METAL-FACH

BALE WRAPPER
Z237

INSTRUCTIONS MANUAL – PART I

TRANSLATION OF THE ORIGINAL INSTRUCTIONS MANUAL

REVISION I

NOVEMBER 2018

Instructions Manual No. Z237-01-167/2013

EC DECLARATION OF CONFORMITY

The undersigned,	Jacek Kucharewicz, President of the Board,	
hereby declares, with full responsibility, that the complete machine:		
Bale Wrapper		
1.1.	Brand (the trading name of the manufacturer)	Metal-Fach
1.2.	Type	Z312
1.2.1.	Variant	
1.2.2.	Version	
1.2.3.	Trade name(s) (if any)	Z237
1.3.	Category, Subcategory and Vehicle Speed Indicator	S1a
1.4.	Company name and manufacturer's address	Metal-Fach sp. z o.o. ul. Kresowa 62 16-100 Sokółka, Poland
1.4.2.	Name and address of the authorised representative of the manufacturer (if applicable)	N/A
1.5.1.	The location of the rating plate of the manufacturer	On the right-hand side of the main frame of the machine
1.5.2.	Method used to fix the rating plate of the manufacturer	Bonded
1.6.1.	The location of the vehicle-identification number on the chassis	
2.	Machine-identification number	

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

The following harmonised standards were applied to assess the compliance.

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

and standards PN-ISO 3600:1998, PN-ISO 11684:1998, and the Regulation of the Minister of Infrastructure dated 31 December 2002 on the technical conditions of vehicles and the range of their essential equipment (Journal of Laws of 2003, No. 32, item 262, as amended).

Safety Testing Report No. MF/5/2010

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

Sokółka
(Place)

27/11/2010
(Date)

Jacek Kucharewicz
(Signature)

Chairman of the Board
(Position)

Machine data

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

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

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PART I

CZĘŚĆ II

INTRODUCTION

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

The machine has been built in compliance with the standards in force and the current legal provisions. The Manual describes principal safety and operation rules for the Metal-Fach Bale Wrapper.

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

If the information included in the instructions manual proves to be incomprehensible, you should address the seller from whom 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

The Guarantee Certificate, together with the warranty terms, is attached to this Instructions Manual as a separate document.

Manufacturer's address:

Metal-Fach sp. z o.o.

ul. Kresowa 62

16-100 Sokółka

Telephone

Phone (0-85) 711 98 40

Fax (0-85) 711 90 65

The symbols used in these Instructions

DANGER

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

CAUTION

This symbol points to especially important information and recommendations. Non-compliance with the described recommendations risks serious damage to the machine due to its incorrect operation.

WARNING

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

This symbol indicates useful information.

This symbol indicates maintenance activities which should be performed periodically.

1. General description

1.1 Introduction

THE INSTRUCTIONS MANUAL IS PROVIDED WITH THE BASIC EQUIPMENT OF THE 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 Bale-Wrapper identification

Identify the Bale Wrapper on the basis of the rating plate permanently fixed to the Bale Wrapper's main frame.

The data printed on the rating plate is shown in Figure 1.

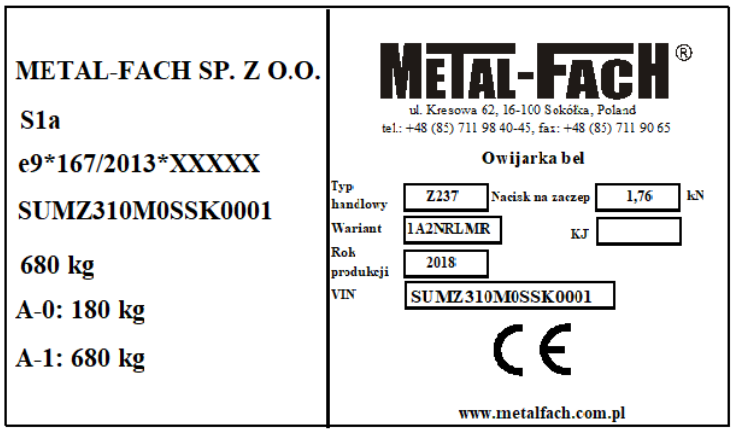


Figure 1. Example of a rating plate

CAUTION

CAUTION!
Operating the Bale Wrapper on public roads without the rating plate or with an illegible rating plate is prohibited.

When purchasing, make sure that the factory number printed on the machine's rating plate and the number provided in the Instructions Manual and Guarantee Certificate are the same - this is crucial for recognising the guarantee.

When contacting the technical service, the seller, or the Manufacturer, the User is obliged to provide the information included on the machine's rating plate.

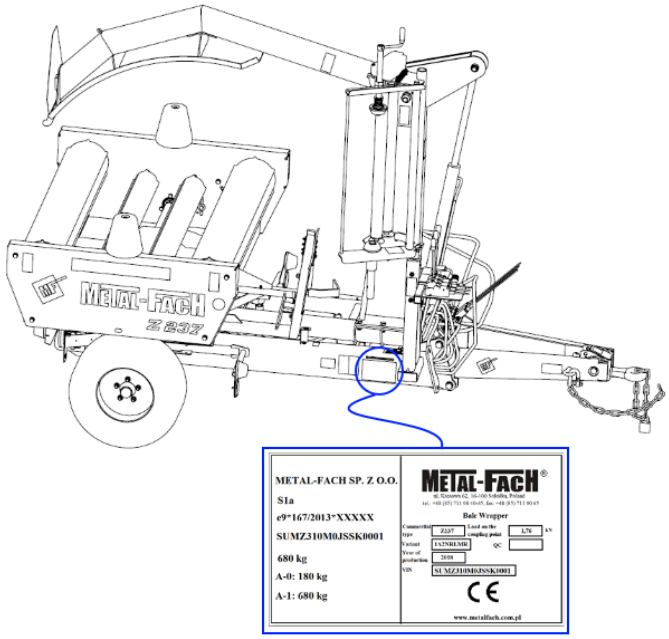


Figure 2. The location of the rating plate on the machine

Ensure the VIN matches the number entered in the GUARANTEE CERTIFICATE, sale documents, and INSTRUCTIONS MANUAL, before you purchase the Bale Wrapper.

It is often necessary to provide the VIN of the machine to identify the Bale Wrapper unambiguously when ordering spare parts, or if any other problems arise, so it is advisable to write this number down below.

Bale Wrapper's VIN

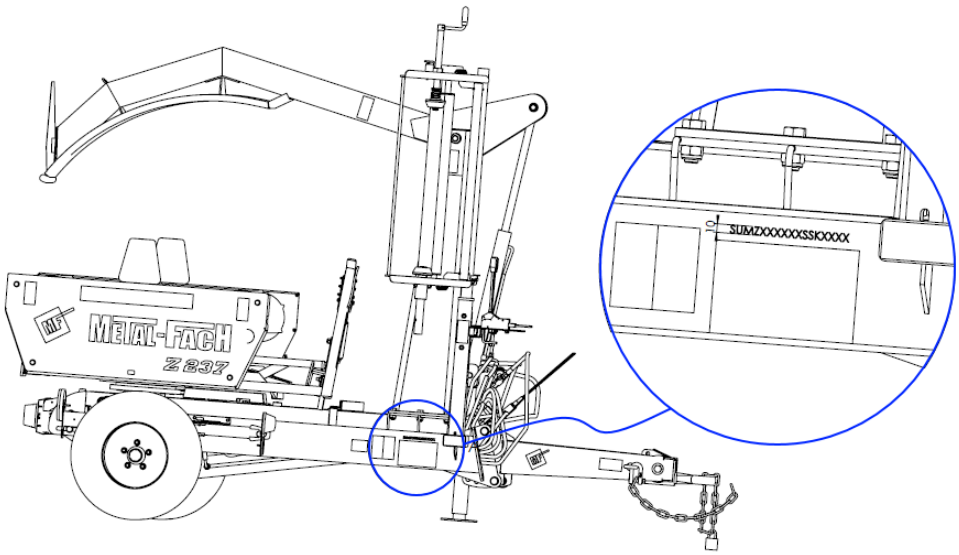


Figure 3. The location of the VIN on the machine

The Instructions Manual is part of the basic equipment of the Z237 Bale Wrapper.

In the case of selling the machine to another user it is obligatory to provide the Instructions Manual. It is recommended for the Bale-Wrapper supplier to archive the Instructions Manual receipt confirmation by the purchaser, submitted with the machine to the new user.

Please read the Instructions Manual carefully!

If you follow its recommendations, it will be possible to operate the machine efficiently and productively, avoid hazards and maintain the warranty for the duration granted by the Manufacturer. Detailed explanations regarding the design, functioning, operating principle, and any other matters related to the machine can be provided by dealers/the manufacturer of the Bale Wrapper.

CAUTION

CAUTION!
It is prohibited for persons who have not read this Instructions Manual to use the Bale Wrapper.

1.3 Intended use

The Z237 Bale Wrapper is a tractor's towed machine, working in one line with the tractor's, 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 rotary service table. Then the machine wraps the loaded bale with film intended for silage, which is charged on the film feeder, on the machine frame. After finishing wrapping the film is gripped and cut by the film cutter. The last stage is the depositing of the wrapped bale onto the ground.

All the work actions must be executed by one person - an operator who is on the tractor seat. The Bale Wrapper is fitted with manual control levers which are installed on the tractor for the period of the operation.

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

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

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

Adhere to Bale Wrapper's intended use, which involves coupling it with farm tractor with a power of over 30 kW and a min. pull class of 0.9, which meet the combination-stability requirements.

During operations, the operator of the Bale Wrapper is not exposed to noise which can cause loss of hearing, since the noise level of the running machine does not exceed 70 dB (A), and the operating position is located inside the tractor's cab.

During operation, the operator of the Bale Wrapper is not exposed to vibrations, since the level of vibrations on the upper limbs of the operator does not exceed 2.5 m/s2, while the vibrations on the body are below 0.5 m/s2, and the operating position is located inside the tractor's cabin.

Detailed explanations regarding the design, functioning, operating principles, and any other matters related to the machine, can be provided by authorised dealers/manufacturer of the Bale Wrapper.

