

9542 / 9546

Operating manual

Original operating manual

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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 details here.

Designation	9542 / 9546
Working width	4.20 m / 4.60 m
Weight	640 kg / 695 kg
Machine number	VF6582 ____ / VF6583 ____
Accessories	
Address of supplier	
Address of manufacturer	Kverneland Group Kerteminde AS Taarpstrandvej 25 DK-5300 Kerteminde Denmark Tel: +45 65 19 19 00

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Preface

Target group for this operating manual

This operating manual is aimed at trained agriculturists and persons who are otherwise qualified for agricultural activities and have received instruction in working with this machine.

Minimum age

Children under the age of 16 are not permitted to operate the machine.

For your safety

You must familiarise yourself with the contents of this operating manual before assembly or initial operation of the machine. In this way, you will achieve optimum work results and operational safety. The operating manual forms an integral part of the machine and must always be kept to hand. This will ensure that you:

- avoid accidents.
- comply with warranty conditions.
- have a fully functional machine in good working order at all times.

Training

Your dealer will provide instruction on operation and care of the machine.

Information for the employer

All personnel are to be regularly, but at least once a year, instructed on the use of the machine, in accordance with the regulations of the national organisation for Health and Safety at Work. Untrained or unauthorised persons are not permitted to use the machine.

You are responsible for ensuring that the machine is operated and maintained safely. Make sure that you and all other persons that operate, maintain or work in close proximity with the machine are familiar with the operating and maintenance regulations, as well as the corresponding safety instructions in this operating manual.

Symbols used

In this operating manual, the following symbols and terms have been used:

- 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.

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



The "Information" pictogram indicates tips and additional information.



The "Examples" pictogram indicates examples that assist understanding of the instructions.



Caution

The warning triangle indicates important safety information. Failure to observe this safety information can result in:

- Serious faults in the correct operation of the implement.
- Damage to the machine.
- Personal injury or accidents.



The spanner indicates tips for assembly or adjustment work.



Switch on the tractor.



Switch off the tractor and secure it against rolling away.



The arrow in the diagram shows the direction of travel.



For your safety

This chapter contains general safety instructions. Each chapter of the operating manual contains additional specific safety information which is not described here. Observe the safety information:

- 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 agricultural machinery in the wrong way. Therefore, always work with particular care and never under time pressure.

Information for the employer

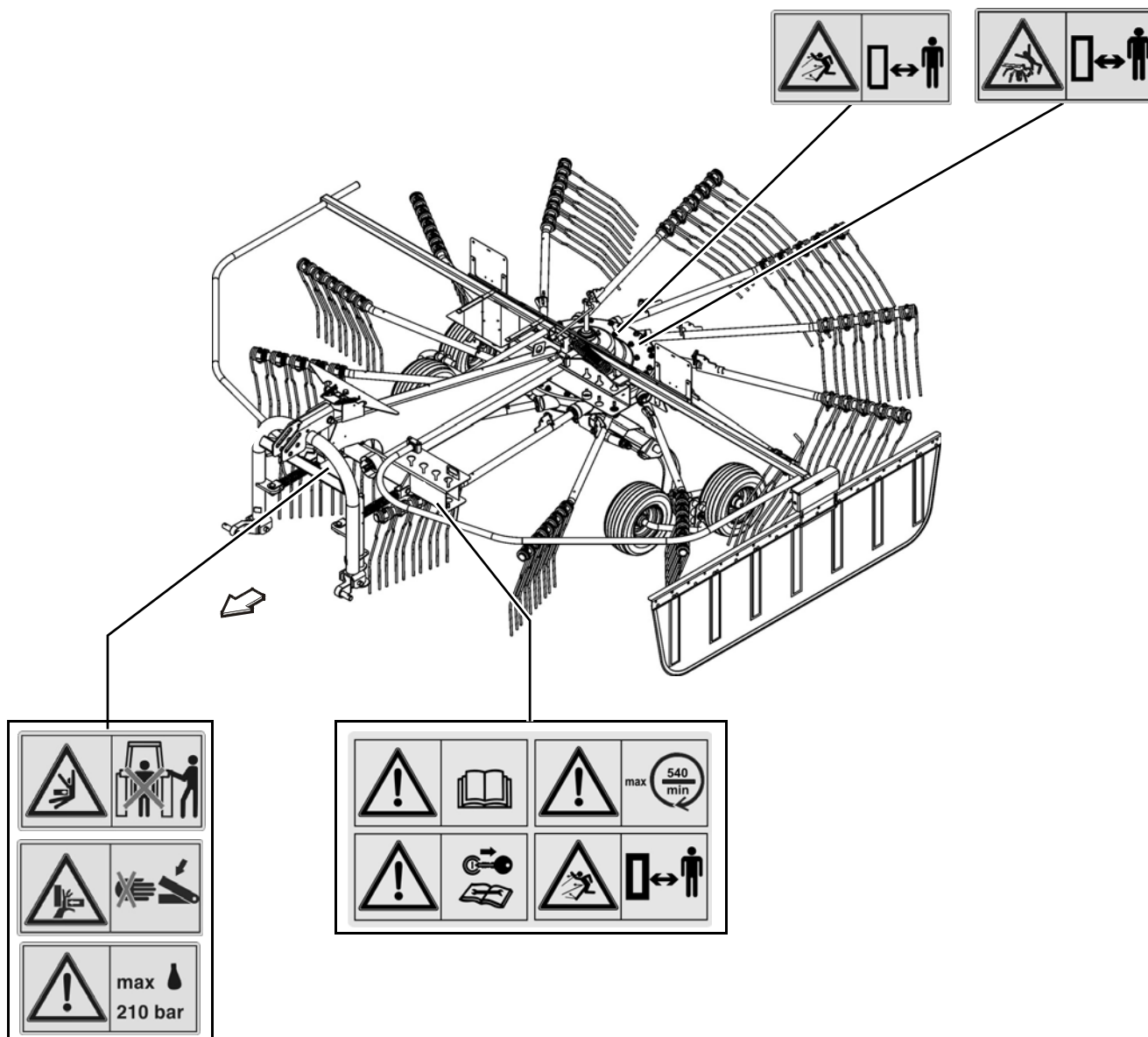
Inform all persons who work with the machine about this safety information at regular intervals and in accordance with statutory regulations.



Warning signs

Safety-related labels attached to the machine indicate potential hazards. The labels must not be removed. Illegible or missing labels should be replaced. You can obtain new labels as replacement parts from your dealer.

Warning signs on the machine





Meaning of warning signs



Read the operating manual

Read and follow the operating and safety instructions before using the machine for the first time. The machine must not be used for the first time until the operating manual has been read and understood. This applies in particular to the safety information. Otherwise, serious or fatal injury may be caused as a result.



Switch off the engine

Only perform maintenance, repair and adjustment work when the machine is shut down. Otherwise, serious or fatal injury may be caused as a result.



Distance from the rotor

Maintain a safe distance from the rotor when it is rotating. Nobody may remain in close proximity to the machine when rakes and swathers are running. Serious or fatal injury may be caused as a result.



Distance from tractor

When the machine is being coupled, uncoupled or operated, there should be no-one between the tractor and the machine. Otherwise, serious or fatal injury may be caused as a result.



Risk of crushing

Never reach into an area where there is a risk of crushing if parts in that area are still likely to move. Otherwise, serious or fatal injury may be caused as a result.



Caution, parts ejected at speed

Hazard caused by parts which may become detached when the drive is in operation, and ejected at speed. Maintain a safe distance. Otherwise, serious or fatal injury may be caused as a result.



PTO shaft speed 540 rpm

The specified maximum PTO shaft speed of 540 rpm must not be exceeded. Otherwise, damage to the machine may be caused as a result.



Do not exceed the maximum hydraulic pressure

The tractor's hydraulic pressure on the machine's hydraulic system must not exceed 210 bar. Otherwise, damage to the machine may be caused as a result.



Who is allowed to operate the machine?

Only qualified persons may operate the machine

Only qualified persons who have been informed of the dangers associated with handling the machine are permitted to operate, service or repair the machine. The necessary knowledge can be gained in the course of agricultural vocational training, professional training or intensive instruction.

General safety information

The general safety information and warning signs apply to every phase of the life cycle of the machine and to every application.



Switch off the tractor and secure it

Before you dismount:

- ▶ Switch off the tractor.
- ▶ Remove the ignition key.
- ▶ Secure the tractor against rolling away.

An unsecured tractor can run you over or trap you. Serious or fatal injury may be caused as a result.

Operate for the first time only after proper training

The machine may only be put into operation after proper training has been provided by an employee from a dealership or the manufacturer, or by a factory representative. Operation without proper training can lead to damage to the machine due to incorrect operation, or may cause accidents.

Safety is your responsibility

Follow the safety instructions. Ensure that all operators comply with the safety instructions. Prevent serious or fatal accidents by following the safety instructions.

Instructions in the event of malfunctions

In the event of a malfunction, shut down, stop and secure the machine immediately. Rectify the malfunction immediately yourself or seek the assistance of a workshop. Operating a faulty machine can cause accidents or damage.

No persons in the working area

Ensure that no persons are present in the slewing and working area of the machine. Persons could be caught by the machine within this area. This could result in fatal injury.

Perfect working condition

Ensure that the tractor and the machine are always in perfect working condition. Make sure that the tractor brakes work in conjunction with the machine. Also follow the instructions in your tractor's operating manual.



Switch off the PTO shaft drive when lifting the machine

Switch off the PTO shaft drive on the tractor if people could enter the working area of the machine when you

- raise the machine to the headland position.

Rotating, unprotected parts can damage the machine and cause life-threatening injuries.

Switch off the tractor PTO shaft drive

Switch off the PTO shaft drive on the tractor when changing from work to transport position (and vice versa). Wait for moving parts to come to a stop. If this requirement is ignored, the consequence may be damage to the machine and even life-threatening injuries.

No reversing while the drive is running

Never drive in reverse with the PTO shaft drive switched on and in the work position if people could enter the working area of the machine. Switch the PTO shaft drive off. Rotating, unprotected parts can damage the machine and cause life-threatening injuries.

Specified workwear

Do not wear loose fitting clothing. Loose fitting items of clothing may become caught in rotating parts. Wear workwear and protective clothing, as specified by the Accident Prevention and Insurance Association. Otherwise, serious or fatal injury may be caused as a result.

No riding on the machine

Persons or objects must never be transported on the machine. Carrying passengers on the machine is life-threatening and prohibited. Serious or fatal injury may be caused as a result.

Never work on the machine while it is running

No operations may be performed on the machine while it is running. Objects or persons can be caught, drawn in or crushed. Serious or fatal injury may be caused as a result.

Safe distance from raised and unsecured loads

Never work under suspended loads. Maintain a sufficient distance from raised and unsecured loads. Otherwise, serious or fatal injury may be caused as a result.

PTO shaft

Use only the PTO shafts specified by the manufacturer and read the attached operating manual carefully. Adjust the length of the PTO shaft as required. Incorrect PTO shaft lengths can cause damage to the machine and personal injury.

Check and fasten the PTO shaft guard in position

The rotating PTO shaft is protected by the PTO shaft guard. Ensure that the guard is not damaged. Fasten the PTO shaft guard in position by connecting the chains on the implement and the tractor. Unguarded PTO shafts can cause life-threatening injuries.

**Make sure the machine is standing level**

Before changing from the transport to the work position (and vice versa), make sure the machine is standing level. The machine could be damaged and serious or fatal injuries could be caused.

Do not make any modifications to the machine

No modifications of any kind may be made to the machine. Unauthorised modifications can adversely affect the correct operation and safety of the machine and shorten its service life. Unauthorised modifications to the machine render the manufacturer's guarantee null and void and free the manufacturer from all liability.

PTO shaft speed 540 rpm

The specified maximum PTO shaft speed of 540 rpm must not be exceeded. A higher PTO shaft speed will damage the machine.

Do not use a PTO shaft with a disconnect coupling

Only use PTO shafts which have been specified by the manufacturer. Other PTO shafts with disconnect couplings may allow higher disconnect torques. Higher disconnect torques may cause damage to the machine.

Unrestricted field of vision to the rear

After it has been coupled, ensure that you have an unrestricted view of the machine, in both its work and transport positions. At the very least, use the panorama mirror provided by the tractor manufacturer. Otherwise, hazardous situations may not be detected in time, resulting in accidents or damage.



Coupling

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, shut off the engine and remove the ignition key.
- Never stand between the tractor and machine.
- Lock the PTO shaft securely on the PTO stub shafts of the tractor and the machine.

If this requirement is ignored, the consequence may be damage to the machine and even life-threatening injuries.

Attaching electrical connections after assembly

The electrical supply to the tractor must not be connected when the lighting equipment is being fitted. Otherwise, short circuits will occur and the electronic system will be damaged.

Observe the operating manual of the PTO shaft manufacturer

Observe the operating manual of the PTO shaft manufacturer. It will provide you with instructions on how to handle the PTO shaft correctly. If these instructions are ignored, damage may be caused to the PTO shaft and machine.

Risk of tipping

When the machine is coupled to tractors with lower link quick-release couplings, the quick-release couplings must be secured against unintentional opening. If the quick-release couplings open unintentionally, the tractor and machine may tip over. If this requirement is ignored, the consequence may be damage to the machine and even life-threatening injuries. Also follow the instructions in your tractor's operating manual.

Hydraulics

Hydraulic connection at zero pressure only

Only connect hydraulic hoses to the tractor hydraulic system if the tractor and machine hydraulic system is at zero pressure. A pressurised hydraulic system can trigger unpredictable movements of the machine and can cause serious machine damage and personal injury. Serious or fatal injury may be caused as a result.

High pressures in the hydraulic system

The hydraulic system is under high pressure. Regularly check all lines, hoses, 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. Seek medical attention immediately if injuries occur.

Replace hydraulic hoses every six years

Hydraulic hoses age without showing externally visible signs. Replace hydraulic hoses every six years. Defective hydraulic lines can cause serious or fatal injuries.



Road transport

Ensuring road safety

The machine must conform to current national traffic regulations if you intend to drive with it on public roads. Ensure the following:

- Lighting, warning and protective equipment must be fitted
- The permissible transport widths and weights, axle loads, tyre load-bearing capacities, laden weights and national speed restrictions must be complied with.
- The maximum permissible road transport speed must be complied with, but not exceed 50 km /h.
- Before driving on public roads, fully fold in all deflector bars and secure the machine. All tine supports which have tips that point at right angles to the direction of travel must be removed.
- The machine should only be towed by agricultural or forestry tractors.

The empty weight of the tractor must be greater than the weight of the machine. The driver and keeper of the vehicle are liable should these conditions not be observed.

Check tyre pressures

Check tyre pressures on a regular basis. Incorrect tyre pressures reduce the service life of a tyre and cause unstable driving characteristics. Accidents with serious or fatal injuries may be caused as a result.

Altered driving and braking performance

Driving and braking characteristics are altered when the machine is coupled or hitched to the tractor. When cornering, take the overall width and balancing weight of the machine into consideration. Adjust your driving speed accordingly. A driving style which is not adapted to conditions can cause accidents. Accidents with serious or fatal injuries may be caused as a result.

Speed adjustment

In poor road conditions and at high speeds, significant forces can be generated which subject the tractor and machine material to high or excessive stresses. Adjust your driving speed to the road conditions. A driving style which is not adapted to conditions can cause accidents. Accidents with serious or fatal injuries may be caused as a result.

Check hitch pins

Hitch pins must be in perfect condition. Hitch pins must show no signs of wear and be properly secured. Otherwise, hitched machines may detach themselves of their own accord. Accidents with serious or fatal injuries may be caused as a result.

