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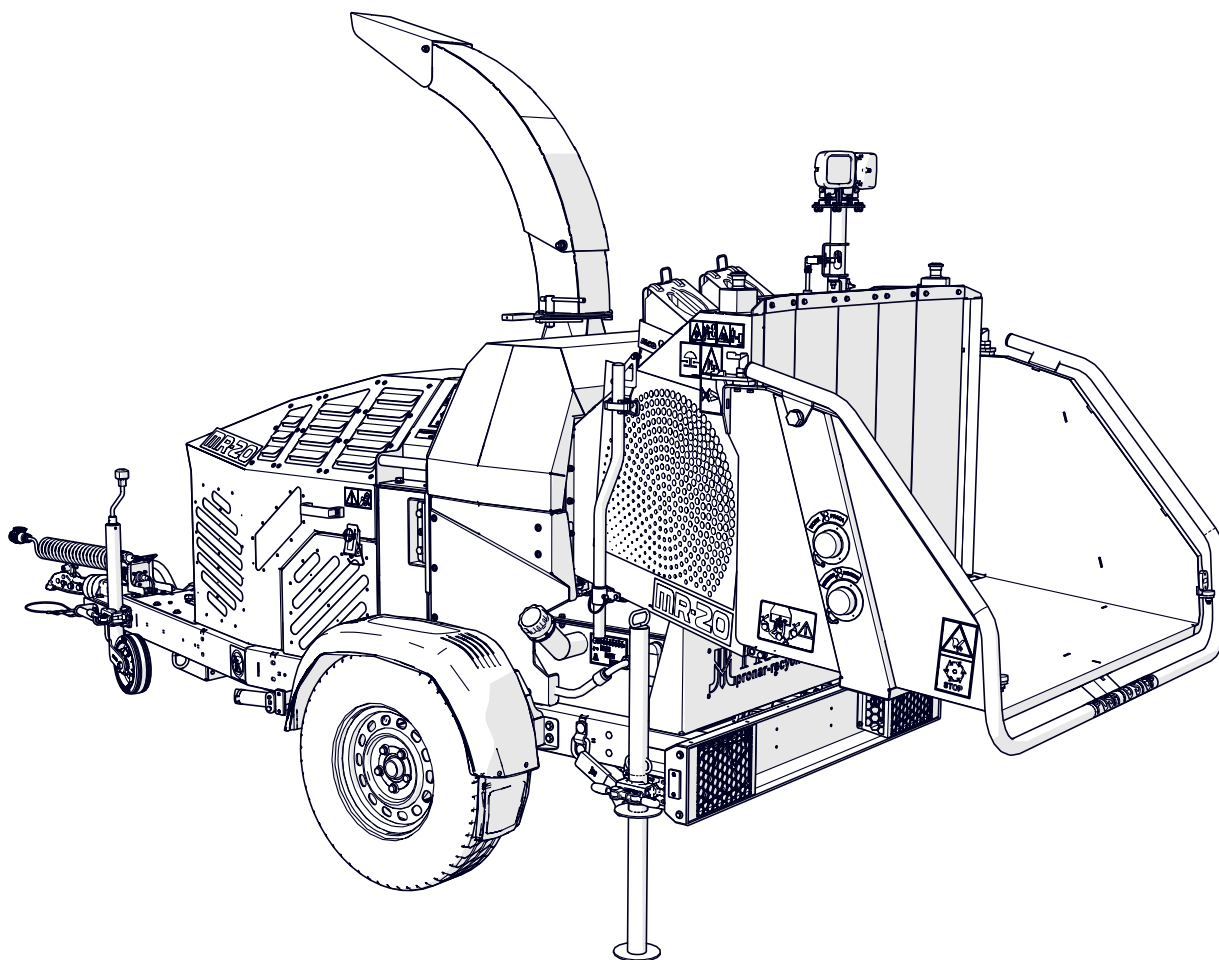
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USER MANUAL

MOBILE WOOD CHIPPER PRONAR MR-20

TRANSLATION OF THE ORIGINAL USER MANUAL



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EN

INTRODUCTION

1.1 INTRODUCTION

Information contained in the publication is current as at the date of its preparation. Some measures, illustrations and completion (standard, additional and optional equipment) contained in this publication may not correspond to the actual state of the machine delivered to the user because of its updating.

The drawings in this publication are intended to explain the operating principle of the machine and may differ from the actual state. It cannot be the basis for any claims in this respect.

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 publication

The User Manual is the basic equipment of the machine. Before starting the operation, the user must read this manual and observe all recommendations contained in it. This will ensure safe operation and failure-free operation of the machine. The machine was constructed in accordance with the applicable standards, documents and current legal regulations.

If the information contained in the User Manual turns out to be incomplete, please contact the store where the machine was purchased or the manufacturer directly.

After purchasing the machine, we recommend that you write down the serial numbers of the machine and the most important components in the fields below.

Machine serial number

Engine serial number

Serial number of the driving axle

This User Manual contains important safety instructions and operating rules for the machine. The User Manual should be kept close to the machine and it should be available to persons authorized to operate it.

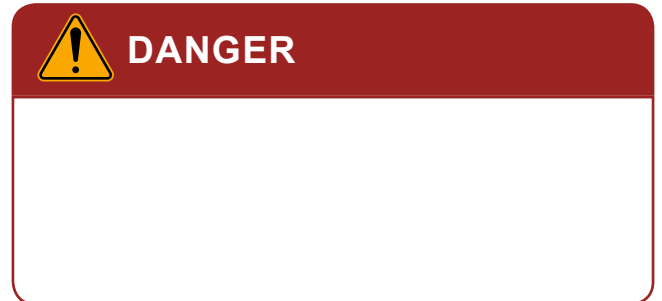
Keep this User Manual for future reference. If the document is lost or damaged, contact the seller or the manufacturer for a duplicate.

The User Manual is intended for the end user. Therefore, some maintenance required is detailed in the inspection tables but the procedure is not described in this publication. Call the manufacturer's authorized service to carry maintenance works.

1.2 SYMBOLS USED IN USER MANUAL

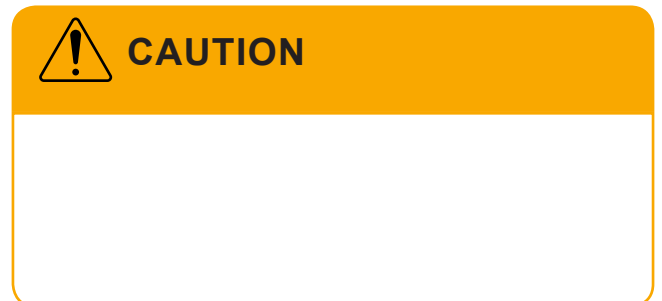
DANGER

Information, descriptions of hazards and precautions as well as instructions and orders related to the safe use contained in the User Manual are marked with a box with the word **DANGER**. Non-adherence to the recommendations may pose a threat to the health and life of the machine operator or bystanders.



CAUTION

Particularly important information and recommendations, the observance of which is absolutely necessary, are highlighted in the text with a box with the inscription **CAUTION**. Non-observance of the recommendations described above may result in damage to the machine due to improper operation, adjustment or use.



NOTE

Additional hints in the User Manual describe useful information on the operation of the machine and are highlighted by a box with the word **NOTE**.



U.02.1.EN

1.3 DETERMINATION OF DIRECTIONS IN USER MANUAL

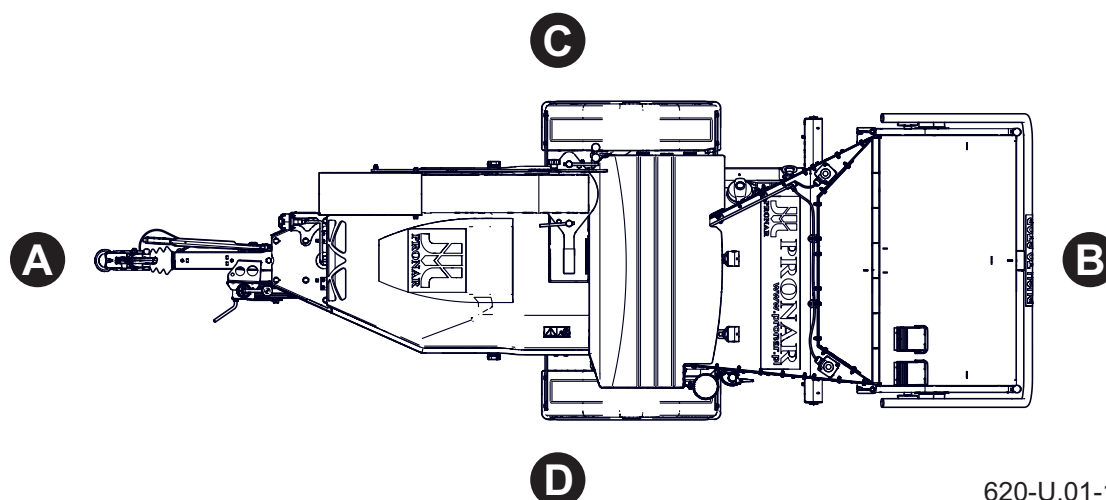


Figure 1.1 Determination of directions on the machine

(A) front

(B) back

(C) right side

(D) left side

Left side – the side on the left hand of the observer facing the direction of machine forward travel.

Right side - the side on the right hand of the observer facing the direction of machine travel forward.

Right turn - clockwise rotation of the mechanism (operator facing the mechanism).

Left turn - counterclockwise rotation of the mechanism (operator facing the mechanism).

U.03.2.EN

1.4 INSPECTION OF THE MACHINE AFTER DELIVERY

The manufacturer ensures that the machine is technically efficient, has been checked according to inspection procedures and is ready for use. However, this does not release the user from the obligation to inspect the machine after delivery and before its first use. The machine is delivered to the User completely assembled. After delivering the machine, the User is obliged to check the completion of the machine in accordance with the order.

INSPECTION RECOMMENDATIONS

- Check the completion of the machine according to the order.
- Check the technical condition of the safety guards, and the correct opening and closing.
- Check the condition of the paint coat, check whether there are traces of

corrosion.

- Check the machine for damage resulting from improper transport of the machine to its destination (dents, punctures, bends or broken details, etc.).
- Check: level of hydraulic oil in the reservoir, level of lubricating oil in the engine.
- Check the condition of tires and rims, check tire pressure.
- Top up the fuel tank.

In case of detected irregularities, they should be reported directly to the seller in order to remove the defects. Incorrect level of operating fluids (except for fuel) may indicate that a leak has occurred. Check the machine for leaks.

U.26.2.EN

1.5 REVIEWS

During use of the machine, it is necessary to constantly check its technical condition and perform maintenance procedures that will keep the machine in good technical condition. Therefore, the user is obliged to perform all maintenance and adjustment activities specified by the Manufacturer in accordance with the assumed schedule. Repairs during the warranty period and all inspections, except for the daily inspection and inspection every 50 hours of operation, may be performed only by authorized service points.

Motor repairs and engine inspections not described in the manual may only be performed by an authorized service point of the engine manufacturer.

The warranty is void in the event of unauthorized repairs, changes to factory settings or activities that have not been considered possible by the machine operator.

The service and inspections of the drive motor are described in the chapter *Motor maintenance*.

The complete inspection of the machine

consists of the following activities:

- periodic inspection of the machine with the assumed interval in accordance with the guidelines contained in the *Periodic inspections, technical service* chapter,
- inspection of the motor with accessories in accordance with the guidelines contained in the *Motor maintenance* chapter,
- Perform lubrication in accordance with the *Lubrication Schedule* chapter.

The run-in inspection should be performed after 50 hours of motor operation, but not later than 100 hours. Subsequent inspections should be performed by an authorized service each time every 250 hours of motor operation, i.e. after 250, 500, 750 hours, etc. (during the warranty period). Acceptable delay in performing the inspection cannot be longer than 50 hours from the assumed interval. The scope of these inspections is specified in the User's Manual.

U.41.1.EN

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Deklaracja zgodności WE maszyny

PRONAR Sp. z o.o. deklaruje z pełną odpowiedzialnością, że maszyna:

Opis i dane identyfikacyjne maszyny	
Ogólne określenie i funkcja:	Mobilny rębak
Typ:	
Model:	MR-20
Numer seryjny:	
Nazwa handlowa:	Mobilny rębak PRONAR MR-20

do której odnosi się ta deklaracja, spełnia wszystkie odpowiednie wymagania dyrektyw:

- **2006/42/WE- MD** - Dyrektywa dotycząca maszyn,
- **2014/35/UE- LVD** - Dyrektywa dotycząca sprzętu elektrycznego,
- **2016/1628 zmieniona przez 2020/1040** - Rozporządzenie Parlamentu Europejskiego i Rady (UE) z dnia 14 września 2016r. w sprawie wymogów dotyczących silników spalinowych.

Maszyna została zaprojektowana i spełnia wymagania norm:

**PN-EN ISO 12100; PN-EN ISO 4413; PN-EN ISO 14120; PN-EN ISO 13849-1;
PN-EN ISO 13850; PN-EN ISO 13857; PN-EN 60204-1; PN-EN 13525**

Deklaracja ta odnosi się wyłącznie do maszyny w stanie, w jakim została wprowadzona do obrotu i nie obejmuje części składowych dodanych przez użytkownika końcowego lub przeprowadzonych przez niego późniejszych działań.

Instrukcja obsługi jest integralną częścią maszyny.

Osobą upoważnioną do udostępnienia dokumentacji technicznej jest Kierownik Wydziału Wdrożeń w PRONAR Sp. z o.o., 17-210 Narew, ul. Mickiewicza 101A.

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d/s technicznych
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Roman Opatkiewicz

Narew, dnia 2022-12-06
Miejsce i data wystawienia

Imię, nazwisko osoby upoważnionej
stanowisko, podpis

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SECTION 1

BASIC INFORMATION

1.1 IDENTIFICATION

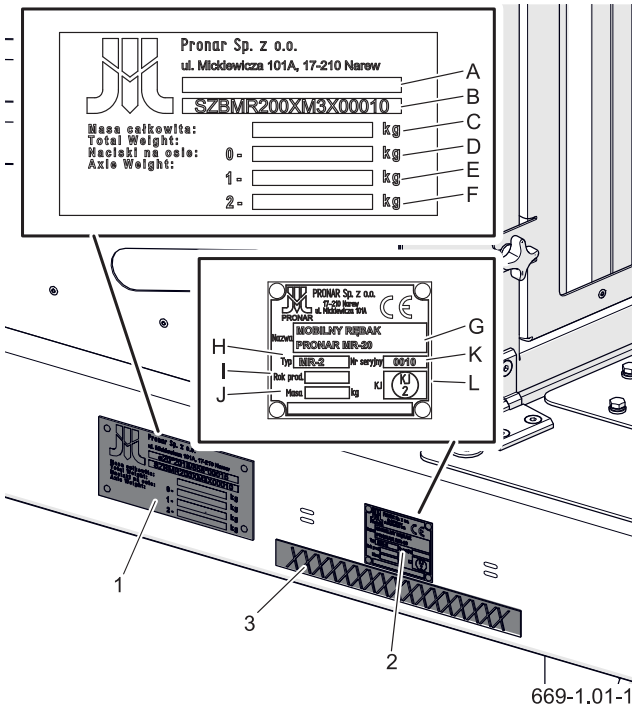


Figure 1.1 Location of the nameplates.

The PRONAR MR-20 mobile chipper is marked with nameplates (1) and (2), located on the right side of the frame - figure (1.1). Next to the nameplates there is a serial number (2). When purchasing the machine, make sure that the serial

Table 1.1 Markings on nameplate

Item	Meaning
A	Official certificate number
B	VIN
C	Maximum gross weight
D	Permissible hitch load
E	Permissible axle 1 load
F	Permissible axle 2 load
G	General description and purpose
H	Symbol /Machine type
I	Year of manufacture
J	Tare weight
K	Serial number
L	quality Control marking

numbers on the machine are the same as entered in the *Warranty Book*, in sales documents and in the *Operator Manual*. The meaning of the individual items found on the nameplates are presented in table (1.1).

TIP

When ordering spare parts or when problems occur, it is often necessary to provide the VIN and serial number of the machine.

1.2 INTENDED USE

The MR-20 mobile chipper is designed and constructed according to current safety and engineering standards.

The MR-20 chipper is designed for shredding branches and shrubs up to a maximum diameter of 20 cm. Using the machine for other purposes will be regarded as contrary to intended use.

Transporting people, animals or other materials is prohibited and regarded as contrary to the intended purpose. During the use of the machine comply with all road traffic regulations and transport regulations in force in the given country, and any breach of these regulations is regarded by the Manufacturer as use contrary to the intended use of the machine.

Using it as intended involves all actions connected with the safe and proper operation and maintenance of the machine. Due to the above, the user is obliged to:



ATTENTION

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

- roots from the ground, stones, rocks,
- construction waste, plastics, glass, metal, paper, textiles.

DO NOT transport any cargo, in particular people and animals.

- carefully read the *Operator Manual* and comply with its recommendations,
- 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 and transport regulations in force in the given country, in which

Table 1.2 Carrier vehicle requirements for towing the machine.

Contents	Unit	Requirements
Hitch	-	Tow bar ball for trailers, ball diameter Ø 50 mm
Height of hitch	mm	450
Lighting system socket	-	13-pole compliant with ISO 11446
Electrical system voltage	V	12

the machine is used,

The machine may only be used by persons,
who:

- have become familiar with the content

of this publication,

- have been trained in machine operation and safe working conditions,

E.5.2.669.01.1.EN

1.3 EQUIPMENT

Table 1.3 PRONAR MR-20 mobile chipper equipment

Equipment	
<i>Operator Manual</i>	S
<i>Warranty Book</i>	S
Lighting system wiring harness	S
Folding rotating discharge chute	S
Overrun brake	S
Jockey wheel	S
Wheel chocks	S
Spare wheel	O
Lamp covers	O
Operating zone lights	O
Pusher	O

Equipment: Standard; Optional

E.5.2.669.02.1.EN

1.4 TERMS & CONDITIONS OF WARRANTY

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 Manual*. Defects discovered during the warranty period will be removed by the Warranty Service. The repair period is specified in the *Warranty Book*.

The warranty does not cover those parts and sub-assemblies of the machine which are subject to wear in normal usage conditions, regardless of the warranty period. The warranty service only applies to such cases as: mechanical damage which is not the user's fault, factory defects of parts, etc.

In the event of damage arising from:

- mechanical damage which is the user's fault, damage caused by road accidents,
- incorrect use, adjustment or maintenance, use of the machine for purposes other than those for which it is intended, shredding of prohibited materials,
- use of damaged machine,

TIP

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

- repairs carried out by unauthorised persons, repairs carried out improperly,
- 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 newly purchased machine.

Do NOT attempt to modify the machine without the written consent of the Manufacturer. 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.

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1.5 TRANSPORT

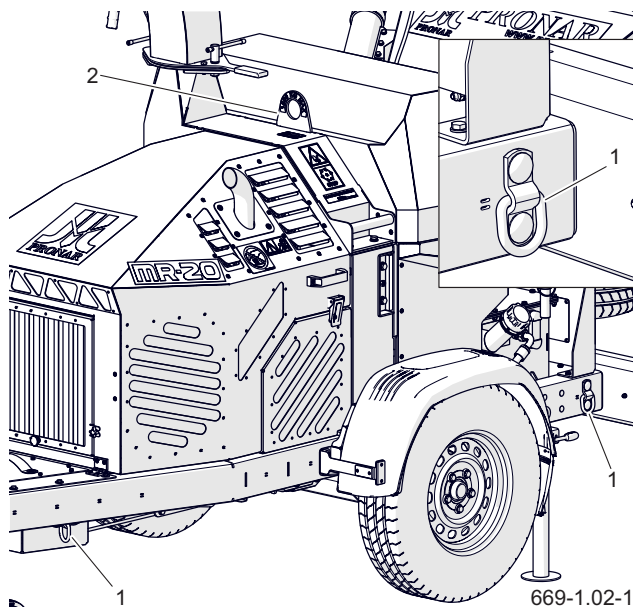


Figure 1.2 Transport lugs
(1) transport lug (2) lifting lugs

The MR-20 mobile chipper is ready for sale completely assembled and does not require packing. Packing is only required for the machine's technical documentation and any extra accessories.

The agricultural trailer is delivered to the user either transported on a loading platform of a vehicle or independently (towed after being attached to a carrier). Transport of the machine is permissible connected to a carrier vehicle provided the vehicle's driver familiarises himself with the machine's Operator Manual and particularly with information concerning safety and principles of hitching and transport on public roads.



DANGER

Incorrect use of securing measures may cause an accident.

Loading and unloading of the machine from the loading platform should be carried out using a loading ramp, ramps, a low-bed trailer, a carrier, an gantry or a crane. Persons operating reloading equipment must have the qualifications required to operate these machines. When loading and unloading the machine, follow the general health and safety regulations for reloading work. Lifting equipment used for transporting the machine must be attached only to the attachment points (2) – figure (1.2).

During road transport the machine should be firmly secured on the load box by means of certified belts or chains fitted with a tightening mechanism. In order to attach the machine in a proper manner, use transport lugs (1) – figure (1.2).

Chocks, wooden blocks or other objects without sharp edges should be placed under the wheels of the slurry tanker to prevent it from rolling. Wheel blocks must be nailed to the vehicle load box planks or secured in another manner preventing their movement.

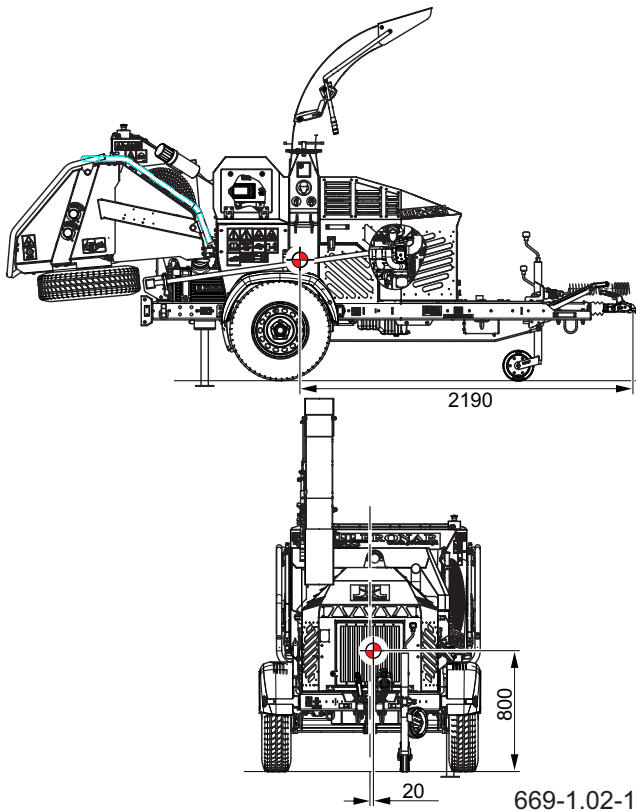


Figure 1.3 Center of gravity

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



ATTENTION

When transporting the machine independently, the user must carefully read this Operator Manual and observe all its instructions. When being transported on a motor vehicle the machine must be mounted on the vehicle's platform in accordance with the transport safety requirements. The driver of the vehicle should use extreme caution while driving. This is due to the vehicle's centre of gravity shifting upwards when the machine is loaded.

A correctly secured machine does not change its position with regard to the transporting 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 secure the load. If necessary, the discharge chute must be dismantled.

During reloading work, take special care not to damage any accessories or paint finish. The tare weight of the chipper is given in table (3.1).

In the event of independent transport, the user should read the machine's Operator Manual and adhere to its instructions. Independent transport involves towing the machine with carrier unit to its destination. The driver of the carrier vehicle should familiarize himself with the content of the Operating Instructions, especially the information concerning safety and the rules for hitching and transporting on public

roads. During shipping adjust ground speed to the prevailing road conditions, but do not exceed the maximum design speed of 80km/h.

E.5.2.669.03.1.EN

1.6 ENVIRONMENTAL RISK

A hydraulic oil leak constitutes a direct threat to the natural environment owing to its limited biodegradability. Maintenance and repair work which involves the risk of an oil leak should be performed in the rooms with oil resistant surface. In the event of oil leaking into the environment, first of all contain the source of the leak, and then collect the leaked oil using available means. Remaining oil should be collected using sorbents, or by mixing the oil with sand, sawdust or other absorbent materials. The oil contaminations, once gathered up, should be kept in a sealed, marked, hydrocarbon resistant container, and then passed on to the appropriate oil waste recycling centre. The container should be kept away from heat sources, flammable materials and food. Oil which has been used up or is unsuitable



ATTENTION

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



DANGER

Do not store waste oil in food containers. Store used oil in hydrocarbon-resistant containers.

TIP

The hydraulic system of the machine is filled with HLP 46 hydraulic oil.

for further use owing to loss of its properties should be stored in its original packaging in the conditions described above. Waste code: 13 01 10 (hydraulic oil). Detailed information on hydraulic oils can be found in the Material Safety Data Sheets.

E.3.1.526.06.1.EN

1.7 WITHDRAWAL FROM USE

Should you decide to withdraw the machine from use, comply with the regulations in force in the given country regarding withdrawal from use and recycling of machines withdrawn from use.

Before proceeding to dismantle machine, oil shall be completely removed from hydraulic system.

When spare parts are changed, worn out or damaged parts should be taken to a collection point for recyclable raw materials.



DANGER

During dismantling, use the appropriate tools, equipment (overhead crane, crane or hoist etc.) and use personal protection equipment, i.e. protective clothing, footwear, gloves and eye protection etc. Avoid contact of skin with oil. Do not allow used hydraulic oil to spill.

Used oil and also rubber and plastic elements should be taken to the appropriate facilities dealing with the recycling of this type of waste.

E.3.1.526.07.1.EN

SECTION 2

SAFETY ADVICE

2.1 SAFE USE

- Before use, the user must carefully read this Operator Manual and the *Warranty Book*. When operating the machine, follow all instructions in these documents.
- The machine may only be used and operated by persons trained in the principles of safe machine operation. This publication contains information on the correct and safe operation and maintenance of the machine.
- If the information in this Operator Manual is difficult to understand, contact the seller who runs the authorised technical service on behalf of the Manufacturer, or contact the Manufacturer directly. The user is obliged to acquaint himself with all control elements and operation control indicators of the machine.
- The Operator Manual should be available to the operator at all times. Please protect the operating instructions from damage.
- Careless and improper use and operation of the machine, and failure to comply with the instructions of this operator manual is dangerous to your health.
- Be aware of the residual risk. Use caution when operating this machine and follow all relevant safety instructions.
- The machine must never be used by unauthorised persons, including children, and people under the influence of alcohol, drugs or other intoxicants.
- Non-compliance with the safety rules of this Operator's Manual can be dangerous to the health and life of the operator and others.
- It is not allowed for bystanders to stay near the working machine (within the danger zone - minimum 10 m around the machine).
- Before using the machine always check whether it is properly prepared for work, especially in terms of safety.
- The machine is not intended to transport any load (including people and animals).
- Operation and completeness of the electrical lighting installation must be checked before each transport of the machine.
- The machine must not be used for purposes other than those for which it is intended. Anyone who uses the mobile chipper other than the way

intended takes full responsibility for himself for any consequences of this use. Use of the machine for purposes other than those for which it is intended by the Manufacturer may invalidate the guarantee.

- The mobile chipper may only be used when all the safety guards and other protective elements are technically sound and correctly positioned. In the event of loss or damage to the protective guards, they must be replaced with new ones.
- Parking brake must be engaged and the wheel must be blocked with support wedges before starting to operate the machine.
- Do NOT open the guards during machine operation!
- While operating the machine do not wear loose clothing, scarves, ties or jewellery (e.g. watches, rings, etc.).
- Long hair should be properly covered to prevent it from being caught in moving parts of the machine or in the shredding material.
- The operator should also use personal protective equipment such as protective clothing, safety goggles, hearing protection, safety helmet to reduce the risk of injuries.
- Use personal protective equipment (ear protectors) in order to limit occupational risks associated with exposure to noise during machine operation.
- Do not leave the pump running unattended.
- Do not operate the machine in poor visibility.

F.5.2.620.01.1.EN

2.2 SAFETY WHEN HITCHING THE MACHINE

- The machine and carrier may only be coupled to the appropriate ball hitch.
- After connecting to the carrier, check that the coupler is properly locked. Connect the safety cable to the carrier.
- The carrier vehicle to which the machine will be coupled must be technically reliable and must meet all manufacturer's requirements.
- Be especially careful when hitching the machine to tractor.
- When hitching, there must be nobody between the machine and the carrier vehicle.
- Engage parking break before unhitching the machine from the carrier vehicle. Place support chocks under the wheel.
- The machine disconnected from the carrier should stand on a flat, levelled and suitably hardened surface. Rest the disconnected chipper on the support wheel.
- Level the machine using the support wheel.
- Connect the lighting cable and check the operation of individual lamps.

F.5.2.620.02.1.EN

2.3 SAFETY RULES WHEN MAINTAINING HYDRAULIC SYSTEM

- The hydraulic system is under high pressure when operating.
- Regularly check the technical condition of the hydraulic lines and connections. There must be no oil leaks.
- In the event of the hydraulic system malfunction, discontinue using the machine until the malfunction is corrected.
- 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).
- Use the hydraulic oil recommended by the Manufacturer. Never mix two types of oil.
- After changing the hydraulic oil, the used oil should be properly disposed of. Used oil or deteriorated oil should be stored in original containers or replacement containers resistant to hydrocarbons. Replacement containers must be clearly marked and appropriately stored.
- Do not store hydraulic oil in packaging designed for storing food or foodstuffs.
- Rubber hydraulic lines must be replaced every 4 years regardless of their technical condition.
- Repair and replacement of hydraulic system elements should be entrusted to the appropriately qualified persons.

F.5.2.620.03.1.EN

2.4 SAFETY DURING TRANSPORT TRAVEL

- When driving on public roads, observe all road traffic regulations in force in the country, in which the machine is used.
- Do NOT exceed the maximum speed of 80 km/h. Adjust speed to the prevailing road conditions and other limitations arising from road traffic regulations.
- Before starting to drive, release the parking brake and fold the support wheel into the transport position. Fold and rotate the discharge chute parallel to the direction of travel.
- People or animals or whatever materials must not be carried on the machine.
- Avoid potholes, sudden manoeuvres or high speeds when turning.
- Reckless driving and excessive speed may cause accidents.
- The machine must NOT be left unsecured. Securing the machine involves immobilising chipper with the parking brake and placing chocks under the wheels. Unfold the parking stand.
- Before using the machine always check its technical condition, especially in terms of safety. In particular, check the technical condition of the linkage and drive system. Check the operation and completeness of the lighting system.

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2.5 MAINTENANCE

- During the warranty period, any repairs may only be carried out by warranty service authorised by the Manufacturer. It is recommended that necessary repairs to machine should be undertaken by specialised workshops.
- In the event of any fault or damage, do not use the machine until the fault has been corrected.
- Do NOT perform maintenance or repair work when the engine is turned on. Before carrying out maintenance, adjustment or repair, turn off the machine engine and remove the ignition key. Close the control panel door.
- During work, use appropriate, close-fitting protective clothing, gloves and appropriate tools. When working on hydraulic systems it is recommended to use oil resistant gloves and protective goggles.
- During maintenance work and repairs, only necessary personnel may have access to the machine.
- Any modification of the machine releases the manufacturer from any responsibility for damage or detriment to health which may arise as a result.
- Regularly check the technical condition of the safety devices and correct tightening of bolt connections.
- Regularly perform service inspections of machine as recommended by the Manufacturer.
- Before beginning repairs on hydraulic systems, reduce oil pressure.
- The user must not repair by himself the components of the power hydraulics, automation systems or the engine. 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.
- Before welding or electrical work, the mobile chipper should be disconnected from the power supply (disconnect (-) and (+) wires from the battery). Paint coat should be removed before welding because burning paint fumes are poisonous for people and animals.
- 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.

