METAL-FACH

SUSPENDED BALE WRAPPER

Z629

INSTRUCTION MANUAL

TRANSLATION OF THE ORIGINAL INSTRUCTION MANUAL

ISSUE 2

10/08/2023

Instruction Manual No. Z629-02-3600/2022

EC DECLARATION OF CONFORMITY

The undersigned,	Jacek Kucharewicz, President of the Board,	
hereby declares, with full responsibility, that the complete machine:		
SUSPENDED BALE WRAPPER		
1.1.	Brand (trading name of the manufacturer)	Metal-Fach
1.2.	Type:	Z529
1.2.1.	Variant:	Z629-000; Z629-0S0
1.2.2.	Version:	
1.2.3.	Trade name(s) (if any):	
1.3.	Category, subcategory and vehicle speed indicator	
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)	
1.5.1.	Location of the manufacturer's rating plate	On the front part of the main frame of the machine
1.5.2.	Method used to fix the manufacturer's rating plate:	Bonded
1.6.1.	Location of the vehicle identification number on the chassis	
2.	Machine identification number:	
3.	Function	

referred to in this Declaration, meets the requirements of:

Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery (Official Journal EU L157 of 09/06/2006, pp.24-86), the Regulation of the Minister of Economy of 21 October 2008 on essential requirements for machinery (Journal of laws 199, item 1228) and the Announcement of the Minister of Infrastructure and Construction of 27 October 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 2016, item 2022)

The following harmonised standards were applied in order to assess compliance.

PN-EN ISO 4254-1: 2016-02, PN-EN ISO 4254-14: 2016-02, PN-EN ISO 13857: 2010, PN-EN ISO 12100: 2012

and standards and regulations: PN-ISO 3600:1998, PN-ISO 11684:1998

Safety test report No. LBC/83/2016

The person responsible for making the technical documentation of the machine available is the Head of the Design and Technology Department, 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)

20/04/2017
(Date)

Jacek Kucharewicz
(Signature)

President of the Board
(position)

Machine data

Machine type:		Suspended bale wrapper
Type designation:		Z629
Serial number[1]:		_____
Machine manufacturer:		METAL-FACH Sp. z o.o. 16-100 Sokółka ul. Kresowa 62 Phone: (0-85) 711 98 40 Fax: (085) 711 90 65
Reseller:		_____
	Address:	_____
		_____
	Phone/Fax.:	_____
		_____
Delivery date:		_____
Owner or user:	Last Name:	_____
	Address:	_____
		_____
Phone/Fax.:		_____

[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 amending these instructions. 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 suspended bale wrapper made by Metal-Fach, type Z629.

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 as 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 .

The Warranty Card, including the terms and conditions of the warranty, is attached to this Instruction 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

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. Wrapping machine identification, general safety principles

1.1 Introduction

THE INSTRUCTIONS MANUAL IS PROVIDED WITH THE BASIC EQUIPMENT OF THE SUSPENDED BALE WRAPPER

To operate the bale wrapper in a safe manner, read and adhere to all the instructions set out in this instructions manual. Abiding by the guidelines provided in the instructions manual ensures safe operation for the user, and also prolongs the service life of the machine.

1.2 Identification of the wrapper

Identify the bale wrapper on the basis of the rating plate permanently fixed to its main frame.

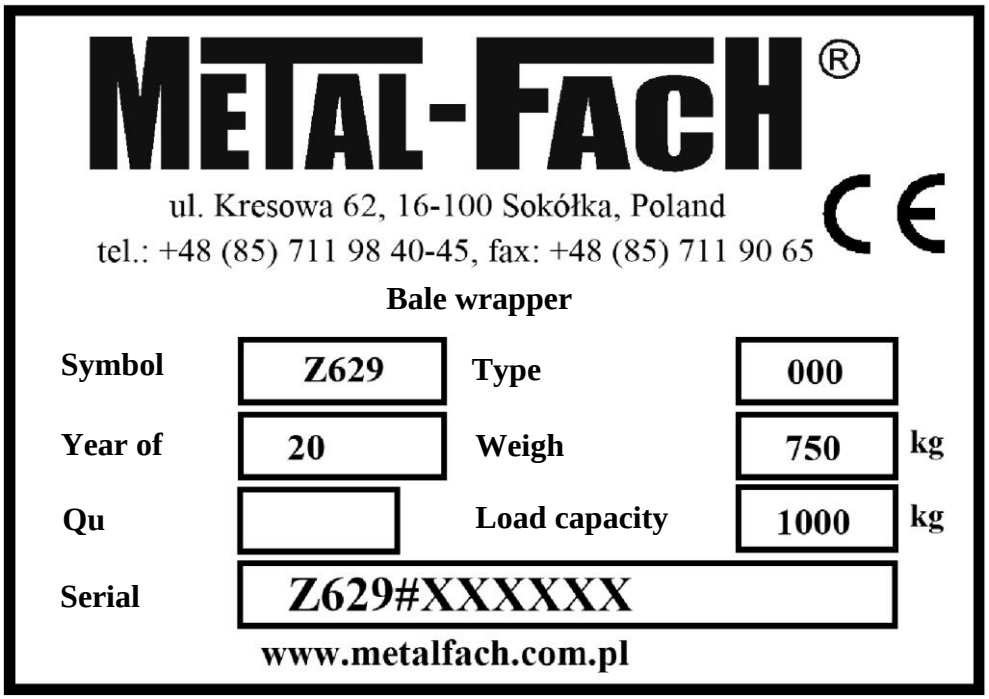


Figure 1. The data placed on the rating plate

CAUTION

CAUTION!

Operating the bale wrapper on public roads without the rating plate, or with an illegible rating plate, is prohibited.

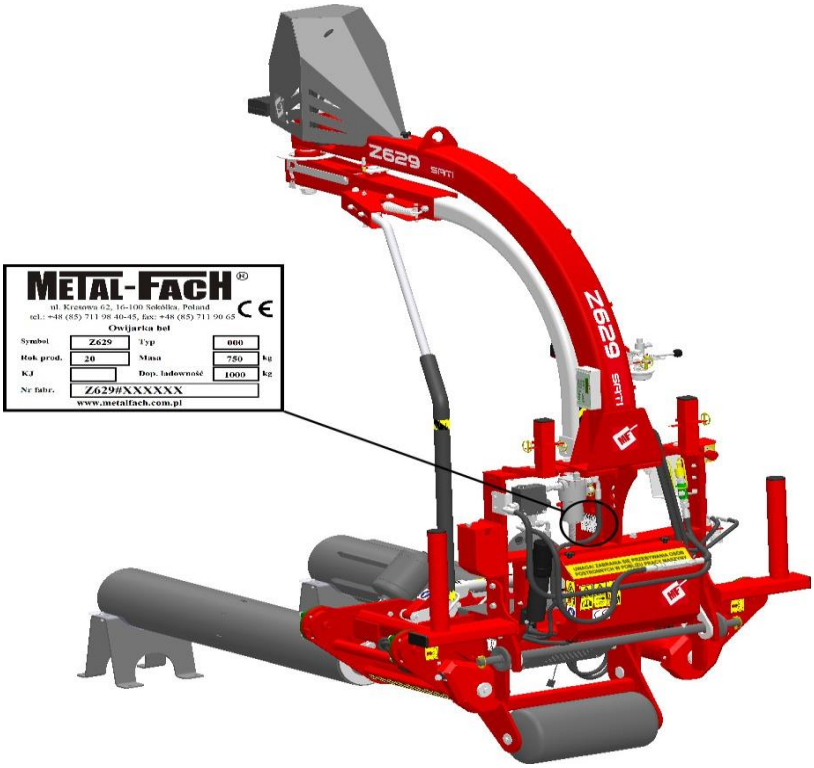


Figure 2. Location of the rating plate

Upon purchase, check the compliance of the factory number located on the machine rating plate with the number written in the instruction manual and warranty certificate – it is crucial for recognising the warranty. When contacting technical service, the seller, or the manufacturer, the user is obliged to provide the information included on the machine's rating plate.

The instruction manual constitutes the basic equipment of the bale wrapping machine Z629.

Factory number:

T	X	3	0	#	P				

Space 6 in the number indicates the year of manufacture (according to the table below):

Table 1. Year of manufacture

Code	Year	Code	Year
P	2023	T	2026
R	2024	V	2027
S	2025	W	2028

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.

Please read the instruction manual carefully!

Application of its recommendations will allow hazards to be avoided, and to efficiently and productively operate the machine and maintain the guarantee for the duration period granted by the manufacturer.

CAUTION

CAUTION!

It is prohibited for persons who have not read this manual to use the bale wrapper.

1.3 Intended use

The Z629 bale wrapper is a machine attached to the back on a three-point hitch, intended to take up bales of compressed grass, hay or other not lignified plants from the ground using bottom wrapping arms. Then the process of wrapping the loaded bale with film intended for silage, which is charged on the film feeder located on the upper wrapping arm, which rotates round the bale, takes place. After finishing wrapping the film is caught and cut off by the film cutting unit. The last stage is the depositing of the wrapped bale onto the ground.

All the working actions must be carried out by one person – the operator who is in the tractor's seat. The wrapper is a machine controlled electronically, the particular cycles of its work are executed automatically after confirming their start by the operator.

No cargo, goods, people, or animals may be transported by the wrapper. It is prohibited to transport bales on the wrapping machine on public roads.

The wrapping machine may not be used for wrapping or catching/lifting materials other than plant-material bales.

Foils or other materials intended by the manufacturer for applications other than wrapping up bales from plant materials may not be used with the wrapper.

1.3.1 Incorrect and prohibited uses

The following uses are incorrect and prohibited:

- checking the technical condition and cleaning the machine while the tractor engine is running;
- transporting cargo, goods, people or animals;
- transporting bales on a wrapper on public roads;
- wrapping or grabbing/lifting of materials other than bales of plant material;
- the use of film or other materials for purposes other than wrapping bales of plant material as intended by the manufacturer;
- using faulty hydraulic hoses;
- operation of the machine while under the influence of alcohol or drugs;
- working with a defective machine;
- working on sloping terrain;
- entering the area between the tractor and the machine with the engine running;
- any other use of the machine not in compliance with its intended purpose.

The machine is intended for use exclusively for agricultural purposes as described in these instructions. Any other utilisation of the wrapping machine is considered to be non-compliant with its intended use, and releases the manufacturer and distributor from their responsibility for any damage arising as a result of incorrect utilisation.

CAUTION

CAUTION!

Unauthorised construction changes, work with the bale wrapper that is not compliant with its intended use, and avoiding the safety principles release the manufacturer from responsibility for any resulting hazards and damages.

1.4 General safety rules

WARNING

WARNING!

The wrapper can be operated only by qualified persons who have read this instruction manual.

Prior to the first starting up all the chapters of the instruction manual should be read carefully, if it is done during operation it may be too late.

The wrapper was designed and constructed so as to provide maximum safety of use.

1) 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 machine should be met.
2) The wrapper operator can only be an adult person holding a valid authorization to operate agricultural tractors, familiar with the occupational safety and health regulations in respect of operating agricultural equipment and familiar with this instruction manual.
3) Read and thoroughly understand this manual, and observe its recommendations, paying close attention to the instructions concerning the safe operation of the bale wrapper.
4) The instructions indicate the machine elements constituting potential hazards. Dangerous places are marked on the machine with yellow labels with warning pictograms. Special attention should be paid to the dangerous places, and recommendations should be strictly adhered to.
5) You should learn the meanings of the pictograms you come across.
6) Operation of the wrapper without protective guards installed in place is strictly prohibited.
7) Prior to each starting of the wrapper, check the machine's condition, completeness, and the mounting of the guards.
8) Prior to each departure, starting up and driving on public roads check correctness of the machine connection with the tractor.
9) It is only allowed to drive on public roads with the wrapper in the transport position.
10) 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.
11) Prior to commencement and during loading of bales make sure that there are no by-

standers, especially children.

12) During the operation of the wrapper clear a free space in the zone of the rotating parts. During wrapping of the bales there can be no people or animals in the zone of the rotating parts.
13) Never leave the machine unattended during operations.
14) Take special care during operations on inclined areas. Pay special attention to the possibility of a bale rolling down.
15) It is strictly forbidden to operate the wrapper under raised machine units.
16) It is strictly forbidden for any person to stay between the tractor and the wrapper during tractor-engine's operations.
17) Take particular care when connecting and disconnecting the wrapper from the tractor.
18) During work use relevant working clothes and shoes with non-slip soles.
19) Bale wrapping film should be charged with the tractor's engine switched off and protected against its accidental starting up (keys removed from the ignition and parking brake engaged).
20) It is forbidden to use damaged power-hydraulics hoses. Immediately replace damaged hoses with new ones. During the exchange of the damaged hoses use impermeable protective clothes.
21) Control the power-hydraulics installation from the tractor operator's cockpit only.
22) During transport on public roads follow the traffic law regulations and recommendations of the manufacturer.
23) Prior to entry onto public roads, ensure visual control of the transported machine.
24) It is forbidden to climb onto the wrapper during parking, transport and operation.
25) While transporting on the public roads, it is forbidden to ride on the wrapper's swathes or hay-silage bales.
26) It is forbidden to work with the wrapper while under the influence of alcohol.
27) It is forbidden for persons under the influence of narcotics, or medicines with a narcotic reaction, to operate the wrapper
28) It is forbidden for the machine to be operated by persons under the influence of medicines with a negative influence on the ability to drive vehicles and general psychophysical efficiency, and medicines causing disturbances of concentration or delays to reaction time.
29) It is forbidden to operate the wrapper in a state of exhaustion that can cause interruptions to concentration and delays to reaction time.
30) It is forbidden to drive the wrapper near sources of open fire.
31) The firefighting regulations must be strictly obeyed and the hazards arising during operation or stoppage of the wrapping machine must be eliminated immediately.
32) The sources of fires must be extinguished using a dry-powder fire extinguisher.
33) During the operation of the wrapper do not approach it with open fire and do not smoke near the machine.
34) Prior to each departure to work check if there is a dry powder fire extinguisher included in the tractor equipment. If there is not one available provide the tractor with one.
35) When a breakdown occurs press STOP button on the control panel. Stop the tractor's engine, take the key from the ignition, and engage the auxiliary brake. Locate the breakdown and remove it using an authorised service.
36) Before reversing, bystanders must be warned by means of an audible signal or by the assisting person.

1.5 Wrapper design

The Z629 wrapper is made up of the following units: electronic control panel, main frame, hydraulic distributor, control module, lower hitch bar, upper hitch, support wheel or bale tipper (depending on version), lower wrapping arms, bale guiding rollers, film cutter, film feeder, safety arm, upper wrapping arm, main clamping arm, connecting hydraulic lines.

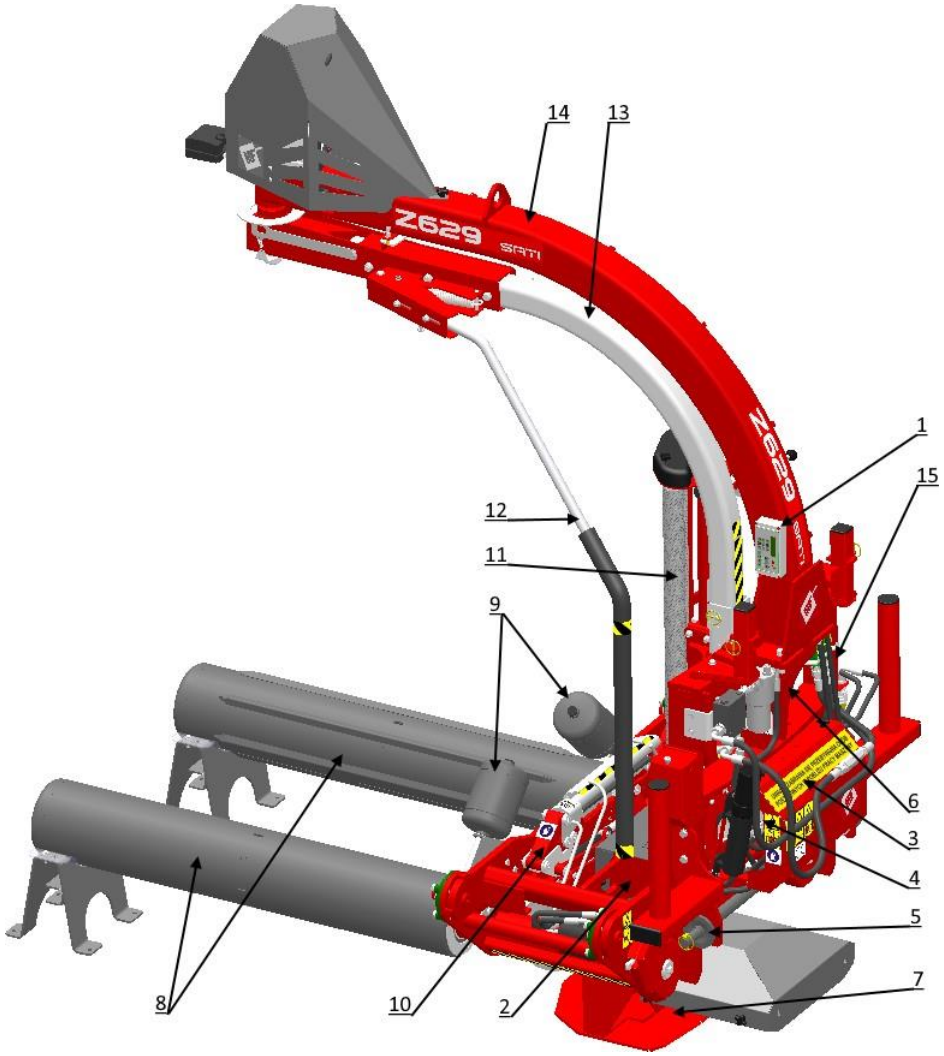


Figure 3. Bale wrapper design

1 – electronic control panel, 2 – main frame, 3 – hydraulic distributor, 4 – control unit, 5 – lower hitch bar, 6 – upper hitch point, 7 – bale tipper or support wheel, 8 – lower wrapping arms, 9 – bale guiding rollers, 10 – film cutter, 11 – film feeder, 12 – safety arm, 13 – upper wrapping arm, 14 – main clamping arm, 15 – hydraulic connection lines.

