



METAL-FACH



BELT BALER

Z514

INSTRUCTIONS MANUAL – PART I

TRANSLATION OF THE ORIGINAL INSTRUCTIONS MANUAL

REVISION I

JANUARY 2020



EC DECLARATION OF CONFORMITY

The undersigned,		Jacek Kucharewicz, President of the Board,
hereby declares, with full responsibility, that the complete machine:		
BELT BALER		
1.1.	Brand (the trading name of the manufacturer)	Metal-Fach
1.2.	Type:	Z514
1.2.1.	Variant:	
1.2.2.	Version:	
1.2.3.	Trade name(s) (if any):	Z514
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 manufacturer's rating plate:	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:	
<p>We hereby declare that the machine as detailed in this declaration fulfils the requirements of: Directive 2006/42/EC of the European Parliament and of the Council of 17th May 2006 on machinery (Official Journal of the European Union L 157, 9th June 2006, p. 24-86) and the Regulation of the Minister of Economy dated 21st October 2008 on principal requirements for machines (Journal of Laws No. 199, item 1228), and the Regulation of the Minister of Labour and Social Policy of 12th June 2018 concerning maximum admissible concentrations and intensities for agents harmful to health in the working environment (Journal of Laws 2018, item 1286);</p> <p>The following harmonised standards were applied to assess the compliance. <u>PN-EN ISO 12100: 2012; PN-EN ISO 4254-1: 2016-02; PN-EN ISO 4254-11: 2012; PN-EN ISO 4413 :2011</u></p> <p>and the following standards and regulations: PN-ISO 3600:1998; PN-EN ISO 7010:2012; PN-ISO 11684: 1998;</p> <p>Journal of Laws No. 2016, item 2022</p> <p>Safety Testing Report No.: LB/18/2019, LB/19/2019, LB/20/2019</p> <p>This EC Declaration of Conformity shall become null and void if the machine is modified or reconstructed without the Manufacturer's consent.</p>		

Sokółka
(Place)

13/07/2019
(Date)

Jacek Kucharewicz
(Signature)

President of the Board,
(Position)

Machine data

Machine type	Baler
Trade name	Z514
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
Seller:	_____
Address:	_____ _____
Phone/Fax.:	_____ _____
Delivery date:	_____
Owner or User:	Last Name: _____
	Address: _____ _____
	Phone/Fax.: _____

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

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INTRODUCTION

The information included in the Instructions Manual is valid as of the date of its drawing up. The manufacturer reserves its right to make design changes to the machines, and due to this, some values or illustrations might not correspond to the actual state of the machine supplied to the user. The manufacturer reserves its right to make design changes without amending these instructions. The Instructions Manual is part of the basic equipment of the machine. Before using the machine, the User is obliged to read the contents within the Instructions Manual and to comply with its recommendations. It will ensure a safe operation and a trouble-free machine operation.

The machine has been built in compliance with the standards in force and the current legal provisions. The Instructions describe the basic safety and operation principles regarding the Z514 Baler manufactured by Metal-Fach.

The significant obligations of the Manufacturer are shown in the Guarantee Certificate, which includes the complete regulations currently in force regarding the guarantee coverage.

If the information included in the Instructions Manual proves to be incomprehensible, you should ask for assistance at the point of sale where the machine was purchased, or the manufacturer directly.

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

Pursuant to the Act of 4th February 1994 on copyrights and related Laws (Journal of Laws of 2017, item 880), the Instructions Manual is protected by copyright. It is prohibited to copy and distribute the contents and figures herein without the consent of the proprietor of the copyright.

The Warranty Card, together with the warranty terms, is attached to the Instructions Manual as a separate document.

Manufacturer's 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!

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 highlights very important information and recommendations. Non-compliance with the described recommendations risks serious damage to the machine due to its incorrect operation.



WARNING

This symbol indicates the possibility of the occurrence of a hazard, which, if not avoided, can result in death or serious injury. This symbol indicates a lower level of risk of injury than the symbol including the word "DANGER".



This symbol indicates useful information.



This symbol indicates maintenance activities that should be performed periodically.

1. General description

1.1 Introduction

THE INSTRUCTIONS MANUAL IS PART OF THE BASIC ACCESSORIES OF THE BALER

The machine can be operated only by those who have read the Instructions Manual, understand the design and how to operate the Baler, and the functioning of the tractor it is coupled with.

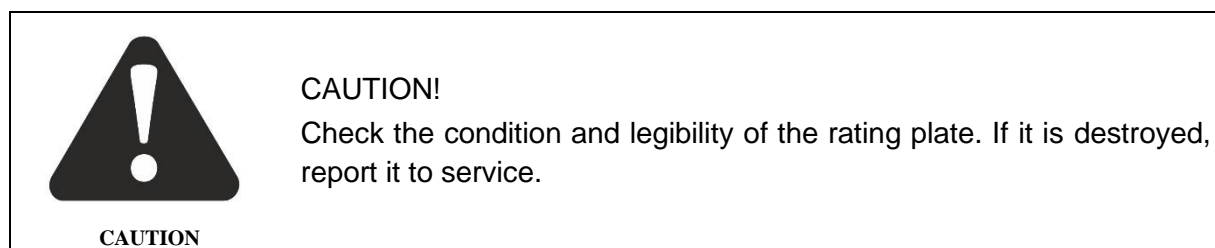
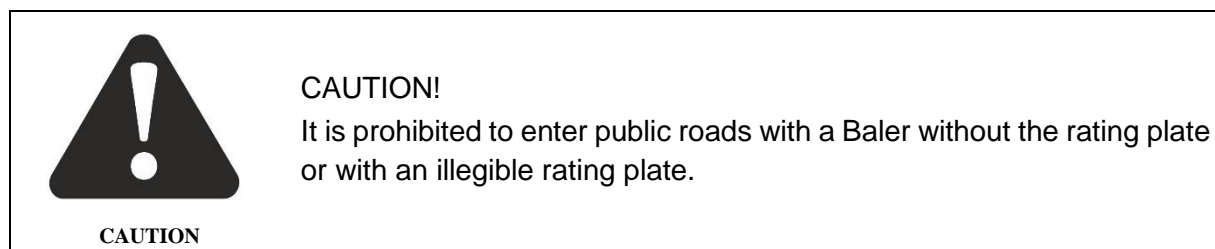
Read and adhere to all the guidelines set forth in the Instructions Manual in order to operate the machine in a safe manner. Abiding to the guidelines that are provided in the Instructions Manual ensures a safe operation for the User, and also it prolongs the machine's life.

1.2 Baler Identification

The identification data can be found on the rating plate located on the front part of the frame. The rating plate contains the data required to identify the machine, i.e. commercial type, serial number, year of manufacture, and load exerted on the hitch.

METAL-FACH SP. Z O.O.	
S1a	
e32*167/2013*XXXXX	
SUMZ06140JSSK0005	
3330 kg	
A-0: 720 kg	
A-1: 3330 kg	
METAL-FACH®	
ul. Kresowa 62, 16-100 Sokółka, Poland tel.: +48 (85) 711 98 40-45, fax: +48 (85) 711 90 65	
Prasa rolnicza	
Typ handlowy	Z514 Nacisk na zaczep 7,1 kN
Wariant	GIRPSR KJ
Rok produkcji	2018
VIN	SUMZ06140JSSK0005
CE	
www.metalfach.com.pl	

Figure 1. Example of a rating plate





At the moment of purchase, check if the VIN number stated on the machine's rating plate complies with the number specified in the Instructions Manual and the Warranty Card.



This document should be preserved for future users.

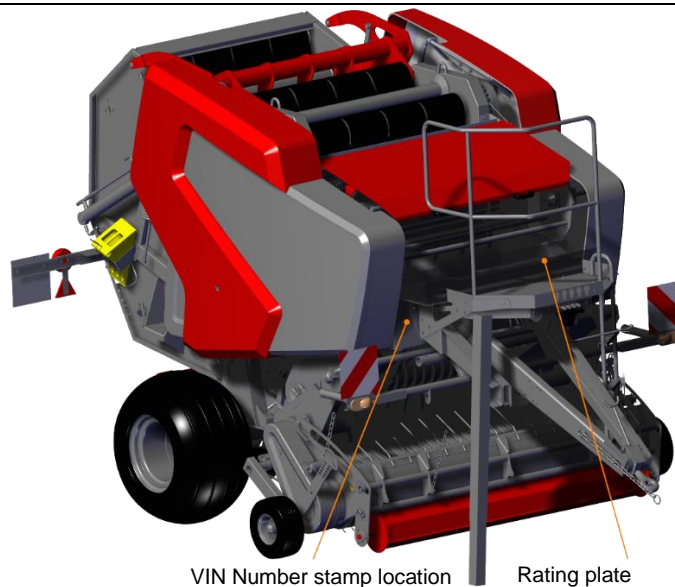


Figure 2. VIN Number stamp location and rating plate is affixed to the machine

In the event of selling the machine to another user, it is obligatory to provide the Instructions Manual. It is recommended for the Baler's supplier to archive the confirmation of receiving the Instructions Manual submitted with the machine to the new user, signed by the purchaser.