- Should it be necessary to change individual parts, use only original parts. Non-adherence to these requirements may put the user and other people's health and life at risk, and also damage the machine and invalidate the warranty.
- Regularly check technical condition and mounting of all guards and protective elements.
- In the event of work requiring the machine to be raised, use properly certified hydraulic or mechanical lifts for this purpose. After lifting the machine, stable and durable supports must also be used.
- The machine must not be supported using fragile elements (bricks or concrete blocks).
- After completing work associated with lubrication, remove excess oil or grease.
- In order to reduce the danger of fire the machine must be kept in a clean condition.
- After completed maintenance work and repairs, before starting the machine, make sure that no tools or spare parts are left inside the machine and that all protection devices and shields are correctly installed.

F.5.2.620.05.1.EN

2.6 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 electric welding, disconnect the machine from the 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.

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2.7 SAFETY DURING MOBILE CHIPPER OPERATION

- Before starting the machine make sure that there are no bystanders (especially children) or animals in the danger zone. The machine operator is obliged to ensure proper visibility of the machine and the working area.
- Before starting the machine, check that there are no tools, spare parts or blocked shredded material inside.
- Each time the machine is used, always ensure that all the safety guards are in good condition and in place.
- The machine may be started only if it is fully operational.
- Do not leave the machine running unattended.
- Do not open shields during machine operation!
- Use personal protective equipment, especially hearing protection.
- During operation, the appropriate engine speed must be set.
- During operation, it is absolutely necessary to immobilize the chipper with the parking brake and place chocks under the wheels.
- Do not shred material larger than 20cm in diameter. Use only as intended.
- Do not put your hands into the working space of the machine. Any jams of the shredded material should be removed after the machine has stopped and the shredding disc has stopped spinning.
- If the discharge chute becomes clogged, stop work immediately. Remove the blockage with the machine engine turned off.
- While shredding the material, do not stand directly in front of the loading hopper; it is recommended to take place next to the hopper.
- The shredded material flies out of the discharge chute at high speed and can cause injuries.
- Smoking and the use of open flames while working and refuelling is prohibited. Fuel vapors are flammable and form explosive mixtures.

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2.8 RESIDUAL RISK

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

- using the machine for purposes other than those for which it is intended,
- being within the range of material discharge from the discharge chute while the machine is operating,
- being on the machine during work or transport,
- operating the machine with removed or faulty safety guards,
- failure to maintain a safe distance from the danger zone or being within the zones while the machine is operating,
- machine operation by unauthorized persons or persons under the influence of alcohol
- cleaning, maintenance and technical

inspection while the machine is running.

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

- operate the machine in prudent and unhurried manner,
- sensibly apply the remarks and recommendations contained in the Operator Manual,
- carry out repairs and maintenance work in line with operating safety rules,
- repair and maintenance work should be carried out by persons trained to do so,
- use close fitting protective clothing,
- ensure unauthorised persons have no access to the machine, especially children.
- maintain a safe distance from forbidden or dangerous places
- do not climb on the machine when it is operating

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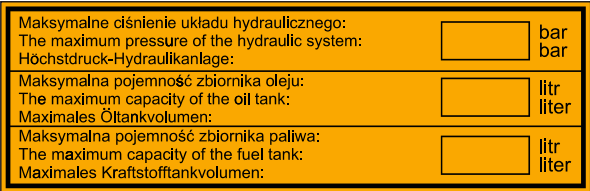
2.9 INFORMATION AND WARNING DECALS

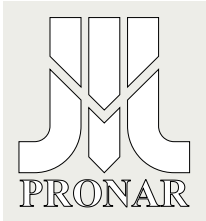
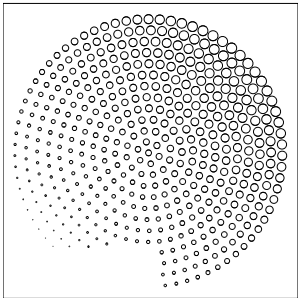
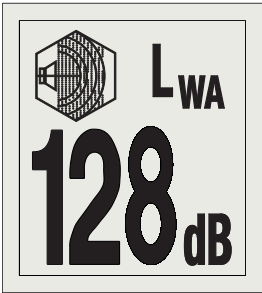
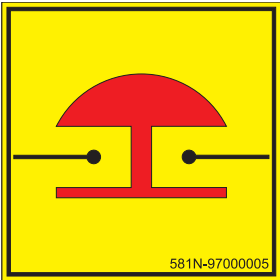
The machine is labelled with the information and warning decals mentioned in table (2.1). Throughout the machine use, you must ensure that any warning messages and information decals located on the machine are clear and legible. If any are destroyed or damaged, they must be replaced with new. Safety decals can be purchased from the Manufacturer of the machine or your PRONAR dealer. New

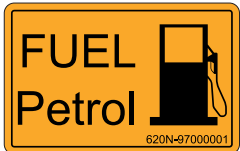
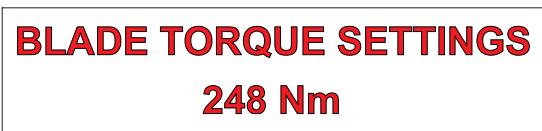
assemblies, changed during repair, must be labelled once again with the appropriate safety signs. When cleaning the multifunction arm, do not use solvents that may damage the coating of information decals and do not subject them to action of strong water jets.

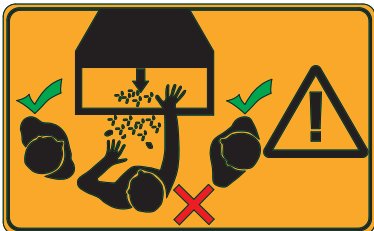
Table 2.1 Information and warning decals

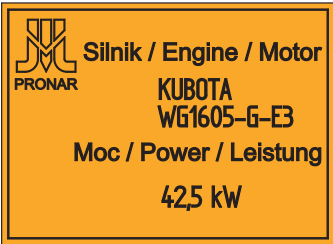
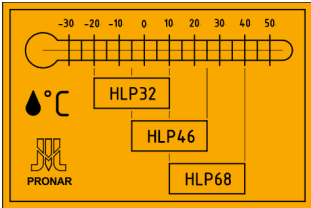
Item	Decal	Meaning
1		Grease the machine according to the lubrication schedule in the Operator Manual. 104N-00000004
2		Warning decal. Risk of crushing or severing fingers or hands. 123N-00000004
4		Information decal - logo 187N-00000033C
5		Warning decal. Attention! Belt transmission, take extreme care. 206N-00000004

Item	Decal	Meaning
7		Warning decal. Suspension point for transport. 35N-27000009-01
8		Warning decal. Do not touch any rotating machine parts before they have come to a complete stop. 361N-97000005
9		Warning decal. Pressurised liquid. Carefully read the Operator Manual. 361N-97000006
10		Warning decal. Beware of hot surfaces, risk of burn injuries. Keep a safe distance. 361N-97000007
11		Information decal. Oil pressure, tanks capacities. 361N-97000008
12		Warning decal. Beware of hot surfaces, risk of burn injuries. Keep a safe distance. 415N-96000003

Item	Decal	Meaning
13	 A large logo decal featuring a stylized 'JK' monogram above the word 'PRONAR' in a sans-serif font.	Information decal - large logo 422N-97000001-M
14	 A decorative decal consisting of a semi-circular pattern of small dots of varying sizes, creating a textured, wave-like effect.	Decorative decal. 422N-97000006-B
15	 An information decal for sound power level. It features a speaker icon, the text 'LWA', and a large '128 dB'.	Information decal - sound power level 669N-97000007
16	 A warning decal with a yellow background and a red border. It shows a red symbol of a switch with a red umbrella-like shape above it. The text '581N-97000005' is at the bottom.	Warning decal. Safety switch. 581N-97000005
17	 A warning decal with an orange background and a black border. It contains two black icons: a triangle with a person and a machine, and a person with a double-headed arrow pointing to a machine. The text '581N-97000006' is at the bottom.	Warning decal. Do not use the machine if there are bystanders in the immediate vicinity. 581N-97000006
18	 A warning decal with a blue background and a white border. It shows a white icon of a person wearing a headset or hearing protection.	Warning decal. Use hearing protection equipment. 361N-97000027

Item	Decal	Meaning
19		Warning decal. Use protective gloves. 5N-97000018
20		Warning decal. Wear safety goggles. 5N-97000019
21		Information decal. Fuel tank marking. 620N-97000001
22		Information decal www.pronar.pl 620N-97000002
23		Information decal. Stop the drive. 620N-97000004
24		Information decal. Tightening torque of the blades screws. 620N-97000005
25		Warning decal. Danger of pulling limbs. Do not approach the rotating parts of the machine. 620N-97000015
26		Roller operation information decal. 620N-97000016

Item	Decal	Meaning
27		Information decal reverse of the rollers. 620N-97000017
28		Warning decal correct working position at the loading hopper. Do not stand in front of the moving feed rollers. 620N-97000020
30		Information decal. Machine model. 669N-97000002
31		Information decal. Permissible load. 669N-97000003
32		Warning decal. Important! Before starting work, carefully read the Operator Manual. 70N-00000004
33		Before maintenance or repairs, turn off the tractor unit's engine and the shredder's engine and remove keys from ignition. 70N-00000005

Item	Decal	Meaning
40		Information decal. Engine power. 669N-11000002
41		Information decal. Hydraulic oil characteristics. 361N-97000004

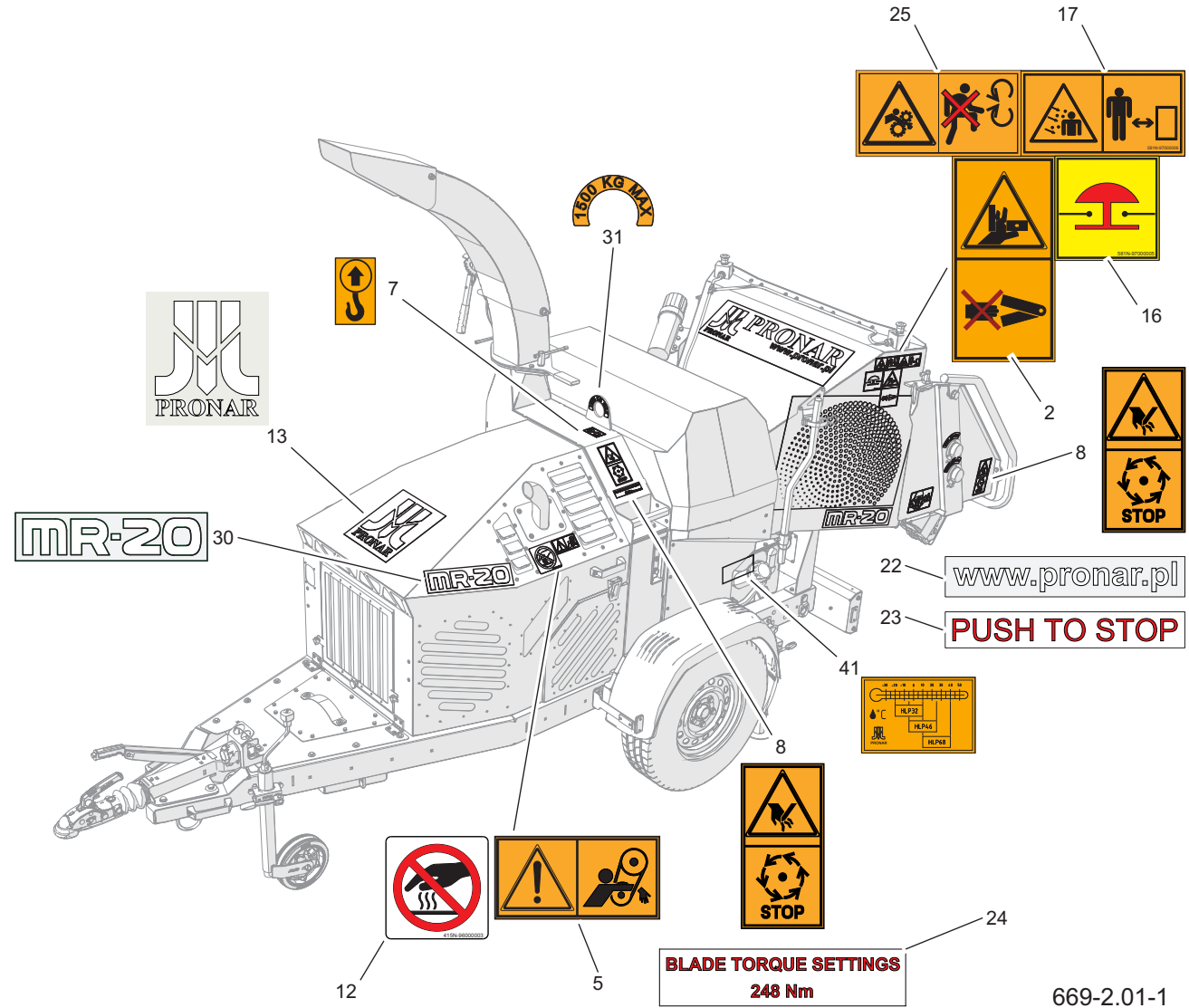


Figure 2.1 Locations of information and warning decals.

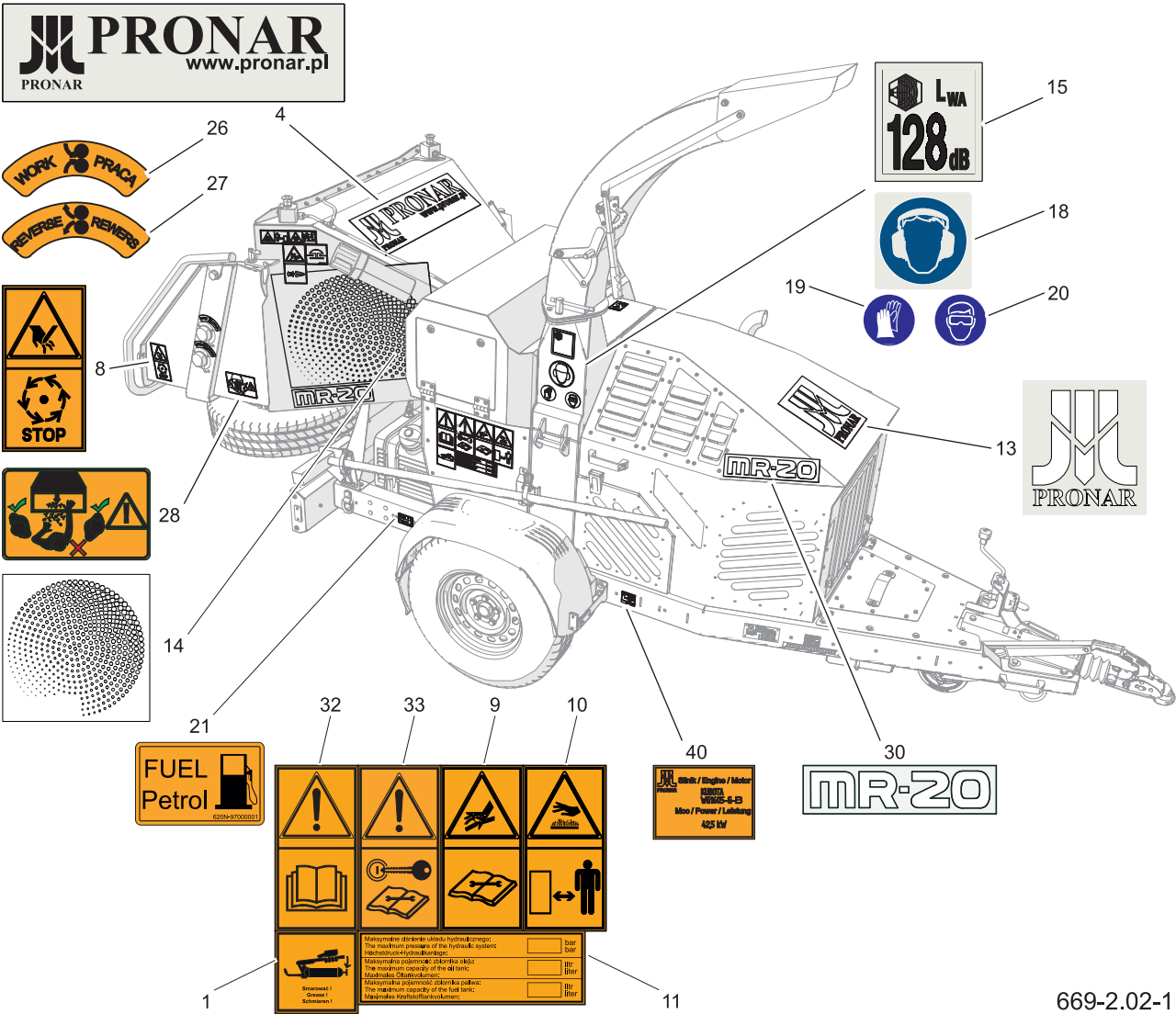


Figure 2.2 Locations of information and warning decals.

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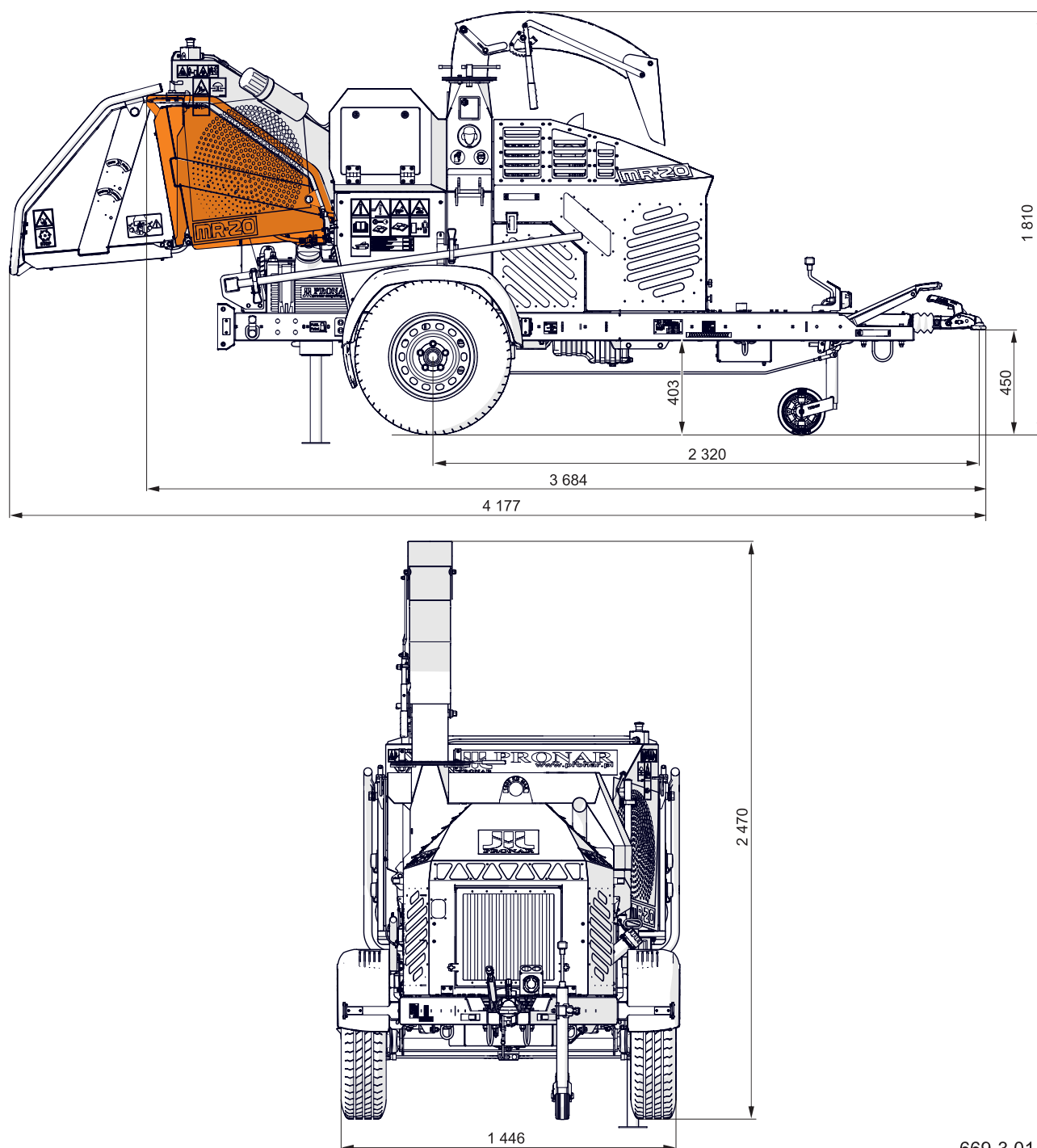
SECTION 3

DESIGN AND OPERATION

3.1 TECHNICAL SPECIFICATION

Table 3.1 Basic technical specification

Contents	Unit	MR-20
Engine		
Type	-	combustion 4-stroke, four-cylinder
Model	-	Kubota WG1605-G-E3
Power	HP	57
Engine displacement	cm ³	1537
Cooling	-	liquid
Fuel Type	-	unleaded petrol PB95
Electric	-	starting
Machine weight	kg	1250
Dimensions		
Length - loading platform folded/unfolded	mm	3 685 / 4 180
Width	mm	1466
Height - chimney folded / unfolded	mm	1 810 / 2 470
Suspension	-	braked axle, 1500kg with overrun and parking brake suspension: rubber torsion bars
Maximum diameter of shredded material	cm	20
Number of cutting blades	pc.	2x268mm (double sided)
Flywheel	mm	Ø730x30
Feeding system	-	2 rollers Ø170 hydraulically driven
Fuel tank capacity	dm ³ (L)	35
Oil tank capacity	dm ³ (L)	25
Electrical system voltage	V	12
Inlet window (throat) size	mm	200x255
Size of wood chips	mm	5 - 20
Sound power level	dB	128

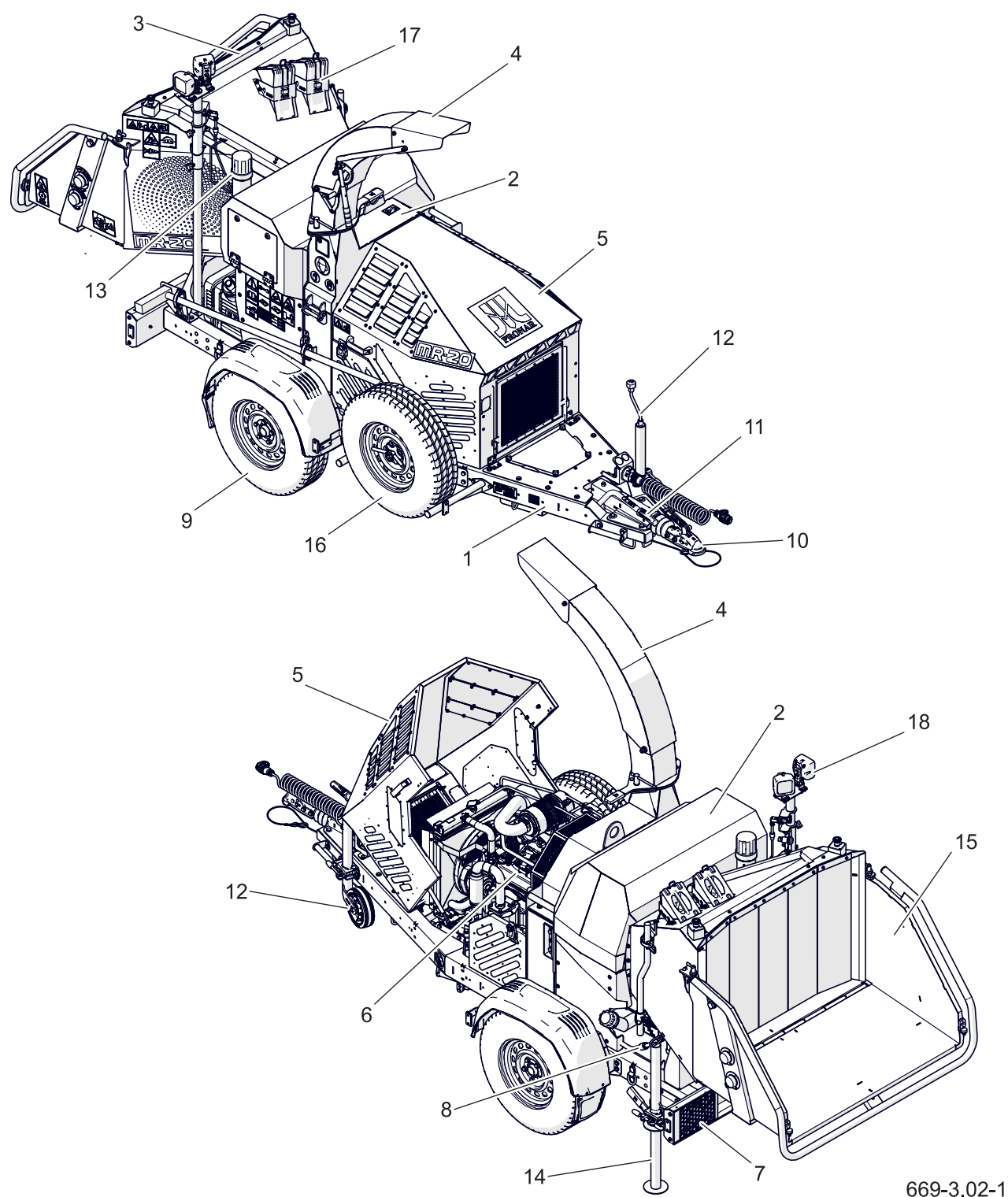


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Figure 3.1 Dimensions of the Pronar MR-20 mobile chipper
Dimensions on the drawing are given in millimetres

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3.2 GENERAL DESIGN



669-3.02-1

Figure 3.2 General design

- | | | |
|-----------------------|----------------------|----------------------------|
| (1) frame | (2) working chamber | (3) loading hopper |
| (4) discharge chute | (5) covers | (6) combustion engine |
| (7) electrical system | (8) hydraulic system | (9) wheels with drive axle |
| (10) catch | (11) hand brake | (12) jockey wheel |
| (13) document holder | (14) parking stand | (15) loading platform |
| (16) spare wheel | (17) wheel chocks | (18) working lights |

The PRONAR MR-20 mobile chipper is based on a frame (1) on which a petrol combustion engine (6) is mounted, which drives the hydraulic pump (8) and the cutting disc placed in the working chamber (2). On top of the working chamber (2) a foldable, rotatable discharge chute (4) is mounted. At the rear of the machine there is a loading hopper (3) with a foldable platform (15). The entire structure is enclosed with covers (5).

The machine is adapted to be towed by a carrier equipped with an appropriate hook and a 12V electrical socket. A set of lamps is placed on the rear beam. The axle system consists of a braked axle (9) together with the road wheels. The hitch (10) with the overrun brake constitutes the braking system of the machine, additionally a parking brake (11) and a support wheel are mounted on it. (12).

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3.3 ELECTRICAL SYSTEM

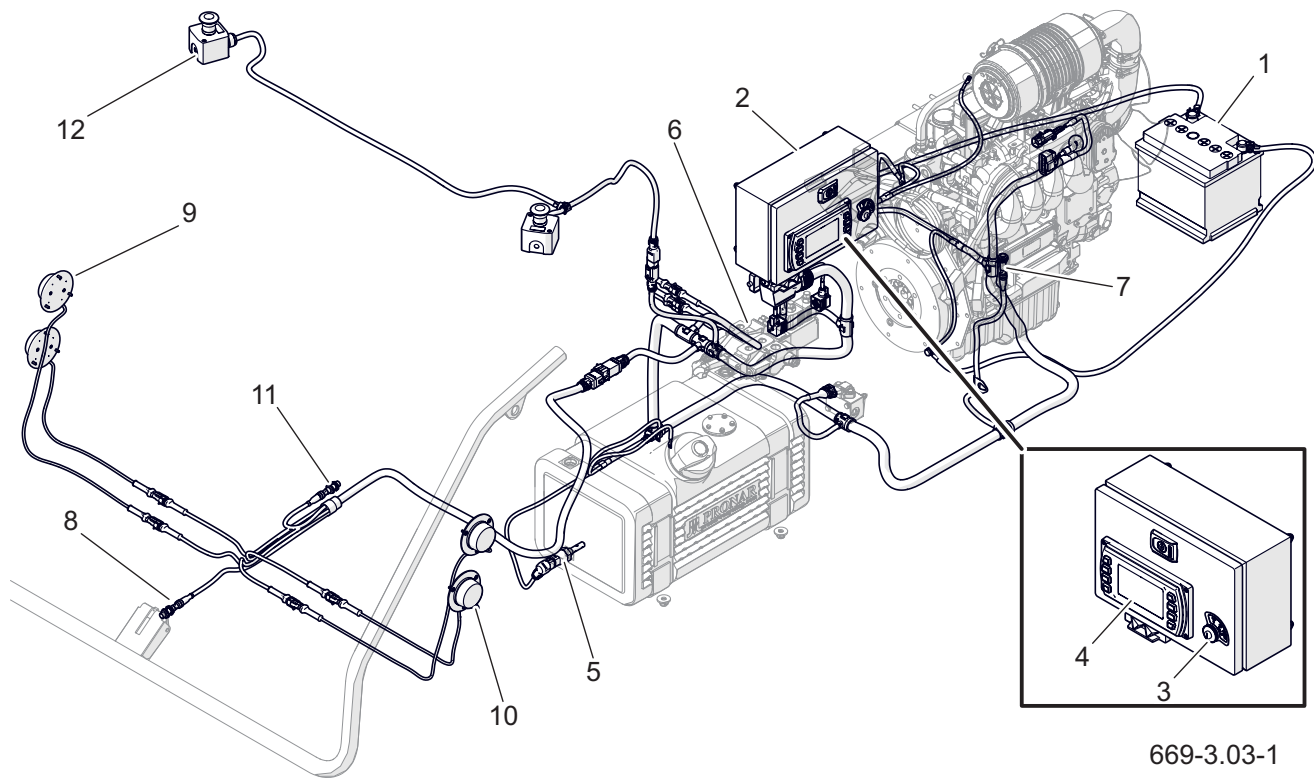


Figure 3.3 Electrical system design

- | | | |
|--------------------------|-----------------------------|---------------------|
| (1) battery | (2) control box | (3) ignition switch |
| (4) display | (5) fuel level sensor | (6) manifold |
| (7) cover opening sensor | (8) stop sensor | (9) PRACA button |
| (10) REWERS button | (11) hopper position sensor | (12) safety switch |

The mobile chipper electrical system diagram is shown in figure (3.3). The control box (2) is equipped with an ignition switch (3) and a display (4). A number of sensors have also been installed to monitor the chipper's operation and ensure the operator's safety. In the operator's work zone there are safety switches (13) and machine

control buttons (9) and (10).