In the main frame (2), a lower hitch bar (5) mounted and the upper hitch point (6), through which the wrapper is to be connected with a tractor and levelled for both the transport and working positions.

The main fixing arm (14) is mounted to the main frame (2) and the main wrapping arm (13) is mounted to it with the protection arm (12) and foil feeder (11). The movable bale turning and loading arms (8) are fixed to the main frame (2). The film feeder (10) is fixed to the main frame (2).

1.6 Wrapper description

Table 2. Wrapper specifications

No.	Detailed list	UOM	
1	Type		Z629
2	The way of connecting with the tractor		Suspended
3	Overall dimensions in operating position Length/width/height	mm	2258/1674/2751
4	Overall dimensions in transport position Length/width/height	mm	2258/1452/2751
5	Machine weight (Z629-000/Z629-0S0)	kg	750/800
6	Maximum bale weight	kg	1000
7	Dimensions of a wrapped bale Length Diameter	mm	 1200 1200-1500
8	Maximum operation speed	km/h	10
9	Maximum transport speed	km/h	15
10	Connected with the tractor by	-	Three-point hitch (TUZ)
11	Hitch category	-	2
12	Minimal tractor power	kW	60
13	Required pressure in tractor hydraulic actuator system	MPa	14
14	Recommended tractor pump output	l/min	Min.: 22 Max: 50
15	Hydraulic oil purity class	-	Not less than 8 acc. to NAS 1638 (category 19/17/14 acc. to ISO 4406-1996)
16	Wrapper drive	-	Hydraulic from the tractor's power hydraulics
17	Wrapper arm drive	-	Hydraulic motor
18	Maximum rotary speed of the wrapper arm	rpm	30
19	Bale-loading method	-	Self-acting with bottom arms
20	Bale-unloading method	-	Self-acting with bottom arms (a bale tipper as an extra option)
21	Film cutting	-	Automatic after completing the wrapping cycle
22	Film width	mm	750
23	Wrapping arm revs with 750 mm film, bale diameter 1200 mm, 4 layers	rev.	16
24	Bale wrapping time (loading, wrapping, unloading)	min	~ 1
25	Number of operators	-	1 (tractor's operator)
26	Control panel	-	Electronic, type Z629
27	Electrical system voltage	V	12

1.7 Wrapper dimensions

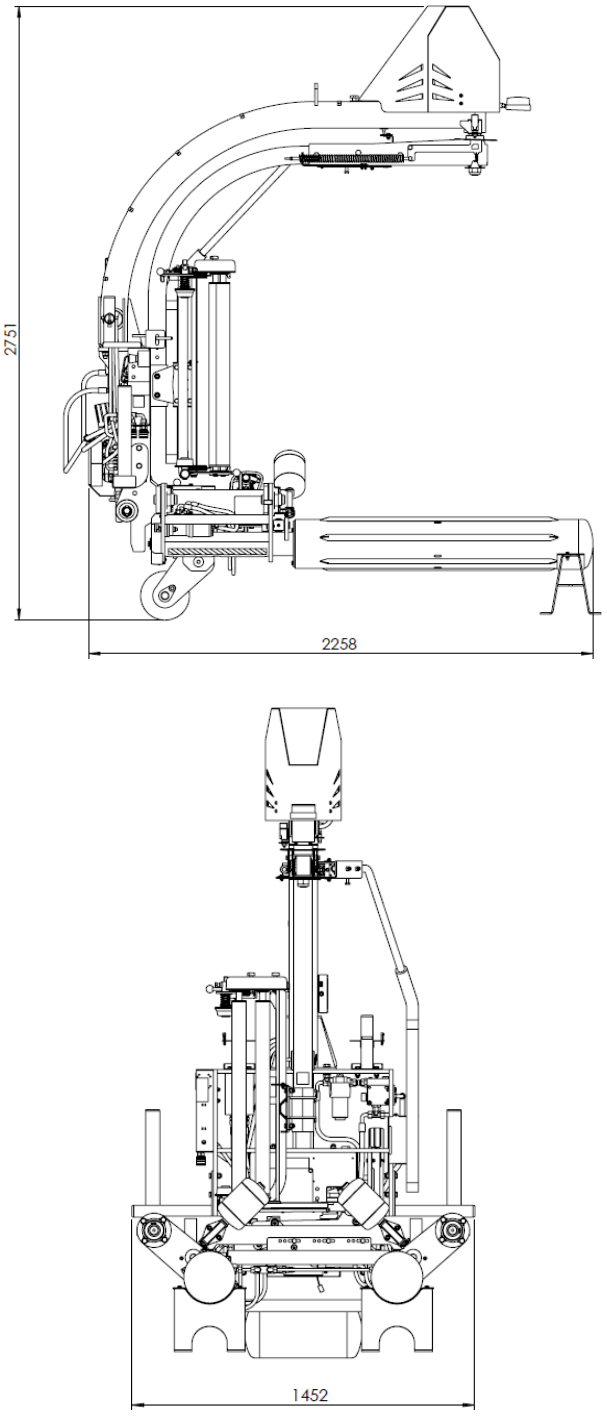


Figure 4. Overall wrapper dimensions in transport position

Overall wrapper dimensions in operating position are given in Table 1:

1.8 Location of pictograms

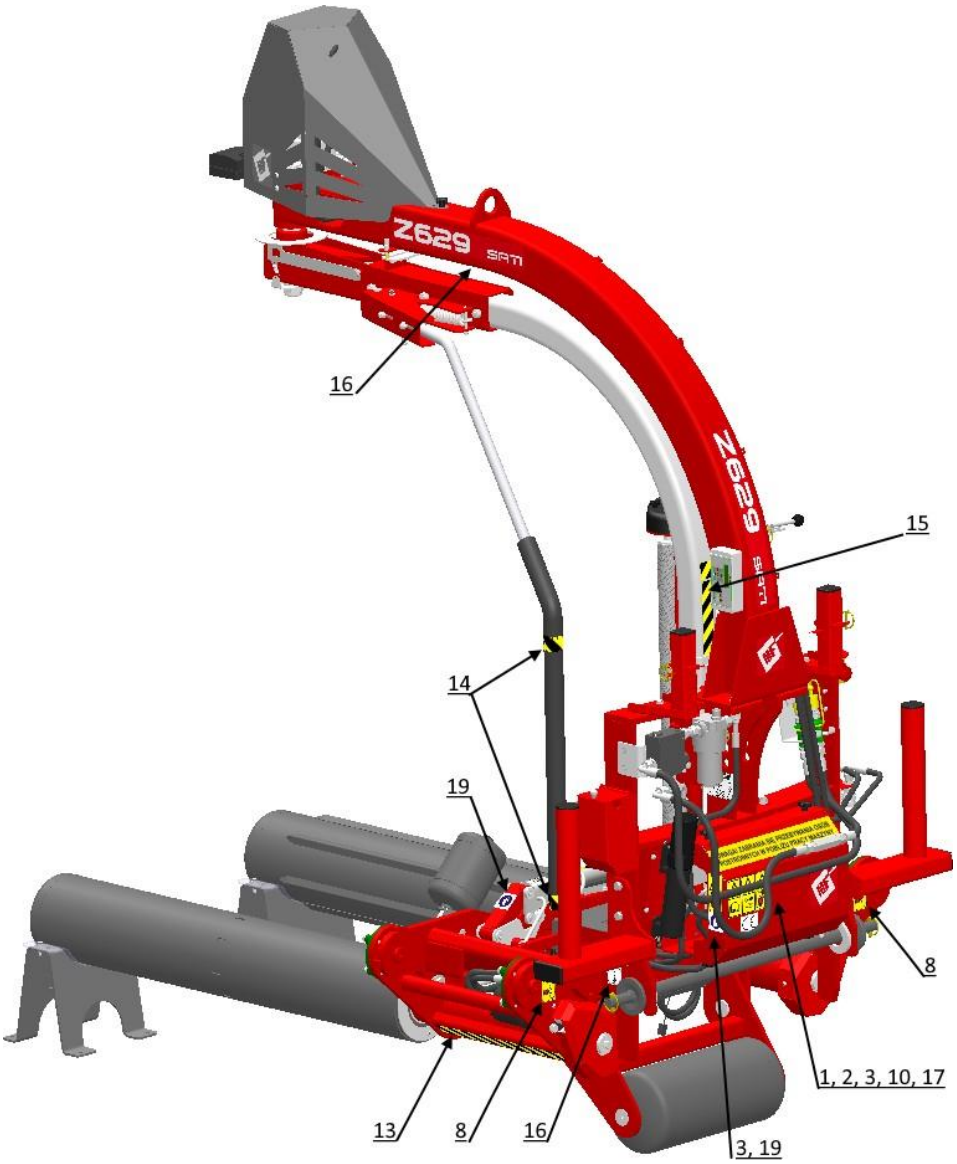


Figure 5. Location of pictograms back view
For the designations of the pictograms, see Section 1.9.

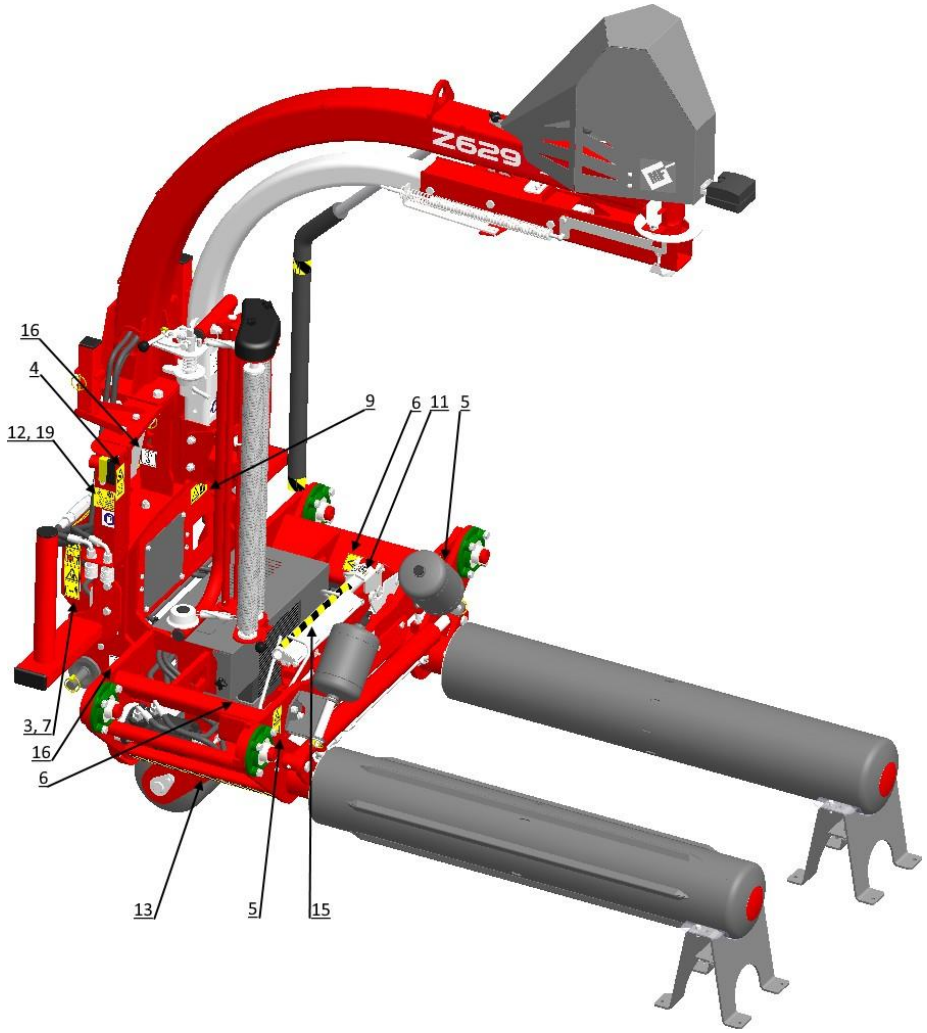


Figure 6. Location of the pictograms front view
For the designations of the pictograms, see Section 1.9.

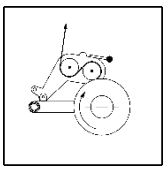
1.9 Warning symbols

Warning pictograms located on the machine (Section 1.8) inform the operator on hazards and risks that can occur during operation of the machine. Keep the symbols clean and legible.

Illegible symbols should be replaced with new ones; available for purchase from the manufacturer.

Table 3. List of safety signs and hazard tables

No.	Warning symbol	Symbol description
1.		Caution. Read the user manual
2.		Caution. Stop the engine and remove the key from the ignition prior to commencing the service or repair activities.
3.		Caution. Do not stand near tractor tie-rods during control of the lifter.
4.		Caution. Do not touch the machine elements before all its units have stopped.
5.		Caution. Crushing – rolling bale. Keep a safe distance from the machine.
6.		Caution. Do not reach into the crushing area if the elements can move.
7.		Caution. Risk of crushing toes or a foot. Keep a safe distance from the machine.
8.		Caution. Do not open and remove protective guards if the engine is in operation.

9.		Caution. Do not travel on platforms or ladders.
10.		Warning inscription Caution! Bystanders standing within the machine operation range is prohibited.
11.		Warning inscription Caution! Sharp blade.
12.		Warning inscription Make sure to read the instruction manual before starting up the machine and strictly adhere to recommendations concerning safety of work during machine operation.
13.		Warning stripe 40 x 440.
14.		Warning stripe 40 x 260.
15.		Warning stripe 40 x 400.
16.		Pictogram informing of: Sling attachment/Lifting point.
17.		Pictogram informing of: CE marking the manufacturer's conformity declaration on the complying of the machine with European Union Directives.
18.		Pictogram informing of: Film mounting procedure.
19.		Pictogram informing of: Wear safety gloves.

2. Use with a tractor

Prior to the commencement of connecting the bale wrapper to the tractor make sure that it fulfils all the requirements specified in the machine characteristics (Section 1.6). Connect the wrapper Z629 with a tractor featuring the power of not less than 60 kW.

The tractor must be provided with at least two power-hydraulics quick-release sockets (acc. to ISO 7241-1, type A, size 12.5), affording pressure supply and the free return of oil from the wrapper's distributor to the tractor's oil tank. The tractor's hydraulic installation must allow the switching off of the hydraulic supply of the working sections from the tractor's operator's seat in the tractor's cockpit.

The tractor must be provided with a 3-pin 12 V electric socket (DIN 9680).

Prior to connecting with the tractor the operator must make sure that the wrapper is complete.

Make sure that the points marked for lubrication are actually greased. If it is not the case, have them lubricated (Section 5.1).

CAUTION

CAUTION!

Make sure the power hydraulic system is tight. In order to check that there are no leaks from the hoses use tissue paper or other paper.

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 being ejected, wear a protective helmet with eye protection.

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 in the near proximity of the machine. Stop the bale wrapper immediately if any persons come near the machine, and require any unauthorised persons to leave this 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 Bale Wrapper's operator is responsible for all damage inflicted by the machine during operations.

