INTRODUCTION

Information contained herein is current at date of publication. As a result of improvements, some numerical values and illustrations contained in this publication may not correspond to the factual specification of the machine supplied to the user. The manufacturer reserves the right to introduce design changes in machines produced that facilitate operation and improve the quality of their work, without making minor amendments to this Operator's Manual.

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

The manual describes the basic safety rules and operation of mobile trommel screen PRONAR MPB18.47.

If the information stated in the Operator's Manual needs clarification then the user should refer for assistance to the sale point where the machine was purchased or to the Manufacturer.

MANUFACTURER'S ADDRESS:

PRONAR Sp. z o.o.
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17-210 Narew

CONTACT TELEPHONES

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SYMBOLS APPEARING IN THIS OPERATOR'S MANUAL

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

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

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

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

Additional tips and advice for machine operation are marked:

and also preceded by the word **"TIP".**

DIRECTIONS USED IN THIS OPERATOR'S MANUAL

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).

REQUIRED SERVICE ACTIONS

Service actions described in the manual are marked: ➡
Result of service/adjustment actions or comments concerning the performance of actions are marked: ⇨

GLOSSARY OF TERMS USED IN THE OPERATOR'S MANUAL

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

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

Agricultural tractor - 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.

ABS - Antilock Braking System – the system that prevents vehicle wheel locking during braking.

ALB - Automatic load dependent brake control - automatic adjustment of braking force dependent on trailer load

CAN - Controller Area Network – serial communication bus

ECU - Electronic Control Unit – electronic controller of braking system

TEBS G2- Trailer Electronic Braking System – the second generation electronic braking system for trailers

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EC DECLARATION OF CONFORMITY OF THE MACHINERY

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

Description and identification of the machinery	
Generic denomination and function:	**Mobile drum screen**
Type:	**MP-1**
Model:	**MPB18.47**
Serial number:	
Commercial name:	**Mobile drum screen PRONAR MPB18.47**

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

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

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

Z-CA DYREKTORA
d/s [illegible]
[illegible] Zarządu
Roman Omelaniuk

Narew, the 2013-12-11

Place and date

Full name of the empowered person position, signature

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Section

1

BASIC INFORMATION

1.1 IDENTIFICATION OF MACHINE AND ITS MAIN SUBASSEMBLIES

1.1.1 IDENTIFICATION OF TROMMEL SCREEN

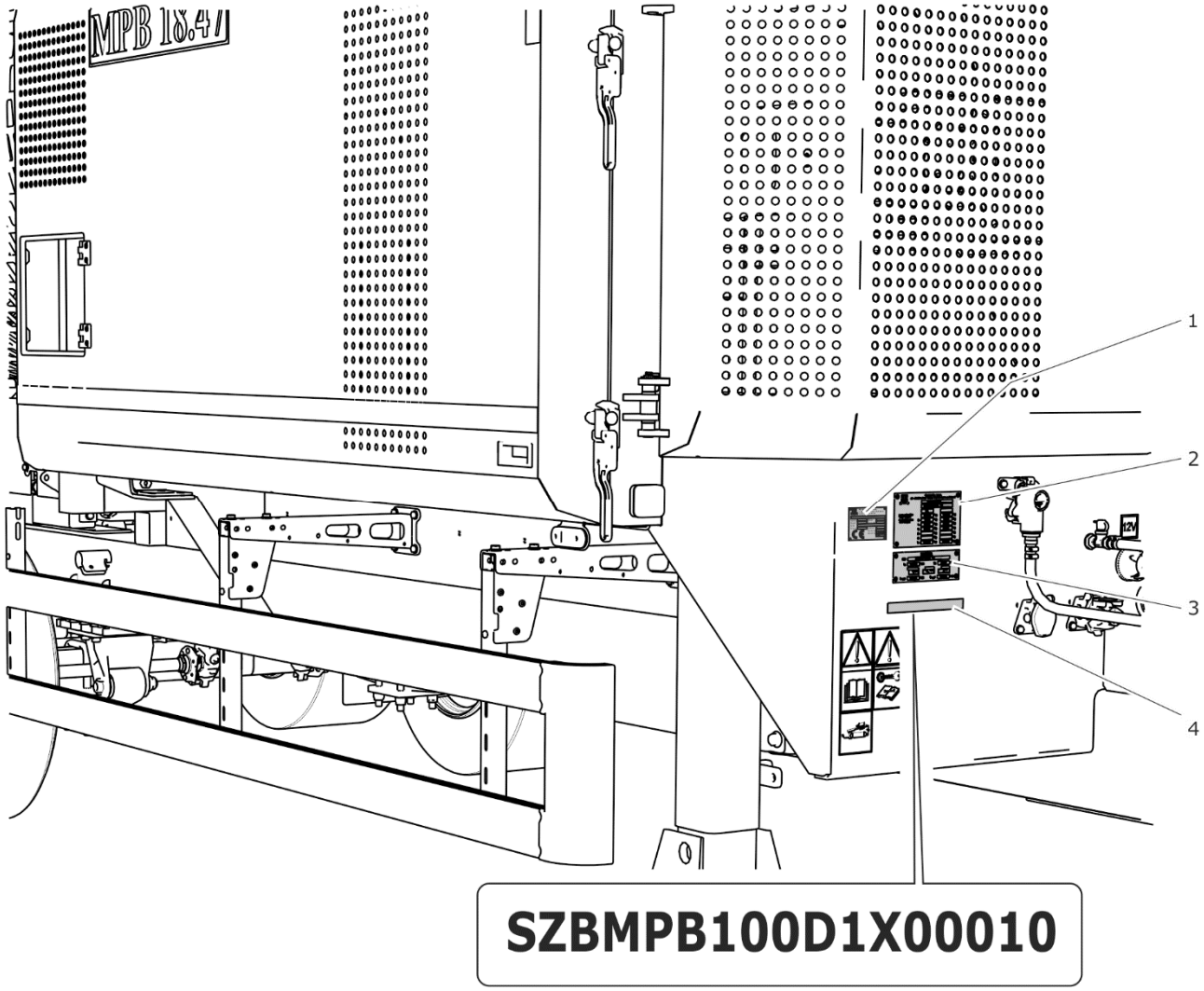


FIG. 1.1 *Marking of mobile trommel screen*

(1) data plate *(2) data plate* *(3) dimensional plate*

(4) example of VIN number

Markings of the mobile trommel screen in the form of a dimensional plate, two data plates and VIN number are located on the front profile of the lower frame on the right side of the machine – figure (1.1). When buying the machine check that the serial numbers on the machine agree with the number written in the *WARRANTY BOOK* and in the sales documents.

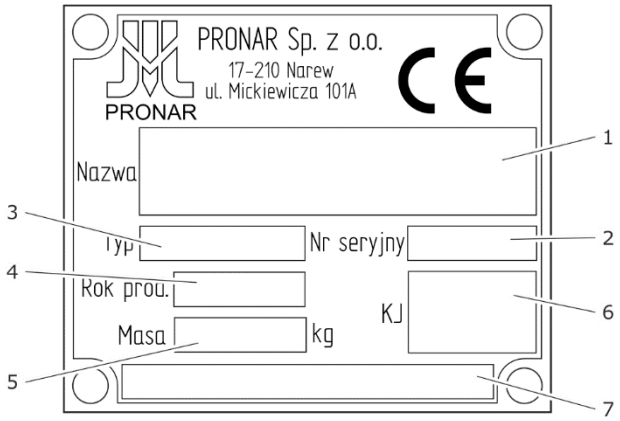


FIG. 1.2 *Data plate*

(1) machine name *(2) serial number*

(3) type *(4) year of manufacture*

(5) gross weight *(6) Quality Control stamp*

(7) machine name, name extension

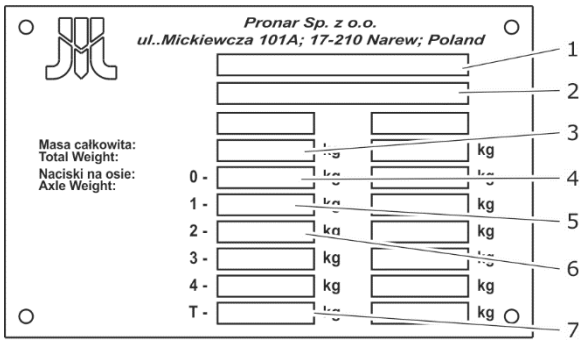


FIG. 1.3 *Data plate*

(1) official certificate number *(2) VIN number*

(3) gross weight *(4) hitch load*

(5) axle 1 load *(6) axle 2 load*

(7) maximum gross weight for a group of axles

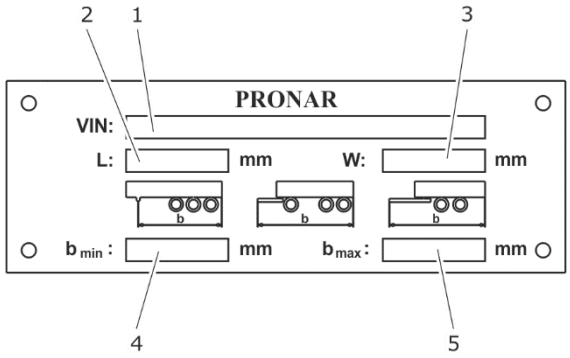


FIG. 1.4 *Dimensional plate*

(1) VIN number *(2) total length*

(3) total width

(4) minimum length measured to the hitch axis

(5) maximum length measured to the hitch axis

1.1.2 AXLE IDENTIFICATION

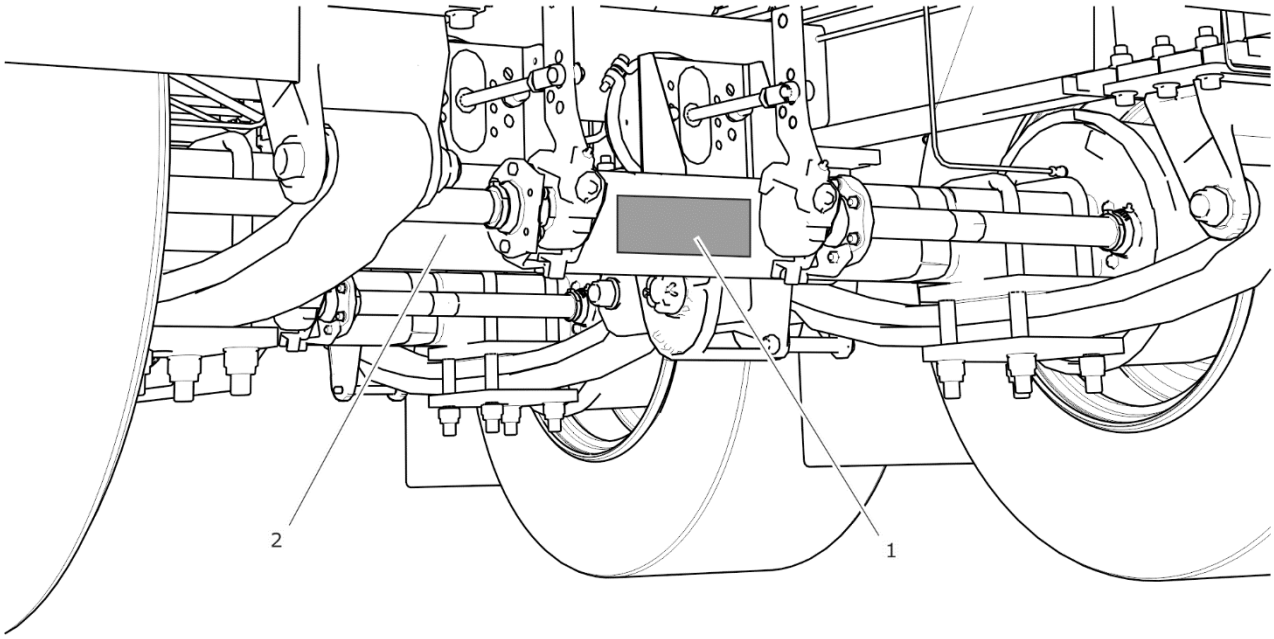


FIG. 1.5 *Location of the axle data plate*

(1) data plate *(2) wheel axle*

1.1.3 IDENTIFICATION OF COMBUSTION ENGINE

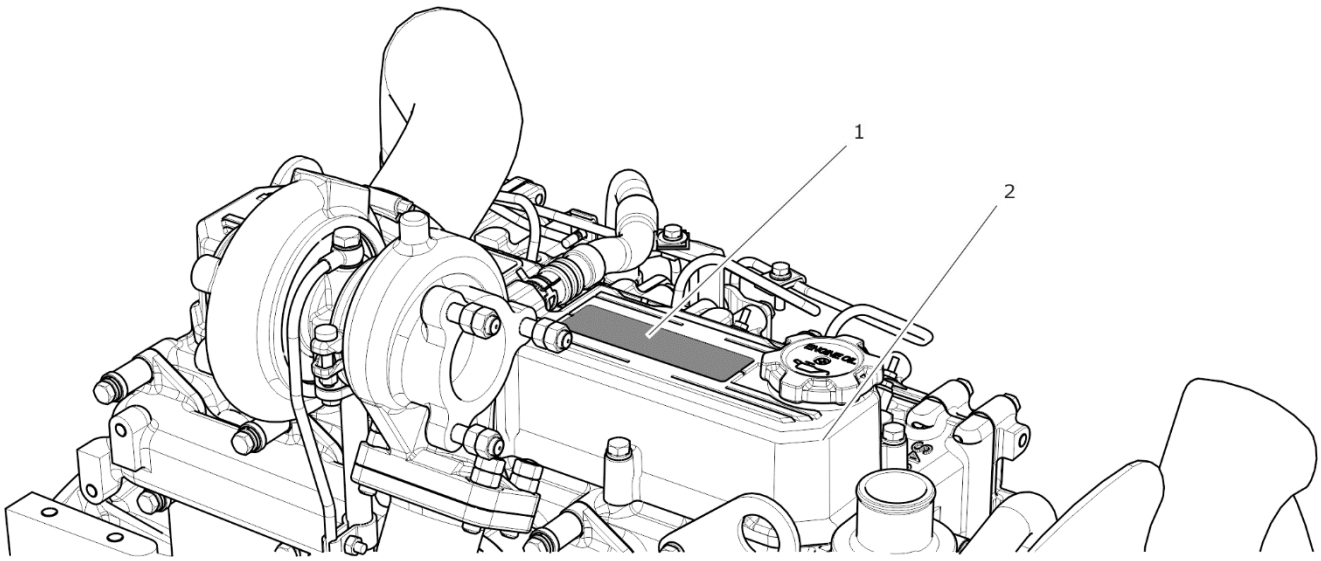


FIG. 1.6 *Location of the engine data plate*

(1) data plate *(2) engine valve cover*

1.1.4 LIST OF SERIAL NUMBERS

TIP

It is recommended that the factory numbers of the axles, the serial number of the mobile trommel screen and the engine serial number are inscribed in the spaces below after purchase of the machine.

SERIAL NUMBER OF MOBILE TROMMEL SCREEN

S	Z	B	M	P	B	1	0	0			X					

SERIAL NUMBER OF FRONT AXLE

SERIAL NUMBER OF REAR AXLE

ENGINE SERIAL NUMBER

1.2 PROPER USE

Mobile trommel screen Pronar MPB18.47 is designed for screening charge material into fractions and sorting charge material. Depending on the drum installed, the machine can be used for screening disintegrated municipal waste and construction waste, construction materials (sand, gravel), compost, earth, wood chips and bark, ash, slag, biomass and similar materials. The trommel screen is designed only for processing dry materials. The machine is not intended for screening the following materials:

- lump materials (large pieces of rubble, stones, wood),
- long materials (steel bars, wooden beams and slats, steel strips, flat bars),
- dangerous, toxic and caustic materials,
- semi-fluid materials,
- and other materials whose weight, shape or chemical properties may cause damage to conveyor belts, drum and other structural elements of the machine.

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

In connection with this the user is obliged to:

- carefully read the *OPERATOR'S MANUAL*of the trommel screen and the *WARRANTY BOOK*and conform with the recommendations contained in these documents,
- understand the machine's operating principle and how to operate it safely and correctly,
- adhere to the established maintenance and adjustment plans,
- comply with general safety regulations while working,
- prevent accidents,
- comply with the road traffic regulations in force in a given country, in which the trommel screen is used,
- carefully read the truck tractor Operator's Manual and comply with its recommendations,
- only hitch the trommel screen to a truck tractor which fulfils all the requirements specified by the trommel screen's Manufacturer.

IMPORTANT!

The mobile trommel screen must not be used for purposes other than those for which it is intended.

Screening of forbidden materials will invalidate the guarantee.

The trommel screen may only be used by persons, who:

- are familiar with the contents of the publications and documents delivered with the machine and with the contents of the truck tractor Operator's Manual,
- have been trained in trommel screen service and safe operation,
- are qualified to drive truck tractors, in the event of the machine transport.

The machine is designed to be operated with truck tractors which meet the requirements specified in table (1.1).

The mobile trommel screen is designed according to current safety requirements and engineering standards. The maximum design speed of the truck tractor with the trommel screen is 100 km/h.

TAB. 1.1 *Requirements for truck tractor*

CONTENTS	Unit	REQUIREMENTS
Brake system		
Pneumatic control socket (yellow)		according to DIN 1728
Pneumatic supply socket (red)		according to DIN 1728
Supply socket for EBS+CAN		7-pin or 5-pin socket, 24V DIN 7638-1996
Electrical system		
Electrical system voltage	V	24
15-pin socket	-	according to ISO 12098

CONTENTS	Unit	REQUIREMENTS
7-pin socket 24-V-N (1)	-	according to DIN ISO 1185
7-pin socket 24-V-S (1)	-	according to DIN ISO 3731
Hitch		
Hitch diameter	mm	50
Minimum vertical load capacity	kg	1,000

(1) Interchangeable with a 15-pin socket. Use a proper conversion cable for connection.

1.3 EQUIPMENT

TAB. 1.2 *Equipment*

EQUIPMENT	1	2	3
OPERATOR'S MANUAL	✓		
WARRANTY BOOK	✓		
Rear supports		✓	
Rear conveyor 3 m			✓
Screening drum		✓	

Equipment: 1 - standard, 2 - additional, 3 - optional

Information concerning tyres is provided at the end of this manual in ANNEX A.

Density and shape of screening drum perforations should be agreed before purchase of the machine.

1.4 TERMS & CONDITIONS OF WARRANTY

TIP

Demand that the seller carefully and precisely 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.

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

The warranty does not apply to those parts and sub-assemblies of the machine, which are subject to wear in normal usage conditions, regardless of the warranty period. Consumables include the following parts/sub-assemblies:

- drawbar hitching eye,
- tyres,
- bulbs,
- seals,
- bearings,
- rubber conveyor belts,
- brushes,
- polyurethane drum rolls,

- runners.

The warranty service only applies to factory defects and mechanical damage that is not due to the user's fault.

In the event of damage arising from:

- mechanical damage which is the user's fault, caused by road accidents,
- screening of forbidden materials,
- inappropriate use, adjustment or maintenance, use of the trommel screen for purposes other than those for which it is intended,
- use of damaged machine,
- repairs carried out by unauthorised persons, improperly carried out repairs,
- making unauthorised alterations to machine design,

the user will lose the right to warranty service.

The user is obliged to report immediately on noticing any wear in the paint coating or traces of corrosion, and to have the faults rectified whether they are covered by the warranty or not. For detailed Terms & Conditions of Warranty, please refer to the *WARRANTY BOOK* attached to each machine.

Modification of the machine without the written consent of the Manufacturer is forbidden. In particular, do NOT weld, drill holes in, cut or heat the main structural elements of the machine, which have a direct impact on the machine operation safety.

1.5 TRANSPORT

The mobile trommel screen is ready for sale completely assembled. The purchased machine is delivered with the *OPERATOR'S MANUAL*, *WARRANTY BOOK* and possible additional equipment. The trommel screen is delivered to the user either transported on a vehicle or, after being attached to a truck tractor, independently (the trommel screen is towed by a truck tractor).

1.5.1 TRANSPORT ON VEHICLE

Before loading onto a transport vehicle, the trommel screen should be prepared according to instructions contained in section 4.

Loading and unloading of the trommel screen from vehicle shall be conducted using a loading ramp or ramps of a low chassis trailer. When loading and unloading the trommel screen, make sure that the rear lights support beam does not hit the platform's structural elements or the ground. If there is such a risk, dismantle the lights support beam. During work adhere to the general principles of Health and Safety at Work applicable to reloading work. Persons operating reloading equipment must have the qualifications required to operate these machines.

The trommel screen should be attached firmly to the platform of the transport vehicle using straps, chains, stays or other securing measures fitted with a tightening mechanism. Securing elements should be attached to the fixed structural elements of the trommel screen (lower frame, drawbar, axle beam). Chocks, wooden blocks or other objects without sharp edges should be placed under the wheels of the trommel screen to prevent it from rolling. Wheel blocks must be nailed to the vehicle load platform planks or secured in another manner preventing their movement.

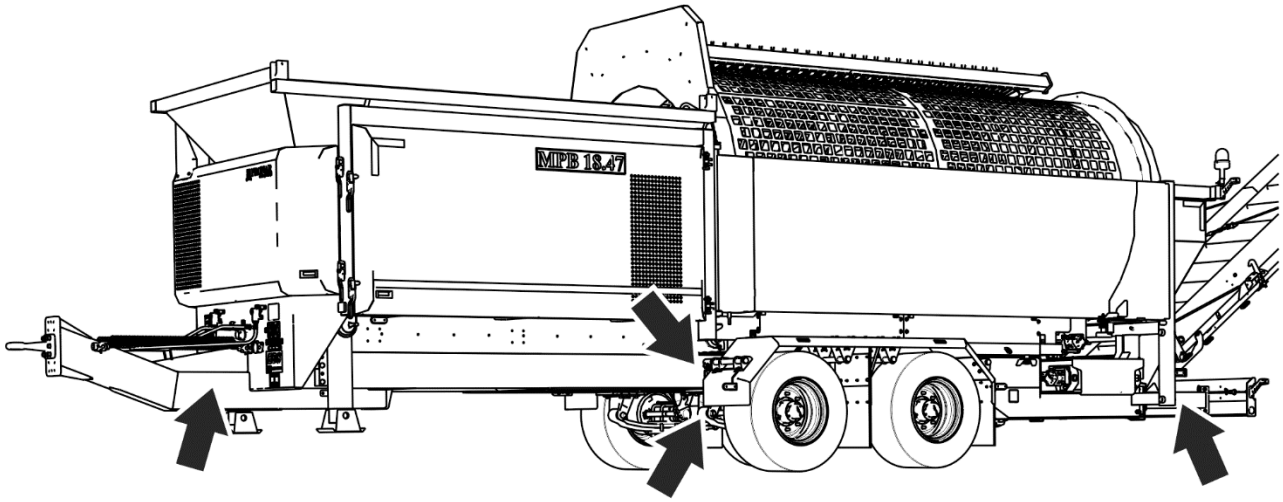


FIG. 1.7 *Recommended mounting points*

DANGER

When being road transported on a motor vehicle the trommel screen must be mounted on the vehicle's platform in accordance with the transport safety requirements and the regulations.

Use certified and technically reliable securing measures. Worn straps, cracked securing catches, bent or corroded hooks as well as other damage may disqualify use of the given element from use. Carefully read the information stated in the Operator's Manual for the given securing measure. The number of securing elements (cables, straps, chains and stay etc.) and the force necessary for their tensioning depend on a number of things, including weight of the trommel screen, construction of the vehicle carrying the trommel screen, speed of travel and other conditions. For this reason it is impossible to define the securing plan precisely.

DANGER

Incorrect application of securing measures may cause an accident.

Driver of the vehicle should be particularly careful during travel. This is due to the vehicle's centre of gravity shifting upwards when loaded with the machine.

Use only certified and technically reliable securing measures. Carefully read the manufacturer's instructions for the securing measures.

A correctly secured machine does not change its position with regard to the transport in vehicle. 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 straps in order to immobilise the trommel screen. If necessary, sharp edges of the trommel screen should be protected at the same time protecting the securing elements from breaking during transport.

During reloading work, particular care should be taken not to damage parts of the machine's fittings or the lacquer coating. Weight and dimensions of the trommel screen are given in table (3.1).

1.5.2 INDEPENDENT TRANSPORT BY THE USER

IMPORTANT!

Before transporting independently, the truck tractor driver must carefully read this Operator's Manual and observe its recommendations.

In the event of independent transport by the user, carefully read the *OPERATOR'S MANUAL* and follow its recommendations. Independent transport involves towing the machine with own truck tractor to its destination. During transport adjust travel speed to the prevailing road conditions, but do not exceed the maximum design speed.

1.6 ENVIRONMENTAL HAZARDS

A leak of hydraulic, lubricating or diesel oil constitutes a direct threat to the natural environment owing to limited biodegradability of oil. Information concerning consumables used is given in section 5 of this Operator's Manual.

While carrying out maintenance and repair work, which involves the risk of an oil leak, this work should take place on an oil resistant floor or surface. In the event of oil leaking into the environment, first of all contain the source of the leak, and then collect the leaked oil using available means. Remaining oil 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.

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.

Oils, which have been used up or are unsuitable for further use owing to a loss of its properties should be stored in its original packaging in the conditions described above.

IMPORTANT!

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

1.7 WITHDRAWAL FROM USE

In the event of decision by the user to withdraw the trommel screen from use, comply with the regulations in force in the given country concerning withdrawal from use and recycling of machines withdrawn from use. Worn out or damaged parts that cannot be reclaimed should be taken to a collection point for recyclable raw materials. Hydraulic oil, engine oil and engine coolant should be taken to the appropriate facility dealing with the re-use of this type of waste.

DANGER

During dismantling, use the appropriate tools, equipment (overhead travelling crane, crane or hoist etc.) and use personal protection equipment, i.e. protective clothing, footwear, gloves and eye protection etc.

Section

2

SAFETY ADVICE

2.1 SAFETY INFORMATION

2.1.1 BASIC SAFETY RULES

- Before using the mobile trommel screen, the user must carefully read this Operator's Manual. When operating the machine, the operator must comply with all the recommendations included in the Operator's Manual.
- The user is obliged to acquaint himself with all control elements and operation control indicators of the machine. It must be done before using the machine. Do NOT start the machine without knowledge of its function.
- The user is obliged to acquaint himself with the construction, action and the principles of safe usage of the machine.
- Before using the trommel screen always check whether it is properly prepared for work, especially in terms of safety.
- If the information contained in the Operator's Manual is difficult to understand, contact a seller, who runs an authorised technical service on behalf of the manufacturer, or contact the manufacturer directly.
- Entering the machine is only allowed when the machine is absolutely motionless. Turn off ignition key of the vehicle (truck tractor or agricultural tractor), if the trommel screen is connected to the vehicle, and turn off and remove the ignition key of the trommel screen engine. Before entering the trommel screen, immobilise it with parking brake.
- Careless and improper use and operation of the trommel screen and also non-observance of the recommendations contained in this Operator's Manual, endanger health and life of third persons and/or machine operator.
- The trommel screen may only be used when all the safety guards and other protective elements are technically sound and correctly positioned.
- Be aware of the existence of a residual risk, and for this reason the fundamental basis for using this trommel screen should be the application of safety rules.
- The machine must never be used by unauthorised persons, including children and people under the influence of alcohol or other drugs. The trommel screen may be transported only by persons who have appropriate and valid authorisation for driving the truck tractor.
- The trommel screen must not be used for purposes other than those for which it is intended. Anyone who uses the machine in any other way than the way intended takes full responsibility for any consequences of this use. Use of the trommel screen for purposes other than those for which it is intended by the Manufacturer may invalidate the guarantee.
- Any modification to the trommel screen frees Pronar from any responsibility for damage or detriment to health which may arise as a result.
- Before using the machine always check its technical condition, especially in terms of safety.
- Do NOT overload the trommel screen's mechanisms.
- Do NOT exceed permissible travel speed of tractor and machine assembly.

- The trommel screen is not intended to transport any load (including people and animals).

2.1.2 HITCHING AND UNHITCHING FROM TRUCK TRACTOR

- Before hitching the trommel screen to the tractor or truck tractor check that both machines are in good technical condition.
- Be especially careful when hitching the machine to the tractor or truck tractor.
- When hitching the trommel screen, use the appropriate hitch of the truck tractor. After hitching the machines, check the hitch lock. Carefully read the truck tractor Operator's Manual. If the truck tractor is equipped with an automatic hitch, make certain that the hitching operation is completed.
- When hitching, there must be nobody between the truck tractor and the trommel screen.
- Do NOT hitch the trommel screen to the truck tractor if it does not fulfil the requirements made by the Manufacturer.
- The trommel screen when unhitched from the tractor must stand on level ground and be supported with the aid of a support. Conduit terminals should be protected against contamination by placing them in proper holding sockets. Make sure that the trommel screen is immobilised with parking brake.
-

2.1.3 HYDRAULIC AND PNEUMATIC SYSTEM

- The hydraulic system is under high pressure when the trommel screen is operating.
- Regularly check the condition of the connections and the hydraulic and pneumatic leads. There must not be any leaks of hydraulic oil and any loss of air from leaky pneumatic system.
- In the event of malfunction of the hydraulic or pneumatic system, do not use the trommel screen until the malfunction is corrected.
- Do NOT tow the trommel screen when the pneumatic system is out of order.
- Before proceeding to maintenance-repair work, make certain that the hydraulic system is not under pressure.
- Rubber hydraulic conduits must be replaced every 4 years regardless of their technical condition.
- Use the hydraulic oil recommended by the Manufacturer.
- Do not store hydraulic oil in packaging designed for storing food or foodstuffs.
- In the event of injuries being caused by pressurised hydraulic oil, contact a doctor immediately. Hydraulic oil may find its way under the skin and cause infections. 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. 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).
- After changing the hydraulic oil, the used oil should be properly disposed of. Used oil or oil which has lost its properties should be stored in original containers or replacement

containers resistant to action of hydrocarbons. Replacement containers must be clearly marked and appropriately stored.

2.1.4 MAINTENANCE

- Do NOT perform maintenance or repair work when the engine is turned on. Before commencing work, turn off the trommel screen engine and remove key from ignition. Protect the machine against rolling by placing chocks under the wheels. Immobilise the trommel screen with parking brake.

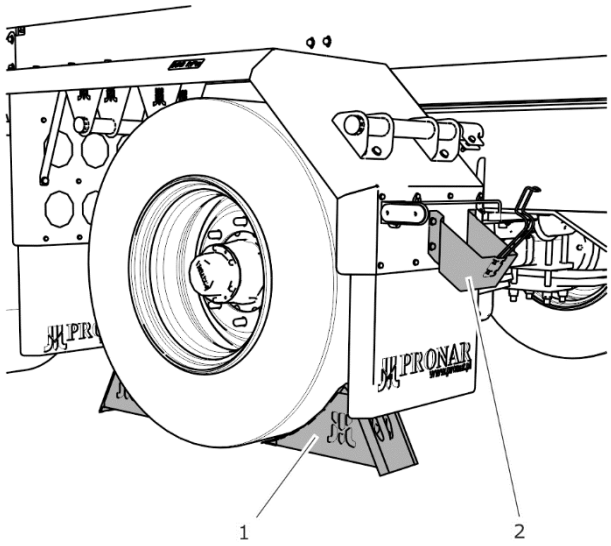


FIG. 2.1 *Arrangement of chocks*

(1) chock *(2) chock bracket*

- Regularly check the condition of the bolt and nut connections.
- During the warranty period, any repairs may only be carried out by *WARRANTY SERVICE* authorised by the Manufacturer. After the expiry of the warranty period it is recommended that possible repairs to the trommel screen be performed by specialised workshops.
- While performing maintenance work, use proper, close-fitting protective clothing, gloves, protective shoes, protective goggles and appropriate tools.
- In the event of any fault or damage whatsoever, do not use the machine until the fault has been corrected.
- Servicing and repair work should be carried out in line with the general principles of workplace health and safety. In the event of injury, the wound must be immediately cleaned and disinfected. In the event of more serious injuries, seek a doctor's advice.
- Service inspections of the trommel screen and its subassemblies should be carried out according to the frequency specified in this Operator's Manual.
- Before welding or electrical work, the trommel screen should be disconnected from the power supply (disconnect (-) and (+) leads from the battery). The paint coating should be cleaned. Burning paint fumes are poisonous for people and animals. Welding work should be carried out in a well lit and well ventilated space. Welding return lead should be connected near the place of repair.
- During welding work pay attention to flammable or fusible elements (parts of the electric, hydraulic and pneumatic systems, plastic and rubber parts). If there is a risk that they will catch fire or be damaged, they should be removed or covered with non-flammable material before commencing welding work. Before beginning work, prepare a CO_2 or foam extinguisher.
- In the event of work requiring the trommel screen 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. Do NOT carry

out work under a machine, which has only been raised with the lift jack.

- The trommel screen must not be supported using fragile elements (bricks or concrete blocks).
- The drum can be replaced only using a lifting device with proper lifting capacity. The machine operator must have proper qualifications for operating a crane, overhead travelling crane etc.
- After completing work associated with lubrication, remove excess oil or grease. The trommel screen should be kept clean and tidy.
- Exercise particular caution when climbing on top of the trommel screen. The machine must be protected against rolling by means of chocks, its engine must be stopped and the ignition key must be removed.
- The user must not repair by himself the components of the power hydraulics and brake system automation. In the event of damage to these elements, repair should be entrusted to an authorised service point or elements should be replaced with new ones.
- Do NOT make repairs to drawbar and drawbar eye (straightening, pad welding or welding). Damaged drawbar eye should be replaced.
- Do NOT install additional appliances or fittings not according to the specifications defined by the Manufacturer.
- The trommel screen may only be towed when axles and wheels, brake system and lighting system are reliable.
- Regularly check technical condition and mounting of all guards and protective elements.
- Should it be necessary to change individual parts, use only original parts or those indicated by the Manufacturer. Non-adherence to these requirements may put the user and other people's health and life at risk, and also damage the machine.

2.1.5 DRIVING ON PUBLIC ROADS

- During transport, adjust travel speed to road conditions. If possible avoid travelling on uneven terrain and unexpected corners. Do not exceed the maximum design speed.
- When driving on public roads, comply with the road traffic regulations.
- Before driving off, the trommel screen should be prepared for transport according to instructions contained in section 4.
- Reckless driving and excessive speed may cause accidents.
- Before driving off, make sure that the trommel screen is correctly hitched to the truck tractor and check if the brake system and electrical system are correctly connected.
- Vertical load borne by the trommel screen drawbar eye affects the steering of the truck tractor.
- Do NOT attempt to climb the machine while travelling.
- Do NOT park the machine on slope.

- The machine must NOT be left unsecured. When disconnected from the truck tractor, the trommel screen must be protected against rolling with chocks or other objects without sharp edges placed under the front and back wheels. Immobilise the trommel screen with parking brake.
- Do NOT travel with unfolded belt conveyors.
- When driving on public roads, the yellow beacon light should be turned on.

2.1.6 OPERATION OF THE TROMMEL SCREEN

- The machine may be started only if it is fully operational.
- The trommel screen may only be used by appropriately trained persons.
- Do NOT start the trommel screen if its safety guards are open or removed.
- Before starting the trommel screen, make certain that there are no bystanders near the danger zones and that there are no obstacles preventing faultless machine operation.
- Ensure sufficient area for the trommel screen operation.
- Dismantle transport locks of the belts of the side conveyor and rear conveyor.
- The trommel screen may be operated only on level and stable surface.
- Charging hopper should be loaded using a proper loader. Keep a safe distance from the working loader.
- Do NOT stand near working belt conveyors and the chute.
- After completed operation of the trommel screen, set the battery switch to *SWITCHED OFF* position.

2.1.7 SAFETY DURING BATTERY MAINTENANCE

- Do NOT use an open flame and do NOT produce sparks near the battery. Danger of explosion.
- Smoking near the battery is forbidden.
- Keep a proper sequence when disconnecting the battery terminals. First disconnect terminal (-) and then disconnect terminal (+). The leads should be connected in reverse order.
- Before commencing electric welding, disconnect the machine from power source. To do this, disconnect both battery leads.
- Do NOT short the battery leads. Risk of fire or explosion.
- The battery contains caustic sulfuric acid. Contact of the acid with skin can cause very severe chemical burns. In case of contamination with electrolyte, immediately take off contaminated clothes and rinse skin or eyes contaminated with acid using plenty of running water. If swallowed, do not induce vomiting. Drink plenty of cold water. Consult a doctor immediately.
- When handling the battery, use rubber gloves and protective goggles.
- The battery should be charged in rooms with efficiently operating ventilation.

2.1.8 SAFETY RULES DURING ENGINE MAINTENANCE

- Lost or damaged fuel filler plug should always be replaced with original replacement plug.
- Do NOT remove the fuel filler plug when the engine is running or near an open flame.
- Immediately wipe away spilt fuel. The engine and engine compartment should be kept clean and tidy.
- Do NOT approach the engine with an open flame. There is a risk that fuel fumes or oil will catch fire.
- Do not approach the rotating parts of the engine.
- Keep a safe distance from hot elements of the engine. Risk of burn injuries.
- All maintenance and repair works should be performed only when the engine is stopped and the ignition key is removed. Before starting work, set the ground switch to *SWITCHED OFF* position.
- Do not unscrew the engine coolant filler plug when the engine is running or hot. Risk of burn injuries.
- Slowly unscrew the engine coolant filler plug in order to safely release coolant fumes.
- Add coolant only when the engine is cold.

2.1.9 SAFE OPERATION OF BELT CONVEYORS

- Do NOT stand on belt conveyors during machine operation and standstill.
- Rear and side belt conveyors may be unfolded only by one person. The conveyor should be unfolded in a smooth manner, according to proper sequence.
- Before unfolding the conveyors, make sure there are no bystanders near the machine.
- Do NOT unfold the conveyors if steel securing cables are disassembled.
- Before beginning work, make sure that all transport locks are dismantled.
- Do not stand under the conveyor during its working and unfolding.
- Do not allow overloading of conveyors. If a large amount of material is accumulated, reduce rotational speed of the screening drum.
- The belt conveyors (rear conveyor and side conveyor) are equipped with emergency safety switches which are used for stopping the trommel screen if health and life of people is endangered or if there is a risk of serious machine damage. After emergency stopping of the trommel screen, wait for 10 seconds, pull the emergency switch mushroom push-button and restart the engine.
- After finishing work, remove remains of screened material from conveyor belts.

2.1.10 TYRES

- When working with tyres, the trommel screen should be secured against rolling by placing chocks under the wheels. Wheels can be taken off only when the trommel screen is not loaded.

- Repair work on the wheels or tyres should be carried out by persons trained and entitled to do so. This work should be carried out using appropriate tools.
- Regularly check if the nuts fixing the wheels are properly tightened.
- Avoid potholes, sudden manoeuvres or high speeds when turning.
- Regularly check air pressure in the tyres.
- Protect tyre valves using suitable caps to avoid soiling.

2.2 DESCRIPTION OF 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:

- use of the trommel screen for purposes other than those for which it is intended by the Manufacturer,
- being between the tractor and the trommel screen while hitching,
- being on the machine while the engine is running,
- operating the trommel screen with removed or faulty safety guards,
- not maintaining a safe distance while the trommel screen is in operation,
- operation of the machine by persons under the influence of alcohol,
- cleaning, maintenance and technical checks of the machine,
- work of machine on unstable and sloping surface,
- 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.

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

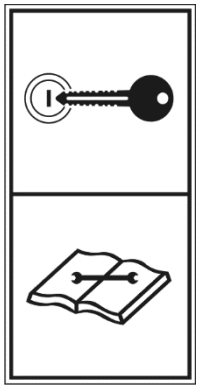
- prudent and unhurried operation of the machine,
- maintaining a safe distance from forbidden or dangerous places,
- sensible application of the remarks and recommendations contained in the *OPERATOR'S MANUAL*,
- carrying out repair and maintenance work according to safe operation principles, performing maintenance and repair work by trained persons,
- using close fitting protective clothing, and appropriate tools,
- ensuring unauthorised persons have no access to the machine, especially children,
- a ban on being on the machine during travel, loading and screening.
-

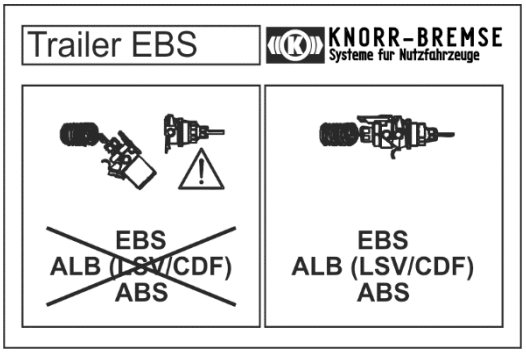
2.3 INFORMATION AND WARNING DECALS

The trommel screen is marked with information and warning decals referred to in table (2.1). The symbols are positioned as presented in figures (2.2) and (2.3). Throughout the time it is in use, the user of the machine is obliged to take care that notices and warning and information symbols located on the trommel screen are clear and legible. In the event of their destruction, they must be replaced with new ones. Safety decals can be purchased from the Manufacturer of the trommel screen or your PRONAR dealer. Part numbers of information decals are given under pictogram description in table (2.1) and in *SPARE PARTS LIST.*. New assemblies, changed during repair, must be labelled once again with the appropriate safety signs. During trommel screen cleaning do not use solvents which may damage the coating of information label stickers and do not subject them to strong water jets.