Keep the Instructions Manual in a safe place, where it should be available to the user for the entire machine's life cycle.

If the Instructions Manual gets damaged or lost, notify the technical service and provide the document number or the data from the rating plate to receive a new copy of the Baler's Instructions Manual. You can also download the Instructions Manual from our website: www.metalfach.com.pl.

Before starting the machine after a longer period of down time, carefully read the information regarding its use and safety contained in the Instructions Manual.

You must read all sections of the Instructions Manual and, if necessary, contact a local Metal-Fach distributor. The contact information of the distributors and service centres are

published at www.metalfach.com.pl. The machine should be operated, serviced, and repaired by those familiar with its specific characteristics and acquainted with the rules of conduct in terms of occupational safety.

The machine's manufacturer shall not be held liable for any damage arising from non-compliance with the principles contained in the Instructions Manual!

USE ONLY ORIGINAL SPARE PARTS!

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

1.3 Baler intended use

The Z514 Baler is designed for picking up the material raked into windrows by rolling them into bales: hay with a humidity level of up to 20% and green fodder with a humidity level of up to 60% and straw.

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

Using the Baler for any other purpose than for its intended use shall be considered as misuse. Metal Fach shall not be held responsible for damage caused to people, animals or for any other damage that results from the improper use of the machine.

1.4 Design and operation of the Baler

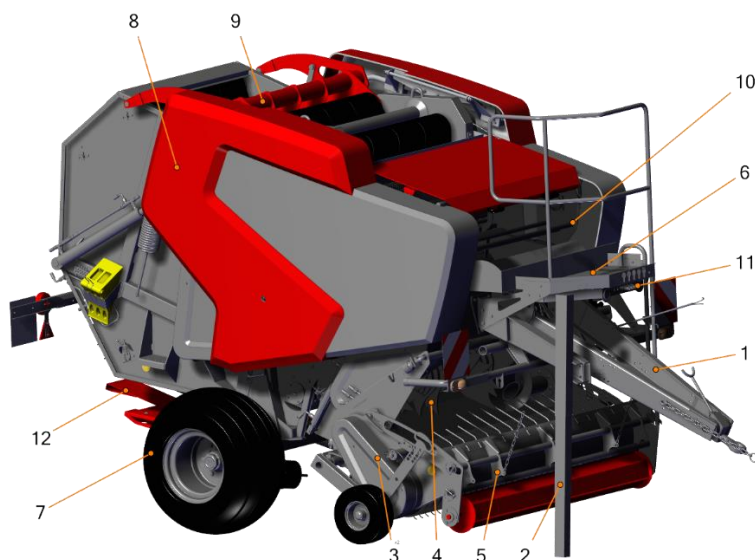


Figure 3. The Z514 Baler's design:

- 1 - drawbar, 2 - support foot, 3 - pick-up, 4 - rotor, 5 - roller clamp, 6 - platform, 7 - running wheel, 8 - guard, 9 - rocker arm, 10 - net wrapper, 11 - hydraulic pipes, 12 - bale ejector

Baler's design The front section of the Baler features the pick-up (3) designed for collecting rolled windrow. The material collected by the rotor (4) is delivered to the rolling chamber. The rotating motion of the 4 straps tensioned by the rocker arm (9) and the material is rolled and crushed. After reaching the pre-set bale diameter, it is signalled on the control panel in the operator's cabin, and the net wrapper (10) wraps the bale in the net. Then, after opening the rear chamber, the bale is ejected by the ejector (12).

The Baler is coupled with the tractor, by means of the drawbar (1), PTO drive shaft, and hydraulic hoses (11). The support foot (2) is used for propping the machine for stationary position. It must be lifted by means of the provided crank for the time of the operation. The machine is fitted with a platform (6) with a foldable ladder, which must be folded during operation. The Baler is fitted with ground wheels (7) for riding behind the tractor.

1.4.1 Hydraulic system



WARNING

WARNING!

Ensure the full working order of the hydraulic system. The oil which works under high pressure heats up to the temperature which pose a threat for health.



CAUTION

CAUTION!

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



CAUTION

CAUTION!

Regularly check the condition of the hydraulic hoses (Chapter 5.14), according to the schedule (Chapter 5.2).



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 of its operation.

The Baler's hydraulic system is supplied from the tractor's hydraulic system, which must be fitted with a 3-section hydraulic manifold. Connect the rear chamber assembly to the first section, then connect the pick-up unit to the second section, and finally the rotor's floor system

to the third one. Connect the opening / closing system of the rear chamber and the raising / lowering system of the pick-up to the tractor's power hydraulic system by means of the connecting lines supplying the cylinders of the chamber and the pick-up, as shown in Fig. 4 and Fig. 5.

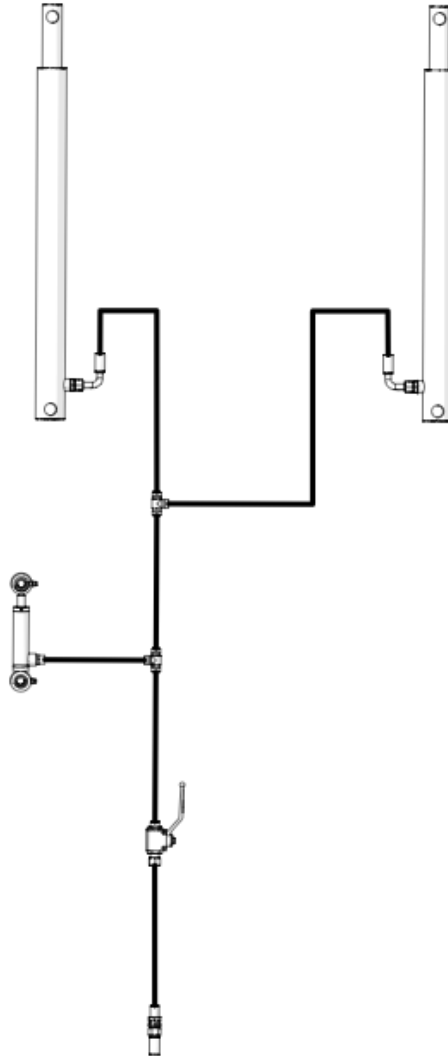


Figure 4. Diagram of the hydraulic system – the rear chamber and the net wrapper

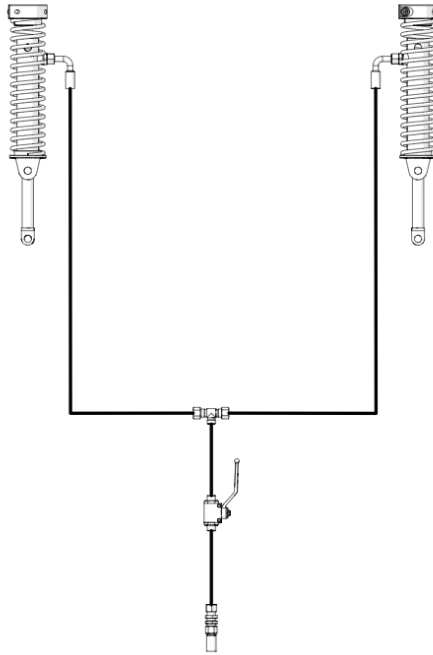


Figure 5. Diagram of the hydraulic system – pick-up

Connect the raising / lowering system of the rotor's floor to the tractor's power hydraulic system by means of the connecting lines supplying the cylinders of the rotor's floor, as shown in Fig. 6.

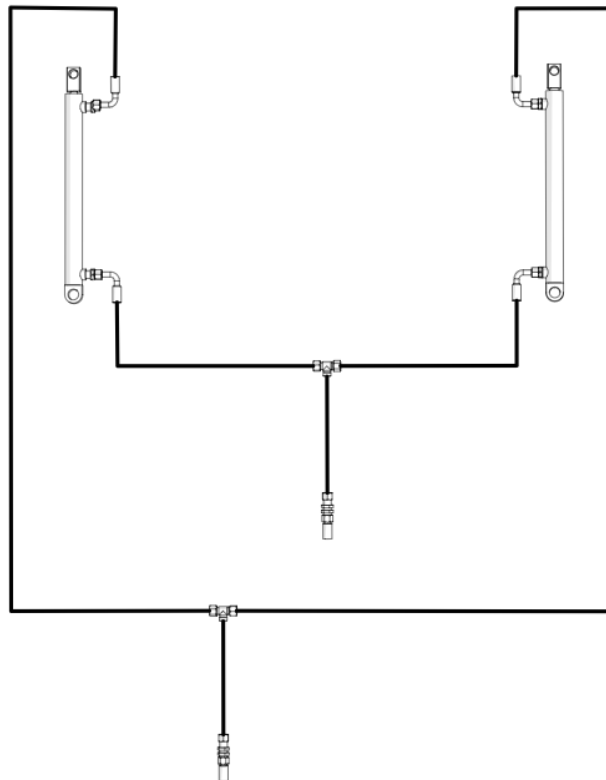


Figure 6. Diagram of the hydraulic system – the rotor's floor

1.4.2 Electrical system



WARNING

WARNING!