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, working with the Bale Wrapper non-compliant with its intended use, and avoiding the safety principles release the manufacturer from responsibility for any resulting hazards and damages

1.4 Bale-Wrapper design

The Z577 Bale Wrapper is composed of the following units (Fig. 4):

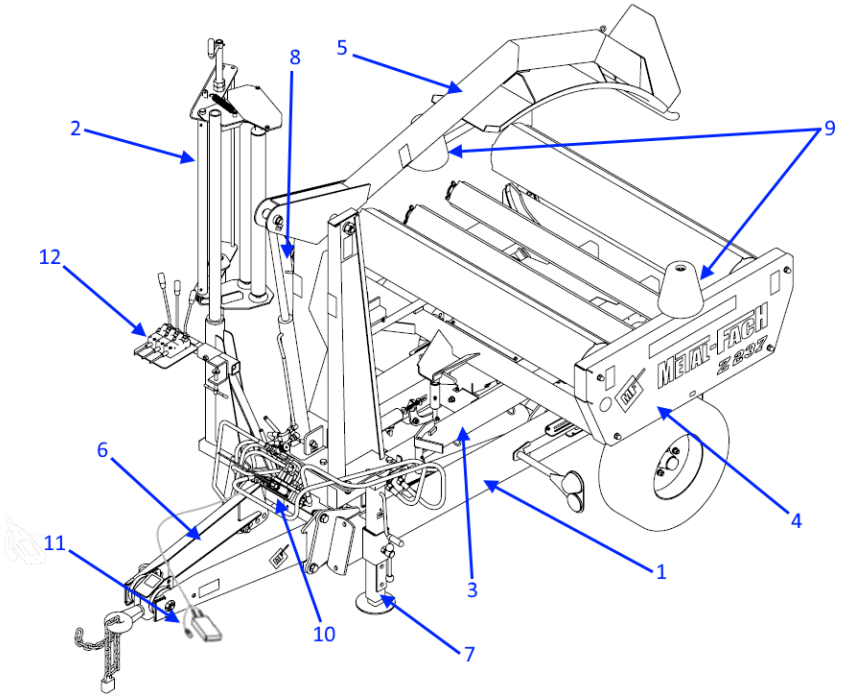


Figure 4. Bale-Wrapper design 1 – Main frame, 2 – Film feeder, 3 – Moving frame, 4 – Rotary frame, 5 – Loading arm, 6 – Drawbar, 7 – Support foot, 8 – Cutting unit, 9 – Side cone, 10 – Hydraulic manifold, 11 – L-02 Counter, 12 – Control levers

Fixed to the main frame (1) is a hitch drawbar (6), used for coupling the Bale Wrapper with the farm tractor, and its levelling in both the working and transporting positions.

The main frame (1) has an articulated joint with a moving frame (3) which is joined to the rotary frame (4). The main frame (1) is fitted with a film feeder (2) and an adjustable support foot (7). The loading arm (5) is fitted to the main frame (1) by means of an articulated joint. The rotary frame (4) is supplied with a cutting unit (8) and side cones (9) which prevent bales from sliding down.

The control components include the hydraulic manifold (10) linked with the control levers (12) by means of ropes. The L-02 counter (11) is used for overseeing the work status, and is ultimately put in the tractor's cab, along with the control levers (12).

1.5 Wrapper characteristics

Table 1. Wrapper characteristics

No.	Detailed list	
1.	Type of vehicle	Bale Wrapper
2.	Manufacturer	METAL-FACH Sp. z o.o., 16-100 Sokółka, ul. Kresowa 62
3.	Type	Z312
4.	Trade name	Z237
5.	The location of the rating plate	The front part of the main frame of the machine
6.	Chassis type	Single axle
7.	The way of connecting with the tractor	Towed
8.	Connected with the tractor by	Hitch
9.	Length, mm	min. 3,040; max.: 3200
10.	Width, mm	min. 1630; max.: 1700
11.	Height, mm	min. 2380; max.: 2580
12.	No. of axes:	2 axle shafts
13.	Distance between the coupling point and the axle shafts, mm	min. 2355; max.: 2515
14.	Wheel track, mm	min. 1310; max.: 1390
15.	Drawbar eye diameter, mm	44
16.	Maximum tractor's hitch pressure, kN	4.2
17.	Machine weight, kg	850
18.	Maximum bale weight, kg	800
19.	Bale length, mm	1200
20.	Bale diameter, mm	1,000-1,200
21.	Tyres	23x8.50-12 76 A4
22.	Tyre pressure, bar	3.5
23.	Maximum service speed, km/h	10
24.	Maximum transport speed, km/h	40
25.	Tractor's pull class	0.9
26.	Minimum tractor's power, kW	30
27.	Required pressure in the tractor's hydraulic actuator system, MPa	14
28.	Recommended capacity of the tractor's pump, l/min	25
29.	Wrapper drive	Hydraulic from the tractor's power hydraulics
30.	Rotary frame drive	Hydraulic motor
31.	Max. rotary-frame speed, rpm	35

32.	Bale-loading method	Self-loading arm
33.	Bale-unloading method	Self-unloading unit
34.	Film cutting	Automatic, during unloading
35.	Film width, mm	500; 750
36.	Bale-wrapping time, min.	~2
37.	Number of operators	1 (tractor's operator)
38.	Wrapping counter	Electronic, type L-02
39.	Electrical-system voltage, V	12

CAUTION

CAUTION!
The maximum transporting speed of the Bale Wrapper is restricted by the speed index of the tyres fitted (Tab. 2) and shall not be higher than 40 km/h.

Table 2. Index indicated on tyres

Tyre marking	Max. allowed speed
A1	5 km/h
A2	10 km/h
A3	15 km/h
A4	20 km/h
A5	25 km/h
A6	30 km/h
A7	35 km/h
A8	40 km/h

1.6 Bale-Wrapper dimensions

Overall Bale-Wrapper dimensions in the transporting position are shown in the drawings:

