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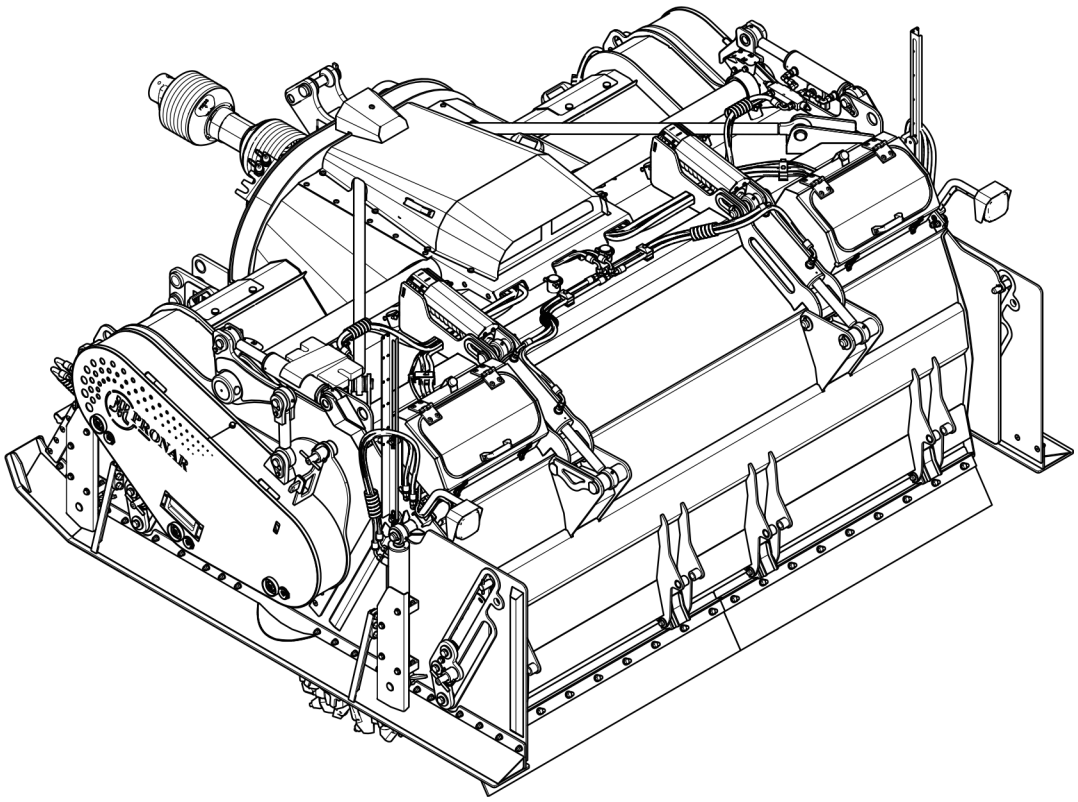
OPERATOR MANUAL

SOIL STABILIZER

PRONAR SGD 25z

TRANSLATION OF THE ORIGINAL COPY OF THE MANUAL



REVISION 1A

10-2024

PUBLICATION NO 680.01.UM.1A.EN

EN

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This Operator Manual contains important safety and operating instructions for the machine. The Operator Manual should be kept near the machine so that it is accessible to authorized operators.

Keep this manual for future reference. If the Operator Manual is lost or damaged, contact the seller or the manufacturer for a copy.

Contents

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CE

EC Declaration of Conformity

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

Machine description and identification data	
General description and purpose:	**Soil stabilizer**
Type:	-
Model:	**SGD25z**
Serial number:	
Commercial name:	**Soil stabilizer PRONAR SGD25z**

referred to in this declaration meets the requirements of Directives:

- **2006/42/EC- MD** - Machine Directive,
- **2014/30/UE- EMC** – Electromagnetic compatibility Directive,
- **2014/35/EU- LVD** - Low Voltage Directive,
- **2016/1628 amended by 2020/1040** - Regulation of the European Parliament and of the Council (EU) of 14 September, 2016. on requirements for internal combustion engines.

The machine has been designed for and meets the requirements of the following standards:

PN-EN ISO 12100; PN-EN ISO 4413; PN-EN ISO 14120; PN-EN ISO 4254-1; PN-EN ISO 13524; PN-EN ISO 60204;

This declaration applies exclusively to the machine in the condition, in which it was sold and does not include components or parts added or subsequent modifications made by the final user.

The operator's manual is an integral part of the machine.

The Implementation Department Manager of PRONAR Sp. z o.o., 17-210 Narew, ul. Mickiewicza 101A is authorised to provide the technical documentation.

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Z-CA DYREKTORA
d/s technicznych
członek zarządu
Roman Ołdakiniuk

Narew, on 2025-02-27
Date and place issued

Full name of the authorised person, position, signature

Chapter 1

Introduction

PRONAR SGD 25z

1.1 DEAR USER

The manual instruction is intended for the end user. For this reason, some required maintenance is listed in the inspection tables but the procedure is not described in this publication. To perform them, call the manufacturer's authorized service center.

Before starting the machine, you will be familiarized with its construction, principle of operation, available equipment and operation, and above all safety rules. The operator and qualified personnel should be trained during final reception.
Remember!!! You can run the machine only when you have read the content of this „User Manual", you have been trained and you can handle it safely. In case of any doubts, contact the seller to clarify the problem.
The most important thing during operation is your safety, therefore, regardless of everything, all recommendations
contained in the „User's Manual" should
be observed and guided by reasonable procedure.
Remember that the correct service, in accordance with the manufacturer's instructions, reduces the risk of an accident to a minimum, and working with the machine is more efficient and less emergency.

When buying machines, check the compatibility of serial numbers placed on the machine with the number entered in the “Warranty card” and in the sales documents. For information on identifying the machine, see “Basic information” chapter. We recommend that you have the most important serial numbers entered the field below.

Machine serial number:

WST.3.B-001.01.EN

1.2 TARGET AUDIENCE

This Operator's Manual is intended for persons operating the machine hereinafter referred to as end users, and qualified persons, such as electricians, mechanics, plumbers. Detailed information on the competences and responsibilities of end users and qualified persons can be found below in this chapter.

1.2.1 End user (user, authorized user, operator)

Who is the end user?

The end user, otherwise known as the user or operator, is the person authorized to operate the machine. The user may be authorized to operate the machine if the following conditions are met.

- The user has read the contents of the " *Operating Instructions*" of the machine and follows its recommendations.
- Carefully read the carrier vehicle's Operator Manual and comply with its recommendations.
- Comply with the road traffic regulations and transport regulations in force in the given country, in which the machine is used,
- Has been trained to follow established maintenance and adjustment plans.
- Have driving licenses (vehicle combinations) required in the country of use.

Duties and responsibilities

The knowledge acquired by the user allows the machine to be operated safely. In accidental situations, the user should follow reasonable procedures and first of all ensure her/his own safety and safety persons nearby the operating machine and other road users.
The user's knowledge and skills entitle to operate the machine, carry out maintenance and perform repairs or adjustments to the extent specified by the

manufacturer. Activities that can be performed by the operator are marked with the pictogram:

1.2.2 Qualified person(s)

Who is a qualified person?

A qualified person is a person authorized to perform certain maintenance, repair or adjustment work to

the extent specified by the machine manufacturer and has acquired suitable technical training in a specific profession which is confirmed by an appropriate document, completed training conducted by authorized manufacturer or seller and is able to perceive and counteract hazards. The acquired professional experience and professional skills entitle a qualified person to carry out some repairs on the machine and perform basic maintenance operations to the extent envisioned by the manufacturer. In addition to the necessary knowledge, a qualified person has the skills to use specialized equipment necessary to perform the responsibilities. Qualified persons include the following:

- qualified mechanic,
- qualified electrician
- qualified plumber.

Activities that a qualified mechanic should perform are marked with a pictogram:

Activities that a qualified electrician should perform are marked with a pictogram:

Activities that a qualified plumber should perform are marked with a pictogram:

1.2.3 Service technicians

Who are the service technicians?

The service technicians, otherwise known as the manufacturer's service technicians, is a person or group of qualified persons with much more experience and knowledge to perform specific repairs and maintenance than qualified persons. Service technicians have the right tools to carry out the work. The manufacturer's service technicians have the required qualifications and represent the machine or other equipment manufacturer.

1.2.4 Unauthorized user

Who is an unauthorized user?

An unauthorized user, also known as a bystander, is a person who has not been trained by the manufacturer or authorized seller, has not been familiarized with the basic safety rules, has little or no knowledge of the machine, has not read the entire operator’s manual and therefore is not authorized to operate the

machine. A bystander must not be allowed to work with the machine.

WST.2.6-003.03.EN

1.3 RULES FOR USING THE USER'S MANUAL

The information contained in the publication is current as at the date of publication. As a result of improvement, some sizes and illustrations contained in this publication may not correspond to the actual state of the machine delivered to the user.

The drawings contained in this publication are aimed at clarifying the principle of machine operation and may differ from the facts. This can not be a reason for any claims for this. The manufacturer reserves the right to introduce constructional changes in the manufactured machines to facilitate operation and improve the quality of their work, without making any current changes to this publication.

The operating instruction is the basic equipment of the machine. If the information contained in this study prove not fully understandable to ask for aid to the point of sale in which the machine has been purchased or directly to the manufacturer.

The machine was constructed in accordance with applicable standards, documents and current legal regulations.

Separate studies can be attached to this manual that can be found in the chapter "*Attachments and additional materials*".

WST.3.B-002.01.EN

1.4 SYMBOLS AND TAGS USED IN THE MANUAL

1.4.1 Danger

Information, descriptions of hazards and precautions as well as instructions and orders related to the safety of use in the content of the manual are marked with a frame with the word **DANGER**. Failure to comply with these recommendations may endanger the health or life of persons operating the machine or bystanders.

1.4.2 Caution

Particularly important information and recommendations, the observance of which is absolutely necessary, are highlighted in the text with a frame and word **CAUTION.** Failure to comply with these recommendations creates the risk of damage to the machine due to improper handling, adjustment or use.

1.4.3 Advice

Additional instructions contained in the manual describe useful information on operating the machine and are marked with a frame with the word **ADVICE.**

1.4.4 Personal protective equipment pictograms

	Work shoes
	reflective vest
	industrial helmet
	working clothes
	respiratory protection
	safety goggles
	protective gloves
	hearing protectors

1.4.5 Qualification pictograms

	operator
	qualified mechanic
	qualified plumber
	qualified electrician

1.4.6 Typography of the User Manual

Bulleted list

The bulleted list presents actions to perform whose order is not relevant.

Example of using a bulleted list

- ....
- Check the condition of connections and hydraulic and pneumatic hoses. Hydraulic oil leaks and air defects from a leaky installation are unacceptable.
- In the event of a hydraulic or pneumatic installation failure, the trailer should be turned off from operation until the failure is removed.
- .....

Comment on the text

Comment is most often a supplement and additional explanation to order a specific activity. Additional information can also be included in the comment.

An example of a comment

The required air pressure is described on the sticker placed on the machine frame, over the wheel.

Defined list

List shows the to-do, which execution order is important.

Example of using a defined list

1. .....
2. Unscrew the handles (2) securing the crank (1).
3. Insert the crank into a square shaft of the gear and turning the clock clockwise on the direction of the clock.
4. ....

References to pages

Reference to chapter (place in the manual) related thematically

An example of a reference application

📖 *page 9.4*

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1.5 GLOSSARY OF TERMS

agricultural tractor

A motor vehicle designed for use in combination with implements for agricultural, forestry and horticultural work; the agricultural tractor can be also adapted for towing a trailer and for earthwork.

tractor unit

A motor vehicle designed exclusively for towing a trailer; this term refers to semi-trailer truck and ballast tractor.

carrier vehicle

A motor vehicle made in a special way so that it not only pulls tools but also carries them on itself, and can work with implements attached or suspended from the rear or front of the vehicle.

final acceptance

A number of activities related to getting the finished product ready for delivery and actual delivery of the product. The final acceptance includes delivery of documentation, basic training, acceptance for transport and first start of the machine.

bystander

see - unauthorized user

qualified person

A qualified person is a person authorized to perform certain maintenance, repair or adjustment work to the extent specified by the machine manufacturer and has acquired suitable technical training in a specific profession which is confirmed by an appropriate document, completed training conducted by authorized

manufacturer or seller and is able to perceive and counteract hazards.

lorry

A motor vehicle designed for transporting goods; this term also refers to goods and passenger carrier vehicles that are designed for carrying goods and people (from 4 to 9 persons including a driver).

danger zone

A danger zone is an area around the machine where people's health or life is endangered.

three-point linkage

Three-point linkage - a lever system used in agricultural tractors to hitch machines and implements suspended on a hydraulic linkage.

end user

Otherwise referred to as the user, authorized user or operator — a person authorized to operate the machine.

unauthorized user

Also referred to as a bystander — a person who has not been trained and has not been allowed to operate the machine.

PTO

PTO - Power Take-Off Shaft - a shaft transmitting drive from the carrier vehicle (tractor) to the machine being moved. The drive is most often transmitted via a articulated telescopic shaft and is received by the machine via a power take-off shaft (PTO).

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1.6 DIRECTIONS USED IN THIS OPERATOR MANUAL

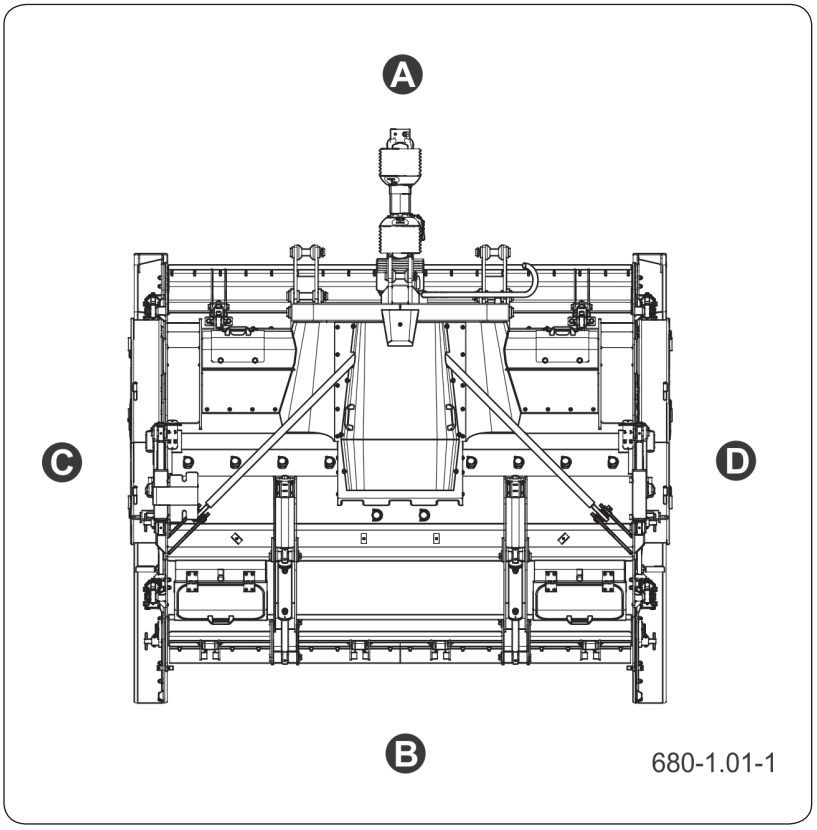

Figure 1.1 Determining directions on the machine (top view)

(A) front *(B) rear* *(C) left side*
(D) right side

Left side – side to the left hand of the operator facing in the direction of machine's forward travel.
Right side – side to the right hand of the operator facing in the direction of machine's forward travel.
Rotation to the right – clockwise rotation of a mechanism (the operator is facing the mechanism).
Rotation to the left – counterclockwise rotation of a mechanism (the operator is facing the mechanism).

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1.7 FINAL ACCEPTANCE

1.7.1 Preliminary information

Final acceptance takes place after the machine is delivered to the customer. Final acceptance includes the following:

- provide the required documents, including the "*Operator Manual*", "*Warranty Book*" and other documents,
- information from the seller about the machine use, risks resulting from using the machine contrary to its intended purpose and about hitching the machine to a tractor and operation.
- inspect the machine upon delivery,
- first start-up of the machine and discussion of the use and operation of the machine.

1.7.2 Inspect the machine upon delivery

The scope of inspection

- Check completeness of the machine according to order:
- Check technical condition of safety guards.
- Check condition of paint coating; check the machine for traces of corrosion.
- Check the machine for damage resulting from wrong transport of the machine to its destination (crushing, piercing, bending or breaking of parts etc.).

1.7.3 First start-up of the machine

Start-up must be preceded by training conducted by the Seller or authorized employees of the Seller.

The scope of operations during the first start-up

- Make sure that the hydraulic and electrical connections on the tractor are compatible with those of the machine.
- Check technical condition of elastic hydraulic lines. Make sure the systems are tight.
- Inspect hydraulic actuators for leaks and tightness.
- Check all lubrication points and regrease if necessary.

If the condition of the machine is satisfactory, proceed to a test run:

- Connect the machine to the tractor's linkage system.
- Connect a properly fitted PTO shaft.
- Connect the hydraulic and electrical lines (optional).
- Raise the machine above the ground surface (approx. 10 cm).
- Check the correct operation of the hydraulic and electrical systems (option).
- Start the PTO and check the operation of the driven system.

If during test run worrying symptoms occur such as:

- noise and abnormal sounds originating from the abrasion of moving elements of the machine design,
- hydraulic or gear oil leaks,
- incorrect hydraulic system operation

or other faults, diagnose the problem. If a fault cannot be rectified or the repair could void the guarantee, please contact the dealer for additional clarifications or to make a repair.

ATTENTION

Training by the seller does not release the user from the obligation to read this Operator Manual and the Operator Manual of PTO shaft attached to the machine and observe all recommendations.

TIP

Adjustment of the PTO shaft applies only to a specific type of tractor. If the machine is connected to a different type of tractor, the adjustment procedure for this type of tractor should be possibly carried out.

ATTENTION

Pipe profiles of the PTO shaft must overlap at least at 1/2 of the length in normal working conditions and at least at 1/3 of the length in all working conditions. When adjusting the PTO shaft, follow the instructions in the operating instructions of the PTO shaft manufacturer.

1.8 PERSONAL PROTECTIVE EQUIPMENT

1.8.1 General

CAUTION

Personal protective equipment should be used in accordance with the recommendations of the security manufacturer.

Follow local regulations regarding personal protective equipment.

The personal protective equipment listed below is a minimum protection for the operator against the effects of unfavourable external factors and is only a recommendation for use.

We recommend carrying out a risk assessment at the machine's workplace and adjusting the personal protective equipment of operator depending on the actual working conditions.

1.8.2 Work clothing

Work clothing should fit the operator's body correctly. The material from which the clothing is made should be characterized by high tear strength. Clothing must not have any protruding elements that may be accidentally caught by the mechanisms of the machine.

1.8.3 Hearing protectors

It is recommended to use of ear muffs for use with a protective industrial helmet for hearing protection. The selection of the damping value should be selected individually depending on the noise level at the location of the machine, which is the result of various sources (e.g. tractor, loader, belt conveyors, etc.).

Remember to properly store and maintain your hearing protectors. Poorly stored and maintained hearing protectors lose their protective properties over time. Periodically replace the soundproofing cushions according to the manufacturer's recommendations.

1.8.4 Work shoes

Work shoes should have the following properties:

- non-slip sole,
- sole material made of a material resistant to oils, gasoline and other organic solvents.
- toe cap resistant to impact with an energy of 200 J,
- insert securing the foot against piercing of the sole.

The above properties correspond to the S3 shoe category according to PN-EN ISO 20345.

1.8.5 Warning vest

The warning (reflective) vest is designed to increase the operator's visibility to other users. Instead of a reflective vest, you may wear work clothes that meet the requirements of EN471. It is recommended that the warning vest (or work clothing) be class 2.

1.8.6 Protective gloves

Protective gloves should be selected depending on the currently performed work.

Strong protective gloves

Strong protective gloves for hand protection are used for protection during heavy work such as cleaning the machine, removing clogs and the like, where there is a risk of damaging the hands. Protective gloves should protect the hands from cuts, scratches,

abrasions, punctures and similar injuries to the skin and against light burns in contact with hot surfaces.

Light protective gloves

For light work (general operation, minor maintenance etc.), we recommend using light protective gloves for work in a dry or slightly oily environment. The working surface of the gloves (internal part should be covered with an impermeable material, e.g. nitrile.

Nitrile gloves

They are designed for light work where there is a risk of skin contact with lubricants, fuel, urea, gear oil and hydraulic oil.

1.8.7 Safety glasses with side shields

Safety glasses to protect the eyes against contact with hazardous substances, splashing liquids or dust and airborne of the machine dust. Safety glasses with side shields increase the level of protection.

1.8.8 Industrial protective helmet

CAUTION

Remember that personal protective equipment should be regularly maintained and used in accordance with the recommendations of the product manufacturer. Following these guidelines will ensure safe use and the best protection.

The industrial safety helmet is designed to protect the head against injuries related to the fall of thrown objects, parts or materials. The design of the helmet should be in accordance with the EN397 standard. During normal machine operation, wearing lightweight industrial helmets will not protect the user from injury and is therefore not recommended.

The protective helmet must fit correctly to the anatomical shape of the skull. There are adjustment straps for this purpose. The helmet has a limited shelf

life., After this date, the material from which it was made loses its properties and does not fulfil the assumed task. The helmet must be replaced.

1.8.9 Anti-dust respirator

Dust can become airborne when operating the machine. It is recommended to use disposable respirators with an exhalation valve to protect the respiratory tract.

The size of the mask should match the operator's face. The mask should fit snugly against the skin. The nasal part should be adjusted using the adjustment plate. Remember that facial hair can make it difficult to seal the face mask.

Minimum half mask recommendations:

- type FFP1, in accordance with EN-149: 2001 + A1: 2009, protection against non-toxic liquid or solid aerosols,
- P1 class.

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1.9 ENVIRONMENTAL RISK

DANGER

Used oil or gathered remains mixed with absorbent material should be stored in a precisely marked container. Do not use food packaging for this purpose.

ATTENTION

Waste oil should only be taken to the appropriate facility dealing with the re-use of this type of waste. Under no circumstances should oils be poured into sewers or water reservoirs.

A hydraulic or gear oil leak constitutes a direct threat to the natural environment owing to its limited biodegradability.

Maintenance and repair work that involves the risk of leakage should be performed in rooms with oil-resistant surfaces. 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 should be collected using sorbents, or by mixing the oil with sand, sawdust or other absorbent materials. The oil pollution, once gathered up, should be kept in a sealed, marked, hydrocarbon resistant container, and then passed on to the appropriate oil waste recycling centre. The container should be kept away from heat sources, flammable materials and food.

Store used oils or oils that are no longer suitable for reuse due to loss of their properties in their original packaging under the same conditions as described above.

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Chapter 2

Basic information

PRONAR SGD 25z

2.1 IDENTIFICATION

2.1.1 Machine identification

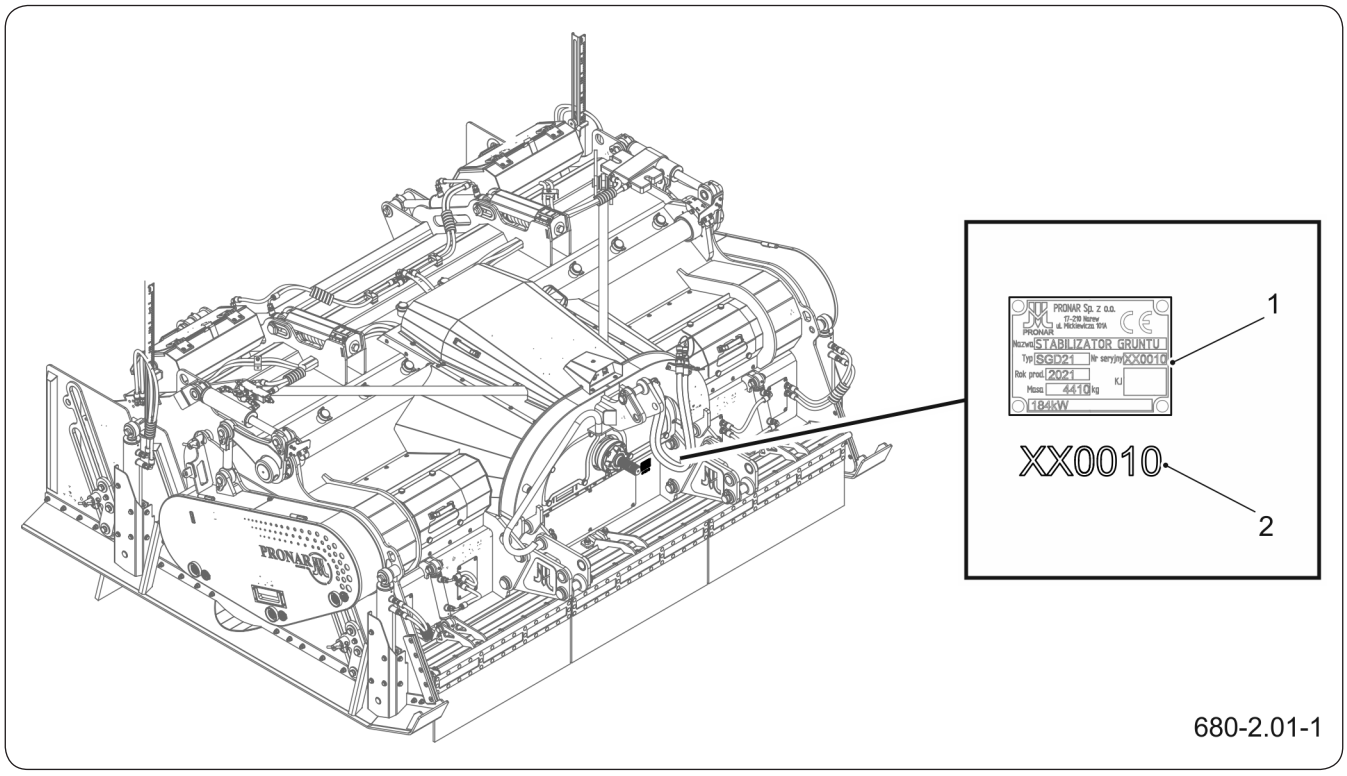

Figure 2.1 Machine identification

(1) nameplate *(2) serial number*

TIP

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

The machine is marked with a nameplate (1) and a serial number (2) located under the plate on the machine frame.

When buying the machine 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 Manual*.

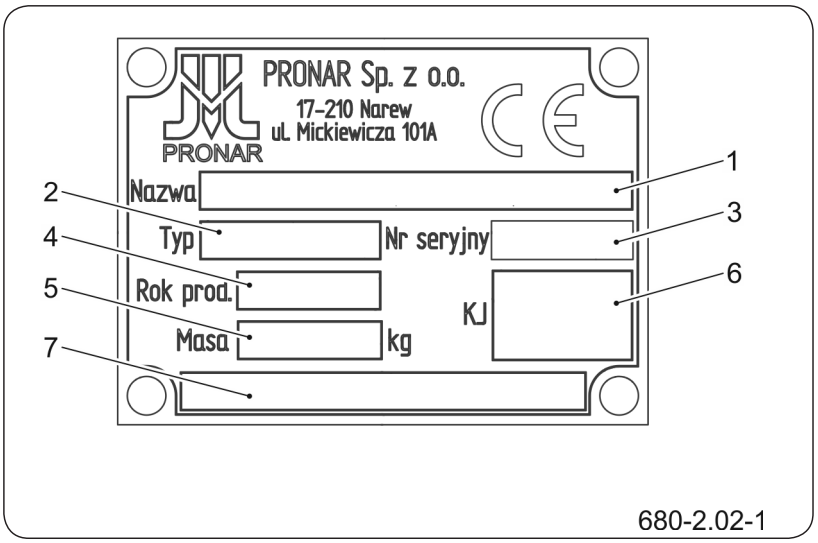

Figure 2.2 Name plate

(1) Machine name
(2) Type/symbol
(3) Serial number
(4) Year of manufacture
(5) Gross weight [kg]
(6) Quality Control Stamp
KJ
(7) additional information

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2.2 INTENDED USE OF THE MACHINE

2.2.1 Intended use

DANGER

The machine must not be used for purposes other than those for which it is intended.

ATTENTION

The machine is intended for use only in temperate climate zones

PRONAR SGD25z soil stabilizer is intended for preparing the soil before its compaction by mixing previously scattered ingredients that increase the stability and cohesion parameters.

During the use of the machine comply with all road traffic regulations and transport regulations in force in the given country, and any breach of these regulations is regarded by the Manufacturer as use contrary to the intended use of the machine.

The soil stabilizer can be aggregated with an agricultural tractor that meets the requirements listed in the table " *Agricultural tractor requirements"*

Using it as intended also involves all actions connected with the safe and proper operation and maintenance of the machine.

Due to the above, the user is obliged to:

- carefully read the *Operator Manual* and comply with its recommendations,
- understand the machine's operating principle and how to operate it safely and correctly,
- comply with general safety regulations while working,
- prevent accidents,
- comply with road traffic regulations.

The machine may only be used by persons, who:

- are familiar with the contents of this publication and with the contents of the agricultural tractor (carrier vehicle) Operator Manual,
- have been trained in machine operation and safe working conditions,
- have the required authorisation to drive the vehicle and are familiar with the road traffic regulations and transport regulations.

2.2.2 Anticipated misuse

The SGD25z soil stabilizer must not be used for purposes other than those for which it is intended, in particular:

- for transporting people and animals,
- transporting any loads,
- processing stones, rubble, stumps, hardened surfaces (asphalt, cobblestones, paving, concrete, and others),
- processing unprepared ground (risk of encountering an invisible obstacle),
- working with open safety guards, covers or without covers,
- working around other people;
- working with an incomplete or damaged working roller.
- working with an unrecommended carrier vehicle and with unrecommended parameters;
- as a hoist,
- working in climatic zones other than the temperate climate zone.

Do NOT allow anyone without qualifications and required skills or anyone who has not been trained in the safe use, health and safety, to operate the machine.

When operating the machine, do NOT:

- stay in the danger zone,
- climb on the machine when it operates,
- make any arbitrary design modifications,
- allow unauthorized and unqualified person to repair and service the machine

INF.2.9-014.01.EN

2.3 REQUIREMENTS FOR AGRICULTURAL TRACTOR

Table 2.1 Requirements for agricultural tractor

Contents	JM	Requirements
Rear power take-off shaft PTO		
Type of shaft	-	type 3 according to ISO 500: 1¾" z=20
Rotation speed	RPM	1000
Rotation direction	-	Clockwise (looking at the shaft front)
Hydraulic system		
The required tractor hydraulic outlets	-	1 power socket 1 free oil drain socket (12.5 ISO 7241-1 Type A)
Hydraulic system pressure rating	bar / MPa	210 / 21
Hydraulic oil	-	L-HL-46 (1)
Electrical system		
Electrical system voltage	V	12
Supply socket	-	3-pin ISO 9680 compliant on rear of carrier
Lighting socket	-	7-pin ISO 1724 compliant on rear of carrier
Tractor linkage		
Type	-	Rear three-point linkage system cat. 3 (cat. 4-option) according to ISO 730-1
Other requirements		
Min. tractor power	kW / HP	180 / 245
Maximum PTO power	kW / HP	294 / 400
Wheel drive (recommended)	-	continuously variable transmission
Beacon light	-	orange light

(1) – use of other oil is permitted on condition that it may be mixed with the oil in the machine.