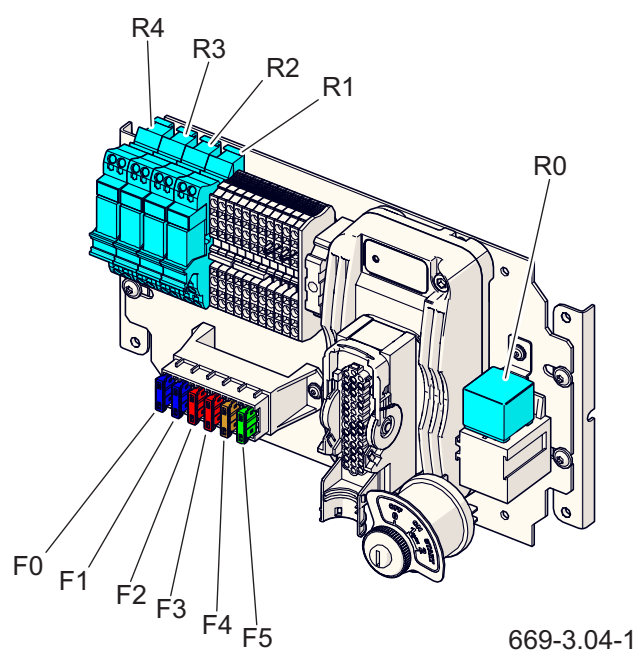


Figure 3.4 Fuses and relays

Table 3.2 Fuse and relay markings

Markings	Description
Fuse F0	Power supply of control box 15A
Fuse F1	Starter 15A
Fuse F2	Engine speed cylinder 10A
Fuse F3	Controller supply 10A
Fuse F4	Power supply of sensors 5A
Fuse F5	Power supply of control box 30A
R0 relay	Power supply of control box
R1 relay	Fuel pump supply
R2 relay	Starter
R3 relay	Stopping the engine
R4 relay	Engine speed cylinder

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3.4 LIGHTING SYSTEM

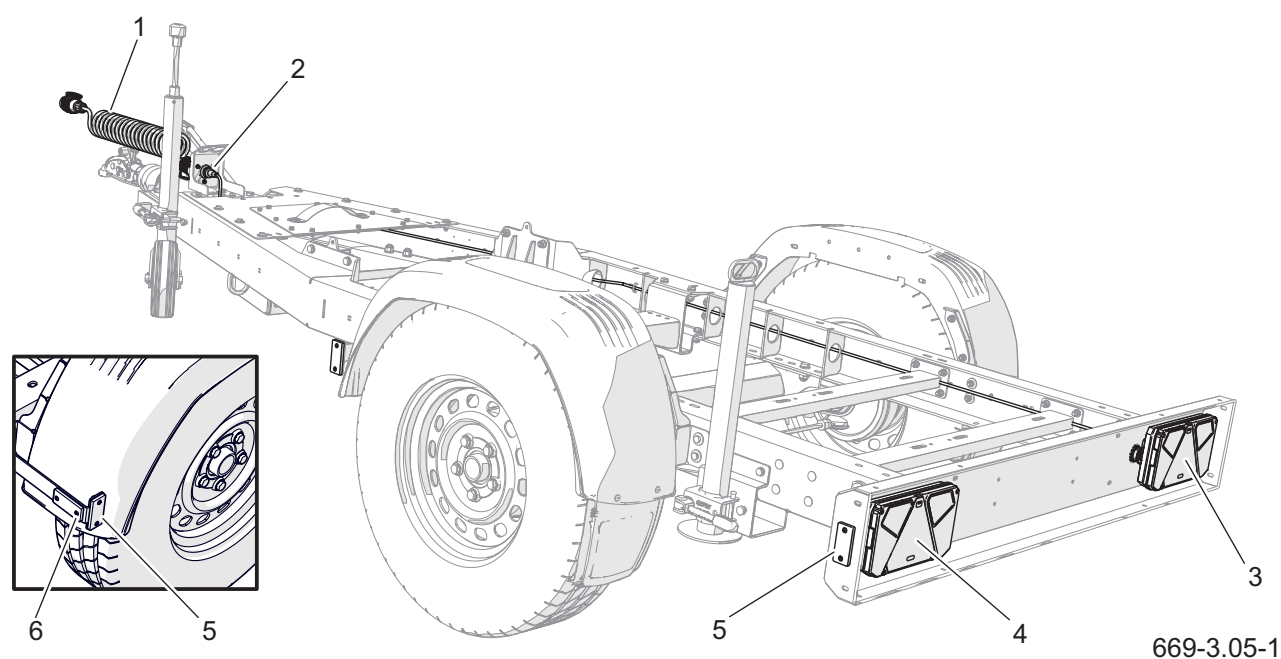


Figure 3.5 Design of electrical lighting system

(1) connection wire

(2) 13-pin socket

(3) right lamp assembly

(4) left lamp assembly

(5) orange reflector

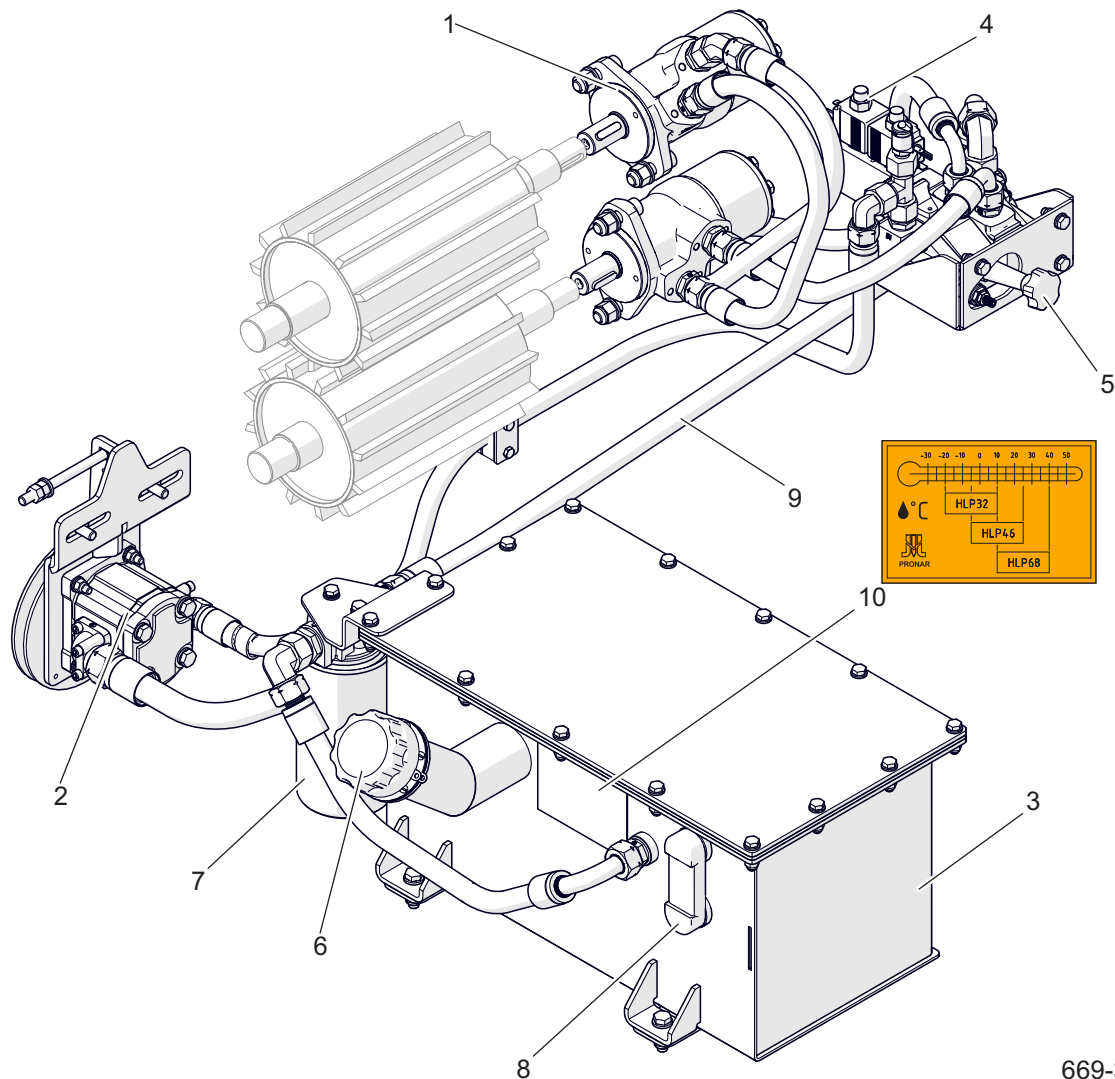
(6) white reflector

The electrical lighting system is powered from the carrier with a voltage of 12V via a connecting cable (1). The vehicle towing the machine should be equipped with

a 13-pin socket. If the towing vehicle is equipped with a 7-pin socket, appropriate adapter plugs must be used.

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3.5 HYDRAULIC SYSTEM



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Figure 3.6 Hydraulic system design

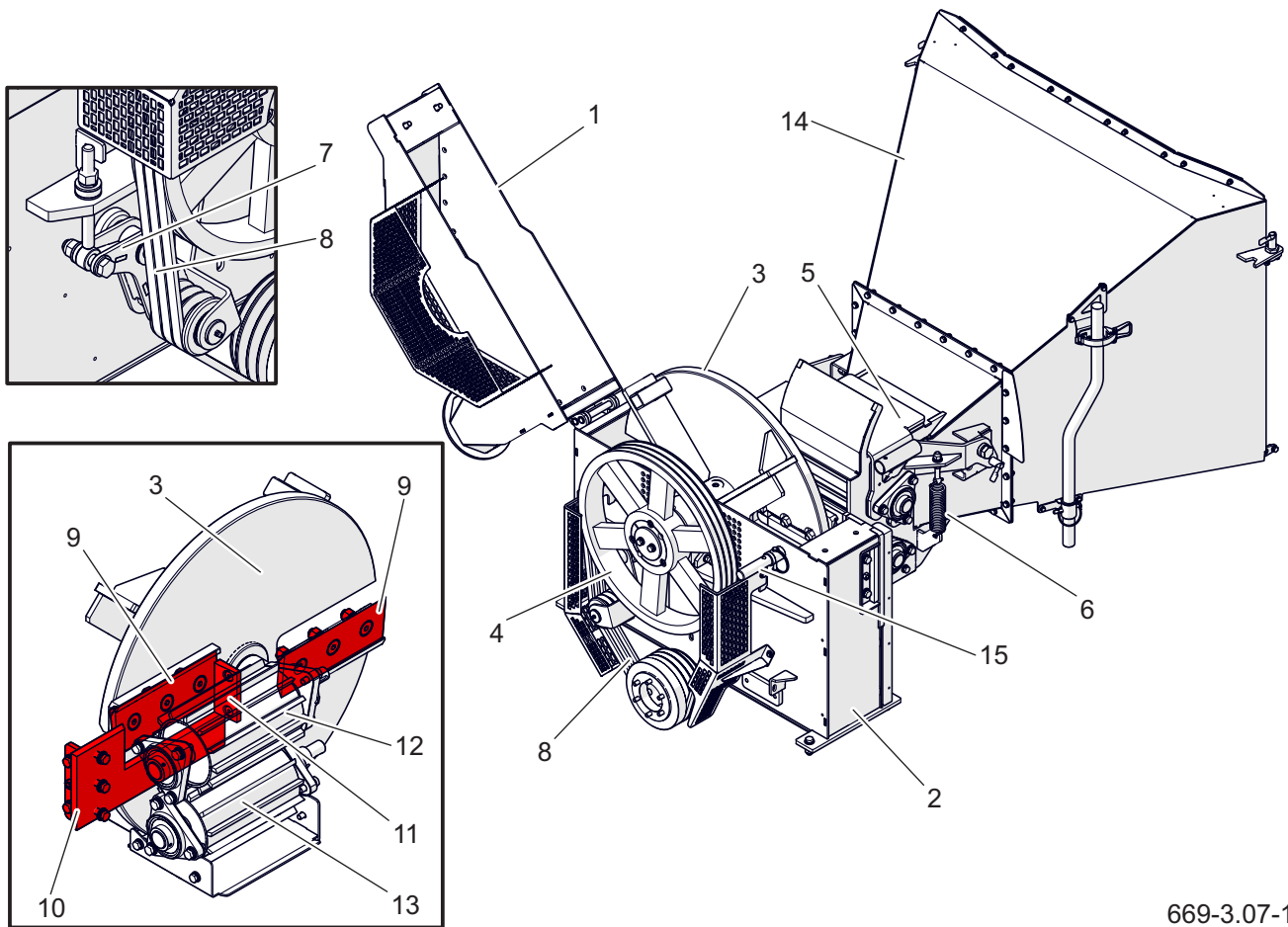
- | | | |
|-----------------------|--------------------------------|--------------------|
| (1) hydraulic motor | (2) hydraulic pump | (3) oil tank |
| (4) hydraulic divider | (5) flow regulator | (6) filler plug |
| (7) oil filter | (8) indicator with thermometer | (9) hydraulic line |

The hydraulic system is used to drive the rollers that feed the shredded material onto the cutting disc. The oil pump (2) driven by the combustion engine, supplies hydraulic oil from the tank (3) via a flow regulator (5) to the hydraulic motors (1). The oil flow

rate and consequently the rotation speed of the feed rollers is adjusted using the regulator knob (5) and the speed of the combustion engine. Hydraulic motors can operate in both directions.

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3.6 SHREDDING MECHANISM



669-3.07-1

Figure 3.7 Shredding mechanism design

- | | | |
|--------------------------------|-------------------------------|--------------------------------|
| (1) cover | (2) housing | (3) cutting disc |
| (4) pulley | (5) upper roller arm | (6) spring |
| (7) tensioner | (8) V-belt | (9) double sided cutting blade |
| (10) fixed lower cutting blade | (11) fixed side cutting blade | (12) movable upper roller |
| (13) fixed lower roller | (14) discharge chute | (15) safety pin |

The shredding mechanism is built into a welded housing (2). Access to the mechanism is gained by unscrewing and lifting the cover (1). The cutting disc (3) mounted on rolling bearings is driven by an internal combustion engine via a belt transmission. The drive belts (6) transmitting the drive

from the engine pulley to the wheel (4) are tensioned by means of a tensioner (7).

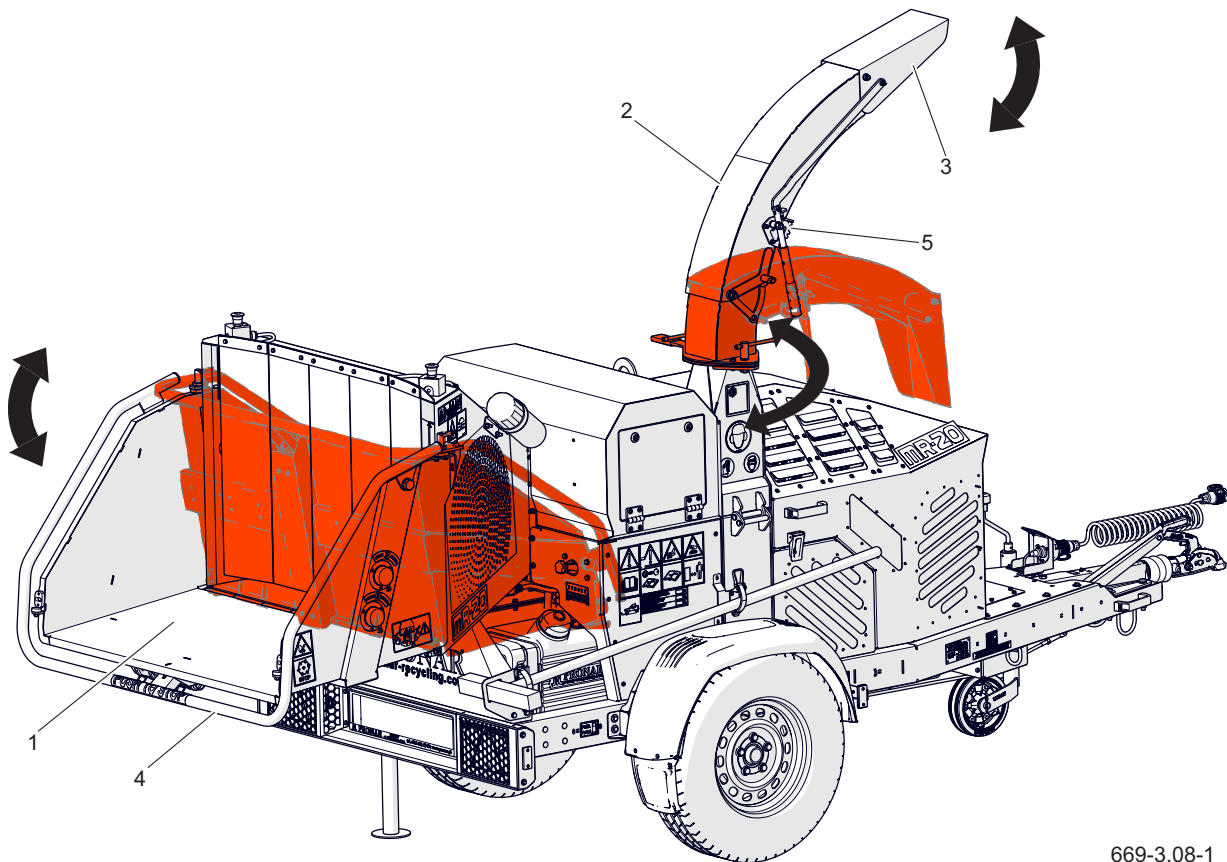
The housing (2) contains a fixed side cutting blade (11) and a fixed bottom cutting blade (10). There are two cutting blades (9) placed on the cutting disc (3). All blades are replaceable.

In the rear part of the housing there are rollers feeding the material onto the set of shredding blades. The lower roller (13) cannot move, while the upper roller (12) placed on the movable arm (5) can move

up and down depending on the diameter of the material being shredded. The roller pressure (12) is achieved by means of two springs (6).

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3.7 LOADING PLATFORM AND DISCHARGE CHUTE



669-3.08-1

Figure 3.8 Loading and discharge mechanism design

(1) loading platform

(2) discharge chute

(3) steering lever

(4) safety bar

(5) folding mechanism

At the rear of the machine there is a platform (1) to facilitate loading of the shredded material. The platform has a safety bar (4) which, when pressed, disconnects the feed roller drive. The platform can be locked in two positions: work - platform unfolded and transport - platform folded. There is

a sensor in the lower housing that signals the position of the loading platform; work with the platform folded is impossible.

The shredded material flies out of the working chamber through a rotating discharge chute, at the end of which there is an adjustable guide bar (3).

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3.8 MOTOR AND ACCESSORIES

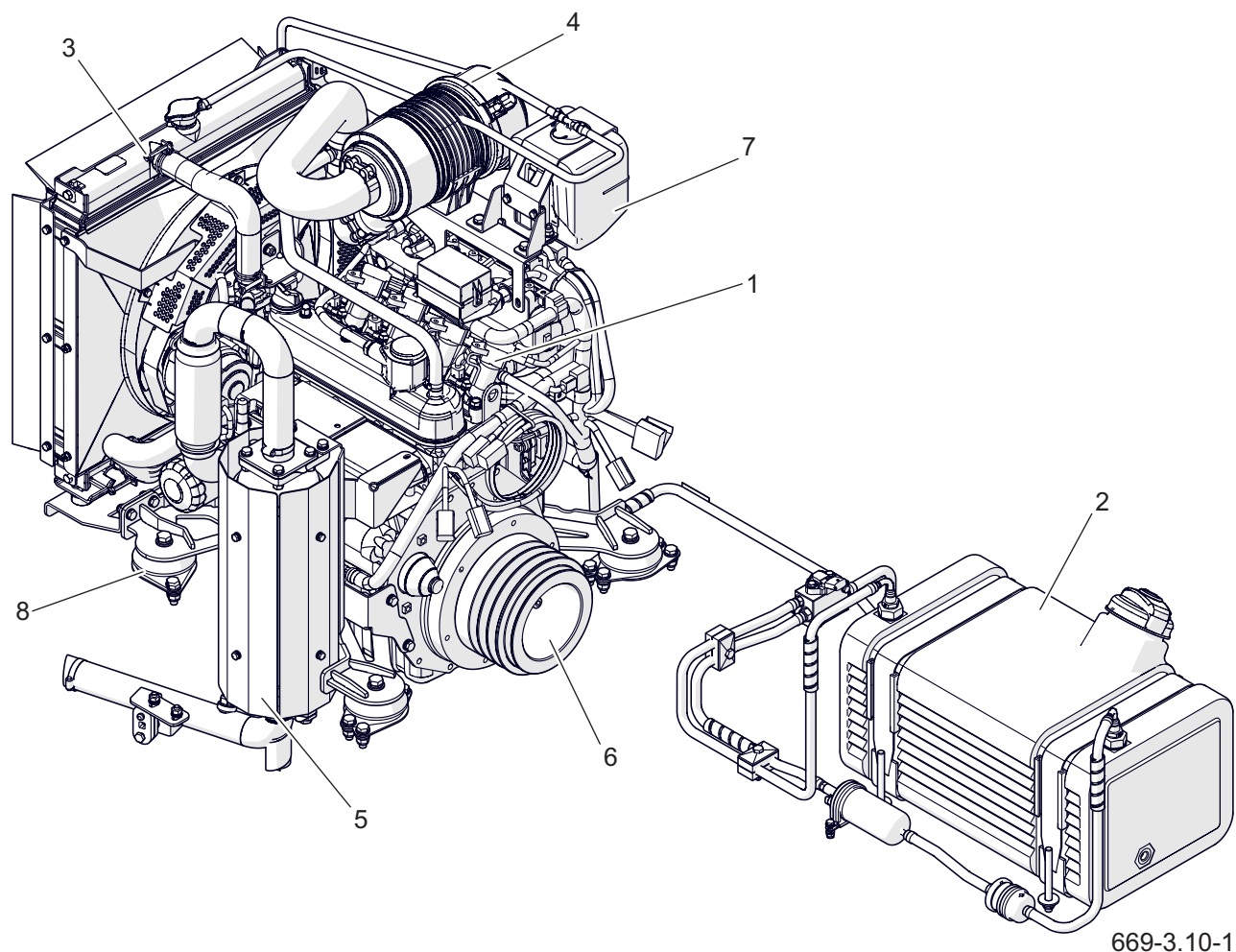


Figure 3.9 Combustion engine and accessories

(1) combustion engine

(2) fuel tank

(3) radiator

(4) air filter

(5) exhaust system

(6) pulley

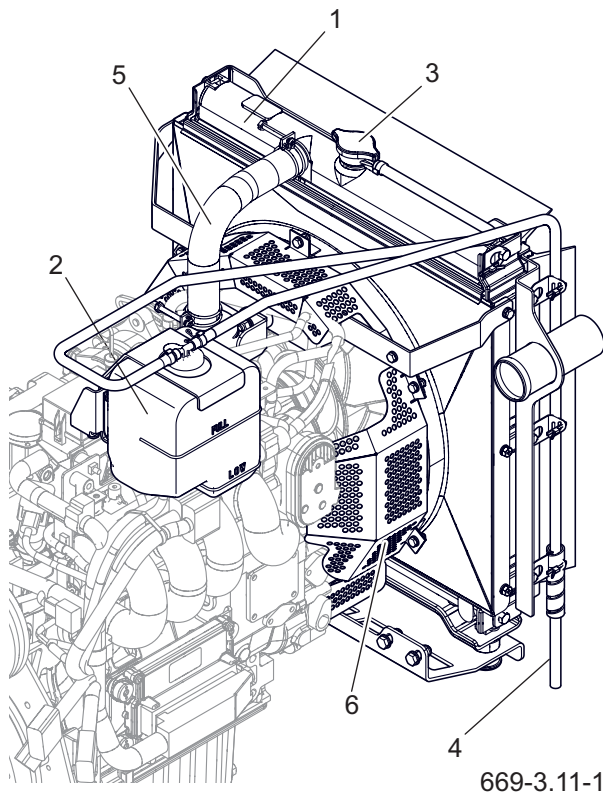
(7) equalization tank

(8) engine cushion

In the front part of the frame, a four-stroke internal combustion engine (1) powered by PB95 unleaded petrol from the fuel tank (2) is mounted on shock-absorbing cushions (8). The engine is cooled by liquid. The engine cooling system consists of, among

others, a radiator (3) and an expansion tank (7). The air filter (4) is located above the drive unit. The exhaust gases are discharged through the exhaust system (5).

3.9 ENGINE COOLING SYSTEM



The cooling system is designed to maintain the optimal operating temperature of the combustion engine. The engine block filled with coolant is connected to the radiator (1) via a thermostat and a water pump. If the engine temperature rises above the set value, the thermostat opens and the pump starts to pump the coolant to the radiator (1), where its temperature drops and it flows back into the combustion engine block.

Figure 3.10 Cooling system design

(1) radiator (2) expansion tank

(3) radiator cap

(4) overflow conduit

(5) supply conduit

(6) fan cover

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3.10 FUEL SYSTEMS

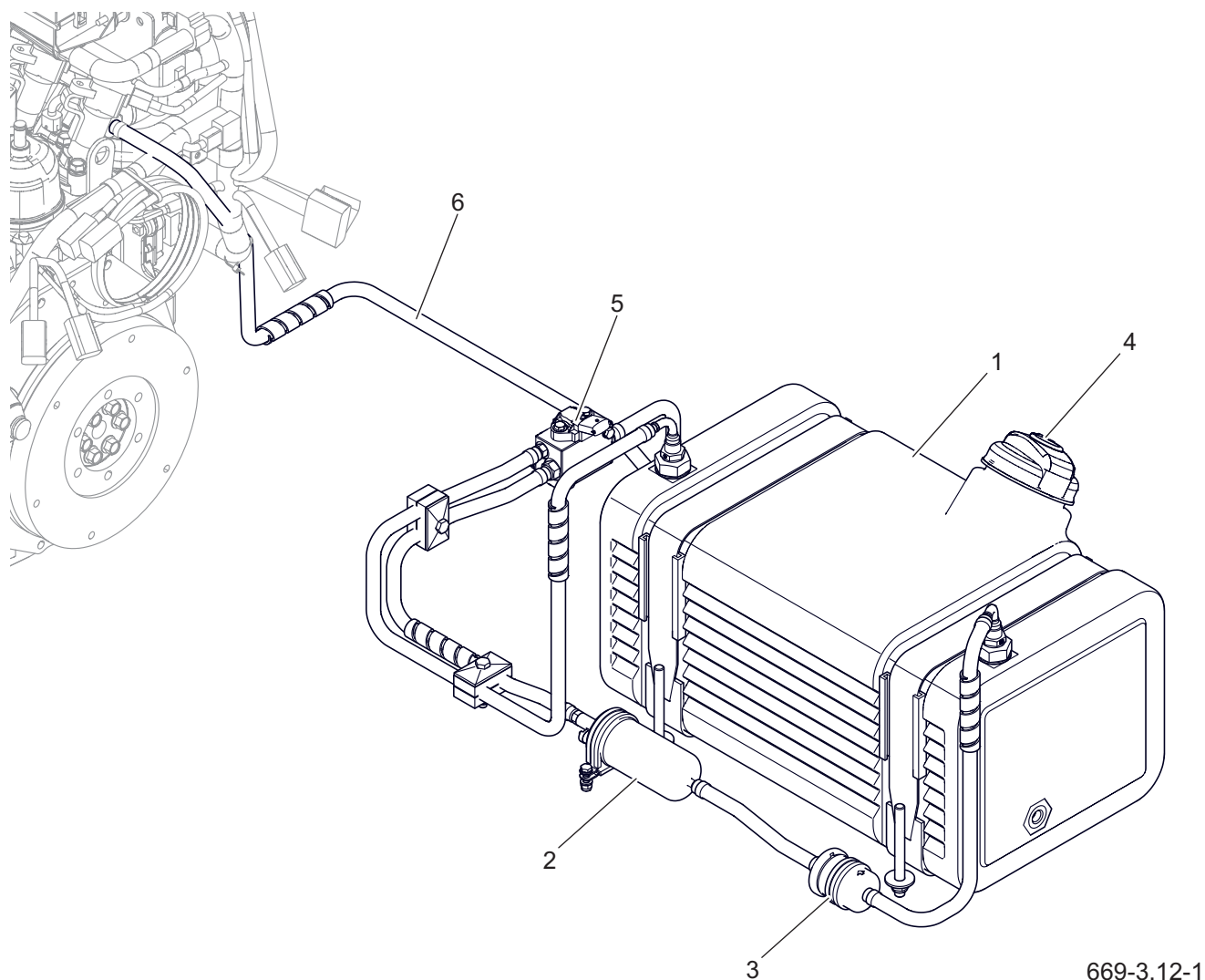


Figure 3.11 Fuel system design

(1) fuel tank

(2) fuel pump

(3) fuel filter

(4) filler plug

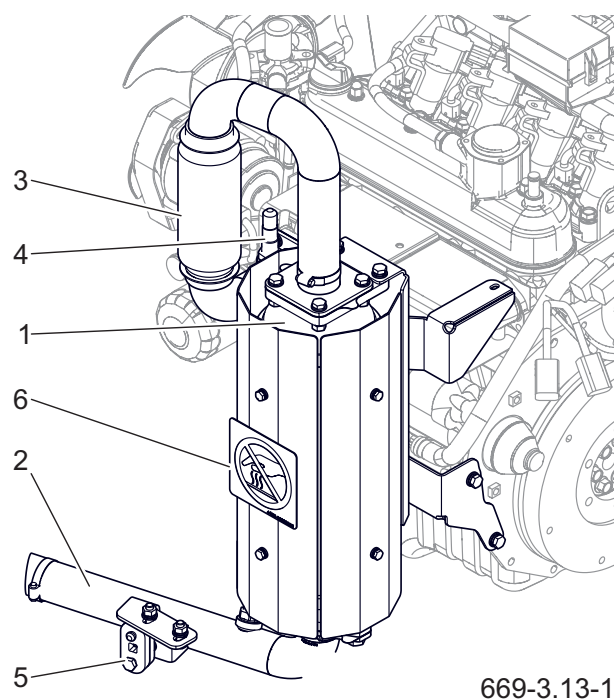
(5) fuel pressure sensor

(6) supply line

The fuel system is used to supply the internal combustion engine with the appropriate dose of petrol. Make sure that the system is tight and regularly check the

fuel level in the tank (1). Operating the fuel pump (2) without fuel will cause it to fail, replace the fuel filter (3) regularly.

3.11 EXHAUST SYSTEM



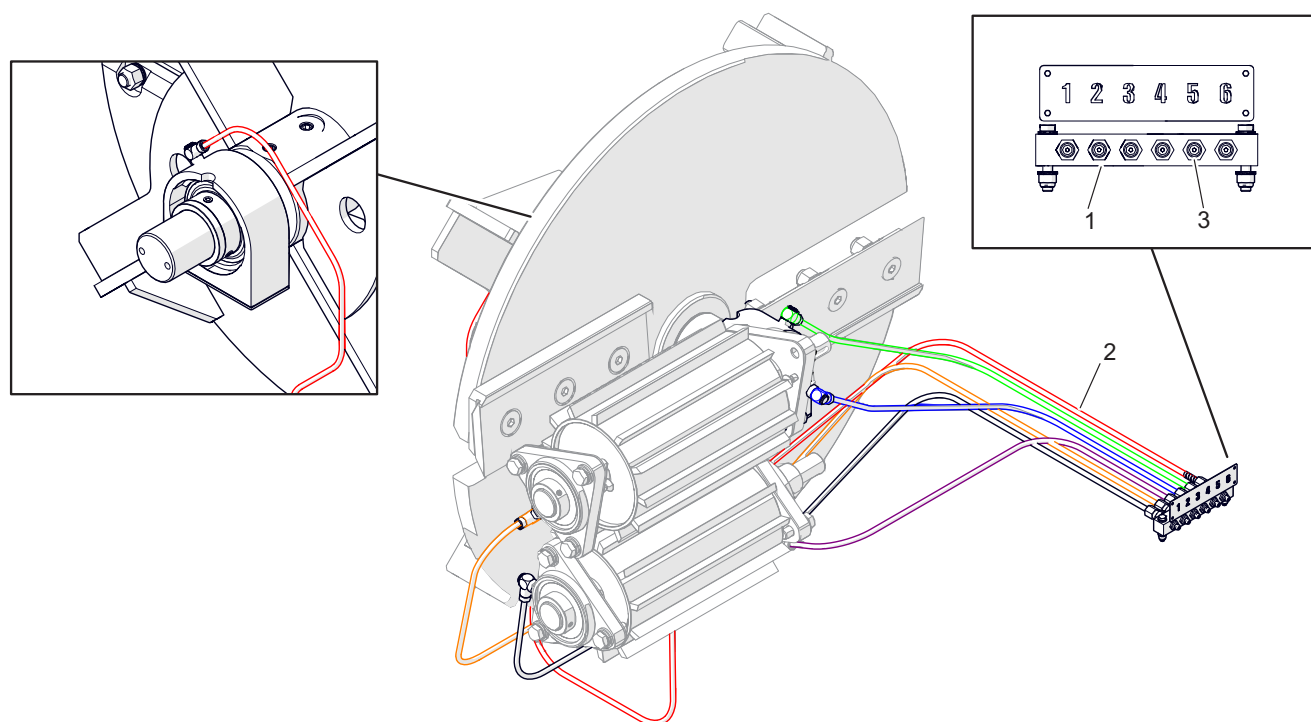
The exhaust system is responsible for removing exhaust gases from the engine's combustion chamber. The collector pipe (3), in which the lambda probe (4) is mounted, is connected to the muffler (1) to which the final exhaust (2) is mounted. The whole thing is screwed together and hung on a flexible connector (5). There is an information decal (6) on the muffler cover.