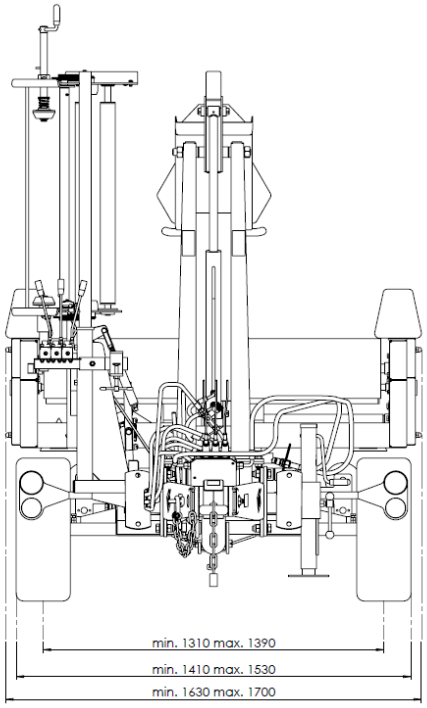


Figure 5. Wrapper dimensions – front

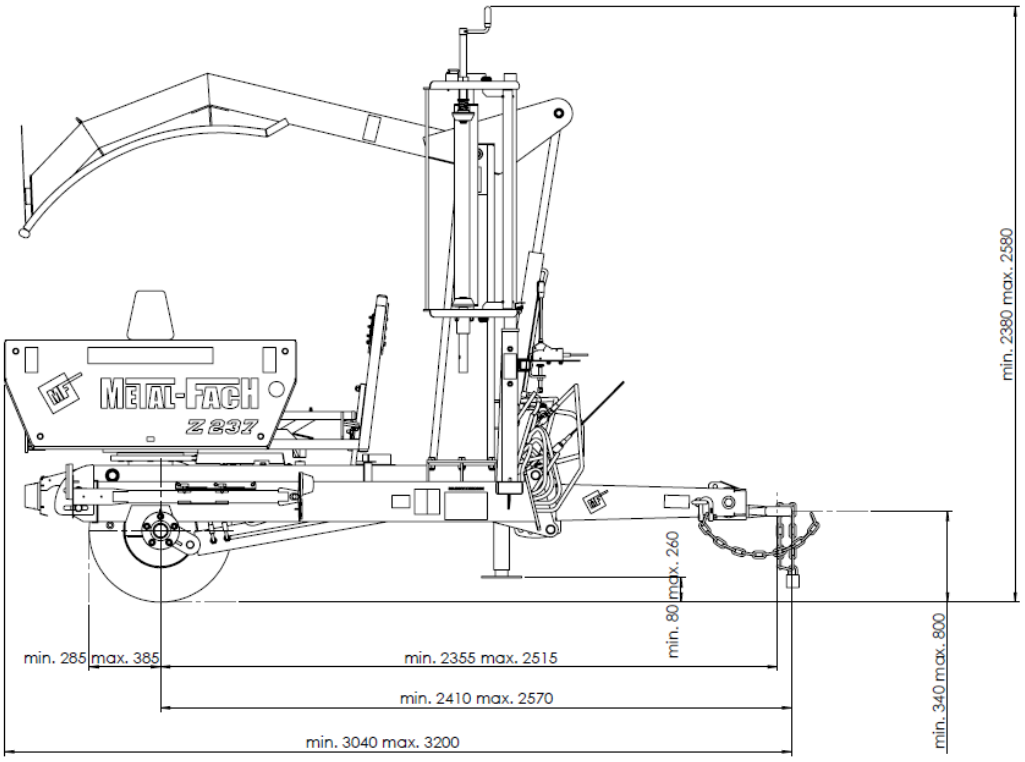


Figure 6. Wrapper dimensions – side

1.7 The location of pictograms

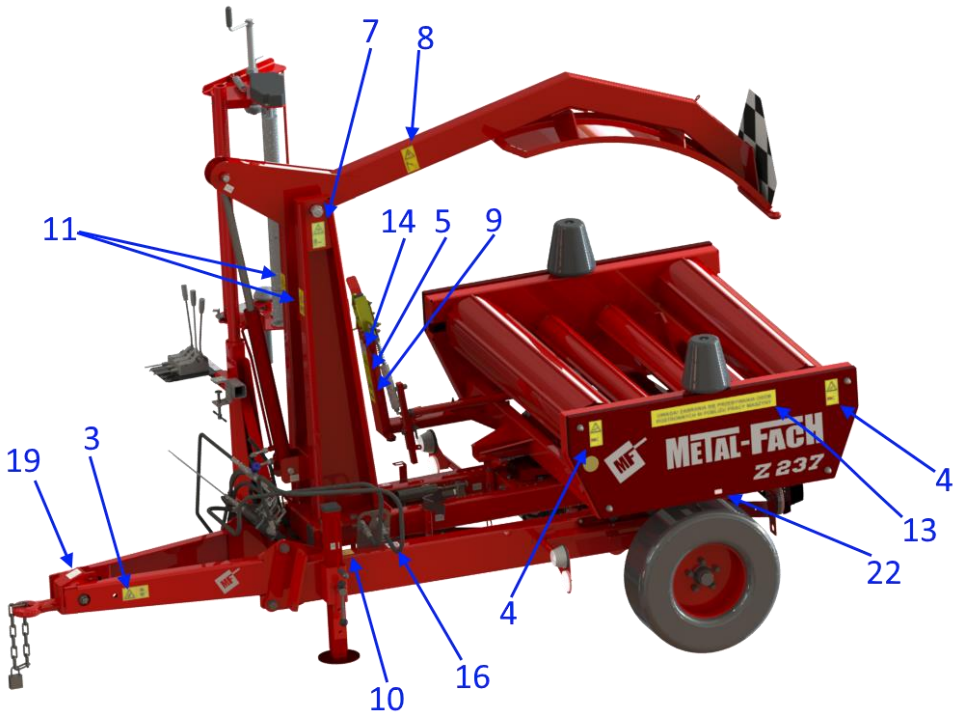


Figure 7. The arrangement of pictograms – left-hand side

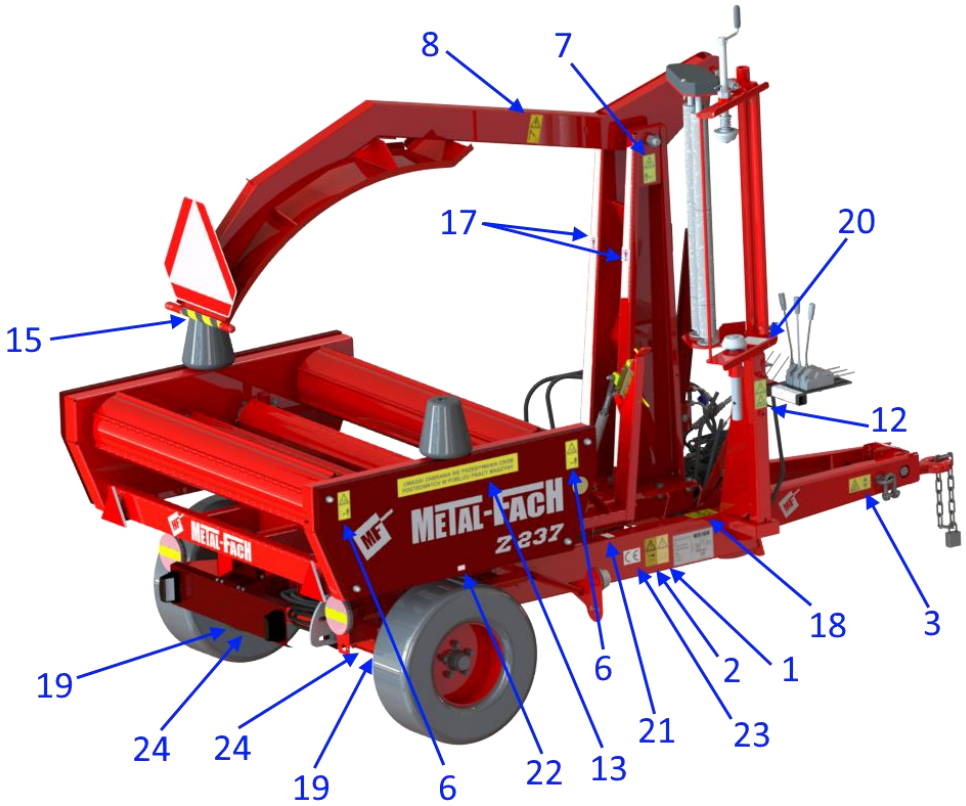


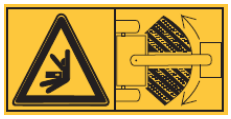
Figure 8. The arrangement of pictograms – right-hand side

1.8 Hazard-warning symbols

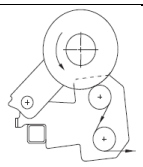
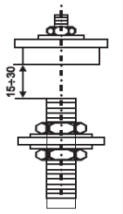
The warning pictograms located on the machine (Section 1.7) inform the operator of hazards and risks that can occur during operation of the machine. Ensure that the symbols are clean and legible.

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

Table 3. Pictogram list

No.	Warning symbol (sign)	Meaning
1.		Attention. Before you start operating the machine, read the Instructions Manual.
2.		Attention. Before starting work or repairs, stop the tractor's engine, and take the key from the ignition switch.
3.		Attention. Keep away from the links of the Bale Wrapper at work.
4.		Attention. Do not open and remove the protective guards during machine operation.
5.		Attention. Do not touch the revolving components of the machine at work.
6.		Attention. Keep away from the machine during operation Risk of being crushed by a bale.

7.		Attention. Keep a safe distance from the raised arms. Danger of crushing
8.		Attention. Keep a safe distance from the power lines during machine operation.
9.		Attention. Crushing hazard.
10.		Attention. Avoid contact with liquid under pressure.
11.		Attention. Keep away from the links of the Bale Wrapper at work.
12.		Attention. Finger-crushing hazard.
13.		Warning inscription: Attention. Bystanders standing within the machine operation range is prohibited.
14.		Warning inscription: Attention. Sharp blade.

15.		Dimensions of the board: 40x240.
16.		Wearing safety gloves to operate the machine is mandatory.
17.		Keep a safe distance from the working machine.
18.		Warning inscription:
19.		Pictogram informing of: Sling attachment/Lifting point.
20.		Pictogram informing of: Film-mounting procedure.
21.		Information pictogram. The proper attachment of the bale-counter sensor under a magnet.
22.		Recommended tyre pressures for the Bale Wrapper.
23.		Pictogram informing of: CE marking - manufacturer's conformity declaration on the complying of the machine with the European Union Directives.
24.		Jack-attachment point.
25.		Lubrication point.

2. Safety of use

2.1 Obligation to provide information

CAUTION

CAUTION!
When being sold to another user, the Bale Wrapper must be handed over together with the Instructions Manual, and the person purchasing the machine must undergo training, according to the guidelines provided herein.

2.2 General safety principles

1. As well as the information included in the Instructions Manual all the principles and local legal regulations related to safety of work and machine disposal must be met.
2. The Bale Wrapper may only be operated by an adult with a valid licence for driving farm tractors, and proper knowledge of the health-and-safety regulations with regard to agricultural-equipment operation, provided that they have read and understood this Instructions Manual.
3. Read thoroughly and understand this Instructions 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's 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. Operating the Bale Wrapper without protective guards in place is strictly prohibited.
7. Prior to each starting of the Bale Wrapper check the machine's condition, completeness, and the mounting of the guards.
8. Prior to each departure, start-up, or ride on public roads, check the correctness of the machine's connection with the tractor, tightening of the wheels and the correct drawbar and tractor's connection.
9. Riding the Bale Wrapper on public roads is allowed only in the transporting position, having locked the bale tipper.
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 free space in the zone of the rotating parts. During the switching of the machine to the operating or transporting positions, and the wrapping of 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 area. Pay special attention to the possibility of bales' rolling down.
15. It is strictly forbidden to operate the Bale Wrapper under raised machine units.
16. It is strictly forbidden for any person to stay between the tractor and the Bale Wrapper during tractor-engine's operations.

17. Take particular care when connecting and disconnecting the Bale 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 Bale Wrapper drawbar (Section 1.5).
18. During operation, use appropriate work clothing and footwear with non-slip soles.
19. Bale wrapping film should be charged at the tractor's engine switched off and protected against its accidental starting 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's operator cockpit only.
22. Traffic Law and manufacturer's recommendations must be observed while transporting on roads (Section 7.1).
23. Prior to entry onto public roads, ensure visual control of the transported machine.
24. It is forbidden to climb the Bale Wrapper during its transporting and operation.
25. It is forbidden to climb onto the components of the Bale Wrapper while parking, transporting, and operating.
26. While transporting on the public roads, it is forbidden to ride on the Bale Wrapper's swathes or hay-silage Bales
27. While driving the Bale Wrapper on public roads, the user must use road the lighting installed on the Bale Wrapper in compliance with the local regulations in force.
28. It is forbidden to work with the Bale Wrapper while under the influence of alcohol.
29. It is forbidden for persons under the influence of narcotics, or medicines with a narcotic reaction, to operate the Bale Wrapper.
30. 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.
31. It is forbidden to operate the Bale Wrapper in a state of exhaustion which can cause interruptions to concentration and delays to reaction time.
32. It is forbidden to drive the Bale Wrapper near sources of open fire.
33. The firefighting 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 the operation of the Bale Wrapper do not approach it with open fire and do not smoke near the machine.
36. Before each ride to work, check that the tractor is equipped with a dry-powder fire extinguisher. If there is not one available provide the tractor with one.
37. When failure occurs or a malfunction is discovered on the machine, switch the tractor's hydraulic system off. Stop the tractor's engine, take the key from the ignition, and engage the auxiliary brake. Locate the reason for the breakdown or failure and have an authorised service centre remedy it.

CAUTION

CAUTION!
A risk of lightning strike during the Bale Wrapper operation.

The Bale Wrapper comes with a securing chain, padlock, and two sets of keys.

CAUTION

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

CAUTION

CAUTION!
Rotating action is not allowed when
- the loading arm is its lower position
- the moving frame with the service table is in its upper position

CAUTION

CAUTION!
The raising action of the loading arm is not allowed when
- the service table has not been locked in the loading setting
- the moving frame with the service table is in its upper position

CAUTION

CAUTION!
Unloading is not allowed when
- the service table has not been locked in the unloading setting

2.3 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 1.5). Combine the Bale Wrapper Z237 with a farm tractor with power of at least 30 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), 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 fitted with a 12V power socket with a 10A fuse (lighter socket).

Connect the Bale Wrapper to the lower tractor's hitch, which facilitates the transmission of a vertical load of 2.5 kN.

Prior to connecting the wrapper with the tractor the operator must make sure that the wrapper is complete and all the bolts are tightened correctly (see Section 5.4 for the table of bolt-tightening torques).

Make sure that the points marked for lubrication are actually greased. If it is not the case, have them lubricated. (Section 5.6.)

DANGER

DANGER!

The machine's working area is considered a danger zone. Prior to starting up the machine, make sure that there are neither people nor animals around in the near proximity of the machine. 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 operation.

CAUTION

CAUTION!

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.

WARNING

WARNING!

Wear well-fitting clothes which cannot be caught by movable elements, and boots with non-slippery soles.

In case of the hazard of an item ejection wear a protective helmet with eye protection.

CAUTION

CAUTION!

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

CAUTION

CAUTION!

Standing near the machine during operating the Bale Wrapper poses the threat of impact or crushing. Exercise special caution while coupling and uncoupling the machine's hitch.

2.3.1 Connecting with the drive

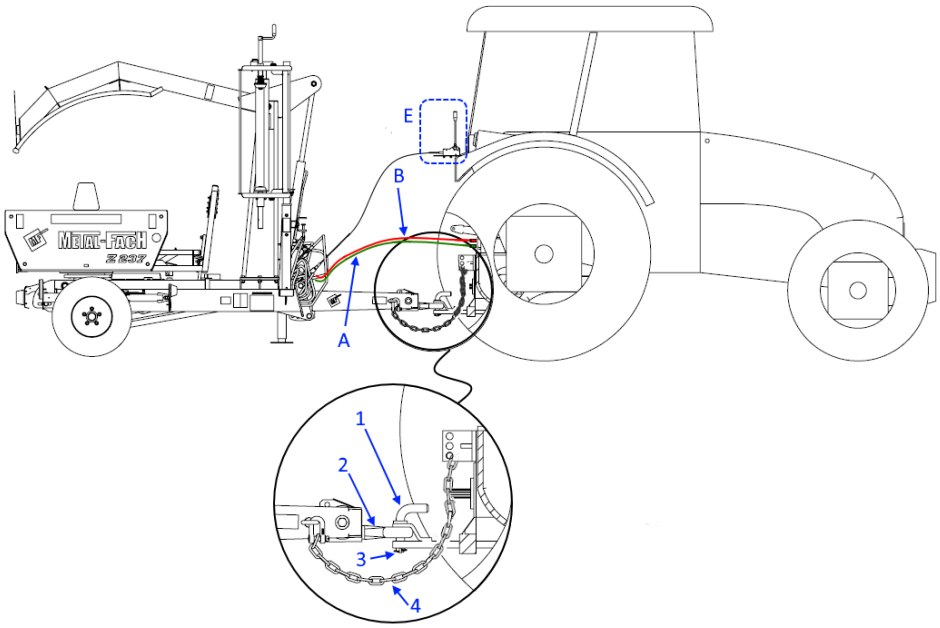


Figure 9. Connecting the hitch and drive of the Bale Wrapper

- Connect the Bale Wrapper to the lower or upper tractor's hitch, which allows the transmission of a vertical load of 4.2 kN. Check stability and manoeuvrability with the tractor connected (Chapter 7.2).
- Make sure that in the area of the Bale Wrapper coupling with the tractor and in the near vicinity there are no bystanders present, especially children.
- While connecting with the tractor, position the machine along the tractor's axis on paved, even and level ground. Stop the tractor's engine, take the key from the ignition, and engage the tractor's auxiliary brake.
- Level the Bale Wrapper by means of the adjustable support foot, and by setting a suitable hitch height at an appropriate adjustment eye (Section 3.5).
- Remove the padlocked chain, which protects the machine against unauthorised use, from the hitch eye (Section 2.4 – 1).

