Operating Manual

SAFETY Mower SME-3
Type 085, 105, 125, 145
for single-axle tractor

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Declaration of conformity

for the device we have manufactured, the

SAFETY Mulcher
Type: Type SME-3 085, 105, 125, 145,
Type: SME-H 085, 105, 125, 145

ID no.: Standard implement single-axle tractor 268 00 000
        Hydraulic implement single-axle tractor 267 00 000

We confirm the compliance with the requirements of the Machinery Directive 2006/42/EC including its modifications and supplements published up to the present. Corresponding technical documentation can be made available. The following standards and directives were taken into account in the design and manufacture:

DIN EN ISO 12100:2011 Safety of machinery
   (general, including risk assessment)
DIN EN ISO 13857:2008 Safety of machinery (hazard zones being reached by upper and lower limbs)
DIN EN ISO 12100 + 14121 Safety of machinery – risk assessment
DIN EN 13 524 + A1 Machines for road maintenance service – Safety requirements
EN 12733 Agricultural and forestry machinery, pedestrian controlled motor mowers, safety

Authorised person for documentation: Wolfgang Websky.
For address, refer to manufacturer.

Bermatingen, May 2019
Maschinenfabrik Bermatingen GmbH & Co. KG
Company management

[Signature]
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Information concerning the mulchers

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Maschinenfabrik Bermatingen GmbH & Co. KG
Kesselbachstr. 2
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Phone +49 (0) 75 44 / 95 06 0
Fax +49 (0) 75 44 / 52 07

Rating plate of your implement

Serial number (ser.no.) is located on the rating plate on your mulcher. Please enter this serial number here:

Without this serial number, claims under guarantee and queries cannot be processed.

Symbols in these operating instructions

The following symbols are used in these operating instructions:

- This symbol is positioned before activities to be carried out

Indication of danger to humans

Failure to comply with this information can result in hazards to life and limb for people.

Attention Indication of material or personal injury

Note Positioned before text which provides additional information.
Warnings for humus product line

Explanation of the pictograms

- **Exclamation mark**: Read and comply with the operating manual.
- **Key and wrench**: Prior to maintenance and repair tasks switch off the motor and remove key.
- **Person and distance**: Maintain a safe distance when the motor is running.
- **Bird and prohibition sign**: Danger due to rotating machine parts.
- **Headphones and glasses**: Wear eye protection and hearing protection.
1. Safety requirements

Are you among that group of people who do not read operating manuals?
For your own safety and for the safety of others you must read this manual before
starting up the implement.

In spite of high safety standards of the mulcher there is residual risk of hazards for people,
animals and objects is associated with its operation.

Due to the rotating blade roller you must pay particular attention to the
following dangers:

– Cutting unit damage due to foreign objects, such as bottles, metal parts, rocks, etc.
– Danger of injury due to rotating components
– Residual danger due to objects that are whirled up, such as rocks, etc.

Follow the instructions in this manual and you will enjoy working with your machine for
many years.

1.1 General safety requirements

1. Climbing on the mower is prohibited.
2. Only execute maintenance and inspection tasks under the lifted implement
that is additionally secured with support trestles.
3. Danger due to tools that do not come to an immediate standstill after they are
switched off.
4. Protective cloths and pendulum flaps and their fastenings must be checked for
damage.

In addition to the instructions below, the statutory safety and accident protection regulations
must also be complied with.

1.2 Machines with hydraulic drive – hydraulic safety requirements

– The hydraulic equipment is configured for a maximum permissible pressure of 250 bar.
– At attachment to the towing vehicle, it must be ensured that this pressure is not exceeded
under any circumstances (adjustment of the vehicle-side pressure limiting valve).
– Visually inspect the hydraulic lines prior to each start-up.
– Do not, under any circumstances, work with the implement if hoses and fittings
are damaged.
– Hoses and fittings must fit together and should be from the same manufacturer.
– Hose lines must be checked for damage by an expert on a regular basis (at least once
a year) (chafing marks, cracks, cuts, bulges, etc.) and replaced if necessary.
– Hydraulic hose lines must be completely replaced every 6 years at the latest.
The date of manufacture is stamped on the line fitting.
– Collect or bind escaping hydraulic oil and dispose of it as prescribed.
– Comply with environmental regulations.

