

INTRODUCTION

Information contained herein is current at date of publication. As a result of improvements, some numerical values and illustrations contained in this publication may not correspond to the factual specification of the machine supplied to the user. The manufacturer reserves the right to introduce design changes in machines produced that facilitate operation and improve the quality of their work, without making minor amendments to this Operator's Manual. Please send your comments and proposals on the design and operation of the machine to the Manufacturer. This information enables objective evaluation of the machines produced and provides indications for their further improvement. Information on significant design changes is passed on to users on information inserts attached to this Operator's Manual (annexes).

This Operator's Manual is an integral part of the machine's documentation. Before using the machine, the user must carefully read this Operator's Manual and observe all recommendations. This guarantees safe operation and ensures malfunction free work of the machine. The machine is designed to meet obligatory standards, documents and legal regulations currently in force.

This Operator's Manual describes the basic safety rules and operation of T185 Hook Trailer. If the information contained in the Operator's Manual needs clarification then the user should refer for assistance to the sale point where the tractor was purchased or to the Manufacturer

Manufacturer's address:

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Information, descriptions of danger and precautions and also recommendations and prohibitions associated with user safety instructions are marked:



and also preceded by the word "**DANGER**". Failure to observe the instructions may endanger the machine operator's or other person's health or life.

Particularly important information and instructions, the observance of which is essential, are distinguished in the text by the sign:



and also preceded by the word "**ATTENTION**". Failure to observe the instructions may lead to damage to the machine as a result of improper operation, adjustment or use.

In order to focus the user's attention on the need to perform maintenance, the relevant section of the Operator's Manual is marked with the pictogram:





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EC DECLARATION OF CONFORMITY OF THE MACHINERY

PRONAR Sp. z o.o. declares with full responsibility, that the machine:

Description and identification of the machinery	
Generic denomination and function:	TRAILER
Type:	T185
Model:	-----
Serial number:	
Commercial name:	TRAILER PRONAR T185

to which this declaration relates, fulfills all the relevant provisions of the Directive **2006/42/EC** of The European Parliament and of The Council of 17 May 2006 on machinery, and amending Directive 95/16/EC (Official Journal of the EU, L 157/24 of 09.06.2006).

The person authorized to compile the technical file is the Head of Research and Development Department at PRONAR Sp. z o.o., 17-210 Narew, ul. Mickiewicza 101A, Poland.

This declaration relates exclusively to the machinery in the state in which it was placed on the market, and excludes components which are added and/or operations carried out subsequently by the final user.

Narew, the _____

Place and date

Z-CA DYREKTORA
d/s technicznych
członk zarządu

Roman 

*Full name of the empowered person
position, signature*

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SECTION

1

BASIC INFORMATION

IDENTIFICATION

PROPER USE

EQUIPMENT

WARRANTY TERMS

TRANSPORT

ENVIRONMENTAL HAZARDS

WITHDRAWAL FROM USE

1.1 IDENTIFICATION

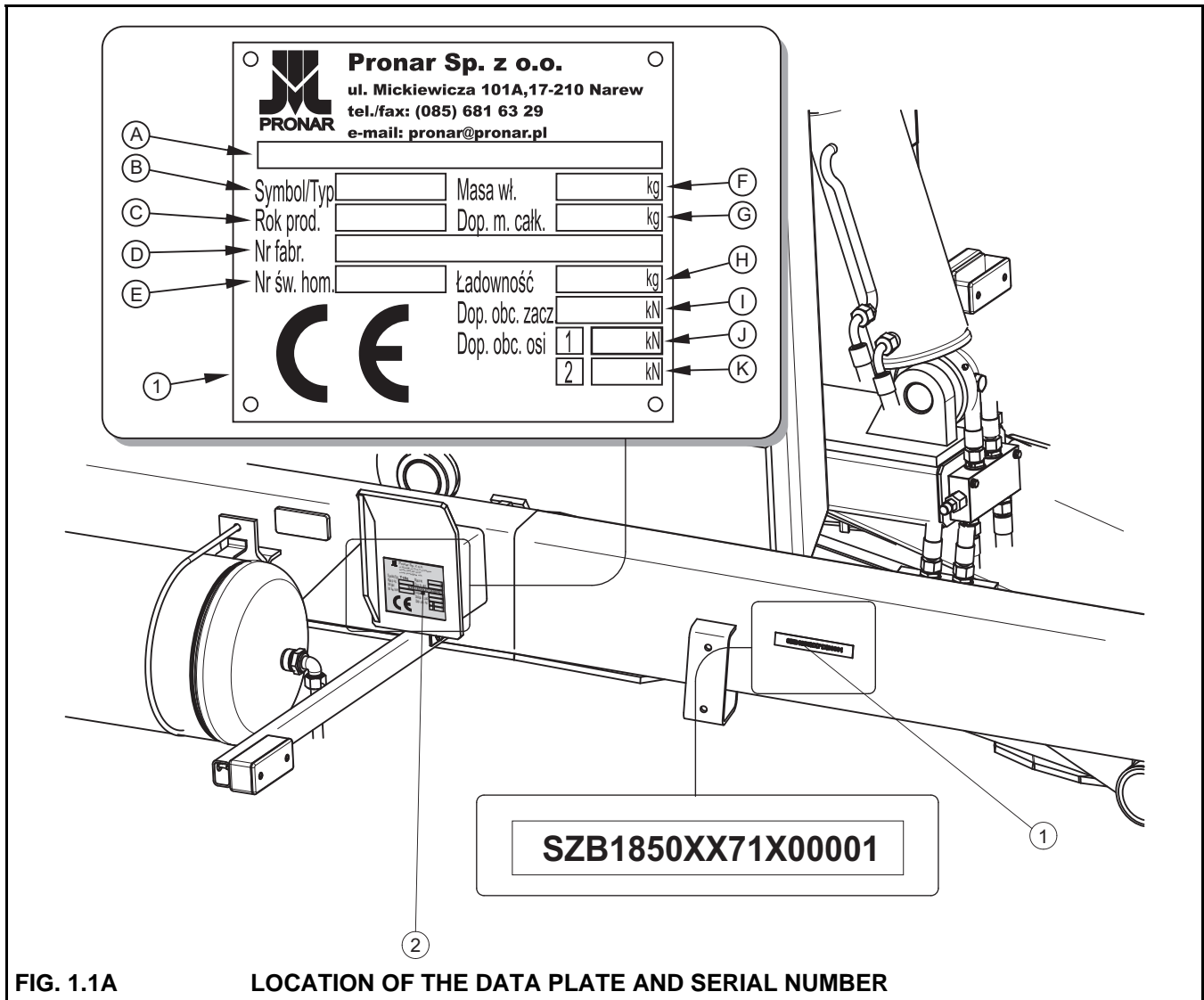


FIG. 1.1A LOCATION OF THE DATA PLATE AND SERIAL NUMBER

(1) data plate, (2) serial number

The T185 hook trailer has an data plate located on the right longitudinal rail of lower frame. The factory number is stamped into the identity plate and into the right longitudinal rail of a frame, on a rectangle area painted silver. When buying the Hook Trailer check that the serial numbers on the machine agree with the number written in the *WARRANTY BOOK*, in the sales documents and in the *OPERATOR'S MANUAL*.

The factory number of the axle half shaft and its type is stamped onto the identity plate secured to the hub cap of the axle shaft (from the inside).

TAB. 1.1 MARKINGS ON DATA PLATE

ITEM	MARKING
A	General description and purpose
B	Symbol /Type
C	Year of manufacture
D	Seventeen digit serial number (VIN)
E	Official certificate number
F	Tare weight
G	Maximum gross weight
H	Carrying capacity
I	Permissible hitching system loading
J	Permissible front axle load
K	Permissible rear axle load

1.2 PROPER USE

The hook trailer is designated for use with various types of load boxes (agricultural, building, communal, special and transport platforms etc), fulfilling the requirements described in table (1.2), at maximum design speed of 40 km/h. Trailer design enables connection and disconnection of load boxes and their unloading by tipping to the rear. Type of load carried depends on load box use. The trailer must not be used in any way other than that described above. Using it as intended also involves all actions connected with the safe and proper operation and maintenance of the machine. The trailer is not intended or designed for transporting people or animals.

TAB. 1.2 LOAD BOX REQUIREMENTS ACCORDING TO DIN 30722-1

DATA	UNIT	VALUE
Minimum length	[mm]	4,650
Maximum length	[mm]	4,900
Maximum width	[mm]	2,550
Maximum height	[mm]	2,000
Maximum gross weight	[kg]	12,130

The hook trailer is adapted for work with load boxes executed according to DIN 30722-1 standard. Use is permitted with load boxes, of total length not less than 4 650 mm and not greater 4 900 mm. Width and height of load box may not exceed dimensions given table (1.2). The trailer is also adapted to work with load boxes produced by Pronar, which are detailed in table (1.3).

The brake system and the light and indicator system meet the requirements of road traffic regulations. The maximum speed of the trailer on public roads is 30 km/h in Poland (pursuant to Road Traffic Act of June 20th 1997, art. 20). In the countries where the trailer is used, the limits stipulated by the road traffic legislation in force in a given country must be observed. The trailer speed must not, however, be greater than the maximum design speed of 40 km/h.

TAB. 1.3 PRONAR LOAD BOXES

TYPE	PROPER USE	INTERNAL DIMENSIONS [mm] LENGTH / WIDTH / HEIGHT
KO 01	Agricultural	4,560 / 2,395 / 1 405
KO 02	Construction	4,560 / 2,392 / 700
KO 03	Construction	4,560 / 2392 / 700

Requirements concerning trailer operation with agricultural tractor are presented in the table below.

TAB. 1.4 AGRICULTURAL TRACTOR'S REQUIREMENTS

CONTENTS	UNIT	REQUIREMENTS
Brake system		
Pneumatic system 1 – conduit	-	sockets compliant with PN-ISO 1728:2007
Pneumatic system 2 – conduit	-	sockets compliant with PN-ISO 1728:2007
Pressure rating of the pneumatic system	kPa	600
Hydraulic brake system		socket with ISO 7241-A type pin
Pressure rating of the hydraulic system	MPa	16
Hydraulic system		
Hydraulic oil	-	HL 32
Pressure rating of the system	bar / MPa	200 / 20
Oil demand:	l	38
Electrical system		
Electrical system voltage	V	12
Attachment socket	-	7 polar compliant with ISO 1724
Tractor hitches		
Minimum vertical load capacity of hitch	kN / kg	19.62 / 2 000
Other requirements		
Minimum power demand	kW/HP	53.5 / 72.8

Axle system (axles, wheels and tyres), meet the requirements of agricultural trailers. The fulfilment of these requirements secures proper operation.

The trailer user must carefully read the Operator's Manual and comply with it,

Depending on the fitted accessories, hook trailer can be equipped with a rotating drawbar eye \varnothing 50 mm, or regular drawbar with eye \varnothing 40 mm.

DANGER

The trailer must not be used for purposes other than those for which it is intended, in particular:



- for transporting people and animals,
- for transporting loose unsecured toxic materials, if there is a possibility of causing environmental damage,
- for transporting machines and equipment, with high centre of gravity affecting trailer stability,
- for transporting loads with uneven loading and overloading of axles,
- for transporting unsecured loads, which may move in the load box.
- with load boxes not complying with the Manufacturer's requirements.

1.3 EQUIPMENT

The standard equipment of each trailer includes:

- *OPERATOR'S MANUALS*,
- *WARRANTY BOOK*,
- Connection lead for the electrical system
- hydraulic support,
- Wheel chocks

On request, the manufacturer may equip hook trailer with the following additional equipment:

- Slow-moving vehicle warning sign
- warning reflective triangle,
- mechanical worm gear support (instead of hydraulic support).

1.4 WARRANTY TERMS

PRONAR Sp. z o.o., Narew guarantees the reliable operation of the machine when it is used according to its intended purpose as described in the *OPERATOR'S MANUAL*.

The repair period is specified in the *WARRANTY BOOK*.

The guarantee does not apply to parts and sub-assemblies of the machine, which are subject to wear in normal usage conditions, regardless of the warranty period. normal tyre wear, brake linings, mechanical damage, damage arising from improper use, adjustment and maintenance.

Detailed guarantee regulations are contained in the *WARRANTY BOOK* attached to each machine.



ATTENTION!

Demand that the seller carefully and precisely fills out the *WARRANTY BOOK* and guarantee repair coupons. A missing date of purchase or sale point stamp, may make the user ineligible for any warranty repair or refund.

1.5 TRANSPORT

The hook trailer is ready for sale completely assembled and does not require packing. Packing is only required for the machine's technical documentation and any extra fittings.

The trailer is delivered to the user either transported on a vehicle or, independently (towed), after being attached to a tractor.



ATTENTION!

When transporting independently, the user must carefully read this operator's manual and observe its recommendations. When being transported on a motor vehicle the trailer must be mounted on the vehicle's platform in accordance with the transport safety requirements. The driver of the vehicle should take particular care while transporting the trailer. This is due to the vehicle's centre of gravity shifting upwards when loaded with the machine.

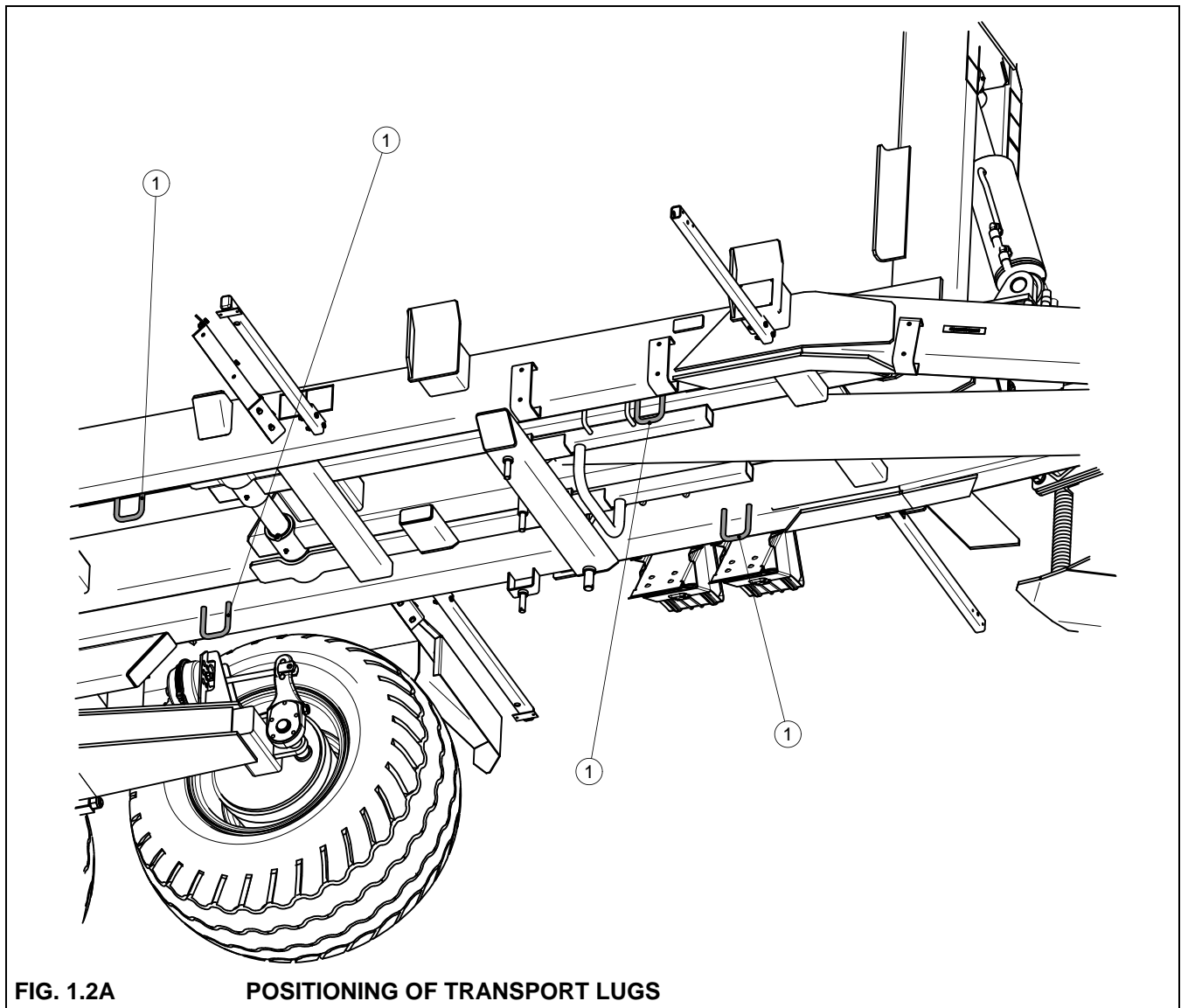


FIG. 1.2A **POSITIONING OF TRANSPORT LUGS**

(1) transport lugs

When loading and unloading the hook trailer, comply with the general principles of workplace health and safety for reloading work. Persons operating reloading equipment must have the qualifications required to operate these machines.

The hook trailer should be attached firmly to the platform of the vehicle using straps or chains fitted with a tightening mechanism. The fastening equipment used must have a valid safety certificate. Chocks or other objects without sharp edges should be placed under the wheels of the trailer to prevent it from rolling. The chocks must be fixed to the platform of the vehicle. During reloading work, particular care should be taken not to damage parts of the trailer's fittings or the lacquer coating.

1.6 ENVIRONMENTAL HAZARDS

A hydraulic oil leak constitutes a direct threat to the natural environment owing to its limited biodegradability. While carrying out maintenance and repair work which involves the risk of an oil leak, this work should take place on an oil resistant floor or surface. In the event of oil leaking into the environment, first of all contain the source of the leak, and then collect the leaked oil using available means. Remaining oil must be collected using sorbents.

1.7 WITHDRAWAL FROM USE

Should the user decide to withdraw the machine from use, the entire trailer should be taken to a scrap yard approved by local authorities. When spare parts are changed, worn out or damaged parts should be taken to a collection point for recyclable raw materials. Hydraulic oil should be taken to the appropriate facility dealing with the re-use of this type of waste.

SECTION

2

SAFETY ADVICE

BASIC SAFETY RULES

DRIVING ON PUBLIC ROADS

DESCRIPTION OF MINIMAL RISK

INFORMATION AND WARNING DECALS

2.1 BASIC SAFETY RULES

- Before using the trailer, the user must carefully read this operator's manual. When operating the machine, the operator must comply with the recommendations.
- If the information contained in the Operator's Manual is difficult to understand, contact a seller, who runs an authorised technical service on behalf of the manufacturer, or contact the manufacturer directly.
- Careless and improper use and operation of the hook trailer, and non-compliance with the recommendations given in this operator's Manual is dangerous to your health.
- Non-compliance with the safety rules of this Operator's Manual can be dangerous to the health and life of the operator and others.
- Be aware of the existence of a minimal risk, and for this reason the fundamental basis for using this hook trailer should be the application of safety rules and sensible behaviour.
- The machine must never be used by persons, who are not authorised to drive agricultural tractors, including children and people under the influence of alcohol or other drugs.
- The machine must not be used for purposes other than those for which it is intended. Anyone who uses the machine other than the way intended takes full responsibility for himself for any consequences of this use.
- Any modification to the hook trailer frees the manufacturer from any responsibility for damage or detriment to health which may arise as a result.
- Before using the hook trailer always check its technical condition. In particular, check the technical condition of the hitch system, the hook, the axle system, brake systems and indicator lights.
- The machine can only be stood on when it is absolutely motionless and the tractor engine is switched off. Agricultural tractor and trailer must be immobilised with parking brake.
- Do not move the middle frame interlock lever with extended or raised frame.

- Hook trailer unhitched from tractor must be immobilised with parking brake. If the machine is positioned on a slope or elevation it shall be additionally secured by the placing under the wheels of trailer equipment chocks or other objects without sharp edges.
- The trailer may only be used when all the safety guards and other protective elements are technically sound and correctly positioned. In the event of loss or destruction of the safety guards, they must be replaced with new ones.
- Before using the trailer always check the machine, whether it is properly prepared for work, especially in terms of safety.
- People or animals must not be carried either on the trailer chassis or in load boxes.
- Do NOT exceed the trailer's maximum carrying capacity.
- The trailer and tractor must not be attached if the hydraulic oil in the two machines is of different types.
- While connecting the hook trailer to the tractor, use the lower transport hitch - the hitch for single axle trailer. Check safety clips.
- Be especially careful when hitching the machine.
- When hitching, there must be nobody between the trailer and the tractor.
- Regularly check the condition of connections and safety devices.
- The hydraulic system is under high pressure when operating.
- Regularly check the technical condition of the connections and the hydraulic and pneumatic leads.
- In the event of any fault or damage whatsoever, do not use the trailer until the fault has been fixed.
- When connecting the hydraulic conduits to the tractor, make sure that the tractor hydraulic system and hook trailer are not under pressure.
- Check condition of machine hydraulic system frequently, oil leaks are not allowed.
- Before beginning repair works on hydraulic or pneumatic systems reduce oil or air pressure.

- In the event of injuries being caused by pressurised hydraulic oil, contact a doctor immediately. Hydraulic oil may find its way under the skin and cause infections.
- Use the hydraulic oil recommended by the Manufacturer. Never mix two types of oil.
- After changing the hydraulic oil, the used oil should be properly disposed of.
- When working on the tyres, chocks attached to hook trailer should be placed under the wheels of the hook trailer to prevent it from rolling.
- Repair work on the wheels or tyres should be carried out by persons trained and entitled to do so. This work should be carried out using appropriate tools.
- After removing a wheel, always check how firmly the nuts are screwed in. Inspection should take place each time after first use, after first journey with a load and then every 6 months.
- Check the tyre pressure regularly.
- During work use the proper, close-fitting protective clothing, gloves and appropriate tools.
- Servicing and repair work should be carried out in line with the general principles of workplace health and safety. In the event of injury, the wound must be immediately cleaned and disinfected. In the event of more serious injuries, seek a doctor's advice.
- Repair, maintenance and cleaning work should be carried out with the tractor's engine switched off and the ignition key removed.
- Regularly check the condition of the bolt and nut connections.
- Before welding or electrical work, the hook trailer should be disconnected from the power supply.
- During the warranty period, any repairs may only be carried out by Warranty Service authorised by the manufacturer.
- Should it be necessary to change individual parts, use only original parts. Non-adherence to these requirements may put the user and other people's health and life at risk, and also damage the hook trailer.

