METAL-FACH

SELF-LOADING BALE WRAPPER
Z598

INSTRUCTION MANUAL – PART I

TRANSLATION OF THE ORIGINAL INSTRUCTION MANUAL

REV. I

AUGUST 2017

Instruction manual No. Z598-01-167/2013

EC DECLARATION OF CONFORMITY

The undersigned:	Jacek Kucharewicz, Chairman of the Board	
declares hereby with full responsibility, that the complete machine:		
Bale Wrapper		
0.1.	Brand(s) (manufacturer's registered trademark):	Metal-Fach
0.2.	Type:	Z598
	Variant:	Z598-00
	Version:	N/A
0.2.1	Vehicle trading name(s) (if any):	N/A
0.3.	Type identification, if marked on the vehicle:	
0.3.1.	Manufacturer's plate (location and method of its attachment):	On the front part of the machine main frame, glued
0.3.2.	Chassis identification number (location):	
0.4.	Vehicle category[3]:	S
0.5	Manufacturer's name and address:	Metal-Fach sp. z o.o. ul. Kresowa 62 16-100 Sokółka, Poland

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

The following harmonized standards were applied to assess the compliance: PN-EN ISO 4254-1: 2016-02, PN-EN ISO 13857: 2010, PN-EN ISO 12100: 2012 and standards: PN-ISO 3600:1998, PN-ISO 11684:1998 and Regulation of the Minister of Infrastructure dated 31 December 2002 on technical conditions of vehicles and the range of their necessary equipment (Journal of Laws of 2003, No. 32, item 262, as amended).

Safety testing report No.: LB/84/2016

This declaration of conformity EC becomes null and void if the machine is changed or reconstructed with no consent of the manufacturer.

Sokółka
(Location)

14/12/2016
(Date)

Jacek Kucharewicz
(Signature)

Chairman of the Board
(Position)

Machine data

Machine kind:		Bale Wrapper
Type designation:		Z598
Serial Number[1]:		_____
Machine manufacturer:		METAL-FACH Sp. z o.o. 16-100 Sokółka ul. Kresowa 62 Phone: (0-85) 711 98 40 Telefax: (0-85) 711 90 65
Seller:		_____
	Address:	_____
		_____
	Phone/fax:	_____
		_____
Delivery date:		_____
Owner or user:	Name:	_____
	Address:	_____
		_____
	Phone/fax:	_____

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

Table of contents

PART I

INTRODUCTION 9

1. Wrapping machine identification, general safety principles 11

1.1 Wrapping machine identification 11

1.2 Proper use 12

1.3 General safety principles 13

1.4 Wrapper design 15

1.5 Wrapper characteristics 18

1.6 Wrapper dimensions 18

1.7 Location of pictograms 20

1.8 Hazard warning symbols 21

2. Cooperation with a tractor 24

2.1 Connection with drive 25

2.1.1 Checking of operation of wrapper hydraulic system control 26

2.1.2 Checking power hydraulics control for correctness in the automatic mode 26

2.2 Drive disconnection 27

2.3 Power supply system 28

2.4 Lighting system 29

2.5 Wrapper hydraulic installation 30

3. Control elements and work with wrapper 33

3.1 Description of control panel push buttons of Z598 33

3.2 Wrapper operation with the control panel 34

3.2.1 Panel switching on 35

3.2.2 Switching off the Panel 36

3.2.3 Protections against collisions. 36

3.2.4 Wrapper manual operation 37

3.2.5 Working position 37

3.2.6 Standby position 38

3.2.7 Transport position 39

3.3 2D wrapping 40

3.3.1 2D wrapping sequence description 41

3.3.2 2D wrapping sequence procedure 41

3.4 3D wrapping 45

3.4.1 3D wrapping sequence description 45

3.4.2 3D wrapping sequence procedure 45
3.5 Operation stoppage when wrapping 47
3.6 Emergency stop from the control panel.....47
3.6.1 Emergency stop by the planet arm limit stops.....47
NAME AND ABBREVIATION INDEXES 49
ALPHABETIC INDEX 50

PART II

4. First starting up **Błąd! Nie zdefiniowano zakładki.**

5. Current adjustment elements **Błąd! Nie zdefiniowano zakładki.**

5.1 Adjusting the height of the wrapper hitch eye **Błąd! Nie zdefiniowano zakładki.**

5.2 Adjusting the support foot ..... **Błąd! Nie zdefiniowano zakładki.**

5.3 Wrapper sensors ..... **Błąd! Nie zdefiniowano zakładki.**

5.3.1 Sensor description ..... **Błąd! Nie zdefiniowano zakładki.**

5.3.2 Locations of the sensors ..... **Błąd! Nie zdefiniowano zakładki.**

5.3.3 Adjustment of the inductive sensors' settings..... **Błąd! Nie zdefiniowano zakładki.**

5.3.4 Adjusting the angle sensor settings ..... **Błąd! Nie zdefiniowano zakładki.**

5.3.5 Verifying the function of the wrapping module limit stop sensors **Błąd! Nie zdefiniowano zakładki.**

5.4 Adjustment of the hydraulic components .. **Błąd! Nie zdefiniowano zakładki.**

5.4.1 Adjusting the speed of film feeder lowering..... **Błąd! Nie zdefiniowano zakładki.**

5.5 Adjusting the tension of the chains ..... **Błąd! Nie zdefiniowano zakładki.**

5.5.1 Drive chain of the service table drums . **Błąd! Nie zdefiniowano zakładki.**

5.5.2 Chain of the film adjuster gear unit ..... **Błąd! Nie zdefiniowano zakładki.**

6. Preparation for wrapping **Błąd! Nie zdefiniowano zakładki.**

6.1 Film installation ..... **Błąd! Nie zdefiniowano zakładki.**

6.2 Customising the service table to the bale size **Błąd! Nie zdefiniowano zakładki.**

6.3 Storage bins for sparefilm rolls ..... **Błąd! Nie zdefiniowano zakładki.**

6.4 Attaching film ..... **Błąd! Nie zdefiniowano zakładki.**

6.5 Basic rules of wrapping..... **Błąd! Nie zdefiniowano zakładki.**

6.5.1 Preparing bales ..... **Błąd! Nie zdefiniowano zakładki.**

6.5.2 Preparing film ..... **Błąd! Nie zdefiniowano zakładki.**

6.5.3 Number of planet arm revolutions ..... **Błąd! Nie zdefiniowano zakładki.**

6.5.4 Film layer number ..... **Błąd! Nie zdefiniowano zakładki.**

7. Operation and maintenance activities **Błąd! Nie zdefiniowano zakładki.**

7.1 Cleaning ..... **Błąd! Nie zdefiniowano zakładki.**

7.2 Machine maintenance..... **Błąd! Nie zdefiniowano zakładki.**

7.3 Lubrication interval..... **Błąd! Nie zdefiniowano zakładki.**

7.4 Lubrication points ..... **Błąd! Nie zdefiniowano zakładki.**

7.4.1 Film cutter and film feeder ..... **Błąd! Nie zdefiniowano zakładki.**

7.4.2 Drawbar components..... **Błąd! Nie zdefiniowano zakładki.**

7.4.3 Service table with the loading arm ..... **Błąd! Nie zdefiniowano zakładki.**

7.4.4 Drive module of the planet arms and limit stop latches ..... **Błąd! Nie zdefiniowano zakładki.**

7.5 Bolt tightening specifications..... **Błąd! Nie zdefiniowano zakładki.**

7.6 Regular replacement components ..... **Błąd! Nie zdefiniowano zakładki.**

7.7 Storage..... **Błąd! Nie zdefiniowano zakładki.**

8. Authorised service
Błąd! Nie zdefiniowano zakładki.

8.1 Guarantee service ..... **Błąd! Nie zdefiniowano zakładki.**

8.2 Routine service..... **Błąd! Nie zdefiniowano zakładki.**

8.3 Ordering spare parts..... **Błąd! Nie zdefiniowano zakładki.**

9. Wrapper transport
Błąd! Nie zdefiniowano zakładki.

9.1 Stability of the tractor and wrapper unit during bale unloading**Błąd! Nie zdefiniowano zakładki.**

9.2 Manoeuvrability of the tractor and wrapper unit with a loaded bale**Błąd! Nie zdefiniowano zakładki.**

9.3 Load transport ..... **Błąd! Nie zdefiniowano zakładki.**

10. Wrapper disposal
Błąd! Nie zdefiniowano zakładki.

11. Accessories
Błąd! Nie zdefiniowano zakładki.

12. Residual risk
Błąd! Nie zdefiniowano zakładki.

12.1 Residual risk description..... **Błąd! Nie zdefiniowano zakładki.**

12.2 Residual risk assessment ..... **Błąd! Nie zdefiniowano zakładki.**

13. Typical faults and their removing
Błąd! Nie zdefiniowano zakładki.

GUARANTEE TERMS
Błąd! Nie zdefiniowano zakładki.

GUARANTEE CARD
Błąd! Nie zdefiniowano zakładki.

GUARANTEE REPAIRS
Błąd! Nie zdefiniowano zakładki.

NAME AND ABBREVIATION INDEXES
Błąd! Nie zdefiniowano zakładki.
ALPHABETIC INDEX
Błąd! Nie zdefiniowano zakładki.
NOTES
Błąd! Nie zdefiniowano zakładki.

INTRODUCTION

The information included in the instruction manual is valid for the date of development. The manufacturer reserves himself the right to implement in machines construction changes 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 himself the right to implement construction changes without changing this instruction. The instruction manual constitutes the basic equipment of the machine. The user is obliged to acquaint himself with the contents of this instruction before commencing of operation and to meet the recommendations included in it. It will guarantee safe operation and assure trouble free machine operation. The machine was constructed according to the standards in force and current legal stipulations. The instruction describes the basic safety and operation principles of the bale wrapper made by Metal-Fach, type Z598.

The material obligations of the manufacturer are presented in the Guarantee Certificate, which includes the complete regulations currently in force in the guarantee coverage.

If the information included in the instruction manual prove to be incomprehensible, you should address the seller where the machine was purchased or the manufacturer directly for assistance.

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

Manufacturer address:
Metal-Fach sp. z.o.o.
ul. Kresowa 62
16-100 Sokółka
Telephone:
Phone: (0-85) 711 98 40
Telefax: (0-85) 711 90 65

Symbols used in the instruction:

WARNING

Hazard warning symbol. It points to the occurrence of a serious hazard condition, which, if not avoided, may result in death or serious injury. The symbol warns against the most dangerous situations.

ATTENTION

The symbol pointing to especially important information and recommendations. Non-compliance with the described recommendations may result in serious damage of the machine due to its incorrect operation.

DANGER

The symbol indicating the possibility of occurrence of a hazard, which, if not avoided, may result in death or serious injury. This symbol informs about lower level of risk of injury than the symbol with the word “DANGER”.

The symbol indicating useful information.

The symbol indicating service operations that should be performed periodically.

1. Wrapping machine identification, general safety principles

1.1 Wrapping machine identification

Identify the wrapping machine on the basis of the rating plate permanently fixed to the wrapper main frame.

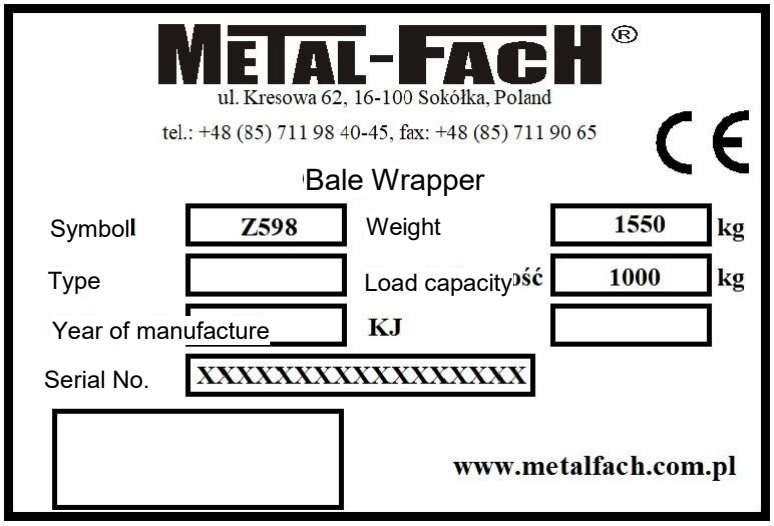


Figure 1. The data placed on the rating plate

ATTENTION

ATTENTION!
Operating the wrapper on public roads without the nameplate or with an illegible nameplate is prohibited.

