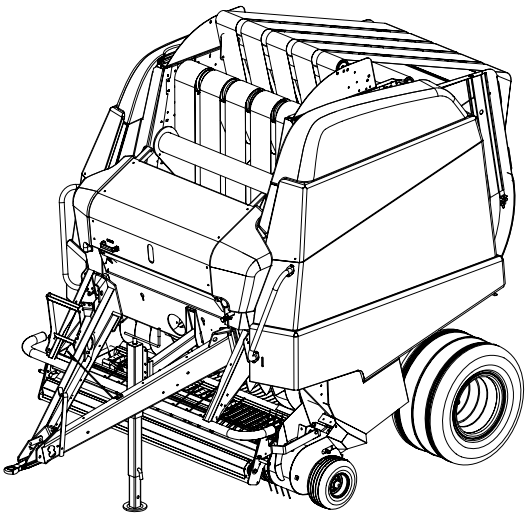

Varimaster 560 / 590 Autoplus

Operation manual

Issue	03/2008
Date of printing	3.2008
Language	EN
From machinenumber (PSN)	RK000300 / RL000300
Serial number (PIN)	03RK01 / 03RL01
Reference number	VGG0803RKLAP(5)EN

DEUTZ FAHR

Identification of the machine

To support you as soon as possible your dealer requires several details of your machine.
Please enter the information here.

Designation	Varimaster 560 / 590 Autoplus
PSN	RK ..... / RL .....
Software version	
Assembled options	
Dealer's address	
Manufacturer's address	Kverneland Group Geldrop BV Nuenenseweg 165 5667 KP Geldrop The Netherlands Phone +31 40 2893300

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Target group of this operation manual

This operation manual is meant for those concerned with the control, use and maintenance of the machine. It contains all data required for a safe handling, use and maintenance of the machine.

For your safety
Before starting to adjust and use your machine, familiarise yourself with this operation manual. By doing so your safety and the best performance are assured. It is very important to read this manual carefully before using the machine and to keep it handy. In this way, you will

- avoid accidents
- respect the warranty conditions
- always have a functional machine in perfect working order

For the employer
All personnel are to be trained in the use of the machine regularly (at least once a year) in accordance with employers' liability insurance association guidelines. Untrained or unauthorised individuals are not permitted to use the machinery.
You are responsible for the safe operation and maintenance of your machine. You must ensure that you and anyone else who is going to operate, maintain or work around the unit be familiar with the operating and maintenance procedures and related safety information contained in this manual.

Symbols used

In this operation manual the following symbols and terms are used:

- A bullet stands at enumerations

> A triangle stands at steps, which you must do

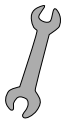
→ An arrow shows cross-references at other text passages

[+] The plus sign shows that it handles about optional equipment, which does not belong to the standard model.

Besides these symbols, pictograms are used, which will help you with locating of text passages:

TIP The word “Tip“ shows tips and an advice to the use.

The triangle refers to danger at assembling or adjusting work.



The key refers to tips at assembling or adjusting work.

The star shows examples, which are needed for a better understanding.

For your safety

This chapter contains all general safety instructions. Subject-specific safety instructions are located per chapter. Take care of the safety instructions

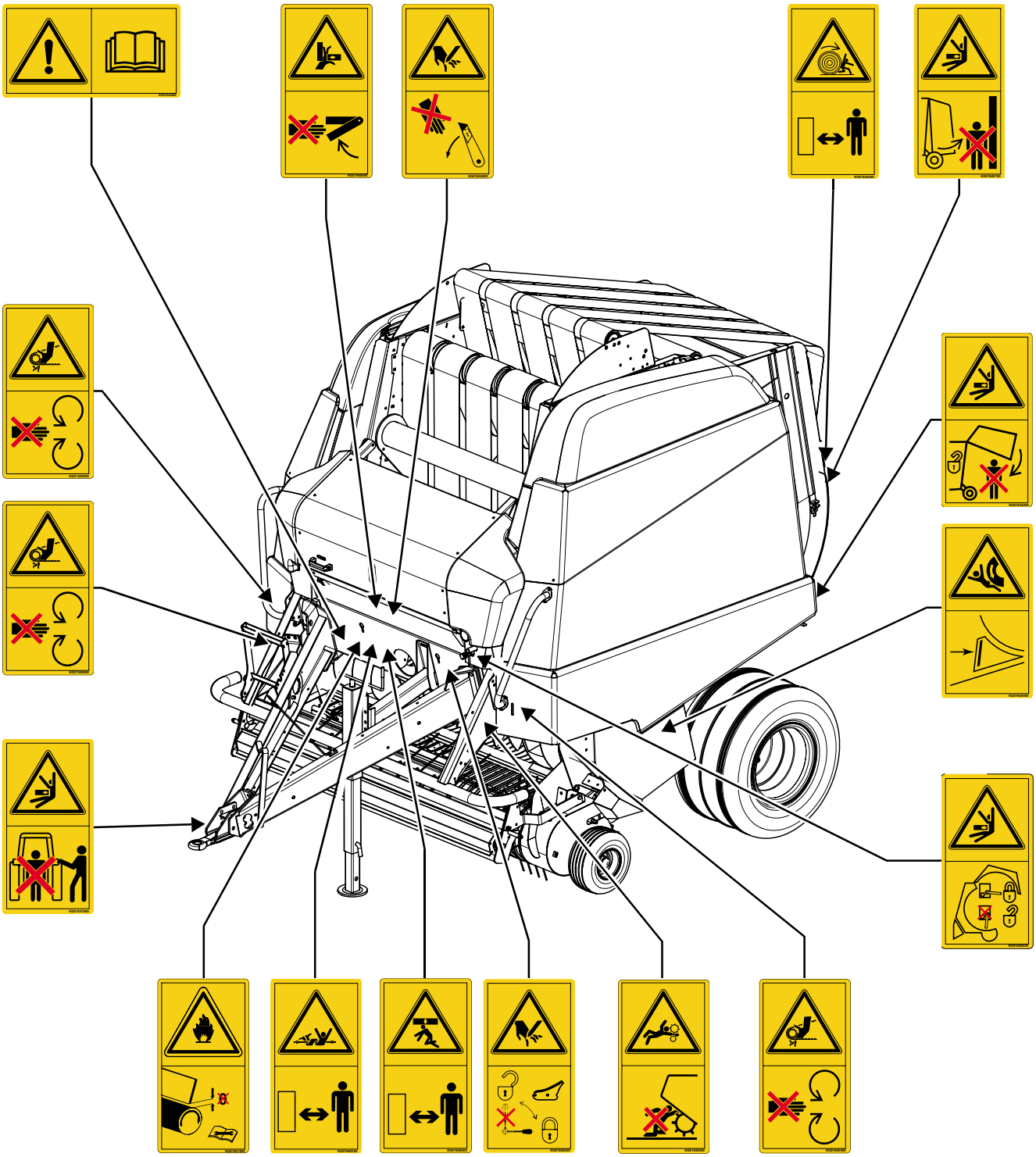
- because of your own safety
- because of the safety of your fellow man and
- to guarantee the machine safety

When handling agricultural machinery, wrong behaviour can lead to a lot of danger. Therefore work with special care and never under pressure of time.

For the employer
Inform the one who works with this machine frequently about these safety instructions and according to the legal regulations.

Safety decals at the machine

The installed warning and advisory signs give important hints for a safe operation; adhering to serves your own safety. Keep safety decals and signs clean and legible at all times. Replace safety decals and signs that are missing or have become illegible. If original parts on which a safety decal or sign was installed are replaced, be sure that the replacement part also displays the current decal or sign.



Meaning of the safety decals

Read the operation manual carefully
Read the operation manual carefully before taking the machine into operation. Various setup and maintenance procedures require special settings. Not following these special settings can cause serious or deadly injuries or machine damage.

Stay clear of a raised tailgate
Stay clear of a raised tailgate unless the safety lock is applied. An unsecured tailgate can lower. Serious or deadly injuries can occur.

Place chocks at a parked machine
Always place chocks if the machine is parked on a non-horizontal plane. A non-secured machine can cause serious or deadly injuries or damages.

Stay clear of pto drive shaft
Stay clear of danger area of pto drive shaft. Do not work with a pto drive shaft if protection is damaged or not present. Personal injuries can occur.

Stay clear of a moving pick-up
Stay at a safe distance of a rotating pick-up. The pick-up tines may grab your clothes if you come close to it and pull you inside the machine. Serious or deadly injuries can occur.

Stay clear of draft link lifting range
Do not stay between the machine and the tractor during hitching and unhitching of the machine. Serious or deadly injuries can occur.

Stay clear of the tailgate area
Stay clear of the tailgate area while the tractor engine is running. A swinging tailgate can cause personal injuries.

Never stay behind a working machine on a slope
An out coming, rolling bale has a heavy mass and a high speed. A bale rolling down can cause serious or deadly injuries.

Correct scraper setting
Ensure the scrapers have always the correct setting in accordance with the crop, especially when baling dry crop. A false scraper adjustment can cause fire. Personal or machine damages can occur.

Stay clear of the twine tubes area
Stay clear of the moving twine tubes area. Hands can be squeezed between the moving parts. Personal injuries can occur.

Stay clear of a raised machine
Stay clear at a safe distance of a raised machine. Serious or deadly injuries can occur.

Danger of cutting by twine or net cutter
Stay clear of the area of the twine or net cutting blade if electronic control can be activated. Serious injuries can occur.

Keep doors closed on a running machine
Behind lateral doors rotate chains and sprockets. Do not open the shielding while the engine is running. Personal injuries can occur.

Danger of crushing by tailgate
Stay clear of the tailgate area if electronic or hydraulic control can be activated.
Apply tailgate safety lock prior to going under an opened tailgate:
lever to the right = safe;
lever downward = working position = unsafe.

Apply the cutting unit safety lock
Apply the cutting unit safety lock prior to work on the cutting unit or pick-up:
lever to the right = safe;
lever upward = working position = unsafe.

Who is allowed to operate the machine?

Authorised people only
The machine may only be used, maintained or repaired by authorised people who have been informed about the dangers when handling the machine.
Usually such persons have an agricultural or equal intensive education.

General

Safety is your responsibility
Apply and insist upon application of the safety instructions. Most accidents are avoidable. Do not run the risk of serious or fatal accidents through ignorance of these safety instructions.

Wear close fitting clothing
Avoid wearing loose fitting clothing.
Loose clothing can get stuck between rotating parts. Danger of serious injury.

Keep the machine clean
Always keep the machine clean to avoid fire risk.

Fire extinguisher
Carry a fire extinguisher at all times, especially when operating in dry crop materials. This should be a multi-purpose ABC rated extinguisher with a 10 kg capacity, approved by the appropriate authority.

Good operating condition
Always check that

- the tractor is in good operating condition and
- the tractor brakes are powerful enough for the machine

Use a proper tractor
Make sure the tractor is in safe operating condition with adequate braking capabilities for a machine of this weight. See the tractor's technical details, or contact the local tractor dealer.

Running in an enclosed area
Do not run the machine in an enclosed area. Exhaust fumes can be dangerous.

Never work on a running machine
Never work on the machine while it is running. Severe injuries can occur.

No modification of the machine
Do not modify the machine in any way. Unauthorised modifications may impair the function and/or safety and could affect the life of the machine. Modification of the machine will void the warranty.

Hitching the machine

Increased danger of injury
While hitching the machine onto the tractor an increased danger of injury occurs. Therefore:

- prevent the tractor from rolling away, shut down the engine and remove the ignition key
- never stay between tractor and machine during hitching
- mount and secure the pto drive shaft at the pto

In case of negligence damages to the machine or serious personal injuries can occur.

Pto drive shaft
Only use the pto drive shaft complying with the manufacturer's specification. Other pto drive shafts with slip clutches can permit higher torques. Higher torques can damage the machine.

Pto drive shaft operation manual
Regard to the operation manual of the pto drive shaft manufacturer. Here you find instructions for correct handling of the pto drive shaft. Negligence can lead to damages at the pto drive shaft and to the machine.

Fix and check pto drive shaft protection
The rotating pto drive shaft is secured by a pto drive shaft protection. Take care that the pto drive shaft protection is not damaged. Pto drive shaft protection must be fixed through the chains, both at tractor and machine side. Unprotected pto drive shafts can cause serious personal injuries.

Pto speed 540 rpm
The prescribed pto speed of maximum 540 rpm may not be exceeded. Higher pto rpm can cause damages to the machine.

Hydraulics

Hydraulic couplings only pressureless
Only couple the hydraulic hoses to the tractor when both tractor and machine hydraulics are pressureless. Hydraulics under pressure can cause accidental movements of the machine.

High pressure in the hydraulic system
The hydraulic system is under high pressure. All tubes, hoses and couplings must be controlled regularly for leaks and external damages. Only use suitable tools when searching for leaks. Immediately repair damages. Leaking oil can cause injuries and fire. When having injuries visit a doctor immediately.

Road transport

Pay attention to road-safe condition
When driving on local roads, the machine must correspond to the current traffic regulations. To which for example belongs:

- mounting of lighting, warning and protection installations
- comply with the permissible transport dimensions and weights, Maximum permissible axle loads, tyre carrying capacity, total weights and national speed limits
- taking care of the maximum permitted speed

In case of negligence, the driver and owner of the machine are fully liable.

Check tyre pressure
Check the tyre pressure regularly. Wrong tyre pressure decreases the life of the tyres and can cause unstable driving characteristics and accidents.

Prohibition of transporting people and animals on the machine
Nobody and nothing shall be transported on the machine during transport. Transporting of people, animals, or objects on the machine is perilous and therefore prohibited.

Changed driving and braking handling
Because of the hitched machine the driving and braking handling changes. Especially when driving curves the dimensions and mass of the machine have to be taken into account. A non adapted driving style can lead to accidents.

Adapted driving speed
Under bad road circumstances and at high driving speeds very high forces can appear, which load or overload the tractor and machine to much. Adapt the driving speed according to road circumstances. A non adapted driving speed can lead to accidents.

Do not transport bales in the bale chamber
Never transport bales in the bale chamber. Transporting a bale influences the tractor's steering and braking capacities. Personal injuries or machine damages can occur.

Working with the machine

First use only after instruction
The machine may at the first time of use only be brought into use by employees of the dealer, factory representatives or employees of the manufacturer. False use after bringing the machine into use without instructions can cause damages to the machine or accidents.

Take care of technical correct condition
Only bring the machine into use in a technical correct condition. Check all important parts and replace defective parts before use. Defective parts can cause damage to the material or personal injuries.

Do not remove protective covers
The protective covers should not be removed, avoided or damaged. Check all protective covers before using, the covers have to be closed. Unprotected machine parts can cause serious or deadly accidents.

Prohibition of transporting people on the machine
Nobody and nothing shall be transported on the machine during transport. Transporting of people, animals, or objects on the machine is perilous and prohibited.

Check the direct surroundings
Before driving and bringing into use of the machine the direct surroundings must be checked. Take care of sufficient view. Only start driving when no persons, animals, or objects are in the direct surroundings. Perilous injuries can occur.

Tighten bolts and nuts
Check bolts and nuts regularly for being tight and tighten if necessary. Because of using the machine bolts can get loose. Damages to the machine or accidents can be caused.

Behaviour at troubles
At functional troubles stop and secure the machine immediately. Remedy the trouble immediately or commission a workshop. Continue working with the machine can cause personal injuries or damage to the machine.

Pto rotates after disengaging
After the PTO is disengaged or switched off, the machine will continue to tun because of inertia. Keep a safe distance to the machine until the pick-up and the moving parts really stand still.

Cornering or manoeuvring
When turning or going around the corner, you have to anticipate because of centrifugal forces caused by the distance of the centre of gravity of the machine. Beware of the turning radius and the inertia of the machine.

Bale ejection
Keep a safe distance from the bale ejection area. Danger of crushing. Which can cause severe injuries.
Never stand behind the machine when a bale comes out.

Drive adapted to ground conditions
Always drive with caution on sloping or moving ground.
Respect the maximum load permitted per axle and the total working weight authorised.

Blockage of a security device
In case of a blockage or operation of a security device, never work on the machine without

- disengaging the tractor pto first
- switching off the electronic control system
- stopping the engine and remove the ignition key

Do not hand feed or unblock the machine while it is running. Serious or deadly injuries can occur.

Unhitching the machine

Increased danger of injury
While unhitching the machine from the tractor an increased danger of injury occurs. Therefore:

- prevent the tractor from rolling away, shut down the engine and remove the ignition key
- never stay between tractor and machine during unhitching
- take care of a level and secure surface for the machine
- take care of a secure lock of the jack stand
- place the pto drive shaft at the support or hang it in the chain
- prevent the machine from rolling away
- only disconnect the hydraulic hoses when the hydraulic system at both tractor and machine is pressureless

In case of negligence heavy or deadly injuries can be the consequence.

Care and maintenance

Observe the care and maintenance intervals
Observe the prescribed maintenance intervals and those stated in the operation manual for recurring checks and inspections. In case of negligence of the intervals damages to the machine or accidents can be caused.

Use genuine parts only
Many components have special properties, which decides for the stability and the function of the machine. Only the parts and options delivered from the manufacturer have been tested and released. Other products can interrupt the function of the machine or can harm the security. When using not original parts the warranty and liability of the manufacturer reduces to nil and void.

At all care and maintenance work:

- switch off pto
- make the hydraulics pressureless
- unhitch the tractor if possible
- switch off the engine and remove the ignition key
- make sure the tractor and machine are positioned on a firm and level area, support if necessary
- do not use parts of the machine as climbing help, use suitable climbing helps on the contrary
- prevent the machine from rolling away

Only when observing these prescriptions a secured working during care and maintenance work is guaranteed.

Interrupt electric power supply
Before working on the electrical device, separate this from the electric power supply. Supplies being charged can cause material or personal damages.

Exchange hydraulic hoses
Hydraulic hoses can age without external recognizable indications. We therefore recommend to exchange all hydraulic hoses every three years. Defective hydraulic hoses can cause heavy or deadly injuries.

Careful when cleaning with high-pressure cleaner
The machine can be cleaned with water or steam. Clean bearings, electrical parts, plastic parts and hydraulic hoses with low pressure only. Too high of a pressure can damage these parts.

No aggressive wax additives
When cleaning do not use aggressive wax additives. Bright metal surfaces can get damaged.

Before welding work
Before welding to the hitched machine, disconnect the tractor's battery and the dynamo. Therefore you will avoid damages to the electrical installation.

Tighten bolted links
After care and maintenance work all loose bolted links must be tightened. Because of loose bolted links material damages can be caused.

Further prescriptions

Observe the prescriptions
Please observe besides these safety information

- the accident prevention regulations
- the general accredited safety-technical, industrial medicinal and road traffic law rules
- the tips in this operation manual
- the work, care and maintenance regulations

Warranty

Disregard of the 'Safety instructions', inadequate maintenance, use of the machine other than for its intended purpose, overloading or unauthorised modification of the machine, renders the manufacturer's warranty and responsibility void.

This chapter contains general information about your machine and information about:

- the characteristics
- the technical specifications

Destination of the machine

The machine is a round baler, which is exclusively appropriate designed for collecting of cut non or insignificantly ligneous plants, mainly grasses, from the ground, feeding them through pick-up and cutting system, forming a round bale inside the bale chamber, and consequently wrapping the bale with twine or net, taking into account all prescriptions, procedures, etcetera as stated herein and/or through decals or other signs on the machine.

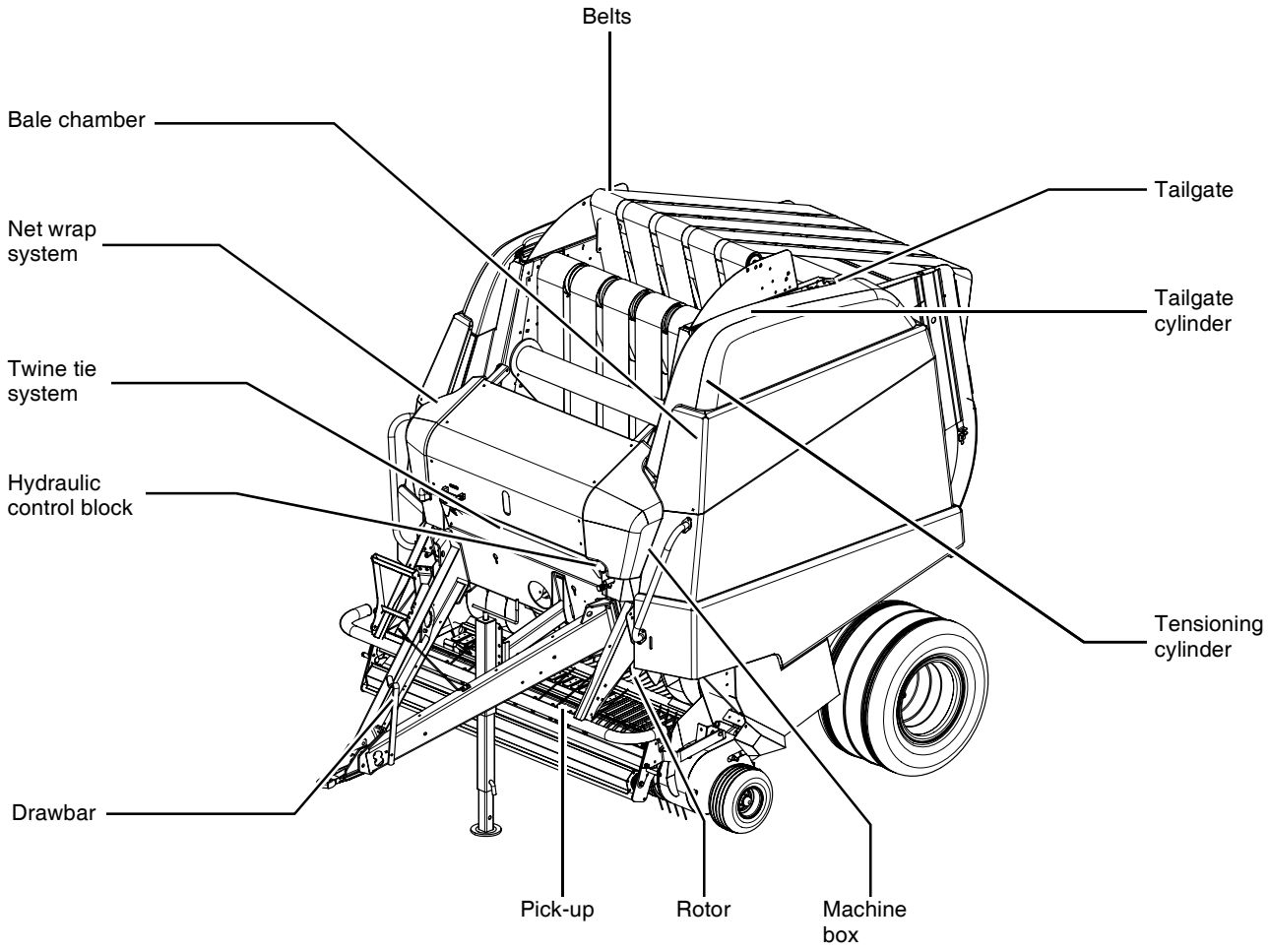
Intended use of the machine

This machine shall be exclusively used for the normal agricultural work. Any use beyond the one stipulated above is not intended use. For damages, occurring of non-intended use, neither the manufacturer nor the dealer are liable. The risk is for the user only.

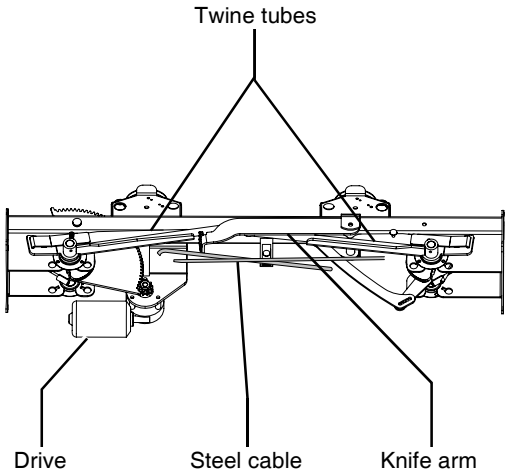
Characteristics of the machine

The pick-up picks up the crop from the ground. A belt system provides rotational movement and thus rolls the bale into shape. The build core presses the starter chamber and keeps growing by the constantly fed-in crop. Upon reaching the desired diameter the bale is wrapped with twine or net. Then the tailgate is opened and the bale is cleared out.

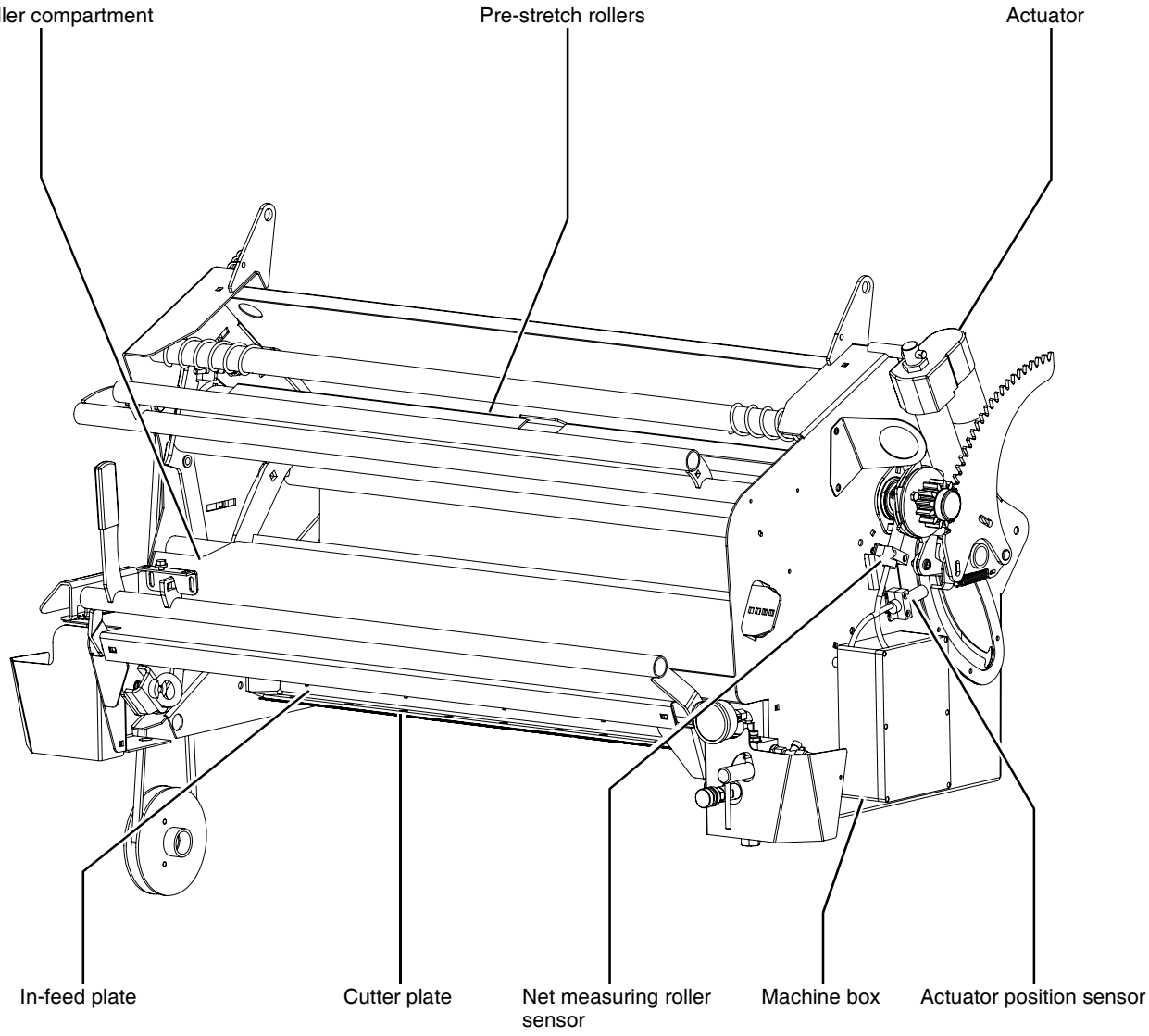
Description of the components



Twine tie system



Net wrap system



Technical specifications

RK - Open intake / Rotor

	RK - Open intake	RK - Rotor
Weight		
Weight empty (kg)	2,210	2,490
Weight net wrap unit (kg)	155	155
Length (m)		
Overall length	4.02	4.02
Overall length with net wrap unit	4.26	4.26
Width (m)		
Width	2.46	2.46
Height with tailgate closed	2.67	2.67
Height with tailgate opened	3.74	3.74
Tyres/axle		
Tyres	11.5/80-15	11.5/80-15
	15.0/55-17	15.0/55-17
	19.0/45-17	19.0/45-17
	-	500/50-17
Maximum transport speed (km/h)	30	30
Bale dimensions (m)		
Width	1.20	1.20
Diameter	adjustable from 0.80 to 1.65	adjustable from 0.80 to 1.65
Pick-up		
Collecting width (m)	2.10	2.10
Reel diameter (m)	0.30	0.30
Number of tine bars/tines	4/60	4/60
Space between tines (cm)	6.1	6.1
Lift/lower	hydraulic	hydraulic
Gauge wheels	2 pneumatic wheels	2 pneumatic wheels
Feeding		rotor with integrated augers and automatic overload clutch
Baling		
Density control	hydraulic system	hydraulic system

