METAL-FACH

TRAILER WITH A SLIDING SYSTEM
T935, T951

INSTRUCTIONS MANUAL PART I

TRANSLATION OF THE ORIGINAL INSTRUCTION MANUAL

REV. II

MARCH 2024

Instruction Manual No. T935/6_T951/6-02-3600/2015

EC DECLARATION OF CONFORMITY

The undersigned,	Jacek Kucharewicz, President of the Board,	
hereby declares, with full responsibility, that the complete machine:		
NAME		
1.1.	Brand (trading name of the manufacturer)	Metal-Fach
1.2.	Type:	T935 & T951
1.2.1.	Variant:	T935/6, T951/6
1.2.2.	Version:	
1.2.3.	Trade name(s) (if any):	Trailer with a sliding system
1.3.	Category, subcategory and vehicle speed indicator	R3a, R4a
1.4.	Company name and manufacturer's address:	Metal-Fach Sp. z o.o. ul. Kresowa 62 16-100 Sokółka, Poland
1.4.2.	Name and address of the manufacturer's authorised representative (if applicable)	
1.5.1.	Location of the manufacturer's rating plate	Right hand chassis frame side member
1.5.2.	Method used to fix the manufacturer's rating plate:	Bonded or riveted
1.6.1.	Location of the vehicle identification number on the chassis	Right hand chassis frame side member
2.	Machine identification number:	

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

The following harmonised standards were applied to assess the compliance.

PN-EN 1853+A1: 2009E, PN-EN ISO 13857: 2010P, PN-EN ISO 4254-1:2009E, PN-EN ISO 12100: 2012P

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

Safety Testing Report No. XXX/ XX /XX

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

Sokółka, Poland
(Place)

00.00.0000
(Date)

Jacek Kucharewicz
(Signature)

President of the Board
(position)

Machine data

Machine type:		Trailer with a sliding system
Trade name		T935/…, T951/…
Serial number/ VIN [1]		_____
Machine manufacturer:		METAL-FACH Sp. z o.o. 16-100 Sokółka ul. Kresowa 62 Tel: (0-85) 711 98 40 Fax: (0-85) 711 90 65
Seller:		_____
	Address:	_____
		_____
	Tel/Fax:	_____
		_____
Delivery date:		_____
Owner or user:	Last Name:	_____
	Address:	_____
		_____
	Tel/Fax:	_____

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

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PART II

INTRODUCTION

The information included in the user manual is valid as of the date it was drawn up. The manufacturer reserves its right to make design changes to machines, and due to this, some values or illustrations might not correspond to the actual specifications of the machine supplied to the user. The manufacturer reserves its right to make design changes without amending these instructions. The user manual is part of the basic equipment of the machine. Before using the machine, the user is obliged to read the contents of this user manual and to comply with its recommendations. This will ensure the safe operation and reliable performance of the machine.

The machine has been built in compliance with the standards in force and current regulations of the law. The manual describes the basic safety and operating principles of the T935/6, T951/6 Metal-Fach trailer.

The essential obligations of the manufacturer are shown in the Warranty Certificate, which includes the complete and currently prevailing regulations on commercial warranty services.

If you do not understand the information in the instruction manual, consult the original reseller of this machine or the manufacturer directly.

The spare parts catalogue functions as a separate list, and is attached in the form of a CD as part of the machine's purchase, and it is also available on the manufacturer’s website: www.metalfach.com.pl

The Warranty Card, including the terms and conditions of warranty, is attached to this Instruction Manual as a separate document.

Manufacturer’s address:

Metal-Fach Sp. z o.o.

ul. Kresowa 62

16-100 Sokółka

Contact:

Tel: (0-85) 711 98 40

Fax: (0-85) 711 90 65

The symbols used in these instructions:

DANGER

Hazard warning symbol: indicates a severe hazard that, if not avoided, may result in death or serious injury. This symbol warns against the most dangerous situations.

CAUTION

This symbol indicates very important information and instructions. Non-compliance can lead to serious damage to the machine, as a result of its incorrect operation.

WARNING

The symbol indicating the possibility of the occurrence of a hazard that, if not avoided, may result in death or serious injury. This symbol indicates a lower level of risk of injury than the DANGER symbol.

symbol indicating useful information.

This symbol indicates maintenance activities that should be performed periodically.

1. General description

1.1 Introduction

THE INSTRUCTION MANUAL IS PROVIDED WITH THE TRAILER'S BASIC EQUIPMENT

The machine can only be operated by persons who have read this Instruction Manual, are familiar with the design and operation of the trailer, and also with the operation of the tractor it works with.

Read and follow all the information provided in this Instruction Manual, in order to operate the machine in a safe manner. Abiding by the guidelines provided in the user manual ensures safe operation for the user, and also prolongs the machine's service.

1.2 Identification of the T935/6, T951/6 trailer

Identify the trailer by its rating plate, which has been permanently attached to the main frame.

The data on the rating plate of the trailer is shown in the figure below.

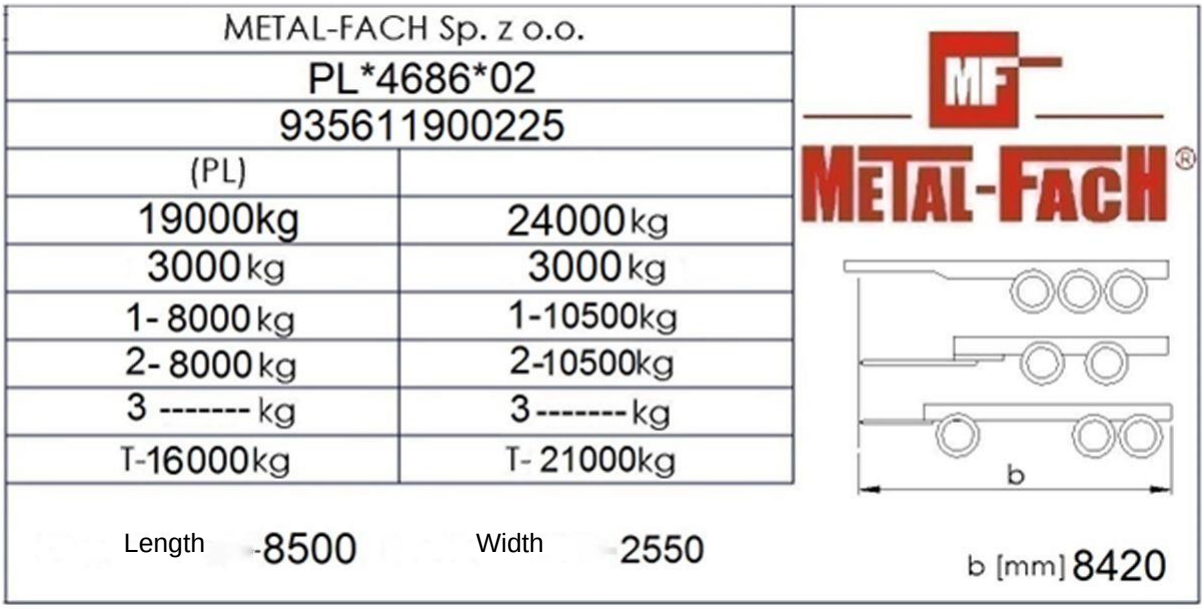


Figure 1. Rating plate

CAUTION

Every user of the trailer shall read and understand this Operating Manual before using the machine. This Operating Manual is essential equipment of the T935/6, T951/6 trailer.

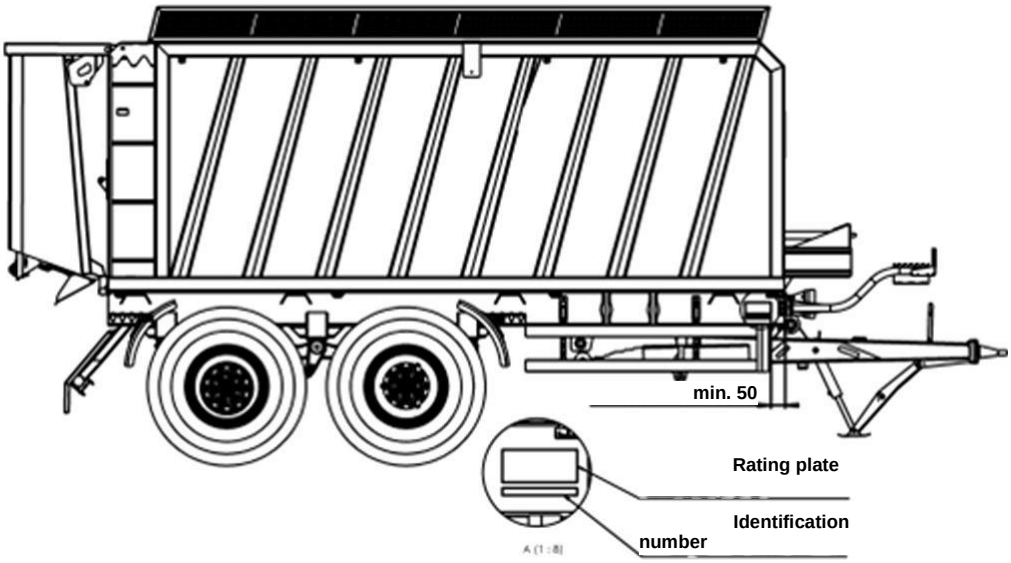


Figure 2. The position of the rating plate and serial number

CAUTION

CAUTION!
Entering public roads without the rating plate or with an illegible rating plate is prohibited.

When purchasing, make sure that the factory number printed on the machine's rating plate and the number provided in the instruction manual and Warranty Certificate are the same, this is crucial for recognising the guarantee. When contacting the technical service, the seller, or the manufacturer, the User is obliged to provide the information included on the machine's rating plate.

The Instruction manual is provided as the basic equipment of each trailer.

Should the trailer be sold to a different user, it is obligatory to hand the Instruction Manual to them. It is recommended for the trailer supplier to keep a record of the Instructions Manual's receipt confirmation by the purchaser, submitted with the machine to the new user.

Please read the operating instruction carefully!

If you follow its recommendations, it will be possible to avoid hazards, operate the machine efficiently and productively, and maintain the warranty for the duration granted by the manufacturer.

CAUTION

CAUTION!

The use of the trailer by those who have not read this Instruction Manual is forbidden.

1.3 Intended use of the trailer

The trailer is intended for the transport of agricultural produce and other bulk and loose materials on farms and public roads. The trailer is designed to be coupled with farm tractors that provide external hydraulic power, warning and marker/clearance light wiring and brake system connections, and a transport (pick-up) hitch.

CAUTION

Do not use the trailer to transport any fuel, gas cylinders, or similar loads that require compliance with other technical specification for the transport of dangerous goods.

Do not use the trailer to transport any toxic materials that could cause environmental contamination. The manufacturer is not responsible for the resulting damage – this risk is borne by the owner.

The trailer shall only be used by individuals who have read and understood the Operating Manual and who are trained in the risks of the machine and administration of first aid to victims of accidents.

Follow the applicable accident prevention regulations and other recognised practices of engineering safety, occupational medicine, and road traffic safety.

Unauthorised structural modifications to the trailer void the manufacturer's liability for consequential damage.

The machine operator shall use the machine in accordance with its intended use by the proper and safe operation and maintenance of this trailer as follows:

- Read and understand the operating principle of the trailer.
- Operate the machine safely and correctly.
- Always maintain or have the machine maintained on schedule.
- Comply with the general safety regulations.
- Comply with the traffic laws.

