METAL-FACH

16-100 SOKÓŁKA, POLAND UL. KRESOWA 62

OPERATING INSTRUCTIONS
PARTS CATALOGUE

MANURE SPREADER

N 267, N 267/1

Edition no. 03
Year of issue: 2010
The original operating manual language is Polish.

CE DECLARATION OF CONFORMITY

FOR THE MACHINE

METAL-FACH Sp. z o. o.
ul. Kresowa 62
16-100 SOKÓŁKA
which acts as the manufacturer

declares under sole responsibility that the following machine:

Manure spreader

type/model: N 267-.....

year of manufacture: .....

serial number: .....

this declaration concerns, meets the following requirements:

- Directive 2006/42/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL dated 17 May 2006 on machines, and amending Directive 95/16/EC (OJ EU L157 of 09/06/2006, p. 24) and the Resolution of the Minister of Economy of 21 October 2008 concerning general requirements for machinery (Journal of Laws, no. 199 item 1228).

The following harmonised standards were used for compliance evaluation:

PN-EN 690+A1:2009	PN-EN ISO 4254-1:2009
PN-EN ISO 4254-1: 2009/AC:2010	PN-EN ISO 12100:2011
PN-EN ISO 13857:2010	PN-ISO 11684:1998

- and the following standards: PN-ISO 3600:1998, PN-ISO 11684:1998; and the Resolution of the Ministry of Infrastructure of 31 December 2002 on technical requirements for vehicles and the scope of their necessary equipment (Journal of Laws no. 32 item 262 as amended).

Safe Use Test Report No. MF/4/2012
Person responsible for engineering documentation: Marcin Halicki

This Declaration of Conformity becomes void and null if the machine design is changed or modified in any manner without prior consent from the manufacturer.

Sokółka, 05.11.2012

President of the Management Board

Jacek Marek Kucharewicz

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INFORMATION!
FAILURE TO FOLLOW THE RULES AND GUIDELINES ICNLUDED IN THESE INSTRUCTIONS MAY RESULT IN DEATH OR SEVERE BODY INJURY!

1. INTRODUCTION

The user of this product should read and understand these Operating Instructions in full, as well as follow all the guidelines contained herein to ensure safe operation of this machine. The Instructions include the description of design and operating principle, technical characteristics and rules of intended use and servicing of the machine. Exercise extreme caution when in doubt about any procedure or operation. Should you have any questions, consult the authorised seller or the manufacturer.

Hazard warning sign

This sign denotes important information on the operating safety, which must be read in full and relayed to all the service personnel if necessary. The information included in the Instructions contains the basic guidelines for proper operation and servicing, as well as about the operating safety and health regulations.

Pursuant to the Regulation of the Ministry of Transportation and Marine Economy issued on 7 October 1999, no. 91 item 432 included in the Polish Official Journal of Laws no. 32 of 31 December 2002, item 2.6.2. on additional conditions for slow-moving vehicles, we hereby notify that farming tractors and slow-moving vehicles, as well as trailer units designed for coupling with these vehicles must feature an identification emblem. The emblems are not required for a vehicle included in a string of vehicles which is not the last vehicle in the string. We follow this requirement by equipping our vehicles with special mounting frames which are located on the spreader adapter guard. **Always mount the identification emblem for travelling on public roads.** Place the emblem in the tractor cab when the spreader is on duty.

All manure spreaders conform to the traffic code regulations regarding the traffic of machines with the maximum speed of 30 km/h on public roads. The machines also conform to the safety requirements of the valid regulations for the agricultural machines of this type.

2. SAFETY INSTRUCTIONS

Always turn off the tractor's engine, remove the ignition key and engage the parking brake before leaving the driver's seat. Should any failure occur, always turn off the tractor engine.

Do not turn on the conveyor when the adapter is off. Prior to starting your work, first lift the body gate, engage the adapter, run it at the full PTO speed and then turn on the floor conveyor drive.

Before attempting to work on any systems of the spreader connected to the tractor with the drive-shaft, turn off the tractor engine and remove the ignition key. Decouple the drive-shaft before servicing (maintenance, repairs) the machine. Engage the spreader parking brake and chock the wheels.

Do not remain in the load body when the drive is on. Do not enter the spread zone when the spreader is working.
Ensure that no persons remain in the spread zone.

Do not exceed the permissible payload and driving speed, otherwise the machine may be damaged and the traffic safety may be compromised. Adapt the driving speed to the conditions when working or travelling on a rough terrain. Follow the traffic code regulations when travelling on public roads.

Do not use the floor conveyor to unload such materials as coal, wood, stone or construction materials.

Do not use the machine on a terrain with an inclination of 8.5 °.
Note that during the unloading the machine will change its impact on the tractor and its manoeuvring conditions.

Operation of the spreader without the system guards, riding on the spreader and its tow bar or driving without the connected braking system is strictly forbidden. The driver's mesh guard must be installed on the front end of the load body. The upper edge of the mesh guard must be placed at least 2.6 m from the ground surface. The PTO drive-shaft must always be equipped with the full guard.

The mesh guard must be positioned to secure the adapter drums when towing the spreader on public roads. Spreaders equipped with the body gate can only travel on public roads with the gate closed.

The spreader can be operated only by adult personnel with a valid tractor driving licence. It is strictly forbidden to operate the machine when under the influence of alcohol or drugs.

Exercise due caution when performing any disassembly to prevent personal injury. If your skin is cut, wash the wound thoroughly, disinfect with medical hydrogen peroxide solution and seek medical attention. Any wound fouled with manure may result in Tetanus bacteria infection.

2.1. RESIDUAL RISKS

This spreader has been designed and produced in accordance to the state of technology and safety requirements valid for its year of manufacture.

The manufacturer of this spreader has taken every effort in its design, production and labelling to eliminate all hazards related to operation, servicing and maintenance. However, there are specific unavoidable risk present.

