MANUFACTURER

PRONAR Sp. z o.o.

17-210 NAREW, ul. Mickiewicza 101A; Region of Podlasie

tel./fax: 0(85) 681 63 29; 0(85) 681 64 29; 0(85) 681 63 81;
0(85) 681 63 82; 0(85) 681 63 84;
fax: 0(85) 681 63 83; 0(85) 682 71 10;

www.pronar.pl

DOUBLE-AXLE AGRICULTURAL TRAILER THREE-SIDE DUMPER

T680

OPERATION & MAINTENANCE MANUAL

Identification of the machine

Symbol /Type: T680

KTM Symbol: 1026-635-848-104

Serial:

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.

Product verified by the IBMER – the research lab authorised by the PCA

CONTENTS

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 of agricultural produce as well as loose and volume materials within farm limits and on public roads with the maximum speed of 30 kph.

The driving system (axes, suspension springs, wheels, tyres) fulfils requirements for agricultural trailers, which – according to Polish “Traffic regulations” – can be used with maximum admissible speed of 30 kph. Fulfilling of these requirements depends on proper maintenance and observation of rules given in present manual.

The trailer is adapted for coupling with agricultural tractors fitted with external hydraulic system and an upper towing hook. The rear coupling of the trailer is designed for coupling only with double-axle trailers.

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

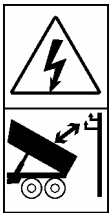
- The user should read carefully the manual before operation and observe all recommendations given in the manual during operation.
- If information contained within the manual will be not comprehensible for the user please do not hesitate to contact your dealer, who also provides repair & service or 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.
- Lack of observation 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 and reasonable utilisation 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. The rear coupling of the trailer is designed for coupling only with other double-axle trailers. Check protection devices.
- Whilst coupling the trailer with the tractor use exclusively the upper towing hook. Check the safety device.
- 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

Safety sign or text	Explanation	Location
	Read operation manual	Front wall
	Prior to maintenance & repair stop the engine and remove the ignition key	Front wall
	Prior to maintenance & repair secure the load crate	Right & left wall

Table 1. Information & warning stickers, continued

Safety sign or text	Explanation	Location
	Take special precautions while operating near to energetic lines	Right & left wall
Prior to unloading unlock two bolts connecting the crate with the frame on the opposite side of the dump flap. The load crate is raised, keep safe distance.		Front wall
Prior to unloading unlock two bolts connecting the crate with the frame on the opposite side of the dump flap. The load crate is raised, keep safe distance.		Front wall
Couple only with the upper tow coupling		Front wall
1 2	For hydraulic systems of I and II trailer	Cut-off valve
Ładowność: 12970 kg Ładowność: 13100 kg Ładowność: 13470 kg		Side walls
850 kPa	Tyre pressure 425/65-22.5 20PR	Above wheels, right & left wall
850 kPa	Tyre pressure 445/65-22.5 20PR	Above wheels, right & left wall
800 kPa	Tyre pressure 385/65-22.5 18PR	Above wheels, right & left wall

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. 1)).

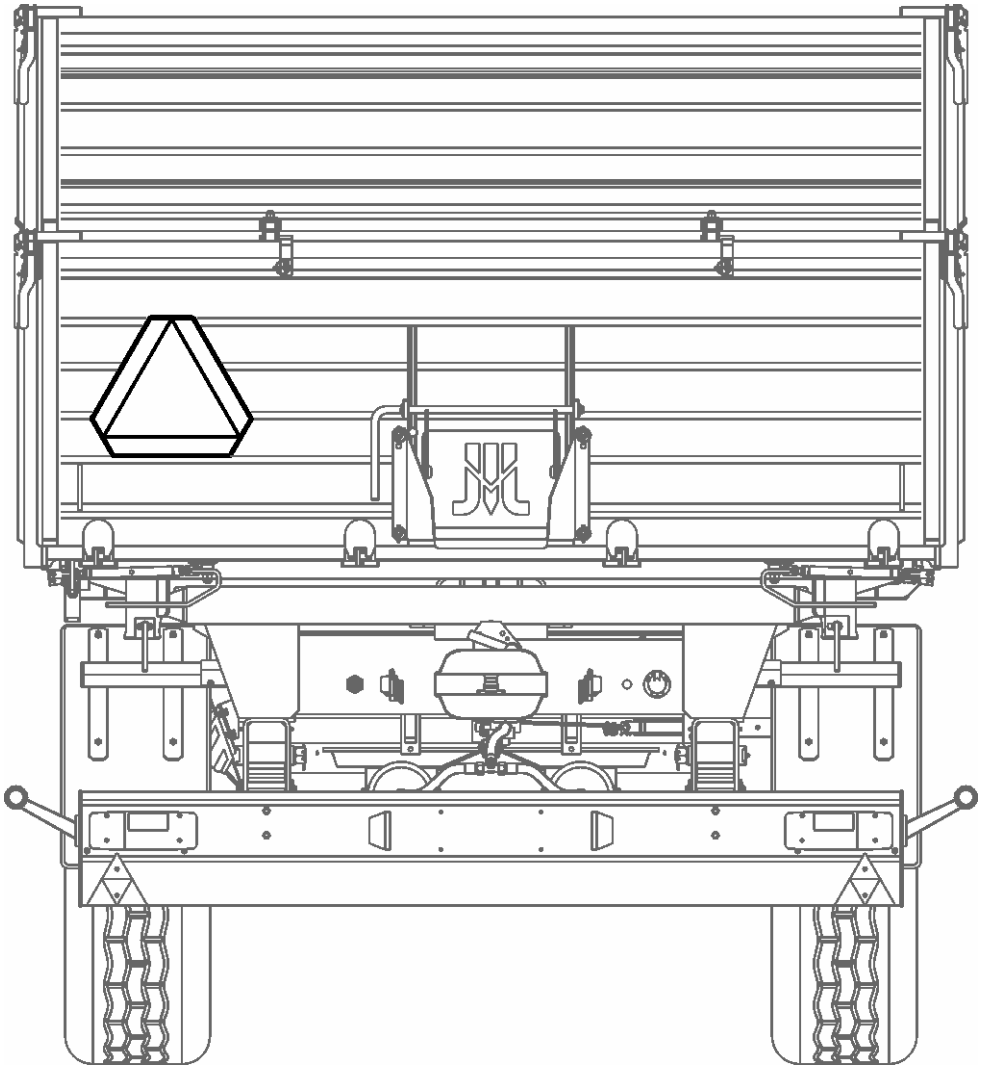


Fig. 1 Location of a triangular plate for slowly moving vehicles**.**

3 ADDITIONAL INFORMATION

3.1 TRAILER EQUIPMENT

Trailer equipment consists of:

- operation & maintenance manual + spare parts catalogue - 1
- warranty card - 1
- connection cable - 1
- load crate support - 1

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

- warning reflecting triangle
- triangular plate for slowly moving vehicles

CAUTION!

Assembly & disassembly of the superstructure should be performed with help of proper platform, ladder or ramp. Two operators secured from falling down should perform this operation with special care.

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 TRANSPORTATION

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	T680 with various tyre variants		
			385/65 R22.5 18PR	425/65 R22.5 20PR	445/65 R22.5 20PR
1	Overall length	mm	7228	7228	7228
2	Overall width	mm	2548	2548	2548
3	Overall height w/o superstructures	mm	2194	2225	2239
4	Overall height with superstructures	mm	2826	2857	2871
5	Overall height with superstructures + frame	mm	3095	3126	3140
6	Wheel base	mm	1900	1900	1900
7	Load crate intern. dimensions:				
	- length	mm	5103	5103	5103
	- width (front / rear)	mm	2410	2410	2410
	- height w/o superstructures	mm	800	800	800
	- height with superstructures	mm	1400	1400	1400
8	Load volume w/o superstructures	m^3	9.8	9.8	9.8
9	Load volume with superstructures	m^3	17.2	17.2	17.2
10	Load surface	m^2	12.3	12.3	12.3
11	Load surface height above ground	mm	1383	1408	1422
12	Weight w/o superstructures	kg	4530	4530	4530
13	Weight with superstructures	kg	4900	4900	4900
14	Weight with superstructures + frame + tarpaulin + platform	kg	5030	5030	5030
15	Admissible load w/o superstructures	kg	13470	13470	13470
16	Admissible load with superstructures	kg	13100	13000	13100
17	Admissible load with superstructures + frame + tarpaulin + platform	kg	12970	12970	12970
18	Load crate tilt angle - rearward	(°)	50	50	50
19	Rated voltage	V	12	12	12
20	Admissible speed	km/h	30	30	30
21	Hydraulic oil capacity	l	18	18	18

Table 3. Tyres – technical data

Tyre dimensions (+ PR number)	Load index & speed symbol	Tread	Ring	Rolling radius [mm]	Load [kg] at speed [kph]			Used pressure [kPa]	Notes
					30	40	other		
385/65 R22.5 (15.0 R22.5) 18PR	160F	Y-1	11.75x22.5	485	5125	4715	4100 (80 km/h)	800	Mitas
425/65 R22.5 20 PR	165J	Y-1	13.00x22.5	501			5150 (100 km/h)	850	Geyer & Hosaja
445/65 R22.5 20PR	168J	Y-1	14.00x22.5	514			5600 (100 km/h)	850	Geyer & Hosaja

4.2 STRUCTURE AND OPERATIONAL PRINCIPLE

4.2.1 Undercarriage

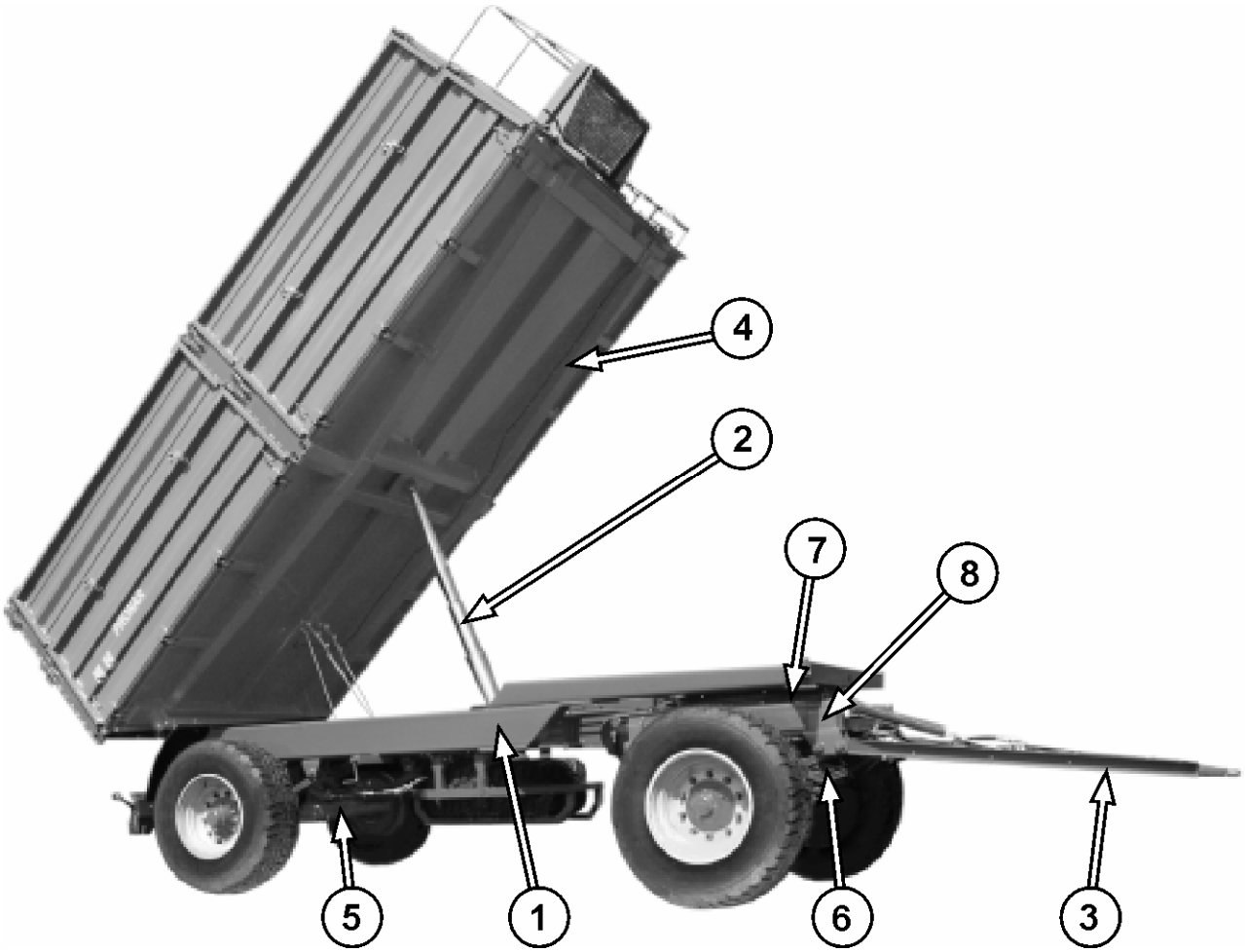


Fig. 2 Chassis and upper frame

1 – lower frame, 2 – hydraulic cylinder, 3 – hitch bar, 4 – upper frame, 5 - axle, 6 – suspension spring, 7 – turntable, 8 – turntable frame

Trailer's undercarriage consists of parts shown on the Fig. 2. 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. The rear part of the frame is fitted with bolts for mounting the upper frame (4), the middle part – with a seat for hydraulic cylinder (2). The front frame part is fitted elements of front axle suspension: turntable (7), turntable frame (8), suspension springs (6) and hitch bar (3). The rear part of the frame is fitted also with mountings for the rear axle (5) and for rear lighting elements.

Axles 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.

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 the axis for tilting.

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

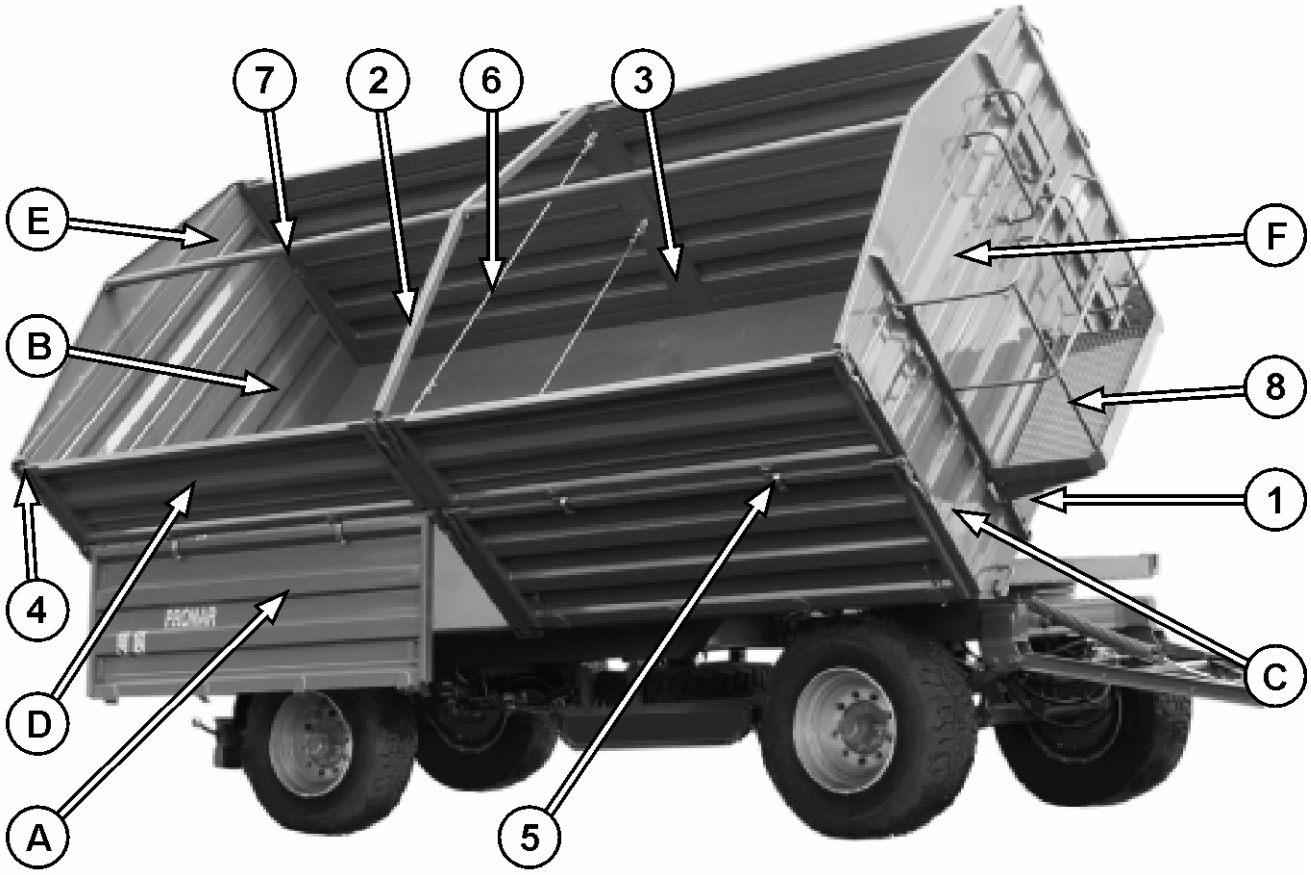


Fig. 3 Load crate elements

A – side walls, B – rear wall, C – front wall, D – side superstructure, E – rear superstructure, F – front superstructure, 1 – upper frame, 2 – rear post, 3 – middle post, 4 – wall lock, 5 - hinge, 6 – connecting cable, 7 – tarpaulin frame, 8 - platform

4.2.3 Hydraulic tilting system

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

The trailer's hydraulic system consists of two independent circuits:

- Circuit I – for supplying the trailer hydraulic cylinder
- Circuit II – for supplying the second trailer cylinder if two trailers are coupled to the tractor.

Both circuits are operated with the control valve 2 (Fig. 4). The valve lever can be set in two positions:

- ,, O_I '' – first trailer tilting system open
- ,, O_{II} '' – second trailer tilting system open

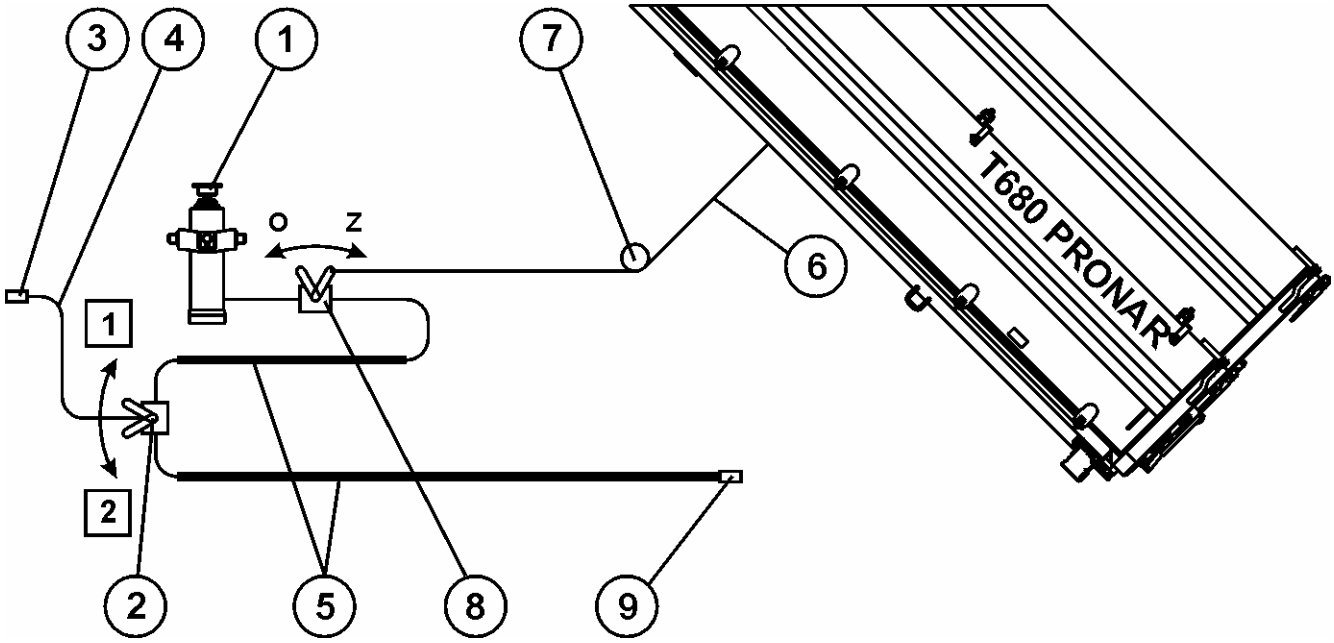


Fig. 4 Hydraulic system for tilting the load crate

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. 4) reduces load crate tilting angle while tilted sidewards. 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.

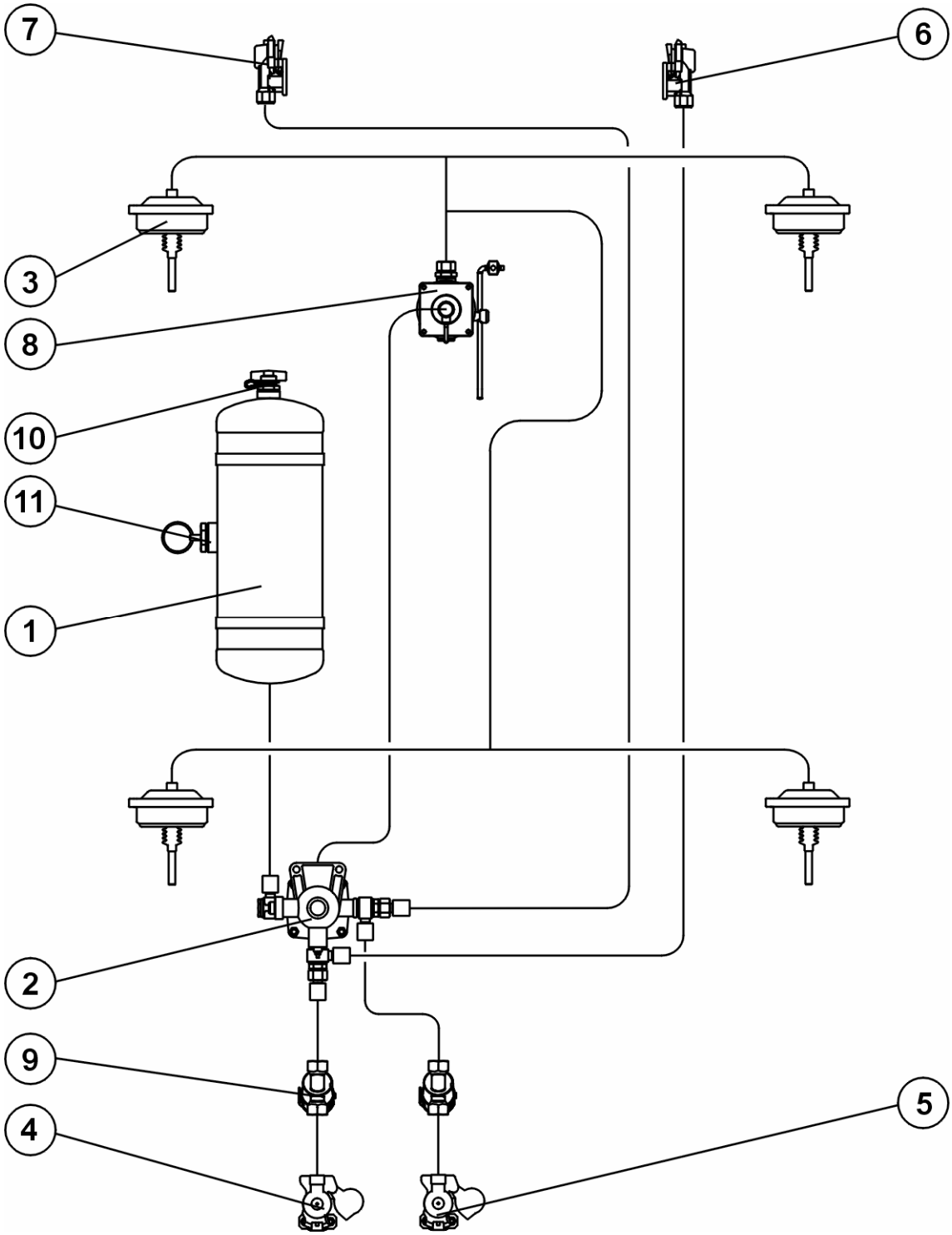


Fig. 5 Pneumatic braking system

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 złącze, 11- drain valve

4.2.5 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 conduit.