Table 1. Requirements for agricultural tractors

Description	Requirements	UoM
Braking system 2-line braking system Pressure rating of the system:	 as per PN-ISO-1728:2007 650–800	kPa
Hydraulic system Hydraulic oil Nominal pressure Oil purity	 HL 46 17.5 20/18/15 acc. to ISO 4406-1996	MPa
Electrical system Electrical system voltage Connection socket	 12 7-pole acc. to ISO 1724	V
Tractor hitch Minimum vertical load-bearing capacity of the hitch	 3000	kg
Minimum power demand of the tractor	T935 – 180 T951 – 220	HP
Minimum turning radius	6	m

1.4 Basic components

The basic components of each Trailer include the following.

- The Instruction Manual
- guarantee certificate and warranty conditions
- A bracket for fixing a slow-vehicle marking plate
- two-line pneumatic brakes with manually adjustable braking force;
- automatic parking brake (parking-release valve);
- lighting system;
- hydraulic tipping system;
- wheel chocks;
- lighting system;

1.5 Transport to the user

Transport the trailer from the dealership/manufacturer on its wheels, towed by a tractor, or on a low-bed trailer. Before loading on a low-bed trailer, couple the trailer to the transport hitch of the tractor and connect the trailer brake system lines. Drive the trailer onto the low-bed trailer using ramps. With the trailer on the low-bed platform, chock the wheels.

Next, disconnect the brake system lines and uncouple the trailer from the tractor. Secure the trailer with cargo straps to the low-bed trailer. Before unloading the trailer, deploy the ramps and release the cargo straps.

Next, drive the tractor close enough to connect the brake lines. Finally, remove the chocks from under the wheels of the trailer. Next, you can proceed to drive the trailer off the low-bed platform.

1.6 Storage

Protect the trailer against direct exposure to sunlight and rain, parked on firm ground, on its ground wheels secured with chocks (partially reduce the pressure in the tyres and protect them from direct sunlight).

If the trailer is exposed to weather, periodically inspect it to make sure the load body is not flooded with water. Inspect the paint coating for damage. Clean and degrease every damaged area of the paint coat and recoat with the same colour and to the same coating film thickness.

Long-term storage is only permitted inside shelters.

1.7 Sale

The buyer shall collect the trailer from the manufacturer or the dealership or coordinate for other delivery conditions.

The trailer is sold fully assembled, ready for operation, with its essential equipment, as specified in this Manual. Optional equipment can be purchased for an extra fee.

The dealership team is required to introduce the buyer into the structure and operation of the trailer, its safety requirements, and the warranty terms and conditions.

The buyer shall verify the following:

- The trailer is complete, undamaged, and provided with its essential equipment components;
- The VIN number is stamped on the rating plate, located on the front crossmember of the chassis frame, and the rating plate information is true to the entries on the warranty certificate;
- The warranty certificate is filled in correctly and true to the rating plate contents.

1.8 Environmental hazards

Leaking hydraulic and gear oils can pose a direct threat to the natural environment. Carry out all maintenance and repairs in areas with an oil-resistant surface if there is a risk of oil leakage. If an oil leak occurs, secure the source of the leak and collect the spilled oil. Use absorbent materials to collect oil residue. When collected, all pollutants must be stored in tightly closed, oil-resistant, and marked, containers.

DANGER

DANGER!
Store used hydraulic oil or any collected residue mixed with absorbent materials in tightly sealed containers. Do not use food containers for this purpose.

CAUTION

Dispose of all waste oil and used oil, in accordance with the applicable regulations.
It is forbidden to dispose of oil into the sewage system or water reservoirs.

1.9 Decommissioning

If the machine is to be withdrawn from use, the User must comply with the national regulations regarding withdrawing from use and recycling of end-of-life machines, applicable in a given country. Before dismantling, remove all oil from the hydraulic systems and gearboxes. Reduce air pressure in the braking system to the minimum.

DANGER

DANGER!
When dismantling, use suitable tools, lifting equipment and personal protective equipment such as gloves, shoes, protective clothing, glasses, etc.
Avoid contact with skin. Prevent any oil leaks.
Dispose of all waste oil and used oil, in accordance with the applicable regulations.
When changing worn, damaged, or unrepairable parts and components, send them to buy-back recycling centres.

CAUTION

CAUTION!
General health and safety regulations must be observed when loading and unloading the trailer. Those operating the loading and unloading equipment must have the required authorisation to use it.

2. Safety of use

2.1 Basic safety principles

2.1.1 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.

2.1.2 Symbols and definitions

Qualified personnel are individuals who, by virtue of education, experience and instruction, awareness of standards, definitions, safety regulations, and operating conditions, always perform the required actions while identifying the potential hazards and being able to avoid it.

This requires the understanding of first aid to accident victims (e.g. for treatment of cuts).

“Operation” means the actions of setting, commissioning (meaning preparation for use) and controlling (starting, engaging, disabling, stopping, etc.).

“Maintenance” means the actions of checks and care (by inspection and adjustment), servicing, and repairs (which involves troubleshooting).

Note and follow other (specifically indicated) specifications, which include:

- Transport;
- Installation/assembly;
- Operation;
- Servicing;
- Technical data (specified in the Operating Manual, the production folders, and on the trailer).

It is just as necessary due to the potential hazards (direct and indirect), which may result in severe injury or damage.

2.1.3 General work and use considerations

Each time before using the trailer, inspect it for safe operation.

- Follow the generally applicable safety and accident prevention regulations in addition to the information provided in this Operating Manual.
- Follow all safety symbols, warnings, and notices displayed on the trailer that provide important guidelines for the safe operation of the machine.
- Operate the trailer only if all the required equipment are connected and secured against unintentional detachment, uncoupling or opening (e.g. the hitch, the drawbar, and the couplings).
- Before operating, understand all the controls and their functions. It will be too late to do this while working!

- This trailer shall never be used by any personnel under the influence of alcohol or other stimulants, and/or untrained, and/or without the correct license for the operation of motor vehicles.

2.1.4 Operating safety

1) Provide all safety-relevant information to all users of this trailer.
2) Before operating the machine, inspect the direct vicinity (for any children and bystanders). Extreme attention is required if visibility is poor. Never stand on the trailer while it is being towed, coupled/uncoupled to/from a tractor, or being loaded/unloaded.
3) When unloading is complete, lower the load body all the way down. Never leave the trailer unattended with the load body raised/tipped back.
4) Enter the trailer only when it is stationary and the engine of the coupled tractor is stopped.
5) Always operate the load body tipping and lowering from the tractor operator's seat.
6) Couple the trailer according to prevailing regulations of law, connect it only to the recommended equipment, and secure the drawbar eye to the tractor's transport (pick-up) hitch.
7) Extreme caution is required when coupling/decoupling the trailer.
8) When installing and removing any support and safety devices and ladders, always place them in a position that ensures safe operation.
9) Do not exceed the maximum axle load, the gross weight, and the transport clearances.
10) Check the transport equipment by inspecting the connections and operation of the light and brake systems, the Slow Vehicle warning plate, and other protective devices and equipment.
11) Before driving out, test and verify that the lights and brakes are operational, and prepare the trailer in accordance with the instructions in the section "Driving on public roads".
12) Consider all changes in behaviour of the towing vehicle and the steering and braking performance caused by the coupled trailer and its load.
13) When towing the trailer, remember the distribution of its load and/or forces of inertia, especially if the load is asymmetrical.
14) Do not stay within the range of the load to be discharged.
15) Operate the hydraulic tipping movement of the load body only when:
    - the trailer has been coupled to the tractor;
    - the trailer is standing on a flat and sound surface;
    - there is no one within the unloading area;
    - the tractor is aligned with the centreline of the trailer;
    - there is a safe distance from overhead power lines;
    - there are no strong gusts of wind;
    - when there is no risk of lightning strike;
16) If you need to unload the trailer from the rear down a slope, the tractor and trailer should be parked uphill. When unloading from the side down a slope, tip the load body to the side opposite to the roll of the trailer.
17) For all work with the tailgate raised, secure the tailgate to prevent it from falling. Use of the supplied non-return valve is recommended.
18) Be careful to avoid crushing fingers and hands when opening and closing the side walls of the load body.
19) Mind the crush and shear hazard points when operating the trailer. There is a risk of injury when coupling and uncoupling the trailer to and from the tractor. Do not enter between the

trailer and the tractor when coupling and uncoupling and do not stand behind the trailer if it is not secured with wheel chocks or its parking brake.
20) No-one may stand between the tractor and the trailer unless the vehicle has been secured against rolling using the parking brake and/or by placing a wheel chock.
21) Secure the trailer and the tractor against rolling when stationary.
22) Never drive with a tipped load body.
23) Keep a safe distance from overhead power lines when tipping the load body. The trailer front wall displays Symbol C.2.30 specified PN-ISO 11684:1998 “Warning of Overhead Power Lines”.
24) For repair and maintenance work that requires the load body to be lifted, empty it and secure with the mechanical safety support to prevent accidental dropping of the load body.
25) Always adapt your driving speed to the prevailing conditions.
26) Avoid sudden turns when driving up or down a slope. Maintain a sufficient safe distance when turning with the coupled trailer.
27) When reversing, ensure that you have sufficient visibility (if possible, have someone assist you with guidance).
28) When cornering, consider the inertia of the trailer.
29) Before installing any additional protection on the load to be carried with the trailer, e.g. chains, tarpaulins, plastic sheet, nets etc., turn off the tractor engine and remove the ignition key.
30) Do not attempt to troubleshoot any coupled machine/implement before turning off the engine and removing the ignition key.
31) Do not enter the load body without turning off the power take-off and the engine first. Remove the ignition key.
32) Turn off the engine and remove the ignition key before leaving the tractor cab. Engage the parking brake and secure the trailer with wheel chocks.
33) The maximum permitted pressure in the hydraulic power system is 16 MPa.
34) The maximum permitted pressure is 0.63 MPa for a single-line pneumatic system and 0.8 MPa for a double-line pneumatic system.
35) When preparing the trailer for operation by connecting the hydraulic and pneumatic hoses etc., turn off the tractor engine and remove the ignition key first.
36) The Manufacturer delivers the trailer fully assembled.
37) Replace the hydraulic hoses every 6 (six) years.
38) Noise level – the equivalent A-weighted emission sound pressure level (LpA) does not exceed 70 dB.

2.1.5 Tyres

1) When servicing the tyres, secure the trailer from rolling away unintentionally.
2) Any repair work on tyres and wheels shall be carried out by skilled personnel using suitable tools.
3) The air pressure must be checked regularly. Maintain the recommended tyre inflation pressure.
4) Protect the tyres from sunlight when parked for a long time.
5) Change the wheels with the trailer empty, whenever feasible to do so.

2.1.6 Hydraulic system

1) The hydraulic system is under high pressure.

2) Routinely check the condition of the hydraulic connections and lines/hoses. NEVER leave any hydraulic fluid leak from the system unrepaired.
3) Too much wall pressure on the tailgate (e.g. when discharging through the grain shaft) restricts the pressure regulator valve in the hydraulic system. It is forbidden to adjust the valve during use of the trailer, as it is a relief device and is set at the factory.
4) Whenever the hydraulic system fails, remove the trailer from service until repairs are complete.
5) When connecting the hydraulic hoses to the tractor, make sure that the tractor-side and trailer-side hydraulic systems are depressurised. Whenever necessary, bleed all residual pressure from the systems.
6) Use the hydraulic fluid recommended by Metal-Fach.