Binding - twine tie		
Number of twine spools	8	8
Recommended twine (m/kg)	400-700 (synthetic)	400-700 (synthetic)
	200-330 (sisal)	200-330 (sisal)
Binding - net wrap		
Number of net rolls	1	1
Recommended net roll width (m)	1.23-1.30	1.23-1.30
Maximum net roll diameter (m)	0.32	0.32
Recommended net	Polydress Rondotex MX1000 or TAMA edge-to-edge (2000 or 3000 m rolls)	Polydress Rondotex MX1000 or TAMA edge-to-edge (2000 or 3000 m rolls)
Tractor requirements		
Pto horsepower (kW / hp)	40 / 54	50 / 67
Pto speed (rpm)	540	540
Electric supply	12 V (DC) coupling for control box (DIN 9680)	12 V (DC) coupling for control box (DIN 9680)
	12 V (DC) coupling for road lighting (DIN ISO 1724)	12 V (DC) coupling for road lighting (DIN ISO 1724)
Hydraulics	1 single acting control valve	1 single acting control valve
	1 double acting control valve	1 double acting control valve
	1 brake connection to ISO 5676 [+]	1 brake connection to ISO 5676 [+]
Pneumatics	2 connections for pneumatic brakes [+]	2 connections for pneumatic brakes [+]

RK - XL-Rotor

	RK - XL-Rotor
Weight	
Weight empty (kg)	2,680
Weight net wrap unit (kg)	155
Length (m)	
Overall length	4.02
Overall length with net wrap unit	4.26
Width (m)	
Width	2.46
Height with tailgate closed	2.67
Height with tailgate opened	3.74
Tyres/axle	
Tyres	11.5/80-15
	15.0/55-17
	19.0/45-17
	500/50-17
Maximum transport speed (km/h)	30
Bale dimensions (m)	
Width	1.20
Diameter	adjustable from 0.80 to 1.65
Pick-up	
Collecting width (m)	2.10
Reel diameter (m)	0.30
Number of tine bars/tines	4/60
Space between tines (cm)	6.1
Lift/lower	hydraulic
Gauge wheels	2 pneumatic wheels
Feeding	rotor with integrated augers and automatic overload clutch
Baling	
Density control	hydraulic system
Binding - twine tie	
Number of twine spools	8
Recommended twine (m/kg)	400-700 (synthetic)

	200-330 (sisal)
Binding - net wrap	
Number of net rolls	1
Recommended net roll width (m)	1.23-1.30
Maximum net roll diameter (m)	0.32
Recommended net	Polydress Rondotex MX1000 or TAMA edge-to-edge (2000 or 3000 m rolls)
Tractor requirements	
Pto horsepower (kW / hp)	50 / 67
Pto speed (rpm)	540
Electric supply	12 V (DC) coupling for control box (DIN 9680)
	12 V (DC) coupling for road lighting (DIN ISO 1724)
Hydraulics	1 single acting control valve
	1 double acting control valve
	1 brake connection to ISO 5676 [+]
Pneumatics	2 connections for pneumatic brakes [+]

RL - Open intake / Rotor

	RL - Open intake	RL - Rotor
Weight		
Weight empty (kg)	2,260	2,540
Weight net wrap unit (kg)	155	155
Length (m)		
Overall length	4.12	4.12
Overall length with net wrap unit	4.38	4.38
Width (m)		
Width	2.46	2.46
Height with tailgate closed	2.87	2.87
Height with tailgate opened	3.77	3.77
Tyres/axle		
Tyres	11.5/80-15	11.5/80-15
	15.0/55-17	15.0/55-17
	19.0/45-17	19.0/45-17
	-	500/50-17
Maximum transport speed (km/h)	30	30
Bale dimensions (m)		
Width	1.20	1.20
Diameter	adjustable from 0.80 to 1.85	adjustable from 0.80 to 1.85
Pick-up		
Collecting width (m)	2.10	2.10
Reel diameter (m)	0.30	0.30
Number of tine bars/tines	4/60	4/60
Space between tines (cm)	6.1	6.1
Lift/lower	hydraulic	hydraulic
Gauge wheels	2 pneumatic wheels	2 pneumatic wheels
Feeding		rotor with integrated augers and automatic overload clutch
Baling		
Density control	hydraulic system	hydraulic system
Binding - twine tie		
Number of twine spools	8	8

Recommended twine (m/kg)	400-700 (synthetic)	400-700 (synthetic)
	200-330 (sisal)	200-330 (sisal)
Binding - net wrap		
Number of net rolls	1	1
Recommended net roll width (m)	1.23-1.30	1.23-1.30
Maximum net roll diameter (m)	0.32	0.32
Recommended net	Polydress Rondotex MX1000 or TAMA edge-to-edge (2000 or 3000 m rolls)	Polydress Rondotex MX1000 or TAMA edge-to-edge (2000 or 3000 m rolls)
Tractor requirements		
Pto horsepower (kW / hp)	40 / 54.4	50 / 67
Pto speed (rpm)	540	540
Electric supply	12 V (DC) coupling for control box (DIN 9680)	12 V (DC) coupling for control box (DIN 9680)
	12 V (DC) coupling for road lighting (DIN ISO 1724)	12 V (DC) coupling for road lighting (DIN ISO 1724)
Hydraulics	1 single acting control valve	1 single acting control valve
	1 double acting control valve	1 double acting control valve
	1 brake connection to ISO 5676 [+]	1 brake connection to ISO 5676 [+]
Pneumatics	2 connections for pneumatic brakes [+]	2 connections for pneumatic brakes [+]

RL - XL-Rotor

	RL - XL-Rotor
Weight	
Weight empty (kg)	2.730
Weight net wrap unit (kg)	155
Length (m)	
Overall length	4.12
Overall length with net wrap unit	4.38
Width (m)	
Width	2.46
Height with tailgate closed	2.87
Height with tailgate opened	3.77
Tyres/axle	
Tyres	11.5/80-15
	15.0/55-17
	19.0/45-17
	500/50-17
Maximum transport speed (km/h)	30
Bale dimensions (m)	
Width	1.20
Diameter	adjustable from 0.80 to 1.85
Pick-up	
Collecting width (m)	2.10
Reel diameter (m)	0.30
Number of tine bars/tines	4/60
Space between tines (cm)	6.1
Lift/lower	hydraulic
Gauge wheels	2 pneumatic wheels
Feeding	rotor with integrated augers and automatic overload clutch
Baling	
Density control	hydraulic system
Binding - twine tie	
Number of twine spools	8
Recommended twine (m/kg)	400-700 (synthetic)

	200-330 (sisal)
Binding - net wrap	
Number of net rolls	1
Recommended net roll width (m)	1.23-1.30
Maximum net roll diameter (m)	0.32
Recommended net	Polydress Rondotex MX1000 or TAMA edge-to-edge (2000 or 3000 m rolls)
Tractor requirements	
Pto horsepower (kW / hp)	50 / 67
Pto speed (rpm)	540
Electric supply	12 V (DC) coupling for control box (DIN 9680)
	12 V (DC) coupling for road lighting (DIN ISO 1724)
Hydraulics	1 single acting control valve
	1 double acting control valve
	1 brake connection to ISO 5676 [+]
Pneumatics	2 connections for pneumatic brakes [+]

Checking on delivery

Completely delivered
The machine is delivered completely. In case parts are not mounted, please contact your dealer.

The machine must be checked after delivery. The machine is equipped with:

- Operation manual
- Spare parts manual
- Pto drive shaft assembly
- Hydraulic hoses with couplings
- Electronic control system (control box, fixing brackets, power cable)
- Lighting cables
- Mechanical brake cord [+]
- Number plate board

Safety

Increased danger of injury

- Prevent the tractor from rolling away
- Never stay between the tractor and the machine during hitching

In case of negligence serious or deadly injuries can occur.

Use a proper tractor

Make sure the tractor

- is in safe operating condition,
- has adequate braking capabilities for this machine
- is suitable for carrying and transporting this machine

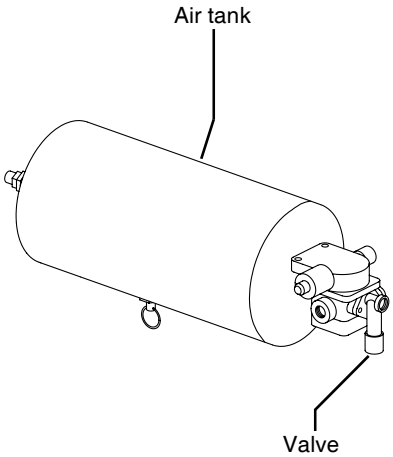
Using a tractor which is not suitable can cause serious personal and material damages.

General

The machine is ex works provided for hitching onto the tractor's hook. To prepare the machine for hitching, the following items are necessary:

- Both tractor and machine must be placed on a firm level
- The drawbar must be adjusted
- The hitch eye must be adjusted
- The pto drive shaft must be coupled
- The machine must be levelled
- The electronic control box must be installed
- The parking brake [+] must be installed
- The hydraulic hoses must be coupled
- The pneumatic hoses [+] must be coupled
- The lighting cables must be coupled

Moving the machine without tractor



When the machine is equipped with pneumatic brakes, it must be prepared before it can be moved without a tractor.

> Push the valve upwards

After moving

> pull the valve downwards

Hitching

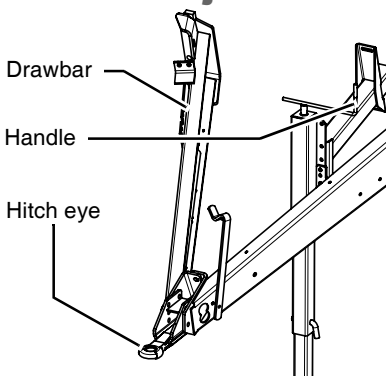
Remove tractor lower links
Remove the tractor lower links to avoid them touching the drawbar. During turning, the lower links can touch the drawbar and the machine can tip over. This can cause personal injuries or damage to the machine.

Before the machine can be hitched onto the hook, the correct height of the hitch eye to the tractor's clevis must be determined.

> Place both tractor and machine in line on a firm level, with a distance between clevis and hitch eye of about 15 cm

Both drawbar and hitch eye can be turned upside down. By doing this the drawbar can be set for high and low attachment.

Drawbar adjustment



The machine must be placed in a horizontal position:

> Turn the handle to the left: the drawbar goes upwards

or

> Turn the handle to the right: the drawbar goes downwards

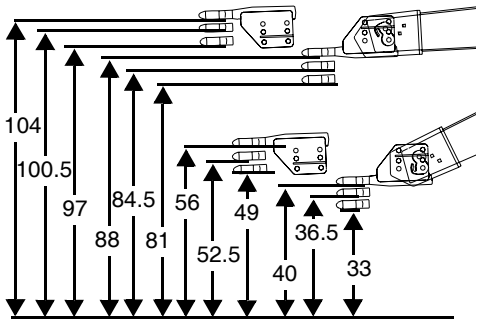
> Check the height of the tractor's clevis

The drawbar height can be changed by

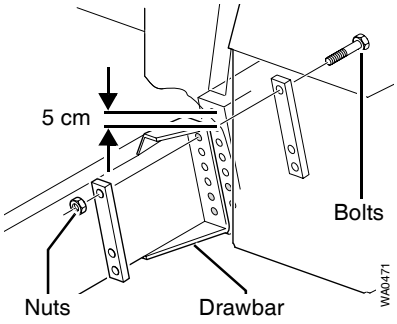
- moving the drawbar
- moving the hitch eye

Select the correct position in accordance with your tractor in order to have tractor and machine lined up correctly.
→ Levelling the machine, page 39

Moving the drawbar



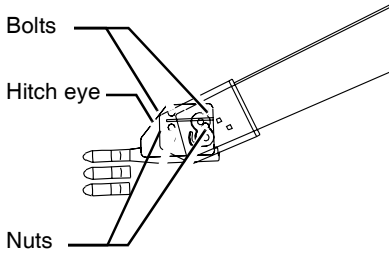
Hitch height (cm)
33
36.5
40
49
52.5
56
81
84.5
88
97
100.5
104



> Secure the drawbar by placing it in a well suited hoist
> Loosen the bolts and the nuts
> Move the drawbar to the desired position
> Tighten the bolts and the nuts
> Torque the bolts and the nuts to 450 Nm
> Remove the hoist

The hole pattern on the machine allows one extra position 5 cm higher. The drawbar must always be fitted with 3 bolts and nuts per side.

Moving the hitch eye

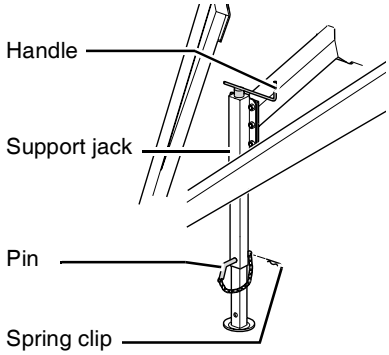


The hitch eye can be moved into six positions.

> Loosen the bolts and the nuts
> Move the hitch eye to the desired position
> Tighten the bolts and the nuts

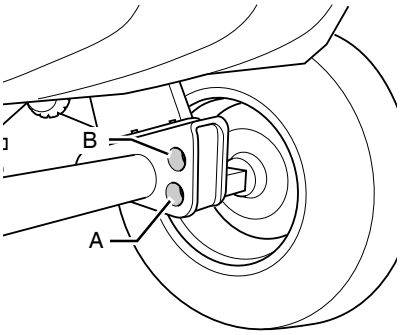
→ Tightening torques, page 113

Support jack



> Level the drawbar to the correct height using handle
> Attach the machine onto the tractor
> Fully retract the support jack using the handle
> Remove the spring clip
> Remove the pin
> Push the support jack fully up
> Place the pin
> Lock the pin with the spring clip

Ground adjustment of the machine

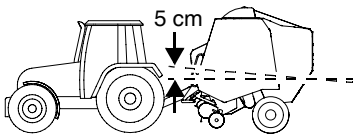


The ground distance of the machine can be adjusted by moving the axles.

Setting	Explanation
A	standard setting
B	low setting for: • machines with a wide pick-up • hilly terrain • a better bale start (open intake)

> Place a well-suited jack under the axle
> Loosen the wheel nuts
> Remove the wheel
> Loosen the axle
> Move the axle to the desired setting
> Tighten the axle
> Place the wheel
> Tighten the wheel nuts
> Remove the jack
> Repeat the mentioned procedure for the other axle

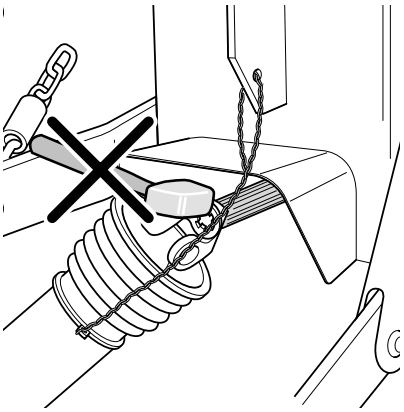
Levelling the machine



The machine must be lined up correctly behind the tractor. The machine must be horizontally or slightly inclined backwards.

> Use the horizontal lines of the lateral doors at both sides for reference

Coupling the pto drive shaft



Do not use a hammer
The pto drive shaft may not be mounted using a hammer or other equivalent tools. Using these, the pto drive shaft can get seriously damaged. A damaged pto can cause both machine and tractor damages.

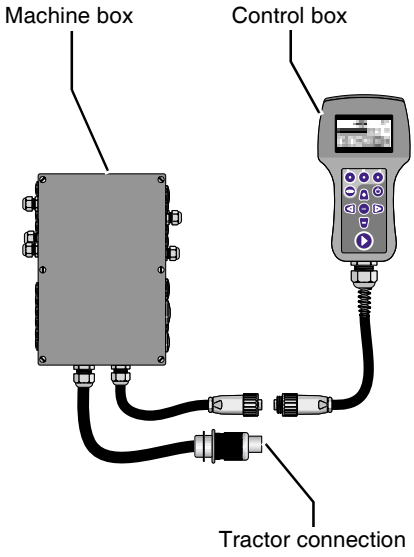
> Check, before coupling the pto drive shaft, if the pto drive shaft has to be shortened
> Shorten the pto if necessary
→ Pto drive shaft, page 114
> Make sure the tractor pto is clean and greased
> Couple the pto drive shaft to the pto of the tractor
> Couple the pto drive shaft to the machine
> make sure the shaft sliding ring catches with the slot of the pto
> Fit the chains to rigid positions at both tractor and machine to prevent the protection covers from turning

Installation control box

The control box must be installed on a support or holder in the tractor cab.
Take care of the following:

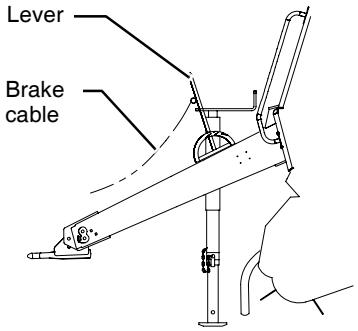
- make sure that the control box is installed in good manual and visible reach of the operator
- Do not mount the control box onto a part that is subject to strong vibrations
- Make sure that the control box is in an area with less dust
- Do not install the control box where bright sun or rain may can reach it

Electrical connections



> Connect the cable of the machine box direct to tractor connection

Parking/emergency brake [+]



Only if the machine is equipped with hydraulic brakes [+], or pneumatic brakes [+], it is provided with a combined parking/emergency brake. The parking brake prevents the machine from rolling away when parked. The emergency brake will come into force and stops the machine from uncontrolled rolling away in case the machine breaks away from the tractor.

> Always attach the brake cable to the brake lever at the machine and to a fixed point at the tractor. It is not allowed to pull the machine without a fixed brake cable or with an incorrect installed brake cable. An uncontrolled rolling machine can cause serious or deadly injuries and damage the material. Obey the local and national traffic regulations.

To release the parking brake; push the release button and move the lever backwards.

Connections

Hydraulic connections

Hydraulic coupling only pressureless
Only couple the hydraulic hoses to the tractor when both tractor and machine hydraulics are pressureless. Hydraulics under pressure can cause accidental movements of the machine.

Avoid oil mixture
When using the machine in combination with different tractors, improper oil mixture can take place. Improper oil mixture can destroy tractor parts.

Avoid entering of dirt into the hydraulic system
The hydraulic system can get seriously damaged. Personal injuries or material damage can be caused.

Check hoses and couplings
Before connecting, prove all hydraulic hoses for damages. After connecting check all hydraulic couplings for tight connection. Defective hydraulic hoses or bad connected hydraulic couplings can cause injuries or unforeseen movements of the machine.

Secure tractor hydraulic devices
In transport position tractor hydraulic devices must be secured against unintentional movements. Unintentional movements of the hydraulic device can cause serious injuries or unforeseen movements of the machine.

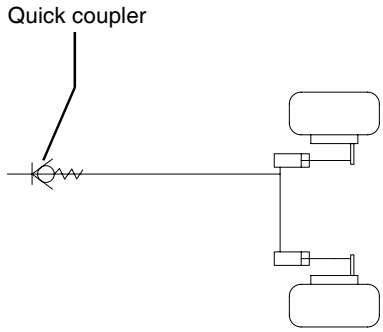
Check correct position of hydraulic hoses
Hydraulic hoses may not stick or tighten. Pay attention to sufficient free space. Torn or stuck hydraulic hoses cause unverifiable movements of the machine and serious injuries.

Take care of the correct laying of hydraulic hoses
Hydraulic hoses may not stick or tighten. Take care of sufficient free space. Worn or stuck hydraulic hoses can cause heavy damage to the machine or severe injuries.

Check the following connections from the tractor to the machine (if applicable):

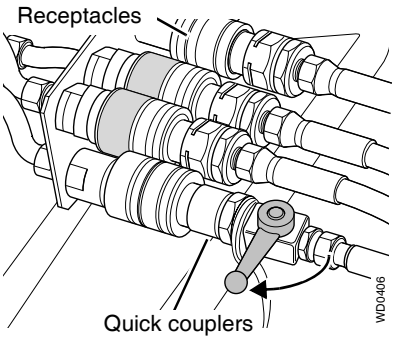
- hydraulic connections
- electronic connections
- pneumatic connections

Brake coupling



> Make sure that the quick coupler is clean
> Make sure that the hydraulic braking valve of the tractor is pressureless
> Couple the brake coupling to the braking valve

Coupling



> Make sure that the quick couplers are clean
> Make sure that the hydraulic device of the tractor is pressureless
> Couple the hydraulic couplings to the concerning hydraulic valves

Pneumatic connections [+]

Avoid the entering of dirt into the pneumatic system. The pneumatic system can get seriously damaged. Personal or material damage can be caused.

Pneumatic connections are only available if the machine has been provided with pneumatic brakes.

> Make sure that the quick couplers are clean
> Connect the quick couplers of the pneumatic hoses to the pneumatic receptacles of the tractor

Coupling

> Make sure that the valves at the tractor are open
> Couple the red quick coupler to the corresponding tractor valve
> Couple the yellow quick coupler to the corresponding tractor valve

Electric lighting

> Fit the license plate board (if necessary)
> Connect the 7-pin plug to the trailer lighting socket on the tractor

Safety

Obey safety instructions
Obey the safety instructions at the execution of all work. Ignoring the safety instructions can lead to serious or deadly injuries.

Never work on the machine while it is running
Never carry out adjustment work while the machine is running.

- Pto must be switched off
- Tractor engine must be switched off and the ignition key must be removed
- Electronic control box must be switched off

In case of negligence, serious or deadly injuries can occur.

No persons in turning area
During work, no persons may be within the turning area of the machine. Serious personal injuries can be caused.

Secure the machine
During adjustment, an increased danger of injury exists. Therefore

- secure the machine from accidental commencement of operations and rolling away (use wheel chocks)
- the machine must have a level, secure position and must be supported during working if necessary

Unsecured or not supported machines can lead to accidents.

Wear safety shoes
During all work at the machine never bring your feet under the machine and always wear safety shoes. Wearing safety shoes prevents or decreases the risk of serious injuries.

Guarantee correct hydraulic coupling
Check definitely, before using the machine, that the hydraulics for the pick-up, the tailgate and the cutting system are coupled to the correct single or double acting valves. Not correct coupled hydraulic hoses can cause unpredictable and accidental movements of the machine.

General

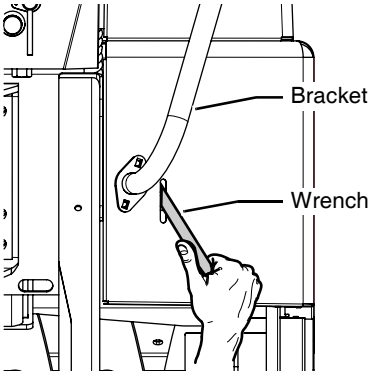
For the realization of all preparations counts:

- Secure the machine
- Check the tyre pressure

The following settings have to be realized before using the machine:

- gauge wheels adjustment
- pick-up safety chains
- pick-up suspension
- net installation
- twine installation
- core density adjustment
- scraper adjustment

Lateral doors



The lateral doors can be opened for

- storing a net roll
- storing an extra net roll [+]
- storing twine spools
- adjustments
- maintenance

Opening the lateral doors

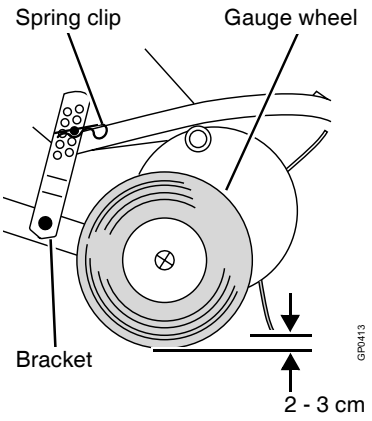
> Use a 13-mm open-ended wrench to unlock the lock
> Pull up the bracket to open the lateral door

Closing the lateral doors

Carefully pull down lateral door
Be careful when pulling down the bracket to close the lateral door. The lateral door is spring loaded to close on the last part of the stroke. Personal injuries can occur.

> Pull down the bracket to close the lateral door
> Make sure that the lateral door locks automatically

Adjustment gauge wheels



The adjustment of the pick-up working height is determined by the height of the gauge wheels on each side of the machine.

The mentioned height above the ground is just a recommendation since the correct value depends much on ground and crop conditions. Both sides of the pick-up shall be set to the same height.

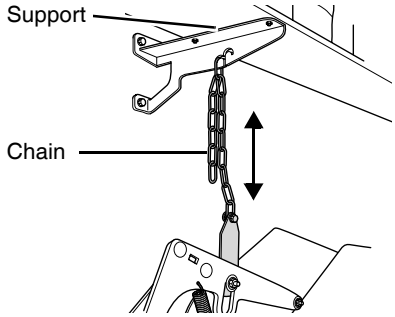
The adjustment of the gauge wheels is carried out by placing the bracket in different vertical positions. Adjust as follows:

> Raise the pick-up fully
> Close the valve
> Remove the spring clip
> Place the gauge wheel with help of bracket at the desired position
> Replace the spring clip

Pick-up safety chains

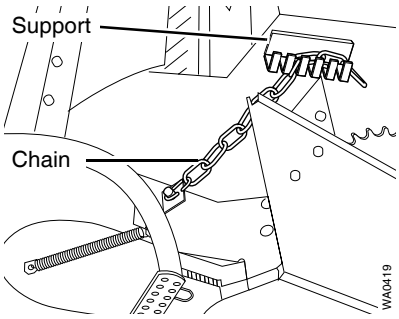
The pick-up is prevented by two chains from unexpected lowering during working.

Wide pick-up



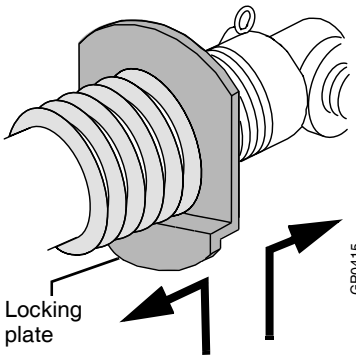
> Attach the chain on both sides of the machine at the support

Rotor



> Attach the chain on both sides of the machine at the support

Pick-up suspension



Two springs, located on the pick-up hydraulic cylinders, ensure suspension of the pick-up.

Adjust the spring tension on both sides of the pick-up as follows:

> Raise pick-up fully

> Close valve

> Move locking plate to the left: increase spring tension

or

> Move locking plate to the right: decrease spring tension

The pick-up is correctly adjusted when it can be lifted by hand at the front of the flanks.

TIP Make sure that the spring tension is the same on both sides of the pick-up.

Twine installation

Before guiding the twine:

> Switch off the pto

> Stop the tractor engine

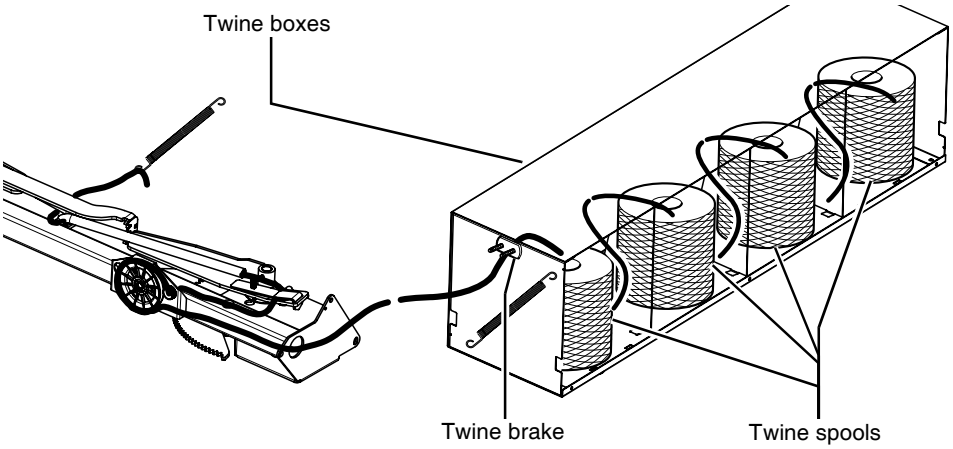
> Remove the ignition key

Wear safety gloves
The twine knife is very sharp. Always wear safety gloves when handling the twine knife. Not wearing safety gloves can cause serious injuries.

> Choose a good quality twine in order to ensure a satisfactory wrapping function

Recommended is
→ Technical specifications, page 26

Guiding the twine



> Push to 0 to switch off the system

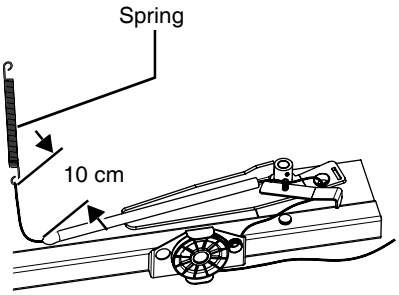
All cycles are now interrupted. The machine is in safe mode.

