



# METAL-FACH



## SINGLE-AXLE FARM TRAILER T957

INSTRUCTIONS MANUAL  
TRANSLATION OF THE ORIGINAL INSTRUCTIONS MANUAL

REV. II  
MAY 2018



UE





## EC DECLARATION OF CONFORMITY

The undersigned,	Jacek Kucharewicz, President of the Board,	
hereby declares, with full responsibility, that the complete machine:		
<b>Farming-Truck Trailer</b>		
1.1.	Brand (the trading name of the manufacturer)	Metal-Fach
1.2.	Type	T957
1.2.1.	Variant	
1.2.2.	Version	
1.2.3.	Trade name(s) (if any)	N/A
1.3.	Category, Subcategory and Vehicle Speed Indicator	R3a
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.	Location of the rating plate of the manufacturer	Right-hand side of the front crossmember of the top frame
1.5.2.	Method used to fix the rating plate of the manufacturer	Bonded
1.6.1.	Location of the vehicle-identification number on the chassis	Right-hand side of the front crossmember of the chassis frame
2.	Machine-identification number	
<p>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)</p> <p>The following harmonised standards were applied to assess the compliance.  <u>PN-EN ISO 4254-1: 2016-02, PN-EN ISO 13857: 2010, PN-EN ISO 12100: 2012</u>  and standards ISO 3600:2015, PN-ISO 11684:1998, and Regulation of the Minister of Infrastructure dated 31 December 2002 on the technical conditions of vehicles and the range of their necessary equipment (Journal of Laws of 2003, No. 32, item 262, as amended).</p> <p><b>Safety Testing Report No. LBC/71/16</b></p> <p><b>This EC Declaration of Conformity shall become null and void if the machine is modified or reconstructed without the Manufacturer's consent.</b></p>		

**Sokółka**  
(Place)

**20/10/2016**  
(Date)

**Jacek Kucharewicz**  
(Signature)

**Chairman of the Board**  
(Position)

## Machine data

<b>Type of machine</b>	Single-Axle Farm Trailer
Type designation	T957
Serial Number <sup>(1)</sup> :	_____
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	_____
<b>Owner or User:</b>	Name: _____
	Address _____ _____
	Phone/Fax _____

\_\_\_\_\_

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

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The information included in the instructions manual is valid as of the date of issue. 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 provided with the basic equipment of the machine. The user is obliged to read the contents of this manual before commencing of operation and to meet the recommendations included in it. 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. This Manual describes the basic safety and operation principles of the Metal-Fach T957 Trailer.

The substantial obligations of the manufacturer are presented in the guarantee card, which includes the complete and currently-in-force regulations on the guarantee coverage.

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 at the time of the machine purchase, and also is available on the Manufacturer's website: [www.metalfach.com.pl](http://www.metalfach.com.pl).

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

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

**Manufacturer address:**

Metal-Fach sp. z o.o.  
ul. Kresowa 62  
16-100 Sokółka

**Telephone**

Tel.: (0-85) 711 98 40  
Fax (0-85) 711 90 65

## The symbols used in these Instructions



**DANGER**

Hazard-warning symbol. It 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 TRAILER

The Trailer is intended for the transporting of agricultural produce and other bulk and loose materials within the farm area and on public roads.

The Trailer is unloaded either manually or by tilting the Trailer body to the rear or to the sides. The Trailer is designed to work with agricultural tractors equipped with external hydraulic systems, both signal and warning and brake-system sockets, and a transporting hitch.

To operate the Trailer in a safe manner, read and adhere to all the instructions set out in this Instructions Manual. Abiding by the guidelines provided in the Instructions Manual ensures safe operation for the User, and also prolongs the service life of the machine.

## 1.2. Identification

Identify the Trailer on the basis of the rating plate and VIN number. The rating plate is fixed on the right-hand side of the front crossmember of the Trailer body frame. The VIN number is stamped on the right-hand side of the front crossmember of the Trailer chassis frame, and on the rating plate; see Fig. 1.

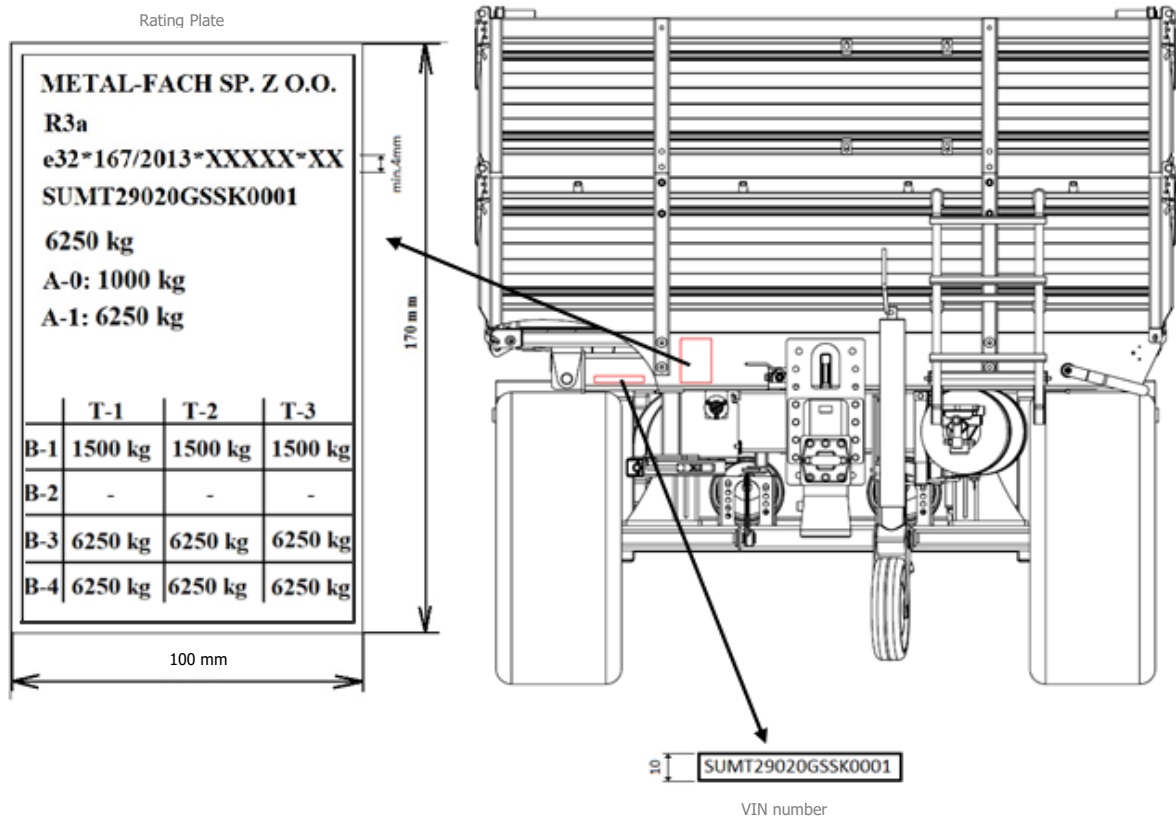
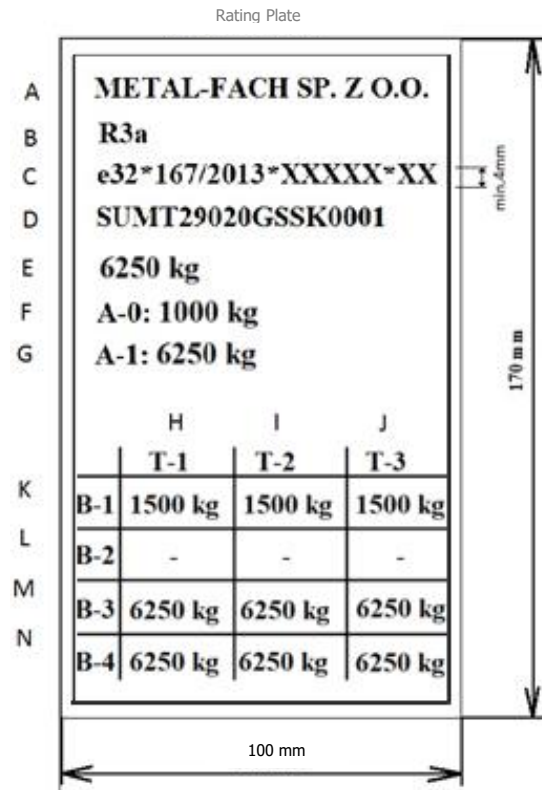



Figure 1. Rating plate and VIN number




**Figure 2.** Key to the fields on the rating plate

- A - Manufacturer
- B - Category, Subcategory, and Vehicle-Speed Indicator
- C - EU-Type Approval Number
- D - VIN
- E - Permissible total design weight of the vehicle
- F - Load at the coupling point
- G - Permissible design weight per axle
- H - Permissible towable design weight with drawbar
- I - Permissible towable design weight with rigid drawbar
- J - Permissible towable design weight with central axle
- K - Permissible towable design weight without brake

- L - Permissible towable design weight with overrun braking
- M - Permissible towable design weight with continuous or semi-continuous braking
- N - Permissible towable design weight with hydraulic or pneumatic braking



On purchase, check the compliance of the factory number on the machine rating plate with the number in the Instructions Manual, Guarantee Certificate, and sale notes.



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

Trailer VIN number

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

### 1.3. Intended use

The Trailer is intended for the transporting of agricultural produce and other bulk and loose materials, or for carrying loads on box pallets or Europallets within the farm area and on public roads. The transporting of building materials, mineral fertilisers, and other loads is also permitted, provided the appropriate requirements described in section 2.3.3 Loading the Trailer body are met.

Failure to follow appropriate guidelines for carrying and loading goods specified by the Manufacturer and the road-transport regulations in force in the country of use of the Trailer will invalidate the warranty, and is considered misuse of the machine.

The Trailer cannot be used to carry people, animals, or goods classified as hazardous materials.

The Trailer may only be used by persons who have read the Instructions Manual, and who are trained in the risks and provision of pre-medical assistance to the victims of accidents.

The Trailer is unloaded either manually or by tilting the body to the rear or to the sides. The Trailer is designed to work with agricultural tractors equipped with external hydraulic systems - signal-, warning-, and brake-system sockets - and a transporting hitch.



**CAUTION**

**CAUTION!**

The Trailer must not be used contrary to its intended purpose. It is especially forbidden to:

- 1) Carry fuel, gas cylinders or similar loads, because of the obligation to comply with the additional technical conditions for the carriage of dangerous goods.
- 2) Carry toxic materials which can cause environmental contamination. The manufacturer is not responsible for the resulting damage – this risk is borne by the owner.
- 3) Carry people and animals.
- 4) Carry dangerous materials and loads acting aggressively as a result of chemical reactions to the structural components of the Trailer.
- 5) Carry loads which result in an uneven load or the overloading of the axles and suspension components.
- 6) Make unauthorised changes to the Trailer, as they preclude the manufacturer's liability for consequential damage.

