MANUFACTURER

PRONAR Sp. z o.o.

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AGRICULTURAL MONOCOQUE TRAILER / DUMPER „TANDEM”

T669

OPERATION & MAINTENANCE MANUAL

Identification of the machine

Symbol /Type: T669

KTM Symbol: 1026-634-847-708

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 agricultural produce as well as loose and volume materials within farm limits and on public roads.

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

The trailer is adapted for coupling with agricultural tractors fitted with external hydraulic system and a hook for single-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 should be the basic principle of trailer's use.
- Persons unauthorised for driving agricultural tractors including children and drunken 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 resulting 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.
- For coupling with tractor use only hooks for single-axle trailers. Check 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

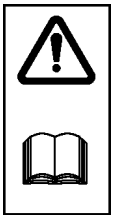
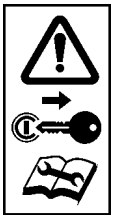
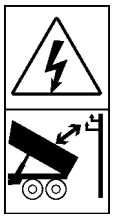
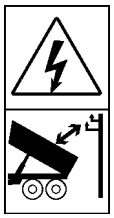
Safety sign or text	Explanation	Location
	Read operation manual	Front wall
	Prior to maintenance & repair stop the engine and remove the ignition key	Front wall
	Prior to maintenance & repair secure the load crate	Right & left wall

Table 1. Information & warning stickers, continued

Safety sign or text	Explanation	Location
	Take special precautions while operating near to energetic lines	Right & left wall
	Take special precautions while opening / closing the rear flap	Right & left wall
1 2 (for hydraulic systems of I and II trailer)		Cut-off valve
Load: **With superstructures 13500 kg** **W/o superstructures 14100 kg**		Right & left wall
25 kN	Minimum vertical load of tractor's hitch	Hitch rod
280 kPa	Tyre pressure 50x20.0 R22 32PR	Above wheels, right & left wall
210 kPa	Tyre pressure 550/60-22.5 12PR	Above wheels, right & left wall
280 kPa	Tyre pressure 550/60-22.5 16PR	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)).

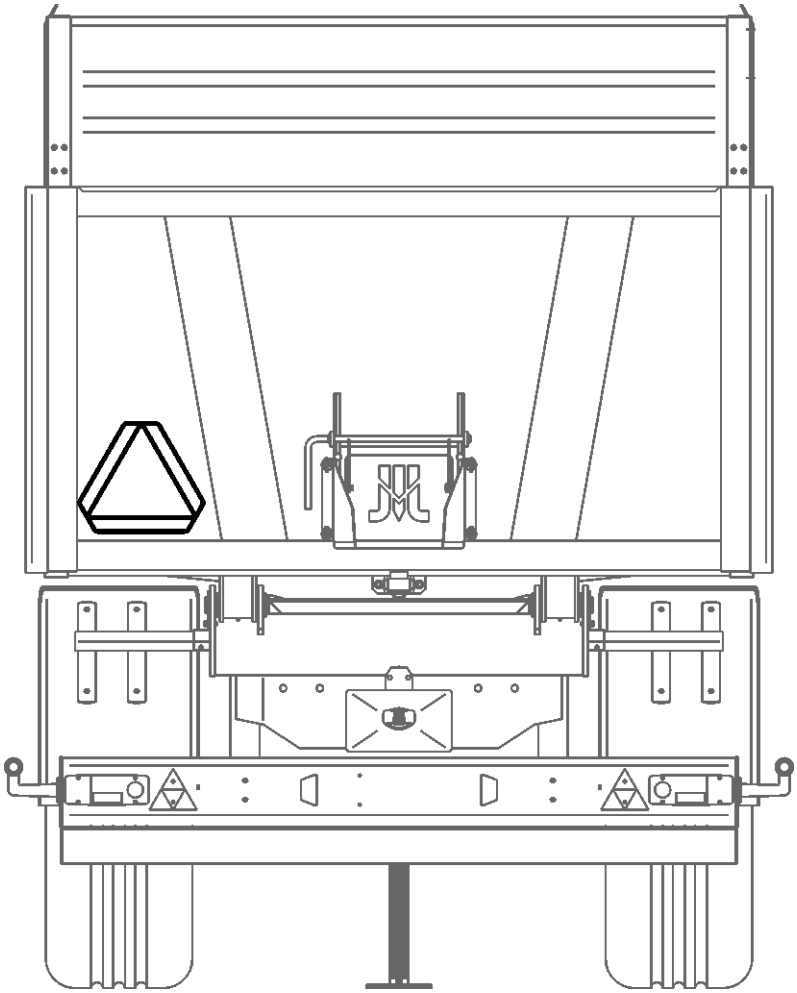


Fig. 1 Location of a triangular plate for slowly moving vehicles.

It is prohibited to leave unsecured trailer. Always activate the parking brake.

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

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 within 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	T669 with various tyre variants			
			50x20.0R22 32PR	550/60-22.5 12PR	550/60-22.5 16PR	385/65-R22.5 18PR
1	Overall length	mm	7103	7103	7103	7103
2	Overall width	mm	2550	2550	2550	2550
3	Overall height w/o superstructures	mm	2754	2764	2764	2680
4	Overall height with superstructures	mm	3334	3344	3344	3260
5	Wheel base	mm	1920	1900	1900	1900
6	Load crate internal dimensions:					
	- length (lower/upper)	mm	5500/5760	5500/5760	5500/5760	5500/5760
	- width (front / rear)	mm	2200/2250	2200/2250	2200/2250	2200/2250
	- height w/o superstructures	mm	1200	1200	1200	1200
	- height with superstructures	mm	1780	1780	1780	1780
7	Load volume (with superstructures)	m^3	22.4	22.4	22.4	22.4
8	Load surface	m^2	12.2	12.2	12.2	12.2
9	Load surface height above ground	mm	1511,5	1521,5	1521,5	1436,5
10	Weight w/o superstructures	kg	5900	5900	5900	5900
11	Weight with superstructures	kg	6500	6500	6500	6500
12	Admissible load w/o superstructures	kg	14100	14100	14100	14100
13	Admissible load with superstructures	kg	13500	13500	13500	13500
14	Load crate tilt angle	(°)	50	50	50	50
15	Tyre pressure	kPa	280	210	280	800
16	Rated voltage	V	12	12	12	12
17	Admissible speed	km/h	30	30	30	30
18	Hydraulic oil capacity	l	29	29	29	29

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		
50x20.0 R22 32PR	170 A8	Rib	16.00x22	605	6420	6000		280	
550/60-22.5 12PR	164 A8	TR 08	16.00x22.5	544	5350	5000		210	Vredestein
550/60-22.5 16PR	163 A8	TR 08	16.00x22.5	542	5216	4875		280	Mitas
15.0 R22.5 18PR (385/65R R22.5)	160F	Y-1	11.75x22.5	485	5125	4715	4100 (80 km/h)	800	Guma Bolechowo

4.2 TRUCTURE AND OPERATIONAL PRINCIPLE

4.2.1 Undercarriage

Fig. 2 Undercarriage.

1 – lower frame, 2 – hydraulic cylinder, 3 – hitch rod, 4 – load crate, 5 – load crate support, 6 –hydraulic support, 7 - axle.

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 middle part is fitted with a seat for hydraulic cylinder (2). The rear part of the frame is fitted with elements for fastening of axle, elements connecting the lower frame with the load crate (4) and elements of rear lighting assembly.

Axles (7) 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

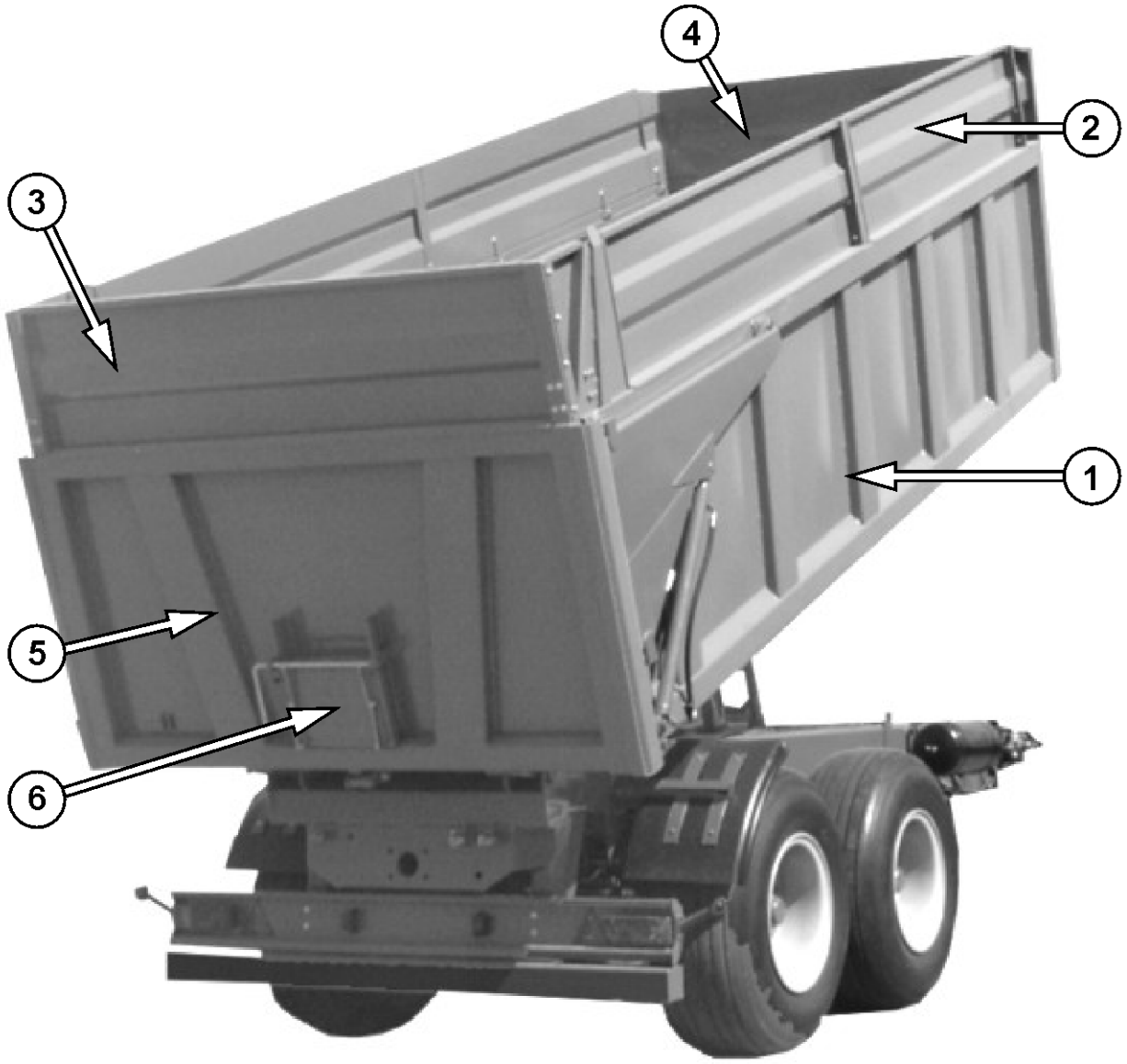


Fig. 3 Load crate elements.

1 – load crate, 2 – side superstructures, 3 – rear superstructure, 4 – front superstructure, 5 – rear flap, 6 – chute flap

4.2.3 Hydraulic tilting system

Hydraulic tilting system is designed for automated unloading of the trailer through raising of the rear flap and tilting the load crate backwards. The hydraulic system is supplied with oil from tractor's hydraulic system and consists of two separate circuits: for raising / lowering the load crate and for raising / lowering the rear flap.

The circuit for raising / lowering the load crate consists of hydraulic conduits, hydraulic cylinder, cut-off valve and control cable for the cut-off valve.

The purpose of the cable (7) is to cut-off the flow of hydraulic oil to the cylinder (1) through switch-over of the cut-off valve (2) if maximum tilt angle is exceeded. The hydraulic system diagram is shown on the fig. 4.

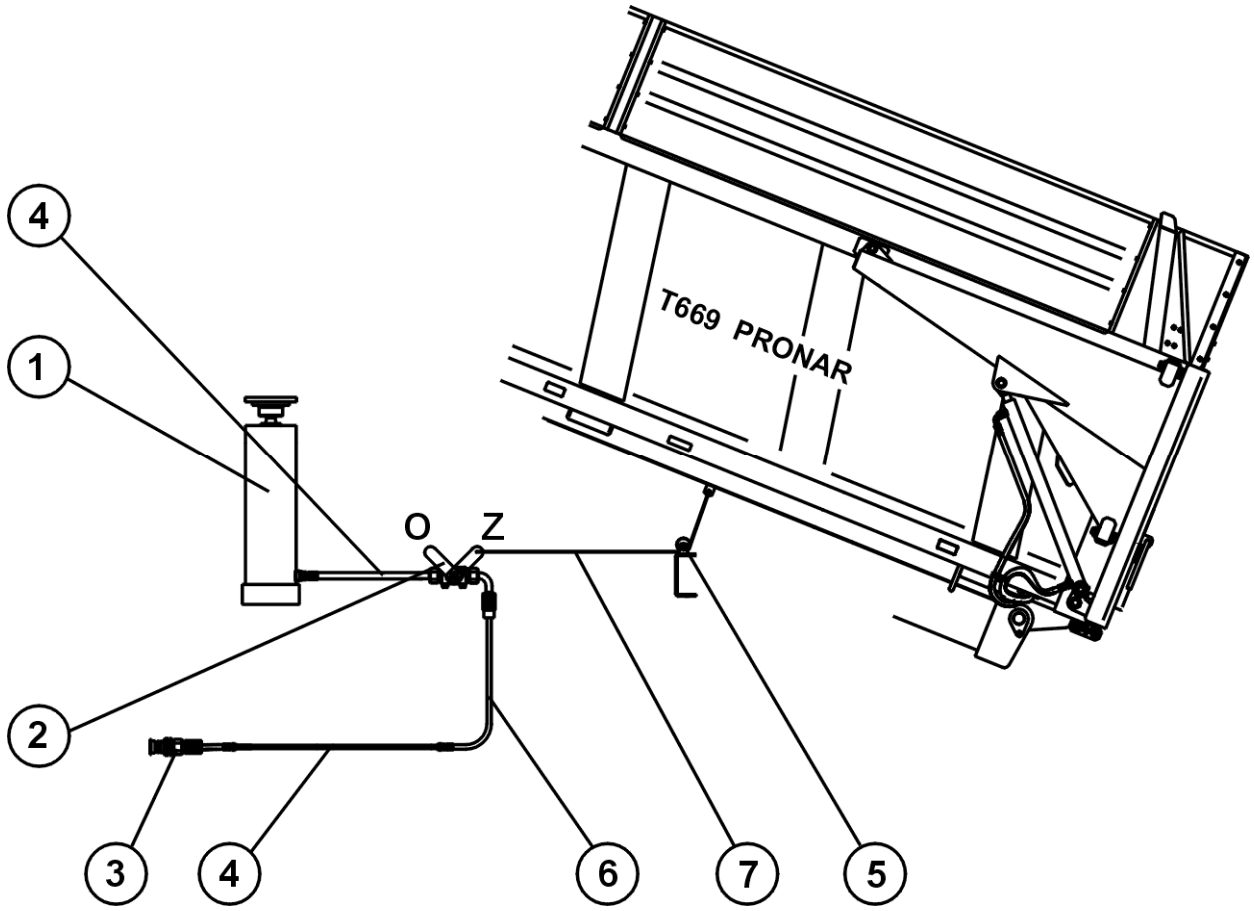


Fig. 4 Load crate tilt hydraulic system.

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

CAUTION!

The cut-off valve 2 (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.

The circuit for raising / lowering the rear flap consists of two double-action hydraulic cylinders and hydraulic conduits. When the system works, cylinders control operation of locking hooks. When the rear flap is closing, locking hooks lock it (pos. (a), fig. 5).

CAUTION!

When the rear flap is lowered the locking hook must lock completely the locking bolt of the rear flap (3) (fig. 5).

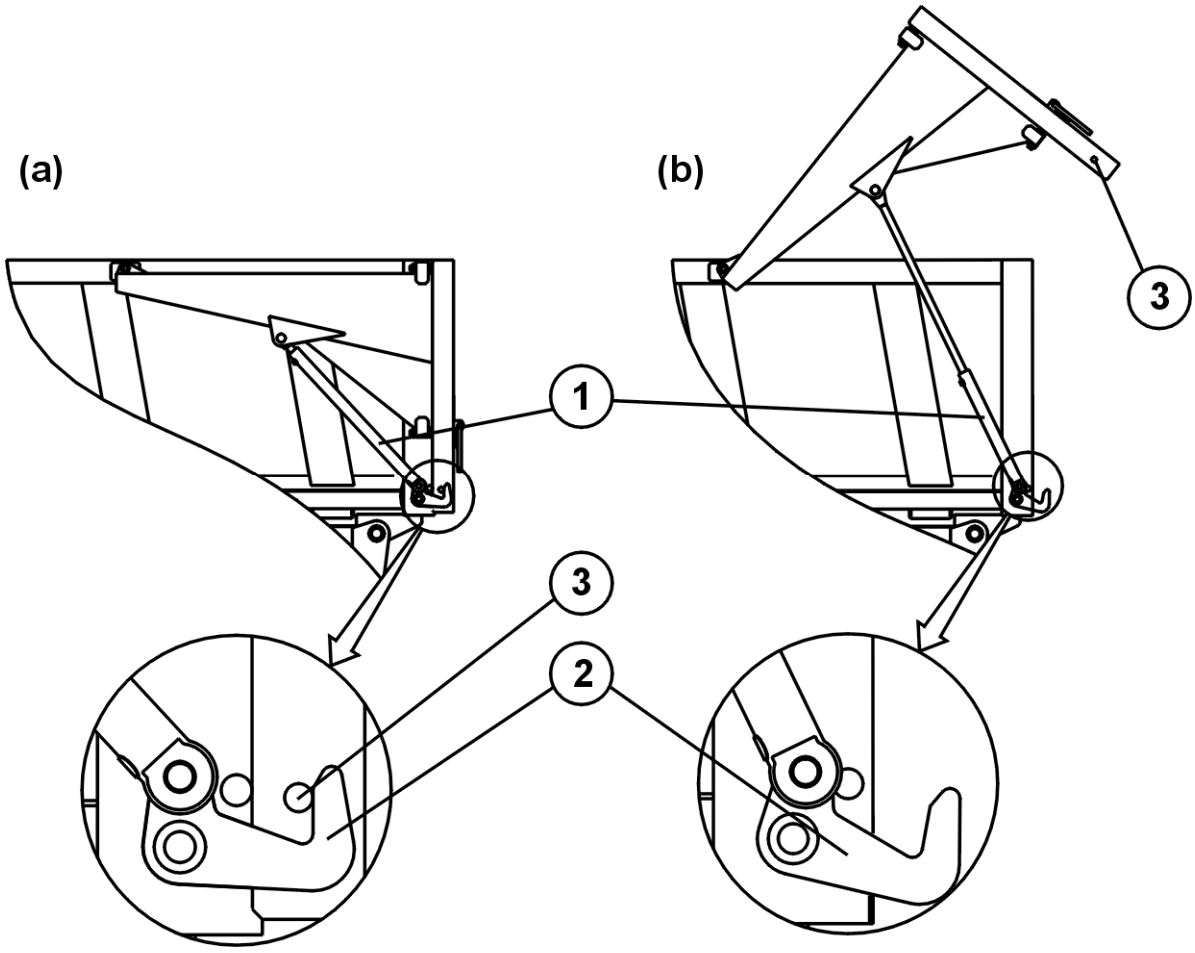


Fig. 5 Operation of the rear flap.

1 – double-action hydraulic cylinder, 2 – locking hook, 3 – rear flap locking bolt

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.

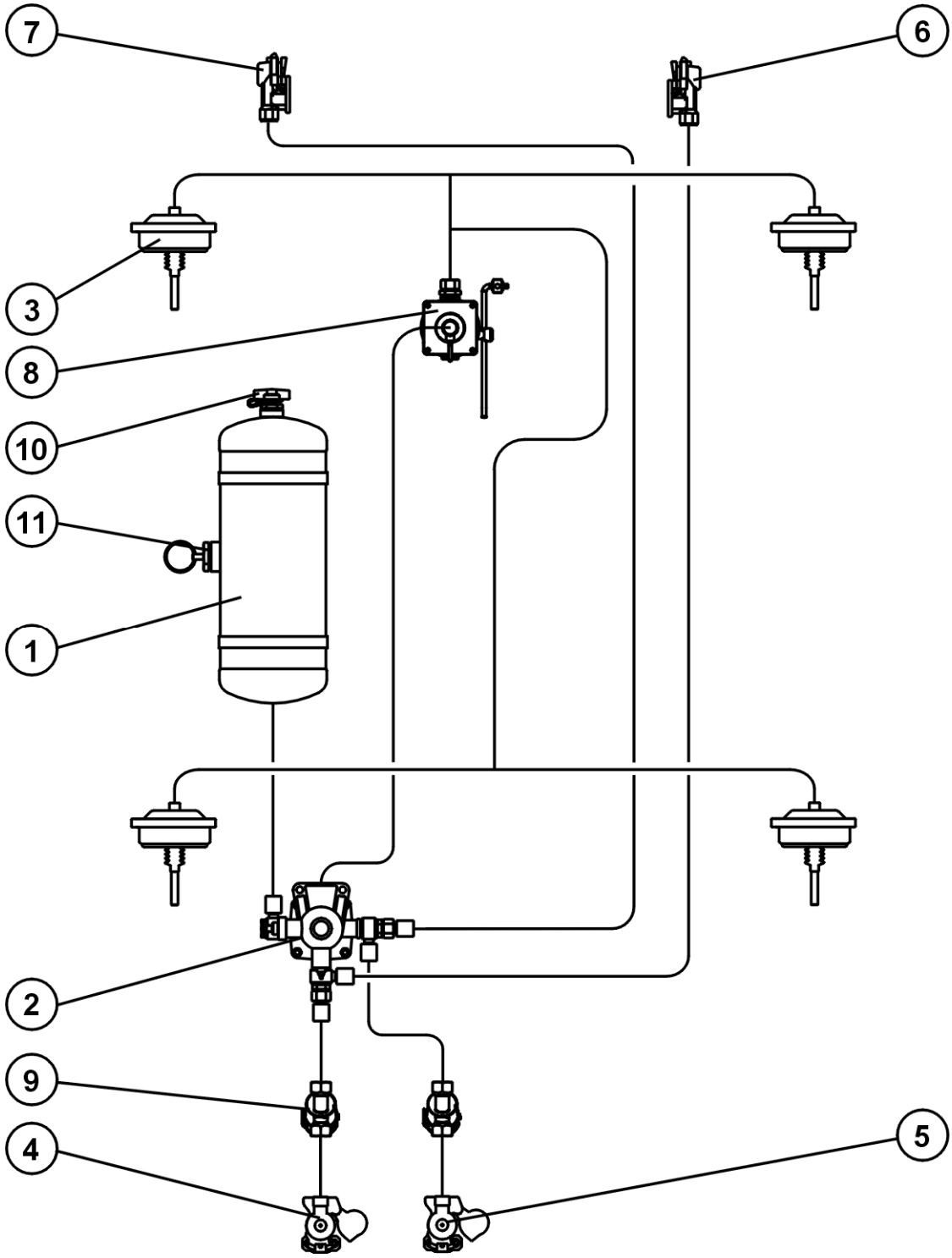


Fig. 6 Two-conduit pneumatic braking system with automated braking force controller.

