OPERATION MANUAL

EN | Original

MU-COLLECT / MU COLLECT Hydro

FROM PRODUCTION 2018
EDITION 11.2022
REFERENCE NUMBER MU-Collect_BA_18_EN_2022-11

Machine identification

In order for your dealer to assist you as efficiently as possible, you will need to provide some information about your machine. Please enter the information here.

Designation	
Working width	
Weight	
Machine number	
Additional equipment	
Dealer's address	
Manufacturer's address	Müthing GmbH & Co. KG Soest Am Silberg 23 59494 Soest Germany

Handover declaration

– Fill out this sheet with your dealer.
– Then separate this sheet from the operating manual and send it to the manufacturer within 10 days of delivery. Only in this way will the guarantee be effective from the date of delivery

To
Müthing Gmbh & Co. KG Soest
Am Silberg 23
59494 Soest
Germany

I have bought the machine described below from Müthing GmbH & Co. KG Soest, and confirm full delivery and handover of the machine including the operating manual and spare parts list, as well as training in operating the devices with safety instructions and warning information from your dealer.

I confirm additionally that I have read and understood the operating manual and am in agreement with the information contained therein. This applies in particular to the chapter Safety.

Client

Name		First name	
Address			
Post code		Town/city	
Telephone		Fax	
E-mail		Date	

Machine

Machine	MU-	Serial number	
Working width		Gear-box	
Rigid mounting		Non-rigid mounting	
Year of construction		Delivery date	
Delivered by			

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Signature of client

Signature and stamp of sales partner

Handover declaration

Handover declaration – Copy

– This sheet remains with the client in the operating manual

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Table of contents

About this operating manual

Target group

This operating manual is intended for trained machine operators and persons who are otherwise qualified to carry out landscape work and who have received training in how to use this machine.

Safety

Familiarise yourself with the contents of this operating manual which are relevant for your activity before commissioning or assembling the machine. Always read through the safety instructions in the chapter “Safety” and observe the warning information in the individual chapters. In this way, you will achieve optimum work results and operational safety.

For the employer

Staff must be instructed in the safe handling of the machine before the initial commissioning. Untrained or unauthorised persons are not permitted to use the machine.

The following are included in this training:

- Checking that staff possess the necessary requirements for safely handling the machine.
- Handing out the operating manual and the other relevant and applicable documents or an intensive course of training which, in particular, includes the safe handling of the machine.

Regular instruction sessions

Instruct your staff regularly, but at least once a year, concerning the basic procedural measures for safely handling the machine.

Instruction

You will receive training from your dealership concerning using the controls, safe operation and care of the machine. Commissioning without first receiving training is not permitted.

Other applicable documents

In addition to the operating manual, other documents also form an integral part of the machine:

EU-conformity declaration	Integral part of this operating manual → Chapter »EU-conformity declaration«, Page 78
Spare parts list	Integral part of the delivery with this machine
PTO shaft operating manual	Integral part of the delivery with this machine
In case of a later conversion from mulching to operation with scarifying blades	Certificate of the certified professional workshop about the conversion
In the event of a later conversion from scarifying to operation with mulching tools	Certificate of the certified professional workshop about the conversion

Symbols

In order to make this manual clear and easy to read, we have used various symbols. They are explained below:

- A bullet point accompanies each item in a list

▸ A triangle indicates operating functions which must be performed

→ An arrow indicates a cross-reference to other sections of this manual

[+] A plus sign indicates an accessory that is not included in the standard version.

Pictograms

We have also used pictograms to help you find instructions more quickly:

The warning triangle indicates warning information. Failure to observe these safety instructions can result in:

- Moderate to serious injury
- Fatal injury

You will find the warning information associated with individual operations, where it is important to observe the warning information before these operations are carried out.
You will also find safety instructions in the chapter »Safety« which cannot be assigned to any particular operations, but increase your ability to work safely in different situations.

This sign indicates important instructions regarding the machine. Failure to observe these safety instructions can result in:

- Serious faults in the correct operation of the machine.
- Damage to the machine

This symbol indicates information, tips and instructions about operation.

This symbol indicates tips for assembly or adjustment work.

This symbol indicates examples that help you to understand the instructions better.

Parts in the text which refer to individual machines or to conditions have a colored background. After the colored section, the text then applies again to all machines. For example:

Only for MU-Farmer/S with pneumatic brake system

▸ Connect brake hoses

▸ Connect hydraulic hoses

For your safety

This chapter contains general safety instructions. Each chapter of the operating manual contains additional warning instructions which are not described here. Observe the safety instructions:

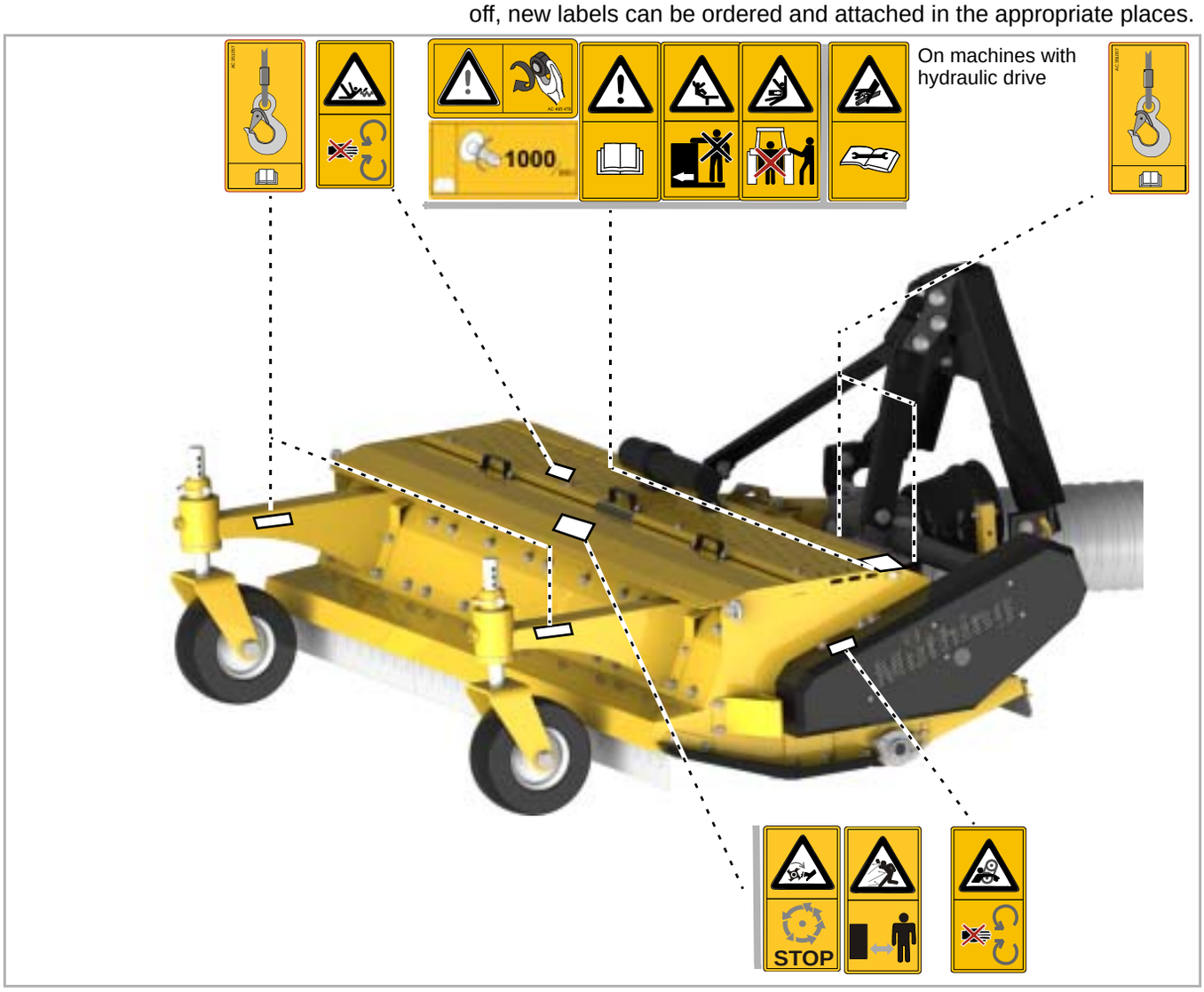
- In the interest of your own safety,
- In the interest of the safety of others
- To ensure the safety of the machine

Numerous risks can result from handling landscaping machines the wrong way. Therefore, always work with particular care and never under time pressure. Therefore, always work with particular care and never under time pressure.

For the employer
Inform personnel working with the machine of these safety instructions at regular intervals and according to statutory regulations.

Warning signs

On the machine you will find labels that serve to ensure your safety. The labels must not be removed. If labels become illegible or begin to peel off, new labels can be ordered and attached in the appropriate places.



Meaning of warning signs

Read the operating manual carefully and follow the instructions
Commissioning of the machine must not take place before the operating manual has been read and understood. This particularly applies to safety instructions.

Do not stand between the carrier vehicle and the machine
Standing between the carrier vehicle and the machine while the engine is running is prohibited, especially during coupling and uncoupling. The carrier vehicle must also be secured so that it cannot roll away.

Riding on the machine is prohibited
It can result in serious or even fatal injury.

Do not remove protective devices
Do not open or remove the protective devices while the engine of the carrier vehicle is running. Never operate the machine without the protective device.

Be aware of the danger of being pulled in
There is a danger of being pulled into the PTO shaft in the event of inappropriate use.

Shackles
Only raise the machine using loading equipment at the points indicated.

Proceed with great care in the event of leaking hydraulic fluid
Do not look for leakage points without correct protection. Fine oil jets could penetrate eyes and skin under high pressure. Observe the corresponding safety instructions in the operating manual.

Rotating and trailing machine parts
Only approach the machine when all machine parts have stopped moving.

Danger of objects being thrown out
During operation, there is a danger of objects such as stones being picked up and thrown out by the machine. Ensure that no persons are present in the hazard area.

Danger from moving machine parts
Nobody is permitted to remain within the hazard area during operation.

Example

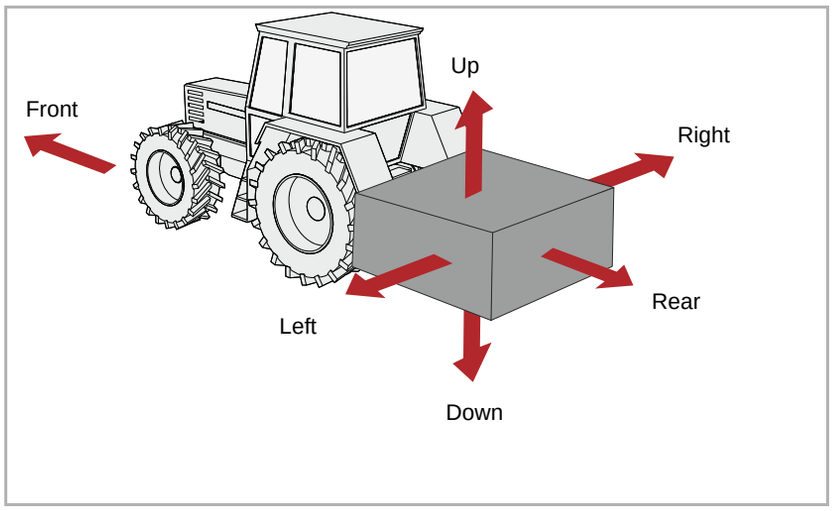
Do not stand in the slewing range
There is an extreme risk of injury within the slewing range from slewing or folding machine parts.

Check the rotational speed of the PTO stub shaft
Connect PTO shaft to a PTO stub shaft with an appropriate rpm. Always switch off the PTO stub shaft when working on the machine.

Retighten screws
After the first hours of operation, and as required, all screws must be checked and tightened if necessary. Vibrations might have loosened the screwed connections.

Definitions

All direction information is given in relation to the direction of travel of the machine:



Who is allowed to operate the machine?

Only qualified personnel
Only qualified persons who have been informed of the dangers associated with handling the machine are permitted to operate, service or repair the machine. As a rule, such persons are trained machine operators or have had similar intensive training.

Coupling

Increased risk of injury
There is an increased risk of injury when the machine is being coupled to the carrier vehicle. Therefore:

- The carrier vehicle must be fitted with the corresponding adaptor in order to be coupled to the machine.
- Only couple the machine with the road chassis raised
- Secure the carrier vehicle so that it cannot roll away.
- Never stand between the carrier vehicle and the machine during coupling.
- Actuate the power lever slowly and carefully.

Failure to observe these instructions can result in serious or fatal injury.

Connect electric wires or cables only after mounting the attachment
The electrical supply to the carrier vehicle must not be connected up during the fitting of the lighting equipment. Short circuits and damage to the electronics are possible.

Only connect hydraulics at zero pressure
Only connect the hydraulic hoses to the carrier vehicle while the hydraulic system on the carrier vehicle and machine is de-pressurised. A hydraulic system under pressure can trigger unpredictable machine movements.

High pressures in the hydraulic system
The hydraulic system is under high pressure. Regularly check all lines, tubes and screwed connections for leaks and externally visible damage. Only use suitable tools when looking for leaks. Rectify any damage immediately. Oil escaping under pressure may result in injuries and fires. In the event of injuries, seek medical attention immediately.

Color-coded hydraulic hoses
To avoid operating errors, the sockets and plugs of the hydraulic connections between the carrier vehicle and the machine should be color-coded. Wrongly connected hydraulic hoses can trigger unpredictable movements of the machine.

Centre of gravity

Observe the total weight, axle loads, tyre load-bearing capacity and minimum ballast specifications
The front or rear mounting of machines must not cause the carrier vehicle's permissible total weight, permissible axle loads, or tyre load-bearing capacity to be exceeded. The front axle must bear at least 20 % of the empty weight of the carrier vehicle to ensure steering capability.

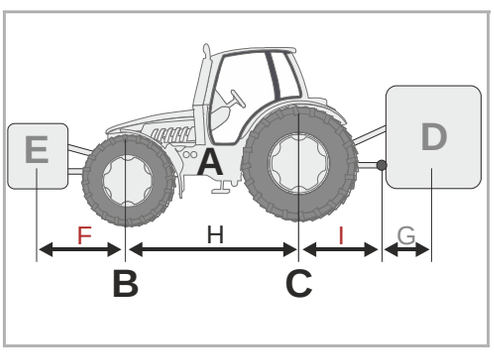
You can calculate:

- Total weight
- Axle loads
- Minimum added weight

Data

For this calculation, some data is required out of the following documents and measurement results:

- Operating manual of carrier vehicle
- This operating manual
- Measurement results from carrier vehicle and attached machine



Data from the operating manual of the carrier vehicle:

- (A) unladen weight
- (B) front axle load
- (C) rear axle load
- (H) wheel base of carrier vehicle

Please take into consideration, for example, the weight of water in the tyres, accessories, etc.

Data from this operating manual:

- (D) Total weight of the machine when rear-mounted; the supporting load with the machines attached
- (E) Total weight of the machine when front-mounted
- (G) Distance between the lower link ball midpoint and the machine's centre of gravity when rear-mounted. With machines attached, G=0.

Data which you can determine by measuring:

- (F) Distance between the machine's centre of gravity when front-mounted and the front-axle midpoint
- (I) distance between the rear axle midpoint and the lower link ball midpoint. For rear-mounted machines between rear axle midpoint to drawbar coupling midpoint or hitch ball

Calculation

The measured values can now be inserted into the formulas.

Ballast with front weights

Calculating the **ballast with front weights** on rear-mounted machines.

$$\text{Front ballast in kg} = \frac{D \times (I + G) - (B \times H) + (0,2 \times A \times H)}{F + H}$$

Ballast with rear weights

Calculating the **ballast with rear weights** on front-mounted machines.

$$\text{Rear ballast in kg} = \frac{(E \times F) - (C \times H) + (0,45 \times A \times H)}{H + I + G}$$

Front axle load

Calculating the **actual front axle load**

$$\text{Front axle load in kg} = \frac{E \times (F + H) + (B \times H) - D \times (I + G)}{H}$$

Total weight

Calculating the **actual total weight**

$$\text{Total weight} = E + A + D$$

Rear axle load

Calculating the **actual rear axle load**

Rear axle load in kg = actual total weight - actual front axle load

Tyre load-bearing capacity

Data on the tyre load-bearing capacity of the front and rear tyres can be found in the tyre manufacturer's documentation.

- The front tyre load-bearing capacity for two wheels is equal to twice the permissible tyre load-bearing capacity of a single front wheel.
- The rear tyre load-bearing capacity for two wheels is equal to twice the permissible tyre load-bearing capacity of a single rear wheel.

Summary

Check if the following conditions are met:

- The actual rear axle load is less than the permissible values for the axle load stated in the operating manual of the carrierer vehicle
- The actual total weight is less than the permissible values for the total weight stated in the operating manual of the carrierer vehicle
- The sum of the permissible rear wheel load capacity is higher than the real rear wheel load capacity
- The sum of the permissible front wheel load capacity is higher than the real front wheel load capacity

If all conditions are met, the machine may be attached to this carrier vehicle.

You can use a sufficiently large weigh-bridge to determine the total weight, the rear axle load and the front axle load by weighing.

Road transport

Make sure that the condition of the machine conforms to traffic regulations
The machine must conform to current traffic regulations if you intend to drive it on public roads. This includes for example:

- Fitting lighting equipment, warning devices and protective devices
- Observing the permissible transport widths, transport weights, axle loads, tyre load-bearing capacity and total weights

The driver and owner of the vehicle are liable if traffic regulations are not observed.