Check the function of the electrical system and lighting each time before you drive with the Baler on public roads.

The Baler's electrical system is supplied by the tractor's electrical system. Connect the Baler to the tractor's electrical system circuit by means of the 7-pin connection cord, as shown in Fig. 7.

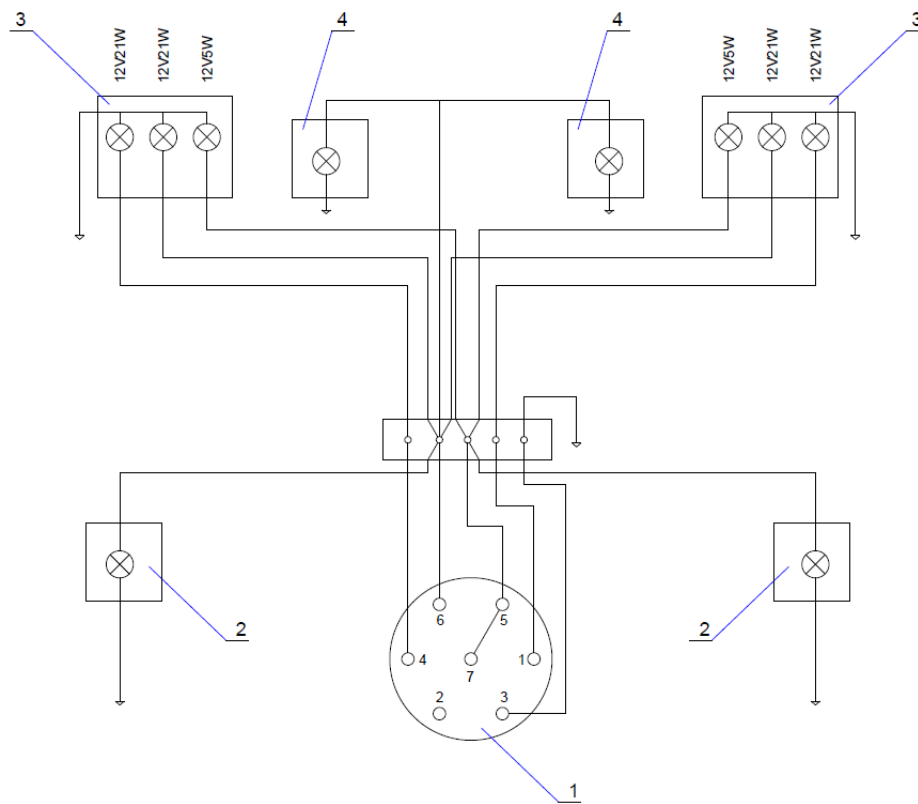


Figure 7. Wiring Diagram:

1 - connection plug, 2 - front lamp, 3 - rear lamp, 4 - license plate lamp

1.4.3 Braking system

The Baler comes with a double-line pneumatic single-circuit braking system. The double-line braking system is only compatible with the tractor's double-line pneumatic system. Coupling the Baler with the tractor, by means of single-line pneumatic and hydraulic systems, is prohibited.

The braking system (see Fig. 8) is activated by the tractor's pneumatic braking system. Both brake lines connecting the Baler with the tractor are equipped with filters. The red brake line supplies the machine's braking system with compressed air. The yellow brake line controls the braking force of the Baler. The higher the pressure in the control line, the more effective the operation of the brakes in the Baler. The higher the force applied when pressing on the brake pedal, the higher the pressure in the control line. If the red brake line gets disconnected from the tractor, it activates the emergency brakes in the Baler.

The Baler is equipped with a pneumatic spring parking brake. It is actuated by the air supplied from the spring chamber of the brake actuators. The operation of the parking brake is described in section 5.1.3.

The machine is also equipped with an emergency brake, which is actuated if the brake lines break off.

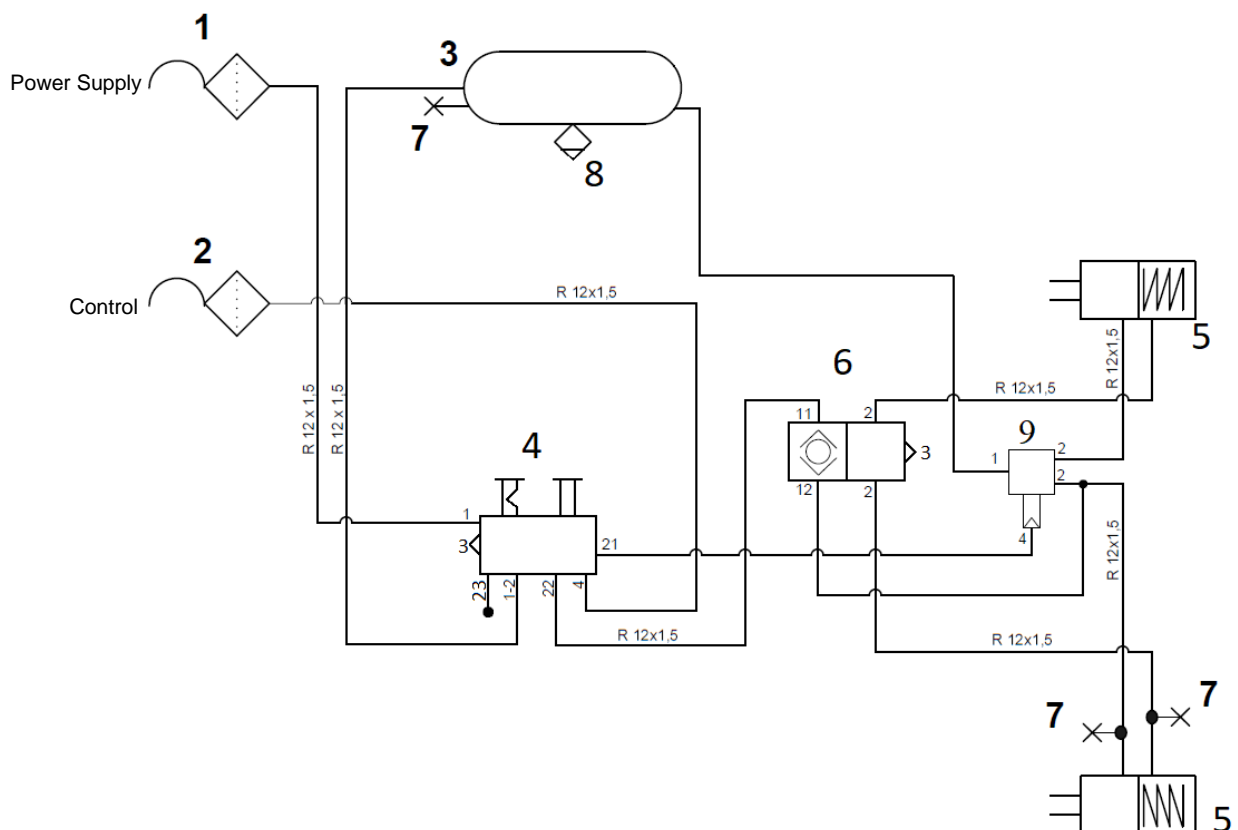


Figure 8. Diagram of the braking system:

- 1 - connection between the filter and lines (power supply), 2 - connection between the filter (control), 3 - air tank, 4 - parking and release valve, 5 - brake actuator (diaphragm-spring), 6 - 2/3 way valve + vent, 7 - control valve, 8 - drain valve, 9 - relay valve