TAB. 2.1 *Information and warning decals*

Item	DECAL	DESCRIPTION
1	PRONAR MPB 18.47	Information decal. **361N-97000003**
2	MPB 18.47	Information decal. **361N-97000001**
3		Attention! Before starting work, carefully read the *OPERATOR'S MANUAL.* **70RPN-00.00.00.04**

Item	DECAL	DESCRIPTION
4		Before beginning servicing or repairs, switch off the tractor's engine and the trommel screen's engine and remove keys from ignition. Ensure that unauthorised persons do not have access to the tractor cab. **70RPN-00.00.00.05**
5		Grease the trommel screen according to the lubrication schedule included in the Operator's Manual. **104RPN-00.00.00.04**
6		Danger of crushing or severing. **123N-00000004**
7	PRONAR www.pronar.pl PRONAR	Information decal **187N-00000033C**
8	900 kPa	Air pressure in the tyres **67N-00000004**
9	UWAGA ! Po przeciągnięciu pojazdu zredukować ciśnienie w złączu	Information decal (optional) **361N-71000024**
10	12V	Information decal of connection socket of 12V electrical system.

Item	DECAL	DESCRIPTION
11		Information decal. The trommel screen is equipped with EBS system.
12		Before driving off, make sure that the EBS supply conduit is correctly connected.
13		Emergency stopping of the trommel screen

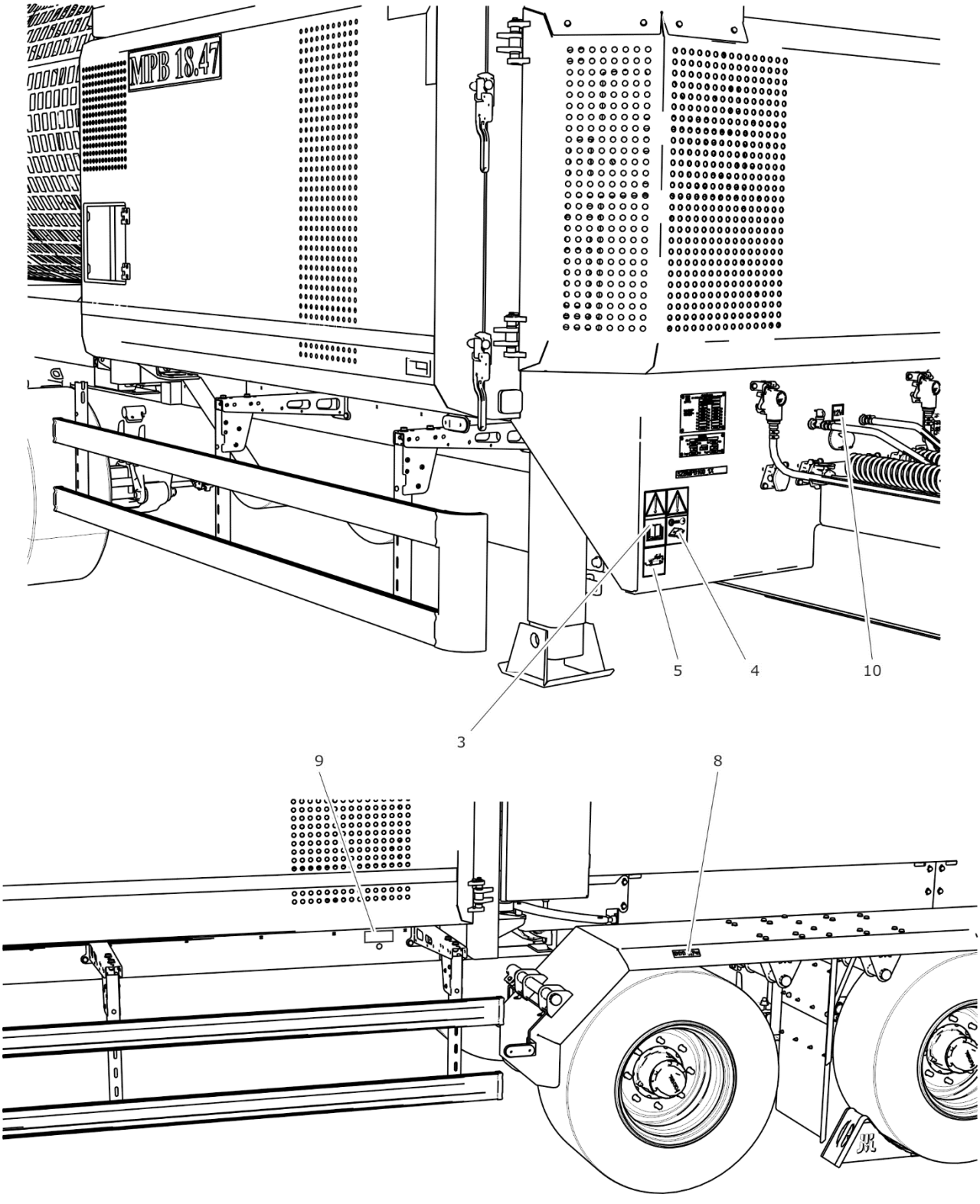


FIG. 2.2 *Locations of information and warning decals.*

Section

3

DESIGN AND OPERATION

3.1 SPECIFICATION

TAB. 3.1 *Basic technical specification of the trommel screen*

CONTENTS	Unit	MPB18.47
Dimensions		
Transport position		
Length	mm	11,000
Width	mm	2,550
Height	mm	3,845
Working position		
Length (with rear conveyor 3m)	mm	13,050
Length (with rear conveyor 5m)	mm	14,900
Width	mm	6,700
Height	mm	3,550
Engine		
Manufacturer	-	Mitsubishi
Model	-	S4S-Z3DT
Number of cylinders	-	4
Rated power	kW	62 (at 2 500 rpm)
Maximum torque	Nm	265 (at 1 800 rpm)
Unit fuel consumption	g/kWh	235
Piston diameter	mm	94
Stroke	mm	120
Engine displacement	l	3.331
Fuel tank capacity	l	300
Voltage of electrical system of engine accessories	V	12
Axle system		
Axle base	mm	1,350
Wheel track	mm	2,045
Screening drum		
Effective screen area	m^2	22.1

CONTENTS	Unit	MPB18.47
External diameter of screen surface	mm	1,810
Length	mm	4,708
Screen perforation	-	as agreed
Side belt conveyor 5m		
Belt width	mm	800
Total length	mm	5,150
Rear belt conveyor 5m		
Belt width	mm	800
Total length	mm	5,150
Rear belt conveyor 3m		
Belt width	mm	800
Total length	mm	3,300
Other information		
Maximum design speed	km/h	100
Permissible vertical hitch load	kg	1,000
Electrical system voltage	V	24 / 12
Acoustic power level L_{WA}	dB (A)	81.4
Acoustic pressure level at working position	dB (A)	92.3
Weights		
Tare weight	kg	12,800
Permissible weight of screening drum	kg	1,800

3.2 DESIGN OF MOBILE TROMMEL SCREEN

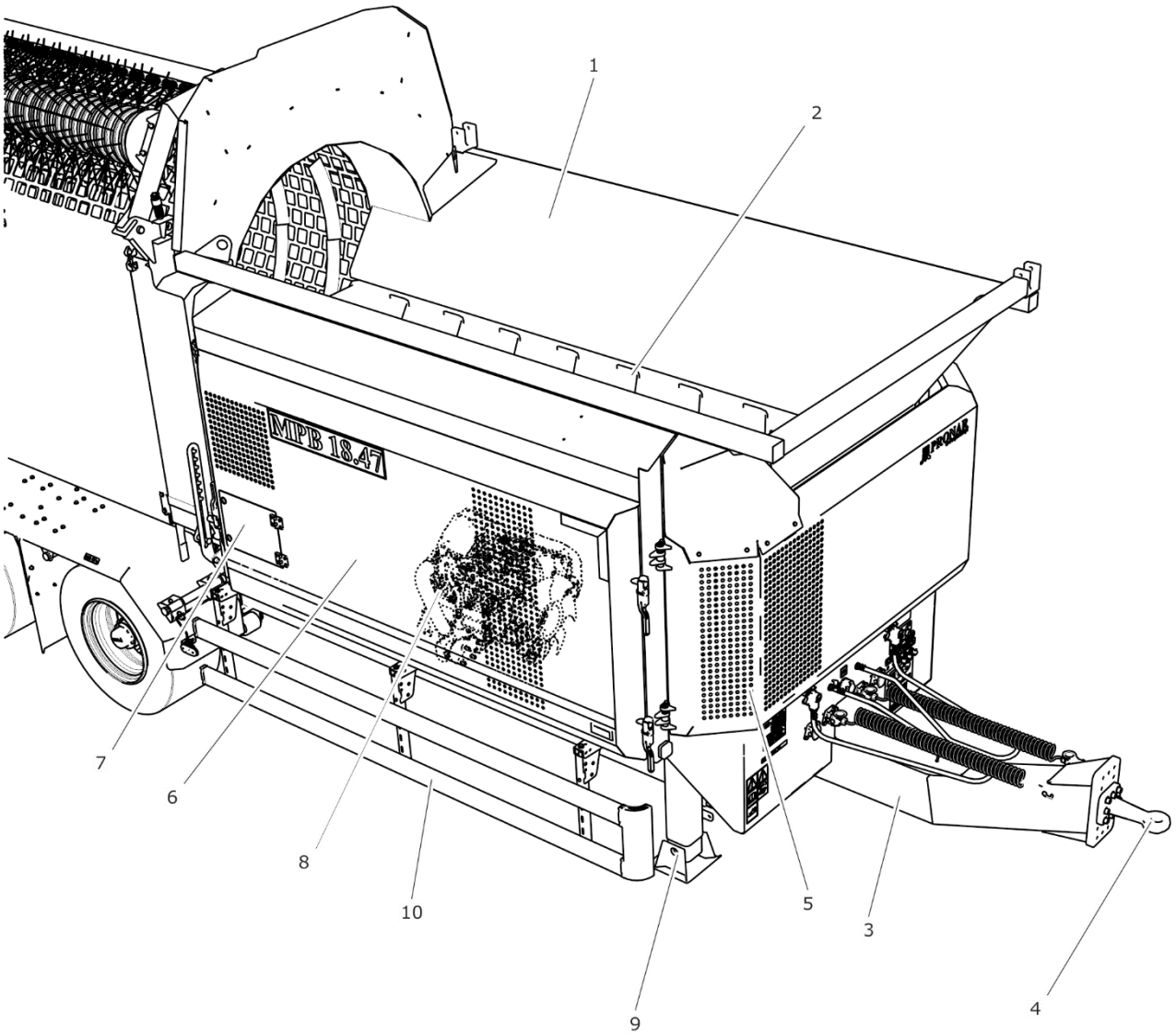


FIG. 3.1 *Design of trommel screen, view 1*

(1) charging hopper *(2) charging hopper conveyor* *(3) lower frame*
(4) drawbar hitching eye *(5) front shield of charging hopper* *(6) right shield of charging hopper*
(7) control panel door *(8) combustion engine* *(9) front supports*
(10) side under-run protective devices

Design of mobile trommel screen is presented in figures (3.1), (3.2) and (3.3).

Material to be screened is loaded to charging hopper (1), figure (3.1), and then transported to screening drum by means of belt conveyor (2). Engine, hydraulic pump, hydraulic manifolds, control panel and hydraulic oil tank are located behind shield (6).

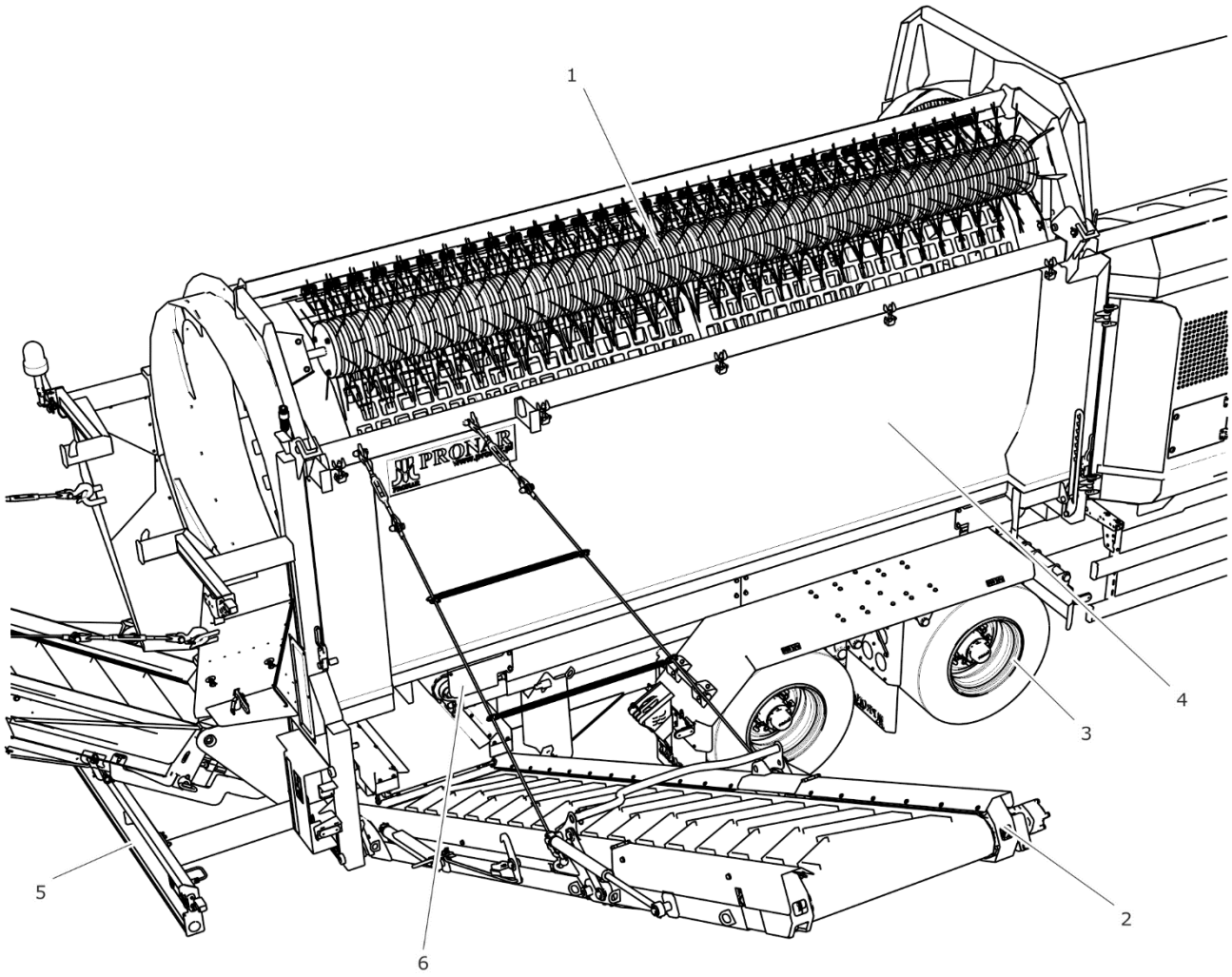


FIG. 3.2 *Design of trommel screen, view 2*

(1) brush *(2) side conveyor* *(3) axle system*
(4) right shield of screening drum *(5) rear lights support beam* *(6) longitudinal conveyor*

Material delivered from charging hopper is screened during transport in screening drum. As a result of drum rotation, small fractions of material fall onto feeder located below the drum. Larger fractions of material are transported further to the rear belt feeder which discharges material onto a pile. Smaller fractions of material fall onto transverse belt feeder (4), figure (3.3), and then onto side conveyor (2), figure (3.2).

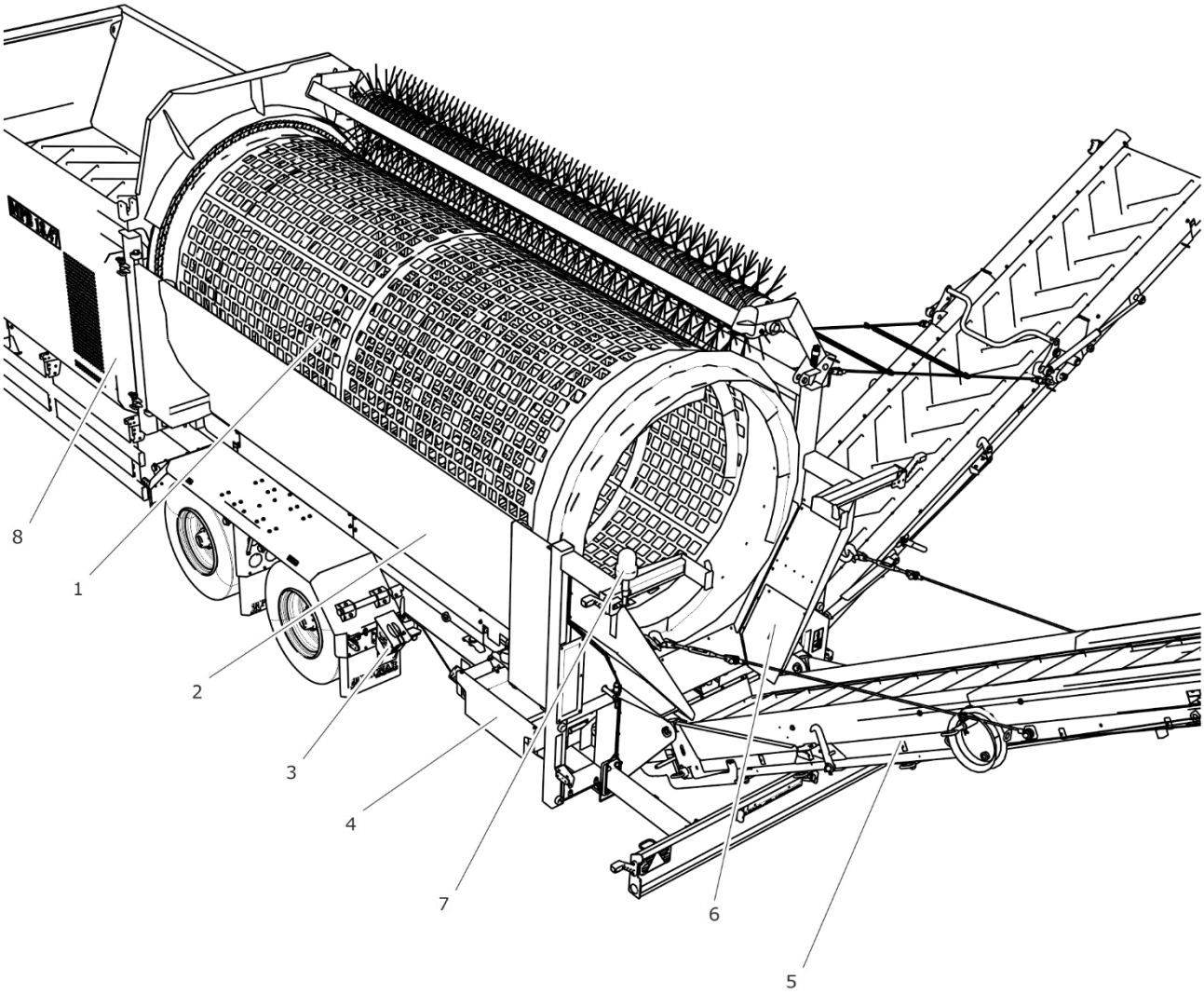


FIG. 3.3 *Design of trommel screen, view 3*

(1) screening drum *(2) left shield of screening drum* *(3) wheel chock*
(4) transverse conveyor *(5) rear conveyor* *(6) chute plate*
(7) yellow beacon light *(8) left shield of charging hopper*

3.3 ENGINE DESIGN

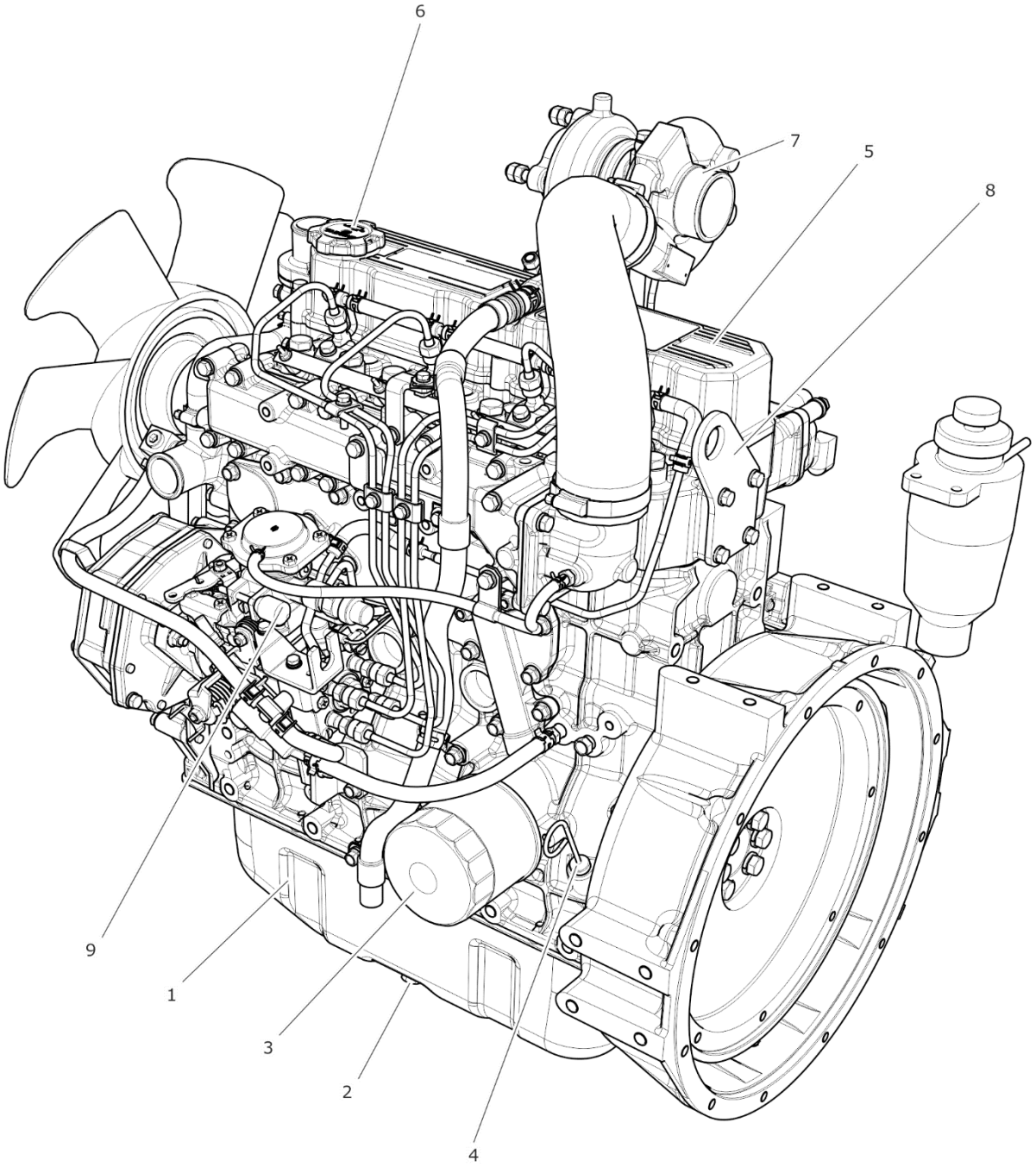


FIG. 3.4 *Engine design, view 1*

(1) oil pan *(2) oil drain plug* *(3) oil filter*
(4) oil dipstick *(5) valve cover* *(6) oil filler plug*
(7) turbo compressor *(8) engine suspension* *(9) injection pump*

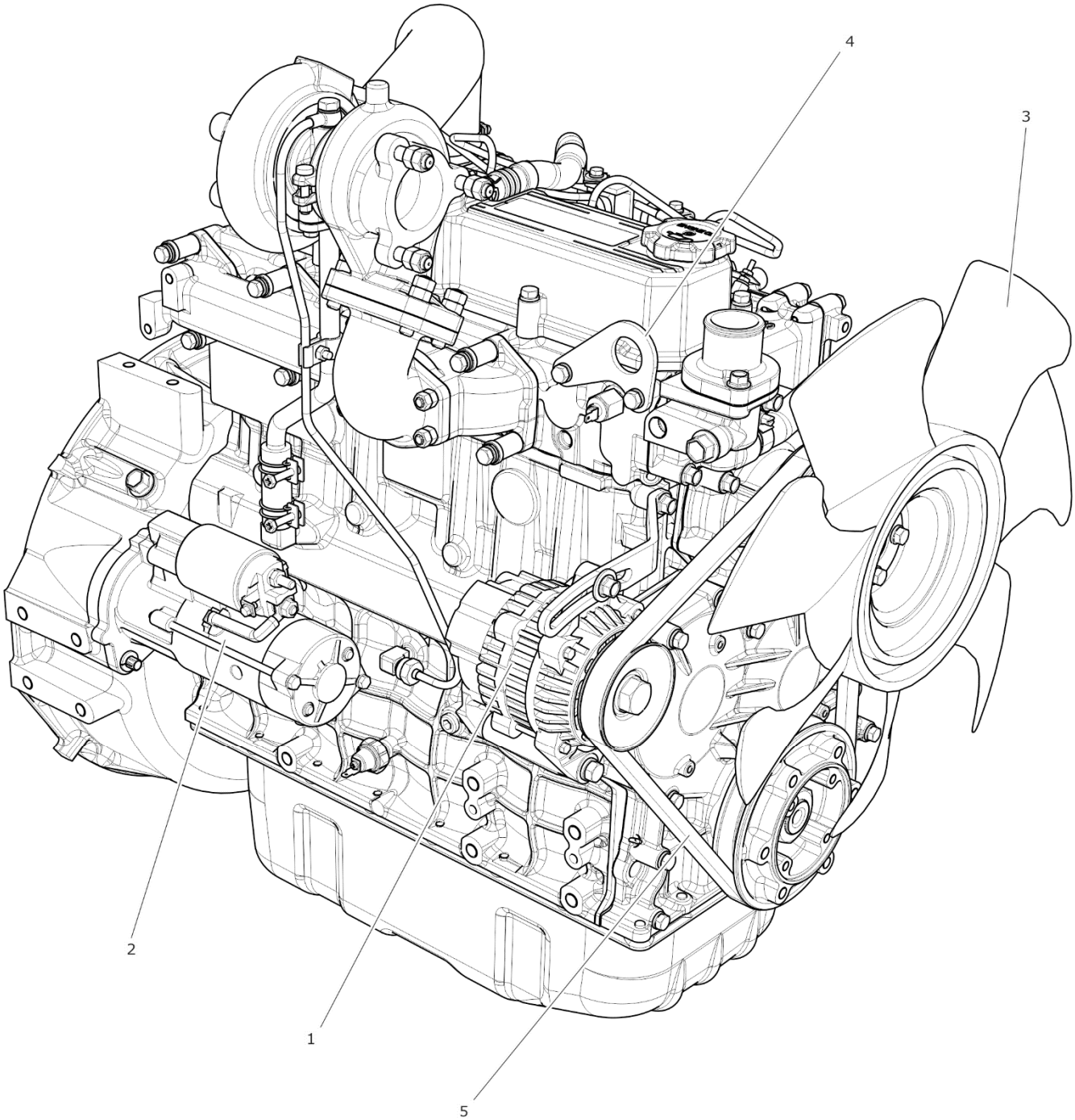


FIG. 3.5 *Engine design, view 2*

(1) alternator *(2) starter* *(3) fan*

(4) engine suspension *(5) vee-belt*

3.4 ELECTRICAL LIGHTING SYSTEM

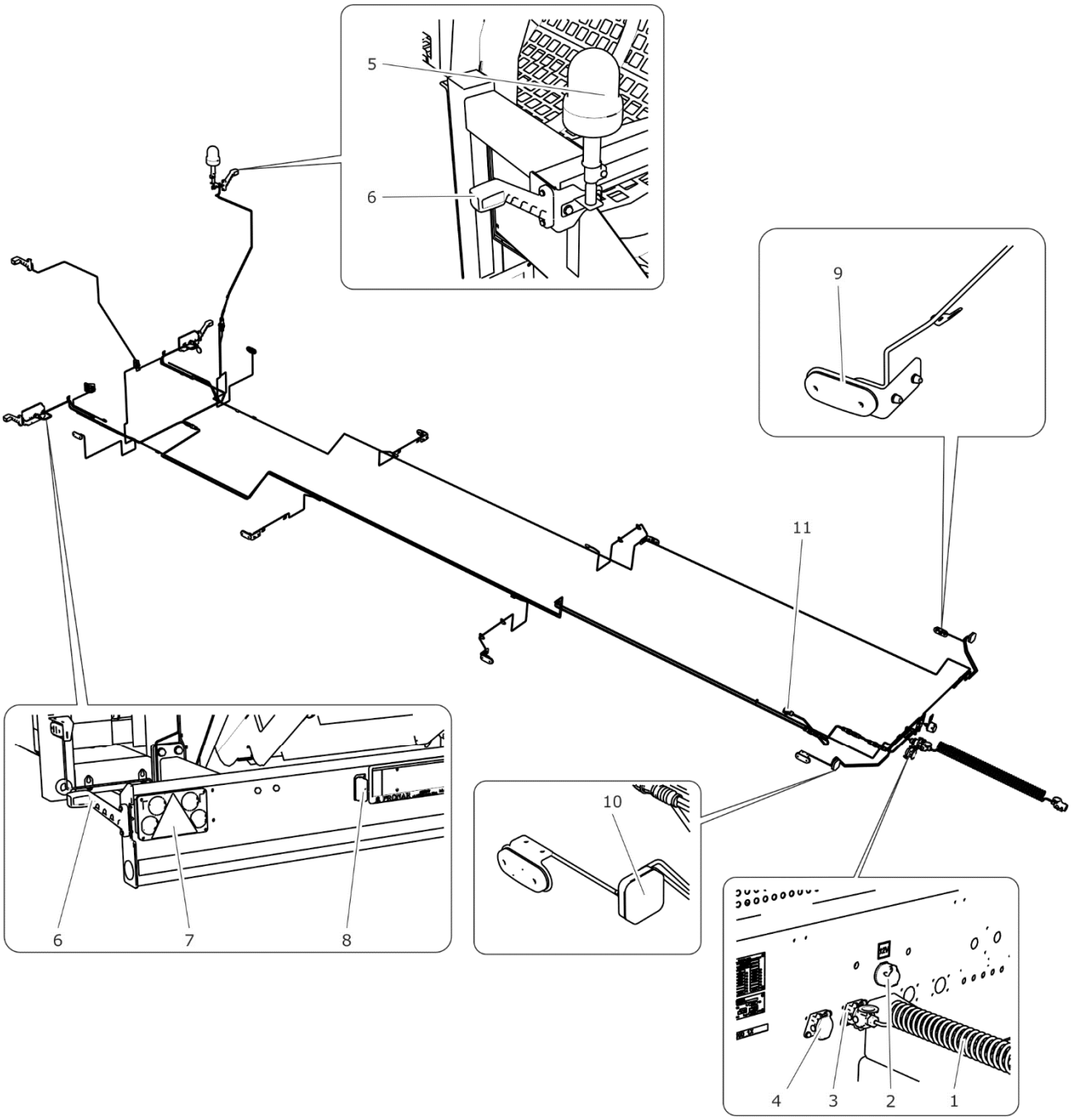


FIG. 3.6 *Design of electrical lighting system*

(1) connection lead *(2) 7-pin socket (12V)* *(3) 15-pin socket*
(4) holding socket *(5) yellow beacon light* *(6) clearance lamp*
(7) rear lamp assembly *(8) license plate light* *(9) side parking light*
(10) front parking light *(11) connection of emergency supply of brake system*

Electrical lighting system of mobile trommel screen
is designed for 24V or 12 V DC supply.

VARIANTS OF TROMMEL SCREEN CONNECTION

- 24V – a 15-conductor connection lead, a 15-pin socket in truck tractor and in trommel screen
- 24V – conversion cable (2x7-conductor cable to 1x15-conductor cable), two 7-pin sockets in truck tractor (according to ISO 1185 and ISO 3731 standards), 15-pin socket in trommel screen
- 12V – a 7-conductor lead, a 7-pin socket in truck tractor and in trommel screen.

If the trommel screen is not connected to truck tractor, the lead plug point must be placed in holding socket (4) specially provided for that purpose.

3.5 PNEUMATIC BRAKE SYSTEM

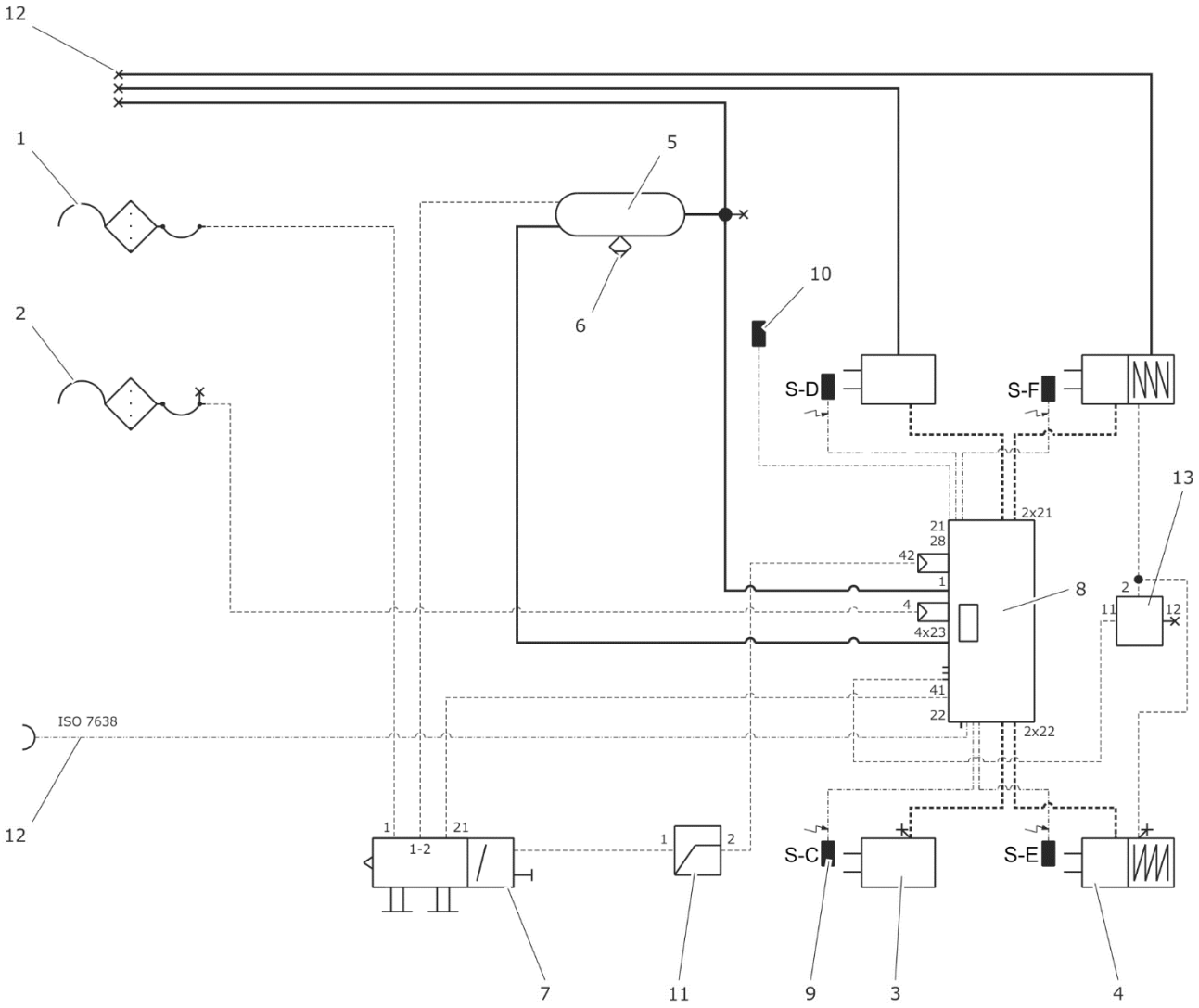


FIG. 3.7 *Pneumatic brake system diagram, variant 1*

(1) control connection *(2) supply connection* *(3) diaphragm pneumatic cylinder*
(4) diaphragm pneumatic spring cylinder *(5) air tank* *(6) drain valve*
(7) loosening-parking valve *(8) TEBS module* *(9) ABS sensor (2 or 4 pieces)*
(10) ALB sensor (option) *(11) pressure limiting valve* *(12) brake system supply*
(13) three-way valve

IMPORTANT! Pressure limiting valve (11), figure (3.7) and (3.8), is present only when the trommel screen is not equipped with ABS system

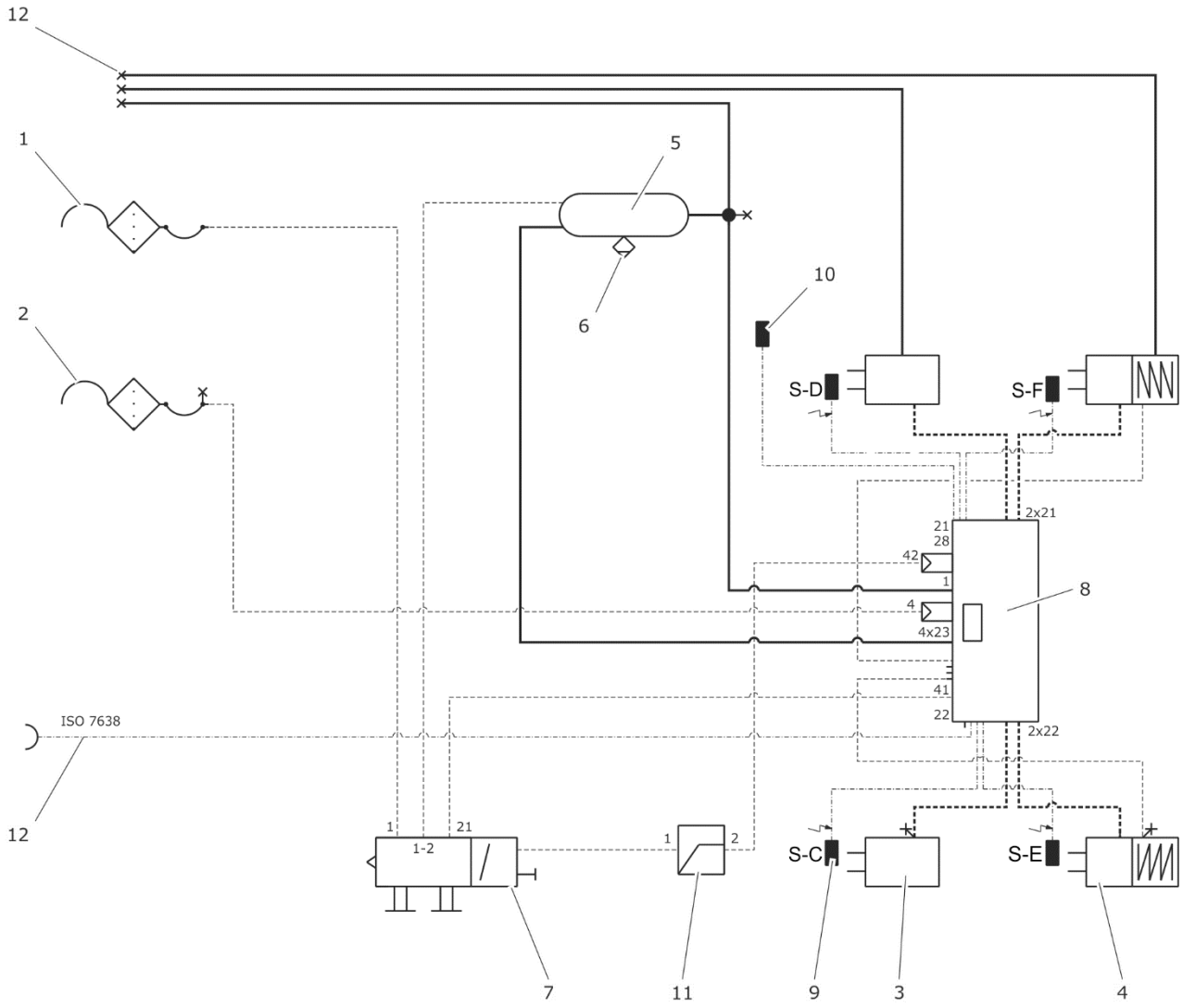


FIG. 3.8 *Pneumatic brake system diagram, variant 2*

(1) control connection *(2) supply connection* *(3) diaphragm pneumatic cylinder*
(4) diaphragm pneumatic spring cylinder *(5) air tank* *(6) drain valve*
(7) loosening-parking valve *(8) TEBS module* *(9) ABS sensor (2 or 4 pieces)*
(10) ALB sensor (option) *(11) pressure limiting valve* *(12) brake system supply*

As standard, the trommel screen is equipped with TEBS G2 braking system (Trailer Electronic Braking System). The braking system is equipped with the system that prevents vehicle wheel locking during braking (ABS - Antilock Braking System) and, optionally, with the automatic adjustment of braking force dependent on trommel screen load (ALB - Automatic load dependent brake control).

Proper operation of the braking system is possible only when two pneumatic connections (red supply connection; yellow control connection) and 7-pin EBS electric connection are connected (ISO7638+CAN). During transport on non-public roads or in working location, the trommel screen may be connected to a standard 12V electric connection of agricultural tractor.

If the pneumatic supply conduit is damaged, the trommel screen will be braked by diaphragm-spring cylinders located on the rear axle.

Depending on machine version, the trommel screen is equipped with one of the two available variants of braking system. The difference between the braking systems consists in the use of an additional three-way valve (13), figure (3.7), to which a pneumatic connection is attached at output 12. The connection is designed for releasing diaphragm cylinders by means of air supplied from outside (e.g. from compressor). Detailed information concerning the operation is given in section 4.

