Operating Instructions

SAFETY-Mulcher
Type 090, 105, 125, 145, A155, A180, A200

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Declaration of Conformity

for

SAFETY-Mulcher

Type: 090, 105, 125, 145, A155, A180, A200

manufactured by us

Ident-No.: Standard machine with mechanical drive 266 00 000
Standard machine with hydraulic drive 267 00 000
Standard machine with single-axle carrier 270 00 000
A155H 186 00 000 A180A 183 00 000
A180H 188 00 000 A200A 182 00 000
A200H 184 00 000

We confirm the compliance with the requirements of the standard 98/37 EG guidelines including the modifications and amendments published to date. Corresponding technical documentation can be supplied. The following standards and guidelines were followed during construction and production:

EN 292 T1/T2 Safety of machinery (general)
EN 745(8/99) Safety requirements for agricultural and forestry machines-rotary mowers and mulching machines (stone impact test)
EN 811 (12/96) Safety of machinery (Safety distances to prevent danger zones being reached by the lower limbs)
EN 12 733
- Especially safety distances
- After-running time of cutting unit
- Thrown object test
- Mountin on carrier vehicle according to Operating Instructions p. 15-17 only

Bermatingen, May 2001
Maschinenfabrik Bermatingen GmbH & Co.
General Manager

Ulrich Gotterbarm
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General Information for the mulching machines

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Your mower serial plate

The Serial Number (Ser. Nr.) appears on the serial plate of your machine. Please enter this number in the following field:

Warranty claims and enquiries cannot be processed without the serial number.

Symbols used in these Operating Instructions

The following symbols are used in the operating instructions:

- This symbol appears in front of work which must be undertaken.

Warning – personal danger
Non-compliance of this reference can endanger health and life of persons.

ATTENTION Reference to material damage or personal danger

NOTE Appears in front of text which contains additional information
Pictograms for the humus product range

Explanations to warnings

<table>
<thead>
<tr>
<th>Pictogram</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Exclamation Triangle" /> <img src="image2" alt="Book" /></td>
<td>Meaning: Read and observe operating instructions prior to use.</td>
</tr>
<tr>
<td><img src="image3" alt="Exclamation Triangle" /> <img src="image4" alt="Key" /></td>
<td>Meaning: Stop engine and remove key prior to carrying out any maintenance or repair work.</td>
</tr>
<tr>
<td><img src="image5" alt="Exclamation Triangle" /> <img src="image6" alt="Person" /> <img src="image7" alt="Safety Clearance" /></td>
<td>Meaning: Possible danger due to catapulting parts. Maintain safety clearance when the engine is running.</td>
</tr>
<tr>
<td><img src="image8" alt="Exclamation Triangle" /> <img src="image9" alt="Hand" /> <img src="image10" alt="Rotation" /></td>
<td>Meaning: Possible danger from rotating machine parts.</td>
</tr>
<tr>
<td><img src="image11" alt="Eye Protection" /> <img src="image12" alt="Ear Protection" /></td>
<td>Meaning: Use eye and ear protection.</td>
</tr>
</tbody>
</table>
1 Safety regulations

Are you one of those people who do not read operating instructions? For your own safety and for the safety of others, these instructions must be read before putting the machine into operation.

Despite the high safety standards of the machine, during operation there is potential danger to people, animals or objects.

Due to the rotating blade roller, the following dangers should be taken into account:

– Damage at the cutting device through debris, like bottles, metal parts, stones etc.
– Rotating machine components causing injuries
– Potential danger through flying objects, like stones etc.

Follow these operating instructions and your mulcher will give you pleasure for a long time.

1.1 General safety regulations

1. Do not climb on the machine
2. Do not undertake maintenance or inspection unless the machine is secured with chocks and suitable lifting equipment.
3. Danger from parts which continue to rotate while stopping.
4. Protection covers and pendulum flaps and mountings have to be checked for damage.

In addition to the following instructions, the legislative safety and accident prevention must be observed.