2.1 Coupling with the drive

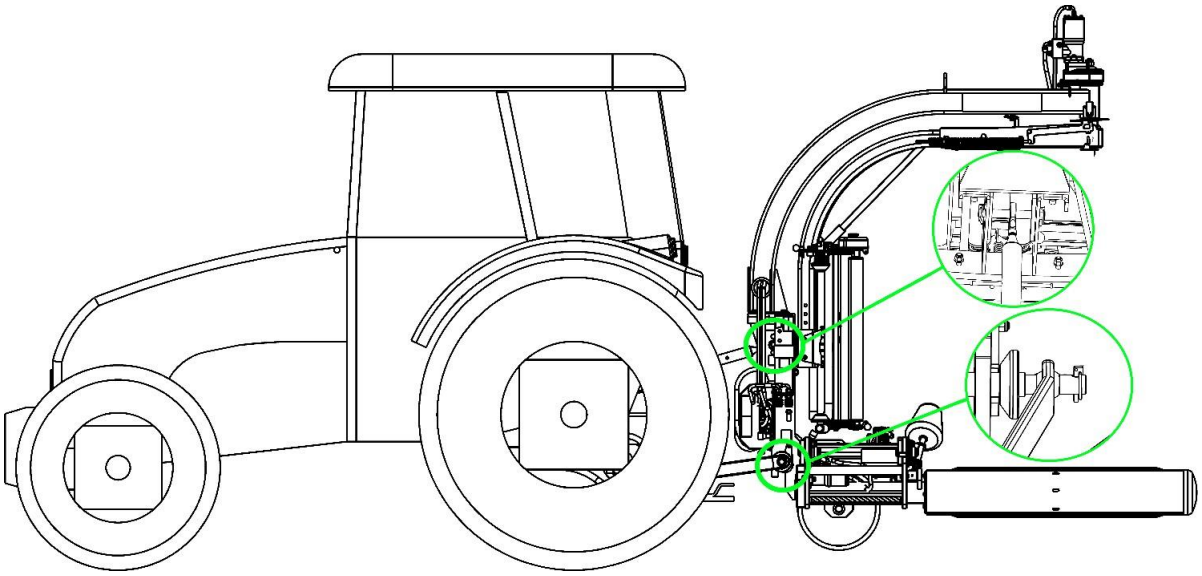


Figure 7. Point of connecting the tractor with the wrapper

- The wrapper should be connected to the three-point hitch TUZ class 2.
- Make sure that in the area of connecting the wrapper with the tractor and in the near vicinity there are no third parties present, children especially.
- When coupling to the tractor the wrapper should be positioned on a hardened level and horizontal surface (Fig. 10). Stop the tractor’s engine, take the key from the ignition, and engage the tractor’s parking brake.
- Fit and secure the wrapper hitch bar to the tractor's lower hitch. Set the hooks securing the hitch bar on the wrapper in the raised position.
- Position the tractor so that the lower links of the lift with the hitch bar are opposite the lower attachment sockets of the wrapper.
- Lower the lower links of the hydraulic lift below the height of the lower mounting sockets and drive the bar slowly backwards under the mounting sockets by reversing the tractor. The side stops on the hitch bar should be on the outside of the mounting sockets.
- Use the tractor control lever to lower the lower links of the hydraulic lift below the height of the lower mounting sockets and drive the bar slowly backwards under the mounting sockets by reversing the tractor. The side stops on the hitch bar should be on the outside of the mounting sockets.
- Raise the lift links by sliding the bar into the sockets until the hooks securing the bar can be lowered.
- Connect the upper tractor hitch point with the wrapper with the third link.
- Adjust (by tensioning properly) the stiffness of the bottom links of the tractor lift.
- Lift up the wrapper with the lift and using the upper link and adjust setting of the wrapper to be in proper positions.
- Connect the electric power supply plug to the wrapper (Section 2.3). Protect against accidental disconnection. Any excess length of the power supply cable should be placed in the operator cockpit.
- Place the control panel in the tractor cockpit and then connect to it the communication cable. Any excess length of the control cable should be placed in the operator cockpit.

- Connect the hydraulic supply system – the return line plug (-) to the tractor's free drain socket and the supply line plug (+) to the tractor's hydraulic distributor working section socket.
- Remove the transport lock of the wrapping arm (Section 7.2, Fig. 44)
- Start the tractor, switch on the control panel and check the correct operation of the power hydraulic systems in the manual mode, without the bale and without foil on the feeder. (Section 2.1.1)

CAUTION

CAUTION!

It is recommended to connect the wrapper's T-drain line plug, marked on the handle with a (-) sign, to the tractor's free drain. This will ensure low flow resistance in the oil return at volume feed rates above 30 l/min.

CAUTION

CAUTION!

Ensure that the wrapper drain line marked (-) on the plug handle is correctly connected to the T-line of the tractor. Failure to connect the drain line and apply pressure to the plug (+) will result in leakage and damage to the oil cooler.

CAUTION

CAUTION!

Connect the + and - hydraulic plugs of the wrapper supply to the stopped-off tractor after releasing the pressure from the hydraulic sockets. This will ensure that the quick-release couplings engage correctly.

CAUTION

CAUTION!

Before attaching the wrapper to the TPH, it is a good idea to ensure that the tractor's lower hitch bar will not interfere with the wrapper. If necessary, remove the tractor lower hitch before attaching the wrapper to the TPH to avoid collision.

2.1.1. Checking of operation of wrapper hydraulic system control

CAUTION

CAUTION!

Before testing the correct operation of the wrapper, refer to Section (3. Control elements and work with wrapper) of the respective manual.

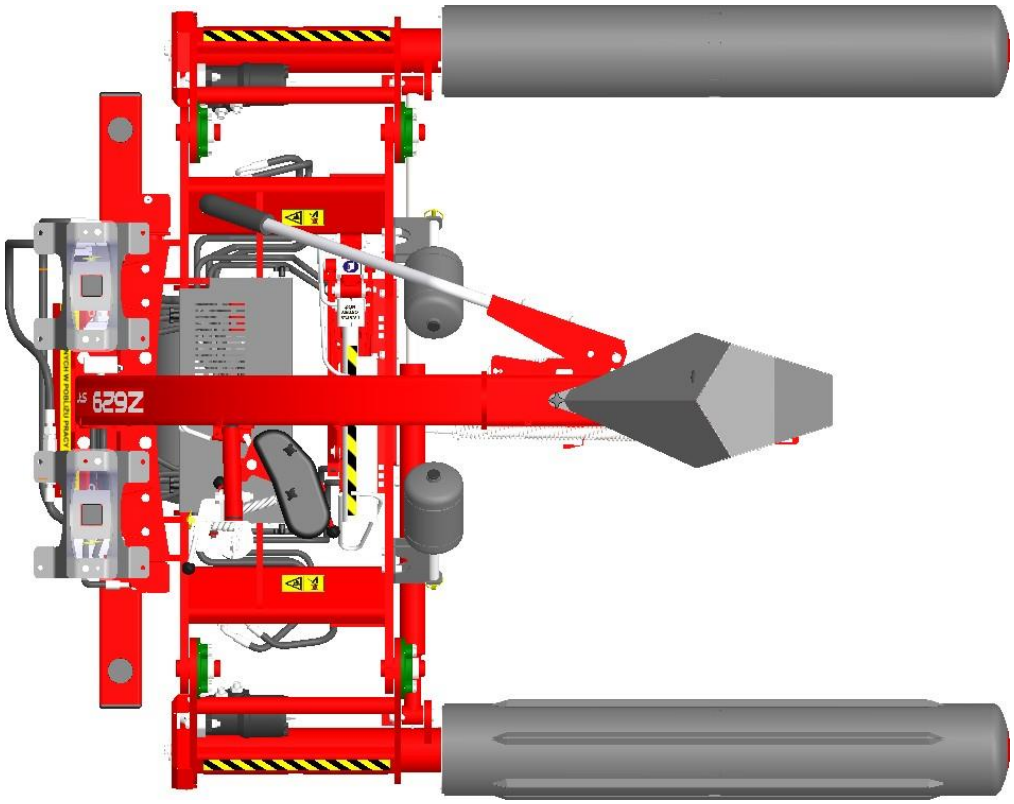


Figure 8. The wrapper in the initial position (view from the top)

To check the correct operation of the wrapper, perform the following steps:

- Remove the transport lock of the wrapping arm
- Make movements with bottom arms in the manual mode, maximal extension and contraction of the arms.
- Make some revolutions with the top wrapping arm with slow and fast revolution speed. Stop the arm in the initial position (Fig. 8).
- Perform opening and closing of the film cutter. Leave it in closed position.

2.1.2. Checking of correctness of power hydraulics control in automatic mode

To check the correct control of the power hydraulic system in automatic mode, perform the following steps:

- select the automatic mode,
- perform automatic unloading,
- perform automatic wrapping, the upper wrapping arm should turn clockwise looking from the top, move slowly and smoothly; after performing the programmed number of revolutions, the arm should stop in the initial position (Fig. 8),
- perform the loading.

If the hydraulic and control systems operate correctly load the first bale and make sure that the stability of the tractor with the wrapper is correct. It is proved by the tractor being completely controllable. This can be calculated by following the recommendations in Section 2.2.

2.2 Stability of the tractor-wrapper unit

The tractor-wrapper unit may become unstable if the weight is insufficient on the front axle of the tractor. A ballast is required (m_z) of the front tractor axle, in order to obtain at least 20% of the tractor curb weight falling on the front axle, it can be calculated using the following formula:

$$m_z \times (d+i) \geq m_a \times (s_1 + s_2) - 0.2 \times m_t \times i$$

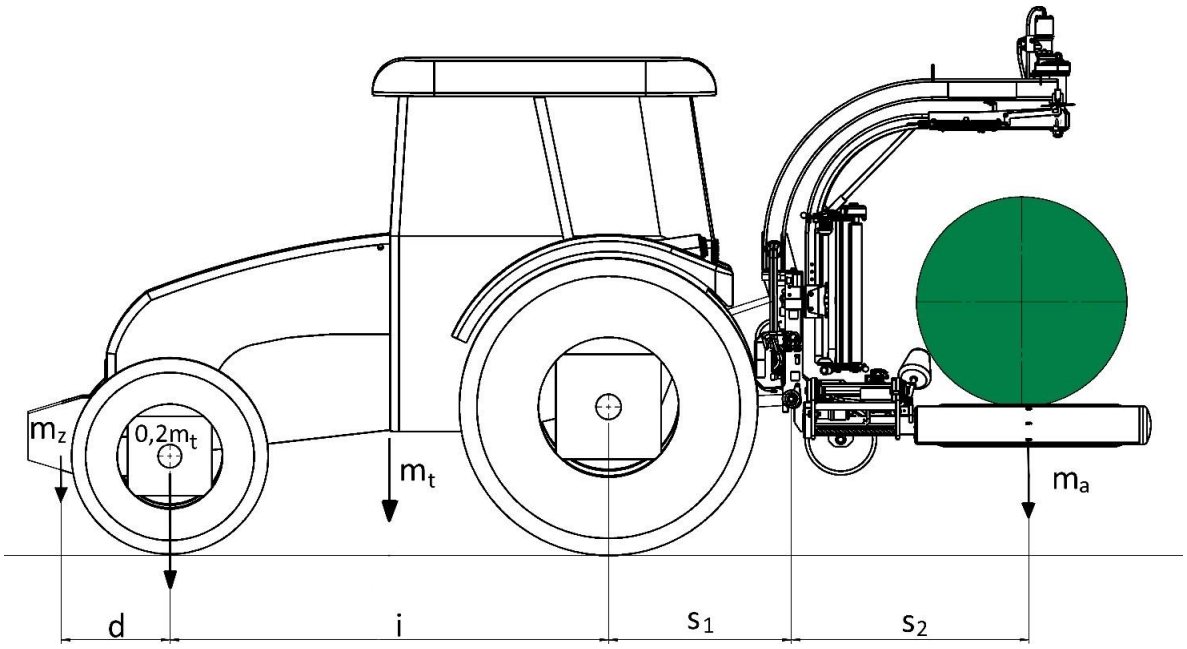


Figure 9. Calculation of the ballast required to maintain stability of the tractor-wrapper unit

Explanation

m_t – tractor curb weight (kg);

m_a – 1900 kg, weight of the suspended machine including the maximum weight of the bale defined in point 1.3 (kg);

m_z – ballast weight (kg);

d – distance from the ballast centre of gravity from the front axle centre (m);

i – tractor wheel base;

s_1 – distance between the centre of the back axle and the centre of the bottom points of the three-point hitch (m);

s_2 – 0.99 m, distance between the centre of the bottom points of the three-point hitch and the suspended machine centre of gravity with the bale (m).

2.3 Disconnection of the drive

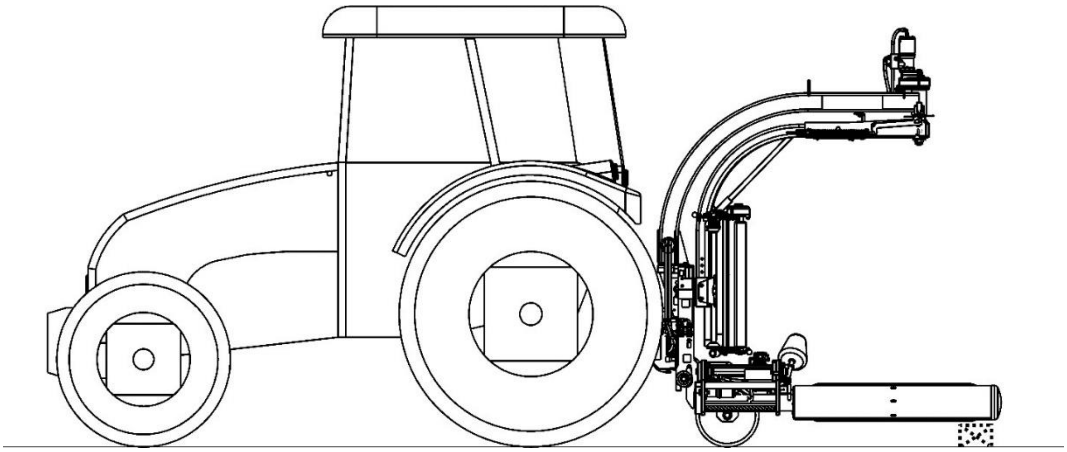


Figure 10. Wrapper position at connection and disconnection with the tractor drive

To detach the wrapper from the tractor perform the following steps:

- Make sure that in the area of connecting the wrapper with the tractor and in the near vicinity, there are no third parties present, especially children.
- Move the wrapper into transport position – loading arms with drums pulled down, wrapping arm secured with transport lock.
- Position the wrapper on its storage place on even and level ground (Fig. 10). The included drum supports can be used to ensure the wrapper is horizontal.
- Lower the jack until the wrapper support makes contact with the ground. Lower the top link until the drums come into contact with the ground or the supports. Stop the tractor's engine, take the key from the ignition, and engage the tractor's parking brake.
- Disconnect the electric power supply system and control system of the wrapper. Roll up the wires and store them in the box located on the right side of the wrapper body.
- Release and disconnect the power hydraulic system, secure the hydraulic lines in their holders on the main frame of the wrapper (fig. 11-A). Disconnect the (+) plug first and then the (-) plug.
- Make sure that there is no risk of accidental machine displacement.
- Disconnect the three-point hitch.
- Slowly drive the tractor away from the wrapper.

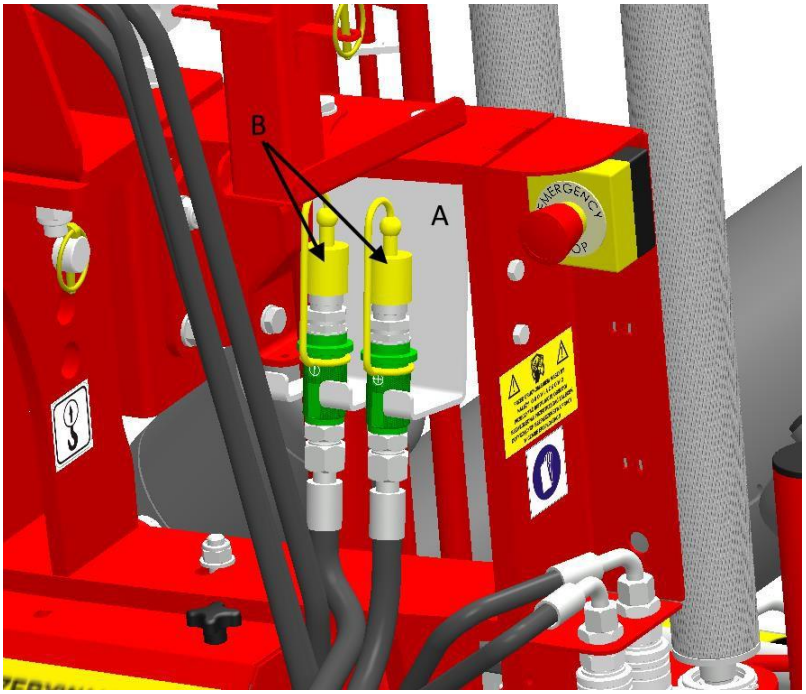


Figure 11. Hydraulic conductor clamp:
A – cable attachment, B – plastic cap

CAUTION

CAUTION!

Hydraulic connections must be always kept clean. After use reinstall plastic covers supplied when purchasing the machine (Fig. 11-B).

CAUTION

CAUTION!

After disconnecting the wrapper from the tractor, its control panel should be stored in a dry, safe, place, away from the reach of unauthorised persons, especially children.

CAUTION

CAUTION!

After disconnecting the wrapper from the tractor, its power supply wires and the communication cable of the control panel should be stored in the box mounted to the right of the wrapper body.