CAUTION

If you are injured by a jet of hydraulic fluid, seek medical attention, as hydraulic fluid can penetrate under the skin and cause infection. Wash the skin contaminated with hydraulic fluid with water and soap. DO NOT USE ORGANIC SOLVENTS (including petrol or naphtha).

CAUTION

If the hydraulic fluid gets in the eyes, rinse them with plenty of water. If irritation occurs, consult a doctor.

2.1.7 Working with the PTO shaft

- The trailer may only be connected to the tractor, by means of an appropriately selected PTO shaft recommended by the Manufacturer.
- Before starting work, read the Instruction Manual of the drive shaft and follow its guidelines.
- Connect and disconnect the PTO shaft only when:
  - the spreader is coupled with the tractor hitch,
  - the tractor's engine is switched off,
  - the key is removed from the ignition switch,
  - the parking brake is on,
  - and the PTO shaft is switched off.
- Before starting the tractor coupled with the trailer, make sure that the PTO shaft drive in the tractor is switched off.
- The PTO shaft must be fitted with guards.
- It is forbidden to use the PTO shaft without its guards or with damaged components.
- Install the articulated telescopic shaft, in accordance with the guidelines provided in the Operating Instructions issued by the shaft's Manufacturer.
- Secure the guards of the PTO shaft against rotating, using chains. Fasten the chains of the shaft to the permanent structural components of the trailer and the tractor.

- The PTO shaft's guard is marked indicating which end of the shaft should be installed on the machine's side and which on the tractor's side. The protective couplings must always be fitted on the machine side.
- After installing the PTO shaft, make sure that it is correctly and safely connected to the tractor and the trailer.
- Each time you start the trailer, make sure that the PTO shaft's guards are in good technical condition and correctly positioned. Change any damaged or faulty components for new ones.
- When working with and maintaining the machine, it is forbidden to wear loose clothing, which can be caught by the rotating parts of the PTO shaft. Any contact with a rotating articulated telescopic shaft can result in a serious injury or death.
- When working in conditions of reduced visibility, use the tractor's service lights to ensure adequate sight of the working PTO shaft and its immediate vicinity.
- Transport and store the PTO shaft horizontally with its chains fastened together, to prevent damage to the guards and other components.
- It is forbidden to overload the PTO shaft and the drive system of the trailer adapter. It is not allowed to suddenly start the PTO shaft of the tractor. Before starting the PTO shaft, make sure that the direction of rotation is correct.
- **Use a PTO shaft speed of 1000 rpm during operation.** Operating at different speeds can damage the machine or its components.
- Switch off the PTO drive, whenever there is no need to drive the machine, or when the tractor and trailer are positioned at an unfavourable angle.
- Do not exceed the maximum permissible working length of the PTO shaft.
- When uncoupling the PTO shaft from the tractor, place it in the special holder designed for that purpose.
- It is forbidden to use chains for suspending or supporting the PTO shaft when the trailer is parked or transported.

2.2 Residual risk

2.2.1 Residual risk description

Although METAL-FACH Sp. z o.o. in Sokółka is liable for the design and structure of the machine to eliminate its hazards, some risks are unavoidable when the trailer is in operation.

These residual risks can be a result of human error by the trailer's operator, caused by carelessness, ignorance or improper behaviour. The following prohibited actions cause the highest level of risk:

- Operation of the trailer by minors and those who are not authorised/licensed to operate a tractor, as well as those who do not understand this Operating Manual;
- Operation of the trailer by any personnel who are unwell, intoxicated by alcohol or other intoxicants, drugs or narcotics;
- Using the trailer for purposes different from the intended use specified in this Operating Manual;
- Standing between the tractor and the trailer while the tractor's engine is running;
- Bystanders, children in particular, standing close to the trailer in operation;
- Cleaning the trailer in operation;

- Tampering with the tractor's drive train and the Trailer's moving parts when the machines are in operation;
- Inspecting the technical condition of the trailer in operation.

In the specification of residual risks, the trailer is interpreted as a machine that has been designed and manufactured in accordance with the state of the art in the year of its production.

2.2.2 Residual risk assessment

Compliance with the following instructions:

1) Follow the safety principles specified in the Operating Manual;
2) Read the Operating Manual carefully;
3) Do not reach into dangerous and/or restricted areas with your hands;
4) Do not operate the trailer in the presence of bystanders, children in particular;
5) The trailer shall be maintained and repaired by suitably trained personnel only;
6) The trailer shall only be operated by personnel with prior instruction and understanding of the Operating Manual;
7) Keep the trailer out of the reach of children;
8) ... facilitates the elimination of the residual risks of trailer operation, to prevent hazards to people and the environment.

WARNING

Failure to comply with the instructions and guidance provided herein may result in residual risks!

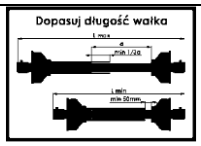
2.3 Warning and information stickers

Do not remove any warning signs or inscriptions located on the trailer. They are intended for the safe handling of the trailer. If an information notice sticker is damaged or removed, reorder a duplicate. You can purchase the warning and notice stickers from service points or the trailer's manufacturer.

Table 2. Information and warning stickers

No.	Safety symbol (sign)	Meaning of the symbol (sign) or content of the inscription	Location on the trailer
1.		Caution! Before you start operating the machine, read the Instruction Manual.	Load body front wall

2.		Turn off the engine, remove the key, and disconnect the telescopic shaft before servicing or repairing.	Load body front wall
3.		Caution! Risk of electric shock. Keep a safe distance from power lines.	Load body front wall
4.		Do not reach into the crushing area if parts may move	Load body front wall and tailgate
5.		Caution! Install the safety support before entering the hazardous area	Chassis frame side member, by the safety support
6.		Caution! Do not ride on the machine – use the passenger seat only	Load body front wall
7.		Caution! Keep clear of the machine	Load body front wall
8.		Caution! Risk of falling. Do not travel on platforms or ladders.	Next to the ladder

9.		Caution! Hazard of finger/toe crushing Force applied from the top.	At the safety support
10.		Caution! Risk of impact, crushing. Opening, closing flap area.	At the tailgate
11.		Caution! Torso crushing hazard. Stay clear of the area where the articulated coupling joints rotate, if the engine is running.	Load body front wall
12.		Caution! Danger of being dragged in by the drivetrain. Do not reach into the area of rotating parts.	At the front wall of the spreader body and at the rear on the right-hand side of the spreader body
13.		Attachment points of the transport tie down straps	At the attachment points
14.		Jacking point	On the running axle
15.		PTO rotational speed	On the front sheath
16.		Adjust the length of the shaft	On the hitch

	Warning inscriptions	**Meaning of the symbol (sign) or content of the inscription**	**Location on the trailer**
17		Max 30 kN	Drawbar
18		Do not attempt any inspection or servicing under the load body if loaded or tipped without a safety support.	At the safety support, on the frame side member

19		Keep clear of the discharged load It is forbidden to climb onto the Trailer while it is being driven.	Load body front wall
20		Load capacity: 18 t – T935/6, 27 t – T951/6	On the front frame wall
21		Maximum hydraulic system pressure 16 MPa	Frame front wall
22		Adapter weight ...	On the adapter frame