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

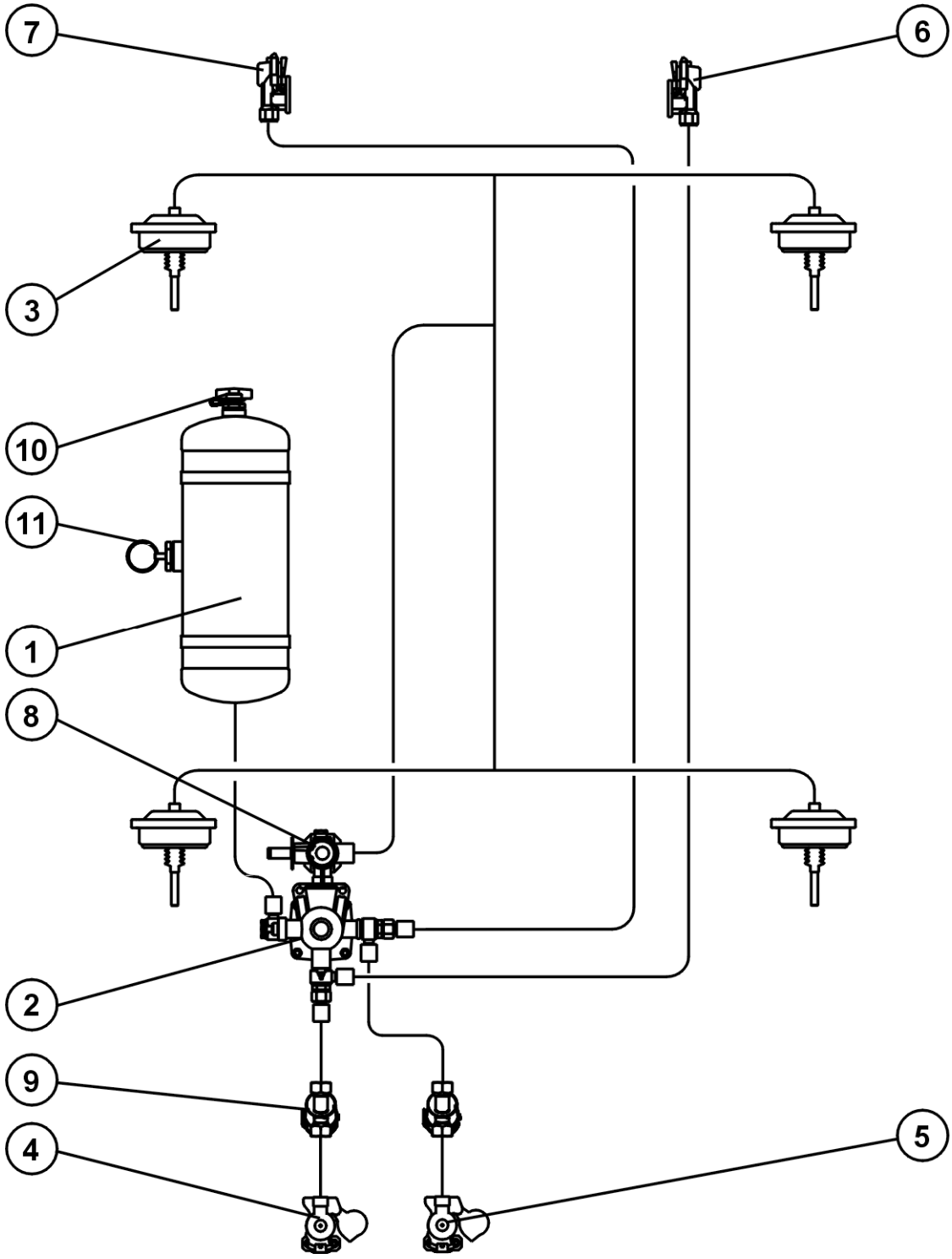


Fig. 7 Two-conduit pneumatic braking system with three-range braking force controller.

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 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.

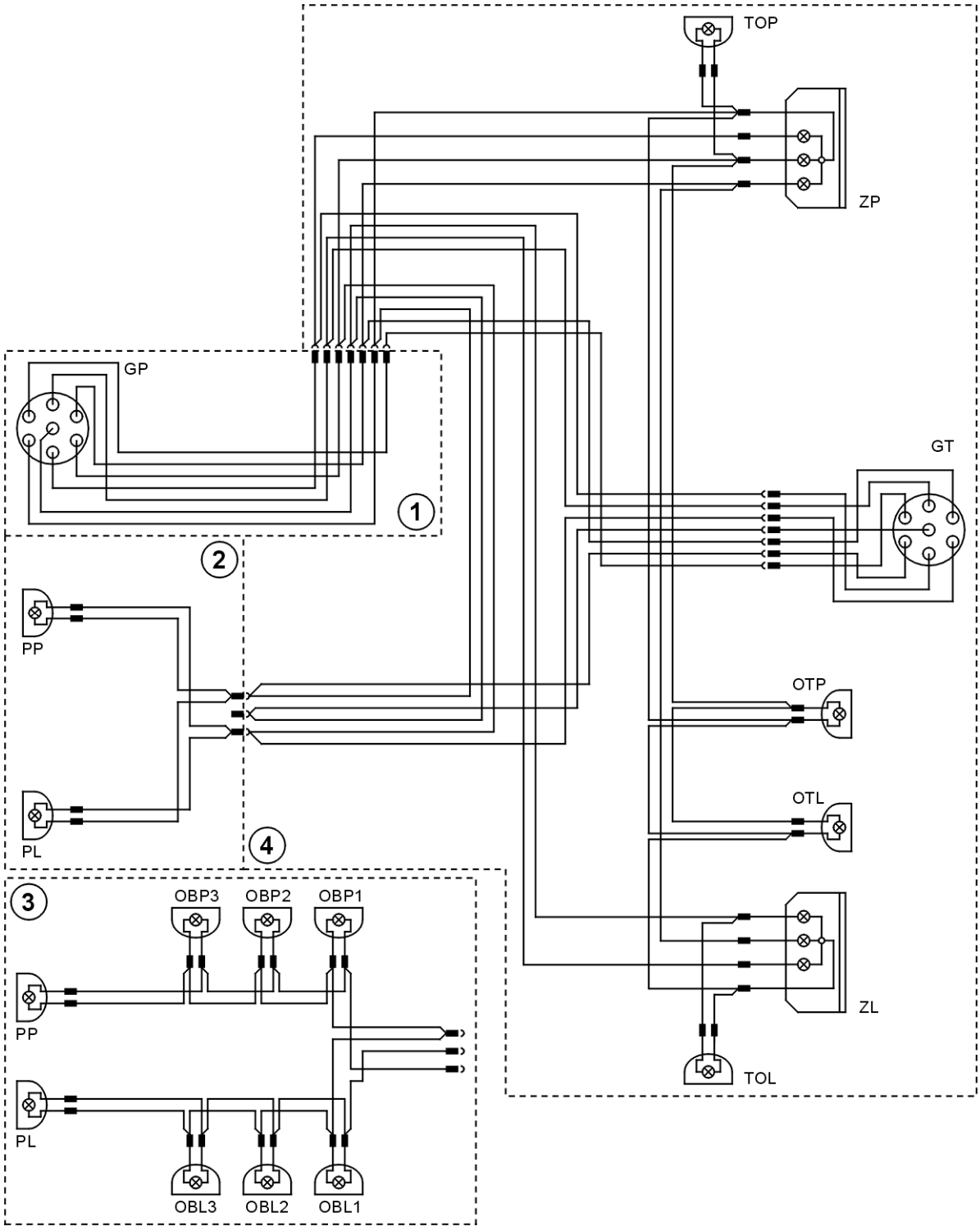


Fig. 8 Wiring system diagram.

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), OBP (OBL) – side contour lamp right (left)

1 – central bundle, 2 – front bundle (Polish version), 3 – front bundle (Danish version), 4 – rear bundle

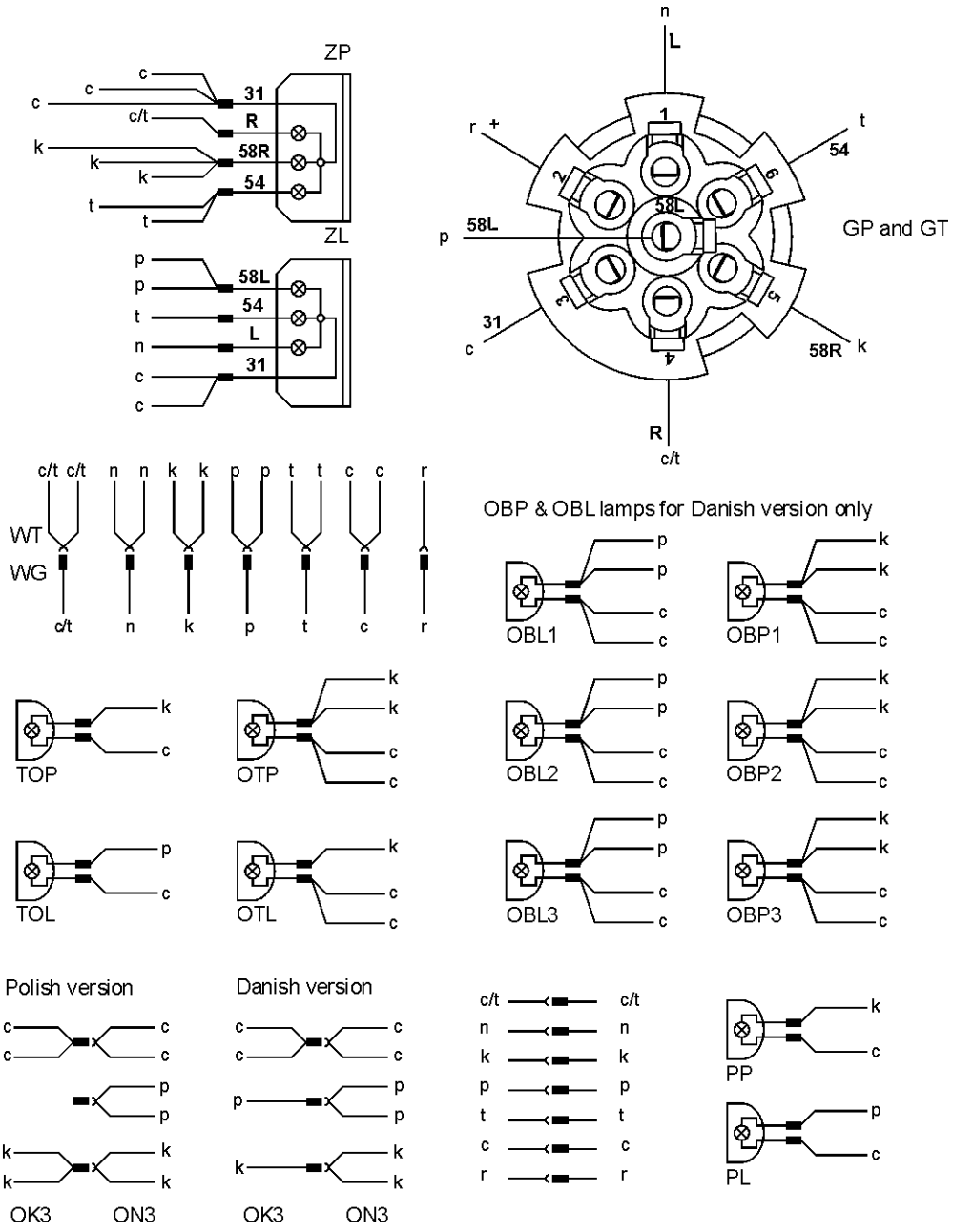


Fig. 9 Connection of conductors.

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. The tractor should be fitted with a tow hook, which is able to carry min. 25 kN (2500 kg) vertical load.

To couple trailer with tractor it is necessary to perform following operations:

- Position the hitch rod eye on suitable level.
- Precise adjustment of the hitch rod can be achieved with help of the hydraulic support. For this purpose draw back the tractor and connect the hydraulic support conduit to the tractor; then open the support securing valve and position the hitch rod eye.
- Draw back the tractor, couple hitch rod eye with the lower tow coupling on the tractor and check its fastening.
- Raise the support
- Connect electrical, hydraulic (tilt + rear flap) 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**
- **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 the chute of the rear flap is 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	0,6
cement, dry gravel, soil, brick	0,7
manure, full brick, mineral fertiliser	1,2
rye, potatoes, maize, rape, wheat	1,5
barley, oats, peat, coke	1,8

CAUTION!

It is prohibited to exceed the admissible trailer load. Overload may endanger traffic safety and damage the trailer.

4.3.4 Transport

- 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. 2)).

4.3.5 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.

4.3.6 Load crate unloading

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

CAUTION!

It is prohibited to raise loaded crate when the flap is closed.

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.
- Open the rear flap with help of hydraulic cylinders.
- Tilt the load crate by raising it with the hydraulic cylinder.

CAUTION!

- **It is allowed to tilt the load crate only when the trailer stands on hard, flat ground.**
- **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.**

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. Having unloaded the trailer lower the load crate.

- Lower the load crate.
- Close the rear flap by controlling relevant circuit from the tractor. Closing / opening the flap is realised with 2 double-action hydraulic cylinders (pos. 1 fig. 5). The rear flap closing should be realised until the flap becomes locked with locking hooks (pos. 2 fig. 5).

CAUTION!

- **Take special precautions while closing the rear flap because, otherwise resulting injuries may cause serious health detriment or – in certain cases - death.**
- **Take special precautions while closing flap chute to avoid crushing fingers.**
- **Do not move and/or drive with the load crate in upper position.**

4.3.7 Uncoupling the tractor.

To uncouple the trailer perform following actions:

- Stop the tractor and the trailer with the parking brake.
- With help of the hydraulic support place the trailer at proper height and secure with the support securing valve.
- 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

4.3.8 Failures and defects

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

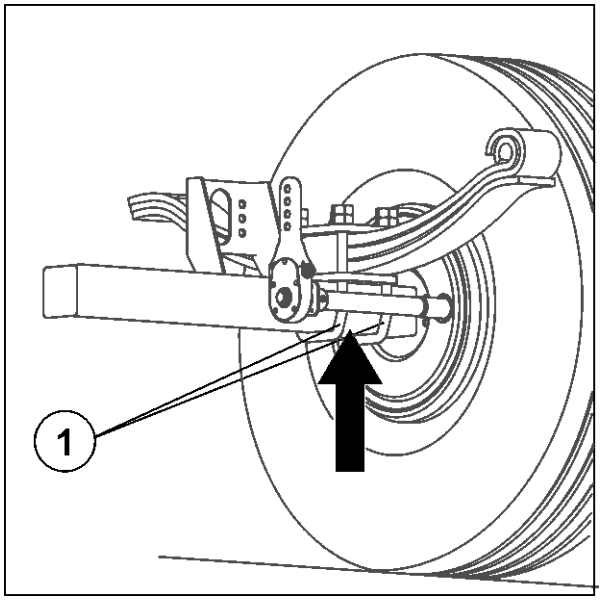
5 MAINTENANCE

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.**

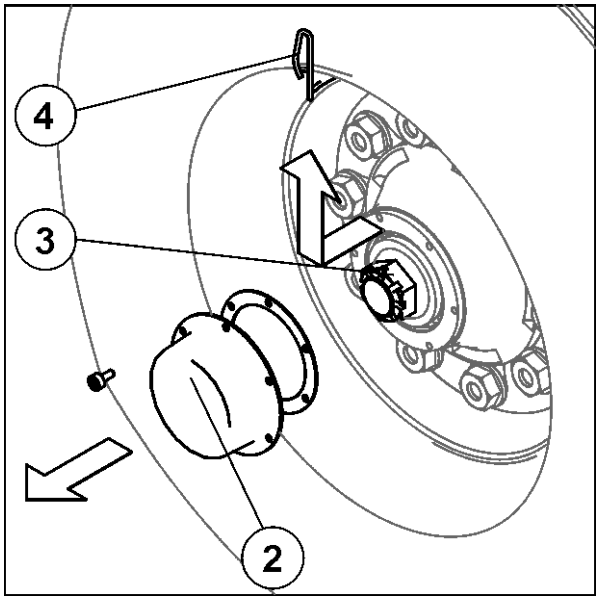
5.1 ADJUSTMENT OF WHEEL BEARINGS

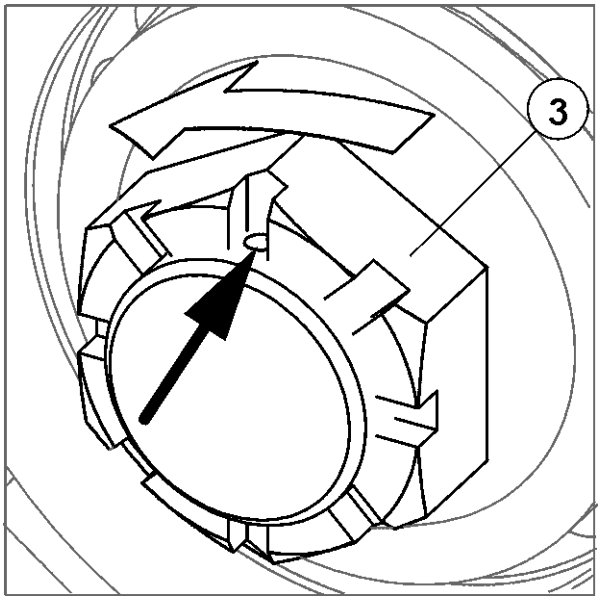
After first 500 km and after every next 1500-2000 km check and – if necessary – adjust play of wheel bearings.



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.

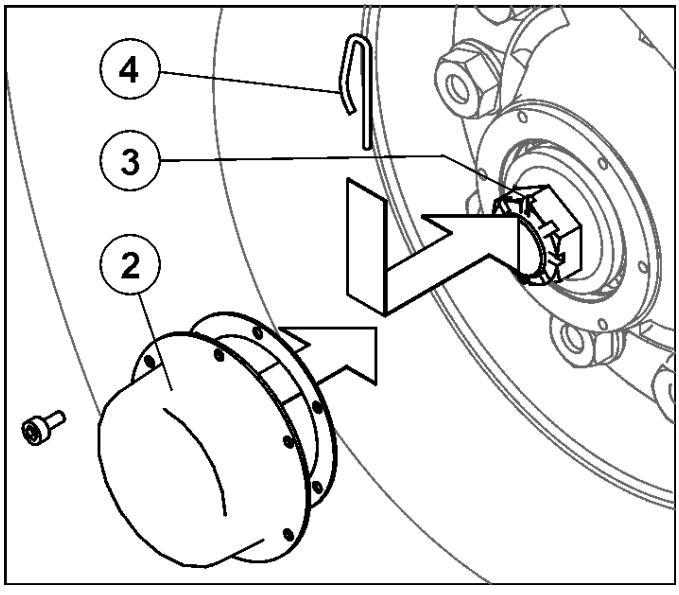
If the play is excessive, dismount the hub cover (2) and remove the cotter pin (4) of the crown nut (3).





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 ÷ 2 cm.

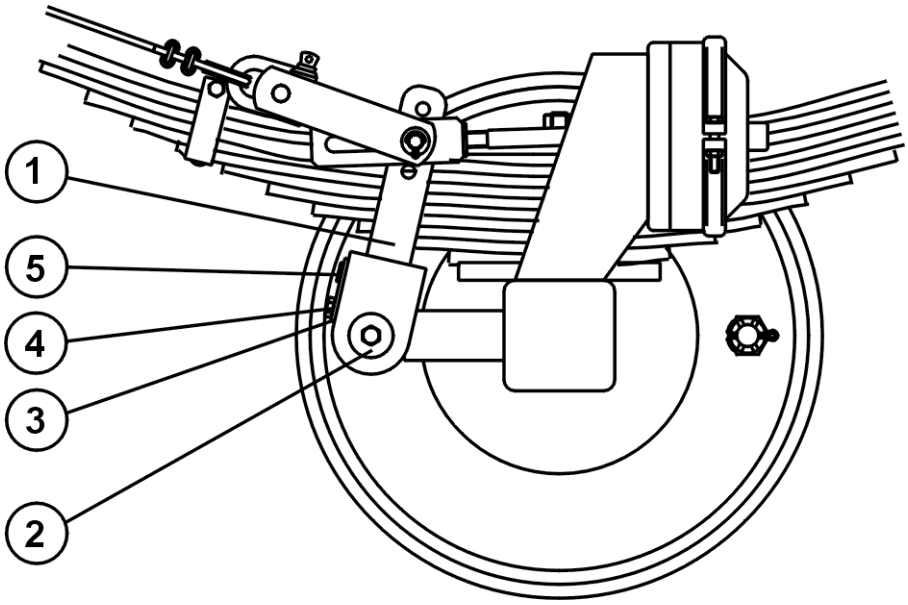


Fig. 10 Brake adjustment elements

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)
T669	55,5	33,3

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

UWAGA!

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 leakages – 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 mandrel 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. 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".

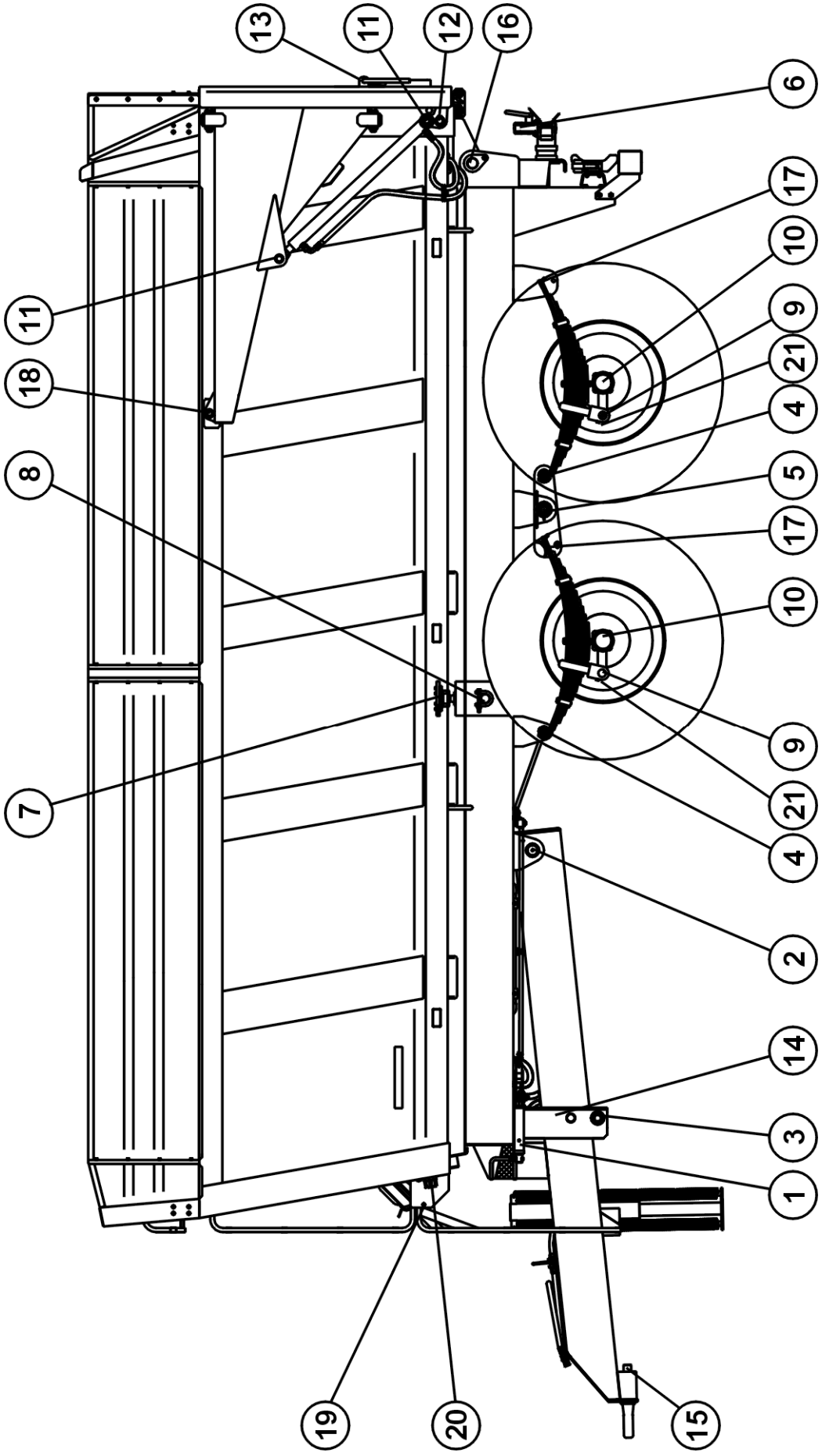


Fig. 11 Trailer lubrication points.