- The paint coating should be cleaned off before beginning welding work. Burning paint fumes are poisonous for people and animals. Welding work should be carried out in a well lit and well ventilated space.
- During welding work pay attention to flammable or fusible elements (parts of the pneumatic, electric and hydraulic systems, plastic parts). If there is a risk that they will catch fire or be damaged, they should be removed before commencing welding work.
- In the event of work requiring the trailer to be raised, use properly certified hydraulic or mechanical lifts for this purpose. After lifting the trailer, stable and durable supports must also be used. Do NOT carry out work under a machine, which has only been raised with the lift jack.
- The trailer must not be supported using fragile elements (bricks or concrete blocks).
- After completing work associated with lubrication, remove excess oil or grease.
- Loading and unloading work should be carried out by someone experienced in this type of work.
- Load must be uniformly distributed and it must not obstruct visibility or hinder driving.
- Do NOT exceed the trailer's maximum carrying capacity.

2.2 DRIVING ON PUBLIC ROADS

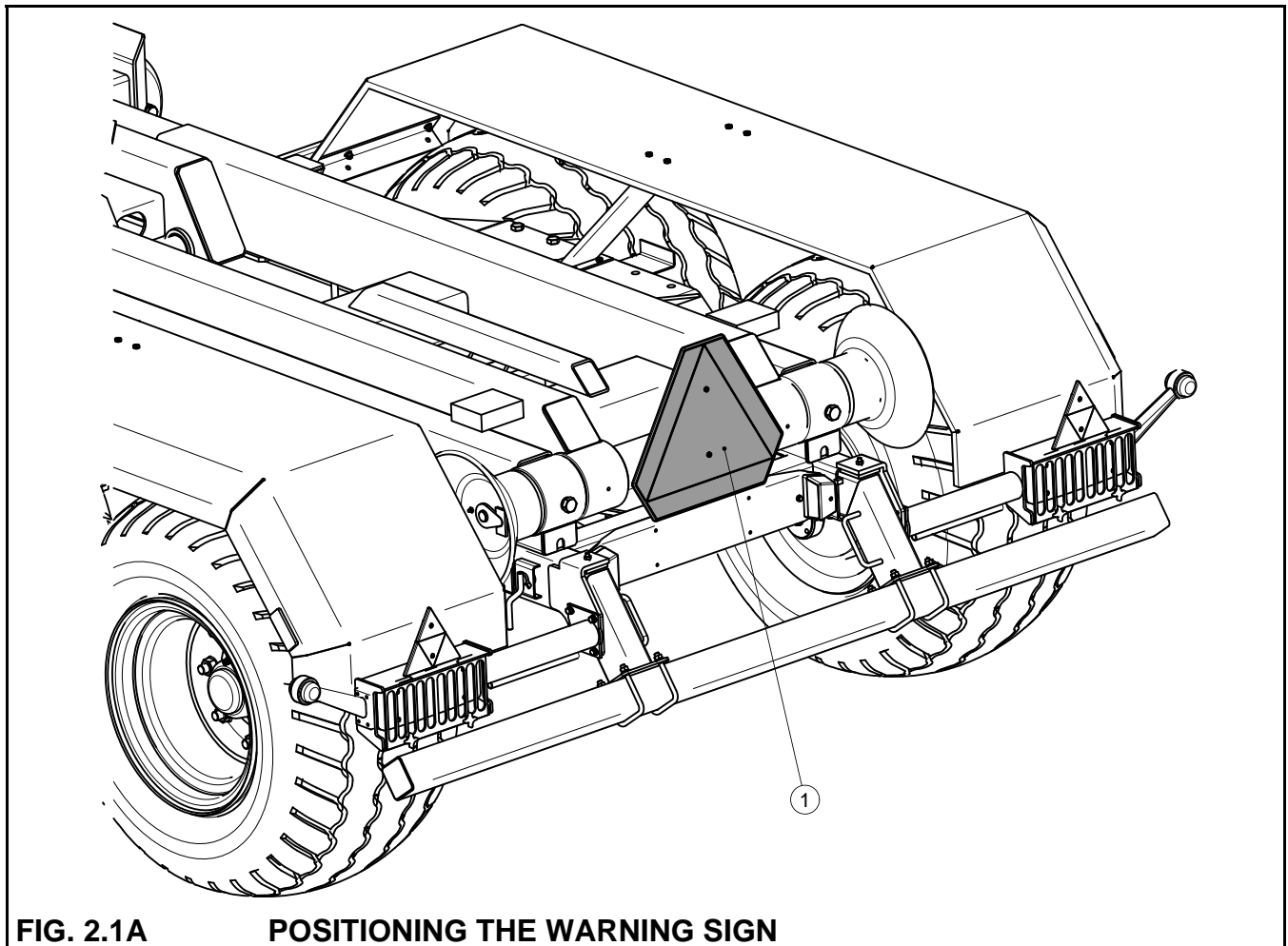


FIG. 2.1A **POSITIONING THE WARNING SIGN**

(1) slow-moving vehicle sign

- When driving on public roads, comply with the road traffic regulations.
- Exceeding the maximum load capacity of the hook trailer may damage it, and also threaten the safety of traffic.
- If the journey takes place without load box, a slow-moving vehicle sign should be placed on the rear beam of the trailer, if the machine is the last vehicle in the group – figure (2.1A). If the journey takes place with load box then slow-moving vehicle sign should be placed on the rear wall of the load box.
- Do not exceed the maximum design speed. Adjust your speed to the road conditions.
- The machine must NOT be left unsecured. Securing involves engaging the parking brake and/or placing chocks under trailer wheels.

- While driving on public roads the trailer must be fitted with a certified or authorised reflective warning triangle.
- While driving with trailer fitted with load box, the impact beam has to be extended. While driving with trailer without load box, the impact beam has to be withdrawn.
- During travel, guards protecting rear light assemblies should be taken from lamp shields.

2.3 DESCRIPTION OF MINIMAL RISK

Pronar Sp. z o. o. in Narew has made every effort to eliminate the risk of accidents. There is, however, a certain minimal risk, which could lead to an accident, and this is connected mainly with the actions described below:

- using hook trailer for purposes other than those described in the Operator's Manual,
- being between the tractor and the trailer while the engine is working and when the machine is being attached,
- operating the trailer with the safety guards removed or faulty,
- operation of the trailer by persons under the influence of alcohol or other intoxicating substances,
- operation of trailer by an authorised person,
- being on the machine during work,
- cleaning, maintenance and technical checks of the trailer,
- being near to dangerous places during loading, disconnection, connection or unloading load box.

The minimal risk may be kept to a minimum by following the recommendations below:

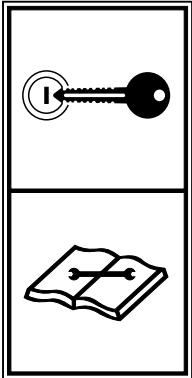
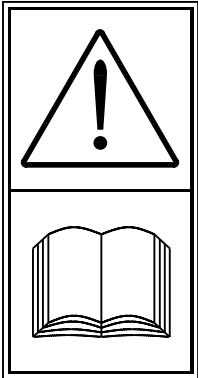
- prudent and unhurried operation of the machine,
- sensible application of the remarks and recommendations contained in the *OPERATOR'S MANUAL*,
- maintaining safe distance from forbidden or dangerous places,
- a ban on being on the machine when it is operating,

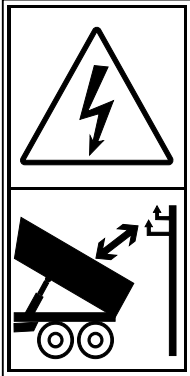
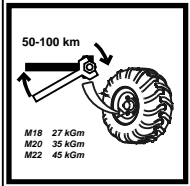


- carrying out repair and maintenance work by persons trained to do so,
- using suitable protective clothing,
- ensuring unauthorised persons have no access to the machine, especially children.

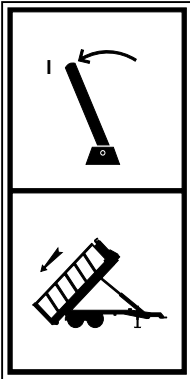
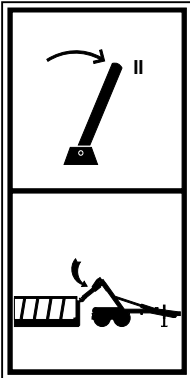

2.4 INFORMATION AND WARNING DECALS

The hook trailer is labelled with the information and warning decals mentioned in table (2.1). The symbols are positioned as presented in figure (2.2A). Throughout the time it is in use, the user of the machine is obliged to take care that notices and warning and information symbols located on the hook trailer are clear and legible. In the event of their destruction, they must be replaced with new ones. Safety decals are available from your PRONAR dealer or directly from PRONAR customer service. New assemblies, changed during repair, must be labelled once again with the appropriate safety signs.

TAB. 2.1 INFORMATION AND WARNING DECALS

ITEM	SAFETY SYMBOL	DESCRIPTION
1		<p>Before beginning servicing or repairs, switch off engine and remove key from ignition</p>
2		<p>Before starting work, carefully read the Operator's Manual.</p>

ITEM	SAFETY SYMBOL	DESCRIPTION
3		<p>Keep a safe distance from electric power lines during tipping or connecting and disconnecting load box</p>
4		<p>Check the condition of the screw and nut connections of the wheel axles</p>
5		<p>Grease according to the recommendations in the Operator's Manual</p>
6	<p>T185 PRONAR</p>	<p>Machine type</p>
7	<p>360 kPa</p>	<p>Air pressure in the tyres★</p>
8	<p>20 kN</p>	<p>Maximum vertical drawbar load</p>
9		<p>Do not perform maintenance or repair work under laden and / or unsupported load box.</p>

ITEM	SAFETY SYMBOL	DESCRIPTION
10	<div style="border: 1px solid black; padding: 5px;"> <p>Ostion lamp nie u ywa podczas jazdy po drogach publicznych - mocowa tutaj</p> <p>Lampenschutz nicht bei Fahrt auf öffentlichen Straßen benutzen - hier befestigen</p> <p>Do not use the lamp covers by driving on public roads - fasten them here</p> </div>	Information on application of rear lamp assembly shields
11		<p>Tipping frame block Position I Tipping the loadbox</p>
12		<p>Unblocking middle frame Position II Disconnecting/connecting load box</p>
13		Information on possibility of application of tipping frame interlock depending on its position

★ - air pressure in tyres depends on tyres used

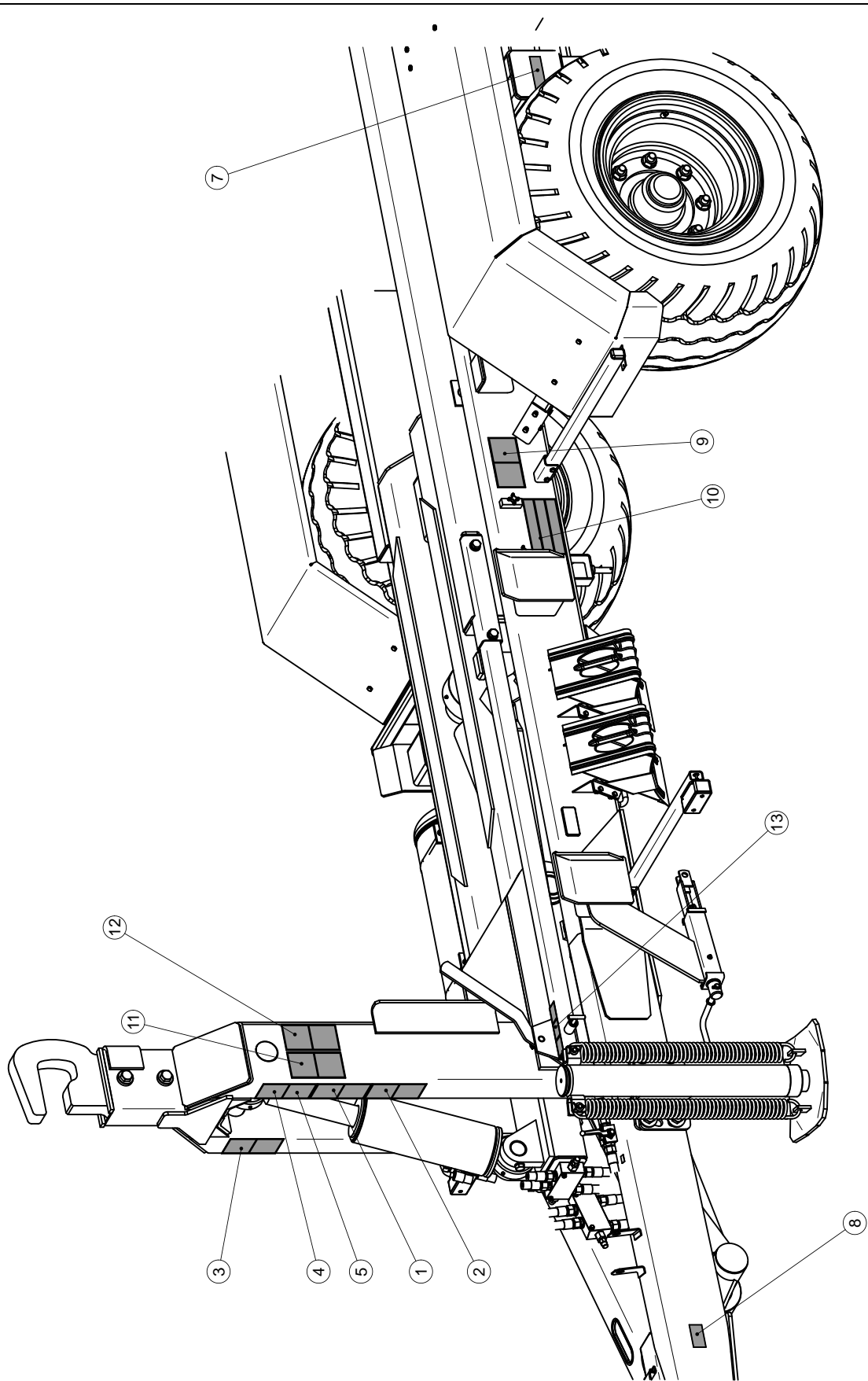


FIG. 2.2A **DECAL LOCATIONS**

Labelling according to table 2.1 „Information and warning decals”

SECTION

3

DESIGN AND OPERATION

TECHNICAL SPECIFICATION

CHASSIS

TIPPING FRAME

MAIN BRAKE

PARKING BRAKE

HYDRAULIC TIPPER SYSTEM

HYDRAULIC ROCKER ARM BLOCK SYSTEM

ELECTRICAL SYSTEM, WARNING SIGNS AND REFLECTIVE LIGHTS

3.1 TECHNICAL SPECIFICATION

TAB. 3.1 TRAILER TECHNICAL SPECIFICATION OF STANDARD FITTINGS

CONTENTS	UNIT	T185
Dimensions		
Total length (without load box)	mm	5 920
Width (without load box)	mm	2 360
Height (without load box)	mm	2,512
Length with shortest load box	mm	6 415
Length with longest load box	mm	6 782
Width including load box (min/max)	mm/mm	2 360 / 2 550
Loading space length (min/max)	mm/mm	4,540 / 4 907
Technical specification		
Carrying capacity★	kg	12,130
Tare weight of hook trailer	kg	2,870
Maximum gross weight	kg	15 000
Permitted hitched load box dimensions		
Length (min/max)	mm	from 4,540 to 4,907
Width	mm	to 2,550
Height	mm	to 2,000
Tyres		
Tyre dimensions	-	500/50-17
Pressure	kPa	450
Other information		
Maximum load box tipping angle	deg	46
Axle track (min/max)	mm	1 830 / 1 870
Maximum design speed	km/h	40
Maximum drawbar eye load	kg	2,000
Oil demand (without hydraulic brake system)	l	38
Pressure rating of the hydraulic system	MPa	16

★ - tare weight weight of load box + payload

Air Pressure - Table (3.1) depends on the tires used. The table shows pressure for standard wheels.

3.2 CHASSIS

The main bearing element of the hook trailer is the lower frame (1) – figure (3.1A), which is of welded steel section structure. To the front of the frame is the drawbar beam, to which the drawbar (2) with 50 mm eye \varnothing is secured. As an option, drawbar beam has a different ending, for screwing fixed drawbar (3), with a $\varnothing 40$ mm eye.

To the left of the drawbar longitudinal beam the straight hydraulic support (4) (standard equipment) is bolted or worm gear mechanical support (5). On the left side of the frame the parking brake is welded to a bracket (6). Rollers guiding the brake cable and the brake lever are mounted to the lower part of the frame.

At the rear part of the frame is the tandem wheel combination. The wheel half axles (2) are welded to the rocker arms (1) - figure (3.2A), The half axles are made from rectangular rod finished with a pin, on which, on cone bearings it seated the hub. Wheel hubs are equipped with shoe breaks activated through mechanical expander cams. Executive elements activating the brakes are pneumatic or hydraulic ram cylinders depending on the brake system mounted. The mudguards (7) are screwed to frame brackets. The trailer suspension may be blocked using hydraulic rams.

Impact beam (3), was placed in the holes of the reinforcement of the lower frame longitudinal members and secured against falling out with the pins (4).

At the ends of longitudinal members, on the left and right side, elements of the rear lamp assembly (5) are bolted. Rear light assemblies are protected against damage by guard shields (8). While driving on public roads these guard shields must be transferred to the brackets located in front of the frame, on the left longitudinal member.

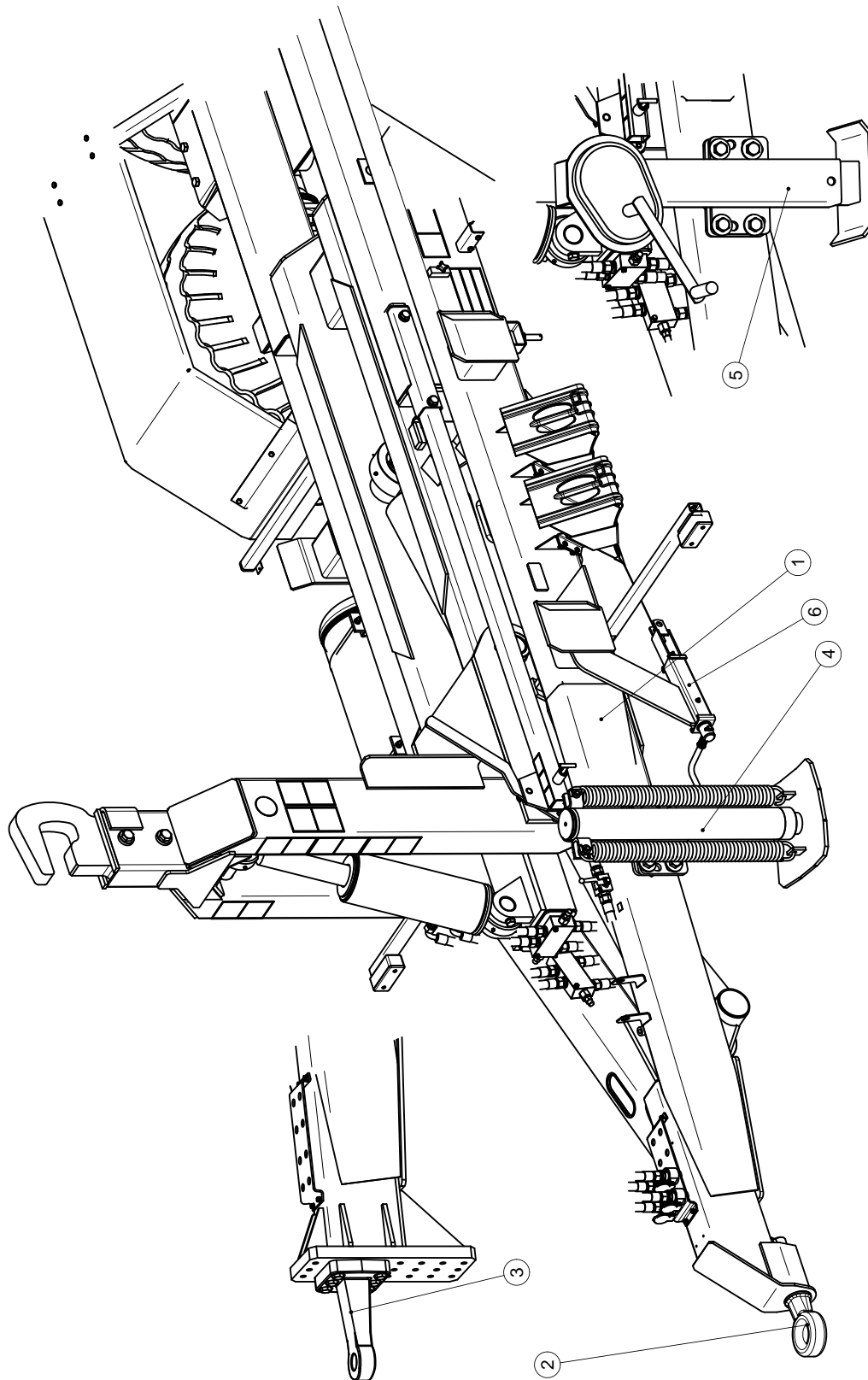


FIG 3.1A TRAILER CHASSIS – FRONT VIEW

(1) lower frame, (2) rotating drawbar eye $\varnothing 50$ mm, (3) fixed drawbar eye $\varnothing 40$ mm, (4) straight hydraulic support, (5) mechanical support with gear, (6) hand brake mechanism