CAUTION

CAUTION!
Couple the drawbar eye with the tractor's agricultural hitch only and check the connection for correctness, and the protection against accidental disconnection.

- Start the tractor and drive it towards the Bale Wrapper so that the opening in the hitch eye of the tractor aligns with the opening in the hitch eye of the Bale Wrapper. The opening diameter in the hitch eye is 45 mm.
- Stop the tractor's engine, take the key from the ignition, and engage the parking brake.
- Attach the Bale Wrapper hitch eye (2) by means of a suitable hitch pin (1), and secure the pin against spontaneous detachment (3).

- Use a chain (4) to provide additional security against detachment of the combination by fastening it between the Bale Wrapper hitch and the tractor. It will ensure residual controllability of the Bale Wrapper if the machines get uncoupled abruptly.
- Put the panel with the control levers (E) in the tractor's cab.
- Connect the hydraulic supply system by plugging the supply hose plug (A) and the return hose (B) in the supply sockets of the hydraulic 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 Bale Wrapper's lighting system (Section 2.5) to the socket in the tractor. Check the road lighting for correctness. Check the axle shaft for locking in position.
- Start the tractor, switch on the control panel and check the correct operation of the power hydraulic systems, without the bale and without film in the feeder (Section 4.5).

CAUTION

CAUTION!
While connecting with the tractor, position the machine along the tractor's axis, on paved, even, and level ground. Stop the tractor's engine, take the key from the ignition, and engage the tractor's auxiliary brake.
Set the proper level of the hitch by selecting the appropriate adjustment eye to level the Bale Wrapper.

2.3.2 Drive disconnection

The procedure for uncoupling the Bale Wrapper from the tractor

- Make sure that in the area of the Bale Wrapper coupling with the tractor and in the near vicinity there are no bystanders present, especially children.
- If it is possible, set the Bale Wrapper's components in the transporting position.
- If the Bale Wrapper is to be idle for a longer time, lower the loading arm, or fit a lock to the same.
- Position the Bale Wrapper in its storage place on even and level ground.
- Stop the tractor's engine, take the key from the ignition, and engage the tractor's auxiliary brake.
- Disconnect both the power supply and lighting systems, wind the wires up, and put them away under the spare film-roll containers.
- Disconnect the power hydraulics system and protect the hydraulic hoses in their clamps on the Bale Wrapper's frame (Fig. 10 – 1).
- Put the panel with control levers of the Bale Wrapper in the holder on the pole of the machine's film feeder.
- Lower the support foot from its transporting position to the working position.
- Make sure that there is no risk of accidental machine displacement.
- Disconnect the drawbar eye from the transport hitch of the tractor. Detach the additional chain which links the hitch with the tractor (Fig. 9 – 4).
- Fit the drawbar eye with the protection against unauthorised use (Fig. 11 – 1).

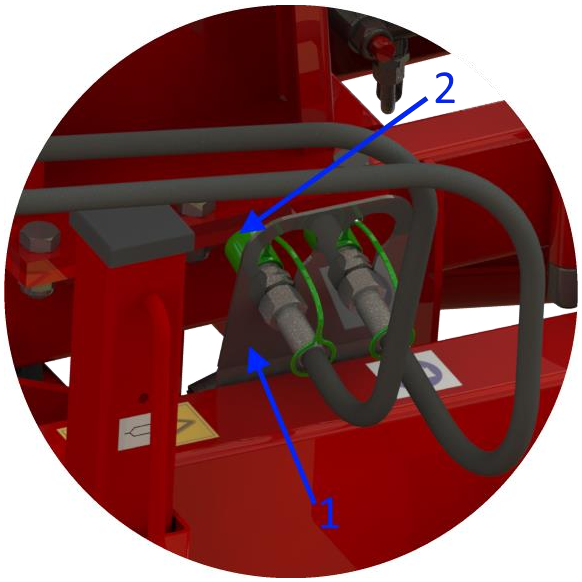


Figure 10. Place for storing hydraulic hoses
1 – hose bracket, 2 – plastic cap

CAUTION

CAUTION!
Hydraulic connections must be always kept clean. After use reinstall plastic cover supplied with the machine purchase.

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 Bale Wrapper from the tractor wind up and store its power-supply wires and the communication cables of the control panel in the dedicated box.

2.4 Drawbar components

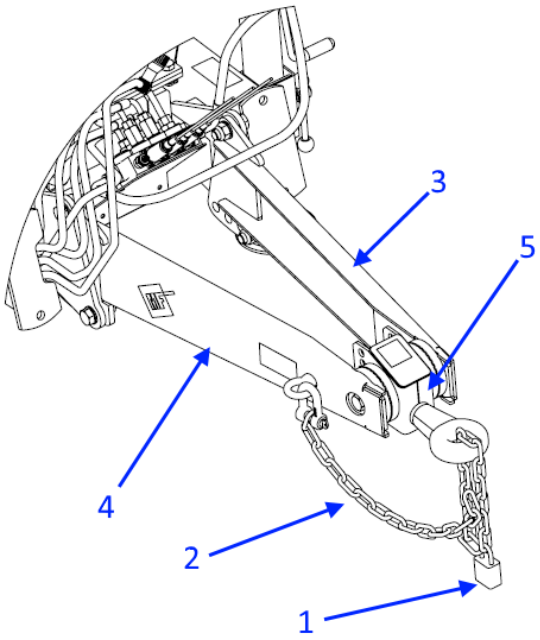


Figure 11. Drawbar components

Key for the Z237 Bale Wrapper drawbar components (Fig. 11)

1. Chain with a padlock and key set (protection against unauthorised use of the machine)
2. Chain with a connecting shackle (additional protection against combination detachment)
3. Left drawbar arm
4. Right drawbar arm
5. Hitch with swivel eye

2.5 Lighting system

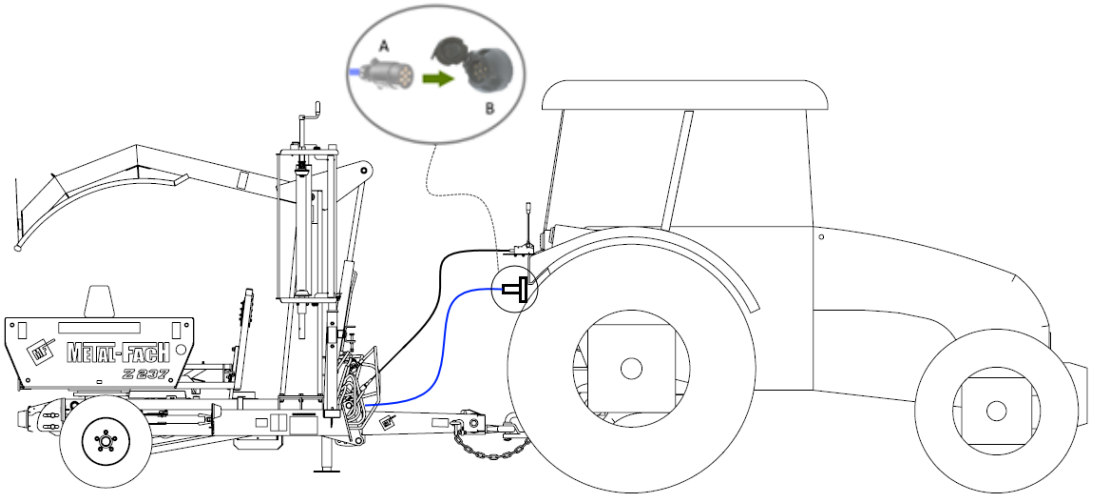


Figure 12. System wiring diagram

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

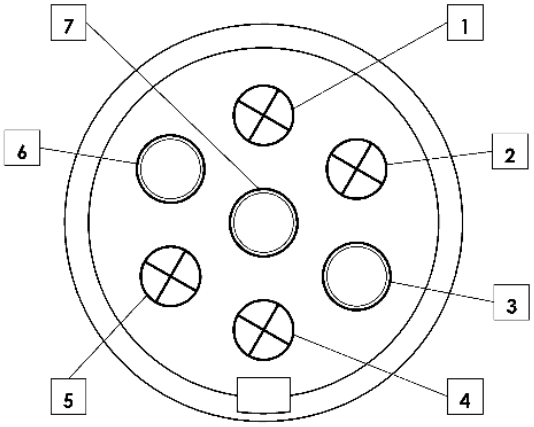


Figure 13. Wrapper-lighting plug (socket side view)

Table 4. Description of the plug lighting wires (Fig. 13)

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

2.6 Hydraulic system

The Bale Wrapper's hydraulic installation is supplied from the tractor's power hydraulics system. Connecting to the power hydraulic system is done by connecting the hoses supplying the hydraulic distributor and then the hydraulic motor and hydraulic servos (cylinders). The individual hydraulic components are connected to one another with flexible and metal hydraulic hoses.

Depending on the version, the Z237 Bale Wrapper features a power hydraulic system (Fig. 14), consisting of the following parts.

1 – Control levers, 2 – Hydraulic manifold, 3 – One-way flow control valve, 4 – Hydraulic motor for turntable, 5 – Cylinder for locking the service table, 6 – Cylinder for raising and lowering the moving frame, 7 – Cylinder for raising and lowering the loading arm.