Figure 3.12 Exhaust system design

- | | |
|---------------------|-------------------|
| (1) muffler | (2) final exhaust |
| (3) collector pipe | (4) lambda probe |
| (5) exhaust bracket | (6) decal |

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3.12 CENTRAL LUBRICATION SYSTEM



669-3.09-1

Figure 3.13 Central lubrication system design

(1) grease nipple block

(2) conduit

(3) grease nipple

Table 3.3 Lubrication points of the central lubrication system

Grease nipple number	Lubrication point
Grease nipple 1	Fixed roller left frame
Grease nipple 2	Movable roller left frame
Grease nipple 3	Fixed roller right frame
Grease nipple 4	Movable roller right frame
Grease nipple 5	Cutting disc rear frame
Grease nipple 6	Cutting disc front frame

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SECTION 4

CONTROL PANEL

4.1 CONTROL PANEL

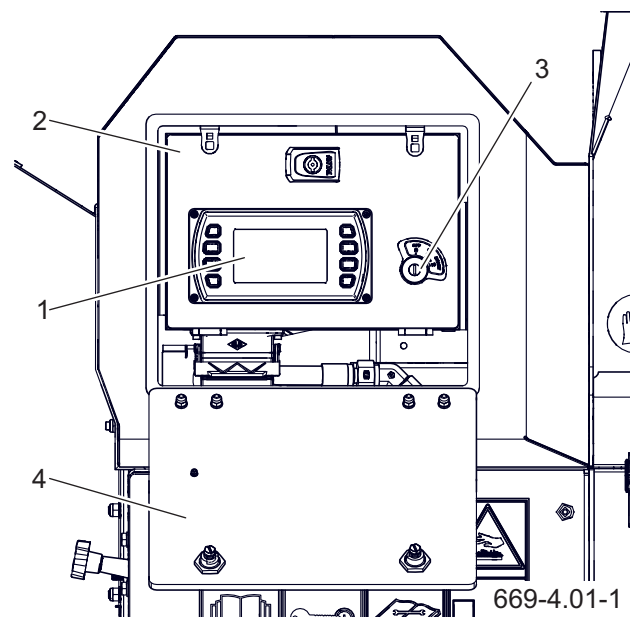


Figure 4.1 Location of control panel
(1) control panel (2) control box
(3) ignition switch (4) cover

The control panel (1) is located in the control box (2) next to the ignition switch (3). The box with the built-in control panel and ignition switch are covered with a lockable cover (4) .

The control panel (figure *Control panel design*) consists of a colour LCD (3) which displays information about the chipper's operating parameters. The left buttons (1) and right buttons (2) are used to navigate

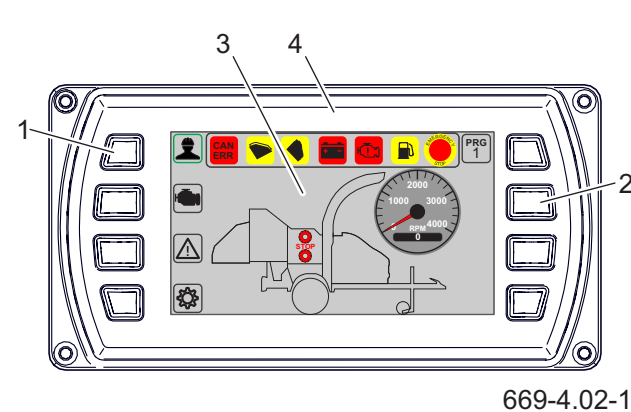


Figure 4.2 Control panel design
(1) left side navigation buttons (2) right side navigation buttons
(3) display (4) housing

the machine menu.
Use the left buttons (1) to select the appropriate menu screen.

Table 4.1 Menu pictograms

Pictogram	Meaning
	Operator screen
	Engine screen
	Alarms screen
	Settings screen

4.2 OPERATOR SCREEN MENU

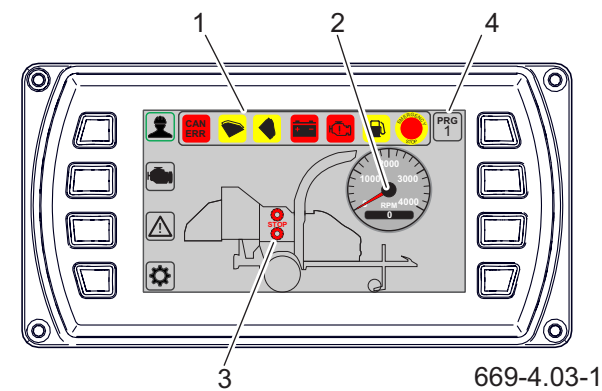


Figure 4.3 Operator screen.
(1) alarms / warnings (2) counter
(3) machine operating status (4) working mode

The illuminated frame of the pictogram  indicates the active menu *Operator screen*. The control panel screen displays the appropriate operating states depending on the machine operating conditions (table (4.3). Additionally, a counter (2) is displayed, showing in real time the

Table 4.3 Chipper operating states

Pictogram	Meaning
	Stop. The shredding mechanism is working. Feed rollers stopped.
	Work. The shredding mechanism is working. The feed rollers feed the material.
	Reverse. The shredding mechanism is working. The feed rollers retract the material.

Table 4.2 Alarms/warnings

Pictogram	Meaning
	Controller communication failure
	Closed loading platform.
	Engine cover opened.
	No battery charging.
	Critical engine error. Alarm.
	Engine error. Danger
	Low fuel level in the tank.
	STOP Safety button is depressed Stop the engine

revolutions of the combustion engine and its load.

Table (4.2) describes the meaning of the alarm pictograms that appear at the top of the control panel. Specific machine states are signaled here.

In the right corner of the control panel there is a *Program*  button (4), which allows you to select one of the three operating

modes configured by the user. A single press of the program button allows you to switch between the three available programs. Holding the button (4) longer activates the settings for a given program as shown in the figure *Program settings screen*.

By selecting and holding the button of a given program you go to the parameter settings. Use the up (5)  and down (6)  buttons to select the appropriate value using the  button (7). The frame around the selected option will flash. Use the  and  buttons to set the appropriate speed value. Changing the speed in one of the parameters results in a change in the remaining values. The speed settings are dependent on each other.

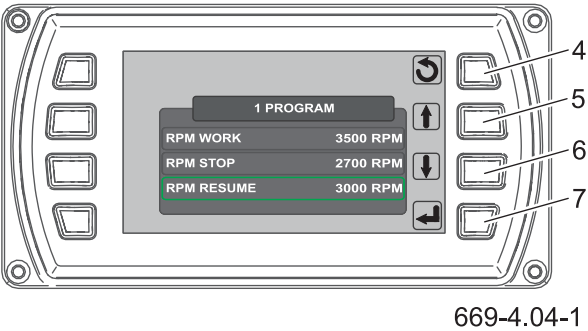


Figure 4.4 Program settings screen
(4) exit button (5) up button
(6) down button (7) confirm button

Table 4.4 Programs screen.

Pictogram	Meaning
	Work program number.
	Back to user screen.
	Move up.
	Move down.
	Enter and confirm.

Table 4.5 Combustion engine speed in program setting

Marking	Description	Adjustment range
RPM WORK	Engine speed.	3 000 - 3 500 RPM
RPM STOP	Speed at which the feed rollers will stop.	2 500 - 3 350 RPM
RPM RESUME	Speed at which the feed rollers will start operating.	2 600 - 3 450 RPM

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4.3 ENGINE SCREEN MENU

The illuminated frame of the pictogram  indicates that the *Engine screen* menu is active.

The control panel screen displays the current engine operating parameters and the upper part of the display shows any current alarms or warnings.

Use the  button (3) held for about 6 seconds to reset the average fuel consumption reading,

Press  button (4) to increase the engine speed without engaging the feed rollers; this function is also available while the chipper is operating (feed rollers and shredding mechanism). If the engine speed during operation is lower than RPM RESUME, the machine will stop shredding

Table 4.6 Engine screen.

Pictogram	Meaning
	Average fuel consumption reset.
	Engine speed increase.
	Engine speed decrease.
	Idling combustion engine speed

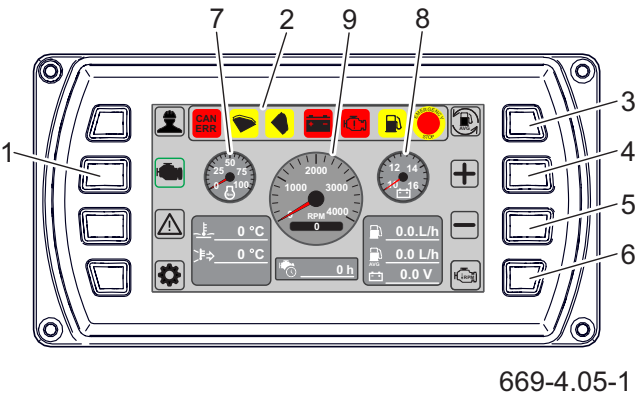


Figure 4.5 Engine screen
(1) engine screen button (2) alarms / warnings
(3) average fuel consumption reset (4) increase engine speed
(5) decrease engine speed (6) idling engine speed
(7) engine load (8) battery voltage
(9) engine rpm

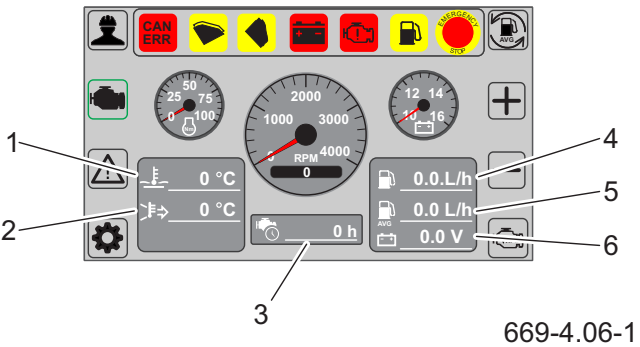


Figure 4.6 Engine screen
(1) engine temperature (2) intake temperature of the engine
(3) engine operation time (4) instantaneous fuel consumption
(5) average fuel consumption (6) battery voltage

the material and the engine will run at idle speed.

Use  button (5) to reduce the engine speed during no-load operation as well as

during operation.

Use  button (6) to lower the engine speed to idle. This function is also available

while the machine is running. Pressing the button during shredding will stop the feed rollers and the cutting mechanism.

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4.4 WARNINGS AND ALARMS SCREEN

Table 4.8 Alarms / Warnings screen.

Pictogram	Meaning
	Closed loading platform.
	Engine error. Danger
	High engine temperature Danger
	Engine cover opened.
	The engine was turned off by closing the loading platform.
	Critical engine error. Danger Alarm.
	Very high engine tempera- ture. Danger Alarm
	The engine was turned off by opening the engine cover.
	Engine oil pressure low Danger
	High temperature of engine oil. Danger
	High intake air temperature Danger
	Water in fuel. Danger

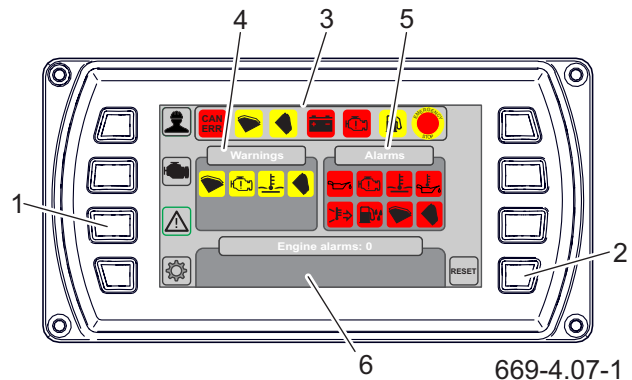


Figure 4.7 Warnings and alarms screen

- (1) alarm screen button (2) reset button
(3) alarms / warnings (4) warnings
(5) alarms (6) engine errors

The illuminated frame of the  pictogram indicates an active menu *Warnings and alarms screen*. If the pictogram is highlighted in yellow  it means that warnings have appeared in the menu.

If the pictogram is highlighted in red  it means that alarms have appeared in the menu.

The  button (2) is used to clear errors. After stopping the chipper due to alarms, the displayed errors must be cleared, otherwise it will not be possible to operate the machine and start the engine.

4.5 SETTINGS SCREEN

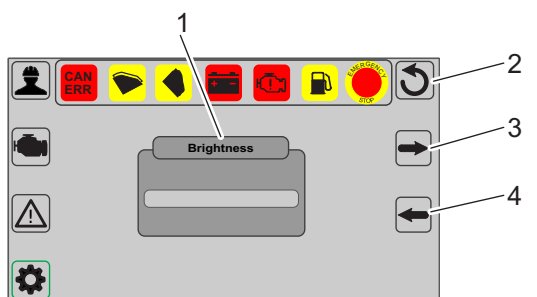
The illuminated frame of the  pictogram indicates an active menu *Settings screen*. Current alarms and warnings are displayed at the top of the screen (2). Use the button (3) to select the menu language. The remaining buttons on the right side are used to navigate the settings screen menu. Additionally, the screen displays information about the controller software version (1) and the screen software version (2).

Item (6) *Service settings* is not available from the end user level of the chipper.

The individual settings are shown in the figures below.

SCREEN BRIGHTNESS

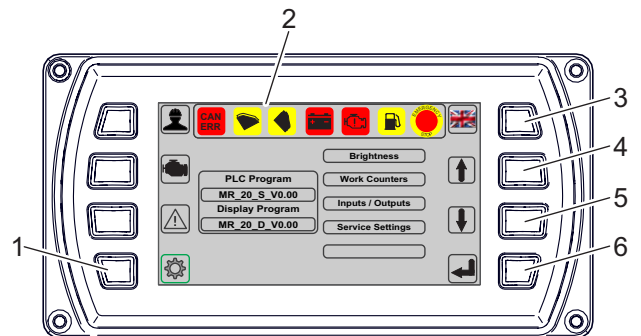
Using the buttons in the main menu, select *Screen brightness* using the buttons (3)



669-4.10-1

Figure 4.10 Screen brightness.

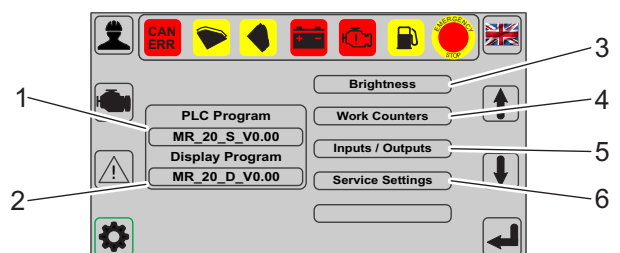
- | | |
|-------------------------|-------------------------|
| (1) setting value | (2) back to the menu |
| (3) increase brightness | (4) decrease brightness |



669-4.08-1

Figure 4.8 Settings screen

- | | |
|----------------------------|-----------------------|
| (1) settings screen button | (2) alarms / warnings |
| (3) language button | (4) up button |
| (5) down button | (6) confirm button |



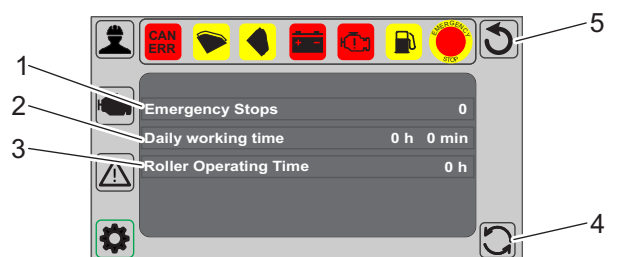
669-4.09-1

Figure 4.9 Settings screen

- | | |
|------------------------|----------------------|
| (1) controller program | (2) screen program |
| (3) screen brightness | (4) working time |
| (5) inputs / outputs | (6) service settings |

and (4), set the appropriate display contrast and use the button (2) to return to the initial screen.

OPERATION TIME SCREEN



669-4.11-1

Figure 4.11 Working time screen

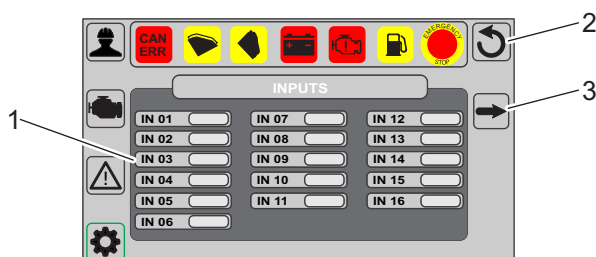
- (1) emergency stop time of the chipper during operation
 (2) daily working time (3) rollers working time
 (4) resetting (zeroing) of counter (5) back to the menu

Using the buttons in the main menu, select *Working time*. On this screen you can read the emergency stop time of the chipper while the machine is running (1). Position (2) shows the daily operating time of the machine, position (3) is the operating time of the feed rollers. It is possible to delete daily work time. To do this, hold down the button (4) for about 6 seconds. Use the button (5) to return to the main menu screen.

INPUTS\OUTPUTS SCREEN

Using the buttons in the main menu, select *Inputs / Outputs*.

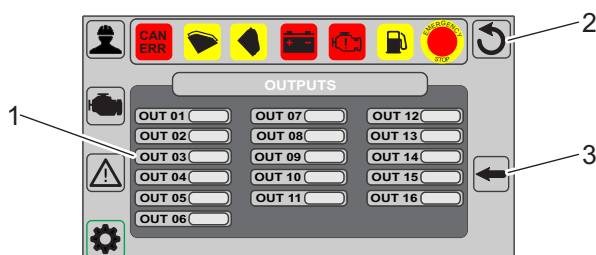
Active pins with a voltage (signal) applied will be highlighted in green.



669-4.12-1

Figure 4.12 Input screen

- (1) input signal (2) back to the menu
 (3) next screen



669-4.13-1

Figure 4.13 Output screen

- (1) exit warning (2) back to the menu
 (3) front screen

SECTION 5

CORRECT USE

5.1 GET READY FOR OPERATION BEFORE FIRST USE

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

Before hitching to carrier vehicle, the operator must check the technical condition of the machine and prepare it for test start-up. In order to do this:

- the user must carefully read this Operator Manual and observe all recommendations, understand the design and the principle of machine operation,
- check the condition of protective paint coat,
- inspect machine's individual components for mechanical damage resulting from incorrect transport (dents, piercing, bent or broken components),
- check all lubrication points, lubricate the machine according to recommendations provided in section 8 „*Maintenance*”,
- check technical condition of the



DANGER

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

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

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

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

Before starting the machine, ensure that there are no bystanders in the danger zone.



ATTENTION

Failure to follow instructions in this Operator Manual or starting the machine incorrectly may cause damage to the machine.

Before using the machine always check its technical condition. There must not be any doubt about technical condition.

Do NOT use an inoperative machine.

hydraulic system;

- check the following hydraulic oil level in the tank, level of engine lubricating oil,
- check level of liquid in engine cooling system;
- add fuel to the fuel tank,
- check the condition of the screw connections, paying particular attention to the coupling system and the wheel bolts,

- check the correct operation of the parking brake,
- check the pressure of the road wheels,
- check the correct mounting of the cutting disc and individual cutting blades; it is recommended to rotate the cutting disc several times before starting the machine,
- check the tension of the V-belts of the cutting disc,

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

- hitch the machine to carrier vehicle (see "*Hitching to carrier vehicle*"),
- check the operation of the road lighting system.
- perform a test run, check the operation of the overrun brake and the possibility of driving the machine and carrier in reverse,

Disconnect the chipper from the carrier, secure it against rolling using the parking brake and wedges. Start up the shredding mechanism:

- start the engine (see *Start the engine*),
- start the shredding mechanism (see "*Machine operation*"),
- check the operation of control buttons and safety devices,
- check the operation of additional work lighting (optional).

The mobile chipper's operation at no load should be smooth. Shaking of drive transmission is not acceptable, nor is abnormal noise and vibrations coming from loose nut and bolt connections. Check the hydraulic system for proper operation and oil leaks.

If any faults are detected they must be identified and rectified. If a fault cannot be rectified or the repair could void the warranty, please contact retailer for additional clarifications.

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5.2 INSPECTIONS DURING DAILY OPERATION

- Conduct daily inspection according to the guidelines presented in sections „*Periodic Inspections*“, „*Maintenance*“, „*Engine Maintenance*“ and „*Lubrication Schedul*“. If necessary, make the necessary repairs immediately.
- Check technical condition of protective shields and wear parts. Check if shields are complete and correctly closed.
- If the machine is to be towed, pay special attention to the axle system and hitch. Before setting off, check that the road lighting system is complete and functioning correctly. Ensure that warning and reflective



ATTENTION

Do NOT start the machine if its daily inspection was not carried out.

markings are complete.

- Check the fuel level in the tank and add fuel if necessary. Check the hydraulic oil level in the hydraulic oil tank. Check engine oil level. Check the coolant level in expansion tank.
- Check the technical condition of cutting disc, if elements are complete and correctly mounted.
- After finishing work, check and, if necessary, remove any accumulated material from the shredding chamber.

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5.3 HITCHING AND DISCONNECTING FROM CARRIER VEHICLE

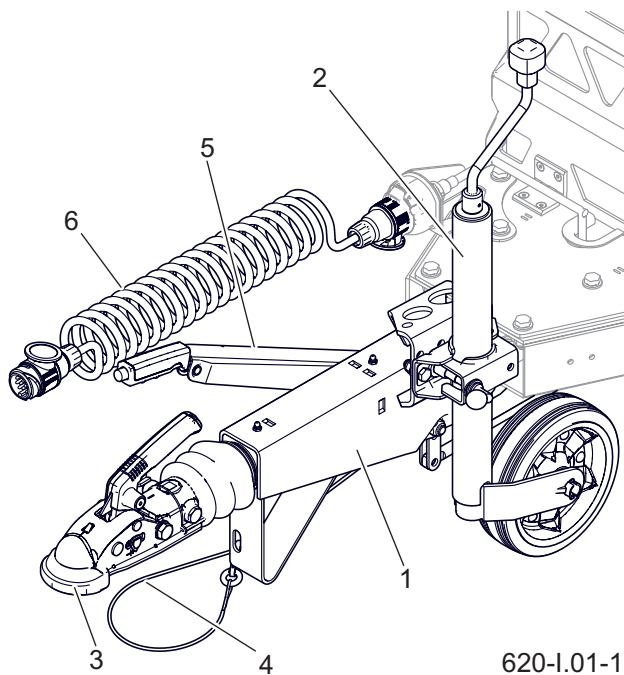


Figure 5.1 Connecting the machine

- | | |
|---------------------|--------------------------|
| (1) overrun drawbar | (2) jockey wheel |
| (3) catch | (4) securing cable |
| (5) parking brake | (6) lighting system wire |

The carrier towing the machine should meet the requirements given in Table “Requirements for a carrier vehicle towing the machine”. Connect the machine according to the following guidelines.

- Reverse the carrier as close as possible to the machine hitch (3).

Due to limited visibility, it is recommended to use the help of a second person.



DANGER

When connecting the machine, exercise particular caution due to limited visibility and the risk of an accident.



ATTENTION

Before towing the machine, carefully check the coupling security and the operation of the lighting system.

- Immobilize the carrier with the parking brake, remove the key from the ignition, and secure the vehicle cabin against access by unauthorized persons.
- Attach the safety cable (4) to the towing vehicle's hitch.
- Unlock the machine hook (3) and place it on the carrier hitch, then secure the hook.
- Fold down the machine support wheel (2).
- Connect the machine lighting cable (6) to the carrier's electrical socket.
- Check the coupling lock and release the machine parking brake (5).

Disconnect the machine in reverse order.

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5.4 DRIVING ON PUBLIC ROADS

When driving on public roads, respect the road traffic regulations, exercise caution and prudence. Make sure that the machine is correctly hitched to the carrier vehicle. Ensure that while towing the machine, driver has sufficient visibility.

Avoid ruts, depressions, ditches or driving on roadside slopes. Driving across such obstacles could cause the carrier vehicle and the machine 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. During shipping adjust ground speed to the prevailing road conditions, but do not exceed the maximum design speed of 80km/h.

Before setting off, it is recommended to check the connected machines according to the following points:

- Assess the correctness and locking of the coupling.



ATTENTION

The permissible design speed of the machine is 80 km/h and cannot be exceeded.



DANGER

DO NOT tow the machine with a damaged chassis or brake system.

The transport of any materials, including animals and people, is not allowed.

- Check technical condition and air pressure in tyres.
- Inspect the lighting system.
- Do not drive on public roads with rear lights covered.
- Check the closure and security of the covers, make sure that the discharge chute is folded, secured with a lock and positioned parallel to the direction of travel.
- The loading platform must be folded and secured with locks.
- Before towing the machine, check the operation of the overrun brake.

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5.5 GET READY FOR OPERATION

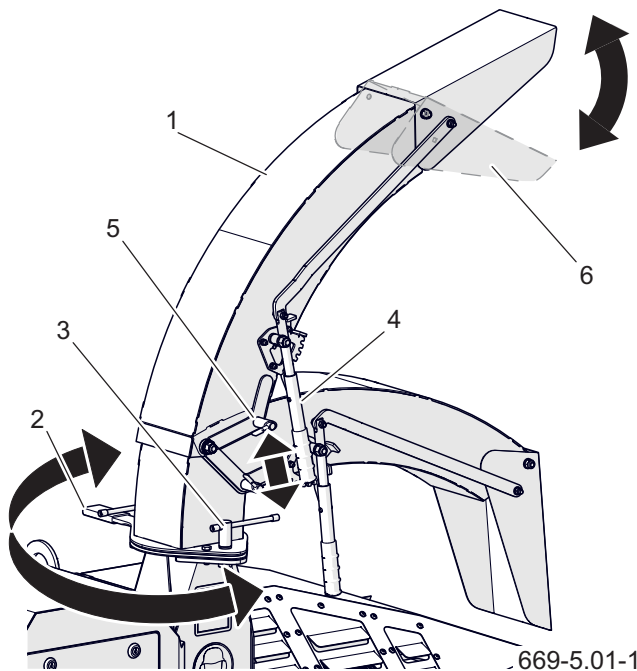


Figure 5.2 Discharge chute

- | | |
|-----------------------------|--------------------|
| (1) discharge chute | (2) lever |
| (3) interlock | (4) steering lever |
| (5) chute locking mechanism | (6) steering lever |

Before starting work, check and correctly adjust the machine. The work area should be on a level, flat and stable surface. Within the working area there should be no overhead power lines or other obstacles that would hinder the loading of long branches. Before starting the engine and starting work, set the parking brake and place the chocks under the wheel, fold out the jockey wheel and the rear stand. Direct the discharge chute in the appropriate direction. Set up the chute according to the following guidelines:

- loosen both locks (3),

- by gripping the lever (2) turn the chute (1) in the appropriate direction,
- lock the locking mechanism (3)
- unfold the chute by releasing the lock (5) and adjust the discharge angle using the steering lever (4).

The loading platform must be folded during transport. Before starting work, it must be unfolded as described below. There is a sensor under the platform that will not allow the machine to be started when the platform is folded (message on the control panel).

Platform unfolding:

- lift and turn both locks (3),

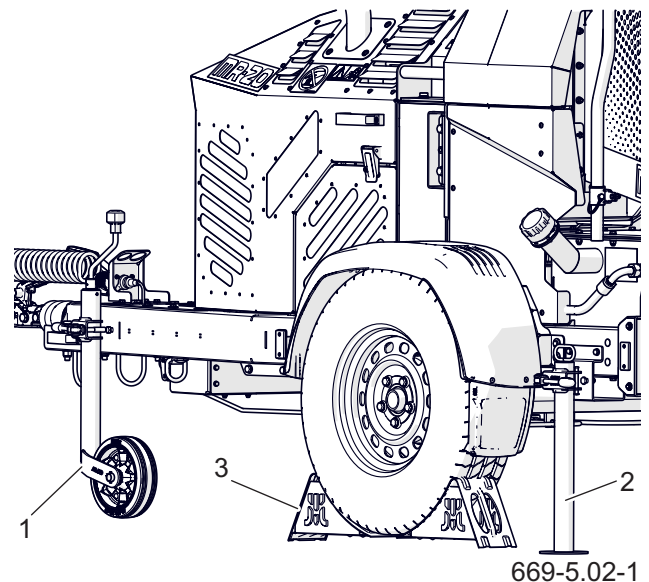


Figure 5.3 Supporting points

- | | |
|------------------|------------------|
| (1) jockey wheel | (2) rear support |
| (3) wheel chock | |

- unfold the loading platform (1),
- lock the locks (3) in the platform holes (1),
- check the platform locking,

correctly unfolded and locked platform allows the machine to be started in work mode.



DANGER

When unfolding and folding the chute, be especially careful because there is a risk of crushing fingers. Use suitable protective gloves.

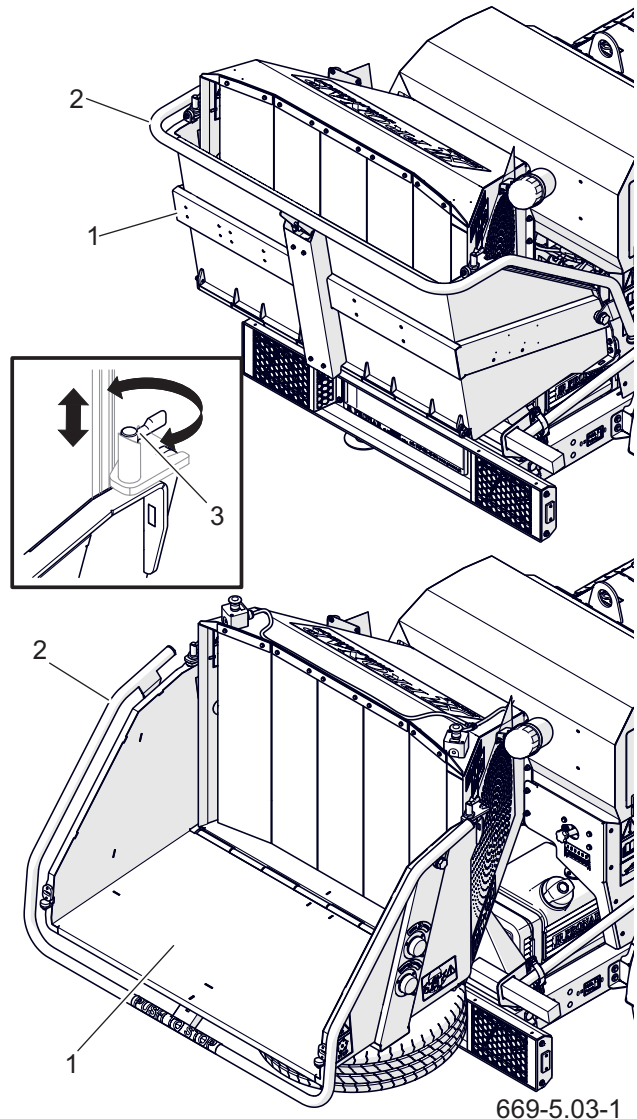
DO NOT change the discharge chute setting while the engine is running.