1.3 Transport safety requirements, front & rear attachment

• Attention: Only transport the mulcher in switched-off status.
• Otherwise the regulations of the Highway Traffic Act (StVZO § 53b) concerning
the recognition of attached devices; the owner is responsible in this regard.
1.4 Operation

- The mulcher must only be used for mulching grass.
- Only execute the activities described in this operating manual on the mulcher.
- Never operate the mulcher with defective or lost protective devices.
- Never remove protective device!
- Prior to each start-up, check whether cutter and fastening screws are properly fastened and secured.
- Wear protective goggles when mulching.
- Wear hearing protection when mulching.
- Use the chain attached to it to safeguard the universal joint shaft protective pipe from running along with the shaft (see operating manual of the universal joint shaft).
- Prior to mulching, foreign objects (rocks, branches, bottles, etc.) must be removed from the area to be mulched.
- Instruct all persons to leave the direct hazard area.
- Only the operator (tractor operator) is allowed in the mulcher's hazard area, and the operator must be in the operating position/at the guide bar.
- If persons, pets or motor vehicles approach the direct hazard area, mulching must be interrupted.
- With the implement attached, transporting other persons on the passenger seat of the tractor is prohibited.
- Only lift out the mulcher when the mower is at a complete standstill.
- A different use or use that extends beyond that specified above, as well as unauthorized modification are considered non-intended use.
  The manufacturer is not liable for damage resulting from non-intended use.
  This risk is borne solely by the user.

1.5 Maintenance, care and repair

- Only perform the tasks described in this operating manual for maintenance and care of the mulcher.
- Repair and overhaul tasks on the mulcher must only be performed by the manufacturer or by the authorized dealer (agriculture machine workshop).
- Only use original spare parts from the manufacturer.
- Only perform maintenance and care tasks in switched-off status of the towing vehicle, and safeguard the towing vehicle from being switched on again.
- Never position yourself under the non-safeguarded mulcher for repair or inspection.
2 Attachment on the single-axle tractor

2.1 Attachment

Prior to executing the attachment, always ensure that the profile of the connection shaft and the profile of the connection piece fit together. The specifications of the implement carrier must also be taken into account.

Attention!
Fasten the drive shaft for transport of the mulching head (loose part)!

Attachment:
- Alignment of the mulching head to the single-axle tractor
- Grease the connection piece
- Dismount the protective cover
- Insert drive shaft, check the position according to implement carrier information!
- Join single-axle tractor and mulching head together.
- In this process, turn the drive with the belt pulley so that the gearing of the drive shaft engages, slide the devices together to the stop.
- Install the locking screw (bolt, snap-closure) on the connection piece.
- Check implement carrier connection (screws, snap-closure, bolt) locking mechanism
- Grease the connection piece again

Function test – test run:
Check rotor shaft speed and direction of rotation, see chapter "Rotor shaft speeds".

Attention
The specified speed of the blade shafts of the machine (see sticker on the housing) must not be exceeded.

Brake test (at each new attachment, at least 2x a year):
- Brake is installed in the gearbox
- Set the max. speed
- Pull motor clutch and switch off drive
  Thereafter the blade shaft must come to a standstill in approx. 7 seconds

The mulcher is now ready for operation

Note
General check after first start-up
After approx. 2 hours of machine operation:
- Check V-belts
- Check track roller
- Check blade shaft; firm seat of the blade is strictly required!
- Re-grease all lubricating points!
2.2 Attachment with quick coupling

Prior to executing the attachment, always ensure that the profile of the connection shaft and the profile of the connection piece fit together.

**Attention!**
Fasten the drive shaft for transport of the mulching head (loose part)!

**Attachment:**
- Alignment of the mulching head to the single-axle tractor
- Grease the connection piece
- Dismount the protective cover
- Insert drive shaft, check the position according to implement carrier information!
- Join single-axle tractor and mulching head together.
- In this process, turn the drive with the belt pulley so that the gearing of the drive shaft engages, slide the devices together to the stop.
- Install the locking screw (bolt, snap-closure) on the connection piece.
- Check implement carrier connection (screws, snap-closure, bolt) locking mechanism
- Grease the connection piece again.

**Function test – test run:**
Check rotor shaft speed and direction of rotation, see chapter “Rotor shaft speeds”.

The specified speed of the blade shafts of the machine (see sticker on the housing) must not be exceeded.

**Brake test** (at each new attachment, at least 2x a year):
- Brake is installed in the gearbox
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- Pull motor clutch and switch off drive
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The mulcher is now ready for operation

**Note**
General check after first start-up
After approx. 2 hours of machine operation:
- Check V-belts
- Check track roller
- Check blade shaft; firm seat of the blade is strictly required!
- Re-grease all lubricating points!

