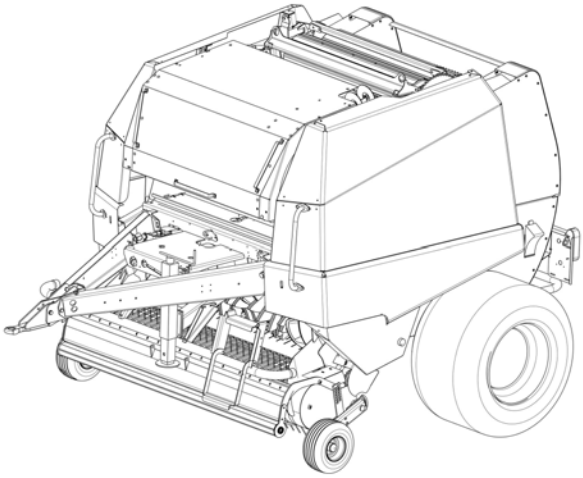


RF 2235

Operating manual

Edition	7.2007
Date of print	8.2007
Language	EN
Type	VGJC
From serial number	VGJC 000101 -
Document number	G0708JC(3)EN

Implement code

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

Designation	Vicon RF 2235
Serial number	VGJC _ _ _ _ _ _
Software version	AutoPlus 1.03
Accessories	
Address of supplier	
Address of manufacturer	Kverneland Group Geldrop B.V. BA Grass - Bale Equipment Nuenenseweg 165 NL-5667 KP Geldrop The Netherlands Tel.: +31 40 289 33 00

Inhaltsverzeichnis

Inhaltsverzeichnis

Inhaltsverzeichnis

Target group for this operating manual

This operating manual is directed at trained farmers and individuals who are otherwise qualified to perform agricultural activities and who have received instruction on the handling of this implement.

For your safety
You must familiarise yourself with the contents of this operating manual before assembly or initial operation of the implement. In this way, performance and work safety are optimised. The operating manual is an integral part of the implement and must always be kept to hand. This will allow:

- accidents to be avoided,
- the warranty conditions to be met,
- a well-functioning implement to remain in good working order.

Training

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

Employer information
All personnel are to be regularly instructed on the use of the implement, at least once annually, in accordance with the regulations of the national organisation for Health and Safety at Work. Untrained or unauthorised persons are not allowed to use this implement.

They are personally responsible for the safe operation and maintenance of the implement. Always ensure that all other personnel that use or maintain the implement, or that work in the immediate vicinity of the implement, are familiar with the operation and maintenance instructions and the relevant safety instructions from this operating manual.

Symbols used

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

- A dot accompanies each item in a list.

> A triangle indicates operating functions which must be performed.

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

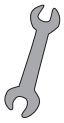
[+] A plus sign indicates an accessory, which is not included in the standard version.

Next to these symbols, pictograms are used to help you locate other sections of this manual:

NOTE The term, “Note” indicates tips and notes on operation.

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

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



The screwdriver indicates tips during assembly or adjustments.

A star indicates examples that assist understanding of the instructions.

For your safety

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

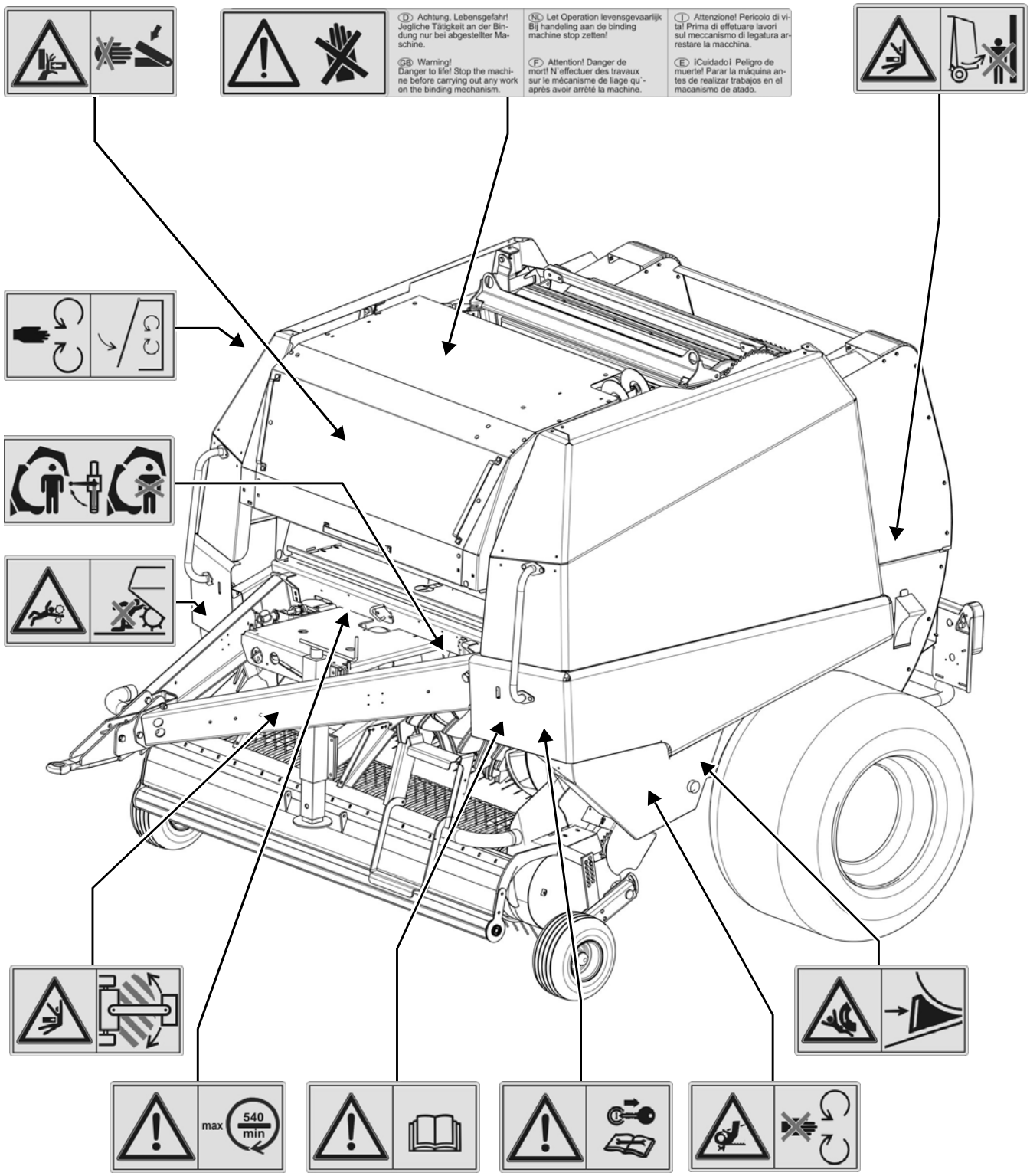
- in the interest of your own safety,
- in the interest of the safety of others, and
- to ensure the safety of the implement.

Numerous risks can result from incorrect handling of agricultural implements. Therefore, always work with special care and never under pressure.

Employer information
At regular intervals, inform those who work with the implement about these safety instructions and the statutory regulations.

Warning symbols

On the implement, there are safety labels that are for the purpose of drawing attention to dangers. The labels must not be removed. If any labels are illegible or have been lost, it is possible to order new labels as spare parts and affix them to the implement.



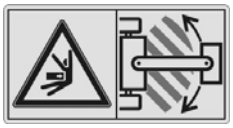
Meaning of warning symbols

Read the operating manual
Read and observe the operating manual and the safety regulations prior to commissioning! The machine may only be commissioned once the operating manual has been read and understood. This applies in particular to the safety instructions.

Switch off the engine
Perform all maintenance, repair and adjusting work only when the implement is at a standstill. Serious or fatal injury can be the result.

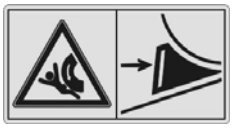
Maximum cardan shaft speed 540 rpm
The prescribed maximum cardan shaft speed of 540 rpm must not be exceeded. The consequence could be damage to the implement.

Distance from the opened rear flap
Remain a safe distance away from the rear flap if the safety catch is not activated. An unsecured rear flap may drop of its own accord. Serious or fatal injury can be the result.



Distance from the slewing range
Remain a safe distance away from the slewing area and the deployment/retraction area. There is a risk of crushing. Serious or fatal injury can be the result.

Caution regarding the knife area
Remain a safe distance away from the knife area. There is a danger of being crushed and cut by the knives or sharp edges. This could otherwise result in serious injury.



Secure the implement with wheel chocks
Always secure the implement in the park and stop position with wheel chocks to ensure it cannot roll away. Serious or fatal injury can be the result.

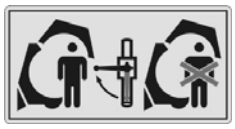
Avoid the danger zone around the cardan shaft
Stay well outside of the danger zone around the cardan shaft. Do not use the cardan shaft if the protective guard is damaged or defective. This could otherwise result in serious injury.

Distance from the pick-up equipment
Remain a safe distance away from the rotating pick-up equipment. You may be caught by the rotating tines and pulled into the implement. Serious or fatal injury can be the result.

Distance from the tractor
When the implement is being coupled, uncoupled or operated, there should be no-one causing an obstruction between the tractor and the implement. Serious or fatal injury can be the result.

Distance from the closed rear flap
Maintain a safe distance from the closed rear flap. The rear flap may open by itself. Serious or fatal injury can be the result.

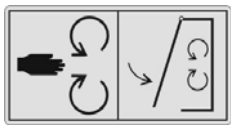
Close the side doors
Chains and chain wheel teeth are rotating behind the side doors. This protective guard must not be opened during operation or when the engine is running. This could otherwise result in serious injury.



Distance from the rear flap
Stay out of the rear flap slewing range if the electronic or hydraulic steering can be activated. Serious or fatal injury can be the result.

Avoid the cutting knives area
Remain a safe distance away from the cutterbar area if the knives have not been secured. Before accessing the danger zone, activate the safety valve. This could otherwise result in serious injury.

Do not exceed the maximum hydraulic pressure
The hydraulic pressure of the tractor on the implement's hydraulic system must not exceed 210 bar. The consequence could be damage to the implement.



Close the implement's protective equipment
Before commissioning the implement, close and lock all protective equipment such as doors, brackets, flaps and covers. Operating the implement with protective equipment which is open is prohibited. Doing so could result in serious injury.

Who is allowed to operate the implement

Only qualified personnel
Only qualified persons who have been informed of the dangers associated with handling the implement are permitted to operate, service or repair the implement. This knowledge can be gained via agricultural training, technical training or intensive instruction.

General

Safety is your responsibility
Follow the safety regulations. Ensure you are always in compliance with the safety regulations. Most accidents can be avoided. Avoid serious or fatal accidents by following the safety instructions.

Prescribed workwear
Do not wear loose, baggy clothing. Any loose or baggy items of clothing worn may become caught in the rotating parts. Wear workwear and protective clothing, as prescribed by the trade's mutual indemnity association. There is otherwise the risk of serious or fatal injury.

Fire hazard
Ensure the implement is always clean and remove any remaining crop. This will ensure that any fire hazards are avoided.

Fire extinguisher
The fire extinguisher must always be kept with the implement. A multipurpose ABC fire extinguisher with a volume of 5 kg is recommended. The fire extinguisher must be approved by the relevant authorities.

Good working condition
Ensure that the tractor is always in good working condition, and that the tractor's brakes and the implement are working perfectly. Observe the information and technical data in the operating manual for your tractor.

Use in enclosed spaces
An implement which is coupled and connected to the tractor must not be run in enclosed spaces. Combustion engine exhaust fumes are dangerous. There is a danger of asphyxiation.

Never work on the implement when it is running
Actions should not be carried out on the implement while it is running. Objects or personnel can be caught, drawn in or crushed. There is otherwise the risk of serious or fatal injury.

Do not make any modifications to the implement
No modifications whatsoever must be made to the implement. Unauthorised modifications can impair safety and affect the service life of the implement. Unauthorised modifications to the implement render the manufacturer's guarantee null and void and frees the manufacturer from all liability.

Avoid the area to the rear when the bales are being deposited
Remain a safe distance away from the rear area. The bales can cause serious or fatal injuries when they are deposited.

Deposit the bale on level ground
Always deposit the discharged bale on a flat surface. Never deposit the bale on a slope. The deposited bale must not keep moving uncontrollably as a result of its weight and ejection speed. A rolling bale can result in damage or serious or fatal injuries.

Welding work
Disconnect all electrical connections from the tractor when carrying out welding on the attached implement. Damage may otherwise be caused to the electrical system.

Fire hazards when welding
When welding, be careful of any fire or combustion hazards caused by sprayed metal and sparks. Work away from flammable objects or cover them. Seal off any gaps or chinks. Ensure there is a suitable extinguishing device and check the working premises; check them again at the end of the welding process.

Hitching

Increased risk of injury
When hitching the implement to the tractor, there is an increased risk of injury. Therefore:

- secure the tractor in such a way that it cannot roll forwards or backwards.
- Switch off the engine.
- Remove the ignition key.
- Never stand between the tractor and the implement during hitching.
- Mount and secure the implement's cardan shaft to the tractor's PTO shaft.

Failure to comply may cause damage to the implement and even life-threatening injuries.

Cardan shaft
Only use a cardan shaft that complies with the manufacturer's specifications. Other cardan shafts with friction clutches require a higher torque. A higher torque can cause damage to the implement.

Cardan shaft operating manual
Please ensure that you observe the manufacturer's operating manual for the cardan shaft. This will provide you with information regarding intended use. Failure to comply can cause damage to the cardan shaft and to the implement.

Check and attach the protective guard for the cardan shaft
The rotating cardan shaft is protected by a protective guard. Make sure that the protective guard for the cardan shaft is not damaged. The protective guard for the cardan shaft must be attached to the tractor and the implement by chains. Unsecured cardan shafts can cause serious injuries.

PTO shaft speed 540 rpm
The prescribed maximum PTO shaft speed of 540 rpm must not be exceeded. A higher PTO shaft speed can cause damage to the implement.

Hydraulic

Hydraulic connection at zero pressure only
Only connect hydraulic tubes to the tractor hydraulic system if the tractor and implement hydraulic system is at zero pressure. A pressurised hydraulic system can trigger unforeseen movements on the implement and can cause serious damage and injuries. There is otherwise the risk of serious or fatal injury.

High pressure in the hydraulic system
The hydraulic system is often overpressurised. All pipes, tubes, couplings and connecting passageways must be checked for leaks and other damage on a regular basis. Only use suitable tools when checking for leaks. Repair any damage immediately. Escaping oil can cause injuries and burns. Seek medical attention immediately if injuries occur.

Road travel

Ensuring road safety
The implement must conform to current national traffic regulations if you intend to drive it on public roads. Ensure:

- Lighting, warning and protective equipment is installed and functioning
- Compliance with the permissible transport widths and weights, axle loads, tyre loadbearing capacities, laden weights and national speed restrictions.
- Compliance with the maximum permissible road transport speed of 40 km/h.

If this is not complied with, the driver and keeper of the vehicle are liable.

Check the tyre pressure
Check tyre pressure on a regular basis. The wrong tyre pressure will reduce the service life of a tyre and can cause unstable driving properties and accidents.

Adjusting the load-dependent brake
Before travelling on the road, check that the lever of the implement's load-dependent brake is adjusted to “Full load”. The braking efficiency changes. This can cause accidents. The consequence can be traffic accidents with serious or fatal injuries.

No riding on the implement
Neither personnel nor objects are allowed to be transported on the implement at any time. Riding on the implement is hazardous and strictly prohibited.

Altered driving and braking performance
The driving and braking performance are altered when the implement is attached to the tractor. Take the width and balancing weight of the implement into consideration, especially when cornering. A driving style which is not adapted to conditions can cause accidents.

Adapted speed
In the event of bad road conditions and excessive speed, very high forces can occur that subject the tractor and implement material to high loads or to an overload. Adapt the speed to the road conditions. A driving style which is not adapted to conditions can cause accidents. The consequence can be traffic accidents with serious or fatal injuries.

No bales in the bale chamber
Bales must not be transported in the bale chamber. Transporting bales will affect the steering, braking capability and driving behaviour of the tractor. Personnel may be injured or the implement may be damaged as a result.

Operation

The implement should not be put into operation for the first time until the user has been trained to use it.
The implement must not be used until instruction has been given by distribution company employees, company representatives or manufacturer's employees. If initial operation is performed without instruction, damage to the implement can be caused by operating errors and accidents can occur.

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

Check the protective equipment
The protective equipment must not be removed or by-passed. Check all protective equipment before starting the implement. Unguarded parts of the implement can cause serious or fatal injuries.

No riding on the implement
Neither personnel nor objects are allowed to be transported on the implement at any time. Riding on the implement is hazardous and strictly prohibited.

Make sure the immediate vicinity is clear
Check the surrounding area of the implement before starting and continually during operation. Make sure the operator has an adequate view of the work area. Only begin work if the immediate vicinity is cleared of any persons or objects. There is otherwise the risk of serious or fatal injury.

Retighten all nuts, bolts and screws
Regularly check that the nuts, bolts and screws are fully tightened and tighten them, if necessary. Screws can work loose when the implement is used. The consequence can be damage to the implement and accidents.

Instructions in the event of malfunctions
In the event of a malfunction, stop, shut down and secure the implement immediately. The malfunction may be eliminated immediately, or your dealer must be assigned the task. Using a faulty implement can cause accidents or damage.

The tractor's PTO shaft continues turning after it has been switched off
After the tractor's PTO shaft has been unhitched or disconnected the implement continues running due to inertia. Maintain a safe distance until the pick-up equipment and all moving parts have come to a complete standstill.

Cornering and turning manoeuvres
Centrifugal forces are in operation when cornering. The implement'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. The consequence can be accidents with serious or fatal injuries.

Bale ejection
Stay away from the bale ejection area. There is a risk of crushing. never stand behind the implement when a bale is being ejected. Ensure that no other persons are positioned behind the implement. There is otherwise the risk of serious or fatal injury.

Observe the field conditions
Proceed with the utmost caution on hilly terrain or shifting subsoil. Keep to both the maximum permissible engine load and the gross working weight limit. A driving style which is not adapted to conditions can cause accidents. The consequence can be accidents with serious or fatal injuries.

Obstruction by a safety device
If there is a blockage or if a safety device is triggered, only operate on the implement after following the instructions below:

- Switch off the tractor's PTO shaft.
- Switch off the electronic control system.
- Switch off the engine and take out the ignition key.

Never try to repair a blockage or a malfunction on the implement manually during operation. There is otherwise the risk of serious or fatal injury.

Unhitching

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

- Secure the tractor against rolling away, switch off and take out the ignition key.
- Never stand between the tractor and the implement during uncoupling.
- Stop the implement on firm, secure, level ground.
- Ensure that the sustainer is securely locked.
- Place the cardan shaft in the brackets provided.
- Secure the implement against rolling away (use wheel wedges).
- Do not disconnect the hydraulic tubes until the hydraulic system is at zero pressure on both the tractor and implement faces.

If this is not complied with, the consequence can be serious or fatal injuries.

Care and maintenance

Follow the care and maintenance chart
Observe prescribed intervals for maintenance checks and inspections specified in the operating manual. If these intervals are not complied with, damage to the implement and accidents can be caused.

Use original parts
Many components have special properties that are decisive for the stability and operability of the implement. Only spare and wear parts supplied by the manufacturer have been tested and cleared. Using other products may lead to malfunctions or reduce safety of operation. The use of 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 cardan shaft drive.
- Depressurise the hydraulic system.
- Whenever possible, uncouple the tractor.
- Switch off the AutoPlus-Pilotbox.
- Switch off the tractor and remove the ignition key.
- Ensure the implement is standing on firm, secure, level ground, and provide additional support, if necessary.
- Do not use parts of the implement to climb onto it; use only secure steps, ladders or other means of access.
- Secure the implement against rolling away (use wheel wedges).

Only if these regulations are complied with is safety ensured during care and maintenance work.

Turn off the electrical supply
Prior to carrying out work on the electrical system, disconnect it from the power supply. Equipment under electrical power can cause damage to equipment and injury to persons.

Replace hydraulic tubes every six years
Hydraulic tubes can age without this being externally visible. We therefore recommend replacing the hydraulic tubes every six years. Defective hydraulic lines can cause serious or fatal injuries.

Caution when cleaning with a high-pressure cleaner
Caution when cleaning with a high-pressure cleaner. Bearings, seals and pipe unions are not waterproof. Avoid damaging the implement; the bearings, seals and pipe unions must not come into direct contact with the high pressure water jets.

No corrosive washing additives
Do not use any corrosive washing additives for cleaning. The bright metal surfaces can get damaged.

Prior to carrying out **welding work**
Disconnect all electrical connections from the tractor when carrying out welding on the attached implement. Damage may otherwise be caused to the electrical system.

Tighten bolt and screw connections
All screwed/bolted connections that are released during maintenance and repair operations must be retightened. Serious injuries and damage to property can be caused by loose bolt and screw connections.

Further regulations

Observe the regulations
In addition to the safety instructions listed above, please observe the following:

- Accident prevention regulations.
- Generally recognised safety regulations, occupational health requirements and road traffic regulations.
- Instructions given in this operating manual.
- Regulations pertaining to operation, maintenance and repair.

Warranty

The warranty and manufacturer's responsibility will no longer be valid if the instructions given in the chapter on Safety are not respected, if maintenance is inadequate or incorrect, if the implement is overloaded or used for purposes other than those for which it was intended, or if unauthorised modifications are made to the implement.

General

This chapter contains the following information:

- Range of application and properties
- Technical specifications

Range of application

This implement is a round baler. The implement is solely intended and designed for the purpose of gathering cut, non-woody or slightly woody plants, particularly stem crop, from the ground. The gathered crop is collected together and cut using the cutterbar. The crop is formed into a round bale in the bale chamber and then wrapped with twine or net material. This must always take place in compliance with the conditions, instructions, procedures and regulations in this document and shown in the warning diagrams and safety diagrams on the implement.

Proper use of the implement

This implement is only designed to be used for agricultural purposes. Any use whatsoever other than the above mentioned is not proper use. Neither the manufacturer nor the dealer is liable for any damage resulting from improper use of the implement. The operator of the implement alone is liable in this case.

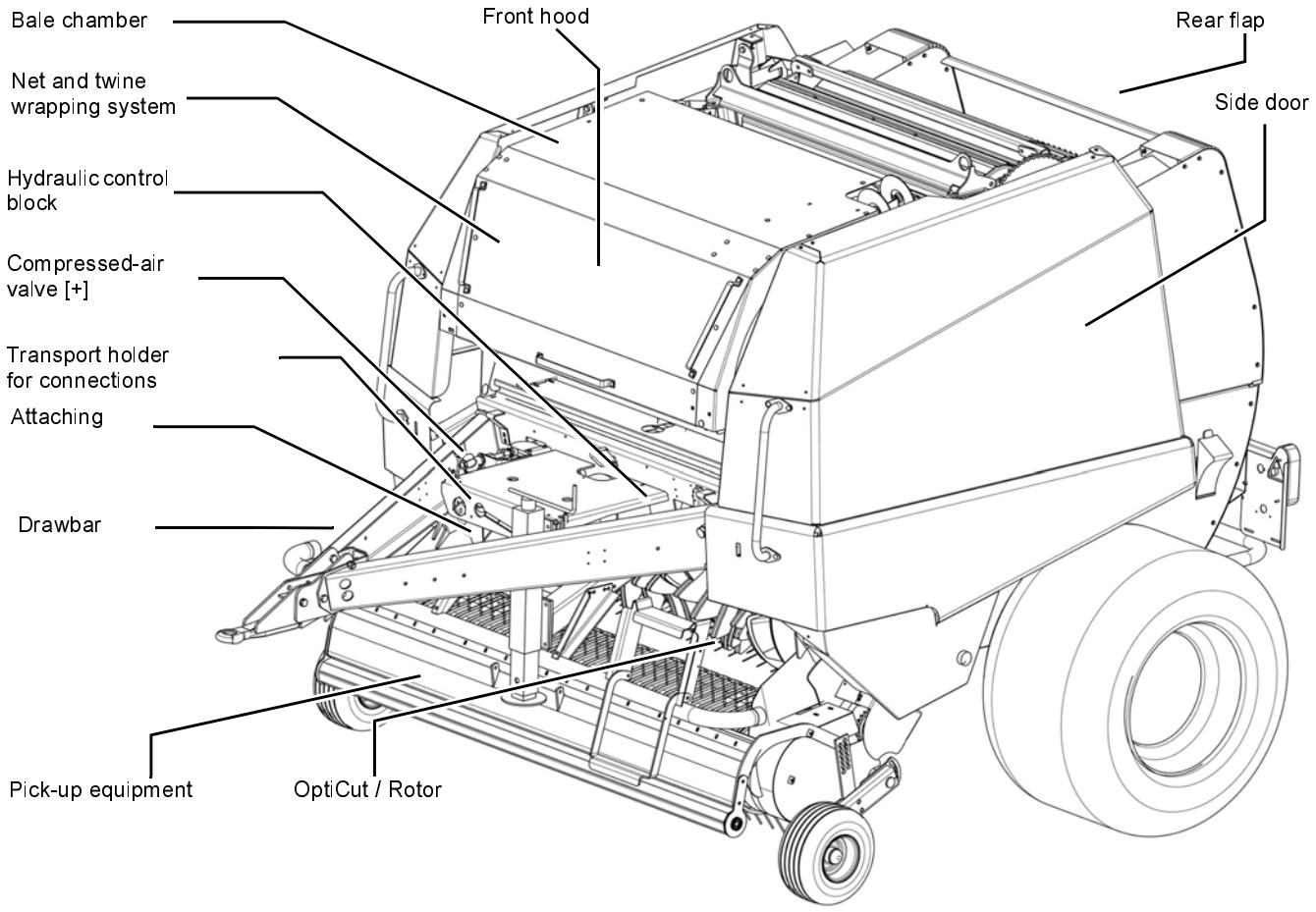
Properties

The pick-up equipment takes the crop from the ground and feeds it into the bale chamber. In this process, the crop is also cut by the OptiCut cutterbar. The bale is uniformly formed by the rotary motion of the roller systems. The bale expands due to the constant feeding of crop. When the chosen bale density is achieved, the bale is tied with either twine or net. The rear flap is opened and the bale is ejected.

