METAL-FACH

CHAIN BALER
Z587, Z587/1
INSTRUCTION MANUAL

TRANSLATION OF THE ORIGINAL INSTRUCTION MANUAL

REVISION 8

21/06/2023

Operating Manual No. Z587-08-167/2013

EC DECLARATION OF CONFORMITY

The undersigned,	Jacek Kucharewicz, President of the Board,	
hereby declares, with full responsibility, that the complete machine:		
BALER		
1.1.	Brand (the trading name of the manufacturer)	Metal-Fach
1.2.	Type:	Z345
1.2.1.	Variant:	
1.2.2.	Version:	
1.2.3.	Trade name(s) (if any):	Z587, Z587/1
1.3.	Category, subcategory, and vehicle speed indicator	S1a
1.4.	Company name and manufacturer's address:	Metal-Fach Sp. z o.o. ul. Kresowa 62 16-100 Sokółka, Poland
1.4.2.	Name and address of the manufacturer's authorised representative (if applicable)	N/A
1.5.1.	The location of the manufacturer's rating plate	On the front part of the main frame of the machine
1.5.2.	The method used to fix the rating plate of the manufacturer:	Bonded
1.6.1.	The location of the vehicle-identification number on the chassis	On the front part of the main frame of the machine
2.	Machine-identification number:	
3.	Function	Harvesting of the raked raw material by rolling into bales

Complies with all the appropriate regulations of Directive 2006/42/EC and the Regulation of the Minister of the Economy dated 21 October 2008 on the principal requirements for machines (Journal of Laws of 2008, No. 199, item 1228, as amended)

The following harmonised standards were applied to assess the compliance.

PN-EN ISO 4254-11: 2012, PN-EN ISO 4254 -1: 2016-02, PN-EN ISO 12100: 2012, PN-EN ISO 13857: 2020–03

and the following standards: ISO 3600:2015, PN-ISO 11684:1998 and the Notice of the Minister of Infrastructure and Construction of 15.12.2016 on the announcement of the consolidated text of the Regulation of the Minister of Infrastructure on technical conditions of vehicles and the scope of their necessary equipment, (Journal of Laws item 2022 of 15.12.2016).

Safety Testing Report No. LBC/64/21

The person responsible for making the technical documentation of the machine available is the Head of the Design and Technology Department, Adrian Łapiński, Metal-Fach sp. z o.o., ul. Kresowa 62, 16-100 Sokółka, Poland

This EC Declaration of Conformity shall become null and void if the machine is modified or reconstructed without the manufacturer's consent.

Sokółka (Place)

11/11/2021 (Date)

Jacek Kucharewicz (Signature)

President of the Board (position)

Machine data

Machine type:		Baler
Trade name		Z587 / Z587/1*
Serial number[(1)]:		_____
Machine manufacturer:		METAL-FACH Sp. z o.o. 16-100 Sokółka ul. Kresowa 62 Phone: (0-85) 711 98 40 Fax: (0-85) 711 90 65
Reseller:		_____
	Address:	_____
		_____
	Phone/Fax.:	_____
		_____
Delivery date:		_____
		_____
Owner or user:	Last Name:	_____
	Address:	_____
		_____
	Phone/Fax.:	_____
		_____

*Delete as applicable

[(1)] The data is located on the machine rating plate located on the front part of the machine main frame

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INTRODUCTION

The information included in the Operating Manual is valid as of the date of its issue. The manufacturer reserves its right to make design changes in machines and due to this fact some values or illustrations may not correspond to the actual state of the machine supplied to the user. The manufacturer reserves its right to make design changes without changing this instruction. The instruction manual is included as the basic equipment of the machine. Before using the machine, its user shall read the contents of this Operating Manual and comply with its instructions. This will ensure the safe operation and reliable performance of the machine.

The machine has been built in compliance with the standards in force and current regulations of the law. The instruction describes the basic safety and operation principles of the baler Z587 and Z587/1 made by Metal-Fach.

The essential obligations of the manufacturer are shown in the Warranty Certificate, which includes the complete and currently prevailing regulations on commercial warranty services.

If you do not understand the information in the Operating Manual, consult the original reseller of this machine or the Manufacturer directly.

The spare-parts catalogue functions is a separate list, and is attached in the form of a CD as part of the machine purchase, and also is available on the Manufacturer's web site: www.metalfach.com.pl .

Manufacturer address:
Metal-Fach Sp. z o.o.
ul. Kresowa 62
16-100 Sokółka

Contact:

Phone: (0-85) 711 98 40

Fax: (0-85) 711 90 65

The symbols used in these Instructions:

DANGER

A hazard warning symbol: This indicates the occurrence of a serious hazard condition, which, if not avoided, can result in death or serious injury. This symbol warns against the most-dangerous situations.

CAUTION

This symbol indicates very important information and instructions. Non-compliance can lead to serious damage to the machine, resulting from its incorrect operation.

WARNING

This symbol indicates potential hazards that, if not avoided, can result in death or serious injury. This symbol indicates a lower level of risk of injury than the DANGER symbol.

The symbol indicating useful information.

The symbol indicating service operations that should be performed periodically.

1. General description

1.1 Introduction

THIS USER MANUAL IS PART OF THE BASIC ACCESSORIES OF THE BALER

The machine can be operated only by persons who have read this Instruction Manual, know the design and functioning of the baler, and the functioning of the tractor working with it.

To operate the machine safely, adhere to and follow all the instructions set forth in this Instruction Manual. Abiding by the guidelines provided in the Instruction Manual ensures safe operation for the User, and also prolongs the machine's service.

1.2 Baler Identification

The identification data is located on the rating plate located on the front part of the frame. To read the data on the rating plate, remove the cover, located on the front of the machine. The rating plate shows data used to identify the machine, i.e. a code, serial number, manufacture year and pressure on the hitch.

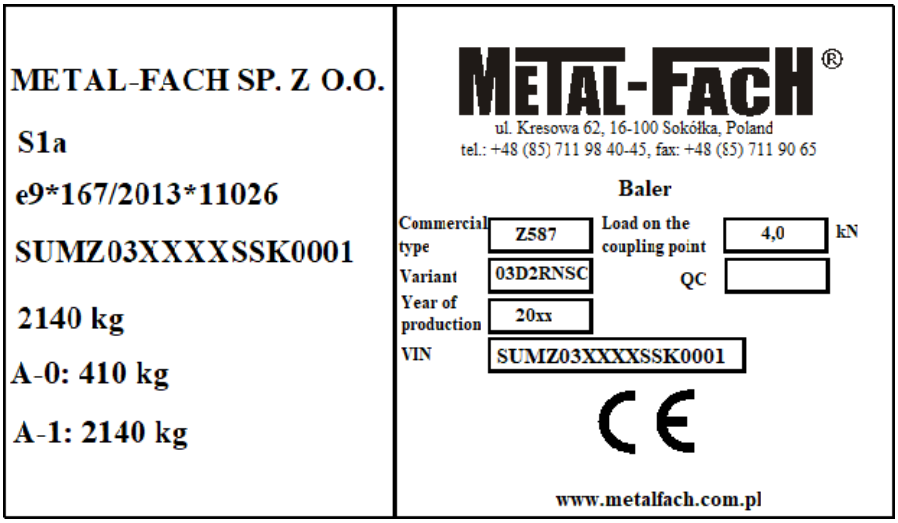


Fig. 1. Sample rating plate

CAUTION

CAUTION!
It is prohibited to enter public roads with a bale wrapping press without the rating plate or with an illegible rating plate.

CAUTION

CAUTION!
Check the condition and legibility of the rating plate. In case it is destroyed report it at the service.

Upon purchase, check the compliance of the serial number located on the nameplate of the machine with the number provided in the user manual and warranty card.

The manual should be preserved for future users.

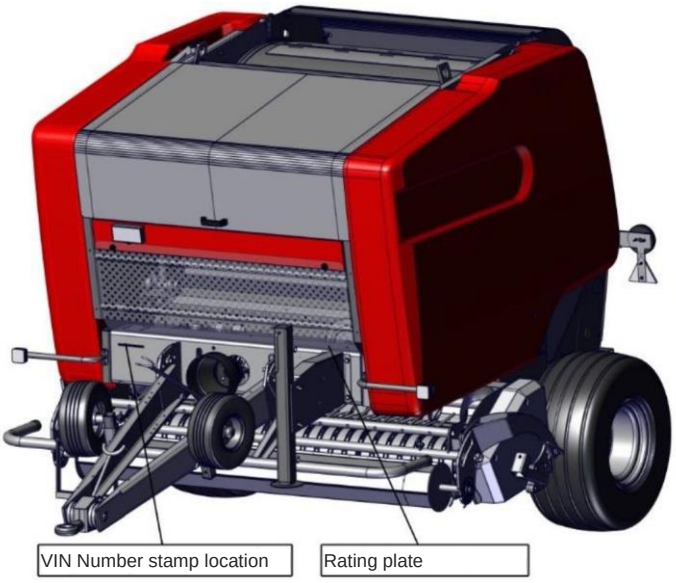


Fig. 2. VIN Number stamp location and rating plate affixed to the machine

In the case of selling the machine to another user it is obligatory to provide the instruction manual. It is recommended for the baler supplier to archive the instruction manual receipt confirmation by the purchaser, submitted with the machine to the new user.

Keep the instruction in a safe place, where it should be available to the user and service technician through the entire life cycle of the machine.

If the instruction manual is damaged or lost, notify the service centre and provide the manual number or the data from the rating plate to receive a new copy of the baler operation manual. You can also download the instruction manual from the website: www.metalfach.com.pl .

Before you start the machine after a longer period of stoppage, carefully read the information on the use and safety contained in this manual.

You must read all the parts of the instruction manual and, if necessary, contact a local Metal-Fach distributor. The contact details of the distributors and service centres are published at www.metalfach.com.pl. The machine should be operated, serviced and repaired by people familiar with its specific characteristics and acquainted with the rules of conduct in terms of occupational safety.

The manufacturer of the machine shall not be held liable for damage arising from non-compliance with the principles contained in this instruction manual!

USE ORIGINAL SPARE PARTS ONLY!

If you need any spare parts, call your local Metal Fach distributor or Metal Fach in Sokółka directly.

1.3 Intended use of the baler

The Z587 and Z587/1 balers are designed for picking up the material raked into windrows by rolling them into bales: hay with a humidity of up to 20%, green fodder with a humidity of up to 60% and straw.

All the work actions must be executed by one person, an operator who is in the tractor cab.

Using the balers for any purpose other than the intended use shall be considered an improper use, contrary to the intended use. Metal Fach shall have no responsibility for damage caused to persons, animals or for any other damage resulting from improper use of the machine.

WARNING

DANGER!
Using the balers for any purpose other than the intended use shall be considered an improper use, contrary to the intended use. Metal Fach shall have no responsibility for damage caused to persons, animals or for any other damage resulting from the improper use of the machine.

CAUTION

CAUTION!
Unauthorised construction changes, working with the baler not in compliance with its intended use, and avoiding the safety principles release the manufacturer from responsibility for any resulting hazards and damages

1.3.1 Incorrect and prohibited uses

The following uses are incorrect and prohibited:

- coupling the balers with tractors that fail to meet the requirements given in the manual;
- standing under the lifted machine chamber that is not secured against accidental drop;
- standing on the baler during transport;
- checking the technical condition and cleaning the machine when the tractor engine is running and the machine drive is on;
- operation with the guards opened;
- servicing or repairing the PTO shaft when the tractor engine is on;
- using the twine removed from an earlier rolled bale;
- using faulty hydraulic hoses;
- control of the baler by an operator who is outside the tractor cab;
- operation of the machine under the influence of alcohol or drugs;

• operating a damaged machine or operation with the guards removed;

• transport of a rolled bale in the baler chamber;

• leaving the unsecured machine on a slope;

• entering the area between the tractor and the machine with the engine running;

• any other use of the machine not in conformity with its intended purpose.

WARNING

DANGER!
Use of the machine other than for its intended purpose is prohibited. It can cause damage to the machine, injury or death of the machine operator and bystanders.

1.4 Baler design

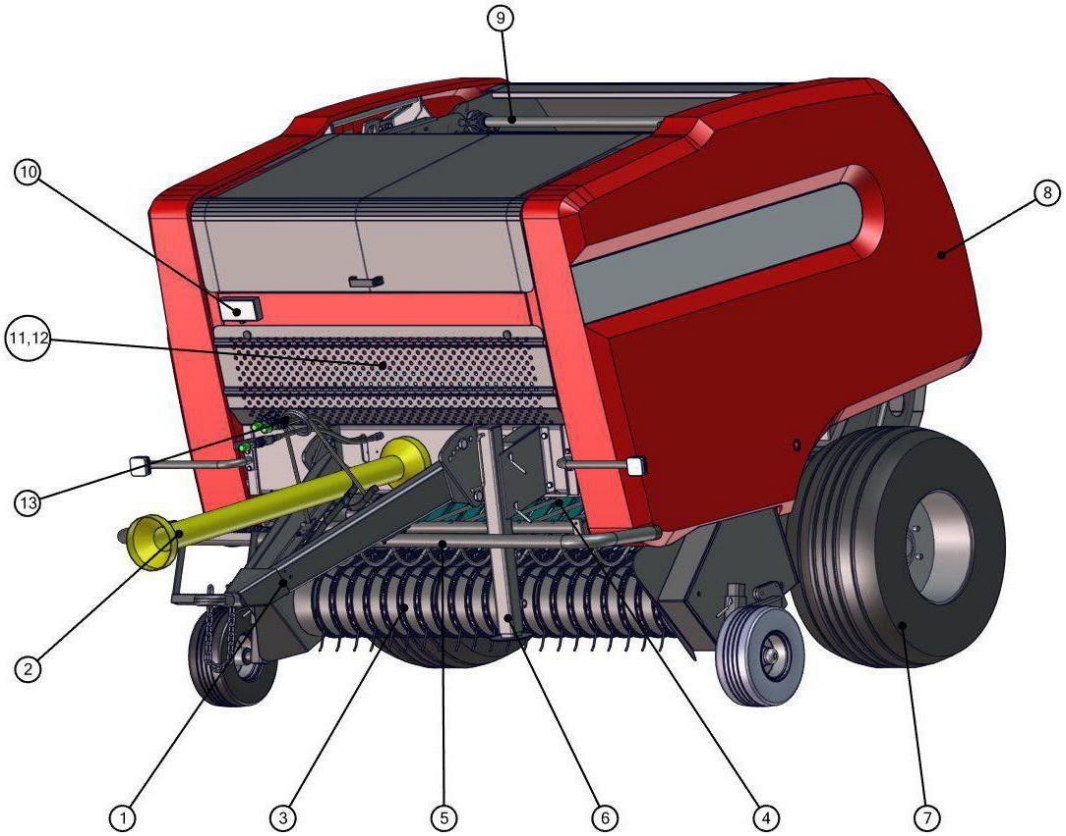


Figure 3 Design of the Z587, Z587/1 baler (1 – Drawbar; 2 – PTO shaft; 3 – Pick-up; 4 – Collector; 5 – Guardrail with platform, 6 – Parking jack; 7 – Ground wheel; 8 – Guard; 9 – Chain and rod conveyor set; 10 – Control panel; 11 – Net binding unit; 12 – Twine binding unit; 13 - Hydraulic supply lines

The front section of the baler features the pick-up (3) which collects the windrows. The material collected by the collector (4) is delivered to the rolling chamber in the form of a roll. A pair of chains drive special rollers which move along the circumference of this chamber. The motion of the rollers propels the material rolling and compaction. Achieving a pre-set degree of compaction is signalled by the control panel (10) in the operator's cab. After the pre-set compaction degree is achieved, the binding unit (11, 12) ties the bale with twine or net.

The baler coupling with the tractor is achieved by means of the drawbar (1), PTO shaft (2) and hydraulic hose (13). The support foot (6) is used for propping the machine in a stationary position. It must be lifted by means of the provided crank during operation. The baler is fitted with ground wheels (7) for towing behind the tractor.

1.5 Technical specification of the baler

Table 1. Technical specification of the baler

No.	Contents		
	General data		
1.	Machine Type	Baler	
2.	Manufacturer	METAL-FACH Sp. z o.o. 16-100 Sokółka, ul. Kresowa 62	
3.	Rating plate location	Front bar	
4.	Number stamp location	Front body, right side	
5.	Trade name	Z587	Z587/1
	Dimensions		
6.	Length [mm]	4325	5070
7.	Width [mm]	2540	2550
8.	Height [mm]	2200	2395
	Weights		
9.	Maximum weight [kg]	2550	2950
	Technical data		
10.	Maximum hitch pressure [kN]	4.0	4.6
11.	Rolled bale dimensions (diameter/width) [mm]	1200/1200	1500/1200
12.	Bale weight [kg]	100–600	150–900
13.	Efficiency [bales/h]	20–35	15–30
14.	Rolling assembly – chamber type	Chain-type, fixed chamber	
15.	Bale density	Variable	
16.	Drawbar eye diameter [mm]	45	
17.	Number of operators	1 (tractor’s operator)	
	Requirements for tractor		
18.	Power demand [kW/HP]	37/50	
19.	Power demand on the power take on [kW/HP]	37/50	
20.	PTOff rotational speed [rpm]	540	
21.	Connected with the tractor by	Lower transport hitch	
22.	Hydraulic system	1 dual direction manifold, 1 unidirectional manifold	
23.	Required pressure in the tractor hydraulic system [Atm./MPa]	140/14	
24.	Electrical system [V]	12	
25.	Plug	“Lighter” type	
26.	Transport speed [km/h]	40	
	Pick-up*		

		Narrow pick-up	Broad pick-up
27.	Pick-up type	Drum and tine, 4-bars	Drum and tine, 4-bars
29.	Max. distance between the extreme pick-up tines [mm]	1520	1830
30.	Number of pick-up tines	44	52
31.	Working height adjustment	Mechanical, 5 settings	
Binding			
32.	Binding unit	Automatic binding with a single twine, net binding (optional)	
33.	Twine binding density adjustment	2-step	
32.	Number of net rolls	1.	
Tyres			
33.	Size	400/60 – 15.5	
34.	Load and speed index	Min 117 A8	
35.	Pressure in tyres [kPa]	250	
Power take-off shaft (PTO)**			
36.	Type	Standard	Wide-angle
37.	Transferred torque [Nm]	2000	1860
38.	Minimum length [mm]	1410	1210
39.	Type of coupling	Shear	Shear

* The Z587/1 baler may be configured with the broad pick-up.
* The wide angle shaft is an optional accessory for the baler.

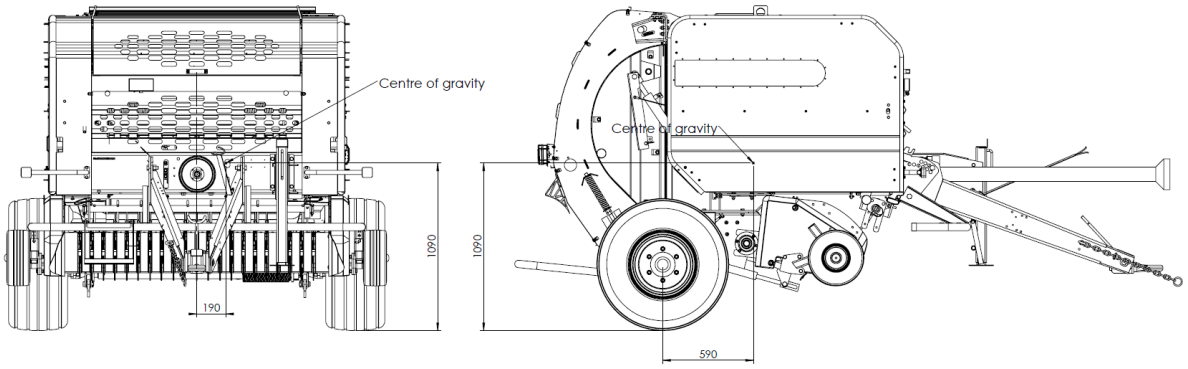


Figure 4. Centre of gravity of the Z587 baler

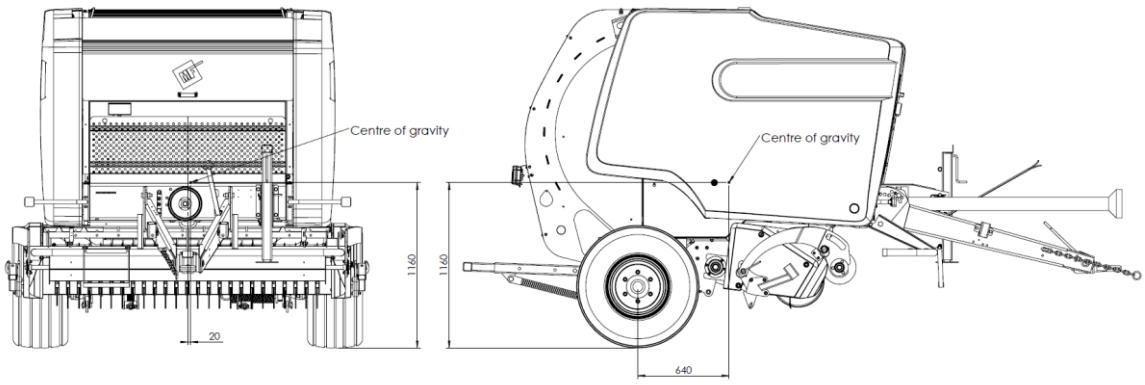


Figure 5. Centre of gravity of the Z587/1 baler

1.6 General safety principles

Before starting the baler operation, read this operation manual to avoid risks. Apart from the information included in the instruction manual all the principles and local legal regulations related to safety of work and utilization of the machines should be met.