INF.2.9-010.01.EN

2.4 MACHINE EQUIPMENT

Table 2.2 Equipment (1)

Contents	Standard	Additional	Optional
Operator Manual	●		
Warranty Book	●		
Special tools (short punch, long punch)	●		
Special tools (wrenches size 46 and 70)		●	
Optibelt TT frequency meter	●		
Split flat plate	●		
Split comb plate			●
Rubber scraper			●
Rubber scraper with shock absorption	●		
Working shaft	●		
Working shaft with replaceable mountings			●
PTO shaft P700 PG30 480 K64 24R 420 1 ¾" z=20 on the tractor and machine side	●		
RS22/HD carbide cutters (teeth)	●		
RX22/HDR carbide cutters (teeth)			●
Electrical system, rear road lighting		●	
Cat. 3 balls for the lower connector Cat. 3/3 or Cat. 4/3		●	
Central connector category 4 (without eye)		●	
Central connector eye d=32.3 B50			●
Central connector eye d=37.3 B50			●
Central connector eye d=45.2 B50			●
Central connector eye d=40.5 B60			●
Central connector eye d=45 B60			●

(1) Some standard equipment components, which are listed in the table, may not be present in the delivered machine. This allows the possibility of ordering new machines with a different set of optional equipment, replacing standard equipment.

INF.2.9-011.01.EN

2.5 TRANSPORT

The machine is prepared for sale completely assembled and does not require packing. Packing is only required for the machine's technical documentation and possibly some elements of additional equipment. The machine is delivered to the user either transported on a vehicle or independently, after being attached to a carrier vehicle.

2.5.1 Shipping by road

ATTENTION

Do NOT secure lifting slings or any types of securing elements to hydraulic and electrical system components and fragile elements of the machine (e.g. shields, lines)

When loading and unloading the machine, follow the general health and safety regulations for reloading work. Persons operating reloading equipment must have the qualifications required to operate these machines.

The machine should be attached firmly to the platform of the vehicle using straps or chains fitted with a tightening mechanism. Securing elements should be attached to the transport lugs designed for this purpose (Fig. *Attachment points*) marked with stickers.

Use only certified and technically reliable securing

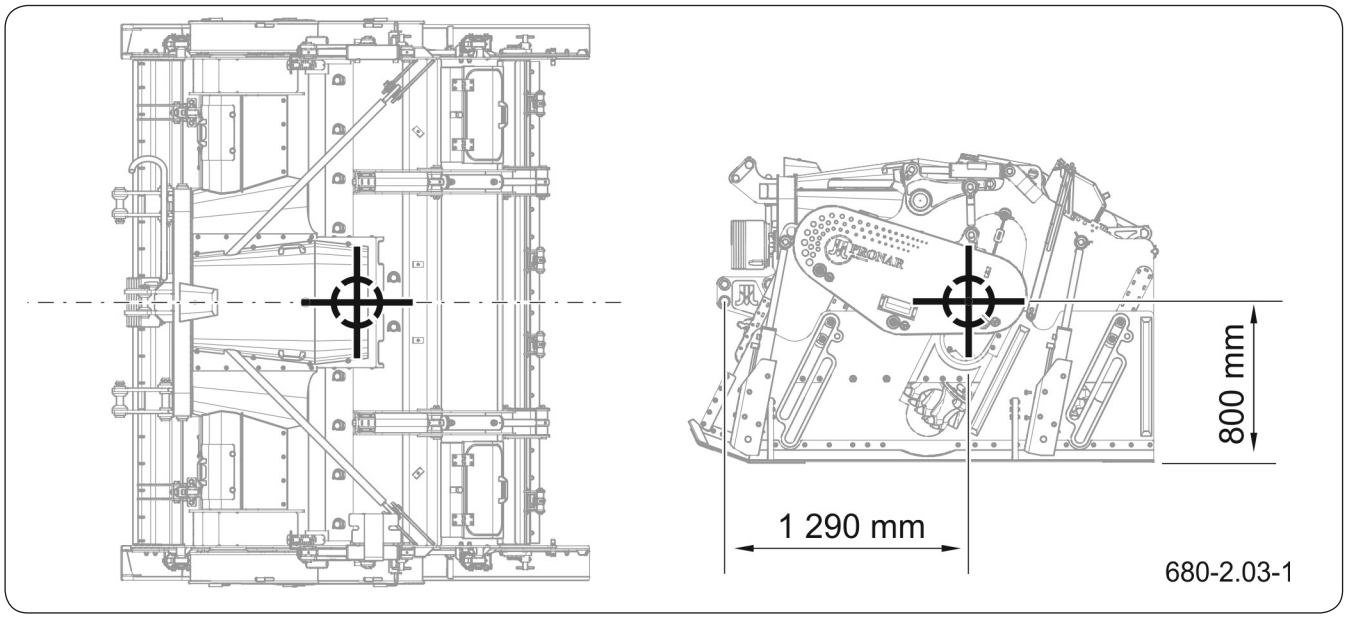


Figure 2.3 Machine's centre of gravity

Depending on the version, centre of gravity varies in the ±75 mm range.

DANGER

When shipped by road on a motor vehicle the machine must be mounted on the vehicle's platform in accordance with the safety requirements and regulations.

Vehicle driver should be especially careful when driving. This is due to the vehicle's centre of gravity shifting upwards when the machine is loaded.

measures. Worn straps, cracked securing catches, bent or corroded hooks as well as elements damaged in a different way may be unsuitable for use. Carefully read the information in the Operator Manual for the given securing measure. The number of securing elements (cables, straps, chains, stays etc.) and the force necessary for their tensioning depend on a number of factors, including weight of the machine, carrying vehicle design, ground speed and other conditions. For this reason it is impossible to define the securing plan precisely.

The securing elements must be selected according to the guidelines of the Manufacturer of these elements. In case of doubt apply a greater number of securing

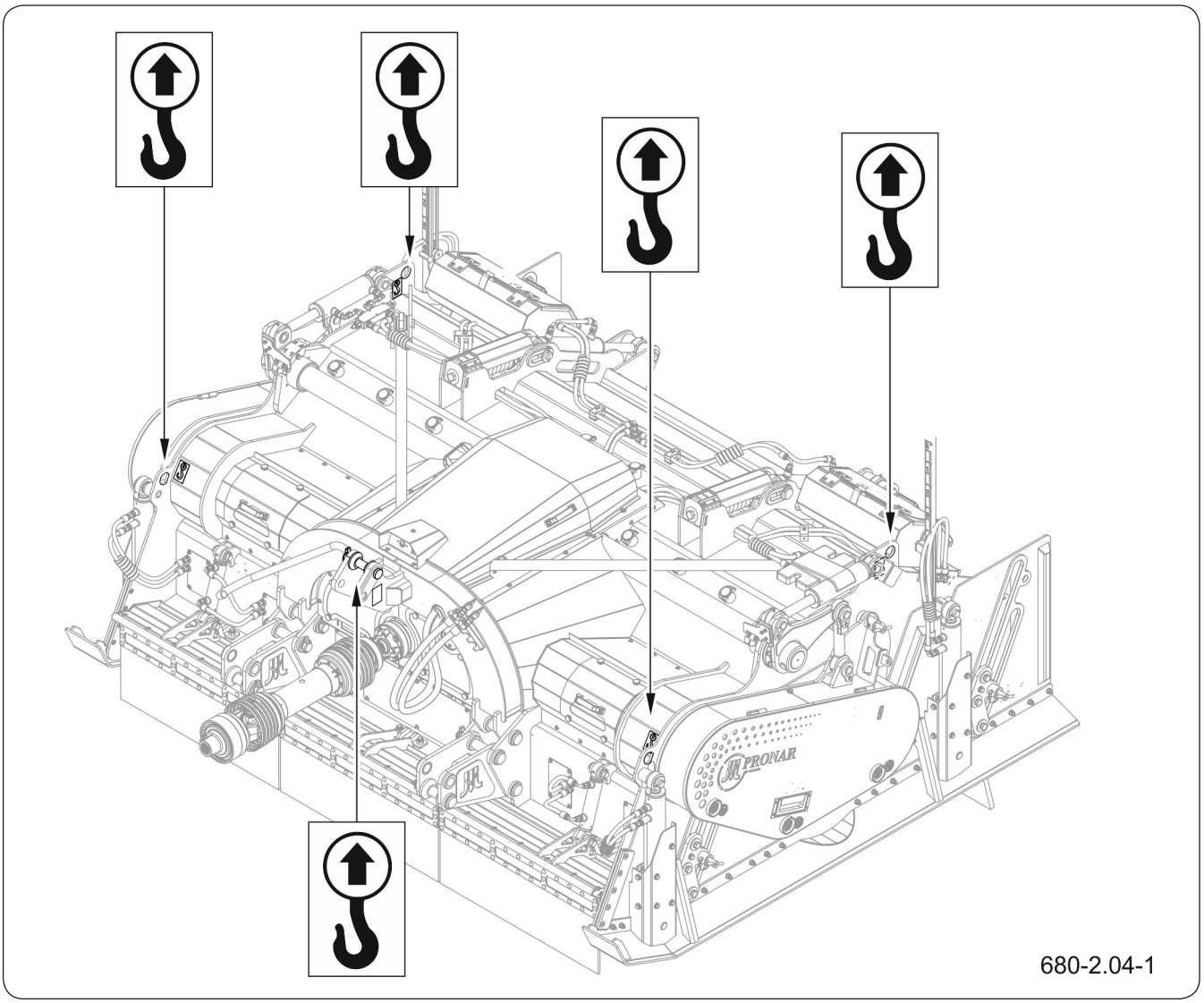


Figure 2.4 Attachment points

DANGER

Use only certified and technically reliable securing measures. Carefully read the information contained in the Operator Manuals for the given securing measures.

Incorrect use of securing measures may cause an accident.

straps in order to secure the load. If necessary, cover the sharp edges of the machine in order to protect the securing elements from tearing or breaking during transport.

During reloading work, take special care not to damage any accessories or paint finish.

During transport, the machine should be supported on the secured side flaps. The front and back flaps should be closed. The working shaft should be raised and secured.

2.5.2 Trailer transported by the user

Transport after connecting to a carrier vehicle can be performed if the machine does not cover the rear lights of the tractor. Otherwise, the machine should be equipped with a lighting system (additional equipment).

In the event of transport by the user, read the User Manual and follow its recommendations. During driving adjust ground speed to the prevailing road conditions, but do not exceed the maximum design speed of 25km/h.

Turn off the PTO drive during driving.

INF.2.9-012.01.EN

ATTENTION

When transporting independently, the user must carefully read this Operator Manual and observe all its instructions.

2.6 TERMS OF WARRANTY

ADVICE

You should require the seller to carefully fill out the Warranty Card and complaint coupons. The lack of e.g. date of sale or point of sale stamp exposes the user to not accept any complaints.

PRONAR Sp. z o.o. in Narew guarantees easy operation of the machine when it is used in accordance with the technical and operational conditions described in the USER MANUAL. Defects revealed during the warranty period will be removed by the Warranty Service. Deadline for completion of repairs is specified in the Warranty Card.

The warranty does not apply to parts and sub-assemblies of the machine, which are subject to wear in normal operating conditions, regardless of the warranty period. The group of these elements includes, among others, the following parts/components:

- Tires
- Spring fingers,
- Bearings.

The warranty services apply only to such cases as: mechanical damage not attributable to the user, factory defects of parts, etc.

In the event that the damage arose as a result of:

- mechanical damage caused by the fault of the user, a road accident,
- from improper operation, adjustment and maintenance, misuse of machine,
- use of a damaged machine,
- performing repairs by unauthorized persons, improper repairs,
- execution of user changes in machine design,

the user loses the warranty.

The user is obliged to immediately report all noticed defects regardless of whether the damage is covered by the warranty or not. Detailed warranty conditions are given in the WARRANTY CARD attached to the newly purchased machine.

Modifications to the machine without the written consent of the Manufacturer are prohibited. In

particular, it is unacceptable to weld, drill, cut and heat the main structural elements of the machine, which directly affect the safety of work with the machine.

INF.2.2-011.01.EN

2.7 ENVIRONMENTAL RISK

DANGER

Do not store oil waste in containers for food.

Store used oil in hydrocarbon--resistant containers.

ATTENTION

Waste oil should only be taken to the appropriate facility dealing with the re-use of this type of waste. Do NOT dispose of or pour oil into sewerage drains or water reservoirs.

A hydraulic oil leak constitutes a direct threat to the natural environment owing to its limited biodegradability. Maintenance and repair work which involves the risk of an oil leak should be performed in the rooms with oil resistant 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 should be collected using sorbents, or by mixing the oil with sand, sawdust or other absorbent materials. The oil contaminations, once gathered up, should be kept in a sealed, marked, hydrocarbon resistant container, and then passed on to the appropriate oil waste recycling centre. The container should be kept away from heat sources, flammable materials and food.

Oil which has been used up or is unsuitable for further use owing to loss of its properties should be stored in its original packaging in the conditions described above. Detailed information on hydraulic oils can be found in the Material Safety Data Sheets.

INF.3.B-007.02.EN

2.8 WITHDRAWAL

DANGER

Before commencing dismantling, reduce residual pressure in hydraulic systems.

DANGER

During dismantling, use appropriate tools and equipment (overhead cranes, elevators, lifts, etc.) and use personal protective equipment, i.e. protective clothing, footwear, gloves, glasses, etc.

Avoid oil contact with skin. Do not allow oil to leak.

In the event of decision by the user to withdraw the machine from use, comply with the regulations on withdrawal from use and recycling of machines withdrawn from use in force in a given country.

Before proceeding with disassembly, reduce the residual pressure in the hydraulic system, completely remove the oil from the system and the gearbox. In the event of replacement of parts, take the worn or damaged elements to a collection point for recyclable materials. Take used oil as well as rubber or plastic elements to plants dealing with the utilization of this type of waste.

INF.2.9-008.01.EN

Table 2.3 Codes of waste generated by dismantling of the machine

Item	Code	Meaning
1	07 02 13	Plastic waste
2	13 01 10	Other hydraulic oils
3	13 02 04*	Mineral engine, gear and lubricating oils containing halogenated organic compounds
4	13 02 06*	Synthetic engine, gear and lubricating oils
5	13 02 08*	Other engine, gear and lubricating oils
6	13 05 02*	Sludges from oil dewatering in separators
7	13 05 08*	A mixture of sand trap waste and oil dewatering in separators
8	15 01 10*	Packaging containing residues of or contaminated by hazardous substances
9	15 02 02*	Sorbents, filter materials and protective clothing contaminated with hazardous substances
10	16 01 03	Worn tires
11	16 01 17	Ferrous metals
12	16 01 22	Other not listed items

Chapter 3

Safety of use

PRONAR SGD 25z

3.1 BASIC SAFETY RULES

CAUTION

If the information contained in the User's Manual is difficult to understand, contact a seller who runs an authorized technical service on behalf of the manufacturer, or contact the manufacturer directly.

- Before using the machine, please read carefully the content of this publication and the „Warranty Card". During operation, follow all recommendations.
- The user manual should be available to the operator for all the time. Protect the manual from damage.
- If the information contained in the User's Manual is difficult to understand, contact a seller who runs an authorized technical service on behalf of the manufacturer, or contact the manufacturer directly.
- If you ignore the recommendations contained in these document, you create a threat to the health and life of bystanders and/or the machine operator.
- Use and operate the machine carefully! By a careless work, you create a threat to the health and life of bystanders and/or the machine operator.
- You are obliged to familiarize yourself with the construction, operation principles and safe operation of the machine.
- Familiarize yourself with all machine controls before starting work.
- Do not use the machine without knowing its function.
- There is a residual risk of threats, therefore the basic principle of using the machine should be the application of the principles of safe use and sensible behaviour. Remember that your safety is the most important thing.
- It is forbidden to use the machine by persons who are not authorized to drive carriers, including children, people under the influence

CAUTION

The machine may only be used and operated by persons qualified to drive agricultural tractors (carriers).

of alcohol, drugs or other intoxicating substances, etc.

- The machine may not be used for purposes other than those for which it was intended. Everyone who uses the machine in a manner contrary to its intended use, thus takes full responsibility for all consequences arising from its use.
- Use of the machine for purposes other than envisaged by the Manufacturer is inconsistent with the intended use and may void the warranty.
- The machine may only be used when all safety elements (e.g. covers, pins, cotter pins, warning labels) are technically sound and placed in the right place. If the safety elements are damaged or lost, replace them with new ones.

BHP.2.9-001.01.EN

3.2 SAFETY WHEN HITCHING THE MACHINE

DANGER

Be especially careful when hitching the machine.

- Do not connect the machine to a tractor if it does not meet the requirements set by the Manufacturer (minimum tractor power requirement, inappropriate connections, etc.) - see section *"Agricultural tractor requirements".*
- Before hitching the machine, make certain that oil in the external hydraulic system of tractor may be mixed with the hydraulic oil in the machine's hydraulic system.
- Before hitching the machine check that both machines are in good technical condition.
- Carefully read the tractor Operator Manual.
- Use only genuine pins and safeguards to hitch the machine to the carrier vehicle.
- After completion of hitching the machine, check the safeguards.
- Be especially careful when hitching the machine.
- When hitching, there must be nobody between the machine and the tractor.
- You can only couple and uncouple the machine when the carrier vehicle is stationary.
- Before disconnecting the machine from the tractor, lower and lock the side guards in the lower position. Lift the working shaft and lock it in the upper position.
- Machine unhitched from the carrier vehicle must be placed on level, sufficiently hard surface in such a manner as to ensure that it is possible to connect it again.

BHP.2.9-011.01.EN

3.3 SAFETY DURING TRANSPORT TRAVEL

ATTENTION

When driving on public roads, the machine should be equipped with clearance lamps.

ATTENTION

Do not exceed the maximum speed resulting from road conditions and design restrictions (maximum of 25 km/h).

DANGER

Do NOT ride on the machine or transport any materials on it.

Before driving on the roads:

1. Make sure that the machine is correctly attached to the carrier vehicle.
2. While driving on public roads the machine and the carrier vehicle must be fitted with a certified or authorised reflective warning triangle.
3. Check whether lights work correctly.

Also:

- When driving on public roads, observe all road traffic regulations in force in the country, in which the machine is used.
- Adjust your speed to the road conditions.
- Before using the machine always check its technical condition, especially in terms of safety. In particular, check the technical condition of the mounting elements for the coupling system, as well as the connecting elements of the hydraulic and electrical systems.
- When driving the machine on uneven terrain, exercise particular caution and reduce the travel speed as the carrier and the machine may become damaged or overturned.
- Reckless driving and excessive speed may cause accidents.
- When driving with raised machine, the carrier vehicle's linkage should be locked in the up position to prevent accidental lowering.
- Do NOT leave machine raised and unsecured while the carrier vehicle is parked. Lower the machine when parked.

BHP.2.6-010.02.EN

3.4 SAFETY RULES WHEN OPERATING THE HYDRAULIC SYSTEM

DANGER

The hydraulic system of the machine is under high pressure during operation.

- Regularly check the technical condition of connections and hydraulic lines.
- Machine operation with a leaking system is forbidden.
- In the event of failure of the hydraulic system, the machine must be decommissioned until the failure is remedied.
- When connecting the hydraulic conduits to the carrier, make sure that the tractor and machine hydraulic systems are not under pressure. If necessary, reduce the residual pressure of the installation (see chapter "*Hydraulic installation operation*").
- Use hydraulic oil recommended by the manufacturer.
- After changing the hydraulic oil, the used oil must be disposed of. Used oil or oil which has lost its properties should be stored in original containers or replacement packaging resistant to hydrocarbons. Replacement containers must be accurately described and properly stored.
- It is forbidden to store oil in packaging intended for food storage.
- Rubber hydraulic hoses should be replaced every 4 years regardless of their technical condition.

Procedure in the event of an accident

- In the event of injuries being caused by pressurized hydraulic oil, contact a doctor immediately. Hydraulic oil can penetrate the skin and cause infection.
- If the oil gets into the eyes, rinse with plenty of water and if irritation occurs, contact a doctor.

- In the event of contact of oil with skin wash the area of contact with water and soap. Do not use organic solvents (petrol, kerosene).

BHP.2.9-003.01.EN

3.5 MAINTENANCE AND CLEANING

- During the warranty period, any repairs may only be carried out by a manufacturer-authorised warranty service. It is recommended that any repairs are carried out by specialised workshops.
- When you find any malfunctions or damage to the machine, stop using it until it is repaired.
- Use appropriate, fitted protective clothing, gloves and the right tools when working. Wear oil-resistant gloves and safety goggles when working on the hydraulic system.
- Any modifications to the machine will relieve PRONAR Narew of any responsibility for damage or injury caused.
- Before any work is undertaken on the machine, switch off the engine of the carrier (tractor) and wait for all rotating parts to stop.
- Regularly check the technical condition of the safety devices and the correct tightness of the screw connections.
- Carry out regular maintenance on the machine in accordance with the scope specified by the manufacturer.
- Reduce the residual oil pressure completely before carrying out repair work on the hydraulic system.
- Carry out repair, maintenance and cleaning work with the carrier engine switched off and the ignition key removed from the ignition. Secure the carrier with the parking brake. Secure the tractor cab against unauthorised access.
- If individual components need to be replaced, only use parts recommended by the manufacturer. If you do not comply with these

requirements you may endanger the health or life of bystanders or operators, contribute to damage to the machine. This constitutes grounds for revocation of the guarantee.

- Check the condition of protective elements, their technical condition and correct fastening.
- In the event of work requiring the machine to be raised, use properly certified hydraulic or mechanical lifts for this purpose. After lifting the machine, stable and durable supports must also be used. You may not carry out any work underneath the machine, raised only by means of a lift (without supports).
- Do not support the machine with brittle elements (bricks, hollow blocks, concrete blocks).
- After completing work associated with lubrication, remove excess grease or oil. Keep the machine clean.
- You may not carry out repairs to plumbing components yourself. If these components are damaged, have them repaired by an authorised repairer.
- To reduce the risk of fire, keep the machine clean.
- Clean the machine as required.
- Before using the pressure washer, familiarise yourself with the principle of operation and the recommendations for safe operation of this equipment.
- Use only clean running water for cleaning. It is possible to use pH-neutral cleaning detergents that do not have an aggressive effect on the structural components of the machine.
- The use of pressure washers increases the effectiveness of cleaning, but be careful when working. When cleaning, do not approach the nozzle of the cleaning unit at a distance of less

DANGER

Refer to the instructions for using cleaning detergents and preservatives.

When washing with detergents, wear suitable protective clothing and eye protection.

CAUTION

Strong water jet pressure can cause mechanical damage or corrosion to the machine.

than 50 cm from the surface to be cleaned.

- The water temperature should not exceed 55 ^{0}C.
- Do not point the water jet directly at system components and equipment, i.e. control valves, bearings, electrical and hydraulic plugs, lights, electrical connections, information and warning labels, rating plate, cable connections, lubrication points, etc. High water jet pressure can cause water penetration and consequent mechanical damage or corrosion.
- Do not use organic solvents, preparations of unknown origin or other substances which may cause damage to painted, rubber or plastic surfaces. It is recommended to make a test on an invisible surface in case of doubt.
- Surfaces oily or greasy by grease should be cleaned with petrol or degreasing agents, and then washed with clean water and detergent. Follow the cleaning agent manufacturer's instructions.
- Store detergents for washing in their original containers, or alternatively in substitute containers, but very carefully labelled. Detergents must not be stored in food or drink storage containers or unlabelled containers.
- Observe the rules of environmental protection, wash the machine in designated areas.
- Washing and drying of the axle must take place at an ambient temperature above 0°C.
- Every time you wash the machine, carry out lubrication.
- Perform maintenance and repair activities applying the general principles of health and safety at work.

Accident management

- In case of injury, wash and disinfect the wound immediately.
- In case of serious injuries consult a physician.

BHP.2.9-005.01.EN

3.6 SAFETY DURING MACHINE OPERATION

DANGER

The machine can throw objects at considerable distances during operation. Stop the machine when bystanders enter the work area.

- Before starting the machine make sure that there are no bystanders (especially children) or animals in the danger zone.
- The machine operator is obliged to ensure proper visibility of the machine and the working area.
- Each time the machine is used, always ensure that all the safety guards are in good condition and in place. Damaged or incomplete sub-assemblies must be exchanged for original new ones.
- Select appropriate settings and parameters when operating the machine.
- Before starting the tractor with the connected machine make sure the PTO drive is not engaged, otherwise it can lead to uncontrolled operation of the machine.
- During machine operation do not occupy a different position than that of the operator in the tractor cab. Do NOT leave the cab, when the machine is in operation.
- DO NOT enter the work area of the machine elements.
- There must be no bystanders within the machine discharge zone.
- No one is allowed between the carrier vehicle and the machine during operation.
- Do not approach the machine until the rotating parts come to a complete standstill.

BHP.2.9-012.01.EN

3.7 SAFE OPERATION OF THE PTO SHAFT

CAUTION

Before starting work, read the operator's manual of the shaft provided by the shaft manufacturer.

- Before starting work, read the operator's manual of the PTO provided by the shaft's manufacturer and follow the recommendations contained therein.
- If necessary, adjust the length of the shaft to the cooperating tractor in accordance with the shaft's instruction manual.
- The machine may only be connected to the tractor with the use of a properly selected articulated telescopic shaft recommended by the Manufacturer.
- The drive shaft must be equipped with guards. It is forbidden to use the shaft with damaged or missing safety elements.
- Some parts of the PTO shaft (especially the clutch) can become very hot. Do not touch hot parts.
- After installing the shaft, make sure that it is correctly and securely connected to the tractor and the machine.
- Do not wear loose clothing, loose belts or anything that could get caught in a rotating shaft. Contact with the rotating articulated telescopic shaft may cause serious injuries.
- Before disconnecting the shaft, turn off the tractor engine and remove the key from the ignition switch. Secure the tractor with the parking brake.
- When working in conditions of limited visibility, use the tractor's working lights to illuminate the articulated telescopic shaft and its surroundings.
- During transport, the shaft should be stored in a horizontal position so as to avoid damaging the guards and other securing elements.

DANGER

Before disconnecting of the shaft, you should:

- turn off the PTO drive,
- turn off the engine of the carrying vehicle (tractor)
- remove the ignition key.

- During the use of the shaft and the machine, do not use a different speed of PTO than the permissible one. Do not overload the shaft and the machine, do not engage the clutch suddenly. Before starting the articulated telescopic shaft, make sure that the PTO rotation direction is correct.
- Do not go over or under the shaft and do not stand on it, both during operation and when the machine is stopped.
- The articulated telescopic shaft has markings on the casing, indicating which end of the shaft should be connected to the tractor.
- Never use a damaged PTO shaft, it may cause an accident. Repair the damaged shaft or replace it with a new one.
- Do not use PTO shaft extensions / adapters.
- Disconnect the drive of the shaft each time when there is no need to drive the machine, or when the tractor and the machine are in an unfavourable angular position to each other.
- Prevent the shaft cover securing chain from turning while the shaft is working, and attach it to a fixed structural element of the machine.
- Do not use protective chains to support the shaft during a stop or transport of the machine, use a bracket on the machine's frame.

BHP.2.9-007.01.EN

3.8 RESIDUAL RISK

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

- using the machine contrary to its intended purpose,
- being between the carrier (tractor) and the machine while the engine is running,
- being on the machine while the engine is running,
- operating the machine with removed or faulty safety guards,
- failure to maintain a safe distance from the danger zone or being within the zones while the machine is operating,
- operation of the machine by unauthorized persons or persons under the influence of alcohol or psychoactive substances,
- cleaning, maintenance and technical checks when carrier vehicle (tractor) is connected and engine is running.
- making modifications to the machine without the consent of the Manufacturer,
- presence of persons, animals or obstacles in areas invisible from the operator's position.
- danger of winding long elements (ropes),
- encountering an invisible obstacle,
- failure to comply with the required work parameters.

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

- operate the machine in prudent and unhurried manner,
- reasonably apply all the remarks and

recommendations stated in the Operator Manual,

- carry out repairs and maintenance work in line with operating safety rules,
- repair and maintenance work should be carried out by persons trained to do so,
- using suitable protective clothing,
- ensure unauthorised persons have no access to the machine, especially children,
- maintain a safe distance from prohibited or dangerous places
- do not climb on the machine when it is operating or transported
- reducing travel speed when working in areas where there may be hidden obstacles.

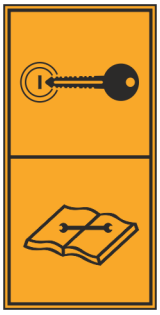
BHP.2.9-013.01.EN

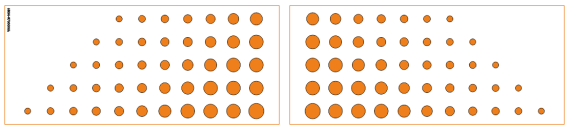
3.9 INFORMATION AND WARNING DECALS

The machine is labelled with the information and warning decals mentioned in table 3.1. Throughout the machine use, you must ensure that any warning messages and information decals located on the machine are clear and legible. If any are destroyed or damaged, they must be replaced with new. New assemblies, changed during repair, must be labelled once again with the appropriate safety signs. During machine cleaning do not use solvents, which may damage the coating of information decals and do not subject them to strong water jets.

