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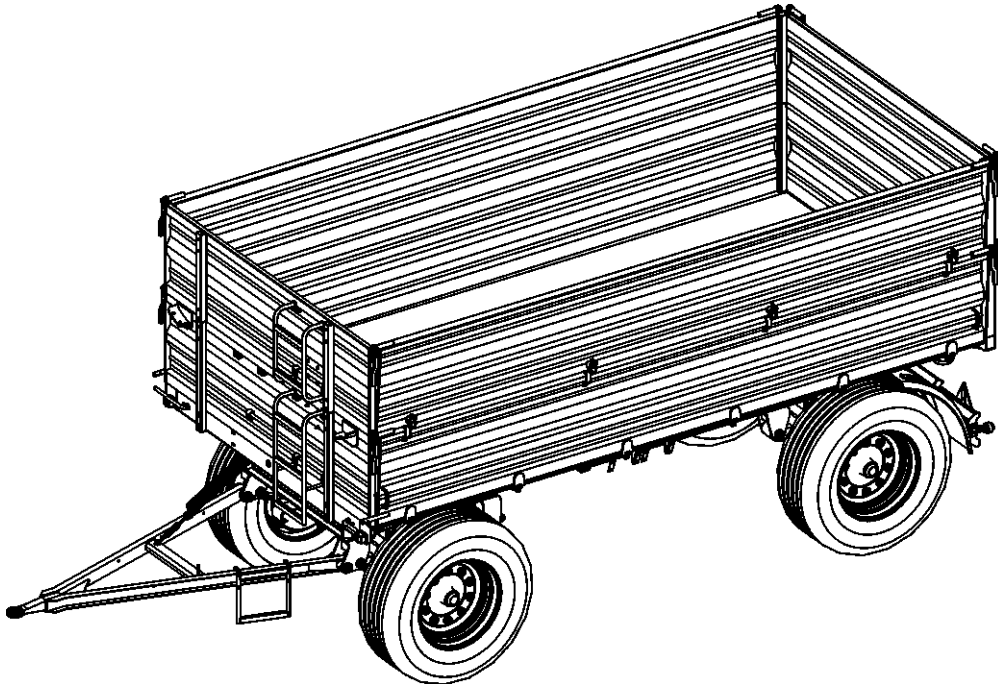
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DOUBLE-AXLE AGRICULTURAL TRAILER THREE-SIDE DUMPER

T672/2



OPERATION & MAINTENANCE MANUAL

Edition III

Narew 2007

PRODUCENT



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DOUBLE-AXLE AGRICULTURAL TRAILER THREE-SIDE DUMPER

T672/2 T672/2/D

OPERATION & MAINTENANCE MANUAL

Identification of the machine

Symbol /Type:

KTM Symbol: 1026-635-847-923

Serial VIN:

The serial is stamped on the type plate and on the front of the trailer's frame. The type plate is riveted to the load-carrying body.

In the course of purchase check conformity of the serial stamped on the trailer with the serial given in the warranty card, in purchase documents and in the operation manual.

Hydraulic system is filled with HL32 hydraulic oil

Quality Inspection Sign.....

The manual and the spare parts catalogue are valid together with the annex No. from the

The manufacturer reserves the right to introduce design modifications for the purpose of simplified maintenance and improved operation quality.

Remarks and notices about design and operation of the trailer should be submitted to the manufacturer. This information allows us to evaluate objectively manufactured machines and will be used as hints for further modernisation.

Information about major design alterations will be supplied to users in the form of enclosed information leaflets (annexes).

CAUTION!

The operation & maintenance manual is the substantial equipment of the trailer.

The user should read carefully the manual before operation and observe all recommendations given in the manual. This will ensure safe maintenance and failure-free operation of the machine.

The machine has been designed in accordance with generally recognised standards, documents and currently binding legal regulations.

CONTENTS

1	INTRODUCTION	5
1.1	GENERAL INFORMATION.....	5
1.2	APPLICATION OF THE TRAILER.....	5
2	OPERATIONAL SAFETY	6
2.1	PRINCIPLES OF USE OF PUBLIC ROADS.....	10
3	ADDITIONAL INFORMATION	11
3.1	TRAILER EQUIPMENT.....	11
3.2	WARRANTY CONDITIONS	11
3.3	DELIVERY.....	11
4	OPERATIONAL INFORMATION	13
4.1	TECHNICAL DATA	13
4.2	STRUCTURE AND OPERATIONAL PRINCIPLE.....	14
4.2.1	Undercarriage.....	14
4.2.2	Load crate.....	15
4.2.3	Hydraulic tilting system.....	15
4.2.4	Braking system	16
4.3	WIRING, LIGHTING, SIGNALLING	18
4.4	TRAILER OPERATION PRINCIPLES	20
4.4.1	Coupling with tractor.....	20
4.4.2	Preparation for work	21
4.4.3	Loading of the load crate	21
4.4.4	Principles of use of tyres.....	22
4.4.5	Unloading of the load crate.....	22
4.4.6	Uncoupling from the tractor	25
4.4.7	Failures and defects	25
5	MAINTENANCE	26
5.1	ADJUSTMENT OF WHEEL BEARINGS	26
5.2	ADJUSTMENT OF BRAKES	28
5.3	MAINTENANCE OF PNEUMATIC SYSTEM	29
5.4	MAINTENANCE OF HYDRAULIC SYSTEM	29
5.5	LUBRICATION.....	30
5.6	MAINTENANCE OF SUSPENSION SPRINGS.....	32
5.7	MAINTENANCE OF LOAD CRATE.....	33
5.7.1	Assembly / disassembly of superstructures.....	33
5.7.2	Maintenance of tarpaulin & frame.....	34
5.8	STORAGE & PRESERVATION	34

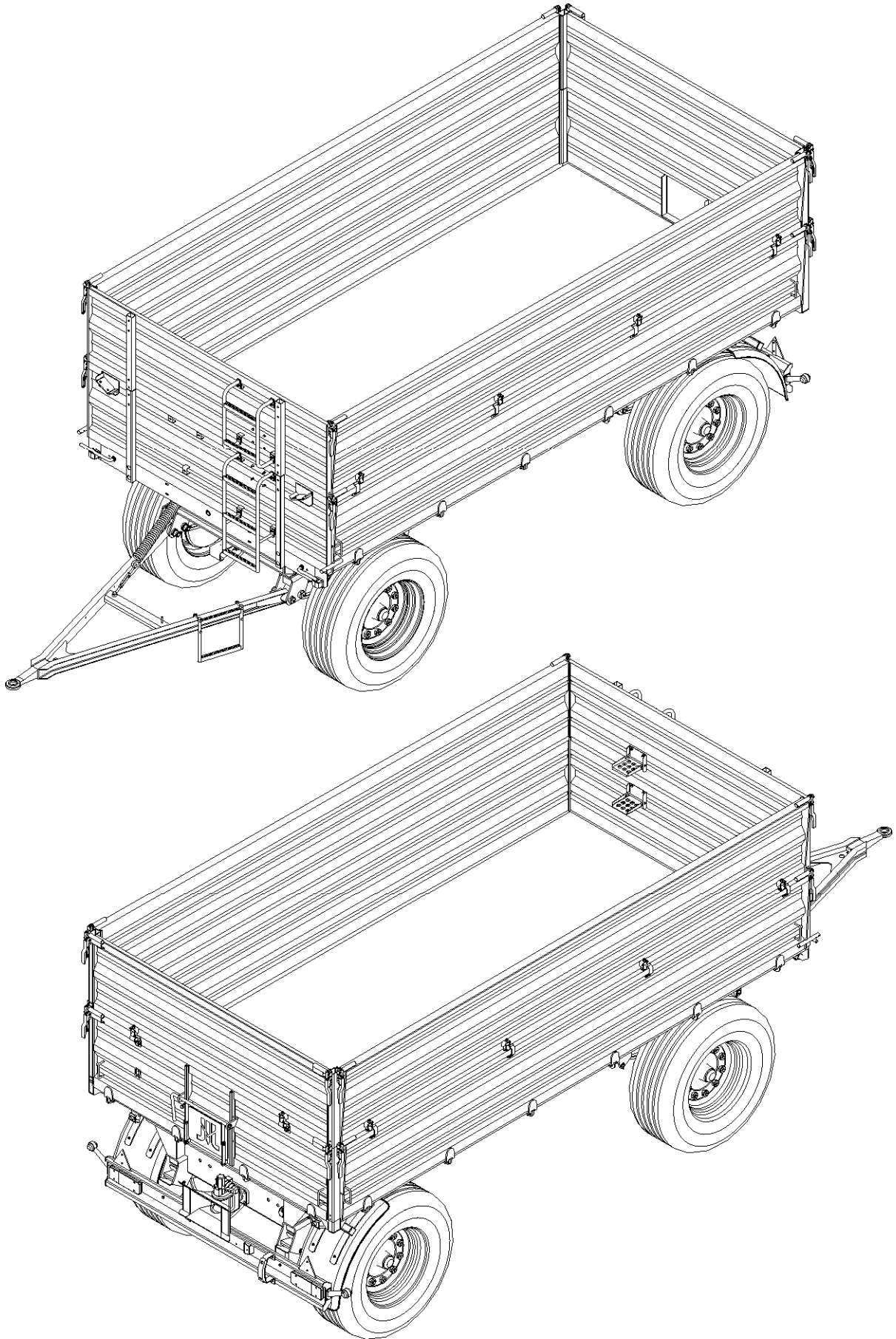


Fig. 1 Trailer T672/2

1 INTRODUCTION

1.1 GENERAL INFORMATION

The manual describes basic rules of safe operation & maintenance of the agricultural trailer. If information contained within the manual will be not comprehensible for the user please do not hesitate to contact your dealer or directly the manufacturer.

Especially important are information and recommendation marked in the text by bold characters or preceded by the word "CAUTION".

Information, descriptions of danger and precautions as well as commands and orders concerning safe operations are marked with following sign:



and mentioned in the chapter „Safe operation“.

1.2 APPLICATION OF THE TRAILER

The trailer is designed for transportation of agricultural produce as well as loose and volume materials within farm limits and on public roads with maximum speed of 40 kph.

Brake, lighting and signalling systems fulfil all requirements of traffic regulations.

The driving system (axles, suspension springs, wheels, tyres) fulfils requirements for agricultural trailers, which – according to the act „Traffic law“ – must not exceed the maximum speed of 40 kph

The trailer is adapted for coupling with agricultural tractors fitted with external hydraulic system and an upper towing hook.



CAUTION!