Table 6. Trailer lubrication points

No. at fig. 11	Lubrication point	Number of points	Grease type	Frequency & method of lubrication
1	Parking brake screw	1	solid	every 3-4 months
2	Hitch rod bolt	2	solid	every 3-4 months
3	Hitch rod sliding surface	2	solid	every 3-4 months
4	Suspension spring bolt	4	solid	once a month cover with grease
5	Rocker bolts	2	solid	once a month cover with grease
6	Rear tow coupling assembly	1	solid	every 3-4 months
7	Upper ball articulation of the cylinder	1	solid	every 6 months
8	Bolts of mounting of the hydraulic cylinder	2	solid	every 6 months cover bolts with fresh grease
9	Cam shaft sleeves	8	solid	every 6 months
10	Wheel bearings	4	solid	replace grease every 2 years
11	Rear flap cylinder bearings	4	solid	every 3-4 months
12	Locking hook bolts	2	solid	every 3-4 months
13	Chute guide	2	solid	every 3-4 months cover with very thin layer of grease
14	Hitch rod resistance surface	2	solid	once a month
15	Hitch rod rotational pull rod	1	solid	every 3-4 months
16	Tilt sleeves	2	solid	every 3-4 months
17	Suspension spring slide surfaces	4	solid	once a month
18	Flap bolts	4	solid	every 3-4 months
19	Ladder axle	1	solid	every 3-4 months
20	Ladder clamp	1	solid	every 3-4 months cover with very thin layer of grease
21	Brake adjustment screws	4	solid	every 6 months

5.6 ASSEMBLY / DISASSEMBLY OF SUPERSTRUCTURES

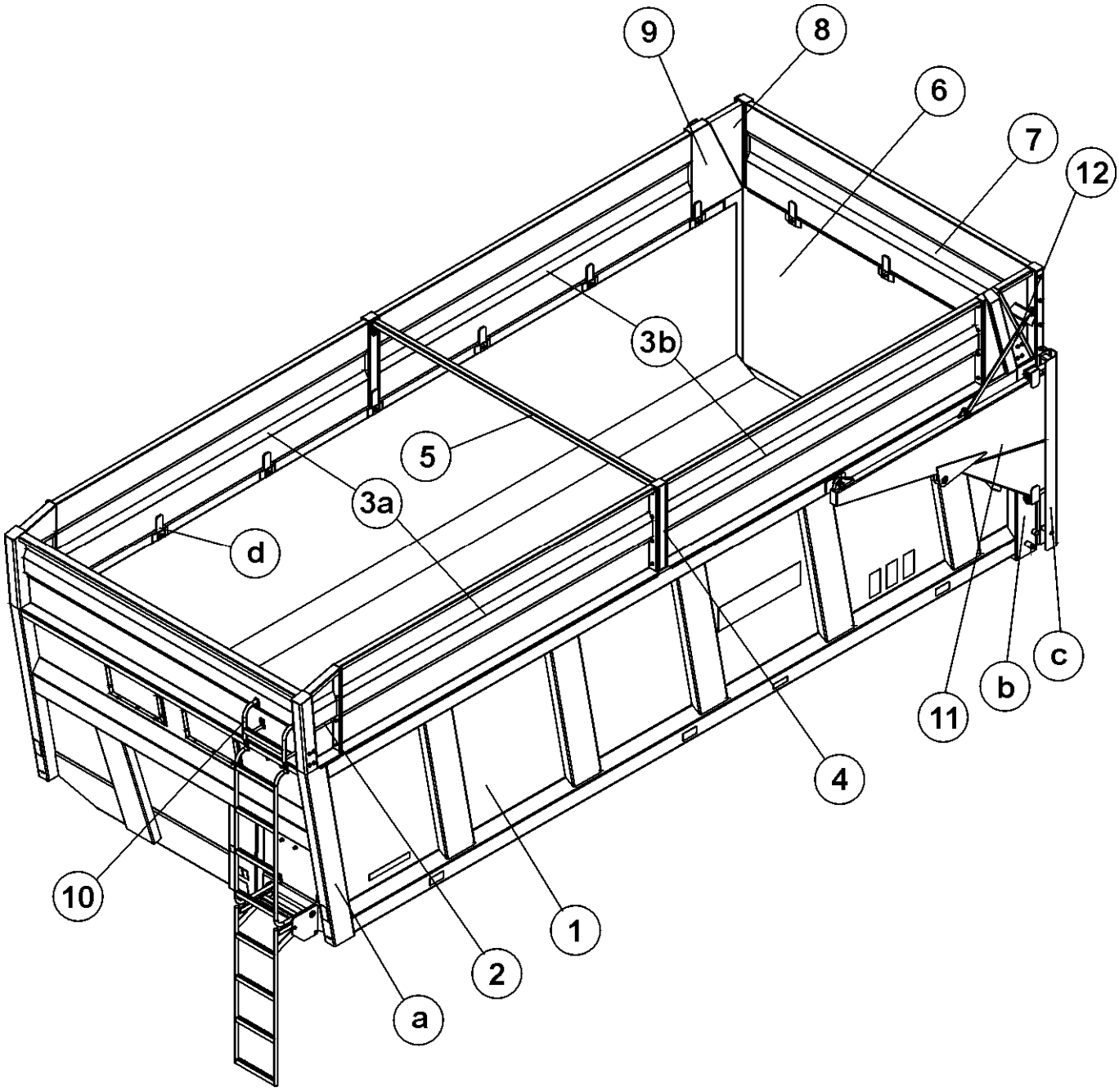
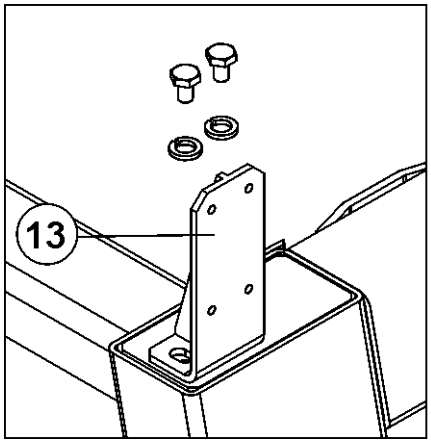


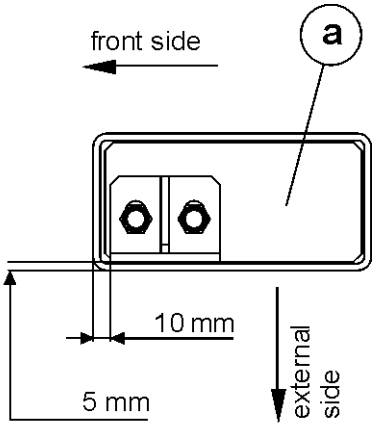
Fig. 12 Load crate + set of superstructures.

1 – load crate, 2 – front superstructure, 3a – front side superstructures, 3b- rear side superstructures, 4 – superstructure side post, 5 – connecting beam, 6 – rear flap, 7 – rear superstructure, 8- rear superstructure section (left, right), 9 – rear post (left, right), 10 – superstructure ladder, 11 – flap wing (left, right) , 12 – string, 13 – superstructure brackets (invisible on the drawing)

a – load crate left front post, b – load crate left rear post, c – flap left post, d – fastening grips

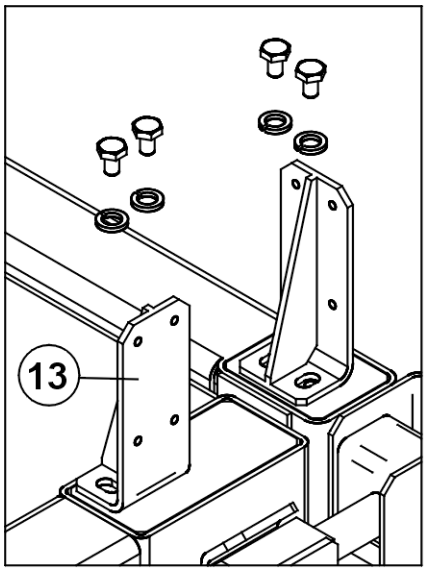
Scheme 1

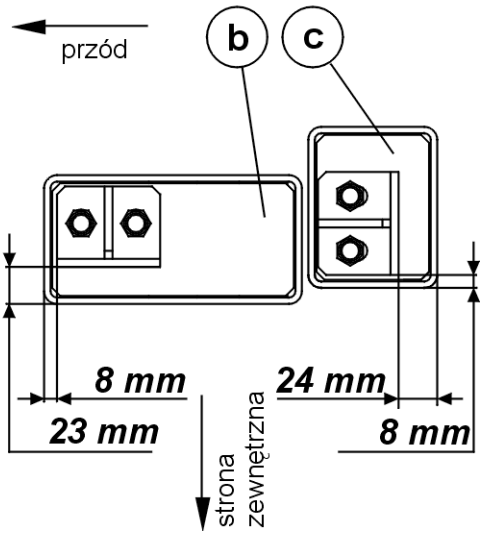




First screw 6 superstructure brackets (13) to the load crate posts and to the flap. While performing this action pay special attention to keeping proper dimensions as shown on schemes. The scheme (1) shows fastening of the bracket to the front left post of the load crate (a) The right bracket should be installed on the front right post of the load crate in the same way.

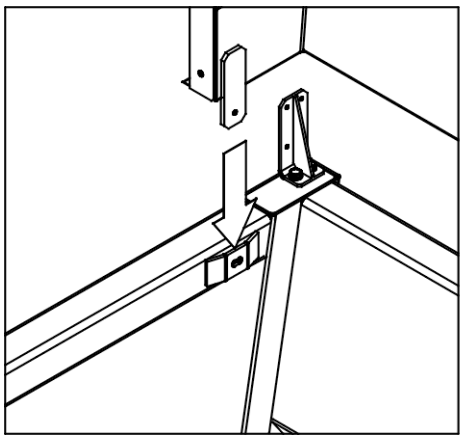
Scheme 2

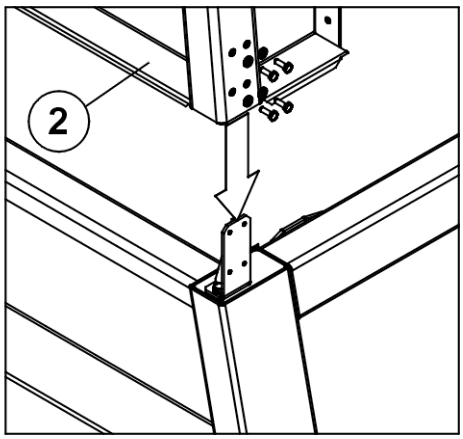




Install the superstructure brackets (13), on the rear posts of the load crate and on the flap side posts. The scheme (2) shows fastening of brackets on the left rear post of the load crate (b) and on the flap left post (c).

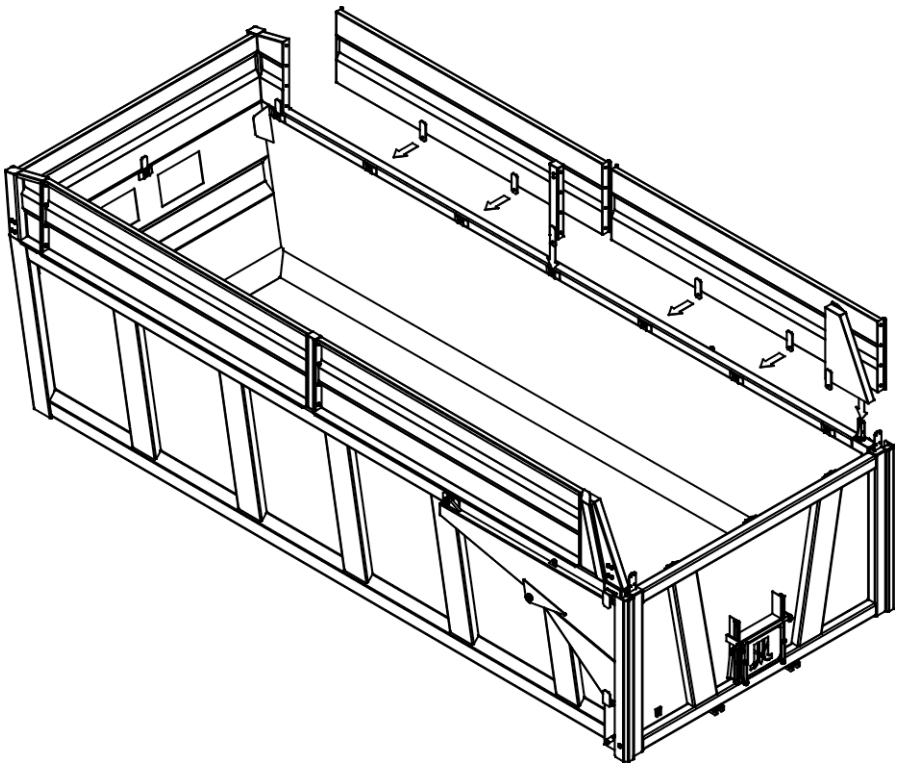
Scheme 3





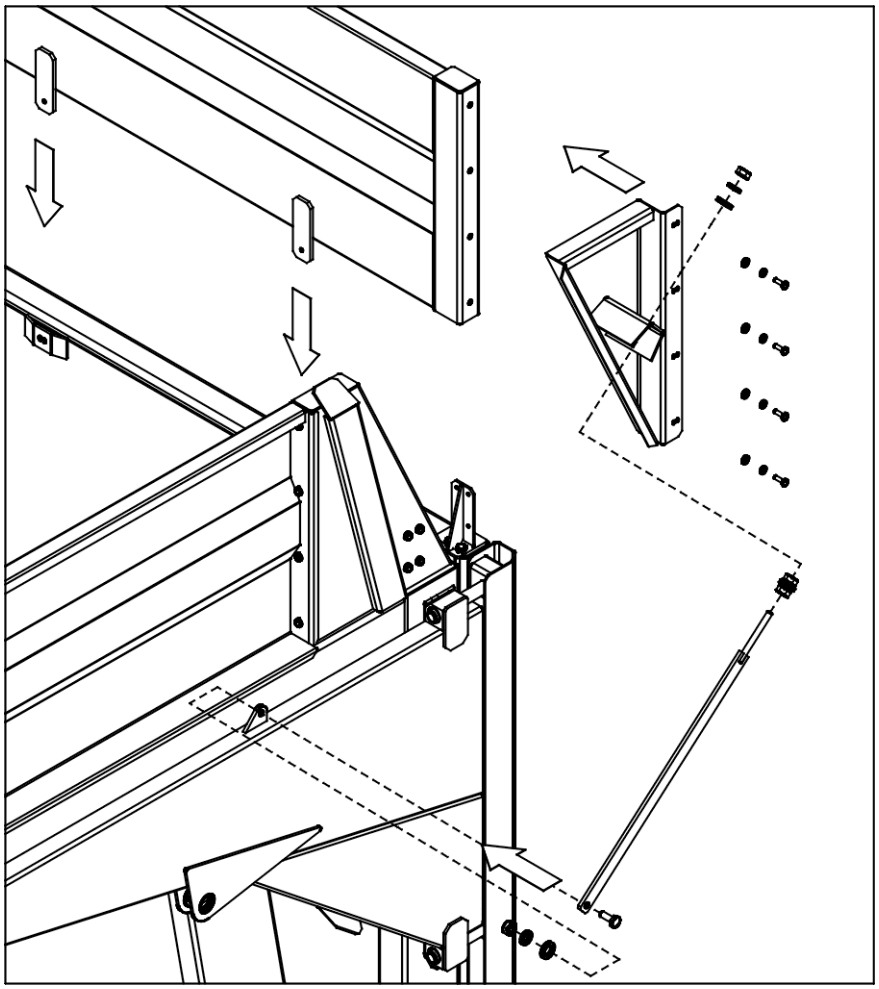
Install the front superstructure (2). Openings in the superstructure posts should agree with bracket openings. Arms (d), which fasten the superstructure to the load crate, should be put into relevant fastening grips welded to the load crate.

Scheme 4



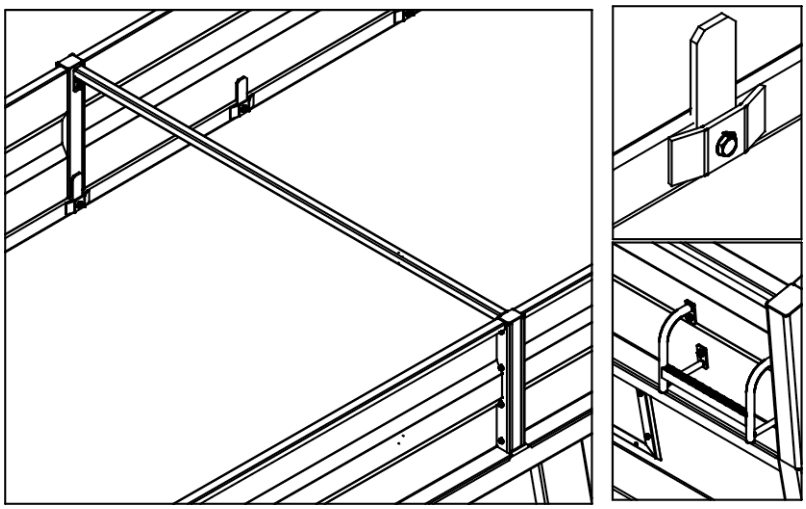
Install both front side superstructures (3a), by putting them into relevant grips (marked with arrows on the scheme (4)). Screw side superstructures (3a) to the front superstructure (2). Screw two side posts (4) and the next pair of rear side superstructures (3b). Screw the side superstructures (3b) and (3a) to posts (4). Install rear superstructure posts: left (9) and right on superstructure brackets (13). Screw the rear pair of side superstructures (3b) to rear posts.

Scheme 5



Fasten the rear flap superstructure (7) to the flap (6) with brackets (13). Screw the rear superstructure sections (8), left and right, to the rear superstructure posts (8). Stiffen the entire structure with two strings (12) on both sides of the load crate. The strings (12) should be screwed to the left & right flap wings and side sections (8) of the rear superstructure.

Scheme (6)



Having installed the superstructures, screw the connection beam (5) to side posts (4). Screw all superstructures (2), (3a), (3b), (7) and posts (4), (5), (6) to the load crate. Finally, fasten the ladder (10) to the front superstructure.

Detailed list of screwed connections is given in the spare parts catalogue. Description of structural elements on assembly schemes refers to the fig. 12 “Load crate + set of superstructures”.

Disassembly of superstructures 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. The operation should be carried out by at least two operators. Take special precautions.

CAUTION!

Lower edges of superstructure posts should agree with upper edges of the load crate (fig. 13, „Inspection of correct superstructure installation.”). Otherwise, the flap operation gear and superstructures may be damaged while opening / closing the flap.

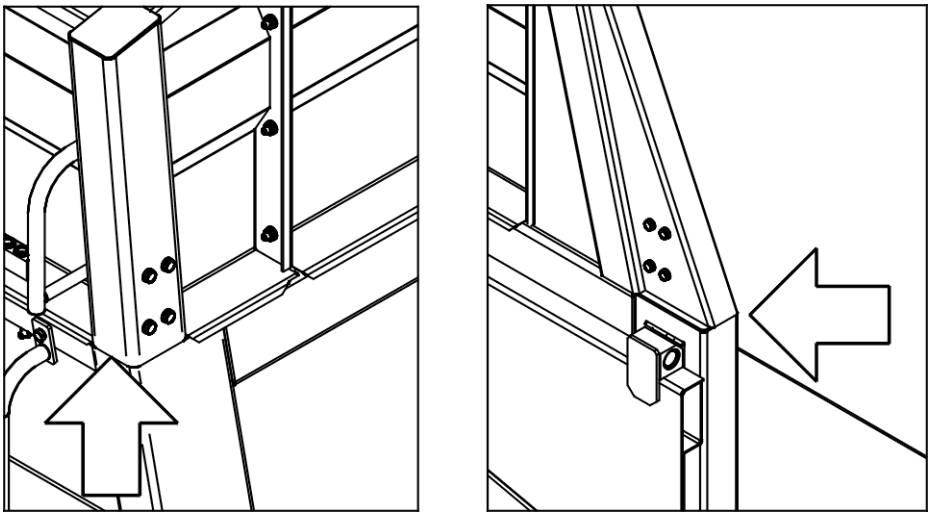


Fig. 13 Inspection of correct superstructure installation.

5.7 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.

AGRICULTURAL MONOCOQUE TRAILER / DUMPER „TANDEM”

T669

SPARE PARTS CATALOGUE

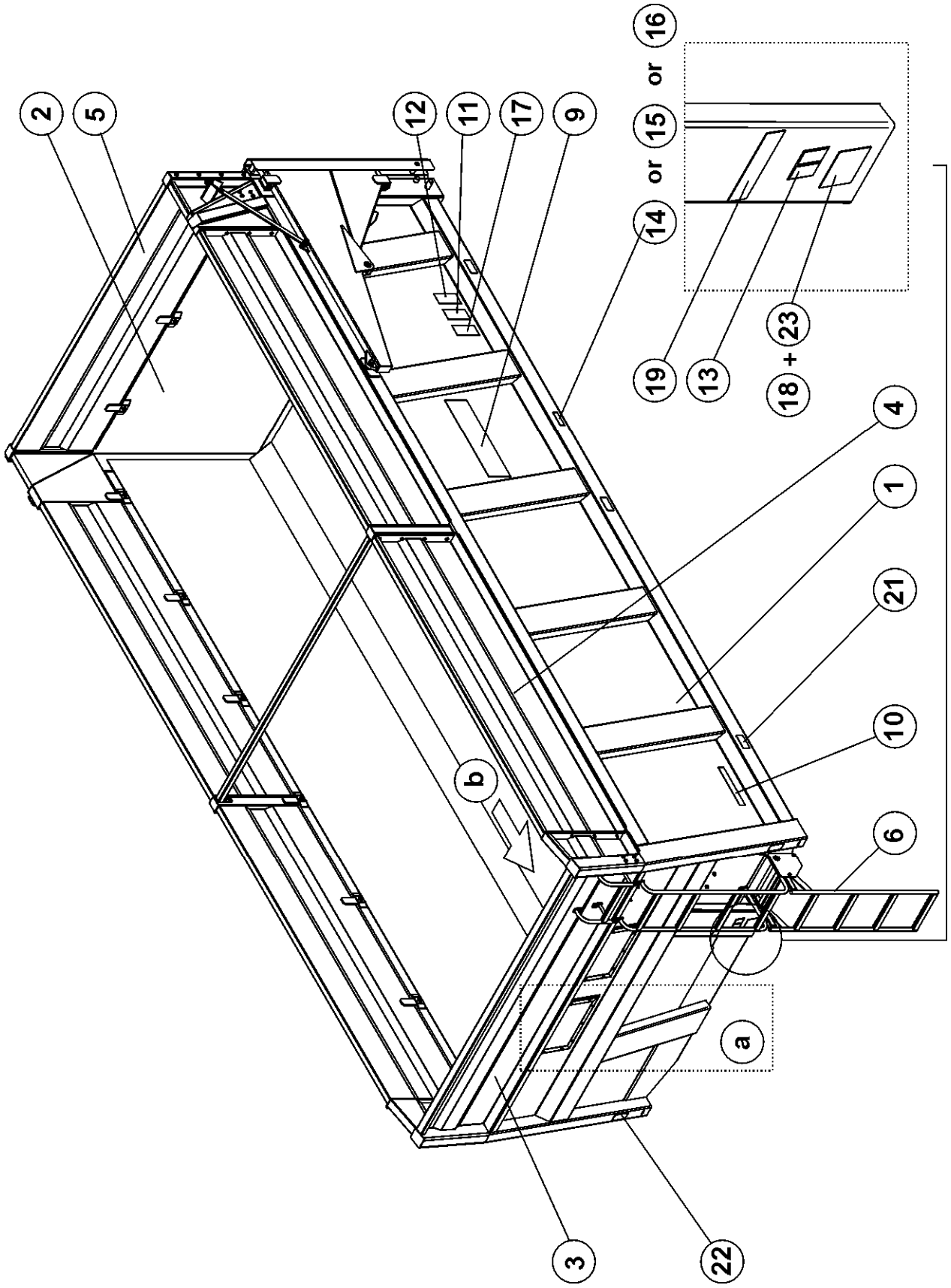


Fig. 14 Load crate, complete

Component name: LOAD CRATE			Quantity		
Drawing No.: 14, 15		No. of complete component/part:			
No.	Part name	Drawing / standard No.	T669	T669 DK	T669 A
1	Load crate	58RPN-03.00.000	1	1	1
2	Flap cpl.	58RPN-04.00.000	1	1	1
3	Superstructure, front 580	58RPN-10.01.000	1	1	1
4	Superstructure, side 580	58RPN-10.02.000	4	4	4
5	Superstructure, flap 580	58RPN-10.03.000	1	1	1
6	Ladder , set	58RPN-00.01.000	1	1	1
7	Window frames	58RPN-00.00.100	2	2	2
8	Plexiglas plate	58RPN-00.00.009	2	2	2
9	Sticker „T669”	58RPN-00.00.010	2	2	2
10	Sticker „Load”	58RPN-00.00.011	2	-	-
11	Warning sticker I	58RPN-00.00.012	2	2	2
12	Warning sticker II	58RPN-00.00.013	2	2	2
13	Information sticker	58RPN-00.00.014	1	1	1
14	Sticker „210 kPa”	58RPN-00.00.017	2 ⊗	2 ⊗	2 ⊗
15	Sticker „280 kPa”	58RPN-00.00.018	2	2	2
16	Sticker „340 kPa”	29RPN-00.00.019	2 ⊗	2 ⊗	2 ⊗
17	Warning sticker III	58RPN-00.00.020	2	2	2
18	Type plate	29RPN-00.00.011	1	-	-
19	Information sticker II	29RPN-00.00.022	1	-	-
20	Side step	EB20-010 Zn.	3	3	3
21	Rectangular reflective sticker, white	DOB35	2	2	2
22	Rectangular reflective sticker, yellow	DOB35	6	-	-
23	Rivet P Al/Fe 3x8	PN-83/M-82971	4	-	-
24	Screw M8x25 8.8-B-Fe/Zn5	PN-85/M-82105	12	12	12
25	Screw M6x25-8.8-B-Fe/Zn	PN-85/M-82105	20	20	20
26	Nut M8-8-B-Fe/Zn5	PN-86/M-82144	12	12	12
27	Nut M6-8-B-Fe/Zn5	PN-86/M-82144	20	20	20
28	Washer 8.4-Fe/Zn5	PN-78/M-82005	12	12	12
29	Washer 6.4-Fe/Zn5	Pn-78/M-82005	20	20	20
30	Spring washer Z8.2-Fe/Zn5	PN-90/M-82008	12	12	12
31	Spring washer Z6.1-Fe/Zn5	PN-90/M-82008	20	20	20