In order to use the Trailer in accordance with its intended use, you must also perform all the operations associated with the correct and safe operation and maintenance of the machine. Therefore, the user must:

- Read and follow the instructions in the Instructions Manual
- Observe the instructions for maintenance and routine adjustments
- Follow the safety principles
- Comply with the road-traffic regulations of the country in which the Trailer is being used

#### **1.4. Basic components**

The basic components of each Trailer include

- Instructions Manual
- Guarantee Certificate and warranty conditions
- Bracket for a slow-vehicle marking plate
- Pneumatic two-line brakes, hydraulic two-line brakes, or overrunning brake
- Parking brake
- Lighting system
- Wheel chocks
- Rear hitch

## 1.5. Sale, transporting, and storage

### 1.5.1. Sale

The buyer shall collect the Trailer at the manufacturer or from the point of sale, or agrees on the terms of delivery with the manufacturer. The Trailer is sold as fully assembled, ready for operation, with the basic components, as specified in Section 1.4 of this manual. Additional equipment may be purchased for an additional fee.

The point-of-sale staff are obliged to acquaint the buyer with the rules of construction and operation of the Trailer, safety requirements, and warranty conditions.

The Buyer is obliged to check whether

- the Trailer is complete, undamaged, and equipped with the basic components
- the VIN number is stamped on the rating plate on the front crossmember of the body frame, and whether this information matches the one entered in the warranty
- the warranty is completed correctly according to the identification data on the rating plate

### 1.5.2. Transporting to the user

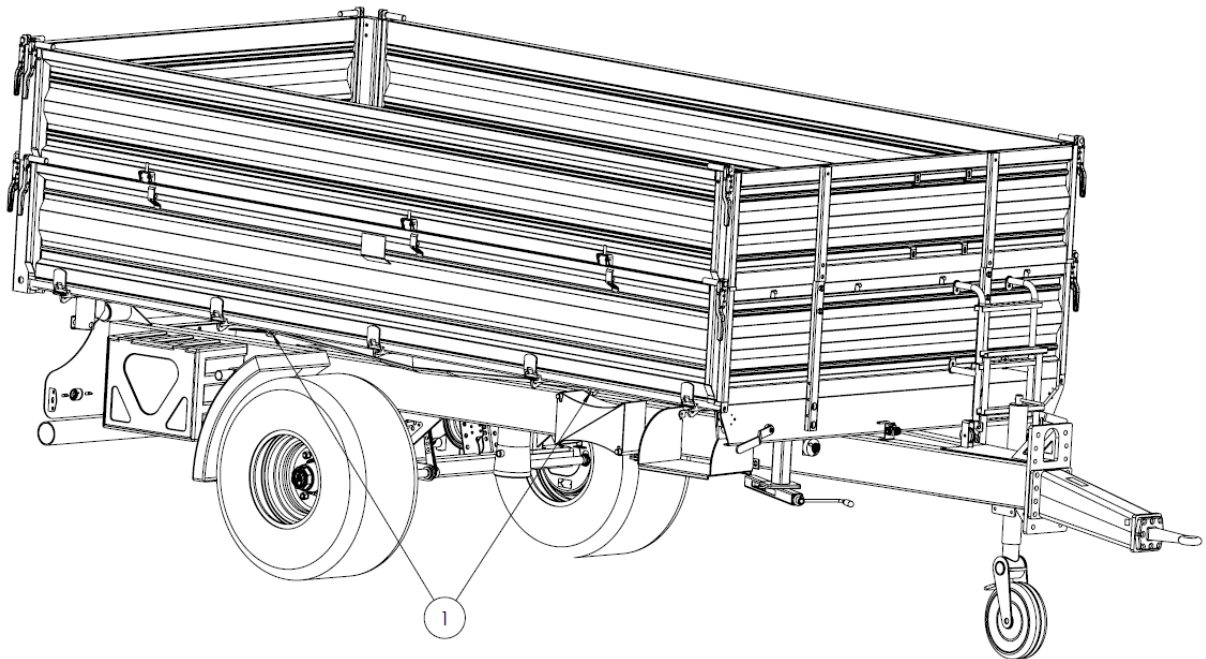
The Trailer must be transported on wheels, coupled with a tractor, or on a low-loading platform from the point of sale or from the manufacturer. Before it is loaded onto a low-loading platform, couple it to the tractor's hitch and connect the brake-system's lines. Use unfolded ramps to drive the Trailer on to the low-loading platform. Once on the low-loading platform, secure the Trailer wheels with chocks. Having done this, uncouple the brake lines and uncouple the Trailer from the tractor. Make sure the Trailer is secured with special fastening devices (transporting straps, ropes, chains, guy ropes, etc.) during transporting, attached at the points indicated in Fig. 3, or to other permanent structural parts of the Trailer (e.g. ledgers, crossbars, etc.). Make a visual check to ensure the fastening items are fully functional, i.e. they are not broken, worn, or the hooks unbent. Fit the wheel chocks in such a way as to prevent the Trailer from moving. Secure the Trailer in such a way as to prevent its movement during transporting.



**DANGER**

**DANGER!**

Improper use of fasteners can cause an accident.



**Figure 3.** Attachment points of the transporting straps  
1 – transporting bracket

Before unloading the Trailer, unfold the ramps, and then unlock the straps which secure the Trailer against possible sliding down during transporting. Next, drive the tractor near enough to connect the brake lines. Pull out the chocks from under the wheels of the Trailer. After all the above steps have been completed, you can proceed to the drive the Trailer from the platform.

### 1.5.1. Trailer transporting by the user

The user can transport the Trailer by towing it to its destination with his or her own agricultural tractor.

Before you transport the Trailer yourself, it is absolutely necessary that you read this Instructions Manual and follow its guidelines.



**CAUTION**

**CAUTION!**

When driving, the driver of a Trailer-towing vehicle must exercise particular caution, as the centre of gravity of the vehicle shifts upwards. Use only technically sound and certified fastening accessories. Before you select the fastening accessories, read their manufacturers' operating instructions.



**CAUTION**

**CAUTION!**

The tractor operator must read the Instructions Manual and follow the guidelines contained therein.



**DANGER**

**DANGER!**

Check the components with which the tractor and Trailer are coupled, as their improper use can cause an accident.



**CAUTION**

**CAUTION!**

When coupling or uncoupling the Trailer to or from the tractor, stand at a safe distance from the space between the tractor and Trailer.

### **1.5.2. Storage**

The Trailer must be protected from direct weather conditions (e.g. sun, rain), parked on solid ground on its ground wheels, secured with chocks. Reduce tyre pressure and cover the tyres if there is a likelihood of prolonged exposure to sunlight.

If the Trailer is exposed to weather conditions, check from time to time to ensure that there is no rainwater in it. Make sure the paint coat is intact. These areas should be cleaned, degreased, and then covered with paint, maintaining a uniform colour and the even thickness of the protective coating.

Long-term storage is permitted only in enclosed areas.

### **1.6. Trailer Cleaning and Maintenance**

Clean the machine before each long period of disuse, after carrying loads which can cause corrosion, and whenever necessary. Clean the Trailer according to the following guidelines.

The machine may be cleaned only in designated areas when the air temperature is above zero.

First, before you start the cleaning, open the sideboards and extensions of the Trailer to remove any residual material which has been carried. Once this preparation is completed, you can start cleaning the Trailer.

Clean the Trailer with clean water or water and detergent. When using different types of detergents, please read their application specifications, and assess whether they may be used to clean the Trailer.

It is not allowed to use any kind of organic solvents or other substances which could damage coated surfaces and rubber or plastic components.

A pressure washer may be used to clean the Trailer. Read the operating instructions attached with the washer beforehand. When using a pressure washer, keep a safe distance between the device nozzle and the Trailer surface. Minimum distance is 50 cm. When washing the Trailer using a pressure washer, never direct the water jet directly onto the hydraulic and pneumatic system components, i.e. hoses, valves, cylinders, plugs, electrical connections, etc., or onto the Trailer lubricating points, information and warning signs, and the rating plates.

The Trailer comes with plastic parts which are recommended to be washed with clean water or water with a special detergent formulated for this type of surface.

Surfaces contaminated with oil or grease must be cleaned with agents intended for this type of contamination. Other degreasing agents designed for cleaning this type of contamination may be used. Before using them, it is recommended that you read the information on how to use them to clean surfaces. After degreasing a contaminated surface, wash it with water and a detergent which is intended for this purpose.

When using various types of detergents and organic agents, remember that they can affect the machine components, especially seals and flexible hoses. Some substances can accelerate the ageing of the material. Use only special cleaning and maintenance products designed for the surfaces. Always read and follow the information provided with the cleaning and maintenance products.

The spray-suppression valves must be cleaned on a regular basis.

After cleaning and drying the machine, grease all lubrication points.

### **1.7. Storage**

The Trailer must be stored in roofed areas (preferably on a level and hard surface) and in such a way as to prevent injury to people and animals.

If the Trailer is not to be used for a longer period of time, ensure the machine is protected from the harmful effects of the weather. Preparing the Trailer for a long-term disuse involves, among other things, thorough cleaning and drying all machine components, including tyres and rims, in accordance with the INSTRUCTIONS in Section 1.6. "Trailer Cleaning and Maintenance".

Ensure that there are no corrosive environments. To this end, apply primer coat and topcoat on the susceptible places having prepared them properly. Follow the recommendations of paint manufacturers.

When preparing the Trailer for long periods of disuse, lubricate the machine parts regardless of the date of previous lubrication.

Check the tyre pressure from time to time during long-term disuse of the machine. If the pressure is too low, re-inflate the tyre.

Changing the position of the wheel is recommended every 14 days so that the contact area between the tyre and the ground is variable during extended periods of disuse.

Wash the tarpaulin and dry it before you store it for a longer period of time. Ensure the tarpaulin is stored in either the unfolded or rolled-up position so as not to cause folds in the material.

### **1.8. Scrapping the Vehicle**

If the user decides to scrap the machine, they must comply with the national regulations for the scrapping and recycling of end-of-life machines. The certificate issued by a scrap-metal yard designated by the responsible authorities, shall be the basis for the deregistration of the Trailer.

The first step in dismantling the Trailer is to drain all the oil from the hydraulic system. Then, air pressure in the air-braking system must be depressurised completely.

Hand over any useless, worn, non-repairable or non-recoverable components to an appropriate facility which collects recyclable materials. For environmental reasons, it is obligatory to hand hydraulic oil over to a plant where such waste is disposed of.



## 2. User Safety

### 2.1. Obligation to provide information



**CAUTION**

**CAUTION!**

When the Trailer is sold to further users, attach the Instructions Manual; and the purchaser of the Trailer must undergo training as indicated in the Manual.

### 2.2. General user-safety principles

Each time you start the Trailer, check it for safe operation. Observe the generally applicable safety and accident prevention regulations, and note the information in this Instructions Manual. Observe all the safety symbols, warning, and information inscriptions affixed to the Trailer which provide important guidelines for safe operation. Operate the Trailer only if all required devices are connected and protected against unintentional disconnection or opening, e.g. hitch and drawbar, couplings. Before you start work, learn the functions of and the ways of operating all the devices and controls.