The trailer must not be used contrary to its proper application and especially:

- **for transporting of persons & animals,**
 - **for transporting of loose, unprotected toxic materials if there is the possibility of environment contamination,**
 - **for transporting of machinery & devices, which location of gravity centre may influence negatively on trailer's stability,**
 - **for transporting of loads, which may cause unequal load or overload of axles,**
 - **for transporting of non-fastened loads, which may change their location on the trailer's platform during drive.**
-

2 OPERATIONAL SAFETY



- The user should read carefully the manual before operation and during operation observe all recommendations given in the manual.
- If information contained within the manual will be not comprehensible for the user please do not hesitate to contact your dealer, who also provides repair & service or directly the manufacturer.
- Careless and improper operation & maintenance of the trailer as well as lack of observation of recommendations given in present manual may endanger human health and life.
- Inobservation of safe use rules may endanger health of operators and third persons.
- There is the risk of residual danger, thus application of safe operation rules should be the basic principle of trailer's use.
- Persons unauthorised for driving agricultural tractors including children and drunk persons have no right to use the trailer.
- It is prohibited to use the trailer contrary to its purposes. User, who utilise the trailer in other than prescribed manner, takes all responsibility for all consequences resulting from trailer's use.
- Any unauthorised modification absolves the PRONAR Narew from responsibility for resulted damage or health detriment.
- Prior to each trailer's use check its technical condition, especially coupling system, drive system, brakes and signalling lights.
- Check trailer's hydraulic system frequently; any oil leakage is inadmissible.
- Take special care while coupling trailer with tractor.
- While coupling the trailer with tractor use only the upper tractor's tow coupling. Check protection devices.
- In the course of coupling no one is allowed to stand between trailer and tractor.
- Climbing on the trailer is allowed only if the trailer is completely stopped and tractor's engine off; the trailer should be also braked with its hand brake.
- Disconnection of the trailer while the load crate is lifted with the telescope cylinder is prohibited. Take special care by disconnecting the trailer.
- Disconnected trailer should be braked. If the trailer stands on a slope or an elevation it should be protected additionally with wedges or other blunt-edged objects placed under wheels.
- The load should be placed uniformly on the load crate surface.

- Admissible load must not be exceeded.
- Driving with lifted load crate and transporting of people & animals is prohibited.
- No one is allowed to stand in the vicinity of lifted load crate and unloaded material.
- Keep safe distance from electric lines while lifting the load crate.
- If any operation failure or damage occurs, stop operation of the trailer and repair the damage.
- Maintenance & repair of the trailer with loaded and/or lifted load crate without proper support of the crate is prohibited.
- During trailer's operation use protection gloves and proper tools.
- All maintenance & repair works should be performed with observation of safety regulations. In the case of wound wash and disinfect wounded place immediately. In the case of serious injuries consult a physician.
- The trailer is marked with information / signalling stickers as described in the table 1 below. The user should take care of legibility and cleanliness of inscriptions & warnings for all time of trailer's operation. In the case of damage or destruction replace missing stickers with new ones – available at your dealer or manufacturer.

Table 1. Information & warning stickers



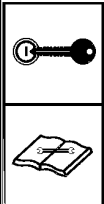




Nr on the fig 2	Safety sign or text	Explanation	Location
1		Lubricate according to the maintenance manual	Front wall
1		Check screwed connection of drive axles	Front wall
1		Prior to maintenance & repair stop the engine and remove the ignition key	Front wall

Table 1. Information & warning stickers, continued

Nr on the fig 2	Safety sign or text	Explanation	Location
2		Read operation manual	Front wall
2		Prior to climbing on the trailer stop the engine and remove the ignition key	Front wall
3		Take special precautions while operating near to energetic lines	Right & left wall
4		Do not support loaded crate	Right & left wall
5	<div style="border: 2px solid black; padding: 5px; display: inline-block;">T672/2 PRONAR</div>		Right & left wall
6	<div style="border: 2px solid black; padding: 5px; display: inline-block;">Ładowność 10000 kg</div>		Right & left wall
7	<div style="border: 2px solid black; padding: 5px; display: inline-block;">550 kPa</div>	Tyre pressure 15R R22.5 18PR	Above wheels
8	<div style="border: 2px solid black; padding: 5px; display: inline-block;">Łączenie tylko z górnym zaczepem transportowym</div>	Couple only with upper towing hook	Front wall
9	<div style="display: inline-block; border: 2px solid black; padding: 5px; margin-right: 10px;">1</div> <div style="display: inline-block; border: 2px solid black; padding: 5px;">2</div>	Switch over of hydraulic systems of 1st and 2nd trailer	Cut-off valve

Arrangement of information & warning stickers is shown on the fig. 2.

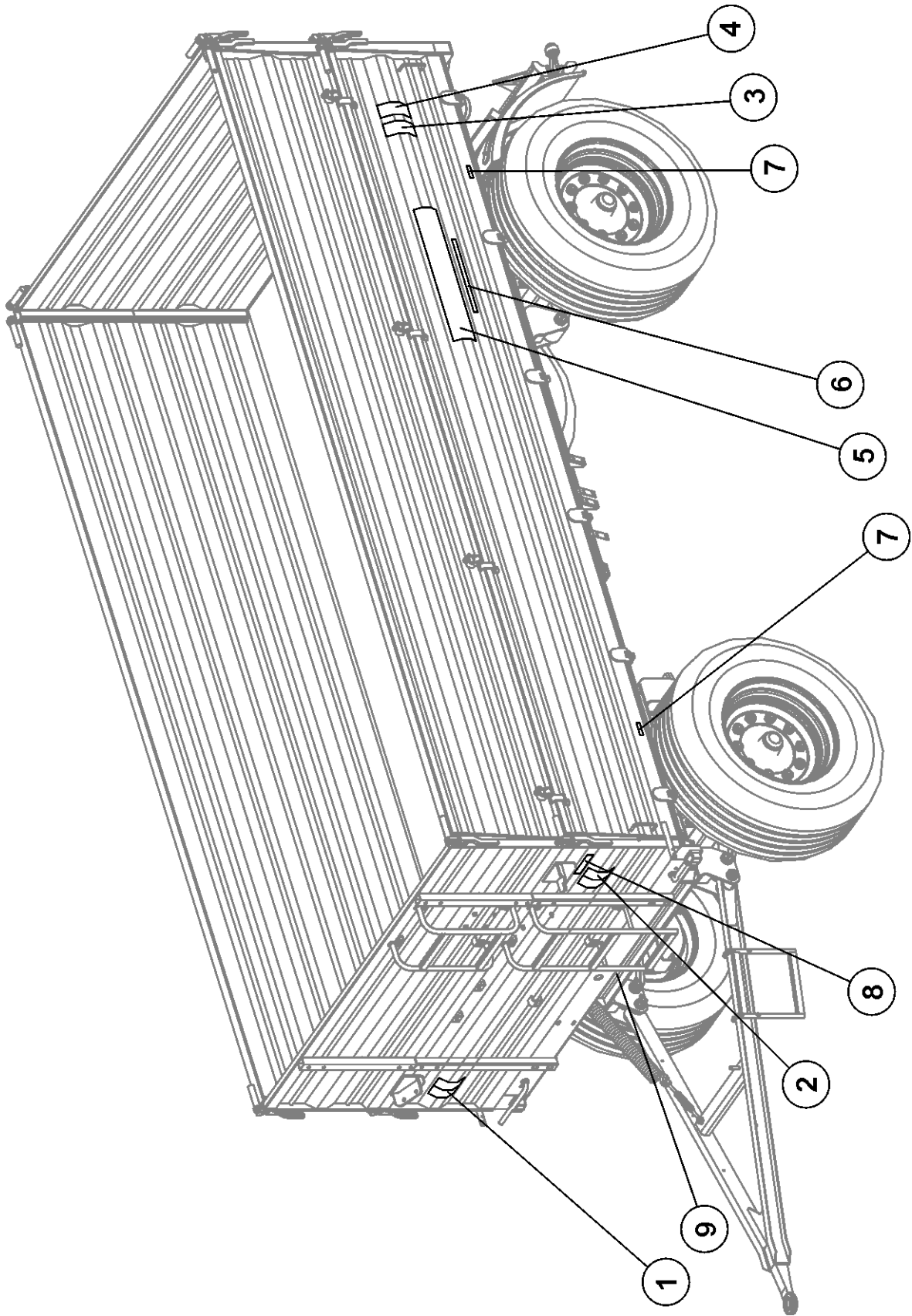


Fig. 2 Arrangement of information & warning stickers.

2.1 PRINCIPLES OF USE OF PUBLIC ROADS

- While driving public roads observe traffic regulations.
- Trailer's overload may cause its damage and endanger traffic safety.
- Do not exceed the maximum speed of 30 kph. Adjust the speed to traffic conditions.
- The trailer can work on slopes up to 8°. Lift the load crate on level ground only.
- It is prohibited to leave unsecured trailer. Always activate the parking brake.
- While driving public roads the trailer should be equipped with certified or approved warning reflecting triangle.
- Rear wall should be equipped with a triangular plate for slowly moving vehicles if the trailer is the last vehicle in a set (Fig. 3).

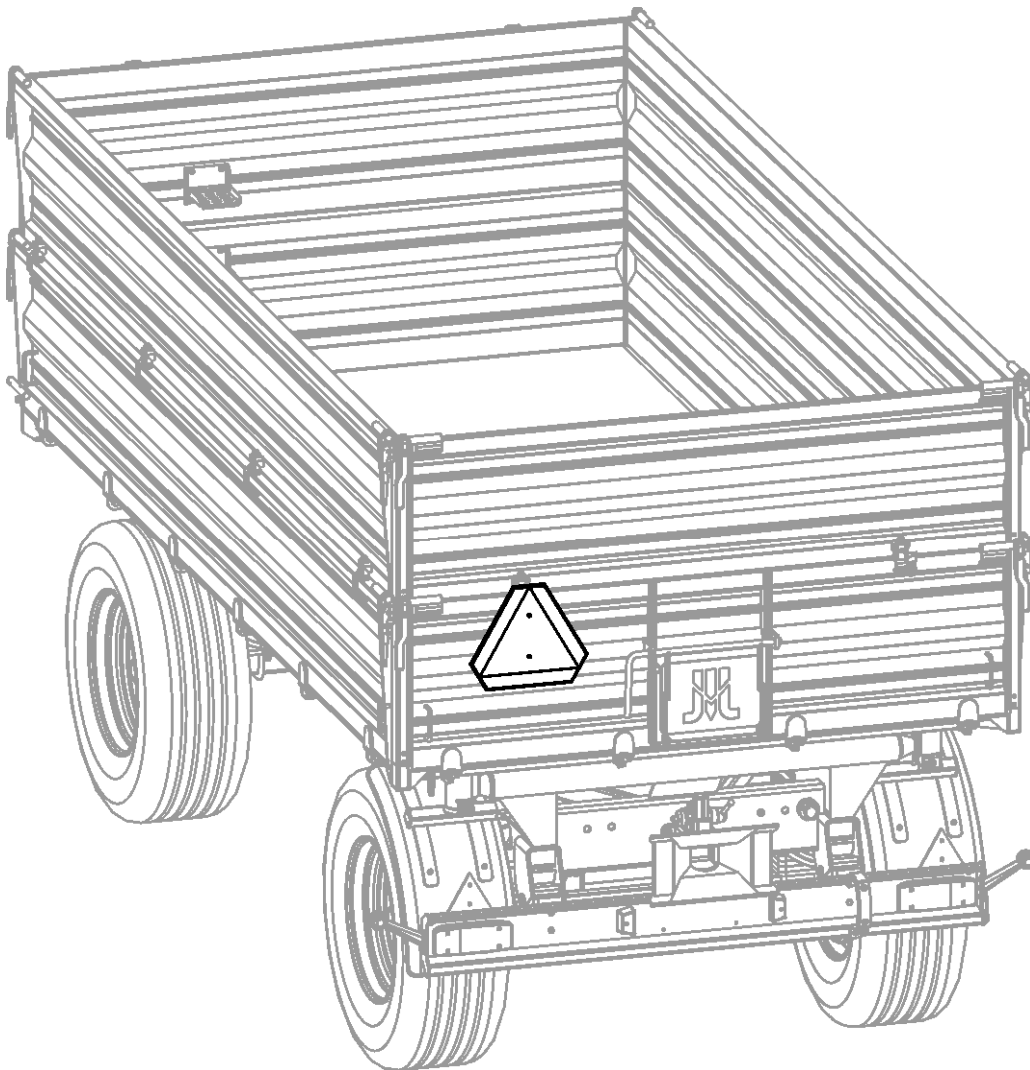


Fig. 3 Location of a triangular plate for slowly moving vehicles.