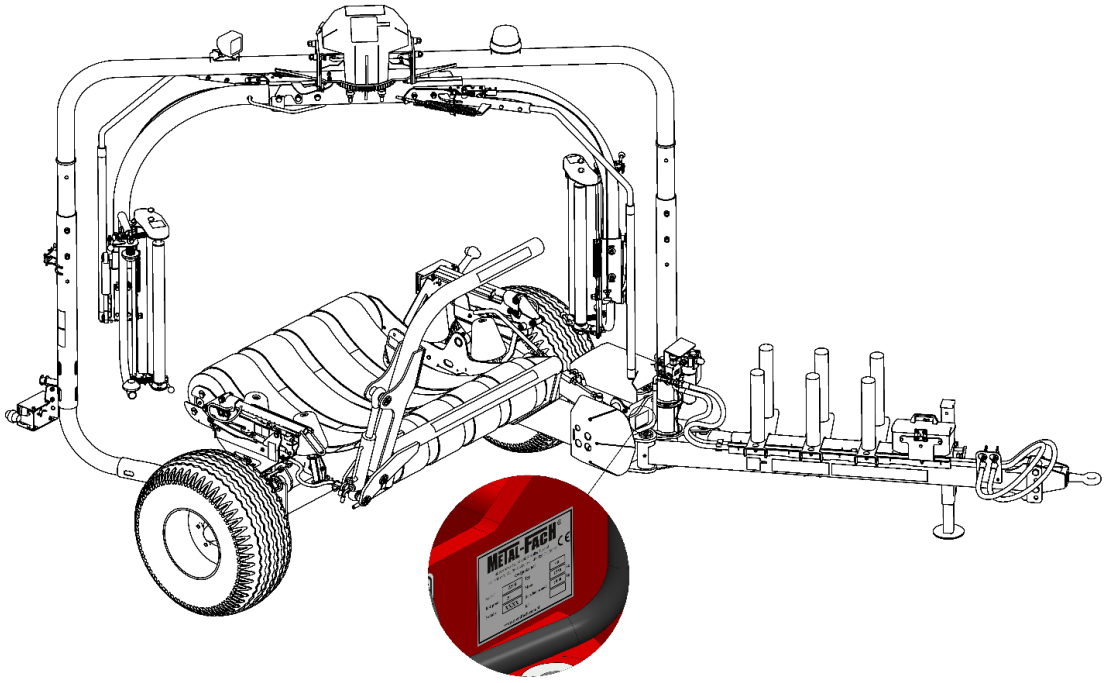


Figure 2. Location of the rating plate

Upon the purchase check the compliance of the factory number located on the machine rating plate with the number written in the instruction manual and guarantee card - it is crucial for recognizing the guarantee. In the case of the user contact with the service, seller or manufacturer, the user is obliged to indicate information included on the machine rating plate.

The instruction manual constitutes the basic equipment of the bale wrapping machine Z598.

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

User, read the instruction manual carefully, please.

Application of its recommendations will allow to avoid hazards, efficiently and productively operate the machine and keep the guarantee for the duration period granted by

ATTENTION

ATTENTION!
It is prohibited to use the wrapper by the persons who have not red this instruction manual.

1.2 Proper use

The Bale Wrapper Z598 is a tractor towed machine, working in tilted position, on the right hand side of the tractor, designed for lifting compressed bales of grass, hay or other non-lignified plants from the soil, by means of a loading arm, and loading bales onto the service table. Then, the process of wrapping of the loaded bale with film intended for silage, which is charged on the film feeders located on the planet arms, which turn round the bale. After finishing wrapping the film is caught and cut off by the film cutting unit. The last stage is unloading of the wrapped up bale onto the ground.

All the work actions must be executed by one person - an operator who is on the tractor seat. The wrapper is a machine controlled electronically, the particular cycles of its work are executed automatically after confirming their start by the operator.

Any cargo, goods, people or animals cannot be transported by the wrapper. It is prohibited to transport bales on the wrapping machine on public roads.

The wrapping machine cannot be used for wrapping or catching/lifting other materials than the plant material bales.

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

The machine is intended for use exclusively for agricultural purposes described in this instruction. Any other utilization of the wrapping machine is considered to be non-compliant with its intended use and releases the manufacturer and distributor from their responsibility for damages arising in the result of incorrect utilization.

ATTENTION

ATTENTION!
Unauthorised construction changes and working with the wrapper non-compliant with its intended use and avoiding the safety principles release the manufacturer from responsibility for any resulting hazards and damages

1.3 General safety principles

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.

Safety principles:

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 machines should be met.
2) The wrapper operator can only be an adult person holding valid authorization to operate agricultural tractors, familiar with the occupational safety and health regulations in the respect of operating agricultural equipment and familiar with this instruction manual.
3) This instruction manual should be read carefully and adhered to its recommendations with the particular attention paid to the indications concerning safe wrapper work.
4) The instruction indicates the machine elements constituting potential hazards. Dangerous places are marked on the machine with yellow label with warning pictograms. Special attention should be paid to the dangerous places and recommendations should be strictly adhered to.
5) You should learn the meaning of the pictograms that appear.
6) Operation of the wrapper without protective guards installed on the place is strictly prohibited.
7) Prior to each starting of the wrapper check the machine condition, completeness and mounting of the guards.

8) Prior to each departure, starting up and ride on public roads, check correctness of the machine connection with the tractor, tightening of the wheels and correct drawbar and tractor connection.
9) It is allowed to ride the wrapper on public roads only in the transport position after protecting the bale tipper (if present).
10) All the adjustment, repair and service works should be executed with the tractor engine off, making sure before that it is protected in a right way against accidental starting up.
11) Prior to commencement and during loading of bales make sure that there are no by-standers and children especially.
12) During operation of the wrapper provide free space in the zone of the rotating parts. During the switching of the machine to the operating or transport positions, and 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 operation.
14) Take special care during operation on inclined area. Pay special attention to the possibility of 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 operation.
17) Take particular care at connecting and disconnecting the wrapper from the tractor. The machine must be connected to a tractor equipped with an agricultural hitch withstanding a higher vertical load than the vertical load on the wrapper drawbar.
18) During operation, use appropriate work clothing and footwear with non-slip soles.
19) Bale wrapping film should be charged at the tractor engine switched off and protected against its accidental staring up (the 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. Impermeable protective clothing and gloves must be worn and the environment must be protected from oil contamination while replacing hoses.
21) Control the power hydraulics installation form the tractor operator cockpit only.
22) During transport on public roads follow the traffic law regulations and recommendations of the manufacturer.
23) Prior to entrance on the public roads provide visual control of the transported machine.
24) It is forbidden to climb the wrapper during its transport and operation.
25) It is forbidden to climb the components of the wrapper during parking, transport and operation.
26) During transport on the public roads it is forbidden to transport on the wrapper swathe or hay silage bales.
27) During driving the wrapper on public roads, the user must use road lighting installed on the wrapper in compliance with the local regulations in force.
28) It is forbidden to work with the wrapper under the influence of alcohol.
29) It is forbidden to operate the wrapper by the persons under the influence of narcotic or medicines with the narcotic reaction
30) It is forbidden to operate the machine by the people under the influence of medicines having a negative influence on the ability to drive vehicles and general psychophysical efficiency and medicines causing disturbances of concentration or delay of the reaction time.
31) It is forbidden to operate the wrapper in exhaustion that can cause disturbances of concentration and delay of the reaction time.

32) It is forbidden to drive the wrapper near open fire.
33) The fire fighting regulations must be strictly obeyed and the hazards arising during operation or stoppage of the wrapping machine must be eliminated immediately.
34) The sources of fire must be liquidated using a dry powder fire extinguisher.
35) During operation of the wrapper do not approach it with open fire and do not smoke near the machine.
36) Prior to each departure to work check if there is a dry powder fire extinguisher included in the tractor equipment. If there is not any provide the tractor with one.
37) When failure occurs or any defective operation of the machine is noticed, use the STOP push button on the control panel. Stop the tractor engine, take off the key from the ignition and engage the auxiliary brake. Locate the breakdown and remove it using an authorized service.

1.4 Wrapper design

The Z598 wrapper is constructed of the following units (**Fig. 3**):

1 – Main frame,
2 – Ground axles with wheels,
3 – Drawbar with rotating hitch,
4 – Storage bins for spare film rolls,
5 – Box for electric bundle,
6 – Service table,
7 – Loading arm,
8 – Wrapping module,
9 – Side rolls,
10 – Planet arms,
11 – Limit switch stops,
12 – Film feeders,
13 – Film cutters,
14 – Bale tipper unit (optional),
15 – Parking support,
16 – Road lighting,
17 – Work Lighting (optional),
18 – Flow control,
19 – Hydraulic filter,
20 – Hydraulic manifold,
21 – Wrapping module motor valve,
22 – Control module,
23 – Control panel.

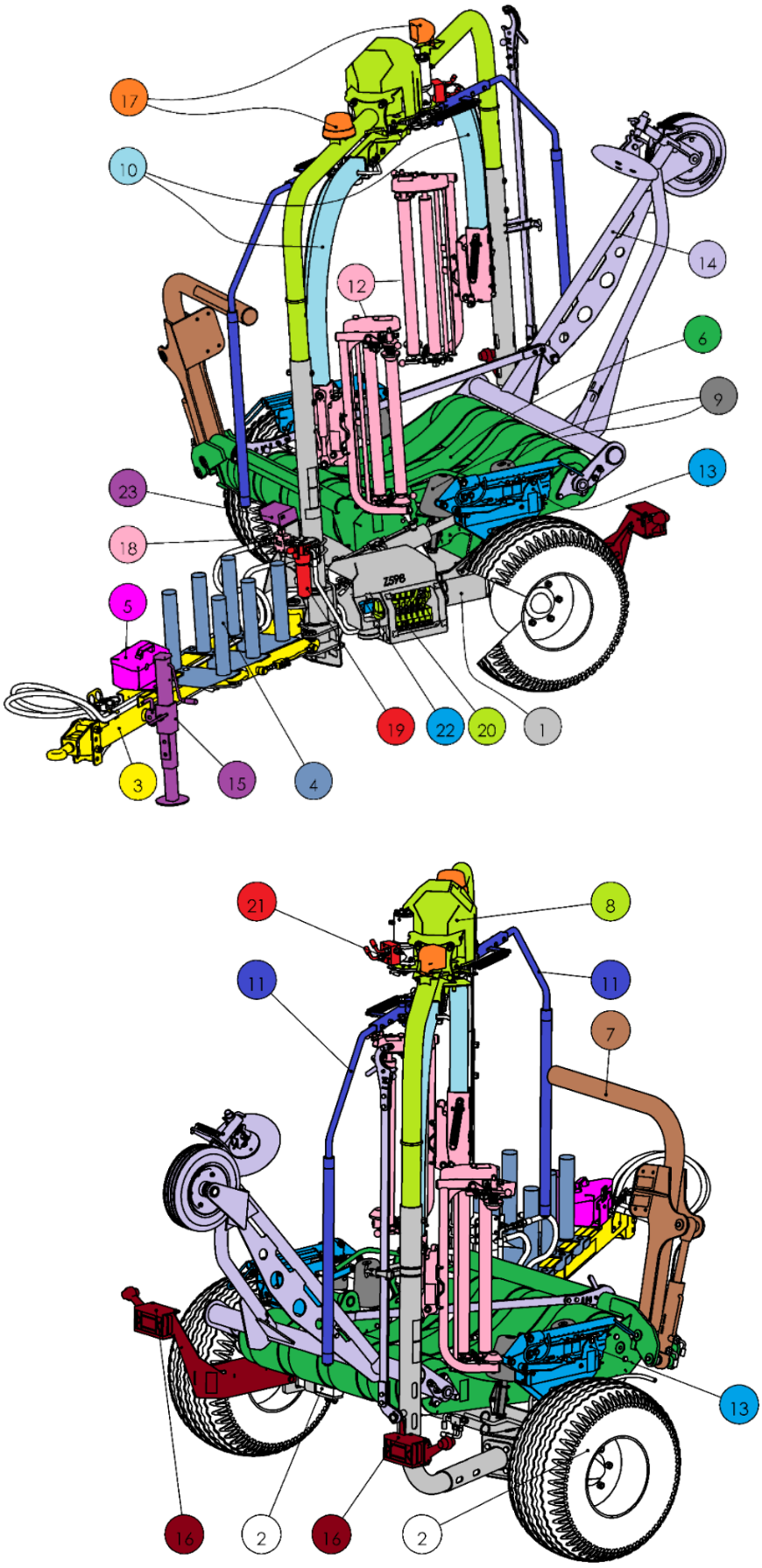


Figure 3. Wrapper design

Fixed to the main frame (1) are ground axles (2) with wheels and a pin-jointed drawbar (3) switched with a hydraulic cylinder, terminated with an adjustable, swivel hitching eye used for coupling the wrapper with the farming tractor, and its levelling in both the working and transport positions. Fixed to the drawbar are storage bins (4) for six spare film rolls, electric bundle box (5) and pin-jointed support foot (15), with incremental and stepless height adjustment and setting in transport position. Fixed to the main frame is a pin-jointed service table (6), to which a pin-jointed loading arm (7) is fixed, and both components are driven by cylinders. Four tilt-adjustable side rolls (9) are attached to the service table. Film cutters (13) are permanently fixed to the main frame on both sides of the service table. Both 90°-rotation film feeders (12) are fixed to the planet arms (10), which are fixed to the wrapping module (8), a part of which is moving, driven by the hydraulic engine fitted with a valve (21). The wrapping module is connected to the main frame by means of supports. Limit switch stops (11), which switch off the machine if it hits an obstacle, are fixed to the planet arms. The wrapper is equipped with road lighting (16) mounted on the main frame of the wrapper and the rear wrapping module support.

On the front wrapping module support, there is an oil flow control (18) with a hydraulic filter (19) behind it. A hydraulic manifold (20) and a control module (22) is fixed to the main frame in front of the left ground wheel of the wrapper. The control module is connected to the control panel (23) by means of a communication cable.

It is possible to install optional components, such as vertical bale tipper (14) fixed to the service table, and working lighting (17) fixed to the wrapping module supports.