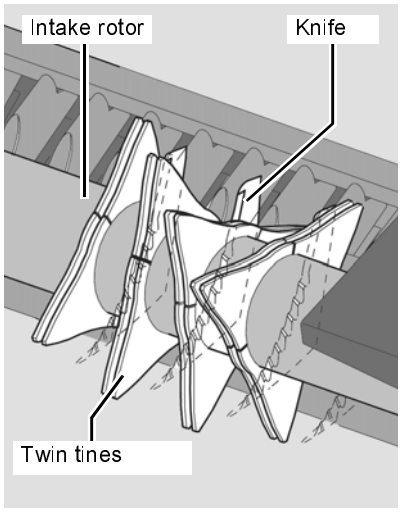
Protecting the stubble
The optional load-dependent compressed-air brake for the implement enables the braking force to be adjusted in direct dependence to the actual weight in field use. The braking force is manually adjusted in 3 stages. This function protects the stubble.

Component designations

Overview of the device



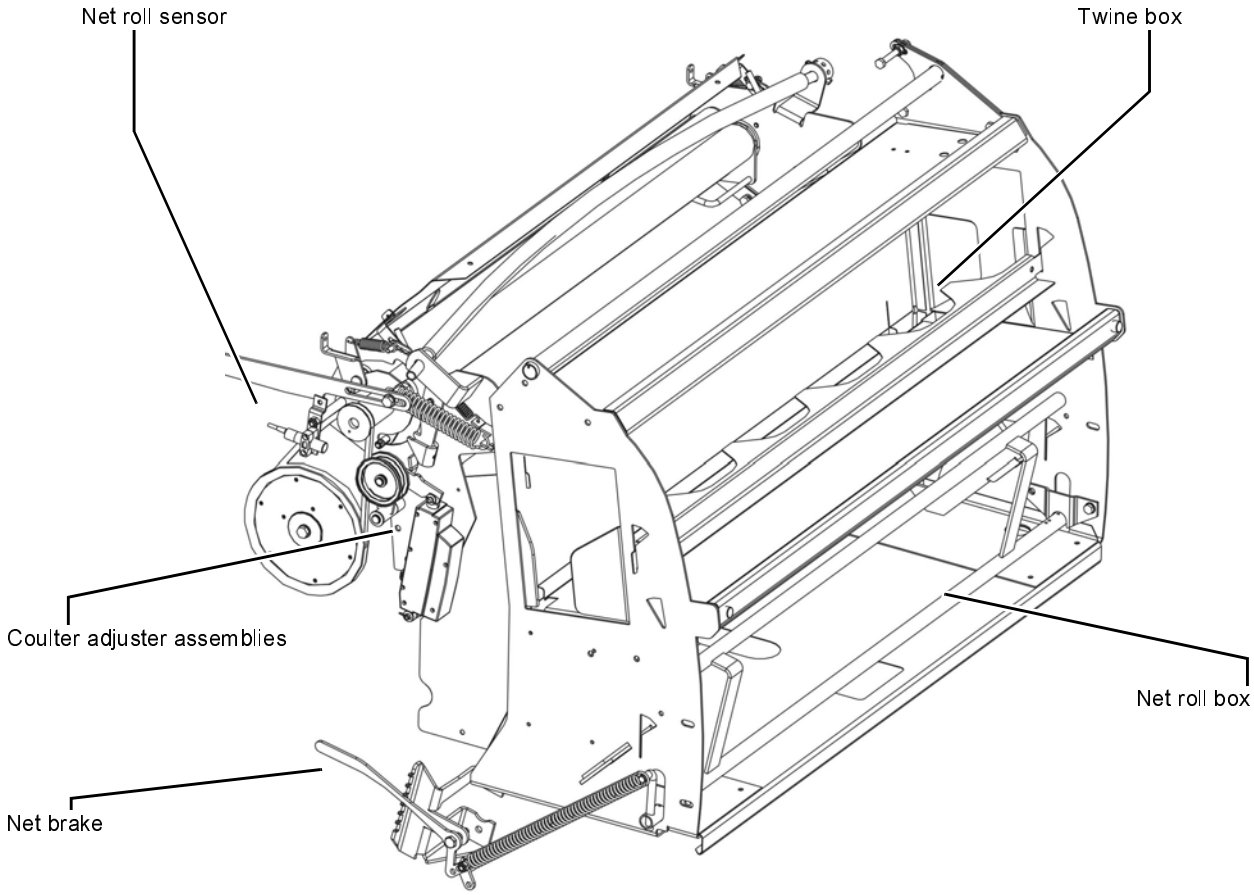
OptiCut cutting system



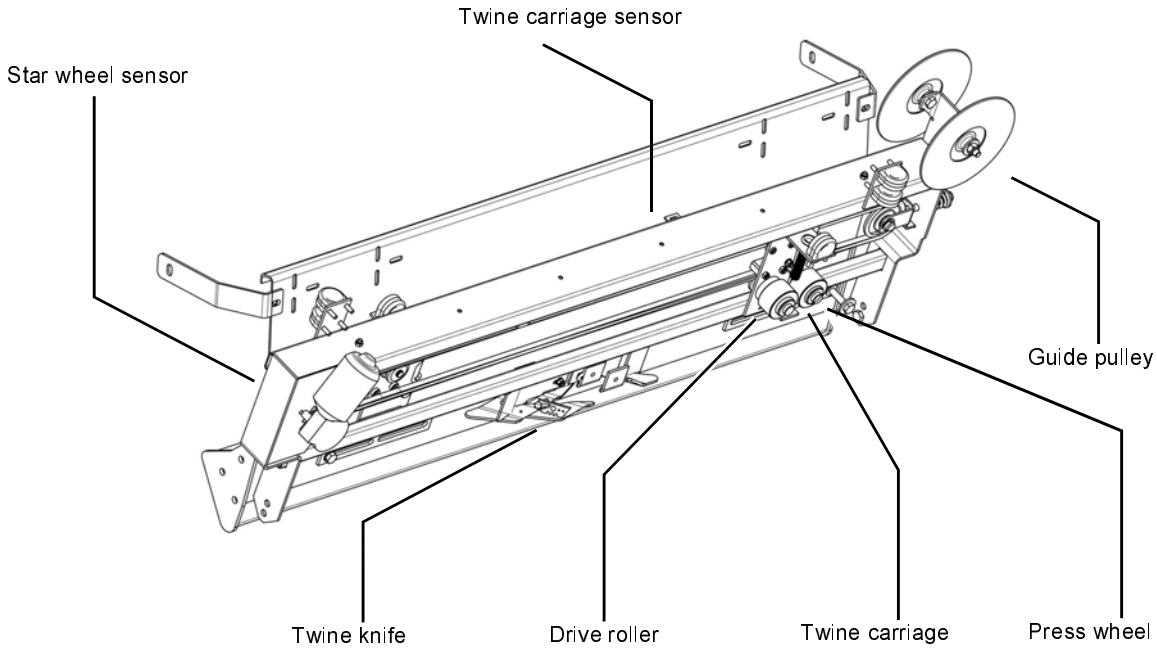
The OptiCut cutting system rotor guarantees a continuous, drawn cut above the knife through spirally attached twin tines. The OptiCut system can be used to cut the crop with different settings.

The knives are swivelled in and out hydraulically. The individual knife protection prevents the knife from being damaged by foreign bodies. If a foreign body is taken in through the rotor, and reaches the knife working area, it is moved away towards the rear. This function ensures trouble-free operation. Foreign bodies should no longer be found in the working area of the individual knives; the knife automatically moves back to the original operating position.

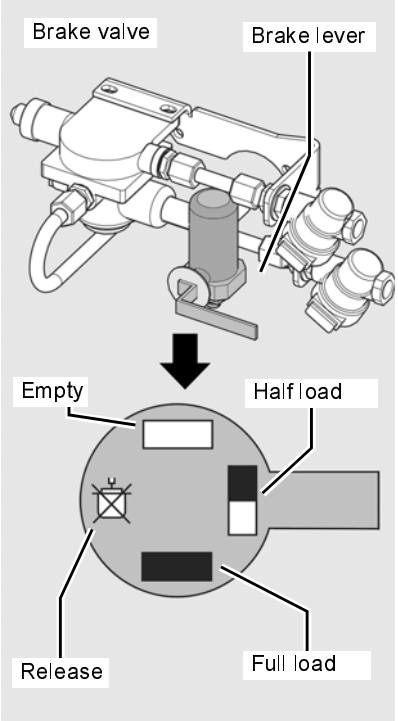
Net wrapping



Twine tying



Load-dependent brake [+]



Load-dependent brake during road travel
Always set the load-dependent brake to the “full load” brake power during road travel. Otherwise there is reduced brake power. There is otherwise the risk of traffic accidents and accidents with fatal consequences.

Load-dependent brake on hilly terrain
Always set the load-dependent brake to the “full load” brake power when travelling on hilly terrain. Otherwise there is reduced brake power. The consequence can be serious accidents.

Adjusting the load-dependent brake in field use
The optional load-dependent compressed-air brake is used to adjust the braking force of the implement to the actual weight of the load, and is triggered accordingly. Optimum deceleration is achieved in this way. The following settings can be made using the brake lever on the brake valve:

- Full load: Setting for road transport.
- Half load: Setting for field use.
  This function protects the stubble.
- Empty: Setting for field use.
  This function protects the stubble.
- Released: Brake released.
  The implement can be stored.

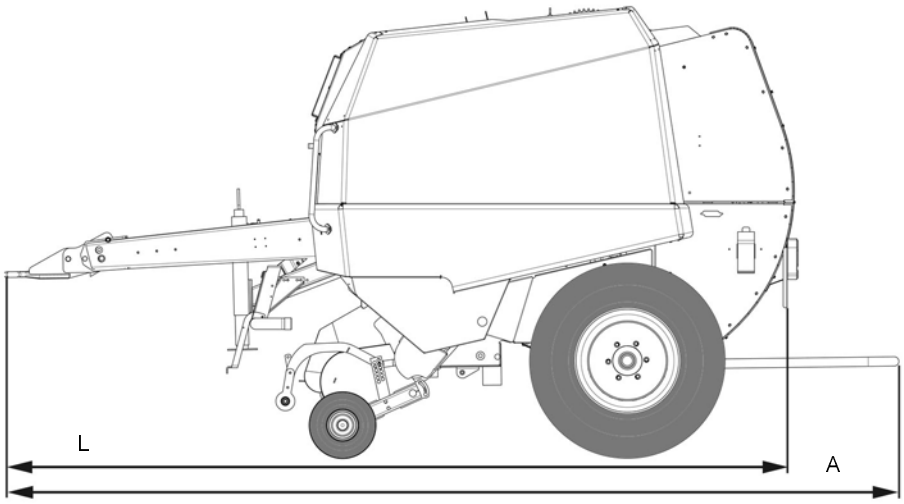
NOTE If the bale chamber becomes full of silage, the braking load should be set to “Full load”. Otherwise reduced brake power must be anticipated.

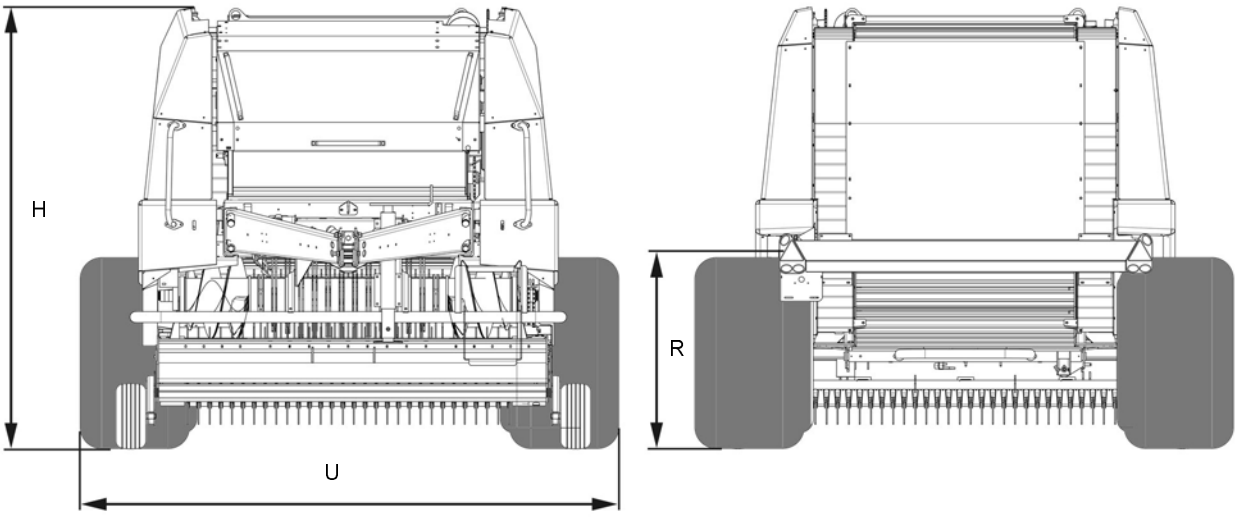
NOTE Adjusting the braking force correctly protects the stubble.

Technical specifications

Dimensions

A	Length (m)	4,40 - 4,80
L	Length (m) to rear lights	3,90 - 4,33
H	Height (m)	2,30 - 2,39
R	Height (m) to rear lights	0,94 - 1,03
U	Width (m)	2,77 - 2,94
	Maximum weight (kg)	3 400 kg (with brakes [+]) 2,995 kg (without brakes)





Required tractor equipment

Output / connections	
Maximum transport speed on the road with brakes	40 km/h
Maximum transport speed on the road without brakes	25 km/h
Minimum output of the tractor	65 kW/85 hp
Maximum PTO shaft rpm	540 rpm
Control panel power supply	12 V, 3-pin socket (DIN 9680)
Lighting power supply	12 V, 7-pin socket (ISO 1724)
Hydraulic	1 x single-action control device with return line
	1 x double-acting control device
Compressed air	2 connections for compressed-air brake [+]

Baler equipment

Drawhook	
Fixed drawbar eye, 40 mm	Standard
Pivoting drawbar eye, 40 mm	[+]
Hitch-drawbar eye, 52 mm	[+]
Forked drawhook; 33 mm	[+]
Tyre/Axle	
	16.0/70-20
	400/60-22,5
	500/50-17
	500/45-22,5
	600/40-22,5
	15.0/55-17 (Korea)
Roller feelers	15x6.0-6
Hydraulic brake [+]	[+]
Compressed-air brake [+]	[+]
Pick-up equipment	
Pick-up width (m)	2.30
Roller diameter (mm)	300 mm
Number of tine rows/tines	5/80
Distance between tines (mm)	61 mm
Raising/lowering	Hydraulic
Roller feelers	2 air-filled wheels
Overload protection	Pin coupling
Rotor uncoupling [+]	Hydraulic [+]
PowerPush system [+]	Hydraulic [+]
Bale chamber	
Barrels	14
Barrel diameter (mm)	290 mm
Bale density adjustment	Hydraulic
Bale chamber locking	Hydraulic
Automatic chain lubrication	Automatic

Twine tying	
Number of reels	6
Recommended twine (m/kg)	400-700 (synthetic)
	200-330 (sisal)
Net wrapping	
Number of net rolls	1 (+1)
Recommended net roll width	1.23-1.30 m
Maximum net roll diameter	320 mm
Recommended net	RKW Rondotex® MX 1,000 or TamaNet EDGE TO EDGE® (2,000 or 3,000 m rolls)
Drive	
Cardan shaft clutch	Pin coupling; 1500 Nm

Bale dimensions

Width (m)	1.22 m
Diameter (m)	1.25 m

OptiCut 14

Number of knives	14
Knife distance (mm)	70
Dummy blade [+]	14
Knife protection	Mechanical

OptiCut 23

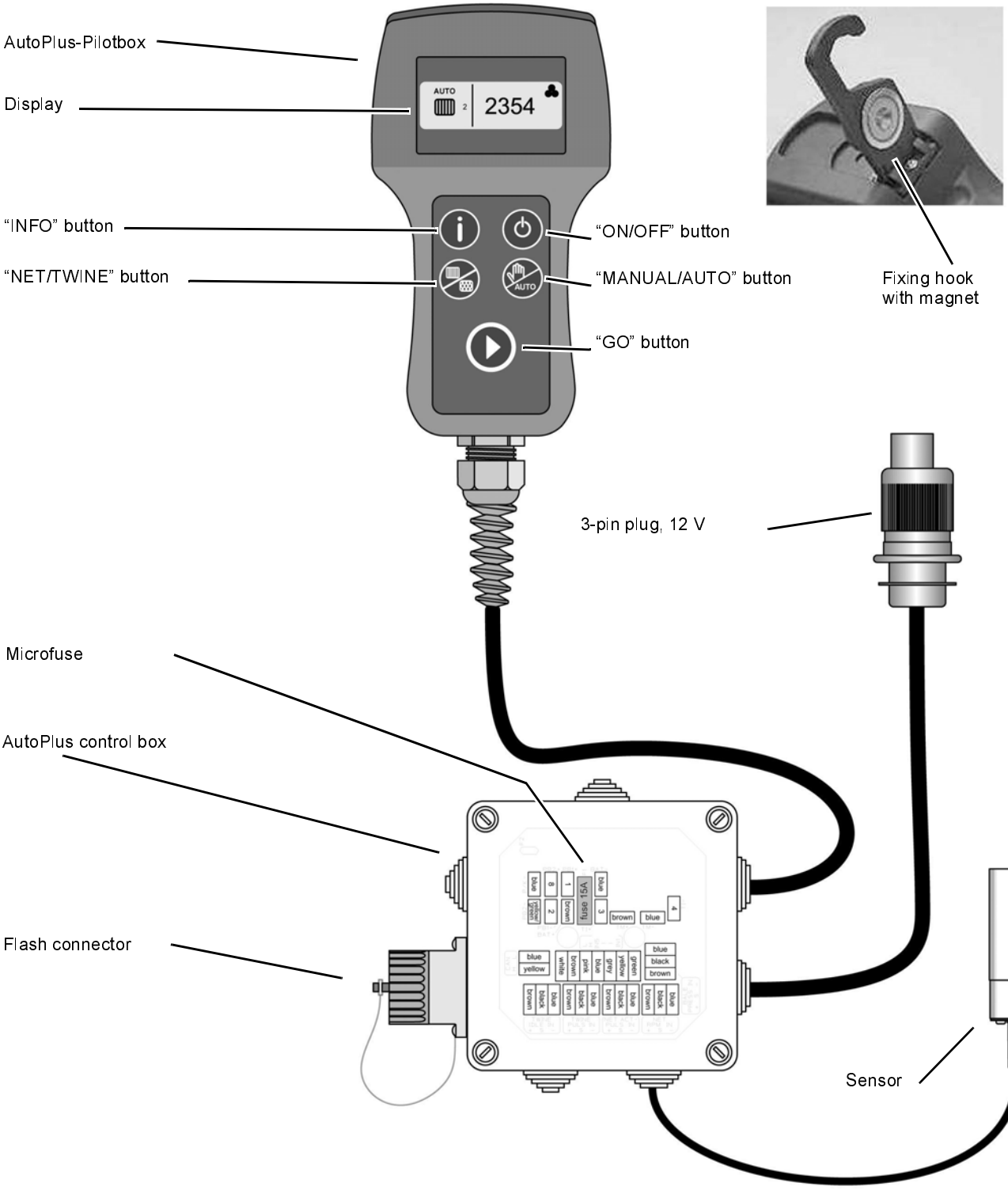
	OptiCut 23 SuperSilage	**OptiCut 23 HydroProtected**
Number of knives	23	
Knife distance (mm)	45 - 90	
Dummy blade [+]	23	
Knife protection	Mechanical	Hydraulic
Hydraulic knife group switching	-	Yes

AutoPlus- Pilotbox

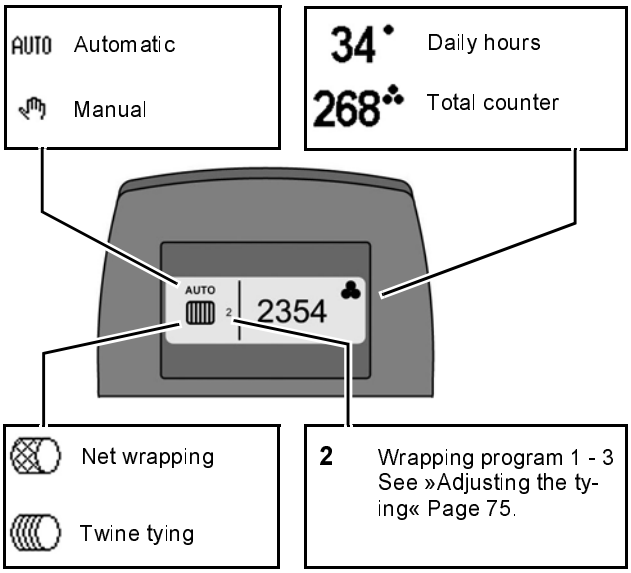
Protecting electrical parts against moisture
The AutoPlus-Pilotbox, control box and electrical plug connections must be protected against damp and penetrating moisture. Dampness in electronic devices can lead to leakage current, which results in malfunction.

The central functions and settings of the baler are controlled, stored and issued by the AutoPlus-Pilotbox.

Component overview

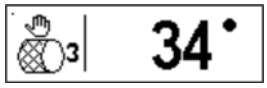
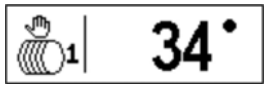
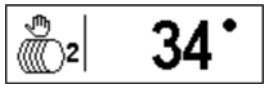
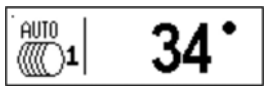
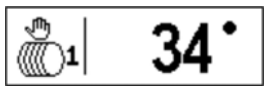


AutoPlus display overview

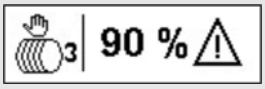
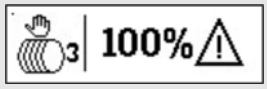
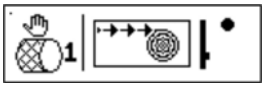
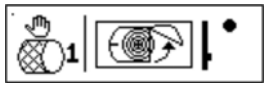
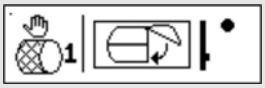
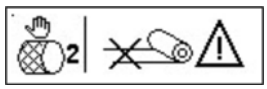
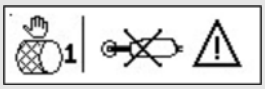


AutoPlus display

"ON/OFF" button			
	Press the "ON/OFF" button.		
AUTO 1.03 PLUS	Welcome display. This display appears as soon as the AutoPlus-Pilotbox is switched on.	Push for Reset	The Welcome display changes to the Reset display. When the "GO" button is pressed, the net/twine motor moves to the basic position.
"INFO" button			
	Press the "INFO" button. The daily recorder and total bale counter information is displayed. Also, this actuates the baler hydraulic valve, in order to control the pick-up equipment and the knives. The relevant daily recorder is reset by pressing and holding the "INFO" button, whilst in the corresponding function.		
1 press	Daily recorder program 1 • **The number of bales from daily recorder 1 is shown (0 bales).**	2 presses	Daily recorder program 2 • **The number of bales from daily recorder 2 is shown (0 bales).**
3 presses	Daily recorder program 3 • **The number of bales from daily recorder 3 is shown (0 bales).**	4 presses	Total counter program • **The number of bales from the total counter is shown (268 bales).**

5 presses 	The pick-up equipment is selected. The pick-up equipment is raised or lowered by the tractor's control device.	Press the “GO” button 	The cutterbar is selected. The knives can be swivelled in and out by the tractor control unit.
“NET/TWINE” button			
	**Press the “NET/TWINE” button:** The tying program is preselected. Pressing the button changes from one tying program to the next. Only the active program are available to select.		
Net wrapping			
	Net program 1 • **Net wrapping** • **Net tying program 1 with 2 wraps**		Net program 2 • **Net wrapping** • **Net tying program 2 with 3 wraps**
	Net program 3 • **Net wrapping** • **Net tying program 3 with 4 wraps**		
Twine tying			
	Twine program 1 • **Twine tying** • **Twine tying program 1 with 18 wraps**		Twine program 2 • **Twine tying** • **Twine tying program 2 with 22 wraps**
	Twine program 3 • **Twine tying** • **Twine tying program 3 with 26 wraps**		
Combi-tying [+]			
	Combi program 1 • **Twine tying program 1 with 18 wraps** • **Net tying program 1 with 2 wraps**		
“MANUAL/AUTO” button			
	**Press the “MANUAL/AUTO” button:** The operating mode is preselected. Press the button to switch between programs. Manual: Net wrapping is activated with the GO button when bale density is 100%. Automatic: Net wrapping starts automatically when bale density is 100%.		
1 press 	• **Automatic tying**	2 presses 	• **Manual tying**

AutoPlus control unit messages

	Bale density 90% Indicates that 90% of the set bale density has been reached. A signal sounds to give notification.		Bale density 100% Indicates that the set bale density has been reached. A signal sounds to give notification.
	"Start tying" is displayed. The tying cycle is running.		The tying cycle was successful. Open the rear flap via the tractor control device. Observe the safety instructions for operation.
	The bale was ejected. Close the rear flap via the control device. Leave the control device lever in rear flap closed position for approximately 3 seconds, to build up the pressure for the default bale density.		Low battery voltage . The battery voltage is under 9 volts. Check the tractor's power supply. A signal sounds to give notification.
	Twine malfunction The twine tying does not run. A signal sounds to give notification. Observe the safety instructions »Maintenance« on page 86.		Net malfunction The net tying does not run. A signal sounds to give notification. Observe the safety instructions »Maintenance« on page 86.
	Net motor malfunction The net motor does not run. A signal sounds to give notification. Observe the safety instructions »Maintenance« on page 86.		The net was drawn in at the wrong moment. A signal sounds to give notification. Observe the safety instructions »Maintenance« on page 86.

