

# Operating Manual

## Maus 6

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For models:

Maus 6a

Maus 6c

Maus 6d

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# ***ROPA***

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## Translation of the Original Operating Manual

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# 1 Preface



We congratulate you on the purchase of your new ROPA machine. Please take the time and read thoroughly the operating manual. The operating manual is primarily intended for the machine operator. It contains all information required for safe operation of this machine, informs about safe handling and gives hints on practical use as well as for self-help and servicing. The respective safety information is based on the safety, work and health protection regulations applicable at the time of printing of this operating manual. In case of questions about the machine, on operation of the machine or on ordering of spare parts, please contact the dealer in your vicinity or the manufacturer directly:

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E-mail Spare Parts [Bestellung@ropa-maschinenbau.de](mailto:Bestellung@ropa-maschinenbau.de)

### Important information

- Original ROPA spare parts have been especially developed for your machine. They conform to the high ROPA standards for safety and reliability. We would like to point out that parts and accessories not approved by ROPA may not be used on ROPA machines, otherwise the safety and operability of the machine may be impaired. We cannot assume any responsibility for such installations, additions or reconstructions. In case of unauthorized modifications to the machine, any warranty claim lapses! Furthermore, the Declaration of Conformity (CE Marking) or regulatory approvals can be declared ineffective. This also applies if seals or sealing wax applied by the factory are removed.

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### WARNING



In rare cases, massive interference of vehicle electronics or malfunctions of the machine may occur due to operation of improperly installed electronic appliances (e.g. radios or other appliances emitting electromagnetic radiation). In case of such interference, the complete machine may suddenly stop operating or execute unwanted functions.

- In such cases, immediately shut off the sources of interference and immediately shut down the machine.
  - If needed, notify the company ROPA or the nearest authorised customer service of ROPA.
-

- After-sales services and specific maintenance work on the diesel engine may only be performed by companies or individuals expressly authorised for this purpose by MTU or Mercedes-Benz. This work must be acknowledged accordingly in maintenance vouchers of Mercedes-Benz by these individuals or companies. Without these maintenance vouchers properly completed, any warranty or statutory warranty of the engine manufacturer lapses.
- We expressly reserve the right to make technical modifications for the purpose of improving our machines or increasing the safety standards – even without specific notification.
- All information about directions given in this operating manual (front, rear, right, left) are in relation to the driving direction forward. Please always state the chassis number of the machine for any orders for spare parts and technical inquiries. You will find the chassis number on the name plate and on the vehicle chassis above the name plate.
- All information on required wrench sizes are abbreviated with SW e.g. **SW36** = 36 mm wrench size.
- Please have the machine serviced according to regulations. Comply with the information given in this operating manual and have parts subject to wear replaced in due time respectively ensure timely repairs. Have the machine respectively maintained or repaired according to regulations.
- Employ the decades of experience collected by ROPA in sugar beet harvesting and loading technology and implemented in this machine, by correct operation of this machine. Remember that any neglect in maintenance and servicing inevitably leads to loss of performance and therefore to loss of time.
- Listen for suddenly occurring, unusual noises and have their cause remedied before the machine is operated further, since otherwise heavy damage or costly repairs to the machine may be caused.
- Generally comply with the respective applicable regulations for road traffic and the applicable regulations on occupational health and safety.
- A copy of this manual must be accessible to authorized personnel any time for the entire lifetime of the machine. Make sure that the manual is supplied with the machine, e.g. in the event of an onward sale.

We expressly point out that any damage caused by the fact that this operating manual is not or not completely followed is not covered by the statutory warranty of ROPA. Even though this operating manual is comprehensive, in your own interest you should completely and carefully read it and slowly familiarize yourself with the machine using this operating manual.



## 1.1 Name plate and important data

The name plate (2) of the machine is located on the right side of the vehicle, on the vehicle frame next to the front wheel behind the factory number (1).

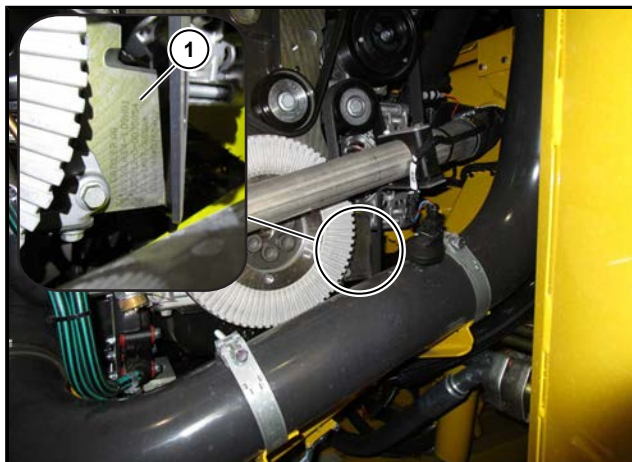


Please enter the data of your machine in the following image of the name plate. You will need this data for ordering spare parts.

<b>CE</b>	<b>ROPA</b>	<b>Fahrzeug- und Maschinenbau GmbH</b> <small>Sittelsdorf 24 • D-84097 Herrngiersdorf • Tel. +49 (0) 8785/9601-0 • Fax +49 (0) 8785/566</small>
Fahrz.-Typ		Baujahr
Leistung	kW	Homologation
Fabr. Nr.		
Zul. Gesamt-Gewicht	kg	Zul. Achslast 1
Zul. Anhängelast	kg	Zul. Achslast 2
<div style="border: 1px solid black; width: 30px; height: 30px; display: inline-block;"></div> Zul. Stützlast	kg	Zul. Achslast 3
		Zul. Achslast 4
	kg	

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## 1.2      Serial number of diesel engine



The serial number of the diesel engine (1) is located on the engine block near the V-belt pulley of the crankshaft.

### 1.3 Declaration of Conformity

The Declaration of Conformity belongs to separately provided documents and is handed over on the delivery of the machine.

The CE marking of the machine is a constituent part of the name plate.

#### CE-KONFORMITÄTSERKLÄRUNG

zur Bestätigung der Übereinstimmung mit der Maschinenrichtlinie (Richtlinie 2006/42/EG) und den zu ihrer Umsetzung erlassenen Rechtsvorschriften.

Die Firma **ROPA Fahrzeug- und Maschinenbau GmbH**  
Sittelsdorf 24  
84097 Herrngiersdorf  
Deutschland  
Telefonnummer: +49-8785-9601-0  
Telefaxnummer: +49-8785-9601-142

erklärt hiermit als Hersteller, dass die nachfolgend bezeichnete Maschine:

Selbstfahrendes Rübenlade- u. Reinigungsgerät

Bezeichnung: **ROPA Maus 6**

Maschinentyp: Maus 6a / Maus 6c / Maus 6d

Fahrgestellnummer from 8\*1506

Baujahr: from 2020

aufgrund ihrer Konzipierung und Bauart in der von uns in Verkehr gebrachten Ausführung mit den Bestimmungen der Maschinenrichtlinie (Richtlinie 2006/42/EG) und mit den sie umsetzenden nationalen Rechtsvorschriften übereinstimmt.

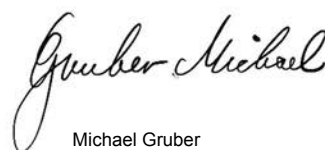
Das Konformitätsbewertungsverfahren wurde nach Anhang 8 der Maschinenrichtlinie durchgeführt. Dokumentationsbevollmächtigter in unserem Unternehmen ist: Herr Michael Gruber

Bei jeder Veränderung der Maschine, die nicht unmittelbar mit der ROPA Fahrzeug- und Maschinenbau GmbH abgestimmt ist, wird diese Erklärung ungültig.

Datum: 2023-07-27

Hersteller Unterschrift:

Funktion des Unterzeichners:



Michael Gruber

Head of sugar beet technology branch





## **2      Safety**



## 2.1 General

The machine has been manufactured according to the current state of technology and tested for safety.

The machine is CE compliant and therefore conforms to the respective European regulations for free movement of goods within the European Union respectively the European economic region.

Modifications to this machine may only be performed with the express approval of the manufacturer, since otherwise the manufacturer's warranty lapses. In addition, the road traffic registration may lapse and other registrations of the machine may become invalid. The operating manual supplied must be strictly observed. The manufacturer shall not be liable for damage caused by incorrect handling, inappropriate application or incorrect repairs respectively missing maintenance and service carried out by the customer. The machine may only be operated in a technically perfect condition, for its intended purpose and with due consideration of the risks involved.

## 2.2 Obligations of the entrepreneur

The entrepreneur employing the machine, respectively his agent, is obliged:

- To observe the applicable European and national work and safety regulations.
- To instruct the machine operators about their special obligation for safe driving of the machine. These instructions must be given anew before the start of each season. These instructions shall be recorded in writing and signed by the entrepreneur and the instructed machine operator. These records shall be kept by the entrepreneur for at least one year.
- To instruct the machine operators on the operation or safe handling of the machine before using it for the first time.

Forms for these instructions may be found in Chapter 9 of this operating manual (documentation of instructions given to the driver, [See Page 532](#)). When needed, please copy these forms before completing them.