1.5 Wrapper characteristics

Table 1. Wrapper specifications

Item	Detailed list	UOM	
1	Type		Z598-00
2	The way of connecting with the tractor		Towed
3	Chassis type		Single axle
4	Overall dimensions in operating position Length/width/height	mm	4450/3540/3000
5	Overall dimensions in transport position Length/width/height	mm	4650/2800/3000
6	Machine mass	kg	1550
7	Maximum bale mass	kg	1000
8	Dimensions of a wrapped bale Length Diameter	mm	 1200 1000-1600
9	Maximum operation speed	km/h	10
10	Maximum transport speed	km/h	15
11	Connected with the tractor by	-	Hitch
12	Tractor class	-	0,9
13	Minimal tractor power	kW	35
14	Required pressure in tractor hydraulic actuator system	MPa	14
15	Recommended tractor pump output	l/min	minimum 40
16	Hydraulic oil purity class	-	not less than 8 acc. to NAS 1638 (category 19/17/14 acc. to ISO 4406-1996)
17	Vertical load on tractor hitch	kN	2
18	Wheel track	mm	2420
19	Tyres	-	400/60-15.5 14PR
20	Pressure in tyres [MPa]	bar	3.5
21	Drawbar eye diameter	mm	40
22	Wrapper drive	-	Hydraulic from the tractor power hydraulics
23	Wrapping module drive	-	Hydraulic motor
24	Maximum rotary speed of planet arms	rpm	20
25	Bale loading method	-	Self-loading arm
26	Bale unloading method	-	Self-unloading service table
27	Film cutting	-	Automatic after completing the wrapping cycle
28	Film width	mm	750
29	Number of planet arm revolutions for 4 covering layers of Ø1200mm bale	rev.	9
30	Bale wrapping time (loading, wrapping, unloading)	min	1 min
31	Number of operators	-	1 (tractor operator)
32	Control panel	-	Electronic
33	Electrical installation voltage	V	12
34	Machine lighting	-	As per requirements of the traffic code

1.6 Wrapper dimensions

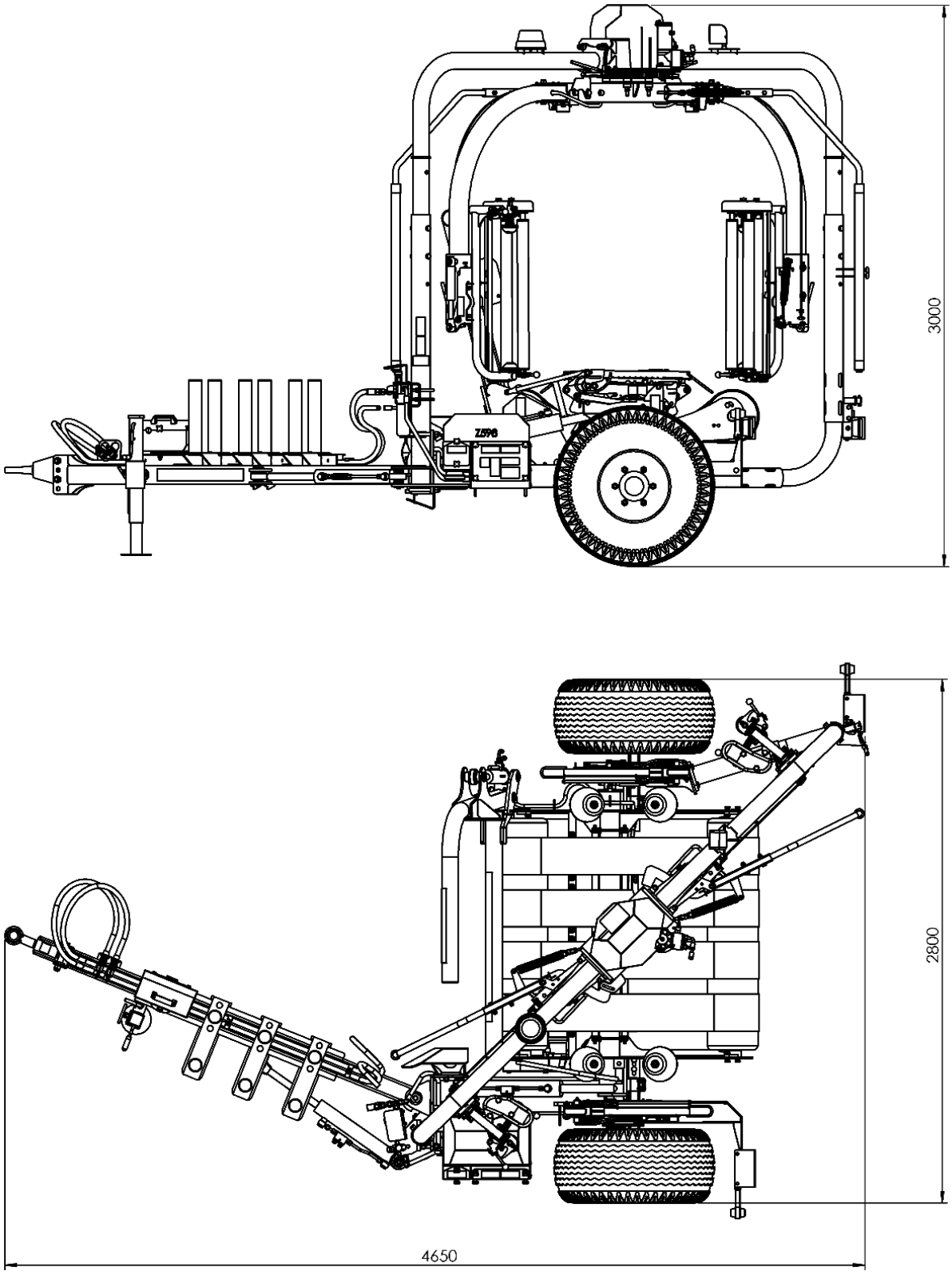


Figure 4. Overall wrapper dimensions in transport position Overall wrapper dimensions in operating position are presented: **Wrapper characteristics** chapter 1.5 of the instruction manual.

1.7 Location of pictograms

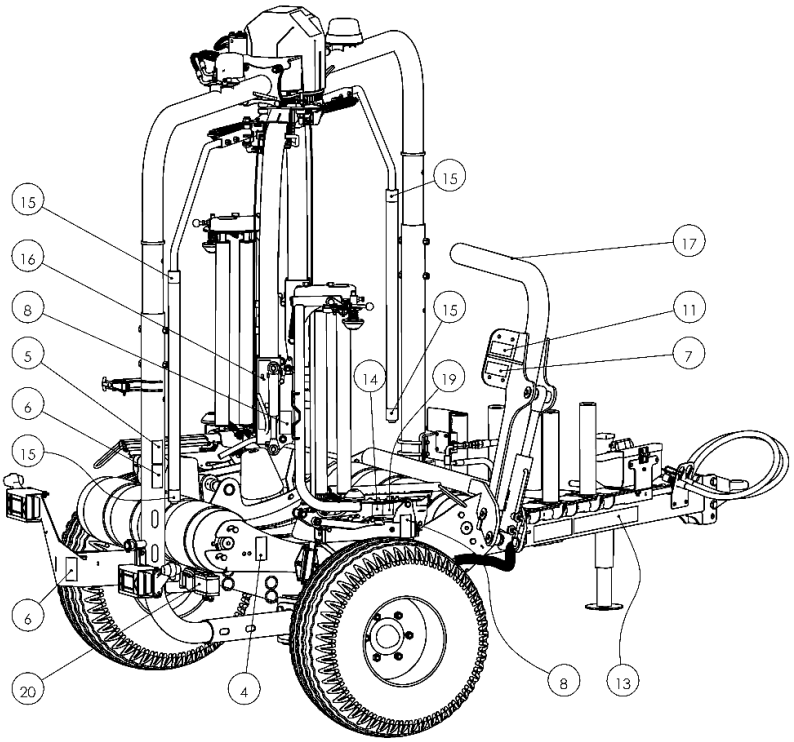


Figure 5. Arrangement of pictograms – right-hand side. Meaning of the pictograms is indicated in chapter **1.8** of the manual

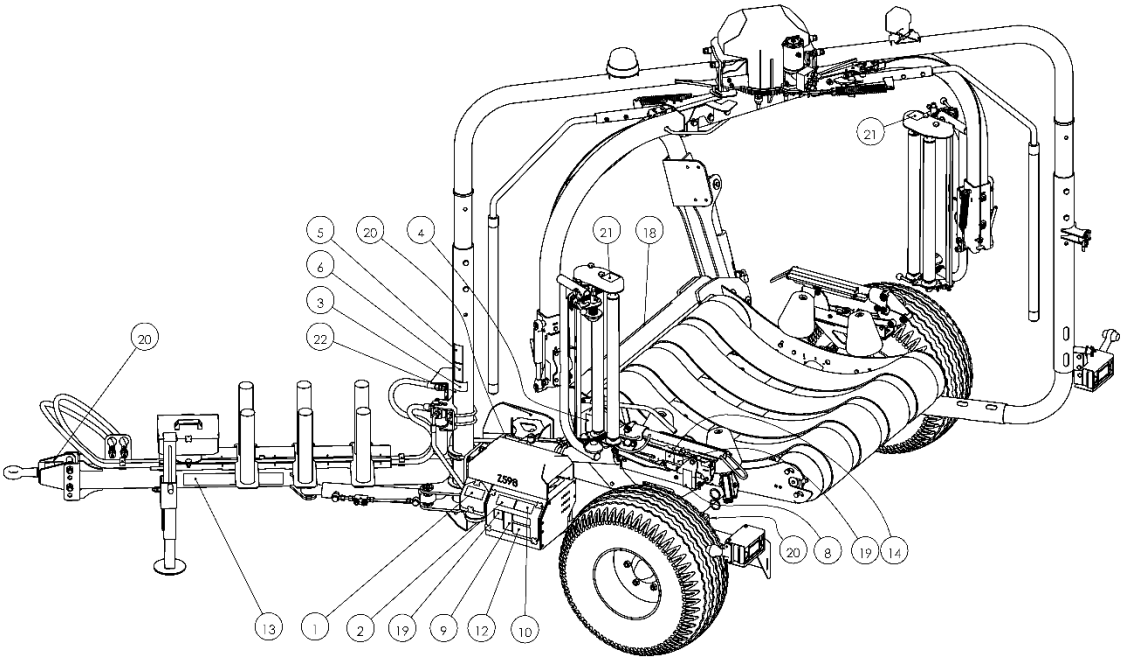


Figure 6. Arrangement of pictograms– left-hand side. Meaning of the pictograms is indicated in chapter **1.8** of the manual

1.8 Hazard warning symbols

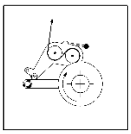
Warning pictograms located on the machine (**Chapter 1.7**) inform the operator on hazards and risks that can occur during operation of the machine. Maintain the symbols clean and legible and ensure you know their meanings.

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

Table 2. List of safety signs and hazard signs

No.	Warning symbol	Symbol description
1.		Attention. Read the instruction manual
2.		Attention. Stop the engine and remove the key from the ignition prior to commencing the service or repair activities
3.		Attention. Crushing of the torso by a side force. Do not stand near the motion zone of the articulated coupling joints when the engine is running.
4.		Attention. Do not open and remove protective guards if the engine is in operation
5.		Attention. Do not touch the machine elements before all its units are stopped
6.		Attention. Crushing - rolling bale. Keep safe distance from the machine

7.		Attention. Before you enter the danger zone, fit a support. Danger of crushing
8.		Attention. Do not reach into the crushing area if the elements can move
9.		Attention. Avoid exposure to liquid flowing under pressure. Read the User Manual and learn about the operation procedures
10.		Attention. Do not ride on platforms and ladders
11.		Attention. Risk of crushing toes or a foot. Keep safe distance from the machine
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 inscription: Attention! Third parties are forbidden to stay near the machine working place
14.		Warning inscription: Attention! Sharp blade
15.		Warning stripe 170x50
16.		Warning stripe 300x50
17.		Warning stripe 400x40
18.		Warning stripe 800x40
19.		Pictogram informing on: Wear safety gloves
20.		Pictogram informing on: Hooking or lifting point
21.		Pictogram informing on: Film mounting procedure
22.		Pictogram informing on: CE marking - manufacturer's conformity declaration on complying of the machine with the European Union Directives

2. Cooperation with a tractor

Prior to commencement of connecting the bale wrapper to the tractor make sure that its fulfils all the requirements presented in the machine characteristics (**Chapter 1.5**) Combine the Bale Wrapper Z598 with a farming tractor with power of at least 35 kW and a pull class of at least 0.9.

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

The Bale Wrapper is designed to work with open centre hydraulic systems. The wrapper manifold supports drive hydraulic systems with a load sensing feature.

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

Prior to connecting with the tractor the operator must make sure that the wrapper is complete and all the bolts are tightened correctly (see **Chapter 7.5** for the table of bolt tightening torques).

Make sure that the point marked as lubrication one are really greased. If it is not the case, have them lubricated. (**Chapter 7.4.**)

ATTENTION

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

WARNING

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

DANGER

DANGER!
The machine 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. In the case anyone appears near the machine the wrapper must be stopped immediately and you must make all undesired persons leave the zone. Never stop closely or just under: terraces, balconies, in front of open rooms or all kinds of platforms where there may be people or animals. The wrapper operator is responsible for any kinds of damages caused by the machine during operation.