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.	The point of mounting the rating plate	Front bar
4.	Number stamp location	Front body, right side
5.	Trade name	Z514
Dimensions		
6.	Maximum length [mm]	4955
7.	Maximum width [mm]	2700
8.	Maximum height [mm]	2850
Weights		
9.	Maximum weight [kg]	4050
Technical data		
10.	Maximum hitch pressure [kN]	7.1
11.	Rolled bale dimensions (diameter/width) [mm]	900/1200 – 1600/1200
12.	Rolling assembly – chamber type	Belt Baler, variable chamber
13.	Bale density	Variable
14.	Drawbar eye diameter [mm]	44
15.	Number of operators	1 (tractor's operator)
Requirements for tractor		
16.	Minimum power demand [kW / HP]	59/80*
17.	PTO rotational speed [RPM]	540
18.	Type of PTO hitch	1 3/8" Z6
19.	Coupling with the tractor using	Lower transporting hitch Upper transporting hitch
20.	Hydraulic system	2 unidirectional manifolds, 1 dual-direction manifold
21.	Required pressure in the tractor's hydraulic system [Atm./MPa]	140/14
22.	Electrical system [V]	12
23.	Socket	3-pin COBO type
24.	Transport speed [km/h]	40
Feeder unit		
25.	Pick-up type	Drum and tine, 4-bars
26.	Pick-up width [mm]	2000
27.	Max. distance between the extreme pick-up tines [mm]	1890
28.	Number of pick-up tines	60
29.	Adjustment of the pick-up's working height	Mechanical, 10 settings
Binding		
30.	Number of net rolls	2
31.	Maximum net width [m]	1230
32.	Maximum net length [m]	4000
33.	Minimum strength [kg]	275

Tyres		
34.	Size	500/50 – 17
35.	Load- and speed-index	(14PR) 149 A8
36.	Pressure in tyres [kPa]	250
Power take-off shaft (PTO)		
37.	Type	Wide-angle
38.	Transferred torque [Nm]	2100
39.	Minimum length [mm]	1410
40.	Type of coupling	Automatic
41.	Catalogue no.	8G7R141CEWR7006
Braking system		
Service brake		
42.	Type	Mechanical, drum brake
43.	Control	Pneumatic (double-line braking system)
Parking brake		
44.	Type	Mechanical, drum brake
45.	Control	Pneumatic (double-line braking system)

* The minimum tractor's power of 80 HP is sufficient for the machine to work properly. The Baler operates with highest efficiency when coupled with a tractor with the power rating exceeding 130 HP.

1.6 General safety principles

Before starting the Baler, read the Instructions Manual carefully in order to eliminate any possible hazards. In addition to the information contained in the Instructions Manual, all the principles and local legal regulations related to the operational safety and use of the machine must be followed.

The Baler was designed and made in such a way in order to provide maximum safety of use.

Before the initial start-up, carefully read all the chapters of the Instructions Manual.

Metal-Fach shall not be held liable for any damage arising from non-compliance with the principles contained in the Baler's Instructions 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 Baler can be operated only by those who are qualified and who have read the Instructions Manual.



WARNING

WARNING!

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

Pay attention to the warning signs indicated in the Instructions Manual and on the machine. All signs which warn about dangers on the machine must be clearly visible at all times.

Make sure that the safety signs are kept clean at all times. Replace them if they are damaged or barely legible. You can find the list of hazard warning signs and their locations in Chapter 1.6.2. "Warning signs".



WARNING

WARNING!

Never leave the machine unattended during operation.



WARNING

WARNING!

Never leave the tractor unattended when its engine is running.



DANGER!

DANGER!

During operation, 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 from all rotating parts. Keep a safe distance at all times.

Do not use tubes, hoses or other parts of the machine as handrails.

Carrying people or animals on the machine or tractor is strictly forbidden.



DANGER!

DANGER!

The machine's working area is considered a danger zone. Prior to starting up the machine, make sure that there are neither people nor animals around in the near proximity of the machine. If anyone appears near the machine, stop the Baler immediately and make sure that no one is in the area. Never stop in the close proximity of or under terraces or balconies, in front of open rooms, or any kinds of platform, where people or animals can be present. The Baler operator is responsible for any kinds of damages caused by the machine during an operation.



DANGER!

DANGER!

The areas around the drawbar, pick-up, feeder, rear chamber, and all the moving parts are particularly dangerous. Crushing, cutting, and entanglement hazards occur there. Exercise extra caution. It is forbidden to come closer to these areas while the machine is in operation and while its components are in motion.



WARNING

WARNING!

The Baler's operation without mounted and closed guards which protect the moving parts is strictly prohibited.



WARNING

WARNING!

Prior to each starting of the Baler, check its technical condition, completeness, and make sure the guards are in place.



CAUTION

CAUTION!

It is strictly forbidden to operate the Baler under raised and unprotected machine units.

**CAUTION****CAUTION!**

Take particular care at connecting and disconnecting the Baler from the tractor. The machine must be connected to a tractor equipped with a lower transportation hitch withstanding a higher vertical load than the vertical load on the Baler's drawbar (Chapter 1.5).

**CAUTION****CAUTION!**

Prior to each Baler start-up and ride on public roads, check if the machine is correctly connected with the tractor, if the wheels are correctly tightened, and if the drawbar is properly connected to the tractor.

**DANGER!****DANGER!**

It is strictly forbidden for anyone to stand between the tractor and the Baler when the tractor's engine is operating.

**DANGER!****DANGER!**

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

**CAUTION****CAUTION!**

Before each departure, check the position of the support foot. The support foot must be in the transportation position.

**WARNING****WARNING!**

Control the Baler's power hydraulic system from only the operator's cabin of the tractor.



WARNING

WARNING!

It is forbidden to operate the machine for people under the influence of medicines or other substances which affect the ability to drive vehicles and general psychophysical efficiency, or medicines causing problems of concentrating, or delaying the response time, and for those under the influence of alcohol.



WARNING

WARNING!

It is forbidden to climb the Baler during its transportation and operation.



CAUTION

CAUTION!

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



WARNING

WARNING!

Take special care during operations on inclined area. Pay particular attention to the possibility of bales rolling down and to the risk of losing stability by the machine.



WARNING

WARNING!

Take special care when working, paying particular attention to the possibility of the Baler tipping over to the side if it drives into a hole, ditch, or other irregular terrain on the field, especially if its ejection flap door is open.



DANGER!

DANGER!

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

**WARNING****WARNING!**

Particular caution should be exercised during standing on the platform. It is forbidden to stand on the platform during the machine's operation.

**WARNING****WARNING!**

Wear well-fitting clothes which cannot be caught by the movable elements and boots with non-slippery soles. If there is a risk where items may eject during an operation, wear a safety helmet with an eye shield.

**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.

**WARNING****WARNING!**

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



Check and, if necessary, replace any damaged tube guards and fixing. 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 blotting paper or other paper.

**CAUTION****CAUTION!**

Hydraulic connections must be always kept clean. Always reattach the plastic cap supplied with the machine after use.



WARNING

WARNING!

Work on the pressurised hoses is prohibited; it may cause pollution or serious injuries.



WARNING

WARNING!

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



WARNING

WARNING!

Traffic laws and manufacturer's recommendations must be observed during transportation on roads (Chapter 1.7.3).



CAUTION

CAUTION!

Prior to going on public roads, carry out a visual inspection of the transported machine.



WARNING

WARNING!

While transporting on public roads, it is forbidden to transport rolled bales in the Baler's chamber.



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. The tractor should be equipped with a fire extinguisher. To reduce a fire hazard, perform regular maintenance of the Baler and clean it of the crop or the binding material wound up on it.

**WARNING****WARNING!**

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

**WARNING****WARNING!**

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

**WARNING****WARNING!**

During the Baler's operation, there is a risk of lightning strike.

**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 above 78 dB;

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 a 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.

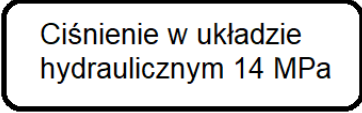
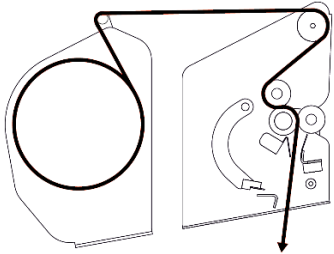
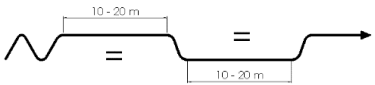
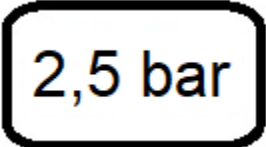




1.6.2 Warning signs





Table 2 Warning signs

	Safety symbol (sign)	Meaning of the symbol (sign) or content of the inscription
1		Warning – read the Instructions Manual before performing this operation.
2		Before performing any maintenance or repairs, switch off the engine and remove the ignition key, and then read the Instructions Manual.
3		Keep a safe distance from the lifted cover when the Baler is in operation.
4		Do not stay under a raised and unsecured rear flap. Close the stop valve to secure the rear flap from falling down.