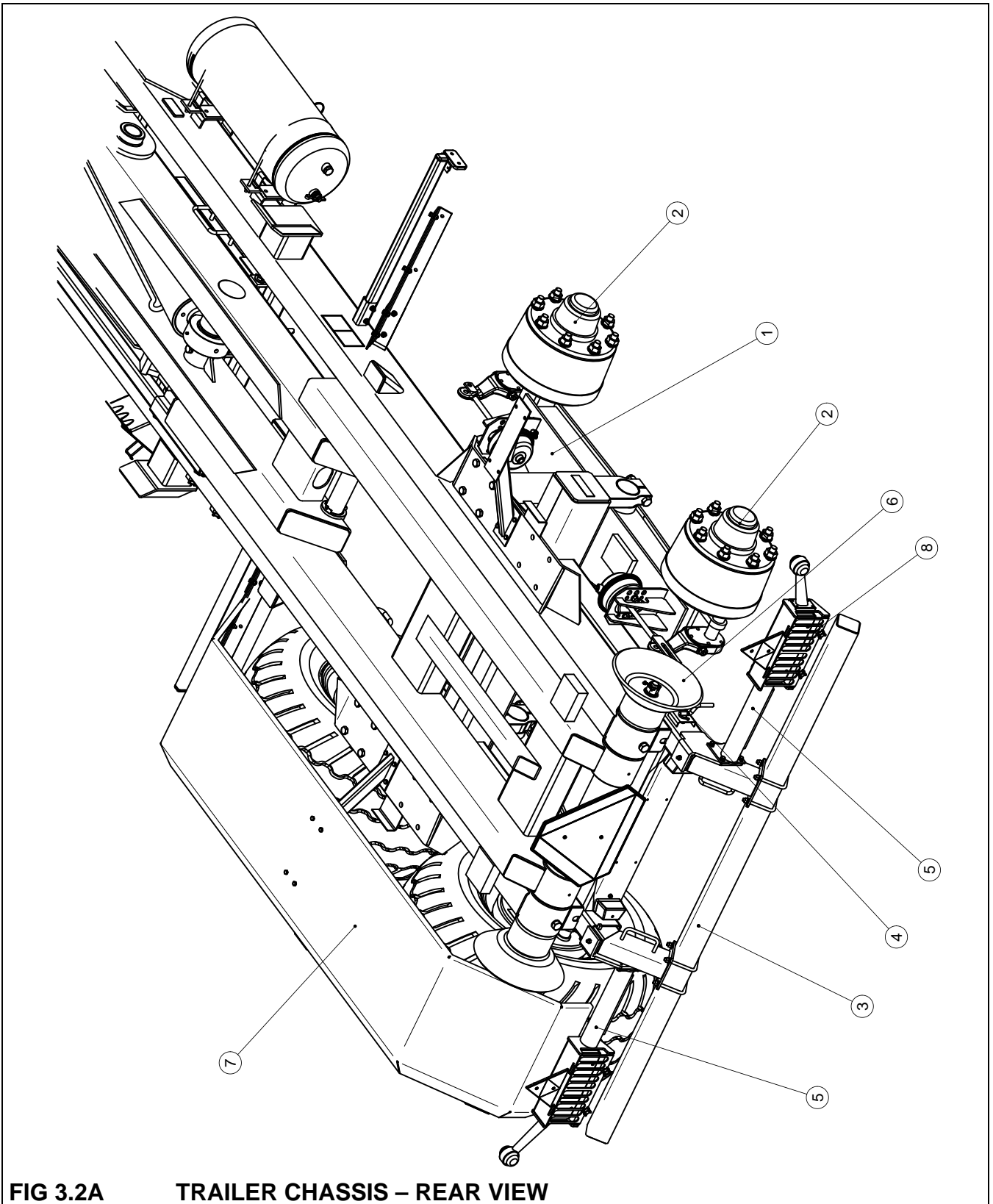


FIG 3.2A TRAILER CHASSIS – REAR VIEW

(1) rocker arm, (2) half axle, (3) impact beam, (4) safety pin, (5) rear lamp assembly, (6) guide roller, (7) mudguard, (8) lamp shield

3.3 TIPPING FRAME

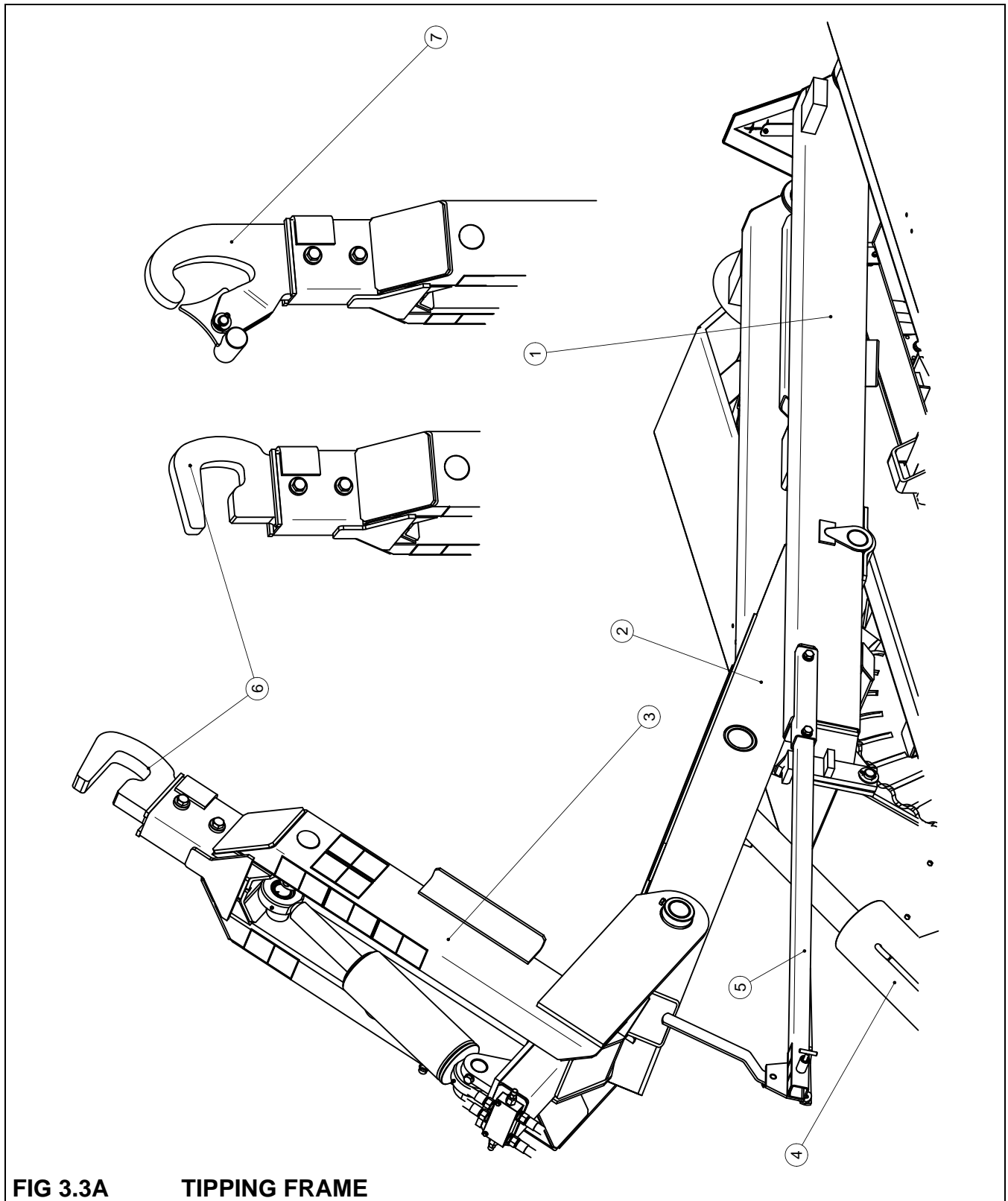


FIG 3.3A TIPPING FRAME

(1) rear frame, (2) central frame, (3) hook frame, (4) tipping ram, (5) support, (6) hook, (7) hook with latch - optional

Tipping frame (complete) is secured to lower frame with the aid of tipping axis, whereas in front part it is connected with the tipping ram (4). Tipping frame consists of a rear frame (1), the central frame (2), and the hook frame (3) to which one of two types of hooks available - (6) or (7) is screwed - optional on customer order. Individual frames are connected with the aid of pins. Screwed to the left longitudinal member of the frame is the support (5), which is a support structure used to attach the interlocking system.

During tipping the load box to the rear, the blocking system immobilises the central frame together with the rear frame. Lever (1) – figure (3.5A) during this process it is in position (I). The whole tipping frame is raised by the tipping ram. The lever (1) is secured with the aid of a block (4), which prevents accidental connection. When setting lever in position II, the central frame is released. The rear frame remains on the lower trailer frame, the central frame is raised by the tipping ram – figure (3.6A). Tipping the central frame enables connection or disconnection of load box. Control of the hook frame is independent from the lever setting (1).

ATTENTION!



Connecting lever (1) – figure (3.5A), is allowed when, the tipping frame is in the rest position. During this time the rear frame and the central frame are set in such a position relative to each other, which enables blocking or releasing the system without impediment. **An attempt to connect the lever in another setting may cause damage and seriously jeopardise the safety of persons operating the trailer or nearby.** The decal placed on the lever bracket warns of this risk - Figure (3.4a).



FIG 3.4A INFORMATION DECAL

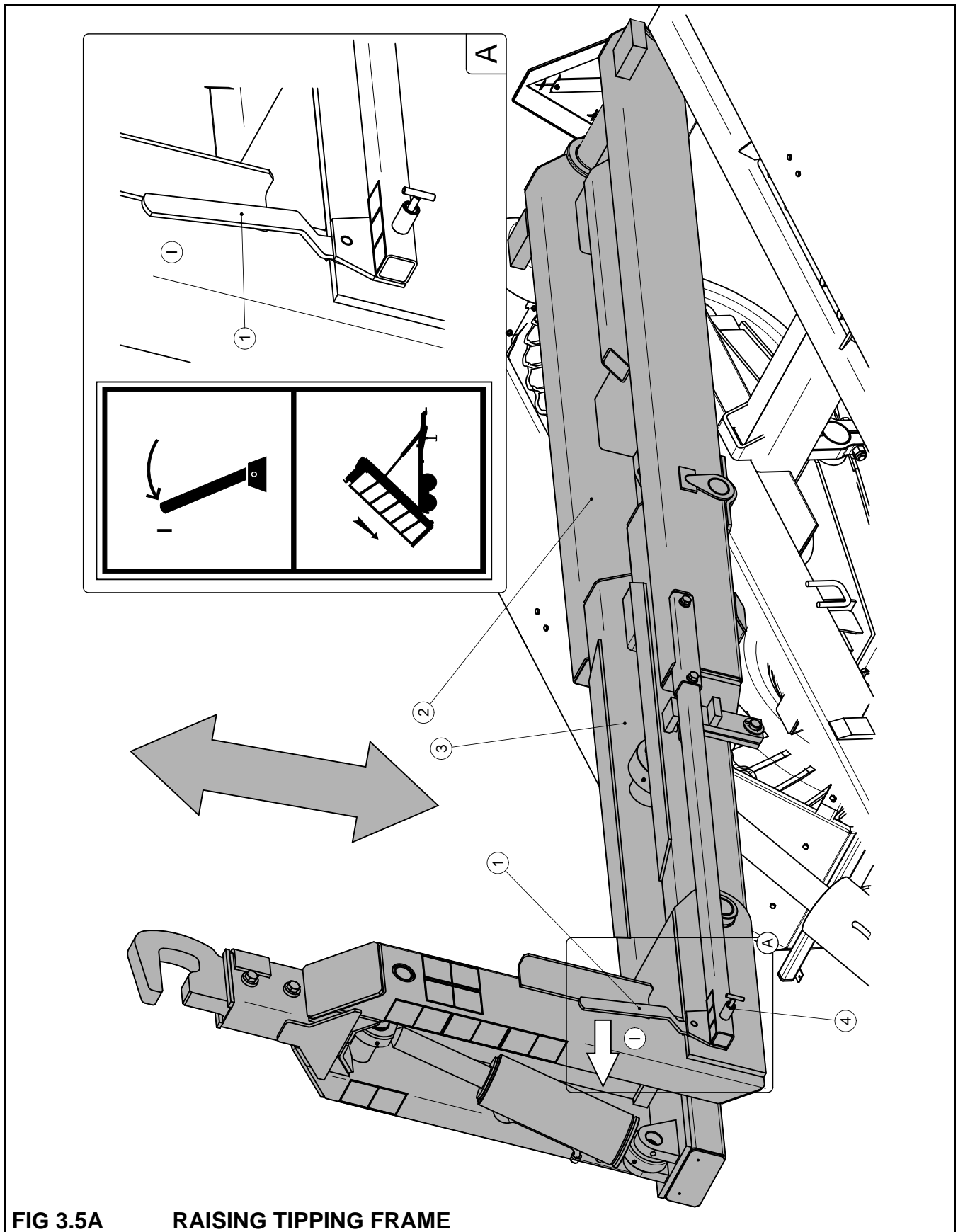


FIG 3.5A RAISING TIPPING FRAME

(1) lever block, (2) rear frame, (3) central frame, (4) lever block, (I) – lever position in load box tipping position

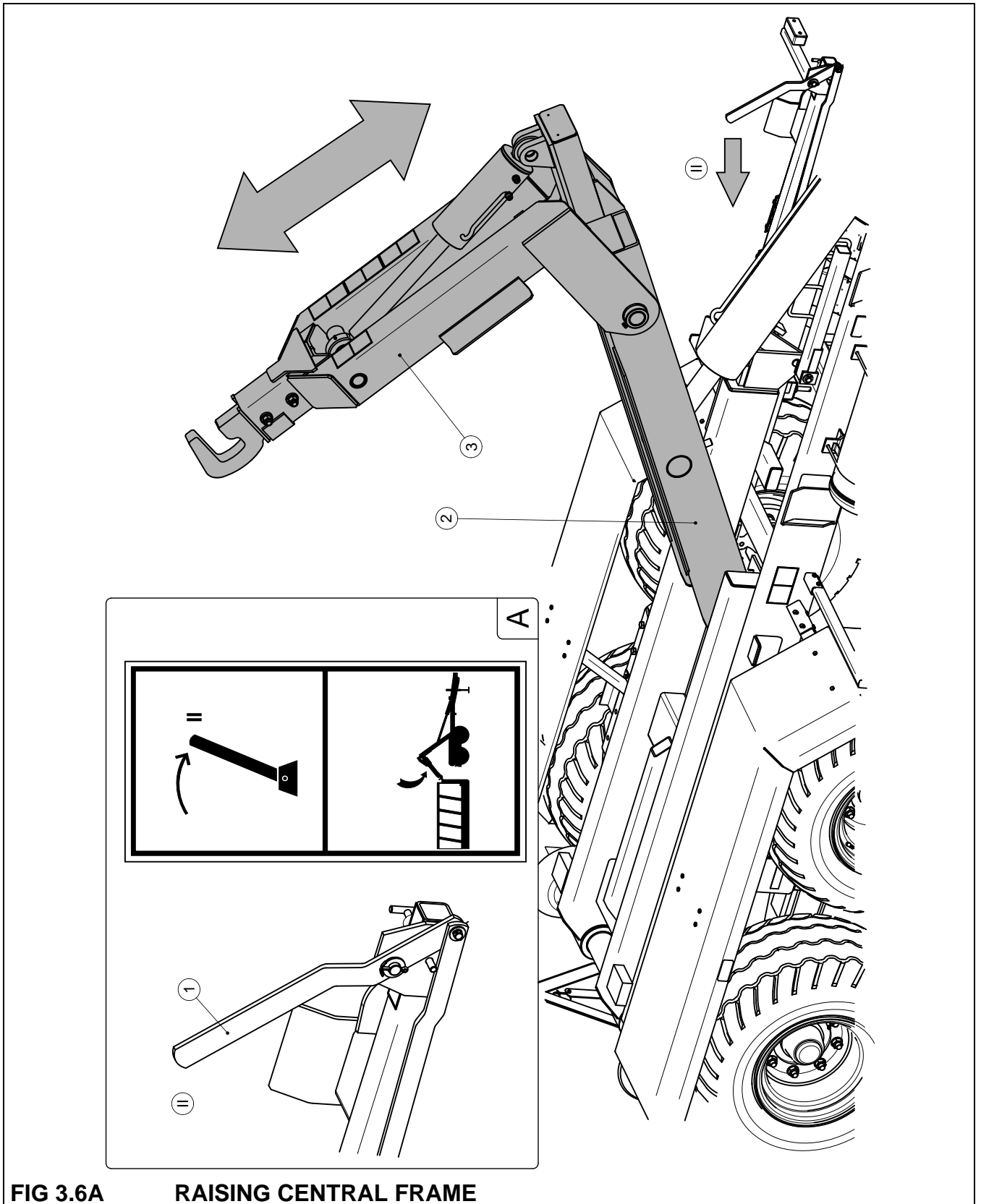


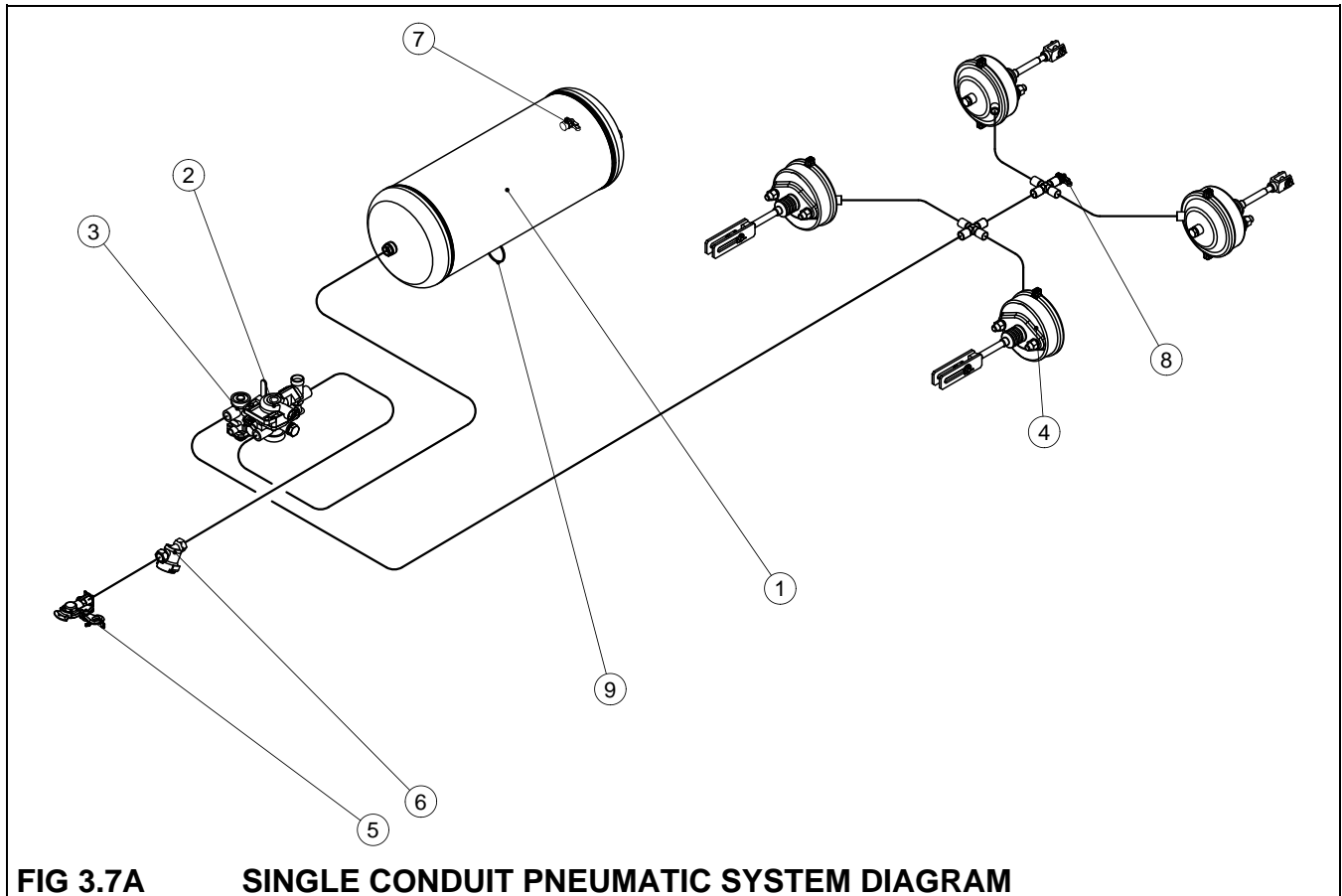
FIG 3.6A RAISING CENTRAL FRAME

(1) lever, (2) central frame, (3) hook frame, (II) lever setting during connection or disconnection of load box

3.4 MAIN BRAKE

The hook trailer is equipped with one of three types of working brake:

- single conduit pneumatic system - figure (3.7A),
- double conduit pneumatic system - figure (3.8A),
- hydraulic brake system - figure (3.9A).