2.1 Connection with drive

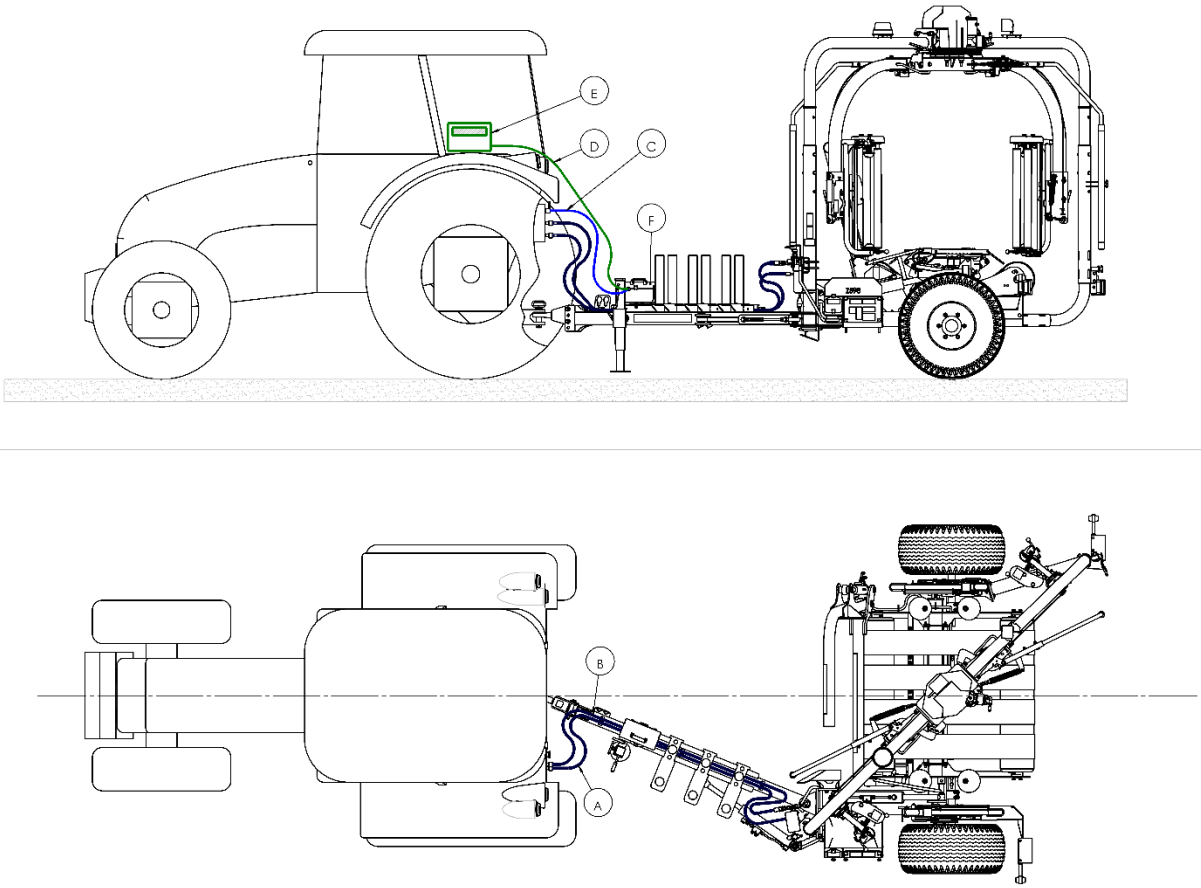


Figure 7. Attaching the wrapper to a tractor

- Connect the wrapper to the lower tractor hitch, which enables the transmission of a vertical load of 2 kN. Check stability and manoeuvrability with the tractor connected (**Chapter 9**).
- 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.
- During connecting with the tractor position the machine along the tractor axis on paved, even and level ground. Stop the tractor engine, take off the key from the ignition and engage the tractor auxiliary brake.
- Level the wrapper by means of the adjustable support foot and by setting an appropriate hitch height at an appropriate adjustment eye (**Chapter 5.1**).

ATTENTION

ATTENTION!
Connect the drawbar eye only with the lower tractor transport hitch. Check the connection for correctness, and the protections for accidental disconnection.

- Connect the electric power supply plug to the wrapper (**chapter 2.3**). Protect against accidental disconnection. Put the excess of supply conductor (C) in the operator cab or in the box for electric bundle (F).

- Place the control panel (E) in the tractor cockpit and then connect to it the communication cable (D). Put the excess of communication cable in the operator cab or in the box for electric bundle.
- Connect the hydraulic supply system by plugging the supply hose plug (A) and the return hose (B) in the supply sockets of the tractor.
- Adjust the support foot and set it to the transport position.
- Before you start working or enter public roads, ensure the ground wheel bolts are tightened correctly.
- Before you enter public roads, connect the wrapper lighting system (**Chapter 2.4**) to the socket in the tractor. Check the lighting for correctness.
- Start the tractor, switch on the control panel and check correct operation of the power hydraulic systems in the manual mode, without the bale and without film on the feeders (**Chapter 2.1.1**).

2.1.1 Checking of operation of wrapper hydraulic system control

- In the manual mode, move the drawbar to set it in both the working and transport positions.
- If the planet arms are not in the collision position with the loading arm, extend and fold the arm manually to check its functionality. Leave the arm in the extended position.
- Tilt the service table for loading and unloading (with the loading arm extended). Leave the service table in the horizontal position.
- Open and close the film cutters. Leave the cutters in the closed position.
- If the planet arms are not in the collision position with other wrapper components and the film feeders are in the vertical position, perform several clockwise (looking at the wrapper from above) rotations of the wrapping module. Stop the planet arms aligned with the wrapper longitudinal axis.
- Use the push button on the control panel to turn the film feeder by 90° to the horizontal position.
- Then, use the film cutter closing button to lift the film feeders to the vertical position.
- Turn the planet arms of the wrapping module to the standby or transport position, and leave them in such.
- Optionally, check the power hydraulics without bales and without film for functionality in the automatic mode (Chapter 2.1.2).

2.1.2 Checking power hydraulics control for correctness in the automatic mode

- Set the moving wrapper components in the working position. Set the minimum number of rotations of the wrapping module.
- Select the 2D wrapping operation mode and confirm starting the automatic operation – the auto./man button.
- Execute automatic loading.

- Execute automatic wrapping. The planet arms should turn clockwise looking from the top, start and slow down smoothly. After the preconfigured number of rotations, the planet arms should stop in the position which prevents unloading or reloading.
- If the planet arms have stopped correctly, you can confirm the automatic unloading.
- After unloading, the wrapper should go into the standby position.

If the hydraulic and control systems work correctly, load first vale and ensure that the value of the tractor front axle load does not exceed 20% of the tractor weight. It is proved by maintaining by the tractor of the complete controllability. The stability of the unit during unloading can be calculated following the guidelines in **Chapter 9.1.** The manoeuvrability of the tractor and wrapper unit can be calculated following the guidelines in **Chapter 9.2.**

2.2 Drive disconnection

- 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.
- If it is possible, set the wrapper components in the transport position.
- If the wrapper is to be idle for a longer time, lower the service table and extend the loading arm.
- Position the wrapper on its storage place on even and level ground. Stop the tractor engine, take off the key from the ignition and engage the tractor auxiliary brake.
- Disconnect the electrical supply, wrapper control and lighting systems. Wind the cables and place them in the box on the wrapper drawbar.
- Disconnect the power hydraulics system and protect the hydraulic hoses in their clamps on the wrapper drawbar (Fig. 8- B).
- Lower the support foot from its transport position to the working position.
- Make sure that there is no hazard of accidental machine displacement and place a wheel chock if necessary.
- Disconnect the drawbar eye from the transport hitch of the tractor.

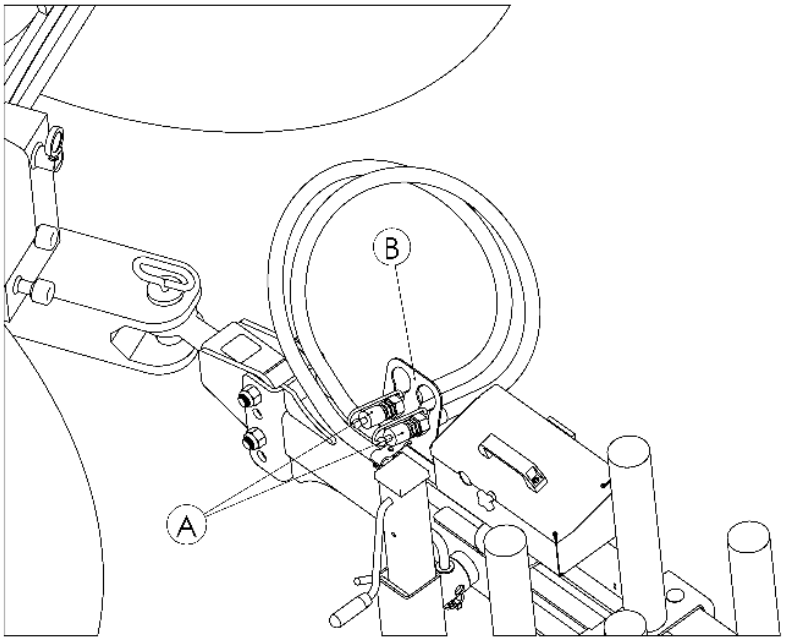


Figure 8. Hydraulic conductor clamp

ATTENTION

ATTENTION!
Hydraulic connections must be always kept clean. After use reinstall plastic cover supplied at purchasing the machine (Fig. 8- A).

ATTENTION

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

ATTENTION

ATTENTION!
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 for electric bundle mounted on the wrapper drawbar.

2.3 Power supply system

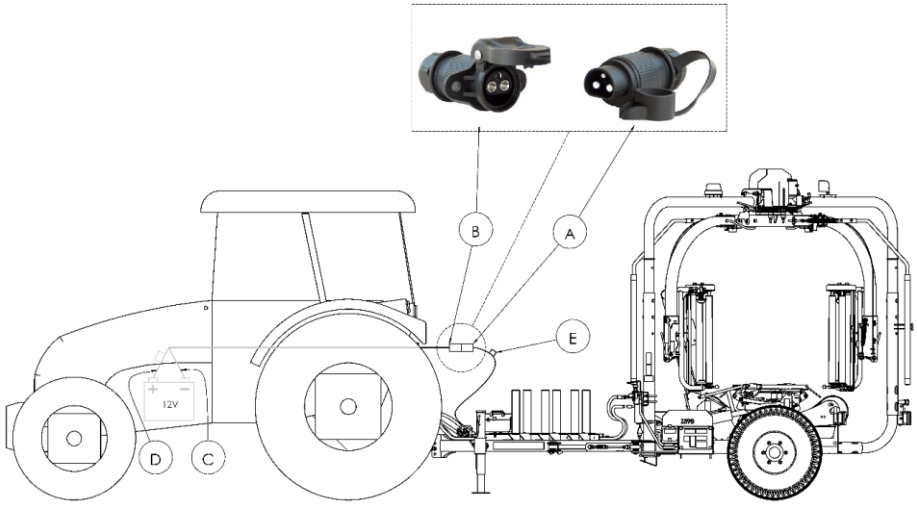


Figure 9. The connection diagram of 12V electric power supply of the tractor to the wrapper

Electric power supply 12V of the wrapper is taken from the electric system of the tractor after connecting the 3-pin power supply plug A (Fig. 9 - A) to the tractor electric socket B (Fig. 9 - B). The tractor must be provided with a 3 - pin electric socket 12V (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 (**Fig. 9**-E) immediately after the plug A.

In the case of burning 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.

ATTENTION

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

Table 3. Connection of the socket wires to the battery (Fig. 9 – B,C,D):

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

ATTENTION

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

2.4 Lighting system

The wrapper is equipped with the 12V road lighting system connected to the tractor system by means of the 7-pin plug, ISO 1724 Type N (**Fig. 10** – A). The tractor must be fitted with a socket which is suitable for the plug (**Fig.10** – B).

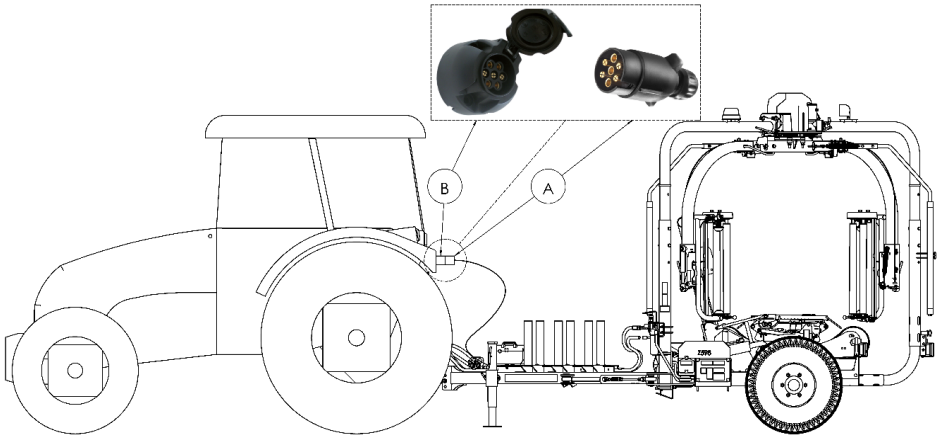


Figure 10. Connection of the lighting system

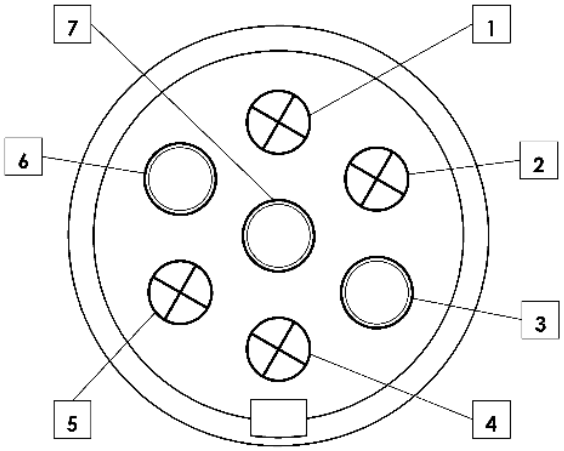


Figure 11. Wrapper lighting plug (socket side view)

Table 4. Description of the plug lighting wires (**Fig. 11**)

No. of pin	Marking	Circuit description
1	L	Left indicator
2	54G	Fog lights
3	31	Weight
4	R	Right indicator
5	58R	Right position lamps
6	54	STOP
7	58L	Left position lamps

2.5 Wrapper hydraulic installation

Wrapper hydraulic installation is supplied from the tractor power hydraulics system. Connecting to the power hydraulic system is realized with connecting hoses supplying the hydraulic distributor and further on the hydraulic motors and hydraulic servos (cylinders). The individual hydraulic components are connected to one another with flexible and metal hydraulic hoses.