The improper use of the machine will result in the risk of voiding the warranty. The user who fails to operate the Trailer according to its intended use assumes full responsibility for all the consequences resulting from such use.

Noise – the equivalent A-weighted emission sound pressure level (LpA) is not above 70 dB.

Persons under the influence of alcohol or other stimulants, and those who are not trained, and do not hold the proper driving licences, are forbidden to operate the Trailer.

### 2.3. Preparing the machine for operation

Check the technical condition of the Trailer each time before you start the machine. Make sure you have read this Instructions Manual and follow the guidelines contained herein. For safe operation of the machine, it is essential that you know its components and understand how it works.



**CAUTION**

**CAUTION!**

The user is obliged to check the Trailer after delivery and before the start-up, as well as to read the Instructions Manual.

#### Checklist

- Completeness of the Trailer (standard and optional equipment)
- Condition of the coating
- Condition of the ground wheels and tyre pressure
- Technical condition of the hydraulic hoses

- Technical condition of the pneumatic hoses
- Lighting components

Before coupling the Trailer for the first time, carry out preparation work. This involves checking the tightness of the wheel nuts, draining the air tank in the air-braking system, and adjusting the height of the drawbar-eye setting.

### 2.3.1. Coupling and uncoupling the Trailer with/from the tractor

Before coupling the Trailer, make sure both the Trailer and tractor are fully operational. To couple the Trailer, use only the tractor's upper transporting hitch. Carefully check the hitch securing device. If the tractor is equipped with an automatic hitch, make sure the coupling operation has been completed. Use special caution when connecting the machines.

It is forbidden to stand between the Trailer and the tractor while coupling. It is forbidden to uncouple the Trailer if its body is raised. When coupling and uncoupling the Trailer, apply the parking brake of the machine.

Any improper use or non-observance of the guidelines in this Instructions Manual poses a health hazard to Trailer operators and bystanders.

### 2.3.2. Trailer start-up



**CAUTION**

#### CAUTION!

The tractor operator must read the Instructions Manual and follow the guidelines contained therein.

The Trailer must be coupled only with a tractor which is in good working order and which is fitted with an operational transporting hitch, operational air or hydraulic system, and signalling and warning system.

The use and operation of the Trailer may only be carried out by persons authorised to drive Trailer-towing agricultural tractors.

If any information in this Instructions Manual is not fully understood, please contact your dealer or technical service department.

Follow the procedure below before start-up.

- 1) Learn the names and locations of the individual Trailer units/components
- 2) Check the Trailer's tyre pressures
- 3) Couple the Trailer with the tractor
  - Set the drawbar eye of the Trailer at the height of the tractor-transporting hitch
  - Couple the drawbar eye with the tractor hitch
  - Secure the hitch pin against falling out
  - Switch off the tractor's engine
  - Engage the tractor's parking brake
  - Connect the pneumatic or hydraulic systems and the electrical system to the appropriate sockets on the tractor
  - Check the operation and tightness of the pneumatic or hydraulic systems, and the electrical system of the Trailer and tractor
  - Check all the devices, their connection and protection against undesired disconnection or displacement

4) Switch off the Trailer's parking brake

Carry out these activities every time you start the Trailer.

### 2.3.3. Loading the Trailer body

The Trailer body may only be loaded when the Trailer is coupled with a tractor, positioned on horizontal ground and with the drawbar in the straight ahead position.

Preferably use mechanical loading devices like cranes, loaders, conveyors, etc. for loading.

Before loading, check that both sideboard and extension locks are closed.

When loading the Trailer, distribute the load evenly over the entire surface of the Trailer body. When transporting materials exerting point pressure on the floor of the body (concentrated loads, e.g. large stones), place thick boards on the floor before loading. This will allow a smaller surface load on the floor and protect it against damage.

For the transporting of bulk materials, use wall extensions of the Trailer body, and when transporting materials protruding beyond the Trailer's contour planes, road-traffic regulations must be observed, and the protruding load must be marked accordingly.

When using the Trailer in cold temperatures, pay particular attention to the agglomeration of the material to be loaded. Low temperatures can cause aggregations of loose materials. Dropping such materials from a height can cause damage to the floor and other parts of the Trailer (e.g. sideboards of the body, tarpaulin frame, etc.).



**CAUTION**

#### CAUTION

It is forbidden to exceed the permissible load capacity of the Trailer and the permissible axle loads, as this threatens road safety, and can cause damage to the Trailer.

The load to be carried must be protected against displacement, the generation of excessive noise, and road spillage

### 2.3.4. Tarpaulin cover

The Trailer can be equipped with a tarpaulin cover as an option. The tarpaulin is used as required for the protection of the Trailer against weather conditions and against spilling loose loads during transporting passes. Make sure that any precipitation does not accumulate on the tarpaulin, as this can cause deformation. The tarpaulin cover is not suitable for use in freezing temperatures. Low temperatures cause tarpaulin material deterioration visible as cracks.

### 2.3.5. Coupling and uncoupling an additional Trailer

The Trailer comes with a coupling for an additional Trailer. Before you couple an additional Trailer, read this Instructions Manual and follow its guidelines. Remember the following when connecting an additional Trailer.

- The permissible towed-Trailer weight depends on the Trailer variant and must not exceed the weight of the first Trailer.
- Before coupling the Trailer, make sure that both Trailers are fully operational.

- No-one may stand between the Trailers during the coupling process. The person assisting in the coupling of the machines must be outside the danger zone and clearly visible to the operator.

Follow the procedure below to couple an additional Trailer.

- 1) Align the tractor with the first Trailer coupled in front of the drawbar of the Trailer to be added.
- 2) The Trailer to be coupled must be immobilised with the parking brake.
- 3) Remove the rear hitch pin from the first Trailer.
- 4) Set the drawbar of the second Trailer to the coupling-enabled position.
- 5) When reversing the tractor, drive the rear hitch of the first Trailer onto the second Trailer's drawbar.
- 6) Lock the connection with a pin secured with the cotter pin.
- 7) Connect the pneumatic or hydraulic hoses, and electrical lines, according to the guidelines in the Instructions Manual.

### 2.3.6. Pneumatic and hydraulic systems

The pneumatic system is under high pressure. When connecting pneumatic lines to the tractor's pneumatic system, ensure that the valves on both the tractor and Trailer sides are not under pressure. Check the pneumatic connection on a regular basis, and replace damaged components and ageing parts. Check the tightness of the hoses. Air leakage is not permitted. The replacement of lines must comply with the manufacturer's technical requirements. Replace flexible lines every five years, unless damage is found earlier.

Before starting repair work, depressurise the air system and switch off the tractor's engine. Only an authorised representative of the Trailer manufacturer may repair the pneumatic system.

The Trailer's hydraulic system is also under high pressure. Check the condition of the hydraulic lines on a regular basis. Oil leaks are not permitted. There is a shut-off valve in the hydraulic system which limits the tilting angle of the Trailer body. The user is not permitted to adjust the length of the control rope.

When connecting the hydraulic hoses to the tractor, ensure the hydraulic system of the tractor and Trailer is not under pressure. If necessary, reduce the residual pressure of the system.



**CAUTION**

Risk of injury from a strong jet of hydraulic fluid. If injured, see a doctor immediately. If oil gets into your eyes, rinse with plenty of water. If your eyes are irritated, see a doctor. Use soap and water to wash away oil after its contact with the skin. Do not use organic solvents such as kerosene or benzene.

Dispose of used oil after replenishing. Storing used oil in their original containers or in hydrocarbon-resistant replacement containers is recommended. Replacement containers may be used provided that they are properly marked and stored. Storing oil in food storage containers is prohibited.

Replace rubber hydraulic hoses every four years regardless of their technical condition, unless a fault is found earlier.

If any failure occurs in the pneumatic or hydraulic system, shut down the Trailer immediately.



Replace flexible pneumatic lines every five years, unless damage is found earlier.  
Replace rubber hydraulic hoses every four years regardless of their technical condition, unless a fault is found earlier.

### 2.3.7. Tyre guidelines

Secure the machine with the parking brake and the wheels with chocks when maintaining the tyres.

Changing the wheel is only permitted if the Trailer body has been emptied. Use suitable tools for repairing the wheels. Due to the risks associated with the maintenance and repair works of tyres, the repairer should be trained for this purpose. It is advisable to check the tightening of the nuts after the first use, after the first laden drive and after each intensive use of the machine, and/or every 100 kilometres. Repeat these checks each time after you disassemble the wheels. The lifting points are marked in Fig. 4

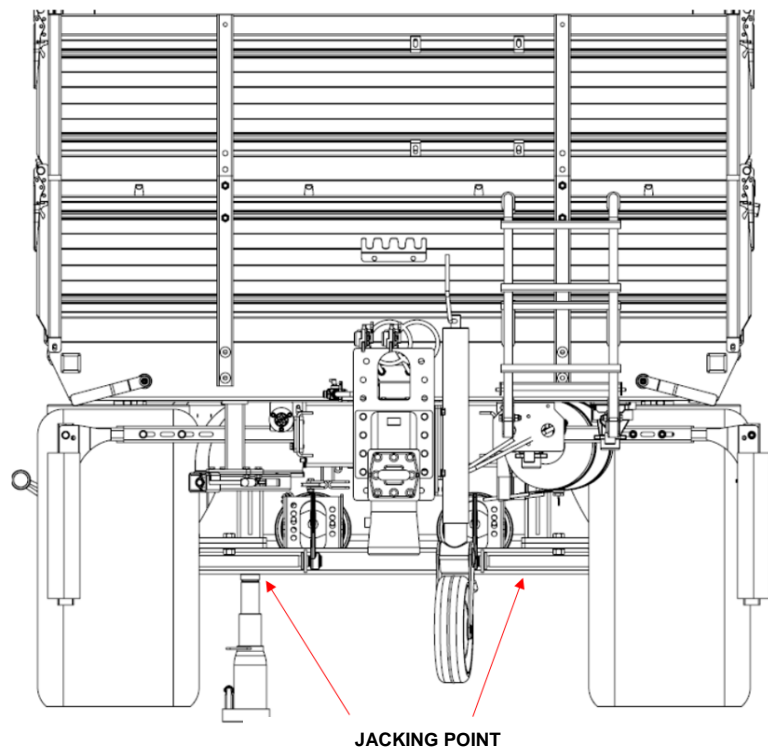


Figure 4. Jacking point


 <b>CAUTION</b>	<p><b>CAUTION!</b>  Check the wheel nuts on a regular basis for their condition and tightening before each use of the Trailer, and tighten, if necessary.  Tightening torque of nuts for threads – Tab. 1.</p>
-----------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Table 1. Tightening torque values for metric bolts

Bolt tightening torques – metrical bolts in Nm							
Size Ø mm	Pitch mm	Bolt version – strength classes					Wheel nuts, wheel bolts
		4.8	5.8	8.8	10.9	12.9	
3	0.50	0.9	1.1	1.8	2.6	3.0	
4	0.70	1.6	2.0	3.1	4.5	5.3	
5	0.80	3.2	4.0	6.1	8.9	10.4	
6	1.00	5.5	6.8	10.4	15.3	17.9	
7	1.00	9.3	11.5	17.2	25	30	
8	1.25	13.6	16.8	25	37	44	
8	1.00	14.5	18	27	40	47	
10	1.50	26.6	33	50	73	86	45
10	1.25	28	35	53	78	91	
12	1.75	46	56	86	127	148	
12	1.50						80
12	1.25	50	62	95	139	163	
14	2.00	73	90	137	201	235	
14	1.50	79	96	150	220	257	140
16	2.00	113	141	214	314	369	
16	1.50	121	150	229	336	393	220
18	2.50	157	194	306	435	509	
18	1.50	178	220	345	491	575	300
20	2.50	222	275	432	615	719	
20	1.50	248	307	482	687	804	400
22	2.50	305	376	502	843	987	
22	2.00						450
22	1.50	337	416	654	932	1090	500
24	3.00	383	474	744	1080	1240	
24	2.00	420	519	814	1160	1360	
24	1.50						550
27	3.00	568	703	100	1570	1840	
27	2.00	615	760	1200	1700	1990	
30	3.50	772	995	1500	2130	2500	
30	2.00	850	1060	1670	2370	2380	

Regularly check the tyre pressures. Tyre pressures can change during a whole day's operation. Adjust your speed and load capacity to suit your tyres' pressures. The recommended tyre pressure for size 500/50 R17 is 4.0 bar.