The locking screw can be used for a rigid or pivoting mulching head – for this it must be screwed in either on the left or right.
2.3 Attachment adapter

**Attention** The safety mulchers for single-axle tractors are attached with type-specific adapters.

Drive speed variants of single-axle tractors 840 rpm, 900 rpm, 1000 rpm

![Attachment adapters for different manufacturers: Aebi, Köppl, Irus, Rapid, Agria, Reform.](image-url)
2.4 Attachment with hydraulic drive

For all tasks on the hydraulic system of this implement, the hydraulic safety requirements on page 6 point 1.2 must be strictly complied with.

The attachment is executed by an authorised specialist. This machine type is not driven with a universal joint shaft, but rather it is driven hydraulically. The configuration of the mulcher and the connection condition was already specified when the machine was purchased.

At first attachment and first start-up
- a speed check on the cutting roller and
- capacity check of the hydraulic system
must always be executed by the same specialised workshop.

**Attention**

Never exceed the highest permissible blade shaft speed. The highest permissible blade shaft speed for your implement is specified on the sticker next to the rating plate.
3. Adjustment tasks

3.1 Adjusting the cutting height on the attached single-axle tractor

On the implement carrier pull the parking brake and switch off the drive motor!

Basic setting A and B results in a cutting height of approx. 50 mm.

Basic setting of the cutting height:

- Position mulching housing with top link 3 parallel to the level surface A.
- If the track roller is not in B, then unscrew threaded fittings 1, re-insert track roller in B and tighten threaded fitting.

Fast adjustment of the cutting height:

- Unscrew 2 screws and adjust the cutting height by turning the top link 3.

![Diagram of cutting height adjustment](image)

**Note**
The fast adjustment of the cutting height is easy to executed with the provided special spanner 4.

**Note**
Recommended cutting height adjustment for the following conditions:

- Difficult terrain: Set the cutting height higher!
- Low engine power: Set the cutting height higher!
- Reduce fuel consumption: Set the cutting height higher!
- Clean cut: Set the cutting height lower!
- Improve the cutting quality Set the cutting height lower!
3.2 V-belts

**Attention:** All tasks on the V-belts must only be performed when the mulcher is switched off and has been safeguarded from being switched on again.

At first use of the mulcher, check the V-belt tension after 1/2 hour of operation. Check the V-belt tension after overload or at each lubrication interval.

### 3.2.1 Check the V-belt tension

1. Open the inspection cover A
2. Push on the belt (Fig. 3).
3. At a pressure of 50 N it should be possible to press the belt in approx. 0.5 cm.
4. Close the inspection cover.

### 3.2.2 Check and retension the V-belts

1. Dismount the protective cover. (Fig. 2)
2. Visual inspection of the V-belt drive for contamination, loose parts, and wear of the parts
3. Retension: Unscrew fastening screws 1 and 2 (8 screws in total).
4. Slide the gearbox parallel with the aid of tension screw 3 until the correct belt tension is achieved (50 N, belt can be pushed in 0.5 cm).
5. Fix fastening screws in place and mount the protective cover.

### 3.2.3 Replacing the V-belts

1. Dismount the protective cover. (Fig. 1)
2. Visual inspection of the V-belt drive for contamination, loose parts, and wear of the parts
3. Replacing: Loosen fastening screws 1 and 2, as well as tension screw 3.
4. Slide gearbox to the stop; ensure the least possible centre distance of the belt pulleys.
5. Replace V-belts.
6. To tension the new belts execute the steps in the reverse sequence.
7. Check V-belt tension after 1/2 hour of operation.
4. Rotational speeds – rotor shafts

Attention: Rotor shaft speed must be checked at first start-up or when the single-axle tractor is changed.

Max. permissible rotation on the rotor shafts:

<table>
<thead>
<tr>
<th>Safety shaft:</th>
<th>Rotor shaft – flails:</th>
<th>Rotor shaft – fine-cut blade:</th>
</tr>
</thead>
<tbody>
<tr>
<td>4950 rpm</td>
<td>3100 rpm</td>
<td>3100 rpm</td>
</tr>
</tbody>
</table>

Drive-speed variants on the single-axle tractor:
840 rpm, 900 rpm, 1000 rpm

Hydraulic drive:
Rotational speed is set according to the power of the single-axle tractor.

