



## **OPERATION MANUAL**

EN | Original

**MU-PRO/F 860**

**FROM PRODUCTION** 2018

**EDITION** 11-2022

**REFERENCE NUMBER** MU-Pro-F\_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 Silberberg 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			

\_\_\_\_\_  
Signature of client

\_\_\_\_\_  
Signature and stamp of sales partner

# Handover declaration

# Handover declaration – Copy

– This sheet remains with the client in the operating manual

I have bought the machine described below from Mühling 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.

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# Table of contents

<b>Handover declaration</b> .....	<b>3</b>	<b>Mulching</b> .....	<b>48</b>
<b>Handover declaration – Copy</b> .....	<b>5</b>	Work position	48
<b>About this operating manual</b> .....	<b>8</b>	Task	48
Target group	8	Folding out	50
Safety	8	Task	51
Instruction	8	Individual control [+]	51
Other applicable documents	8	<b>Cleaning and care</b> .....	<b>52</b>
Symbols	9	Cleaning	52
<b>Safety</b> .....	<b>10</b>	Care	52
For your safety	10	<b>Parking and storage</b> .....	<b>53</b>
Warning signs	10	Setting down the machine in a	
Definitions	13	secure position	53
Who is allowed to operate the machine?	13	Work position	54
Coupling	14	Transport position	55
Centre of gravity	15	Electrics and hydraulics	56
Road transport	17	<b>Maintenance</b> .....	<b>58</b>
Putting the machine into operation	17	For your safety	58
Uncoupling the machine	19	General information	59
Care and maintenance	19	Maintenance intervals and setting work	62
Further regulations	20	Lubricating work	63
<b>Familiarising yourself with the machine</b> ..	<b>21</b>	PTO shaft	65
Range of application of the machine	21	Transmission oil	66
Features of the machine	22	Tools	68
Designation of components	23	V-belt	69
Technical specifications	24	Runners	72
<b>Delivery and assembly</b> .....	<b>26</b>	<b>Accessory</b> .....	<b>73</b>
Checking the scope of delivery	26	Cutting bar	73
<b>Coupling the machine</b> .....	<b>27</b>	Scraper	73
Coupling the tractor	27	short-chopping bar	73
Lower link	30	Additional guard	74
Top link	30	Individual control	74
PTO shaft	31	Operating hours counter	74
Hydraulics	33	<b>Fault elimination</b> .....	<b>75</b>
Electrics	33	<b>Disposal of the machine</b> .....	<b>77</b>
<b>Preparation</b> .....	<b>34</b>	<b>EU-conformity declaration</b> .....	<b>78</b>
Cutting bar [+]	34	EC Directive	
Depositing cut material	35	2006/42/EG	78
Additional guard [+]	41	<b>UK Declaration of Conformity</b> .....	<b>79</b>
Working width	42	UKCA	79
Cutting level	43	<b>Index</b> .....	<b>80</b>
<b>Driving on the road</b> .....	<b>45</b>	<b>Notice</b> .....	<b>81</b>
Transport position	45		
Lower link	46		
Lighting equipment	47		
Control devices	47		

# 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



# About this operating manual

## 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

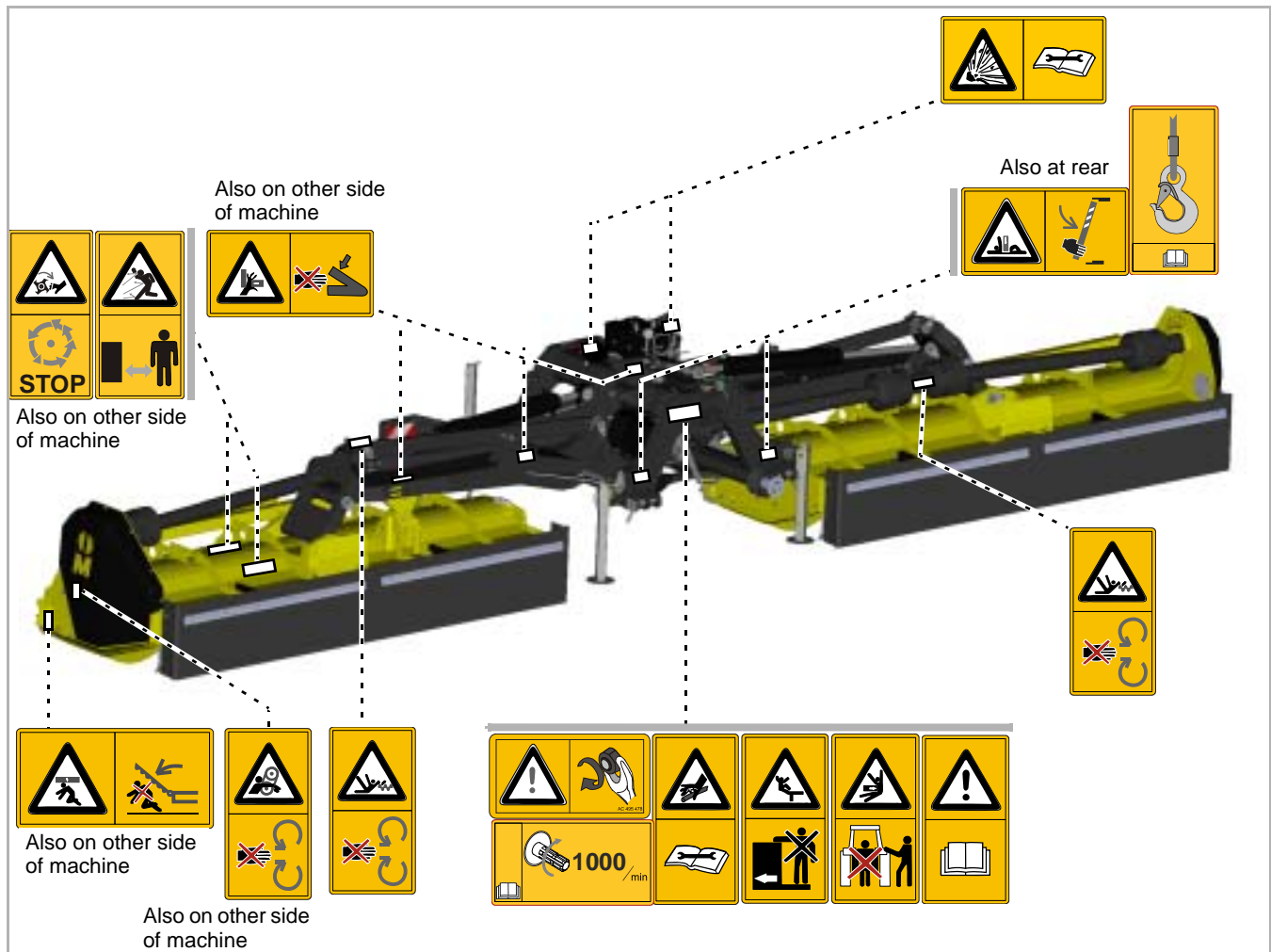
Numerous risks can result from handling landscaping machines the wrong way. Therefore, always work with particular care and never under time pressure. Therefore, always work with particular care and never under time pressure.

### 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 tractor and the machine**  
Standing between the tractor and the machine with the engine running is prohibited, especially during coupling and uncoupling. The tractor must be additionally secured against rolling away.



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



**Do not remove protective devices**  
Never open or remove the protective devices while the tractor's engine 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.



**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.



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



### 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.



### Caution, risk of tipping

The machine or parts can tip over. Attach the safety supports before you stand in the hazard area. To uncouple, use the struts provided and position on firm ground.



### Caution, risk of crushing

Avoid the hazard area. Gaps between components may become smaller or disappear completely.



### Caution, risk of explosion

The pressure accumulator contains pressurised gas and oil. Removal and repair work must only be carried out by qualified specialists.



### 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.

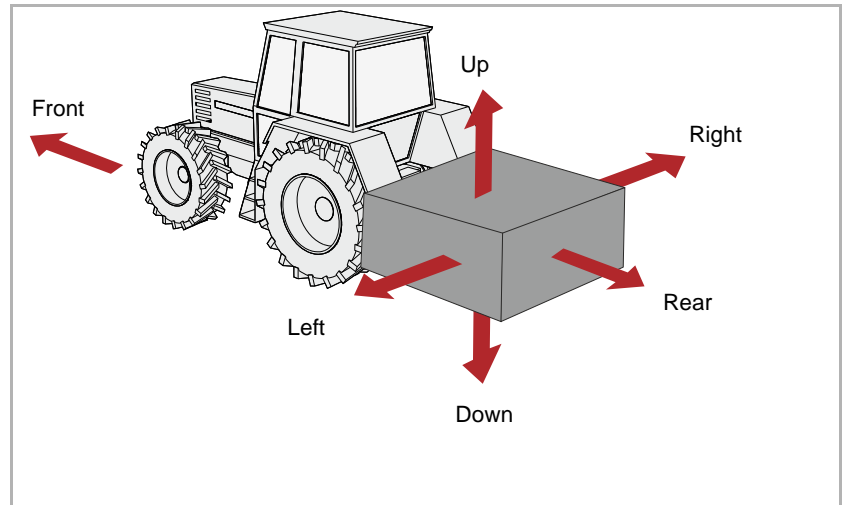


### Retighten screws

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.
- 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

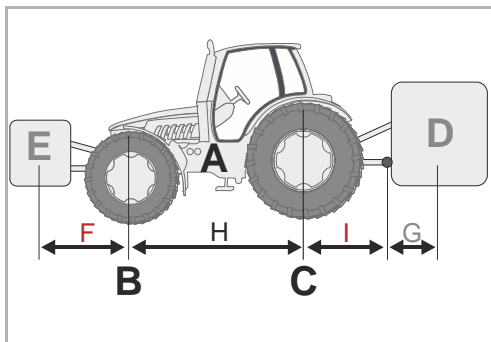
Please take into consideration, for example, the weight of water in the tyres, accessories, etc.

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



# Safety

## 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**

$$\text{Rear axle load in kg} = \text{actual total weight} - \text{actual front axle load}$$

### 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. Attached machines might otherwise come loose from the three-point linkage of their own accord.

### **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.

### **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.

## Putting the machine into operation

## **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

# Familiarising yourself with the machine

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 may only be used for its intended agricultural or associated purpose, depending on the type of tool with which it is equipped.

Tool	Purpose
Hammer flail	To cut grass, other growth or sections up to a maximum of 5 cm diameter

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.

The machine can only be used effectively in combination with an additional flail mower attached at the front. Your dealer or the manufacturer will be happy to help you choose the right machine.

## 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 attachment
- Working depths under 25 mm clearance from 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.

# Familiarising yourself with the machine

## 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**

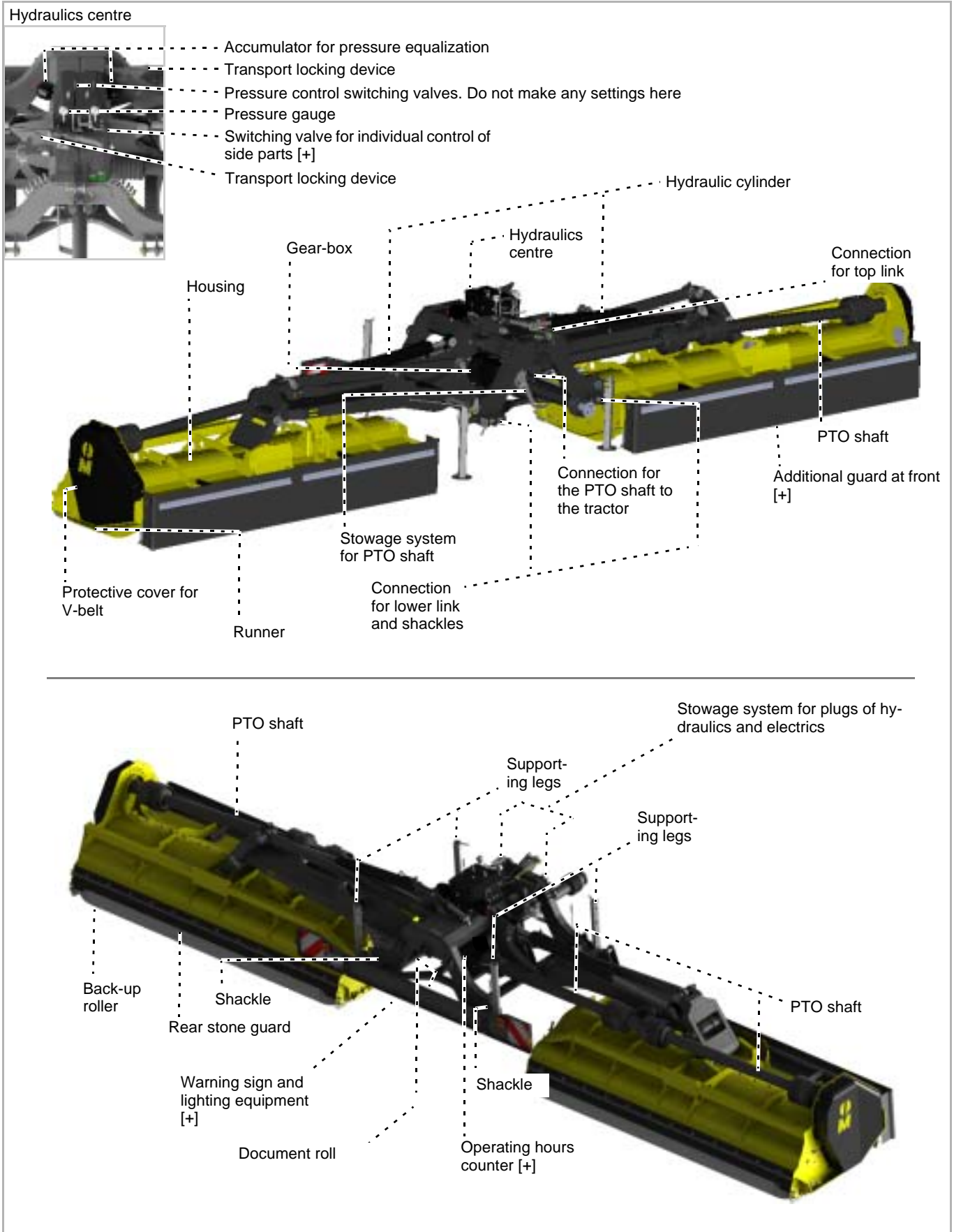
The power transmission takes place mechanically via a PTO shaft on a gear box. From there, the rotor is driven via V-belt.