3 ADDITIONAL INFORMATION

3.1 TRAILER EQUIPMENT

Trailer equipment consists of:

- operation & maintenance manual + spare parts catalogue - 1
- warranty card - 1
- connection conductor - 1

For user's order the trailer may be equipped additionally with:

- warning reflecting triangle
- triangular plate for slowly moving vehicles
- automated towing hook
- tarpaulin & platform

3.2 WARRANTY CONDITIONS

"PRONAR" Sp. z o.o. guarantees efficient operation of the trailer if utilised according to technical & operation conditions described in the manual.

Failures detected during warranty period will be removed by the Warranty Service within no longer than 14 working days from the date of delivery to a repair station or within any other agreed period.

Normally wearing parts i.e. tyres, brake linings as well as mechanical damage, damage resulted from improper use, adjustment or maintenance are not subject of warranty.

Detailed warranty conditions are mentioned in the warranty card supplied together with the newly bought trailer.



CAUTION!

Demand your dealer to fill the warranty card and complaint coupons exactly and completely. Lack of e.g. sale date or dealer's stamp may render your possible complaint void.

3.3 DELIVERY

The trailer is delivered for sale fully assembled and requires no package. Packed are only: the manual, the connection cable and – if ordered – the warning triangle.

The trailer is supplied to the user with a truck or the user can take by himself with his own tractor.



CAUTION!

If the user takes the trailer by him he should read present manual and observe all recommendations given in the manual. In the case of transportation with a truck the trailer is fastened on the load crate according to generally recognised safety rules. The truck driver should take special precautions while transporting the trailer, because the gravity centre of the loaded truck is shifted upwards.

4 OPERATIONAL INFORMATION

4.1 TECHNICAL DATA

Table 2. Basic technical data

No.	Data	Unit	T672/2
1	Overall length	mm	6484
2	Overall width	mm	2390
3	Overall height with 1800mm walls and tarpaulin	mm	3425
4	Wheel base	mm	1700
5	Load crate intern. dimensions:		
	- length	mm	4440
	- width (front / rear)	mm	(2340/2390)
	- height ★	mm	600/1200/1800/1200/1800
6	Load volume ★	m ³	5.9/11.8/17.8/11.8/17.8
7	Load surface	m ²	10,5
8	Load surface height above ground	mm	1325
9	Empty weight ★	kg	3020/3600/4180/3693/4273
10	Admissible total weight	kg	14000
11	Admissible load ★	kg	10980/10400/9820/10307/9727
12	Load crate tilt angle		
	- sideward	(°)	50
	- rearward	(°)	50
13	Wheel ring size		11.75x22.5
14	Tyre size & PR number		385/65 R22.5 18PR RE
16	Tyre pressure	kPa	550
17	Rated voltage	V	12
18	Admissible speed	km/h	30
19	Hydraulic oil capacity	l	13

★ - depending on version:

- trailer T672/2 with 600mm load crate walls
- trailer T672/2 with 600+600mm load crate walls
- trailer T672/2 with 600+600+600mm load crate walls
- trailer T672/2 with 600+600mm load crate walls, frame & platform
- trailer T672/2 with 600+600+600mm load crate walls, frame & platform

4.2 STRUCTURE AND OPERATIONAL PRINCIPLE

4.2.1 Undercarriage

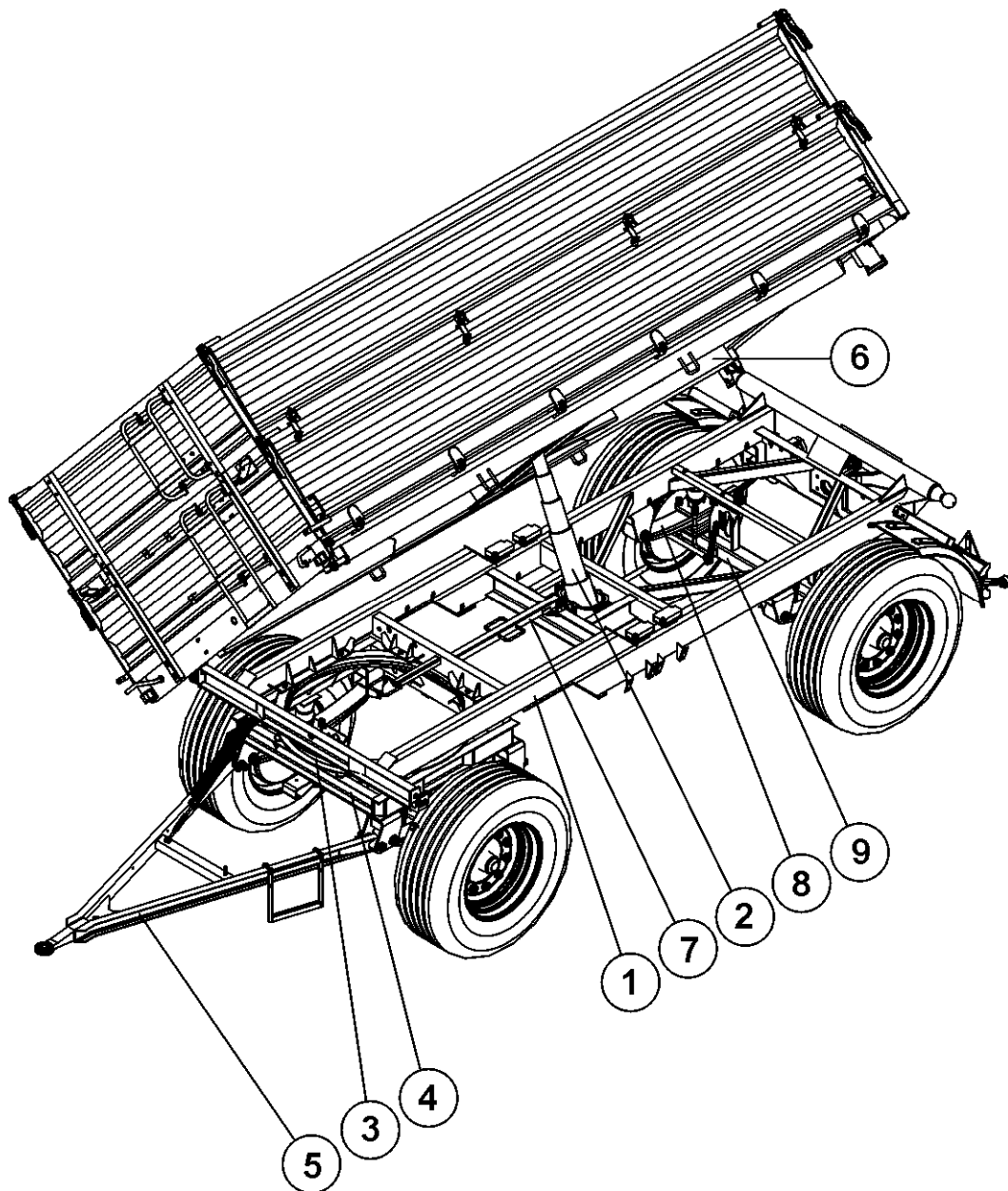


Fig. 4 Undercarriage and upper frame

1 – lower frame, 2 – hydraulic cylinder, 3 - turntable, 4 – turntable frame, 5 – draught bar, 6 – upper frame, 7 – load crate support, 8 – suspension springs, 9- axle

Trailer's undercarriage consists of parts shown on the Fig. 4. The lower frame (1) is a welded structure made of steel profiles. Main carrying elements are two stringers connected each to other with cross-bars. In frame corners there are pivots for mounting of the upper frame (6), and in the middle part of the frame there are seats for fastening of the hydraulic cylinder (2). The front frame part is fitted elements of front axle suspension: turntable (3), turntable frame (4), suspension springs and draught bar (5). The rear part of the frame is fitted also with mountings for the rear axle (5) and for rear lighting elements.

Axes are made of a square rod with pivots on either end; on pivots are mounted conical bearings and on bearings – wheel hubs. The wheels are of single type, fitted with shoe brakes actuated with brake cams.

Suspension of the trailer consists of steel leaf springs.

4.2.2 Load crate

The load crate consists of: upper frame welded together with floor, walls A, B and C and set of superstructures D, E and F.

The upper frame is mounted to the lower frame in articulated joints and protected with bolts, which simultaneously are axes for tilting.

The wall & superstructure locks and the chute flap are protected against spontaneous, undesirable opening.

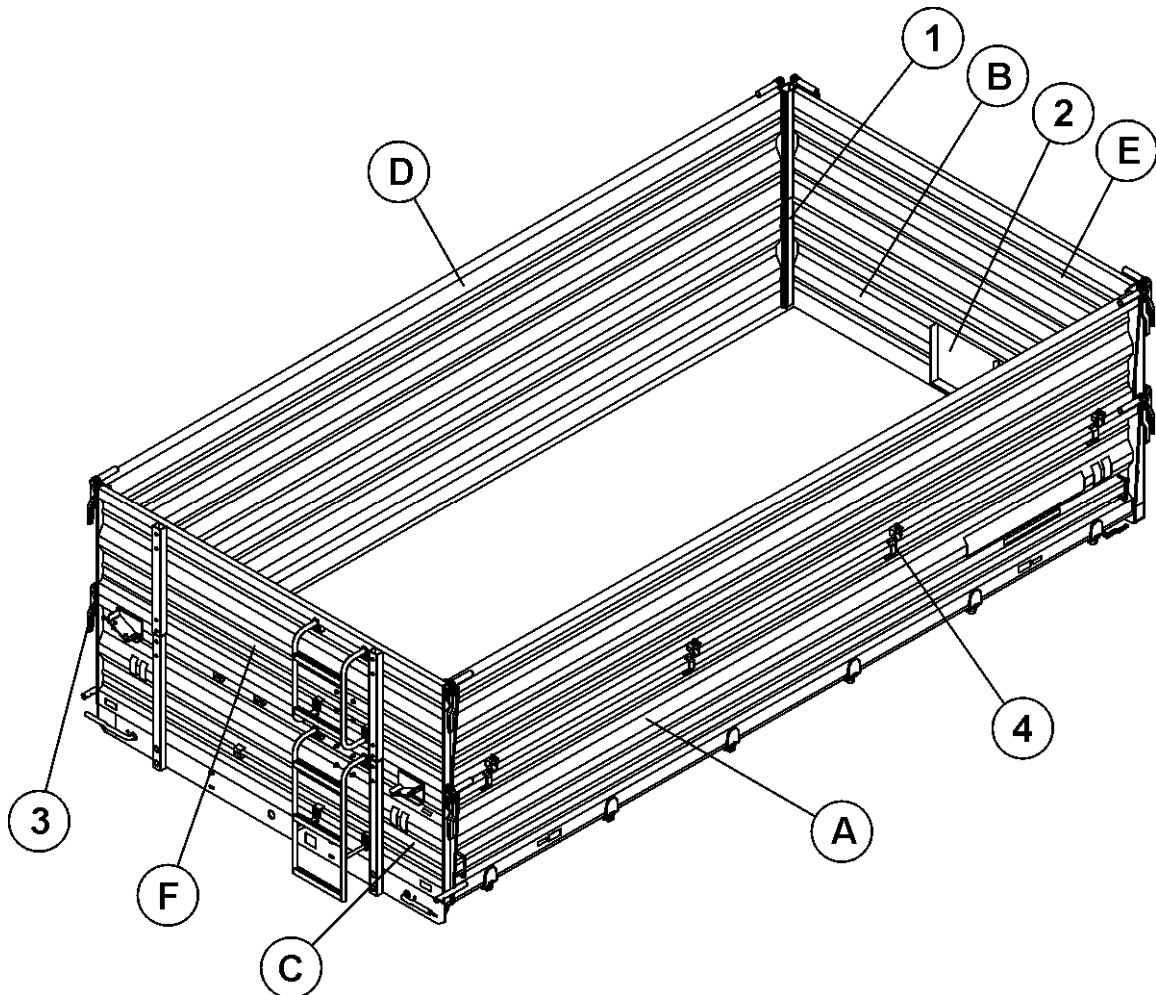


Fig. 5 Load crate

A – side walls, B – rear wall, C - front wall, D – side superstructure, E – rear superstructure, F – front superstructure, 1 – rear post, 2 – chute, 3 – wall lock, 4 - hinge

4.2.3 Hydraulic tilting system

Hydraulic tilting system is designed for automated unloading of the trailer through tilting the load crate backwards or sideways. The hydraulic system is supplied with oil from tractor's hydraulic system. Tilting of the load crate is controlled with the distributor of tractor's external hydraulic system.

