MANURE SPREADER

“VIKING”

N272/3, N272/6, N272/7, N272/8

USER MANUAL – PART 1 of 2

TRANSLATION OF THE ORIGINAL USER MANUAL

REVISION IV

JANUARY 2026

User Manual ref. N272/3_6_7_8-04-167/2013

EC DECLARATION OF CONFORMITY

The undersigned,	Jacek Kucharewicz, President of the Board,	
hereby declares, with full responsibility, that the complete machine:		
MANURE SPREADER		
1.1.	Brand (trading name of the manufacturer)	Metal-Fach
1.2.	Type:	N272
1.2.1.	Variant:	-
1.2.2.	Version:	-
1.2.3.	Trade name(s) (if any):	VIKING N272/3, VIKING N272/6 VIKING N272/7, VIKING N272/8
1.3.	Category, subcategory and vehicle speed indicator	S2a
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)	N/A
1.5.1.	Location of the manufacturer's rating plate	At the right side; in the front part of the frame
1.5.2.	Method used to fix the manufacturer's rating plate:	Riveted, glued
1.6.1.	Location of the vehicle identification number on the chassis	In the front part of the right beam
2.	Machine identification number:	
3.	Function	Manure Spreader

referred to in this declaration, meets the requirements of:

Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC (OJ of the European Union L 15 of, 09/06/2006, p. 24)

In addition, the machine meets the requirements of the following harmonised standards:

PN-EN 690:2014-02, PN-EN ISO 4254-1:2016-02/A1:2022-05,
PN-EN ISO 12100:2012, PN-EN ISO 20607:2019-08

and of the following standards:

PN-ISO 3600:1998, PN-ISO 11684:1998

The person responsible for making the technical documentation of the machine available is the Head of the Design and Technology Department, Metal-Fach sp. z o.o., ul. Kresowa 62, 16-100 Sokółka, Poland

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

This User Manual is an integral part of the product. The user is obliged to hand over the product to another owner only in perfect technical condition and with the User Manual and the declaration of conformity attached.

Sokółka, Poland
(Place)

14/01/2026
(Date)

Jacek Kucharewicz
(Signature)

President of the Board
(position)

Machine data

Machine type:		Manure Spreader
Type designation:		N272/3, N272/6, N27/7, N272/8*
Serial number[1]		_____
Machine manufacturer:		METAL-FACH Sp. z o.o. 16-100 Sokółka ul. Kresowa 62 Telephone: (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:	_____

*Delete as applicable

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

Table of Contents

PART I

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 this User Manual. The User Manual is the integral part 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. This User Manual describes the basic safety and operation principles of the Manure Spreader made by Metal-Fach, type N272/3, N272/6, N272/7 and N272/8.

The significant obligations of the manufacturer are shown in the Warranty Card, which includes the complete regulations currently in force regarding guarantee services.

If you do not understand the information in the User 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 at the time 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 User Manual as a separate document.

Manufacturer's address:

Metal-Fach Sp. z o.o.

ul. Kresowa 62

16-100 Sokółka

Contact:

Telephone: (0-85) 711 98 40

Fax: (0-85) 711 90 65

The symbols used in this Manual:

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.

The symbol indicating particularly important information and recommendations. Non-compliance can lead to serious damage to the machine, as a result of its incorrect operation.

CAUTION

This symbol indicates potential hazards that, if not avoided, can result in death or serious injury. This symbol indicates a lower level of risk of injury than the DANGER symbol.

WARNING

symbol indicating useful information.

This symbol indicates maintenance activities that should be performed periodically.

1. Basic information

1.1 Introduction

THIS USER MANUAL IS AN INTEGRAL PART OF THE MANURE SPREADER

The machine can only be operated by persons who have read this User Manual, who are familiar with the design and functioning of the Manure Spreader, and with the operation of the tractor unit it works with.

To operate the machine safely, adhere to and follow all the instructions set forth in this User Manual. Adhering to the guidelines of the User Manual ensures the User works safely and the machine service life is longer.

1.2 Identification of Manure Spreaders N272/3, N272/6, N272/7 and N272/8

The Manure Spreader should be identified using the nameplate, which is permanently attached to the loading box.

The data on the rating plate of the manure spreader is shown in figure 1. For the description of the markings on the nameplate, see Figure 2. The position of the rating plate and serial number is shown in Figure 3.

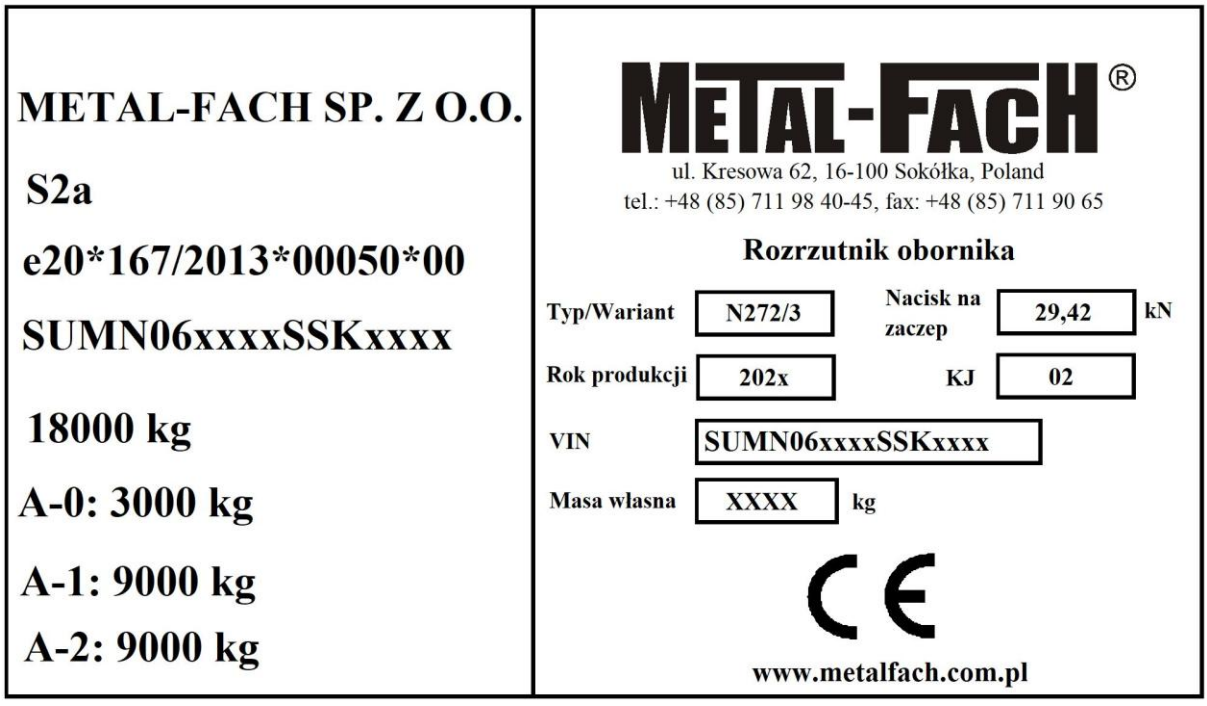


Figure 1. Rating plate

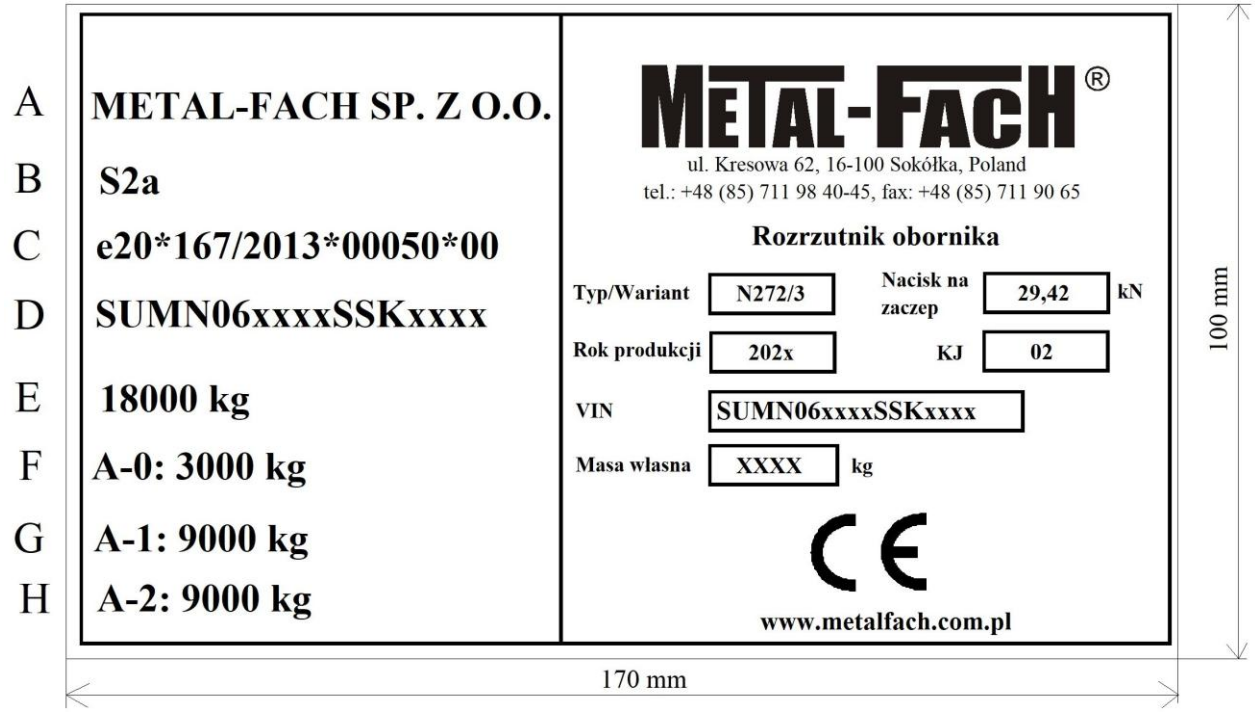
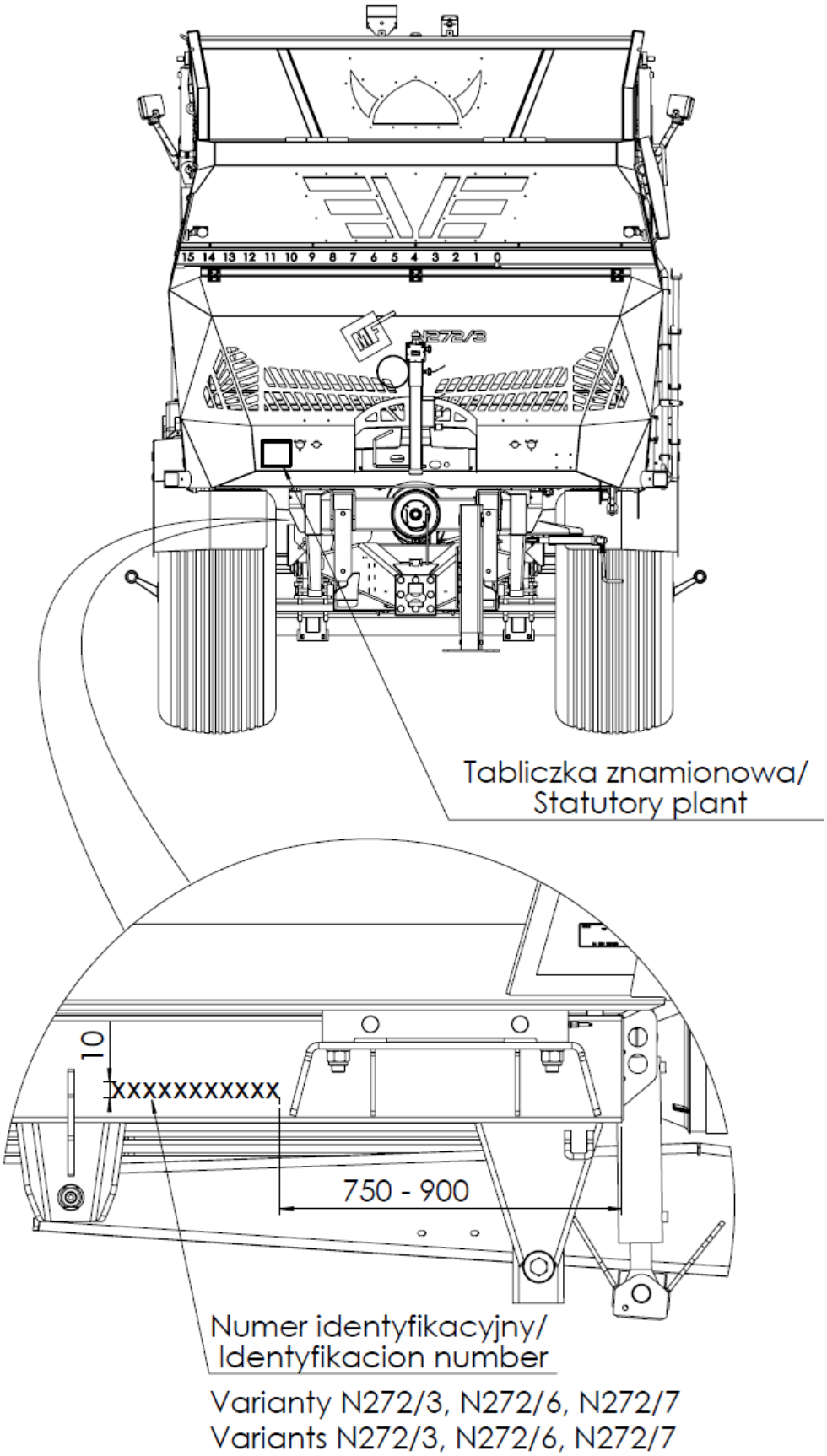


Figure 2. Marking on nameplate fields:
A – Manufacturer's name;
B – Category, Subcategory, and Vehicle-Speed Indicator;
C – EU-Type Approval Number;
D – VIN;
E – Permissible total design weight of the vehicle;
F – Permissible maximum hitch pressure;
G – Permissible maximum weight on the 1st axle;
H – Permissible maximum weight on the 2nd axle;