The Z598 wrapper features the power hydraulic system (**Fig. 12**), in which the following element can be distinguished:

1 – hydraulic supply plugs,
2 – oil flow control,
3 – oil pressure filter,
4 – hydraulic manifold,
5 – cylinder hydraulic valve,
6 – hydraulic motor valve,
7 – check valve,
8 – stop valve,
9 – throttle/ non-return valve,
10 – hydraulic swivel hitch.

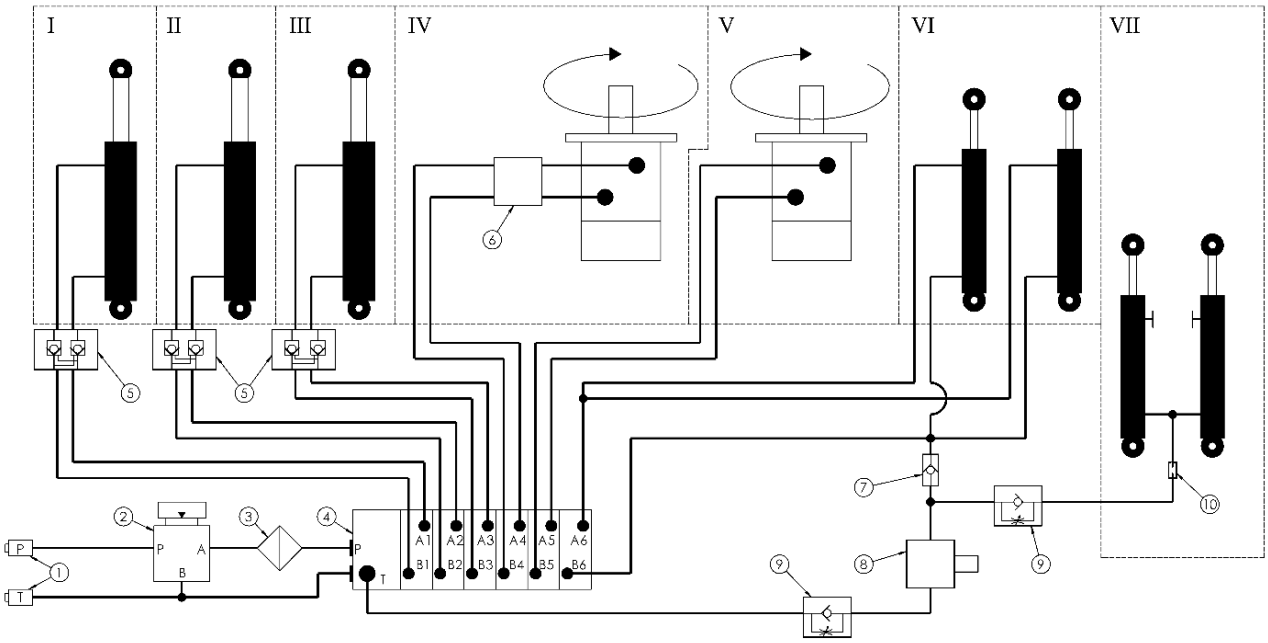


Figure 12. Central unit hydraulic system

- Section I – drawbar hydraulic cylinder,
- Section II – loading arm hydraulic cylinder,
- Section III – service table frame hydraulic cylinder,
- Section IV – wrapping module hydraulic motor,
- Section V – service table roller hydraulic motor,
- Section VI – film cutter hydraulic cylinders,
- Section VII – film feeder tilt hydraulic cylinders.

The control of the hydraulic receivers is executed via the electronic control panel located for the time of operation in the tractor operator's cab. The panel is communicated via the communication cable with the control module, which directly controls solenoid valves in the hydraulic distributor and receives the signals from the sensors.

The hydraulic block is protected against too high pressure of the tractor power hydraulic system with a pressure valve set by default at 180 bar. A maximum hydraulic oil pressure at which the wrapper can work is 160 bar.

A flow controller with the range of 0 – 50 l/min prevents the wrapper hydraulic system from excessive oil volume coming from the tractor power hydraulic system.

The hydraulic system of the wrapper was factory filled up with L-HL 46 oil type. The hydraulic system of the tractor cooperating with the wrapper should have the oil of the same type. Filling up of the hydraulic system with oil of other type should be consulted with the manufacturer of the machine.

ATTENTION

ATTENTION!
Never combine different types of oil, as it poses a risk of damaging the tractor and the wrapper itself.

ATTENTION

ATTENTION!
Supplying the wrapper with pressure higher than the one recommended in the manual may lead to damaging the wrapper hydraulic system.

The wrapper hydraulic system has been protected from dirt by installing a high pressure filter on the line. Replace the filter element every 2 years of wrapper operation or whenever the contamination indicator installed on the filter shows the red field (Fig. 3 – item 19).

WARNING

WARNING!
The manual control lever located on the hydraulic block are used only for manual machine setting in the transport position in the event of failure of the electronic control. Do not use it for regular machine operation under any circumstances.

ATTENTION

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

ATTENTION

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

3. Control elements and work with wrapper

3.1 Description of control panel push buttons of Z598

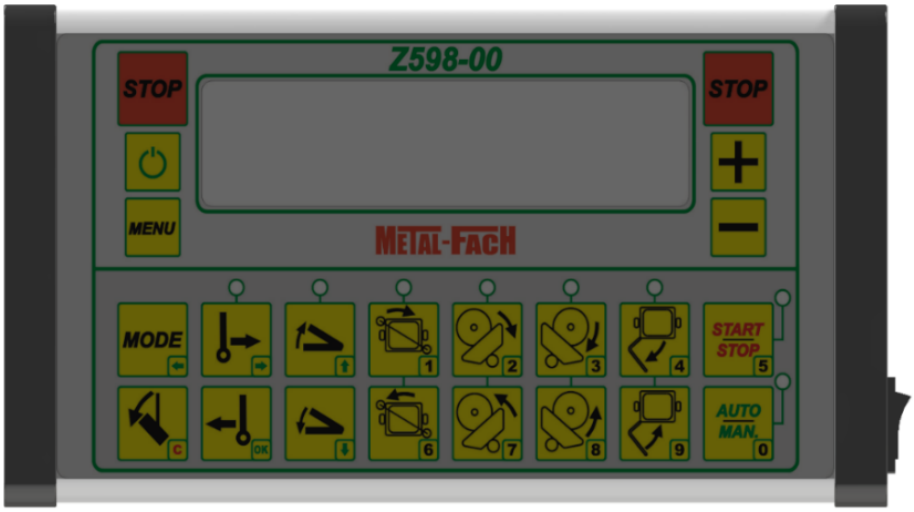


Figure 13. Control panel

Table 5. Description of control push buttons:

Push button (symbol)	Name	Function
STOP	STOP	**Emergency stop** - locking of operation of all the wrapper functions. Unlocking with a key combination or switching off the supply.
	POWER	Key for switching on and off the control panel.
	Plus	Change/increase of the definable value.
	Minus	Change/decrease of the definable value.
MENU	Menu	**Enter the control panel menu** (navigation keys): - Bale counter resetting - Setting time and date – + / – keys - All field counter resetting - Setting the number of wrappings (10-99) – + / – keys - field selection – + / – keys Accepting with the OK key
MODE	MODE (left arrow)	**Manual mode** – wrapper operation mode selection with the + / - keys: - automatic 2D - automatic 3D - transport position **Automatic operation mode** – selecting type of operation to execute: - loading - wrapping - unloading
C	Horizontal position of the film feeders (c)	**Manual mode** – rotation of film feeders from vertical to horizontal position.

		(C) – When in **MENU** or **MODE** options, it is an exit from the menu and other locations to the home desktop without any changes made.
	Folding the drawbar (right arrow)	**Manual mode** – push the key to set the drawbar to the transport position. In **MENU** or **MODE** – navigation key
	Extending the drawbar (OK)	**Manual mode** – push the key to set the drawbar to the working position. In **MENU** or **MODE** – confirs/saves the changes made or enters another menu levels.
	Opening the film cutter (Upward arrow)	**Manual mode** – push the key to open the film cutter. In **MENU** or **MODE** – navigation key
	Closing the film cutter (Downward arrow)	**Manual mode** – push the key to close the film cutter. When the film feeders are in horizontal position, push the key to lift the feeders. In **MENU** or **MODE** – navigation key
	Turn the planet arms in the direction of wrapping (1)	Push the key to rotate the planet arms in the direction of wrapping.
	Turn the planet arms in the opposite direction to that of wrapping (6)	Push the key to rotate the planet arms in the opposite direction to that of wrapping.
	Service table motion (2)	Push the key to shift the service table from the loading to horizontal position.
	Service table motion (7)	Push the key to shift the service table from the horizontal to loading position.
	Service table motion (3)	Push the key to shift the service table from the horizontal to unloading position.
	Service table motion (8)	Push the key to shift the service table from the unloading to horizontal position.
	Extending the loading arm (4)	Hold the key to extend the loading arm.
	Folding the loading arm (9)	Hold the key to fold the loading arm.
	Stop/Start (5)	Starting the auto- or semi-automatic wrapping action. Press the button again during the wrapping activity to stop it.
	Automat/Manual (0)	Switching on/off the automatic mode. During the ongoing process, the Start/Stop button is not active.

3.2 Wrapper operation with the control panel

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.

ATTENTION

ATTENTION!
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 at 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 as the operator could operate the device with no difficulty and tiredness and have the review of the messages appearing on his display.

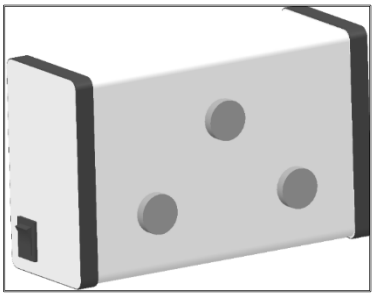


Figure 14. Control panel magnetic clamps

If the tractor body does not allow for mounting the panel using magnetic clamps due to its finishing 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 110x60x2 mm, using a strong double sided mounting tape with a foam core.

3.2.1 Panel switching on

1. Connect the supply plug of the wrapper to the tractor socket 12V.
2. Connect the panel to the control module with the **M12 A-coded, 8-pole, male/female** cable.
3. Turn the panel main switch from the position 0 to I. The change-over switch is to the side of the panel.
4. If the LED next to the Start/stop button flashes green it means that the panel has correct power supply.
5. Switch the control panel on with the push button  . In this moment communication of the panel with the control module takes place. Wait for approx. 5 sec. for the communication to be completed successfully. In the case of incorrect communication check the connection of the cables to the control module for correctness.

3.2.2 Switching off the Panel

1. Make sure that the wrapper is in the transport position or that the working components' position does not cause any risk or hinder any movement around the deactivated machine.
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 for approx. 3 sec. for the panel display to go out.
4. Switch the panel power supply off with the change-over switch to the side 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 revolving planet arms. If any such action is attempted, a message will be displayed to warn about an incorrect setting of one of the working components and advise a measure to enable the intended action.

No manual or automatic planet arm rotation is possible when:

- the loading arm is in the closed position.

No film feeder rotation to the horizontal position is possible when:

- the loading arm is in the closed position,
- the service table is not in the horizontal position,
- the planet arms are set in the stop position for the transport position or in the stop position having completed the wrapping.

ATTENTION

ATTENTION!
You can rotate the film feeders manually only when the planet arms are aligned with the longitudinal axis of the machine.

ATTENTION

ATTENTION!
Never rotate the planet arms if the film feeders are in the horizontal setting.

ATTENTION

ATTENTION!
Never unload bales unless the film cutters are closed.

3.2.4 Wrapper manual operation

Movements of the working components of the wrapper are executed using the push buttons marked on the panel with the machine part symbols (**tab.** 5). The movement is executed as long as the push button is depressed or until the working element reaches its limit position and the limit sensor is activated. When turning, the planet arms are in motion until the button is released.

When a working component is in the limit position, it is signalled by coming on of the green or red LED over the button which controls the component activation.