### **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.

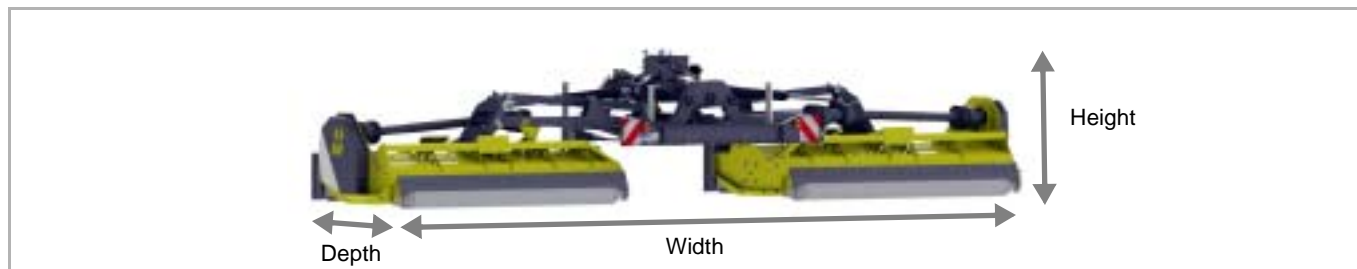
# Familiarising yourself with the machine

## Designation of components



# Familiarising yourself with the machine

## Technical specifications



	<b>MU-PRO/F Vario</b>
	<b>860</b>
<b>Height [m]</b>	
In work position	1,57
In transport position, plus lifting height of the tractor. At least 30 cm	3,55
<b>Width [m]</b>	
In work position	8,99
In transport position	2,88
<b>Depth [m]</b>	
In work position	1,71
<b>Working width [m]</b>	
In work position	8,6
<b>Total weight [kg]</b>	
Depending on equipment level, approx.	3590
<b>Centre of gravity (dimension G)</b>	
Rear-mounted, depending on equipment, approx.	815
<b>Rotational speed of rotor [rpm]</b>	
PTO stub shaft 1000 rpm	2100
<b>Power demand [kW/HP]</b>	
Minimum	147/200
Maximum permitted	298/400
<b>Tractor weight [kg]</b>	
Minimum	7000
<b>Working depth [mm]</b>	
Adjustable, hammer flail	25/49/73
<b>Number of tools</b>	
M-hammer flail	56
<b>Category</b>	
Lower link category	III + IV
<b>Lubricants</b>	
Gear-box oil, fully synthetic	SAE 75W-90
hydraulic oil	HLP46
<b>Noise emission [dB(A)]</b>	
In the workplace	< 80



# Familiarising yourself with the machine

	MU-PRO/F Vario
	860
<b>Paint colors</b>	
Yellow	RAL 1007
Black	RAL 9005
<b>PTO shaft</b>	
Model	GE 2601, GE 2602, GE 2603

# Delivery and assembly

## 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.



## Increased risk of injury

When the machine is being coupled to the tractor, there is an increased risk of injury. Therefore:

- Secure the tractor against rolling away
- The tractor and machine must belong to the same category
- Never stand between the tractor and the machine during coupling
- Actuate the three-point power lift system slowly and carefully

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

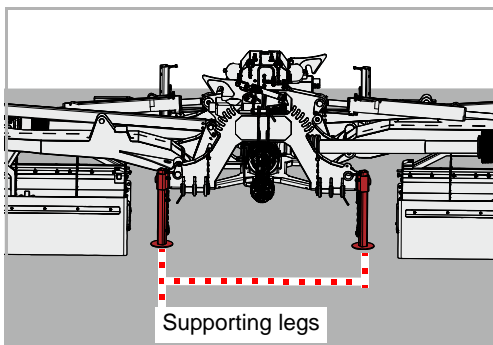


## Only attach the machine to the rear

The machine may only be attached to the rear of the tractor. *The tractor and machine can be damaged if front-mounted.*

## Coupling the tractor

### In work position



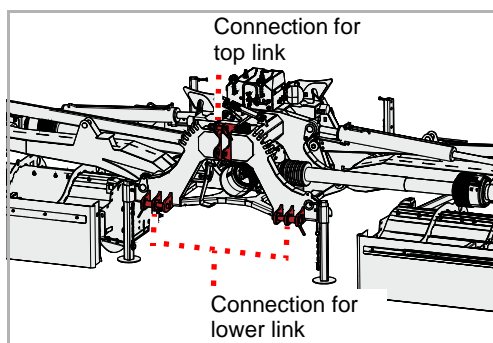
The machine can be attached in the work position or in the transport position.

- ▶ Check that the machine is securely positioned. The machine is folded out into the work position and the front supporting legs are lowered.

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

### If the machine is not securely positioned:

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

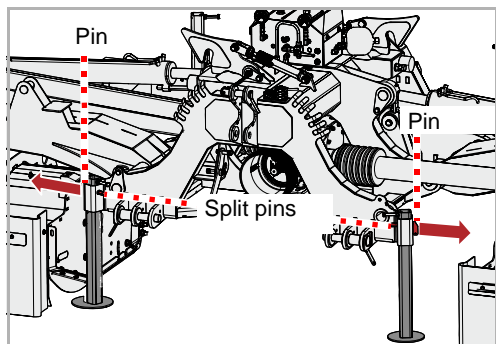


Attachment can be performed on tractors with connections for lower links of category III or category IV.

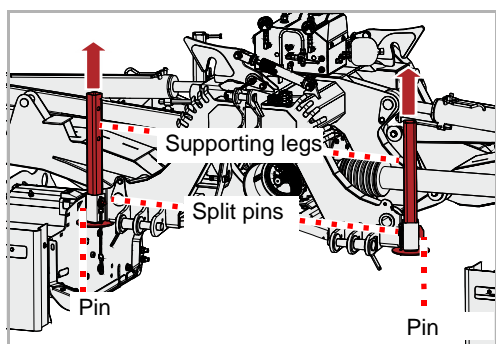
- ▶ Adjust both lower links on the tractor to the same height
- ▶ Connect the lower link according to the category of tractor and secure with linchpin
- ▶ Connect the top link according to the category of tractor and secure with linchpin

# Coupling the machine

## Supporting legs

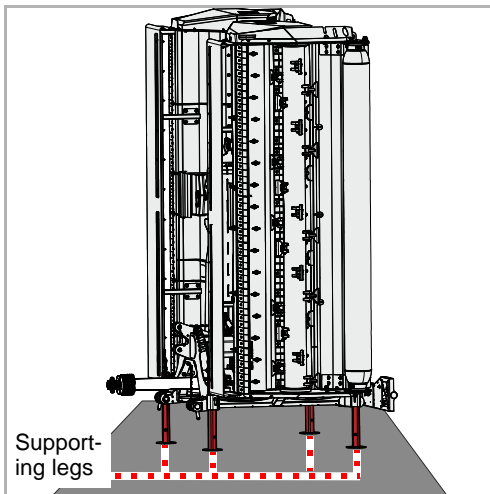


- ▶ Raise the machine slightly
- ▶ Remove split pins at pins
- ▶ Pull out the pins



- ▶ Push supporting leg upwards and secure in top position with pins and split pins

## In transport position

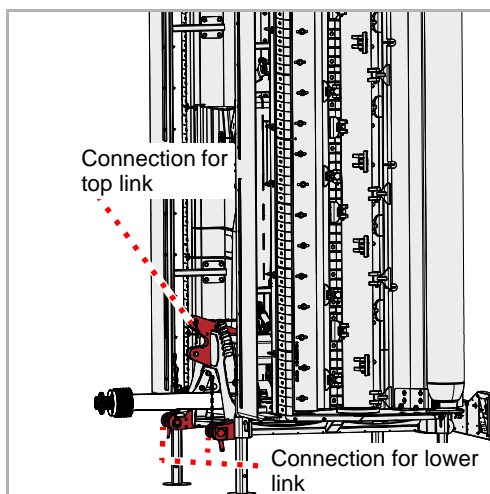


- ▶ Check that the machine is securely positioned. The machine is folded into the transport position and the front and rear supporting legs are lowered.

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

### If the machine is not securely positioned:

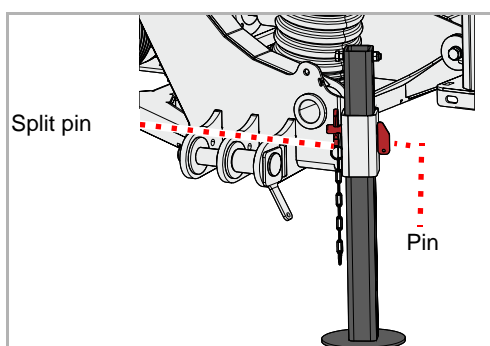
- ▶ Secure the machine with suitable lifting gear and move into the correct position



Attachment can be performed on tractors with connections for lower links of category III or category IV.

- ▶ Adjust both lower links on the tractor to the same height
- ▶ Connect the lower link according to the category of tractor and secure with linchpin
- ▶ Connect the top link according to the category of tractor and secure with linchpin

## Supporting legs



- ▶ Raise the machine slightly
- ▶ Remove split pin at pin
- ▶ Pull out the pins
- ▶ Push supporting leg upwards and secure in top position with pin and split pin
- ▶ Also secure the remaining 3 supporting legs in the upper position

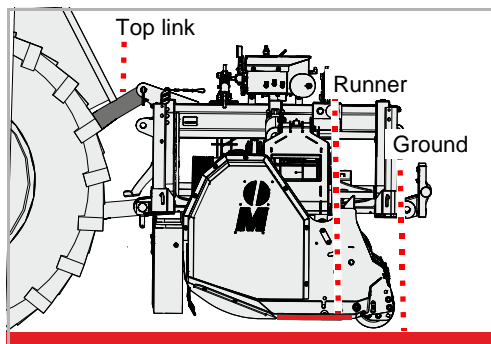
# Coupling the machine

## Lower link

- ▶ Adjust the lower link so that the machine has little play to the left or right

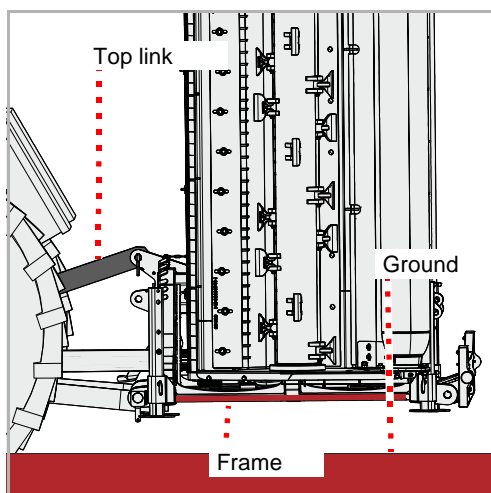
## Top link

### In work position



- ▶ Adjust the top link so that the runners are parallel to the ground

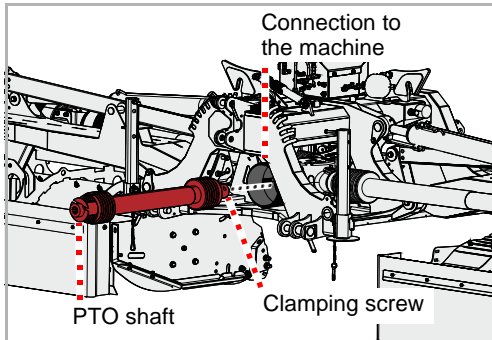
### In transport position



- ▶ Adjust the top link so that the frame is parallel to the ground

## PTO shaft

### Connection to the machine



The PTO shaft has been adjusted to fit your tractor by your dealer.

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
- ▶ Slide propeller shaft onto connection on machine and secure with clamp screw

### Connection to the tractor



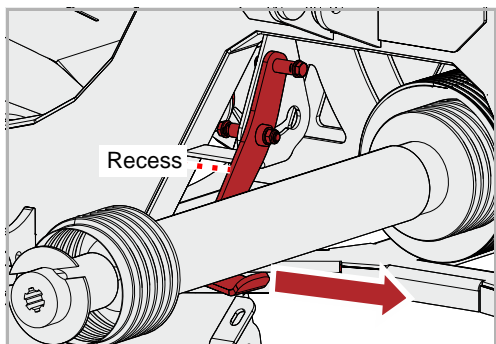
If the tractor is changed, the correct length of the PTO shaft must be checked. It is particularly important when checking the PTO shaft to ensure that the two halves of the PTO shaft continue to overlap at the position in which the PTO shaft is pulled apart furthest.

Please pay particular attention to the following points in the operating manual for the PTO shaft:

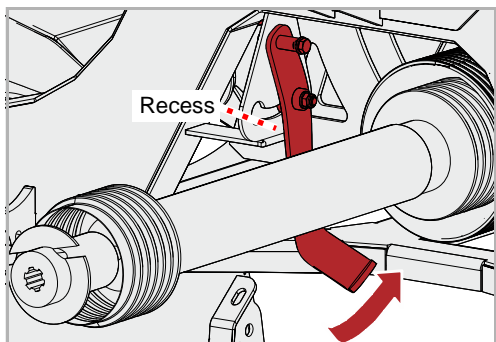
- Shortening the PTO shaft
- Maintenance
- Required grease quantity
- Care of PTO shaft

When changing the tractor, check that the PTO shaft is suitable for this tractor and if necessary, replace the PTO shaft and have it adjusted at a qualified specialist workshop.