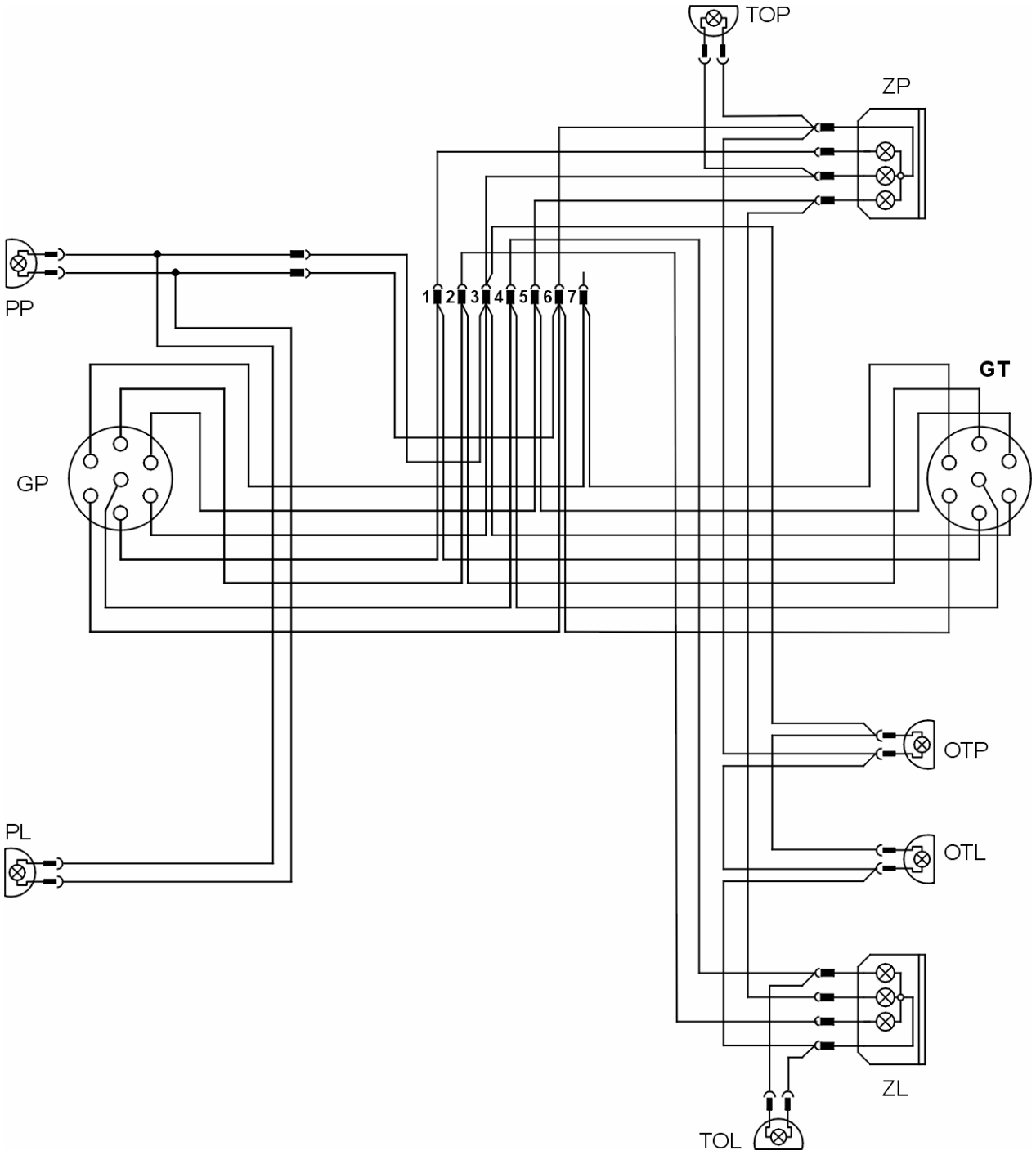


Fig. 6 Trailer wiring system

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

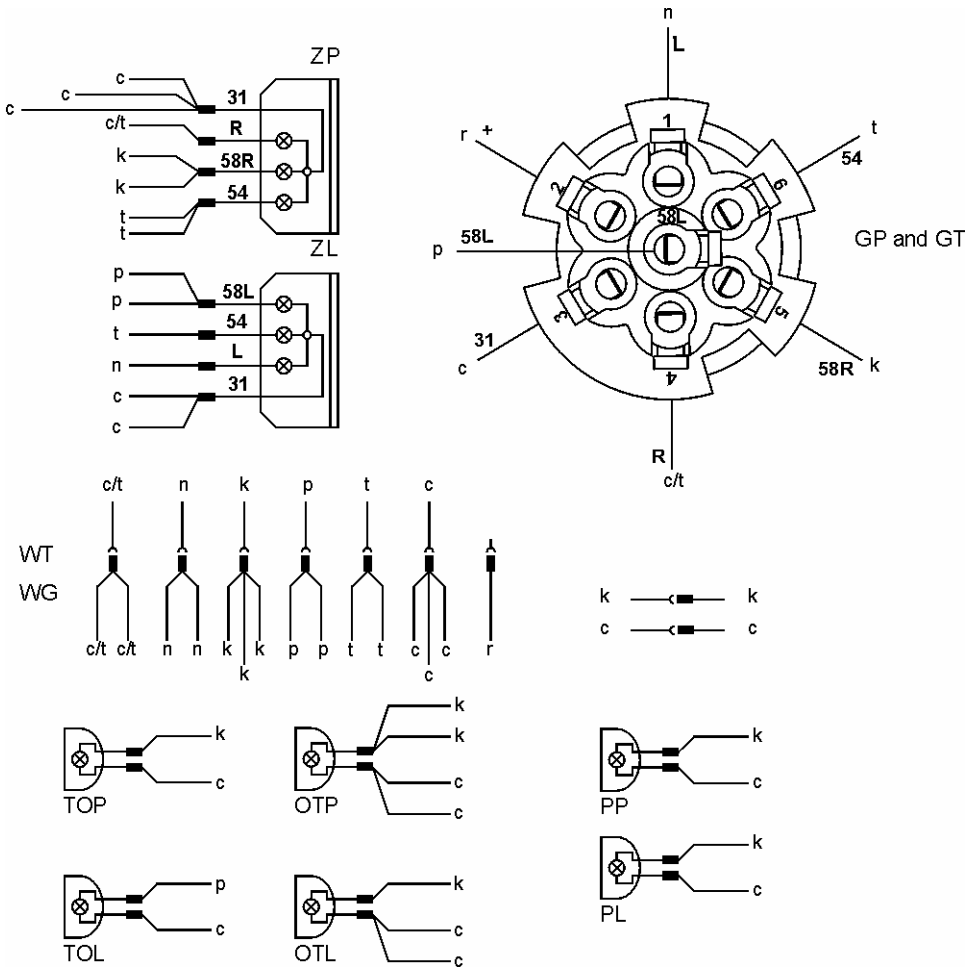


Fig. 7 Connection of conductors

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

4.3 TRAILER OPERATION PRINCIPLES

4.3.1 Coupling with tractor

Prior to coupling with tractor check if the trailer is braked with the parking brake. To couple trailer with tractor it is necessary to perform following operations:

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

CAUTION!

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

4.3.2 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 and hinges**
- **function of hydraulic tilting system**

4.3.3 Loading 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 4 contains admissible loading heights of 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 4. Loading height

Type of material	Loading height [m]
wet gravel, wet soil, clinker, stone	0,53
cement, dry gravel, soil, brick	0,69
manure, full brick, mineral fertiliser	1,14
rye, potatoes, maize, rape, wheat	1,4
barley, oats, peat, coke	1,4

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.**

4.3.4 Tyre maintenance manual

- During assembly & disassembly of tyres protect the trailer against unintended movements.
- Repair or replacement of tyres should be performed by trained personnel and with suitable tools.
- After each wheel mounting tighten the nuts after first 10 hrs and check their tightening every next 50 hrs.
- Regularly check and preserve proper tyre pressure according to the manual (especially after longer standstills).
- Check the tyre pressure also during intensive daily work. Take into consideration the fact that the increase of tyre temperature may cause tyre pressure growth even by 1 bar. In the case of such pressure & temperature increase reduce the load or / and speed.
- Never reduce the tyre pressure through inflation valves if the pressure has grown due to the temperature.
- Protect tube inflation valves with suitable nuts to avoid penetration of impurities.
- Do not exceed the maximum trailer's speed.
- In the course of daily work make at least one hour lasting pause at noon.
- Make 30 minutes lasting pauses for cooling down the tyres after each 75 km or 150 minutes of continuous drive depending on which occurs first.
- Avoid holes, sudden and violent manoeuvres and reduce speed during turning.

4.3.5 Load crate unloading

Unloading is performed through tilting the load crate backwards or sidewards. 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 to drive forward.
- Place the bolts with grips connecting the load crate with lower frame on the unloading side
- Open lower locks and relevant wall locks (according to unloading direction)
- Tilt the load crate with the hydraulic cylinder

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.**

The rear wall is fitted with a chute, which opening can be adjusted resulting in slots 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.

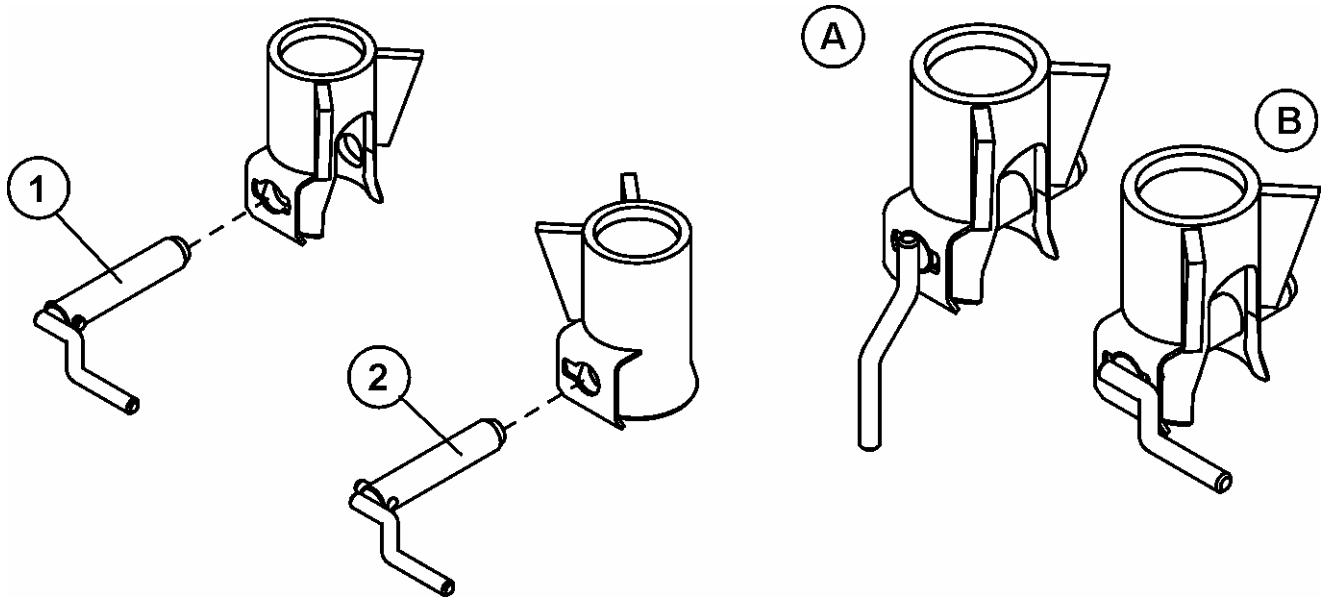


Fig. 8 Tilt bolts

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

A – tilt bolt locked, B – tilt bolt unlocked

After unloading:

- Lower the load crate
- Install and secure bolts connecting load crate with lower frame
- Clean wall edges and floor from residues or impurities. Close walls. Close locks to make spontaneous opening impossible
- when unloading on sloped ground t is admissible to tilt the load crate on this side, which is higher.

4.3.6 Uncoupling the tractor

To uncouple the trailer perform following actions:

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

4.3.7 Failures and defects

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

5 MAINTENANCE

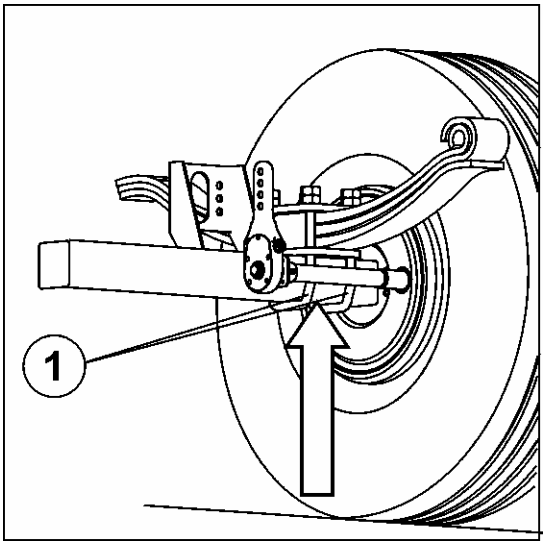
CAUTION!

- **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

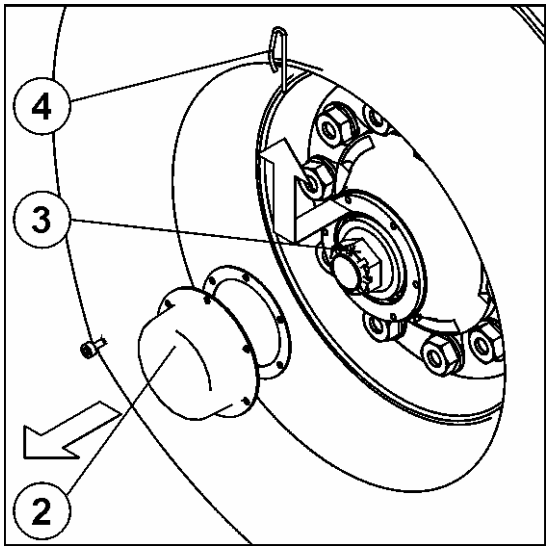
After first 500 km and after every next 1500-2000 km check and – if necessary – adjust play of wheel bearings.

Scheme 1



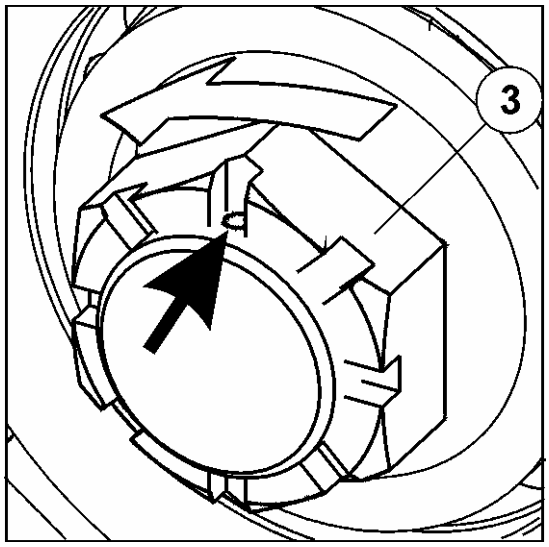
Couple the trailer with a tractor, brake the tractor, place locking wedges under trailer wheels and raise each wheel with suitable hoist. Place the hoist between bail screws (1), which fasten the suspension spring to the axle. Check play of bearings.

Scheme 2



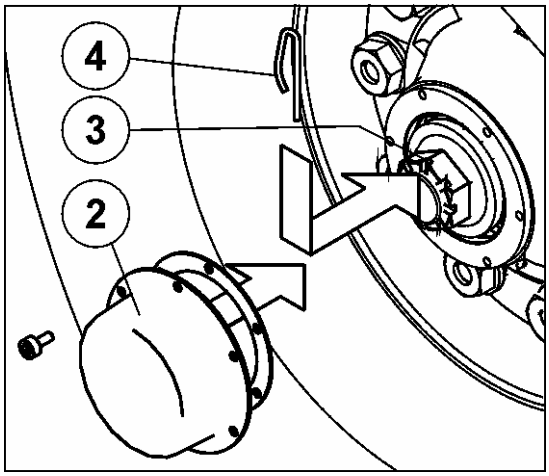
If the play is excessive, dismount the hub cover (2) and remove the cotter pin (4) of the crown nut (3).

Scheme 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.

Scheme 4



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 ÷ 2 cm.

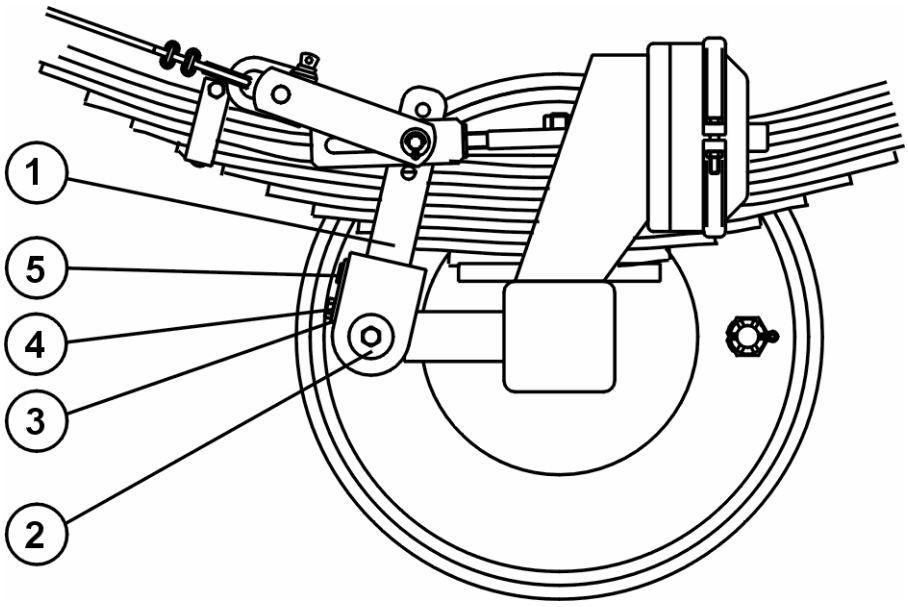


Fig. 9 Brake adjustment elements

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 5.

Table 5. Braking force.

Trailer type	Main brake braking force (kN)	Parking brake braking force (kN)
T680	48	28,8

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, sealings 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 sealings 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. 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 tightens 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. Each 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 sealings. Small leakage of "sweating off" type are 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. 4, "Hydraulic system of the load crate tilting system")

CAUTION!

Condition of the hydraulic system should be checked all time 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. 10, and described in the Table 6 „Lubrication points of the trailer".

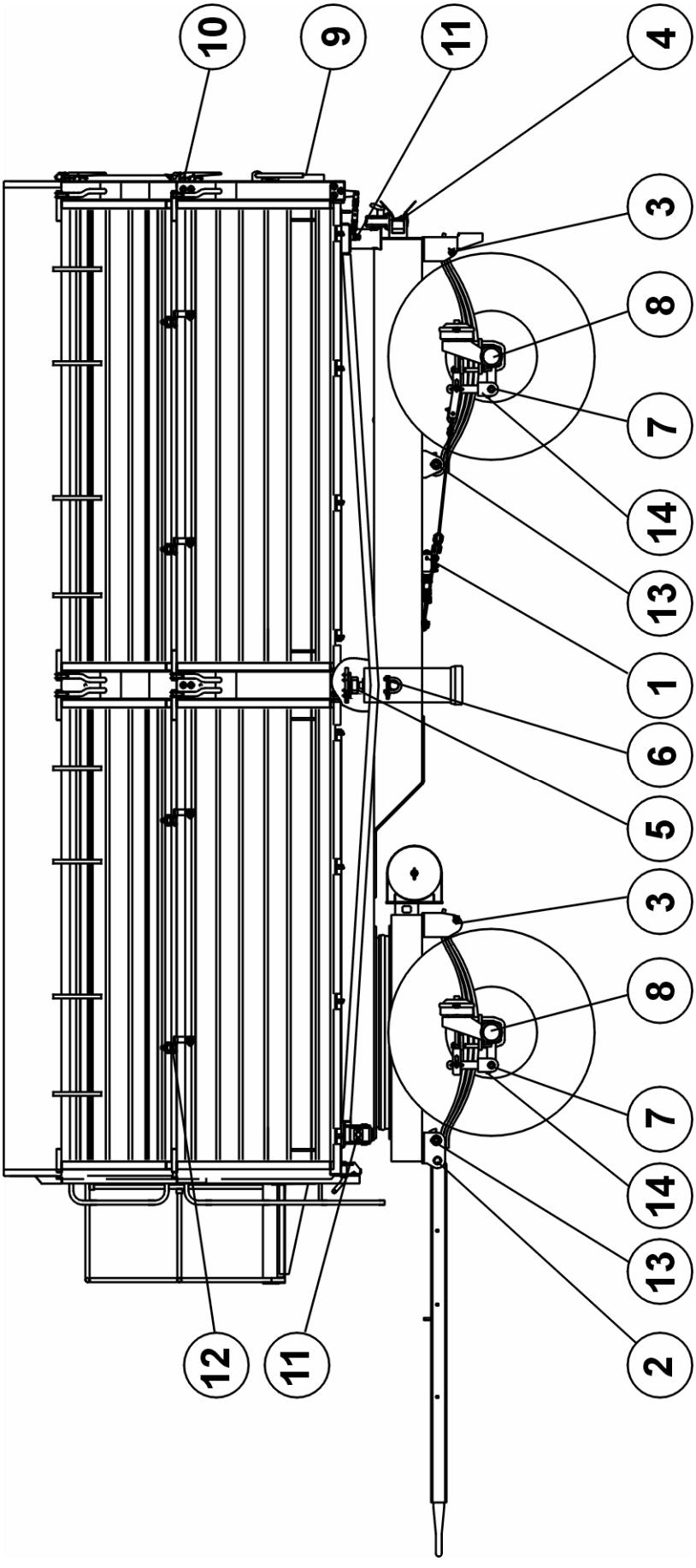


Fig. 10 Trailer lubrication points

Table 6. Trailer lubrication points

No. at fig. 10	Lubrication point	Number of points	Grease type	Frequency & method of lubrication
1	Parking brake screw	1	solid	every 3-4 months
2	Hitch rod bolts	2	solid	every 3-4 months
3	Suspension spring slide surfaces	4	solid	cover with grease once a month
4	Rear tow coupling assembly	1	solid	every 3-4 months
5	Upper ball articulation of the cylinder	1	solid	every 6 months
6	Bolts of mounting of the hydraulic cylinder	2	solid	every 6 months cover bolts with fresh grease
7	Cam shaft sleeves	8	solid	every 6 months
8	Wheel bearings	4	solid	Replace grease every 2 years
9	Chute guide	2	solid	every 3-4 months cover with very thin layer of grease
10	Load crate wall locks	12	oil	once a month
11	Seats of load crate	4	solid	every 2 months cover surfaces with fresh grease
12	Superstructure hinges	10	solid	once a month cover bolts with fresh grease
13	Suspension spring bolts	4	solid	every 6 months
14	Cam shaft adjustment screw	4	solid	every 6 months

5.6 MAINTENANCE OF SUSPENSION SPRINGS

Maintenance of suspension springs consists in periodical lubrication in points given in the Table 6 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 LOAD CRATE MAINTENANCE

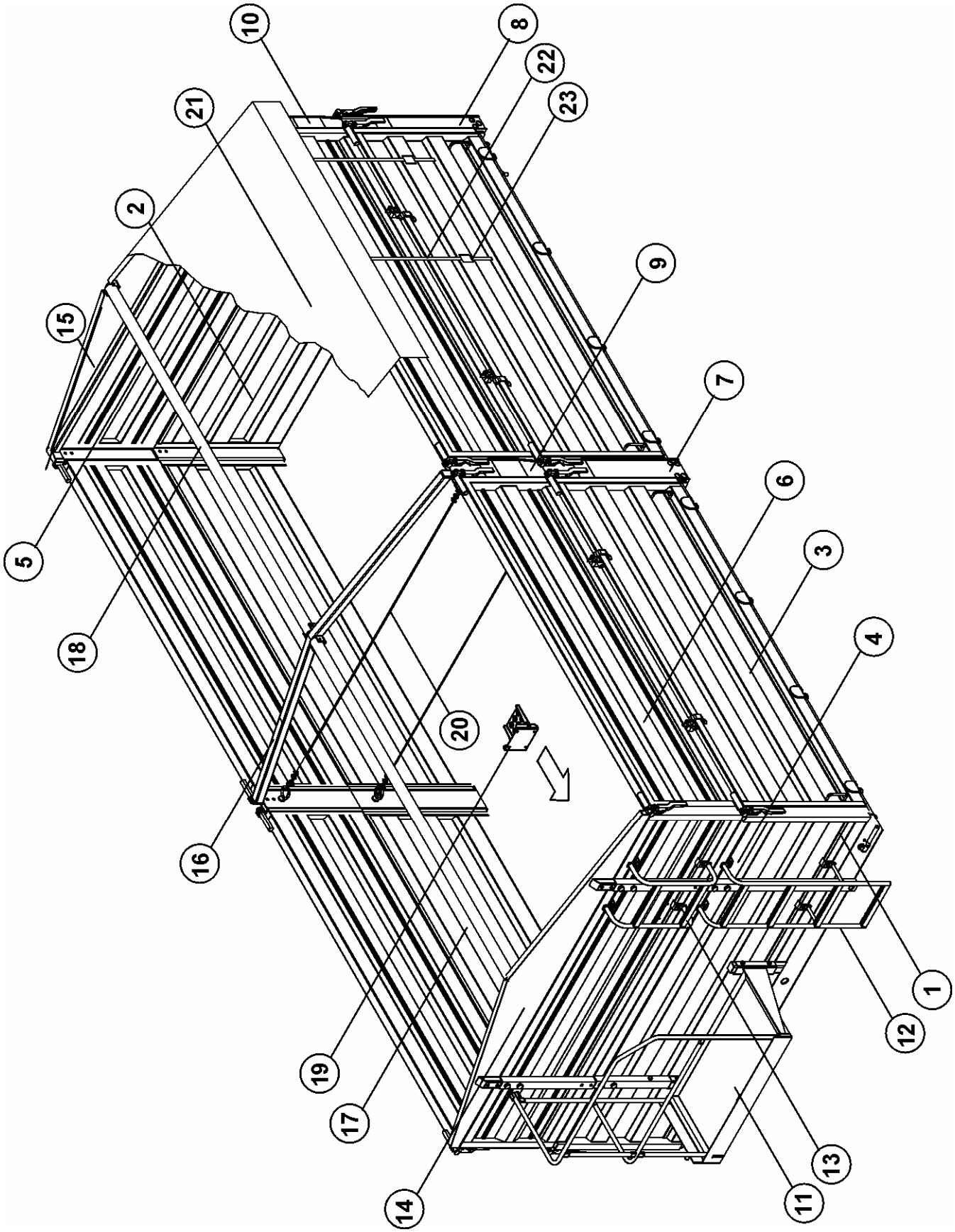


Fig. 11 Load crate

Fig. 11 Load crate, continued. List of elements.