Trailer's hydraulic system consists of two independent circuits:

- Circuit **1** - for supplying of trailer's hydraulic cylinder
- Circuit **2** - for supplying of second trailer's cylinder if two trailers are coupled with the tractor.

Both circuits are operated with the control valve 2 (Fig. 5). The valve lever can be set in two positions:

- **1** - first trailer tilting system open
- **2** - second trailer tilting system open

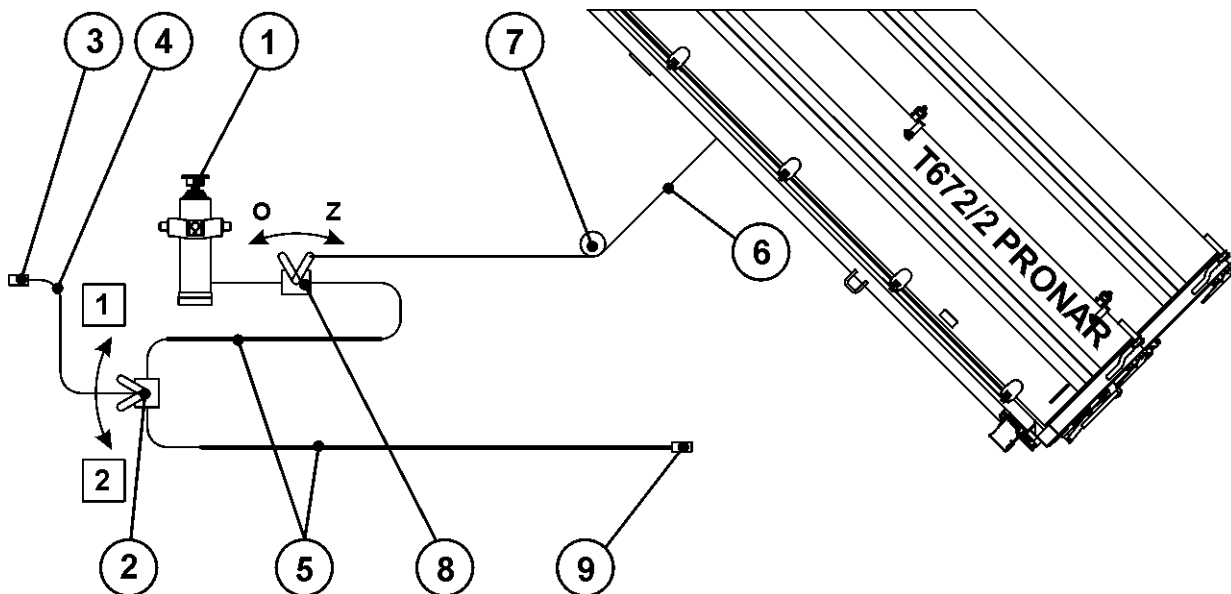


Fig. 6 Hydraulic system for tilting of the load crate

1 – hydraulic cylinder, 2 – cut-off valve, 3 – connection valve plug, 4 – flexible conduits, 5 – rigid hydraulic conduits, 6 – control cable for cut off valve, 7 – roller, 8 – cut off valve, 9 – connection valve socket



CAUTION!

The cut-off valve 8 (Fig. 6) reduces load crate tilting angle while tilted sideways. The length of the cable rope is adjusted by the manufacturer and must not be readjusted by the user.

4.2.4 Braking system

The trailer is fitted with a braking system, which consists of:

- pneumatically controlled operational brake
- manually operated (crank-operated) parking brake

The operational brake (pneumatic) is actuated from driver's seat with a brake pedal. In the case of disconnection from tractor's pneumatic system of the brake is actuated automatically

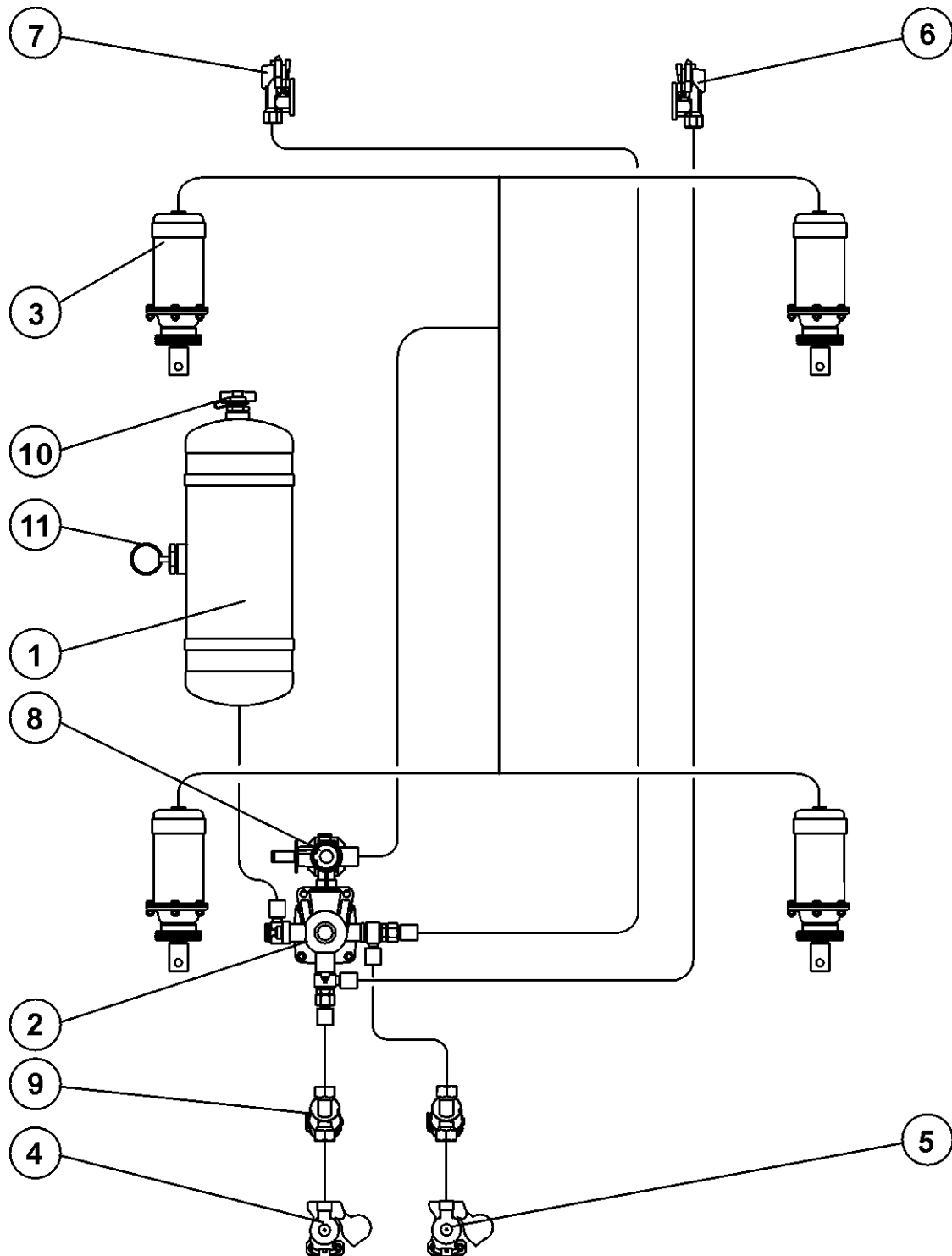


Fig. 7 Pneumatic double-conduit brake system with three-range braking force controller

1 – air reservoir, 2 – control valve, 3 – pneumatic cylinder, 4 – connector (yellow) of the control conduit for coupling with the tractor, 5 – connector (red) of the supply conduit for coupling with the tractor, 6 – connector (yellow) of the control conduit for coupling with second trailer, 7 – connector (red) of the supply conduit for coupling with second trailer, 8 – three-range braking force controller, 9 – air filter, 10 – air reservoir inspection connector, 11- drain valve