## 2.3 General symbols and instructions

The following symbols are used for safety instructions in this operating manual. They serve as a warning against possible personal injury or material damage, or provide help in facilitating work.

### **DANGER**



This signal word warns of imminent danger of fatal accident or serious injury. This hazard may always occur if the operating or working instructions are not or only imprecisely observed.

### **WARNING**



This signal word warns you of a possibly dangerous situation which may lead to serious injury or to death. This hazard may always occur if the operating or working instructions are not or only imprecisely observed.

### **CAUTION**



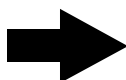
This signal word warns you of a possibly dangerous situation which may lead to serious injury or to death and damage to the machine or other serious property damage. Non-observance of these instructions may lead to loss of warranty. This hazard may always occur if the operating or working instructions are not or only imprecisely observed.

### **ATTENTION**



This signal word warns you of a possible severe damage to the machine or other severe property damage. Non-observance of these instructions may lead to loss of warranty. This hazard may always occur if the operating or working instructions are not or only imprecisely observed.

### **ADVICE**



This symbol draws your attention to some special aspects. This helps to facilitate work.

#### **(1) Item numbers**

The item numbers used in drawings are put in text in parentheses **(1)** and marked in bold.

#### **- Operational activities**

The defined sequence of operational activities facilitates the correct and safe use of the device.

### 2.3.1 Safety signs

The safety signs illustrate a danger source.



#### **Warning of a general danger**

This warning symbol stands for activities where several causes may lead to hazards.



#### **Warning of dangerous electrical voltage**

This warning symbol stands for activities during which the hazards of electrical shocks with possible deadly consequences exist.



#### **Warning against open running belt**

This warning symbol stands for activities during which the hazards of open running belt or chains with possible deadly consequences exist.



#### **Warning against hot surfaces/hot liquids**

This warning symbol stands for activities during which the hazards of hot surfaces/hot liquids with possible deadly consequences exist.



#### **Warning against explosion hazard, battery area**

This warning symbol stands for activities during which the hazards of corrosive liquid and gases exist.



#### **Warning against falling hazard**

This warning symbol stands for activities during which the hazards of falling with possible deadly consequences exist.



#### **Warning of electromagnetic fields**

This warning symbol stands for activities during which the hazards of electromagnetic fields respectively disorders exist.



#### **Warning against crushing hazard**

This warning symbol stands for activities during which the crush hazards with possible deadly consequences exist.



#### **Warning against crushing hazard**

This warning symbol stands for activities during which the crush hazards with possible deadly consequences exist.

## **2.4 Proper use**

This machine is exclusively meant for:

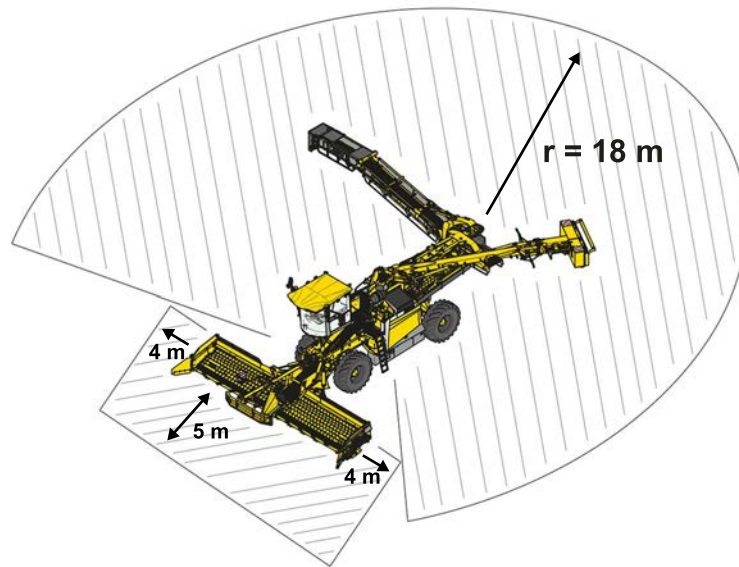
- loading and cleaning of sugar beets or similar crops.

Included in proper use is that the machine is driven under compliance with the applicable road traffic regulations on public roads. This includes driving forward and backward. Any other use of the machine is deemed improper and is therefore prohibited.

### **2.4.1 Foreseeable misuse**

We would like expressly to point out that this machine may not be used for pulling trailers, for towing or salvaging other vehicles or for pulling respectively pushing or transport of any loads or any goods.

## 2.5 Hazard zone



No one may stay in the hazard zone during operation of the machine. The operator must immediately shut down the machine in case of any threatening hazard and request the persons concerned to leave the hazard zone immediately. He may only restart the machine when there are no more persons in the hazard zone.

Anyone, who wants to approach the machine during its operation, must clearly communicate his/her intentions to the operator (e.g. by calling or by agreed hand signals) to avoid misunderstanding. The hazard zone shown in the following drawing applies as soon as the machine is started up. As soon as a person enters this zone, the machine must be immediately shut down and the person concerned must be requested to leave the hazard zone immediately. The machine may only be restarted when no one stays in the hazard zone.

Only specially authorised personnel may enter the hazard areas for maintenance or inspection work after exact agreement with the operator. Thoroughly inform these persons of the potential risk and dangers before they enter the hazard zones. All activities between the operator and said personnel shall be thoroughly agreed prior to the start of such activities. All maintenance, adjusting and monitoring work on this machine shall, to the technically possible extent, always be performed with the machine standing totally still and the diesel engine shut down. In this case, the operator of the machine is responsible for ensuring that unauthorised persons do not operate the machine either inadvertently or contrary to prior agreements.



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**DANGER**

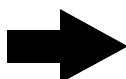


There is a risk of serious or even fatal injuries for persons staying in the hazard zone. Especially in the pickup area, persons or objects may be drawn into running shafts by body parts or clothing. In this case, body parts may be ripped off and fragmented. Objects may be drawn in by the rollers and destroyed or cause severe damage to the pickup of the machine.

- The operator is obliged to immediately shut down the machine as soon as people or animals enter the hazard zone or try to reach into the hazard zone with some objects.
- It is expressly prohibited to move sugar beets not picked up by the machine into the machine manually or using tools, as long as the machine is running.
- Before maintenance and repair work, the machine must be shut down and the diesel engine switched off.
- Secure the diesel engine against accidental start-up, keep the ignition key out of reach of any third party!
- In all cases, please read the operating manual and comply with the safety instructions.
- In the past, these activities have lead to severest accidents. Staying under lifted machine parts or within the swivelling perimeter of machine parts is hazardous and therefore prohibited.