1 – front wall, 2 – rear wall, 3 – side wall, 4 – front superstructure, 5 – rear superstructure, 6 – side superstructure, 7 – side post of walls, 8 – rear left post of walls, 9 – side post of superstructures, 10 – rear left post of superstructures, 11 – platform, 12 – lower ladder, 13 – superstructure ladder, 14 – front gable, 15 – rear gable, 16 – middle gable, 17 – front tube, 18 – rear tube, 19 – step, 20 – connecting cable, 21 – tarpaulin, 22 – tarpaulin strip, 23 – self-clamping strip lock

The load crate (standard version) consists of set of walls (1), (2), (3), (7), (8) and superstructures (4), (5), (6), (9), (10), lower ladder (12) and superstructure ladder (13), connecting cables (20) and steps (19). Additional equipment (for customer order) consists of a frame (14), (15), (16), (17), (18), tarpaulin (21) and platform (11).

5.7.1 Assembly / disassembly of superstructures

Assembly of superstructures should be performed as follows:

- fasten superstructure side posts (9) to wall side posts (7)
- fasten rear superstructure posts (10) to wall rear posts (8)
- install front (4) and rear (5) superstructure
- install side superstructures (6)
- screw the step (19) and the superstructure ladder (13)
- fasten the connection cable (20) to side superstructure posts (9).

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 Tarpaulin & frame maintenance

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 (22).

The frame consists of the front gable (14), the rear gable (15), the middle gable (16), the front tube (17) and the rear tube (18). Installation of the frame and the tarpaulin should be performed as follows:

- install the front gable (14) on the front superstructure (4),
- install the rear gable (15) on the rear superstructure (5),
- screw the middle gable (16) to the superstructure side posts (9),
- screw the tube (17) to the front and middle gables, and the tube (18) to the rear and middle 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.

During operation of the trailer fitted with third superstructures appears increased risk of following phenomena:

- **loss of trailer's stability**
- **trailer's turn over**
- **loss of strength of trailer elements**
- **insufficient visibility of movement path of trailer body elements**
- **uncontrolled body movements on the rough ground**
- **danger due to excessive load**

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.

DOUBLE-AXLE AGRICULTURAL TRAILER
THREE-SIDE DUMPER

T680

SPARE PARTS CATALOGUE

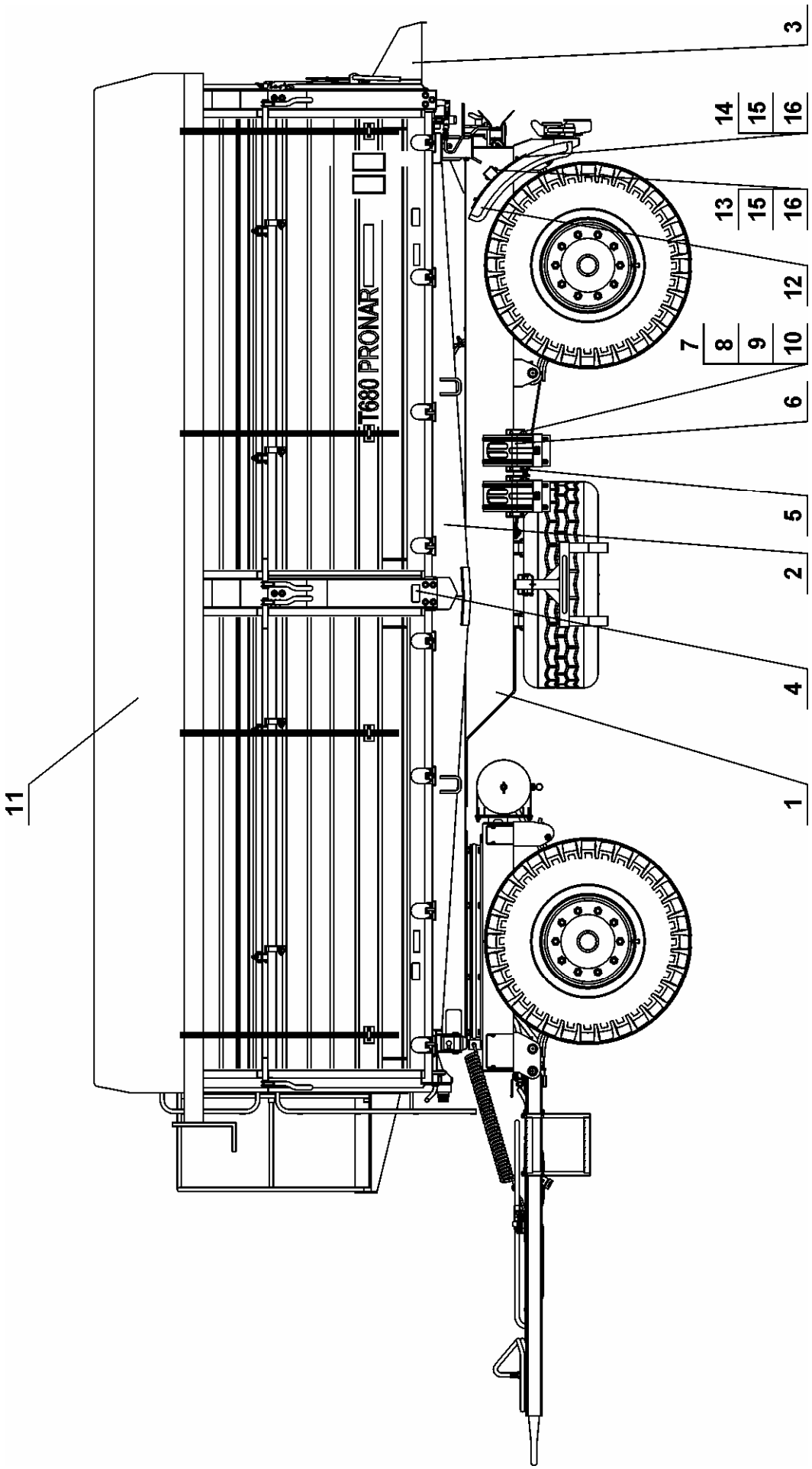


Fig. 12 Side view

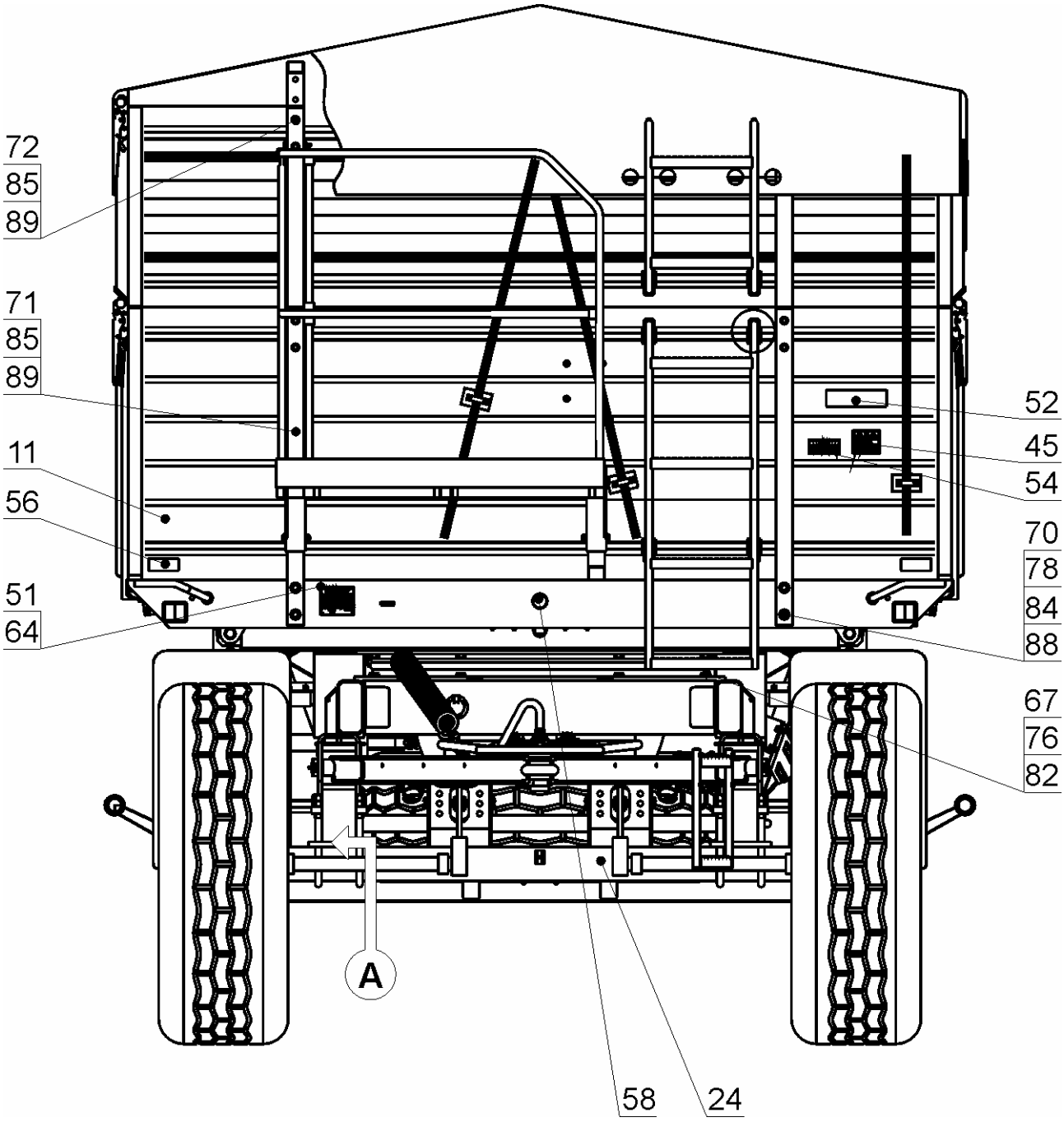


Fig. 13 Front view

Component name TRAILER T680, SIDE VIEW, FRONT VIEW			Quantity
Drawing No. 12, 13		No. of complete component/part 62RPN 00.000.00	T680
No.	**Part name**	**Drawing / standard No.**	
1	Lower frame	62RPN-01.00.000	1
2	Upper frame	62RPN-02.00.000	1
3	Chute, set.	62RPN-00.11.000	1
4	Rectangular reflective sticker, yellow		6
5	Wedge grip	244377	2
6	Wheel wedge	244374	2
7	Screw M8x16-B Fe/Zn5	PN-85/M-82105	8
8	Nut M8-5-B Fe/Zn5	PN-86/M-82144	8
9	Washer 8.4 Fe/Zn5	PN-78/M-82005	8
10	Washer Z8.2 Fe/Zn5	PN-77/M-82008	8
11	Tarpaulin	62RPN-18.02.000	1
12	Left wing (right), set	62RPN-00.07.000 (62RPN-00.08.000)	1 (1) ⊗
13	Screw M8x70-5.8 Fe/Zn5	PN-85/M-82101	2 (2) ⊗
14	Screw Z 8x25-5.8 Fe/Zn5	PN-87/M82406	4 (4) ⊗
15	Nut M8-6-B Fe/Zn5	PN-86/M-82144	6 (6) ⊗
16	Washer Z 8.2 Fe/Zn9	PN-77/M-82008	6 (6) ⊗
17	Information sticker	29RPN-00.00.022	1
18	Rectangular reflective sticker, white		2
19	Information sticker	58RPN-00.00.014	1
20	Information sticker	29RPN-00.00.024	1
21	Type plate	29RPN-00.00.025	1