Residual risk results from incorrect or improper conduct of the operating personnel. The greatest hazards occur during the following forbidden actions:

- **Operation of the spreader by minors or persons who are unfamiliar with the operating instructions;**
- **Operation of the spreader by personnel under the influence of alcohol or other intoxicants;**
- **Performance of any work on the spreader systems, when the spreader is coupled with the tractor with the running engine;**
- **Attempting to work with the machine before inspecting the work site and environment;**
- **Remaining on (aboard) the machine when it is working or in transit;**
- **Use of PTO drive-shafts without any guards;**

Follow these guidelines and prohibitions:

- **read and fully understand the operating instructions;**
- **secure the machine against access by unauthorised persons and children;**
- **cleaning, maintenance and repairs must be performed by adequately trained persons and with the PTO drive-shaft decoupled;**
- **keep your hands out of hazardous spaces;**
- **do not use the machine when it is not fit for duty and/or when the guards are missing;**
- **do not use the PTO drive-shafts without any guards;**
- **no persons are allowed to remain near the machine when it is working;**
- **no persons are allowed to remain on the machine when it is working or in transit;**
- **do not transport the machine without the connected and functioning braking and lighting systems;**

only then can you eliminate the residual risks to people and the environment when using this spreader.

INFORMATION!

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

2.2. NOISE AND VIBRATION

The operator is inside the tractor cab when the machine is working.

The equivalent sound pressure emission level A (L_{pA}) is 76.0 ± 1 dB.

The peak sound pressure value C (L_{Cpeak}) is 86.0 ± 1 dB.

Machine sound power – N/A.

(Measurements acc. to PN-EN ISO 4254-1:2006 Annex B section 2.6)

No vibration hazards occur when working with this machine.

The operator's work station is located in the tractor cab, with shock absorption and an ergonomically profiled seat. The value of the vibration exposure of the operation does not exceed 0.6 m/s^2.

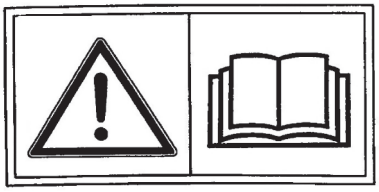
3. INFORMATION AND WARNING SIGNS

Extremely hazardous areas are indicated with the yellow warning signs and warning labels placed on the machine. During operation of this machine, exercise extreme caution when remaining in direct proximity of these areas.

Check the serial number indicated in the Operating Instructions and the warranty card against the serial number stamped on the nameplate and the chassis frame. The nameplate and the stamped serial number are located on the chassis end sill, i.e. on the right side of the machine.

The warning stickers must always be legible. If the stickers become illegible, if the assembly on which they are located is replaced or the machine is repainted, the stickers must be purchased at the retail outlets or ordered at your local dealer as spare parts and suitably replaced.

1



Warning! Read the Operating Instructions.
(1x)

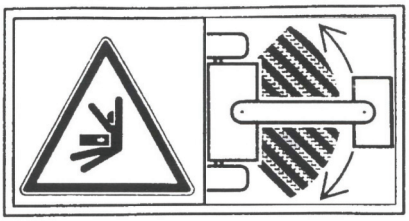
2

Turn off the engine
and remove the ignition key before servicing or repairs.
(1x)

3

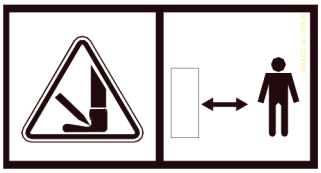
PTO rotational speed: 540 RPM.
(1x)

4



Do not remain between the machine and the tractor when the engine is running.
(1x)

5



Do not approach the working machine.
Maintain a safe distance from the tow bar when it is being lifted or lowered.
(2x)

6

Speed limit sign.
(1x)

7

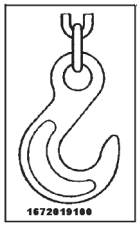
Air pressure in tyres.
(2x)

8

NAMEPLATE

Nameplate
(1x)

(9)



Lug for lifting hooks
(8x)

(10)

Couple with the trailer by using the single-axle trailer hitch

Warning label.
(1x)

(11)

Turn off the PTO drive at road turns.

Warning label.
(1x)

(12)

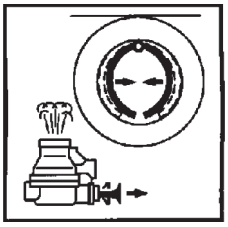
Do not enter the load body when the drive is on.

Warning label.
(1x)

(13)

Keep a safe distance from power
(1x)

(14)



Brake release sign.
(1x)

(15)

Load capacity: ... t

Information label
(2x)

(16)

METAL-FACH

Company logo.
(2x)

(17)

N267

Information label – machine symbol**.**
(2x)

(18)

Weight: .... kg

Description of the adapter weight.
(2x)

(19)

Keep a safe distance from the adapter. Do not put your hands between the rotors.
(2x)

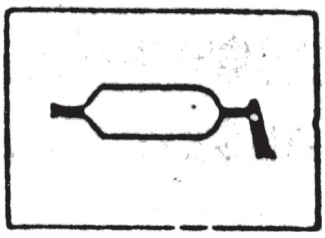
(20)

Warning sign.
(2x)

(21)

Ejected objects. Keep a safe distance from the machine
(2x)

(22)



Lubrication point.
(4x)