2.4 Power supply system

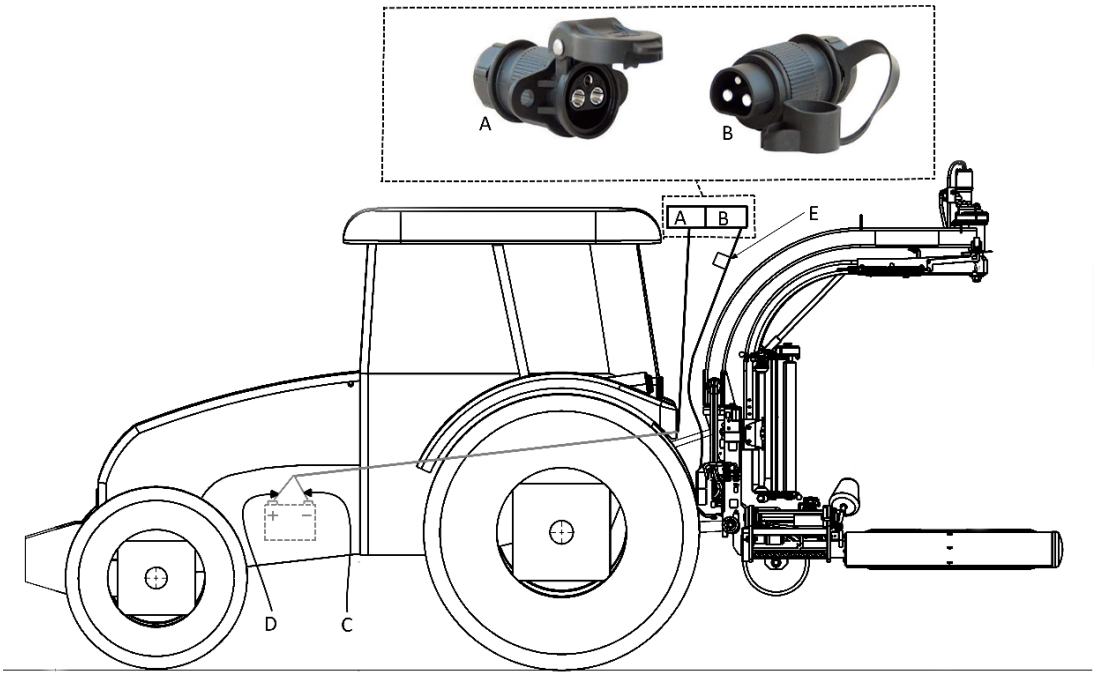


Figure 12. The connection diagram of 12 V electric power supply of the tractor to the wrapper

The 12 V electric power supply of the wrapper is taken from the electric system of the tractor after connecting the 3-pin power supply plug B (Fig. 12 – B) to the tractor electric socket A (Fig. 12 – A). The tractor must be provided with a 3-pin electric socket 12 V DIN 9680 connected to the tractor battery.

The power supply wiring harness has an overload protection in the form of fuses, which are placed in their bases E immediately after the plug A.

In the case of burning-out of any of the fuses of the power supply wiring harness disconnect the power supply plug and replace the damaged fuse with a new one of the same load value. Before reconnecting find and eliminate the source of installation overload.

CAUTION

CAUTION!

Do not connect the power supply of the wrapper to the lighter plug if the tractor is not provided with the 3-pin 12 V DIN 9680 socket. Request the distributor of the tractor provides the tractor with this socket fitted with a suitable wire connection to the battery.

Table 4. Connection of the socket wires to the battery (**Fig. 12** – C,D)

Lead (battery pole)	Pin marking on socket
C (-)	31
D (+)	15/30

CAUTION

CAUTION!

Provide relevant space for electric wires of the power supply and control. Too much tensioned or loosely hanging wires may be damaged or shorted and result in uncontrolled movements of the machine, consequently damaging it or the tractor.

2.5 Hydraulic system of the wrapper

The bale wrapper's hydraulic installation is supplied from the tractor's power hydraulics system. Connecting to the power hydraulic system is done with connecting hoses supplying the hydraulic distributor and further on the hydraulic motors and hydraulic servos (cylinders). A hydraulic motor actuates the wrapping arm via a toothed gear. The next two motors drive the bottom arms of the wrapper via a chain transmission. Double acting hydraulic cylinders ensure:

- extending and contracting of the bottom wrapper arms,
- opening and closing of the film cutter,

The Z629 bale wrapper features a power hydraulic system (**Fig. 13**), consisting of the following parts.

- main hydraulic block;
- electrically operated directional valve;
- Directional valve;
- engine braking valve;
- flow controller
- oil filter
- oil cooler
- ports for supplying hydraulic motors during wrapping
- ports for opening and closing of the wrapper bottom arms
- film cutter feed ports;
- power sockets for the bale tipper.

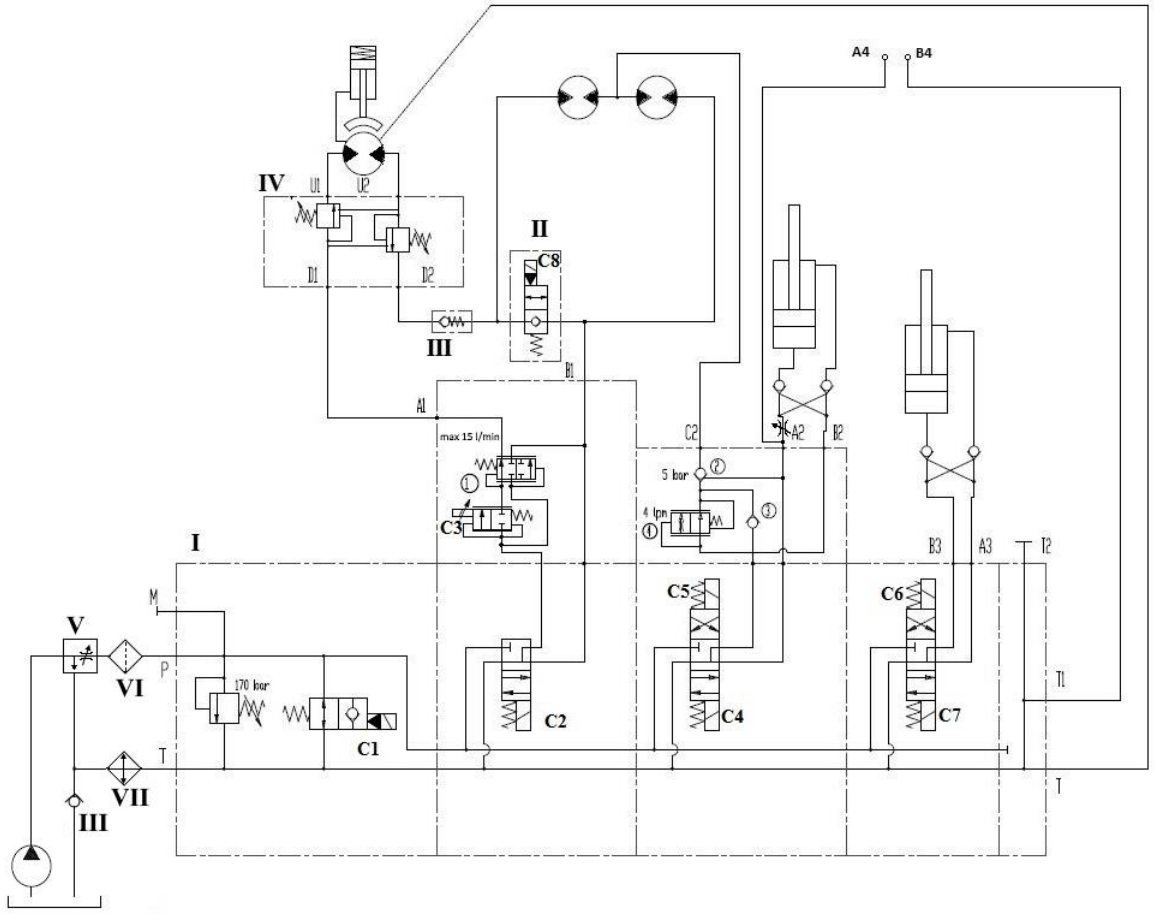


Figure 13. Hydraulic system of the wrapper:

I – main hydraulic manifold; II – electrically operated directional valve; III – directional valve; IV – engine braking valve V – flow controller; VI – oil filter; VII – oil cooler A1, B1- ports for feeding hydraulic motors during wrapping; C2; A2; B2 – ports for opening and closing of the wrapper bottom arms; A3; B3 – ports supplying the film cutter; A4, B4 – bale tipper sockets (accessory)

Controlling of the hydraulic motors and cylinders is executed via the electronic control panel located for the time of operation in the tractor operator's cockpit. The panel is communicated via the cable type **M12 a-coded cable assembly L=5 m** with a control module, which controls directly solenoid valves in the hydraulic distributor and receives the signal from the sensor.

The hydraulic block is protected against the tractor power hydraulic high pressure system with a pressure valve. Maximum pressure of the hydraulic system is 160 Bar.

The hydraulic system of the wrapper is factory filled with L-HL 46 oil type.

The tractor's hydraulic system working with the bale wrapper must be filled with the same type of oil. It is permitted to operate the wrapper with tractors using HL-36 type oil after draining the HL-46 oil.

CAUTION

CAUTION!

The volumetric flow rate of the distributor on the tractor must be set to a value less than or equal to 50 l/min. The flow controller of the wrapper is set at the factory to a value of 30 l/min.

CAUTION

CAUTION!

It is recommended to connect the wrapper's T-drain line plug, marked on the handle with a (-) sign, to the tractor's free drain. This will ensure low flow resistance in the oil return at volume feed rates above 30 l/min.

CAUTION

CAUTION!

Before connecting the hydraulic quick-release couplings, make sure they are relieved and depressurised. Attempting to connect quick couplings that have not been depressurised may cause them to engage without the plug and socket mushroom valves opening each other, resulting in flow blockage and damage to the wrapper hydraulic system.

CAUTION

CAUTION!

Hydraulic oils of different types should not be mixed together. It may result in damaging the tractor and the wrapper itself.

CAUTION

CAUTION!

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 contact of hazardous substances with the skin. Wash yourself thoroughly after you have used the above-mentioned hazardous substances.

CAUTION

CAUTION!

Work on pressurised hoses is prohibited, it may cause pollution or serious injuries. Carry out all repair work on the hydraulic system of the wrapper after releasing the pressure.

CAUTION

CAUTION!

The maximum oil pressure on the T-line must not exceed 25 bar. Above this limit, the oil cooler may be irreparably damaged. Ensure that the hydraulic plugs of the wrappers are correctly connected to the tractor.

CAUTION

WARNING!

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

When starting the wrapper for the first time, it is good to verify the actual volume flow rate on the feed section of the tractor's hydraulic distributor. For this, it is recommended to use a rotameter flow meter connected to the supply line P (+) and/or by verifying the pressure at the drain line T (-) with a hydraulic pressure gauge with a pressure range of up to 250 bar.

The measurement of the volume flow rate and pressure at the return line should be checked for the tractor engine speed at which we will be operated, typically 1000-1200 rpm and at higher speeds of 1500 and 2000 rpm.
If a pressure above 15 bar is registered on the drain, reduce the volume flow rate on the tractor flow controller and connect the T-plug (-) drain line to the free drain.
The volume flow rate of the hydraulic oil supplying the wrapper hydraulics should not exceed 50 l/min, optimally 30 l/min.
If, despite a reduction in volume output and the connection of the wrapper's drain line to the tractor's free drain, the pressure on the drain does not drop below 15 bar, the condition of the plugs on the wrapper and the sockets on the tractor must be verified; there is a risk that their mushroom valves do not open fully.

3. Control elements and work with the wrapper

3.1 Description of the Z629 control panel push buttons

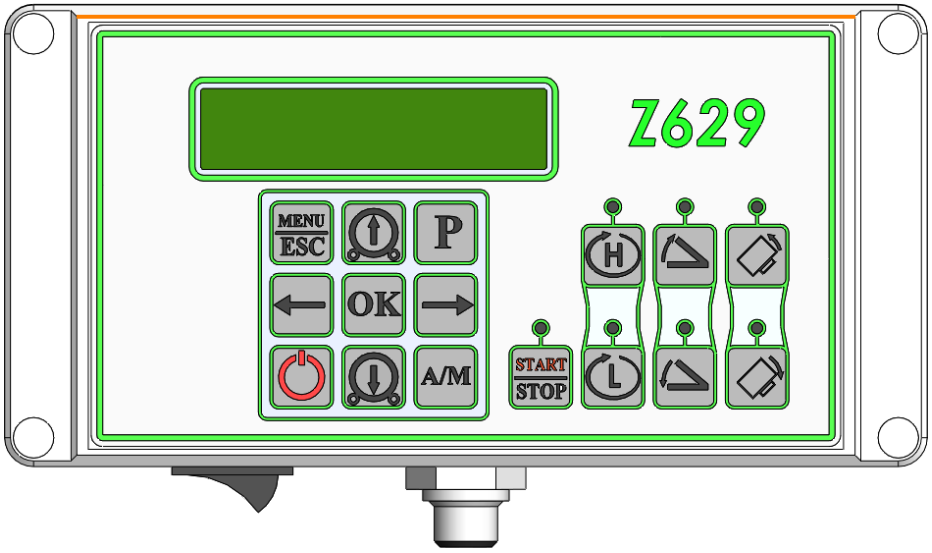
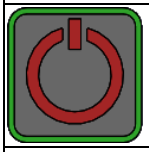
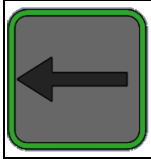
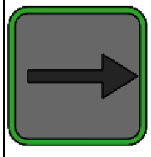
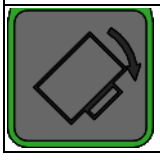


Figure 14. Z629 Control panel

Table 5. Description of control push buttons

Button (symbol)	Name	Function
	START/STOP	Emergency stop – locking of operation of all the wrapper functions. Push it again to unlock it. Starting and stopping of the automatic operation mode.
	On switch / Off switch	Control panel switch.
	MENU/ESC	Enters the control panel menu (selection with the left and right cursor buttons), acknowledge: OK): - Wrap counter reset; - Set the number of wraps (8-50); - Delete data from the current field; - Change the loading time (4-15 s); - Menu language selection
	Left arrow	Change/diminishing of the defined value, moving between MENU options.
	Right arrow	Change/increasing of the defined value, moving between MENU options.
	Field	Preview of saved wrapper statistics on fields 1-16. Selection of the working field – arrow keys, approval: OK

	OK	Validation of the input changes or entering the next selection level (menu).
	Bale loading	Holding results in retracting of the bottom arms (bale loading).
	Bale unloading	Holding results in expanding of the bottom arms (bale unloading).
	A/M	Wrapper operation mode selection: M – manual mode; A1 – semi-automatic mode – confirmation of start of wrapping required; A2 – automatic mode – automatic wrapping when loading is complete.
	Arm revolution – fast run	Holding results in quick turning of the wrapping arm and drums of the bottom arms.
	Arm revolution – slow run	Holding results in slow turning of the wrapping arm and drums of the bottom arms.
	Film cutter opening	Holding results in film cutter opening.
	Film cutter closing	Holding causes closing of the film cutter.
	Moving out of the bale tipper	Holding it extends the bale wrapper and spreads the lower arms.
	Retraction of the bale tipper	Holding results in retraction of the bale tipper.

3.2 Control panel operation

The panel is an electronic device intended to control wrapper operation, moreover it transfers information to the user concerning the current machine settings and work performed by it.

CAUTION

CAUTION!

In order to avoid the risk of causing an unintended wrapper movement, introduction of changes in the work parameters on the control panel should always be executed with the hydraulic system switched off. After inputting the parameter changes the hydraulic supply can be switched on again.

The control device features magnetic clamps, by which it should be attached to the metal parts of the body so as to prevent accidental movement of the panel or unintended starting up of the working sections of the wrapper. The panel should be located in the tractor so that the operator can operate the device without difficulty or strain and have the review of the messages appearing on his display.

Figure 15. Control panel magnetic clamps

If the tractor body does not allow for mounting the panel using magnetic clamps due to its finish with plastics, it may be mounted by bonding on the flat surface of the body of a rectangular piece of the steel plate with dimensions 110 x 60 x 2 mm, using a strong double sided mounting tape with a foam core.

3.2.1. Switching on the panel

1. Connect the plug of the wrapper to the tractor's 12 V socket.
2. Connect the panel to the control module with the **M12 a-coded cable assembly L=5 m**.
3. Turn the panel main switch from the position 0 to I. The change-over switch is located at the bottom of the panel.
4. If the LED next to the Start/stop button flashes red it means that the panel has the correct power supply.
5. Switch the control panel with the  push button. In this moment communication of the panel with the control module takes place. Wait approx. 5 sec. for the communication to be completed successfully. In the case of incorrect communication check the correctness of connection of the cables to the control module.