Tabela 3.1 Information and warning decals

Item	Decal	Meaning
1		Thrown out objects endanger the whole body. Keep a safe distance. **12N-15000008**
2		Transport belts or chains fastening points **35N-27000009**
3		Before starting work, carefully read the Operator Manual. **70N-00000004**

Item	Decal	Meaning
4		Before maintenance or repairs, turn off the tractor unit's engine and remove keys from ignition. **70N-00000005**
5		Pulling the whole body - Drive train **78N-00000005**
6		Do not reach into crushing space if elements may move. Danger of crushing hands or fingers. **35N-27000008**
7		Caution! Belt transmission. Exercise extra caution. Danger of hand injuries. **206N-00000004**
8		Direction and PTO RPM **153N-00000009**
9		Machine model. Side marking **680N-97000002**
10		Machine model. Rear marking **680N-97000001**

Item	Decal	Meaning
11		Rear marking **680N-97000003, 680N-97000004**
12		Manufacturer's name and logo **680N-97000006**
13		Manufacturer's logo **680N-97000003**
14		Hearing protection recommended **130N-36000011**
15		Attention, danger zone **421N-97000018**
16		Danger. Rotating elements **655N-96000002**

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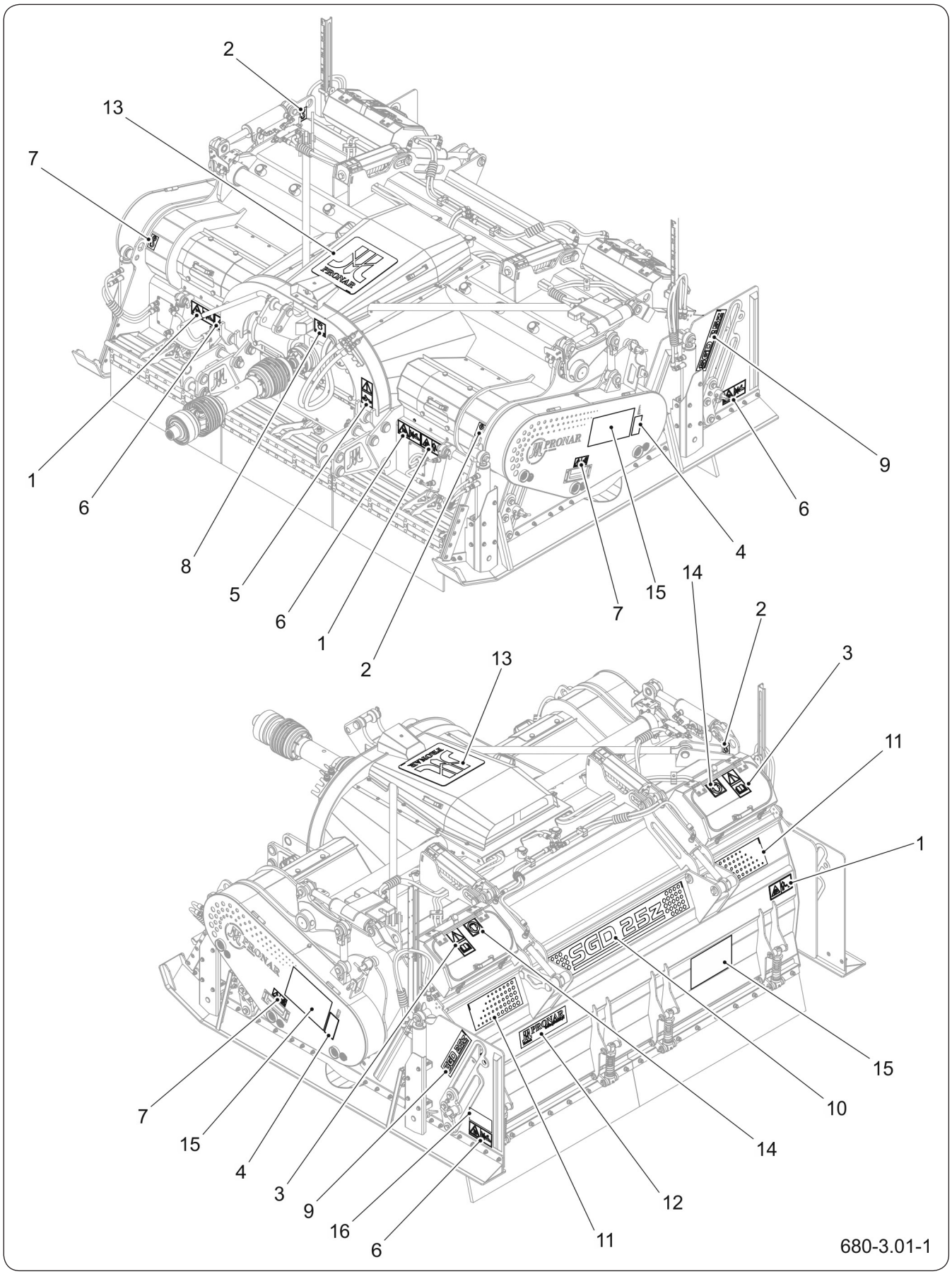

Rysunek 3.1 Locations of information and warning decals

Chapter 4

Design and operation

PRONAR SGD 25z

4.1 TECHNICAL SPECIFICATION

Contents	J.M.	SGD 25z
Technical specification		
Working width	mm	2500
Maximum working depth	mm	600
Speed of the working roller	rpm	210
Working shaft diameter	mm	1200
Method of attachment to carrier vehicle	-	Rear three-point linkage system cat. 3 (cat. 4-option) according to ISO 730-1
Power take-off shaft	-	type 3 according to ISO 500: 1,000 RPM
Working speed	km/h	0.1 - 2 (depending on working conditions)
Transport speed	km/h	25 (maximum)
Weight (basic version)	kg	5200
Dimensions		
Width	mm	2930
Length	mm	2520
Height	mm	1906
Transport height	mm	1520
Other information		
Operation	-	single person operation
Noise emission level	dB	

BIZ.2.9-006.01.EN

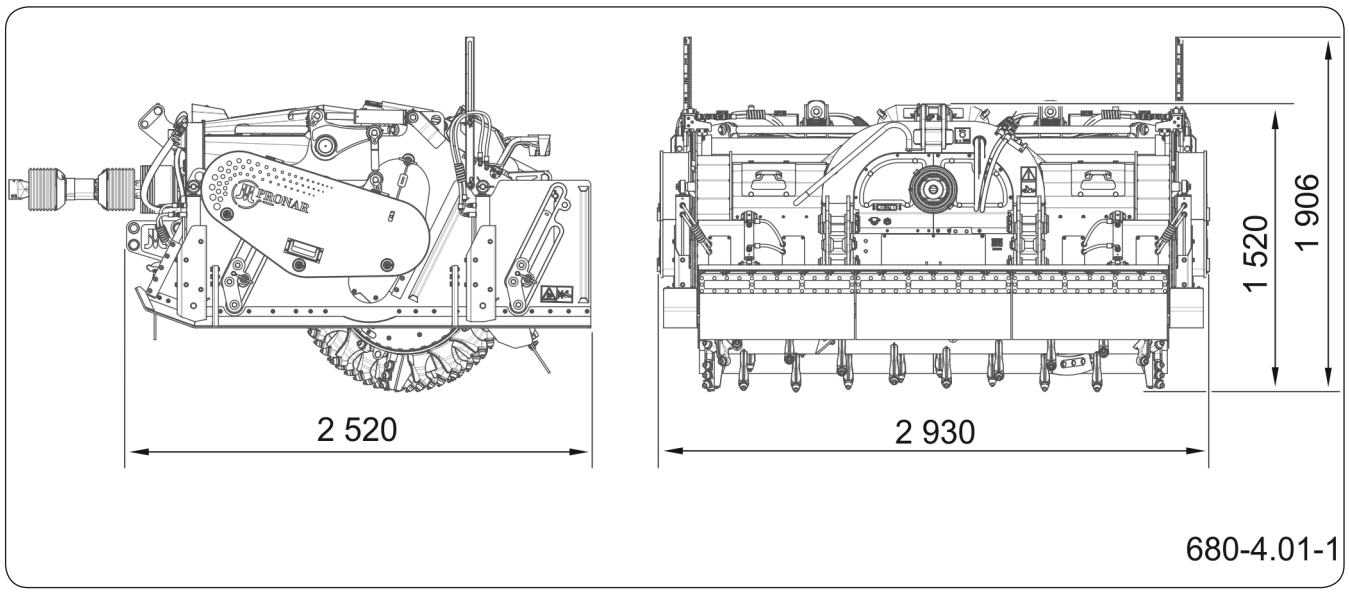

Figure 4.1 Hydraulic system design

Dimensions on the drawing are given in millimetres [mm].

ATTENTION

Some technical parameters may vary depending on additional equipment of the machine.

4.2 GENERAL DESIGN

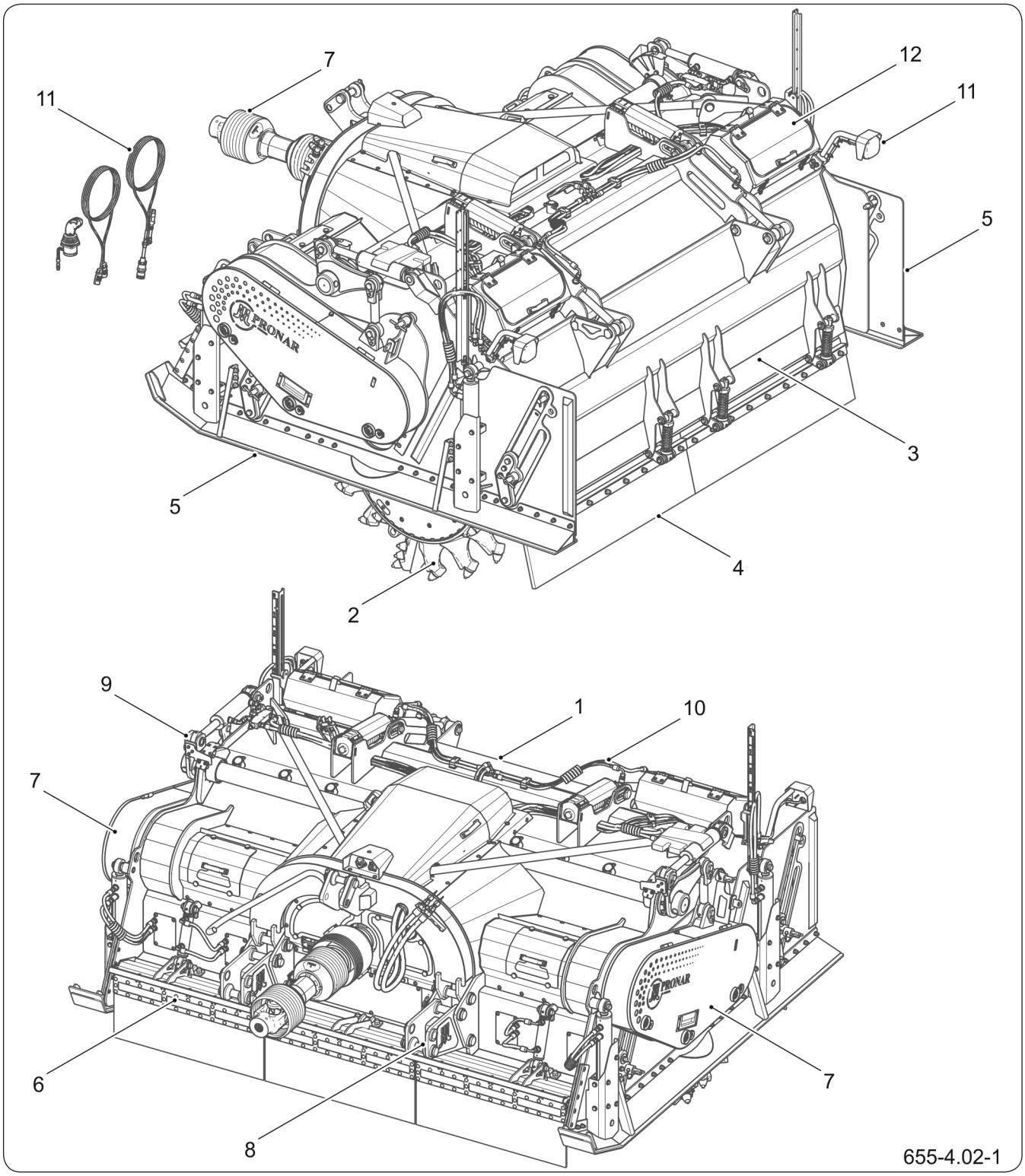

Figure 4.2 General design SGD 25z

(1) working chamber *(2) working roller* *(3) tailgate*
(4) scraper *(5) side flaps* *(6) front flaps*
(7) drive transmission *(8) three-point linkage* *(9) shaft lifting assembly*
(10) hydraulic system *(11) electrical system* *(12) toolbox*

BIZ.2.9-007.01.EN

4.3 DRIVE TRANSMISSION.

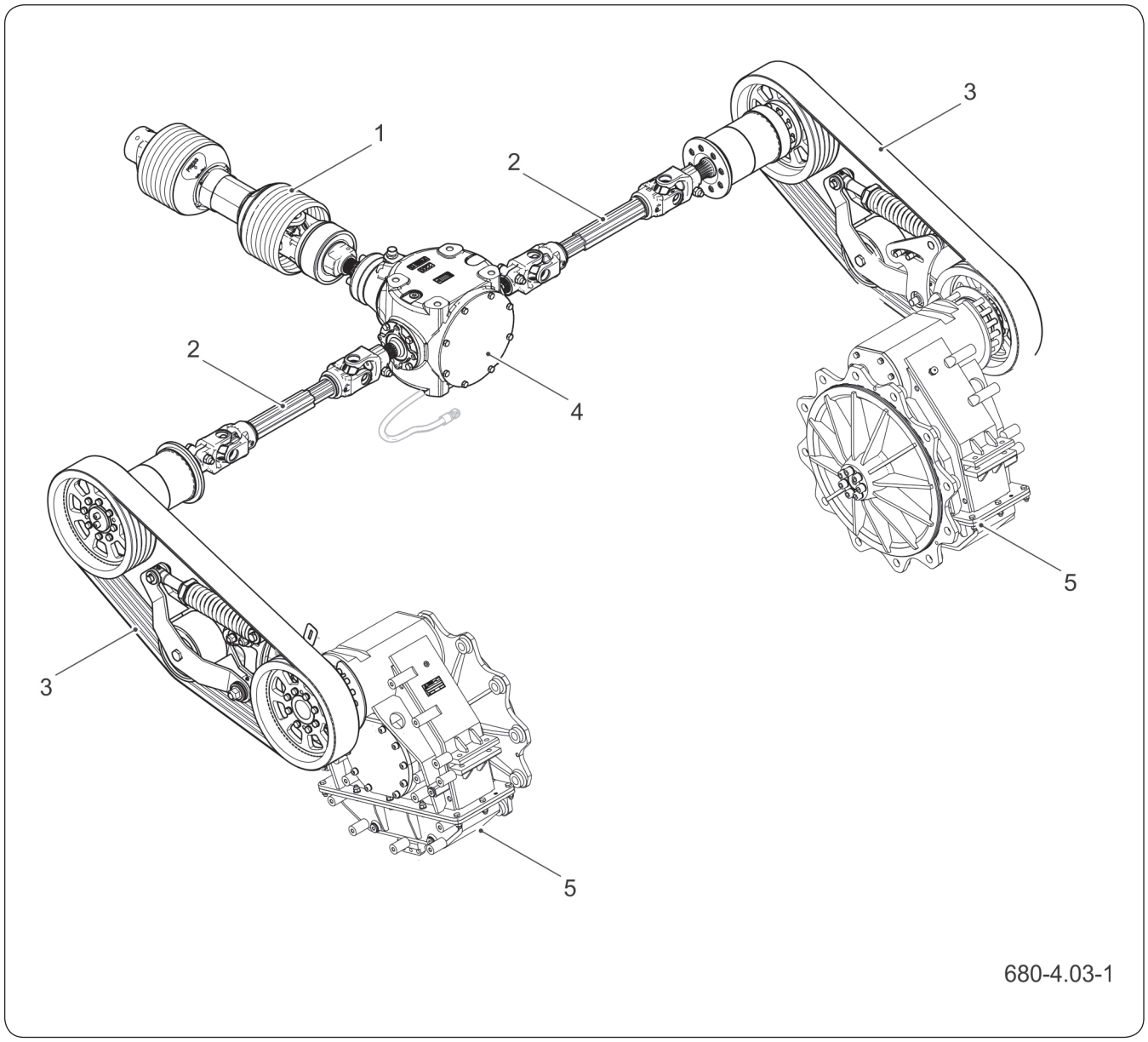

Figure 4.3 Design of drive transmission system

(1) drive telescopic articulated shaft *(2) side telescopic articulated shaft*
(3) gearing shaft *(4) central bevel gear* *(5) gearing shaft*

BIZ.2.9-008.01.EN

4.4 HYDRAULIC SYSTEM

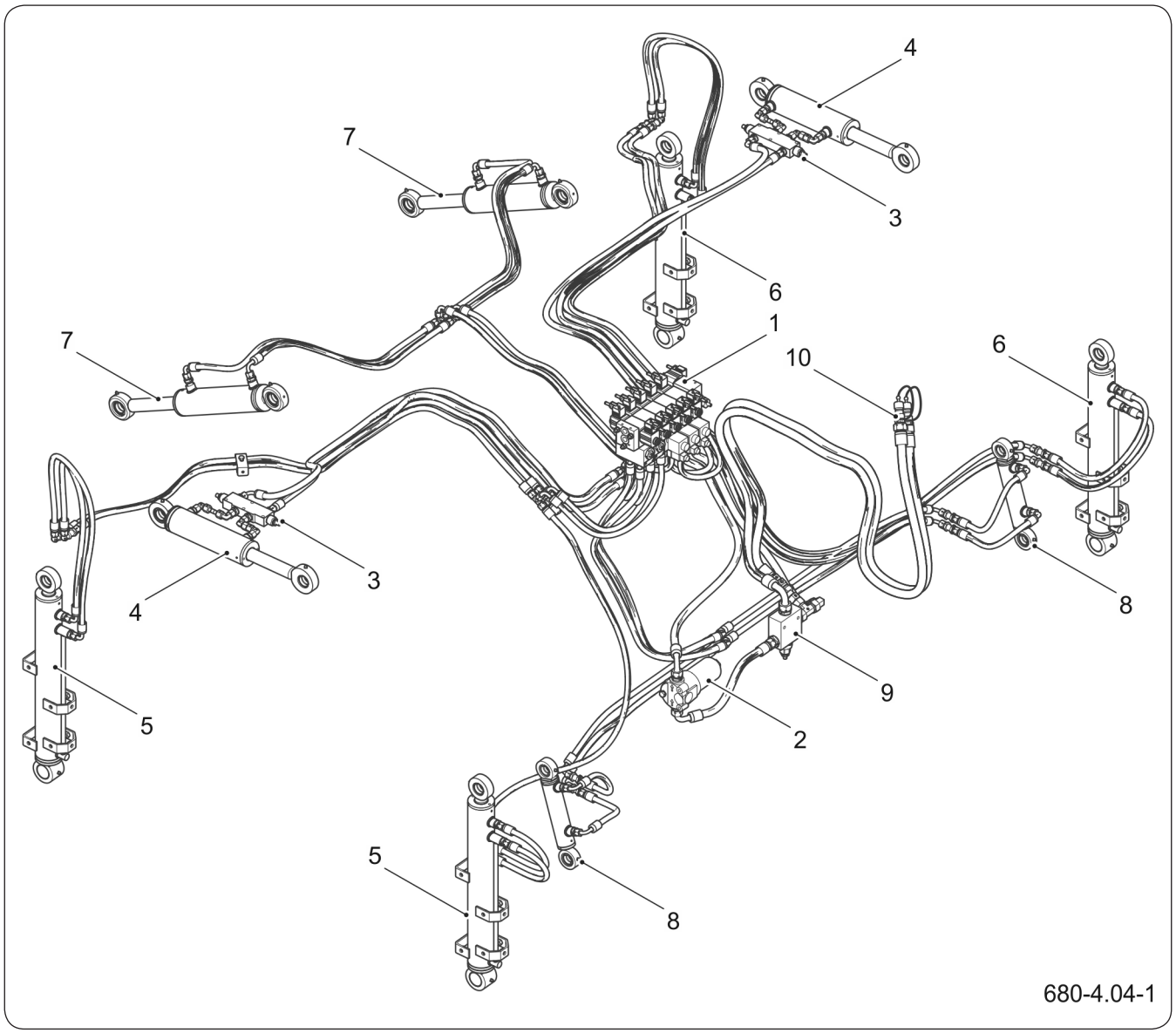

Figure 4.4 Hydraulic system design

(1) distributor *(2) oil filter* *(3) overload valve* *(4) shaft lifting actuator*
(5) left side flap lifting actuator *(6) right side flap lifting actuator*
(7) tailgate actuator *(8) front flap actuator*
(9) flow regulator *(10) hydraulic quick coupler*

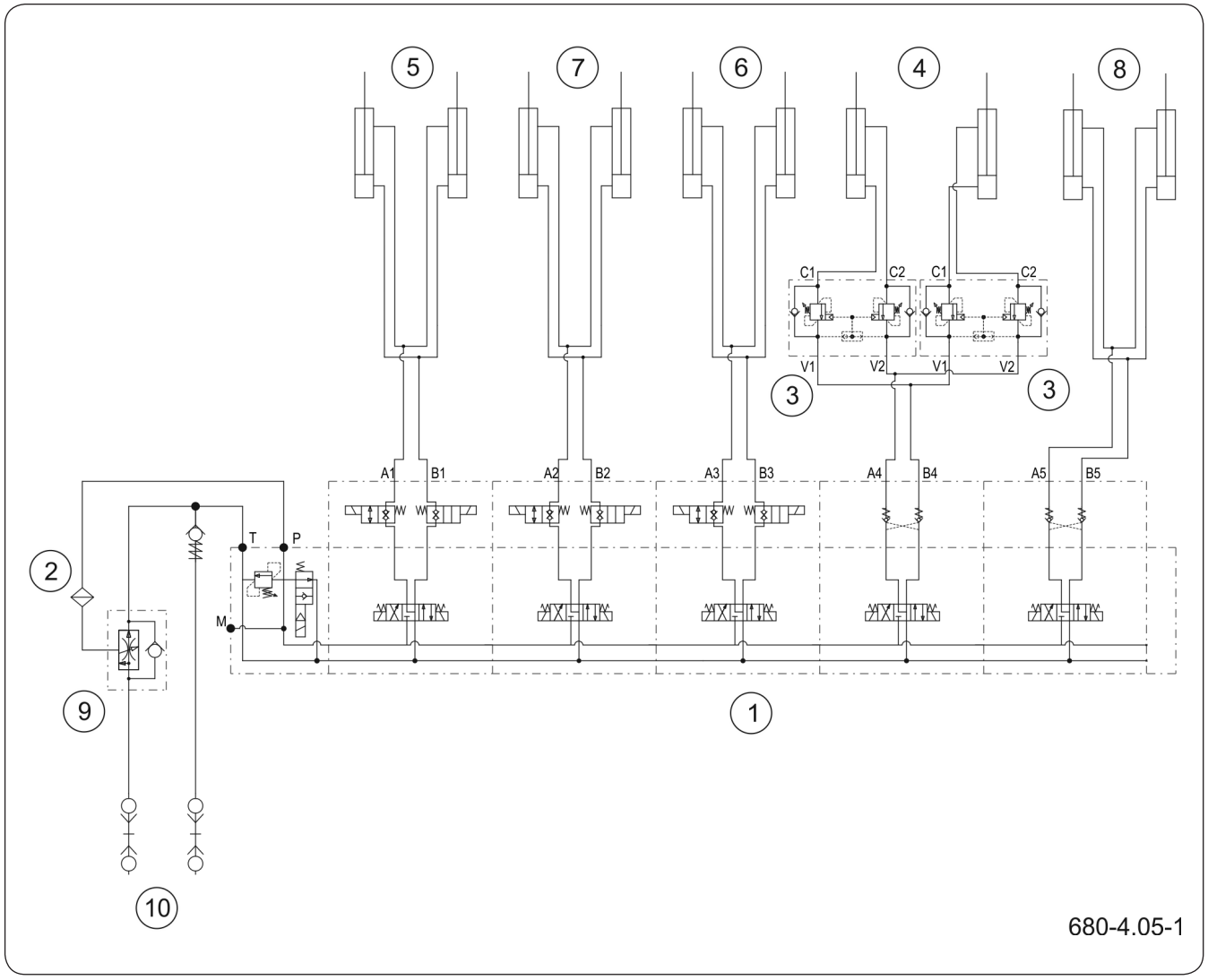

Figure 4.5 Hydraulic system diagram

(1) distributor *(2) oil filter* *(3) overload valve* *(4) shaft lifting actuator*
(5) left side flap lifting actuator *(6) right side flap lifting actuator*
(7) tailgate actuator *(8) front flap actuator* *(9) flow regulator*
(10) hydraulic quick coupler

BIZ.2.9-009.01.EN

4.5 ELECTRICAL SYSTEM

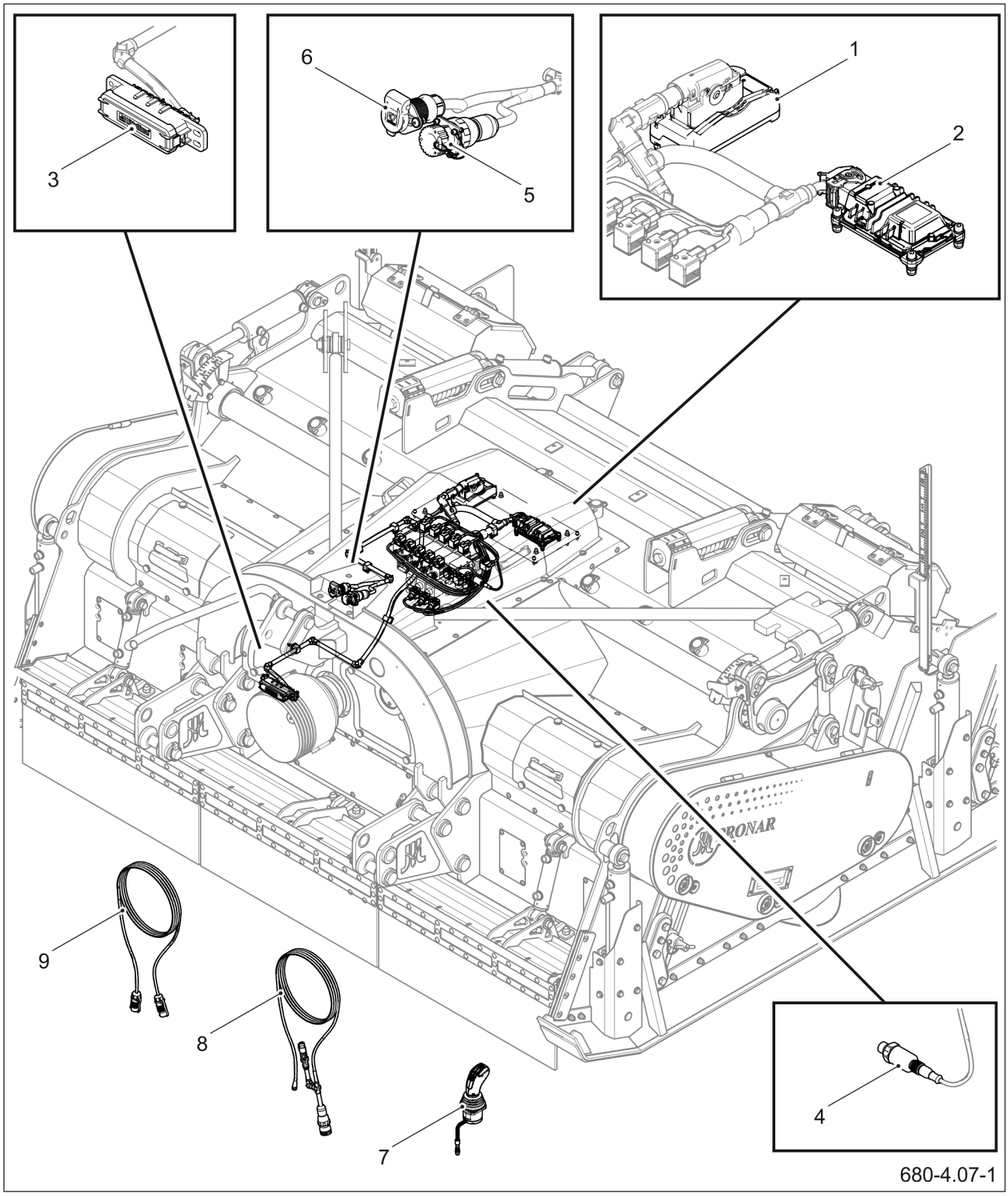

Figure 4.6 Design of the electrical control system

(1) controller *(2) extension module* *(3) fuse housing*

(4) oil pressure sensor 3-pin power cable *(5) control socket*

(6) 3-pin socket *(7) multi-function control lever, so-called joystick*

(8) control cable (9) power cable

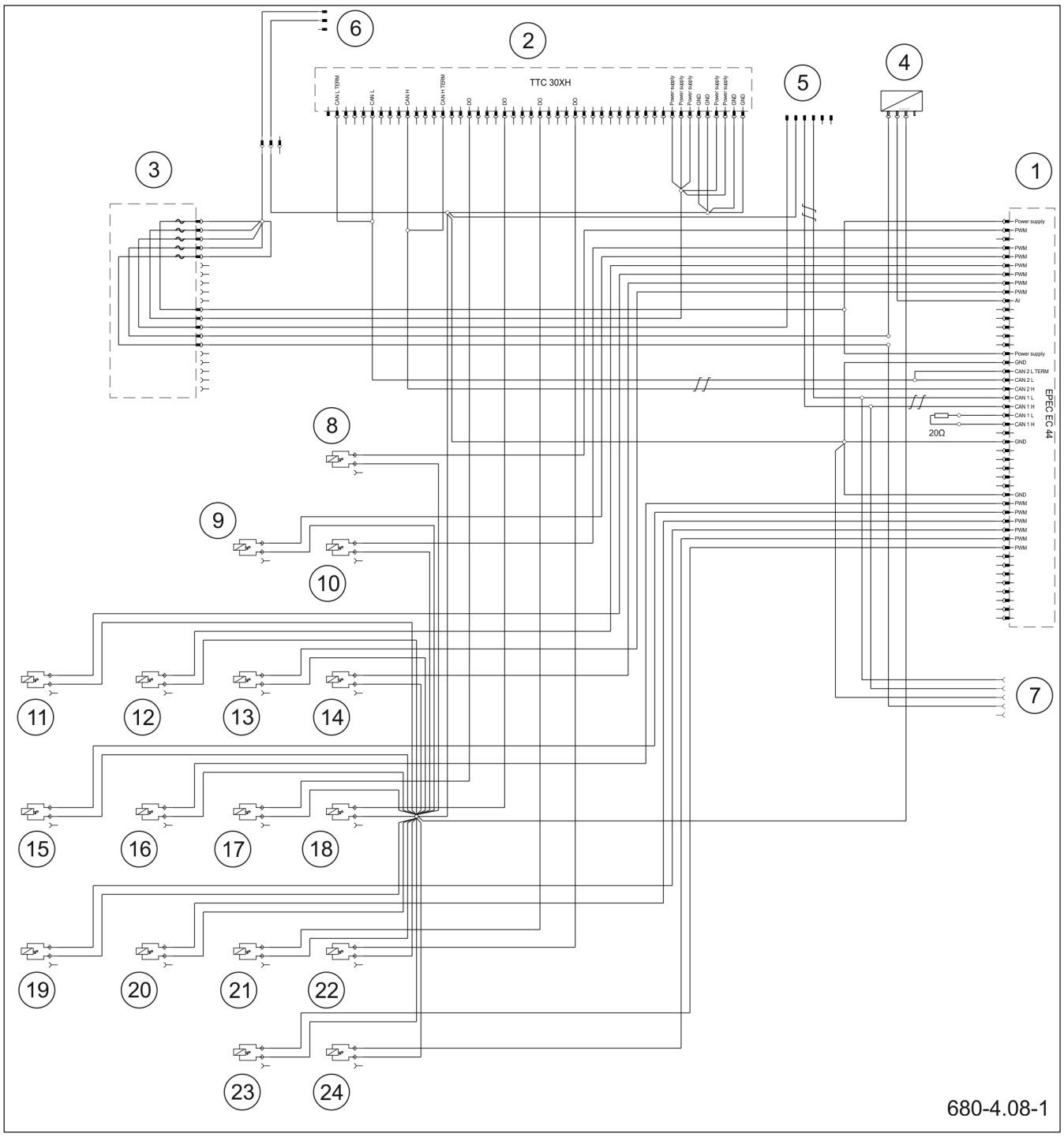

Figure 4.7 Control electrical system diagram

(1) controller *(2) extension module* *(3) fuse housing*
(4) oil pressure sensor *(5) control socket* *(6) 3-pin power socket*
(7) diagnostic socket *(8) unloading valve* *(9) shaft lowering*
(10) shaft raising *(11) rear flap bypass 2* *(12) rear flap bypass 1*
(13) rear flap raising *(14) rear flap lowering* *(15) right flap bypass 2*
(16) right flap bypass 1 *(17) right flap raising* *(18) right flap lowering*
(19) left flap bypass 2 *(20) left flap bypass 1* *(21) left flap raising*
(22) left flap lowering *(23) front flap raising* *(24) front flap lowering*