2.4 Location of signs on the machine

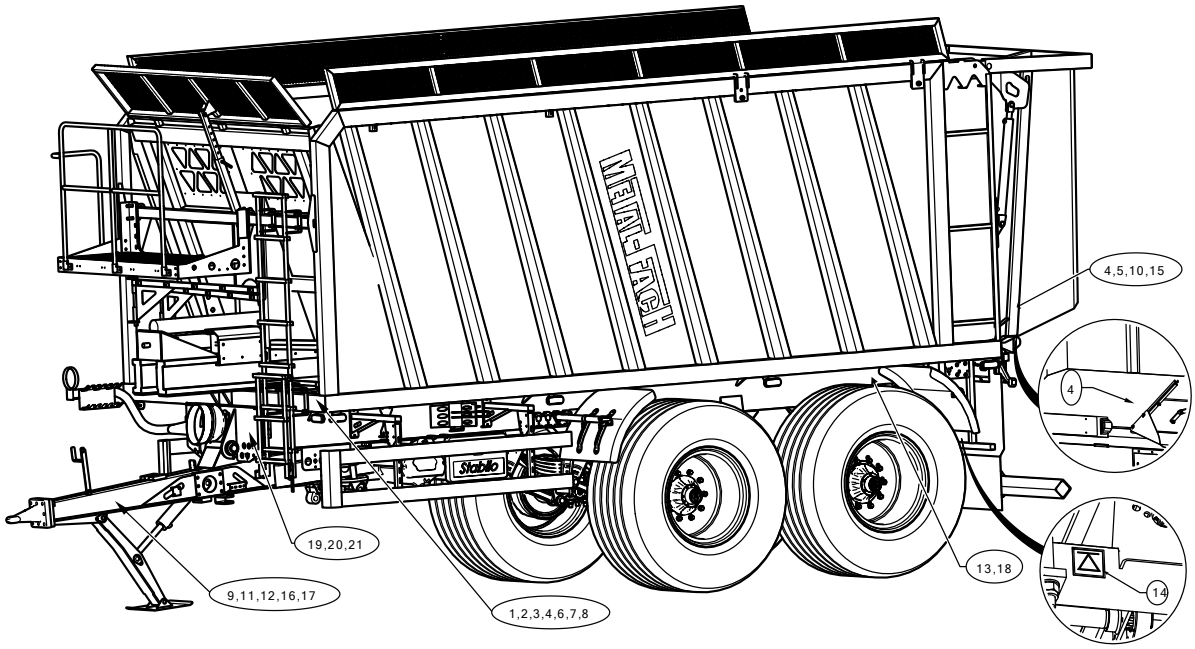


Figure 3. Arrangement of pictograms on the T935/6 machine

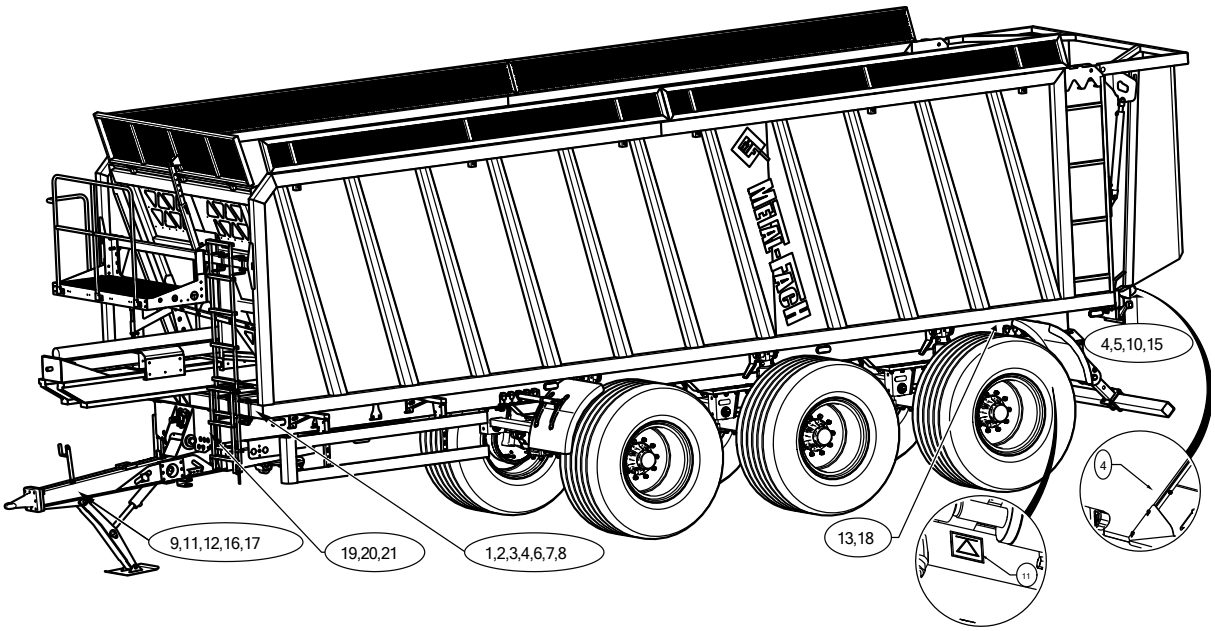


Figure 4. Arrangement of pictograms on the T951/6 machine

3. Design and operating principle of the T951/6, T935/6

3.1 Basic technical data

Table 3. Basic technical data

No.	General data		
1.	Vehicle type	Farming trailer	
2.	Manufacturer	METAL-FACH Sp. z o.o., 16-100 Sokółka, ul. Kresowa 62	
3.	Type (Model)	T951/6, T935/6	
4.	Body type	box	
5.	Rating plate location	Frame RH side member	
6.	Number stamp location	on the rating plate and underneath	
Dimensions/weights			
		T951/6	**T935/6**
7.	Length, mm	11500	8500
8.	Width, mm	2540	2540
9.	Height, mm	3600[2]-3950[3]	3600[2]-3950[3]
10.	Number of axles, pcs.	3	2
11.	Wheelbase mm	2000	2000
12.	Front overhang, mm	---	----
13.	Rear overhang, mm	---	---
14.	Load body dimensions		
	- length, mm	9470	6600
	- width, mm	2375	2375
	- height, mm	2000	2000
	- capacity, m^3	45	28
15.	Load surface lift, mm	1600	1600
16.	Vehicle kerb weight, kg	9000-12000	6000-10500
17.	Gross vehicle weight rating, kg:	36000	18000 (20000[4])
18.	Maximum load, kg		
	- axle, kg	11000	9000 (10000[4])
	- drawbar eye (hitch), kg	3000	3000
19.	Technically permissible payload of the vehicle, kg	27000	17000
Suspension			
20.	Type of suspension	- hydraulic suspension or parabolic suspension	- parabolic, boogie or hydraulic suspension

[2] Without raised front wall
[3] With raised front wall
[4] Suspension with wider wheel base

Wheels and tyres					
21.	Number of wheels, pcs.	6		4	
22.	Tyre size	Min. 550/60R22.5 Max 710/50R26.5	Min. 385/65R22.5 Max 650/60 R26.5	Min. 550/60R22.5 Max. 710/50 R26.5	Min. 385/65R22.5 Max. 650/60 R26.5
23.	Tyre pressure, bar	Depending on tyre specifications			
Brake system					
24.	Service brake				
	- type	mechanical drum brake			
	- control	pneumatic, positive pressure, double-line system or hydraulic			
	- braked wheels (count)	6		4	
25.	Parking brake				
	- type	mechanical drum brake			
	- control	Pneumatic brake – pneumatic control membrane/spring actuators Hydraulic brake – manual control, with crank-operated helical gear			
	- braked wheels (count)	2		2	
Electrical system					
26.	Voltage V	12 V, from coupled tractor			
Load discharge actuation					
27.	Actuation type	hydraulic			
28.	Number of actuators/drive stages, pcs./pcs.	3/1		3/1	
29.	Maximum load body tipping angle, rearward/side, degs.	-	–	–	
30.	Maximum system pressure, MPa	175			
31.	Hydraulic coupling type	Euro ISO 7241 A			
Operating data					
32.	Maximum driving speed, km/h	40			
Additional information					
33.	Other information:				
	- tractor hitch coupling	Only with single-axle trailer hitches			
	- coupled tractor rating	min. 160 kW	min. 160 kW	Min. 130 kW	Min. 130 kW
	- required from the coupled tractor	Min. load transfer capacity of the hitch: 30 kN			
	- required oil volume, l	30		25	
Standard equipment					
34.	Pneumatic brake system				
35.	Pneumatic parking brake				

36.	Axles and mechanical suspension – parabolic leaf springs
37.	12 V electrical lighting system
38.	Hydraulic system for moving the wall
39.	Longitudinal suspension hitch
40.	Hydraulically-operated tailgate
41.	Automatic flap locks
42.	Wheel chocks
43.	Hydraulic scissor parking jack
44.	Hitch eye

Please note dimensions may vary depending on equipment used

The user must observe the permissible transport speeds commensurate with the maximum load carrying capacity of the trailer.

3.2 Trailer widths depending on wheels and suspension

				Suspension			
				parabolic tandem	hydraulic	Boogie	parabolic tridem
Wheel	560/60 R22.5	T951/6	width		2750		2500
			height		3530		3535
		T935/6	width	2500	2750	2850	
			height	3535	3530	3530	
	650/55 R26.5	T951/6	width		2900		2650
			height		3600		3600
		T935/6	width	2650	2900	3000	
			height	3600	3600	3610	
	710/50 R26.5	T951/6	width		3080		2930
			height		3620		2645
		T935/6	width	2930	3075	3175	
			height	3645	3620	3625	

Figure 5. Height and overall width of the trailer depending on the wheels and suspension used. Dimensions are given in mm Note that the raised maximum grid on the sliding wall raises the height by approximately 350 mm.

3.3 Design and operation principle of the T935/6, T951/6 trailer

3.3.1 Trailer with a sliding system T935/6

The main components of the T935/6 trailer are: chassis, sprung hitch, load body, tailgate, support foot, sliding floor, sliding wall, and electrical and hydraulic systems: for sliding and tailgate operation.

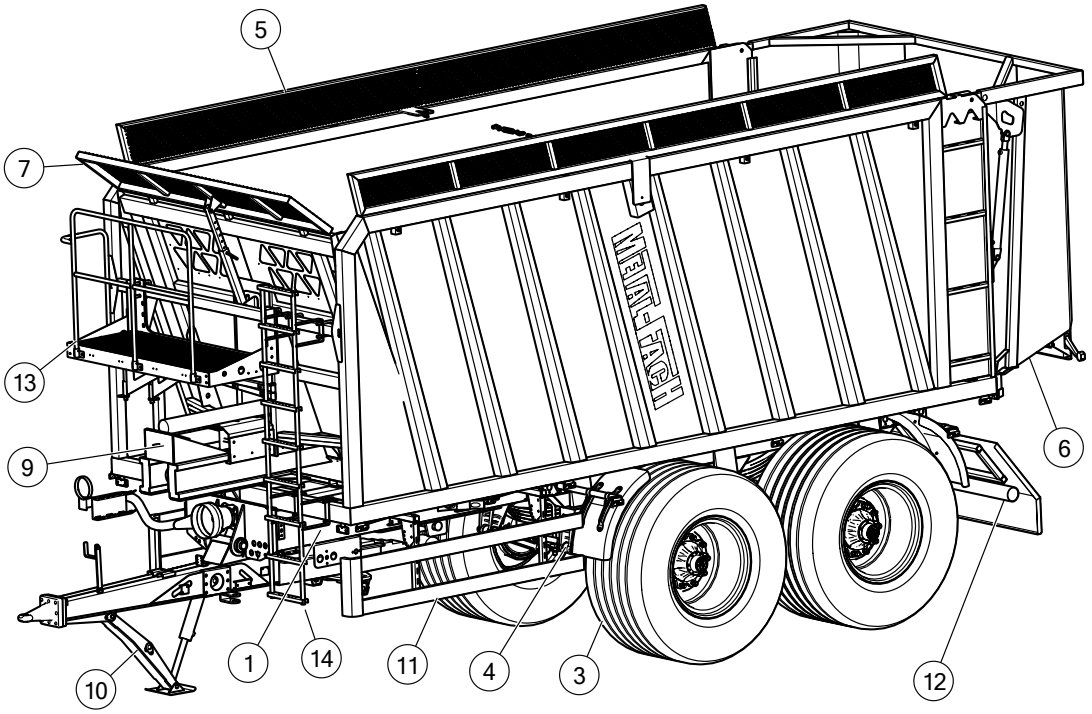
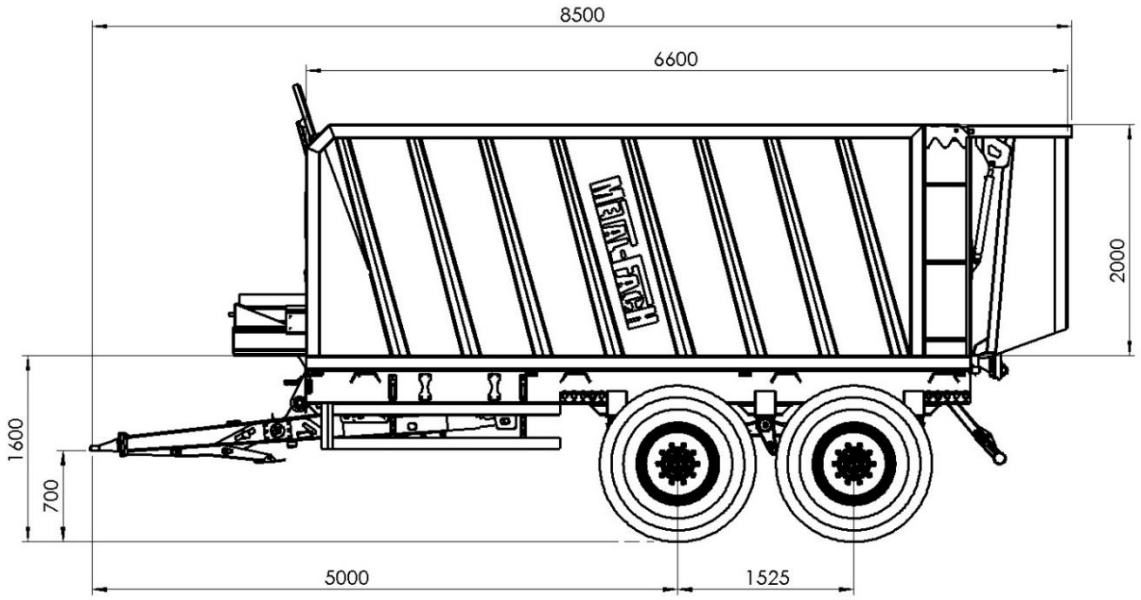


Figure 6. Trailer components: 1 – main frame; 2 – shock absorbing hitch; 3 – ground wheels; 4 – leaf spring suspension; 5 – load body; 6 – tailgate; 7 – folding mesh; 8 – sliding wall; 9 – sliding floor, 10 – hydraulic scissor parking jack; 11 – side crash guards, 12 – rear overrun guard, 13 – platform, 14 – ladder