Varianty N272/3, N272/6, N272/7
Variants N272/3, N272/6, N272/7

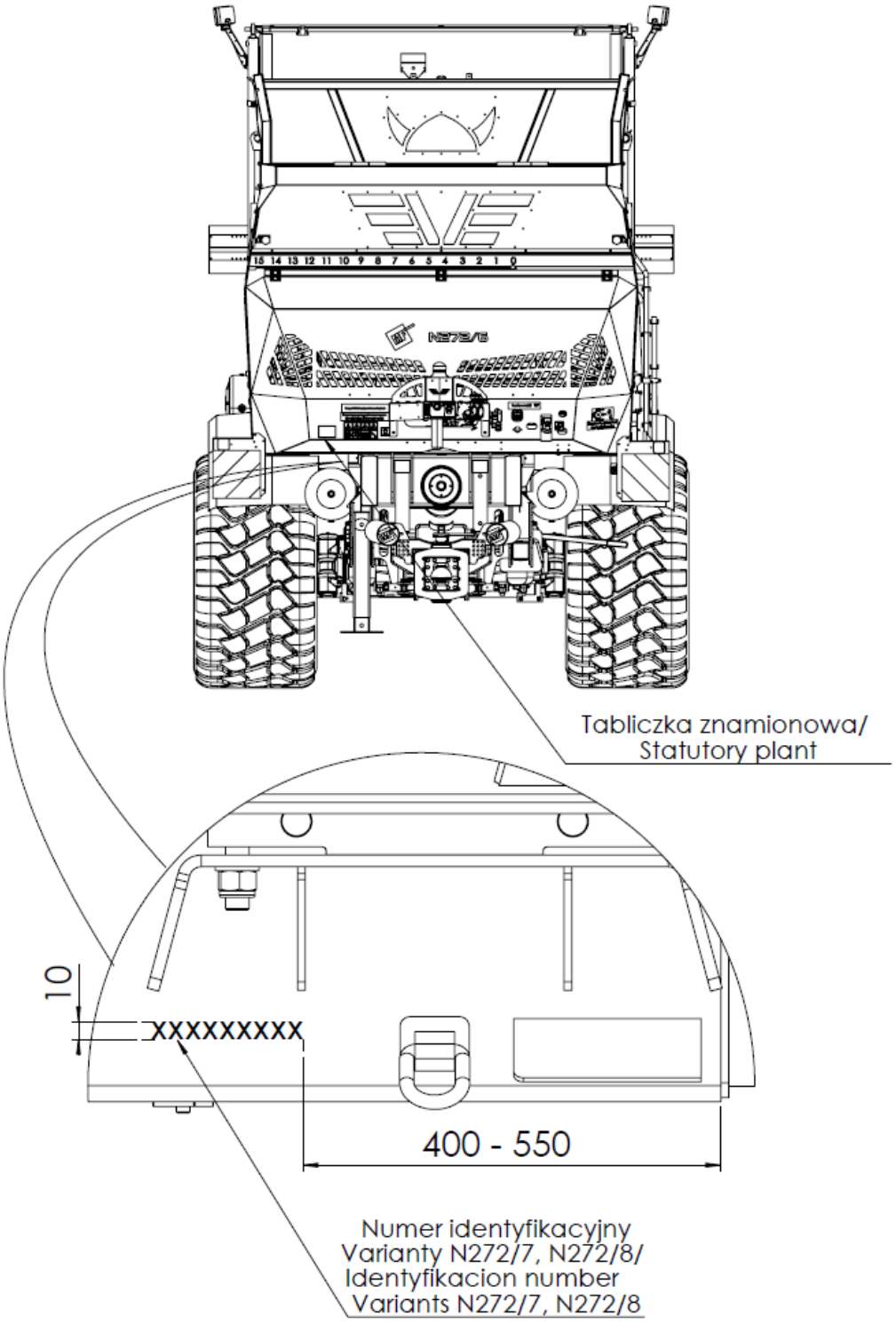


Figure 3. The position of the rating plate and serial number

CAUTION!

Entering public roads without a 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 User Manual and Warranty Card are the same, this is crucial for recognising the warranty. 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 User Manual is provided as the basic equipment of each Manure Spreader.

In the case of selling the Spreader to another user it is obligatory to provide the User Manual. It is recommended for the Spreader supplier to keep record of the User Manual receipt confirmation by the purchaser, submitted with the machine to the new user.

Please read the User Manual 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!

It is prohibited for persons who have not red this User Manual to use the Spreader.

1.3 Intended use of the Manure Spreader

Manure spreader is designed for the even spreading of manure, peat, compost, etc. and for transport of agricultural products on farms and on public roads. It is not permitted to use the spreader in any other way than the one described above.

The operator must use the machine in accordance with its intended use by carrying out activities involving the correct and safe operation and maintenance of the spreader, which will include:

- reading and understanding the spreader's principles of operation
- safe and correct operation of the machine
- Always maintain or have the machine maintained on schedule.
- Comply with the general safety regulations.
- Comply with the traffic laws.

DANGER

DANGER!

The Spreader must not be used contrary to its intended purpose, in particular to:

- carry people and animals
- operate it with exceeded payloads
- spread and transport toxic and flammable materials,
- distribute liquids, sand or fibrous substances
- carry goods, machinery and equipment not secured, which, while driving, may shift its position or affect the stability of the spreader
- to transport construction materials, individual objects, or any other materials not included in the scope of its intended use.

Unauthorised structural changes to the spreader voids the manufacturer's liability for consequential damage.

Requirements for agricultural tractors

Description	Requirements	UoM
Braking system 2-line braking system Pressure rating of the system	 Sockets acc. to PN-ISO-1728:2007 min. 650	 kPa
Hydraulic system Hydraulic oil Nominal pressure Oil purity	 HL 46 16 20/18/15 acc. to ISO 4406-1996	 MPa
Electrical system Electrical system voltage Connection socket	 12 7-pin acc. to ISO 1724	 V
Tractor hitch Minimum vertical load-bearing capacity of the hitch	N272/3 – 3000 N272/6 – 3000 N272/7 – 4000 N272/8 – 4000	kg
Minimum power demand of the tractor	N272/3 – 135 N272/6 – 140-150 N272/7 – 170 N272/8 – 250	HP
Minimum turning radius	6	m

1.4 Basic equipment

The basic accessories of each Spreader include:

- this User Manual;
- Warranty Card and T&C;
- a bracket for fixing a slow-vehicle marking plate;
- dual-line pneumatic brakes with adjustable braking force (dual-line pneumatic brakes with ALB);
- automatic parking brake (parking-release valve);
- lighting system.

1.5 Transport

The Spreader is sold fully assembled and does not require any further assembly. It is delivered to the User by means of motor transport or independently, when coupled with a tractor.

CAUTION!

CAUTION!

General health and safety regulations must be observed when loading and unloading the spreader. Persons operating the loading and unloading equipment must have the required authorisation to use the equipment.

CAUTION

CAUTION!

It is forbidden to attach slings of lifting devices to the upper mounting brackets of the body and the adapter to lift, load or unload a complete spreader.

Fasten the spreader to be transported on a platform by means of tie down straps or chains providing tensioning mechanism. The fasteners must have a valid safety certificate. Place chocks or other parts without sharp edges under the wheels of the spreader to prevent the machine from rolling. Attach the chocks to the platform of the means of transport. Special attention must be paid during loading and unloading so as not to damage the equipment of the spreader and its paint coating. Attach the fastening straps or chains to the shipping brackets welded to the frame of the load body, as marked with pictograms. The longitudinal members or other robust structural elements of the frame can also be used for that purpose.

Before loading the Spreader on the platform, couple it with the farm tractor's hitch and connect the brake system lines. A loader or forklift truck can be used for loading, provided they are fitted with suitable transport hitches and a braking system compatible with the Spreader's braking system. Use the extended ramps or a loading ramp to move the Spreader onto the low-loading machine.

DANGER

DANGER!

Improper use of fasteners can cause an accident.

CAUTION

CAUTION!

Pay particular attention to the angle of inclination of the ramps of a low-loading machine. It may not exceed 10°. The excessive inclination of the ramps can lead to damage to both the Manure Spreader and the transport machine.

The Spreader may be driven on public roads, as a machine attached to the **lower hitch** of a farm tractor.

Before merging with the traffic on public roads, make sure that the tractor is fully manoeuvrable. The front-axle load of the tractor must be at least 20% of the tractor's weight, which also applies when transporting and operating a loaded Spreader. If this condition is not fulfilled the front axle of the tractor must be loaded additionally.

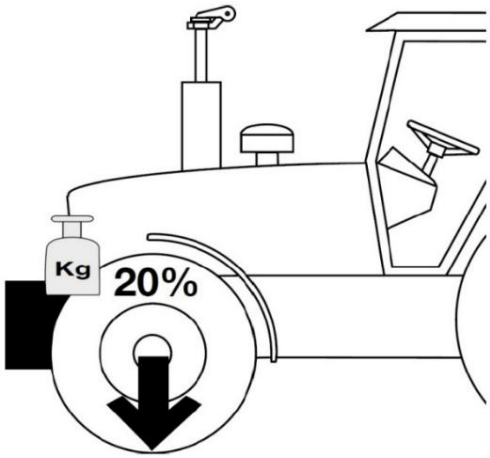


Figure 4. Minimum front axle load of the tractor

CAUTION!

CAUTION!

During the transport of the machine on public roads adapt the speed to the traffic conditions and do not exceed the speed of 40 km/h.

Prior to spreader transport make sure that

- the spreader is properly coupled to the tractor and the hitch device is secured against accidental disconnection
- both the spreader and the tractor brake systems function correctly
- the lighting systems of both the Spreader and the tractor are working correctly;

- the body gate is in its lowest position
- the hydraulic and pneumatic hoses are properly arranged and protected against damage in transport;
- the parking jack is raised to its uppermost position;
- the parking brake is released;
- the triangle which indicates slow-moving vehicles is mounted in a bracket on the rear cover of the adapter.

During transport of the spreader on public roads adhere to the road traffic regulations. During emergency parking of the tractor with the attached machine the driver must:

- Ensure that no safety hazard is caused on the road when stopping the vehicle
- Park the vehicle as close to the edge of the road as possible, parallel to the road centre line
- Stop the tractor engine, take out the key from the ignition switch, engage the auxiliary brake and place the chocks under a spreader wheel
- Outside a built-up area, place a warning triangle between 30 and 50 metres behind the vehicle and switch on hazard-warning lights
- when in a built-up area, switch on the hazard-warning lights and place a warning triangle behind the vehicle, unless it is installed on a bracket on the rear of the machine; make sure that it is clearly visible to other road users;
- in the event of a breakdown, take the appropriate steps to secure the area where the breakdown has occurred.

1.6 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 oil is leaked, close the source of the leakage and collect the spilled oil. Use absorbent materials to collect the oil residues. Store all pollutants such collected in tightly closed, oil-resistant and marked containers.

CAUTION!

DANGER!

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

CAUTION

CAUTION!

Send all waste oil for disposal in accordance with the applicable regulations.

It is forbidden to remove oil into drains or water reservoirs.

1.7 Decommissioning

If you decide to scrap the machine, you must comply with the national regulations for destruction and recycling of end-of-life machines. Before dismantling, remove all oil from the hydraulic system and gearboxes. Reduce the air pressure in the brake system to a 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.

Send all waste oil for disposal in accordance with the applicable regulations.

When replacing worn, damaged or unrepairable parts and components send them to recyclable material sites.

2. Safety of use

2.1 Basic safety principles

2.1.1 Obligation to provide information

CAUTION

CAUTION!

If the Spreader is sold to further users, attach this User Manual, and the purchaser of the spreader must undergo training as indicated in the Manual.

2.1.2 General regulations for work safety and use

Before each commissioning, the spreader must be checked for safe operation:

- Observe the generally applicable safety and accident prevention regulations and follow the information in this User Manual;
- The attached symbols, warning and informatory inscriptions provide important guidelines for safe operation – observing them ensures your safety;
- Start the Spreader only if all the required accessories are connected and protected against unintentional disconnecting or opening (e.g. hitch and drawbar, couplings, PTO shaft);
- Before starting work, learn how to operate all devices and controls, and their functions. It will be too late to do this during the operation;
- The Spreader must not be used by persons under the influence of alcohol or other stimulants, or those not trained in its operation, or not appropriately authorised to drive motor vehicles, which also includes children.

2.1.3 Operational safety

1) Before using the machine, the user must read and understand the content of this User Manual. Observe all instructions in this Manual during operation.
2) If the information contained in this Manual is unclear, please contact the distributor running an authorized technical service on behalf of the Manufacturer or contact the Manufacturer directly.
3) Careless and improper use and operation of the spreader, as well as failure to observe the recommendations contained in this Manual pose health risks.
4) Failure to observe the safety rules poses a threat to the health and life of the operators, and third parties.
5) Please note that during the spreader operation some residual risks occur, so exercising safety rules must be a priority.
6) All safety-related information must also be passed on to all other spreader users and operators.
7) Any structural and functional modifications of the Spreader release Metal-Fach Sp. z.o.o. from liability for damage to property or health impairment.
8) For power PTO transmission use only recommended PTO shafts with correct parameters.
9) Do not use uncovered articulated telescopic shafts (without guards) for power transmission.