The baler was designed and made in such a way so as to provide maximum safety of use.

Before first start-up, read all the chapters of the instruction manual carefully.

Metal-Fach shall not be held liable for any damage arising from non-compliance with the principles contained in this baler instruction manual.

The company shall also waive all responsibility for any damage arising from improper use of the machine and any unauthorised changes made to the machine.

Check the condition of the machine regularly. Pay special attention to the correct functioning of all safety components. All protective guards must be installed according to the manufacturer's instruction.

WARNING

WARNING!
The operator of the baler may only be an adult, qualified person with a valid license to drive an agricultural tractor, who is familiar with health and safety regulations for the operation of agricultural equipment and who is familiar with this Manual.

WARNING

WARNING!
Before starting the operation, check the machine for correct functioning, completeness and proper securing of its moving parts.

You should take note of all the warning signs indicated in the manual and present on the machine. All signs that warn about risks present on the machine must be visible at all times.

Please, ensure that the safety signs are kept clean at all times and if damaged or barely legible, they are replaced. You can find the list of safety signs with their locations in Chapter 1.6.1. “Safety signs”

WARNING

WARNING!
Never leave the machine unattended during operation.

WARNING

WARNING!
Never leave the tractor unattended, when its engine is running.

DANGER!
Take particular care while getting into and out of the tractor.

DANGER!
Before reversing, bystanders must be warned by means of an audible signal or by the assisting person.

WARNING!
During the baler operation, there is a risk of lightning strike.

DANGER!
During the work, it is strictly forbidden to come near the rotating components, touching the moving parts or reaching into them.
Keep your face, hands and legs away of all rotating parts. Keep safe distance at all times.
Do not use tubes, hoses or other parts of the machine as handrails.
Carrying persons or animals on the machine or tractor is strictly forbidden.

WARNING!
During the maintenance and repair works, wearing protective clothing, safety gloves, protective footwear and goggles is mandatory.

WARNING!
Always keep the oils and lubricants out of the reach of children. Always carefully read the warnings and precautions placed on packaging. Do not allow skin contact with all the hazardous substances. Wash yourself thoroughly after you have used the above-mentioned hazardous substances.

WARNING!
Work on pressurised hoses is prohibited, it may cause pollution or serious injuries.

WARNING

WARNING!
Wear well-fitting clothes that cannot be caught by movable elements, and boots with non-slip soles. In case of the hazard of an item's ejection, wear a protective helmet with eye protection.

CAUTION

CAUTION!
It is not allowed to leave the farming equipment on slopes or other inclines without securing the vehicle against accidental rolling away.

DANGER

DANGER!
The machine’s working area is considered a danger zone. Particular risk areas for crushing, shearing, entanglement are: drawbar, PTO shaft, pick-up, tosser, twine wrapper, net wrapper, rear compartment. Before starting the machine, make sure that there are no people (especially children) or animals around, in the immediate vicinity or inside the machine. In case anyone appears near the machine the baler must be stopped immediately and you must make all undesired persons leave the zone. Never stop in the close proximity of or under terraces or balconies, in front of open rooms, or any kinds of platform, where persons or animals can stay. The baler operator is responsible for any kinds of damage caused by the machine during operation.

WARNING

WARNING!
The operation of the baler without mounted and closed guards that protect the moving parts is strictly prohibited.

WARNING

WARNING!
Prior to each starting of the baler, check the machine condition, completeness and mounting of the guards.

CAUTION

CAUTION!
Hydraulic connections must be always kept clean. After use reinstall plastic covers supplied upon the machine's purchase.

Check and if necessary replace any damaged tube guards and fixings. All moving tube guards must be replaced every 5 years. Hydraulic lines must be replaced every 6 years. You must record the date of the latest replacement. Before enabling pressure in the hoses, check if all the hoses and their fixing is air-tight. In order to check that there are no leaks from the hoses use tissue paper or other paper.

CAUTION

CAUTION!
Prior to each baler start-up and driving on public roads, check correctness of the machine connection with the tractor, tightening of the wheels and correct drawbar and tractor connection.

CAUTION

CAUTION!
During transport on public roads, the pick-up wheels must be in the transport position (section 1.7)

DANGER

DANGER!
Prior to starting and during collecting of swathes, make sure that there are no by-standers, especially children.

WARNING

WARNING!
Take special care during operations on inclined area. Pay particular attention to the possibility of bales rolling and the possibility of losing stability.

WARNING

WARNING!
Take special care when working, paying particular attention to the possibility of the baler tipping over on its side if it encounters a hole, ditch or other irregularity in the field, particularly when it has the ejection flap door open.

CAUTION

CAUTION!
It is strictly forbidden to operate the baler under raised and unprotected machine units.

DANGER

DANGER!
It is strictly forbidden for any person to stay between the tractor and the baling press during tractor engine operation.

CAUTION

CAUTION!
Take particular care when connecting and disconnecting the baler from the tractor. The machine must be connected to a tractor equipped with a lower transport hitch withstanding a higher vertical load than the vertical load on the baler drawbar (Chapter 1.5.).

WARNING

WARNING!
During operations, wear the appropriate work clothing, and footwear with non-slip soles.

DANGER

DANGER!
Load the binding twine and net when the tractor engine is switched off and protected against accidental starting up (key removed from the ignition and the parking brake engaged).

WARNING

WARNING!
Control the power hydraulic system of the baler from the tractor operator's cab only.

CAUTION

CAUTION!
Before each new passage, check the position of the support foot. The support foot must be in the transport position.

WARNING

WARNING!
Traffic laws and manufacturer's recommendations must be observed during transport on roads (Chapter 1.7.2).

CAUTION

CAUTION!
Prior to entrance on the public roads carry out visual control of the transported machine.

WARNING

WARNING!
It is forbidden to climb the baler during its transport and operation.
It is forbidden to climb on the machine, especially during operation.

WARNING

WARNING!
During transport on the public roads, it is forbidden to transport rolled bales in the baler chamber.

WARNING

WARNING!
It is forbidden for people under the influence of medicines or other substances which affect the ability to drive vehicles and general psychophysical efficiency, or medicines causing disturbances of concentration or delay of the response time, and for persons after alcohol consumption to operate the machine.
It is forbidden to operate the baler in a state of exhaustion, which can cause interruptions to concentration and delays to reaction time.

WARNING

WARNING!
It is forbidden to drive the baler near open fire.

WARNING

WARNING!
Always observe fire regulations and immediately eliminate any hazards occurring in the course of operation of the baler or when parked.

WARNING

WARNING!
During the operation of the baler, do not approach it with open fire and do not smoke near the machine.

WARNING

WARNING!
Prior to each departure to work check if there is a dry powder fire extinguisher included in the tractor equipment. If missing, the tractor must be provided with one.

CAUTION

CAUTION!
When parked, the machine must be secured with a chain which runs through the hitch eye.

WARNING

WARNING!
Noise – equivalent A-weighted emission sound pressure level (LpA) is not above78 ± 1 dB;
Testing was carried out in accordance with EN ISO 4254-1:2016-02 p.4.3 and Annex B.

DANGER

DANGER!
All adjustment, repair and servicing works should be carried out with the tractor’s engine off, making sure beforehand that it is protected in the correct way against accidental starting up.

1.6.1 Safety signs

The safety signs located on the baler contain important notices for the operator's safety. Their purpose is to draw the operator's attention to the safety accident prevention principles and to possible risks during machine operation and servicing.

The safety signs are black and red symbols on yellow background.

Keep the signs clean and legible at all times. They should be replaced immediately if lost or damaged. You can buy them at the manufacturer.

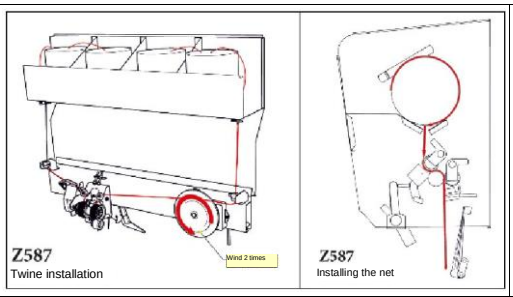
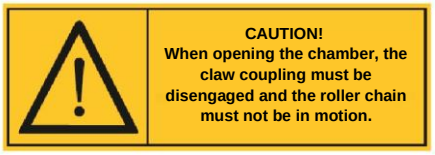
1.6.2 Warning signs

Table 2. Warning signs

	Safety symbol (sign)	Meaning of the symbol (sign) or content of the inscription
1.		Warning – read the user manual before performing this operation.
2		Switch off the engine and remove the ignition key and read the instruction manual before any maintenance or repairs.
3		Keep a safe distance from the lifted cover during baler operation.
4		Secure the lifting cylinder before entering the danger zone.
5		Do not reach into the pick-up zone when the tractor engine or PTO shaft is working.

6		Do not stand under the lifted cover which is not secured against accidentally dropping.
7		Danger of being crushed by bales rolling out. Keep a safe distance from the working machine.
8		Do not open and remove the protective guards during machine operation.
9		Do not open and remove the protective guards during machine operation.
10		Notice about the PTOff rotational speed and rotation direction.
11		Do not ride on platforms or ladders.

12		Do not come near any moving swivel joints of the hitches when the engine is working.
13		Do not stand between the machine and tractor, when the tractor engine is working. This area is particularly dangerous.
14		Keep away off the revolving PTOn shaft.
15		Information pictogram.
16		Information pictogram.
17		Keep a safe distance from the working machine.
18		Main lubrication points of the baler.
19		Lifting points for loading on a means of transport.
20		Speed limit of 40 km/h

21		The method of installing the net and twine.
22		If you remove the guards to carry out works, use a special lengthening bar to protect the net device blade.
23		Lift placement points.
24		Warning pictogram.
25		Warning pictogram.
26		Danger of entanglement. Keep a safe distance from the working machine.

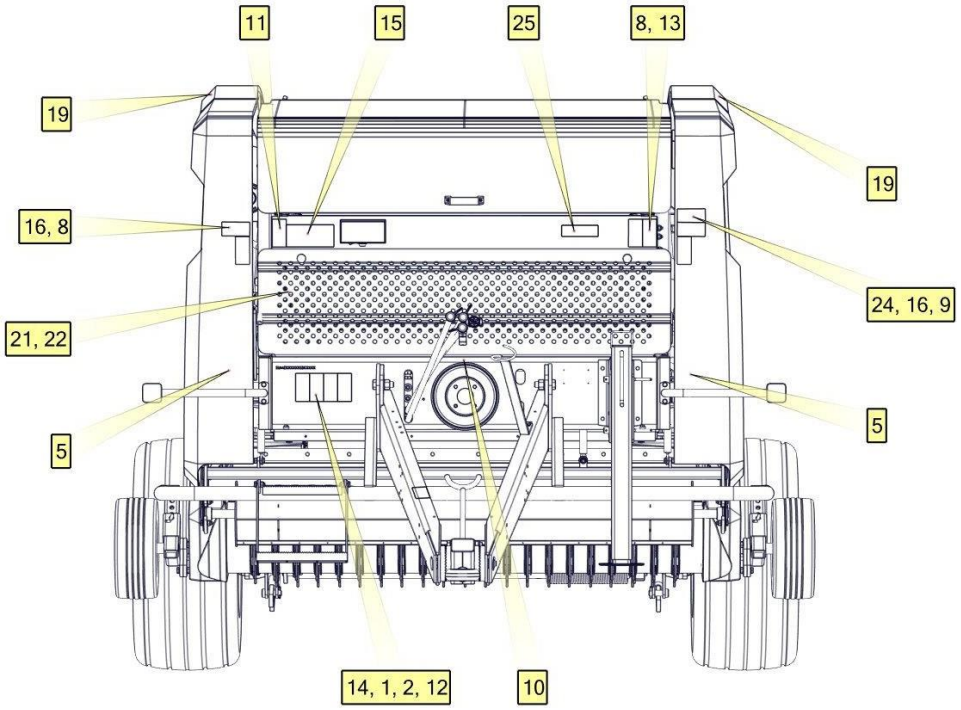


Figure 6 Arrangement of warning symbols on the machine – front

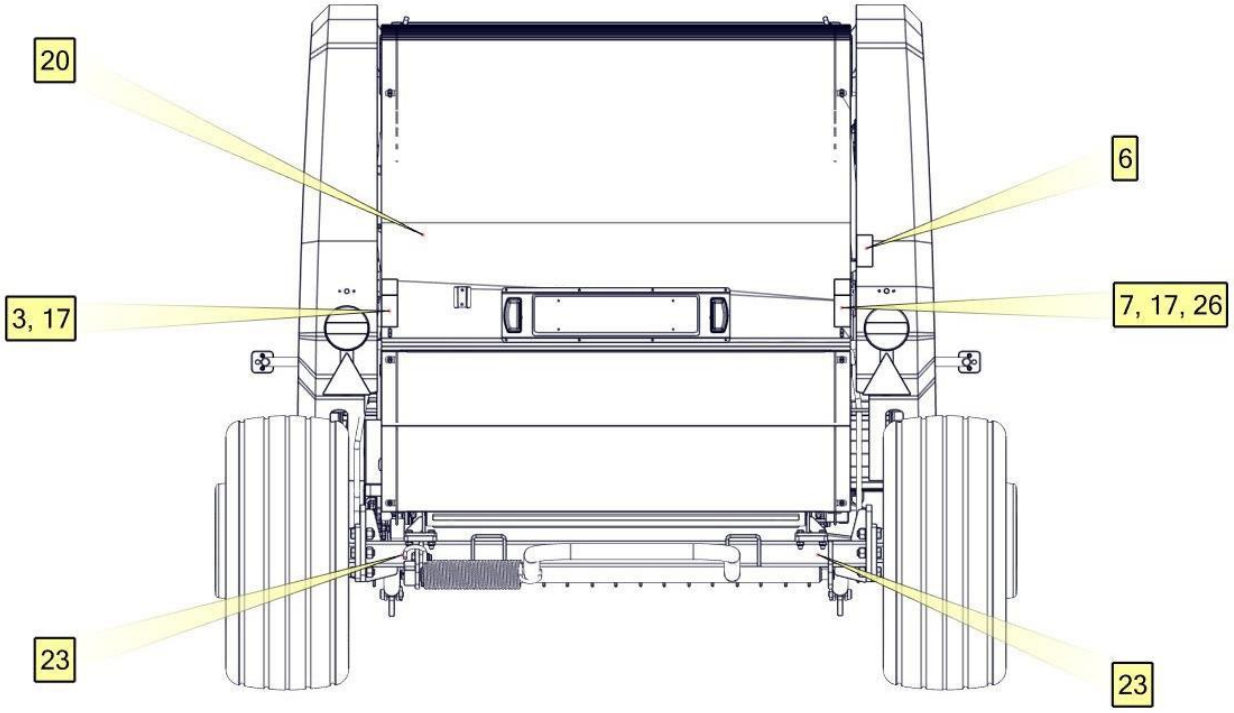


Figure 7 Arrangement of warning symbols on the machine – rear

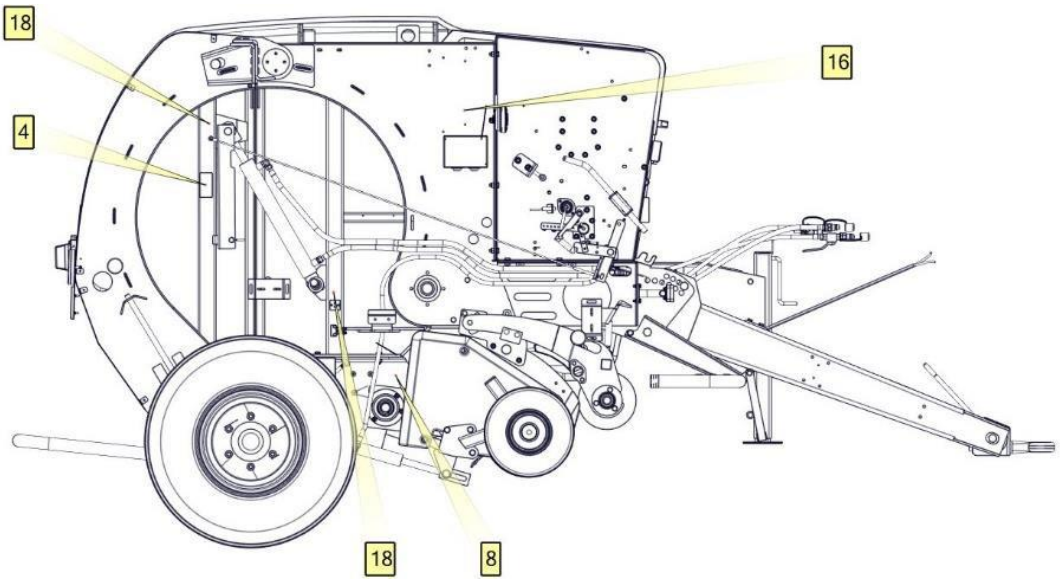


Figure 8 Arrangement of warning symbols on the machine – right side

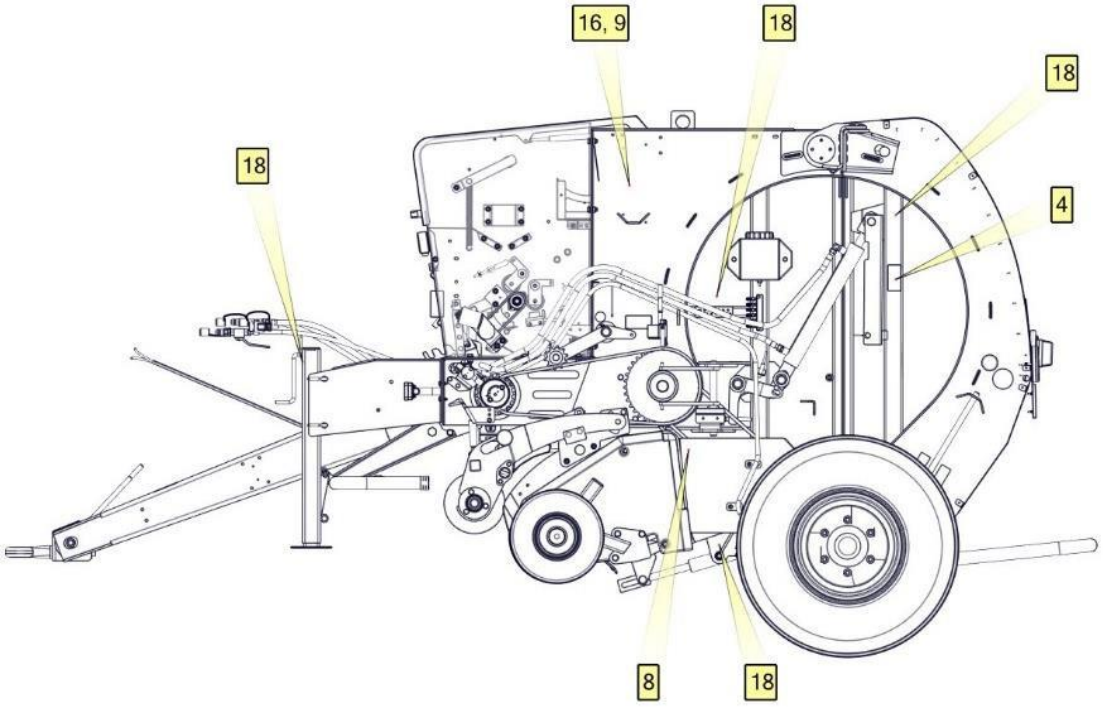


Figure 9 Arrangement of warning symbols on the machine – left side

1.7 Baler transport

1.7.1 Transport of loads

The baler is designed for rail and road transport of relevant payload capacity.

Lifting equipment can be operated by trained operators holding the relevant qualifications.

The suspension sling attachment points for the transport of the baler are shown in Fig. 10.

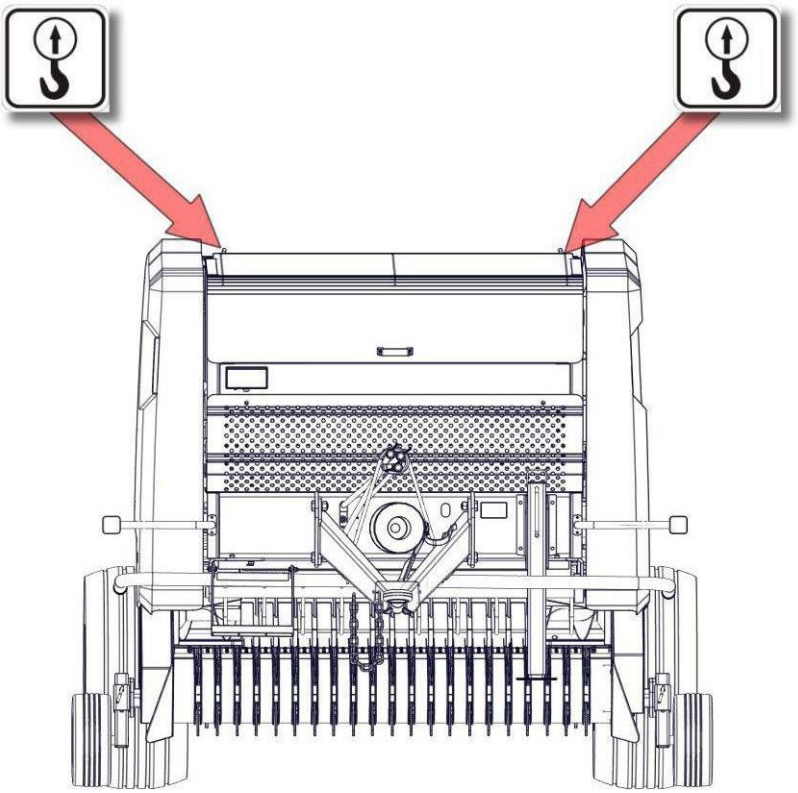


Figure 10 Sling attachment points

The placement points of the lift are shown in Fig. 11.