5		<p>Do not reach into the pick-up zone when the tractor's engine or PTO drive shaft is working.</p>
6		<p>Do not stand under the lifted cover which is not secured against accidental drop.</p>
7		<p>Danger of being crushed by bales rolling out. Keep a safe distance from the working machine.</p>
8		<p>Do not open and remove the protective guards while the machine is in operation.</p>
9		<p>Do not open and remove the protective guards while the machine is in operation.</p>
10		<p>Information about the PTO's rotational speed and direction of rotation.</p>
11		<p>Do not travel on platforms or ladders.</p>

12		<p>Do not come near any moving swivel joints of the hitches when the engine is working.</p>
13		<p>Do not stand between the machine and tractor, when the tractor engine is working. This area is particularly dangerous.</p>
14		<p>Keep away from the rotating power input connection.</p>
15	<p>UŻYTKOWNIKU ! Przy zawracaniu i na ostrych łukach obowiązkowo wyłącz napęd WOM ciągnika</p>	<p>Information pictogram.</p>
16	 <p>UWAGA! MASZYNA MOŻE BYĆ URUCHOMIONA DOPIERO PO ZAMKNIĘCIU OSŁON</p>	<p>Information pictogram.</p>
17		<p>Keep a safe distance from the working machine.</p>
18		<p>Main lubrication points of the Baler.</p>
19		<p>Lifting points for loading as means of transportation.</p>

20		Information pictogram.
21		The method of installing the net.
22		Information pictogram.
23		Information pictogram.
24		Lift placement points.
25		Warning pictogram.
26		Before carrying out any maintenance work in the net wrapping area, secure the net cutter.
27		Do not open and remove the protective guards while the machine is in operation.

28		Do not reach into the crushing area if the elements can move.
29		Avoid exposure to liquid flowing under pressure. Read the Instructions Manual regarding maintenance.
30		Information pictogram.
31		Warning pictogram.