For both left and right side of the machine:

> Put the twine spools in the twine boxes

> Attach the twine ends to each other

> Pass the twine through the twine brakes inside the twine boxes



> Pass the twine through
- the twine indication rollers
- the twine brakes
- the twine tubes

> Use the spring to pass the twine through the twine tubes

The end of the twine shall protrude about 10 cm the twine tubes.

> Push to switch on the system

The system is now ready to operate.

Twine brakes

The twine brakes in the twine boxes and at the twine tubes pretension the twine.
Adjustment:
→ Twine brake - twine boxes, page 134
→ Twine brake - twine tubes, page 134

Net installation

Before installing the net:

> Switch off the pto

> Stop the tractor engine

> Remove the ignition key

Cutter plate cutting hazard
The cutter plate is very sharp. Make sure the cutter plate is in rest position and wear safety gloves. An unsafe cutter plate can cause serious injuries.

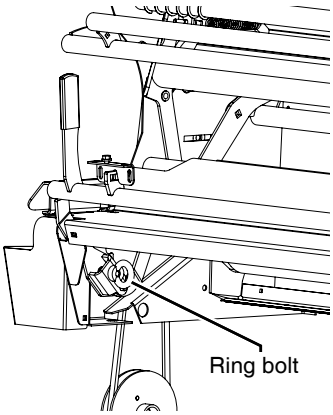
> Choose a good quality of net in order to ensure trouble free functioning of the net wrap system

Recommended is
→ Technical specifications, page 26

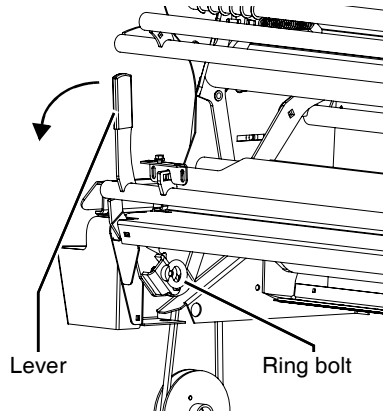
Placing the net roll

> Push to 0 to switch off the system

All cycles are now interrupted. The machine is in safe mode.

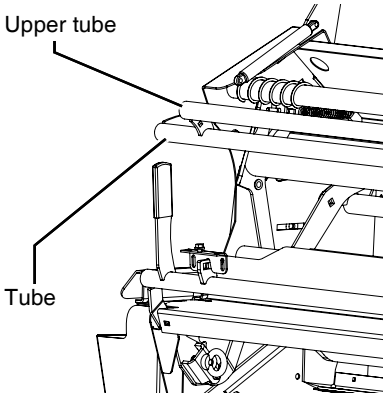


> Pull the ring bolt and hold it



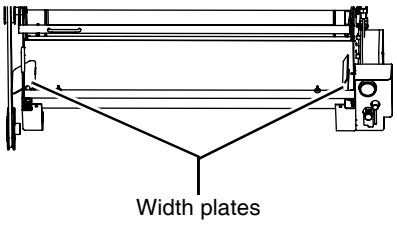
> Move down the lever completely and release the ring bolt

The lever is locked now.



> Move up the tube completely, using the upper tube

> Place the net roll in the net roll compartment
> Check that the net is rolling off in the right direction

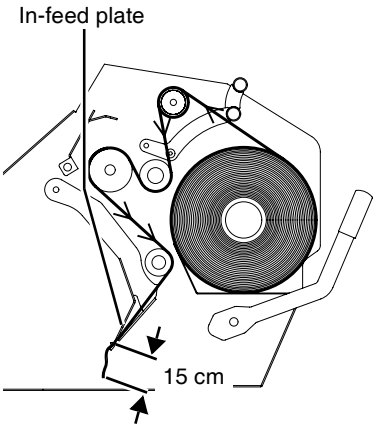


> Move both left and right width plates if necessary to the

- outermost position: 130 cm net roll
- inmost position: 123 cm net roll

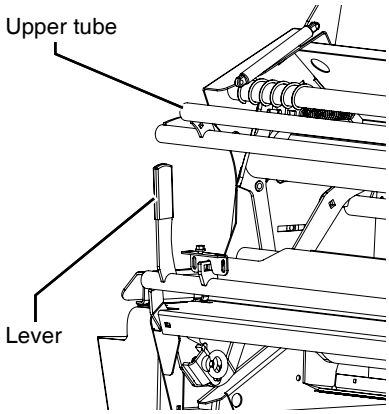
The net roll is now centered.

Guiding the net



> Guide the net according to the scheme
> Leave about 15 cm net out of the in-feed plate

TIP It is not necessary to spread the net to its full width.

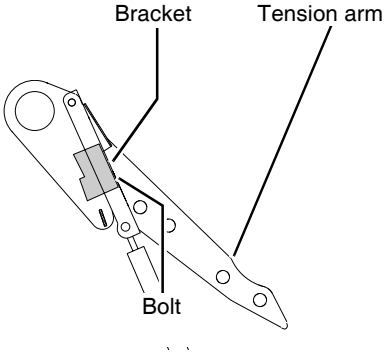


> Move the lever completely upwards
> Move down the tube completely, using the upper tube
> Close the screen lid

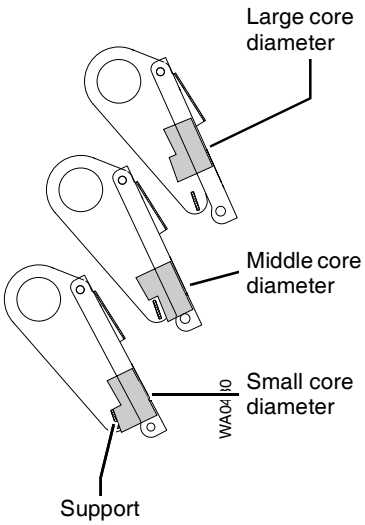
> Push to switch on the system

The system is now ready to operate.

Core density adjustment



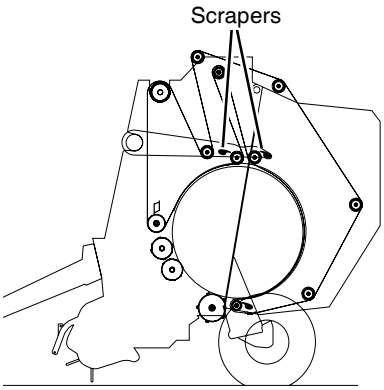
After some time, the belts are getting longer. In standard case the tension arm is little hydraulically loaded when the bale chamber is empty. This is in order to create a uniform core diameter. To compensate the belt elongation a bracket on the tension arm can be set.



> Loosen bolt
> Place bracket to the desired core density
> Tighten bolt

TIP After mounting the bracket and tightening of the bolt, there should always remain a gap between bracket and support when the bale chamber is empty.

Scraper adjustment



In order to ensure the crop does not stick onto the rollers the machine has been equipped with scrapers.
The following types of scrapers have been installed:

- sharp scrapers
- scrapers of the profiled rollers

These scrapers are both provided for the following crops:

- dry crop
- silage

For scraper adjustment
→ Scraper adjustment, page 124

Windrow dimensions

A constantly built windrow allows crop collection at a constant speed and avoid shocks to the machine. Its shape, volume and moisture directly affects the output of the machine.
The machine can take in windrows according to the following specifications:

Width (m)	Height (m)
maximum 1.20	0.40

A windrow with a larger height than 0.40 m risks being caught by the drawbar and so creating an irregular feed to the pick-up, upsetting the normal rhythm of the machine (risking the overload of the feeding system during baling).

Running

> Run the tractor pto at idle speed
- Check the correct operation of the components
- Check that there are no unusual noises

> Run the machine at 540 rpm for some minutes

> Switch off the pto
- Check the tightness of the hardware
- Check the tension of the chains

During the running-in period, a specific maintenance must be done, confer to maintenance chart
→ Maintenance intervals, page 109

Safety

Before road transport will take place, please read the following safety information. The compliance is prescribed and helps you to avoid accidents.

Close valves
Before road transport close all valves. With open valves and false operation the lifting cylinder can be lowered. Traffic accidents can be caused.

Clean the machine before road transport
Clean the machine, before every road transport, from crop residues and heavy dirt. Crop or dirt, falling at the road, can cause a slippery state of the road. This can lead to fatal accidents.

Tractor rear wheels may not touch the drawbar
During driving through curves the tractor rear wheels may not touch the drawbar. The tractor rear wheels can touch the pto drive shaft. Serious machine damages can be caused.

Do not transport bales in the bale chamber
Never transport bales in the bale chamber. Transporting a bale influences the tractor's steering and braking capacities. Personal or machine damages can occur.

Before road transport

Road transport must be done in transport position. To bring the machine into transport position, the following steps are necessary:

> Remove crop residues and heavy dirt
> Lift the pick-up fully
> Close the tailgate

Preparing the machine

Guarantee correct hydraulic couplings
Before preparing the machine, strictly check if the hydraulic couplings are coupled correctly to the hydraulic valve. Not correct coupled hydraulic couplings can cause unpredictable movements of the machine. Personal or machine damages can occur.

Checking the machine

Check the machine before road transport by the checklist:

- Tailgate closed and locked completely?
- Electronic control switched off?
- Tractor hydraulic switched off?
- Pto switched off?
- All valves closed?
- Correct tyre pressure?
- Crop residues and heavy dirt are removed?
- Road lighting is connected properly?
- The braking system (if available) is connected properly?
- Cables and lines are placed in that way they will not tension or get in touch with the tractor rear tyres during curve driving?
- Lighting functions?

Road transport

- Before starting driving, check the close environment. Always take care of a clear view and especially at children in the working environment of the machine.
- Lock hydraulic valves of the tractor before road transport
- Do not transport any persons or objects at or inside the machine
- Adapt the drive speed to the road conditions
- Do not exceed the maximum speed of 40 km/h. Obey the national and local speed limits.
- Pay attention to sufficient driving and braking capacity. Then driving and braking capacity are influenced by the attached machine (longer braking paths because of larger propulsion).

Preparation for road transport

Before the machine is travelling by road, the machine must be placed into transport position. Therefore

- the pick-up must be lifted to maximum height
- the bale chamber must be empty

Pick-up

When the machine is travelling by road, the pick-up must be fully lifted to the maximum height.

> Lift the pick-up to maximum height

> Close the isolating valve on the hydraulic hose at tractor side

Bale chamber

The bale chamber must be empty before road transport may take place. Eventual the last bale must be tied with either twine or net.

Twine tie

> Push to choose twine tie

> Push to start wrapping

> Open the tailgate to eject the bale

> Close the tailgate

Net wrap

> Push to choose net wrap

> Push to start wrapping

> Open the tailgate to eject the bale

> Close the tailgate

Wheels / tyres

Tyre pressure

> Check the tyre pressure
→ Wheels, page 145

Tightness of wheel nuts

> Check the tightness of the wheel nuts
→ Tightness of wheel nuts, page 144

Safety

Obey the safety information
Obey the safety information at the execution of all work. Ignoring the safety information can lead to serious or deadly injuries.

Secure tractor and machine

- Switch off and secure the tractor
- Prevent the machine against accidental commencement of operations

Unsecured machines can lead to accidents.

Performing settings

The settings to the machine must be performed in working position. They are described in the next sections:

- Crop guard adjustment

Prior to baling

Before baling can start, the following has to be checked:

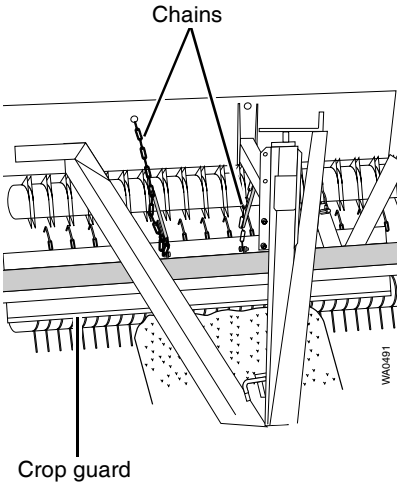
- Has the electronic control box been switched on?
- Has the bale diameter been set?
- Has the pto been switched on at low rpm and increased to 540 rpm?
- Has the hydraulic density pressure been adjusted?
- Has the pick-up been positioned at the desired height?
- Is the tailgate closed?
- Is the tailgate locked by its locks?
- Have the scrapers been adjusted?
- Has the crop guard been set?

Crop guard adjustment

The crop guard favours a good crop feed. Especially in short crop and windy weather.
The crop guard adjustment depends on the kind of pick-up mounted:

- WPU
- Rotor + XL-Rotor

Crop guard - Rotor



The crop guard can be placed into various positions.

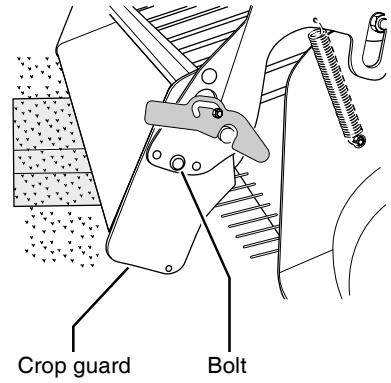
> Support the crop guard by one hand

> Place the chains to the desired position

The bottom side must just touch the windrow.
Both chains should be at the same height.

> Let go the crop guard slowly

Crop guard - WPU



The crop guard can be placed into three positions.

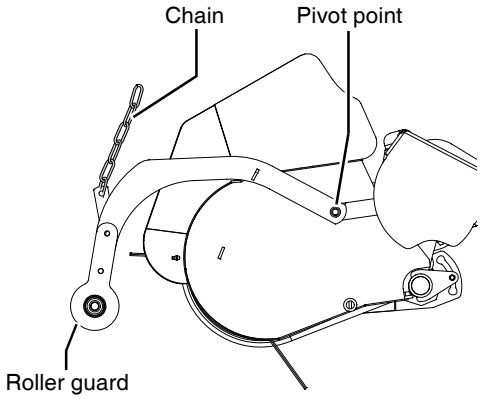
> Remove the bolt

> Place the crop guard in the desired position

The bottom side must just touch the windrow.

> Mount the bolt

Roller guard



The bottom side of the roller guard must just touch the windrow.
The roller guard may only be used in the most forward pivot point.

Adjust the roller guard as follows:

> Use the chain to prevent the roller guard from sinking

Safety

No adjustment on a working machine
It is prohibited to do adjustments on a working or moving machine.

Driving along at the machine prohibited
It is not allowed that people or objects drive along at the machine. Driving along at the machine is perilous and prohibited.

No persons in the turning area
Take care of no people be in the turning and working area of the machine. People can get grabbed or hit by the machine. Serious or deadly injuries can occur.

Pto speed maximum 540 rpm
The pto speed may not exceed 540 rpm and must be adapted to the condition of the crop. A higher rpm can cause damages to the machine.

Do not compress the pto drive shaft
In no working or transport position may the pto drive shaft be compressed. Compressed pto drive shafts can cause damages to the tractor or the machine.

Bale diameter setting

The bale diameter must be set electronically in order to control eventual alarms.
The bale diameter in metres can be set

- from 0.80 to 1.65 (RK)
- from 0.80 to 1.85 (RL)

Bale diameter

→ Bale diameter and mixed chamber settings, page 83

Manual binding control

Manual wrapping control can be used for a short period in the following cases:

- if one or more connections are faulty
- if one or more sensors are defective

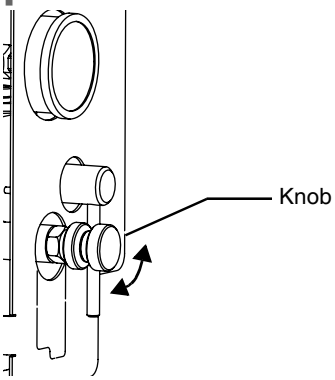
That way a field can be completed.

Manual wrapping control offers the possibility to control the net wrap actuator and the twine motor manually.

Manual binding

Net wrap
→ Manual net binding, page 82
Twine tie
→ Manual twine binding, page 82

Adjustments bale pressure



No modifications causing a higher pressure allowed
Any modification to obtain a higher pressure may cause damage to the machine. Even at the attempt of such a modification all liability and warranty become extinct.

The bale pressure can be set between 60 and 200 bar. The set bale pressure can be controlled by closing the tailgate via the control valve of the tractor. When the tailgate has been closed completely the set pressure can be read on the pressure gauge.
The pressure can be adjusted by knob.

> Turn knob clockwise: pressure increases

> Turn knob counterclockwise: pressure decreases

When working with a tractor that cannot provide the set pressure you only can verify the pressure setting when making the next bale.

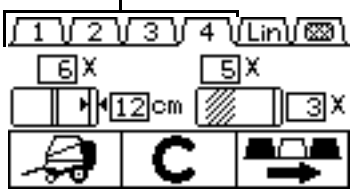
The given pressure values are standard values only. The real values required depends on the crop type and baling conditions. Therefore they may differ a lot.

Setting	Pressure (bar)
Very dry hay or dry straw	200
Normal dry hay	180
Silage	140 - 180 (dependent on crop humidity)

TIP The set pressure may not be reached if the crop quantity taken in is too little.

Electronic twine tie settings

Twine tie programs



For additional explanation
→ Twine tie settings, page 84

> Push, the display twine tie settings appears

> Push to go to the next desired wrapping program

When in the desired wrapping program:

> Push to select a value to be changed

> Push to increase the desired value

or

> Push to decrease the desired value

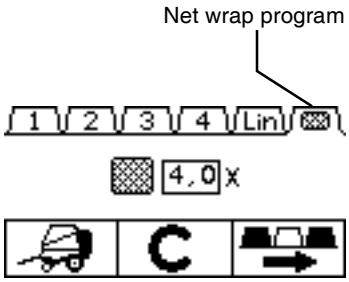
> Push to accept the changed value

> Push to confirm and to go back to the operating display

The chosen twine wrapping program number is shown in the operating display.

Push to restore the default value

Electronic net wrap settings



For additional explanation
→ Net wrap settings, page 85

> Push, the display net wrap settings appears

> Push to go to the net wrap program

or

When in the net wrap program:

> Push to select a value to be changed

> Push to increase the desired value

or

> Push to decrease the desired value

> Push to accept the changed value

> Push to confirm and to go back to the operating display

The net wrap selection is framed in the operating display.

Push to restore the default value

Driving

Run 540 rpm during use
It is vital to let the machine run at 540 rpm speed during use. Only then a fluent operation of the various functions can be guaranteed.

Please take care of the following during use:

- the pto must be switched on
- drive at the correct working speed (between 4 and 15 km/h); adapted according to the crop

Pto

The pto may only be switched on at low motor rpm.

> Switch on the pto

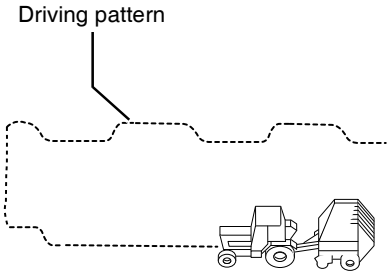
Driving speed

Use an adequate forward speed to ensure the crop is fed uniformly and constantly into the machine.

> Adjust the driving speed according to

- crop amount
- windrow volume
- ground conditions

Driving pattern



The bale shape indication arrows on the control box display indicate how the bale is formed inside the bale chamber.

> Steer the machine in such a way that the windrow is fed at both sides into the pick-up in an alternating line

This in order to fill the bale chamber to the optimum.

> Continue checking this on the display

The driving is especially critical when working in a narrow windrow.

TIP Do not weave over a narrow windrow but always stay driving for a while at the sides as the figure shows. This since zig-zagging causes bad lateral feed and thus badly formed bales.

> Start slowly straight on the windrow

> Maintain 540 rpm at windrow end so eventually a binding cycle operates

Pick-up

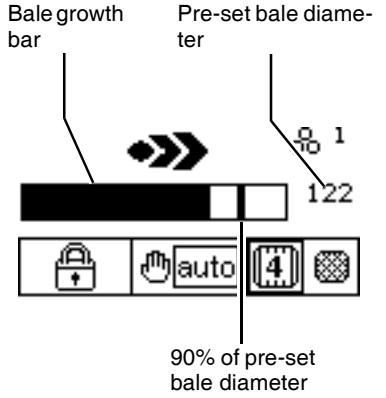
Stay clear of a rotating pick-up
Never try to pull crop out of or push crop into a rotating pick-up. Serious personal injuries can occur.

> Put the hydraulic valve in floating position

Pick-up height

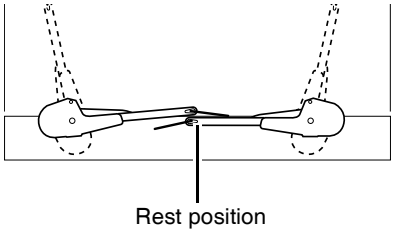
In rough and/or stony terrain it is recommended to use only the chains and not the gauge wheels.
In that case the gauge wheels must be lifted high enough not to interfere
→ Adjustment gauge wheels, page 47

Bale growth

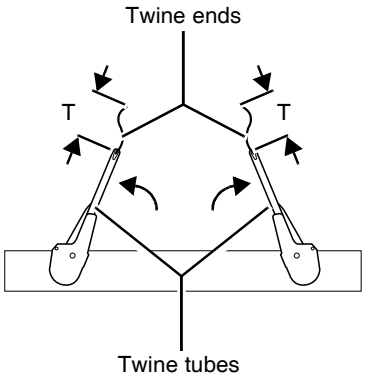


In the working screens, the display always shows a horizontal bale growth bar. The values beside match the pre-set bale diameter. The bar displays the part of the bale diameter which has been reached. When the bale chamber is empty, the bale growth bar is empty (set to 0).

Twine tie system

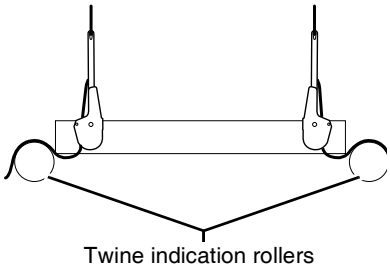


During baling the twine tie system remains in its rest position. Except for baling flax.

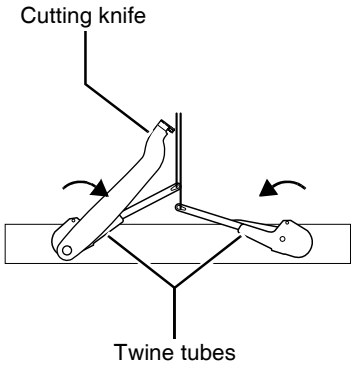


Upon activation of the tying system the twine tubes move to the borders of the bale.

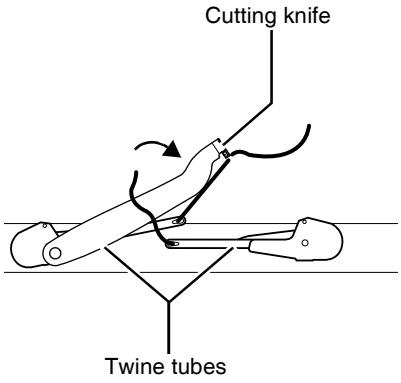
In order to ensure a good twine tie starting it is necessary that the twine ends T protrude about 10 cm out of the twine tubes.



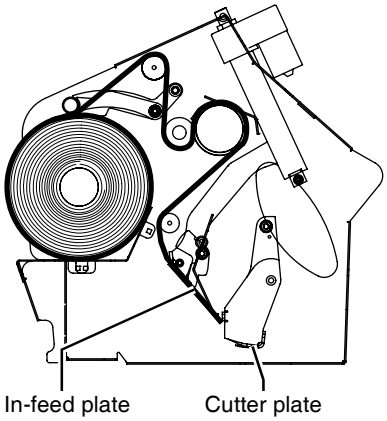
The twine brake is released momentarily in order to allow the twine to start running. As soon as the twine has been caught by the bale the twine indication rollers rotate and the lateral wraps are laid around the outer sides of the bale.



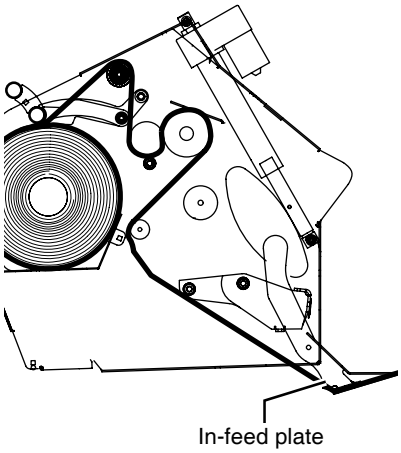
Both twine tubes move simultaneously to the centre where they lay the final wraps over each other. Then the twine is automatically cut. The movement of the twine tubes can be set using the control box, thus enabling several tying patterns.



Net wrap system



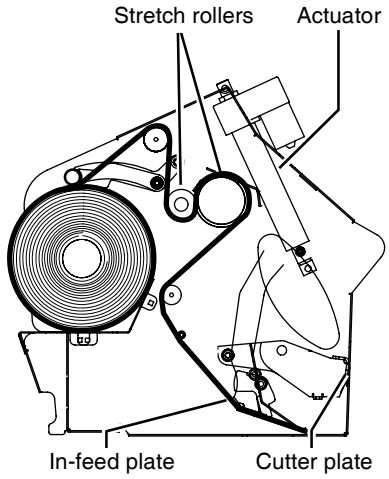
During baling, the net binding mechanism is in the rest position. The cutter plate is in the lowest position. The in-feed plate is in the rest position.



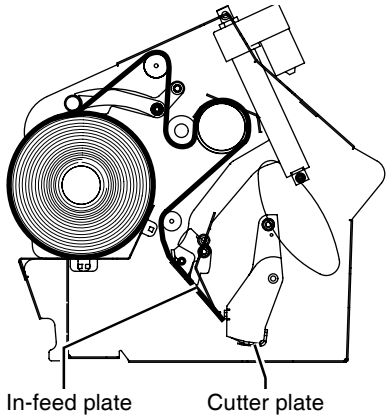
When the net binder is activated

- the actuator moves out completely and
- the in-feed plate moves down

The required length of net is supplied by the stretch rollers. At the same time, the in-feed plate moves towards the bale.



The net is now taken along with the bale. When the net is taken by the bale, the actuator moves back so far that the net is held at full width. The in-feed plate is now free of the bale. Via the measuring roller and the sensor, the net in-feed length is measured.



After the set amount of net is fed in, the actuator moves completely back, which causes the cutter plate to move down and cut the net.

After the first bale

After the first bale, the following must be checked and readjusted if required:

- Bale diameter
- Bale density
- Wrapping of the bale

- Bale diameter

→ Bale diameter and mixed chamber settings, page 83

- Bale density

→ Bale diameter and mixed chamber settings, page 83

- Wrapping of the bale

→ Twine tie settings, page 84
→ Net wrap settings, page 85
→ Net brake tension, page 128

Re-baling bales

When re-baling bales, make sure:

- the bales are clear of all net
- the material has been spread to avoid an overload of the pick-up or cutting system

End of baling

At the end of the job:

- the last bale must have been wrapped
- the last bale must have been cleared out
- the tailgate must have been closed and locked
- the pto must be switched off
- the control box must be switched off
- the pick-up must be moved fully up and locked
- the valve in the hydraulic line must be closed
- all doors and accesses must be closed and locked

Cleaning the bale chamber

- Never work on the machine while it is running
- Due to its inertia, the pto continues to rotate after disengaging. Stay clear of the machine until it has come to a complete stop

The bale chamber must be empty before road transport may take place. Eventual the last bale must be tied with either twine or net.