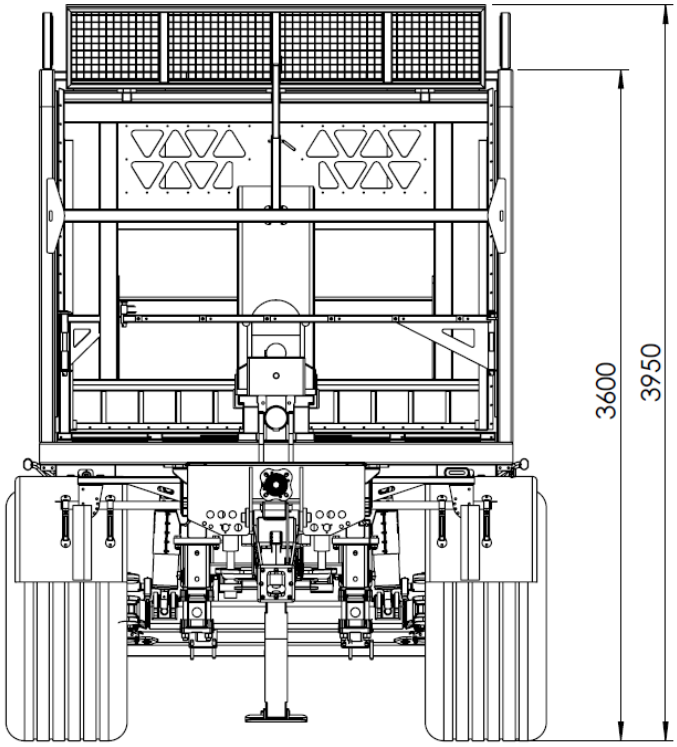


Figure 7. Basic dimensions (dimensions may vary depending on equipment options)

3.3.2 Trailer with a sliding system T951/6

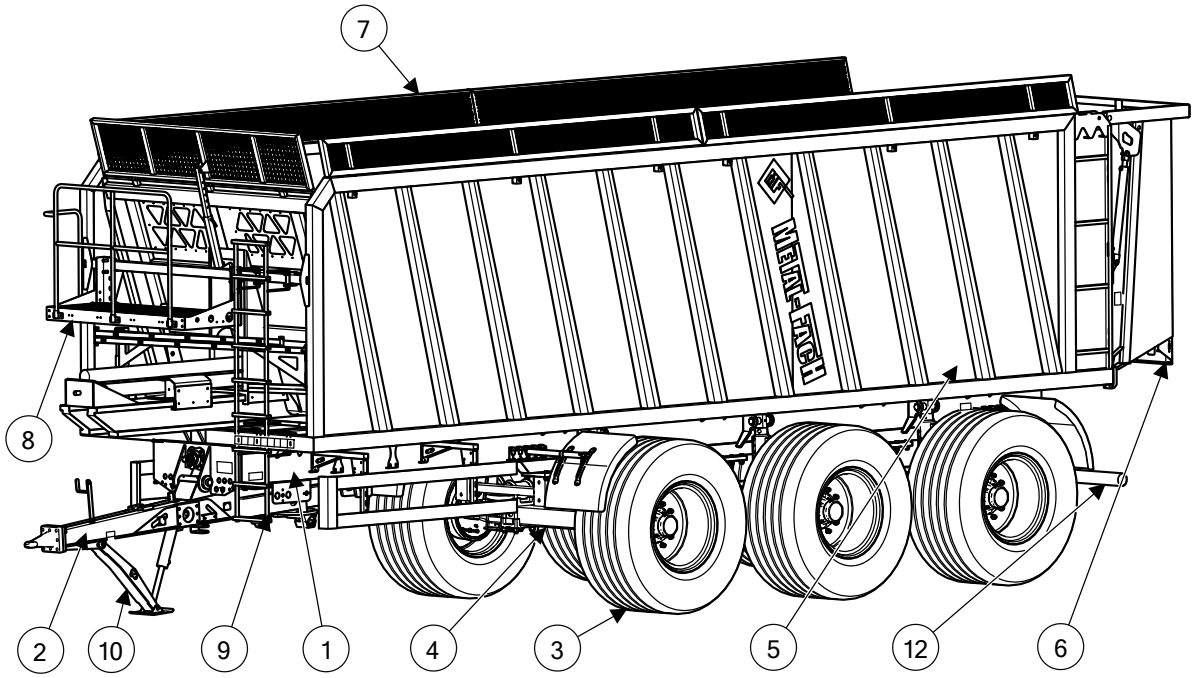
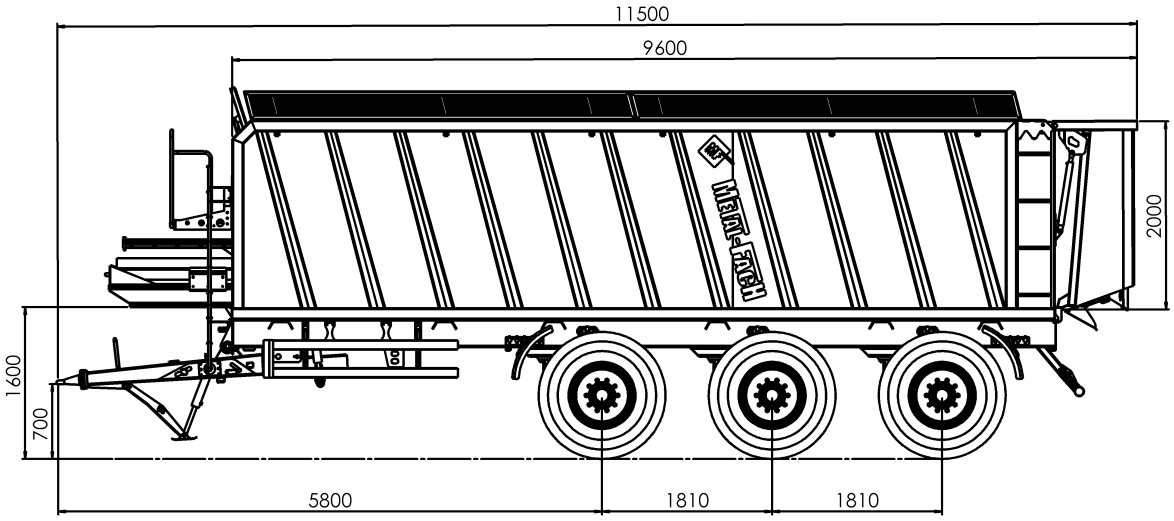


Figure 8. Trailer components: 1 – main frame; 2 – shock absorbing hitch; 3 – ground wheels; 4 – leaf spring suspension; 5 – load body; 6 – tailgate; 7 – set of top extensions; 8 – platform; 9 – ladder, 10 – hydraulic scissor parking jack; 11 – side crash guards, 12 – rear overrun guard



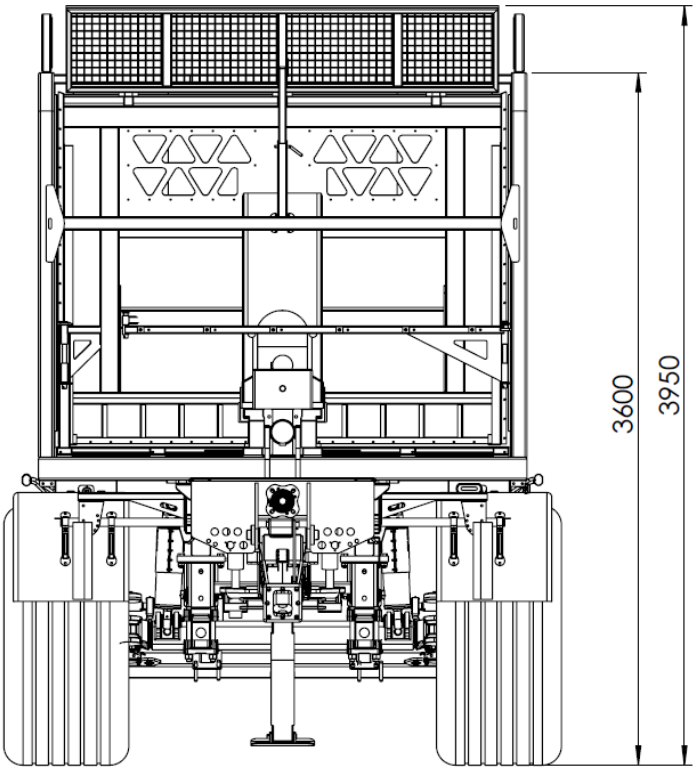


Figure 9. Basic dimensions (these dimensions may vary depending on equipment options)

3.3.3 Trailer chassis

- **T935/6**

Chassis of the T935/6 trailer series made from 300 x 100 x 10 steel sections to which the tandem suspension on parabolic springs or the boogie tandem is attached. Two fixed axles or one fixed and one steering axle can be attached to the suspension. The main load-bearing component of the frame is formed by two side members, welded together with crossmembers. A drawbar sprung by a main pin is fitted to the front of the frame. A collapsible overrun protection is fitted to the rear of the main frame. Holes are provided in the frame crossmembers because of the attachment of the drive shaft option.

The chassis of the T935/6 trailer includes a tandem or boogie spring suspension, as well as two fixed or fixed and steering axles.

The tandem suspension has the primary structural assembly formed by rocking arm-coupled parabolic leaf springs. The running axles are fixed with the aid of a spring plate and screws. This whole assembly is attached to the chassis frame.

The drawbar has a longitudinal spring suspension or a hydraulic suspension system, depending on the option. A hydraulic scissor parking jack is attached to the drawbar.

- **T951/6**

The chassis of the T951/6 trailer series is made of 300 x 100 x 10 steel sections, to which a hydro-pneumatic suspension on hydraulic cylinders is attached. The main load-bearing component of the frame is formed by two side members, welded together with crossmembers. A drawbar sprung by a main pin is fitted to the front of the frame. A collapsible overrun protection is fitted to the rear of the main frame. Holes are provided in the frame crossmembers because of the attachment of the drive shaft option.

The chassis of the T935/6 trailer comprises three hydro-pneumatic axles. The hydraulic suspension can be used to change the setting of the chassis without affecting the stability and safety of the vehicle; this feature is essential for the safety of a vehicle operating in extreme conditions. It is the fluid that determines the position of the running gear. The fluid is incompressible and the alignment of the running gear is precise and stable. Comfort is provided by gas. By adjusting the gas pressure, the suspension can be made stiffer or softer: two different fluids with two different functions.

The running axles are fixed with the aid of a spring plate and screws. This whole assembly is attached to the chassis frame.

The drawbar has a longitudinal spring suspension or a hydraulic suspension system, depending on the option. A hydraulic scissor parking jack is attached to the drawbar.

3.3.4 Load body

On the lower frame of the T935/6 and T951/6 trailers, the load body, which is made of sheet metal and steel sections, is attached by means of bolted connections. The box contains the main actuators of the machine, i.e. the sliding floor and the sliding wall that pushes out the load. These components also have polyurethane seals. The pushing wall is fitted with a mesh extension that can be folded manually or, as an option, hydraulically.

3.3.5 Hydraulic suspension

The suspension provides optimum driving comfort on the road as well as on agricultural land. Thanks to the large stroke of the cylinders, the suspension guarantees the comfort and stability of the towed vehicle. The high stability is particularly useful when driving on steep slopes.