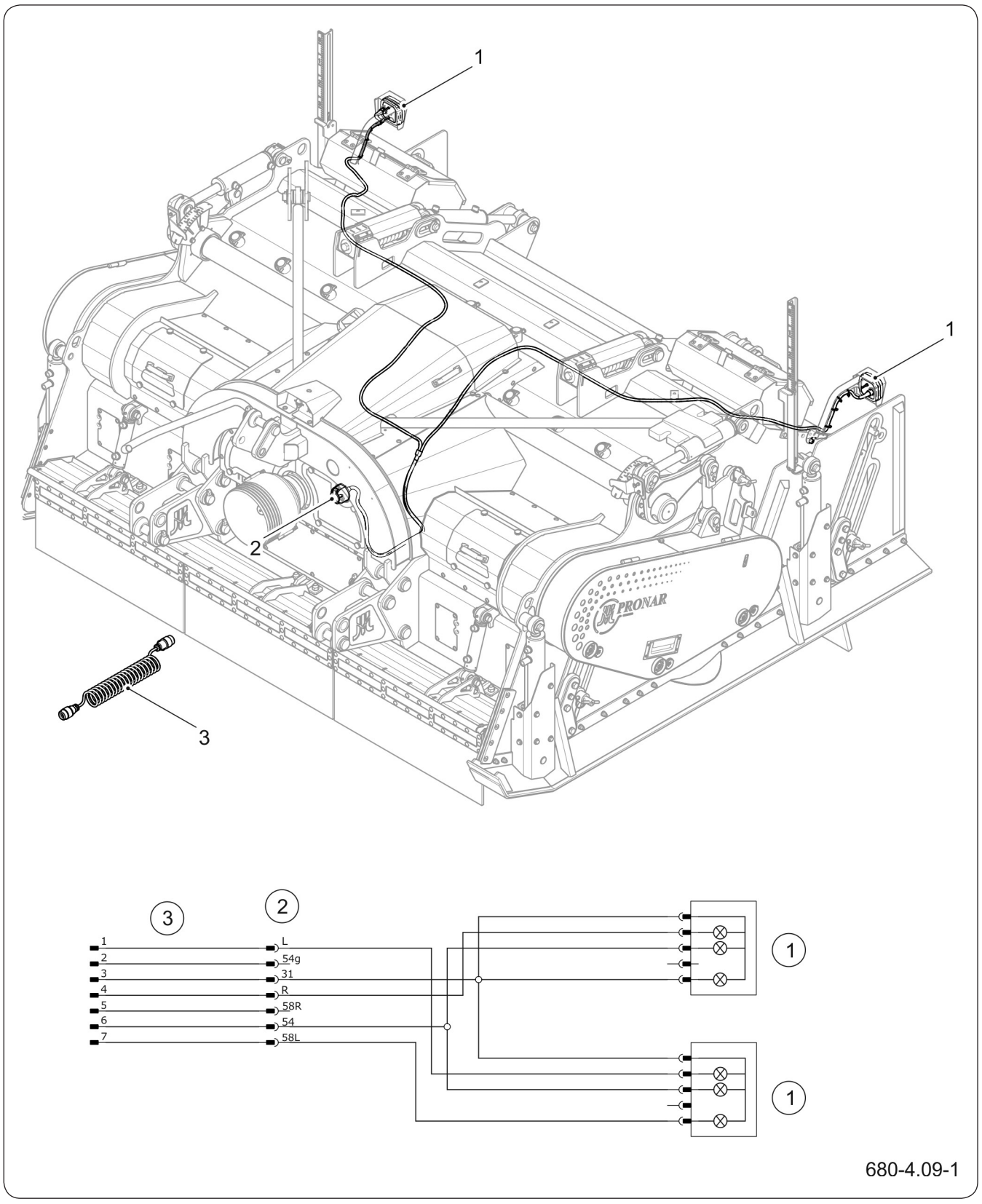

Figure 4.8 Design of electrical system for road lighting (optional)

(1) rear combination lamp (2) 7-pin socket (3) connecting cable

Table 4.1 Connection markings for the 7-pin connection socket

Marking	Function
3/31	Weight
2/54	unused
1/L	Left indicator
6/54	STOP light
7/58L	Rear left parking light
5/58R	Rear right parking light
4/R	Right indicator

Table 4.2 Color marking of wires in the electrical diagram

Marking	Colour
b	White
c	Black
f	Violet
k	Red
l	Lazurite
n	Blue
o	Brown
p	Orange
r	Pink
s	Grey
t	Green
z	Yellow

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Chapter 5

Rules of use

PRONAR SGD 25z

5.1 GET READY FOR OPERATION

DANGER

Before using the machine, the user must carefully read this Operator Manual

Careless and incorrect use and operation of the machine, and failure to follow instructions in this Operator Manual is dangerous to your life and health.

The manufacturer guarantees that the machine is fully operational and has been checked according to quality control procedures and is ready for use. This does not release the user from an obligation to check the machine's condition after delivery and before first use. The machine is delivered to the user completely assembled. Prior to connecting to the carrier vehicle, trained machine operator must verify the machine technical condition.

DANGER

The machine must never be used by persons who are not authorised to drive carrier vehicles, including children and people under the influence of alcohol or other drugs.

Non-compliance with the safety rules of this Operator Manual can be dangerous to the health and life of the operator and others.

ATTENTION

Before using the machine always check its technical condition. In particular, check the technical condition of the linkage system, drive system, completeness of protective covers and lighting.

Procedure:

- the user must carefully read this Operator Manual and observe all recommendations, understand the design and the principle of machine operation,
- Make sure that the machine's linkage is compatible with that of the carrier vehicle.
- Check the compatibility and technical condition of the hydraulic and electric system, including compatibility of the hydraulic connectors,
- Inspect machine's individual components for mechanical damage resulting from incorrect transport (dents, piercing, bent or broken components),
- Check the technical condition of working elements (wear, damage).
- Check technical condition of protective shields and check if they are correctly installed,

If all the above checks have been performed and there is no doubt as to the machine's good technical condition, it can be connected to carrier vehicle, started and all its individual systems checked.

DANGER

Before starting the machine, ensure that there are no by-standers in the danger zone.

DANGER

When starting machine for the first time as well as after servicing the hydraulic system, extreme caution should be exercised because the aerated hydraulic system causes accelerated movement of the powered components.

ATTENTION

Work connected with the repair, change or regeneration of electrical and hydraulic system components should be entrusted to specialist establishments, having the appropriate technology and qualifications for this type of work.

Procedure:

- Hitch the machine to carrier vehicle (see 4.3 “HITCHING TO CARRIER VEHICLE”),
- After connecting hydraulic system lines and electrical system wiring, check the correct operation of systems and inspect the hydraulic system for tightness,
- In the event of a disruption in the operation of the machine immediately discontinue its use, locate and remove the fault. If a fault cannot be rectified or the repair could void the warranty, please contact the Manufacturer for additional clarifications.

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5.2 BALLASTING THE CARRIER VEHICLE

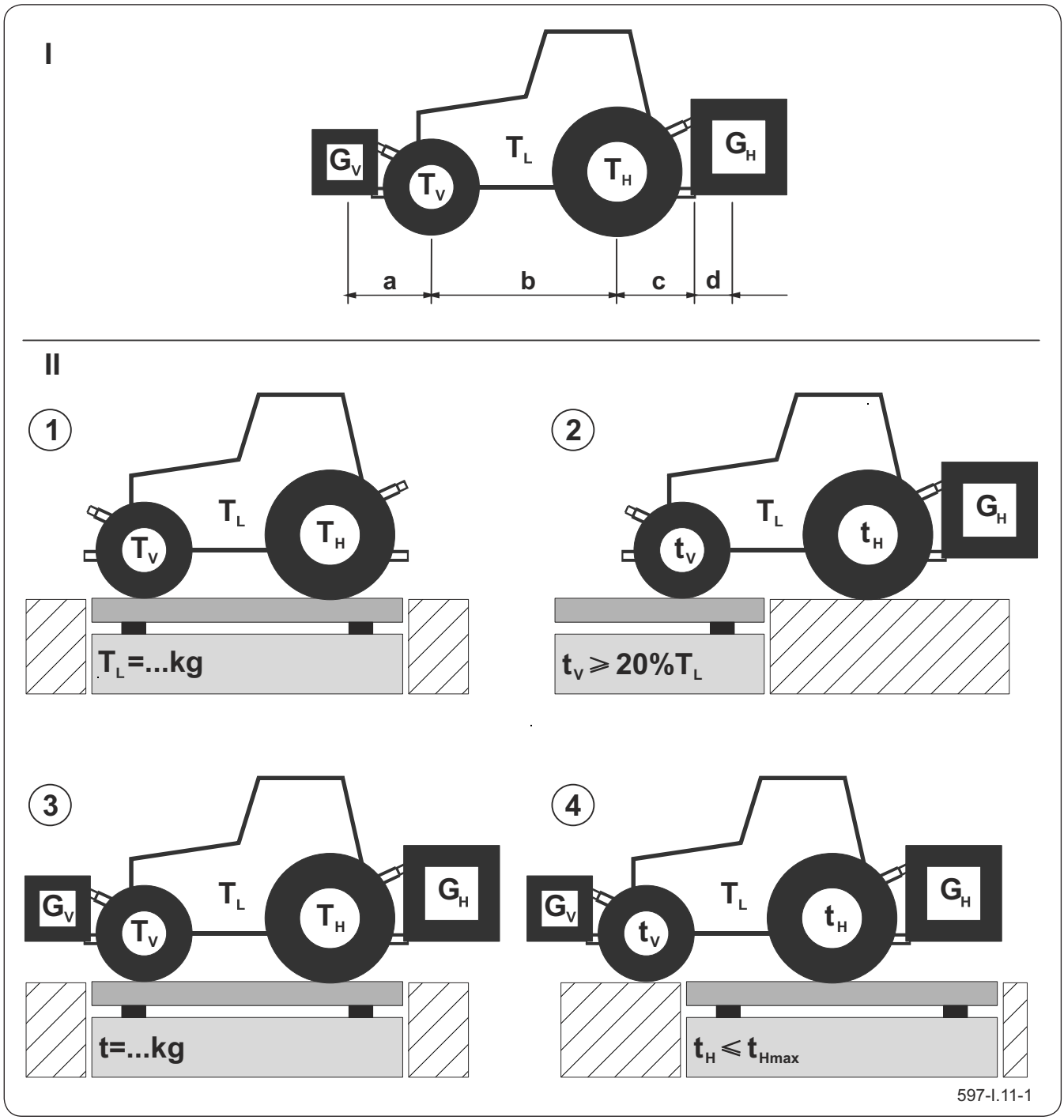

Figure 5.1 Ballasting the tractor.

ATTENTION

The load on the front axle of the carrier vehicle (tractor) must be at least 20% of its own weight and the load of the coupled machine.

Before hitching the machine to the tractor, confirm that the tractor is suitable for this purpose. Installation of implements on the front or rear three-point linkage must not result in exceeding the permissible total weight, permissible axle load and load capacity of tractor's tyres. The tractor's front axle must be always

ATTENTION

Misuse of the tractor may cause damage to the tractor as well as reduce its stability, manoeuvrability and braking efficiency.

loaded with at least 20% of the tractor's weight and the load of the aggregated machine.
Make the following calculations in order to confirm that these conditions are met:

Calculate the minimum front ballast G_{Vmin}

$$G_{Vmin} = \frac{G_H \cdot (c+d) - T_V \cdot b + 0{,}2 \cdot T_L \cdot b}{a + b}$$

Calculate the minimum rear ballast G_{Hmin}

$$G_{Hmin} = \frac{G_V \cdot a - T_H \cdot b + 0{,}45 \cdot T_L \cdot b}{b + c + d}$$

It is assumed that all parameters for the calculations of the minimum front and rear ballast are known.
If the parameters are unknown and cannot be determined, make the measurements using a weighing scale.

Measurement of permissible axle loads using a weighing scale.
Measure the tare weight of the carrier vehicle (T_L).
Hitch the machine to tractor and measure the front axle load (t_V). If the axle load is smaller than 20% of the carrier vehicle weight (T_L), add weights to exceed the minimum axle load value ($t_V \geq 20\% T_L$).
Measure the total weight (t) of the carrier vehicle with the machine and weights. Check in the tractor's Operator Manual if the measured value is smaller than the average value of gross weight.
Measure the rear axle load (t_H) and check in the carrier vehicle's Operator Manual if the measured value is smaller than the maximum permissible rear axle load of the carrier vehicle (t_{Hmax}).

Table 5.1 Ballasting the tractor

Symbol / dimension	Unit	Description
T_L	kg	Tractor tare weight
T_V	kg	Front axle load for tractor without machine
T_H	kg	Rear axle load for tractor without machine
t	kg	Load applied to axles of tractor with machine
t_V	kg	Front axle load for tractor with machine
t_H	kg	Rear axle load for tractor with machine
G_H	kg	Total weight of a rear-mounted machine or a rear ballast
G_V	kg	Total weight of a front-mounted machine or a front ballast
a	m	Distance between the centre of gravity of a front-mounted machine / front ballast and the centre of the front axle
b	m	Tractor axle base
c	m	Distance between the centre of the rear axle and the centre of the lower linkage arms of the tractor
d	m	Distance between the centre of the lower linkage arms of the tractor and the centre of gravity of a rear-mounted machine or a rear ballast

OBS.2.2-021.01.EN

5.3 ARTICULATED TELESCOPIC BOOM LIFT ADJUSTMENT

DANGER

Stop the tractor engine, remove the ignition key and brake the tractor with the parking brake before adjusting the shaft. Secure the tractor against unauthorized access.

CAUTION

When adjusting articulated telescopic boom lift first follow and use the instructions contained in the articulated telescopic boom lift manual.

CAUTION

Check and adjust the length of the articulated telescopic boom lift every time you change the tractor, as recommended by the articulated telescopic boom lift manufacturer. Failure to do so may result in damage to the tractor shaft, machine or PTO.

CAUTION

If the articulated telescopic boom lift is equipped with an overrunning clutch, make sure that the overrunning clutch is installed on the machine side when installing the articulated telescopic boom lift .

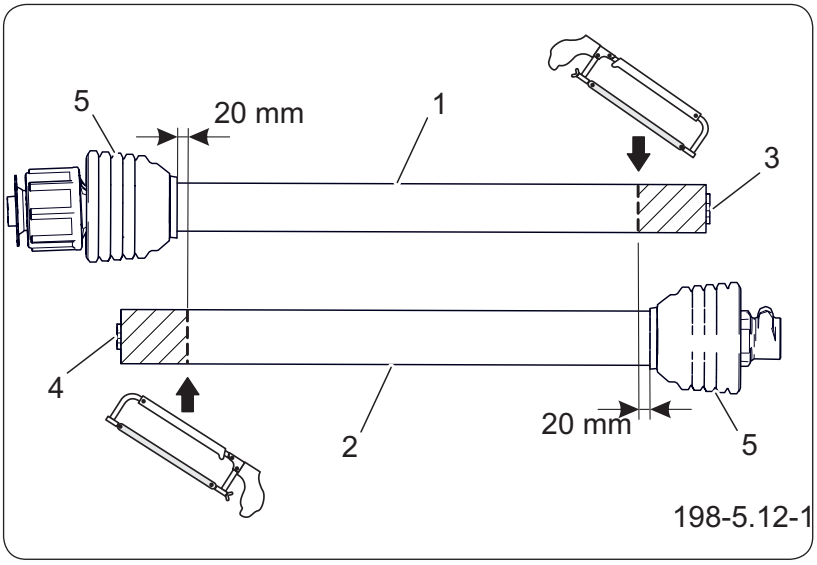

Figure 5.2 The principle of adjusting the articulated telescopic boom lift with the shortest working setting.

(1) inner shield tube *(2) outer shield tube*
(3) outer shaft profile tube *(4) inner shaft profile tube*
(5) cross joint tapered guards

Adjust the length of the articulated telescopic boom lift before the first start-up.

For this purpose:

1. Attach the machine to the tractor suspension system
2. Position the machine so that the distance between the tractor's Power take-Off (PTO) terminals and the machine is the smallest.
3. Slide the articulated telescopic boom lift shield into two parts (1) and (2).
4. Install one part of the shaft on the tractor PTO end.
5. Install the second part of the shaft onto the PTO end of the machine.

   The shaft assembly procedure is specified in detail in the shaft manufacturer's operating instructions.
6. Position the two parts of the shaft guard (1)

ADVICE

Use a hand-held metal saw to shorten shaft guards and profile pipes.

and (2) parallel to each other.

7. Mark the location where the guard tubes should be shortened with a minimum clearance. 20 mm from the tapered roller guards (5) of the shaft cross joints.
8. Shorten the guard tubes (1) and (2) at the selection point.
9. Shorten the profile tubes (3) and (4) by the same length as the guard tubes (1) and (2).
10. Sharp edges of profile pipes (3) and (4) gently walk with a file and remove any metal swarf.
11. Coat the outer surface of the inner profile tube (4) with grease.
12. Slide the profile tubes (3) (4) and guard tubes (1) (2) off the shaft.
13. Make sure that the profile tubes (3) and (4) overlap with the greatest distance between the tractor and machine PTO ends is sufficient.

Refer to the shaft manufacturer's manual for details on shaft alignment and inspection.

OBS.1.4-026.01.EN

5.4 CONNECTING THE MACHINE TO THE CARRIER VEHICLE

DANGER

Use only original fasteners to connect the machine to the carrier.

TIP

The above hitching method is described only for reference and may vary depending on the loader model.

The machine may be hitched to a carrier vehicle if all connections (electrical, hydraulic) and the linkage system in the carrier vehicle comply with the requirements of the machine manufacturer given in the table "Requirements of carrier vehicle"

1. Place the tractor with its back facing straight in front of the machine's linkage system.
2. When reversing the tractor, bring the lower links of the tractor's three-point linkage closer to the lower link attachment points (A) on the machine.
3. When controlling the carrier suspension system, set the lower links to the appropriate

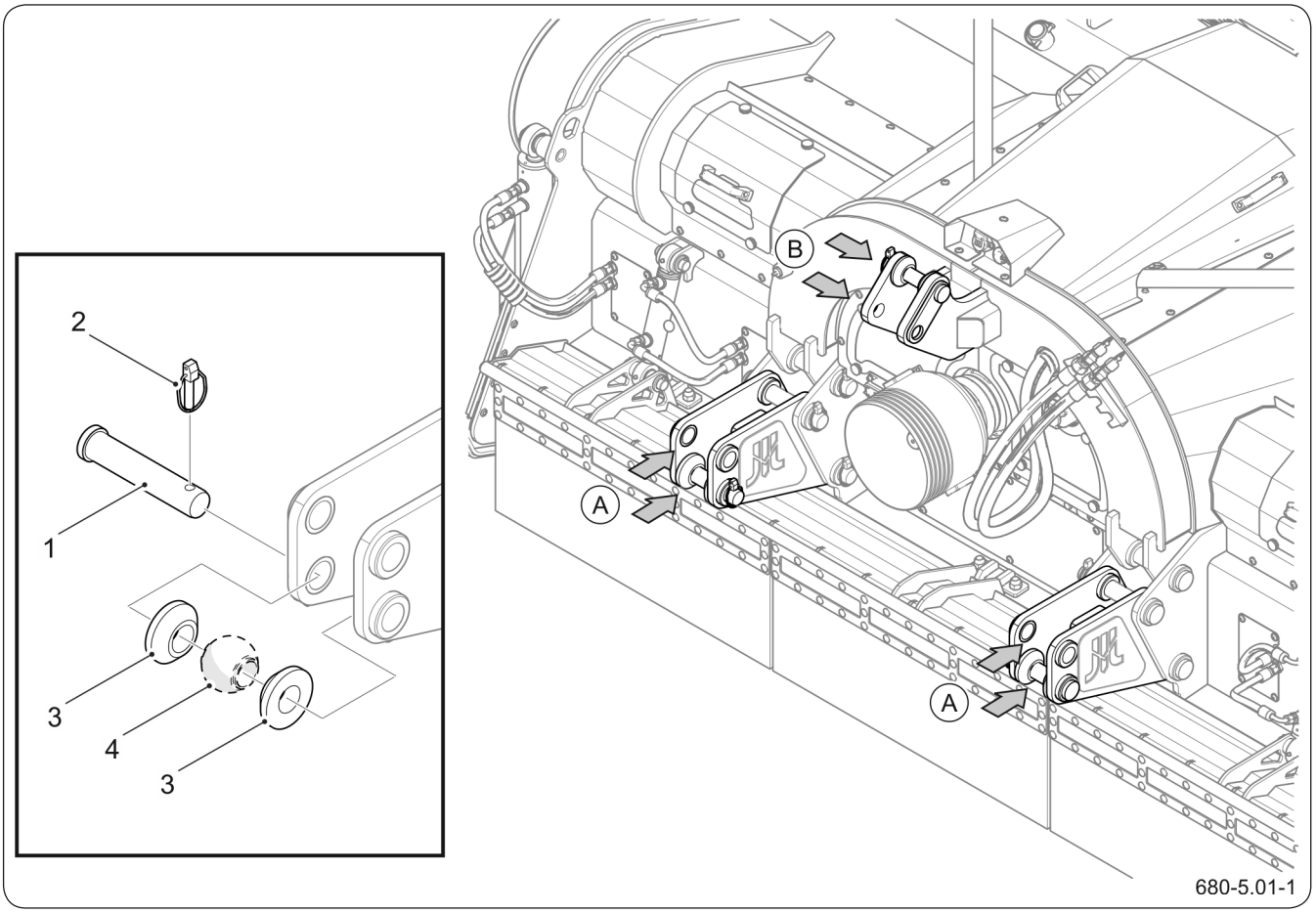

Figure 5.3 Connecting the machine to the tractor's three-point linkage

(A) lower link mounting points (B) central link mounting points

(1) pin (2) cotter pin (3) spacer sleeve

(4) ball (accessory)

DANGER

When hitching, there must be nobody between the machine and the carrier vehicle. When hitching the machine, driver must exercise due caution and make sure that nobody is present in the hazard zone.

Ensure sufficient visibility during hitching.

After completed hitching of the machine, check the safeguards.

ATTENTION

Both lower links of the carrier three-point linkage should be set at the same height.

Lock the tractor's three-point linkage lower links to prevent side movements of the machine.

TIP

It is recommended to use a hydraulic central connector category 4 according to ISO 730-1

height.

4. If necessary, use balls of the links (additional equipment).
5. Connect the lower links of the tractor's linkage system with the lower mounting points (A) on the machine and secure.
6. Turn off the tractor engine and immobilize it with the parking brake. Ensure that unauthorised persons do not have access to the cab.
7. Connect the central connector to the upper attachment point (B) on the machine and secure it.
8. Connect the PTO shaft.

   📖 ***"5.5 Connecting and disconnecting the PTO shaft"***
9. Connect hydraulic system lines.

   📖 ***„5.6 Connecting and disconnecting the hydraulic system”***
10. Connect the control and lighting system electrical wiring.

    📖 ***„5.7 Connecting and disconnecting the electrical system”***

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5.5 CONNECTING AND DISCONNECTING THE PTO SHAFT

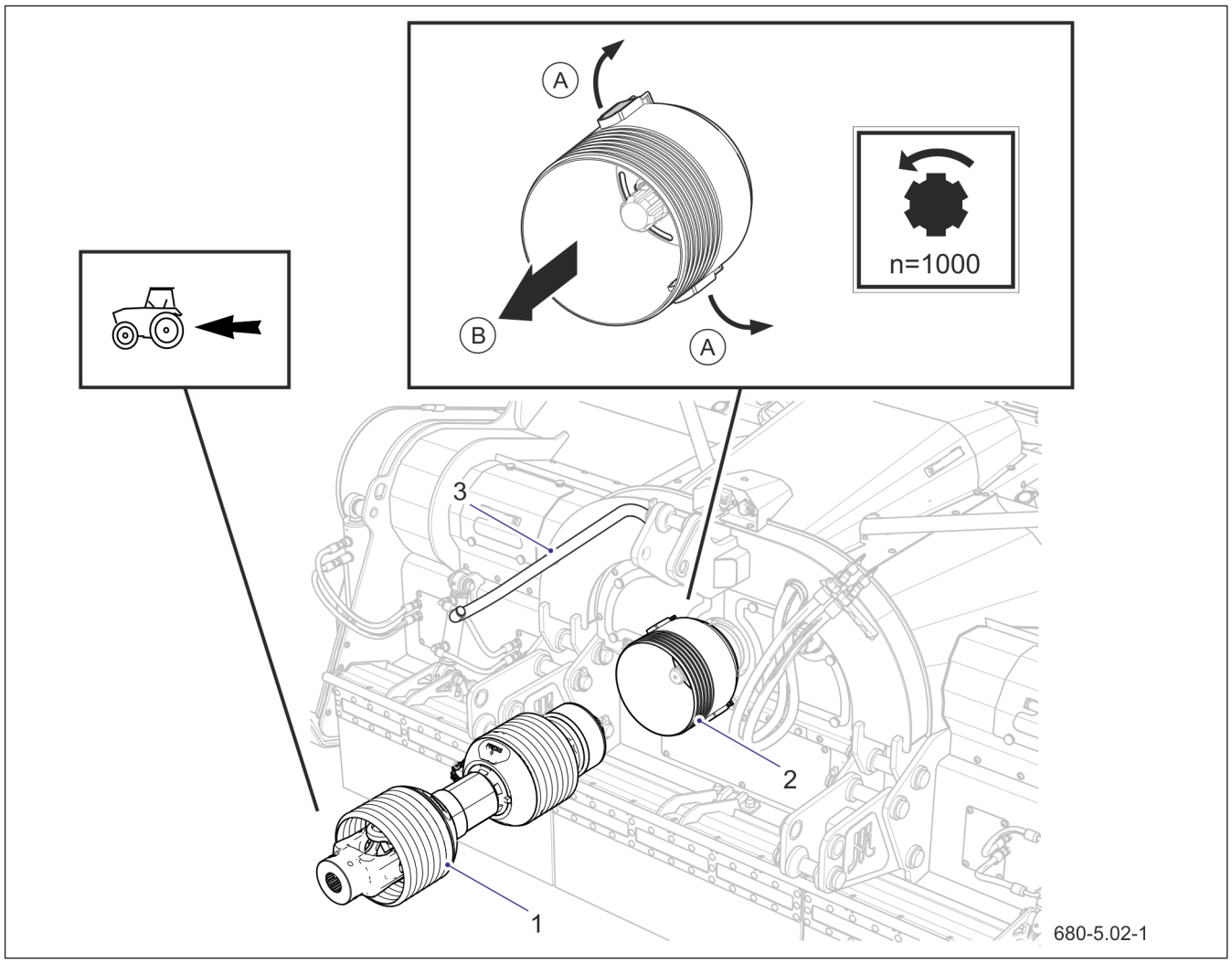

Figure 5.4 Connecting PTO shaft

(A) unlocking the cover fastening latches *(B) removing the cover*
(1) PTO shaft *(2) cover* *(3) shaft support in working position*

ATTENTION

When connecting the machine to the carrier vehicle, select the position of the lower link holes so that when operating the machine, the PTO shaft is as close to the horizontal as possible. Exceeding the permissible operating angles of the roller causes its damage.

Before connecting, check the length of the PTO shaft and adjust if necessary.

📖 ***"5.3 Articulated telescopic boom lift adjustment"***

Connecting the shaft

1. Unlock the latches (A) of the PTO shaft cover on the machine.
2. Slide the shaft cover in direction (B).
3. Connect the PTO shaft to the machine and

ATTENTION

To connect the machine's drive to the carrier's PTO shaft, use the PTO shaft recommended by the Manufacturer.

Read the user manual of the PTO shaft manufacturer and follow all instructions contained therein.

TIP

The ends of the PTO shaft are marked to indicate which side should be connected to the carrier.

carrier and secure it.

4. Slide the cover counterclockwise (B) and lock the latches (A).
5. Secure the shaft cover against rotation with retaining chains.
6. Fold the shaft support (3) to the working position.

Disconnecting the shaft

1. Disconnect the carrier end of the shaft.
2. Fold out the shaft support to the parking position.
3. Place the shaft on the bracket.

   During storage, there is no need to disconnect the shaft from the machine each time.

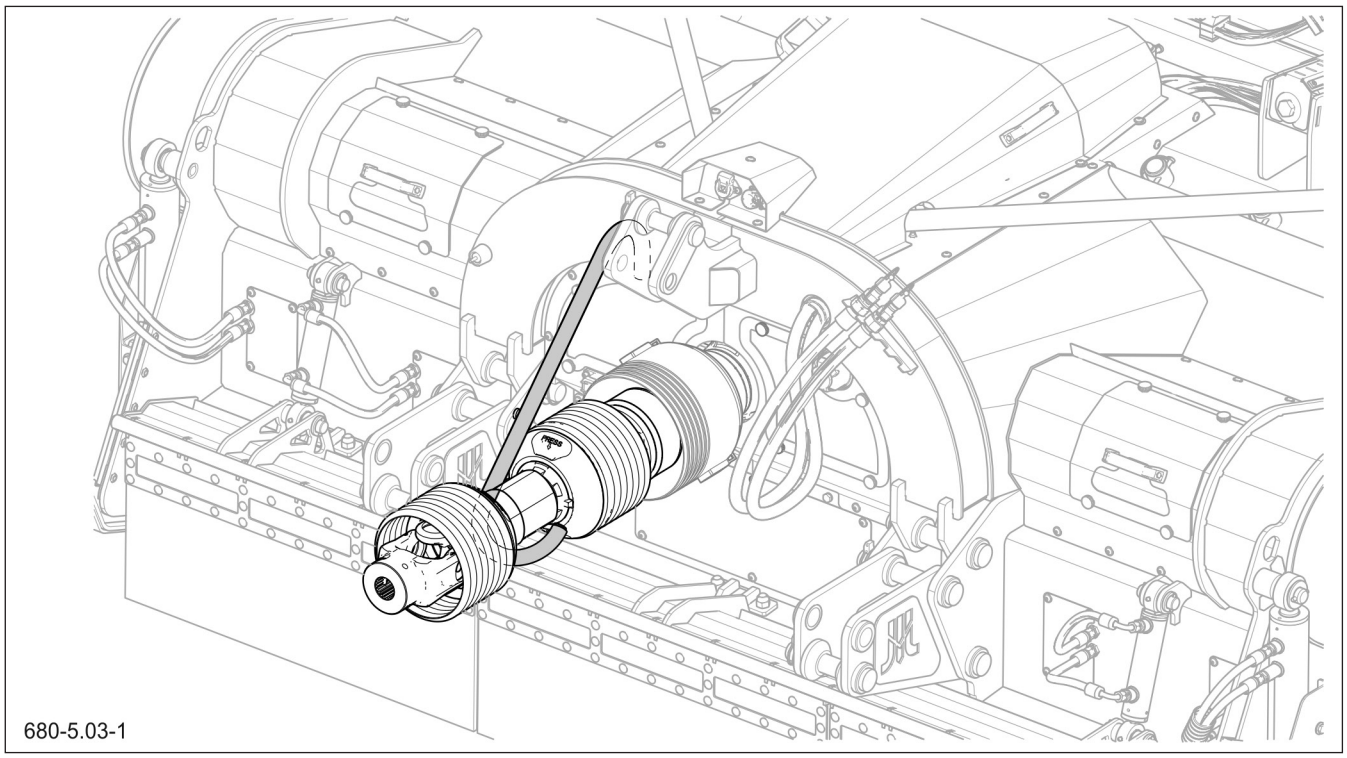

Figure 5.5 The PTO shaft is disconnected from the carrier and placed on a support in the parking position.