Checking the scope of delivery

The delivery arrives fully assembled
The implement is delivered fully assembled. The implement must be checked after delivery. Check loose parts against the following checklist. If any parts of the implement have not been assembled or are missing, please contact your dealer.

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

Checklist for loose parts	Quantity
Operating manual	1
Spare parts list	1
Cardan shafts	1
Wheel wedge	2
Special accessories	See delivery note

Safety

Increased risk of injury
When hitching the implement to the tractor, there is an increased risk of injury. Therefore:

- secure the tractor in such a way that it cannot roll forwards or backwards.
- Switch off the engine.
- Remove the ignition key.
- Never stand between the tractor and the implement during hitching.
- Mount and secure the implement's cardan shaft to the tractor's PTO shaft.

If this is not complied with, the consequence can be damage to the implement and even life-threatening injuries.

Ensuring the tractor is safe to use
Ensure that the tractor

- is safe and in good working condition,
- has suitable brake mechanisms for the implement,
- is able to transport the implement,
- and that the implement can be hitched to it.

A tractor which is not in good working condition can cause serious injuries to personnel and damage to the equipment.

General

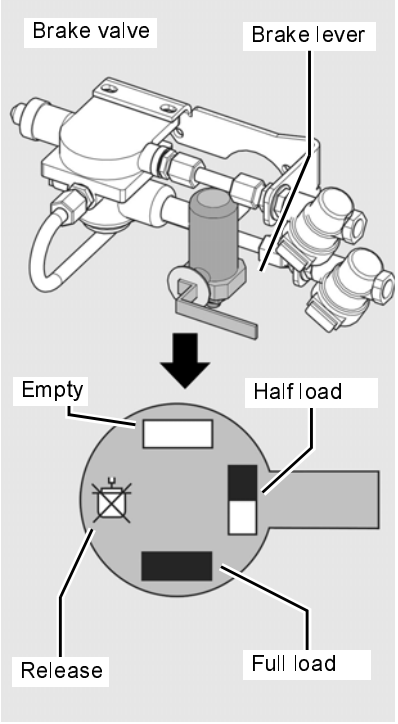
The following work steps are described in this section:

- Manoeuvring.
- Hitching.
- Adjusting the drawbar.
- Adjusting the drawbar height.
- Raising the sustainer.
- Checking the working position.
- Coupling the cardan shaft.
- Hydraulic connections.
- Electrical connections
- Compressed-air brake [+].
- Checking the implement.

The implement attachment is provided with the fittings required to hitch it to the tow jaw coupling of a tractor ex works.
The following work steps must be observed when coupling the implement:

- The tractor and the implement must be standing on firm, secure, level ground.
- The drawbar must be adjusted.
- The drawbar eye must be adjusted.
- The drawbar must be coupled.
- The AutoPlus-Pilotbox electrical connections must be connected.
- The parking brake [+] must be connected.
- The hydraulic tubes must be connected.
- The pneumatic tubes [+] must be connected.
- The lighting electrical connections must be connected.
- The sustainer must be inserted.

Manoeuvring



If the implement is equipped with the “load-dependent brake” accessory, the following provisions must be carried out before manoeuvring:

> Hitch the implement.
> Raise and secure the sustainer.
> Release the parking brake lever.
> Move the brake lever to the “released” position.
> Manoeuvre the implement.
> Move the brake lever to the “full load” position.
> Activate the parking brake lever and secure the implement against rolling away.

→ See »Parking brake [+]«, page 41.

Hitching

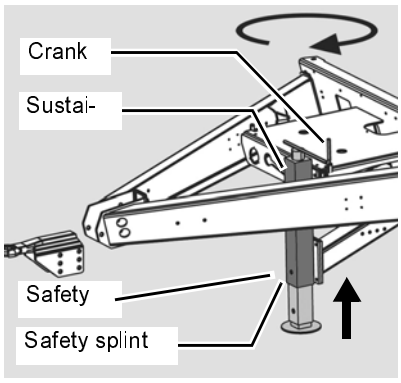
Remove the tractor's lower link
Remove the lower link from the tractor to ensure there is no contact with the drawbar during use. The lower link can come into contact with the drawbar when cornering. There is a danger of tipping. Personnel may be injured or the implement may be damaged as a result.

Securing moving parts
Moving parts must be secured with lifting gear against sliding, folding or swivelling. Personnel may be injured or the implement may be damaged as a result.

Before the implement is hitched, the drawbar eye must be set at the right height for the tractor's drawhook. Proceed as follows:

> Position the tractor and the implement one behind the other on firm, level ground.
> Keep a distance of approximately 15 cm between the drawbar eye and the hitch.

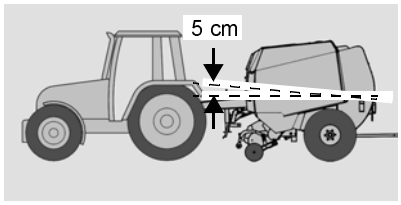
Raising the sustainer



The crank on the sustainer acts as a screw adjustment for the drawbar height.

> Bring the drawbar to the desired height by turning the crank.
> Adjust the drawbar if necessary.
→ »Drawbar«, page 110
> Hitch the implement to the tractor.
> Release the sustainer using the crank.
> Remove the safety splint from the bolt.
> Remove the bolt from the sustainer.
> Slide the sustainer upwards.
> Insert the bolt into the hole in the sustainer and secure it with the safety splint.

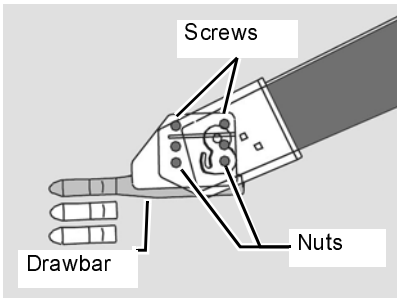
Checking the working position



To ensure the crop is gathered correctly, the implement must be aligned behind the tractor in the correct working position: The implement must be horizontal in relation to the tractor or slightly tilted towards the rear.
Use the horizontal line from the side doors as a guide.

> Check and adjust the working position.

Adjusting the drawbar height



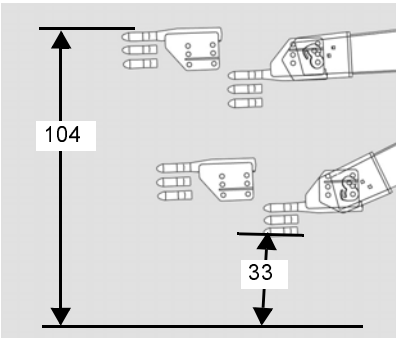
The drawbar eye can be fitted in different positions.

> Loosen the nuts and bolts.

> Move the drawbar eye to the desired position

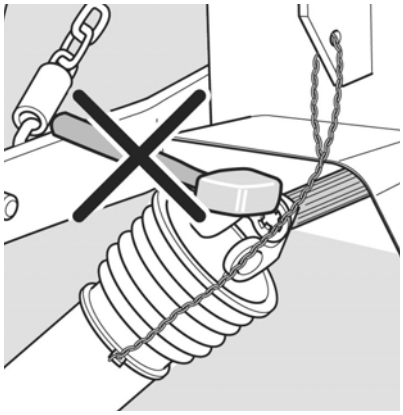
> Fit and tighten the screws and nuts to 310 Nm.

→ »Torque for screw connections«, page 92



Attachment height	**cm**
Minimum	33
Maximum	104

Coupling the cardan shaft



Do not use a hammer
When coupling the cardan shaft, do not use a hammer or any similar tools. Using this type of tool can severely damage the cardan shaft. A damaged cardan shaft can cause damage to the tractor and the implement.

> Check whether the cardan shaft must be shortened before coupling.

> Shorten the cardan shaft, if necessary.

→ »Cardan shaft«, page 93

> Check that the tractor drawbar eye is clean and lubricated.

> Couple the cardan shaft to the tractor and the implement.

> Ensure that the single wide-angle cardan shaft is engaged in the shaft end.

> By means of a chain, secure the single wide-angle cardan shaft's guard tube against being co-rotated.

Electricity supply

AutoPlus control electricity supply
The cable should under no circumstances be supplied with power by the cigarette lighter. The power must always be supplied via the 3-pin 12 V plug (DIN 9680). The condition of the fuse in the power cable must be checked. There is a risk of electrical power cuts and malfunctions.

The AutoPlus-Pilotbox must be fitted in an easily accessible position within the tractor cabin.

Please note the following:

- Ensure that the tractor operator can easily activate the AutoPlus-Pilotbox and easily read the LCD.
- Wherever possible, the AutoPlus-Pilotbox should be fitted where the vibration from the tractor is at its weakest.
- Wherever possible, the AutoPlus-Pilotbox should be fitted where there is the least risk of dust.
- Protect the AutoPlus-Pilotbox from direct sunlight or moisture.

Check the cable routing
Check the cable routing. The cable must shown no signs of abrasion or sagging. Torn or frayed cables can cause unforeseen movements on the implement.

Attach the following electrical cables to the tractor:

Lighting

- Lighting of the implement.

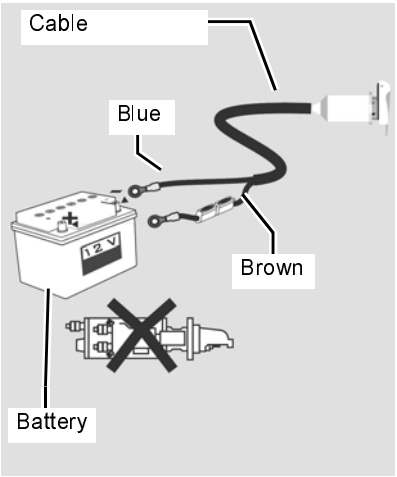
> Connect the plug for the 12-V power supply to the 7-pin plug socket on the tractor.

AutoPlus- Pilotbox

- Power supply to the AutoPlus-Pilotbox

> Connect the plug for the 12 V power supply to the 3-pin plug socket on the tractor.

Alternative connector cable

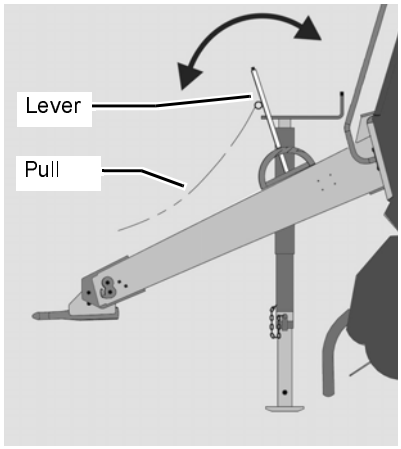


For owners of tractors for which no 3-pin 12-V connection is available, an alternative cable for the AutoPlus control box power supply is provided.

> The alternative cable [+] for the AutoPlus control box is directly connected to the tractor 12-V battery.

Colour	Pole
Brown	+
Blue	-

Parking brake [+]



The parking brake [+] secures the implement in the park position to ensure it does not roll away. As an additional safety measure, a pull rope is also used.

To activate the parking brake:

> Pull the parking brake lever to the front.

> Attach the pull rope to a fixed point on the tractor.

To release the parking brake:

> Move the parking brake lever to the rear.

Hydraulic connections

Hydraulic connections

Hydraulic connection at zero pressure only
Only connect hydraulic tubes to the tractor hydraulic system if the tractor and implement hydraulic system is at zero pressure. A pressurised hydraulic system can trigger unforeseen movements on the implement and can cause serious damage and injuries. There is otherwise the risk of serious or fatal injury.

Avoid oil mixtures
If the implement is used on different tractors, an unauthorised oil mixture may occur. Non-allowed oil mixtures can destroy components on the tractor.

Clean hydraulic system
Remove any dirt which has entered the hydraulic system. The hydraulic system can be seriously damaged. Material damage and injuries to personnel may be caused.

Check tubes and couplings
Check all hydraulic tubes for damage before connecting them. Check all hydraulic couplings for firm seating after connecting them. Defective hydraulic tubes or incorrectly positioned hydraulic couplings can cause the implement to move unexpectedly and may cause serious damage to personnel or the implement. There is otherwise the risk of serious or fatal injury.

Secure the control devices
In transport position, secure the control devices on the tractor against unintended actuation and lock if possible. Unintended actuation of the control device can cause the implement to move unexpectedly and may cause serious damage to personnel or the implement. There is otherwise the risk of serious or fatal injury.

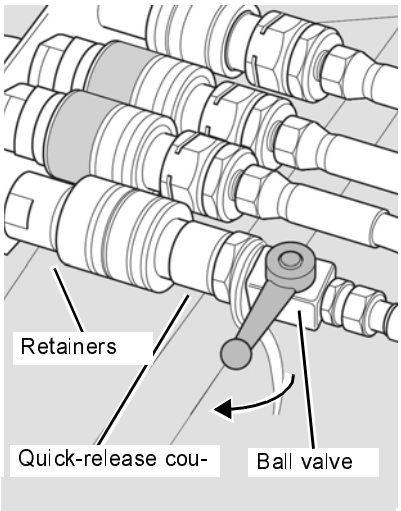
Check that the hydraulic tubes are correctly positioned
Ensure that the hydraulic tubes are not caught, pinched or trapped. Ensure there is ample free space. Hydraulic tubes which are damaged or entangled with other components can cause the implement to move unexpectedly and uncontrollably and may cause serious damage to personnel or the implement. There is otherwise the risk of serious or fatal injury.

Check the cable routing
Check the cable routing. The cable must shown no signs of abrasion or sagging. Torn or frayed cables can cause unforeseen movements on the implement.

Check the following connections between the tractor and the implement:

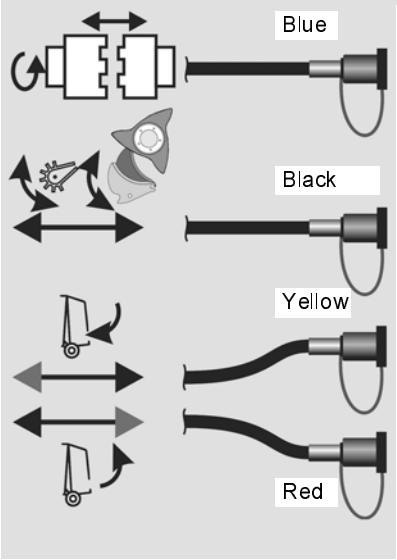
- hydraulic connections,
- electronic connections and
- compressed air connections (where applicable)

Connecting the hydraulic quick-release coupling



Connect the hydraulic lines as follows:

> Check that the quick-release couplings are clean.
> Connect the quick-release couplings to the tractor.
> Ensure that the tractor's hydraulic system is not pressurised.



> Connect the blue quick-release coupling for the rotor uncoupling [+] to a single acting control device.
> Connect the black quick-release coupling for the pick-up equipment and the knives to a single acting control device.
> Connect the yellow quick-release coupling from the rear flap closure to the double-acting control device.
> Connect the red quick-release coupling from the rear flap opening to the double-acting control device.
> Connect the quick-release coupling for the hydraulic brake [+] to the corresponding retainer.

Pneumatic brake [+]

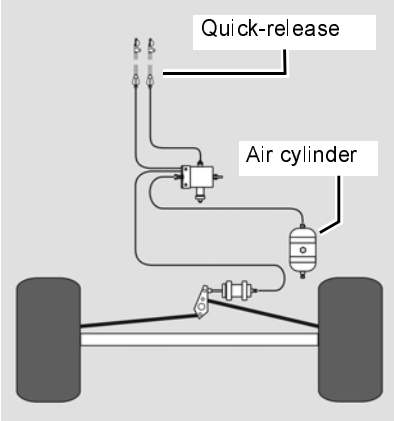
Clean the pneumatic system
Prevent any dirt from entering the pneumatic system. The pneumatic system can otherwise be seriously damaged. Material damage and injuries to personnel may be caused.

No water in the compressed-air circuit
Ensure that there is no water in the compressed-air circuit. Otherwise the braking capacity may be affected. This may cause accidents, material damage and injury to personnel.

Pneumatic couplings are only available if the implement was ordered with compressed-air brakes as additional equipment.

> Check that the quick-release couplings are clean.
> Connect the quick-release couplings for the pneumatic tubes to the tractor's pneumatic retainers.

Connecting the pneumatic coupling



> Ensure that the pneumatic valve on the tractor is open.
> Connect the red quick-release coupling to the corresponding tractor valve.
> Connect the yellow quick-release coupling to the corresponding tractor valve.
> Briefly activate the bleed valve on the underneath of the air tank to bleed the water.

Safety

Observe safety instructions
Observe the safety instructions for the performance of all work. Any disregard for safety instructions can lead to serious or fatal injuries to persons.

Switch off the tractor and secure it
Before you dismount: Switch off the tractor, take out the ignition key and secure the tractor against rolling away. An unsecured tractor may run you over or trap you. There is otherwise the risk of serious or fatal injury.

Securing the implement
Secure the implement against inadvertent starting and rolling away. Use wheel chocks. The implement must be standing on firm and level ground and, if necessary, must be supported during work. Unsecured or non-supported implements can cause accidents. There is otherwise the risk of serious or fatal injury.

Check the hydraulic connections
Before use, check that all hydraulic connections are correctly connected to the tractor's single and double-acting control devices. Incorrectly connected hydraulic hoses can cause the implement to move unexpectedly. There is otherwise the risk of serious or fatal injury.

Keep a certain distance from the closed rear flap
Maintain a safe distance from the closed rear flap. The rear flap may open by itself. Serious or fatal injury can be the result.

Keep a certain distance from the open rear flap
Remain a safe distance away from the rear flap, if the safety catch is not activated. An unsecured rear flap may drop of its own accord. Serious or fatal injury can be the result.

Never work on the implement when it is running
Actions should not be carried out on the implement while it is running. Objects or personnel can be caught, drawn in or crushed. There is otherwise the risk of serious or fatal injury.

Always switch off the AutoPlus-Pilotbox when working on the implement
Always switch off the pilot box when working on the implement. If the Pilotbox is switched on or starts inadvertently, unforeseen movements may be triggered on the implement. This can cause accidents with fatal consequences.

General conditions

The following applies for all preliminary provisions:

- Secure the tractor and the implement.
- Check the tyre pressure.

Before commissioning the implement, the following work steps must be carried out, as described in this chapter:

- Open the rear flap.
- Close the rear flap.
- Adjust the roller feelers.
- Adjust the pick-up equipment.
- Adjust the OptiCut cutterbar.
- Insert the twine.
- Insert the net.
- Adjust the bale density.
- Adjust the scraper.

Opening the rear flap

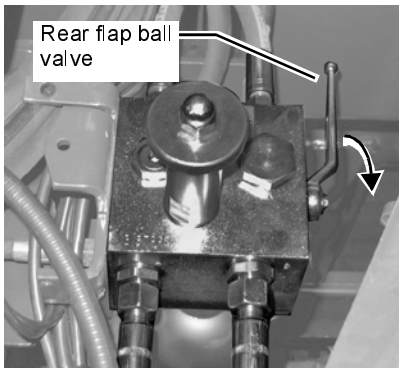
> Open the rear flap via the control device.

Switch off the AutoPlus-Pilotbox.

> Press the “ON/OFF” button.

> Switch off the tractor, take out the ignition key and secure it.

> Close the rear flap hydraulic manifold ball valve. The hydraulic manifold is located between the drawbar. When closed, the open rear flap is secured.



Closing the rear flap

> Open the rear flap hydraulic manifold ball valve . When open, the rear flap is no longer secured and can be closed.

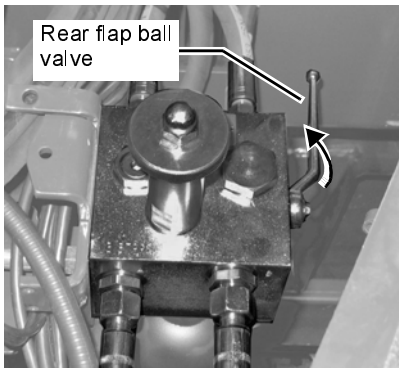
> Switch the tractor on.

Switch on the AutoPlus-Pilotbox.

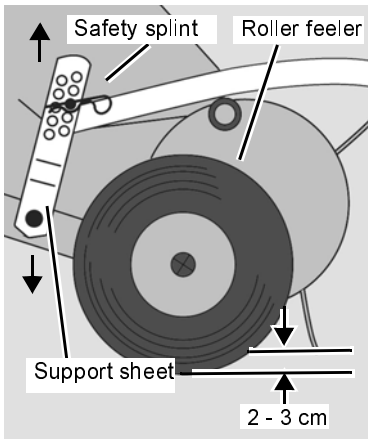
> Press the “ON/OFF” button.

> Close the rear flap via the control device.

> Leave the control device lever in rear flap closed position for approximately 3 seconds, to build up the pressure for the default bale density.



Adjusting the roller feelers



The working height of the pick-up equipment is set via the positioning of the roller feeders, which are locate on both sides of the implement.

The working height specified in the illustration shown is only a recommendation. The correct working height depends on the nature of the ground and the crop.

Always set the two retainers on the sides of the pick-up equipment to the same working height.

The roller feelers are adjusted by changing the vertical position of the support. Adjust as follows:

> Switch the tractor on.

Switch on the AutoPlus-Pilotbox.

> Press the “ON/OFF” button.

> Press the “INFO” button...

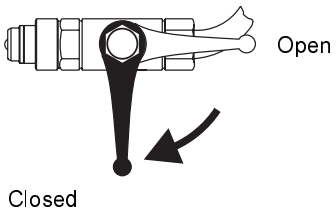
> ...until the “Pick-up/Knives” symbol is displayed.

> Raise the pick-up equipment via the control device.

Switch off the AutoPlus-Pilotbox.

> Press the “ON/OFF” button.

> Switch off the tractor and secure it.
> Close the ball valve.
> Remove the safety splint.
> Bring both supports to the same working height.
> Attach and secure the safety splint.
> Open the ball valve.
> Switch the tractor on.

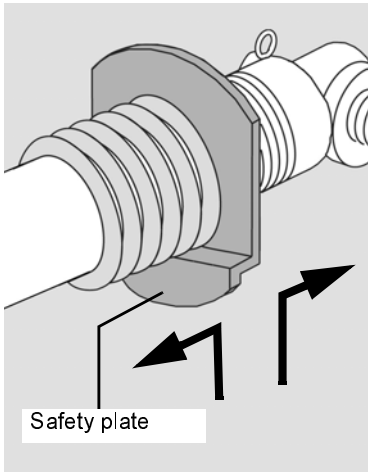


Switch on the AutoPlus-Pilotbox.

> Press the “ON/OFF” button.

> Lower the pick-up equipment via the control device.
> Check the pick-up equipment setting.

Adjusting the pick-up equipment



The pick-up equipment adjusts the ground pressure using two springs on the hydraulic cylinders, to ensure that the crop is gathered correctly. The safety plate can be placed in four positions, to enable different pick-up equipment setting gradients.

The spring tension on both sides of the pick-up equipment is adjusted as follows:

> Switch the tractor on.

Switch on the AutoPlus-Pilotbox.

> Press the “ON/OFF” button.

> Press the “INFO” button...

> ...until the “Pick-up/Knives” symbol is displayed.

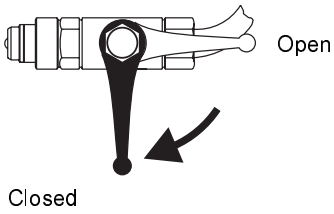
> Raise the pick-up equipment via the control device.

Switch off the AutoPlus-Pilotbox.

> Press the “ON/OFF” button.

> Switch off the tractor and secure it.

> Close the ball valve.



> Slide the safety plate in the direction of motion: The spring tension is increased. The pick-up of the crop is more gentle.

or

> Slide the safety plate towards the rear: The spring tension is reduced. The pick-up of the crop is more aggressive.

> Open the ball valve.

> Switch the tractor on.

> Raise the pick-up equipment via the control device.

NOTE Ensure that the spring tension on both sides of the pick-up equipment is identical.

Adjusting the OptiCut cutterbar

Wear protective gloves
The knives are very sharp. Always wear protective gloves when handling the knives. Failing to wear protective gloves can cause serious injuries.

Secure the control devices
Secure the control devices on the tractor against unintended actuation and lock if possible. Unintended actuation of the control device can cause the implement to move unexpectedly and may cause accidents.

Working in the bale chamber
The following conditions must be observed for carrying out repairs and maintenance work and rectifying malfunctions in the bale chamber:

> Empty and open the bale chamber.
> Switch off the tractor's PTO shaft.
> Switch off the tractor engine.
> Switch off the AutoPlus-Pilotbox.
> Take out the ignition key.
> Secure the bale chamber with the ball valve.

Severe accidents can result if the device starts inadvertently.

OptiCut cutterbars

Cutterbar	Knife protection
OptiCut 14	Mechanical
OptiCut 23 SuperSilage	Mechanical
OptiCut 23 HydroProtected	Hydraulic

OptiCut 14 and OptiCut 23 SuperSilage

Removing the knives

The knife driving shaft can be accessed via the bale chamber. Please observe the relevant safety instructions »Working in the bale chamber«, page 49.

Switch on the AutoPlus-Pilotbox.

> Press the “ON/OFF” button.

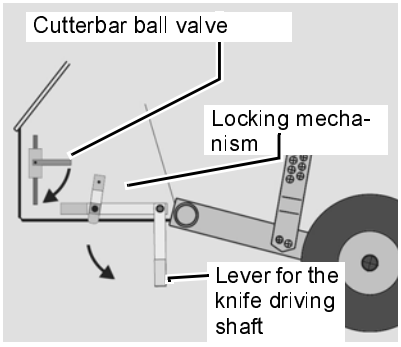
> Press the “INFO” button...