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**ADVICE**

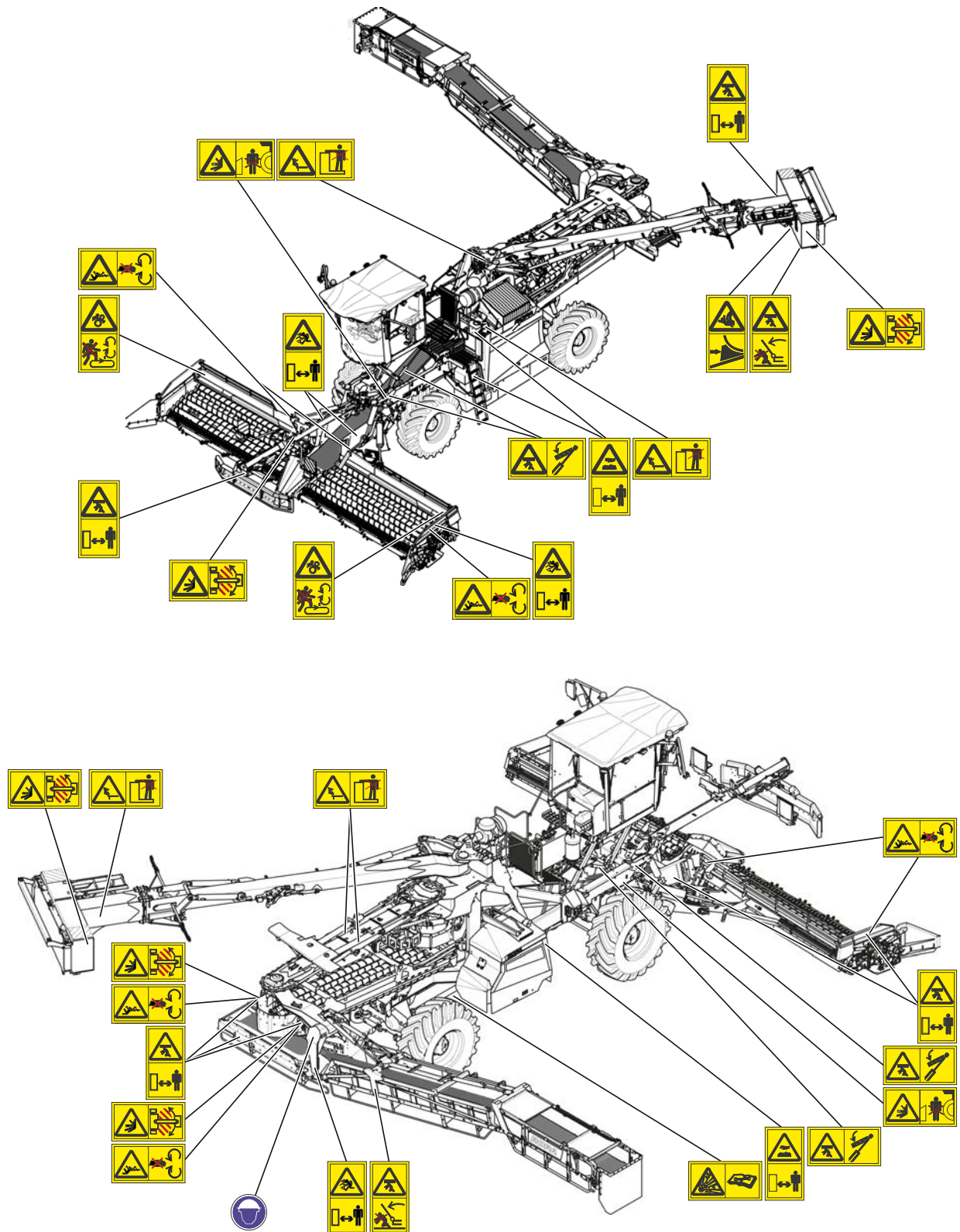


We recommend that the operator of the machine informs every person present during lifting about the possible hazards. You will find an information sheet for this purpose in the appendix. When needed, you should copy this sheet and hand it out to the people concerned. For your own safety and as protection against possible recourse (liability) claims, you should obtain written confirmation about receipt of this sheet in the space provided.

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All parts of the machine which may cause specific hazards are additionally marked using warning labels (pictographs). These pictographs point out possible hazards. They form a part of the operating instructions. They must always be kept in clean and well legible condition. Damaged or illegible safety stickers must be replaced immediately. The meaning of each individual pictograph is explained below. In addition, each pictograph has a number. This is the ROPA order number. Stating this number, you may reorder the respective pictograph from ROPA. The number stated in brackets is printed on the respective sticker. This enables simple allocation of the pictograph to the order number and the explanation.

## 2.6 Safety stickers on the machine



## Safety

### Safety stickers on the machine



355007100 (1)

Before starting up, read the operating manual respectively the maintenance manual and observe all remarks on safety.



355007900 (04)

Hazard under loads. Never stay under this part.



355007700 (25)

Hazard that body parts can be pulled in. Do not reach into the rotating rollers. Do not climb onto the rollers. Never enter the loading area with the drive switched on and the diesel engine running.



355006300 (33)

Hazard from parts being flung away with the engine running. Keep a sufficient safety distance!



355007000 (34)

Always switch off the diesel engine and remove the ignition key before carrying out maintenance and repair work. Read the operating manual and comply with remarks on safety.



355006800 (39)

Hazard due to electrical current! Observe a sufficiently safe distance to high-voltage power lines.



355008100 (40)

Hazard of escaping liquids that are under high pressure. Before performing maintenance and repair work, read the operating manual and comply with remarks on safety.



355006900 (41)

Burning hazard due to hot surfaces! Keep clear of hot surfaces!



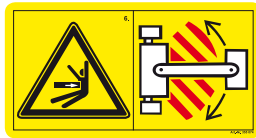
355007300 (50)

Hazard due to machine parts swinging down. Never step into the hazard zone of raised and unsecured machine parts.



355006400 (52)

Hazard due to the machine inadvertently rolling away. Secure machine against inadvertently rolling away using a wedge before uncoupling or parking it.



355007400 (06)  
Hazard of swinging machine parts. Never stay in swivelling area.



355007800 (11)  
Hazard of lowering machine parts! Staying in the hazard zone is only admissible when the safety lock for the lifting cylinder is engaged.



355007200 (15)  
Hazard from rotating parts. Never reach into the operating auger. Hazard of clothing or body parts being pulled in. Do not open or remove protective equipment during operation.



355006500 (37)  
Falling hazard! Riding on steps or platforms is prohibited.



355008000 (42)  
Explosion hazard. The pressure reservoir is under very high pressure. Perform removal and repair only following instructions from the manual.



355006700 (44)  
Never step in the hazard area between attached device and machine.

## 2.7 Safety and health protection

The stipulations and regulations listed below must be rigorously observed in order to reduce the risk of personal injury and/or property damage. Furthermore, the regionally applicable regulations and instructions on safety at work and for safe handling of self-propelled processing machines must be observed in any case. For safety reasons, anyone working with the machine must have read and understood the operating instructions. He must also be familiar with the applicable regulations on safety at work and health protection regulations.

For safe operation of the machine, the applicable health protection regulations, the relevant national work safety regulations or equivalently applicable national work safety and health protection regulations of other member states of the European Union or other states which have signed the agreement on the European Economic Area must be rigorously applied.

The operator is obliged to provide the applicable regulations in their current versions free of charge to the machine operator.

- The machine may only be used for its intended purpose and in compliance with these operating instructions.
- The machine must be used and operated in such a manner that its stability is guaranteed at any time.
- The machine may not be operated in enclosed rooms.
- The effectiveness of operating and adjusting components may not be impaired or overridden without approval.

## 2.8 Requirements for operating and maintenance personnel

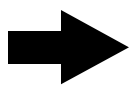
The independent operation and maintenance of the machine is restricted exclusively to persons who are of age and:

- must have a required and valid driver's license (when driving on public roads), are physically and mentally suitable,
- are not under the influence of drugs, alcohol or medicine which may impair the reactions of the machine operator in any manner,
- have been instructed about operation and maintenance of the machine and have proven their ability to the entrepreneur,
- have been instructed by the entrepreneur about their specific obligation for safe driving of the machine,
- are familiar with the vicinity and it may be expected that they will reliably discharge the tasks assigned to them,
- are specifically authorised by the entrepreneur.

The operating personnel must thoroughly read and understand the operating instructions of the machine.

All maintenance work which is not specifically the responsibility of the operator may only be carried out by instructed or trained maintenance personnel. Some activities may only be performed by people expressly authorised by ROPA for these activities. In case of doubt, ask the manufacturer whether you may perform a specific activity yourself without any hazard.

### ADVICE



Forms for instruction on safety given for operating and maintenance personnel are included in this operating manual. When needed, please copy these forms before completing them.

## 2.9 Use of the boarding steps

For safety reasons, always face the machine when ascending or descending the boarding steps. When ascending or descending, always use both hands to hold on to both handrails and remember to always grasp the handrails firmly when using the boarding steps.

The safety rail at the upper end of the boarding steps serves as a fall arrester (guardrail). Please bear in mind that this safety rail always closes automatically and can not be blocked in any way. For safety reasons, this safety rail must not be permanently held open.

## 2.10 In the event of accidents

In the event of accidents involving personal injury, the machine must be shut down immediately. To the extent required, immediately necessary first aid measures must be initiated, medical assistance called in and the next accessible supervisor should be informed.

## 2.11 Handling and process materials

- When handling process materials the appropriate protective clothing must always be worn to prevent or reduce skin contact with these materials.
- Defective, dismantled parts shall be sorted according to material type and routed to the proper recycling channel.
- Residues of oil, grease, solvents or cleaning agents must be reliably and environmentally compatible collected in suitable and prescribed containers and stored before being disposed of in an environmentally compatible manner in accordance with the local regulations.

## 2.12 Residual risks

Residual risks are special hazards involved in the use of the machine which cannot be fully eliminated despite a safety-conscious design. These residual risks are not readily recognizable and may result in injury or damage to health.

In the event such unforeseen residual risks become apparent, the machine must be shut down immediately and the responsible supervisor informed accordingly (if applicable). The supervisor then makes any further decisions and initiates the necessary measures for elimination of the hazard. If required, the machine manufacturer must be informed.

## 2.13 Hazards caused by mechanical influences

### DANGER



**During operation of the machine, there is mortal danger from uncovered rotating machine parts (drive shafts, shafts, rollers, and conveyor belts...) and attached parts jutting out.**



Rotating machine parts and breaking attached parts may cause the severest injuries like contusions, loss of body parts, broken bones. These injuries may be deadly in especially severe cases. During loading, there is extreme hazard to life in the pickup area due to rotating pickup shafts.

- You can protect yourself against these hazards by maintaining a sufficient safety distance, by constant attention and by wearing suitable protective clothing.

## 2.14 Hazards caused by electricity

### **DANGER**



#### **Danger of death due to electric voltage.**

Cables and components are live, there is a danger of injury with deadly consequences. Clamping points are under voltage also after shut-off.

- All work on the electrical equipment of the machine must always be carried out by qualified electricians.
- Check electrical equipment on a regular basis: refasten loose connections and replace damaged lines and cables immediately.