# Coupling the machine



- ▶ Lift propeller shaft and pull stowage system to the right



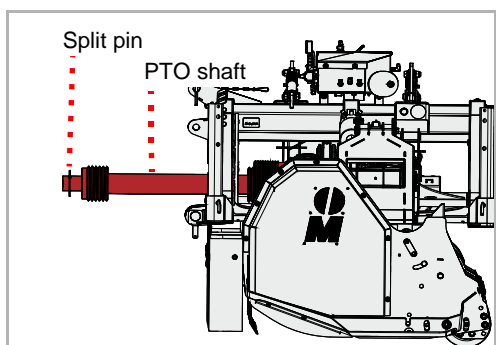
- ▶ Swivel the stowage system into the rear position and make sure that the stowage system locks into place



**Do not lay the attached PTO shaft on the stowage system**

The attached PTO shaft must not lie in the stowage system.

*A PTO shaft lying in the stowage system will be damaged during road transport or when operating the lower link.*



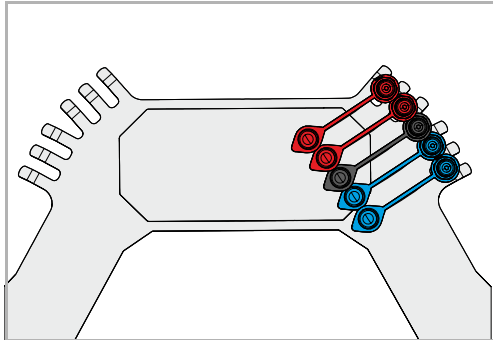
- ▶ Connect the PTO shaft to the PTO stub shaft of the tractor and ensure that the cotter pin is locked in place on the PTO shaft



## Hydraulics

The following functions can be controlled:

Function	Color of dust cap	control valve
Fold machine in or out	Blue [+] [-]	Double-acting
Unlock machine	Black	Single-acting
Lift machine to headland position	Red [+]	Single-acting
Lift machine at left or right to headland position [+]	Red [+] [+]	Single-acting



- ▶ Connect hydraulic hoses to corresponding control valves on tractor

## Electrics

If present, attach the following plugs to the tractor for:

- The lighting equipment on the machine
- ▶ Check that the lighting equipment is working correctly

**For indicators which are not signalling and are equipped with LEDs:**



Depending on the tractor, the tractor's electrics may require regrouping in the electrical cable's plug connection. Please contact your dealer in this case.

# Preparation

## Cutting bar [+]

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

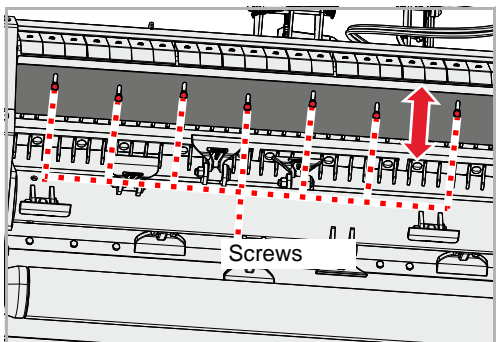


### **Check for contact between tools and the cutting bar**

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.*

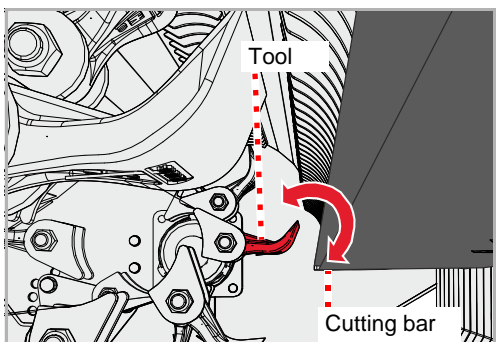
## Adjusting



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:**

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

## Depositing cut material

Depending on the soil conditions, you can decide whether to deposit the cut material behind or in front of the support roller.

Use	Advantages	Disadvantages
On green areas Depositing behind the support roller	In normal soil conditions, the cut material is deposited behind the support roller.  The support roller runs directly over the ground. The machine follows the contours of the ground precisely.	In poor soil conditions, the support roller becomes contaminated.
On field surfaces Depositing in front of the support roller	The cut material is deposited in front of the support roller.  The support roller runs over the cut material, not directly over the ground. This reduces the level of contamination on the support roller.	The support roller presses the cut material on to the ground.  The machine does not follow the contours of the ground as precisely as when using a standard support roller.  You can only select two of the three working depths.

## In front of the support roller

Depositing the cut material in front of the support roller is advantageous on field surfaces. In this position, the support roller runs over the cut material, not directly over the ground. The following preparations must be made to do so:

- Remove rear stone guard
- Swivel the support roller to the correct position
- Fit the scraper
- Swivel the guide plate to the correct position

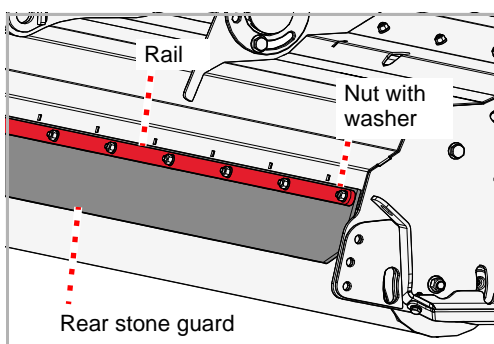
## Rear stone guard

Before conversion, you must remove the rear stone guard and fit the scraper.



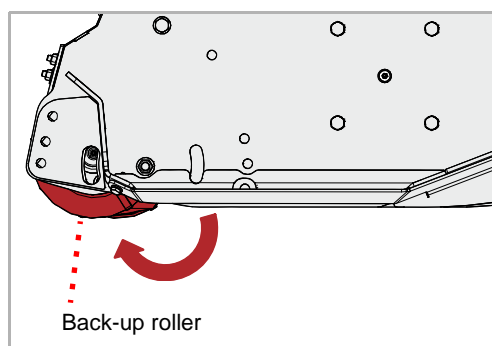
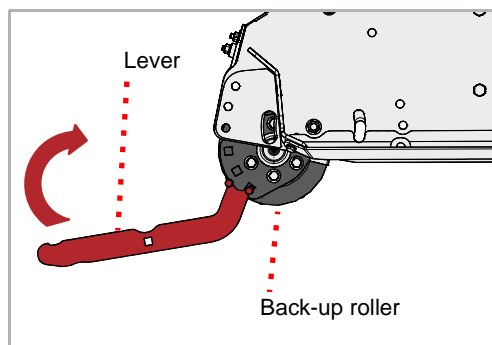
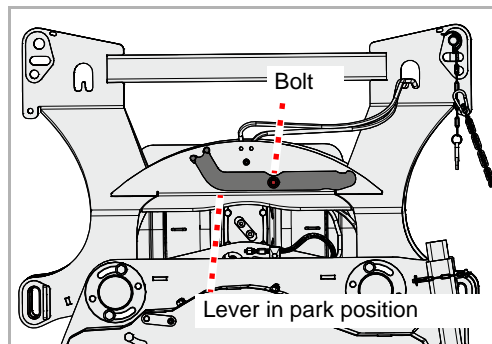
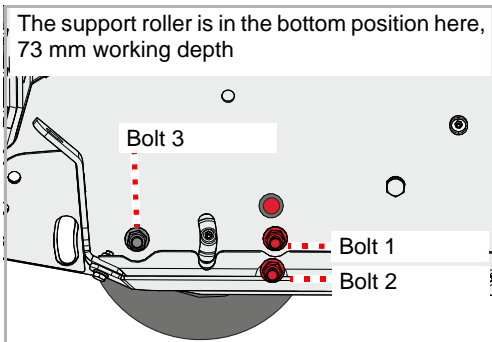
Store all removed parts together in a safe place. Should you wish to convert the support roller again at a later date, you will need the parts you removed.

- ▶ Raise the machine slightly and secure it against lowering
- ▶ Undo all the nuts on the rail and remove them along with the washers
- ▶ Remove rail and rear stone guard



# Preparation

## Back-up roller



The support roller must be swivelled into the rear position.

- ▶ Undo and remove bolts [1] and [2]
- ▶ Also undo and remove bolts [1] and [2] on the opposite side of the housing
- ▶ Undo bolt [3]
- ▶ Also undo bolt [3] on the opposite side of the housing

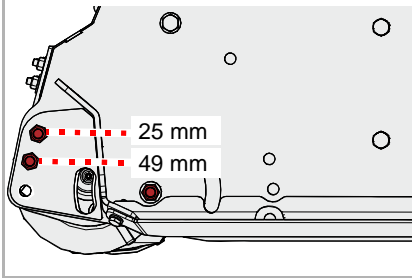
The lever is located on the front-mounted flail mower

- ▶ Undo the bolt on the lever
- ▶ Move the lever out of park position

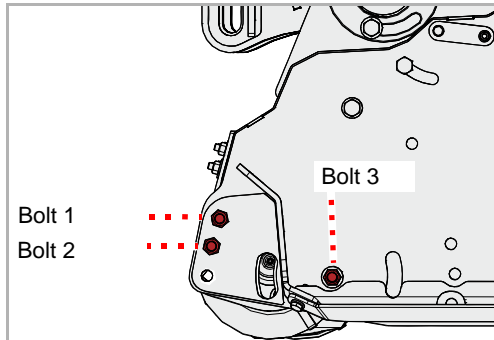
- ▶ Position the lever on the support roller

- ▶ Use the lever to swivel the support roller into the rear position

The support roller is in the central position here, 49 mm working depth



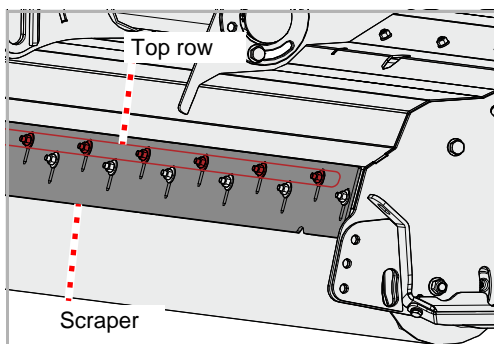
Set the working depth using the centre hole in the support roller. The working depth can be set to 25 mm or 49 mm.



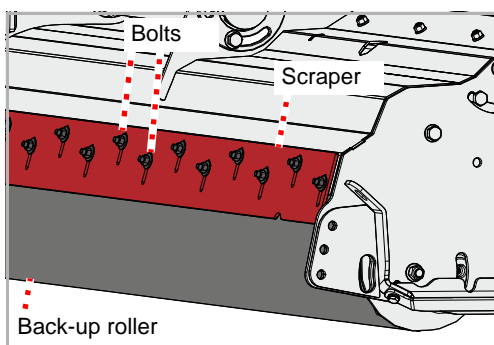
- ▶ Set the support roller to the required working depth and fix it in position using bolts [1] and [2]
- ▶ On the opposite side of the housing, use the lever to set the support roller to the required working depth
- ▶ Also fix the support roller in position using bolts [1] and [2] on the opposite side of the housing
- ▶ Tighten bolt [3]
- ▶ Also tighten bolt [3] on the opposite side of the housing

## Scraper

The scraper should be set so that the clearance between it and the support roller is 3-5 mm. If the scraper is worn, or if you have fitted it on the extension support roller, it must be adjusted.



- ▶ Fit the scraper and secure with nuts and washers. Insert additional bolts in the top row and also secure with nuts and washers

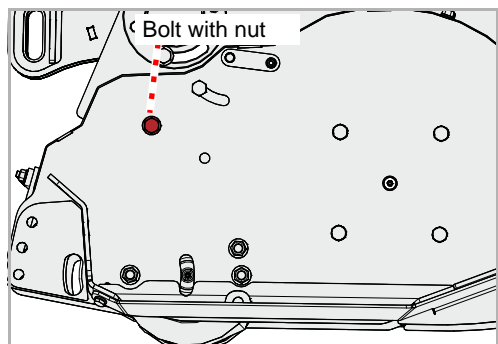


- ▶ Adjust the scraper so that the clearance between it and the support roller is 3-5 mm
- ▶ Check the clearance by turning the support roller. The support roller must not touch the scraper.
- ▶ Tighten the nuts

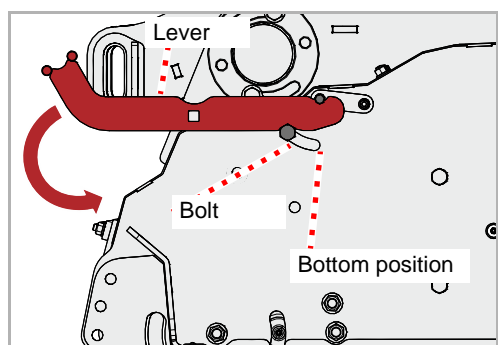
# Preparation

## Guide plate

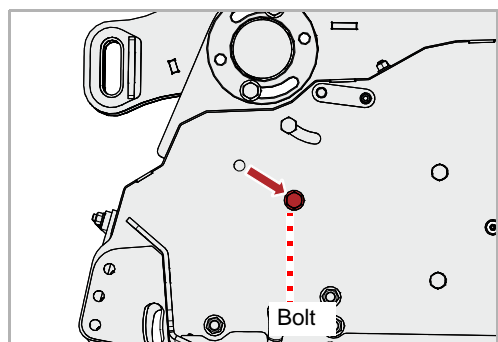
The guide plate guides the mulched material in front of the support roller.