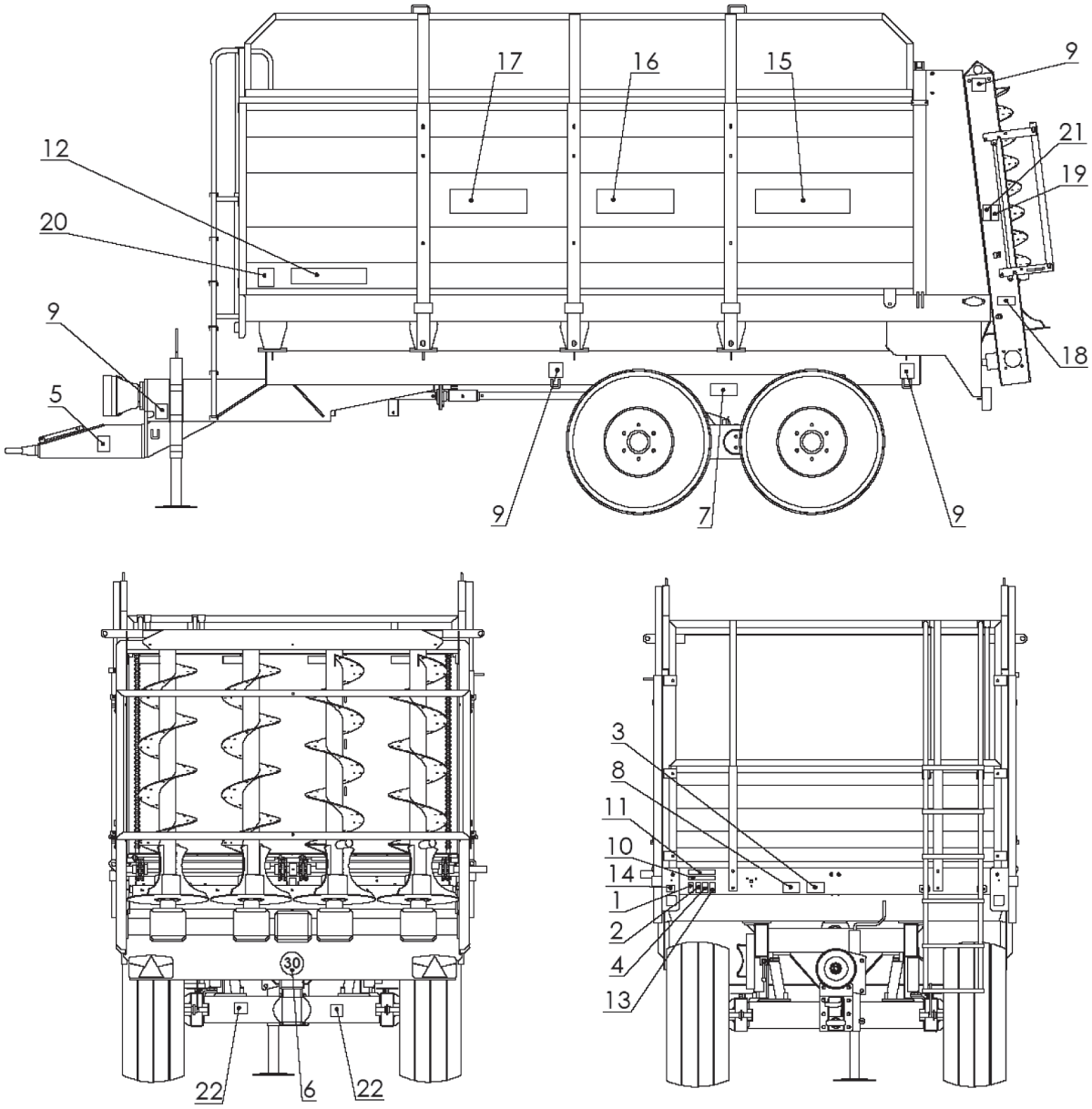


Fig. 1. Locations of the information and warning signs

4. INTENDED USE

- The spreaders are intended for spreading of manure, peat, compost, etc. and transportation of crops within farms and on public roads. The machines are self-dumping and coupled **with farming tractors only by the lower hitch.**
- Spreaders equipped with gates facilitate transport of fine-grained bulk loads by preventing its spillage from the load body.
- **The spreaders can only be operated and serviced by adults who have read and understood these Operating Instructions, in particular the information in section "Safety Instructions".**

- **Improper servicing and use of this machine, i.e. not following the Operating Instructions relieves the manufacturer from any liability for the results of improper use and makes the warranty void and null.**
- The manufacturer forbids any unauthorized modification of the spreader designs. **Making any modifications of the design releases the manufacturer from any effects of such changes and may void the warranty.**
- Consult your supplier or the manufacturer's service department in case of any doubts regarding the use of the spreader.

5. OPERATION OF SPREADERS

5.1. Coupling the spreader with the tractor

The spreader is coupled with the tractor in the following way:

- attach the spreader tow bar lug to the lower hitch of the tractor;
- fit the PTO drive-shaft and use the chains to prevent the shaft guard against turning during operation;
- connect the spreader's electrical system to the tractor's electrical system and secure the plug against decoupling;
- connect the spreader's drive hydraulic system to the terminal of the tractor's hydraulic system by twisting the quick-release coupling's nut clockwise until resistance is felt;
- connect the pneumatic system of the service brake;
- connect the body gate's hydraulic system;
- next, check the tightness of the connection between spreader and the tractor's hitch, check operation of the electrical system, service brake, systems and drives. If all systems are work properly, release the parking brake and set the support in the travel position.

THE FOLLOWING IS STRICTLY FORBIDDEN:

- **coupling the spreader with the tractor using any other coupling than the lower hitch. The machine must have the parking brake engaged when it is being coupled;**
- **to keep the external hydraulic systems of the tractor pressurised when coupling the trailer – all control valves must be set to neutral. When the quick-release coupling nut is tightened, the coupling is opened and high oil pressure may result in a leak. Tighten the nuts until resistance is felt to guarantee tightness;**
- **loosening the quick-release coupling nuts when the power system and the hydraulic brake are working.**

Disconnecting the spreader

Before disconnecting/decoupling the spreader from the tractor, first engage the machine parking brake and lower the support – see fig. 2 item 1.

The support stabilizes the spreader whether it is loaded or not.

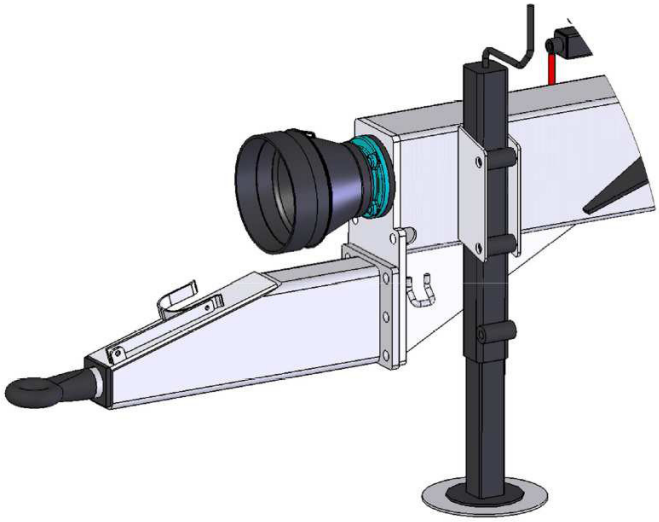


Fig. 2. N267 and N267/1 spreader support

Do not disassemble the support or rest the machine on makeshift supports.

Do not leave agricultural equipment on slopes or any other terrain inclinations without securing it against accidental rolling.

5.1.1. Adapter drive

The adapter drums are driven by the PTO drive-shaft, which couples the tractor PTO with the two-sectional drive shaft and the PTO drive-shaft with the friction overload clutch. The clutch protects the power system against damage when the torque exceeds the factory set value.