⊗ - Quantity in quotes refers to the right wing

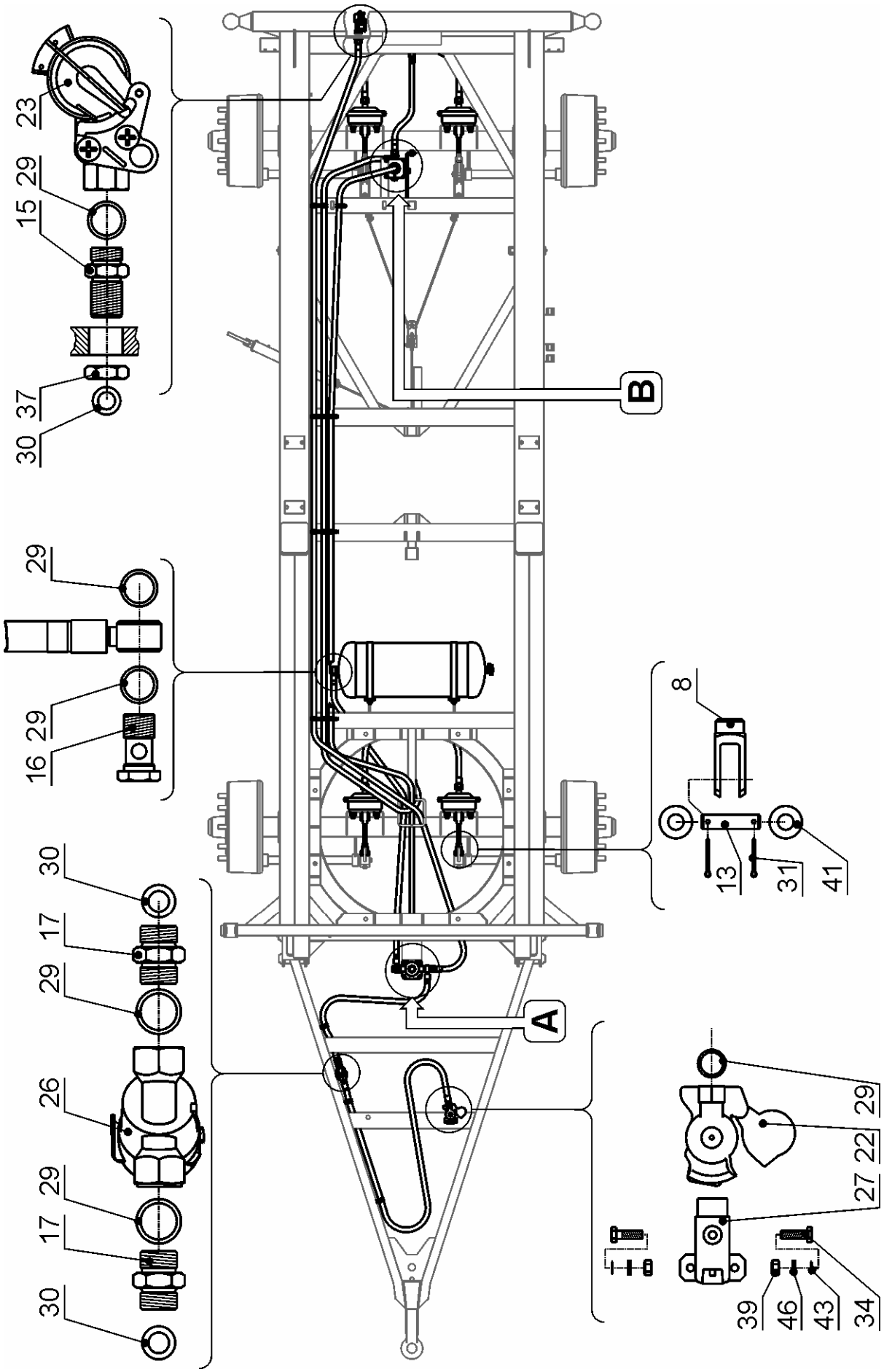


Fig. 14 Single-conduit pneumatic system, view from above

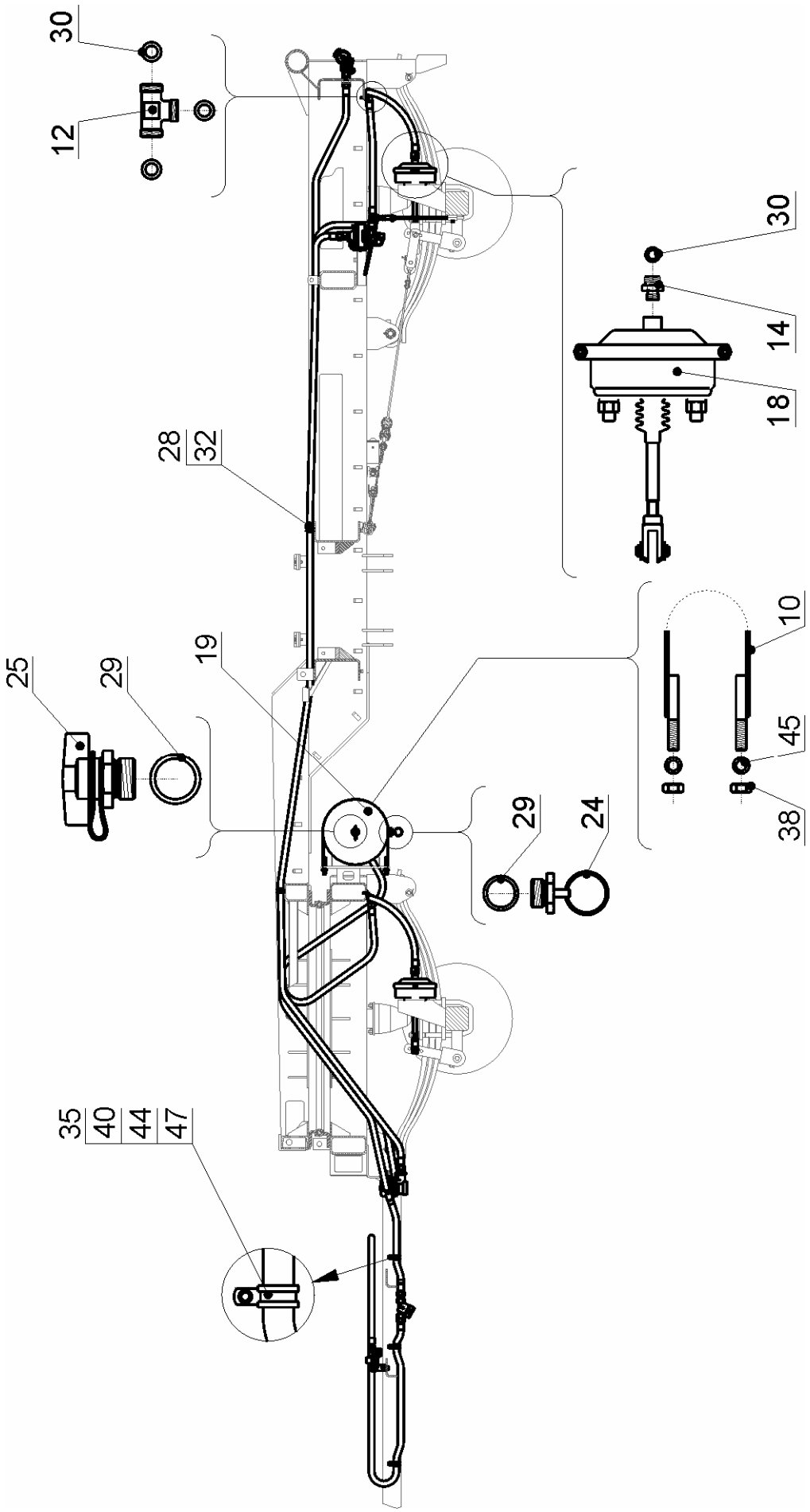


Fig. 15 Single-conduit pneumatic system, side view

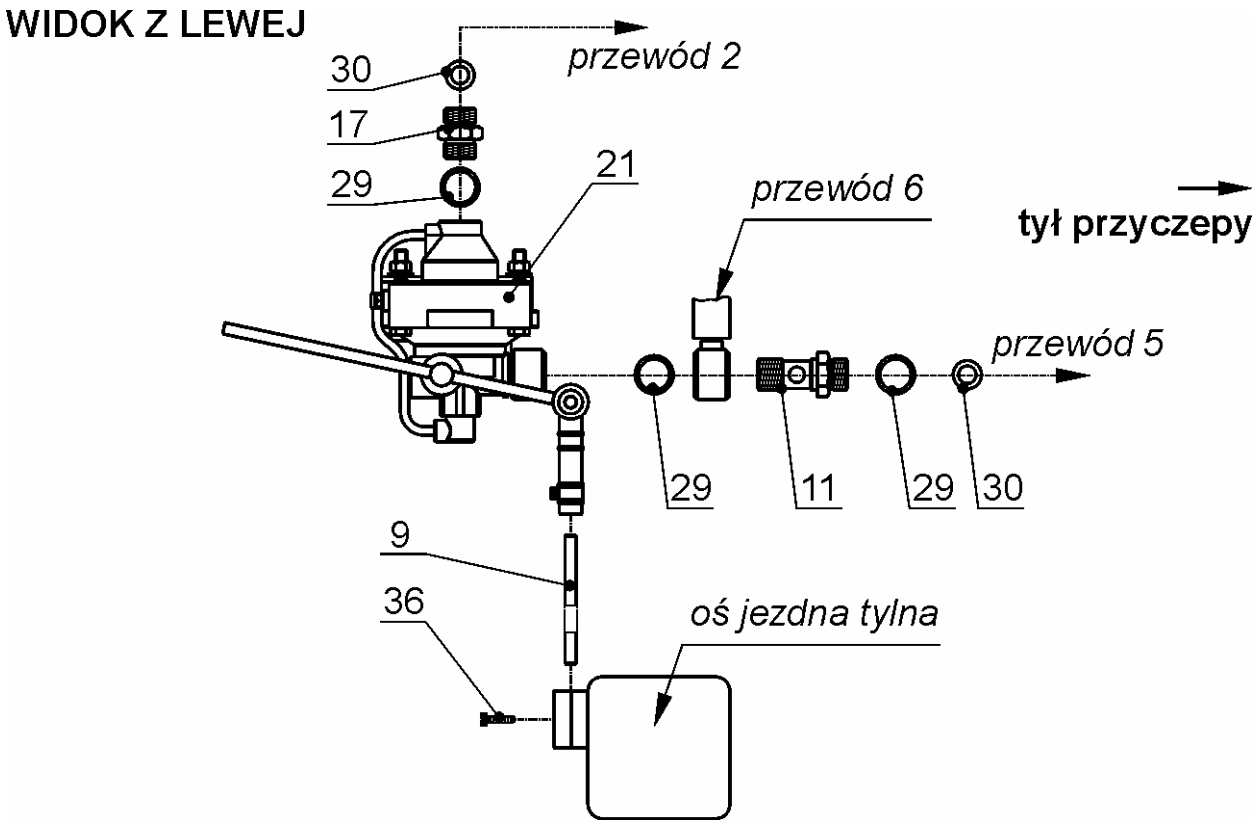


Fig. 16 Single-conduit pneumatic system, braking force controller

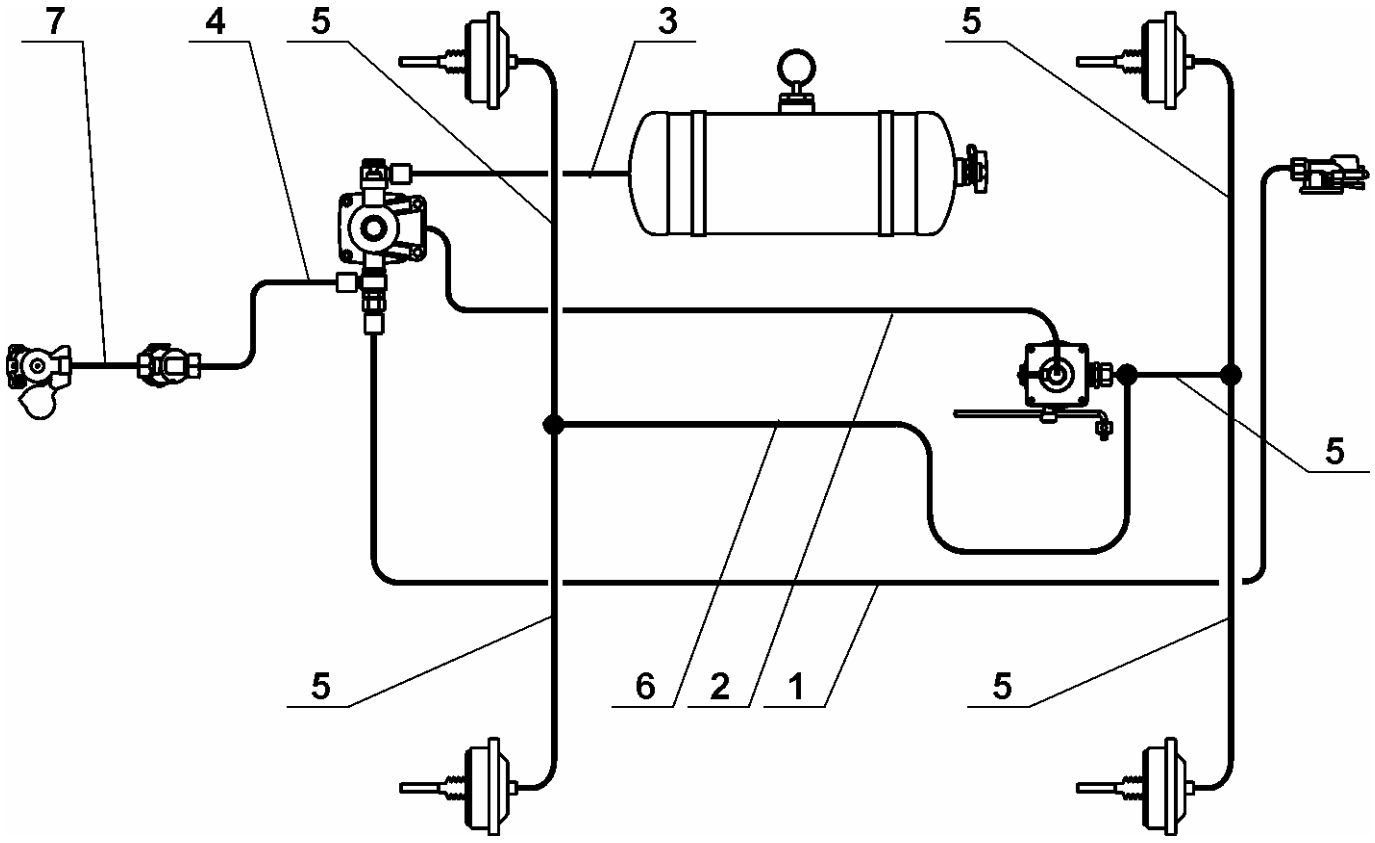


Fig. 17 Single-conduit pneumatic system, list of conduits

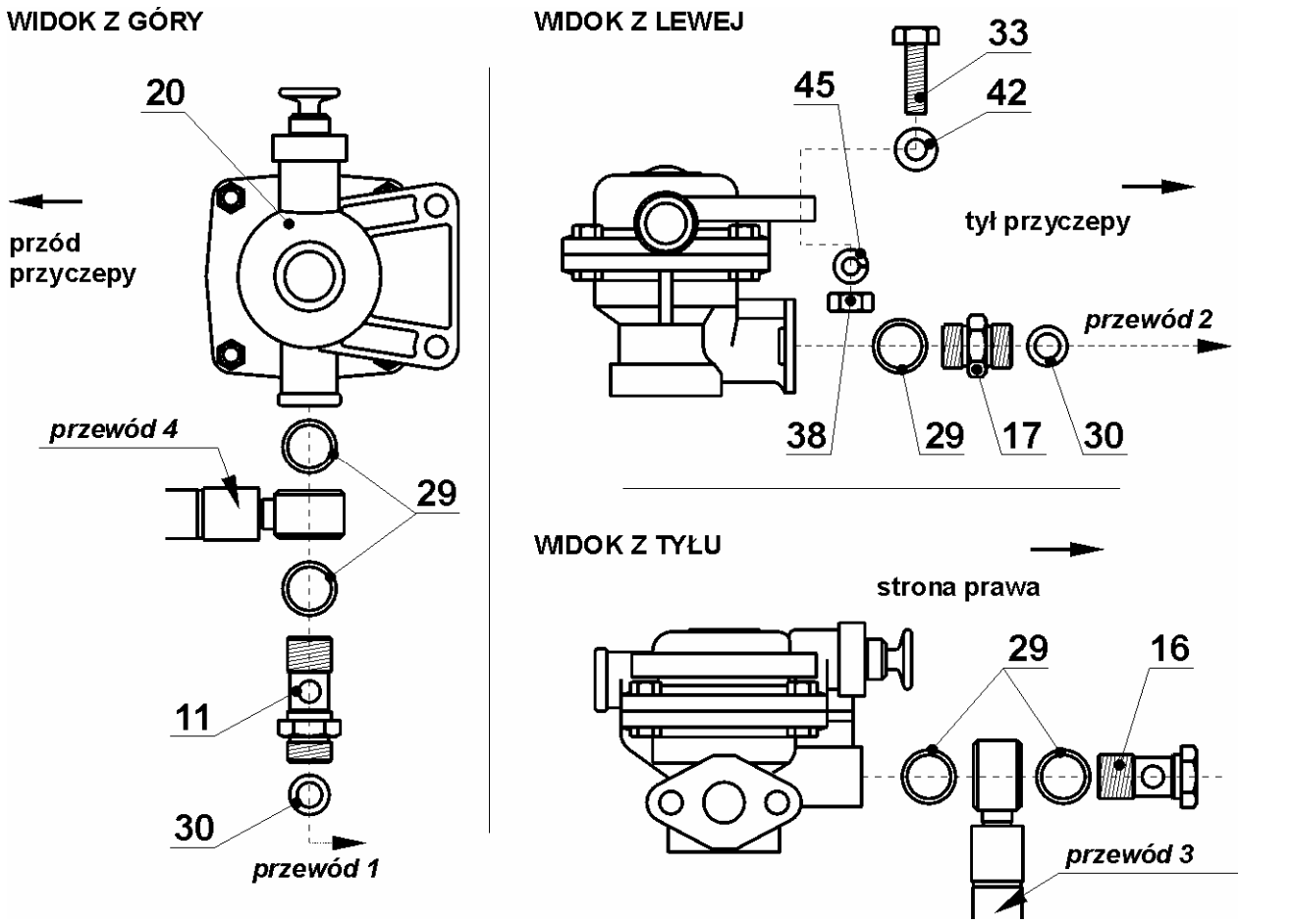


Fig. 18 Single-conduit pneumatic system, control valve

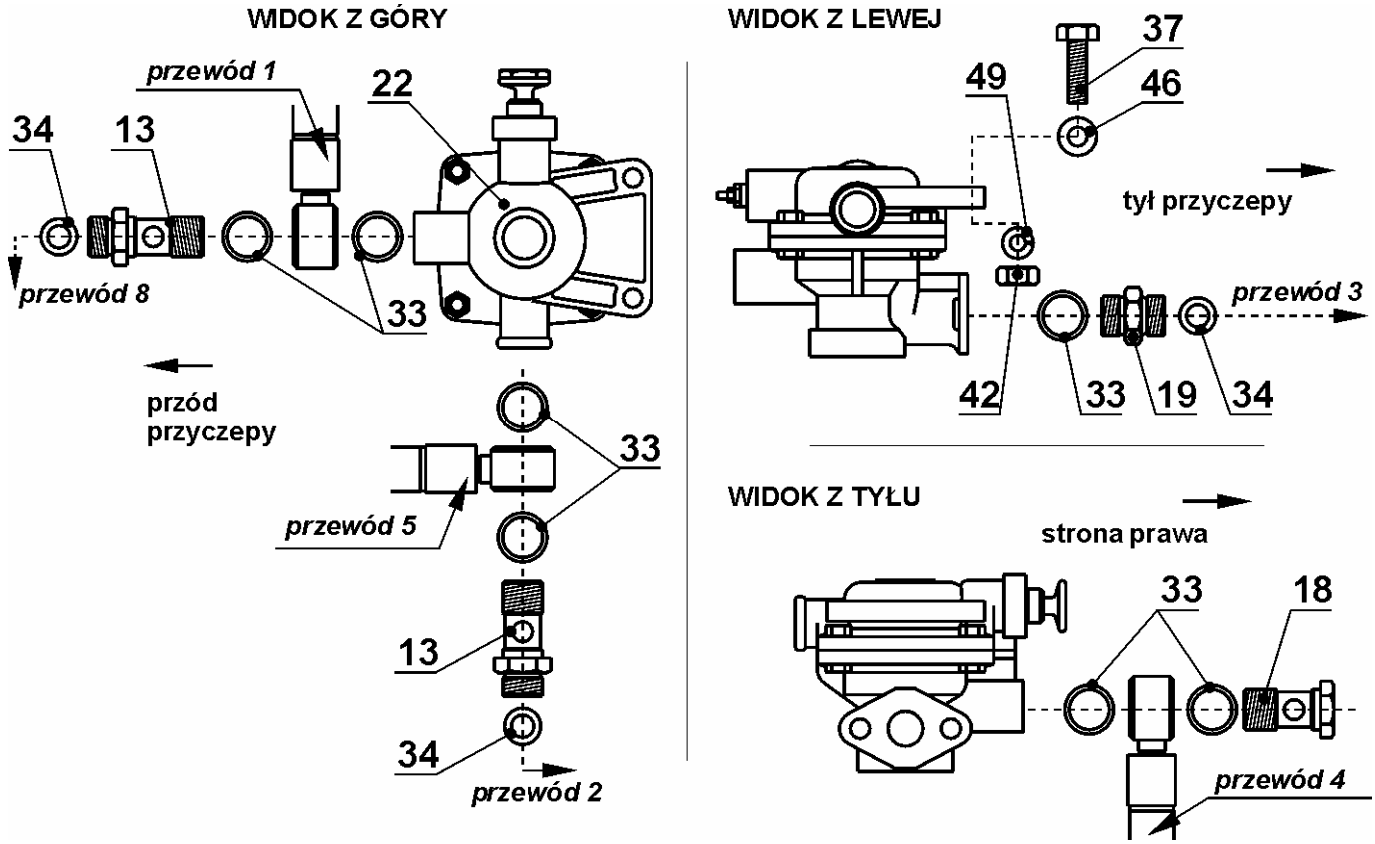


Fig. 19 Single-conduit pneumatic system, control valve

Component name			Quantity
SINGLE-CONDUIT PNEUMATIC SYSTEM			
Drawing No.		No. of complete component/part	
14, 15, 16, 17, 18		62RPN-08.00.000	T680
No.	**Part name**	**Drawing / standard No.**	
1	Conduit W-W 5650	62RPN-08.01.000	1
2	Conduit W-W 4700	62RPN-08.02.000	1
3	Conduit O-O 2200	62RPN-08.03.000	1
4	Conduit O-W 1000	62RPN-08.04.000	1
5	Conduit W-W 550	62RPN-08.05.000	5
6	Conduit O-W 4600	53RPN-11.02.000	1
7	Conduit Z-Z 2300	29RPN-11.09.000	1
8	Fork	62RPN-08.00.001	2
9	Rod	62RPN-08.00.002	1
11	Special connection screw	29RPN-11.00.001	2
12	T-connector	29RPN-11.00.003	2
13	Bolt	29RPN-11.00.004	2
14	Connector body	12RPN-25.00.002	4
15	Long connector	6RPN-01.00.006	1
16	Connection screw	6RPN-01.00.010	2
17	Short connector	6RPN-01.00.011	3
18	Membrane cylinder 24'' 74500170		4
19	Air reservoir 529 000 000		1
20	Control valve 44.11.011.0		1
21	Braking force controller 61.20.015.0		1
22	Conduit connector 87.30.010.0		1
23	Conduit connector 87.30.011.0		1
24	Drain valve 83.10.012.0		1
25	Inspection connector 88.10.011.0		1
26	Filter conduits 81.01.010.0		1
27	Connector clamp Art.-3 31000		1
28	Band RIBENCLIP 22		19
29	Washer Cu 27/22/2		16
30	Washer Cu 2-0/12.5/2		16
31	Cotter pin S-Zn 3.2x25	PN-76/M-82001	4
32	Self-tapping screw R5.5x19	DIN-7504-K	12
33	Screw M10x35-5.8-B-Fe/Zn5	PN-85/M-82105	2
34	Screw M8x30-5.8-B-Fe/Zn5	PN-85/M-82105	2
35	Screw M6x16-5.8-B-Fe/Zn5	PN-85/M-82105	3
36	Screw M5x20-4.8-B-Fe/Zn5	PN-85/M-82215	1
37	Nut M22x1.5-04-B-Fe/Zn5	PN-86/M-82153	1
38	Nut M10-5-B-Fe/Zn5	PN-86/M82144	2
39	Nut M8-5-B-Fe/Zn5	PN-86/M82144	2
40	Nut M6-5-B-Fe/Zn5	PN-86/M82144	3
41	Washer 13 Fe/Zn5	PN-78/M-82005	4
42	Washer 10.5 Fe/Zn5	PN-78/M-82005	2
43	Washer 8.4 Fe/Zn5	PN-78/M-82005	2
44	Washer 6.4 Fe/Zn5	PN-78/M-82005	3
45	Washer Z10.2 Fe/Zn5	PN-77/M-82008	2
46	Washer Z8.2 Fe/Zn5	PN-77/M-82008	2
47	Washer Z6.1 Fe/Zn5	PN-77/M-82008	3