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5.6 CONNECTING AND DISCONNECTING THE HYDRAULIC SYSTEM

DANGER

Do NOT use out of order machine.

Be especially careful, the hydraulic system may be under high pressure.

ATTENTION

Pay attention to the possibility of mixing oils in the hydraulic system of the carrier and machine.

Requirements

1. Connect the machine to the carrier's mounting system.
2. Lower the machine to the ground.
3. Reduce the residual pressure in the carrier's hydraulic system;
4. Immobilize the carrier against rolling and turn off the engine. Ensure that unauthorised persons do not have access to the vehicle cab.

Connecting the hydraulic system

1. Remove the safety plugs (2) and check the condition and cleanliness of the hydraulic quick couplers on the machine and carrier.

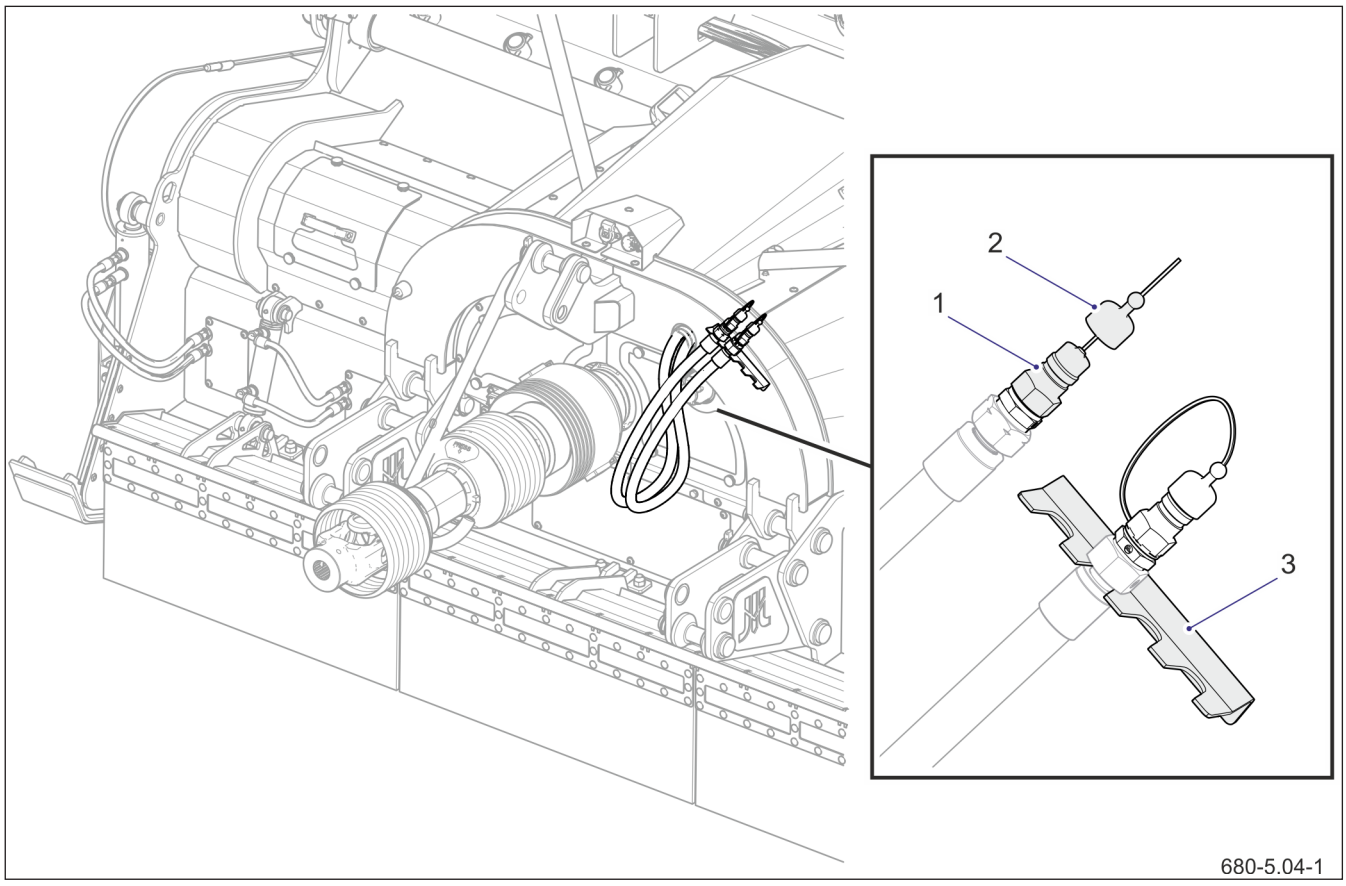

Figure 5.6 Hydraulic system connections depending on the machine version

(1) hydraulic quick couplers *(2) protective cap* *(3) bracket*

ATTENTION

Connection lines of hydraulic system should be routed in such a way that they do not get caught in the parts of the machine and the carrier and are not exposed to damage.

ATTENTION

Secure the hydraulic hose connections disconnected from the carrier by placing them in the bracket on the machine frame.

TIP

Due to the variety of hydraulic systems of carriers, the machine manufacturer is not able to determine a universal method of reducing pressure in the hydraulic system. Refer to the carrier's instruction manual.

2. Connect the quick couplers (1) of the machine's hydraulic system to one of the carrier's external hydraulic circuits with the possibility of locking in the on position.

   If the machine does not work after connecting and starting the hydraulic system, reverse the direction of oil flow in the carrier's hydraulic circuit or swap the quick couplers.

Disconnecting the hydraulic system

1. Reduce the residual pressure of the machine's hydraulic system with the carrier's hydraulic system.
2. Disconnect the quick connectors (1) of the hydraulic lines from the carrier distributor connectors.
3. Place the hydraulic hose quick couplers in the bracket (2) on the machine.

Reduction of residual pressure

The hydraulic system is designed in such a way that when the machine is operated correctly, there is no residual pressure. However, during use of the machine, situations may arise in which pressure appears in the hydraulic system.

To relieve pressure in such a case, the machine's cylinders must be unloaded.

OBS.2.9-012.01.EN

5.7 CONNECTING AND DISCONNECTING THE ELECTRICAL SYSTEM

ATTENTION

Connection wires and lines of electrical system should be routed in such a way that they do not get caught in the moving parts of the machine and the carrier and are not exposed to kinking or cutting.

Requirements

1. Connect the machine to the carrier's mounting system.
2. Lower the machine to the ground.
3. Immobilize the carrier against rolling and turn off the engine. Ensure that unauthorised persons do not have access to the vehicle cab.

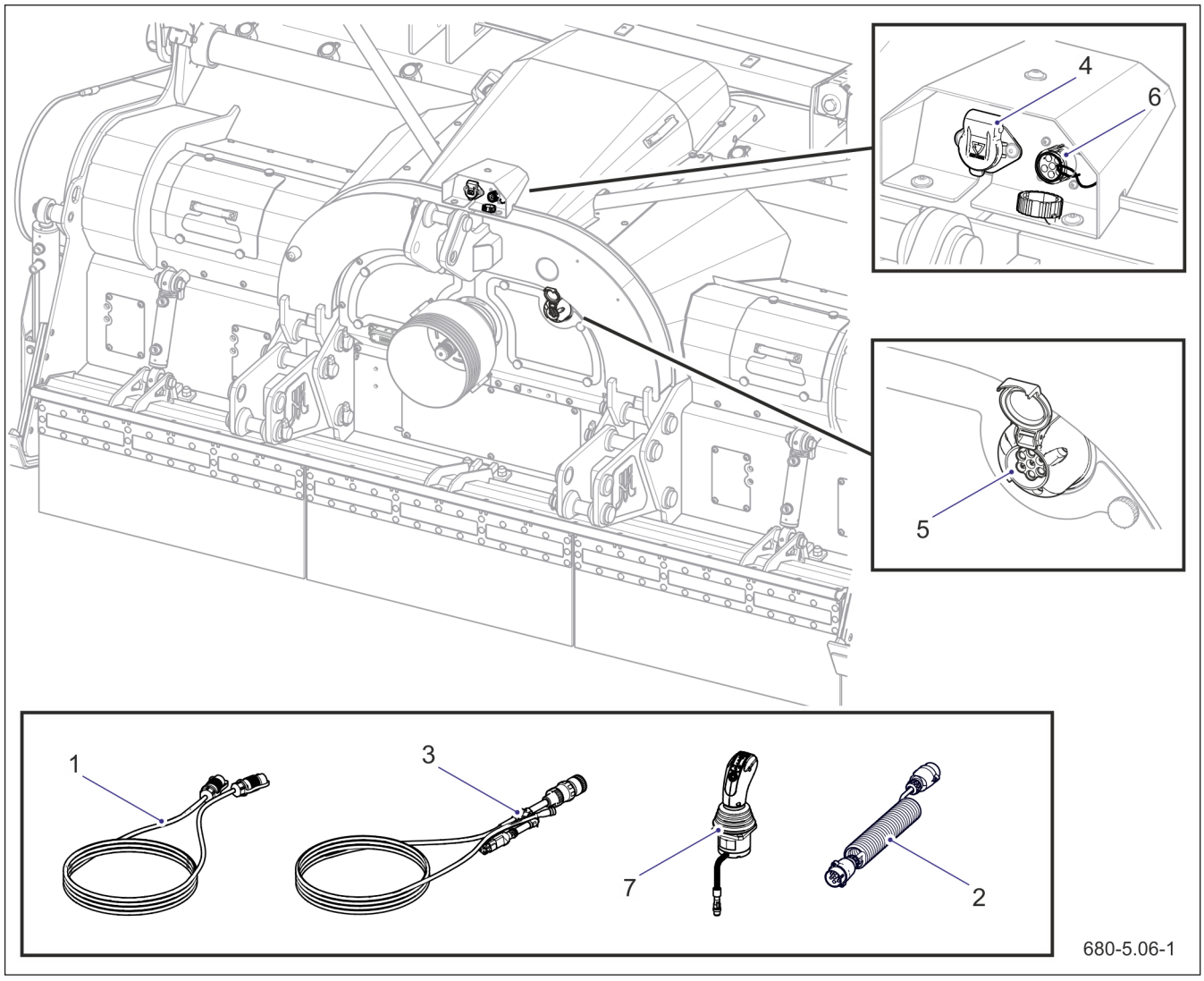

Figure 5.7 Electrical system connection

(1) power cable for the control electrical system
(2) power cable for the road lighting system
(3) control cable
(4) 3-pin socket
(5) 7-pin socket
(6) 6-pin socket
(7) multi-function lever (joystick)

TIP

If the carrier does not have a suitable socket or the socket is of a different type, then entrust the installation work to qualified persons.

ATTENTION

Before driving, check the operation and completeness of the electrical system.

Connecting the electrical system

1. Connect the control electrical system power cable (1) to the 3-pin socket (4) on the machine and to the appropriate socket on the carrier.
2. Connect the lighting power cable (2) to the 7-pin socket (5) on the machine and to the appropriate socket on the carrier.
3. Connect the control cable (3) to the socket (6) on the machine. Connect the other end of the cable to the multi-function lever connector (7) (so-called joystick). Install the control lever (7) in the operator's cab.
4. Check operation of the system.

Disconnecting the electrical system

1. Disconnect power wire from the carrier vehicle's electrical system.
2. Protect electrical connection plugs against contamination and damage.

The connecting cables, once disconnected from the carrier, can be stored in boxes on the machine.

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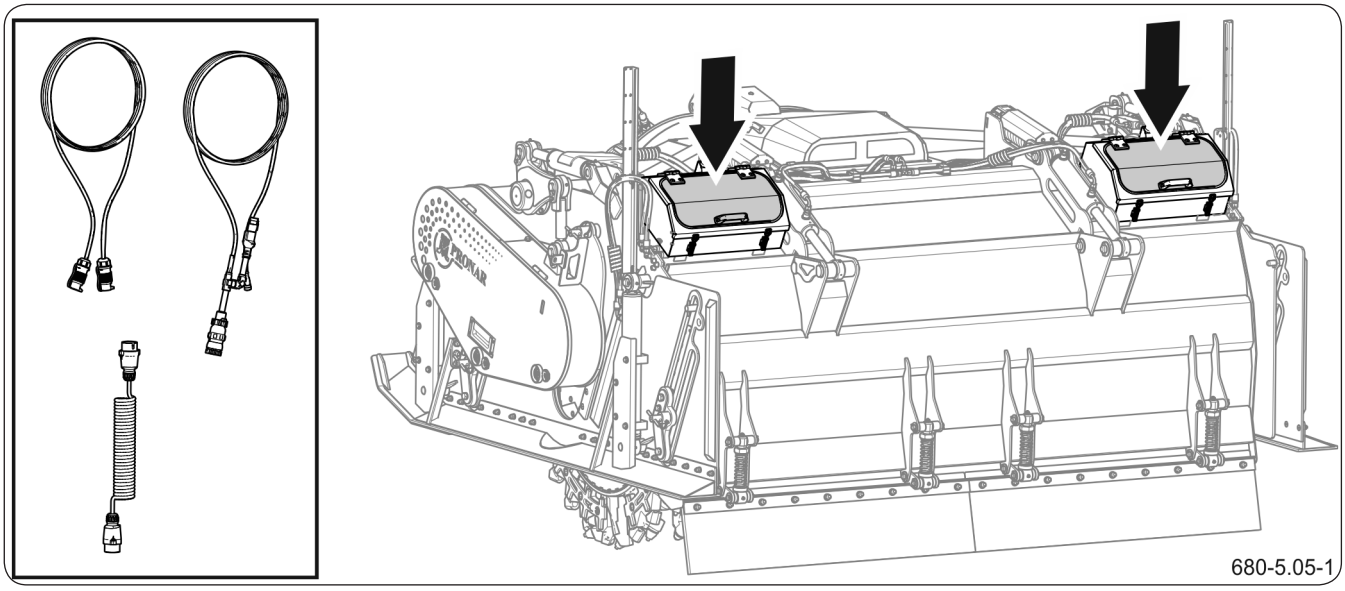

Figure 5.8 Boxes for storing machine equipment components

5.8 MACHINE OPERATION

5.8.1 Preparation of the work area

DANGER

Make sure that no bystanders or animals are within a radius of 50 m from the workplace when operating the machine.

Before starting work, especially in wasteland, remove objects such as rocks, concrete, tree trunks, wires, cables and metal objects from the work area. Wire, cable, rope, chains and metal objects can be thrown, entangled in the working roller and rotated at high speed:

Mark objects that cannot be cleared or removed. Avoid these objects while working.

5.8.2 Preparing the machine for work

Requirements:

1. Connect the machine to the carrier's mounting system. Connect the hydraulic and electrical systems.

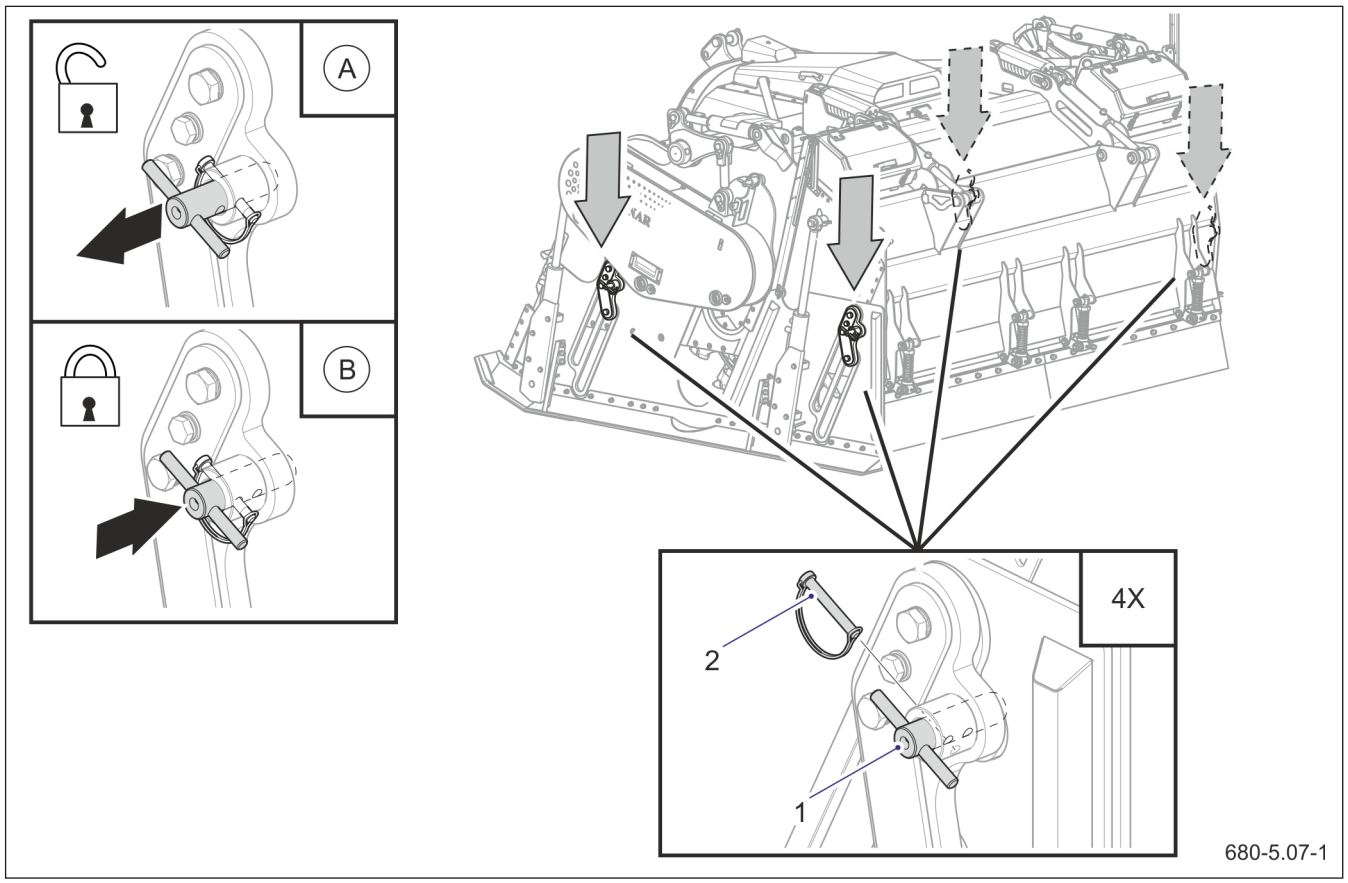

Figure 5.9 Locking the side covers of the working chamber

(A) cover unlocked (B) cover locked (1) locking pin (2) cotter pin

DANGER

Before starting the carrier engine make sure that the PTO drive is disengaged. Otherwise, the machine may be started in an uncontrolled manner.

The machine may only be started when all its protection guards are installed properly.

Before engaging PTO drive make sure that there are no bystanders, especially children, near the machine.

ATTENTION

Before starting to work with the machine, dismantle all 4 side guard locks and 2 working shaft lowering system locks located on both sides of the machine.

5.8.3 Machine operation

DANGER

Do not operate the machine in conditions of limited visibility.

2. Raise the machine slightly above the ground using the carrier suspension system.
3. Immobilize the carrier against rolling and turn off the engine. Ensure that unauthorised persons do not have access to the vehicle cab.

Unlocking the side covers of the working chamber

Before starting to operate the machine, unlock both side covers of the working chamber (if they were previously locked).

1. Raise the machine slightly above the ground using the carrier suspension system.
2. Unlock and remove the cotter pin.
3. Pull out the locking pin and lock it in this position with the cotter pin.
4. Unlock all locking pins on both sides of the machine (4 in total).

Unlocking the shaft lifting assembly

Before starting to work with the machine, unlock the shaft lifting assembly (if it was previously locked):

1. Remove the cotter pin (2).
2. Pull out the locking pin (1) and lock it in this position with the cotter pin.
3. Do the same on the other side of the machine.

Before starting the machine, position it so that the working shaft is slightly raised above the ground and then engage the PTO drive.

Slowly lower the working shaft to the desired height and start driving. Adjust the working speed to the type of ground and working conditions.

If the tractor load is too heavy when operating the machine, reduce the driving speed or working depth.

Stop the machine immediately if the working roller hits heavy objects, metal elements, rock, concrete

DANGER

When operating the machine, there is a risk of objects being thrown towards the tractor

ATTENTION

Do not operate the machine on hard surfaces (asphalt, cobblestones, pavement, concrete, etc.).

Do not operate the machine while driving in reverse because there is a risk of damaging the machine's components.

ATTENTION

Adjust the working speed to the type of ground and working conditions.

Incorrect work speed has a negative impact on the work effect and the life of the machine.

ATTENTION

Monitor the temperature of the central gear while operating the machine. If the operating conditions cause the permissible gear temperature - 90 °C to be exceeded, work breaks should be taken to cool the system.

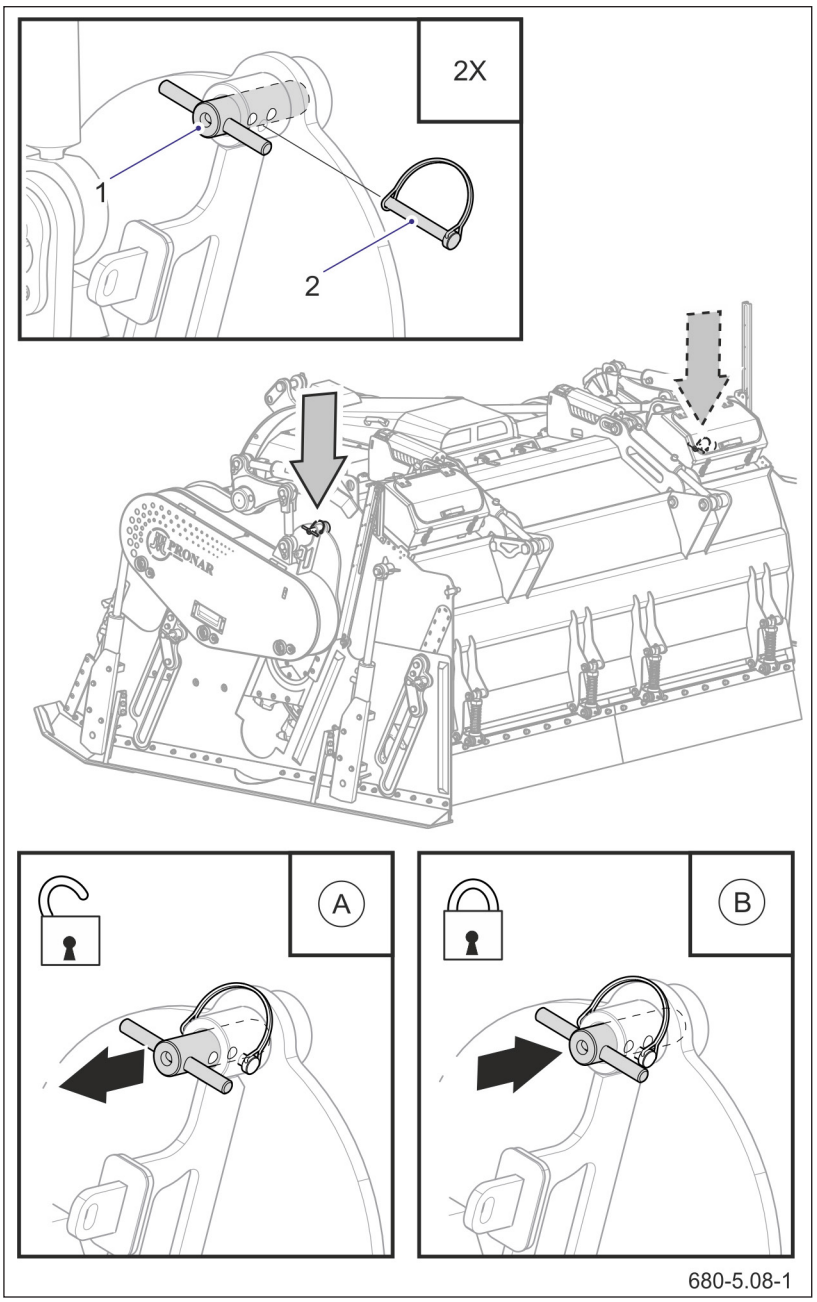

Figure 5.10 Shaft lifting assembly interlock
(A) shaft unlocked *(B) shaft locked*
(1) locking pin *(2) cotter pin*

and check its technical condition.

While operating the machine, check the technical condition and completeness of the working roller teeth. Working without teeth or with worn tooth flanges results in wear of the mounting sockets and the need for time-consuming and expensive regeneration. The method of replacing teeth is described in Chapter 6.

Periodically check the technical condition of the side

DANGER

Do not operate the machine with the covers raised.

covers, front and back covers.

After finishing work

After finishing working with the machine, turn off the PTO drive of the carrier. To disconnect the machine from the carrier, follow the section "*Disconnecting the machine from the carrier".*

OBS.2.9-014.01.EN

5.9 TRANSPORTING THE MACHINE

DANGER

When driving the machine in the transport position on uneven terrain, exercise particular caution and reduce the travel speed as the carrier and the machine may become damaged or overturned.

ATTENTION

If the machine covers the tractor's rear lighting while driving on public roads, it should be equipped with a lighting system (additional equipment)

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

- Driving on public roads may only take place if the machine is equipped with rear lighting (additional equipment).
- Before moving off, make sure that there are no bystanders, especially children, near the machine or the tractor. Ensure that the driver has sufficient visibility.
- Make sure that the machine is correctly attached to the tractor, and linkage is properly secured.
- The weight of the machine affects the tractor's steerability.
- Do not exceed the design speed of 25 km/h and maximum speed allowed by road traffic regulations. Ground speed should be adjusted to prevailing road conditions and other conditions.
- When driving, comply with all road traffic regulations, indicate an intention to turn using indicator lamps, keep all road lights and indicator lights (optional equipment) 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.
- Avoid ruts, depressions, ditches or driving on roadside slopes. Driving across such obstacles could cause the machine or the tractor to suddenly tilt. Driving near ditches or canals 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.
- Please note that the braking distance is substantially increased at higher speeds and loads.
- Monitor machine behaviour when travelling on an uneven terrain. Adjust speed to the terrain and road conditions.
- While operating the machine, turn on the orange beacon light in the tractor.
- While driving on public roads, the machine should be marked with slow-moving vehicle warning sign placed on the rear of the machine.

OBS.2.9-005.01.EN

5.10 CONTROL

Table 5.2 Control lever functions

Marking (Figure 5.11)	Function
A	Lifting the working shaft
B	Lowering the working shaft
1	Control lever switch (when switched on, the lamps L1, L2, L3 light up)
2	Lowering the right cover
3	Lowering the left cover
4	Raising the right cover
4(4)	Right cover floating position (double press)
5	Raising the left cover
5(5)	Left cover floating position (double press)
6(6)	Front cover floating position (double press)
6+A	Lifting the front flap
6+B	Lowering the front flap
6+7	Activation of working time signalling (signalling by lamp L2)
7(7)	Back flap floating position (double press)
7+A	Raising the back flap
7+B	Lowering the back flap
L1	Left cover floating position indicator light (green light flashing)
L2	Back flap floating position activation indicator light (yellow light flashing)
L3	Right cover floating position activation indicator light (red light flashing)

DANGER

During machine operation do not occupy a different position than that of the operator in the tractor cab. Do NOT leave the cab, when the machine is in operation.

It is forbidden for people to stay between the carrier and the machine while the engine is running.

Do not approach the machine until the rotating parts come to a complete standstill.

