Thank you for choosing our Z577 bale wrapping machine designed for efficient operation.

This manual will allow you to fully use the advantages of our wrapping machine and to optimise the bale wrapping process.

The manual contains a detailed table of contents followed by descriptions which will allow to easily identify the device and to make the best use of it.

The information regarding safety and comfort of operation, description of coupling with a tractor, technical service activities and storage conditions are listed in the following pages of the manual.

A spare parts catalogue containing the list of the wrapping machine's major components allowing for easy ordering is attached to the manual in digital form on a CD.

The printed version of the catalogue may be purchased at authorised dealerships or directly form the manufacturer.

Both the manual and the spare parts catalogue contain basic information on the product. The elements fitted to the equipment may slightly differ from those presented in the manual.

The manufacturer reserves the right to introduce changes without notice.

Symbols

Warning:

This is a warning symbol indicating that it is required to pay special attention to operator's and bystanders' safety requirements or safe operation requirements.

Information:

This symbol indicates additional information which allows to optimise the machine operation.

Environmental protection:

This symbol indicates the need to pay special attention to environmental considerations.

Cross-reference:

this symbol directs you to a page on which detailed information on a given subject is presented.

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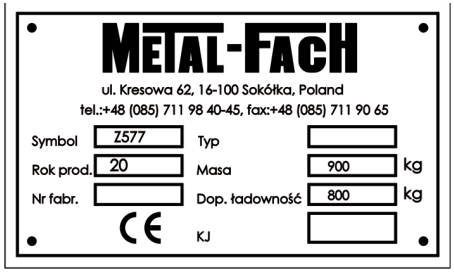
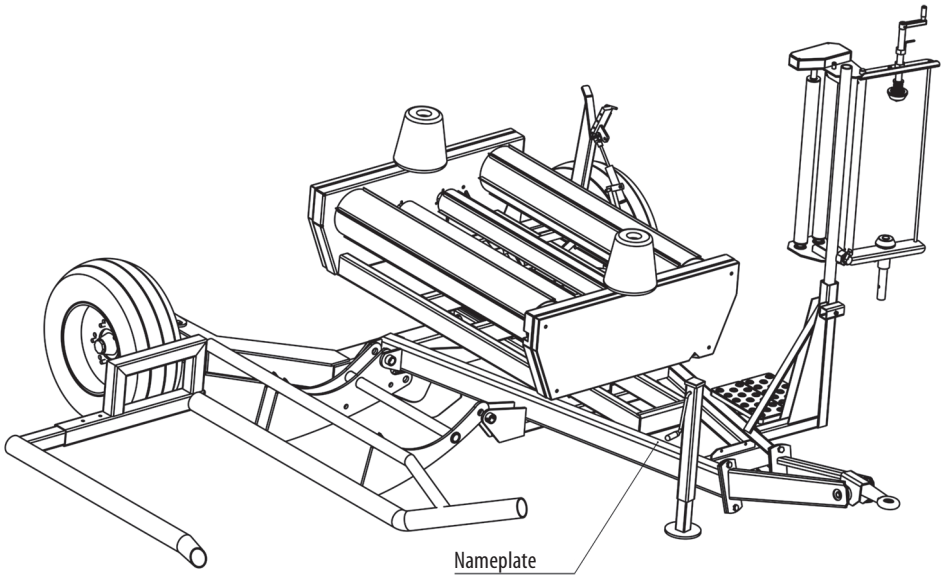
1 Wrapping machine identification, general safety rules
1.1 Wrapping machine identification

The wrapping machine is identified by its nameplate securely fastened to the machine's main frame.

The information presented on the nameplate is shown on the diagram below.



It is forbidden to drive the wrapping machine on public roads without its nameplate or with an illegible nameplate.



When purchasing the machine check the serial number indicated in the Operating Instructions and the warranty sheet against the serial number stamped on the nameplate.

The operating manual is a part of the Z577 wrapping machine's capital outfit.

If the machine is sold to another user, it must be supplied with the Operating Manual. It is advised that the supplier has a confirmation stating that the manual was transferred together with the machine, signed by the buyer and archived.

Users must familiarise themselves with the operating manual.

If the rules stated in this manual are complied with, it will be possible to prevent hazards and to operate the machine efficiently; it will also allow to retain the warranty throughout the period granted by the manufacturer.
Detailed information on the structure, operating principles, technology and other details may be obtained from authorised resellers or the wrapping machine manufacturer.

All persons who have not familiarised themselves with the following manual are forbidden to operate the machine.

The wrapping machine shall be operated according to its intended use by coupling it with a tractor with nominal power exceeding 30kW and traction class of at least 0.9. The Z577 bale wrapping machine is designed to pick up bales from the ground, wrap them in film and unload to the ground.
Dry grass and other papilionaceous plants with humidity of approx. 60%1 shall be rolled into bales using the collecting and wrapping presses. The bale wrapping process should be conducted on the field or in the storage yard practically immediately after they have been rolled (up to 2 hours2). The wrapped bales should be stacked in up to two layers on a dry level surface making sure the wrapping film is not torn.
The fermentation process must continue for 6 to 8 weeks in positive temperatures. Thus provided silage is fit for use as a wholesome feed for animals.
During the operation, the operator is not subject to noise which may cause the loss of hearing as the noise level of the machine does not exceed 70 dB (A) and the operator works inside the tractor's cabin.

During the operation, the operator is not subject to harmful vibration as the vibration level transferred to the upper limbs does not exceed 2.5 m/s^2, and the vibration level transferred to the body is lower than 0.5 m/s^2 and the operator is positioned in the tractor's cabin.

Unauthorised modifications introduced in the wrapping machine structure absolve the manufacturer from all responsibility for the risks and damage they may cause.

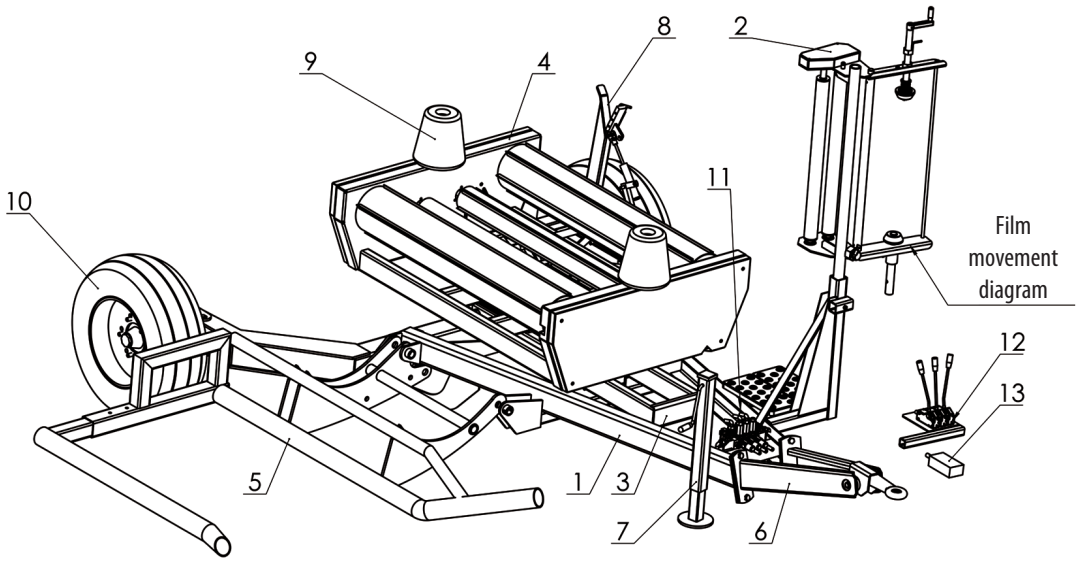
[1] Grass and other papilionaceous plants prepared for souring and wrapping should be mowed in the early phase of heading (best done in the afternoon). On the next day, after a few hours of drying, the mowed material should be gathered using the wrapping presses. Maximum bale compression must be maintained.

[2] An unwanted decomposition process takes place in bales left unwrapped for a longer time.

1.2 Wrapping machine construction

The Z577 wrapping machine consists of the following assemblies:

- Main frame item 1
- Wrapping film feeder item 2
- Movable frame item 3
- Rotary frame item 4
- Loading arm item 5
- Drawbar item 6
- Support foot item 7
- Cutting assembly item 8
- Side taper item 9
- Rotary axle shaft item 10
- Hydraulic control unit item 11
- Control levers item 12
- L-02 Counter item 13