- ▶ Remove the nut and bolt
- ▶ Also remove the nut and bolt on the opposite side of the housing



- ▶ Engage the lever and move the bolt into the bottom position
- ▶ Also engage the lever and move the bolt into the bottom position on the opposite side of the housing



- ▶ Fit the nut and bolt and fix the guide plate in place
- ▶ Also fit the nut and bolt and fix the guide plate in place on the opposite side of the housing
- ▶ Move the lever back into park position

## Behind the support roller

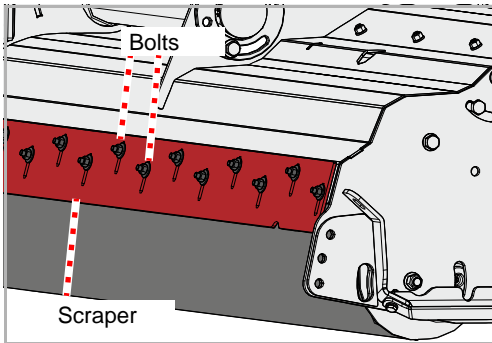
Depositing the cut material behind the support roller is the default setting. In this position, the support roller runs directly over the ground.



Store all parts together in a safe place. Should you wish to convert the support roller again at a later date, you will need the parts you removed again.

## Scraper

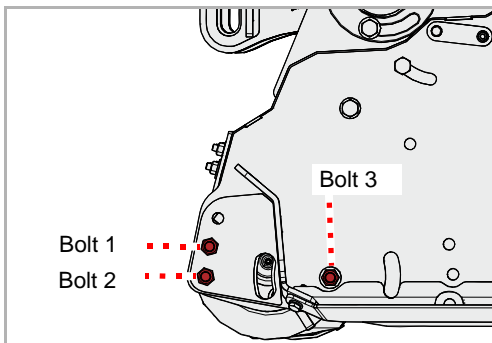
You must remove the scraper.



- ▶ Raise the machine slightly and secure it against lowering
- ▶ Undo the nuts and remove them along with the washers
- ▶ Remove the scraper

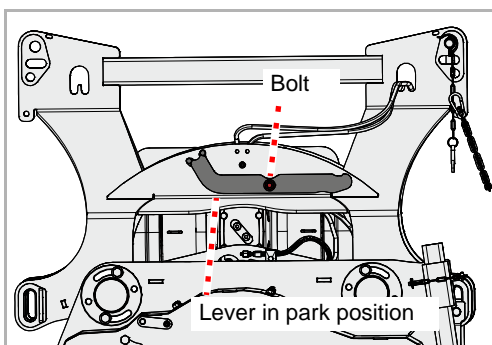
## Back-up roller

The support roller must be swivelled into the front position.



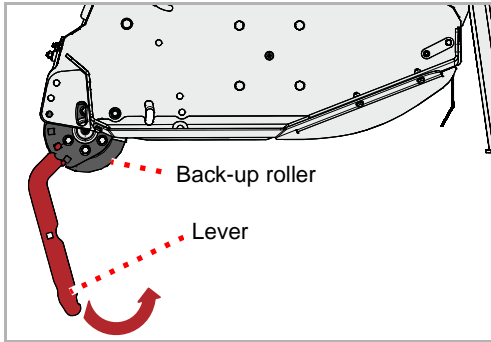
- ▶ Undo and remove bolts [1] and [2]
- ▶ Also undo and remove bolts [1] and [2] on the opposite side of the housing
- ▶ Loosen bolt [3] but do not remove it
- ▶ Also loosen, but do not remove, bolt [3] on the opposite side of the housing

The lever is located on the front-mounted flail mower

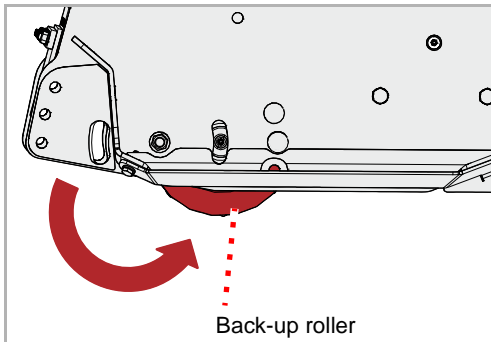


- ▶ Undo the bolt on the lever
- ▶ Move the lever out of park position

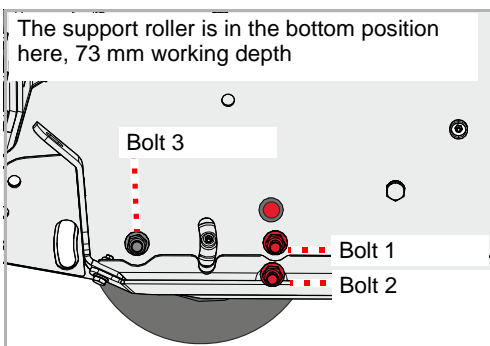
# Preparation



- ▶ Position the lever on the support roller

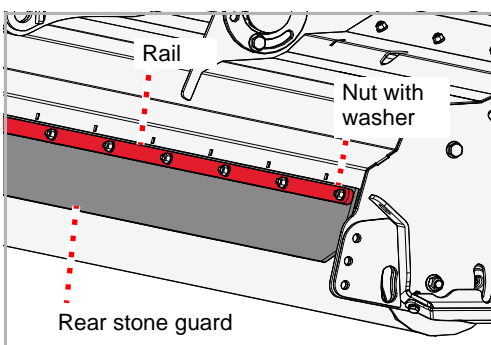


- ▶ Fold the support roller into the front position
  - ▶ Select the working depth
- Chapter »Preparation« paragraph »Working width«, page 42



- ▶ Insert and tighten bolts [1] and [2]
- ▶ Retighten bolt [3]
- ▶ Make the same adjustment on the opposite side of the housing.

## Rear stone guard

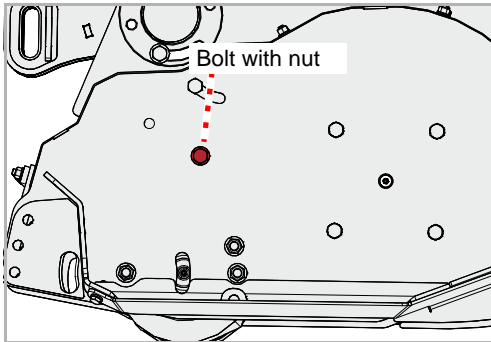


- ▶ Insert all bolts for the rail in the housing
- ▶ Attach rear stone guard and insert rail
- ▶ Fix the rail in place using nuts and washers

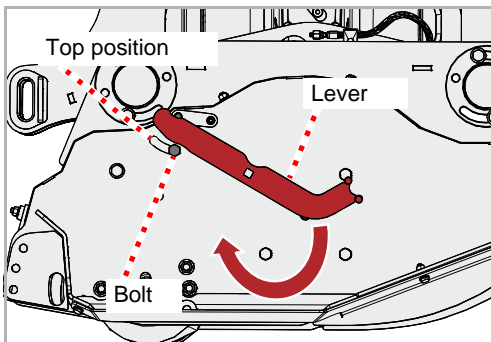


## Guide plate

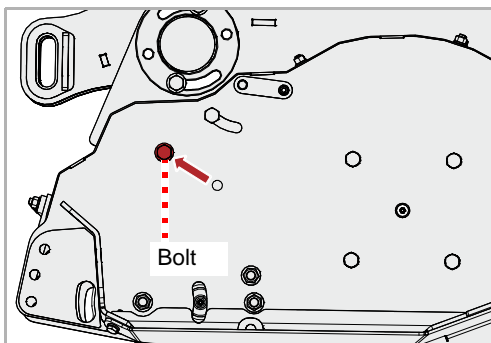
The guide plate must be configured so that the mulched material is guided behind the support roller.



- ▶ Remove the nut and bolt
- ▶ Also remove the nut and bolt on the opposite side of the housing



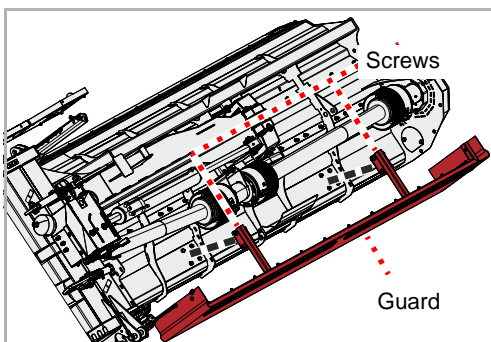
- ▶ Engage the lever and move the bolt into the top position
- ▶ Also engage the lever and move the bolt into the top position on the opposite side of the housing



- ▶ Fit the nut and bolt and fix the guide plate in place
- ▶ Also fit the nut and bolt and fix the guide plate in place on the opposite side of the housing
- ▶ Move the lever back into park position

## Additional guard [+]

For particularly sensitive application areas, you can fit an additional guard.



- ▶ Fit guard with 8 screws

# Preparation

## Working width

The working depth setting depends on where the cut material is deposited.

### Depositing cut material behind the support roller

The working depth can be adjusted in three stages. The optimal working depth for most applications is the middle setting.

### Depositing cut material in front of the support roller

The working depth can be set at one of two levels. The working depth can be set to 25 mm or 49 mm.

## adjustment



### 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.*



### Check the number of bolts

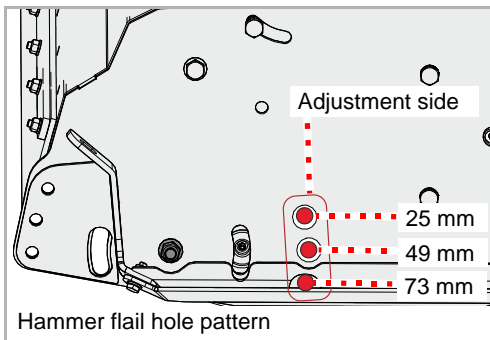
The working depth setting must be secured with two bolts on the adjustment side.

*If only one bolt is used on the adjustment side, the machine may be damaged by excessive wear.*

## Tools

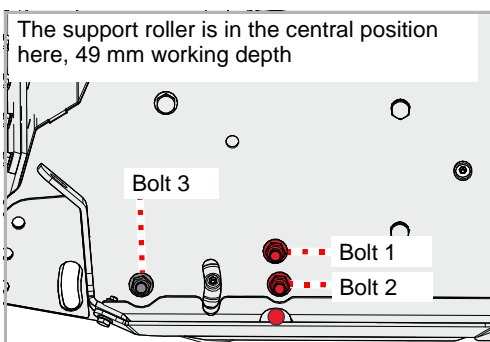
The working depth setting depends on the type of tool.

Tool	Possible working depths [mm]		
Hammer flail	25	49	73

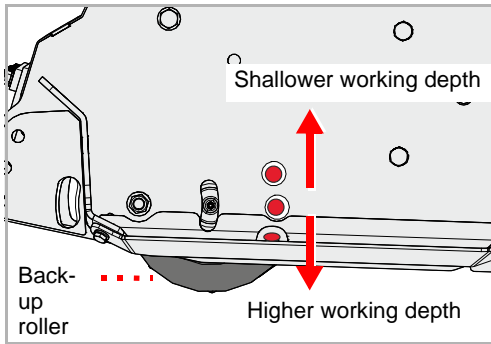


Set the working depth using the centre hole in the support roller.

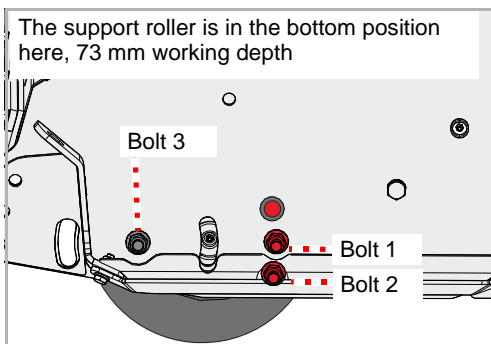
- ▶ Secure the tractor against rolling away
- ▶ Raise the machine approximately 5 cm



- ▶ Undo and remove bolts [1] and [2]
- ▶ Loosen bolt [3]



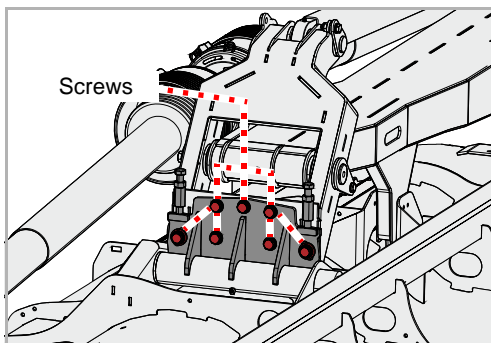
- ▶ Raise or lower the machine so that it is at the desired working depth. Pay attention to the centre hole of the support roller while doing this. The centre hole must be in the position in the hole pattern in which the required working depth can be set.



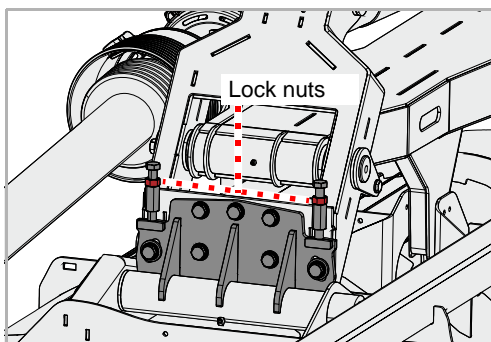
- ▶ Insert and tighten bolts [1] and [2]
- ▶ Retighten bolt [3]
- ▶ Make the same adjustment on the opposite side of the housing.

## Cutting level

The cutting level between the left and right housings is set at the factory. If you notice differences in the cutting heights, you can adjust the inclination of both housings towards the front or rear.