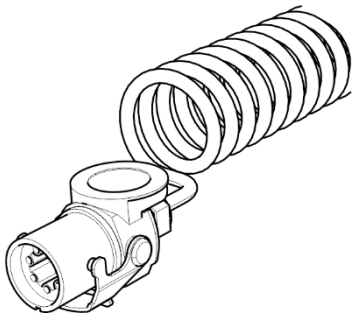


FIG. 3.9 *Electric supply connection of EBS modulator*

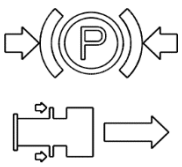
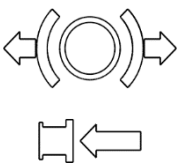
3.5.1 LOOSENING-PARKING VALVE

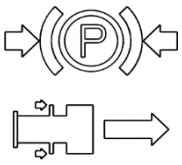
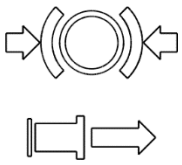
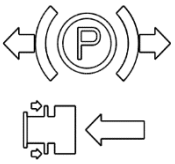
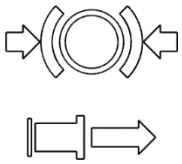
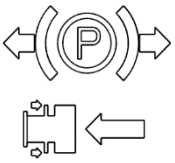
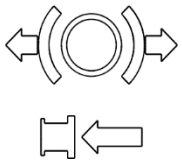
The loosening-parking valve is equipped with the emergency brake function which is activated in the event of pressure drop in the supply conduit (as a result of conduit disconnection or damage). Two push-buttons located in this valve make it possible to set the machine to an appropriate working mode.

Black push-button controls the manoeuvre valve. It is designed for engaging or releasing the brake if the machine is unhitched from the truck tractor. The black push-button can not be depressed when pneumatic conduits are connected. In the depressed position, the spring (parking) brake is released.

Red push-button controls operation of the parking valve when the machine is hitched to truck tractor. If the push-button is released, the parking (spring) brake is engaged. Information concerning setting of operation mode of the loosening-parking valve is given in table (3.2).

TAB. 3.2 *Valve operation modes*

POSITION	PUSH-BUTTON RED	PUSH-BUTTON BLACK	DESCRIPTION
A	RELEASED 	DEPRESSED 	**The machine is braked with parking brake.** If the red push-button is released, the trommel screen is immobilized with parking brake regardless of the black push-button position.

POSITION	PUSH-BUTTON RED	PUSH-BUTTON BLACK	DESCRIPTION
B	RELEASED 	RELEASED 	
C	DEPRESSED 	RELEASED 	**Machine is prepared for travel** Pneumatic conduits are connected to trommel screen. Black push-button can not be depressed **Machine is braked** Pneumatic conduits are not connected. If the black push-button is depressed, the brake will be released.
D	DEPRESSED 	DEPRESSED 	**Parking brake is released, manoeuvre position** The trommel screen's brake is completely released. Pneumatic conduits are not connected.

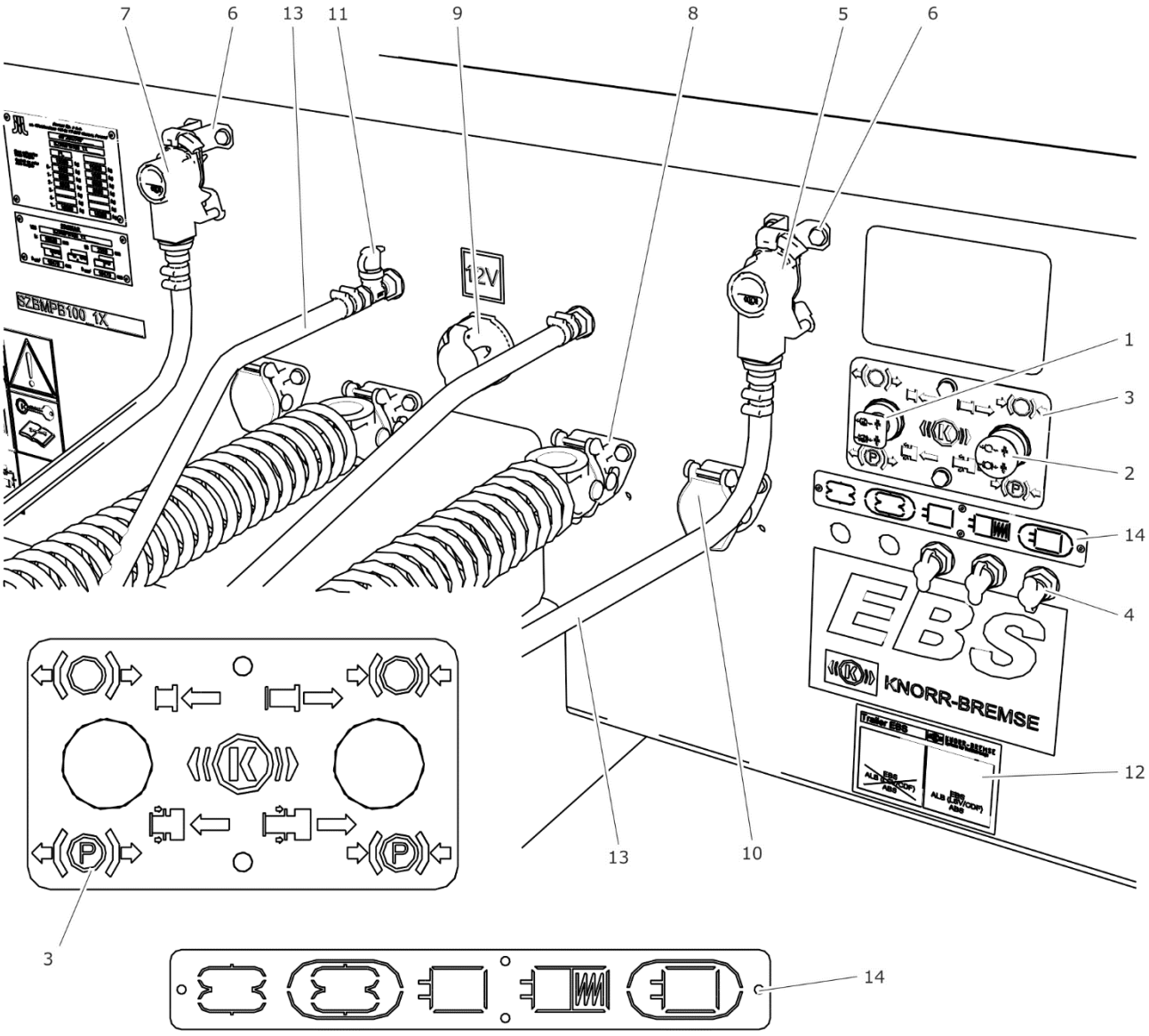


FIG. 3.10 *The frame front beam with elements of pneumatic system*

(1) valve's red push-button *(2) valve's black push-button* *(3) valve's information plate*
(4) control connections *(5) red pneumatic connection* *(6) holding socket of connection*
(7) yellow pneumatic connection *(8) EBS 24V electric socket* *(9) 12V electric socket*
(10) EBS holding socket *(11) control connection* *(12) warning decal*
(13) rubber or spiral pneumatic conduits *(14) information plate (label) of control connections*

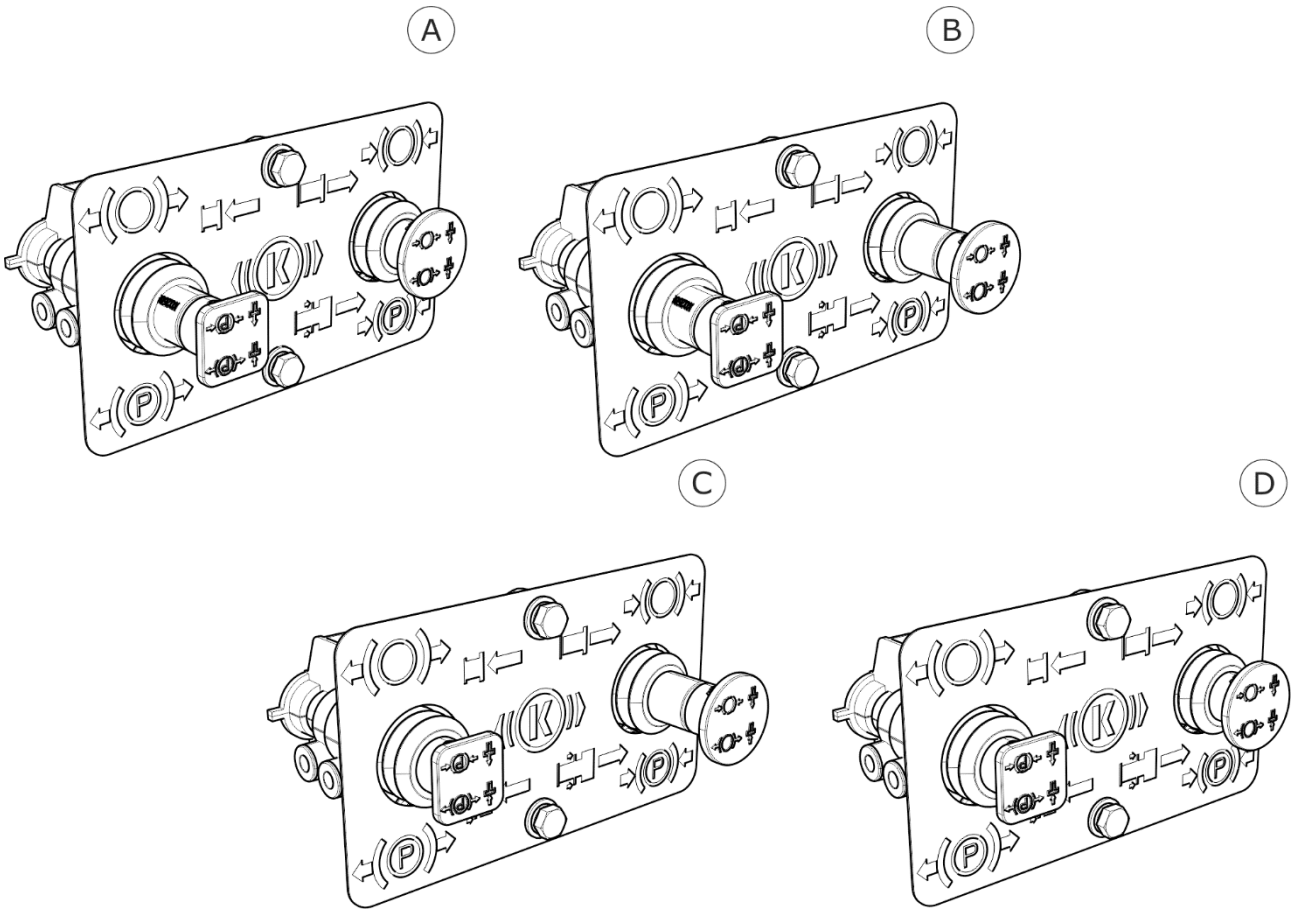


FIG. 3.11 *Possible combinations of settings of the loosening-parking valve's push-buttons*

3.5.2 PNEUMATIC CONNECTIONS

Pneumatic connections are equipped with covers that protect the connections against contamination and entrance of dirt into the system. They are made from coloured plastic (red connection – supply air; yellow connection - control air). The connections are made according to recommendations of DIN ISO 1728 standard. Thanks to this, the connections can not be incorrectly connected to the truck tractor's sockets. Pneumatic connections are integrated with air filters which protect the pneumatic system against ingress of contaminations. After unhitching the trommel screen, place the pneumatic connections in the specifically prepared sockets, located on the right side and the left side of the drawbar – figure (3.10).

3.5.3 MODULATOR TEBS G2

Main control valve is integrated with Electronic Control Unit (ECU). Proper operation of the modulator is possible only after connection of electric power lead. Driving without connected power lead is forbidden which is stated on the warning decal.

During normal operation, the signals from speed sensors installed in axles and possibly, signals from ALB sensor are sent to TEBS control unit. Calculations of braking force are made on the basis of this data. The trommel screen can be braked by means of CAN bus (a braking command is sent from the truck tractor's EBS system using the bus signalling system) or by aeration of control conduit (braking is forced by the truck tractor driver).

3.5.4 ABS FUNCTION

ABS function is integrated with TEBS G2 module. This system has to prevent vehicle wheel locking during braking. Action of ABS system can be compared to pulsating braking. Two or four rotational speed sensors (induction sensors) read out changing values of wheel rotational speed. If any of the wheels is locked during braking or its speed is considerably changed with regard to other wheels, a proper message is sent to the control system which reduces pressure of air in the cylinder braking a given wheel.

Locking of wheels during braking is very dangerous. ABS function considerably reduces loss of stability of the trommel screen and shortens braking distance of the machine.

3.6 CONTROL ELEMENTS OF THE TROMMEL SCREEN

3.6.1 MAIN CONTROL PANEL

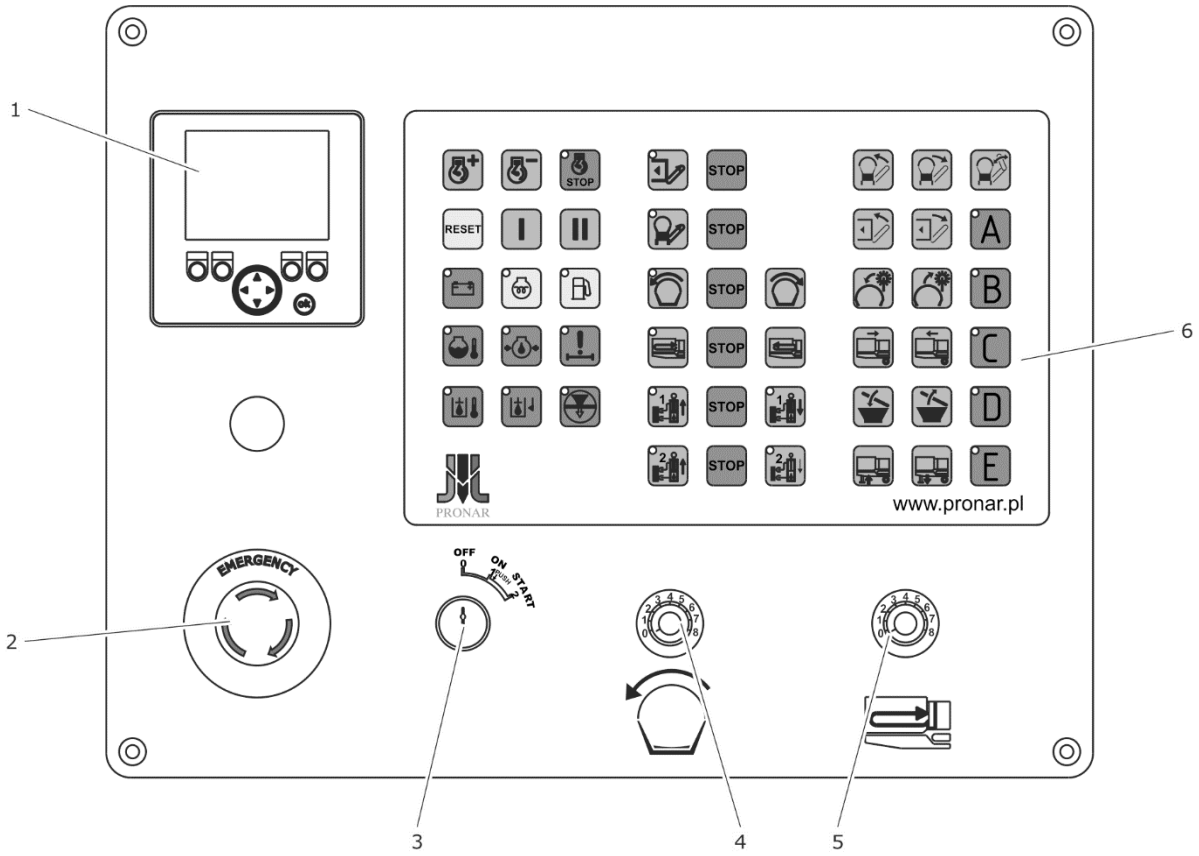
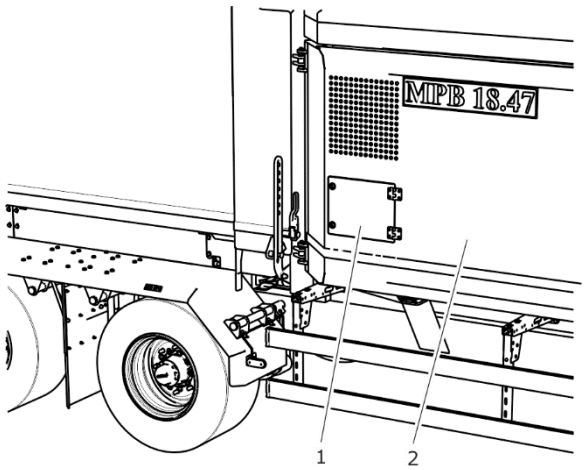


FIG. 3.12 *View of main control panel*

(1) display *(2) emergency switch* *(3) ignition switch*
(4) drum speed adjusting knob *(5) charging hopper conveyor speed adjusting knob*
(6) control panel



The main control panel of the trommel screen is located on the right side of the machine, behind the door (1) made from transparent plastic.

FIG. 3.13 *Location of main control panel*

(1) door *(2) right shield of charging hopper*

TAB. 3.3 *Description of function keys and information-warning indicators on the control panel*

PICTOGRAM	DESCRIPTION
	Increasing engine rpm. (green colour)
	Stopping the engine. (red colour)
	Reserve push-button. (green colour)
	No battery charging. (red colour)
	Low fuel level. (yellow colour)

PICTOGRAM	DESCRIPTION
	Decreasing engine rpm. (green colour)
	Cancelling an alarm signal. (yellow colour)
	Reserve push-button. (green colour)
	Heating of glow plugs. (yellow colour)
	Excessive temperature of engine coolant. (red colour)

PICTOGRAM	DESCRIPTION
	Insufficient pressure of engine oil (red colour)
	High temperature of hydraulic oil. (red colour)
	Contaminated filter of hydraulic system (option) (red colour)
	Start of side conveyor drive. (green colour)
	Start of screening drum in reverse direction. (green colour)
	Start of belt conveyor in reverse direction. (green colour)
	Reserve push-button. (green colour)
	Reserve push-button. (green colour)
	Stopping drives. (red colour)

PICTOGRAM	DESCRIPTION
	Water in fuel. Contaminated air filter. (red colour)
	Low level of hydraulic oil. (red colour)
	Start of rear conveyor drive. (green colour)
	Start of screening drum drive. (green colour)
	Start of belt conveyor drive in charging hopper. (green colour)
	Reserve push-button. (green colour)
	Reserve push-button. (green colour)
	Side conveyor folding. (green colour)
	Side conveyor unfolding. (green colour)

PICTOGRAM	DESCRIPTION
	Folding or unfolding the upper part of the side conveyor. (green colour)
	Rear conveyor unfolding. (green colour)
	Brush rising. (green colour)
	Sliding in charging hopper. (green colour)
	Reserve push-button. (green colour)
	Lowering the rear hydraulic support; optional equipment. (green colour)
	Reserve push-button.
	Reserve push-button.

PICTOGRAM	DESCRIPTION
	Rear conveyor folding. (green colour)
	Brush lowering. (green colour)
	Sliding out charging hopper. (green colour)
	Reserve push-button. (green colour)
	Rising the front hydraulic support; optional equipment. (green colour)
	Reserve push-button.
	Reserve push-button.
	Reserve push-button.

TIP

Detailed information concerning the operation of the control panel is given in section 4.

3.6.2 LCD DISPLAY

FIG. 3.14 *LCD display*

(1) information message (2) warning message

LCD display is located in the left upper corner of the main control panel. During operation in normal mode, a message (1) is displayed which contains basic working parameters of the engine and trommel screen's subassemblies (see the below table). Message (2) is displayed during start up of the trommel screen (switching the ignition key from position [0] to position [1]) and during emergency stop of the trommel screen.

TAB. 3.4 *List of LCD display messages*

CONTENT OF MESSAGES	Unit
Engine status	-
Engine temperature	C
Engine Speed	rpm
Engine life time	h
Fuel level	%
Sieve life time / (screening drum life time)	h
Transporter live time / (charging hopper conveyor life time)	h
Battery / (battery voltage)	V

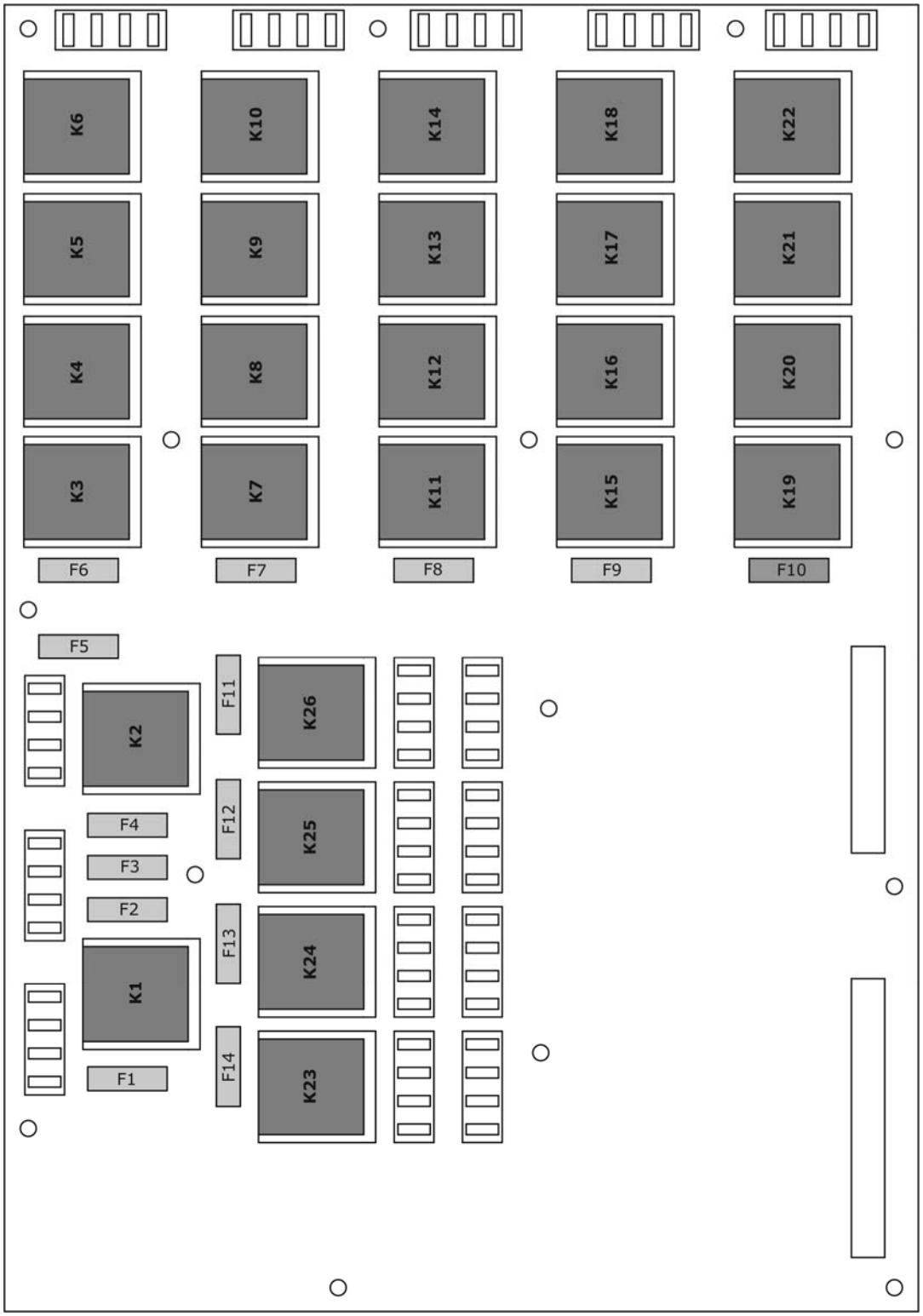


FIG. 3.15 *Arrangement of fuses and relays on the control panel main board*

Marking description on table (3.5)

TAB. 3.5 *List of fuses and relays*

SYMBOL	CIRCUIT
K1	Controller supply
K2	Safety switches
K3	Additional connection (not used)
K4	Additional connection (not used)
K5	Side feeder – starting
K6	Rear feeder – starting
K7	Side conveyor – rising
K8	Side conveyor – lowering
K9	Additional connection (not used)
K10	Additional connection (not used)
K11	Brush rising
K12	Rear conveyor – rising
K13	Rear conveyor – lowering
K14	Side conveyor – folding
K15	Not used
K16	Sliding out charging hopper
K17	Sliding in charging hopper
K18	Brush lowering
K19	Not used
K20	Support rising - option
K21	Support lowering – option
K22	Not used
K23	Starter motor
K24	Engine rotation cylinder
K25	Glow plugs
K26	Stopping the engine
F1	Fuse 5A, to relay K1
F2	Fuse 5A, power circuit of IFM controller
F3	Fuse 15A, power circuit of IFM controller's outputs
F4	Fuse 5A, circuit of safety switches

SYMBOL	CIRCUIT
F5	Fuse 20A, main power supply of K3÷K22 relays
F6	Fuse 15A, to relays K3…K6
F7	Fuse 15A, to relays K7…K10
F8	Fuse 15A, to relays K11…K14
F9	Fuse 15A, to relays K15…K18
F10	Fuse 15A, to relays K19…K22
F11	Fuse 15A, to relay K26
F12	Fuse 25A, to relay K25
F13	Fuse 25A, to relay K24
F14	Fuse 30A, to relay K23

3.6.3 AUXILIARY CONTROL PANEL

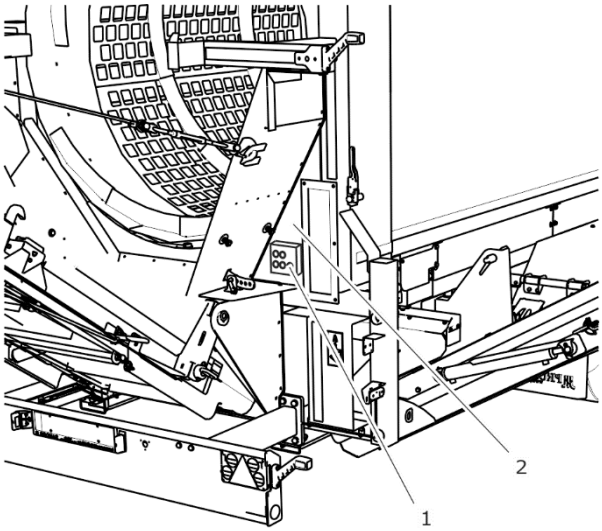


FIG. 3.16 *Location of the auxiliary control panel*

(1) auxiliary control panel (2) rear wall

The auxiliary control panel of the trommel screen is located on the machine's rear wall.

Description of control push-buttons can be found in table (3.3).

Detailed information concerning the operation of the control panel is given in section 4.

3.7 HYDRAULIC SYSTEM OF THE TROMMEL SCREEN

Hydraulic system diagram is shown in *ATTACHMENT B* at the end of the Operator's Manual. The pump system including two multi-piston pumps (1) and three gear pumps (2) is driven by combustion engine (4). The variable-displacement multi-piston pumps are designed for driving the screening drum and charging hopper feeder. The gear pumps drive the other conveyors:

side conveyor, rear conveyor, transverse conveyor and longitudinal conveyor. Conveyor folding and unfolding, charging hopper conveyor extending and brush rising and lowering are performed by means of hydraulic cylinders. The system operation is controlled by means of the main control panel and auxiliary control panel.

The hydraulic system is protected against overheating of hydraulic oil. When the limit temperature of 80^{o}C is reached, the control unit reduces output of the multi-piston pumps to 0 and stops all circuits of the system. Finally, the combustion engine is stopped. Emergency stop of the trommel screen is signalled by indicator light (1) - figure (3.17). The machine can be restarted only after oil has cooled down to 70^{o}C. Emergency stop of the trommel screen can be also caused by lowering of hydraulic oil level in the tank to emergency level which is signalled by indicator light (2).

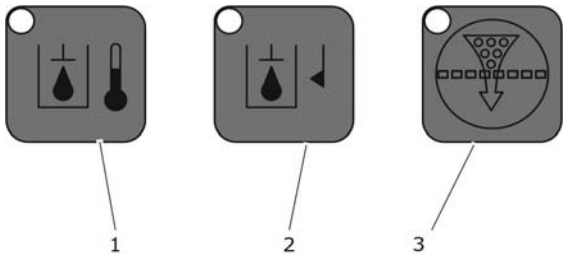


FIG. 3.17 *Hydraulic system alarm indicators*

(1) high temperature *(2) low oil level*

(3) contaminated filter (option)

Section

4

CORRECT USE

4.1 CHECKING THE TROMMEL SCREEN AFTER DELIVERY

4.1.1 PRELIMINARY INFORMATION

The manufacturer guarantees that the mobile trommel screen 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 trommel screen is delivered to the user completely assembled.

4.1.2 CHECKING THE TROMMEL SCREEN AFTER DELIVERY

After delivery of the machine to the buyer, the user is obliged to check by himself technical condition of the trommel screen and carefully read the Operator's Manual. Check completeness of the machine according to order.

IMPORTANT!

The seller is obliged to conduct the training in operation of the trommel screen and the first start of the machine in the presence of the user.

The user trained by the seller is not released from the obligation to read this Operator's Manual carefully.

INSPECTION RECOMMENDATIONS

- Check completeness of the machine according to order, (set of ignition keys and keys to the main control panel door, *WARRANTY BOOK*).
- Check technical condition of protective shields and check if they open and close correctly (engine compartment side shields, front shield and side shields of charging hopper, side under-run protective devices).
- 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.).
- Check air pressure in tyres and check correct tightening of wheel nuts.
- Check technical condition of drawbar eye and if correctly installed.
- Check the following: hydraulic oil level in the tank, level of engine lubricating oil, level of engine coolant.
- Add fuel to the fuel tank.
- Check grease level in automatic lubrication system.
- Check technical condition of conveyor belts.

Discovered defects should be notified directly to the seller in order to remove them. Incorrect level of operating fluids (except fuel) may indicate that there is a leakage. Check the machine for tightness.

4.1.3 TEST RUN OF THE TROMMEL SCREEN

PRELIMINARY INFORMATION

TIP

The training and the test run of the trommel screen are carried out by authorized employees of the Seller.

Test run of the trommel screen must be preceded by the training in the scope of design, functioning, correct operation, adjustment, maintenance and hitching the machine, including information about possible risks and dangers. The training and the test run are carried out by authorized employees of the Seller. The user must be informed about this when buying the machine.

TEST RUN

During test run, the user will undergo practical training in operation of the trommel screen. The main issues to be discussed during the training are listed below.

- Hitching the trommel screen to truck tractor and agricultural tractor. Adjusting the drawbar hitching eye.
- Preparing the machine for work (setting the machine, inspections during daily operation, starting the engine, unfolding the belt conveyors, checking the operation of belt conveyors)
- Adjustment of belt conveyors.
- Activities connected with screening and operation of the main control panel and the auxiliary control panel.
- Stopping the machine operation in normal mode; stopping the machine operation in emergency mode.
- The procedure in case of clogging and blocking of the trommel screen.
- Adjustment and maintenance activities that can be performed by the user.
- Dangers resulting from wrong maintenance and repair activities.
- Operation of the control panel, information about alarms and related procedures.

DANGER

Careless and improper use and operation of the trommel screen and non-compliance with the recommendations given in this Operator's Manual are dangerous to health and life.

The trommel screen must never be used by unauthorised persons (especially children and people under the influence of alcohol or other drugs).

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

4.2 HITCHING AND UNHITCHING THE TROMMEL SCREEN

The machine may be connected to truck tractor if all connections (electrical and pneumatic ones) and the hitch of the tractor are according to the machine Manufacturer's requirements.

CONNECTION

➡ Position the truck tractor directly in front of the trommel screen's drawbar eye.

➡ Reverse the agricultural tractor near the trommel screen drawbar eye. If necessary,

adjust the height of the drawbar eye by means of the parking stand according to location of tractor hitch.

- Hitch the trommel screen to the tractor's hitch, check the hitch lock protecting the machine against accidental unhitching.
- If the truck tractor is equipped with an automatic coupler, ensure that the hitching operation is completed and that drawbar eye is secured.
- Raise parking stand to the upper extreme position. Raise the rear supports and secure the pins.
- Turn off the truck tractor's engine.
- Connect pneumatic conduit marked yellow.
- Connect pneumatic conduit marked red.
- Connect electric lead supplying TEBS G2 module.
- Connect supply conduit of lighting system – compare section 3.4.
- Check and, if necessary, protect conduits against rubbing or other mechanical damage. When turning, connecting conduits must hang loosely and not become tangled with moving elements of the machine and tractor.
- Just before driving off, remove chocks from under the trommel screen's wheels and release parking brake (press the red push-button of the loosening-parking valve).

Check operation of the lighting system

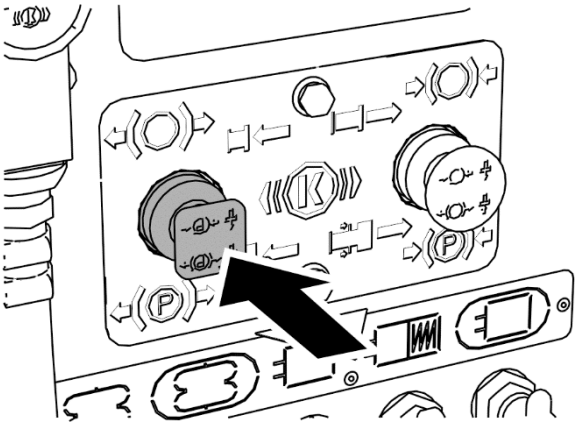


FIG. 4.1 *Loosening-parking valve*

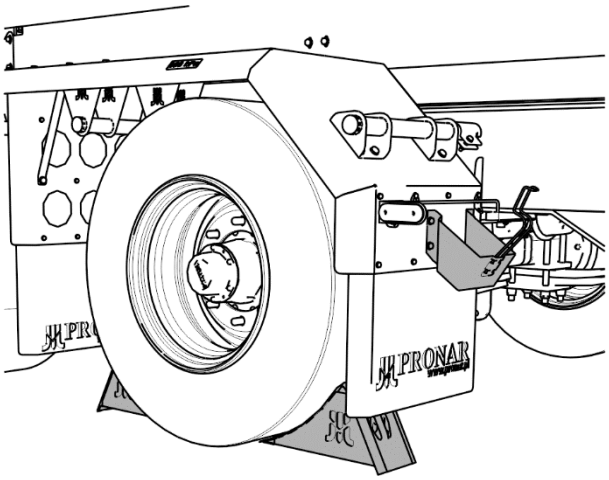


FIG. 4.2 *Chocks and chock bracket*

UNHITCHING THE TROMMEL SCREEN

- Disconnect conduit marked red.
- Disconnect conduit marked yellow.
- Disconnect electric leads (supply lead of TEBS G2 module and supply lead of lighting system).
- Place electric leads and pneumatic conduits in the specifically prepared holding sockets, located on the front beam of the trommel screen's frame.
- Lower the parking stand.
- Release the red push-button of the loosening-parking valve.
- Place chocks under the trommel screen wheels.

➡ Unlock the truck tractor hitch, drive tractor away from the trommel screen.

DANGER

When hitching, there must be nobody between the trommel screen and the tractor. When hitching the machine, the truck tractor driver must exercise caution and make sure that nobody is present in the hazard zone.

When connecting the pneumatic conduits to the tractor, make sure that the pneumatic systems of the tractor and the trommel screen are not under pressure.

Ensure sufficient visibility during hitching.

After completion of hitching check the security of the hitching pin.

4.3 INSPECTIONS DURING DAILY OPERATION

4.3.1 CHECKING HYDRAULIC OIL LEVEL

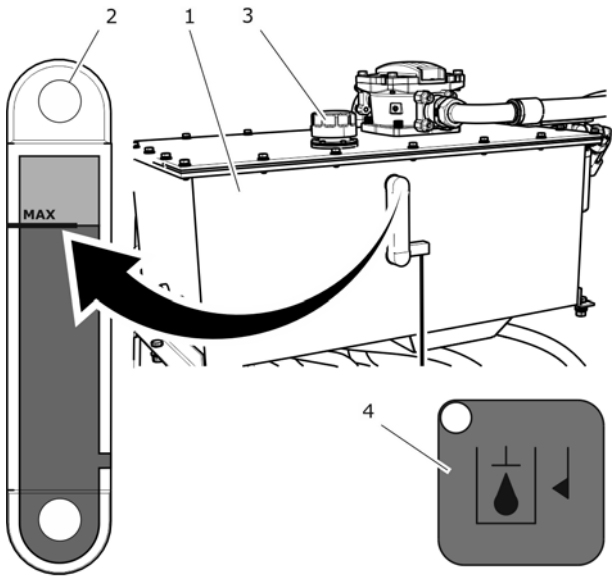


FIG. 4.3 *Checking hydraulic oil level*

(1) oil tank *(2) oil level indicator*

(3) filler plug *(4) indicator light.*

EXTENT OF ACTIVITY

➡ Open the right shield of the engine compartment.

➡ Check hydraulic oil level on the oil level indicator (2)

⇨ Proper oil level is indicated by the black mark.

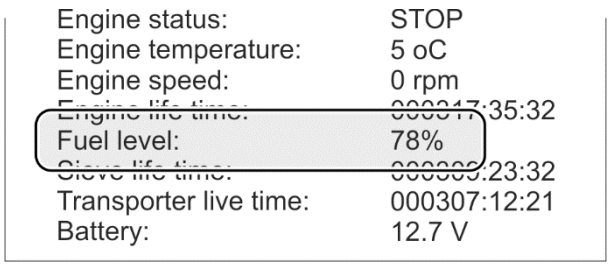
➡ If oil level is too low, unscrew filler plug (3) and supplement oil to the maximum level.

➡ Tighten filler plug.

TIP

Low level of hydraulic oil is signalled by indicator light (4). Activation of alarm causes emergency stop of the engine.

4.3.2 CHECKING FUEL LEVEL



- Insert key to ignition.
- Turn key from position [0] to position [1].
- Switch on the control panel and check fuel level (percentage value).

If necessary, add fuel.

FIG. 4.4 *Checking fuel level*

4.3.3 CHECKING LEVEL OF ENGINE LUBRICATING OIL

EXTENT OF ACTIVITY

- Remove safety pin of engine frame, tilt the engine frame
- Take out oil dipstick (1) and wipe it until dry.
- Insert oil dipstick and take it out again.
- Check oil level in the engine. Proper oil level should be between the marks of the maximum and the minimum oil level (MIN and MAX).
- If engine oil level is too low, unscrew filler plug (2) and add proper amount of oil.

TIP

Insufficient pressure of lubricating oil is signalled by indicator light (4). Activation of alarm causes emergency stop of the engine. One of the causes of the engine stop may be insufficient level of lubricating oil.

- After fresh oil is added, wait until oil flows into the oil pan and check oil level again.
- Tighten filler plug (2).
- Insert oil dipstick (1).
- Fold the engine frame and secure it with a pin.

Excessive oil level may be caused by leaky fuel system, leaky cooling system or other defect.

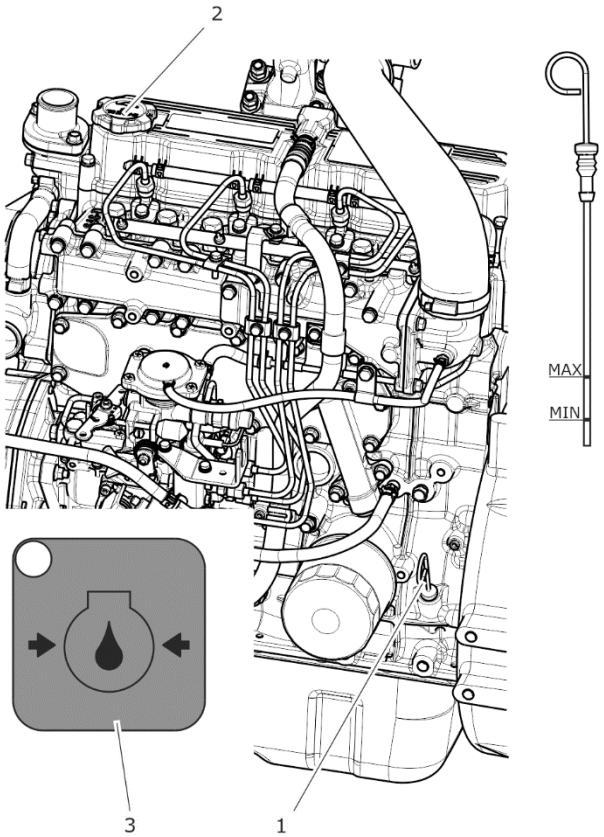


FIG. 4.5 *Checking level of engine lubricating oil*

(1) oil dipstick *(2) filler plug*

(3) indicator light.

4.3.4 CHECKING THE LUBRICATION PUMP SETTINGS

EXTENT OF ACTIVITY

The settings of the automatic lubrication pump are selected by the Manufacturer for specific working conditions of the machine and they must not be changed.

However, before starting the trommel screen always check the pump working time setting (1) – value [10] and the lubrication cycle setting (2) – value [0.5] to confirm that the settings have not been changed by non-authorized persons.

After turning the ignition key from position [0] to position [1], check also the indications of red diode (4) and green diode (3). Detailed information concerning the codes displayed by the diodes is given in section 5.

IMPORTANT!

The settings of the automatic lubrication pump are selected by the Manufacturer for specific working conditions of the machine and they must not be changed.

TIP

Automatic lubrication system pump is located on the right side of the trommel screen, below the engine compartment.

If push-button (5) is pressed, the pump will start working in a set cycle. Start of lubrication process is signalled by lighting of green diode.