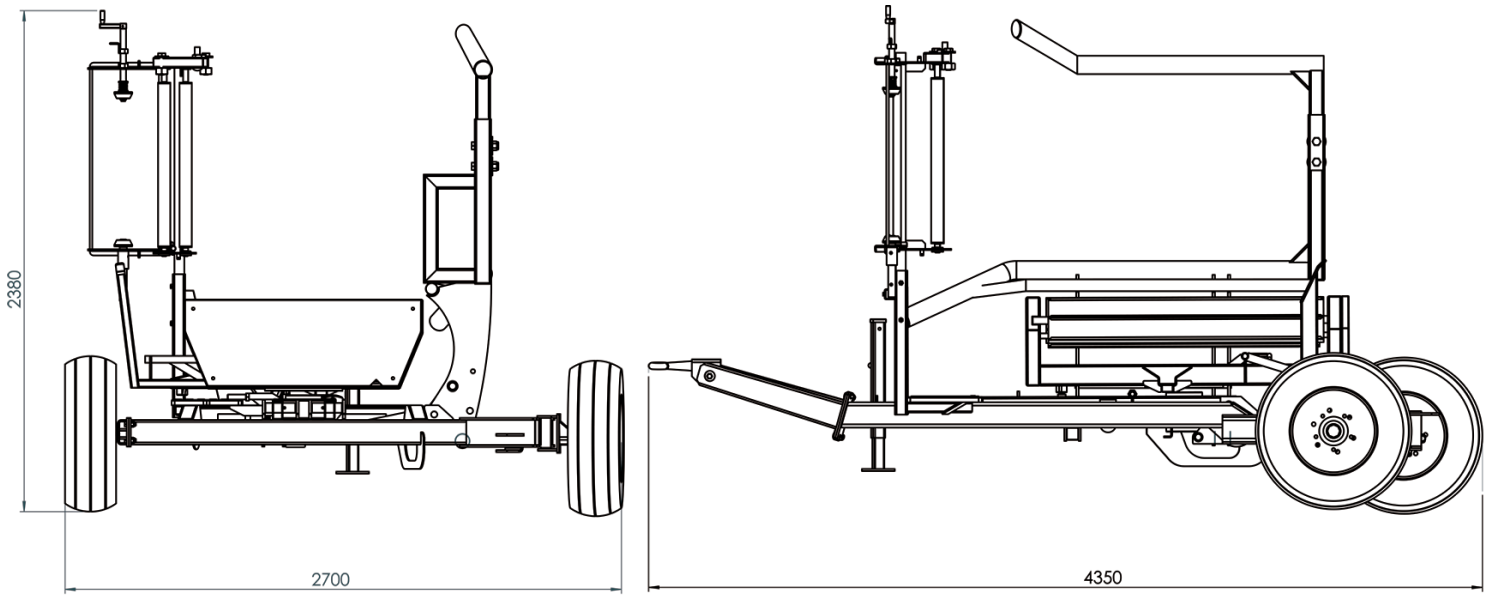
The drawbar (6) is attached to the main frame (1) and equipped with an adjustable hitch ring for the connection of the wrapping machine to the tractor and its levelling.
The rotary frame (4) frame is attached to the movable frame (3). The loading arm (5) is mounted to the main frame (1) on a swivel. The film feeder (2) is attached to the main frame (1). A diagram presenting the film movement during the wrapping machine's operation is placed on the film feeder.

1.3 Wrapping machine characteristics

No.	Designation	Unit	
1	Type		Z577
2	Coupling with the tractor	-	Hitched
3	Undercarriage type	-	Mono-axial
4	Overall dimensions in the working setup Length/Width/Height	mm	4350/2700-3760/2380
5	Overall dimensions in the transport setup Length/Width/Height	mm	4350/2450/2380
6	Machine weight	kg	950
7	Maximum bale weight	kg	800
8	Wrapped bale dimensions Length Diameter	 mm mm	 1200 1000-1200
9	Maximum operating speed	km/h	10
10	Maximum transport speed	km/h	15
11	Coupling with a tractor through	-	Tractor's upper or lower hitch
12	Tractor class	-	0.9
13	Minimum tractor power output	kW	30
14	Required pressure in the tractor power hydraulics system:	MPa	14
15	Recommended tractor pump output	l/min	22
16	Tractor hitch load	kN	4.7

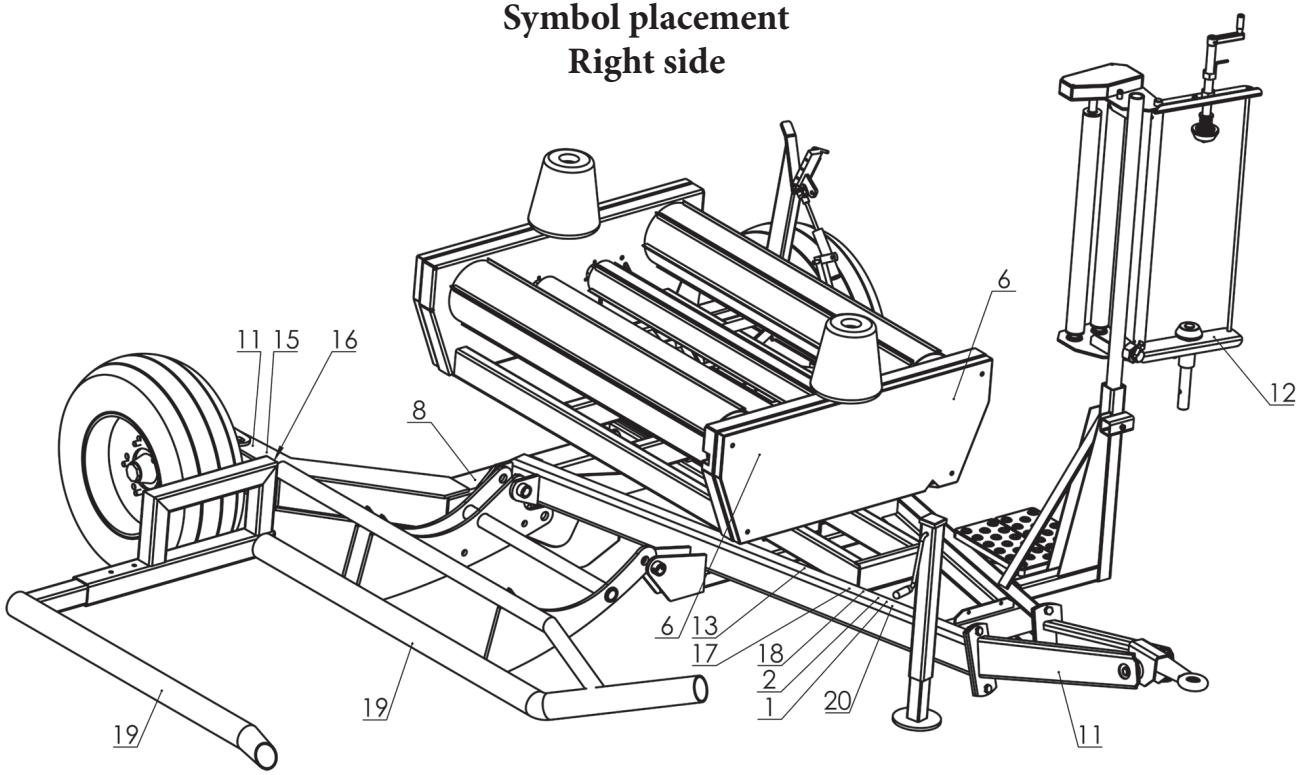
17	Wheel track in the working setup	mm	2950
18	Wheel track in the transport setup	mm	2030
19	Tyres	-	10.0/80 – 12 10 PR
20	Tyre pressure	bar	3.5
21	Drawbar hitch-ring diameter	mm	40
22	Wrapping machine drive	-	Hydraulic, from the tractor's power hydraulics system
23	Rotary frame drive	-	Hydraulic motor
24	Maximum rotation speed of the rotary frame	RPM	35
25	Bale loading method	-	Automatic, using a loading arm
26	Bale unloading method	-	Automatic, using a tilting frame
27	Film cutting	-	Automatic, after bale wrapping is finished
28	Film width	mm	500, 750
29	Number of rotary frame revolutions using film: 500 mm 750 mm	 revs. revs.	 24 16
30	Bale wrapping time	min	~ 2
31	Number of operators	-	1 (tractor driver)
32	Wrap counter	-	Electronic, type L-02
33	Electrical lighting system voltage	V	12
34	Machine lighting - optional	-	Following the requirements of the road code

1.4 Wrapping machine dimensions



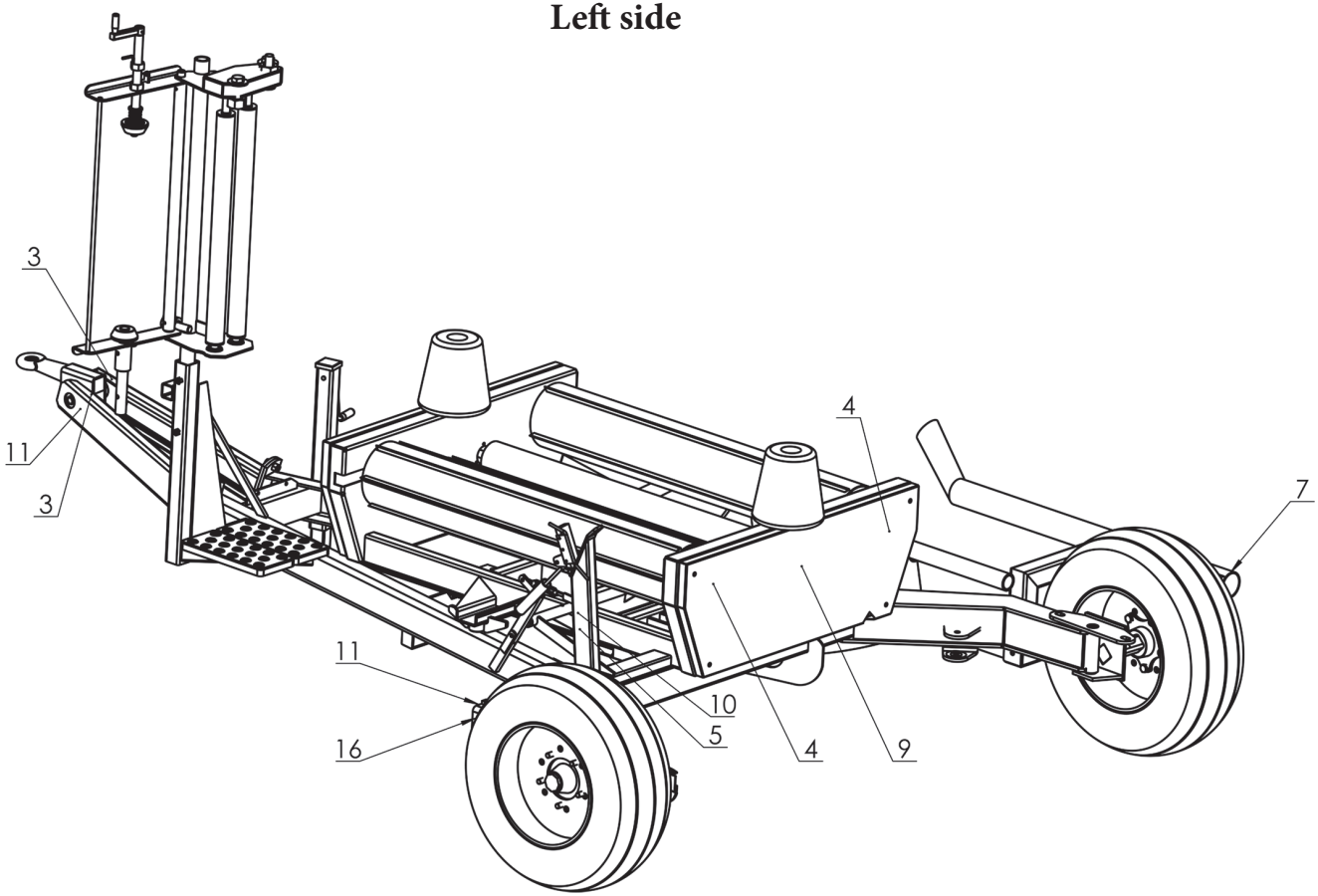
The drawing shows the dimensions of the wrapping machine in the working setup.