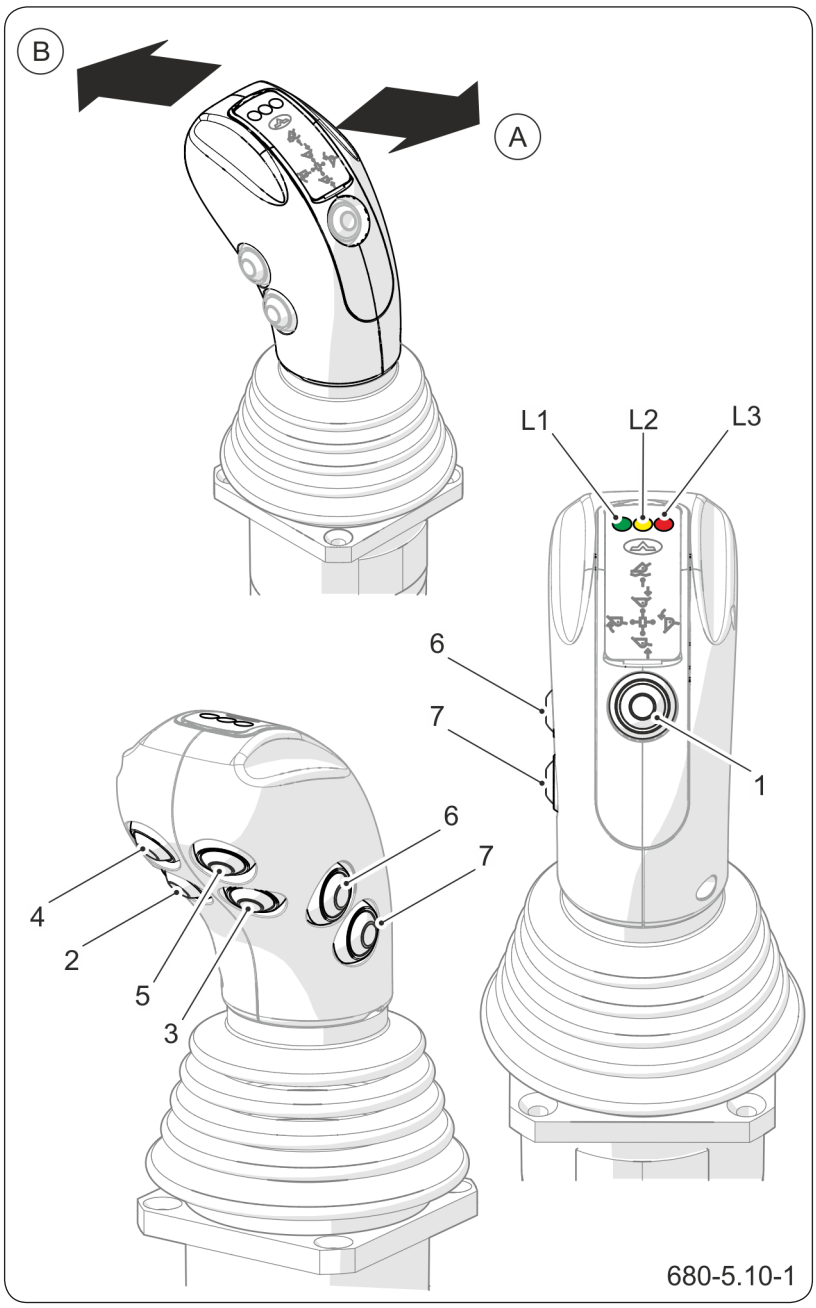

Figure 5.11 Control lever functions

The description of the functions is presented in Table 5.2

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5.11 ADJUSTMENT AND SETTINGS

Back flap pressure

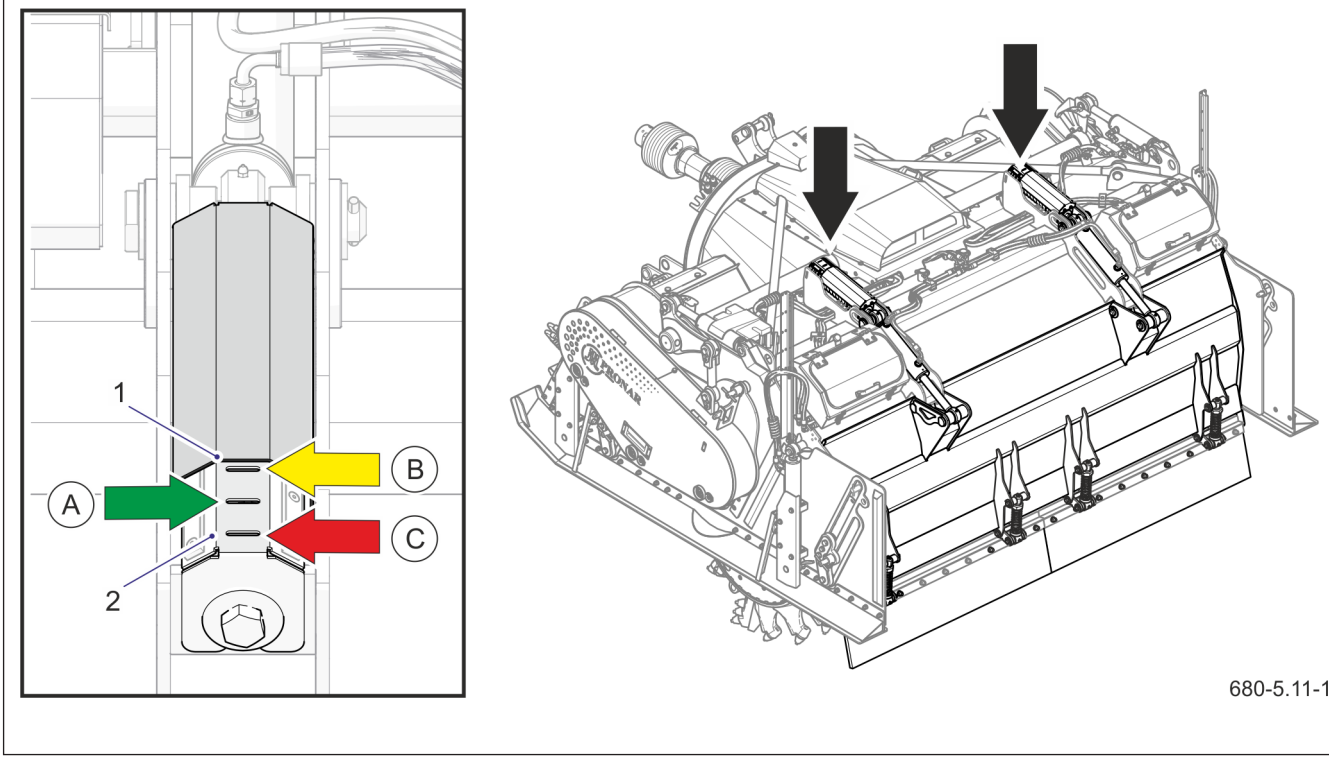

Figure 5.12 Back flap downforce indicator

(A) optimal pressure *(B) pressure too low (C) pressure too high*

(1) indicator *(2) scale*

Monitor and adjust the spring pressure of the hydraulically adjustable back flap while working. The degree of pressure is shown on the spring mark and should be in the middle (A) of the operating range. The degree of pressure can be changed from the operator's position by controlling the position of the back flap.

📖 ***see „5.10 Control”***

Working depth

The working depth of the working roller can be adjusted smoothly using the three-point linkage (TUZ) of the tractor. The shaft lifting system is equipped with indicators informing about the current position of the shaft. Position "0" is the highest position of the shaft.
By controlling the working roller lifting system, the volume of the working chamber is changed, which allows the degree of soil mixing to be increased or decreased.

📖 ***see „5.10 Control”***

Lowering the working shaft results in an increase in the volume of the mixing chamber, which results in better mixing of the binder with the material and requires a correspondingly reduced driving speed.
Raising the working shaft reduces the working chamber and is used for smaller stabilization depths and allows for faster driving.
The machine's depth of penetration can also be adjusted using the side covers on which the skids are mounted.
Adjust the height of the front flap to the current working

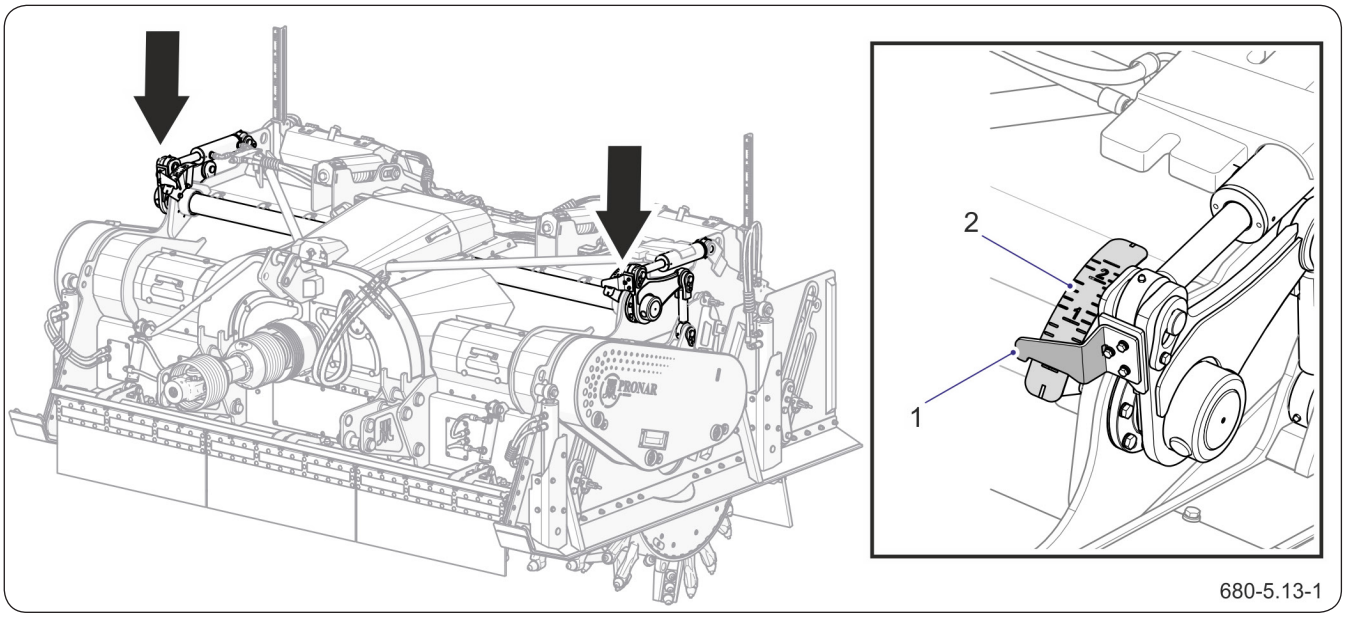

Figure 5.13 Working shaft position indicator
(1) indicator *(2) scale*

depth so that the material does not escape outside the machine housing.

Adjusting the side covers of the working chamber

If the machine's penetration depth is adjusted using the tractor's three-point linkage (TUZ), set the side covers of the working chamber to the floating position to allow them to move freely and adapt to uneven terrain. If the side cover becomes blocked by debris during operation, it may remain raised too high or penetrate too deeply into the ground material. In this case, depending on the situation, lower or raise the side cover hydraulically and then return it to the floating position.

If the machine's penetration depth is adjusted using side covers, the tractor's three-point linkage should be set to the floating position and the side covers should be set to the "rigid" position.

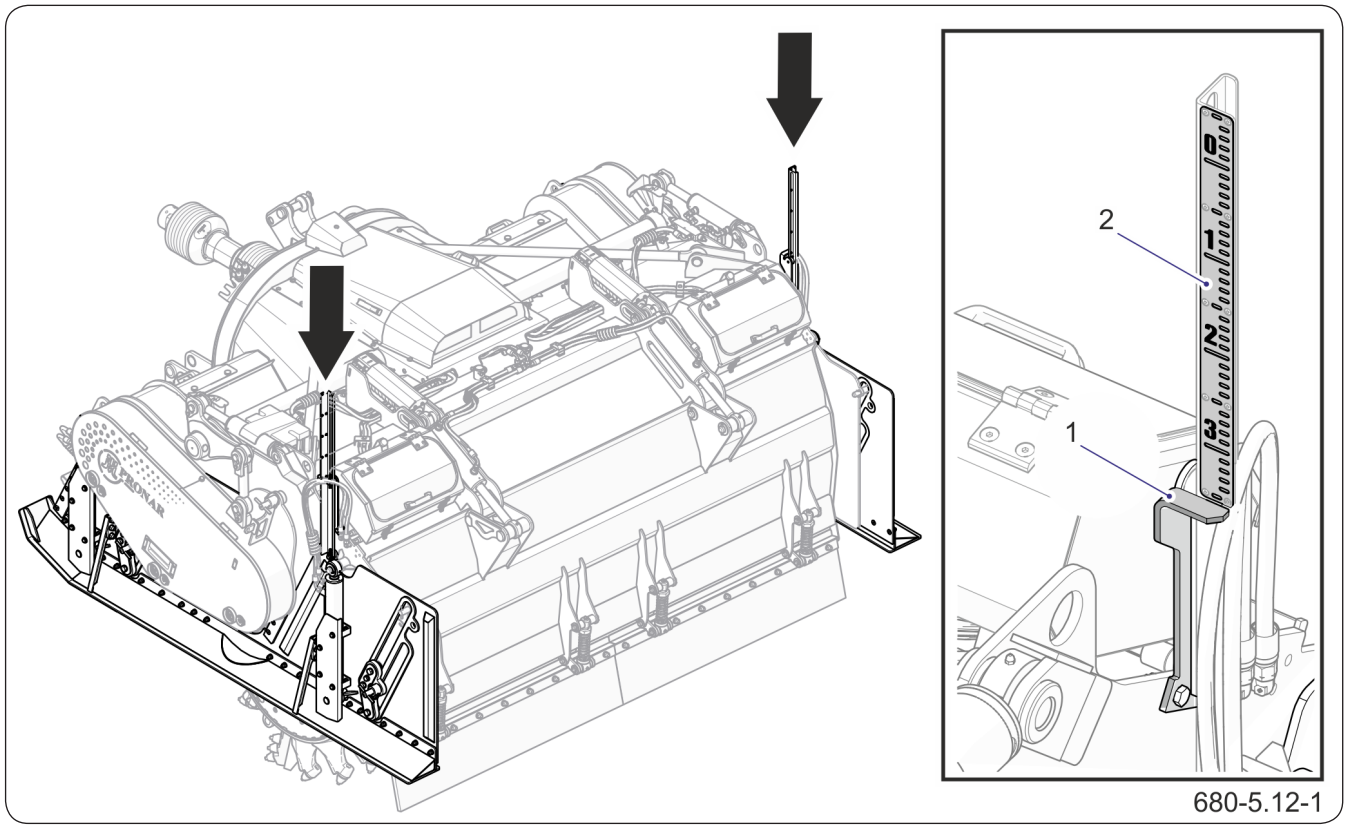

Figure 5.14 Side cover position indicators

(1) indicator *(2) scale*

📖 ***see "5.10 Control"***

In this case, the machine's penetration depth is adjusted by changing the height of the side covers. In a situation where the material of the ground being processed is too loose and causes the slides of the side covers to sink too much, the floating position of the three-point linkage should be switched off and the carrier suspension system should be slightly raised.
The machine is equipped with cover position indicators on the right and left sides. Position "0" is the lowest position of the covers.

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5.12 UNHITCHING THE MACHINE FROM CARRIER VEHICLE

DANGER

Before unhitching the machine from the carrier vehicle, turn off the carrier vehicle's engine, engage parking brake and secure cab against access of unauthorised persons.

Be especially careful when unhitching the machine from the carrier vehicle.

Before disconnecting the machine from the carrier vehicle, place the machine on a horizontal, sufficiently hard surface so that it can be reconnected.

Locking the side covers of the working chamber

Before disconnecting the machine from the carrier, lock both side covers of the work chamber:

1. Raise the machine slightly above the ground using the carrier suspension system.
2. Lower both working chamber covers to their lowest position.
3. Turn off the engine, remove key from ignition and engage parking brake.
4. Unlock and remove the cotter pin (2).
5. Insert the locking pin (1) and lock it in this

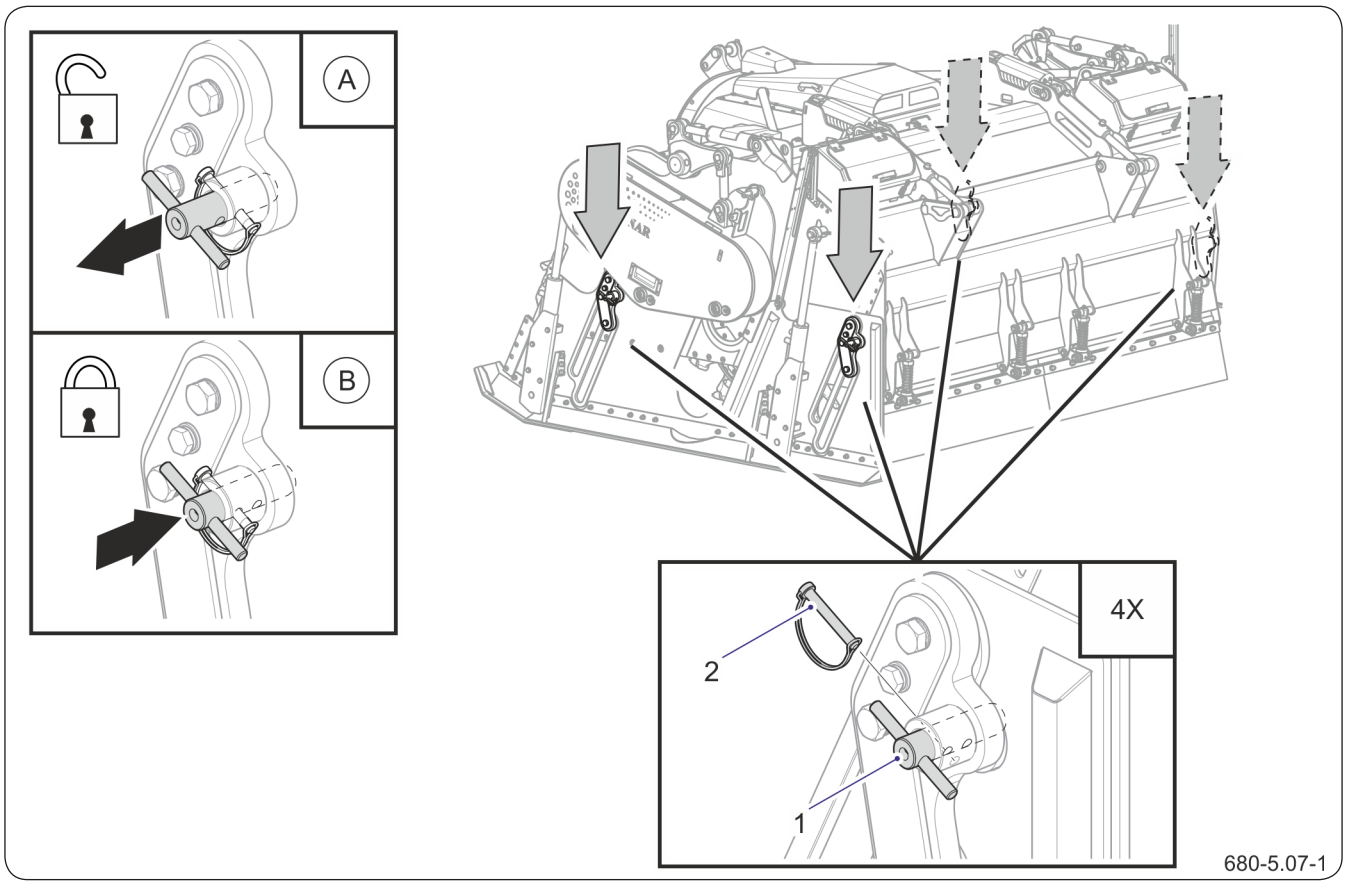

Figure 5.15 Locking the side covers of the working chamber

(A) cover unlocked *(B) cover locked*

(1) lock pin *(2) securing cotter pin*

ATTENTION

Before disconnecting from the carrier, lower the side covers of the working chamber and lock them in the lower, end position.

ATTENTION

Before disconnecting from the carrier, raise the operating shaft and lock it in the upper, end position.

position with the cotter pin (2).

6. Lock all locking pins on both sides of the machine (4 in total).

Shaft lifting assembly interlock

Before disconnecting the machine from the carrier, lock the shaft lifting assembly in the upper position:

1. Remove the cotter pin (2).
2. Insert the locking pin (1) and lock it in this position with the cotter pin (2).
3. Do the same on the other side of the machine.

Unhitching the machine from carrier vehicle

Place the tractor with the machine in a parking place that is level and sufficiently firm, so that it can be reattached.

1. Lower the machine to the ground.

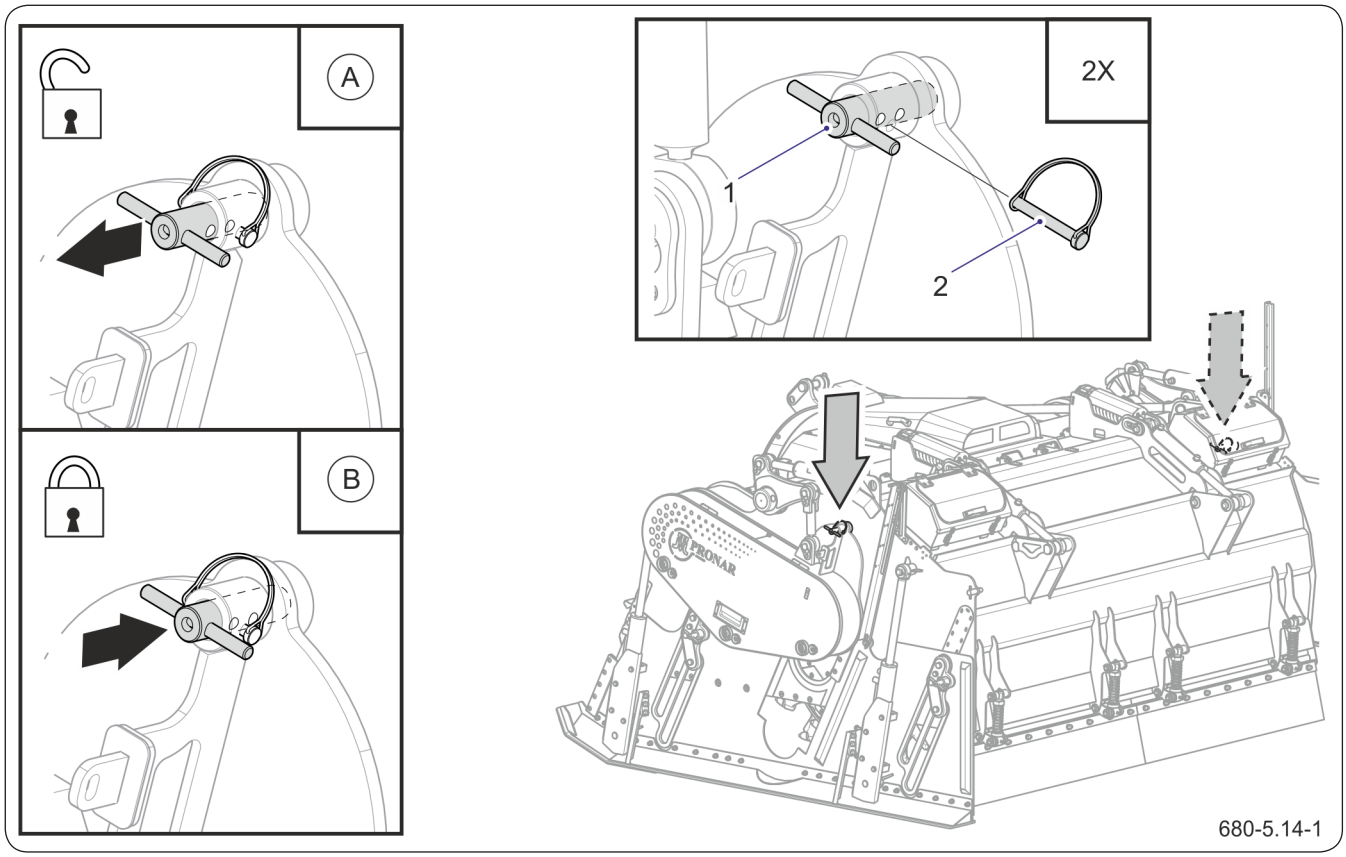

Figure 5.16 Shaft lifting assembly interlock

(A) shaft unlocked *(B) shaft locked*

(1) lock pin *(2) securing cotter pin*

2. Turn off the engine, remove key from ignition and engage parking brake.
3. Reduce residual pressure in the hydraulic system and disconnect the quick couplers. Secure the plugs with caps and place them in the bracket on the machine frame.

   📖 ***see „5.6 Connecting and disconnecting the hydraulic system”***
4. Disconnect the control and lighting wiring from the carrier.

   📖 ***see „5.7 Connecting and disconnecting the electrical system”***
5. Disconnect the telescopic shaft from the carrier and place it on the bracket.

   📖 ***see "5.5 Connecting and disconnecting the PTO shaft"***
6. Unlock and disconnect the upper link (central link).
7. Unlock the tractor's three-point linkage lower links and disconnect it from the machine.
8. Start the tractor and drive away from the machine.

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5.13 CLEANING

DANGER

Carefully read the instructions for application of detergents and maintenance preparations.

While washing with detergents, wear appropriate protective clothing and goggles protecting against splashing.

DANGER

When the machine is connected to the carrier vehicle, you can only be near the machine when:

- the carrier vehicle engine is turned off,

-the machine is lowered to the ground

ATTENTION

After each use, clean the machine of any remaining material.

After finishing washing wait until the machine is dry and then grease all greasing points according to recommendations. Remove excess oil or grease with a dry cloth.

During work, use appropriate, close-fitting protective clothing, gloves and appropriate tools.

Every day, after finishing work, thoroughly clean the machine of any remaining dirt. Before using the pressure washer the user is obligated to acquaint himself with the operating principles and recommendations concerning safe use of this equipment.

Machine cleaning guidelines

Stop the carrier vehicle with the machine on a flat, level surface.

- Lower the machine to the ground, raise the covers.
- Turn off the vehicle's engine and remove the key from the ignition;
- Secure the carrier vehicle with the parking brake and the cabin against access by other people.
- Clean and wash the machine with a strong stream of water and leave to dry in a dry and airy place.

The use of pressure washers increases the effectiveness of washing, but be careful when working. During washing, washer nozzle may not be closer than 50 cm from the surface being cleaned.

Water temperature should not exceed 55^{0}C. Using excessive pressure for washing may damage lacquer coating.

Do not direct the water jet directly at the system and equipment elements of the machine, i.e. valves, bearings, electrical and hydraulic plugs, lights, electrical connector, information and warning stickers, nameplate, cable connections, lubrication points, etc. high jet pressure water may mechanically damage these components.

- For cleaning and maintenance of plastic

TIP

Once a month, while the machine is in operation, clean the central gearbox compartment, the PTO shaft compartment, the inside of the belt drive covers and the space under the hydraulic solenoid valve covers. Use compressed air to clean these components.

After cleaning the machine, reinstall all covers.

coated surfaces, use clean water or special preparations designed for this purpose.

- Do not apply organic solvents, preparations of unknown origin or other substances, which may cause damage to lacquered, rubber or plastic surfaces. If in doubt, test on an inconspicuous surface.
- Surfaces smeared with oil or grease should be cleaned by application of white spirit or other degreasing agents and then washed with clean water with added detergent. Follow the cleaning agent manufacturer instructions.
- Washing detergent should be kept in original

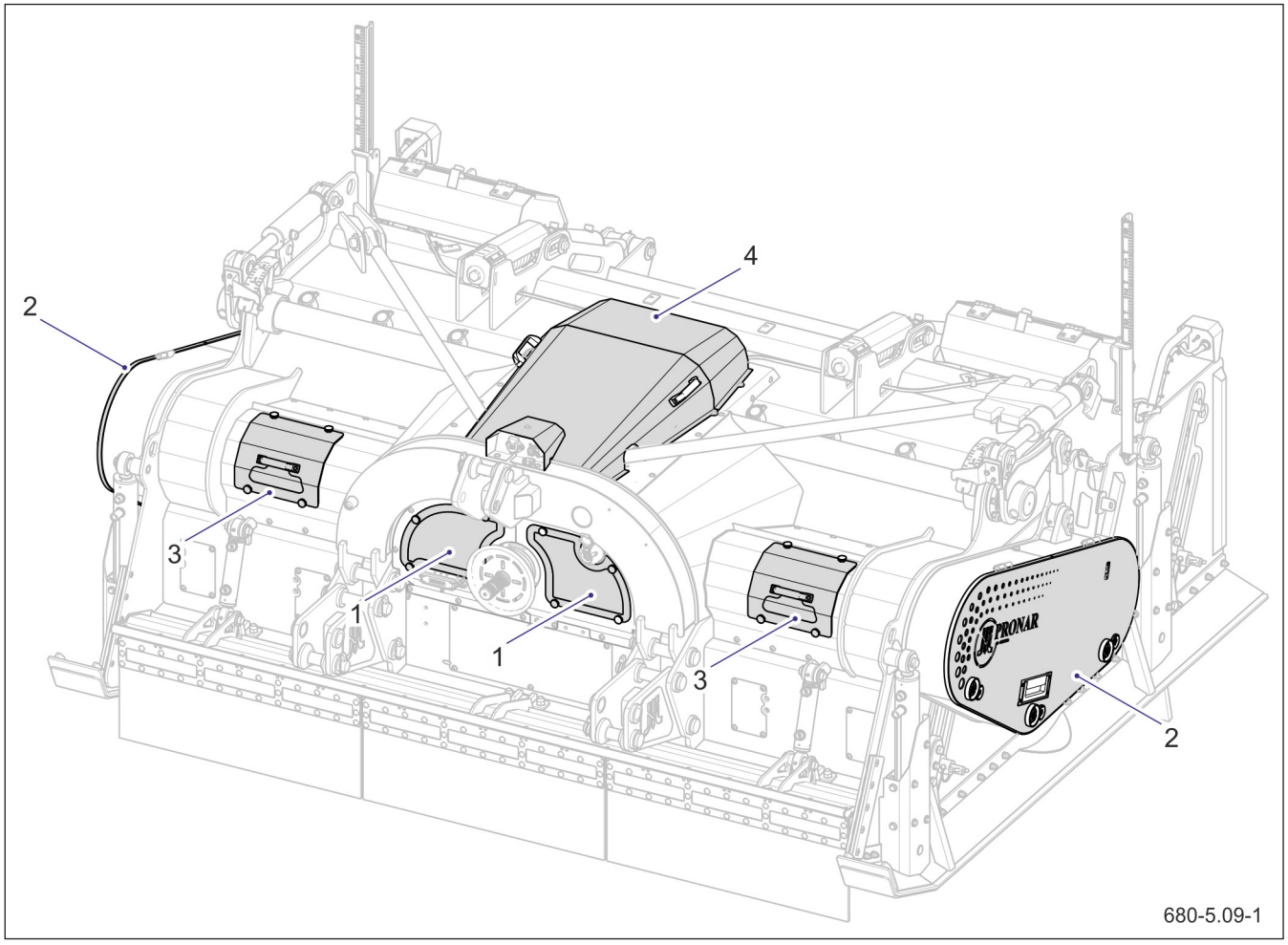

Figure 5.17 Covers removable to clean the machine with compressed air

(1) central gear cover (2) belt drive cover (3) telescopic articulated shaft covers (4) upper cover

TIP

After washing and drying the machine, apply a layer of oil to the actuator piston rods to protect against corrosion.

containers, optionally in replacement containers, but very clearly marked. Preparations may not be stored in food and drink containers.

- Observe the rules of environmental protection and wash the machine in a place designed for this purpose.
- Washing and drying the machine must take place at temperature above 5^0C.

In winter, freezing water may cause damage to paint coating or machine elements.

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5.14 STORAGE

After finishing work, carefully clean, wash and lubricate the machine.

Machine should be kept in closed or roofed building.

Before longer outdoor storage, it is essential to protect the machine against adverse weather conditions, especially those causing corrosion.

In the event of damage to the lacquer coating clean those places from rust and dirt, degrease and then paint with paint maintaining uniform colour and even thickness of protective coating. Until the time of touch-up painting, the damaged place should be covered with a thin layer of grease, anticorrosion preparation or priming paint.

If the machine has been parked for more than 1 month, lubricate all points regardless of the period of the last treatment and subject the machine to a comprehensive check.

For the duration of the standstill, leave the PTO shaft mounted on the gearbox and resting on the shaft bracket. The connecting cables for the electrical installation and small parts of the machine equipment, e.g. a key and a pin for replacing teeth, etc., can

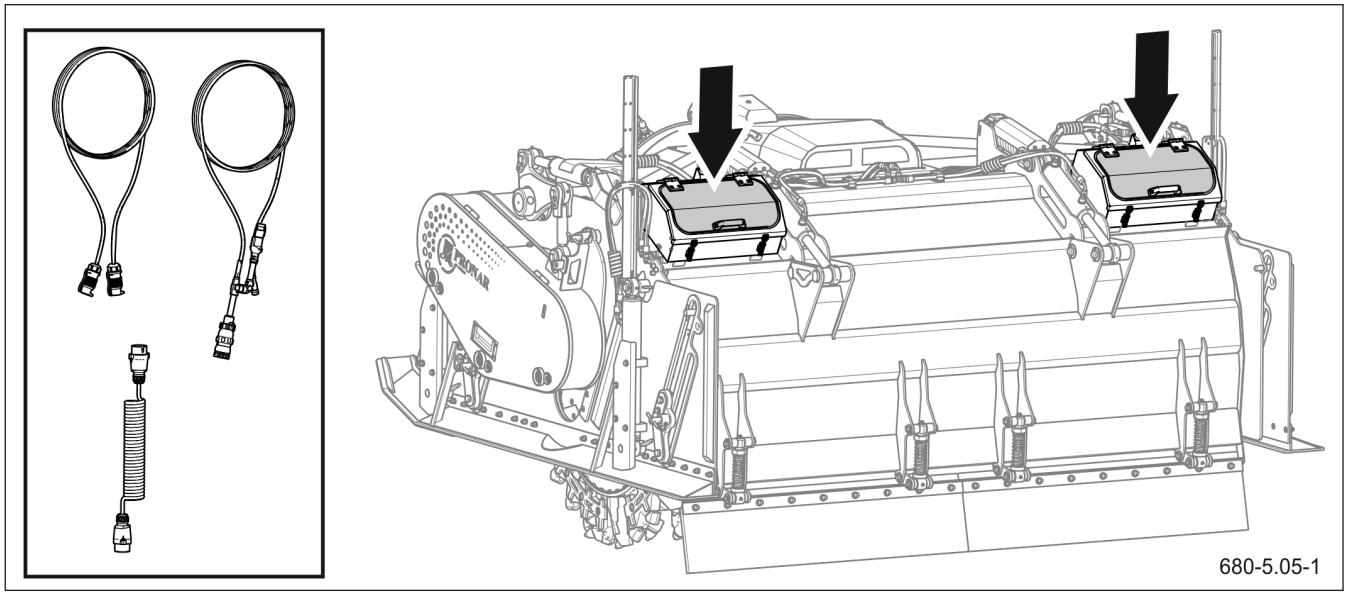

Figure 5.18 Storage compartment for equipment items

be stored in special compartments on the machine frame.