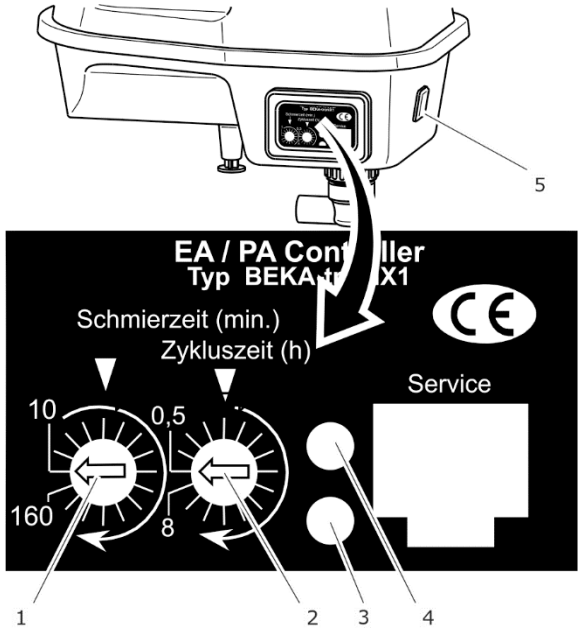


FIG. 4.6 *Checking the lubrication pump settings*

(1) working time *(2) lubrication cycle*

(3) green diode *(4) red diode*

(5) push-button activating the pump

4.3.5 CHECKING GREASE LEVEL

EXTENT OF ACTIVITY

- ➡ Check grease level in the pump tank.
- ➡ If necessary, add grease.

The grease pump tank should be filled through grease nipple (1) using a manual or pneumatic grease gun for this purpose.

TIP

Information concerning lubricants should be given in section 5.

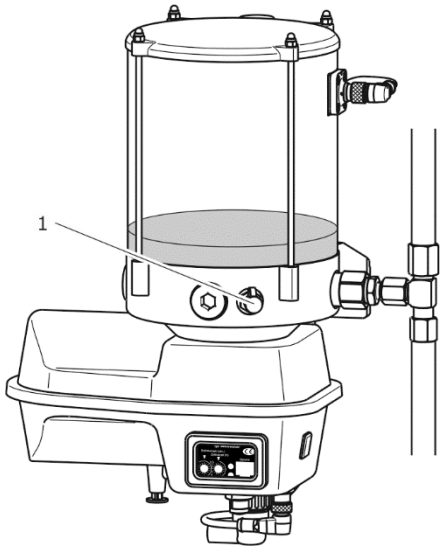


FIG. 4.7 *Checking grease level*

(1) grease nipple

4.3.6 CHECKING ENGINE COOLANT LEVEL

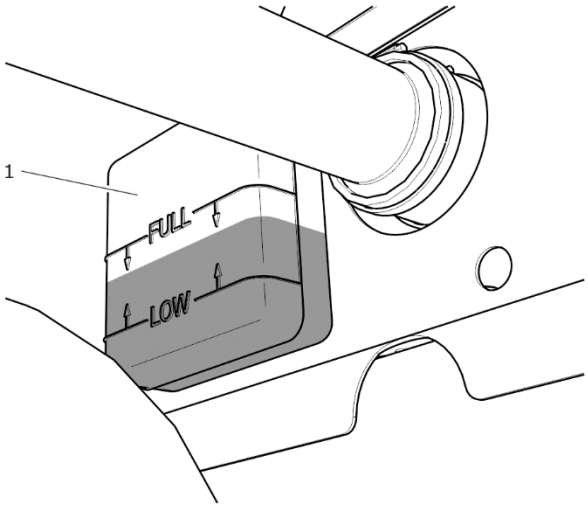


FIG. 4.8 *Checking engine coolant level*

(1) equalization tank

EXTENT OF ACTIVITY

- Check engine coolant level in equalization tank.
- Proper engine coolant level should be between LOW and FULL marks.
- If necessary, add engine coolant according to specification of operating fluids – section 5.

TIP

The coolant equalization tank is located above the radiator, in the engine compartment.

4.3.7 OTHER INSPECTION ACTIVITIES

- Conduct daily inspection according to guidelines presented in section 5.
- Check correctness of electrical system operation (whenever the trommel screen is towed on public roads).
- Check technical condition and completeness of safety shields (side shields of engine compartment, side shields of screening drum, front shield of engine compartment, side under-run protective devices). Check if shields are correctly closed.

➡ Visually inspect if the tyres are properly inflated. If necessary inflate the tyres up to recommend pressure.

➡ Check and possibly remove thicker contaminations from the brush.

4.4 STARTING THE TROMMEL SCREEN

4.4.1 PRELIMINARY INFORMATION

If no contraindications for starting the trommel screen are found during daily inspection, commence starting the machine. Proper starting of the machine includes a range of preparatory activities such as:

- positioning the machine in working location,
- starting the engine,
- unfolding the conveyors (the side conveyor and the rear conveyor),
- checking and, possibly, adjusting tension of conveyor belts,
- starting proper working.

DANGER

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

4.4.2 POSITIONING THE MACHINE IN WORKING LOCATION

➡ Position the trommel screen on hard, stable, flat and level ground and ensure sufficient yard area around the machine for piling the screened charge material.

➡ Tractor must be placed to drive forward.

➡ Disconnect pneumatic conduits and electric leads from the tractor and place conduit terminals in the specifically prepared holding sockets located on the front beam of the lower frame.

➡ Immobilise the trommel screen with parking brake by releasing the red push-button of the loosening-parking valve.

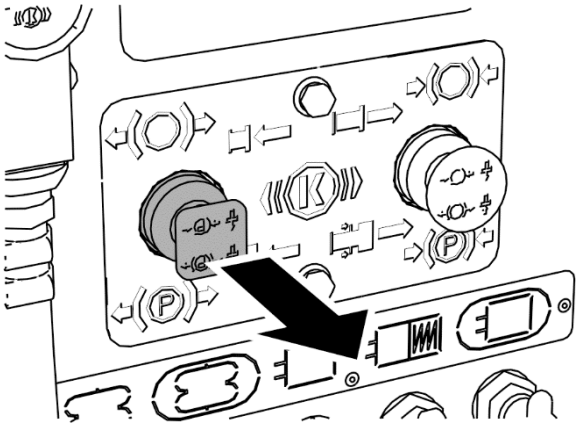


FIG. 4.9 *Engaging the parking brake*

➡ Place chocks under the trommel screen's wheels in order to prevent the machine from rolling. Place one chock in front of the wheel and the second one behind the wheel. The

chocks are located on brackets fixed to mudguards.

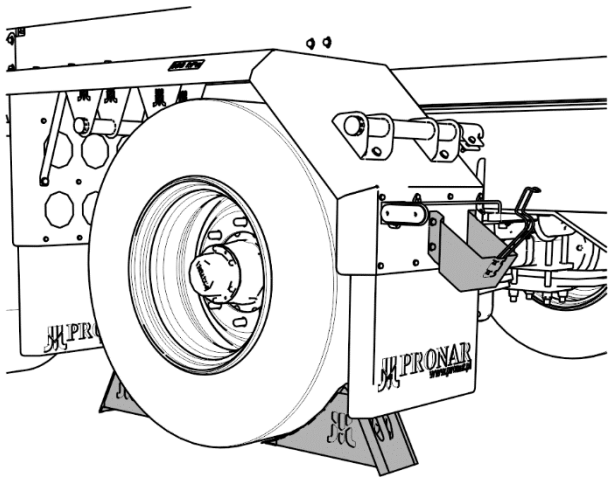


FIG. 4.10 *Chocks*

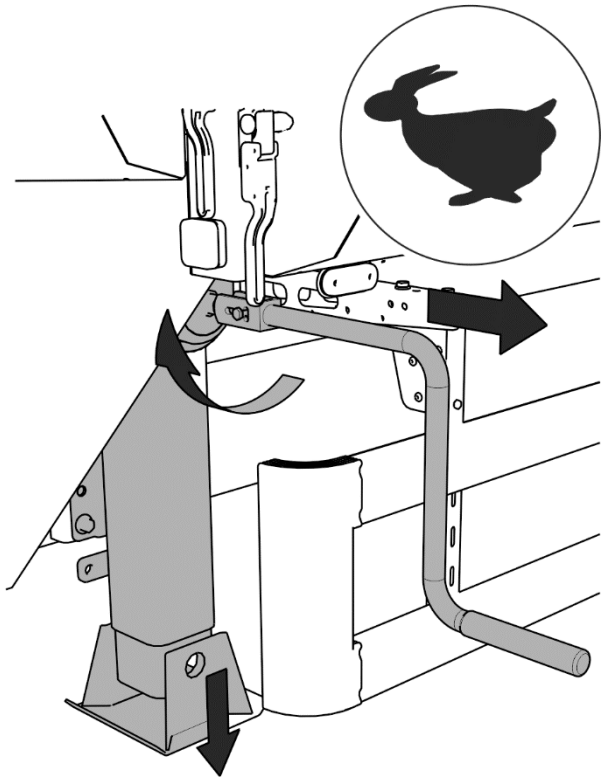


FIG. 4.11 *Front support, quick feed*

- Take the support crank off from the holder and fold the crank to working position.
- Pull the crank (shifting to a higher-speed working mode of the support – quick feed of the support foot) – figure (4.11).
- Turn the crank to the right to slide out the support foot until it touches the ground.
- Press the support shaft (shifting to a lower-speed working mode of the support – slow feed of the support foot). – figure (4.12).
- Turn the crank in the same direction to set the drawbar eye at such a height that it is possible to unhitch the drawbar hitching eye from the tractor hitch.

IMPORTANT!

Do NOT use a high speed when the support is greatly loaded.

- Unhitch the drawbar hitching eye and drive tractor away from the machine.
- Set the drawbar eye at such a height that it is possible to level the lower frame.

TIP

The trommel screen is allowed to be slightly tilted backwards (4^o - 6^o).

DANGER

Be especially careful when unhitching the trommel screen from the tractor. If it is not necessary, do not stand between the machines.

Ensure proper visibility and make sure that nobody is present in the hazard zone when unhitching the machines.

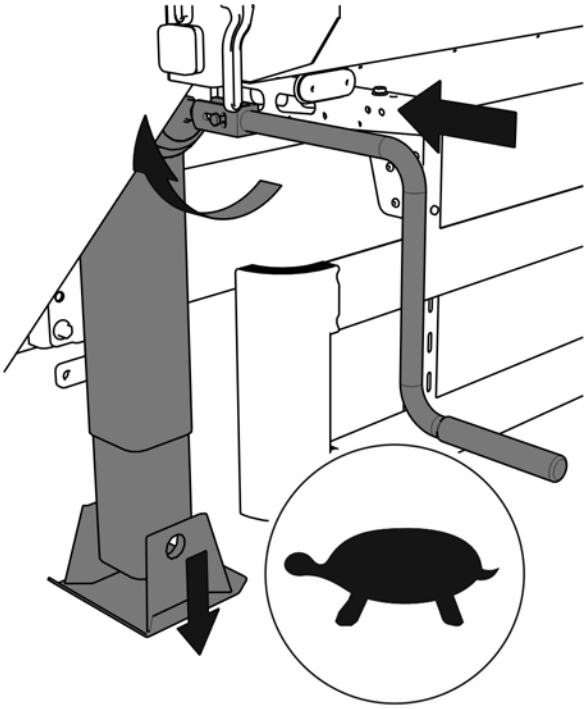


FIG. 4.12 *Front support, slow feed*

4.4.3 STARTING THE ENGINE

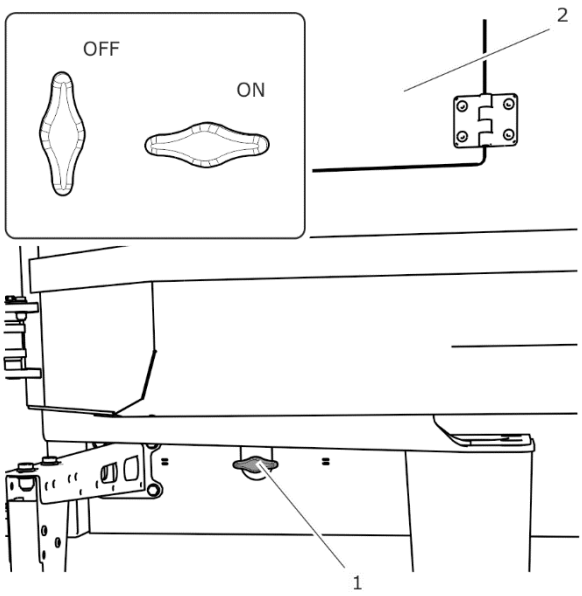


FIG. 4.13 *Main switch*

(1) switch *(2) panel's door*

➡ Turn main switch to **ON** position.

⇨ The switch is located on the lower frame bracket under the engine shield, at the height of the main control panel.

➡ Open the main control panel door, insert key to ignition.

➡ Turn the key from position **0 (OFF)** to position **1 (ON)**.

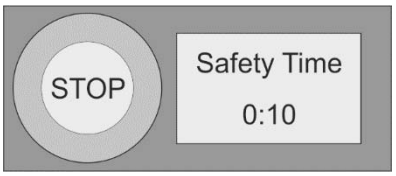


FIG. 4.14 *Information message*

⇨ After turning the ignition key, heating of glow plugs is switched on (this is signalled by corresponding indicator light) and the control panel is activated on which the following message is displayed: **STOP, SAFETY TIME 10S**. If none of the safety switches is activated, the engine can be started after 10 seconds.

TIP

Two indicator lights should be normally on before the engine is started i.e. no battery charging indicator light and low oil pressure indicator light. The indicator lights go out after starting the engine.

➡ Push the key in and turn it to position **2 (START)**. The engine should start immediately.

⇨ If the engine can not be started, do not hold the key in **START** position for more than 10 seconds. Try to start the engine again after about 60 seconds. If the engine can not be started after 3 – 4 trials, find and remove the cause of the problem.

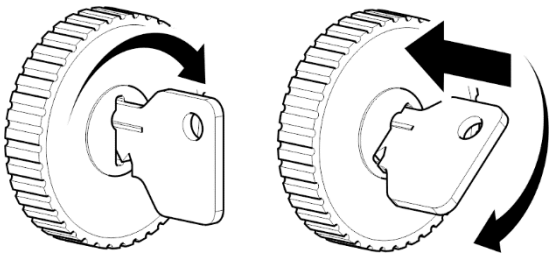


FIG. 4.15 *Ignition*

➡ After starting the engine, working time of the engine is being counted (**ENGINE LIFE TIME**) as well as current temperature (**ENGINE TEMPERATURE**) and rotational speed (**ENGINE SPEED**) are displayed.

Engine status:	START
Engine temperature:	25 oC
Engine speed:	1100 rpm
Engine life time:	000317:35:32
Fuel level:	77%
Sieve life time:	000309:23:32
Transporter live time:	000307:12:21
Battery:	12.4 V

FIG. 4.16 *Information message*

After starting the cold engine, wait until the green indicator light with description **READY**, located under the LCD panel, is on. This indicator light signals that the engine reached the temperature of 40^{o}C and hydraulic pumps can be started. The hydraulic pumps can not be started at a lower temperature (protection of cold engine against loading).

DANGER

Before starting the engine make certain that all shields are closed.

4.4.4 UNFOLDING THE SIDE CONVEYOR

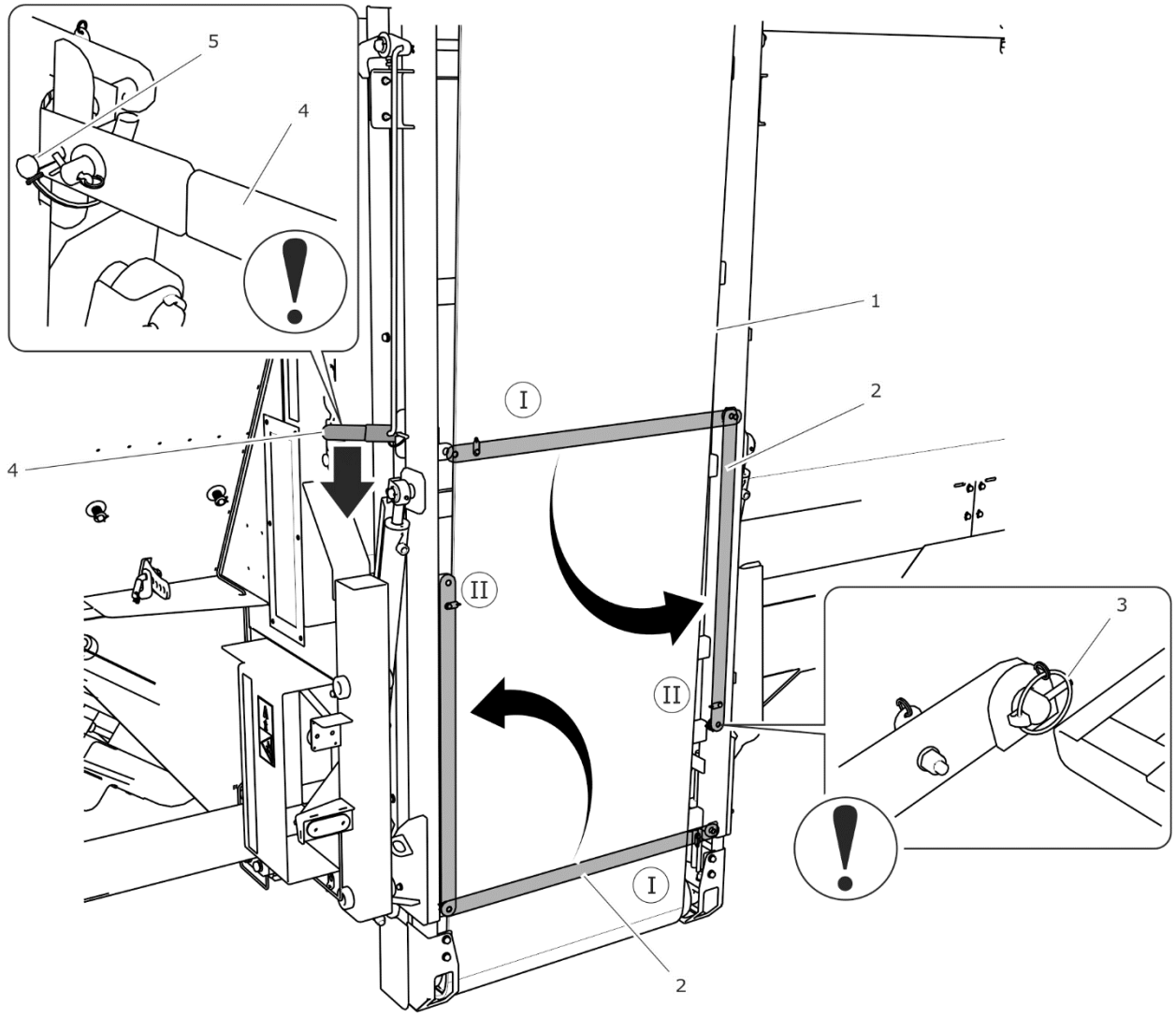


FIG. 4.17 *Preparing the side conveyor for unfolding*

(1) side conveyor *(2) protective strip* *(3) strip cotter pin*

(4) latch lever *(5) lever cotter pin*

- ➡ Dismantle two cotter pins (3).
- ➡ Relocate protective strips (2) from position **I** to position **II**.
- ➡ Install cotter pins (3).
- ➡ Take out cotter pin (5) protecting the lever.
- ➡ Using the auxiliary control panel, press the conveyor to the machine.
  - ⇨ If the conveyor is pressed to the machine, the latches can be unlocked.
- ➡ Move the lever (4) in the direction indicated by the arrow and hold it.
- ➡ Using the main control panel or the auxiliary control panel, first unfold the complete conveyor from the trommel screen – STAGE **I** to **II**.
- ➡ When unfolding the conveyor, the lever (4) can be released.
- ➡ Then, while holding two push-buttons on the panel, (compare figure), unfold the upper part of the conveyor, STAGE **II** to **III**.

DANGER

Keep the proper sequence of conveyor unfolding.

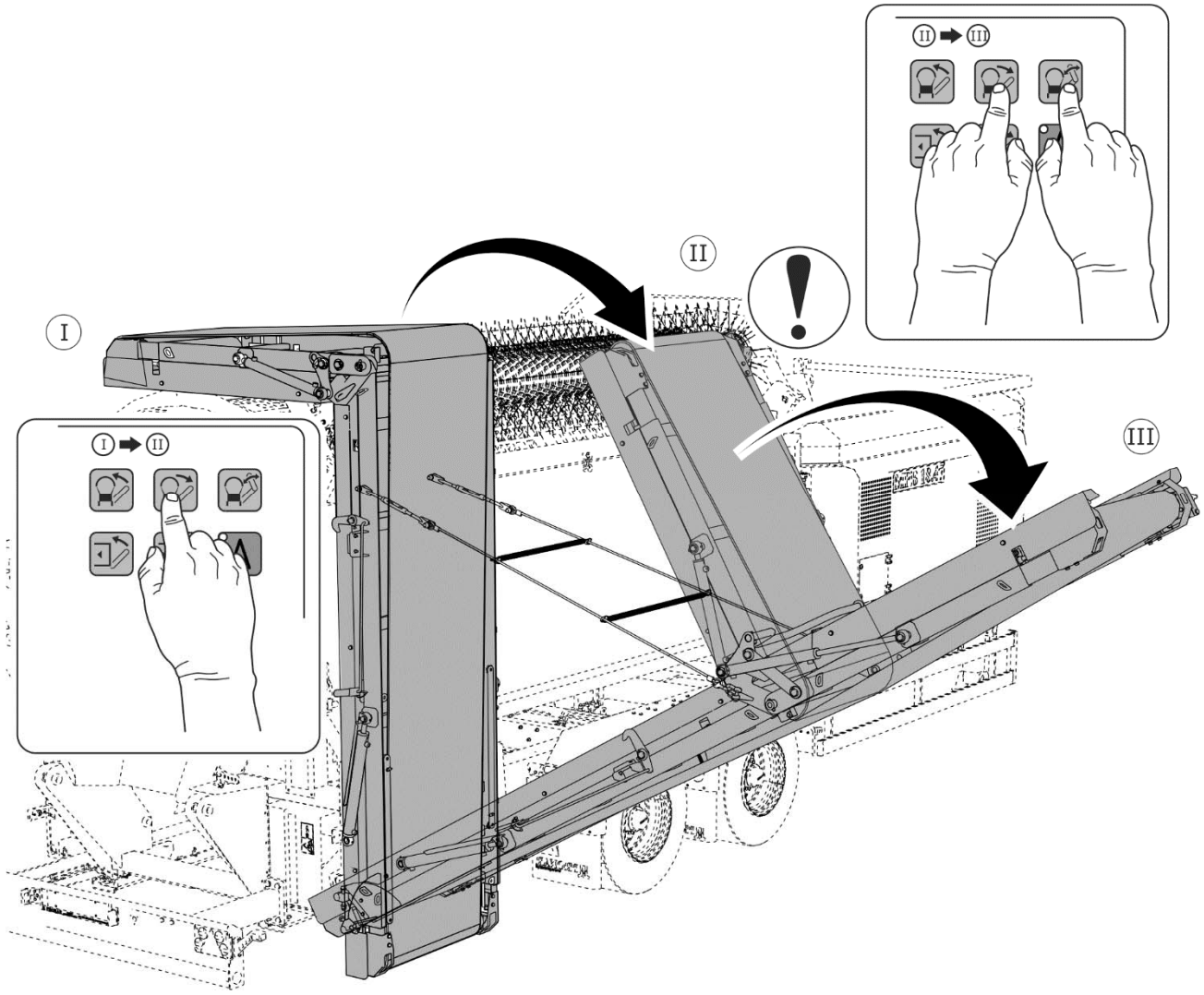


FIG. 4.18 *Stages of side conveyor unfolding.*

4.4.5 SIDE CONVEYOR FOLDING

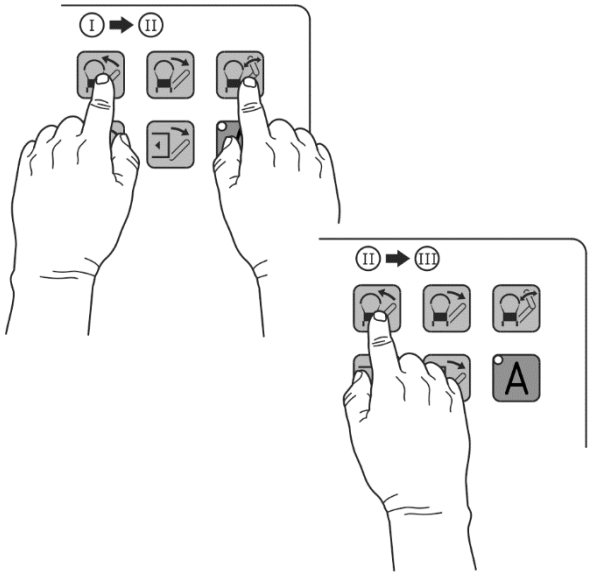


FIG. 4.19 *Side conveyor folding*

- While holding two push-buttons on the panel, (compare figure), fold the upper part of the conveyor, STAGE **I** to **II**.
- Control the arrangement of conveyor belt.
- While holding the push-button on the panel, (compare figure), fold the complete conveyor, STAGE **II** to **III**.
- The conveyor will be automatically locked by means of latches.
- Lock the latch lever using a cotter pin.
- Relocate the strips protecting the conveyor belt to horizontal position – position **I** – figure (4.17) and secure them by means of cotter pins.

4.4.6 UNFOLDING THE REAR CONVEYOR

- Remove lever cotter pin (9)
- Remove cotter pin (7) from the pin that holds the belt (2) – figure (4.20).
- Remove cotter pin (7) from the pin (3) that locks the foldable part of the conveyor.
- Remove pins (2) and (3).
- Using the auxiliary control panel, press the conveyor to the machine.
  - ⇨ If the conveyor is pressed to the machine, the latches can be unlocked.
- Move the lever (8) in the direction indicated by the arrow and hold it.
- Using the auxiliary control panel, unfold the conveyor.
- When unfolding the conveyor, the latch lever (8) can be released.
- Take out two cotter pins (6), from the left side and the right side of the conveyor.
- Insert two pins (5) maximally and secure them again with cotter pin (6).
  - ⇨ Cotter pins should be located in hole (B). Hole (A) is used for fixing the pin's cotter pin when the conveyor is folded.
- Install pins (2) and (3) in such a way that they are located inside the belt. Secure the pins with cotter pins (7).
- Remove cotter pin (7) from pin (4), remove the pin and install it again in such a way that it is located inside the conveyor belt. Secure the pin with a cotter pin.
- Install cotter pin (9).

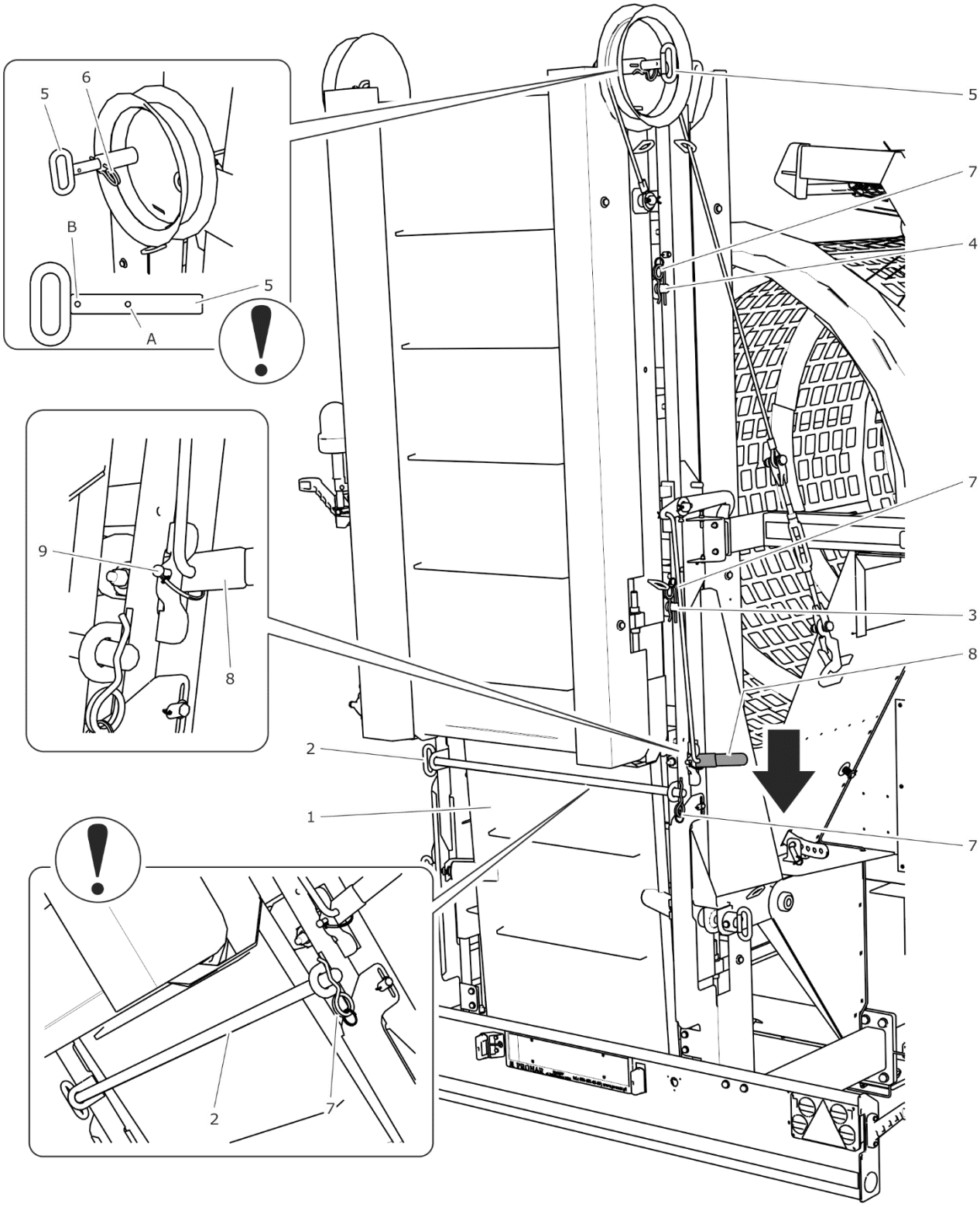


FIG. 4.20 *Preparing the rear conveyor for unfolding*

(1) rear conveyor *(2) supporting pin* *(3) locking pin*

(4) supporting pin *(5) pin* *(6) cotter pin*

(7) cotter pin *(8) latch lever* *(9) lever cotter pin*

(A), (B) cotter pin positions

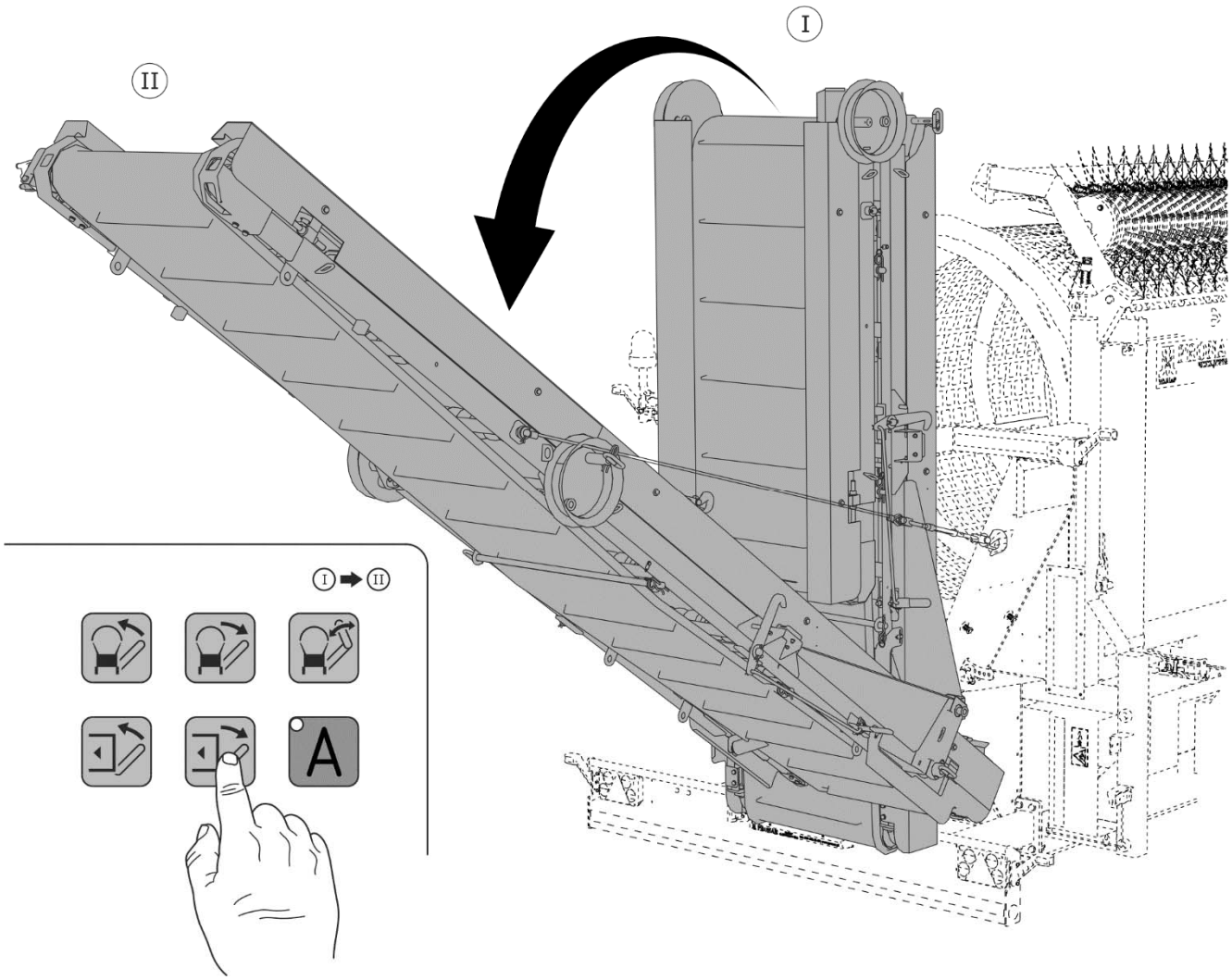


FIG. 4.21 *Stages of rear conveyor unfolding*

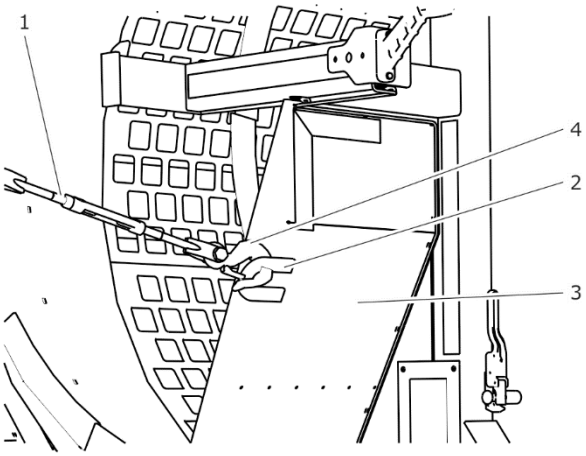


FIG. 4.22 *Disassembly of rear cables*

(1) steel cable *(2) lug*

(3) rear wall *(4) hook*

Working angle of the rear conveyor can be adjusted as needed by means of hydraulic cylinders. In order to do that, two steel cables must be disassembled (1). The cables should be dismounted from lugs (2) welded to the rear wall structure (3). The cables can be dismounted only after complete unfolding of the rear conveyor.

DANGER

After each installation of pins, install and check correctness of installation of securing cotter pins.

Do NOT stand under the side conveyor or rear conveyor during their unfolding.

4.4.7 FOLDING THE REAR CONVEYOR

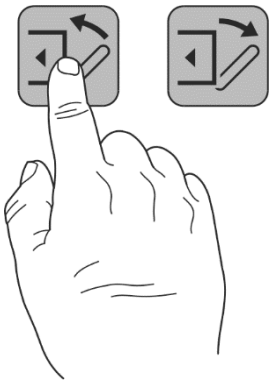


FIG. 4.23 *Folding the rear conveyor*

- ➡ Raise the rear conveyor to such a height that it is possible to install steel cables (if they were dismounted) and install the cables.
- ➡ Lower the conveyor to tighten the cables completely.
- ➡ Take out two cotter pins (6) - figure (4.20), slide the pins out to align the pin's hole (A) with the socket hole. Secure pins with cotter pins.
- ➡ Remove all cotter pins (7) of pins (2), (3) and (4). Remove these pins.
- ➡ Install pin (2) in such a manner that it is located under the belt. Secure the pin with a cotter pin.
- ➡ Install pin (4) in such a manner that it is located under the belt. Secure the pin with a cotter pin.
- ➡ Remove lever cotter pin (9).
- ➡ Using the auxiliary control panel, raise the conveyor. Raise the conveyor until it is automatically locked.
- ➡ Install lever cotter pin (9).
- ➡ Install pin (4) and secure it with a cotter pin Pin (4) connects two rear conveyor frames in folded position.

4.4.8 CHECKING CONVEYORS OPERATION

Check operation of the conveyors each time before start of screening. The purpose of checking is to confirm correctness of the conveyor belt guidance and tension. In order to do this:

- start all conveyors in succession,
- during movement of the conveyor belt, check that the belt does not shift sideways to the left or to the right on the driving and return rolls,
- check that the belt does not slide on the driving roll,

If the conveyor belt does not work properly, adjust the conveyor. Detailed information concerning maintenance and adjustment of the conveyors is given in section 5.

IMPORTANT!

Conveyor belt wears out faster if it slides and (or) shifts sideways on the rolls.

The inspection can be carried out only when the screening drum and conveyors are empty.

4.5 STARTING THE TROMMEL SCREEN'S DRIVES

IMPORTANT!

Before commencing work, make sure that the trommel screen is fully operational and correctly adjusted. Do NOT start out-of-order machine.

Before loading the charging hopper, start all necessary drive systems in the following sequence:

- drive of side conveyor and transverse conveyor,
- drive of longitudinal conveyor and rear conveyor,
- drive of screening drum,
- drive of conveyor in charging hopper.

Proper starting sequence enables removal of remaining material from the trommel screen and prevents clogging and blocking of the machine at start-up. After the first start (from cold engine condition), the trommel screen should be loaded slowly until nominal working parameters of the engine are achieved.

Before starting the charging hopper conveyor drive, wait until the drum reaches the preset working speed. Also, the charging hopper conveyor may be loaded only when the preset speed of the conveyor belt is reached.

4.5.1 STARTING THE DRIVE OF SIDE CONVEYOR AND TRANSVERSE CONVEYOR

➡ In order to start the conveyors, press push-button (1) – START of the drive.

⇨ When the drive is switched on, diode (3) indicating operation of the conveyors is on.

➡ In order to stop the conveyors' drive, press push-button (2) – STOP.

Operation of the conveyors is controlled only by means of the main control panel.

IMPORTANT!

Do NOT start the conveyors' drive when the side conveyor is folded

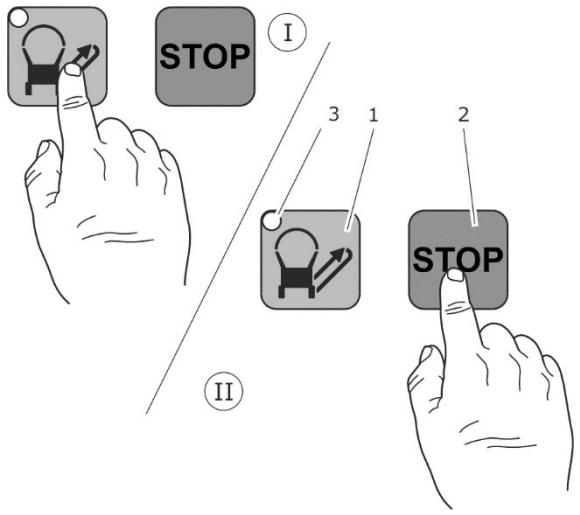


FIG. 4.24 *Controlling the side conveyor and transverse conveyor*

(1) START push-button (2) STOP push-button

(3) LED

4.5.2 STARTING THE DRIVE OF LONGITUDINAL CONVEYOR AND REAR CONVEYOR

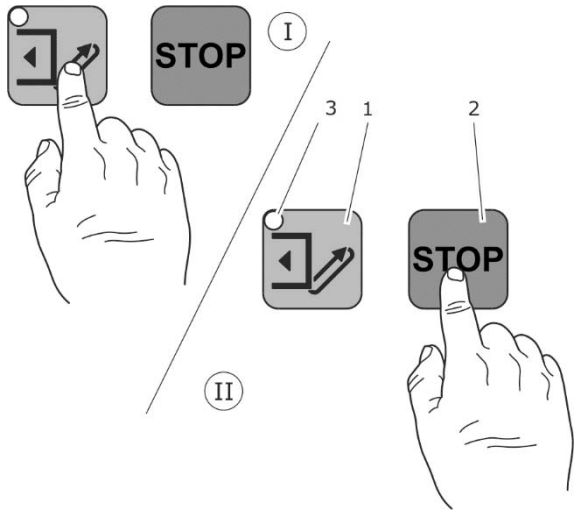


FIG. 4.25 *Controlling the longitudinal conveyor and rear conveyor*

(1) START push-button (2) STOP push-button

(3) LED

➡ In order to start the conveyors, press push-button (1) – START of the drive.

⇨ When the drive is switched on, diode (3) indicating operation of the conveyors is on.

➡ In order to stop the conveyors' drive, press push-button (2) – STOP.

Operation of the conveyors is controlled only by means of the main control panel.

IMPORTANT!