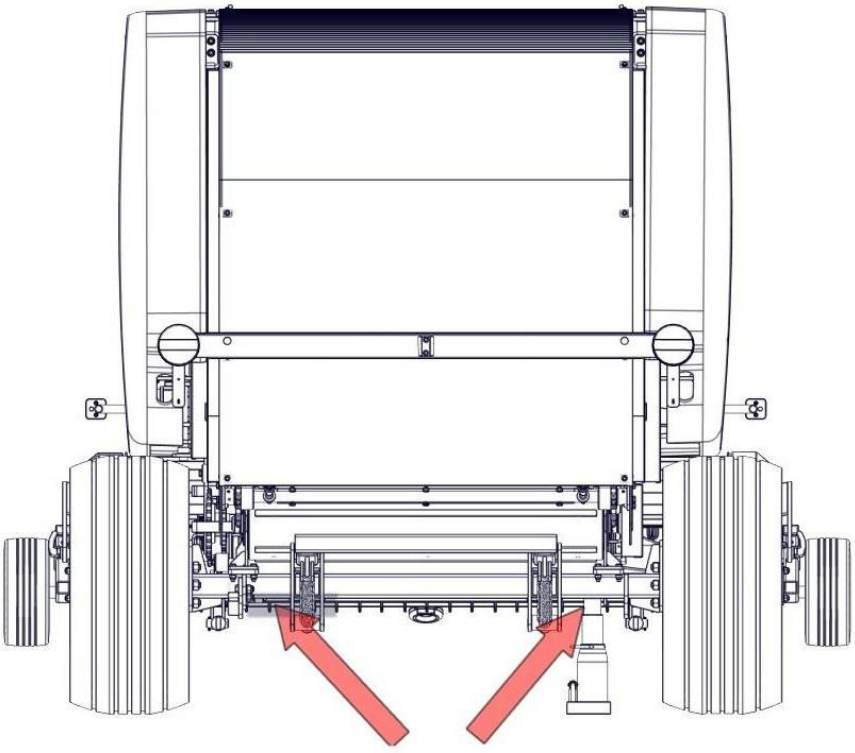


Figure 11 Jacking points

Transport of the baler with a bale in the chamber is prohibited.

For the time of transport, the transported baler should be permanently and reliably attached to the floor.

A special parking jack (Fig. 12) can be used for transporting the machine on the trailer. This support is distinguished by its yellow colour. When the machine is delivered, the transport support must be removed by unscrewing the 4 screws (Fig. 12) and replaced with a standard support in the colour of the baler body. The yellow transport support must not be used during normal machine operation.

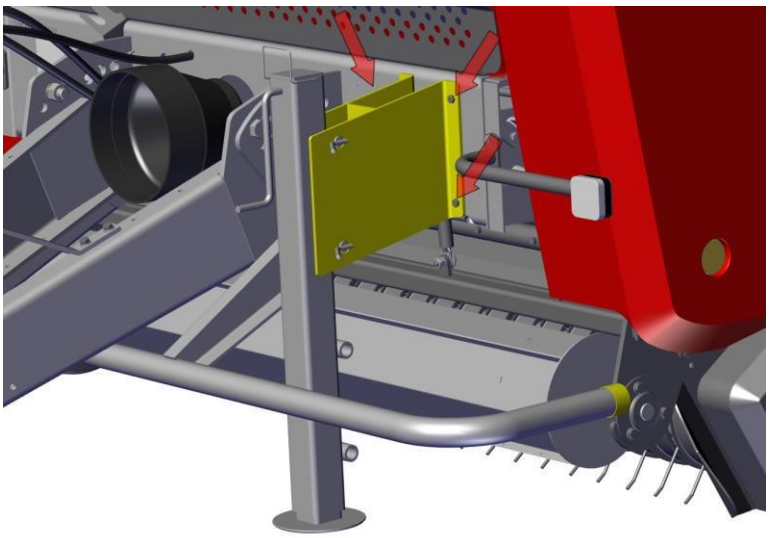


Figure 12 Transport support for the parking jack

1.7.2 Road-Traffic Participant

The baler is designed for the public road traffic as a machine attached to the farming tractor lower hitch.

Only agricultural tractors with a power output of not lower than 35 kW and a drawbar pull class of not lower than 0.9, fitted with the lower transport hitch, may be used for transport on public roads.

When travelling on public roads with a baler fitted with a wide pick-up, the pick-up wheels must be in the transport position shown in Figure 13. If they are at the pick-up, they must be placed on the brackets on the drawbar and locked in position with pin 1 and pin 2. Do this for the left and right wheels.

WARNING

WARNING!
It is forbidden to carry persons on the machine during operation or transport.
Transport of a rolled bale in the baler chamber is forbidden.

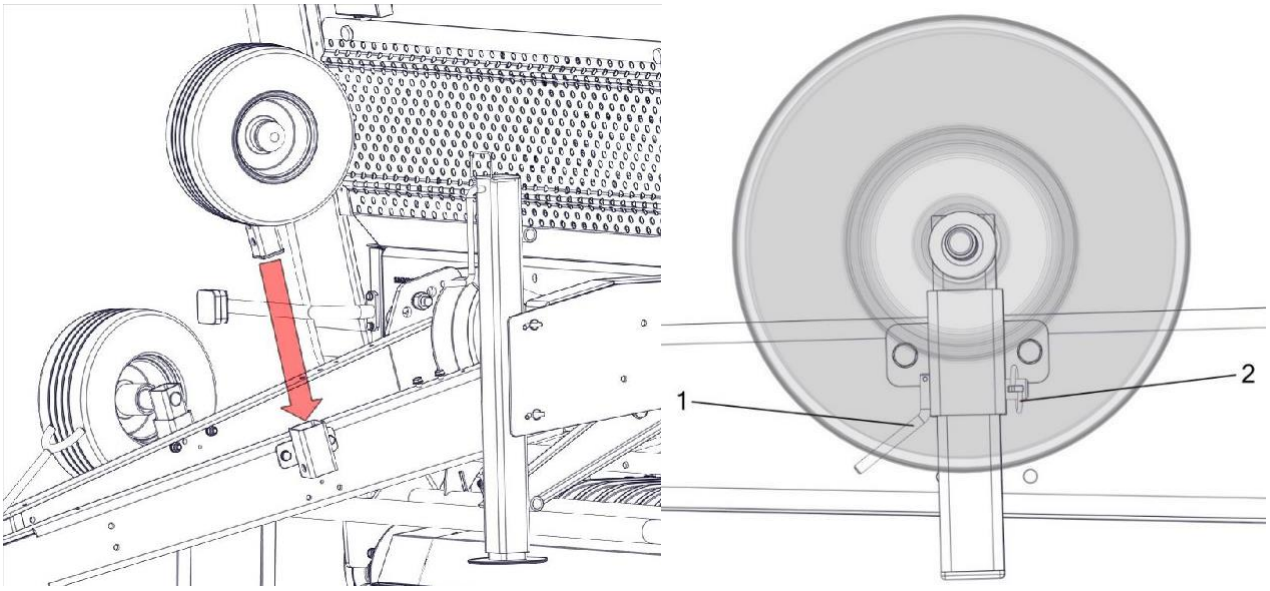


Figure 13 Pick-up wheels in transport position

Prior to entrance on the public roads follow the procedure.

- Disable the PTO shaft,
- The hydraulic hoses should be disconnected and fixed in a relevant way,
- Disable the counter and leave it in the cab,
- Mount a notice indicating slow moving vehicles in the holder on the rear section of the machine (fig. 14)
- Check the good working order of the lighting and signalling system,
- Check tyre pressure,
- Check that the pick-up wheels are in the transport position (fig. 13),
- Check that the press is fitted with the support foot in the colour of the body (section 1.7.1).
- Check that the rear chamber and guards are closed.

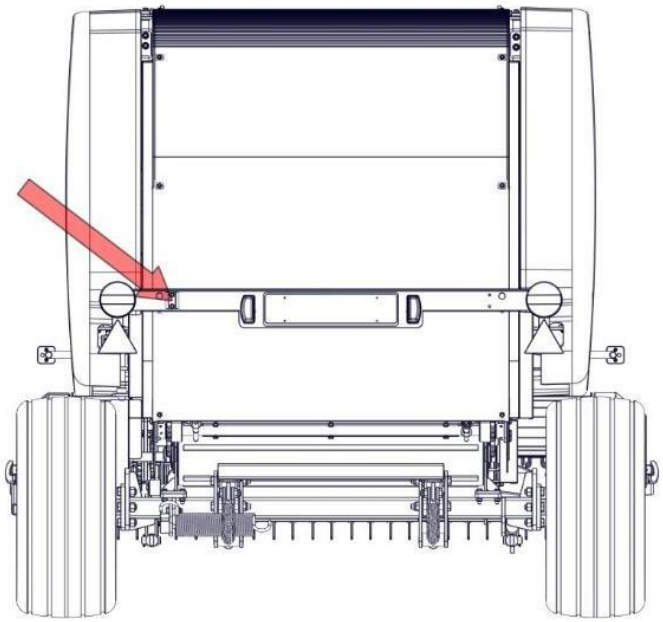


Figure 14 Location of the board indicating slowly moving vehicles

Before merging with the traffic on public roads, make sure that the tractor is fully manoeuvrable. The front axle load of the tractor must be at least 20% of the tractor weight. If this condition is not fulfilled the front axle of the tractor must be loaded additionally.

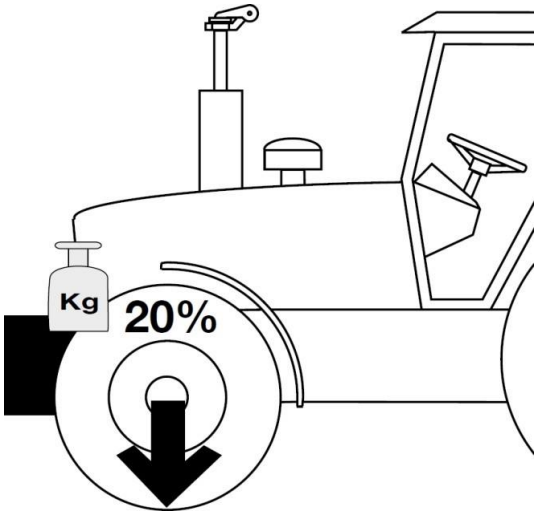


Figure 15 Minimum front-axle load of the tractor

WARNING

WARNING!
During transport of the machine on the public roads adapt the speed to the traffic conditions and do not exceed the speed of 40km/h.

During transport of the baler on public roads follow the traffic law regulations. In the event of an emergency stop of the tractor with attached baler, upon stopping on a public road the driver should:

- Stop the vehicle by avoiding causing any hazard to the safety on the road;
- Park the vehicle as close to the road edge as possible, parallel to the lane axis;
- Switch off the engine and remove the key from the ignition, engage the auxiliary brake of the tractor and place chocks under the wheels of the baler;
- Outside of a built-up area a warning, reflective triangle should be placed in the distance of 30 to 50 m behind the vehicle and the hazard light should be on;
- In a built-up area, switch on hazard lights and place a warning triangle behind the vehicle, if it is not installed in a bracket on the rear of the machine. Make sure that it is well visible for the other road users;
- In the case of a breakdown undertake relevant steps in order to secure the place of the breakdown.

1.8 Baler cleaning

WARNING

WARNING!
Before you clean the baler, ensure that the baler, PTO drive and tractor engine are all disabled (the ignition key removed). Disconnect the supply, lighting and control panel cords.

WARNING

WARNING!
Clean with caution, especially next to the moving parts and blades of the machine.

WARNING

WARNING!
To reduce the risk of fire, the baler should be regularly maintained and cleaned of unwound crop and binding material.

After each day of work, remove dust, accumulated harvest residue, etc. using a brush.

We do not recommend cleaning the baler with a high pressure water stream. Directing the stream of water at the hydraulic, electrical and bearing components is forbidden.

Prior to a long stop, dust the baler and remove the harvest residue by means of compressed air. Directing the stream of compressed air at the hydraulic and electrical components is forbidden.

After water cleaning and prior to a long stop, it is recommended to lubricate all the lubrication points and applying a suitable protective agent on all drive chains.

1.9 Baler storage

Store the baler control panel in a dry room protecting the terminals against dirt and humidity using the provided guard covers.

Wind the connection cable and store it in a dry room protecting the terminals against dirt and humidity.

Store the baler on a flat, level and paved surface.

It is recommended to store the machine in a dry area, protected against UV rays and other harmful factors.

Protect the baler stored outside with no roofing with a water proof tarpaulin or film.

After the season is over, clean the baler and check the condition of the protective layers. Repair damaged coating as required.

CAUTION

CAUTION!
Check the condition and legibility of the rating plate. In the case it is destroyed report it at the service.

Check the condition and legibility of the pictograms. In the case they are damaged replace them with new ones.

1.10 Risk

1.10.1 Residual risk description

The residual risk stems from improper procedures implemented by baler operators. The

following prohibited actions cause the highest level of risk:

- Coupling the balers with tractors that fail to meet the requirements given in the manual;
- Standing under the lifted machine chamber that is not secured against accidentally dropping;
- Standing on the baler during transport;
- Checking the technical condition and cleaning the machine when the tractor engine is running and the machine drive is on;
- Operation with the guards opened;
- Servicing or repairing the PTO shaft when the tractor engine is on;
- Using the twine removed from an earlier rolled bale;
- Using faulty hydraulic hoses;
- Control of the baler by an operator who is outside the tractor cab,
- Operation of the machine under the influence of alcohol or drugs;
- Operating a damaged machine or operation with the guards removed;
- Transport of a rolled bale in the baler chamber;
- Using the baler for other than its intended purpose,
- Leaving the unsecured machine on slopes,
- Entering the area between the tractor and the machine with the engine running.

When presenting the residual risk the Z562 baler is treated as a machine that until the moment of starting its manufacturing was designed according to the current state of the art.

1.10.2 Residual risk assessment

Compliance with the following instructions:

- Careful reading and meeting the recommendations of the instruction manual,
- Standing under raised machine units is forbidden,
- No persons allowed in the area of baler operation,
- Maintenance and repair of the machine at authorised servicing stations,
- Operation of the baler by trained and authorised operators,
- Protection of the baling press against the access of children and bystanders,

it is possible to eliminate residual risk associated with machine operation, and as a result, the machine may be operated without any risk to persons and the environment.

DANGER!
If the listed instructions and guidelines of the manufacturer are not followed, a risk of accident arises.

1.11 Dismantling and Disposal

Disassembly and disposal should be performed by specialised service centres that are familiar with the design and operation of the baler. Only specialised service centres have the full and up-to-date knowledge on the applied materials and risk associated with the hazards of improper storage and transport. The authorized services offer both counselling and performance of the complete services concerning disposal of the machine.

Proper tools and auxiliary equipment (hoist, wheel puller) must be used for dismantling.

Store the used oil in air-tight containers. Take it to a petrol station that collects used oil immediately.

Dismantle the machine. Sort the dismantled parts. Send them to relevant companies that collect such materials.

During dismantling of the baler, use proper protective clothes and protective boots.

1.12 Accessories

The user can purchase the following optional and additional equipment at the dealer or at the manufacturer

- Spare parts catalogue as a hard copy,
- A triangular plate indicating slowly moving vehicles.

2. Commissioning

The first start-up of a newly purchased baler should be performed by an employee of the dealer's or manufacturer's authorised service centre in the presence of an operator (user/buyer).

WARNING

WARNING!
Prior to first start-up of the baler, read this manual thoroughly paying close attention to the sections concerning the safety of the operator and bystanders.

In the event of any uncertainties regarding safety, contact the dealer/manufacturer.

Before each start of the baler, install the control panel in the tractor operating cab.

2.1 First Start-up of the baler

CAUTION

CAUTION!
Use special care during the first start-up.
Bystanders within the working area of the machine compromise safety.

During the start-up, an employee of the dealer's or manufacturer's licensed service, accompanied by the user (buyer), is to perform the following:

- Inspect accessories and functioning of the baler:
  - Check the machine for completeness and condition,
  - Check the lighting system and horn,
  - Check the hydraulic system
    - Raising and lowering the pick-up,
    - Raising and lowering the rear chamber,
  - Checking the pick-up functioning,
  - Checking the binding process function:
    - with twine,
    - with net,
  - Checking the function of central lubrication system,

- Training the user on the correct baler operation:
  - Discuss the design and principle of operation of the pick-up:
    - Setting the spring impact angle,
    - Enabling the overload coupling,
    - Installing the coupling after bolt breaks,
    - Replacing entire coupling,
    - Lubrication of roller runners,
  - Discuss the design and principle of operation of twine binding:
    - Discussing the principle of operation,
    - Twine installation,
    - Adjusting the twine binding density and tension,
    - Adjusting the degree of bale compaction,
    - Cleaning the twine feeder
  - Discuss the design and principle of operation of net binding:
    - Discussing the principle of operation,
    - Net installation.
    - Adjusting the bind counter,
    - Adjusting the spring tension for blade frame tensioning,
  - Discuss the design and principle of operation of the central lubrication system:
    - Discussing the principle of operation,
    - Adjusting pump consumption,
  - Discuss the design and the principle of operation of the control panel,
  - Discussing the principle of operation of the tractor and baler unit during baling:
    - Operation of the tractor during picking up windrows on a straight line,
    - Operation of the tractor during picking up windrows in curves and sharp turns,
    - Discussing risks,
  - Performing a full cycle of both the twine and net bale binding by the user (buyer) assisted by the service technician,
  - Discussing and adjusting the tension of the chains,
  - Discussing the method of lubrication and ongoing Baler maintenance;

First start-up is executed by the service centre free of charge.

The service technician's signature in the guarantee certificate shall be the proof of the first start-up described in this section. The customer's signature in the guarantee certificate shall prove the first start-up of the baler in the presence of by the user (buyer).

3. Use of the machine

3.1 Foreword

All the activities must be done by a single operator who has read this instruction manual thoroughly, and the safety of operation chapter in particular.

Before starting work, check

- If the machine is in good working condition,
- If all the guards are in place and closed,
- Oil level in gear units is sufficient,
- The parts for wear,
- The baler for presence of the body-coloured parking jack (section 1.7.1),
- The condition of hydraulic lines,

Hydraulic lines must be replaced every 6 years.

- Tyre pressure; recommended tyre pressure is 2.5 bar.

Unless the manual specifies otherwise, always perform adjustments and preparatory activities when:

- The engine is disabled and ignition key is removed,
- All machine components have stopped,
- The machine stands on stable ground,
- Before starting field work:

3.2 Attaching the baler to a tractor

Couple the baler with agricultural tractors with a power output of not lower than 35 kW and a drawbar pull class of 0.9, fitted with the output coupling of the power hydraulics and the 1 3/8'' Z6 rear PTO with a rated rotational speed of 540 rpm.

Connect the baler to the tractor lower transport hitch, which enables the transmission of a vertical load of 4.0 kN (for the Z587/1 baler, the load on the hitch is 4.6 kN).

3.2.1 Connecting with the lower tractor transport hitch

Make sure that in the area of baler coupling with the tractor and in the near vicinity there are no bystanders present, children in particular.

Prior to the coupling activity, align the tractor's centre line with the machine axis on even and level ground. Stop the tractor's engine, take the key from the ignition, and engage the tractor's parking brake.

First, unlock the protective chain running through the hitch eye and remove it. Then, set the correct height of the baler hitch by choosing a correct adjustment eye of the hitch, as shown in Fig. 16.

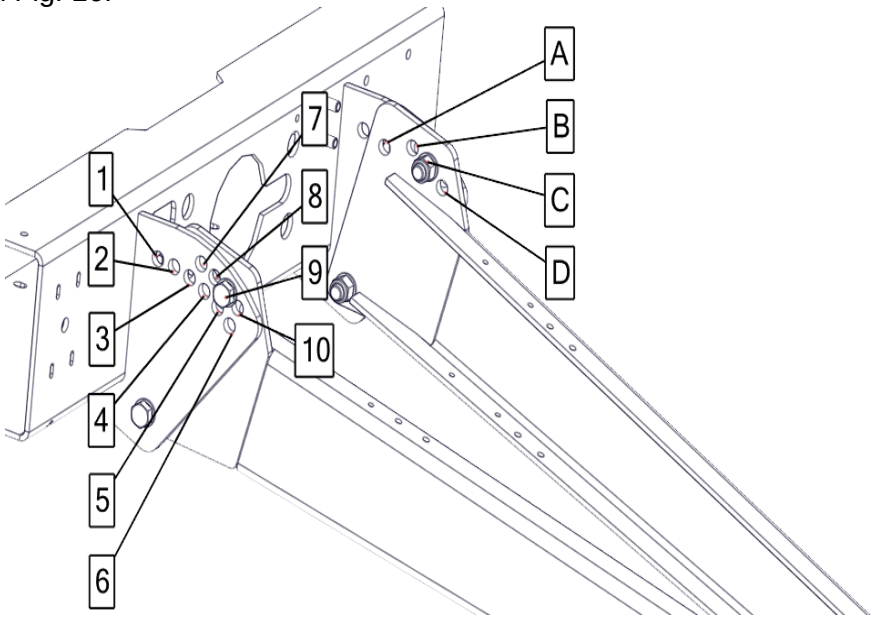


Figure 16 Setting the hitch height

The table below gives the height of the drawbar eye against the ground.