(1) air tank, (2) control valve, (3) brake force regulator, (4) pneumatic cylinder, (5) conduit connector, (6) air filter, (7) air tank control connector, (8) control connector, (9) drain valve

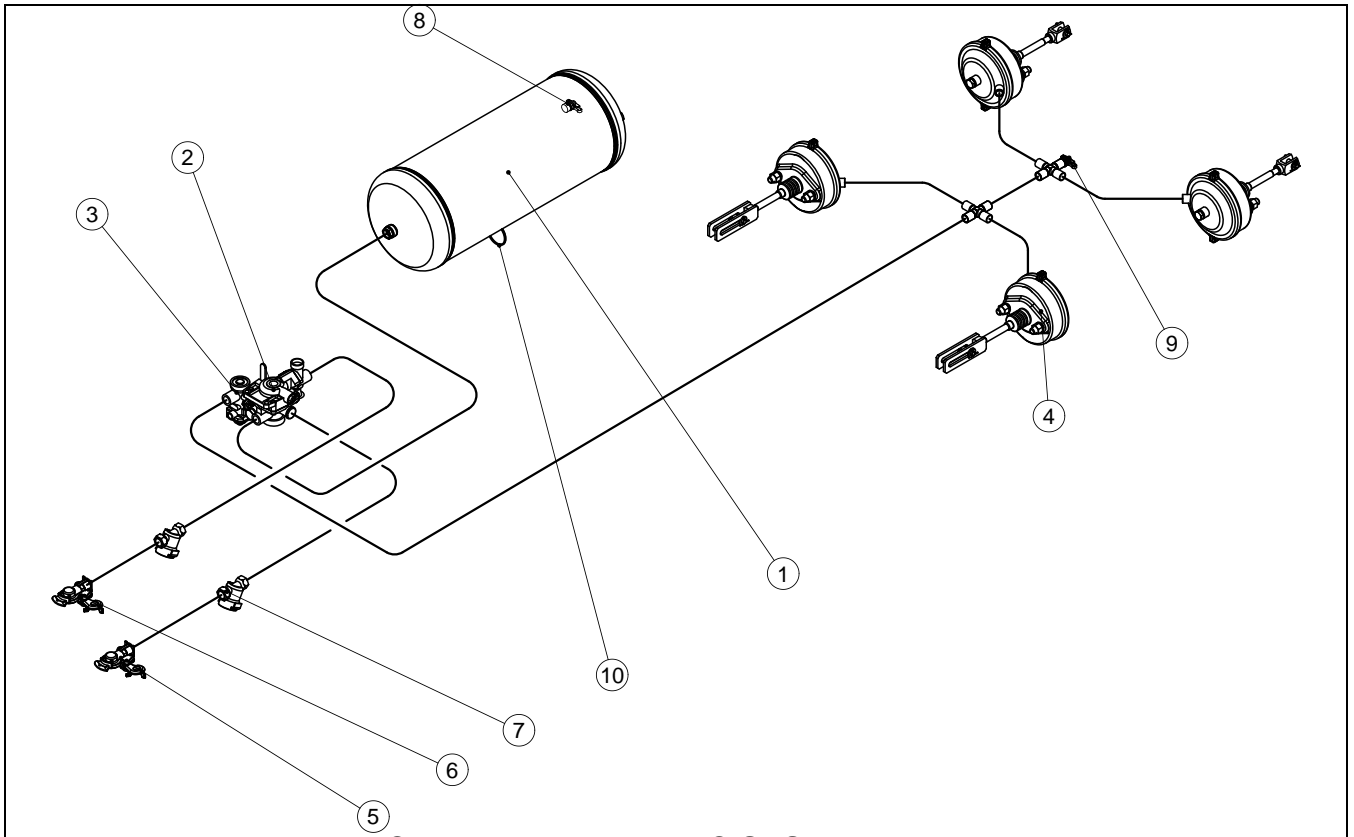


FIG 3.8A DOUBLE CONDUIT PNEUMATIC SYSTEM DIAGRAM

(1) air tank, (2) control valve, (3) brake force regulator, (4) cylinder, (5), (6) conduit connection, (7) air filter, (8) air tank control connector, (9) control connector, (10) drain valve

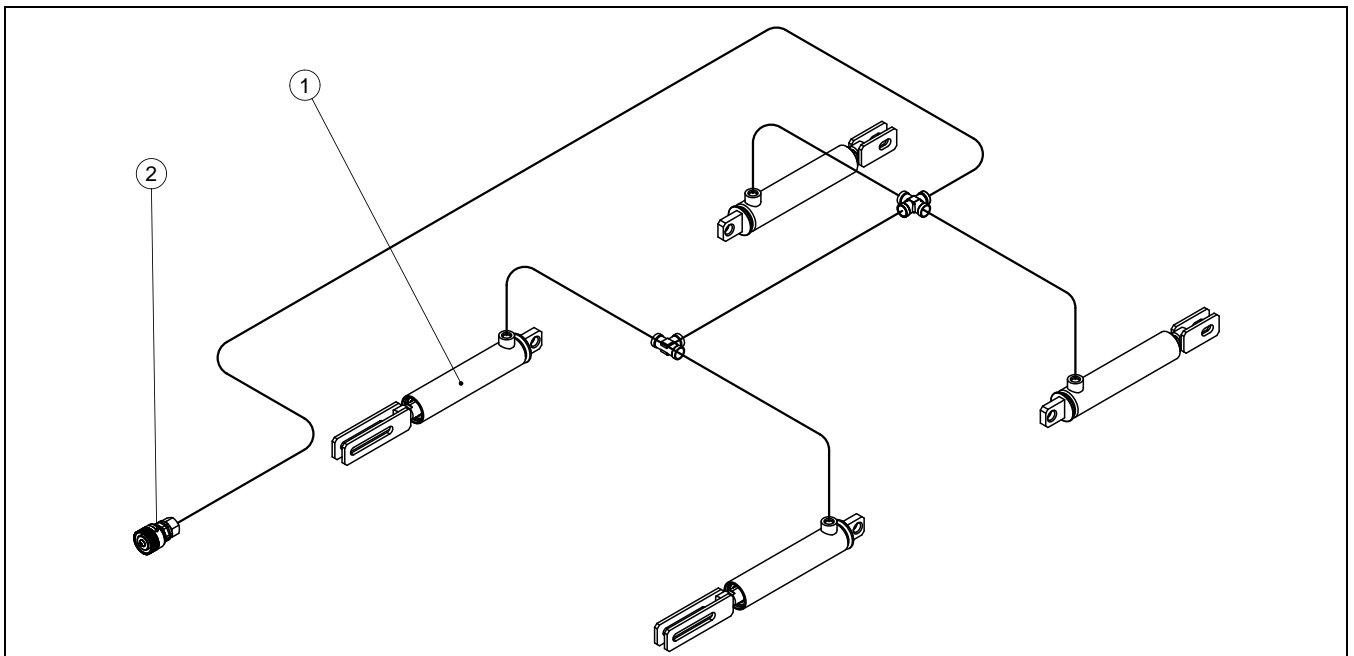


FIG 3.9A HYDRAULIC BRAKES SYSTEM DIAGRAM

(1) hydraulic brake cylinder, (2) quick coupler

Working brake is activated from the tractor driver's cab by pressing on the brake pedal in the tractor. The function of the control valve (2), applied in pneumatic systems - figure (3.7A) and (3.8A), is the operation of the hook trailer brakes simultaneously when tractor's brakes are applied. Furthermore, in case of an inadvertent disconnection of the conduit between the trailer and the tractor, the control valve will automatically activate trailer's brakes. Valve used in the system is equipped with a circuit causing the brakes to be applied when trailer is disconnected from the tractor. When compressed air conduit is connected to the tractor, the device automatically applying the brakes now changes its position to allow normal brake operation.

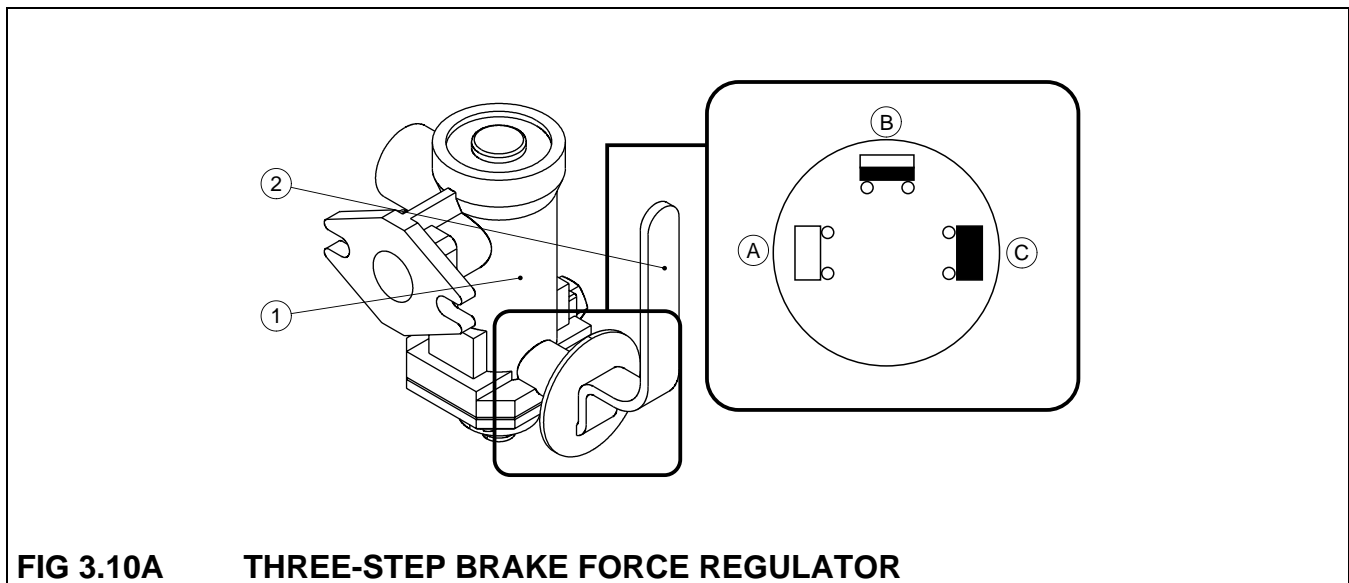


FIG 3.10A THREE-STEP BRAKE FORCE REGULATOR

(1) three-step brake force regulator, (2) regulator setting control lever, (A), (B), (C) regulator operation position

Three-step brake force regulator - figure (3.10A), applied in pneumatic systems adjusts braking force depending on setting. Switching to a suitable working mode is done manually by machine operator with the aid of the lever (2) prior to moving off. Three working positions are available: A - "no load", B - "half load" and C - "full load".

3.5 PARKING BRAKE

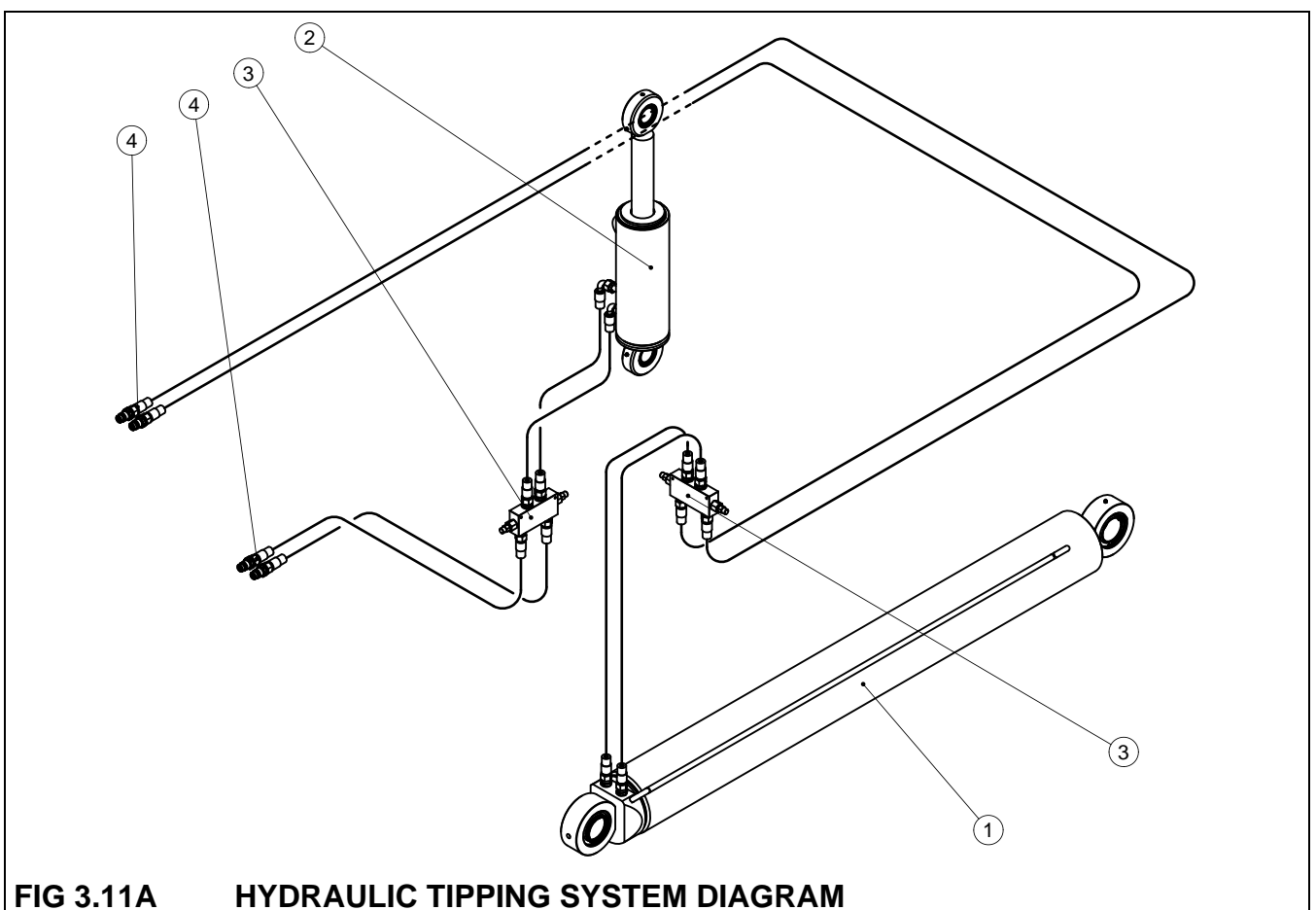
The parking brake is for immobilising trailer while standing motionless. The brake crank mechanism is welded to the bracket placed on the left longitudinal member of the frame. The steel cable is connected with the axle expander lever through the handbrake release with the crank mechanism. Tightening the cable causes tilting of the expander lever, which parts the jaws of the brake shoes immobilising the trailer.

3.6 HYDRAULIC TIPPER SYSTEM

Hydraulic tipping system serves in automatic unloading of trailer by tipping the load box to the rear, and also connection and disconnection of load box from trailer. The hydraulic system is supplied with oil from external hydraulic system of the tractor, controlled by the tractor hydraulic manifold.

The trailer system consists of two independent circuits:

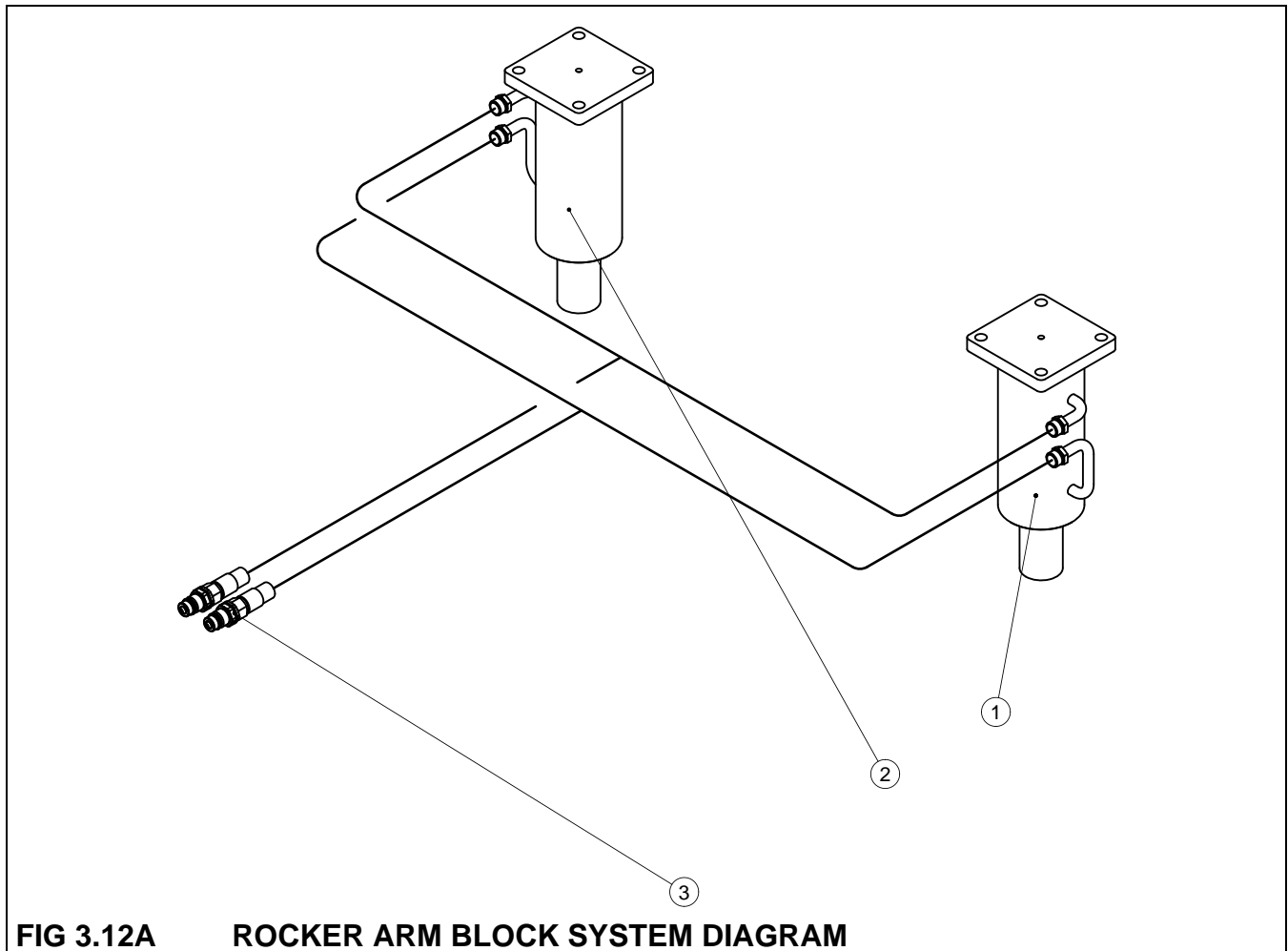
- The tipping frame cylinder circuit (1) – tipping hydraulic cylinder,
- Hook frame power supply cylinder (2).



(1) tipping frame hydraulic cylinder, (2) hook frame hydraulic, (3) valve, (4) conduit plug point

Both circuits operate independently of each other. While tipping load box (unloading), only the tipping frame supply circuit is used (1), if connecting or disconnecting the load box both systems are used. Detailed description of these functions is found in section 4. Valves (3), installed in the system relieve the system of sudden loading due to which the hydraulic cylinder operation is very smooth.

3.7 HYDRAULIC ROCKER ARM BLOCK SYSTEM



(1) Right rocker arm cylinder block, (2) Left rocker arm cylinder block, (3) lead plug point

Rocker arm hydraulic block system diagram is shown in figure (3.12A). This system is operated from the tractor driver's cab, with the aid of the tractor hydraulic system external hydraulic manifold. The system blocks the rocker arms while unloading the load box. When driving with the trailer, the system must not be used, and the cylinder rams must be raised maximally to allow the free operation of the suspension.