Do NOT start the conveyors' drive when the rear conveyor is folded

4.5.3 STARTING THE SCREENING DRUM DRIVE

- ➡ In order to start the drum, press push-button (1) - START.
- ➡ Rotational speed of the drum can be set by means of potentiometer (5).
  - ⇨ When the drum is accelerating to reach the set speed, diode (4) is blinking slowly.
  - ⇨ When the drum is decelerating, diode (1) is blinking quickly.
  - ⇨ If the rotational speed of the drum is equal to the set speed, diode is on constantly.
- ➡ In order to stop the drum drive, press push-button (2) – STOP.
- ➡ In order to start the drum in reverse direction, first stop the drum and then press push-button (3) – REVERSE RUN.
  - ⇨ During reverse run, the drum rotates at a constant speed regardless of the potentiometer setting (5).

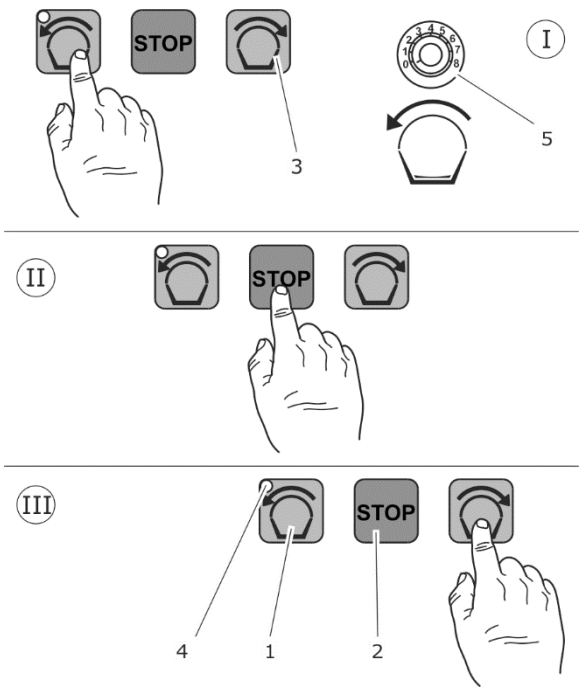


FIG. 4.26 *Controlling the drum*

(1) START push-button (2) STOP push-button

(3) REVERSE RUN push-button

(4) LED *(5) potentiometer*

IMPORTANT!

The reverse run of the drum is used only for adjusting the screening drum position.

Do NOT use the reverse run of the screening drum in order to remove clogging of charge material.

4.5.4 STARTING THE CHARGING HOPPER CONVEYOR DRIVE

- ➡ In order to start the charging hopper conveyor, press push-button (1) - START.
- ➡ Conveyor speed can be set by means of potentiometer (5).
  - ⇨ When the conveyor is accelerating to reach the set speed, diode (4) is blinking slowly.
  - ⇨ When the conveyor is decelerating, diode (1) is blinking quickly.
  - ⇨ If the conveyor belt speed is equal to the set speed, diode is on constantly.
- ➡ In order to stop the drum drive, press push-button (2) – STOP.

➡ In order to start the conveyor in reverse direction, first stop the conveyor and then press push-button (3) – REVERSE RUN.

⇨ During reverse run, the charging hopper conveyor belt moves at a constant speed regardless of the potentiometer setting (5).

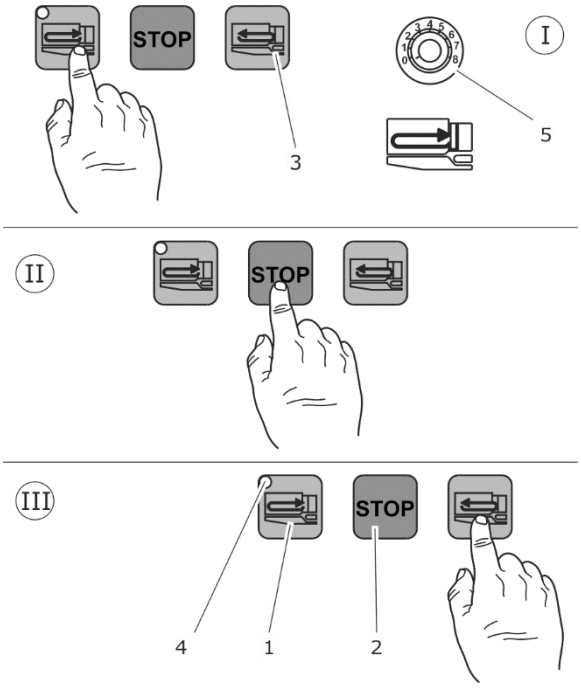


FIG. 4.27 *Controlling the charging hopper feeder*

(1) START push-button (2) STOP push-button

(3) REVERSE RUN push-button

(4) LED (5) potentiometer

4.6 SCREENING

It is impossible to specify detailed working principles due to the diversity of charge materials. Depending on a charge material, the user should choose by himself individual working parameters of the machine (rotational speed of the drum, speed of the charging hopper conveyor belt, chute plate angle, etc.).

The charging hopper can be loaded using external belt conveyors, feeders, front loaders, loaders and other machines. Do not load charge material from a great height. During operation, working parameters of the machine should be regularly checked.

Alarm conditions may occur during screening. Such alarm conditions are indicated on the main control panel. Depending on a situation, it may be necessary to stop and check the machine. Detailed information concerning alarm conditions and their handling is given in section 5.

IMPORTANT!

Charge material must not overload the charging hopper conveyor drive and other drive systems.

Do NOT screen materials forbidden by the Manufacturer.

DANGER

Ensure that there are no bystanders in the loading zone.

Do NOT stand near working belt conveyors – danger of injury caused by ejected objects.

4.7 STOPPING THE TROMMEL SCREEN

4.7.1 STOPPING THE TROMMEL SCREEN IN NORMAL MODE

In order to stop the machine in a proper manner, switch off individual drives in proper sequence and maintain sufficiently long intervals when switching the drives successively.

EXTENT OF ACTIVITY

- After emptying the charging hopper, switch off the charging hopper conveyor drive.
- After completed screening, stop the screening drum drive.
- Switch off the drives of the longitudinal conveyor and rear conveyor only when these conveyors are empty.
- Switch off the drives of the side conveyor and transverse conveyor only when these conveyors are empty.
- Decrease rotational speed of the engine.
- Turn off the engine after 3 minutes.
- Set the main switch to OFF position.

4.7.2 STOPPING THE TROMMEL SCREEN IN EMERGENCY MODE

When the trommel screen is stopped in emergency mode, fuel supply to the engine and hydraulic oil supply to the receivers are immediately shut off. The machine is stopped by pressing one of 5 switches whose arrangement is shown in figure (4.28). One safety switch (not shown in figure) is located on the main control panel.

IMPORTANT!

Emergency stopping of the trommel screen deteriorates durability of individual elements of the machine

The trommel screen may be stopped in emergency mode only if life or health of persons near the working machine is endangered or if there is a risk of serious damage to the trommel screen.

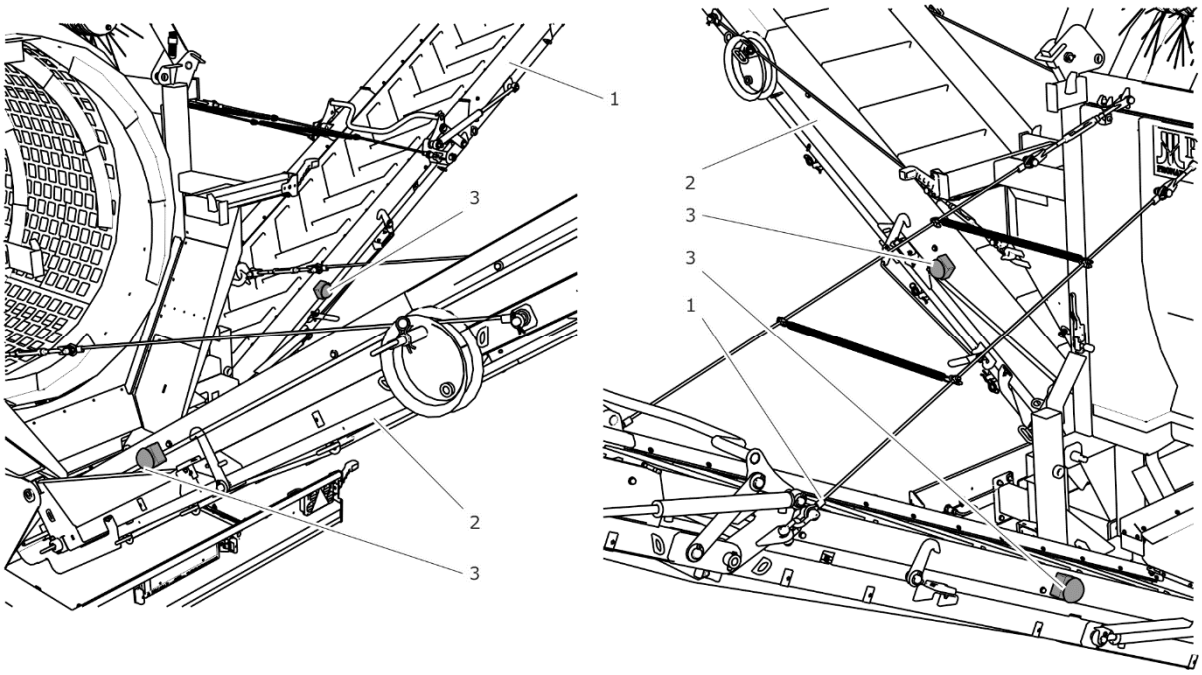


FIG. 4.28 *Arrangement of safety switches*

(1) side conveyor *(2) rear conveyor* *(3) safety switch*

4.7.3 STARTING THE TROMMEL SCREEN AFTER EMERGENCY STOPPING

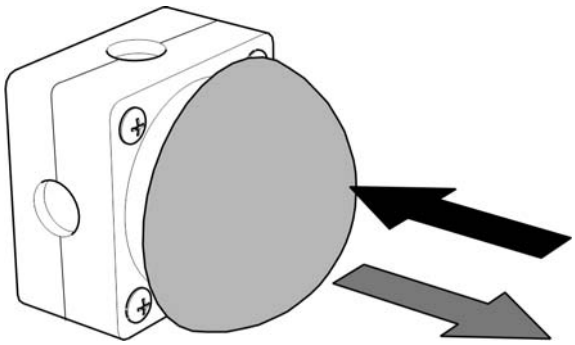


FIG. 4.29 *Safety switch*

Before restarting the trommel screen, make sure that its operation does not pose a threat to bystanders and that possible problems have been eliminated.

If at least one of the safety switches is activated, the following message is displayed constantly on the main control panel display: **STOP, SAFETY TIME 10S**. The counter displays constantly the time of 10 seconds. The countdown will be restarted only after unlocking the safety switch. In order to do that release (pull out) the red push-button or, in case of the switch located on the control panel, turn the switch - the switch will automatically return to unlocked position. After 10 seconds, normal starting of the engine and trommel screen can be commenced.

4.7.4 STOPPING THE TROMMEL SCREEN IN ALARM CONDITIONS

The trommel screen is protected against damage if at least one of the following malfunctions occurs:

- excessive temperature of engine coolant,
- excessive temperature of hydraulic oil,
- no pressure of engine lubricating oil,
- too low level of hydraulic oil.

If the above-mentioned alarms occur, the trommel screen stopping procedure will be initiated and corresponding information indicator will light up. If

the machine has been stopped automatically, check its individual systems before restarting. In particular, check the trommel screen for tightness (hydraulic system, engine oil pan); check oil level and engine coolant level. The trommel screen can be also stopped due to overheating caused by contaminated radiator, hydraulic oil or overload of drive systems. Detailed information concerning alarm conditions and their handling is given in section 5.

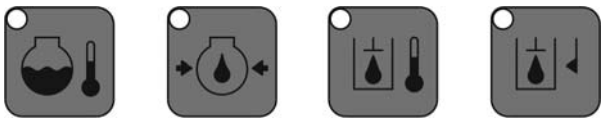


FIG. 4.30 *Alarm indicators*

4.8 BRUSH

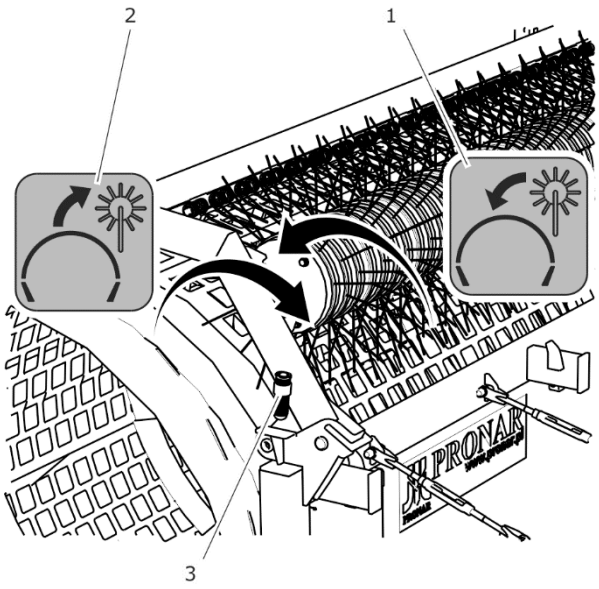


FIG. 4.31 *Brush*

(1) lowering push-button (2) rising push-button

(3) limiter

The brush is designed for cleaning and unclogging the screening drum perforations during charge material screening. If these operations are not necessary, the brush should be raised.

- ➡ Lowering the brush – press and hold push-button (1).
- ➡ Rising the brush – press and hold push-button (2).

The brush must be lowered maximally. Lowering depth is adjusted by means of limiter (3).

TIP

Unnecessary use of the brush accelerates its wear.

4.9 OPENING THE SHIELDS

4.9.1 ENGINE COMPARTMENT SHIELDS

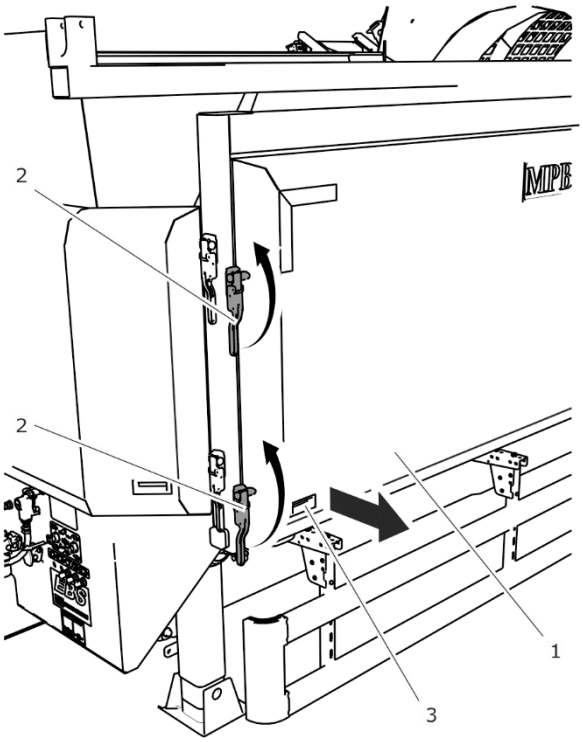


FIG. 4.32 *Left shield*

(1) shield *(2) lock*

(3) handle

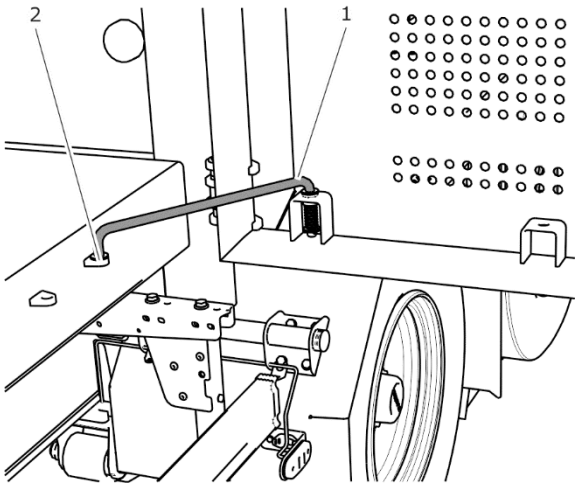


FIG. 4.33 *Shield lock*

(1) interlock *(2) socket*

EXTENT OF ACTIVITY

- Open the upper lock and lower lock (2) of the shield - figure (4.32).
- Tilt the shield.
- Protect the shield against closing by placing lock (1) in socket (2) – figure (4.33).

DANGER

Do NOT open the shields in strong gusty winds conditions.

Do NOT open the shields during machine operation!

The remaining shields (the right shield of the engine compartment and the front shield) are equipped with the same opening and locking system.

Each shield has two open positions – at angle of 45 and 90 degree. Opening angle depends on location of lock (1) in lock socket (2).

4.9.2 RIGHT SHIELD OF SCREENING DRUM

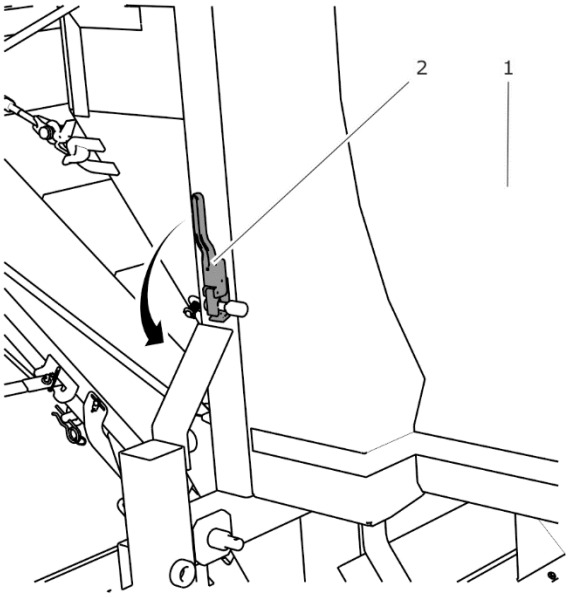


FIG. 4.34 *Right shield of screening drum, lock*

(1) right shield of screening drum (2) lock

EXTENT OF ACTIVITY

Right shield of screening drum can be unfolded only when the side conveyor is lowered.

- ➡ Open the shield lock (2), figure (4.34), on the left side and the right side.
- ➡ Raise the cover while holding the shield handle.
  - ⇨ Bolt (1), figure (4.35), will drop automatically and protect the shield against falling.
- ➡ Secure the interlock using a latch (3).

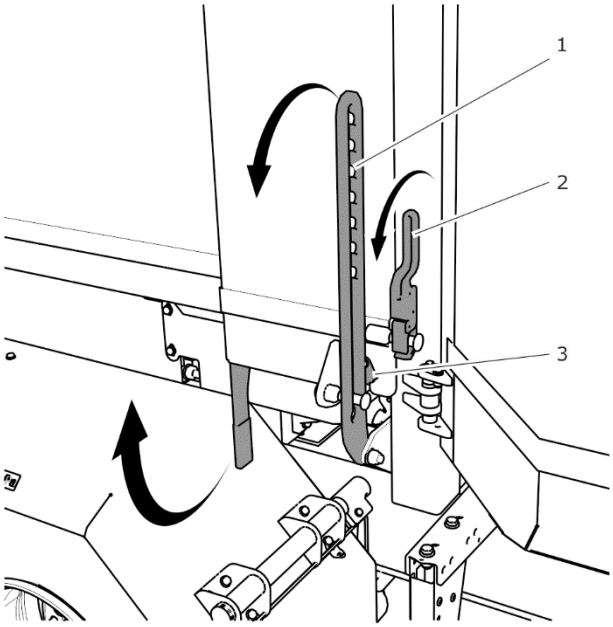


FIG. 4.35 *Right shield of screening drum, interlock*

(1) bolt (2) lock

(3) latch

DANGER

Do NOT open the shields during machine operation!

4.9.3 LEFT SHIELD OF SCREENING DRUM

EXTENT OF ACTIVITY

- ➡ Unlock the pin.
  - ⇨ Individual stages of unlocking the pin are shown in figure (4.36).
- ➡ Open the left shield of the screening drum while pulling the lever.
- ➡ Keep opening the shield until the shield interlock (2) is snapped in the frame socket - compare figure (4.37).

DANGER

Do NOT open the shields in strong gusty winds conditions.

Do NOT open the shields during machine operation!

Before closing the shield (1), move the interlock (2) upwards to unlock.

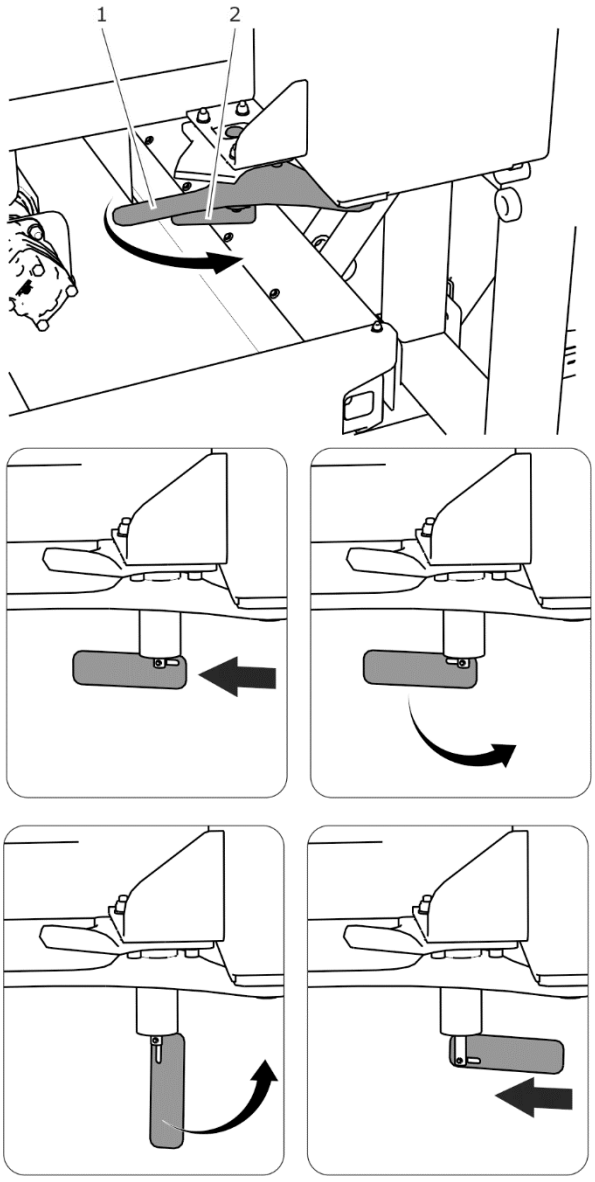


FIG. 4.36 *Left shield of screening drum, lock*

(1) lever *(2) pin protection*

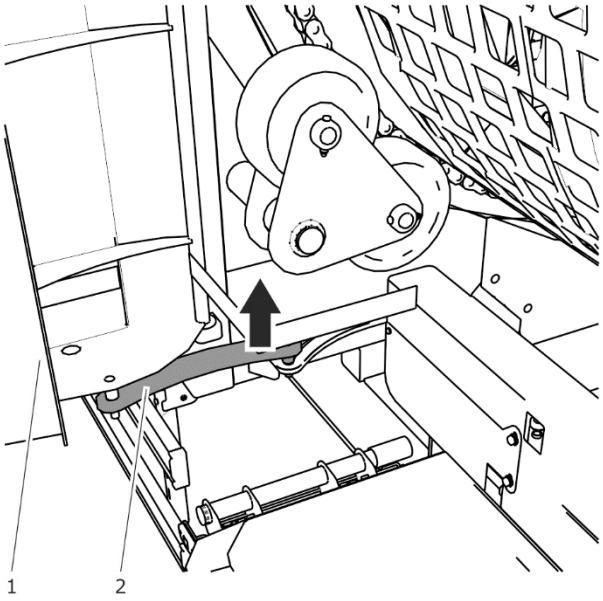


FIG. 4.37 *Left shield of screening drum, interlock*

(1) screening drum shield *(2) interlock*

4.10 ENGINE FRAME

SLIDING THE ENGINE FRAME OUT

- ➡ Stop the trommel screen operation. Turn off the engine.
- ➡ Open the right shield of the engine compartment and lock it in the maximum opening position (90 degree).
- ➡ Take out cotter pin of engine frame's pin.
- ➡ Remove engine frame's pin (2).
- ➡ Pull out the engine frame (1).

FOLDING THE ENGINE FRAME

- ➡ Fold the engine frame.
- ➡ Install pin (2).
- ➡ Insert securing cotter pin.
- ➡ Unlock the interlock of the right shield of the engine compartment and close the shield.

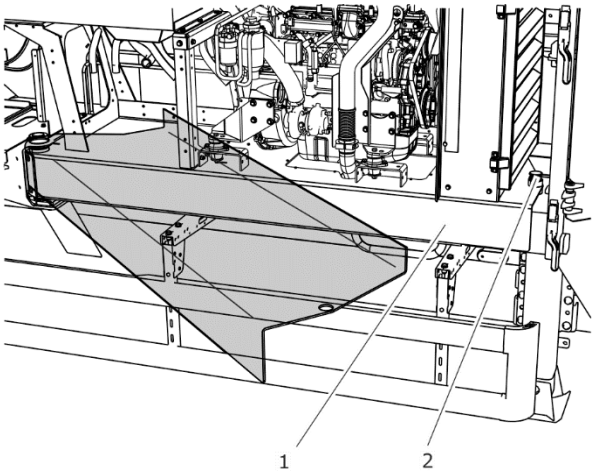


FIG. 4.38 *Sliding the engine frame out*

(1) engine frame *(2) safety pin*

DANGER

Exercise particular caution due to danger of crushing or cutting of limbs.

4.11 CLOGGING

Excessive amount of charge material or excessive material feeding speed may cause overload of the screening drum drive system. In such a situation, the trommel screen's controller will automatically reduce the rotational speed of the charging hopper conveyor's engine or will stop the engine completely until the screening drum is emptied.

PROCEDURES

- Stop loading the material to the charging hopper.
- Wait until the drum is emptied by itself (the charging hopper conveyor will be restarted when the load of the screening drum drive system is reduced).
- Reduce the charging hopper conveyor speed.
- Check cleanliness of the screening drum perforations.
- If necessary, lower the brush in order to clean the screen perforations.
- If the drive system is still overloaded, stop the trommel screen, switch off the engine and remove key from ignition.

- Open side shields of the trommel screen; check the drum and drum drive.
- Empty manually the drum and possibly the charging hopper. If necessary, clean the screening drum perforations and belt conveyors.
- Close the shields and start the trommel screen.
- Do not charge the material; check correctness of the trommel screen operation without load.
- If the problem still exists and its cause can not be defined, ask the authorised technical service for assistance. Do not use the trommel screen until the malfunction is corrected.
- If charge material is accumulated in front of the drum at the end of the charging hopper conveyor, stop the conveyor and switch on the reverse drive. Collected material should be evenly distributed on the conveyor belt. Start the conveyor in normal working direction.

DANGER

Before entering the trommel screen or opening the shields, stop the machine drive, turn off the engine and remove key from ignition.

IMPORTANT!

Do NOT use the reverse run of the screening drum in order to remove clogging of charge material.

4.12 SIDE UNDER-RUN PROTECTIVE DEVICES

Two side under-run protective devices (1) are installed in the front part of the chassis frame, in front of the suspension system. The complete protective device is bolted to the barrier handle bracket that is welded to the lower frame. The design of the side under-run protective devices enables their locking in the transport position and in the raised position.

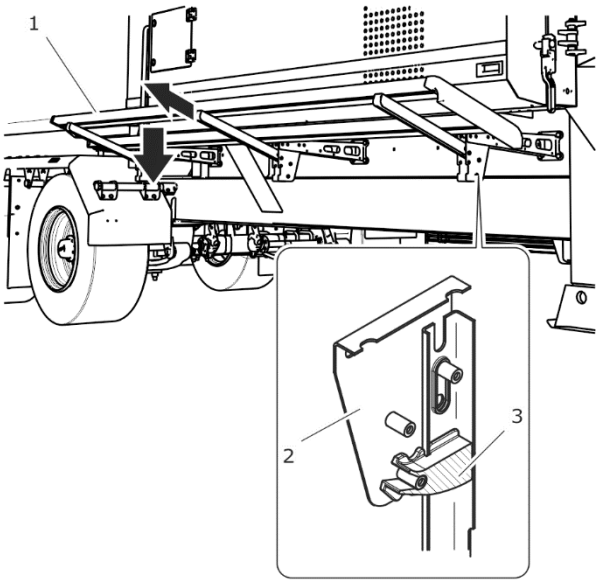


FIG. 4.39 *Rear under run protective device*

(1) left protective device(2) clamping ring

(3) latch

RISING THE SIDE UNDER-RUN PROTECTIVE DEVICES

- Pull the under-run protective device by holding its lower bar.
- Raise the under-run protective device to the height shown in figure (4.39).
- Move the under-run protective device away. Appropriate recess and slotted holes in the clamping ring allow the locking of under-run protective device in the raised position.

LOWERING THE SIDE UNDER-RUN PROTECTIVE DEVICES

- Pull the under-run protective device.
- Lower the under-run protective device and press until the bracket locks into the latch.

DANGER

Do NOT move off or drive when under-run protective device is raised. Before driving, make sure that under-run protective devices are lowered and locked in the lower position.

Unless necessary, do not leave the under-run protective device in the raised position.

4.13 TOWING THE TROMMEL SCREEN ATTACHED TO AN AGRICULTURAL TRACTOR

The trommel screen must be often towed within a working yard. In such a case, it is not necessary to hitch the machine to the truck tractor. Agricultural tractor can be used for this purpose.

HITCHING TROMMEL SCREEN TO AGRICULTURAL TRACTOR

- Position agricultural tractor directly in front of the trommel screen drawbar eye.
- Reverse the agricultural tractor near the trommel screen drawbar eye. If necessary, adjust the height of the drawbar eye by means of the parking stand according to location of tractor hitch.
- Hitch the trommel screen to the tractor's hitch, check the hitch lock protecting the machine against accidental unhitching.
- If the agricultural tractor is equipped with an automatic coupler, ensure that the hitching operation is completed and that drawbar eye is secured.
- Raise parking stand to the upper extreme position. Raise the rear supports and secure the pins.
- Turn off tractor engine.
- Connect pneumatic conduit marked yellow.
- Connect pneumatic conduit marked red.
- Check and, if necessary, protect conduits against rubbing or other mechanical damage. When turning, connecting conduits must hang loosely and not become tangled with moving elements of the machine and tractor.
- Just before driving off, remove chocks from under the trommel screen's wheels and release parking brake (press the red push-button of the loosening-parking valve).

IMPORTANT!

The trommel screen must not be hitched to agricultural tractor when driving on public roads. The trommel screen may be transported on public roads only using a truck tractor.

UNHITCHING TROMMEL SCREEN FROM AGRICULTURAL TRACTOR

- ➡ Disconnect pneumatic conduit marked red.
- ➡ Disconnect pneumatic conduit marked yellow.
- ➡ Place pneumatic conduits in the specifically prepared holding sockets, located on the front beam of the trommel screen's frame.
- ➡ Lower the parking stand.
- ➡ Release the red push-button of the loosening-parking valve.
- ➡ Place chocks under the trommel screen wheels.
- ➡ Unlock the truck tractor hitch, drive tractor away from the trommel screen.

4.14 DRIVING ON PUBLIC ROADS

To prepare the trommel screen for travel on public roads, do the following:

- ➡ Clean the trommel screen before driving on the public roads.
- ➡ Hitch the trommel screen to truck tractor.
- ➡ Release the trommel screen's parking brake and make sure that chocks are located in holders.
- ➡ Make sure that parking stand is maximally raised. Raise rear supports (optional equipment).
- ➡ Check if drawbar eye is correctly attached and pneumatic leads and electric leads are properly connected.
- ➡ Check correctness of electrical system operation.
- ➡ When moving off check if the brakes operate correctly.

When driving on public roads, respect the road traffic regulations, exercise caution and prudence.

- Before moving off, make sure that there are no bystanders, especially children, near the trommel screen and truck tractor. Take care that the driver has sufficient visibility.
- Vertical load borne by the trommel screen drawbar eye affects the steering of the tractor.
- When driving on public roads, do NOT carry any load in the trommel screen.
- Before driving on public roads, the trommel screen must be cleaned of dirt accumulated during the machine operation, which may cause fouling of roads.
- Permissible design speed and maximum speed allowed by road traffic law must not be exceeded. Speed of travel should be adjusted to prevailing road conditions and other conditions.
- In the event of machine or truck tractor malfunction, pull over on the hard shoulder avoiding any risk to other road users and position a reflective warning triangle according to traffic regulations.
- The tractor driver shall be equipped with a certified or approved reflective warning triangle.

- When driving, comply with all road traffic regulations, indicate an intention to turn using indicator lamps, keep all road lights and indicator lights clean at all times and ensure they are in good condition. Any damaged or lost lamps or indicator lights must be immediately repaired or replaced.
- Avoid ruts, depressions, ditches or driving on roadside slopes. Driving across such obstacles could cause the trommel screen 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 of the tractor and trommel screen combination is substantially increased at higher speeds.
- Monitor the trommel screen's behaviour when travelling on an uneven terrain and adjust driving speed to road and terrain conditions.
- If necessary, put additional weights on the truck tractor to achieve greater stability of the truck tractor-machine unit.

4.15 PROPER USE AND MAINTENANCE OF TYRES

- When working with tyres, the machine should be secured against rolling by placing chocks under the wheels. Wheels can be taken off the machine axle only when the machine is not loaded.
- Repair work on the wheels or tyres should be carried out by persons trained and entitled to do so. This work should be carried out using appropriate tools.
- Tightness of wheel nuts and air pressure in tyres should be regularly checked.
- Do not release air from warm tyres to adjust the pressure or the tyres will be underinflated when temperatures return to normal.
- Tyre valves should be protected with the appropriate caps to avoid soiling.
- Do not exceed the maximum design speed of the trommel screen.
- When the trommel screen is operated all day, stop working for a minimum of one hour at noon.
- Take breaks during driving in order to cool down tyres.
- Avoid potholes, sudden manoeuvres or high speeds when turning.

Section

5

MAINTENANCE

5.1 PRELIMINARY INFORMATION

When using the trommel screen, regular inspections of its technical condition and the performance of maintenance procedures are essential, which keep the machine in good technical condition. In connection with this the user of the trommel screen is obliged to perform all the maintenance and adjustment procedures defined by the Manufacturer.

Repairs during the warranty period may only be performed by authorised service points.

Detailed procedures and extent of activities which the user may perform by himself are described in this section. In the event of unauthorised repairs, changes to factory settings and other actions, which are not regarded as possible for the trommel screen operator to perform, the user shall invalidate the warranty. The inspections specified in columns (A), (B) and (J) in table (5.1) must be conducted by the trommel screen operator. The remaining inspections are conducted by the Authorized Service Station.

5.2 INSPECTION AND MAINTENANCE SCHEDULE

TAB. 5.1 *Maintenance schedule*

	A	B	C	D	E	F	G	H	I	J	Section
Engine											
Checking engine oil level	✓										4.2.3
Checking fuel level	✓										4.2.2
Checking engine coolant level	✓										4.2.6
Draining water from fuel tank		✓									5.3.1
Replacement and cleaning of air filter										✓	5.3.2
Oil change			✓	✓							5.3.3
Replacement of oil filter			✓	✓							5.3.4
Tightening bolts and nuts				✓		✓					
Cleaning and inspection of the radiator				✓						✓	5.3.5
Adjustment and inspection of the belt and tensioner			✓	✓							5.3.6
Lubrication				✓							
Replacement of fuel filter					✓						5.3.7
Bleeding the fuel system					✓					✓	5.3.8
Draining water from fuel filter										✓	5.3.9
Checking valve clearance					✓						

	A	B	C	D	E	F	G	H	I	J	Section
Inspecting the starter and the alternator						✓				✓	5.3.10
Cleaning the fuel tank (or once a year)					✓						
Inspecting the glow plugs					✓						
Cleaning the injection sprayers							✓				
Inspecting and cleaning the injectors								✓			
Coolant change									✓		
Electrical system											
Inspecting the battery										✓	5.3.11
Belt conveyors											
Adjusting guidance and tension of conveyor belts	✓		✓	✓						✓	5.3.12
Cleaning and adjusting the scrapers	✓			✓						✓	5.3.13
Inspecting and cleaning the belt conveyor rolls	✓									✓	5.3.19
Brush											
Inspecting and cleaning the brush	✓			✓						✓	5.3.14
Adjustment of brush position				✓						✓	5.3.15
Drum											
Inspecting and cleaning the supporting rolls	✓		✓	✓						✓	5.3.16
Inspecting the rear guide roll and the front guide roll	✓		✓	✓						✓	5.3.17
Inspection and adjustment of the screening drum drive wheel	✓		✓	✓						✓	5.3.18
Cleaning and lubricating the screening drum drive chain				✓						✓	
Hydraulic system											
Checking hydraulic system tightness	✓			✓						✓	5.3.20
Replacement of hydraulic conduits (every 4 years)											5.3.21
Hydraulic oil change						✓					5.3.22
Checking oil level	✓									✓	4.2.1
Replacement of oil filters			✓							✓	5.3.23
Cleaning and inspection of the oil cooler		✓								✓	5.3.24

	A	B	C	D	E	F	G	H	I	J	Section
Pneumatic system											
Checking air tightness of pneumatic system			✓	✓						✓	5.3.25
Cleaning the air filters, inspecting the connections		✓								✓	5.3.26
Draining water from air tank, cleaning the valve		✓								✓	5.3.27
Mechanical brakes and axle system											
Checking slackness of wheel axle bearings			✓			✓				✓	5.3.28
Adjustment of slackness of wheel axle bearings										✓	5.3.29
Inspecting tightness of nuts, mounting and dismounting wheel			✓	✓		✓				✓	5.3.30
Checking air pressure in tyres, inspection of wheels	✓			✓						✓	5.3.31
Checking thickness of brake shoe linings				✓						✓	5.3.32
Other maintenance activities											
Cleaning the trommel screen										✓	5.3.33
Checking grease level in the pump	✓										4.2.5
Lubrication – according to a separate schedule											5.3.34
Checking oil level and changing oil in the gear			✓		✓						5.3.35

TAB. 5.2 *Maintenance frequency*

A	Daily maintenance	Inspection conducted daily before the first start or every 10 hours of continuous operation.
B	Every 50 working hours	Periodic inspection conducted every 50 working hours of the engine
C	After the first 50 working hours	One-time inspection conducted after 50 working hours of a new engine / machine or after 50 working hours following the repair of the trommel screen's engine
D	Every 250 working hours	Periodic inspection conducted every 250 working hours
E	Every 500 working hours	Periodic inspection conducted every 500 working hours of the engine
F	Every 1000 working hours	Periodic inspection conducted every 1000 working hours
G	Every 1500 working hours	Periodic inspection conducted every 1500 working hours of the engine
H	Every 3000 working hours	Periodic inspection conducted every 3000 working hours
I	Every 2 years	Periodic inspection conducted every 2 working years of the engine
J	If needed	If inspections are required

5.3 PERIODIC INSPECTIONS

5.3.1 DRAINING WATER FROM FUEL TANK

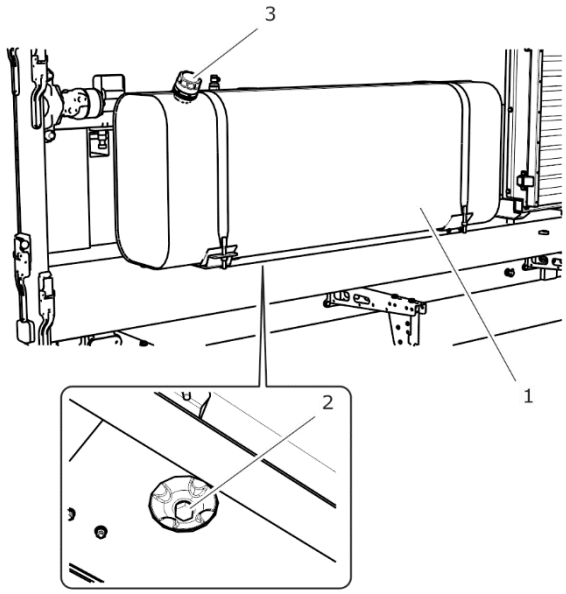


FIG. 5.1 *Fuel tank*

(1) tank *(2) drain plug*

(3) filler plug

Contaminated fuel may cause damage to or malfunction of the fuel system and the engine. Fuel tank should be periodically cleaned by draining 1 - 2 litres of fuel.

- ➡ Place a container with capacity of at least 2 litres under the fuel drain plug (2).
- ➡ Unscrew the fuel drain plug and drain at least 1 litre of fuel.
- ➡ Tighten the fuel drain plug (2).
- ➡ If fuel is still contaminated, drain another litre of fuel.

DANGER

Do NOT approach the tank with an open flame.

Wipe away spilt fuel until dry because it may cause fire.

5.3.2 REPLACEMENT AND CLEANING OF AIR FILTER

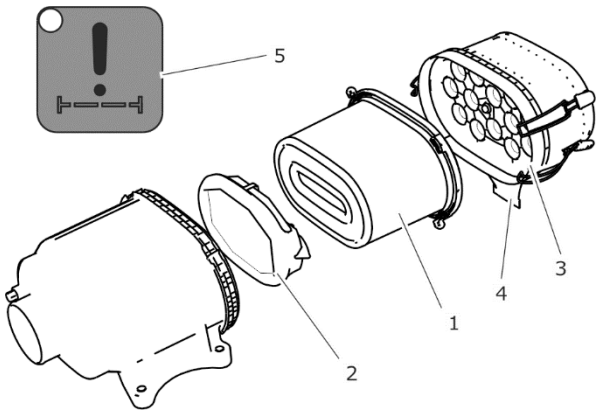


FIG. 5.2 *Air filter*

(1) main filter element (2) auxiliary filter element

(3) cover (4) valve

(5) alarm indicator light

Alarm signalled by indicator light (5) may be generated if there is water in fuel (fuel filter) or if air filter is maximally contaminated. If there is no doubt as to the cleanliness of fuel, replace the main filter element (1).