There is an electrical hazard during work on the machine:

- During direct contact with live parts or parts that have become energized due to fault conditions.
- By electrostatically charged parts.
- During all work on live parts, lines or cables, a second person must be present, who turns off the main switch in an emergency case.
- Never clean electrical equipment with water or similar liquids.
- Do not touch live parts inside and outside the machine.
- Before beginning work on the machine, switch it off at the main switch, make sure that no voltage is present and secure it from unintentional restart.
- Before opening cabinets and devices, discharge all parts that collect electrical charge, and make sure that all components are de-energized.



## 2.15 Hazards caused by process materials

### WARNING



Oil, fuel and grease can cause the following damages:

- poisoning by inhalation of fuel vapours,
- allergies due to skin contact with fuel, oil or grease,
- fire and explosion hazard due to smoking or the use of fire or naked flame when handling fuel, oil or grease.

Protective measures:

- When handling fuel or oil, smoking or use of open fire or naked flame is strictly forbidden. Oil and fuel may only be kept in suitable, approved containers.
- Do not expose fuel containers to direct sunlight.
- Always keep fuel containers in the shade.
- Great caution must be exercised when handling fuel. The relevant safety regulations for handling of fuel must be strictly observed.
- Clothing soaked in fuel must be removed immediately and ventilated in a suitable place.
- Rags soaked with fuel or oil must be kept in suitable, approved containers and disposed of in an environmentally compatible manner.
- Always use a suitable funnel for filling fuel or oil.
- In all cases, avoid skin contact with fuel, oil or grease! In case of need, wear suitable protective gloves.
- Only decant fuel or oil in the open air or in well ventilated rooms.

### ADVICE



**Hazard of damage to the environment by leaking fuel or oil!**  
**Hazard of pollution of ground or water bodies.**

Prevention:

- Always carefully close containers containing fuel or oil.
- Dispose of empty containers in accordance with regulations and in an environmentally compatible manner.
- Keep a supply of a suitable binding agent and use immediately as required.

## 2.16 Hazards caused by noise

### WARNING



#### Noise

Noise can cause loss of hearing (deafness), hearing defects, health disorders such as loss of balance or consciousness disorders, as well as disorders of the heart and circulation. Noise may lead to reduction of the attention of people. In addition, noise may interfere with verbal communications among operating personnel as well as to the outside world. Perception of acoustic warning signals may be impaired or blocked.

#### Protection

- Wear ear protection (cotton wool, earplugs, capsules or helmets).
- Keep sufficient distance to operating machine.

#### Possible causes:

Pulse noise (< 0.2 s; > 90 dB(A))

Machine noise in excess of 90 dB (A)

## 2.17 Hazards caused by the hydraulic system

### WARNING



Hydraulic fluid may cause irritation of the skin. Leaking hydraulic fluid may damage the environment. High pressure and partially high temperatures exist within hydraulic systems. Hydraulic fluid emitting at high pressure may enter the body through the skin and cause the most severe tissue damage and scalding. If work on the hydraulic system is carried out incorrectly, tools or machine parts may be flung away with great force and cause severe injuries.

#### Protection

- Regularly check all hydraulic hoses for their condition and immediately have damaged hoses exchanged by trained specialist personnel.
- The hydraulic hoses must be regularly checked following the recognized rules of technology and the regionally applicable safety regulations, and in case of need, replaced.
- Works on the hydraulic system have to be performed only by specially trained staff.
- When working on the hydraulic system, first make it pressureless! Avoid skin contact with hydraulic oil.

## 2.18 Hazards caused by pneumatic system

In case of damage to the pneumatic system, the raised warning signs on the pile pickup may suddenly come down and cause severe injury to people located in this area.

When working on the pneumatic system there is a risk that compressed air escapes abruptly and causes injuries.

- All work on the pneumatic equipment must always be carried out by qualified personnel.
- All pneumatic pressure lines and pressure vessels must be depressurized and vented before maintenance work.

## 2.19 Hazards caused by hot substances/surfaces

Burning hazard/hazard of scalding due to:

- Hot surfaces (hot machine parts).
- Hot engine oil.
- Hot hydraulic oil.
- Hot coolant.

Counteractive measures:

- Let machine and operating supplies cool down.
- Wear protective gloves.

## 2.20 Personal protective equipment

Wear tight-fitting clothing to prevent accidents. Particularly, do not wear ties, scarves, rings or chains that may be caught by moving machine parts. Wear appropriate head-gear for long hair.

Do not carry highly inflammable objects, e.g. matches and lighters in your pockets.

All persons staying within the area of effect of the machine are situationally obliged to wear the following protective equipment:

Always

- Safety shoes with slip-resistant soles.
- Tight-fitting working protective clothing.

Additionally for transport or assembly work

- Protective helmet.

Additionally for maintenance

- Cut-resistant gloves.
- Protective cream (make a skin protection plan).
- Protective goggles.
- Eye/face protection and acid resistant gloves (when working on the battery).
- Tight-fitting working protective clothing with long sleeves.
- Heat and coolant-resistant protective gloves (when working on the cooling system).
- Oil-resistant protective gloves (when working on oil-containing systems).
- When working on the AdBlue system: protective goggles (tightly sealed goggles) and gloves in accordance with Material Safety Data Sheet.

Additionally if noise emissions exceed the limit value

- Ear protection.

Additionally on public roads

- Warning vest.

## 2.21 Leakage

The following measures shall be taken in case of leakage:

- Switch off the effective component and set it pressure-free if possible.
- Place a suitable container underneath.
- Exchange a component/sealing.
- Remove immediately and completely leaked substance.

## 2.22 General notes on safety when handling acid batteries

- Fire, sparks, smoking and open flames are prohibited. Avoid generation of sparks formed by connecting and disconnecting electrical loads or measuring devices directly to battery terminals. Before connecting and disconnecting batteries, switch off the main battery switch. First remove the ground connection. Prevent short circuits due to false polarity connections and avoid working near battery with spanner wrenches. Do not unnecessarily remove pole protection covers. When connecting, connect the ground cable last.
- Wear eye/face protection!
- Keep children away from acids and batteries!
- Batteries contain corrosive acid. Wear appropriate protective clothing and acid-resistant rubber gloves. Do not tilt the battery because acid may emit from the ventilation opening.
- Comply with instructions from the battery manufacturer.

### **DANGER**



#### **Explosion hazard!**

Charging may create highly explosive oxyhydrogen gas.

- Increased care is required after longer operation or when charging the battery using a charging device.
- Always ensure the area is adequately ventilated.
- Make sure that acid batteries are only charged using the permitted charging current.

## 2.23 Prohibition of unauthorised modifications and alterations

All unauthorised modifications and alterations are expressly prohibited.

Such actions require the express consent of the manufacturer. It is strictly prohibited to modify mechanical, electrical, pneumatic or hydraulic safety and control devices in order to bypass or put them out of operation.

## 2.24 General safety instructions for the park heating system

- The heating appliance may not be operated in enclosed rooms, not even under timer control or "Telestart" (e.g. garage or workshops without exhaust-gas extraction).
- Due to the explosion hazard, the heating system must be switched off at gas stations and fuel dispensing systems.
- Due to explosion hazard, the heating system must be shut off in any place where combustible fumes or dust can form (e.g. near fuel, coal, wood dust or grain storage or similar).
- The heating system must be checked by a specialist at the latest at the start of the heating season.
- In cases of continual generation of dense smoke, unusual combustion sounds or smell of fuel fumes, the heating system must be taken from operation by removing the fuse and may only be recommissioned after inspection by personnel trained by Webasto for this work.
- Only diesel is to be used as fuel.
- A temperature of 120°C must not be exceeded in the vicinity of the heating system. Excess temperature may cause permanent damage to the electronics.

## 2.25 Safety and protective equipment

Perform a documented function test after work on the safety equipment. Perform a regular function check of the safety equipment, keep maintenance intervals.

The safety equipment of the machine consists of:

- Emergency stop switch in the operating console.
- Back run warning system.
- Battery main switch.
- Battery emergency stop switch in the central electrics box.
- Protective covers, protective doors, safety switches.
- Rotating beacons.
- Safety and guard rails.
- Seat contact switch.
- Foot-switch look forward.
- Rotating seat sensor.

### DANGER



#### **Risk of inactive safety devices.**

Defect or overridden protective devices can not prevent from severe injuries and hazards.