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Chapter 6

Periodic inspection and maintenance

PRONAR SGD 25z

6.1 BASIC INFORMATION

CAUTION

It is forbidden to use a defective machine.

Repairs during the guarantee period may only be carried out by authorised service centres.

When using the sweeper, it is necessary to constantly check the technical condition and perform maintenance procedures that will allow the machine to be kept in good technical condition. Compulsorily carry out all maintenance and adjustment activities specified by the Manufacturer according to the established schedule.

Repairs during the warranty period may only be carried out by Authorised Sales and Service Outlets (APSiO). The warranty inspection of the machine is only carried out by an authorised service centre.

In the event of unauthorised repairs, changes to the factory settings or operations not included as possible by the machine operator (not described in this manual), the user will forfeit the warranty.

For detailed information on the maintenance schedule, refer to the chapter entitled*" Maintenance and Inspection Schedule* ".

After the warranty expires, it is recommended that servicing is carried out by specialised repair shops.

Use appropriate protective clothing and equipment when working.

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6.2 MAINTENANCE AND INSPECTION SCHEDULE

Table 6.1 Inspection categories

Category	Description	Carried out by	Frequency
A	Daily inspection	Operator	Inspection conducted daily before the first start or every 10 hours of continuous operation in shift mode.
B	Warranty inspection	Service or APSIO (1)	The inspection is performed for a fee, once after the first 50 hours of operation.
C	Maintenance inspection	Operator	Inspection performed periodically every 50 hours of engine operation. Daily inspection should be carried out each time before this inspection.
D	Maintenance inspection	Operator	Inspection performed periodically every 300 hours of engine operation. Each time before performing this inspection, a daily inspection and an inspection every 50 hours should be performed.
E	Warranty inspection	APSiO(1)	The inspection is performed for a fee after the first 12 months of use of the machine (or after the first 500 hours of operation), upon notification by the owner.
F	Maintenance inspection	Operator	The inspection is performed periodically every 12 months or 500 hours of machine operation (whichever comes first). Before performing this inspection, always perform a daily inspection, an inspection every 50 hours and an inspection every 300 hours of machine use.
G	Maintenance inspection	Service (2)	Inspection carried out every 4 years of the machine use

(1) - Authorized Point of Sale and Service

(2) - post-warranty service

Table 6.2 Maintenance schedule

Description of activities	A	B	C	D	E	F	G
Correct mounting and wear of the working roller teeth.	•						
Technical condition of the back flap	•						
Technical condition of PTO shaft, its shields and securing chains (1)	•						
Inspection of connection plugs and sockets	•						
Inspection of protective shields	•						
Checking the tension of the belts of the belt transmission (2)	•						
Efficiency of the electrical installation	•						
Pulley inspection				•			
Checking the oil level in the central gear and in the cylindrical gears of the working shaft			•				
Inspect the hydraulic system			•				
Changing the oil in the central gear and the cylindrical gears of the working shaft		•			•	•	
Replace hydraulic lines							•
Lubrication	See table: *Lubrication schedule*						
Inspection of screw connections	See point: *Tightening torque for nut and bolt connections*						

(1) in accordance with the PTO shaft's Operator Manual

(2) first inspection after 15 hours of operation, then every 50 hours.

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6.3 INSPECTION OF CONNECTION PLUGS AND SOCKETS

DANGER

The hydraulic system of the machine and carrier vehicle is under high pressure during operation.

Do NOT use an inoperative machine.

Damaged connection body or hydraulic or electric line socket body should be replaced. In the event of damage to cover or seal, change these elements for new reliable elements.

If the machine is disconnected from the carrier vehicle, secure the hydraulic plugs with covers and place them in the brackets intended for this purpose.

Hydraulic connections for connecting to carrier vehicle must be technically reliable and kept clean.

Each time before hitching the machine, inspect technical condition and cleanness of connections and sockets in carrier vehicle unit.

If necessary, clean or have the carrier vehicle sockets repaired.

Carrier vehicle and machine hydraulic systems are sensitive to the presence of permanent contamination, which may cause damage to precision system components (jamming of hydraulic valves, scratching of cylinder surfaces etc.)

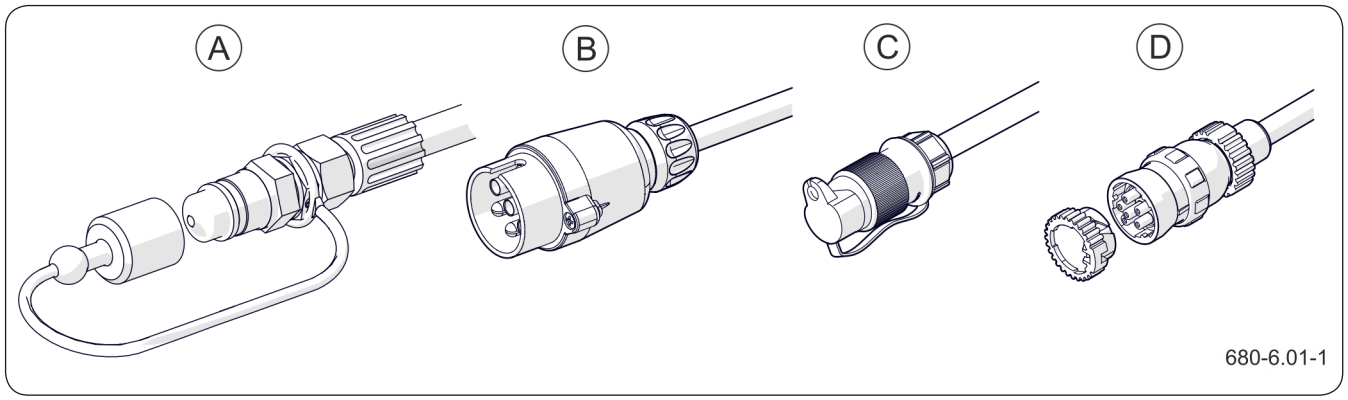

Figure 6.1 Machine's connections

(A) hydraulic plug
(B) 7-pin electrical plug for lighting
(C) 3-pin power supply electrical plug
(D) 5-pin control electrical plug

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6.4 OPERATING TIME SIGNALLING

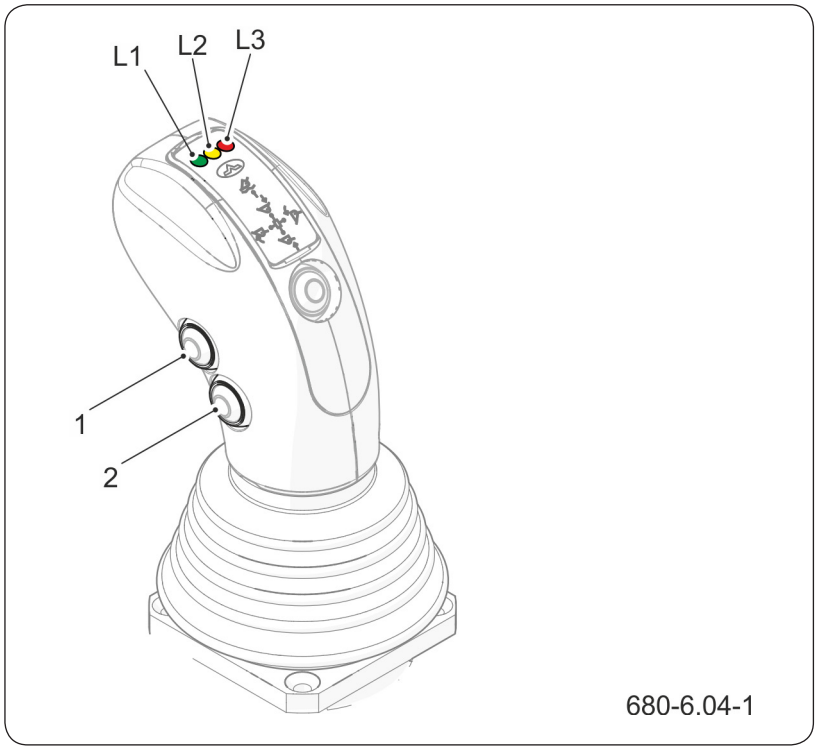
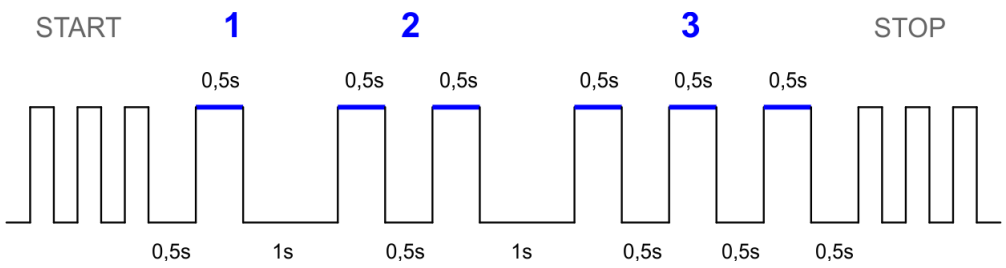


Figure 6.2 Control lever indicator diodes

(L1), (L2), (L3) control diodes
(1)+(2) buttons activating the operating time signalling

Operating time is signalled by a diode on the control lever. To activate the signaling, simultaneously press the button (1) and (2) responsible for controlling the front and rear flaps. The start and end of the operating time display is signalled by the lighting of all three diodes (L1, L2, L3) simultaneously. The operating time is indicated only by the diode (L2).

Table 6.3 Description of operating time signals

Meaning (1)	**Flash signal description**
START	Start of signalling: 3 signals, all three diodes simultaneously
1	1 beep for 0.5 seconds
2	2 beeps for 0.5 seconds with a 0.5 second break
3	3 beeps for 0.5 seconds with a 0.5 second break
4	4 beeps for 0.5 seconds with a 0.5 second break
5	5 beeps for 0.5 seconds with a 0.5 second break
6	6 beeps for 0.5 seconds with a 0.5 second break
7	7 beeps for 0.5 seconds with a 0.5 second break
8	8 beeps for 0.5 seconds with a 0.5 second break
9	9 beeps for 0.5 seconds with a 0.5 second break
0	1 beep for 1 second
STOP	End of signalling: 3 signals, all three diodes simultaneously
Example: **123** hours	

(1) *- 1 second pause between hours greater than 9, 99, 999.. etc.*

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6.5 INSPECT THE HYDRAULIC SYSTEM

DANGER

The hydraulic system is under high pressure when operating.

ATTENTION

Do NOT use the machine if the hydraulic system is unreliable.

DANGER

Repair or replacement of the hydraulic system components should be performed by suitably qualified personnel.

Check hydraulic system tightness,

1. Connect the machine to the carrier vehicle.
2. Connect all hydraulic system lines according to maintenance instructions.
3. Clean the system components.
4. Start all hydraulic systems in turn by extending and withdrawing the cylinder piston rods.
5. Repeat the above actions 3-4 times.
6. Leave the hydraulic cylinders in the maximally extended position.
7. Check all hydraulic components for tightness.

Inspect seals when cylinder piston rods are completely extended. If oil is found on hydraulic cylinder body, check origin of leak.

Minor leaks with symptoms of "sweating" are acceptable. If you notice drip leaks, do not use the machine until the fault is repaired.

If leaks appear at conduit connections then tighten the connections using the specified torque and recheck the connections. If the problem persists, have the leaking element replaced.

Inspect the technical condition of hydraulic connectors

Follow the steps described in:

📖 ***Inspection of connection plugs and sockets***

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6.6 REPLACEMENT OF HYDRAULIC HOSES

Rubber hydraulic hoses should be replaced every 4 years regardless of their technical condition. This operation should be entrusted to specialized workshops.

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6.7 MAINTENANCE OF ELECTRICAL SYSTEM AND WARNING ELEMENTS

ATTENTION

Do NOT travel with out of order lighting system. Damaged lamp lenses must be replaced immediately before travelling. Lost or damaged warning signs must be replaced.

Before driving on a public road, make sure all lamps and reflectors are clean.

Work connected with the repair, change or regeneration of electrical system components should be entrusted to specialist establishments, having the appropriate technology and qualifications for this type of work.

Your duties include only the technical inspection of the electrical system, additional lighting (if any) and warning signs (if any) and, if necessary, replacing fuses.

6.7.1 Check technical condition of electrical system

TIP

Light-emitting diodes (LED) are used as the source of light. Damaged lights can be replaced only as complete units. It is impossible to repair or regenerate them.

Procedure

1. Check if the connection wire is reliable. Check connection sockets in carrier vehicle and machine.
2. Connect the machine to the carrier vehicle with the appropriate connection cable.
3. Check the completeness, technical condition and correct operation of the electrical system.
4. Check wiring harnesses for damage (abrasion of insulation, broken leads, etc.). Check the completeness of lamps and reflective elements (if present).
5. Check the positioning of electrical cables on the carrier and machine to ensure they are protected against damage.

Table 6.4 List of lighting components

Lamp type Catalogue number	Lighting
Right/left combination lamp W145 1089/I LED	LED (not changeable)

6.7.2 Fuse replacement

The fuses are located in a housing located on the front of the machine. Access to the fuses is possible after removing the cover.

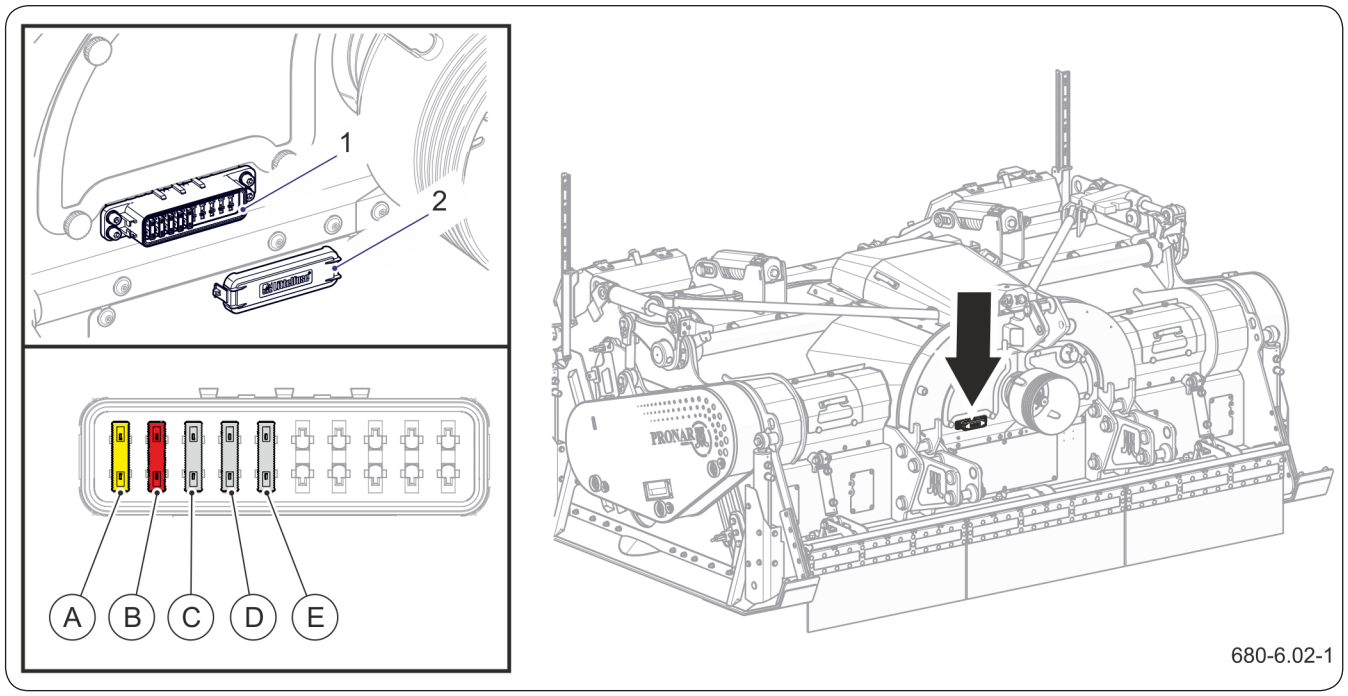

Figure 6.3 Fuses

(1) fuse box *(2) cover*

(A)..(E) fuses (description in the table "List of fuses")

Table 6.5 List of fuses

Marking	Description	Type
A	Controller supply	Unival 20A
B	Power supply for the input/output module	Unival 10A
C	Control lever (joystick) power supply	Unival 2A
D	Power supply of sensors	Unival 2A
E	Diagnostic socket	Unival 2A

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6.8 TIGHTENING TORQUES FOR SCREW CONNECTIONS

During maintenance and repair work, apply appropriate tightening torques to screw connections, unless other tightening parameters are given. Recommended tightening torques for the most commonly used bolted connections are shown in the Table *"Tightening torques for screw connections"*. The given values apply to non-lubricated steel bolts.

Hydraulic lines and other hydraulic components with rubber seals should be tightened with torque according to the Table *"Tightening torques of hydraulic elements"*.

Check the tightness using a torque wrench. During daily inspection of the machine pay attention to loose connections and tighten the connector if necessary. Replace the lost elements with new ones.

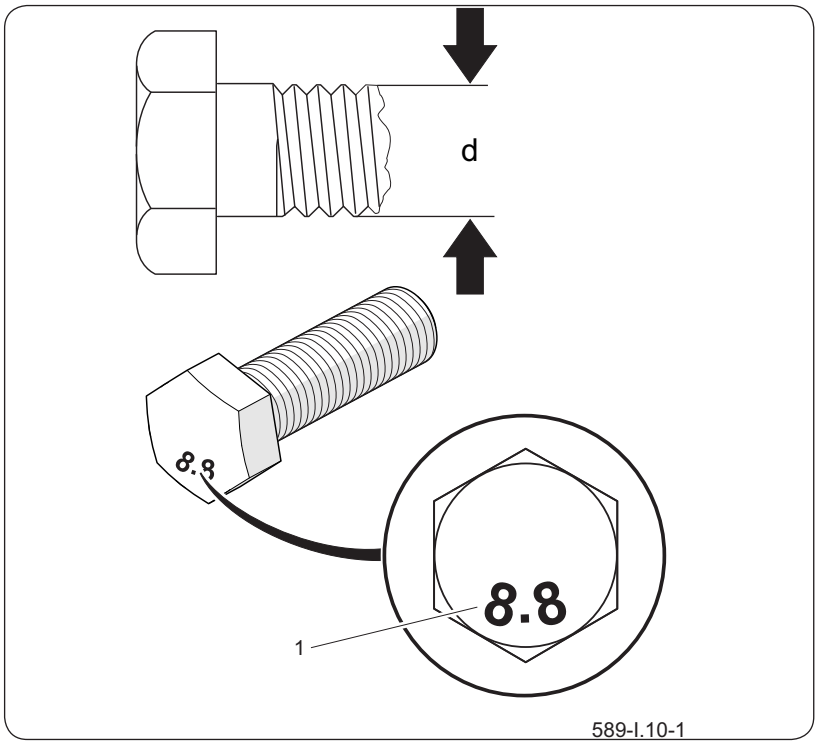

Figure 6.4 Screw with metric thread

(1) strength class, (d) thread diameter

Table 6.6 Tightening torques for screw connections

Metric		
	8.8(*)	**10.9**(*)
M8	25	36
M10	49	72
M12	85	125
M14	135	200
M16	210	310
M20	425	610
M24	730	1,050
M27	1,150	1,650
M30	1,450	2,100

(*) - strength class according to DIN ISO 898

Table 6.7 Tightening torques of hydraulic elements

Thread of nuts	Wire diameter DN (inch)	Tightening torques [Nm]
M10x1 | M12x1.5 | M14x1.5	6 (1/4”)	30÷ 50
M16x1.5 | M18x1.5	8 (5/16”)	30÷ 50
M18x1.5 | M20x1.5 | M22x1.5	10 (3/8”)	50÷ 70
M22x1 | M24x1.5 | M26x1.5	13 (1/2”)	50÷ 70
M26x1.5 | M27x1.5 | M27x2	16 (5/8”)	70÷ 100
M30x1.5 | M30x2 | M33x1.5	20 (3/4”)	70÷ 100
M38x1.5 | M36x2	25 (1”)	100÷ 150
M45x1.5	32 (1.1/4”)	150÷ 200

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6.9 DRIVE TRANSMISSION SYSTEM MAINTENANCE

DANGER

Perform all activities related to the operation of the drive transmission with the machine switched off and secured against accidental or unauthorized start-up.

DANGER

The transmission may become very hot during operation.

Do not touch the transmission immediately after the machine has stopped.

Drive transmission system maintenance involves:

- periodic inspection and adjustment of belt tension of belt transmissions,
- checking and changing the oil in the central gearbox,
- periodic inspection and replacement of oil in the working shaft gears.
- lubrication of telescopic shafts in accordance with the shaft manufacturer's recommendations.

Before measuring the oil level in the gears, the machine should be positioned horizontally.

It is best to change oil immediately after completing work when the gear is still hot and impurities are suspended in oil. Perform all oil change activities when the machine is level and resting on the ground.

If you notice a leak, carefully inspect the seal and check the oil level. Operating the transmission with insufficient amount of oil or without oil may cause permanent damage.

6.9.1 Central transmission

ATTENTION

Repairs of the transmission during warranty period may only be performed at authorised mechanical workshops.

To check the oil level in the central gear, remove the cover (1). Unscrew the inspection plug (5). The correct oil level (A) in the central gear should reach the lower edge of the inspection hole secured with the inspection plug (5). To top up the oil, use the filler hole secured with a breather plug (4) located under the top cover (3).

Changing the oil in the central gearbox:

1. Prepare a suitable container for used oil.
2. Remove the cover (2) under the gearbox.
3. Remove the top cover (3).

TIP

Oil in central gear must be changed after the first 50 hours of work. The next oil changes should be made every 500 hours or once a year (whichever occurs first).

4. Unscrew filler plug (4) and inspection plug (5).
5. Pull out the drain hose, unscrew the plug (6) and drain the oil into the container.
6. Tighten drain plug (6).
7. Pour new oil through the filler hole (4) until oil appears in the inspection hole (5).
8. Tighten inspection plug (5) and filler plug (4)
9. Install all previously removed covers.

TIP

The central gearbox uses ISO VG 150 EP or SAE 90 EP oil in the amount of 6 litres.

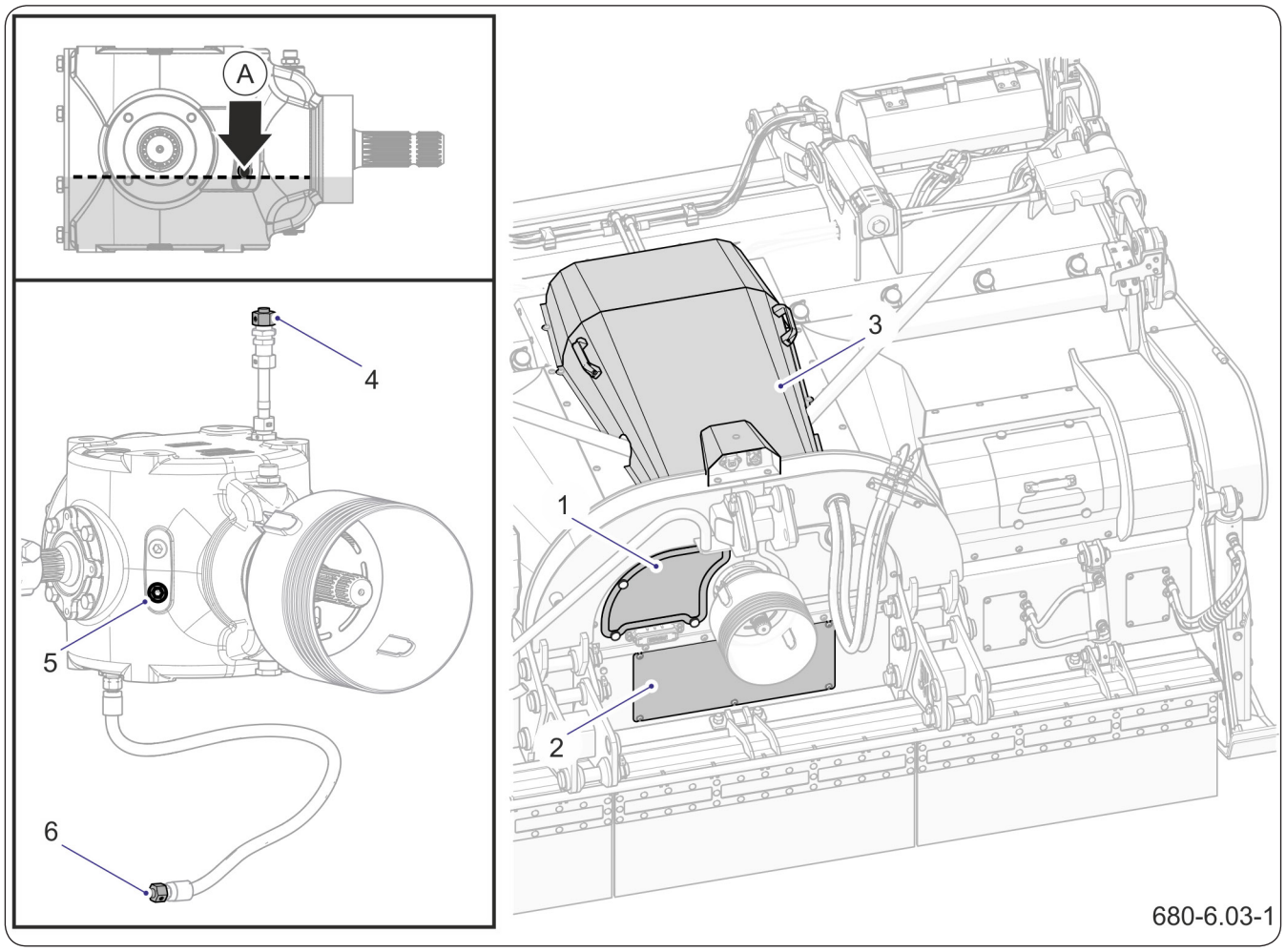

Figure 6.5 Check and change of oil in central gear

(1) center cover *(2) lower cover* *(3) upper cover*
(4) filler plug, *(5) inspection plug,* *(6) drain plug*
(A) correct oil level

TIP

Oil in both gearing shafts must be changed after the first 50 hours of work. The next oil changes should be made every 500 hours or once a year (whichever occurs first).

ATTENTION

If the operating conditions cause the permissible gear temperature - 90 °C to be exceeded, work breaks should be taken to cool the system.

TIP

The cylindrical gear unit uses ISO VG 150 EP or SAE 90 EP oil in the amount of 11 litres.

Before checking or changing the oil, place the machine horizontally, raise the side covers to the upper end position and lower the working shaft to the lower end position. Remove the lower cover (3) of the gearbox. The correct oil level in the working shaft gear should reach the lower edge of the inspection and filling hole secured with a plug (1).

Changing the oil in the shaft gear:

1. Prepare a container for used oil.
2. Unscrew filler plug (1).
3. Unscrew the drain plug (2) and drain the oil into a container.
4. Tighten the drain plug (2),
5. Pour new oil through the filler hole until the oil flows out of the hole (1).
6. Tighten filler plug (3) and inspection plug (2).
7. Do the same for the second gear.

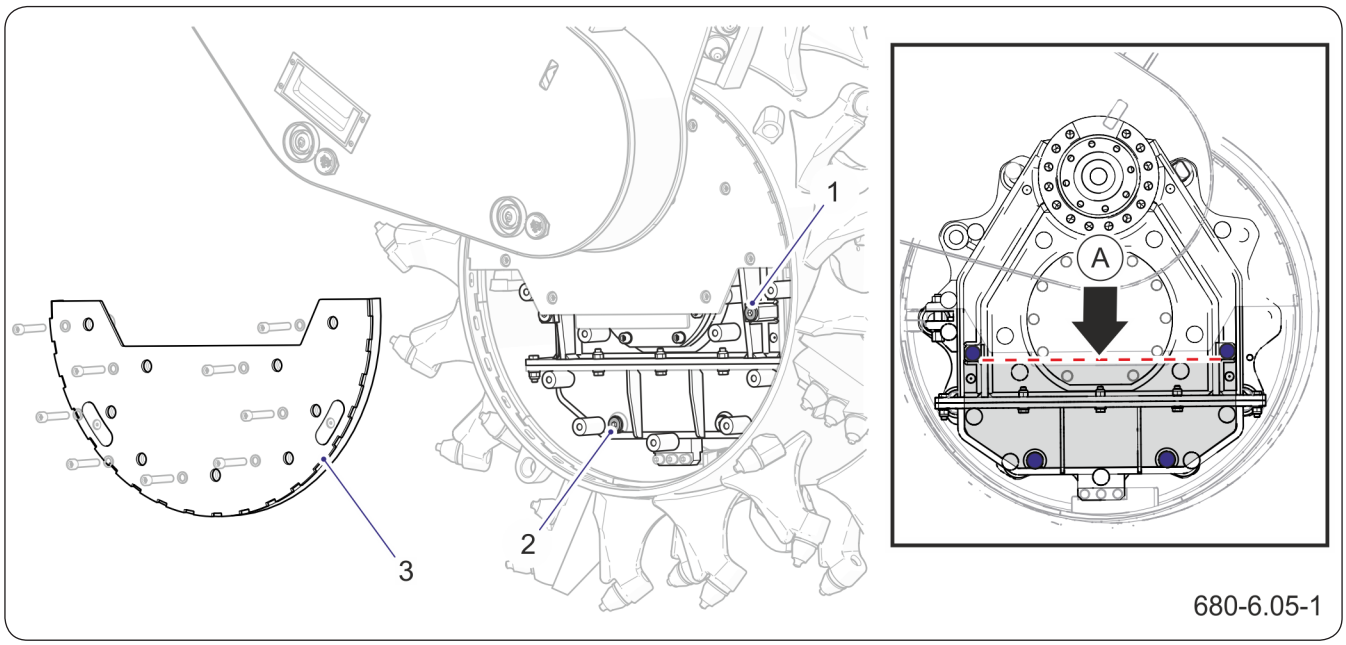

Figure 6.6 Checking and changing the oil in the cylindrical gears of the working shaft

(1) lower cover *(2) inspection and filler plug* *(3) drain plug*

(A) correct oil level

6.9.3 Vee belt transmissions

DANGER

Do not open covers and shields while the machine is operating.

TIP

The belt tension frequency measured with the Optibelt TT meter should be 26.5+/-0.5 Hz.

Belt drive inspection

The Optibelt TT belt tension frequency meter included with the machine is used to check the tension of the transmission belts.