Check release cords on quick-release couplings

Release cords must hang loose and must not allow a release in their lowered position. Hitched machines may otherwise detach themselves from the lower link hitching system of their own accord. Accidents with serious or fatal injuries may be caused as a result.



Operation

Operate for the first time only after proper training

The machine may only be put into operation after proper training has been provided by an employee from a dealership or the manufacturer, or by a factory representative. Operation without training can lead to damage to the machine due to incorrect operation, or cause accidents.

Ensure that the machine is in perfect working condition

Do not operate the machine unless it is in perfect working condition. Check all key components and their correct operation before use. Replace defective components. Defective components can cause material damage and personal injury.

Check the protective equipment

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

Check the immediate vicinity

Check the area immediately surrounding the machine before driving off, and continually during operation. Make sure that you have an adequate view. Only begin work when the immediate vicinity is cleared of any persons or objects. Otherwise, serious or fatal injury may be caused as a result.

Retighten all nuts, bolts and screws

Regularly check that nuts and bolts are correctly tightened. Retighten bolts if necessary. Nuts and bolts can work loose when the machine is used. Damage to the machine or accidents may be caused as a result.

The PTO stub shaft continues turning after it has been switched off

After the PTO stub shaft drive on the tractor has been switched off, the machine continues to run due to the moment of inertia. Maintain a sufficiently safe distance until all moving parts have come to a complete standstill. Otherwise, damage to the machine and serious or fatal injury may be caused as a result.

Cornering and turning manoeuvres

Centrifugal forces are in operation during cornering. The machine's centre of gravity at the rear of the tractor is displaced. Be aware of the turning radius and the moment of inertia. A driving style which is not adapted to conditions can cause accidents. Accidents with serious or fatal injuries may be caused as a result.



Uncoupling

Increased risk of injury

There is an increased risk of injury when uncoupling the machine from the tractor. Therefore:

- Secure the tractor against rolling away, turn off the engine and remove the ignition key.
- Never stand between the tractor and machine.
- Set the machine down on firm, secure and level ground.
- Ensure that the sustainer is securely locked.
- Place the PTO shaft in the holder provided.
- Secure the machine against rolling away (use wheel chocks).
- Do not disconnect hydraulic hoses until there is no pressure in the tractor and machine hydraulic system.

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



Care and maintenance

Observe the care and maintenance intervals

Observe the periods specified in the operating manual for recurrent checks and inspections. If these periods are not observed, damage to the machine and accidents may be caused as a result.

Use original parts

Many components have special properties that are essential for the stability and correct operation of the machine. Only spare parts and accessories supplied by the manufacturer have been tested and approved. Other products may adversely affect the correct operation of the machine and safety. Using non-OEM replacement parts renders the manufacturer's guarantee null and void and frees the manufacturer from all liability.

When performing care and maintenance work:

- Switch off the PTO shaft drive.
- Depressurise the hydraulic system.
- Whenever possible, uncouple the tractor.
- Switch off the tractor and remove the ignition key.
- Ensure the machine is standing on firm, secure and level ground, and provide additional support, if necessary.
- Secure the machine against rolling away (use wheel chocks).

Only if these regulations are observed can safe working be ensured during care and maintenance work.

Turn off the electrical supply

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

Caution when cleaning with a high-pressure cleaner

Exercise caution when cleaning with a high-pressure cleaner. Bearings, seals and pipe unions are not waterproof. In order to prevent damage to the machine, the bearings, seals and pipe unions must not be exposed to direct contact with the high pressure water jets.

No aggressive washing additives

Do not use any aggressive washing additives for cleaning. Uncoated metal surfaces can be damaged.

Before carrying out welding work

Disconnect all electrical connections from the tractor when carrying out welding on the hitched machine. Damage may otherwise be caused to the electrical system.

Retighten all nuts, bolts and screws

All screwed/bolted connections that are loosened during maintenance and repair operations must be retightened. Serious injury and damage to equipment can be caused by loose pin and screwed connections.



Further regulations

Observe the regulations

In addition to the safety information listed above, please observe the following:

- Accident prevention regulations.
- Generally recognised safety regulations, occupational health requirements and road traffic regulations.
- The instructions provided in this operating manual.
- Regulations relating to operation, maintenance and repair.

Warranty

The warranty and manufacturer's liability will no longer be valid if the instructions provided in the chapter on Safety are not observed, if maintenance is inadequate or faulty, if the machine is used for purposes other than those for which it was intended and if it is overstressed, or if impermissible modifications are made to the machine.

Getting to know the machine

Range of application

This product is classified as replaceable equipment in accordance with EC directive 2006/42/EC.

The machine is a single-wheel rake, which is suitable only for the raking together of mown, stalked material (for example, hay or straw).

Proper use

Any other use, for example, for silo distribution, any form of soil preparation, road sweeping or for the transmission of power to other machines, is not permitted. The manufacturer and dealers are not liable for damage caused by improper use. The risk is borne solely by the user.

Features

Flexible in operation

This single-wheel rake meets all the requirements of modern crop harvesting engineering. Important functions for field use are controlled during operation. With Hydrolift, the individual rotor working depths are set from the tractor seat:

The rake can be pulled by tractors of 40 kW (54 hp) or more.

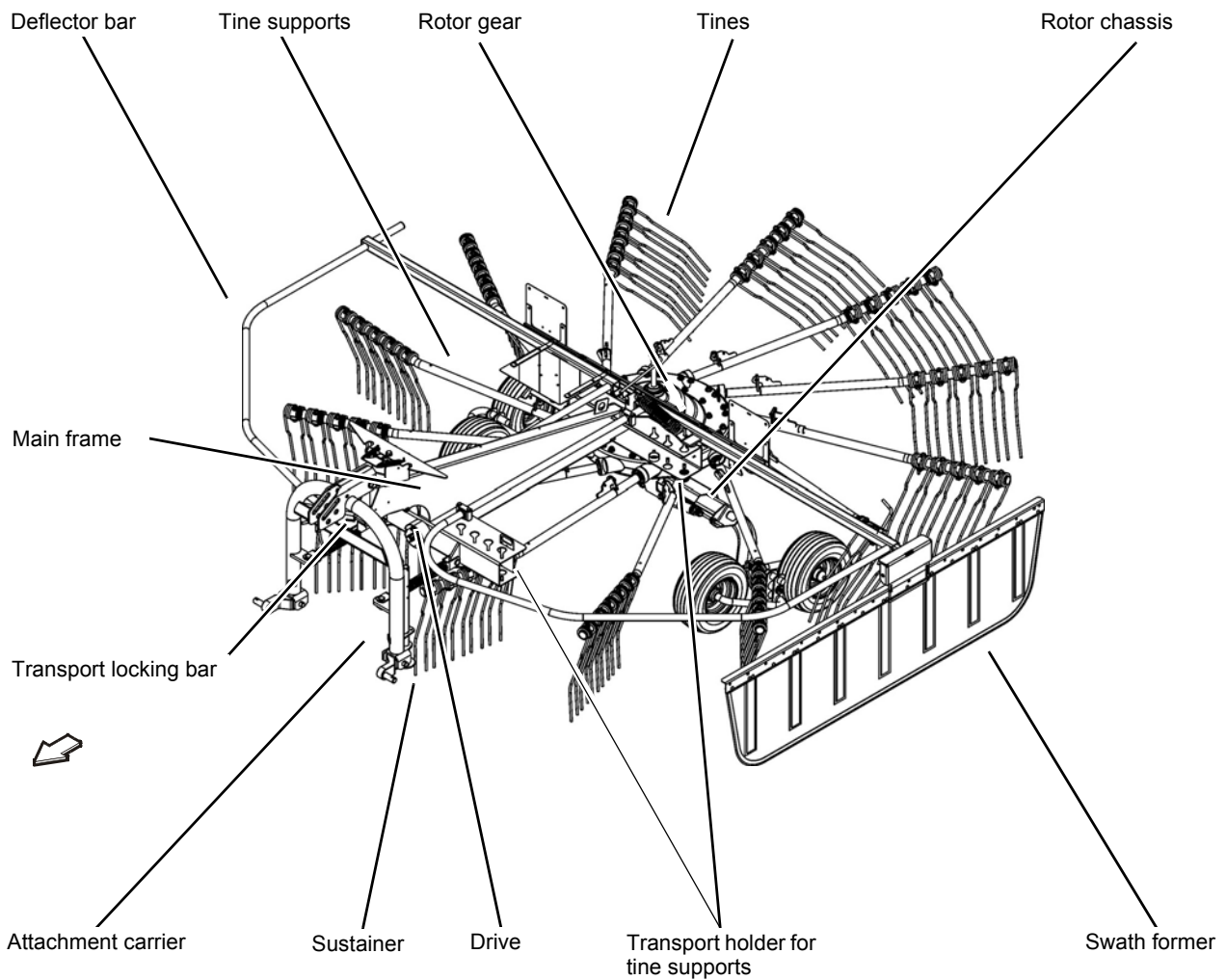
Extensive equipment

The machine is equipped with a low-maintenance gear box and 12 or 13 tine supports on the rotor. The cranked tines achieve a very good raking quality.

Easy changeover from work to transport position

The rake is easily changed over from the work to the transport position.

Designation of components

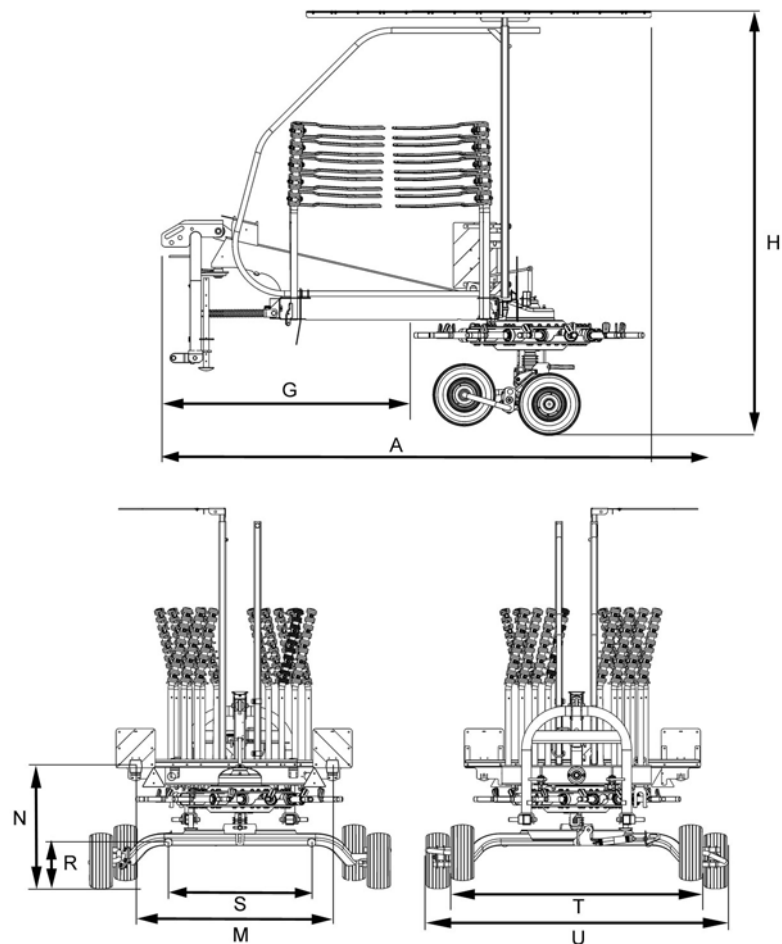


Getting to know the machine

Technical specifications

Dimensions in transport position

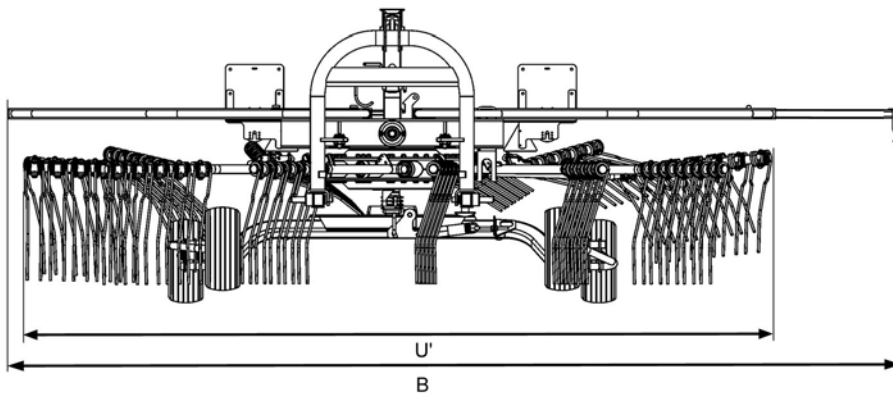
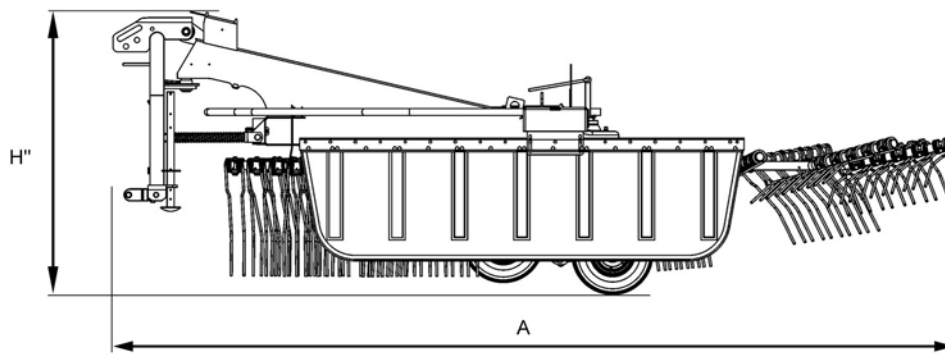
		Transport position [m]	
Model		6582	6583
A	Length	3.93	4.23
H	Height	2.59	2.74
U	Transport width	1.74	2.14
M	Distance, lighting equipment [*]	1.45	1.81
N	Height, lighting equipment [*]	0.88	0.88
R	Height of bottom reflectors	0.33	0.33
S	Distance between bottom reflectors	0.80	1.03
T	Track	1.56	1.96
G	Distance, machine's centre of gravity	1.45	1.70



Getting to know the machine

Dimensions in work position

		Work position [m]	
Model		6582	6583
A	Length	3.93	4.23
H''	Height in work position	1.42	1.42
U'	Rotor diameter	3.35	3.65
B	Working width	4.20	4.60



Getting to know the machine

Weights

	6582	6583
Total weight	640 kg	695 kg
Load supported on sustainer	160 kg	176 kg

Tractor equipment required

Output / connections		
	Minimum output of the tractor	40 kW (54 hp)
	Lighting power supply	12 V, 7-pin plug socket ISO 1724
	Hydraulic connections	1 x single-acting hydraulic control device
	Hydraulic pressure	150 - 210 bar
	Maximum PTO shaft speed	540 rpm
	Lower link	Fixable in height and laterally

Machine equipment

Model		6582	6583
Swath deposit			
	Swath former	Standard	
Rotors / tine supports / tines			
	Number of rotors	1	
	Number of tine supports per rotor	12	13
	Number of tines per tine support	4	
	Removable tine arms	Standard	
	Rotor height adjustment	hydraulic / mechanical	
	Tine saver	[+]	
Wheels			
	Rotor chassis, tandem axle	16 x 6.50-8 6 PR	
Safety accessories			
	Lighting equipment	[+]	
	Warning signs	[+]	
PTO shaft			
	PTO shaft	Standard	

Airborne sound emissions measurement

The airborne sound emissions from the machine are below the levels stipulated by machinery directive 2006/42/EC.