⊗ - depending on used tyres

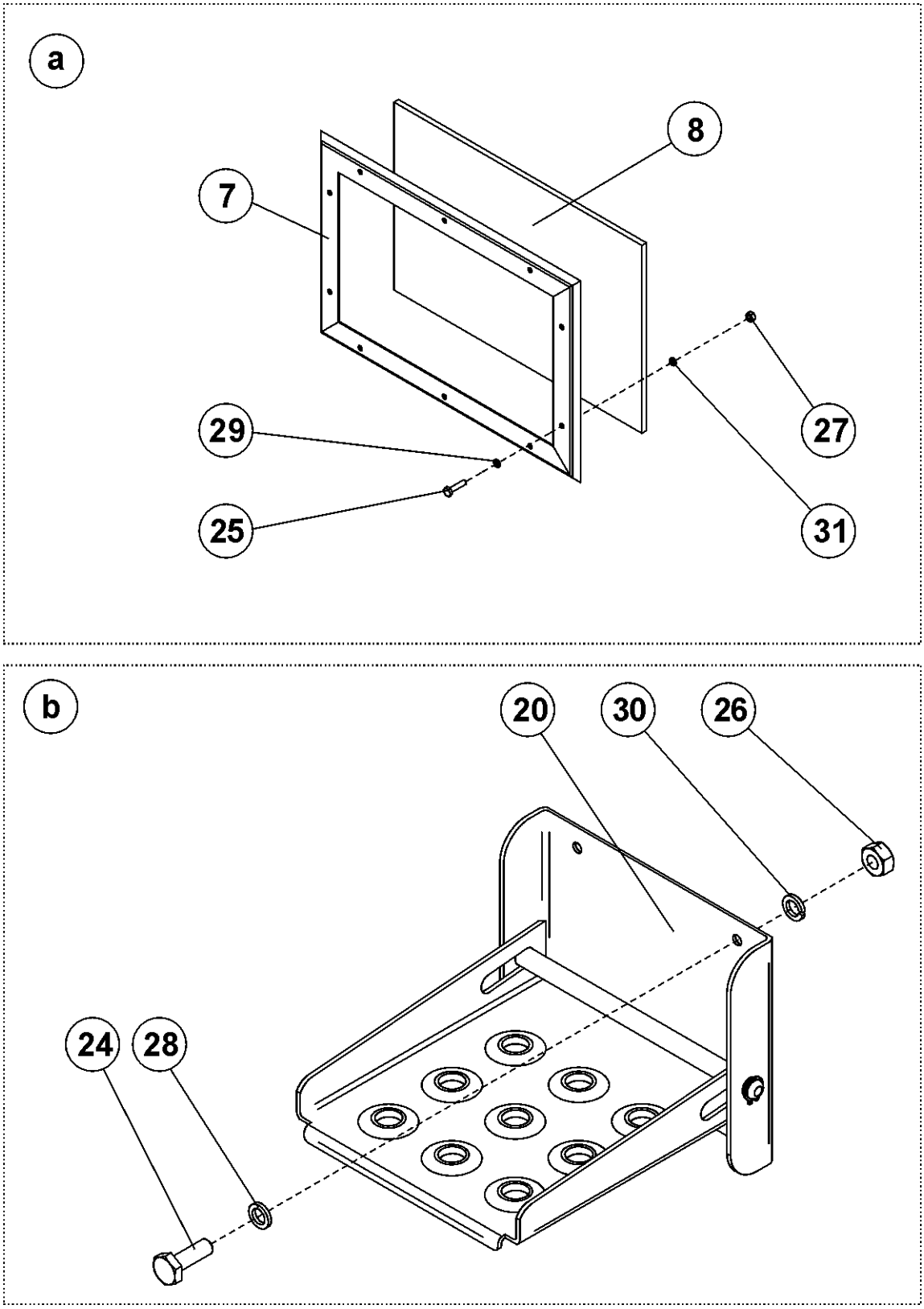


Fig. 15 Load crate, complete

Component name: LOAD CRATE			Quantity		
Drawing No.: 14, 15		No. of complete component/part:			
No.	Part name	Drawing / standard No.	T669	T669 DK	T669 A
1	Load crate	58RPN-03.00.000	1	1	1
2	Flap cpl.	58RPN-04.00.000	1	1	1
3	Superstructure, front 580	58RPN-10.01.000	1	1	1
4	Superstructure, side 580	58RPN-10.02.000	4	4	4
5	Superstructure, flap 580	58RPN-10.03.000	1	1	1
6	Ladder , set	58RPN-00.01.000	1	1	1
7	Window frames	58RPN-00.00.100	2	2	2
8	Plexiglas plate	58RPN-00.00.009	2	2	2
9	Sticker „T669”	58RPN-00.00.010	2	2	2
10	Sticker „Load”	58RPN-00.00.011	2	-	-
11	Warning sticker I	58RPN-00.00.012	2	2	2
12	Warning sticker II	58RPN-00.00.013	2	2	2
13	Information sticker	58RPN-00.00.014	1	1	1
14	Sticker „210 kPa”	58RPN-00.00.017	2 ⊗	2 ⊗	2 ⊗
15	Sticker „280 kPa”	58RPN-00.00.018	2	2	2
16	Sticker „340 kPa”	29RPN-00.00.019	2 ⊗	2 ⊗	2 ⊗
17	Warning sticker III	58RPN-00.00.020	2	2	2
18	Type plate	29RPN-00.00.011	1	-	-
19	Information sticker II	29RPN-00.00.022	1	-	-
20	Side step	EB20-010 Zn.	3	3	3
21	Rectangular reflective sticker, white	DOB35	2	2	2
22	Rectangular reflective sticker, yellow	DOB35	6	-	-
23	Rivet P Al/Fe 3x8	PN-83/M-82971	4	-	-
24	Screw M8x25 8.8-B-Fe/Zn5	PN-85/M-82105	12	12	12
25	Screw M6x25-8.8-B-Fe/Zn	PN-85/M-82105	20	20	20
26	Nut M8-8-B-Fe/Zn5	PN-86/M-82144	12	12	12
27	Nut M6-8-B-Fe/Zn5	PN-86/M-82144	20	20	20
28	Washer 8.4-Fe/Zn5	PN-78/M-82005	12	12	12
29	Washer 6.4-Fe/Zn5	Pn-78/M-82005	20	20	20
30	Spring washer Z8.2-Fe/Zn5	PN-90/M-82008	12	12	12
31	Spring washer Z6.1-Fe/Zn5	PN-90/M-82008	20	20	20

⊗ - depending on used tyres

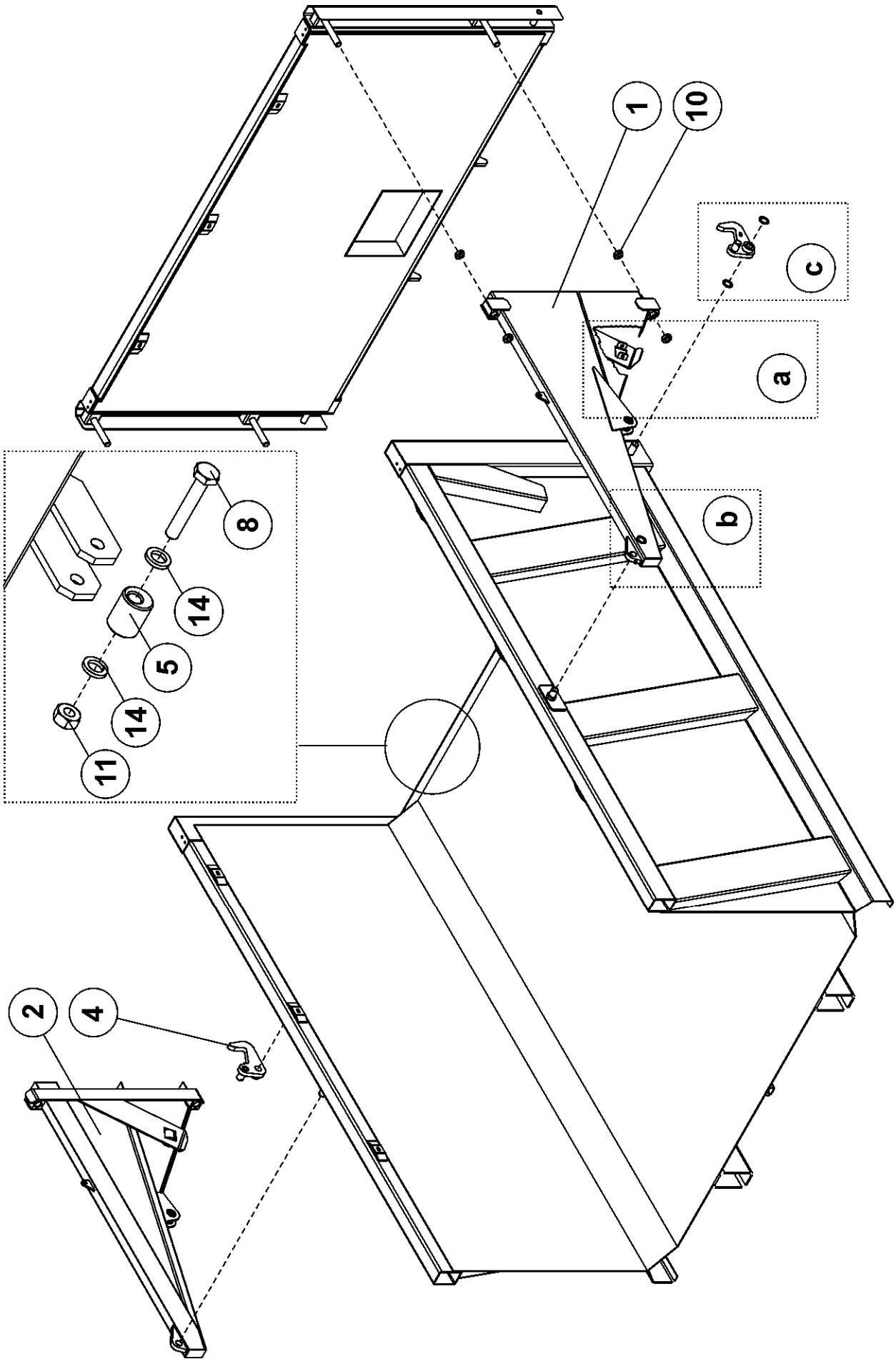


Fig. 16 Rear flap fastening

Component name REAR FLAP FASTENING			Quantity		
Drawing No. 16, 17		No. of complete component/part			
No.	Part name	Drawing / standard No.	T669	T669 DK	T669 A
1	Left wing, cpl.	58RPN-05.00.000	1	1	1
2	Right wing, cpl.	58RPN-06.00.000	1	1	1
3	Locking hook, left	58RPN-00.00.200	1	1	1
4	Locking hook, right	58RPN-00.00.300	1	1	1
5	Flap lock sleeve	64RPN-00.00.001	2	2	2
6	Hook washer	58RPN-00.00.008	2	2	2
7	Wing roller	58RPN-05.00.001	2	2	2
8	Screw M16x100-8.8-B-Fe/Zn5	PN-85/M-82101	2	2	2
9	Screw M12x100-5.8-B-Fe/Zn5	PN-85/M-82101	2	2	2
10	Nut M27x2-05-B-Fe/Zn5	PN-86/M-82153	8	8	8
11	Self-locking nut M16-8-B-Fe/Zn5	PN-85/M-82175	2	2	2
12	Self-locking nut M12-5-B-Fe/Zn5	PN-85/M-82175	2	2	2
13	Washer 30 Fe/Zn5	PN-90/M-82004	2	2	2
14	Washer 17 Fe/Zn5	PN-78/M-82005	4	4	4
15	Washer 13 Fe/Zn5	PN-78/M-82005	4	4	4
16	Cotter pin S-Zn 6.3x45	PN-76/M-82001	2	2	2
17	Nipple M6	PN-76/M-86002	2	2	2

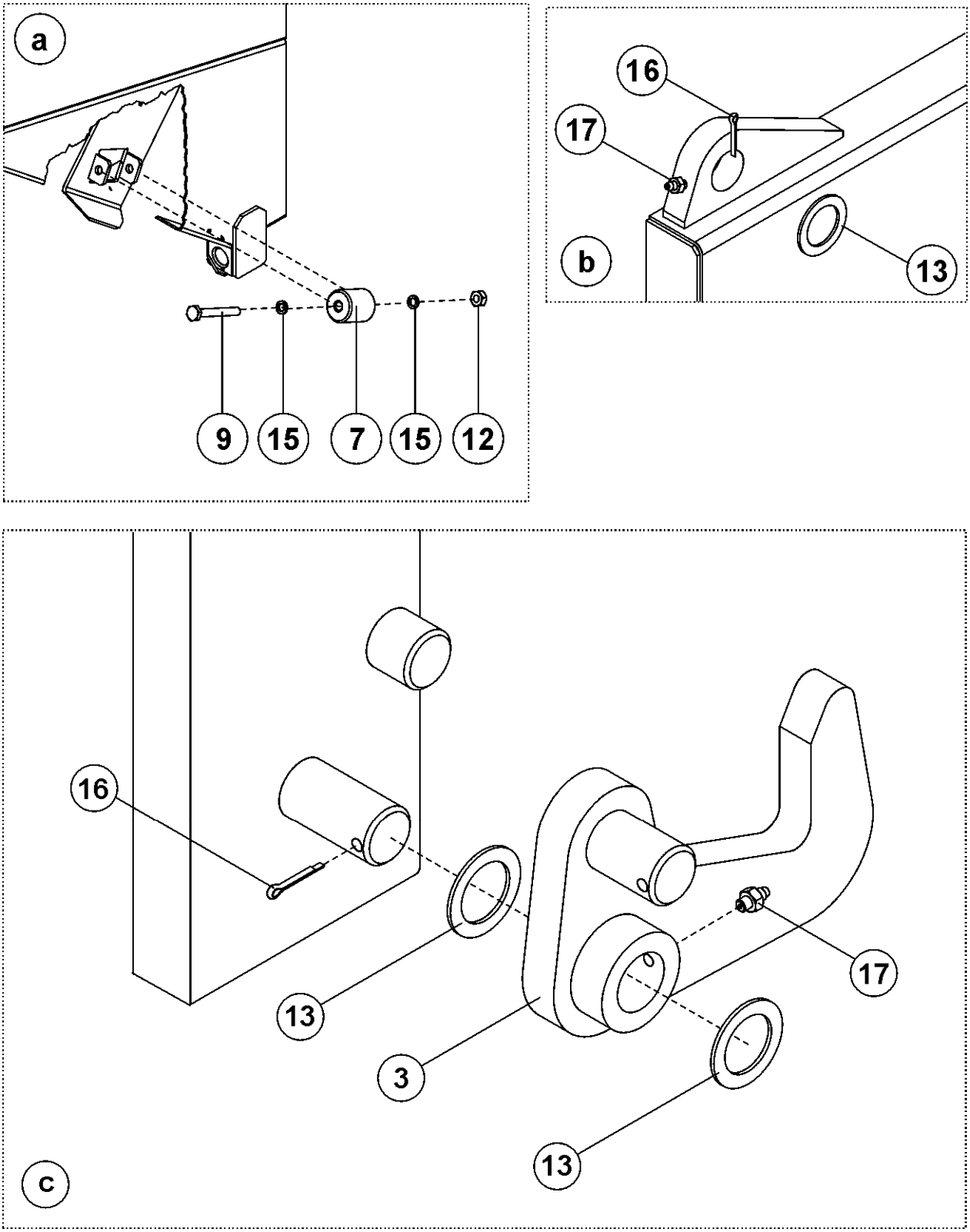


Fig. 17 Rear flap fastening

Component name **REAR FLAP FASTENING**			Quantity		
Drawing No. **16, 17**		No. of complete component/part			
No.	**Part name**	**Drawing / standard No.**	**T669**	**T669 DK**	**T669 A**
1	Left wing, cpl.	58RPN-05.00.000	1	1	1
2	Right wing, cpl.	58RPN-06.00.000	1	1	1
3	Locking hook, left	58RPN-00.00.200	1	1	1
4	Locking hook, right	58RPN-00.00.300	1	1	1
5	Flap lock sleeve	64RPN-00.00.001	2	2	2
6	Hook washer	58RPN-00.00.008	2	2	2
7	Wing roller	58RPN-05.00.001	2	2	2
8	Screw M16x100-8.8-B-Fe/Zn5	PN-85/M-82101	2	2	2
9	Screw M12x100-5.8-B-Fe/Zn5	PN-85/M-82101	2	2	2
10	Nut M27x2-05-B-Fe/Zn5	PN-86/M-82153	8	8	8
11	Self-locking nut M16-8-B-Fe/Zn5	PN-85/M-82175	2	2	2
12	Self-locking nut M12-5-B-Fe/Zn5	PN-85/M-82175	2	2	2
13	Washer 30 Fe/Zn5	PN-90/M-82004	2	2	2
14	Washer 17 Fe/Zn5	PN-78/M-82005	4	4	4
15	Washer 13 Fe/Zn5	PN-78/M-82005	4	4	4
16	Cotter pin S-Zn 6.3x45	PN-76/M-82001	2	2	2
17	Nipple M6	PN-76/M-86002	2	2	2

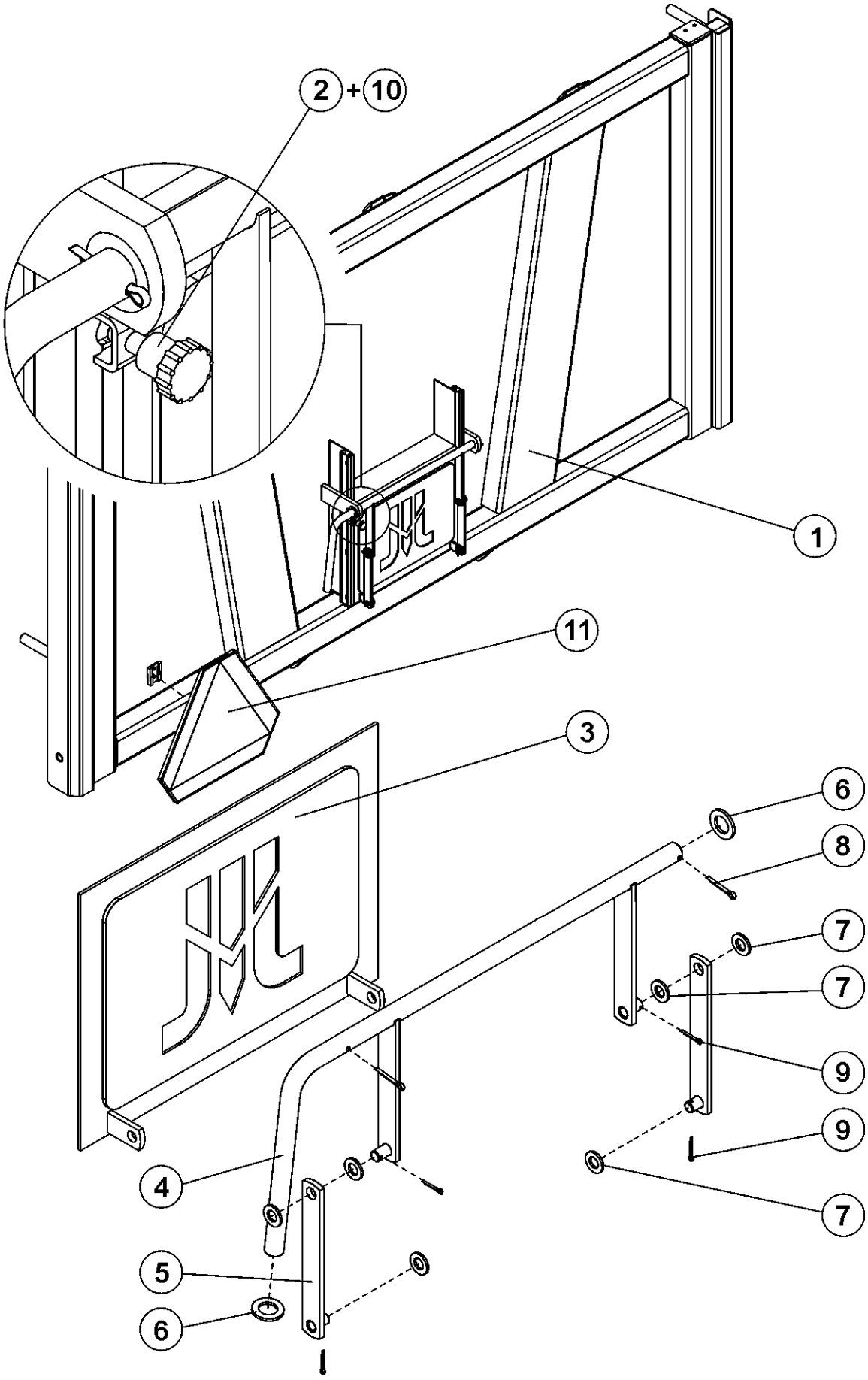


Fig. 18 Rear flap, complete

Component name REAR FLAP, COMPLETE			Quantity		
Drawing No. 18		No. of complete component/part	T669	T669 DK	T669 A
No.	Part name	Drawing / standard No.			
1	Rear flap	58RPN-04.01.000	1	1	1
2	Fastening screw	29RPN-06.01.104	1	1	1
3	Gate, cpl	29RPN-06.02.000	1	1	1
4	Lever	29RPN-06.03.000	1	1	1
5	String	29RPN-06.04.000	2	2	2
6	Washer 21 Fe/Zn5	PN-78/M-82005	2	2	2
7	Washer 13 Fe/Zn5	PN-78/M-82005	6	6	6
8	Cotter pin S-Zn 5x28	PN-76/M-82001	2	2	2
9	Cotter pin S-Zn 3.2x16	PN-76/M-82001	4	4	4
10	Spring pin 3x10 Fe/Zn5	Pn-89/M-85023	1	1	1
11	Triangle for slowly moving vehicles		1 ⊗	1 ⊗	1 ⊗