Tyre over-inflation can cause a blow-out.



**CAUTION**

**CAUTION!**

Check tyre pressures. The correct pressure is indicated on the tyre or on a sticker near the wheel. The pressure rating is given for the maximum load capacity and transporting at maximum speed.



The spray suppression valances must be cleaned on a regular basis.

### **2.3.8. Checking driving axle bearings for play**

Regular checks of the driving axle bearings for play are recommended. Carry out such checks on a newly purchased Trailer after the first 100 km. From then on recheck after driving about 1,500-2,000 km during operation and adjust, if necessary.

To adjust the bearing play, follow the procedure below.

- 1) Couple the Trailer with the tractor and engage the parking brake of the tractor
- 2) Lift one side of the Trailer so that the wheel does not touch the ground and secure it against dropping
- 3) If the wheel shows excessive play, remove the hub cap and the securing pin to prevent the castellated nut from spontaneous unscrewing.
- 4) Turn the wheel while simultaneously tightening the castellated nut, until the wheel has stopped completely.
- 5) Loosen the nut by  $1/6 \div 1/3$  of a turn, until the nearest pin groove overlaps with the hole on the hub spigot.
- 6) Secure the nut with a new pin, replace, and fasten the hub cap.

If the bearing play is adjusted correctly, the wheel should rotate freely, without stoppage or evident resistance (other than friction of the brake shoes against the drum). Slight friction of the shoes against the drum, particularly in a new Trailer, or after their replacement, is a typical occurrence. After driving for a few kilometres observe how the wheel hubs heat up, to check finally if the bearing-play adjustment is correct. In addition to the incorrect adjustment of the bearing play, it is the impurities present in grease, or bearing damage, which cause considerable resistance during wheel rotation and heating of the hubs. The above symptoms require disassembly of the wheel hub and removal of the malfunction.

### **2.3.9. Lubrication**

Proper lubrication is one of the most-important factors which determine the efficient operation of individual Trailer assemblies and mechanisms.


Compliance with the manufacturer's lubrication recommendations significantly reduces the possibility of damage or early wear and tear of individual parts.

Follow the guidelines for lubrication listed below.

- Clean the grease nipple before you start pumping the grease
- Pump the grease until fresh grease appears in the slots through which the used grease is squeezed out during pumping
- After lubrication, leave some grease on the grease nipple head

Threaded, lever connections, etc. must be lubricated with oil.

It is recommended to check the lubrication of wheel hub bearings at least every 3 months. The bearing grease must be replenished or replaced once a year. When replacing the grease, remove the hub, remove any used grease, evaluate the condition of the bearings (replace if necessary), and after applying fresh grease and reassembling the hub, adjust the bearing play.

 <b>CAUTION</b>	<p><b>CAUTION!</b>            Use only high quality bearing grease.            Never drive without the hub cover, otherwise penetrating dirt (sand) will damage the wheel bearings.</p>
-----------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

**Table 2.** Lubrication points

Lubrication point	Lubricant grade	Lubrication interval
Wheel hub bearings	ŁT 43	At least every 3 months
Hydraulic cylinder head socket	Graphite grease	At least every 3 months
Components of the Trailer body tilting system	ŁT 43	At least every 3 months
Ring hitch	ŁT 43	At least every 3 months

Other components which require routine lubrication.

- Moving parts of locks, hinges and articulated joints
- Moving brake parts (levers and pins)

If it is necessary to lubricate the axle bearings of the brake shoes, apply very little grease.

### 2.3.10. Loading and unloading of the Trailer body

Have the loading and unloading of the Trailer body carried out by a person experienced in this type of work.

The Trailer body may only be loaded when the Trailer is coupled with a tractor, positioned on horizontal ground, and with the drawbar in the straight-ahead position. Preferably use mechanical loading devices like cranes, loaders, conveyors, etc. for loading. Before loading, check that both sideboard and extension locks are closed. When loading the Trailer, distribute the load evenly over the entire surface of the Trailer body. When transporting materials exerting point pressure on the floor of the body (concentrated loads, e.g. large stones), place thick boards on the floor before loading. This will allow a smaller surface load on the floor and protect it against damage. When transporting materials protruding beyond the Trailer's contour planes, road-traffic regulations must be observed and the protruding load



must be marked accordingly. Keep a safe distance from overhead power lines when lifting the Trailer body. Exercise special care when operating the Trailer body to avoid crushing the fingers.

Carrying persons, animals and hazardous materials is prohibited. Lifting the laden Trailer body with closed sideboards is prohibited. Jerking the Trailer forward to move unloaded volume loads, or other loads which are difficult to discharge, is prohibited. When unloading has been completed, make sure that the Trailer body is empty. It is absolutely forbidden to drive with the Trailer body lifted. It is forbidden to enter or reach between open sideboards and the Trailer body. Bystanders are prohibited from standing in the unloading/loading zone. The operator must ensure there is adequate visibility and that there are no bystanders in the unloading/loading zone.

When remedying a defect in the Trailer body, lower the body or, if it is necessary to lift the body, it must be secured with a support. The Trailer body must be empty, and the Trailer immobilised with the parking brake and wheel chocks.

### **2.3.11. Driving on public roads**

When travelling, you must comply with the traffic regulations of the country in which the Trailer is being operated. The speed must be adjusted to the road conditions and the loading level of the Trailer. It is prohibited to exceed the permissible design speed.

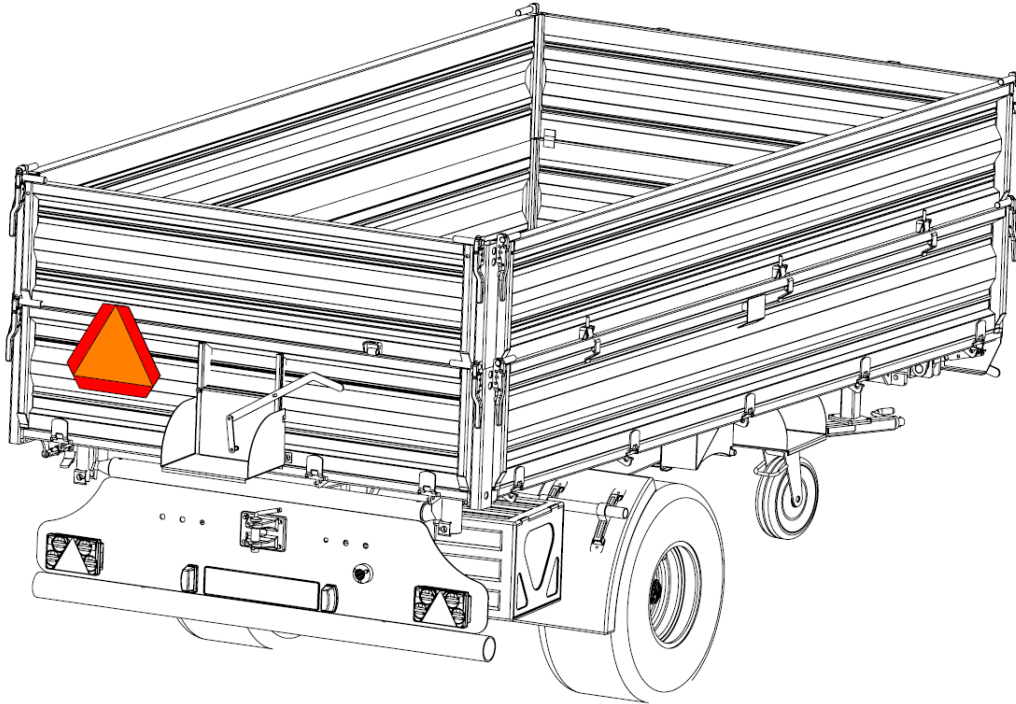
Check that the machine is correctly coupled before you start the transporting pass, especially the safety devices of the hitch pin. Before you start driving, it is essential to check that all pins are secured against falling out. Check that the rear sideboard gate is secured and make sure that all the sideboards of the Trailer body are properly closed.

Before each use of the machine, it is necessary to check the technical condition of the machine for safety. This in particular includes the drawbar, chassis, brake system and light signalling, as well as the hydraulic and pneumatic systems. Release the parking brake before driving.

Do not operate the Trailer on a slope with a ratio of more than 8°. Using the Trailer on a steeper gradient can cause the Trailer to tip over as a result of loss of stability.

It is forbidden to exceed the Trailer's gross weight. Exceeding this weight can cause damage to the machine and create danger while driving. Overloading the Trailer will reduce the braking system's performance.

When driving on public roads, you must comply with the road-traffic regulations of the Community Member State in which the Trailer is being operated. Amongst other things, the Trailer must be fitted with an approved triangle indicating slow-moving vehicles, if required, as shown in Fig. 5.



**Figure 5.** The location of the triangle indicating slow-moving vehicles

During transporting, the load must be distributed evenly and secured in such a way that it cannot move or tip over.

It is forbidden to climb onto and stand on the Trailer during a ride.

It is forbidden to park the Trailer on an incline.

There is a risk of the machine's tipping over when driving on sloping or uneven ground.



**CAUTION**

**CAUTION!**

Before each use of the machine, it is necessary to check the technical condition of the machine for safety.

When driving on public roads, you must provide the Trailer with an approved triangle to indicate slow-moving vehicles, if required by the regulations of the country in which the Trailer is being used.








It is forbidden to climb onto the Trailer while driving.






It is forbidden to park the Trailer on an incline.