Table 3. Height of the drawbar eye against the ground

No. of the drawbar hole / No. of the beam hole	A	B	C	D
	Height of the drawbar eye from the ground [cm]			
1.	88	-	-	-
2	67	-	-	-
3	47	-	-	-
4	-	-	-	-
5	-	-	-	-
6	-	-	-	-
7	-	67	89	-
8	-	51	72	93
9	-	34	55	76
10	-	-	39	60

Couple the drawbar eye with the tractor transport hitch and check the connection for correctness, and the protections for accidental disconnection.

Check the tightness of the drawbar bolts every 400 bales according to Table 4.

Only tractors with a weight equal to at least the weight of the baler to be coupled are allowed.

Connect the power supply. Check if the working and signalling systems work properly.

Connect the hydraulic supply system. Check if the power hydraulic systems work correctly, especially opening and closing of the baler cover.

3.2.2 Coupling the baler with the rear PTOff shaft

Before you connect the PTO shaft, check the direction and rotational speed of the PTOff.

Stop the tractor's engine, take the key from the ignition, and engage the tractor's parking brake.

Using the PTO shafts with specifications other than those indicated by the manufacturer is forbidden.

The PTO shaft is a CE labelled drive transmission component.

Each shaft comes with an instruction manual. You must read the instruction manual for the PTO shaft, adhere to the safety rules and follow the guidelines contained in the manual.

Install the PTO shaft, delivered with the machine, between the tractor shaft and coupling box in the machine.

The method of connecting the shaft with the tractor is shown on the shaft.

Check if in curves (at shaft shortest span), the minimum distance shown in the figure below is not exceeded. **The minimum distance is 4 cm.**

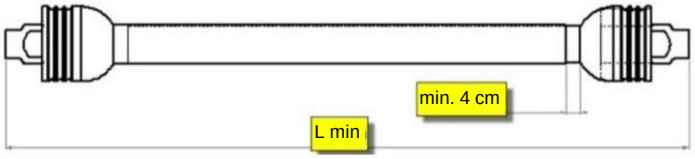


Figure 17 Length of the PTO

Ensure that the shaft length is correct. At the shaft's longest span, the shaft tubes must overlap by at least 1/3 of their length.

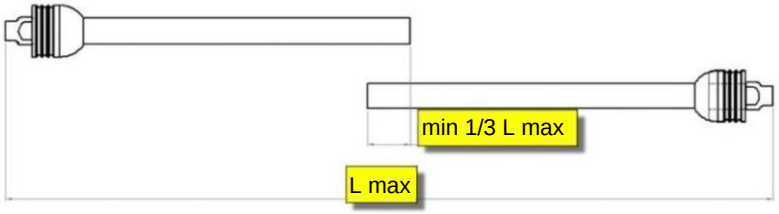


Figure 18 Length of the PTO guards

Make sure that the components protecting the PTO shaft from sliding off are located in their correct positions. Check if the tubes can rotate freely against the shaft and lubricate as required.

Install the chain securing the tubes.

Read the manual of the shaft to find detailed information on the use of the PTO shaft.

WARNING

WARNING!
It is strictly forbidden to operate the PTO shaft with its tube damaged or not in place, or without additional canopy guards on the tractor PTOff side and the machine PTOn side.

3.2.3 Hydraulic system installation

Connect hydraulic hoses:

- Connect the hose used to lift the pick-up with the cut-off valve to the unidirectional manifold;
- Connect the supply hoses for the chamber to the dual direction manifold.

Connect the hydraulic hoses in pairs to one control section. The pairs of hoses in one hydraulic section are marked with the same colour.

Before lifting the pick-up:

- set the lever of the cut-off valve in the “OPEN” position, and then, lift the pick-up (transport position);
- after you have lifted the lever set it in the “CLOSED” position to lock the system; The pick-up should remain in the upper position.

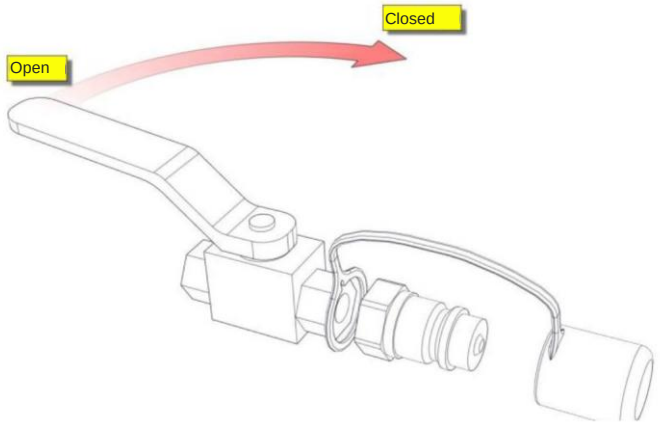


Figure 19 Shut-off valve

Do not move the machine with the lowered pick-up, with the wheels on the ground.

3.2.4 Lighting connection

Connect the lighting system and check if all control lamps and lights work correctly.

Always use proper fuses, do not replace the cords, plugs or sockets with ones that do not match the original ones.

Put the caps for protecting the electrical pins during operation in the tractor cab. After completing the work, re-install the caps on the pins.

3.2.5 Connecting the control system

The baler electrical system requires power supply of 12 V. Procedure of connecting the control system (Fig. 20):

- Install the control panel “SS” in the tractor cab in such a way that it is visible and accessible for the operator,
- Connect the power supply cord “PZ”,
- Connect the data transmission cable “PS”,
- Check if the control panel “SS” is enabled.

If the cords are connected correctly, the control panel lights up and starts loading data.

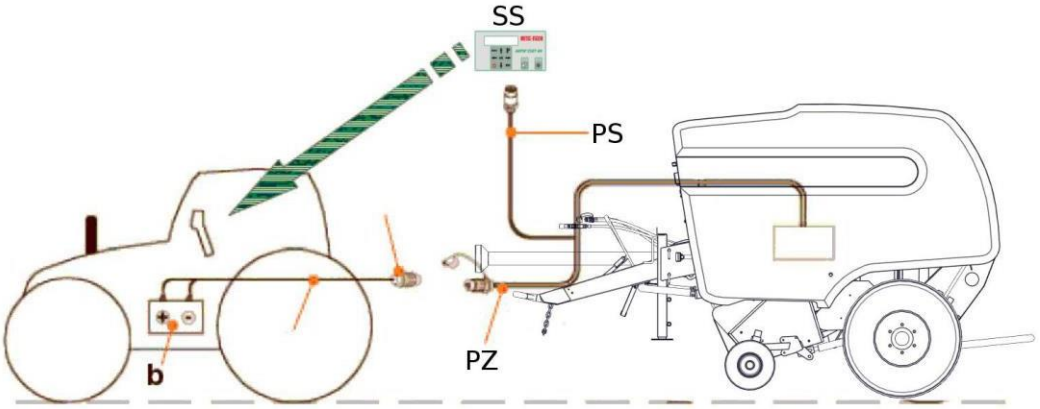


Figure 20 Connection of the control system

3.2.6 Drive disconnection

Make sure that no bystanders, especially children, are present in the baler storage area and immediate vicinity. Procedure:

- Position the baler on its storage place on even and level ground. Stop the tractor engine, take out the key from the ignition and engage the tractor auxiliary brake;
- Disconnect the electrical supply system;
- Disengage the power hydraulics;
- Place wheel chocks (section 3.2.7);
- Lower the support foot. Disconnect the drawbar eye from the tractor hitch. Make sure that there is no hazard of accidental machine displacement. Draw the protecting chain through the hitch eye and lock it;
- Disable and dismantle the PTO shaft. Put the dismantled shaft on the support designed to store it. Protect the terminations of PTO with covers;
- Install the hydraulic and electric connection caps.

3.2.7 Chock placement

When the machine is to be uncoupled from the tractor, secure the running wheels with the chocks (1), which are located in the brackets (2) on the left and right sides of the machine (Figure 21).

The chocks must be removed before starting to drive the baler connected to the tractor.

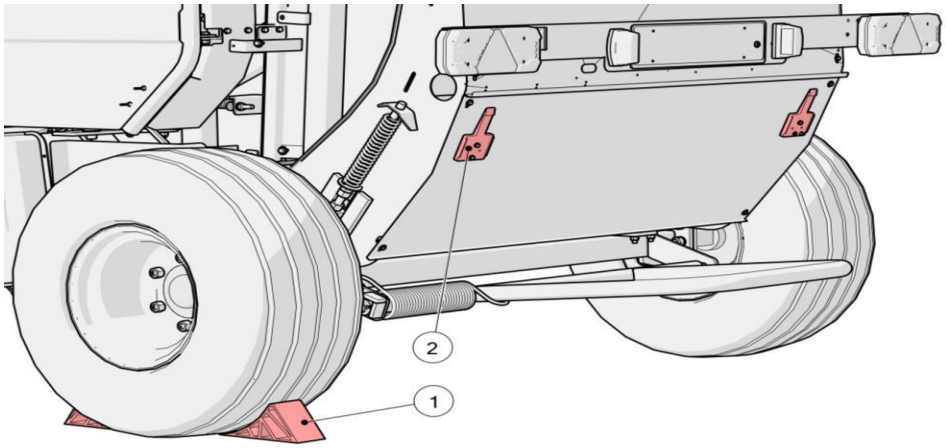


Figure 21 Securing the running wheel with chocks

3.3 Operational check

After attaching the baler to a tractor:

- Start the tractor without starting the PTO shaft and check if all movement features of the baler work correctly;
- Check that the hydraulic system is working; Check that the rear cover opens and closes; Raise and lower the pick-up;
- Check if the electrical connection of the control unit work correctly;
- Check the electrical system, indicating lamps and lighting;
- Close the rear cover and start the PTO shaft;
- Prior to starting the PTO shaft, make sure that there are no people near the machine. Use great care by checking if all mechanical and drive components work correctly;
- Open the rear baler chamber and check if the chain conveyor has stopped;
- Close the rear chamber and check if the chain conveyor has re-started in the chamber.

3.4 Preparing the machine for operation

Before you start work, perform all necessary machine adjustments to prepare it for the requirements of the tasks to be done.

The baler can work with two types of bale binding devices:

• binding with single or double twine;

• binding with net.

Both the twine and net binding devices may be installed in the baler simultaneously.

3.4.1 Mounting and operation of the twine binding unit

To prevent any problems during the binding process, it is recommended to use synthetic twine of 500-700 m/kg or natural twine of 200-400 m/kg.

DANGER!
Load the bale binding twine when the tractor engine is switched off and protected against accidental starting up (key removed from the ignition and the parking brake engaged).

DANGER!
It is forbidden to manually feed the twine to start the tying process when the bale is rotating.

DANGER

DANGER!
Particular caution should be exercised during twine installation. Note particularly the binding unit blade.

WARNING

WARNING!
Install the twine for the first time with the assistance of the employee of the authorised or manufacturer's service centre.

Before starting work in the area of binding units, set the protective bar in the “stop” position to prevent accidents (Fig. 20).

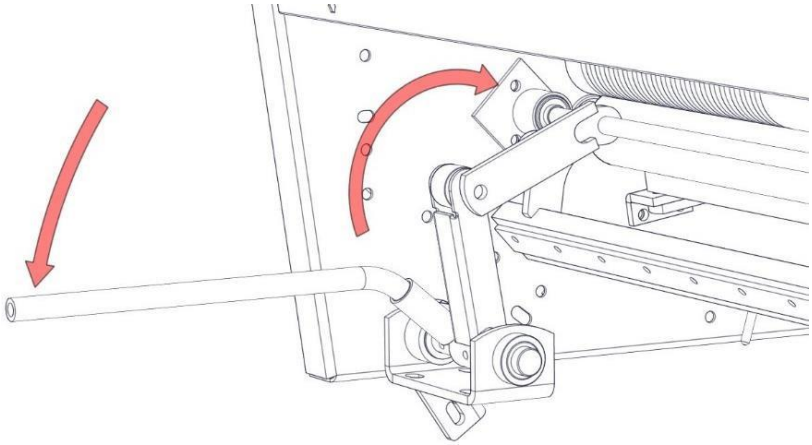


Figure 22 Mesh blade protection

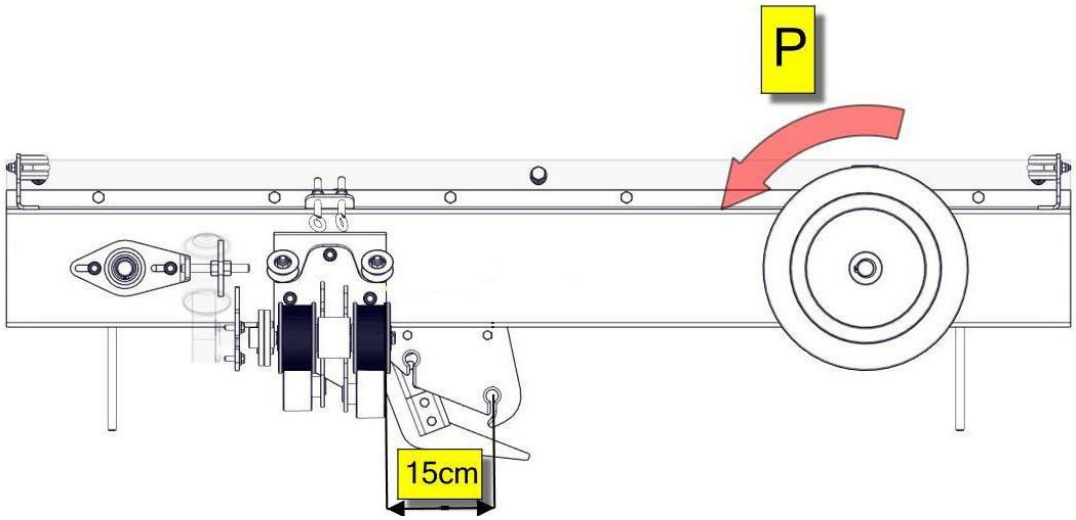


Figure 23 Twine guide element

The procedure of twine installation:

- Lift the cover and place the twine reels in the chamber;

- Make sure that the home position of the twine guiding component is exactly the same as shown in Fig. 23. Otherwise, rotate the belt wheel P manually counter-clockwise until you reach the required position.
- Connect reels A and B as well as C and D by tying the ends of A and B reels with each other, and the ends of C and D reels likewise. Ensure that the knot is tight enough and its size will not obstruct smooth twine motion.
- Draw the twines through the twine brakes, which are located on the left- and right-hand side, under the reel storage boxes.
- Then, wind twine S1 around the belt wheel P.
- Guide it between the knurled rollers of the drive. Approx. 15-20 cm of the twine should hang from the last fairlead.
- Then, guide S2 between the rollers of the drive. Approx. 15-20 cm of the twine should hang from the last fairlead.

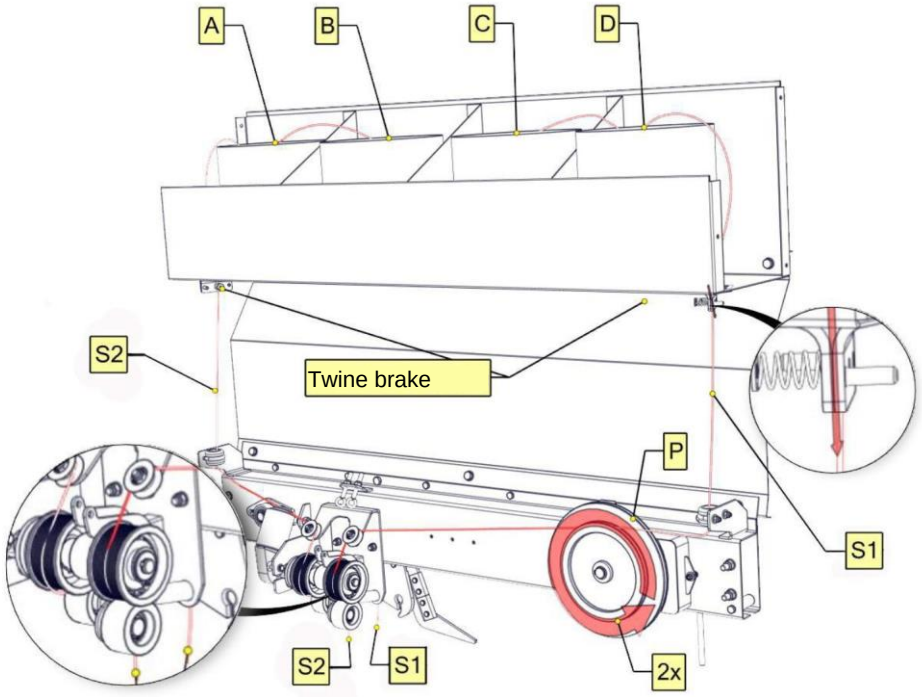


Figure 24 Feeding the twine

3.4.2 Mounting and operation of the net binding unit

The manufacturer recommends using net reels with a length of 2000 m to 3000 m and weight of 14-16 g/m^2.

DANGER

DANGER!
Load the binding net when the tractor engine is switched off and protected against accidental starting up (key removed from the ignition and the parking brake engaged).

DANGER

DANGER!
It is forbidden to manually feed the net to start the strapping process when the bale is rotating.

DANGER

DANGER!
Particular caution should be exercised during net installation. Note the binding unit blade in particular.

WARNING

WARNING!
Install the net for the first time with the assistance of the employee of the authorised or manufacturer's service centre.

Before starting work in the area of binding units, set the protective bar in the (stop) position to prevent any hand cut accident. (Figure 22).

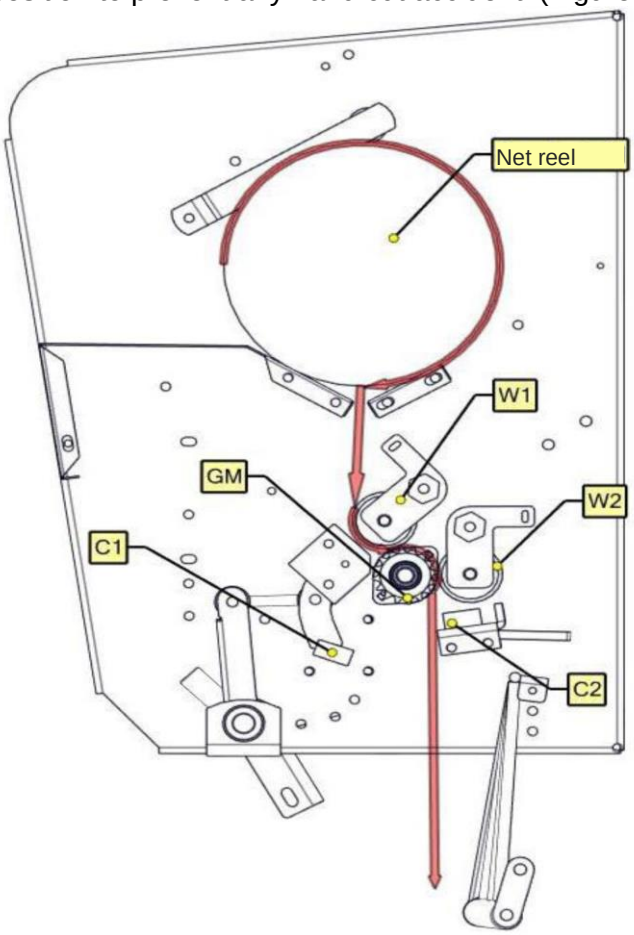


Figure 25 Installing the net

The net installation procedure:

- Lift the cover and place the net reel in the chamber;
- Turn the end of the net into a splice and guide it between the rubber roller GM and smooth rollers W1, W2.
- Then, guide the net between blade C1 and counter-knife C2, spreading the whole width of it. Leave approx. 20 cm of the net to hang beyond the counter-knife C2.

Start the binding process when there is still an amount of collected material on the pick-up.

3.5 Control panel operation

The control panel is fixed in the tractor cab by means of magnetic components. It enables access to various features of the baler, described below.

The control panel has features suitable for the version of the machine and a market where it was purchased. The control panel of the baler comes with the options of twine and net binding. The signalling fields of the counter give information about the opening of the chamber and the twine binding unit work.

CAUTION

CAUTION!
Pressing the touch screen keys with your nails or sharp and hard objects is forbidden. Risk of permanent damage of the keyboard.