- ➡ Open the right shield of the engine and secure it by means of an interlock.
- ➡ Remove the filter cover (3).
- ➡ Take out the main filter element (1).
- ➡ Check the auxiliary filter element (2).
- ➡ The auxiliary filter element (2) should be replaced every third replacement of the main filter element (1). The auxiliary filter element (2) should be also replaced if it is contaminated or damaged.
- ➡ Check filter housing and cover, blow the filter with compressed air.
- ➡ Install filter element (2) and filter element (1); install filter cover (3).

TIP

The auxiliary filter element should be replaced every third replacement of the main filter element or when it is excessively contaminated or damaged.

NUMBERS OF FILTER ELEMENTS

Main filter element: **C 26 270**

Auxiliary filter element: **CF 2125/1**

5.3.3 OIL CHANGE

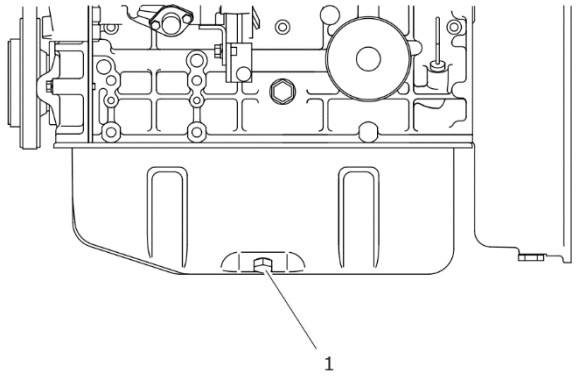


FIG. 5.3 *Oil change*

(1) oil drain plug

- ➡ Oil and oil filter must be replaced at the same time.
- ➡ Warm up the engine to nominal working temperature.
- ➡ Stop the engine, remove key from ignition.

DANGER

Wear safety goggles when draining hot oil or changing oil filter. Hot engine oil may cause burns.

- ➡ Place an appropriately sized container under the oil pan (drain plug).
- ➡ Unscrew oil drain plug.
- ➡ Tighten drain plug.
- ➡ Unscrew oil filler plug, fill the engine with new oil according to the Manufacturer's recommendations while regularly checking the oil level.
- ➡ Start the engine for 10 seconds and then stop the engine for 1 minute (repeat this procedure two or three times).
- ➡ Check oil level.
- ➡ Check drain plug and other engine parts for tightness.

IMPORTANT!

Do NOT pour used oil into sewerage, water courses etc. Used oil should be disposed of according to regulations in force.

5.3.4 REPLACEMENT OF OIL FILTER

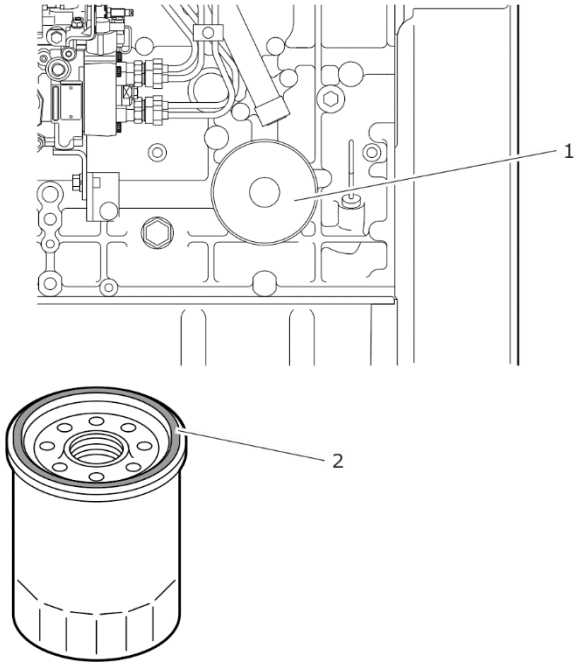


FIG. 5.4 *Oil filter*

(1) oil filter *(2) seal*

- When changing oil, replace oil filter as well.
- Remove contaminations from the filter area on the engine block.
- Unscrew the filter using the wrench for filters.
- Confirm that there are no metallic fragments of damaged engine parts inside the filter.
- Carefully wipe the contact surface for the gasket on the engine block.
- Confirm that the gasket is correctly placed in the filter.
- Cover the gasket of the new filter with a film of oil.
- Tighten the oil filter manually.
- Start the engine and check the filter for tightness.

IMPORTANT!

Before installing the filter, make sure that it is not damaged.

Do NOT tighten the oil filter using a wrench.

5.3.5 CLEANING AND INSPECTION OF THE RADIATOR

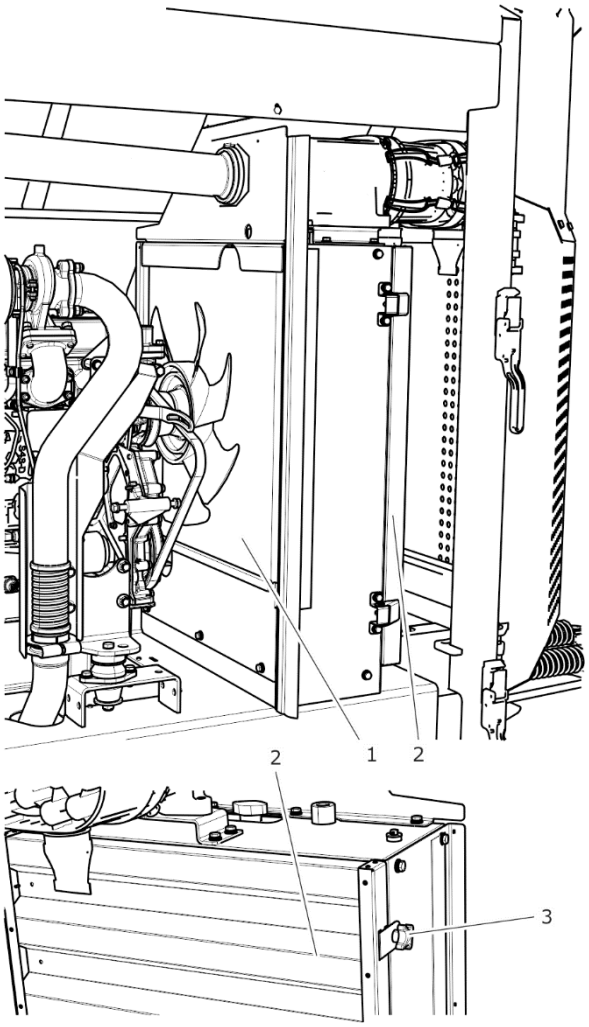


FIG. 5.5 *Engine radiator*

(1) radiator *(2) shield*

(3) bolt

Due to difficult working conditions of the cooling system (possibility of quick contamination of the radiator), exchange of heat in the heat exchanger is considerably deteriorated. That is why cleanliness of radiator (1) and shield (2) should be periodically checked. If necessary, blow these two elements with compressed air.

- ➡ Open the right shield of the engine compartment and secure it by means of an interlock.
- ➡ Open the front shield of the trommel screen and secure it by means of an interlock.
- ➡ Swing the engine frame.
- ➡ Unscrew two bolts (3) of shield (2) and open the radiator shield.
- ➡ Blow the radiator and the shield with compressed air in the direction opposite to normal air flow direction.
- ➡ Close all shields.

IMPORTANT!

Before starting work, stop the engine and remove key from ignition.

Protect the shields against accidental closing using interlocks.

5.3.6 ADJUSTMENT AND INSPECTION OF THE BELT AND TENSIONER

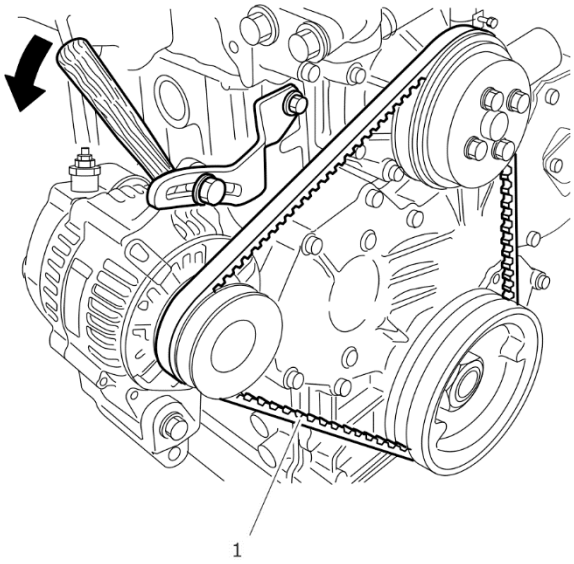


FIG. 5.6 *Tightening the belt*

(1) belt

The belt with such defects as cuts, delaminations and fuzzed edges should be replaced. The belt should be kept clean i.e. its surface should not be oiled or contaminated with grease. Oil and grease considerably shorten the life of the belt. Tension of the belt should be also checked because excessive tension also shortens the life of the belt as well as increases the wear of the alternator's bearings.

INSPECTION

- Open the right shield of the engine compartment and secure it by means of an interlock.
- Visually inspect the belt for mechanical damage. Confirm that the belt is not cracked, cut or fuzzy. If such defects occur, the belt should be replaced with a new one.
- Press the belt in the middle between the rolls using force of about 98 N.
- If deflection is larger than 12 mm, adjust belt tension.

TENSION ADJUSTMENT

- Loosen the bolts that fix the alternator.
- Pull out the alternator in order to achieve the required tension.
- Tighten the fixing bolts.

5.3.7 REPLACEMENT OF FUEL FILTER

DANGER

Before starting work, stop the engine and remove key from ignition of the trommel screen's control panel.

While working, do not approach the machine with an open flame.

- Open the right shield of the engine compartment and secure it by means of an interlock.
- Clean the filter body (2).
- Disconnect level sensor (4) from plug.
- Place a container for fuel under the filter.
- Loosen valve (5) and drain fuel from the filter.
- Dismantle fluid level sensor (4) from the filter.
- Unscrew filter element (1).

IMPORTANT!

Before installing the filter, make sure that it is not damaged.

TIP

Tightening torque of valve (5) is 15+/- 3 Nm.

- Using a clean cloth, wipe the surface where the filter element gasket and filter body (2) join.
- Confirm that the gasket is correctly placed in the new filter element.
- Install new filter element.
- Replace and install a new sealing ring (3); install a level sensor.
- Bleed air from fuel system.
- Start the engine and let it idle for some minutes.
- Check the fuel system for leaks. If a leak is detected, tighten the elements or replace the gaskets.

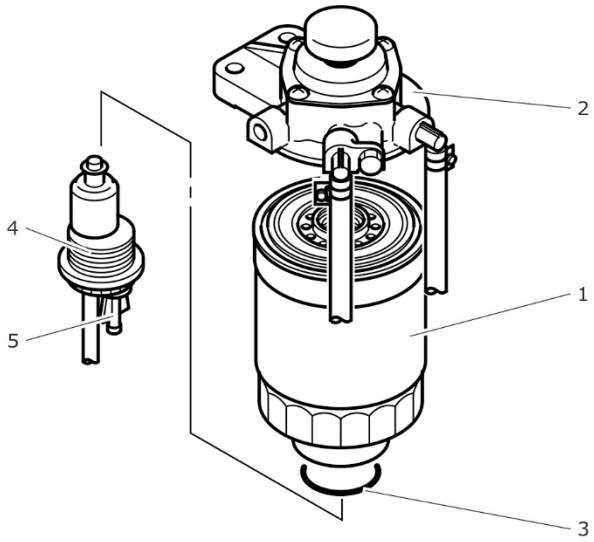


FIG. 5.7 *Replacement of fuel filter*

(1) filter element *(2) body*

(3) O-ring *(4) water in fuel sensor*

(5) valve

5.3.8 BLEEDING THE FUEL SYSTEM

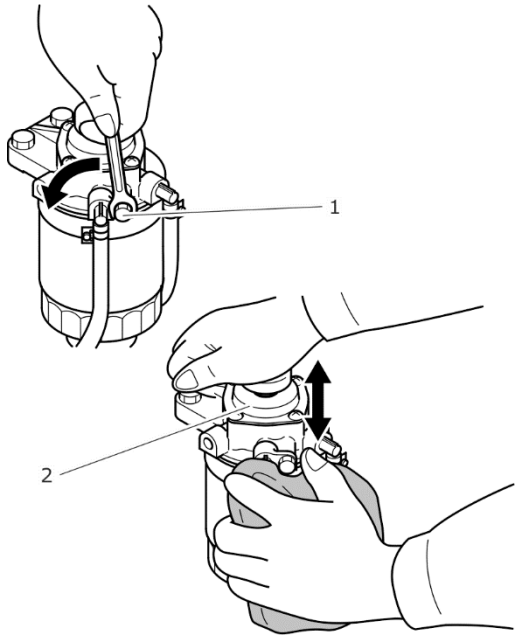


FIG. 5.8 *Bleeding the fuel filter*

(1) air vent plug *(2) pump*

Bleed the fuel system after replacement of fuel filter, after draining water from the fuel system and after the engine was stopped due to lack of fuel.

- Open the right shield of the engine compartment and secure it by means of an interlock.
- Unscrew plug (1) by about ¼ rotation.
- Place a small container or a clean cloth under the plug.
- Start pumping fuel using pump (2).
- Pump fuel until there are no air bubbles in the fuel.
- Tighten plug (1).
- Wipe the fuel filter until dry.

DANGER

Before starting work, stop the engine and remove key from ignition.

While working, do not approach the machine with an open flame.

5.3.9 DRAINING WATER FROM FUEL FILTERS

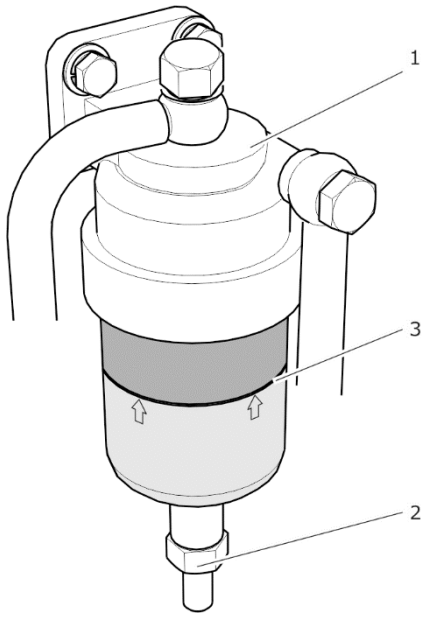


FIG. 5.9 *Draining water from preliminary filter*

(1) filter body *(2) drain plug*

(3) maximum level

- ➡ Place a small container under the preliminary filter.
- ➡ Unscrew drain plug.
- ➡ Drain water from the preliminary filter and tighten the drain plug (2).
- ➡ Place the container under the second filter.
- ➡ Loosen the drain plug and drain water from the filter.
- ➡ Pump fuel in order to facilitate draining water (press the pump push-button about 7 times).
- ➡ After draining water, tighten the drain plug.
- ➡ After draining water, bleed the filters

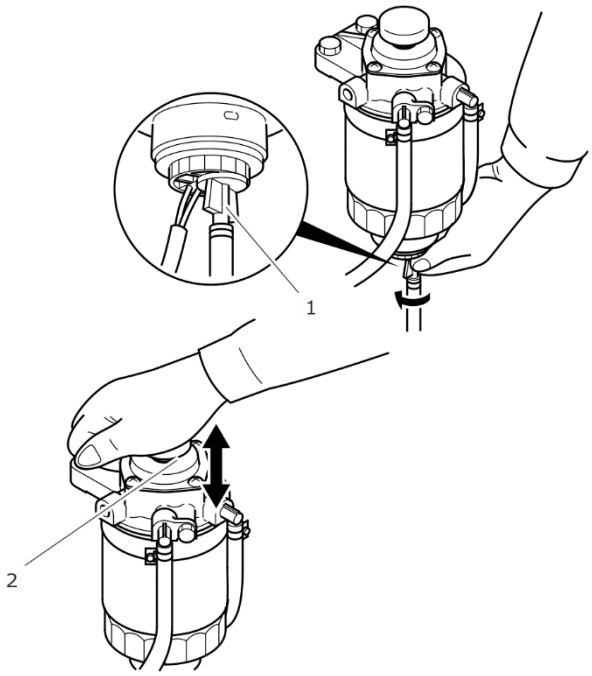


FIG. 5.10 *Draining water from the main filter*

(1) drain plug (2) pump

DANGER

Before starting work, stop the engine and remove key from ignition.

While working, do not approach the machine with an open flame.

5.3.10 INSPECTING THE STARTER AND THE ALTERNATOR

Inspection of these elements involves visual inspection of their technical condition. During the inspection, check condition of housing, correctness of connection of electric leads, belt tension (in case of alternator) and cleanliness. Contaminated subassemblies should be cleaned by blowing them with compressed air. The Manufacturer should be notified about the damage to alternator or starter in order to repair them.

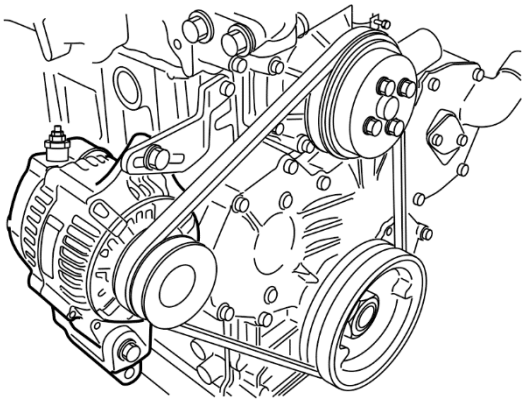


FIG. 5.12 *Alternator*

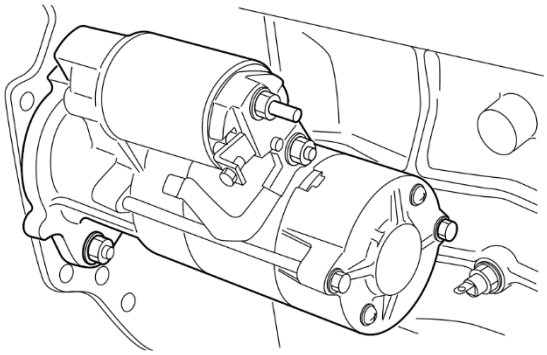


FIG. 5.11 *Starter*

5.3.11 INSPECTING THE BATTERY

DANGER

Do not approach the battery with an open flame during battery charging (or just after charging). Danger of explosion.

Electrolyte contained in the battery is a strongly caustic acid. Wear safety goggles and proper working clothes during battery maintenance.

Stop battery charging when temperature of electrolyte exceeds 55°C.

ELECTROLYTE LEVEL

Electrolyte evaporates during battery use. Electrolyte level should be between the marks of the upper and lower level or, if there are no marks, electrolyte level should be 10 – 15 mm above the upper part of the battery electrodes. If loss of electrolyte is large, add only distilled water to the battery cells.

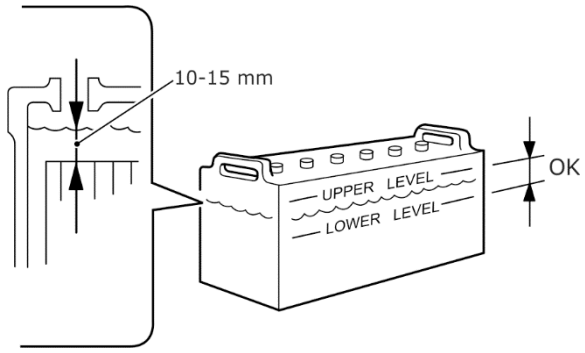


FIG. 5.13 *Checking electrolyte level*

DENSITY OF ELECTROLYTE

Using a densimeter, check density of electrolyte in each battery cell. Density of liquid in a properly charged battery should be 1.28 g/cm^3 (not more than 1.29). If density of electrolyte is lower than 1.26 g/cm^3, charge the battery. Make the measurement at temperature of 25°C.

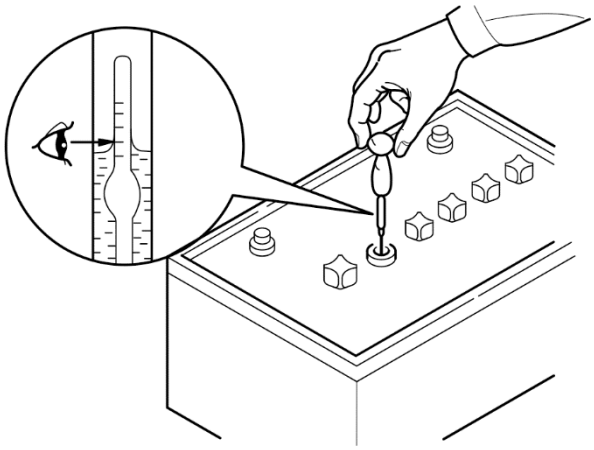


FIG. 5.14 *Checking density of electrolyte*

CHARGING

- The battery should be charged using current with value not higher than 10% of the battery's rated capacity (e.g. 4.5A at capacity of 45Ah).
- Disconnect lead (-) from the battery.
- Disconnect lead (+) from the battery.
- Dismantle the battery.
- Place the battery in a well-ventilated place.
- Remove plugs and check level and density of electrolyte.
- If necessary supplement electrolyte with distilled water.
- Connect lead (+) of the rectifier and then connect lead (-). Set charging current and connect the rectifier to the mains.

Charge the battery until electrolyte reaches constant density of 1.28 g/cm^3

5.3.12 ADJUSTING GUIDANCE AND TENSION OF CONVEYOR BELTS

CHECKING AND ADJUSTING GUIDANCE OF CONVEYOR BELTS

Exercise due care and keep a safe distance from working machine while checking guidance of conveyor belts. The inspection involves checking whether the moving conveyor belt tends to shift outwards If it does, first make certain that the rolls (the guiding roll and the return roll) are clean. Cleanliness of the rolls may be checked and, possibly, the rolls may be cleaned only when the conveyor drive and the trommel screen's engine are switched off. After cleaning, check again whether the belt guidance is correct. If the belt still tends to shift outwards, adjust the rolls. The adjustment principle is to shift the side of the roll to which the belt shifts to direction (B).

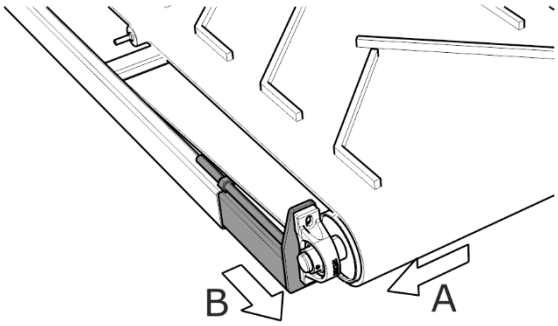


FIG. 5.15 *Principle of adjustment*

(A) belt shifting direction

(B) desirable direction of tensioner adjustment

ADJUSTMENT OF CONVEYOR ROLLS

- Check correctness of belt guidance on the drive roll side and the return roll side.
- If adjustment is required, stop the conveyor drive and turn off the trommel screen engine.
- Turn adjusting nut (1) in order to slide the tensioner out.
- Start the engine, start the conveyor drive. If another adjustment is required, repeat all the above mentioned activities.

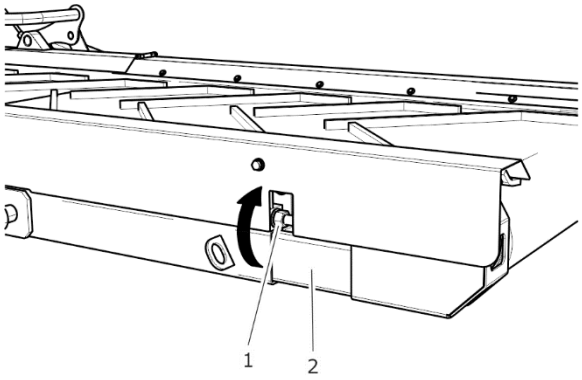


FIG. 5.16 *Adjustment*

(1) adjusting nut *(2) tensioner*

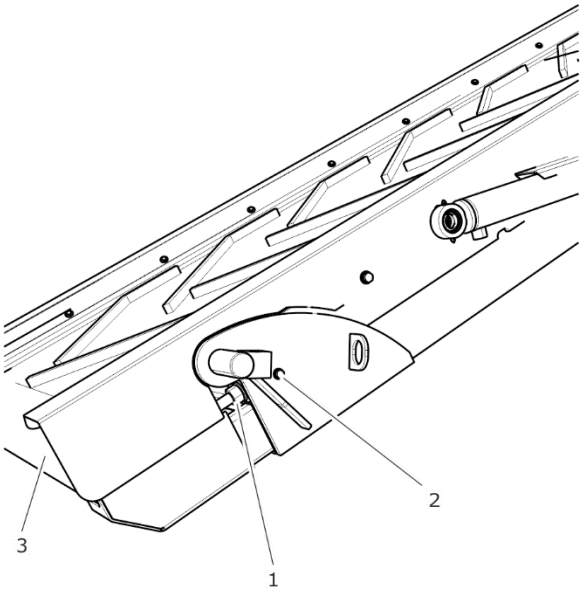


FIG. 5.17 *Return roll of side conveyor*

(1) adjusting nut *(2) bolt*

(3) return roll (lower)

All conveyor belts are adjusted in the same way. The only exception is the return roll (lower one) of the side conveyor. Before adjustment, loosen bolt (2) on both sides of the conveyor. Then, start the adjustment.

TIP

After adjustment of the return roll of the side conveyor, tighten bolt (2) only until the spring washer is completely tensioned.

If the belt is strongly tensioned, it can be adjusted by loosening the tensioning nuts on this side of the roll from which the belt shifts away – the reverse situation than shown in figures (5.15) and (5.16)

DANGER

Keep a safe distance and exercise caution when checking the belts.

Before adjustment, stop the conveyor drive and turn off the trommel screen engine.

ADJUSTING TENSION OF CONVEYORS BELTS

The conveyors belts tend to lengthen during normal operation of the trommel screen. This is a normal phenomenon. Correctness of operation of these subassemblies should be regularly checked.

If conveyor belt slips on the drive roll, adjust the belt tension.

- ➡ Stop the conveyor drive.
- ➡ Stop the trommel screen's engine.
- ➡ Screw in adjusting nuts (1) in order to shift the drive roll and return roll outwards.
- ➡ Start the conveyor drive and check correctness of belt tension.
- ➡ If necessary, repeat all adjustment activities.
- ➡ Check correctness of belt guidance, adjust if necessary.

TIP

During adjustment of belt tension, turn all adjustment nuts by the same number of turns (e.g. by 2 full turns).

When tightening the return roll of the side conveyor, loosen two locking bolts (compare figure RETURN ROLL OF SIDE CONVEYOR).

Tighten and adjust the belts using the attached wrench.

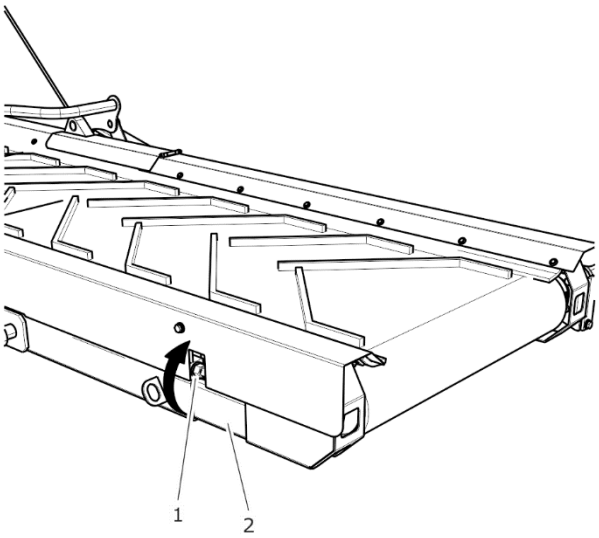


FIG. 5.18 *Return roll of side conveyor*

(1) adjusting nut *(2) tensioner*

IMPORTANT!

Excessive extension of tensioners will cause lowering of the return roll and drive roll which means that the belt is excessively worn. The conveyor belt should be replaced.

Before adjustment of the rear conveyor, loosen counter nuts (4) – figure (5.19). Make the adjustment using the wrench included in the machine equipment.

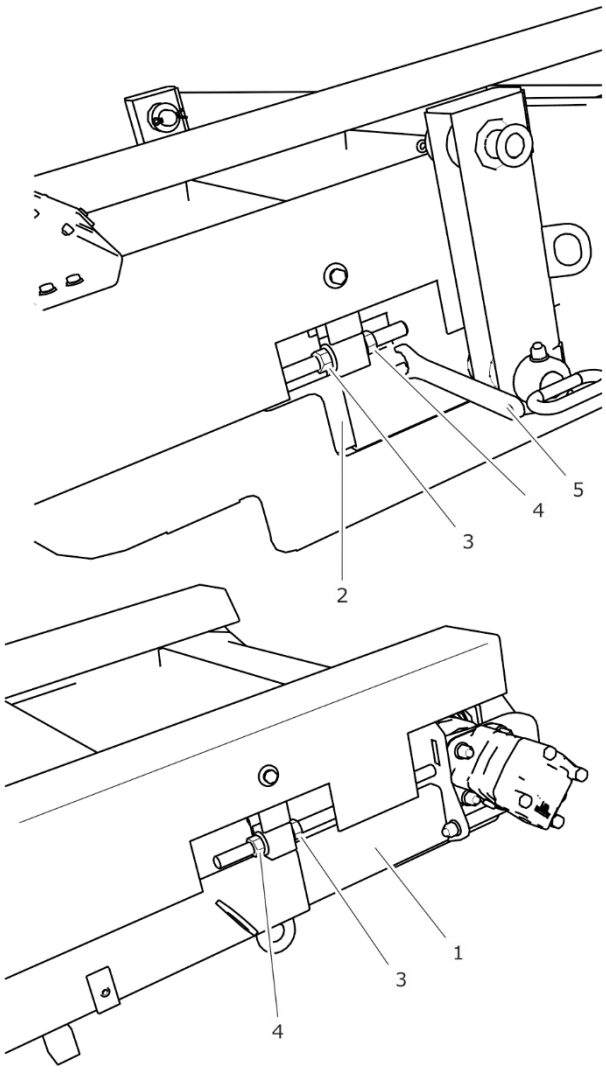


FIG. 5.19 *Tensioner of rear conveyor*

(1) upper tensioner *(2) lower tensioner*

(3) adjusting nut *(4) counter nut*

(5) wrench

5.3.13 CLEANING AND ADJUSTING THE SCRAPERS

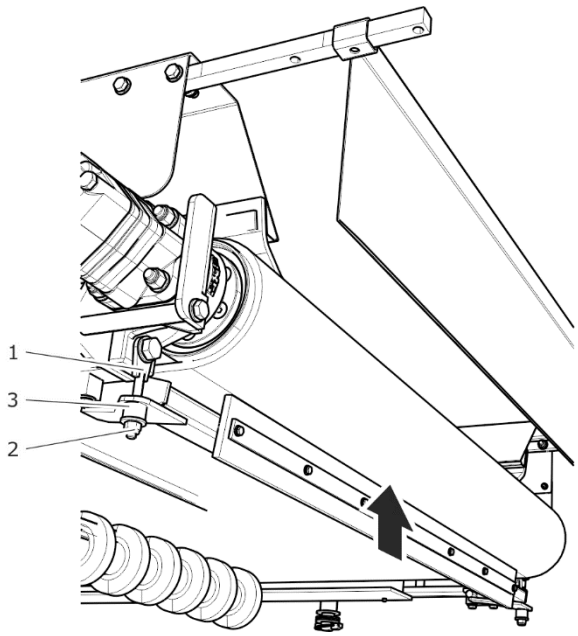


FIG. 5.20 *Adjusting the position of the longitudinal conveyor's scraper*

(1) adjusting bolt *(2) nut*

(3) shock absorber

Each time before starting work, check and, if necessary, clean the external scraper of the longitudinal conveyor (located under the screening drum) and the scraper of the side conveyor. Remove accumulated sediment using available tools. High-pressure washer may be also used for this purpose.

Scraper strips wear down gradually during normal operation of belt conveyors. Proper operation of these elements extends the life of the complete conveyor and limits contamination of remaining elements of the trommel screen. If the adjustment scope is too small, replace the scraper strips with new ones. In case of the longitudinal conveyor's scraper, the strip can be turned by 180 degree.

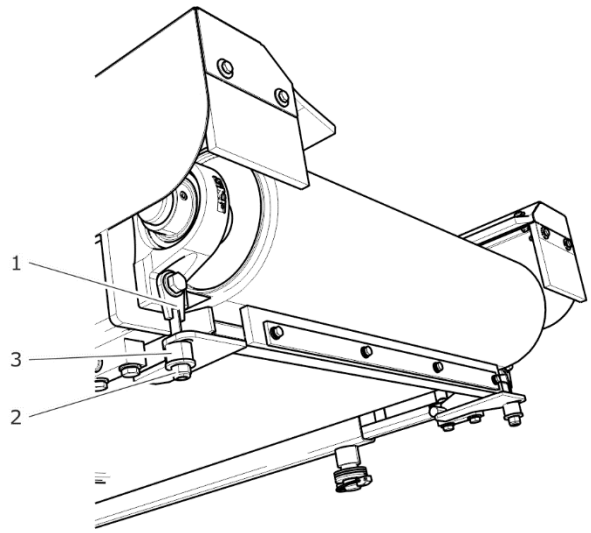


FIG. 5.21 *Adjusting the position of the transverse conveyor's scraper*

(1) adjusting bolt *(2) nut*

(3) shock absorber

IMPORTANT!

Excessive pressing of the scraper strip will lead to premature wear of the strip and conveyor.

Do not operate the trommel screen without scrapers.

- ➡ Clean the scrapers of the longitudinal conveyor and transverse conveyor.
- ➡ Start the drive of the longitudinal conveyor and transverse conveyor.
- ➡ Visually inspect if the scraper is positioned correctly with regard to the conveyor belt.
- ⇨ The conveyor belt should be lightly pressed by the scraper. When the belt connection (belt boss) is moving by the scraper, the scraper should be slightly lowered on the shock absorber (3).
- ➡ If the clearance is too large, adjust the scraper.

- Stop the conveyors' drive, switch off the engine and remove key from ignition.
- Screw in nut (2) on the left side and the right side of the conveyor in order to raise the scraper.
- Make sure that the scraper strip edge is parallel to the belt, if necessary correct the arrangement.
- Repeat all the above-mentioned activities while adjusting the second scraper.

5.3.14 CHECKING AND CLEANING THE BRUSH

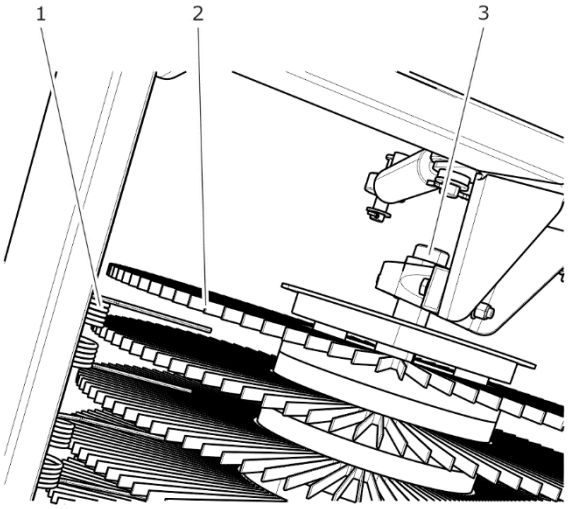


FIG. 5.22 *Cleaning the brush*

(1) spring *(2) brush*

(3) axle

The brush installed above the screening drum should be periodically cleaned. When performing the inspection, use ladders or platforms with proper height and load capacity.

The places between individual brushes as well as axles and springs are especially exposed to contamination. Screened waste may be accumulated and wrapped in these places. Use generally available tools to clean the waste. While cleaning, check completeness of springs (1), their fixing and degree of wear of brushes (2).

DANGER

Exercise particular caution while working at heights.

5.3.15 ADJUSTMENT OF BRUSH POSITION

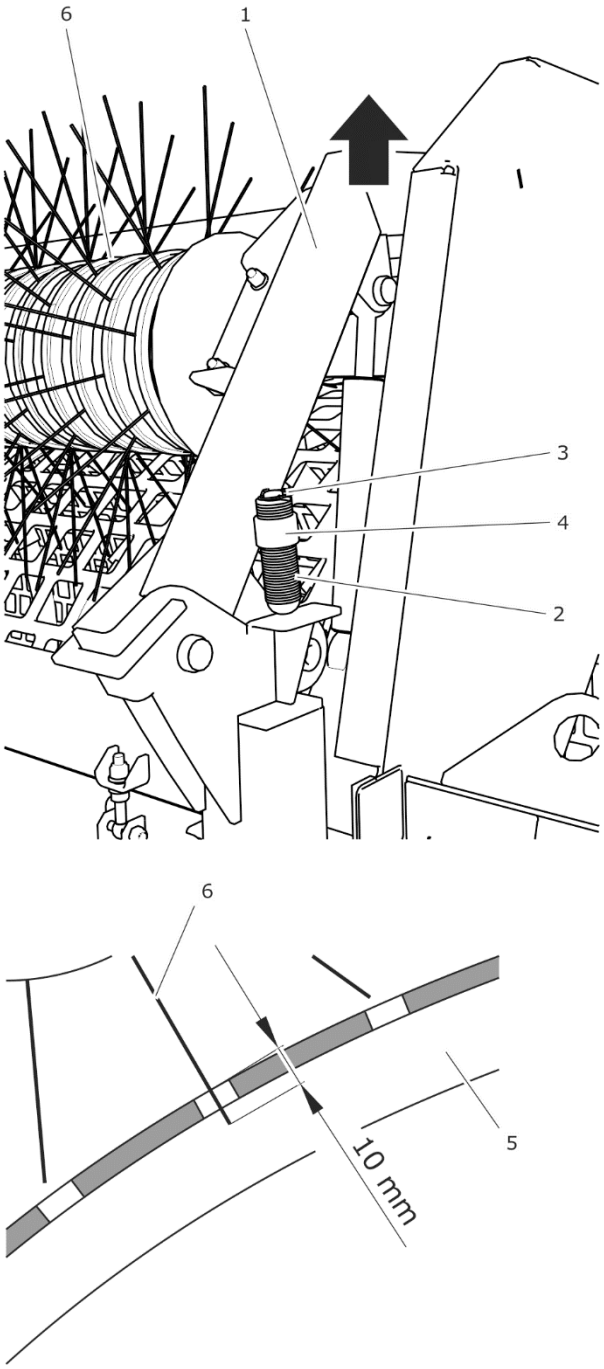


FIG. 5.23 *Height adjustment*

(1) brush frame *(2) washers*

(3) cotter pin *(4) socket*

(5) drum *(6) brush*

The brush wears out normally during normal use. The brush tips wear off and become fuzzy. Consequently, the brush works inefficiently or it does not perform its function at all.

- Raise the brush by means of hydraulic system.
- Switch off the engine and remove key from ignition.
- Remove securing cotter pin (3), remove all washers located above socket (4).
- Remove pin and take out several washers located under socket (4) and relocate them to a higher position.
- Install cotter pin (3).
- Repeat the activities on the other side of the brush and ensure that the number of washers under the socket on both sides is the same.
- Start the engine and lower the brush.
- Start the drum drive and check correctness of the adjustment after stopping the drum. If necessary, adjust brush position again.

During the machine operation, the brush should be positioned in such a manner as to ensure that the brush bristle enters maximally 10 mm into the drum openings.

5.3.16 INSPECTING AND CLEANING THE SUPPORTING ROLLS

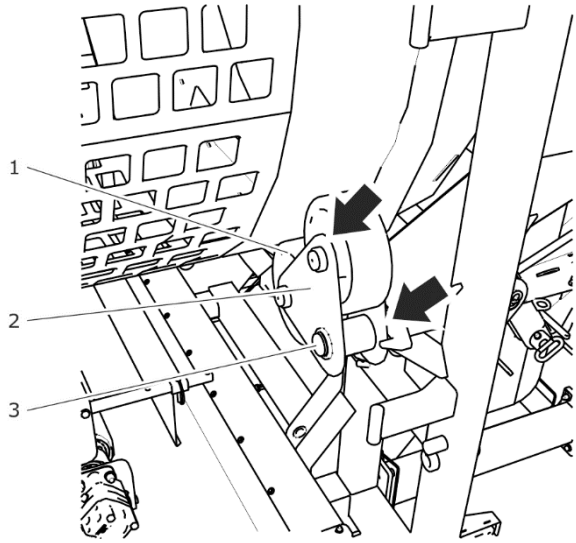


FIG. 5.24 *Inspection of rolls*

(1) roll *(2) body*

(3) axle

Due to very difficult working conditions of the rolls, check their technical condition and cleanliness daily. If necessary, clean the rolls before starting the trommel screen.

- ➡ Open the left shield of the drum and secure it by means of interlock.
- ➡ Check cleanliness of rolls, in particular the space between body (2) and rolls (1) and roll axle (3).
- ➡ Remove accumulated material using available tools.
- ➡ Check whether lubricating conduits are correctly fixed.
- ➡ Check the screening drum surface in the place of contact with rolls and clean if necessary.
- ➡ Check condition and uniformity of wear of the rolls.
- ⇨ Contaminated rolls may be blocked and stop rotating.
- ➡ Repeat the activities for the three remaining sets of rolls.
- ➡ Close the screening drum shields.

DANGER

Before starting work, protect the trommel screen against accidental starting by unauthorized persons.