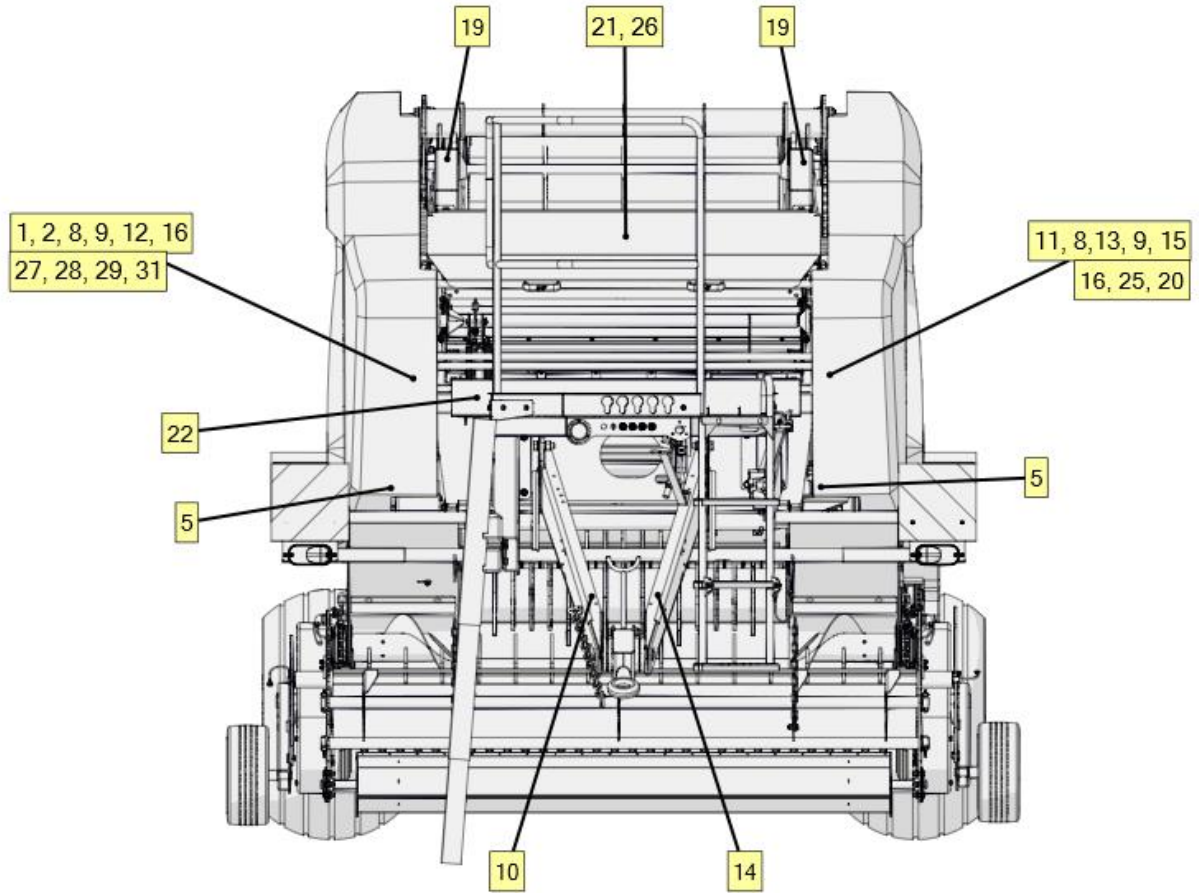


Figure 9. The arrangement of safety signs on the machine - front side

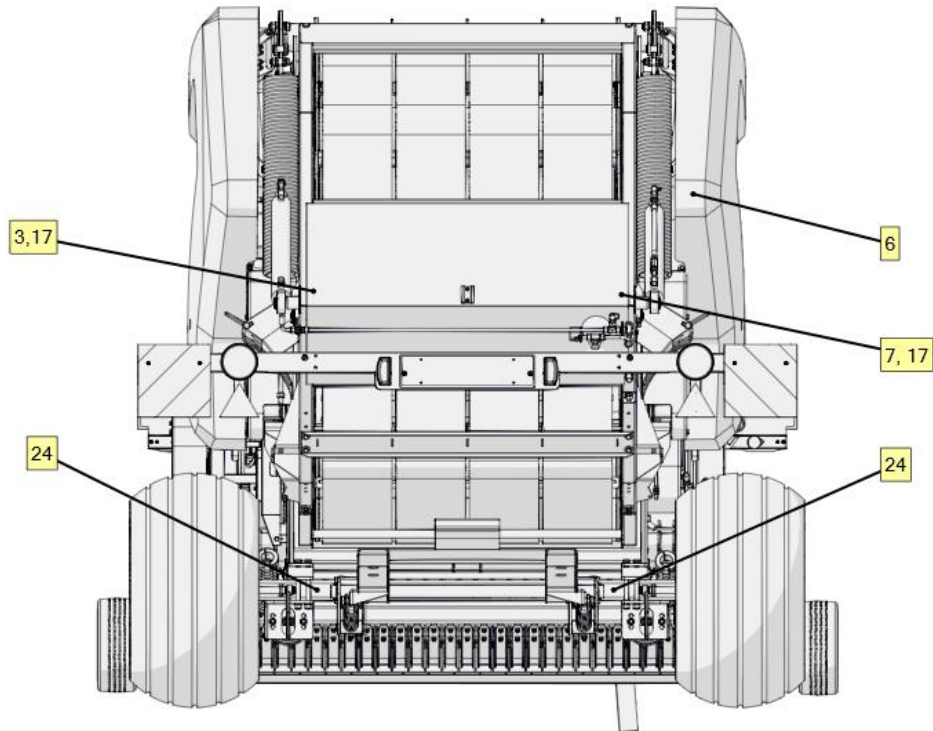


Figure 10. The arrangement of safety signs on the machine - rear side

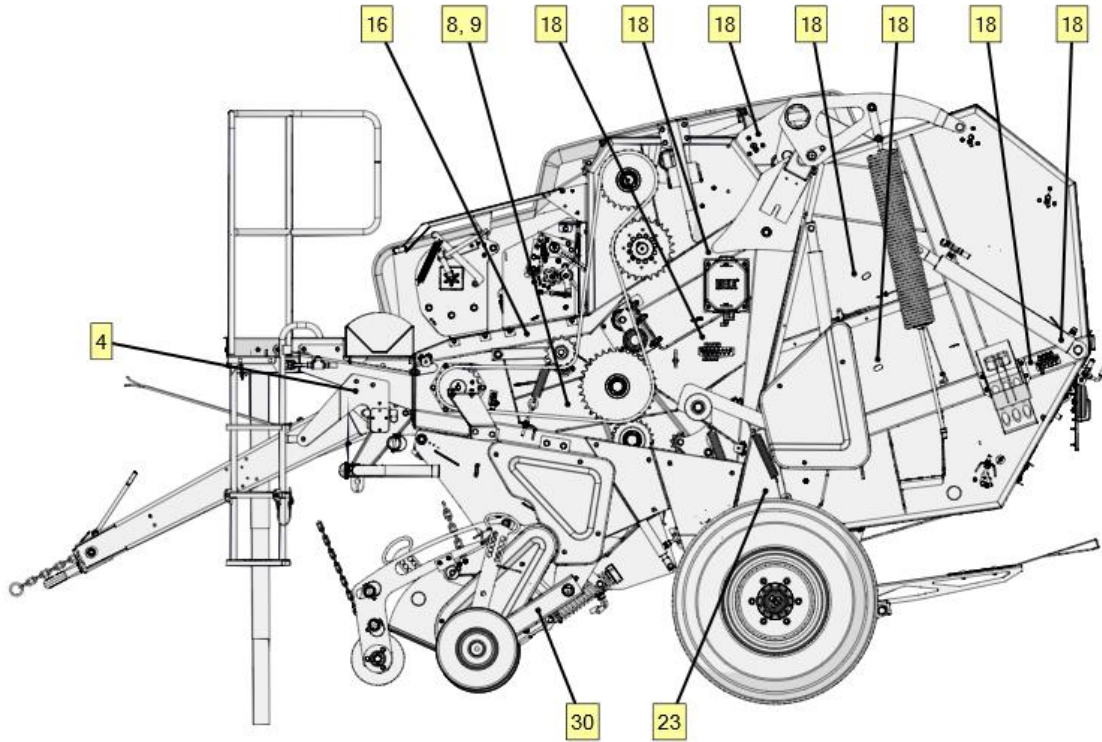


Figure 11. The arrangement of safety signs on the machine - left side

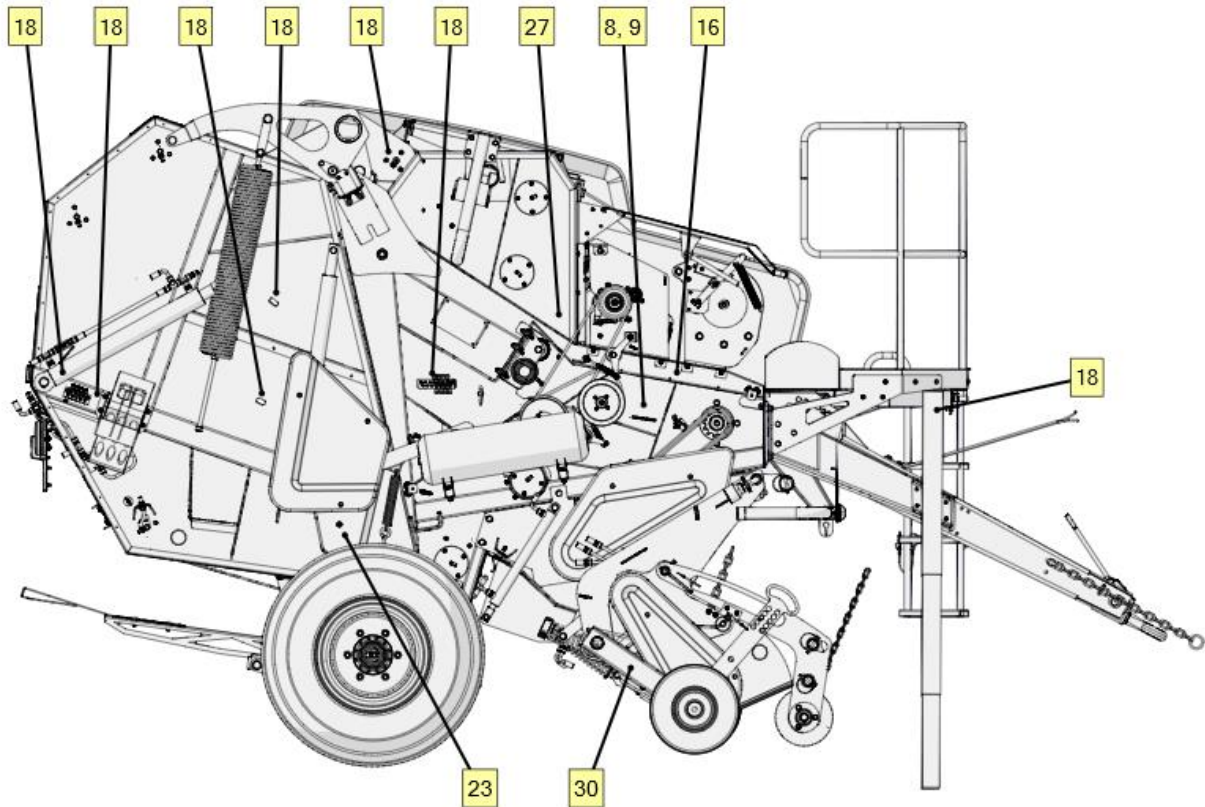


Figure 12. The arrangement of safety signs on the machine - right side

1.7 Baler transportation

1.7.1 Stability of the tractor-baler unit

Before coupling the machine with the tractor, determine the stability, according to the following equation. The tractor's front axle load must be at least 20% of the tractor's weight (Fig. 13). If this condition is not met, the tractor's front axle must be additionally loaded.

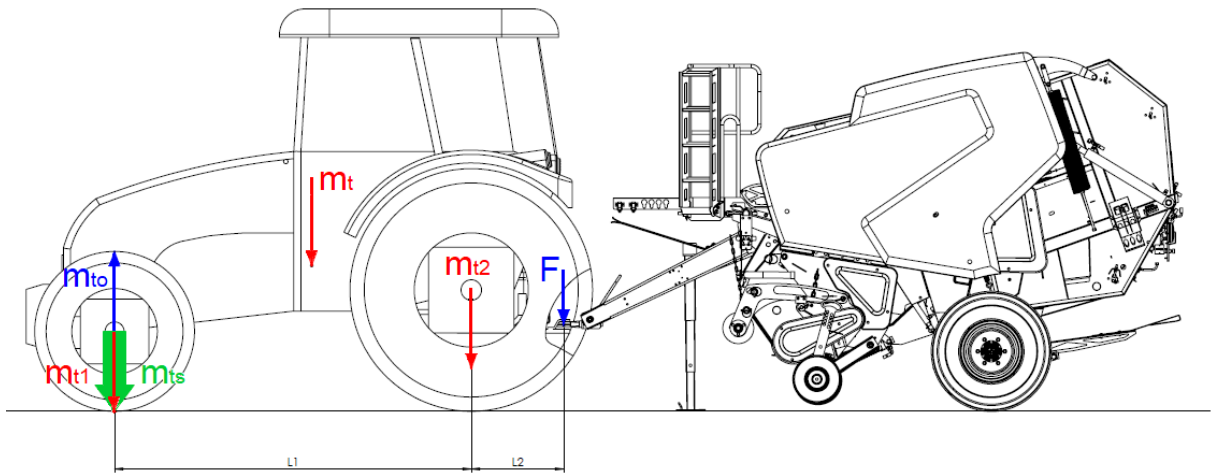


Figure 13. Stability of the tractor-baler unit

$$m_{t0} = \frac{F(L_1 + L_2)}{L_1 g}$$

$$m_{tS} = m_{t1} - m_{t0}$$

$$m_{tS} \geq 0,2m_t$$

where

F2 – the downward vertical force acting on the hitch, $F = 7100$ [N],

g – gravitational acceleration, $g = 9.8 \left[\frac{m}{s^2} \right]$

m_t - tractor weight [kg];

m_{t1} – load exerted on the tractor's axle, without hitching the Baler [kg],

m_{t0} – additional unloading of the tractor front axle [kg],

m_{t1} – load exerted on the tractor's axle with the Baler coupled [kg],

L_1 – the distance between the tractor's axles [m],

L_2 – the distance between the centre of the tractor's rear axle to the hitching point [m].

1.7.2 Transporting loads



The Baler is designed for the rail and road transportation of the relevant load carrying capacity.

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

The suspension sling attachment points for the transportation of the Baler are shown in Fig. 14.

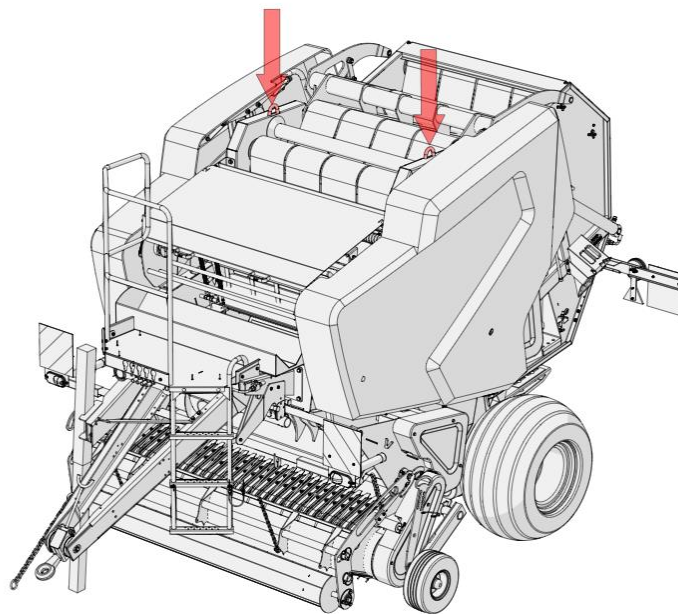


Figure 14. Suspension sling attachment points

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

For the duration of transportation, the Baler must be permanently and reliably attached to the floor.