> ...until the “Pick-up/Knives” symbol is displayed.

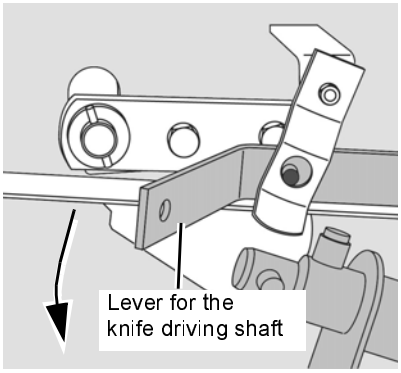
> Press the “GO” button...

> until the “Pick-up/Knives” symbol is selected on the display.

> Swivel the knives in via the control device.
> Open and secure the rear flap.
→ »Opening the rear flap«, page 46.



> Close the ball valve for the cutterbar (to do this, open the right-hand side door).
> Release the knife driving shaft locking mechanism.
> Pull the knife driving shaft lever downwards.



> Hold the ends of the knives and pull them out of the knife driving shaft towards the rear.

NOTE The cutting knives must always be well sharpened. Sharp knives save energy and guarantee the highest possible quality.
→ »Sharpening the knives«, page 98

Fitting the knives

The knife driving shaft can be accessed via the bale chamber. Please observe the relevant safety instructions »Working in the bale chamber«, page 49.

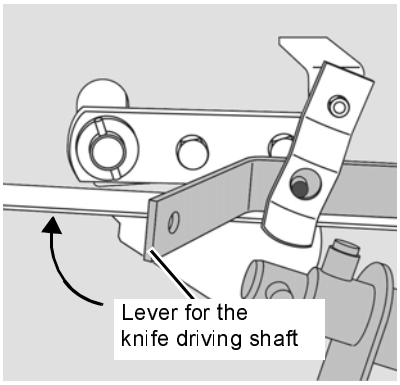
> When fitting the knives, hold the ends and insert them into the oval holes on top of the knife driving shaft.
> Ensure that the bale chamber is empty at the end of the work.
> Empty the bale chamber.
> Close the rear flap.

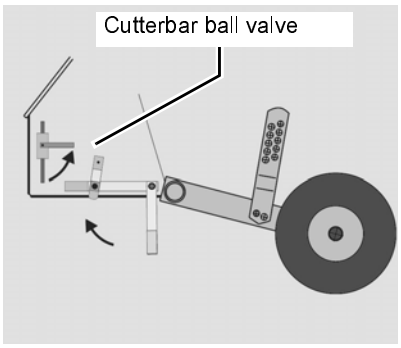
→ »Closing the rear flap«, page 46

Switch off the AutoPlus-Pilotbox.

> Press the “ON/OFF” button.

> Switch off the tractor, take out the ignition key and secure it.
> Push the lever for the knife driving shaft upwards (to do this, open the right-hand side door).





> Open the cutterbar ball valve.

> Switch the tractor on.

Switch on the AutoPlus-Pilotbox.

> Press the “ON/OFF” button.

> Press the “INFO” button...

> ...until the “Pick-up/Knives” symbol is displayed.

> Press the “GO” button...

> until the “Pick-up/Knives” symbol is selected on the display.

> Swivel the knives in with the control device.

OptiCut 23 HydroProtected

Removing the knives

The knife driving shaft can be accessed via the bale chamber. Please observe the relevant safety instructions »Working in the bale chamber«, page 49.

Switch on the AutoPlus-Pilotbox.

> Press the “ON/OFF” button.

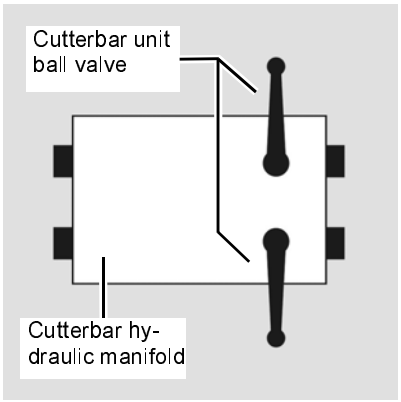
> Press the “INFO” button...

> ...until the “Pick-up/Knives” symbol is displayed.

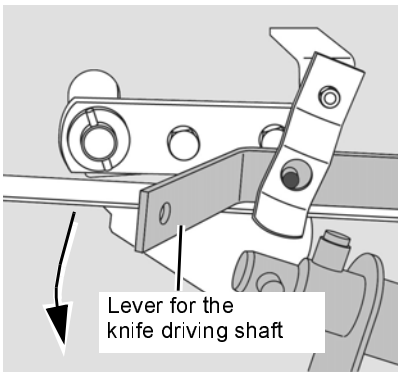
> Press the “GO” button...

> until the “Pick-up/Knives” symbol is selected on the display.

> Swivel the knives in via the control device.
> Open and secure the rear flap.
→ »Opening the rear flap«, page 46.



> Close both ball valves on the hydraulic manifold for the cutterbar (to do this, open the right-hand side door).
> Release the knife driving shaft locking mechanism.
> Pull the knife driving shaft lever downwards.



> Hold the ends of the knives and pull them out of the knife driving shaft towards the rear.

NOTE The cutting knives must always be well sharpened. Sharp knives save energy and guarantee the highest possible quality.
»Sharpening the knives«, page 98

Fitting the knives

The knife driving shaft can be accessed via the bale chamber. Please observe the relevant safety instructions in the »Removing the knives« chapter, page 53.

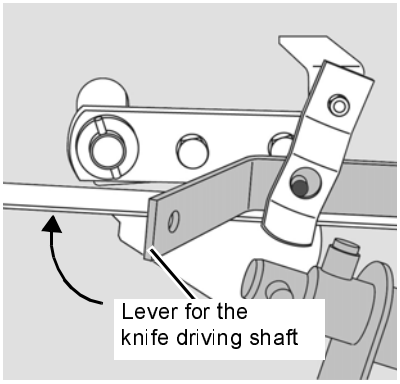
> When fitting the knives, hold the ends and insert them into the oval holes on top of the knife driving shaft.
> Ensure that the bale chamber is empty at the end of the work.
> Empty the bale chamber.
> Close the rear flap.

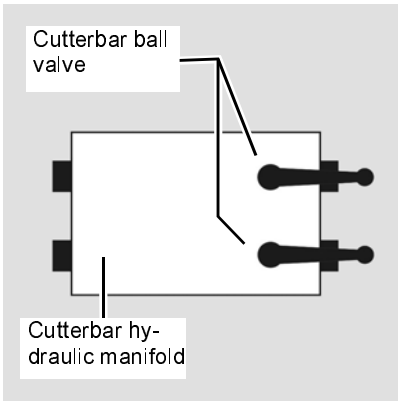
→ »Closing the rear flap«, page 46

Switch off the AutoPlus-Pilotbox.

> Press the “ON/OFF” button.

> Switch off the tractor, take out the ignition key and secure it.
> Push the lever for the knife driving shaft upwards (to do this, open the right-hand side door).





> Open both ball valves on the hydraulic manifold for the cutterbar (to do this, open the right-hand side door).

> Switch the tractor on.

Switch on the AutoPlus-Pilotbox.

> Press the “ON/OFF” button.

> Press the “INFO” button...

> ...until the “Pick-up/Knives” symbol is displayed.

> Press the “GO” button...

> until the “Pick-up/Knives” symbol is selected on the display.
> Swivel the knives in with the control device.

Cutting length - OptiCut 23

The cutting length can be changed by the variable number of knives. The OptiCut 23 cutterbar has two knife groups. The knife groups can be swivelled in and out in various combinations:

Knife group	Cutting length
Use with 23 knives	45 mm
Use with 11 knives	90 mm
Use with 12 knives	90 mm
Use without knives	-

Switching knife groups

When the desired switch position of the ball valves is set on the hydraulic manifold of the cutterbar, the selected knife groups can be swivelled in and out by the tractor's control device.

> Press the “INFO” button...

> ...until the “Pick-up/Knives” symbol is displayed.

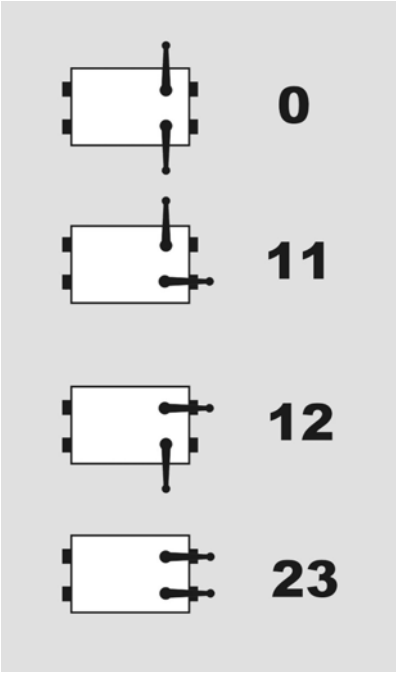
> Press the “GO” button...

> until the “Pick-up/Knives” symbol is selected on the display.

> Swivel the knives out with the control device.

Preselecting the knife group.

> Move the ball valves on the hydraulic manifold for the cutterbar into the desired position (to do this, open the right-hand side door).



> Switch the tractor on.

Switch on the AutoPlus-Pilotbox.

> Press the “ON/OFF” button.

> Press the “INFO” button...

> ...until the “Pick-up/Knives” symbol is displayed.

> Press the “GO” button...

> until the “Pick-up/Knives” symbol is selected on the display.

> Swivel the knives in with the control device.

The selected knife group swivels into the feed channel.

Insert the twine

Before the twine is inserted:

> Switch off the tractor's PTO shaft.
> Switch off the AutoPlus-Pilotbox.
> Switch off the tractor engine.
> Take out the ignition key.

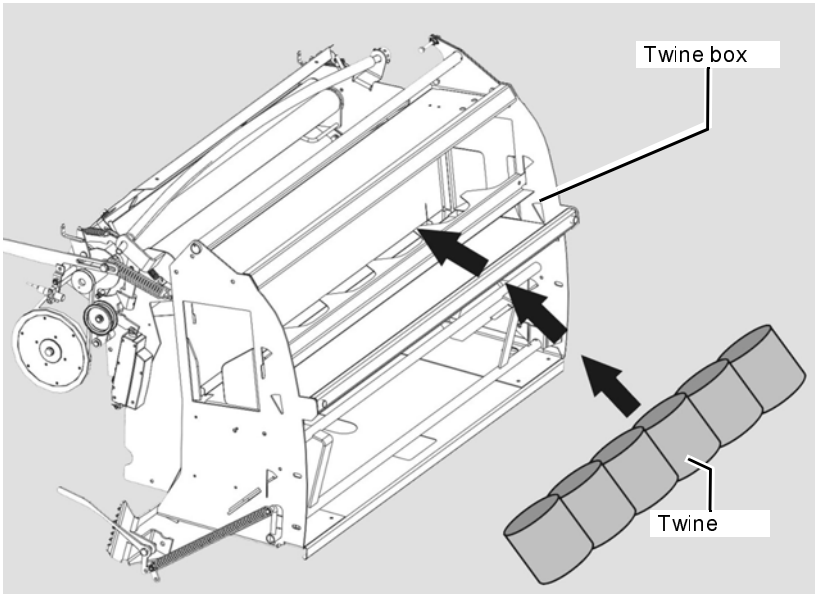
Wear protective gloves
The twine knife is very sharp. Always wear protective gloves when handling the knives. Failing to wear protective gloves can cause serious injuries.

> For trouble-free twine tying, a high value twine must be selected.

The following is recommended:
→ »Technical specifications«, page 27

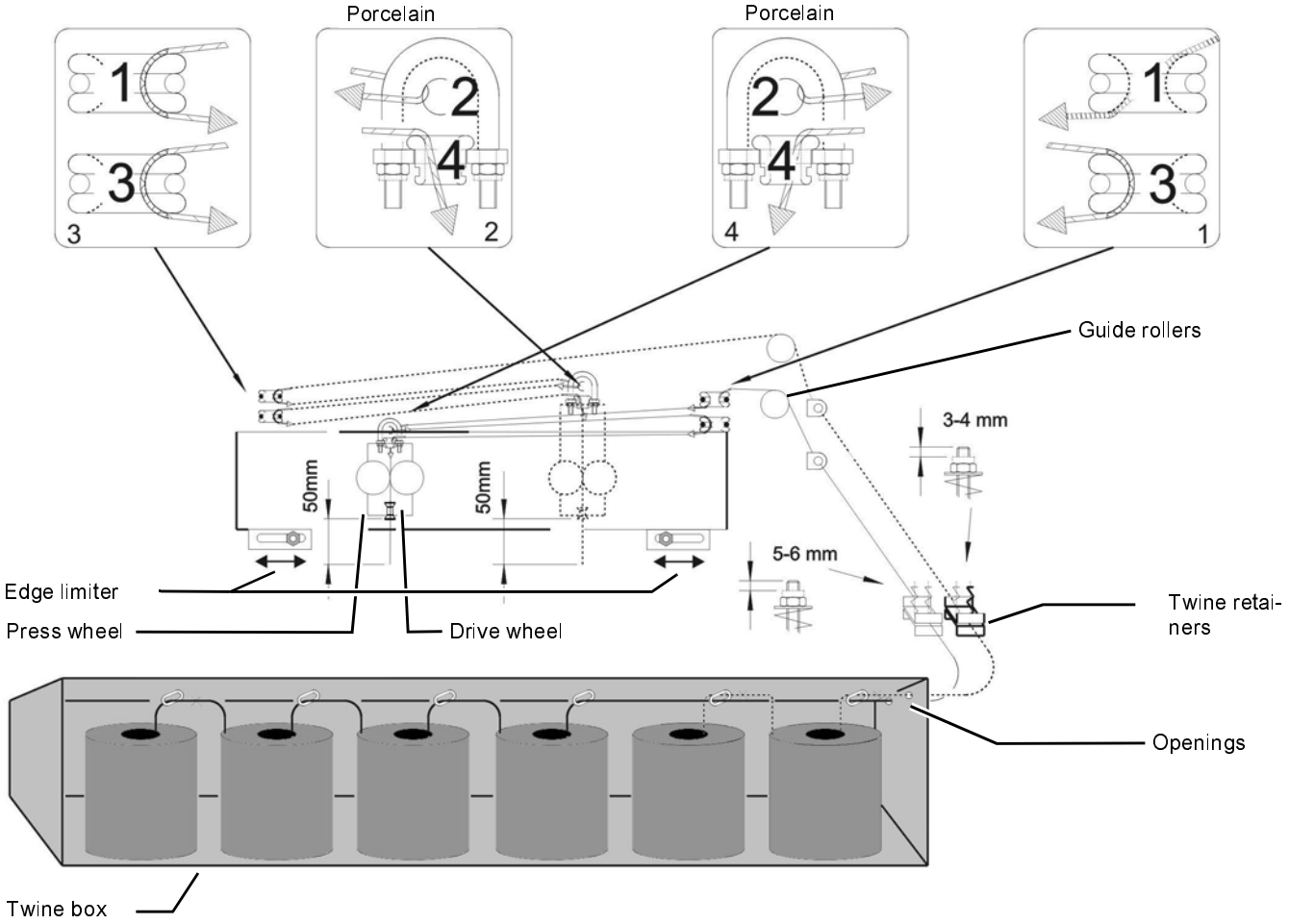
Inserting the twine spools

> Open the front cover.
> Insert five twine spools in the twine box.
> Open the right-hand side door.
> Place additional spools in the twine retainer.
> Close the side door and the front cover.



Twine guide

> Thread the end of the twine spool through the opening in the twine box.
> Thread the ends through the twine retainers.
> Thread each end through a porcelain eye.
> Position each end with a loop of approximately 90° over a guide roller.
> Thread the twine through the porcelain eye (see diagrams 2 and 4) on the frame, so it passes through the corresponding eyelets in ascending number order. Observe the numbering of the eyelets as per the stickers on the tying equipment.
> Thread the twine through the drive wheel and the press wheel (turn the press wheel and pull in the twine). Once threaded through the drive wheel/press wheel, thread the twine through a spring and then through a porcelain eye.
> Length of twine at the outlet: approx. 50 mm.



Tips and tricks: threading aid
As a threading aid, tie a cable tie around all twine ends and pull them through. After threading, remove the cable tie. Maintain the length of twine at the outlet of 50 mm.

After inserting the twine

After the twine is inserted, the following adjustments must be made:

- Adjusting the twine retainer.

→ »Adjusting the twine retainer«, page 104

- Adjusting the distance of the twine from the edge of the bale with the edge limiters.

→ »Twine on the edge of the bale«, page 104

Inserting the net

Before the net is inserted:

> Switch off the tractor's PTO shaft.

> Switch off the AutoPlus-Pilotbox.

> Switch off the tractor engine.

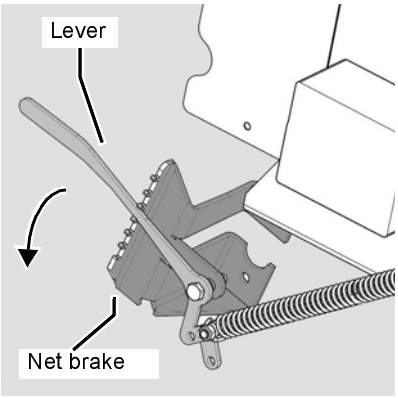
> Take out the ignition key.

Wear protective gloves
The cutting plate is very sharp. Wear protective gloves when working on it. Failing to wear protective gloves may result in serious injuries.

> For trouble-free net tying, a high value net must be selected.

The following is recommended:
→ »Recommended net«, page 30

Positioning the net roll

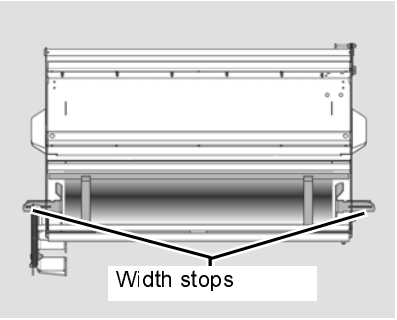


> Open the right-hand side door.

> Move the net brake lever fully downwards.

> Position the net roll in the net roll compartment.

> Check that the net unwinds in the correct direction.

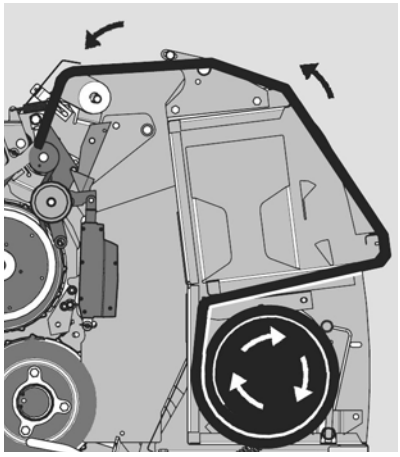


> If necessary, adjust the left and right-hand width stops for the net roll:

- Outer position for a 130 cm net roll.
- Inner position for a 123 cm net roll.

The net roll is centred.

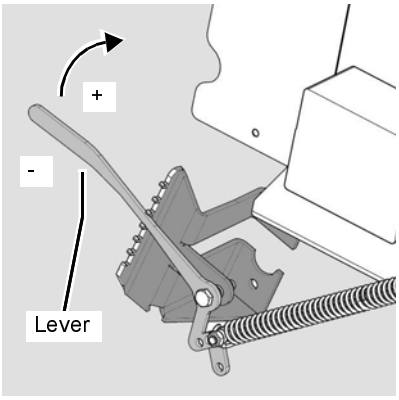
Feeding the net



> Feed the net as shown in the diagram.
> Position the start of the net uniformly over the upper roller and turn it by hand until the net is gripped by the roller (max. 2 cm).
> Close the cover.

NOTE Do not allow more than 2 cm of the start of the net to be pulled in by the roller.

Adjusting the net brake



> Adjust the net tension with the net brake lever.

The system is now ready for operation.

NOTE Net brake lever

- Move upwards: The net tension is increased.
- Move downwards: The net tension is reduced.

Operation

> Put the tractor's PTO shaft in neutral when operating.
- Check that all components are operating correctly.
- Ensure that no there are no unusual noises.

> Let the implement run at 540 rpm for one minute.

> Switch off the tractor's PTO shaft.
- Check that the components are securely tightened.

During the running-in period, special maintenance must be undertaken (see the maintenance table)
→ »Maintenance intervals«, page 89

Safety

Before you transport the implement on the road, please read the following safety instructions. Compliance is mandatory and will help you in avoiding accidents.

Observe safety instructions
Observe the safety instructions for the performance of all work. Any disregard for safety instructions can lead to serious or fatal injuries to persons.

Always switch off the AutoPlus-Pilotbox when working on the implement
Always switch off the pilot box when working on the implement. If the Pilotbox is switched on or starts inadvertently, unforeseen movements may be triggered on the implement. This can cause accidents with fatal consequences.

Adjusting the load-dependent brake
Before travelling on the road, check that the lever of the implement's load-dependent brake is adjusted to “Full load”. The braking efficiency changes. This can cause accidents. The consequence can be traffic accidents with serious or fatal injuries.

Cleaning the tractor and the implement before road transport
Before any road transport, clean the tractor and implement of any coarse dirt, remaining crops and clods of earth. Crops or dirt that drop onto the road can cause slippery road conditions. There is otherwise the risk of traffic accidents and accidents with fatal consequences.

Close the valves
Close all hydraulic couplings before any transport on public roads. If the valves are open, then the pick-up equipment may be lowered. There is otherwise the risk of traffic accidents and accidents with fatal consequences.

Observe the slewing range
The rear wheel of the tractor should not come into contact with the drawbar when cornering. This may happen during tight turning circles. Unsuitable driving behaviour can cause serious damage to the implement.

No bales in the bale chamber
Bales must not be transported in the bale chamber. Transporting bales will affect the steering, braking capability and driving behaviour of the tractor. Personnel may be injured or the implement may be damaged as a result.

Checking the hydraulic connections
Before use, check that all hydraulic connections are correctly connected to the tractor's single and double-acting control devices. Incorrectly connected hydraulic connections can cause the implement to move unexpectedly. There is otherwise the risk of serious or fatal injury.

Make sure the immediate vicinity is clear
Check the surrounding area of the implement before starting and continually during operation. Make sure the operator has an adequate view of the work area. Only begin work if the immediate vicinity is cleared of any persons or objects. There is otherwise the risk of serious or fatal injury.

No riding on the implement
Neither personnel nor objects are allowed to be transported on the implement at any time. Riding on the implement is hazardous and strictly prohibited. There is otherwise the risk of serious or fatal injury.

Ensuring road safety
The implement must conform to current national traffic regulations if you intend to drive it on public roads. Ensure:

- Lighting, warning and protective equipment is installed
- Compliance with the permissible transport widths and weights, axle loads, tyre loadbearing capacities, laden weights and national speed restrictions.
- Compliance with the maximum permissible road transport speed of 40 km/h.

If this is not complied with, the driver and keeper of the vehicle are liable.

General conditions

The transport position must be used for all transport on public roads. The following work steps are described in this section:

- Bring the implement into transport position.
- Raise the pick-up equipment.
- Empty the bale chamber.
- Wheels / Tyres.
- Adjust the compressed-air brake.
- Road travel check list.
- Road travel.

Move the implement into the transport position

When travelling on public roads or when stationary in the park position, the implement must be in the transport position. The following steps are necessary to bring the implement into the transport position:

- Raise the pick-up equipment to the highest position.
- Empty the bale chamber.
- Close the rear flap.

Raising the pick-up equipment

Before road transport, the pick-up equipment must be raised to the highest position.

> Switch the tractor on.

Switch on the AutoPlus-Pilotbox.

> Press the “ON/OFF” button.

> Press the “INFO” button...

> ...until the “Pick-up/Knives” symbol is displayed.

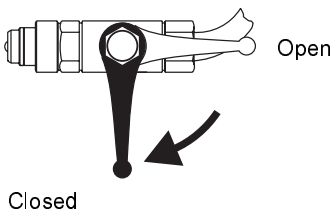
> Raise the pick-up equipment to the highest position with the control device.

Switch off the AutoPlus-Pilotbox.

> Press the “ON/OFF” button.

> Switch off the tractor and secure it.

> Close the ball valve for the pick-up equipment / knives.



Emptying the bale chamber.

Before road transport, the crop must be removed from the bale chamber. Proceed as follows:

If bale production is not possible, remove the remaining crop from the bale chamber.

> Carry out the »Cleaning the bale chamber« operating instructions, page 81.

If bale production is possible, release the bale.

> Carry out the »“MANUAL/AUTO” program changeover« operating instructions on page 67.

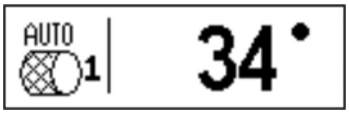
“MANUAL/AUTO” program changeover

The following operating modes can be selected with the AutoPlus-Pilotbox for net tying and twine tying:

- AUTO: Automatic start of bale tying

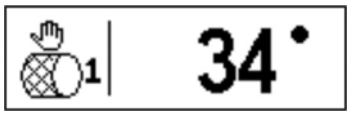
or

- MANUAL: Bale tying starts with the “GO” button



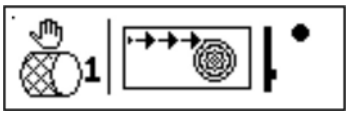
> The display shows automatic tying is active.

> Press the “MANUAL/AUTO” button:

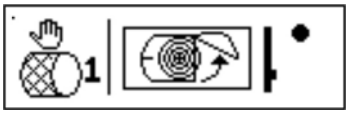


> The display shows manual tying.

> Press the “GO” button. Net tying is triggered.



> The display shows “tying start” during bale wrapping.



> The display shows “rear flap open” after successful bale wrapping and the cutting of the tying materials.

> Carry out the »Depositing the bale« operating instructions on page 79.

NOTE These operating instructions are also applicable for twine tying.

Wheels/tyres

Tyre pressure

> Check the tyre pressure.