⊗ - special equipment, for order

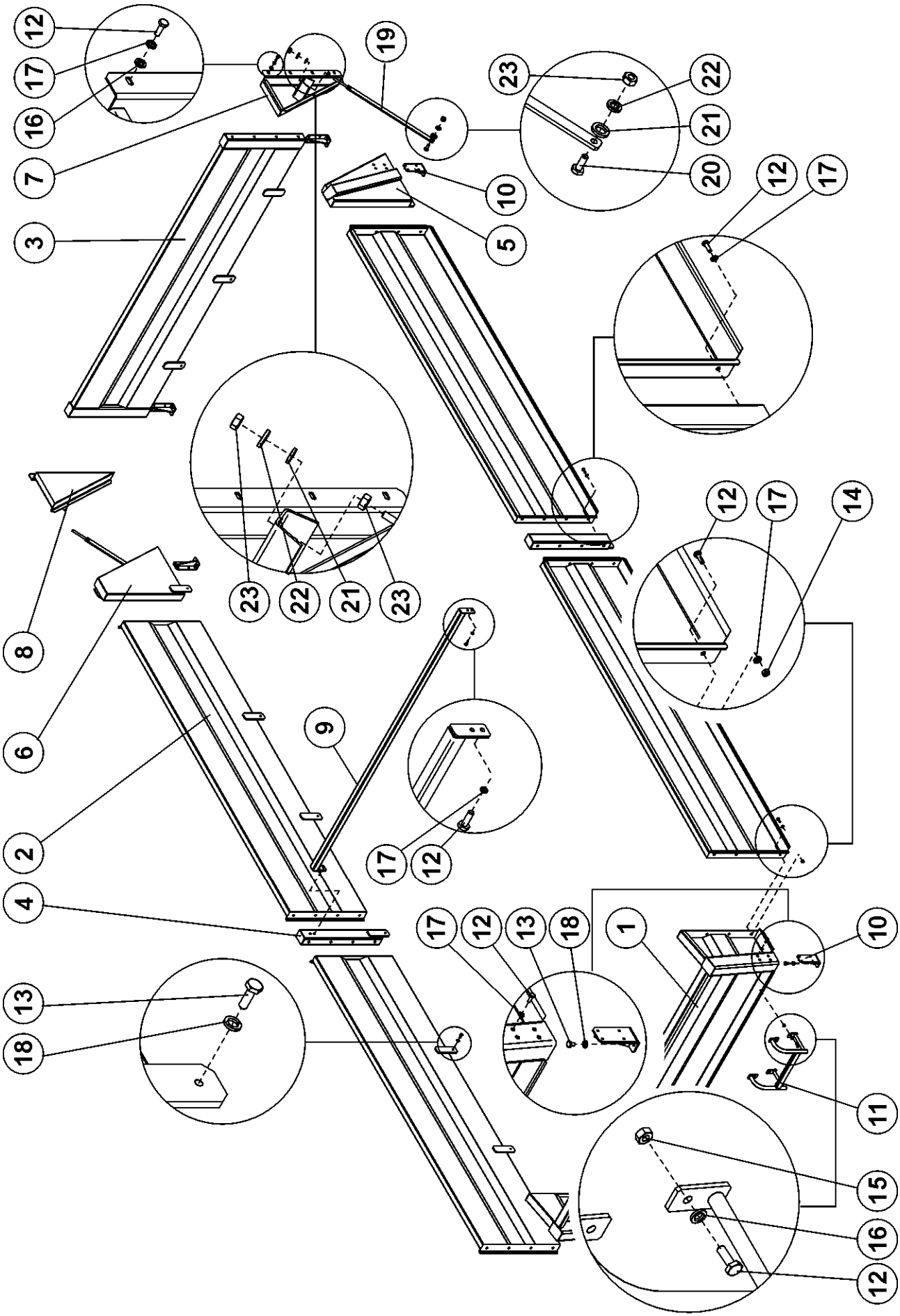


Fig. 19 Set of superstructures

Component name SET OF SUPERSTRUCTURES			Quantity		
Drawing No. 19		No. of complete component/part			
No.	Part name	Drawing / standard No.	T669	T669 DK	T669 A
1	Superstructure, front 580	58RPN-10.01.000	1	1	1
2	Superstructure, side 580	58RPN-10.02.000	4	4	4
3	Superstructure, flap 580	58RPN-10.03.000	1	1	1
4	Side post 580	58RPN-10.04.000	2	2	2
5	Rear left post 580	58RPN-10.05.000	1	1	1
6	Rear right post 580	58RPN-10.06.000	1	1	1
7	Rear left section 580	58RPN-10.07.000	1	1	1
8	Rear right section 580	58RPN-10.08.000	1	1	1
9	Connection beam	58RPN-10.00.100	1	1	1
10	Superstructure bracket	58RPN-10.00.200	6	6	6
11	Superstructure ladder 580	58RPN-10.00.300	1	1	1
12	Screw M8x20-8.8-B/Fe5	PN-85/M-82105	72	72	72
13	Screw M10x16-8.8-B-Fe/Zn5	PN-85/M-82105	28	28	28
14	Nut M8-B-Fe/Zn5	PN-86/M-82144	8	8	8
15	Self-locking nut R M8-5-B-Fe/Zn5	PN-85/M-82175	4	4	4
16	Washer 8.4 Fe/Zn5	PN-78/M-82005	36	36	36
17	Spring washer Z8.2 Fe/Zn5	PN-77/M-82008	68	68	68
18	Spring washer Z10.2 Fe/Zn5	PN-77/M-82008	28	28	28
19	String, cpl.	58RPN-10.00.400	2	2	2
20	Screw M12x35-8.8-B-Fe/Zn5	PN-85/M-82105	2	2	2
21	Washer 13 Fe/Zn5	PN-78/M-82005	4	4	4
22	Spring washer Z12.2 Fe/Zn5	PN-77/M-82008	4	4	4
23	Nut M12-8-B-Fe/Zn5	PN-86/M-82144	6	6	6

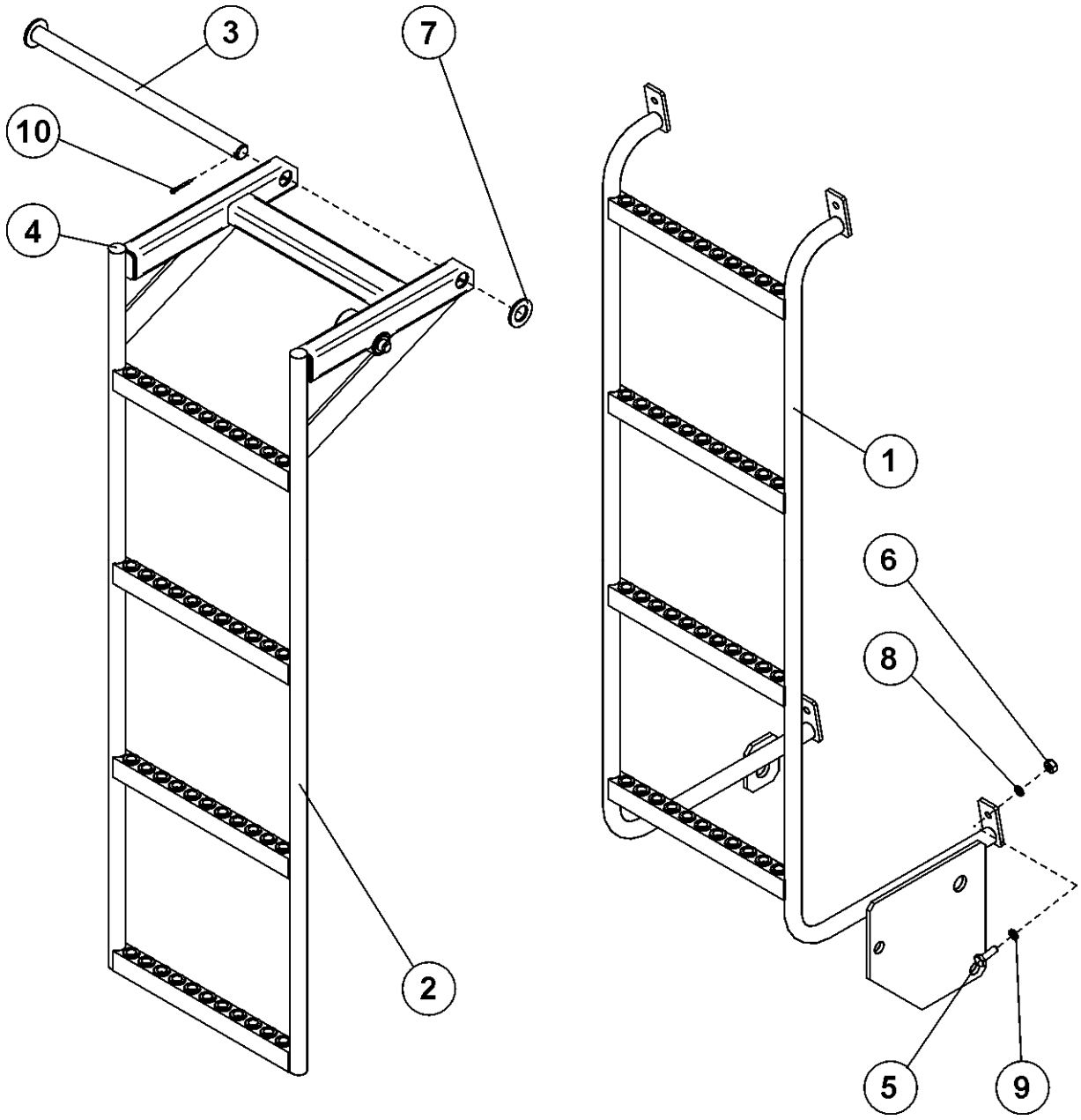


Fig. 20 Ladder, set

Component name: LADDER, SET			Quantity		
Drawing No.: 20		No. of complete component/part: 58RPN-00.01.000			
No.	**Part name**	**Drawing / standard No.**	**T669**	**T669 DK**	**T669 A**
1	Upper ladder	58RPN-00.01.100	1	1	1
2	Lower ladder	58RPN-00.01.200	1	1	1
3	Bolt, set	58RPN-00.01.300	1	1	1
4	Stopper IK22	PPHU Plast Trading	4	4	4
5	Screw M8x25-8.8-B-Fe/Zn5	PN-85/M-82105	4	4	4
6	Nut M8-8-B-Fe/Zn5	PN-86/M-82144	4	4	4
7	Washer 21 Fe/Zn5	PN-78/M-82005	1	1	1
8	Spring washer Z8.2-Fe/Zn5	PN-90/M82008	4	4	4
9	Washer 8.4-Fe/Zn5	PN-78/M-82005	4	4	4
10	Cotter pin S-Zn 4x32	PN-76/M-82001	1	1	1

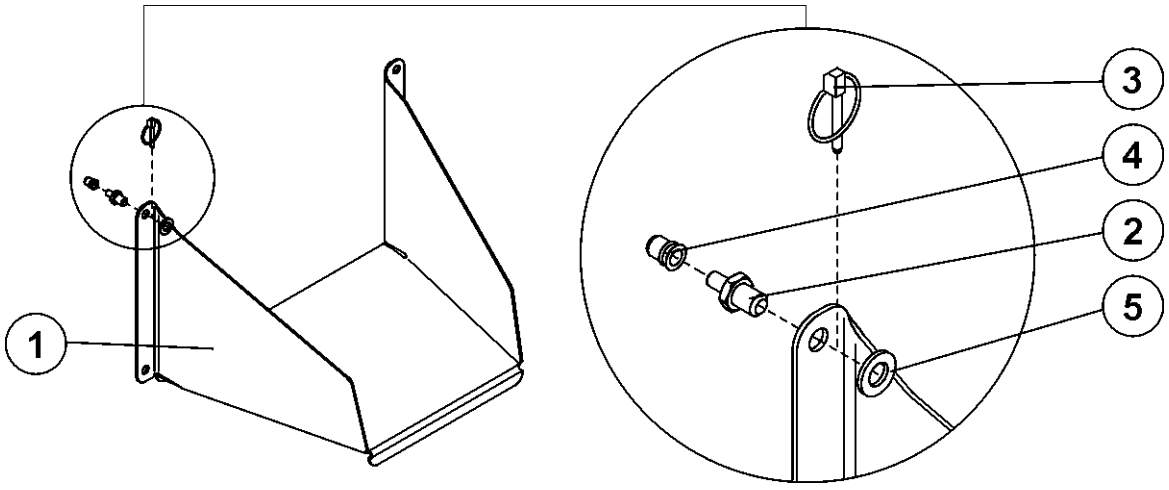


Fig. 21 Chute, cpl. ⊗

⊗ - for special order

Component name: CHUTE, CPL.			Quantity		
Drawing No.: 21		No. of complete component/part: 58RPN-00.08.000			
No.	**Part name**	**Drawing / standard No.**	**T669**	**T669 DK**	**T669 A**
1	Chute	58RPN-00.08.001	1	1	1
2	Chute screw	58RPN-00.08.002	4	4	4
3	Pin S.3545		4	4	4
4	Rivet/nut M8, knurled		4	4	4
5	Washer 13 Fe/Zn5	PN-78/M-82005	4	4	4