3.2.2. Switching off the Panel

1) Make sure that the working modules are in the protected, transport position or in the initial position.
2) If the power hydraulics of the tractor is on it should be switched off.
3) Switch the panel off with the  push button and wait approx. 3 sec. for the panel display to go out.
4) Switch the panel power supply off with the change over switch on the bottom of the panel from the position I to 0.

3.2.3. Protections against collisions

The wrapper features a programme protection against executing the actions that may cause a collision with the wrapping arm. A safety arm is located in front of the wrapping arm, which after hitting an obstacle switches the control panel off and stops all the operation functions in the wrapper.

When the work is stopped due to the safety arm hitting an obstacle, the tractor's power hydraulics must be switched off and the obstacle removed from the wrapping area. Restart the control panel to start the wrapper.

3.2.4. Wrapper manual operation

Movements of the working elements of the wrapper are executed using the push buttons marked on the panel with the machine part symbols (**Tab.** 4). The movement is executed as long as the push button is depressed or until the working element reaches its limit position.

When pushing the slow 

or fast 

rotation button to actuate the bale wrapping arm rotations, a green light comes on over the pushed button at the same time. Revolving movement is executed only when the button is depressed.

We will also manually control the opening of the film cutter  as well as its closing  . At the moment of depressing the push button a green LED lights up above it. The cutter opens and closes until the moment when it comes to its limit position or possibly to the moment when the pressed button is released. In the moment of opening and closing of the cutter there should be no third persons near the wrapper.

By pressing and holding the  push button the bale tipper is pushed out and pulled in with the  push button. The bale tipper opens and closes until it comes to its limit position or until the press button is released. These two functions are available only in the option with the bale tipper.

3.2.5 Automatic mode operation

In the automatic mode of operation the whole wrapping process is executed automatically. Only loading of a bale requires acceptance and after it is completed the wrapping function must be accepted.

Acceptance by the user of bale unloading is always required. It is connected with maintaining safety so unloading does not take place in the place not intended or not suitable for this purpose.

Automatic mode operation – the algorithm:

1. Press the **MENU/ESC** button and, using the cursor arrows, move on to setting of the number of wraps option. When the number of wraps appears on the display, press the **OK** button and then use the arrows to set the number of wraps. For a bale diameter of 1,200 mm the number of wrappings is 16. In order to accept the selected value press the **OK** button. After accepting leave the menu with the **MENU/ESC** button.
2. Press the **A/M** button to select the automatic mode of operation (A1). The current operation mode will be displayed in the upper right corner. The M symbol indicates the manual mode, A1 semi-automatic mode, A2 automatic mode without confirmation of the start of wrapping at the end of loading.
3. Press and hold the  push button to extend the bottom arms. Move the bale wrapper in the loading position (Fig. 16). Press the 

button to begin bale loading. When loading is over a green LED above the **START/STOP** push button begins to flash meaning readiness for wrapping to start. If, during the automatic loading, the arms do not contract the end they should be closed manually with the  button. You can also change the automatic loading time between 4-15 s in the control panel menu.
4. Lift the wrapper to the position of bale wrapping (Fig. 17) Press the **START/STOP** push button to commence the automatic wrapping process. Once the wrapping operation is complete, the film will be cut automatically.
5. Set the bale wrapper in the unloading position (Fig. 18). Start the unloading by pressing the  or  button when using the bale tipper (if equipped).
6. After the discharge using the tipper, press  to retract it.

   After finished unloading one bale will be counted as completed.
7. After driving up to the next bale, press the **START/STOP** button again to start loading.

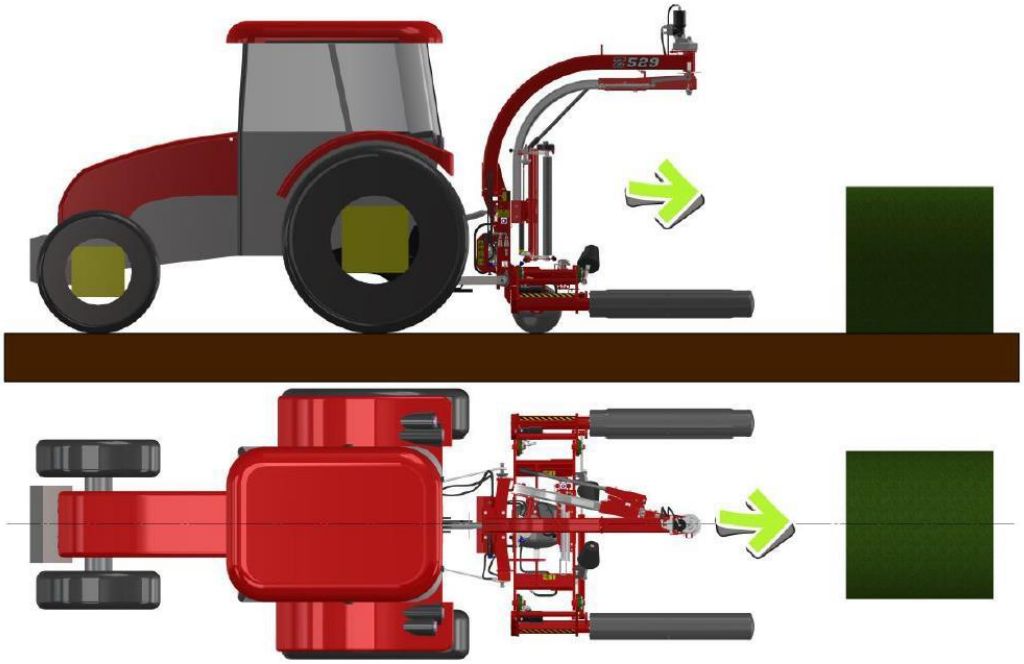


Figure 16. Bale loading position

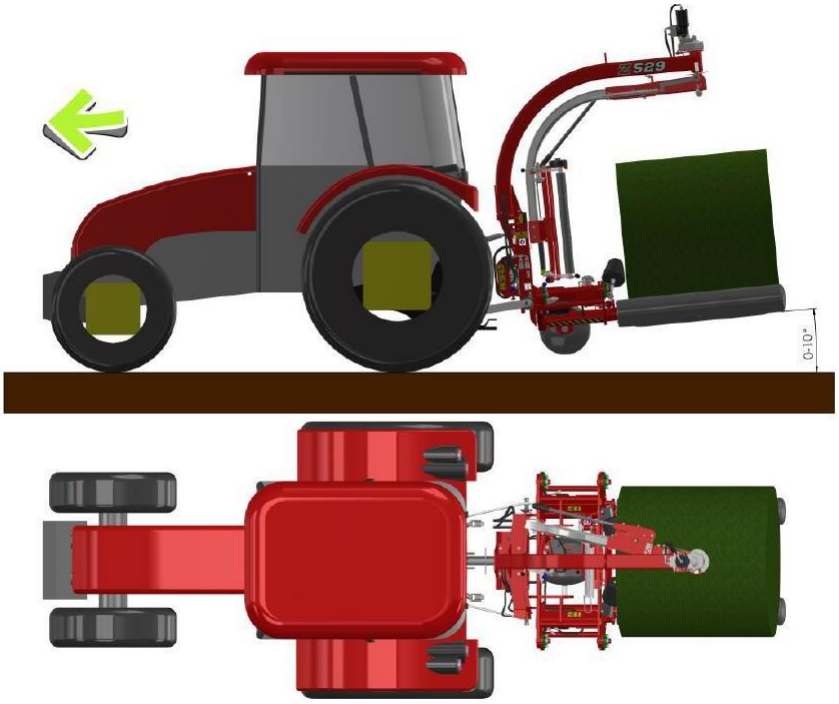


Figure 17. Position during wrapping up a bale

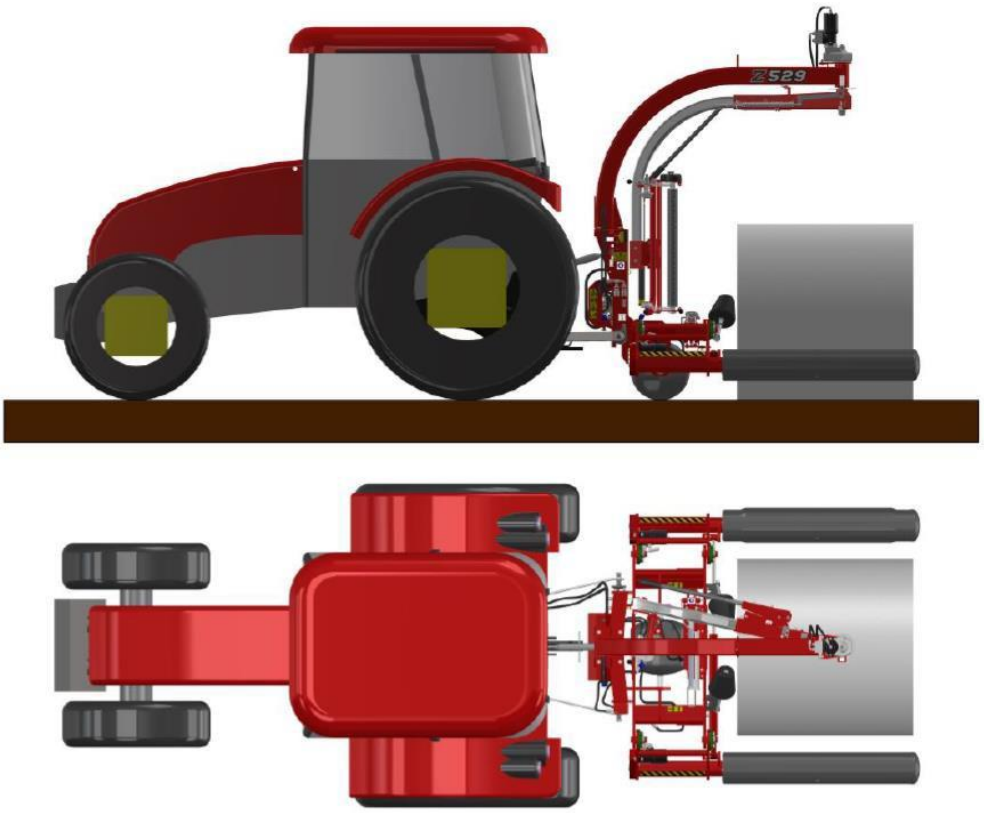


Figure 18. Bale unloading position

CAUTION

CAUTION!

During unloading the tractor must be on even surface. It is so the unloaded bale does not roll to another place causing a hazard.

CAUTION

CAUTION!

Upon bale unloading drive away straight so as not to damage the film wrapped around the bale with the bottom arm.

3.2.6. Transport position

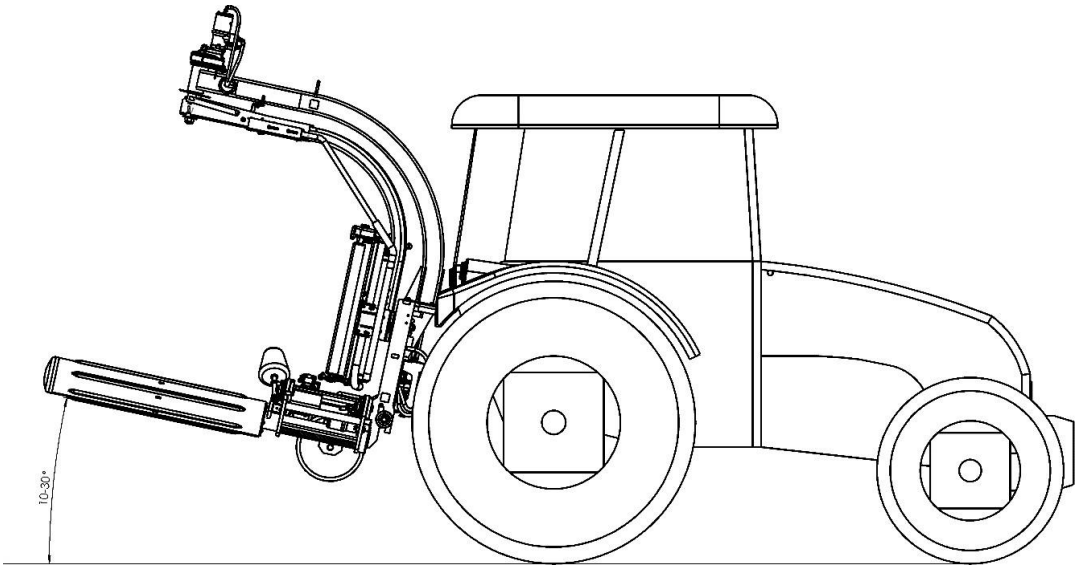


Figure 19. Transport position

The transport position of the wrapper allows the user safe movement with the machine on public roads. In the transport position the bottom wrapping arm is retracted. Thanks to this the machine has smaller dimensions and it is easier to move along a road with it.

In order to reposition the wrapper into the transport position you should:

1. Contract the bottom wrapping arms.
2. Position the upper wrapping arm along the main clamping arm (Fig. 3) and attach the arm transport lock (Fig. 44).
3. Lift the wrapper to the transport position (Fig. 19).

CAUTION

CAUTION!

The servo motor of the bottom wrapping arms is equipped with a safety valve preventing the arms from falling under their own weight. However, staying near them during wrapper transport should be avoided.

CAUTION

CAUTION!

For transport, the upper wrapping arm must be secured with the special transport lock.

3.2.7. Operation stoppage when wrapping

If during wrapping in the automatic mode it is necessary to stop the wrapper operation press the push button **START/STOP**. It will cause the currently moving working sections to stop (stopping of the bottom arms during loading, stopping the arms during wrapping, stopping the film cutter during cutting).

Automatic wrapping will be repeated when the **START/STOP** button is pressed again.

Resuming operation after a stoppage at the time of automatic loading or the movement of the cutter will not automatically complete the cycle of operation due to the limited time for their tripping. These elements must be brought to the desired position using the manual control buttons.

3.2.8. Emergency stopping

If an emergency occurs during the operation of the wrapper or a situation that may cause a hazard occurs, operation of the wrapper must be stopped by switch off the control panel power supply by pressing the push button at the bottom of the panel from the position I to the position 0. Then switch off the tractor's hydraulic power supply system.

If there is a risk of the machine starting up during maintenance operations, switch off the power supply by pressing the safety switch located on the body of the machine on its left side – the red button on the yellow housing.

Once the malfunction or hazard has been eliminated, work can be resumed by restoring electrical power – flipping the safety button and switching the panel back on.

4. Elements requiring adjustments

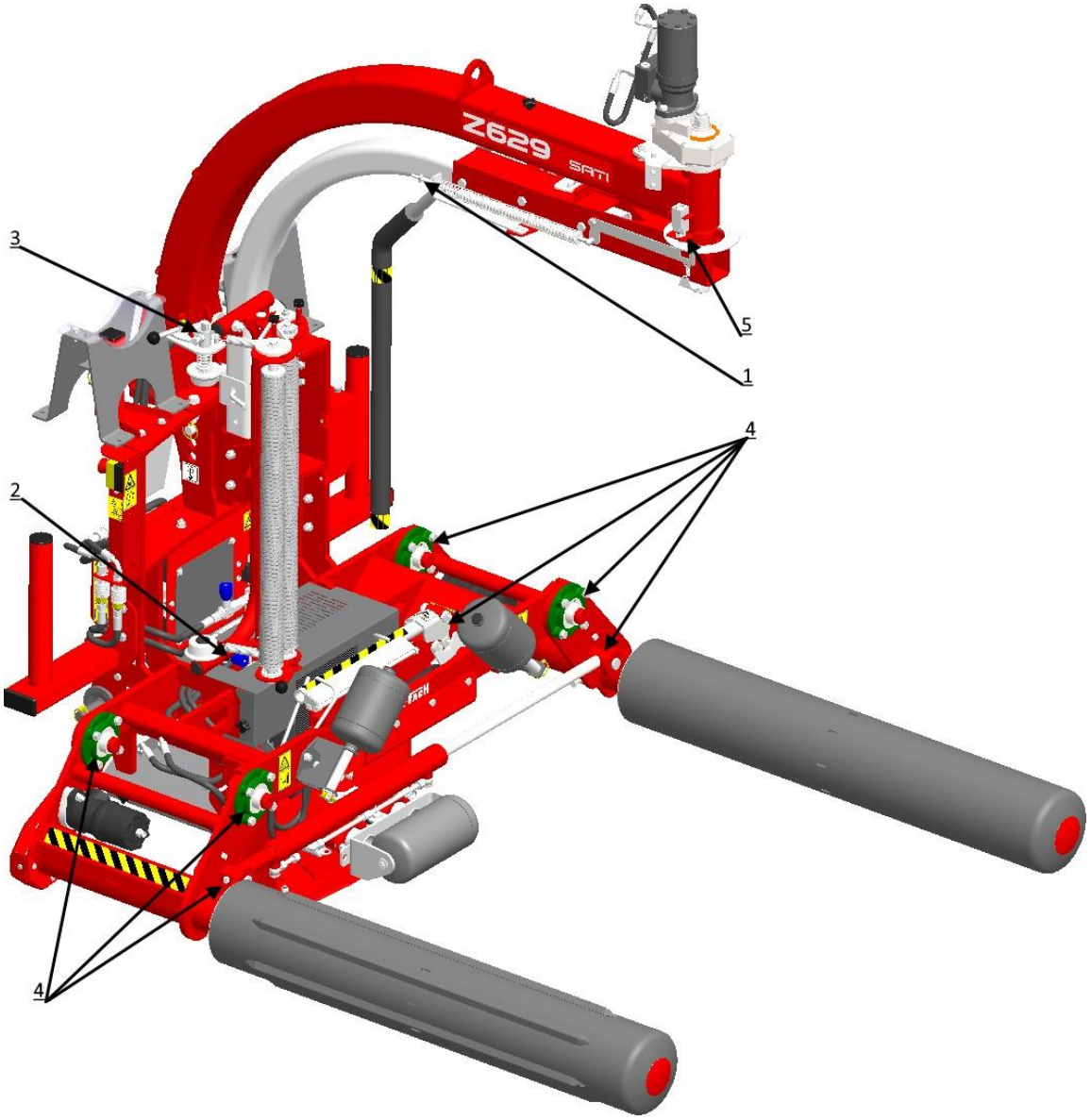


Figure 20. Layout of controls – front:
1 – spring tensioning in safety arm; 2 – film cutter throttle/non-return valve; 3 – film pressure adjustment; 4 – lubrication points – indicated by pictograms on the machine; 5 – safety limit switch;