1.2 Machines with hydraulic drive

Hydraulic safety regulations

– The hydraulic unit is designed for a maximum permissible pressure of 250 bar.
– When mounting on the tractor, please ensure that this pressure will under no circumstances be exceeded. (Adjust the pressure limiting valve of the vehicle.)
– Before starting the mulcher, always visually examine the hydraulic hoses.
– Under no circumstances use the mulcher with damaged hoses or fittings.
– Hoses and fittings have to match and should be from the same manufacturer.
– At least once a year, all hoses should be checked for damage (chafe marks, cracks, cuts, bulges etc.) by a specialist and changed if necessary.
– All hydraulic hoses are to be replaced at least every 6 years. The manufacturing date is marked on all fittings.
– Collect and dispose of any hydraulic fluid which has escaped.
– Please observe the environmental regulations.

1.3 Transport

Safety regulations, front and rear mounting

• Attention: Only transport the mower whilst it is switched off.
• When transporting the mulcher on public roads, the mower has to be fixed centrally (in the middle) on the tractor.
• Fix mechanical swinging unit with locking bolt.
  Fix hydraulic swinging unit.
• According to relevant road traffic laws, when front mounted, the hydraulic lever for raising and lowering the mulcher must be mechanically locked whilst being transported on the road.
  The driving speed has to be adjusted to the prevailing road and traffic situation.
  Pay attention to the effect of the mower on the axle load distribution when braking.
• In addition, check the relevant road licensing regulations with regard to the identification procedure for such mounted machines.

1.3.1 Transport – safety regulations for the side mulcher

Positioning of the mulcher for transport

While transporting the mulcher, the following points have to be observed:
– Be aware of the dimensions and overhang of mulcher and vehicle (endangering other road users) and fix the signs required by the road traffic regulations.
– During transport, the PTO shaft must always be switched off.
– Check, if the safety hook ① of the mulching head is clicked into place.
– Block hydraulic tilting cylinder and hand lever valve ②.

Only raise or bring the side mower into transport position, if the vehicle is stable.

When transporting the mulcher, only drive slowly, specially on bad roads. The weight of the mulching machine could affect vehicle performance and lead to damage of the mulcher or the vehicle.
1.4 Operation

- The mower may only be used to cut grass and similar vegetation.
- At the mower, only carry out the functions described in the operating instructions.
- Never operate the mower if the safety devices are faulty or missing.
- Never remove the safety devices.
- Check each time before putting into operation, whether the cutters and fastening bolts are properly tightened and secured (see also section 5.5).
- Always wear eye protection and ear protection if necessary.
- Before mowing, remove any foreign objects lying on the mowing area, like bottles, tins, stones. They cause damage to the mower, especially at the safety cutting roller. Despite the safety cutting roller, one cannot be 100% sure that these foreign objects will not cause damage/injury.
- Attach the safety chain to prevent the PTO shaft protective tube from turning (see operating instructions for the PTO shaft).
- Only switch on the mower when lowered.
- **Instruct everyone to leave the danger zone.**
  The danger zone covers an area with a radius of 100 m. The owner is responsible.
- Only the operator, i.e. the driver of the vehicle, sitting on the vehicle seat, is allowed to be within the danger zone of the mower.
- It is forbidden to allow any other people to sit on the seat next to the vehicle driver whilst he is driving, once the mower has been mounted.
- **If any people or vehicles should approach the machine within the danger zone (radius of 100 m), the mower must be switched off immediately.**
- **Do not raise the mower until the machine is at a complete standstill and the vehicle is in a stable position.**
- Authorised use includes adhering to the manufacturer’s specified operation, service and maintenance conditions. Any unauthorised modifications invalidate the warranty and product liability.

1.5 Maintenance, service and repair

- When undertaking maintenance and servicing, only proceed as described in these operating instructions.
- Repairs to the mulching machine may only be carried out by the manufacturer or an authorised specialist dealer (a specialist repair workshop for agricultural machinery).
- Use only original spare parts obtained from the manufacturer.
- Maintenance and repair work may only be carried out when the vehicle is switched off and secured against accidental restarting (by removing the PTO shaft).
- Never go underneath the mower, to repair or check it, if it has not been made safe.
2. Mounting and removal from the carrier vehicle (three-point)

It is absolutely necessary to check if the carrier vehicle is permitted to take the load of the mulching machine.