3.8 ELECTRICAL SYSTEM, WARNING SIGNS AND REFLECTIVE LIGHTS

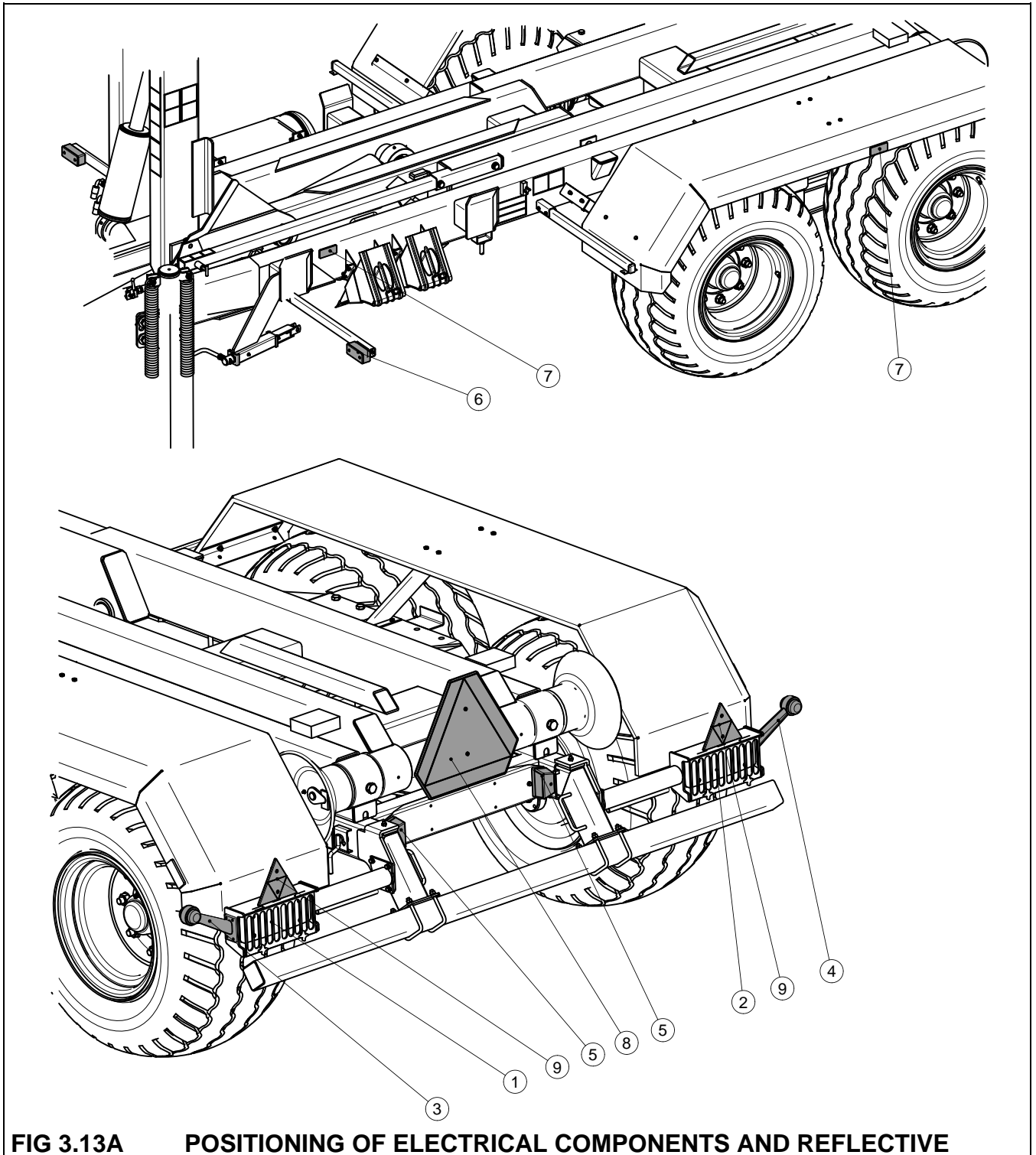


FIG 3.13A POSITIONING OF ELECTRICAL COMPONENTS AND REFLECTIVE

(1) rear left lamp assembly, (2) rear right lamp assembly, (3) left clearance lamp, (4) right clearance lamp, (5) license plate light, (6) front position lamp, (7) lateral reflector (8) slow-moving vehicle warning sign, (9) rear triangular reflector

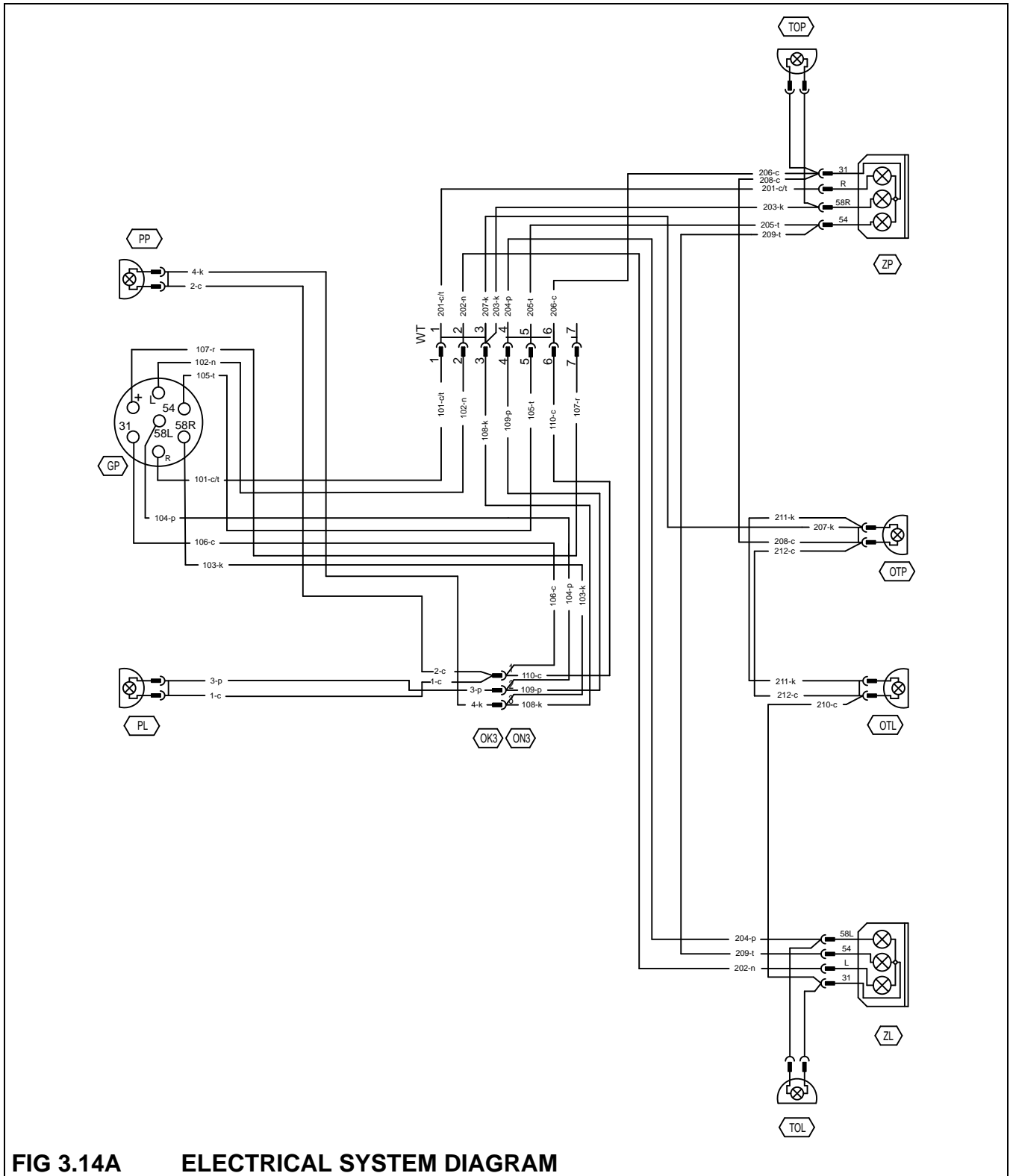


FIG 3.14A ELECTRICAL SYSTEM DIAGRAM

(ZP), (ZL) rear lamp assembly, (TOP), (TOL) clearance lamp, (GP) 7-pin socket, (PL), (PP) front parking light, (OTP), (OTL) license plate illumination light

The trailer's electrical system is designed for supply of 12 V DC. Connection of the hook trailer electrical system with the tractor should be made through an appropriate connection

lead that is part of the trailer's standard equipment. Positioning of electrical components and warning reflectors is shown on figure (3.13A). Also available as an option, there is the side clearance lamp system, which replaces the orange reflective tape.

Electrical system concept diagram in standard equipment is shown in figure (3.14A).

SECTION

4

CORRECT USE

PREPARING FOR WORK BEFORE FIRST USE
CHECKING THE TRAILER'S TECHNICAL CONDITION
HITCHING TO TRACTOR
CONNECTING LOAD BOX
DISCONNECTING LOAD BOX
LOADING LOAD BOX
TRANSPORTING LOADS
UNLOADING
DISCONNECTING FROM TRACTOR
PROPER USE AND MAINTENANCE OF TYRES

4.1 PREPARING FOR WORK BEFORE FIRST USE

The trailer is supplied to the user completely assembled and does not require additional mounting operations of machine sub-assemblies. The manufacturer guarantees that the machine is fully operational and has been checked according to quality control procedures and is ready for normal use. This does not release the user from an obligation to check the machine's condition prior to purchasing and before first use.

Prior to connecting to the tractor, machine operator must verify the trailer's technical condition. In order to do this:

- the user must carefully read this operator's manual and observe all recommendations
- immobilise trailer with parking brake,
- check condition of paint coatings, traces of corrosion or mechanical damage (crushing, piercing, bending or breaking of minor elements),
- check air pressure in tyres and check correct tightening of wheel nuts,
- check all nut and bolt connections of trailer drawbar,
- after hitching trailer to tractor, the correct operation of hydraulic tipping system and tipping frame block should be checked.

If all the above checks have been performed and there is no doubt as to the trailer's good technical condition, it should be hitched to tractor (4.3). After connection of brake system conduits and hydraulic tipping and hydraulic support system conduit (if trailer is equipped with hydraulic support), the correct operation of individual systems should be checked with inspection of systems and hydraulic cylinders with regard to seals and tightness. Further use of the trailer, is not permitted, if there are any leaks from hydraulic systems or if the brake systems are unreliable. If any faults are detected they must be identified and rectified. If a fault cannot be rectified or the repair could void the guarantee, please contact retailer for additional clarifications.



ATTENTION!

Non-adherence to the recommendations contained in the Operator's Manual or improper use of trailer may cause damage to the machine.

The technical condition prior to starting use may not give rise to any reservation.

4.2 CHECKING THE TRAILER'S TECHNICAL CONDITION

When preparing the trailer for normal use, check individual elements according to guidelines presented in table (4.1).

TAB. 4.1 TECHNICAL INSPECTION SCHEDULE

DESCRIPTION	SERVICE OPERATION	FREQUENCY
Check technical condition of tyres and tyre pressure,	Visually inspect the tyres and check if they are properly inflated.	Before each use
Correct operation of lights and indicators.	After hitching trailer to the tractor activate in sequence individual lights, check if all reflective lights are installed, check if slow-moving vehicle warning sign is in place.	
Operation of brake system	Attach trailer to the tractor and test the brakes after moving off.	
Operation of hydraulic tipping system	Hitch trailer to tractor. Check and evaluate seal tightness and quality of operation of systems during tipping and during connecting/disconnecting load box	
Tipping frame block	Set block lever in setting I. Raise and lower tipping frame. Set block lever in setting II, raise and lower central frame.	
Check technical condition of tyres and tyre pressure,	Check the condition of tyre tread, lateral surfaces, wheel rim and if necessary inflate the tyres up to recommend pressure	Every month

DESCRIPTION	SERVICE OPERATION	FREQUENCY
Check if the nuts and bolts securing drawbar, rear hitch and remaining nut and bolt connections are properly tightened,	Torque values should be according to table (5.6)	Every three months
Lubrication	Lubricate elements according to guidelines presented in section "lubrication points".	According to table (5.5)
Degree of tightening of road wheel nuts	Torque values should be according to table (5.6)	According to section 4.8 "Proper use and maintenance of tyres"



ATTENTION!

The trailer must not be used when not in working order.

Prior to connecting individual system conduits the user must carefully read the tractor operator's manual and observe all Manufacturer's recommendations.

4.3 HITCHING TO TRACTOR

Trailer may only be hitched to tractor equipped with a hitch, capable of carrying vertical loading of at least 19.62 kN (2,000 kg).



DANGER

When hitching, there must be nobody between the trailer and the tractor. when hitching the trailer, tractors driver must exercise caution and make sure that nobody is present in the hazard zone.

Hitching trailer to agricultural tractor shall be performed according to the sequence described below:

- immobilise trailer with parking brake,
- place tractor sufficiently near to trailer,

- connect tubes supplying hydraulic support cylinder to socket in tractor (hydraulic support single-acting cylinder),
- set valve (3) in position (O) – open,
- using control lever of external tractor hydraulic system set trailer drawbar shaft at the appropriate height enabling hitching connection of drawbar to tractor hitch,
- reverse tractor, connect drawbar eye with appropriate tractor hitch, secure the hitch against inadvertent disconnection of the trailer

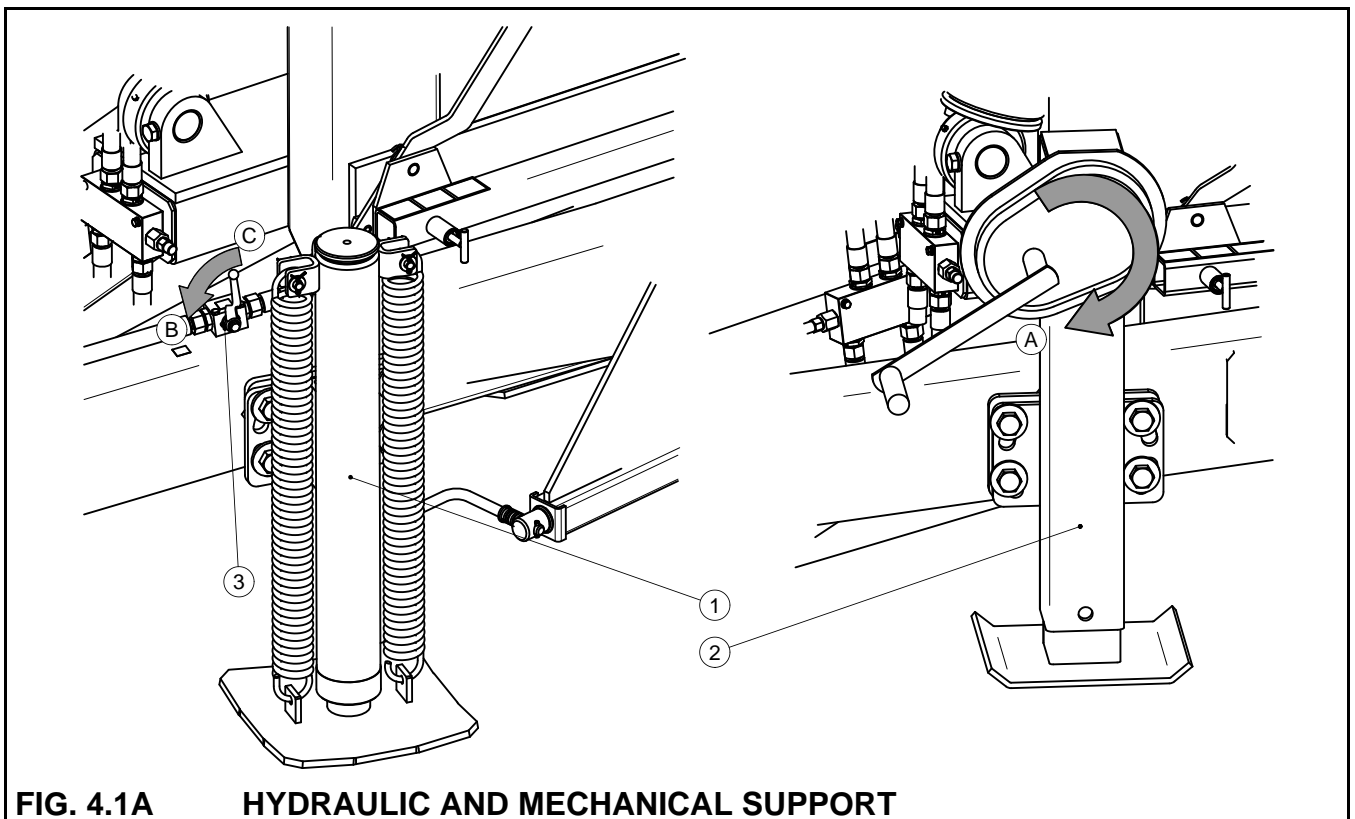


FIG. 4.1A HYDRAULIC AND MECHANICAL SUPPORT

(1) hydraulic support, (2) support with mechanical gearing, (3) support hydraulic valve, (A) direction of crank rotation - raising, (B) OPEN valve position, (C) CLOSED valve position

- raise support maximally upwards, valve (3) set in position (Z) - closed,
- connect electrical leads to the tractor as well as braking and tipping system conduit tubes to appropriate tractor sockets,
- release parking handbrake, turning brake mechanical crank anticlockwise.

If trailer is equipped with mechanical gear support; the drawbar shaft height is obtained by turning handwheel of support gear. After finishing hitching tractor to trailer, the support should be maximally raised upwards.

ATTENTION!



Do NOT travel with trailer which has an unreliable brake, lighting or signalling system.

When turning, conduit connection tubes must hang loosely and not become tangled with moving elements of trailer and tractor.

During work and travel the hydraulic or gear mechanism support must be maximally raised, and the cut-off valve must be set in position CLOSED (applies to hydraulic support).

Pneumatic brake systems are equipped with connectors, whose safety caps, are made from coloured plastic. The colours of these elements correspond to the colours of the connection sockets in the tractor (yellow, red or black).

4.4 CONNECTING LOAD BOX



ATTENTION!

Before connecting load box withdraw impact beam and remove the slow-moving vehicle warning sign. Suspension should be blocked using hydraulic ram cylinders.

Before connecting load box withdraw impact beam and remove the slow-moving vehicle warning sign from the trailer. To do this, remove the two bolts (2) - Figure (4.2A), and withdraw the impact beam in the direction of the arrow. Set the beam and insert the two pins (2). Lock the pins - the lever should be placed in an upright position - the handle facing downwards.

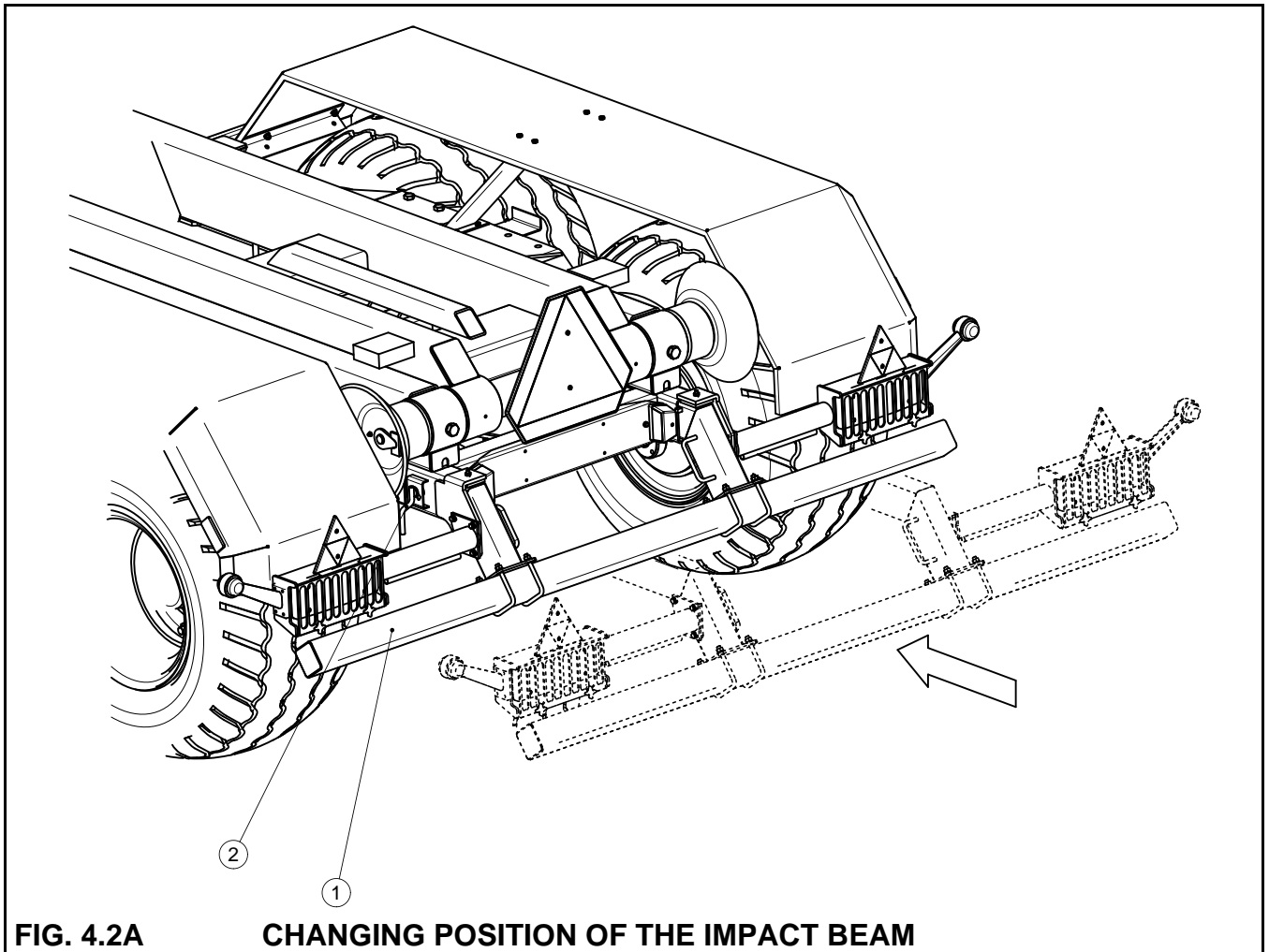


FIG. 4.2A CHANGING POSITION OF THE IMPACT BEAM

(1) impact beam, (2) the locking pin

In order to connect load box, action should be taken in the same sequence as presented below:

- Place tractor and trailer in front of load box at a distance of about 1 metre from load box hitch,
- lever (1) – figure (3.6A) place in position II,
- extend ram cylinder suspension blocks and block rocker arms,
- using the tipping cylinder ram tilt central frame in such a way that the hook is beyond the rear edge of the trailer,

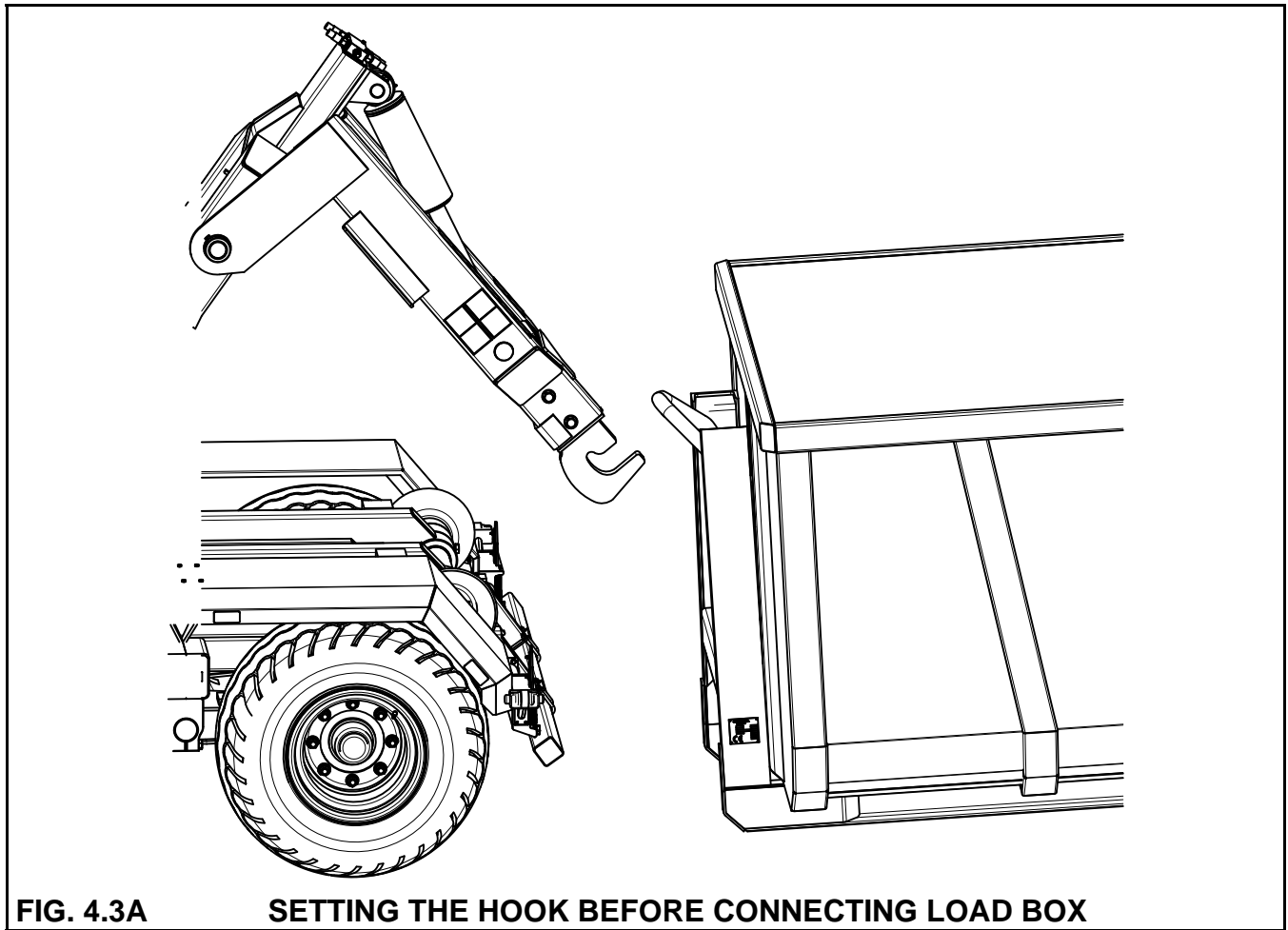


FIG. 4.3A SETTING THE HOOK BEFORE CONNECTING LOAD BOX

- lower hook using hook frame cylinder ram, so that it is just below the height of the load box hitching catch eye,
- reverse trailer to such a position in order to be able to hook the load box,
- raise the hook frame maximally, fold the central frame to its original position,
- when retracting the central frame, the load box automatically places itself on the guide rollers placed in the rear part of the trailer lower frame and is pulled in onto the trailer,
- place slow-moving vehicle plate on rear wall of load box.