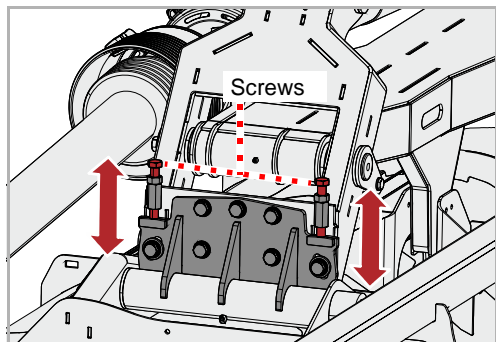


- ▶ Undo the bolts



- ▶ Loosen lock nuts on both sides

# Preparation



- ▶ Use the screws to lift the housing on the desired side or push it downwards
- ▶ Retighten the lock nuts and nuts

**If the inclination of the housing on the other side also needs to be adjusted:**

- ▶ Adjust housing on other side

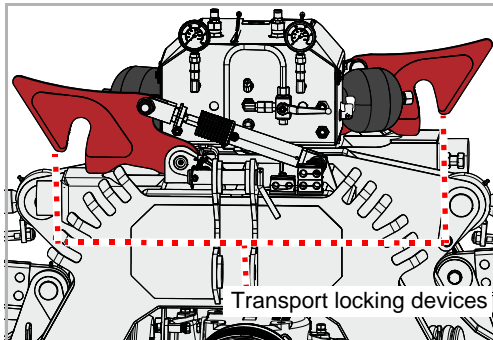
## Transport position

The machine must be attached to the rear of the tractor.

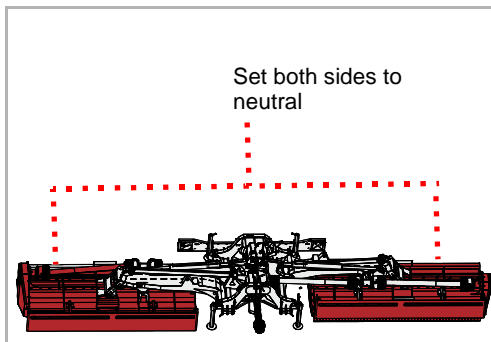
## Folding in

To fold the machine in, both transport locking devices of the machine must be unpressurised.

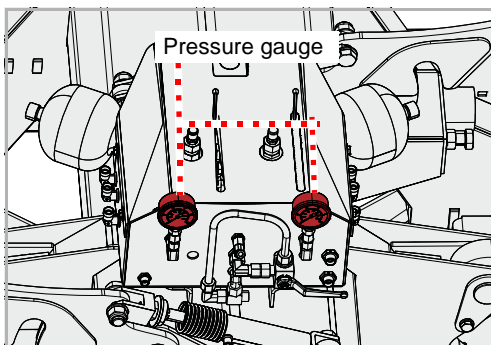
- ▶ Release the pressure from both transport locking devices of the machine via the control valve of the tractor



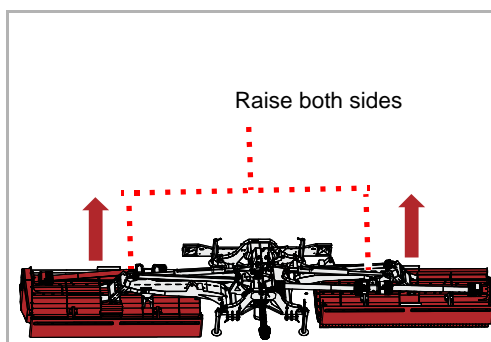
- ▶ Set both sides of the machine to neutral via the control valve of the tractor. In this position, both pressure gauges should indicate a pressure of about 70 bar.



- ▶ Check that the pressure at the pressure gauges is around 70 bar



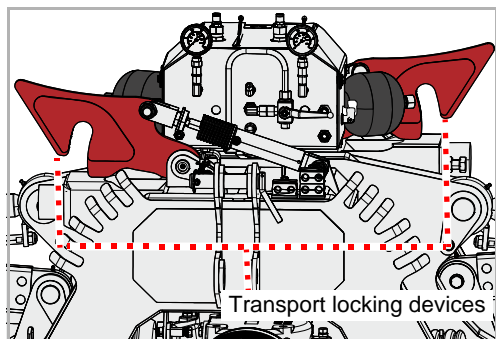
- ▶ Lift both sides of the machine via the control valve of the tractor



# Driving on the road

## On tractors with braking device for PTO

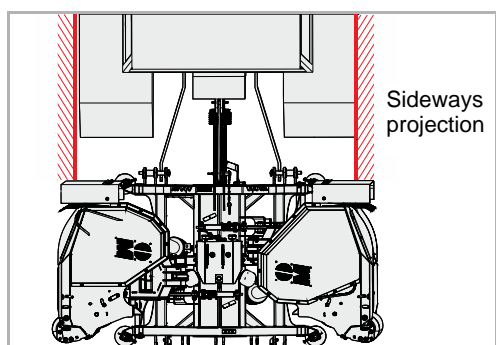
- ▶ Release brake of PTO on tractor
- ▶ Fold the machine in using the control valve of the tractor. Make sure that the two transport locking devices lock into place securely.



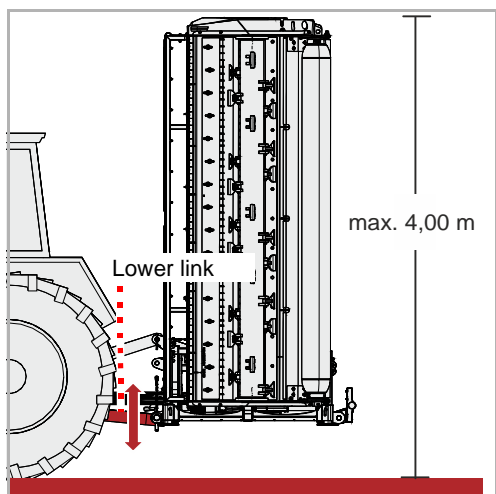
## Side protrusion of machine

Depending on the width of the tractor, the machine protrudes out to the side on the right and left-hand side. Adapt your driving style accordingly.

The overall width of tractor and machine must not exceed the maximum vehicle width permitted for road transport.



## Lower link

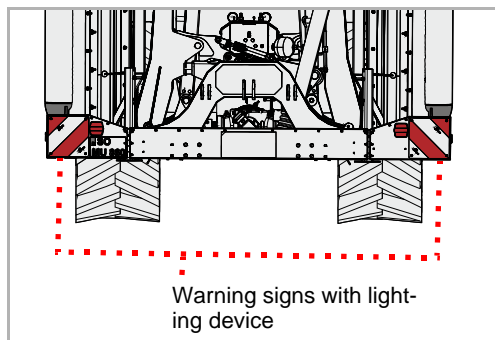


- ▶ Adjust the height of the lower links via the three-point linkage system of the tractor

Observe the following points when adjusting the height:

- The machine must have sufficient ground clearance for transport
- A height of 4.00 m measured from the ground should not be exceeded

## Lighting equipment



- ▶ Check lighting device for correct function

## Control devices



### **Close the stop valves, secure the control devices**

Prior to road transport, the control devices on the tractor must be secured against inadvertent actuation.

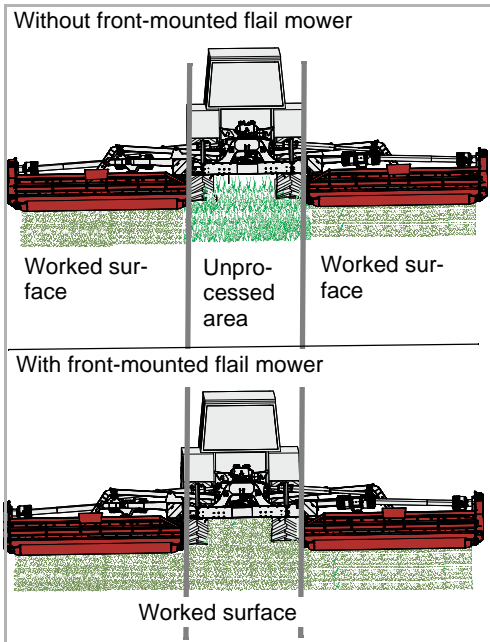
*If the control devices on the tractor have not been secured, the machine may accidentally swing out into the work position during road transport. This can result in accidents.*

# Mulching

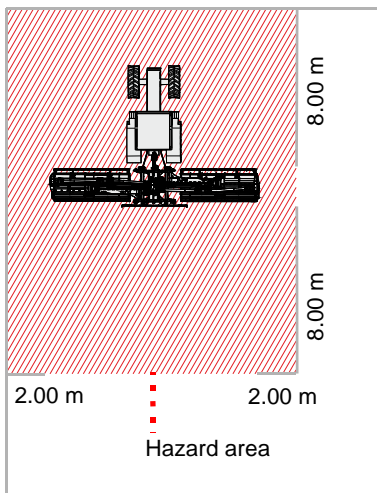
## Work position

The machine works in two strips to the right and left of the tractor. The central strip is left unprocessed. The central strip is usually covered by an additional flail mower attached at the front.

You should therefore make sure that the correct flail mower is mounted on the front of the tractor.



## Task



### Check the hazard area

The hazard area in front of and behind 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 tractor with an enclosed cab and a dust filter.

*Dust exposure may lead to respiratory diseases.*



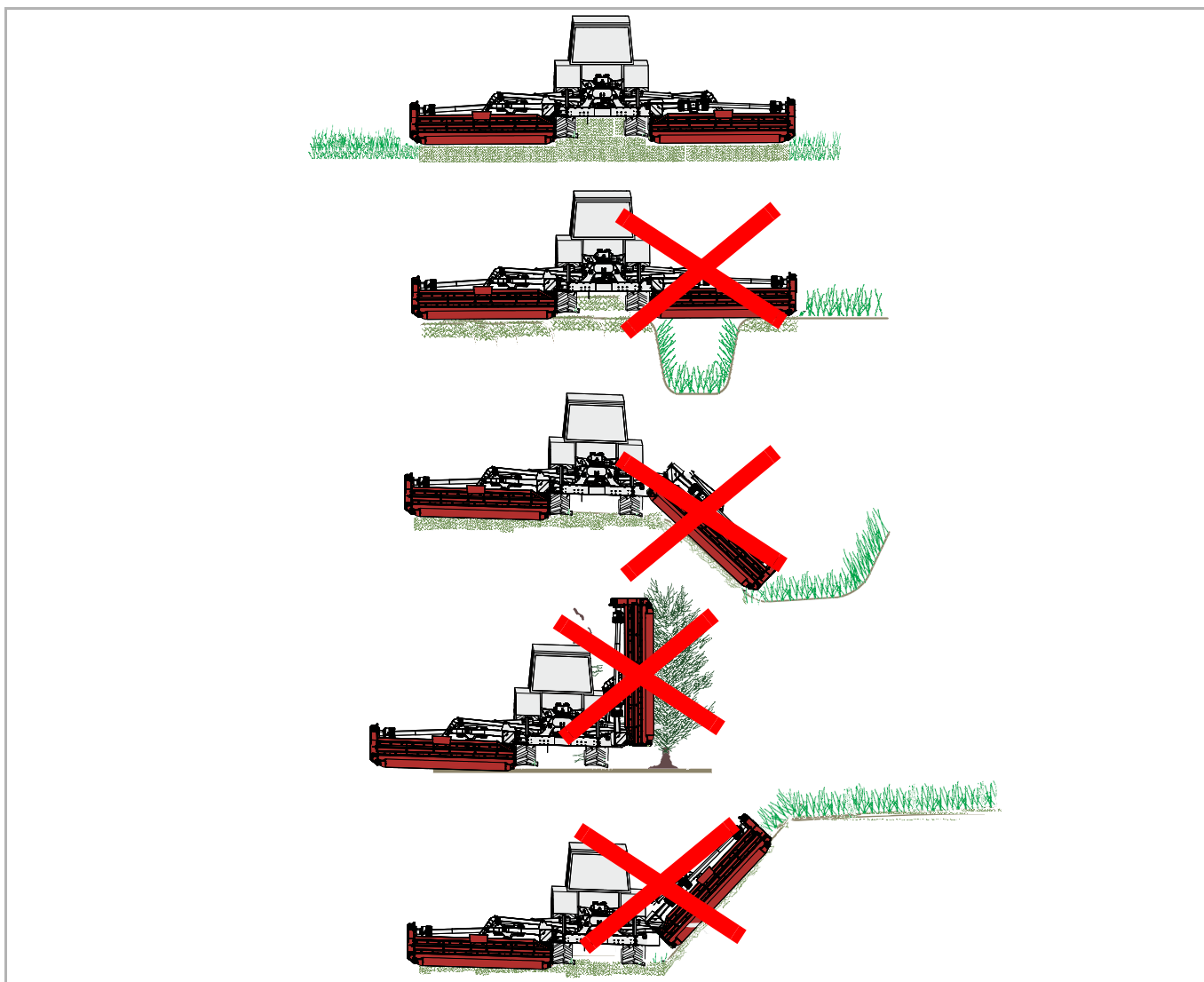


## Only work forwards

The machine may only be located in work position when moving forwards. The machine must be raised up when reversing.

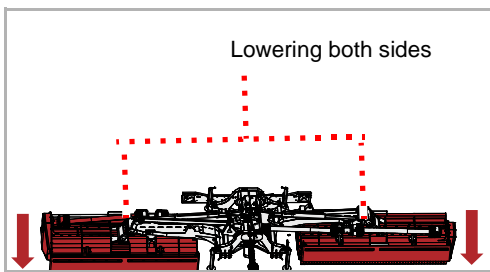
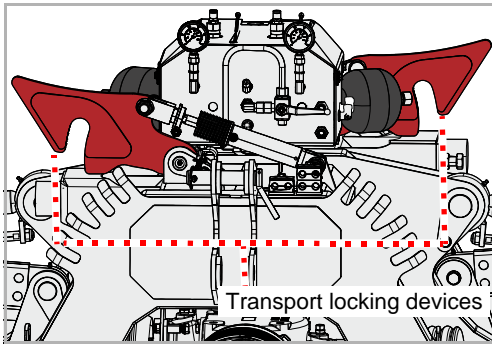
*A machine in work position when reversing could result in serious damage to the machine.*

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.