The PTO drive-shafts used in the spreader:

Machine type	Shaft designation	Rated torque	Rated length	Transferred output	Overload clutches
		Nm	mm	kW	Nm
N267	6R602-7-BA-K601	540	1745	30	1600
N267/1	8R802-3-DA-C803	900	920	50	1500

The shaft must have the "CE" marking. Use only the shafts that are equipped with complete guards.

Do not use the PTO drive-shaft with damaged guards.

The overload clutch should not engage when the machine is properly operated. If the clutch engages, the machine is overloaded. If the material is not ejected during operation, the friction overload clutch is engaged. Eliminate the cause of overload (e.g. a cord wound on the drums, objects jammed between the drums, i.e. pegs or alike).

Before attempting to clear the jam, turn off the tractor engine and remove the ignition key. Decouple the PTO drive-shaft from the tractor.

Prior to turning the machine on after elimination of the problem; switch the shift direction for a short moment directly before turning on the drive. (The conveyor shift direction is switched by changing the feed direction with the directional control valve of the tractor.)

5.1.2. Commissioning and running-in

Do the following before commissioning the spreader:

- read and understand the operating instructions in full;
- configure the machine in accordance with the intended work;
- check the tightness of all threaded connections and the tension of chains;
- supply lubricants at the lubrication points;
- check the transmission oil level and add if required – use HIPOL – 15 oil;
- park the spreader and run it in initially without load.

The initial running-in should last approximately 15 minutes at decreased rotational speed of the tractor drive. During this procedure ensure that all systems work smoothly, without jamming and excessive noise. Make sure that the fastening bolts did not become loose and check the chain tension after the initial running-in is finished.

During the first 20 operating hours, lubricate all lubrication points twice a day. Replace the transmission oil afterwards and check the tightening of bolts and chain tension. Readjust if necessary.

5.2. Electrical system

The spreader is equipped with a 12 V electrical system supplied from the tractor. Always make sure that the lighting system is functional before entering a public road. The electrical system powers the two front side lamps, the lamp clusters and the clearance lamps.

5.3. Loading and unloading

Manure can be mechanically loaded on the spreader. In order to fully use the spreader's load capacity when working with long-straw manure, it is allowed to fill the load body **up to 10 cm** above the upper edge. Do not load the long-straw manure directly on the adapter drums – this may damage the drive. The load must not hang over the body sides. When the work is finished or if needed, remove the manure which may accumulate on the rear beam in the area of socket wheels and on the spreader drums, as well as on the drive shafts. Excessive accumulation of dirt can overload the tractor and elongate the conveyor chains. **In order to achieve the best**

spreading parameters (i.e. width and uniformity), keep the PTO speed on the tractor between **470–540** rpm.

REMARKS:

1. **After all manure has been spread, turn off the adapter drive and lower the rear gate.**
2. **Clean the spreader only when the drive is decoupled and the tractor is stopped. Exercise extreme caution when cleaning with the raised gate. Decouple the PTO drive-shaft from the tractor.**
3. **When the spreader works on the field, the material in the load body moves towards its rear end. This slowly decreases the pressure on the tractor hitch and lowers the wheel grip of the rear tractor wheels. This may reduce the tractor's pull force on difficult terrain (i.e. hummocky or damp ground). Due to this fact, it is advised to perform the final phase of unloading the load body of the spreader when moving down a slope or on a flat (level) terrain.**

5.4. Description of the hydraulic system

The spreader is equipped with a single-section or two section hydraulic system.

The hydraulic control in the single-section system is effected by a set of two levers delivered with the spreader. The levers are to be installed in the tractor cab.

These levers control the two-sectional directional control valve, which is fed directly from the tractor's system. One of the levers actuates the gate drive, while the other actuates the floor conveyor drive.

In the two-section hydraulic system, the hydraulic lines of the gate and conveyor drives are connected directly to the tractor. The control is effected directly from the cab by actuation of corresponding hydraulic output sections of the tractor.

5.5. Hydraulic drive of the floor conveyor

The floor conveyor system of the spreader is hydraulically driven by the transmission gearbox powered from the hydraulic motor, which in turn is driven by the hydraulic system of the tractor.

The shift speed of the floor conveyor (i.e. the manure spreading output) is controlled and adjustable by setting the adjustment screw (2) of the flow controller (1) installed in the right section of the spreader front panel. Turning the adjustment screw clockwise increases the conveyor shift speed, while turning it counter-clockwise decreases the shift speed. When the spreader is unloaded and the material mass decreases, the conveyor shift speed slightly increases at the same time.

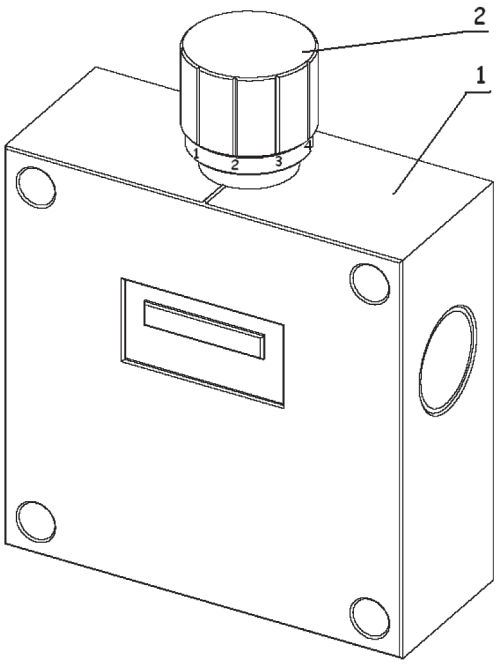


Fig. 3. Flow controller

Only the reverse shift speed of the conveyor is pre-set. Switching the conveyor shift to forward motion is done by changing the feeding direction in the tractor (with the directional control valve of the tractor) when the valve at the flow controller is open.

Optional accessories include an user-installed adapter kit that enables coupling with a single hydraulic section of the tractor. The gate and the floor conveyor are simultaneously controlled by a DCV attached to the spreader and controlled from inside of the cabin with Bowden cables.