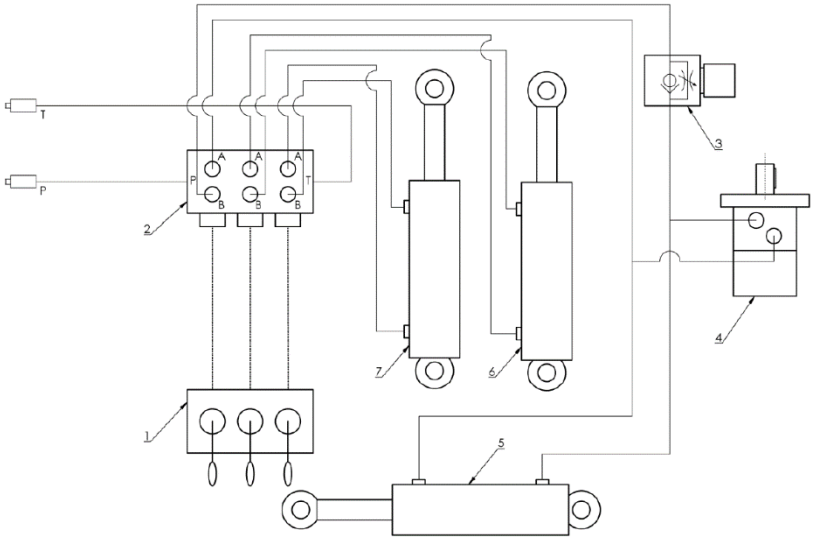


Figure 14. The hydraulic system of the Z237 Bale Wrapper with mechanical film cutter

The control of the hydraulic receivers is carried out via the control-lever panel which is put in the tractor's operator's cab for the time of operation. The control levers are joined with the valves in the hydraulic manifold by means of Bowden cables (two-way action links).

The hydraulic block is protected against too-high pressure in the tractor's power hydraulic system with a pressure valve set by default at 200 bar. The maximum hydraulic oil pressure at which the Bale Wrapper can work is 160 bar.

If the tractor's pump volume of consumption is above 30 l/min, use the tractor's valve to reduce it to 25l/min. If the tractor is not supplied with a flow regulator, have one fitted.

The hydraulic system of the wrapper was factory filled up 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. Filling up the hydraulic system with oil of another type should be consulted on with the manufacturer of the machine.

CAUTION

CAUTION!
Filling the Bale Wrapper with a different volume of oil consumption from that recommended might result in too-abrupt action by the parts of the machine, fast oil overheating, and eventually damage to the parts of the machine. Use-flow regulators.

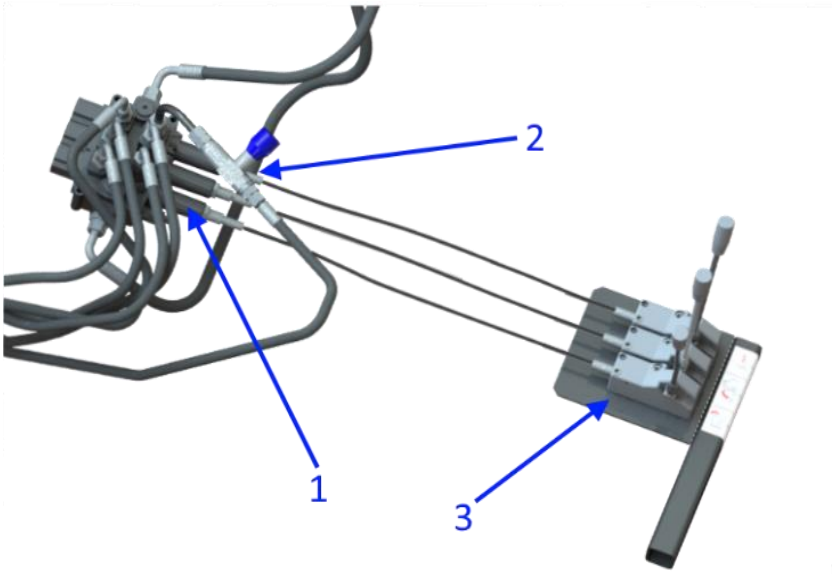


Figure 15. Hydraulic system
1 – 3-section manifold, 2 – valve, 3 – control levers

2.7 Start-up

The start-up of a newly-purchased Bale Wrapper is carried out by the distributor's technical department.

CAUTION

CAUTION!
Prior to the start-up of the Bale Wrapper, read this Manual carefully paying close attention to the sections concerning the safety of the operator and bystanders.

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

CAUTION

CAUTION!
Before you start operating the machine, read the Instructions Manual and adhere to the guidance herein.
Couple the Bale Wrapper with tractor in good working condition only, and ensure its agricultural hitch, and the hydraulic, 12V electrical and signalling/warning systems are fully operational.

CAUTION

CAUTION!
Before you start operating the machine, read the Instructions Manual and adhere to the guidance herein.
Couple the Bale Wrapper with tractor in good working condition only, and ensure its agricultural hitch, and the hydraulic, 12V electrical and signalling/warning systems are fully operational.

WARNING

WARNING!

Use special care during the start-up.

Any bystanders in the working area of the machine compromise safety.

CAUTION

CAUTION!
Each time before starting the Bale Wrapper, install the control levers in the tractor's cab.

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

1. Inspect the accessories and functioning of the Bale Wrapper.
   - Check the machine for completeness and good working condition
   - Check the lighting system and horn
   - Check the electrical system.
     - connect the communication cable with the counter
     - connect the supply conductor to the tractor's socket
     - start up the counter (Section 2.7.1).
   - Check the hydraulic system.
     - connect the hydraulic hoses to the tractor, determine the correct direction of the oil flow
     - remove the transport protections of the bale tipper, reset the machine in the service position
     - make trial actions of the Bale Wrapper service parts, check the functioning of the sensor counting the service table revolutions
     - set the machine in the transporting position
2. Train the user on the correct Bale-Wrapper operation.
   - Discuss the rules of the wrapper operation
   - Film installation
   - Discuss the design and functioning of the control-lever panel
   - Discuss the risks which can arise from improper Bale Wrapper operation
   - The Wrapper's adjustable components
     - adjusting the hitch height
     - the method of resetting the axle shaft of the rotary Bale Wrapper to the transporting and servicing positions
     - adjusting the height and angle of film feeder rotation
     - adjusting the film feeder for 500 mm and 750 mm film
     - adjusting the chain tension on the chain drives of the film feeder, service table, and service-table roller
     - adjusting the film cutting/grabbing device
     - adjusting the throttle/non-return valve for the service table-locking device
     - adjusting the throttle/non-return valve for the raising unit of the bale tipper
     - adjusting the throttle/non-return valve for the lowering unit of the bale tipper
   - Discuss the method of lubrication and ongoing Bale Wrapper maintenance
   - Perform a full cycle of the bale-film wrapping by the user (buyer) assisted by the service technician
   - Perform the procedure of resetting the Bale Wrapper in the service and transporting positions, including the machine preparation for riding on public roads

2.7.1 Counter start-up

Install the wrapping counter in the tractor's cab. Connect it with to the revolution sensor and use the power cord to connect it to the power supply.

A red light will flash on the counter display to confirm correct connection.

Press and hold the "ON" button (symbol C)

Each time the counter is switched on, the display and power supply are tested. The display will show 8888, all decimal dots and LED's will be lit, and the device will generate a sound. Then, the display will show the counter's supply voltage, e.g. U12.7 which stands for 12.7V.

Any different counter status means that it is faulty.

Next, the display will show a manufacture date for the counter, e.g. 2011, and a yellow LED (1) will be lit. Use the F2 button to enter the manufacture year for your Bale Wrapper (from 2000 to 2099).

Use the F1 button to move to the serial number setting for the Bale Wrapper. The serial-number setting mode is confirmed by a lit LED (2). Enter the serial number by pressing and holding the F2 button (from 0000 to 9999).

Verify the data entered are correct by pressing F1. The Bale Wrapper's manufacture year and serial number should be displayed alternately.

Press and hold the "ON" button C for around 10 seconds to confirm the correctly entered data. The red LED will flash and a sound will be generated alternately to confirm that the data have been entered successfully.

You can enter the manufacture date and serial number only once. Once confirmed, you cannot enter any further data.

To stop entering data, unplug the counter from the power-supply voltage. The wrap counters cannot delete or make changes to data.

3. Ongoing control and adjustment components

CAUTION

CAUTION!
Before you start the operation and adjustment works, ensure you switch off the tractor's hydraulic system, stop the engine, take the key from the ignition, and engage the tractor's auxiliary brake.

3.1 The arrangement of the ongoing adjustment controls

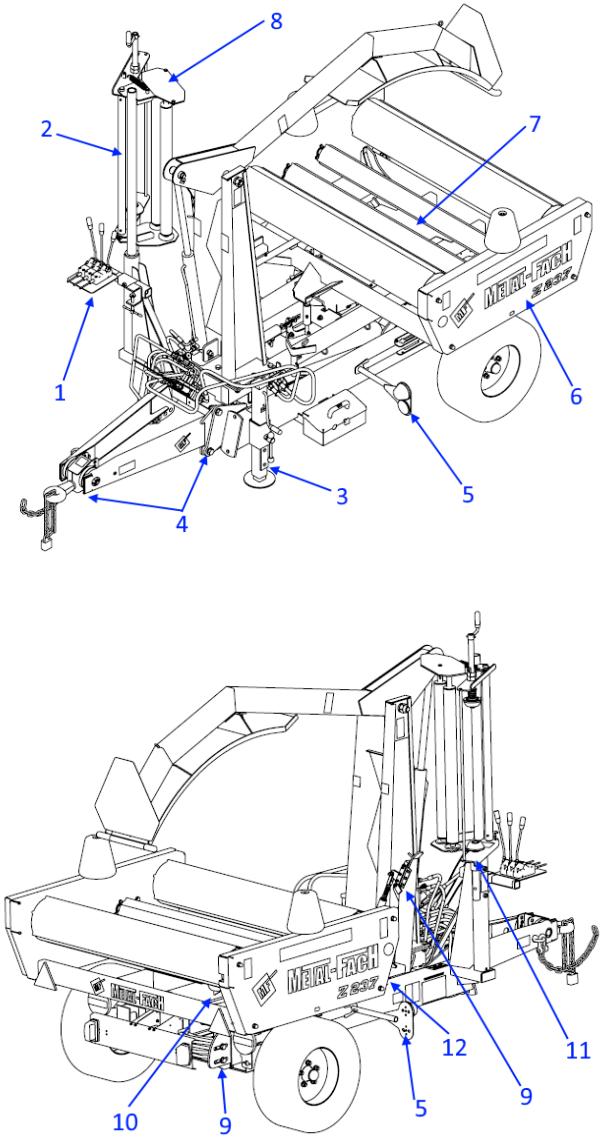


Figure 16. Ongoing adjustment components
1 – control lever, 2 – film feeder, 3 – support foot, 4 – hitch height adjustment, 5 – lighting, 6 – roller chain drive, 7 – intersecting axis gear, 8 – film feeder chain drive, 9 – film cutter,10 – service table chain drive, 11 – film roll adjustment device,12 – revolution counting sensor

3.2 Control lever

CAUTION

CAUTION!
Each time before starting the Bale Wrapper, install the control levers in the tractor's cab.