Closing ball valves
If ball valves are provided on the hydraulic lines or the chassis cylinders, the ball valves must be closed for road transport. The accidental actuation of control devices on the carrier vehicle could otherwise cause movements on the machine. Accidents or damage to the machine may be caused as a result.

Check release cable for the quick-release coupling
Release cables must hang loose and must not, when in their lowered position, release the couplings of their own accord. Otherwise, attached machines can detach themselves from the three-point hitch.

Riding on the machine is strictly prohibited
People or objects must never be transported on the machine. Riding on the machine poses a risk to life and limb and is strictly prohibited.

Take altered driving and braking behaviour into account
Driving and braking performance is altered when the machine is attached to the tractor. Take the width and balancing weight of the machine into consideration, especially when cornering. A driving style which not adjusted to the road conditions can lead to accidents.

Drive at a suitable speed
Always adjust your driving speed to the road conditions. Driving at excessive speeds in poor road conditions can create extremely high forces which can severely load or overload the carrier vehicle and machine. Driving at unsuitable speeds can cause machine damage and lead to accidents.

Putting the machine into operation

Training required before commissioning
The machine must not be put into operation until the user has been given proper training by an employee of the dealer, a factory representative, or an employee of the manufacturer. Commissioning without training can lead to damage to the machine due to false operation or accidents can happen.

Ensure that the machine is in perfect working condition
Do not operate the machine unless it is in perfect working condition. Check all important components and replace any defective components before starting the machine. Defective components can cause damage to equipment and personal injury.

Do not remove the protective equipment
The protective equipment must not be removed or by-passed. Check all protective equipment before starting the machine. Unprotected machine parts can cause serious or fatal injury.

Riding on the machine is strictly prohibited
People or objects must never be transported on the machine. Riding on the machine poses a risk to life and limb and is strictly prohibited.

Height of the machine and overhead power lines
If a height of 4.00 m is exceeded when folding the machine in and out, the machine must not be folded in the vicinity of live overhead power lines. Danger of electrocution! Should the machine come into contact with a live overhead power line:

- Do not leave the carrier vehicle.
- Do not touch any of the metal parts on the carrier vehicle.
- Do not create any conductive contact with the ground
- Warn anyone in the area not to approach the carrier vehicle or machine.
- Wait for help from professional emergency service personnel as power in the live overhead power line must first be switched off

Never climb onto the machine beneath live overhead power lines. The voltage can jump across even if the lines are not actually touching the machine.

Check the hazard area
Before driving off, folding out, and operating the machine and during operation, check its hazard area. Make sure that you have an adequate view. Do not begin work until the hazard area is cleared of any persons or objects. Information regarding the hazard area can be found in the corresponding chapter.
→ Chapter »Mulching«, Section »Task«, Page 48.
Parts could be ejected from the machine at high speed in certain circumstances. The hazard area, particularly in front of and behind the machine, must be cleared of any persons, animals or objects before starting.
Any use of the machine without verification of the hazard area can lead to serious or fatal accidents.

Retighten all nuts, bolts and screws
Nuts, bolts and screws should be checked at regular intervals and tightened if necessary. Screws can come loose unnoticed while operating. Damage to the machine or accidents may be caused as a result.

What to do in the event of a fault
In the event of a malfunction, shut down and secure the machine immediately. The fault may be eliminated immediately, or a specialist workshop must be assigned the task. Further operation of the machine can lead to damage to the machine or injury to persons.

Uncoupling the machine

Increased risk of injury
There is an increased risk of injury when uncoupling the machine from the carrier vehicle. Therefore:

- Secure the carrier vehicle so that it cannot roll away.
- Never stand between the carrier vehicle and the machine during uncoupling.
- Actuate the power lever slowly and carefully.
- Make sure the machine is standing on a secure and level surface
- Do not disconnect the hydraulic hoses until the hydraulic system of the carrier vehicle and machine is de-pressurised.

Failure to observe these instructions can result in serious or fatal injury.

Care and maintenance

Observe the care and maintenance intervals
Observe prescribed intervals for maintenance checks and inspections specified in the operating manual. If these periods are not observed, this can lead to damage to the machine, poor quality of work or accidents.

Use original replacement parts
Many components have special properties that are essential for the stability and correct operation of the machine. Unsuitable spare parts or accessory parts or incorrectly performed repairs or changes can cause damage to the machine, accidents or serious injury.
Müthing strongly recommends using only approved original Müthing accessories and spare parts. Müthing can guarantee the safety, reliability and suitability of these parts only.
Use of non-original Müthing spare parts shall invalidate any warranty claims.

When performing any care and maintenance work:

- Switch off the PTO stub shaft
- Depressurise the hydraulic system
- If possible, uncouple the carrier vehicle.
- Make sure the machine is standing securely. Provide additional support as required
- Do not use parts of the machine as climbing aids; use only secure steps, ladders or other means of access
- Secure the machine against rolling away
- Never reach into the V-belt while it is moving

It is only possible to guarantee work safety during care or maintenance work through observing these regulations.

Turn off the electrical supply
Prior to carrying out work on the electrical system, disconnect the system from the power supply. Systems supplied with electrical power can cause damage to equipment and personal injury.

Replace hydraulic hoses
Replace hydraulic hoses every six years. Hydraulic hoses can age without any externally visible damage. Defect hydraulic lines can lead to severe or fatal injuries.

Caution when cleaning with a high-pressure cleaner
The machine can be cleaned using either water or a steam jet. Only use a low pressure to clean bearings, fans, signal mixer units, plastic parts and hydraulic hoses. Excessively high pressures can cause damage to these parts.

Before carrying out welding work, disconnect the battery and alternator
Before carrying out any electric welding work on the attached machine, disconnect the battery of the carrier vehicle and disconnect the alternator. This avoids damage to the electrical system.

Tighten all screwed connections
All screw connections that are released during maintenance and repair work must now be retightened. Loose screwed connections can cause bolts to undo without you noticing during your work. As a result, machine parts can become detached. Otherwise, this may result in severe injury or damage to equipment.

Further regulations

Observe the regulations
In addition to these safety instructions, observe the following:

- Accident prevention regulations
- Generally recognised safety regulations, occupational health requirements and road traffic regulations
- Information and instructions in this operating manual
- Operation, maintenance and repair instructions

This chapter contains general information on your machine as well as information on:

- Range of application
- Features
- Designation of components
- Technical specifications

Range of application of the machine

The machine is only allowed to be used for its intended purpose in landscaping or similar fields of work in accordance with its tooling.

Tool	Purpose
Carbide M shackle flails	To cut grass, other growth or sections up to a maximum of 2 cm diameter. The shackle flails can deviate sideways. As they are made from carbide, the flails can be used for longer and need to be replaced less often.
Scarifying blade	Verticutting of grass swards that have been mown short in advance.

Since the conditions of use are very varied, the user must pay particular attention to the machine's performance limits. The machine must be switched off immediately if there is any indication of overstress.

Proper use

The machine should only be used for the designated work as described in this operating manual. Any application other than or beyond this is considered improper use.
Examples of improper use:

- Transporting persons or objects
- Cutting of any products other than those specified or those of a similar nature

→ »Range of application of the machine«

- Transferring power to other objects
- Front mounting of machines designed for rear mounting
- Rear mounting of machines designed for front mounting
- When mulching, working depths below 11 mm ground clearance
- When scarifying, working depths at which the scarifying blades penetrate deeper than 2 mm into the ground
- Any type of ground work
- Use of the machine in a position in which the tools do not point towards the ground, for example in a vertical position

The manufacturer and dealers are not liable for damage caused by improper use. The risk is borne solely by the user.

Features of the machine

Robust housing in optimised form
The housing is particularly robust for heavy use and is designed in an optimised form.

Power transmission
In the case of mechanically driven machines, power is transmitted to a gear box using a PTO shaft. From there, the rotor is driven via V-belt. From there, the rotor is driven via V-belt.

In the case of hydraulically driven machines, power is transmitted directly to a V-belt pulley using a hydraulic motor. From there, the rotor is driven via V-belt.

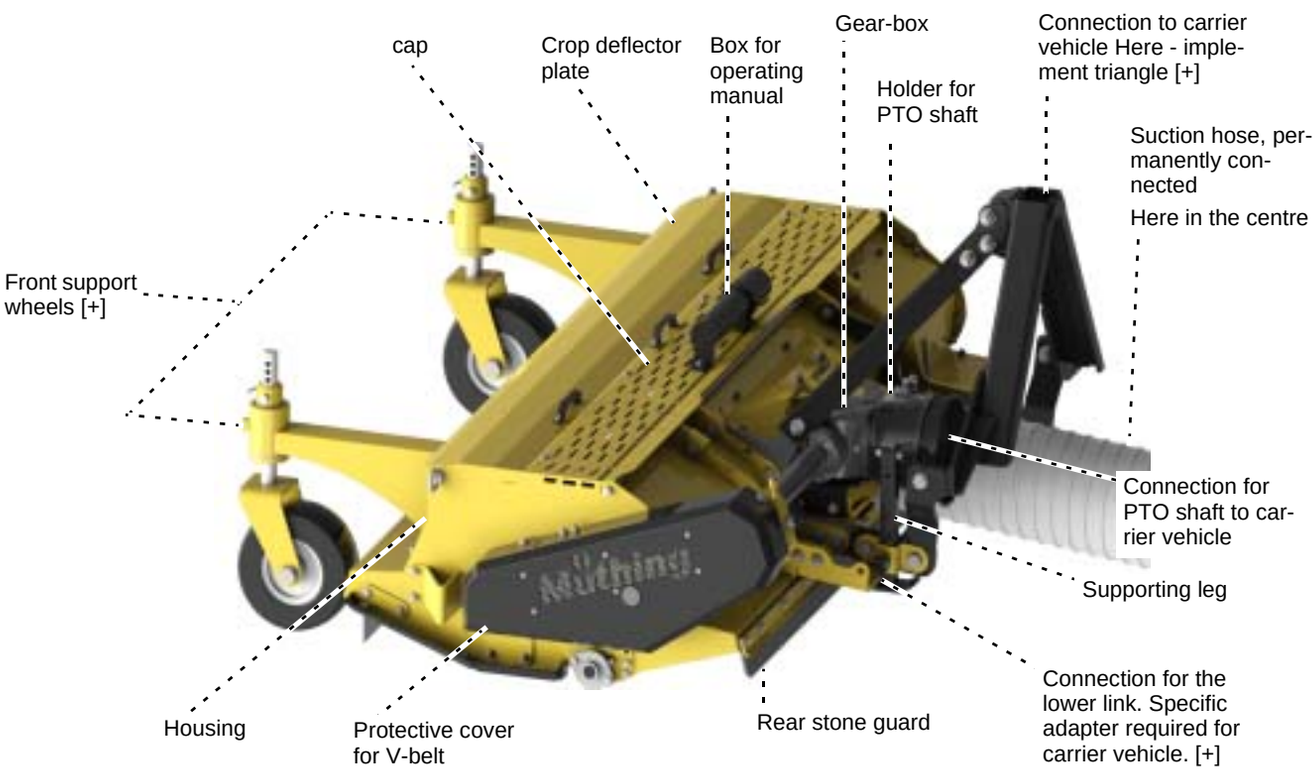
Tools
The tools are manufactured using high-quality material. Optimal shredding is achieved in conjunction with the short chopping bars.

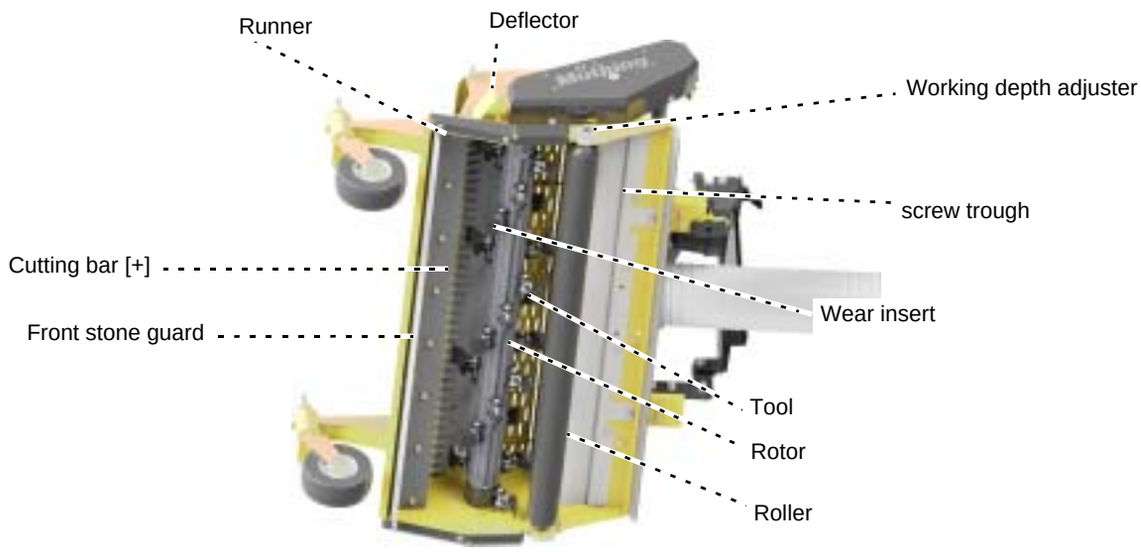
Integrated suction pipe connection
Matched to your carrier vehicle, a suction pipe is permanently attached directly to the machine. In this way, the mulch is transported directly into the collection container of your carrier vehicle.

Safety
The machine is constructed in accordance with EU regulations, for maximum possible safety of operation. The machine bears the CE mark and the UKCA mark.