While the machine is operating, the exhaust chute must be secured against rotating. Do not direct shredded material into areas where people are.

The flying material has high velocity and can cause serious injuries.

If the chute becomes clogged, immediately turn off the machine and unclog the chute.

DO NOT operate the machine with the discharge chute folded.



669-5.03-1

Figure 5.4 Loading platform operation

(1) loading platform

(2) safety bar

(3) interlock

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5.6 MACHINE OPERATION

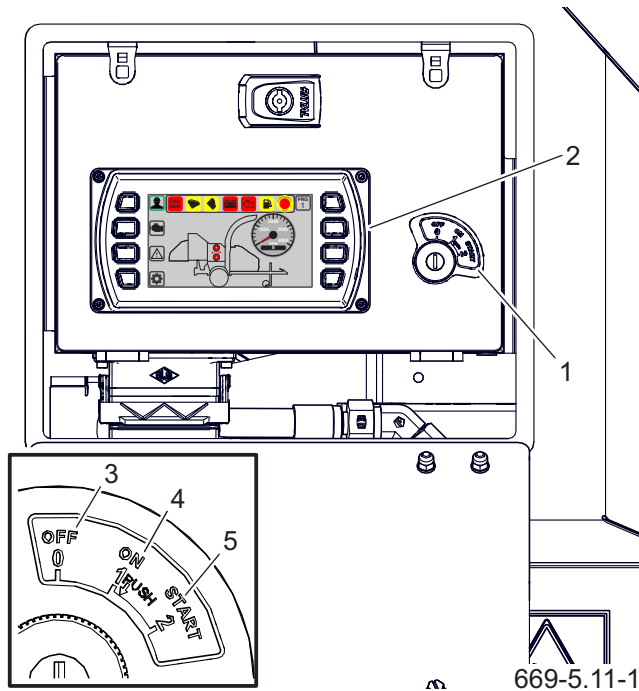


Figure 5.5 Control box

- | | |
|---------------------|-------------------|
| (1) ignition switch | (2) control panel |
| (3) stop | (4) ignition |
| (5) start-up | |

PRELIMINARY INFORMATION

Proper starting of the machine includes a range of preparatory activities such as:

- daily inspection,
- prepare for work,
- start the engine,
- starting work.

After carrying out the daily inspection and if there are no contraindications to starting



ATTENTION

To stop the engine, turn the key in the ignition fully to the left - position (3).



DANGER

Do NOT use an inoperative machine. Never operate the machine unless you are sure that it is fully operational. There must be no bystanders within the machine working zone.



ATTENTION

Before starting the engine make certain that all shields are closed. An unlocked engine cover and folded loading platform will not allow the chipper engine to start. Additionally, alarms and warnings will be displayed on the control panel.

the machine, start up the chipper.

STARTING THE ENGINE AND SETTING THE OPERATING PARAMETERS

- insert the key into the ignition (1),
- turn the key clockwise to the ON (4) ignition position.
- check the control panel for any alarms or warnings.
- If errors occur, check that the engine cover is closed and the loading platform is correctly unfolded.
- enter the alarms screen and clear errors and warnings.
- turn the key to the START position (5). Start the engine.

After starting the engine, wait a moment



ATTENTION

Do not turn the machine engine off when working at full load. Before turning the engine off, let it run idling for a short time.

before starting to work with the chipper. Go to *Operator screen* , in which you can select the appropriate chipper operating program. A single press of the program button (4) allows you to switch between the three available programs. Pressing the *Program* button longer activates the settings for the given program. All settings are described in detail in Section 4.2 *Operator screen menu*.

The engine rotations and current load are continuously displayed on the machine's control panel (5).

Start the feed rollers by pressing the green START button.

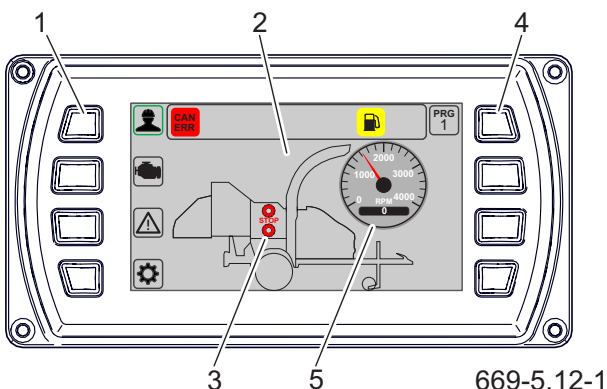


Figure 5.7 Control panel

- (1) operator screen button (2) screen
(3) working condition of the rollers (4) program button
(5) rev-counter

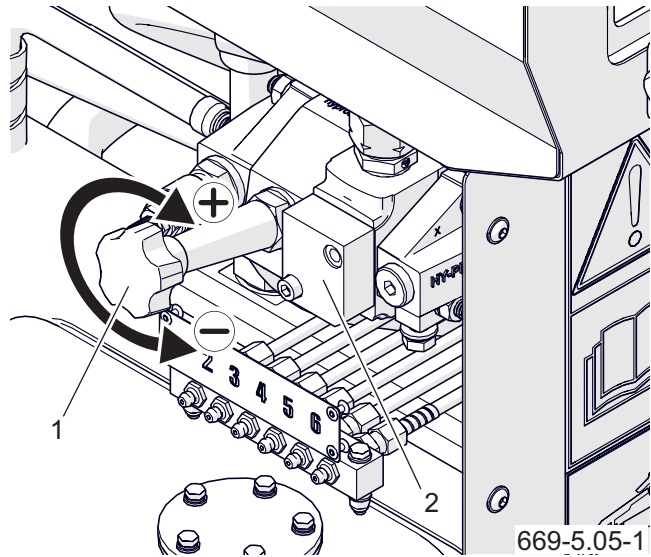


Figure 5.6 Feed rollers speed

- (1) hydraulic divider (2) knob

Each time you work, you should select the speed of the feed rollers for optimal working conditions. Set the rotational speed of the feed rollers in a range that allows the machine to operate smoothly and without jams. This will allow the chipper to operate optimally with maximum efficiency. For materials with a small diameter and lower density, a faster feed roller speed can be set, materials with a larger cutting diameter and hardwood, dry wood should be shredded at a slower speed.

Next to the control panel there is a flow regulator knob (1) for controlling the rotational speed of the feed rollers.

Adjusting the speed of the feed rollers:

- Turning the knob clockwise increases the feed speed.

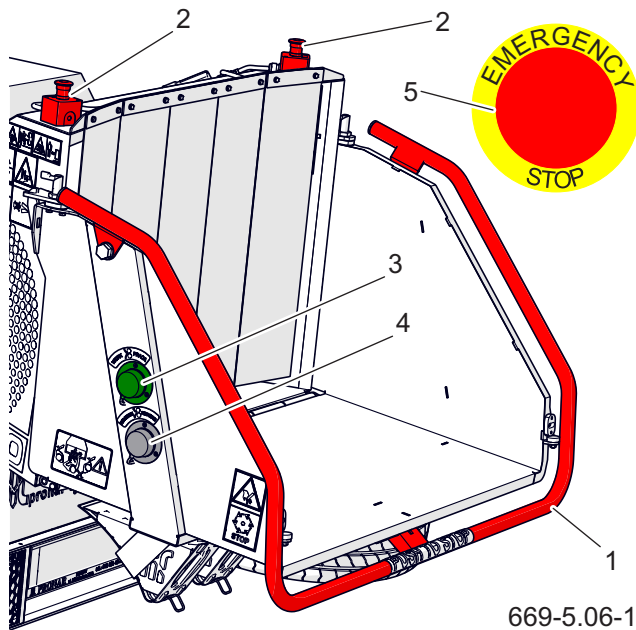


Figure 5.8 Emergency stop

- (1) safety bar (2) emergency button
(3) green button *WORK* (4) gray button *REVERSE*
(5) emergency stop warning

- Turning the knob counterclockwise - decreases the feed speed.

GETTING STARTED

Having set the operating parameters (speed of the feed rollers, appropriate program - engine speed), press the green OPERATION button (3).

If the shredding material becomes jammed or if it needs to be removed from the working chamber, press and hold the grey REVERSE button (4).

The direction of rotation of the rollers will change. The material will be pushed out of the shredding chamber.

Table 5.1 Feed roller operating states

Pictogram	Meaning
	Stop. Shredding mechanism stopped.
	Work. The shredding mechanism is working. The feed rollers feed the material.
	Reverse. The shredding mechanism is working. The feed rollers retract the material.

EMERGENCY STOP

During operation, it may be necessary to immediately stop the machine.

The roller drive can be switched off by:

- deflection of the safety bar (1).

The display will show a red icon illustrating the operation of the rollers "STOP" - table (5.1).

The roller drive is re-enabled by pressing the green START button.

- pressing the emergency button (2). The machine will be turned off; the feed rollers will stop and the motor will turn off.

The display will show the alarm icon EMERGENCY STOP message. The drive can be re-enabled by pulling the button (2) and deleting the errors in the alarm screen.

- pressing the grey REVERSE button (4). The feed rollers stop immediately, the motor continues to run.

The display will show a red icon showing the rollers operation "STOP" - table (5.1) . To re-enable the roller drive, press the green (3) START button.

**DANGER**

When operating the machine, wear appropriate and fitted protective clothing. Pay particular attention to hearing and eye protection. Protective gloves with wrist cuffs and a helmet with eye and hearing protection should be worn.

Do not wear watches, rings, jewellery chains, etc. DO NOT work in loose clothing or with loose hair.

Make sure that no bystanders or children are in the work area.

Do not stand in front of the working chamber during shredding, there is a risk of being hit by the fed material. Take a position to the side of the loading hopper. Use dust masks if necessary, some shredded materials may release harmful or irritating substances. Breathing problems or poisoning may occur.

Do not reach into the loading hopper with your hands or enter it. Feed short pieces of shredding material onto the rollers by pushing them with a piece of wood.

If the material to be shredded is long and heavy, seek the help of a second person.

TIP

When inserting material into the working chamber, start shredding from the thicker part of the branch.

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5.7 WORKING CHAMBER OPERATION

The shredded material fed into the shredding chamber (1) flows out through the discharge chute (3) in the form of chips. While operating the machine, observe whether the shredded material leaves the working chamber. If the operator notices problems with the ejection of chips from the working chamber, the material feeding should be stopped immediately and the machine engine should be turned off. Continuing to feed material with the working chamber clogged or the discharge chute blocked will worsen the problem and make it significantly more difficult to remove the blockage.

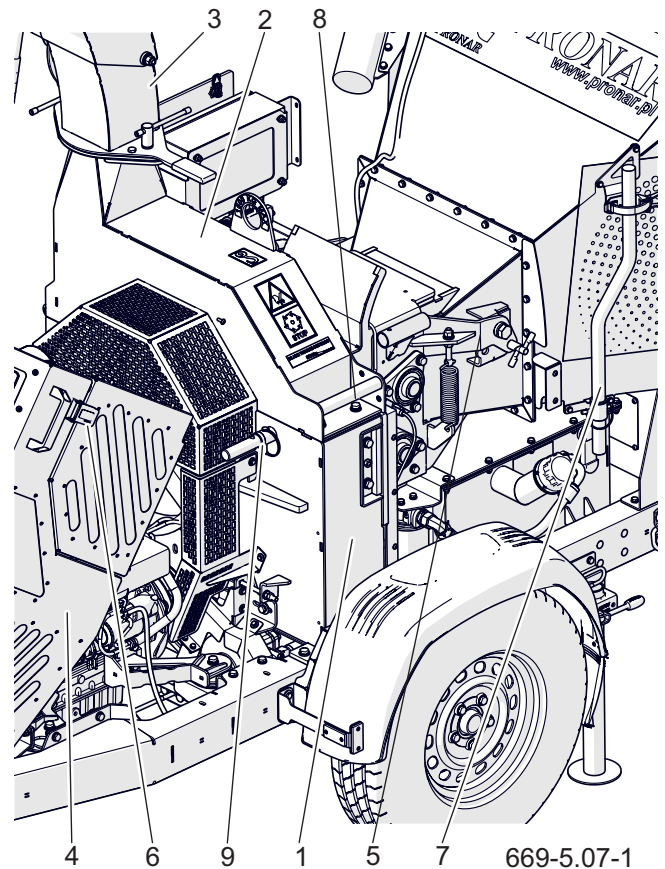


Figure 5.9 Working chamber

- | | |
|---------------------|-------------------|
| (1) working chamber | (2) chamber cover |
| (3) discharge chute | (4) front cover |
| (5) roller arm | (6) lock |
| (7) lever | (8) bolts |
| (9) interlock | |

WORKING CHAMBER BLOCKAGE

To remove the clog, you should:

- turn off the engine and remove key from ignition.
- check obstructions in the discharge chute (3), clean the chute if necessary.
- If clogging occurs in the working chamber, open the front cover (4) - release the handles (6).
- unscrew the screws (8) securing the cover of the working chamber (2),
- tilt the cover (2) and clean the inside of the working chamber (1).



DANGER

Do not put your hands into the working chamber and discharge chute, always use protective gloves. Any remaining material should be removed using tools without sharp edges, e.g. a piece of wood. Sharp rotating parts, risk of serious injury.

TIP

Removing the fixed lower blade will make cleaning the working chamber much easier.

FEED ROLLERS LOCK

If the feed rollers become blocked, you should:

- turn off the engine and remove key from ignition.
- open the front cover (4) by releasing the fasteners (6),
- remove the side covers to gain access to the upper feed roller (1) and its arm (2),
- loosen or unscrew the nut (6) of the tension screw (4) on both sides,
- If necessary, remove the tension springs (5),
- insert the lever (7) into the arm socket (2),
- pull and turn the lock (3),
- using the lever (7) lift the arm (2) with the roller (1),
- secure the roller arm with the lock (3), check the locking,
- with the roller raised, carefully remove any material that is blocking the work, without reaching into the area of the shredding mechanism or the locking

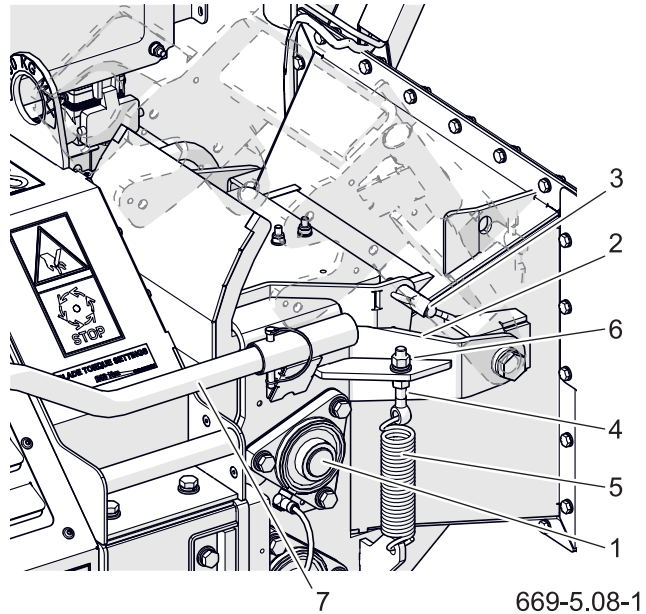


Figure 5.10 Raised top roller

(1) upper roller

(2) roller arm

(3) lock

(4) spring bolt

(5) spring

(6) nut

(7) roller lever

mechanism.

CUTTING BLADES

Optimal and efficient machine operation requires sharp cutting blades. The condition and sharpness of the blades and their



ATTENTION

The tension of both springs must be the same. The roller lever is made of metal and cannot be used to feed the material being shredded while the shredding mechanism is operating. Accidental entry of the lever into the working chamber of the machine may cause serious damage.



DANGER

Before starting cleaning or maintenance work on the feeding mechanism, check that the arm is properly locked.

Always wear protective gloves.

Any remaining material should be removed using tools without sharp edges, e.g. a piece of wood.

Use extreme caution due to the risk of serious cuts and crushing of fingers.

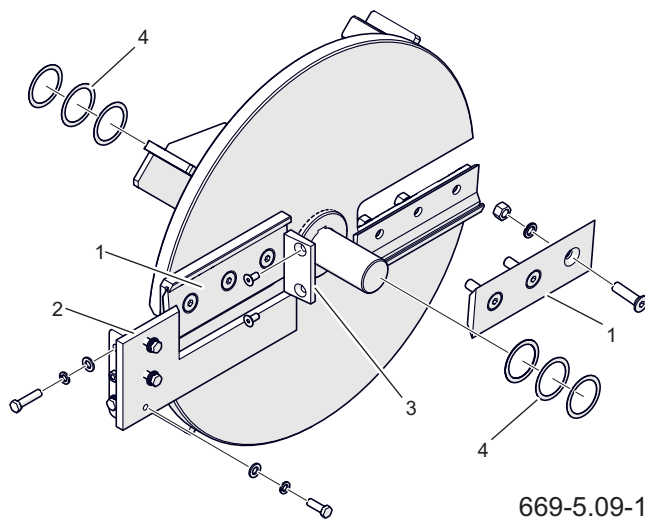


Figure 5.11 Cutting blades

- (1) cutting blade (2) fixed cutting blade
(3) fixed side cutting blade (4) spacer ring

screw connections should be checked regularly. The location and method of installation of the cutting elements are shown in drawing *Cutting blades*.

Access to cutting blades:

- turn off the engine and remove key from ignition,
- open the front cover (4) by releasing the engine cover fasteners
- unscrew the screws (8) securing the cover of the working chamber (2) and open it - drawing *Working chamber*,
- inspect the cutting surfaces of all blades. Any cracks or chips in the blades disqualify the blade from further use and they must be replaced with new ones,

TIP

Some blade fixing screws are secured with thread lock adhesive. After replacing or sharpening the blades, the gap between the blades (1) on the cutting disc and the fixed blade (2) must be set. Details are described later in the manual.



DANGER

Be extremely careful, there is a high risk of serious injury. Always wear protective gloves. Replace cutting blades only with new and original parts recommended by the machine manufacturer. It is not allowed to sharpen cutting blades attached on the machine. Remains of the shredded material may ignite. Remove the blade before sharpening. Be sure to wear eye and hearing protection when sharpening.

- if the cutting edges are blunt, it is allowed to sharpen the blade,
- unscrew the screws of the individual blades and dismantle the blade.

CUTTING DISC LOCKING

When working on the cutting disc, it can be locked in two positions to facilitate access to the cutting blades.

Installing the disc lock:

- set the cutting disc (3) so that the disc socket (square profile) is opposite the pin hole (1),
- release and take out locking cotter pin (2),
- remove and turn the pin (1),
- insert the longer part of the pin (1) into the cutting disc socket (3) and secure it with a cotter pin (2),
- Unlock in reverse order.

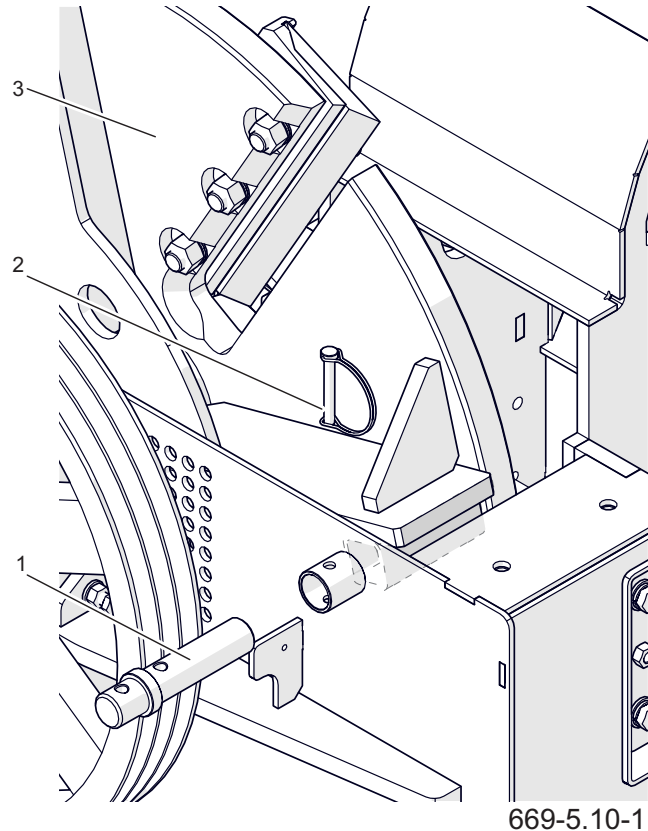


Figure 5.12 Cutting disc locking

(1) pin

(2) cotter pin

(3) cutting disc



DANGER

After completing work on the cutting disc, it is absolutely necessary to reposition the pin and secure it with a cotter pin. An unsecured pin may fall out of its socket due to vibrations caused by machine operation and cause a serious damage or accident.

Use extreme caution due to the risk of serious cuts and crushing of fingers.

Wear protective gloves, safety glasses and hearing protection when shredding the material.



ATTENTION

Before starting cleaning and maintenance work on the cutting disc, it must be blocked from rotating. After working on the cutting mechanism, it is recommended to check whether the shredding mechanism rotates without jamming or collisions. Manually rotate the cutting disc one full rotation.

H.5.2.669.03.1.EN

5.8 WORKING LIGHTS OPERATION

Optionally, the machine can be equipped with additional work lighting.

Switch the lights on:

- turn off the chipper engine,
- loosen two bolts (5),
- release and take out locking cotter pin (3),
- extend the lamp support (1) to the desired height,
- install locking cotter pin (3) and tighten bolts (5).
- start the engine and press the button (4) to turn on the lights.

Install in reverse order.

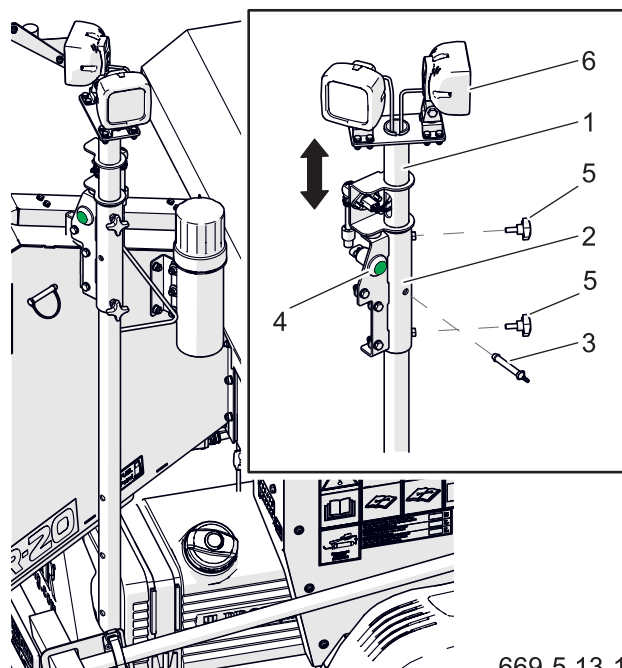


Figure 5.13 Operating zone lights

- | | |
|------------------|---------------------|
| (1) lamp bracket | (2) support bracket |
| (3) cotter pin | (4) switch |
| (5) bolt | (6) lamp |



ATTENTION

Always secure the lamp support using a cotter pin and screws. High structural vibrations occurring during operation are transferred to all machine elements. Improper installation may result in structural damage.



DANGER

DO NOT drive with the lamp support extended. Do not point the light beam directly at the person operating the machine. Risk of blinding. When maneuvering the material to be shredded (branches, logs, etc.), pay attention to the risk of collision with work lights.

H.5.2.620.06.1.EN

SECTION 6

INSPECTION AND
MAINTENANCE

6.1 TECHNICAL INSPECTION SCHEDULE

Table 6.1 Expected periodic inspections of the machine

Inspection	Description	Inspection conducted by
A	Inspection conducted daily before the first start or every 10 hours of continuous operation in shift mode.	User.
B	Inspection performed every 50 hours of engine operation. Before commencing work, perform also all the activities included in the scope of daily inspection.	User.
C	Inspection performed every 250 hours of engine operation. Before starting work, also perform all inspection steps every 50 hours of operation.	Warranty Service.
D	Inspection performed every 500 hours of engine operation.	Warranty Service.
E	Inspection performed every 1000 hours of engine operation. Before starting work, also perform all inspection steps every 50 and 350 hours of operation.	Warranty Service.
F	Inspection performed every 3000 hours of engine operation. Before commencing work, perform also all the activities included in the scope of inspections conducted every 50, 250, 500 and 1000 working hours.	Warranty Service.
G	Inspection conducted every 4 years of the machine use.	Warranty Service.
H	Inspection should be conducted as needed.	User.

During the warranty period, C, D, E, F and G inspections are performed by a manufacturer service point. After the warranty period, we recommended that these inspections should be performed by specialised workshops.

The A, B and H inspections are performed by the machine operator according to the

schedule.

Having performed the machine inspections described below, also carry out the scheduled engine inspection - see table *Engine maintenance schedule*, check components according to guidelines presented in Table 7.3.

Table 6.2 Machine inspection schedule

Description of activities	A	B	C	D	E	F	G	H
Inspect covers		●						
Check fuel level and refuelling	●							
Drain water from fuel tank			●					
Inspect the hydraulic system	●							
Check hydraulic oil level and add hydraulic oil	●							
Change hydraulic oil				● ⁽²⁾				
Replacement of hydraulic oil filter				● ⁽²⁾				
Replace hydraulic lines							●	
Check engine coolant level and add coolant	●							
Inspect cutting disc	●							
Check technical condition of electrical system	●							
Sensor setting check						●		
Check the battery		● ⁽¹⁾	● ⁽²⁾					
Battery charging								●
Replace the battery								●
Air pressure measurement, inspection of tyres and wheels		●						
Checking wheel axle bearings for slackness						●		
Check thickness of brake shoe linings					●			
Check tightening torque of nut and bolt connections		●						
Check the vee belts tension						●		
Lubrication – according to a separate schedule								
⁽¹⁾ - first time								
⁽²⁾ - or every 12 months depending on which occurs first								
⁽³⁾ - at least once a month								

6.2 INSPECT COVERS

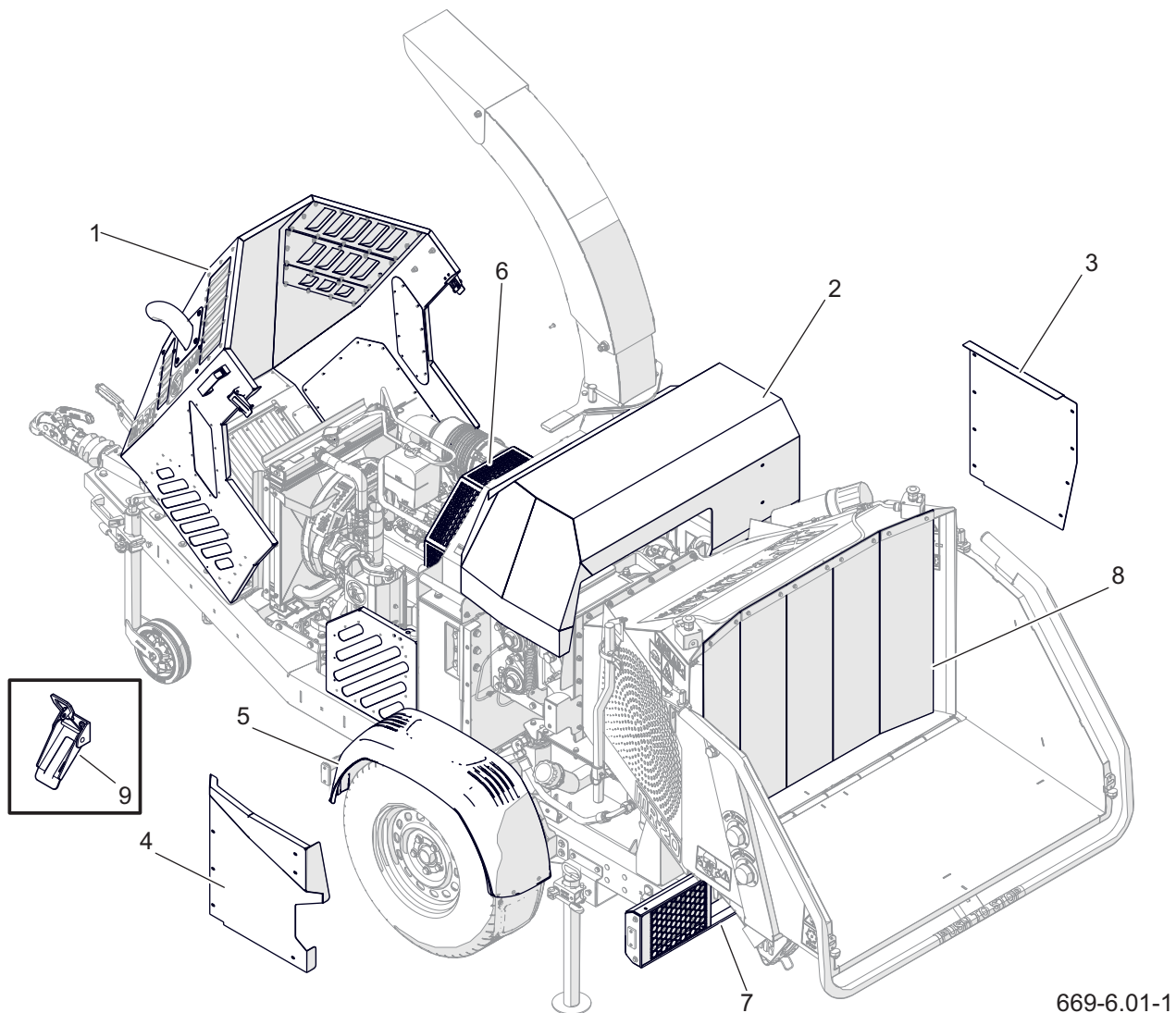


Figure 6.1 PRONAR MR-20 chipper guards and covers

- | | | |
|------------------|--------------------|---------------------------------|
| (1) front cover, | (2) upper cover, | (3) right cover |
| (4) left shield | (5) mudguard, | (6) vee belt transmission cover |
| (7) bumper | (8) hopper curtain | (9) lock |

Covers protect the machine user's health and life and the machine subassemblies

against damage. Therefore, their technical condition must be checked before using the trailer. Any damaged or lost components must be repaired or replaced.

Check completeness of protective covers.

- check that the covers are properly installed and not damaged, missing fasteners should be replaced,



ATTENTION

Damaged or incomplete covers must be replaced or repaired immediately. Operating the machine without guards is prohibited and very dangerous.

- check the locking of the front cover (1) using the fasteners (9), inspect the fastening of the hinges and gas springs of the cover,
- assess the condition of the bumper (7) and fenders (5),
- missing elements of the hopper curtain (8) should be replaced with new ones immediately,
- If necessary, tighten the bolt connections fixing the shields.

**DANGER**

The machine guards used do not release the operator from the obligation to use personal protective clothing and equipment. Pay particular attention to hearing and eye protection.