10) Before starting to drive, check that the parking brake is released and that the brake force control is in the correct setting for the load status (it applies to a dual-line pneumatic system with manual brake force control).
11) Check the immediate vicinity (children, bystanders) before starting. Extreme attention is required if visibility is poor.
12) After finishing spreading, lower the slide gate of the load body completely, switch off the PTO shaft drive, and switch off the floor conveyor drive. Never leave the Spreader with the gate of the load body open, if the PTO shaft drive or the floor conveyor drive are switched on, and/or the adapter shields open, without supervision.
13) It is only allowed to enter the load body, if the Spreader has come to a complete stop, the PTO shaft is disengaged, the tractor's engine switched off, and the machine is protected against unauthorized access.
14) Always activate and deactivate the PTO shaft and hydraulically-controlled components from the driver's seat.
15) Couple the spreader as prescribed and only connect it to the recommended coupling equipment and secure the drawbar eye with the tractor's transport hitch.
16) Special care must be exercised, when coupling and uncoupling the Spreader to and from the tractor.
17) When installing and removing any supporting and safety devices, and ladders, always place them in a position ensuring safe operation.
18) Follow the acceptable axle loads, total weight, and transport dimensions.
19) Check the transporting equipment like the brakes and lights, the marking plate and other protective devices for connection and functioning.
20) Before driving, check the operation of the lights and brakes, and prepare the Spreader, in accordance with the recommendations provided in the “Driving on public roads” section.
21) Ensure that the Spreader is loaded in such a way that the material does not contaminate surfaces when travelling on public roads.
22) After completion of work and before driving on public roads, remove any residues of the spreading material from the external parts of the machine, to prevent it from falling and contaminating roads.
23) Notice all changes in vehicle behaviour, steering and braking performance due to loaded spreader being coupled to it.
24) When driving with a coupled spreader, notice how the load and/or inertia forces are distributed, especially if the load distribution is asymmetrical.
25) Do not stand within the range of the material being spread.
26) The spreading of manure can only be carried out, if:

- the Spreader is coupled with the tractor,
- the tractor and spreader unit is standing on a firm surface,
- the front-axle load of the tractor is at least 20% of the weight of the tractor,
- there are no persons within the spreading area,
- the tractor is aligned with the centre line of the spreader,
- keeping a safe distance from the power lines,
- no strong gusts of wind occur, which can carry the spreading material away outside the permitted spreading area.

27) If it is necessary to continue the final stage of spreading on a slope, drive the tractor and Spreader down the slope. When spreading on slopes, make sure that the surface inclination does not exceed 10°.
28) Exercise care when opening the shields, so your fingers and hands are not crushed.
29) When starting the Spreader, observe the signs warning against places, where crushing, dragging, and catching hazards can occur. There is a risk of crushing and wounding when coupling and uncoupling the spreader to the tractor.
30) No person is allowed to be present between the tractor and the Spreader, unless the vehicle is protected against rolling by the parking brake and/or wheel chocks.
31) Secure the Spreader and the tractor against rolling, when stationary.
32) It is forbidden to transport the Spreader with the load body's slide gate raised and the adapter's covers removed.
33) Keep a safe distance from power lines, when lifting the slide gate of the load body.
34) When carrying out repair and maintenance work, which requires entering the load body, the tractor must be stationary and protected against the risk of starting the engine and the use of the control elements by unauthorised personnel.
35) Always adjust your driving speed to the existing conditions. Avoid sudden up or downhill turns on sloping terrain.
36) Maintain a sufficient safety clearance within the turning area of the unit.
37) When reversing, ensure that you have sufficient visibility (if possible, have someone to assist you with guidance).
38) When cornering, take into account the inertia of the Spreader.
39) Observe a minimum turning radius of approx. 6 m when turning and reversing.
40) Remove any functional faults of the attached devices only when the engine is switched off and the ignition key removed.
41) In the event of a failure of the hydraulic or pneumatic systems, the Spreader must be taken out of service, until the failure has been remedied.
42) It is forbidden to carry out maintenance or repair work, when the load body is loaded.
43) Before carrying out repair work on the hydraulic or pneumatic systems, the oil or air pressure must be reduced.
44) In the event of an injury sustained from a strong hydraulic oil jet, consult a physician immediately. Hydraulic oil can penetrate under the skin or into the eye, and cause infections.
45) Use the hydraulic oil recommended by the Manufacturer. Never mix two types of oil.
46) Use the gear oil recommended by the Manufacturer. Never mix two types of oil.
47) Before leaving the tractor, switch off the engine, remove the key from the ignition, apply the handbrake and secure the Spreader with chocks.
48) Do not exceed the maximum permissible axle loads of the Spreader.
49) Exceeding the permissible technical load carrying capacity of the Spreader can damage the machine, and cause the loss of its stability while driving, and spillage of the load, and also compromise the safety of other road traffic. The braking system has been adapted to the permissible total weight of the Spreader, which, if exceeded, will considerably reduce the performance of the main brake.
50) It is forbidden to exceed the permissible driving speed.
51) The maximum allowable pressure in the hydraulic system is 16 MPa.
52) The maximum allowable pressure in a double-line pneumatic system is 0.80 MPa, and the minimum is 0.65 MPa.

53) Preparing the spreader for operation (connecting hydraulic hoses, pneumatic system, PTO shaft, etc.) must be made with the tractor engine switched off and the ignition key removed.
54) The Manufacturer provides the spreader as fully assembled.
55) Change the hydraulic (rubber) lines every 4 years.
56) Noise – the arithmetic mean of the two highest sound power levels L_{WA} is 78.7 dB(A). The arithmetic mean of the two highest sound pressure levels L_{pA} is 76 dB(A). The need for hearing protection depends on the emitted sound level and the sound power level of the towing vehicle, with which the Manure Spreader will be coupled. The machine manufacturer recommends the use of hearing protection.
57) Do not go under the machine whilst the floor conveyor is in motion.
58) Keep the spreader clean.
59) Depending on the degree of loading with the working material, the centre of gravity of the Manure Spreader is located 4700 - 5100 mm from the rear edge of the vehicle in the horizontal plane, in the transverse plane it is located along the axis of the vehicle, at a height of 1900 - 2300 mm from the ground.

WARNING

WARNING!
If operated during a storm, there is a risk of lightning striking the spreader.

2.1.4 Working with the machine

- When working with the machine, make sure that no people or animals are present in the vicinity of the spreading area.
- It is forbidden to stand within the spreading area, since the spreading material can contain stones, fragments of wood, or other objects.
- Before commencing work, check the condition of the adapter blades and their fasteners.
- Before loading, check the tension of the chains of the floor conveyor. Regularly check the tension of the conveyor chains.
- When working close to roads, drainage ditches, plot boundaries, and water bodies, make sure that designated spreading zone is not exceeded.

2.1.5 Pneumatic and hydraulic systems

CAUTION!

CAUTION!
The pneumatic braking system is under high pressure.
Before starting work on the system, switch off the tractor engine, secure the spreader with the parking brake and support chocks and depressurise it.

- When connecting pneumatic lines to the tractor's pneumatic system, ensure that the valves on the tractor and spreader side are not under pressure.
- Check the pneumatic connection on a regular basis and change damaged and ageing parts. Replace the lines as required by the manufacturer's specifications. Replace flexible pneumatic lines every 5 years unless damage has been found earlier.
- Air leaks from the pneumatic braking system are not allowed.
- The hydraulic system is under high pressure during operations.
- Use the hydraulic oil recommended by the manufacturer. Never mix two different types of oil.

CAUTION!

CAUTION!

The required purity of hydraulic oil is 20/18/15, according to ISO 4406-1996.

- Regularly check the technical condition of the hydraulic connections and lines.
- When connecting the hydraulic hoses to the tractor, make sure that the hydraulic systems of the tractor and the Spreader are not under pressure. If necessary, reduce the residual pressure of the system.
- In the event of an injury sustained from a strong hydraulic oil jet, consult a physician immediately. Hydraulic oil can penetrate under the skin or into the eye, and cause infections.

Replace flexible pneumatic lines every 5 years unless damage has been found earlier.

Replace rubber hydraulic hoses every 4 years regardless of their technical condition, unless a fault has been found earlier.

- Repair work on the pneumatic or hydraulic systems may only be carried out by an authorised representative of the spreader manufacturer.
- In the event of a failure of the hydraulic or pneumatic system, the spreader must be taken out of service until the failure has been removed.

2.1.6 Working with the PTO

- The Spreader may only be connected to the tractor by means of an appropriately selected PTO shaft recommended by the Manufacturer.
- Before starting work, read the User 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 with the spreader hitched, 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 user manual 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 spreader and the tractor.
- The PTO sheath is marked indicating which end of the shaft to mount on the machine side and which on the tractor 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 Spreader.
- Each time you start the Spreader, make sure that the PTO guards are in good technical condition, and that they are 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. Contact with a rotating PTO 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 chains fastened to prevent damage to sheaths and other components.
- It is forbidden to overload the PTO shaft and the drive system of the spreader's adapter. Rapid starting of the tractor's PTO shaft is not permitted. Before starting the PTO shaft, make sure that the direction of rotation is correct.
- **Use a PTO shaft speed of 1,000 rpm during operation.** Operating at different speeds can damage the machine or its components.
- Switch off the PTO shaft drive, whenever there is no need to drive the machine, or when the tractor and Spreader are oriented at an unfavourable angle.
- Do not exceed the maximum or minimum permissible working time of the articulated 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 during the spreader is parked or transported.

2.2 Residual risk

2.2.1 Residual risk description

Although METAL-FACH in Sokółka assumes responsibility for the machine's design and structure, in terms of eliminating hazards, it is inevitable that some risks are present during the Spreader's operation.

The residual risk occurs due to incorrect behaviour of the spreader operator, e.g. their carelessness, ignorance or improper behaviour. The following prohibited actions cause the highest level of risk.

1) The operating of the Spreader by minors or persons without authorisation to drive a tractor, as well as by persons who have failed to read the User Manual.
2) The operating of the Spreader by persons, who are sick or under the influence of alcohol or other intoxicating substances.
3) Using the Spreader for purposes other than those described in the User Manual.
4) Standing between the tractor and the Spreader, while the tractor's engine is running.
5) Oil leakage and sudden movement of components caused by rupturing of hydraulic hoses.
6) Standing on the machine while operating or transporting.
7) Bystanders, children in particular, standing close to the running spreader.
8) Presence of persons or animals in areas not visible from the operator's position.
9) Cleaning, maintaining and inspecting the spreader assemblies connected to the PTO shaft while the tractor engine is running.
10) Checking its technical condition, when the Spreader is in operation.
11) Operating defective power take-off shafts.
12) Exceeding the permissible speed and the permissible total weight.
13) Making modifications to the machine without the Manufacturer's consent.

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

2.2.2 Residual risk assessment

The residual risk can be reduced to the minimum by applying the following recommendations:

1) Adhering to the safety rules described in the User Manual.
2) Using common sense, when operating the machine.
3) Do not hurry, when operating the machine.
4) Maintain a safe distance from the restricted and dangerous places.
5) Do not reach into dangerous and/or restricted places with your hands.
6) Do not stand on the machine, while it is in operation.
7) Have repair and maintenance work performed by trained personnel.
8) Wear the appropriate protective clothing.
9) Prevent unauthorized access, especially children, to the machine.
10) Ensure that no one is in the danger zone – particularly before starting to operate the machine, whilst it is in operation, and during reversing and coupling manoeuvres.

CAUTION!

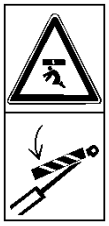
CAUTION!
Failure to comply with the instructions and guidance provided herein may result in residual risks!

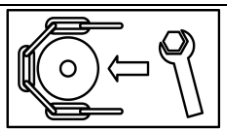
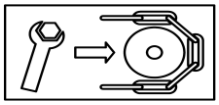
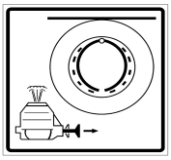
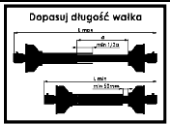
2.3 Warning and information stickers

The Manure Spreader is marked with information and warning stickers. The User is obliged to ensure that the inscriptions, warning signs and information labels provided on the Spreader are legible throughout the working life of the Spreader. If any information or warning sticker has been damaged or removed, have it ordered from the Manufacturer or the point of sale the machine was purchased from. Re-attach stickers to any new components that have been fitted during repair work. When cleaning, do not point a strong jet of water at the labels and do not use solvents.

Information and warning stickers

No.	Safety symbol (sign)	Meaning of the symbol (sign) or content of the inscription	Location on the spreader
1.		Caution! Before you start operating the machine, read the User Manual.	Load body front wall
2.		Caution! 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.		Caution! Torso crushing hazard. Stay clear of the area where the articulated coupling joints rotate, if the engine is running.	Load body front wall
5.		Caution! Danger of being dragged in by the drivetrain. Do not reach into the area of rotating parts.	At the drawbar and at the rear on the right-hand side

6.		Caution! Thrown or flying materials. Hazard to the whole body. Keep a safe distance from the machine.	On the adapter frame
7.		Caution! Hand crushing hazard. Keep a safe distance from moving parts.	On the adapter frame
8.		Caution! Danger of hand or upper torso being dragged in by the rotors of the adapter. Do not reach into the area of rotating parts.	On the rear panel of the load body. Near the adapter.
9.		Caution! Risk of falling. Do not travel on platforms or ladders.	On the right-hand panel of the load body. On the ladder
10.		Caution! Danger of crushing toes or feet. Keep a safe distance from the support leg and drawbar.	At the parking jack
11.		Secure the lifting ram before entering the danger zone.	On both sides of the horizontal adapter flap
12.		Do stand under the rising cover	On both sides of the horizontal adapter flap

13.		Do not stand under the cover being lowered	On both sides of the horizontal adapter flap
14.		Attachment points of the transport tie down straps	At the attachment points
15.		Lubricating points	The front and rear sections of the floor conveyor
16.		Tensioning the floor conveyor chain	On the left panel of the load body
17.		Tensioning the floor conveyor chain	On the right-hand panel of the load body
18.		Speed limit of 40 km/h	At the rear, on the lightboard
19.		Pneumatic brake release mechanism	Load body front wall
20.		PTO rotational speed	On the front sheath
21.		Jacking point	On the driving axles
22.		Adjust the length of the shaft	On the hitch
23.		Do not put your hand into moving parts of the conveyor, be careful	On the right and left panels of the load body front and rear

	Warning inscriptions	Meaning of the symbol (sign) or content of the inscription	Location on the spreader
24.		Turn off the PTO drive and close the adapter covers when the machine is stationary!	Load body front wall
25.		Check chain tension regularly	On the right and left panels of the load body
26.		Do not enter the load body when the drive is enabled	On the right-hand panel of the load body. On the ladder
27.		Tighten the wheel nuts after a few kilometres and then periodically	Above the road wheels
28.		Adapter weight …… kg	On the adapter frame
29.		Load capacity: 14 t – N272/3, 18 t – N272/6, N272/7 – 24 t, N272/8 – 36 t	Load body front wall
30.		Switch off the PTO shaft drive when cornering.	Load body front wall
31.		Use a hitch designed for single-axle machines to couple the vehicle.	Load body front wall

CAUTION

CAUTION!