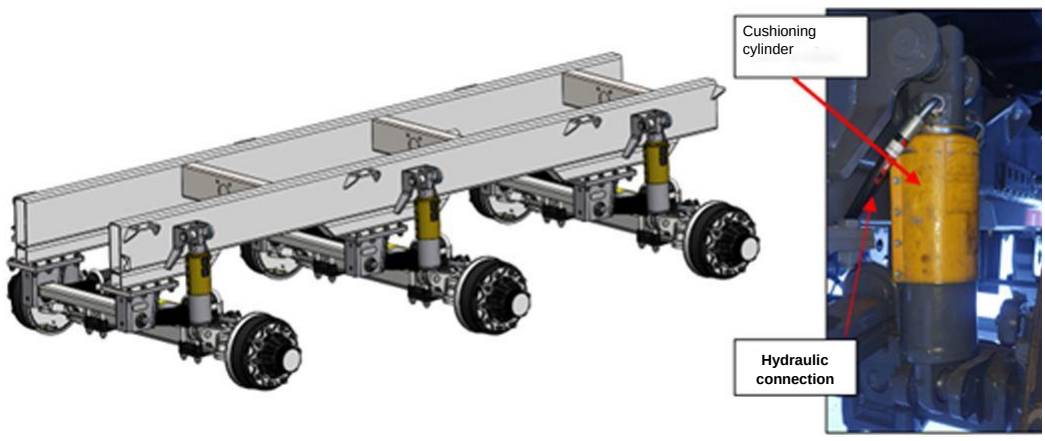


Figure 10. Hydraulic suspension including cylinder

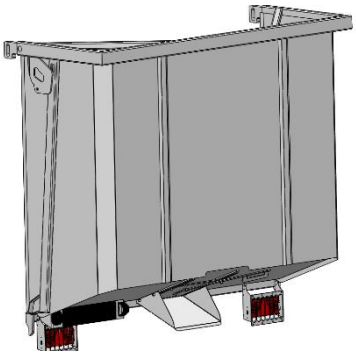
The system is filled with hydraulic oil from the tractor's hydraulic system. The suspension includes actuators, parabolic springs, a solenoid valve block, and hydraulic connection components. All functions are controlled from the tractor via a panel.

Figure 11. Suspension control panel

The suspension is self-levelling while driving. There is an option to raise the first (Axle lift) axis and to change the height of the entire system (Levelling).

3.3.6 Tailgate

The tailgate is in the rear part of the load body and is opened by operation of hydraulic actuators. The hydraulic actuators are fed with pressurized oil from the external hydraulic DCVs of the tractor to open the tailgate. It closes automatically under its own weight when the distributor lever on the tractor is released. The non-return valve when engaged prevents the gate from falling uncontrollably in the event of a hose rupture, for example.

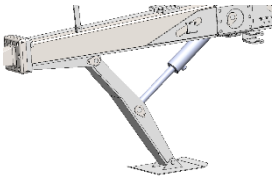


To make the unloading of material, e.g. grain, more precise a discharge window can be fitted in the tailgate as an option. Do not open the tailgate with a grain chute attached, open the slide gate and start the sliding operation slowly. The load will be discharged through the window.

The tailgate has security bolts that slide into fixings in the box, preventing it from swinging open by itself.

3.3.7 Parking jack

The parking jack supports the trailer drawbar when coupling/uncoupling to/from the tractor. The parking jack is powered by the tractor's hydraulic power system. The parking jack operation is controlled directly from the tractor, via a DCV. Once set to the required height, secure the parking jack by closing its ball valve, installed on the trailer drawbar.



3.3.8 Hydraulic system of the steering lock T935/6

The trailer can be equipped with a passive steering rear axle. The axle design makes it easier to change the direction of the vehicle when taking sharp turns, it avoids ruts in the ground and gives better stability when cornering.

The hydraulic steering lock system is used to lock the rear axle when driving on public roads at higher speeds and when reversing. Otherwise, the trailer will tend to turn uncontrollably to the left or right.

The following figure (Figure 12) shows the 2-circuit hydraulic system for the steering axis lock.

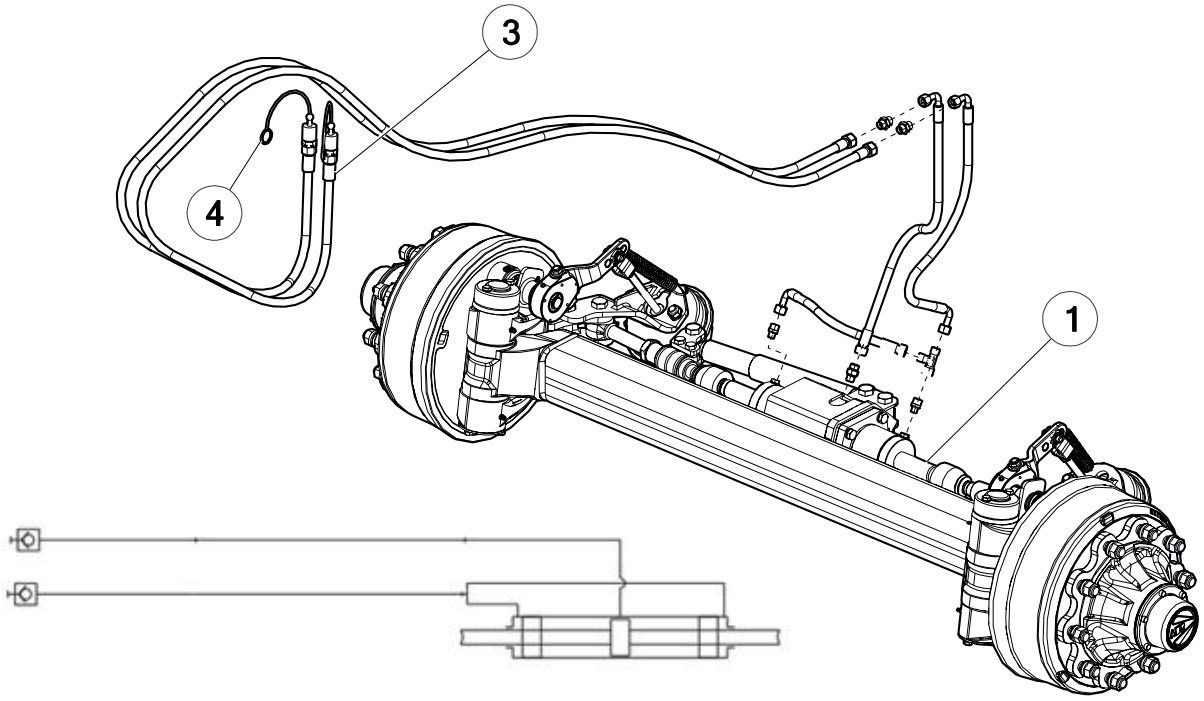


Figure 12. Rear axle hydraulic lock system diagram 1 – hydraulic cylinder, 2 – hydraulic line, 3 – hydraulic quick connector, 4 – hydraulic plug

The axle steering lock is controlled from the tractor cab via the external hydraulics distributor lever on the tractor. The hydraulic lines (2) for connecting to the tractor are equipped with quick plug couplings (3) and secured with plugs (4). The lock mechanism is released and locked by pushing the piston rod in or out of the hydraulic cylinder (1).

3.3.9 Hydraulic forced steering system

A trailer with tandem or tridem suspension can be fitted with a positive steering system. This solution is used to steer the rear axles of the trailer. Such a set-up reduces tyre wear, improves driving comfort and facilitates manoeuvring. In the case of a tandem trailer, the first axle is controlled, in the case of a tridem trailer the first and third axles. This system can only be used with a ball hitch (K80 or K50 depending on the tractor hitch). The clearance between the cylinders and the ball hitch of 250 mm (+- 5 mm) must be maintained.

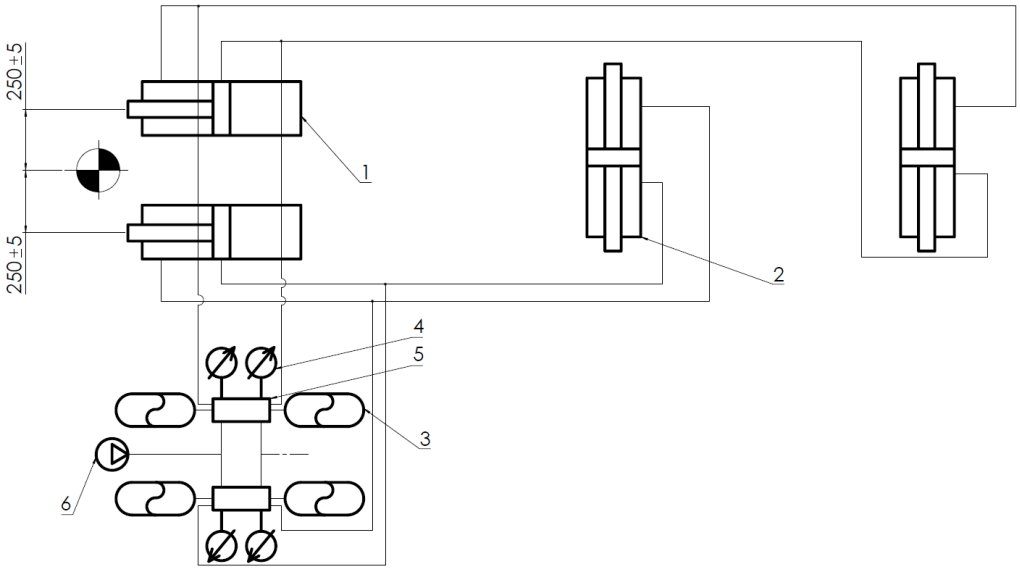


Figure 13. Diagram of the system of a forced steering tridem. (1) axle steering cylinder, (2) axle steering cylinder, (3) hydraulic accumulator, (4) pressure gauge, (5) hydraulic valve, (6) hand pump

To connect the system to the trailer: Connect the cylinders, hitch to the tractor and secure. Move the levers at the hydraulic valves to the flow position (Fig. 14). Make a pass with the tractor to straighten the wheels. Top up the hydraulic system with a pump to 200 bar, bleed the system, then pressurise to ~150 bar. Perform this until the air is eliminated from the system. Close all levers. Make a test run and check for correct operation.

Figure 14. Illustration of opening and closing the hydraulic valve

3.3.10 Brake system

The T951/6, T935/6 trailer features the following brake systems:

Service brake, pneumatically operated, double-line (alternatively, it is a hydraulic brake system), brakes all wheels, operated by the tractor operator pressing the tractor's brake pedal;

Parking brake, pneumatically operated with the parking brake release valve, located on the left-hand side of the trailer main frame, brakes the front multiple axle wheels. For a hydraulic brake system, the parking brake is operated mechanically with a crank and a helical gear, installed on the right-hand side of the trailer, which brakes the front multiple axle wheels.

The design of the service brake ensures automatic braking of the trailer ground wheels if the pneumatic system connection is accidentally broken between the trailer and its tractor.