The mulching machines are suitable for mounting on a vehicle with hydraulic three-point linkage.

Attention: No-one may stand between the vehicle and the mulcher when coupling.

2.1 Mechanical drive

• For rear mounting, drive the vehicle in reverse towards the mower and position the lower guide rods (1) so that they fit into the lower suspensions (2) of the mower.
  Note: For mounting at the front, the three-point frame is located at the rear of the mower. In this case, the vehicle drives forward up to the back of the mower. Otherwise, mounting onto front or rear machines is identical.
• Push the fastening bolts (3) either from the inside or the outside through the suspension hooks and lower guide rod.
• Secure the fastening bolts with pins (4).
• Push the vehicle top link (5) into the three-point frame (6).
• Push the fastening bolt (7) through the three-point frame and top link and secure with the pin (8).
• Remove chain (9) from fastening bolt.
  Note: the chain attached to the fastening bolt serves for supporting the PTO shaft when the mower is not mounted on the vehicle.
• Tighten the supports (adjusting chains) on both bottom links.

Figure 1: Mounting onto the vehicle
• Adjust the PTO shaft (10) to the required length and couple it to the vehicle (see operating instructions for the PTO shaft).
• Fasten the support chain (11) for the PTO shaft protection onto the mower.
• Check, if the rotation speed and the direction of rotation of the drive shaft correspond to those of the mulcher. If necessary, adjust the rotation speed at the vehicle as required.
• Connect hydraulic hoses (12) to the connections on the carrier vehicle.
• The carrier vehicle top link (with front and rear mounting) may only be fixed inclining downwards from the machine to the tractor. Otherwise the machine would be damaged when driving through fields. When front mounted, the top link may only be driven in the long hole. Should there be a hydraulic lifting load alleviation at the carrier vehicle, it should be adjusted to 30 - 50 kg, depending on the model of the carrier vehicle.
• Lift supporting leg and fix it with the plug-in pin.

Rear and front mounting are identical. For disconnecting the mulcher, follow the instructions in reverse.

Mounting - Note

Note: The revs of the cutter rotor have to be at least 2250 1/min.

Always check the revs at the rotor, as the score for the PTO at the carrier vehicle is often too inexact!

Mounting

1. Place support for roller into the uppermost position, directly to the edge of the housing.
2. Fix bolt connection between plate and roller bearing M12-35 in the uppermost hole.
3. Fix top link on one of the two long holes (depending on model of carrier vehicle).
4. Should the carrier vehicle be AEIBI, it is essential to remove the suspension.

2.2 Mounting PTO drive shaft

After undertaking the above, mount the PTO drive shaft. Make sure that the overlap is at least 2/3 of the length of the stroke when the PTO drive shaft is closed. To achieve this, leave a play of at least 4 cm (see figure 12). If the space has to be shortened, do this as indicated on the drawings (figure 13).

To prevent rotation, secure the PTO guards with chains between the mulcher and carrier vehicle.

The overlap of cap and PTO shaft has to be at least 5 cm (figure 14).
2.3 Mounting side mulcher

Connecting and disconnecting at the carrier vehicle

Before executing these steps and before every use of the side mulcher, please pay attention to the following points:

Attention: side mulchers require an additional safety load of 40 % to the weight of the mulching machine, which has to be taken into account.

– General visual check of the mower.
– Inspection of all safety devices for faults.
– Check the blades for faults.
– Lubrication of the bearings and all greasing points marked with corresponding stickers.
– Inspection of the hydraulic hoses for damage and possible oil leaks (check ground).
– Check the rotation speed and its direction correspond to that of the side mulcher.
– To connect the mulcher to the carrier vehicle (figure 12), approach both arms of the hydraulic lifting device of the vehicle (1) to the bolt couplings of the side mulcher.
– Insert both bolts (2) with the corresponding safety split-pin (3).
– Insert the top link (4) and attach the PTO shaft (6).

The hydraulic hoses are attached to the connections on the carrier vehicle. Unlock hand lever valve at the hydraulic tilting cylinder. Then, the mower can be brought into the transport position using the tilting cylinder.