- A-weighted sound level in the workplace:
< 70 dB(A)
- Currently C-weighted sound level:
< 63 Pa (130 dB based on 20 µPa)
- A-weighted sound level on the machine:
< 80 dB(A)

Getting to know the machine

Centre of gravity considerations

Observe the total weight, axle loads, tyre load-bearing capacity and minimum ballast specifications.

The front or rear attachment of machines must not cause the tractor's permissible total weight, its permissible axle load or its tyre load-bearing capacity to be exceeded. In order for steering capability to be maintained, the front axle must bear at least 20 % of the tractor's unladen weight.

By investing some effort in making the calculations you can determine the:

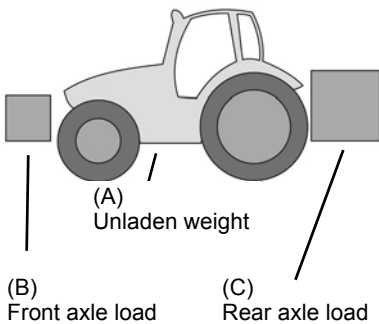
- Total weight
- Axle load
- Tyre load-bearing capacity
- Minimum ballast

For this calculation, the following data is required:

Data from the tractor's operating manual:

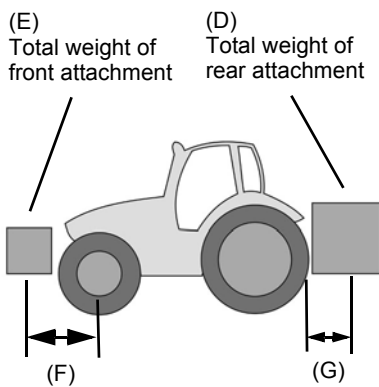
- (A) Unladen weight in kg.
- (B) Front axle load in kg.
- (C) Rear axle load in kg.

Take into consideration any further weights, such as water in the tyres, additional equipment etc.



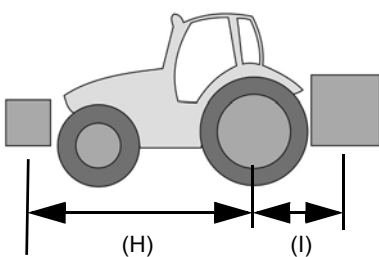
Data from this operating manual:

- (D) Total weight of the machine in the rear attachment. For hitched machines, the supporting load in kg.
- (E) Total weight of the machine in the front attachment in kg.
- (F) Distance between the machine's centre of gravity in the front attachment and front axle midpoint in m.
- (G) Distance between the lower link ball midpoint and the machine's centre of gravity in the rear attachment in m. With hitched machine $G=0$



Data to be measured:

- (H) Tractor's wheel base in m.
- (I) Distance between the rear axle midpoint and the lower link ball midpoint in m



Getting to know the machine

Calculation

The values (A) to (I) can be inserted in the formulas.

Ballast with front weights

Calculation of the **ballast with front weights** for 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

Calculation of the **ballast with rear weights** for 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 (J)**.

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

Total weight

Calculating the **actual total weight (K)**.

$$\text{Total weight in kg: } K = E + A + D$$

Rear axle load

Calculating the **actual rear axle load (L)**.

$$\text{Rear axle load in kg: } L = K - J$$

Tyre load-bearing capacity

Information about the tyre load-bearing capacity of the front and rear wheels can be found in the tyre manufacturer's details.

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

The actual values for the rear axle load must be less than the permissible values given in the tractor's operating manual. The tyre load-bearing capacity must be greater than the values for the rear axle load given in the operating manual.

The actual total weight must be less than the permissible total weight given in the tractor's operating manual. If not, the machine must not be coupled to the tractor.

Delivery and assembly

Checking the scope of delivery

Delivery is in the fully assembled state

The machine is delivered fully assembled. Using the checklist, check the loose parts on delivery. If any parts of the machine have not been fitted or are missing, please contact your dealer.



Do not assemble the machine yourself

Trained personnel are required to assemble the machine. Do not perform assembly work yourself. The following points are required to be met for the machine to be in proper condition:

- Observance of a sequence of work steps.
- Compliance with tolerances and torques.
- Knowledge of work safety during assembly.

Incorrect assembly can result in damage to the machine or accidents.



If parts are missing or have been damaged during transportation, please inform the dealer, importer or manufacturer immediately.

Checklist for parts which were supplied loose	Quantity
PTO shaft for drive	1
Tine support placing swaths on the right	12 / 13
Swath former	1
Operating manual	1
Spare parts list	1
Accessories	See delivery note

PTO shaft length

The length of the PTO shaft was selected at the factory to suit almost all types of tractor. Only in exceptional cases is a correction of the PTO shaft length required on individual tractors. Check the length of the PTO shaft on each tractor prior to first use.

A manufacturer's operating manual for the PTO shaft is enclosed. This includes detailed information on the relevant version of the PTO shaft and must be observed.

Safety



Switch off the tractor and secure it

Before you dismount:

- ▶ Switch off the tractor.
- ▶ Remove the ignition key.
- ▶ Secure the tractor against rolling away.

An unsecured tractor can run you over or trap you. Serious or fatal injury may be caused as a result.

Check the angle of lock

The PTO shaft has a wide hinge joint giving the tractor a steering angle of up to 80°. Make sure that the PTO shaft is not damaged during sharp cornering. The machine may be damaged as a result.

Correct length

A PTO shaft that is too long must not be used. This would result in damage to the drive bearings of the tractor and the machine.

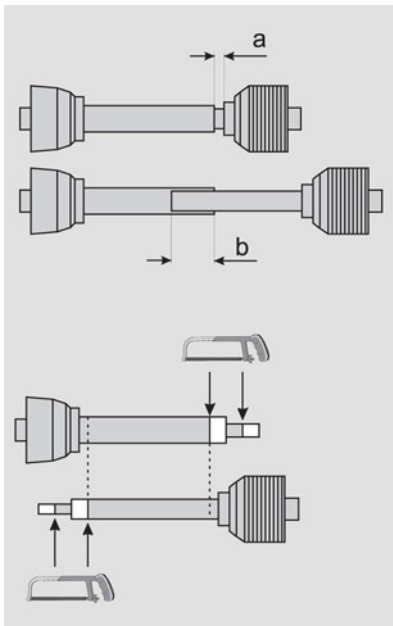
Checking the length of the PTO shaft



- ▶ Couple the machine to the tractor without the PTO shaft.
- ▶ Lower the tractor's lower link.
- ▶ Set the combination (tractor and machine) to the smallest steering angle.
- ▶ Switch off the tractor and secure it against rolling away.

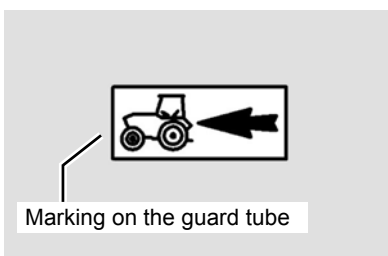
Delivery and assembly

Shortening the PTO shaft



- ▶ Pull the PTO shaft apart and connect one half to the tractor PTO stub shaft drive and the other half to the machine and secure them.
- ▶ Place the two shaft halves next to each other and:
 - Check for a minimum of 250 mm overlap (b).
 - Check that the PTO shaft is not blocked at one end (minimum distance (a) = 20 mm).
- ▶ Shorten the slide tube and guard tube by the same dimension.
- ▶ Deburr the ends of the tubes.
- ▶ Remove the swarf.
- ▶ Grease the sliding surfaces well.

Fitting the PTO shaft



Make sure that you fit the PTO shaft in the correct installation position. There is a marking on the guard tube of the PTO shaft.

- ▶ Check the length of the PTO shaft and shorten it if necessary.
- ▶ Place the PTO shaft onto the PTO stub shaft of the machine.
- ▶ Secure the PTO shaft with a locking pin.

Safety



Observe the safety information

Observe the safety information. Disregard for safety information can lead to serious or fatal injury. See chapter »Safety«, page 6.

Increased risk of injury

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

- Never stand between the tractor and machine.
- Secure the tractor against rolling away.
- Actuate the three-point power lift system slowly and carefully.

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

General

The machine is equipped ex-factory for coupling to the tractor's 3 point trestle.

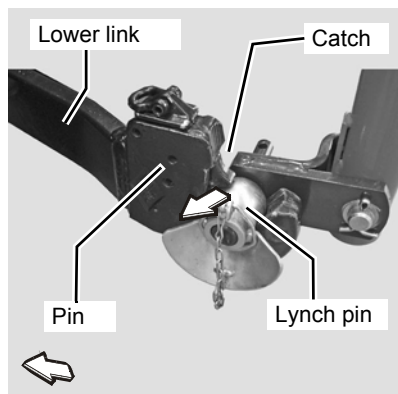
The following work steps are described in this section:

- »Coupling the 3 point trestle«
- »Inserting the sustainer«
- »Coupling the PTO shaft«
- »Connecting the electrics«
- »Connecting hydraulics«

Coupling the machine

Coupling the 3 point trestle

Tractors with quick-release couplings



Follow the instructions for the quick-release coupling

Follow the instructions below for tractors with quick-release couplings. If this requirement is ignored, the consequence may be damage to the machine and even life-threatening injuries.

- ▶ Slide guided cone balls suitable for the tractor onto the lower link hitching system of the machine.
- ▶ To couple the machine, raise the lower link until the catch engages.
- ▶ Secure the quick-release coupling with linchpins.
- ▶ Secure the catch with pins.
- ▶ Follow the instructions for »Tractors without quick-release coupling«.



Note the instructions and warnings in the operating manual of the tractor manufacturer for tractors with lower link quick-release couplings.

Tractors without quick-release coupling

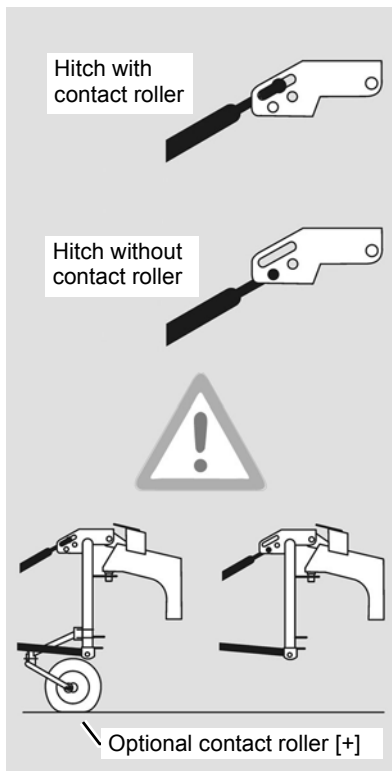
The following applies to all tractors, with or without quick-release couplings:

- ▶ Reverse the tractor with lower links lowered until the hooks on the lower link are below the machine's hitch pins.
- ▶ Lift the lower link with the tractor's hydraulic control device until the hooks on the lower link engage with the hitch pins.
- ▶ Switch off the tractor and secure it.
- ▶ Secure hitch pins for lower link.
- ▶ Insert the sustainer.



→ See »Inserting the sustainer«, page 31.

Coupling the top link



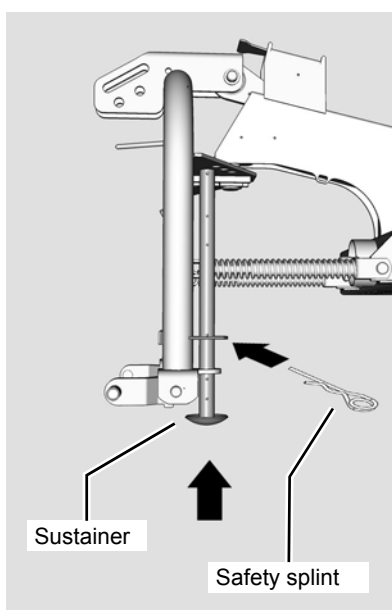
When coupling the top link, ensure that the hitch pin is correctly fitted (see adjacent illustration).

- ▶ Please note the following (otherwise, the machine may be damaged):
 - ▶ With the optional contact roller, insert the hitch pin for the top link into the elongated hole and secure using a safety splint.
 - ▶ Without the contact roller, insert the hitch pin for the top link into the hole and secure using a safety splint.
- ▶ Adjust the tractor's top link to the required length and connect to the top link hitch pin.
- ▶ Secure the top link hitch pin using a safety splint.
- ▶ Adjust the lower link such that a uniform ground clearance is maintained.



Please ensure that, where an optional contact roller is used, the hitch pin for the upper link attachment is in the middle of the elongated hole when the machine is lowered. Otherwise, the machine may not be able to handle the unevenness of the ground.

Inserting the sustainer

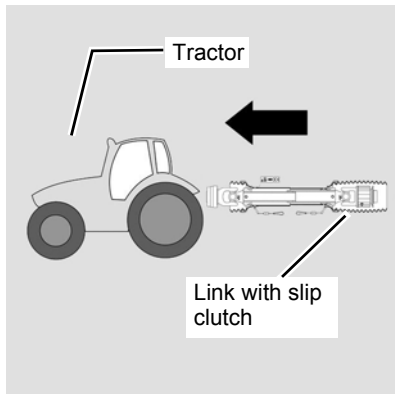


After coupling, insert the sustainer.

- ▶ Switch off the tractor and secure it.
- ▶ Pull out the safety splint on the sustainer.
- ▶ Insert the sustainer.
- ▶ Secure the sustainer with the safety splint.

Coupling the machine

Coupling the PTO shaft



When coupling the PTO shaft, make sure it is in the correct position.

- ▶ Check whether the PTO shaft must be shortened before coupling.
- ▶ Shorten the PTO shaft if necessary.
→ »PTO shaft length«, page 27
- ▶ Check that the tractor's PTO stub shaft is clean and lubricated.
- ▶ Couple the PTO shaft to the tractor and the machine.
- ▶ Ensure that the PTO shaft is engaged on the shaft ends.
- ▶ Secure the guard tubes so that they cannot rotate.
- ▶ Couple the link with slip clutch to the machine's PTO stub shaft.

Connecting the electrics



Checking the electrical cables

Check the electrical cables. The electrical cables must not chafe or hang loose. Electrical cables that have been torn away or worn through must be replaced. Otherwise, this will cause damage to the machine.

Attach the following electrical cables to the tractor:

Lighting equipment [+]



- ▶ Connect the plug for the 12 V power supply to the 7-pin plug socket on the tractor.

Connecting hydraulics



Check hoses and couplings

Check all hydraulic hoses for damage before connecting them. Check all hydraulic couplings for firm seating after connecting them. Defective hydraulic hoses and poorly fitting hydraulic connections can trigger unpredictable movements of the machine, causing severe damage to the machine as well as personal injury. Serious or fatal injury may be caused as a result.

Secure the tractor's control devices

In the transport position, secure the control devices on the tractor against unintended actuation and lock them if possible. Unintentional activation of a control device can trigger unpredictable movements of the machine and cause serious machine damage and personal injury. Serious or fatal injury may be caused as a result.

Check the routing of the hydraulic hoses

Close or disconnect the quick couplings with great care. Remove any dirt or air which has entered the hydraulic system. The hydraulic system may otherwise be seriously damaged. Material damage or personal injury may be caused as a result.

Avoid mixing oils

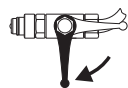
If the machine is used on different tractors, an impermissible mixing of oil may occur. Impermissible oil mixtures can irreparably damage tractor components.