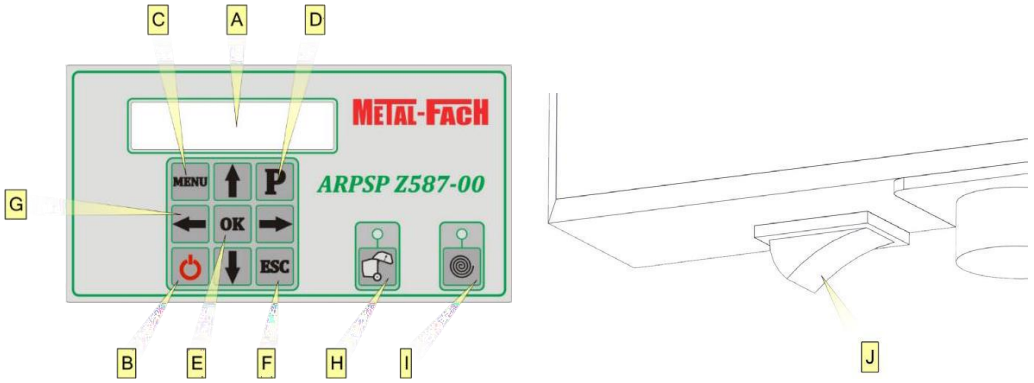


Figure 26 Control panel – description of buttons

Description of control panel keys (Fig. 26)
A – LCD: it indicates the status of baler operation, and it enables the communication during configuration;

B – a key for switching the control panel on;

C – “MENU” key for selecting available options:

- Binding material;
- Working mode;
- Compaction degree;
- Twine feeding time (adjust the value to your individual needs);
- Net feeding time (adjust the value to your individual needs);
- Zeroing the workday counter;

D – “P” key: field selection;

E – “OK” key: confirmation;

F – “ESC” key: exiting the menu;

G – menu navigation keys;

H – Chamber opening indicator lamp;

I – a key for feeding the binding material in the manual mode;

J – the main switch for switching the control panel supply on.

3.5.1 Switching on the panel

Procedure:

- Connect the plug of the baler to the tractor socket 12 V;
- Connect the panel to the control module;
- Push the panel main switch “J” from the position 0 to I. The switch is on the bottom wall of the panel;
- If the chamber opening LED flashes, it means that the panel power is supplied correctly;
- Use key “B” to activate (switching the control panel on).

3.5.2 Switching off the panel

Procedure:

- Press key “B” on the panel;
- Push the switch “J” from the position I to 0 to switch off the panel supply.

3.5.3 Main screen description

Main screen description is shown in the figure below.

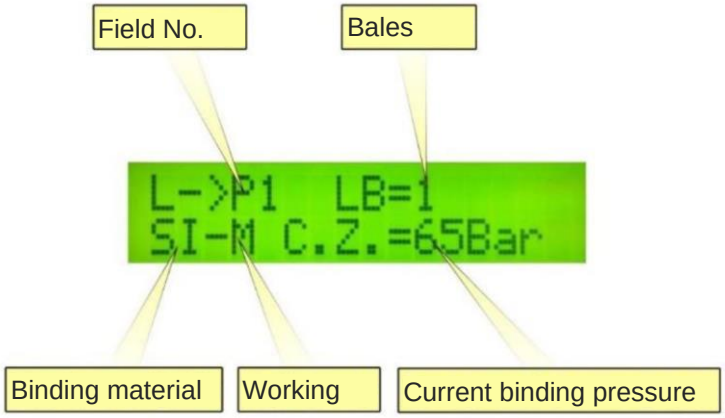


Figure 27 Main screen of the control panel

3.5.4 Baler manual control

In the manual mode, after completing bale formation, that is, after a sufficient pressure has been obtained (value displayed on the panel), the manual operation of bale binding may be started (key “I” on the panel). Using the manual bale binding key enables the feeding of material for 5 seconds. This time may be modified for twine and net.
When binding, the displays shows the message about binding with a selected material and the indicator light above “I” key flashes. After binding is completed, the display shows the message: “Bale ready”.

CAUTION

CAUTION!
Maximum pressure of the compaction is 170 bar. Exceeding this figure may cause damage to the machine.

3.5.5 Baler automatic control

Before you start the operation in the automatic mode, determine the bale compaction pressure. After completing bale formation, that is after a pre-set pressure is obtained, the process of feeding the material starts, which is signalled acoustically, with a message “Twine/Net feeding started”, and flashing indicator lamp over the binding material feeding key. Then, the process of binding starts, which is indicated with a message “Binding running”. The end of this process is signalled with a message “Bale ready”. In the automatic mode, you can also feed twine or net manually.

After a message “Twine/Net feeding started” is displayed, drive for 1-1.5 m more and stop.

3.6 Hydraulic system

WARNING

WARNING!
Ensure full working order of the hydraulic system. The oil that works under high pressure heats up to the temperature that pose a threat for health.
There is a risk of injury if a hydraulic line breaks.

CAUTION

CAUTION!
Ensure the oil purity in the tractor power hydraulic system. The purity of oil must be compliant with condition 20/18/15 of ISO 4406-1996.

CAUTION

CAUTION!
Worn or defective hoses of the power hydraulics must be replaced with new ones.

CAUTION

CAUTION!
For replacements it is recommended to use original spare parts that will assure maintaining the baler in full efficiency for a long time.

The baling press hydraulic system is supplied from the hydraulic system of the tractor. Connect the opening/closing unit of the rear cover to the tractor power hydraulic system by means of a connection line supplying the chamber opening cylinders, as shown in Fig. 28. On the line, there is a valve that maintains suitable pressure during bale formation.

Connect the lifting/lowering unit of the pick-up to the tractor power hydraulic system by means of a connection line supplying the chamber lifting cylinders, as shown in Fig. 29.

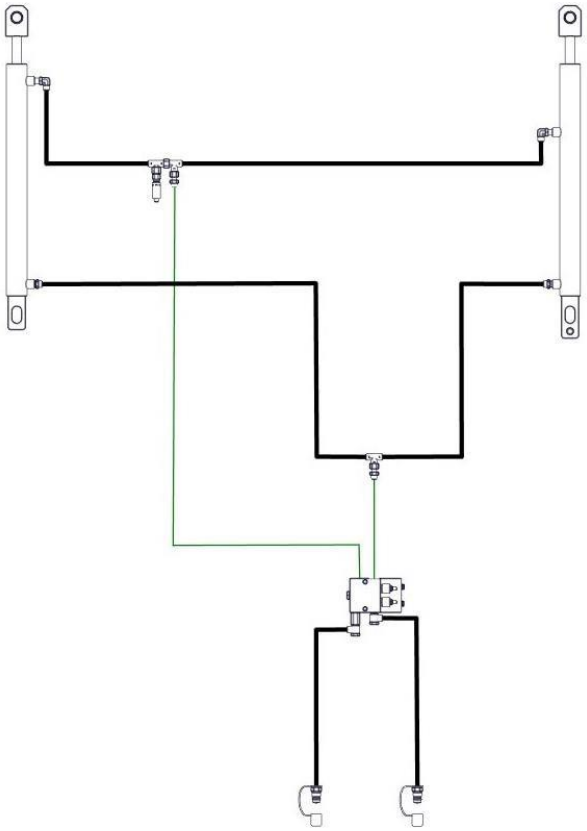


Figure 28 Hydraulic system diagram – rear compartment

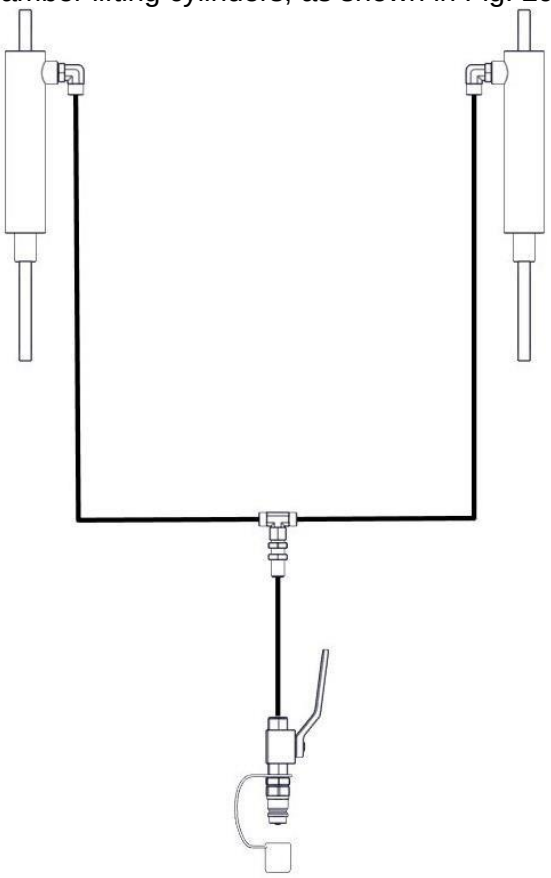


Figure 29 Hydraulic system diagram – pick-up

3.7 Electrical system

The baling press electrical system is supplied from the electrical system of the tractor. Connect the baler to the tractor electrical system circuit by means of the 7-pin connection cord, as shown in Figure 30.

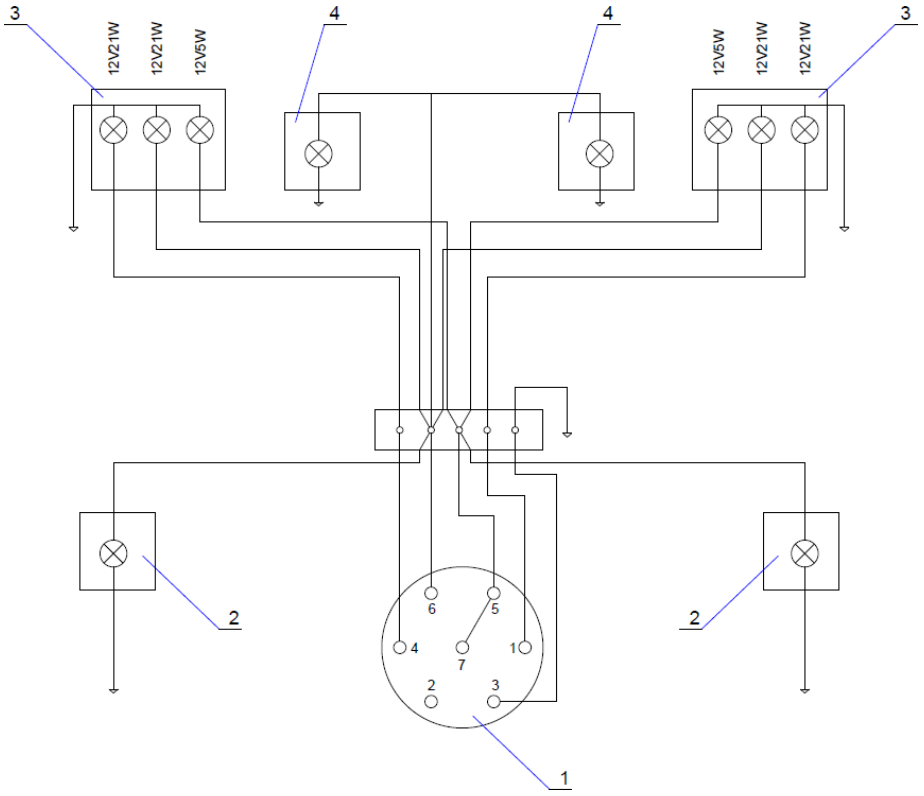


Figure 30 Electrical wiring diagram (1 – connection plug, 2 – head light, 3 – tail light, 4 – licence plate light)

3.8 Windrow collection

3.8.1 Principles of operation

The baler collects the material from the fields by means of a hydraulically lifted pick-up. The picked up material is pressed and rolled into cylindrical rolls, and then it is bound with twine or net, and finally tossed out of the rolling chamber, as shown in Fig. 31.

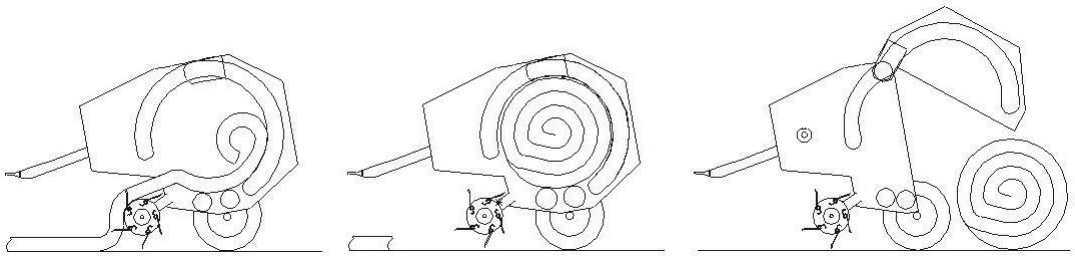


Figure 31 Bale formation

3.8.2 Operation description

The picked up material is fed to the rolling chamber, where the rolling chain moves to compact and roll it into a pressed roll. The pressing action is indicated by the acoustic signal on the control panel.

After the binding material is fed and the tractor stopped (the tractor stop instruction is displayed on the control panel), the acoustic signal stops.

The end of the twine or net is fed together with the collected material to the binding press chamber. Then, after the whole bale binding cycle is completed, the binding material is cut off, which is indicated in the control panel by a message “Bale ready”.

After that, open the press chamber to enable the bale to roll out along the discharge deck to the ground and away from the working baler.

The recommended driving speed for the tractor is up to 10 km/h.

Prior to harvesting, the material must be properly prepared by raking. Subsequently, form the windrows into shafts not wider than 1.1 m in width. Collect the shaped windrow shafts as shown in the following diagram. Adjust the length of straight sections to particular conditions. To avoid clogging of the baler, the width
and height of the windrows should be equal throughout their lengths. Slow down at wider windrow sections.

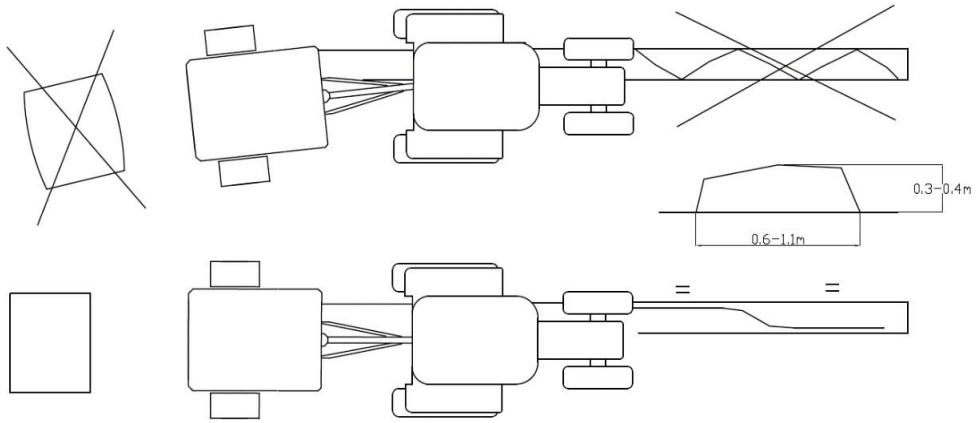


Figure 32 Picking up windrows

Mow grass and other papilionaceae intended for silaging and wrapping in the first phase of earing (preferably in the afternoon). Next day, after a few hours of drying, gather the mowed material with the use of balers. Keep the maximum bale compaction degree.

3.9 Manual removal of the accumulated material

During the material pick-up, it is possible that it will accumulate on the pick-up. Clogging is the result of improper adjusting of the speed to the harvest condition and improperly formed windrow.

DANGER!
Removing the accumulated material during the machine operation is forbidden.

DANGER

DANGER!
Take particular care when removing accumulated material, as the pick-up, topper and rear chamber areas are particularly dangerous.

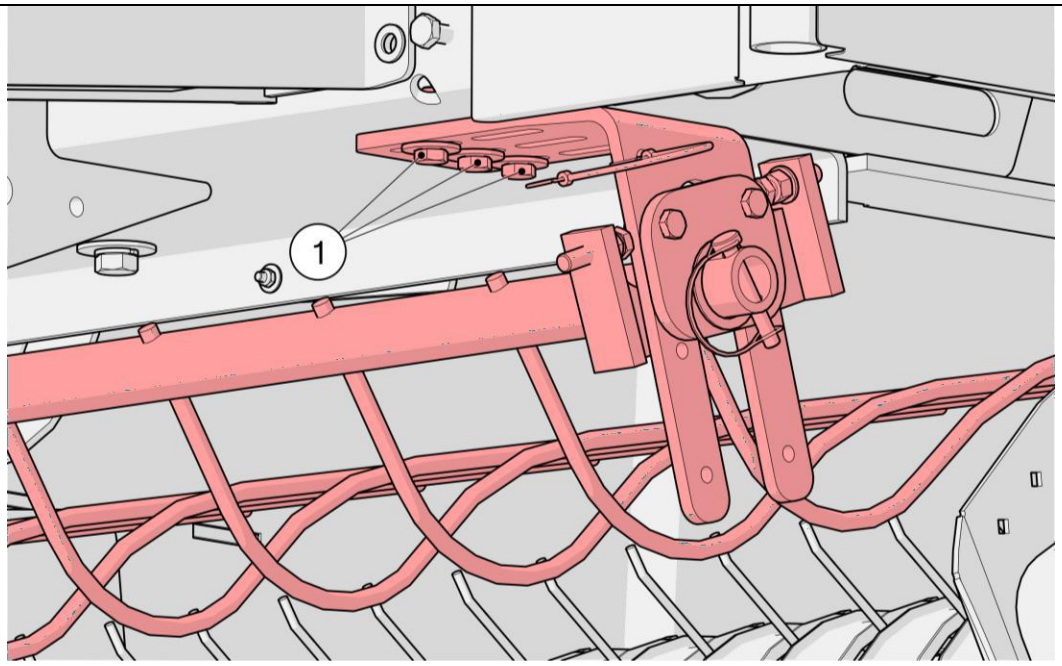


Figure 33 Removing the windrow clamp

Do the following activities to remove the accumulated material:

- Switch off the PTO shaft
- Switch off the tractor's engine and remove the key from the ignition switch
- Disconnect the electrical system
- Wait until all moving parts of the machine have come to a complete standstill
- Disconnect the drive shaft
- Remove the clamp of the cut material, located over the pick-up, to remove the material in the front section. To do this, unscrew the screws (1) on the left and right sides of the machine as shown in Figure 33, in turn removing the clamp from the baler. The figure shows dismantling of the narrow windrow clamp. Dismantle the wide clamp in similar way.
- Manually remove the accumulated material;
- Reinstall the windrow clamp.
- Lift the rear chamber;
- Lock the cylinders by means of protection locks (Fig. 34 and 35);
- Remove the material from the inside of the press chamber;
- Remove the locks for securing the cylinders;
- Close the rear compartment;
- Connect the power supply;
- Connect the PTO shaft;
- Switch the tractor's engine on;
- Start the baler.

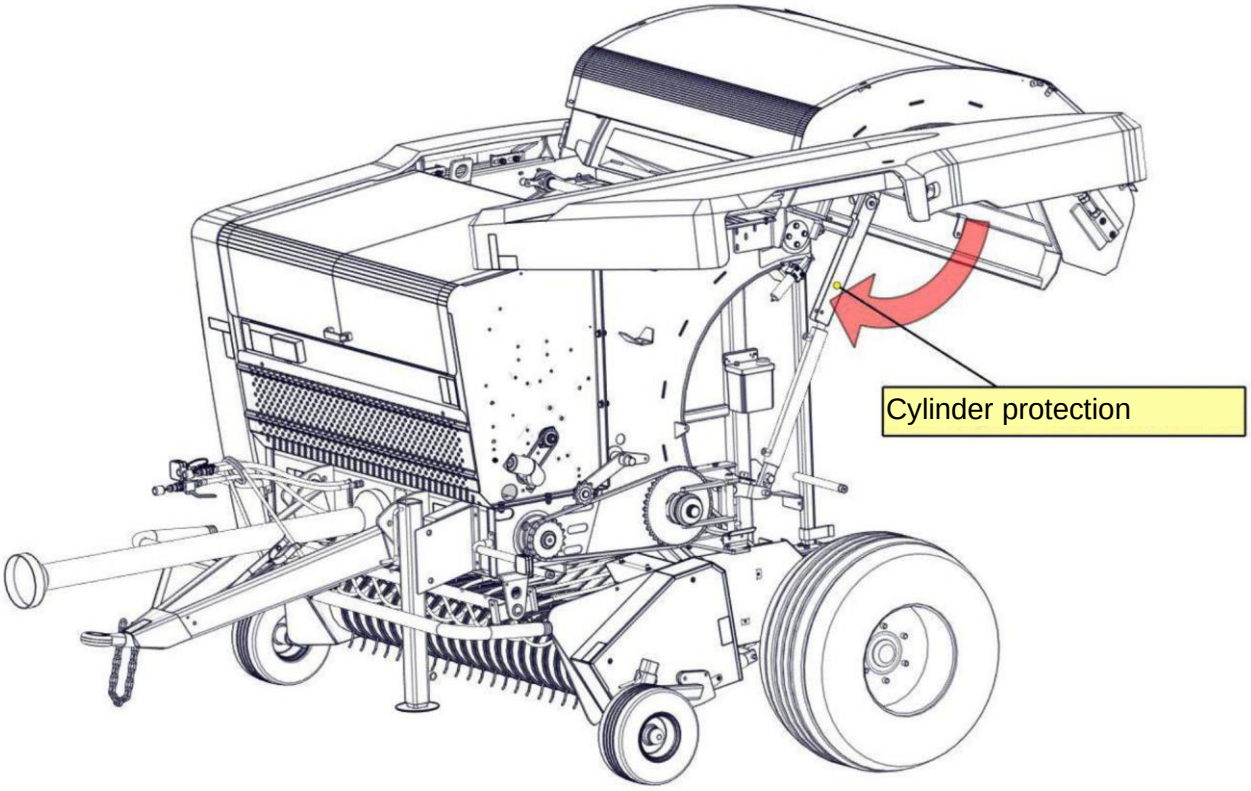


Figure 34 Actuator protection

3.10 End of operation

After you finish work always:

- Disable the counter and protect it from moisture;
- Store the baler on a flat, level and paved surface;
- Disconnect the hydraulic system and electric circuit supplies;
- Prop the baler with the use of the support foot;
- Disconnect the machine drawbar from the transport hitch of the tractor;
- Disable the PTO shaft and leave it on the support. Install the caps on the PTO terminations;
- Disconnecting the baler from the tractor with the bale in the rolling chamber is forbidden;
- The machine must be cleaned and thoroughly inspected, paying attention to the quality of protective paint coating. If necessary, re-coat the machine with the paint repair kit offered by the manufacturer;
- Protect the rubber components, such as hydraulic hoses and baler tyres from the exposure to sunlight;

During long stoppage periods, the manufacturer recommends storing the baler in a dry room or under roofing, which protects the baler from the effect of weather conditions.