When lifting the mower, always pay attention to the ground clearance and contact with other components (danger of squashing cables). Ensure the carrier vehicle is in a safe position.

For disconnecting the side mulcher from the vehicle, follow the instructions indicated above, in reverse.
2.3.1 Balancing on the carrier vehicle

The nature of the side mulcher and its function require good stability on the carrier vehicle, to prevent imbalance or possible tipping.

- Arrange the wheels of the carrier vehicle with its maximum track width (figure 15).
- Weight the rear wheel, on the opposite side to the machine, and the front of the carrier vehicle (figure 16).
- In extreme cases and only for the duration of mowing, block the front axle joint by inserting a spacer between frame and axle (figure 17).
- Never work on an extreme slope or with the carrier in a dangerous position.

2.3.2 Lowering the side mulcher

- To avoid tipping, only lower the machine on flat and solid ground.
- Lower and block the support leg before lowering the machine using the hydraulic lifting device. Unlock the transport securing device, site the mulcher in working position, block the hydraulic locking valve at the tilting cylinder (18). To remove, follow the procedure as explained in the chapter on mounting and removing the three-point lift.
2.4 Mounting with quick coupling triangle

To mount the Safety-Mulcher, a carrier vehicle with front PTO shaft and front lifting gear with coupling triangle is required. No tools are required, the mulcher is mounted with the quick release coupling triangle. The mulcher is aligned to allow the carrier to drive up to the coupling triangle. The coupling triangle is lowered to the ground and below the triangle of the mulcher when driving forward. The triangle is lifted with the hydraulics on the carrier and the mower hooks into the front lift. Then, the locking bolt (bolt 1) has to be inserted at the triangle of the mulcher and secured with the spring cotter. If this is not possible, the locking unit has to be tightened. To do so, both nuts have to be unscrewed, the locking unit adjusted to insert the bolt, and then tightened correctly again. A PTO shaft is required for the power transfer between the multi–equipment carrier and the mower. Only the PTO shaft supplied by the manufacturer is to be used.

Attention:
Pay attention to the safety and maintenance notes in the PTO shaft operating instructions!

2.4.1 Pendulum suspension function of the mulcher

A pendulum function has been fitted for driving over uneven ground. When transporting the mower, this pendulum function must be locked with bolt 2 and use the spring cotter for securing it (see picture on left).

Attention:
If the bolts (1 and 2) are not fitted properly, this could endanger the carrier vehicle, mulching machine, people and other road users!
2.5 Mounting hydraulic drive

Before undertaking any work on the hydraulic system of this mulcher, it is absolutely essential to follow the general safety regulations on page 6, point 1.1.

Mount as explained on page 9, point 2. This model has hydraulic drive instead of a PTO drive shaft. The hydraulics and connections required are specified when the machine is purchased. When first installed and put into use, the following must be checked by a specialist – rotational speed at the rotor and the – performance test of the hydraulics

ATTENTION

Never exceed the maximum rotational speed of the rotor. The maximum rotational speed of the rotor of your mower is indicated on the sticker beside the rating plate.

2.6 Side adjustment of all models

Before mounting onto the carrier vehicle the manual side adjustment is set, fixed with a bolt and secured by a spring pin. With the hydraulic side adjustment, the mounted machine can be pushed to the side by the hydraulic cylinder.
2.7 Mounting on single-axle carriers

Note: The appropriate revs for an optimal work output are 4300 - 4995 revs/min.

2.7.1 Mounting without quick coupling

Before executing the mounting, always make sure that the profile of the drive shaft and the piece to be connected match (see Fig. chap. 2.7.4).

**Mounting:**
- Align the mulching head.
- Grease connection piece.
- Insert drive shaft.

**Attention!**
Fix drive shaft of the mulching head during transport (loose part)!

- Join carrier vehicle and mulching head
- and keep on turning the cutter roller slowly, so that the gearing of the drive shaft latches.
- Insert safety screw at the connection piece.
- Grease connection piece once again.

**Operation test:**
- Check revs and direction of rotation.
  Remove v-belt cover and check revs at the centring of the cutter roller with a rev-counter.