## 2.4. Warning and information pictograms

### 2.4.1. List of pictograms

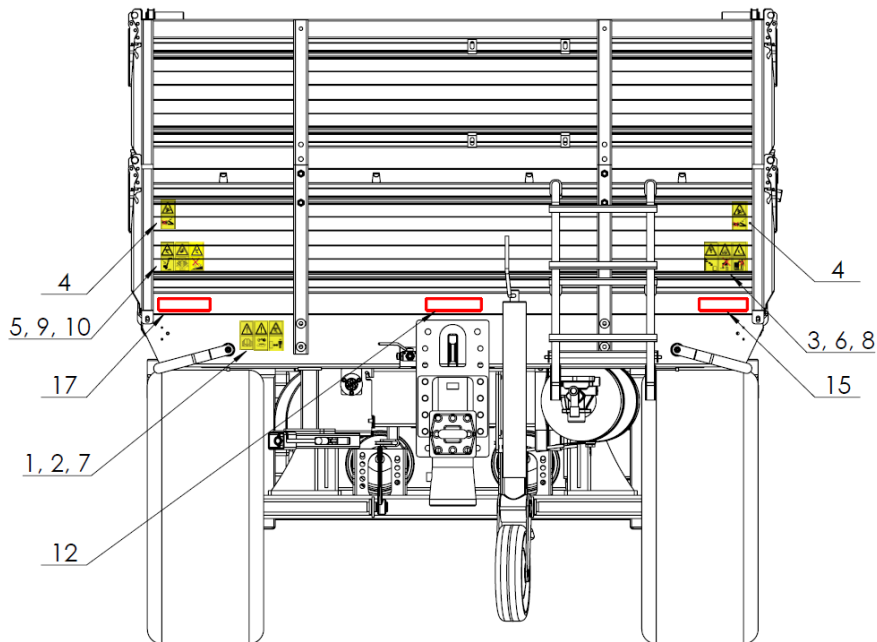
Table 3. Warning and information pictograms

No.	Pictograms	Meaning
1.		Attention. Before you start operating the machine, read the Instructions Manual.
2.		Attention. Before carrying out any maintenance or repair work, switch off the tractor's engine and remove the keys.
3.		Attention. Risk of electric shock. Keep a safe distance from overhead power lines.
4.		Attention. Finger crushing hazard. Do not reach into the crushing area if the parts are moving.
5.		Attention. Danger of crushing It is forbidden to carry out maintenance or repair work under an unpropped Trailer body.
6.		Attention. Danger of being run over. Travelling on the machine is only permitted on the passenger seat if the driver's visibility is not obstructed.
7.		Attention. Body crushing hazard. Keep a safe distance from the machine.

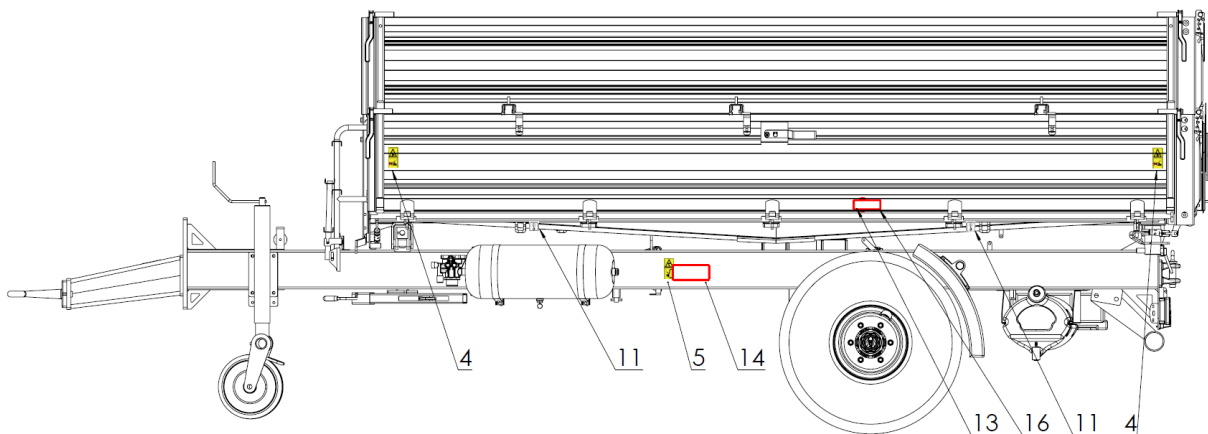
8.		<p>Attention. A fall from height Do not ride on platforms or ladders.</p>
9.		<p>Attention. Torso crushing hazard. Do not stand near the motion zone of the articulated coupling joints when the engine is running.</p>
10.		<p>Attention. Tilting the Trailer's body on an inclined surface is prohibited. Bodily injury can be caused by the machine tipping over and crushing.</p>
11.		<p>Sling attachment/Lifting point.</p>
12.		<p>Jacking point</p>
13.	<p>Load capacity 4.5 t Load capacity 5 t</p>	<p>For the variant with an overrun brake. For the variant with pneumatic or hydraulic brakes.</p>
14.	<p>Maximum tyre pressure</p>	
15.	<p>Caution! It is forbidden to carry out check and maintenance work with a loaded, tipped, or unsupported Trailer body.</p>	
16.	<p>Caution! It is forbidden to stand within the range of a load being discharged. It is forbidden to climb onto the Trailer while it is being driven.</p>	
17.	<p>Tighten the wheel nuts after a few kilometres and retighten periodically</p>	
18.	<p>Couple the Trailer with the tractor's top hitch only.</p>	

### 2.4.2. The arrangement of pictograms on the machine

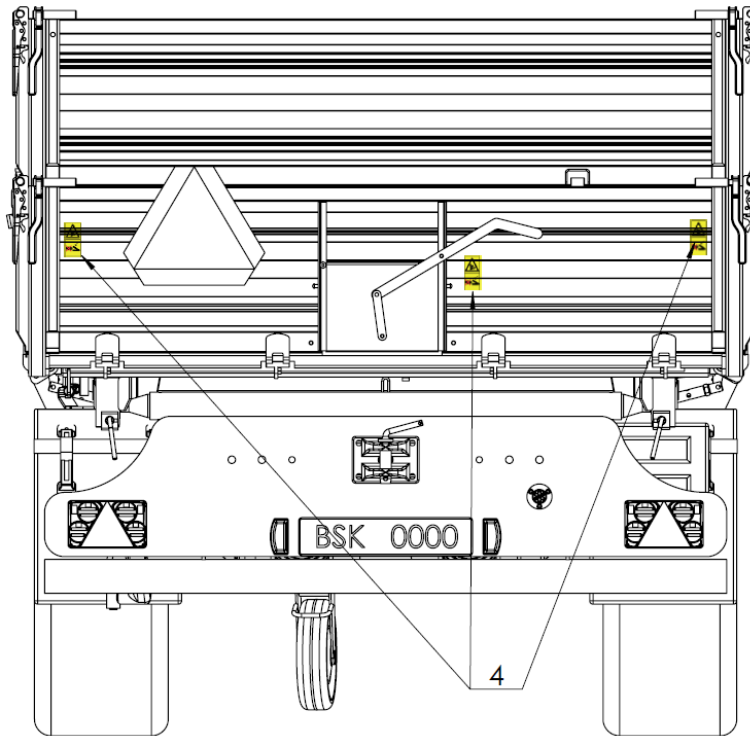
The warning signs and phrases on the Trailer must not be removed. They are intended for the safe handling of the Trailer. If the information sticker has been damaged or removed, it must be reordered. Stickers with phrases and symbols can be purchased at service points or from the Trailer's manufacturer.



**Figure 6.** The arrangement of pictograms on the front sideboard of the Trailer



**Figure 7.** The arrangement of pictograms on the left sideboard of the Trailer (symmetrical on the right-hand side)



**Figure 8.** The arrangement of pictograms on the rear sideboard of the Trailer



**CAUTION**

**CAUTION!**

The user of the Trailer must maintain over the whole period of operation the legibility of all warning inscriptions and signs affixed to the Trailer. If they are damaged or destroyed, replace them with new ones.

**2.5. Residual-risk descriptions**

Although the T957 Trailer is designed to guarantee the safety of its users, there is a residual risk of an accident. Certain risks are unavoidable when operating the Trailer. Residual risk stems from improper procedures implemented by Trailer operators, e.g. because of their lack of care or knowledge. The following prohibited actions cause the highest level of risk.

- Operation of the Trailer by minors or persons who are not authorised to drive a tractor, as well as persons who are not familiar with the Instructions Manual.
- Operation of the Trailer by persons who are sick or under the influence of alcohol or other intoxicating substances.
- Using the Trailer for purposes other than those described in the Instructions Manual.
- Standing between the tractor and the Trailer while the tractor's engine is running and when coupling the machine or additional Trailer.
- Bystanders, children in particular, standing close to the running Trailer.
- Persons or animals present in spaces not visible to the operator
- Failure to maintain a safe distance when loading or unloading the Trailer
- Tampering with the tractor drive train and Trailer moving parts during operation.
- Making changes to the structure without the Manufacturer's consent

- Cleaning, checking the technical condition or maintenance works during the operation of the machine.

When specifying the residual risks, we assume that the Trailer is a machine which was state-of-the-art designed and manufactured in the year of its manufacture.

Follow the guidelines below to reduce residual risk.

- Adhere to the safety rules described in the Instructions Manual
- Read the Instructions Manual carefully
- Use the Trailer according to the guidelines in this Manual
- Use the machine only for the purposes described in the Instructions Manual
- The Trailer may be operated only by persons who have been trained and have read the Instructions Manual
- Protect the Trailer against access by children and persons unauthorised to operate the machine
- Operating the unit in the presence of bystanders, children in particular, is forbidden
- Standing on the machine while the Trailer is in operation is forbidden
- Reaching into dangerous and prohibited places is forbidden
- The use of the Trailer by an operator under the influence of alcohol, drugs or stress is forbidden
- Keep a safe distance from prohibited or dangerous places when unloading, loading, or coupling the Trailer
- Maintenance and repair work must be carried out in accordance with the operational safety rules by persons who are appropriately trained

## **2.6. Test drive**

After checking the technical condition of your Trailer, you may couple it to a previously tested and technically sound tractor. You can then start the tractor to inspect the individual systems, perform a trial start-up of the Trailer, and perform an unladen test drive. Ensure you perform test tipping of the body to verify the correct operation of the tipping mechanism.

If any unusual symptoms occur during the test drive, eg. increased noise, friction noises generated by parts moving against the Trailer's structure, leakage of hydraulic oil or pressure drop in the pneumatic system or hydraulic system, or the like, it is necessary to diagnose the problem and rectify the defect or report the failure to the Manufacturer's service centre.

## **2.7. General**

A Trailer in the warranty period must be serviced exclusively by the Manufacturer's Guarantee Service Centre.

The Trailer's operation must be terminated immediately if any fault or damage is discovered.

Check the technical condition of the protective devices regularly.

Climbing onto the Trailer is only permitted when the Trailer is stationary and the tractor engine is switched off. Both machines must be secured with parking brakes. The wheels must be secured with chocks.

Exercise particular caution when entering the Trailer's structure. Use the ladder or platform on the front sideboard of the Trailer for climbing. Using other components not intended for the purpose of climbing the Trailer body is forbidden.