Twine tie

> Push to choose twine tie

> Push to start wrapping

> Open the tailgate to eject the bale

> Close the tailgate

Net wrap

> Push to choose net wrap

> Push to start wrapping

> Open the tailgate to eject the bale

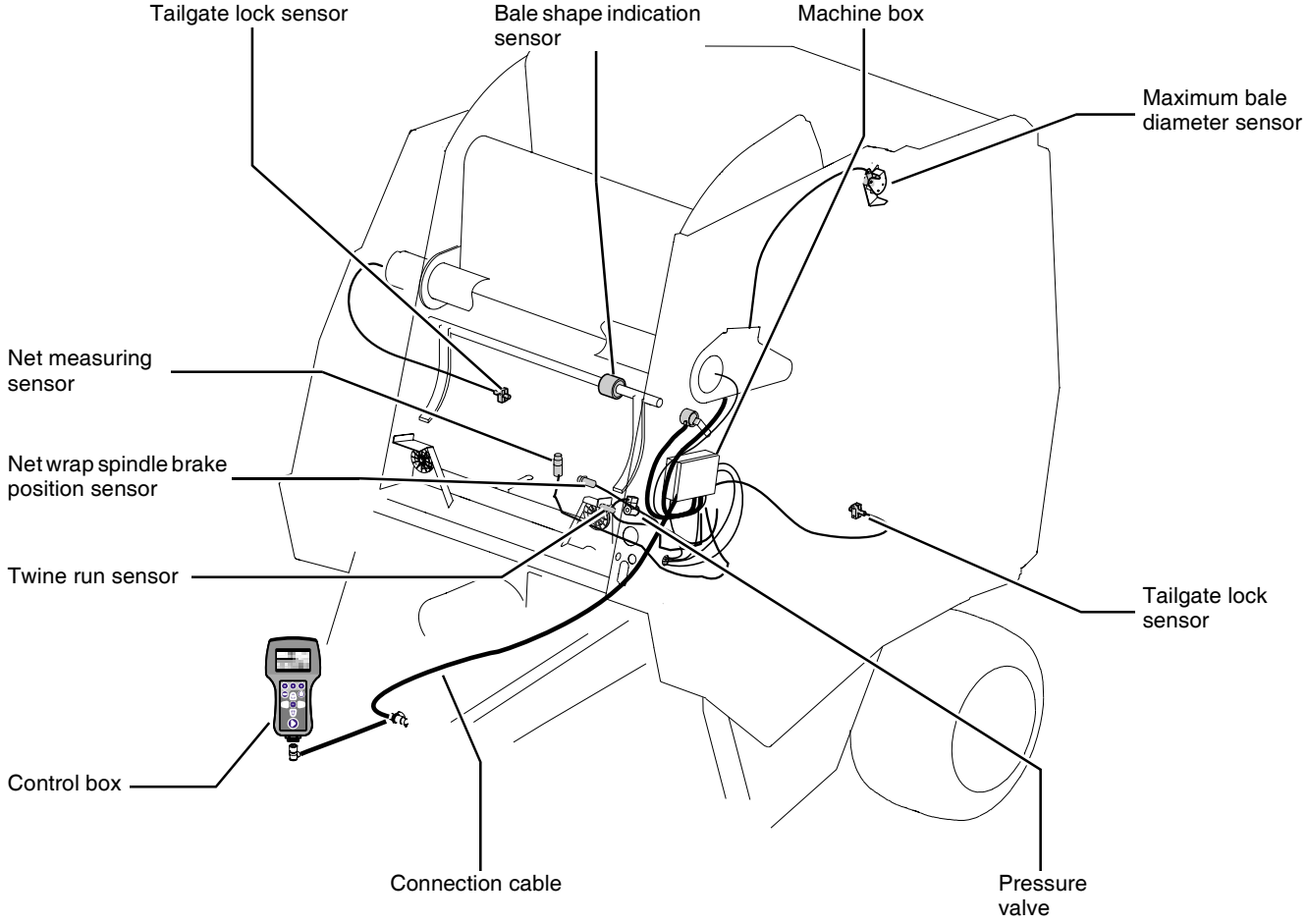
> Close the tailgate

General

The electronic control system controls and monitors the growing bale, the wrapping and clearing out of the bale. Furthermore the system also provides error indicating functions.

Overview main parts

The machine is equipped with sensors (proximity switches and rotational sensors).

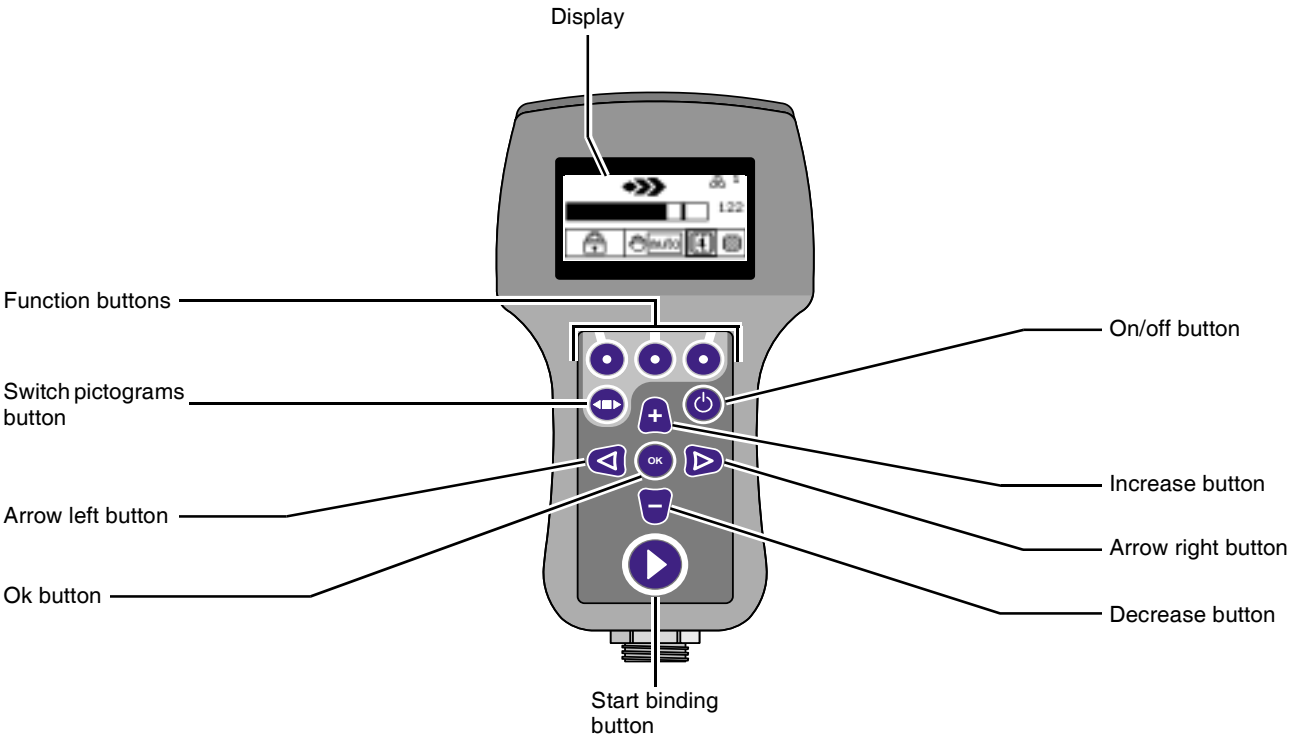


Control box

The control box enables supervision of the total baling procedure from the tractor cab. Especially the following functions can be monitored:

- Bale diameter indication
- Bale shape indications
- Drive indications to fill the bale chamber uniformly
- Bale wrapping process (twine tie/net wrap)
- Tailgate open/closed information
- Soft-core control [+]
- Bale counters (day counters + total counter)

Control box - front



Buttons

Stop button
To switch the electronic control system on or off.

Start binding button
- To start a manual binding cycle.

Increase value button
- To increase a value.

Decrease value button
- To decrease a value.

Switch pictograms button
- To switch between rows/banks of pictograms.

Left arrow button
To switch between settings.

Right arrow button
To switch between settings.

Confirm / save button
The value blinks no longer after confirming / saving.
- In some functions used to move to the next function in series.
- To acknowledge an error message.

Function button
To activate or de-activate the function of the corresponding pictogram above.

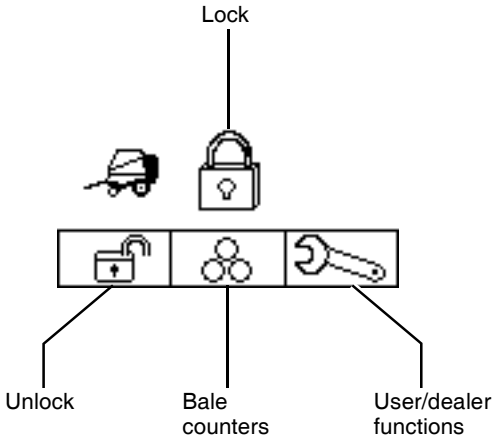
Operation

To switch on the system

> push

The basic display automatically appears.

Basic display



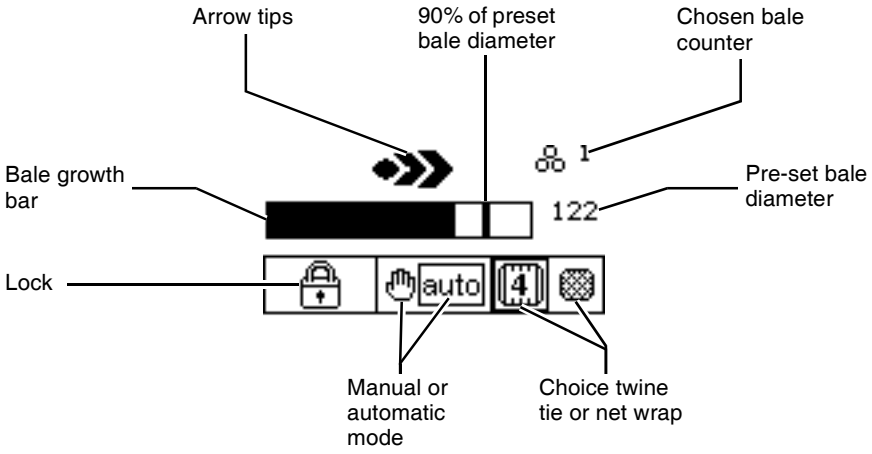
The basic display shows the following information:

- System lock
- Pictogram to unlock the system
  Push to unlock the system and to enter the operating display
- Pictogram that gives access to the bale counters
  Push to enter the bale counter display
- Pictogram that gives access to user and dealer functions
  Push to get access to the user and dealer functions

From the basic display, the following displays can be entered:

- Operating display
- Settings display
- Bale counter display

Operating display



The operating display monitors the baling process.

The operating display always shows the following information, depending on the settings:

- Chosen bale counter
- The pre-set bale diameter
- Choice between net wrap or twine tie
- Choice between Automatic (auto) or manual mode (hand symbol)
- Lock
- Bale growth bar
- Arrow tips; displays the difference between left and right side diameter. Four arrow tips indicate that the maximum difference has been reached.
- Vertical line shows 90% of the pre-set bale diameter
- Chosen binding program (twine tie only)

Manual activation of the twine and net motor

The following procedure describes how to manually activate the twine and net motor.

Push the switch pictograms button to display the second row/bank of pictograms.

Push the switch to pictograms button again to go back to operation display.

Push to set the bale diameter, soft-core setting (option). For more information see page 83.

When twine tie is chosen:

Push to manual activate the twine motor, so that the twine tubes will move to the rest position.

Push to manual activate the twine motor, so that the twine tubes will move to the outside position.

When net wrap is chosen:

Push to manual activate the net motor, so that the net feed-in plate moves down.

Push to manual activate the net motor, so that the net feed-in plate moves up.

Manual or automatic mode

The system starts in automatic mode. Automatic mode is standard setting. Manual mode can be used:

- to complete a field
- during twine or net installation
- to create a user-defined twine pattern

The complete baling cycle is automatic except the wrapping.

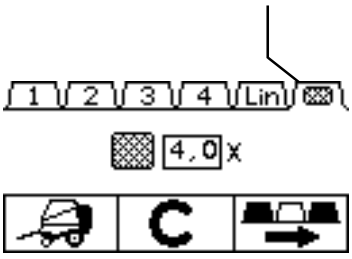
> Push to choose automatic mode

or

> Push to choose manual mode.

Manual net binding

Net wrap program



> Push to choose net wrap from the operational display.
Depending on the setting, the concerning choice is framed.

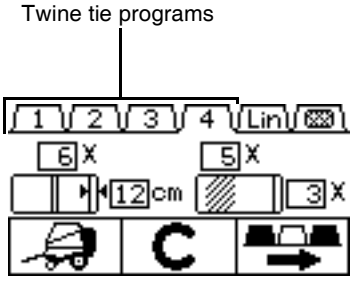
> Select the proper net wrap program

> Push to confirm and go back to the operating display
Depending on the setting, the concerning choice is framed.

> Push the start binding button to start the wrapping

Manual twine binding

Twine tie programs



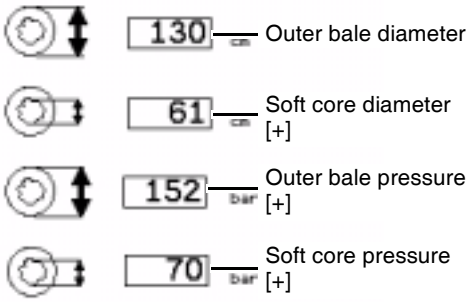
> Push the twine tie from the operation display

> Select the proper twine tie program.

> Push to confirm and go back to the operating display
Depending on the setting, the concerning choice is framed.

> Push the start binding button to start the wrapping

Bale diameter and mixed chamber settings



In the operating display:

> Push to enter the display bale diameter and mixed chamber settings

A proportional pressure valve enables adjustment of both the outside and the core pressure.

The maximum outer bale diameter depends on the machine type; 160 or 185 cm.

The minimum soft core diameter is 60 cm (0 = no soft core).
The maximum value equals the total bale diameter. The entire bale is soft than.

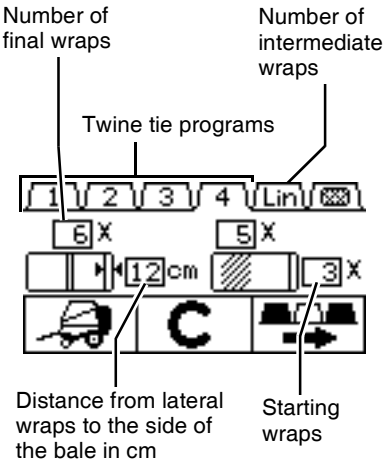
> Push to select a value to be changed

> Push to set the required value

> Push to accept the changed value

> Push to confirm and to go back to the operating display

Twine tie settings



> Push, the display twine tie settings appears

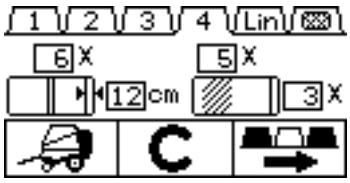
Adjustable are:

- Distance from lateral wraps to the side of the bale in cm
- Number of wraps near the bale sides (starting wraps)
- Number of intermediate wraps
- Number of final wraps in total

Four twine tie programmes can be changed upon desire.

The number of wraps does not depend upon the bale diameter. At the start of wrapping the control system automatically calculates the quantity taking into account the actual bale diameter. Only the pto speed influences the real number of wraps: it is based upon a pto speed of 540 rpm.

Changing the twine wrapping settings



> Push to go to the next desired wrapping program

When in the desired wrapping program:

> Push to select a value to be changed

> Push to increase the desired value

or

> Push to decrease the desired value

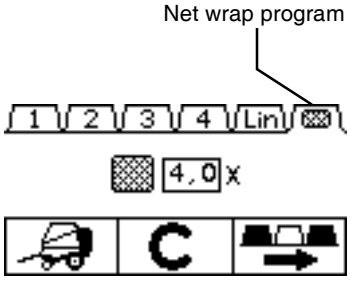
> Push to accept the changed value

> Push to confirm and to go back to the operating display

The chosen twine wrapping program number is shown in the operating display.

Push to restore the default value

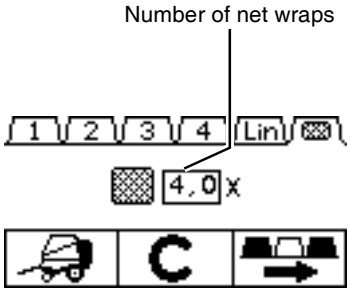
Net wrap settings



> Push, the display net wrap settings appears

The number of wraps does not depend upon the bale diameter. At the start of wrapping the control system automatically calculates the quantity taking into account the actual bale diameter. Only the pto speed influences the real number of wraps: it is based upon a pto speed of 540 rpm.

Changing the net wrap settings



> Push to go to the net wrap program

When in the net wrap program:

> Push to select a value to be changed

> Push to increase the desired value

or

> Push to decrease the desired value

> Push to accept the changed value

> Push to confirm and to go back to the operating display

The net wrap selection is framed in the operating display.

Push to restore the default value

Driving

> Adapt the driving direction when the third arrow tip shows

As soon as the fourth arrow tip shows, the buzzer sounds.

> Immediately change the driving direction

The arrow tips are replaced by a single complete arrow if the bale shape indication

- does not function correctly at both sides in the bale chamber
- has not been installed

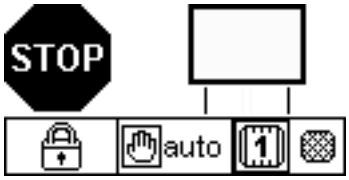
> Drive with an adequate forward speed (4 - 15 km/h) over the windrow

> Steer left and right in accordance with the indication of the bale shape indication system

The buzzer sounds when 90% of the pre-set bale diameter has been reached.

Upon reaching the pre-set bale diameter (100%), the buzzer sounds again, with different sound.

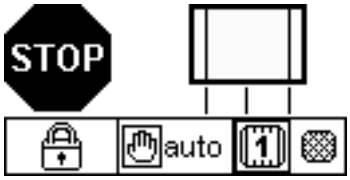
Twine tie process



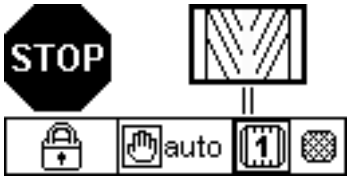
If twine tying commences this display shows.

> Stop immediately when this display appears

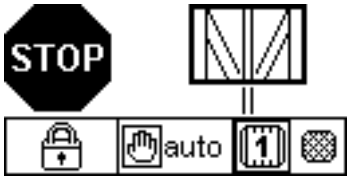
The twine tubes now move to their starting position.



As soon as the twine tubes have reached their lateral position this graphic appears.



The intermediate wraps are being made.



The final wraps are being made.

When twine tie has been finished, the open/close tailgate display appears.
Now the tailgate can be opened.

> Open the tailgate, using the hydraulic valve control lever in the tractor cabin

The bale is cleared out of the bale chamber.

When the bale is cleared out of the bale chamber:

> Close the tailgate

The working display re-appears.

Net wrap process

Upon reaching the desired bale diameter (100%) the buzzer sounds.

> Stop immediately

During the net wrap cycle the actual number of net wraps is indicated in the center of the display.

After completion of the net wrap the open/close tailgate display appears.

> Open the tailgate

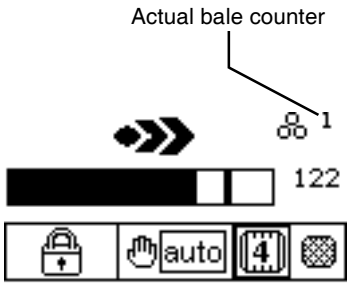
The bale is cleared out of the bale chamber.

When the bale is cleared out of the bale chamber:

> Close the tailgate

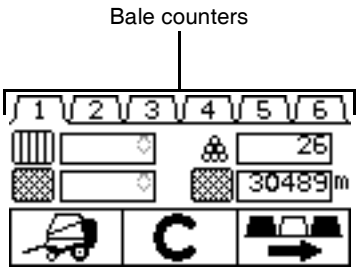
When the tailgate is closed, the working display re-appears.

Bale counters



The active bale counter is shown in the operating display.

> Push to go back to the basic display



> Push to enter the entire bale counters

6 bale counters are available.

Each bale counter consists of different types of counters:

- bales wrapped with twine
- bales wrapped with net
- one total bale counter [can not be reset to zero]
- the total number of net used [can be reset to zero]

> Push to go to the next bale counter

When in the desired bale counter:

> Push to reset the counter to zero

> Push to confirm and to go back to the basic display

The chosen bale counter number is shown in the operating display.

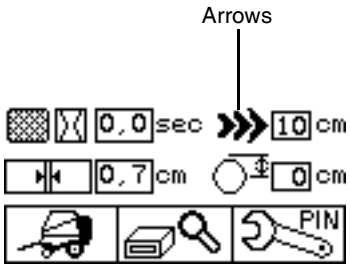
User functions

The following user functions can be set:

- bale shape indication sensitivity
- twine end distance
- net wrap delay
- bale diameter correction

> Push to enter the user functions

Bale shape indication



The bale shape indication indicates the difference between the left and right side bale diameter.

The value in the display indicates the difference in cm between left and right side bale diameter. This value is represented by four arrow tips. One arrow tip is the fourth part of that value.

The bale shape indication can be set between 5 and 20 cm. 10 cm is factory setting.

> Push to select a value to be changed

> Push to increase the desired value

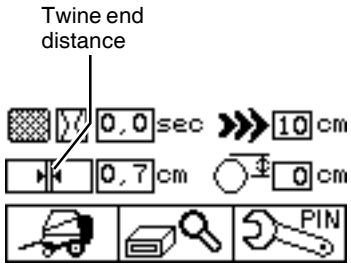
or

> Push to decrease the desired value

> Push to accept the changed value

> Push to confirm and to go back to the basic display

Twine end distance



The twine end distance indicates set-off between the final twine end wraps.

Standard setting is 0.7 cm. A higher value means a larger distance between the final wraps.

The value in the display indicates the distance in cm between the final twine end wraps.

> Push to select a value to be changed

> Push to increase the desired value

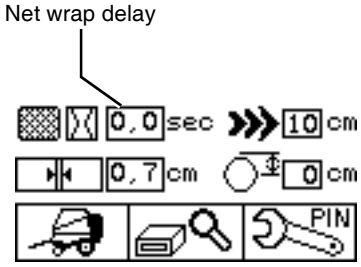
or

> Push to decrease the desired value

> Push to accept the changed value

> Push to confirm and to go back to the basic display

Net wrap delay



In Automatic mode, it is possible to delay the net wrap start when the bale diameter has reached its preset value.
Standard setting is 0. A higher value means: the Stop sign will appear earlier than the moment the actuator starts.

> Push to select a value to be changed

> Push to increase the desired value

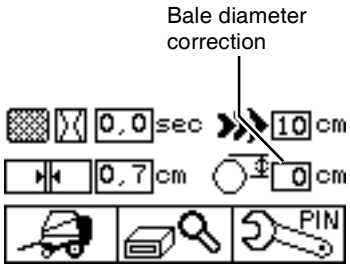
or

> Push to decrease the desired value

> Push to accept the changed value

> Push to confirm and to go back to the basic display

Bale diameter correction



In case the real bale diameter differs from the pre-set bale diameter, the bale diameter has to be corrected.
The bale diameter can be adjusted between +10 and -10 cm.

> Push to select a value to be changed

> Push to increase the desired value

or

> Push to decrease the desired value

> Push to accept the changed value

> Push to confirm and to go back to the basic display

Diagnostics

The information in the diagnostics display is important when contacting your dealer or service manager.


> Push to go to the user functions display


> Push to enter the diagnostics display


> Push to go to the next display


> Push to go to the previous display


> Push to go back to the basic display

Dealer menu

> Push to go to the user functions display

PIN > Push to go to the dealer menu

> Push button to return to the basic display

> Push to enter PIN

> Push to select the PIN code; enter 5

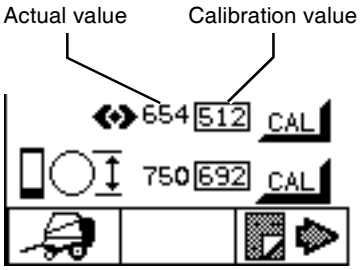
OK > Push to confirm

Dealer menu 1

The following dealer functions can be set:

- bale shape sensor calibration
- bale growth sensor calibration

Bale shape sensor calibration



To compensate the left and right bale shape sensor, they must be calibrated with respect to each other.

> Ensure the bale chamber is empty

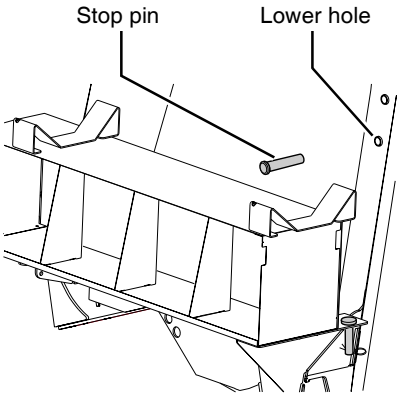
> Ensure there is no pollution underneath both bale shape sensors

> Push to go to CAL

OK > Push to confirm

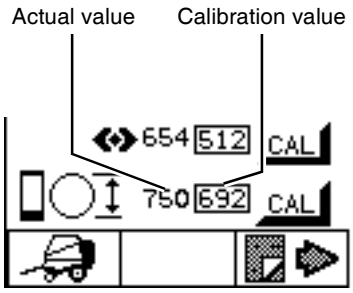
The shown actual calibration value (e.g. 654) is now entered and confirmed.
512 is the default value.

Bale growth sensor calibration



> Open the tailgate hydraulically
> Place the pin in the lower hole in the lateral wall
> Lower the tailgate pressureless (floating position) until the tensioner arm rests on the pin

This is the basic position for calibration.



> Push to go to CAL

> Push to confirm

The calibration value is now entered and confirmed.
692 is the default value.

> Open the tailgate hydraulically
> Remove the pin from the lower hole in the lateral wall
> Close the tailgate completely

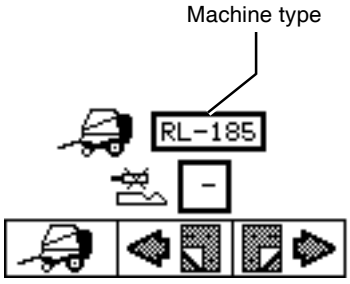
> Push to enter the dealer menu 2

Dealer menu 2

The following functions can be set:

- machine type (RK-160 or RL-185)
- tailgate lock sensor switch off

Machine type



The following machine types can be set:

- RK-160
- RL-185

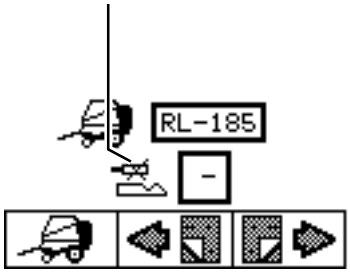
RK and RL indicate the type, 160 and 185 the maximum bale diameter in cm.

> Push to set the machine type

> Push to enter the machine type

> Push to confirm

Tailgate lock sensor switch off



In case one tailgate lock sensor is faulty, this sensor can be switched off.

> Push to select a value to be changed

> Push to select L, R or to leave the field blank

or

> Push to select L, R or to leave the field blank

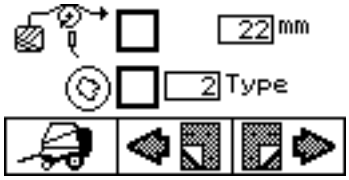
> Push to confirm

> Push to return to the dealer menu 1

or

> Push to go to the dealer menu 3

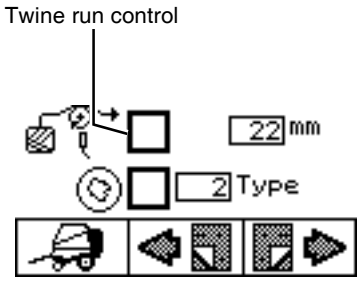
Dealer menu 3



The following functions can be set:

- twine run control [+] on or off
- twine tubes calibration
- mixed chamber control [+] on or off
- proportional valve type
- Low density kit [+] on or off

Twine run control [+]



Twine run control checks if the twine is running or not.

> Push to go to twine run control

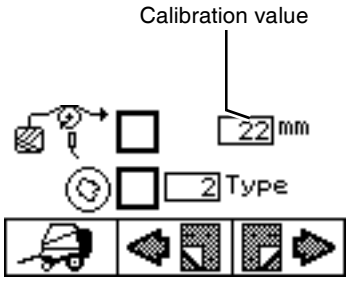
> Push to switch on twine run control

or

> Push to switch off twine run control

> Push to confirm

Twine tubes calibration



The twine tubes in rest position must have a certain distance to the frame of the twine binding device. Default distance is 34 mm.

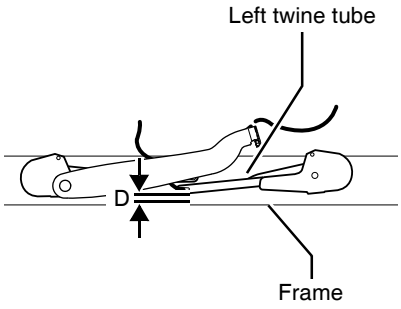
> Push.

> Push.

The mechanism fully retracts.

> Push to put the system in safe mode

The twine tubes are in rest position.