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

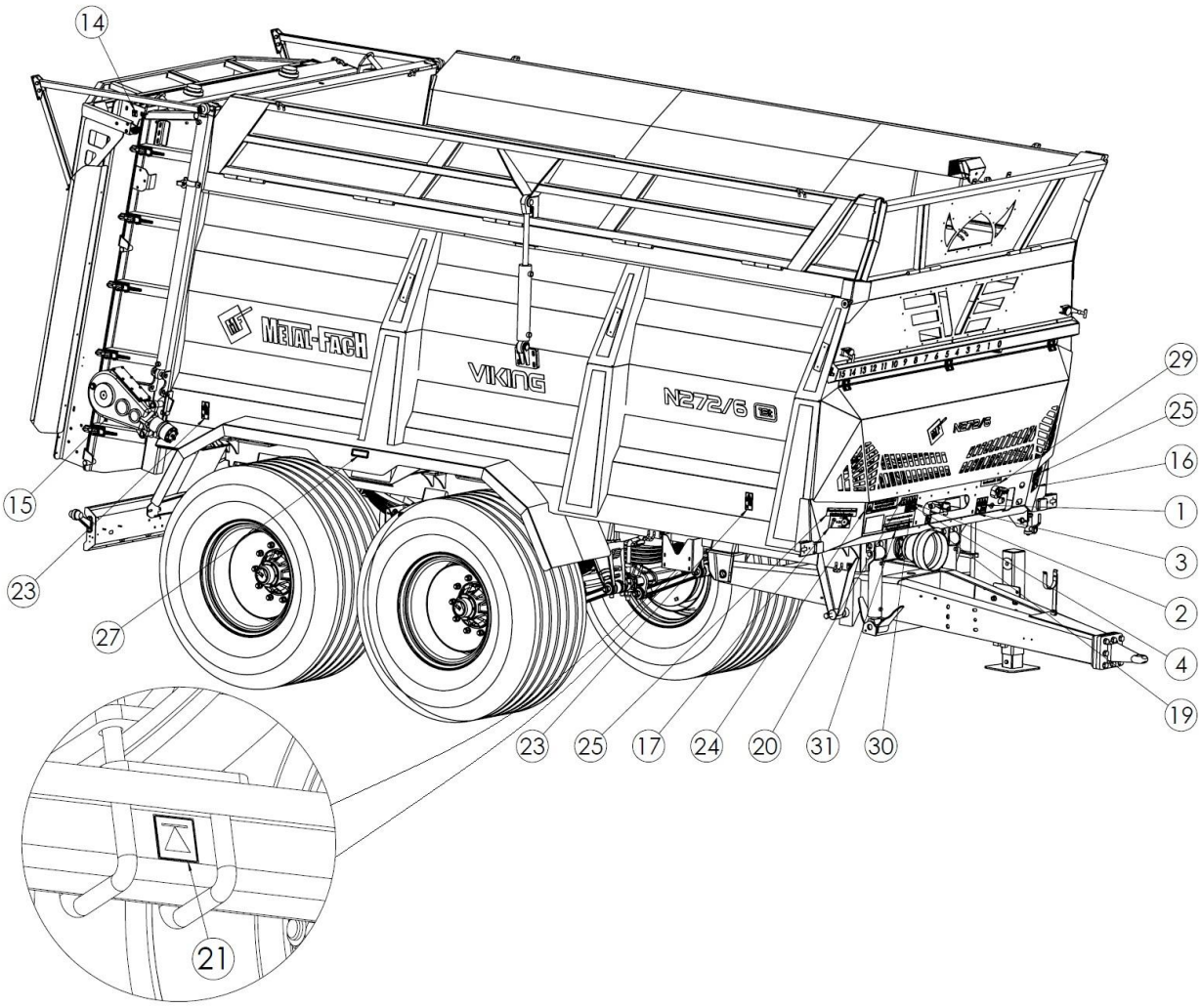


Figure 5. Location of warning and information stickers in the vertical adapter (front)

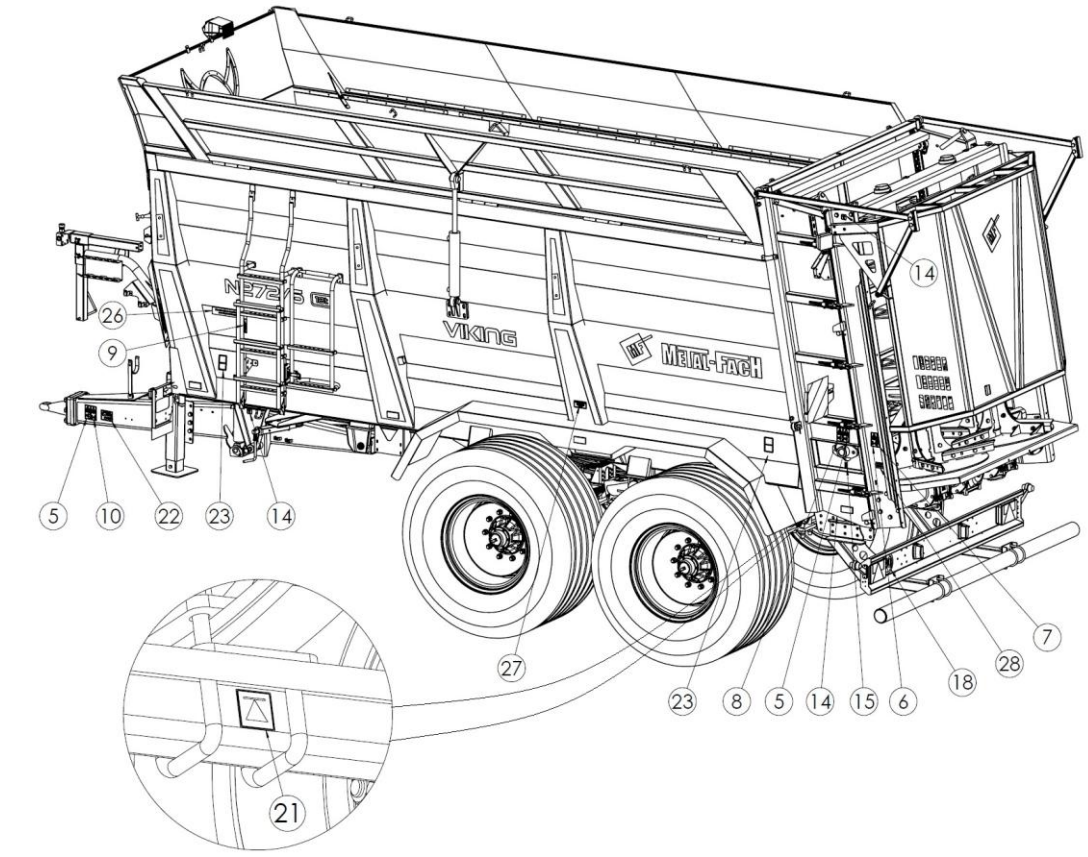


Figure 6. Location of warning and information stickers in the vertical adapter (rear)

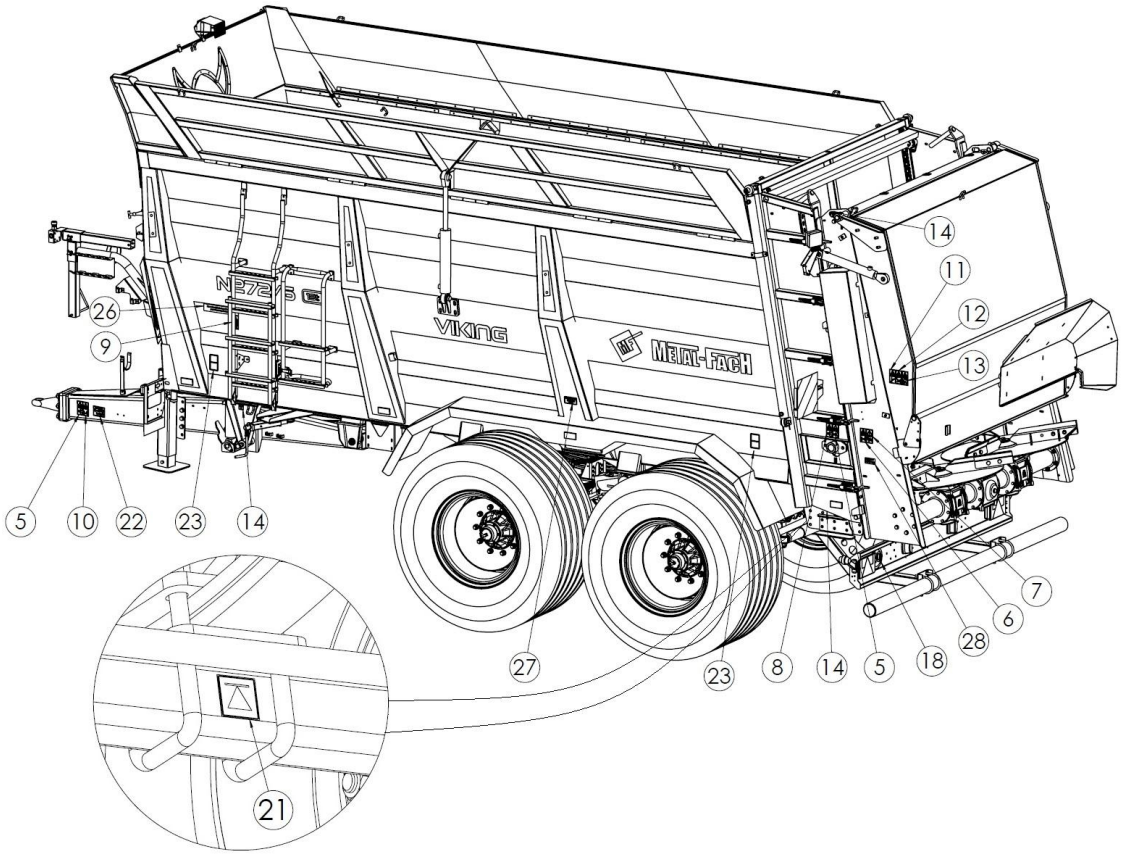


Figure 7. Location of warning and information stickers on the horizontal adapter

2.4 Fire protection

1) Because the Manure Spreader handles materials which, in some cases, may be flammable, it is essential to comply strictly with fire safety regulations and to eliminate any risk of fire during operation. When using the machine, it is essential that the tractor is equipped with a fully functional powder fire extinguisher (BCE type).
2) In the event of a fire, stop the machine immediately and switch off the tractor engine. Use a fire extinguisher, if provided, to extinguish the fire source; If a fire extinguisher is unavailable, sand can be used to extinguish the fire. If necessary, call the emergency number or the fire brigade and ask for help.
3) It is not allowed to smoke or use open fire near the machine.
4) Prior to commencing work, lubricate the machine according to the lubricating plan, and then start the machine and make sure that the moving parts of the machine do not rub against the immovable parts. Make sure all causes of mechanisms rubbing against each other are removed prior to commencing work.
5) It is unacceptable to repair or weld the machine, if it has not been cleaned of all residues of flammable materials that could cause fire. Before starting welding work, make sure the electrical and hydraulic lines, the bearings and plastic sleeve housings are secured against any damage.
6) When an accident happens, call the emergency number of rescue centre, ambulance service or fire brigade.

CAUTION!

CAUTION!

Users must remember that:

It is absolutely mandatory to follow all industrial safety regulations, traffic regulations, and fire protection regulations.

2.5 Noise emissions

The level of noise highly depends on the farm tractor used. The arithmetic mean of the two highest sound power levels L_{WA} is 78.7 dB(A). The arithmetic mean of the two highest sound pressure levels L_{pA} is 76 dB(A). The need for hearing protection depends on the emitted sound level and the sound power level of the towing vehicle, with which the Manure Spreader will be coupled. The machine manufacturer recommends the use of hearing protection.

2.6 Accident management

In the event of an accident during work, provide first aid to the injured person immediately. If necessary, call the emergency services by dialling 112. Protect the scene of the accident to prevent further hazards and to enable the causes to be found out.

3. Design and operation principle

3.1 Main technical data

Main technical data

No.	General data				
1.	Vehicle type		Manure Spreader		
2.	Suspension		Tandem on 4 parabolic leaf springs		
3.	Trade name		N272/3 (14 t); N272/6 (18 t) **VIKING**		
4.	Body type		Shell type load body		
5.	Rating plate location		Front beam of the shell		
Overall dimensions					
			UoM	**N272/3 (14 t)**	**N272/6 (18 t)**
6.	Length	2-rotor vertical adapter	mm	7925	
		2-rotor horizontal disc adapter		8114	
7.	Width	550-60/22.5” wheels	mm	2550	2650
		600-55/22.5” wheels		2600	2700
		650/55R26.5” wheels		-	2750
		710/45R22.5” wheels		2710	-
		710/50 R26.5 wheels		-	2930
8.	Height	550-60/22.5” wheels	mm	3390	3495
		600-55/22.5” wheels		3410	3515
		650/55R26.5”, 710/50R26.5 wheels		-	3550
		710/45R22.5” wheels		3370	-
9.	Wheel track		mm	1900-2100	2100-2200
Loading height					
10.	Loading height	550-60/22.5” wheels	mm	2870	2975
		600-55/22.5” wheels		2890	2995
		650/55R26.5”, 710/50R26.5 wheels		-	3030
		710/45R22.5” wheels		2850	-
11.	Loading height with extensions	550-60/22.5” wheels	mm	3370	3475
		600-55/22.5” wheels		3390	3495
		650/55R26.5”, 710/50R26.5 wheels		-	3530
		710/45R22.5” wheels		3350	-
12.	Ground clearance of the load body floor	550-60/22.5” wheels	mm	1520	1625
		600-55/22.5” wheels		1540	1645
		650/55R26.5”, 710/50R26.5 wheels		-	1680
		710/45R22.5” wheels		1500	-
Internal dimensions of the spreader body					
13.	Length		mm	5000	
14.	Width		mm	2000	