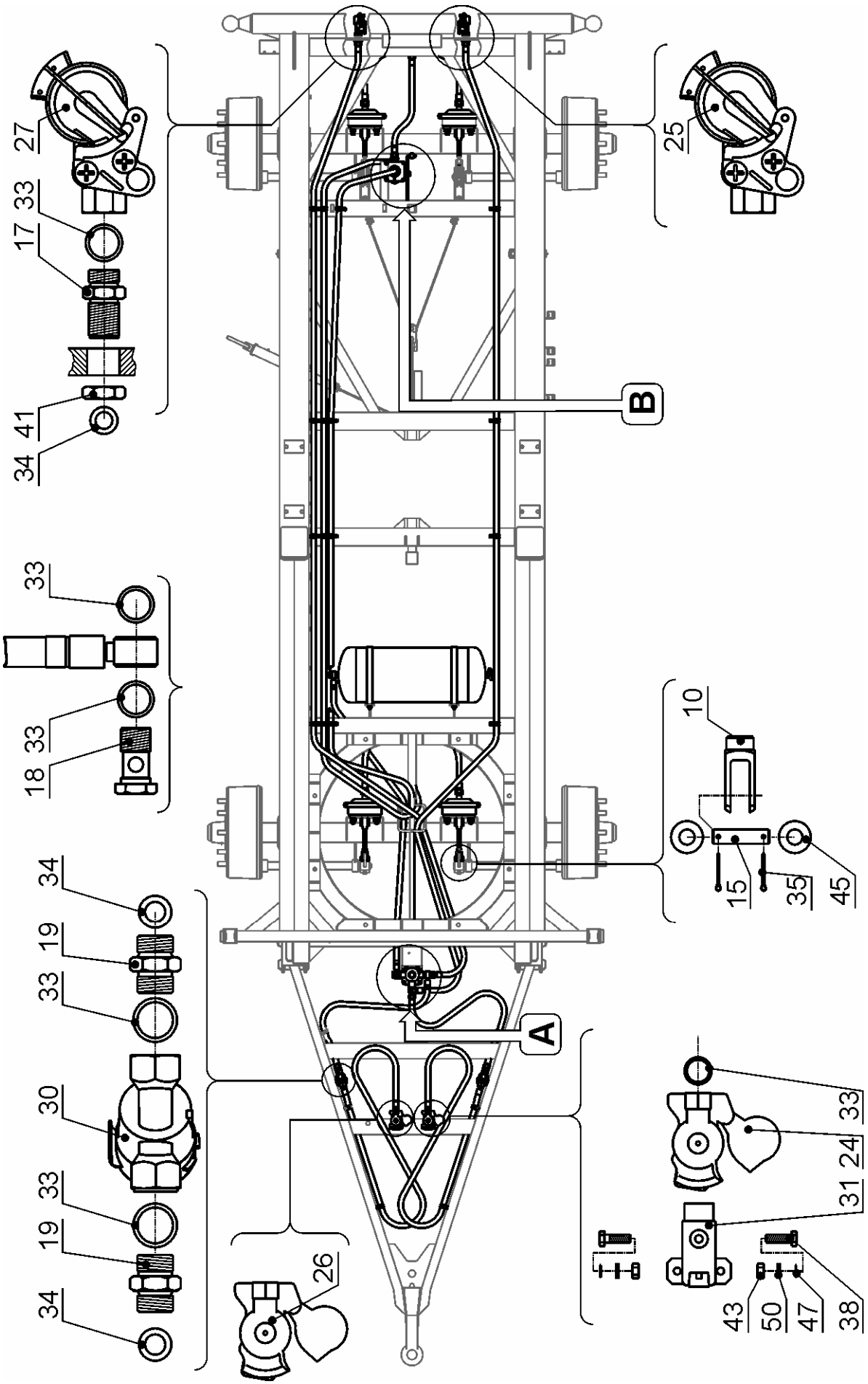


Fig. 20 Two-conduit pneumatic system, view from above

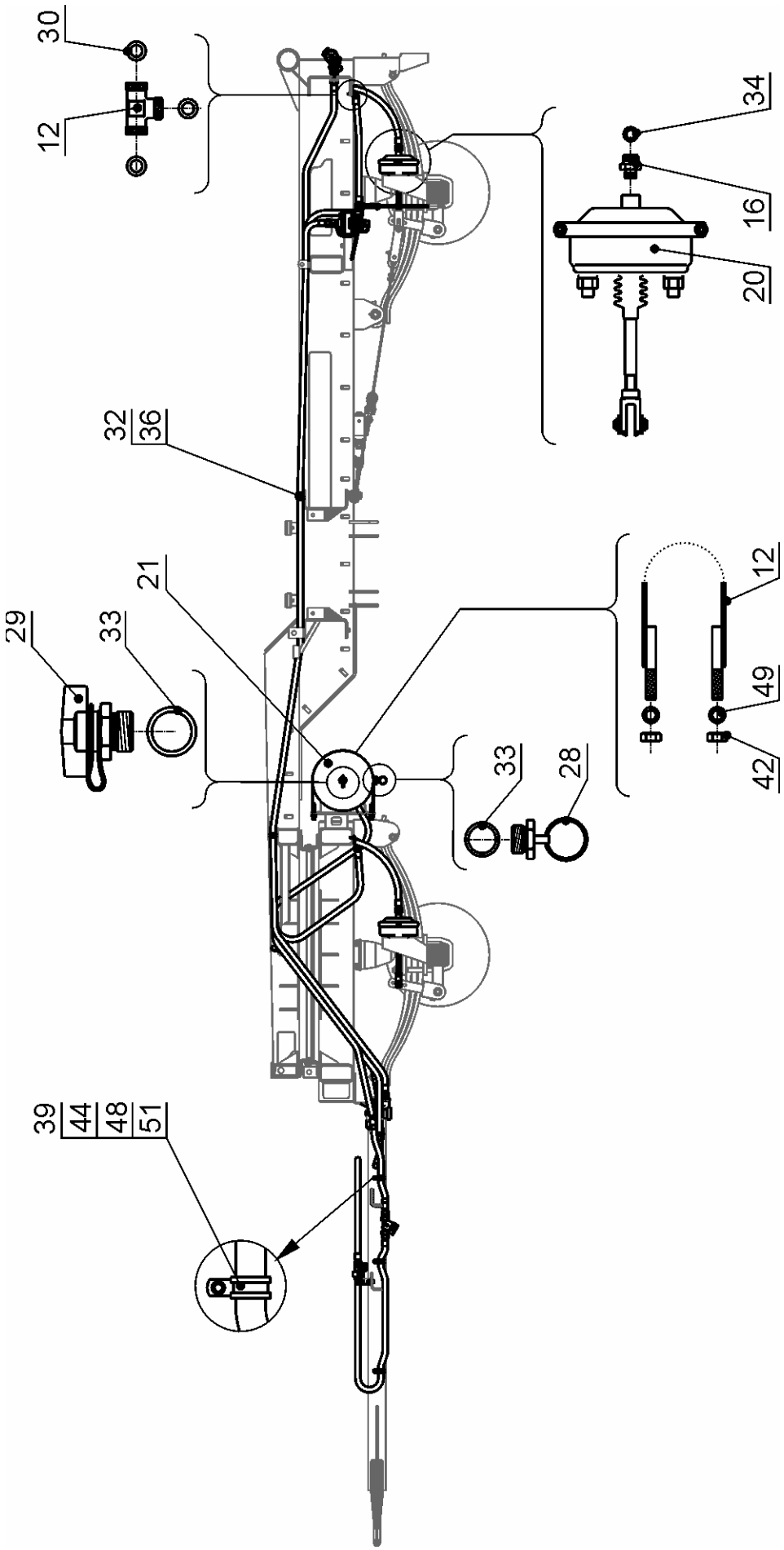


Fig. 21 Two-conduit pneumatic system, side view

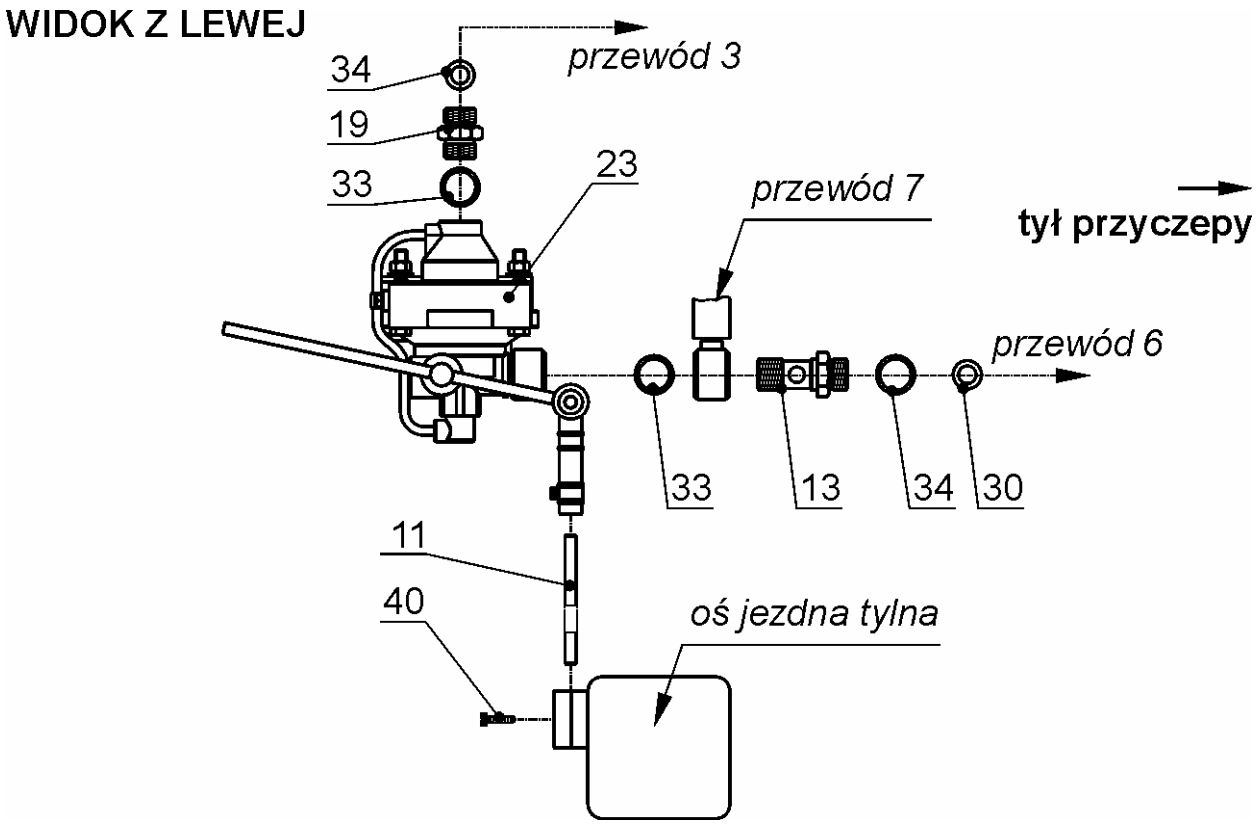


Fig. 22 Two-conduit pneumatic system, braking force controller

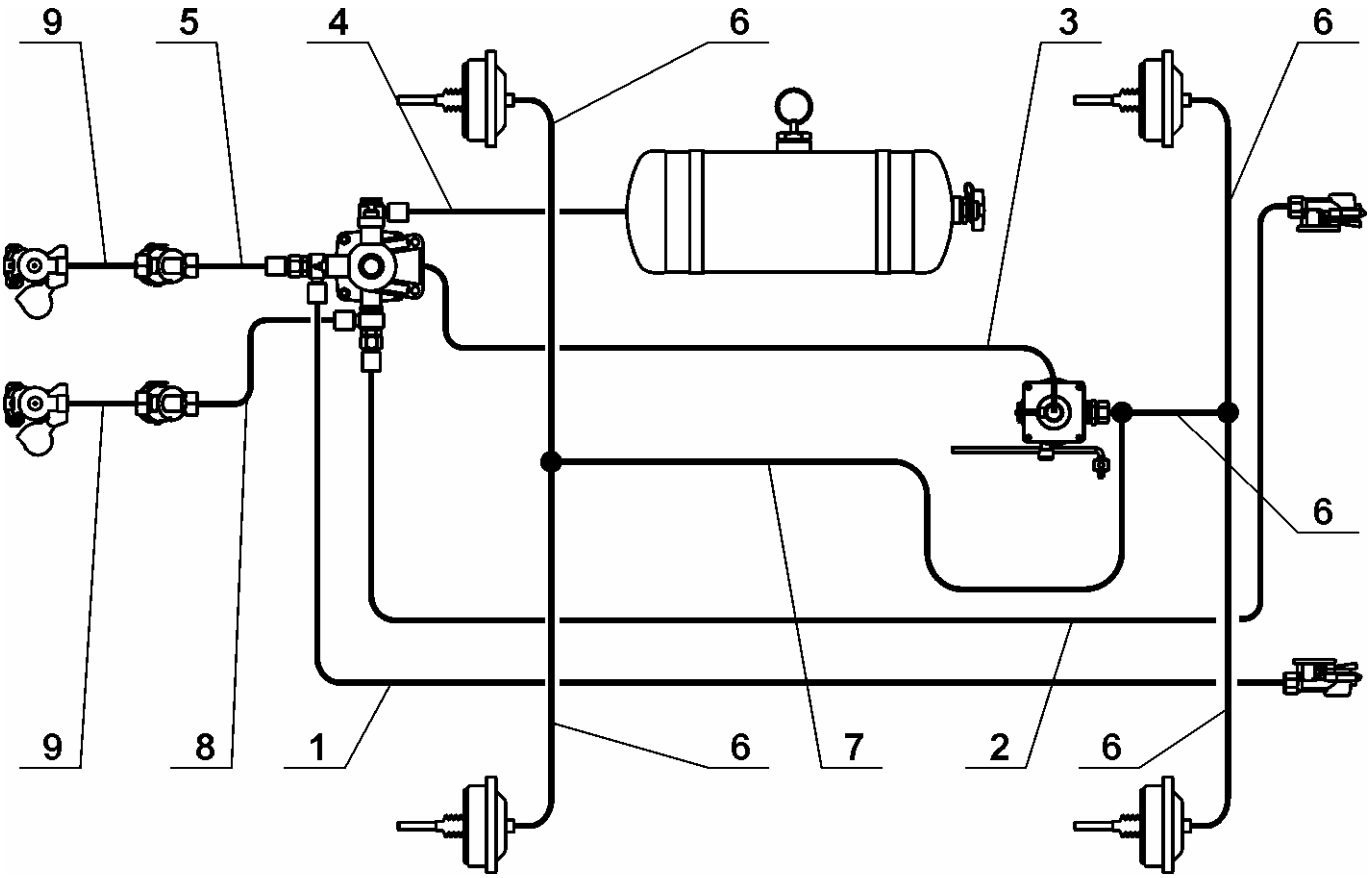


Fig. 23 Two-conduit pneumatic system, list of conduits

Component name TWO-CONDUIT PNEUMATIC SYSTEM			Quantity
Drawing No. 19, 20, 21, 22, 23		No. of complete component/part 62RPN-09.00.000	T680
No.	**Part name**	**Drawing / standard No.**	
1	Conduit W-W 5750	62RPN-09.01.000	1
2	Conduit W-W 5650	62RPN-08.01.000	1
3	Conduit W-W 4700	62RPN-08.02.000	1
4	Conduit O-O 2200	62RPN-08.03.000	1
5	Conduit O-W 1000	62RPN-08.04.000	1
6	Conduit W-W 550	62RPN-08.05.000	5
7	Conduit O-W 4600	53RPN-11.02.000	1
8	Conduit W-W 1000	29RPN-11.07.000	1
9	Conduit Z-Z 2300	29RPN-11.09.000	2
10	Fork	62RPN-08.00.001	2
11	Rod	62RPN-08.00.002	1
13	Special connection screw	29RPN-11.00.001	3
14	T-connector	29RPN-11.00.003	2
15	Bolt	29RPN-11.00.004	2
16	Connector body	12RPN-25.00.002	4
17	Long connector	6RPN-01.00.006	1
18	Connection screw	6RPN-01.00.010	2
19	Short connector	6RPN-01.00.011	4
20	Membrane cylinder 24'' 74500170		4
21	Air reservoir 529 000 000		1
22	Control valve 44.12.010.0		1
23	Braking force controller 61.20.015.0		1
24	Conduit connector 87.10.030.0		1
25	Conduit connector 87.15.030.0		1
26	Conduit connector 87.10.020.0		1
27	Conduit connector 87.15.020.0		1
28	Drain valve 83.10.012.0		1
29	Inspection connector 88.10.011.0		1
30	Filter conduits 81.01.010.0		2
31	Connector clamp Art.-331000		2
32	Band RIBENCLIP 22		26
33	Washer Cu 27/22/2		20
34	Washer Cu 2-0/12.5/2		18
35	Cotter pin S-Zn 3.2x25	PN-76/M-82001	4
36	Self-tapping screw R5.5x19	DIN-7504-K	16
37	Screw M10x35-5.8-B-Fe/Zn5	PN-85/M-82105	2
38	Screw M8x30-5.8-B-Fe/Zn5	PN-85/M-82105	4
39	Screw M6x16-5.8-B-Fe/Zn5	PN-85/M-82105	6
40	Screw M5x20-4.8-B-Fe/Zn5	PN-85/M-82215	1
41	Nut M22x1.5-04-B-Fe/Zn5	PN-86/M-82153	2
42	Nut M10-5-B-Fe/Zn5	PN-86/M82144	4
43	Nut M8-5-B-Fe/Zn5	PN-86/M82144	4
44	Nut M6-5-B-Fe/Zn5	PN-86/M82144	6
45	Washer 13 Fe/Zn5	PN-78/M-82005	4
46	Washer 10.5 Fe/Zn5	PN-78/M-82005	2
47	Washer 8.4 Fe/Zn5	PN-78/M-82005	4
48	Washer 6.4 Fe/Zn5	PN-78/M-82005	6
49	Washer Z10.2 Fe/Zn5	PN-77/M-82008	2
50	Washer Z8.2 Fe/Zn5	PN-77/M-82008	4
51	Washer Z6.1 Fe/Zn5	PN-77/M-82008	6

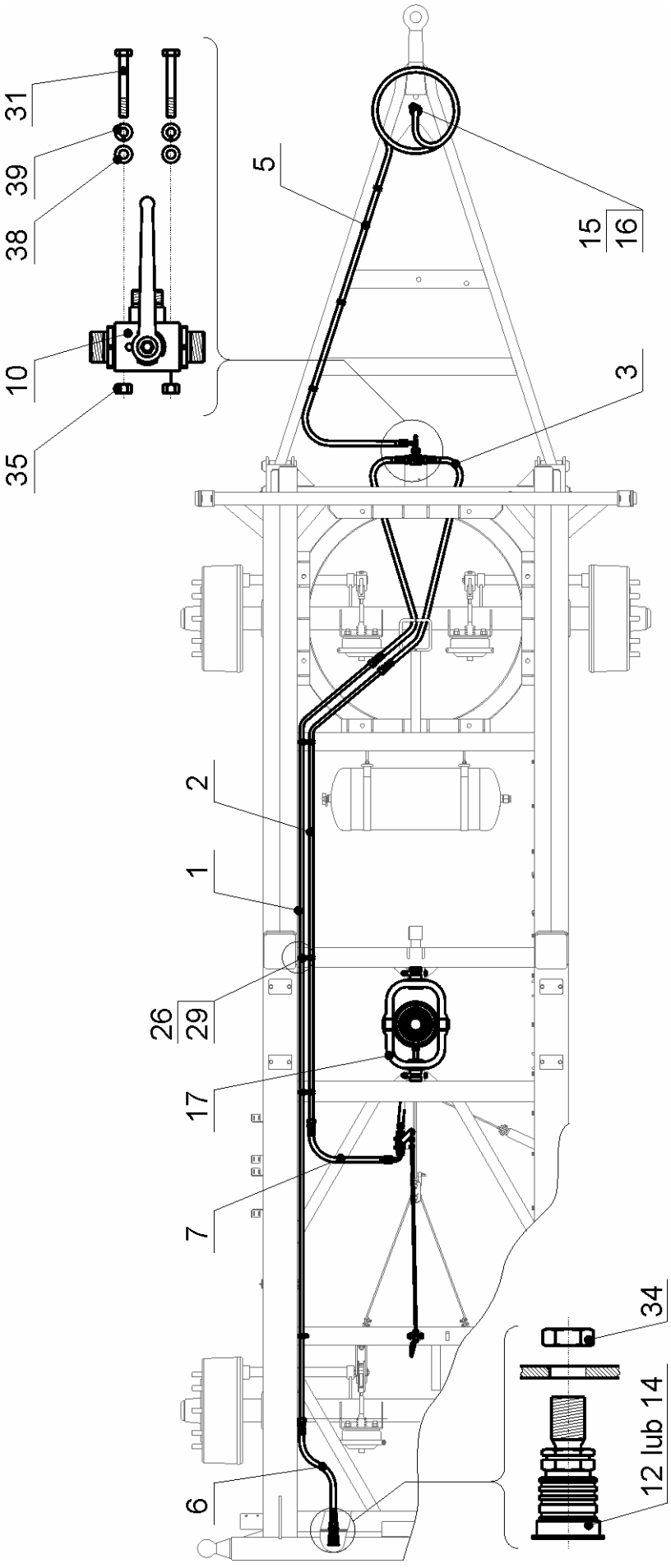


Fig. 24 Tilt hydraulic system, view from above

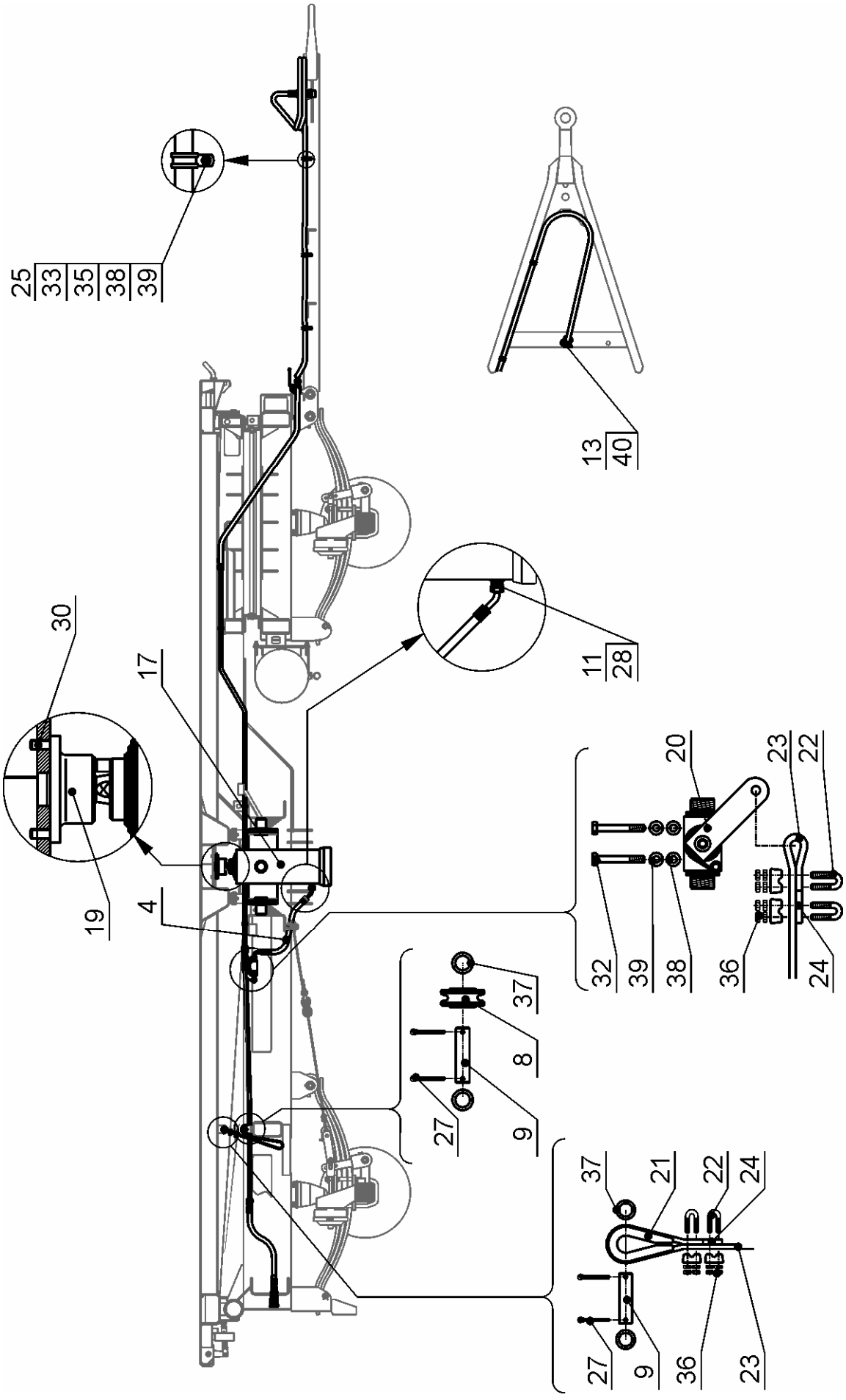


Fig. 25 Tilt hydraulic system, side view

Component name: TILT HYDRAULIC SYSTEM			Quantity
Drawing No.: 24, 25		No. of complete component/part: 62RPN-15.00.000	T680
No.	**Part name**	**Drawing / standard No.**	
1	Tube I, set	62RPN-15.01.000	1
2	Tube II, set	62RPN-15.02.000	1
3	Conduit DN13 H2.12 H4.13 1600	62RPN-15.03.000	2
4	Conduit DN13 900	62RPN-15.04.000	1
5	Conduit DN13 H17.8 H2 12 3100	53RPN-14.10.000	1
6	Conduit DN13 H2.12H4.13 650	53RPN-14.07.000	1
7	Conduit DN13 H17.8H4.13 500	45RPN-12.06.000	1
8	Rope wheel	29RPN-13.00.001	1
9	Wheel axle	29RPN-13.00.002	2
10	Three-way hydraulic valve	29RPN-13.00.003	1
11	Connector	29RPN-13.00.004	1
12	Quick-release connector – socket SZ12-G06L		1 ⊗
13	Quick-release connector – plug SZ12-W06		1 ⊗
14	Socket ZSR32 – G01L	ZSR6-160-13/100	1
15	Plug ZSR32 – W01	ZSR6-160-13/200	1
16	Plug socket	ZSR5-160-13/300	1
17	Telescopic cylinder CT-S227-75/5/1980		1
18	Cylinder hinge ZCT – 145		1
19	Ball bearing 55 ŁK-S01-55/0.00		1
20	Cut-off valve Pister	HBKH-15L-DN13	1
21	Thimble A6 Zn.	PN-66/M-80247	1
22	Bail clamp 6.5 Zn	PN-73/M-80241	4
23	Rope ∅6 6x19+P+p l=2250		1
24	Heat-shrinkable pipe PBF 12/6 l=30	BN-89/C-89209	2
25	Band RIBENCLIP 22		3
26	Band RIBENCLIP 16		7
27	Cotter pin S-Zn 4x32	PN-76/M-82001	4
28	Washer Cu 27/22/2		1
29	Self-tapping screw ∅5.5 x 19	DIN-7504-K	4
30	Screw M12x25-8.8-B Fe/Zn5	DIN 7991	6
31	Screw M6x50-5.8-B Fe/Zn5	PN-85/M-82101	2
32	Screw M6x45-5.8-B Fe/Zn5	PN-85/M-82101	2
33	Screw M6x16-5.8-B Fe/Zn5	PN-85/M-82105	3
34	Nut M22x1.5-04-B Fe/Zn5	PN-86/M-82153	1
35	Nut M6-5-B Fe/Zn5	PN-86/M-82144	5
36	Nut M5-B Fe/Zn5	PN-86/M-82144	4
37	Washer 17 Fe/Zn5	PN-78/M-82005	4
38	Washer 6.4 Fe/Zn5	PN-78/M-82005	10
39	Washer 6.1 Fe/Zn5	PN-77/M-82008	10
40	Plug socket Art. 920025 Fiegl		1 ⊗

⊗ for special order, instead of socket & plug ZSR and plug socket

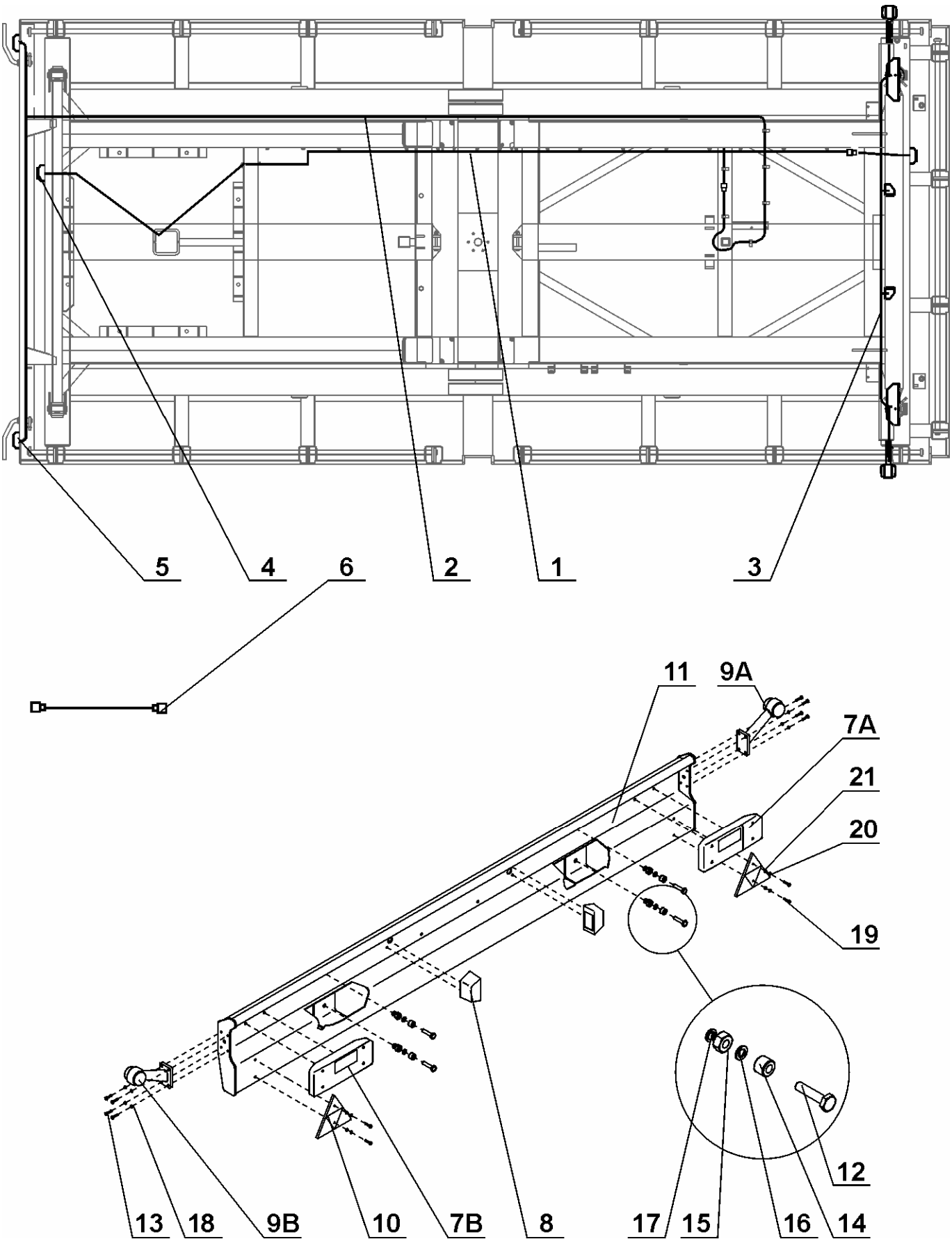


Fig. 26 Wiring system

Component name: WIRING SYSTEM			Quantity
Drawing No.: 26		No. of complete component/part: 62RPN-10.00.00.00.00	T680
No.	**Part name**	**Drawing / standard No.**	
1	Central bundle	62RPN-10.01.00.00	1
2	Front bundle	62RPN-10.02.00.00	1
3	Rear bundle	62RPN-10.03.00.00	1
4	Socket GN-7 (X7)	8JB001941-002	2
5	Front position light LO-110PP		2
6	Connection cable	29RPN-10.05.00	1
7A	Compact rear light, right		1
7B	Compact rear light, left		1
8	Number plate lamp LT-120		2
9A	Contour light, right		1
9B	Contour light, left		1
10	Reflection triangle DOB31		2
11	Lighting beam, set	62RPN-07.00.000	1
12	Screw M10x45-8.8-B Fe/Zn5	PN-85/M-82105	4
13	Screw M5x16 B Fe/Zn5	PN/M-82201	8
14	Lighting beam spacer	29RPN-10.00.001	4
15	Nut M10-8.8-B Fe/Zn5	PN-86/M-82144	4
16	Washer 10.5 Fe/Zn5	PN-59/M-82030	4
17	Washer Z10.2 Fe/Zn5	PN-77/M-82008	4
18	Washer 5.3 Fe/Zn5	PN/M-82005	12
19	Screw M5x20-4.8-B Fe/Zn5	PN-85/M-82215	4
20	Nut M5-5-B F/Zn5	PN-86/M-82144	4
21	Washer Z5.1 Fe/Zn5	PN-77/M-82008	4