**Attention!**
Never exceed the allowed revs of the machine (see sticker on the housing).

**Brake test** (always after a new mounting, min. 2 x per year):
- Brake is installed in the drive.
- Fix max. revs.
- Pull drive coupling and switch off drive.
The cutter roller has to come to a complete standstill after 7 seconds.

**General checks:**
After approx. 2 hrs. of operation:
- Check v-belts
- Check roller
- Check cutter roller; firm fit of the cutters is absolutely necessary!
- Grease all appropriate units once again!
2.7.2 Mounting with quick coupling

Before executing the mounting, always make sure that the profile of the drive shaft and the piece to be connected match (see Fig. chap. 2.7.4).

Mounting:
– Align the mulching head.
– Join carrier vehicle and mulching head and keep on turning the cutter roller slowly, so that the gearing of the drive shaft latches.
– Insert safety screw at the connection piece.

Operation test:
– Check revs and direction of rotation.
  Remove v-belt cover and check revs at the centring of the cutter roller with a rev-counter.

Attention!
Never exceed the allowed revs of the machine (see sticker on the housing).

Brake test (always after a new mounting, min. 2 x per year):
– Brake is installed in the drive.
– Fix max. revs.
– Pull drive coupling and switch off drive.
The cutter roller has to come to a complete standstill after 7 seconds.

General checks:
After approx. 2 hrs. of operation:
– Check v-belts
– Check roller
– Check cutter roller; firm fit of the cutters is absolutely necessary!
– Grease all appropriate units once again!
2.7.3 Adapters for mounting

- Agria from 2003
- Bucher
- Vogel/Noot
- Agria until 2002
- Aebi
3 Types of drive

3.1 The PTO drive shaft

Attention: Maintenance of the PTO shaft must conform with the manufacturer’s operating instructions. Observe the manufacturer’s safety regulations! Replace faulty or missing protective tubing, guards and supporting chains immediately.

Attention: Only use the PTO shaft supplied with the mower and ensure it is kept in good condition.

3.1.1 Revs

Rotation speed (carrier vehicle): 540 rpm, 1000 rpm, 1500 rpm, 2000 rpm, 2350 rpm.

3.2 Hydraulic drive

3.2.1 Rotation speed

Maximum permissible rotation of blade rotor:

- Model 105–145: 4950 rpm
- Model A155A–A200A: 2950 rpm

Attention: The maximum rotation speed for your mower is indicated on a yellow sticker beside the rating plate!

Attention: For safety reasons, never exceed the maximum rotational speed!

4 Adjustments

4.1 Cutting height adjustments

The cutting height is adjusted by the roller (loosen screw 1, insert in the required hole and tighten again) and by turning the carrier vehicle top link.

Attention: Set the cutting height so that the cutters do not touch the ground. Only set the cutting height when the mower has come to a complete standstill.

Exceptional for the models A 155-200:

- The mower is mounted optimal, when the culling height is adjusted to 30 mm, the machine is horizontally and the distance between skid and ground is 15 to 20 mm.
5 Working with the mulching machine

5.1 Check before commencing work

Before operating the mower, the following preliminary work must be done each time:

- Checks at the mower:
  - the safety guards are completely in order
  - the attachment bolts and securing pins for suspending the mower are completely in order
  - the cutters are secured
  - sufficient lubrication has been carried out
  - the v-belt tension is correct
- Remove any hard objects (e.g. stones, wire, pieces of wood, mole-hills, etc.) from the grass strip to be mown.
- Ensure that nobody is within the danger zone (within a radius of 100 m).

ATTENTION: Only take the mover into operation, if all safety regulations are adhered to (see chap.1).

5.2 Operation

Once the mower has been mounted onto the tractor, all the adjustments have been carried out and after the mulcher has been checked (see chapter 5.1) and the safety regulations are adhered to, mowing can now commence.

To mow, proceed as follows:

- Lower the mower
- Release socket pin of the swinging protection and hydraulic side adjustment safety device.
- Switch on the PTO shaft and increase to nominal speed.
- The mulcher is ready for operation.

5.3 Driving speed and cutting speed

The driving speed has to be adjusted to the density, height and kind of the material to be mowed. The fineness of the mulched material decreases as the driving speed increases.