1.5 Symbol placement
Symbol placement
Right side



The meaning of symbols is explained in par. 1.6 of the manual.

Symbol placement
Left side



The meaning of symbols is explained in par. 1.6 of the manual.

1.6 Warning Symbols

The warning symbols placed on the machine inform the operator about the hazards and danger which may occur during work. Keep the symbols clean and legible.

Replace worn symbols with new ones. New symbols may be purchased from the manufacturer.

Symbol 1
Refer to the operating manual before performing this action.

Symbol 2
Turn off the engine and remove the ignition key before servicing or repairs.

Symbol 3
Do not stand near the links of the operating wrapping machine.

Symbol 4
Do not open or remove the safety covers during machine operation.

Symbol 5
Do not touch the spinning elements during machine operation.

Symbol 6
Do not approach the working machine. Danger of being crushed by a bale.

Symbol 7
Keep a safe distance from the raised arm. Danger of being crushed.

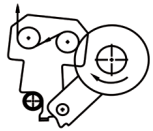
Symbol 8
Dangerous zone. Before operating install a support.

Symbol 9
NOTE! IT IS FORBIDDEN FOR BYSTANDERS TO REMAIN NEAR THE OPERATING MACHINE.
Warning label.

NOTE!
SHARP KNIFE

Symbol 10
Warning label.

Symbol 11
Attachment points for loading on a means of transport.



Symbol 12
Film wrapping diagram.

Symbol 13
Proper location of the bale counter sensor below the magnet.

Symbol 14
Lubrication point.

Symbol 15
Danger of crushing.

Symbol 16
Recommended wrapping machine tire pressure.

Symbol 17
Avoid contact with liquids under pressure.

Symbol 18
Use protective gloves during maintenance operations.

Symbol 19
40 x 1000 warning sign.

Symbol 20

CE requirements conformity symbol.

1.7 General safety rules

1.7.1 During operation and repair of the wrapping machine the farming health and safety regulations contained in the Regulation of the Minister of Agriculture and Food Economy of 12 January 1998 must be complied with.

1.7.2 Only an adult with a valid farming tractor driver's licence and familiarised with the occupational health and safety regulations regarding the farming equipment and the following manual may operate this machine.

1.7.3 The following manual must be read and adhered to paying special attention to directions regarding the safe operation of the wrapping machine.

1.7.4 The manual indicates the machine parts which pose a potential threat. Hazardous areas are marked with yellow stickers with warning symbols. Pay special attention to the hazardous areas and strictly adhere to the rules.

1.7.5 The operator must familiarise themselves with the meaning of warning symbols.

1.7.6 It is forbidden to operate the wrapping machine without the safety guards installed on moving components.

1.7.7 Every time before the the wrapping machine is started, check the condition and completeness of the machine and positioning of its safety guards.

1.7.8 Before starting the wrapping machine and entering public roads, inspect the attachment of the machine to the tractor, attachment of the wheels and proper connection of the drawbar to the tractor.

1.7.9 All adjustment, repair and maintenance works shall be conducted with the tractor engine turned off and making sure that the machine is secured against accidental activation.

1.7.10 Before commencing and during loading, make sure that there are no bystanders, especially children, nearby.

1.7.11 During the operation of the wrapping machine, allow for free space near the rotating elements. During bale wrapping, no people or animals are allowed near the rotating elements.

1.7.12 Exercise extreme caution when working on an inclined terrain. Note that the bales may roll down slopes.

1.7.13 It is forbidden to operate the wrapping machine with any of the assemblies lifted.

1.7.14 Do not stand between the wrapping machine and the tractor when the tractor engine is running.

1.7.15 Exercise extreme caution when coupling and uncoupling the wrapping machine with/from the tractor. The machine should be coupled with the tractor equipped with a coupling device able to withstand the vertical load larger than the vertical load exerted on the wrapping machine's drawbar ⏭ Chapter 1.4.

1.7.16 During operation, use appropriate protective clothing and shoes with anti-skid soles Chapter 13 accessories.

1.7.17 While loading the wrapping film, the tractor engine must be turned off and protected against accidental activation (ignition key removed, parking brake on).

1.7.18 It is forbidden to operate damaged hydraulic lines. The damaged lines must be immediately replaced with new ones. During the replacement of hydraulic lines, use impermeable protective clothing.

1.7.19 The machine's hydraulic system shall only be operated from the tractor's cabin.

1.7.20 The hydraulic control unit should be installed in the tractor's cabin within the operator's reach in a way which will not pose a threat to the operator in case a hydraulic line breaks.

1.7.21 Follow the traffic code regulations and the manufacturer's recommendations when travelling on public roads. ⏭ Chapter 8.2.

1.7.22 Before entering public roads, perform a visual inspection of the transported machine.

1.7.23 It is forbidden to remain on the wrapping machine during transport.

1.7.24 While travelling on public roads, it is forbidden to transport wrapped swath or silage on the wrapping machine.

1.7.25 It is forbidden to operate the wrapping machine while under influence of alcohol.

1.7.26 It is forbidden to operate the wrapping machine while under influence of drugs or medicines with similar effects.

1.7.27 It is forbidden to operate the wrapping machine while under influence of medicines which affect the ability to drive vehicles or reduce psychophysical fitness or cause concentration disorders and increase reaction time.

1.7.28 It is forbidden to drive the wrapping machine near sources of open flame.

1.7.29 It is required to strictly adhere to the fire protection regulations and immediately extinguish any fire which may occur during the wrapping machine use or at its standstill.

1.7.30 Do not approach the working wrapping machine with open flame and do not smoke near the machine.

1.7.31 Every time before commencing work, check if the tractor is equipped with a dry powder extinguisher. If not, place such an extinguisher on the tractor.

2 Drive operation

2.1 Drive coupling

The Z 577 bale wrapping machine should be coupled with tractors of rated power not lower than 30kW and traction class 0.9, equipped with two hydraulic system connections.

The wrapping machine shall be coupled to the lower hitch or to the upper hitch allowing for the maximum vertical load of 4.7 kN.

Coupling with the lower hitch

Make sure that there are no bystanders, especially children, in the coupling area.

Before coupling the equipment, place the tractor axis in the machine's axis on a hard, flat, level ground. Turn off the tractor engine, remove the ignition key and engage the tractor parking brake. Level the wrapping machine by selecting the appropriate adjustment opening in the hitch.

Couple the hitch-ring only with the lower hitch and check whether the machine is properly connected and secured against accidental disconnection.

Make sure that the hydraulic system is sealed.

Connect the electric power source. Check if the operating and signalling systems work properly.

Connect the hydraulic power source. Check if the hydraulic systems work properly, especially the lifting and blocking mechanisms responsible for controlling the working and transport positions.

Obraz 1Load the first bale ⏭ (5.4) and make sure that the vertical load on the tractor's front axle is larger than 20% of the tractor's weight. The tractor should remain fully steerable.

Coupling with the upper transport hitch

The wrapping machine may be coupled with tractors equipped with an upper transport hitch able to transfer vertical loads in excess of 4.7 kN (470kG).

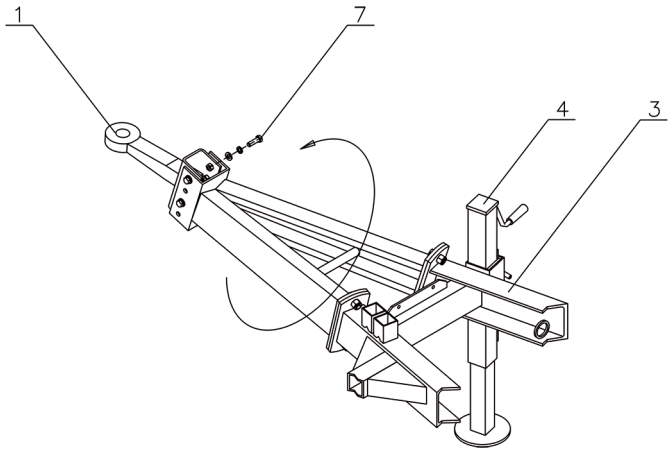
The wrapping machine may be prepared for coupling with the upper hitch by one person.

Set the support stand (item 4) of the wrapping machine in a position which allows the front of the frame to rest on the ground as shown in the illustration.

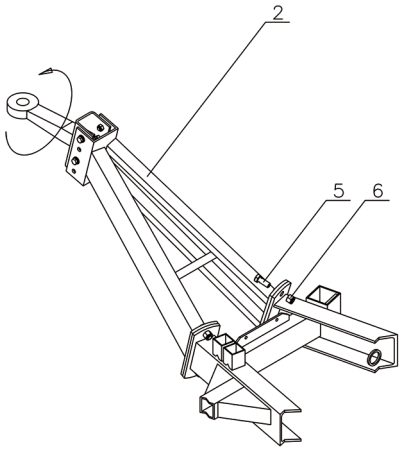
Change the position of the transport hitch in the following way:

- Undo the four nuts and remove the M16 bolts.
- Rotate the transport hitch by 180°.
- Place the M16 screws in the openings and tighten them.
- Unscrew the M12 screws holding the hitch-ring.
- Rotate the hitch-ring by 180°.
- Tighten the M12 screws fixing the hitch-ring.