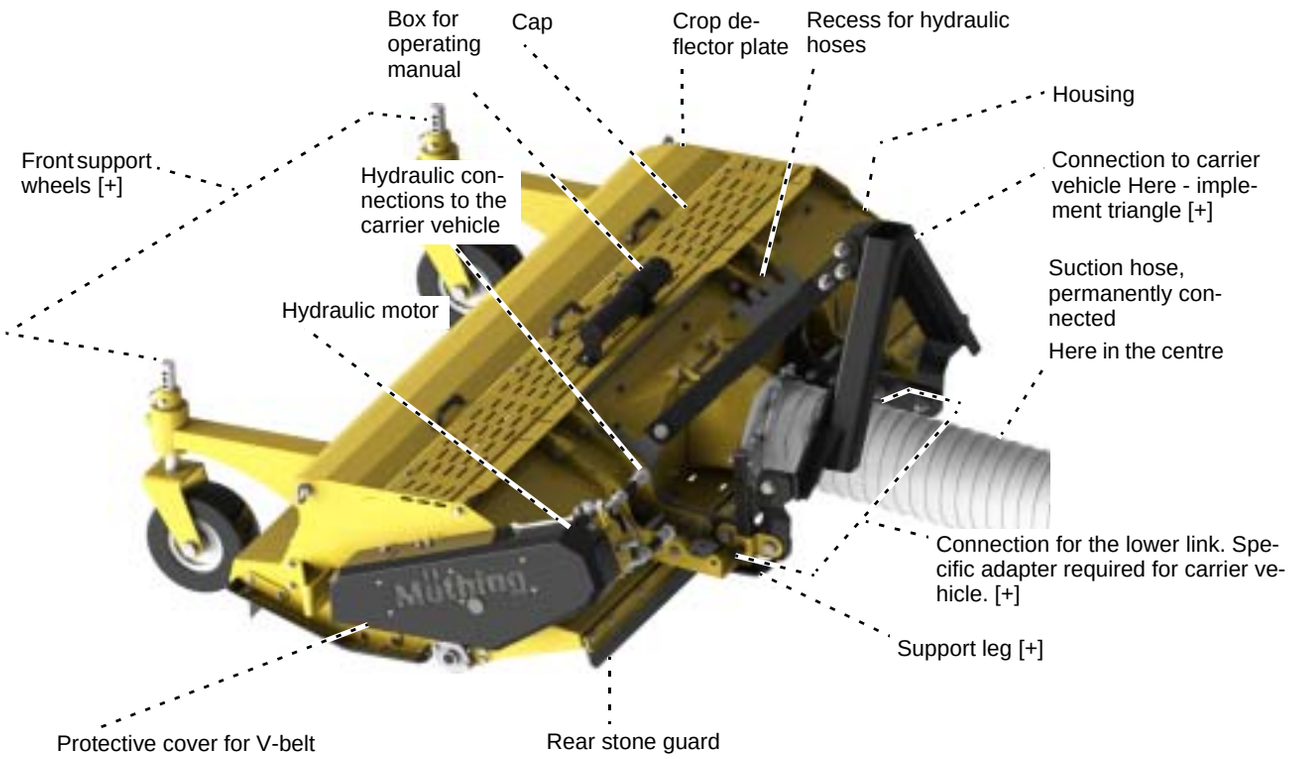
Designation of components

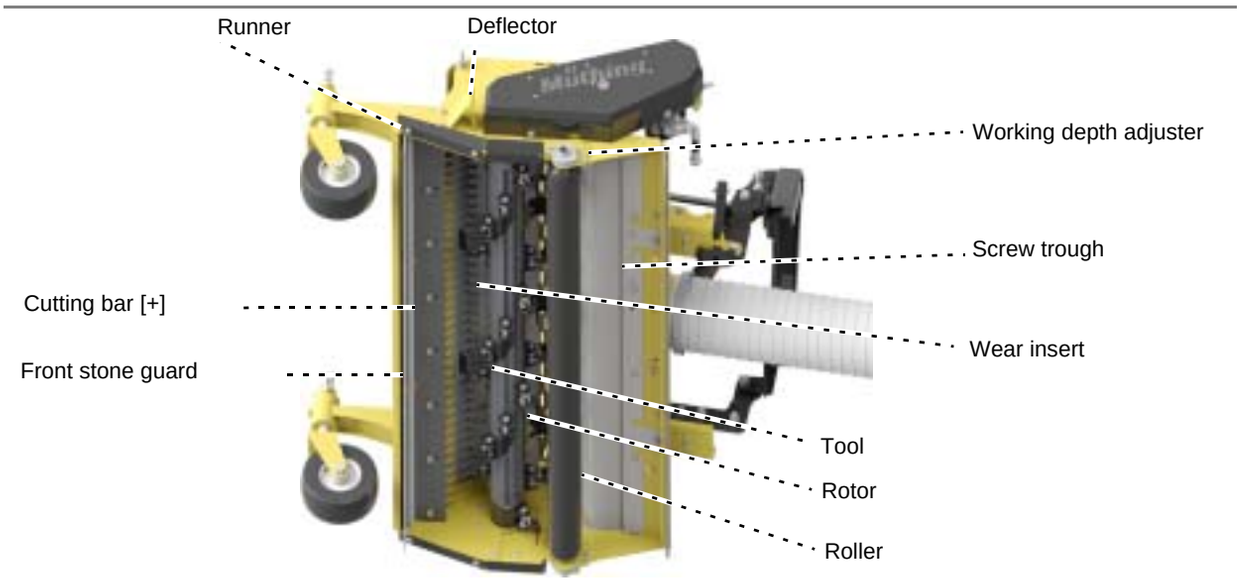
Mechanical drive





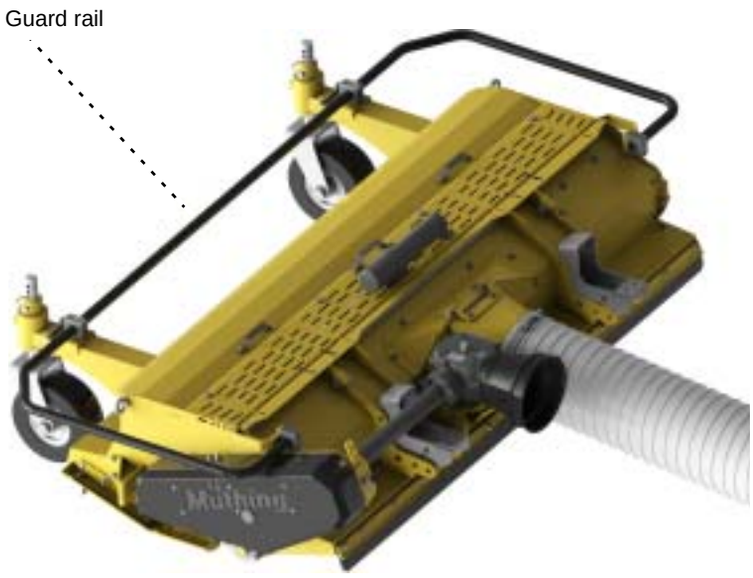
Hydraulic drive

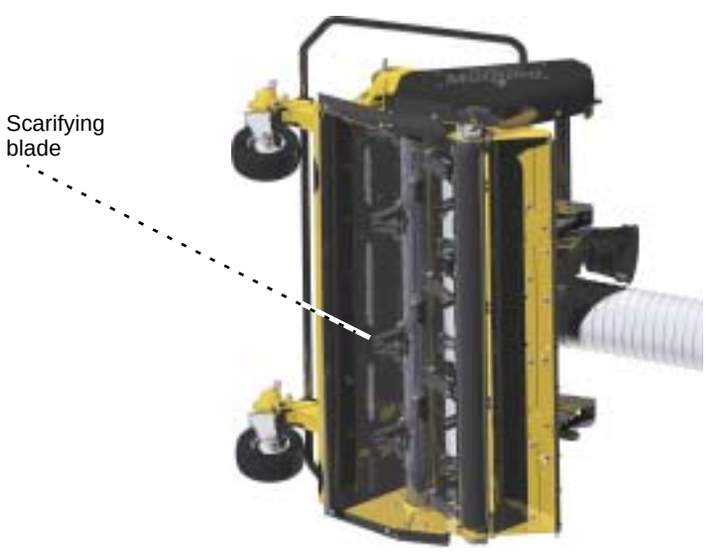




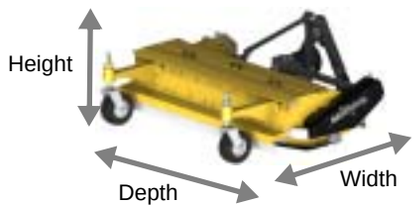
Additional equipment for scarifying

With the additional equipment for scarifying, you can use your machine as a scarifier. The conversion is carried out in a certified specialist workshop.





Technical specifications



Mechanical drive

	Mechanical drive	
	MU-Collect 140	**MU-Collect 160**
Height [m]		
Without support wheels	0.42	0.42
With support wheels	0.52	0.52
Width [m]		
In work position	1.62	1.82
Depth [m]		
Without support wheels	1.00	1.00
With support wheels	1.30	1.30
Working width [m]		
In work position	1.40	1.60
Total weight [kg] without adapter for carrier vehicle		
Without support wheels	228	248
With support wheels	253	273
Adapter for carrier vehicle, approx.	30	30
Centre of gravity [dimension G]		
Without support wheels	0.27	0.22
Depending on equipment level, approx.	0.34	0.29
Rotational speed of rotor [rpm]		
PTO stub shaft 1000 rpm	2850	2850
PTO stub shaft 1000 2000 rpm	2800-3000	2800-3000
Power requirement [kW]		
Minimum	20	20
Maximum permitted	30	30
Working depth [mm]		
Without support wheels, in 7 mm steps	11-40	11-40
With support wheels, in 15-mm steps	11-50	11-50
Number of tools		
Carbide M shackle flails	24	28
Scarifying blades, double set	24	28
Lubricants		
Transmission oil	SAE 70W90 VS	SAE 70W90 VS

	Mechanical drive	
	MU-Collect 140	**MU-Collect 160**
Category		
CAT 0	–	x
CAT 1n	–	x
Individual adapters for carrier vehicles	x	x
Paint colors		
Yellow	RAL 1007	RAL 1007
Black	RAL 9005	RAL 9005
PTO shaft		
Model	Depending on the carrier vehicle	
Noise emission [dB(A)]		
In the workplace	< 85	< 85

Hydraulic drive

	Hydraulic drive	
	MU-Collect 140 Hydro	**MU-Collect 160 Hydro**
Height [m]		
Without support wheels	0.42	0.42
With support wheels	0.52	0.52
Width [m]		
In work position	1.62	1.82
Depth [m]		
Without support wheels	0.92	0.92
With support wheels	1.21	1.21
Working width [m]		
In work position	1.40	1.60
Total weight [kg]		
Without support wheels	210	229
With support wheels	235	254
Centre of gravity [dimension G]		
Without support wheels	0.33	0.33
Depending on equipment level, approx.	0.40	0.40
Rotational speed of rotor [rpm]		
Hydraulic drive, depending on carrier vehicle	2700-3000	2700-3000
Power requirement [kW]		
Minimum	20	20
Maximum permitted	30	30
Working depth [mm]		
Without support wheels, in 7	11-40	11-40
With support wheels, in 15-mm steps	11-50	11-50
Number of tools		
Carbide M shackle flails	24	28
Scarifying blades, double set	24	28
Lubricants		
Transmission oil	SAE 70W90 VS	SAE 70W90 VS
hydraulic oil	HLP46	HLP46
Noise emission [dB(A)]		
In the workplace	< 85	< 85
Category		
CAT 0	x	x
CAT 1n	x	x
Individual adapter for each carrier vehicle	x	x
Paint colors		
Yellow	RAL 1007	RAL 1007
Black	RAL 9005	RAL 9005

	Hydraulic drive	
	MU-Collect 140 Hydro	**MU-Collect 160 Hydro**
Hydraulic drive		
hydraulic motor		
Oil quantity in l/min at 180 bar	35-70	35-70
Connections required on carrier vehicle 1 x feed 1 x pressureless return line Depending on type of hydraulic motor: 1 x leak-off oil line, depressurised	x	x

Checking the scope of delivery

The machine is delivered completely assembled. If parts of the machine have not been assembled, please contact your dealer.

Do not assemble the machine yourself
Do not perform assembly work yourself since requirements for an orderly condition of the machine are :

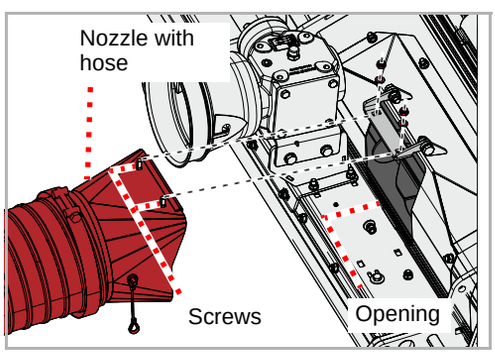
- Observance of a sequence of worksteps
- Compliance with tolerances and torques

Incorrect assembly may result in damage to the machine or poor performance.

If parts are missing or have been damaged during transportation, please submit a claim immediately to your dealer, importer or the manufacturer.

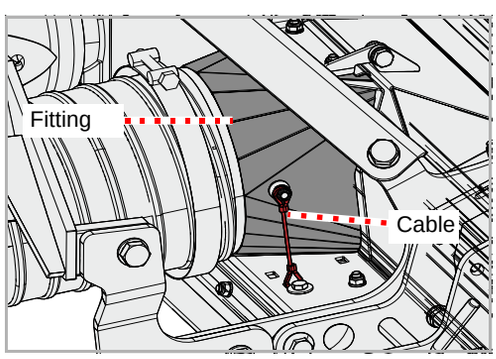
Fitting

The nozzle is supplied pre-assembled with the hose. Before using the machine for the first time, you must attach the nozzle with the hose to the machine



- Place the suction hose with nozzle on the opening and secure the screws with washers and nuts

Risk of cuts
The nozzle must be secured against folding up with a cable.
Failure to do so may result in serious or fatal injury when reaching into the opening.



- Secure nozzle with cable
- Check that the nozzle is securely seated. To do this, lift the nozzle carefully. The nozzle shall clear a maximum gap of 20 mm.

The machine must be fitted with a suitable adaptor in order to be attached to a carrier vehicle. Before attaching the machine, you should therefore check whether the correct adaptor for your carrier vehicle is present on the machine. Only use carrier vehicles from the list below.

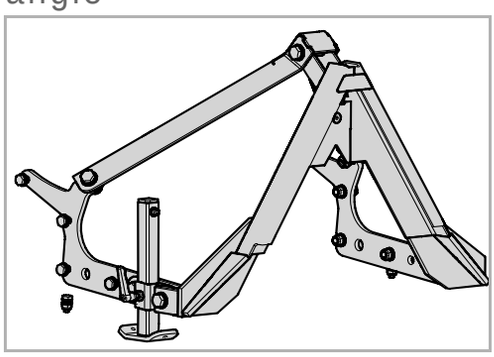
If you do not have the correct adaptor:

- Contact your dealer or the manufacturer. They will be able to supply the correct adaptor.

Rigid implement triangles

Standard implement triangle for attachment of front-mounted implement to carrier vehicles with tractor triangle with the following category:

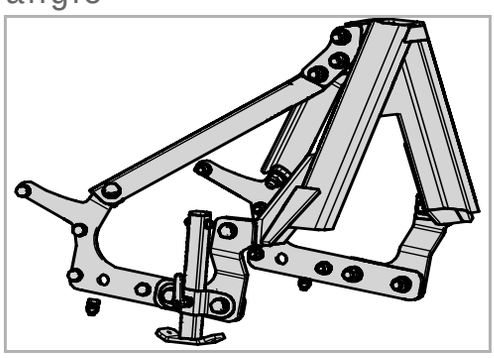
Cat. 0 implement triangle



For mechanical drive with PTO shaft holder.
For hydraulic drive with holder for the hydraulic hoses.

Weight: Approx. 22 kg

Cat. 1n implement triangle



For mechanical drive with PTO shaft holder.
For hydraulic drive with holder for the hydraulic hoses.

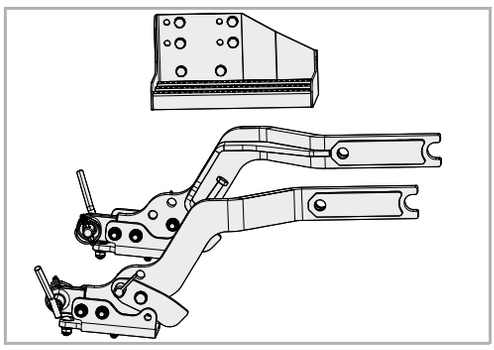
Weight: Approx. 30.5 kg

MU-Collect adapter

Attachment kits

Attachment kit for attachment of front-mounted implement to carrier vehicles.

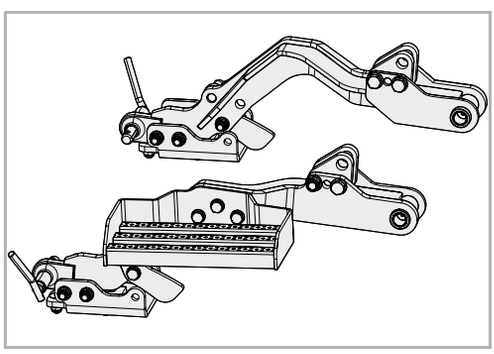
Iseki



- ISEKI SF450
- ISEKI SF235

Weight: approx. 31.5 kg

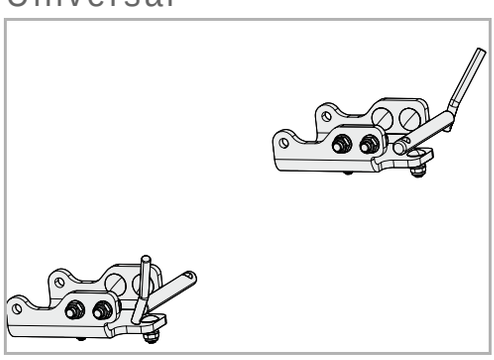
Grillo



- FD 2200
- FD 2200 TS

Weight: approx. 30 kg

Universal



Please contact your dealer to find out whether your vehicle is approved for the use of the universal attachment kit.

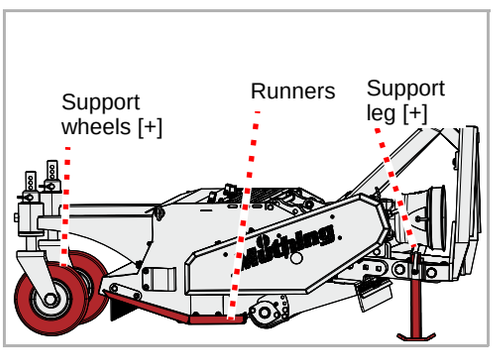
Weight: approx. 7.5 kg

Increased risk of injury
There is an increased risk of injury when the machine is being coupled to the carrier vehicle. Therefore:

- Secure the carrier vehicle so that it cannot roll away.
- The carrier vehicle must be fitted with an adaptor for the machine.
- Never stand between the carrier vehicle and the machine during coupling.
- Actuate the power lever slowly and carefully.

Failure to observe these instructions can result in serious or fatal injury.

Machine for front mounting only
The machine is only allowed to be attached to the carrier vehicle at the front.
You can damage the machine if you mount it at the rear.



- Check that the machine is securely positioned. The support wheels and runners should be on the ground. A support leg can also be installed depending on the adapter.

→ Chapter »Parking and storage« paragraph »Setting down the machine in a secure position«, page 53

If the machine is not securely positioned:

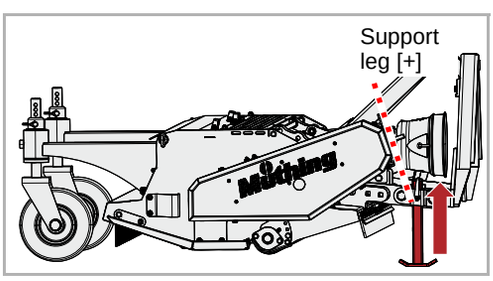
- Secure the machine with suitable lifting gear and move into the correct position

Coupling triangle

Requirement: Your carrier vehicle is fitted with an implement triangle and the machine is fitted with the corresponding receiver.

- Drive the carrier vehicle up to the receiver on the machine so that it is centrally positioned.
- Lower the implement triangle on the carrier vehicle so that it fits under the receiver on the machine.
- Drive the carrier vehicle up to the receiver on the machine.
- Raise the implement triangle, making sure that it latches into the receiver securely.
- Secure the implement triangle in the receiver.

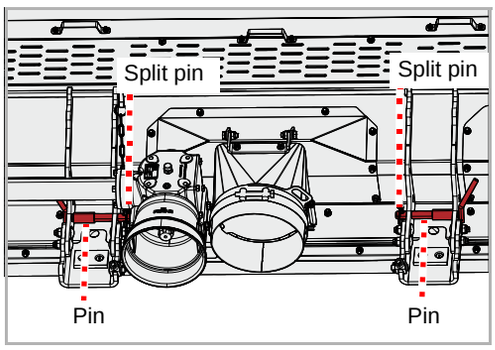
→ Implement triangle operating instructions



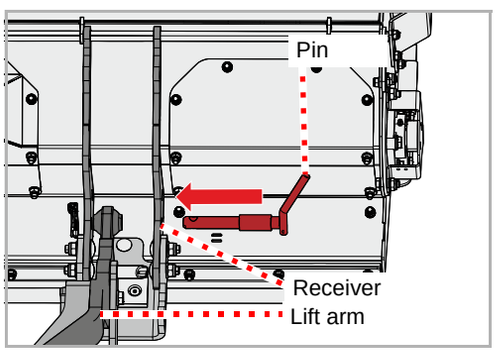
- Raise support leg and secure in top position

Two-point connection

Requirement: Your carrier vehicle is fitted with the appropriate lift arm.