For optimal results, we recommend the highest permissible drive shaft/cutting rotor speed.
6 Care and maintenance

- For care and maintenance of the mower only the functions described in these operating instructions may be carried out.
- Repair work on the mulcher may only be carried out by the manufacturer or an authorised specialist dealer (specialist workshop for agricultural vehicles).
- Only use original spare parts from the manufacturer. Otherwise, there is no warranty or responsibility.
- Only carry out maintenance work on the mower when it is switched off and secured against being switched on again (uncouple the PTO shaft).
- Never go underneath the mower to do repairs or checking unless it has been secured against being switched on.

6.1 Maintenance work on the mulching machine

Care is cheaper than repair.

Therefore, you should carry out the following on a regular basis:

- After each application:
  - clean mower
  **Attention:** When using a high pressure hose do not point directly towards the bearings.
  - check gearbox for possible oil leaks.

- After every 10 hours of operation:
  - lubricate the mower

- After ever 1000 hours of operation:
  - renew gear oil

*Note: Always grease after use and cleaning.*
6.2 Lubrication of the mulcher

Attention: Only lubricate the mower when it is switched off.

The bearings of the mower should be greased according to the table. All grease points are marked by stickers. The grease nipples of the main bearings are covered with a plastic top.

The bearings shall be greased according to the table. Greasing points are marked in red.

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Greasing point</th>
<th>Type of grease</th>
<th>No of grease nipples</th>
<th>Hours of operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>knife rotor left</td>
<td>lubricating grease K 2 K-30 (DIN 51502)</td>
<td>1 grease nipple</td>
<td>15 hrs.</td>
</tr>
<tr>
<td>2</td>
<td>knife rotor right</td>
<td>lubric. grease K 2 K-30</td>
<td>1 grease nipple</td>
<td>15 hrs.</td>
</tr>
<tr>
<td>3</td>
<td>roller left</td>
<td>lubric. grease K 2 K-30</td>
<td>1 grease nipple</td>
<td>25 hrs.</td>
</tr>
<tr>
<td>4</td>
<td>roller right</td>
<td>lubric. grease K 2 K-30</td>
<td>1 grease nipple</td>
<td>25 hrs.</td>
</tr>
<tr>
<td>6</td>
<td>PTO shaft-bearing</td>
<td>lubric. grease K 2 K-30</td>
<td>2 grease nipples</td>
<td>75 hrs.</td>
</tr>
<tr>
<td>7</td>
<td>PTO shaft-telescopic section</td>
<td>lubric. grease K 2 K-30</td>
<td>use a brush for lubricating</td>
<td>100 hrs.</td>
</tr>
</tbody>
</table>

Note: The joints at the extension arm are fitted with maintenance-free bushes. Clean the grease nipple before lubricating. Do not use excessive pressure when greasing.
6.3 Checking the cutters

Checking the cutter segments and its fixings

Badly worn cutters do not give a clean cut and therefore have to be replaced – always ensure the rotor is balanced and change cutters as required. When changing the cutters, always change either the whole cutter set or segments to a circumference of 3 cutters.

Note: Before undertaking inspection, maintenance and repairs, the mulching head has to be laid down safely and stable. Then, the above mentioned work can be executed by using an inspection pit or a creeper.

Attention: The cutters may only be replaced by the manufacturer or an authorised specialist dealer.

DANGER: Never undertake any welding work on the cutters and its fixings. These parts are made of hardened steel and could become brittle with heat and cause an accident.

Checking the fixings

DANGER: Only check the fixings with the rotor and the drive of the carrier vehicle at a complete standstill. Pay attention to the rotor which will continue to rotate until fully stopped!

The fixings must be checked

– before each application of the mower
– after having driven against a hard obstacle.

Check the following parts for a secure fit:

Fixings: 3 screws (tensile strength 10.9) with self–locking nuts (DIN 980 tensile strength 10.9) per segment.

Tightening torque: 70 ± 2 Nm – M 10 screws
                  35 ± 2 Nm – M 8 screws
6.4 The v-belts

Check the v-belts frequently. When using the mower for the first time, check the tension of the v-belt after 1/2 hour.