Drawbar set for connection with the lower hitch



Drawbar set for connection with the upper hitch



Make sure that there are no bystanders, especially children, in the coupling area.

Before coupling the equipment, place the tractor axis in the machine's axis on a hard, flat, level ground. Turn off the tractor engine, remove the ignition key and engage the tractor parking brake.

Level the wrapping machine by selecting the appropriate adjustment opening in the hitch. Connect the hitch-ring with the upper hitch. Check if the coupling is properly connected and secured against accidental disconnection.

Connect the hydraulic power source. Check if the hydraulic systems work properly, especially the lifting and blocking mechanisms responsible for controlling the working and transport positions.

Make sure that the hydraulic system is sealed.

Connect the electric power source. Check if the operating and signalling systems work properly.

Load the first bale (5.4) and make sure that the vertical load on the tractor's front axle is larger than 20% of the tractor's weight. The tractor should remain fully steerable.

2.2 Disconnecting the drive

Make sure that there are no bystanders, especially children, in the wrapping machine's storage area and its vicinity.

Place the wrapping machine for storage on a hard, flat and level ground.

Turn off the tractor engine, remove the ignition key and engage the tractor's parking brake.
Disconnect the electric power supply.

Disconnect the hydraulic system.

Lower the main frame support. Disconnect the hitch-ring from the transport hitch. Make sure that the machine will not move accidentally.

3 Commissioning

The commissioning of a newly purchased bale wrapping machine should be performed under the supervision of an experienced operator or a dealer's service representative.

Before commissioning, familiarise yourself with the following manual, paying special attention to the fragments regarding the safety of the operator and bystanders.

If there are any doubts regarding the safety issues, please contact your sales representative or the manufacturer.

Before each start up of the wrapping machine, the control levers shall be installed in the tractor's cabin.

Commissioning of the counter

The wrap counter shall be installed in the tractor's cabin, connected to the revolution sensor and attached to the electric power source using the power cable.

The proper connection is signalled by a blinking red light on the counter display. Press and hold the button (activation symbol C).

Each activation of the counter is accompanied by the display test and power supply voltage test. The display will show the indication 8888 and all decimal points and LEDs will light up, additionally the sound signal will be activated.

Then, the power source voltage will be displayed e.g. U12.7, which denotes voltage of 12.7 V.

Every other condition indicates that the counter is damaged.

Then the year of manufacture of the counter will be displayed e.g. 2011 and a yellow LED will light up (1). Using the F2 button enter the year of manufacture of the wrapping machine (between 2000 and 2099).

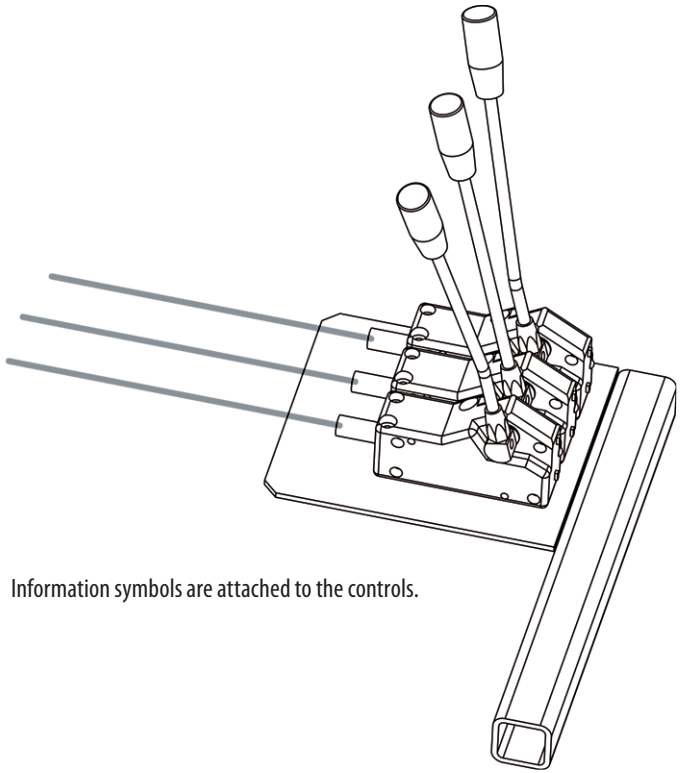
Check if the entered data is correct by pressing the F1 button. It should display the year of manufacture and the wrapping machine's serial number interchangeably.

If the entered data is correct, confirm using the on/C button by pressing and holding it for about 10 seconds. The confirmation of the entered data will be signalled by a blinking red LED and intermittent sound signal.

It is only possible to enter the year of manufacture and serial number once. After the information is confirmed, it cannot be corrected. To stop the data entering procedure, disconnect the counter from its power source. The wrap counter data cannot be erased and no changes can be made.

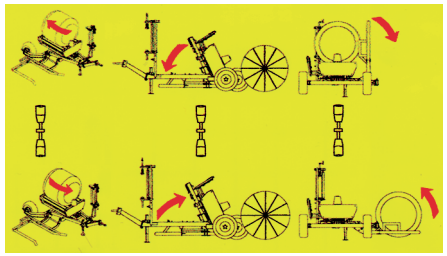
4 Controls and ongoing adjustments
4.1 Location of the controls

Before each start up of the wrapping machine, the control levers shall be installed in the tractor's cabin.



Information symbols are attached to the controls.

Symbols on the control levers.



Symbols listed from left to right:

- Rotary table movement.
- raising and lowering of the rotary table;
- Loading arm movement.

4.2 Location of ongoing adjustment points

Levelling of the wrapping machine during coupling with the tractor item 1

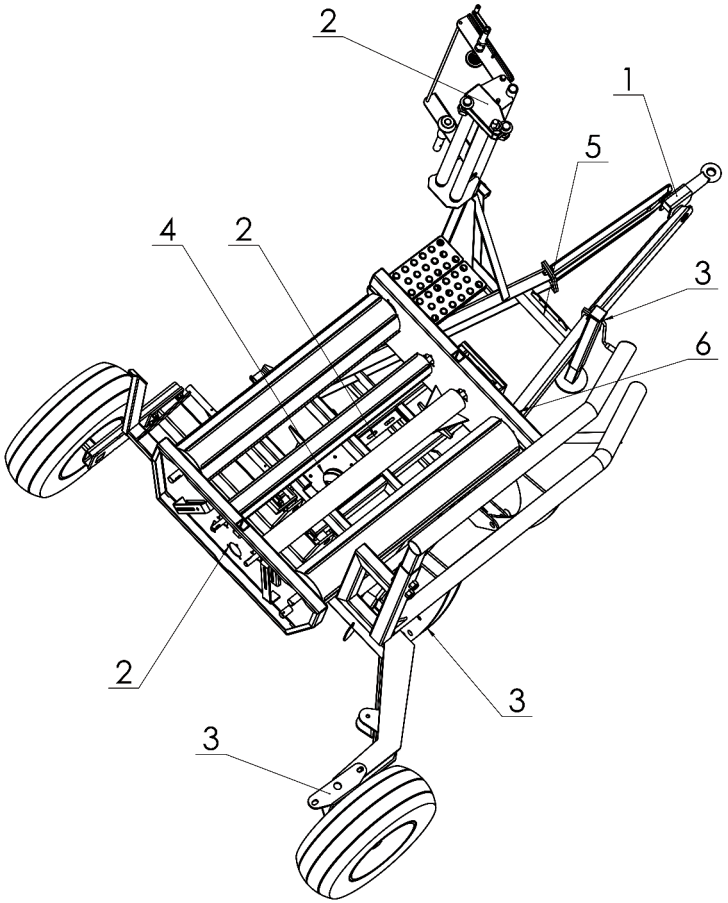
Chain tightening item 2

Lubricating point symbols are located on the machine. ⏭ chapter 1.5 item 3

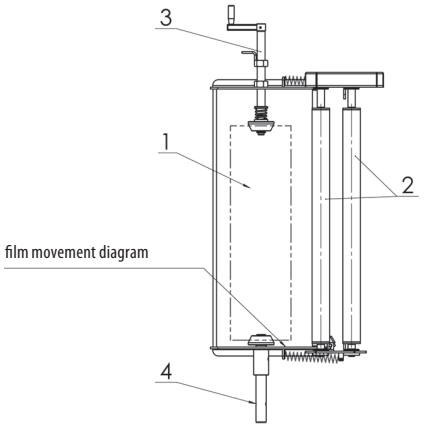
Intersecting axis gear item 4

Hydraulic control unit item 5

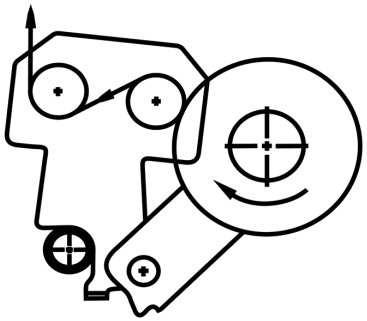
The revolutions sensor is marked with a symbol located on the machine ⏭ chapter 1.5 item 6



Wrapping film feeder



Film movement diagram



With each revolution of the rotating frame, the bale and film rotate by a certain angle around the horizontal axis, which causes the consecutive layers of film to be wrapped tightly around the bale.