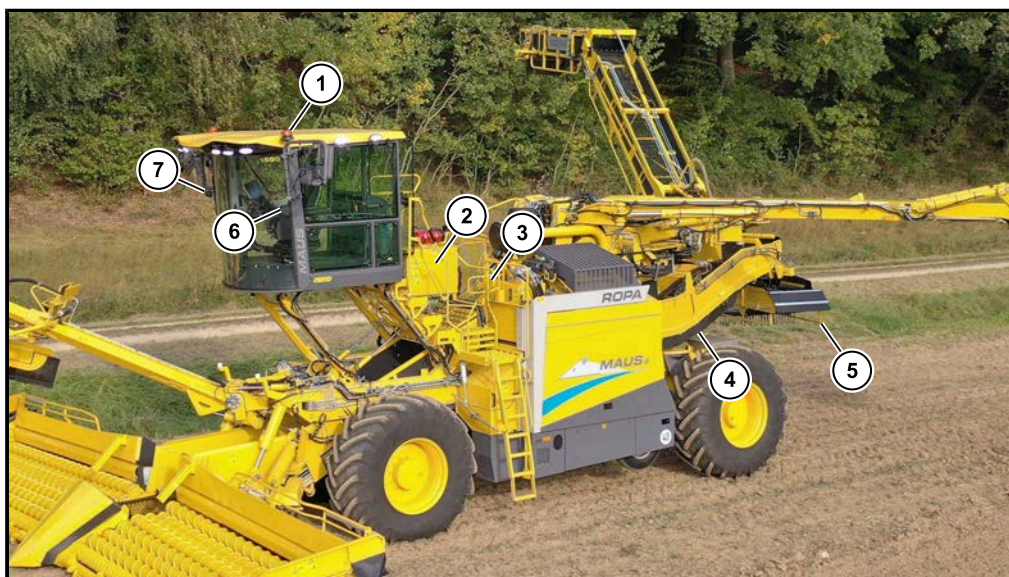
- After maintenance work and before the restart of the machine, make sure in any case that all protective devices are fully assembled and functional.

### CAUTION



It is necessary for the safe operation of the control units that the ignition is switched off at least once every 24 hours (position 0). Wait until the green LED on the colour terminal goes off before switching the machine on again. Only then the machine is considered to be switched off completely.

## Overview



- (1) Front rotating beacon
- (2) Battery emergency stop switch in the central electrics box
- (3) Safety rail at the ladder
- (4) Protective rubber at the recleaner
- (5) Guard rail at the truck conveyor
- (6) Emergency stop switch in the operating console
- (7) Loud-speaker outside intercom facility

### 2.26 Emergency exit

Depending on the design, the machine is not equipped with a separate emergency exit. If the driver's cabin is deformed by external forces, e.g. during an accident, the driver's cabin can generally be exited via the access doors since these doors are glazed with safety glass. This type of glass can be destroyed using a forceful blow with a pointed object so that the driver's cabin can be exited without a problem. If the glass pane is subjected to excessive stresses, e.g. after deformation of the driver's cabin, then this glass pane will automatically break and make the exit route free.

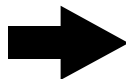
### **3      Technical data and general view**





### 3.1 Technical data

#### ADVICE



The Maus 6 is available with 3 different types of diesel engines. These are distinguished by means of a letter in the Vehicle type field on the name plate. In addition, they can meet different exhaust gas standards. For information on the engine version and exhaust gas standard of your machine, please refer to the myROPA portal ([See Page 61](#)).

The following type abbreviations are commonly used in the ROPA documentation:

- Maus 6a → RM6a
- Maus 6c → RM6c
- Maus 6d → RM6d

In this manual, we also use this designation with regard to the engine:

- Maus 6a → a-diesel engine
- Maus 6c → c-diesel engine
- Maus 6d → d-diesel engine

## Technical data and general view

### Technical data



Machine type:	Maus 6a	Maus 6c	Maus 6d
Type identification:	RM6a	RM6c	RM6d
Mercedes-Benz engine type:	OM936LA.E3A-1	OM936LA.E4-1	OM936LA.E5-2
Engine model:	D 935.914	D 935.912	D 935.916
Exhaust gas standard according to (EU) 2016/1628:	97/68/EG stage 3 A		Stage 5
Exhaust gas standard according to EPA (USA):		TIER 4 final	
Exhaust gas standard according to (EU) 2016/1628 and EPA (USA) (dual certificate):			Stage 5 TIER 4 final
Exhaust gas standard according to China IV:			GB20981-2014 HJ1014-2020
Capacity:	260 kW		
Max. torque:	1,400 Nm/1,200 - 1,600 rpm		
Rated speed (ROPA):	2,200 rpm		
Maximum rotational speed with machine drive switched on:	1,975 rpm		
Engine type:	Diesel engine 4-stroke, direct fuel injection		
Displacement:	7,698 cm <sup>3</sup>		
Traction drive:	Continuously variable, hydrostatic in three operating modes		
Operating mode "Turtle":	0-0.7 km/h		
Operating mode "Rabbit I":	0-10.5 km/h		
Operating mode "Rabbit II":	0-40 km/h (resp. 32 km/h, 30 km/h or 25 km/h)		
Steering drive axles:	Two mechanically driven axles with differential lock.		
Empty weight, depending on the equipment variant:	30,400 - 31,600 kg	30,600 - 31,800 kg	30,700 - 31,900 kg
Gross weight rating/axle loads:	see name plate		
Admissible axle load front:	see name plate		
Admissible axle load rear:	see name plate		
Fuel tank level:	1,190 l		
AdBlue tank level:	---	95 l	till 8*1687: 95 l from 8*1688: 75 l

Tyres front axle:	710/75 R34 Michelin MEGAXBIB 2 (178A8)
	800/70 R32 Michelin CEREXBIB 2 (182A8)
Tyres rear axle:	710/75 R34 Michelin MEGAXBIB 2 (178A8)
	800/70 R32 Michelin CEREXBIB 2 (182A8)
Tyres additional axles:	235/75 R17.5
Generator:	150 A
System voltage:	24 V
Battery capacity:	2 x 170 Ah
Loading performance in t/h:	average approx. 250 / max. 560
Length (position driving on roads):	14,970 mm
Width (position driving on roads):	3,000 mm (with 710/75 R34 tyres) 3,260 mm (with 800/70 R32 tyres)
Height (position driving on roads):	4,000 mm
Driving noise level with driver's cabin closed*):	76 dbA
Standing noise level with driver's cabin closed*):	57 dbA
Mechanical vibration and shocks according to standard UNI EN ISO 2631	$a_{w,s} \leq 0.5 \text{ m/s}^2$

\*) higher noise level with opened driver's cabin, hearing protection might be required.

## 3.2 Tyre pressure

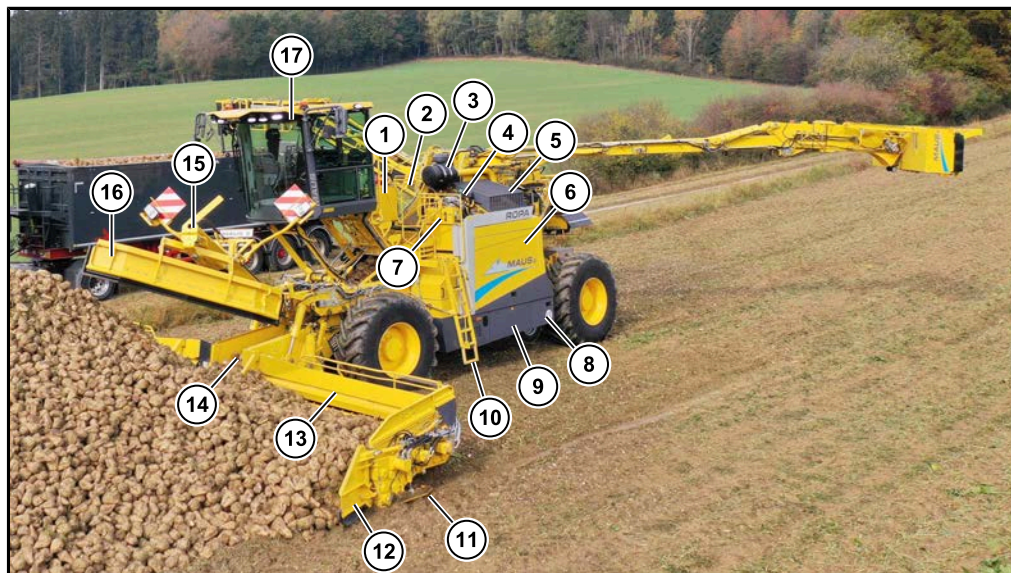
Tyre pressure

All data in bars.

	Tires type	min.	Recommendation	max.
1	Front axle			
	710/75 R34	2.7	3.0	3.2
	800/70 R32	2.2	2.4	2.4
2	Rear axle			
	710/75 R34	2.7	3.0	3.2
	800/70 R32	2.2	2.4	2.4
Others		min.	Recommendation	max.
3/4	additional axle 235/75 R17.5	-	8.0	-

### 3.3 General view

This overview is intended to familiarize you with the most important components of your machine.