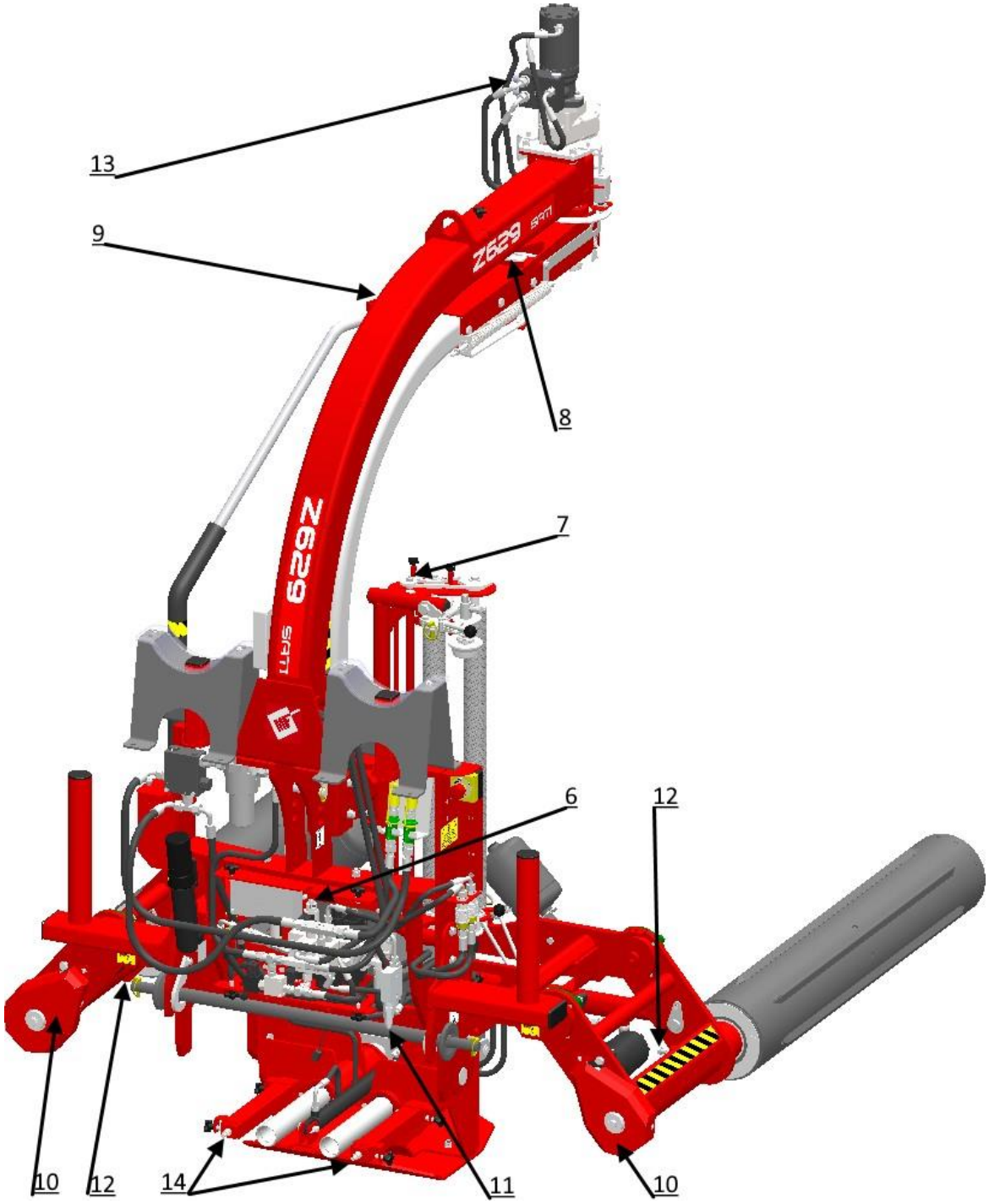


Figure 21. Layout of controls – back:
6 – wrapping arm slow rotation adjustment; 7 – chain tension in the film feeder; 8 – rpm sensor setting; 9 – spring tensioning in the safety arm; 10 – chain tension of the bottom arms; 11 – bale tipper sequential valve; 12 – drum height adjustment; 13 – engine valve pressure control; 14 – bale tipper spring tension adjustment

4.1 Sensor alignment correction

The wrapper rpm sensor (Fig. 21 – 8) is the part most exposed to damage and the safety of work depends on it the most. A damaged sensor should be replaced with a new one. The sensor operation range is 1-10 mm. In the case of setting correction of the sensor distance from its activator or other machine metal parts it is recommended to keep distances between them of approx. 8 mm. Direct contact of the sensor tip with the activator or other machine metal parts should be avoided.

Figure 22. Inductive revolution sensor setting

CAUTION

CAUTION!

Sensor setting corrections should be executed only with the tractor hydraulics switched off, the tractor engine switched off and the tractor auxiliary brake engaged.

The sensor responsible for counting revolutions and stopping the upper wrapping arm in the initial position (Fig. 8) should be set so as to lose the activator signal at approx. 5 to 10 mm from reaching the initial position. It results from the inertia of the upper wrapping arm.

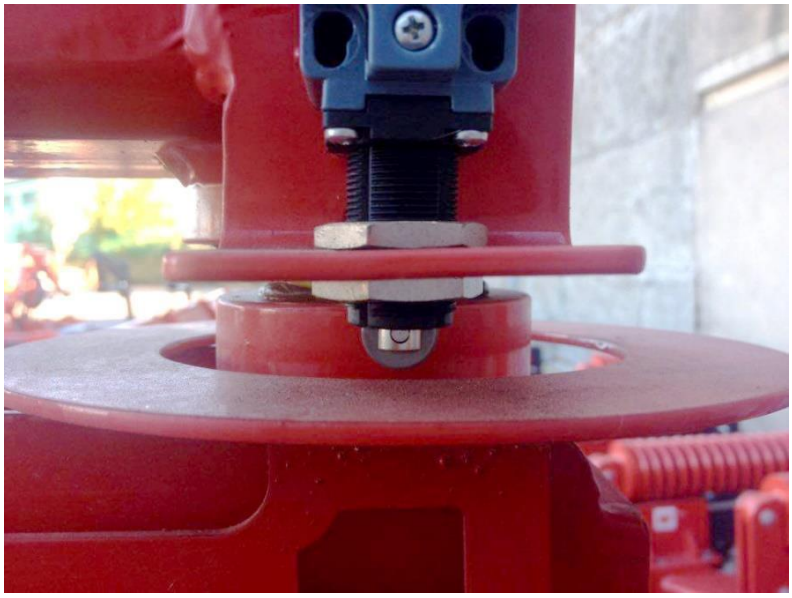


Figure 23. Safety limit sensor setting.

The safety limit sensor (Fig. 20 – 5) disconnects the power supply and this causes the stoppage of all the functions of the wrapping machine in the case when the safety arm collides with any item during operation. The sensor should be set in the way so as the activating element would switch it on at each strike at the arm. The distance between the end roller and the activator plate should be approximately 5 mm.

4.2 Spring straining and tension adjustment

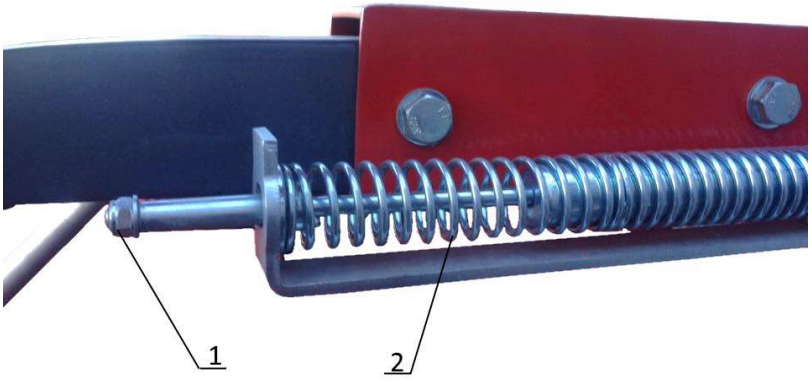


Figure 24. Spring tensioning adjustment in safety arm:
1 – nut, 2 – spring

When the safety arm does not return to its initial position in the event of a collision, it means that the springs are under-tensioned. In order to tension them unscrew the nut (Fig. 24 – 1) which will allow the movement of the guide and spring tensioning (Fig. 24 – 2).

If the safety arm activates due to inertia at the start of rotation, the tension of the spring on the other side of the wrapping arm must also be checked (Fig. 25 – 2). The tensioning is adjusted by tightening the nut (Fig. 25 – 1).

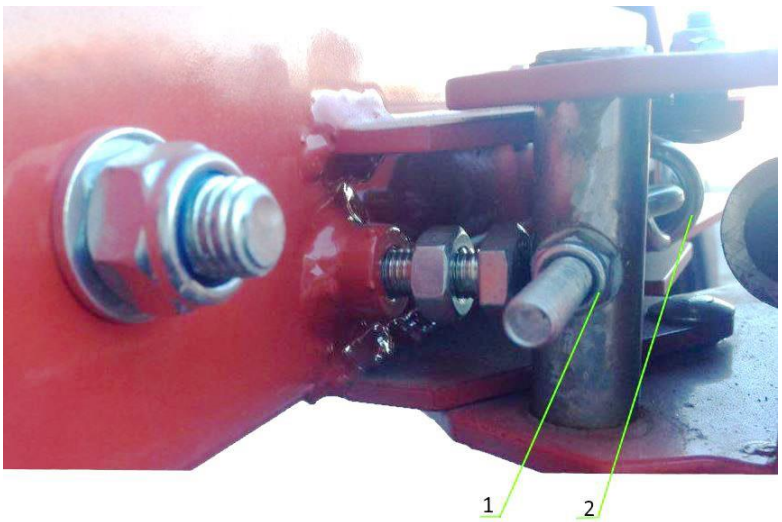


Figure 25. Spring tensioning adjustment in the safety arm:
1 – nut, 2 – spring

4.3 Hydraulic adjustable valves

There are check-throttle valves in the wrapper hydraulic system. Do not change their factory settings if not absolutely needed.

The film cutter check valve (Fig. 26; Fig. 20 – 2) is located at the main frame of the wrapper. It allows for the slowing down of the closing of the film cutter, thanks to which when closing the cutter the risk of tearing the film due to the abrupt and fast closing is eliminated. By turning the valve clockwise closing of the film cutter is slowed down.

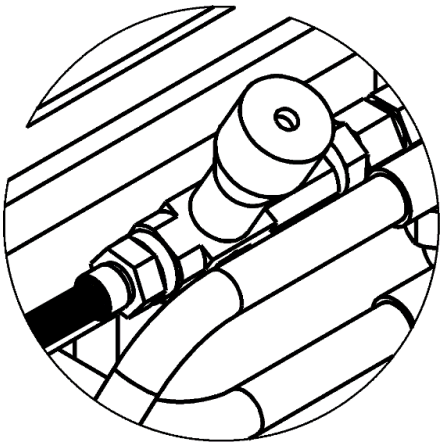


Figure 26. Film cutter throttle/non-return valve

In the model with the bale tipper, the non-return and throttle valve (Fig. 27; Fig. 21 item 11) located in front of the tipper valve above the radiator cover causes the locking of the erector in the extended position. It is closed in the factory acting as a non-return valve. By opening it the supply line of the tipper can be depressurised.

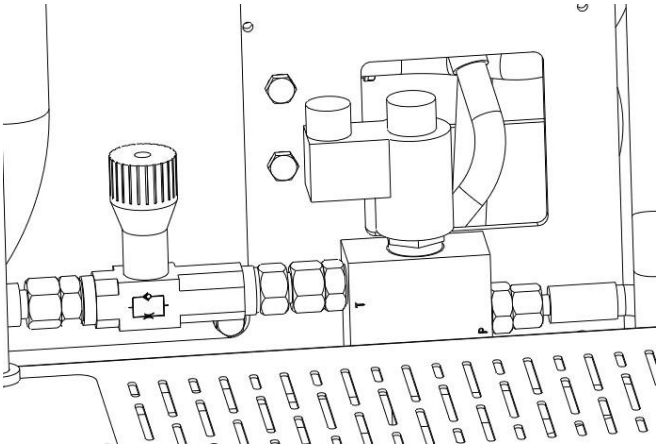


Figure 27. Non-return and throttle valve locking the tipper in the extended position

The proportional valve (Fig. 28; Fig. 21 – 6) adjusts the slow revolutions of the upper wrapping arm. To change it, a counter nut should be released (Fig. 28 – 1). The control screw (Fig. 28 – 2) can be adjusted within one full turn. When it is fully screwed in the valve is open and the arm runs at idle at full speed. On the other hand, unscrewing the control screw results in a slower rotation of the wrapping arm at slow speed. In order to change it the counter nut should be released Fig. 28 – 2.

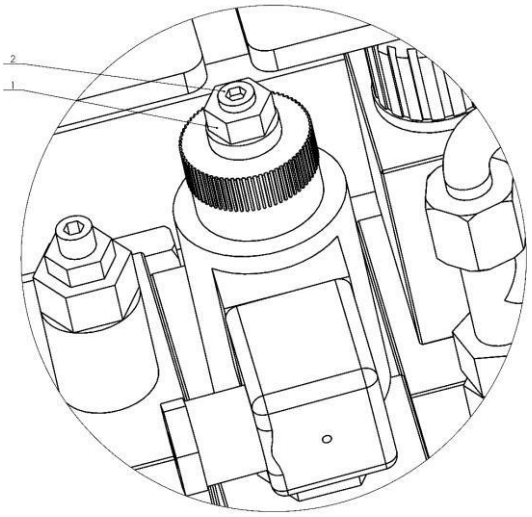


Figure 28. Proportional valve

The upper motor valve (Fig. 29; Fig. 20 – 3) controls the applying of the top brake of the hydraulic motor in case of the loss of supply pressure and assists in stopping the motor by closing the oil outlet when the pressure drops below the opening limit of the valve. It has two adjustment points that change the minimum supply pressure to the motor. This particular setting is done during the machine assembly, therefore it should not be changed without prior contact with the authorised manufacturer's service.

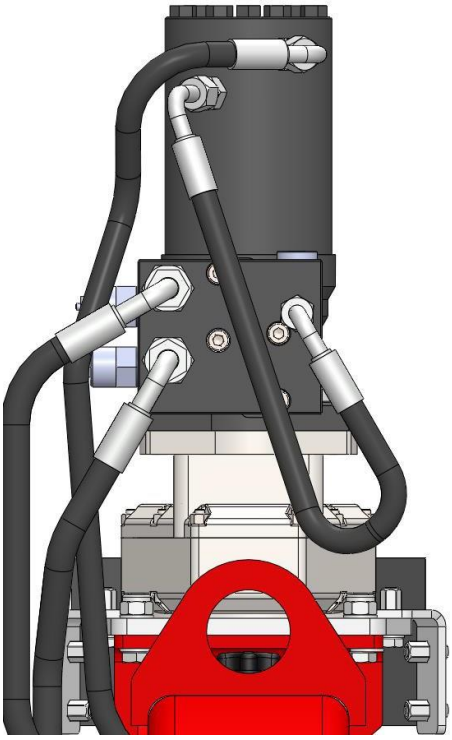


Figure 29. Motor upper valve

The wrapper is equipped with a hydraulic oil flow controller set at the factory to 30 l/min (Fig. 30).