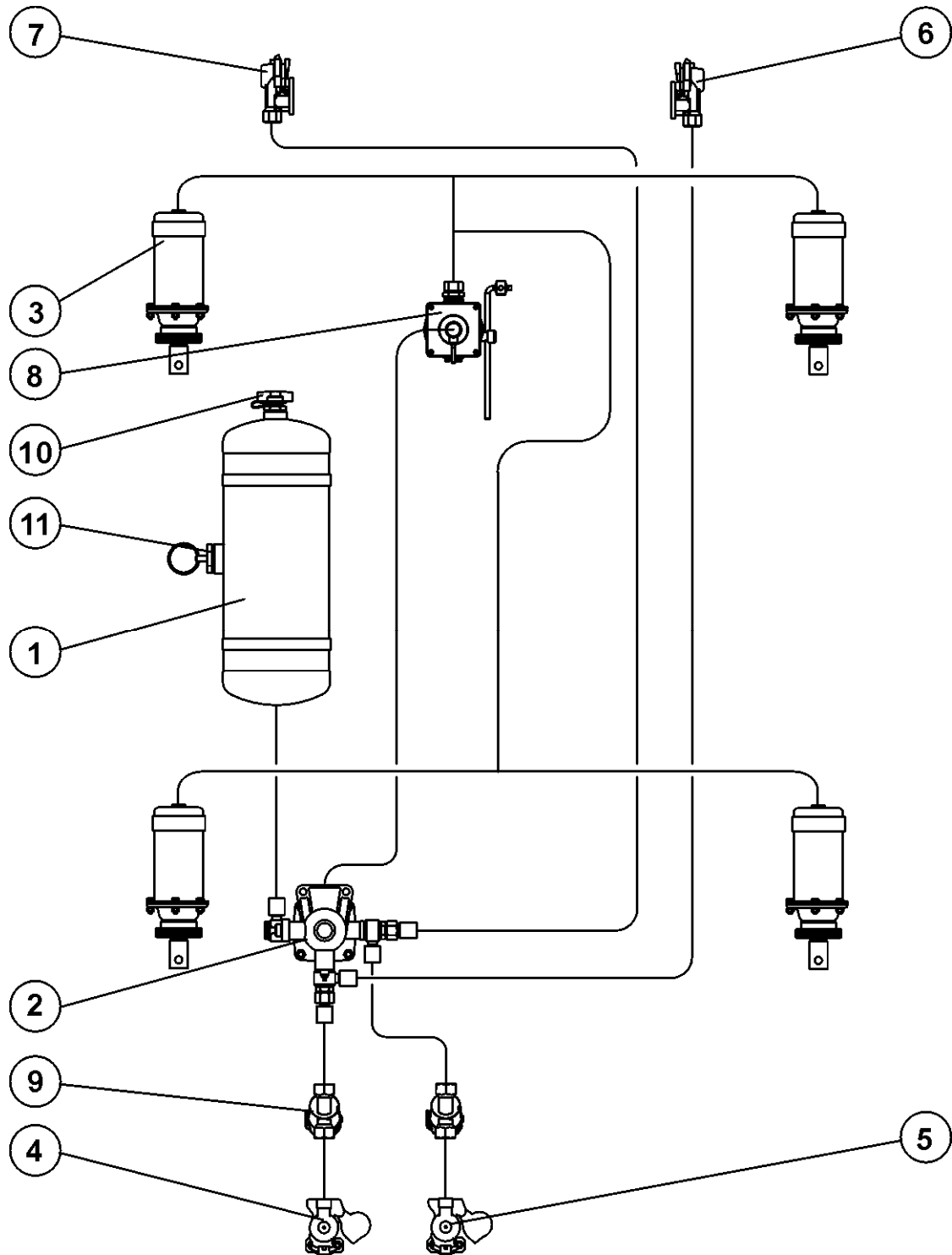


Fig. 8 Pneumatic double-conduit brake system with automated braking force controller

1 – air reservoir, 2 – control valve, 3 – pneumatic cylinder, 4 – connector (yellow) of the control conduit for coupling with the tractor, 5 – connector (red) of the supply conduit for coupling with the tractor, 6 – connector (yellow) of the control conduit for coupling with second trailer, 7 – connector (red) of the supply conduit for coupling with second trailer, 8 – automated braking force controller, 9 – air filter, 10 – air reservoir inspection connector, 11- drain valve

4.3 WIRING, LIGHTING, SIGNALLING

The wiring system is adapted for power supply with 12 V DC. Trailer and tractor electrical systems should be connected together with suitable connection conductor.

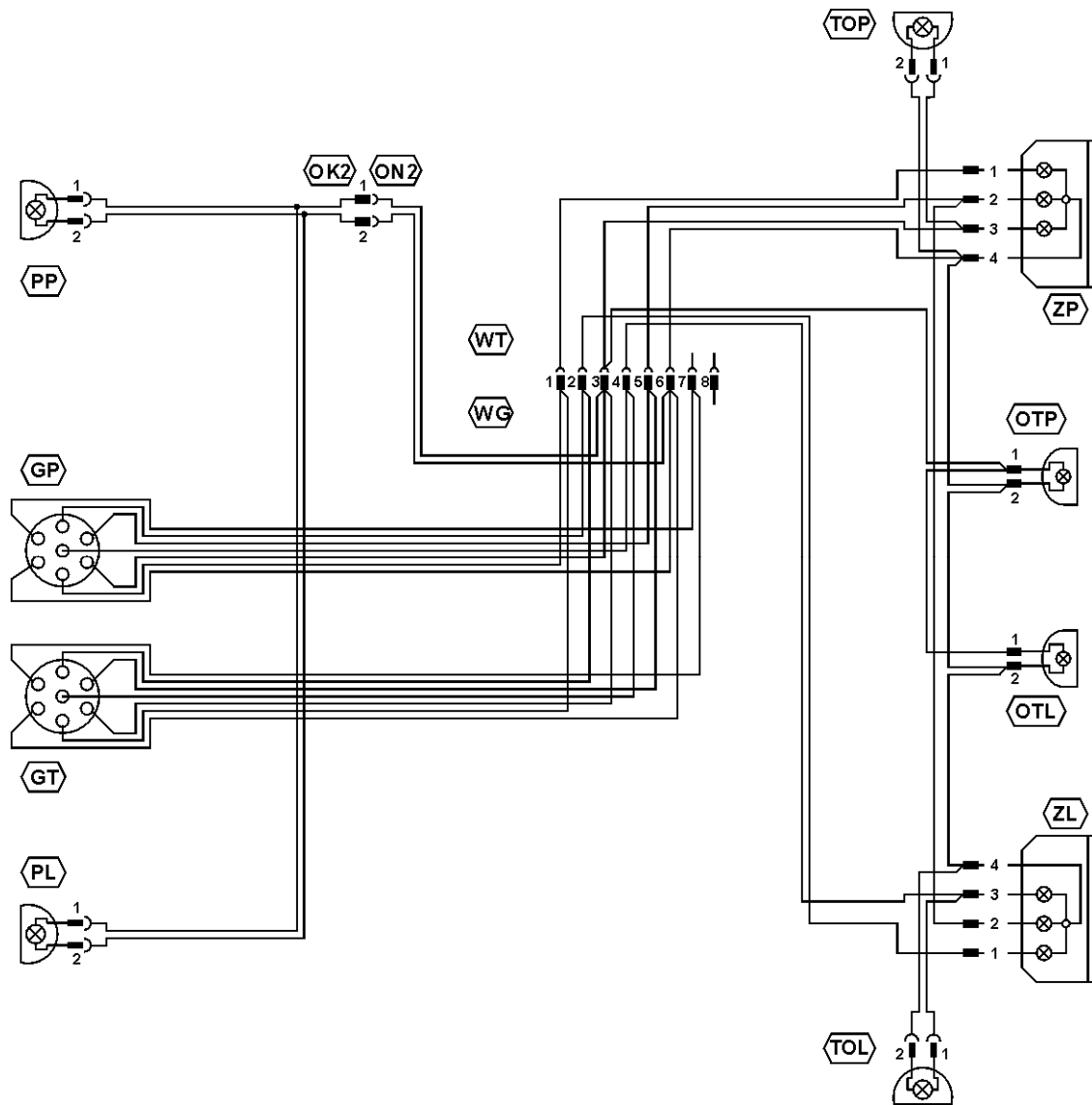


Fig. 9 Trailer wiring

PP (PL) - right (left) front position light, ZP (ZL) – rear compact lamp right (left), OTP (OTL) – number plates lighting lamp right (left), GP (GT) – front (rear) seven-pin socket, TOP (TOL) – rear contour lamp right (left)

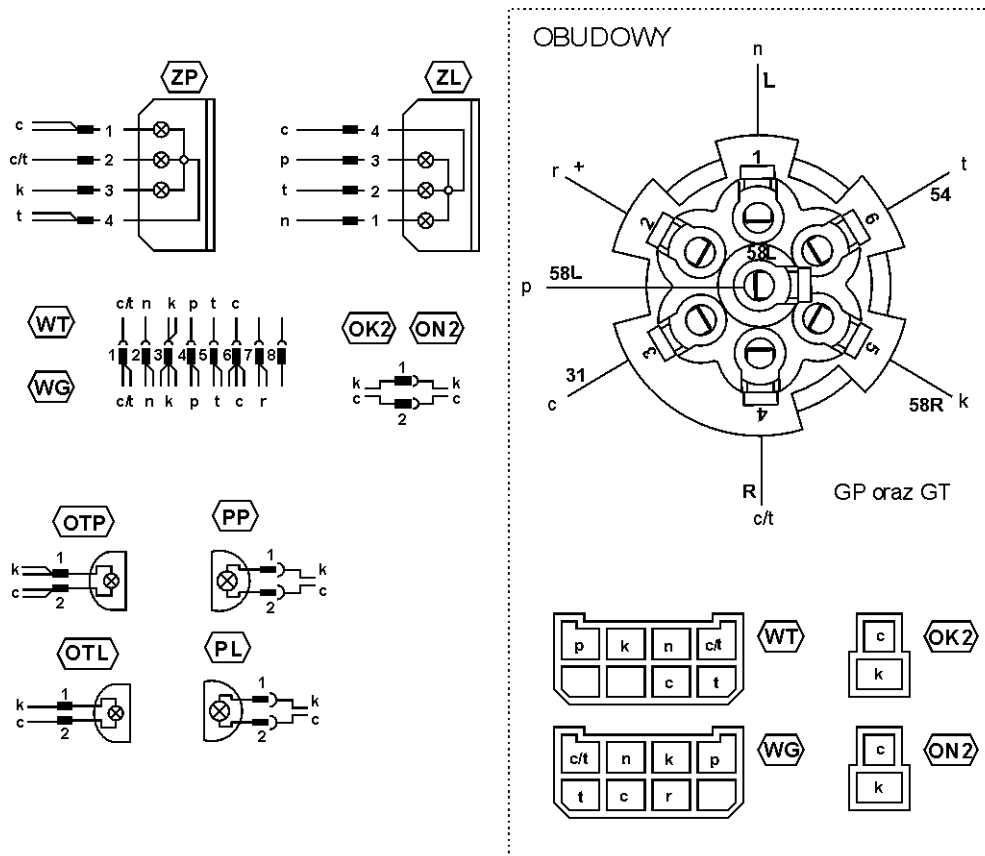


Fig. 10 Connection of conductors

Conductor colours

p – orange, c – black, k – red, r – rose, n – blue, c/t – black-green, t - green,

31 – frame, R (L) – right (left) blinker, 58R (58L) – right (left) position lamp, 54 - „STOP”, „+” – power supply +12V DC

4.4 TRAILER OPERATION PRINCIPLES

4.4.1 Coupling with tractor

Prior to coupling with tractor check if the trailer is braked with the parking brake.

To couple trailer with tractor perform following operations:

- Position the draught bar eye on suitable level.
- Precise adjustment of the eye can be achieved by adjustment of the hook spring tension with use of the tensioning screw.
- Draw back the tractor, couple draught bar eye with tractor’s upper tow coupling and check its fastening.
- Connect electrical, hydraulic and brake conduits to the tractor.
- Release the trailer parking brake.



CAUTION!

In the course of coupling no one except of operator is allowed to stand between trailer and tractor.

4.4.2 Preparation for work

During preparation for work it is necessary to check following items:

- condition of tyres and tyre pressure
- fastening of nuts fixing wheels and hitch rod
- condition of other screw connections
- function of lighting & signalling systems
- function of braking system
- condition and function of wall locks & hinges and tilt bolts
- function of hydraulic tilting system

4.4.3 Loading of the load crate

It is allowed to load the crate only if it is coupled with a tractor and stands on the level ground. Loading should be arranged uniformly on the entire load crate floor, if possible.

It is recommended to use a crane, a loader or a conveyor for loading. Prior to loading check if wall locks & hinges and the chute flap are closed.

In the case of objects, which put pressure in a few points only use thick boards as separators. Table 3 contains admissible layer thickness for various materials. **The table shows clearly that – in many cases – it is impossible to use the entire loading volume without exceeding the admissible load.** It is important not to overload the trailer during loading.