To install the adapter kit:

1. Open the 4 hydraulic lines that couple the tractor with the spreader.
2. Screw the cable-actuated DCV (included with the kit) to the spreader.
3 Install a two-position catch (included with the kit) on the right hand spreader section that controls the floor conveyor drive.
4. Connect the Bowden cables to the DCV.
5 Connect the 2 hydraulic lines between the DCV and the tractor (the inputs are at the DCV sides).
6. Connect 4 hydraulic lines with the DCV section outputs (the lines which are connected with the gate's steel lines on the spreader left hand side and with the conveyor speed controller unit on the right hand side).

When in doubt, consult the spreader single-section hydraulic system diagram in the Spare Parts Catalogue.

The design manure feed rate at the tractor PTO rotational speed of 540 rpm and the hydraulic system pressure of 13 MPa can be infinitely variably adjusted from 0.2 to 1.3 m/min.

Note: Take extra caution when performing the adjustment. Turn off the tractor engine, remove the ignition key and engage the parking brake of the tractor.

5.6. Adjustment of conveyor chain tension

The conveyor chains are adjusted by the stretcher screws (see fig. 4 item 1) located on the front panel of the spreader. The tension of the chains is verified by lifting the chain at the middle of the body floor length. The distance of the chain from the floor should be **1–6 cm** when lifted. If the chain is stretched beyond the maximum adjustment value, replace the chain.

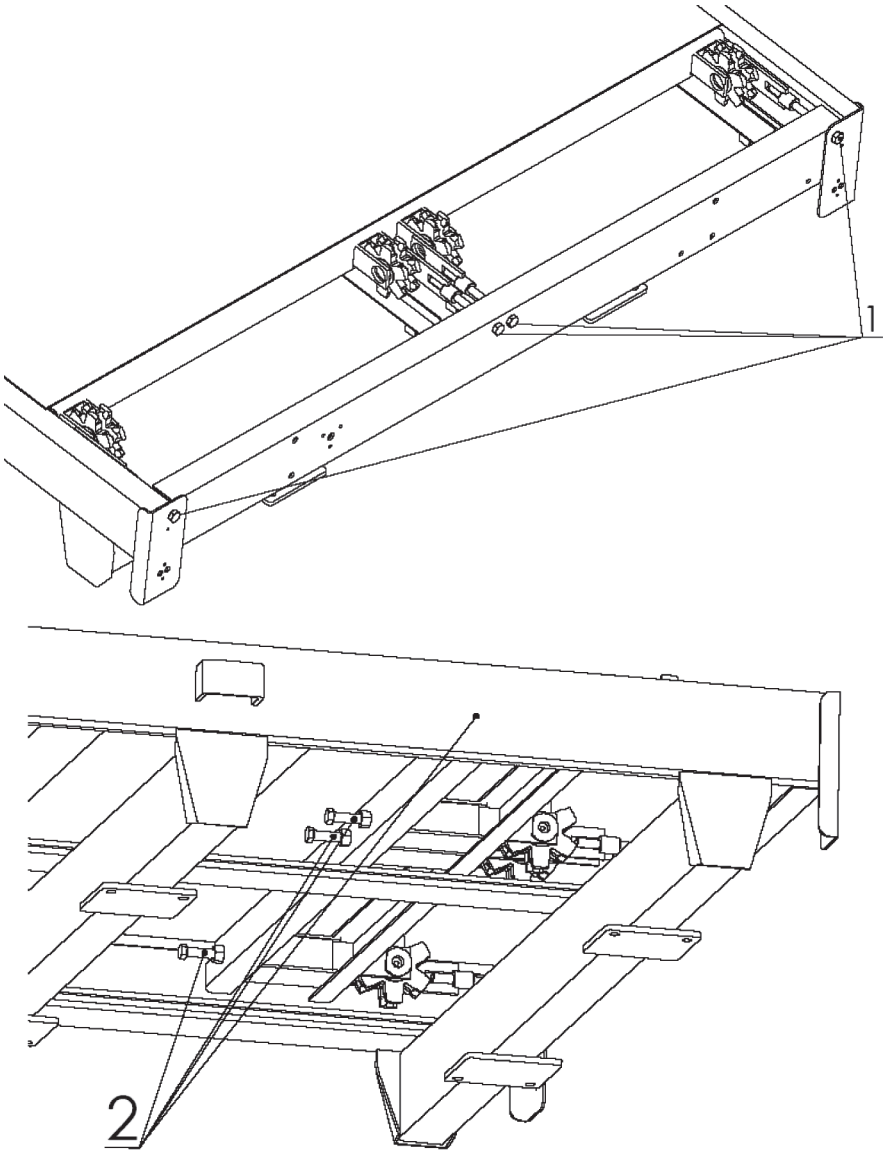


Fig. 4. Tensioning the conveyor chains

Adjust with the screws (1). When the chain is tensioned with the screws (1), lock the chain stretcher bodies by tightening the bolts (2) and securing them with locknuts.

5.7. Spreading adapter

The adapter consists of a frame which houses four worm drums driven by the PTO drive-shaft, the drive shafts and the transmission gearbox. The drive is transmitted from the tractor's PTO.

The adapter frame is connected to the spreader chassis with two pins set in the bottom frame grips (see fig. 5 item 1) and fastened to the load body with the bolts (see fig. 5 item 2).

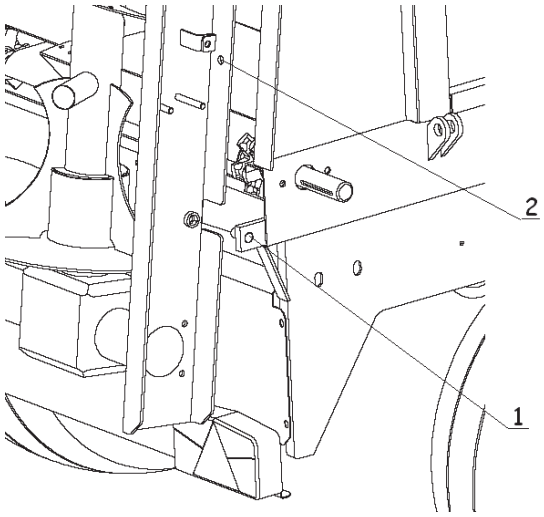


Fig. 5. Adapter mounting

Adapter disassembly procedure:

- Decouple the PTO drive-shaft from the adapter transmission.
- Remove the fastening bolts which attach the adapter to the side panels and remove the adapter.
- Use a lifting device with the minimum capacity of 600 kg to remove the adapter.