- Remove the split pins and take out the pins
- With the carrier vehicle centrally positioned, drive up to the machine, paying attention to the position of the lift arms in relation to the machine.

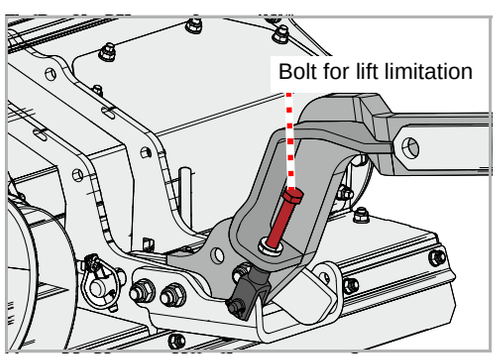


- Align the lift arms so that they fit into the receivers on the machine

If your connection adapter is equipped with a spacer sleeve:

- Put the spacer sleeve on the pin

- Secure the lift arm with the pin, secure the pin with the split pin



- Insert bolt for lift limitation and screw in

Suction hose

Risk of cuts
The nozzle with suction hose must be attached to the machine. It is forbidden to operate the machine without a suction hose nozzle attached.
Failure to do so may result in serious or fatal injury when reaching into the opening.

If the nozzle with suction hose is not fitted to the machine:

- Attach the nozzle with suction hose to the machine

→ Chapter »Coupling the machine« paragraph »Suction hose«, page 35

You must connect the suction hose to your carrier vehicle. Depending on the carrier vehicle, the following diameters of the suction hose are available:

Centre connection	Side connection
Ø 200 mm	Ø 200 mm
Ø 220 mm	–
Ø 250 mm	–

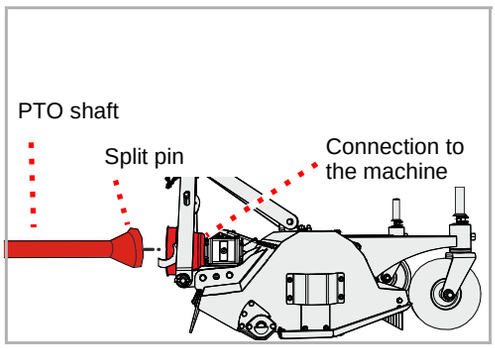
- Connect the suction hose to the collection container according to the operating instructions of your carrier vehicle

Mechanical drive

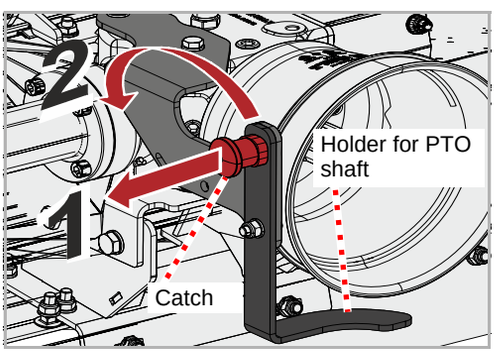
The PTO shaft has been adapted by your dealer in line with your carrier vehicle.

PTO shaft

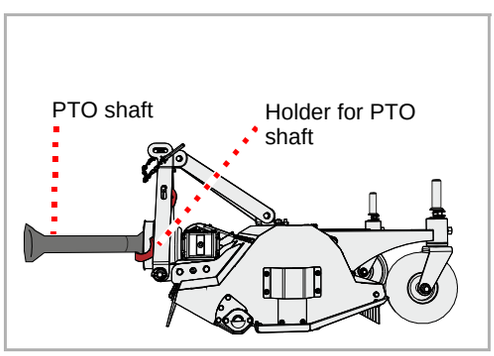
Generally, the PTO shaft is already connected to the machine. If the PTO shaft is replaced or after maintenance work to the PTO shaft, it will be necessary to connect it to the machine.



- Carefully clean and grease the PTO shaft and connection to the machine
- Push the PTO shaft onto the connection to the machine and ensure that the cotter pin locks into place on the PTO shaft
- Connect the safety chain of the PTO shaft guard



- Release detent
- Fold up the holder for the PTO shaft and secure it with a detent

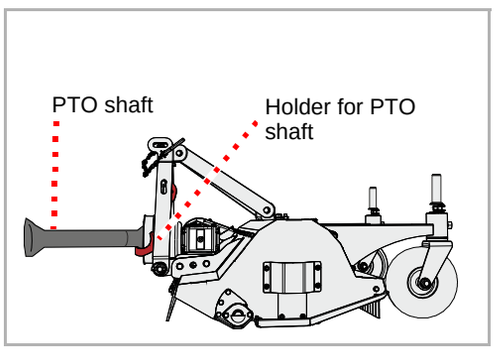


- Place the PTO shaft on the holder for the PTO shaft

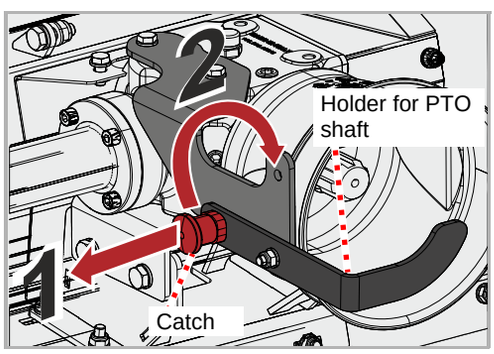
Connection to carrier vehicle

If you switch to a different carrier vehicle, you must check that the PTO shaft is the right length. It is particularly important when checking the PTO shaft to ensure that the two halves of the PTO shaft continue to overlap at the position in which the PTO shaft is pulled apart furthest.

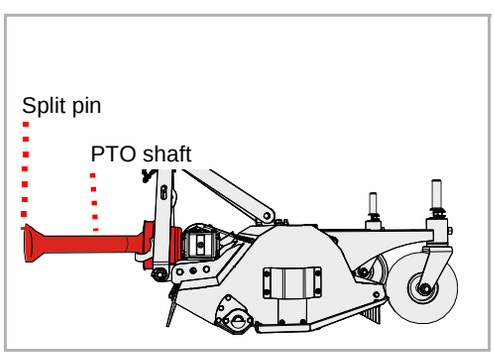
If you switch to a different carrier vehicle, you must make sure that the PTO shaft is suitable for the new carrier vehicle. If necessary, you must swap the PTO shaft for a new one and have it adapted in a qualified specialist workshop.



- Remove the PTO shaft from the PTO shaft holder.



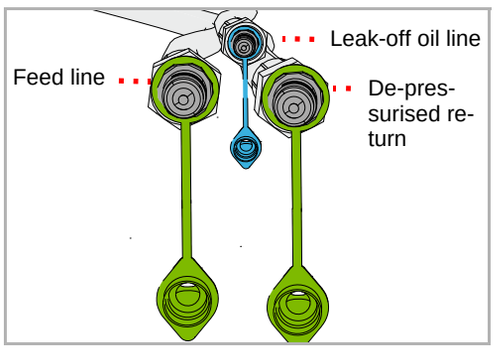
- Release detent
- Fold down the holder for the PTO shaft and secure it with a detent



- Connect the propeller shaft to the PTO shaft of the carrier vehicle. Make sure that the split pin on the propeller shaft latches into place

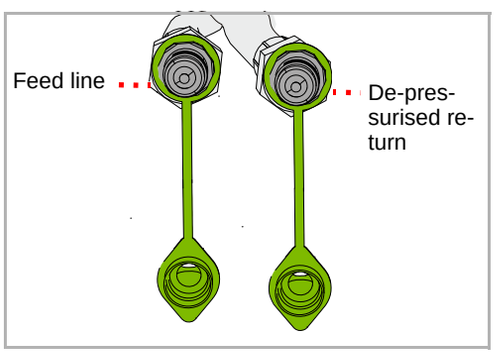
Hydraulic drive

Function	Color of dust cap
Feed line	Green
De-pressurised return	Green
Depressurised leak-off oil line	Blue



Machines with separate leak-off oil line:

- Connect the hydraulic hoses to the corresponding connections on the carrier vehicle



Machines with integrated overflow oil line:

- Connect the hydraulic hoses to the corresponding connections on the carrier vehicle

- Lowering the machine

Prerequisites for working on the machine
Only perform work on the machine if you have the required expert knowledge and suitable tools.
A lack of specialist knowledge or the use of unsuitable tools can cause accidents.

Protect the machine from being started up accidentally
If the machine is coupled, only carry out repair and maintenance work and only rectify malfunctions on it if:

- The PTO stub shaft is off
- The engine is switched off
- The ignition key is removed
- Hand brake applied

Serious accidents may be caused if the machine starts accidentally.

Blower unit

The machine may only be operated with the blower unit on the carrier vehicle. This section describes the steps necessary for operation with blower unit.

Prerequisites for operation with extractor:

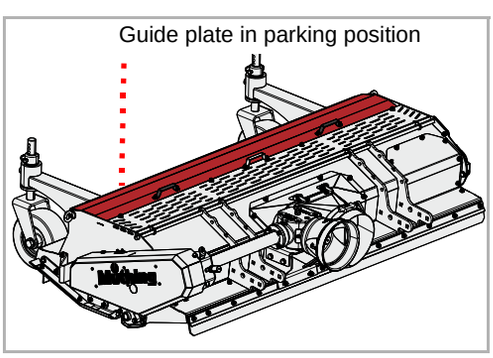
- The carrier vehicle is appropriately equipped with suction and collection container
- The guide plate is installed on the housing
- The machine has been inspected for foreign bodies
- The suction hose is connected to the fitting on the machine and secured

Crop deflector plate

The guide plate can be in the parking position or work position. For operation with a blower unit, the crop deflector must be in the park position.

Parking position

Guide plate in parking position



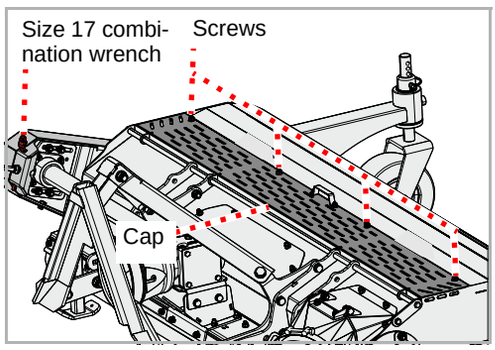
- Check whether the guide plate is in the parking position

If the guide plate is not in the parking position:

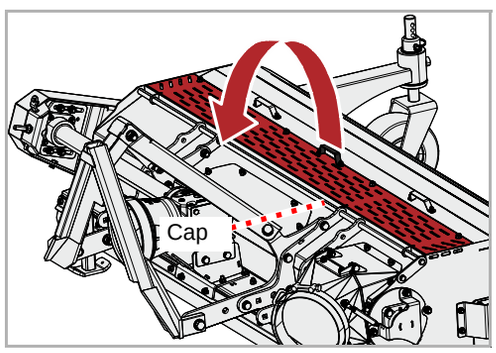
- Fit the crop deflector in the parking position

→ Section »Work position --> Parking position«, page

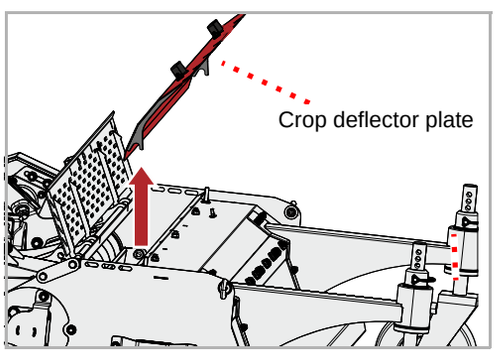
Work position --> Parking position



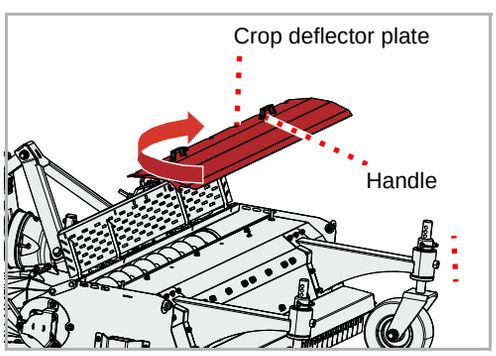
- Remove the 17 ring spanner from its holder
- Loosen the screws on the cap



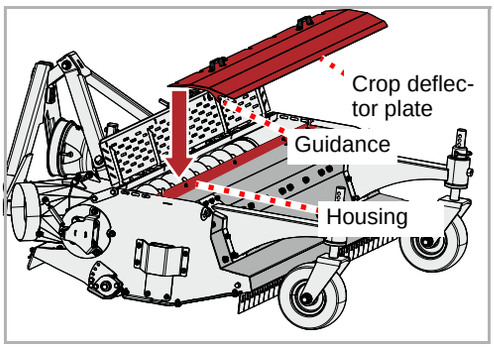
- Open cap



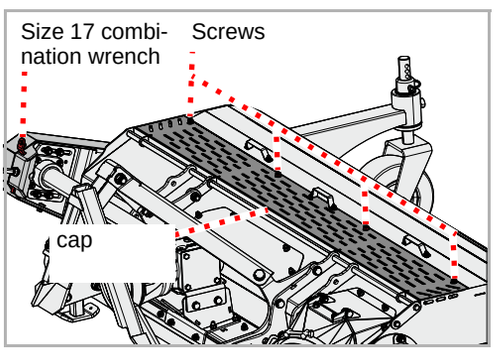
- Lift guide plate at handles



- Turn guide plate through 180°. The handles remain at the top while turning.



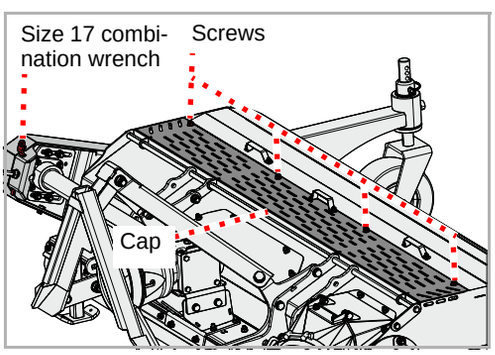
- Insert the crop deflector with the help of the lateral guide on the housing



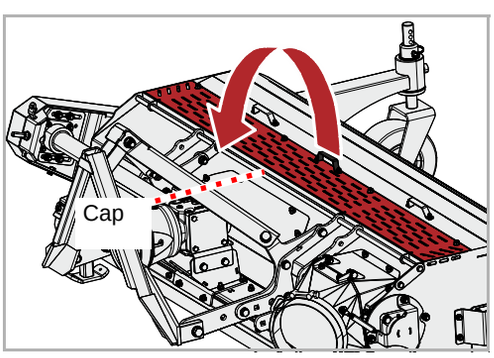
- Close the cap and secure it with screws
- Insert the 17 ring spanner into its holder

foreign bodies

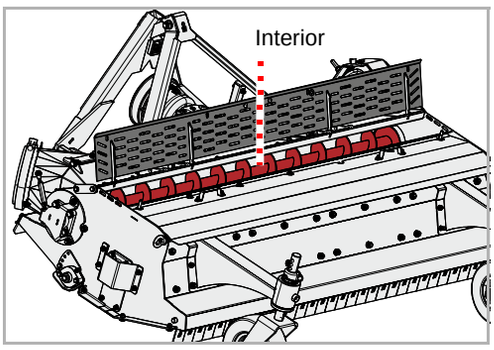
Before installing the suction hose, you must check the machine for foreign bodies.



- Remove the 17 ring spanner from its holder
- Loosen and remove the screws on the cap



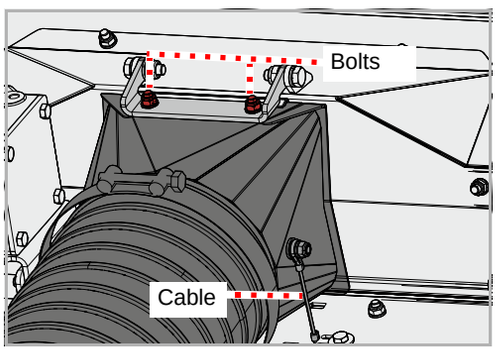
- Open cap



- Inspect interior for foreign bodies

If there are foreign bodies on the interior:

- Remove foreign bodies



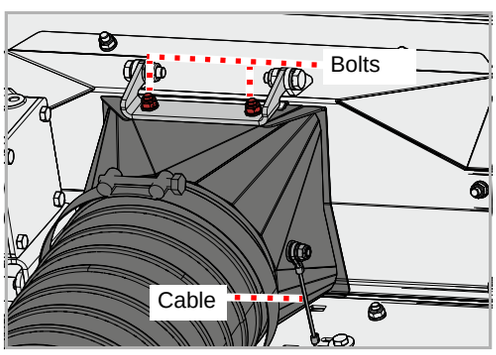
- Loosen and remove nuts

The suction hose with nozzle can now be pushed to the side. The suction pipe cannot be completely removed due to the rope.

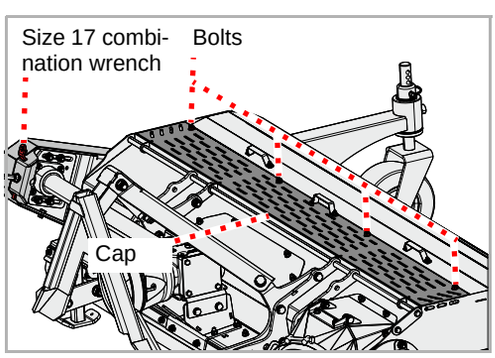
If there are foreign bodies in the fitting:

- Remove foreign bodies

Operate only with suction hose connected
If the suction hose is not connected, it is possible to reach into the tools.
Body parts can be cut off by the rotating tools.