15.	Height			mm	1350
16.	Height with hydraulic extensions (sheet metal)			mm	1850
Performance parameters					
				UoM	**N272/3 (14 t)** / **N272/6 (18 t)**
17.	Gross vehicle weight rating			kg	18000
18.	Poor visibility in traffic*			kg	13000-14800 / 12000-14400
19.	Permissible load per axle in road traffic			kg	9000/9000
20.	Kerb weight			kg	6200-8000 / 6600-9000
21.	Maximum pressure on drawbar eye (max.)			kg	3000 / 3000
22.	PTO rotational speed			RPM	1000
23.	Tractor power demand (min)			HP	at least 135 / min. 140–150
24.	Cargo space			m³	13.4
25.	Load capacity with extensions			m³	18.4
26.	Effective spreading width			m	8
27.	Maximum spreading width			m	8-12
28.	Permissible transport speed			km/h	40
29.	Working speed			km/h	4-10
Miscellaneous					
30.	Pressure in the hydraulic system (max)			MPa	16
31.	Maximum pressure in the 2-line pneumatic braking system			MPa	0.80
32.	Electrical system voltage			V	12
33.	Types of hitch	Type of shock absorption		-	Hydraulic
		Coupling with the tractor	Lower hitch		YES
			Upper hitch		NO
34.	Drawbar eyes (types)	Standard		mm	Drawbar eye ∅50
		Optional			Rotational drawbar eye ∅50
		Optional			Drawbar eye ∅40
		Optional			K80 ball drawbar eye
35.	Driving axles	Standard		mm	Permanent □90 / Permanent □130
		Optional			NONE / Trailing, steering □130
36.	Brakes	Standard		-	Pneumatic with ALB

			UoM	N272/3 (14 t)	N272/6 (18 t)
37.	Parking brake		-	Pneumatic – manually controlled by the parking and release valve, braking 1 front axle	
38.	Tyre size	Standard	-	550/60-22.5”	
		Optional		600/55-22.5”	
		Optional		-	650/55R26.5”
		Optional		710/45R22.5”	-
		Optional		-	600/55 R26.5
		Optional		-	710/50 R26.5
39.	Tyre air pressure*		bar	2.8–4.0	
40.	Minimum load index and speed rating of tyres		-	160 A8	
41.	Adapter type	Standard	-	2-rotor, vertical, 2000 x 1880, fixed with an eccentric fastener	
		Optional		2-rotor, horizontal, disc, 2000 x 1830, fixed with an eccentric fastener	
42.	Adapter weight	Vertical 2-rotor	kg	1010	
		2-rotor horizontal disc adapter		1000	
43.	Oil in the hydraulic system (HL-46)		L	10.5	
44.	Oil in the gearbox of the floor conveyor (gearbox oil 80W90)		L	4.3	
45.	Oil in the gearbox of the spreading adapter (gearbox oil 80W90)		L	13.5	
46.	Chain of the floor conveyor	Chain link	mm	∅14 (14 x 50)	
		Number of rows	pcs.	4	
47.	Tensioning the chain of the floor conveyor	Tensioning screws in the front beam	pcs	4	
48.	The chain wheel scrapers on the floor conveyor	Front	-	YES	
		Rear		YES	
49.	Safeguards (overload couplings)	Adapter	-	Front articulated telescopic shaft – shear pin	Articulated telescopic shaft at the rear – friction clutch
		Floor conveyor gearbox		The cross-directional hydraulic valve	
50.	The slide gate-lifting indicator	Standard	-	YES	
51.	The thickness of the load body panel (steel grade)		mm	3 (S355)	

				UoM	N272/3 (14 t)	N272/6 (18 t)
52.	The thickness of the load body floor (steel grade)			mm	3 (STRENX 700)	
53.	The wheel chocks included in the delivery			-	YES	
54.	Wheel mudguards	Standard		-	YES	
55.	Deflectors	Vertical adapter	Standard	-	Fixed permanently (no adjustment)	
		Horizontal adapter	Standard		Deflector guarding the right-hand bottom disc	
56.	Adapter tailgate (cover)		Vertical adapter		Lifted, with a slide gate	
			Horizontal adapter		Lifted hydraulically	
57.	External ladder			-	Fixed with bolts on the left-hand side of the body	
Hydraulic system						
58.	Hydraulic extensions	Standard	0.5 m	-	Hydraulically controlled	
59.	Load body slide gate			-	Hydraulic control	
60.	Parking jack			-	Hydraulic control	
61.	The drive of the floor conveyor			-	Hydraulically controlled	
62.	Bottom hitch (drawbar suspension)			-	Hydraulically controlled	
63.	Panel-controlled valve unit (simple control)		Standard	-	2 pair of lines (supply, parking jack)	3 sets of lines (power supply, parking jack, steering axle)
64.	Valve unit – Precision fertilisation (with control panel)		Optional	-	2 pair of lines (supply, parking jack)	2 pair of lines (supply, parking jack)
65.	Valve unit – ISOBUS precision fertilisation		Optional	-	2 pair of lines (supply, parking jack)	2 pair of lines (supply, parking jack)

* depending on the equipment

No.	General data				
1.	Vehicle type		Manure Spreader		
2.	Suspension		Tandem with parabolic leaf springs/hydraulic suspension	Tridem with parabolic leaf springs/hydraulic suspension	
3.	Type (Model)		N272/7 (24t); N272/8 (36 t) **VIKING**		
4.	Body type		Shell type load body		
5.	Rating plate location		Front beam of the shell		
Overall dimensions					
			UoM	**N272/7 (24 t)**	**N272/8 (36 t)**
6.	Length	2-rotor vertical adapter	mm	9760	11700
		2-rotor horizontal disc adapter		9950	11950
7.	Width	560/60R22.5” wheels	mm	2660	2760
		710/45R22.5” wheels		2810	2910
		650/55R26.5” wheels		2750	2850
		710/50R26.5” wheels		2930	2930
8.	Height	560/60R22.5” wheels	mm	3550	3870
		710/45R22.5” wheels		3560	3880
		650/55R26.5” wheels		3600	3920
		710/50R26.5” wheels		3630	3950
9.	Wheel track		mm	2100	2400
Loading height					
10.	Loading height	560/60R22.5” wheels	mm	3020	3020
		710/45R22.5” wheels		3030	3030
		650/55R26.5” wheels		3070	3070
		710/50R26.5” wheels		3100	3100
11.	Loading height with extensions	560/60R22.5” wheels	mm	3520	3520
		710/45R22.5” wheels		3530	3530
		650/55R26.5” wheels		3570	3570
		710/50R26.5” wheels		3600	3600
12.	Ground clearance of the load body floor	560/60R22.5” wheels	mm	1670	1670
		710/45R22.5” wheels		1680	1680
		650/55R26.5” wheels		1720	1720
		710/50R26.5” wheels		1750	1750
Internal dimensions of the spreader body					
13.	Length		mm	6800	8600
14.	Width		mm	2000	2000
15.	Height		mm	1350	1350
16.	Height with hydraulic extensions (sheet metal)		mm	1850	1850

				UoM	N272/7 (24 t)	N272/8 (36 t)
Performance parameters						
17.	Gross vehicle weight rating			kg	20000	30000
19.	Poor visibility in traffic*				11000-14500*	17000-22000*
21.	Permissible load per axle in road traffic				10000/10000	10000/10000/ 10000
22.	Kerb weight (max)	At least		kg	9500	12000
		Max			13000	17000
23.	Drawbar eye load (max)			kg	4000	4000
24.	PTO rotational speed			RPM	1000	
25.	Tractor power demand (min)			HP	170	250
26.	Load capacity without extensions			m^3	18.4	23
27.	Heaped load capacity without extensions				21.5	31.6
28.	Load capacity with extensions				25	27
29.	Heaped load capacity with extensions				28	36
30.	Effective spreading width			m	8	
31.	Maximum spreading width			m	8-12	
32.	Permissible transport speed			km/h	40	
33.	Working speed			km/h	4-10	
Miscellaneous						
34.	Pressure in the hydraulic system (max)			MPa	16	
35.	Maximum pressure in the 2-line pneumatic braking system			MPa	0.80	
35.	Electrical system voltage			V	12	
36.	Types of hitch	Type of shock absorption		-	Hydraulic	
		Coupling with the tractor	Lower hitch		YES	
			Upper hitch		NO	
37.	Drawbar eyes (types)	Standard		-	K80 ball drawbar eye	
		Optional		-	Drawbar eye ∅50	
38.	Driving axles	Standard		mm	Passive self-steer □150	2x passive self-steer □150
		Optional			□150 Forced self-steer	□150 Forced self-steer
39.	Suspension	Standard		-	Parabolic leaf spring	
		Optional			Hydraulic	
40.	Brakes	Standard		-	Pneumatic models from ALB, with membrane-spring rams	

			UoM	N272/7 (24 t)	N272/8 (36 t)
41.	Parking brake		-	Automatic – (parking and release valve)	
42.	Tyre size	Optional	-	560/60R22.5”	
		Standard		650/55R26.5”	
		Optional		710/50R26.5”	
42.	Adapter type	Standard	-	2-rotor, vertical, 2000 x 1880, fixed with an eccentric fastener	2-rotor, vertical, 2000 x 2385, fixed with an eccentric fastener
		Optional		2-rotor, horizontal, disc, 2000 x 1830, fixed with an eccentric fastener	2-rotor, horizontal, disc, 2000 x 2350, fixed with an eccentric fastener
43.	Adapter weight	Vertical 2-rotor	kg	1100	1220
		2-rotor horizontal disc adapter		1100	1570
44.	Oil in the hydraulic system (HL-46)		L	14.5	16.5
45.	Oil in the gearbox of the floor conveyor (gearbox oil 80W90)		L	8.6 (Starosielski)	9.5 (Sisp)
46.	Oil in the gearbox of the spreading adapter (gearbox oil 80W90)		L	13.5	
48.	Chain of the floor conveyor	Chain link	mm	∅14 (14 x 50)	∅18 (18x64)
		Number of rows	pcs.	4	
49.	Tensioning the chain of the floor conveyor	Tensioning screws in the front beam	pcs	4	
50.	The chain wheel scrapers on the floor conveyor	Front	-	YES	
		Rear		YES	
51.	Safeguards (overload couplings)	Tractor	-	Automatic coupling	
		Adapter		One-way coupling	
		Floor conveyor gearbox		The cross-directional hydraulic valve	
52.	Tailgate indicator	Standard	-	YES	

				UoM	N272/7 (24 t)	N272/8 (36 t)
53.	The thickness of the load body panel (steel grade)			mm	3 (STRENX 700)	
54.	The thickness of the load body floor (steel grade)			mm	3 (STRENX 700)	
55.	The wheel chocks included in the delivery			-	YES	
56.	Wheel mudguards	Standard		-	YES	
55.	Deflectors	Vertical adapter		-	Fixed permanently (no adjustment)	Hydraulic
		Horizontal adapter			Hydraulic control deflectors	
56.	Adapter tailgate (cover)		Vertical adapter		Lifted, with a slide gate	Hydraulically opened
			Horizontal adapter (optional)		Lifted hydraulically	
57.	External ladder			-	Left side of the load body (foldable)	
Hydraulic system						
58.	Hydraulic extensions	Standard	0.5 m	-	Hydraulically controlled	
59.	Load body slide gate			-	Hydraulic control	
60.	Parking jack			-	Hydraulic control	
61.	The drive of the floor conveyor			-	Hydraulically controlled	
62.	Bottom hitch			-	Hydraulically controlled	
63.	Panel-controlled valve unit (simple control)		Standard	-	3 pair of lines (unit supply, steering axle, hydraulic parking jack)	
64.	Valve unit – Precision fertilisation (with control panel)		Optional	-	2 pair of lines (unit supply, hydraulic parking jack)	
65.	Valve unit – ISOBUS precision fertilisation		Optional	-	2 pair of lines (unit supply, hydraulic parking jack)	

* depending on the equipment

Key technical data for tyres

Tyre assembly No. *Tyre Combination No*	Oś nr *Axle No*	Rozmiar opony, w tym indeks nośności i symbol kategorii prędkości *Tyre dimension including load capacity index and speed category symbol*	Promień toczny (1) [mm] *Rolling radius [mm]*	Obciążenie znamionowe jednej opony [kg] Tyre Load rating per tyre [kg]	Maksymalna dopuszczalna masa na oś [kg] (*) Maximum permissible mass per axle [kg] (*)	Maksymalna dopuszczalna masa pojazdu [kg] (*) Maximum permissible mass of the vehicle [kg] (*)	Maksymalne dopuszczalne obciążenie pionowe w punkcie sprzęgu [kg] (*) (**) (***) Maximum permissible vertical load on the coupling point [kg] (*) (**)	Rozstaw kół [mm] Track width [mm]	
								Minimum Minimum	Maksimum Maximum
Variant: A (N272/1), B (N272/2, N272/3, N272/6)									
D	1.2	550/60 22.5 160 A8	593	Min. 4500 kg	9000 kg	18000 kg	3000 kg	1900	2200
E	1.2	550/60 R22.5 160 A8	593	Min. 4500 kg	9000 kg	18000 kg	3000 kg	1900	2200
S	1.2	560/60 R22.5 160 A8	549	Min. 4500 kg	9000 kg	18000 kg	3000 kg	1900	2200
T	1.2	580/65 R22.5 160 A8	594	Min. 4500 kg	9000 kg	18000 kg	3000 kg	1900	2200
G	1.2	600/55- R22.5 160 A8	518	Min. 4500 kg	9000 kg	18000 kg	3000 kg	1900	2200
F	1.2	600/55-22.5 160 A8	591	Min. 4500 kg	9000 kg	18000 kg	3000 kg	1900	2200
U	1.2	600/50 R22.5 160 A8	555	Min. 4500 kg	9000 kg	18000 kg	3000 kg	1900	2200
W	1.2	620/50 R22.5 160 A8	555	Min. 4500 kg	9000 kg	18000 kg	3000 kg	1900	2200
H	1.2	710/45 R22.5 160 A8	567	Min. 4500 kg	9000 kg	18000 kg	3000 kg	1900	2200
I	1.2	600/55 -26.5 160 A8	644	Min. 4500 kg	9000 kg	18000 kg	3000 kg	2100	2200
J	1.2	600/55 R26.5 160 A8	606	Min. 4500 kg	9000 kg	18000 kg	3000 kg	2100	2200
K	1.2	650/55 R26.5 160 A8	670	Min. 4500 kg	9000 kg	18000 kg	3000 kg	2100	2200
X	1.2	680/55 R26.5 160 A8	631	Min. 4500 kg	9000 kg	18000 kg	3000 kg	2100	2200
L	1.2	710/50 R26.5 160 A8	667	Min. 4500 kg	9000 kg	18000 kg	3000 kg	2100	2200
1	1.2	750/45 R26.5 160 A8	665	Min. 4500 kg	9000 kg	18000 kg	3000 kg	2100	2250
Variant: K (N272/7)									
D	1.2	550/60 22.5 164 A8	593	Min. of 5000 kg	10000 kg	20000 kg	4000 kg	1900	2200
E	1.2	550/60 R22.5 164 A8	593					1900	2200