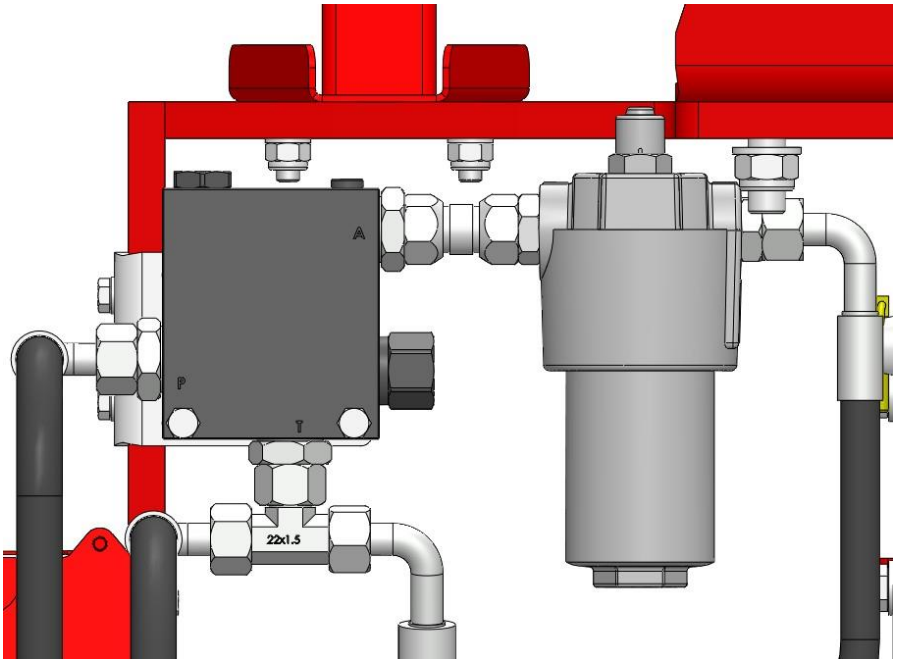


Figure 30. Flow control

4.4 Film insertion

Install the film on a roll on the film feeder pin in the following sequence:

- Tilt the film support frame and protect it with a hook attached to the wrapping unit (1);
- Remove protection (5) from the upper film clamp;
- Move the lever of the upper film clamp (6) and lift the clamp;
- Install the film roll on the bottom conical clamp (4);
- Clamp the roll by closing the upper clamp;
- Install protection so that the upper clamp will not open during wrapping;
- Install the film with its external gluey side towards the bale axle
- Pull the film through the rollers (2) according to the diagram located on the feeder frame;
- Insert the end of the film to enable the free holding and operation of the film;
- Tilt the film support frame and release the hook protection.

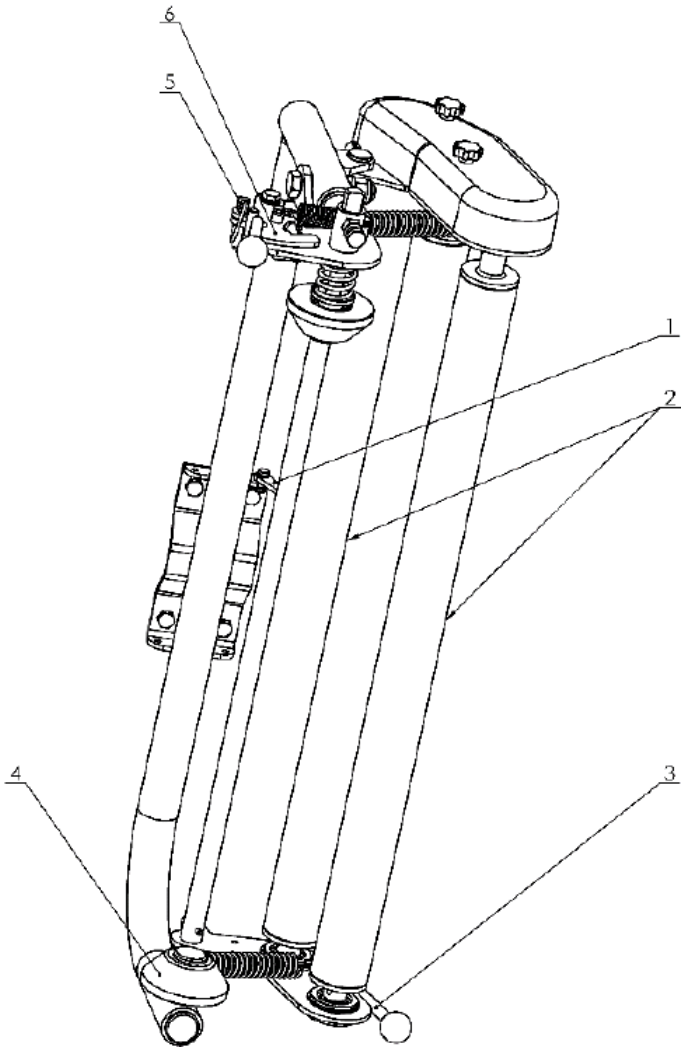


Figure 31. Film feeder

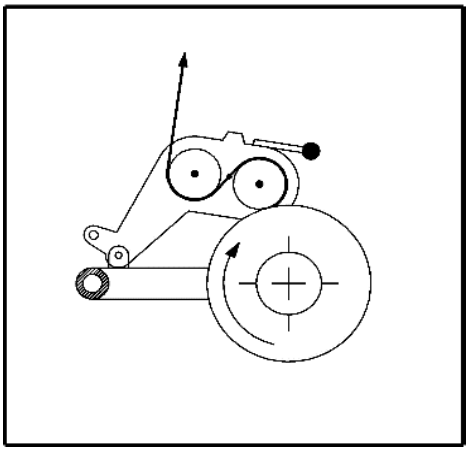


Figure 32. Film flow diagram

At each rotation of the bottom wrapping arms the bale with the film turns by a certain angle around the horizontal axis causing the overlapping of the film layers wrapping the bale tightly.

CAUTION

CAUTION!

The Bale Wrapper is factory set to wrap with film of 750 mm width.

Figure 33. Correct installation of the film in the feeder

4.5 Adjustment of the drive chain

In the bale wrapper two chain transmissions were installed as the drive in the bottom wrapping arms. After wrapping of the first 10 bales tensioning of the drive chains should be adjusted. Perform the adjustment of the drive chain tension by repositioning of the motor.

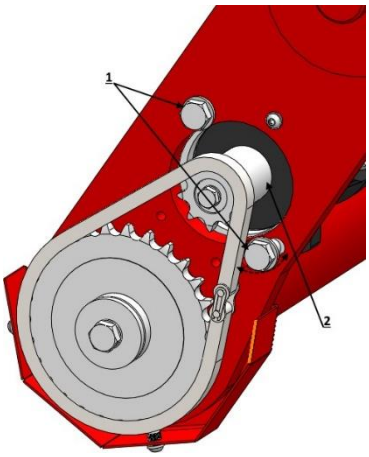


Figure 34. Adjustment of the bottom wrapping arms drive chain

Adjustment of the bottom wrapping arms drive chain (Fig. 34):

- Remove the chain guard,
- Loosen 2 M12 screws **(1)**,
- Tension the chain by moving the motor **(2)**,
- Tighten 2 M12 screws **(1)**,
- Install the chain guard.

The periodical control of chain tension must be performed after making 120 bales.

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

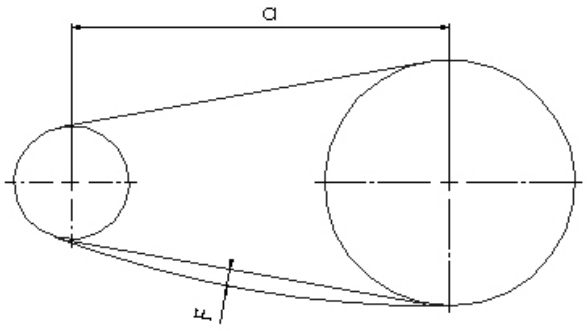


Figure 35. Chain tension

4.6 Positioning of the lower wrapping arms

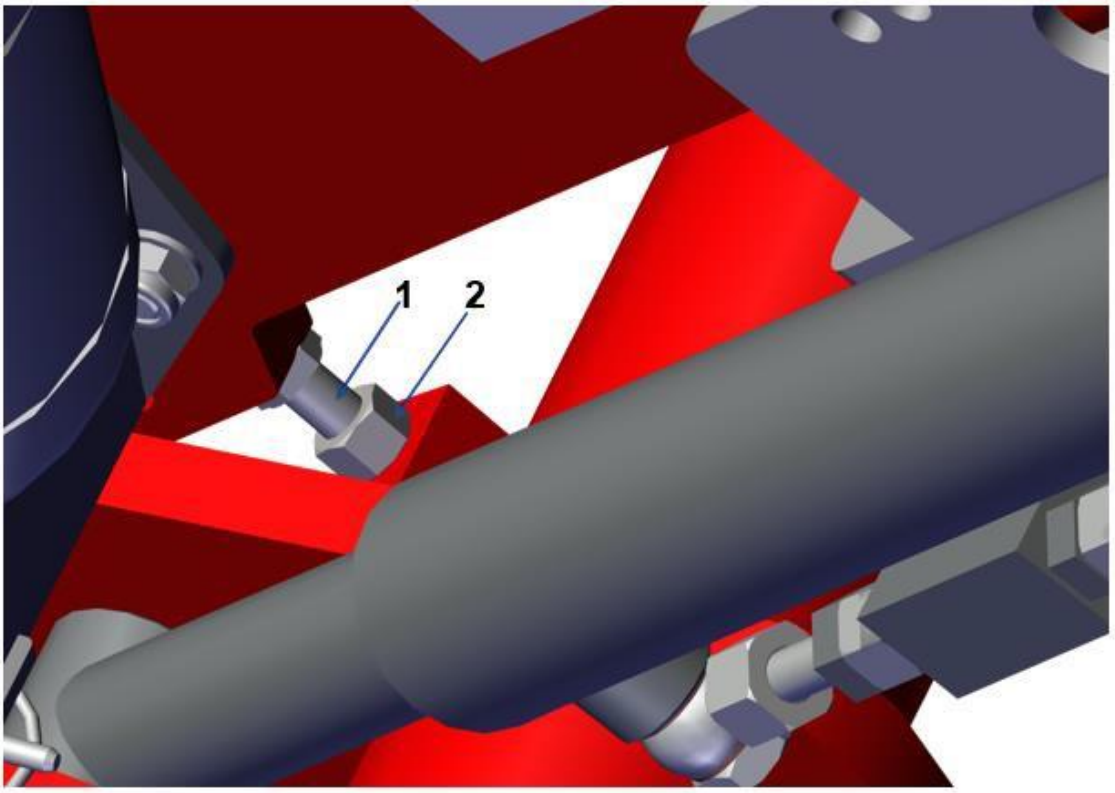


Figure 36. Limiting the arms' folding movement

The default setting of the wrapping arms is for a bale diameter of 1,200 mm. To wrap bales with a diameter larger than 1,200 mm, adjust the lower wrapping bales (to enable correct revolution of the larger diameter bales). To make the adjustment, loosen the nut (Fig. 36 – 2) and screw in the screw (Fig. 36 – 1) to a height that will cause the lower wrapping arms to expand accordingly. Once the height of the screw (Fig. 36 – 1) has been determined, lock it with the nut (Fig. 36 – 2). Proceed in the same way for both wrapping arms.

5. Operation-maintenance activities

WARNING

WARNING!

The operation-maintenance activities can be performed exclusively by persons familiar with this instruction manual, having the relevant qualifications and tools for performing such activities. Lack of knowledge concerning the principles of safe operation and maintenance works of the wrapper and use of improper tools can result in a hazard to human life or machine damage.

During the performance of the operation-maintenance works you should wear relevant protective clothes and boots, used for the activities to be performed and substances with which you will be in contact.

Do not repair leaks from the pressurised devices and hydraulic elements.

In the case of damage to machine parts they should be replaced with new, original parts. The application of non-original or incorrect parts results in the loss of the machine guarantee.

Unintended operation of the bale wrapper or operation by unauthorised persons who do not have the right qualifications must be strictly avoided.

The accidental starting up of the machine must be prevented.

In case it is necessary to carry out work on the wrapper elements that cannot be reached standing on the ground, only equipment intended for ascending (safe ladders) can be used. Do not use the bale wrapper's components to climb on the machine.

Follow the check lists during the connection of the machine with the tractor, starting it up and disconnecting the wrapper from the tractor.

It is recommended to run an operation-maintenance activities log book. It will facilitate continuous insight into the machine's technical condition and to avoid the need for repair activities in the field.

Hydraulic-oil leaks to the environment must be prevented. Carry out repairs to the hydraulic installation in a place where there is no danger of oil penetration into the soil, ground water, food, or animal fodder. Use tight and safe containers to store used oil.

If it is necessary to conduct the operation-maintenance activities under the elevated machine parts, they must be protected against lowering by installing stable supports under them.

5.1 Lubrication points

The lubrication points are marked numerically, where each number has one of the three markings, which means the kind of the lubricant and tools used for its application.

Marking of the lubrication points:

(1) – plastic grease applied with a grease gun

◇1 – plastic grease applied on sliding surfaces with a brush,

⬠1 – plant oil (e.g. rape) applied with a brush.

5.1.1. Film cutter and film feeder

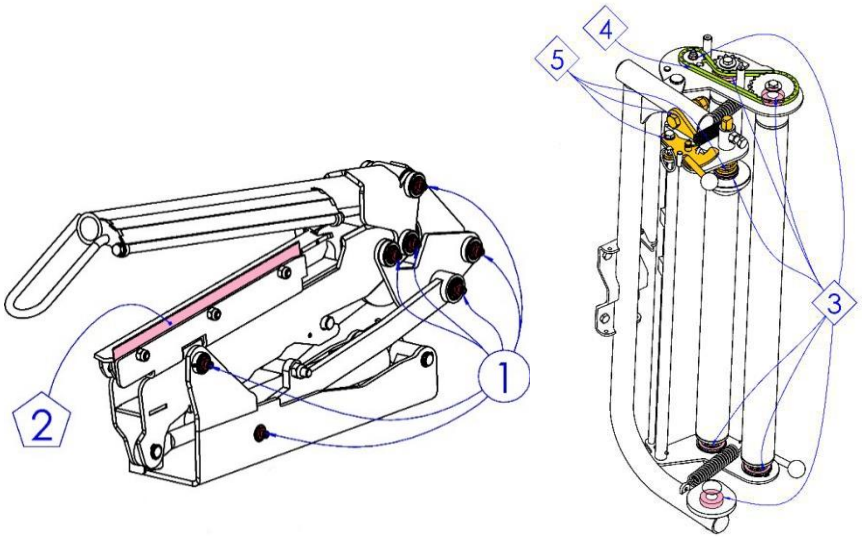


Figure 37. Lubricating points of film cutter and film feeder:
1 – joint grease nipples; 2 – cutting blade; 3 – feeder bearings; 4 – feeder gear unit drive chain; 5 – upper clamp of film roll

5.1.2. Lower arms servomotor and bearings

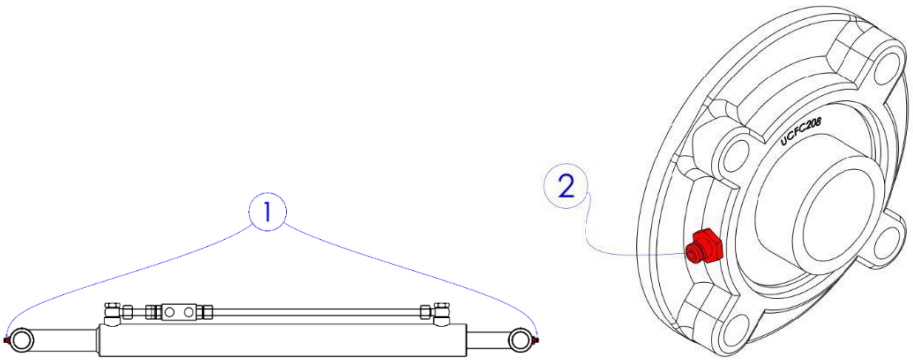


Figure 38. Lubrication point of Lower arms servomotor and bearings:
1 – pin grease nipples; 2 – bearing grease nipples

5.1.3. Lower arm drive

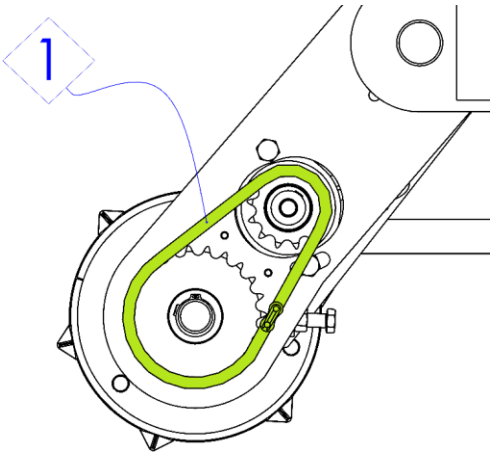


Figure 39. Bottom arms chain lubrication:
1 – bottom arm drive chain

5.2 Transmission oil exchange (once a year)

The oil in the transmission box should be exchanged after the first 50 hours of operation and then in 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).