Excessively or unevenly worn rolls should be replaced.

5.3.17 CHECKING AND CLEANING THE REAR GUIDE ROLL AND THE FRONT GUIDE ROLL

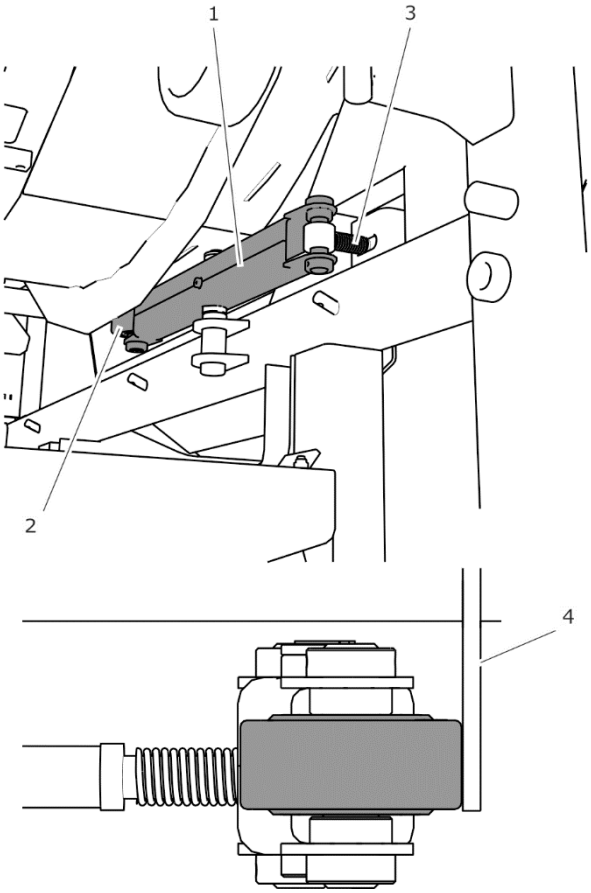


FIG. 5.25 *Rear guide roll*

(1) roll arm *(2) roll*

(3) tensioner *(4) drum flange*

Similarly as in case of support rolls, degree of wear and contamination of the front guide roll and the rear guide roll should be also checked.

- ➡ Open the right shield and the left shield of the screening drum chamber and secure them by means of interlocks.
- ➡ Check correctness of adjustment of the screening drum drive wheel (see section *INSPECTION AND ADJUSTMENT OF THE SCREENING DRUM DRIVE WHEEL*).
- ➡ Check cleanliness of rolls. Check technical condition of the rear roll tensioner (3).
- ➡ Remove accumulated material using available tools.

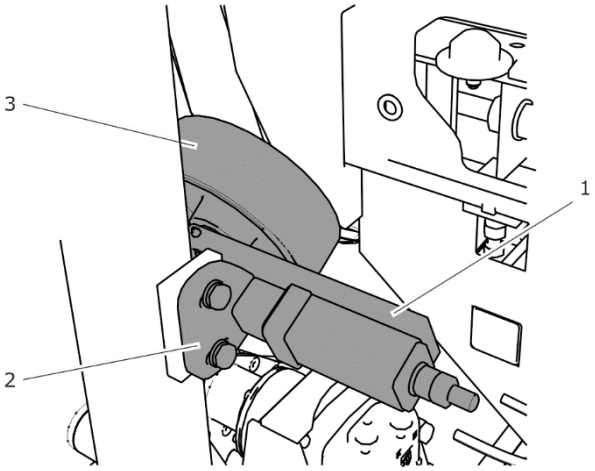


FIG. 5.26 *Front guide roll*

(1) movable bracket *(2) fixed bracket*

(3) roll

- ➡ Check whether lubricating conduits are correctly fixed.
- ➡ Check the screening drum flange surface in the place of contact with rolls and clean if necessary.
- ➡ Check condition and uniformity of wear of the rolls.
- ⇨ Contaminated rolls may be blocked and stop rotating.
- ➡ Close the screening drum shields.

5.3.18 INSPECTION AND ADJUSTMENT OF THE SCREENING DRUM DRIVE WHEEL

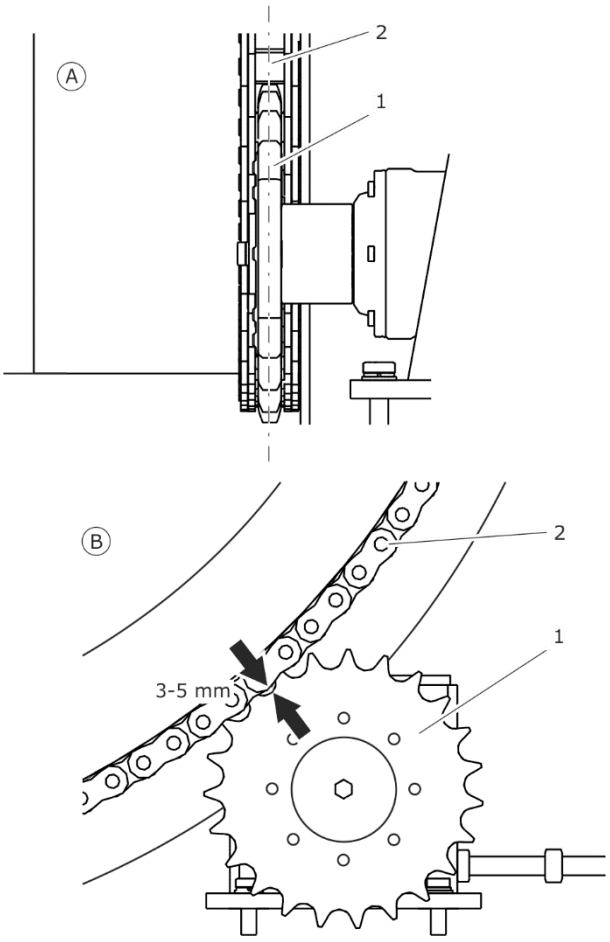


FIG. 5.27 *Inspecting the position of the screening drum drive wheel*

(1) drive wheel *(2) chain*

INSPECTING THE POSITION OF THE DRIVE WHEEL AND THE DRUM

➡ Check position of drive wheel with regard to chain.

⇨ The drive wheel should be positioned symmetrically with regard to the chain – view (A).

⇨ If the drive wheel position is not symmetrical, adjust the drum position by means of the rear and front guide rolls.

➡ Check clearance between the drive wheel and the chain rolls – view (B).

⇨ Proper clearance range should be 3 - 5 mm.

⇨ If measured clearance is outside the above range, adjust position of drive engine.

ADJUSTMENT OF DRUM POSITION

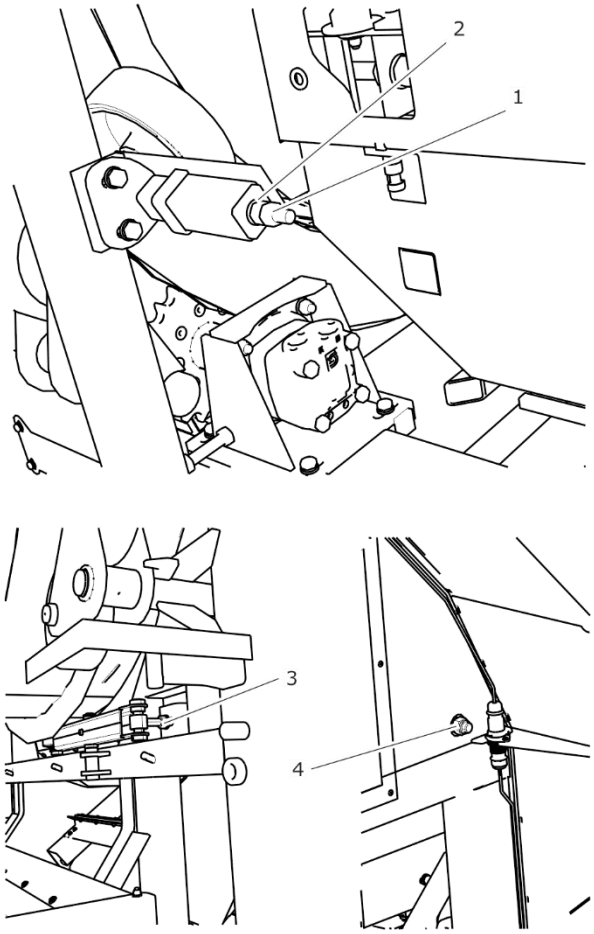


FIG. 5.28 *Adjustment of drum position*

(1) nut *(2) counter nut*

(3) nut *(4) adjusting nut*

➡ Loosen nut (1) and counter nut (2) of the front guide wheel.

➡ Unscrew nut (3).

➡ Screw nut (4) in if the drum is excessively withdrawn or screw the nut out if the drum is moved too much forward.

⇨ One full rotation of the nut moves the drum by 2 mm.

➡ Tighten nut (3).

➡ Move the front guide wheel to the drum flange and tighten counter nut (2) until slight resistance is felt.

➡ Tighten nut (1).

➡ Start the drum. After several rotations stop the drum and the engine and check the drum position again. If necessary, repeat the adjustment.

ADJUSTMENT OF DRIVE WHEEL POSITION

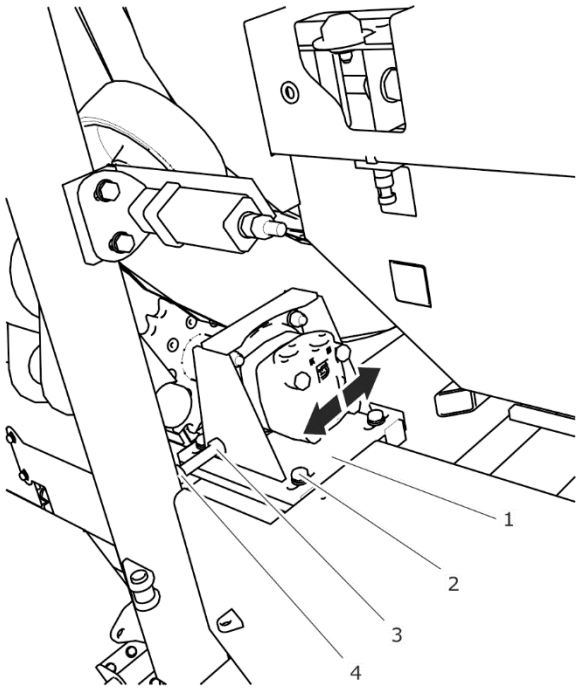


FIG. 5.29 *Adjustment of drive wheel position*

(1) base *(2) bolt*

(3) bolt *(4) locking nut*

➡ Loosen nut (4).

➡ Loosen bolts (2).

➡ Rotate bolt (3) in order to move the drum drive system in chosen direction while measuring the clearance between the wheel and the chain.

➡ Tighten bolts (2) when proper setting is achieved.

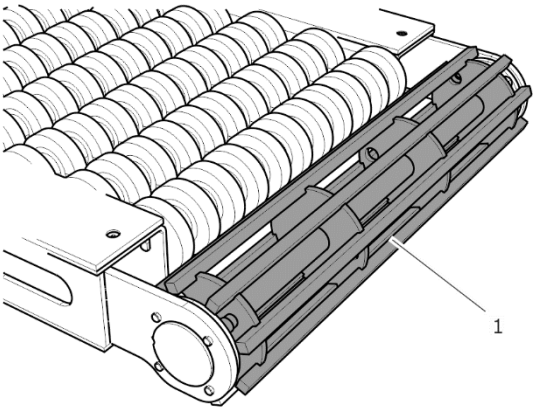
⇨ Make sure that bolt (3) always presses against the engine bracket.

➡ Tighten locking nut (4)

➡ Start the drum. After several rotations stop the drum and the engine and check the clearance again. If necessary, repeat the adjustment.

5.3.19 INSPECTING AND CLEANING THE BELT CONVEYOR ROLLS

Each time after finished work or after 10 hours of screening, stop the machine and check cleanliness of all conveyors. Due to diversity of screened materials, the user should choose by himself the conveyor cleaning method.



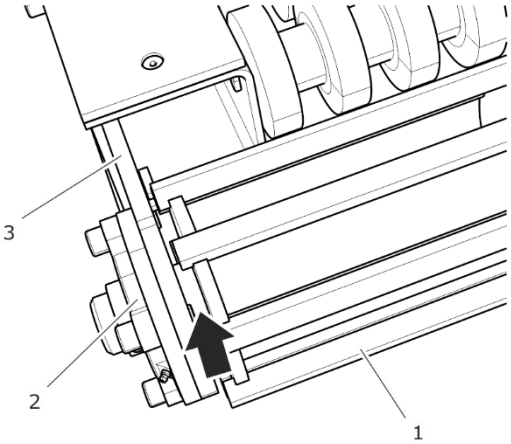


FIG. 5.30 *Charging hopper conveyor – inspection points*

(1) return roll *(2) bearing*

(3) tensioner bracket

Remains of material (especially ash) may solidify under influence of humidity and may form compact and difficult-to-remove lumps in free space of the machine. Material entwined between the roll and bearing should be immediately removed using available tools.

IMPORTANT!

Each time after finished work or after 10 hours of screening, stop the machine and check cleanliness of all conveyors.

Contamination of rolls and shafts is the most common cause of failures of belts and bearings.

CHECKING CLEANLINESS OF ROLLS

- Finish the charging hopper filling. Wait until the screening is completed. Stop the trommel screen engine and remove key from the ignition of the main control panel.
- Check cleanliness of rolls in all conveyors. Pay particular attention to openwork rolls of the charging hopper conveyor which are most exposed to contamination.
- Check the space between roll and bearing (indicated by arrow).

In extreme cases, disassembly of a conveyor may be necessary. The openwork drive roll of the charging hopper conveyor can be cleaned after sliding the hopper out by means of cylinder – see section *REPLACEMENT OF DRUM.*

IMPORTANT!

Regularly check cleanliness of the machine's conveyors, especially the charging hopper conveyor.

5.3.20 CHECKING HYDRAULIC SYSTEM TIGHTNESS

TIP

Bleeding of the hydraulic system is not required during normal operation of the trommel screen.

- Prepare the trommel screen for inspection. Clean connections of conduits, bodies and seals of hydraulic cylinders, bodies of pumps and engines.
- Start the combustion engine and then start all conveyors, fold and unfold the side conveyor and the rear conveyor.
- Switch off the tractor engine and remove key from ignition.
- Check the machine for tightness of the systems.

The hydraulic system must be completely tight. Replace damaged leak stoppers of pumps and hydraulic cylinders. If leaks appear at connections then try to tighten the connections. Tightening torques of hydraulic conduits are given in table (5.3). If the leak at connections is not removed, replace conduit, connector and seals (depending on place of leakage). Hydraulic oil leaks may occur also in rubber conduits, as a result of their delamination or abrasion. A conduit must be replaced with a new one.

IMPORTANT!

Do NOT use the trommel screen if the hydraulic system is unreliable.

TAB. 5.3 *Tightening torque for terminals of hydraulic conduits*

Conduit size DN	Tightening torque [Nm]
6	30÷50
8	30÷50
10	50÷70
13	50÷70
16	70÷100
20	70÷100
25	100÷150
32	150÷200

5.3.21 REPLACEMENT OF HYDRAULIC CONDUITS

Rubber hydraulic conduits must be replaced every 4 years regardless of their technical condition. This should be entrusted to specialised workshops.

Information concerning hydraulic conduits can be found in the spare parts list.

Tightening torques of the conduits are given in table (5.3).

IMPORTANT!

Flexible hydraulic conduits must be replaced every 4 years due to their working characteristics and material (ageing, high pressure, variable loads).

5.3.22 HYDRAULIC OIL CHANGE

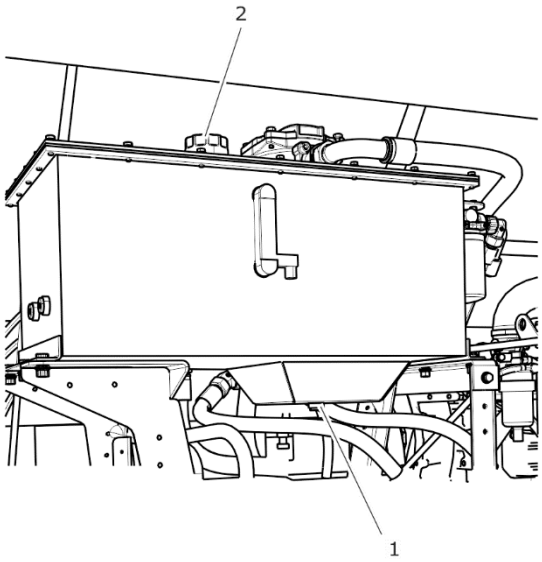


FIG. 5.31 *Hydraulic oil tank*

(1) drain plug *(2) filler plug*

- Prepare a container for used oil (about 100 litres).
- Open the right shield of the engine compartment and secure it by means of an interlock.
- Unscrew filler plug (2) and drain plug (1) and drain oil to the container.
- Install a new seal on the plug i tighten the plug (1).
- Replace oil filters.
- Remove strainer (from under the filler plug) and blow it with compressed air.
- Install strainer and pour new oil to the maximum level.
- Check the filler plug seal, confirm that vent openings in the plug are not blocked. Tighten the plug.
- Used hydraulic oil should be disposed of according to local regulations.

TIP

Information concerning recommended hydraulic oil is given in section CONSUMABLES.

5.3.23 REPLACEMENT OF OIL FILTERS

REPLACEMENT OF ELEMENT OF RETURN-SUCTION FILTER

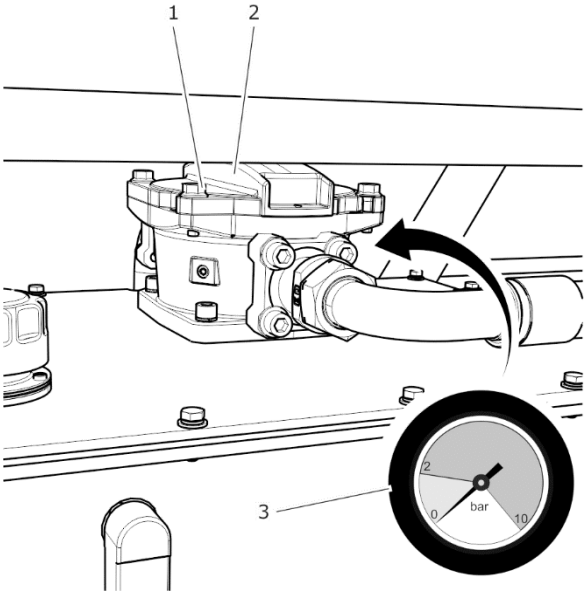


FIG. 5.32 *Return-suction oil filter*

(1) bolt *(2) cover*

(3) contamination indicator

- Unlock and slide out the engine frame.
- Clean the filter cover area.
- Unscrew 4 bolts in the filter cover (2).
- Dismantle cover (2).
- Remove filter element.
- Install new filter element, check cover seal.
- Install cover and bolt it with 4 bolts.
- Start the engine and check operation of contamination indicator (3).

Filter element number: 0300 RK 010

REPLACEMENT OF BY-PASS FILTER ELEMENT

- Clean the filter body.
- Unscrew filter element (1) using a wrench.
- Check seal of the new filter element.
- Clean the surface where the filter element and filter body join.
- Fix new filter element with bolts.
- Start the engine and check indication of filter contamination indicator (2).

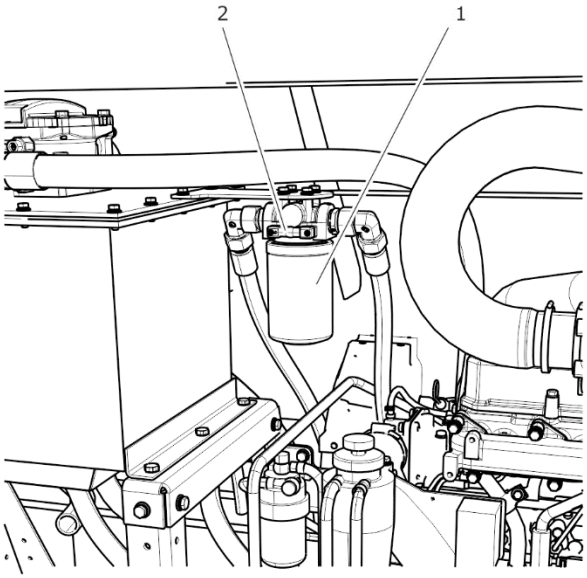


FIG. 5.33 *By-pass oil filter*

(1) filter element *(2) contamination indicator*

Filter element number: CSD 050 0 A10

IMPORTANT!

Check technical condition of filter element before its installation. Damaged filter elements are not suitable for use.

5.3.24 CLEANING AND INSPECTION OF THE OIL COOLER

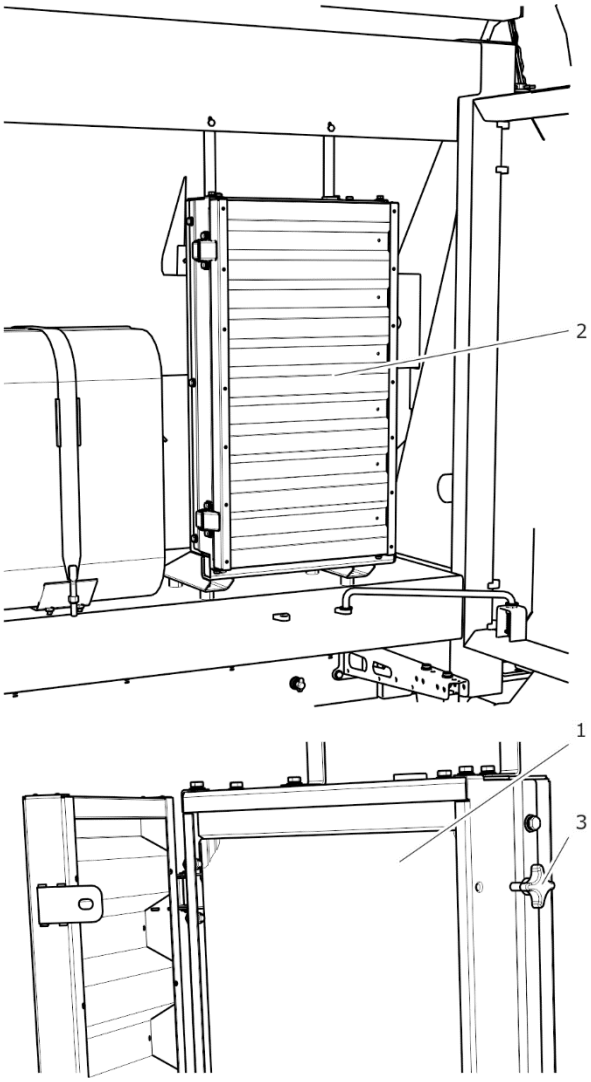


FIG. 5.34 *Hydraulic oil cooler*

(1) radiator *(2) shield*

(3) bolt

Due to difficult working conditions of the cooling system (possibility of quick contamination of the radiator), exchange of heat in the heat exchanger is considerably deteriorated. That is why cleanliness of radiator (1) and shield (2) should be periodically checked. If necessary, blow these two elements with compressed air.

- Open the left shield of the engine compartment and secure it by means of an interlock.
- Unscrew two bolts (3) of shield (2) and open the radiator shield.
- Blow the radiator and the shield with compressed air in the direction opposite to normal air flow direction.
- Close the engine compartment shield.

IMPORTANT!

Before starting work, stop the engine and remove key from ignition.

5.3.25 CHECKING AIR TIGHTNESS OF PNEUMATIC SYSTEM

IMPORTANT!

Do NOT hitch and tow the trommel screen if its brake system is out of order.

- Hitch the trommel screen to truck tractor. Park machine and tractor on level surface.
- Protect the trommel screen against rolling by placing chocks under the wheels. Immobilise truck tractor and trommel screen with parking brake.
- Start the truck tractor engine and supplement air in the brake system tank. Turn off tractor ignition.
- Check system components by releasing brake pedal in tractor.
- Give particular attention to conduit connections and brake cylinders.
- Repeat system check with depressed tractor brake pedal.

In the event of the appearance of leaks, compressed air will escape at the places of damage, with a characteristic hiss. Lack of system tightness may be exposed by covering checked elements with washing fluid or other foaming preparations, which will not react aggressively with system components. It is recommended to supply preparations commercially available designed to facilitate discovering air leaks. Damaged components should be replaced or repaired. If leaks appear at connections then tighten the connections. If air continues to escape replace connection component or seal.

During tightness inspection attention should additionally be given to technical condition and degree of cleanness of the system components. Contact of pneumatic conduit seals etc. with oil, grease, petrol etc. may cause damage and accelerate the ageing process. Bent, permanently deformed, cut or worn conduits should be replaced.

5.3.26 CLEANING THE AIR FILTERS, INSPECTING THE CONNECTIONS

Filter elements are reusable and are not subject to changing unless they are mechanically damaged.

- ➡ Reduce pressure in pneumatic conduit.
- ⇨ Pressure in conduit can be reduced by pressing the head of the pneumatic connection until resistance is felt.
- ➡ Turn cover (2) by 90° to the left.
- ➡ Remove filter element.
- ➡ Wash filter element and interior of connection body, blow them with compressed air.
- ➡ Install filter element and cover (2).
- ➡ Check technical condition of seal (3) and shield (4).

Connection with damaged body should be replaced. In event of damage to cover or seal, change these elements for new reliable elements. Contact of pneumatic connector seals with oils, grease, petrol etc. may cause damage and accelerate ageing process.

If the trommel screen is unhitched from the truck tractor, connections should be protected by covers or placed in their designated holding sockets. Before the winter period it is recommended to preserve the seal with a special preparation (e.g. silicon grease for rubber elements).

Each time before hitching the machine, inspect technical condition and cleanness of connections and sockets in truck tractor. If necessary clean or repair tractor socket.

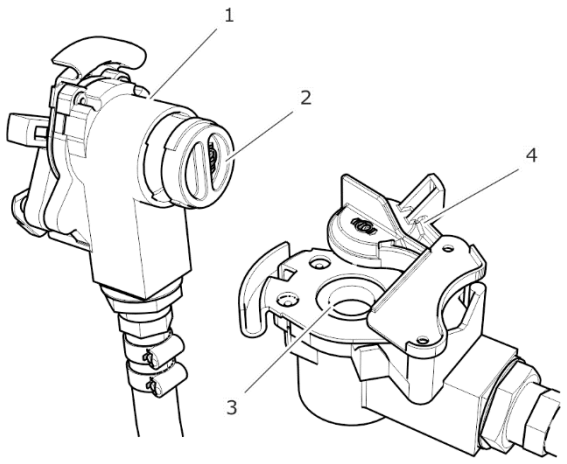


FIG. 5.35 *Pneumatic connection with air filter*

(1) body *(2) cover*

(3) seal *(4) shield*

DANGER

Unreliable and contaminated trommel screen connections may cause malfunctioning of the brake system.

5.3.27 DRAINING WATER FROM THE AIR TANK, CLEANING THE DRAIN VALVE

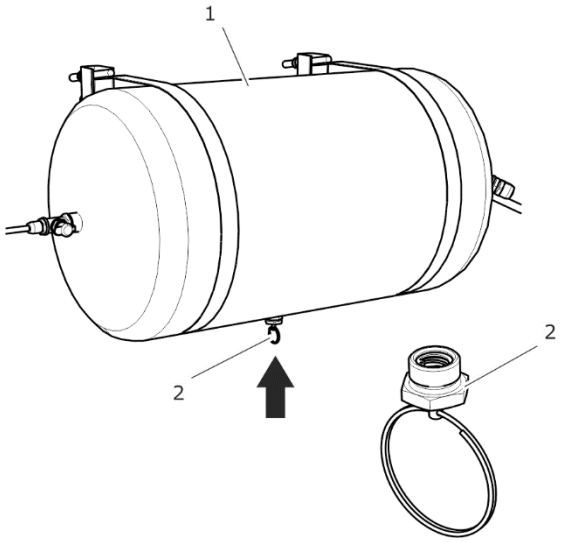


FIG. 5.36 *Air tank*

(1) tank *(2) drain valve*

DRAINING WATER FROM THE TANK

➡ Tilt drain valve stem (2) located in the lower part of tank (1).

⇨ The compressed air in the tank causes the removal of water to the exterior.

➡ Released valve stem should automatically close and stop flow of air from the tank.

In the event, that the valve stem resists returning to its setting, then the whole drain valve must be unscrewed and cleaned, or replaced.

CLEANING THE DRAIN VALVE

DANGER

Before dismantling drain valve release air from tank.

➡ Reduce pressure in air tank.

⇨ Reduction of pressure in tank is achieved by tilting the drain valve stem.

Unscrew drain valve.

Clean the valve and blow it with compressed air.

Check condition of spring and valve stem, replace the valve if necessary.

Screw valve in, fill tanks with air, check tightness.

5.3.28 CHECKING SLACKNESS OF WHEEL AXLE BEARINGS

PREPARATION PROCEDURES

- Hitch the trommel screen to agricultural tractor or truck tractor.
- Immobilise tractor with parking brake.
- Position the trommel screen on hard, level and stable surface.
- Tractor must be placed to drive forward.
- Place chocks under the trommel screen's wheel that will not be raised. Ensure that machine will not move during inspection.
- Raise the wheel (opposite to the side where chocks are placed).
- Lifting jack should be positioned in the place indicated by the arrow in the below figure. Lifting jack must be suitable for the weight of the trommel screen.

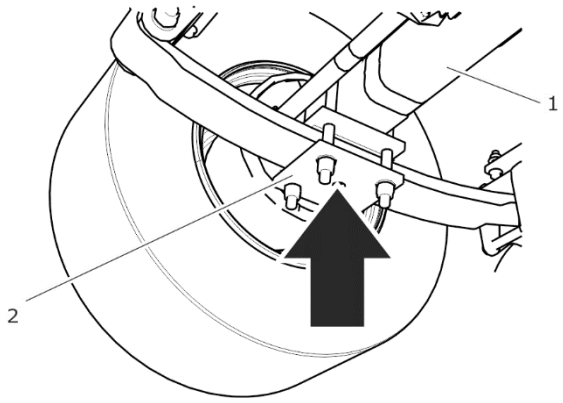


FIG. 5.37 *Recommended lifting jack supporting points*

(1) wheel axle *(2) axle backing*

CHECKING SLACKNESS OF WHEEL AXLE BEARINGS

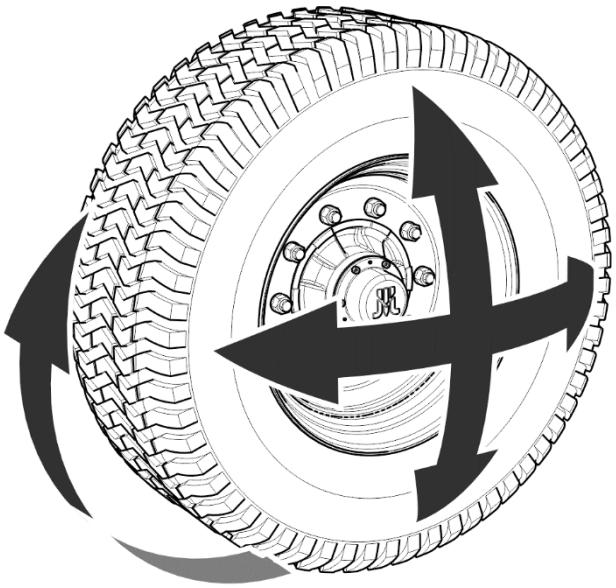


FIG. 5.38 *Checking slackness*

DANGER

Use a lifting jack that is suitable for the weight of the trommel screen. Position the lifting jack on hard and stable surface.

Lifted machine must be additionally secured using sufficiently high and strong supports. The machine must not be supported using fragile elements (bricks, hollow bricks etc.).

Before commencing work the user must read the instructions for lifting and adhere to the manufacturer's instructions.

The lifting jack must be stably supported by the ground and so must the axle.

Ensure that the trommel screen shall not move during inspection of axle bearing slackness.

- Turning the wheel slowly in both directions check that movement is smooth and that the wheel rotates without excessive resistance.

➡ Turn the wheel so that it rotates very quickly, check that the bearing does not make any unusual sounds.

➡ Holding the wheel above and below, try to feel any slackness.

⇨ You may use a lever placed under the wheel supporting the other end on the floor.

➡ Lower the lifting jack, relocate the chocks to the other wheel and repeat the inspection procedure for the other wheels.

TIP

If hub cover is damaged or missing, contamination and dampness enter the hub, which causes significantly faster wear of bearing and hub seals.

Bearing life is dependent on working conditions of the trommel screen, loading, speed of travel and lubrication conditions.

If slackness is felt, adjust bearing. Unusual sounds coming from bearing may be symptoms of excess wear, dirt or damage. In such a case, the bearing and sealing ring should be replaced with new parts (if they are not suitable for further operation) or cleaned and greased again.

Check condition of hub cover, if necessary replace with new cover. Inspection of bearing slackness may only be conducted when the trommel screen is hitched to the truck tractor. The machine may not be loaded.

5.3.29 ADJUSTMENT OF SLACKNESS OF WHEEL AXLE BEARINGS

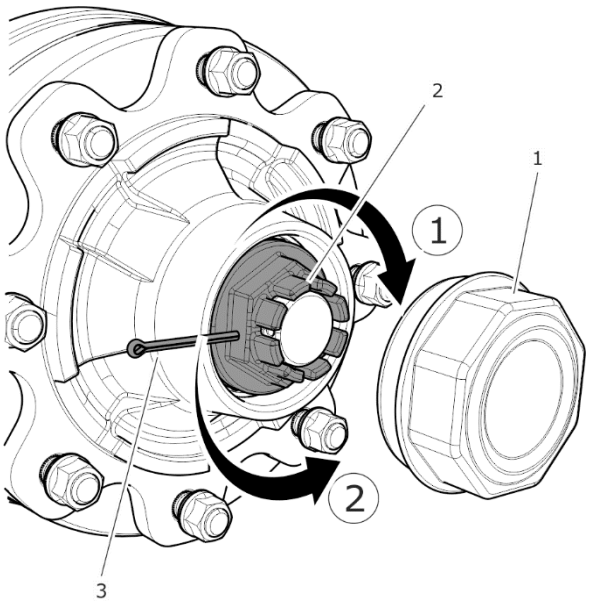


FIG. 5.39 *Adjustment of play*

(1) hub cover *(2) castellated nut*

(3) cotter pin

The wheel should turn smoothly without stiffness or detectable resistance. Adjustment of bearing slackness may only be conducted when the trommel screen is not loaded and is hitched to the tractor.

- ➡ Ensure that the trommel screen is properly secured and will not move during adjustment.
- ➡ Take off hub cover (1).
- ➡ Take out split cotter pin (3) securing castellated nut (2).
- ➡ Tighten castellated nut in order to eliminate slackness (right-hand thread).
- ⇨ Wheel should rotate with some resistance.
- ➡ Undo the nut until resistance is reduced and wheel rotates smoothly. Turn the nut to align the nearest nut groove with opening in wheel axle stub.
- ⇨ Nut may not be excessively tightened. Do not apply excessive pressure because working conditions of the bearings may deteriorate.
- ➡ Secure castellated nut with cotter pin and mount hub cap.
- ➡ Delicately tap hub cap with rubber or wooden hammer.

5.3.30 INSPECTING TIGHTNESS OF NUTS, MOUNTING AND DISMOUNTING WHEEL

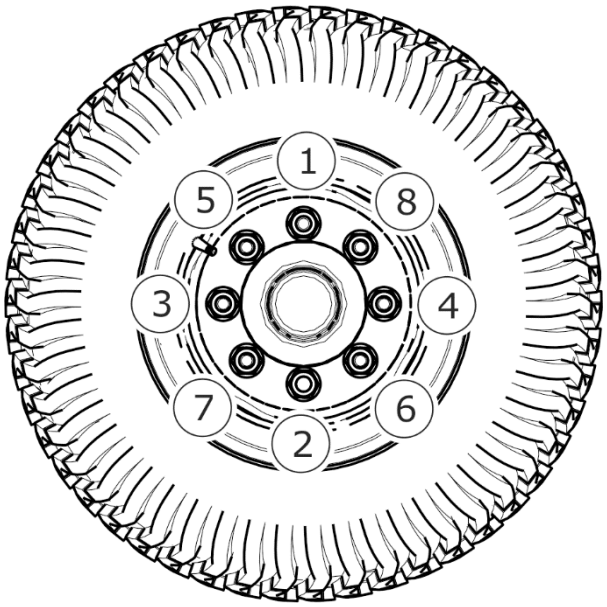


FIG. 5.40 *Sequence of undoing and tightening nuts*

DISMOUNTING WHEEL

- ➡ Place chocks under wheel that will not be dismounted.
- ➡ Ensure that the trommel screen is properly secured and will not move during wheel dismounting.
- ➡ Loosen wheel nuts according to the sequence given in the above figure.
- ➡ Place lifting jack and lift the trommel screen.
- ➡ Dismount wheel.

WHEEL MOUNTING

- ➡ Clean axle pins and nuts of dirt contamination.
- ⇨ Do not grease thread of nuts and pins.
- ➡ Check condition of pins and nuts, if necessary replace.
- ➡ Place wheel on hub, tighten nuts so that wheel rim adjoins hub exactly.
- ➡ Lower the trommel screen, tighten nuts according to recommended torque and given sequence.

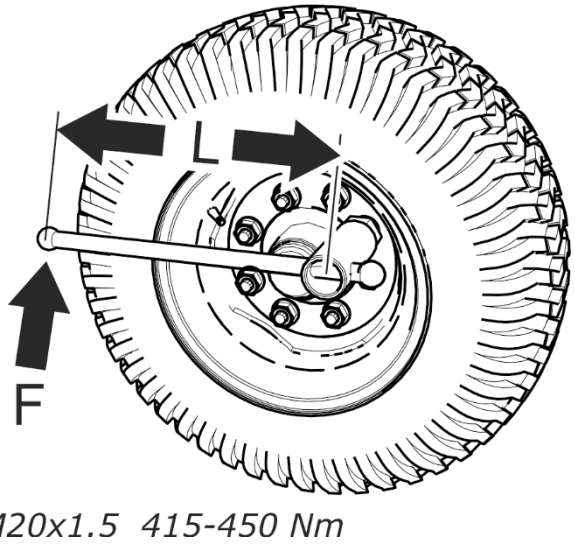


FIG. 5.41 *Tightening method*

(F) – weight of the person tightening the nut

(L) - length of spanner arm

TIGHTENING NUTS

IMPORTANT!

Axle nuts may not be tightened with impact wrench, because of danger of exceeding permissible tightening torque, the consequence of which may be breaking the thread connection or breaking off the hub pins.

The greatest precision is achieved using a torque spanner. Before commencing work, ensure that correct tightening torque value is set.

Nuts should be tightened gradually diagonally, (in several stages, until obtaining the required tightening torque) using a torque spanner. If a torque spanner is not available, one may use an ordinary spanner. The arm of the spanner (L) should be selected according to the weight of the person (F) tightening the nuts. Remember that this

method of tightening is not as accurate as the use of a torque spanner.

TIP

If a wheel has been removed, repeat all wheel nut tightening inspections according to table (5.1).

TAB. 5.4 *Selection of spanner arm length*

WHEEL TIGHTENING TORQUE [Nm]	BODY WEIGHT (F) [kg]	ARM LENGTH (L) [m]
415÷450	90	0.46÷0.50
	85	0.48÷0.53
	80	0.52÷0.56
	75	0.53÷0.60
	70	0.59÷0.64

5.3.31 CHECKING AIR PRESSURE IN TYRES, EVALUATING TECHNICAL CONDITION OF TYRES AND STEEL WHEELS

TIP

Tyre pressure values are specified in information decal, placed on wheel or on the frame above machine wheel.

Tyre pressure should be checked each time after changing spare wheel and according to guidelines presented in table (5.1). In the event of intensive use, air pressure in tyres should be checked more frequently. The trommel screen must be unloaded during checking. Checking should be done before travelling when tyres are not heated, or after an extended period of parking.

DANGER

Damaged tyres or wheels may be the cause of a serious accident.

While checking pressure pay attention to technical condition of wheels and tyres. Look carefully at tyre sides and check the condition of tread. In case of mechanical damage consult the nearest tyre service and check whether the tyre defect requires tyre replacement. Wheels should be inspected with regard to distortion, breaking of material, breaking of welds, corrosion, especially in the area of welds and contact with tyre.

5.3.32 CHECKING THICKNESS OF BRAKE SHOE LININGS

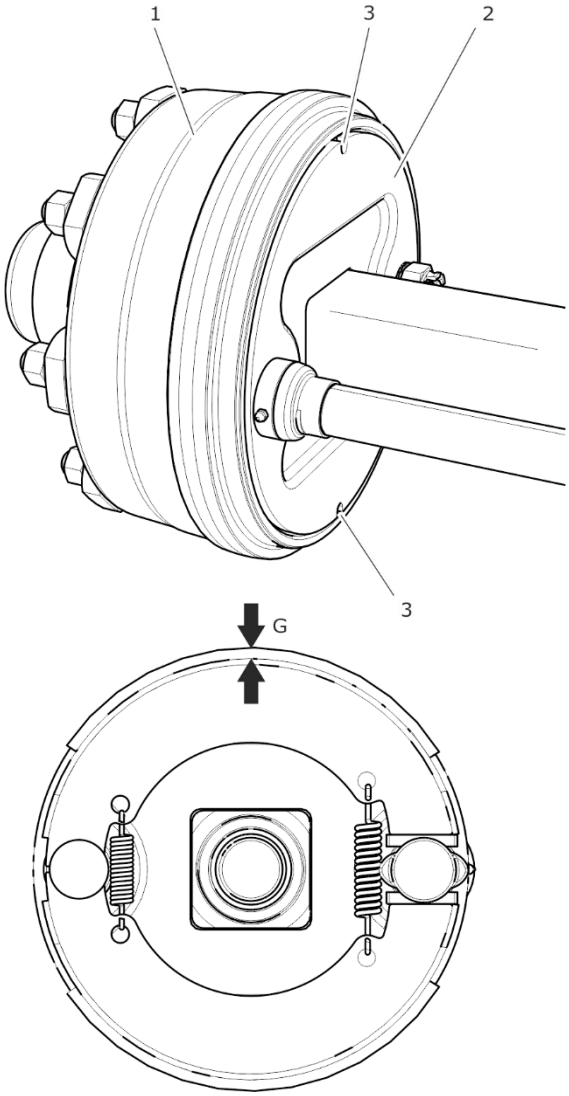


FIG. 5.42 *Checking brake shoe linings*

(1) brake drum *(2) disc*

(3) inspection openings (G) thickness of brake shoe lining

During the trommel screen operation, drum brake linings are subjected to wear. In such a case, the complete brake shoes should be replaced with new ones. Excessive wear of brake shoes is the condition in which the thickness of linings which are glued or riveted to steel structures of brake shoes is smaller than the minimum value. This condition is indicated by extended cylinder piston stroke. Check technical condition of brake shoe linings through inspection openings (3).