- (1) Central electrics cabinet
- (2) Rear platform wall
- (3) Air filter
- (4) Expansion tank for coolant
- (5) Intake grid for cooler
- (6) Engine housing
- (7) Hydraulic oil tank
- (8) Storage compartment for tools
- (9) Battery case
- (10) Climbing ladder
- (11) Support foot
- (12) Clearing shield
- (13) Pickup side section left
- (14) Infeed conveyor
- (15) Pile pickup (telescopic tube)
- (16) Residual beet pickup
- (17) Driver's cabin



- (18) Under-run protective device
- (19) Fuel tank
- (20) Counterweight arm
- (21) Articulation of the truck conveyor
- (22) Truck conveyor
- (23) Swivel support for truck conveyor
- (24) Recleaning
- (25) Energy ducting chain
- (26) Rear axle
- (27) Pickup side section left
- (28) Pickup side section right
- (29) Tool box rear (option)

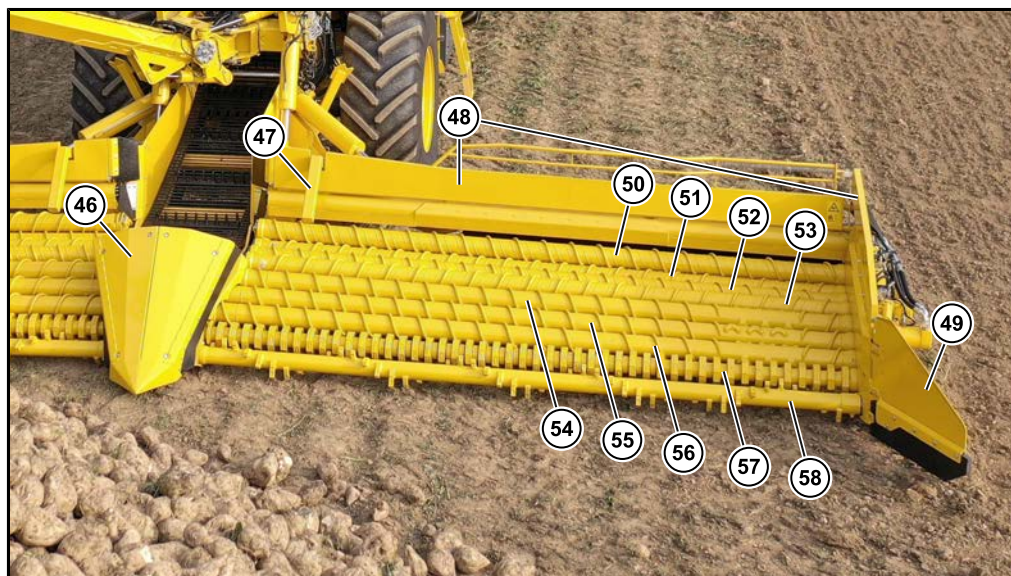




- (30) Swivel arm
- (31) Rotary drive for truck conveyor
- (32) Rotary drive for swivel arm
- (33) Swivel support for truck conveyor
- (34) Swivel arm lock
- (35) Cylinder axle support
- (36) Engine storage compartment
- (37) Counterweight arm lock



- (38) Control unit operating hydraulics II
- (39) Fire extinguisher
- (40) Grease bucket
- (41) Tank for windscreen washer system
- (42) Control unit for operating hydraulics I
- (43) AdBlue tank (not applicable for a-diesel engine and c-diesel engine EFP variants)
- (44) Side cover on the right, there is right storage compartment or water tank (option) behind it
- (45) Exhaust system depending on engine version:
  - a-diesel engine: only exhaust silencer
  - c-diesel engine: with SCR catalytic converter
  - d-diesel engine: with SCR catalytic converter and diesel particulate filter



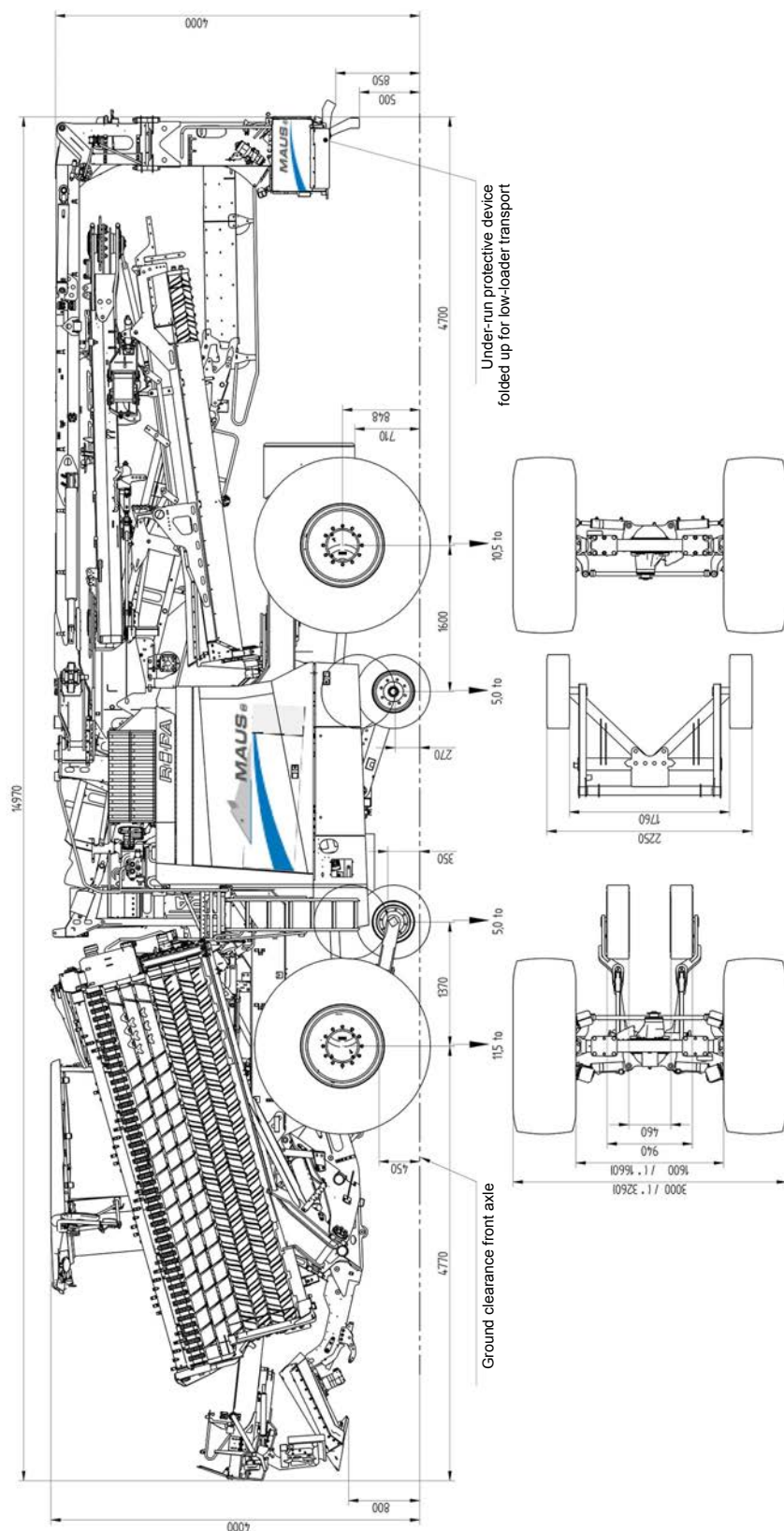
- (46) Central mark
- (47) Frost breaker
- (48) Fold plates
- (49) Clearing shield
- (50) Pinch roller 4
- (51) Pinch roller 3
- (52) Pinch roller 2
- (53) Pinch roller 1
- (54) Conveyor roller 3
- (55) Conveyor roller 2
- (56) Conveyor roller 1
- (57) Cleaning roller
- (58) Pickup roller



Machine ready for driving on roads



### 3.4 Transport draft for low-loader transport



Dimensions with 710/75 R34 tyres  
 \*Dimensions with 800/70 R32 tyres  
 The heaviest equipment: 31.9 metric tons net weight  
 with full fuel tank, with roller recleaner  
 without roller recleaner minus approx. 1.0 metric tons

Note: for low-loader transport max. admis. Fuel amount in tank: 990 litre

All data in mm.



### 3.5 Lashing eyes for transport by low-loader/ship

The front axle is equipped with eyes, located on the right and left side, for clamping it down in ground direction. The rear axle support is also equipped with eyes located on the right and left side for clamping the axle down towards the ground. Each eyelet may be loaded with a maximum tensile force of 5000 daN. Clamping chains etc. must not be stretched over mechanical parts.



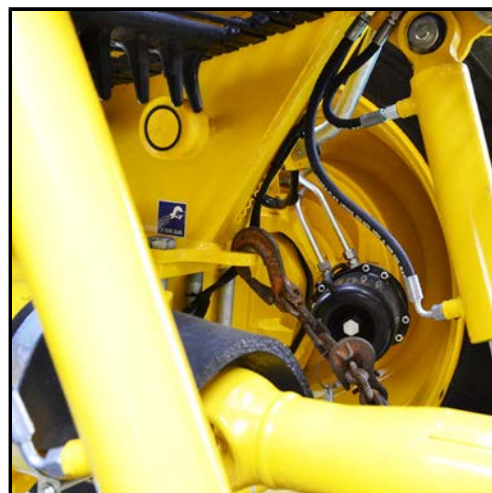
*Regular low loader for road transport with minimum transport height*



*Lashing of the front axle*



*Lashing point behind the front axle, left side*



*Lashing point behind the front axle, right side*



*Lashing point at the rear axle support*



*Loading onto ship; photo of an earlier model*

The machine has no attachment points by which it can be lifted. For hoisting it into a ship for example, special, approved and TÜV-approved lifting devices are necessary.