Connecting hydraulic couplings



Make sure the connection is correct

Ensure that the hydraulic system is connected correctly. otherwise damage to the machine and personal injury will be caused as a result.



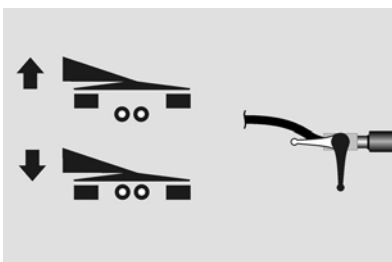
▶ Close the ball valve.

▶ Set the tractor hydraulics to "free float".



▶ Switch off the tractor and secure it.

▶ Connect the hydraulic coupling on the machine to the single-acting hydraulic control device.



With Hydrolift, the working depth of the rotors is controlled via the single-acting hydraulic control device.

Safety

The following applies to all preparations for operation:



Observe the safety information

Observe the safety information. Disregard for safety information can lead to serious or fatal injury. See chapter »Safety«, page 6.

Secure the machine

Secure the machine against accidental starting and rolling away. Use wheel chocks. The machine must stand on a level, firm and secure surface and be supported during the work, if necessary. Unsecured or non-supported machines can cause accidents. Serious or fatal injury may be caused as a result.

No persons in the working area

Ensure that no persons are present in the slewing and working area of the machine. Persons could be caught by the machine within this area. This could result in fatal injury.

Avoid the hazard area

The rotors are considered a hazard area. Do not stand in the hazard area. The rotors may lower or turn. This can lead to serious or fatal injuries.

Remove tine supports

When carrying out adjustment work on the machine, tine supports which hinder work on the machine must be removed. Tine supports that are not removed can cause serious injuries.

Unfold fully and evenly

Ensure that the side devices are evenly unfolded. If there is a malfunction, fold the side devices back in and repeat the process at a higher engine speed. The hydraulic cylinders must be completely extended in the work position, otherwise the machine may be damaged.

General

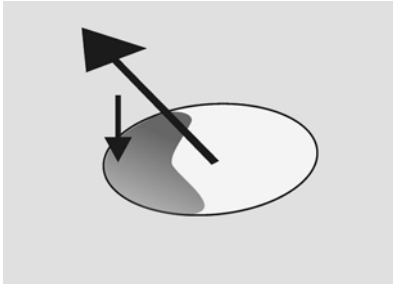
The following applies when performing all adjustment work:

- ▶ Check the tyre pressures.
- ▶ Secure the machine.
- ▶ Lower the machine to the work position.
- ▶ Undo appropriate bolts and/or screws.
- ▶ Make the required adjustment.
- ▶ Retighten the bolts.
- ▶ Fit and secure the tine supports.

The following work steps are described in this section:

- »Rotor pitch«
- »Working depth«

Rotor pitch



Close the ball valve

Close the ball valve before working on the machine or carrying out any adjustment work. If the ball valve is open and there is an operating error, the machine can lower itself and cause serious injuries.

The rotors are inclined transversely to the chassis. The rotor is already inclined transversely ex-factory. If the crop is not picked up cleanly, the raking quality can be improved by adjusting the rotor pitch.

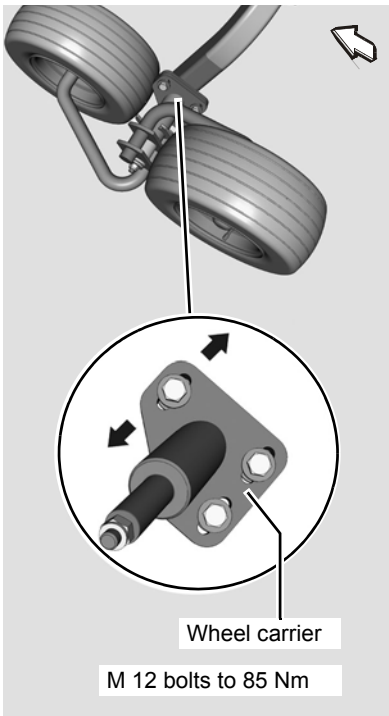
The rotor pitch is adjusted as follows:

- ▶ Swing the machine into the headland position using the hydraulic control device in the tractor.
- ▶ Close the ball valve.
- ▶ Switch off the tractor and secure it.
- ▶ Secure the rotors using supports.
- ▶ Remove the tine supports.



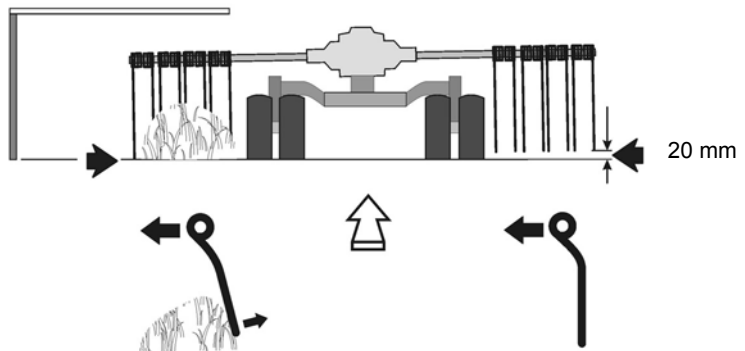
Improved raking quality is achieved by adjusting the pitch of the rotor until the tines in the front left working range have the lowest ground clearance before depositing the crop (see adjacent illustration).

Adjusting the rotor pitch



It is possible to adjust the position of the rotors laterally to the direction of travel.

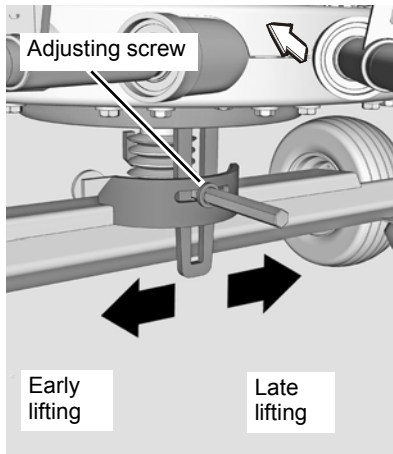
- ▶ Remove the tine supports via the wheel carrier.
- ▶ Slightly loosen the three screws on the wheel carrier.
- ▶ Push the wheel carriers into the required position (see graphic below).
- ▶ Retighten the bolts to a tightening torque of 85 Nm.
- ▶ Fit and secure the tine supports.



Crop pickup increases the distance between the tines and the ground.

Preparing for use

Tine lifting



The time for lifting the tines can be adapted to the crop (early or late lifting). The control cam can be infinitely adjusted. To do this, the following steps are required.

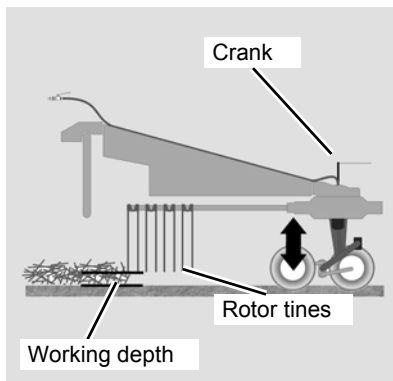


- ▶ Fully lower the machine.
- ▶ Switch off the tractor and secure it.
- ▶ Remove the tine supports via the adjusting screw.
- ▶ Loosen the adjusting screw on the rotor chassis.
- ▶ Adjust the control cam.
- ▶ Tighten the adjusting screw.
- ▶ Fit and secure the tine supports.



- Move the adjusting screw in the rotational direction of the rotor: Late lifting of the tines increases the swath width.
- Move the adjusting screw against the rotational direction of the rotor: Early lifting of the tines increases the working speed.

Working depth

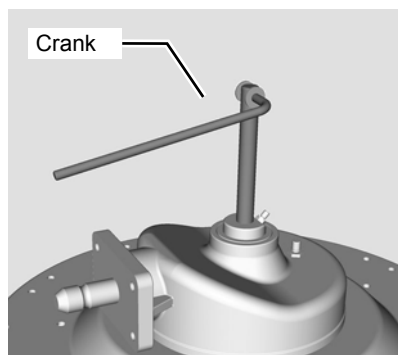


Adjust the working depth as follows:



- ▶ Fully lower the machine using the tractor's hydraulic control device.
- ▶ Switch off the tractor and secure it.
- ▶ Check the working depth to the ground.

Basic working depth setting



The crank sets the basic working depth setting. This task should only be carried out if the rotors have been completely lowered and the hydraulic system is pressureless. The working depth can be controlled with Hydrolift when in operation on the field.

- ▶ Release the crank retainer on the rotor chassis and adjust the working depth by turning the crank.
- Basic setting: the tines lightly touch the ground.
- ▶ After adjusting, secure the crank against turning using the retainer.
- ▶ Readjust the working depth to suit the field conditions if necessary.



1 turn of the crank for working depth equates to a rotor tine height adjustment of about 5 mm. The thread is left-handed.

Further influencing factors for the working depth are:

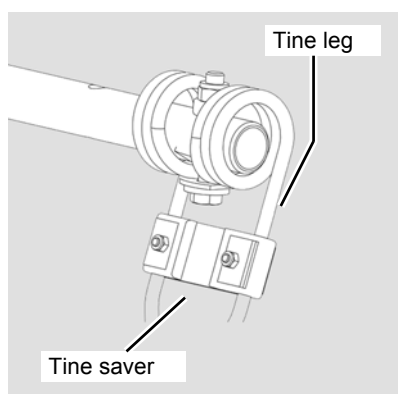
- The soil condition and stubble length.
- The type and quantity of crop.

Tines that are set too low will soil the crop. The load on the rotor tines and the drive is increased.

Hydrolift

The working depth can be controlled with Hydrolift when in operation on the field.

Tine saver [+]



If the tines are broken, the tine saver can prevent the broken-off part from being lost. Any machines following behind, for example straw cutters, are then not damaged by lost tines in the crop.

For a good swath deposit, both tine legs must run parallel to one another after the tine savers have been fitted.

- ▶ Fit one tine saver for each tine pair.
- ▶ Visually check that both tine legs run parallel to each other.

Checking the tine position

Check the tine position for each tine. If the tine saver is overtightened, the tine legs become splayed. Proceed as follows:

- ▶ Check the tine position.
- ▶ Loosen the screwed connection until both tine legs run parallel.

Safety

Before transporting the machine on public roads, please read the following safety information. Compliance is mandatory and will help you to avoid accidents.



Observe the safety information

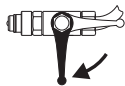
Observe the safety information. Disregard for safety information can lead to serious or fatal injury. See chapter »Safety«, page 6.

Ensuring road safety

The machine must conform to current national traffic regulations if you intend to drive with it on public roads. Ensure the following:

- Lighting, warning and protective equipment must be fitted
- The permissible transport widths and weights, axle loads, tyre load-bearing capacities, laden weights and national speed restrictions must be complied with.
- The maximum permissible road transport speed must be complied with, but not exceed 50 km /h.
- Before driving on public roads, fold in all deflector bars and rotors and secure the machine. All tine supports which have tips that point at right angles to the direction of travel and which are at a height of less than 2 metres must be removed.
- The machine should only be towed by agricultural or forestry tractors.
- The empty weight of the tractor must be greater than the weight of the machine.

The driver and keeper of the vehicle are liable should these conditions not be observed.



Close the ball valve

Close the ball valve before driving on the road. If the ball valve is open and there is an operating error, the machine may drop or swing out unexpectedly. This could cause traffic accidents and accidents with fatal consequences.

Clean the machine before travelling on the road

Before travelling on the road, remove all coarse dirt, crop residues and clods of earth from the machine and clean it. Crops or dirt that drop onto the road can cause slippery road conditions. This could cause traffic accidents and accidents with fatal consequences.

**Observe transport width**

Observe the permissible transport widths. Put the machine in the transport position and attach lights, warning signs and protective equipment. The driver and keeper of the vehicle are liable for any non-compliance with national traffic regulations.

Clean lighting equipment before travelling on the road

All lighting equipment must be cleaned before road transport. Crop residue or dirt may cover up the lighting equipment and adversely affect its correct operation. This could cause traffic accidents and accidents with fatal consequences.

Remove tine supports

For operation on public roads and in the park position, the tine supports which are level with the field of vision (2.0 m) must be removed. There is otherwise the risk of traffic accidents and accidents with fatal consequences.

Observe the contour of the terrain

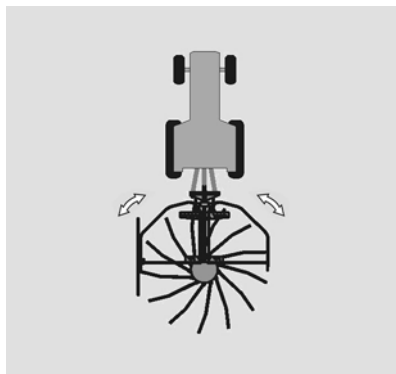
Move the machine onto ground that is as flat as possible before changing from the work position to the transport position. Avoid inclines on which the combination (tractor and machine) could slip or overturn. There is an increased risk of tipping and injury in a position at right angles to the direction of the slope.

The following work steps are described in this section:

- »Prior to road transport«
- »Fold in the deflector bar«
- »Bring the machine into the transport position«
- »Checking the machine«
- »Road transport«

Road transport

Prior to road transport



When driving on public roads, the machine must be in the transport position. To prepare the machine for road transport, carry out the following steps:

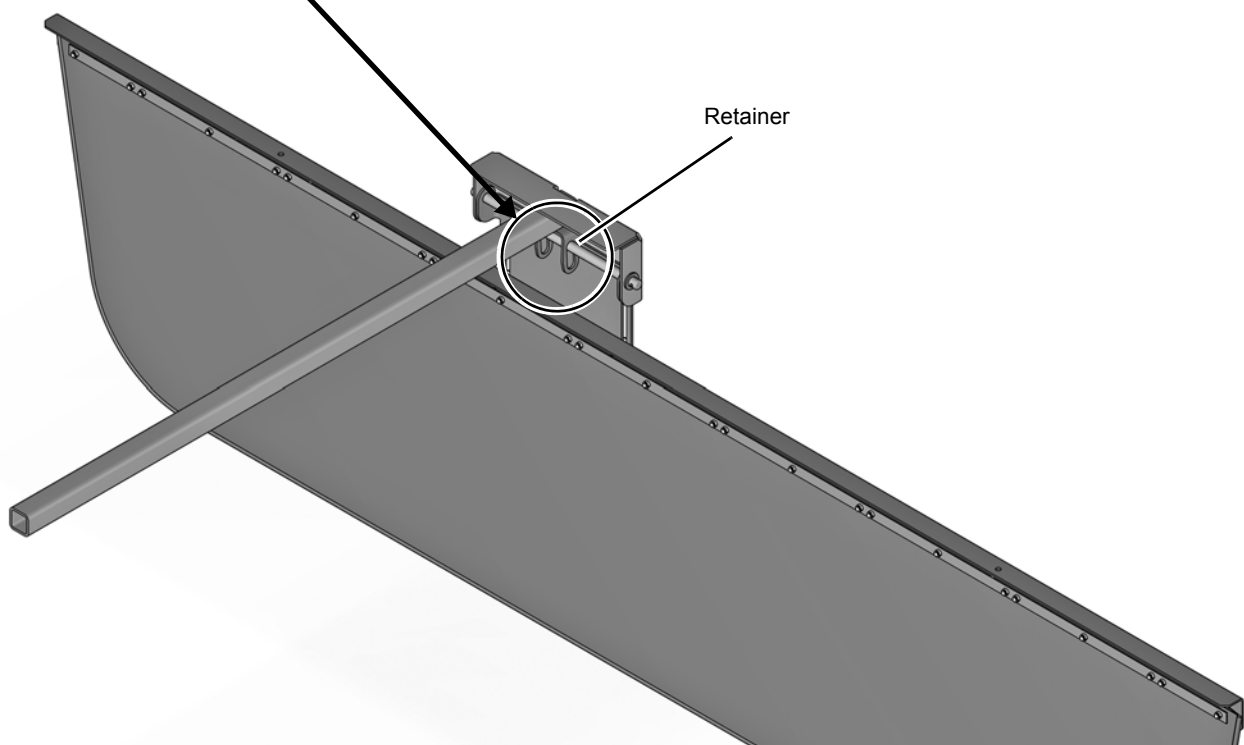
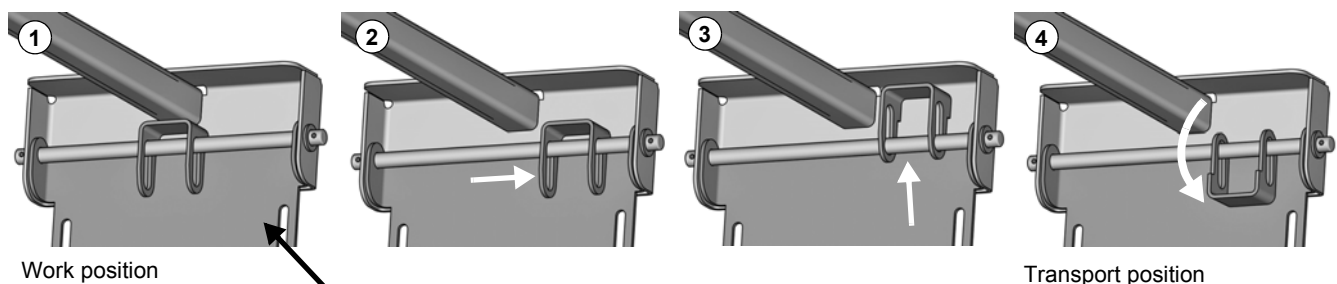
- ▶ »Unlocking the swath former«
- ▶ »Fold in the deflector bar«
- ▶ »Removing the tine supports«
- ▶ »Locking the tine supports in the transport holder«
- ▶ »Bring the machine into the transport position«
- ▶ »Locking the contact roller [+]
transport locking device«
- ▶ »Checking the machine«