Lightweight materials of great volume may be loaded above wall height but the load should be properly secured from falling down and polluting the road.

Table 3. Layer thickness.

Type of material	Layer thickness [m]
wet gravel, wet soil, clinker, stone	0,5
cement, dry gravel, soil, brick	0,7
manure, full brick, mineral fertiliser	1.1
rye, potatoes, maize, rape, wheat	1.2
barley, oats, peat, coke	1.2



CAUTION!

- **It is prohibited to exceed the admissible trailer load. Overload may endanger traffic safety and damage the trailer.**
 - **Prior to drive with the trailer check if:**
 - **bolts connecting load crate with lower frame are protected against spontaneous falling out**
 - **wall hinge bolts are secured from falling out.**
-

4.4.4 Principles of use of tyres.

- During assembly/disassembly of tyres protect the trailer against accidental movements.
- Repair/replacement of tyres should be performed by trained personnel and with proper tools.
- After each installation of a wheel tighten nuts after first 10 working hours and then check their tightening each 50 working hours.
- Regularly check the tyre pressure and keep the pressure value according to the manual (especially after longer standstills)
- Tyre pressure should be checked during all-day intensive work. Take into consideration the fact that the temperature increase can raise the pressure even by 1 bar. In the case of such raise of temperature and pressure reduce the load or the speed.
- Never reduce the pressure through deflating, if the pressure increase was the result of temperature increase.
- Protect valves with proper caps to avoid penetration of impurities.
- Do not exceed the maximum speed.
- During all-day working cycle in summer check the tyre temperature. Make a pause if the temperature is too excessive.
- Avoid holes, quick and variable manoeuvres and high speed during turns.

4.4.5 Unloading of the load crate

Unloading is performed through tilting the load crate backwards or sideways. Automated unloading should be executed as follows:

- Place the trailer on flat ground, brake the tractor and the trailer with the parking brake. During unloading the tractor should be positioned as for drive forward.
- Place the bolts with grips connecting the load crate with lower frame on the intended unloading side
- Open lower locks and relevant wall locks (according to unloading direction)
- Tilt the load crate with the hydraulic cylinder.

The rear wall is fitted with a chute, which opening can be adjusted resulting in slot of various heights. This enables adjustment of output of unloaded loose materials e.g. mineral fertilisers or cereal. To open the chute, first loose the nut of the securing clamp. While using the chute do not open rear wall locks.



CAUTION!

- **It is allowed to tilt the load crate only when the trailer stands on hard, flat ground.**
 - **Use only original bolts with grip. Use of other bolts may result in destruction of the trailer**
 - **Take special precautions while opening wall locks due to load pressure on walls**
 - **Take special precautions while closing walls and chute to avoid crushing fingers.**
 - **Unloading of loose materials loaded higher than 1 m may be realised only by tilting the load crate backwards.**
 - **During unloading no one is allowed to stand in the vicinity of tilted load crate.**
 - **It is allowed to tilt the load crate only if the trailer is coupled with a tractor.**
 - **It is prohibited to tilt the load crate during violent wind gusts.**
 - **Do not move and/or drive with the load crate in upper position.**
-

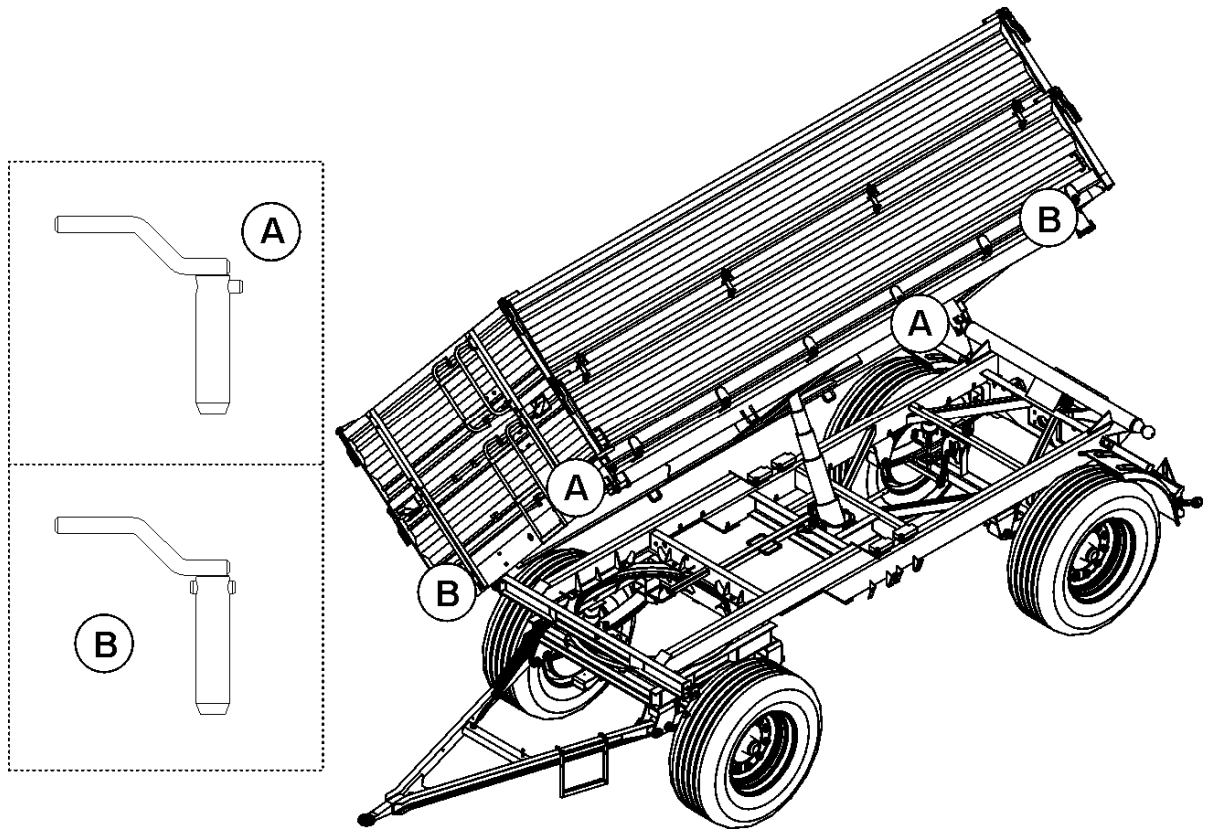


Fig. 11 Tilt bolts

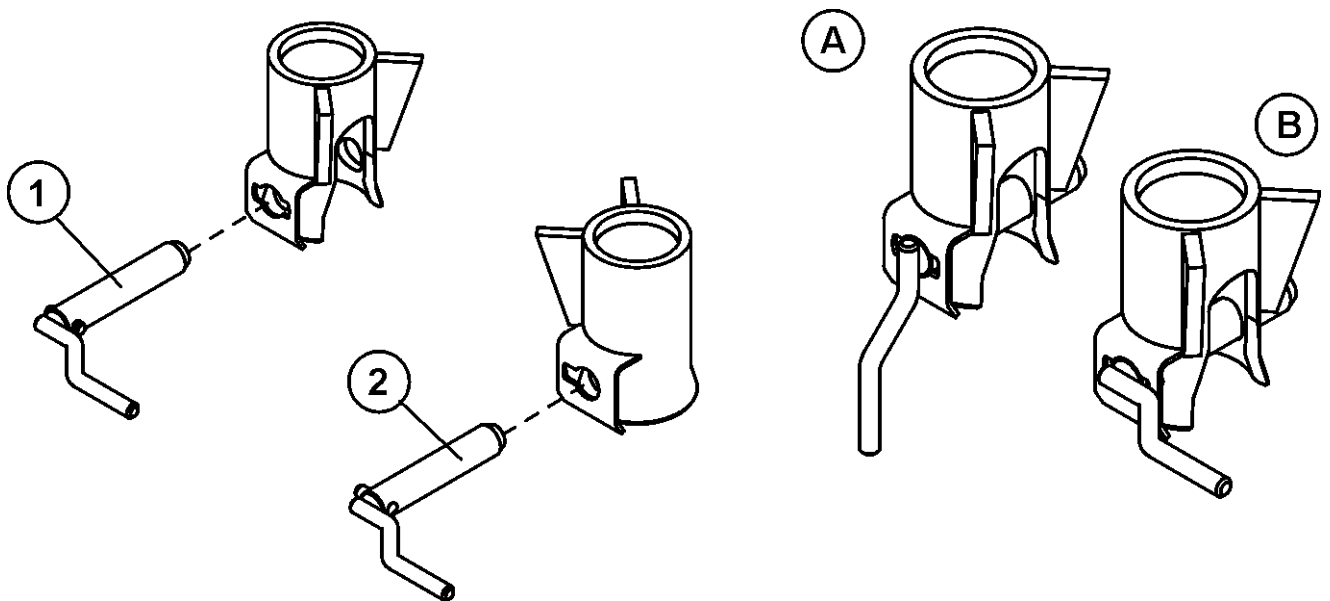


Fig. 12 Tilt bolts

1 – tilt bolt left rear (right front), 2 – tilt bolt right rear (left front)

A – bolt locked, B – bolt unlocked

After unloading:

- Lower the load crate
- Clean wall edges and floor from residues or impurities. Close walls. Close locks to make spontaneous opening impossible.

When unloading on sloped ground it is admissible to tilt the load crate on this side, which is higher.

4.4.6 Uncoupling from the tractor

W celu odłączenia przyczepy od ciągnika należy wykonać następujące czynności:

- Stop the tractor and the trailer with the parking brake.
- Disconnect electric, hydraulic and brake conduits; protect their ends against dirt.
- Uncouple the pull rod of trailer's draught bar from tractor's towing hook and drive away with the tractor.

4.4.7 Failures and defects

Frequently appearing failures & defects and troubleshooting are given in the chapter "MAINTENANCE".

5 MAINTENANCE

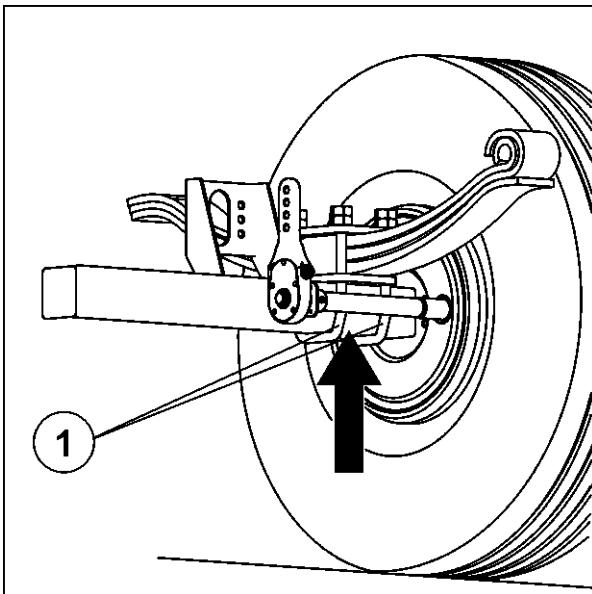


CAUTION!