# Mulching

## Folding out



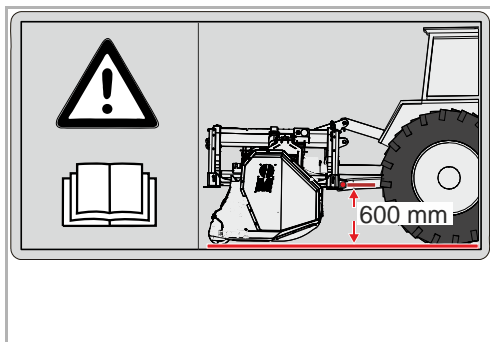
- ▶ Set both sides of machine to neutral position
- ▶ Unlock transport locking devices
- ▶ Fold out the machine

- ▶ Lower both sides of the machine. Wait until both sides of the machine are lowered to the same depth.
- ▶ Set control valve at the tractor to “floating position”

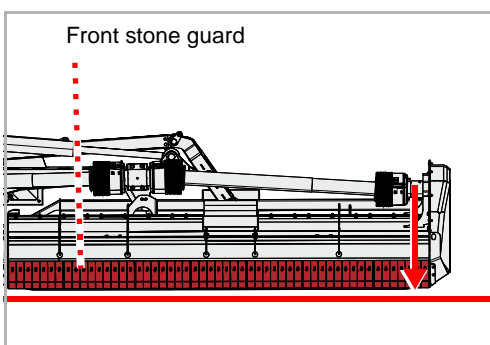


### Do not lean the machine forwards

The machine must not lean forwards when operating. A machine that is leaning forwards could block and operate incorrectly.

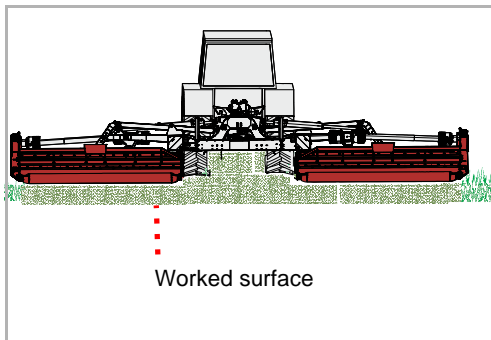


- ▶ Lower the machine via the lower links of the tractor. Adjust the lower links of the tractor so that the distance between the ground and the centre of the lower link ball is 600 mm.



The front stone guard should be parallel to the ground.

## Task



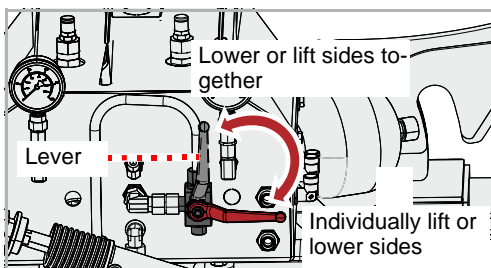
- ▶ Switch the PTO stub shaft into the work position and slowly bring the machine to the rated speed
- ▶ Then drive at low speed into the stock, increase speed slowly. Pay attention to the machine while doing this.

### If the machine is working too hard:

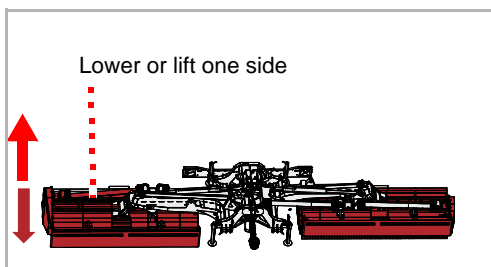
- ▶ Reduce speed
- ▶ Drive at a suitable speed. The speed must be appropriate to the growth and the type of terrain.

## Individual control

[+]



- ▶ Set the lever of the switching valve to the desired position



- ▶ Select the desired side via the control valve of the tractor and lift or lower the side

# 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.*

## 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

The machine can be parked in working position or in transport position.



### **Ensure that there are no unauthorised persons can enter the set-down location**

If the machine is set down coupled or uncoupled on the tractor, the set-down location must be selected to ensure that no unauthorised persons can enter.

*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.*

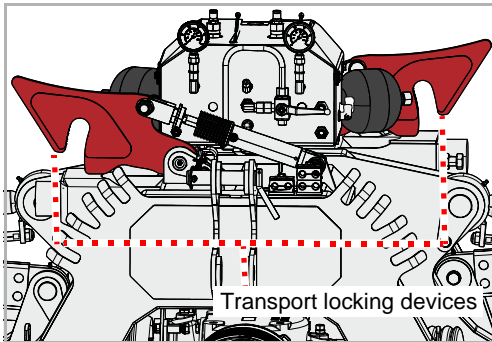
Requirements on the set-down location:

- Horizontal, solid surface
- Sufficient room on all sides
- Protected against access by unauthorised persons, such as children
  
- Fold out when the machine is parked in the work position
- Lower supporting legs
- Disconnect electrical cables and hydraulic hoses from the tractor
- Remove the PTO shaft
- Remove the top link, undo the lower link

# Parking and storage

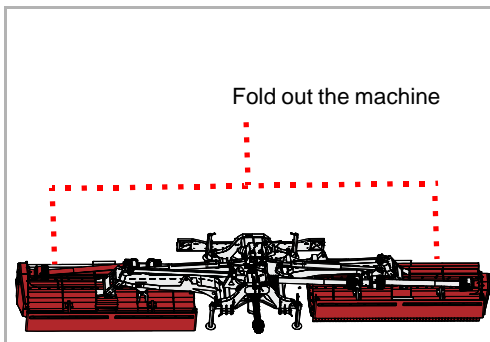
## Work position

### Folding out



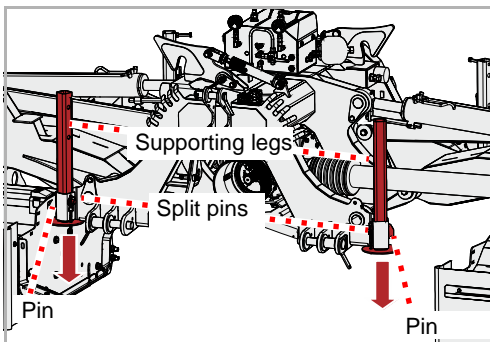
The machine is folded out into the work position via the corresponding control valves on the tractor.

- ▶ Set both sides of machine to neutral position
- ▶ Unlock transport locking devices



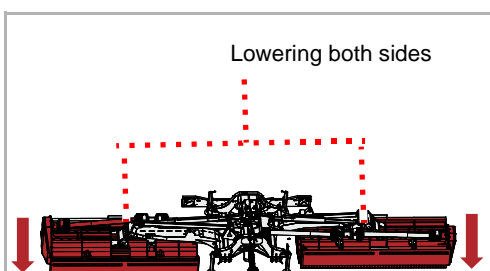
- ▶ Fold out the machine

### Supporting legs



- ▶ Remove split pins at pins
- ▶ Pull out the pins
- ▶ Push both front supporting legs downwards and secure in bottom position with pins and split pins
- ▶ Lower the lower link until the top link is no longer under compressive or tensile strain

### Lowering



Lowering is carried out via the corresponding control valves on the tractor.

- ▶ Lower both sides of the machine. Wait until both sides of the machine are lowered to the same depth.

## Transport position



### Select the set-down location carefully

The set-down location must be relatively even and the ground must be solid.

*People could be injured or killed by the machine tipping over on uneven or soft ground.*

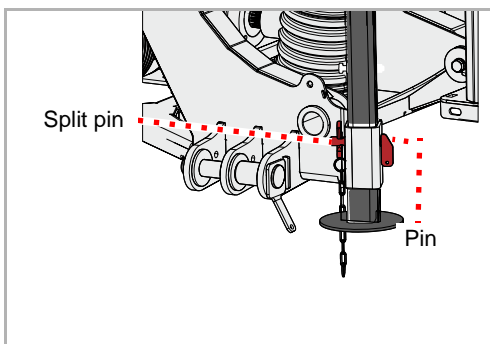


### Pay attention to transport locking device

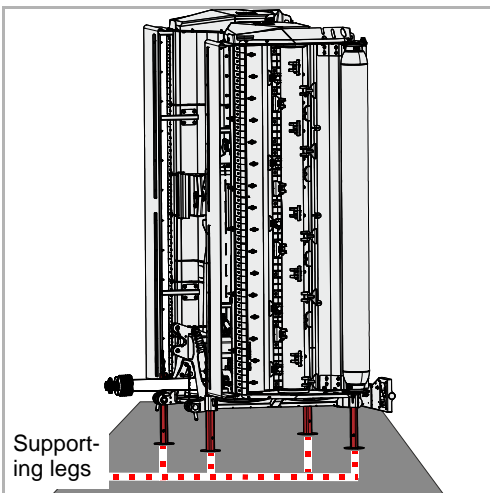
If the machine is set down without the transport locking device engaged, the side parts can drop down independently.

*People could be crushed by parts of the machine dropping.*

## Supporting legs



- ▶ Remove split pin at pin
- ▶ Pull out the pins
- ▶ Push supporting leg downwards and secure in bottom position with pin and split pin
- ▶ Also secure the remaining 3 supporting legs in the bottom position



- ▶ Check that the machine can be set down safely
- ▶ Lower the lower link until the top link is no longer under compressive or tensile strain

# Parking and storage

## Electrics and hydraulics

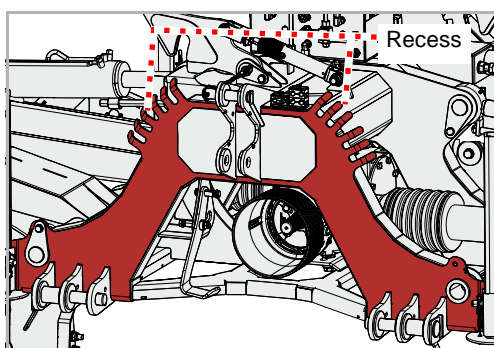
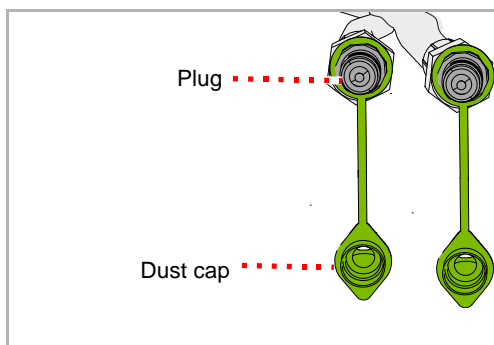


**Only uncouple hydraulic hoses when they are depressurised**

When the hydraulic hoses are uncoupled, they must be depressurised.

*It may no longer be possible to couple hydraulic hoses which were uncoupled while still pressurised.*

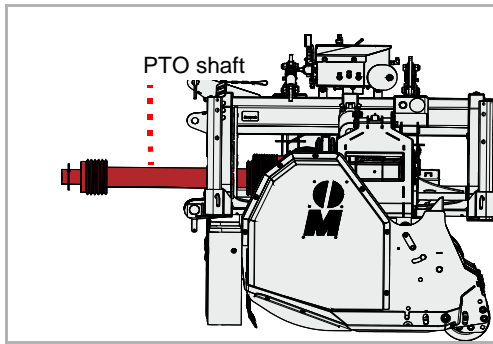
- ▶ Disconnect electrical cables and hydraulic hoses from the tractor's connections
- ▶ Protect plugs with dust cap



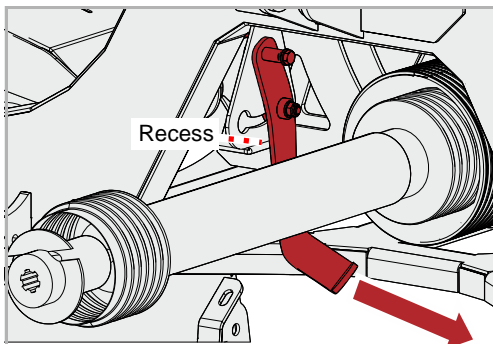
- ▶ Hook plugs onto stowage system



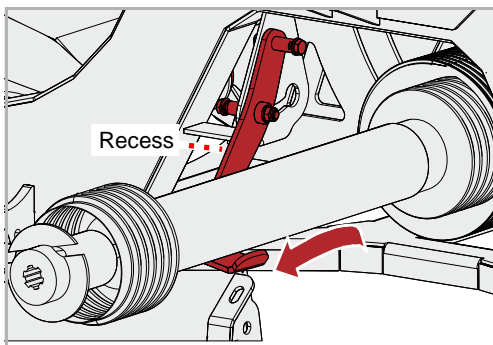
## PTO shaft



- ▶ Disconnect the PTO shaft from the tractor



- ▶ Lift propeller shaft and pull storage system to the right



- ▶ Swivel the storage system to the front position and make sure that the storage system locks into place
- ▶ Place the PTO shaft to one side

## Top link, lower link

- ▶ Remove the top link
- ▶ Undo the lower link and lower

## 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

*Serious accidents may be caused if the machine starts accidentally.*



### **Welding work**

Welding work may only be carried out by persons trained in welding who also have specialist knowledge of repairing agricultural 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.