5 Wrapping machine operation

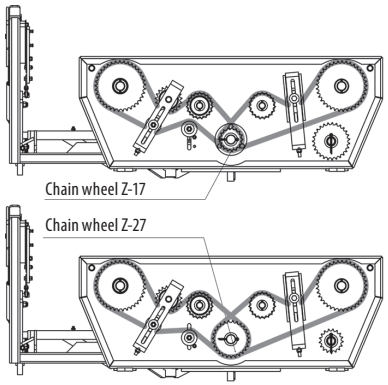
5.1 Installing the film

Place the film roll on the feeder pin in the following order:

- Deflect the support with the metal rollers and secure it using the hook attached to the wrapping assembly..
- Using a lever (crank) undo the upper pin pressing the film upwards..
- Set the height of the lower pin in position appropriate for the film roll width (500 mm or 750 mm)..
- Place the film roll on the lower conic pin..
- Clamp the roll by turning the lever (crank) on the upper pin so that the roll is securely held in the vertical position.
- Protect the roll from unscrewing using the nut on the crank screw.
- When installing the roll of film, place its internal, sticky side towards the bale axis.
- Properly set the initial tightening of the film. ⏭ Chapter 5.4.
- Pull the film through the rollers as indicated on the diagram located on the gear cover.
- Pull the end of the film so that it may be easily handled in the machine.

The wrapping machine is pre-set to use 500 mm film. To use 750 mm film, the chain wheel must be replaced (see the diagram below). To do so, it is required to:

- Unscrew the 4 M12 hub nuts, remove the side cover of the rotating frame (on the side of the chain transmission).
- Loosen the M12 screw on the chain tightening mechanism.
- Remove the chain from the Z17 chain wheel installed on the main shaft and remove the split pin securing the wheel.
- Remove the Z17 chain wheel form the shaft (using an appropriate tool).
- Secure the removed Z 17 chain wheel.
- Replace it with a Z27 chain wheel.
- Secure the Z27 repeating the above procedure in the reverse order.

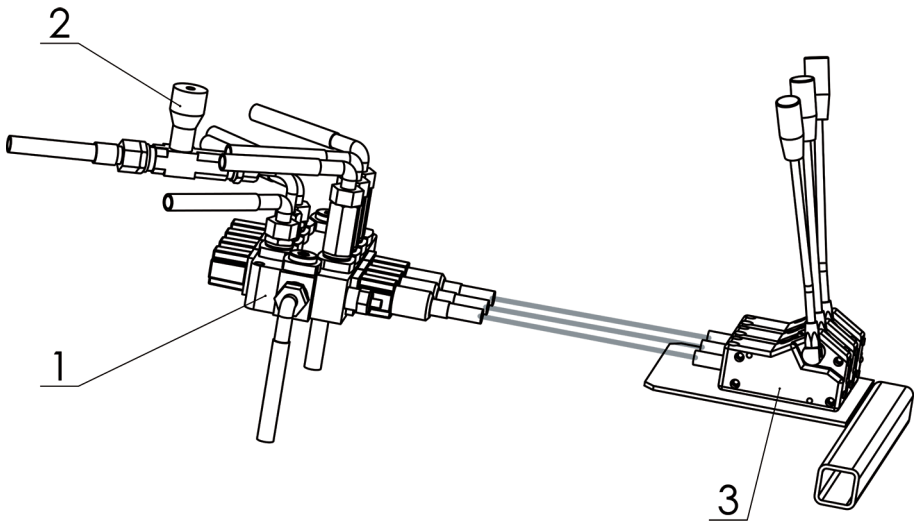


5.2 Hydraulic system

The wrapping machine's hydraulic system is powered from the tractor's hydraulic system. To attach the machine to the tractor's hydraulic system, the attachment cables are connected to the hydraulic controls and further to the wrapping machine's hydraulic motor.
Through the chain transmission, the hydraulic motor rotates the drums with the loaded silage bales.
By means of the three-section hydraulic control unit (1), the hydraulic engine powers 5 double-acting cylinders responsible for:

- tilting the rotary table and the unloading unit to the vertical and horizontal position;
- raising and lowering of the loading arm;
- rotation of the rotary table;

The control over the engine and hydraulic cylinders is ensured using the control levers located in the tractor's cabin during operation. These levers are connected to the three-section control unit using Bowden cables.



The symbols on the support inform about the functions fulfilled by each lever on the control unit (1).
The three section control unit (1) is protected against high pressure from the hydraulic system by means of a safety valve.

The valve indicated on the illustration as item 2 is located in the rotating frame section and operates only in the table rotation system rotating clockwise, which is opposite to the wrapping direction. Its task is to smoothly stop the rotating frame.

Delayed blocking of the rotary table indicates that the valve must be adjusted properly.

Do not adjust the valve behind the control unit.
It is pre-adjusted by the manufacturer.

Before operating the wrapping machine, check the operation of the hydraulic system by testing the following elements without a bale loaded:

- table rotation;
- raising and lowering of the rotary table;
- raising and lowering of the loading arm.

5.3 Wrap counter

5.3.1 Wrap counter system

L-02 wrap counter

The wrap counter is an electronic device used for counting the wraps on a bale and may be used on all types of wrapping machines.

The wrap counter should be installed in the tractor's cabin in a place where it is visible and accessible to the operator.

Protect the counter against humidity, excessive vibration and hitting the cabin elements, and especially against falling on a hard surface. The counter can be fixed using its back surface catch.

Protect the meter from water, chemical agents, direct atmospheric precipitation, frost, high temperature in excess of 50°C and direct exposure to sunlight.

The counter kit comprises of:

- pre-programmed counter in a plastic casing;
- revolution sensor;
- bundle of wires;
- multi-contact connection.

The revolution sensor attached to an unmoving part of the wrapping machine operates in conjunction with a magnet attached to the rotary frame which passes impulses to the revolution counter. Each rotation of the bale is counted and displayed on the revolution counter display. When the programmed number of revolutions is performed, the counter signals the completion of the wrapping process with a blinking light and sound signal. The counter may be programmed to a required number of revolutions between 10 and 49.

Revolution sensor

Connect the revolution sensor installed in the cabin to the power source (12V) and revolution sensor using the specially prepared bundle of wires.

Protect the wires connecting the sensor with the revolution counter against accidental mechanical damage.

Protect the connections of the wires with the revolution counter against accidental uncoupling.

5.3.2 Switching the system on and off

The blinking red signalling light indicates that the revolution counter system has been configured properly.

Press and hold the ON button marked with the letter C.

Each activation of the counter is accompanied by the display test and the power supply voltage test. ⏭ Chapter 3.

A positive test result indicates the unit is ready to work with the settings entered during the previous use.

Press and hold the C button until a red blinking light appears on the display (for about 3 seconds). After this signal, the counter unit may be disconnected.

5.3.3 Working with the counter in counting mode

Setting the wrap number

Press the F1 and F2 buttons at the same time. The last settings shall be displayed. The setting mode is signalled by the activation of two LEDs, red - warning and green - wrapping. Change the number of wraps using the F2 button (within the scope of 10 to 49 wraps). Confirm using the C button. The counter is ready to work with its new settings.

Field selection

Change the field number using the F1 button (1, 2, 3). Change the stored bale indication for a given field using the F2 - set the number of wraps and the number of bales. Additionally, the F2 button can display the average efficiency of the wrapping machine during a working hour.

After the field number is selected, erase the counter indication by simultaneously pressing the F2 and C buttons. When the device is ready to enter changes, the red LED will light up and a sound signal will be emitted. Hold both buttons pressed until the sound signal is heard. The indications for the given field have been erased.

Operation of the counter in counting mode

Start work after selecting the field and setting the number of wraps. The counter indicates wrapping as soon as it receives impulses from the wrapping machine's sensor. After a set number of wraps is reached, the red LED and the counter display begin to blink. A complete wrap is also signalled by an intermittent sound signal.

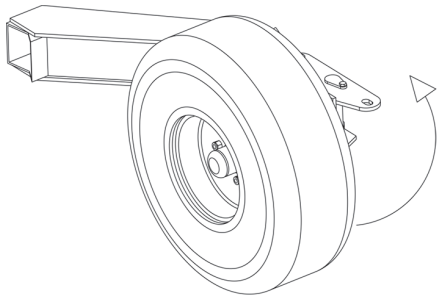
Erase the wrapping end signal by pressing and holding the C button. Hold the button until the display indicates the number of wrapped bales and the red LED turns off. The counter is ready for counting wraps on another bale.

Example of the L02 wrap counter indications:

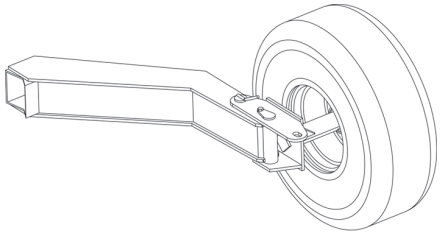
Graphic symbol	Indication	Example indication	Meaning
	Bale number	16	On a given field 12 bales were wrapped.
	Time	3.25	Run time On a given field this was 3 hours 25 minutes.
	Production efficiency	3.5	On a given field 3.5 bales are wrapped per 1 hour.
	Wrapping	24.15	Wrap counter set to 24 wraps. In a given moment the number of wraps is 15.
	Warnings Alarms	Blinking and Err 1 signal displayed	Error no. 1

5.4 Wrapping

To prepare the machine for work, its side wheel needs to be placed in its working position following the diagram below:



Transport position



Working position
Wheel rotated by 180°

To change the position of the side wheel, it is required to do the following:

- Place the coupled wrapping machine so that the machine's drawbar is parallel to the tractor's axis.
- Remove the pin securing the side wheel and place it in the tractor's cabin.
- Move the tractor and the wrapping machine slightly forward.
- Manually turn the side wheel beyond its dead spot.
- Gently move the tractor and the wrapping machine backwards until the side wheel's position is stable.
- Correct the placement of the side wheel if necessary so that it is possible to enter the locking pin.
- Lock the side wheel using the locking pin.
- Protect the pin using a safety pin.