ATTENTION!



Hook frame must be folded prior to the folding of the central frame. Changing the position of the hook frame is allowed only during hooking or unhooking the load box. Pulling the load box on or off the trailer can be done only using the central frame.

While connecting load box arrange it in such a way that the longitudinal axis of the trailer is aligned with the longitudinal axis of the load box. If not, the load box longitudinal members of the frame may not fit on the trailer rollers lengthwise. While pulling in the load box is necessary to observe whether its length is properly supported on the trailer guide rollers. If necessary manoeuvre the trailer, to connect the load box properly.

DANGER



When pulling in the load box onto the trailer the drawbar shaft and tractor hitch are subjected to great load.

Other persons must NOT be in the immediate vicinity of the trailer and especially behind the connected load box.

Take particular care while working near electric power lines.

4.5 DISCONNECTING LOAD BOX

Disconnecting the load box must be done on hard and level ground. If not, the load box rollers may dig into the earth and hinder disconnection from the trailer.

In order to disconnect the load box from the trailer carry out the following actions in the following sequence:

- Set tractor and trailer on hard level ground; tractor and trailer must be positioned in order to drive straight forwards,
- install the impact beam,
- extend ram cylinder suspension blocks and block suspension,
- place lever (1) – figure (3.6A) in position II,
- With the aid of the tipping ram cylinder progressively tip central frame to such a position, in which the hook shall be beyond the rear edge of the trailer,
- lower hook frame and drive away from load box,
- retract and fold down hook frame, retract central frame,

- attach slow moving vehicle plate.

DANGER



When disconnecting the load box from the trailer the drawbar shaft and tractor hitch are subjected to great loading.

Other persons must NOT be in the immediate vicinity of the trailer and especially behind the disconnected load box.

Take particular care while working near electric power lines.

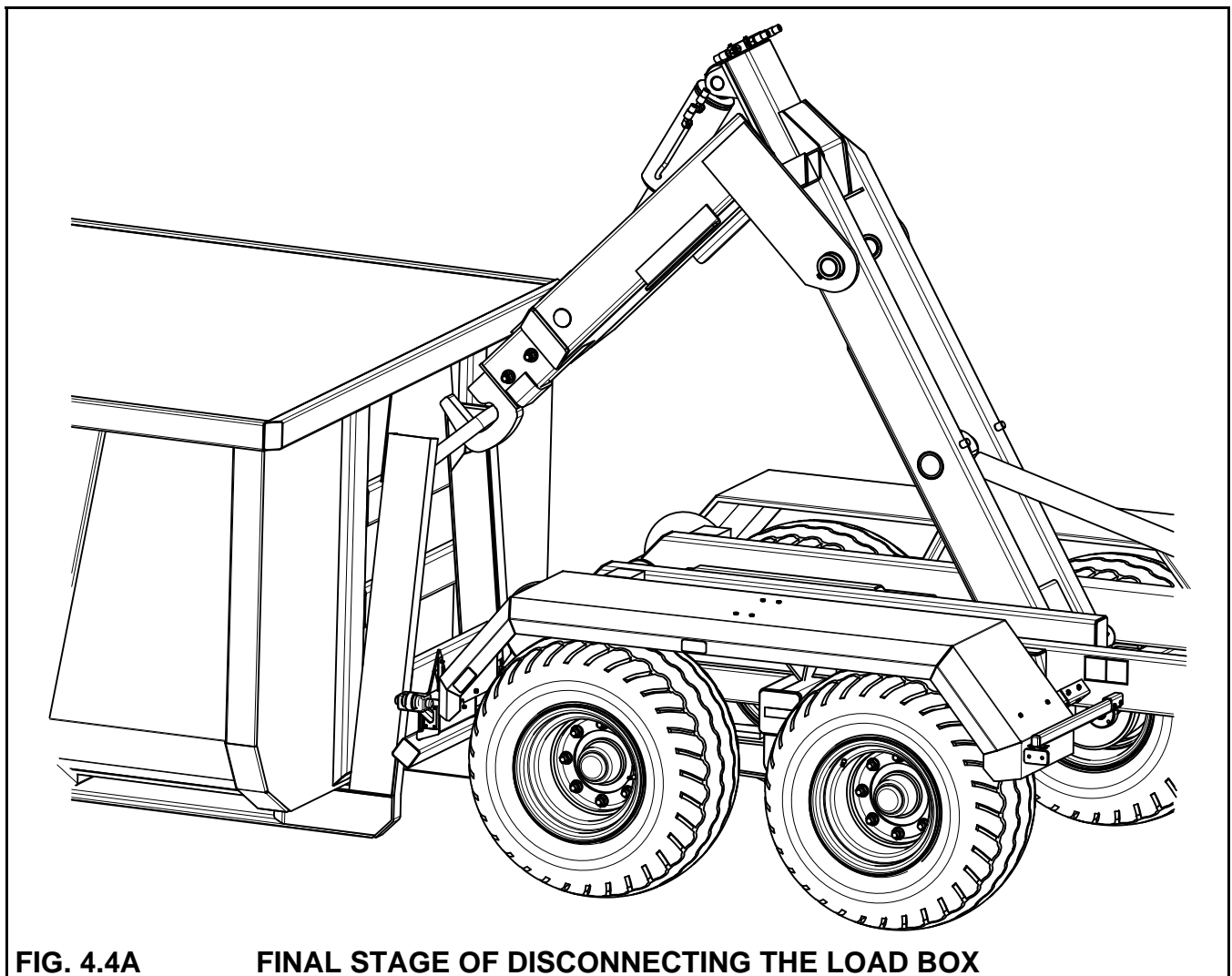


FIG. 4.4A FINAL STAGE OF DISCONNECTING THE LOAD BOX

When disconnecting the load box, user must take particular care that prior to lowering the load box to the ground it shall not strike any trailer's structural elements.



ATTENTION!

Before disconnecting the load box the impact beam must be withdrawn. Hydraulic cylinders blocking suspension must be extended - in suspension blocking position.

4.6 LOADING LOAD BOX

Before beginning loading make certain that the load box side walls are properly closed and secured. The trailer must be positioned to travel forwards and be hitched to the tractor. Loading should only take place, when trailer is placed on flat level surface and hitched to tractor. Load should be distributed evenly in load box. Depending on type of load, use the appropriate equipment (crane, loader, front loader etc.). Loading should be carried out by a person experienced in this type of work and having appropriate authorisations for operating equipment (if they are required). Type of load carried depends on load box use.

TAB. 4.2 GUIDELINE WEIGHTS VOLUME OF SELECTED LOADS

TYPE OF MATERIAL	VOLUME WEIGHT kg/m ³
Root crops: raw potatoes steamed crushed potatoes dried potatoes sugar beet - roots fodder beet - roots	 700 - 820 850 - 950 130 - 150 560 - 720 500 - 700
Organic fertilisers: old manure mature manure fresh manure compost dry peat	 700 - 800 800 - 900 700 - 750 950 – 1 100 500 - 600
Mineral fertilisers: ammonium sulphate potash salt	 800 - 850 1 100 – 1 200

TYPE OF MATERIAL	VOLUME WEIGHT kg/m ³
super phosphate	850 – 1 440
basic slag phosphate	2 000 – 2 300
potassium sulphate	1 200 – 1 300
kainite	1 050 – 1 440
milled lime fertiliser	1 250 - 1 300
Building materials:	
cement	1 200 – 1 300
dry sand	1 350 – 1 650
wet sand	1 700 – 2 050
solid bricks	1 500 – 2 100
hollow bricks	1 000 – 1 200
stones	1 500 – 2 200
soft wood	300 - 450
hard sawn timber	500 - 600
impregnated timber	600 - 800
steel structures	700 - 7000
milled burnt lime	700 - 800
cinders	650 - 750
gravel	1 600 – 1 800
straw litter and bulk feeds	
meadow hay dried in the swath	10 - 18
hay wilted in the swath	15 - 25
hay in gathering trailer (dry wilted)	50 - 80
wilted cut hay	60 - 70
dry baled hay	120 - 150
wilted baled hay	200 - 290
stored dry hay	50 - 90
stored cut hay	90 - 150
clover (lucerne) wilted in the swath	20 - 25
clover (lucerne) cut wilted on trailer	110 - 160
clover (lucerne) wilted on gathering trailer	60 - 100
dry stored clover	40 - 60

TYPE OF MATERIAL	VOLUME WEIGHT kg/m ³
cut dry stored clover	80 - 140
dry straw in round bales	8 - 15
damp straw in round bales	15 - 20
cut damp straw in bulk trailer	50 - 80
cut dry straw in bulk trailer	20 - 40
cut dry straw in gathering trailer	50 - 90
cut dry straw in stack	40 - 100
baled straw (lightly crushed)	80 - 90
baled straw (heavily crushed)	110 - 150
cereal mass in round bales	20 - 25
cut cereal mass in bulk trailer	35 - 75
cut cereal mass in gathering trailer	60 - 100
green fodder in swath	28 - 35
cut green fodder in bulk trailer	150 - 400
green fodder in gathering trailer	120 - 270
fresh beet leaves	140 - 160
cut fresh beet leaves	350 - 400
beet leaves in gathering trailer	180 - 250
concentrated feeds and mixed feeds:	
stored chaff	200 - 225
pressed cake	880 - 1 000
milled dry feed	170 - 185
mixed feeds	450 - 650
mineral mixtures★	1 100 - 1 300
ground oats	380 - 410
wet sugar beet pulp	830-1000
pressed sugar beet pulp	750 - 800
dry sugar beet pulp	350 - 400
bran	320 - 600
bone meal	700 - 1 000
pasture salt★	1 100 - 1 200
molasses	1 350 - 1 450

TYPE OF MATERIAL	VOLUME WEIGHT kg/m ³
silage (pit silo)	650 – 1 050
hay silage (tower silo)	550 - 750
Seeds and grains:	
beans	750 - 850
mustard	600 - 700
peas	650 - 750
lentils	750 - 860
runner beans	780 - 870
barley	600 - 750
clover	700 - 800
grass	360 - 500
maize	700 - 850
wheat	720 - 830
oil seed rape	600 - 750
linseed	640 - 750
lupins	700 - 800
oats	400 - 530
lucerne	760 - 800
rye	640 - 760
Others:	
dry soil	1 300 – 1 400
wet soil	1 900 – 2 100
fresh peat	700 - 850
garden soil	250 - 350

Source: "Technology of machine work in agriculture", PWN, Warszawa 1985

★ - building materials, mineral fertilisers and mineral mixtures cause damage to trailer structure and/or paint coating and cause the creation of corrosion points

Due to the various density of materials, using the total load box capacity may cause exceeding permissible carrying capacity of hook trailer. Guideline specific weight of selected materials shown in table (4.2). It is necessary to pay particular attention not to overload the trailer.

Light materials with a large volume (hay, round or rectangular bales, straw, green fodder etc.), maybe loaded even above the edge of the load box paying particular attention to trailer stability. Regardless of the type of load carried, the user is obliged to secure it in such a manner that the load is unable to spread and cause contamination of the road.

Mineral fertilisers and other materials, which by having contact with painted or steel surfaces may cause damage, are recommended to be carried in sealed packing (sacks, boxes, drums, barrels etc.).

ATTENTION!



Do NOT exceed permissible load weight of trailer because this may cause danger to road traffic and cause damage to the machine.

Individual types of load boxes are adapted to carrying various groups of materials, therefore the user is obligated to carefully read the load box operator's manual and comply with its recommendations.

4.7 TRANSPORTING LOADS

When driving on public or private roads, respect the road traffic regulations, exercise caution and prudence. Listed below are the key guidelines for driving the tractor and trailer combination.

- Before moving off make sure that there are no bystanders, especially children, near the trailer or the tractor. Take care that the driver has sufficient visibility.
- Make sure that the trailer is correctly attached to the tractor and tractor's hitch is properly secured.
- The trailer must not be overloaded, loads must be uniformly distributed so that the maximum permissible axle and drawbar loads are not exceeded. The trailer's maximum carrying capacity must not be exceeded as this can damage the trailer and pose a risk to the operator or other road users.
- Permissible design speed and maximum speed allowed by road traffic law must not be exceeded. The towing speed should be adapted to the current road conditions, load carried by the trailer, road surface conditions and other relevant conditions.
- Trailer may be towed on slopes of up to 8°, unloading, disconnection and connection of load box must take place only on a level surface.

- When not connected to the tractor, the trailer must be immobilised using parking brake and possibly also with chocks or other objects without sharp edges placed under the front and back wheels. Do NOT leave unsecured trailer. In the event of trailer malfunction, pull over on the hard shoulder avoiding any risk to other road users and position reflective warning triangle according to traffic regulations.
- When driving on public roads trailer must be marked with a slow-moving vehicle warning sign attached to the rear chassis beam (travelling without load box), or on rear wall of load box. While driving on public roads the trailer must be fitted with a certified or authorised reflective warning triangle. When driving, comply with all road traffic regulations, indicate an intention to turn using indicator lamps, keep all road lights and indicator lights clean at all times and ensure they are in good condition. Any damaged or lost lamps or indicator lights must be immediately repaired or replaced.
- When driving with trailer without the load box, impact beam must be withdrawn. When driving with the load box fitted on trailer, maximally extend the impact beam and secure with pins.
- Avoid ruts, depressions, ditches or driving on roadside slopes. Driving across such obstacles could cause the trailer or the tractor to suddenly tilt. This is of special importance because loaded trailer's centre of gravity is higher, which reduces safety. Driving near ditches or channels is dangerous as there is a risk of the wheels sliding down the slope or the slope collapsing.
- Speed must be sufficiently reduced before making a turn or driving on an uneven road or a slope.
- When driving, avoid sharp turns especially on slopes.
- When trailer is towed (with load box or without load box), hydraulic cylinder suspension blocks must be completely raised.
- Please note that the braking distance of tractor and trailer combination is substantially increased at higher speeds and loads carried in the trailer.
- While travelling on roads (public or private) remove protective mesh from rear light assemblies and fit them on the left side longitudinal member in the place marked with the information decal (10), p. 2.10.

4.8 UNLOADING

Unloading materials in the load box takes place by tipping the load box to the rear. Operation is controlled from driver's cab using external tractor hydraulic system manifold. Unloading trailer is performed in the following sequence:

- tractor and trailer must be placed to drive forwards on flat ground,
- immobilise tractor and trailer with parking brake,
- withdraw impact beam maximally and secure it with pins,
- extend ram cylinder suspension blocks and block suspension,
- open the appropriate closure of rear wall of load box, during opening be careful, because load may exert great pressure on the opened rear side wall,
- set block lever (1) – figure (3.5A) in position I – tip load box,
- using manifold lever in tractor cab raise tipping frame together with load box,
- after unloading lower tipping frame, clean load remnants from load box edge,
- close and secure rear wall of load box,
- Raise hydraulic cylinder suspension blocks maximally upwards.

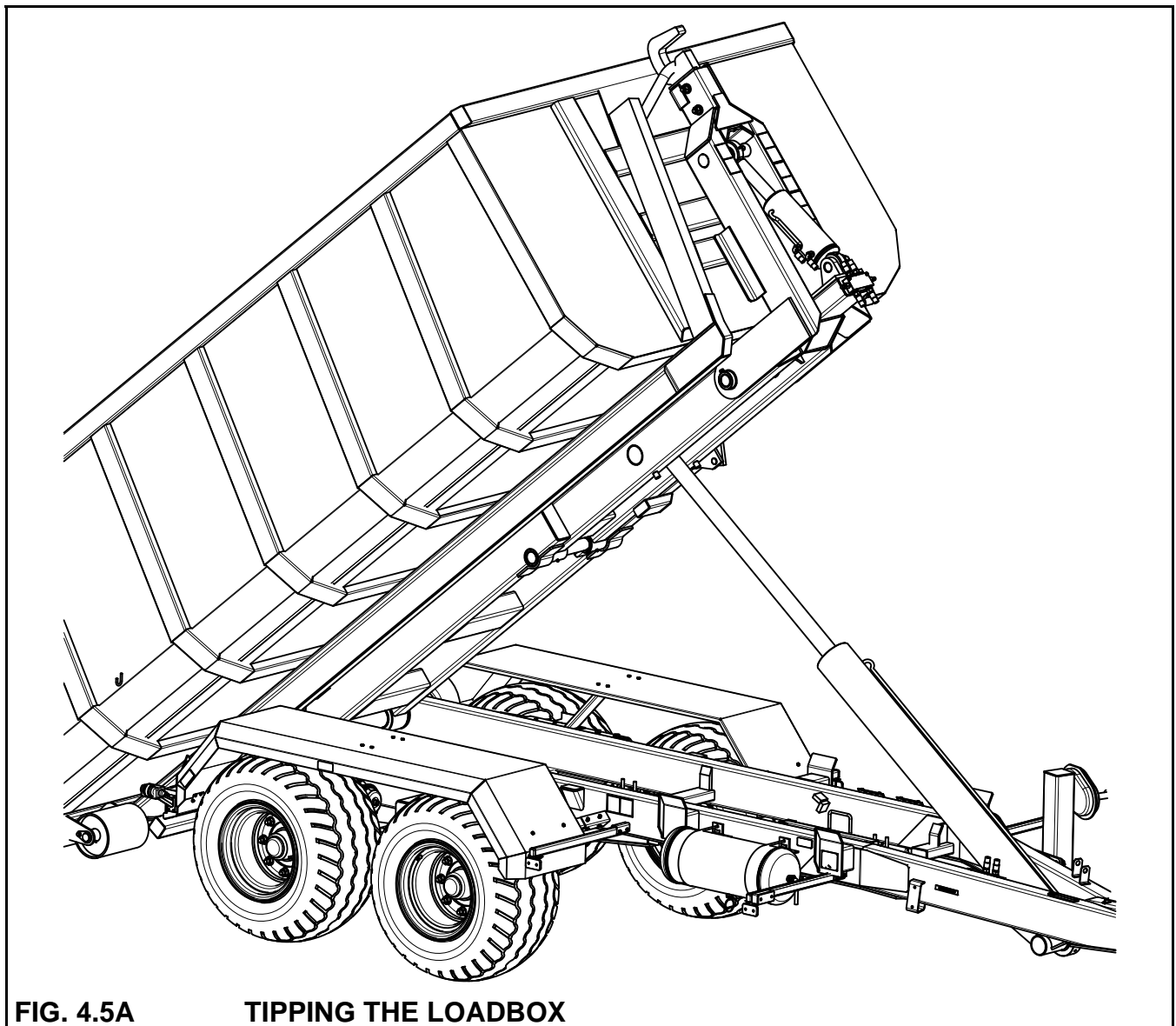


FIG. 4.5A **TIPPING THE LOADBOX**

DANGER



Tipping the load box must be done on hard and level ground.

When opening load box closure take particular care, because of the pressure of the load on the wall.

When closing load box wall take particular care to avoid crushing fingers.

Ensure that during unloading nobody is near tipped load box or load material pouring out.

DANGER



Tipping may only be performed when trailer is hitched to tractor.

Do NOT tip load box in strong gusty winds conditions.

Do NOT move off or drive when load box is raised.

Take particular care while working near electric power lines.

Before tipping the load box, withdraw impact beam and extend suspension locking cylinders, lock rocker arms.

4.9 DISCONNECTING FROM TRACTOR

In order to disconnect the trailer from the tractor proceed as follows:

- stop tractor, immobilise trailer with parking brake and if needed place chocks under wheels,
- if trailer equipped with hydraulic support - set hydraulic support operating valve in position "O", take load off drawbar using hydraulic support; set support operating valve in position "Z",
- if trailer is equipped with mechanical gear support, take a load off drawbar by turning crank anticlockwise,
- disconnect from the tractor all electrical leads as well as hydraulic tipping and braking system conduits tubes and protect ends of these conduits against contamination,
- disconnect the trailer drawbar hitching eye from the tractor hitch and move the tractor forward.

Extended parking of the trailer fitted with load box and cargo is prohibited when the trailer is equipped with hydraulic parking stand.



IMPORTANT!