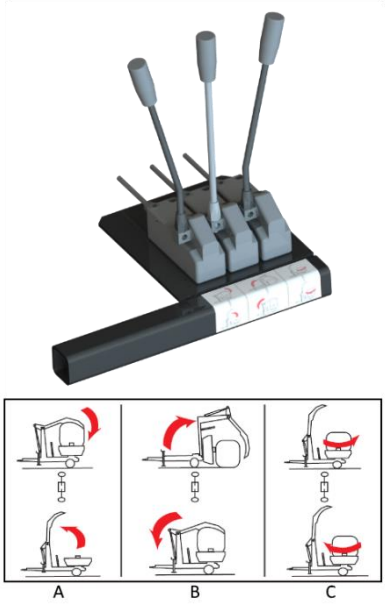


Figure 17. The pictograms on the control lever panel.
A – raising and lowering the loading arm
B – raising and lowering the turntable, C – table revolution

CAUTION

CAUTION!
When controlling the Bale Wrapper, follow the principles below to move the levers: try to start and finish the movements of the machine's working parts smoothly. Sudden and reckless movements can result in machine damage.

The control-lever panel is fitted with a clamp for securing it in the tractor's cab. Fix the lever panel firmly so that it does not hamper driving the tractor or make difficult the use of the control levers during operation.

CAUTION

CAUTION!
Take time! If you are a beginner at Bale Wrapper operations, always check the pictogram to confirm the lever matches the action you want to activate.

3.3 Film feeder

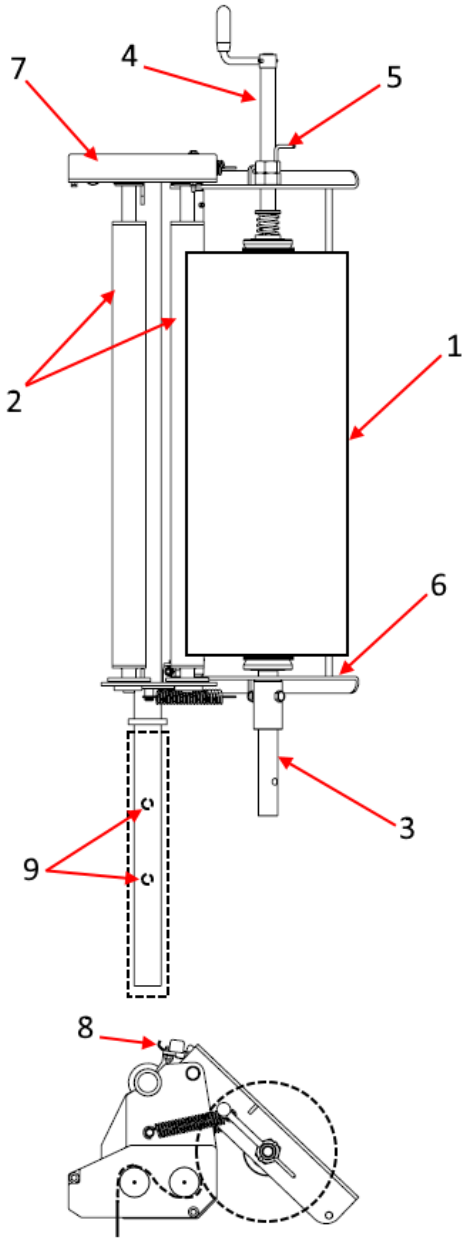


Figure 18. Film feeder 1 – film roll, 2 – pre-stretchers, 3 – upper clamp, 4 – lower clamp, 5 – jam nut, 6 – film flow sticker, 7 – pre-stretcher gear, 8 – hook securing a bracket, 9 – setting screws for feeder angle

The film feeder is a device which feeds a band of film to be wrapped around a bale which is rotated on the turntable. A 500- or 750-mm film roll is placed in a rotary position, contained in a feeder frame, between the upper and lower clamps. The band of film is unwound between the pre-stretchers, which stretch the film from the beginning of the wrapping process. The ratio on the chain drive between the roller near the roll and the outer roller is 1.75.

The film should be pre-stretched at 70-80%, but it might vary due to different types and properties of films.

3.4 Support foot

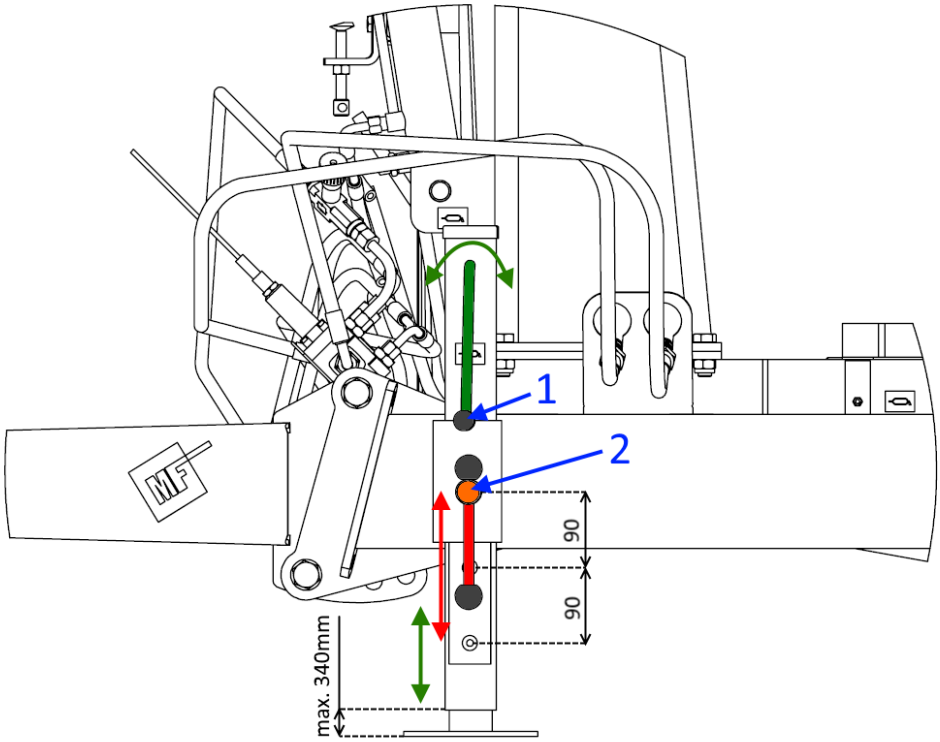


Figure 19. Support foot of the Bale Wrapper

The support foot features two adjustment levels (Fig. 19), 1 – a non-step adjustment of the level of support within 340 mm changed with a handwheel (crank), 2 – a three 90 mm step adjustment, set with a handwheel.

CAUTION!
Use the step adjustment of the support foot only when the Bale Wrapper is connected to the tractor's hitch.
Loosening the setting handwheel when the drawbar is not supported can result in crushing.

When the machine is not coupled with the tractor, the support foot is used to prop the machine firmly. Use it to level the Bale Wrapper when coupling the machine with the tractor.

3.5 Adjusting the hitch height

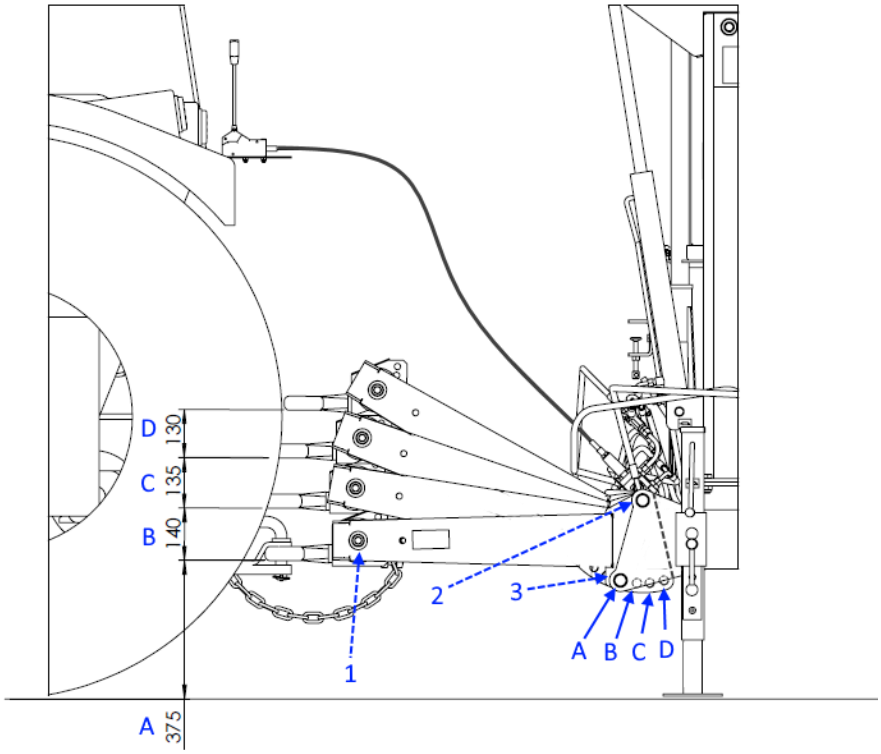


Figure 20. Adjusting the hitch height

The Bale Wrapper's hitch is supplied with four height settings, 375, 515, 650, and 780 mm above the ground.

Follow the adjustment procedure (Fig. 20).

- Position the tractor as closely as possible to the hitch eye of the Bale Wrapper.
- Level the Bale Wrapper with the ground using the support foot.
- Loosen the M20 nut (1) which locks the hitch eye in place.
- Loosen the M20 nuts (2) on the bolts which are rotary pins of the drawbar mounted on the main frame.
- Loosen the M20 nuts (3) on the bolts which set the height of the drawbar and remove the bolts.
- Set the drawbar to the required height by slotting the bolt into a proper hole – positions A, B ,C, or D.
- Set the hitch eye to the horizontal position by turning it on the curved link.
- Secure the hitch-eye connection by tightening the bolt and nut (1) to a torque of 400 Nm.
- Secure the connection of the drawbar and the Bale Wrapper frame by tightening the bolts and nuts (2) and (3) to a torque of 400 Nm.

3.6 Adjusting the height of the revolution-counter sensor

Follow the sensor-adjustment procedure.

- Loosen the bolts which lock the sensor and put its setting to the lowest level possible.
- Start the tractor, position the service table so that the activating magnet is over the sensor.
- Switch off the tractor's engine, set the hydraulic manifold levers to the neutral, and apply the auxiliary brake.
- Turn the power supply on for the L-02 counter, turn the counter on, and set it to the rev-counter mode.
- Set the sensor at such a distance from the magnet as to enable pulse counting; usually it is 10-15 mm. Each pulse is signalled by a short sound from the counter.
- Fit the sensor in the correct position using sensor's nuts.
- Put the counter panel in the tractor, start the tractor and turn the table to check whether the revolutions are being counted on the L-02 counter.

3.7 Adjusting the tension of the chains

Two chain drives are designed in the Bale Wrapper to drive the service table and rollers, and one chain drive for correct ratio of the pre-stretchers in the foil feeder.

Routine checks of chain tension must be performed after wrapping 120 bales.