1.7.3 Road user

The Baler is designed for driving on public roads, as a machine coupled with the farming tractor's lower transporting hitch.

You can use an agricultural tractor with the technical characteristics shown in Table 1, for transportation on public roads.

When driving the Baler on public roads, the wheels of the pick-up must be in the transportation position, as shown in Figure 15. If the wheels are by the pick-up, place them in the tube (2), and lock the position with the pin (1). Do the same for both the left and right wheels.

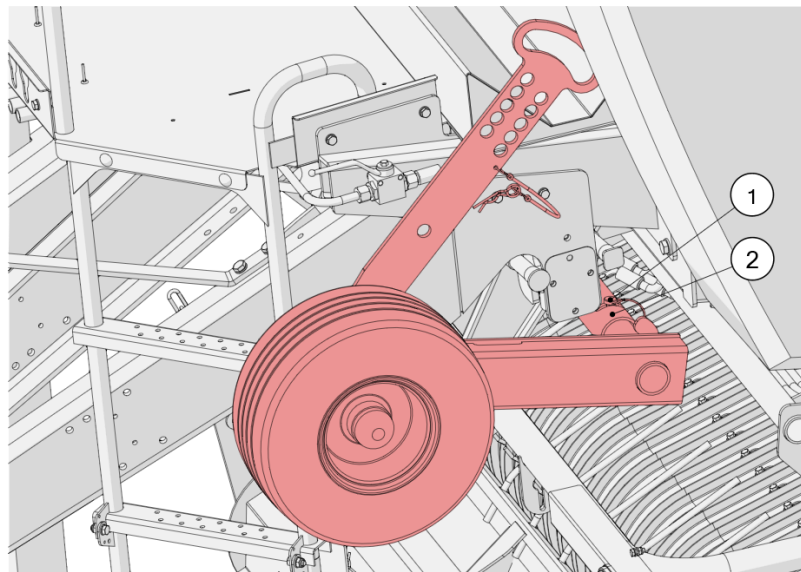


Figure 15. The wheels of the pick-up in the transportation position

Prior to going on the public roads:

- Disable the PTO drive shaft;
- The hydraulic hoses should be disconnected and fixed in a relevant way;
- Disable the counter and leave it in the cabin;
- Fix the sign indicating slow moving vehicles in the bracket in the rear section of the machine (Fig. 16);
- Check if the lighting and signalling systems are in good working order;
- Check tyre pressure;
- Make sure that the wheels of the pick-up are in the transportation position (Fig. 15);
- Make sure that the rear chamber and guards are closed;
- Secure the pick-up (see Chapter 5.1.7.3.)



WARNING

WARNING!

It is forbidden to carry people on the machine during operation or transportation.



WARNING

WARNING!

Transport of a rolled bale in the Baler chamber is forbidden.

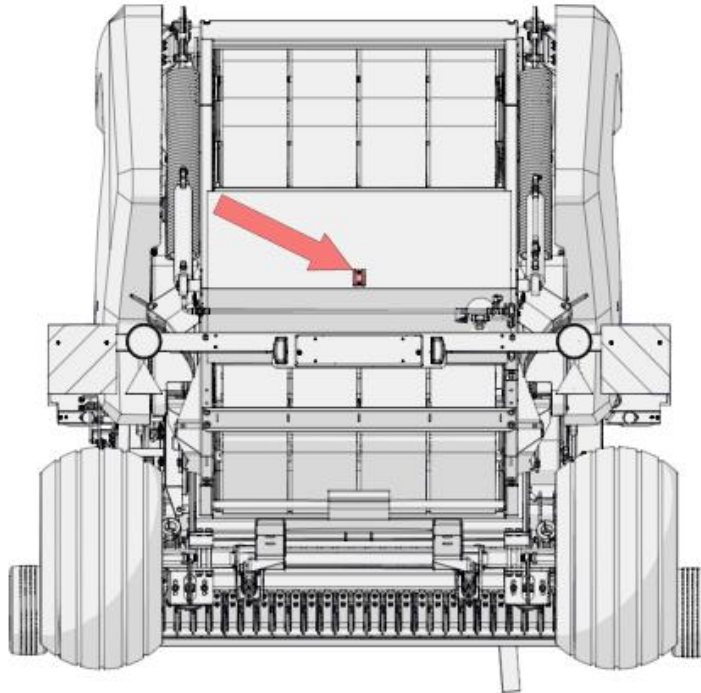


Figure 16. Location of the board indicating slowly moving vehicles,



WARNING

WARNING!

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

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

- Stop the vehicle to avoid causing any safety hazards 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 a built-up area, a reflective triangle should be placed 30 m to 50 m behind the vehicle, and the hazard warning lights should be on;
- In a built-up area, switch on the hazard warning 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 traffic participants;
- In the case of a breakdown, undertake the 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 the tractor's engine are all disabled (the ignition key removed).

Disconnect the supply, lighting, and control panel cords.

Secure all units of the machine, as described in section 5.1.7.



WARNING

WARNING!

Exercise care when cleaning the machine, especially near its moving parts and knives.

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 longer 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 longer 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 delivered guarding covers.

Store the Baler on a flat, level, and hardened surface, to prevent injury to people and animals.

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 canvas 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. If it is destroyed, report at the service.

Check the condition and legibility of the pictograms. If they are destroyed, replace them with new ones.

1.10 Risk

1.10.1 Residual-risk description

The residual risk stems from improper procedures implemented by Baler's operators. The following prohibited actions cause the highest level of risk:

- coupling the balers with tractors, which fail to meet the requirements given in the document;
- standing under the lifted machine chamber which is not secured against accidental drop;
- standing on the Baler during transportation;
- checking the technical condition and cleaning the machine when the tractor's engine is running and the machine drive is on;
- operation with the guards opened;
- servicing or repairing the PTO drive shaft when the tractor's engine is on;
- using faulty hydraulic hoses;
- control of the Baler by an operator who is outside the tractor's cabin;
- operating the machine under the influence of alcohol or drugs;
- operating a damaged machine or operating with the guards removed;
- transportation of a rolled bale in the Baler's chamber;
- using the Baler for other than its intended purpose;
- leaving the unsecured machine on slopes;
- working on sloped terrain;
- standing between the tractor and the machine with the engine running.

When presenting the residual risk, the Z514 Baler is treated as a machine that, from the moment of the start of its manufacturing, was designed according to the current state of the art.

1.10.2 Assessing residual risk

By observing the following instructions:

- Read the guidelines in the Instructions Manual carefully and adhere to them
- Standing under raised machine units is forbidden
- no one is allowed in the area of Baler's operation,
- maintenance and repair of the machine at authorised servicing stations,
- operation of the Baler by trained and authorised operators,
- protecting the Baler from children and bystanders, it is possible to eliminate the residual risk associated with machine operation, and as a result, eliminates the risk to people and the environment.



DANGER!

DANGER!

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

1.11 Dismantling and disposal

Dismantling and disposing of the machine can be dangerous, and it can only be carried out by specialised technical services 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 transportation. The authorised 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 disassembly.

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

Disassemble the machine. Sort the disassembled parts. Send them to relevant companies which collect such materials.

During disassembly of the Baler, use proper protective clothes and protective boots.

1.12 Accessories

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

- a hard copy of the spare parts catalogue;
- a triangular plate indicating slowly moving vehicles.

2. Start-up



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 the initial start-up of the Baler, read the Instructions Manual thoroughly; pay 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 starting of the Baler, install the control panel in the tractor's operating cabin.



CAUTION

CAUTION!

Exercise extra care during the initial start-up.

No bystanders can be present in the working area of the machine as it may 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,
 - Raising and lowering the rotor's floor,
 - Checking the pick-up functioning,
 - Checking the functioning of the net wrapping mechanism,
 - Checking the functioning of the 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,
 - Discussing the design and principle of operation of net wrapping:
 - 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 the pump's rate of delivery,
 - Discussing 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 along a straight line,
 - Operation of the tractor during picking up windrows along curves and when making sharp turns,
 - Discussing risks,
 - Performing a complete bale binding process by the user (buyer), assisted by a service technician,
 - Discussing and adjusting the tension of the chains,
 - Discussing the method of lubrication and ongoing Baler maintenance,



The first start-up is executed by the technical service, free of charge.

The service technician's signature in the guarantee card is proof of completing the initial start-up procedure, as 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 the user (buyer).