Sharp machine parts rotating at high speed can lead to serious accidents, therefore special care must be taken during operation and the machine guards must be kept intact.

**ATTENTION**

Do NOT use an inoperative machine.

J.5.2.620.02.1.EN

6.3 CHECK FUEL LEVEL AND REFUELLING

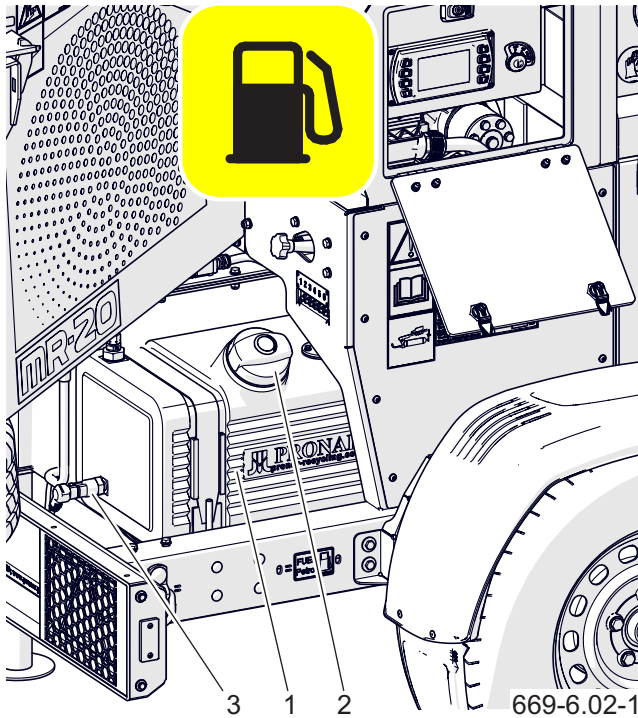


Figure 6.2 Check fuel level

- (1) fuel tank (2) filler plug
(3) fuel level sensor (4) control panel

Before each start-up and during operation of the machine, check the fuel level in the



DANGER

Be especially careful when refuelling. Be careful of static electricity.
When refuelling, do not use an open flame and do not smoke.
Refuelling can only be done when the engine is off.
Wipe up spilled fuel immediately.



ATTENTION

Lost or damaged plug should be replaced with an original replacement plug
Never remove the plug or refuel when the engine is running.
Use fuel that meets the requirements of the engine specification.
Do not fill the tank completely, leave room for the fuel to expand.

TIP

Fuel tank capacity is 35 litres.

fuel tank. Low fuel level indication is displayed on the control panel screen.

To refill the fuel tank (1) you need:

- clean the surfaces around the filler cap (2),
- unscrew the filling plug (2)

To prevent fuel spillage, it is recommended to use a fuel funnel.

- refill the fuel tank, tighten the filler cap. If fuel is spilled, thoroughly wipe and dry the area.

J.5.2.669.07.1.EN

6.4 DRAIN WATER FROM FUEL TANK

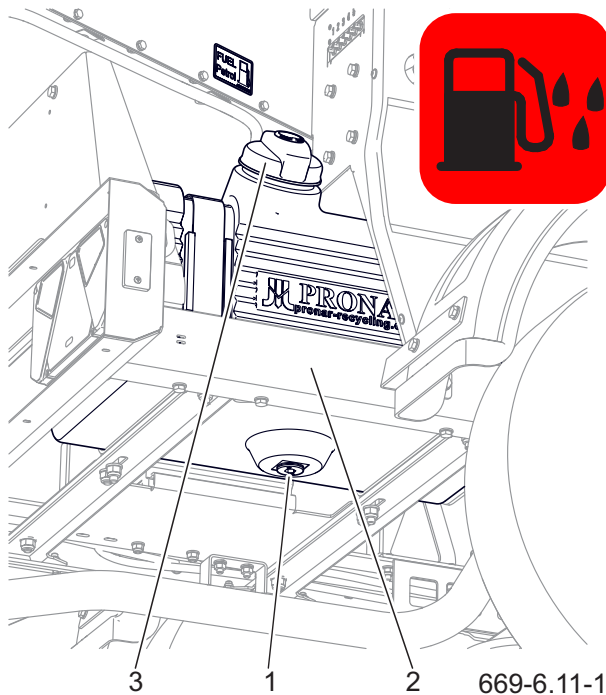


Figure 6.3 Drain water from fuel tank

(1) drain plug

(2) fuel tank

(3) filler plug



DANGER

Do NOT approach the fuel tank with an open flame. Immediately wipe away spilt fuel until dry because it may cause fire.

to or malfunctioning of the engine. The presence of water in the fuel is indicated on the control panel screen in the Alarms and warnings screen. 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 drain plug (1).
- Unscrew the fuel drain plug and drain about 1 litre of fuel.
- if the fuel is still contaminated, drain another litre of fuel,
- tighten drain plug,

Contaminated fuel may cause damage

J.5.2.669.08.1.EN

6.5 INSPECT THE HYDRAULIC SYSTEM

**ATTENTION**

Before starting work, visually inspect the hydraulic system components.

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

The hydraulic system is under high pressure when operating.

Regularly check the technical condition of the hydraulic lines and connections.

Flexible hydraulic lines should not be entwined or fractured.

The hydraulic system is filled with HL-46 hydraulic oil.

Hydraulic system maintenance duties:

- visual inspection of tightness of hydraulic pump, motors and connections,
- check the technical condition of lines;
- visual inspection of hydraulic connections.

In the event of contact of oil with skin wash the place of contact with water and soap. 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. Do NOT apply organic solvents (petrol, kerosene). Contaminated clothing should be changed to prevent access of oil to skin. In the event of contact of oil with eye, rinse with large quantity of water and in the event of the occurrence of irritation consult a doctor.

Spilt oil should be immediately collected

**DANGER**

Before commencing whatever work on hydraulic system reduce the pressure in the system.

During work on hydraulic system, use the appropriate personal protection equipment i.e. protective clothing, footwear, gloves and eye protection. Avoid contact of skin with oil.

Do not repair hydraulic system on your own. All hydraulic system repairs must be performed only by suitably qualified personnel.

and placed in a marked tight container. Used oil should be taken to the appropriate facility dealing with recycling or regeneration of oils.

The hydraulic system must be tight. Replace any leaking or damaged seals of pumps and hydraulic cylinders. If leaks appear at connections then try to tighten the connections. Tightening torques for hydraulic lines are given in the table

Table 6.3 Hydraulic line terminal tightening torque

Line size	Torque
DN	[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

“Tightening torques for hydraulic hose terminations.” 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 lines, as a result of their delamination or abrasion. A conduit must be replaced with a new one.

TIP

The condition of hydraulic system should be inspected regularly while using the machine. Bleeding of the hydraulic system is not required during normal operation of the conveyor.

Oil fires should be quenched with carbon dioxide (CO₂), foam or extinguisher steam. Do NOT use water for fire extinguishing.

J.5.2.620.05.1.EN

6.6 CHECK HYDRAULIC OIL LEVEL AND ADD HYDRAULIC OIL

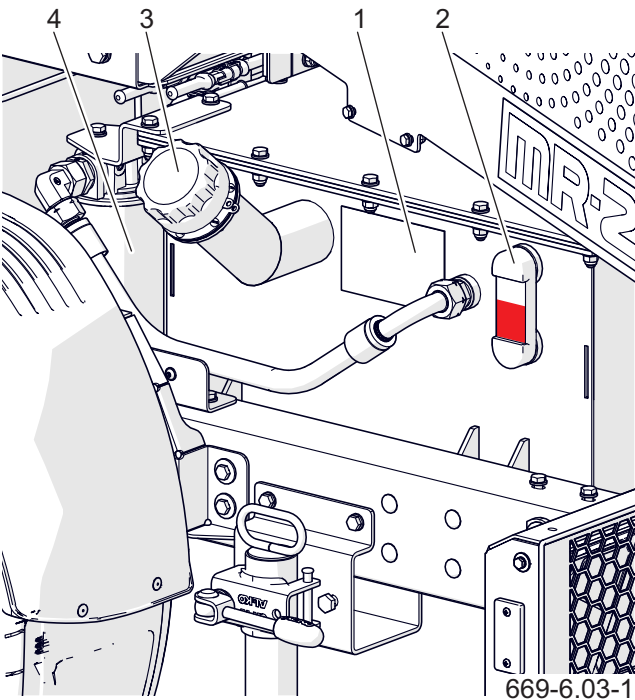


Figure 6.4 Oil tank
(1) oil tank (2) indicator
(3) filler plug (4) filter

The oil tank (1) holds 25 l of HLP 46 hydraulic oil. Check tank welded joints and

**DANGER**

Be careful when adding oil.
Do not use an open flame and do not smoke during work.
Wipe up spilled oil immediately. Oil-contaminated cleaning cloth should be stored in dedicated containers. Danger of ignition.

hydraulic hoses for leaks every day.

- Check hydraulic oil level on the oil level indicator (2)
the indicator has a scale for measuring the hydraulic oil temperature,
- Use rags to clean the filler cap and its surroundings, wipe the oil level gauge,
- If hydraulic oil level is too low, unscrew filler plug (3) and add oil.
- tighten filler plug.

Table 6.4 Recommended oil grade depending on operating temperature

Item	Oil name	Volume [l]	Recommended ambient temperature range [°C]
1	HLP 32 according to DIN 51524-2	25	-20°C -:- +10°C
2	HLP 46 according to DIN 51524-2	25	-5°C -:- +0°C
3	HLP 68 according to DIN 51524-2	25	+10°C -:- +40°C

J.5.2.669.01.1.EN

6.7 CHANGE THE HYDRAULIC OIL AND OIL FILTER

Only the authorised service may change the hydraulic oil and filter cartridges during the warranty period. The oil filter is located on the oil return to the tank (1).

- Unscrew the filler plug (2) and the oil drain plug (4).
- Drain oil to previously prepared container (about 25 litres).
- unscrew the filter (3), drain the oil from the filter.
- grease O-ring of the new filter with a thin layer of fresh oil.
- screw the new filter (3) onto the base (5) by hand. Do not use tools when tightening the filter.
- Remove the strainer (from under the filler plug (2)) and blow it with compressed air.
- Check the filler plug seal (2), confirm that vent openings in the plug are not blocked. Tighten the plug.
- pour fresh oil into the tank to the required level,
- Used hydraulic oil should be disposed

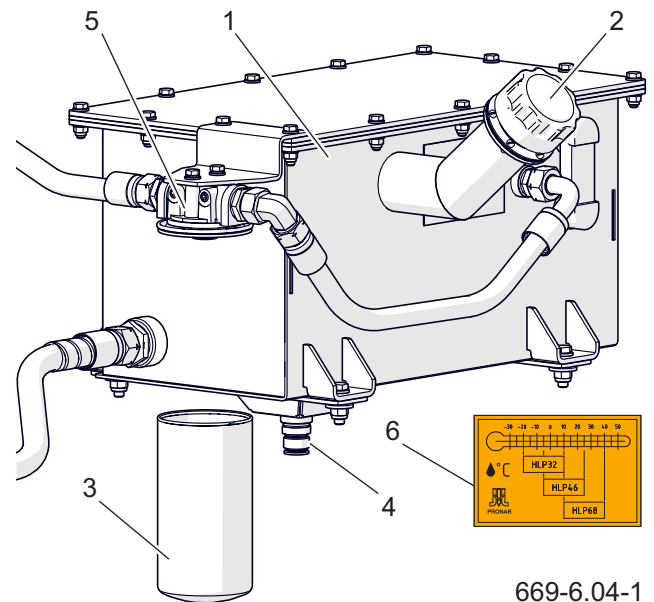


Figure 6.5 Oil filter

- | | |
|-----------------|-----------------|
| (1) oil tank | (2) filler plug |
| (3) oil filter | (4) drain plug |
| (5) filter base | (6) decal |



ATTENTION

The filter should be replaced every time the oil in the tank is changed. When unscrewing oil filter do not use hammer, chisel etc. as this may damage filter casing. Use filters recommended by the machine manufacturer (original filters).

of according to local regulations.

J.5.2.669.02.1.EN

6.8 REPLACE HYDRAULIC LINES

Rubber hydraulic lines must be replaced every 4 years regardless of their technical condition. The replacement should be entrusted to specialist repair workshops.

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



ATTENTION

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

J.2.4.415.18.1.EN

6.9 CHECK ENGINE COOLANT LEVEL AND ADD COOLANT

The coolant level should be checked regularly, it is recommended to check the level each time before starting the chipper.

- set the chipper in a horizontal position.
- Secure the machine against unintentional or unauthorized starting.
- open the engine cover.
- Check the engine coolant level on the expansion tank.

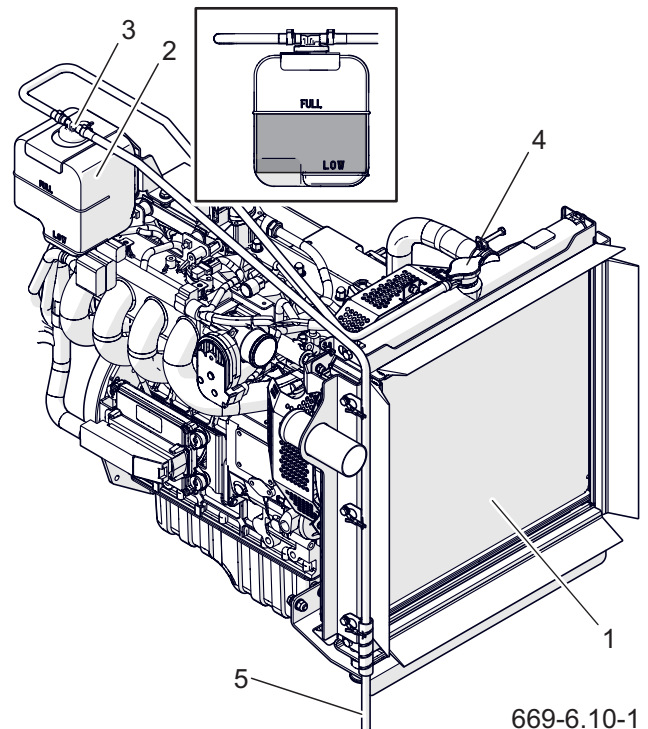
the correct level should be between the LOW (minimum) and FULL (maximum) marks

- If necessary, top up coolant through the expansion tank cap (3).
- check the radiator cap seals.
If the cap is damaged, replace it.
- Install and tighten the cap.
- Close the engine cover.



ATTENTION

Never mix different types of coolant. Always use the coolant recommended by the manufacturer.



669-6.10-1

Figure 6.6

Cooling system

(1) radiator

(2) tank

(3) tank plug

(4) radiator cap

(5) overflow



DANGER

The radiator cap should be unscrewed very slowly when the engine is turned off and cooled down. Danger of burns due to fumes or hot coolant.

TIP

Check the coolant level when the shredder is placed on a horizontal surface.
For details on the recommended coolant, refer to "Consumables".

I.5.2.669.06.1.EN

6.10 INSPECT CUTTING DISC

Technical condition of cutting mechanism blades should be checked periodically paying attention to mechanical damage, excessive wear and completeness of securing elements. It is important to check the correct installation and adjustment of the cutting disc.

- open the front cover latches and open the front cover,
- unscrew the screws of the chamber cover, tilt the cover to the side,
- clean the working chamber from any remaining material,
- Turn the cutting disc slowly to check the condition of the cutting blades (1),
- check the cutting gap for which the value between the blades should be in the range of 1-1.5 mm,
- check the wear level of the lower fixed blade (2) and the side fixed blade (3),
if necessary, dismantle the appropriate blade and sharpen it or replace it,
- check the transverse and longitudinal clearances of the cutting disc,
- unscrew the cutting disc and check whether there are no disturbing sounds coming from the bearing housings and whether the disc rotates smoothly without jamming,

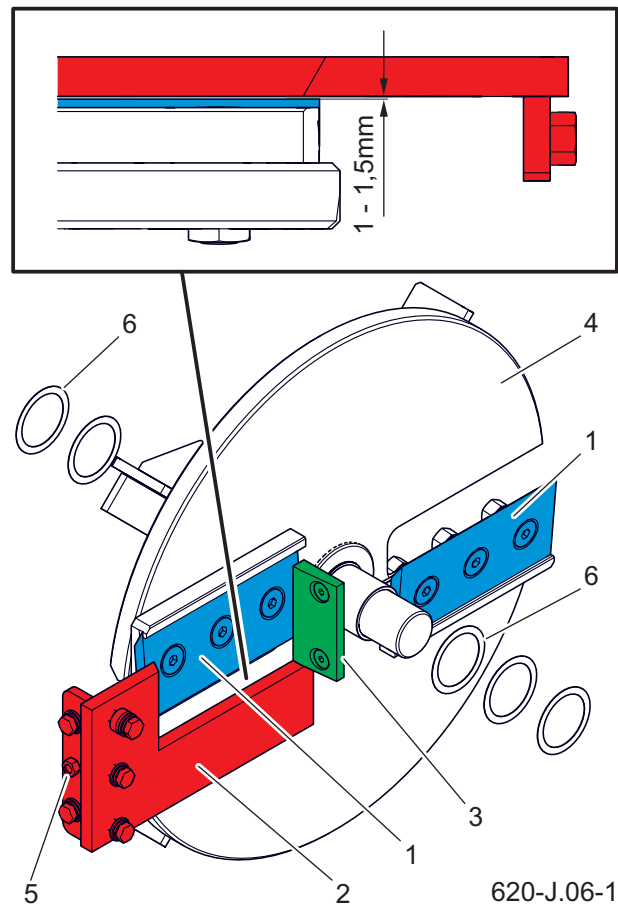


Figure 6.7 Cutting unit

- | | |
|------------------------------|-------------------------------|
| (1) cutting blade | (2) fixed lower cutting blade |
| (3) fixed side cutting blade | (4) cutting disc |
| (5) nut | (6) washer |

TIP

To easily remove the lower fixed blade (2), screw the M12 screw into the blade nut (5).



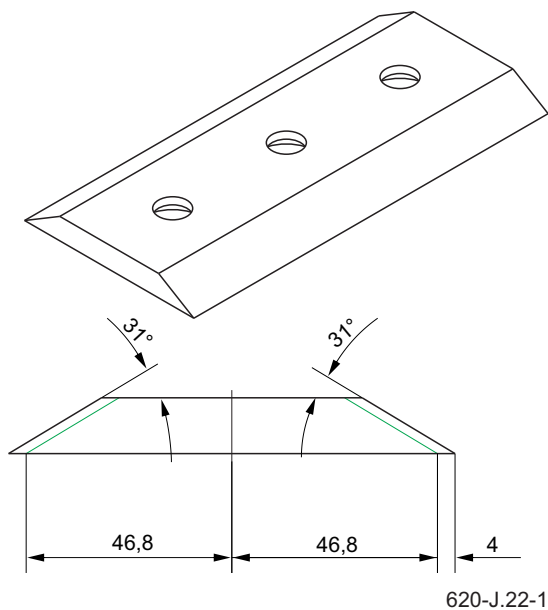
DANGER

Be especially careful when checking and replacing the cutting blades, as there is a risk of crushing and serious injury.

- After sharpening or replacing the

Table 6.5 Shredding disc replacement parts

Item	Name	Part number	Quantity [pcs]
1	Double sided cutting blade	303-890-001338	2
2	Fixed lower cutting blade	403-005-031258	1
3	Fixed side cutting blade	403-005-011195	1
6	Spacer washer	324-300-000739	6

**Figure 6.8** Minimum allowable dimensions of the blade after sharpening**ATTENTION**

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 cause damage to the machine.

blades, check and, if necessary, set the cutting gap to 1-1.5 mm using spacers,

- in the case of double-sided cutting blades, after one cutting edge becomes dull, it is possible to turn the blade so that it works with the other blade,

J.5.2.620.08.1.EN

6.11 CHECK TECHNICAL CONDITION OF ELECTRICAL SYSTEM

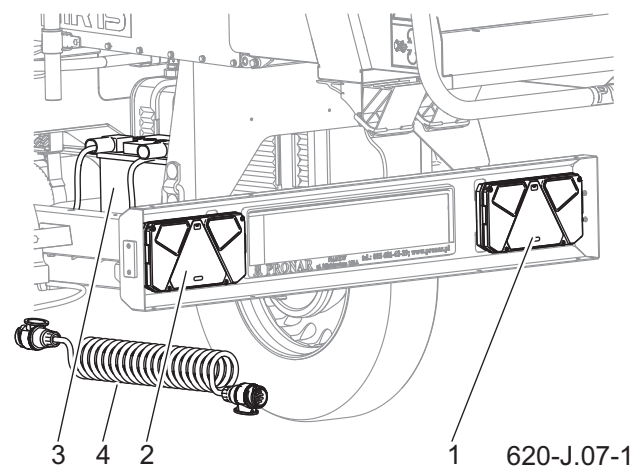


Figure 6.9 Lighting system
(1) right lamp (2) left lamp
(3) battery (4) 13-pin wire

 DANGER

Before beginning repairs of electrical system, disconnect the machine from power source.
Do NOT travel with out of order lighting system.
Burned-out or damaged lamps must be replaced with new ones.

 ATTENTION

Do not independently repair electrical system, except items described in section "*ELECTRICAL SYSTEM INSPECTION*". All electrical system repairs must be performed only by suitably qualified personnel.

Table 6.6 Spare parts for electrical system

Item	Name	Part number	Quantity [pcs]
1	Lamp assembly right W125dP	302-320-000251	1
2	Lamp assembly left W125dL	302-320-000250	1
3	Battery 56Ah	301-380-000050	1
6	13-pin wire	303-340-000159	1

The service of the electrical system involves periodic inspection of the operation of the control system as well as the lighting system.

If the bulb burns out, replace it with a new one. The list of bulbs is presented in the table "*List of lighting components.*"

In the event of a fault in the electrical system, check the fuses. The fuses and relays are located in the control box

underneath the housing. Remove a blown fuse from the holder and replace it with a new one. The list of fuses is presented in the figure and the table "*Fuses.*"

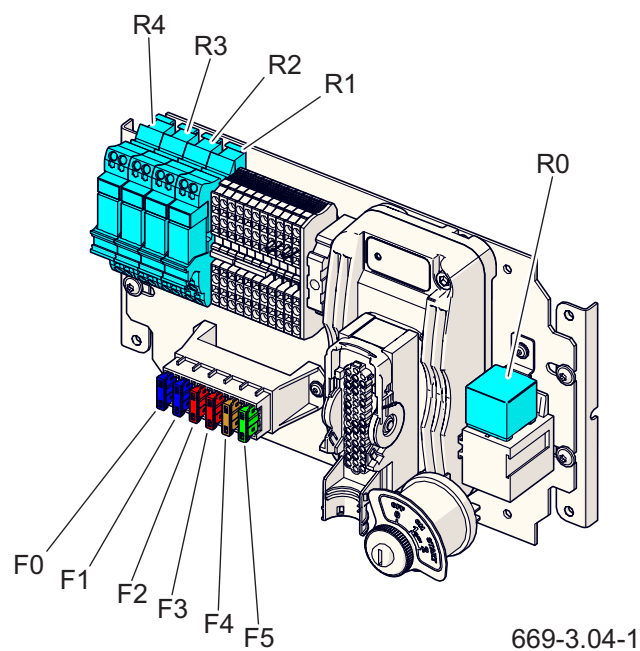


Figure 6.10 Fuses and relays

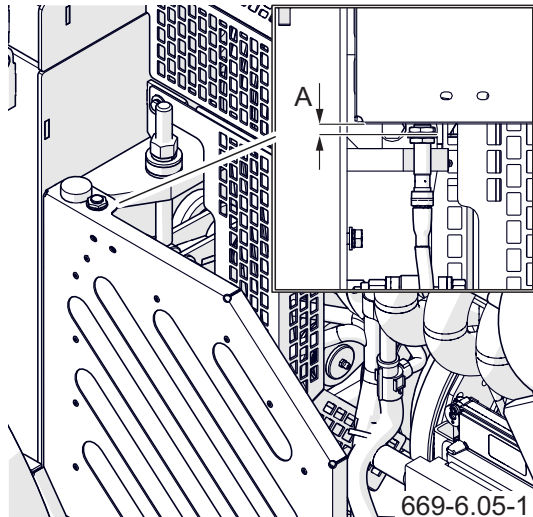
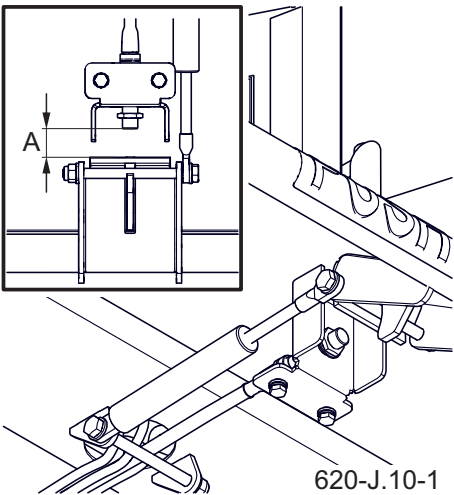
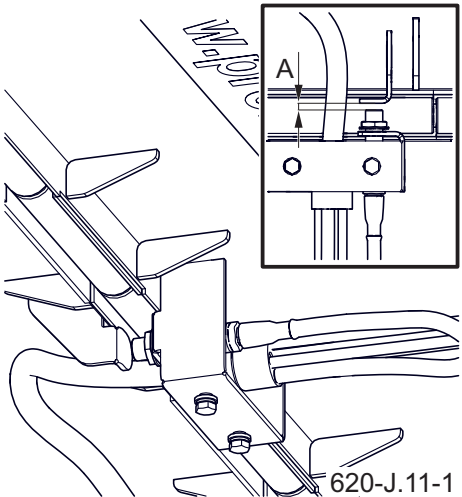
Table 6.7 Fuse and relay markings

Markings	Description
Fuse F0	Power supply of control box 15A
Fuse F1	Starter 15A
Fuse F2	Engine speed cylinder 10A
Fuse F3	Controller supply 10A
Fuse F4	Power supply of sensors 5A
Fuse F5	Power supply of control box 30A
R0 relay	Power supply of control box
R1 relay	Fuel pump supply
R2 relay	Starter
R3 relay	Stopping the engine
R4 relay	Engine speed cylinder

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6.12 SENSOR CHECK AND ADJUSTMENT

Table 6.8 Sensor placement and setting

Sensor	Setting	Location	Figure
Cover open sensor	A=2-3mm	Right lower frame side member, under the front cover.	 669-6.05-1
Safety beam sensor	A=2-3mm	Lower surface of the loading hopper under the bundle cover.	 620-J.10-1
Sensor	A=2-3mm	Loading hopper folding hinge under the harness cover.	 620-J.11-1

Incorrect sensor settings will be displayed on the control panel display in the Input/Output menu settings screen.

**ATTENTION**

Correct sensor setting is essential for optimal machine operation.

I.5.2.669.04.1.EN

6.13 CHECK THE BATTERY

CHECK ELECTROLYTE LEVEL IN THE BATTERY

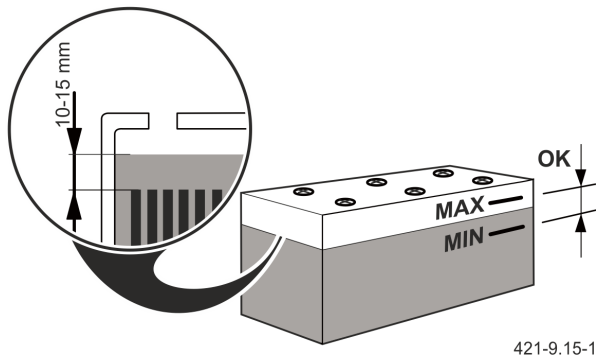


Figure 6.11 Check electrolyte level



DANGER

Electrolyte contained in the battery is a strongly caustic acid. Wear safety goggles and proper working clothes during battery maintenance. Before measuring density, carefully read the Operator Manual of the densimeter. Do not lay tools or other metal items on top of the battery.

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.

The battery in which an excessive loss of electrolyte has occurred may be permanently damaged.

CHECK BATTERY CHARGE LEVEL

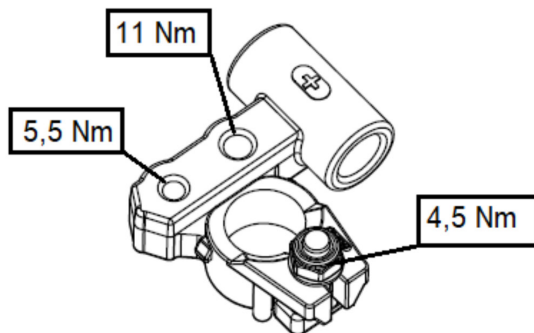
Battery charge level should be checked using available testers or by measuring density of electrolyte.

Electrolyte density should be measured using a densimeter by sampling electrolyte from each battery cell. Density of electrolyte in a properly charged battery should be 1.28 g/cm^3 (not more than 1.29 g/cm^3). If density of electrolyte is lower than 1.26 g/cm^3 , charge the battery. Take the measurement at temperature of 25°C .

If the battery connections are sulphated, disconnect the battery leads and clean the sulphated areas with fine sandpaper. Before reconnecting the leads to the battery, grease them with industrial grade petroleum jelly or electrical contact grease.

J.2.4.415.12.1.EN

6.14 CHECKING THE TIGHTNESS OF SCREW CONNECTIONS OF THE BATTERY CABLES



562-9.28-1

Figure 6.12 Battery clamp

The correct operation of the machine's electrical system depends, among other

things, on the condition of the battery; its charge, correct installation and correct tightening of both terminals.

The correct installation of the clamps should be checked regularly.

- Secure the machine against unintentional or unauthorized starting.
- unscrew and remove the battery cover.
- remove the plastic terminal covers.
- Depending on the type of terminal, tighten the screws to the torque indicated in the drawing.

tighten all screws on each terminal.

- install plastic covers.
- Install and tighten the battery cover.

I.5.2.669.06.1.EN

6.15 BATTERY CHARGING

If the battery is maintenance-free and you cannot check the electrolyte density, check the battery no-load voltage. If voltage drops below 12.5 V, you must charge the battery. 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). The charging time should be at least 10 hours.

- remove battery cover.
- Remove clamps covers.
- disconnect wire (-) from the battery.
- disconnect wire (+) 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.
- Check condition of terminals and any obstruction of ventilation openings in caps and clean if necessary.
- Connect wire (+) of the rectifier and then connect wire (-). Set charging current and connect the rectifier to the mains.
- Charge the battery until electrolyte reaches constant density 1.28 g/cm³. or the voltage on the



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.

In case of contact with acid:

- rinse skin with plenty of water,
- rinse eyes with water for about 15-30 minutes and consult a doctor immediately.

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

Never reverse the positive (+) and negative (-) battery terminals.

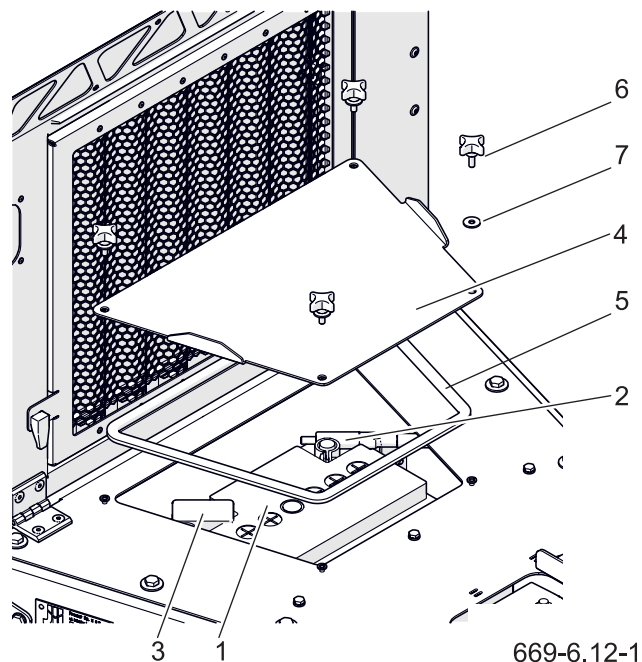


Figure 6.13 Battery

- | | |
|-----------------|-----------|
| (1) battery | (2) clamp |
| (3) clamp cover | (4) cover |
| (5) seal | (8) bolt |

clamps of battery at no load is at least 12.5 V.