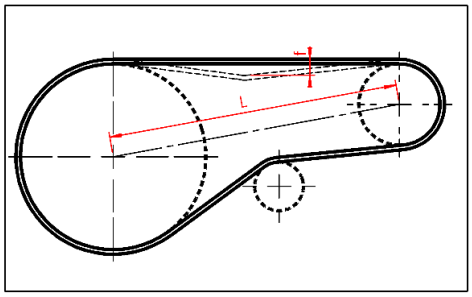


Figure 21. Chain-tension adjustment – determining a chain bend: f – chain bend value, L – distance between the sprocket centre lines

$$f = 0.1 \times L$$

3.7.1 Adjusting the drive-chain tension for the service table

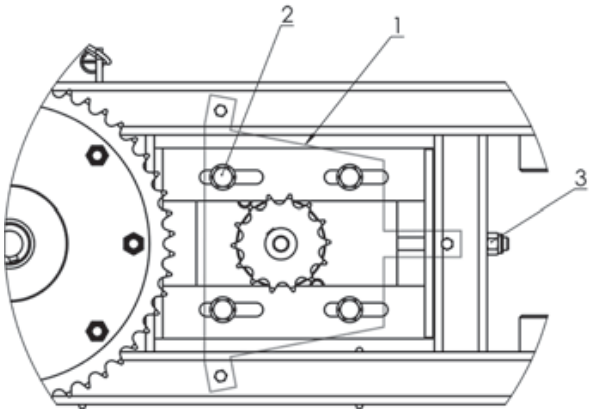


Figure 22. Drive-chain adjustment
1 – chain guard, 2 – M12 nuts, 3 – chain tensioner bolt

Two chain drives are used for the Bale Wrapper's turntable and rollers. Tension the drive chains after wrapping the first 10 bales (Fig. 22).

- Dismount the chain guard (1)
- Loosen the 4 M12 nuts (2)
- Tighten the M12 bolt for the chain tensioner (3) so that it results in a 20 mm bend of the chain
- Tighten the 4 M12 nuts (2)
- Install the chain guard

3.7.2 Adjusting the drive chain for the rollers of the service table

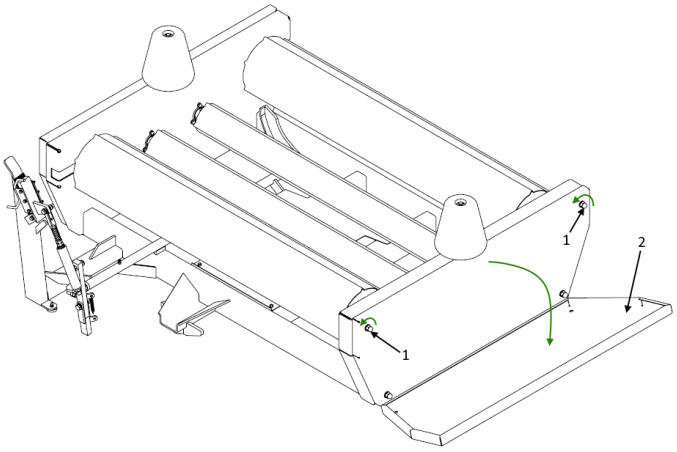


Figure 23. Dismount the guard of the roller-drive chain

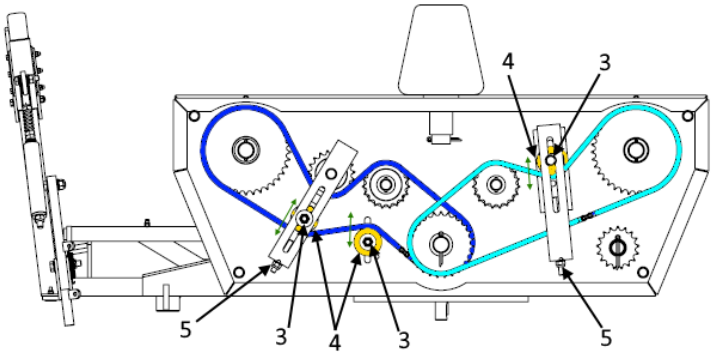


Figure 24. Adjust the tension of the roller-drive chains

Follow the procedure below to adjust the chain tension in the drive of the service-table rollers (Fig. 23, 24).

- Loosen the M12 nuts (1) which lock the guard (2) and open it.
- Loosen the M12 nuts (3) which lock the sliding bushes of the tensioners in place.
- Use the adjustment nuts (5) to set the correct tension of the drive chains.
- The correct tension is characteristic of a chain bend of 10–15 mm.
- Once the chain tension is set, tighten the locking nuts (3).
- Replace the guard (2) and secure it by tightening its nuts (1).

For the hydraulic film-cutter version, the roller-drive chain is on the opposite side of the service table and mirrors the Bale Wrapper drive chain in the mechanical film cutter.

3.7.3 Adjusting the film-feeder chain drive

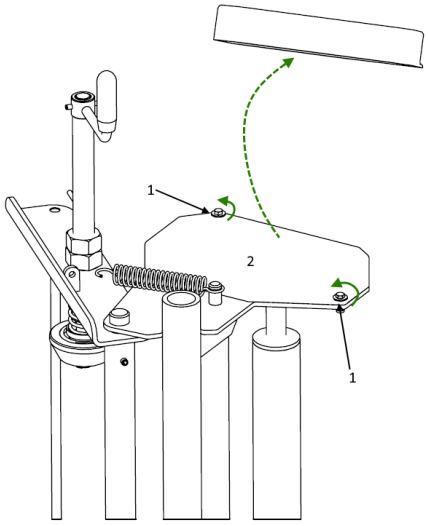


Figure 25. Dismount the guard of the feeder chain drive

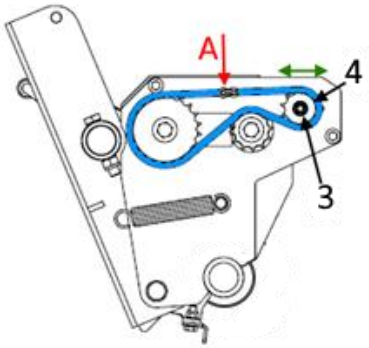


Figure 26. Adjust the tension of the feeder drive chain

Follow the procedure below to adjust the chain tension in the drive of the service-table rollers (Fig. 25, 26).

- Loosen the M8 bolts (1) which lock the drive guard (2) and open it.
- Loosen the M12 nut (3) which locks the tensioner (4) in place
- Shift the tensioner left so that the chain bend at point (A) is 5-10 mm
- Once the chain tension is set, tighten the locking nut (3).
- Replace the guard (2) and secure it by tightening its bolts (1).

A correctly tensioned chain of the drive will facilitate the smooth rotation of the film pre-stretchers. If the rotation of the rollers is obstructed or blocked, it can be caused by excessive tension of the drive chain.

3.8 Adapting the wrapping for 500 mm film

The Bale Wrapper is factory set to wrap with film of 750 mm width. For wrapping with 500-mm film, change the sprocket of the roller drive (Fig. 27) and adapt the film feeder for 500 mm film (Section 3.8.2).

3.8.1 Adapting the service-table chain drive for 500 mm film

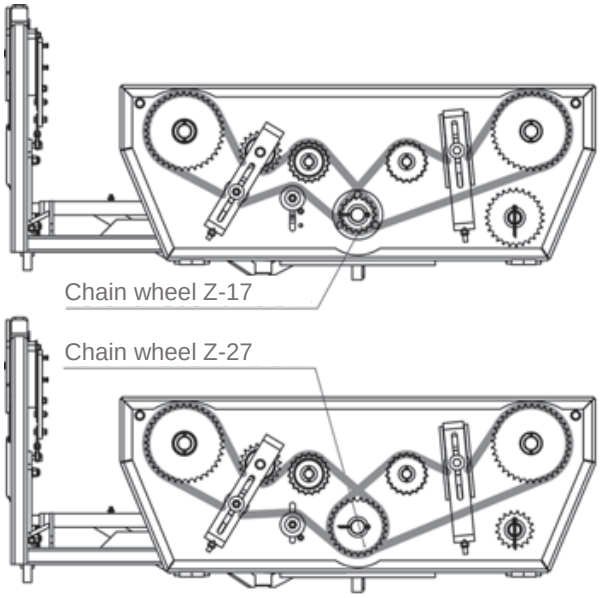


Figure 27. Sprockets of the roller-drive chains

- Loosen the 4 M12 cap nuts, remove the side guard of the rotary frame (at the drive chain side).
- Loosen the M12 bolts of the chain tensioners.
- Remove both chains from the Z-27 sprocket installed on the main shaft and remove the pin which locks this sprocket in place.
- Dismount the Z-27 sprocket from the shaft using a proper extractor.
- Dismount the Z-17 sprocket from the spare sprocket bar, replace it with the Z-27 sprocket and secure it with a pin.
- Mount the Z-17 sprocket on the drive shaft.
- Secure the Z-17 with a pin, mount the chains and adjust their tension.
- Fit the side cover.

3.8.2 Adapting the feeder for 500 mm film

- Loosen the M12 nut on the bolt which locks the upper clamp spindle and remove the locking bolt.
- Lower the upper spindle so that its adjustment hole is aligned with the locking hole in the locking bushes.
- Lock it in place again by fitting a locking bolt and lock it in place by tightening the M12 nut onto it.
- Tighten the lower clamp shaft using the crank provided at a height which enables the mounting of the 500- mm film roll.

3.9 Adjustment valves

The hydraulic system of the Bale Wrapper is supplied with throttle/non-return valves, used for setting the speed of the cylinder action. These valves have factory settings, but as the Bale Wrapper continues to be operated, readjustment might be necessary.

Before adjusting, switch off the tractor's engine, apply the auxiliary brake, and take the key from the ignition.

Before adjusting the throttle/non-return valve, turn it off and count the number of handwheel turns while doing so. This will ensure the factory setting. It is advisable to take note of the values to return to the factory settings easily.

While adjusting, turn the valve handwheel off and on by half a turn compared to the factory setting, depending on whether you want to slow down or accelerate the cylinder action.

CAUTION

CAUTION!
Never adjust the valves while the tractor's engine and power hydraulic system are working.

Once the valve is set, check the functioning of a selected section, and if the result is not satisfactory, turn the valve handwheel off or on by another half a turn.

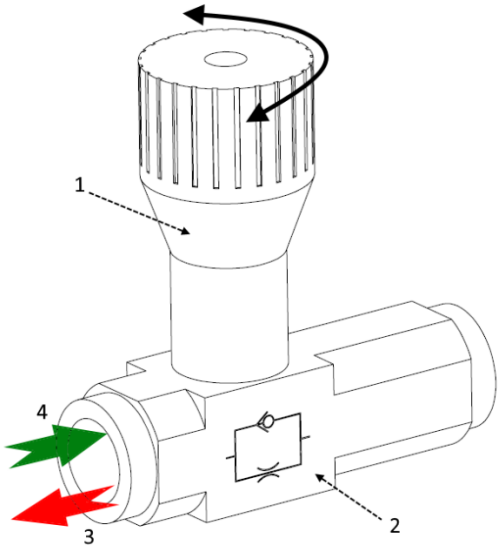


Figure 28. Throttle/non-return valve, 1 – valve handwheel, 2 – valve shell marked for the throttling direction, 3 – throttled flow direction, 4 – free flow direction

The valve design allows the throttling of the oil flow to be set in one direction, marked on the valve shell. Throttling does not apply in the opposite direction.