3. Coupling the machine

All the activities must be performed by a single person, who has read these Instructions Manual thoroughly, in particular the chapter discussing operational safety.

Before starting work, check the following:

- 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 technical condition of the parts for wearing,
- The condition of hydraulic lines,



Hydraulic lines must be replaced every 6 years.

- Tyre pressure; The recommended tyre pressure is 2.5 bar.
- Whether the machine has been prepared for operation (see Chapter 4.1);
- Whether all the activities described in the maintenance schedule have been performed (see Chapter 5.2);
- Whether the rear flap's valve is open;
- Whether the tank of the pneumatic braking system is empty.

Unless specified otherwise in the Instructions Manual, 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:

3.1 Requirements for tractor

Couple the Baler with agricultural tractors with the technical characteristics shown in Table 1.

3.2 Coupling with the tractor's lower transportation hitch

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

Prior to coupling, align the tractor's centre line with the machine's centre line on an even and level ground. Stop the tractor's engine, take the key from the ignition, and engage the tractor's auxiliary 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. 17.

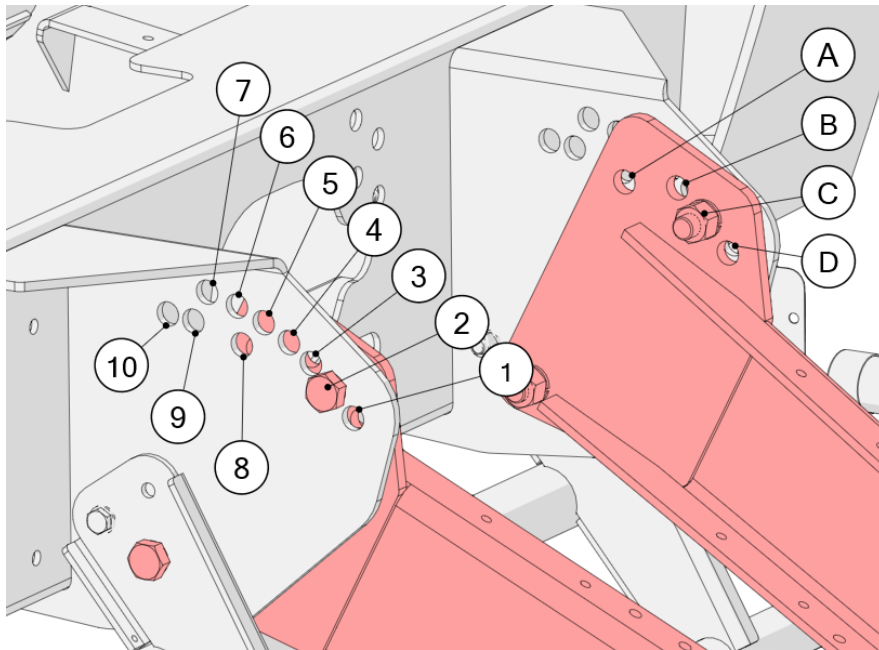


Figure 17. Setting the drawbar height

The table below gives the distance of the drawbar eye from the ground.

Table 3 Distance of the drawbar eye from the ground

Drawbar hole No. Bar hole No.	A	B	C	D
	Distance of the drawbar eye from the ground [cm]			
1	-	28	46	65
2	-	43	62	82
3	-	58	78	99
4	-	73	94	115
5	-	90	111	-
6	-	106		-
7	-	125	-	-
8	69	-	-	-
9	102	-	-	-
10	120	-	-	-

Perform the levelling of the hitch eye. Couple the drawbar eye with the tractor's transportation hitch and check the connection for correctness, and the protections for accidental disconnection.

Couple the machine only with tractors, the weight of which is at least equal to the weight of the Baler.

3.3 Coupling the Baler with the rear PTO drive shaft

Before connecting the PTO drive shaft, check the direction and rotational speed of the PTO.

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

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

The PTO drive shaft is a CE labelled drive transmission component.

Each PTO drive shaft comes with an Instructions Manual. You must read the Instructions Manual dedicated to the PTO drive shaft and follow the safety rules and guidelines contained in it.

Install the PTO drive shaft delivered with the machine between the tractor's shaft and the machine's gearbox.

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.

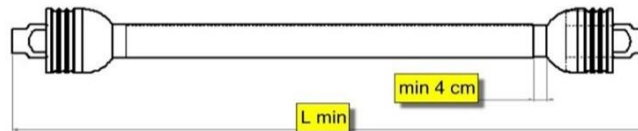


Figure 18. PTO drive shaft length

Adjust the length of the PTO drive shaft, as shown in Figures 18 and 19. The guards must overlap by at least 1/3 of their length, with the PTO drive shaft extended to the maximum.

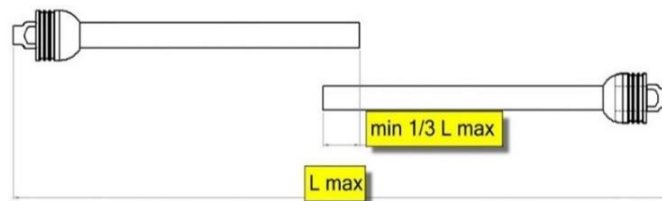


Figure 19. Length of the PTO drive shaft's guards

Make sure that the components protecting the PTO drive shaft from sliding off are 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 Instructions Manual regarding the drive shaft to find detailed information on its operation.



WARNING

WARNING!

It is strictly forbidden to operate the PTO drive shaft with its guard damaged or not in place, or without additional canopy guards installed on the tractor's PTO side and the machine's power input connection side.

3.4 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 hose with the cut-off valve, which supplies the chamber, to the unidirectional manifold.
- Connect the hoses controlling the floor to the two-directional manifold.

Before lifting the pick-up:

- Set the lever of the cut-off valve in the “OPENED” position, and then lift the pick-up (the transportation 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.

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

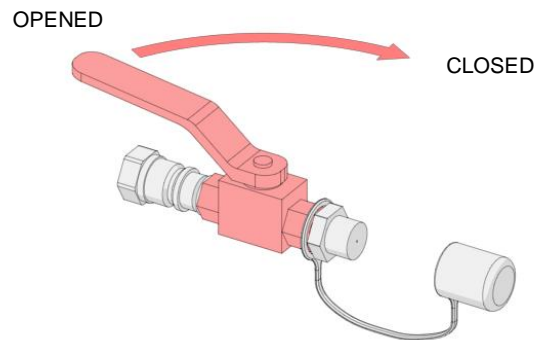


Figure 20. Cut-off valve

Before commencing baling, make sure that the cut-off valve in the baling chamber is open. This valve should be closed during maintenance work (see Chapter 5.1.7.1).

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

3.5 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 the ones which do not match the original ones.

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

3.6 Connecting the control system

The Baler's electrical system requires power supply of 12 V. Procedure of connecting the control system:

- Install the control panel in the tractor’s cabin in such a way that it is visible and accessible for the operator;

- Plug in the power supply cable to the socket in the tractor;
- Connect the signal cable to the control panel;
- Check if the control cabinet is enabled after pressing the switch. If the cords are connected correctly, the control panel lights up and starts loading data.

3.7 Connecting the braking system



DANGER!

DANGER!

It is forbidden to drive the Baler on public roads with a defective or disconnected braking system. The defective or disconnected braking system can lead to a collision or accident. It may cause an injury or death of the driver or other traffic participants.



CAUTION

CAUTION!

Remember about inspecting the braking system before each time you start the machine. Repairs of the braking system may be carried out only by those trained in it. Unauthorised repairs of the braking system are forbidden.

To connect the braking system:

- Empty the air tank (see Chapter 5.1.6);
- Check the cleanliness of the sealing washers of the coupling heads in the tractor and the Baler;
- Connect the pneumatic lines:
 - Connect the hose with the red cap to the red pneumatic connector in the tractor;
 - Connect the hose with the yellow cap to the yellow pneumatic connector in the tractor;
- After starting the tractor, wait for the braking system to reach the correct pressure;
- Check the correct functioning of the brakes.

INDEX OF NAMES AND ABBREVIATIONS

BHP - occupational safety and health;

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

Hitch, the lower transportation hitch – hitching components of an agricultural tractor (see the tractor's Instructions Manual)

kg – kilogram, weight unit

km/h – kilometre per hour, linear speed unit

kPa – kilo pascal, pressure unit

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

Pictogram – an information plate

Power input connection - the shaft receiving the transferred torque - a part of the Baler;

PTO - the rear Power-Take-Off shaft – a part of an agricultural tractor;

PTO drive shaft - the articulated telescopic shaft transmitting the torque;

rev - revolution, determining the kind of movement;

RPM - revolution per minute, a rotation speed unit;

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;

V – Volt, a voltage unit

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NOTES

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