> Measure the distance D between the left twine tube and the frame

> Push to go to calibration value

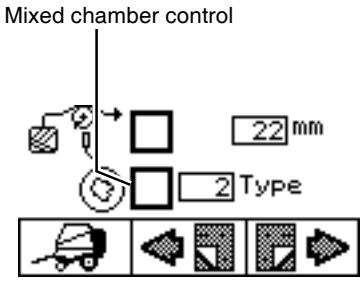
> Push to enter the measured value of distance D

or

> Push to enter the measured value of distance D

> Push to confirm

Mixed chamber control [+]



> Push to go to mixed chamber

> Push to switch on mixed chamber control

or

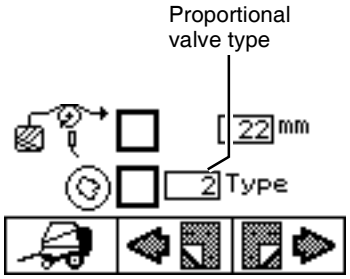
> Push to switch off mixed chamber control

> Push to confirm

> Enter the valve type

→ Proportional valve type, page 99

Proportional valve type



Only possible when mixed chamber control is switched on.
→ Mixed chamber control [+], page 99

> Read out the one-digit value inscribed at the proportional valve

> Push to go to valve type

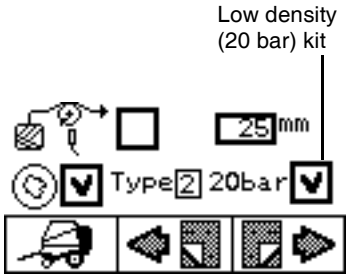
> Push to enter the read-out value

or

> Push to enter the read-out value

> Push to confirm

Low density kit [+] (20 bar kit)



Only possible when the mixed chamber control is switched on.
→ Mixed chamber control [+], see page 99

> Push to go to the 20 bar kit

> Push to switch on the 20 bar kit

or

> Push to switch off the 20 bar kit

>

> Push to return to the dealer menu 2

or

> Push to go to the dealer menu 4

Dealer menu 4

Default re-initiation resets the electronic control system to the default factory settings.

To reset the electronic control system to the factory setting:

> Push to go to DEFAULT

> Push to confirm

> Push to return to the dealer menu 3

or

> Push to return to the basic display

After default re-initiation:

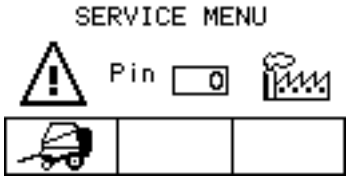
> calibrate the bale shape sensor

→ Bale shape sensor calibration, page 95

> calibrate the bale growth sensor

→ Bale growth sensor calibration, page 96

Service menu



The functions in the service menu are functions meant for reading and adjustment especially by an authorized service technician.

> Push to go to the user functions display

> Push to switch the pictogram buttons

> Push to enter the display service functions

> Push to enter PIN

> Push to select the PIN code

> Push to confirm

Safety

For all cleaning and caring activities applies:

Do not penetrate bearings and hydraulic parts
Be careful when cleaning with a high-pressure cleaner. Bearings, sealings and bolted joints are not waterproof. To avoid machine damages never penetrate bearings, sealings and bolted joints with water.

Do not clean bearings, electronic and hydraulic parts with high pressure
Do not clean bearings, electronic and hydraulic parts with a high-pressure cleaner. Bright metal parts will get degreased and start rusting. After every cleaning grease the bearings and grease bright metal parts.

Cleaning

After every time of using the machine:

> Empty and clean the machine of all accumulated crop

Cleaning can be done with low pressure with the high-pressure cleaner. Do not clean bearings, electronic and hydraulic parts while cleaning with the high-pressure cleaner.

After cleaning

After cleaning with the high-pressure cleaner

> grease all bearings

Caring

When you observe the rules below, you will have a fully operational machine at the start of the next season:

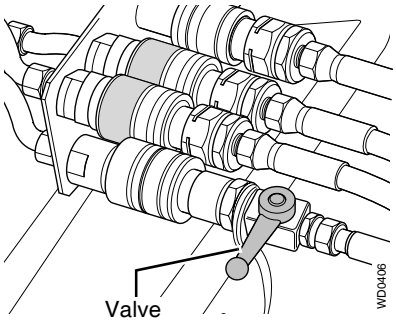
> Protect all bright metal parts with an oil film. Only use authorized biological oil, like rape oil
> Repaint any paint damages

Safety

Obey the safety instructions
Obey the safety instructions at the execution of all work. Ignoring the safety information can lead to serious or deadly injuries.

Machine is no toy
Store the machine in an area away from human activity. Never allow children to play on or around the stored machine. Metal edges and parts of the machine can lead to serious injuries.

General



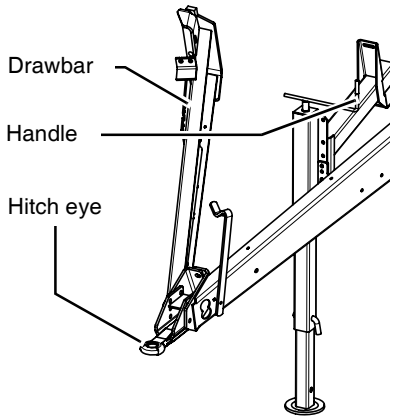
Prior to detaching the machine from the tractor

> Close both valves

This in order to avoid hydraulic oil leaking from the cutting system cylinder to the pick-up cylinder.

Unhitching and securing of the machine

> Place the machine on a dry and stable ground
> Secure the tractor from rolling away
> Tighten the machine parking brake (if applicable)
> Put the wheel chocks [+] in place
> Place the pto drive shaft on the support provided
> Disconnect the hydraulic connections and store them in the support at the drawbar
> Disconnect the pneumatic connections [+]
> Disconnect the road lighting connection and store it in the support at the drawbar
> Disconnect the electric cables of the electronic control system



> Remove the spring clip, lower the support jack fully and mount the spring clip
> Unhitch the machine from the tractor

After the season

After the season and at longer storage periods, the following work must be performed:

- Release the pick-up springs
- Lower the pick-up
- Remove all twine and net
- Thoroughly clean the machine

→ Cleaning, page 102

- Check all bolted joints and torque them
- Lubricate the machine
- Check the tyre pressure
- Store the control box in a dry and dust free room free from rodents, insects and martens

Safety

For all maintenance work applies:

Take care of the safety information
Definitely take care of the safety information during all work. In case of negligence of the safety information serious or deadly accidents can occur.

Conditions for maintenance work
Only carry out maintenance work if you do dispose of the necessary professional knowledge and of the suitable tools. Missing professional knowledge or unsuitable tools can cause accidents or damages.

Use original parts
Use original parts for safety relevant components. Dimensions, strength, and material quality must be guaranteed. Building in of not original parts the warranty reduces to nil and void.

Protect the machine against unintentional use
Carry out general repairs, maintenance and repair of function troubles at the hitched machine, in principle with switched off pto, switched off engine and removed ignition key! At unintended taking into use serious accidents can be caused.

Protection measures in contact with oil or lubricants

Additives in oil and lubricants can have, under circumstances, harmful effects to health. Because an indication according to the danger order is not necessary, therefore in principle please pay attention to:

Avoid skin contact
Avoid skin contact with these oil and lubricants. Protect your skin by skin protection creams or oil-resistant gloves. Skin contact can lead to skin diseases.

Do not use oil for cleaning
Never use oil and lubricants for hand cleaning! Chips and waste in this oil and lubricants can extra lead to injuries.

Change dirty clothing
Change extremely filthy oiled clothing as soon as possible. Oil can cause health injuries.

TIP
- Waste oil must be collected and recycled
- in case skin diseases by oil or lubricants occur, immediately visit a doctor

General

This information is related to all maintenance work. At all maintenance work the machine must be secured in working position. In case the transport position is necessary for maintenance, you will find suitable tips to the maintenance work.

Information of directions

Information of directions (left, right, front, rear, above, below) are to be seen in the direction of travel.
The direction of rotation has been defined as follows:

Direction	Description
Left	counterclockwise
Right	clockwise
Front	in the direction of travel
Rear	in the direction of travel
Rotation around a horizontal axis	as seen at right angles to the direction of travel from left to right
Rotation around a vertical axis	as seen from top to bottom
Rotation from bolts, nuts, etcetera	always as seen from the operating side

Maintenance intervals

Before doing any maintenance, the following must be obtained:

- Empty the bale chamber before doing any repair work
- Clean the machine before doing any repair work
- Electronic control system must be switched off
- Never work on the machine while it is running
- Pto must be switched off
- Tractor engine must be stopped; ignition key must be removed
- Clean the machine with an air jet

		At beginning of the season	After the first 5 working hours	After 10 working hours	Every 10 working hours	Every 50 working hours	Every 3,000 bales	Every 10,000 bales	Grease	Oil	Check	Change	Clean	Sharpen	Page
Attaching elements															
	Screwing bolts tighter		•												112
	Special torques														112
Lubrication															
	Pto drive shaft				•				•						116
	Cam type slip clutch (Rotor)				•				•						117
Pick-up/rotor															
	Pick-up overload clutch rotor				•				•						117
	Pick-up overload clutch WPU				•				•						117
	Rotor unit				•				•						117
	Pick-up tines	•		•							•	•			117
	Pick-up drive chains lubrication				•					•					118
	Pick-up drive chains tension - rotor										•				118
	Chain tensioners pick-up - WPU	•									•				118
Bale chamber															
	Filter hydraulic system	•						•					•		121
	Rollers		•		•						•		•		121
	Tailgate locking pin				•					•					122
	Tailgate lock hinge				•					•					122
	Tailgate hinge				•				•						122
	Top of tailgate cylinder				•				•						122
	Attachment tailgate cylinder				•					•					123
	Bottom end of tensioning cylinders				•					•					123
	Lubrication of the drive roller				•				•						123
	Scraper adjustment				•				•						124
	Scraper adjustment				•						•				124
	Bale chamber drive chains				•	•				•	•				124
	Chain lubrication system [+]				•					•					119
Tension arm															

	At beginning of the season	After the first 5 working hours	After 10 working hours	Every 10 working hours	Every 50 working hours	Every 3,000 bales	Every 10,000 bales	Grease	Oil	Check	Change	Clean	Sharpen	Page
Alignment of the tension arm	•						•			•	•			125
Hinge nuts tension arm										•	•			125
Spring tension of the tension arm					•					•	•			126
Lubrication tension arm				•					•					126
Gearbox														
Checking the oil level	•				•					•				127
Filling the gearbox					•		•		•		•			127
Mechanical netbinder settings														
Net roll pre-stress adjustment						•				•				128
Net brake tension						•				•				128
Clamping force stretch rollers						•				•				129
Top of the actuator				•					•	•				130
Bottom of the actuator				•					•	•				130
Knife protection plate						•				•	•			130
Knife catch				•					•	•		•		131
Duckbill braking catch				•					•	•				131
Knife assembly				•					•	•				131
Pressure rod				•					•	•				132
Mechanical twine tie settings														
Twine knife				•						•				133
Twine knife arm				•					•	•				133
Twine brake - twine boxes				•						•				134
Twine brake - twine tubes				•						•				134
Twine tubes position				•						•				135
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		At beginning of the season	After the first 5 working hours	After 10 working hours	Every 10 working hours	Every 50 working hours	Every 3,000 bales	Every 10,000 bales	Grease	Oil	Check	Change	Clean	Sharpen	Page
Drawbar															
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Attaching elements

Screwing bolts tighter

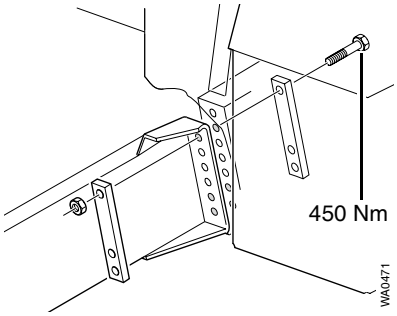
All bolts and nuts must be screwed tighter:

- after the first 5 working hours,
- depending on the usage frequency of the machine,
- at least once per season

Special torques

Take care of the special torques for the following screwed joints:

- 450 Nm drawbar bolts



Tightening torques

All screwed joints on this machine must be torqued in accordance with the values given in this table below unless indicated otherwise.
On this machine, 8.8 is both standard and minimum quality used. If not indicated anyhow use this quality for determination of torque (in most cases the quality can be found on the head of the respective bolt).

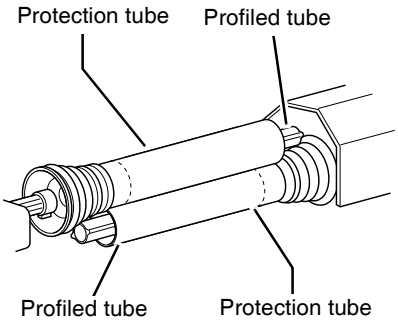
Thread	Torque value			Size of jaw*
	8.8	10.9	12.9	
	Nm			mm
M3	1.3	1.8	2.1	6
M4	2.9	4.1	1.9	7
M5	5.7	8.1	9.7	8
M6	9.9	14	17	10
M8	24	34	41	13
M10	48	68	81	17 (15)
M12	85	120	145	19 (17)
M14	135	190	225	22 (19)
M16	210	290	350	24 (22)
M18	290	400	480	27
M20	400	570	680	30
M22	550	770	920	32
M24	700	980	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 = size of jaw of lock bolts and nuts with toothed flange are given in brackets if different from standard.

TIP

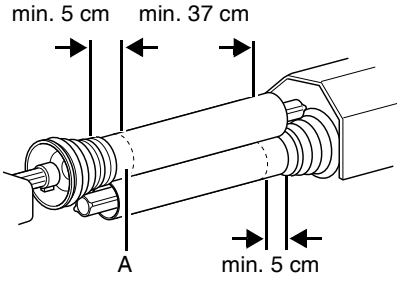
- The listed values are applicable for dry or slightly oiled joints
- Do not use plated bolts/screws/nuts without grease
- When a stiff grease is applied decrease the given value by 10%
- In case lock nuts, lock screws or lock bolts are used increase the given value by 10%
- Torque value of wheel nuts shall be 270 Nm

Pto drive shaft



The length of the pto drive shaft has to be adapted. This depends on the distance between tractor and machine.

Checking length of the pto drive shaft



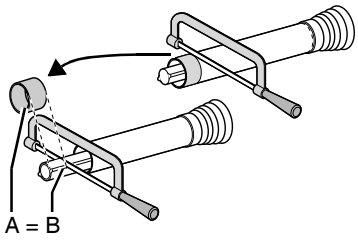
Correct length
A too long of a pto drive shaft may cause serious damage to the drive bearings of both tractor and machine. Which is beyond any warranty.

Prior to coupling the pto drive shaft check the length:

> Correctly line-up tractor and machine
> Ensure the tractor pto is clean and greased
> Fit both pto drive shaft halves (not connected!)
> Hold both pto drive shaft halves together, ensure

- the protection tube shall be at least 5 cm shorter
- the overlap of the profiled drive tubes shall be at least 37 cm

Shortening the pto drive shaft



WD0410

> Exactly determine the correct length of the shaft
> Shorten the protection tubes
> Shorten the profiled drive tubes

The length of both cut-off ends shall be identical.

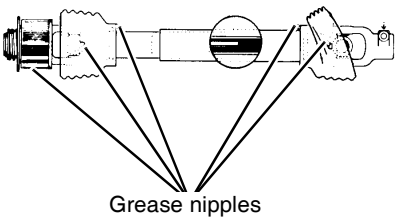
> Clean cut ends of both protection tubes and profile tubes to ensure they are all smooth and clean

At the tractor side the pto drive shaft has a wide angle joint enabling an angle of up to 80°. Ensure the joints are not destroyed due to bottoming of the shaft halves in sharp turns.

Lubrication

All grease nipples must be greased after every cleaning with a high-pressure cleaner.

Pto drive shaft



Grease nipples

An own operation manual of the manufacturer has been added to every pto drive shaft. This contains detailed information to the relevant pto drive shaft model.

Check protective parts
All protective parts of the pto drive shaft must be checked visually on wear and damage. Exchange defective protective parts. An unprotected pto drive shaft or damaged protective parts can cause serious injuries during use.

> Disconnect the pto shaft
> Grease the grease nipples every 20 working hours
> Check every 10 hours that the tubes of pto shaft are sliding correctly
> Largely grease the 2 joints of pto shaft before commissioning the machine

General

Lubrication marks

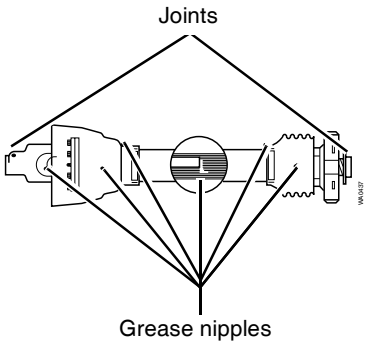
Grease / oil	Specification
Oil	Class NLGI2, K2k in accordance with DIN51825
Grease	Multipurpose

Drive - lubrication

The machine is powered by the tractor through pto and pto drive shaft.
Grease the tubes of the pto drive shaft

- before using the machine
- every 10 hours

Pto drive shaft



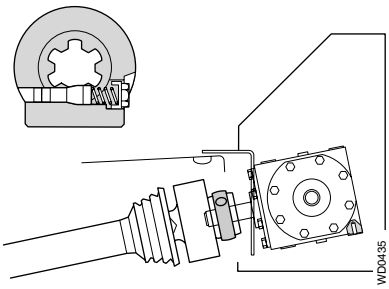
The tube of the pto drive shaft is equipped with grease nipples.

> Disconnect the pto drive shaft and grease the grease nipples

> Largely grease the 2 joints of pto drive shaft before commissioning the machine

> Check every 10 hours that the tubes of pto drive shaft are sliding correctly

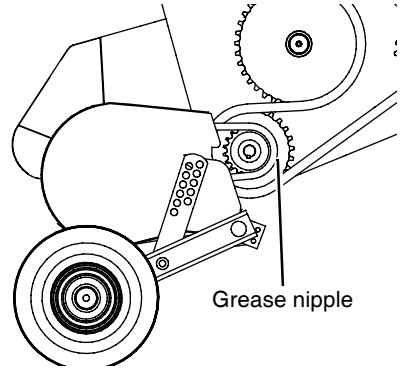
Cam type slip clutch (Rotor)



Can not be adjusted.

Pick-up/rotor

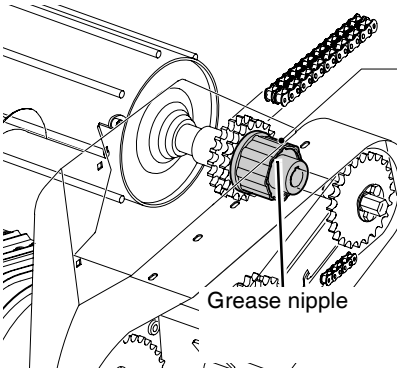
Pick-up overload clutch rotor



Raise the pick-up in the maximum position.

> Grease the grease nipple

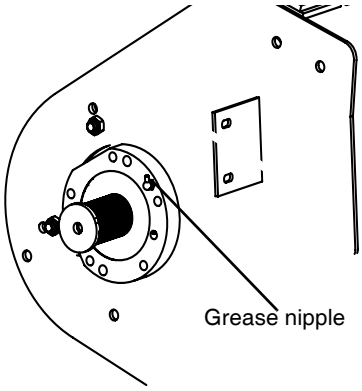
Pick-up overload clutch WPU



Raise the pick-up in the maximum position.

> Grease the grease nipple

Rotor unit



> Grease the grease nipple at both sides of the machine every 10 working hours

Pick-up tines

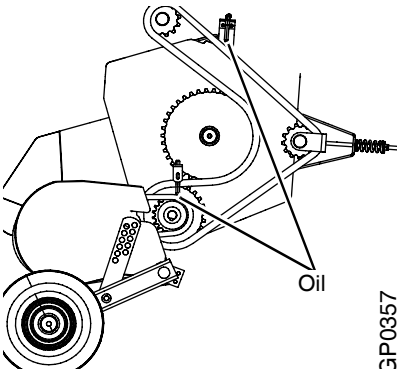
The pick-up tines are subject to wear.

> Check the condition and completeness of the pick-up tines

- after every working day
- at the beginning of the season

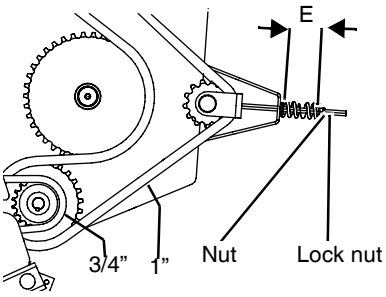
> Replace them if necessary

Pick-up drive chains lubrication



> Un-tension the chain tensioner
> Oil the chain
> Re-tension the chain tensioner
→ Pick-up drive chains tension - rotor, page 118

Pick-up drive chains tension - rotor



The automatic chain tensioner of the pick-up drive is at the left side of the machine.
Pick-up drive:

- 1x left side: compression spring (1")
- 1x left side: automatic tensioner (3/4")

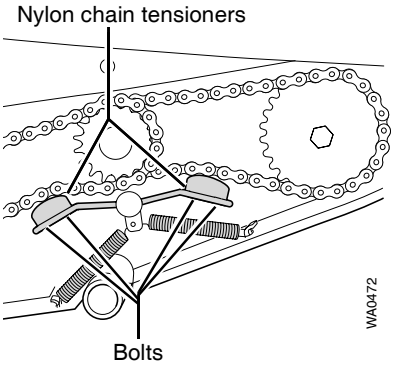
Adjust the chain tension with compression spring (1") as follows:

> Loosen the lock nut
> Loosen or tighten the nut until the length of the spring (E) is 135 mm
> Tighten the lock nut

There is no adjustment for the chain tension with automatic tensioner (3/4"), only the tensioner pad has to be checked.
If necessary replace the nylon chain tensioner pad as follows:

> Loosen the bolts
> Exchange the nylon chain tensioner pad
> Tighten the bolts

Chain tensioners pick-up - WPU



Except regular lubrication the pick-up does not require special maintenance.
At the beginning of the season:

> Check the nylon chain tensioners for excessive wear

If necessary replace the nylon chain tensioners as follows:

> Loosen the bolts
> Exchange the nylon chain tensioner
> Tighten the bolts

Chain lubrication system [+]

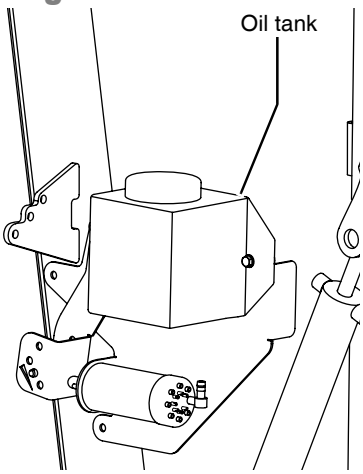
When the automatic chain lubrication system is installed the chains are lubricated automatically.
If not installed, the chains of the bale chamber must be lubricated with a chain lubricant once a day or after 200 bales, whatever occurs first.
The chain lubrication system can be adjusted in two ways:

- total amount
- per lubrication tube

Lubrication marks

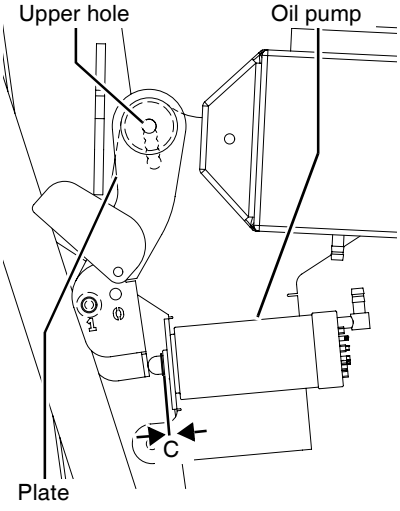
Oil	Specification
Oil	Bio degradable 10W30 - 15W40

Filling



> Open the right lateral door
> Fill the oil tank with maximum 3.2 liter oil
> Close the right lateral door

Oil pump adjustment



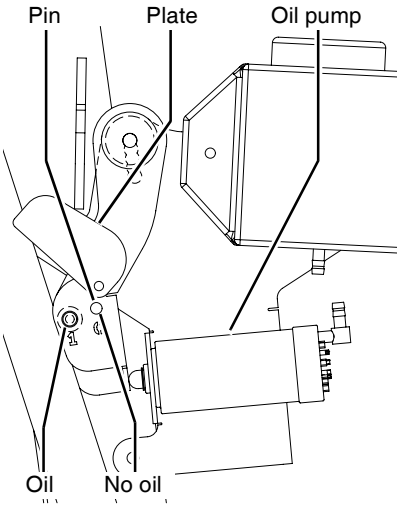
The plate must be adjusted so, that the oil pump uses its full stroke during working.
Before adjusting, the plate must be in the upper hole.

> Use the hydraulic tractor valve to close the tailgate

Distance C between the circlip and the oil pump housing must be 1 mm.
If distance C is not 1 mm

> place the plate in the next lower hole so long, until the correct distance C is reached

General adjustment

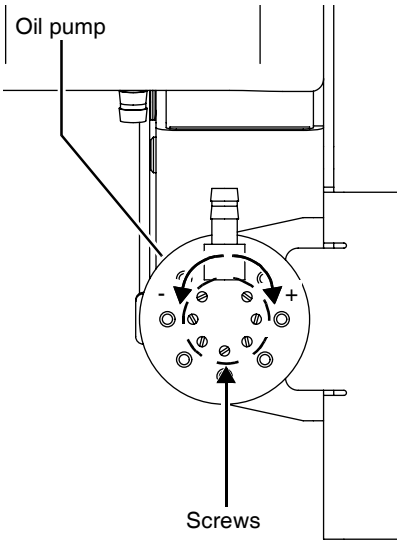


The general setting is done by inserting the pin in a hole of the pattern.

> Move up the plate
> Remove the pin
> Move and place the pin
- to 1: switch on the oil pump
- to 0: switch off the oil pump

> Move down the plate fully

Lubrication tube adjustment



The specific setting is done per lubrication tube, at the pump.

> Use a screwdriver to turn the individual screw at the oil pump to adjust the volume of oil per lubrication tube
- turning clockwise: increases the volume
- turning counterclockwise: decreases the volume

Bale chamber

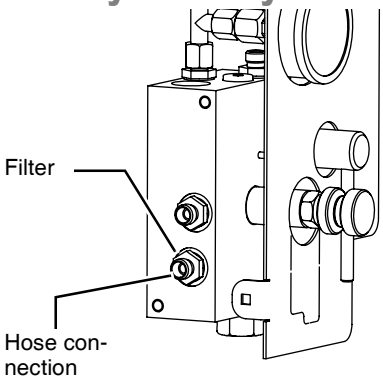
Hydraulic system

A hydraulic system is under high pressure. Never attempt to find or even to stop a hydraulic leakage with your hands. High pressure fluid easily penetrates skin and clothes, causing severe injuries: visit a doctor immediately when injured.

- Take care the hydraulic system stays clean.
- Cautiously (dis)connect the quick couplers. Dust, sand, metallic particles and other contamination destroy a hydraulic system; trapped air disables the control.

Renew worn, cut, abused, squeezed or otherwise damaged/defective hydraulic lines as well as aged hoses.