Warning

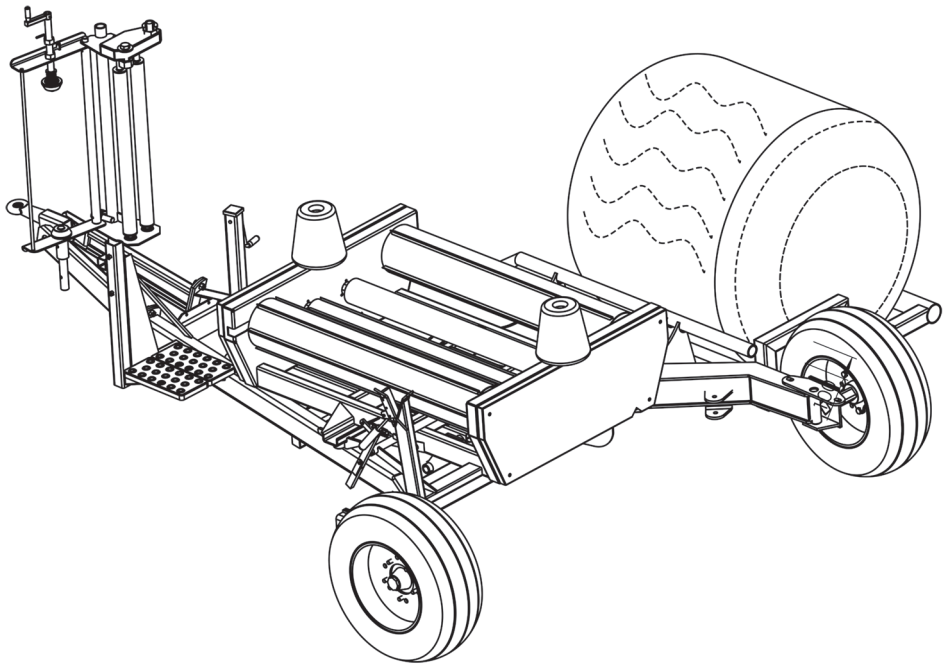
Be careful while changing the position of the side wheel. There is a risk of the operator's hand being crushed.

Bale loading

Lower the loading arm to its maximum lower position i.e. horizontal position when it is approx. 10 cm above ground in its maximum deflection. Place the rotary frame parallel to the driving direction so that the film cutting cutter was in front of the machine. Stop the rotary table about 25° beyond the axis parallel to the wrapping machine's axis and move the table back using the control switch lever to a position parallel to the machine's axis until the rotary table is locked. With this setting, drive towards the bale as presented in the diagram.

The tractor approaching the bale should drive parallel to the bale's axis so that the axis of the loading arm faces the axis of the bale being loaded.

Stop the tractor when the bale rests against the stop plate of the lateral loading arm.
Lift the grab arm until the bale rolls freely onto the wrapping machine's rotary table.
Lower the loading arm. The bale now sits on the rotary table.
Consecutive bales are loaded from the ground to the wrapping machine's rotary table in a similar fashion.



Note:
Before commencing work, check:

- whether the wrapping machine's drawbar is properly connected to the tractor's hitch;
- whether the hydraulic lines are properly connected;
- whether the revolutions counter system is properly connected;
- whether the loading arm can be properly raised and lowered;
- whether the rotary table is placed in its vertical and horizontal position correctly;
- smoothness and direction of the rotary frame and drums movement - the rotary frame should rotate counterclockwise.
- tightening of the wrapping machine side wheels' pins.

The bales should be wrapped only in positive temperatures. The bales should be wrapped on a field or in their storage area.

By avoiding unnecessary transport of bales, the risk of the wrapping film being damaged is minimised.

Pay particular attention to the initial tensioning of the film (65-80%)[1]. A worn or unlubricated tensioning mechanism may cause the film te be wrapped too tightly. The film tensioning level must not exceed 70%.

Pull the film at the first bale as far as possible from the feeder and attach it using the string binding the bale. Using the control lever, turn on the hydraulic motor of the wrapping machine. While placed on the rotary table, the bale is rotated by a certain angle around its horizontal axis with every revolution around its vertical axis, which causes the overlapping of consecutive layers of film resulting in a tight wrap around the bale. Maintain the tractor engine's revolutions at 1500 RPM while wrapping.

Wrap at least 4 layers of film so that each of them is overlapped in 50%.

We advise to finish the wrapping after about 24 revolutions of the rotary frame while using 500 mm film or 16 revolutions while using 750 mm film. Secure the end of the film. A properly wrapped bale has four layers of the wrapping film around it.

[1] Mark two vertical lines on the film in a distance of about 10 cm from each other. The distance between the lines of 17 cm after tensioning represents 70% of the initial film tension. The width of the film measured at the end of the bale may not be lower than 400 mm when using 500 mm film and not lower than 600 mm when using 750 mm film.

Note:
Before turning on the rotary frame drive, make sure that there are no bystanders in the working area.

Note:
Maintaining the rolls in good condition, especially their edges, minimises the risk of the film breaking while wrapping.

Do not wrap during precipitation.

If the bale is wrapped too tightly, halt the wrapping process. Establish the cause of excessive film tension. Set the proper film tension. Resume the wrapping process.

Use the bales within 12 months from their wrapping date.

5.5 Unloading the wrapped bale

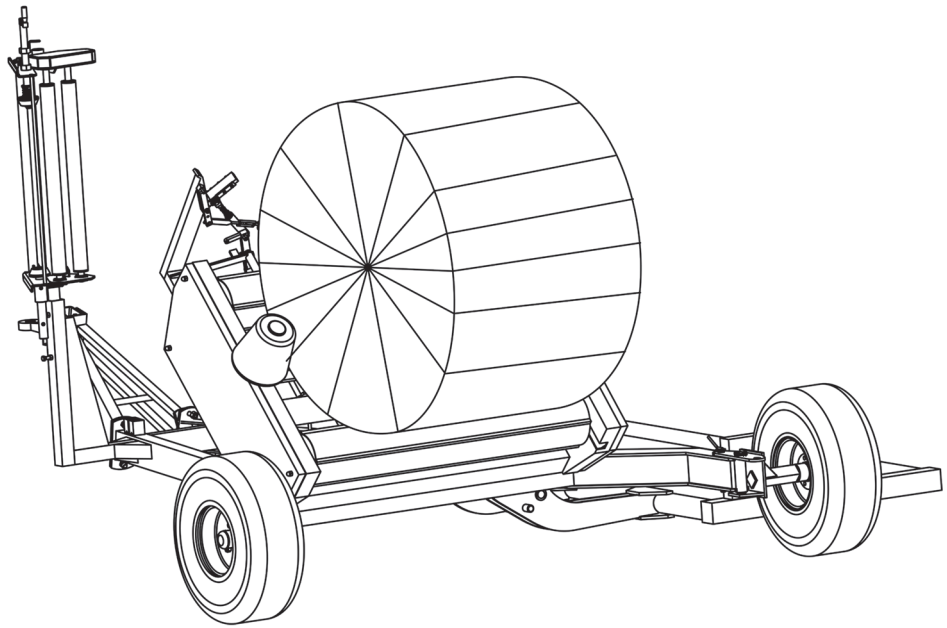
To unload the bale, stop the rotary table about 25° beyond the axis parallel to the wrapping machine's axis and move the table back using the control switch lever to a position parallel to the machine's axis until the rotary table is locked.

The conical rolls located on the sides of the rotary frame prevent the film from falling off the drums while wrapping.

The film cutting system should be located in front of the wrapping machine. The unloading of the bale is completed by lifting the rotary table with the bale as shown on the diagram.

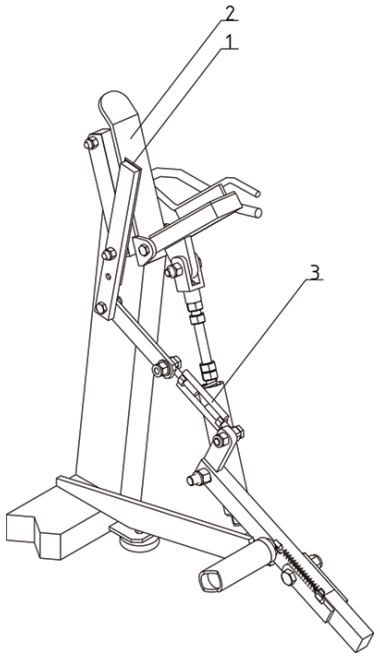
During the unloading process, the cutter cuts away the film.

After unloading the bale, all working components should return to their initial position.
Another bale may now be loaded.



Film cutting

If the film cutter fails to operate correctly, stop the wrapping machine, turn off the tractor engine, remove the ignition key and engage the tractor parking brake. Adjust the cutter cutting angle in relation to the film in the clamp (item 2). The adjustment is made using the tightening screw (item 3). When the screw (3) is turned clockwise, the cutter angle in relation to the film is decreased and the other way round.



A properly set cutter cuts the film when the unloaded bale touches the ground.

When the angle is too steep, the film is not cut even though the bale is unloaded to the ground.

Lower the control lever on the hydraulic control unit when there is danger caused by the wrapping machine.
Turn off the tractor's engine, remove the ignition key and engage the parking brake. Locate the threat and remove it.

Lock the rotary table during loading and unloading of the bale.

Take extra caution when adjusting the cutter. The cutter is extremely sharp. Danger of hand injury.

5.5.1 Bale vertical positioning system

Optional supply

As optional supply, a bale vertical positioning system is available.

This device allows to position the wrapped bale vertically during unloading, in order to properly place it in the silage storing location.

By doing so, we eliminate the risk of damage to the film during transport from the wrapping location to the storage location.

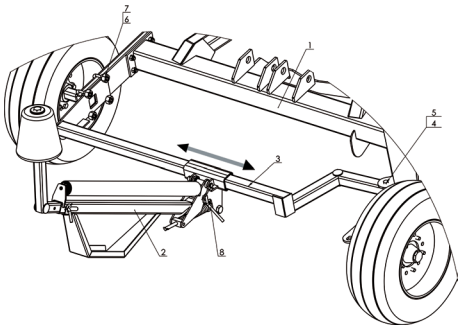
This element may be purchased together with the machine or at a later, convenient date.