When carrying out maintenance and repair work, wear suitable protective clothing, including gloves, footwear, and goggles. It is essential to use the appropriate tools. Observe the generally accepted rules of work health and safety when working. In the event of injury, rinse and disinfect any wound, and, in the case of serious injuries, seek medical advice.

The Trailer body must be unloaded before starting work which requires lifting it. Tip the Trailer body to the side and use the support of the Trailer body to secure it against dropping. When doing so, ensure the Trailer is coupled with the tractor, and secured with chocks and the parking brake.

If it is necessary to replace subassemblies or technical components, use only parts recommended by the Manufacturer. The use of components other than those recommended can compromise health and life, and can void the warranty.

When carrying out repair work which involves welding, pay special attention to flammable or fusible components. If they are susceptible to ignition or damage, they must be dismantled or covered with non-combustible material before starting welding. Before you start the work, it is advisable that you make ready a CO<sub>2</sub> or foam extinguisher.

You are not permitted to repair the drawbar yourself. It is absolutely necessary that you replace a damaged drawbar with a new one.

Only use approved lifting equipment rated for the weight of the Trailer to be lifted when lifting works are required. When the machine is lifted, secure it with firm, strong and sturdy supports. Carrying out any work under the Trailer without securing it with supports is not permitted.

When carrying out lubrication work, ensure that no excess grease or oil remains on the machine. Remove any excess lubricant.

Risk of lightning strike during the Trailer operation.



### 3. Technical data

#### 3.1. Main technical data

**Table 4.** Main technical data

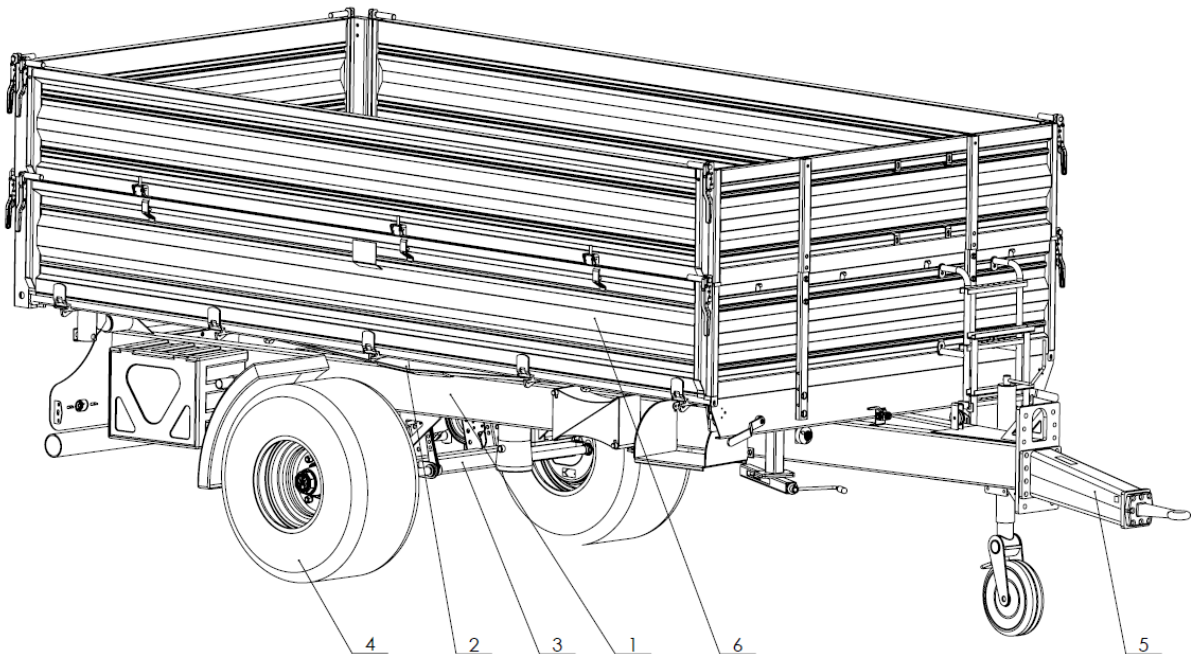
No.	General data	
1.	Type of vehicle	Farm Trailer
2.	Manufacturer	METAL-FACH Sp. z o.o., 16-100 Sokółka, ul. Kresowa 62
3.	Type (Model)	T957
4.	The location of the rating plate	Front crossmember
Dimensions/weights		
5.	Length, mm	Min. 6050 Max. 6400
6.	Width, mm	Min. 1900 Max. 2250
7.	Height, mm	Min. 1070 Max. 4000
8.	Number of axles, pcs	1
9.	Distance between the coupling point and the first axle, mm	Min. 4400 Max. 4650
10.	Wheel track, mm	Min. 1650 Max. 1750
11.	Drawbar-eye diameter, mm	40/50
12.	Vehicle ground clearance, mm	425
13.	Vehicle kerb weight, kg*	Min. 1800 Max. 2250
14.	Permissible total weight of the vehicle, kg	
	- pneumatic and hydraulic brakes variant	7250
	- overrun brake variant	7000
15.	Maximum axle load, kg	6250 kg (A80QI6QCN019) – pneumatic- and hydraulic-brakes variant 6000 kg (A80QI6IRN003) – overrun-brake variant
16.	Permissible load capacity of the vehicle, kg	Min. 5000 Max. 5200
17.	Number of wheels, pcs	2
18.	Maximum vertical load at the coupling point, kg	1000
19.	Tyre size and PR number	500/50 17PR; 19.0/45 17PR
20.	Tyre carrying capacity	Min. 3159 Max. 4125
21.	Tyre pressure, bar	3.5-8

Brake system		
22.	Service brake	
	- type	mechanical, drum brake
	- control system	- pneumatic – two-line system - hydraulic – two-line system - overrun brake
23.	- number of braked wheels	2
24.	Parking brake	
	- type	mechanical, drum brake
	- control system	manual, via worm gear - spring, via a double diaphragm spring brake actuator
	- number of braked wheels	2
25.	Rated voltage, V	12, from coupled tractor
26.	Maximum speed, km/h	40

\* Depending on the Trailer variant

### 3.2. General design and principles of operation

The T957 Trailer consists of a metal structure with an open load space. The main components of the Trailer include a bottom frame, top frame, drive axle, wheels, hitching adapter/overrun brake and the Trailer body (Fig. 9).



**Figure 9.** Trailer components

1 - bottom frame, 2 - top frame, 3 - drive axle, 4 - wheels, 5 - hitching adapter/overrun brake, 6 - body

### 3.2.1. Suspension

The Trailer features a rigid suspension. The axle is fitted to the Trailer by means of mounting plates.

### 3.2.2. Coupling adapter/overrun brake

The Trailer drawbar is supplied with a straight or slanted hitch adapter for versions with a pneumatic or hydraulic brake system. There are threaded holes in the mounting plate for adjusting the height of the adapter depending on the setting. In the overrun brake Trailer variant, an overrun device has the same function and is fixed in the same way as the hitch adapter.

### 3.2.3. Rear hitch

The manufacturer has developed two types of the rear hitch, automatic or manual. The permissible loads for the rear hitch, depending on the rear hitch's manufacturer, are shown in Tab. 5.

**Table 5.** Permissible vertical hitch loads for the variants with pneumatic or hydraulic brakes

Brand	V.Orlandi	Rockinger	V.Orlandi	Rockinger
Type designation by the manufacturer	MH31H	810 B50	AH31H	865 B50
Towable weight (t)	7.25 tonnes	7.25 tonnes	7.25 tonnes	7.25 tonnes
Maximum permissible vertical load on the coupling point	2500 kg	2000 kg	2500 kg	2500 kg

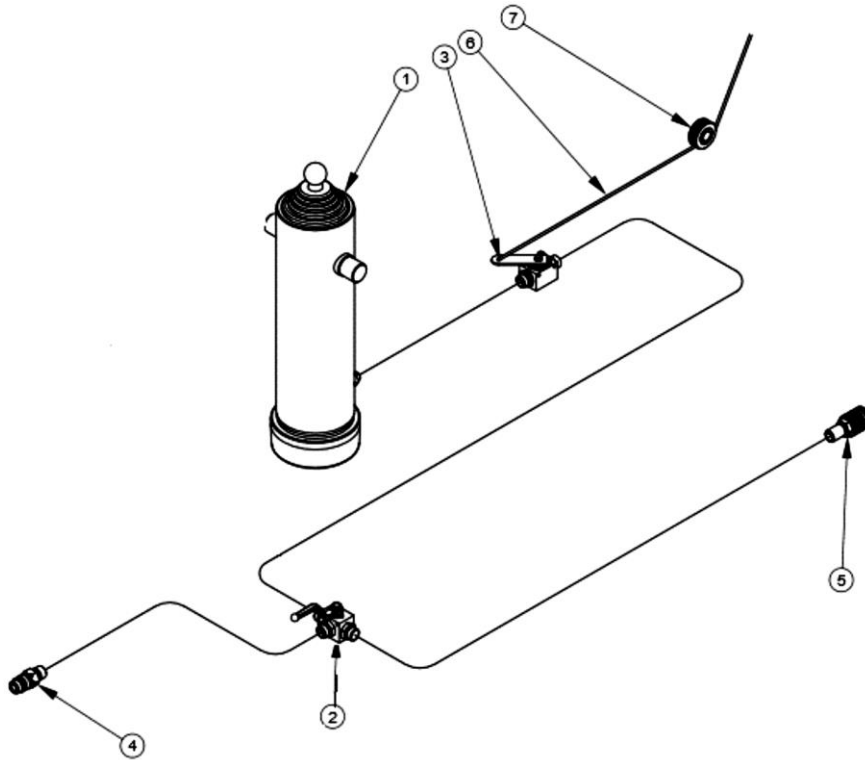
### 3.2.4. Load space

The Trailer's load space consists of an upper frame, which is mounted on the lower frame in articulated sockets secured with pins, which are pivot points during the tilting action of the upper frame with the Trailer body. The Trailer body is also supplied with sideboards and side extensions. Each of the components is fitted with a separate set of locks, which allows the closing and opening individual sections of the sideboards and extensions independently of one other, and in any possible order. Both the sideboards and the extension locks are protected against unauthorised opening. A working platform or ladder can be mounted onto the front sideboard of the Trailer body.

### 3.2.5. The tilting mechanism of the Trailer body

The body-tilting hydraulic mechanism is used for the automatic unloading of the Trailer by tilting the body backwards or to the sides. The hydraulic system of the tilting mechanism is supplied with oil from the tractor's hydraulic system.

The hydraulic system consists of a plug for the coupling valve, hydraulic hoses, a single-acting hydraulic cylinder, and a shut-off valve, as well as fastening and fixing components. See Fig. 10 for the diagram of the hydraulic system of the Trailer body's tilting mechanism. A valve block in the tractor's hydraulic system is used to control the raising and lowering of the Trailer body.