- check that the terminals are tightened

to the appropriate torque.

- After tightening, protect terminals with industrial grade petroleum jelly.

During operation of the machine note that battery life is affected by many factors. Important factors include:

- technical condition of the battery,
- operating temperature.

In the even the mobile conveyor will not be operated for an extended period of time,

**ATTENTION**

Ensure proper ventilation when charging battery in a closed building.

we recommend to remove the battery and store it in a warm and ventilated room and to periodically check if it is properly charged. Before installing the battery, check the voltage.

J.2.4.415.13.1.EN

6.16 REPLACE THE BATTERY

- Turn off the engine and remove key from ignition.
- Remove shield.
- Disconnect wire (-) from the battery.
- Disconnect wire (+) from the battery.
- Unscrew battery clamp.
- Remove battery.
- Install a new battery.
- Connect the (+) wire to the battery.



ATTENTION

Avoid short circuits and any contact of live cables with ground.

Do not disconnect the battery when the engine is running. The resulting voltage peaks can destroy electronic components.

- Connect the (–) wire to the battery.
- Install battery clamp and cover.

J.5.2.620.11.1.EN

6.17 AIR PRESSURE MEASUREMENT, INSPECTION OF TYRES AND WHEELS

Check tyres before you drive off when tyres are still cold, or after the machine has been parked for an extended period.

- Connect a manometer to tyre valve and check air pressure. If necessary, inflate the tyre up to the recommended pressure.
- Check technical condition of tyres (tyre tread depth, tyre side wall).
- Check tyre for mechanical defects such as loss, cut, deformation or bulging. In case of mechanical damage consult the nearest tyre service and check whether the tyre defect requires tyre replacement.
- Check that tyre is correctly installed on rim. Check tyre age.

While checking pressure, pay attention to technical condition of wheels. 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.

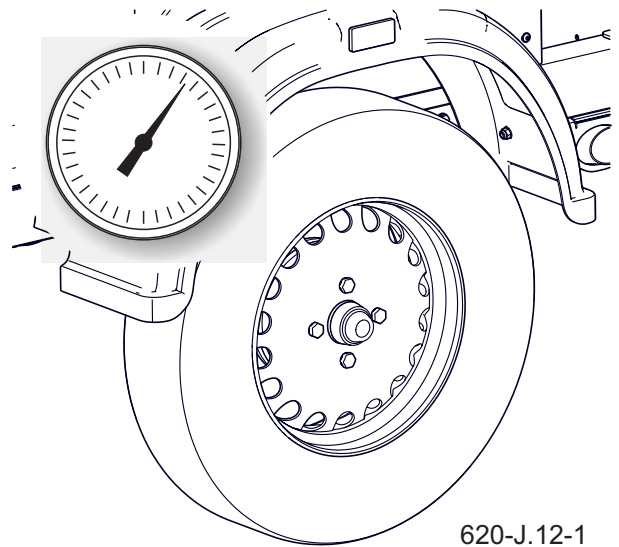


Figure 6.14 Chipper pulley

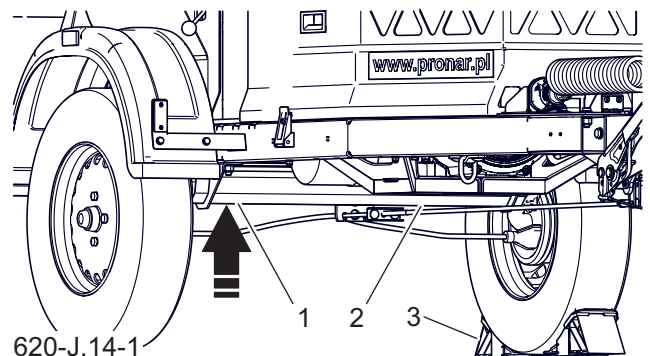


Figure 6.15 The place where the machine is supported by a lifting jack

(1) support point

(2) wheel axle

(3) wheel chock



ATTENTION

Wrong air pressure in tyres may lead to permanent damage of tyres resulting from tyre material delamination and accelerate the wear of tyres.

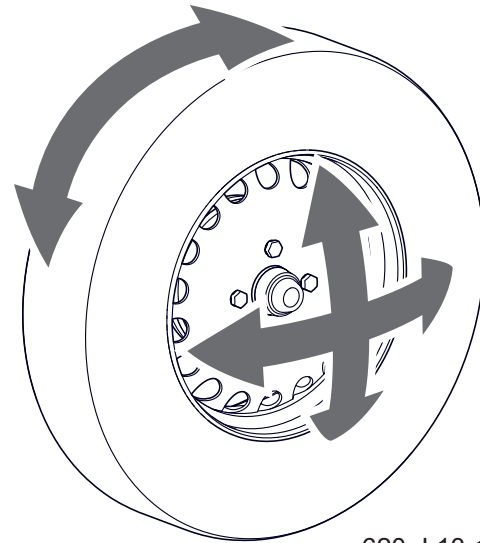
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6.18 CHECKING WHEEL AXLE BEARINGS FOR SLACKNESS

- connect the machine to the carrier, immobilize the carrier with the parking brake.
- Position the tractor and machine to drive forward, on a hard and level surface.
- Place the wheel chocks under the machine's wheel opposite to the lifted wheel.
- Raise the wheel (opposite to the side where chocks are placed). The jack should be placed under the driving axle.

Lifting jack must be suitable for machine weight.

- Turn the wheel slowly in both directions. Check that movement is smooth and that the wheel rotates without excessive resistance and jamming.
- Turn the wheel so that it rotates very quickly, check that the bearing does not make any unusual sounds.
- Moving the wheel try to detect slackness.
- Repeat the procedure for the other wheel, remembering that the lifting jack must be on the side opposite to the chocks.



620-J.13-1

Figure 6.16 Pronar MR-15 mobile chipper wheel



DANGER

Before commencing work you 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. Make sure that the machine does not roll when checking the wheel axle bearings slackness.

Only inspect bearings for looseness, when the machine is hitched to a carrier vehicle.

Unusual noise made by the bearing may be a symptom of excessive wear, dirt or damage.

Signs of wear should be reported to the manufacturer's service centre. Detailed instructions for the axle are included with the machine documentation.

J.5.2.620.13.1.EN

6.19 CHECK THICKNESS OF BRAKE SHOE LININGS

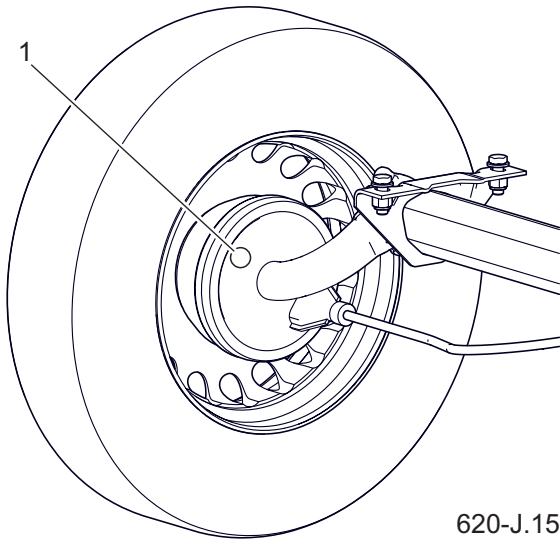


Figure 6.17 Check thickness of brake shoe linings

(1) inspection window

During machine transport, friction lining of brake drums is subject to wear. In such a case, the complete brake shoes should be adjusted or replaced with new ones. Transporting the machine in mountainous terrain causes faster wear of the brake shoe linings. Check the thickness of the

TIP

Check brake shoe linings for wear:

- when braking efficiency has decreased,
- according to the inspection schedule,
- if brakes overheat,
- if there are unusual sounds coming from the area of the drive axle.



ATTENTION

Maintenance and repairs of the braking system should be entrusted to authorized service centres.



DANGER

Driving with a faulty brake system is not allowed and can lead to serious accidents.

brake shoe linings through the inspection window. If the lining thickness is less than 2mm, the brake shoes should be replaced with new ones. Adjustments should be performed by an authorized service centre.

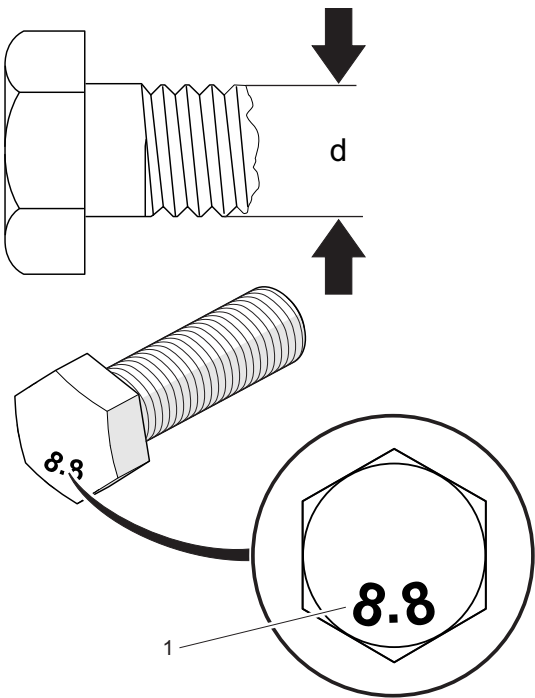
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6.20 CHECK TIGHTENING TORQUE OF NUT AND BOLT CONNECTIONS

TIGHTENING TORQUE FOR NUT AND BOLT CONNECTIONS

During maintenance or repair work, apply appropriate torque when tightening bolt and nut connections, unless other tightening torque values are given. Recommended tightening torque values for the most frequently used bolt and nut connections are given in table (6.9). Given values apply to non-lubricated steel bolts. Hydraulic lines should be tightened with a torque of 50-70 Nm.

Tightening torque should be checked using a torque wrench. During daily inspection of



589-I.10-1

Figure 6.18 Bolt with metric thread.
(1) strength class, (d) thread diameter

Table 6.9 Tightening torque for nut and bolt connections

THREAD DIAMETER [mm]	5.8	8.8	10.9
	TIGHTENING TORQUE [Nm]		
M6	8	10	15
M8	18	25	36
M10	37	49	72
M12	64	85	125
M14	100	135	200
M16	160	210	310
M20	300	425	610
M24	530	730	1050
M27	820	1150	1650
M30	1050	1450	2100
M32	1050	1450	2100

the machine, pay attention to loosen connections and tighten them, if necessary. Lost components must be replaced with new ones.

TIGHTENING OF WHEEL NUTS

Wheel bolts should be tightened gradually and diagonally (in several stages, until the required tightening torque is obtained) using a torque wrench. The recommended sequence for tightening the screws is shown in figure (6.18).

Wheel bolts must not be tightened with impact wrench because of danger of exceeding permissible tightening torque, the consequence of which may be breaking the connection thread.

Wheel nuts should be tightened:

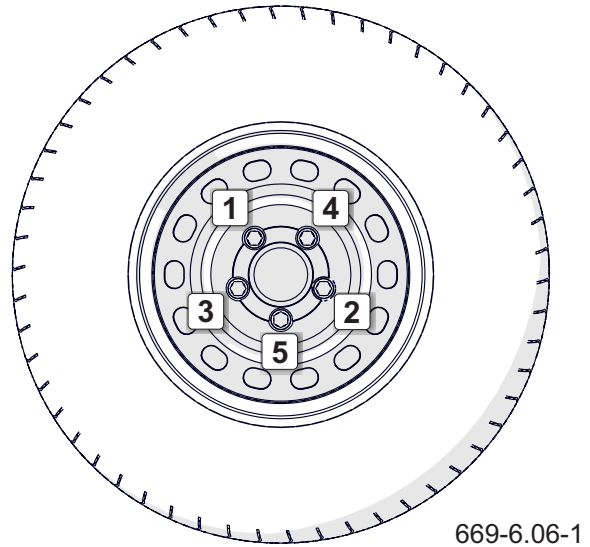


Figure 6.19 Sequence of bolt tightening

- after the first drive of the machine,
- every 20 km of driving during the first month of use,
- every 1,000 km of driving.

The above activities should be repeated if a wheel has been removed from the wheel axle.

J.5.2.620.15.1.EN

6.21 CHECK THE VEE BELTS TENSION

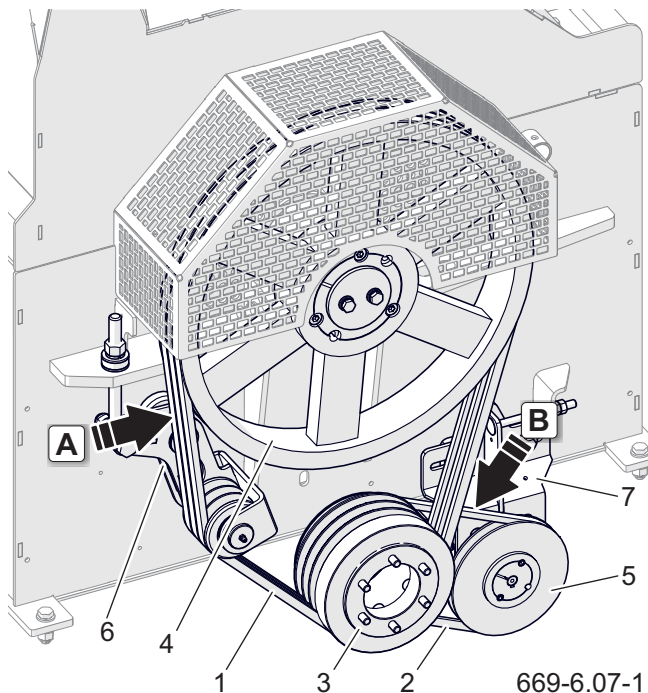


Figure 6.20 Drive belts

- | | |
|--------------------|---------------------|
| (1) V-belt | (2) pump belt |
| (3) motor pulley | (4) mechanism wheel |
| (5) pump wheel | (6) belts tensioner |
| (7) pump tensioner | |

The correct material shredding process requires the appropriate tension of the V-belts driving the shredding mechanism (1) as well as the hydraulic pump drive belt (2). If the belts show signs of wear, damage, surface fraying or have been excessively stretched, they should be replaced with new ones. Incorrect V-belt tension will result in poor shredding performance, wear of belts and pulleys.

TENSION OF VEE-BELTS

- open the front cover,



ATTENTION

Use only original spare parts.
Always replace V-belts in sets.
Pay particular attention to the condition of the V-belt covers and the completeness of their mountings.

- unscrew and tilt the top cover of the shredding mechanism,
- remove the side covers,
- inspect the pulleys carefully, damaged or cracked pulleys should be replaced with new ones,
- check, if possible, the axial and transverse play of all pulleys,
- check the tension of the drive belts (1), if the belt tension is insufficient, use the tensioner (6) to tension the belts so that under a pressure of 4.5 kg the belt deflects by 6 mm,
- check the belt tension of the hydraulic pump (2), if the belt tension is insufficient, use the tensioner (7) to tension the belts so that the belt deflects by 6 mm under a pressure of 4.5 kg,
- check the adhesion of the drive belts to the individual pulleys,
- replace all covers, close the working chamber, lower the front cover.

REPLACING THE SHREDDING

MECHANISM V- BELTS

- open the front cover,
- remove the side covers,
- unscrew and tilt the top cover of the shredding mechanism,
- remove vee-belt side shields (3) and (4),
- loosen tensioning nut (7) of tensioner (5).
- remove the worn V-belts (1),
- unscrew the tensioner pulley and check whether it rotates without jamming or disturbing noises, assess the condition of the bearings,
- Install new V-belts (1) starting from the engine drive pulley,
- tighten the belts so that under a pressure of 4.5 kg the belt deflects by 6 mm,
- check the adhesion of the drive belts to both pulleys,
- put on all covers, close the working chamber, lower the front flap.
- start the machine for a while, then switch it off and check the belt tension again.

PUMP V- BELT REPLACEMENT

- open the front cover,
- remove the side covers,
- unscrew and tilt the top cover of the shredding mechanism,

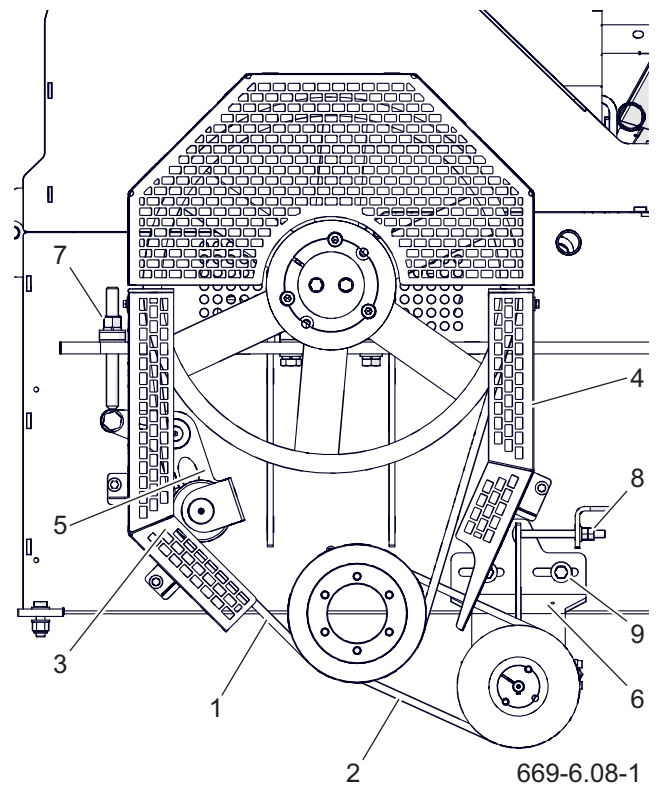


Figure 6.21 Vee belt transmissions

- | | |
|-------------------------|--------------------|
| (1) mechanism belts | (2) pump belt |
| (3) right cover | (4) left shield |
| (5) mechanism tensioner | (6) pump tensioner |
| (7) nut | (8) nut |
| (9) bolt | |

- remove vee-belt side shields (3) and (4),
- loosen the screws (9) of the pump tensioner (6),
- loosen the tensioning nut (8) of the pump tensioner (6),
- remove the used V-belt (2),
- install a new V-belt (2) starting from the engine drive pulley,
- tighten the belt so that under a pressure of 4.5 kg the belt deflects by 6 mm,

- check the adhesion of the drive belt to both pulleys,
- put on all covers, close the working chamber, lower the front flap.
- start the machine for a while, after switching it off check the tension of all belts again.

**DANGER**

Belt drives rotate at high speeds. DO NOT operate the machine with removed or damaged guards and covers. Risk of serious accidents.

Damaged belt transmission elements must be replaced with new ones, recommended by the machine manufacturer.

I.5.2.669.05.1.EN

SECTION 7

ENGINE

7.1 GENERAL INFORMATION

Chapter *ENGINE MAINTENANCE* contains only the technical description of the engine and instructions for starting, operating and maintaining the engine. When operating the engine, observe standards and legal regulations currently in force as

well as all internal regulations.

To ensure correct use of the engine, the prescribed inspection and maintenance intervals must be adhered to. Failure to follow the above-mentioned rules will cause damage to the engine.

K2.2.4.415.01.1.EN

7.2 SAFETY RULES DURING ENGINE MAINTENANCE

- Before starting the engine, it is absolutely necessary to carefully read the Operator Manuals of the machine and the engine. This will prevent accidents, enable proper operation and maintenance and thus ensure maximum service life of the engine.
- Before starting the engine, make sure that all required protection devices are installed.
- The engine may be operated, maintained and repaired only by authorized (qualified) people.
- Do not start the engine in closed rooms or in rooms without ventilation system. Exhaust gas is toxic and it may cause loss of consciousness or even death.
- Do not approach the rotating parts of the engine.
- Keep a safe distance from hot elements of the engine. Risk of burn injuries. Keep flammable and explosive materials away from the engine.
- 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.
- Fuel fumes are very toxic. The fuel producer's instructions must be complied with.
- Only refuel when the engine is switched off.
- Do not fill the fuel tank completely. Allow space for fuel expansion.
- Immediately wipe away spilt fuel and oil. 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.
- All maintenance and repair work should be performed only when the engine is stopped, cool and disconnected from power supply. Disconnect the electrical leads from the battery. Ensure unauthorised people have no access to the ignition key.
- While performing maintenance and repair work, use proper, close-fitting protective clothing, gloves, protective shoes, protective goggles and appropriate tools. Do not wear jewellery chains or other loose objects that can be easily caught by the engine components.
- Start the engine using only the

starting system installed in the machine. The use of electrical bypasses is forbidden.

- The engine is marked with information-warning decals. Follow the instructions on the decals.
- Ensure that the information and warning decals are legible throughout the entire period of the engine use. Clean the decals with clean water or water with a small amount of detergent. If any are destroyed or damaged, they must be replaced with new.
- The applicable regulations for the protection and disposal of used oils, coolants, filters and cleaning agents must be complied with.
- Visually inspect the fuel hoses before starting the engine. Fuel released under high pressure may cause bodily injuries and burns as well as it may cause a fire. Perform technical inspections regularly.
- When performing maintenance work,

be particularly aware of condensate from the exhaust system, which may contain sulfuric acid. Sulfuric acid burns are dangerous to health and life. In the event of contact of acid with skin, rinse the place of contact using plenty of clean running water. Consult a doctor.

- 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.
- Running the engine at no load or at a very low load for a long period may negatively affect its performance. Make sure that the engine load is at least 15%. With such a low degree of the engine power utilization, the engine load should be increased shortly before it is turned off.

K.5.2.669.01.1.EN

7.3 TECHNICAL DATA AND DESIGN OF ENGINE

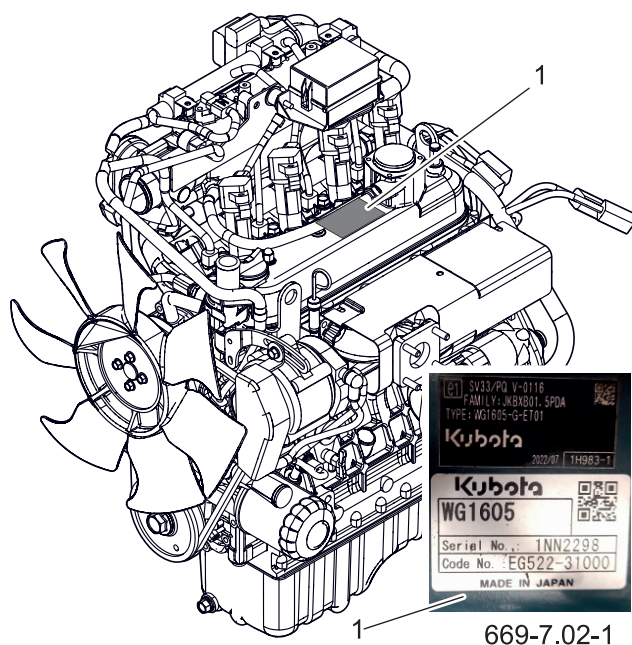


Figure 7.1 Location of the information decal.
(1) information decal with QR code

When purchasing the PRONAR MR-20 mobile chipper, the user receives the original operating and maintenance instructions from the combustion engine manufacturer.

When ordering spare parts or obtaining technical assistance for a combustion engine, please provide the following information: date of purchase, model - type and serial number of the engine. This information should be read from the information sticker and it is recommended that you write it down.

Table 7.1 Basic engine specification

Type		WG1605-G-E3
Type of engine	-	four-stroke engine naturally aspirated cooled with liquid
Combustion system	-	direct injection
Number of cylinders	-	4
Bore / stroke	mm	79,0 / 78,4
Engine displacement	cm ³	1537
Coolant capacity (with radiator)	L	4.0
Engine oil capacity	L	6.0 ⁽¹⁾
Spark plug gap	mm	0.7 - 0.8
Weight	kg	120
Battery power	max. Ah	12V / 56 Ah
Maximum torque	Nm rpm	111 / 2 400
Maximum engine speed	rmp (min ⁻¹)	3600
Maximum engine speed	rmp (min ⁻¹)	750
Degree of compression	-	9.1

⁽¹⁾ - These values should be treated as approximate. The MAX mark on the oil level indicator is always decisive



ATTENTION

If you require technical support or when ordering spare parts, you must provide the machine purchase date, model or code and engine serial number.

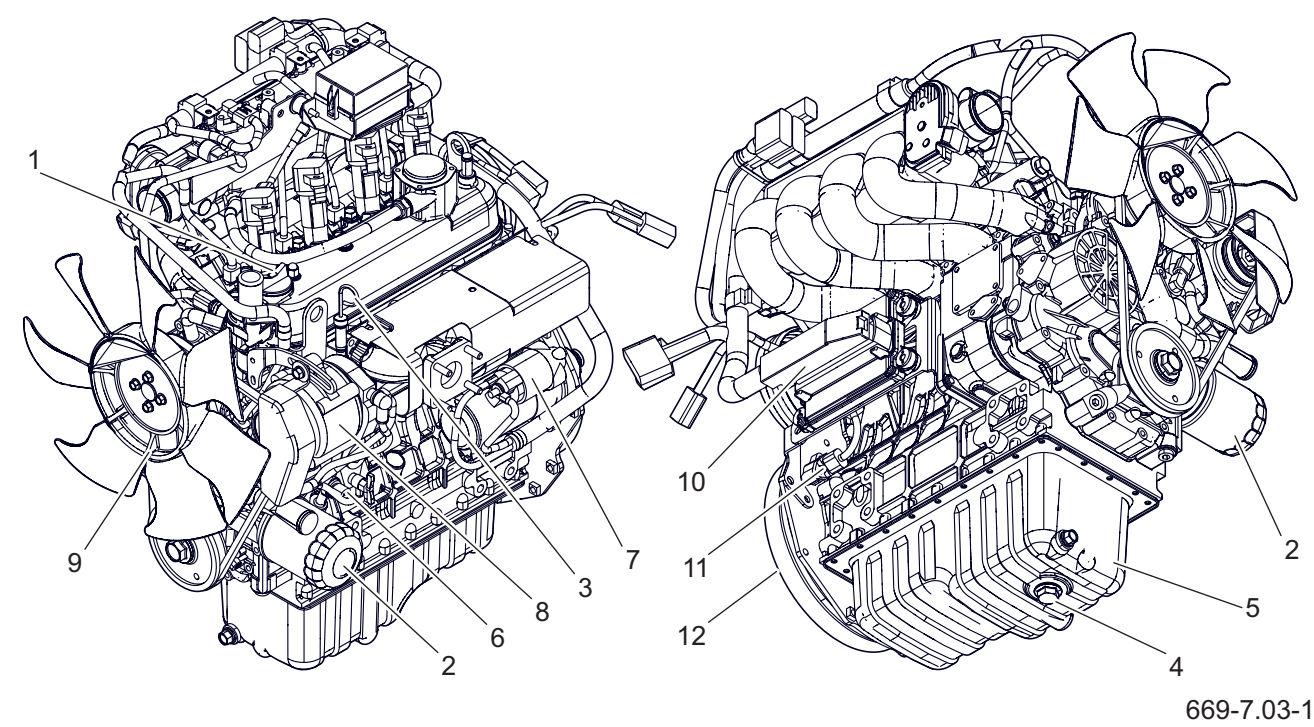


Figure 7.2 Engine design.

- (1) oil filler
- (2) oil filter
- (3) oil level dipstick
- (4) oil drain plug
- (5) oil pan
- (6) oil pressure and temperature sensor
- (7) starter
- (8) alternator
- (9) fan
- (10) engine controller
- (11) crankshaft position sensor
- (12) flywheel

Table 7.2 Engine data

Contents	Data
Purchase date	
Model - Type - Code	
Engine serial number	

TIP

When purchasing the machine, the end user will receive the Operating Instructions from the manufacturer of the combustion engine.

7.4 START THE ENGINE

Before the first start-up of the engine, carry out checks in accordance with the guidelines contained in section 5.1 *PREPARING FOR WORK BEFORE THE FIRST START-UP*.

PREPARING THE ENGINE FOR START-UP

- Check the engine oil level and add oil if necessary.

The engine must be positioned horizontally when checking the oil level.

- Check the fuel level in the tank and add fuel if necessary.

When filling the fuel tank for the first time, with an empty fuel system or after replacing the fuel filter, you will experience difficulty starting before the fuel fills the entire fuel system.

- Check coolant level and add coolant.
- Check that the engine cover is closed correctly, unfold the loading platform.

The engine can only be started when the engine cover is closed and the loading platform is unfolded.

- In the Alarms and warnings screen, clear all errors.



DANGER

Before starting the machine, ensure that there are no bystanders in the danger zone. Do not start the engine in closed or unventilated spaces, engine exhaust fumes are highly toxic. Fuel and its vapours are flammable and explosive.



ATTENTION

Before each start-up, the operator must check condition of the machine to make certain that it can be operated in a safe manner. Never use aerosol starting aids!

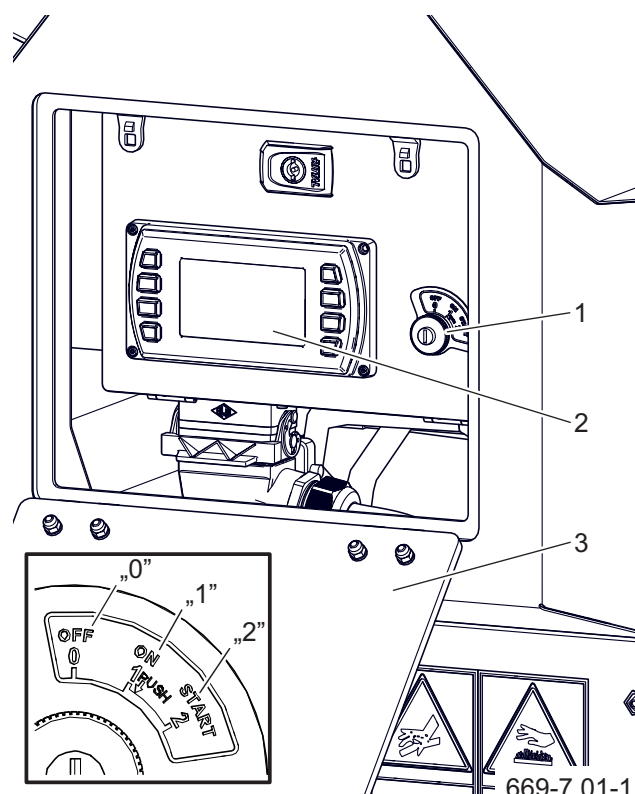


Figure 7.3 Starting the engine

(1) Ignition key

(2) control panel

(3) panel guard

If any alarm or warning occurs, the engine will not start. Press the RESET button.

STARTING THE ENGINE

- Open the cover (4) of the control panel (3). Insert the ignition key (1) into the ignition - Figure 7.3.
- Turn the key (1) to the ON "1" position, then to the START "2" position.

To extend the life of the starter, use short starting cycles (maximum 5 seconds). Wait one minute between start attempts.

- Release the ignition key after starting the engine.