- ▶ Move the machine onto ground that is as flat as possible before changing from the work position to the transport position.

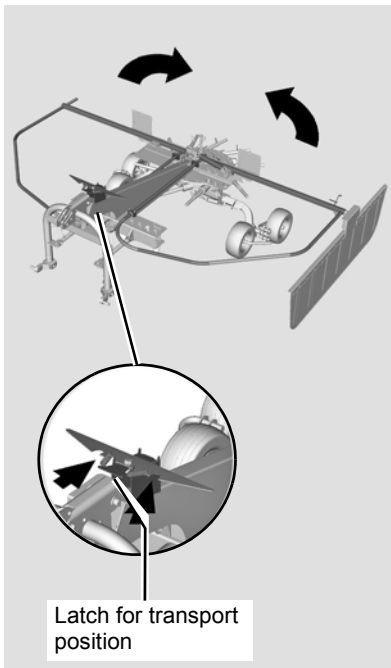
Unlocking the swath former

Proceed as follows:

- ▶ Move the swath former into the correct position and secure with T-bolts.
- ▶ Move the slotted U-piece on the swath former holder into the correct transport position.



Fold in the deflector bar



No persons within the slewing range

There is an acute risk of injury within the slewing range from machine parts which are slewing or folding. Serious or fatal injury may be caused as a result.

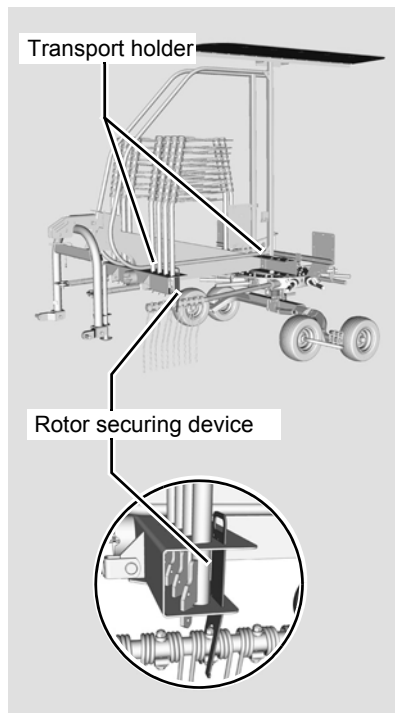
Before removing the tine supports, move all the protective devices around the rotors from the work to the transport position, and lock them in place. Fold in the deflector bar as follows:

- ▶ Lower the machine to the work position using the single-acting hydraulic control device.
- ▶ Switch off the tractor and secure it.
- ▶ Fully insert the swath former.
- ▶ Fold the deflector bar through 90° and engage it in the latch for the transport position.



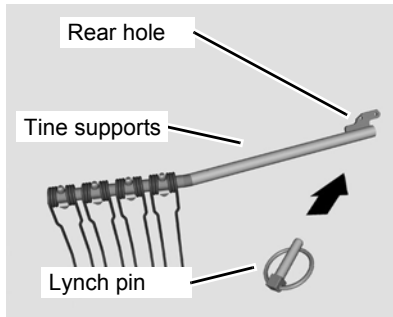
Road transport

Removing the tine supports

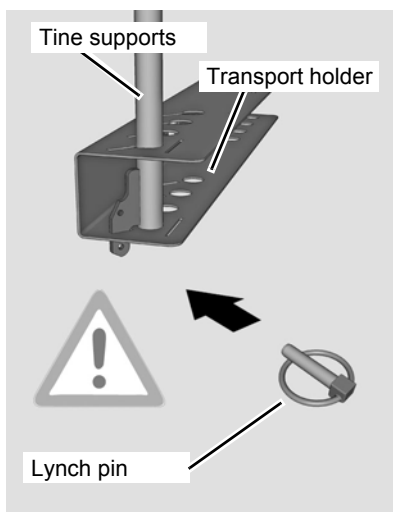


- ▶ Remove any crop and coarse dirt.
- ▶ Remove the tine supports from the rotor and secure them in the transport holder (see adjacent illustration).
- ▶ Do not remove one of the tine supports and secure using a rotor securing device.

Locking the tine supports in the transport holder

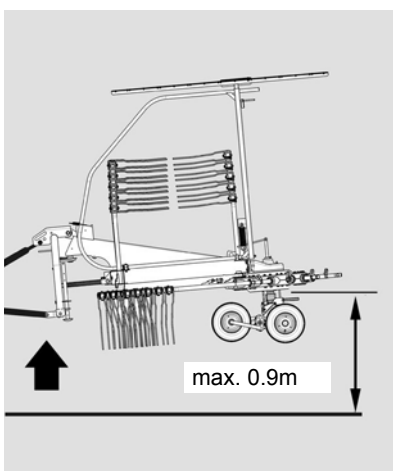


- ▶ Loosen and remove the lynch pin from the tine support.
- ▶ Pull off the tine support.



- ▶ Insert the tine support into the transport holder.
- ▶ Secure the tine supports with lynch pins.

Bring the machine into the transport position



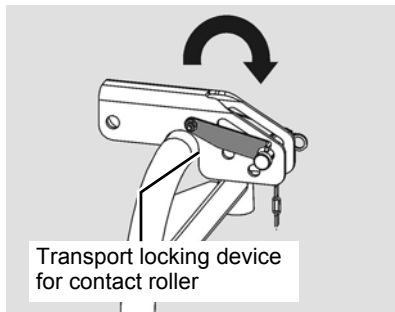
- ▶ Observe the instructions in »Prior to road transport«, page 40.
- ▶ Raise the tractor's lower link until it reaches the transport position.



Do not raise the machine beyond the maximum permitted reflector height.

Road transport

Locking the contact roller [+] transport locking device



Lock the transport locking device

When transporting a raised machine, the transport locking device must be locked. Otherwise, the machine may be damaged.

For the optional contact roller [+], secure the top link hitch pins.

- ▶ Move the machine into its transport position.
- ▶ Lock the contact roller transport locking device.



Remove the transport locking device for the contact roller when putting the machine into operation. Otherwise, the machine may be damaged.

Checking the machine

Prior to driving on the road, check the machine against the check list:

- Tractor's PTO stub shaft drive off?
- Deflector bar folded?
- Tine supports in the transport holder and secured?
- Tyre pressures correct?
- Lower link secured at the sides?
- Crop residues and dirt removed?
- Lighting cables routed so that they are not strained and cannot become caught in the tractor's wheels when cornering?
- Machine in transport position?
- Transport locking device locked?
- Lighting equipment in good working order?

Road transport



Follow the instructions below for road transport. There is otherwise the risk of traffic accidents and accidents with fatal consequences.

- ▶ Before pulling away, check the immediate vicinity. Always make sure that you have a clear field of vision and, in particular, look out for children within the operating area of the machine.
- ▶ When the vehicle is in motion, lock the control devices on tractor.
- ▶ Do not transport people or objects on the machine.
- ▶ Adjust your speed to road conditions.
- ▶ Do not exceed a maximum speed of 50 km/h. Comply with the national speed limits.
- ▶ Ensure sufficient steering and braking capability. Driving characteristics, steering, and braking capability are all influenced if the machine is coupled (increased braking distance as a result of greater inertia).

There is a danger of tipping on slopes and if corners are taken too fast.

Preparations on the field

Safety

The following applies for all preparations on the field:



Observe the safety information

Observe the safety information. Disregard for safety information can lead to serious or fatal injury. See chapter »Safety«, page 6.



Switch off the tractor and secure it

Before you dismount:

- ▶ Switch off the tractor.
- ▶ Remove the ignition key.
- ▶ Secure the tractor against rolling away.

An unsecured tractor can run you over or trap you. Serious or fatal injury may be caused as a result.

Avoid the hazard area

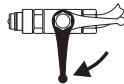
The rotors are considered a hazard area. Do not stand in the hazard area. The rotors may lower or turn. Serious or fatal injury may be caused as a result.

Secure the machine

Secure the machine against accidental starting and rolling away. Use wheel chocks. The machine must stand on a level, firm and secure surface and be supported during the work, if necessary. Unsecured or non-supported machines can cause accidents. Serious or fatal injury may be caused as a result.

No persons in the working area

Ensure that no persons are present in the slewing and working area of the machine. Persons could be caught by the machine within this area. This could result in fatal injury.



Close the ball valve

Close the ball valve before adjusting. If the ball valve is open and there is an operating error, the machine may drop or swing out unexpectedly. This may cause damage to the machine or accidents with fatal consequences.

Observe the slewing process

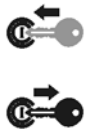
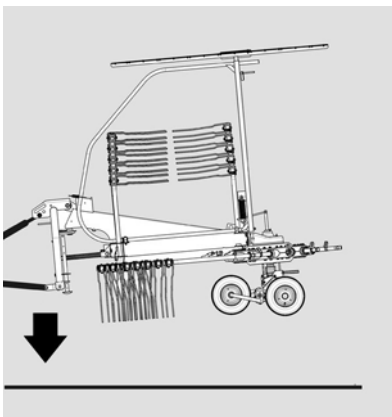
Observe the rotors during the slewing process. If the machine behaves unusually during the process, stop immediately to avoid damage.

General

The following work steps are described in this section:

- »Lowering machine to the work position«
- »Fitting the tine supports«
- »Folding out the deflector bar«
- »Adjusting the swath former«

Lowering machine to the work position

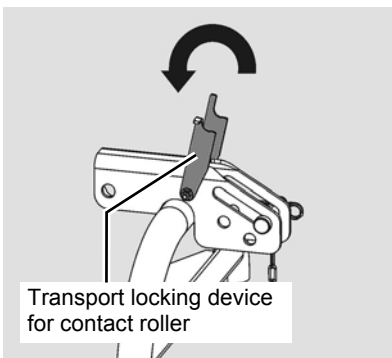


After road transport, the machine is brought into the work position on the field.

- ▶ Switch on the tractor.
- ▶ Lower the lower link until the machine rests on the tandem axles.
- ▶ Switch off the tractor and secure it.

- ▶ Observe the instructions in chapter »Preparing for use«, section »Working depth« on page 36.

Unlocking the contact roller transport locking device



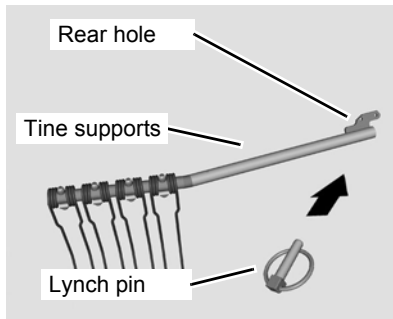
For the optional contact roller [+], secure the top link hitch pins. Otherwise, the machine may be damaged.

- ▶ Lock the contact roller transport locking device.

Preparations on the field

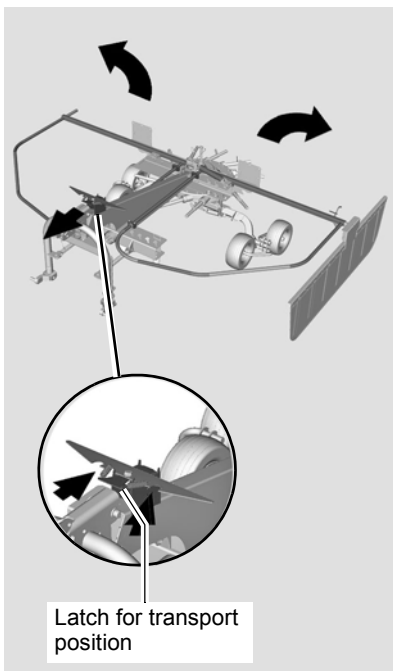
Basic settings

Fitting the tine supports



- ▶ Remove the tine supports from the transport holder.
- ▶ Attach the tine supports to the bushed bearing tube and secure with lynch pins.

Folding out the deflector bar



No persons within the slewing range

There is an acute risk of injury within the slewing range from machine parts which are slewing or folding. Serious or fatal injury may be caused as a result.

After the tines have been attached, all protective devices must be moved from the transport to the work position. Fold out the deflector bar as follows:

- ▶ Release the deflector bar by pulling it out of the lock for the transport position.
- ▶ Fold the deflector bar through 90° to the work position.