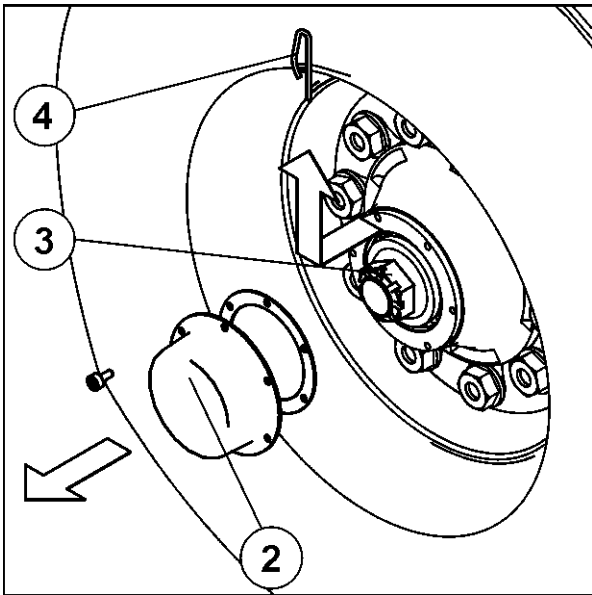
- If any operation failure or damage occurs, stop operation of the trailer and repair the damage/ remove the failure.
- Maintenance & repair of the trailer with loaded and/or lifted load crate without proper support of the crate is prohibited.
- All maintenance & repair works should be performed with observation of safety regulations. In the case of wound wash and disinfect wounded place immediately. In the case of serious injuries consult a physician.
- If it is necessary to maintain the trailer with lifted load crate (e.g. replacement of the telescope cylinder) commission a specialised workshop to make repair.

5.1 ADJUSTMENT OF WHEEL BEARINGS

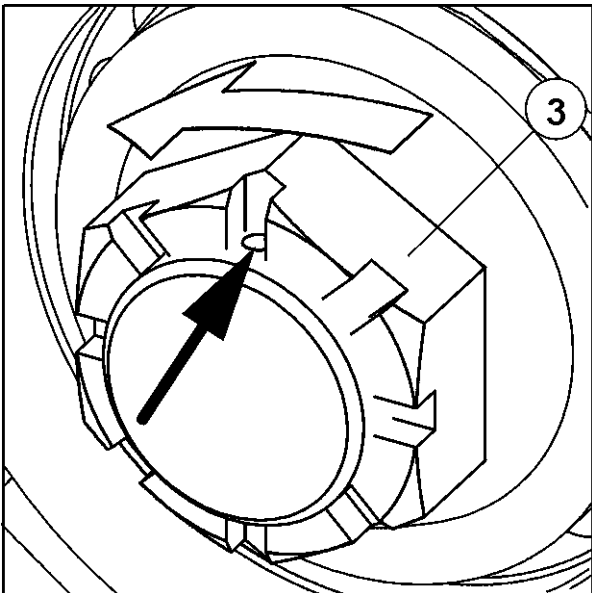
After first 500 km and after every next 1500-2000 km check and – if necessary – adjust play of wheel bearings.



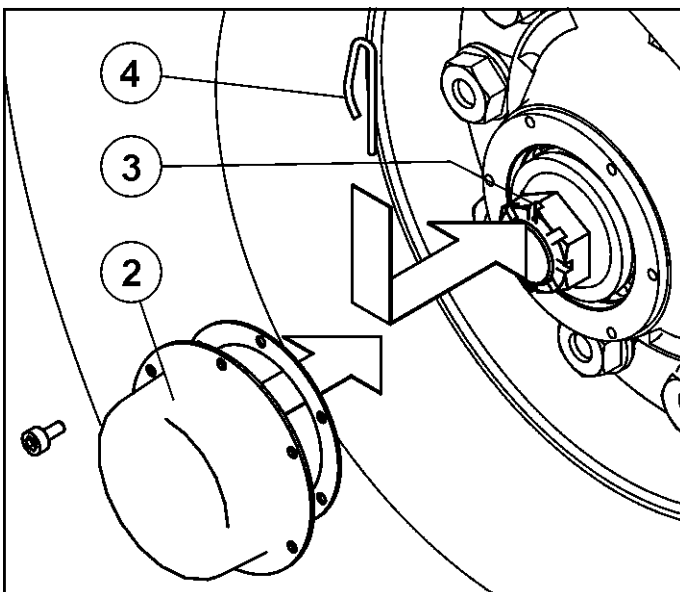
Couple the trailer with a tractor, brake the tractor, place locking wedges under trailer wheels and raise each wheel with suitable hoist. Place the hoist between bail screws (1), which fasten the suspension spring to the axle. Check play of bearings.



If the play is excessive, dismount the hub cover (2) and remove the cotter pin (4) of the crown nut (3).



While turning the wheel screw the crown nut tight until the wheel stops. Unscrew the nut by 1/3 of turn until the next cotter pin groove will be aligned with the opening in the pivot.



Secure the nut (3) with the cotter pin (4) and mount the hub cover (2). The wheel should turn smooth, without stops and perceptible resistance, which do not result from rubbing between brake shoes and the drum.

5.2 ADJUSTMENT OF BRAKES

The brakes should be adjusted if:

- excessive play between shoe and drum appears due to wear of brake shoes; braking efficiency falls down
- Brakes operate uneven and not simultaneously.

If brakes are adjusted properly braking of both wheels should take place in the same moment.

Adjustment of brakes consists in adjustment of position of the brake cam arm (1) (Fig. 11) in relation to the cam shaft (2). For this purpose loose the nut (4) and change position of the arm on the multi-groove end of the shaft (2) towards proper direction i.e.:

- backward – if the brake brakes to late
- forward – if the brake brakes to soon

Perform adjustment separately for each wheel. After proper brake adjustment cam arms should form the angle of 90° in relation to pneumatic cylinder push rod whilst the braking power is greatest. Parking brake should be adjusted if the brake cable is excessively stretched or if cable clamps are loosened. Cable length should be matched so that by fully loosened parking and working brakes the cable would be loose and hang down by $1 \div 2$ cm.

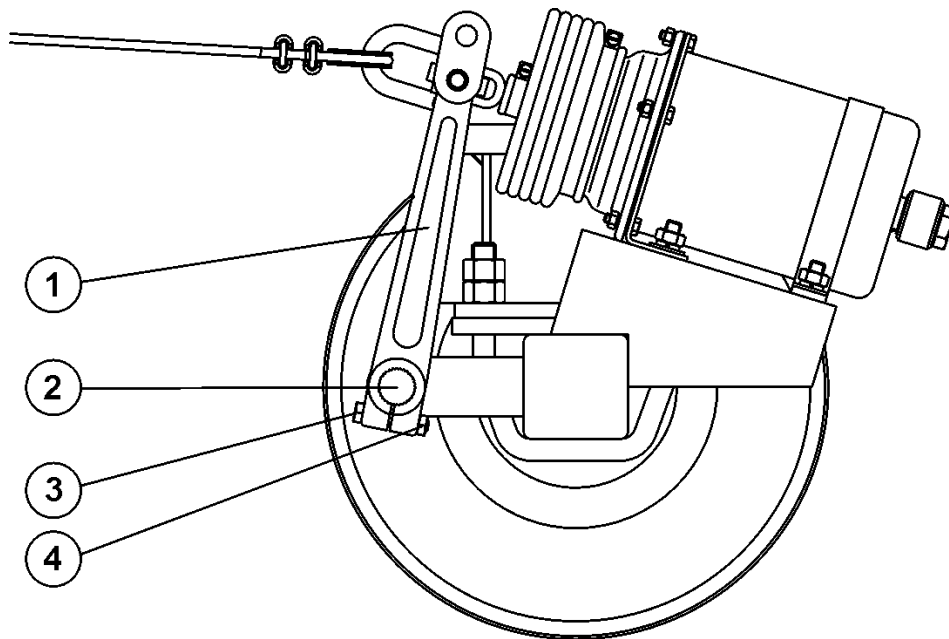


Fig. 13 Brake adjustment elements

1 – brake cam arm, 2 – brake cam shaft, 3 – locking plate or sleeve, 4 – securing screw, 5 – adjustment screw



CAUTION!

With properly adjusted brakes the braking force should be not lower than values given in the Table 4.

Table 4. Braking force.

Trailer type	Main brake braking force (kN)	Parking brake braking force (kN)
T672/2	46	27

Difference between left and right wheel braking forces must not exceed 30% with assumption that the “100%” means the greater force.



CAUTION!

The trailer braking power is the sum of braking forces of both wheels.

5.3 MAINTENANCE OF PNEUMATIC SYSTEM

In the scope of maintenance operations it is necessary to perform inspection of pneumatic system tightness, especially at all connections. Tightness test should be executed with system pressure rated at ca. 600 kPa (6,0 kg/cm²).

If conduits, sealing or other elements of the system are damaged, air will get out in points of damage with typical hiss or – in the case of small leakage – in the form of small air bubbles. Small leakage can be detected with soap water or washing agent. Damaged sealing or conduits replace with new ones. If the reason of leakage is the damaged pneumatic cylinder – regenerate it.

Periodically remove condensed water from the air tank. For this purpose pull out the drain valve arbour located in the upper part of the tank then the compressed air will push the water out. After loosening the arbor the valve should close automatically and stop airflow from the tank.

Once a year just before the winter unscrew the drain valve and clean it from accumulated dirt.

5.4 MAINTENANCE OF HYDRAULIC SYSTEM

It is necessary to take as the principle that the oil in the trailer hydraulic system and the oil in the external tractor hydraulic system is of the same type. Application of different oil types is prohibited. New trailers are filled with HL32 hydraulic oil.

The hydraulic system of the trailer should be absolutely tight.

Test of tightness consists in coupling of the trailer with a tractor, activation of the hydraulic cylinder and keeping it in its maximally pulled out position for 30 s.

If oil leaks at connections of hydraulic conduits, screw the connection tightly; if leakage persists – replace the conduit or the connector with a new one. If oil leaks between connections, replace the damaged conduit. Every mechanical damage requires replacement of damaged element.

If the body of the hydraulic cylinder is polluted with oil check the reason of leakage.

While the cylinders are entirely pulled out check all sealing. Small leakage of “sweating off” type is admissible; if drops of oil are observed – stop the operation and repair the failure.



CAUTION!

Operation of the trailer with leaky tilting hydraulic system is prohibited.

It is prohibited to operate a trailer with lengthened (in relation to manufacturer’s adjustment) rope controlling the cut-off valve (8) (Fig. 5, “Hydraulic system of the load crate tilting system”)



CAUTION!

Condition of the hydraulic system should be checked currently during trailer’s operation.

If the hydraulic systems is used very intensively (great number of tilts), replace hydraulic conduits every 4 years.

5.5 LUBRICATION

The trailer should be lubricated in points shown on fig. 14, and described in the Table 5 „Lubrication points of the trailer”.