1. Unlock the locks (1), open the cover (2) and lock it in the upper position using the lock (6).
2. Visually assess the technical condition of the belts and the cleanliness of the pulley grooves.
3. Check the alignment and coaxiality of the pulleys.
4. Check the tension of the transmission belts and adjust if necessary.
5. Close the cover (2) and lock the locks.

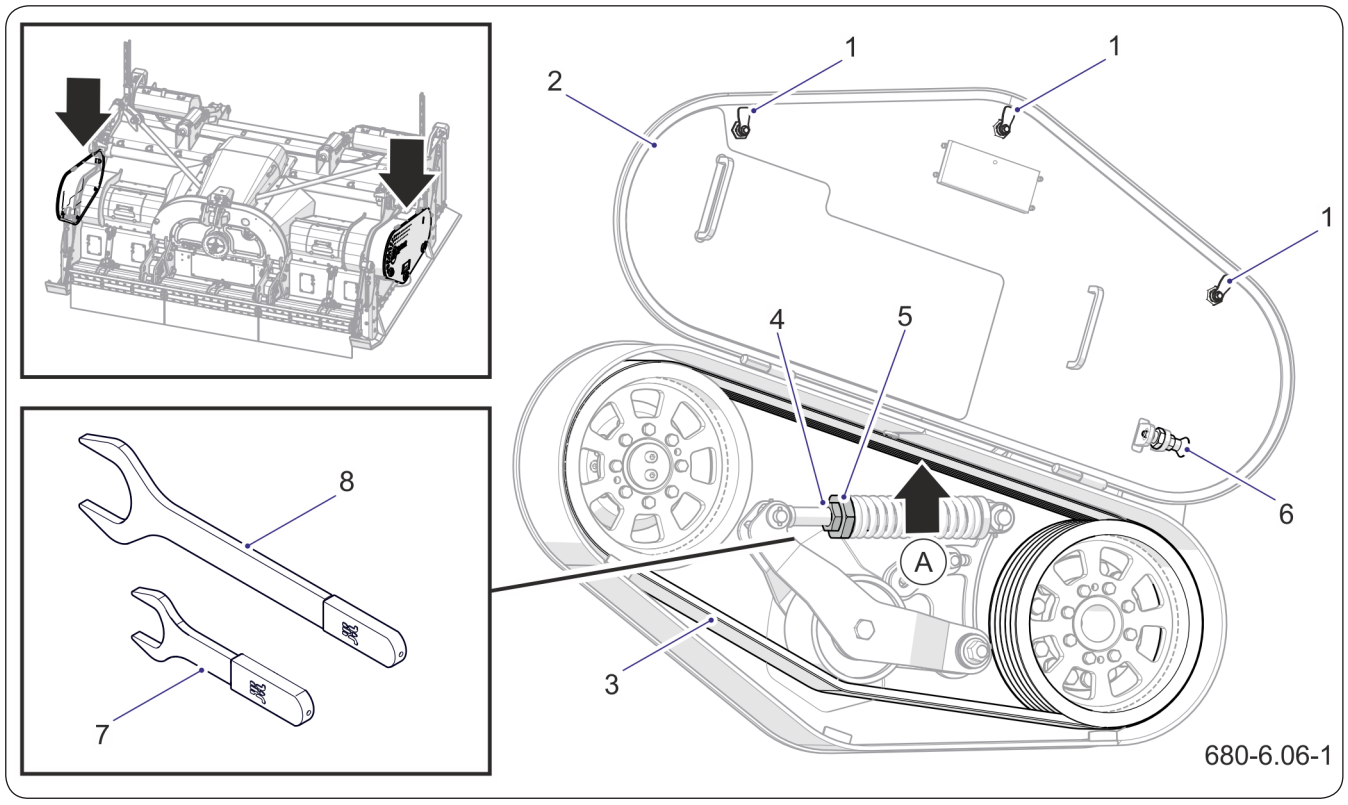

Figure 6.7 Checking and adjusting the belt drive

(1) lock *(2) cover guard* *(3) V-belt* *(4) locking nut*
(5) adjusting nut *(6) locking device* *(7) size 46 wrench* *(8) size 70 wrench*
(A) measuring point

ATTENTION

The belt tension in both gears should be the same.

ATTENTION

When operating the Optibelt TT belt tension frequency meter, follow the instructions in the device manufacturer's operating instructions.

TIP

5-SPB 2800 Blue Power belts were used to drive the belt transmissions.

DANGER

Do not touch the telescopic shaft immediately after stopping the machine!

The shafts are equipped with friction clutches, which can become hot during slipping.

Belt tension adjustment

1. Unlock the locks (1), open the cover (2) and lock it in the upper position using the lock (6).
2. Using the supplied size 46 wrench, loosen the lock nut (4).
3. Using the supplied size 70 wrench, adjust the belt tension by turning the adjusting nut (5).
4. Check the belt tension using a tension meter by measuring at point (A).
5. Tighten lock nut (4).
6. Unlock, close the cover and lock the locks.
7. The belt tension of both transmissions is adjusted in the same way.

PTO shafts

Perform technical service on PTO shafts in accordance with the shaft manufacturer's recommendations. To facilitate access to the shafts connecting the central gearbox and the side belt drives, the machine frame is equipped with inspection covers (1) secured with screws (2).

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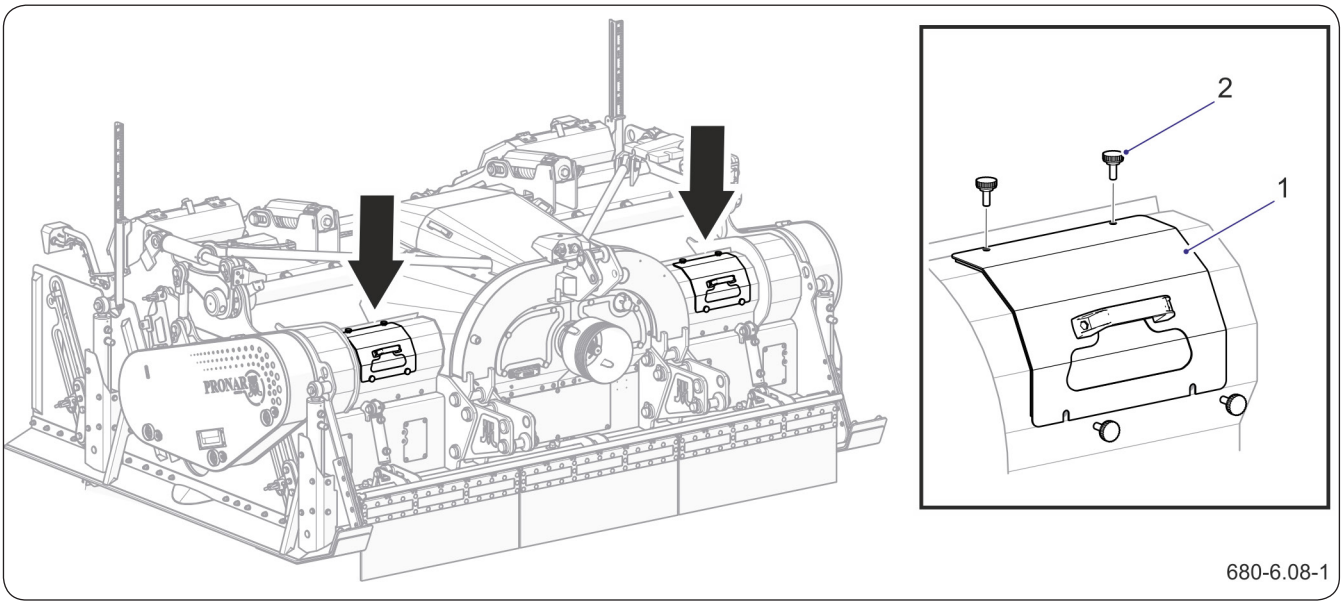

Figure 6.8 Inspection covers for operating PTO shafts

(1) cover *(2) screw*

6.10 OPERATING THE WORKING ROLLER

6.10.1 Working shaft rear flap lock

DANGER

When inspecting and replacing the teeth, the rear flap of the working shaft must be locked in the upper position, the side guards must be lowered and locked, the carrier engine must be turned off, and the cabin must be secured against access by unauthorized persons.

The rear flap lock is used when checking and replacing the working shaft teeth.

Procedure sequence:

1. Remove the locking pins (2) from the cover hole on both sides of the machine - position (A).
2. Raise the flap (1) to the upper end position to control the machine functions.

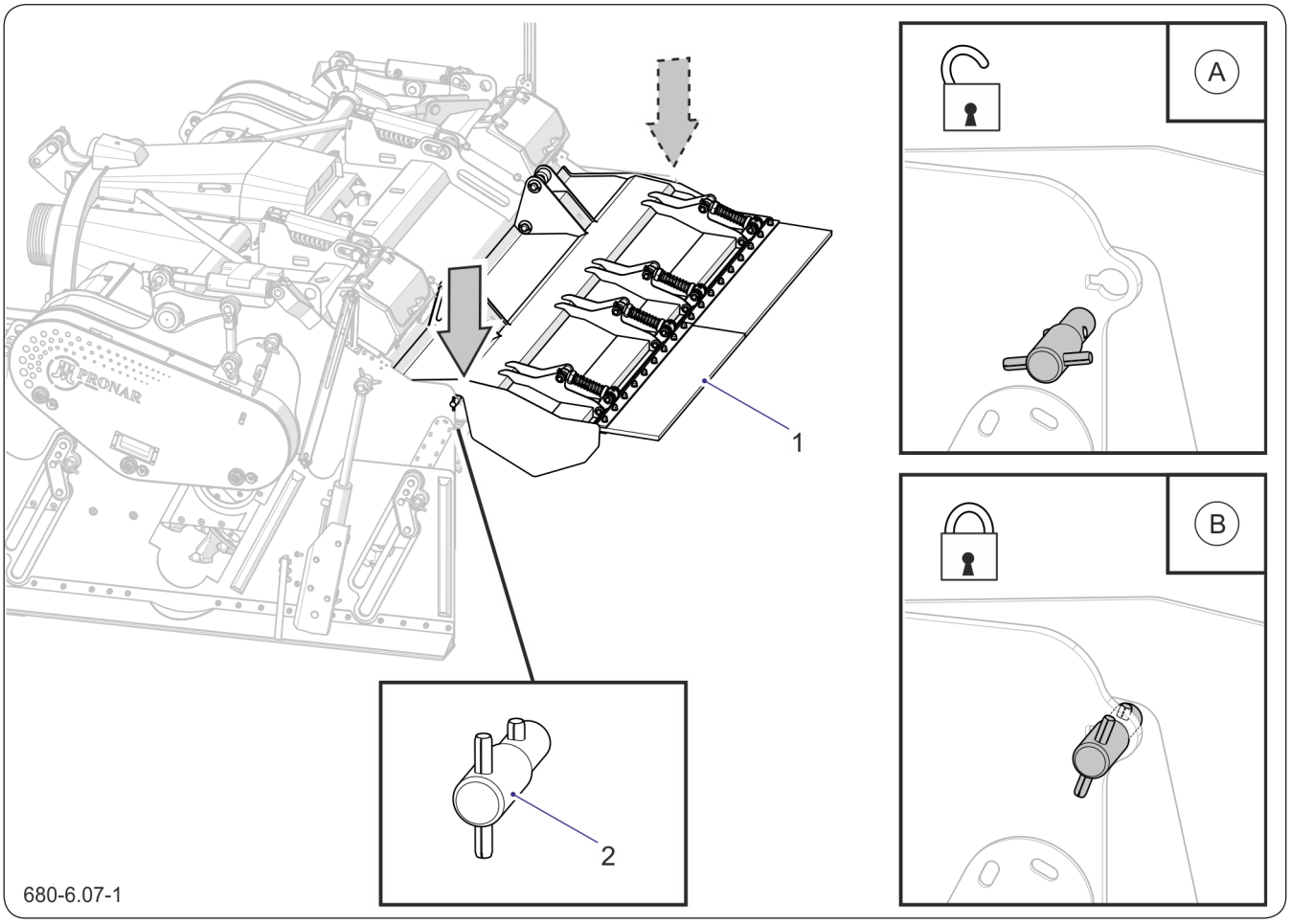

Figure 6.9 Working shaft rear flap lock

(1) rear flap of the working shaft *(2) locking pin*

(A) flap unlocked *(B) flap locked*

3. Insert the lock pins and rotate to secure - position (B).
4. Do the same on the other side.
5. To unlock the flap, perform all steps in reverse order.

6.10.2 Replacement of roller teeth

TIP

The condition of the working roller teeth should be checked every day before starting work. Working your teeth with a worn collar wears out the seat.

Depending on demand, the working roller can be equipped with various types of working teeth. Every day while working with the machine, check the technical condition and completeness of the working teeth. The roller teeth may need to be replaced after some time of use.

TIP

It is recommended to store the tooth replacement punch in a box on the machine frame.

Procedure sequence:

1. Lower both side covers to their lowest position and lock them in this position.
   📖 ***page 5.29 "Locking the side covers of the working chamber"***
2. Raise the rear flap as far as possible and lock it.
3. Using a hammer and a punch (1) or (2) (depending on the type of shaft), knock out the damaged tooth.

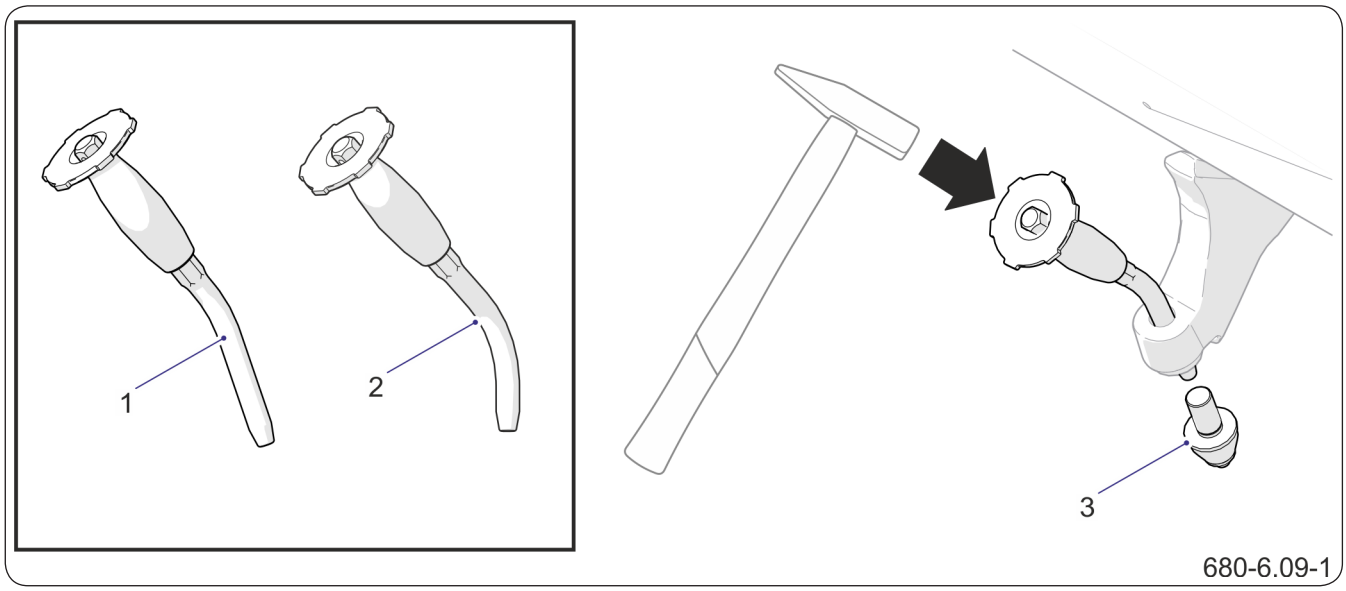

Figure 6.10 Dismantling the teeth of the working roller

(1) long punch *(2) short punch* *(3) tooth*

ATTENTION

When replacing teeth, do not strike the carbide directly with steel objects. Use a copper, brass or hard plastic hammer to install the teeth. For disassembly, use the punches supplied with the machine.

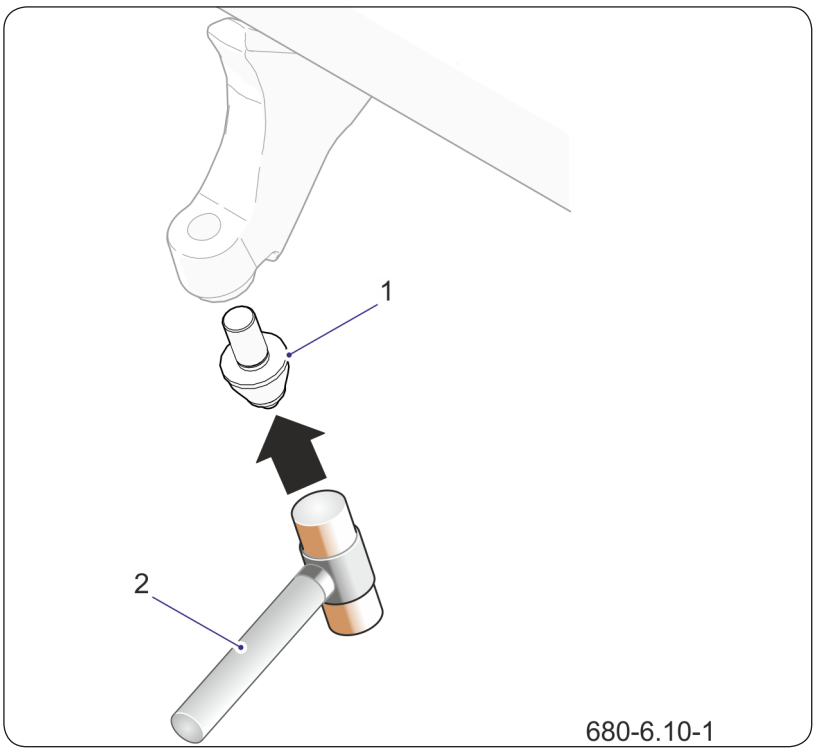

Figure 6.11 Installation of the working roller teeth
(1) tooth *(2) copper hammer*

4. Clean the tooth socket.
5. Install the new tooth using a copper, brass or hard plastic hammer.
6. Unlock and lower the rear flap of the working shaft and unlock the side covers.

Table 6.8 List of teeth depending on the working shaft

Part No.	Quantity
Shaft 680N-07000000-01	
RX22/HDR	120 pcs
RX22/HD	120 pcs
Shaft 680N-07000000-02	
RX22/HDR	112 pcs
RX22/HD	112 pcs

ATTENTION

Regeneration and replacement of the working roller can only be carried out by the machine manufacturer.

ATTENTION

Regeneration works, depending on their scope and location on the roller, may lead to loss of permissible balance. It is recommended to perform balancing when vibrations are greater.

Regeneration of the working roller

The working roller can be regenerated if:

- deposits of the tooth frames will be worn off - resurfacing required,
- wear of the tooth setting is greater than 3 mm of wall thickness - replacement of elements required,
- wear of the tooth body exceeds 20mm in thickness - replacement of elements required
- the working roller tube shows wear of 5mm wall thickness (minimum wall thickness 15mm) - replacement the roller with a new one required.

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6.11 LUBRICATION

TIP

The maintenance intervals given in the user manual refer to normal operating conditions. In difficult operating conditions, it is recommended to increase the frequency of maintenance.

TIP

The lubrication frequency is described in the table: *Machine lubrication schedule*):

D - working day (8 hours of machine use)

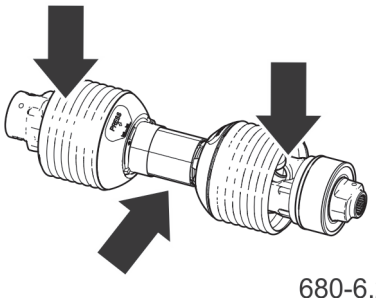
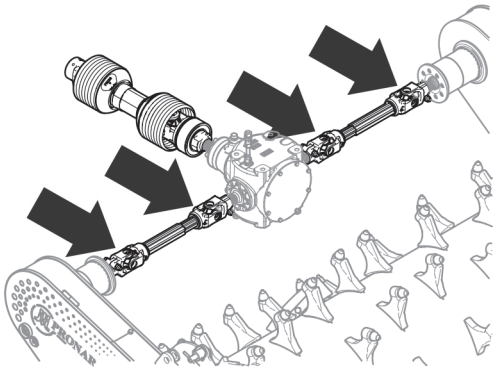
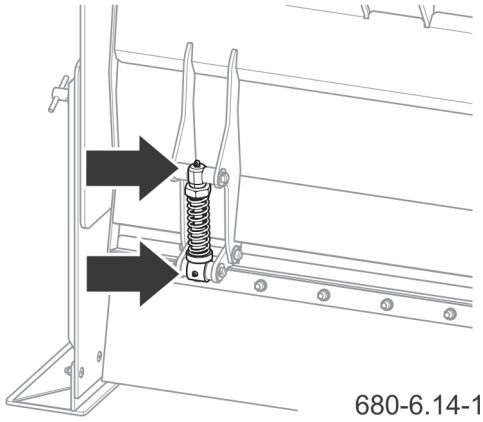
M - month

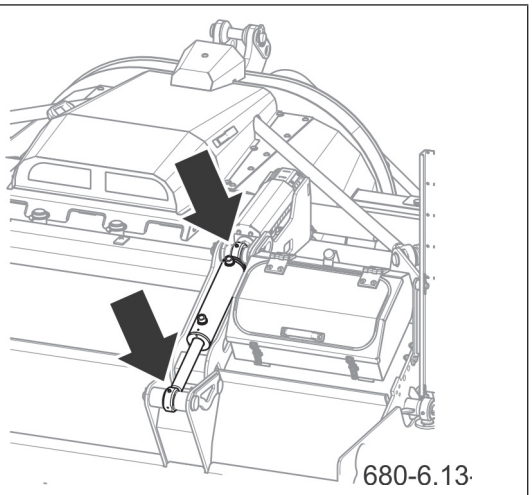
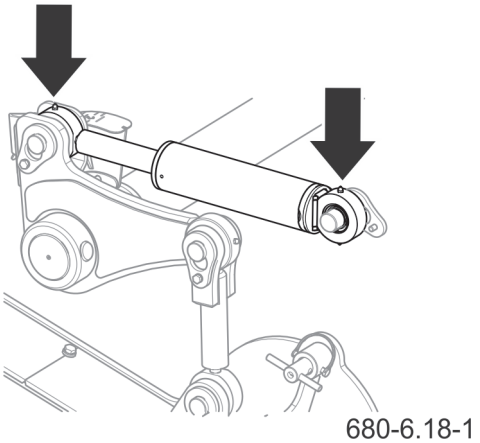
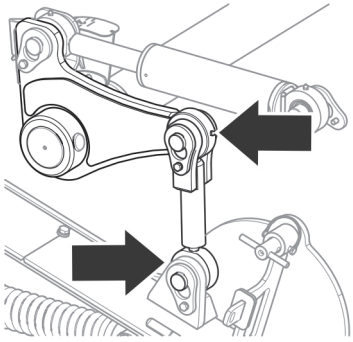
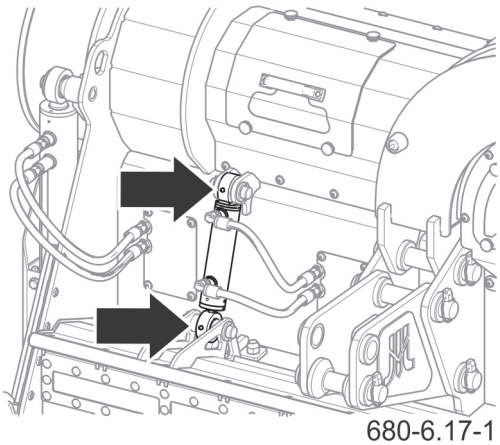
- Machine lubrication should be performed with the aid of a manually or foot operated grease gun, filled recommended grease. Before starting lubrication, remove old grease and other contamination. After completed lubrication, wipe off excess grease.
- Parts to be lubricated with machine oil should be wiped with dry clean cloth. Apply oil to their surfaces using a brush or oil can. Wipe off excess oil.
- Empty grease or oil containers should be disposed of according to the recommendations of the lubricant Manufacturer.
- If the machine will not be used for more than a month, lubrication should be carried out regardless of the period of the last treatment

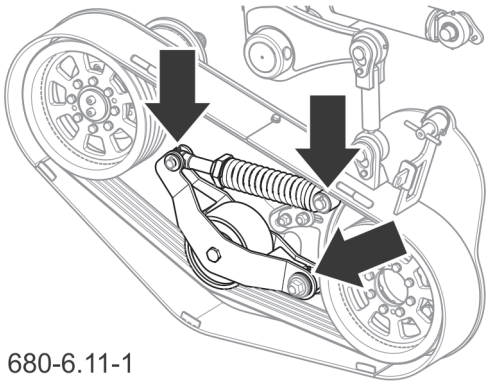
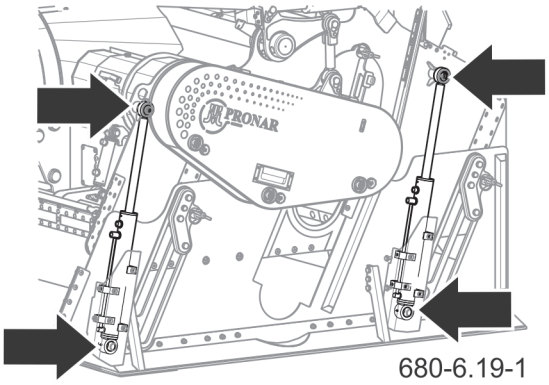
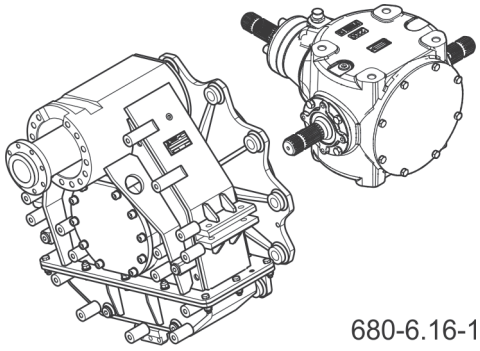
Table 6.9 Lubricants

Item	Symbol	Description
1	A	machine general-purpose grease (lithium, alkaline),
2	B	Grease for heavily loaded elements with addition of MoS_2 or graphite
3	C	anticorrosion preparation in aerosol
4	D	ordinary machine oil, silicon grease in aerosol
5	E	ISO VG 150 EP or SAE 90 EP gear oil

Table 6.10 Machine lubrication schedule

Name	Number of lubrication points	Type of grease	Frequency	
Telescopic shaft pipes and joints*	1	B	2D	 680-6.21-1
Joints of the telescopic PTO connecting the gearboxes	6	B	2D	 680-6.20-1
Scraper pressure spring mounting pins	8	A	7D	 680-6.14-1

Bearing of the cylinder eye of the working shaft of the rear flap	4	A	7D	 680-6.13
Bearing of the cylinder eye of the working shaft lifting mechanism	4	A	7D	 680-6.18-1
Bearing of the working shaft lifting mechanism rod	4	A	7D	 680-6.12-1
Bearing of the cylinder eye of the working shaft front cover	4	A	7D	 680-6.17-1

Belt tensioner mechanism	6	B	7D	 680-6.11-1
Bearing of the cylinder eye of the side cover	8	A	7D	 680-6.19-1
Central transmission Gearing shaft	1 2	E	12M or 500 hours	 680-6.16-1

**- For detailed information on operation and maintenance please refer to Operator Manual enclosed with the shaft.*
D - day, M - month

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6.12 CONSUMABLES

6.12.1 Hydraulic oil

TIP

The hydraulic system of the machine uses L-HL 46 oil.

Always adhere to the principle that the oil in the machine hydraulic system and in the tractor hydraulic system are of the same type. In the event of application of different types of oil make certain that both hydraulic substances may be mixed together. Application of different oil types may cause damage to machine or tractor. In a new machine, the hydraulic system is filled with L-HL46 hydraulic oil.

If it is necessary to change hydraulic oil for another oil, check the recommendations of the oil Manufacturer carefully. If it is recommended to flush the system with the appropriate preparation, then comply with these recommendations. Make sure that the chemicals used for this purpose do not damage the materials of the hydraulic system. During normal machine use change of hydraulic oil is not necessary, but if required, this operation should be entrusted to a specialist service point.

Because of its composition the oil applied is not classified as a dangerous substance, however long-term

Table 6.11 Characteristics of L-HL 46 hydraulic oil

Item	Name	Unit	
1	ISO 3448VG viscosity classification	-	46
2	Kinematic viscosity at40°C	mm^2/s	44.3
3	ISO ISO 6743-4 quality classification	-	HL
4	DIN 51524/1 quality classification	-	HL
5	ISO 11158 quality classification	-	HL
6	Flash-point	°C	224
7	Flow temperature	°C	-28

DANGER

Do not use water to quench oil fires!

action on the skin or eyes may cause irritation. In the event of contact of oil with skin wash the area 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 carbon dioxide, foam or extinguisher steam.

6.12.2 Lubricants

TIP

The lubrication frequency is shown in table *Machine lubrication schedule*).

For heavily loaded parts it is recommended to apply lithium greases with addition of molybdenum disulphide (MOS2) or graphite. In the case of less loaded sub-assemblies the application of general purpose machine greases is recommended, which contain anticorrosion additives and have significant resistance to being washed away by water. Aerosol preparations (silicon greases and anticorrosive-lubricating substances) should have similar characteristics.

Before starting to use greases acquaint oneself with the content off the information leaflet for the chosen product. Particularly relevant are safety rules and handling procedures for a given lubricant as well as waste disposal procedure (used containers, contaminated rags etc.). Keep the information leaflet (product card) together with the lubricant.

6.12.3 Gear oil

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Table 6.12 Characteristics of gear oil FUCHS RENOLIN CLP 150

Item	Name	Unit	
1	Classification according to ISO 3448VG	-	150
2	Viscosity index	-	96
3	Viscosity at 100°C	mm^2/s	14.5
4	Viscosity at 40°C	mm^2/s	150
5	Density at 15°C	kg/m^3	894
6	Fluidity loss temperature	°C	-24
7	Flash-point	°C	250

TIP

FUCHS RENOLIN CLP 150 - ISO VG 150 EP gear oil was used in the central gear and both gearing shafts

6.13 TROUBLESHOOTING

Table 6.13 Troubleshooting

Problem	Possible cause	Solution
Excessive vibration	Damage or loss of teeth on the working roller.	Check condition and completeness, replace missing teeth if necessary.
	Loss of factory balance of the working roller due to damage to the roller, its teeth, and repeated repairs of worn out elements.	Have the shaft balanced by the machine manufacturer.
	Uneven wear of the working roller teeth.	Replace excessively worn teeth.
	A stuck foreign body.	Remove the blockage.
The working roller rotates at an inappropriate speed.	Incorrect selection of the carrier's vehicle PTO rotational speed.	Select the appropriate PTO speed.
	Incorrect transmission belt tension.	Adjust the belt tension according to the instructions.
The operating roller does not rotate or stops during operation	Material entangled in the working roller, e.g. cables, ropes, wire	Remove the blockage.
	Gear failure.	Get it repaired.
The machine control is not working	Hydraulic connectors not properly connected to the carrier vehicle.	Check the compatibility of connector types and correct connection.
	Damaged hydraulic lines	Replace damaged lines.
	Electrical system is not connected.	Connect.
	Faulty wiring.	Get it repaired.
	Burnt out fuse.	Replace it.

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