- Reinsert suction hose with nozzle and secure with nuts



- Close cap and secure with nuts
- Insert the 17 ring spanner into its holder

Cutting bar [+]

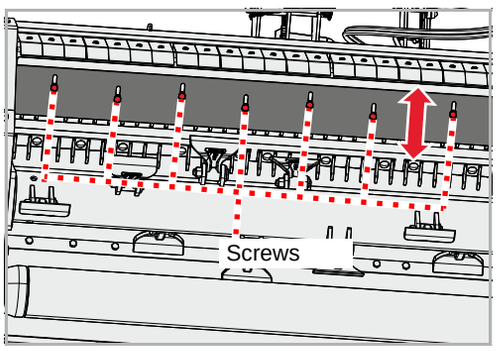
You can alter the degree of shredding using a cutting bar.

Check for contact between tools and the cutting bar
The tools must not be touching the cutting bar.
If any tools are touching the cutting bar, this will damage the tools in question and the cutting bar itself.

Adjusting

After adjusting the cutting bar you must check whether any tools are touching the cutting bar.

- Raise the machine and mechanically secure it against lowering
- Loosen the screws but do not remove them
- Move the cutting bar as required
- Retighten the bolts



Checking

Check whether any of the tools are touching the cutting bar.

- Turn the rotor by hand until one tool is next to the cutting bar
- Move the tool next to the cutting bar back and forth

If the tool touches the cutting bar:

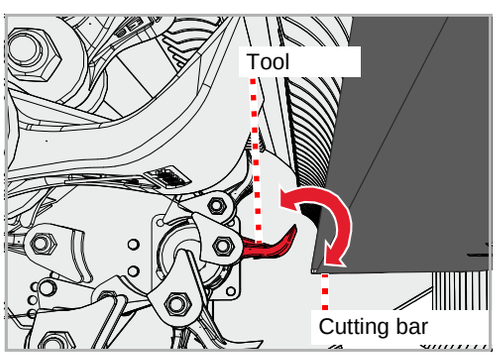
- Check whether the tool is warped

→ Replace any warped tools. Chapter »Maintenance« paragraph »Tools«, page 64

- Check whether the rotor is running with an imbalance

→ Have the unbalanced rotor balanced at a specialist workshop.

- Continue turning the rotor by hand and check the rest of the tools along the entire length of the cutting bar.



Mulching working depth

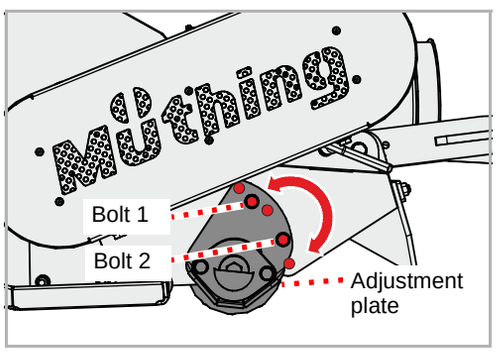
Without support wheels, the working depth can be adjusted in 7 mm steps. With support wheels, the working depth can be adjusted in 15 mm steps.
The optimal working depth for most applications is the middle setting.

Tools must not come into contact with the ground
Any contact with the ground could result in stones or other material not being held back safely by the stone guard.
Persons even outside of the hazard area could be injured by ejected material.

- Secure the carrier vehicle so that it cannot roll away.
- Raise the machine approximately 5 cm

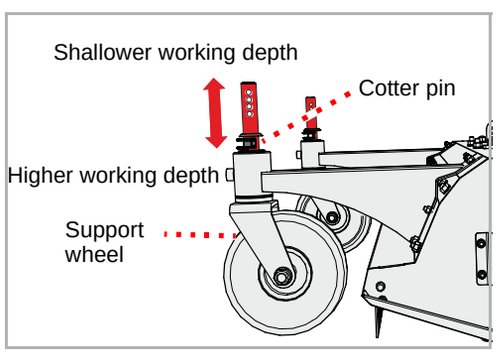
Without support wheels

Always secure the adjustment plate with two bolts
The adjustment plate must always be secured with two bolts. If the adjustment plate is only secured with one bolt, the working depth could change by itself and the tools could come into contact with the ground.
Persons even outside of the hazard area could be injured by ejected material.



- Undo and remove the nuts on bolt 1 and bolt 2.
- Remove bolt 1 and bolt 2.
- Use the adjustment plate to adjust the working depth as desired.
- Secure the adjustment plate with bolt 1 and bolt 2.
- Secure bolt 1 and bolt 2 with nuts.
- Make the same adjustment on the opposite side of the housing.

With support wheels [+]

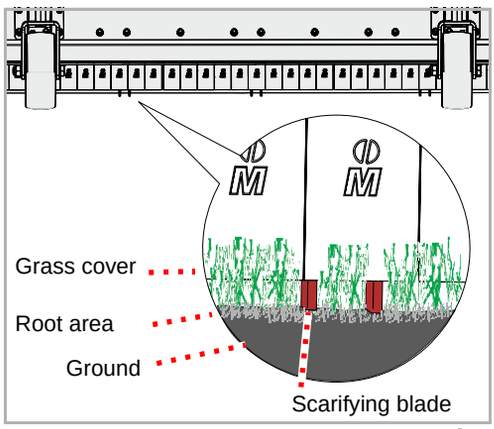


- Remove the cotter pin.
- Raise or lower the support wheel as required.
- Secure the support wheel again using the cotter pin.
- Make the same setting on the second support wheel.

Scarifying working depth

Without support wheels, the working depth can be adjusted in 7 mm steps. With support wheels, the working depth can be adjusted in 15 mm steps.

The optimal working depth for most applications is the middle setting.

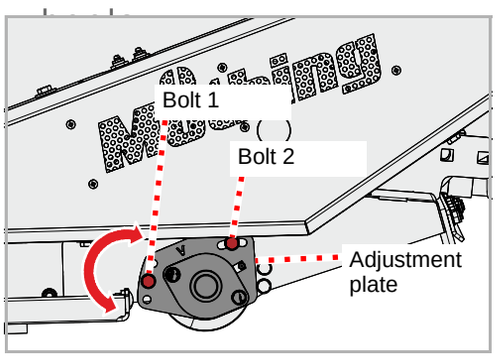


Only switch on the machine at the working place
The scarifying blades work deeper than the support roller. Therefore, the scarifying blades strike on hard ground. The surface and the scarifying blades can be destroyed. Parts could be ejected from the machine at high speed in certain circumstances.
Lowering a machine that is switched on or switching on a lowered machine on hard surfaces can lead to serious or fatal accidents.

The scarifying blades only with little contact to the ground
The scarifying blades should work in the root area of the grass and not work the groundl or only to a depth of 1-2 mm. In case of deeper contact with the ground, stones or other material can no longer be safely retained by the stone guard.
Persons even outside of the hazard area could be injured by ejected material.

- Secure the carrier vehicle so that it cannot roll away.
- Raise the machine approximately 5 cm

Without support wheels



- Loosen and remove nut on screw 1
- Remove screw 1
- Loosen the nut on screw 2, but do not remove it
- Use the adjustment plate to adjust the working depth as desired.
- Secure adjustment plate with screw 1
- Secure bolt 1 and bolt 2 with nuts.
- Make the same adjustment on the opposite side of the housing.

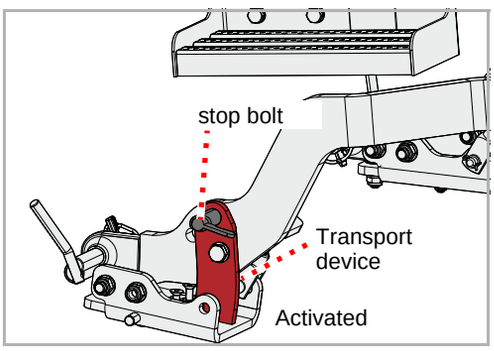
With support wheels [+]

→ Chapter »Preparation« paragraph »Mulching working depth«, page 44

Transport device [+]

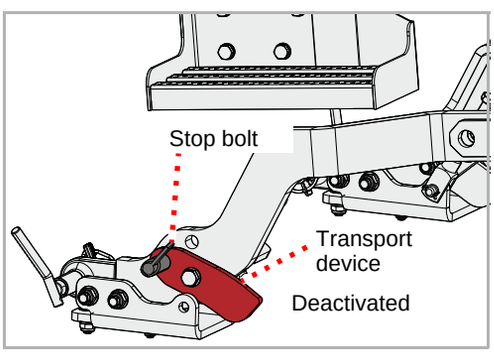
A transport device can be useful in combination with some carrier vehicles. The transport device lifts up the machine 2° higher than is possible without a transport device. This makes it easier to drive the machine over ramps. It is also easier to clean the underside of the machine.

Activation



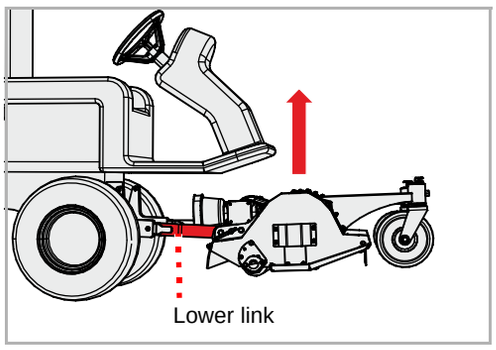
- Pull the stop bolt
- Swivel transport device downwards and allow stop bolt to engage

Deactivation



- Pull the stop bolt
- Swivel transport device upwards and allow stop bolt to engage

Transport position



- Adjust the height of the lower links using the power lever of the carrier vehicle so that the machine is high enough for transport.
- Secure the control devices on the carrier vehicle so that they cannot be actuated accidentally.

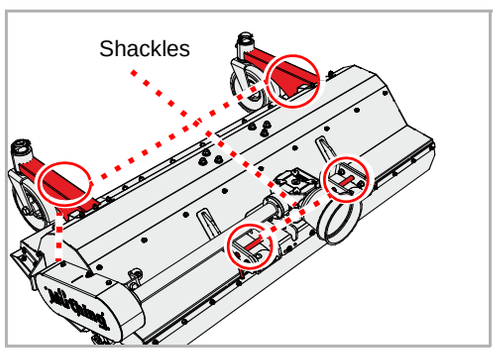
→ Operating manual of carrier vehicle

Transport without coupling

For transport on, for example, a trailer, the machine can be raised. Only use the designated points for attaching the lifting device. The machine must be securely positioned.

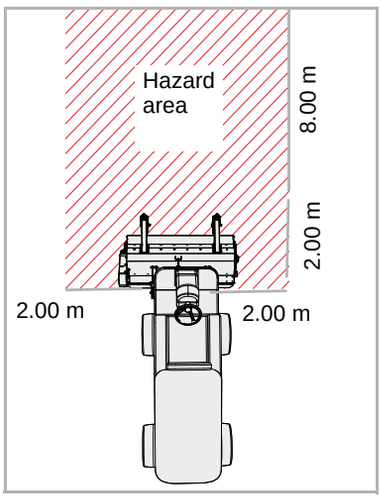
- Setting down the machine in a secure position

→ Chapter »Parking and storage« paragraph »Setting down the machine in a secure position«, page 53



- Attach suitable lifting devices to the lifting eyes
- Raise the machine with suitable lifting gear and position on the loading bed
- Secure the machine against slipping

Task

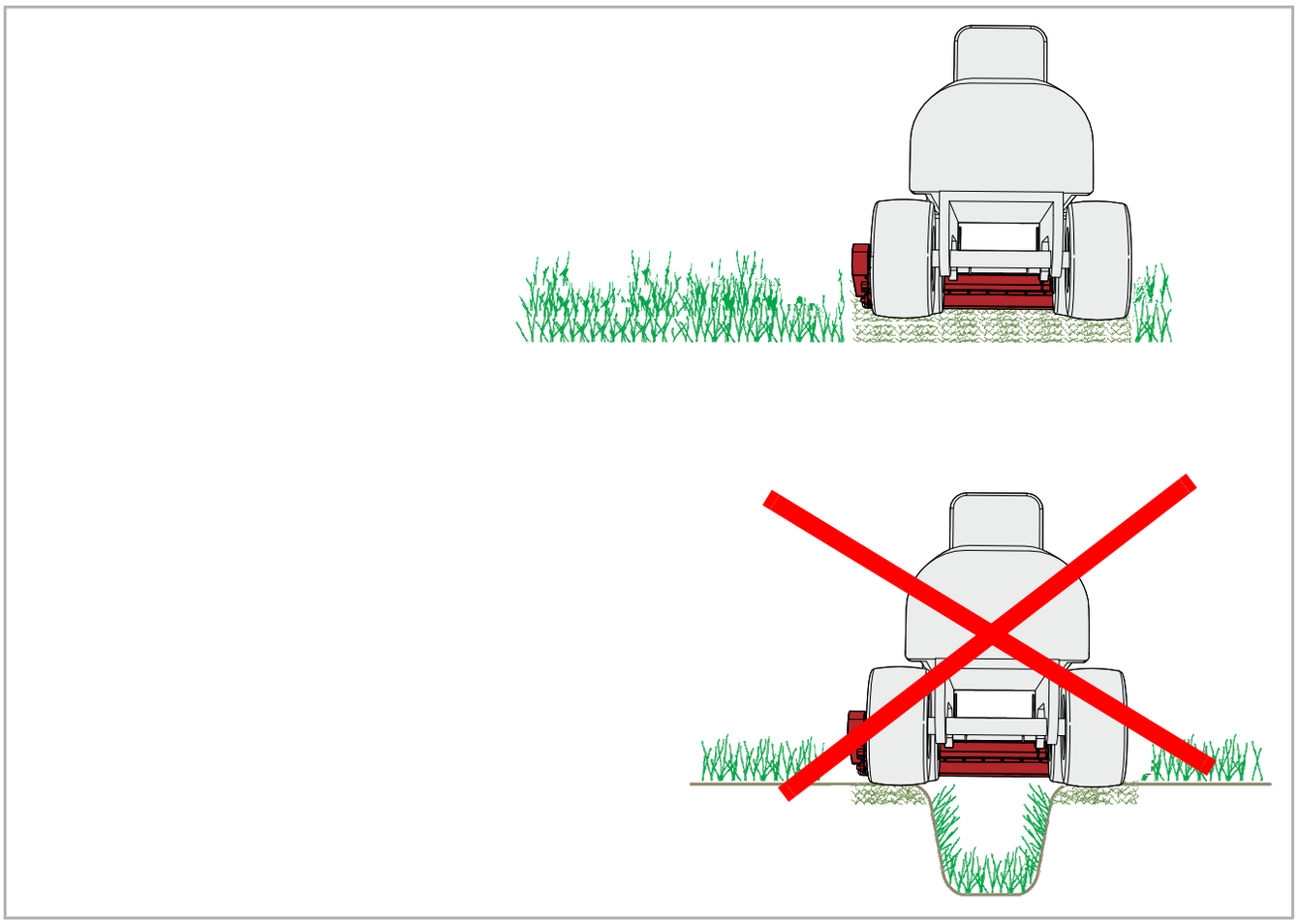


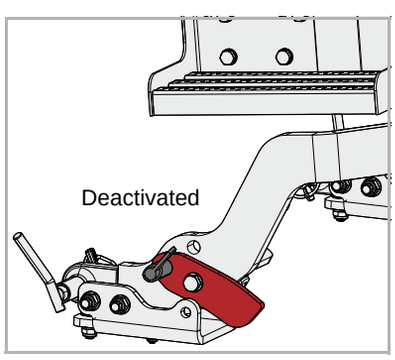
Check the hazard area
The hazard area in front of the machine is 8 m. It is 2 m at the sides. Before driving off, operating the machine and during operation, check its hazard area. Make sure that you have an adequate view. Do not begin work until the hazard area is cleared of any persons or objects. Parts could be ejected from the machine at high speed in certain circumstances. The hazard area, particularly in front of and behind the machine, must be cleared of any persons, animals or objects before starting.
Any use of the machine without verification of the hazard area can lead to serious or fatal accidents.

Assess the dust exposure levels
If the ground and the material to be mulched are dry, you may be exposed to dust. Dust exposure can be avoided by taking into account the direction of the wind. If dust exposure cannot be avoided, you can protect yourself by wearing a dust mask. If these measures are not sufficient, use a carrier vehicle with an enclosed cab and a dust filter.
Dust exposure may lead to respiratory diseases.

Only work forwards
The machine may only be located in work position when moving forwards. The machine must be raised up when reversing.
A machine in work position when reversing could result in serious damage to the machine.

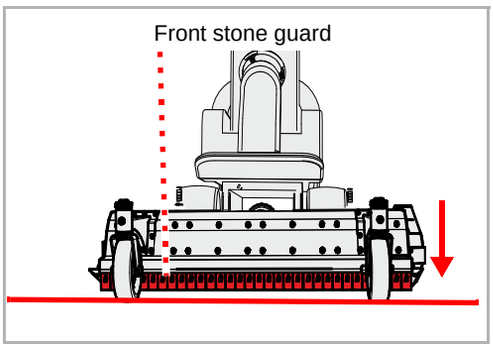
Particular care should be taken by the operator when working with the mulcher. Working on ditches, overhangs or slopes are activities which tend to be particularly hazardous. We can only give general instructions, the actual situation must be evaluated by the operator.