# **4      General Description**



## 4.1 Function

This is a self-propelled working machine for picking up, cleaning and loading of sugar beet from piles at the side of the field.

The sugar beet is picked up via a roller system. The first roller, the pickup roller, works several centimetres into the ground, picks up the sugar beet and lifts it over a cleaning roller onto three conveyor rollers. The conveyor rollers transport the beet outward. The conveyor rollers have carriers attached to them. These preclean the sugar beet and convey it to four counter-rotating pinch rollers positioned behind them. The front and rear rollers may be individually adjusted in their speed. The direction of rotation of the rollers is reversible. Operating disturbances due to jammed stones are generally automatically detected and remedied by the machine.

If needed, the last sugar beet may be pulled onto the pickup rollers using the residual beet pickup controlled via the left joystick in the driver's cabin. No manual assistance is required.

The main cleaning action is performed on the rollers at the front of the machine. The counter-rotating rollers pull out soil, weeds and other impurities. Depending on equipment options, further cleaning is then performed using a sieve conveyor or a roller cleaner which transport the sugar beet to the truck conveyor. The truck conveyor loads the sugar beets onto the transport vehicle (truck).

All computers are networked via a CAN bus and supply all information to the driver on the large R-Touch colour terminals. All functions of the machine are controlled and monitored by a single person from the driver's cabin.

## 4.2 Scope of delivery

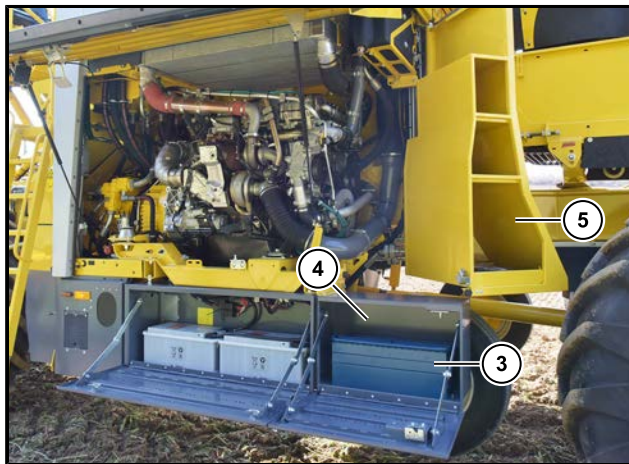
The scope of delivery of the machine includes a cooler, a fire extinguisher, a first-aid kit, two wheel chocks and a tool set with small parts package. The first-aid kit and the cooler are located in the driver's cabin, the fire extinguisher is located on the central electrics cabinet. The tool box is located in the storage compartment for tools (4). The spare part package is located in the engine storage compartment (5).



(1) First-aid box



(2) Cooling box



- (3) Tool box
- (4) Storage compartment for tools
- (5) Engine storage compartment

## 4.2.1 myROPA

The digital product called myROPA is a part of the machine. You can view or download the latest edition of all documents related to your machine (list of spare parts, operating manual, service information, etc.).

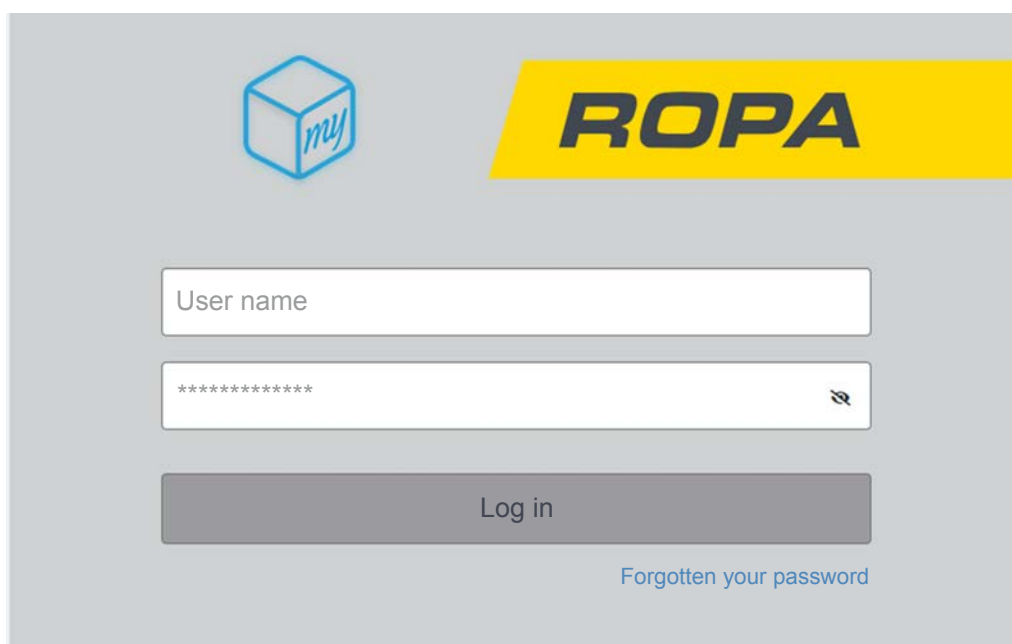
Upon the delivery of the machine, ROPA gives the customer access to the myROPA portal in the form of an account owner.

Here, the account owner can set up a separate user access for any desired person.

An access to the R-Connect module can be granted to the user in the User Management section.

### 4.2.1.1 Registration in myROPA

<https://myropa.com>



#### ADVICE



**Never share your login details with any third party.**

Create a separate user account for each person who needs access to the machine.

#### 4.2.1.2 R-Connect

<https://r-connect.myropa.com>

The ROPA machine comes with the efficient telematics hardware including SIM card for online access as standard equipment. The telematics module is thus the basis for proactive Service 4.0, particularly for predictive analytics and fast assistance and diagnostics if service is required on any continent.

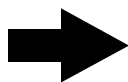
R-Connect is one of several modules of the myROPA portal. In this module, you can access the online data of your ROPA machine.

With the R-Connect online portal, many things are much easier, even if the concern is only bringing the driver a delicious lunch in the field. Experience the various possibilities of the ROPA R-Connect.

<https://youtu.be/wtMZ7nLRhL4>

The Account owner has full access to all machines assigned to his ROPA customer number and equipped with R-Connect. Even without assignment of machine(s) and role(s).

##### ADVICE



In the Roles & Rights category, please assign each user a machine(s) and at least one role for each machine. Please assign at least one machine and at least one role to the newly created user. Otherwise, after logging in to the R-Connect portal, a new user can see NOTHING except an empty dashboard.

The Account Manager has the same rights as the Account Owner. It gives the CEO, board of directors, managing director, etc. the possibility to assign the complete administration of the myROPA portal to one or even several users.

# **5      Operating Components**





## 5.1 Ladders

### DANGER



- Nobody may stay on the platform in front of the driver's cabin and in the driver's cabin when the machine works.
- Ascend ladders and machine only when the machine stands still!

Use of ladders [See Page 32](#)

### 5.1.1 Ladder to driver's cabin

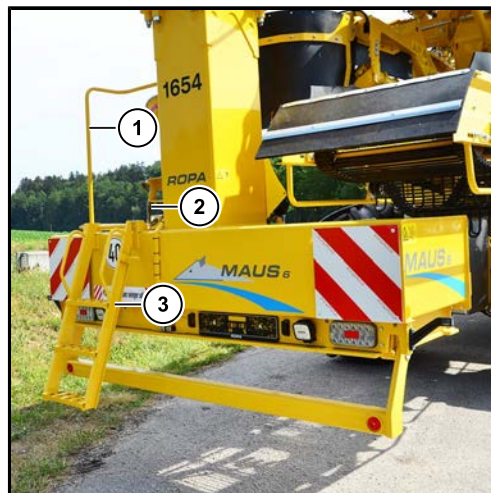


*Ladder to driver's cabin in transport respectively loading position*

(1) Climbing ladder driver's cabin

- The ladder (1) swings out by switching to Turtle operating mode, and swings into the vehicle contour by switching to Rabbit operating mode.

### 5.1.2 Auxiliary steps on the fuel tank



*Auxiliary steps on the fuel tank in road position respectively folded for refueling*

- (1) Guard rail
- (2) Locking lever
- (3) Auxiliary steps

#### **WARNING**



#### **Falling hazard!**

The auxiliary steps on the fuel tank may be used only for refueling the machine and for re-lubricating via the nipple block.

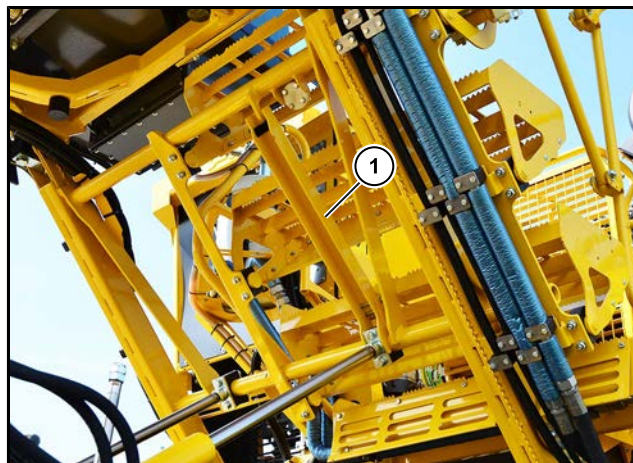
- It is permitted to be on these steps only inside the guard rail.