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

Task	Version
Greasing	<ul style="list-style-type: none"> <li>• Apply grease to the slide surfaces using a brush</li> </ul>
Lubrication	<ul style="list-style-type: none"> <li>• 1 - 2 Unless specified otherwise, one or two strokes with the grease gun provide sufficient lubrication</li> </ul>
Oiling	<ul style="list-style-type: none"> <li>• Unless otherwise specified, use only vegetable-based oil such as rapeseed oil</li> <li>• Mineral oils are not suitable</li> <li>• The use of used oil will endanger your health and is also strictly prohibited</li> </ul>
Replacement	<ul style="list-style-type: none"> <li>• Replace the component in question according to the instructions in the »Maintenance« chapter</li> </ul>
Check	<ul style="list-style-type: none"> <li>• An inspection may be required in conjunction with the replacement of the component in question</li> </ul>
Observe the maintenance intervals	<ul style="list-style-type: none"> <li>• All information is based on average machine usage</li> <li>• In the case of heavy usage (e.g. contract work), shorten the maintenance intervals accordingly</li> <li>• Shorter maintenance intervals may also be required under extreme working conditions (e.g. heavy dust generation)</li> </ul>

## 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“
	<b>Tightening torques in Nm</b>		
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

## 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
<b>General</b>											
Retighten all screws	•					•					
Visual inspection	•	•									
Bearing		•				•		•			
Pivots		•							•		
<b>Hydraulics</b>											
Hydraulic hoses Every 6 years										•	
Hydraulic hoses General						•	•			•	
Hydraulic cylinder		•		•		•		•	•		
<b>Tools</b>											
Fastenings on the rotor		•							•		
Condition, wear		•							•		•
<b>Other</b>											
Position of rotor		•						•			
Roller bearing		•						•			
Shafts and pins			•					•			
PTO shaft Protective cover		• •				• •		• •	• •	• •	• •
Transmission oil		•			•				•		

## Lubricating work

### Lubricate bearings

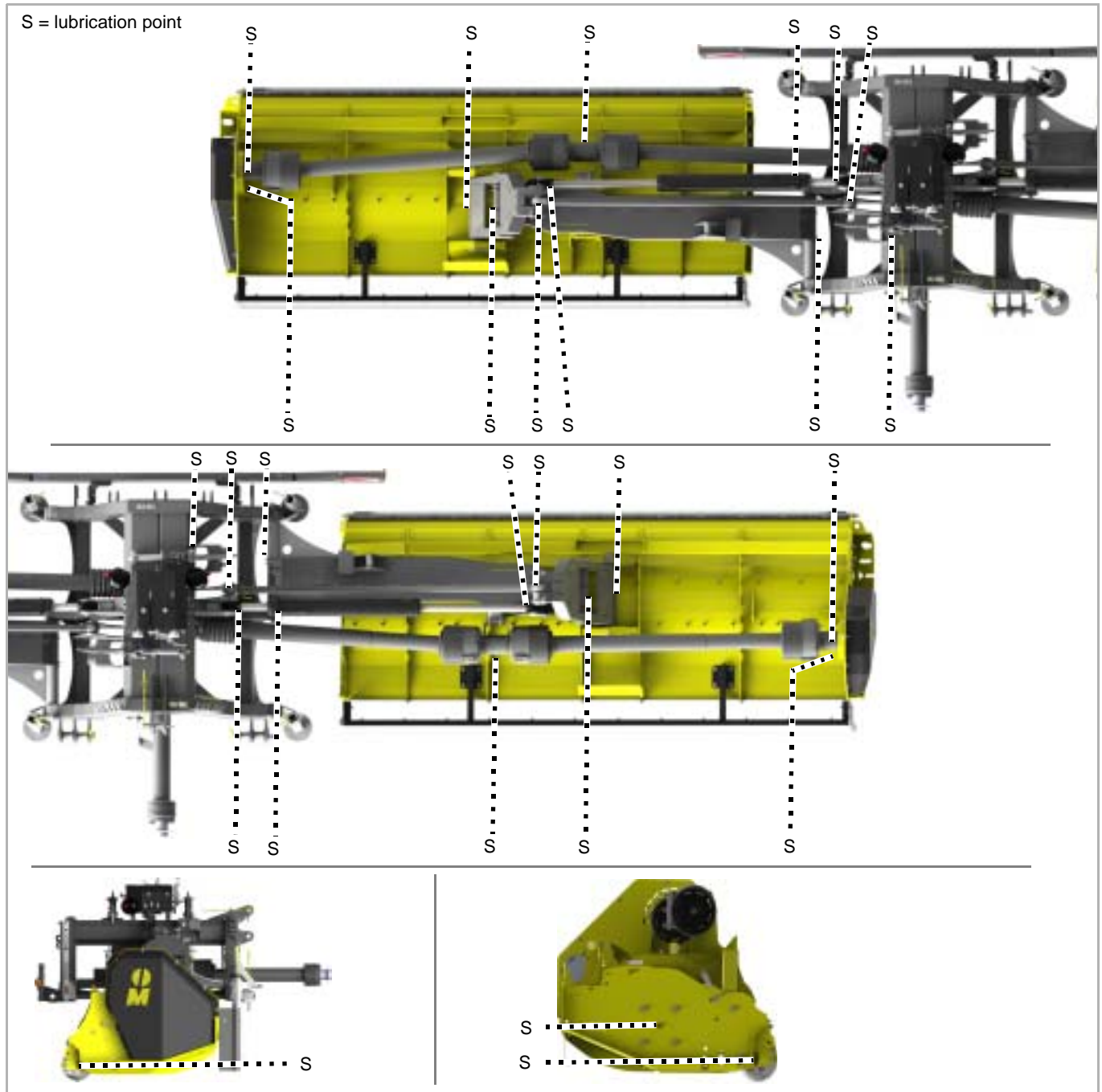
The bearings must be lubricated regularly. Lubricate only with one or two strokes from the grease gun:

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

Bearings that require no maintenance must not be lubricated.

# Maintenance

## Overview of lubrication points



## 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

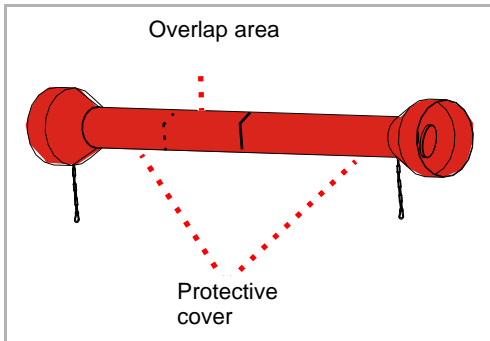
The PTO shafts are heavily stressed. This means that regular maintenance is decisive for the PTO shafts' service life. Only the most important work is shown here.

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

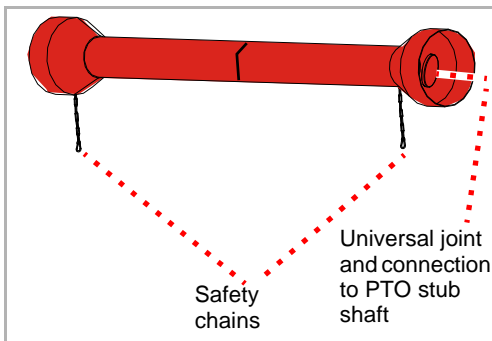
If the PTO shaft is heavily contaminated:

- ▶ 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

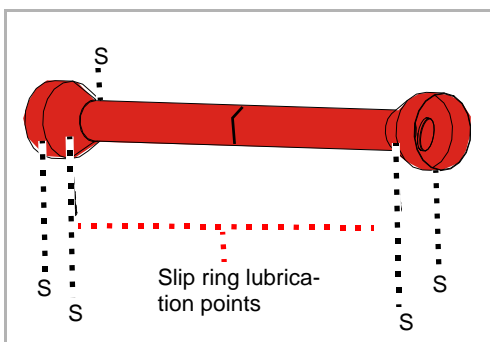
- ▶ Check the PTO shaft for wear in the universal joints and at the connection to the PTO stub shaft

If the universal joints are heavily worn:

- ▶ Replace the universal joints
- PTO shaft operating manual

## Lubrication

### See operating manual for propeller shaft



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 the slip rings according to the information in the operating manual for the propeller shaft

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

# Maintenance

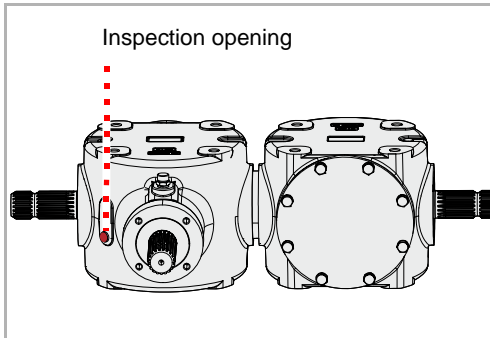
## Transmission oil

The gearbox oil must conform to the specification.

→ Chapter »Familiarising yourself with the machine« paragraph »Technical specifications«, page 24

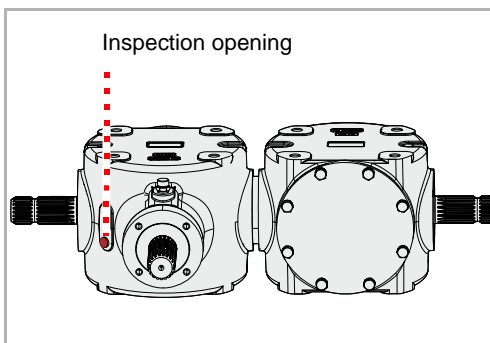
### Check

Twice per season

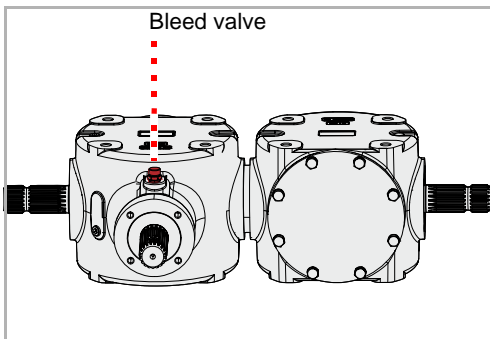


- ▶ Loosen the screw on the inspection opening with an Allen key and remove the screw
- ▶ Check the oil level. The oil level must reach the lower edge of the inspection opening.
- ▶ Retighten the screw at the inspection opening

### Refilling



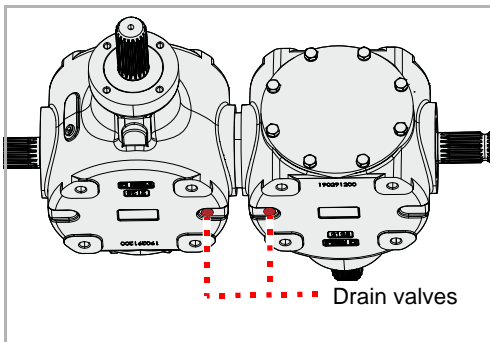
- ▶ Loosen the screw on the inspection opening with an Allen key and remove the screw



- ▶ Unscrew the bleed valve
- ▶ 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
- ▶ Screw the bleed valve back in

## Replacement

1x per season



- ▶ Have a collection container ready for the waste oil
  - ▶ Open drain valve
  - ▶ Allow the oil to drain out fully
  - ▶ Close drain valve
  - ▶ Refill with new gear oil
- Section »Refilling«

## Tools

As required

The tools must be replaced if they:

- Are damaged
- Are heavily worn
- The bore on the tool 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 with tools of the same color coding



When carrying out replacement work, always replace the entire tool set. When changing individual tools, the rotor runs out-of-centre, which leads to a high degree of wear on the bearings or damage to the bearings and rotor.



### 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 dropping, serious or fatal accidents could result.*



### New tools – new fastening set

When replacing the tools, the nuts, bolts, sleeves and shackle must also be replaced.

*If the fastening set is not replaced, worn components 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.*

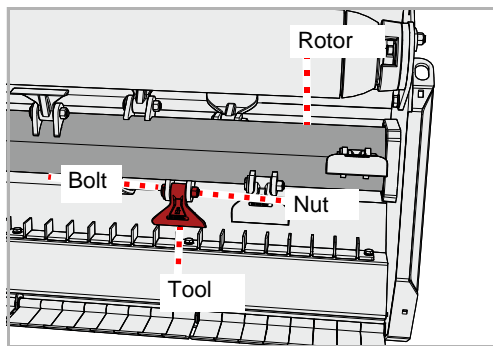


### Use original replacement parts

The nuts and bolts for fastening tools have special properties and strengths.

*If the nuts and bolts do not have the required properties, tools may become detached during work and be flung out. Even persons outside of the hazard area could be seriously injured or killed.*

## Hammer flail

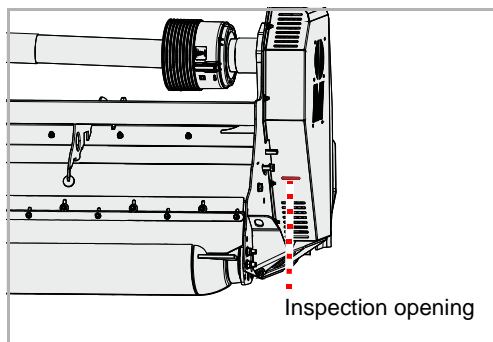


- ▶ Secure the machine against rolling away and dropping
- ▶ Loosen the nuts and remove the bolts
- ▶ Remove old tool
- ▶ Insert the new tool in the same way.
- ▶ Fit a new screw and secure with a new nut

## V-belt

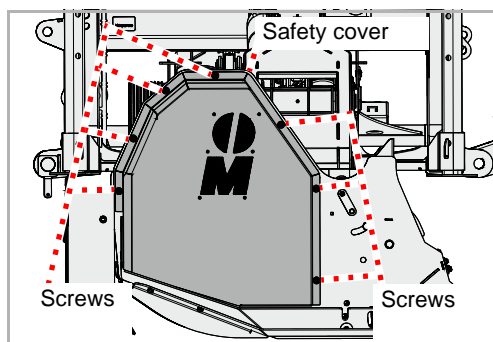
As required

## Checking



There is an inspection opening on the machine.

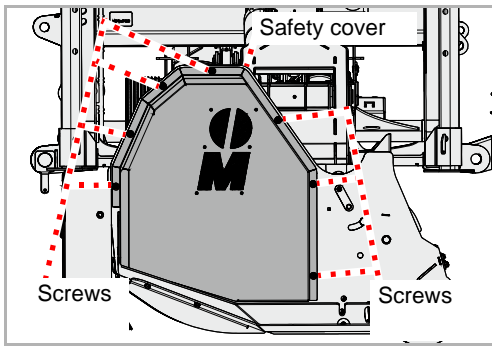
- ▶ Check the tension of the V-belt. When under a load of 6 kg, it must not be possible to push the V-belt through more than 10 mm.