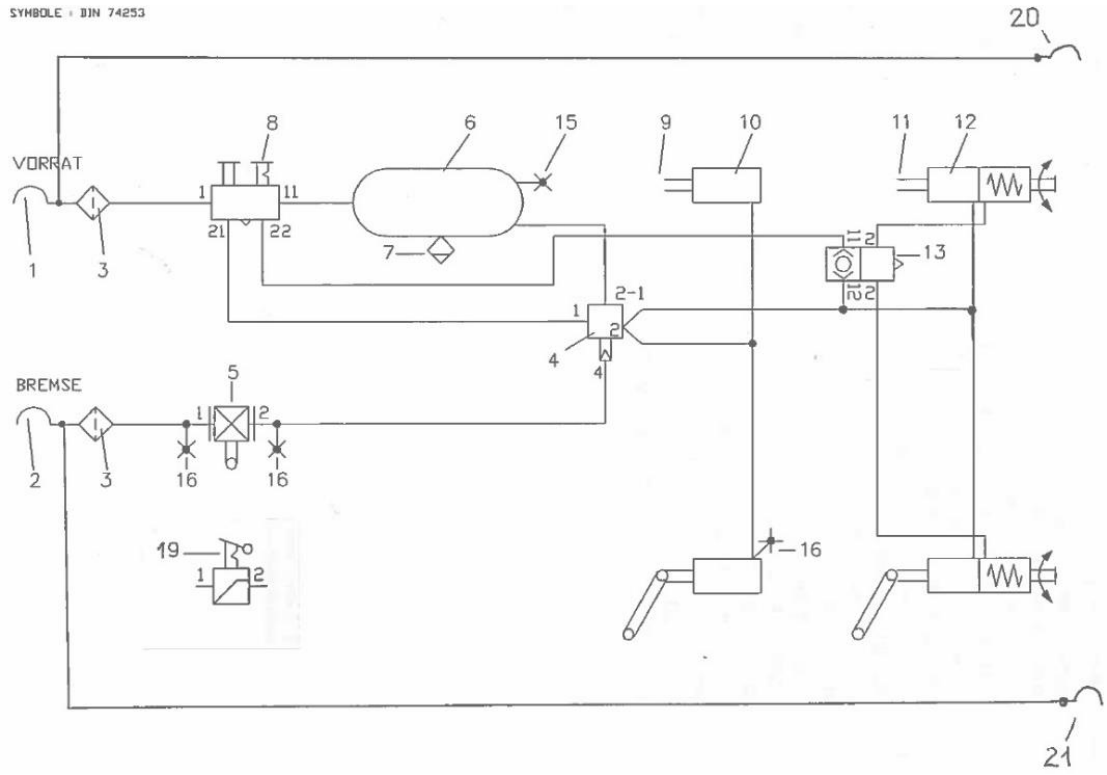


Figure 15. Diagram of the T935/6 braking system. 1 – M16 x 1.5 pressure line coupling with an inline filter; 2 – M16 x 1.5 control line coupling with an inline filter; 4 – trailer brake valve; 5 – mechanical braking force controller; 6 – 60 L/310 air pressure tank with clamps; 7 – water drain valve; 8 – parking brake release valve; 9 – short yoke; 10 – type 30 actuator cylinder; 11- short yoke;12 – type 30/30 membrane/spring actuator; 13 – 2-way valve with a quick vent; 15 – control connector M22 × 1.5; 16 – M16 × 1.5/D=10 mm tee with control connector; 19 – manual braking force controller; 20 – pressure coupling; 21 – rear control coupling

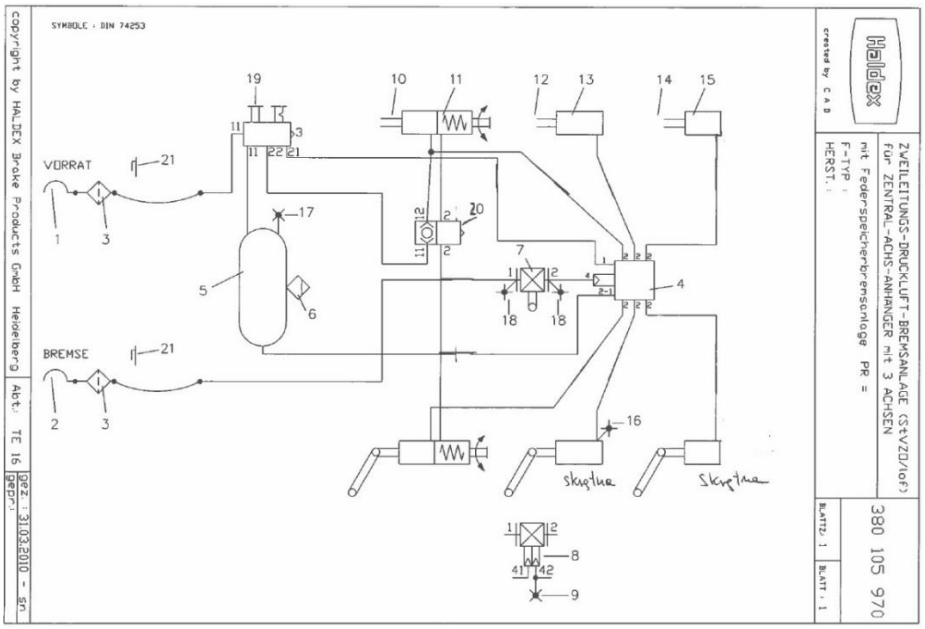


Figure 16. Diagram of the T951/6 braking system. 1 – Line feed connector M16 × 1.5 with filter, 2 – Line control connector M16 x 1.5 with filter, 4 – Trailer brake valve, 5 – Air reservoir 60 L/310 + clamps 6 – Drain valve 7 – ALB valve 9 – ALB simulation connection, 10 – Short fork 11 – Diaphragm spring actuator 12 – Short fork 13 –

Diaphragm actuator 16,17,18 – Control connector 19 – Parking and release valve, 20 – Quick release valve with two-way valve 21 – Coupling mountings

3.3.11 Electrical and lighting system

The Trailer's electric system is adapted to supply power from a 12 V power source, i.e. from the electric system of the coupled tractor.

The connection between the Trailer's electric system and the tractor's electric system is carried out by means of a suitable connecting cable. The electrical wiring diagram and the layout of the trailer lights are shown in Fig. 17 and 18.

The electrical wiring system of the T951 trailer comprises tail light clusters, front marker lights, and side clearance lights.

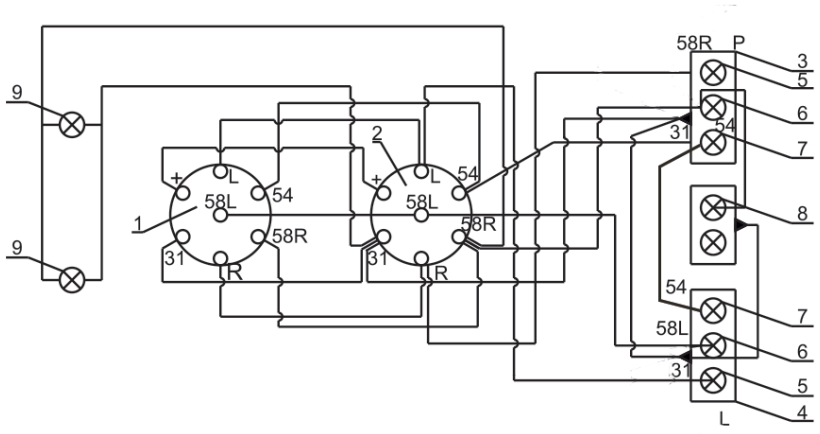


Figure 17. Electrical wiring diagram. 1 – 7-pole plug, 2 – 7-pole socket, 3 – rear lamp cluster, right, 4 – rear lamp cluster, left, 5 – light bulbs for direction indicators, 6 – rear position-lamp bulbs, 7 – braking lights "STOP" bulbs, 8 – number plate lamp bulbs, 9 – front marker light

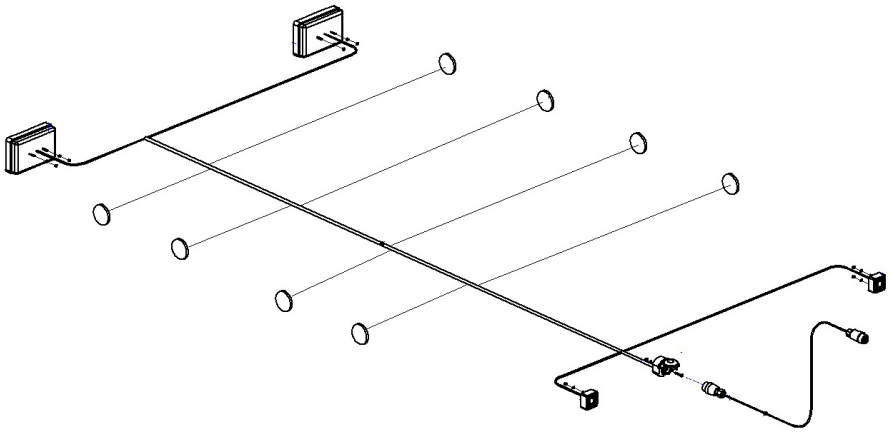


Figure 18. Layout diagram of the trailer lights

3.3.12 Parking brake

The parking brake is used to stop the trailer, while it is parked. The parking brake control valve is shown in Figure 19.

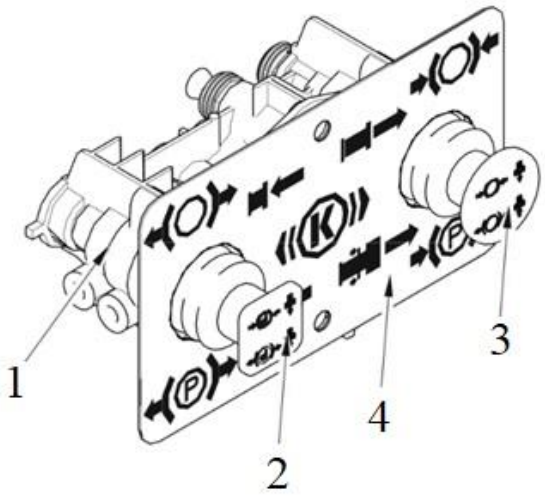


Figure 19. Parking brake – release valve. 1 – valve, 2 – red button, 3 – black button, 4 – rating plate

The parking brake is pneumatically operated with the parking and release valve, located on the left-hand side of the trailer and acts on the wheels of the first axle. This valve is used on trailers with diaphragm spring actuators and is equipped with an emergency brake function. Emergency braking is activated if the supply line pressure drops. Two buttons located on the valve allow you to set the trailer to the appropriate mode of operation.

The red button (2) controls the operation of the parking valve. When the button is pulled out, the parking brake (spring-loaded) is applied. The black button (3) controls the shuttle valve. It is used to release/apply the brake when the trailer is disconnected from the tractor. This button cannot be pressed when the pneumatic lines are connected. In the depressed position, the spring (parking) brake is released.

Table 4. System operating modes

No.	Black button (release valve)	Red button (parking valve)	The trailer is connected to the tractor with pneumatic hoses	Operating conditions	Parking brake
1.	extended	retracted	yes	driving	released
2.	extended	extended	yes	parking	started
3.	retracted	retracted	no	manoeuvring	released
4.	retracted	extended	no	parking (trailer detached)	started

3.3.13 Adapter for manure

The vertical 2-rotor adapter is used for shredding and scattering the material supplied by sliding the wall. The adapter can be fitted to the rear of the trailer. The adapter is supplied by the drive unit and the PTO of the tractor. The adapter is not an integrated part of the trailer; it can quickly be replaced by a flap, for example.