→ »Wheels«, page 107

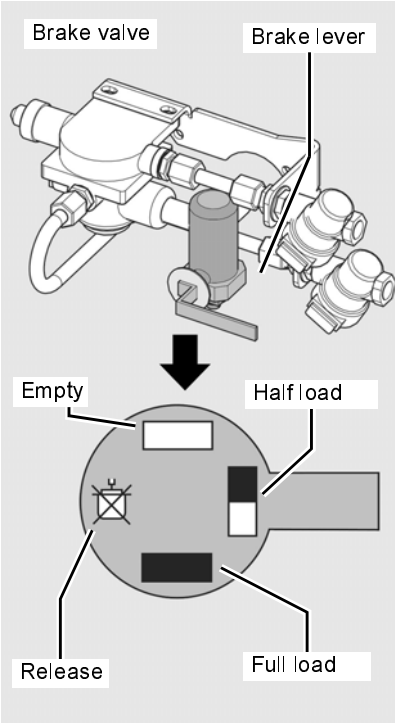
Tightening the wheel nuts

> Check that the wheel nuts are securely tightened.

→ »Tightening the wheel nuts«, page 106

Adjusting the compressed-air brake [+]

> The load-dependent compressed-air brake must be adjusted as follows for road transport: Move the compressed-air-brake brake lever [+] to the “full load” position.



Road travel check list

Prior to driving on the road check the implement against this check list:

- Rear flap completely closed?
- AutoPlus-Pilotbox off?
- Tractor control device in the neutral position?
- Tractor's PTO operation off?
- Stop valves closed?
- Tyre pressure correct?
- Remaining crop and coarse dirt removed?
- Lighting operating?
- Load-dependent brake set to the “Full load” position?
- Brake system correctly connected and checked?
- Are the cables, ropes and lines routed so that they are not straining and cannot interfere with the tractor's wheels when cornering?

Road transport

- Before starting off, check the immediate vicinity. Always ensure that there is an unimpeded view and pay particular attention to any children in the vicinity of the implement.
- Do not transport any personnel or objects on the implement.
- Always adjust your driving speed to the road conditions.
- Do not exceed a maximum speed of 40 km/h. Comply with the national speed limits.
- Ensure sufficient steering and braking capability. Driving behaviour, steering and braking capability are influenced by the implement that is coupled (longer braking distances due to greater thrust).
- There is a danger of tipping in precipitous places and if corners are taken too fast.

Safety

Observe safety instructions
Observe the safety instructions for the performance of all work. Any disregard for safety instructions can lead to serious or fatal injuries to persons.

Secure the tractor
Before you dismount: Switch off the tractor, take out the ignition key and secure the tractor against rolling away. An unsecured tractor may run you over or trap you. There is otherwise the risk of serious or fatal injury.

Securing the implement
Secure the implement against inadvertent starting and rolling away. Use wheel chocks. The implement must be standing on firm and level ground and, if necessary, must be supported during work. Unsecured or non-supported implements can cause accidents. There is otherwise the risk of serious or fatal injury.

Always switch off the AutoPlus-Pilotbox when working on the implement
Always switch off the pilot box when working on the implement. If the Pilotbox is switched on or starts inadvertently, unforeseen movements may be triggered on the implement. This can cause accidents with fatal consequences.

Do not upset the cardan shaft
The cardan shaft between the tractor and implement must not be jolted in any operating or transport position. Upset cardan shafts can cause damage to the implement and tractor.

Increases in pressure are prohibited
It is prohibited to increase the maximum working pressure setting for the bale density on the hydraulic block. Attempting to do so will render the warranty invalid and exempt the manufacturer from all liability. Damage may be caused to the implement.

General

The implement must be adjusted in the operating position. This is described in the following chapter:

- Baler check list.
- Adjust the baffle plate.
- Adjust the bale density.

Baler check list

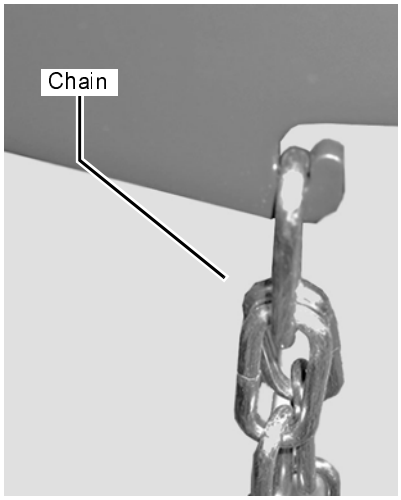
Before bale production, the following must be checked:

- Net inserted?
- Twine inserted?
- AutoPlus-Pilotbox on?
- Bale density set?
- Tractor PTO shaft switched on at a lower speed and brought to 540 rpm?
- Pick-up equipment adjusted to the correct height?
- Rear flap closed?
- Rear flap closed and pressure configured?
- Scraper set?
- Baffle plate set?

Setting the baffle plate

The baffle plate ensures that the crop feeds correctly. Especially short cut crops in windy weather.

Baffle plate



The baffle plate can be attached in different positions.

> Switch off the tractor and secure it.

> Support the baffle plate with one hand.

> Fit the chain on both sides of the implement in the required position.

> Release the baffle plate slowly.

NOTE The underside of the baffle plate should come into contact with the swath evenly.
Fit both chains at the same height. For improved pickup of the crop, an optional roller for the baffle plate is provided.
→ »Roller for baffle plate«, page 118.

Bale density adjustment

Increases in pressure are prohibited
It is prohibited to increase the maximum working pressure setting for the bale density on the hydraulic block. Attempting to do so will render the warranty invalid and exempt the manufacturer from all liability. Damage may be caused to the implement.

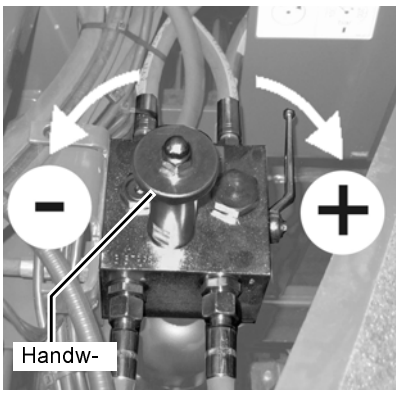
The bale density depends on the type of crop which must be formed into bales and also the set hydraulic pressure. The hydraulic pressure is obtained by closing the rear flap using the tractor's control device. The hydraulic pressure can be read using the pressure gauge. A maximum hydraulic pressure of 165 bar can be set.

NOTE The higher the hydraulic pressure, the denser and heavier the bale will be.

The prescribed pressure values in the table are standard values. The values actually required depend on the type of crop. These values may therefore vary.

Crop	Pressure (bar)
Very dry hay or dry straw	100 - 140
Moderately dry hay	150
Silage	160

NOTE If the set pressure is not achieved, it is possible that too little crop was gathered.



> Switch the tractor on.
> Open the rear flap via the control device.
> Switch off the tractor and secure it.
> Turn the handwheel on the hydraulic manifold to the right to increase the bale density.
> Turn the handwheel on the hydraulic manifold to the left to reduce the bale density.
> Switch the tractor on.
> Close the rear flap via the control device.
> Leave the control device lever in the position for closing the rear flap for approximately 3 seconds to allow the pressure to build up for the default bale density.
> Check the pressure with the pressure gauge.

The set hydraulic pressure is displayed on the pressure gauge.

Safety

Observe safety instructions
Observe the safety instructions for the performance of all work. Any disregard for safety instructions can lead to serious or fatal injuries to persons.

No riding on the implement
Neither personnel nor objects are allowed to be transported on the implement at any time. Riding on the implement is hazardous and strictly prohibited. There is otherwise the risk of serious or fatal injury.

There should be no personnel standing in the working area
No-one is permitted to remain within the working area. Personnel can be caught by the implement. There is otherwise the risk of serious or fatal injury.

Maximum cardan shaft speed 540 rpm
The cardan shaft speed must not exceed 540 rpm and has to be adapted to the condition of the crop. Higher speeds can cause damage to the implement.

Do not upset the cardan shaft
The cardan shaft between the tractor and implement must not be jolted in any operating or transport position. Upset cardan shafts can cause damage to the implement and tractor.

Note the contour of the terrain
Pay even more attention when driving on an incline. Avoid inclines on which the combination (tractor and implement) could slip or overturn. There is an increased risk of tipping and injury if the implement is towed in a direction offset in relation to the direction of the slope.

Swivelling the knives in and out

The cutting length depends on the number of knives. When all of the knives are connected, the crop is cut on the OptiCut 14 to a length of 70 mm by 14 knives, and on the OptiCut 23 to a length of 45 mm.

The knives can be swivelled in and out:

- Swivelling in the knives: The knives swivel into the feed channel and cut the crop.
- Swivelling out the knives: The knives swivel out of the feed channel.

Switch on the AutoPlus-Pilotbox.

> Press the “ON/OFF” button.

> Press the “INFO” button...

> ...until the “Pick-up/Knives” symbol is displayed.

> Press the “GO” button...

> until the “Pick-up/Knives” symbol is selected on the display.

> The knives swivel in or out using the control device on the tractor.

Adjusting the tying

Different adjustments can be made for net and twine tying via the AutoPlus-Pilotbox. This depends on the implement equipment.

Switch on the AutoPlus-Pilotbox.

> Press the “ON/OFF” button.

> Press the “NET/TWINE” button until the desired tying setting is selected.

The following tying types can be selected:

Display	Tying program	Wraps
Twine tying 	**1**	**18**
Twine tying 	**2**	**22**
Twine tying 	**3**	**26**
Net tying [+] 	**1**	**2**
Net tying [+] 	**2**	**3**
Net tying [+] 	**3**	**4**
Twine + Net tying [+] 	**1 twine 1 net**	**18 twines 2 nets**

Driving

Maximum cardan shaft speed 540 rpm
The cardan shaft speed must not exceed 540 rpm and has to be adapted to the condition of the crop. Higher speeds can cause damage to the implement.

Please observe the following instructions when using the implement:

- The tractor's PTO shaft must be switched on.
- The working speed should be adjusted to the crop: between 4 and 15 km/h.

Switch on the tractor's PTO shaft

Only engage the tractor's PTO shaft at a low engine speed.

> Switch on the tractor's PTO shaft.
> Adjust to 540 rpm.
> Lower the pick-up equipment via the control device.

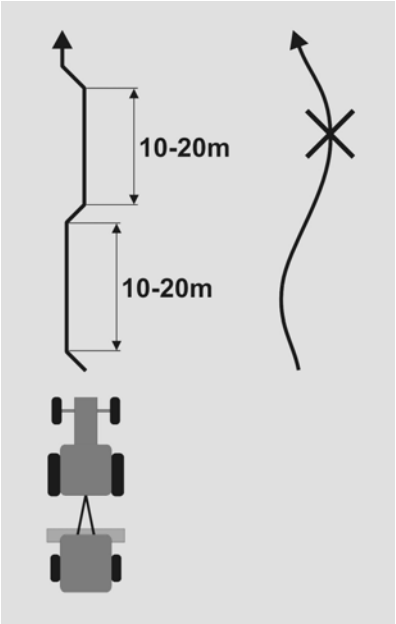
Ground speed

Driving at a suitable ground speed ensures that the crop is collected uniformly and constantly.

> Adapt the drive speed to the:

- Quantity of crop,
- Volume of the swaths,
- The soil condition.

Driving pattern



The driving pattern is critical for the quality of the bale shape. Ensure that the crop is picked up in a uniform manner. Where there are narrow swaths, do not swing backwards and forwards over the swath but drive as shown in the diagram.

> Steer the implement so that the swath is guided into the pick-up equipment alternately to the left and the right.

This ensures that the bale chamber is filled optimally.

> Check the filling process on a regular basis.
> When there is a visual or manual signal from the AutoPlus-Pilot-box, the tying must be started manually or it starts automatically.

→ »Initiating tying«, page 77.

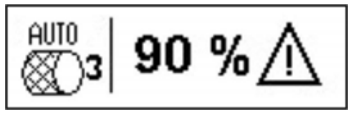
Initiating tying

The crop can be tied automatically or manually. Tying can be performed either by net or twine. The tying cycle starts when the preset bale density is reached.
→ See also »Bale density adjustment« on page 72.

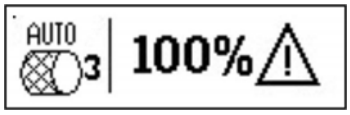
Automatic tying

When the preset bale density is reached, a signal sounds and “Start tying” is shown on the display of the AutoPlus-Pilotbox.

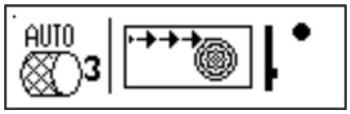
> The AutoPlus-Pilotbox signal sounds.



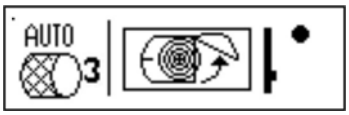
> “Bale density 90%” is displayed.



> “Bale density 100%” is displayed.
> Stop the tractor immediately.



> “Start tying” is displayed.



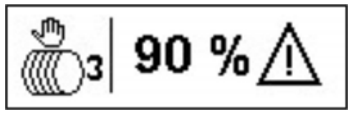
> The display shows “Open rear flap” after successful bale wrapping and cutting of the tying material.

> Carry out the »Depositing the bale« operating instructions, page 79.

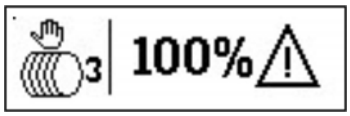
Manual tying

For manual tying, a signal is emitted by the AutoPlus-Pilotbox when the preset bale density is reached. A filling level of 90% is displayed on the AutoPlus-Pilotbox at the same time. As soon as 100% bale density is reached, proceed as follows:

> The AutoPlus-Pilotbox signal sounds.

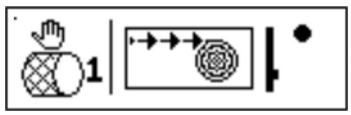


> “Bale density 90%” is displayed.

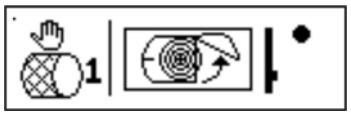


> “Bale density 100%” is displayed.
> Stop the tractor immediately.

> Press the “GO” button. Net or twine tying is triggered and the signal stops.



> The display shows “tying start” during bale wrapping.



> The display shows “Open rear flap” after successful bale wrapping and cutting of the tying material.
> The AutoPlus-Pilotbox signal sounds.
> Carry out the »Depositing the bale« operating instructions, page 79.

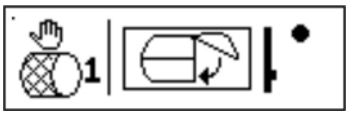
NOTE These operating instructions are also applicable for twine tying.

Depositing the bale

Deposit the bale on level ground
Always deposit the discharged bale on a flat surface. Never deposit the bale on a slope. The deposited bale must not keep moving uncontrollably as a result of its weight and ejection speed. A rolling bale can result in damage or serious or fatal injuries.

Distance from the rear flap
Maintain a safe distance from the rear flap. Ensure that there is nobody in the area of the rear flap. The rear flap can open by itself, causing the bale to roll out of the bale chamber. Serious or fatal injury can be the result.

NOTE When the bale is not deposited in the stop position, raise the pick-up equipment and move to the depositing location.



> Open the rear flap via the control device.

The bale is discharged.

> “Open rear flap” is displayed.

> Close the rear flap via the control device.

→ »Closing the rear flap«, page 46.

> Leave the control device lever in the position for closing the rear flap for approximately 3 seconds to allow the pressure to build up for the default bale density.

Pick-up equipment

Maintain a safe distance from the rotating pick-up equipment. You may be caught by the rotating tines and pulled into the implement. Serious or fatal injury can be the result.

Never try to pull the crop out of the rotating pick-up equipment or push it in. This could otherwise result in serious injury.

Pick-up equipment working height

The correct working height depends on the nature of the ground and the crop.
Always set the two retainers on the sides of the pick-up equipment to the same working height.
→ »Adjusting the roller feelers«, page 47

Baffle plate working height

The baffle plate ensures that the crop feeds correctly. Particularly in the case of close-cut crop.
The baffle plate can be attached in different positions:

- Minimum crop: near to the tine tracks.
- Maximum crop: Further away from the tine tracks.

→ »Setting the baffle plate«, page 71

After the first bale

After the first bale is ready, check the following settings and adjust them if necessary:

- Bale density

→ »Bale density adjustment«, page 72

- Bale tying

→ »Adjusting the tying«, page 75

Finishing bale production

At the end of the operation:

- The last bale must be wrapped.
- The last bale is discharged.
- The rear flap is closed.
- The tractor's PTO shaft is switched off.
- The AutoPlus-Pilotbox is switched off.
- The pick-up equipment is raised completely.
- The ball valve for the pick-up equipment is closed.
- All the doors and openings are closed and locked.

NOTE When producing bales out of old bales, ensure that:

- There is no net left on the bale remains.
- The crop is uniformly distributed on the field to avoid overloading the pick-up equipment or the cutterbars.

Cleaning the bale chamber

Never perform operations whilst the implement is running
Actions should not be carried out on the implement while it is running. Objects or personnel can be caught, drawn in or crushed. There is otherwise the risk of serious or fatal injury.

The tractor's PTO shaft continues turning after it has been switched off
After the tractor's PTO shaft has been unhitched or disconnected the implement continues running due to inertia. Maintain a safe distance until the pick-up equipment and all moving parts have come to a complete standstill.

The bale chamber must be emptied before it is transported on the road. When there is not enough crop to produce a bale, proceed as follows.

> Open and secure the rear flap.

→ »Opening the rear flap«, page 46.

> Remove any crop and crop residues from the bale chamber.

> Close the rear flap.

→ »Closing the rear flap«, page 46.

Safety

The following applies to all cleaning and care work:

Observe safety instructions
Observe the safety instructions for the performance of all work. Any disregard for safety instructions can lead to serious or fatal injuries to persons.

Securing the implement

- Before starting the cleaning work, always switch off the cardan shaft and lock it out against accidental operation.
- Secure the implement against rolling away by using wheel wedges.
- The implement must be standing on firm and level ground and, if necessary, must be supported during work.

Unsecured or non-supported implements can cause accidents.

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 with grease can corrode. After each cleaning process, lubricate the bearing points and grease the bare parts.

Clean the bearings and hydraulic parts carefully
Caution when cleaning with a high-pressure cleaner. Bearings, seals and pipe unions are not waterproof. Avoid damaging the implement; the bearings, seals and pipe unions must not come into direct contact with the high pressure water jets.

Do not clean the electrical parts with high pressure
Do not clean the AutoPlus-Pilotbox, control box and electrical plug connections with a high pressure cleaner. Moisture or water in electronic devices can lead to leakage current, which results in malfunction. Damage may be caused to the implement.

Cleaning

Cleaning is performed with a high-pressure cleaner, with the exception of the bearings and piston rods of the hydraulic cylinders and electrical parts.

> After each use, remove any coarse dirt and crops from the implement.

After cleaning

After cleaning:

> Lubricate all of the bearings.

Care

The implement will be completely ready to be used in the next season if the following instructions are observed:

> applying a protective layer of oil to all bright work tools. Only use approved, biodegradable oil: rapeseed oil, for example.

> Repair any paint damage.

> Check safety stickers and replace or add as required.

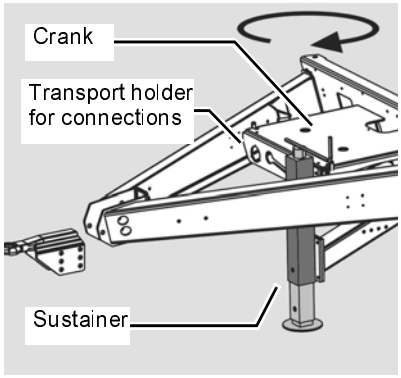
Safety

When setting down and parking the implement, special safety precautions must be observed:

Observe safety instructions
Observe the safety instructions for the performance of all work. Any disregard for safety instructions can lead to serious or fatal injuries to persons.

The implement is not a toy
Children are forbidden from playing on or around the implement. The parking area must be selected so that it is not immediately accessible to unauthorised persons. Metal edges and work tools of the implement can cause serious injury.

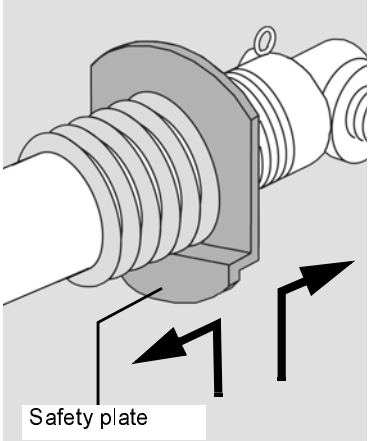
Uncoupling and securing the implement



Uncouple the implement in the reverse order to coupling.

> Stop the implement on dry, firm and level ground.
> secure the tractor in such a way that it cannot roll forwards or backwards.
> Disconnect the hydraulic couplings and secure the drawbar in the transport holder.
> Disconnect the lighting plug and insert it into the transport holder for connections on the drawbar.
> Disconnect the AutoPlus-Pilotbox plug and insert it into the transport holder.
> Store the twine box in the AutoPlus-Pilotbox.
> Lower the sustainer.
→ Reverse sequence of the »Raising the sustainer«, page 38.
> Remove the safety splint from the bolt.
> Remove the bolt from the sustainer.
> Lower the sustainer and secure with bolts and safety splints.
> Secure the implement with wheel chocks.

After the end of the season



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

- Loosen the pick-up equipment spring.

→ See »Adjusting the pick-up equipment«, page 48.

- Lower the pick-up equipment.
- Remove the remaining twine/net.
- Clean the implement.
- Repair any paint damage.
- Check safety stickers and replace or add as required.
- Check all the screw joints and tighten the screws.
- Lubricate the implement in accordance with the lubrication schedule.
- Check the tyre pressure.

Safety

The following applies to all servicing work:

Observe safety instructions
Observe the safety instructions for the performance of all work. Any disregard for safety instructions can lead to serious or fatal injuries to persons.

Prerequisites 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.

Use **OEM (original equipment manufacturers) replacement parts**
Many components have special properties that are decisive for the stability and operability of the implement. Only spare and wear parts supplied by the manufacturer have been tested and cleared. Using other products may lead to malfunctions or reduce safety of operation. The use of non-OEM replacement parts renders the manufacturer's guarantee null and void and frees the manufacturer from all liability.

Protect the device from unintended start-up
The following conditions must be observed for carrying out repairs and maintenance work and rectifying malfunctions on the coupled implement:

- Switch off the tractor's PTO shaft.
- Switch off the AutoPlus-Pilotbox.
- Switch off the tractor engine.
- Take out the ignition key.

Severe accidents can result if the device starts inadvertently.

Protective measures when handling oils or lubricants

Additives in oils and lubricants may have adverse health effects. As marking in accordance with the hazardous goods ordinance 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.

Never use oils for cleaning
Never use oils or lubricants to clean your hands. Burrs and grit in these materials can result in injuries.

Change contaminated clothing
Change any clothing that is heavily contaminated with oil as soon as possible. Oils can cause damage to the health.

NOTE

- Used oil must be collected and disposed of.
- If any major physical damage occurs through oils or lubricants, seek the help of a medical practitioner immediately.

General conditions

This information relates to general servicing work. For all servicing work, the implement must be locked in operating position. If transport position is required for maintenance work, you will find appropriate information for the maintenance work.

Direction specifications

The direction specifications (right, left, front, rear) are meant in relation to the direction of travel.
Rotary direction is defined as follows:

	Description
 Rotary direction right	clockwise
 Rotary direction left	counter-clockwise
 Rotation about the vertical axis	viewed from top to bottom
 Rotation about the horizontal axis	at right-angles to the direction of travel viewed from left to right
Rotation of screws, nuts and suchlike	always viewed from the actuation face

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.
Lubricating	One or two presses of the grease gun, if not stated otherwise
Oiling	If not specified otherwise, use only plant-based oils, such as rapeseed oils. Used oil will endanger your health and in addition its use is strictly prohibited
Replacement	Replace the appropriate part in accordance with the directive in the section Maintenance
Inspection	Check as required the tyre pressure, adjusting dimensions and seal tightness, and replace any worn parts or seals
Observe the maintenance intervals	The specifications relate to an average usage of the implement. 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 production) shorter maintenance intervals are possible

Maintenance intervals

Before starting any maintenance work, carry out the following steps:

> Empty the bale chamber.
> Clean the implement before the repair work.
> Switch off the AutoPlus-Pilotbox.
> No work must be performed on the implement when it is operating.
> Switch off the tractor's PTO shaft.
> Switch off the tractor engine and remove the ignition key.
> Clean the implement with compressed air.