Deactivate transport device
Deactivate the transport device before mulching. A machine with activated transport device operates too high and the stone guard is ineffective.
Any use of the machine with the transport device activated can lead to serious or fatal accidents.

Do not lean the machine forwards
The machine must not lean forwards or backwards during work.
A machine that is leaning forwards or backwards can become clogged up and work incorrectly.



- Lower the machine using the carrier vehicle until the machine is on the ground. The front stone guard should be parallel to the ground.
- Place the control device on the carrier vehicle for the lower links into the floating position.

On machines with blower equipment:

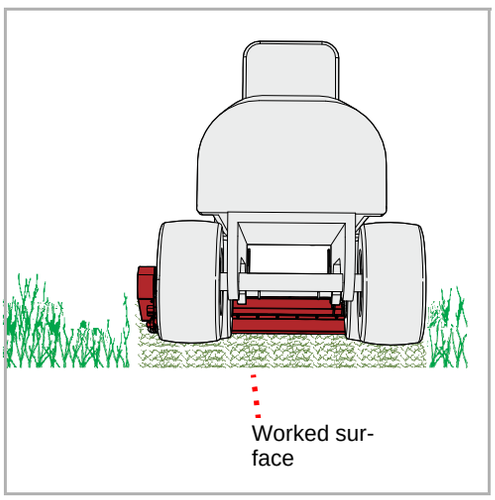
- Check receptacle of carrier vehicle to determine whether there is sufficient space to hold mulch
- Switch on blower equipment

In the case of machines with a mechanical drive:

- Switch the PTO stub shaft into the work position and slowly bring the machine to the rated speed

In the case of machines with a hydraulic drive:

- In the work position, switch on the hydraulic drive and slowly bring the machine up to its rated speed.



- Then drive at low speed into the stock, increase speed slowly. Pay attention to the machine while doing this.

If the machine is working too hard:

- Reduce speed

- Drive at a suitable speed. The speed must be appropriate to the growth and the type of terrain.

After mulching

- Shut off machine via propeller shaft or hydraulic motor

When mulching with blower equipment:

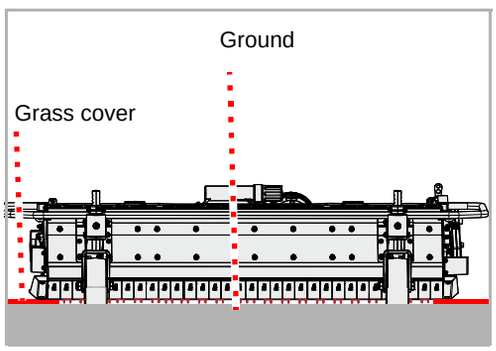
- Allow blower equipment on tractor to run until the suction hose is completely emptied.
- Empty the receptacle of the carrier vehicle promptly so that the mulch cannot self-ignite

Scarifying is only possible with a machine converted for this purpose. Before use, check whether the conversion was carried out in a certified specialist workshop and whether the carrier vehicle is approved for operation with the machine.

Task

The machine is only suitable for scarifying grass swards that have been mown short in advance.

When mulching, the tools work above the grass sward. When scarifying, the blades reach into the upper root space, removing moss, dry plant material and longer grass blades from the grass carpet.



Switch on and lower the machine only at the working location
The scarifying blades work deeper than the support roller. Therefore, the scarifying blades strike unsuitable hard ground. The surface and the scarifying blades can be destroyed. Parts could be ejected from the machine at high speed in certain circumstances.
Lowering a machine that is switched on or switching on a lowered machine on hard surfaces can lead to serious or fatal accidents.

The operation of the machine is the same as for mulching.
→ Chapter »Mulching«, page 48

Cleaning and care

Cleaning

A high-pressure cleaner, for example, can be used to clean the machine. Never point the water jet directly at the labels or type plate.

Only use low pressure to clean the bearings
Only use low pressure to clean the bearings.
The ingress of water shortens the service life of the bearings.

We recommend that you lubricate all bearings after cleaning. his forces any water which has found a way into the bearings back out and increases the service life of the machine.

Care

To ensure the machine's long service life, we recommend applying a protective coating of oil after the end of the season and during storage.

Use only approved and biodegradable oil, e.g. rapeseed oil.

Setting down the machine in a secure position

Ensure that there are no unauthorised persons can enter the set-down location
If the machine is set down either coupled to the carrier vehicle or uncoupled, you must make sure that it is protected so that unauthorised persons have no access to it.
Persons could be injured by coming into contact with parts of the machine or by manipulating the machine.

Select the set-down location carefully
The set-down location must be relatively even and the ground must be solid.
Uneven or soft ground could result in the machine rolling away and becoming damaged.

Requirements on the set-down location:

- Horizontal, solid surface
- Sufficient room on all sides
- Protected against access by unauthorised persons, such as children

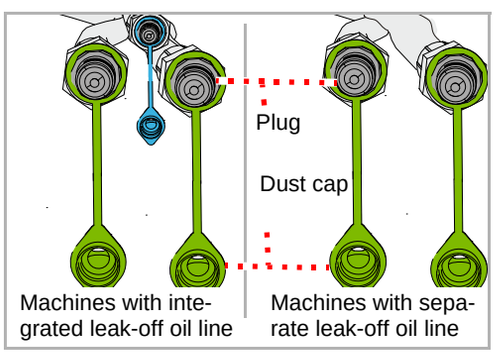
Hydraulics

Increased risk of injury
There is an increased risk of injury when uncoupling the machine from the carrier vehicle. Therefore:

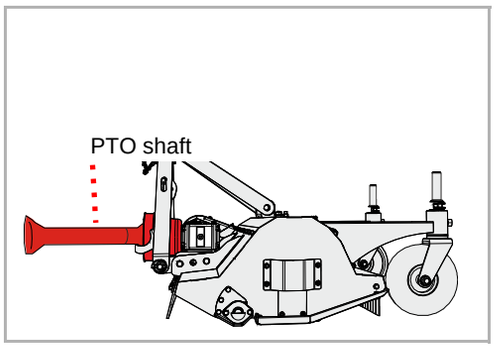
- Secure the carrier vehicle so that it cannot roll away.
- Never stand between the carrier vehicle and the machine during uncoupling.
- Actuate the power lever slowly and carefully.

Failure to observe these instructions can result in serious or fatal injury.

- ▸ Disconnect the hydraulic hoses from the connections on the carrier vehicle
- ▸ Protect the plug with the dust cap and lay it down on the machine

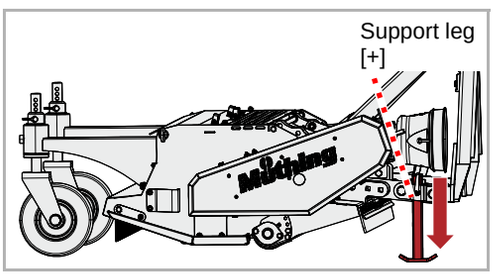


PTO shaft



- Disconnect the PTO shaft from the carrier vehicle.

Coupling triangle

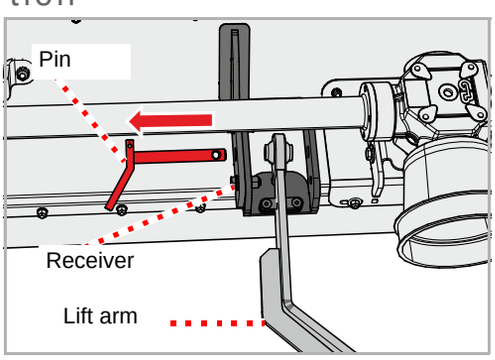


- Lower support leg and secure in bottom position
- Lowering the machine
- Undo the retainer between the implement triangle and the receiver

→ Implement triangle operating instructions

- Lower the implement triangle
- Move the carrier vehicle backwards and away from the machine.

Two-point connection



- On both sides, remove the split pins and the pins
- Move the carrier vehicle backwards and away from the machine.
- Replace the pin and secure with the split pin

The machine is now safely set down.

Storing the machine

After cleaning, the machine should be stored in transport position in a dry location and on a level and stable surface.
→ Section »Setting down the machine in a secure position«, Page 53

Apply a protective coating of oil during storage. Use only approved and biodegradable oil, e.g. rapeseed oil.
→ Chapter »Cleaning and care«, starting at page 52

For your safety

Special safety instructions

Requirements for conducting maintenance work
Only perform the maintenance work if you have the required expert knowledge and suitable tools.
A lack of specialist knowledge or the use of unsuitable tools can cause accidents.

Protect the machine from being started up accidentally
If the machine is coupled, only carry out repair and maintenance work and only rectify malfunctions on it if:

- The PTO stub shaft is off
- The engine is switched off
- The ignition key is removed
- Hand brake applied

Serious accidents may be caused if the machine starts accidentally.

Welding work
Welding work is only allowed to be carried out by persons trained in welding who also have specialist knowledge of repairing landscaping machinery. Welding work which negatively impacts the machine's construction is prohibited.
Incorrect welding work could impair or destroy the machine's function. If in doubt, contact your dealer before carrying out any welding work.

Use replacement parts with identical properties
Many components have special properties that are essential for the stability and correct operation of the machine.
When replacing components, dimensions, stability and material quality must be guaranteed. We recommend the exclusive use of original replacement parts.
Use of replacement parts which do not correspond to requirements could cause damage to the machine or impaired performance.

Protective measures when handling oils or lubricants

Additives in oils and lubricants may have adverse effects on health. Since the hazardous material code does not require any special identification, please always observe the following:

Avoid skin contact
Avoid skin contact with these materials.
Contact can result in skin damage.

Protect your skin
When handling oils and lubricants, protect your skin with lotion or wear oil-resistant gloves.
Oils can be hazardous to your health.

Do not use oils for cleaning
Do not use oils or lubricants to clean your hands.
Swarf and abraded material in these materials can also result in injuries.

Change out of soiled clothing
Change out of clothing that is heavily soiled with oil as soon as possible.
Oils can be hazardous to your health.

- Collect old oil and dispose of it in accordance with statutory regulations.
- If your skin becomes irritated by oil or lubricants, contact a doctor immediately.

General information

This information relates to general maintenance work. For all maintenance work, the machine must be locked in the work position. If it is necessary to put the machine in its transport position for maintenance work, you will see an appropriate reference in the maintenance instructions.

Working with the grease gun:
One or two strokes with the grease gun are sufficient for lubrication. If you feel resistance during the second stroke of the grease gun, do not complete it.
Too much grease will force the bearings apart. This could allow dust and dirt to enter the bearing, resulting in premature wear.

Fundamentals

The following table contains a brief explanation of the most important terms used for maintenance.

Task	Version
Greasing	• Apply grease to the slide surfaces using a brush
Lubrication	• 1 - 2 Unless specified otherwise, one or two strokes with the grease gun provide sufficient lubrication
Oiling	• Unless otherwise specified, use only vegetable-based oil such as rapeseed oil • Mineral oils are not suitable • The use of used oil will endanger your health and is also strictly prohibited
Replacement	• Replace the component in question according to the instructions in the »Maintenance« chapter
Check	• An inspection may be required in conjunction with the replacement of the component in question
Observe the maintenance intervals	• All information is based on average machine usage • In the case of heavy usage (e.g. contract work), shorten the maintenance intervals accordingly • Shorter maintenance intervals may also be required under extreme working conditions (e.g. heavy dust generation)

Screwed connections

Retighten screws

All bolts must be retightened:

- After the first hours of operation
- According to the frequency of use
- But at least once a season

General tightening torques

Tighten all screwed connections in accordance with the information in the table. If different tightening torques are necessary, they are specified in the chapter »Maintenance«. The minimum quality of the bolts is 8.8.

Bolt size	Quality of the bolts		
	„8.8“	„10.9“	„12.9“
	Tightening torques in Nm		
M6	9.9	14	17
M8	24	34	41
M10	48	68	81
M12	85	120	145
M16	210	290	350
M20	425	610	710
M24	730	1050	1220

Maintenance intervals and setting work

The information relates to average usage under the machine's normal operating conditions. Maintenance intervals are shorter for heavy usage, such as with hire companies, or for extreme operating conditions such as very dusty environments.

	After the first hours of operation	Once daily	After 30 hours of operation	After 75 hours of operation	Once per season	As required	In case of wear	grease / oil / lubricate	Check	Replacement	Cleaning
General											
Retighten all screws	•					•					
Visual inspection	•	•									
Bearing		•				•		•			
Pivots		•							•		
Hydraulics											
Hydraulic hoses Every 6 years										•	
Hydraulic hoses General						•	•			•	
Hydraulic cylinder		•		•		•		•	•		
Tools											
Fastenings on the rotor		•							•		
Condition, wear		•							•		•
Other											
Position of rotor		•						•			
Roller bearing		•						•			
Shafts and pins			•					•			
PTO shaft Protective cover		• •				• •		• •	• •	• •	• •
Transmission oil		•							•		
					•					•	

Lubricating work

Lubricate bearings

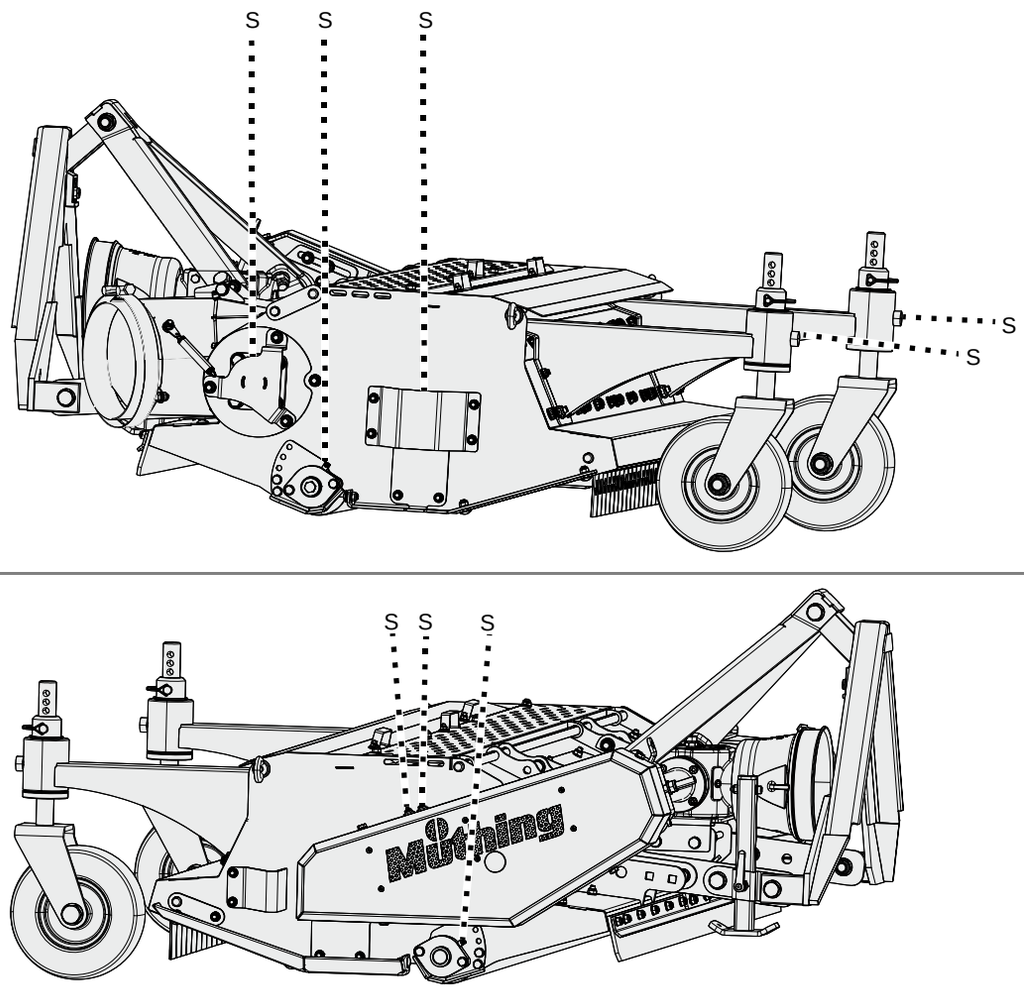
The bearings must be lubricated regularly. Lubricate only with one or two strokes from the grease gun:

- According to the maintenance chart
- After heavy use
- But at least once a season

Bearings that require no maintenance must not be lubricated.

Overview of lubrication points

S = lubrication point



Other lubrication points

The following applies:

- In addition to the lubrication points shown in this operating manual, your machine may have other lubrication points
- As a rule, lubrication points are located at pivots or bearings. Therefore, inspect your entire machine for any such additional lubrication points.

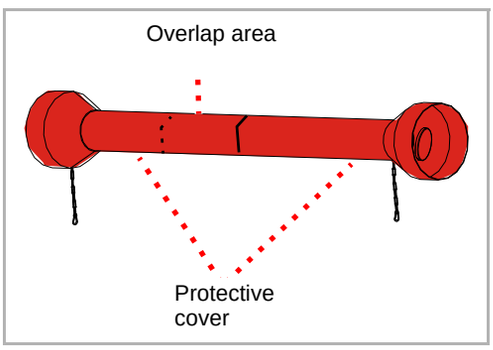
The location of the lubricating nipple is usually shown on one component as an example. If multiple components of this kind exist, the lubricating nipples have to be lubricated at each of these components.