Check the rotational speed and direction of rotation:
Remove belt guard and check the rotational speed on the centring element of the cutter shaft with a rotational speed measuring device.
(Safety shaft = 4000 – 4950 rpm, Rotor shaft = 2700 – 3100 rpm)

ATTENTION: The maximum rotational speed for your implement is specified on a yellow sticker next to the rating plate!

ATTENTION: For safety reasons the maximum rotational speeds must never be exceeded!

Flail shaft works effectively starting at a rotational speed of 2700 rpm.
Safety shaft works effectively starting at a rotational speed of 4000 rpm.
5. Working with the mulcher

5.1 Check before work

Prior to each start-up of the mulcher you must execute the following preliminary tasks:

- Checks on the mulcher:
  - Check for completeness of the protective devices
  - Check for completeness of the fastening bolts and locking pins of the implement suspension
  - Check the fastening of the blades
  - Faultless condition of the blades – not notched, damaged or worn!
  - Ensure adequate lubrication
  - Check the tension of the V-belts
- Remove solid objects (e.g. rocks, wires, pieces of wood, molehills, etc.) from the area to be mulched.
- Instruct persons to leave the direct hazard area.

Attention: Only start up the mulcher after all safety requirements have been fulfilled (see section 1.).

5.2 Mulching

After the mulcher is attached on the tractor, all adjustment tasks have been executed, the mulcher has been checked (section 5.1) and the safety precautions have been taken, you can now mulch.

To mulch, proceed as follows:

- Lower the mulcher.
- Switch on the drive shaft and increase the speed to the rated speed.
- The mulcher is ready for operation.

5.3 Drive speed and cutting speed

The drive speed is based on the density, the height and the condition of the mulch material. The fineness of the much material decreases with increasing drive speed. To achieve optimal mulching performance, we recommend the highest permissible PTO shaft speed / cutting roller speed.

Blades in good condition ensure a higher work rate and lower fuel consumption, as compared to worn or damaged blades!

Flail shaft works effectively starting at a rotational speed of 2700 rpm.
Safety shaft works effectively starting at a rotational speed of 4000 rpm.
6. Care and maintenance

- Only perform the tasks described in this operating manual for care and maintenance of the mulcher.
- Repair and overhaul tasks on the mulcher must only be performed by the manufacturer or by the authorized dealer (agriculture machine workshop).
- Only use original spare parts from the manufacturer, otherwise the guarantee and liability are invalidated.
- Only perform maintenance and care tasks in switched-off status of the mulcher, and safeguard the mulcher from being switched on again (Unplug the spark plug connector).
- Never position yourself under the non-safeguarded mulcher for repair or inspection.

6.1 Care of the mulcher

Care is cheaper than repair. Consequently you should execute the following tasks on a regular basis:

- After each work deployment
  - Clean the mulcher
  - Inspect the gearbox for indications of oil loss.
  - Attention: When using a high-pressure cleaner do not aim the water jet at the bearing positions.

- Every 10 operating hours
  - Lubricate the mulcher

- Every 1000 operating hours
  - Replace gear oil

Note: After each use and after each cleaning the mulcher must be thoroughly lubricated.
6.2 Protective Cover

The mowing device has a protective flap that can only be opened for maintenance, cleaning or changing the blades!

The protective cover can be adjusted by turning the turnbuckle manually.

- Release screw and nut pos. (1) and remove.
- Loosen the nut Pos (2).
- Turn the turnbuckle nut pos. (3) to the desired position of the protective cover.
- To secure the position, tighten the nut Pos (2) again.
- To close the cover, proceed in reverse order.
6.2 Lubricating the mulcher

Attention: Only lubricate the mulcher when the implement is switched off.

The bearings of the mulcher should be lubricated as specified in the table. All lubricating points are marked by stickers/red dot. The lubricating points of the main bearings are covered by plastic caps.

Type 085, 105, 125, 145

The bearings of the safety mulcher must be lubricated as specified in the table. Lubricating points are marked in red.