	At the start of the season	After the first 250 bales	After 500 bales	Every 500 bales or daily	Every 50 operating hours or every 3,000 bales	Every 10,000 bales	Grease	Oil,	Inspection	Replace	Clean	Sharpen	Page
»Screw connections«													
»Tightening screws«		•							•				91
»Special torques«		•							•				91
»Cardan shaft«													
»Lubricating the cardan shaft«	•			•			•						94
»Pick-up equipment and rotor«													
»Pick-up equipment, overload coupling, OptiCut and rotor«				•			•						95
»Rotor cutterbar«				•			•						95
»Pick-up equipment tines«	•		•						•				96
»Pick-up equipment and rotor«	•		•	•				•					95
»Adjusting the pick-up equipment chain tension«	•	•		•					•				96
»Chain lubrication«	•	•	•	• 2x					•				97
»OptiCut cutterbar maintenance«													
»Sharpening the knives«	•			•								•	98
»Bale chamber«													
»Hydraulics«	•					•							100
»Setting scrapers«		•	•						•		•		101
»Main roller drive«				•				•					102
»Front roller drive«	•			•			•						102
»Rear flap roller drive«	•			•			•						102
»Gear box«													
»Checking the oil level«	•				•				•				103
»Filling the gear box«					•	•		•		•			103
»Adjusting the twine wrapping«													

	At the start of the season	After the first 250 bales	After 500 bales	Every 500 bales or daily	Every 50 operating hours or every 3,000 bales	Every 10,000 bales	Grease	Oil,	Inspection	Replace	Clean	Sharpen	Page
»Adjusting the twine retainer«					•				•				104
»Twine on the edge of the bale«					•				•				104
»Adjusting the scraper chain«					•				•				104
»Adjusting the net wrapping«													
»Adjusting the scraper chain«	•					•			•				105
»Net feed roller tension«	•					•			•				105
»Adjusting the net brake«	•				•				•				62
»Wheels«													
»Tightening the wheel nuts«	•	•			•				•				106
»Tyre pressure«	•			•					•				107
»Brakes«													
»Lubricating the brake axle«	•			•			•		•				108
»Hydraulic brakes«	•			•					•				108
»Adjusting the wheel brake«	•			•					•				109
»Drawbar«													
»Trailer ring«	•		•				•						110
»Swivelling drawbar eye«	•		•				•						110
»Lubricating the sustainer«	•						•						111
»Sensors«													
»Net roller sensor«	•			•					•				112
»Twine guide sensor«	•			•					•				113
»Net roller sensor«	•			•	•				•				113
»Hydraulics«													
»Hydraulic tubes«	•				•				•				100
»Accumulator technology«	•								•				101
»Hydraulic couplings«	•								•				100

Screw connections

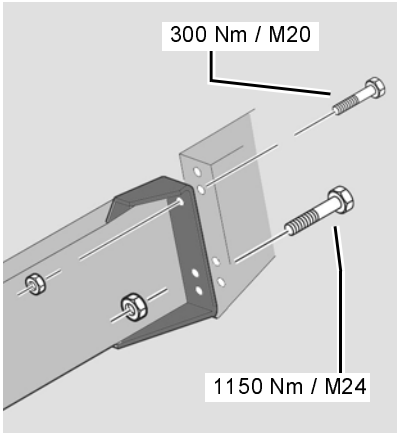
Tightening screws

All screws and nuts have to be retightened:

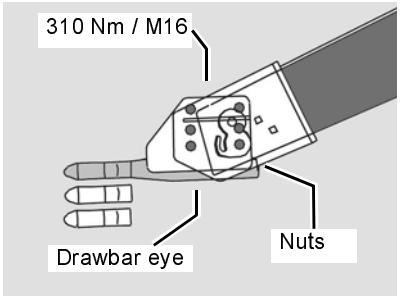
- After the first 5 operating hours, and
- according to the frequency of use,
- but at least once a season.

Special torques

Take heed of the special tightening torques for the following screw connections:



- Top screw on the drawbar: 300 Nm.
- Bottom screw on the drawbar: 1150 Nm.



- Screws on the drawbar eye: 310 Nm.

Torque for screw connections

All other screw connections are to be tightened according to the table below. On this implement screws with a minimum quality of “8.8” (read off the screw head) are used.

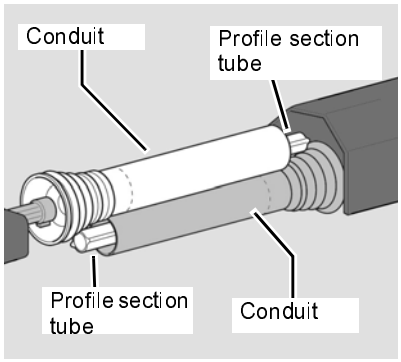
Thread	Torque value			Spanner size*
	8.8	10.9	12.9	
	Nm			mm
M3	1.3	1.8	2.1	6
M4	2.9	4.1	1.9	7
M5	5.7	8.1	9.7	8
M6	9.9	14	17	10
M8	24	34	41	13
M10	48	68	81	17 (15)*
M12	85	120	145	19 (17)*
M14	135	190	225	22 (19)*
M16	210	290	350	24 (22)*
M18	290	400	480	27
M20	400	570	680	30
M22	550	770	920	32
M24	700	980	1180	36
M27	1040	1460	1750	41
M30	1410	1980	2350	46
M33	1910	2700	3200	50
M36	2450	2546	3063	55
M39	3200	4500	5400	60

* Values in brackets: Wrench size for locking screws and nuts with toothed flange.

NOTE

- The values listed apply to dry or lightly lubricated connections.
- Galvanised screws and nuts must not be used without grease.
- When using stiff grease, the relevant values must be reduced by 10%.
- When using locking screws or lock nuts, the value in the table must be increased by 10%.
- The torque value of the wheel nuts is 290 Nm.

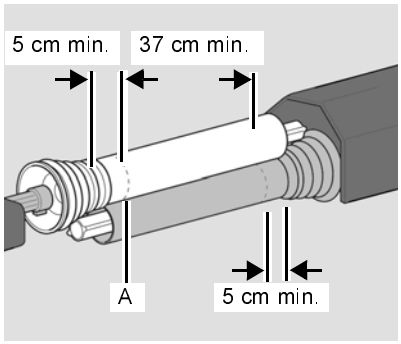
Cardan shaft



The length of the cardan shaft has been selected at the factory so that it fits almost all types of tractor. Only in exceptional cases is a correction of the cardan shaft length required on individual tractors. The cardan shaft length must be checked in the following way before first use:

Switch off the tractor
Perform all work only with the engine switched off and the implement at a standstill. Remove the ignition key. An accidentally switched on cardan shaft can cause very serious injuries.

Checking the length



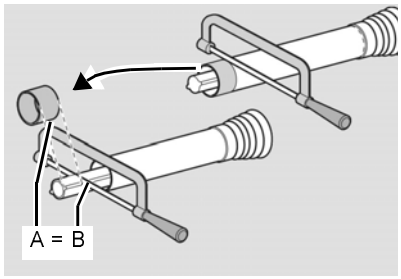
Correct length
A cardan shaft which is too long must not be used. This damages the drive bearings on the tractors and implements. The use of a cardan shaft which is too long renders any warranty and guarantee claims null and void.

Before coupling, check the length of the cardan shaft:

> Correct alignment and connection of the tractor and the implement.
> Check that the tractor drawbar eye is clean and lubricated.
> Fit both universal drive shaft halves (do not connect!)
> Hold both universal drive shaft halves together and check that

- The protective tube must be at least 5 cm shorter,
- The overlap of the profile pipes for the drive must be at least 37 cm.

Shortening the cardan shaft



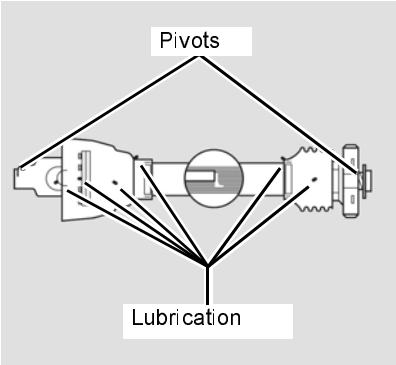
On the tractor side, the cardan shaft has a wide angle joint with an angle of up to 80°. Make sure that the cardan shaft is not damaged during tight turns.

> Determine the correct shaft length.
> Shorten the protective tube.
> Shorten the profile pipes for the drive.

The ends must both be cut to the same length.

> Deburr and clean the raw edges of the protective tubes and profile pipes to ensure that they are smooth and neat.

Lubricating the cardan shaft



All of the fittings for lubrication must be greased after they have been cleaned with the high-pressure cleaner.

The manufacturer's own operating manual is attached to each cardan shaft. This includes detailed information on the relevant version of the cardan shaft and must be observed.

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

6 lubrication points are located on the cardan shaft pipe.

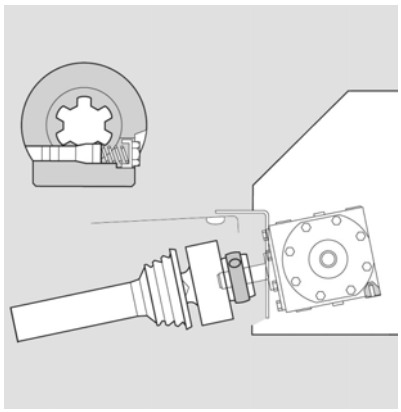
> Remove the cardan shaft.
> Lubricate the cardan shaft lubrication points every 500 bales.
> Lubricate the 2 pivots on the cardan shaft well before putting the implement into operation.
> After every 500 bales, check that the cardan shaft pipe is sufficiently lubricated.

General conditions

Use oil and grease:

Grease / Oil	Specification
Oil,	Class NLGI2, K2k in accordance with DIN51825
Grease	Universal

Slip clutch OptiCut and rotor

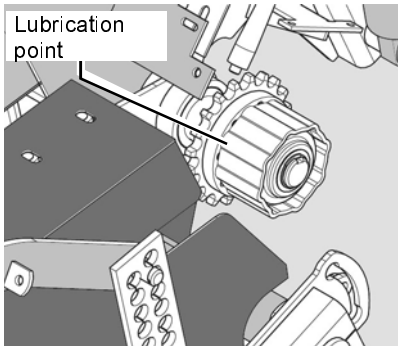


No maintenance necessary.

Pick-up equipment and rotor

NOTE Working with the grease gun
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. This will allow foreign bodies to enter the bearing, resulting in premature wear.

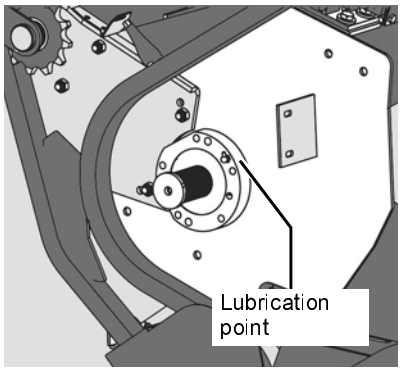
Pick-up equipment, overload coupling, OptiCut and rotor



Raise the pick-up equipment to the highest position.

> Lubricate the lubrication points.

Rotor cutterbar



> Always lubricate the lubrication points for the cutterbar rotor after 500 bales.

Pick-up equipment chain wear

The pick-up equipment chain must be replaced when the chain tensioner is just in front of the end stop.

> Measure the pick-up equipment drive chain and replace if necessary.

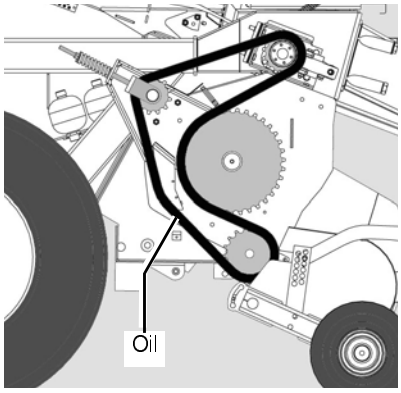
Pick-up equipment tines

The pick-up equipment tines are wear parts.

> Check the condition and completeness of the pick-up equipment tines:
- After every working day.
- At the start of the cutting season.

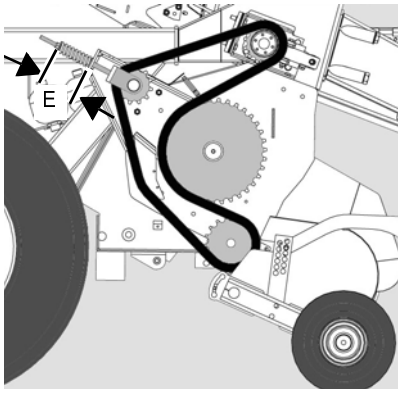
> If necessary, replace bent or broken tines.

Lubricating the pick-up equipment drive chain



> Loosen the chain tensioner.
> Oil the chain.
> Tension the chain tensioner.
→ »Adjusting the pick-up equipment chain tension«, page 96

Adjusting the pick-up equipment chain tension



The chain tensioner for the pick-up equipment is located on the left-hand side of the implement. The chain tension is adjusted as follows:

> Turn the nut until the spring reaches a length (E) of 140 mm.

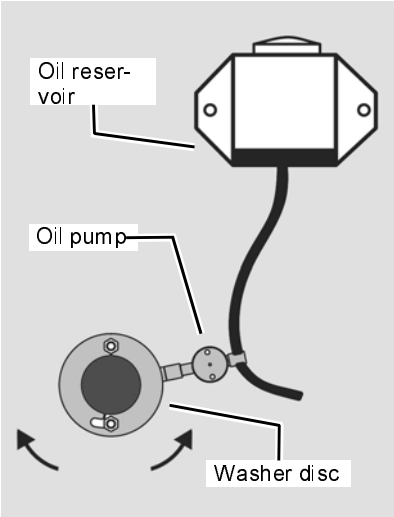
Chain lubrication

When the implement is equipped with the “automatic chain lubrication [+]” supplementary equipment, the chains will be supplied with the correct amount of oil by this system. The oil level in the reservoir must be checked every day.

.

In the absence of this supplementary equipment, the bale chamber chains must be lubricated with chain lubricant several times a day or every 200 bales, depending on which occurs first.

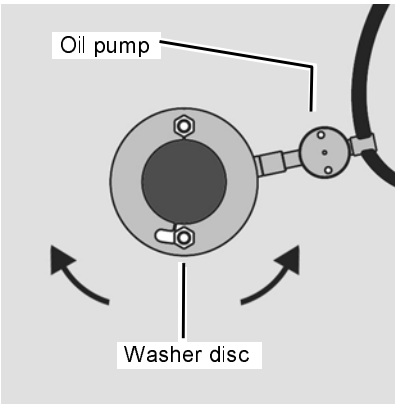
Filling



> Open the left-hand side door.
> Check the oil level.
> Fill the oil level up to 3.5 litres maximum.
> Close the left-hand side door.

Grease / Oil	Specification
Oil,	SAE 30 BIO oil

Adjusting the oil pump



> Release the nuts on the washer disc.
> Turn the washer disc:
- Clockwise to increase the conveying capacity.
- Counter-clockwise to reduce the conveying capacity.

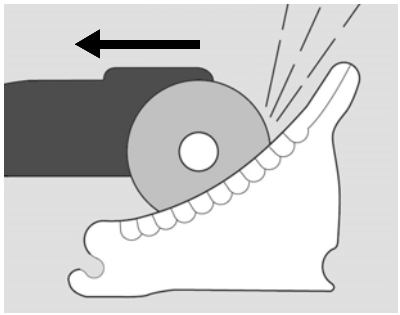
> Tighten the nuts on the washer disc.

OptiCut cutterbar maintenance

Wear protective gloves
The knives are very sharp. Always wear protective gloves when handling the knives. Failing to wear protective gloves may result in serious cutting injuries.

Wear protective goggles
Always wear protective goggles when sharpening knives. Flying debris can cause serious injuries.

Sharpening the knives

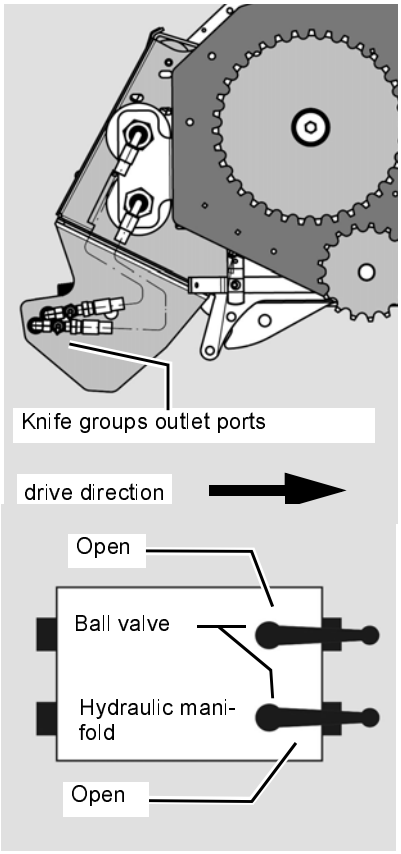


Remove the knives when sharpening. Grind the knives on the flat rubber side after every 500 bales or daily. Do not grind the serrated cutting edges. Check that the knives are still sharp enough every day.

To do this, the following work steps are required:
→ »Removing the knives«, page 50.
> Clamp the knife in a vice.
> Grind the smooth side of the knife using a grinding unit.
→ »Fitting the knives«, page 51.

NOTE
- The knives must be not become hot during grinding. High temperature weakens steel. Repeatedly applying the grinding units is more gentle than continuous grinding.
- The manufacturer provides a knife sharpener as an accessory.

Bleeding the hydraulic system



The hydraulic system for switching the knife groups of the OptiCut 23 HydroProtected is bled when:

- the cylinders are replaced or
- the OptiCut cutterbar is modified.

The outlet ports for the hydraulic system are located on the right-hand side of the pick-up equipment. To do so, you need a hydraulic test hose and a suitable flat catch pan for hydraulic oil.

Proceed as follows:

> Observe the safety instructions »Hydraulics«, page 100.
> Switch off the tractor's PTO shaft.
> Fit the hydraulic test hose to the outlet port of a knife group.
> Hang the end of the hydraulic test hose into a flat catch pan and secure against unforeseen movements caused by a build-up of pressure.
> Open both ball valves on the hydraulic manifold for the knife group switching on the left-hand side of the implement.
> Switch the tractor on.

Switch on the AutoPlus-Pilotbox.

> Press the “ON/OFF” button.

> Press the “INFO” button...

> ...until the “Pick-up/Knives” symbol is displayed.

> Press the “GO” button...

> until the “Pick-up/Knives” symbol is selected on the display.
> Leave the lever on the tractor's control device in the position for swivelling in the knife for approximately 5 seconds so that the air can escape from the hydraulic system.
> Remove the hose.
> Check the oil level in the hydraulic tank.

Repeat the whole process for the other knife group.

NOTE You can procure a hydraulic test hose from your dealer.

Hydraulics

High pressures in the hydraulic system
The hydraulic system is under high pressure. Regularly check all pipes, hoses and bolted connections for leaks and externally visible damage. Only use suitable tools when looking for leaks. Eliminate damage immediately. Escaping fluid may result in injuries and fires. Seek medical attention immediately if injuries occur.

Clean hydraulic system
Close or disconnect the hydraulic coupling with great care. Remove any dirt or air which has entered the hydraulic system. The hydraulic system can be seriously damaged. Material damage and injuries to personnel may be caused.

Hydraulic lines
Replace any worn, cut, chafed, pinched or other damaged hydraulic lines as well as worn tubes immediately. Broken or defective tubes can cause the implement to move unexpectedly and uncontrollably and may cause serious injury to personnel or damage to the implement. There is otherwise the risk of serious or fatal injury.

Be careful when welding
Do not perform any welding work in the vicinity of the hydraulic tubes. Hydraulic oil can burst into flames very easily.

Hydraulic system at zero pressure
Work must only be performed on the hydraulic system if the tractor and implement hydraulic system is at zero pressure. A pressurised hydraulic system can trigger unforeseen movements on the implement and can cause serious damage and injuries. There is otherwise the risk of serious or fatal injury.

Hydraulic tubes

Hydraulic tubes can age without this being externally visible. Replace hydraulic tubes every six years. Check the hydraulic tubes on a regular basis.

> Hydraulic system at zero pressure.
> Switch off the engine.
> Replace hydraulic tubes.

Hydraulic couplings

Check the hydraulic couplings on a regular basis.

Accumulator technology

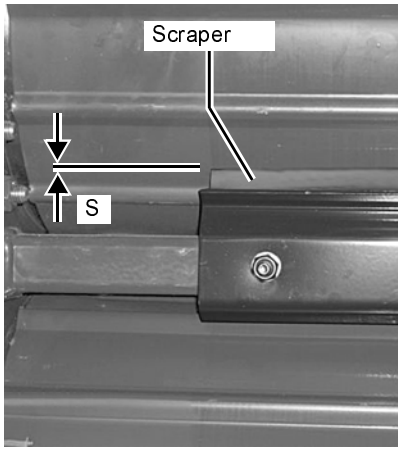
A pressure device is used in the hydraulic system (accumulator bladder).

All repair work, maintenance and commissioning must only be performed by a repair specialist. Only touch the pressure device when it is cold. The nitrogen must only be filled by a repair specialist with suitable special tools.

No changes to the pressure devices
No changes must be made to the pressure devices by means of welding, drilling or any other measures. Opening by force is not permitted.

Bale chamber

Setting scrapers

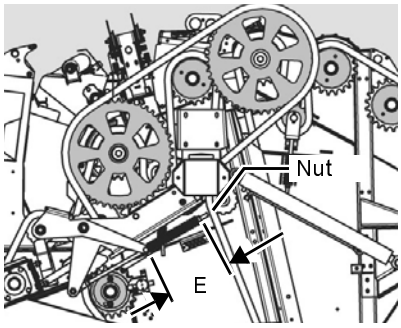


The default setting is 1 mm.
When twine accumulates on the scraper, reduce the distance between the roller and the scraper. The individual scraper must make direct contact.

> Loosen the screws on the scrapers.
> Set the scrapers.
> Adjust the distance S to 1 mm and tighten the scraper screws.

Adjusting the roller drive chains

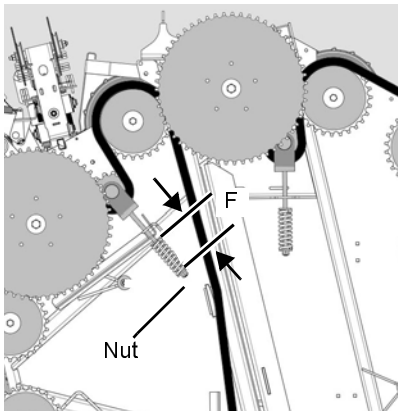
Main roller drive



The chain tensioner for the main roller drives is located on the left-hand side of the implement.
The chain tension is adjusted as follows:

> Turn the nut until the spring reaches a length (E) of 235 mm.

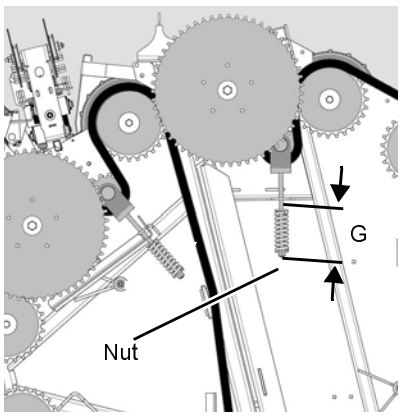
Front roller drive



The chain tensioner for front roller drives is located on the left-hand side of the implement.
The chain tension is adjusted as follows:

> Turn the nut until the spring reaches a length (F) of 125 mm.

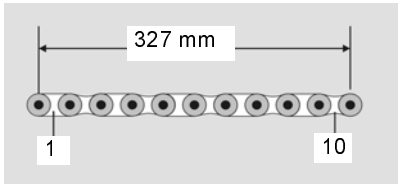
Rear flap roller drive



The chain tensioner for the rear flap roller drives is located on the left-hand side of the implement.
The chain tension is adjusted as follows:

> Turn the nut until the spring reaches a length (G) of 125 mm.

Roller drive chain wear



The roller drive chain must be changed when the dimension of the 10 chain links is 327 mm.

> Measure the roller drive chains and replace if necessary.

NOTE Contact your dealer regarding chain guide wear.

Gear box

Check the gearbox oil level:

- After the first 50 operating hours.
- At the start of the season.
- In the case of excess oil loss.

The oil must be changed:

- After the first 50 operating hours.
- Every 2 years or
- after 20,000 bales.

Fill quantity

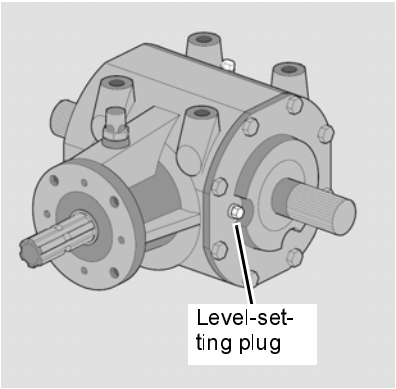
Gear-box	Volume (l)	Specification
	2.3	B 80W90

Checking the oil level correctly
The oil level must only be checked when

- the implement is at a standstill for any length of time and
- the implement is horizontal.

Otherwise, an incorrect oil level will be measured. An incorrect oil level can cause serious damage to the implement.

Checking the oil level



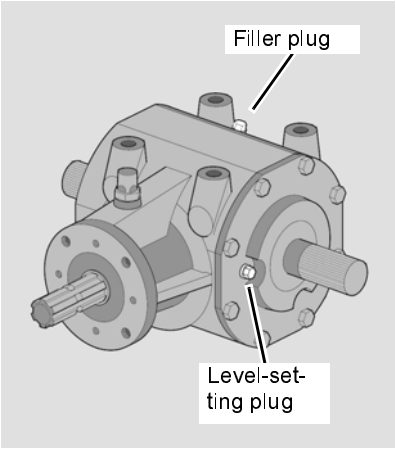
> Remove the level-setting plug.

The filling level is correct when oil runs out.

> Refit the level-setting plug.

If no oil is discharged, the gearbox must be filled with oil.
→ »Filling the gear box«, page 103

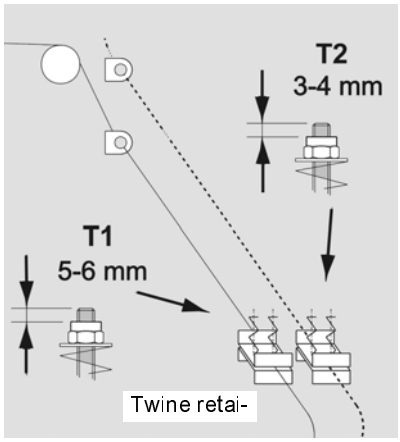
Filling the gear box



> Remove the level-setting plug.
> Remove the screw from the filler neck.
> Fill up with gear oil until the filling level indicator is correct.
> Refit the level-setting plug.
> Seal the filler neck again.

Adjusting the twine wrapping

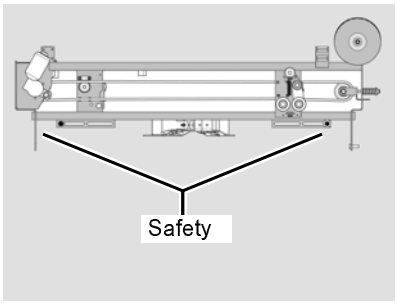
Adjusting the twine retainer



The two twine retainers must be adjusted differently. When the twine retainers are adjusted the same, twine wrapping is not uniform.