SET OF BULBS		Qty
Front position light LO-110PP	C5W-SV 8.5	1
Compact rear light, right (left)	P21W	1
	P21/5W	1
	R5W	1
Number plate lamp LT-120	C5W-SV 8.5	1
Contour light, right (left)	R5W	1

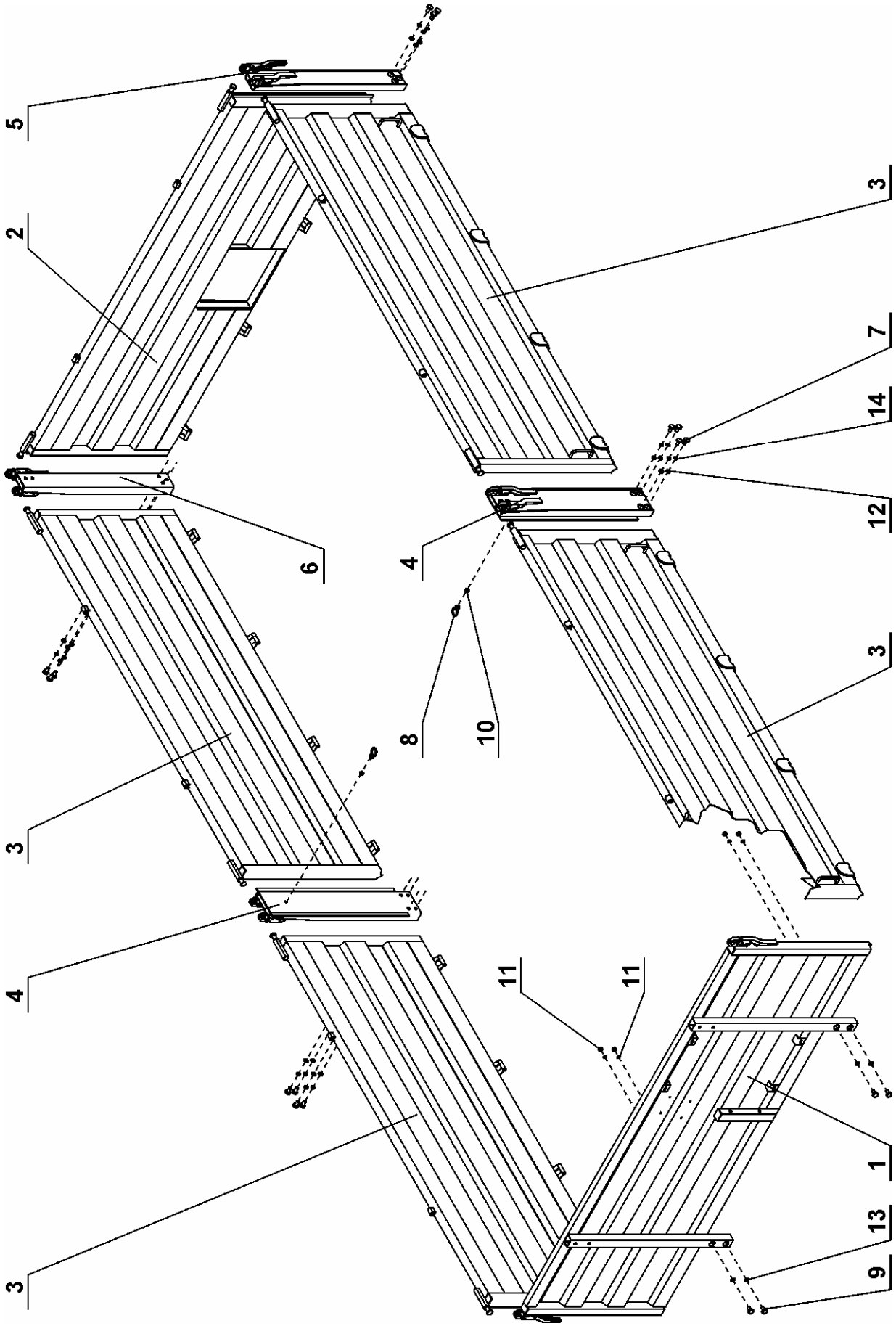


Fig. 27 Set of walls FUHRMANN 800

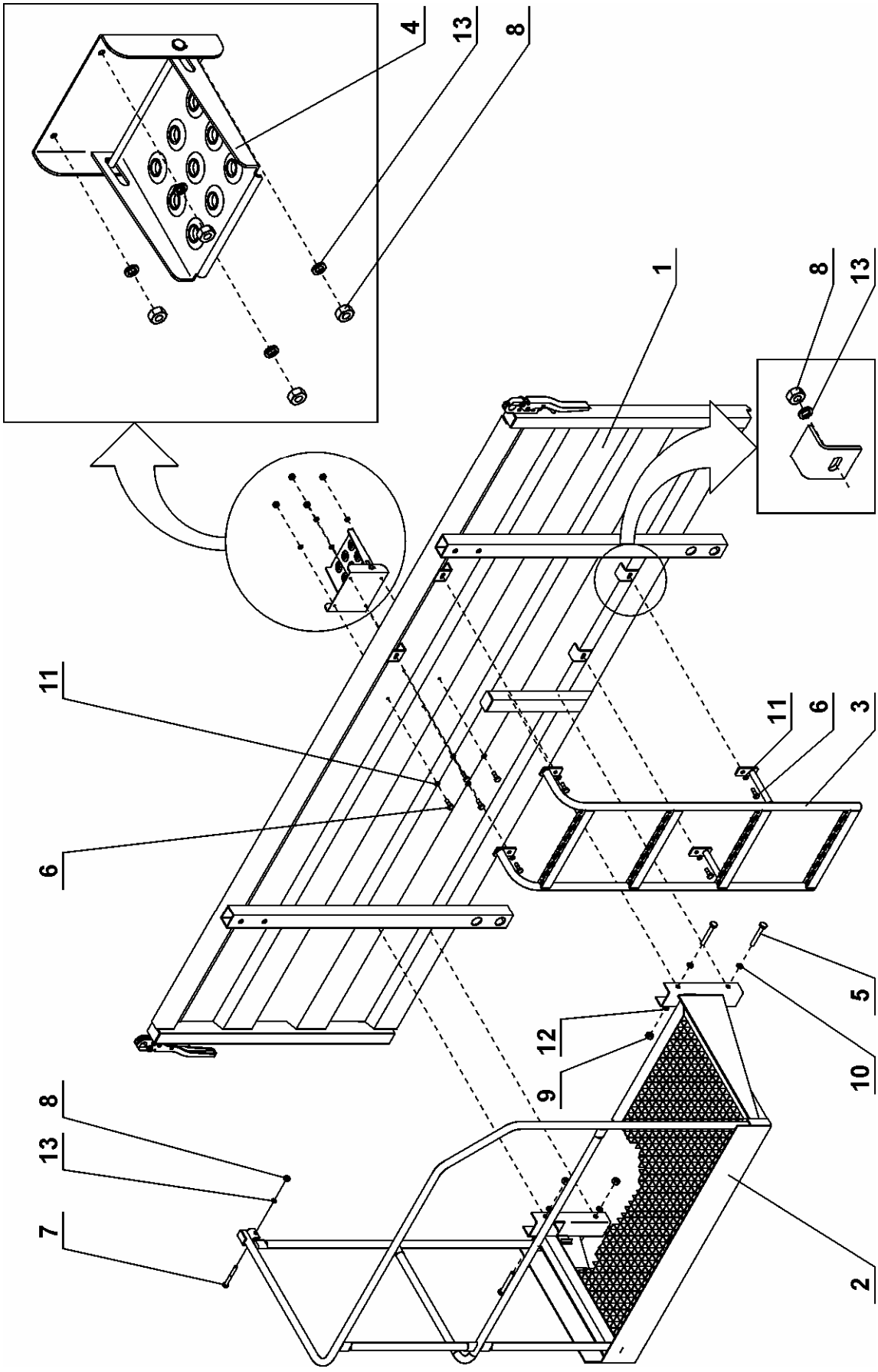


Fig. 28 Front wall, complete, FUHRMANN 800

Component name **SET OF WALLS, FUHRMANN 800**			**Quantity**
Drawing No. **27**	**No. of complete component/part** **62RPN-00.01.000 62RPN-00.02.000** **62RPN-00.03.000 62RPN-11.00.000** **62RPN-12.01.000 62RPN-13.00.000**		**T680**
No.	**Part name**	**Drawing / standard No.**	
1	Front wall	62RPN-11.00.000	1
2	Rear wall	62RPN-12.01.000	1
3	Side wall	62RPN-13.00.000	4
4	Middle post	62RPN-00.01.000	2
5	Left post	62RPN-00.02.000	1
6	Right post	62RPN-00.03.000	1
7	Screw M12x25 -.8-B-Fe/Zn5	PN-85/M-82105	14
8	Eye screw M12	S.54754	2
9	Screw M10x30-8.8-B-Fe/Zn5	PN-85/M-82105	4
10	Nut M12-5-B-Fe/Zn5	PN-86/M-82144	2
11	Nut M10-5-B-Fe/Zn5	PN-86/M-82144	4
12	Washer 13-Fe/Zn5	PN-86/M-82005	14
13	Washer 10.5-Fe/Zn5	PN-86/M-86030	4
14	Washer Z12.2-Fe/Zn5	PN-77/M-82008	14
15	Washer Z10.2-Fe/Zn5	PN-77/M-82008	4

Component name **FRONT WALL, COMPLETE, FUHRMANN 800**			**Quantity**
Drawing No. **28**	**No. of complete component/part** **62RPN-00.05.000 62RPN-05.00.000** **62RPN-11.00.000**		**T680**
No.	**Part name**	**Drawing / standard No.**	
1	Front wall	62RPN-11.00.000	1
2	Platform⊗	62RPN-05.00.000	1
3	Lower ladder	62RPN-00.05.000	1
4	Side step EB 20-010 Zn		1
5	Screw M10x75-5.8-B-Fe/Zn5	PN-85/M-82101	4
6	Screw M8x25-8.8-B-Fe/Zn5	PN-85/M-82105	8
7	Screw M8x70-5.8-B-Fe/Zn5	PN-85/M-82101	1
8	Nut M8-5-B-Fe/Zn5	PN-86/M-82144	9
9	Nut M10-5-B-Fe/Zn5	PN-86/M-82144	4
10	Washer 10.5-Fe/Zn5	PN-78/M-82005	4
11	Washer 8.4-Fe/Zn5	PN-78/M-82005	8
12	Spring washer Z10.2-Fe/Zn5	PN-77/M-82008	4
13	Spring washer Z8.2-Fe/Zn5	PN-77/M-82008	9

⊗ - special equipment, for order

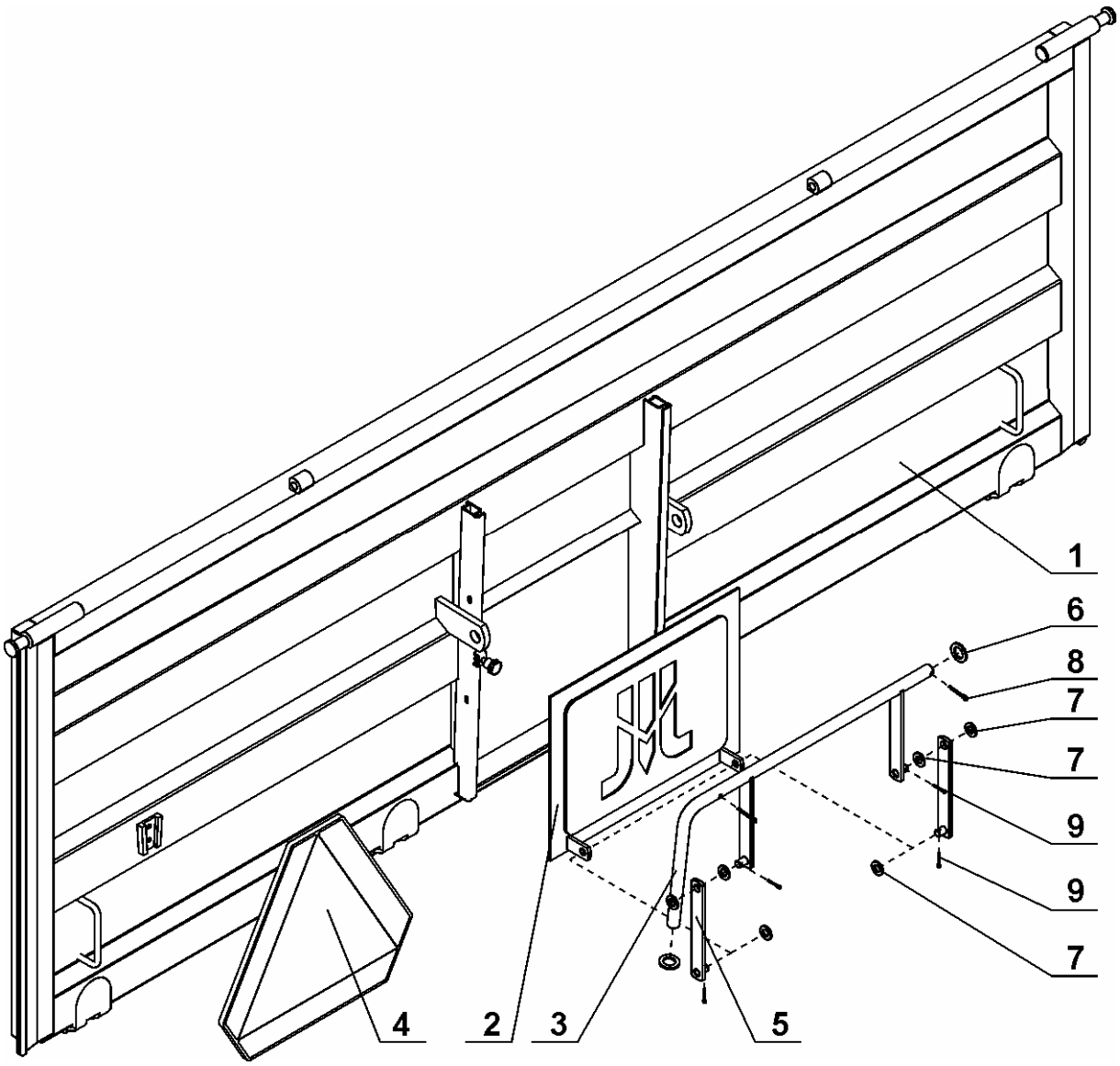


Fig. 29 Rear wall, complete, FUHRMANN 800

Component name **REAR WALL, COMPLETE, FUHRMANN 800**			**Quantity**
Drawing No. **29**	**No. of complete component/part** **62RPN 12.00.000**		**T680**
No.	**Part name**	**Drawing / standard No.**	
1	Rear wall, cpl	62RPN-12.01.000	1
2	Chute gate, set	29RPN-06.02.000	1
3	Lever	29RPN-06.03.000	1
4	Plate for slowly moving vehicles. ⊗		1
5	Pull rod	29RPN-06.04.000	2
6	Washer 21 Fe/Zn5	PN-78/M-82005	2
7	Washer 13 Fe/Zn5	PN-78/M-82005	6
8	Cotter pin S-Zn 5x28	PN-76/M-82001	2
9	Cotter pin S-Zn 3.2x16	PN-76/M-82001	4