Locking the swath former

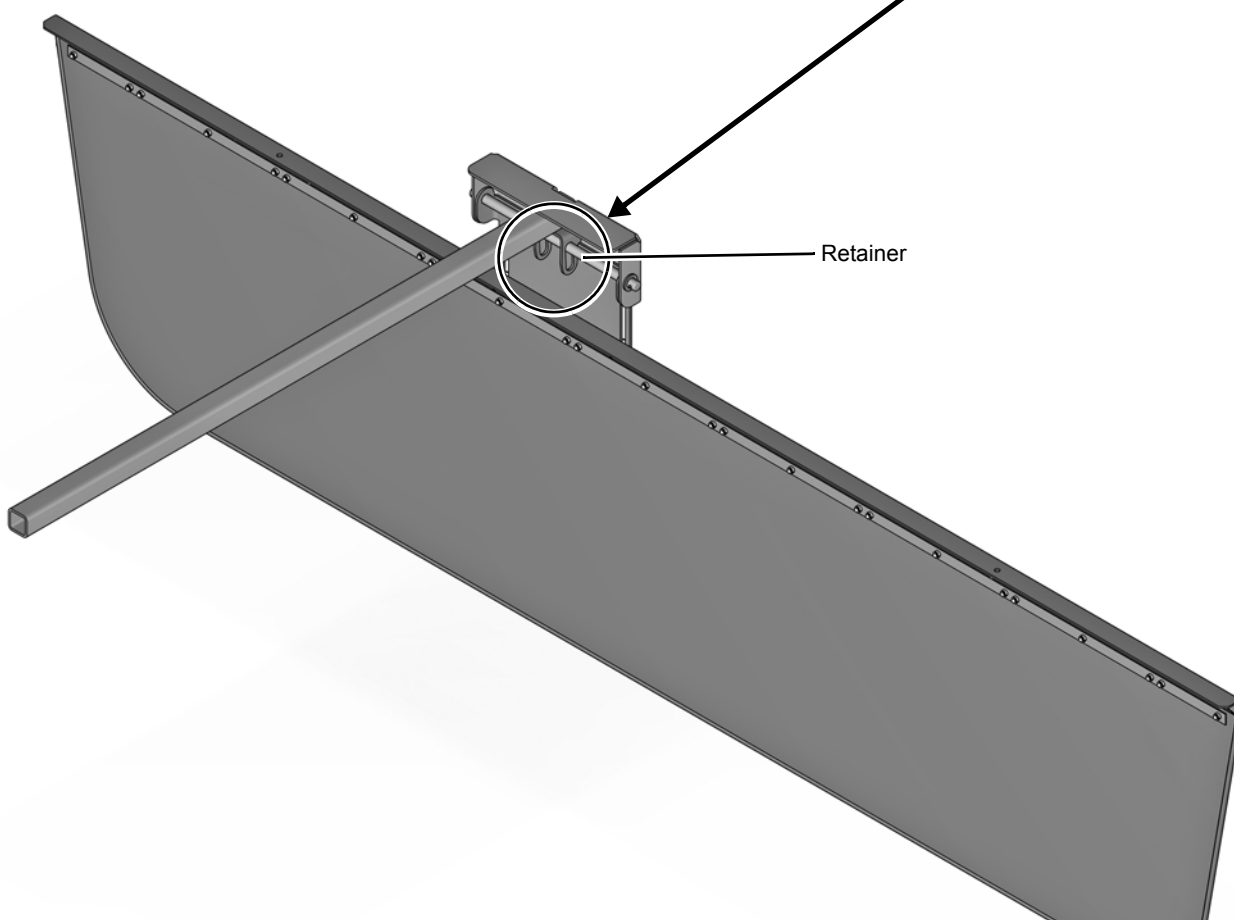
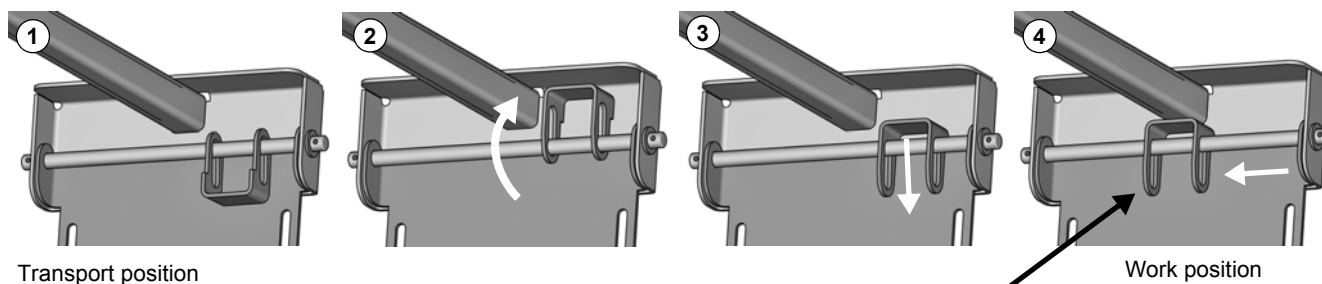


Lock the swath former

Before use, the swath former must be locked using the retainer on the swath former holder. During use, the swath former can swing back and forth and be caught by the tines. Damage to the swath former may be caused as a result.

Proceed as follows:

- ▶ Move the swath former into the correct position and secure with T-bolts.
- ▶ Move the retainer on the swath former holder into the correct work position.

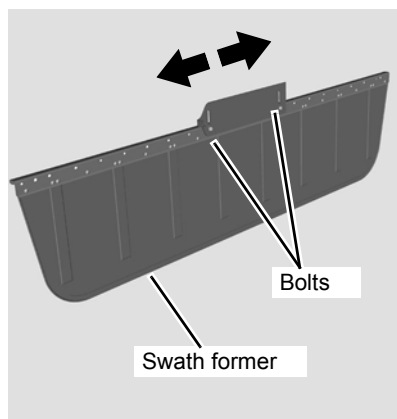


Preparations on the field

Adjusting the swath former

The swath former is folded into the correct position when changing from the transport to the work position.

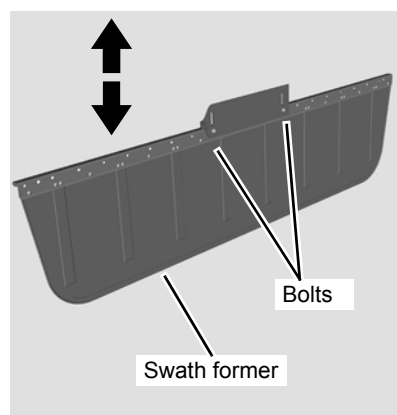
Adjusting the swath former's direction of travel



It is possible to adjust the direction of travel of the swath former as follows:

- ▶ Remove the bolts.
- ▶ Move the swath former into the desired position.
- ▶ Fit the bolts and tighten them in the new position.

Adjusting the swath former's height



It is possible to adjust the height of the swath former as follows:

- ▶ Loosen the screws.
- ▶ Adjust the height of the swath former.
- ▶ Tighten the bolts in the new position.

Safety



Observe the safety information

Observe the safety information. Disregard for safety information can lead to serious or fatal injury. See chapter »Safety«, page 6.

No riding on the machine

Persons or objects must never be transported on the machine. Carrying passengers on the machine is life-threatening and prohibited. Serious or fatal injury may be caused as a result.

No persons in the working area

Ensure that no persons are present in the slewing and working area of the machine. Persons could be caught by the machine within this area. This could result in fatal injury.

Maximum PTO stub shaft speed 540 rpm

The PTO stub shaft speed must not exceed 540 rpm and must be adapted to the condition of the crop. Higher revolution rates can cause damage to the machine.

Only allow the PTO shaft clutch to respond for a short time

Do not allow the slip clutch to respond for longer than 3 seconds. If the clutch responds for a prolonged period, it will become worn and the disconnect torque will drop.

Do not compress the PTO shaft

The PTO shaft between the tractor and machine must not be compressed when in the work position or transport position. If compressed, PTO shafts can cause damage to the machine and tractor.

Observe the contour of the terrain

Pay even more attention when driving on an incline. Avoid inclines on which the combination (tractor and machine) could slip or overturn. There is an increased risk of tipping and injury in a position at right angles to the direction of the slope.

Changes in the centre of gravity

When in work position, the machine's centre of gravity changes. Pay even more attention when driving on an incline. Avoid inclines on which the combination (tractor and machine) could slip or overturn. There is an increased risk of tipping and injury in a position at right angles to the direction of the slope.

General

The following work steps are described in this section:

- »Swathing«
- »Driving on headlands«



Suitable working speeds

Select a driving speed (approx. 4 to 12 km/h) at which the crop is picked up cleanly and completely. The working speed depends on the machine settings and the particular crop.

Swath width

The swath width depends on working width, working speed, tine lifting settings and transverse rotor pitch as well as crop condition.

Swathing



No persons in the working area

Ensure that no persons are present in the slewing and working area of the machine. Persons could be caught by the machine within this area. This could result in fatal injury.

Requirements

After setting the machine as described in chapter »Preparations on the field« page 46, you can start swathing.

The machine is set correctly as follows:

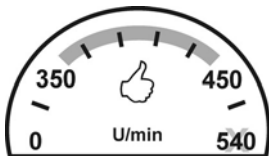
- Swath former adjusted.
- Tine supports attached and secured.
- Rotor securing device on the rotor released.
- Tractor's lower links set to floating position.
- Machine in work position.



Start work as follows:



- ▶ Switch on the tractor.
- ▶ Open the ball valve.
- ▶ Check that there is nobody in the working area of the machine.
- ▶ Switch on the PTO shaft at a low engine speed.
- ▶ Slowly increase the speed. Do not exceed the maximum speed of 540 rpm.
- ▶ Select a driving speed at which the crop is picked up cleanly and completely.



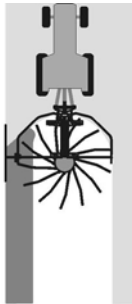


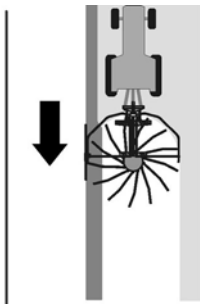
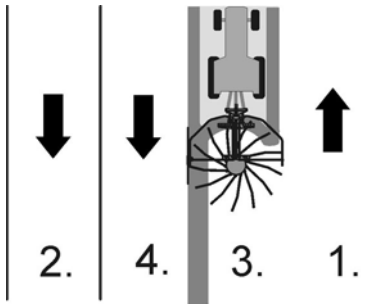
Start swathing at the edge of the field and at headlands to avoid subsequently driving over the crop.

The slip clutch of the machine may also respond at low speed if resistance is increased due to excess crop or obstacles.

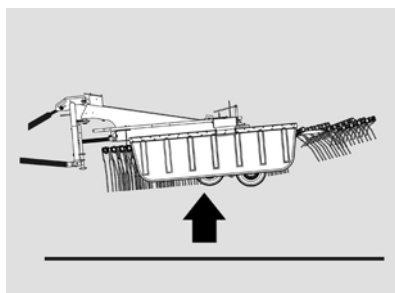
Operation

Swath deposit

The following swath deposits are possible:

Single swath	Night swath	Swath turning
		
Double swath	Multiple swath	
		

Driving on headlands



The rotor can be raised for crossing swaths that have already been harvested.

- ▶ Raise the machine to the headland position using the tractor's lower link control device.
- ▶ Lower the machine again, in order to create a new swath.

Safety

The following applies to all cleaning and care work:



Observe the safety information

Observe the safety information. Disregard for safety information can lead to serious or fatal injury. See chapter »Safety«, page 6.

Secure the machine

- Before starting cleaning work, always switch off the tractor's PTO shaft drive and protect it against accidental restarting.
- Secure the machine against rolling away by using chocks.
- The machine must be standing on firm and level ground and, if necessary, be supported during the work.

Unsecured or non-supported machines can cause accidents.

No persons in the working area

Ensure that no persons are present in the slewing and working area of the machine. Persons could be caught by the machine within this area. This could result in fatal injury.

Do not clean bearings or hydraulic parts with high-pressure cleaners

Do not clean bearings or hydraulic parts with high pressure cleaners. The high-pressure cleaner removes the grease film from the bare metal surfaces. Metal surfaces treated in this way can corrode. After each cleaning procedure, lubricate the bearing points and grease uncoated parts.

Clean the bearings and hydraulic parts with care

Exercise caution when cleaning with a high-pressure cleaner. Bearings, seals and pipe unions are not waterproof. In order to prevent damage to the machine, the bearings, seals and pipe unions must not be exposed to direct contact with the high pressure water jets.

Cleaning and care

Cleaning

- ▶ Lower the machine to the work position.
- ▶ After each use, clean the machine of any coarse dirt and crop residues.
- ▶ Do not clean the bearings and piston rods of hydraulic cylinders using a high-pressure cleaner.

After cleaning

- ▶ Lubricate all bearings after cleaning.

Care

For a long service life, we recommend the following:

- ▶ Apply a protective layer of oil to all uncoated work tools. Only use approved, biodegradable oil, e.g. rapeseed oil.
- ▶ Repair any paint damage.

Setting down the machine in a secure position



When setting down and parking the machine, special safety precautions have to be observed:

Observe the safety information

Observe the safety information. Disregard for safety information can lead to serious or fatal injury. See chapter »Safety«, page 6.

Keep children away from the machine

Forbid children from playing on or around the machine. Select a parking area to which no unauthorised persons have direct access. Metal edges and machine work tools can cause serious injury.

Make sure the machine is standing level

Before changing from the transport to the work position (and vice versa), make sure the machine is standing level. The machine could roll away, particularly on hillside locations. The machine could be damaged and serious or fatal injuries could be caused.

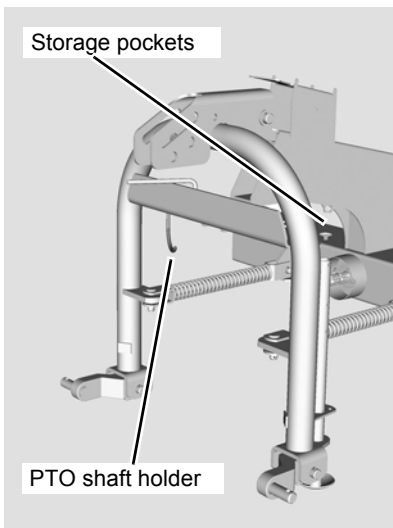
General

The machine must be uncoupled in the reverse order to that in which it was coupled.

→ Chapter »Bring the machine into the transport position« page 43.

→ Chapter »Coupling the machine«, section »Coupling« page 12.

Uncoupling and securing the machine



To uncouple the machine from the tractor, proceed as follows:

- ▶ Move the machine into its transport position.
- ▶ Set the machine down on a firm, level surface and lower it to the work position.
- ▶ Secure the tractor against rolling away, turn off the engine and remove the ignition key.
- ▶ Secure the machine against rolling away by using chocks.
- ▶ Pull off the PTO shaft and place it on the holder provided.
- ▶ Close the ball valve and release the hydraulic couplings.
- ▶ Place hydraulic couplings in storage pockets.
- ▶ Remove the tine supports level with the field of vision (2.0 m).
- ▶ Disconnect the lighting connectors and place them in the storage pockets.
- ▶ Lower the sustainer and secure with pins.
- ▶ Wind the electrical cables onto the hook.
- ▶ Lower the lower link until the sustainer rests safely on the ground.
- ▶ Release the latch between lower link and attachment carrier.
- ▶ Unhitch the machine.

Parking and storage

After the end of the season

After the end of the season and if the machine is to be stored for a long period of time, perform the following work:

- ▶ Clean the machine thoroughly.
- ▶ Check all the screw joints and tighten the screws.
- ▶ Repair or replace any damaged components.
- ▶ Repair any paint damage.
- ▶ Lubricate the machine in accordance with the lubrication schedule.
- ▶ Check the tyre pressures.
- ▶ Replace missing warning signs and stickers.

Safety

The following applies to all servicing work:



Observe the safety information

Observe the safety information. Disregard for safety information can lead to serious or fatal injury. See chapter »Safety«, page 6.

Requirements for maintenance work

Only perform the maintenance operations if you have the required expert knowledge and suitable tools. The absence of technical knowledge or suitable tools can cause accidents and injuries.

Protect the machine against unintended starting

The following conditions must be observed for carrying out repairs and maintenance work and rectifying malfunctions on the machine when it is coupled:

- Switch off the tractor PTO stub shaft drive.
- Switch off the tractor engine.
- Remove the ignition key.

Serious accidents may be caused if the machine starts accidentally.

Use OEM replacement parts

Many components have special properties that are essential for the stability and correct operation of the machine. Only spare parts and accessories supplied by the manufacturer have been tested and approved. Other products may adversely affect the correct operation of the machine and safety. The use of non-OEM replacement parts renders the manufacturer's guarantee null and void and frees the manufacturer from all liability.