The key returns to position "1" ON and remains in this position during the engine operation. The next start-up can be performed



ATTENTION

During breaks or after finishing the machine operation, secure the key against unauthorized access. Protect the ignition switch against dirt and moisture. With the ignition key removed, close the control panel cover.

after the ignition is reset (the key in "0" OFF position).

- After starting the engine, working time of the engine is being counted.
- Leave the engine under no load for a few minutes until the engine temperature begins to rise.
- Observe the engine operation indicators on the control panel.

K.5.2.669.03.1.EN

7.5 STOP THE ENGINE

TIP

When the machine is turned off, always turn the ignition key to position "0", otherwise the battery may be completely discharged.

Depending on the situation, the engine can be turned off in two ways:

- Ignition key.
- Emergency button.

TURNING OFF THE ENGINE WITH THE IGNITION KEY

- Reduce engine speed to idle, wait a moment.
- Turn the ignition key to position "0" OFF.

The engine will shut off.

- Remove key from ignition.
- Close the control panel's cover.

TURNING OFF THE ENGINE WITH THE SAFETY BUTTON

- At any time during machine operation, pressing one of the two safety buttons (1) will stop the feed and immediately turn off the engine.

The engine and therefore the operation of the machine will be stopped. The control panel will



DANGER

Sudden engine stopping is justified in unexpected situations such as a threat to health and life, a serious damage, fire, etc.



ATTENTION

Before turning off the engine, reduce the engine speed, wait a moment, and then turn the engine off. Do not stop the engine at high speed or while shredding material.

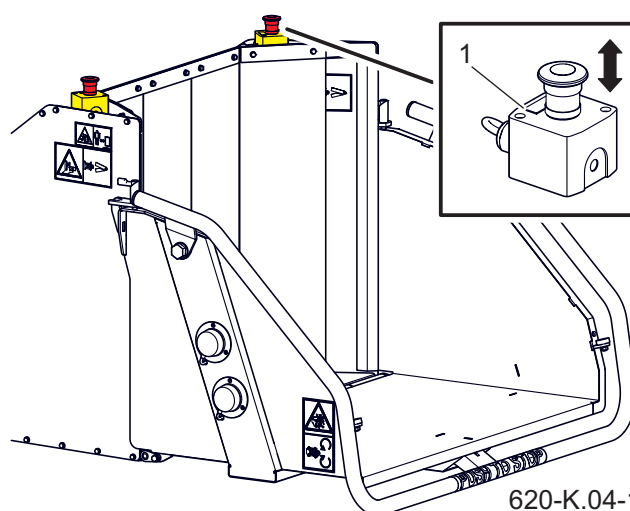


Figure 7.4 Safety button.

display the message STOP.

- Turn the ignition key to 0 (OFF) position and remove the key from the ignition.
- After removing the ignition key, pull the safety button and make sure it returns to its original position.

K.5.2.669.03.1.EN

7.6 TECHNICAL INSPECTIONS

Table 7.3 Engine maintenance schedule

	After the first 5 hours of operation	every 8 - 15 hours or daily before the first start-up	every 100 hours	every 250 hours	If needed	Inspection conducted by
Walk-around inspection		•				U
Engine cleaning					•	U
Checking the level of engine lubricating oil		•				U
Check engine coolant level		•				U
Checking and replacing spark plugs			•			U
Cleaning or changing air filter			•			U
Checking the cooling air area		•				U
Change oil and oil filter	•		•			U
Checking and adjusting the engine valve clearance				•		S
Check tightening torque of nut and bolt connections	• ⁽¹⁾		•			S
Replacement of fuel filter			• ⁽²⁾		•	S
⁽¹⁾ - or after 12 months at the latest, irrespective of the total number of engine operating hours ⁽²⁾ - the frequency of the fuel filter servicing depends on the fuel cleanliness; it may be necessary to reduce the frequency to 250 engine operating hours S - Warranty Service; U - User						

During the warranty period, the inspections marked with the letter "S" are performed by a Warranty Service. After the warranty period, we recommended that these inspections should be performed by specialised workshops.

The inspections marked with the letter "U"

are performed by the machine operator according to the schedule.

Maintenance work beyond the scope described in the Operator Manual may only be performed by authorized (qualified) people.

7.7 WALK-AROUND INSPECTION

Walk-around inspection is a detailed inspection of the engine compartment. Carry out the inspection each time before starting the machine. During walk-around inspection, pay special attention to leaks of fuel and oil. If a leak is detected, determine the place and cause of the leak. Wipe up any spilled liquid and repair or replace damaged parts before starting the engine.

- Check completeness of plugs, stoppers, etc.
- Confirm that protective shields are technically sound and correctly positioned.
- Check wiring harnesses for damage (abrasion of insulation, broken leads, loosening, contact with hot components, etc.).
- Pay attention to loosen bolt and nut connections and tighten them, if



DANGER

Damaged fuel system lines may cause a leak of fuel under pressure, which may cause a fire.



ATTENTION

Do NOT use the machine with damaged conduits. Damaged and leaking conduits may cause a serious defect.

necessary.

- Check elastic conduits for mechanical damage and leaks. Damaged or worn conduits should be replaced. Check band clips and tighten them, if necessary.
- Make sure that the engine compartment is clean, and remove dirt, if necessary.
- If DO NOT START (or similar) label is attached, contact the person who has attached the warning label. The engine may be out of order.

K2.2.4.415.07.1.EN

7.8 ENGINE CLEANING

Before cleaning the engine, stop the engine. Take care to prevent unauthorized operation. The plate with the inscription **DO NOT START** should be suspended in a well visible place for the period of cleaning (e.g. near the ignition).

Always keep the engine clean. Do not clean the engine using aggressive chemicals. Blowing with compressed air is usually sufficient. In case of doubts, contact the engine manufacturer experts. When cleaning, avoid dampening the electrical system components (cables, starter, sensors, etc.) If this is unavoidable, disconnect the battery first and dry all



DANGER

Cleaning, maintenance and repair work should only be carried out with the engine turned off. Engine contaminated with grease, fuel or oil creates fire hazard. Accumulated deposits or spilt flammable liquids should be regularly removed.

components thoroughly with compressed air before reconnecting.

Visually inspect the engine for leaks.

Do not clean the engine and its accessories with a pressure washer. Pressure can cause a lot of damage, and water can get to undesirable places. Observe the rules contained in chapter “*Cleaning the machine*”.

K.5.2.669.05.1.EN

7.9 CHECKING THE LEVEL OF ENGINE LUBRICATING OIL

- Turn off the engine and wait a few minutes for the engine oil to flow down to the crankcase.

The engine must be cool and level.

- Secure the machine against unintentional starting.
- Open engine cover.
- Clean debris from the engine in the area of the oil dipstick (1).
- Take out oil dipstick and wipe it until dry.
- Insert oil dipstick and take it out again to check the engine oil level.

Add engine oil up to the top mark on the oil dipstick.

- If engine oil level is too low, unscrew filler plug (2) and add proper amount of oil.
- After fresh oil is added, wait until oil flows into the oil pan and check oil level again.
- Tighten the filler plug (2) and insert the oil dipstick (1).

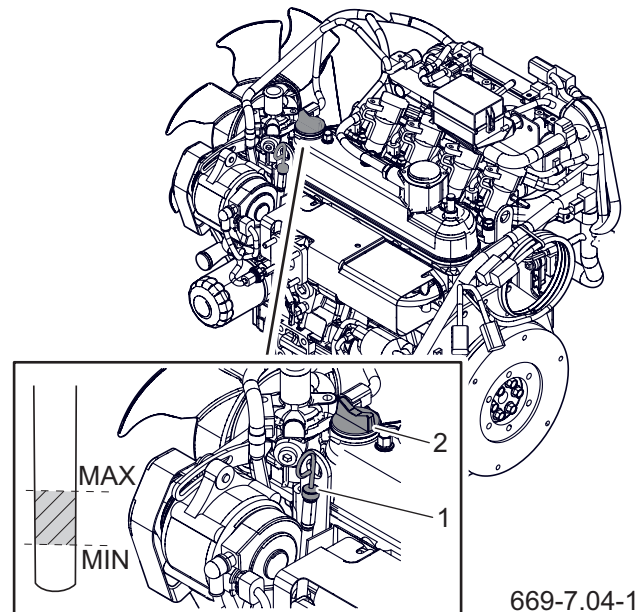


Figure 7.5 Engine lubricating oil.
(1) oil dipstick (2) filler plug



ATTENTION

Operating the engine with the oil level below the MIN level or above the MAX level can cause damage to the engine.

The engine must be cool and positioned horizontally when checking the oil level.

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

K2.2.4.415.09.1.EN

7.10 CHECK ENGINE COOLANT LEVEL

- Set the machine on a level surface.
- Turn off the engine and wait for the coolant to cool.
- Secure the machine against unintentional starting.
- Open engine cover.
- Locate the minimum and maximum level markings on the reservoir.
- Check engine coolant level.
- The correct coolant level should be between the maximum level (FULL) and the minimum level (LOW).
- The coolant level must not be lower than the mark on the expansion tank. If the coolant level is too low, add more.

Add coolant slowly so that the air escapes freely. Add the coolant to the maximum level.

- Close the engine cover.

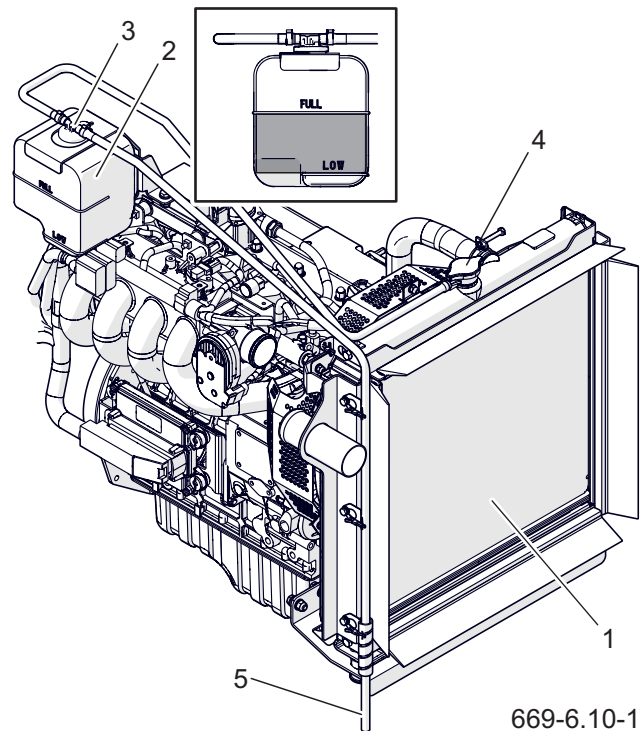


Figure 7.6 Oil filter

- | | |
|---------------|------------------|
| (1) radiator | (2) tank |
| (3) tank plug | (4) radiator cap |
| (5) overflow | |



DANGER

The radiator cap should be unscrewed very slowly when the engine is turned off and cooled down. Danger of burns due to fumes or hot coolant.



ATTENTION

Never mix different types of coolant. Always use the coolant recommended by the manufacturer.

K.5.2.669.12.1.EN

7.11 CHECKING AND REPLACING SPARK PLUGS

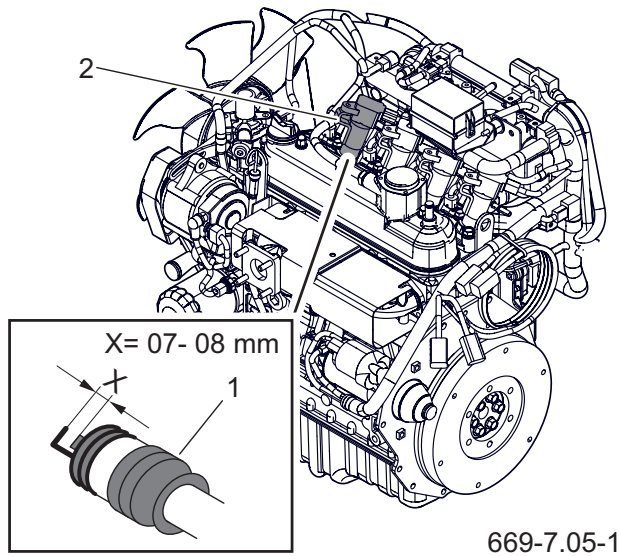


Figure 7.7 Engine spark plugs.

(1) spark plug

(2) cap

- Secure the machine against unintentional starting.
- Open engine cover.



DANGER

Wait until the engine cools down before starting maintenance or repair work. Risk of burns.

- With the engine cold, remove the cap (2).
- Unscrew the spark plug (1) and check the gap with a feeler gauge, the correct value should be 0.7 - 0.8 mm.
- Adjust the electrode gap or replace the spark plug.
- Install the spark plug and tighten it to 20Nm.
- Put the cap on.
- Repeat the steps for the remaining spark plugs.

K.5.2.669.06.1.EN

7.12 CLEANING OR CHANGING AIR FILTER

Table 7.4 Air filters list

Name	Manufacturer no.
Complete air filter	1G994-11010
Air pre-filter	TA040-93230
Fine air filter	TA040-93220

- Secure the machine against unintentional starting.
- Open engine cover.
- Squeeze the valve end with your hand to empty it of dust.
- Open the filter cover by unclipping the clips.
- Remove the pre-filter and fine filter.
- Clean both filters by directing a stream of compressed air into the interior of the cartridge.

DO NOT shake or tap the filters due to the risk of damaging the inserts.

Once the cartridges are removed from the housing, do not blow dirt out of the filter housing.

Risk of contamination entering the intake manifold.

- After cleaning the cartridges, reassemble the filter set in reverse order.

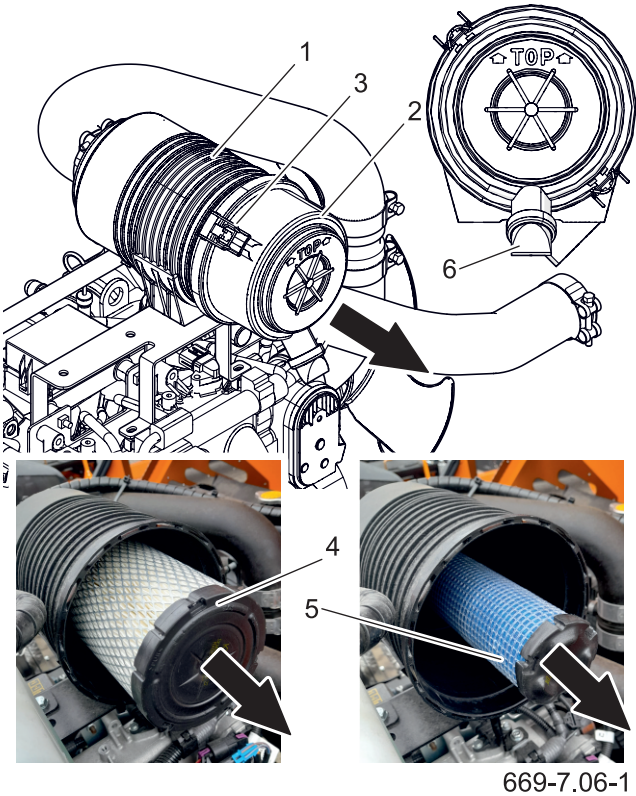


Figure 7.8 Air filter

- (1) complete air filter

(2) filter cover

(3) catches

(4) pre-filter

(5) fine filter

(6) valve



ATTENTION

DO NOT start the engine without an air filter. Contaminated air entering the combustion chamber can cause serious and permanent damage to the engine. Use filters recommended by the engine manufacturer.

- Close the engine cover.

K.5.2.669.07.1.EN

7.13 CHECKING THE COOLING AIR AREA AND RADIATOR.

The internal combustion engine is cooled by liquid which is cooled in the radiator. Dirt or debris can restrict airflow through the radiator and cause the engine to overheat, resulting in reduced performance and reduced engine life.

- Secure the machine against unintentional starting.
- Open engine cover.
- Using a brush or compressed air, clean the cover ventilation holes.
- Check and remove any flammable material remaining in the exhaust system.
- Blow the radiator with compressed air in the direction opposite to normal air flow direction.

The compressed air nozzle should be guided at a distance of at least 6 mm from the radiator

TIP

Heavy contamination indicates that the air filter maintenance intervals should be shortened accordingly due to heavy dusting.



ATTENTION

The frequency of radiator cleaning should be increased if the machine works in extremely difficult conditions.

Allowed air pressure is 205 kPa.

Allowed water pressure is 275 kPa.

fins, in parallel to the core pipes.

- Cleaning may be also performed with a water jet under pressure, especially if the core is contaminated with mud.
- Close the engine cover.
- After cleaning the radiator, run the engine at nominal speed without load. This will help dry the radiator.

K.5.2.669.08.1.EN

7.14 CHANGE OIL AND OIL FILTER

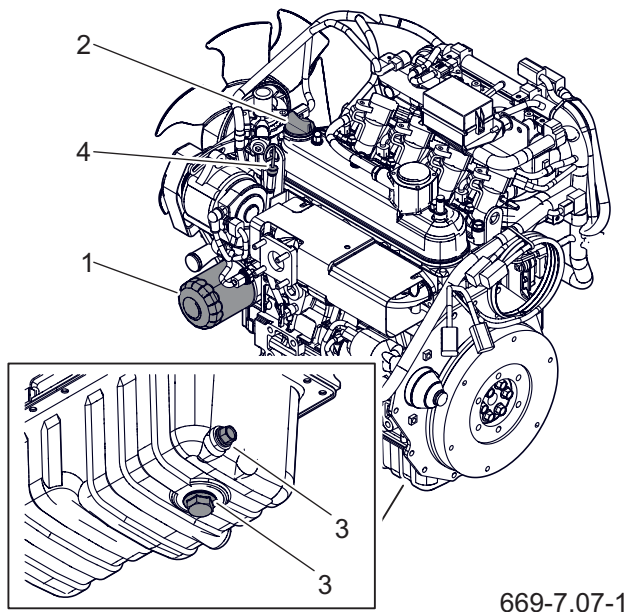


Figure 7.9 Engine lubrication oil.

(1) oil filter

(2) filler plug

(3) drain plug

(4) oil level dipstick

TIP

Immediately before changing the oil, the engine should be warmed up to normal operating temperature.

Check the oil level on a cold engine. However, if the engine has been running, wait 10 minutes before taking the measurement to allow all the oil to drain into the oil pan.



DANGER

Keep a safe distance and do not touch hot engine components - risk of burns.

Hot oil can cause burns, use extreme caution.

- Unscrew the drain plug (3) and drain oil into the container.
- Unscrew the filter (1).
- Clean any dirt from around the drain plug and oil filter base.
- Screw on the drain plug.
- Before installing the new oil filter, lubricate its seal with a small amount of clean engine oil.
- Screw on the new oil filter by hand, the use of additional tools is not necessary.
- Insert the oil level dipstick (4). Unscrew oil filler plug (2).
- Clean the oil filler cap area. Pour in new oil.
- Tighten the filler cap, insert the oil dipstick, and carefully wipe off any spilled oil.



ATTENTION

Use oils and filters recommended by the engine manufacturer. The use of inappropriate components may result in serious failure and void the warranty. Never add engine oil above the maximum permissible level marked MAX on the dipstick.

Regular oil changes and oil filter replacement are essential for the proper operation of the combustion engine.

- Start the engine and warm up the oil, stop the engine.
- Secure the machine against unintentional starting.
- Open engine cover.
- Remove the dipstick (4).

- Close the engine cover and unfold the loading platform.
- Start the engine and check for leaks.
- Check oil level, add oil if necessary

TIP

The manufacturer's recommended oil filter W21E-SO1600 should be used.

Recommended engine oil: Kubota Power Plus 10W30 (SAE 30 100028) in the amount of 6l.

K.5.2.669.09.1.EN

7.15 CONSUMABLES

Table 7.5 List of Kubota consumables

Place of application - name	Quantity	Number / type / standard
Complete air filter	1 pc	1G994-11010
Air pre-filter	1 pc	TA040-93230
Fine air filter	1 pcs	TA040-93220
Engine oil filter	1 pc	W21ESO1600
Fuel filter	1 pc	1258143012
Engine oil (including sump capacity)	6 L	Kubota Power Plus 10W30 SAE 30 100028
Coolant (with radiator)	4 L	Ethylene glycol based fluid
Fuel tank - unleaded petrol	35 L	PN-EN 590+A1:2010

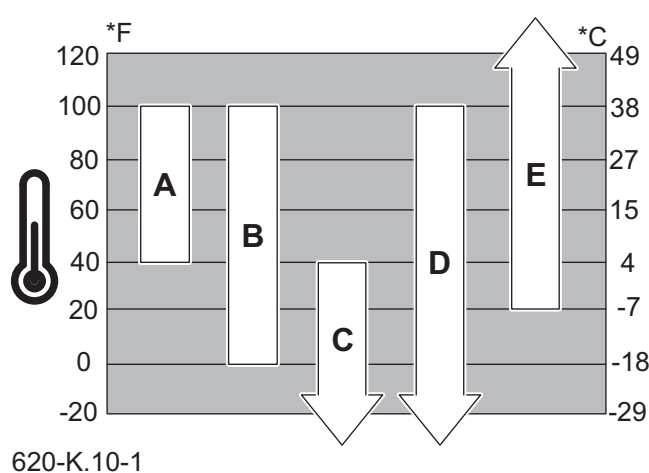


Figure 7.10 Oil viscosity grade depending on temperature



ATTENTION

Wrong engine oil significantly shortens the engine's service life.
Use only engine oil that meets the manufacturer specifications.

For best performance, it is recommended to use the warranty certified Kubota power Plus 10W30 oil. Other high quality oils are acceptable. Oil with added detergent if marked "For Service SF, SG, SH, SJ"

Table 7.6 Engine oil classification

Item	Engine oil typ
A	SAE 30 - If SAE 30 oil is used at temperatures below 40°F (4°C), the engine will be difficult to start.
B	10W30 - At temperatures above 80°F (27°C) use of 10W-30 oil may result in increased oil consumption. The oil level should be checked more often.
C	5W-30
D	5W-30 synthetic
E	15W-50 synthetic

or higher. No special additives should be used.

The proper viscosity of engine oil is determined by the ambient temperature. Use

Figure (7.9) to select the best oil viscosity for a given ambient temperature range.

K.5.2.669.11.1.EN

7.16 TROUBLESHOOTING

Table 7.7 Engine faults and troubleshooting

Fault	Possible cause	Solution
Engine does not start or starts poorly, but the starter rotates the engine crankshaft.	No fuel in the fuel pump.	Add fuel. Check the entire fuel system thoroughly. If no defects are found, check: - conduit leading to the engine, - fuel filter, - operation of the fuel supply pump.
	Compression too low: - Incorrectly set valves. - Worn valves. - Worn cylinder and / or piston ring.	Check valve clearance, adjust if necessary. * Repair *
	Faulty spark plugs.	Check and replace sparking plugs if necessary.
Engine does not start in cold weather	Engine starting speed too low: - Oil too thick. - Insufficiently charged battery.	Change engine oil. Pour in oil of the correct viscosity grade * Check the battery, if necessary, contact the service centre.
Defective starter or engine does not rev up.	Disturbances in the electrical system: - Battery cables and / or other cable connections incorrectly connected. - Loose and / or rusty cable connections. - Defective and / or not charged battery. - Defective starter. - Defective relays or monitoring devices, etc.	Check the electrical system and its components or contact the service centre
The engine starts, but immediately cuts out when the starter is disengaged.	Clogged fuel filter.	Replace the filter *
	Fuel circulation interrupted.	Check the entire fuel system thoroughly.
The engine shuts off by itself.	Mechanical damage.	Contact the service centre
	Fuel circulation interrupted: - No fuel in the fuel tank. - Clogged fuel filter. - Defective fuel supply pump.	Refuel. Replace the filter * Check the entire fuel system*

Fault	Possible cause	Solution
The engine loses power and revs.	Defective fuel system. - No fuel in the fuel tank. - Clogged fuel filter. - Insufficient fuel tank venting.	Refuel. Replace the filter * Provide sufficient fuel tank venting.
	Leaky conduit connections.	Check conduit connections for tightness.
	Uneven engine speed.	Check the operation of the fuel dose control solenoid valve.
The engine loses power and revs, black smoke comes out of the exhaust pipe.	Contaminated air filter.	Clean the air filter or replace it with a new one if necessary. *
	Incorrectly adjusted valves.	Adjust the valves *
The engine is over-heating.	Too much lubricating oil in the engine.	Drain the engine oil to the upper mark (MAX) on the oil dipstick
	Contaminated the entire cooling air area.	Clean the cooling air area.
High coolant temperature	Insufficient amount of coolant in the system.	Check coolant level and add coolant. Faulty level sensor.
	Leak in engine cooling system.	Check and seal engine cooling system. Replace damaged parts.
	Damaged thermostat	Replace thermostat.
	Contaminated radiator.	Clean the radiator
	Contaminated radiator cover.	Clean the cover.
	Sensor circuit shorted	Repair sensor wire.
	Broken cylinder head, damaged cylinder head gasket.	Repair engine.
No battery charging.	Damaged voltage regulator	Repair regulator
	Damaged rectifier system	Repair system
	Worn brushes.	Replace brushes, check rings.
	Broken alternator drive vee-belt	Replace vee-belt.
* during the warranty period inspections and repairs are carried out by authorised service		

SECTION 8

LUBRICATION

8.1 LUBRICATION

Lubrication of the machine should be performed according to the specified schedule or each time after washing the machine, regardless of the date of previous lubrication. Keep lubrication points clean as excessive amount of lubricant causes dirt to accumulate. Lubrication should be performed using generally available tools such as manually or foot operated pneumatic grease guns, etc. filled with a recommended grease.

Before commencing lubrication, remove old grease and other contaminations.



ATTENTION

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



DANGER

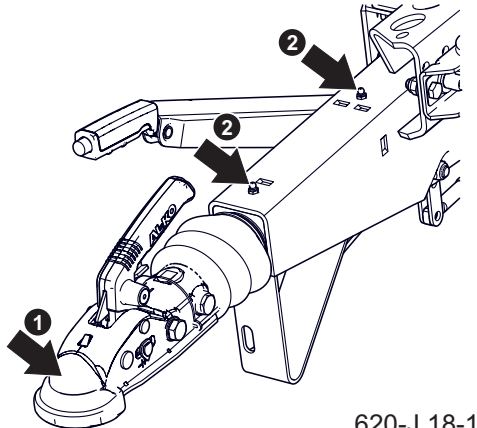
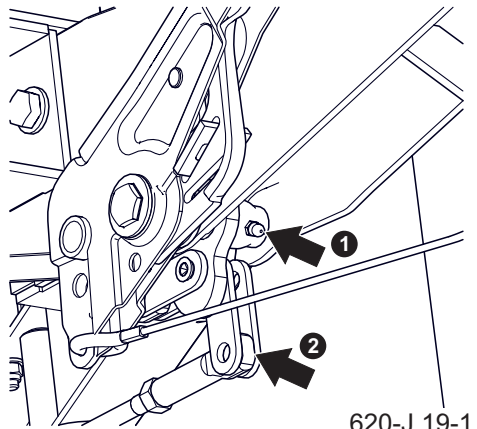
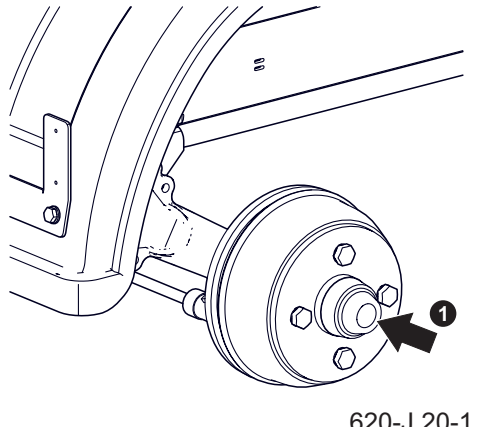
Before starting work, protect the machine against accidental starting by unauthorized persons.

Check grease nipples and set of stoppers. If necessary, supplement missing elements. After finishing work, remove and wipe off excess oil or grease.

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8.2 LUBRICATION SCHEDULE

Table 8.1 Machine lubrication schedule

Name	Number of lubrication points	Type of grease	Frequency	
Ball coupling (1)	1	B	3M	 620-J.18-1
Overrun device	2	A	12M	
Handbrake mechanism (1)	1	A	12M	 620-J.19-1
Articulated elements of the mechanism (2)	4	A	12M	
Hub bearings (1) (2 bearings in each hub)	4	A	12M	 620-J.20-1

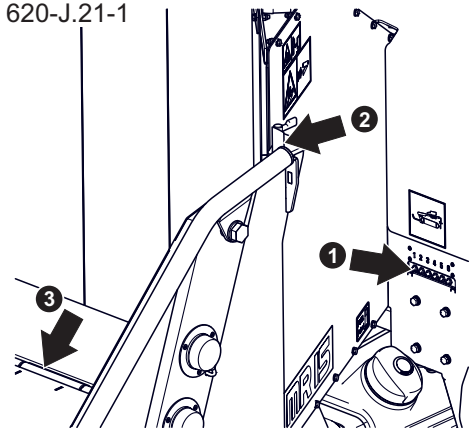
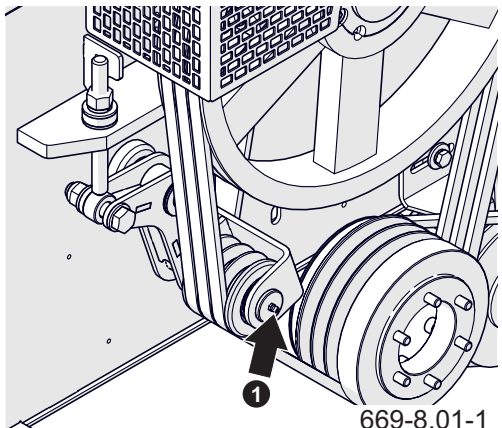
Name	Number of lubrication points	Type of grease	Frequency	
Lubrication block (1)	6	B	3M	
Locking pins (2)	3	C	12M	
Hopper hinge (3)	1	C	6M	
Tension roller	1	A	3M	

Table 8.2 Meaning of symbols in Table 8.1

Symbol	
Type of grease	
A	machine general-purpose grease (lithium, alkaline),
B	Grease for heavily loaded elements with addition of MoS ₂ or graphite
C	anticorrosion preparation in aerosol
Frequency	
D	working day (8 hours of trailer use)
M	month

CHAPTER 9

COMPLETION OF TIRES

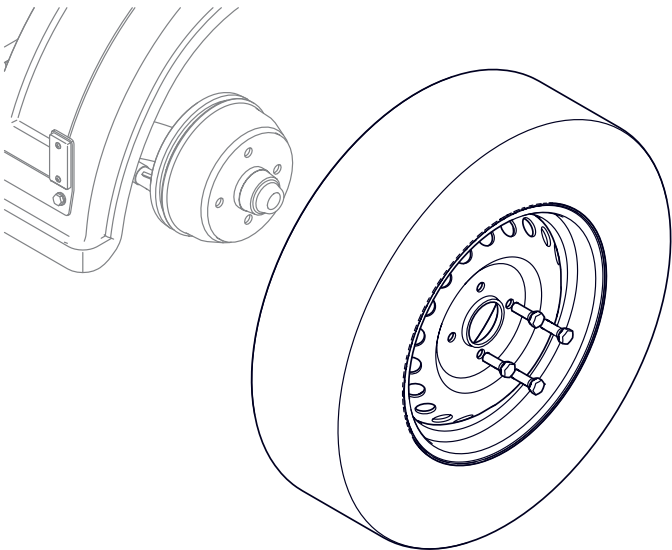


Table 9.1 Machine tires

NO	Tire size	Speed / Load Index
1	185/R14C	104 / 102N
2		