⊗ - special equipment

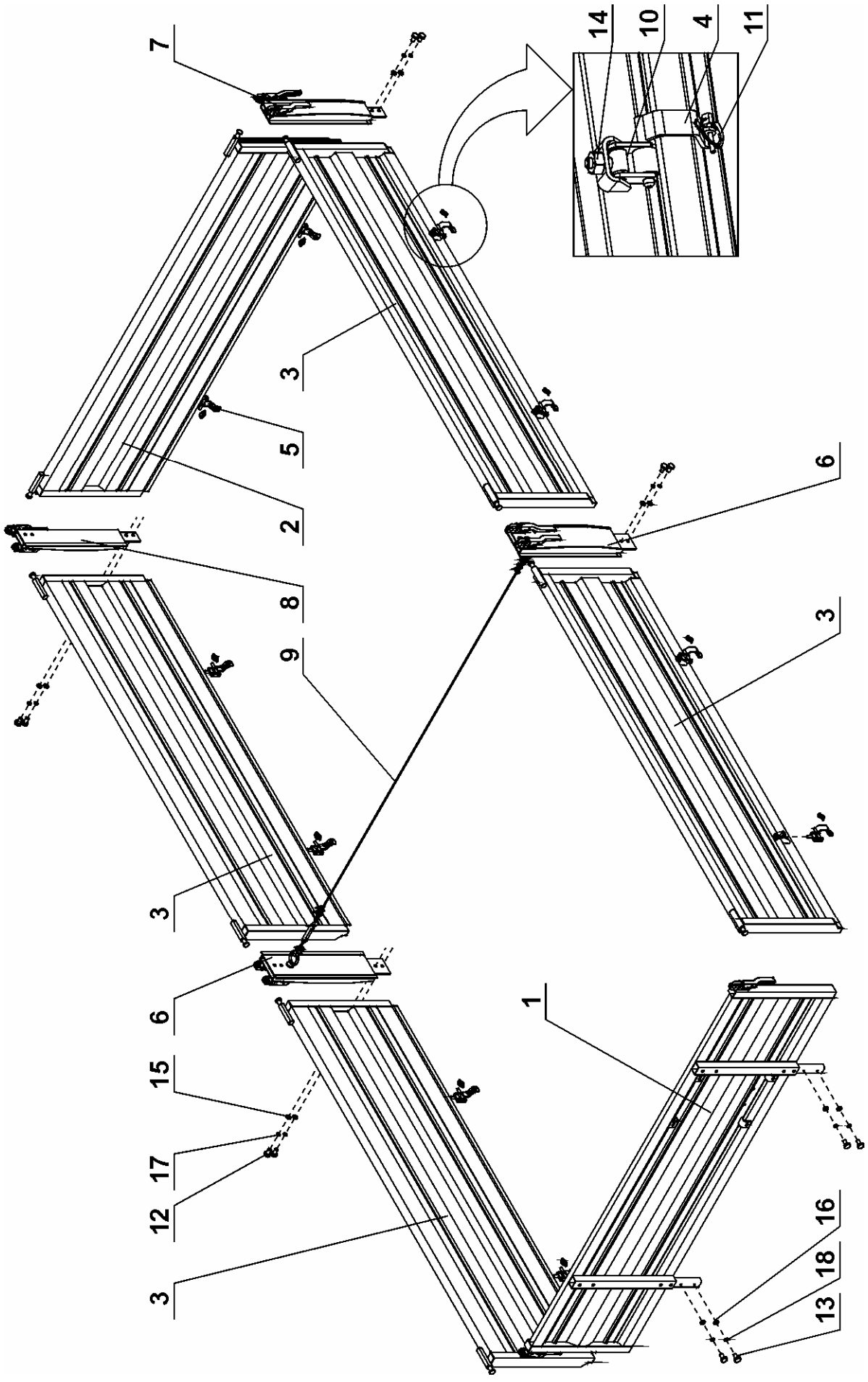


Fig. 30 Set of superstructures, FUHRMANN 600

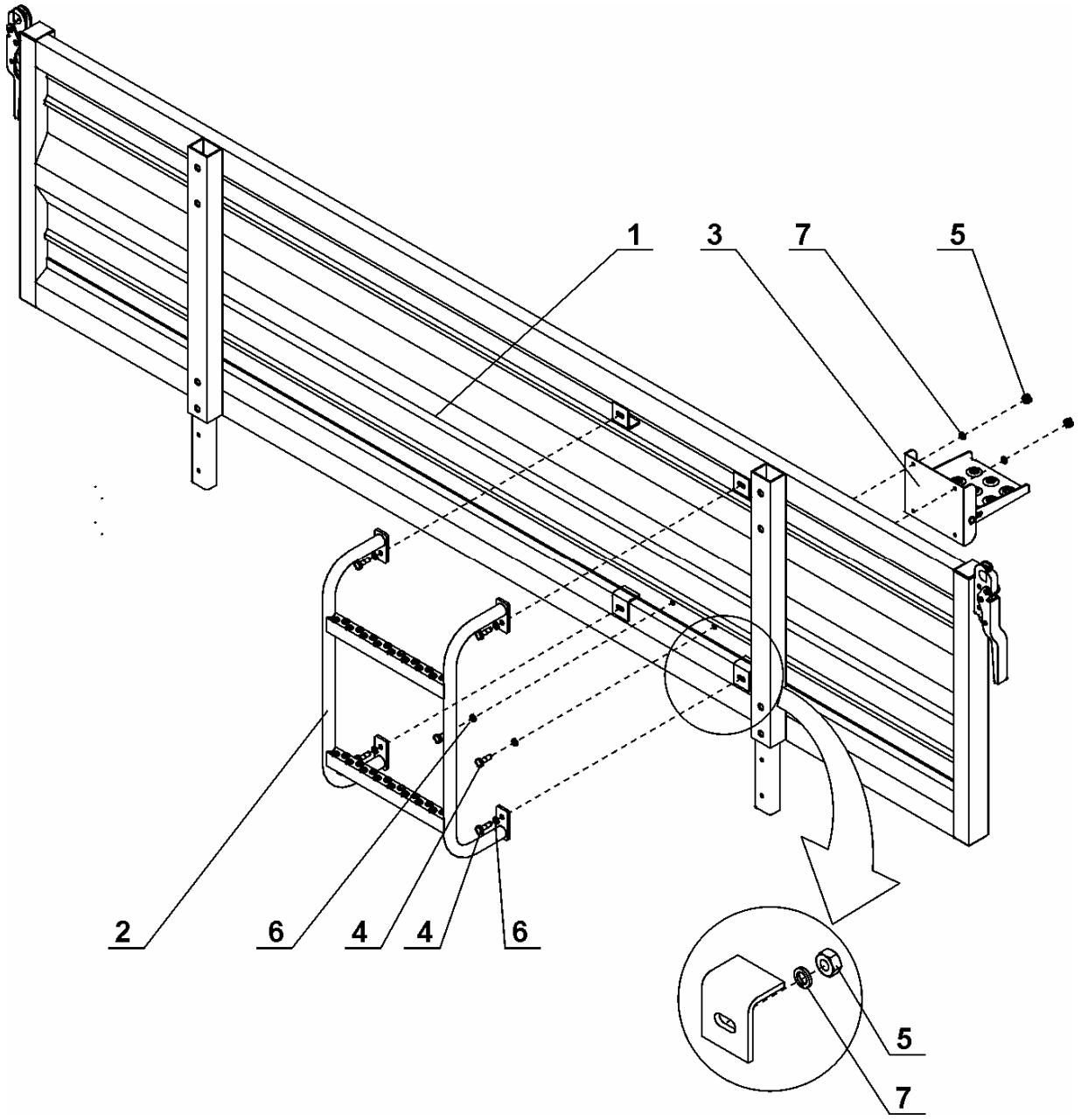


Fig. 31 Front superstructure, FUHRMANN 600, complete

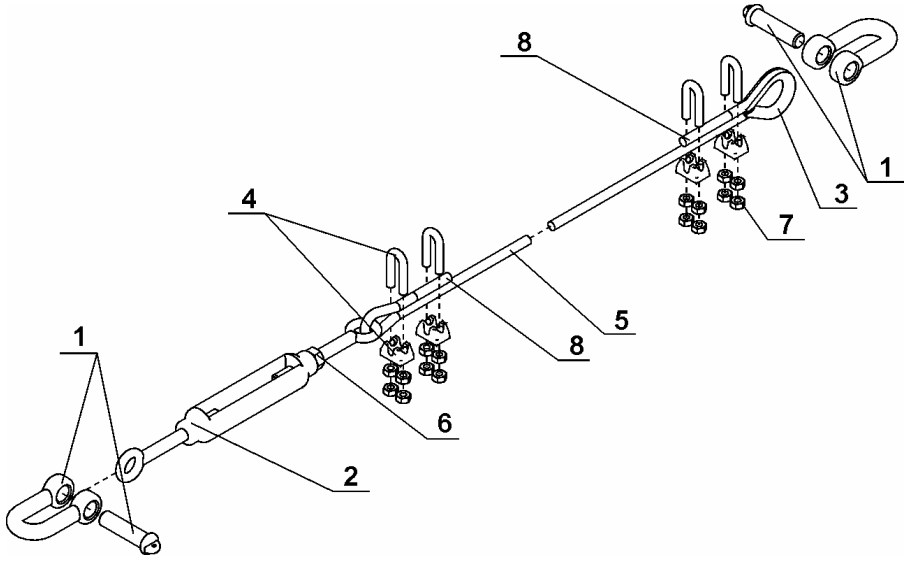


Fig. 32 Connecting cable, complete

Component name: SET OF SUPERSTRUCTURES, FUHRMANN 600			Quantity
Drawing No.: 30		No. of complete component/part: 62RPN 14.00.000	T680
No.	**Part name**	**Drawing / standard No.**	
1	Front superstructure	62RPN-14.01.000	1
2	Rear superstructure	62RPN-14.02.000	1
3	Side superstructure	62RPN-14.03.000	4
4	Side hinge bolt	62RPN-14.00.100	8
5	Rear hinge bolt	62RPN-14.00.200	2
6	Superstructure middle post	62RPN-14.00.300	2
7	Superstructure left post	62RPN-14.00.400	1
8	Superstructure right post	62RPN-14.00.500	1
9	Connecting cable, cpl.	62RPN-00.04.000	1
10	Upper hinge	45RPN-17.00.200	10
11	Pin S.3545		10
12	Screw		8
13	Screw M8X25-8.8-B-Fe/Zn5	PN-85/M-82105	4
14	Self-locking nut M12-6-B Fe/Zn5	PN-85/M-82175	10
15	Washer		8
16	Washer 8.5-Fe/Zn5	PN-86/M-82030	4
17	Washer		8
18	Washer Z8.2-Fe/Zn5	PN-77/M-82008	4

Component name: FRONT SUPERSTRUCTURE, FUHRMANN 600, COMPLETE			Quantity
Drawing No.: 31		No. of complete component/part: 62RPN-14.01.000	T680
No.	**Part name**	**Drawing / standard No.**	
1	Front superstructure	62RPN-14.01.000	1
2	Superstructure ladder	45RPN.17.00.100	1
3	Side step EB 20-010 Zn.		1
4	Screw M8x25-8.8-B-Fe/Zn5	PN-85/M-82105	6
5	Nut M8-5-B-Fe/Zn5	PN-86/M-82144	6
6	Washer 8.4-Fe/Zn5	PN-78/M-82005	6
7	Washer Z8.2-Fe/Zn5	PN-77/M-82008	6

Component name: CONNECTION CABLE, COMPLETE			Quantity
Drawing No.: 32		No. of complete component/part: 62RPN-00.04.000	T680
No.	**Part name**	**Drawing / standard No.**	
1	Shackle Zn S.4869		2
2	Stretcher M8x100 Zn S.11074		1
3	Thimble A6 Zn	PN-66/M-80247	1
4	Bail clamp 6.5 Zn	PN-73/M-80241	4
5	Cable R6 6x19+P+p l=2260		1
6	Nut M8-5-B Fe/Zn5	PN-86/M-82144	1
7	Nut M5-5-B Fe/Zn5	PN-86/M-82144	1
8	Heat-shrinkable pipe PBF 12/6 l=30	BN-89/C-89209	2

Caution! Give quantities refer to single connection cable

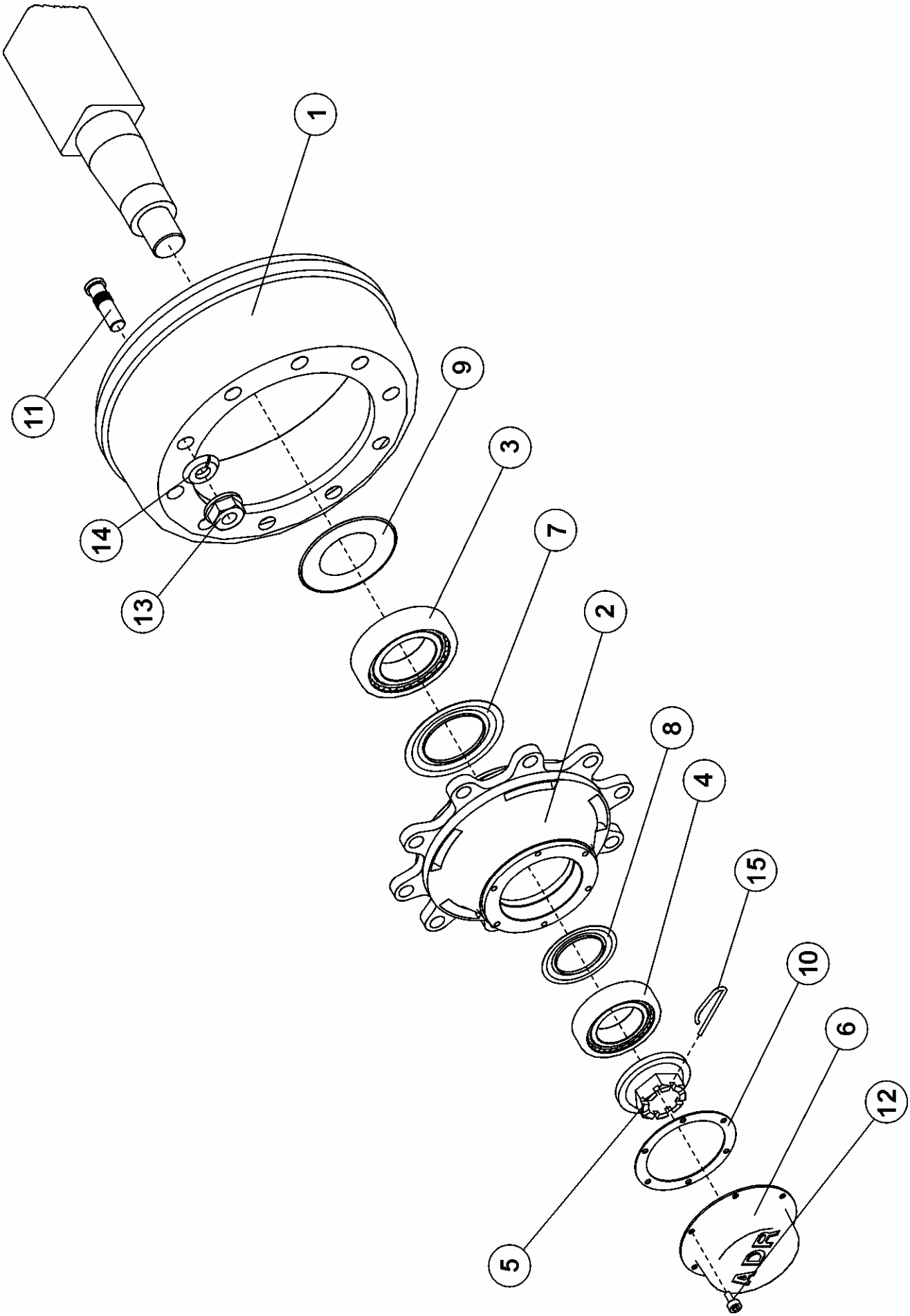


Fig. 33 Hub / drum + axle bearings

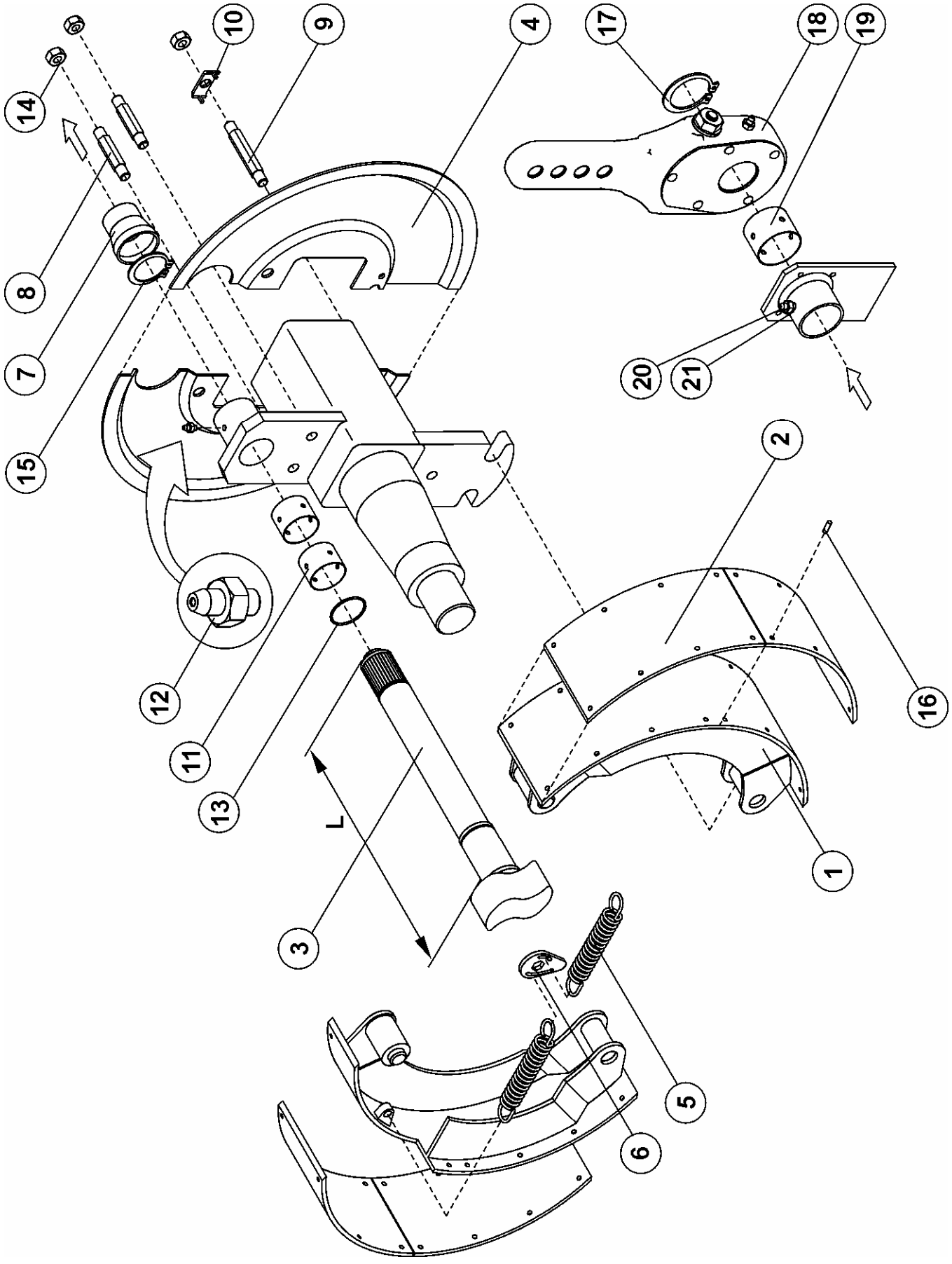


Fig. 34 Axle brake

Component name: HUB/DRUM + AXLE BEARINGS			Quantity
Drawing No.: 33		No. of complete component/part:	T680
No.	**Part name**	**Drawing / standard No.**	
1	Brake drum	66LV1050	1
2	Hub	611L0125150170	1
3	Bearing	902CC32217	1
4	Bearing	902CC32214	1
5	Crown nut M48x1.5	908DF48/65	1
6	Cap	912T125AC	1
7	Bearing shield	915N32217	1
8	Bearing shield	915PA72	1
9	Oil sealing	915PI150/87	1
10	Seal	918G125	1
11	Pin	903C22L1	10
12	Screw M8x1.25	914VB8x10	6
13	Nut M22x1.5	903D228G	10
14	Spring washer	903RL22G	10
15	Cotter pin	914C48E	1

Caution! Quantities given above refer to one axle drum.

Component name: AXLE BRAKE, COMPLETE			Quantity
Drawing No.: 34		No. of complete component/part:	T680
No.	**Part name**	**Drawing / standard No.**	
1	Brake shoe	9FC412	2
2	Brake lining	9FCI406-GUARN	4
3	Cam shaft	RIGHT 755D40M... ⊗ LEFT 756S4N... ⊗	1 1
4	Brake drum shield, set	910PP412 100	1
5	Spring	914M412/30	2
6	Stretcher	914SP262	1
7	Rubber shield	915C42	1
8	Special screw	906A10A	2
9	Special screw	906B10B	1
10	Special washer	915R10/21S	1
11	Bearing sleeve	921B42	2
12	Nipple	914INGR45	1
13	Sealing ring	921OR146	1
14	Self-locking nut	908DA10B	3
15	Outer retaining ring	914RES42	1
16	Rivet	930RIV	44
17	Outer retaining ring	915RES25	1
18	Brake lever	761W20004c0	1
19	Sleeve	921B38	1
20	Nipple	914INGR	1
21	Washer	915R08	1

⊗ - On the order give the cam shaft length (dimension L, drawing 32)

Caution! Quantities given above refer to one axle drum.

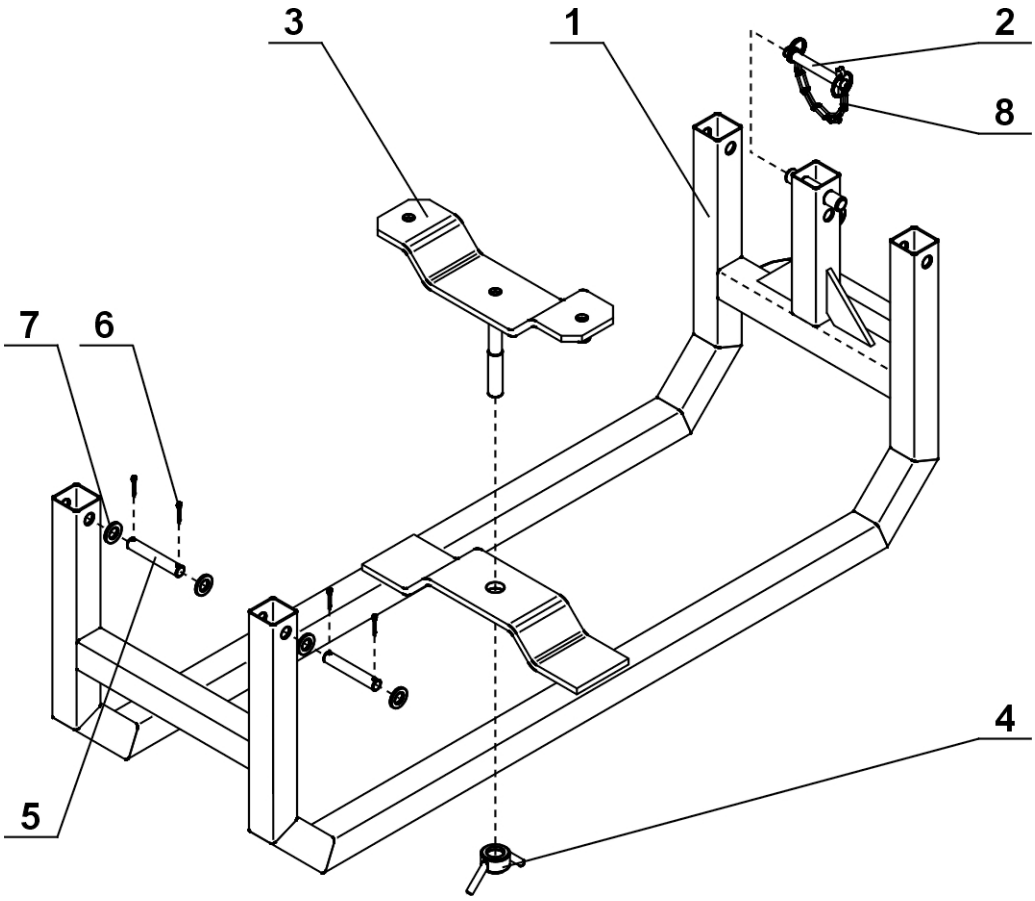


Fig. 35 Spare wheel bracket

Component name: SPARE WHEEL BRACKET			Quantity
Drawing No.: 35	No. of complete component/part: 62RPN-06.00.000		T680
No.	**Part name**	**Drawing / standard No.**	
1	Bracket fastening	62RPN-06.01.000	1
2	Pin, set	62RPN-06.02.000	1
3	Wheel fastener	62RPN-06.03.000	1
4	Fastening nut	62RPN-06.04.000	1
5	Bolt	62RPN-06.00.006	2
6	Cotter pin S-Zn 4x32	PN-76/M-82001	4
7	Washer 17 Fe/Zn5	PN-78/M-82005	4
8	Sanitary chain		1

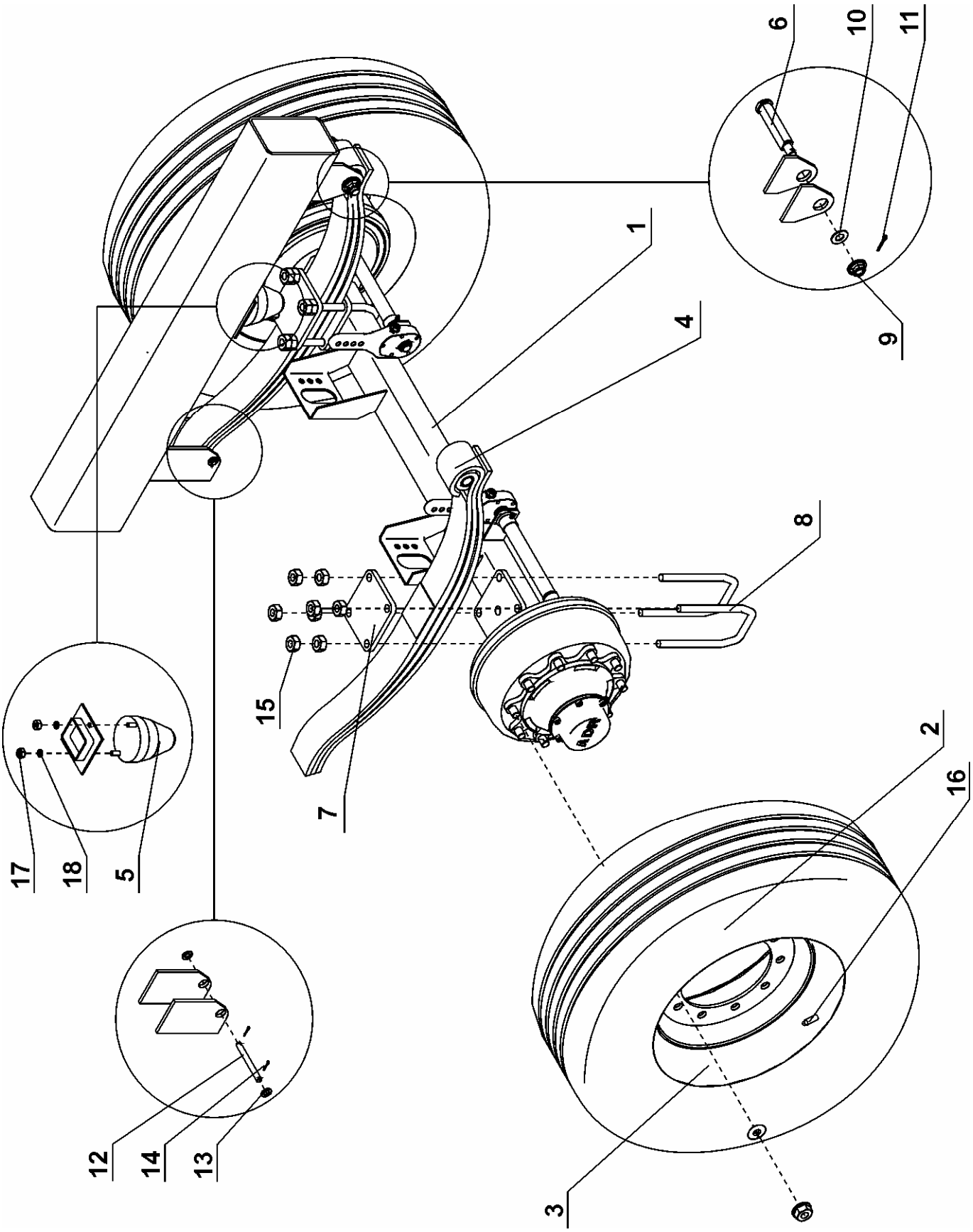


Fig. 36 Axle suspension

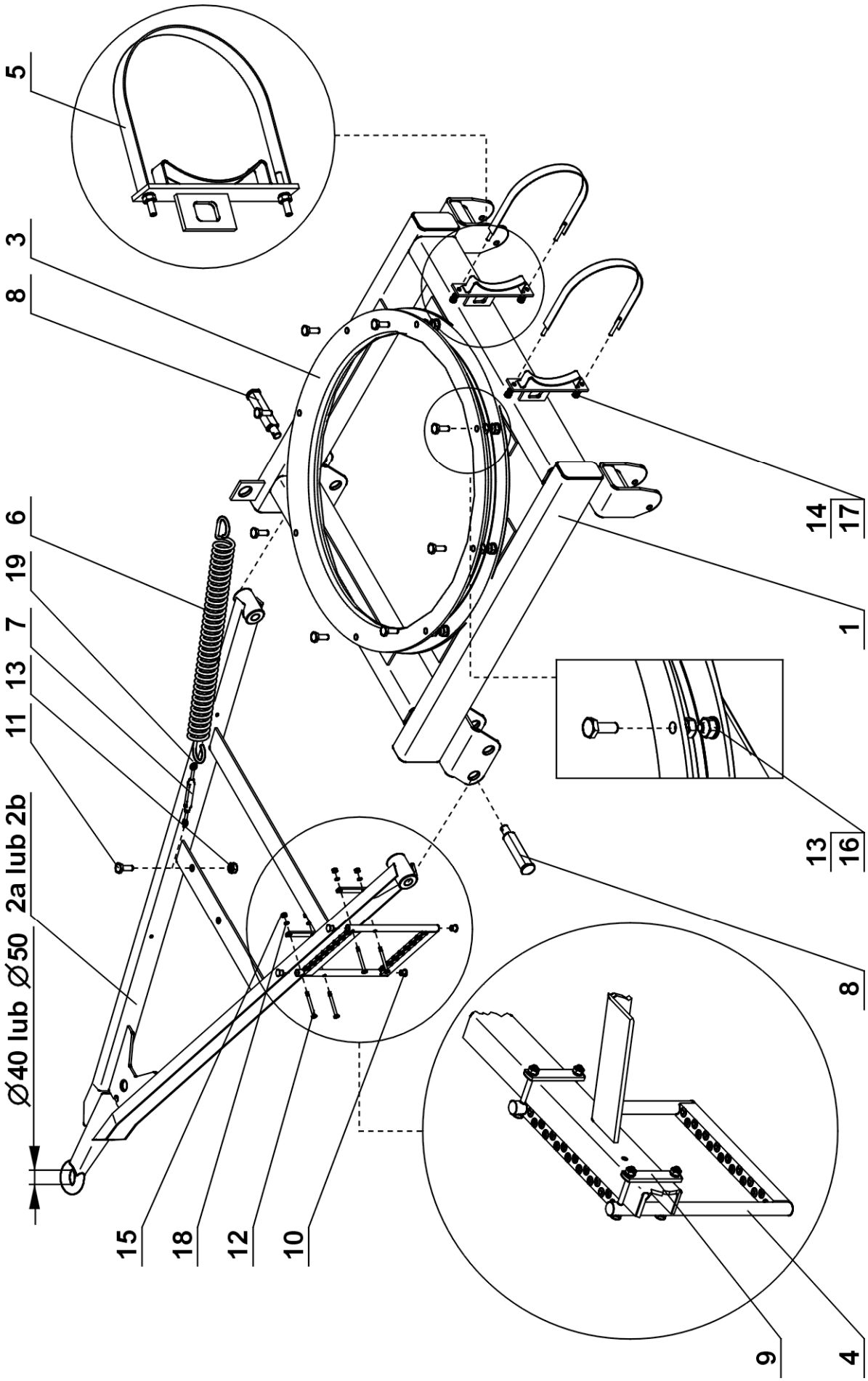


Fig. 37 Hitch rod, turntable and turntable frame

Component name: DRIVE AXLE SUSPENSION			Quantity
Drawing No.: 36		No. of complete component/part: 62RPN 00.00.000 62RPN 00.06.000 62RPN 00.10.000	T680
No.	**Part name**	**Drawing / standard No.**	
1	Drive axle cpl. □100	62RPN-00.06.000	2
2	Tyre 15R22.5 18 PR		4
3	Disc wheel 11.75x22.5''	225117506	4
4	Parabolic suspension spring 3-feather	62RPN-00.00.100	4
5	Rubber suspension	62RPN-00.00.001	4
6	Suspension spring bolt, set	62RPN-00.00.300	4
7	Upper spring plate	58RPN-00.00.003	4
8	Bail screw	62RPN-00.00.003	8
9	Crown nut M24-8-B-Fe/Zn5	PN-86/M-82148	4
10	Washer 25 Fe/Zn5	PN-78/m82005	4
11	Cotter pin S-Zn 5x50	PN-76/M-82001	4
12	Suspension spring bolt	45RPN-00.03.001	4
13	Washer 17 Fe/Zn5	PN-76/M-82005	8
14	Cotter pin S-Zn 4x32	PN-76/M82001	8
15	Nut M20x1.5-5-B-Fe/Zn5	PN-86/M-82144	32
16	Valve TR415		4