Secure moving parts

Moving parts must be secured with lifting gear against sliding, folding or swivelling. Otherwise, serious injury to persons or damage to the machine may be caused as a result.

Disconnect electrical connections before performing welding work

Disconnect all electrical connections from the tractor when carrying out welding on the hitched machine. Otherwise, electrical and hydraulic systems will be damaged as a result.

Protective measures when handling oils or lubricants

Additives in oils and lubricants may have adverse effects on health. As marking in accordance with the hazardous goods regulation is not necessary, please always ensure the following:



Avoid skin contact

Avoid skin contact with these materials. Protect your skin by means of protective skin cream or oil-resistant gloves. Contact can result in skin damage.

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.



- Used oil must be collected and disposed of.
- If the skin is damaged by oil or lubricant, seek medical advice immediately.

General

This information relates to general servicing work. For all servicing work, the machine must be locked in the work position. If the transport position is required for maintenance work, refer to the relevant instructions for the work.

- ▶ Lower the machine to the work position.
- ▶ Secure the machine against rolling away by using chocks.

Direction information

Direction information (right, left, front, rear) is given in relation to the direction of travel. Rotary direction is defined as follows:

- Rotary direction right = clockwise.
- Rotary direction left = anticlockwise.
- Rotation about a vertical axis, viewed from top to bottom.
- Rotation about a horizontal axis, viewed at right angles to the direction of travel, from left to right.
- The rotation of screws and nuts, etc. is always viewed from the operating side.

Maintenance

Maintenance terms

Listed in this table are short explanations of the most important maintenance terms.

Task	Explanation
Greasing	Apply grease to the slide surfaces using a brush.
Lubrication	One or two presses of the grease gun, unless specified otherwise.
Oiling	Unless specified otherwise, use only plant-based oils, such as rapeseed oils. The use of used oil will endanger your health and is also strictly prohibited.
Replacement	Replace the appropriate part in accordance with the instruction in the Maintenance chapter.
Inspection	Check the tyre pressures, adjustment dimensions and seal tightness as required, and replace any worn parts or seals.
Observe the maintenance intervals	The specifications relate to an average usage of the machine. If subjected to heavier duty (e.g. by contracting companies), select the maintenance intervals to be shorter. Also, for extreme working conditions (for example heavy dust creation), shorter maintenance intervals are possible.

Maintenance intervals

	After 5 hours of operation	Daily	After 20 hours of operation	After 50 hours of operation	After 250 hours of operation	Once per season	After heavy use	As required	In case of wear	Lubrication	Greasing	Inspection	Replacement	Cleaning	Page
General															
All screws	•					•		•							63
Visual inspection		•					•					•			
Bearings						•				•		•			65
Hose connections						•						•			
Air pressure		•				•		•				•			67
Lighting equipment								•				•		•	
Hydraulics															
Hydraulic hoses every 6 years								•					•		68
Hydraulic cylinders						•						•			
Hydraulic couplings						•						•			
PTO shafts															
Single joints				•		•				•					65
PTO shaft guard						•				•		•			66
Profile section tube						•					•				66
Gear box															
Rotor gear						•						•			67
Angular gear						•					•				67

Screwed connections

Tightening screws

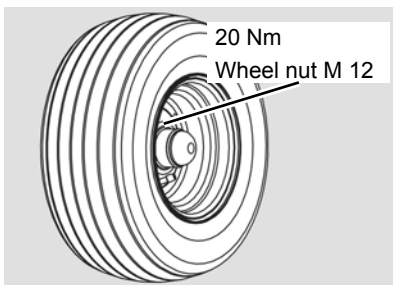
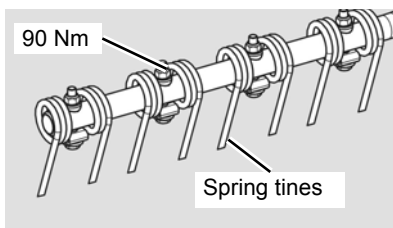
All bolts must be retightened:

- After the first 5 hours of operation.
- According to the frequency of use.
- At least once a season.

Special tightening torques

Observe the special tightening torques for the following screwed connections:

- 90 Nm spring tine.



- 20 Nm Rotor chassis wheel nuts.

Maintenance

Tightening torques for screwed connections

All screwed connections must be tightened in accordance with the table below, if no other torques are specified. On this machine, bolts with a minimum quality of "8.8" (can be seen on the bolt head) are used. The torque specifications refer to a dry coefficient of friction (0.12).

Bolt size	Bolt quality		
	8.8	10.9	12.9
M 6	9.9 Nm (7.3 ft.lbs)	14 Nm (10.3 ft.lbs)	17 Nm (12.5 ft.lbs)
M 8	24 Nm (17.7 ft.lbs)	34 Nm (25 ft.lbs)	41 Nm (30.3 ft.lbs)
M 10	48 Nm (35.4 ft.lbs)	68 Nm (50.2 ft.lbs)	81 Nm (59.8 ft.lbs)
M 12	85 Nm (62.7 ft.lbs)	120 Nm (88.6 ft.lbs)	145 Nm (107 ft.lbs)
M 14	135 Nm (99.6 ft.lbs)	190 Nm (140 ft.lbs)	230 Nm (166 ft.lbs)
M 16	210 Nm (155 ft.lbs)	290 Nm (214 ft.lbs)	350 Nm (258 ft.lbs)
M 20	410 Nm (302 ft.lbs)	580 Nm (428 ft.lbs)	690 Nm (509 ft.lbs)



Tighten safety bolts and nuts with a 10% higher value.

Lubrication points for grease

Working with a grease gun

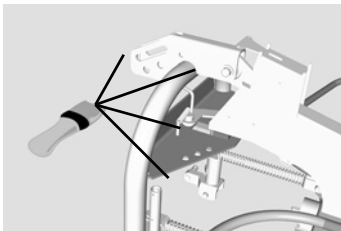
Before applying the grease gun

- ▶ clean lubricating nipples and
- ▶ grease gun attachment fitting.

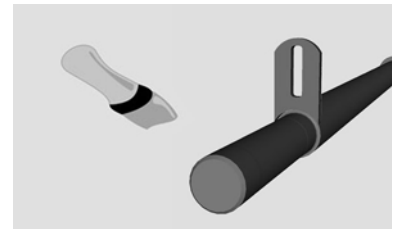
Lubricate the bearings with one or two presses of the grease gun. If you feel resistance at the second press, do not press a second time. Too much grease will force the bearings apart. Dust and dirt can penetrate into the bearings. This leads to premature wear.

Lubricate the places listed in the illustration as follows:

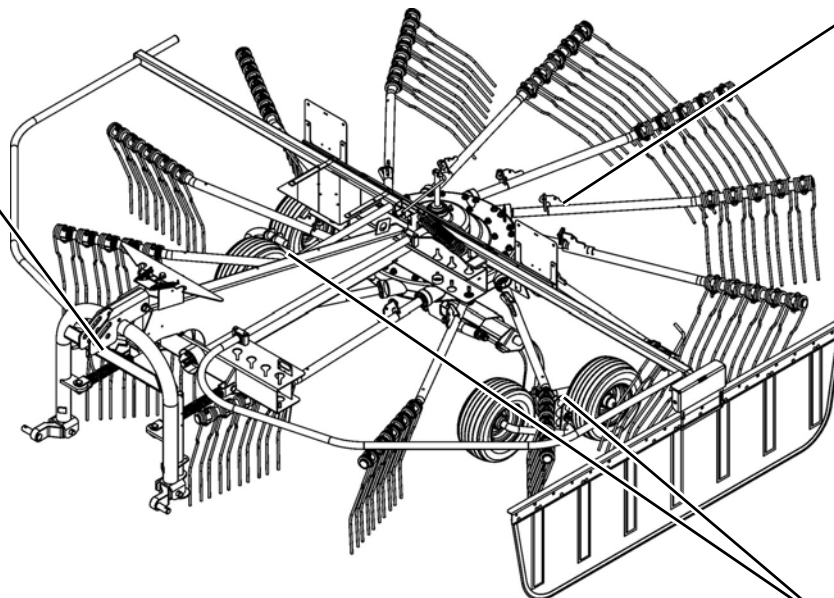
- After 50 hours of operation.
- Before and after the season.
- Each time after cleaning with a high-pressure cleaner.



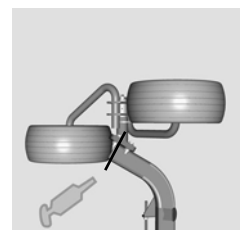
3 point trestle



12 (13) x shaft end tine arm



2 x tandem axle



Lubricating the PTO shafts

The PTO shaft manufacturer's own operating manual is included with each PTO shaft. This includes detailed information on the relevant version of the PTO shaft.



Check the guard components

Check all guard components of the PTO shafts for wear or damage (visual inspection). Replace any defective guard components. An unguarded PTO shaft or damaged guard components can cause very serious injuries during operation.

Lubricate the single joints and their couplings as follows:

- After 50 hours of operation.
- Before and after the season.
- Each time after cleaning with a high-pressure cleaner.

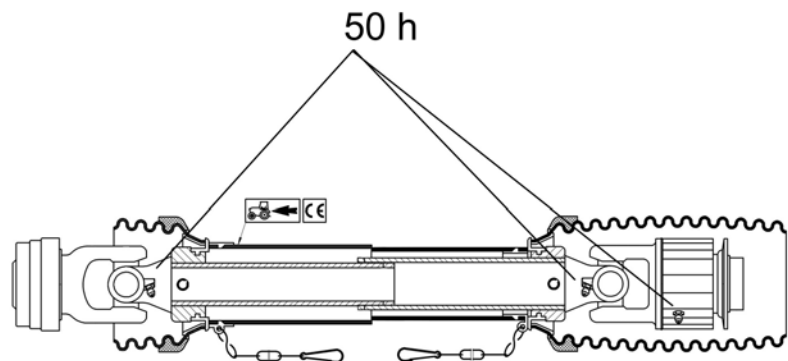
Grease the profile section tubes:

- After 50 hours of operation.
- Before and after the season.
- Each time after cleaning with a high-pressure cleaner.

Lubricate the guard as follows:

- after 250 hours of operation.
- Before and after the season.
- Each time after cleaning with a high-pressure cleaner.

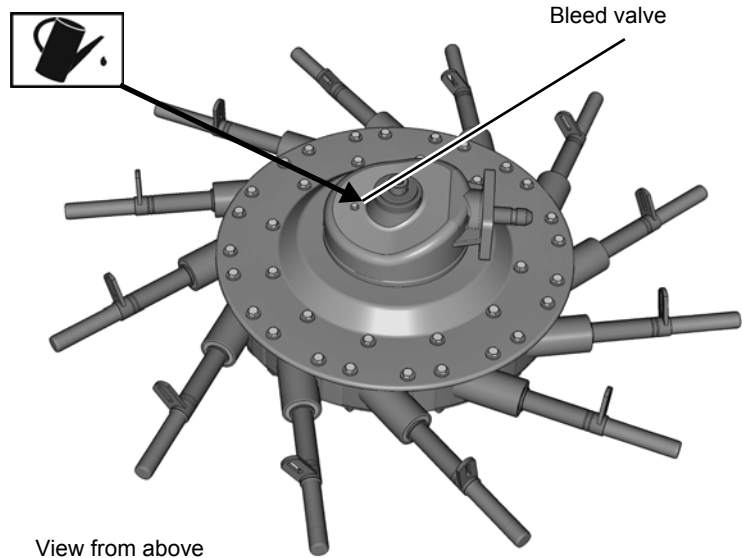
PTO shaft for main drive



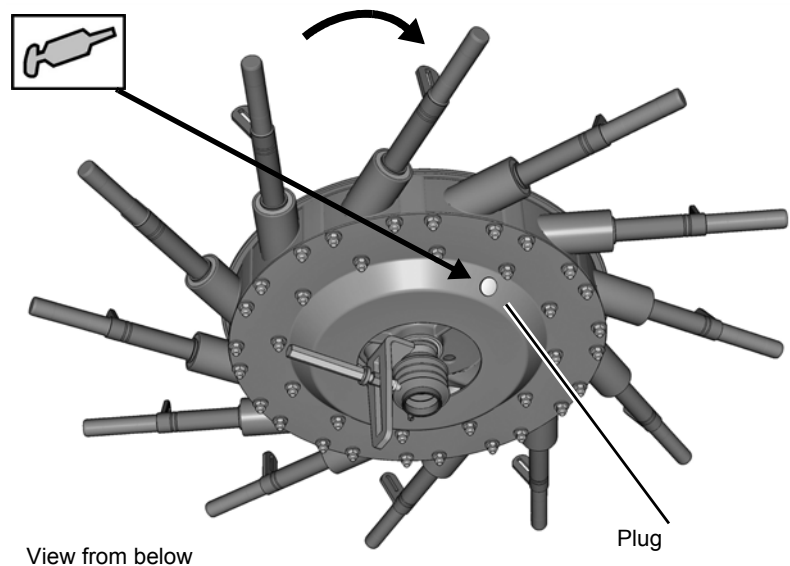
Lubricate rotors

Check the oil level with the machine horizontal only if there is visible loss of oil.

- ▶ Check the oil level at both rotor gears using the bleed valve.
- ▶ If there is a visible loss of oil, top up to the required volume.

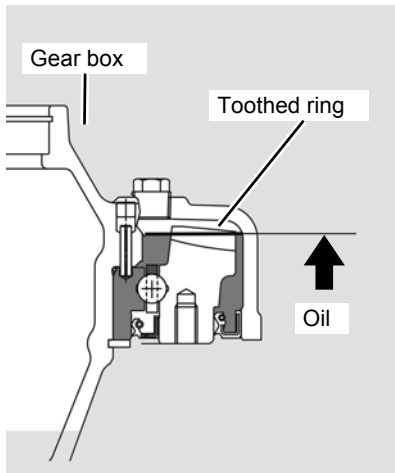


- ▶ Remove all tine supports and the plug under the rotor.
- ▶ Turn rotor by hand so that the filling port is between two tine arms.
- ▶ Once per season, fill between the cam track with 2-3 pumps on the grease gun.
- ▶ Move the rotor further and repeat the process until the cam track is fully lubricated.
- ▶ Refit plug and tine supports.



Maintenance

Filling quantities



Check the oil level with the machine horizontal only if there is visible loss of oil.

- ▶ Open the oil filling screw.
- ▶ Check the oil level.

Gear box	Oil volume [litres] SAE 90 API-GL-4
Rotor gear	0,6



Check and top up the oil level

Top up the oil until it reaches the gear box toothed ring.

Tyres



Do not drive with worn or damaged tyres

Replace worn or damaged tyres immediately. There is a high risk of accident when driving on the road with such tyres.

Tyre pressure

Check the tyre pressures on a regular basis:

- Daily.
- Before any road transport
- As required (for example before setting the tine height).
- Before and after the season.

	Tyre pressure [bar]
Rotor chassis	1,5

Hydraulics



Hydraulic system at zero pressure

Work must only be performed on the hydraulic system if the tractor and machine hydraulic system is at zero pressure. A pressurised hydraulic system can trigger unpredictable movements of the machine and can cause serious machine damage and personal injury. Serious or fatal injury may be caused as a result.

Exercise caution when welding

Do not perform any welding work in the vicinity of the hydraulic hoses. Hydraulic oil can catch fire very easily.

Clean hydraulic system

Close or disconnect the quick couplings with great care. Remove any dirt or air which has entered the hydraulic system. The hydraulic system may otherwise be seriously damaged. Material damage or personal injury may be caused as a result.