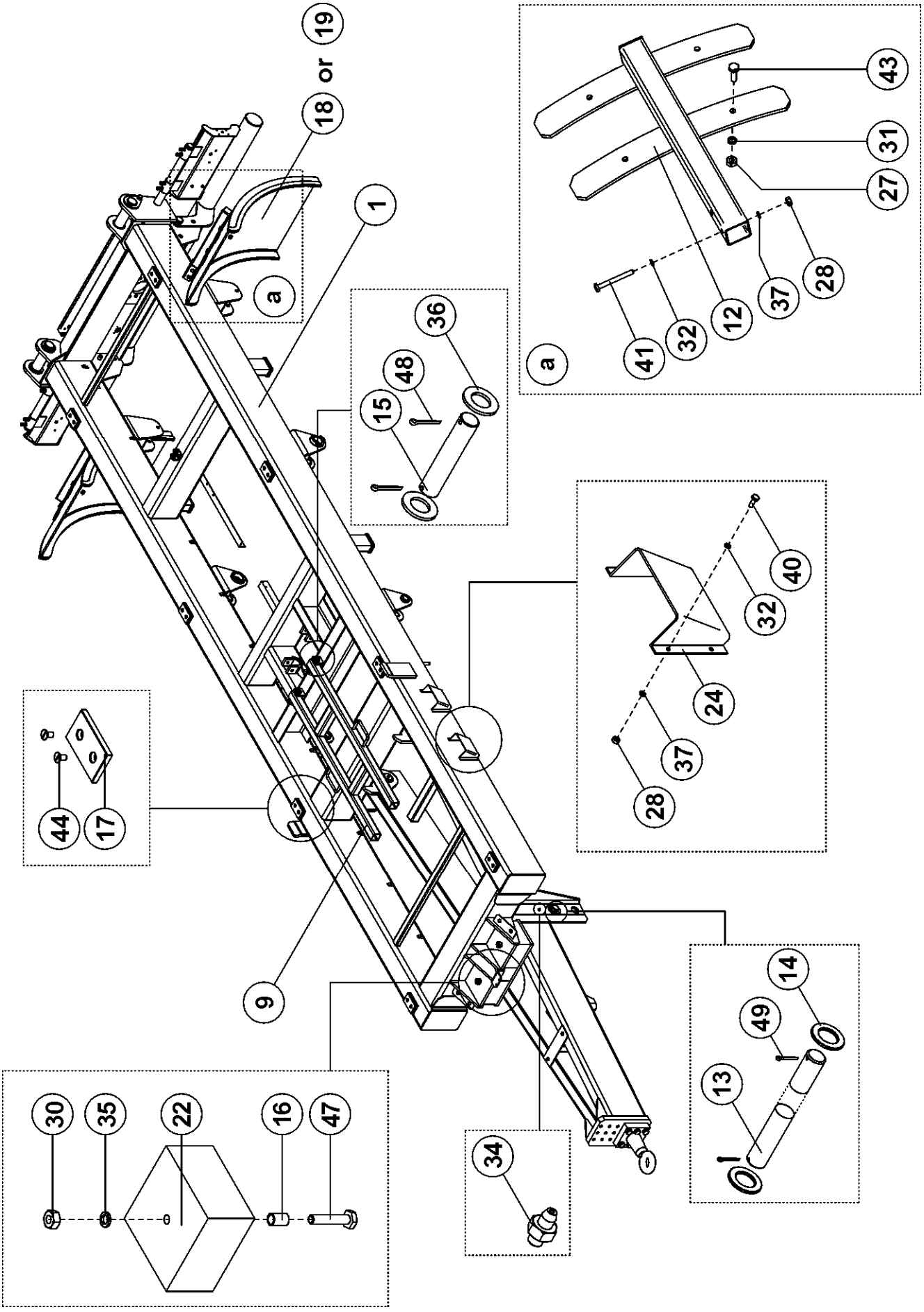


Fig. 22 Undercarriage

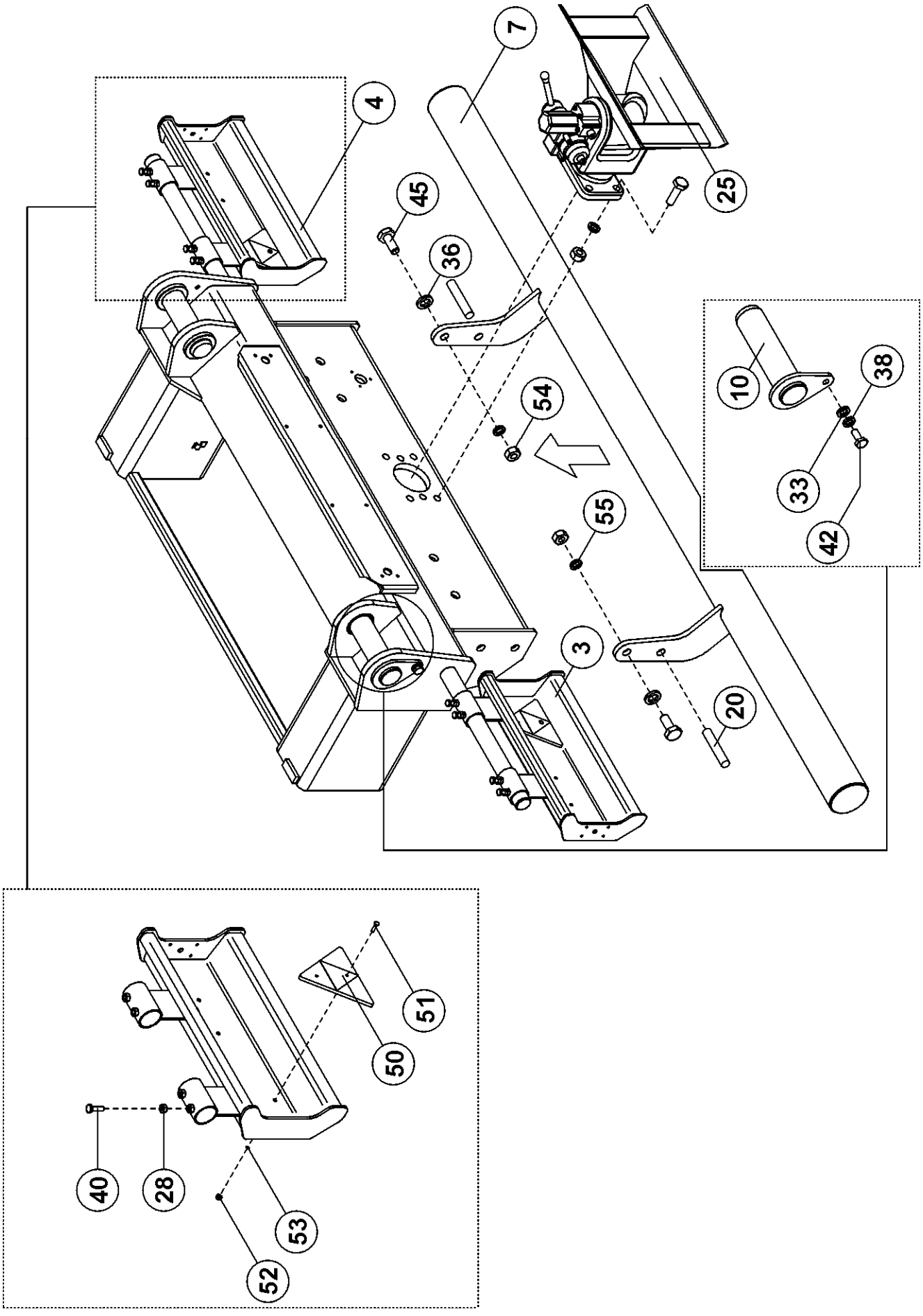


Fig. 23 Undercarriage

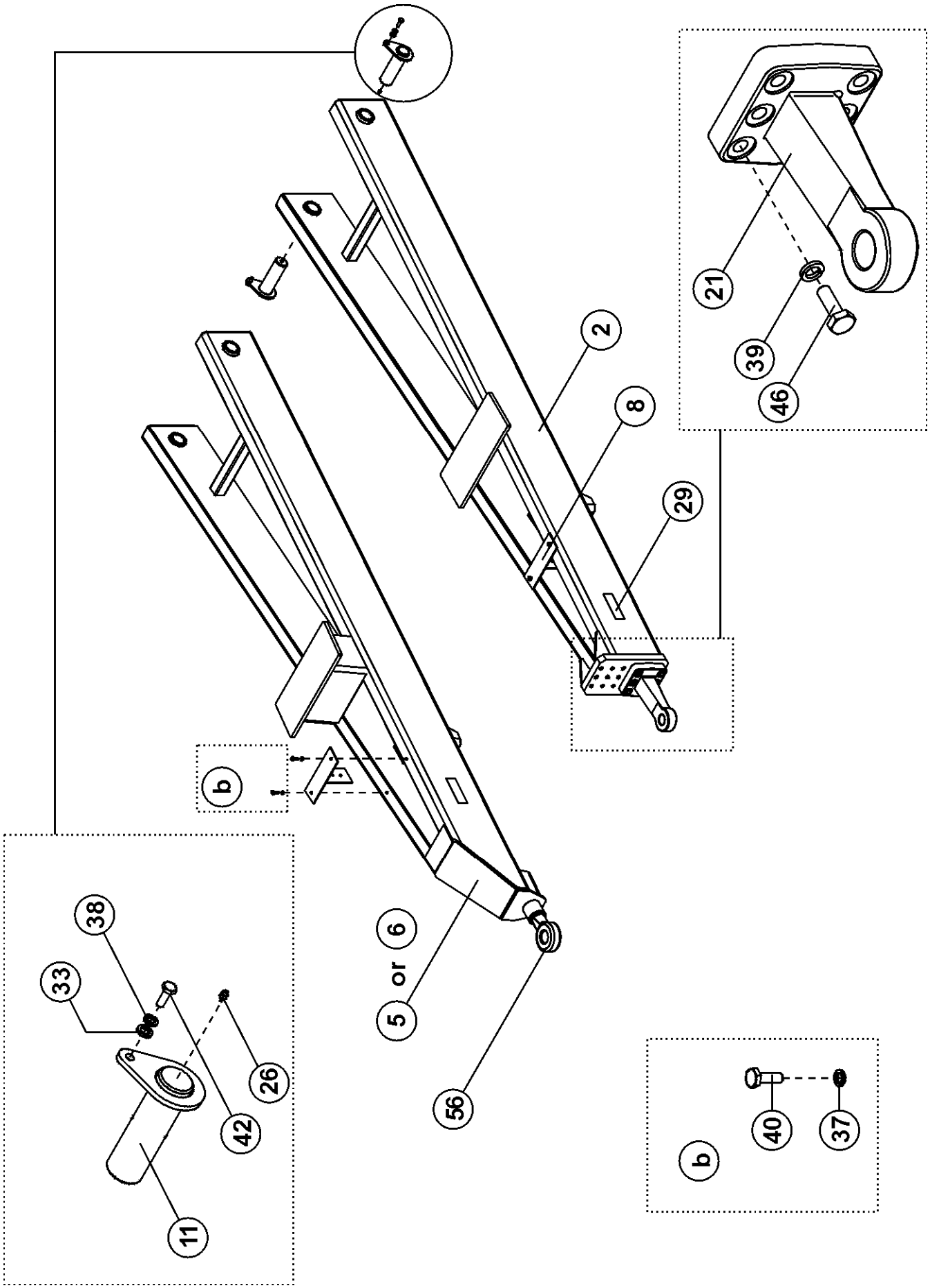


Fig. 24 Undercarriage

Component name: UNDERCARRIAGE			Quantity		
Drawing No.: 22, 23, 24		No. of complete component/part			
No.	Part name	Drawing / standard No.	T669	T669 DK	T669 A
1	Lower frame	58RPN-25.00.000	1	1	1
2	Hitch rod, cpl.	58RPN-02.00.000	-	-	1
3	Lighting beam, left	58RPN-00.12.100	1	1	1
4	Lighting beam, right	58RPN-00.12.200	1	1	1
5	Rotational hitch rod	58RPN-08.00.000	-	1	-
6	Rotational hitch rod	58RPN-08.00.000-PL	1	-	-
7	Buffer, set	58RPN-00.00.600	1	1	1
8	Bracket for hydraulic conduits	58RPN-17.00.000	1	1	1
9	Load crate support	58RPN-18.00.000	1	1	1
10	Load crate tilt bolt, cpl.	58RPN-00.05.000	2	2	2
11	Hitch rod fastening bolt	58RPN-00.06.000	2	2	2
12	Wing arm, cpl.	58RPN-00.11.000	2	2	2
13	Hitch rod suspension bolt	58RPN-00.00.001	1	1	1
14	Washer for hitch rod suspension bolt	58RPN-00.00.002	2	2	2
15	Support bolt	29RPN-00.00.009	2	2	2
16	Space sleeve	58RPN-00.00.006	2	2	2
17	Shock-absorbing washer	64RPN-00.00.004	8	8	8
18	Wing I	58RPN-00.00.015	2	2	2
19	Wing II	58RPN-00.00.016	2⊗	2⊗	2⊗
20	Buffer bolt, cpl.	67RPN-00.06.00.00	2	2	2
21	String Art. 30904	DIN 11026	-	-	1
22	Rubber washer 180x180x100	7617/00-00-023	2	2	2
23	Wheel wedge	EB22-034	2	2	2
24	Wedge pocket	EB22-034	2	2	2
25	Automated catch	R0*400a4600	1⊗⊗	1⊗⊗	1⊗⊗
26	Nipple M8x1	PN-76/M-86002	2	2	2
27	Self-locking nut M10-5-B-Fe/Zn5	PN-85/M-82175	8	8	8
28	Nut M8-8-B-Fe/Zn5	PN-86/M-82144	26	26	26
29	Sticker 25kN	58RPN-00.00.034	2	-	-
30	Self-locking nut M16-8-B-Fe/Zn5	PN-85/M-82175	4	4	4
31	Round washer 10.5 Zn	PN-59/M-82030	8	8	8
32	Washer 8.4-Fe/Zn5	PN-78/M-82005	18	18	18
33	Washer 13 Fe/Zn5	PN-78/M-82005	4	4	4
34	Nipple M6	PN-76/M-86002	2	2	2
35	Washer 17 Fe/Zn5	PN-78/M-82005	2	2	2
36	Washer 21 Fe/Zn5	PN-78/M-82005	6	6	6
37	Spring washer Z8.2 Fe/Zn5	PN-90/M-82008	20	20	20
38	Spring washer Z12.2 Fe/Zn5	PN-90/M-82008	4	4	4
39	Spring washer z16.3 Fe/Zn5	PN-90/M-82008	-	-	6
40	Screw M8x25-8.8-B Fe/Zn	PN-85/M-82105	26	26	26
41	Screw M8x75-8.8-B Fe/Zn	PN-85/M-82101	2	2	2
42	Screw M12x30-8.8-B Fe/Zn	PN-85/M-82105	2	2	2
43	Screw M10x35-8.8-B-Fe/Zn	PN-85/M-82105	8	8	8
44	Screw M8x16-8.8-B-Fe/Zn5	DIN 7991	16	16	16
45	Screw M20x50-8.8-B-Fe/Zn	PN-85/M-82105	2	2	2
46	Screw M16x50	PN-85/M-82105	-	-	6
47	Screw M16x80-5.8-B-Fe/Zn	PN-85/M-82105	2	2	2
48	Cotter pin S-Zn 4x32	PN-76/M-82001	4	4	4
49	Cotter pin S-Zn 6.3x45	PN-76/M-82001	2	2	2

Component name UNDERCARRIAGE			Quantity		
Drawing No. 22, 23, 24		No. of complete component/part			
No.	Part name	Drawing / standard No.	T669	T669 DK	T669 A
50	Reflection triangle DOB31		2	2	2
51	Screw M5x20-4.8-B-Fe/Zn5	PN-85/M-82215	4	4	4
52	Nut M5-5-B-Fe/Zn5	PN-86/M-82144	4	4	4
53	Washer Z5.1-Fe/Zn5	PN-77/M-82008	4	4	4
54	Nut M20-8-B-Fe/Zn5	PN-86/M-82144	2	2	2
55	Spring washer Z20-Fe/Zn5	PN-90/M-82008	2	2	2
56	Rotational string, cpl. Art. 30448		1	1	1

⊗ - depending on used tyres

⊗⊗ - for special order

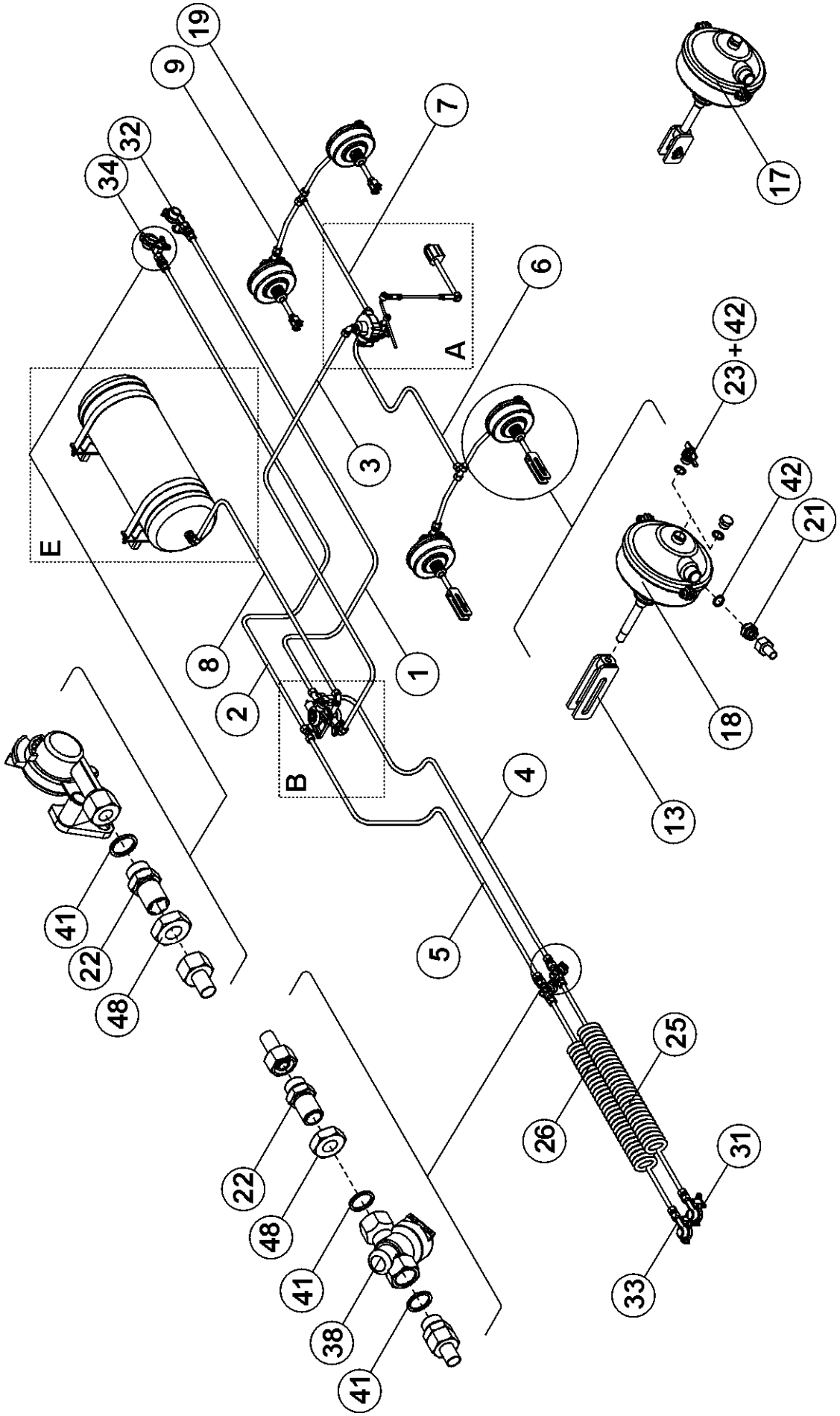


Fig. 25 Two-conduit pneumatic brake system with ALB

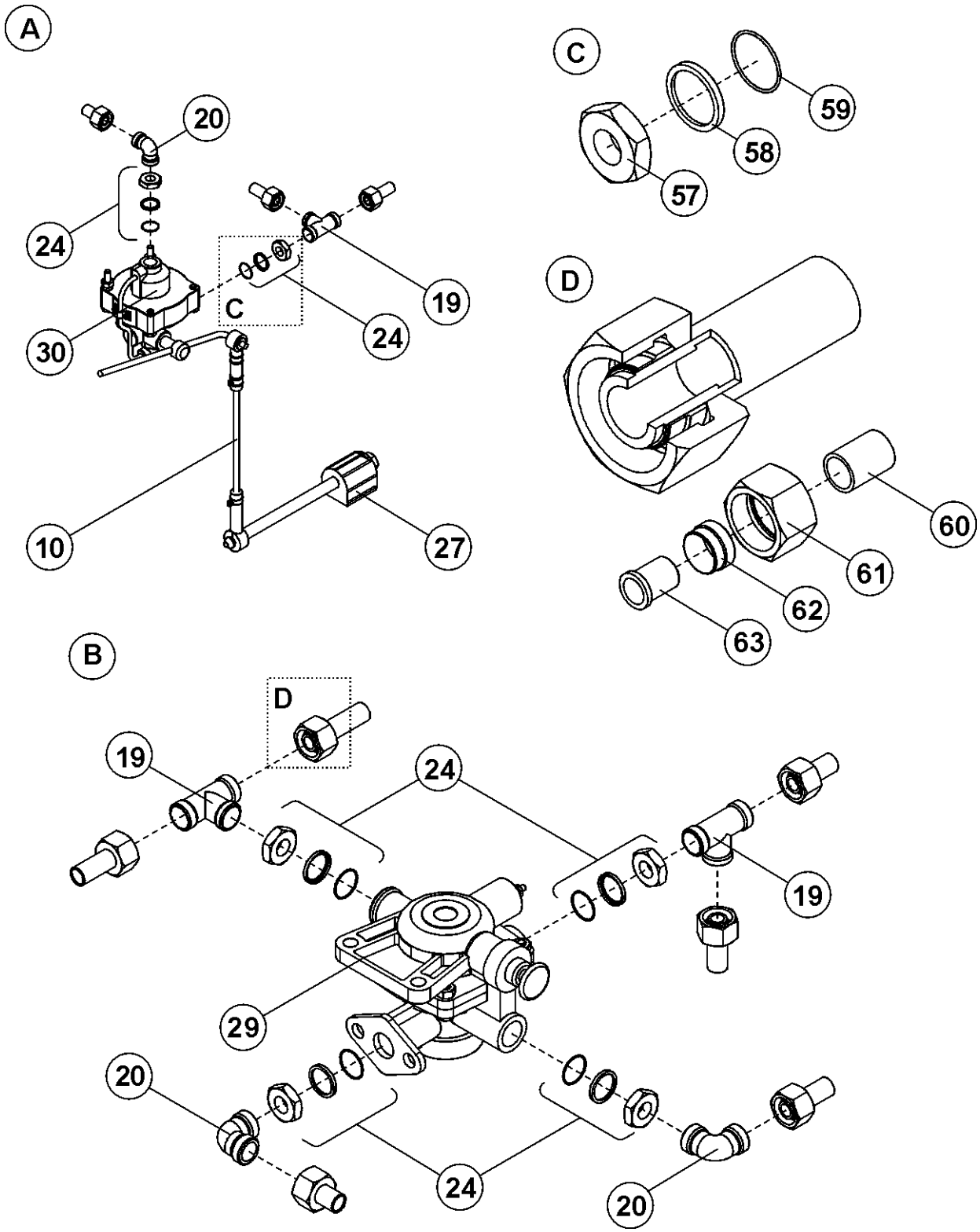


Fig. 26 Two-conduit pneumatic brake system with ALB, continued

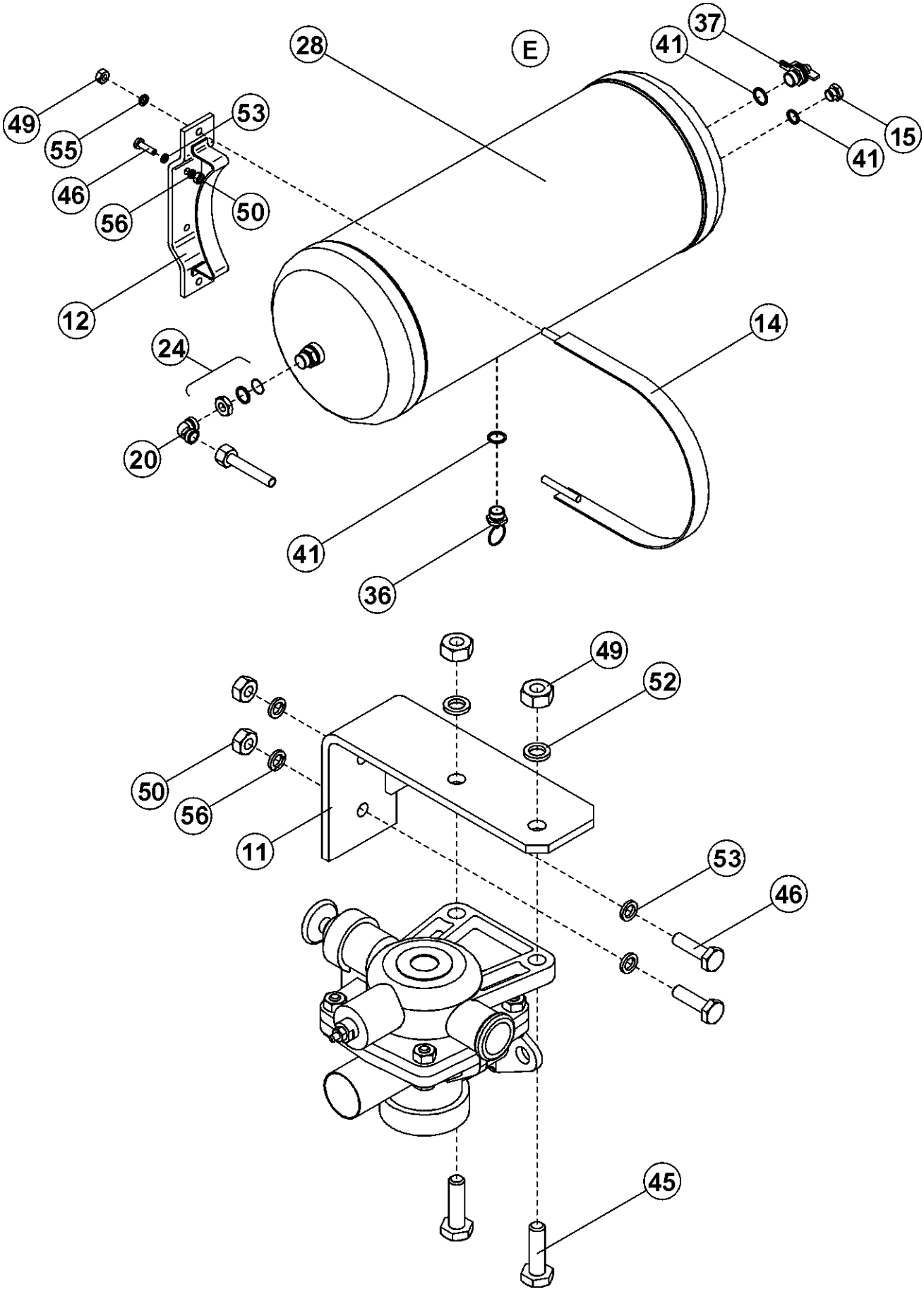


Fig. 27 Two-conduit pneumatic brake system with ALB, continued.

Component name **TWO-CONDUIT PNEUMATIC BRAKE SYSTEM WITH ALB**			Quantity		
Drawing No. **25, 26, 27**		**No. of complete component/part** **67RPN-03.00.00.00**			
No.	**Part name**	**Drawing / standard No.**	**T669**	**T669 DK**	**T669 A**
1	Conduit BŁH W-W 5960	67RPN-03.01.00.00	1	1	1
2	Conduit BŁH W-W 5050	67RPN-03.02.00.00	1	1	1
3	Conduit BŁH W-W 4150	67RPN-03.03.00.00	1	1	1
4	Conduit BŁH W-W 2300	67RPN-03.04.00.00	1	1	1
5	Conduit BŁH W-W 1900	67RPN-03.05.00.00	1	1	1
6	Conduit BŁH W-W 1250	67RPN-03.06.00.00	1	1	1
7	Conduit BŁH W-W 450	67RPN-03.07.00.00	1	1	1
8	Conduit BŁH W-W 300	67RPN-03.08.00.00	1	1	1
9	Conduit BŁH W-W 210	67RPN-03.09.00.00	4	4	4
10	Rod	67RPN-03.00.00.02	1	1	1
11	Valve bracket, cpl.	67RPN-00.00.04.00	1	1	1
12	Air reservoir bracket	64RPN-15.00.100	2	2	2
13	Cylinder fork	58RPN-12.01.000	2	2	2
14	Air reservoir band	45RPN-00.13.000	2	2	2
15	Plug	29RPN-11.00.002	1	1	1
16	Bolt	29RPN-11.00.004	2	2	2
17	Cylinder 24” T25.24.000+short fork, cpl.		2	2	2
18	Cylinder 24” T25.24.000, w/o fork		2	2	2
19	Three-way connector BŁH 063 309 066		5	5	5
20	Elbow connector BŁH 063 206 054		4	4	4
21	Straight connector BŁH M22x1.5/M16x1.5		4	4	4
22	Straight conn., long M22x1.5 063 130 047		4	4	4
23	Inspection connector 333 200 108		2	2	2
24	Sealing set KMPL M22x1.5		7	7	7
25	Spiral hose 12x1.5/4500/2xM22x1.5/żółty	WS-8	1	1	1
26	Spiral hose 12x1.5/4500/2xM22x1.5/czer.	WS-7	1	1	1
27	Spring connector 86.10.014.0		1	1	1
28	Air reservoir 585 000 000		1	1	1
29	Control valve 44.12.010.0		1	1	1
30	Braking force controller 61.20.015.0		1	1	1
31	Conduit connector 87.10.030.0		1	1	1
32	Conduit connector 87.15.030.0		1	1	1
33	Conduit connector 87.10.020.0		1	1	1
34	Conduit connector 87.15.020.0		1	1	1
35	Self-tapping screw ∅5.5x19	DIN-7504-K	11	11	11
36	Drain valve 83.10.012.0		1	1	1
37	Inspection connector 88.10.011.0		1	1	1
38	Conduit filter 81.01.010.0		2	2	2
39	Band Ribenclip 16		13	13	13
40	Connector catch Art.-331000		2	2	2
41	Washer Cu 27/22/2		11	11	11
42	Washer Cu 22/17/2		6	6	6
43	Cotter pin S-Zn3.2x25	PN-76/M-82001	2	2	2
44	Screw M12x25 5.8-B-Fe/Zn5	PN-85/M-82105	1	1	1
45	Screw M10x35 5.8-B-Fe/Zn5	PN-85/M-82105	2	2	2
46	Screw M8x35 5.8-B-Fe/Zn5	PN-85/M-82105	6	6	6
47	Screw M8x25 5.8-B-Ffe/Zn5	PN-85/M-82105	4	4	4
48	Nut M22x1.5-05-B-Fe/Zn5	PN-86/M-82153	4	4	4
49	Nut M10-5-B-Fe/Zn5	PN-86/M-82144	6	6	6

Component name **TWO-CONDUIT PNEUMATIC BRAKE SYSTEM WITH ALB**			Quantity		
Drawing No. **25, 26, 27**		No. of complete component/part **67RPN-03.00.00.00**			
No.	**Part name**	**Drawing / standard No.**	**T669**	**T669 DK**	**T669 A**
50	Nut M8-5-Fe/Zn5	PN-86/M-82144	8	8	8
51	Washer 13Fe/Zn5 Fe/Zn5	PN-78/M-82005	3	3	3
52	Washer 10.5 Fe/Zn5	PN-78/M-82005	2	2	2
53	Washer 8.4 Fe/Zn5	PN-78/M-82005	12	12	12
54	Spring washer Z12.2 Fe/Zn5	PN-77/M-82008	1	1	1
55	Spring washer Z10.2 Fe/Zn5	PN-77/M-82008	4	4	4
56	Spring washer Z8.2 Fe/Zn5	PN-77/M-82008	12	12	12
Sealing set elements (pos. 24), (for 1 set)					
57	Counter-nut M22x1.5		1	1	1
58	Ring 063.000.139		1	1	1
59	O-ring 93H		1	1	1
BŁH conduit elements (for 1 set)					
60	Conduit TEKALAN PA12 15x1.5 L=... ⊗	DIN74324	1	1	1
61	Nut BŁH M22x1.5 063.000.006		2	2	2
62	Cutting ring BŁH ∅15.2 063.00.005		2	2	2
63	Reinforcing sleeve ∅12x17		2	2	2

⊗ - Caution! While ordering a conduit give its length L (pos. 1 - 9)