Wheel, cpl.	**62RPN-00.10.000**
Drive axle cpl.	**62RPN-00.06.000**

Caution! Quantities given above refer to the entire trailer

Component name: HITCH ROD, TURNTABLE AND TURNTABLE FRAME			Quantity
Drawing No.: 37		No. of complete component/part: 62RPN 00.00.000 53RPN 00.01.000	T680
No.	**Part name**	**Drawing / standard No.**	
1	Turntable frame	62RPN 03.00.000	1
2a	Hitch rod ∅50	62RPN 04.00.000	1
2b	Hitch rod ∅40	62RPN-24.00.000	1
3	Turntable	62RPN 00.00.200	1
4	Hitch rod ladder		1
5	Air reservoir band	45RPN 00.13.000	2
6	Spring	29RPN 00.00.001	1
7	Stretcher M12 S.11076		1
8	Suspension spring bolt, set	45RPN 00.03.300	2
9	Fastening plate	53RPN 00.01.002	2
10	Stopper IK22		4
11	Screw M16x45-8.8-B Fe/Zn5	PN-85/M-82105	17
12	Screw M8x80 –5.8-B-Fe/Zn5	PN-85/M-82101	4
13	Nut M16-8-B Fe/Zn5	PN-85/M-82175	17
14	Nut M10-5-B Fe/Zn5	PN-86/M-82144	4
15	Nut M8-5-B Fe/Zn5	PN-86/M-82144	4
16	Washer 17 Fe/Zn5	PN-76/M-82005	16
17	Washer Z10.2 Fe/Zn5	PN-77/M-82008	4
18	Washer Z8.2	PN-77/M-82008	4
19	Spring catch cpl.	65RPN-00.01.000	1

Hitch rod ladder cpl.	**53RPN-00.01.000**

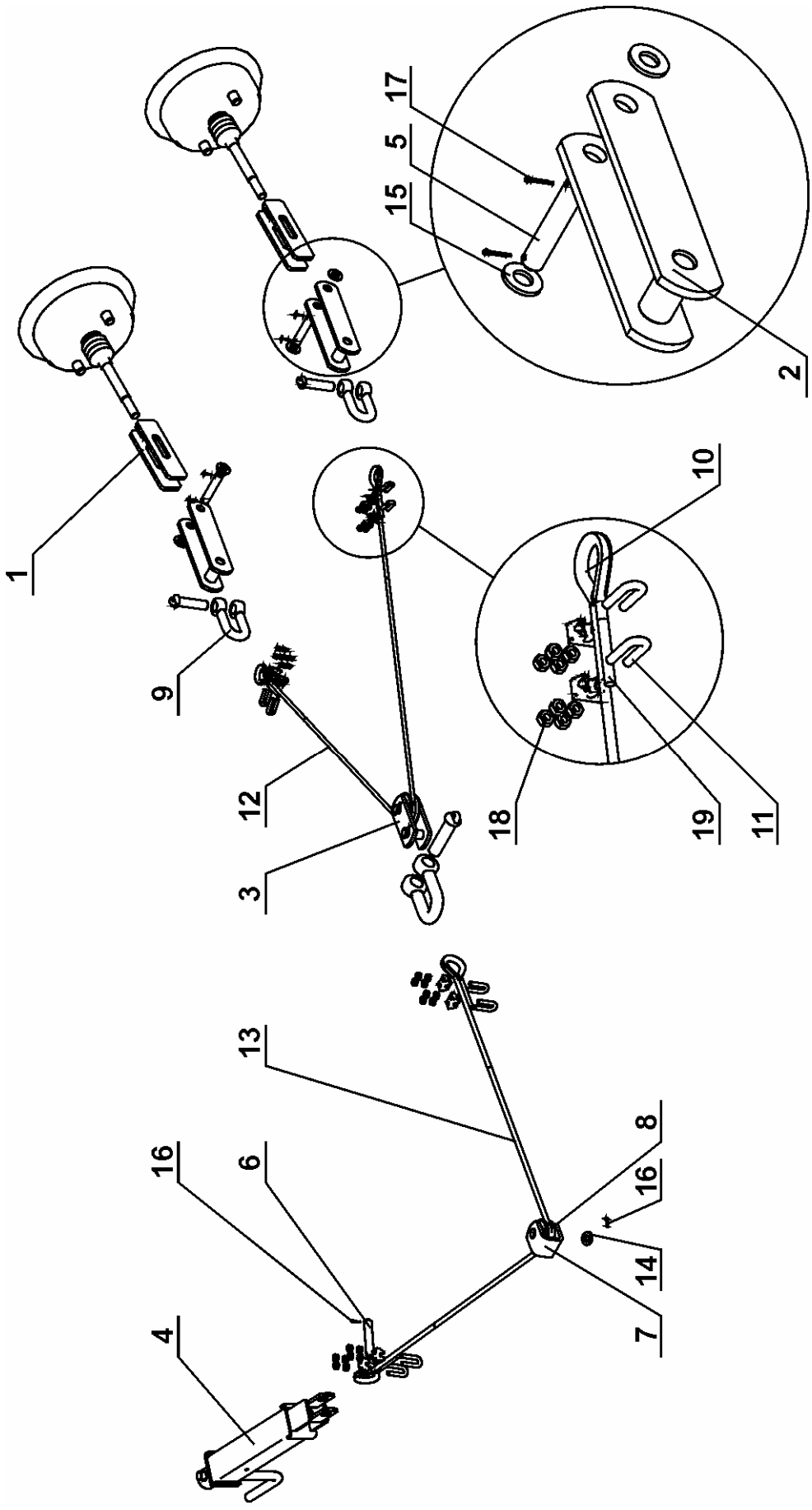


Fig. 38 Parking brake

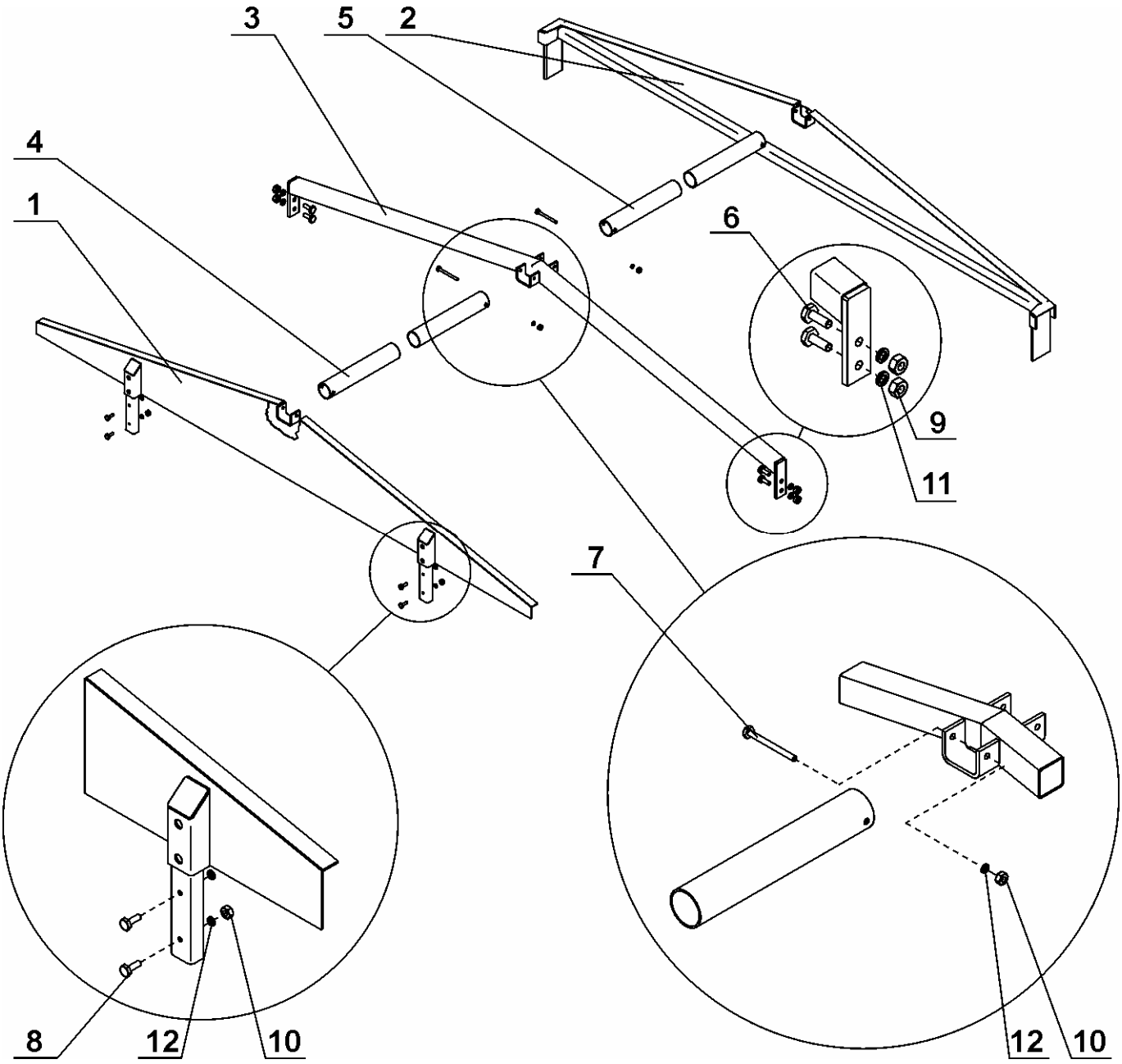


Fig. 39 Tarpaulin frame

Component name: PARKING BRAKE			Quantity
Drawing No.: 38		No. of complete component/part: 62RPN-17.00.000	T680
No.	**Part name**	**Drawing / standard No.**	
1	Cylinder fork	58RPN-12.01.000	2
2	Parking brake lever	45RPN-22.01.000	2
3	Brake lock	31RPN-05.01.000	1
4	Brake gear	29RPN-12.01.000	1
5	Brake bolt	45RPN-22.00.002	2
6	Bolt	29RPN-12.00.001	1
7	Cable catch	29RPN-01.00.018	1
8	Cable wheel	29RPN-13.00.001	1
9	Screw shackle S.2768		3
10	Thimble A6 Zn	PN-66/M-80247	4
11	Bail clamp 6.5 Zn	PN-73/M-80241	8
12	Cable ∅6 6x19+P+p l=1200		1
13	Cable ∅6 6x19+P+p l=1000		1
14	Washer 17 Fe/Zn5	PN-78/M-82005	1
15	Washer 13 Fe/Zn5	PN-78/M-82005	4
16	Cotter pin S-Zn 4x40	PN-76/M-82001	3
17	Cotter pin S-Zn 3.2x25	PN-76/M-82001	4
18	Nut M5-5-B Fe/Zn5	PN-86/M-82144	16
19	Heat-shrinkable pipe PBF 12/6 l=30	BN-89/C-89209	4

Component name: TARPAULIN FRAME			Quantity
Drawing No.: 39		No. of complete component/part: 62RPN-18.01.000	T680
No.	**Part name**	**Drawing / standard No.**	
1	Front gable	62RPN-18.01.100	1
2	Rear gable	62RPN-18.01.200	1
3	Middle gable	62RPN-18.01.300	1
4	Tube I	62RPN-18.01.001	1
5	Tube II	62RPN-18.01.002	1
6	Screw M12x35–5.8-B Fe/Zn5	PN-85/M-82105	4
7	Screw M8x90-5.8-B Fe/Zn5	PN-85/M-82101	2
8	Screw M8x25-8.8-B-Fe/Zn5	PN-85/M-82105	4
9	Nut M12-5-B Fe/Zn5	PN-86/M-82144	6
10	Nut M8-5 Fe/Zn5	PN-86/M-82144	6
11	Spring washer Z12.2 Fe/Zn5	PN-77/M-82008	6
12	Spring washer Z8.2 Fe/Zn5	PN-77/M-82008	4

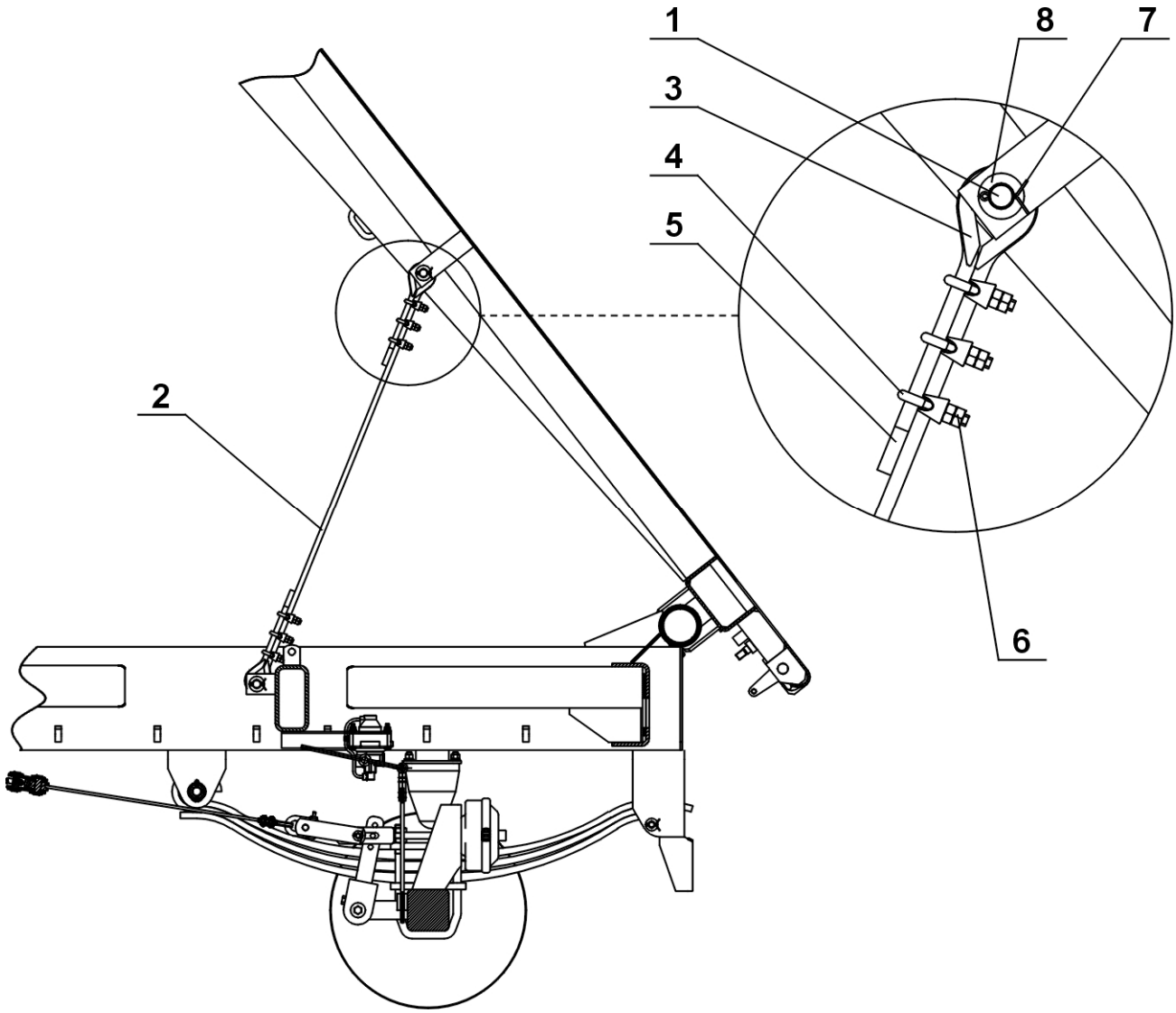


Fig. 40 Tilt lock

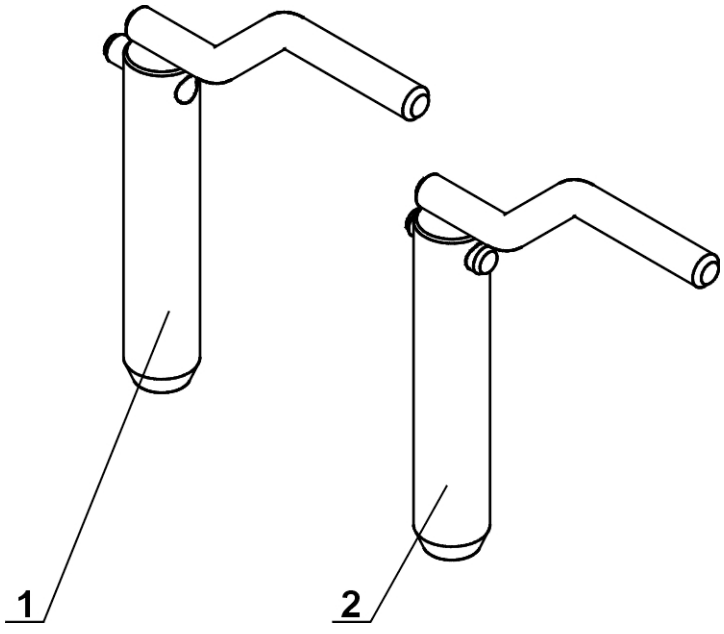


Fig. 41 Tilt bolts

Component name: TILT LOCK			Quantity
Drawing No.: 40	No. of complete component/part: 62RPN-16.00.000		T680
No.	**Part name**	**Drawing / standard No.**	
1	Support bolt	29RPN-00.00.009	4
2	Cable ∅12 T6x37+A_0 l=1800		2
3	Thimble A12 Zn.	PN-66/M-80247	4
4	Bail clamp 12 Zn.	PN-73/M-80241	12
5	Heat-shrinkable pipe PBF 18/6 l=30	BN-89/C-89209	4
6	Nut M8-5-B Fe/Zn5	PN-86/M-82144	24
7	Cotter pin S-Zn 4x32	PN-76/M-82001	8
8	Washer 21 Fe/Zn5	PN-78/M-82005	8

Component name: TILT BOLTS			Quantity
Drawing No.: 41	No. of complete component/part: 45RPN-00.07.000 45RPN-00.08.000		T680
No.	**Part name**	**Drawing / standard No.**	
1	Tilt bolt I	45RPN-00.07.000	1
2	Tilt bolt II	45RPN-00.08.000	1

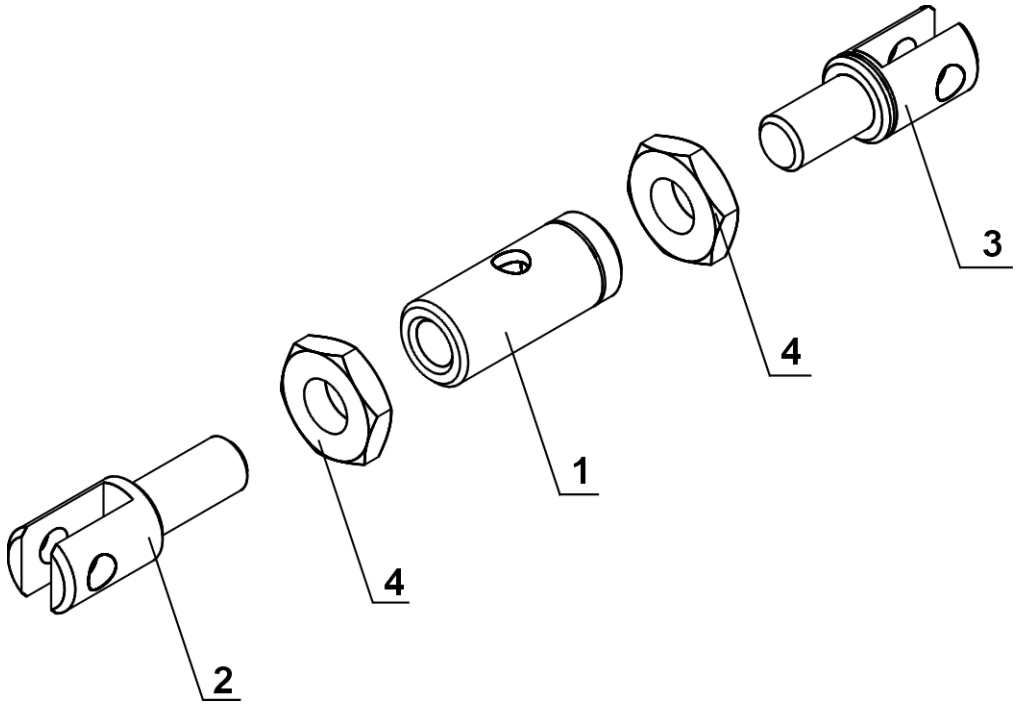


Fig. 42 Pull rod, cpl

Component name: PULL ROD, CPL			Quantity
Drawing No.: 42	No. of complete component/part: 29RPN-00.00.300		T680
No.	**Part name**	**Drawing / standard No.**	
1	Threaded sleeve	29RPN-00.00.303	1
2	Right screw	29RPN-00.00.302	1
3	Left screw	29RPN-00.00.301	
4	Nut M16-05-B Fe/Zn5	PN-86/M-82153	2