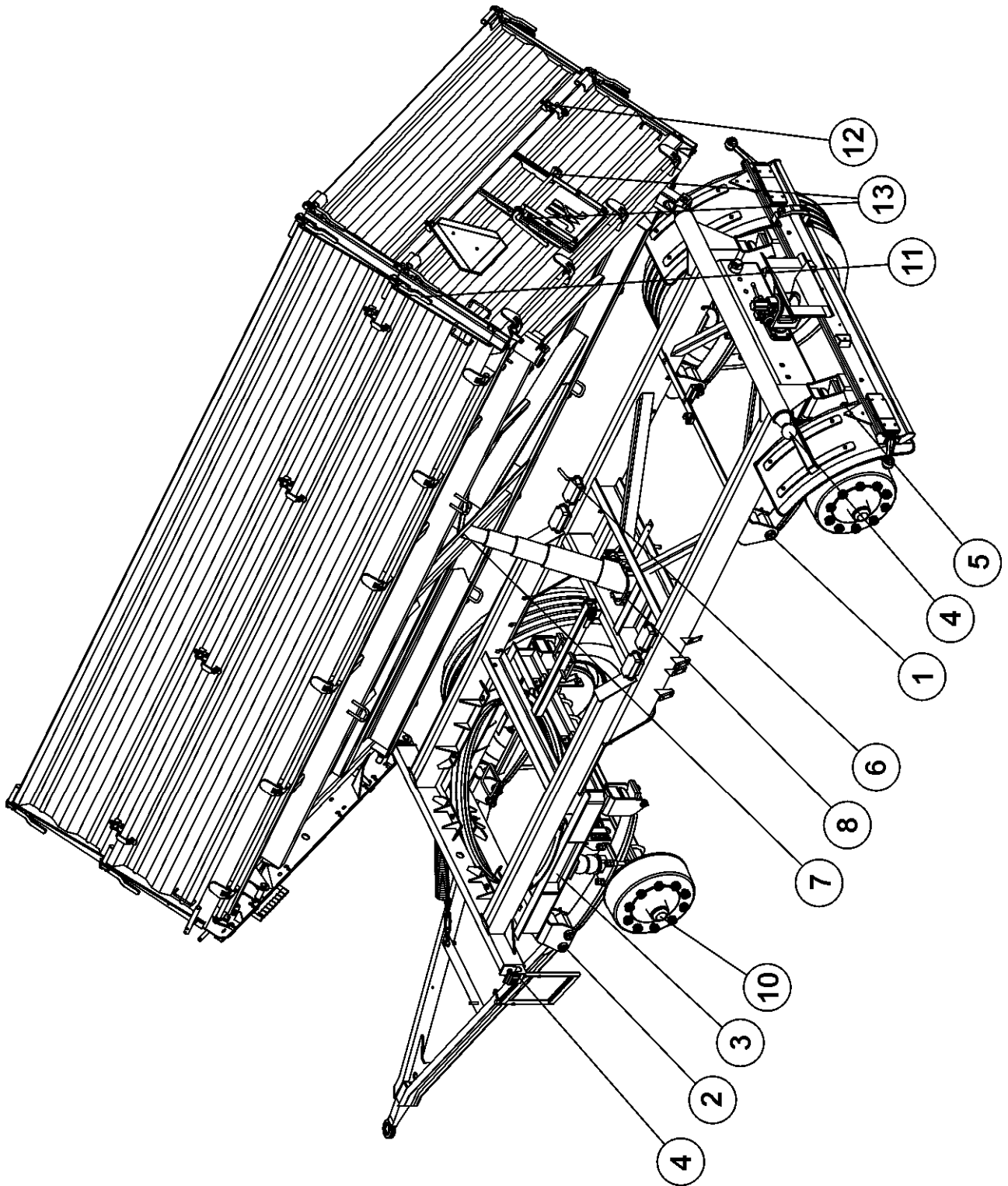


Fig. 14 Trailer lubrication points

Table 5. Trailer lubrication points

No. on fig. 14	Lubrication point	Number of points	Grease type	Frequency & method of lubrication
1	Suspension spring bolts	4	solid	every 3-4 months
2	Draught bar bolts	2	solid	every 3-4 months
3	Turntable	2	solid	every 6-8 months
4	Load crate fastening seats	4	solid	cover with fresh grease every 2 months
5	Suspension spring slide surfaces	4	solid	every 3-4 months
6	Parking brake screw	1	solid	every 3-4 months
7	Upper ball articulation of the cylinder	1	solid	every 6 months
8	Fastening bolts of the hydraulic cylinder	4	solid	cover with fresh grease every 6 months
9	Cam shaft sleeves	4	solid	every 6 months
10	Wheel bearings	4	solid	replace grease every 2 years
11	Load crate wall locks	12	oil	monthly
12	Superstructure hinges	10	solid	once a month cover bolts with grease
13	Chute guide	2	solid	every 3-4 cover with very thin layer of grease

5.6 MAINTENANCE OF SUSPENSION SPRINGS

Maintenance of suspension springs consists in periodical lubrication in points given in the Table 5 and inspection of condition of suspension spring leafs.

Suspension spring leafs should be covered with thin layer of grease. Avoid accumulation of dried mud layer on suspension springs.



CAUTION!

In the case of break of a spring leaf in any suspension spring stop operating the trailer and remove the failure.

5.7 MAINTENANCE OF LOAD CRATE

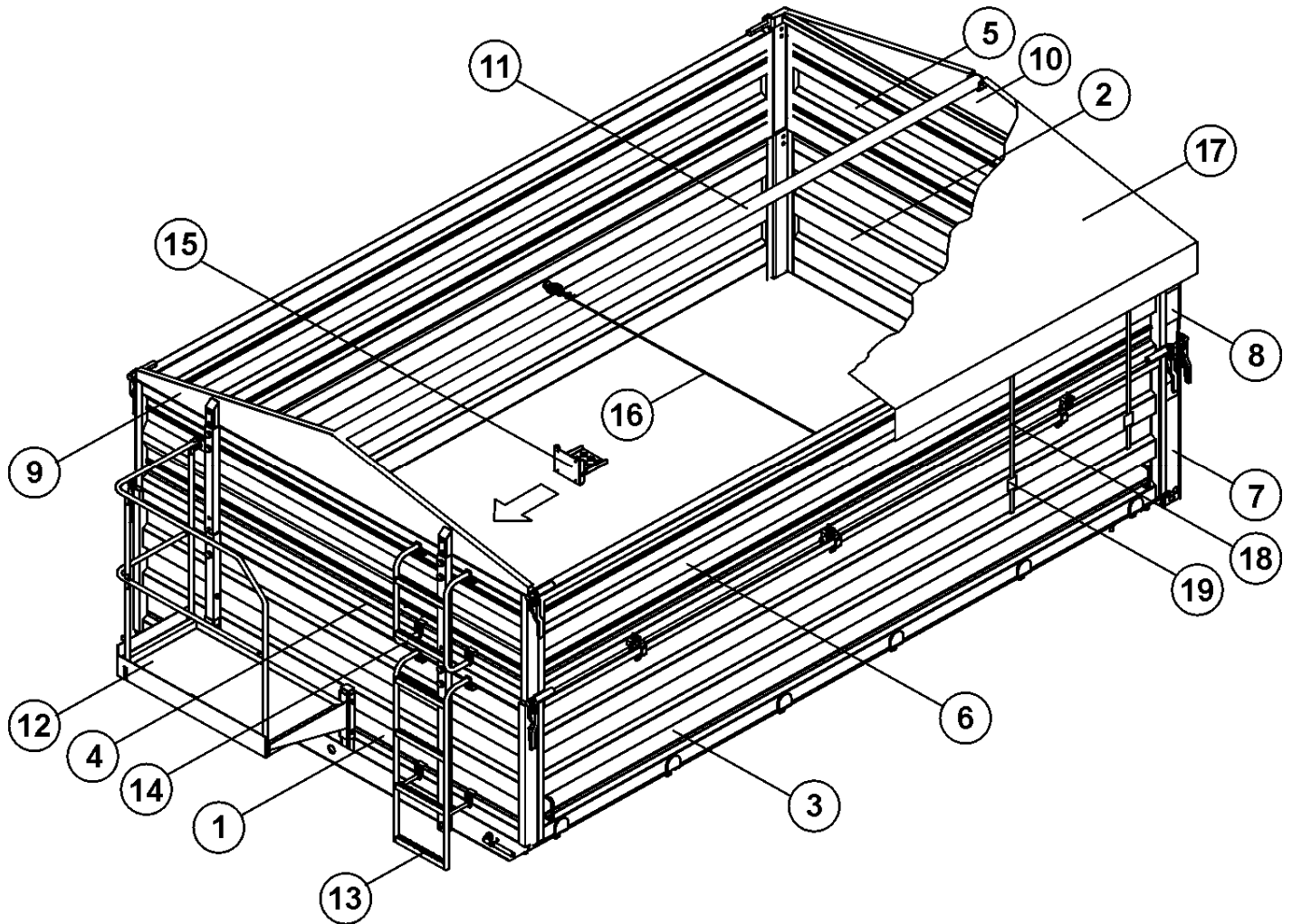


Fig. 15 Load crate

1 – front wall, 2 – rear wall, 3 – side wall, 4 – front superstructure, 5 – rear superstructure, 6 – side superstructure, 7 – wall posts, 8 – superstructure posts, 9 – front gable, 10 – rear gable, 11 – tube, 12 – platform, 13 – lower ladder, 14 – superstructure ladder, 15 – step, 16 – wall connecting cable, 17 – tarpaulin, 18 – tarpaulin strip, 19 – self-clamping lock of strip

The load crate (standard version) consists of set of walls (1), (2), (3), (7), and superstructures (4), (5), (6), (8) lower ladder (13) and superstructure ladder (14), connecting cable (16) and step (15). Additional equipment (for customer order) consists of a frame (9), (10), (11), tarpaulin (17) and platform (12).

5.7.1 Assembly / disassembly of superstructures

Assembly of superstructures should be performed as follows:

- fasten rear superstructure posts (8) to wall rear posts (7)
- install front (4) and rear (5) superstructure
- install side superstructures (6)
- screw the step (15) and the superstructure ladder (14)

Detailed list of screwed connections is given in the spare part catalogue. Disassembly of superstructures should be performed in an opposite order.

5.7.2 Maintenance of tarpaulin & frame

The tarpaulin may be used only with the frame and the platform. The platform is situated on the front wall of the trailer. It enables comfortable and safe operator's position during tarpaulin maintenance works. The tarpaulin should be rolled up and unrolled by an operator standing on the platform. Take special precautions, stand firmly, and hold on the platform railing with one hand. Fasten the tarpaulin with strips (18).

The frame consists of the front gable (9), the rear gable (10), and the tube (11). Installation of the frame and the tarpaulin should be performed as follows

- install the front gable (9) on the front superstructure (4),
- install the rear gable (10) on the rear superstructure (5),
- screw the tube (11) to the front and rear gables,
- put on the tarpaulin.

Detailed list of screwed connections is given in the spare parts catalogue. Disassembly of the frame & tarpaulin should be performed in opposite order.



CAUTION!

Assembly and disassembly of superstructures and frame should be performed with help of suitable platforms, ladders or ramp. Said appliances should protect the operator against falling down. Take special precautions.

In the final phase of tarpaulin's rolling up hold on the platform railing or the front gable with one hand. Inobservance of this principle may result in operator's fall down.

While operating the trailer with installed third superstructures appears the risk of following dangers: loss of trailer's stability, overturning of the trailer, loss of resistance of trailer elements, insufficient view of movement path of trailer elements, uncontrolled movements of trailer's body on rough terrain, risk from overload.

5.8 STORAGE & PRESERVATION

After work clean the trailer and wash with water stream. If the varnish coat is damaged, clean such place from rust and dust, degrease, and paint of the same colour and uniform layer thickness. If damaged places will not be painted immediately, cover them with thin layer of grease or anticorrosion agent.

It is recommended to store the trailer in a closed or roofed storage. If the trailer is stored outdoor for long period protect it from atmospheric influence, especially from agents causing corrosion and ageing of tyres.