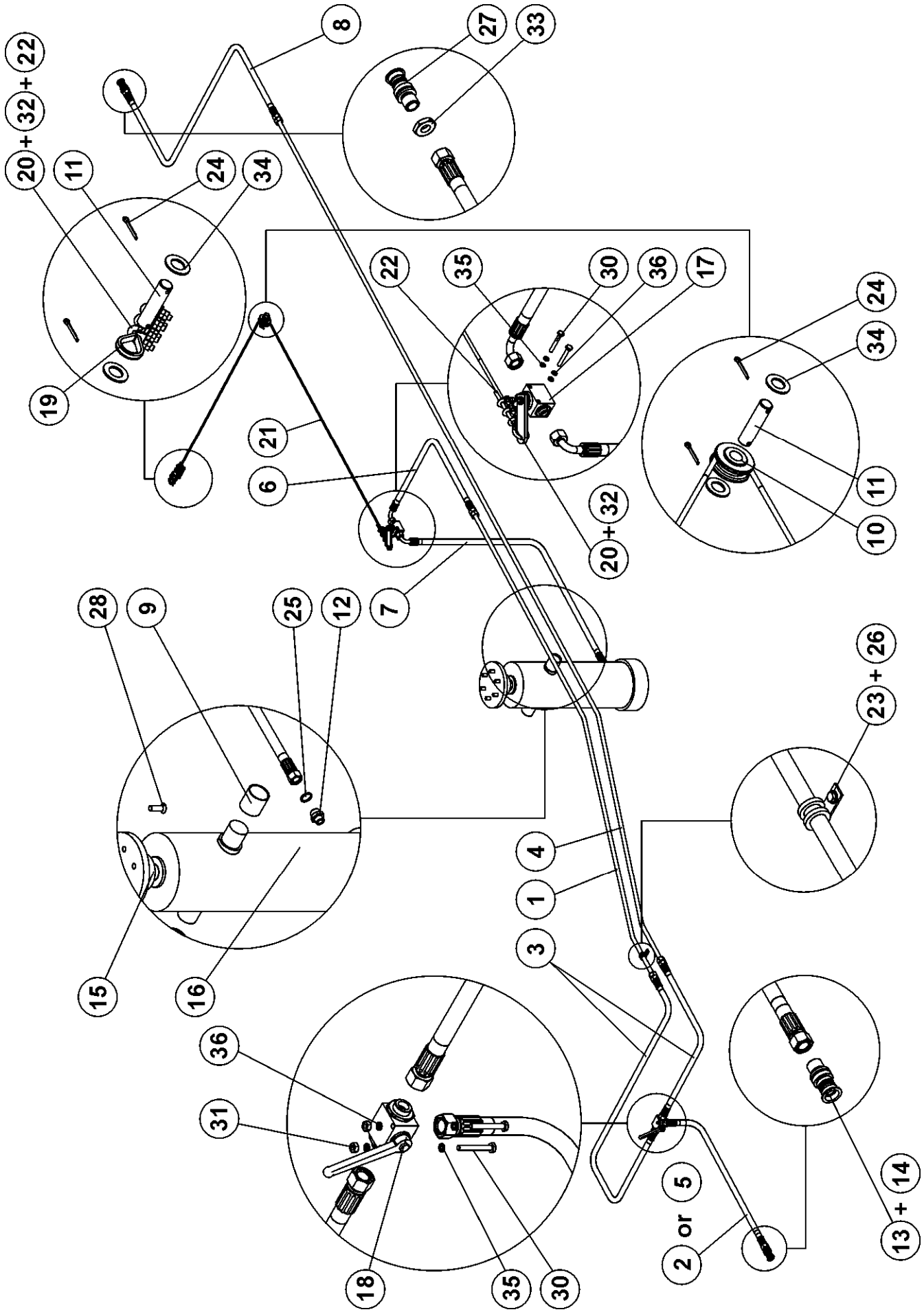


Fig. 28 Tilt hydraulic system

Component name TILT HYDRAULIC SYSTEM			Quantity		
Drawing No. 28		No. of complete component/part			
No.	Part name	Drawing / standard No.	T669	T669 DK	T669 A
1	Pipe I, set	58RPN-15.01.000	1	1	
2	Conduit DN13 H2.12 H4.13 2900	58RPN-15.02.000	1	-	
3	Conduit DN13 H2.12 H4.13 1500	58RPN-15.03.000	-	2	
4	Pipe II set	58RPN-14.01.000	-	1	
5	Conduit DN13 H2.12 H2.12 2500	45RPN-12.07.000	-	1	
6	Conduit DN13 H17.8H4.13 500	45RPN-12.06.000	1	1	
7	Conduit DN13 H17.8H2.12 800	45RPN-12.05.000	1	1	
8	Conduit DN13 H2.12 H4.13 650	53RPN-14.07.000	-	1	
9	Cylinder sleeve	58RPN-15.00.001	2	2	
10	Cable wheel	29RPN-13.00.001	1	1	
11	Wheel axle	29RPN-13.00.002	2	2	
12	Connector body	12RPN-18.00.002	1	1	
13	Quick-release connector – plug ZSR 12.5	ZSR12-W06L	1	1	
14	Cap for plugs ISO 12.5		1	1	
15	Ball bearing 55 ŁK-S01-55/0.00		1	1	
16	Telescopic cylinder CT-S226-16-75/5/2400	CT-S226-75/0.00	1	1	
17	Cut-off valve Pister	HBKH-15L-DN13	1	1	
18	Three-way hydraulic valve	29RPN-13.00.003	-	1	
19	Thimble A6 Zn	PN-66/M-80247	1	1	
20	Bail clamp 6.5 oc	PN-73/M-80241	6	6	
21	Cable ∅6 6x19+P+p l=2520		1	1	
22	Heat-shrinkable pipe PBF 12/6 l=30	BN-89/C-89209	2	2	
23	Band RIBENCLIP 16		4	15	
24	Cotter pin S-Zn 4x32	PN-76/M-82001	4	4	
25	Washer Cu 27/22/2		1	1	
26	Self-tapping screw ∅5.5x19	DIN-7504-K	4	15	
27	Quick-release conn.– socket ZSR 12.5	ZSR12-G06L	-	1	
28	Screw M12x25-8.8-B-Fe/Zn5	DIN 7991	6	6	
29	Screw M12x110-8.8-B-Fe/Zn5	PN-85/M-82101	2	2	
30	Screw M6x45-5.8-B-Fe/Zn5	PN-85/M-82101	2	2	
31	Screw M6x50-5.8-B-Fe/Zn5	PN-85/M-82101	-	2	
32	Nut M6-5-B-Fe/Zn5	PN-86/M-82144	-	2	
33	Nut M5-5-B-Fe/Zn5	PN-86/M-82144	24	24	
34	Nut M12-5-B-Fe/Zn5	PN-86/M-82144	2	2	
35	Nut M22x1.5-0.4-B-Fe/Zn5	PN-86/M-82153	-	1	
36	Washer 17-Fe/Zn5	PN-78/M-82005	4	4	
37	Washer 6.4-Fe/Zn5	PN-78/M-82005	2	6	
38	Washer 6.1-Fe/Zn5	PN-77/M-82008	2	4	
39	Washer Z12.2-Fe/Zn5	PN-77/M-82008	2	2	

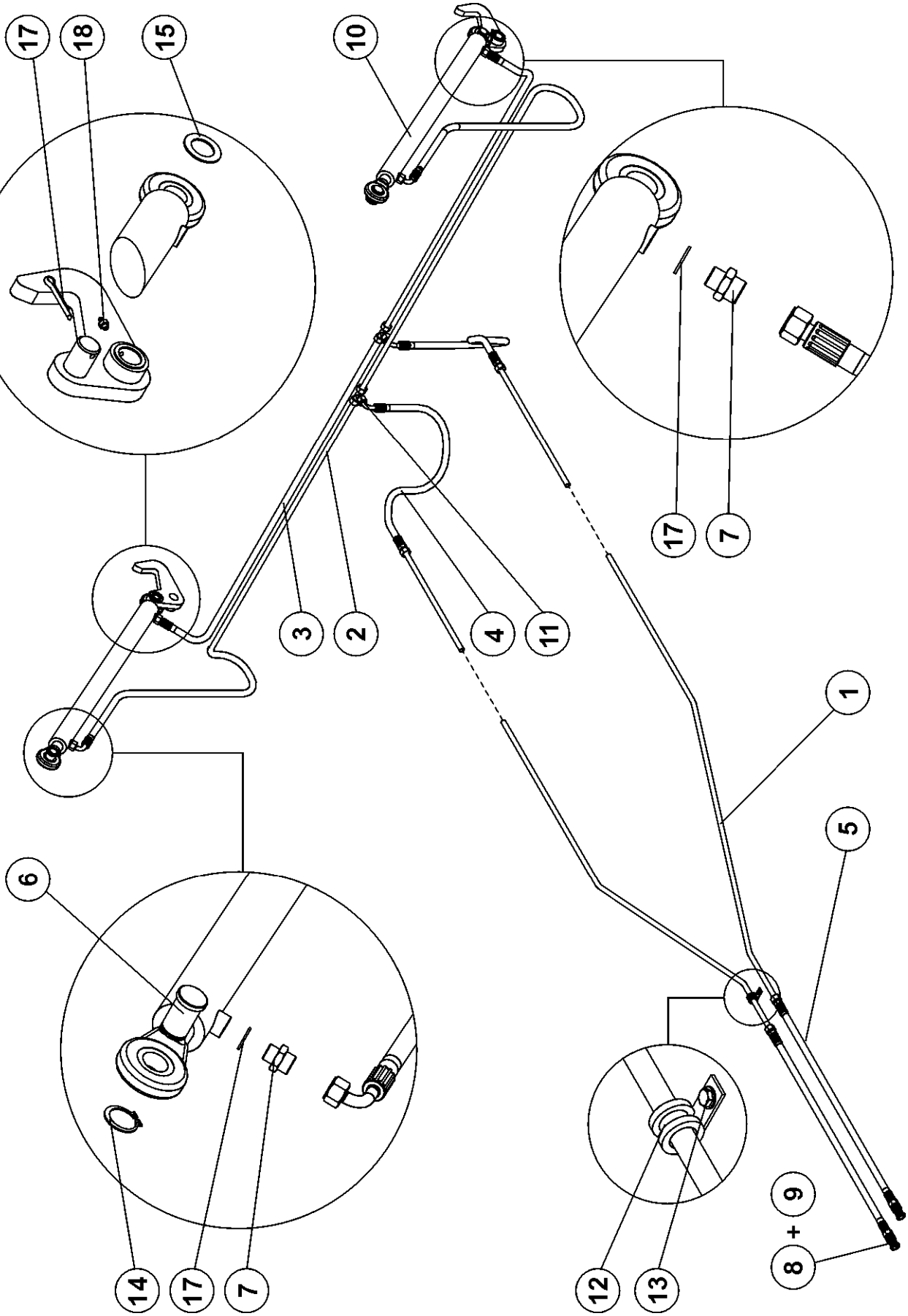


Fig. 29 Rear flap hydraulic system

Component name **REAR FLAP HYDRAULIC SYSTEM**			Quantity		
Drawing No. **29**		No. of complete component/part			
No.	**Part name**	**Drawing / standard No.**	**T669**	**T669 DK**	**T669 A**
1	Pipe I, set	67RPN-05.01.00.00	2	2	2
2	Conduit DN13 H17.8 H4.13 800	58RPN-14.04.000	2	2	2
3	Conduit DN13 H2.12 H4.13 700	58RPN-14.05.000	2	2	2
4	Conduit DN13 H17.8 H4.13 1300	58RPN014.06.000	2	2	2
5	Conduit DN13 H2.12 H4.13 2900	58RPN-15.02.000	2	2	2
6	Bolt	58RPN-14.00.001	2	2	2
7	Connector body	12RPN-18.00.03	4	4	4
8	Quick-release connector – plug ZSR 12.5	ZSR12-W06L	2	2	2
9	Cap for plugs ISO 12.5		2	2	2
10	Cylinder 50sj36A/800m5b16	33RPN-04.07.00.00	2	2	2
11	T-connector body 1613	PN-66/M-73147	2	2	2
12	Band RIBENCLIP 16		24	24	24
13	Self-tapping screw ∅5.5x19	DIN-7504-K	24	24	24
14	Retaining spring ring Z30	PN-81/M-85111	2	2	2
15	Washer 30 Fe/Zn5	PN-90/M-82004	2	2	2
16	Cotter pin S-Zn 6.3x45	PN-76/M-82001	2	2	2
17	Washer Cu 27/22/2		4	4	4
18	Nipple M6	PN-76/M-86002	2	2	2

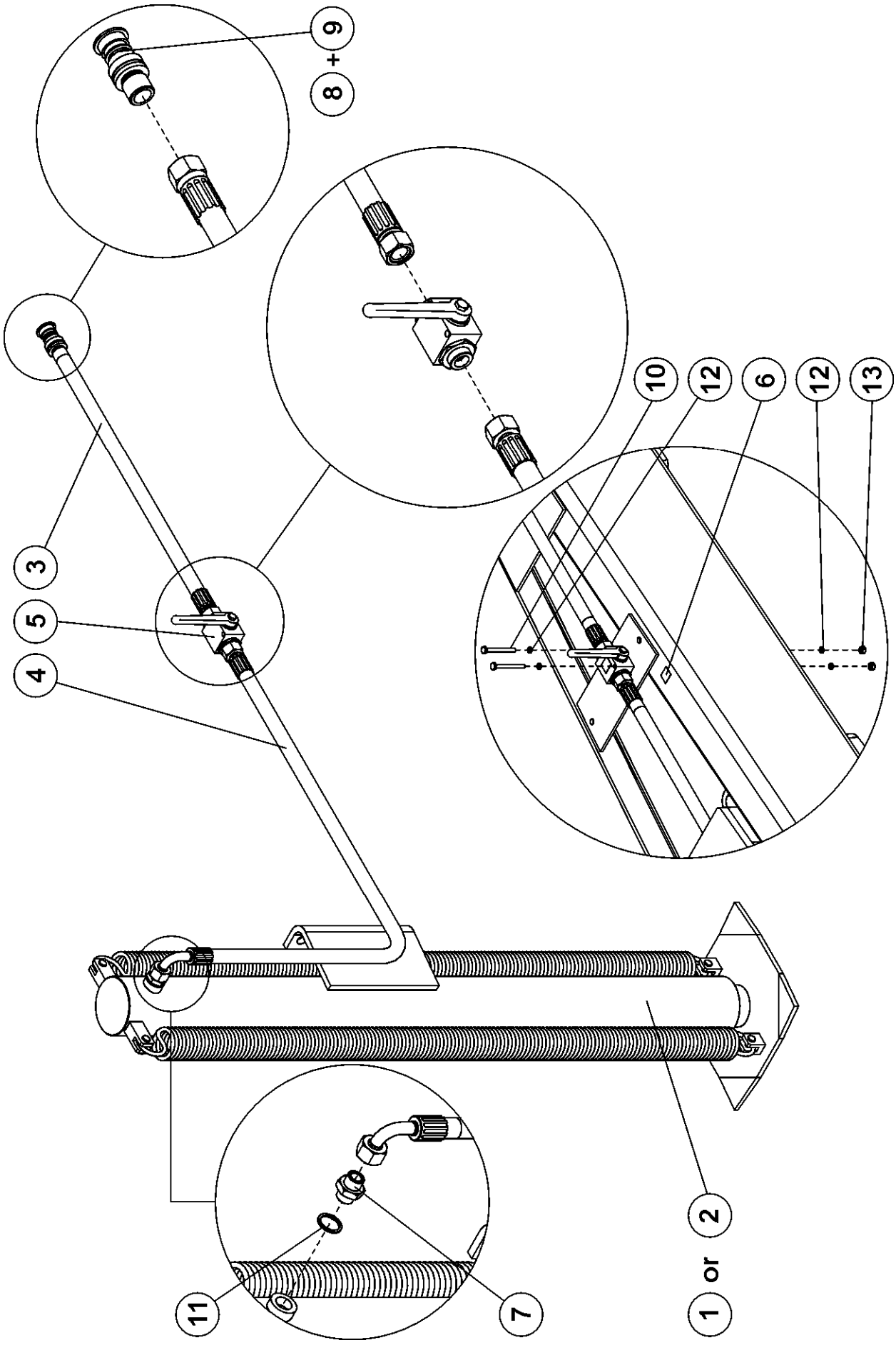


Fig. 30 Support hydraulic system

Component name SUPPORT HYDRAULIC SYSTEM			Quantity		
Drawing No. 30		No. of complete component/part 58RPN-19.00.000 58RPN-13.00.000	T669	T669 DK	T669 A
No.	Part name	Drawing / standard No.			
1	Support, cpl.	58RPN-00.02.000		-	1
2	Rotational hitch rod support, cpl.	58RPN-00.03.000		1	-
3	Conduit DN13 H2.12 H2.12 1800	58RPN-13.01.000		1	1
4	Conduit DN13 H17.8 H2.12 300	58RPN-13.02.000		1	1
5	Hydraulic valve	45RPN-26.00.001		1	1
6	Sticker „O/Z”	45RPN-26.00.002		1	1
7	Connector body	12RPN-18.00.002		1	1
8	Quick-release connector – plug ZSR12.5	ZSR12-W06L		1	1
9	Cap for plugs ISO 12.5			1	1
10	Screw M6x50-5.8-B-Fe/Zn5	PN-85/M-82101		2	2
11	Washer Cu	27/22/2		1	1
12	Washer Z6.1-Fe/Zn5	PN-77/M-82008		2	2
13	Nut M6-8-B-Fe/Zn5	PN-86/M-82144		2	2

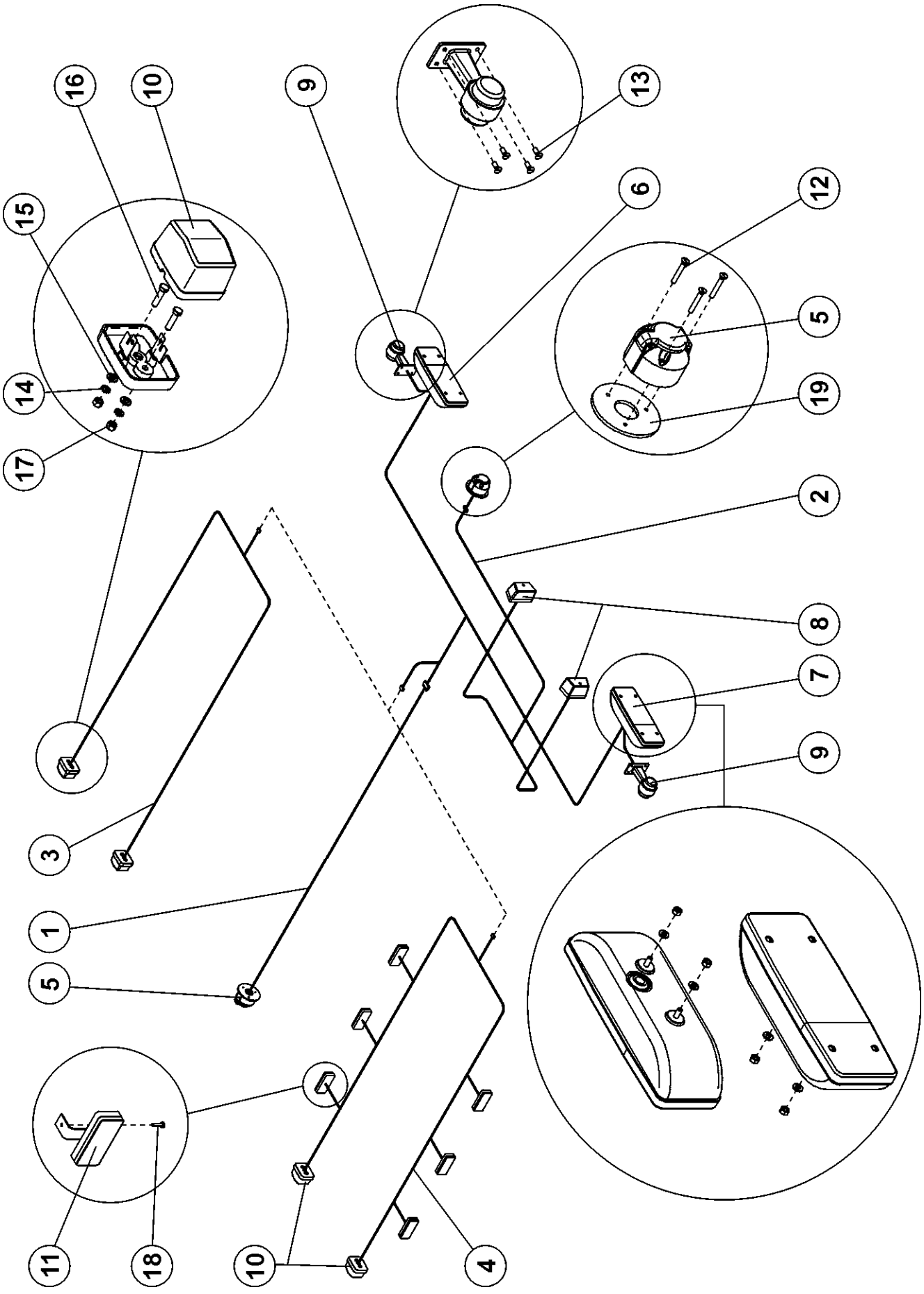


Fig. 31 Wiring system

Component name: WIRING SYSTEM			Quantity		
Drawing No.: 31		No. of complete component/part: 58RPN-09.00.000			
No.	Part name	Drawing / standard No.	T669	T669 DK	T669 A
1	Central bundle	58RPN-11.01.00	1	1	1
2	Rear bundle	67RPN-10.01.00.00	1	1	1
3	Front bundle	58RPN-11.03.00	1	-	1
4	Front bundle	58RPN-11.04.00	-	1	1
5	Socket GN-7(X7)	8JB001941-002	2	2	2
6	Rear compact lamp WE 54P	04	1	1	1
7	Rear compact lamp WE 54L	03	1	1	1
8	Number plate lamp	LT120	2	2	2
9	Contour lamp	127 021 00 00	2	2	2
10	Front position light L0-110PP		2	2	2
11	Side position light W17d	100Z	-	6	-
12	Screw M5x35-5.8 Fe/Zn5	PN/M82207	6	6	6
13	Screw M5x16 B Fe/Zn5	PN/M-82201	8	8	8
14	Spring washer 5.1 Fe/Zn9	PN/M-82008	4	4	4
15	Washer 5.3 Fe/Zn5	PN/M-82005	4	4	4
16	Nut M5-8-Fe/Zn5	PN/M-82144	4	4	4
17	Screw M5x25-B-5.8 Fe/Zn5	PN/M-82105	4	4	4
18	Self-tapping screw 5.5x19	DIN-7504-K	-	12	-
19	7-pole socket washer	006004.60	2	2	2
	Connection conductor	29RPN-10.05.00	1	1	1

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

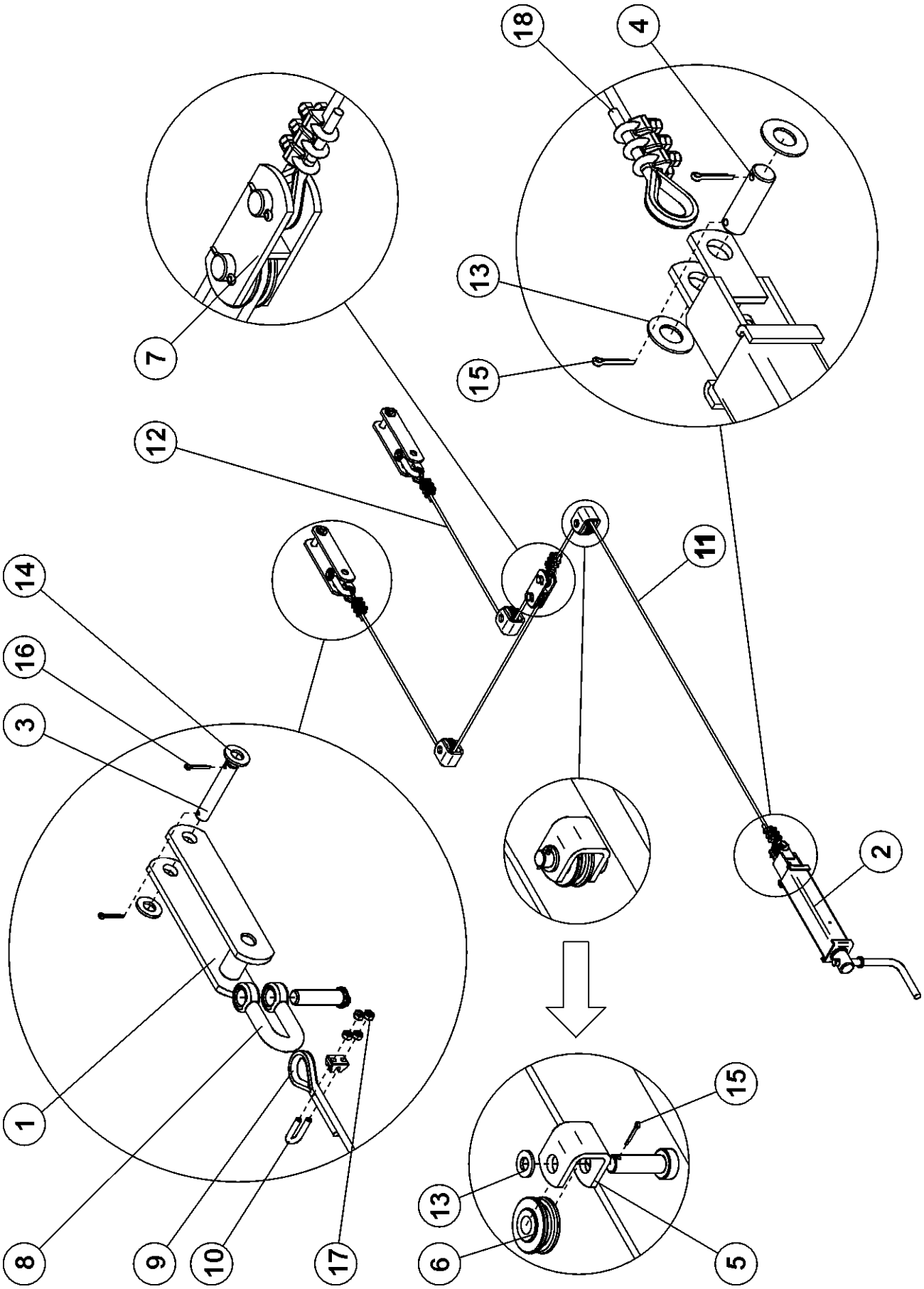


Fig. 32 Parking brake

Component name: PARKING BRAKE			Quantity		
Drawing No.: 32		No. of complete component/part: 58RPN-09.00.000			
No.	**Part name**	**Drawing / standard No.**	**T669**	**T669 DK**	**T669 A**
1	Parking brake lever	45RPN-22.01.000	2	2	2
2	Brake gear	29RPN-12.01.000	1	1	1
3	Brake bolt	45RPN-22.00.002	2	2	2
4	Bolt	29RPN-12.00.001	1	1	1
5	Cable catch	29RPN-01.00.018	3	3	3
6	Cable wheel	29RPN-13.00.001	3	3	3
7	Brake lock	31RPN-05.01.000	1	1	1
8	Screw shackle S.2768	SPRAEX	2	2	2
9	Thimble A6 Zn	PN-66/M-80247	4	4	4
10	Bail clamp 6.5 Zn	PN-73/M-80241	12	12	12
11	Cable I ∅6x19+P+p l=1900		1	1	1
12	Cable II ∅6x19+P+p l=2300		1	1	1
13	Washer 17 Fe/Zn5	PN-78/M-82005	5	5	5
14	Washer 13 Fe/Zn5	PN-78/M-82005	4	4	4
15	Cotter pin S-Zn 4x40	PN-76/M-82001	5	5	5
16	Cotter pin S-Zn 3.2x25	PN76/M-82001	4	4	4
17	Nut M5-5-B Fe/Zn5	PN-86/M-82144	24	24	24
18	Heat-shrinkable pipe PBF 12/6 l=30	BN-89/C-89209	4	4	4