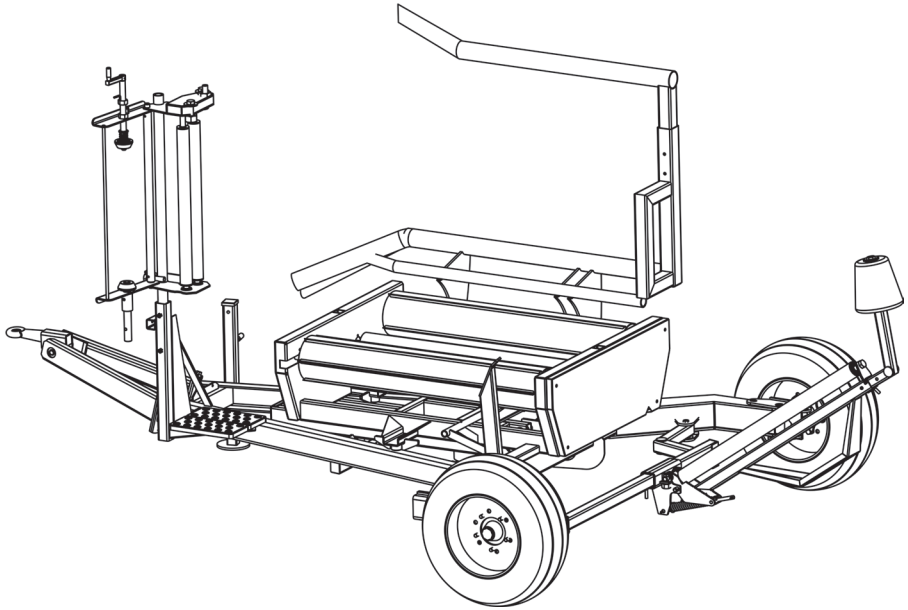
The positioning system allows the placement of bales on the left or right side of the wrapping machine.

The bale vertical positioning system is installed in a way shown on the next page.

The bale vertical positioning system consists of:

Bale positioning arm	item 2
Support frame	item 3
M16x60 bolt	item 4
M16 nut	Item 5
Clamp	item 6
M12 nut	item 7
Locking pin	item 8





Installation

Install the bale vertical positioning system on the back end of the wrapping machine in the appropriate position on the main frame marked on the diagrams as Position 1.

The support frame (item 3) shall be mounted to the wrapping machine using clamps with nuts (item 6 and item 7) and bolts with nuts (item 4 and item 5).

Operating principle

Before commencing work, it is required to:

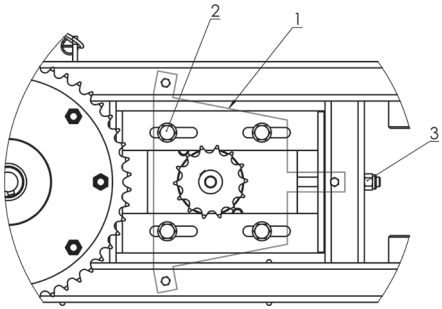
- Remove the locking pin (item 8).
- The bale positioning arm (item 2) will freely drop without touching the ground.
- Set the direction of the bale positioning as indicated by the arrows on the upper diagram.

The bale unloading process is described in chapter 5.5.

After the work is complete, lock the bale positioning arm using the safety pin (item 8).

5.6 Drive chain adjustment

Two chain transmissions are used in this bale wrapping machine. After wrapping the first 10 bales, the tensioning of the drive chains needs to be adjusted.



Remove the chain cover (item 1). Loosen the 4 M12 nuts (item 2). Turn the M12 screw in the chain tightening mechanism (item 3) so that the chain has a 20 mm slack after tightening. Tighten the 4 M12 screws (item 2). Install the chain cover.

Check the tightening and the chain condition periodically after wrapping every 120 bales.

5.7 Finishing work

After the work is complete, disconnect the revolution counter and secure the revolution sensor against humidity.

Before storing the wrapping machine for a longer period, place the impulse sensor in a dry storage room. Place the machine on a hard, flat, level ground. Disconnect the hydraulic power source and the electric power supply.

Support the drawbar using a support stand.

Disconnect the machine's drawbar from the tractor's hitch.

It is forbidden to disconnect the wrapping machine from the tractor when there is a bale on the rotary table.

Clean the machine and inspect its condition paying special attention to the quality of the paint coat. If it is required to make some touch-ups, it is advised to use the paint repair kit supplied by the manufacturer.

Protect the rubber elements, i.e. hydraulic lines, against direct sunlight.

6 Regular inspection

6.1 User inspection

After every use of the wrapping machine, check:

- the condition and legibility of the data plate and symbols;
- condition of the drawbar;
- hydraulic system leakproofness;
- drive chain of the rotary frame;
- drive chains of the rotary drums.
- The nameplate must only be replaced at an authorised repair shop.

Replace the unintelligible symbols with new ones.

After the working season is over, grease the drive chain of the rotary frame and the drive chains of the rotary drums using the LT-43 grease.

Send the counter to an authorised service if the casing is damaged. Any attempt to repair the damaged counter will result in the warranty becoming null and void.

Replace the oil of the intersecting axis gear every two years as follows:

- Place the machine on a level surface.
- Place a leakproof tank below the drain plug.
- Remove the drain plug, the filler plug and the overflow plug,
- After the oil is drained, close the drain plug,
- Pour fresh 80W90 hydraulic gear oil to the filler plug level,
- Close the filler plug and overflow plug.

The used oil should be sent to a gas station which collects such products.

During oil replacement, it is required to wear impermeable protective clothing suitable for contact with oil-based products.

Replace the hydraulic lines every 5 years. Before every working season, check (without a silage bale loaded) the operation of the transmission system by turning on the rotary table, raising and lowering the rotary table and raising and lowering the loading arm.

If the counter is fouled, clean it using a damp cloth with a mild detergent. Do not use organic solvents for cleaning (acetone, gasoline, “nitro” solvent, etc.) as the counter’s casing may be damaged.

6.2 Service checks

Periodical service checks shall be performed after every two working seasons of machine use.

It is advised to use original replacement parts which will help maintain the wrapping machine in good technical condition for a long time.

7 Authorised service

7.1 Warranty Service

The manufacturer issues a warranty on conditions described in the warranty book. During the period covered by the warranty, repairs shall be made at authorised service stations or at the manufacturer's service.

7.2 Ongoing maintenance

After the period covered by the warranty, authorised service stations perform periodical inspections, adjustments and repairs.

7.3 Ordering replacement parts

Spare parts should be ordered from resellers or directly form the manufacturer stating the name and surname of the user or company name and address, name, symbol, serial number and year of manufacture of the machine, catalogue name of the part, catalogue number, number of drawing or standard, number of ordered items and agreed terms of payment.

8 Transporting the wrapping machine

8.1 Load transporting

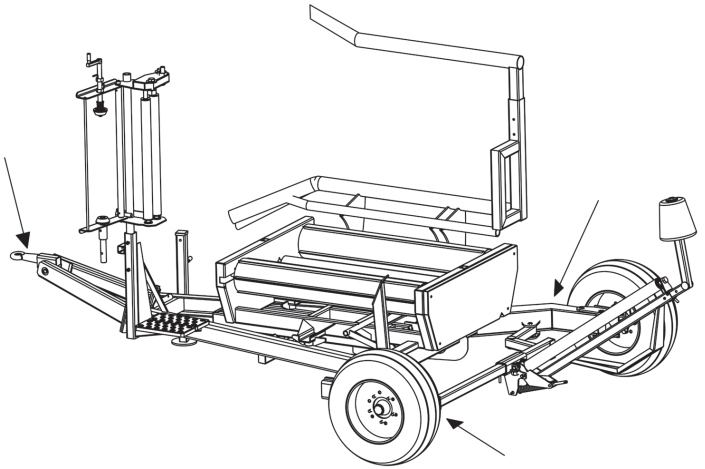
The wrapping machine is suitable for road and rail transport using carriers with appropriate load bearing capacity.

For loading on a means of road transport, use lifting devices with lifting capacity appropriate for the machine's weight including a loaded roll of film. Use the frame elements marked on the machine as attachment points (see the symbol below).

The lifting device should be operated by experienced operators with appropriate qualifications.

It is forbidden to transport the wrapping machine with a bale of silage loaded on it.
The transported wrapping machine must be securely fastened to the carrier vehicle.
It is forbidden to load the wrapping machine with a bale of swath or silage on it.

The lifting sling attachment points are designated on the diagram below.



8.2 Driving on public roads

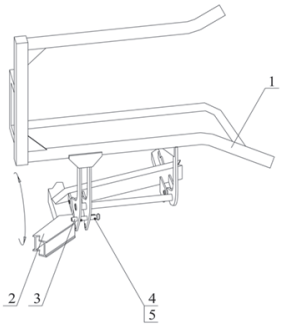
The wrapping machine may be used on public roads as a machine attached to a tractor's transport hitch. The dimensions of the machine prepared for transport are shown in chapter 1.5.

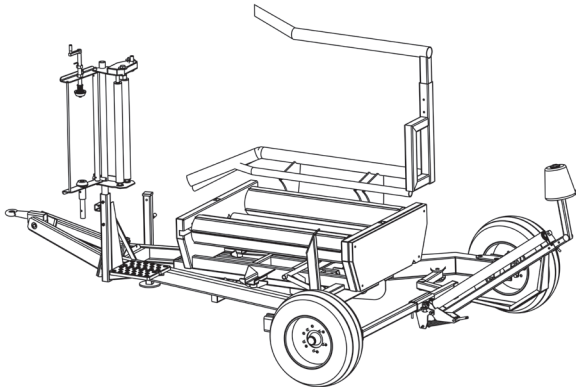
For transporting the machine on public roads, tractors with a rated power not lower than 30kW and traction class not lower than 0.9 equipped with a transport hitch may be used.