**Figure 10.** The hydraulic system of the Trailer body tilting mechanism

- 1 - telescopic actuator, 2 - three-way valve, 3 - shut-off valve, 4 – quick-coupling plug, 5 – quick-coupling socket, 6 - steel cord, 7 - roller

The bottom frame of the Trailer is fitted with a structure which is used to protect against Trailer body drop during maintenance and repair works. It is essential that you use the support structure as it provides protection for the user against bodily injury.



**CAUTION**

**CAUTION!**

It is forbidden to carry out maintenance and repair work under the Trailer body if it is not secured!

### 3.2.6. Pneumatic brake system

The Trailer comes with a pneumatic two-line single-circuit brake system. The two-line brake system is compatible only with tractor's two-line pneumatic system. Coupling the Trailer with a tractor by means of a single-line pneumatic and hydraulic system is prohibited.

The brake system is started by the pneumatic brake system of the towing vehicle. Both brake lines which link the pulled vehicle with the towing vehicle are fitted with filters. The red brake hose supplies the Trailer's brake system with compressed air. The yellow brake hose is a line which controls the brake force of the Trailer. The higher the pressure in the control hose, the stronger the performance of the Trailer brakes. The pressure in the control hose rises along with the rising pressure applied to the brake pedal in the towing vehicle. If the red brake hose is disconnected from the towing vehicle, the emergency brakes of the Trailer are enabled.

Reduce and control the braking force of the unladen Trailer by means of the Trailer's manual brake-force regulator. Depending on the Trailer variant, there can be 4 types of brake system, as shown in the following diagrams.

### **3.2.7. The hydraulic-brake system**

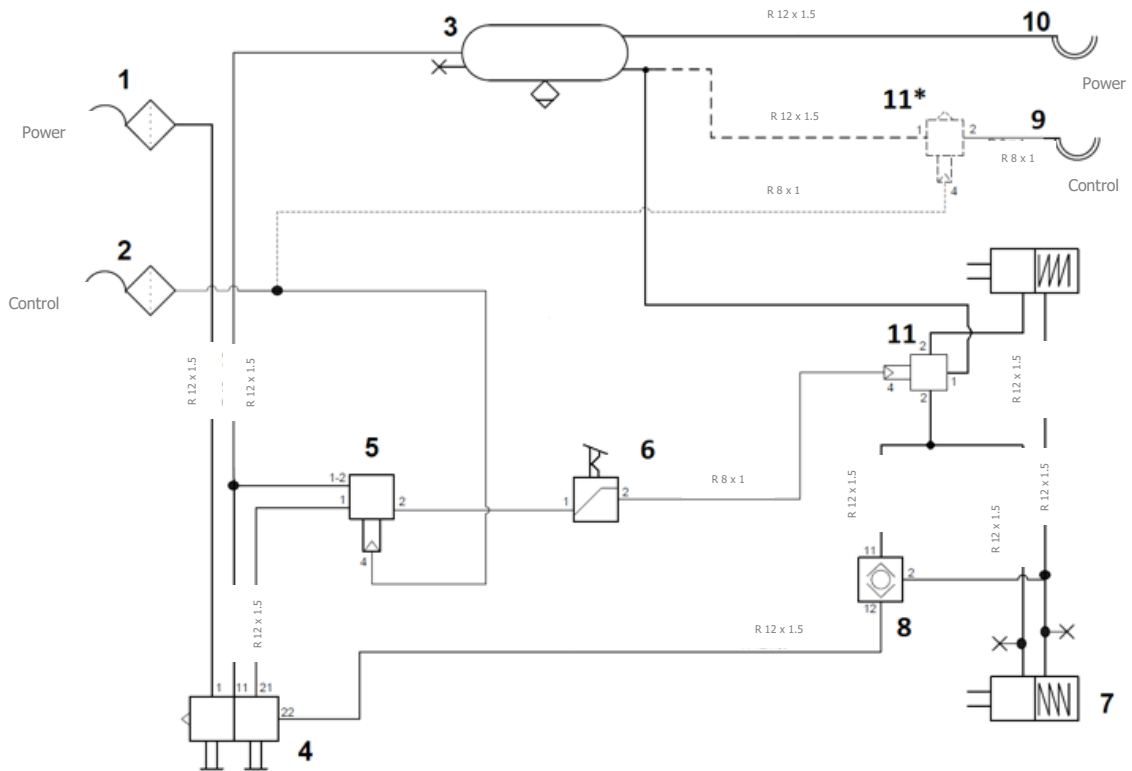
The Trailer's braking system is supplied with a main brake valve with a hydraulic pressure accumulator, manual brake-force regulator. and hydraulic cylinders. The Trailer's two-line braking system is connected to the tractor by means of three hydraulic lines, namely a supply line, a control line, and a return line, and an electrical connector for controlling the main valve. There is a constant pressure in the supply line. In the control line, the pressure level appears as soon as the tractor begins braking. The pressure in the control line is increased proportionally to the braking force of the tractor. The braking force of the Trailer is proportional to the pressure on the control line. If the main valve loses signal from the power line or the solenoid valve, it applies the emergency brake.

### **3.2.8. Inertia braking (overrun drawbar)**

The inertia (overrun) braking results from the Trailer's running over the tractor when the tractor brakes are applied.

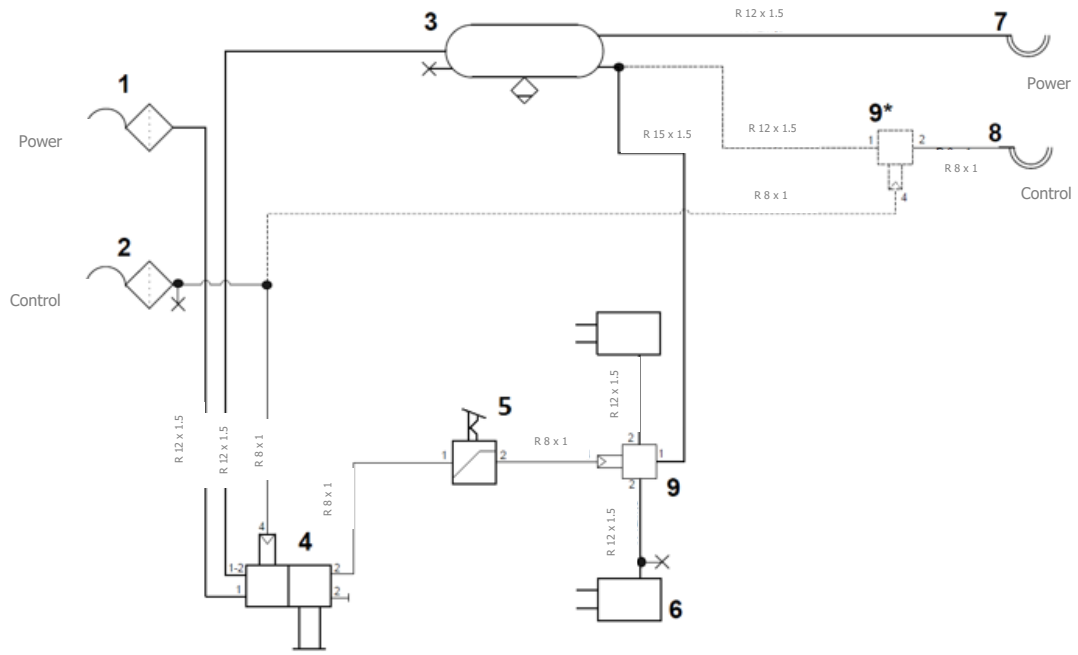
As a result, the levers acting on the axles start braking (service brake). The inertia brake is supplied with an emergency brake. A special cord triggers the emergency brake should the Trailer and tractor uncouple.

The parking brake is applied using a lever on the overrun device.



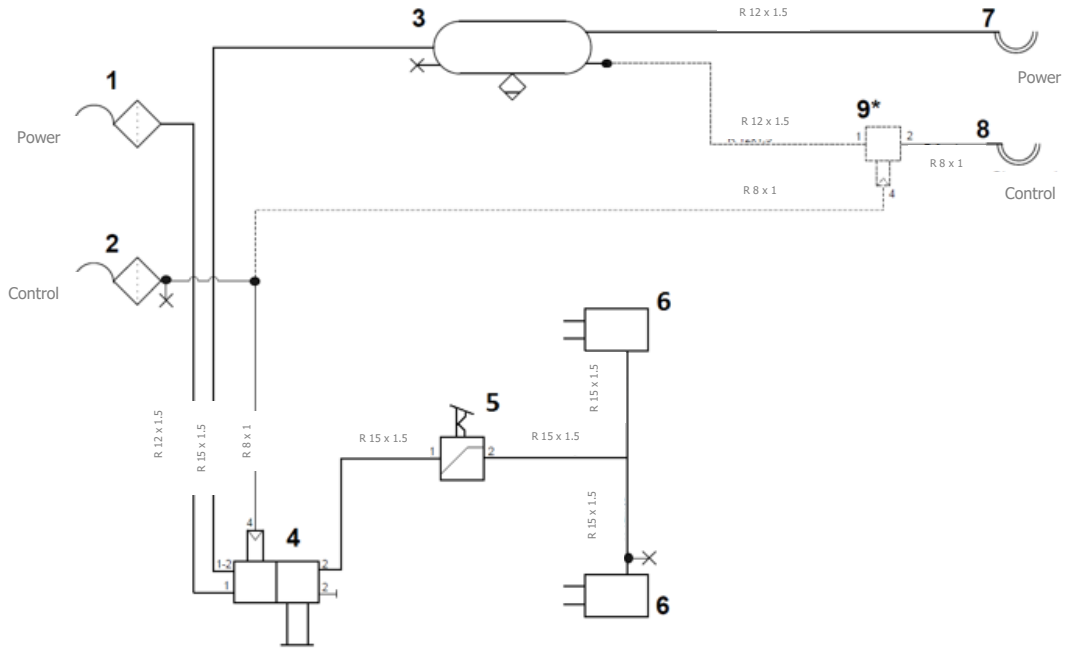
No.	Name of the part
1	Hose coupling with filter, supply
2	Hose coupling with filter, control
3	Air tank
4	Breakaway parking valve
5	Trailer brake valve
6	Manual braking-force regulator
7	Diaphragm spring brake actuator
8	2/3-way valve
9	Rear hose coupling with valve, control
10	Rear hose coupling with valve, supply
11	Relay valve
11*	Optional relay valve

Two-line brake system with diaphragm spring brake actuators and relay valves



No.	The name of the part
1	Hose coupling with filter, supply
2	Hose coupling with filter, control
3	Air tank
4	Brake valve with brake release
5	Manual braking-force regulator
6	Membrane brake cylinder
7	Rear hose coupling with valve, supply
8	Rear hose coupling with valve, control
9	Relay valve
9*	Optional relay valve