3.2.5 Working position

The working position is a state of the moving components of the machine in which the wrapper is ready to start operation and free rides on the field. The following positions of the wrapper working components are considered to be the wrapper working position:

- the service table in the horizontal position,
- the loading arm in the extended position,
- the film cutters in the closed position,
- the planet arms in the position enabling a collision-free loading,
- the film feeders in the vertical position,
- the drawbar in the working position, tilted to the left-hand side of the machine

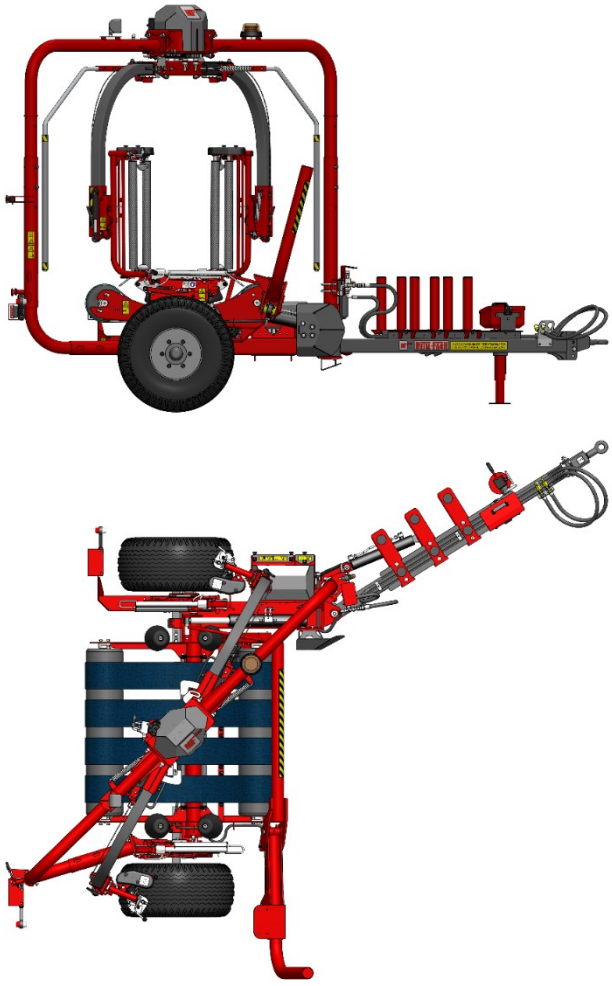


Figure 15. The wrapper in the working position

3.2.6 Standby position

Having completed each full work cycle, the wrapper reverts to standby. The standby position is a state of the machine moving components in which it is ready to load another bale. The following positions of the wrapper working components are considered to be the wrapper standby position:

- the working table tilted forward,
- the loading arm in the extended position,
- the film cutters in the closed position,
- the planet arms in the position enabling a collision-free loading,
- the film feeders in the vertical position,

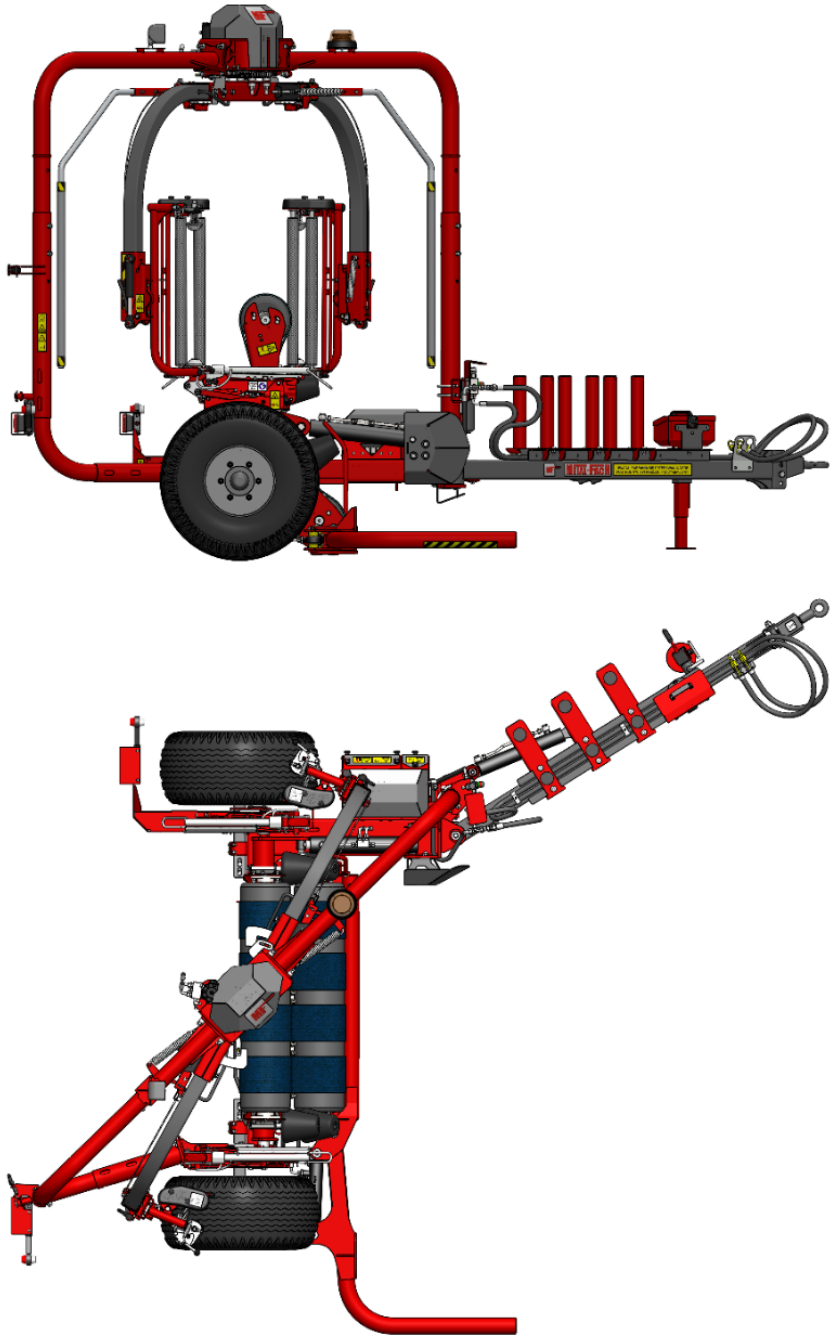


Figure 16. The drawbar in the working position, tilted to the left-hand side of the machine

3.2.7 Transport position

The transport position of the wrapper enables the user to reduce its outline dimensions and drive the machine safely on public roads. In the transport position of the wrapper:

- the loading arm is folded,
- the service table is in horizontal position,
- the film cutters are closed,
- the film feeders are in the vertical position,
- the planet arms and the wrapper drawbar are set to the transport position.

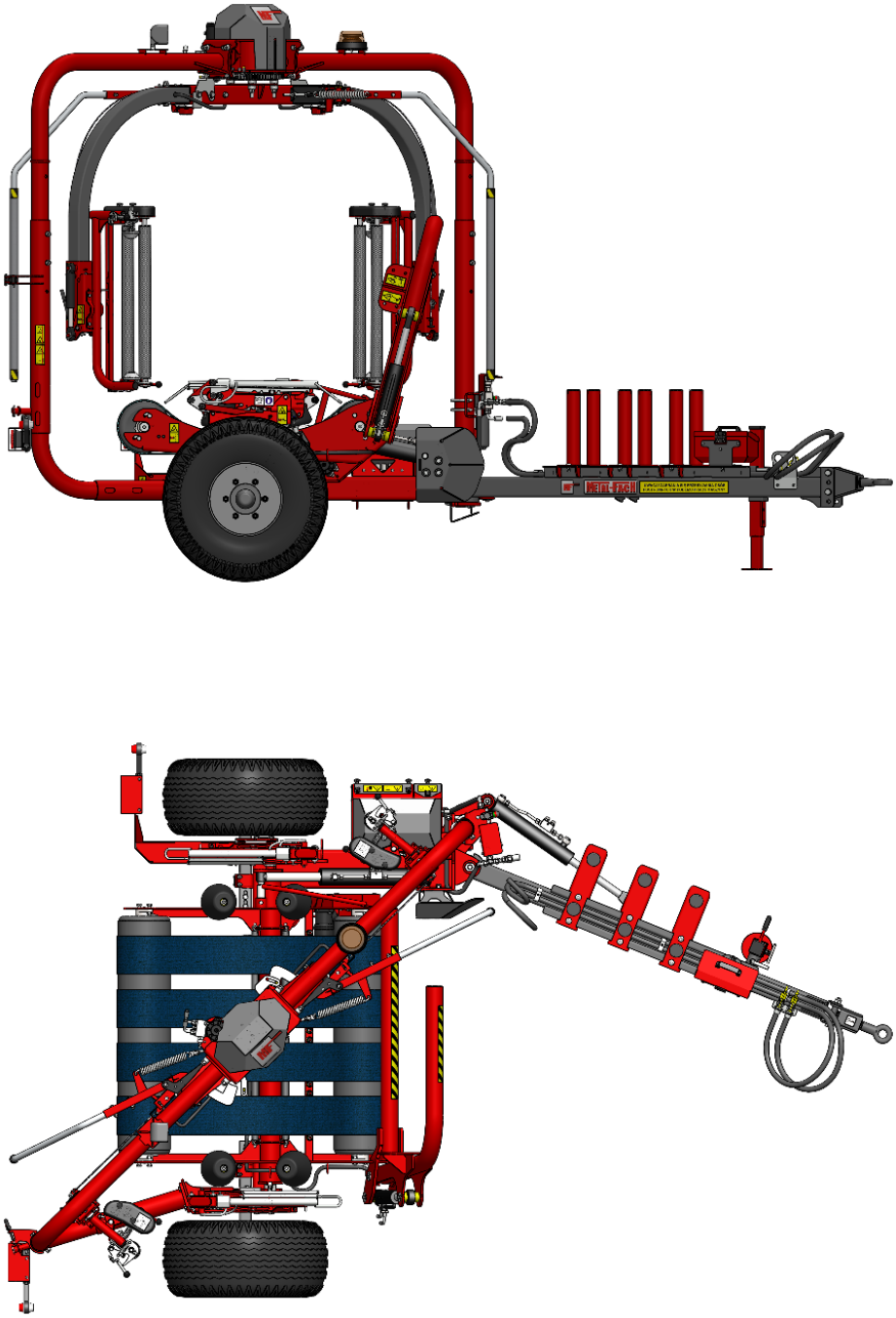


Figure 17. Wrapper transport position

To shift the wrapper to the transport position automatically:

1. Ensure that you can operate the wrapper without causing any risks. During shifting the machine to the transport position, its position behind the tractor will change.
2. Press **MODE** (automatic mode must be deactivated).
3. Use **+/-** keys to select: **Transport Position Working Mode.**
4. Hit **OK** to confirm the selected item**.**
5. Use the Auto/Man button to switch the wrapper automatic mode on.
6. Use the Start/Stop button to start the wrapper folding action.
7. Having completed the action, if the wrapper is fitted with the bale tipper, extend the arm to the open position.
8. Tilt the service table backwards.
9. Turn the tractor hydraulics on, apply the parking brake, switch the tractor off and remove the key.
10. Install the transport protection of the bale tipper (see Chapter: Bale tipper)
11. Start the engine of the tractor, turn on the hydraulic system.
12. Manually set the service table in the horizontal position.
13. Manually close the loading arm.
14. If the wrapper was folded correctly, you can switch the control panel and tractor hydraulics off.

The wrapper can also be set in the transport position manually with the use of control buttons on the control panel.

ATTENTION

ATTENTION!
In the transport position working mode, you cannot rotate the film feeders to the horizontal position, so as to prevent their collision with other wrapper components.

WARNING

WARNING!
The cylinders of the loading arm, service table and drawbar are fitted with the safety valves which prevent their automatic movement. However, staying near them during wrapper transport or storage should be avoided. It is recommended as the safest measure for the time of storing the wrapper to extend the loading arm and lower the service table.

ATTENTION

ATTENTION!
The hydraulic motor of the wrapping module is fitted with a parking brake, but you should additionally protect the wrapper planet arms from accidental rotation with a tie-down strap during the wrapper transport.

3.3 2D wrapping

3.3.1 2D wrapping sequence description

The 2D wrapping is an automatic operating sequence during which a conventional method is used to cover a bale with ensilage film. The planet arms with film feeders mounted on them rotate around the bale vertical axis. The bale rotates on the service table around its horizontal axis at the same time. Such wrapping method ensures uniform distribution of film layers on the cylindrical part of the bale. The bottom and top parts of bales are best covered, as the largest length of film is applied there.

3.3.2 2D wrapping sequence procedure

2D wrapping mode operation - activity diagram:

1) Press **MODE** and use **+/-** keys to select the **2D Wrapping** operation mode. Press **OK** to confirm the selection.
2) Press **Auto/Man**. When the corresponding **Auto/Man**. LED turns green, it means that the wrapper is in the automatic operation mode. The screen should show the following message: **Auto. Loading Press START**. Press **Auto/Man** again to turn the automatic mode off (when the corresponding LED goes off).
3) Drive the wrapper to a bale. The wrapper should be set in standby mode.
4) Press **Start/Stop** to start the automatic bale loading process. After the process is completed, the message is shown: **Auto. Wrapping Press START.**
5) Press **Start/Stop** to start the automatic wrapping process. You can drive up to next bale during the wrapping process. After the wrapping process is completed, the message is shown: **Auto. Unloading Press START.**
6) Now you can press **Start/Stop** to confirm the automatic unloading.
7) After the unloading process has finished, one bale will be counted as completed, and the wrapper service table will come back to its standby position.
8) Press the **Start/Stop** key again to activate the loading and a new wrapping cycle will start.