Before entering a public road:

- Place the hitch in its transport position (see chapter 5.5).
- Place the rotary frame in its transport position so that the drums are locked parallel to the wrapping machine's axle.
- Lift the loading arm to its maximum position and lock it to protect it against unauthorised lowering using a locking device as shown on the illustration.
- Disconnect and properly secure the hydraulic lines.
- The levers of the control unit should remain in the tractor's cabin.

Loading arm locked.
Transport position.





1 - Wrapping machine's loading arm
2 - Lower frame
3 - Locking pin
4 - M8x50 bolt (locking)- 2 pcs.
5 - M8 nut- 2 pcs.

- Place the red and white warning symbols equipped with integrated lights, connect them to the tractor's electric system and check their operation.
- Place the triangle denoting slow-running vehicles in the stand in the rear.

Every time before entering public roads, check if the wrapping machine is correctly connected to the tractor. It is forbidden to carry persons or bales of silage on the rotary table.
Before entering public roads, check if the tractor is fully steerable. The load on the front axle must be at least 20% of the tractor's own weight. If this condition is not met, additional weight is required on the front axle.

While driving on public roads, the speed should be adjusted to the existing conditions and not exceeding 15 kph.
Follow the traffic code regulations and the manufacturer's recommendations when transporting the wrapping machine on public roads.

If an emergency requires the driver to stop the tractor with the wrapping machine in tow on a public road, the tractor driver should:

- stop the vehicle without causing any danger to the road users;
- stop the vehicle as close to the road edge as possible and parallel to the road axis;
- turn off the engine, remove the ignition key, engage the parking brake and place wedges under the wrapping machine's wheels;
- outside a built-up area, the warning triangle should be placed 30 - 50 meters behind the vehicle and the emergency lights must be activated;
- inside a built-up area, turn on the emergency lights and
- place the warning triangle behind the vehicle unless it is already installed on it; make sure that the triangle is visible to other road users;
- in the event of a breakdown, take the required precautions to ensure safety in the area.

9 Wrapping machine storage

The wrap counter should be stored in a dry place with the electrical connections protected against fouling and humidity.

The sensor cable should be folded and stored in a dry place with the electrical connections protected against fouling and humidity.

Store the wrapping machine on a hard, flat, level ground.

It is advised to store the wrapping machine in a dry location, protecting it against UV rays and other harmful agents.

If the wrapping machine is stored without any canopy roof, protect it with a water-resistant tarpaulin or film.

Store the wrapping machine in an atmosphere free of aggressive agents (e.g. ammonia, chemicals).

After the working season is over, clean the wrapping machine and check the condition of the protective paint coating. Touch up the damage to the paint coating at a service workshop.

Check the condition and legibility of the nameplate. If the plate is damaged, notify the service station.

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

10 Hazards

10.1 Description of residual risks

Residual risk results from incorrect actions of the wrapping machine's operator. The greatest hazards occur during the following forbidden actions:

- installation of the wrapping machine on tractors which do not meet the required minimum criteria stated in this manual;
- standing below raised lifting components of the machine;
- standing in the machine's working area;
- maintenance or repairs conducted with the tractor engine on;
- use of damaged hydraulic lines;
- machine operation by an operator standing outside the tractor's cabin;
- operating a wrapping machine which is damaged or without protective covers in place;
- operating the wrapping machine on slopes with an inclination exceeding 8°;
- transporting bales of silage on the wrapping machine;
- remaining on (aboard) the machine when it is working or during transport, page 35;
- misuse of the wrapping machine;
- leaving the wrapping machine unsecured on an inclined terrain;
- standing between the tractor and the machine while the engine is running.

With the aforementioned residual risks, the bale wrapping machine is regarded as a machine which has been designed and built according to the current state of technology.

10.2 Assessment of residual risks

Follow these guidelines:

- Read and understand the operating manual.
- Do not stand below the raised lifting components of the machine.
- Do not stand in the machine's working area.
- The maintenance and repairs of the wrapping machine should performed at authorised service workshops.
- The machine should be used by trained and authorised operators.
- Protect the wrapping machine from access by children and bystanders.

– Only then can you eliminate the residual risks related to using this wrapping machine and keep it safe to people and the environment.

Note:

The residual risks are present when the aforementioned rules and indications are not followed.

11 Wrapping machine disposal

Disassembly and disposal of the wrapping machine should be performed by specialised service stations familiarised with the construction and functioning of the machine. Only specialised service stations have a complete and up-to-date knowledge of the used materials and hazards related to their improper transport and storage. The authorised service stations offer both advice and complete machine disposal services.

Use proper tools and auxiliary equipment for the disassembly (jack, wheel extractor).

The used oil must be stored in sealed containers. Immediately dispose of the used oil at fuel stations which collect such materials.

Deliver the dismantled and segregated parts to appropriate collection points.

During the disassembly of the machine use proper protective clothing and shoes.

12 Typical problems and their remedies

No.	Problem	Possible cause	Remedy
1	2	3	4
1.	Wrapping machine's hydraulic actuators work slowly or do not work at all.	Not enough oil in the tractor's hydraulic system	Check the oil level in the tractor. Top up oil.
		Pressure in the tractor's hydraulic system too low	Check the tractor hydraulic system pressure.
		Wrong diameter setting of the external diameter lever	Turn on the pump drive.
		Damaged actuator	Replace the actuator.
2.	The wrapping machine works too slowly.	Not enough oil in the tractor's hydraulic system	Check the oil level in the tractor. Top up oil.
3.	Oil leaks from the control unit	Worn seal rings	Replace the seal rings on the hydraulic control unit.
4.	Too wide or too narrow overlapping of film edges during wrapping	Improper installation of the chain wheel	Replace with a proper chain wheel ⏭ par. 5.1
5.	The cut film is not held in the cutter unit.	The rubber clamp holding the cut film is not adjusted properly.	Adjust the film pressure element. ⏭ par. 5.5
6.	Problems with bale unloading	Rotary table lock does not operate.	Lock the table ⏭ par 5.2.

13 Accessories

The user may purchase the following optional and additional equipment at an authorised reseller or directly from the manufacturer:

- Spare parts catalogue on a magnetic storage medium.
- Spare parts catalogue - printed version.
- Bale vertical positioning system ⏭ par. 5.5.
- Integrated lights required for travelling on public roads ⏭ par. 8.2.
- Warning triangles for slow-running vehicles ⏭ par. 8.2.
- Locking pin release handle ⏭ par. 5.5.
- Paint touch-up kit ⏭ chapter 5.7.

14 Names and abbreviations

Nameplate - plate with information which unequivocally identifies the product

Symbol - information plate

OH&S - Occupational Health and Safety

Hitch, transport hitch - coupling elements of the tractor ⏭ See the tractor's operation manual.

UV - ultraviolet radiation; invisible electromagnetic radiation which may have a negative influence on human health; UV radiation also has a negative effect on rubber elements.

Traction class - value which characterises the towing power of a given tractor, class 0.9 refers to a towing power of 9kN, Ursus C355 and 4011 are exemplary tractors of this class.

kW - kilowatt, unit of power

V - volt, unit of voltage

bar - unit of pressure

kg - kilogram, unit of mass

m - meter, unit of distance

mm - millimetre, auxiliary unit of distance equal to 0.001 m

min - minute, auxiliary unit of time equal to 60 seconds

rev - revolution, type of movement

RPM - revolutions per minute, unit of rotational speed

kph - kilometres per hour, unit of speed

db(A) - A-scale decibel, unit of acoustic pressure

Bale wrapping machine warranty card

Warranty card
Z577 Bale wrapping machine

Metal-Fach
ul. Kresowa 62
16-100 Sokółka

Bale wrapping machine Z522 **Serial number: ..... Year/date of manufacture.....**

FILLED BY VENDOR

Date of sale .....

The warranty service is provided on behalf of the manufacturer by: .....

Reseller's stamp, legible signature of the dealership representative

Name and surname of the Customer..... Signature .....

City, post code.....

Street, number..... Telephone.....

Warranty conditions

1. The manufacturer provides a bale wrapping machine designed and built in compliance with the currently applicable standards. The manufacturer guarantees that the supplied bale wrapping machine is free of manufacturing defects.

2. Metal-Fach Sp. z o.o. provides warranty service for 12 months starting from the date of first sale, provided the wrapping machine is used for its intended purpose and the recommendations contained in the manual are followed.

3. The warranty card properly filled in at the Dealership is the confirmation of the manufacturer's warranty; the acceptance of the warranty conditions must be confirmed by the customer's signature.

Warranty conditions

4. The quality warranty covers the machine's defects caused by defective manufacturing, material defects and latent defects.

5. The warranty does not cover the assemblies and parts which are subject to normal wear (e.g. tyres, brake pads).

6. The warranty does not cover any mechanical damage or other damage resulting from improper use, improper maintenance or improper adjustment of the wrapping machine.

7. The warranty does not cover any damage resulting from improper storage of the machine.

8. Any unauthorised modifications in the construction of the machine introduced by the user will result in automatic termination of the warranty.

9. The manufacturer shall not be held responsible for any loss, damage or destruction of the product resulting from causes other than defects of the supplied machine.

10. During the warranty period the manufacturer will repair any defects which occurred as a result of the manufacturer's negligence with the exception of defects listed in paragraphs 5 - 8.

11. The warranty repair shall be made within 14 working days of the notification/ supply of the machine to the designated service station or at other time agreed upon by the parties.

12. The warranty is extended by the time required to complete the repair.

13. During the warranty period all repairs which are not covered by the warranty are performed by the authorised service stations at full cost to the user. Before such repairs, the service station will inform the user of the suggested cost, time and scope of the repair.

14. The decision whether to commence a chargeable repair of the wrapping machine with a warranty valid at the time of repair is made by the Customer.