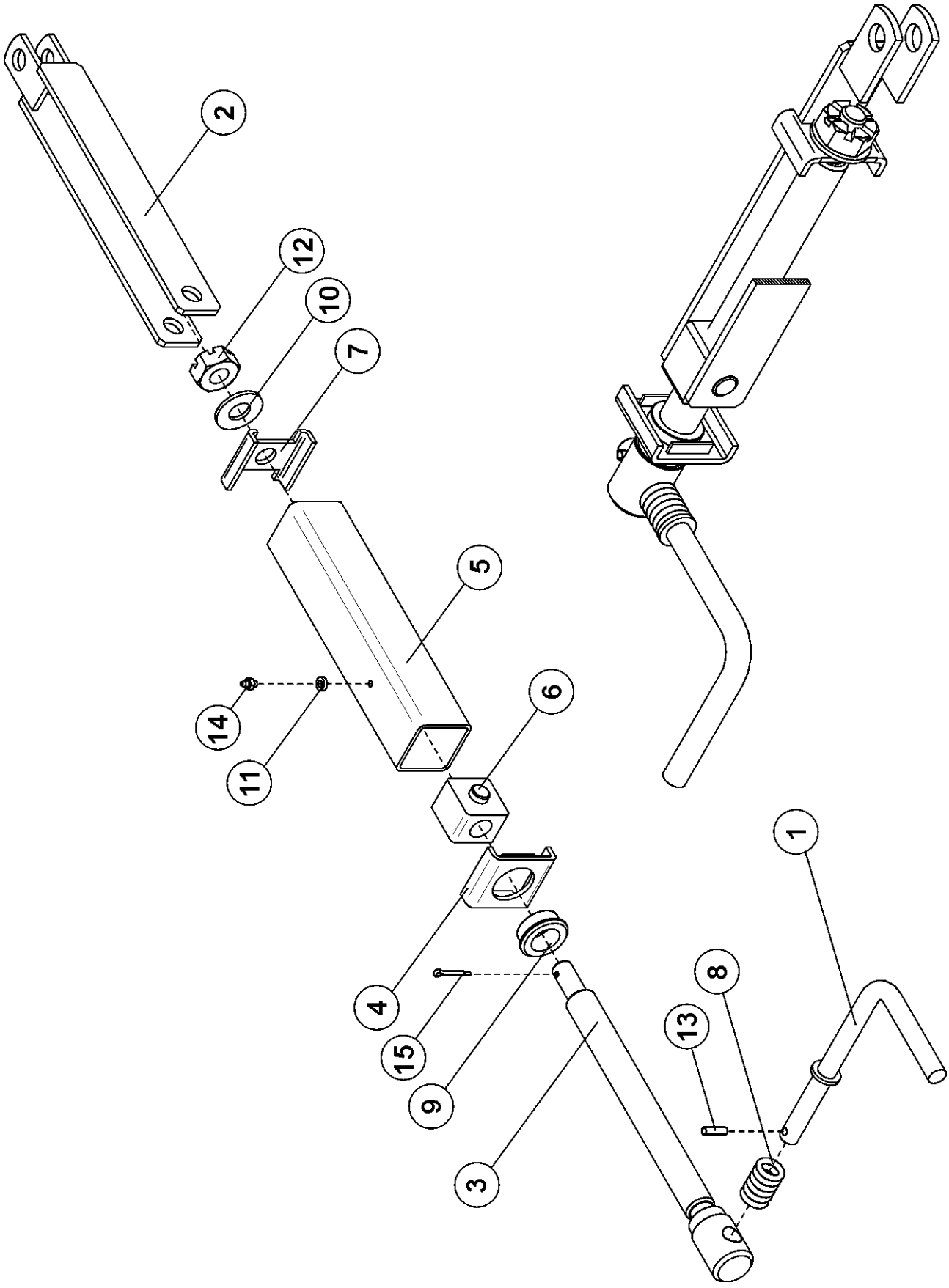


Fig. 33 Brake gear

Component name			Quantity		
BRAKE GEAR					
Drawing No.		No. of complete component/part			
33		29RPN-12.01.000			
No.	Part name	Drawing / standard No.	T669	T669 DK	T669 A
1	Crank, cpl.	29RPN-12.01.100	1	1	1
2	String, cpl.	29RPN-12.01.200	1	1	1
3	Screw, cpl.	29RPN-12.01.300	1	1	1
4	Stopper, set	29RPN-12.01.400	1	1	1
5	Body	29RPN-12.01.001	1	1	1
6	Nut	29RPN-12.01.002	1	1	1
7	Stopper	29RPN-12.01.003	1	1	1
8	Spring	29RPN-12.01.004	1	1	1
9	Sleeve	29RPN-12.01.005	1	1	1
10	Washer 17 Fe/Zn5	PN-78/M-82005	1	1	1
11	Washer 6.4 Fe/Zn5	PN-78/M-82005	1	1	1
12	Crown nut K M16-5-C Fe/Zn5	PN-86/M-82148	1	1	1
13	Spring pin 6x24	PN-89/M-85023	1	1	1
14	Nipple M6	PN-76/M-86002	1	1	1
15	Cotter pin	PN-76/M-82001	1	1	1

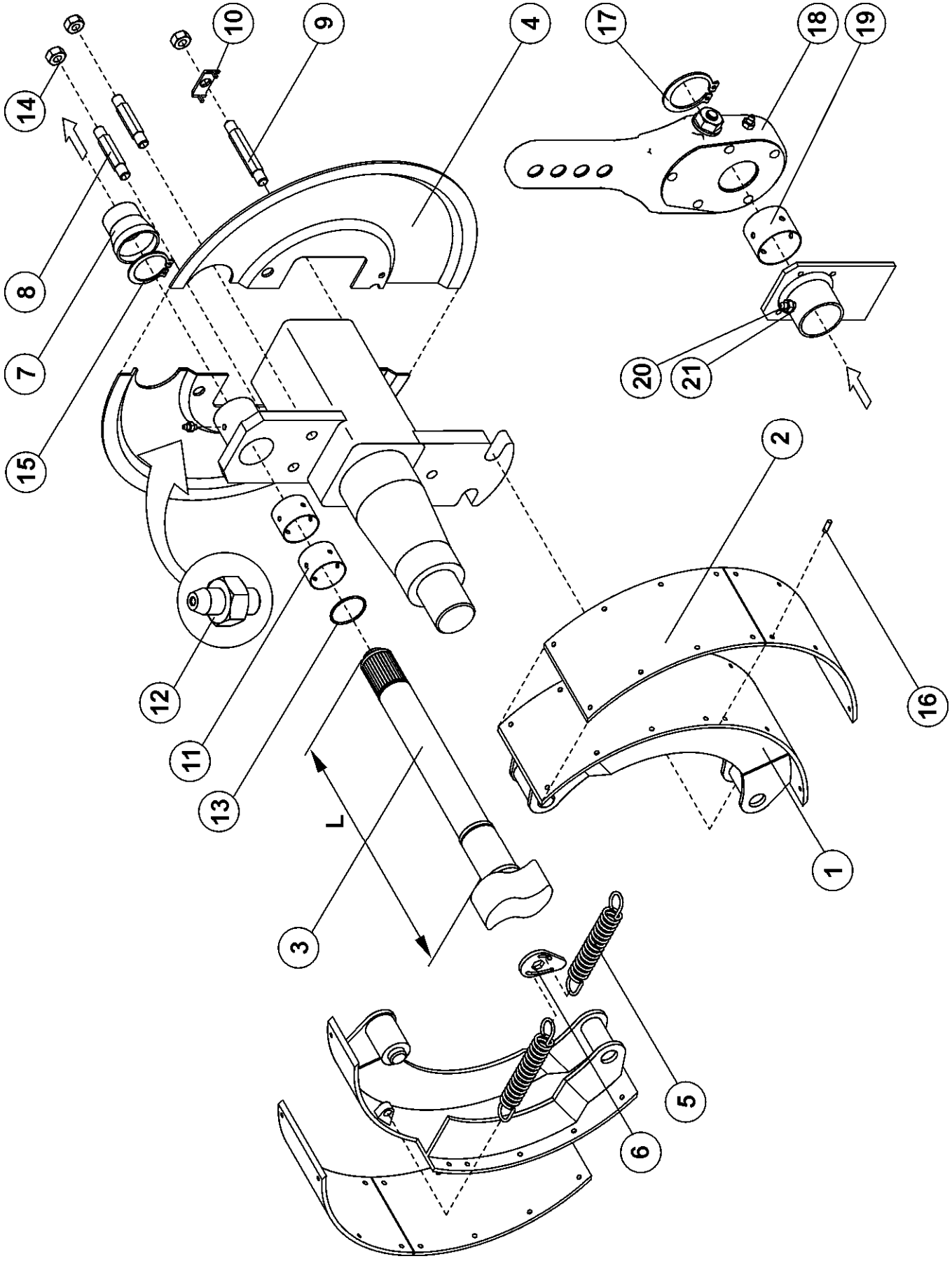


Fig. 34 Axle brake

Component name: AXLE BRAKE			Quantity		
Drawing No.: 34		No. of complete component/part:			
No.	**Part name**	**Drawing / standard No.**	**T669**	**T669 DK**	**T669 A**
1	Brake shoe	9FC412	2	2	2
2	Brake lining	9FCI406-GUARN	4	4	4
3	Cam shaft	LEWY 756S4N	1	1	1
4	Brake drum shield, set	910PP412 100	1	1	1
5	Spring	914M412/30	2	2	2
6	Stretcher	914SP262	1	1	1
7	Rubber shield	915C42	1	1	1
8	Special screw	906A10A	2	2	2
9	Special screw	906B10B	1	1	1
10	Special washer	915R10/21S	1	1	1
11	Bearing sleeve	921B42	2	2	2
12	Nipple	914INGR45	1	1	1
13	Sealing ring	921OR146	1	1	1
14	Self-locking nut	908DA10B	3	3	3
15	Outer retaining ring	914RES42	1	1	1
16	Rivet	930RIV	44	44	44
17	Outer retaining ring	915RES25	1	1	1
18	Brake lever	761W20004c0	1	1	1
19	Sleeve	921B38	1	1	1
20	Nipple	914INGR	1	1	1
21	Washer	915R08	1	1	1

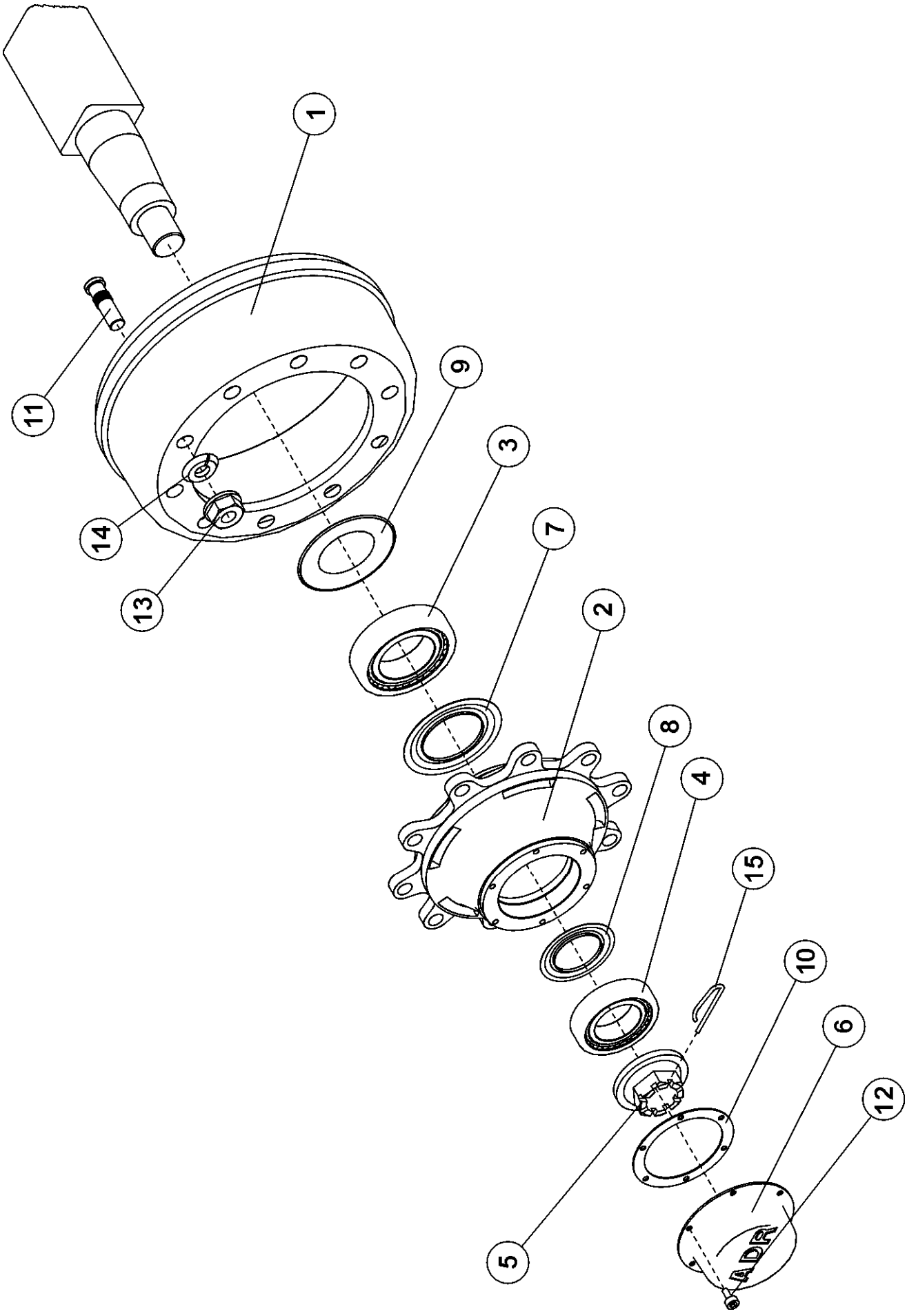


Fig. 35 Hub / drum + axle bearings

Component name HUB / DRUM + AXLE BEARINGS			Quantity		
Drawing No. 35		No. of complete component/part			
No.	Part name	Drawing / standard No.	T669	T669 DK	T669 A
1	Brake drum	66LV1050	1	1	1
2	Hub	611L0125150170	1	1	1
3	Bearing	902CC32217	1	1	1
4	Bearing	902CC32214	1	1	1
5	Crown nut M48x1.5	908DF48/65	1	1	1
6	Cap	912T125AC	1	1	1
7	Bearing shield	915N32217	1	1	1
8	Bearing shield	915PA72	1	1	1
9	Oil sealing	915PI150/87	1	1	1
10	Seal	918G125	1	1	1
11	Pin	903C22L1	10	10	10
12	Screw M8x1.25	914VB8x10	6	6	6
13	Nut M22x1.5	903D228G	10	10	10
14	Spring washer	903RL22G	10	10	10
15	Cotter pin	914C48E	1	1	1

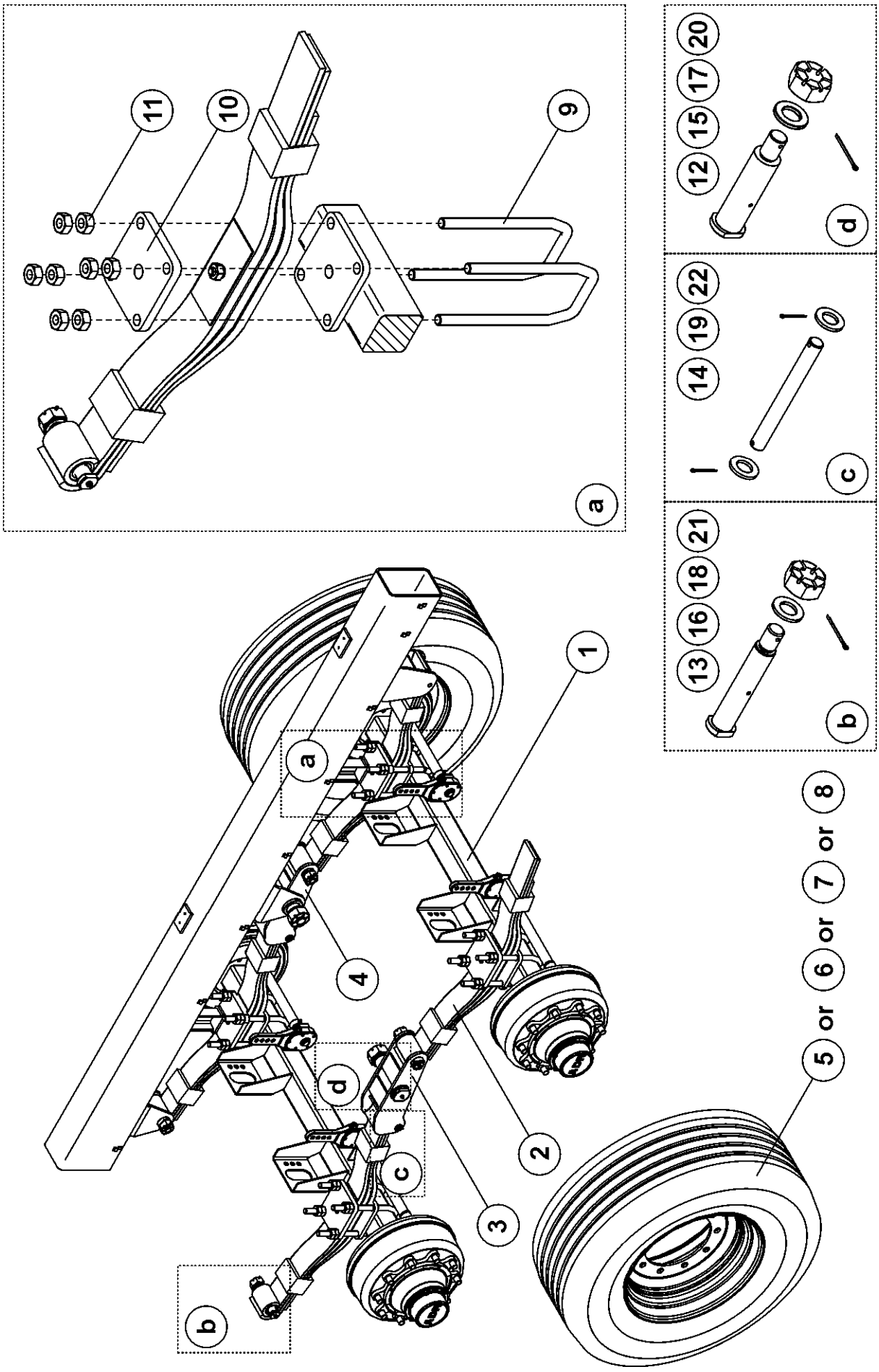


Fig. 36 Suspension

Component name: SUSPENSION			Quantity		
Drawing No.: 36		No. of complete component/part			
No.	**Part name**	**Drawing / standard No.**	**T669**	**T669 DK**	**T669 A**
1	Axle	58RPN-00.04.000	2	2	2
2	Parabolic suspension spring	67RPN-00.04.03.00	4	4	4
3	Left rocker, cpl.		1	1	1
4	Right rocker, cpl.	67RPN-00.04.01.00	1	1	1
5	Wheel, cpl 50x20 R22 32PR	58RPN-00.07.000-01	4	4	4
6	Wheel, cpl 550/60 R22.5 12PR ⊗	58RPN-00.07.000-02	4	4	4
7	Wheel, cpl 550/60 R22.5 16PR ⊗	58RPN-00.07.000-03	4	4	4
8	Wheel, cpl 385/65 R22.5 18PR ⊗	58RPN-00.07.000-04	4	4	4
9	Bail screw	58RPN-00.00.004	8	8	8
10	Upper suspension spring plate	58RPN-00.00.003	4	4	4
11	Nut M20x1.5-5-B-Fe/Zn5	PN-86/M-82144	32	32	32
12	Rocker bolt, cpl.	67RPN-00.04.02.00	2	2	2
13	Suspension spring bolt, cpl.	62RPN-00.00.300	4	4	4
14	Suspension spring bolt	45RPN-00.03.001	4	4	4
15	Washer	37RPN-18.00.002	2	2	2
16	Crown nut Z M24-8-B-Fe/Zn5	PN-86/M-82148	4	4	4
17	Crown nut Z M36x3-8-B-Fe/Zn5	PN-86/M-82148	2	2	2
18	Washer 25 Fe/Zn5	PN-78/M-82005	4	4	4
19	Washer 17 Fe/Zn5	PN-78/M-82005	8	8	8
20	Cotter pin S-Zn 6.3x71	PN-76/M-82001	2	2	2
21	Cotter pin S-Zn 5x50	PN-76/M-82001	4	4	4
22	Cotter pin S-Zn 4x32	PN-76/M-82001	8	8	8

⊗ - for special order

LIST OF DISC WHEELS AND TYRES			Quantity		
No.	**Part name**	**Drawing / standard No.**	**T669**	**T669 DK**	**T669 A**
	Wheel, cpl 50x20 R22 32PR	**58RPN-00.07.000-01**			
1	Disc wheel cpl 16.00x22	22.16.02	1	1	1
2	Tyre Bridgestone 50x20.0R22 32 PR		1	1	1
3	Air tube 16 x 22 w/valve TR 15		1	1	1
4	Tyre flap 16.00x22		1	1	1
	Wheel, cpl 550/60 R22.5 12PR	**58RPN-00.07.000-02**			
1	Disc wheel 16.00x22.5	225.16.01	1	1	1
2	Tyre 550/60-22.5 12 PR		1	1	1
3	Air tube 550/60-22.5 w/valve TR 15		1	1	1
	Wheel, cpl 550/60 R22.5 16PR	**58RPN-00.07.000-03**			
1	Disc wheel 16.00x22.5		1	1	1
2	Tyre 550/60-22.5 16 PR		1	1	1
3	Air tube 550/60-22.5 w/valve TR 15		1	1	1
	Wheel, cpl 385/65 R22.5 18PR	**58RPN-00.07.000-04**			
1	Disc wheel 11.75x22.5	225.1175.06	1	1	1
2	Tyre reg. 385/65-22.5 18 PR		1	1	1
3	Air tube 385/65-22.5 w/valve TR 15		1	1	1

NOTES