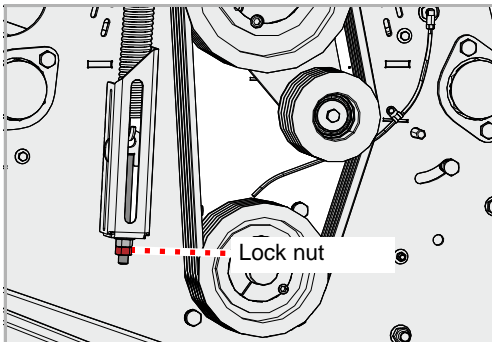
- ▶ Remove the screws, remove the safety cover.
- ▶ Check the V-belt for damage
- ▶ Reassemble the safety cover
- ▶ Perform work on the opposite side of the machine

# Maintenance

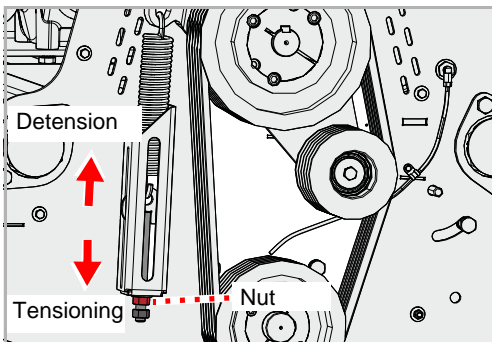
## Tensioning



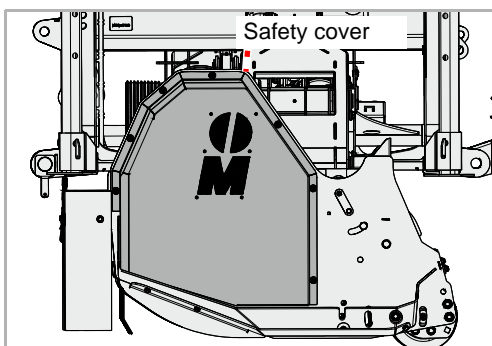
- ▶ Remove the screws, remove the safety cover.



- ▶ Loosen the lock nut



- ▶ Use the nut to set the drive belt tension as required
- ▶ Retighten the lock nuts

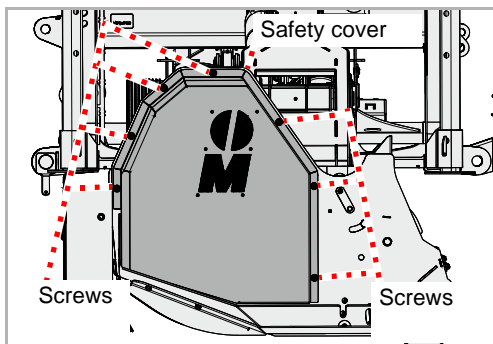


- ▶ Reassemble the safety cover

**If the V-belts also need to be tensioned on the other side:**

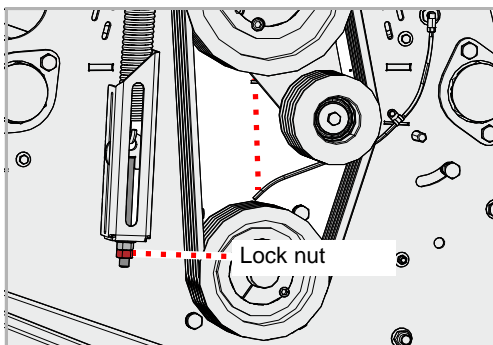
- ▶ Tension V-belts on the other side

## Replacement

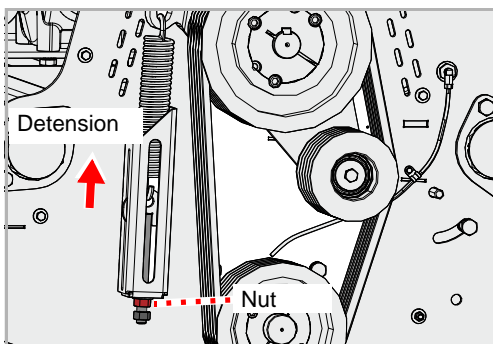


If there are any tears or other damage on the V-belt, it must be replaced.

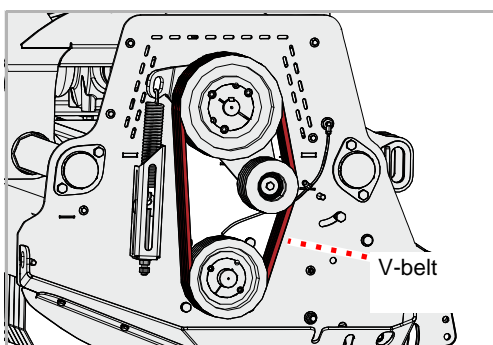
- ▶ Remove the screws, remove the safety cover.



- ▶ Loosen the lock nut



- ▶ Slacken the drive belts using the nut



The drive belt unit consists of five narrow drive 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 70
- ▶ Reassemble the safety cover

**If there are also cracks or other damage on the V-belt on the other side:**

- ▶ Exchange V-belt on the other side

# Maintenance

## 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.

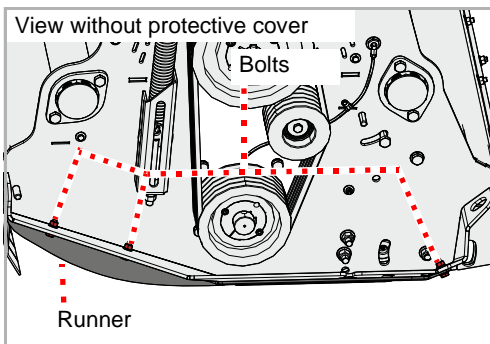


### Secure the machine

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.*

## Replacement



Runners are fitted on each side.

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

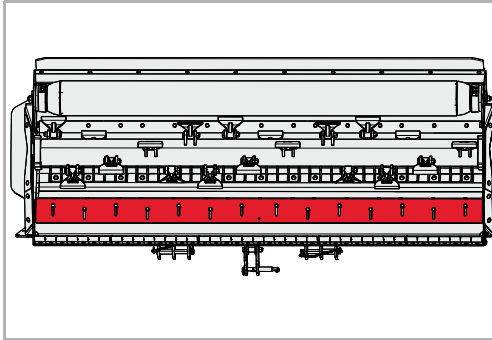
**If the runner on the other side is also worn:**

- ▶ Replace the runner on the other side



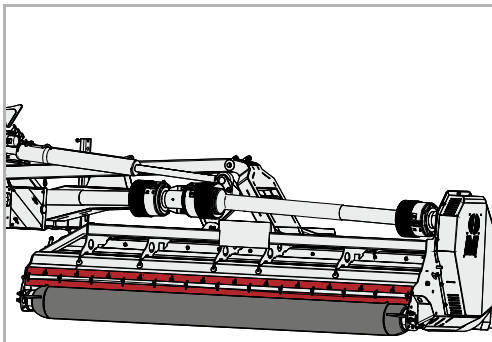
## Cutting bar

The degree of shredding can be altered using a cutting bar. You can use it to determine how finely the material should be shredded.



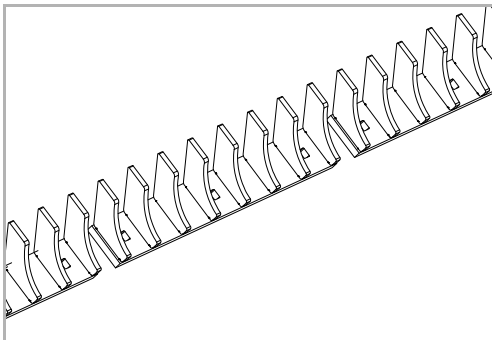
## Scraper

The scraper cleans the roller with each revolution. If the mulch is long or the weather conditions are unfavourable, this therefore prevents malfunctions caused by mulch blockages.



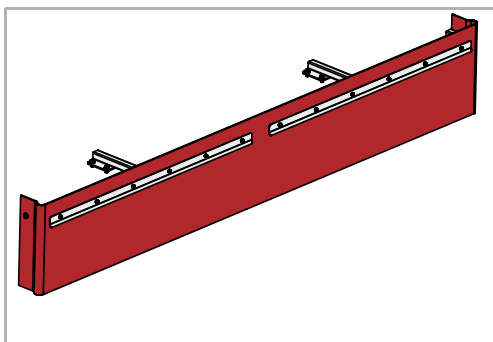
## short-chopping bar

A second counter-cutter optimises the material feed. This produces better cutting. This produces better cutting.



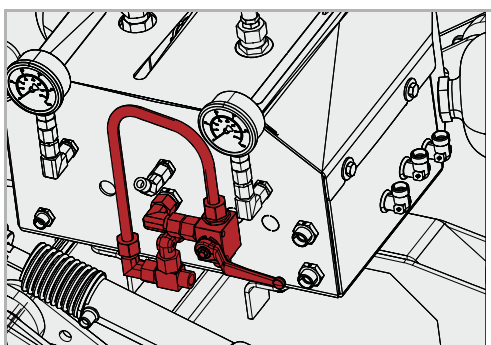
# Accessory

## Additional guard



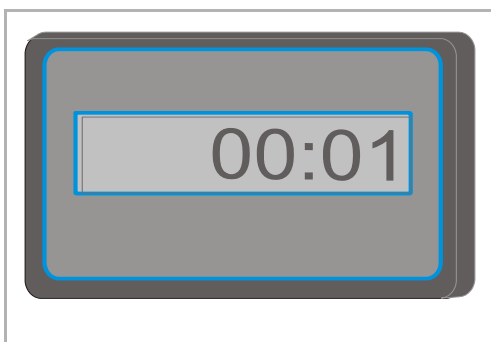
When using of the machine in particularly sensitive areas, the use of an additional guard can be effective. The additional guard is fitted in front of the front stone guard on both sides of the machine.

## Individual control



A control valve allows the two sides of the machine to be lifted or lowered separately. This allows you to react flexibly to different ground contours.

## 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.

# Fault elimination

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 at the tractor defect?  
If so, contact your dealer.
- Is the hydraulic pump of the tractor 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	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
	Rotor not correctly counterbalanced	Check balancing and rebalance the rotor if necessary
Tools wearing quickly	The tools are working too deeply	Set correct working depth
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
	Speed of rotation of the tractor PTO stub shaft 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
Rotor does not turn	Rotor is blocked by a foreign body	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

# Fault elimination

Fault	Cause	Remedy
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.

# Disposal of the machine

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.

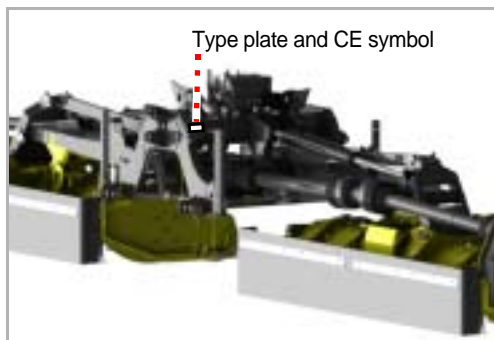
## **Oil**

Collect fluid from the hydraulic system in a suitable container and dispose of at a used oil collection facility.

# 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-PRO/F and accessories

Assorted samples of harmonized standards:

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

Soest, 28.10.2022



Andreas Rohde  
CEO and authorised person for compiling technical documentation

Copy of the type plate/serial number entry

Machine type: Flail mower

Maschine Name:

Working width:

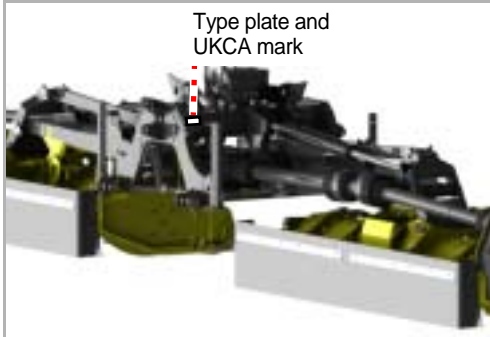
Serial number:

Year of construction:

# UK Declaration of Conformity

UKCA

**Müthing GmbH & Co. KG Soest**  
**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-PRO/F and additional equipment
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The special technical documents corresponding to the machine have been created according to Annex VII, Part B.

Soest, 28.10.2022

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:

# Index

<b>A</b>			
Accessory	73		
Additional guard	74		
Cutting bar	73		
Individual control	74		
Operating hours counter	74		
Scraper	73		
short-chopping bar	73		
assembly	23		
<b>C</b>			
Care	52		
Centre of gravity	15		
Cleaning	52		
Connecting			
Electrics	33		
Hydraulics	33		
Coupling	27		
<b>D</b>			
Direction information	13		
<b>E</b>			
Electrics			
Connecting	33		
Employer	8		
<b>F</b>			
Fault	75		
Features	22		
<b>H</b>			
Hydraulics			
Connecting	33		
<b>I</b>			
Individual control	51		
Instruction	8		
<b>L</b>			
labels, see warning signs			
Lubricate bearings		63	
<b>M</b>			
Maintenance			
General information		59	
Maintenance intervals		62	
Overview of lubrication points		64	
Safety		58	
<b>P</b>			
Parking		53	
Pictograms		9	
Protective procedure			
Oils or lubricants		59	
<b>R</b>			
Range of application		21	
Hammer flail		21	
<b>S</b>			
Safety		10	
Agricultural training		13	
Altered driving and braking behaviour		17	
Care and maintenance intervals		19	
Care and maintenance work		19	
Centre of gravity		15	
Check the screwed connections		20	
Cleaning		20	
Coupling		14	
Proper use		21	
Putting the machine into operation		17	
Riding on the machine		17	
Total weight		15	
Uncoupling the machine		19	
Warning signs		10	
Welding work		20	
Scope of delivery		26	
Screwed connections		61	
Setting down the machine in a secure position		53	
Symbols		9	



## T

Target group	8
Task	48
Technical specifications	24
Tightening torques	
General	61
Transport without coupling	48

## W

Warning signs	10, 48
Meaning	11
Work position	48
Working width	42