> Turn nut T1 and adjust the distance T1 to 5-6 mm.
> Turn nut T2 and adjust the distance T2 to 3-4 mm.

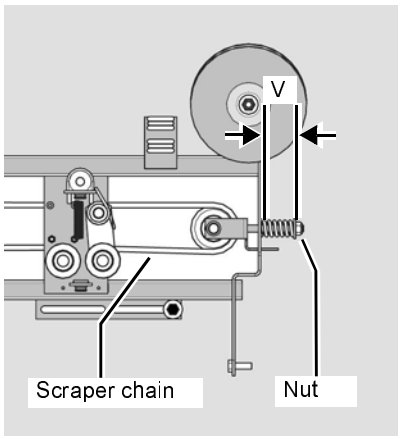
Twine on the edge of the bale



Use the pins to adjust the distance of the twine on the edge of the bale. The two pins must be adjusted to the same distance.

> Loosen the pins.
> Adjust the pins evenly to the desired distance.
> Tighten the pins.

Adjusting the scraper chain



The scraper chain must be adjusted.
There must be a distance (V) of 44 mm.

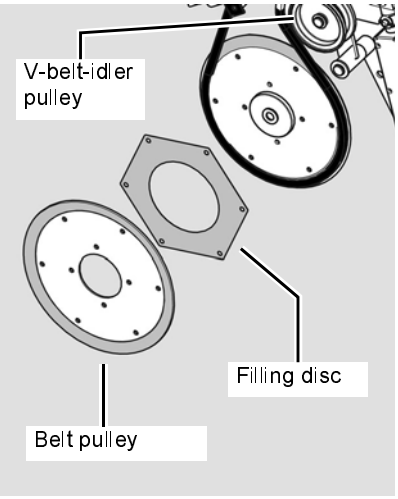
> Turn the nut and adjust the distance (V) to 44 mm.

Adjusting the net wrapping

V-belt for the net drive mechanism

When carrying out regular maintenance, the V-belt tension for the net roller must be checked.

- Excessive belt tensioning: The net is drawn in during bale production.
- Low belt tensioning: Net wrapping does not operate.



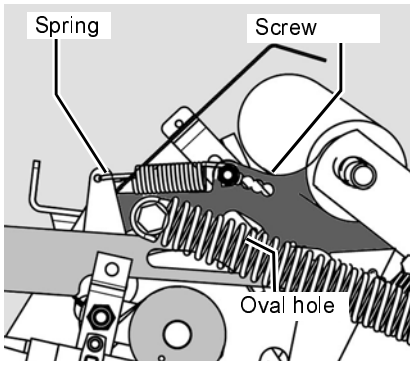
> Loosening the V-belt-idler pulley.

The V-belt is slack.

> Loosen and remove the screw on the belt pulley.
> Remove the belt pulley.
> Fit or remove the filling discs between the belt pulleys.
- Several filling discs: reduced belt tension.
- Few or no filling discs: high belt tension.

> Refit the belt pulley.
> Fit and tighten the belt pulley screws.
> Tension the V-belt-idler pulley.

Net feed roller tension



The contact pressure on the net feed roller is provided by two springs. The springs are located on the left and right of the net feed roller and are secured with a screw. The spring tension for the net rollers can be changed by moving the screw in the oval hole.

> Loosen the screw and the nut.
> Move the screw to the desired position.
> Fit and tighten the screw.

Wheels

Do not drive with worn or damaged tyres
Replace worn or damaged tyres immediately. There is a high risk of accident especially when driving on the road with such tyres.

Repair work
Repair work to wheels and tyres must be carried out:

- by a specialist.
- with the correct tools.

Specialised knowledge, specific tools and sound equipment are necessary to fit wheels and tyres. Personnel may be injured or the implement may be damaged as a result.

Prescribed tyre size
Only fit tyres which are the specified size. Fitting tyres of different sizes can cause accidents. Personnel may be injured or the implement may be damaged as a result.

Prescribed tyre pressure
Only use tyres set at the prescribed tyre pressure. Incorrect tyre pressures can result in serious damage to personnel or traffic accidents.

Securing the implement
Secure the implement against inadvertent starting and rolling away. Use wheel chocks. The implement must be standing on firm and level ground and, if necessary, must be supported during work. Unsecured or non-supported implements can cause accidents. There is otherwise the risk of serious or fatal injury.

Tightening the wheel nuts

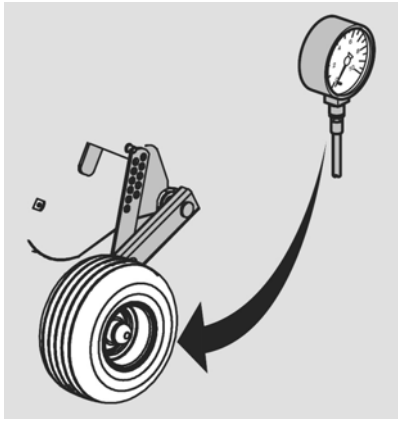
Tighten the wheel nuts:

- After the first 250 bales.
- At the start of the season.
- After every tyre/wheel change.

Tighten the wheel nuts to 290 Nm.

Tyre pressure

Roller feelers

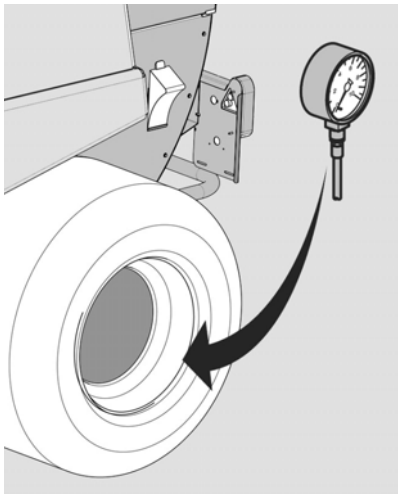


Guide wheel tyre pressure for the pick-up equipment

Tyre size	Pressure
15 x 6.00 - 6	1.75 bar

> Check the tyre pressure on a regular basis and ensure that it is at the required pressure.

Wheels



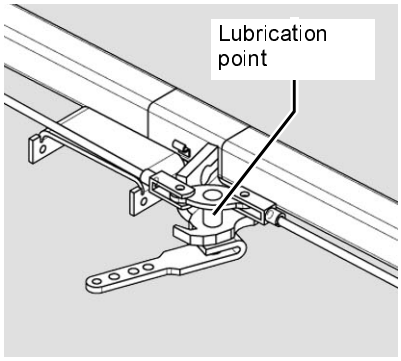
Tyre pressure in relation to speed

	Speed/Pressure	Speed/Pressure
Tyre size	40 km/h	50 km/h
16.0/70-20	1.5 bar	1.5 bar
400/60-22,5	1.5 bar	1.5 bar
500/50-17	1.5 bar	1.5 bar
500/45-22,5	1.5 bar	1.5 bar
600/40-22,5	1.5 bar	1.5 bar
15,0/55-17	1.5 bar	1.5 bar
16,0/70-20	1.5 bar	1.5 bar

> Check the tyre pressure on a regular basis and ensure that it is at the required pressure.

Brakes

Lubricating the brake axle



The brake axle adjustment must be lubricated at the start of the season and every 500 bales. The lubrication points are located on the brake adjustment in the middle of the axle.

> Lubricate the lubrication point.

Hydraulic brakes

Hydraulic system
The hydraulic system is often overpressurised. All pipes, tubes, couplings and connecting passageways must be checked for leaks and other damage on a regular basis. Only use suitable tools when checking for leaks. Repair any damage immediately. Escaping oil can cause injuries and burns. Seek medical attention immediately if injuries occur.

Bleeding the hydraulic brake circuit

Collecting the oil
Leaking oil must be collected and cleaned up in accordance with national regulations. Otherwise damage may be caused to the environment.

The hydraulic brake is connected to a hydraulic trailer brake valve on the tractor.

> Loosen the hose connection on the brake cylinder by one revolution.
> Touch the tractor's brake pedal lightly.
> Repeat this action until no more air is released out of the connection.
> Tighten the hose connection on the brake cylinder again.

→ »Hydraulic brake [+]«, page 116

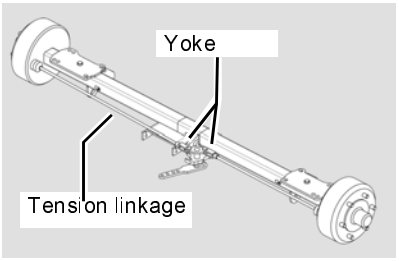
Adjusting the wheel brake

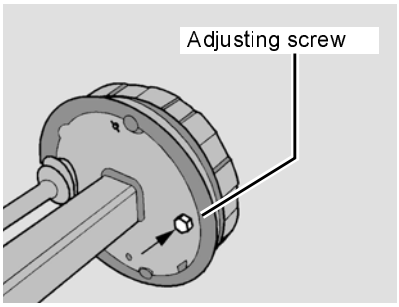
Securing moving parts
Moving parts must be secured with lifting gear against sliding, rolling, folding or swivelling. Personnel may be injured or the implement may be damaged as a result.

In the case of hydraulic and pneumatic brakes, the brake shoe and the brake drum must not make contact in the rest position. This must be checked before the start of the season and every 200 working hours or every 10,000 bales. Proceed as follows:

> Raise the implement and secure it against rolling away by using lifting gear.

> Loosen the tension linkage completely.





> Turn the adjusting screw on the wheel in the direction of arrow until the wheel locks (do this on both wheels).

> Turn back the adjusting screw until the wheel moves freely.

> Adjust the length of the tension linkages by turning the yokes.

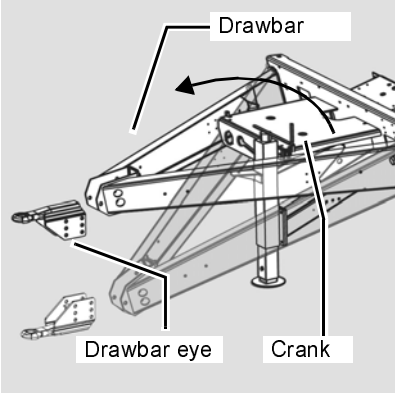
> Tighten the tension linkage.

> Check the simultaneous brake response for both wheels, and adjust as required by turning the yokes.

Drawbar

Securing moving parts
Moving parts must be secured with lifting gear against sliding, folding or swivelling. Personnel may be injured or the implement may be damaged as a result.

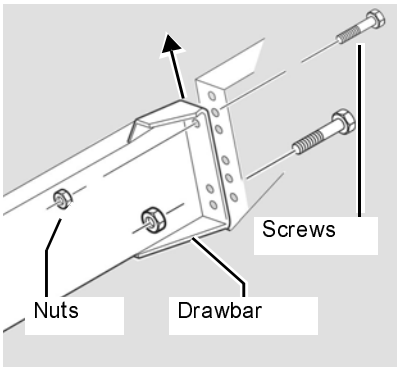
Adjusting the drawbar



The drawbar and drawbar eye can rotate through 180°. In this way, the drawbar can be adjusted for a high or low hitch.

The implement must be positioned horizontally:

> Turn the crank anti-clockwise: Move the drawbar upwards.
> Turn the crank clockwise: Move the drawbar downwards.
> Check the height of the tractor's draw hook.



> Secure the drawbar against sliding.
> Loosen and remove the screws and nuts.
> Move the drawbar to the desired position
> Fit and tighten the screws and nuts.
→ »Special torques«, page 91.
> Remove the safety device preventing sliding.

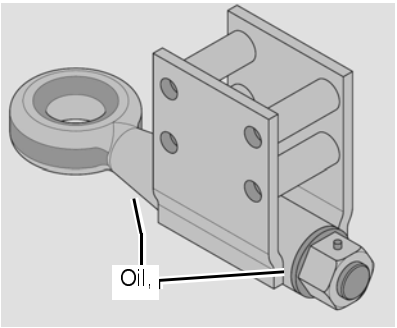
The arrangement of holes on the implement is provided for height adjustment. The drawbar must always be secured on each side with two screws and nuts.

Trailer ring

A bush is located on the trailer ring of the drawbar eye; this must be replaced when it is visibly worn.

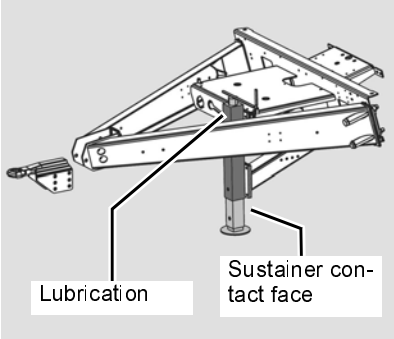
> Before the season and after every 500 bales, the underside of the trailer ring must be lubricated.

Swivelling drawbar eye



> Lubricate the swivelling drawbar eye with oil.

Lubricating the sustainer



Lubricate the sustainer lubrication points at regular intervals.

> Remove the plug on the lubrication point and fill up with grease.

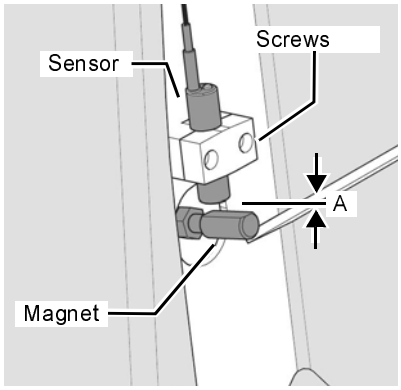
> Grease the contact face of the sustainer.

Sensors

The sensors react when a magnet falls within the preset sensor distance. Therefore the magnet must be adjusted to a specific distance in relation to the sensor.
The distance (A) of all of the sensors must be adjusted to 3 - 5 mm.
Procedure:

> Loosen both screws.
> Adjust the sensor until the required distance A = 3 - 5 mm is obtained.
> Tighten both screws.

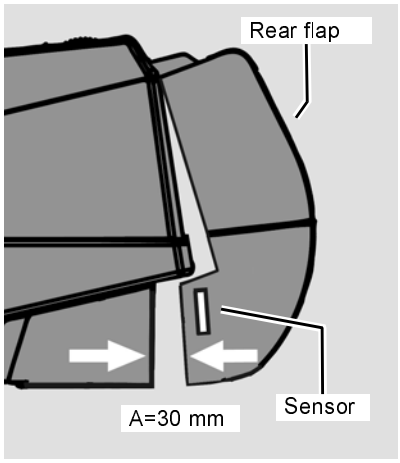
Rear flap sensor



The rear flap sensor transmits a signal to the controller when the rear flap is closed. Adjust the rear flap sensor as follows:

> Loosen the screws on the sensor mounting.
> Adjust the distance A between the sensor and the magnet to 3 - 5 mm.
> Tighten the screws on the sensor mounting.

Basic rear flap-sensor adjustment

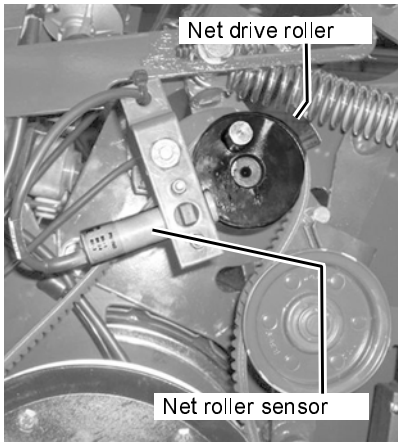


The basic adjustment for the rear flap sensor is made as follows.

> Switch the tractor on.
> Switch on the AutoPlus-Pilotbox.
> Open the rear flap very slowly via the control device.
> “Bale density 90%” is displayed.
> Leave the rear flap in this position.
> Switch off the tractor and secure it.
> Remove the ignition key.
> Secure the rear flap.
> Distance A must be 30 mm.

When distance A is not 30 mm, the magnet for the rear flap sensor must be adjusted. “Bale density 100%” must not be displayed on the AutoPlus-Pilotbox until distance A is set correctly.

Net roller sensor

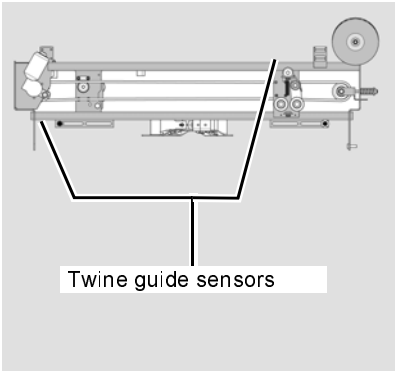


Check, clean and adjust the net feed roller sensor before the season and every 500 bales.
Distance (R) must be 4 mm at the sensor.
The sensor is located to the left of the net drive roller.

Adjust the net feed roller sensor as follows:

> Loosen the screws on the sensor mounting.
> Set the sensor to distance R=4 mm.
> Tighten the screws on the sensor mounting.

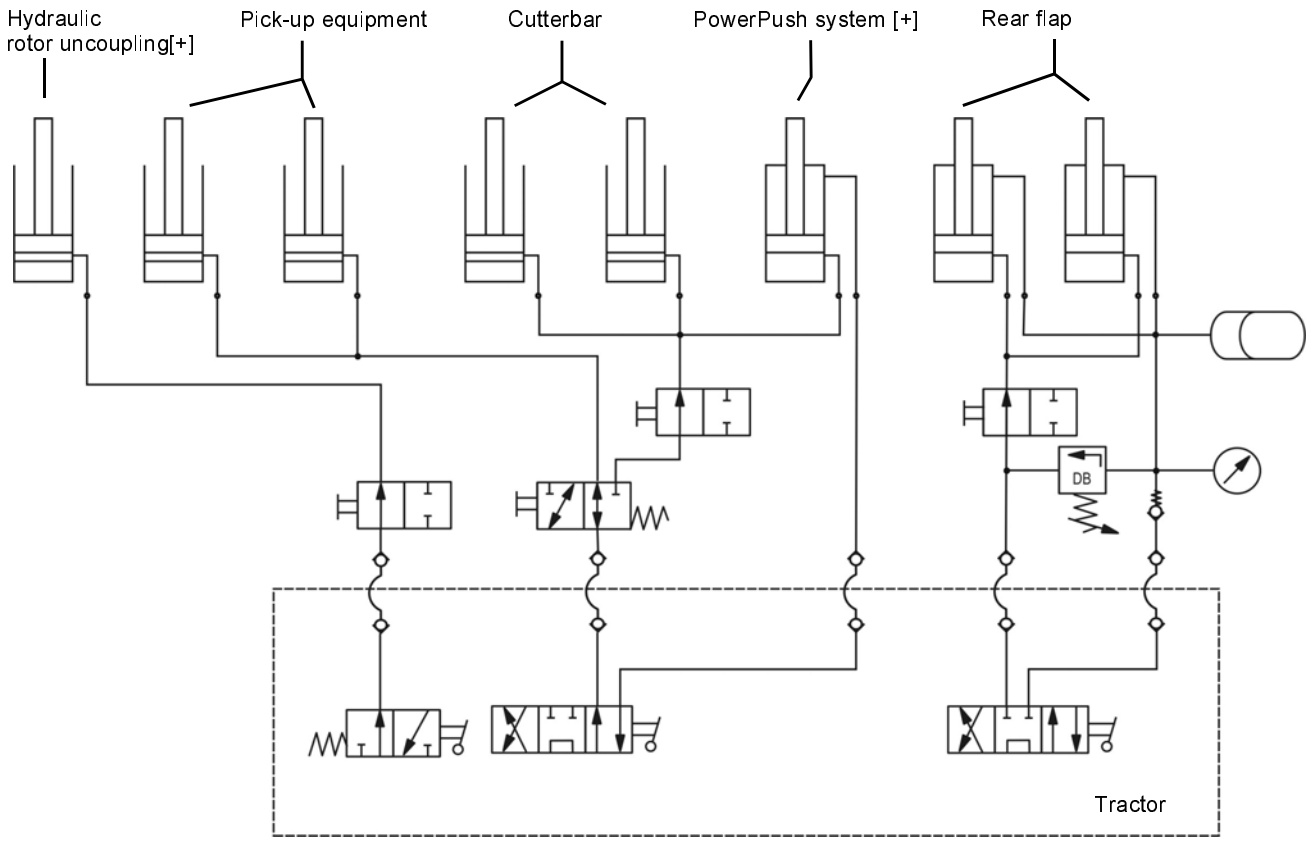
Twine guide sensor



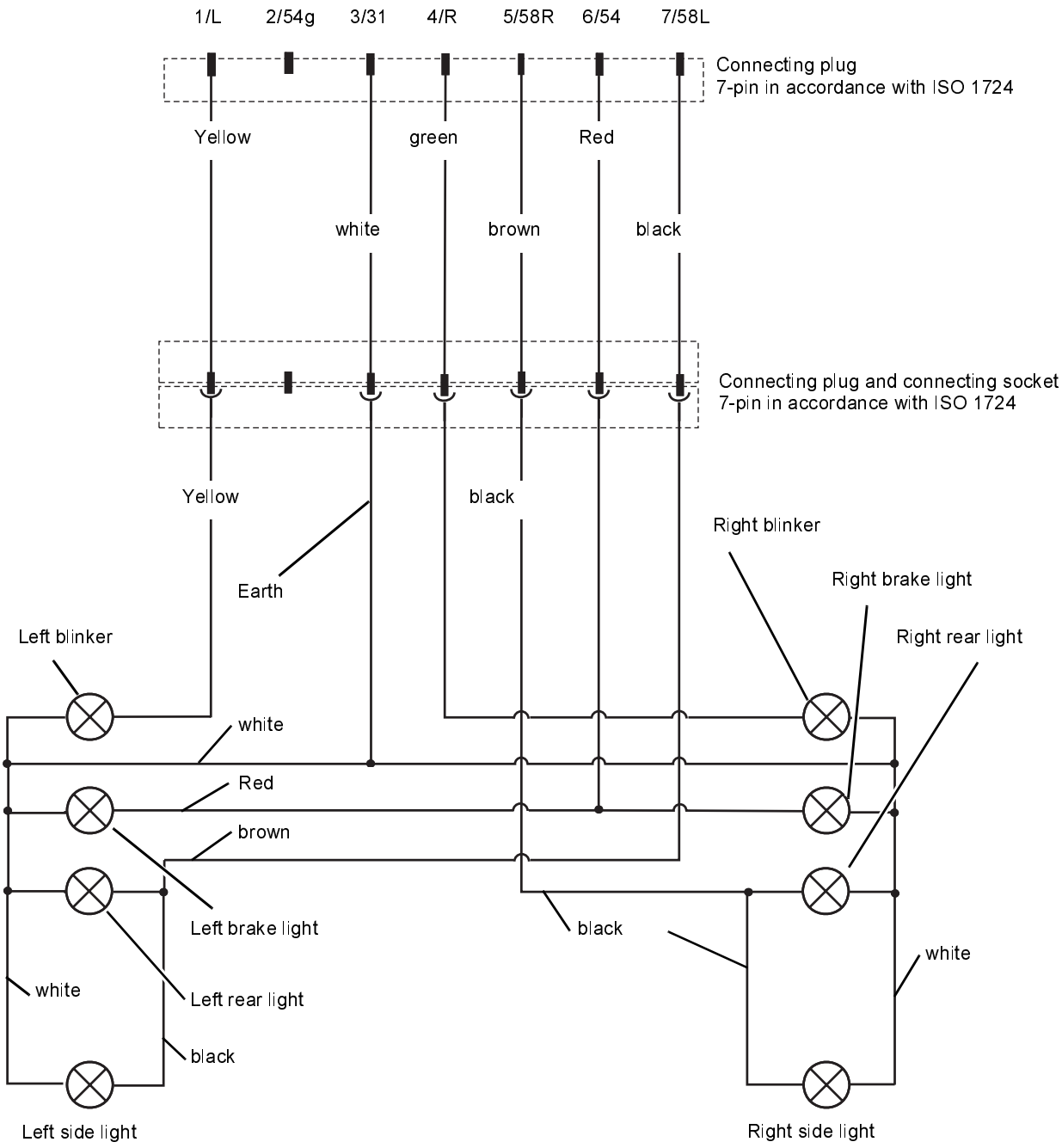
Check, clean and adjust both twine guide sensors every 3,000 bales.
Distance (G) for the twine guide sensors must be 4 mm.
A star wheel sensor is located on the right-hand star wheel on the twine carriage (right-hand side door open). The twine carriage sensor is almost centrally positioned behind the twine carriage.

> Loosen the screws on the sensor mounting.
> Set the distance G between the star wheel sensor and twine carriage sensor to 4 mm.
> Tighten the screws on the sensor mounting.

