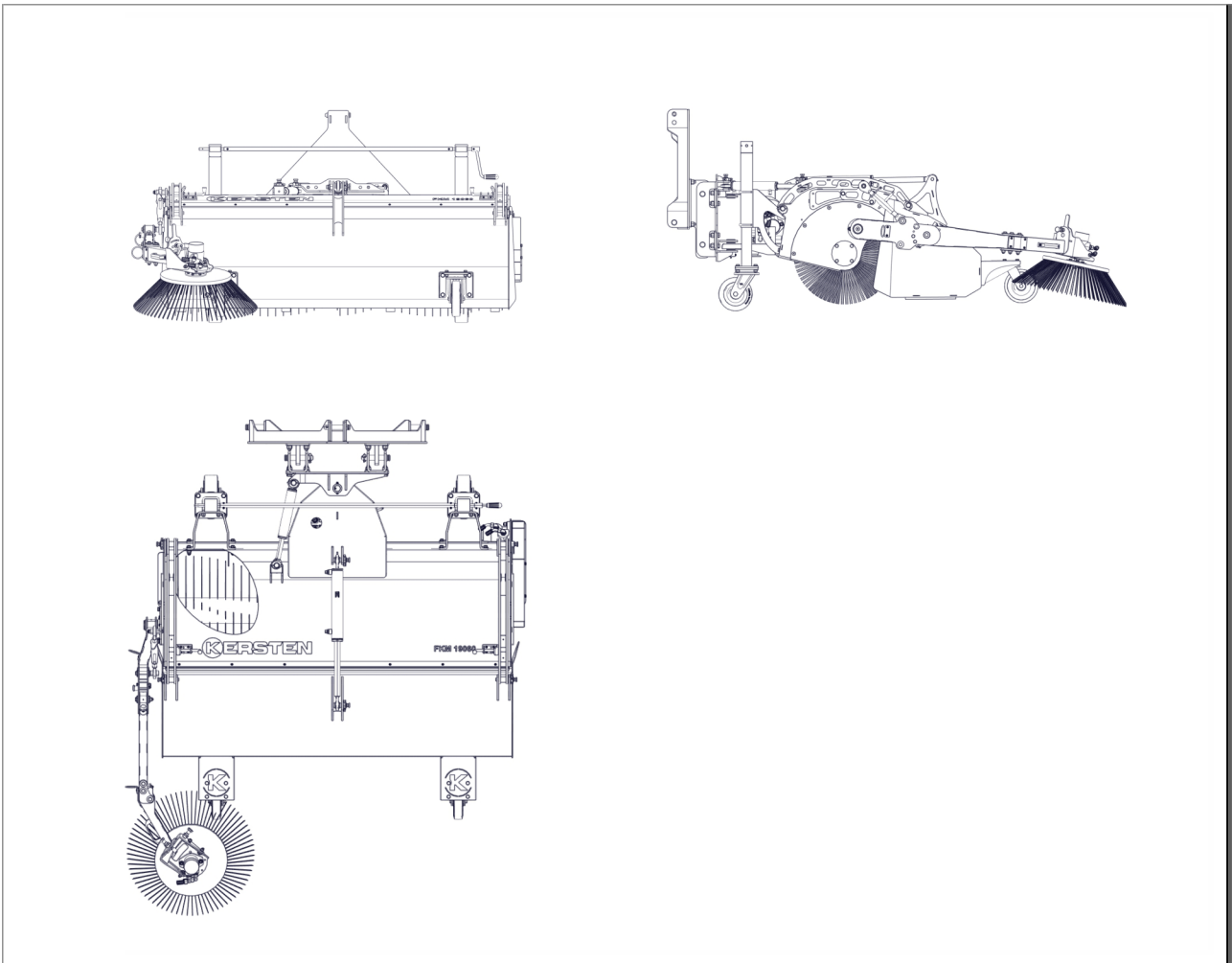


Fig. 32: Layout front sweeping machine FKM 60 (attachment)