Collect escaping oil

Escaping oil must be collected and disposed of in accordance with national regulations. Otherwise, damage may be caused to the environment.

Hydraulic hoses



Replace hydraulic hoses every six years

Hydraulic hoses age without showing externally visible signs. Replace hydraulic hoses every six years. Defective hydraulic lines can cause serious or fatal injuries.

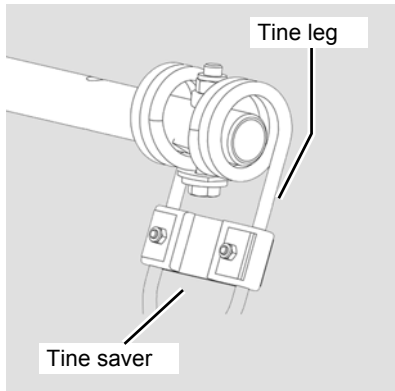


- ▶ Lower the machine to the work position.
- ▶ Depressurise the system.
- ▶ Switch off the tractor.
- ▶ Remove the ignition key.
- ▶ Disconnect the hydraulic hoses.
- ▶ Replace hydraulic hoses.

Accessories

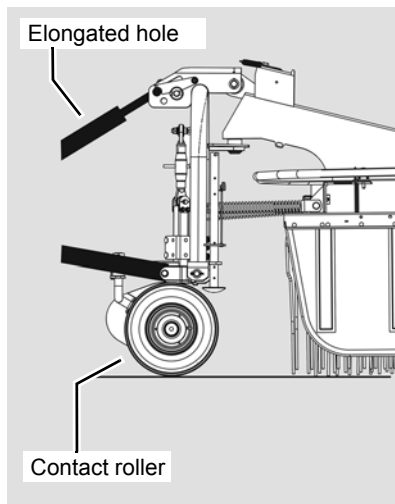
You can purchase additional equipment through your dealer.

Tine saver [+]



If the tines are broken, the tine saver can prevent the broken-off part from being lost. Any machines following behind, for example straw cutters, are then not damaged by lost tines in the crop. The flexible plastic containers can be easily clamped tight and then released again.

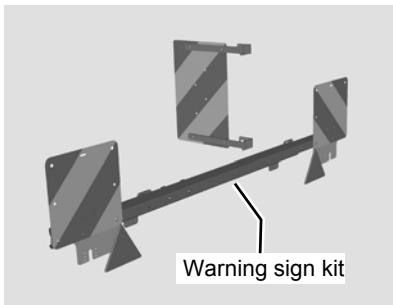
Contact roller [+]



The optional contact roller on the 3 point trestle makes for better contours.

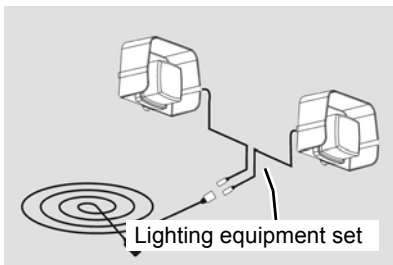
- ▶ Please note: For the optional contact roller, the hitch pin for the top link must be inserted into the elongated hole and secured using a safety splint.
 - See »Coupling the top link«, page 31.
- ▶ Please keep in mind the transport locking device for the contact roller.
 - See »Locking the contact roller [+]
transport locking device«, page 44.
 - See »Unlocking the contact roller transport locking device«, page 47.

Warning sign kit [+]



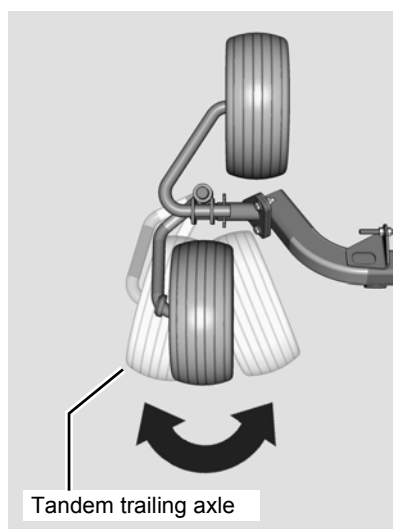
The optional warning sign kit increases safety when travelling on the road.

Lighting equipment set [+]



The optional lighting equipment set increases safety when travelling on the road.

Tandem trailing axle [+]



The optional tandem trailing axles facilitate driving with tight cornering.

Fault elimination

Faults

Faults can often be eliminated quickly and easily. Before contacting Customer Service, refer to the table to check whether you can remedy the fault yourself.



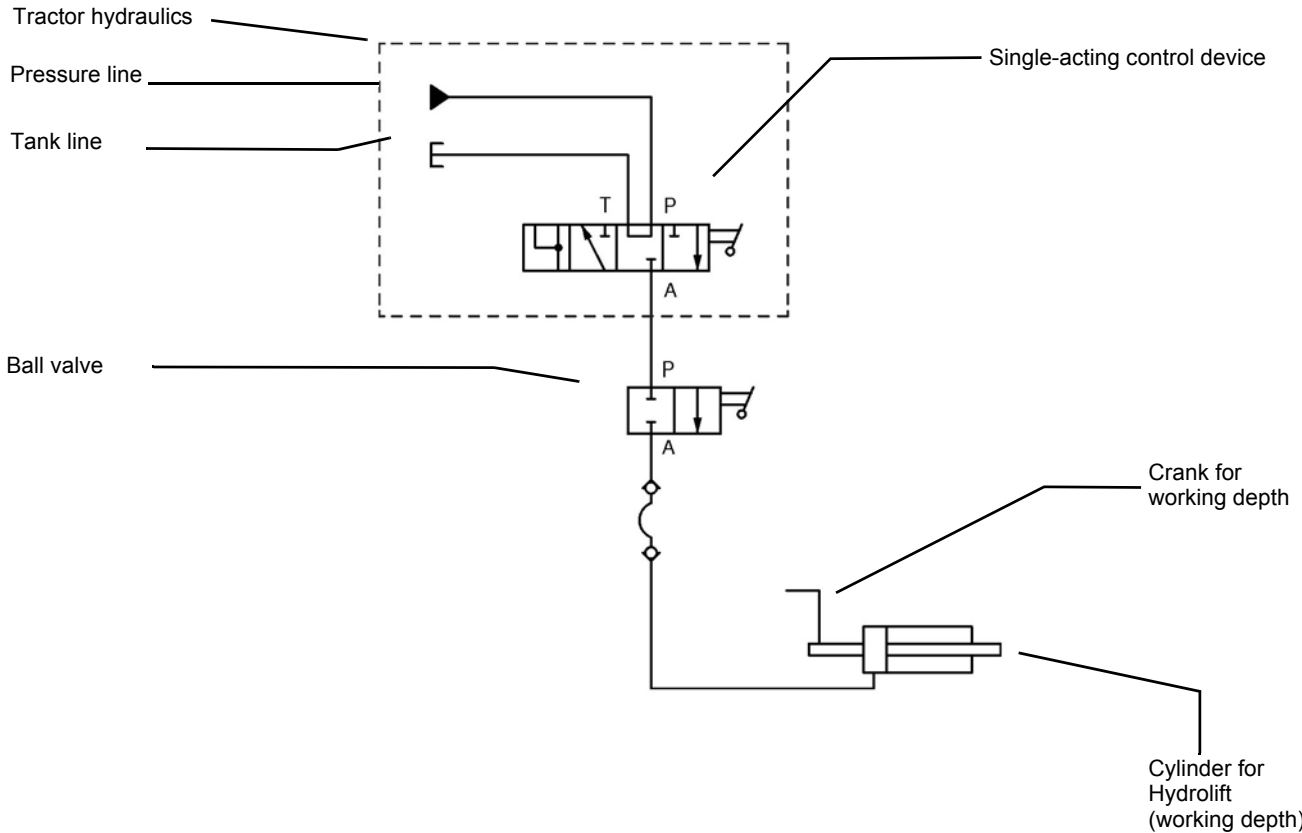
In case of a fault, proceed as follows:



- ▶ Immediately stop operation.
- ▶ Switch off the tractor PTO stub shaft drive.
- ▶ Switch off the tractor and secure it.
- ▶ The fault must be repaired before work can be resumed. Otherwise, damage to the machine and serious or fatal injury may be caused as a result.

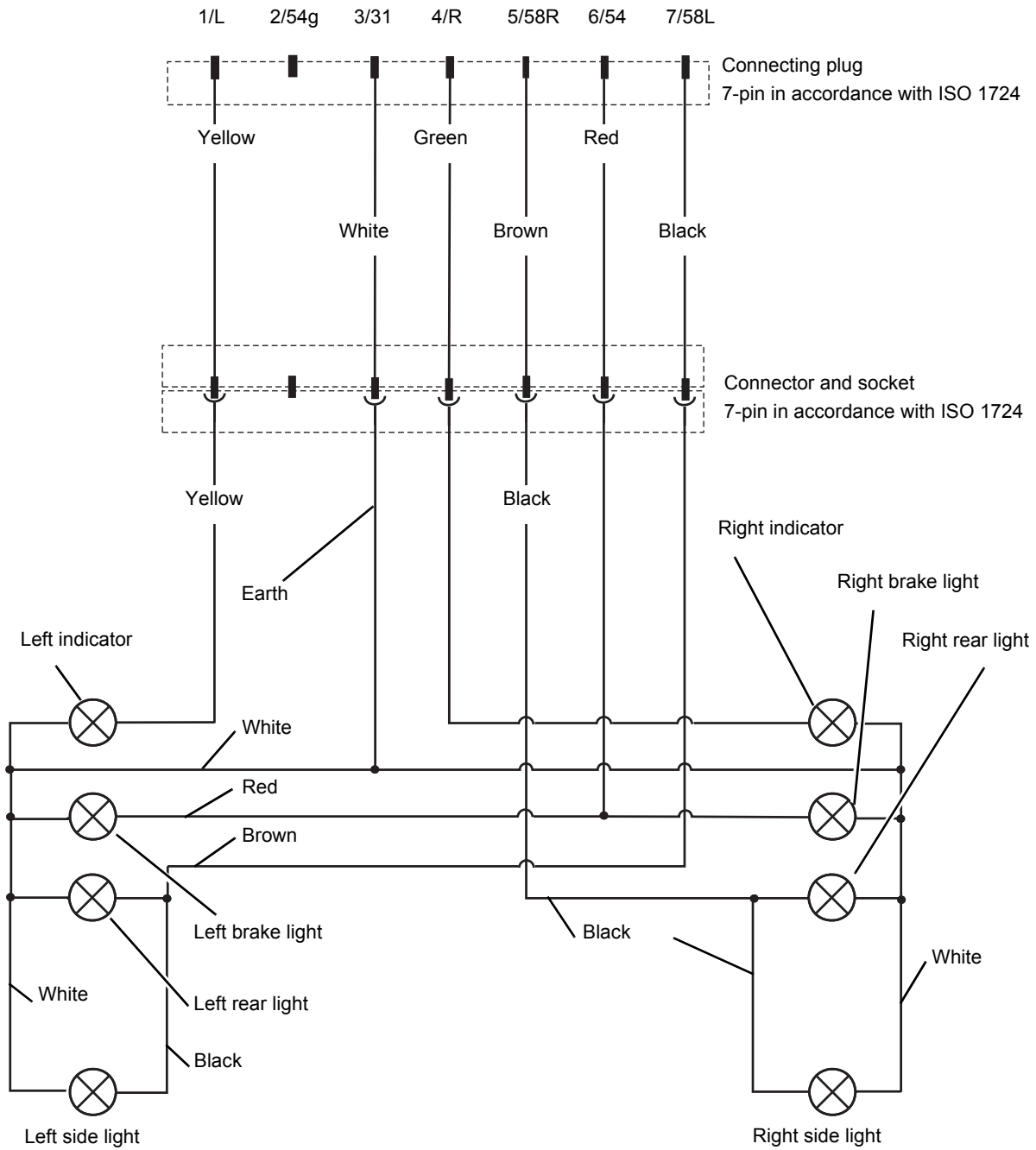
Problem	Cause	Solution
Rotor is leaving crop behind on one side and is digging too deeply into the ground on the other side.	Incorrect adjustment of rotor pitch.	→ Chapter »Preparing for use«, section »Rotor pitch«, page 35
Rotor is leaving crop behind across the entire width.	Working depth set too high.	→ Chapter »Preparing for use«, section »Rotor pitch«, page 35
Crop is heavily contaminated.	Rotor tines set too low.	→ Chapter »Preparing for use«, section »Rotor pitch«, page 35
		→ Chapter »Coupling the machine«, section »Coupling the 3 point trestle«, page 30
Machine not operating cleanly at high speed	Rotor tines set too high. Uneven terrain.	→ Chapter »Preparing for use«, section »Rotor pitch«, page 35
	Speed too high to process crop mass	Reduce speed.
Rotor dragging crop along – Unclean swath form	Crop mass too large.	Reduce speed.
	Rotary speed too high.	Reduce speed.
PTO shaft coupling responding frequently	Crop mass too large or uneven.	Reduce speed.
	Rotor tines set too low.	→ Chapter »Preparing for use«, section »Rotor pitch«, page 35
Noise production during work	Loose screwed connections or worn-out tine supports. Tine support bent	Check tine supports and screwed connections on tines.
Machine rolls offset behind the tractor when driving in a straight line.	Steering/tracking incorrectly adjusted or worn out.	Contact dealer.
Rotor not working cleanly	Poor adaptation to the contours of the land due to severe rotor load relief	Please consult your dealer. You will find assistance under »Circuit diagrams«, page 72.

Hydraulic circuit diagram



Circuit diagrams

Lighting circuit diagram



Environment

During decommissioning, the individual parts must be disposed of properly and in an environmentally friendly manner. Please observe the waste disposal guidelines that are currently in force.

Plastic parts

Plastic parts can be disposed of in normal household waste (residual waste), depending on the laws specific to your country.

Metal parts

All metal parts can be sent for recycling.

Oil

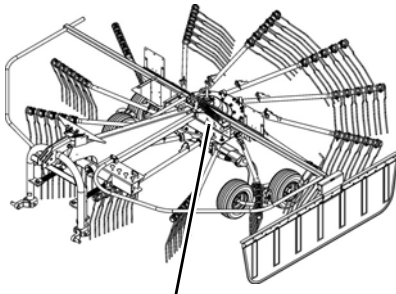
In terms of waste legislation, environmentally-compatible hydraulic oils must be stored, collected and disposed of separately in accordance with regulations.

Rubber

Rubber parts, such as hoses or tyres, must be brought to a rubber recycling centre.

EC Conformity Declaration

**Conforms to
EC Directive
2006/42/EC**



Type plate and CE marking

We

**Kverneland Group Kerteminde AS
Taarpstrandvej 25
DK-5300 Kerteminde
Denmark**

declare with sole responsibility that the product

**SwatMaster 4222 / 4622
An dex 424 / 464
9542 / 9546
and its accessories**

Model: 6582 / 6583


**Valid from machine number:
VF65829601 – / VF65834501 –**

to which this declaration relates, comply with the relevant basic health and safety requirements of EC Directive 2006/42/EC.

To demonstrate our compliance with the health and safety requirements quoted in the EC Directive, we make reference to the following standards:

- DIN EN ISO 12 100:2010
- DIN EN ISO 4254-1:2009 + AC:2010
- DIN EN ISO 4254-10:2009 + AC:2010
- DIN 11001-3:1998

Kverneland Group Kerteminde AS
Kerteminde, 05.12.2011



Uwe Kellermeier

EC authorised representative

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