PTO shaft

The PTO shafts are heavily stressed. This means that regular maintenance is decisive for the PTO shafts' service life. Only the most important work is shown here.
Full maintenance work on the PTO shaft:
→ PTO shaft operating manual

Checking

Daily



- Check the PTO shaft for contamination and clean if required. Dust in conjunction with oil and grease results in increased wear

If the PTO shaft is heavily contaminated:

- Clean PTO shaft
- Grease the interior of the overlap area of the protective cover

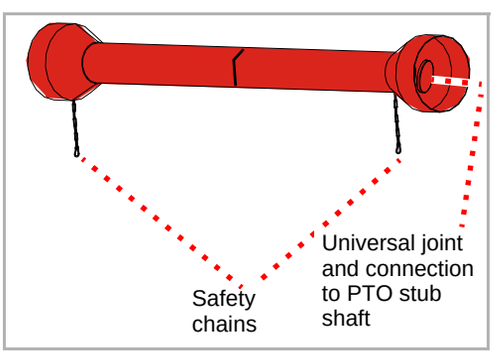
→ PTO shaft operating manual

- Check protective cover for damage

If the protective cover is damaged:

- Replace protective cover

→ PTO shaft operating manual



- Check presence and correct function of safety chains

If the safety chains are not present or are heavily worn:

- Replace the safety chains

→ PTO shaft operating manual

- Check the PTO shaft for wear in the universal joints and at the connection to the PTO stub shaft

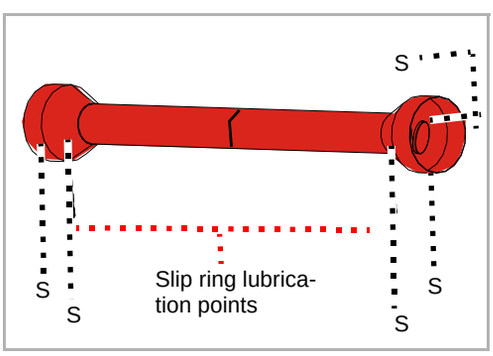
If the universal joints are heavily worn:

- Replace the universal joints

→ PTO shaft operating manual

Lubrication

Every 50 hours of operation



In case of heavy usage or in extreme operating conditions, such as a very dusty environment, more frequent lubrication is required.

- Lubricate in the universal joint with 1 - 2 strokes of the grease gun.
- Lubricate on the slip rings with 1 - 2 pumps of the grease gun

For wide-angle PTO shafts:

The wide-angle joint contains a lubricant reserve which must be filled with 400-500 g [14-17 OZ] of grease.

- Lubricate with at least 5-6 pumps of the grease gun

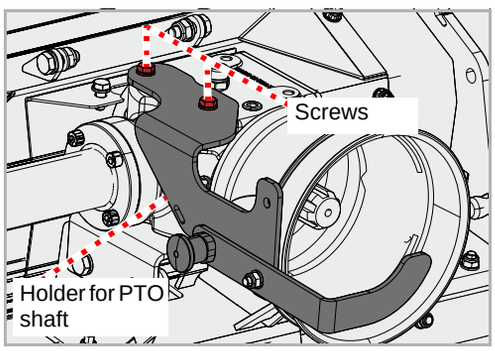
→ PTO shaft operating manual

Transmission oil

The gearbox oil must conform to the specification.
→ Chapter »Familiarising yourself with the machine« paragraph »Technical specifications«, page 26

Check

Twice per season

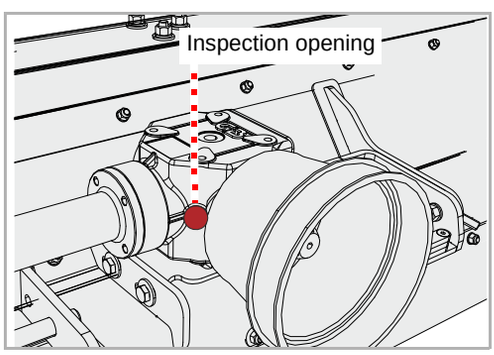


In the case of machines with a mechanical drive:

- Remove the PTO shaft
- Remove the bolts
- Remove the PTO shaft holder

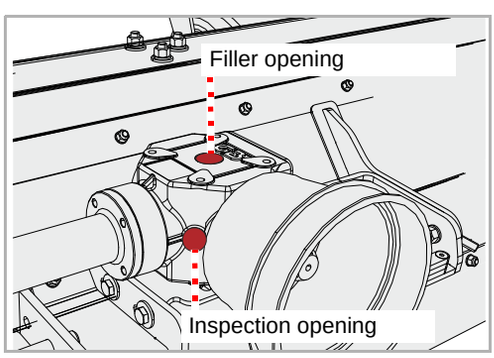
After control:

- Refit the holder for the PTO shaft
- Refit the PTO shaft



- Loosen the screw on the inspection opening with an Allen key and remove the screw
- Check the oil level. The oil level must reach the lower edge of the inspection opening.
- Retighten the screw at the inspection opening

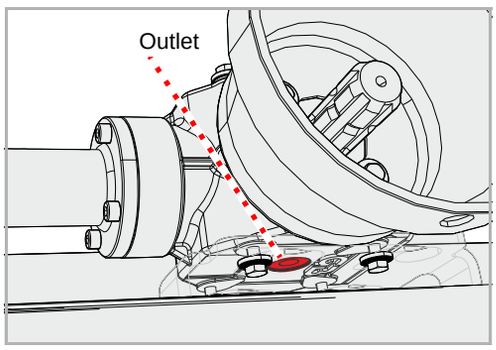
Refilling



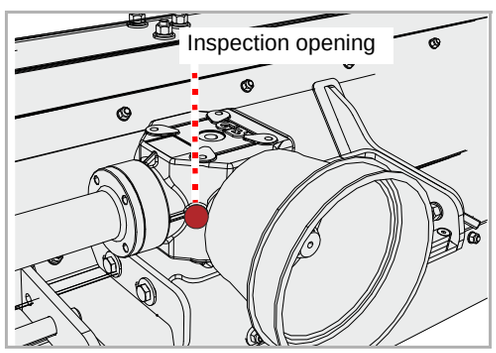
- Loosen the screw on the inspection opening with an Allen key and remove the screw
- Loosen the screw on the filler opening with an Allen key and remove the screw.
- Use a funnel to fill with gear oil of the appropriate specification until the oil level reaches the lower edge of the inspection opening
- Retighten the screw at the inspection opening
- Retighten the screw at the filler opening

Replacement

1x per season



- Place a collection container under the outlet for the waste oil

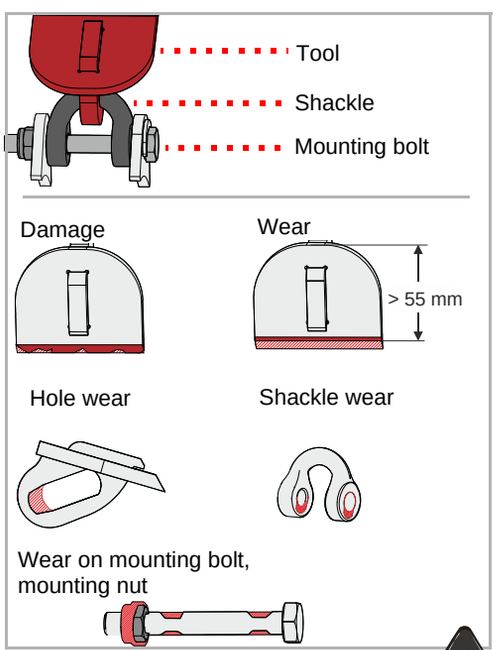


- Loosen the screw on the inspection opening using a hex key
- Loosen the screw on the outlet with an Allen key and remove the screw
- Allow the oil to drain out fully
- Screw the screw on the outlet back in.
- Refill with new gear oil

→ Section »Refilling«

Tools

As required



The tools must be replaced if they:

- Are damaged
- Heavily worn (length of tool less than 55 mm)
- The bore on the tool is worn
- The shackle is worn
- The fastening screws or the fastening nuts are worn

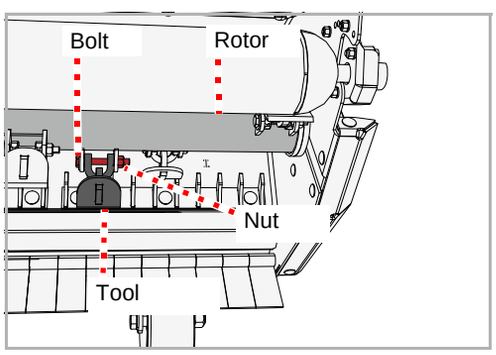
It is important that the rotor runs without unbalance. Therefore:

- Always replace tools with the same type
- Always replace tools opposite each other at the same time
- In case of wear it is best to replace the entire set of tools

Secure the machine
Work can only be carried out on a machine secured against rolling away and dropping. To prevent dropping, for example, permitted and correctly dimensioned support legs can be used.
If the machine is not secured against rolling away and lowering, serious or fatal accidents could result.

New tools – New bolts, nuts and shackles
When replacing the tools, the nuts, bolts and shackles must also be replaced at the same time.
If the nuts and bolts are not replaced, the worn bolts may break. Tools may become detached during work and be flung out. Even persons outside of the hazard area could be seriously injured or killed.

Sharp tools
The tools can be very sharp. Work very carefully and wear protective gloves when working on the tools.
Cut injuries can result if you do not work carefully or work on the tools without protective gloves.



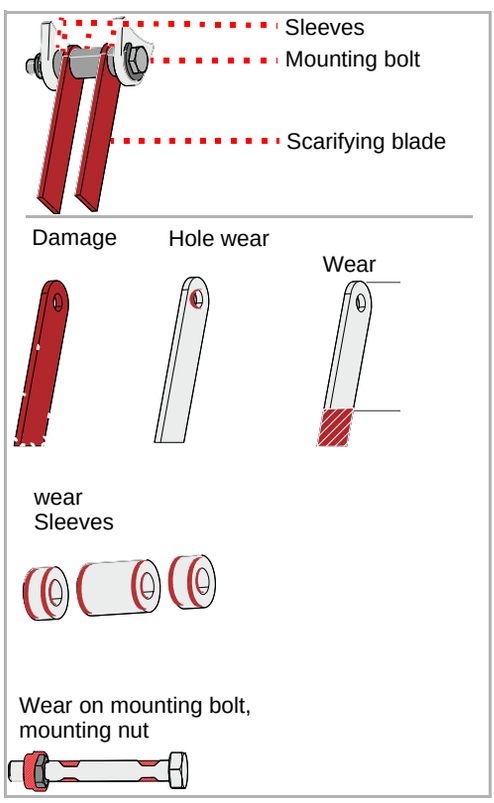
- Secure the machine against rolling away and dropping
- Loosen the nuts and remove the bolts
- Remove old tool
- Insert the new tool in the same way.
- Fit a new screw and secure with a new nut

Scarifying blade

The scarifying blades may only be fitted to machines that have been converted for scarifying in a certified workshop.

Scarifying blades are always replaced as an assembly kit. A assembly kit for scarifying blades consists of:

- 2 scarifying blades
- 3 sleeves
- 1 Mounting bolt
- 1 Nut
- 1 Washer



The scarifying blades must be replaced when they:

- Are damaged or heavily worn
- Worn out at the bores are
- The fastening screws or the fastening nuts are worn

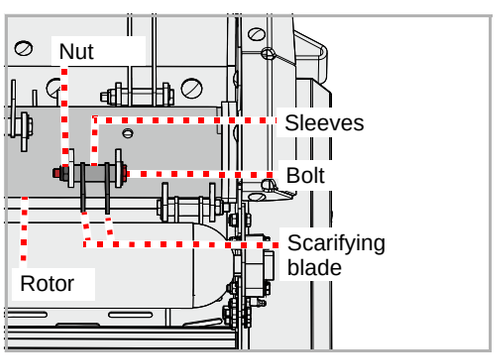
To ensure correct concentricity without unbalance, please observe the following points:

- We recommend replacing all scarifying blades when there is wear or abrasion
- Replace scarifying blades with scarifying blades of the same type
- Always replace opposite scarifying blades at the same time so that there is no imbalance in weight

Secure the machine
Work can only be carried out on a machine secured against rolling away and dropping. To prevent dropping, for example, permitted and correctly dimensioned support legs can be used.
If the machine is not secured against rolling away and lowering, serious or fatal accidents could result.

New tools – new screws, nuts and sleeves
When replacing the tools, the screws, nuts and sleeves must also be replaced.
If the nuts and bolts are not replaced, the worn bolts may break. Tools may become detached during work and be flung out. Even persons outside of the hazard area could be seriously injured or killed.

Sharp tools
The tools can be very sharp. Work very carefully and wear protective gloves when working on the tools.
Cut injuries can result if you do not work carefully or work on the tools without protective gloves.



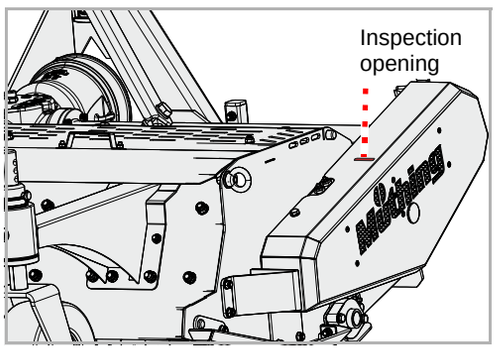
- Secure the machine against rolling away and dropping
- Loosen the nuts and remove the bolts
- Remove old tool and sleeves
- Insert new tool with sleeves in the same way
- Fit a new screw and secure with a new nut

V-belt

As required

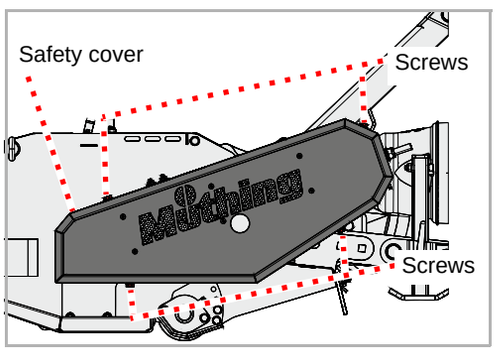
The V-belt is tensioned by a counterweight. If the V-belt is not sufficiently tensioned, it must be retensioned. If there are any tears or the V-belt is damaged, it must be replaced.

Checking



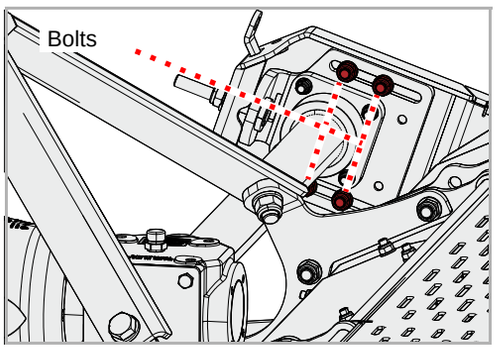
There is an inspection opening on the machine.

- Check the tension of the V-belt. When under a load of 6 kg, it must not be possible to push the V-belt through more than 10 mm.

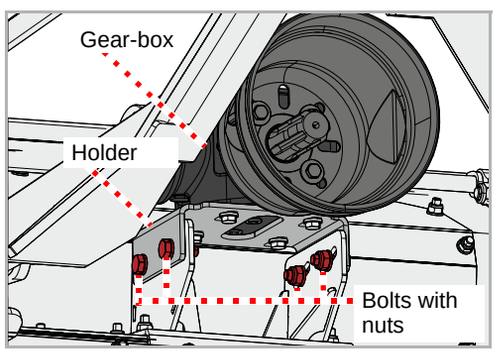


- Remove the screws, remove the safety cover.
- Check the V-belt for damage
- Reassemble the safety cover

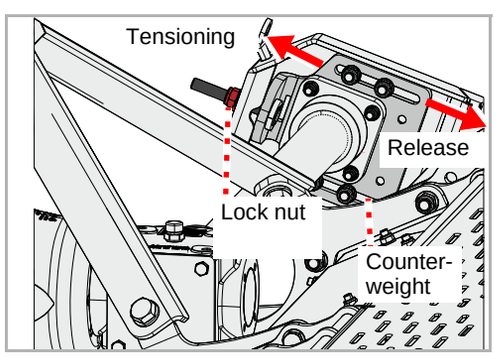
Tensioning



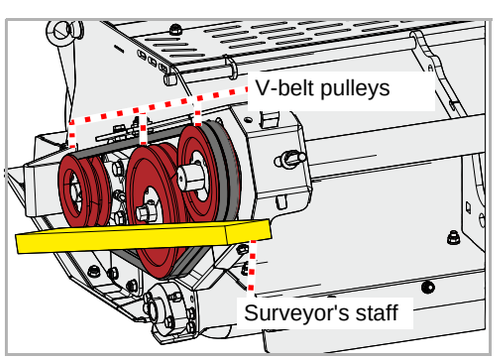
- Loosen the nuts but do not remove them.



- Loosen the nuts on the bolts, but do not remove them



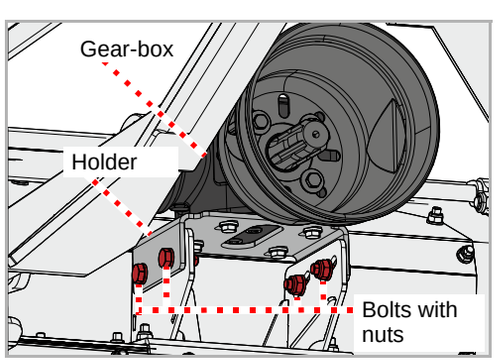
- With the lock nut, adjust the V-belt tension as desired using the counterweight



- Check the alignment of the V-belt pulleys. Use a surveyor's staff or similar. The surveyor's staff must lie flat on both V-belt pulleys and must be properly aligned.