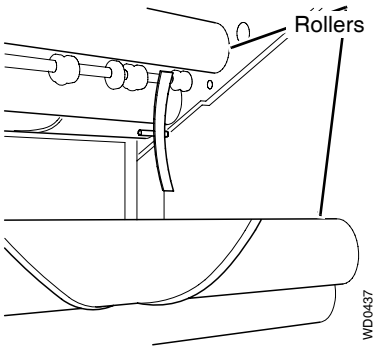
Filter hydraulic system



> Clean the filter, depending on whatever occurs first
- every 10,000 bales or
- once per season

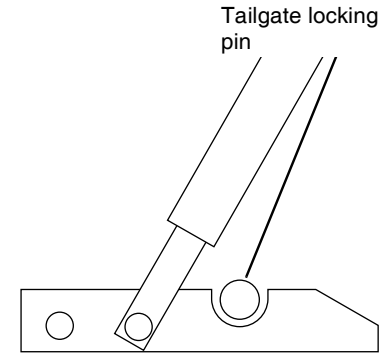
> Remove the hose connection
> Use a screwdriver to remove the filter
> Mount the hose connection

Rollers



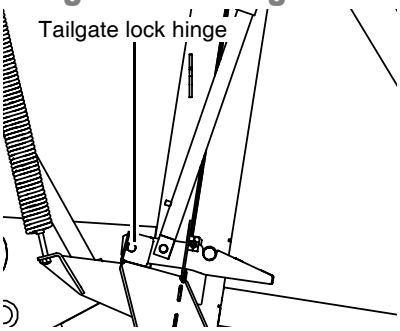
> Daily check the (tension) roller bearing sealings for crop accumulation
> Clean the bearing area as required
> Check the rollers for easy and smooth (no sounds) rotation
> Replace roller or bearing as required

Tailgate locking pin



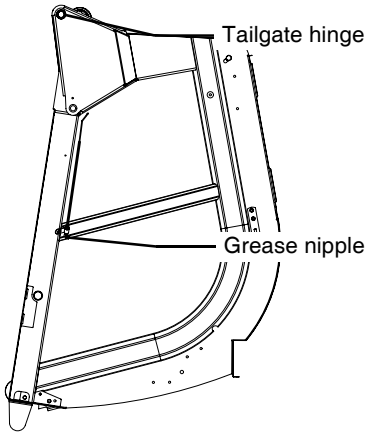
> Oil tailgate locking pins at both sides every 10 working hours

Tailgate lock hinge



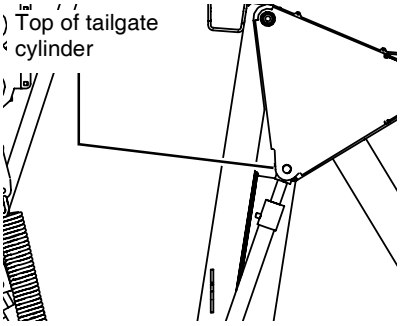
> Oil the tailgate lock hinge at both sides of the machine every 10 working hours

Tailgate hinge



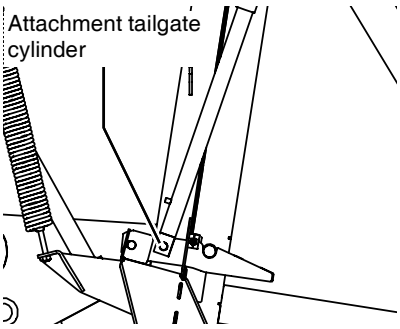
> Grease the tailgate hinge at both sides of the machine every 10 working hours

Top of tailgate cylinder



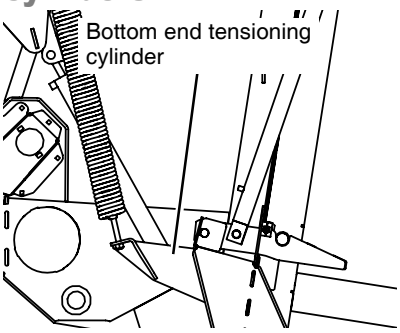
> Grease the top of the tailgate cylinder at both sides of the machine every 10 working hours

Attachment tailgate cylinder



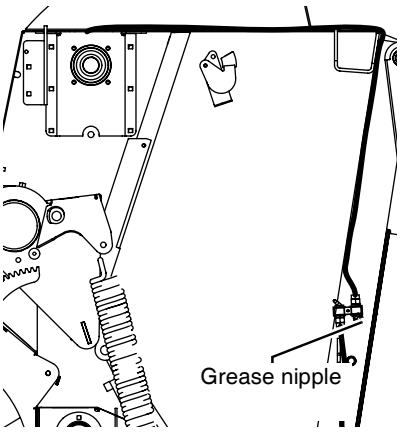
> Oil the attachment of the tailgate cylinder at both sides of the machine every 10 working hours

Bottom end of tensioning cylinders



> Oil the bottom end of tensioning cylinders at both sides of the machine every 10 working hours

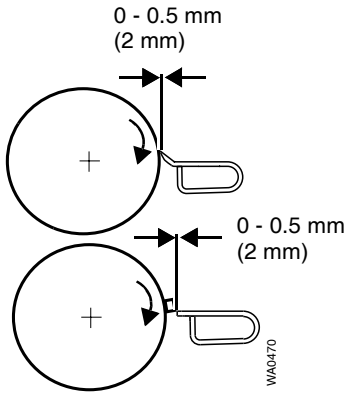
Lubrication of the drive roller



Never lubricate on a running machine!

> Grease the grease nipple at both sides of the machine every 10 working hours

Scraper adjustment



When dry crop is baled, all scrapers shall be set to a distance of 2 mm. This in order to avoid fire.

Standard settings:

- scraper for dry crop: 2 mm
- scraper for silage: 0 - 0.5 mm

If crop accumulates at the scraper decrease distance between scraper and roller. The scraper shall just touch.

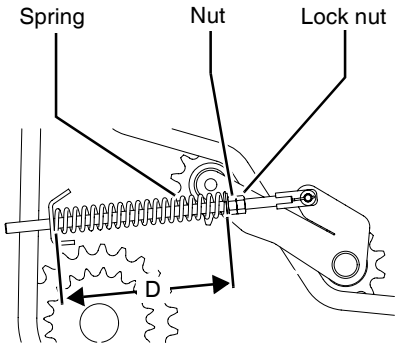
TIP It is recommended to have a fire extinguisher at hand in the tractor with a capacity of at least 5 kg. Have the fire extinguisher checked every year by the approved authority.

Bale chamber drive chains

Two drive chains on the right side of the machine are tensioned by spring loaded tensioners.

> Check the spring length every 1,000 bales

Standard version



The length D of the spring must be 265 mm ± 10 mm.

> Loosen lock nut

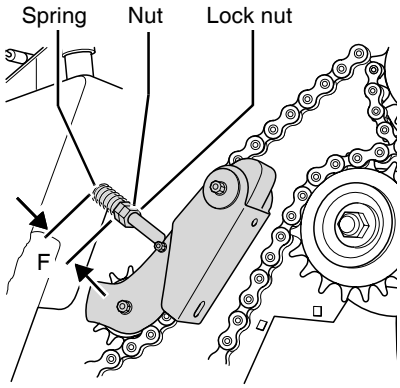
> Tighten nut: spring length decreases

or

> Loosen nut: spring length increases

> Tighten lock nut

Spring starter roller drive



The length F of the spring must be 55 mm.

> Loosen lock nut

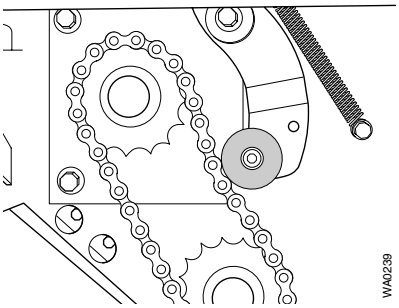
> Tighten nut: spring length decreases

or

> Loosen nut: spring length increases

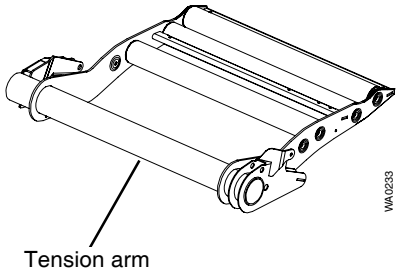
> Tighten lock nut

Chain on the left side



Can not be re-tensioned.

Tension arm

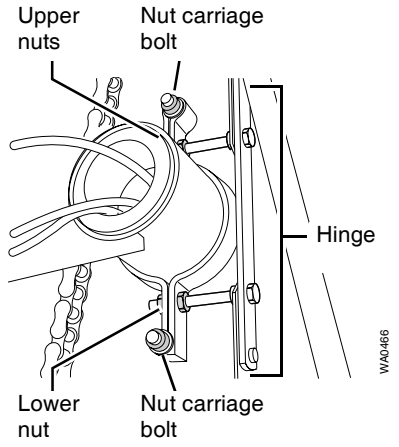


The tension arm:

- builds up the starting chamber
- determines the belt tension

The set-up ensures the most effective build up of the bale pressure with help of the hydraulic tension cylinder and a spring.

Alignment of the tension arm



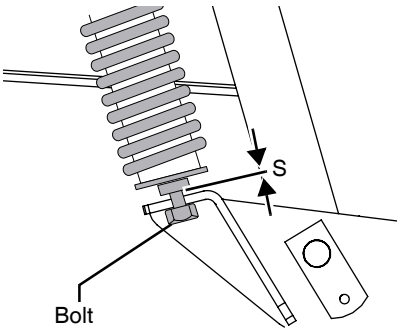
The tension arm can be aligned by adjusting the tension arm hinge at the right side of the machine.
The tension arm has to be adjusted to ensure the distance between tension arm and machine wall is identical at either side.

> Open tailgate hydraulically
> Close safety valve in front of the machine
> Slacken nuts of both carriage bolts
> Slacken upper nuts
> Slacken lower nut
> Align tension arm (use shims as required)
> Retighten nuts of both carriage bolts
> Retighten lower nuts
> Retighten upper nuts
> Open safety valve in front of the machine
> Close tailgate hydraulically

Hinge nuts tension arm

The tension arm hinge nuts must be checked and tightened as required after 100 bales after aligning the tension arm.

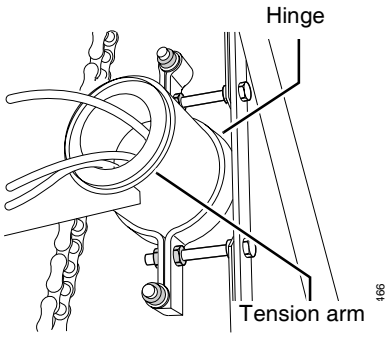
Spring tension of the tension arm



The spring tension of the tension arm can be adjusted using bolt.
Distance S must be 5 mm.
The tension arm must be in the bottom position.

> Turn bolt until distance S is 5 mm

Lubrication tension arm



> Oil the tension arm at both sides of the machine between tension arm and hinge every 10 working hours

Gearbox

The machine contains one gearbox. This gearbox is filled with oil.
The oil level must be checked

- after the first 50 working hours
- once a year
- in case of excessive oil loss

The oil must be changed

- after the first 50 working hours
- once per 2 years or
- after 20,000 bales
- in case of excessive oil loss

Contents

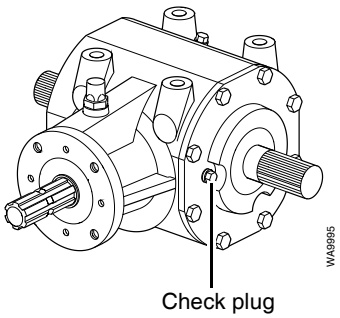
Gearbox	Content (l)	Specification
	2.3	B 80W90

Correct checking the oil level
Checking the oil level may only take place

- when the machine has stand still for a long time and
- when the machine stands horizontal

Otherwise a false oil level can occur. A false grease level can cause serious machine damages.

Checking the oil level



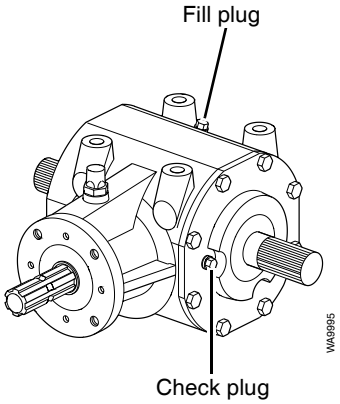
> Remove the check plug

If oil comes out the gap, the level is ok.

> Replace the check plug

If no oil comes out, the gearbox must be filled.
→ Filling the gearbox, page 127

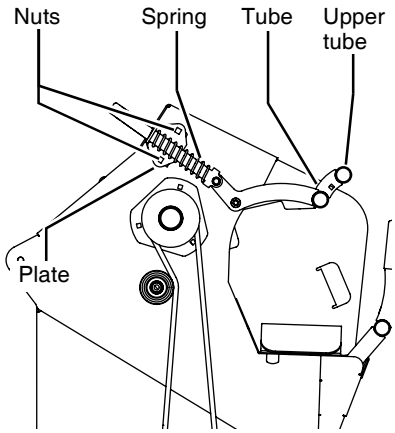
Filling the gearbox



> Remove the check plug
> Remove the fill plug
> Insert oil via the opening of the fill plug, until a little oil comes out the gap of the check plug
> Replace the check plug
> Replace the fill plug

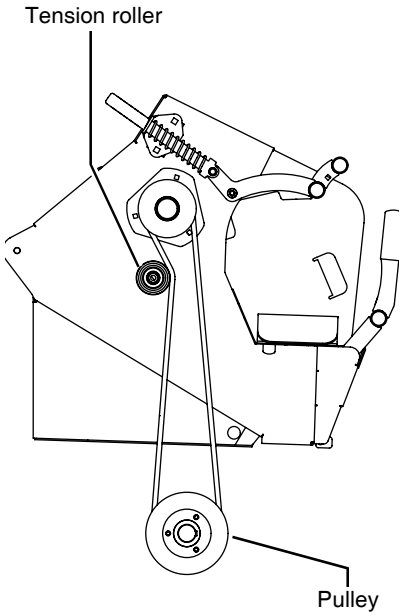
Mechanical net-binder settings

Net roll pre-stress adjustment



> Remove the net roll
> Lower the tube completely, using the upper tube
> Loosen the nuts
> Set the plate for more or less spring tension on the primairy brake
> Tighten the nuts

Net brake tension



The net brake tension is set via the pulley. The net brake tension must be adjusted

- every 1,000 bales
- when a different net quality is used

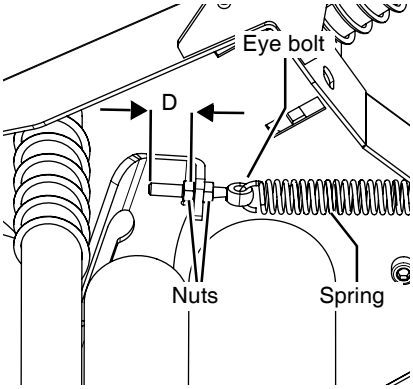
> Loosen the tension roller

The V-belt is released.

> Dismantle the pulley
> Place or remove filler discs
- More filler discs: a higher net brake tension
- Fewer / no filler discs: a lower net brake tension

> Assemble the pulley
> Tighten the tension roller

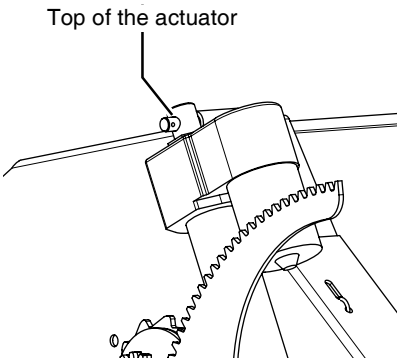
Clamping force stretch rollers



The clamping force of the stretch rollers can be adjusted by the spring tension. Distance D between the end of the eye bolt and the plate must be 30 mm.

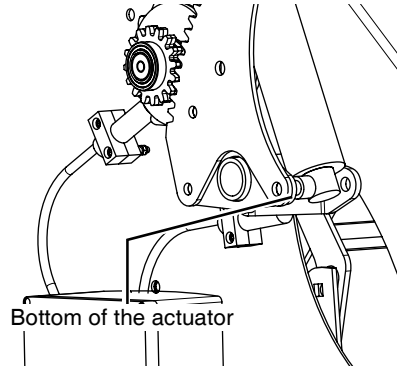
> Tighten or loosen the nuts to adjust distance D to 30 mm

Top of the actuator



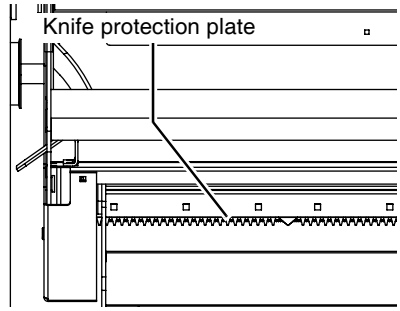
> Oil the top of the actuator every 10 working hours

Bottom of the actuator



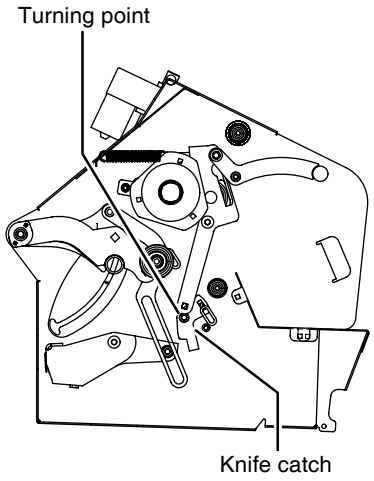
> Oil the bottom of the actuator every 10 working hours

Knife protection plate



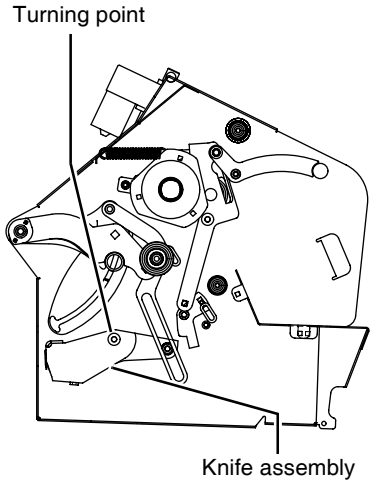
> Check and clean the knife protection plate every 3,000 bales

Knife catch



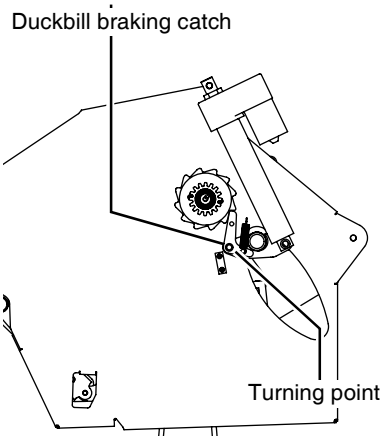
> Oil the knife catch turning point every 10 working hours

Knife assembly



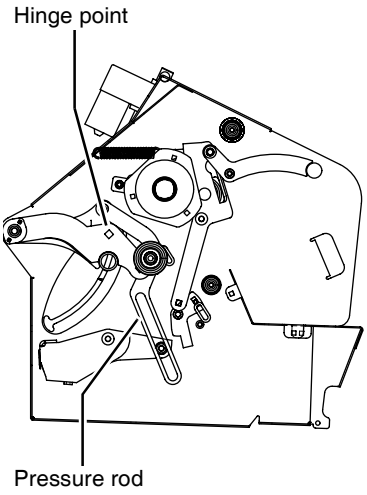
> Oil the knife assembly turning point every 10 working hours

Duckbill braking catch



> Oil the turning point of the duckbill braking catch every 10 working hours

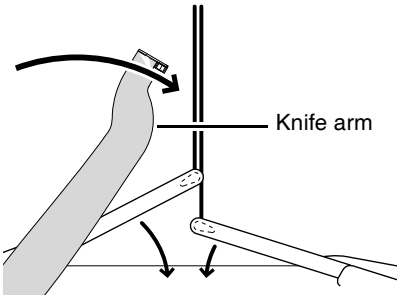
Pressure rod



> Oil the hinge point of the pressure rod between the duckbill and the knife every 10 working hours

Mechanical twine tie settings

Knife arm



Wear safety gloves
The twine knife is very sharp. Always wear safety gloves when handling the twine knife. Not wearing safety gloves can cause serious injuries.

At the end of the twine tie cycle the knife arm moves to both twine threads cutting them almost simultaneously.

> Push

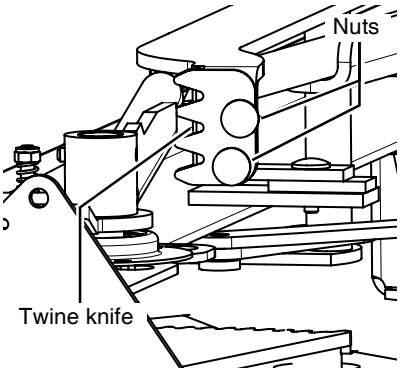
> Push

The twine tubes move to their basic position.

Ensure the cutting edge is sharp since the correct function depends on it.

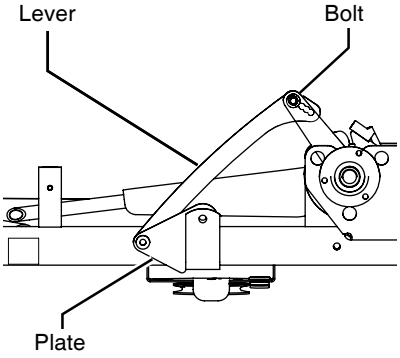
The twine knife is dull if
- one or both twine threads are not cut
- the cutting profile is long and fuzzy

Twine knife



In case of a dull twine knife, it can be exchanged.
> Switch off the pto
> Switch off the electronic control system
> Shut down the tractor engine
> Remove the ignition key
> Loosen the nuts
> Take out the dull twine knife
> Place a new twine knife
> Tighten the nuts

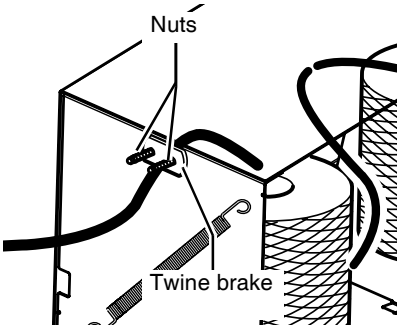
Twine knife arm



The twine knife arm can be synchronized. When the twine tubes are in the rest position, the plate must be against the frame. If not, this can be adjusted by placing the lever into another hole.
> Remove the bolt
> Place the lever into another hole

The plate must now be against the frame.
> Mount the bolt

Twine brake - twine boxes



Do not use the twine brake on the twine boxes to increase twine tension. This twine brake just serves to prevent the twine from unnecessary rolling off the spools during transport and work.

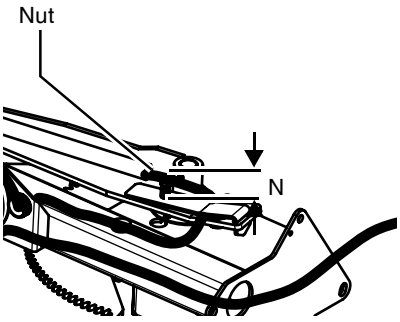
It is possible to adjust the twine brake according to the twine used (diameter, different brands and quality).
Adjust as follows:

> Loosen the nuts to increase the spring length

> Tighten the nuts to decrease the spring length

The spring must just stay under minimum pressure.

Twine brake - twine tubes



Basic adjustment of the spring length N of the twine brakes: 20 mm.
It is possible to adjust this length according to the twine used (diameter, different brands and quality).
Adjust as follows:

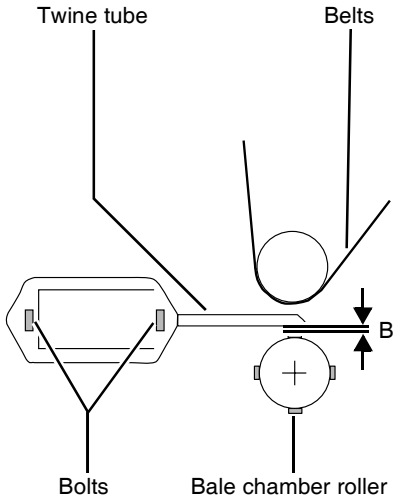
> Check spring length N is 20 mm

> Loosen the nuts to increase the spring length

> Tighten the nuts to decrease the spring length

TIP Do not divert too far from the basic setting. The spring is quite stiff and thus you easily reach a too high or too low tension.

Twine tubes position



The position of the twine tubes with respect to the bale chamber roller is important. The distance between belts and bale chamber roller is small. A correct adjustment prevents the twine tubes from touching the belts or the bale chamber roller.

> Push to switch on the system

> Push to unlock the system and to enter the operating display

> Push to choose twine tie

> Push to extend the twine tubes

or

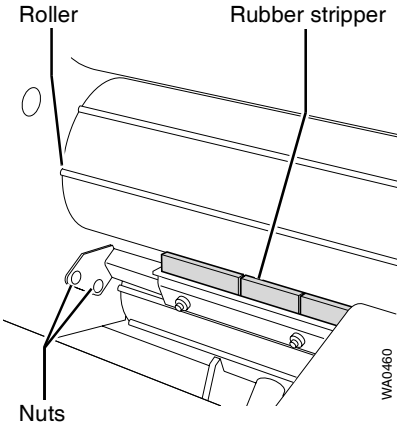
> Push to intend the twine tubes

> Push to switch off the system

The distance B between the maximum diameter of the bale chamber roller and the twine tube must be 4 mm. It can be checked by putting a metal strip of 4 mm between the bale chamber roller and the twine tube.

> Loosen the bolts
> Move twine tube so distance B appears
> Tighten the bolts

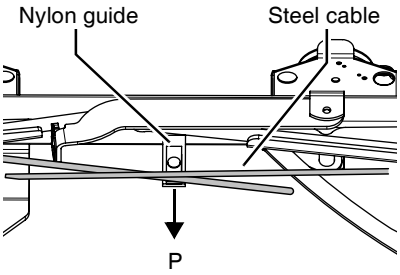
Rubber stripper



In order to prevent twine from wrapping around the bale chamber roller the correct setting of the rubber stripper is important.
Adjust the rubber stripper to such an extend that the rubber just touches the roller.

> Turn the roller till the stripper touches a smooth edge of the roller
> Loosen nuts
> Adjust rubber stripper
> Tighten nuts

Steel cable tension



The steel cable shall be tensioned in the right way.

> Check the cable:
- firstly after 1,000 bales
- after every 5,000 bales

Proceed as follows:

> Use a steelyard to apply a force of 55 N

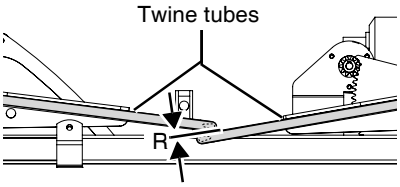
The steel cable must have a play P of 1 cm at the nylon guide.

> Tension the cable if necessary

After tensioning the cable

> recheck the twine tubes synchronisation

Twine tubes synchronisation



When both twine tube are in rest position, the play R between the twine tube ends must be 1 mm.

> Regularly clean the twine tie system

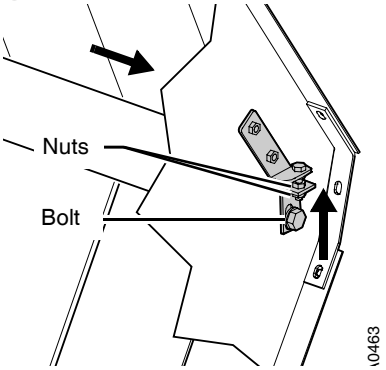
> Regularly check the twine tie system for excessive wear

Belts and belt alignment

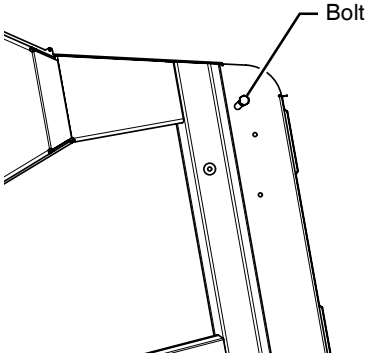
The belts are driven by a rubber roller in the front section of the machine.
This roller is shaped slightly convex in every belt track thus assisting the belt alignment.

Adjustment of the guide roller

It is important the belts run aligned and do not wear through or rubbing along the belt guides. An adjustable guide roller in the rear section of the machine enables correction of the belt alignment.



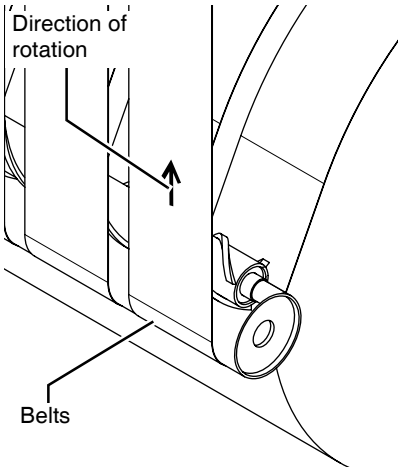
> Loosen the bolt one turn
> Adjust the roller into the desired direction using the nuts
> Tighten the bolt



RL machine only:
A second guide roller can be adjusted as well, this in order to get optimum belt alignment.
If the belt alignment can not be corrected sufficiently when adjusting at one side, the guide roller can be adjusted at the other side as well.

> Loosen the bolt
> Adjust the roller
> Tighten the bolt

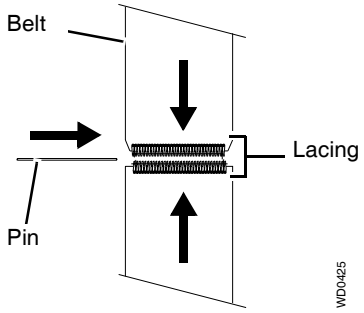
Endless belts (depending on machine version)



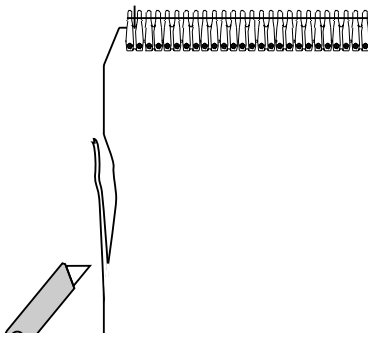
Belts without lacings provide an exceptional long life span in heavy conditions. When exchanging these belts, some rollers must be removed
→ ask your dealer

Install endless belts in such a way that the side with the most profile will be at the bale.

Maintenance of belts and lacings

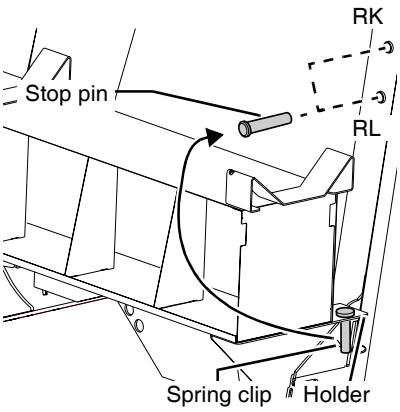


Daily inspect the condition of belts and lacings, pay special attention to wear.
Renew lacing pins every 1,000 - 2,000 bales. If you do not do this, you risk lacing damage.
In order to facilitate the exchange of the pins, clean the lacings prior to the removal with a high pressure cleaner! In every case release the belts.