Attention: Do not undertake any work on the v–belts unless the machine is switched off and unless the mower has been secured against being switched on again.

6.4.1 Checking the v-belt tension

- Unscrew the protective cover plate.
- Press against the belt between the two v-belt pulleys.
- At a pressure of 10 kg the v-belt should depress about 0.5 cm.
- Re-mount the protective plate.

6.4.2 Re-tensioning the v-belts

Only A145A - A200A

The standard v-belts are permanently tensioned by a v–belt tensioning facility on the mower.

6.4.3 Replacing the v-belts

- Remove the protective cover.
- Uncheck tensioning spring (2) of the v-belt tensioning device (3).
- Position the v-belt tensioning device with the roller between the pulleys.
- Place the new v-belt around one of the pulleys and then pull it partially onto the other pulley.
- Wind the v-belt fully onto this second pulley by continuing to turn the latter.
- Hook the tensioning spring of the v-belt tensioning device on again.
- Fit the protective cover.
6.5 Gearbox oil

As the gearbox is in principle maintenance free, refilling the oil is not required. If gear oil leaks from the gearbox, it must be immediately repaired at a specialist repair workshop.

After every 1000 hours of operation, the oil has to be replaced by an authorised specialist workshop.

Note: It is normal for the gearbox to heat up to 70° C during operation.

Attention: Repairs on the gearbox may only be carried out by the manufacturer or by an authorised specialist workshop.

6.6 Use of spare parts

Always use only "humus" spare-parts. Otherwise the product responsibility is invalid in accordance with the CE Declaration of Conformity!

When ordering, please always state the exact type, year of manufacture and machine number of the mower.

Maschinenfabrik Bermatingen GmbH & Co.
Phone No.: +49 (0) 75 44 / 95 06–0, Fax No.: +49 (0) 75 44 / 52 07
## 7 Technical data

### Safety–mulcher gear–box:

<table>
<thead>
<tr>
<th>Types</th>
<th>090</th>
<th>105</th>
<th>125</th>
<th>145</th>
<th>155</th>
<th>180</th>
<th>200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working width (m)</td>
<td>0.86</td>
<td>1.00</td>
<td>1.20</td>
<td>1.40</td>
<td>1.50</td>
<td>1.75</td>
<td>1.95</td>
</tr>
<tr>
<td>Width of mower (m)</td>
<td>0.99</td>
<td>1.19</td>
<td>1.39</td>
<td>1.59</td>
<td>1.75</td>
<td>2.00</td>
<td>2.20</td>
</tr>
<tr>
<td>Power requirement (hp) approx.</td>
<td>13</td>
<td>15</td>
<td>20</td>
<td>25</td>
<td>30</td>
<td>45</td>
<td>50</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>see serial plate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. revs* rpm</td>
<td>7950</td>
<td>4950</td>
<td>2950</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. noise level**</td>
<td>Lp 88 dB(A)</td>
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</table>

*knife rotor  
**at the ear of the user

### Safety–mulcher with hydraulic drive:

<table>
<thead>
<tr>
<th>Types</th>
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<th>105</th>
<th>125</th>
<th>145</th>
<th>155</th>
<th>180</th>
<th>200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working width (m)</td>
<td>0.86</td>
<td>1.00</td>
<td>1.20</td>
<td>1.40</td>
<td>1.50</td>
<td>1.75</td>
<td>1.95</td>
</tr>
<tr>
<td>Width of mower (m)</td>
<td>0.99</td>
<td>1.19</td>
<td>1.39</td>
<td>1.59</td>
<td>1.75</td>
<td>2.00</td>
<td>2.20</td>
</tr>
<tr>
<td>Power requirement (hp) approx.</td>
<td>13</td>
<td>15</td>
<td>20</td>
<td>25</td>
<td>30</td>
<td>45</td>
<td>50</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>see serial plate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. revs* rpm</td>
<td>7950</td>
<td>4950</td>
<td>2950</td>
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</tr>
<tr>
<td>Max. noise level**</td>
<td>Lp 80 dB(A)</td>
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</tbody>
</table>

*knife rotor  
**at the ear of the user