S	1.2	560/60 R22.5 164 A8	549	Min. of 5000 kg	10000 kg	20000 kg	4000 kg	1900	2200
T	1.2	580/65 R22.5 164 A8	594					1900	2200
G	1.2	600/55- R22.5 164 A8	518					1900	2200
F	1.2	600/55-22.5 164 A8	591					1900	2200
U	1.2	600/50 R22.5 164 A8	555					1900	2200
W	1.2	620/50 R22.5 164 A8	555					1900	2200
H	1.2	710/45 R22.5 164 A8	567					1900	2200
I	1.2	600/55 -26.5 164 A8	644					2100	2200
J	1.2	600/55 R26.5 164 A8	606					2100	2200
K	1.2	650/55 R26.5 164 A8	670					2100	2200
X	1.2	680/55 R26.5 164 A8	631					2100	2200
L	1.2	710/50 R26.5 164 A8	667					2100	2200
1	1.2	750/45 R26.5 164 A8	665					2100	2250
Variant: L (N272/8)									
D	1,2,3	550/60 22.5 164 A8	593	Min. of 5000 kg	10000 kg	20000 kg	4000 kg	1900	2200
E	1,2,3	550/60 R22.5 164 A8	593					1900	2200
S	1,2,3	560/60 R22.5 164 A8	549					1900	2200
T	1,2,3	580/65 R22.5 164 A8	594					1900	2200
G	1,2,3	600/55- R22.5 164 A8	518					1900	2200
F	1,2,3	600/55-22.5 164 A8	591					1900	2200
U	1,2,3	600/50 R22.5 164 A8	555					1900	2200
W	1,2,3	620/50 R22.5 164 A8	555					1900	2200
H	1,2,3	710/45 R22.5 164 A8	567					1900	2200
I	1,2,3	600/55 -26.5 164 A8	644					2100	2200
J	1,2,3	600/55 R26.5 164 A8	606					2100	2200

K	1,2,3	650/55 R26.5 164 A8	670	Min. of 5000 kg	10000 kg	20000 kg	4000 kg	2100	2200
X	1,2,3	680/55 R26.5 164 A8	631					2100	2200
L	1,2,3	710/50 R26.5 164 A8	667					2100	2200
1	1,2,3	750/45 R26.5 164 A8	665					2100	2250

(*) Zgodnie ze specyfikacją opon.

(**) Obciążenie przenoszone na środek odniesienia sprzęgu w warunkach statycznych, bez względu na urządzenie sprzęgające; jeżeli maksymalne dopuszczalne obciążenie pionowe w punkcie sprzęgu w zależności od sprzężenia jest wskazane w tej tabeli, rozszerzyć tabelę po prawej stronie i w nagłówku kolumny podać oznaczenie identyfikacyjne urządzenia sprzęgającego; w przypadku pojazdów kategorii R lub S niniejsza kolumna dotyczy tylnych urządzeń sprzęgających, jeżeli je zastosowano.

(***) Wartość tę należy podać, tylko jeżeli maksymalne dopuszczalne obciążenie pionowe w punkcie sprzęgu jest mniejsze niż podane w pozycjach 38.3 i 38.4

(*) According to the tyre specification.

(**) Load transmitted to the reference centre of the coupling under static conditions, irrespective to the coupling device; if the maximum permissible vertical load on the coupling point depending on the coupling is indicated in this table, expand the table at the right side and indicate the identification of the coupling device in the header of the column; for R- or S-category vehicles this column(s) concerns the rear coupling devices if there is such a device.

(***) Value to be provided only if the maximum permissible vertical load on the coupling point is lower than indicated in entries 38.3 and 38.

The User must observe the permissible transport speeds commensurate with the maximum load carrying capacity of the spreader.

If another brand of tyre is used, observe its parameters.

DANGER

DANGER!

Failure to adhere to the permissible speed, tyre and axle loads can result in a serious accident.

3.2 Design and operation principle

The components of the spreader are shown in Figure 8. The main structural parts include a lower frame (4) with tandem/tridem spring-mounted suspension for N272/8 Spreader (5) on which the spreader body (7) is supported. A hydraulically sprung hitch (2) fitted with a fixed drawbar eye (1) is used for connection with the tractor's lower hitch. It is also possible to mount the eye for a rotary and ball drawbar. A mechanical parking jack (3) is attached to the drawbar to support the spreader when it is not connected to the tractor and to adjust the height of the drawbar during coupling. A fixed ladder (17) is installed on the left-hand side of the body wall to inspect the load compartment and enter the inside of the body during cleaning or

maintenance works. There is a hydraulically controlled slide gate (11) at the rear of the body for separating the loaded material from the adapters and prevent it from falling out during transport. The main operation component is the adapter (10) with two vertical rotors. The loaded material is moved towards the adapter unit by the chain feeder (13) installed on the floor of the spreader body. The adapter has a cover (10) which serves as a safety feature during transport. The cover lifts up automatically when the slide gate is extended. This option allows for the fitting of side extensions (20) that are operated by hydraulic rams. This feature allows you to lower the loading height when filling the load body.

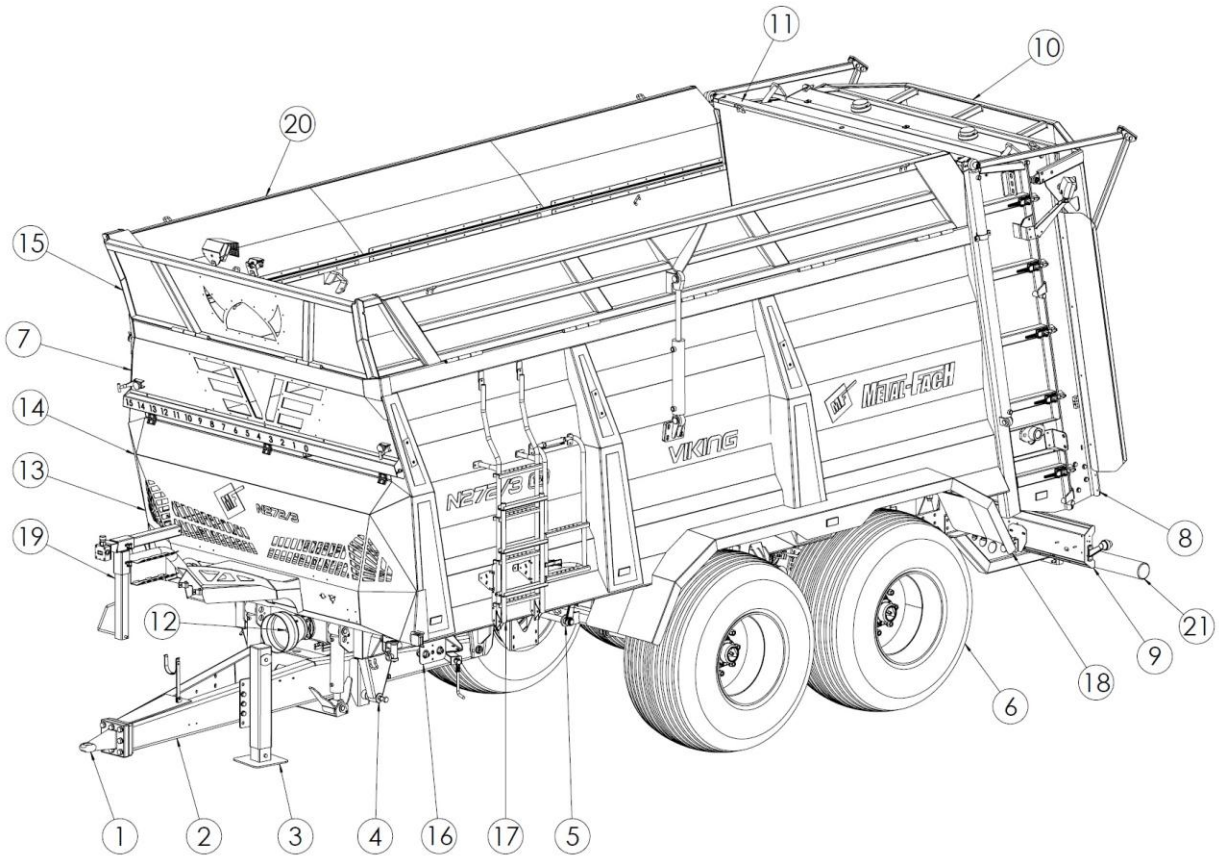


Figure 8. Main components of the manure spreader
1 - drawbar eye, 2 - hitch, 3 - parking jack, 4 - bottom frame, 5 - suspension, 6 - ground wheel, 7 - body, 8 - adapter, 9 - lighting beam, 10 - adapter shield, 11- body gate, 12- drive unit, 13 - chain feeder, 14 - front guard, 15 - front extension, 16 - parking and release brake, 17 - ladder, 18 - mudguards, 19 - cable bracket, 20 - side extension, 21 - underrun protection guard

3.2.1 Feeding unit

The feeding unit consists of a floor conveyor, a feeder roller set and a tensioning system. The entire mechanism is driven by the hydraulic system of the tractor.

The floor conveyor consists of two pairs of chains connected by scraping bars. The chains are driven by sprocket wheels mounted on the feeder roller. The feeder roller is driven by the reduction gear and the hydraulic motor. In the front part of the spreader there is a tensioning system for the chains of the feeder. There are scrapers installed by the sprocket wheels of the conveyor, which prevent the sprockets from clogging.

The floor conveyor is protected against damage by an overload hydraulic valve located in the hydraulic motor. If overloaded or blocked mechanically, the conveyor is paused immediately.

3.2.2 The slide gate-lifting indicator

The slide gate lifting indicator is fitted at the front of the Spreader so that the tractor driver can monitor its position at all times. The scale from 1 to 18 corresponds to the position of the gate from 0 to 1.85 m.

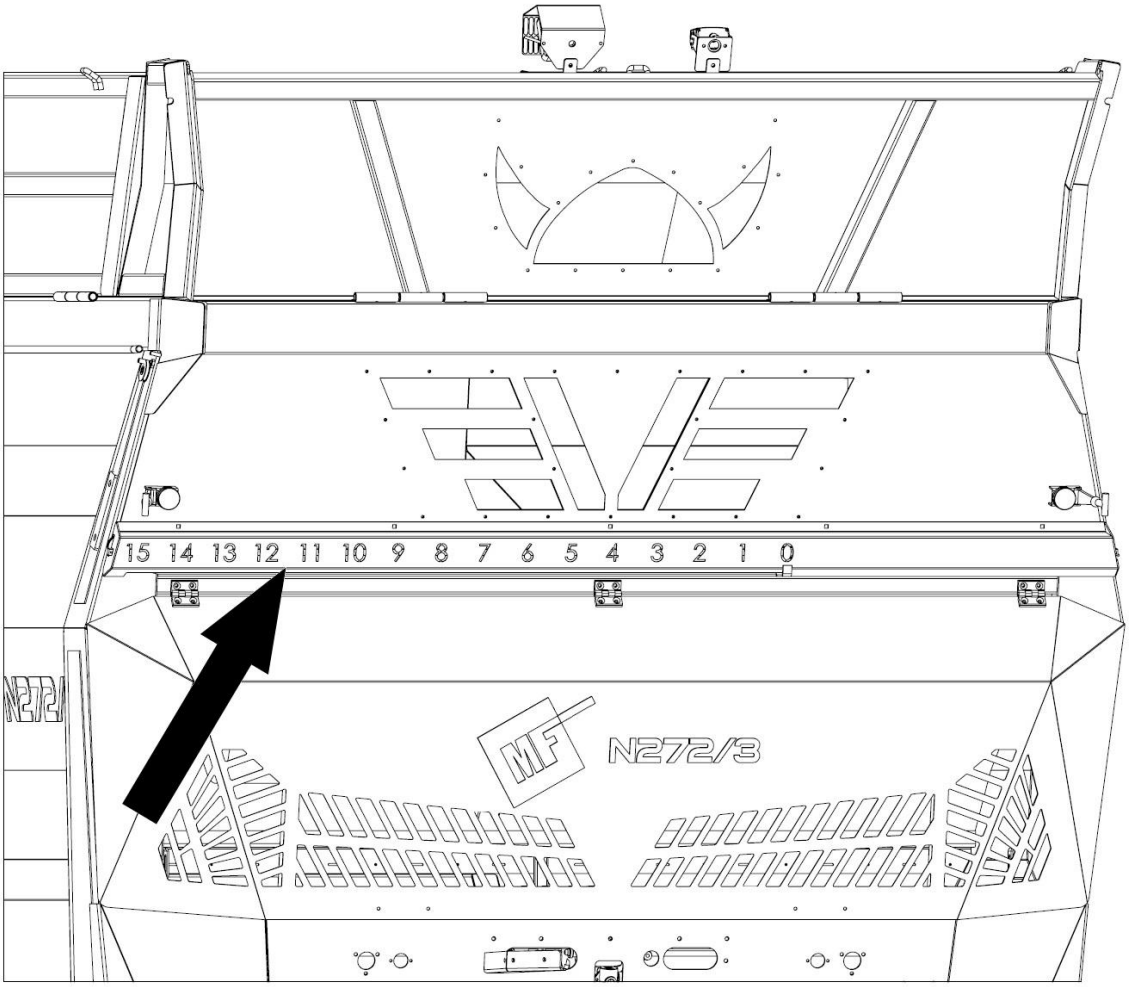


Figure 9. The slide gate-lifting indicator

3.2.3 The drive unit of the adapter

The drive unit of the adapters consists of a tractor connection articulated shaft with a nominal torque of 1040 Nm with a shearbolt clutch, a split cage roller which transmits the drive from the front part to the rear of the spreader and an articulated shaft which transmits the drive to the adapter.