<table>
<thead>
<tr>
<th>Item</th>
<th>Lubricating point</th>
<th>Lubricant</th>
<th>Number of lubricating points</th>
<th>Operating hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Blade shaft left</td>
<td>Lubricating grease K 2 K-30 (DIN 51502)</td>
<td>1 lubricating nipple</td>
<td>15 h</td>
</tr>
<tr>
<td>2</td>
<td>Blade shaft right</td>
<td>Lubricating grease K 2 K-30</td>
<td>1 lubricating nipple</td>
<td>15 h</td>
</tr>
<tr>
<td>3</td>
<td>Track roller left</td>
<td>Lubricating grease K 2 K-30</td>
<td>1 lubricating nipple</td>
<td>25 h</td>
</tr>
<tr>
<td>4</td>
<td>Track roller right</td>
<td>Lubricating grease K 2 K-30</td>
<td>1 lubricating nipple</td>
<td>25 h</td>
</tr>
<tr>
<td>5</td>
<td>Rotary connection (adapter)</td>
<td>Lubricating grease K 2 K-30</td>
<td>2 lubricating nipple</td>
<td>15 h</td>
</tr>
</tbody>
</table>
ATTENTION: Danger of injury
Before each task on the blade shaft the motor must be switched off and you must wait until the blade shaft comes to a standstill. (Pay attention to the stopping time of the blade shaft!)

6.3 Checking the blades

Check the blade segments and their fastening
Heavily worn blades or blades with broken off teeth do not mow cleanly and consequently must be replaced. In addition they cause imbalance and over time this can damage the implement. The entire blade set or sections, for each circumference of the blade shaft must be replaced.

NOTE: Prior to inspection, maintenance and repair tasks the mower head must be set down safely, in such a manner that it cannot tip. Then the tasks cited below can be executed, e.g. above a work pit or with the aid of a trolley.

Attention: Only the manufacturer or an authorised specialist is allowed to replace the blades of the mower.

DANGER: Never perform welding tasks on the blades or their fastening points. These points are made of a hardened steel. After heat exposure these points can break easily and cause an accident.

Checking the fastening

DANGER: The fastening of the blades must only be checked after the blade shaft (worm shaft) and the vehicle motor have come to a complete standstill. Pay attention to the stopping time of the blade shaft.

The fastening and faultless condition of the blade segments must – be checked before each use of the safety mulcher and after hitting a solid obstruction (see 6.3 Checking the blades).

Check the following components of the blade fastening correct seat:

Fastening parts: 3 screws (strength class 10.9) with self-locking nuts (DIN 980 strength class 10.9) per segment.

Tightening torque: 70 ± 2 Nm – M10 screws
35 ± 2 Nm – M8 screws
6.4 The gear oil

Because the gearbox is basically maintenance-free, topping up gear oil is dispensed with. If there are leaks the gearbox must be repaired immediately by a specialised workshop.

The gear oil must be replaced every 1000 operating hours. Go to a specialised workshop for this.

Note: Heating of the gearbox to 80°C during operation is normal.

Attention: Only the manufacturer or an authorised workshop is allowed to repair the gearbox.

6.5 Use of spare parts

Always use only original "humus" spare parts. If other parts are used the product liability in accordance with CE-conformity is invalidated!

When ordering spare parts, always specify the precise type, model year, and the machine number of the mulcher.

Maschinenfabrik Bermatingen GmbH & Co. KG
+49 (0) 75 44 / 95 06-0, Fax +49 (0) 75 44 / 9506 - 677

Spare part orders +49 (0) 7544-9506-41 or 42
7. Technical data

**SAFETY mulcher gearbox, flail mulcher gearbox:**

<table>
<thead>
<tr>
<th></th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>085</td>
</tr>
<tr>
<td>Working width (m)</td>
<td>0,80</td>
</tr>
<tr>
<td>Implement width (m)</td>
<td>0,99</td>
</tr>
<tr>
<td>Power requirement (hp)</td>
<td>approx. 11</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>See rating plate</td>
</tr>
<tr>
<td>Max. speed – safety shaft</td>
<td>4950 rpm</td>
</tr>
<tr>
<td>Max. speed – flail shaft</td>
<td>3200 rpm</td>
</tr>
<tr>
<td>Noise emission value*</td>
<td>Lp 88 dB(A)</td>
</tr>
</tbody>
</table>

* At the operator's ear

**SAFETY mulcher hydr. drive, flail mulcher hydr. drive:**

<table>
<thead>
<tr>
<th></th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>105</td>
</tr>
<tr>
<td>Working width (m)</td>
<td>1,00</td>
</tr>
<tr>
<td>Implement width (m)</td>
<td>1,19</td>
</tr>
<tr>
<td>Power requirement (hp)</td>
<td>approx. 15</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>See rating plate</td>
</tr>
<tr>
<td>Max. speed – safety shaft</td>
<td>4950 rpm</td>
</tr>
<tr>
<td>Max. speed – flail shaft</td>
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</tr>
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* At the operator's ear