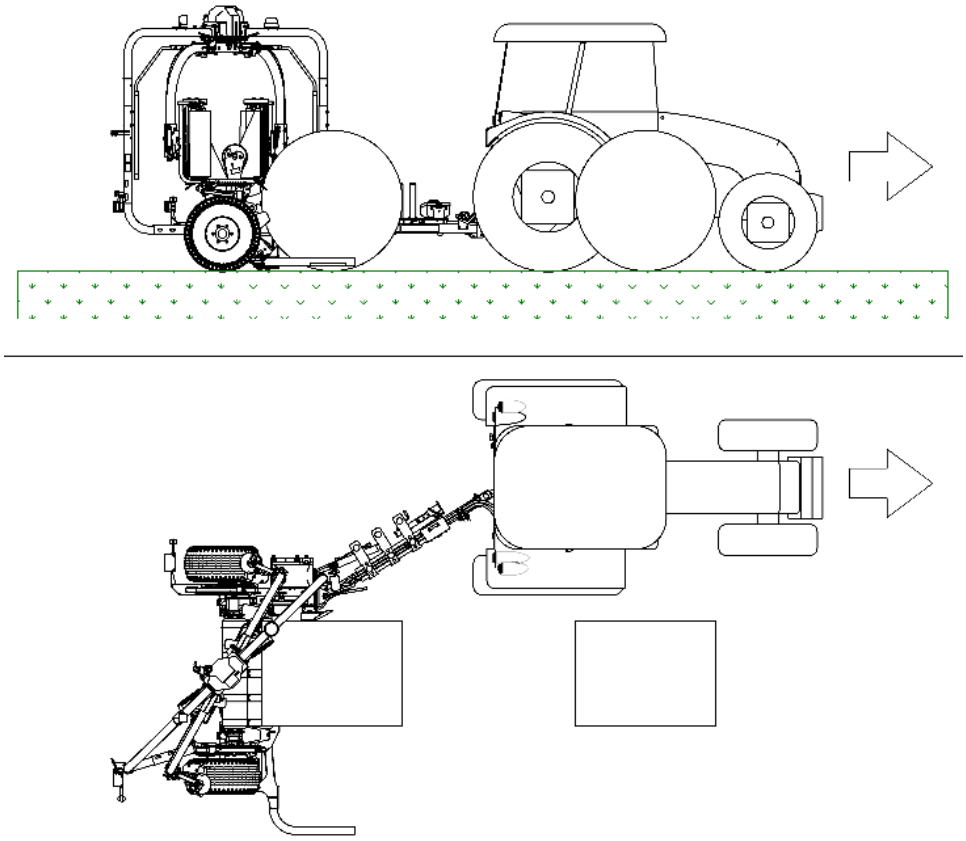


Figure 18. Driving the wrapper up to a bale

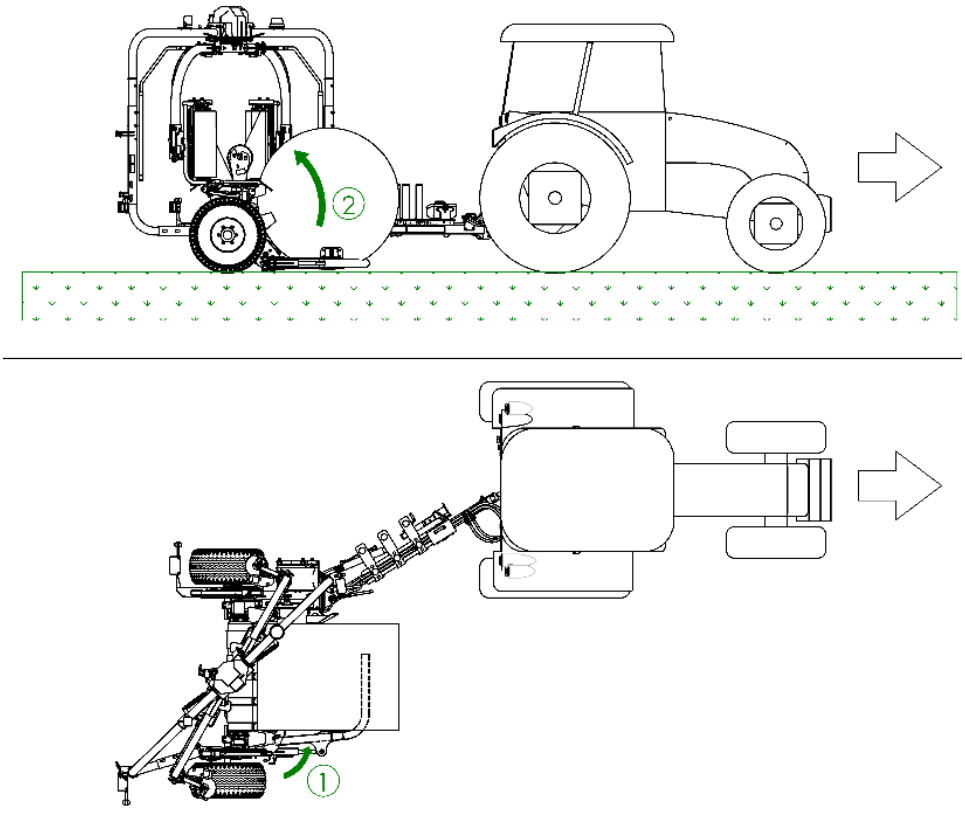


Figure 19. Gripping the bale (item 1) and loading on the service table (item 2)

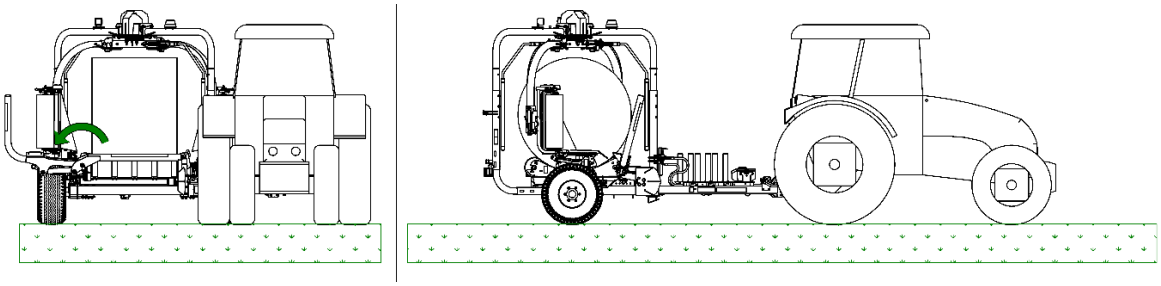


Figure 20. Extending the loading arm

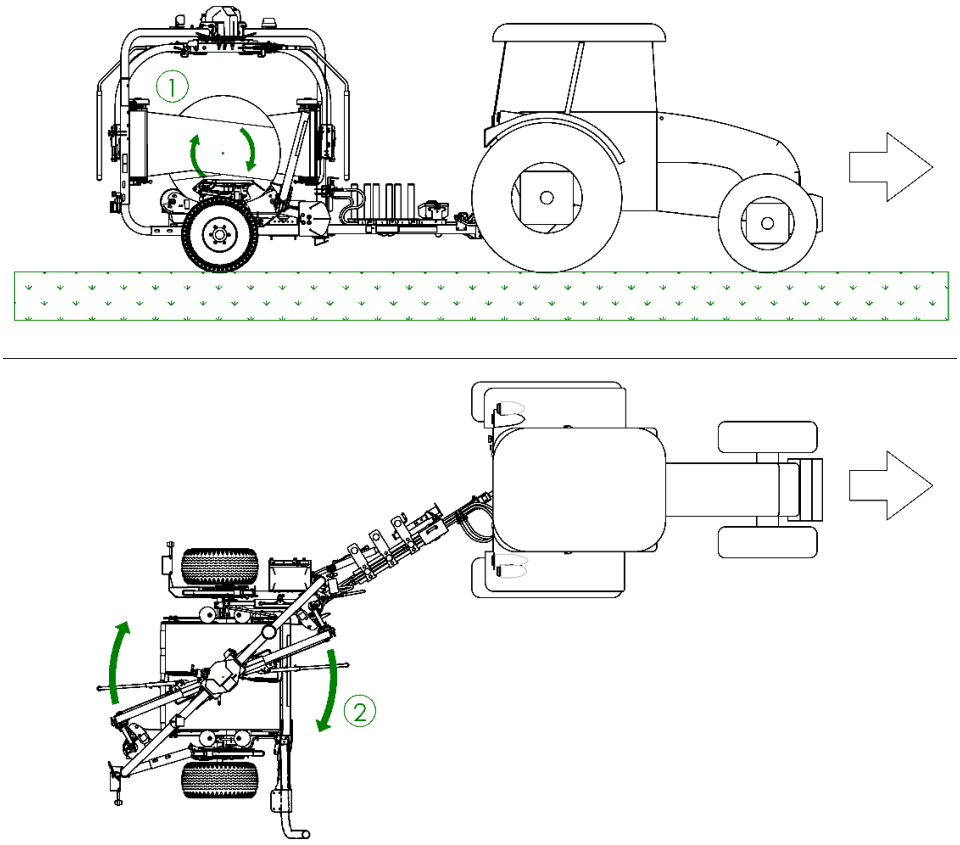


Figure 21. Wrapping a bale. Turning a bale on the service table (item 1), rotation of the planet arms with film feeders around the bale (item 2)

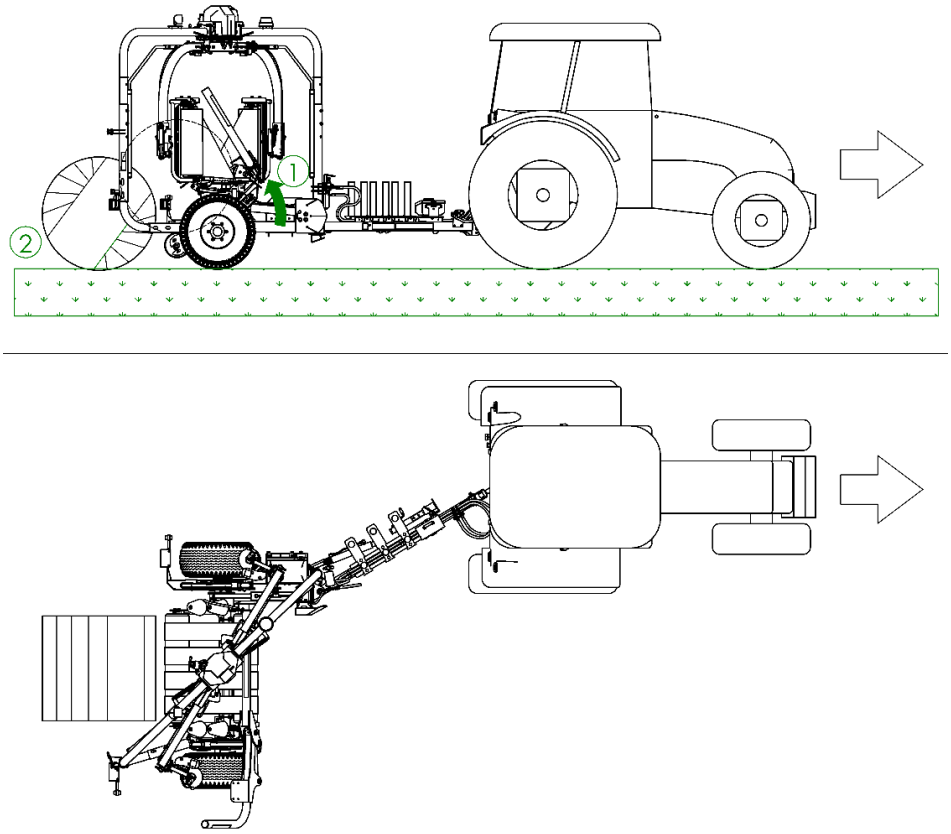


Figure 22. Unloading the wrapped bale. The service table tilting (item 1), unloading a bale onto the ground (item 2)

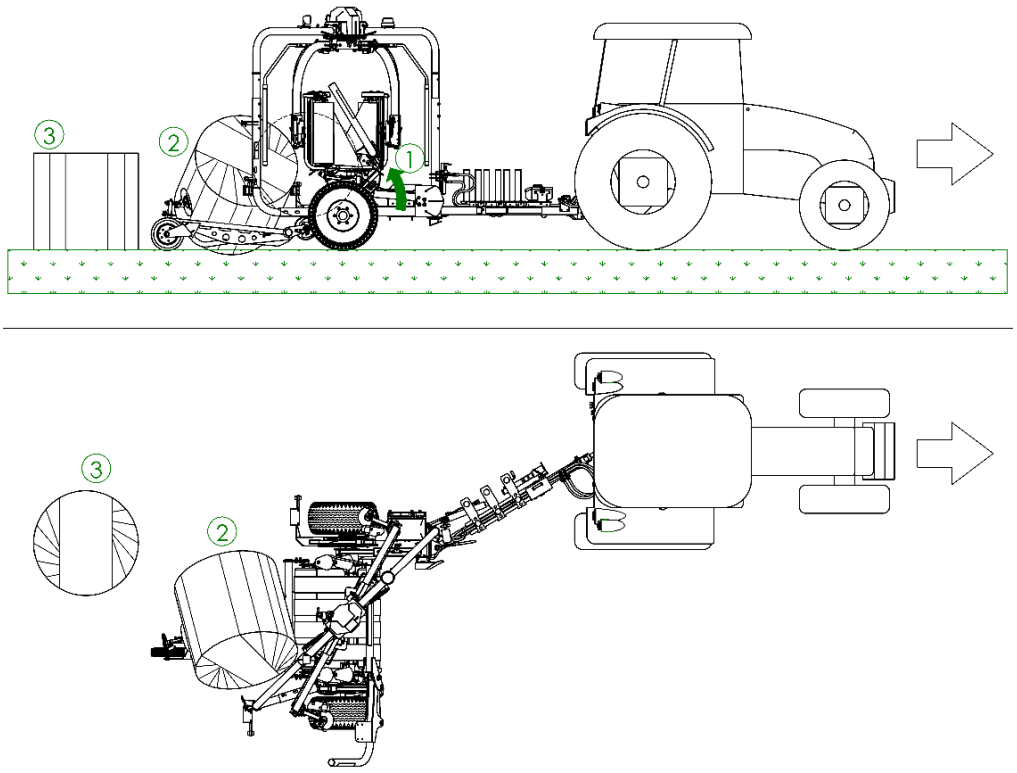


Figure 23. Unloading the wrapped bale with the use of a bale tipper. The service table tilting (item 1), unloading a bale onto the tipper (item 2), putting the bale on its bottom part by a bale tipper (item 3)

3.4 3D wrapping

3.4.1 3D wrapping sequence description

The 3D wrapping is an automatic operating sequence during which a bale is covered with ensilage film arranged in various planes. The planet arms with film feeders mounted on them rotate around the bale vertical axis and they stop after 1.5 turn aligned with the wrapper longitudinal axis. The film feeders rotate from vertical to horizontal position. Only the bale rotates on the service table, without the planet arms. During this cycle, the film is applied on the cylindrical part of the bale only. During the first phase, the film is applied on the centre part of the bale, during the second phase, on the extreme parts and a part of the side surface. After a preconfigured number of film layers has been applied, the film feeders revert to the vertical position and the wrapping process continues in a conventional method.

The 3D wrapping allows for uniform distribution of a film length on the whole bale surface, while the same number of layers as in the conventional wrapping is preserved. During the 3D wrapping, the expense of film drops by 20% on average compared to the conventional method.