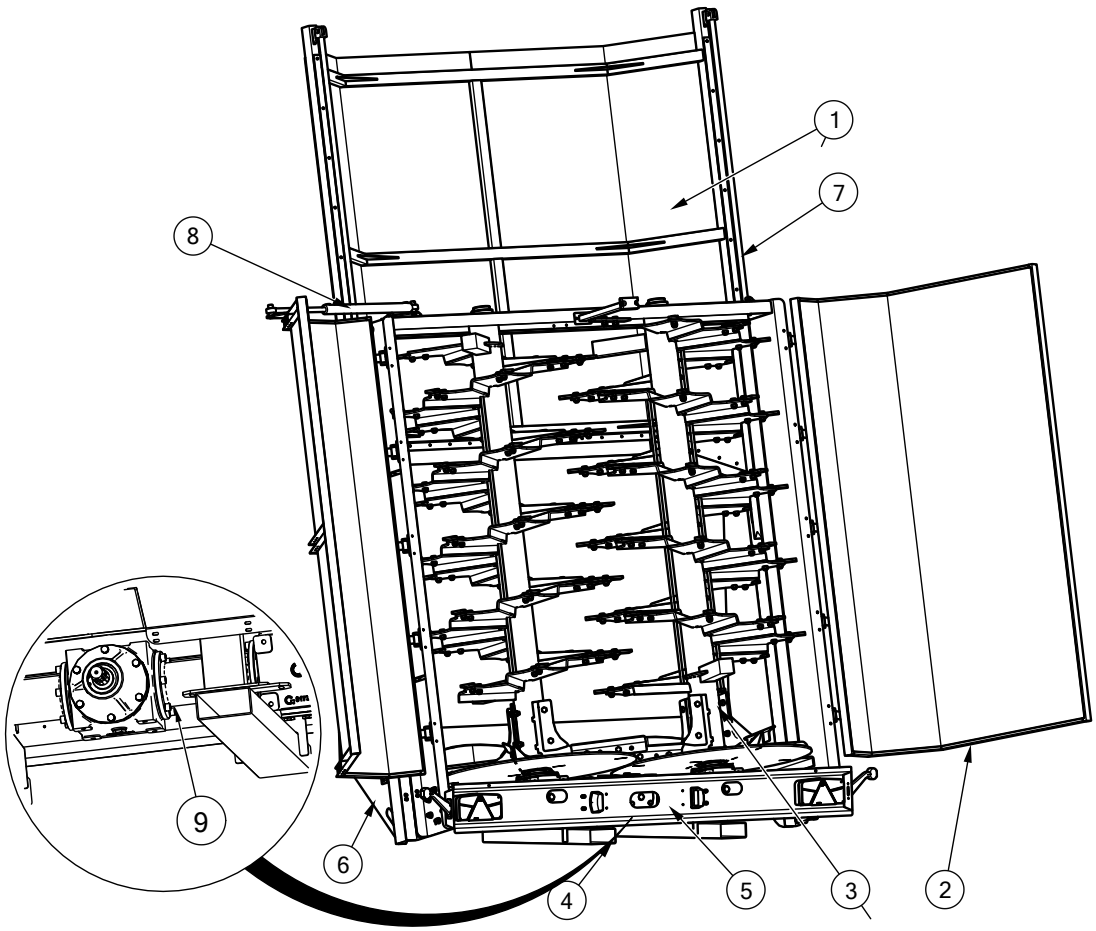


Figure 20. 2-rotor vertical adapter 1 – shutter, 2 – deflector, 3 – working auger, 4 – fork support, 5 – light bar, 6 – main frame, 7 – shutter actuator, 8 – deflector actuator, 9 – gearbox

The adapter (Figure 20) consists of the main frame (6), gate (1), deflector (2), light bar (5), gate and deflector actuators (7, 8). At the bottom, there is the fork support (4), and the gearbox on which the vertical rotors (3) are mounted. The main working tools are replaceable blades bolted to the rotor segments (3). When rotating, the rotors shred the material feed and eject it to the back and the sides. The bottom section of the rotors features bladed discs, which increase the spreading width of the material.

The adapter is fixed to the load body with M12 bolts. To disassemble the beater unit

- disconnect the PTO shaft from the beater unit gearbox
- use a lifting device with the minimum lifting capacity of 1200 kg secure the adapter
- undo the bolts connecting the adapter to the hopper,
- after removing the adapter, place it on a solid surface and secure against tipping over.

3.3.14 Grain screw conveyor

The screw conveyor is designed for handling loads such as grain, maize. The adapter is used to work with a trailer with a sliding wall that is not an integral part with the conveyor. The adapter can be quickly replaced by a gate, for example. The adapter features a 400 mm diameter pipe, with a capacity of ~6000 kg per minute. Loading height ~4.3 m.

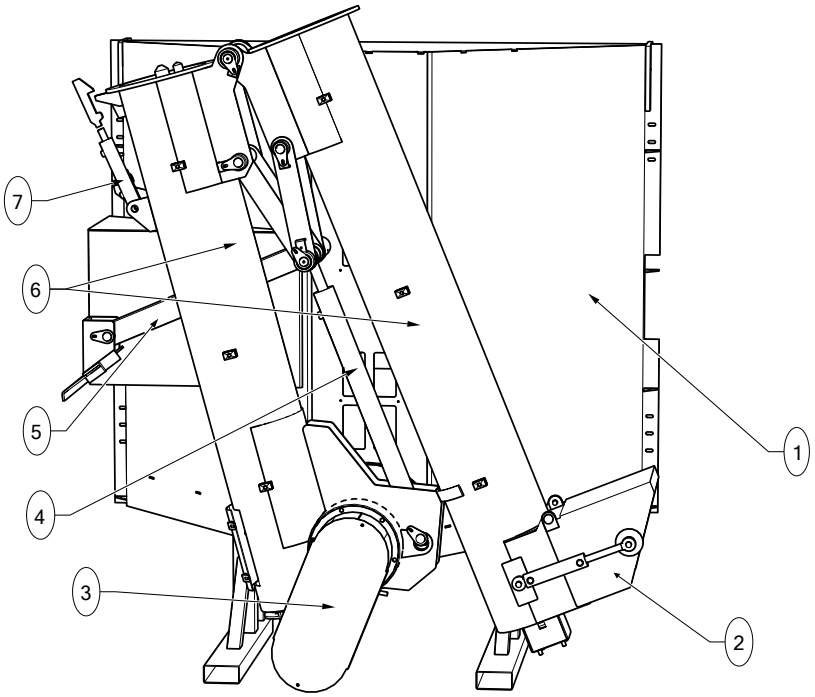


Figure 21. Adapter screw conveyor front

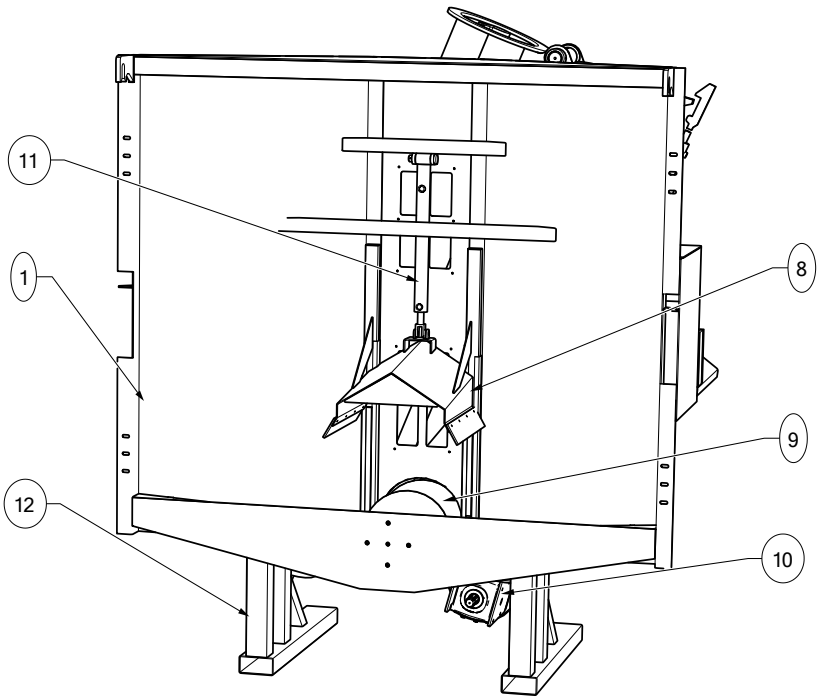


Figure 22. Adapter for screw conveyor rear

Table 5. Components and subassemblies

No.	Name	No.	Name
1.	Conveyor body	10.	Axle gear box
2.	Movable nose	11.	Auger guard actuator
3.	Gear guard	12.	Fork handle
4.	Master cylinder		
5.	Pivot arm		
6.	Transfer tubes		
7.	Pipe clamping cylinder		
8.	Guard		
9.	Horizontal screw		

The conveyor is powered by the PTO shaft and the hydraulic system of the machine to which it is connected. Three pairs of input-output type connections are required to fully utilise the conveyor's functions. In its basic configuration, the adapter requires three PTO shafts.

Before using the machine for the first time, a test unfolding of the unloaded pipe on the trailer should be carried out. Adjust the deployment speed, using the throttle valve on the main cylinder for this purpose.

When working with the material, first engage the tractor drive, unfold the loading tube, start the power take-off drive, maintaining 800 rpm. The auger slide should then be raised and the sliding wall feed slowly started.

When work is complete, first close the shutter, perform a couple of idle revolutions, disengage the PTO drive and fold up the pipe.

The system has a pressure valve to protect against excessive pressure in the system.

Figure 23. Throttling valve

The adapter is fixed to the load body with M12 bolts. To install the adapter:

- remove the running adapter fitted to the trailer in accordance with the instructions,
- use a lifting device with the minimum lifting capacity of 3000 kg, stand the auger next to the box, hang it on the arms,
- connect to the box with screw connections,
- connect the trailer drive system to the adapter drive system via the PTO shaft,
- connect the hydraulic lines as intended, arrange the wiring so that there is no damage,
- connect the electric cables

Once the work is complete, the loading auger should be thoroughly cleaned. Remember to carry out regular maintenance such as greasing the auger bearings, lubricating the drive chain, checking components for possible damage.

INDEX OF NAMES AND ABBREVIATIONS

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

kg – kilogram, weight unit;

km – kilometre, a commonly used multiple measure of the metre, the basic unit of length in the SI system;

HP – horse power, power unit;

kPa – kilopascal, pressure unit

m – metre, unit of length;

mm – millimetre – auxiliary length unit equal to 0.001 m

kPa – Megapascal, a pressure unit;

N – newton, a SI unit of force;

Nm – Newton-metre, a unit for the moment of force in the SI system;

Pictogram – information plate;

T – tonne, a mass unit;

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

V – volt, a voltage unit

Transport (pickup) hitch– the hitching components of a farming tractor (see the tractor's manual).

ALPHABETICAL INDEX

NOTES

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Metal-Fach Sp. z o.o. will not accept any complaints regarding the data and pictures contained in the catalogue, as the presented range of products does not constitute an offer within the meaning of the provisions of the Polish Civil Code.

The pictures do not necessarily show standard equipment.

Original spare parts are available from authorised dealers, both in Poland and abroad, and also at the Metal-Fach retail outlet.

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