4. Maintenance and adjusting

Before you commence any maintenance work, follow the safety rules set forth in Chapter 1.6 “General safety principles”.

DANGER!
All activities related to maintenance and adjusting must be executed during machine stoppage and when all the moving parts of the machine have stopped.

If the baler is connected to the tractor, apply the manual brake, disable the engine and remove the ignition key. Remember to switch off the control panel too.

During maintenance work, when the chamber is open, use locks to secure the cylinders.

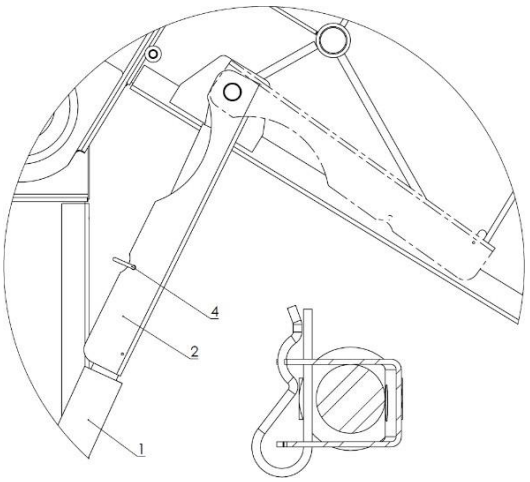


Figure 35 Actuator safety interlocks

Secure the lifted baler cover in its upper position, as shown in Fig. 33. On both sides of the baler, use clamps (2) fixed to the upper pins of the hydraulic cylinders (1) to secure them. Move the clamps (2) fully upwards so that they embrace the stretched cylinder rods. Lock them with locking pins (4) against unauthorised cover closing. Unlock the clamps of the cover after completing the planned activities.

CAUTION!
Use original spare parts only.

Original spare parts by Metal Fach are made to match the specific needs of the devices produced by Metal Fach.

Parts from other manufacturers are not inspected or approved by Metal Fach. To avoid risk, use the original spare parts by Metal Fach only.

Table 4. Tightening-torque values for metric bolts

Bolt-tightening torques - metric bolts in Nm							
Property ∅ mm	**Pitch** mm	**Bolt version – strength class**					**Nuts of wheels bolts of wheels**
		4.8	**5.8**	**8.8**	**10.9**	**12.9**	
3	0.50	0.9	1.1	1.8	2.6	3.0	
4	0.70	1.6	2.0	3.1	4.5	5.3	
5	0.80	3.2	4.0	6.1	8.9	10.4	
6	1.00	5.5	6.8	10.4	15.3	17.9	
7	1.00	9.3	11.5	17.2	25	30	
8	1.25	13.6	16.8	25	37	44	
8	1.00	14.5	18	27	40	47	
10	1.50	26.6	33	50	73	86	45
10	1.25	28	35	53	78	91	
12	1.75	46	56	86	127	148	
12	1.50						80
12	1.25	50	62	95	139	163	
14	2.00	73	90	137	201	235	
14	1.50	79	96	150	220	257	140
16	2.00	113	141	214	314	369	
16	1.50	121	150	229	336	393	220
18	2.50	157	194	306	435	509	
18	1.50	178	220	345	491	575	300
20	2.50	222	275	432	615	719	
20	1.50	248	307	482	687	804	400
22	2.50	305	376	502	843	987	
22	2.00						450
22	1.50	337	416	654	932	1090	500
24	3.00	383	474	744	1080	1240	
24	2.00	420	519	814	1160	1360	
24	1.50						550
27	3.00	568	703	100	1570	1840	
27	2.00	615	760	1200	1700	1990	
30	3.50	772	995	1500	2130	2500	
30	2.00	850	1060	1670	2370	2380	

4.1 Pick-up wheels adjustment

The working position of the pick-up can be adjusted. The procedure:

- Set the proper height of the pick-up operation by changing the support wheel setting,
- Use a cotter pin to lock the setting.

The manufacturer recommends setting the tines of the pick-up at the height of 2-3 cm above the surface.

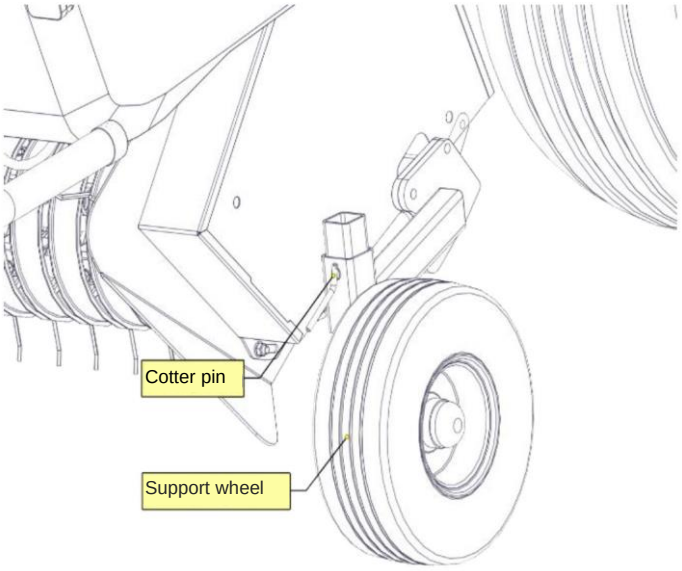


Figure 36 Height adjustment of the pick-up

4.2 Windrow clamp adjustment

The height of roller clamp position should suit the thickness of the windrow. When the windrow size is large, raise the windrow roller clamp, and for small windrow sizes, lower it.

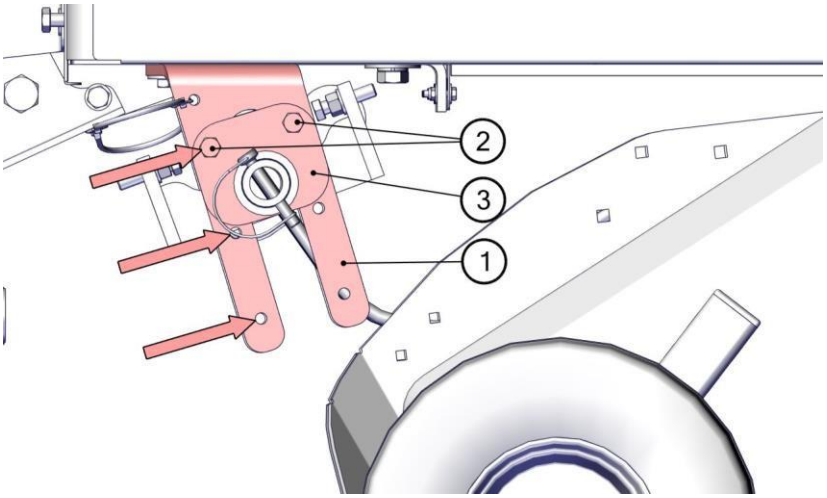


Figure 37 Windrow clamp adjustment

The procedure of adjusting the windrow clamp height:

- Disable the PTO and tractor engine, remove the ignition key;
- Loosen the screws (2);
- Lower or raise the pressure clamp;
- Screw the clamp plate (3) with the screws (2) into the selected hole in the plate (1);
- Perform operations symmetrically on the left and right sides of the machine.

Subsequently, as shown in Figure 38, adjust the position of the clamp rake (3). Use the screws (1) and nuts (2) to adjust the position of the pressure rake so that the distance A is 70-100 mm.

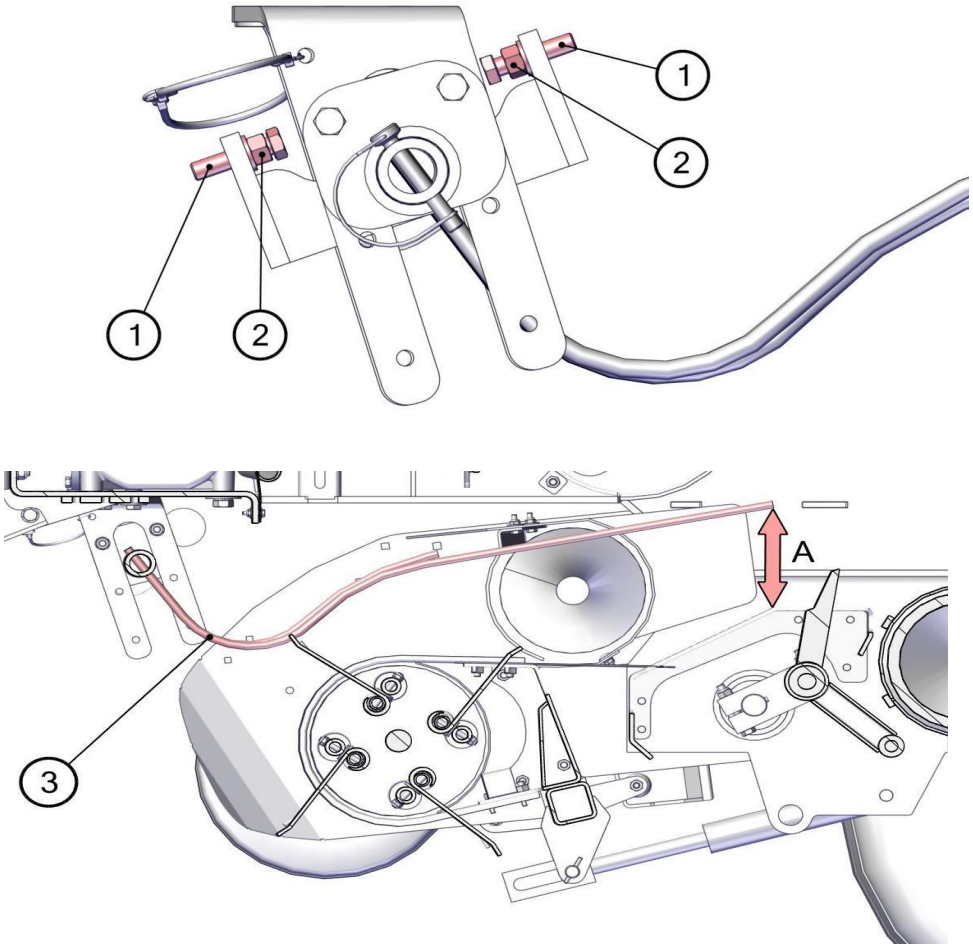
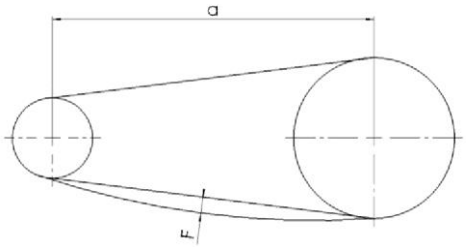


Figure 38 Adjusting the position of the windrow clamp rake

4.3 Adjusting the drive chain tensioning (every 10 hrs of work)

Check the chain tension at regular intervals. The tension value of the chain “F” must be within 3-5 mm.

It can also be determined using the following formula:



F=0.1a

Figure 39 Chain tension

4.3.1 Adjusting the automatic tensioners

The machine chains are tensioned automatically by spring tensioners. Check the chain tension at regular intervals and adjust as required.

The procedure of checking and adjusting the chain tension:

- Open the left-hand side guard;
- Adjust the chain tension using the nut (Fig. 40):
- Close the left-hand side guard.

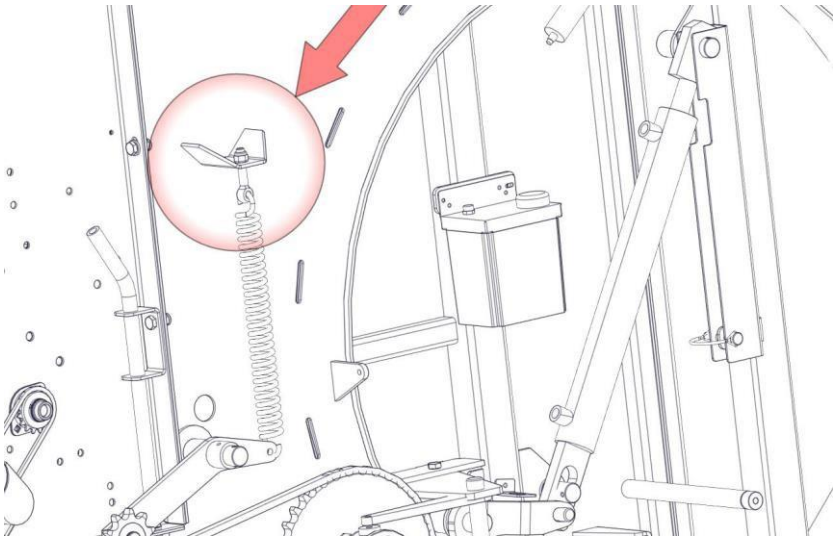


Figure 40 Adjustment of automatic tensioners

4.3.2 Adjusting the manual tensioners

Most of the pin chains in the machine require the manual adjustment of tension. Check the tension at regular intervals and adjust as required.

Adjusting the tension of the pick-up chain

The steps of adjusting the chain tension on the left-hand side (Fig. 41) are as follows:

- Loosen the bolts and remove the side guard from the left side of the pick-up;
- Loosen the bolt 1 and adjust the chain tension by gently hitting the tensioner with a hammer to move it downwards;
- After you obtain a proper chain tension, re-tighten the bolt 1;
- Then, loosen the bolt 2 and turn the eccentric tensioner to adjust the tension of the other chain;
- After you obtain a proper chain tension, re-tighten the bolt;
- Replace the guard and secure it with the screws.

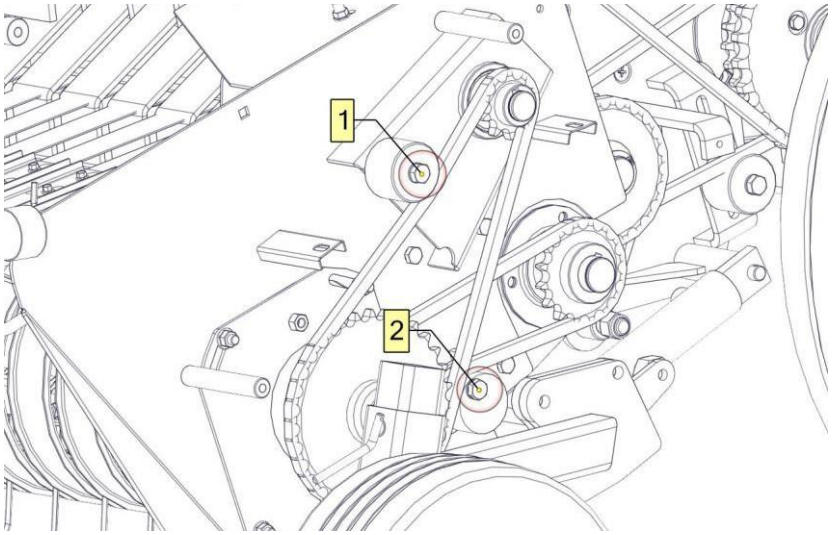


Figure 41 Adjusting the pick-up chain tension (left-hand side)

To tension the right-hand side pick-up chain, follow the steps for the left-hand side one in a similar manner.

Adjusting the chain tension on the left-hand side of the baler

The steps for adjusting the chain tension on the left-hand side of the baler (Fig. 42):

- Remove the lower guard on the left-hand side of the baler;
- Loosen the bolt 1, 2 or 3, depending on a chain to tension;
- Adjust the chain tension by gently hitting the tensioner with a hammer to move it downwards;
- After you obtain a proper chain tension, re-tighten the bolt;
- Replace the guard and secure it with the screws.

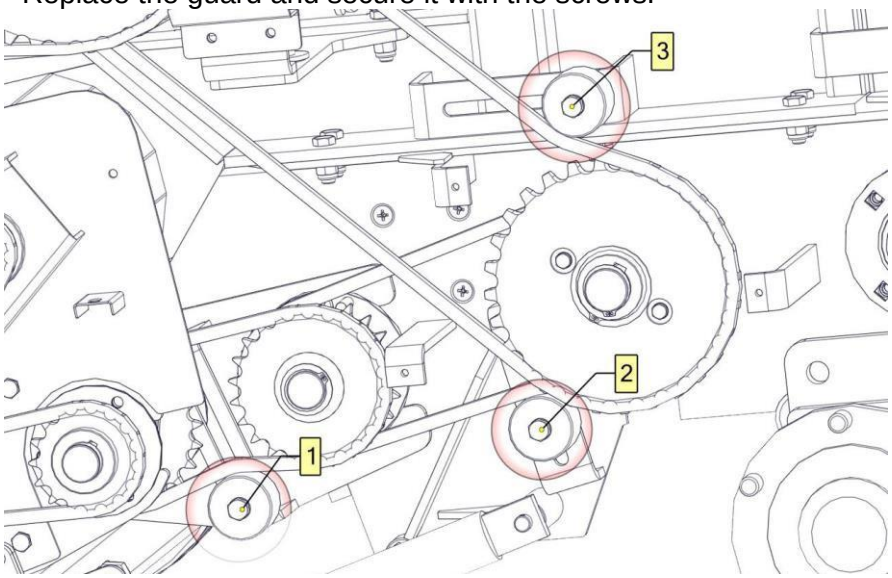


Figure 42 Adjusting the chain tension on the left-hand side of the baler

Adjusting the chain tension on the right-hand side of the baler

The steps for adjusting the chain tension on the right-hand side of the baler (Fig. 43):

- Remove the lower guard on the right-hand side of the baler;
- Loosen the bolt 1;

- Adjust the chain tension by gently hitting the tensioner with a hammer to move it downwards;
- After you obtain a proper chain tension, re-tighten the bolt;
- Replace the guard and secure it with the screws.

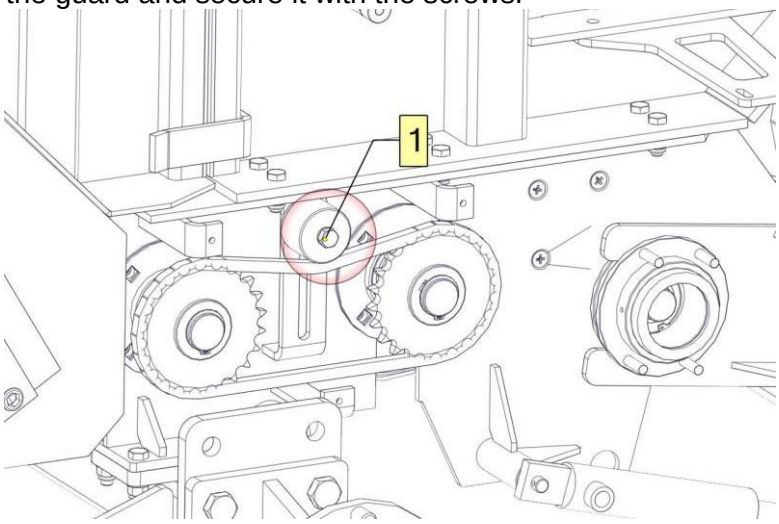


Figure 43 Adjusting the chain tension on the right-hand side of the baler

Adjusting the tension of the chain and rod conveyor set of the Z587 baler

CAUTION

CAUTION!
Adjust the springs that tension the chain of the main conveyor on both sides of the baler.
The degree of spring tension must be equal on both left- and right-hand sides.

The procedure of adjusting the tension of the chain and rod conveyor set:

- Open the left- or right-hand side guard;
- Loosen the locking nut for the nut (1);
- Use the nut (1) to adjust the chain tension. Length “A” (between a lower washer and a bracket) should be 225 mm (Fig. 44);
- After you obtain a proper tension, re-tighten the nut 1.

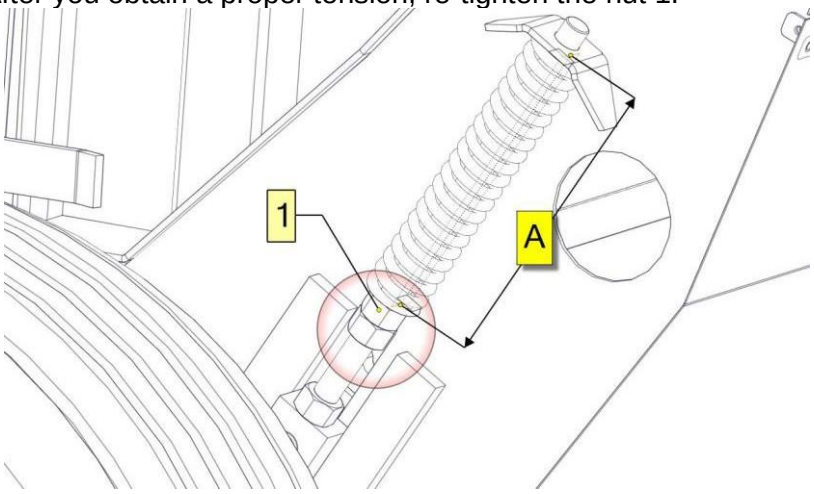


Figure 44 Adjusting the tension of the chain and rod conveyor set of the Z587 baler

Adjusting the tension of the chain and rod conveyor set of the Z587/1 baler

CAUTION

CAUTION!
Adjust the springs that tension the chain of the main conveyor on both sides of the baler.
The degree of spring tension must be equal on both left- and right-hand sides.