3.4.2 3D wrapping sequence procedure

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

3D wrapping mode operation - activity diagram:

1. Press **MODE** and use **+/-** keys to select the **3D Wrapping** operation mode. Press **OK** to confirm the selection.
2. Press **Auto/Man**. When the corresponding **Auto/Man**. LED turns green, it means that the wrapper is in the automatic operation mode. The screen should show the following message: **Auto. Loading Press START** Press **Auto/Man** again to turn the automatic mode off (when the corresponding LED goes off).
3. Drive the wrapper to a bale. The wrapper should be set in standby mode.
4. Press **Start/Stop** to start the automatic bale loading process. After the process is completed, the message is shown: **Auto. Wrapping Press START.**
5. Press **Start/Stop** to start the automatic wrapping process.
6. One complete turn of the planet arms will occur, and then they will stop in the position aligned with the longitudinal axis of the wrapper.
7. The feeders will automatically tilt to the horizontal position and the belts of the service table will start moving.
8. After a preconfigured number of film layers has been applied, the feeders revert to the vertical position and the planet arms turn around the bale to apply further film layers.
9. You can drive up to next bale during the wrapping process. After the wrapping process is completed, the message is shown: **Auto. Unloading Press START**
10. Now you can press **Start/Stop** to confirm the automatic unloading.
11. After the unloading process has finished, one bale will be counted as completed, and the wrapper service table will come back to its standby position.
12. Press the **Start/Stop** key again to activate the loading and a new wrapping cycle will start.

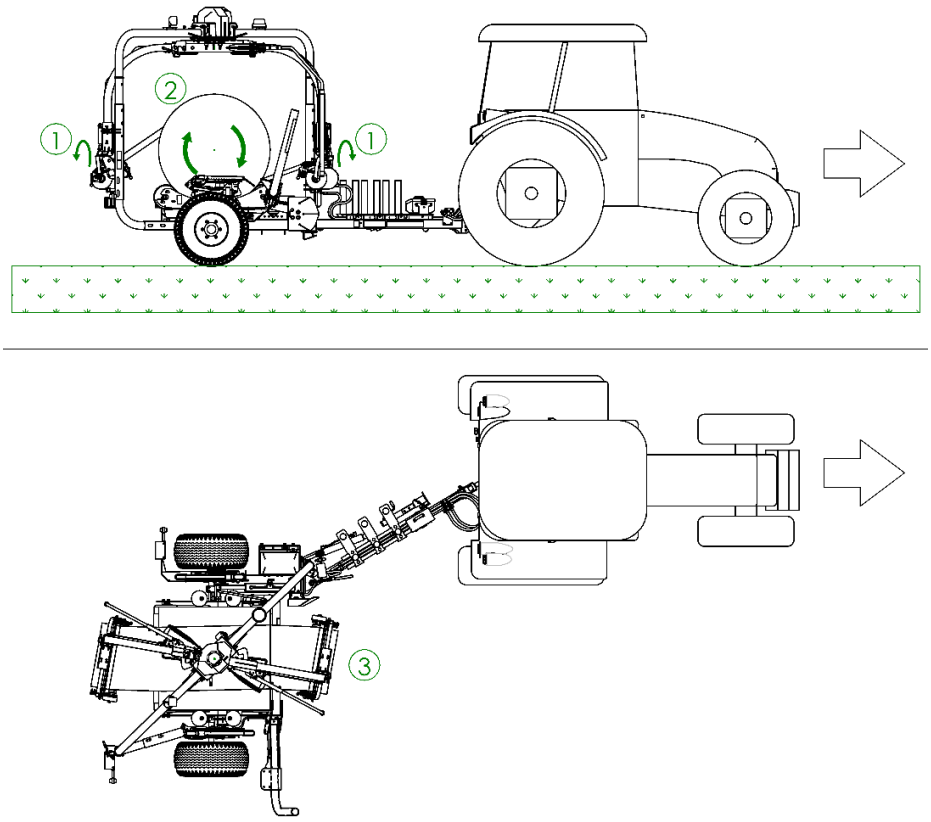


Figure 24. 3D Wrapping Phase One. Feeders rotate by 90° (item 1), a bale rotates on the service table (item 2), the position of the planet arms for wrapping the centre part of a bale (item 3)

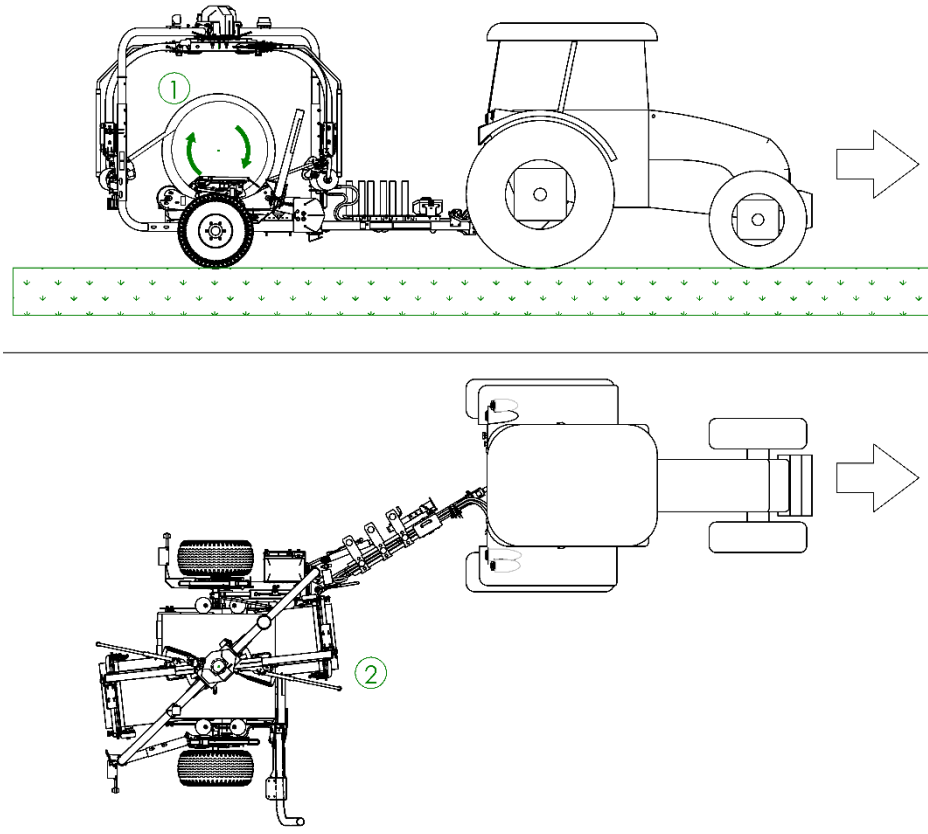


Figure 25. 3D Wrapping Phase Two. Turning a bale on the service table (item 1), the position of the planet arms for wrapping the extreme parts of a bale (item 2)

3.5 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**. This will deactivate the automatic mode and stop the motion of the working components (stopping the arm during loading, stopping the planet arms, stopping the service table).

To avoid repeating the automatic loading when a bale is on the table, or to avoid re-wrapping when a bale is wrapped, it is possible to select an action with witch to re-start the operation in the process automatic mode activated.

When the automatic mode is on, before you start the process, do the following:

1) Press **MODE** (when the green LED next to the **Auto/Man**. key is lit).
2) Use the **+/-** keys to select one of the three actions:
   - **Start with Auto. Loading.**
   - **Start with Auto. Wrapping.**
   - **Start with Auto. Unloading.**
3) Confirm your selection by pressing **OK.**
4) Start working by pressing **Start/Stop.**

The wrapper will start processing the chosen action, and after it has completed the cycle (putting a bale on the ground), next it will automatically load another bale.

3.6 Emergency stop from the control panel

If during the wrapper operation an emergency occurs or any situation that may cause hazard, the operation of the wrapper must be stopped by pressing the 

button on the control panel power, switch the power hydraulic supply, switch the tractor engine off and apply the auxiliary brake. Once the **STOP** button on the control panel is used, the power supply is disconnected from the wrapper control module. The red LEDs on the control panel flash. All actions processed by the wrapper are stopped. The keys of the panel are locked and no movements of the wrapper working components are possible.

After an emergency or hazard has been rectified, you can resume work by switching the panel off and on using the switch on the side wall of the panel or using the key combination displayed on the panel.

3.6.1 Emergency stop by the planet arm limit stops

The wrapper planet arms are fitted with limit stops which, upon hitting an obstacle, cause the activation of the limit stop switches, which stops the wrapper work immediately. The stop of the rotating planet arms should occur before a planet arm or film feeder arrives at the point of collision, so as to prevent another contact with the obstacle.

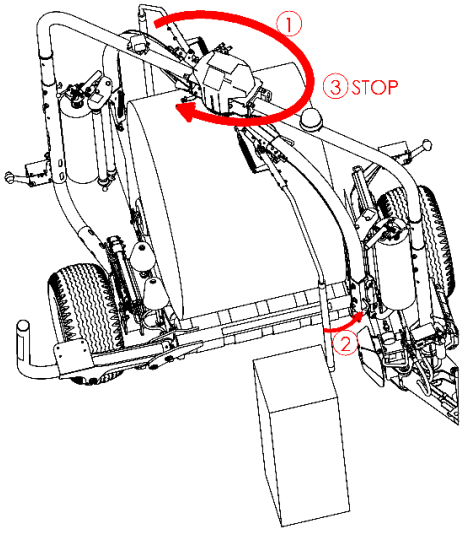
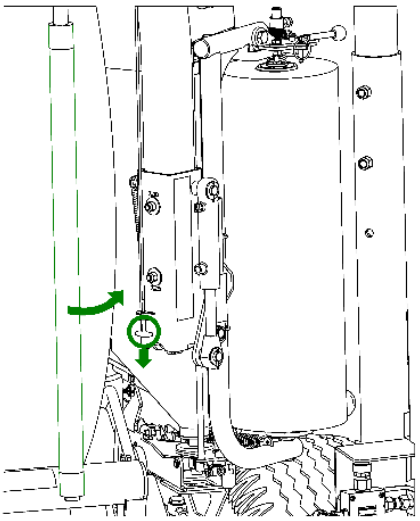


Figure 26. Stopping the work after the contact of the limit stops with an obstacle: 1 – direction of the planet arm rotation, 2 – direction of the limit stop movement after the contact with an obstacle, 3 – stop of the planet arm rotation

The planet arm limit stops are fitted with a ratchet which locks them into a position, to which they were moved at the moment of the collision. This makes another start of the machine impossible until the obstacle is removed to prevent further risk.

Figure 27. Unblocking the planet arm limit stops



To resume further work (**Fig. 27**):

1. Turn off the control panel, turn off the tractor hydraulic system, turn off its engine and apply the auxiliary brake.
2. Remove the obstacle from the planet arms' wrapping area.
3. Push the limit stop to the planet arm gently to lower the pressure on the locking mechanism.
4. Pull the holder downwards to unblock the ratchet and allow the arm to return to its original position.
5. The wrapper is ready to resume work.

NAME AND ABBREVIATION INDEXES

Bar – bar, pressure unit (1 bar = 0.1 MPa),

OHS - occupational health and safety;

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

Drawbar pull class – a value characteristic for drawbar pull of a tractor, class 0.9 corresponds to the drawbar pull of 9 Kn,

km/h - kilometre per hour, linear speed unit;

kW - kilowatt, power unit;

l/min – litre per minute, volume flow rate unit,

m - meter, a length unit;

min - minute, an additional time unit corresponding to 60 seconds;

mm – millimetre, an additional length unit,

rev. - revolution, determining the kind of movement;

rpm - revolution per minute, a rotation speed unit;

pictogram - an information plate;

pos. X – a position, marking a position in a figure or diagram,

Fig. X – a figure numbered X,

Fig. X – Y – a figure numbered X, item in the figure marked Y,

tab. X – a table numbered X,

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

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;

Hitch, upper transport hitch – hitch components of a farming tractor (see a tractor instruction manual).

ALPHABETIC INDEX

PART I

H

Hydraulic system 29

O

Oil 30

Operation description 10

P

Pictograms 18

Principle of operation 10

Press intended use 10

R

Rating plate 9

S

Safety principles 11

Solenoid valve 31, 32

T

Technical characteristics 16

Transport 38

W

Wrapper design 13

Wrapping machine identification 9

Wrapper manual operation 36

PART II

A

Accessories 41

Assembly 16, 39

B

Bearings 27

C

Chains 18-20

F

Film clamp 20

First starting up 7

G

Guarantee 44-45

Guarantee repairs 46

Guarantee terms 43

L

Lubrication 27-28

Lubrication points 28

M

Maintenance 26

O

Oil 25, 38

R

Road traffic 35

Risk 39

S

Storage 33

Since Metal-Fach Sp. z o.o. is continuously perfecting its products and adapting its commercial offer to the needs of clients, we reserve the right to modify our products without prior notice. Therefore, we advise contacting an authorised dealer or sales representative of Metal-Fach Sp. z o.o., prior to making your decision about purchase. Metal-Fach Sp. z o.o. will not accept any complaints, regarding the data and pictures contained in the catalogue, as the presented offer shall 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, located both in Poland and abroad, and also at the Metal-Fach retail outlet.

SERVICE
16-100 Sokółka, ul. Kresowa 62
Tel.: +48 85 711 07 80; Fax: +48 85 711 07 93
serwis@metalfach.com.pl

SALES
16-100 Sokółka, ul. Kresowa 62
Tel.: +48 85 711 07 88; Fax: +48 85 711 07 89
handel@metalfach.com.pl

SPARE PARTS WHOLESALE STORE
16-100 Sokółka, ul. Kresowa 62

Wholesale:
Tel.: +48 85 711 07 80; Fax: +48 85 711 07 93
serwis@metalfach.com.pl

Retail:
Tel.: +48 85 711 07 80; Fax: +48 85 711 07 93
serwis@metalfach.com.pl