Exercise extreme caution when assembling and disassembling (repairing) the adapter. Due to the large weight of these components, use suitable lifting equipment. The assembly and disassembly procedures must be performed by two persons.

The vertical adapters and the attachment must be handled with the use of a lifting device with the minimum capacity of 600 kg.

5.8. Brakes adjustment

5.8.1. Parking brake adjustment

The parking brake is adjusted by setting the initial cable tension by making a loop of a suitable length on both cable ends.

The parking brake is functioning when it is capable of stopping the loaded spreader on a slope with a grade of 18°.

5.8.2. Service brake adjustment

The braking system must be suitably adjusted to compensate the wear of the brake shoe linings. If the actuator idle stroke is excessive, adjust as follows:
remove the cotter pin (3), remove the crown nut (1), loosen the brake expander lever (2) and shift the lever in the direction opposite to the braking motion in such way that the lever is

perpendicular to the brake actuator when the latter is in the braking position. If the brake linings are excessively worn, replace them. After each adjustment make sure to tighten the crown nut and secure it with a new cotter pin.

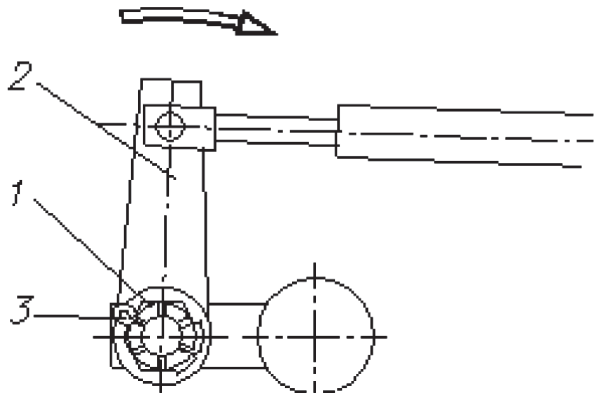


Fig. 6. Main brake adjustment

When the brakes are properly adjusted, the spreading unit (tractor + spreader) with the rated load at 30 km/h should stop at 10 m from the brake engagement and the wheels should brake uniformly.

When the spreader has made the first 100 km, check the brakes and adjust them if necessary.

5.9. Adjustment of the land wheels clearance

When the new spreader has made the first **100** km and every next **1000-1500** km, check the clearance of the land wheels and adjust it if necessary.

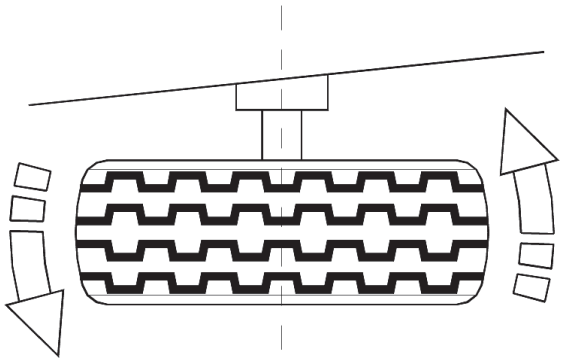


Fig. 7. Checking the clearance of the land wheels

Check the clearance of the land wheels as follows:

Couple the spreader with the tractor on the lower hitch and engage the tractor parking brake. Jack up one side of the spreader to lift the wheel from the ground on this side and secure the spreader against falling. Attempt to turn the wheel in order to check the bearing clearance, see

Fig. 8. If the wheel clearance is too large, remove the hub cap, remove the cap seal and the crown nut clevis pin. Rotate the wheel and tighten the crown nut at the same time until the wheel stops. Now loosen the crown nut by 1/6-1/5 of the full turn, i.e. to the nearest clevis pin groove. Install a new clevis pin, new seal and mount the hub cap. Repeat for the other spreader wheels.

6. MAINTENANCE AND SERVICING

6.1. Hydraulic system servicing

The hydraulic system oil of the spreader and the external hydraulic system oil (tractor) must always be of the same grade.

DO NOT use different oil grades. The system has the SAE 80W viscosity oil.

Caution! The hydraulic hoses must be replaced after 6 years from the date of manufacture.

Caution! The supply (feed) lines are identified with a yellow strap.

The spreader hydraulic system must be absolutely leak-tight. If there are oil leaks at the hydraulic connections, tighten them; if the leak persists, replace the hose or the connection fittings. The hydraulic hoses must also be replaced upon any mechanical damage.

The condition of the hydraulic system must be monitored continuously throughout the operating life.

Caution! The hydraulic oil must be replaced in accordance with the operating manual of the coupled tractor, but at least every two years.

6.2. Pneumatic system servicing

Periodically check the pneumatic system tightness. Thoroughly inspect every connection. Check the leak-tightness of the system at the rated pressure of approx. **600 kPa (6.0 kG/cm^2)**. After decoupling the tractor, the 10-minute pressure loss in the vessel should not exceed 2% of the initial pressure value which is set directly after decoupling the trailer. If any lines, seals or other system components are damaged, the compressed air will escape from the damaged points, producing a distinctive hissing noise. Replace any damaged seals or lines which cause the leaks. If the leak is located at the actuator, replace the device.

If any mechanical damage is found on the vessel (e.g. dents, cracks, etc.) or if the vessel has been exposed to high temperature, replace it. Drain all water from the pneumatic system at least twice a year, especially before winter. To drain the water, loosen the drain plug located at the lower air vessel part by 3-4 turns – the water in the vessel will leave through the plug orifice. Re-tighten the plug when the water has been removed and check the system for leaks.

6.3. Periodic maintenance

The periodic technical inspection of the spreader should be performed every 50 operating hours.

Due to safety considerations, it is necessary to perform functional tests of the service and parking brakes, the power transmission system and the wheel system.

6.4. Lubrication

Lubrication of the spreader systems in accordance with the lubrication schedule ensures better performance and protects from premature wear.

Follow these rules when lubricating:

- before attempting to lubricate, thoroughly clean all grease nipples and areas around the lubrication points from mud and dust;
- feed the grease into the nipple until the fresh grease flows out of the spaces between mating parts;
- apply fresh grease on the land wheel bearings by first removing the wheels with the hubs – then wash the hubs and pivots with Diesel fuel and fill the hub lubricating chambers with fresh grease;
- replace the transmission gearbox oil directly after stopping the spreader (the oil temperature will be higher, which facilitates draining it from the gearbox);
- flush the gearbox with Diesel fuel before priming with fresh oil;
- lubricate the PTO drive-shafts in accordance with the shaft operating manual.