Regularly inspect belts for wear and tear, cut away fringe parts with a knife. Sharp stones may damage belts!
Check belt length after every 10,000 bales (disassemble and check length, then re-assemble). The difference shall not exceed 5 cm.
For the correct belt length
→ Spare parts manual

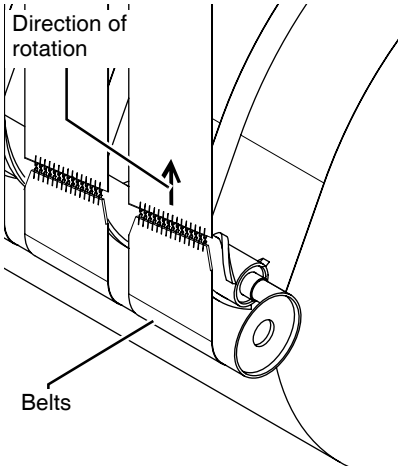
Belt exchange



> Open the tailgate fully
> Fit the stop pins into the lateral wall on both sides of the bale chamber.
> Lower the tailgate pressureless

The tension arm will rest on the stop bolt and slacken the belts.

> Do not lower the tailgate too far: the bale chamber must stay accessible
> Close the tailgate safety valve
> Remove the belt(s)



> Install the new belt(s) paying attention to the direction of running when visible

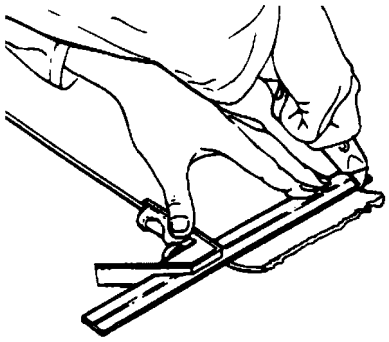
For this reason the leading edge of a belt has trimmed off corners.

> Unlock the tailgate safety
> Fully the open tailgate
> Remove the spring clip
> Remove the stop pin of the side wall
> Place back the stop pin in its holder
> Place the spring clip
> Close the tailgate
> Check the belt alignment
> Correct as necessary

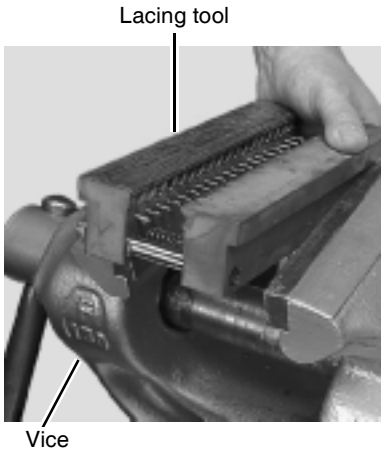
Renewing /exchanging of a lacing

For renewing the belt lacings the following tools and parts are necessary
→ Spare parts manual

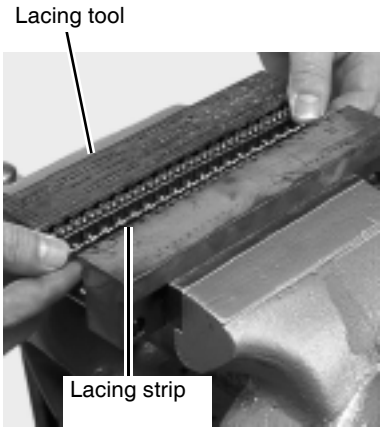
Never shorten a belt more than 10 cm with respect to the original length.
The difference in length between two used belts of one machine shall not exceed 5 cm.



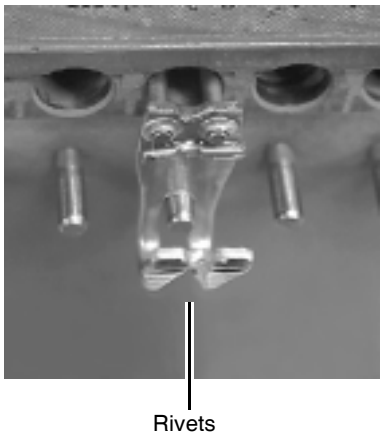
> Cut the belts square as close as possible to the lacing



> Fully open the lacing tool
> Position the lacing tool into a vice: the holes pointing to you

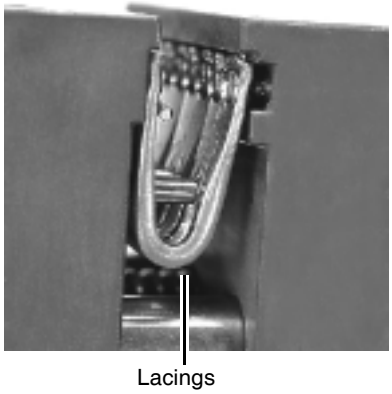


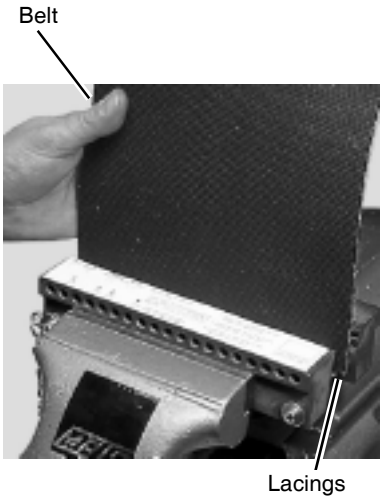
> Position a lacing strip into the lacing tool



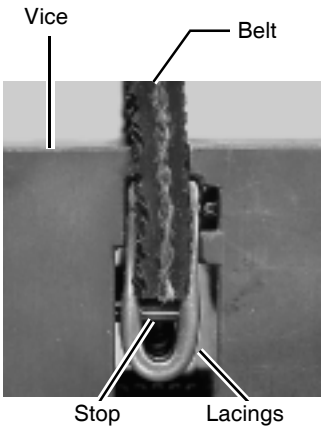
Every hole shall contain two rivets.

> Close the vice just to allow the belt fit between the lacings

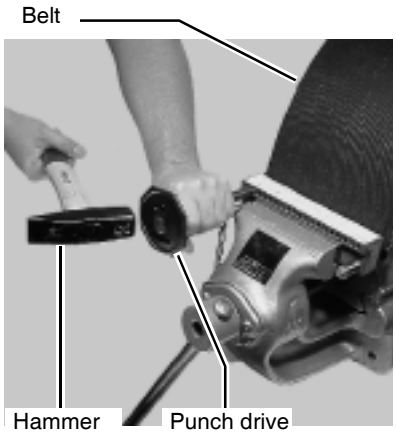




> Slide the belt end between the lacings
> Pay attention to the correct position of the belt

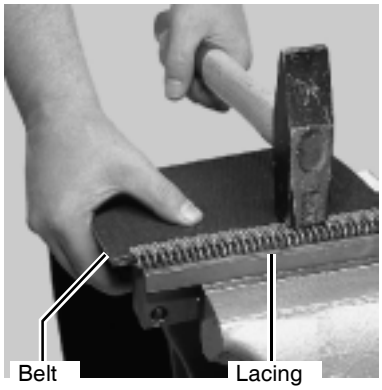


> Force the belt down onto the stop
> Close the vice till the lacings sit against the belt



> Using a hammer and a punch drive the first and the last and thereafter all the other rivets through the belt till the punch hits the stop

> Open the vice
> Take out the belt



> Put the belt with the lacing on a solid surface
> Flatten the rivet heads ensuring the lacing ayes are not damaged
> Repeat the procedure at the other end of the belt

The belt must be positioned into the vice with same side forward.

Edge corners

> Trim off the leading edge corners of the belt with a size of 0.5 x 2 cm

In order to ensure good working

> Use a small but not too hard steel brush to clean the special tool thoroughly after every lacing removing all dust and crumbled material

Wheels/axle

Correct repair work only
Repair work on wheels and tyres must only be carried out

- by professionals
- with the correct fitting equipment

Mounting wheels and tyres requires sufficient knowledge and availability of prescribed tools and equipment being in perfect condition. Serious personal injuries or machine damages can occur.

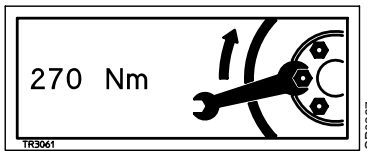
Tyre dimensions as described
Do not fit other tyre dimensions than prescribed. Fitting other tyre dimensions can cause accidents. Personal or machine damages can occur.

Pre-scribed tyre pressure only
Only use the pre-scribed tyre pressure. Using the false tyres pressure can cause serious personal or machine damages or traffic accidents.

When working on the wheels make sure that the machine

- has been placed on the ground safely (use support jack)
- is secured by chocks against unintentional rolling

Tightness of wheel nuts



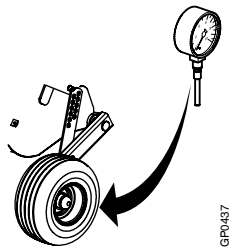
Tighten the wheel nuts:

- after the first 10 working hours
- every 150 working hours
- after every tyre / wheel renewal

Tightness of wheel nuts is 270 Nm.

Tyre pressure

Gauge wheels



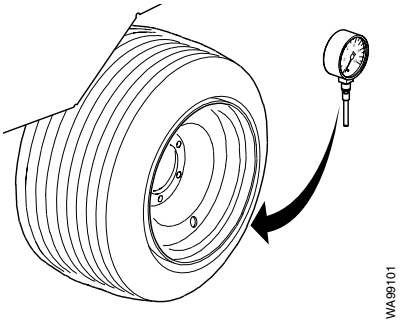
Tyre pressure pick-up gauge wheels

Tyre size	Pressure
15 x 6.00 - 6	1.75 bar

> Check the tyre pressure:

- Visual inspection each time before operating and transporting the machine.
- With an air pressure gauge at the beginning of the season and then monthly. The pressure is given in the above table.

Wheels



Tyre pressure in accordance with speed

	Speed/pressure
Tyre size	25 km/h
11.5/80-15	2.75 bar
15.0/55-17	2 bar
19.0/45-17	1.5 bar
500/50-17.0 14PR	1.5 bar
500/45-22.5	2.8 bar

> Check the tyre pressure:

- Visual inspection each time before operating and transporting the machine.
- With an air pressure gauge at the beginning of the season and then monthly. The pressures for different tyres is given in the above table.

Brakes

Hydraulic brakes

Hydraulic oil under high pressure
Hydraulic oil is under high pressure. Out coming oil can cause severe injuries.

Bleeding hydraulic braking circuit

The brake circuit is a hydraulic single acting system connected to the tractor by a hose with a quick coupler.

> Loosen coupling of the hose at the brake cylinder one turn
> Push the tractor's brake pedal gently
> Repeat this until no more air escapes at the coupling
> Fit the coupling of the hose at the brake cylinder

→ Pneumatic brake [+], page 152

Adjustment brake shoes (hydraulic/pneumatic brake)

The brake shoes must not touch/rub against the drums in the rest position.
Proceed as follows:

> Adjust the position of the brake shoe levers on their splines
> Make a running check by advancing the machine 10 metres

> Frequently clean brake drums and brake shoes

Drawbar

Hitch ring

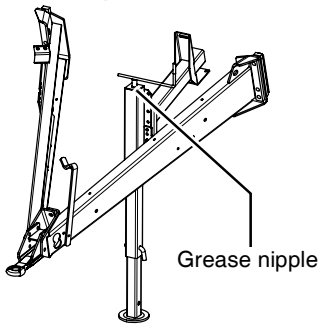
The hitch ring in the hitch eye is fitted with a wearing sleeve. It must be changed as soon as wear appears.

> Grease underside of the hitch ring every 500 bales

Support jack

Grease the nipple of the support jack from time to time.

> Grease the nipple



Sensors

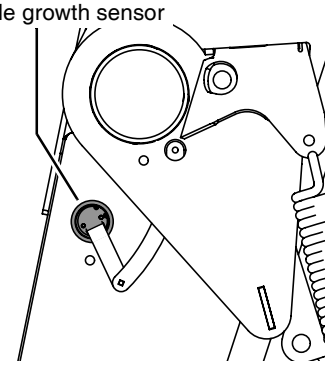
There are different types of sensors used in this machine:

- Rotational sensor (like bale diameter sensor)
- Proximity sensors (like tailgate lock sensor)

Rotational sensors

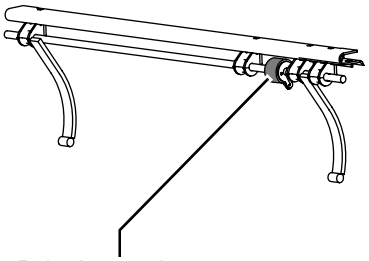
Bale growth sensor

Bale growth sensor



The bale growth sensor must send correct information to the electronic system. If it does not, calibration is required.
After producing a bale of the required diameter, the bale diameter indicated on the display must match the actually produced bale diameter.

Bale shape indication sensor



Bale shape indication sensor

The bale shape indication sensor must send correct information to the electronic system.
If arrows appear in case the bale chamber is empty, calibration is required.
Make sure there is no pollution underneath the left/right sensor indicator.

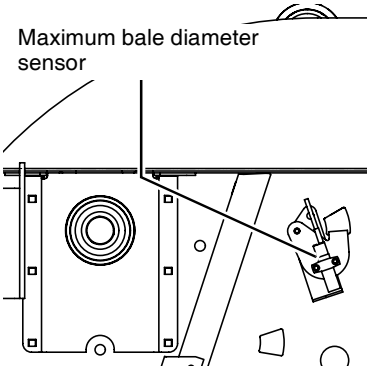
Proximity sensors

The proximity sensors trace metal objects. Therefore they must be set according to a certain distance, depending per sensor.
All proximity sensors must have a distance A of 3 - 5 mm.
Proceed as follows:

> Loosen the two bolts
> Adjust the sensor by moving it, until the required distance has been reached
> Tighten the two bolts

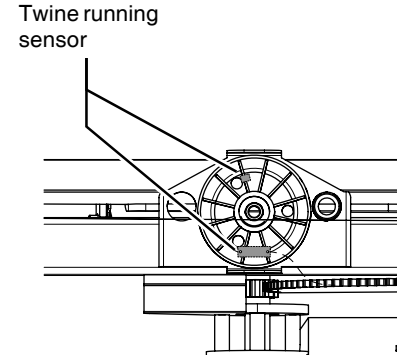
Maximum bale diameter sensor

The maximum bale diameter sensor must send correct information to the electronic system.



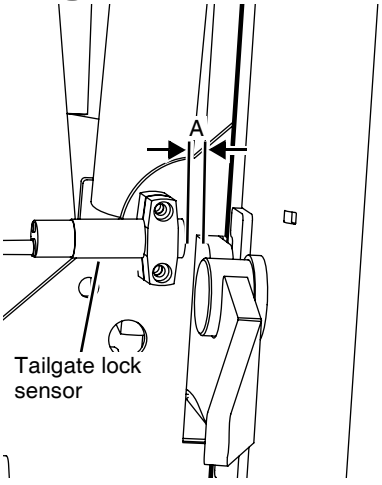
Twine running sensor [+]

The twine running sensor detects the running of the twine.
Situated at the twine pulley on top of the twine wrap device.

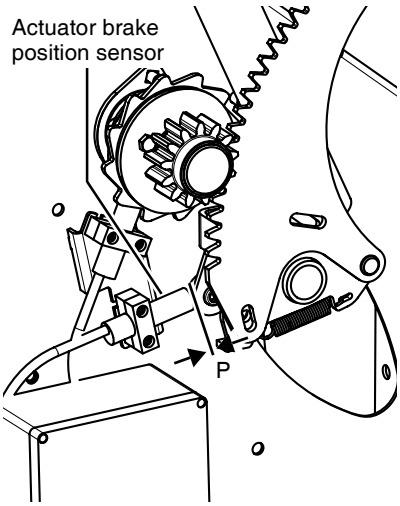


Tailgate lock sensor

The tailgate lock sensor detects whether the tailgate is locked or not.
Situated at the both sides of the tailgate.



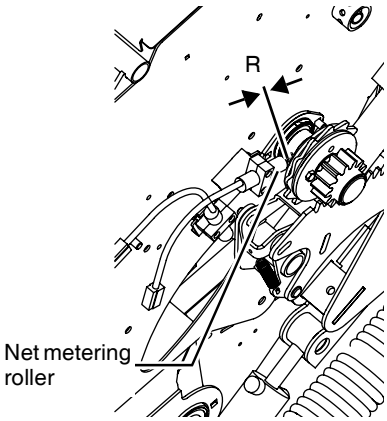
Actuator brake position sensor



Check, clean and adjust the actuator brake position sensor every 3,000 bales.
Situated at the left side of the machine.
Distance P of the actuator brake position sensor must be 4 mm.
Adjust the actuator brake position sensor as follows:

> Loosen the bolts
> Adjust the sensor to distance P
> Tighten the bolts

Net metering roller sensor

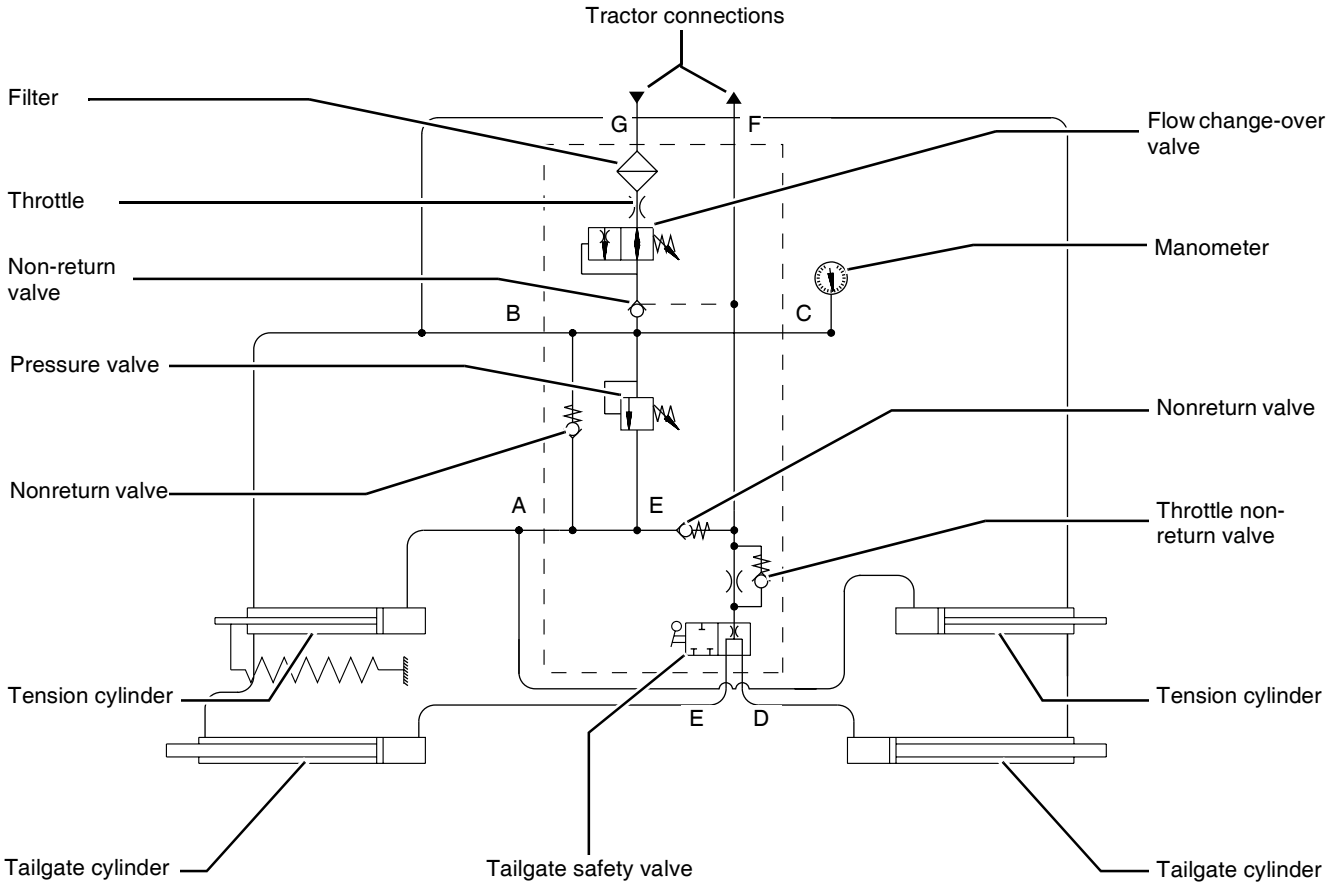


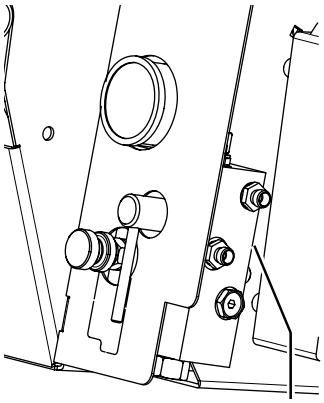
Check, clean and adjust the net metering roller sensor every 3,000 bales.
Distance R between the net metering roller sensor and both springs must be 4 mm.
Situated at the left side of the machine.
Adjust the net metering roller sensor as follows:

> Loosen bolts
> Adjust the sensor to distance R
> Tighten bolts

Diagrams and schemes

Hydraulic diagram





Hydraulic control unit

The hydraulic control unit at the front of the baler directs the hydraulic pressure through lines to activate functions.

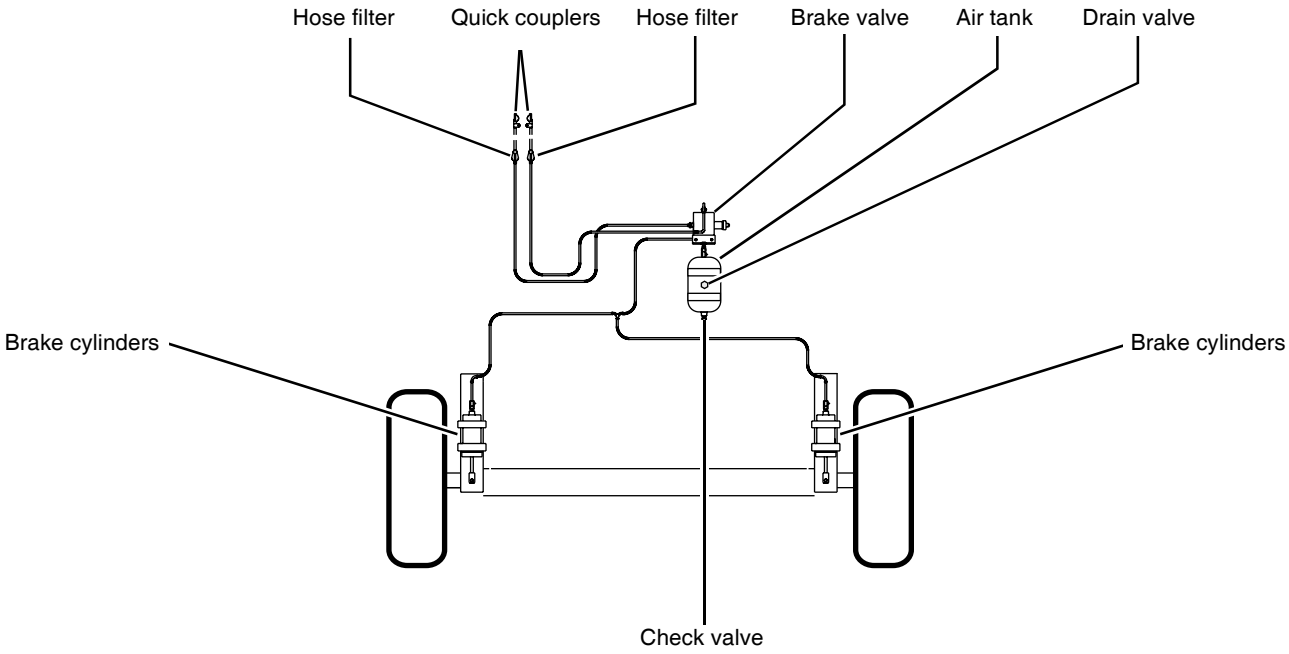
The bale growth in the bale chamber extends the tension cylinders. Hydraulic oil from the top side of the piston is pressed through an adjustable pressure valve and then flows back into the tension cylinders underneath the piston.

The hydraulic control unit directs the hydraulic pressure through lines E and D to the tailgate cylinders. When the tailgate opens the tension cylinders move freely up. A throttle non-return valve in the hydraulic system enables a sufficient flow in order to open the tailgate quickly.

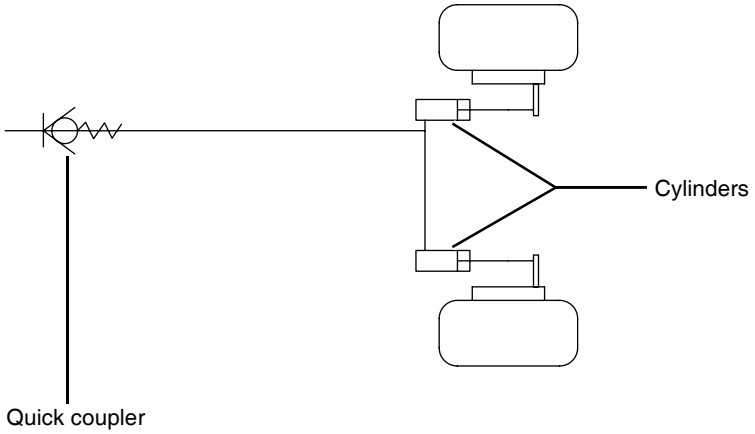
When the tailgate is to close the hydraulic pressure is directed on top of the tailgate cylinders: the tailgate closes. Just before the tailgate is closed the flow changeover valve is connected in between (little flow) and acts to brake the motion of the tailgate and at once prevents a sudden depression in the system.

Each tailgate cylinder has a substantial shock absorber at the end of its stroke.