If the surveyor's staff does not lie flat:

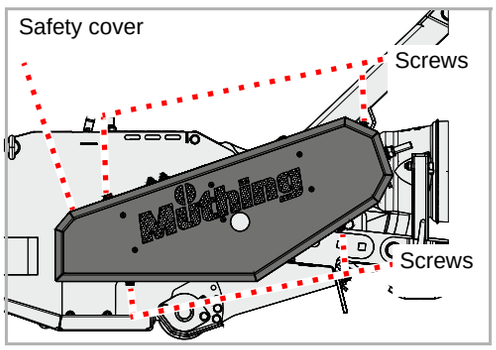
- Move the holder with the gear-box until the surveyor's staff lies flat on both V-belt pulleys
- Retighten the nuts on the bolts.



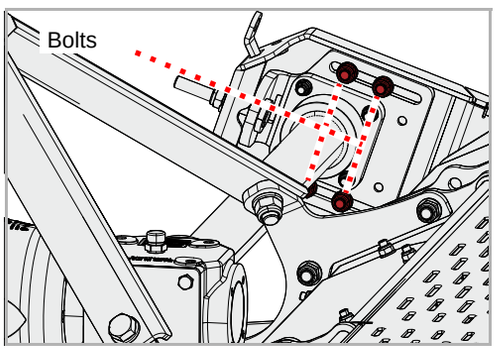
- Check the V-belt tension
- Retighten the nuts

Replacement

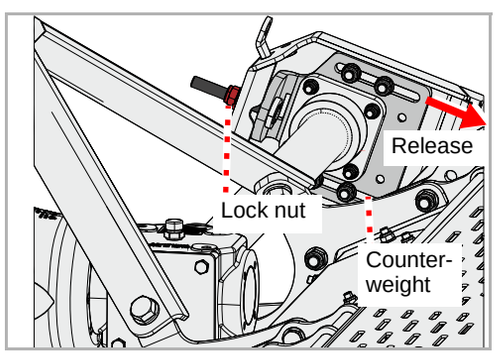
If there are any tears or other damage on the V-belt, it must be replaced.



- Remove the screws, remove the safety cover.

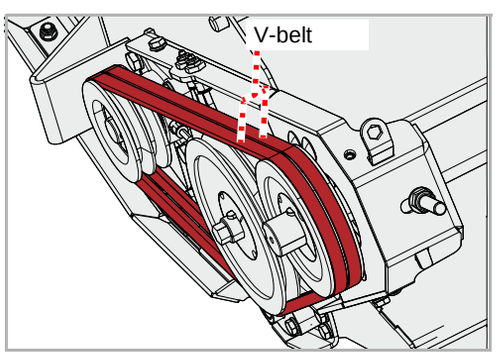


- Loosen the nuts but do not remove them.



- Release the V-belt tension with the lock nut

The V-belt unit consists of two narrow V-belts.



- Remove the old V-belts.
- Fit the new V-belts
- Check the V-belt for correct positioning
- Tension the V-belt

→ Section »Tensioning«, Page 69

- Reassemble the safety cover

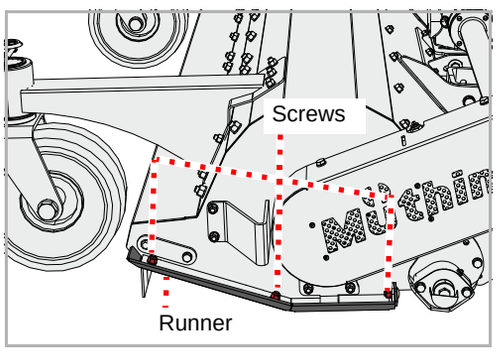
Runners

As required

The runners protect the machine from direct contact with the ground. If they are not replaced in good time, the housing of the machine will be damaged.

Secure the machine
Work can only be carried out on a machine secured against rolling away and dropping. To prevent dropping, for example, permitted and correctly dimensioned support legs can be used.
If the machine is not secured against rolling away and lowering, serious or fatal accidents could result.

Runners



There are runners on the right-hand side and left-hand side.

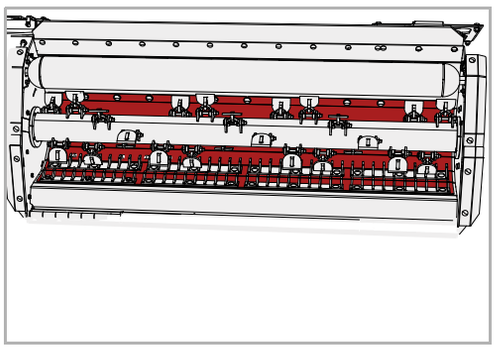
- Undo nuts, remove screws and washers.
- Remove old runner
- Fit new runner
- Fit new screws and washers
- Secure screws with new nuts

If the runners also need to be replaced on the opposite side:

- Replace the runners on the opposite side as well.

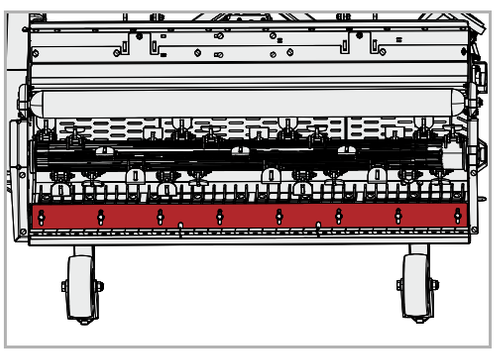
Wear insert

A metal insert protects the housing from wear.



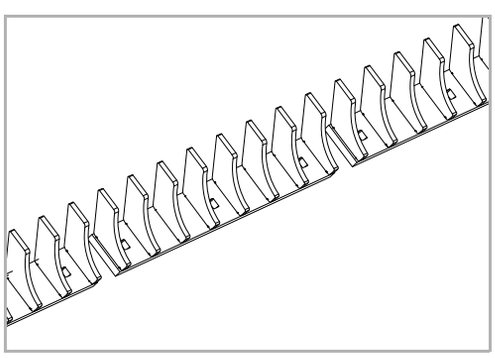
Cutting bar

The cutting bar allows you to adjust the rate of shredding. You can use it to determine how finely the mulch should be shredded.



Short chopping bar

A short chopping bar optimises the material feed. You thus achieve better shredding if the mulch is very long.



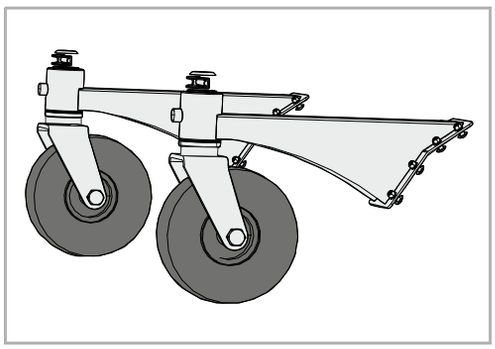
Scarifying blade

The rotating scarifying blades actively cut the matted layer in the root crown area of the grass. This produces a better soil structure and healthier grass. The swinging mounts of the scarifying blades allow them to evade foreign bodies.

For the use of scarifying blades, the machine must be modified in a certified workshop.

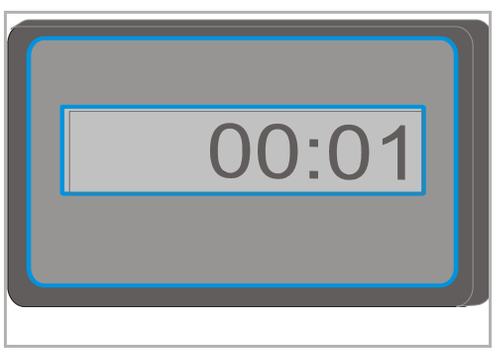
Support wheels

Support wheels are available for comfortable depth guidance.



Operating hours counter

An electronic operating hours counter displays the actual operating duration. This means that data can be recorded precisely and used, for example, for calculations.



Faults can often be eliminated quickly and easily. In the event of hydraulic problems, first check:

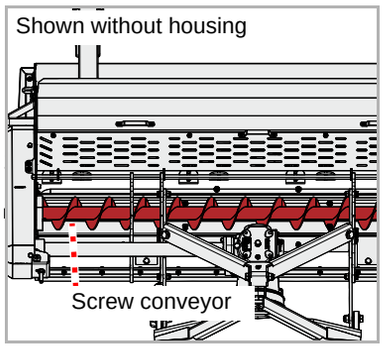
- Are the hydraulic hoses properly connected?
- Is the control valve on the carrier vehicle defective?
  If so, contact your dealer.
- Is the hydraulic pump of the carrier vehicle defective?
  If so, contact your dealer.

Before calling Customer Service, refer to the table below to check whether the fault is one you can eliminate yourself.

Fault	Cause	Remedy
Strong vibrations and high noise development	Tools are worn	Replace the tools
	One or more tools are missing	Replace tools
	Tools are damaged	Replace the tools
	Bearings for the rotor are worn	Have the bearings replaced
	Foreign bodies, such as wire, are wound around the rotor or feeder auger	Remove foreign bodies
	Tools have become loose	Tighten nuts on screws
	Speed of rotation of the PTO stub shaft is not set correctly	Set the correct speed of rotation on the PTO stub shaft
	Bearings for the rotor or feeder auger are worn	Have the bearings replaced
	Rotor or feeder auger not correctly balanced	Check rotor and feeder auger for imbalance and have the rotor or feeder auger re-balanced if necessary
Machine operates sluggishly	Driving speed is too high	Reduce the drive speed
	With blower equipment: Receptacle on carrier vehicle is full	Empty receptacle
Rotor or feeder auger do not rotate	Rotor or feeder auger is blocked by foreign bodies	Remove foreign bodies
	The PTO shaft is free-wheeling or the gear box is incorrectly assembled.	Have the free running state correctly assembled
PTO shaft rotating, rotor is not	V-belt torn	Replace the V-belt
Unusual noises from the PTO shaft	Insufficient lubrication	Lubricate the PTO shaft
Tools wearing quickly	The tools are working too deeply	Set correct working depth

Fault	Cause	Remedy
Material cut too rough and cut material not distributed evenly	Drive speed too high	Reduce the drive speed
	The tools are working too deeply	Set correct working depth
	The tools are working too high	Set correct working depth
	V-belt worn	Replace V-belt set
	V-belt not correctly tensioned	Check V-belt tension and retension if necessary
	The speed of the PTO stub shaft of the carrier vehicle is too low.	Increase the rpm
	Tools are worn	Replace the tools
	The machine is not standing parallel to the ground	Adjust the machine correctly
Mowings remain on the ground	Driving speed is too high	Reduce the drive speed
	With blower equipment: Guide plate is in work position	Reinstall guide plate in parking position
	With blower equipment: Delivery hose to carrier vehicle is blocked Blower equipment on carrier vehicle is blocked	Empty receptacle. Remove foreign bodies. Check delivery hose for leaks. Check blower equipment and remove blockage.
Scarifying blades no longer work cleanly	Scarifying blades are worn	Replace scarifying blades
Gear box overheating	Incorrect oil specification	Change oil and select oil with correct specification
	Oil too old	Change oil
	Oil level too low	Fill the oil to the lower edge of the inspection opening
	Machine overload	Maintain rpm in correct region, adjust driving speed to suit the work, maintain performance area (avoid excessively heavy growth or excessively thick branches)
High wear on V-belts V-belts running hot Power transmission not optimal	The tools are working too deeply and touching the ground	Set correct working depth
	Pulleys not aligned in parallel	Have pulleys correctly aligned
	V-belt is worn	Replace the V-belt
	V-belt is not correctly tensioned	Check the tension jack
Oil leaking from the gear box	Sealing rings worn or damaged	Have sealing rings replaced
Drive elements broken	Machine was started up abruptly or is blocked by foreign bodies	Have defective drive element replaced. Start the machine up slowly.

Screw conveyor

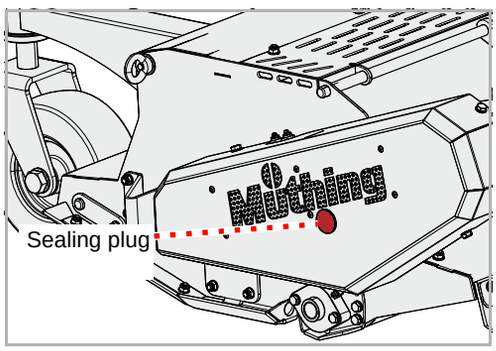


If there is a blockage or foreign bodies on the feeder auger, which are difficult to remove, you can manually turn the feeder auger against its normal direction of rotation.

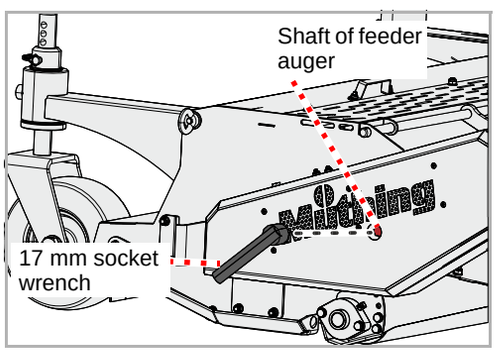
Protect the machine from being started up accidentally
If the machine is coupled, only carry out repair and maintenance work and only rectify malfunctions on it if:

- The PTO stub shaft is off
- The engine is switched off
- The ignition key is removed
- Hand brake applied

Serious accidents may be caused if the machine starts accidentally.



- Remove sealing plug



- Put 17 mm socket wrench on shaft of feeder auger
- Turn shaft anticlockwise using socket wrench
- Remove blockage or foreign bodies
- Reinstall sealing plug

When the service life of your machine is over, it must be disposed of properly. Please observe currently valid disposal regulations.

Metal parts
All metal machine components can be sent for metal recycling.

Plastic parts
All plastic parts are marked and can be recycled.

Oil
Collect oil from the hydraulic system in a suitable catch pan and dispose of at a old oil collection point.

EU-conformity declaration

EC Directive 2006/42/EG

Müthing GmbH & Co. KG Soest
Am Silberg 23
D-59494 Soest

assumes sole responsibility for declaring that the following product complies with EC Directive 2006/42/EC:

MU-Collect and accessories

Assorted samples of harmonized standards:

- DIN EN ISO 4254-1
- DIN EN ISO 4254-12
- EN 13524

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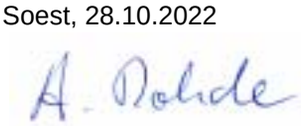
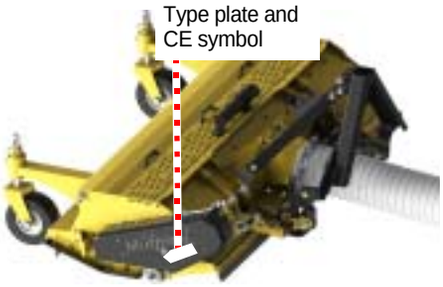


Andreas Rohde
CEO and authorised person for compiling technical documentation

Copy of the type plate/serial number entry

Machine type:	Flail mower
Model:	
Working width:	
Serial number:	
Year of construction:	

EC Directive 2006/42/EG



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Andreas Rohde
CEO and authorised person for compiling technical documentation

Copy of the type plate/serial number entry

Machine type:	Flail mower
Model:	
Working width:	
Serial number:	
Year of construction:	

UK Declaration of Conformity

UKCA

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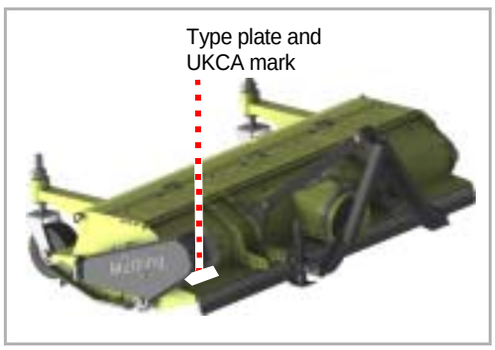
Am Silberg 23
D-59494 Soest
Germany



declares under sole responsibility that the machine conforms with the following directives:

- Supply of Machinery (Safety) Regulations 2008

Assorted samples of harmonized standards:

- BS EN ISO 4254-1
- BS EN ISO 4254-12
- BS EN 13524

Machine designation	MU-collect and additional equipment

The special technical documents corresponding to the machine have been created according to Annex VII, Part B.

Soest, 28.10.2022

A. Rohde

Andreas Rohde
CEO and authorised person for compiling technical documentation

Copy of the type plate/serial number entry

Type of machine:	Mulcher
Model:	
Working Width:	
Machine ID:	
Production Year:	

UK Declaration of Conformity

UKCA

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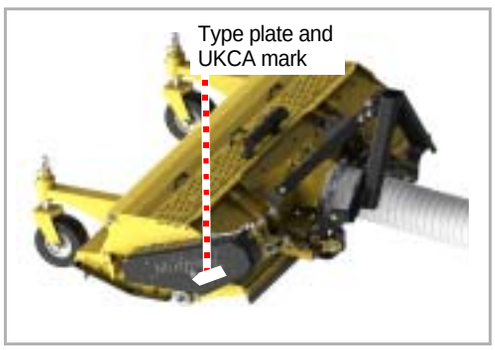
Am Silberg 23
D-59494 Soest
Germany



declares under sole responsibility that the machine conforms with the following directives:

- Supply of Machinery (Safety) Regulations 2008

Assorted samples of harmonized standards:

- BS EN ISO 4254-1
- BS EN ISO 4254-12
- BS EN 13524

Machine designation	MU-Collect Hydro and additional equipment

The special technical documents corresponding to the machine have been created according to Annex VII, Part B.

Soest, 28.10.2022

A. Rohde

Andreas Rohde
CEO and authorised person for compiling technical documentation

Copy of the type plate/serial number entry

Type of machine:	Mulcher
Model:	
Working Width:	
Machine ID:	
Production Year:	

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