5.2.1. Transmission disassembly

CAUTION

CAUTION!

In order to disassemble and assemble the transmission a tool certified for work at heights should be used (a ladder).

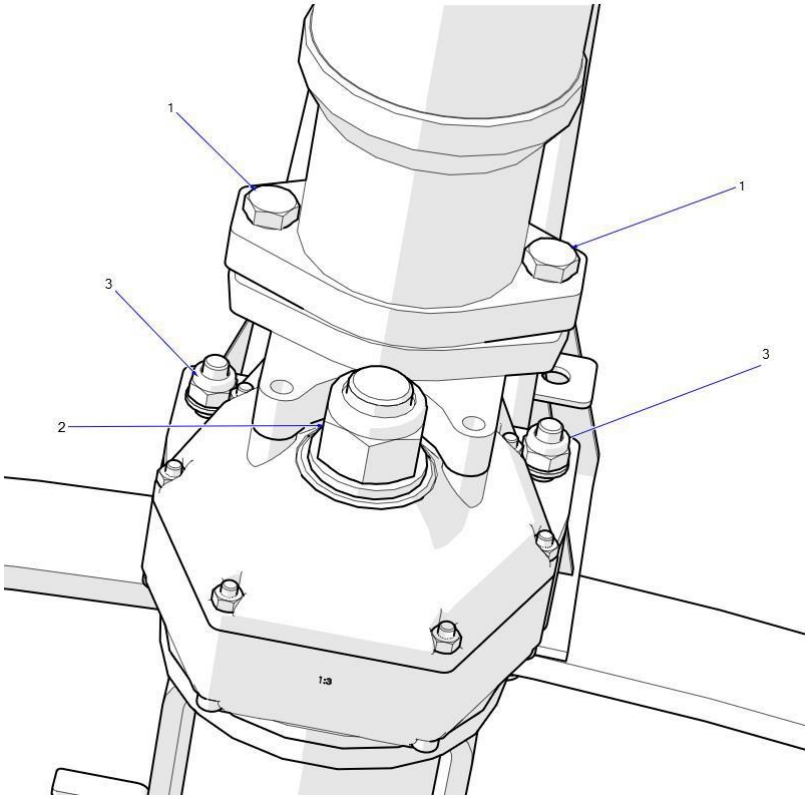


Figure 40. Transmission disassembly

- Unscrew the motor screws item 1,
- Remove the motor from the gearbox,
- Unscrew the axle pressing nut item 2,
- Unscrew the mounting screws of the gearbox item 3,
- Remove the gearbox.

5.2.2. Oil draining

Figure 41. View of the intersecting axis gear – draining plug

- Prepare a container for used oil.
- Unscrew and remove the plug item 1.
- Drain oil to the previously prepared container.
- After emptying the box, replace the cap.

5.2.3. Oil topping-up

Figure 42. View of the intersecting axis gear

- Unscrew and remove the plug item 1,
- Replenish the oil,
- Control the oil level through the sight glass item 2,
- Check the oil level immediately after replacing the plug item 1 and setting the gear in the horizontal position,
- The oil should be in the middle of the control sight glass,
- If the oil level is correct tighten the plug, item 1.

Important: Use the transmission oil type 80W90.

5.2.4. Transmission assembly

- Install the transmission on the axis and screw to the arm (Fig. 40 item 3),
- Screw the pressing nut (Fig. 40 item 2),
- Mount the motor in the gear and connect it with screws (Fig. 40 item 1).

5.3 User inspections

Check the following after each use of the wrapper:

- Condition and legibility of the rating plate and pictograms,
- Hydraulic system tightness,
- Bottom wrapping arms drive chains,
- Chain in the film feeder transmission,
- The rating plate should be replaced in the service only,
- Illegible pictograms should be replaced with new ones.

After the end of the season lubricate the lubrication point with bearing grease e.g. ŁT-43 (chapter 5.1).

Submit the control panel to the authorised service in the case of its damage. Repairing of the control panel on one's own results in cancelling its guarantee.

Every two years exchange the oil in the toothed gear of the machine upper motor in the following way:

- Position the machine on level ground,

- Place a relevant, tight vessel under the drain plug,
- Unscrew the inlet and drain plugs,
- After completely draining the oil replace and tighten the drain plug,
- Pour in the transmission oil 80W90 through the inlet hole until you can see it in the middle of the level control sight glass,
- Replace the inlet plug.

Take the used oil to a petrol station that deals with this product.

CAUTION

CAUTION!

During the operation of the oil exchange use impermeable protective clothes adapted for contact with crude-oil-derived products.

Every 5 years replace the power hydraulics hoses. Before each season check (without the silage bale) the efficiency of operation of all the wrapper functionalities.

Clean the dirty control panel casing with a dump piece of cloth with some detergent. Do not use organic solvents for washing (acetone, benzine, nitro solvent, etc.), as it may result in damage of the panel casing.

5.4 Service inspections

Periodic routine inspections are recommended to be performed after each two seasons of machine use.

For replacements it is recommended to use original spare parts that will assure the maintenance of the wrapper in full efficiency for a long period.

6. Authorised service

6.1 Post-warranty service

The manufacturer provides a commercial warranty for this machine, on the terms and conditions specified in the warranty certificate. In the period covered by the guarantee the repairs are performed by the authorised services of the dealers or the manufacturer's services.

6.2 Day-to-day service

After the period of the guarantee coverage it is recommended to carry out periodic inspections at the authorised services of the dealers.

6.3 Ordering spare parts

Purchase spare parts at dealer centres, or order them from the manufacturer directly, providing your last and first names, or the company name and the address of the buyer, the name, logo, factory number, and year of manufacture, catalogue-part name, catalogue drawing or standard number, number of ordered parts, and agreed terms of payment.

7. Bale wrapper transporting

7.1 Load transport

The bale wrapper is suitable for rail and road transporting of the relevant capacity.

CAUTION

CAUTION!

For loading on railroad transport use lifting equipment with a capacity relevant for the mass of the wrapper with a film roll loaded on it. For lifting points, use the elements of the frame marked on the machine with a pictogram in the places presented below.

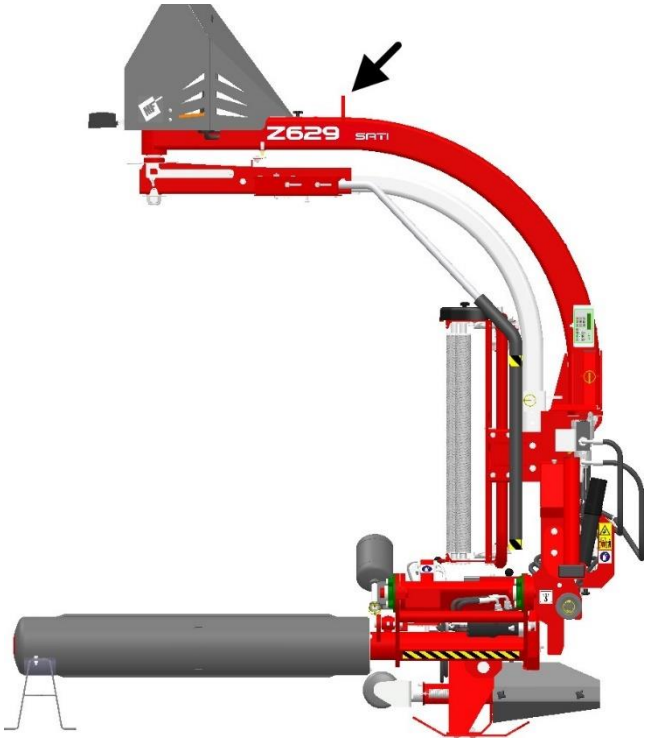


Figure 43. Lifting point on the wrapper

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

It is forbidden to transport the wrapper with a silage bale located on it.

For the time of transporting the Bale Wrapper should be permanently and reliably attached to the floor.

7.2 Driving on public roads

The wrapper is adapted for public road traffic as a machine attached to the three-point hitch system.

The dimensions of a correctly prepared machine are indicated in Chapter 1.5.

You may use an agricultural tractor with a power of not less than 60 kW for transport on public roads.

Prior to entrance on public roads follow the procedure.

- Contract the bottom wrapping arms
- Lift the wrapper to the transport position (**Fig. 19**),
- Secure the upper wrapping arm with the transport lock (Fig. 44),
- The hydraulic hoses should be disconnected and fixed in a relevant way,
- Leave the wrapper control panel in the tractor cockpit.

Figure 44. Wrapping arm transport lock: A – locked position; B – unlocked position

Prior to each departure of the wrapper to public roads check the correctness of the wrapper connection with the tractor. Clean the machine of silage residue so as not to pollute the road surface.

It is forbidden to transport people or silage bales on the wrapper.

Prior to joining the traffic on public roads make sure that the tractor has the required stability (Chapter 2.2). If this condition is not fulfilled the front axle of the tractor must be loaded additionally.

During transport of the machine on public roads adapt the speed to the traffic conditions and do not exceed the speed of 20 km/h.

During transport of the wrapper on public roads follow the traffic law regulations. In the case of an emergency stoppage of the tractor with an attached wrapper, the driver should (when stopping):

- Stop the vehicle and avoid causing any hazard for safety on the road,
- Park the vehicle as close to the road edge as possible, parallel to the lane axis,
- Stop the tractor engine, take out the key from the ignition and engage the auxiliary brake.

Outside built-up areas, place a warning triangle between 30 and 50 metres behind the vehicle and switch on hazard lights

In built-up areas switch on the hazard lights and place the warning, reflective triangle behind the vehicle. Make sure that it is visible for the other traffic participants.

In case of a breakdown undertake relevant steps in order to secure the place of the breakdown.

CAUTION

CAUTION!

When driving the tractor with the wrapper on uneven ground, e.g. crossing meadows, the wrapping arm locking device should be fitted to avoid the risk of damage to the arm gearbox by shocks and sudden tilting of the wrapper

8. Bale-Wrapper storage

1. Store the control panel in a dry room protecting the terminals against dirt and humidity.
2. Wind the control panel cable and store in a dry room protecting the terminals against dirt and humidity.
3. Store the wrapper on a flat, level and paved surface.
4. It is recommended to store the wrapper in a dry room protecting it against the UV radiation and other adverse factors.
5. Protect the wrapper stored outside with no roofing with a waterproof canvas or film.
6. After the season is over clean the wrapper and check the condition of the protective layers. All the areas with protective coating missing should be repainted during the service.
7. Check the condition and legibility of the rating plate. In case it has been destroyed report it at the service.
8. Check the condition and legibility of the pictograms. In case they have been damaged replace them with new ones.

CAUTION

CAUTION!

Store the bale wrapper in an atmosphere free from aggressive factors (e.g. ammonia, chemicals).

9. Bale Wrapper cleaning

CAUTION

WARNING!

Before cleaning the machine, ensure that the tractor engine is stopped (ignition key removed). Disconnect the hydraulic and control panel cables.

CAUTION

WARNING!

Clean with caution, especially next to the moving parts and blades.

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

Prior to a longer stop, clean the bale wrapper of dust 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 washing with water and before prolonged downtime it is advisable to grease all lubrication points

10. Risk

10.1 Residual risk description

Residual risk results from the erroneous behaviour of the bale wrapper operator. The largest hazard occurs during execution of the following activities:

- Assembly of the wrappers on tractors that do not fulfil the requirements described in the instruction,
- Staying under raised machine units,
- People staying in the area of wrapper operation,
- Servicing or repairing the wrapper when the tractor engine is still on,
- Control of the wrapper by an operator who is outside the tractor cockpit,
- Control of the wrapper by an operator under the influence of alcohol,
- Operating of a damaged wrapper or operation with the guards removed.
- Operation of the wrapper on slopes exceeding 8.5°,
- Transport of the wrapper of silage bales on the public roads,
- People staying on the machine during its operation or transport,
- Not using the wrapper for its intended purpose,
- Leaving the unsecured wrapper on slopes,
- Staying in the area between the tractor and the machine during the tractor engine operation.
- Unauthorised interference with the safety features of the wrapper.

When presenting the residual risk the bale wrapper is treated as a machine that until the moment it is started it was manufactured and designed according to the current state of the art.

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,
- People forbidden to stay in the area of wrapper operation,
- Maintenance and repair of the wrapper at authorised services,
- Operation of the machine by trained and authorised operators,
- Protection of the wrapper against the access of children and third persons,
- The residual risk can be minimised during the use of the wrapper and consequently operation of the machine with no hazard for people and the environment.

CAUTION

CAUTION!

There is a residual risk in the case of non-compliance with the particular recommendations and indications of the manufacturer.

11. Bale Wrapper disposal

Disassembly and disposal should be performed by specialised services familiar with the construction and operation of the Wrapper. Only the specialised services possess the full and updated knowledge in respect of the materials used and the risk related to the hazards in the case of their incorrect storage and transport. The authorised services provide both counselling and performance of the complete services concerning the disposal of the machine.

Use proper tools and auxiliary equipment for disassembly.

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. Deliver the dismantled parts to proper recycling collection points.

During the dismantling of the wrapper wear the proper protective clothes and protective boots.

12. Typical faults and troubleshooting

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

The most frequent faults and problems that may occur during the operation of the machine are presented in the table below. After any repair work has been carried out, restart the machine and check that the proposed solution to the problem has corrected the fault. If the suggested solutions fail to bring the required result, contact the distributor or Metal-Fach service centre.

Table 6. Typical faults and their removing

No.	Fault description	Cause	Method of rectification
I	II	III	IV
1.	Hydraulic servos of the wrapper work slowly or do not work. The wrapping arms do work smoothly, work too fast or to slowly.	Insufficient amount of oil in the tractor system.	Check the oil level in the tractor. Replenish the oil.
		Oil pressure in the tractor system too low.	Check the pressure in the tractor hydraulic system
		Faulty setting of the proportional valve.	Check the setting of the proportional valve (**Fig. 28**)
		Defective servomotor or hydraulic motor.	Replace the servomotor or the hydraulic motor.
		Incorrect setting of the external system lever.	Switch on the pump drive.
2.	The wrapper operates too slowly.	Insufficient amount of oil in the tractor system.	Check the oil level in the tractor. Replenish the oil.
3.	Oil leakages from the distributor.	Worn sealing rings.	Replace the sealing rings of the hydraulic distributor.
4.	In Automatic mode, the upper wrapping arm does not stop or it stops at a wrong position.	Incorrect setting of the inductive sensor in respect to the activator.	Correct the setting of sensors in respect to their activators (Chapter 4.1).
		Sensor damage	Replace the damaged sensor with a new one.
5.	No reaction to a manual command of making a movement via the control panel.	No contact on the electrical connections in plugs at the control module.	Check correctness of the connection.
		No contact on the electrical connections in plugs on the solenoid valves of the hydraulic block.	
6.	The hydraulic system does not answer to the controlling signals from the control panel	Incorrect direction of oil flow	Put the distributor lever on a right position or switch the hydraulic plugs.
		Oil pressure too high	Decrease the setting of the oil pressure in the tractor to the max. value of 160 bar (16 MPA)
7.	The control panel does not count wrapping arm rotations	Incorrect setting of the inductive sensor in respect to the activator	Correct the setting of sensors in respect of their activators (chapter 4.1).
		Sensor damage	Replace the damaged sensor with a new one.
8.	Once wrapping has started, the wrapping arm does not rotate and the drums rotate	Damage to the wrapping arm gearbox	Replace the damaged wrapping arm gearbox
	The wrapping arm can be freely rotated by pushing it		Use the transport lock on the wrapping arm when transporting under road conditions and for longer journeys.

13. Accessories

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

- Hard copy of the Spare Parts Catalogue
- Hydraulic bale drop-off gear – for the Z629 wrapper with a drive roller.
- Drive roller – for the Z629 wrapper with bale wrapper.
- Frame for attaching the wrapper to the front loader.
- A triangular plate indicating slow-moving vehicles
- Chain link removing tool,
- Varnish-coating repair set.

INDEX OF NAMES AND ABBREVIATIONS

BHP – occupational safety and health;
dB (A)– decibel A, sound pressure unit;
km/h – kilometre per hour, linear speed 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
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
TUZ– three point hitch (see – the instruction manual of the tractor,
UV – ultraviolet radiation, invisible electromagnetic, invisible electromagnetic radiation with negative effect on human health, the UV radiation has a negative effect on rubber parts;
V – Volt, a voltage unit

ALPHABETICAL INDEX

NOTES

Metal-Fach Sp. z o.o. is constantly improving its products and adjusting its package to the needs of its customers, so it reserves the right to make changes to its product range without notice. Therefore, before making your purchase decision, please contact an authorised dealer or sales representative of Metal-Fach Sp. z o.o. Metal-Fach Sp. z o.o. will not accept any complaints regarding the data and pictures contained in the catalogue, as the presented range of products does not constitute an offer within the meaning of the provisions of the Civil Code.

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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