Articulated telescopic shafts

Symbol of the tractor's PTO shaft	Nominal torque	L min	L max	Transmitted power	Overload coupling
	Nm	mm	mm	kW	Nm
8OM2P1530FR3421	1040	1530	2390	109	1600
8SFR160034Z621C	1040	1600	2500	109	1600

8SI817100418CE	1040	1710	2680	109	1600
Symbol of the adapter's PTO shaft	**Nominal torque**	**L min**	**L max**	**Transmitted power**	**Overload coupling**
8SP2N1071004CEX	1040	710	1020	109	2400
8SP2N1081004CEX	1040	810	1190	109	2400

3.2.4 2-rotor vertical spreading adapter

The 2-rotor vertical spreading adapter is used for shredding and scattering the material supplied by the floor conveyor. The adapter is mounted on the rear of the spreader. The adapter is supplied by the drive unit and the PTO of the tractor.

The adapter consists of a left beam (1), a right beam (2) and an upper beam (3) to form the adapter frame. In its lower part there is a gearbox (4), on which the vertical rotors (5) and (6) are mounted. The main work tools are replaceable blades (7) fastened to the rotor segments. The rotors turn and shred the feed material to eject it backwards and sideways. The bottom section of the rotors features bladed discs, which increase the spreading width of the material.

The adapter is connected to the load body using eccentric clamps. To disassemble the adapter,

- disconnect the PTO shaft from the adapter gearbox,
- disconnect the hydraulic hoses from the hydraulic quick-release couplings (applies to the disc-type horizontal 2-rotor adapter) and the vertical 2-rotor adapter with hydraulically operated covers,
- attach the lifting device's hooks to the upper attachment points on the adapter, as indicated by the pictograms,
- release the eccentric fasteners securing the adapter,
- to secure or release the fasteners, use a certified ladder or platform,
- use a lifting device with the minimum lifting capacity of 1,300 kg to remove the adapter,
- After removing the adapter, place it on a firm surface and secure it to prevent it from tipping over and to keep unauthorised persons away.

DANGER

DANGER!

Using lifting equipment with an insufficient load capacity can lead to a serious accident.

Both the removal and installation of the adapter pose a risk of accident. Take particular care when carrying out these tasks.

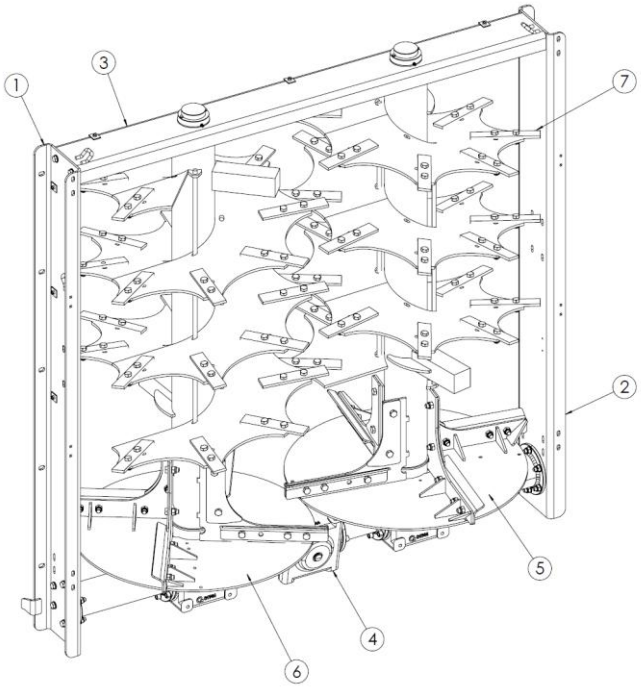


Figure 10. 2-rotor vertical adapter

3.2.5 2-rotor horizontal disc adapter

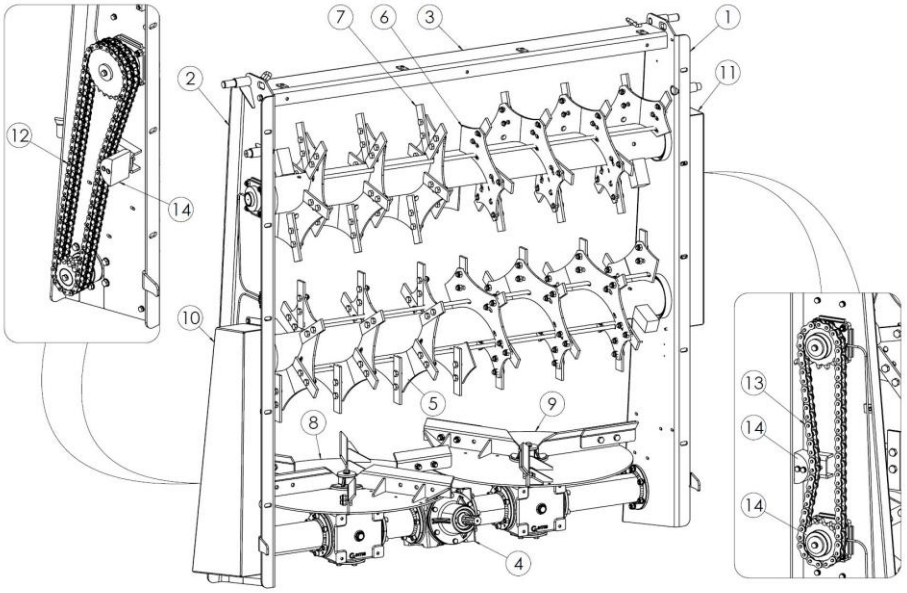


Figure 11. 2-rotor horizontal disc adapter

The 2-rotor horizontal disc adapter (fig. 11) consists of a left beam (1), a right beam (2) and an upper beam (3) to form the adapter frame. In its lower part there is a gearbox (4), on which the spreading discs (5) and (6) are mounted. The main working tools consist of the replaceable blades (7) screwed on to the horizontal rotors (8) and (9). By rotating, the rotors grind the fed material, which is supplied by the adapter guard to the spreading discs. The rotating discs eject the shredded material backwards and sideways. Power is transmitted from the gear (4) to the horizontal rotors (5) and (6), via the chain transmissions installed under the guards (10) and (11). From the gear, power is transmitted to the rotor of the lower 16B2 chain

(12). Power is transmitted from the bottom rotor to the upper rotor by means of the 20B1 chain (13). The chain tension is controlled by tensioners (14).

3.2.6 Adapter cover

The cover of the vertical 2-rotor adapter is attached to the load body by hinges and connected to the load body slide gate by tie rods. As soon as the slide gate is lifted, the adapter cover rises automatically and returns to the “shut” position after the slide gate has been lowered.

The cover of the 2-rotor disc horizontal adapter is attached to the load body in its top section by means of hinges and is opened upwards by hydraulic rams. They are controlled directly from the tractor cab via the lever of the external valve block. Close the adapter shield for transport and operation and open it only for the time of technical inspection of rotor components, cleaning and maintenance. The adapter shield is used as a wall hit during operation by the shredded material. The shredded material then falls on the adapter discs, which eject it evenly backwards and sideways. Working with the shield raised is allowed, but please note that this affects even spread of the material and you will have to keep closely to the previous track while doing the successive pass, which increases the number of passes.

3.2.7 Load body slide gate

The N272/3, N272/6, N272/7 and N272/8 spreaders feature a load body slide gate, as a standard. It separates the transported material from the adapter. It is supported in the side guides which seal and protect the material against penetrating outside the load body. The bottom section of the slide gate is reinforced, which protects the gate against damage resulting from excess manure pressing on it. At the bottom of the gate (as at the front of the body) a rubber sealing belt is fixed, matching the shape of the conveyor chains.

The gate is opened by hydraulic rams, controlled by the tractor's external hydraulic system, to move it upwards.

3.2.8 Main brake system

The N272/3, N272/6, N272/7 and N272/8 Spreaders are fitted with a 2-line pneumatic brake system with ALB (automatic brake force controller), see Figure 12. The brake is activated from the driver's seat by pressing the brake pedal of the tractor. The pneumatic control valve (1) enables the spreader's brakes simultaneously with the tractor's brakes. In the event of an accidental disconnection of the lines (8) and (9) the control valve will automatically activate the brakes of the machine. The ALB system features a valve (2) which automatically and continuously adjusts braking force on the spreader wheels according to the load level of the body.

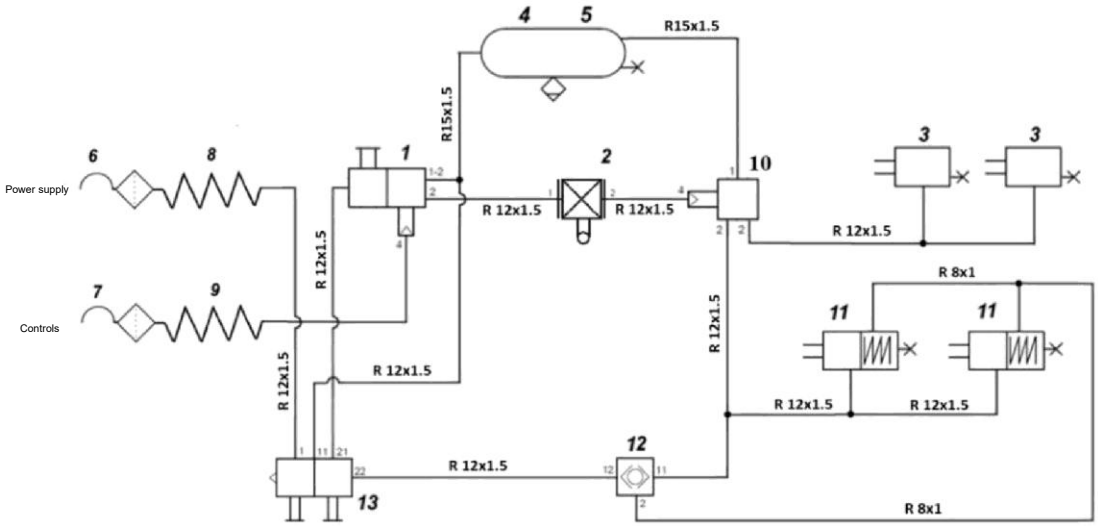


Figure 12. ALB 2-line pneumatic brake system
1 – Master ram, 2 – ALB automatic brake force controller, 3 – 24” membrane ram, 4 - Air tank, 5 – Tank clamp, 6 - Red connector with filter - supply, 7 - Yellow connector with filter - control, 8 - Red spiral hose, 9 - Yellow spiral hose, 10 - Damped relay valve, 11 - 24’/30 membrane and spring ram, 12 – 3/2-way valve, 13 – Parking and release valve

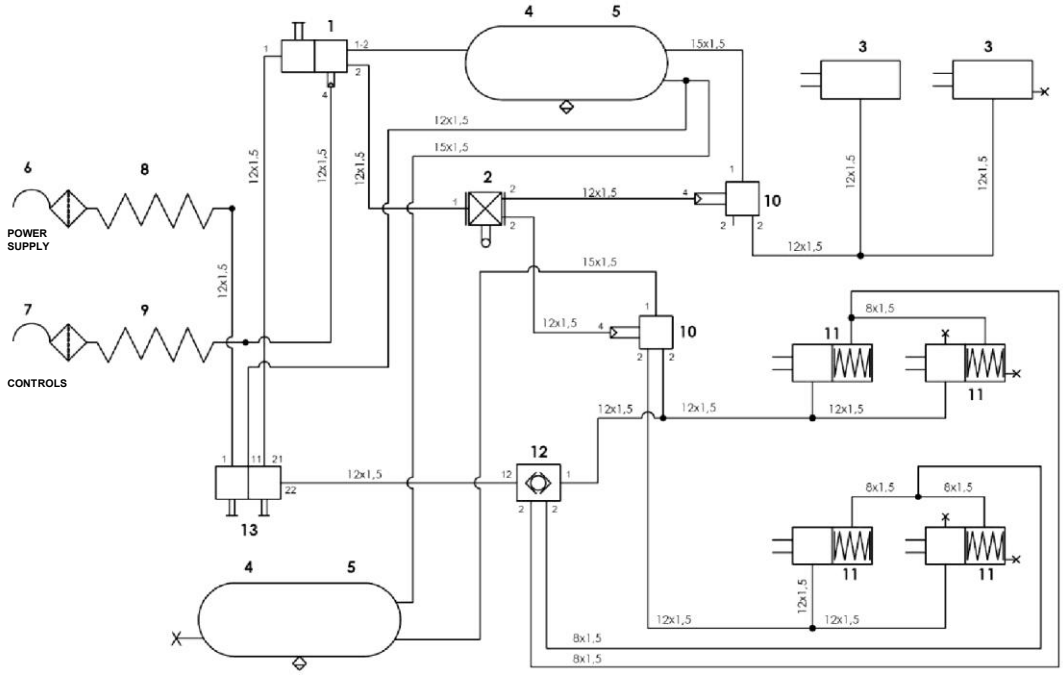


Figure 13. Pneumatic brake system with ALB on the N272/8 spreader (Viking)
1 – Master ram, 2 – ALB automatic brake force controller, 3 – 24” membrane ram, 4 - Air tank, 5 – Tank clamp, 6 - Red connector with filter - supply, 7 - Yellow connector with filter - control, 8 - Red spiral hose, 9 - Yellow spiral hose, 10 - Damped relay valve, 11 - 24’/30 membrane and spring ram, 12 – 3/2-way valve, 13 – Parking and release valve

3.2.9 Parking brake

The parking brake is used to stop the spreader, while it is parked. The parking brake control valve is shown in Figure 14.