The trailer may not be unhitched from the tractor, if the tipping frame or central frame are not fully retracted and when hydraulic cylinder suspension blocks are extended.

4.10 PROPER USE AND MAINTENANCE OF TYRES

- When working on the tyres, chocks or other objects without sharp edges should be placed under the wheels of the trailer to prevent it from rolling. Wheels can be taken off the trailer axle only when the trailer is not loaded.
- Repair work on the wheels or tyres should be carried out by persons trained and entitled to do so. This work should be carried out using appropriate tools.
- After removing a wheel, always check how firmly the nuts are screwed in. Individual checks should be made after the first use, after the first journey with a load and then every 6 months. The above actions should be repeated individually if a wheel has been removed from the wheel axle.
- Regularly check and maintain correct pressure in tyres according to Operator's Manual (especially if trailer is not used for a longer period).
- Pressure and tyres should be also checked after the whole day of intensive work. Please note that higher temperatures could raise tyre pressure by as much as 1 bar. At high temperatures and pressure, reduce load or speed.
- Do not release air from warm tyres to adjust the pressure or the tyres will be underinflated when temperatures return to normal.
- Protect tyre valves using suitable caps to avoid soiling.
- Do not exceed the trailer's maximum design speed.
- When trailer is operated all day, stop working for a minimum of one hour in the afternoon.
- Adhere to 30 minutes rest for cooling tyres after driving 75 km or after 150 minutes continuous travel depending on which occurs first.
- Avoid potholes, sudden manoeuvres or high speeds when turning.

SECTION

5

MAINTENANCE

CHECKING AND ADJUSTMENT OF WHEEL AXLE BEARINGS

ADJUSTMENT OF MAIN BRAKES

ADJUSTMENT OF MAIN BRAKES

PNEUMATIC SYSTEM OPERATION

HYDRAULIC SYSTEM OPERATION

LUBRICATION

STORAGE

TRAILER PREPARATION FOR END OF SEASON

TIGHTENING TORQUE FOR NUT AND BOLT CONNECTIONS

TROUBLESHOOTING

LIST OF BULBS

5.1 CHECKING AND ADJUSTMENT OF WHEEL AXLE BEARINGS

In newly purchased trailer, after covering a distance of 100 km, while during further use – after 6 months of vehicle use check and adjust wheel axle bearings when needed. Worn or damaged bearing should be replaced. Inspection of these elements should be conducted according to instructions below.

- Hitch trailer to tractor, place blocking chocks under trailer wheels and raise wheels in succession using the appropriate lifting jack. Lifting jack should be placed under the end of the the rocker arm under connection of rocker arm with half axle. Make certain that the trailer will not move during inspection of the bearing.
- Turning the wheel slowly in both directions check that movement is smooth and that the wheel rotates without excessive resistance.
- Turn the wheel so that it rotates very quickly, check that the bearing does not make any unusual sounds.
- Grasp wheel above and below and try to feel any slack play, this may equally be checked with the aid of a jack placed under the wheel supported on the floor/ground.

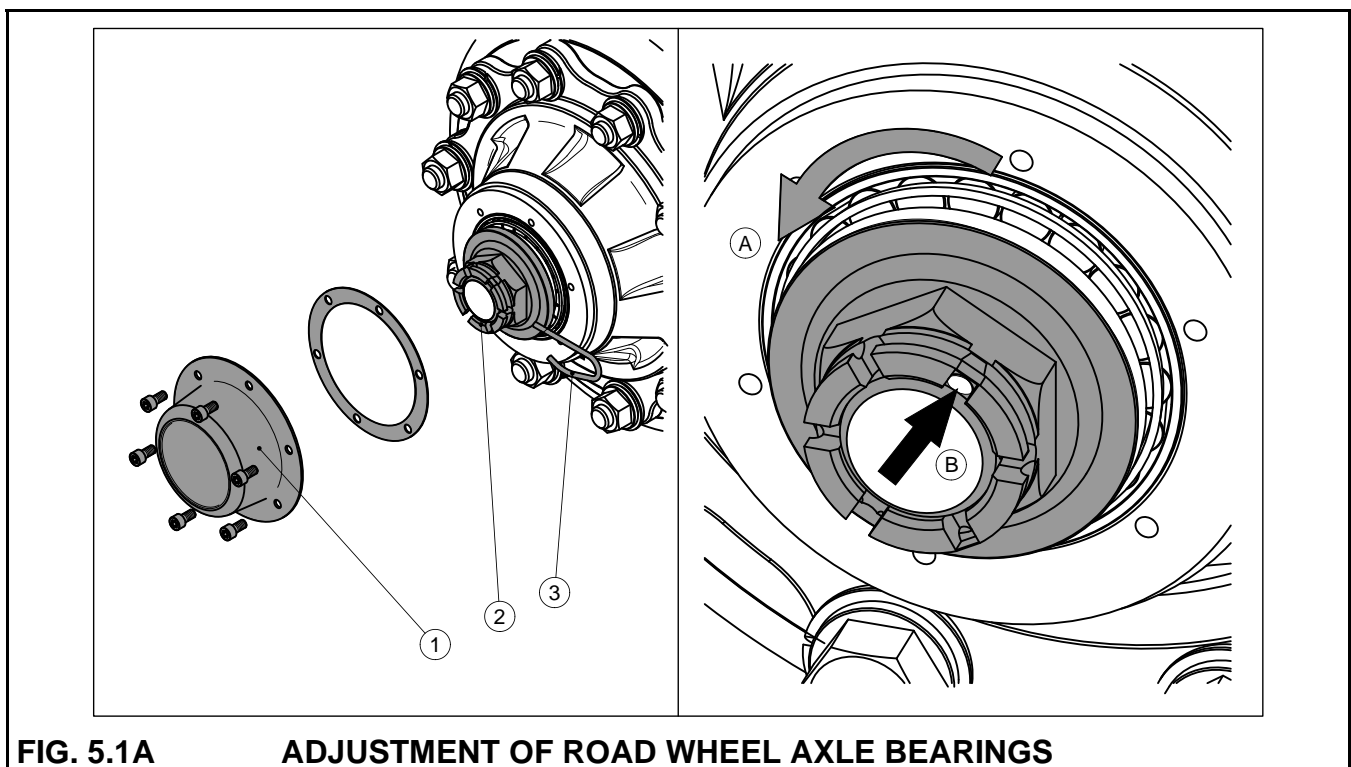


FIG. 5.1A ADJUSTMENT OF ROAD WHEEL AXLE BEARINGS

(1) hub cover, (2) castellated nut, (3) securing split cotter pin

If slack is felt, adjust bearing. Unusual sounds coming from bearing may be symptoms of excess wear, dirt or damage. In such an event the bearing, together with sealing ring, should be replaced with new parts.

Bearing adjustment should be performed according to the following instructions – figure (5.1A):

- take off hub cover (1),
- take out split cotter pin (3) securing castellated nut (2),
- turning the wheel simultaneously tighten castellated nut until the wheel comes to a stop,
- unscrew nut in (A) direction, (not less than 1/3 rotation) to cover the nearest thread groove with alignment to opening in wheel stub axle (B).
- secure castellated nut with cotter pin and mount hub cap.

The wheel should turn smoothly without stiffness or detectable resistance not originating from abrasion of brake shoes in brake drum.

TAB. 5.1 HYDRAULIC LIFT REQUIREMENTS

LIFT CAPACITY	2 000 kg
HEIGHT OF LIFT RAM IN RETRACTED STATE	300 mm

Bearings replacement, lubrication and repairs connected with brake system and wheel axle should be entrusted to specialist service provider.



Inspection of slack and technical condition of wheel axle bearings must be performed after the first month of use, and then every 6 months of trailer use.

5.2 ADJUSTMENT OF MAIN BRAKES

Brakes adjustment is necessary when:

- as a result of wear of brake shoe linings between lining and drum there is excessive slack and reduced braking effectiveness,

- wheel brakes do not brake evenly or simultaneously.

If brakes are correctly adjusted, braking of trailer road wheel takes place simultaneously. Brakes adjustment involves changing setting of axle shaft expander arm (2) in relation to expander shaft (1). To do this rotate adjustment screw (3) set axle shaft expander arm in appropriate direction i.e.:

- in direction of hydraulic cylinder - if brake brakes too late,
- In direction from hydraulic cylinder - brake brakes too early.

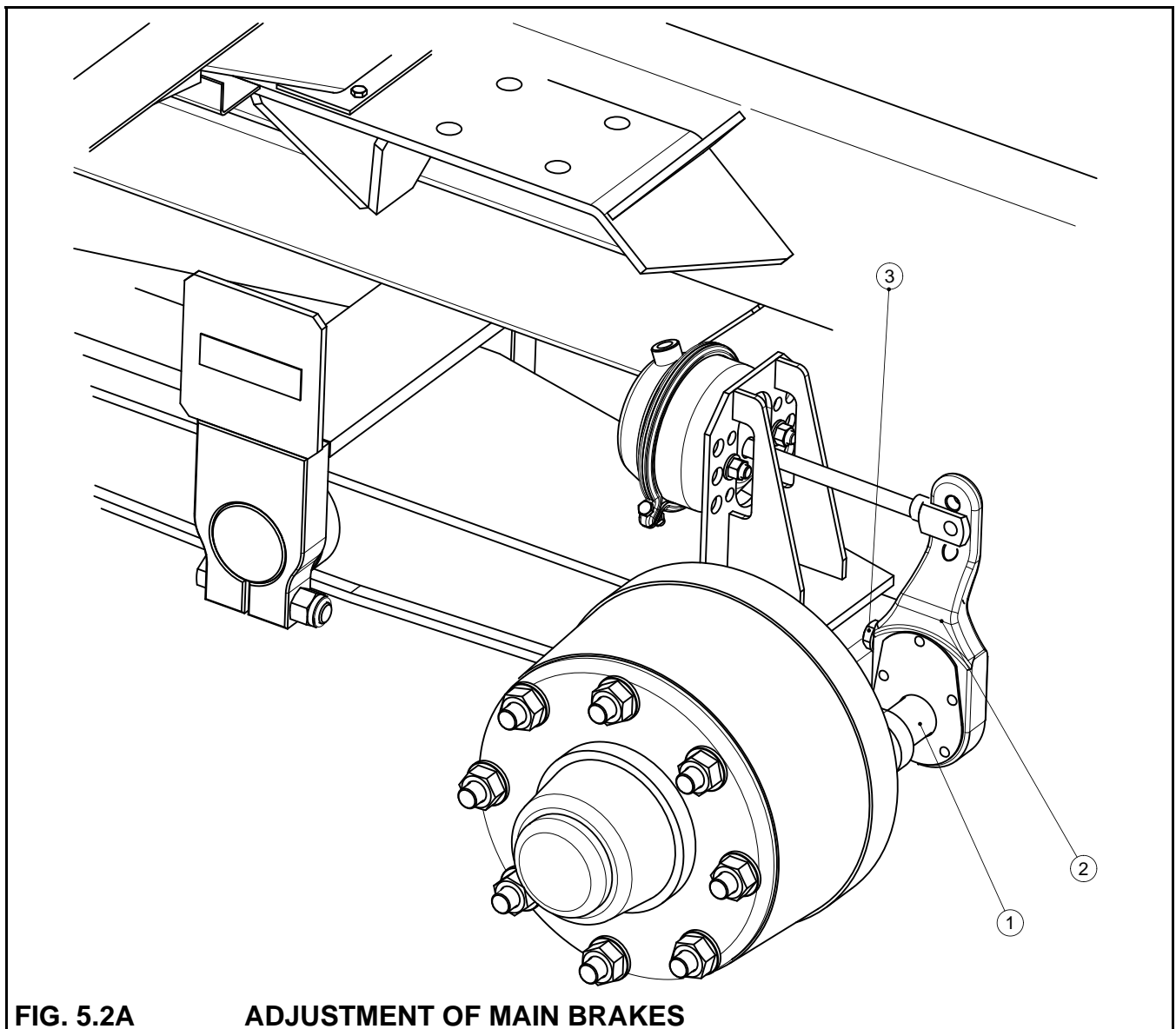


FIG. 5.2A **ADJUSTMENT OF MAIN BRAKES**

(1) expander shaft, (2) expander arm, (3) adjustment bolt

TAB. 5.2 MAIN BRAKE BRAKING FORCE

MAIN BRAKE BRAKING FORCE	UNIT
76	kN

Adjustment should be conducted separately for each wheel. After proper brake adjustment, at full braking the axle shaft expander arm should create an angle of 90° with pneumatic ram piston. With properly adjusted brakes, trailer main brake braking force should reach a value not less than that given in table(5.2).



ATTENTION!

Braking force of the trailer, is the braking force of all trailer wheels.

Difference in braking force may not be greater than 30%, considering that 100% constitutes greater force.



The main brake system should be inspected annually and in case of need should be adjusted.

5.3 ADJUSTMENT OF MAIN BRAKES

Adjustment of parking brake should be conducted in the event of:

- stretching of cable,
- loosening of parking brake cable clamps
- after adjustment of main brake
- after repairs in main brake system
- after repairs in parking brake system.

Before commencing adjustment make certain that the main break is functioning properly. Length of parking brake cable should be so selected that at total release of working and parking brake the cable would be loose and hanging by 1 - 2 cm.

With properly regulated brakes, trailer parking brake braking force should reach a value not less than that given in table (5.3). Difference in braking force of left and right wheel may not be greater than 30%, considering that 100% constitutes greater force.

TAB. 5.3 PARKING BRAKE BRAKING FORCE

PARKING BRAKE BRAKING FORCE	UNIT
24	kN



ATTENTION!

Braking force of the trailer, is the braking force of all trailer wheels, braked with parking brake.



The parking brake system should be inspected annually and in case of need should be adjusted.

5.4 PNEUMATIC SYSTEM OPERATION

As a part of trailer maintenance, conduct inspection of pneumatic system leaktightness, paying particular attention to all places of connection. Tightness of the system should be checked at nominal pressure in system of approximately 600 kPa (6.0 kg/cm²).

If conduits, seals or other system elements are damaged, compressed air will escape in these damaged places with a characteristic hiss. Lack of system tightness may be exposed by covering checked elements with washing fluid or other foaming preparations, which will not react aggressively with system elements. Damaged seals or conduits, causing leaks should be replaced. If the cause of the system leak is the outflow from a piston, control valve body or braking force regulator should be taken to authorised repair provider for repair or replacement of parts.

Condensation collecting as water should be removed from air tank periodically. In order to do this open out drain valve (2) placed in lower part of tank. The compressed air in the tank causes the removal of water to the exterior. After release of the valve stem, the valve should

automatically close and stop airflow from the tank. Annually before the winter period unscrew drain valve and clean off accumulated dirt. Replace copper seal.

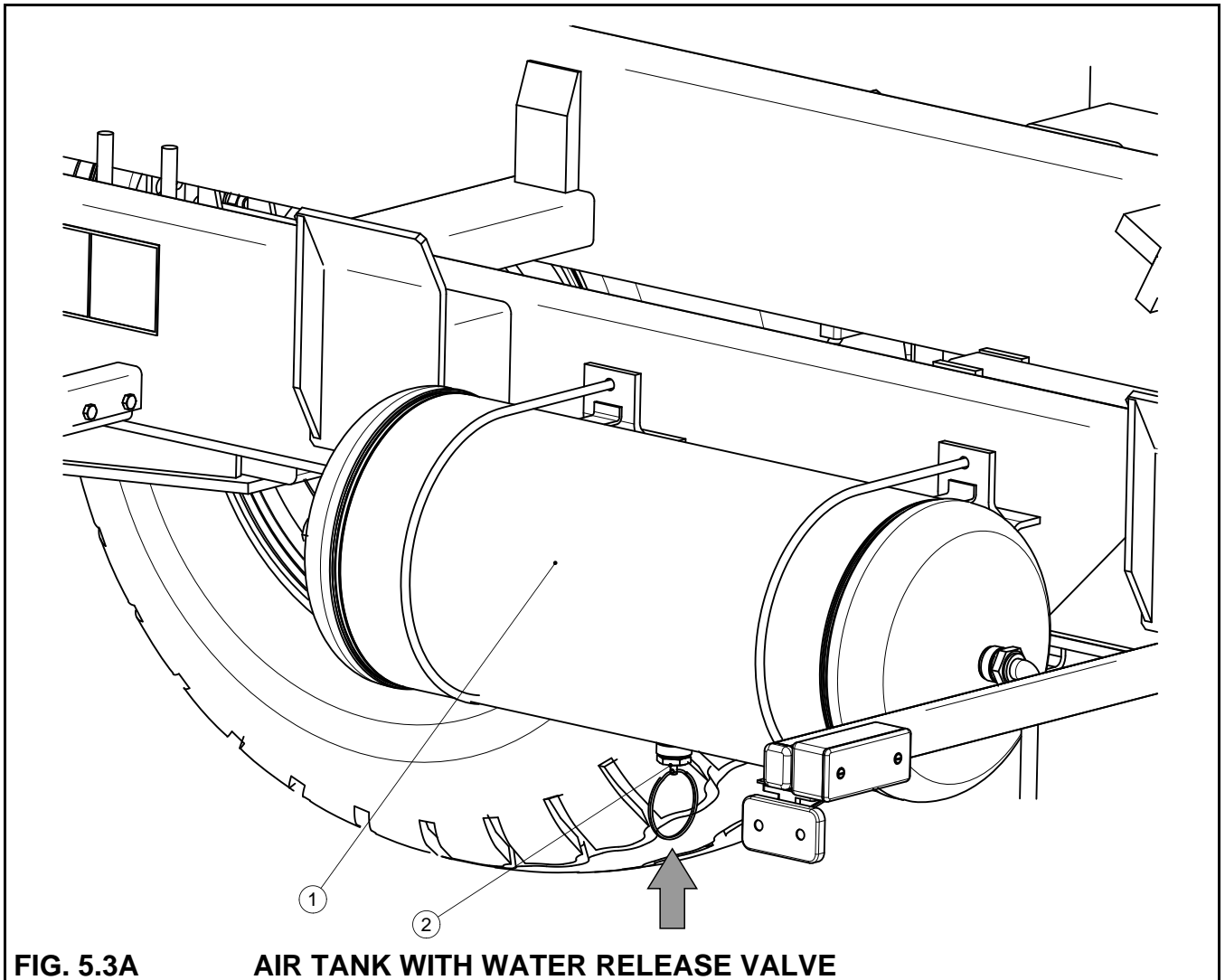


FIG. 5.3A AIR TANK WITH WATER RELEASE VALVE

(1) air tank, (2) drain valve

Depending on trailer working conditions, but not less than once in three months, take out and clean air filter inserts, which are located in pneumatic system connection conduits. Inserts are used many times and are not subject to changing unless they are mechanically damaged. In order to clean insert first reduce pressure in supply conduit. Next slide out the safety slide lock (1) – figure (5.4A) - filter cover (2) should be covered with other hand. After removing slide lock, the cover is pushed off by the spring, in the filter housing. The insert and the filter body should be carefully washed out and blown through with compressed air. Assembly should be done in reverse order.



Annually before the winter period unscrew and clean drain valve.

Inspection of tightness and inspection of pneumatic braking systems in detail should be conducted at least annually and after repairs associated with this system.



DANGER

Before proceeding to dismantle filter, reduce pressure in supply conduit.

While disengaging filter slide gate, hold cover with other hand. Stand away from filter cover vertical direction.

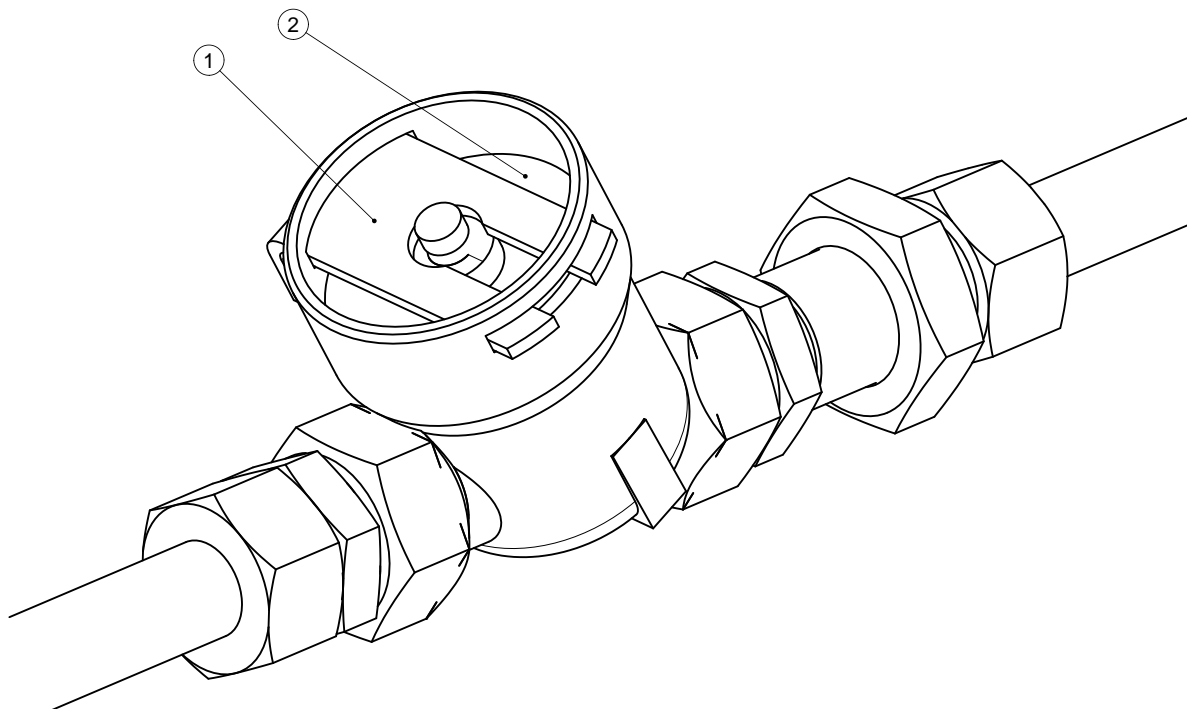


FIG. 5.4A AIR FILTER

(1) securing slide lock, (2) air filter cover



The insert and the air filter body should be cleaned at least every 3 months of trailer use.