10.1 Technical data Hydraulic version

	FKM 13060H	FKM 15060H	FKM 16560H	FKM 19060H	FKM 22560H	FKM 25060H
Sweeping roller diameter	Ø 60 cm	Ø 60 cm	Ø 60 cm	Ø 60 cm	Ø 60 cm	Ø 60 cm
Working with	130 cm	150 cm	165 cm	190 cm	225 cm	250 cm
Number of toos	2 Sweeping rollers	2 Sweeping rollers	2 Sweeping rollers	2 Sweeping rollers	2 Sweeping rollers	2 Sweeping rollers
Power unit	Hydraulic, min. 25 l/min	Hydraulic, min. 25 l/min	Hydraulic, min. 25 l/min	Hydraulic, min. 25 l/min	Hydraulic, min. 25 l/min	Hydraulic, min. 25 l/min
Max. Oil presse	175 bar	175 bar	175 bar	175 bar	175 bar	175 bar
Sound pressure level LpA, eq	dB (A) on the ear of the operator Measurement in accordance with DIN EN 12733:2009	dB (A) on the ear of the operator Measurement in accordance with DIN EN 12733:2009	dB (A) on the ear of the operator Measurement in accordance with DIN EN 12733:2009	dB (A) on the ear of the operator Measurement in accordance with DIN EN 12733:2009	dB (A) on the ear of the operator Measurement in accordance with DIN EN 12733:2009	dB (A) on the ear of the operator Measurement in accordance with DIN EN 12733:2009

10.2 Technical data Hydraulic version

	FKM 13060M	FKM 15060M	FKM 16560M	FKM 19060M	FKM 22560M	FKM 25060M
Sweeping roller diameter	Ø 60 cm	Ø 60 cm	Ø 60 cm	Ø 60 cm	Ø 60 cm	Ø 60 cm
Working with	130 cm	150 cm	165 cm	190 cm	225 cm	250 cm
Number of toos	2 Sweeping rollers	2 Sweeping rollers	2 Sweeping rollers	2 Sweeping rollers	2 Sweeping rollers	2 Sweeping rollers
Max. Oil presse	Mechanically	Mechanically	Mechanically	Mechanically	Mechanically	Mechanically
Sound pressure level LpA, eq	dB (A) on the ear of the operator Measurement in accordance with DIN EN 12733:2009	dB (A) on the ear of the operator Measurement in accordance with DIN EN 12733:2009	dB (A) on the ear of the operator Measurement in accordance with DIN EN 12733:2009	dB (A) on the ear of the operator Measurement in accordance with DIN EN 12733:2009	dB (A) on the ear of the operator Measurement in accordance with DIN EN 12733:2009	dB (A) on the ear of the operator Measurement in accordance with DIN EN 12733:2009

10.3 Additional equipment

- Dirt collecting tank floating
- Mounted side brush (right / left)
- Hydraulic swiveling device
- Solenoid valve
- Water sprinkler with 100l or 200l tank
- On scratch bar
- KM-Control with automatic height adjustment / monitoring of the sweeping roller
- Marker lights red-white
- Set of warning flags with holder

10.4 Declaration of Conformity

We the
Kersten Arealmaschinen GmbH
Empeler Straße 95
D- 46459 Rees

Explain that the product
Front Sweeper FKM 60

Front Sweeper FKM 60

with all relevant provisions of the EC Machinery Directive 2006/42 / EC.

The machine is also in compliance with all relevant provisions of the following EC directives:

Low Voltage Directive	2014/35/EU
Pressure Equipment Directive	2014/68/EU

In addition, the following standards have been
applied: EN ISO 12100: 2010

Dipl. Ing. (FH) Robert Bosch, Empeler Strasse 95, D-46459 Rees is
authorized to compile the technical documentation.

Rees, 18.12.2018



Dipl. Ing. (FH) Robert Bosch
Executive Director

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