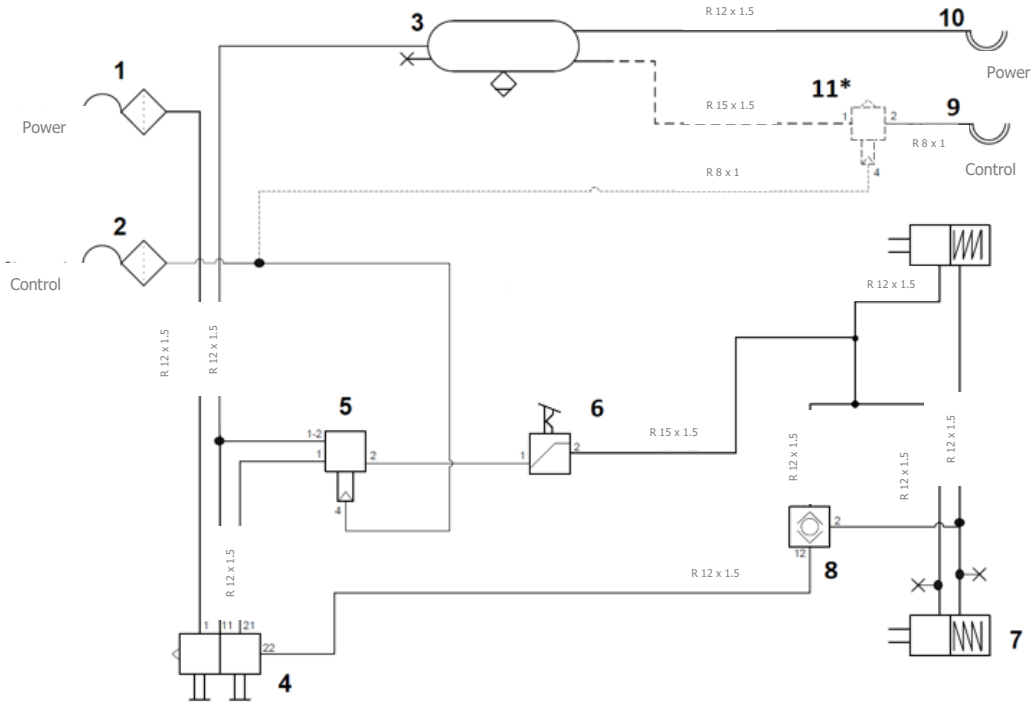
Two-line main braking system with relay valve



No.	The name of the part
1	Hose coupling with filter, supply
2	Hose coupling with filter, control
3	Air tank
4	Brake valve with brake release
5	Manual braking force regulator
6	Membrane brake cylinder
7	Rear hose coupling with valve, supply
8	Rear hose coupling with valve, control
9*	Optional relay valve

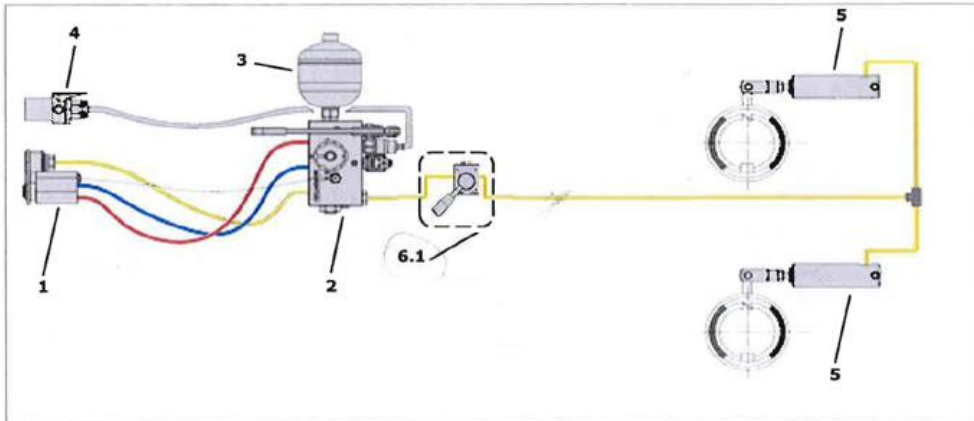
Two-way main braking system





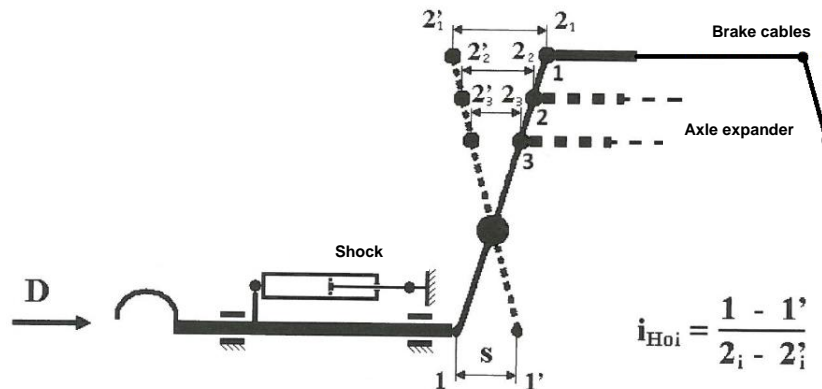
No.	The name of the part
1	Hose coupling with filter, supply
2	Hose coupling with filter, control
3	Air tank
4	Breakaway parking valve
5	Trailer brake valve
6	Manual braking force regulator
7	Diaphragm spring brake actuator
8	2/3-way valve
9*	Rear hose coupling with valve, control
10	Rear hose coupling with valve, supply
11*	Optional relay valve

Two-line brake system with diaphragm spring brake actuators without relay valve



Two-way hydraulic braking system

1 – hydraulic-brake connector, 2 - main brake valve with accumulator, 3 - accumulator, 4 – electrical-brake connector, 5 - hydraulic cylinders, 6.1 - manual brake-pressure regulator



Stroke = 78 mm

Gear reduction of the control unit

$$i_{H0} = (1 - 1') / (2 - 2')$$

with mechanical transmission

$$i_{H01} = 78 / 93 = 0,84$$

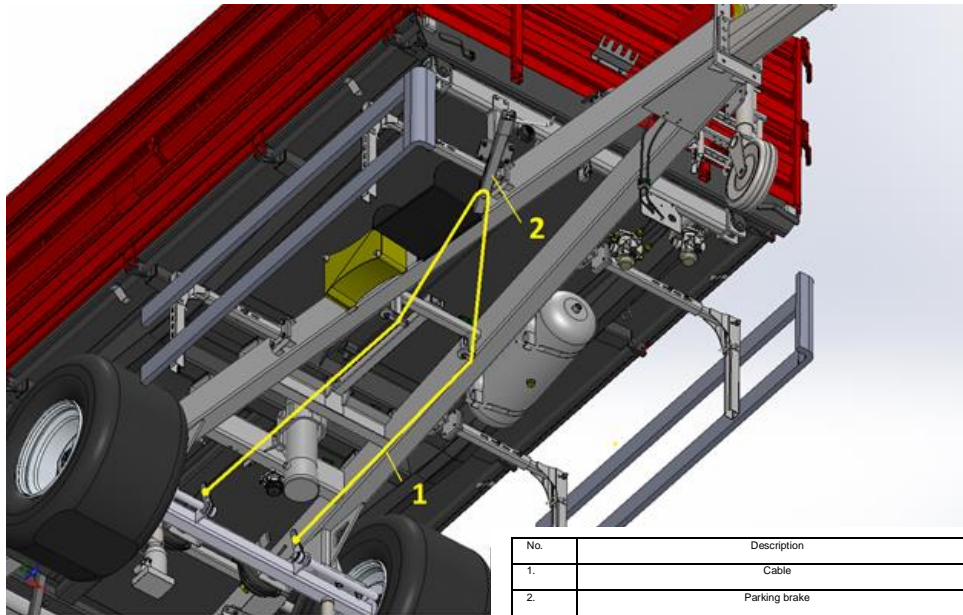
$$i_{H02} = 78 / 69 = 1,13$$

$$i_{H03} = 78 / 46 = 1,70$$

Diagram of the inertia (overrun) brake system

### 3.2.9. Parking brake

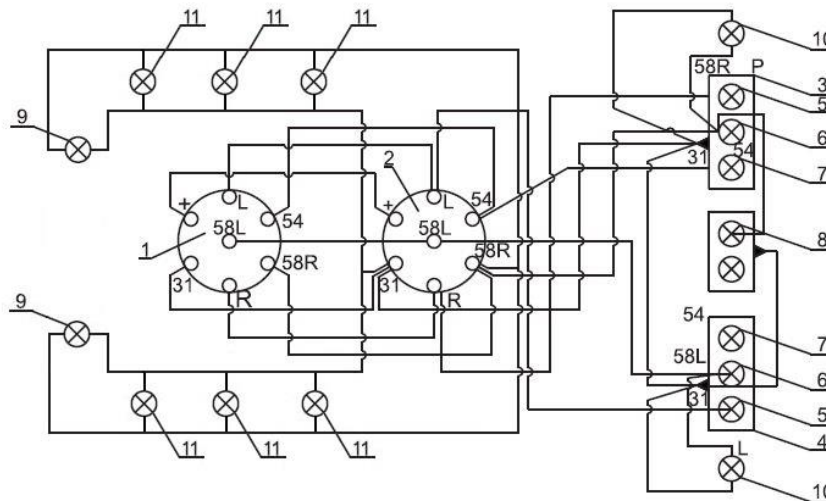
The parking brake is used to immobilise the Trailer when parked and when carrying out repair and maintenance works. The crank mechanism of the brake is installed under the bottom frame ledger. A steel cable is connected to the levers of the rear drive axle expander and to the crank mechanism tensioning the cable. Tensioning the cable, triggered by turning the crank of the mechanism in the clockwise direction, makes the expander levers swivel and actuate the brakes. The permissible force on the crank of the brake cable pulling mechanism is 15 kg. Higher forces can damage the brake components.



**Figure 17.** Parking brake

### 3.2.10. Lighting system

The Trailer's electrical system is designed for a 12V DC power supply. Use a suitable connecting cable to connect the Trailer's electrical system to the tractor.



**Figure 18.** Lighting system diagram

1 - 7-pole plug, 2 - 7-pole socket, 3 - rear lamp cluster, right, 4 - rear lamp cluster, left, 5 - light bulbs, direction indicators, 6 - rear position-lamp bulbs, 7 - brake "STOP" bulbs, 8 - number-plate-lamp bulbs, 9 - front position lamp, 10 - marker light, 11 - side marker light

## INDEX OF NAMES AND ABBREVIATIONS

**bar** – unit of pressure

**kg** – kilogram, weight unit

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

**kPa** – kilopascal, pressure unit

**kW** – kilowatt, power unit

**m** – metre, length unit

**min** – minute, an auxiliary time unit equal to 60 seconds

**mm** – millimetre - auxiliary length unit equal to 0.001m

**Nm, newton metre** – a unit for moment of force in the SI system

**Pictogram** – an information plate

**T** – tonne, a unit of weight

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

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

**V** – Volt, a voltage unit

**VIN** (Vehicle Identification Number) – the vehicle identification number assigned and placed by the manufacturer

**Hitch, the lower transport hitch** – hitch components of a farm tractor (see a tractor instructions manual)

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## NOTES

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