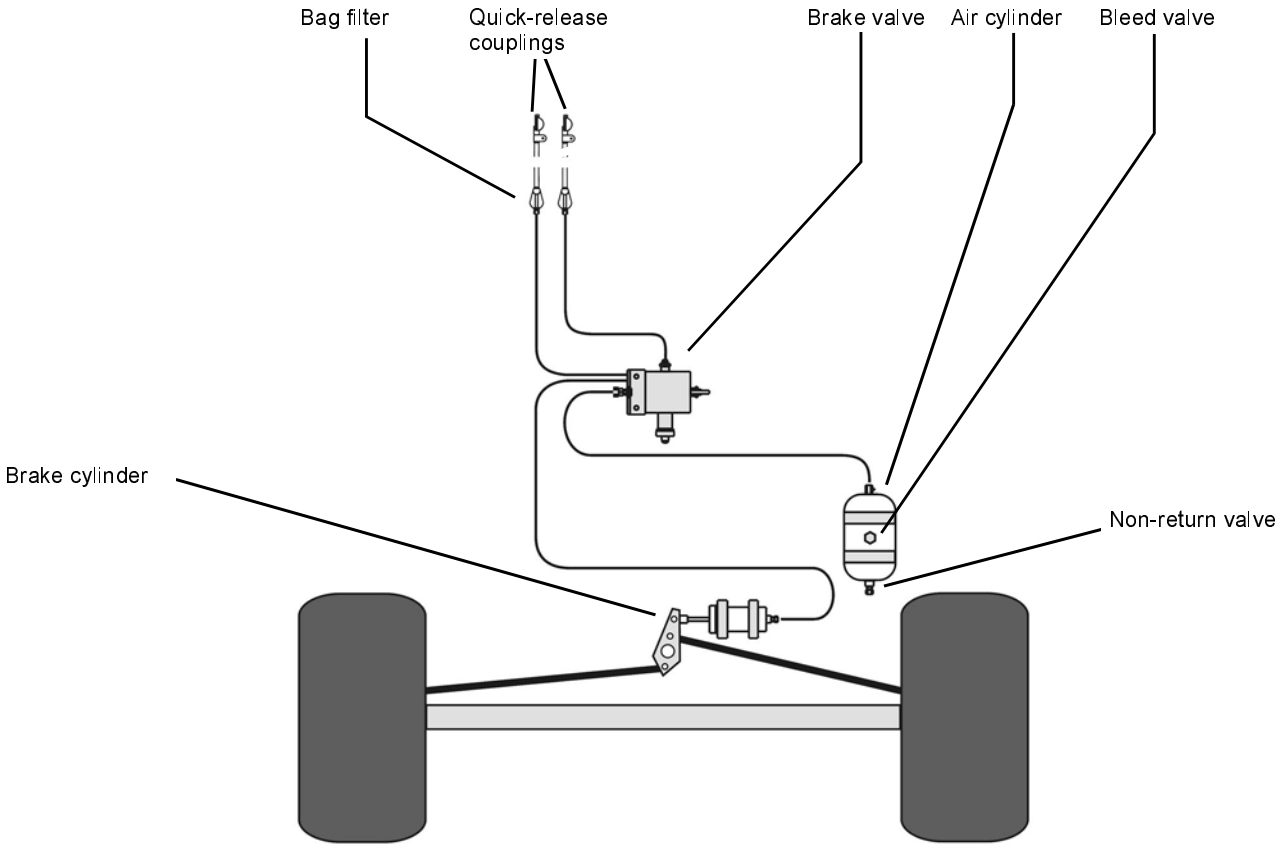
Hydraulic diagram



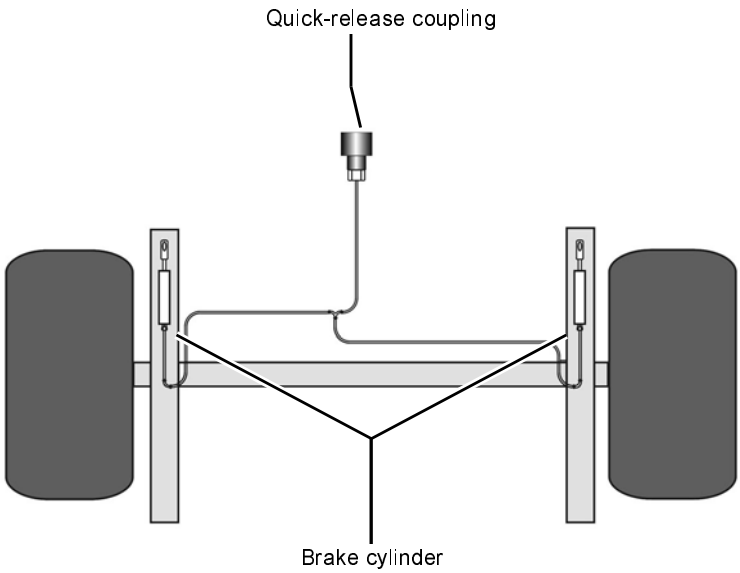
Lighting circuit diagram



Compressed-air brake [+]



Hydraulic brake [+]



General conditions

During replacement operations, only use original spare parts (OEM). Specify the machine identification number when placing orders. Only qualified skilled technicians must carry out maintenance and repair work on the implement. Consult your dealer for more details.
All warranty and guarantee claims are rendered invalid if the implement has been equipped with accessories or spare parts which are not authorised by the manufacturer.

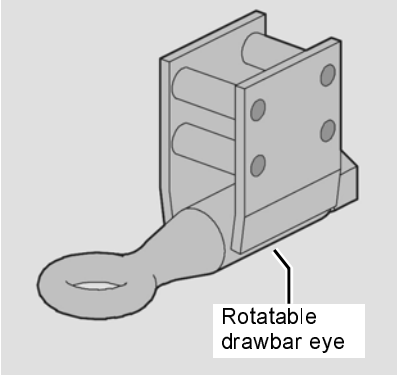
The accessories are attached as follows:

- In accordance with the assembly information and
- only at the specified assembly points provided.

For details of the accessory equipment
→ Replacement part instructions

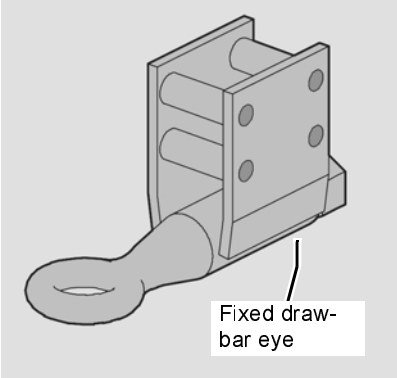
Rotatable drawbar eye

When the tractor is equipped with a fixed hook, the tow bar must be equipped with a rotatable drawbar eye.

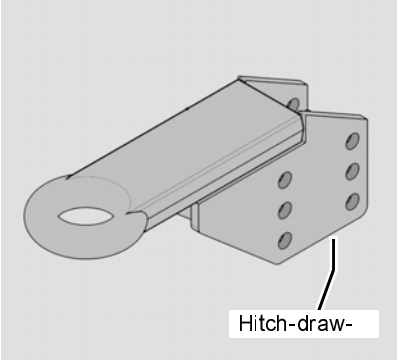


Fixed drawbar eye

When the tractor is equipped with a rotatable hook, the tow bar must be equipped with a fixed drawbar eye.

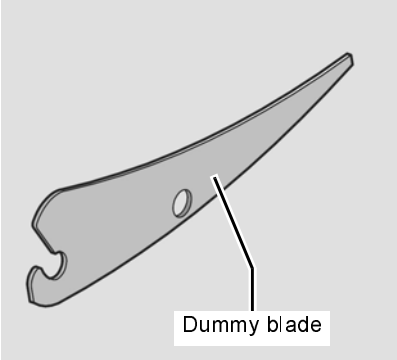


Hitch-drawbar eye



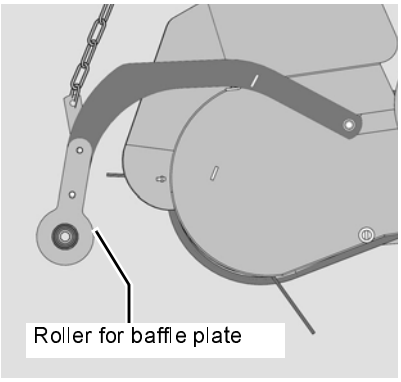
When the tractor is equipped with a hitch hook, the drawbar must be equipped with a draw hook.

Dummy blades for OptiCut



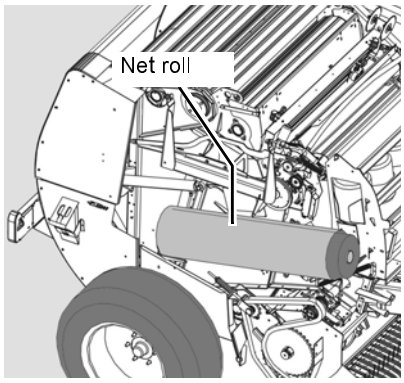
For a variable use of the implement, the knives can be replaced with dummy blades to change the cutting length. It is necessary to fit the dummy blades so that the crop is fed in uniformly.
Dummy blades are fitted in the same way as the knives.
→ See »Removing the knives« and »Fitting the knives«, page 51.
→ See »Removing the knives« and »Fitting the knives«, page 54.

Roller for baffle plate



The baffle plate roller improves the way the crop is fed in. The roller will be fitted on the front baffle plate support (as shown).

Storage for the net roll



Implements equipped for twine and net wrapping have a place to store additional net rolls behind the right-hand side door.

Malfunctions can often be eliminated quickly and easily. Before you contact customer services, always read the corresponding instructions. Follow the trouble shooting information in the safety instructions.

Safety

Before working on the implement:

- Switch off the AutoPlus-Pilotbox.
- Switch off the tractor's PTO shaft.
- Switch off the tractor engine.
- Remove the ignition key.

Never start the tractor or the implement until the cause of the fault has been found and the fault has been resolved. Otherwise, no warranty claims can be made for the components that are damaged as a result.

Safety system protect the implement from:

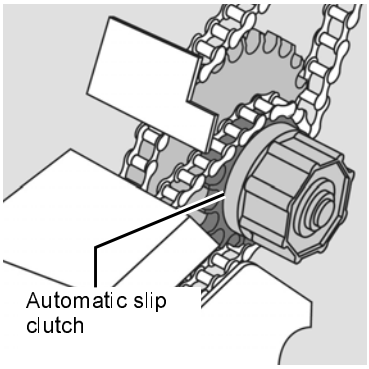
- An overload
- Exceeding the capacity
- Damage caused by foreign bodies

Pick-up equipment slip clutch

The slip clutch of the pick-up equipment responds to an overload and prevents the pick-up equipment from turning:

- when too much crop is fed in,
- when the pick-up equipment is set too low or
- when the forward speed is too high.

Eliminate the causes immediately by activating the slip clutch. It is not otherwise possible to guarantee trouble-free operation. The consequence could be damage to the implement.



The pick-up equipment is protected by a slip clutch.
When the slip clutch responds, proceed as follows:

> Eliminate the cause immediately.

→ »Pick-up equipment«, page 128.

Cutterbar blockage

The entire rotor unit is protected by a slip clutch in the cardan shaft. The slip clutch responds to an overload and transfers no more power. The clutch responds if there is a loud juddering.

The following steps are possible to clear the blockage in the cutterbar:

- Swivel out the knives and engage the tractor's PTO shaft.

or

- Mechanical rotor coupling

or

- Hydraulic rotor uncoupling [+].

or

- Empty the bale chamber when the bale is nearly formed.

or

- Use of the PowerPush system [+]

or

- Reversal of the rotor's direction of rotation for manual or automatic removal of the blockage.

Removing the blockage

Step 1
Swivelling out the knife

> Switch off the tractor's PTO shaft.
> Swivel out the knives.
> Switch on the tractor's PTO shaft.
> Reduce the tractor's PTO shaft speed.
> Try to engage it again.
> Check whether the blockage has been cleared.

Step 2
Emptying the bale chamber

If the blockage remains:

> Disengage the drive coupling
- hydraulically or
- manually.

> Empty the bale chamber when the bale is nearly formed.
> Check whether the blockage has been cleared.

Step 3
Manual reversing

If the blockage remains:

> Use with reversing wrench
→ »Manual reversing«, page 123.

Step 4
Using the PowerPush system [+]

If the blockage remains:

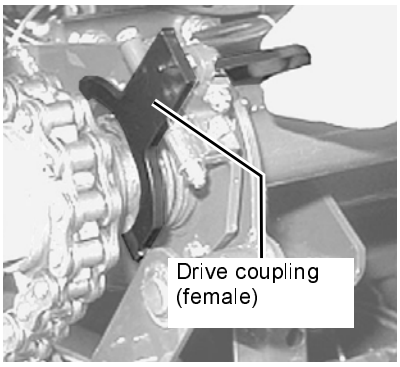
> Use of the PowerPush system [+]
> Check whether the blockage has been cleared.

Step 5
Reversing the direction of rotation

If the blockage remains:

> Reversal of the direction of rotation for the free-wheeling of the production roller.
→ »Reversal of the direction of rotation«, page 125.
> Gradual turning of the production roller using the tractor's control device.

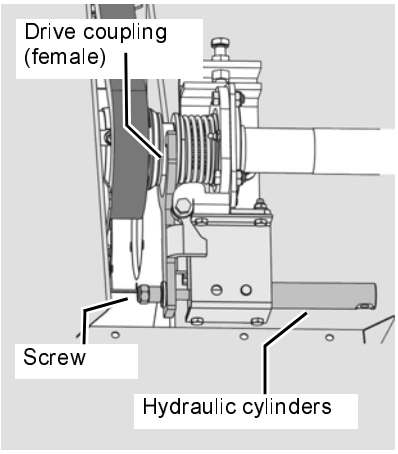
Mechanical rotor uncoupling



> Switch off the tractor's PTO shaft.
> Switch off the tractor and secure it.
> Open the left-hand side door.
> Disengage the drive coupling using the lever.

The cutterbar rotor is decoupled and the production roller can be rotated with the reversing wrench. Alternatively, tying can be triggered when the tractor's PTO shaft is switched on.

Hydraulic rotor uncoupling [+]



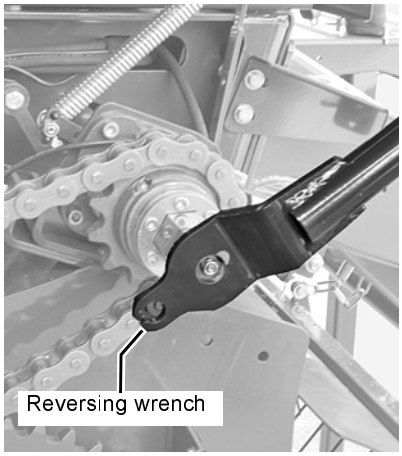
Check whether the screw on the hydraulic cylinder is correctly adjusted. If the rotor uncoupling is not used, the drive coupling (female) must not touch the drive of the cutterbar rotor. If it touches it at high speed, there is a risk of fire. This would result in extreme wear and damage to the implement.

The hydraulic rotor uncoupling [+] is operated with the tractor's control device. The following steps are necessary for the hydraulic rotor uncoupling:

> Switch the tractor on.
> Open the hydraulic rotor uncoupling via the control device.

The cutterbar rotor is decoupled and the production roller can be rotated with the reversing wrench. Alternatively, tying can be triggered when the tractor's PTO shaft is switched on.

Manual reversing



After the rotor is mechanically or hydraulically disengaged, the rotor can be moved using the reversing wrench.

> Switch off the tractor and secure it.
> Open the left-hand side door.
> Fit the reversing wrench on the hexagonal nut and turn in the opposite direction.
> Remove the crop.
> Store the reversing wrench in the drawbar shaft.
> Close the side door.
> Switch the tractor on.
> Close the hydraulic rotor uncoupling via the control device.
> Switch on the tractor's PTO shaft.

PowerPush system [+]

The PowerPush system [+] supports the drive with the help of the cardan shaft drive when removing a blockage. The knives are therefore swivelled out with the AutoPlus-Pilotbox. The tractor is not emptied when the PowerPush system [+] is used.

Make sure that you increase the PTO shaft speed slowly. Observe the process. If the slip clutch responds, you must switch off the tractor's PTO shaft immediately. Damage may be caused to the implement.

Proceed as follows:

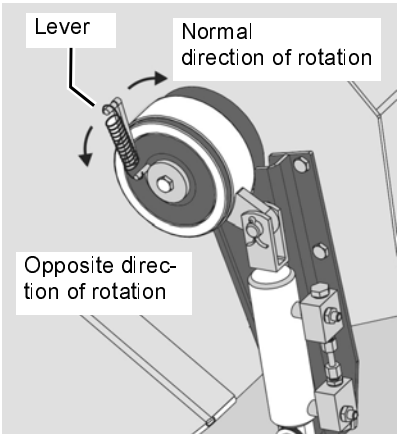
> Press the “INFO” button...

> ...until the “Pick-up/Knives” symbol is displayed.

> Press the “GO” button...

> until the “Pick-up/Knives” symbol is selected on the display.
> Swivel out the knives using the tractor's control device and switch on the tractor's PTO shaft at the same time.
> Check whether the blockage has been cleared.

Reversal of the direction of rotation



When the direction of rotation is reversed, the tractor's PTO shaft must be switched off. A PTO shaft running in the opposite direction of rotation can cause damage to the implement.

In order to eliminate foreign bodies or blockages, the direction of rotation of the production roller can be reversed. The crop is thrown out in the opposite direction of conveying. The reversal is made by moving the lever for free-wheeling. This function is only available in conjunction with the PowerPush system.

> Switch off the tractor's PTO shaft.
> Uncouple the drive manually or hydraulically.
> Move the lever for free-wheeling.

The drive is now running in the opposite direction of conveying.

> Press the “INFO” button...

> ...until the “Pick-up/Knives” symbol is displayed.

> Press the “GO” button...

> until the “Pick-up/Knives” symbol is selected on the display.

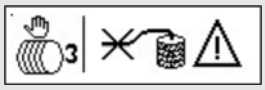
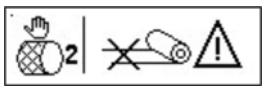
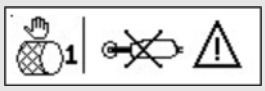
Use the neutral position of the tractor's control device to turn the production roller gradually.

> Check whether the blockage has been cleared.
> When the blockage has been cleared:
> Move the lever for free-wheeling back into the initial position.
> Couple the drive manually or hydraulically.
> Close and secure the side doors.

Malfunctions

Malfunctions can often be eliminated quickly and easily. Before calling Customer Service, refer to the table to check whether the malfunction is one you can eliminate yourself.

AutoPlus-Pilotbox

Problem	Cause	Solution
	Low battery voltage.	> The battery voltage is under 9 volts. Check the tractor's power supply.
	Twine malfunction. The twine wrapping does not start.	> Open the front hood and check the twine guide and sensors. > After clearing the fault, press the “GO” button.
	Net malfunction. The net wrapping does not run.	> Open the front hood and check the net, net guide and sensors. > After clearing the fault, press the “GO” button.
	Net motor malfunction. The net motor does not run.	> Open the front hood and check the connections. > After clearing the fault, press the “GO” button. > If the fault cannot be cleared, contact customer services.
	> The net was drawn in at the wrong moment.	> Open the front hood and check the net, net guide and sensors. > After clearing the fault, press the “GO” button.

Electronics

Problem	Cause	Solution
No display on the AutoPlus-Pilotbox	The control unit has no power	• Switch on the device • Check the system's power supply • Check the fuses in the AutoPlus control box
	Internal control system problem	Please contact your supplier

Hydraulic

Problem	Cause	Solution	Page
Hydraulic pressure does not rise	Contaminated oil	> Drain and clean the circuit and fill with new oil	
	Proportional pressure control valve does not work correctly	> Check the pressure control valve	

Cutterbar

Problem	Cause	Solution	Page
Loss of crop	Crop cut too small	> Reduce the number of knives	50
Accumulation behind the rotor	Cutting length too short	> Reduce the number of knives	50
Crop wrapped around the rotor	Scraper not adjusted optimally	> Adjust the scraper	101
Excessive output of the implement	Blunt knives	> Sharpen the knives	98
	PTO shaft speed too slow	> Increase the PTO shaft speed	
	Drive speed too high	> Reduce the drive speed	
The knives cannot be moved to the cutting position	Dirt on the knife bracket restricts swivelling in and out	> Clean the knives and crop pick-up	121

OptiCut and rotor

Problem	Cause	Solution	Page
Blockage in front of the rotor	Forward speed too high	> Reduce forward speed	
	Speed less than 540 rpm	> Increase the speed to 540 rpm	
	Implement set too low	> Align the implement	38
	Uneven crop flow	> Adapt the baffle plate	
Implement power consumption too high	Blunt knives	> Sharpen the knives	98
	Too many knives	> Remove one or more knives	
	High rpm	> Reduce the rpm to 540 rpm	
	Scraper frame contaminated or incorrectly adjusted	> Clean or readjust	

Pick-up equipment

Problem	Cause	Solution	Page
Swath not picked up	Pick-up equipment set too high	> Lower the pick-up equipment or > Adjust the pick-up equipment wheels or chains	
	Overload protection activated	> Remove the blockage > Pick-up equipment set too low	121 47 66
	Drive chain slipping or jumping out of chain wheel	> Check the chain, replace if necessary	
	Forward speed too high	> Adjust the forward speed	
	Swath too small/thin	> Produce larger swaths	
	Pick-up equipment tines bent or broken	> Straighten the tines > Replace the tines	
Irregular crop supply	Baffle plates set too low	> Set baffle plates higher	71
Baffle plate seesaws	Baffle plate caught on swaths	> Set baffle plates higher	71
Pick-up equipment blockage		> Remove the blockage	121
Unusual noise from the pick-up equipment	Foreign bodies in the pick-up equipment	> Remove the blockage	121
	Bent tines	> Replace the tines	

Twine tying

Problem	Cause	Solution	Page
Twine tying does not start	External blockage	> Correct the position of the twine carriage sensors.	
	Twine threaded incorrectly	> Thread the twine in accordance with the information on the labels	
	The twine retainers are too tight and impede the entire tying process	> Loosen the twine retainers > Use the recommended twine quality	
	Star wheel wobbles and not all tines picked up. This can be seen from the LED on the sensor. Every tine must cause the LED to light up.	> Secure the star wheel so that it does not wobble and adjust the star wheel sensor so that each tine is picked up. Distance approximately 1 mm	
	Defective star wheel sensor	> Contact a repair specialist	
	Mechanical blockage	> Remove the blockage	
	Temporary current interruption	> Fit the cable supplied for the power supply in accordance with the operating manual.	
	Polarity reversal of the twine motors with the alternating motor	> Change the polarity and check if the twine carriage returns to the initial position when there is a 'Reset' via the AutoPlus-Pilotbox	
	Motor faulty	> Contact a repair specialist.	

Net wrapping

Problem	Cause	Solution	Page
The servo-motor moves too slowly	Battery voltage too low	> Check the battery	
	Faulty electrical connections	> Check the electrical connections	
	The swivel joint moves with difficulty	> Adjust so that movement is unrestricted	
Bale incompletely wrapped with net	Poor net quality	> Use the recommended net quality	
The net does not cover full bale width	Cone-shaped bale	> Ensure smooth crop flow	
	Net tension too low	> Adjust the net brake > Adjust the V-belt for the net drive mechanism	62 105
Net not wound closely to bale	Bale insufficiently wrapped	> Increase the number of the wraps	
	Insufficient brake force	> Adjust the net brake > Adjust the V-belt for the net drive mechanism	62 105
Net wrapping system remains inactive	System set to “Manual” mode	> Set to “Automatic” mode	
	No electrical connection	> Ensure electrical connection	
	No signal to net roller sensor	> Clean or adjust the net roller sensor	113
	Crop residues behind the net feed roller	> Remove the soiling	
Net torn before tying is complete	Net brake power set too high	> Remove the filling disc(s) in the belt pulley	
	Net guidance inadequate	> Check the net guide adjustment	
Net not cut	Knives dirty or damaged	> Clean the knives	
	Mechanical obstruction when being drawn in	> Check the mechanism	
	Insufficient power supply	> Ensure sufficient power supply or connect to the battery directly	
	No net tension	> Increase the net tension	62

Bale chamber hydraulic system

Problem	Cause	Solution	Page
Manometer indicates a pressure drop	Leaky pressure valve	> Contact a repair specialist: Clean or replace the valve	
	Rear flap cylinder not sealed	> Contact a repair specialist: Replace the cylinder seal(s)	
	Line not sealed	> Check and repair leaky tubes and pipes	

Rear flap

Problem	Cause	Solution	Page
Rear flap opens during bale production	Rear flap not closed correctly	> After the rear flap was closed using the control device, the pressure has not built up sufficiently (approximately 3 seconds) > When the rear flap is closed correctly, check the rear flap sensor > Replace the cylinder gaskets > Clean the rear flap thoroughly	
Rear flap not completely closed	Rear flap dirty	> Clean the rear flap thoroughly	

Environmental protection

At the end of the implement's service life, the individual components must be disposed of in a correct and environmentally-friendly manner. Please observe the currently valid national waste disposal guidelines.

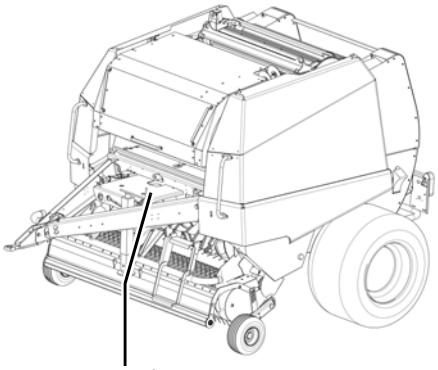
Plastic parts
Plastic parts can be disposed of in the normal household waste (residual waste), depending on the laws specific to your country.

Metal parts
All metal parts can be disposed of in the used metal recycling system.

Oil,
Environmentally-compatible hydraulic oils must be stored, collected and disposed of separately in accordance with waste legislation.

Electronics
The AutoPlus-Pilotbox and control box must be taken to a special waste disposal firm.

In accordance with EU Directive 98/37/EC



Type plate

We

Kverneland Group Geldrop B.V.
BA Grass - Bale Equipment
Nuenenseweg 165
NL-5667 KP Geldrop
The Netherlands

declares on its own responsibility that the product

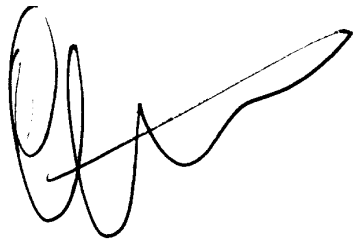
VGJC baler and accessories

to which this declaration relates, complies with the relevant basic safety and health requirements of the EU Directive 98/37/EEC.

The following standards have been respected for appropriate implementation of the health and safety requirements quoted in the EC Directive:

- EN 12100-1;2 (04/2004)
- EN 294 (06/1992)
- EN 982 (09/1996)
- EN 704 (08/1999)
- EN 14982 (07/1998)
- DIN EN ISO 11201
- DIN EN ISO 11204

Kverneland Group Geldrop B.V.
Geldrop, 15.08.2007



Caspar Böhme
Chief Executive Officer

Index

O

P

R

S

T