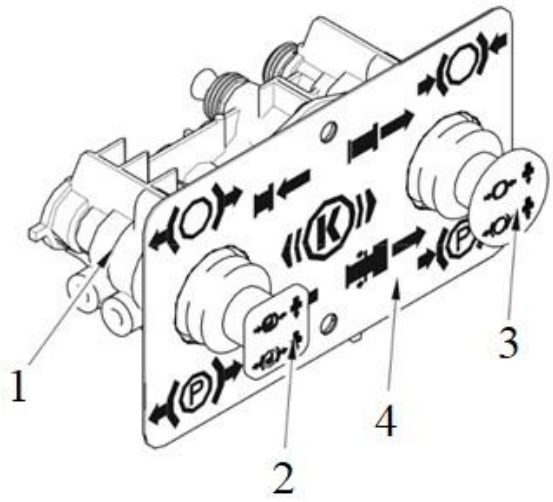


Figure 14. Parking brake – release valve 1 – valve, 2 – red button, 3 – black button, 4 – information label

The parking brake is pneumatically controlled via a lock-release valve located on the left-hand side of the Spreader; it acts on the wheels of the first axle in a tandem configuration, and on the first and second axles in a tridem configuration. This valve is used on Spreaders with membrane 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 Spreader 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 spreader 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.

System operating modes

No.	Black button (release valve)	Red button (parking valve)	Spreader connected to the tractor via 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 (spreader uncoupled)	started

3.2.10 Hydraulic steering lock system

The N272/6 and N272/7 Spreaders are fitted with a rear passive self-steer axle, whilst the N272/8 Spreader has the first and third ones. The self-steer axle helps change the vehicle's direction during work, and manoeuvre when driving forwards. The tyres are prevented from leaving ruts in the ground, and provide better stability when cornering.

The hydraulic steering lock system is used to lock the rear self-steer axle when driving on public roads at higher speeds and when reversing. Wheel locking when reversing is mandatory. An unlocked axle will tend to veer uncontrollably to the left or right.

The figure (15) shows the 2-line hydraulic system for the steering axle lock.

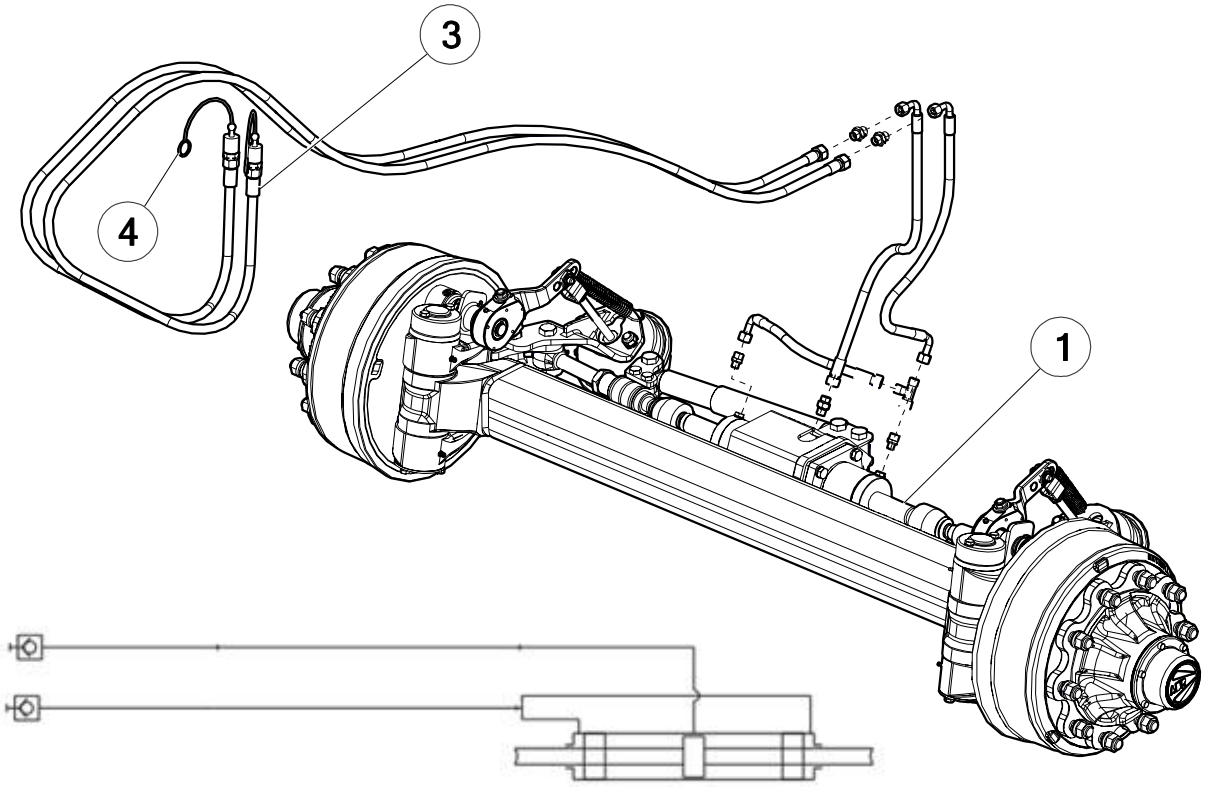


Figure 15. Hydraulic system diagram for the rear axle steering lock
1 – hydraulic ram, 2 – hydraulic hose, 3 – quick-release coupling (male connector), 4 – connector cap

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 rod in or out of the hydraulic ram (1).

3.2.11 Electrical and lighting system

The electrical system of the spreader can supply power from a 12 V DC power source from the tractor electrical system. Connect the electrical system of the spreader to the tractor system using the connecting cable supplied with the machine. The wiring diagram is shown in Figure 15 and the arrangement of the lights in Figure 16.

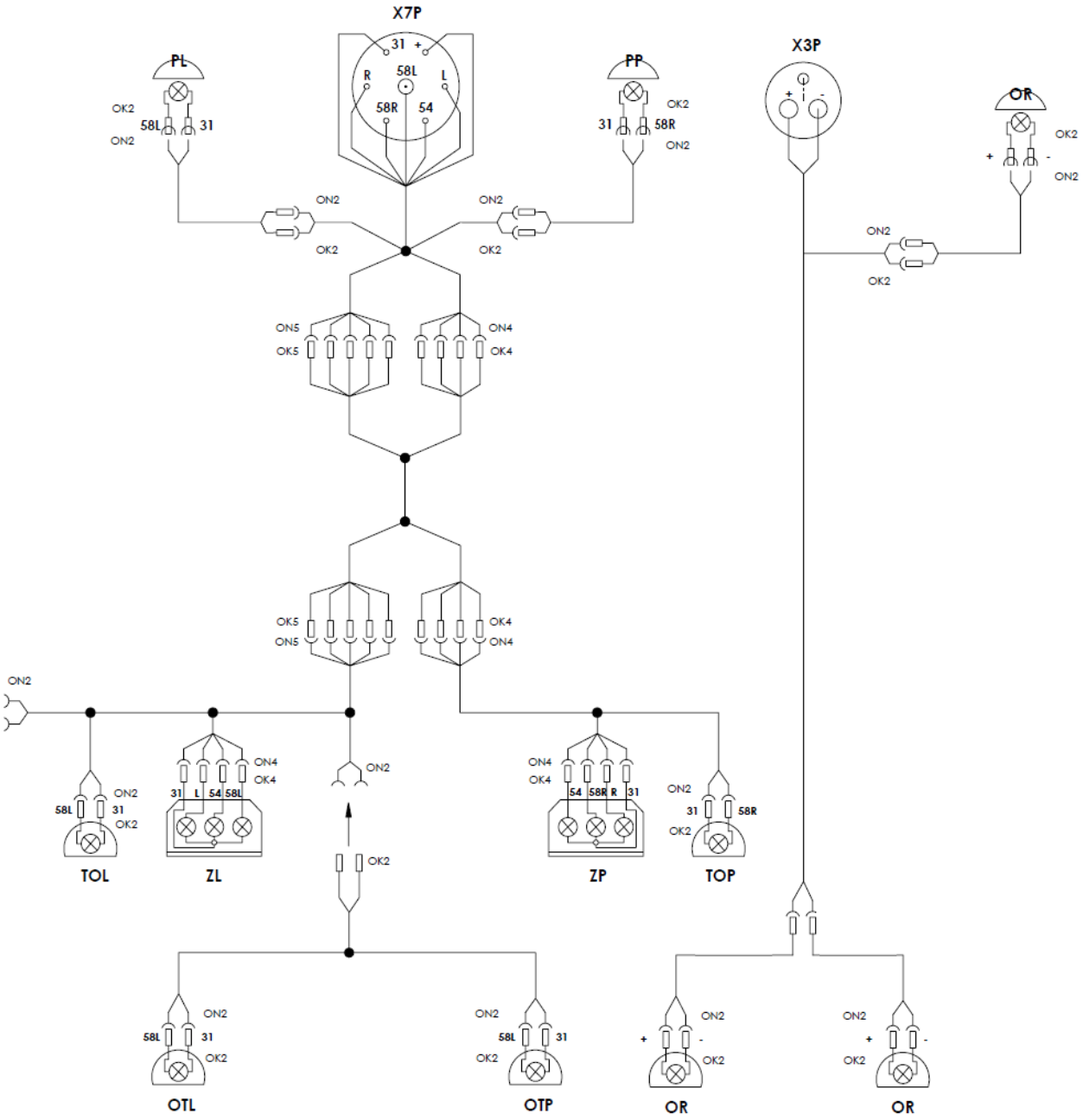


Figure 16. Wiring Diagram

Colour code for wires, electrical parts and connections are given in Tables 7, 8 and 9.

Cable colour code

Designation	Colour
c	Black
b	White
k	Red
t	Green
z	Yellow

List of codes for electrical parts

Symbol	Name
ZP	Rear-light cluster, right
ZL	Rear-light cluster, left
GP	Connection socket
OP	Marker lamp, right
OL	Marker lamp, left
PPP	Front running light, right
PPL	Front running light, left

GT sockets connection marking

Designation	Function
1 - L	Traffic indicator lamp, left
3 - 31	Earth
4 - R	Traffic indicator lamp, right
5 – 58R	Running lights
6-54	Brake light

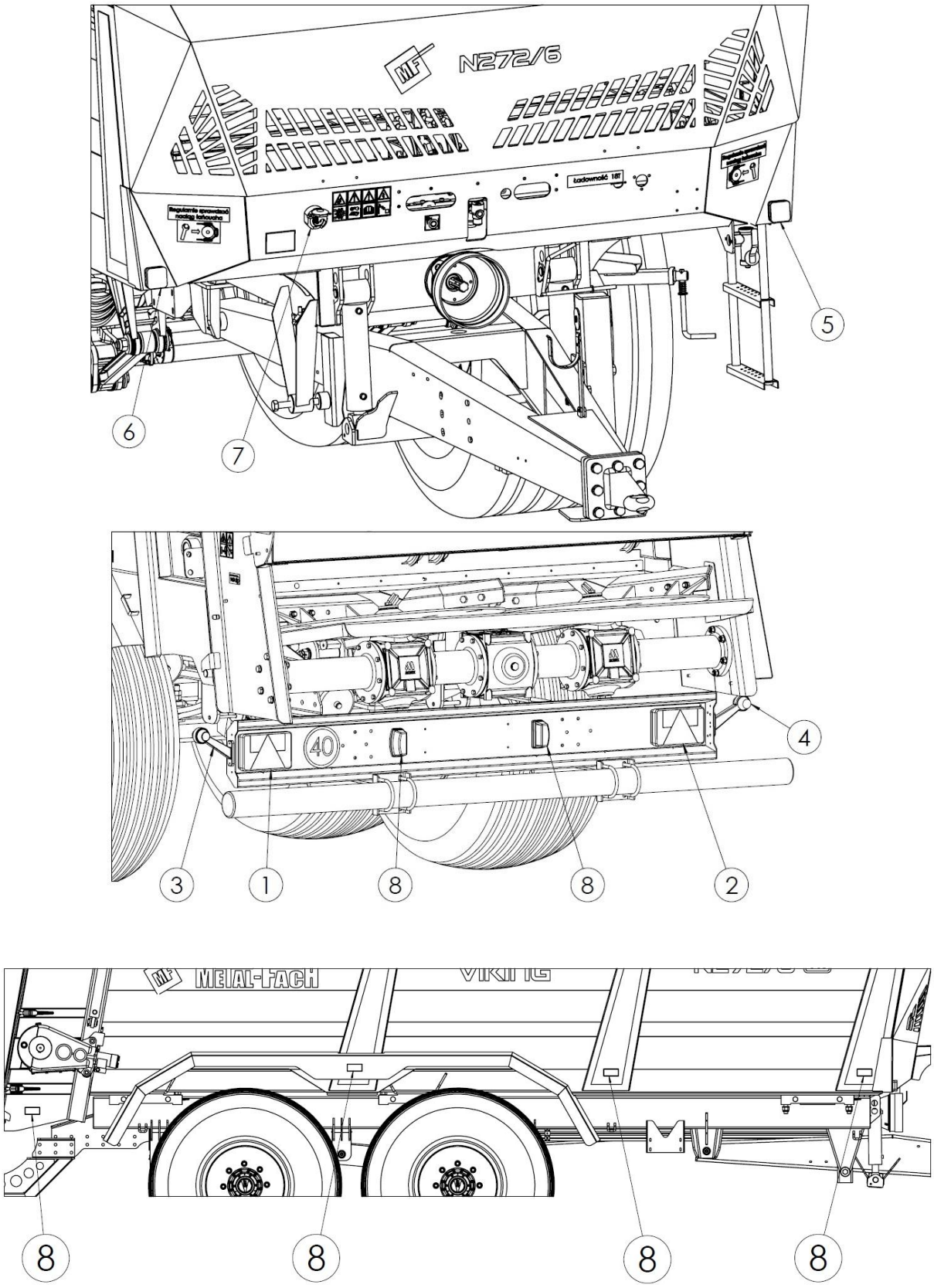


Figure 17. Arrangement of electrical system components
1 - rear left lamp cluster, 2 - rear right lamp cluster, 3 - left marker light, 4 - right marker light, 5 - front left running light, 6 - front right running light, 7 - connection socket

NAME AND ABBREVIATION INDEX

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;

kPa – kilopascal, pressure unit

HP – horse power, power unit;

m – metre, length unit

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

UV – Ultraviolet radiation; Invisible electromagnetic radiation with a negative impact on human health; UV radiation has a negative effect on rubber parts;

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

ALPHABETICAL INDEX

PART I

PART II

T

NOTES

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