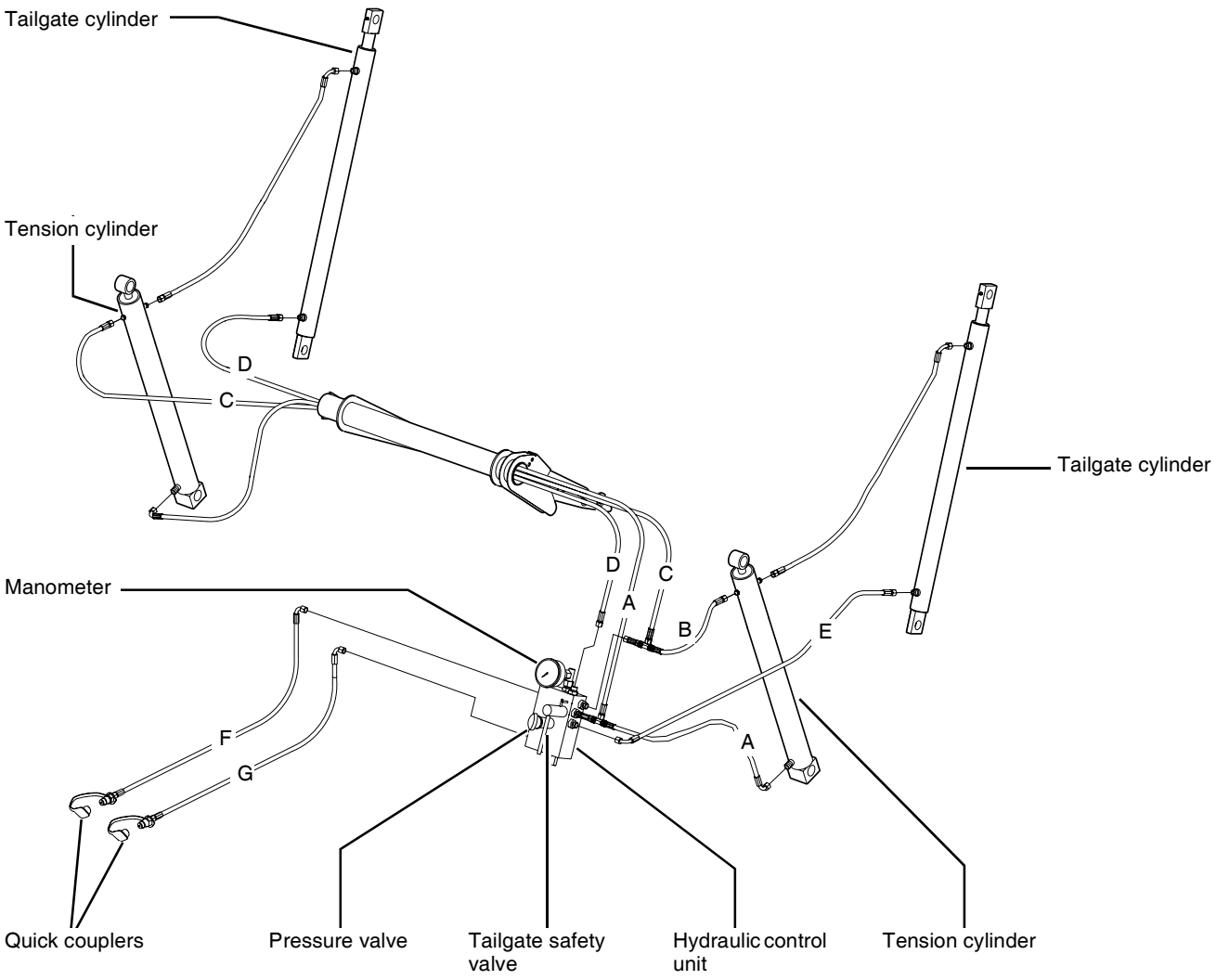
Pneumatic brake [+]



Hydraulic brake [+]

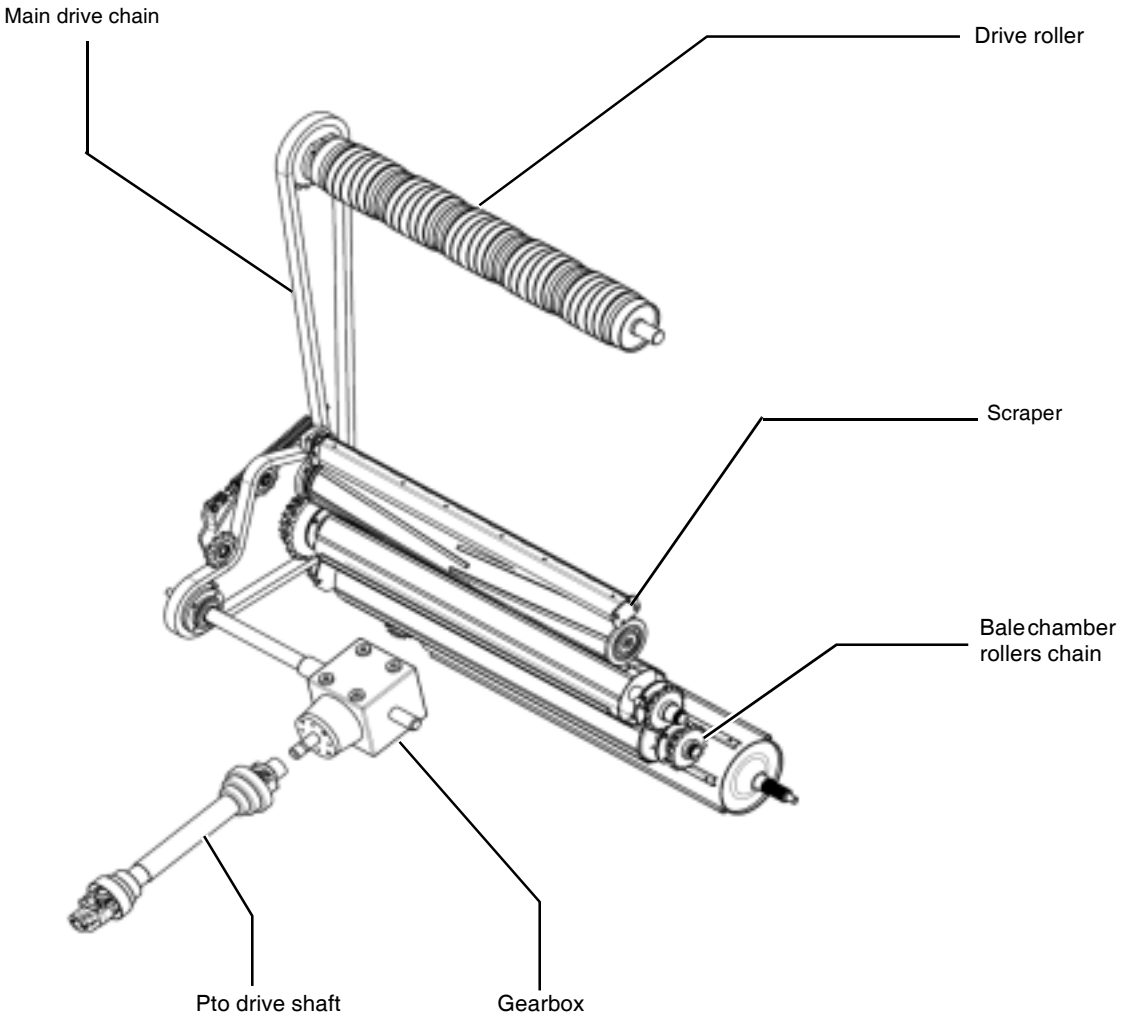


Overview - bale chamber hydraulic system

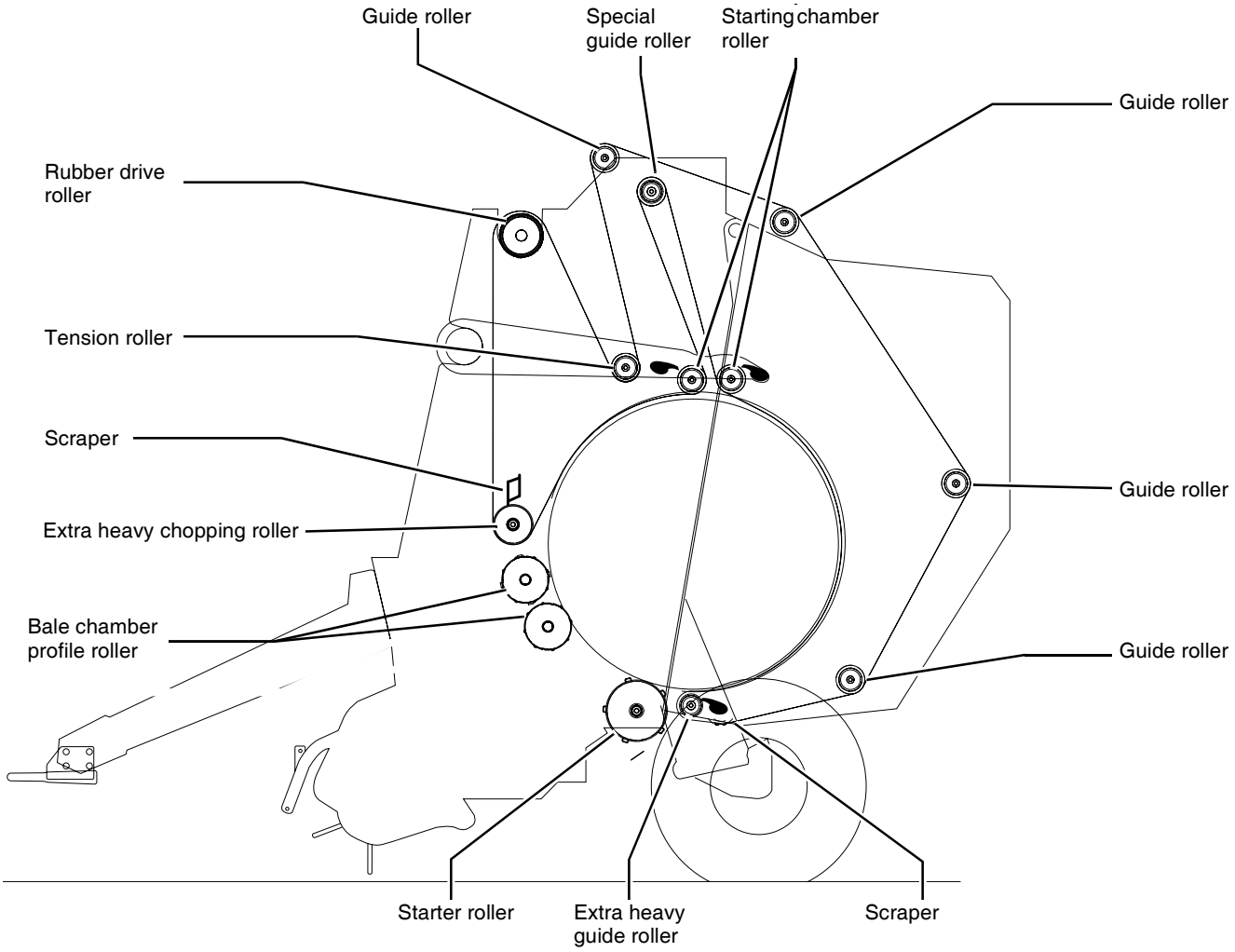


TIP A through G: connection codes on hydraulic control unit.

Drive schematic - bale chamber drive



Overview rollers and scrapers



Roller	Quantity	Function
Rubber drive roller	1	• Drive • Belt alignment correction
Tension roller	1	Transmission of hydraulic pressure onto the belts
Starting chamber roller	2	Building up of the starter chamber
Guide roller	4	Guides the belts
Starter roller	1	Compresses the crop together with the bale
Bale chamber profile roller	2	• Builds up an optimum bale chamber • Increases bale stability • Improves bale shape
Extra heavy chopping roller	1	Guides the belts / removes the pollution
Special guide roller	1	Guides the belts

General

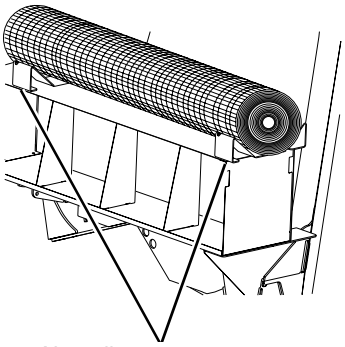
Where parts are to be changed, only use genuine original spare parts. When ordering, quote the machine identification numbers. Trained people only must carry out the use, maintenance and repair of the machine. Consult your dealer for any additional advice.
In addition, the warranty will be automatically annulled if the machine has been equipped with accessories or spare parts not authorised by the manufacturer.
Attach optional equipment

- in accordance with the mounting instructions and
- to the appropriate attaching points only

For details of the optional equipment
→ Spare parts manual

Extra net roll storage

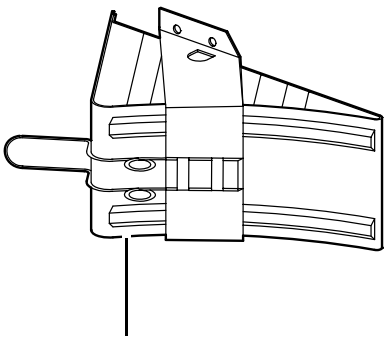
For machines that have net wrap there is a net roll storage support behind the right lateral door.
On machines with net wrap only this is also possible on the left side.



Net roll storage support

Wheel chocks

To secure the machine from rolling away, wheel chocks can be placed.



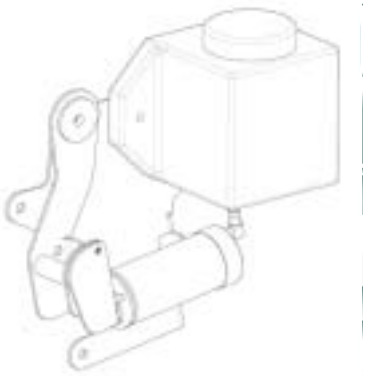
Wheel chock

2 wheels with extra wide tyres

To decrease the soil pressure (kg/m^2) from the baler on the ground.

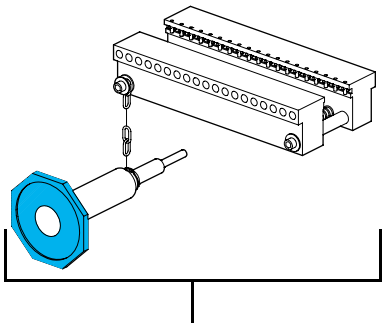
Automatic chain lubrication system

The chains off the machine can be lubricated automatically every time a bale gets thrown out of the machine. It is controlled by the hydraulic cylinder of the tailgate.



Belt repair tool

Tool to repair the belts (lacings).



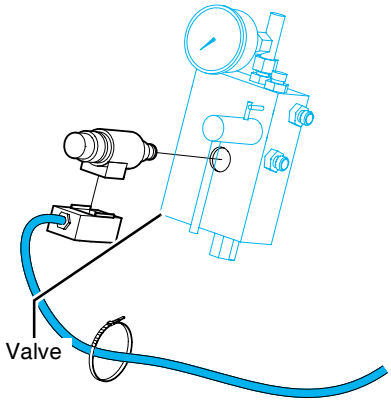
Belt repair set (5 belts)

Lacings and lacing pins to repair the belts.

Guiding “Tear-drop“ plate

Used for a better bale start and bale shape. It prevents the bale from sagging, which will give it a better consistency.

In-cab “mixed chamber” control



Mixed chamber control gives the possibility to control the hydraulic pressure of the belt tensioning system from the tractor cab.
In standard cases manual setting

- is not used during function
- is turned fully counterclockwise (= lowest pressure setting)

In case of electronic failure it is possible to control pressure manually with the valve.

Net binder

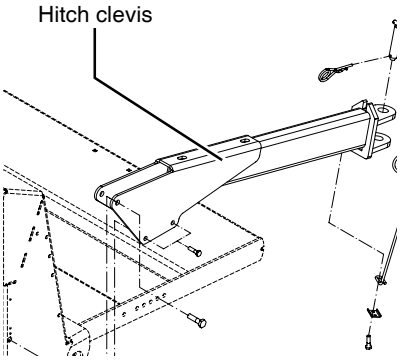
To wrap the bale with a net when the pre-set diameter is reached.

Flax kit

Used for baling flax.

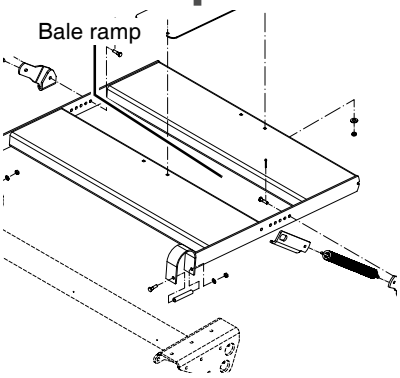
Hitch clevis

The hitch can only be mounted on machines without hydraulic or pneumatic brakes.



Bale ramp

To enlarge the distance between the bale and the baler by pushing the bale away when it gets thrown out of the machine.



Troubleshooting table electronics

Troubles can mostly be easily and quickly be remedied. Before you make an appeal to the service department, please check with help of the table, if you can remedy the trouble by yourself.

- Most malfunctions are caused by incorrect connections
- The machine box may only be opened by people with sufficient expertise
- Make sure no dirt gets into the opened central operating panel
- Only restart the machine once the cause of the failure has been identified. Otherwise, parts damaged as a result will not be covered by warranty

Problem	Cause	Solution
No message on the control box	No power supply to the control system	• Switch on the device • Check the system power • Check fuses
Internal control system problem		Consult your dealer

Error messages

The buzzer warns when an error occurs. Every error indication appears separately on the control box display in order of priority.
If an error occurs:

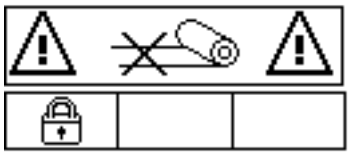
> Stop baling immediately

> Remedy the error before continuing work

Ignoring the fault message and continuing work may cause considerable material and financial damage!

Net not running

This message appears when the net is not running although it should do so.



Cause	Solution	Page
The net roll is empty	> Install a new net roll	
The net roll is wrongly installed	> Install the net roll correct	
The net brake force is too high	> Adjust the net brake force	
The V-belt slips	> Replace the V-belt	
The actuator runs out of its rest position	> Check the actuator rest setting	
The rubber and the aluminium roller are dirty	> Clean the rubber and the aluminium roller	
The net wraps around the rubber and the aluminium roller	> Check the roller surface	
The net sensor is defect	> Check the sensor	

OK > Push to acknowledge the error and continue

Net running

This message appears when the net is running although it should not.

> Check if the net has been cut

> Check whether the net is pulled by the bale

OK > Push to continue

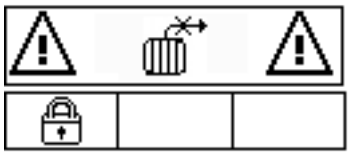
Twine tubes position

This message appears when:

- no twine binding device is available at the machine
- the twine tubes do not move due to a blockage
- the twine tubes do not move due to an electrical storage
- the twine tubes do move but a sensor failure

OK > Push to continue

Twine not running [+]



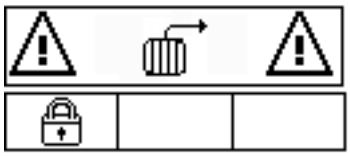
This message appears when the twine is not running although it should do so.

Cause	Solution	Page
The twine boxes are empty	> Install new twine spools	
The twine brake force is too high	> Adjust the twine brake force	
The twine sensor is defect	> Check the twine sensor	

> Pay attention to the correct position of the twine tubes

OK > Push to continue

Twine running [+]

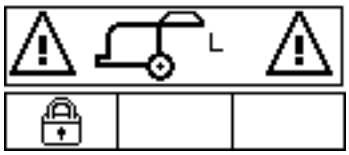


This message appears when the twine is running although it should not do so.

> Check twine guiding
> Correct twine guiding if necessary
> Pay attention to the cutting length and quality of cutting

OK > Push to continue

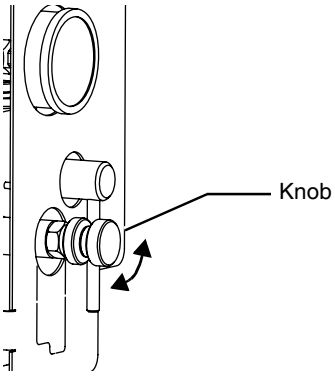
Left tailgate lock



This message appears when the left tailgate lock is not properly closed.

> Check for mechanical obstructions and remove if occurring

> Check if the hydraulic pressure is below 60 bar



> Adjust the hydraulic pressure by turning the knob

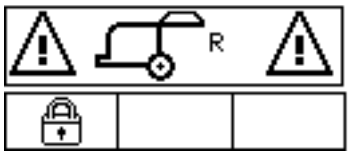
> Check both tailgate sensors

> Renew a faulty sensor as soon as possible

If the left tailgate sensor is faulty, the sensor can be switched off:
→ Tailgate lock sensor switch off, page 97

OK > Push to continue

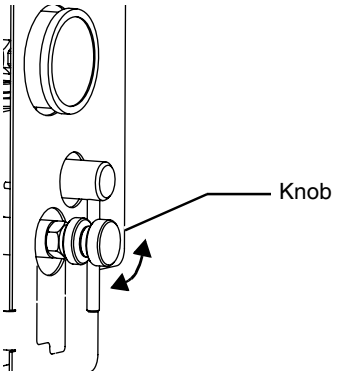
Right tailgate lock



This message appears when the right tailgate lock is not properly closed.

> Check for mechanical obstructions and remove if occurring

> Check if the hydraulic pressure is below 60 bar



> Adjust the hydraulic pressure by turning the knob

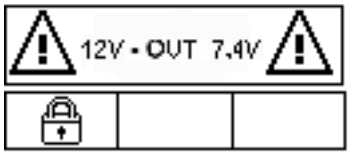
> Check both tailgate sensors

> Renew a faulty sensor as soon as possible

If the right tailgate sensor is faulty, the sensor can be switched off:
→ Tailgate lock sensor switch off, page 97

OK > Push to continue

Low battery Voltage



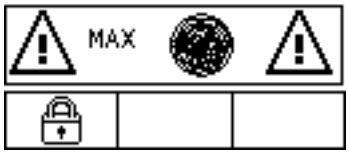
This message appears when during baling the battery voltage drops below 10.5 V (= default value).

> Switch off the electronic control system
> Check the power supply
> Start the tractor

TIP Switch off some tractor lights.

OK > Push to continue

Oversize warning



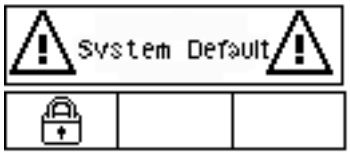
This message appears when the maximum bale diameter oversize sensor has been activated.
Possible cause:

- the maximum bale diameter has been reached

> Check and adjust the maximum bale sensor
> Correct the bale diameter in the dealer functions

OK > Push to continue

System default



This message appears when the system has been restored to its default settings.

Calibration of the following sensors is required:

- bale growth sensor

→ Bale growth sensor calibration, page 96

- bale shape sensor

→ Bale shape sensor calibration, page 95

Non-confirmable error displays

Strong electromagnetic radiation / fields may generate electronic errors. Non-approved transmitters may be the cause.
The system may show non-identifiable errors: if the error cannot be confirmed/identified at the machine, ignore it and proceed your work.

Security systems

Before approaching the machine

- switch off the electronic control system
- switch off the pto
- stop the tractor engine; remove the ignition key

Do not start up the machine again until the cause of the problem has been identified and the problem resolved. Otherwise, parts damaged as a result will not be covered by warranty.

Security systems protect the machine from

- overload
- exceeding the capacity
- damage by foreign objects

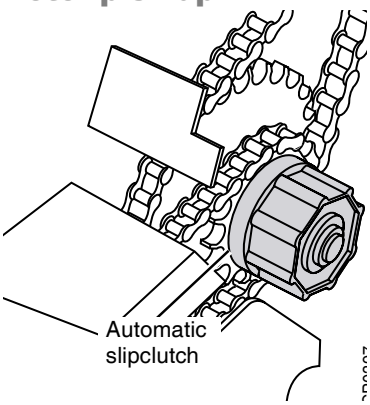
Pick-up protection

The pick-up protection will operate

- in case of excessive input
- when the pick-up setting is too low or
- when the forward speed is too high

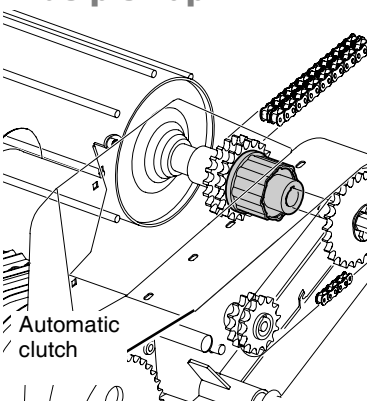
Rotor pick-up

The rotor pick-up is protected by an automatic camtype clutch.



Wide pick-up

The wide pick-up is protected by an automatic camtype clutch.



Overload safety

The complete intake unit [R/WPU/XL-R] is protected through a cam-type slip clutch in the pto drive shaft. In case of an overload this clutch slips announcing this by an audible rattling.

Blockage and reversing

> Switch on the pto
> Let the pto run at a lower speed
> Try to re-engage

If the blockage stays effective:

> Stop the engine and remove the ignition key
> Then proceed to reversing procedure
> Try to remove the blockage through re-engaging at lower pto speed

Crop flow

Problem	Cause	Solution	Page
Breakage of pick-up tines	Pick-up setting too low	> Adjust the pick-up height	47
	Suspension incorrectly adjusted	> Adjust the pick-up suspension	48
	Missing tine guards	> Replace the tine guards	
Noisy pick-up	Cam roller broken or missing	> Replace the cam roller	
	Tine guards badly aligned/damaged	> Correct the tine guard alignment > Replace the tine guard if necessary	

Hydraulics

Problem	Cause	Solution	Page
Hydraulic pressure not increasing	Dirty oil	> Drain, clean out the circuit and refill with new oil	
	Proportional valve not working correctly	> Check the proportional valve	

Rotor

Problem	Cause	Solution	Page
Blockage in front of the rotor	Too high a driving speed	> Decrease the driving speed	
	Low rpm	> Increase the pto speed	
	Machine is set too low	> Level the machine	39
	Irregular crop flow	> Adjust the crop guard	
Crop wrapping around the rotor	Cross scraper support poorly adjusted	> Adjust the cross scraper support	
Excessive power requirement of the machine	Too low pto speed	> Increase the pto speed	
	Too high driving speed	> Reduce the driving speed	
	Cross scraper support clogged or dirtied	> Clean the cross scraper	

Pick-up

Problem	Cause	Solution	Page
Windrow is not picked up	Pick-up is up or is set too high	> Lower the pick-up or > set the pick-up wheels or chains	
	Overload safety activated	> Remove the blockage	
	• Drive chain is broken • The sprocket is jumped off	> Check the chain, replace as required	
	Too high a driving speed	> Adapt the driving speed	
	Windrow too small / thin	> Make bigger windrows	55
	Pick-up tines bent or broken	> Straighten the tines or > replace the tines	
Irregular crop feed	Too high a pressure of wind guard	> Reduce the pressure of the wind guard	
Wind guard bounces	Wind guard rides on windrow	> Adjust the wind guard to a higher position	
The pick-up is blocked		> Switch off the pto > Shut down the tractor engine and remove the ignition key > Wait until the machine has come to a real stand still > Remove the crop Do not attempt to push or pull the material into or out of the machine while it is operating! Regularly remove accumulated materials to reduce fire hazard and interference with the operating parts!	

Net wrap

Problem	Cause	Solution	Page
The actuator spindle moves too slow	Too low a battery tension (voltage)	> Check the battery	
	Poor electrical connections	> Check the electrical connections	
	Hinges of too difficult motion	> Clear to free motion > Oil the hinges	
Net around bale but lacerated	Bad quality of net	> Use the recommended net quality	
Net does not cover full bale width	Bale conical	> Ensure uniform feed	
	Net tension not sufficient	> Increase the net brake force	128
Net not tight around the bale	Insufficient quantity of net around the bale	> Correct the number of wraps	
	Brake force not sufficient	> Adjust the pulley	128
Net wrap system stays inactive	System set in manual mode	> Set to automatic mode	
	No electrical connection	> Ensure the electrical supply	
Net tears prior to end of wrapping cycle	Net brake force set too high	> Remove one or more disc(s) in the pulley	
	Poor net cutting	> Adjust the knife catch	
Net is not cut	• The knife is dirty or • The knife is damaged	> Clean the knife > Replace the knife	
	Mechanical obstruction when retracting	> Check the mechanism	
	Electrical power supply not sufficient	> Ensure the power supply	
	No net tension	> Check the net tension during the cutting procedure	
	Pto switched off	> Switch on the pto	

Bale chamber hydraulic system

Problem	Cause	Solution	Page
Tailgate opens during baling	Tailgate not locked	> Apply the hydraulic tractor valve longer when closing	
	Tailgate cylinder leaking	> Renew the cylinder seal(s)	
	Tension cylinders leaking	> Renew the cylinder seal(s)	
	Pressure < 60 bar	> Increase the pressure	
Pressure gauge shows pressure drop	Pressure valve leaking	> Clean or renew the valve	
	Tailgate cylinder leaking	> Renew the cylinder seal(s)	
	Tension cylinders leaking	> Renew the cylinder seal(s)	
	Line leakage	> Inspect the hoses and tubes for leakage and repair	

Tailgate

Problem	Cause	Solution	Page
Tailgate opens during baling	Tailgate not correctly closed and locked	> Inspect the tailgate locks > Check the electronic system if the tailgate is really closed and locked > Renew cylinder seals > Thoroughly clean closing sills of tailgate	
Tailgate does not lock when closed	Tailgate locks dirty	> Thoroughly clean tailgate locks	

Rollers

Problem	Cause	Solution	Page
Crop sticks onto the rollers	Crop is wet and sticky	> Check scraper settings > Add another set of scrapers as required	

When the real life of the machine has finished, its separate parts must be properly disposed. Please observe the local current and valid waste disposal regulations.

Metal parts
All metal parts have to be delivered to a metal recycling company.

Oil
The hydraulic oil must be disposed at a used-oil recycling company.

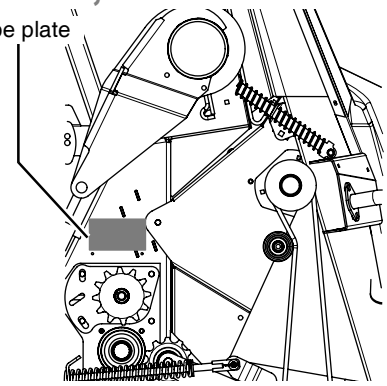
Plastic parts
All plastic parts can be recycled.

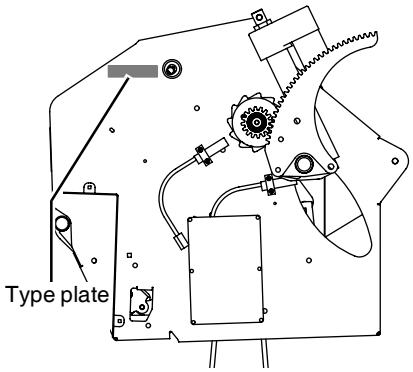
Rubber
Rubber parts, like hoses and tyres, have to be delivered at a rubber recycling company.

Electronic scrap
Electronic scrap, like the electronic control box and the machine box, have to be delivered to a specialized company.

EC Declaration of conformity

In accordance with EU Directive, 98/37/EC





We

Kverneland Group Geldrop BV
Nuenenseweg 165
5667 KP Geldrop
The Netherlands

declare under our sole responsibility that the product

RV 2160 / RV 2190 and accessories

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

For the relevant implementation of the safety and health requirements mentioned in the EU Directive, the following standards have been taken into account:

- EN 12100-1;2 (04/2004);
- EN 294 (06/1992)

Kverneland Group Geldrop BV
Geldrop, 14.02.2008

Anthony van der Ley
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