Adjust the tension of the chain and rod conveyor set by loosening the locking nut 3 and then tightening or loosening the nut 2. After you obtain a required tension, re-tighten the locking nut (3).

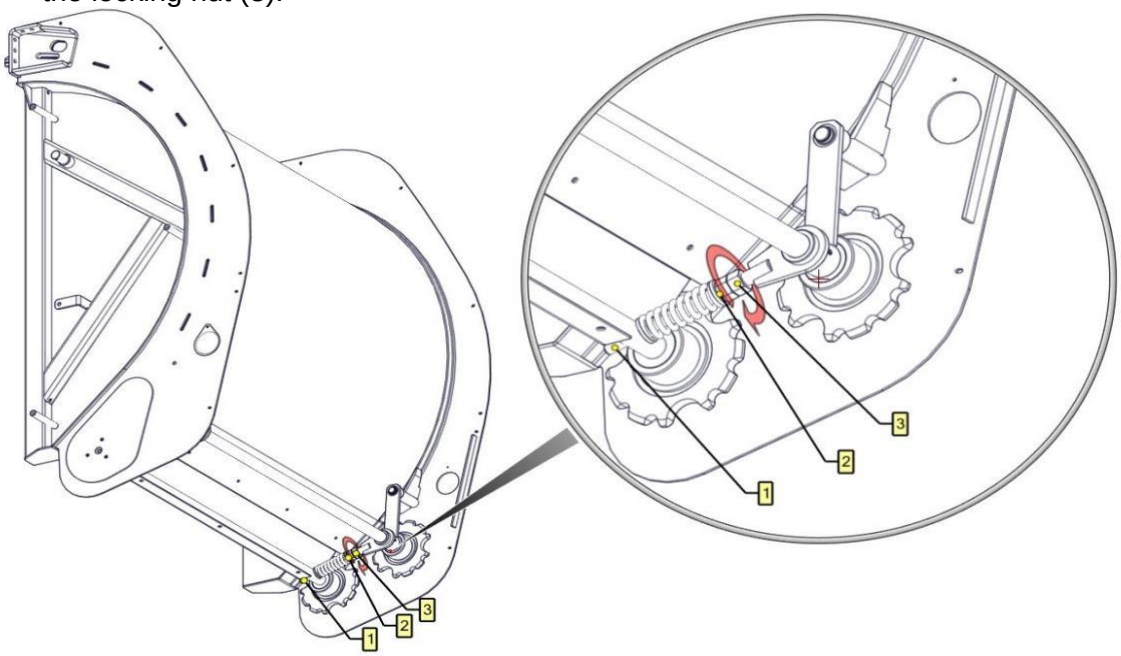


Figure 45 Adjusting the tension of the chain and rod conveyor set of the Z587/1 baler

4.4 Adjusting the jaw coupling for disconnecting the chain and rod conveyor drive

Check on a routine basis and adjust, if required, the setting of the jaw coupling to provide play of 5 mm between the faces of tines (when the coupling is off) (Fig. 46).

To perform the adjustment, turn bolt 1 located near the lever activating the jaw coupling on the right-hand side of the baler.

Perform the adjustment at the pressure in the hydraulic system of at least 40 bar.

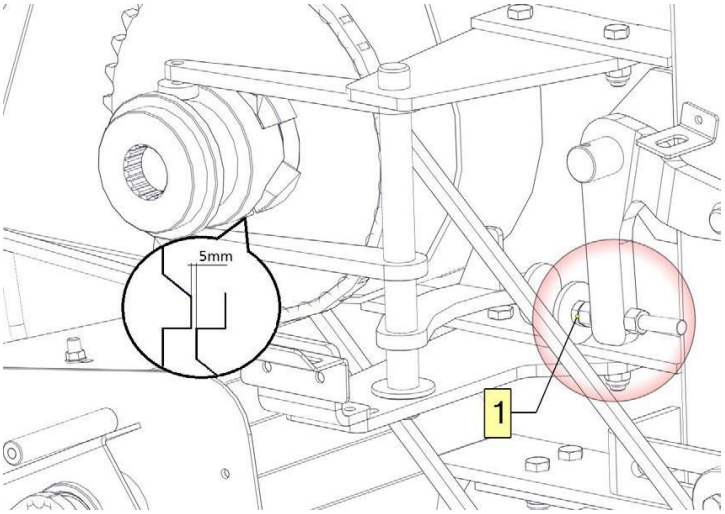


Figure 46 Adjustment of the claw coupling

4.5 Pick-up cam adjustment

Depending on the type of collected material and working conditions, adjust the cam so that it does not pull the material. The procedure:

- Loosen the bolts and remove the guard from the left side of the pick-up;
- Loosen 4 nuts that hold the cam (Fig. 47);

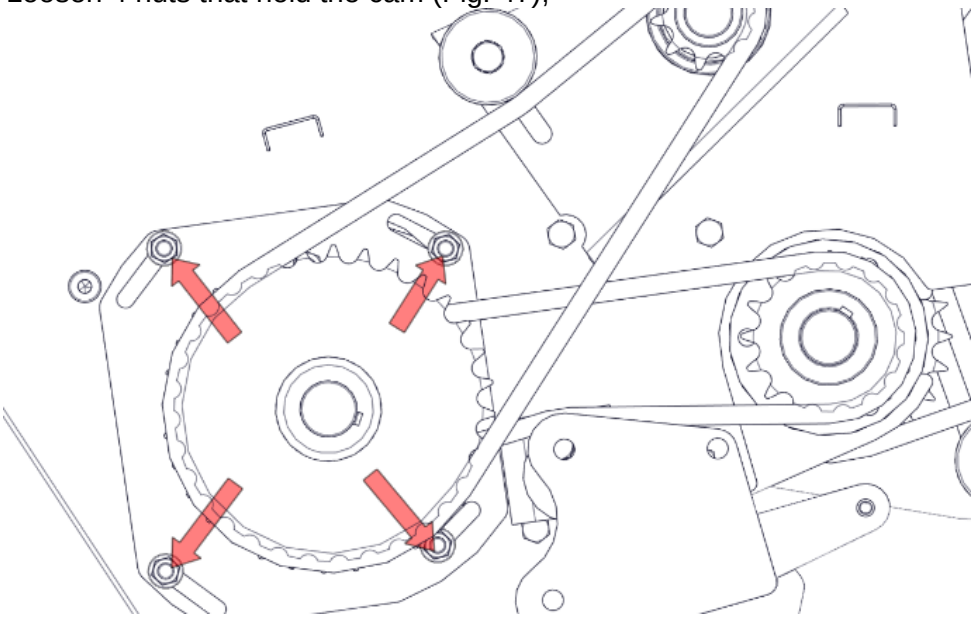


Figure 47 Adjusting the pick-up cam

- Adjust the cam position; turn it to move the pick-up tine closer to or farther from the transmission device. Rotate the cam (Fig. 48):
  - In direction “A” – to move the pick-up tine farther from the pick-up unit,

- In direction “B” – to move the pick-up tine closer to the pick-up unit.

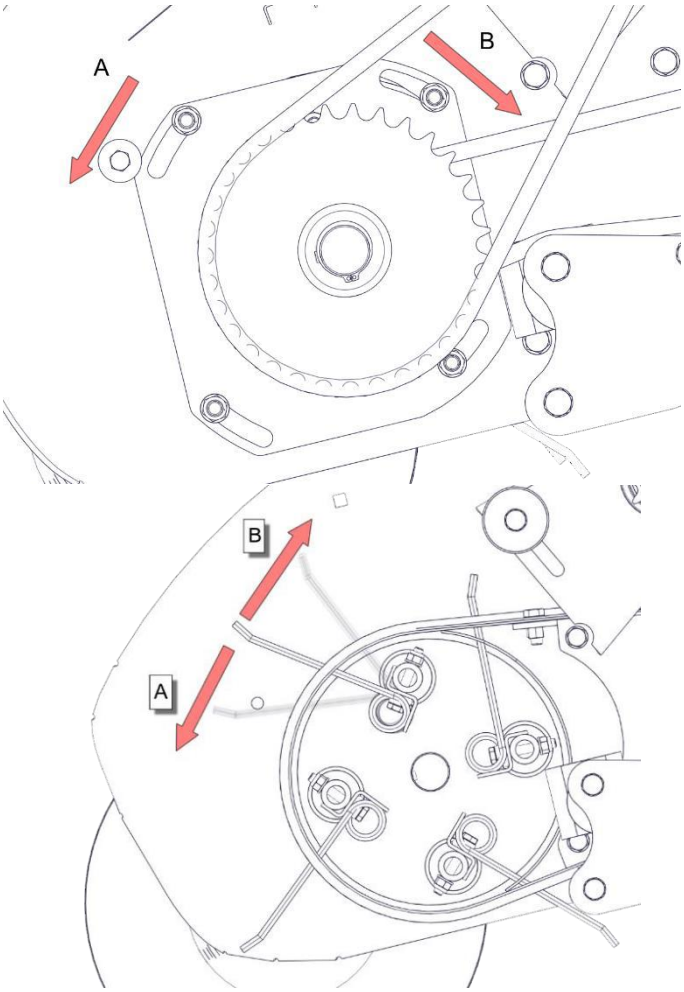


Figure 48 Adjusting the pick-up cam

4.6 Replacing the locking bolt in the pick-up

CAUTION

CAUTION!
Only use manufacturer's bolts for repairing the overload protections. Using improper bolts as locking bolts increases the risk of damaging the machine.

DANGER

DANGER!
Carry out the repairs when the engine is disabled, the ignition key removed and the machine protected from unauthorised movement.

The locking bolt shown in Fig. 49 is an overload protection of the pick-up unit. Damaging the locking bolt stops the drive transmission to the pick-up and supply worms. If the locking bolt is cut in the pick-up protective device, replace it with a bolt of the same specification: Allen head bolt M6 x 40-10.9 PN-EN ISO 4762 (without zinc plate, with partial thread). The procedure:

- Remove the guard on the left-hand side of the baler;
- Remove the cut locking bolt and make sure no parts of the damaged bolt are between the drive components;
- Turn the worm feeder to set the holes of the protective device, insert a new locking bolt, tighten it and fit the safety guard;

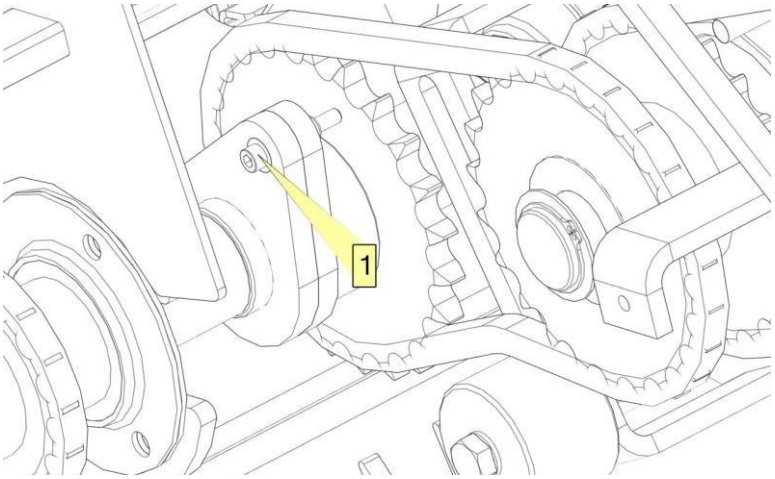


Figure 49 Replacing the locking screw

4.7 Replacing the locking bolt in the supplying unit

DANGER!
Carry out the repairs when the engine is disabled, the ignition key removed and the machine protected from unauthorised movement.

If the locking bolt is cut in the rolling hafts protective device, replace it with a bolt of the same specification: M8 x 35-8.8 bolt, PN-EN ISO 4018:2011. Procedure (Fig. 50):

- Unscrew the left lower chain gear guard;
- Remove the cut locking bolt and make sure no parts of the damaged bolt are in the drive;
- Turn the rolling shaft manually, set the holes of the protective device in such a position to be able to insert a new locking bolt and tighten it;
- Install the protective guard.

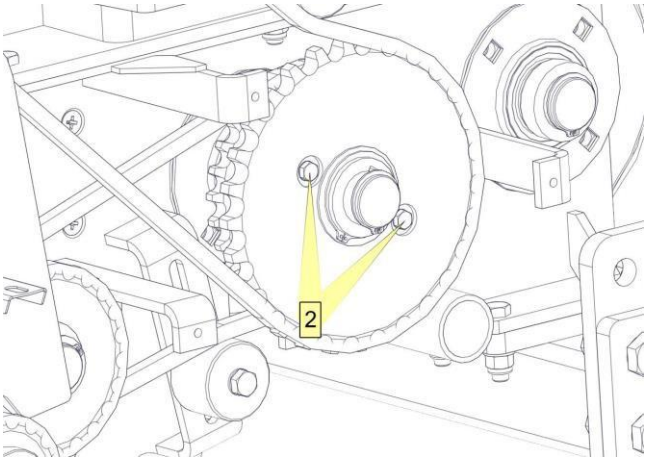


Figure 50 Replacing the locking bolt in the rolling rollers

4.8 Sharpening the twine unit blade

DANGER!
Switch off the engine and remove the key from the ignition before you start sharpening the blade of the twine unit.

Sharpen the twine cutting blade after rolling 1000 bales and before each season of work. Sharpen the blade also when the twine is not cut off.

The blade angle should be 30° (Fig. 51).

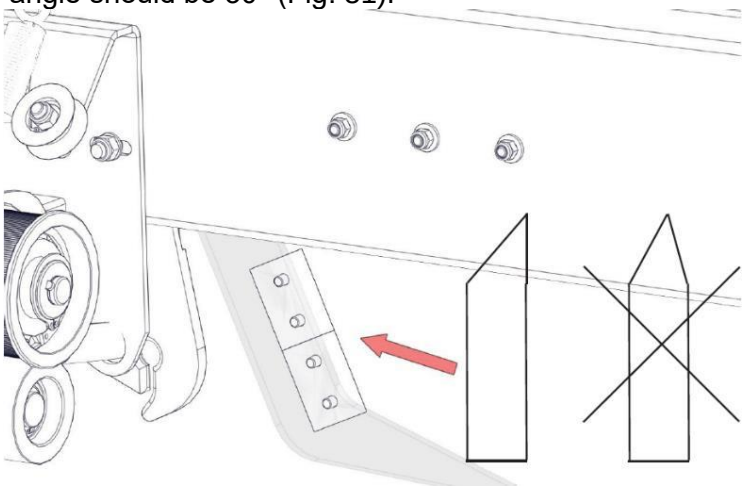


Figure 51 Blade sharpening

4.9 Twine binding unit adjustment

Adjust the twine bale twine binding width by means of two locking (retaining) components, which are located outside of the machine. Setting the limit stops towards the centre of the baler results in the binding of the middle part of a bale. The largest extending of the stops results in the bending of the maximum length of a bale.

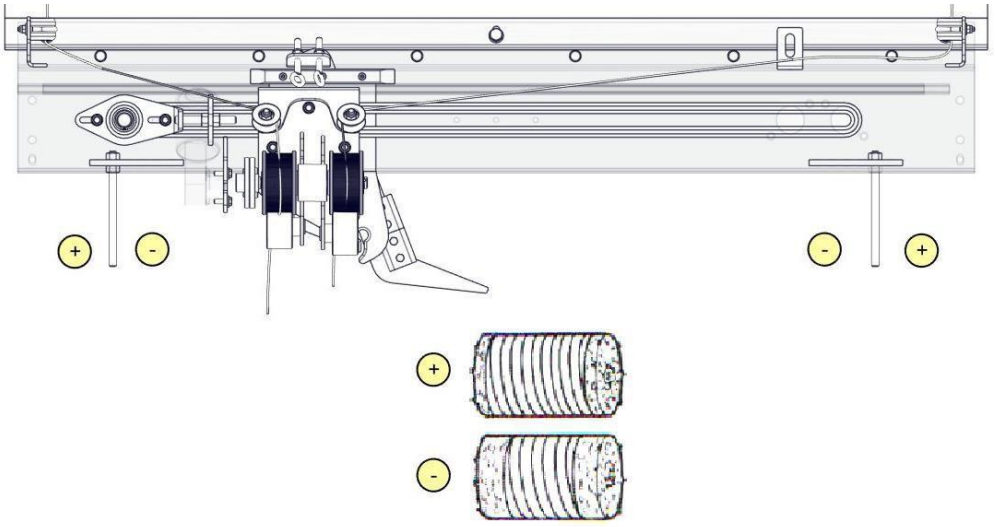


Figure 52 Adjusting the binding width

Adjust the bale twine binding in steps with the use of a two-step belt wheel “P” (Fig. 53):

- To obtain less dense twine binding, wind the twine on “degree 1” of the belt wheel “P”;
- To obtain less dense twine binding, wind the twine on “degree 2” of the belt wheel “P”;

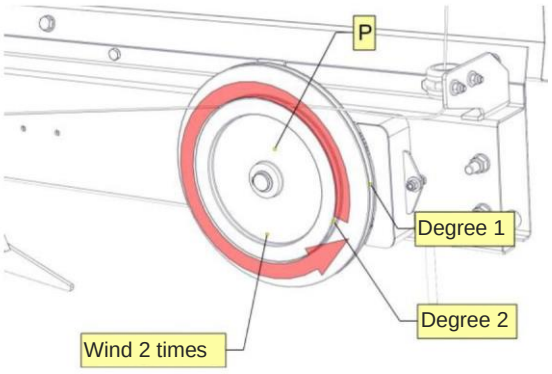


Figure 53 Adjusting the bale twine density

4.10 Net binding device adjustment

The net roll may not unwind freely. It should be withheld lightly. The degree of the force keeping it back is controlled by a spring, the tension of which is adjusted with the component “T” by fixing it in one of the holes.

If the reel is held too much, the rollers that guide the net are not capable of unwinding it.

To adjust the number of bale net binding turns, open the right-hand side guard and select the hole corresponding to the required number of the binding turns. You can also adjust the pressure of the guide rollers. Use the spring tensioners “M” located to the sides for this purpose.

If the reciprocal pressure between the rollers is excessive, the net will show a tendency to pull towards the middle of the bale, which will prevent the bale being bound across its whole width.

If the pressure between the two rollers is not sufficient, the rollers will not be capable of unwinding the net.

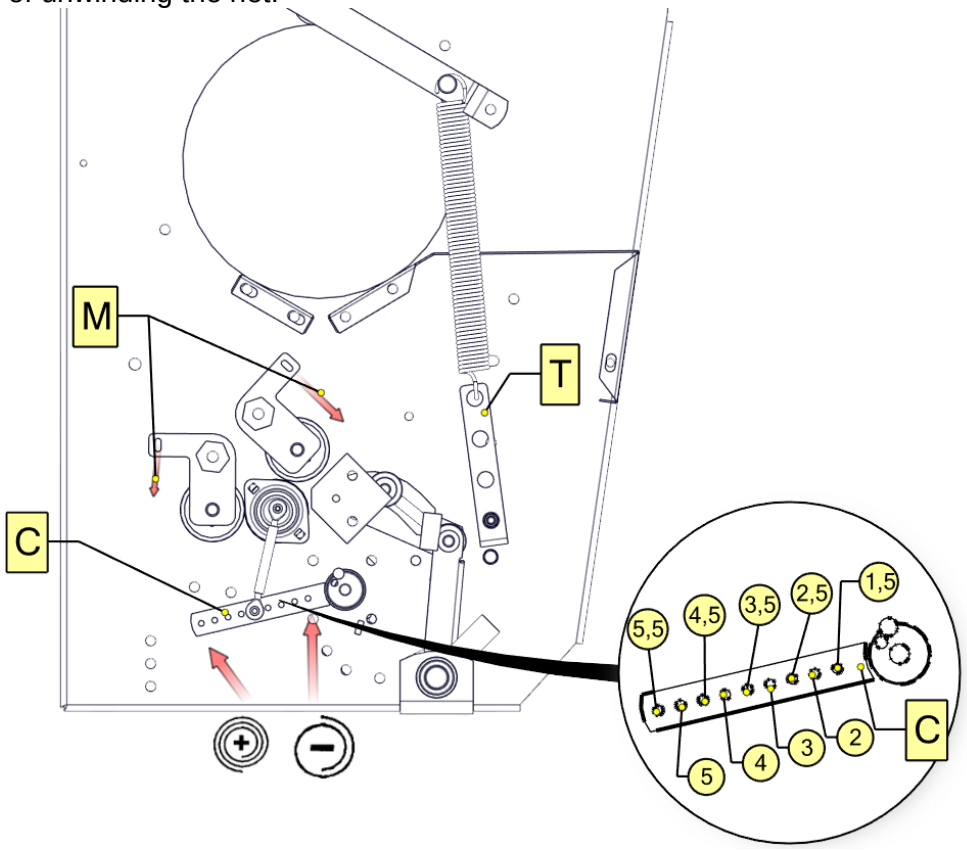


Figure 54 Adjustment of the net wrapping device

4.11 Transmission oil exchange (once a year)

The oil in the transmission box should be exchanged after the first 50 hours of operation and then at the beginning of each season.