Perform the lubrication of the wheel bearing during the inspection and adjustment of the brakes. When replacing the wheel hub bearings, remove all grease from the hub chambers. After each year of operation, remove the hubs with their bearings, wash the bearings and the hub chamber and then refill with fresh grease. The lubrication points are shown in the lubrication diagrams.

All lubrication points indicated in yellow must be greased or checked for grease level before starting the spreader. Use **ŁT-42**, **ŁT-43** or any other high-performance bearing grease. The transmission gearboxes are primed with **HIPOL 15** oil.

Lubrication schedule

Lubrication point no.	Name of the spreader component to be lubricated	Lubricant type	Lubrication method
1	Conveyor stretcher wheels	ŁT-42 or ŁT- 43	lubrication points
2	Spreader rear shaft bearing	ŁT-42 or ŁT- 43	lubrication points
3	Expander bearing	ŁT-42 or ŁT- 43	lubrication points
4	Road wheel bearing	ŁT-42 or ŁT- 43	periodic replacement
5	Conveyor chains	Hipol 15	apply to the surface
6	Support	ŁT-42 or ŁT- 43	periodic replacement
7	Intermediate drive bearing	ŁT-42 or ŁT- 43	lubrication points
8	Transmission gearbox	Hipol 15	periodic replacement
9	Tow bar hitch	ŁT-42 or ŁT- 43	periodic replacement
10	Control arm axle	ŁT-42 or ŁT- 43	lubrication points

7. TECHNICAL CHARACTERISTICS

Symbol:	**N267/1**	**N267**
Load capacity [t]:	6.0	8.0
Overall length [mm]:	5830	6300
Overall width [mm]:	2360	2360
Overall height [mm]:	2670	2800
Loading space: length [mm]:	3600	4000
width [mm]:	2000	2000
height [mm]:	800	1150
top section (optional) height [mm]	500	500
Load body capacity [m^3]:	5.8	9.2
Tow bar lug adjustment range [mm]:	360–540	390–570
Wheel system:	Tandem (two independent control arms, w/o suspension springs)	
Axle base [mm]	1040	
Wheel track [mm]	1700	1790
Hydraulic drive of the floor conveyor:	Slat floor conveyor, hydraulically driven with shift speed adjustment	
Kerb weight [kg]	3150 including: - tow bar hitch ring load: 200; - multiple axle load: 2950;	3400 including: - tow bar hitch ring load: 200; - multiple axle load: 3200;
Permissible overall weight [kg]	9150 including: - tow bar hitch ring load: 1430; - multiple axle load: 7720;	11500 including: - tow bar hitch ring load: 2500; - multiple axle load: 9000;
Adapter type:	Vertical w/ 4 spreading drums	
Adapter weight [kg]	440	470
Adapter drive:	Tractor's PTO (540 Nm), part no. 6R-602-7-BA-K601	
Adapter PTO drive-shaft	540 Nm w/friction clutch, part no. 8R-802-3-DA-C803	
Spreading width [mm]:	8000	
Internal gate	Hydraulically actuated	
Side panel end	Wooden slat	
Ladder	Standard accessory, located in the front	
Tyres	400-60/15.5 14PR	500-50/17 14PR
Tyre pressure [kPa]	350	480
Wheel chocks [pcs]	2	
Braking system	Mechanical, drum-type: - pneumatic-controlled service brake, two-line system, for all 4 wheels; - mechanically-controlled parking brake, for 2 wheels of the front tandem axle	
Driving tractor [kW]	Minimum 50	
Electrical system [V]	12 – feed by the driving tractor	
Hydraulic system pressure [MPa]	Maximum 18	
Transport (transit) speed [km/h]	30	
Service speed [km/h]	8-10	

8. MAINTENANCE, CARE AND STORAGE

When the work season is over, do the following:

- wash the spreader;
- repair all paint coat decrements;
- lubricate all lubrication points;
- protect all quick-release couplings of the hydraulic system from contamination (e.g. by wrapping in foil);
- check all threaded and pin connections (re-tighten or repair as required);
- chock the spreader wheels and reduce the tyre pressure by approx. 0.2–0.25 MPa (2–2.5 Atm.);
- check the transmission oil level and refill to the bottom edge of the filling port;
- clean and preserve the PTO drive-shaft;
- identify all parts which need to be replaced;
- store the machine under a roof if possible.

Before attempting to work on any systems of the spreader connected to the tractor with the drive-shaft, turn off the tractor engine, remove the ignition key and engage the tractor parking brake.
Decouple the drive-shaft before servicing (cleaning, maintenance, repairs) the machine. Engage the spreader parking brake and chock the wheels.

9. DISMANTLING, DISPOSAL AND ENVIRONMENTAL PROTECTION

If the product is repaired, dispose of all worn-out parts at a scrap collection point. Follow all applicable OHS regulations for repair and replacement of worn-out subassemblies. Dispose of the entire product at a recyclable materials collection point.

Each identified hydraulic system fault, i.e. oil leaks, must be immediately rectified to prevent environmental pollution. Do not let the oil to be spilled on the ground when replacing the fluid. Store the used oil in sealed vessels (e.g. used for fresh oils) and periodically dispose of its at fuel stations.

Only the personnel experienced in the design and operation of the machine is authorised to dismantle it. Follow the general safety precautions for agricultural equipment servicing during disassembly (repairs). Due to

the large weight of components (over 20 kg), use suitable lifting equipment for disassembly.

Do not leave any worn-out or damaged parts from repairs or disposal on the field or farm premises. Such items must be stored at a designated area (with restricted access of personnel and animals) and periodically disposed of at a scrap collection point.

Dispose of the entire machine at a specialist facility which handles the dismantling of machines and equipment. If disposing of the machine on your own, segregate all dismantled components in accordance to the material type: rubber, ferrous metals and non-ferrous metals. Submit all rubber parts for re-use (recycling or disposal).

10. EQUIPMENT

Item	*Details*	*Drawing No. or standard*	*N267, N267/1*
1.	Wheel chocks	-	2
2.	PTO drive-shaft	6R602-2-BA-K601	1
3.	Operating Instructions, warranty card	-	1

Make sure that all accessories are present upon purchasing the spreader.