TIP

Minimum thickness of brake shoe linings is 2 mm.

5.3.33 CLEANING THE TROMMEL SCREEN

- The trommel screen should be cleaned as needed. In particular, clean the trommel screen before driving on the public roads. Before using pressure washer the user is obliged to acquaint himself with the operating principles and recommendations concerning safe use of this equipment.
- Before washing, remove manually and as accurately as possible the remains of screened material (in particular, from the charging hopper, screening drum and conveyors). Dry sediment should be removed using compressed air.
- The trommel screen may only be cleaned with clean running water. Cleaning detergents with neutral pH may be used, which do not react aggressively with the trommel screen's structural elements.
- Using pressure washer increases washing effectiveness, but particular care must be taken during work. During washing, washer nozzle may not be closer than 50 cm from the surface being cleaned.
- Water temperature should not exceed 55°C.
- Do not direct water jets at system and equipment elements of the trommel screen i.e. control valves, braking force regulator, brake cylinders, hydraulic cylinders, pneumatic, electric and hydraulic plugs, lights, electrical connections, information and warning decals, identification plate, conduit connections, lubrication points, leaf springs, control panels, safety switches etc. High pressure water jet may get inside the machine and cause mechanical damage or corrosion.
- For cleaning and maintenance of plastic coated surfaces it is recommended to 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. In the event of doubt it is recommended to make a test on an unseen surface area.
- Surfaces smeared with oil or grease should be cleaned by application of benzene or other degreasing agents and then washed with clean water with added detergent. Comply with recommendations of the Manufacturer.
- Washing detergent should be kept in original containers, optionally in replacement containers, but very clearly marked. Preparations may not be stored in food and drink containers.
- Unsure cleanliness of elastic conduits and seals. The plastic from which these elements are made may be susceptible to organic substances and some detergents. As a result of long-term reaction of some substances, the ageing process may be accelerated and risk of damage increased. Rubber elements should be maintained with the aid of special preparations after previous thorough washing.

DANGER

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

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

- Observe environmental protection principles and wash the trommel screen in a place designed for this purpose.
- Washing and drying the trommel screen must take place at temperatures above 0°C.
- Leaf springs should be cleaned using a hard brush. The space between spring leaves should be blown using compressed air.
- Each time after washing, lubricate the trommel screen. In case of central lubrication system, carry out 3 working cycles (pump activation push-button is located on the lubrication pump housing).
- Before washing, sediment accumulated on the conveyor rolls should be mechanically removed. Pay special attention to pins near the bearings. If necessary, clean these places.
- Checking cleanliness of openwork rolls (drive roll and return roll) of the charging hopper conveyor. If necessary, remove and clean the feeder.

5.3.34 LUBRICATION

GENERAL INFORMATION

Lubrication of the trommel screen should be performed with the aid of a manually or foot operated grease gun, filled with recommended grease. Before commencing work insofar as is possible remove old grease and other contamination. Remove and wipe off excess oil or grease.

LUBRICATION OF WHEEL AXLES

Grease in wheel axle hub bearings should be replaced by specialised service points. In order to conduct this lubrication, the complete hub should be disassembled as well as bearings and individual sealing rings should be removed. After careful washing and inspection, mount lubricated elements. If necessary, bearing and seals should be replaced with new parts. Lubricate the remaining elements of the axle.

LEAF SPRING ABSORBERS

Before greasing leaf springs, clean them and blow with compressed air. Do not wash leaf springs using a pressure washer because water may enter between spring leaves. Lubricate this area using commonly available aerosol preparations which have lubricating and anti-corrosion properties. The outer leaf spring surface should be covered with a very thin layer of lithium or lime grease. For this purpose, silicone aerosol preparation can be also used. Sliding surface of leaf spring and leaf spring pin should be lubricated according to recommendations contained in table (5.5).

DRAWBAR HITCHING EYE

Drawbar hitching eye should be lubricated each time before hitching the trommel screen to truck tractor. Due to character of load, the use of greases for heavily loaded parts with addition of graphite or molybdenum is recommended.

SCREENING DRUM CHAIN

Before lubricating, remove remains of old grease from the chain. Use special washing preparations or extraction naphtha for cleaning. After cleaning, check correctness or rotation of chain rolls and joint connecting the chain and drum. After completed inspection, lubricate the chain.

SHIELD LOCKS

Clean the locks and blow them with compressed air. Lubricate all cooperating elements.

TIP

Grease nipples and areas requiring lubrication are indicated by black arrows on the lubrication plan drawing.

IMPORTANT!

Empty grease or oil containers should be disposed of according to the recommendations of the lubricant Manufacturer.

TAB. 5.5 *Lubrication schedule*

Item	Lubrication point	Number of lubrication points	Type of grease	frequency
1	Hub bearing	12	A	24M
2	Expander levers	4	A	3M
3	Expander shaft slide bearings	8	A	3M
4	Leaf spring absorbers	4	C	1M
5	Rocker arm pin	2	B	1M
6	Leaf spring absorber pin	4	B	1M
7	Leaf spring absorber sliding surfaces	4	B	1M
8	Shield locks	10	D	3M
9	Shield pins	6	A	3M
10	Drawbar hitching eye	1	B	14D
11	Engine tipping frame pin	2	A	3M
12	Support	1	A	6M
18	Hydraulic cylinder eyes	10	A	3M
19	Screening drum chain	1	B	10D

Lubrication periods – M months, D – days

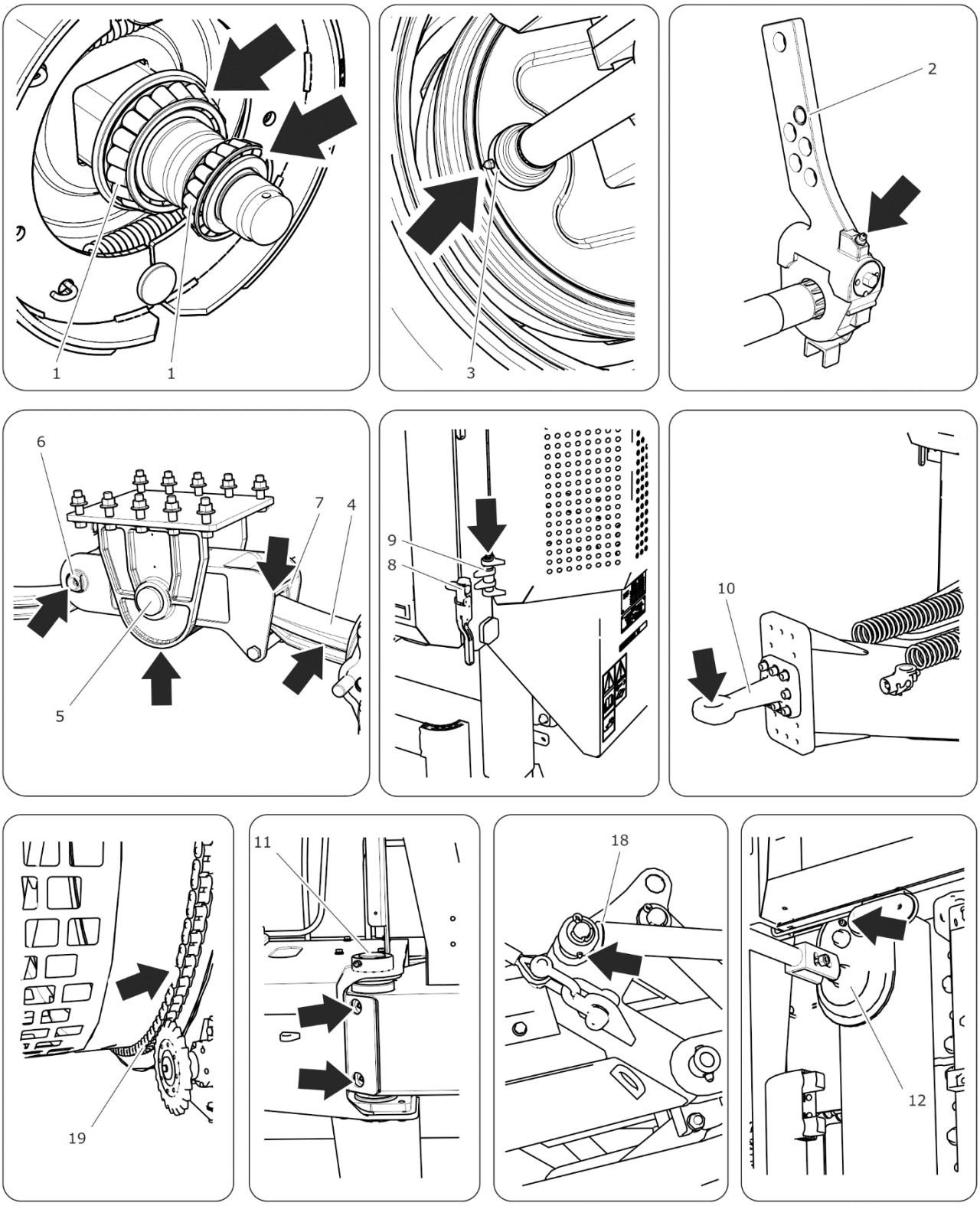


FIG. 5.43 *Lubrication points on the trommel screen*

TAB. 5.6 *Recommended lubricants*

Listed on tab. (5.5)	Description
A	Machine general-purpose grease (lithium, lime).
B	Grease for heavily loaded elements with addition of MoS2 or graphite, chain grease.
C	Anti-corrosion and penetrating preparation in aerosol.
D	General-purpose machine oil, grease in aerosol.

TIP

The remaining lubrication points do not require manual lubrication (they are lubricated automatically).

The central lubrication system pump is switched on by pressing push-button (1). The pump must be started manually each time after washing the trommel screen. If the push-button is pressed, one lubrication cycle will be started.

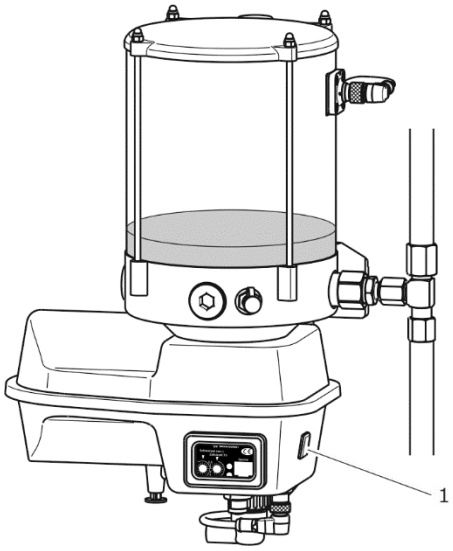


FIG. 5.44 *Central lubrication system pump*

(1) push-button

5.3.35 CHECKING OIL LEVEL AND CHANGING OIL IN THE GEAR

➡ Open the front shield of the charging hopper.

➡ Check oil level in the gear

⇨ Oil level should be approximately at the half of the height of the oil level indicator (1).

➡ If oil level is too low, check tightness of the gear.

⇨ Repair the gear if oil loss is large and oil must be frequently added.

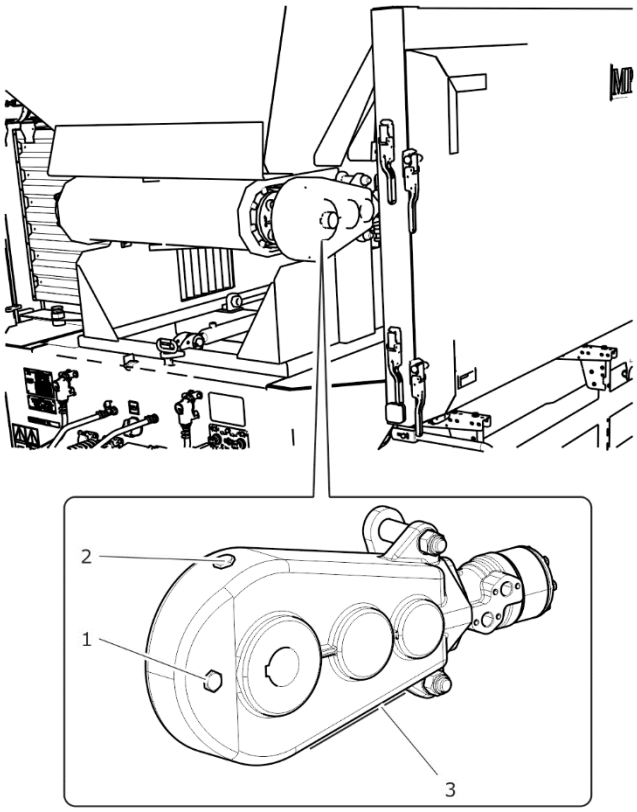


FIG. 5.45 *Reduction gear*

(1) oil level indicator (2) filler plug

(3) cover

➡ Unscrew filler plug and add oil (2).

➡ Check the filler plug seal, replace if necessary.

➡ Close the charging hopper shield.

OIL CHANGE

➡ Start the charging hopper conveyor drive for several minutes.

➡ Stop the drive, turn off the trommel screen engine.

➡ Open the front shield of the charging hopper.

➡ Loosen bolts of cover (3).

➡ Pour oil to a container. Unscrew the lower cover completely. Check technical condition of gear wheels.

➡ Replace seal and tighten cover.

➡ Unscrew filler plug and add oil to the required level.

➡ Check the filler plug seal, replace if necessary.

➡ Close the charging hopper shield.

5.4 REPLACEMENT OF DRUM

- ➡ Protect the trommel screen against rolling by placing chocks under the wheels and immobilize the machine with parking brake.
- ➡ Start the trommel screen's engine.
- ➡ Unfold the side conveyor and the rear conveyor.
- ➡ Open and lock the front shield of the charging hopper (at the maximum opening angle).
- ➡ Remove pin (1), figure (5.46), which protects the charging hopper.
- ➡ Slide out the charging hopper.
- ⇨ Slide the charging hopper in until flange (2) slides out completely from the screening drum.
- ➡ Raise the brush.
- ➡ Switch off the engine and remove key from ignition.
- ➡ Open and lock the left shield of the screening drum (at the maximum opening angle).
- ➡ Retract the rear guide roll from the drum.
- ➡ Fasten the drum using steel slings, belt slings or endless sling. Attach the slings to spreader boom.
- ➡ Lift the drum above the height of stake (5).
- ➡ Take the drum out of the chamber and move it to the left side of the trommel screen.
- ➡ Put the drum on the ground and secure it against rolling.
- ➡ Disconnect slings and attach them to the other drum.
- ➡ In order to install the drum perform the above activities in reverse sequence.
- ➡ After installing the drum, check and adjust drum position and drum drive engine.

TIP

Permissible weight of the screening drum is 1 800 kg.

DANGER

Before beginning work, make sure that lifting devices, slings and accessories have proper lifting capacity and are not damaged.

Do NOT replace the drum in strong gusty winds conditions.

Operator of lifting equipment should have the required authorisation.

Exercise particular caution while working, do not stand under lifted drum.

Disassembled drum should be immediately transported to the storage area and protected against rolling.

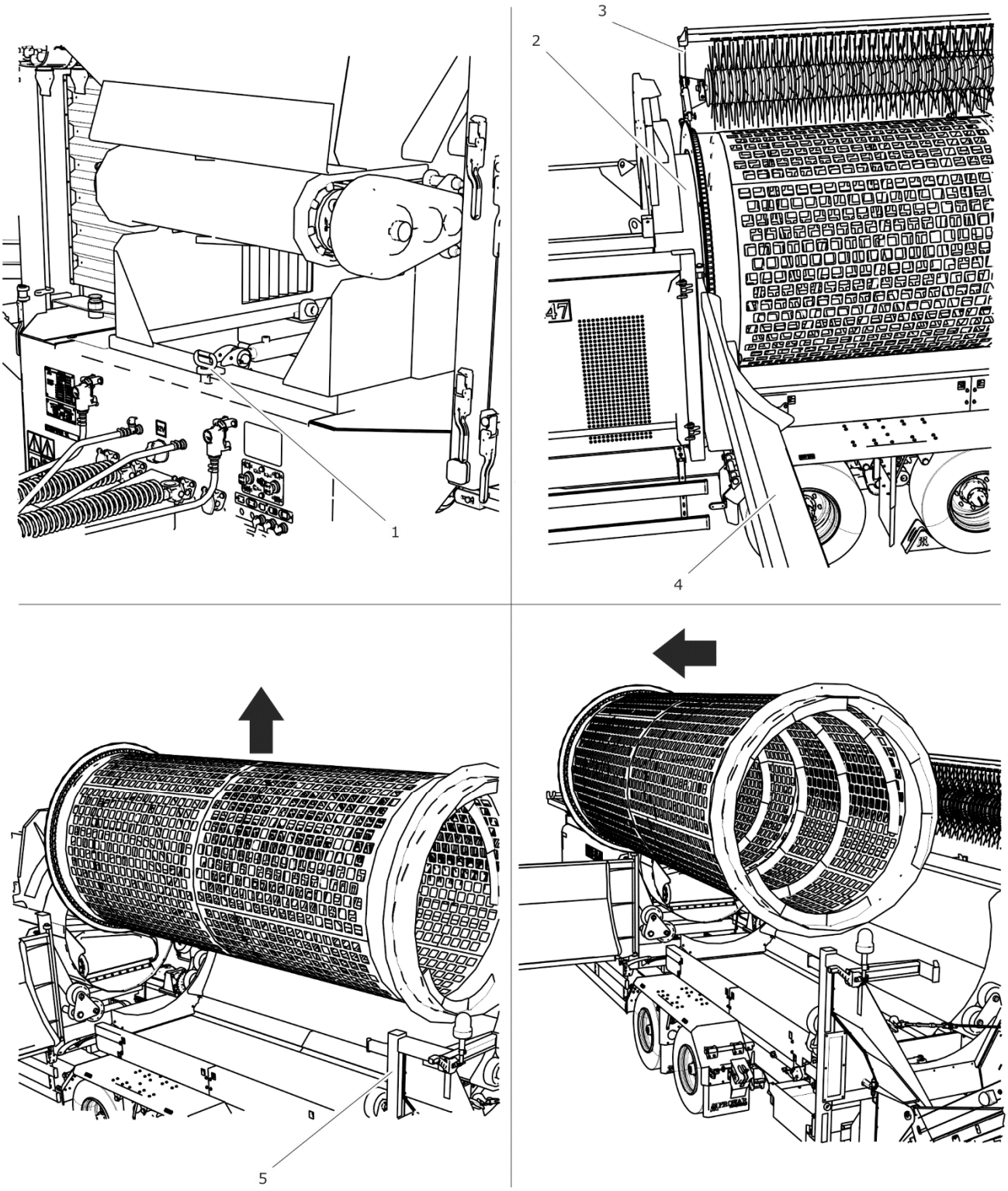


FIG. 5.46 *Disassembly of the screening drum*

(1) pin *(2) flange* *(3) brush*

(4) left shield of screening drum *(5) stake*

5.5 EMERGENCY RELEASE OF DIAPHRAGM-SPRING ACTUATOR

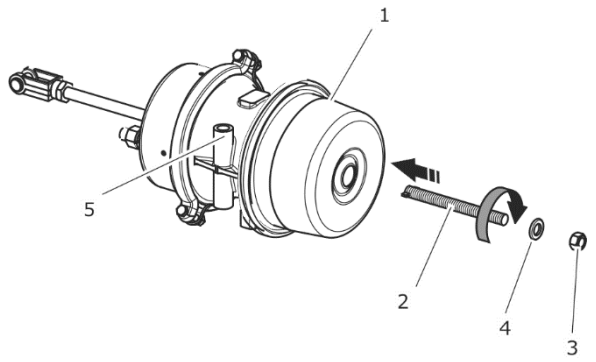


FIG. 5.47 *Diaphragm-spring actuator*

(1) actuator *(2) tensioning bolt*

(3) nut *(4) washer*

(5) tensioning bolt holder

Air may enter the brake system, including brake cylinders, and the machine's brakes may be locked as a result of pneumatic system failure or after extended parking of the trommel screen. Emergency release of these actuators involves putting a spring under tension by means of a tensioning bolt. During normal operation, the bolt is located in the actuator holder (5).

EMERGENCY RELEASE OF DIAPHRAGM ACTUATOR

- ➡ Immobilise the trommel screen by placing wheel chocks under the wheels.
- ➡ Remove stopper from the opening of the rear actuator.
- ➡ Insert tensioning bolt (2) into rear opening of the diaphragm actuator (1).
- ➡ Turn the bolt by 90°.
- ➡ Install washer (4) and screw nut (3) on.
- ➡ Tighten the nut until resistance is felt,
- ➡ Repeat the above steps for the other actuator.

In order to return to actuator normal operation mode, undo nut (3) and take tensioning bolt (2) out of the actuator. After completion of the activities, place the bolt together with other elements in the actuator holder (5) and protect the rear opening with a plastic stopper.

DANGER

Exercise caution while working. During putting the actuator spring under tension, the trommel screen is not immobilised with parking brake. That is why chocks must be placed under the machine wheels in order to secure the it against rolling.

5.6 AERATION OF BRAKE SYSTEM

The purpose of the brake system aeration is to supply air to diaphragm-spring actuators in order to release the trommel screen brakes. The brake system aeration is performed mainly when the trommel screen brake system can not be correctly connected to tractor.

EXTENT OF ACTIVITY

- Hitch the drawbar hitching eye of the trommel screen to the truck.
- Connect air conduit to valve (1).
- Using an external source of compressed air aerate the brake system until the trommel screen's parking brake is completely released.
- Disconnect air conduit and move the trommel screen.
- Press valve head (1) in order to bleed the actuators.
- Unhitch the drawbar hitching eye and drive tractor away from the machine.

DANGER

After unhitching the trommel screen, necessarily bleed the brake system by pressing valve head (1).

If the trommel screen is unhitched from tractor and the brake system is aerated by means of valve (1), parking brake of the machine does not work. There is a risk that the trommel screen will unintentionally move.

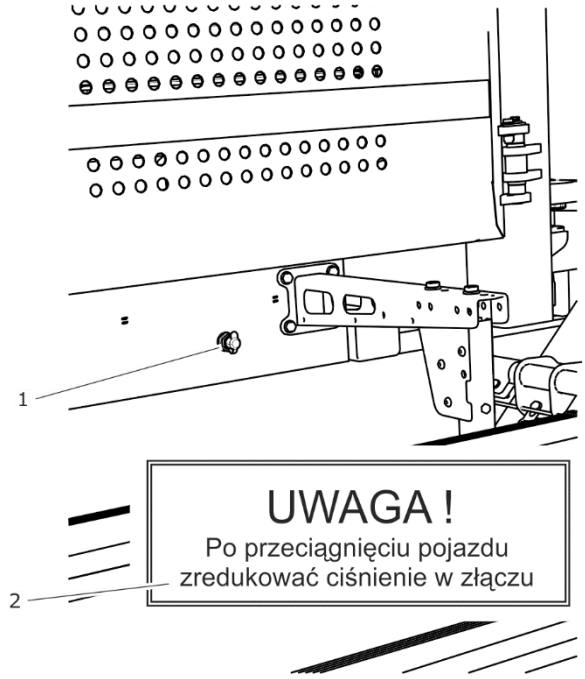


FIG. 5.48 *Aeration valve*

(1) valve *(2) decal*

5.7 ADJUSTMENT OF REAR CONVEYOR

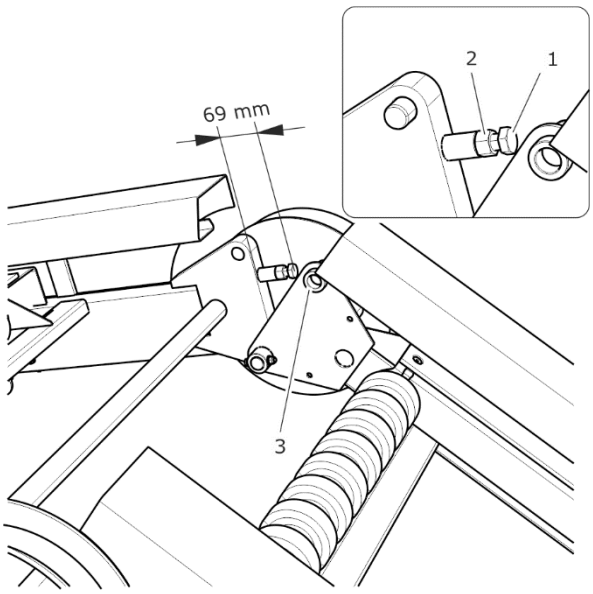


FIG. 5.49 *Adjustment of conveyor*

(1) adjusting bolt *(2) counter nut*

(3) pin socket

Adjustment of foldable part of the rear conveyor is required when this part of the conveyor can not be locked after unfolding. This happens when the openings of the sockets of the fixed part and the foldable part of the conveyor are not aligned.

EXTENT OF ACTIVITY

- ➡ Unfold the rear conveyor to such a position as to ensure comfortable access to adjusting bolt (1).
- ➡ Measure the distance between the bolt head and the bracket to which the sleeve is welded.
- ➡ Unscrew counter nut (2) and screw in or screw out bolt (1) to adjust the distance of 69 mm.
- ➡ Repeat this activity on the other side of the conveyor.
- ➡ Unfold the conveyor completely. Check whether it is possible to lock the conveyor.
- ➡ If it is not possible, adjust the length of bolt (1) on both sides of the conveyor.
- ➡ Check once again whether it is possible to lock the conveyor.
- ➡ After completion of the adjustment activities, tighten counter nut (2).

TIP

One full rotation of adjusting bolt (1) is equal to the stroke of 2 mm.

5.8 CONSUMABLES

TAB. 5.7 *List of recommended consumables*

Place of application	Capacity	Commercial name	Notes
Fuel tank	300 litres	Diesel oil	PN-EN 590+A1:2010
Engine	10 litres	Lotos Turdus Powertec 3000	API CG-4/CH-4 SAE 10W40
Engine cooling system	10 litres	Borygo Eko	
Hydraulic system	100 litres	Lotos HLP32 HLP 46 HLP 68(1)	
Reduction gear	4.3 kg	Lotos Titanis	GL5 80W90 (SAE 90 EP)
Automatic lubrication pump	10 kg	Grease	NLGI1, NLGI2

(1) - depending on temperature conditions

5.9 STORAGE

- The trommel screen should be kept in a roofed building.
- Immobilise the trommel screen with parking brake (release (pull out) the red push-button of the loosening-parking valve).
- If the machine will not be used for a long time, it is essential to protect it from adverse weather conditions, especially those which initiate corrosion of steel, have aggressive impact on anticorrosion coating of the tank and accelerate ageing of tyres and belt conveyors. During this time the machine must be unloaded. The trommel screen should be very carefully washed and dried.
- Corroded places should be cleaned of rust, degreased and protected using undercoat paint and then painted with surface paint according to colour scheme.
- In the event of prolonged work stoppage, it is essential to lubricate all elements regardless of the period of the last lubrication process.
- Wheel rims and tyres should be carefully washed and dried. During a longer storage of the trommel screen, it is recommended that every 2 to 3 weeks the machine should be moved a bit so that the place of contact of tyres with ground is changed. The tyres will not be deformed and maintain proper geometry. Also tyre pressure should be inspected from time to time, and if necessary pressure should be increased to appropriate value.

5.10 INSPECTION OF TIGHTENING TORQUE OF NUT AND BOLT CONNECTIONS

TAB. 5.8 *Tightening torque for nut and bolt connections*

Metric thread	5.8(1)	8.8(1)	10.9(1)
	Md [Nm]		
M10	37	49	72
M12	64	85	125
M14	100	135	200
M16	160	210	310
M20	300	425	610
M24	530	730	1,050
M27	820	1 150	1 650
M30	1 050	1 450	2 100

(1) – resistance class according to DIN ISO 898 standard

TAB. 5.9 *Tightening torque for hydraulic conduit connections*

Conduit size DN	Tightening torque [Nm]
8	30÷50
10	50÷70
13	50÷70
16	70÷100
20	70÷100
25	100÷150
32	150÷200

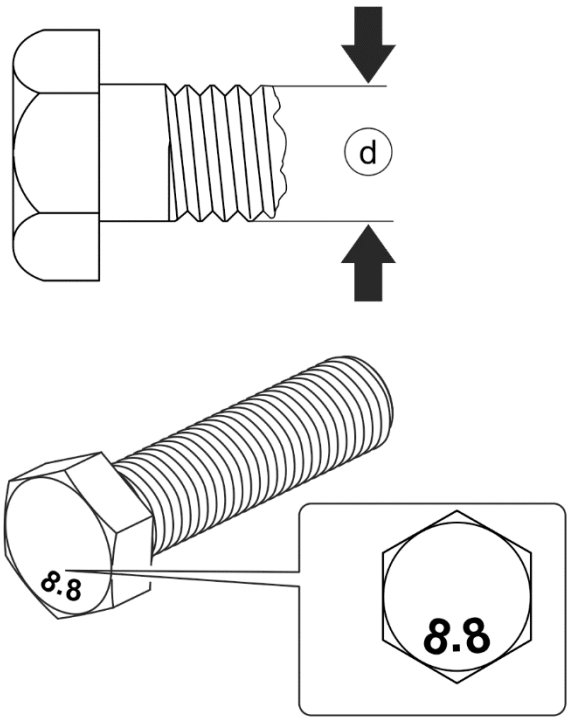


FIG. 5.50 *Bolt with metric thread*

(1) resistance class (d) thread diameter

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

5.11 TROUBLESHOOTING

TAB. 5.10 *Description of alarms on the main control panel*

Alarm	Cause	Remedy
 Damaged alternator	Damaged voltage regulator	Repair regulator
	Damaged rectifier system	Repair system
	Worn brushes.	Replace brushes, check rings.
	Broken alternator drive vee-belt	Replace vee-belt.
 Contaminated fuel filter or air filter.	Water in fuel filter decanter	Drain water from fuel filter
	Water in fuel tank	Drain water from fuel tank
	Contaminated air filter	Replace air filter elements.
 High temperature of coolant	Insufficient amount of coolant in the system.	Check coolant level and add coolant.
	Leaky engine cooling system	Check and seal engine cooling system. Replace damaged parts.
	Damaged thermostat	Replace thermostat.
	Contaminated radiator.	Blow radiator with compressed air
	Contaminated radiator cover	Blow radiator cover with compressed air.
	Short-circuit of sensor lead to ground.	Repair sensor lead.
	Broken cylinder head, damaged cylinder head gasket.	Repair engine.
 Low engine oil pressure	Damaged oil pump	Repair
	Low oil level	Check oil level and add oil
	Contaminated (clogged) oil filter	Replace filter, check cause of clogged filter
	Short-circuit of sensor lead to ground.	Repair sensor lead.
	Worn bearings of crank-piston system	Replace bearing shells

Alarm	Cause	Remedy
 Low level of hydraulic oil	Loss of oil	Check hydraulic system for tightness, check condition of hydraulic conduits and connections. Check tightness of tank and oil cooler.
 High temperature of hydraulic oil	Contaminated oil cooler	Blow oil cooler with compressed air
	Fan does not work	Check the fuse (30A) in the main control panel box.
	Contaminated oil cooler cover	Blow oil cooler cover with compressed air
	Overloaded drive system of the trommel screen	Check and remove clogging, reduce amount of charge material loaded to the charging hopper.
	Mechanically damaged pump	Repair pump
	Damaged thermostat	Replace
 Low fuel level	Low fuel level	Add fuel
	Short-circuit of lead to ground	Check and repair
Red LED blinking on IFM controller (inside the main control panel housing)	Damaged IFM controller or short-circuit in output circuit	Replace controller. Check insulation of leads, check tightness of housing.

TAB. 5.11 *Light codes of the central lubrication system pump*

Diode colour	Description of light code	Meaning of code
Green diode	Lights up for 1,5 second and then goes off	Pump is ready for work.
Red diode	Lights up for 1,5 second and then goes off	
Green diode	Lights up during the whole lubrication cycle	Pump is on, lubrication process
Red diode	Off	
Green diode	Off	Low grease level in the tank
Red diode	Lights up all the time after power on	

Diode colour	Description of light code	Meaning of code
Green diode	Lights up all the time after power on	Excessive pressure increase in lubrication system.
Red diode	Blinks every 1 second	
Green diode	Off	Pump does not rotate.
Red diode	Blinks every 1 second	
Green diode	Off	Controller memory error
Red diode	Blinks every 0.5 second	

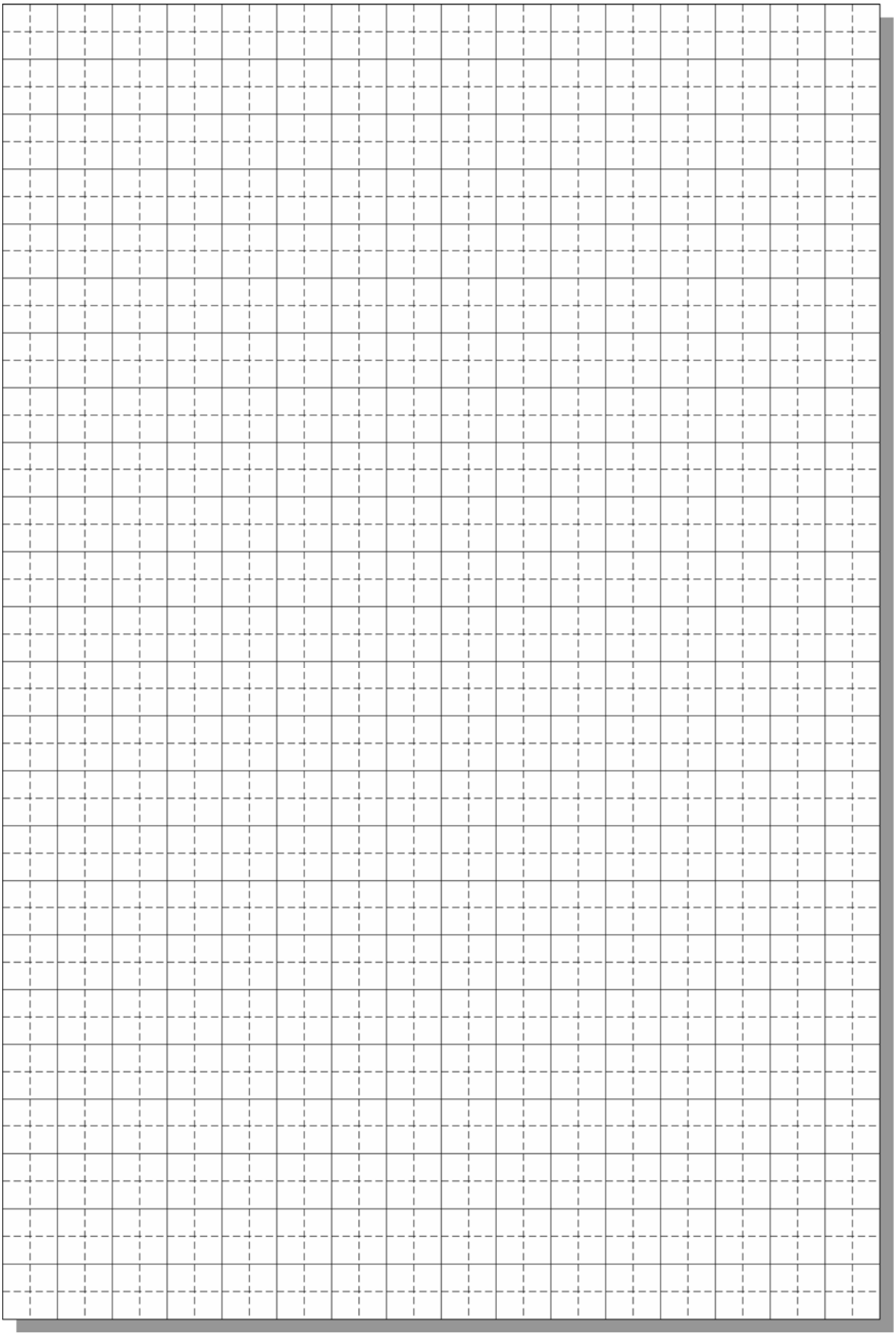
TAB. 5.12 *Other faults*

Fault	Cause	Remedy
Problem with moving off	Brake system conduits not connected	Connect brake conduits.
	Applied parking brake	Release parking brake.
	Damaged pneumatic system connection conduits	Replace.
	Leaking connections	Tighten, replace washers or seal sets, replace conduits.
	Damage control valve or brake force regulator	Check valve, repair or replace.
	Lack of air in brake system	Aerate brake system.
Noise in axle hubs	Excessive play in bearings	Check play and regulate if needed
	Damaged bearing	Replace bearing
	Damaged hub parts	Replace
Poor reliability of braking system	Insufficient pressure in system	Check pressure on tractor pressure gauge, wait till compressor fills tank to required pressure. Damaged air compressor in tractor Repair or replace. Damaged brake valve in tractor. Repair or replace. Leaking system conduits or connections. Check system for tightness.
Excessive heating of axle hubs	Damaged self-regulator of expander lever	Replace.
	Worn brake linings	Change brake shoes

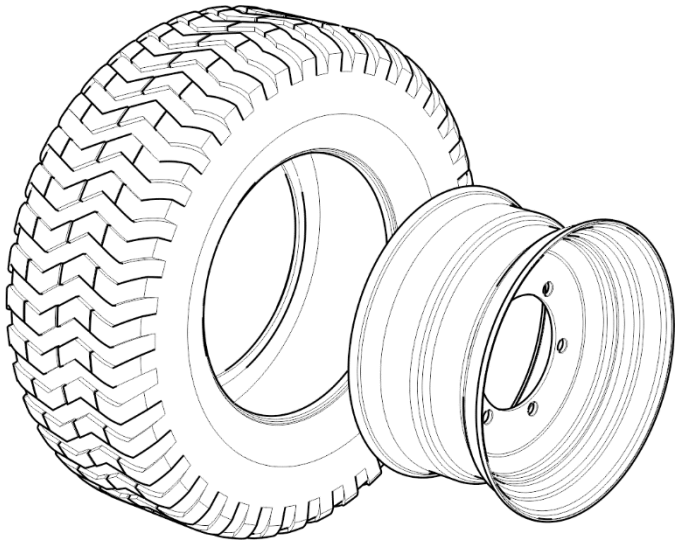
Fault	Cause	Remedy
Incorrect hydraulic system operation	Improper hydraulic oil viscosity	Check quality of oil. Change oil.
	Damaged or contaminated ram cylinder	Check cylinder ram piston (bending, corrosion), check ram cylinder for tightness (piston seal), in case of need repair or replace ram cylinder.
	Excessive cylinder ram loading	Check and reduce cylinder loading if necessary
	Damaged hydraulic conduits	Check and ascertain that hydraulic conduits are tight, not fractured and properly tightened. If necessary replace or tighten.
	Contaminated hydraulic oil	Check cleanliness of oil, replace filters, replace oil
Excessive wear of left and right tyre shoulders on both sides.	Too low air pressure in tyres. Excessive speed of travel on turns. Too fast loss of air due to damaged wheel, valve, puncture.	Check air pressure. Regularly check correctness of air pressure in tyres. Reduce speed of travel while driving on turns on hardened surface. Check wheel and valve. Replace damaged parts.
Excessive wear of central part of tyre.	Excessive air pressure in tyres.	Check air pressure. Regularly check correctness of air pressure in tyres.
Excessive wear of left or right tyre shoulder, on one side	Incorrect toe-in. Incorrectly positioned wheel axles.	Damaged leaf spring on one side of the suspension system. Replace leaf springs.
Worn tyre tread.	Damaged suspension system, broken leaf spring. Damaged brake system, blocking of brakes, incorrectly adjusted brake system. Too frequent and violent braking.	Check suspension system for looseness, check leaf springs. Replace damaged or worn elements. Check brake system for malfunctions. Adjust expander lever.
Side crack.	Prolonged use of tyre with low air pressure. Excessive loading of the trommel screen.	Regularly check air pressure in tyres. Check weight of load while loading.

Fault	Cause	Remedy
Abrasions on external side edge of tyre.	Too frequent driving over sharp or high obstacles (e.g. curbs).	Control driving technique.
Damaged rim (hardening and cracking near rim), brittleness of tyre.	Incorrect braking technique. Too frequent violent braking. Damaged brake system.	Check brake system. Control braking technique. Damage occurs due to excessive heating of hub which leads to heating of wheel.
Individual functions of the trommel screen do not work	Burnt out fuse	Replace fuse with a correct one.
	Damaged relay.	Check and replace.

NOTES



ANNEX A



TYRE SYSTEM

ITEM	TYRE	WHEEL RIM
1	435/50 R19.5 160J	19.5x14.0 8xM20x1.5 ET=0 ø221/275