CAUTION

CAUTION!
Do not overfill the gearbox with oil. It may result in overheating or oil leakage. The oil should be exchanged while it is still warm (e.g. immediately after using the machine).

WARNING

WARNING!
Before checking the oil level in the tank, make sure that the PTO drive and the tractor engine are off, and the key is removed from the ignition.

Oil draining:

- Prepare a container for used oil
- Unscrew and remove the plug located on the bottom of the transmission box; you can access it through the hole in the bottom part of the front bar, over the pick-up;
- Drain oil to the previously prepared container
- After emptying the box, replace the cap.

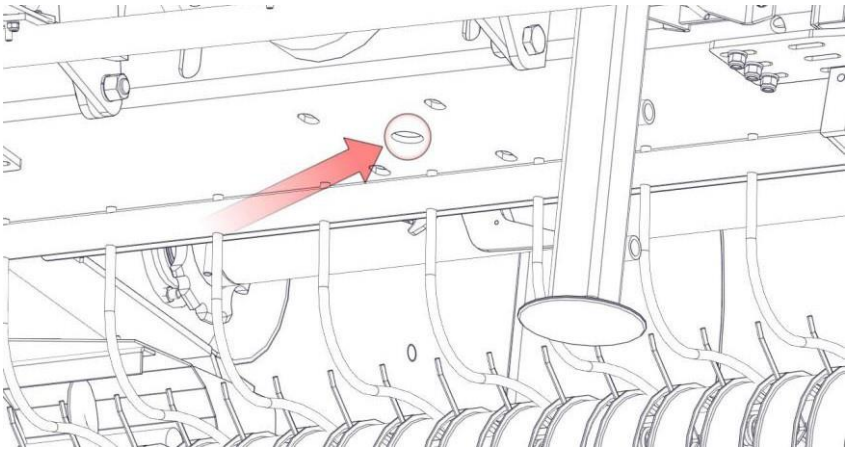


Figure 55 Drain plug

Refilling oil (required oil quantity in the box is 3 L):

- Loosen the bolts, and then remove the protective cover.
- Unscrew and remove the cap in the top section of the transmission box
- Replenish the oil
- After refilling oil, clean and replace the plug;
- Replace the guard and secure it with the screws.

Important: Use transmission oil type 80W90.

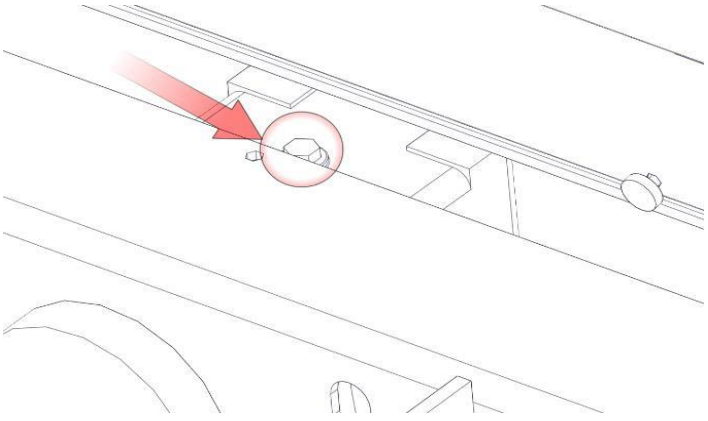


Figure 56 Topping up oil in the gearbox

4.12 Lubrication

CAUTION

CAUTION!
All the items listed below must be lubricated at the beginning and at the end of each season.

Lubricate the drive chains with transmission oil after each 5 hours of baler use or after baling 50 bales. Lubricate the places marked with a pictogram (Fig. 57) before each use of the baler.

If no automatic chain lubrication system is present, carry out this activity manually by using special greases for chain maintenance and lubrication.

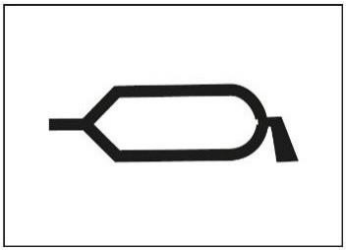
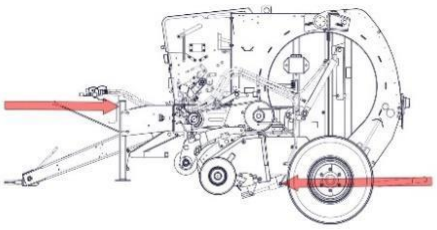
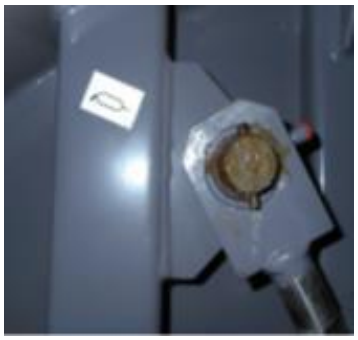
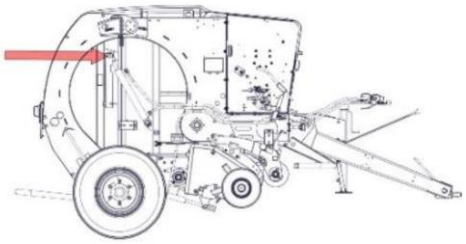
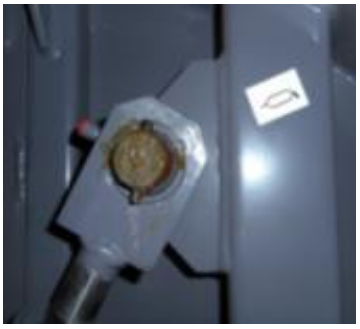


Figure 57 Designation of the main lubrication points on the baller

Table 5. Lubrication points

Lubrication points	Location on the baler	Lubrication points
		
	Right and left side 	

DANGER!
Carry out the chain lubrication when the tractor engine is disabled, the ignition key is removed and the parking brake applied.

Lubricating the chain of the net binding unit

The chain of the net unit is not lubricated by the central lubrication system, so it must be lubricated manually. To perform the lubrication, open the left-hand side guard and lubricate the chain of the net binding unit **(Fig. 58)**.

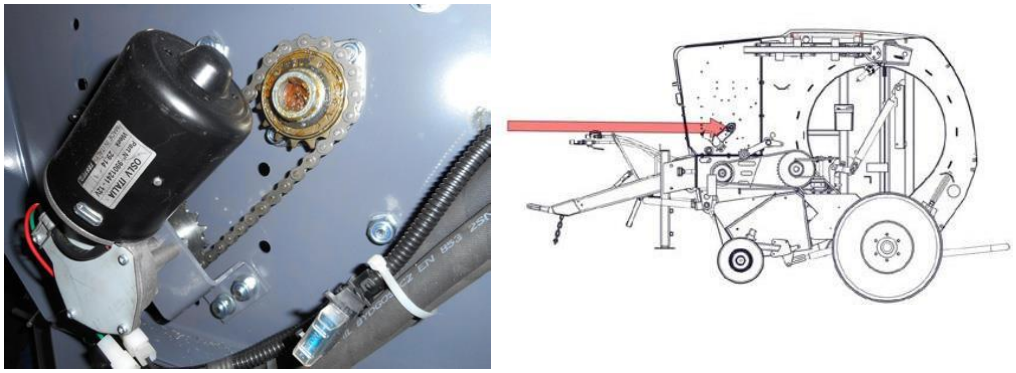


Figure 58 Lubrication of the mesh chain

4.12.1 The automatic lubrication system for chains

The Z587 and Z587/1 balers can be fitted with the integrated main drive chain lubrication system. The standard equipment of the machine allows the user to install the central lubrication system at a later date. The installation is to be performed by the authorised service centre of the user.

The system is composed of a mechanical pump, oil tank with a volume of 3 L, manifolds and dosing ends terminated with brushes feeding oil to the main lubrication points, providing uniform distribution of oil on the chain surface.

The pump (P) provides a stepless adjustment of the amount of oil. To adjust the amount of oil, loosen the nuts (N) on the cam (K) and turn a part of the cam so that the arrow (W) indicates the required number from 1 to 8, where 1 means the lowest oil amount, and 8 the highest.

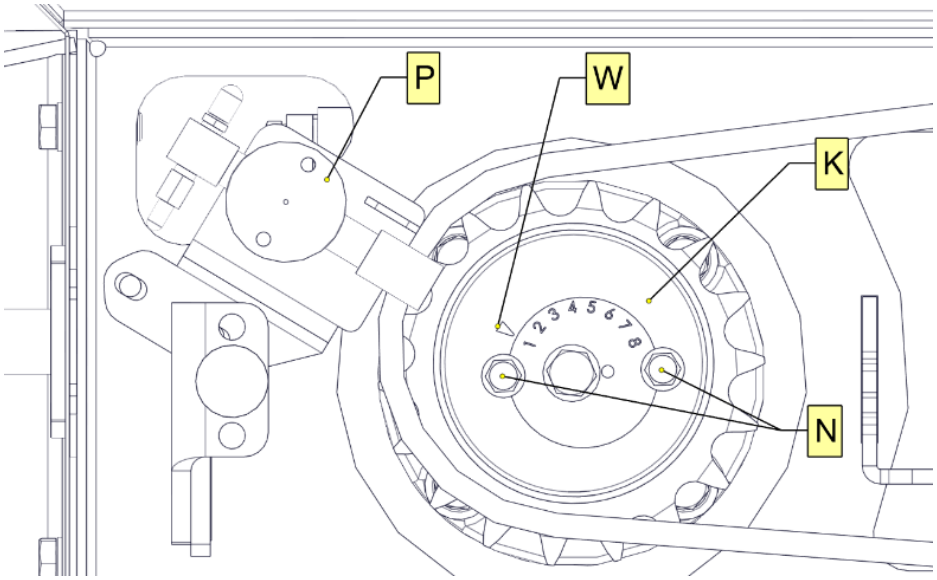


Figure 59 Adjusting the oil amount in the automatic lubrication system

CAUTION

CAUTION!
Using the mechanical pump without oil is prohibited. Operating the "dry" mechanical pump risks damaging it.

Always use clean oils. Simple mineral oils should be used.
Recommended oils:

- SAE30 – for low temperature operation,
- SAE90 – for operation in hot environments.
-

Tank

Carry out routine checks and refill the oil in the tank of the automatic chain lubrication system. The procedure:

- Open the left-hand side protective guard:
- Unscrew the cap, refill oil and re-tighten the cap. The tank volume is 3 L.

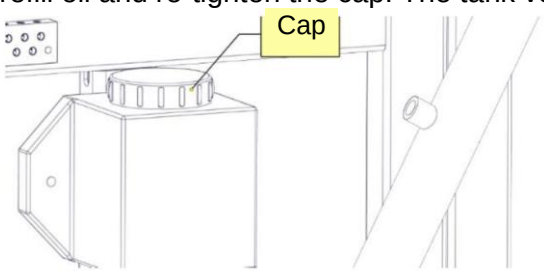


Figure 60 Oil tank of the automatic chain lubrication system

Filter replacement (once a year)

The filter is in the oil tank. It is recommended to replace it once a year. Procedure:

- Open the left-hand side guard:

- Drain the tank,
- Open the automatic lubrication oil tank,
- Replace the filter,
- Refill oil in the tank,
- Close the oil tank,
- Close the cover.

4.12.2 Lubrication of bearings

The Z587 and Z587/1 balers are fitted with the integrated bearing lubrication system. On the left-hand side of the machine, there is a strip “R”, in which there are grease nipples “S”, through which you can lubricate the bearings located on the left-hand side of the baler (Fig. 61). In the likewise manner, there is a strip on the right-hand side which enables lubrication of the bearings located on the right-hand side of the machine (Fig. 62).

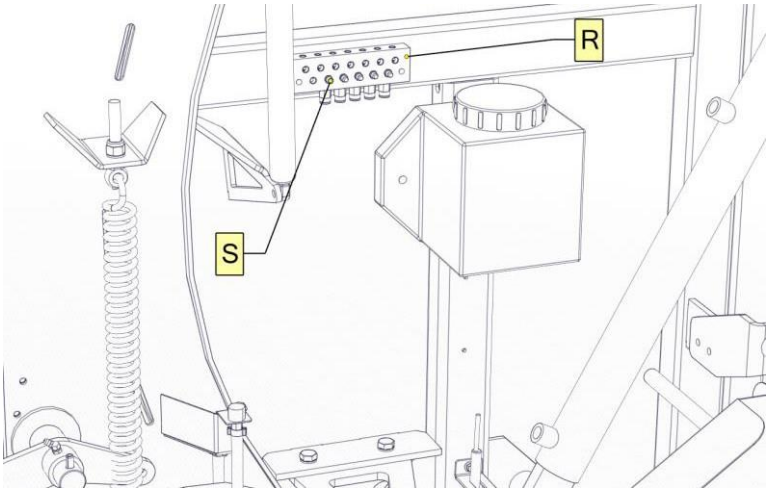


Figure 61 The bearing central lubrication system on the left-hand side of the baler

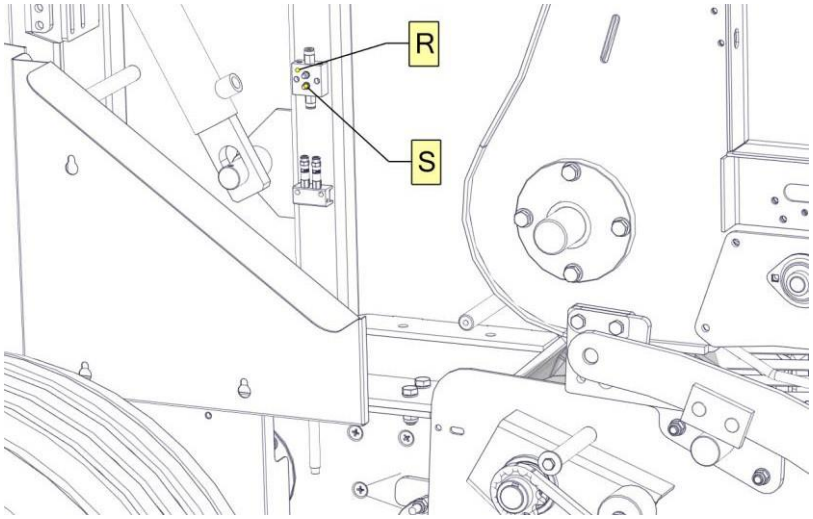


Figure 62 The bearing central lubrication system on the right-hand side of the baler

4.13 Tyres inspection (every 30 days of work)

CAUTION

CAUTION!
Important: Wheel and tyre repairs may be performed only by skilled staff using sufficient equipment.

Schedule regular checks of the tyre pressure and ensure it is suitable for the respective tyre.

CAUTION

CAUTION!
Important: Check the tightening of the wheel bolts regularly. The tightening torque should be in accordance with Table 4.

5. Possible faults

If faults or failures occur, they must be reported to Metal Fach service.

The most frequent faults and problems that may occur during the machine operation are presented in the table below. If the suggested solutions fail to bring the required result, contact the distributor or service centre of Metal Fach.

Table 6. Possible faults

Pick-up

Problem	Possible cause	Solution
The pick-up unit performs the working movement, and the chain and rod conveyor does not.	Chamber not closed.	Close the rear chamber.
	The adjuster of the declutching unit requires adjustment.	Adjust the bolt of the jaw coupling lever (Chapter 4.4).
No lifting or lowering action of the pick-up unit.	The swivel joint supporting the pick-up unit not lubricated.	Lubricate the component fixing the pick-up.
Clogging the inlet of the chamber.	Too large and/or irregular windrows or too high working speed.	Form the windrows of the right size and/or work with lower pick-up speed.
	Excessive picking up the windrow on one of the sides of the pick-up.	Drive the baler equally from one side to the other.
	Too low rotational speed (rpm).	Work with a rotational speed of 540 rpm.
Pick-up tines tear the material.	Too high rotational speed of the pick-up compared to the working speed.	Increase the working speed.
		Decrease the PTO rpm
The pick-up tines leave out parts of the windrow.	Too low rotational speed of the pick-up compared to the working speed.	Decrease the working speed.
		Increase the PTO rpm.

The pick-up does not collect all the windrow.	Too large windrow width.	Form a new, narrower windrow.
The pick-up does not collect windrow from a level ground.	The pick-up set too high.	Lower the pick-up position.
		Set the pick-up wheels correctly.
The pick-up lets the material pass and stops.	The protection component is defective.	Halve the volume of the windrow.
		Adjust the wheel position to lift the pick-up.
		Remove the accumulated plant material and replace the protective component.
Insufficient windrow pick-up.	The pick-up tines are lost or damaged.	Replace the tines.

Forming bales

Problem	Possible cause	Solution
Excessive noise.	Chains loose or not lubricated.	Lubricate the chains or adjust their tension.
A bale is formed incorrectly or has a conical shape.	Picking up the windrow mainly on one side of the pick-up.	Drive the baler equally from one side to the other.
Rods of the rod and chain conveyor get bent.	Value of bale compaction pressure too high.	Do not exceed the compaction pressure of 170 bar.
The chain skips the teeth of the toothed wheels.	Worn out toothed wheels or chain.	Replace the toothed wheels or chain.
	Loose chain.	Tension the loose chains.

Twine binding

Problem	Possible cause	Solution
Twine drops on one side of the bale.	Side limit stops for twine are too far.	Set the limit stops closer to the middle of the baler.
Twine does not remain on the bale.	Binding started without the material on the pick-up.	Always start binding with some of the material on the pick-up.
	Too tight setting for the twine holding assembly.	Loosen the clamp of the twine holding assembly.
The twine is pulled by a bale, but the carriage guiding the twine does not move.	The twine slips on the belt wheel that transmits drive.	Oil the mechanical components of the carriage drive assembly.
		Increase the number of binding turns of the twine around the belt wheel.
Twines are not cut off.	Blade worn out.	Reverse the sides of the twine cutting blades or replace them.

		Increase the twine pressure.

Net binding

Problem	Possible cause	Solution
Net is not distributed well on a bale.	Too large mesh of the net.	Use standard net.
	Incorrect path of net flow.	Check if the net is installed correctly.
	Reel brake function incorrect.	Adjust the side spring tensioners.
	Excessive or insufficient pressure between the rollers.	Adjust the side spring tensioners.

PTO shaft

Problem	Possible cause	Solution
Defective locking bolt.	Bale weight too high.	Reduce bale weight.

Hydraulic system

Problem	Possible cause	Solution
Rear cover will not close.	Closing of the rear cover blocked by a bale.	Remove the bale.
	The hydraulic hose disconnected from the tractor.	Check the connection and connect the hoses if necessary.
Hydraulic system does not work.	No power supply to the hydraulic outputs.	Enable the hydraulic outputs from the tractor.
	The hydraulic hoses are not connected correctly to the external sockets of the tractor hydraulic circuit.	Check and, if necessary, carefully tighten the quick-release coupling in the external sockets of the tractor's hydraulic circuit.
	Insufficient oil supply.	Check and, if necessary, refill oil in the relevant tank of the tractor hydraulic system.
	The pump worn out or damaged (low pressure).	Repair or replace the hydraulic pump.
	Dirt inside the hydraulic circuit.	Blow and, if needed, clean the hydraulic filters.
	Oil leakage in cylinders.	Replace the seal in the cylinders.
	Oil leaks from the hydraulic system.	Check the hoses of the hydraulic circuit and seal connections, if necessary.

Control panel

Problem	Possible cause	Solution
Message “Binding error” and acoustic signal.	No binding material (net, twine).	Replenish the twine or net cartridges.
	The bale did not grip the twine/net.	Always start binding with some of the material on the pick-up.

	The sensor distance to the bolt adjusted incorrectly.	Set the sensor 2-3 mm from the bolt.
Despite the closed chamber, the panel displays “Open chamber”.	The sensor distance to the lever adjusted incorrectly.	The sensor should be 2-3 mm from the lever.
Message “STOP, baler damage risk” and acoustic signal.	Value of bale compaction pressure too high.	Do not exceed the compaction pressure of 170 bar.

INDEX OF NAMES AND ABBREVIATIONS

BHP- occupational safety and health;

dB (A) - decibel A, sound pressure unit;

kg – kilogram, weight unit

km/h – kilometre per hour, linear speed unit

kPa – kilopascal, a unit of pressure;

kW – kilowatt, power unit

m – metre, length unit

min – minute, an auxiliary time unit equal to 60 seconds

mm – millimetre - auxiliary length unit equal to 0.001 m

rev - revolution, determining the kind of movement;

rpm - revolution per minute, a rotation speed unit;

Pictogram – an information plate

Rating plate – a manufacturer's plate unambiguously identifying the machine

UV - ultraviolet radiation; It is an invisible electromagnetic radiation with a negative impact on human health; UV radiation has a negative effect on rubber parts;

PTOff - rear Power-Take-Off shaft, a part of the agricultural tractor;

PTOn - Power-Take-On shaft - a part of the baler;

PTO shaft - telescopic joint shaft – a shaft transmitting the torque;

V – Volt, a voltage unit

Hitch, the lower transport hitch – hitch components of a farm tractor (see a tractor instructions manual)

ALPHABETICAL INDEX

NOTES

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The pictures do not necessarily show standard accessories.

Original spare parts are available from authorised dealers, both in Poland and abroad, and also at the Metal-Fach retail outlet.

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