3.9.1 Adjustment valve for the turntable lock

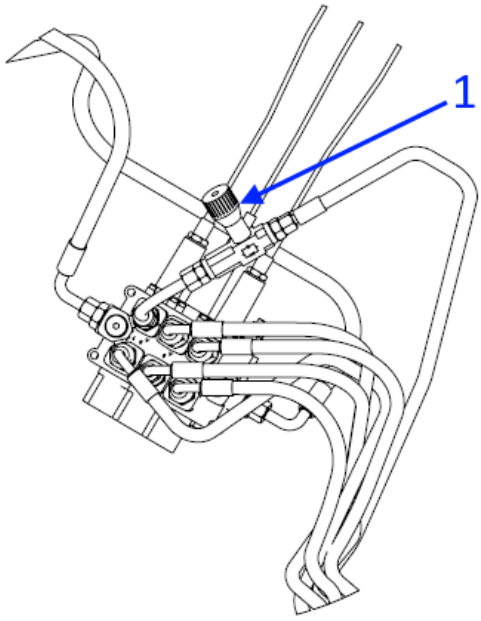


Figure 29. The location of the adjustment valve for the service table lock

The locking pin of the service table should move out during the reverse table revolutions, which is opposite to the wrapping direction. Locking the table is described in Section 4.5.2.

If the locking pin fails to move out, turn the valve handwheel (Fig. 29 – 1) by half a turn and check the locking action. Repeat, if necessary.

If the locking pin moves out too quickly or it falls after the control lever is released, turn the valve handwheel by half a turn and check the locking action. Repeat, if necessary.

CAUTION

CAUTION!
When locking the service table, move the control levers smoothly and avoid sudden movements with the control lever. Locking the service table too abruptly can damage the locking unit.

3.10 Adjusting the mechanical film-cutting device

The correct procedure is described in Section 4.5.4.

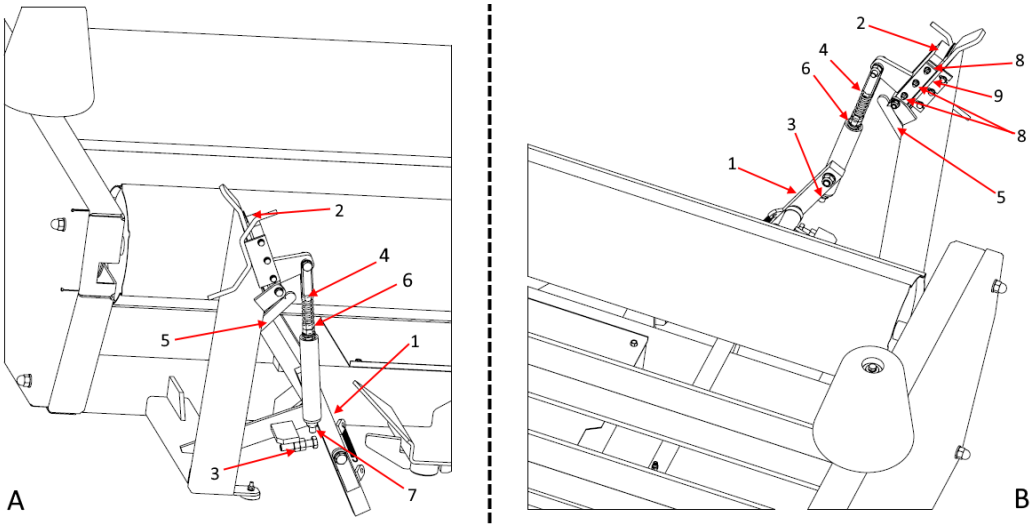


Figure 30. Enclosed film cutter A – front view, B – back view

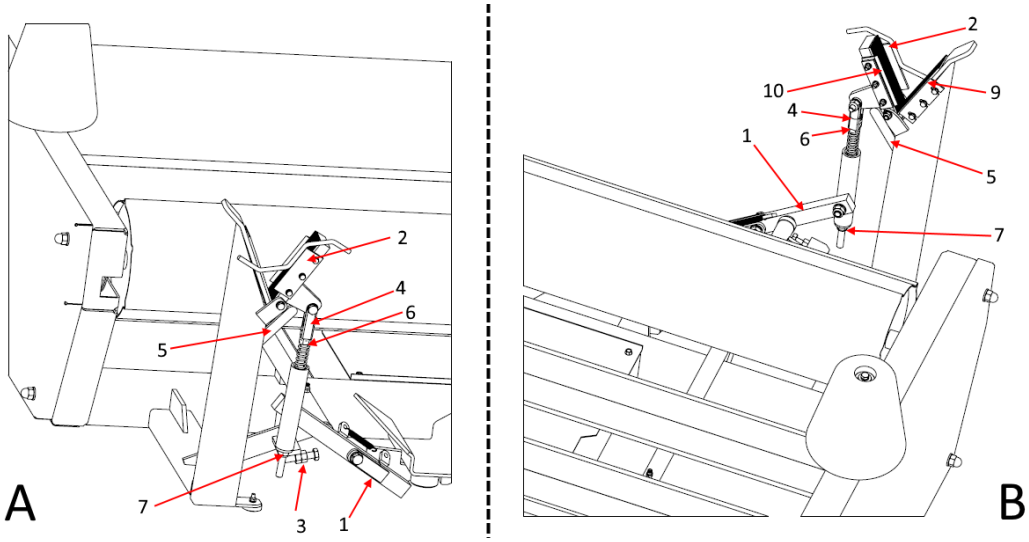


Figure 31. Open film cutter A – back view, B – front view

Adjusting the position of the film-cutter arm (Fig. 30, 31)

- The film-cutter arm (1) in its closed position must be set so that it retains the clamping position (2), and when the service table revolves, the lower part of the arm is able to hit the film cutter buffer (Fig. 45 – 8).
- Adjust the arm position by tightening or loosening the bolt of the end stop (3).
- The open position of the film cutter is defined by its clamping-link length (4).

Adjusting the film cutter's clamping force (Fig. 30, 31)

- The clamping surfaces (2) in the closed position must be flush with each other.
- The ear of the clamping device in the open position, which connects the clamping device (2) with the link (4), must rest on the end stop (5).
- The clamping force is to be adjusted by using the nuts (6) to tension the spring on the link.
- The clamping position is to be adjusted by using a nut (7) to change the link length.

Adjusting the cutting blade (Fig. 30, 31)

- The edge of the moving blade (10) in the closed position must be set parallel to the edge of the fixed blade (9).
- In the open position, the angle between the blade edges must be bigger that the angle of the clamping area, so that the film band is not damaged too soon when it is pulled to the clamping device.
- Use the set screws (8) to set the clamping force of the fixed and moving blades.

DANGER

DANGER!

Exercise particular caution when adjusting the blade. The blade is very sharp. Risk of hand injury.

3.11 Lighting transporting and servicing positions

To avoid any risk of damaging the road lighting during operation, the front and rear lighting are fitted with two brackets, so that resetting them to the service position, where they are out of reach for the moving parts of the Bale Wrapper, is possible.

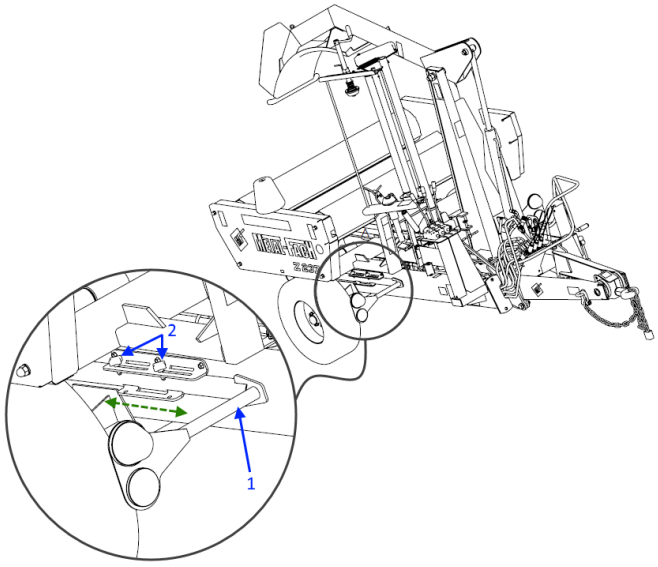


Figure 32. Front-lighting transporting position

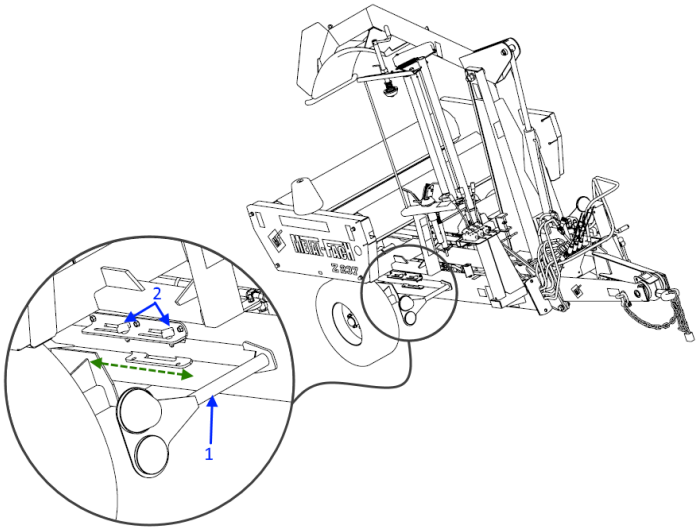


Figure 33. Front-lighting servicing position

Setting the working position of the Bale Wrapper's lighting (Fig. 32)

- Loosen the knobs (2) and move the light brackets (1) forward. Use the knob to lock the position.

Preparing the lighting for the transporting position (Fig. 32)

- Loosen the knobs (2) and move the light brackets (1) backward. Use the knob to lock the position.

INDEX OF NAMES AND ABBREVIATIONS

A – Ampere, electric-current unit

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

OS&H – occupational health and safety

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

Drawbar pull class – a value characteristic for the drawbar pull of a tractor, class 0.9 corresponds to a drawbar pull of 9 Kn. The Ursus C 355 and 4011 tractors have this pull class.

kg – kilogram, weight unit

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

kW – kilowatt, power unit

m – meter, length unit

mm – millimetre, an auxiliary length unit equal to 0.001m

min – minute, an additional time unit corresponding to 60 seconds

rev. – revolution, a type of movement

rpm – revolutions per minute, rotation-speed unit

Pictogram – a notice plate

Fig. X – a figure with the number “X”

Fig. X, Y – figures with the numbers “X” and “Y”

Fig. X-Y – a figure with the number “X”, item in the figure “Y”

Tab. X – a table with the number “X”

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

UV – ultraviolet radiation, invisible electromagnetic, invisible electromagnetic radiation with a negative effect on human health, the UV radiation has a negative effect on rubber parts

V – Volt, a voltage unit

Hitch, upper transporting hitch – hitch components of a farm tractor (see the tractor’s Instructions Manual)

ALPHABETICAL INDEX

PART II

NOTES

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