Pneumatic system connection must be inspected on regularly during use of trailer and if necessary cleaned of all contamination. Particular attention should be paid to the technical condition of security covers and rubber seals. If these elements are damaged they should be

replaced. It is recommended that seals are preserved with silicon preparation, specified for rubber elements every six months. Contact of the seals with fuel, lubricants being petroleum derivatives, paints etc., causes rapid ageing of the material from which they are made.



Connection should be inspected every time before connecting trailer to tractor. During connection make sure that tractor socket is not damaged and is maintained in the due cleanliness.

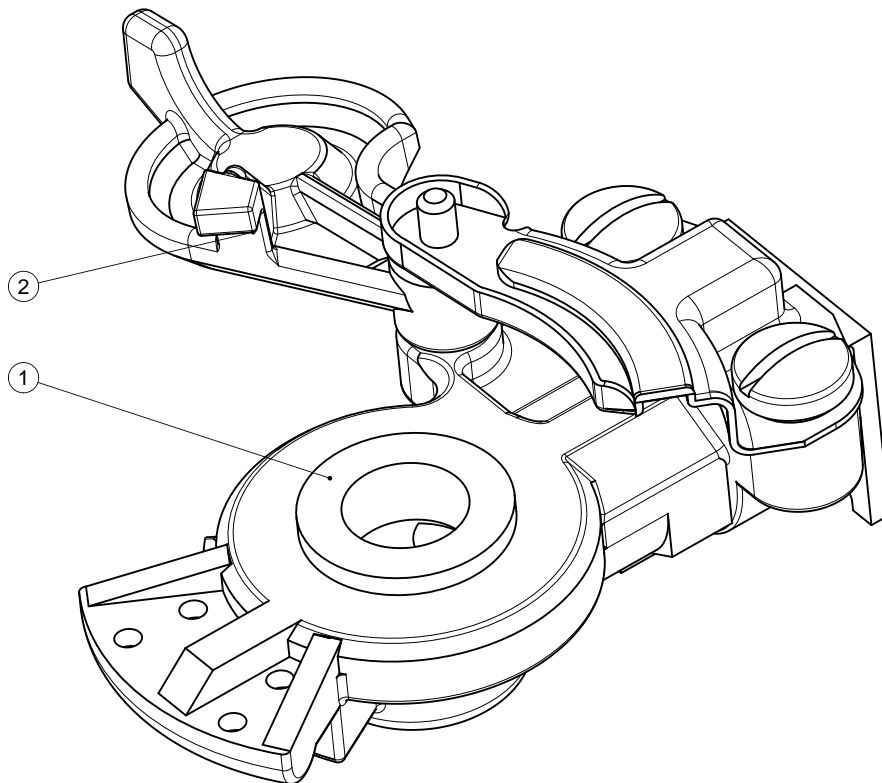


FIG. 5.5A **CONDUIT CONNECTIONS**


(1) rubber seal, (2) security cover

5.5 HYDRAULIC SYSTEM OPERATION

Always adhere to the principle that the oil in the trailer hydraulic system and in the tractor hydraulic system are of the same type. Application of different types of oil is not permitted. In a new trailer, the hydraulic system is filled with HL32 hydraulic oil.


The hydraulic system should be completely tight sealed. Checking tightness of hydraulic system involves connecting machine with tractor and starting hydraulic cylinder rams and holding them in position of maximum extension for a period of 30 seconds. In the event of confirmation of an oil leak on hydraulic conduit connections, tighten connections, and if this

does not remedy faults then change conduit or connection elements. If oil leak occurs beyond connection, the leaking conduit system should be changed. Change of sub assemblies is equally required in each instance of mechanical damage. In the event of confirmation of damage of hydraulic ram cylinders they must be replaced or repaired. In such an event the whole set of seals must be changed.

	<p>Hydraulic conduits should be replaced after 4 years of trailer use.</p> <p>Detailed tightness and technical condition inspection of hydraulic system should be made at least annually.</p>
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TAB. 5.4 HL32 HYDRAULIC OIL CHARACTERISTICS

ITEM	NAME	VALUE
1	ISO 3448VG viscosity classification	32
2	Kinematic viscosity at 40°C	28.8 – 35.2 mm ² /s
3	ISO 6743/99 quality classification	HL
4	DIN 51502 quality classification	HL

	<p>ATTENTION!</p> <p>Trailer with a leaking hydraulic system must NOT be used.</p> <p>The condition of hydraulic systems should be inspected regularly while using trailer.</p> <p>The hydraulic system is under high pressure when operating.</p> <p>Regularly check the technical condition of the connections and the hydraulic conduits.</p> <p>Use the hydraulic oil recommended by the Manufacturer. Never mix two types of oil.</p>
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In the event of necessity of changing hydraulic oil for another oil, check the recommendations of the oil Manufacturer very carefully. If it is recommended to flush the system with the appropriate preparation, then comply with these recommendations. Attention should be given, so that chemical substances used for this purpose do not damage the materials of the hydraulic system.

The oil applied because of its composition is not classified as a dangerous substance, however long-term action on the skin or eyes may cause irritation. In the event of contact of oil with skin wash the place of contact with water and soap. Do NOT apply organic solvents (petrol, kerosene). Contaminated clothing should be changed to prevent access of oil to skin. In the event of contact of oil with eye, rinse with large quantity of water and in the event of the occurrence of irritation consult a doctor. Hydraulic oil in normal conditions is not harmful to the respiratory tract. A hazard only occurs when oil is strongly atomised (oil vapour), or in the case of fire during which toxic compounds may be released. Oil fires should be quenched with the use of carbon dioxide, foam or extinguisher steam.

5.6 LUBRICATION

Trailer lubrication must be carried out in places indicated in figures (5.6A) & (5.7A), and also detailed in table (5.5).

TAB. 5.5 LUBRICATION POINTS

ITEM	NAME	NUMBER OF LUBRICATION POINTS	TYPE OF GREASE	LUBRICATION FREQUENCY
1	Tipping ram cylinder eyes	4	permanent	6 months
2	Rotating drawbar eye	1	permanent	3 – 4 months
3	Guide roller slide sleeves	4	permanent	1 – 2 months
4	Hook frame slide sleeves	2	permanent	3 – 4 months
5	Rocker arm slide sleeves	2	permanent	3 – 4 months
6	Wheel bearings	8	permanent	24 months
7	Axle expander shaft sleeves	4	permanent	6 months
8	Handbrake pin	2	permanent	3 – 4 months

ITEM	NAME	NUMBER OF LUBRICATION POINTS	TYPE OF GREASE	LUBRICATION FREQUENCY
9	Handbrake bolt	1	permanent	3 – 4 months
10	Handbrake cable guide wheel axles	4	permanent	3 – 4 months
11	Tipping frame rotation sleeves	2	permanent	3 – 4 months
12	Central frame rotation sleeves	2	permanent	3 – 4 months
13	Tipping frame block mechanism pins	3	permanent	3 – 4 months
14	Lever block	1	permanent	3 – 4 months

IMPORTANT! Marking description in Item column in table (5.5) conforms with numbering shown in figures (5.6A) & (5.7A).

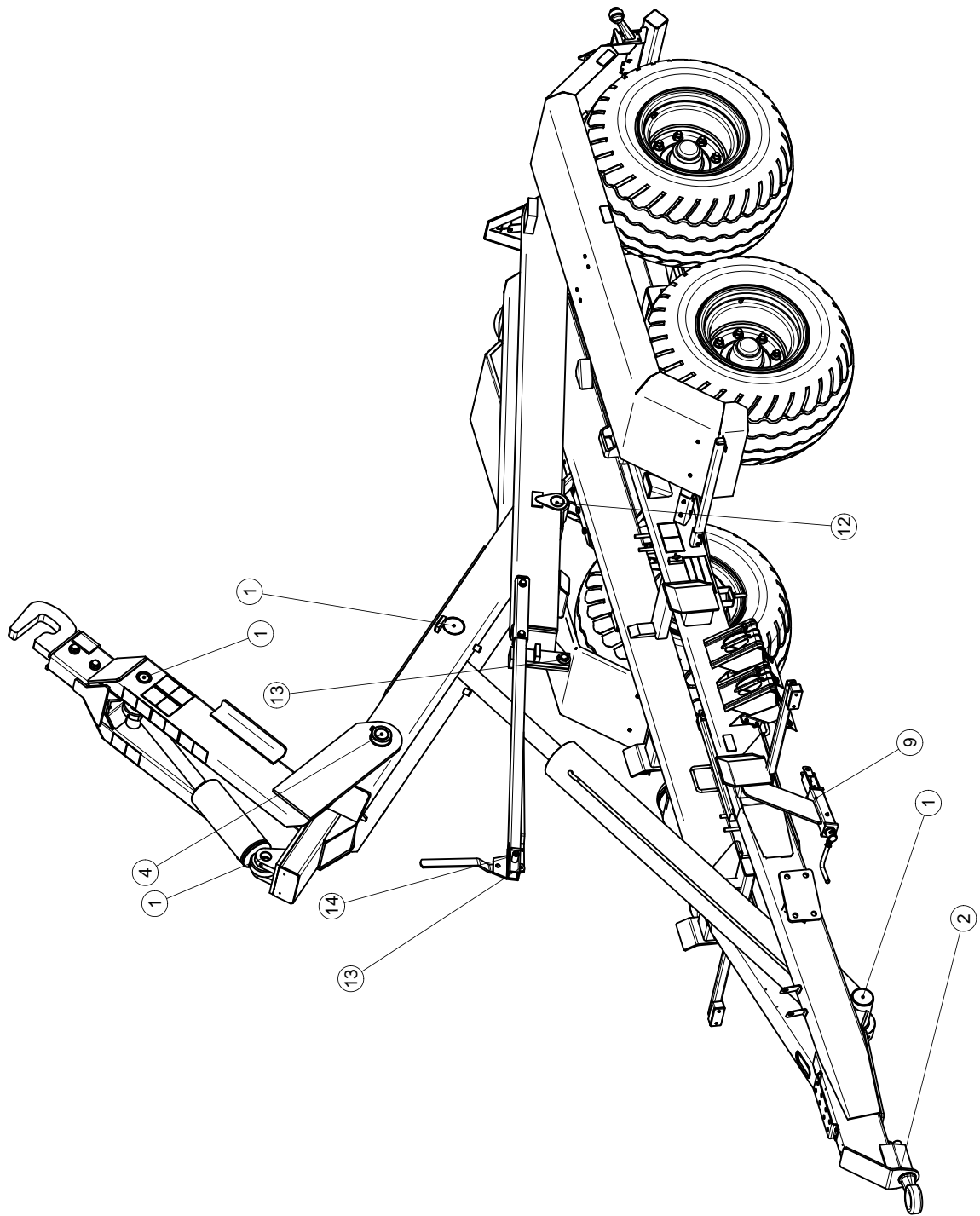


FIG. 5.6A TRAILER'S LUBRICATION POINTS

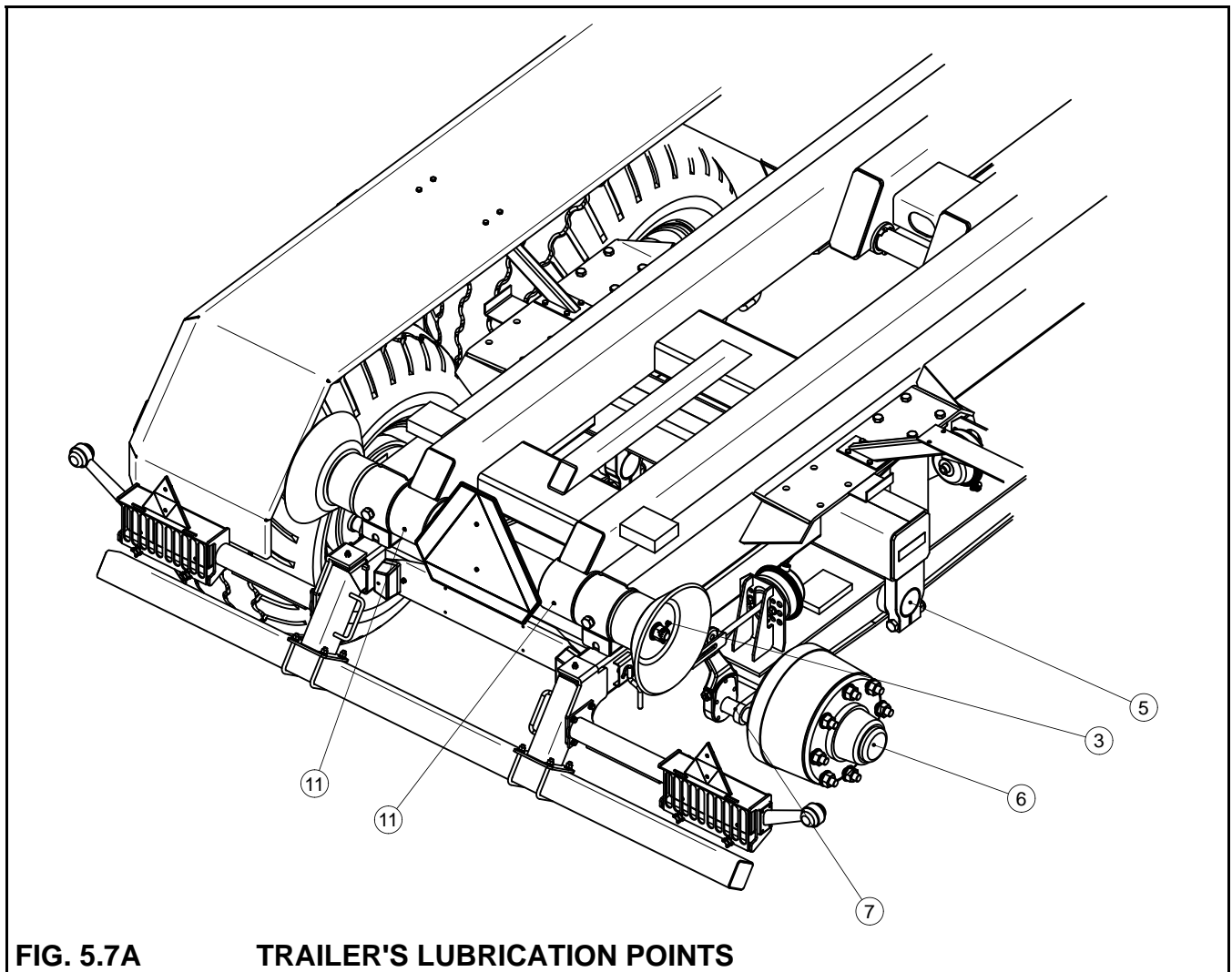


FIG. 5.7A TRAILER'S LUBRICATION POINTS

Trailer lubrication should be performed with the aid of a manually or foot operated grease gun, filled with generally available permanent grease. After lubricating the trailer according to instructions, wipe off excess grease. Changing grease in wheel hub axle bearings should be entrusted to professional service.



During trailer use the user is obliged to observe lubrication instructions according to attached schedule. Excess lubrication substance causes depositing additional contaminants in places requiring lubrication, therefore it is essential to keep individual machine elements clean.

5.7 STORAGE

After finishing work, trailer should be thoroughly cleaned and washed with water jet. In the event of damage to the paint coat, clean rust and dust from damaged area, degrease and then paint with undercoat and after it is dry paint with surface coat paint retaining colour

uniformity and even thickness of protective coating. Until the time of touch-up painting, the damaged place may be covered with a thin layer of grease or anticorrosion preparation. Trailer should be kept in closed or roofed building.

5.8 TRAILER PREPARATION FOR END OF SEASON

If the trailer will not be used for a long time, it is essential to protect it from adverse weather, especially rust and accelerated tyre deterioration. During this time trailer must be unloaded.

Trailer should be very carefully washed and dried. While washing do not direct a strong water or steam jet at information and warning decals, hydraulic or pneumatic cylinders, electrical equipment, and hydraulic and pneumatic systems. Corroded areas should be protected as described above in previous subsection.

Tyres should undergo conservation maintenance at least twice a year using the appropriate preparations designed for this purpose. Wheels and tyres should be previously carefully washed and dried. During longer storage of unused trailer it is recommended that every 2 to 3 weeks the trailer may be moved a bit so that the place of contact of tyres with ground is changed. The tyres will not be deformed and maintain proper geometry. Also tyre pressure should be inspected from time to time, and if necessary pressure should be increased to appropriate value.

Lubricate elements according to guidelines presented in section "Lubrication".

5.9 TIGHTENING TORQUE FOR NUT AND BOLT CONNECTIONS

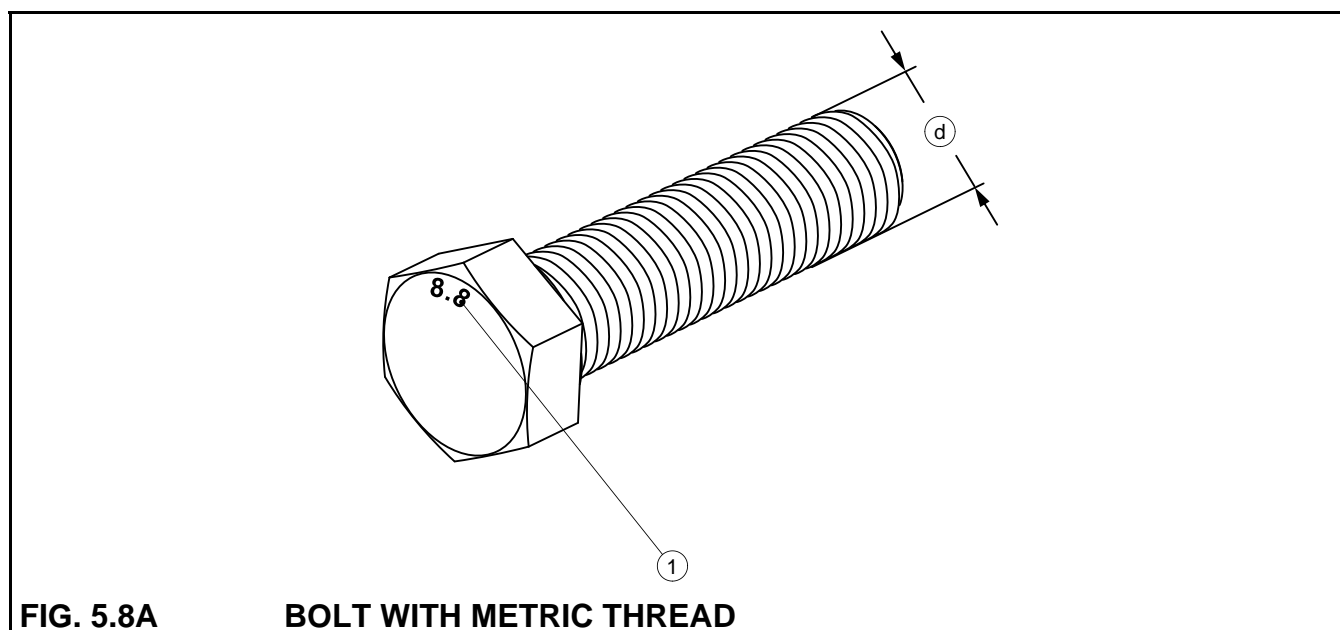
Unless other tightening parameters are given, during maintenance repair work apply appropriate torque to tightening nut and bolt connections. Recommended tightening torque of most frequently applied nut and bolt connections are given in table (5.6). Given values apply to non-lubricated steel bolts.

TAB. 5.6 TIGHTENING TORQUE FOR NUT AND BOLT CONNECTIONS

THREAD (d) [mm]	5.8	8.8	10.9
	M _D [Nm]		
M6	8	10	15

THREAD (d) [mm]	5.8	8.8	10.9
	M_D [Nm]		
M8	18	25	36
M10	37	49	72
M12	64	85	125
M14	100	135	200
M16	160	210	310
M20	300	425	610
M24	530	730	1050
M27	820	1150	1650
M30	1050	1450	2100

(M_D) – tightening torque, (d) thread diameter



(1) bolt strength class, (d) thread diameter

5.10 TROUBLESHOOTING

TAB. 5.7 FAULTS AND MEANS OF REMEDYING THEM

FAULT	CAUSE	REMEDY
Problem with moving off	Brake system pneumatic conduits not connected	Connect brake conduit.
	Damaged pneumatic system connection conduits	Replace
	Leaking connections	Tighten, replace washers or seal set
	Parking brake applied	Release parking brake
Noise in axle hubs	Excessive slack in bearings	Check slack and regulate if needed
	Damaged bearing	Change bearing together with sealing ring
Excessive heating of axle hubs	Incorrectly adjusted main brake	Regulate setting of expander arms
	Incorrectly adjusted parking brake	Adjust tension of parking brake cables
	Worn brake linings	Change brake shoes
Tipping / connecting / disconnecting load box not possible	Brake system hydraulic conduits not connected	Connect conduits
	Incorrect placing of conduit leads in tractor hydraulic system sockets	Check connections, if necessary correct
	Damaged hydraulic quick couplers	Replace
	Insufficient quantity of hydraulic oil in tractor's hydraulic system	Use tractor, having hydraulic oil capacity/output according to oil requirements of trailer
Knocking in vicinity of rocker arms during travel	Hydraulic cylinder suspension blocks are not completely withdrawn	Extend the cylinders maximally upward and use them only when tipping the load box.

5.11 LIST OF BULBS

TAB. 5.8 LIST OF BULBS

LAMP	BULB
Front parking lamp left/right LO - 110PP	C5W-SV8.5
Left/right clearance lamp	R5W
License plate light LT - 120	C5W-SV8.5
Rear lamp assembly: left WE 549L, right WE 549P	indicator light: P21W brake light: P21W parking light: R10W
Licence plate illumination light	C5W-SV8.5



ATTENTION!

The trailer's electrical system is supplied with 12V.

NOTES

A series of horizontal dotted lines for writing notes.