The optional accessories are the top sections made of metal sheets or wire mesh panels. The top section length for the N267 spreader is 4000 mm and 3510 mm for the N267/1.

The top section height is 500 mm. They are installed by inserting the section posts into the side wall posts and tightened with M12x50 bolts.

If installing the top sections for the first time, drill a Ø10 hole in the front mesh guard angle bar. Do this after installing the top sections.

11. USE

The manure spreader is fully adapted for public traffic by featuring a pneumatic braking system, parking brake and electrical lighting system. **The spreader can only be operated by adults with a valid tractor driving licence. Prior to travelling, check that the brakes and lighting work properly. Do not exceed the permissible load capacity and driving speed.**

Travel on public roads only when the mesh guard installed on the adapter frame grips and the triangle identification emblem is present. The gate must be lowered. During the work, the mesh guard must be installed on the grips located on the right panel of the load body.

INFORMATION! Exercise extreme caution when travelling on public roads and follow the valid traffic code.

12. DESIGN AND OPERATING PRINCIPLE OF THE SPREADER

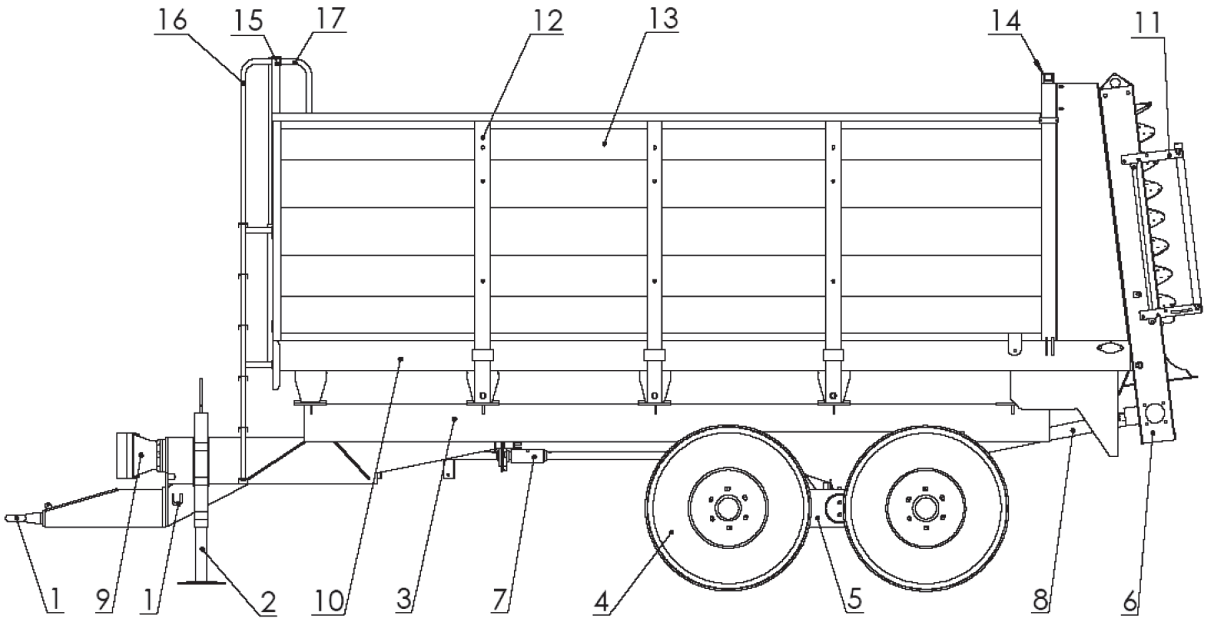


Fig. 8. Design of the spreader

1 - hitch, 2 - support, 3 - bottom frame, 4 - land wheel, 5 - tandem axle, 6 - adapter, 7 - adapter power system, 8 - adapter jointed shaft, 9 - joint guard, 10 - top frame, 11 - rear guard, 12 - post, 13 - side wall, 14 - rear gate, 15 - front mesh, 16 - outer ladder, 17 - inner ladder.

The N267 spreader is adapted for coupling with the tractor hitch. The machine consists of the following main assemblies:

- hitch system,
- top frame with vessel,
- spreading adapter,
- wheel system,
- hydraulic system,

The manure spreader is intended for transport and spreading of loose manure. The manure spreader design includes the load body with side panels and a chain conveyor which moves on the floor. The rear end of the load body is closed by a articulated rear end wall with rubber seals along its bottom edge. The end wall is installed on guides and actuated or positioned by hydraulic actuators. A horizontal conveyor drive shaft with socket wheels is installed in the rear section of the load body. The shaft is propelled by a reduction gear coupled with a hydraulic motor. The end of the load body features the manure spreading adapter, which consists of four vertical worm screws with bolted shredding blades.

The spreader should be charged uniformly to ensure an optimum spread. The charging (loading) height must not exceed the spreading adapter clearance height. Make sure that no larger solid bodies (stones and alike) are present in the manure to prevent damage.

Prior to spreading, remove the mesh guard from the spreading drums and make sure that the mesh guard is installed on the front panel which protects the operator from injury by falling objects, e.g. stones.

INFORMATION!
No person is allowed to remain on the machine or within its operating area when the spreader is working.

In order to ensure uniform manure spreading, first increase the maximum PTO rotational speed to 540 rpm when the machine is parked and then turn on the grate floor. Spread enough manure in park until the required amount is fed to the spreading worm screws. Then shift into the suitable gear and begin work. Keep the PTO speed at 540 rpm to achieve an optimum spreading pattern. The spread layer thickness can be adjusted by changing the floor shift speed and the spreader charging ratio. When making a U-turn on the field, decouple the PTO which will protect the PTO drive-shaft and ensure an uniform spread. If the overload protection engages during the manure spreading an the shear pins of the PTO drive-shaft are damaged, install new shear pins. Stop the PTO and the tractor engine before replacing these components! The most common cause for pin shearing is jamming of the spreading adapter with stones or other foreign bodies.

METAL-FACH

16-100 SOKÓŁKA UL. KRESOWA 62

WARRANTY CARD
MANURE SPREADER

N267
N267/1

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

.....

filled out by the seller

Date of manufacture..... Date of sale .....
Serial number..... Signature of the Seller .....

Customer's name and surname .....
Address .....

Item	Service call date	Date of completion	Description of completed service actions and replaced parts	Service technician name	Service stamp