## 5.2 Driver's cabin cylinder support

The driver's cabin must not be raised or lowered unless both pickup side sections are folded out and if the driver is sure that there is no obstacle within a height of 5.3 m above the driver's cabin.



*Cylinder support engaged*



*Cylinder support in parking position*

### **DANGER**



#### **Risk of fatal injuries**

The driver's cabin may lower without warning.

- The cylinder support (1) must be engaged before working under the driver's cabin.
- Return the cylinder support to parking position before lowering the driver's cabin.

### **WARNING**



#### **Risk of very serious injuries**

- It is the responsibility of the driver to ensure that there is nobody in the area between the safety rail at the boarding steps (2) and the cabin door when lifting or lowering the cabin.

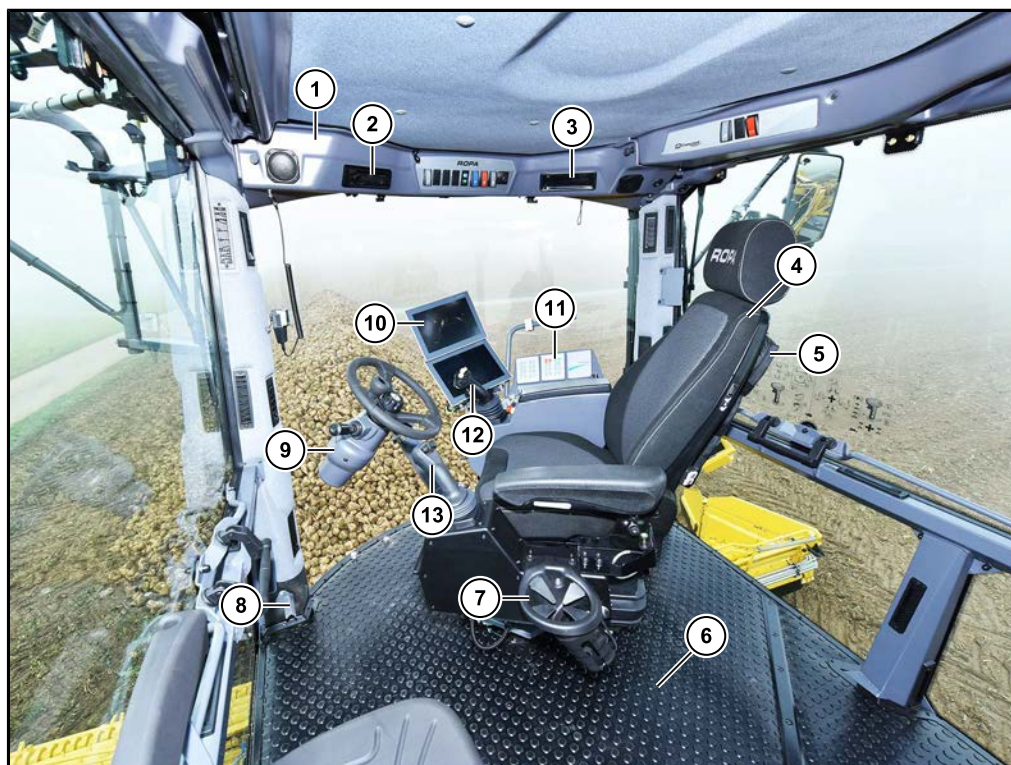


The driver's cabin can only be raised or lowered if the safety rail (2) at the boarding steps is closed.



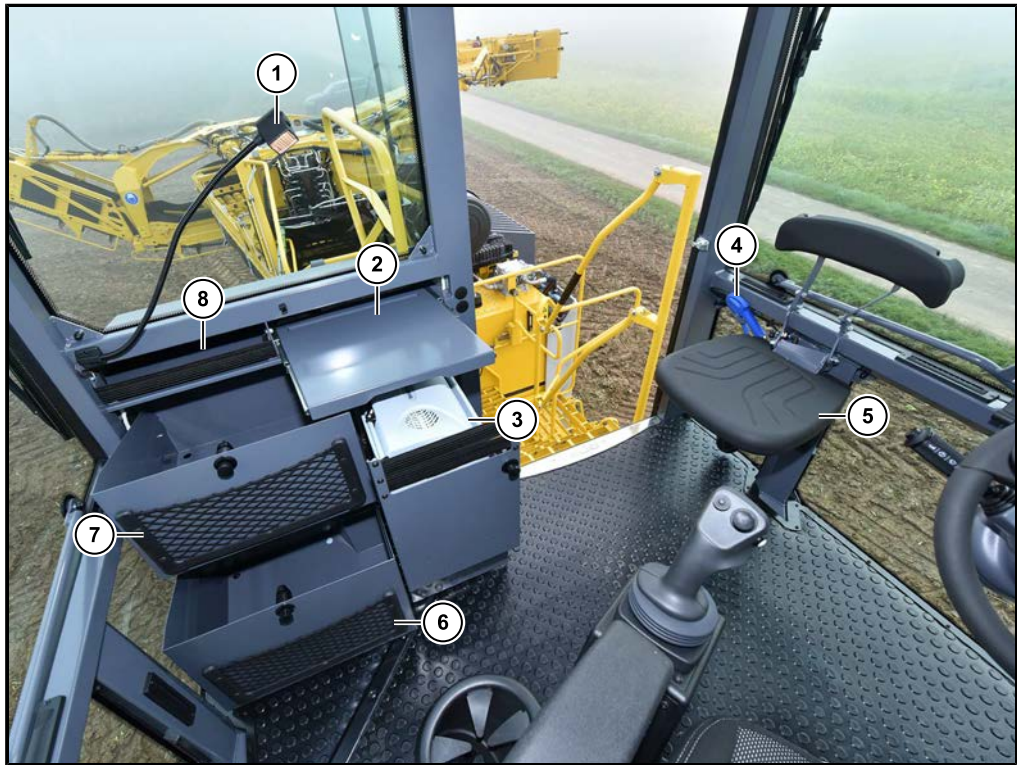


### 5.3 Driver's cabin overview



- (1) Roof console
- (2) Radio
- (3) Storage compartment, installation option for radio equipment
- (4) Rotating driver's seat, with seat brake
- (5) First aid kit (on the backrest of the driver's seat)
- (6) Cabin floor with underfloor heating
- (7) Bottle holder
- (8) Footrest on A-column
- (9) Steering column
- (10) R-Touch terminals
- (11) Operating console at driver's seat
- (12) Right joystick with multi-functional handle
- (13) Left joystick

## 5.4 Rear part of cabin



- (1) Reading light
- (2) Pull-out shelf
- (3) Storage compartment with cooler
- (4) Blow-out gun
- (5) Emergency seat, foldable
- (6) Storage compartment at cabin rear wall, bottom, pull-out
- (7) Storage compartment at cabin rear wall, top, pull-out
- (8) Storage compartment at cabin rear wall

## 5.5 Cabin ceiling



- (1) Roller blind left rear
- (2) Roller blind left front
- (3) Roller blind front
- (4) Roller blind right front
- (5) Roller blind right rear

## 5.6 Steering column



### **DANGER**



**Hazard of deadly injuries if the steering column is moved while driving.**

In this case, the machine can go out of control and cause the severest damages.

- Therefore, NEVER move the steering column while driving!

### **Turn handle (1) for height adjustment**

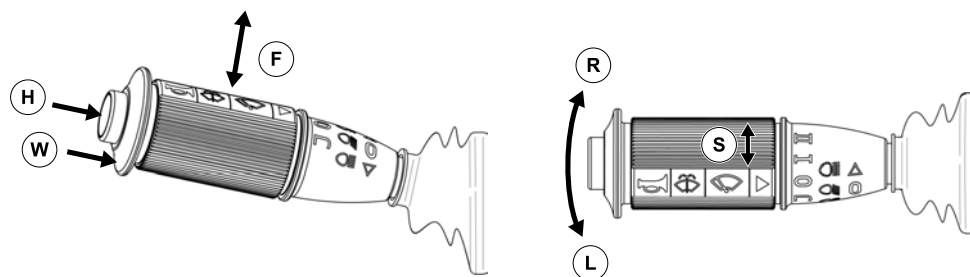
Release turn handle (1) (turn to the left), move the steering column to the desired height, retighten the rotating handle (turn to the right) and block the steering column. Check if the steering column is securely fixed in the desired position.

### **Clamping screw (2) for incline adjustment**

Loosen the clamping screw (2) and pull or push steering column into the desired position. Retighten the clamping screw (2). Check if the steering column is securely fixed in the desired position.

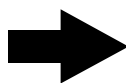


### 5.6.1 Steering column switch

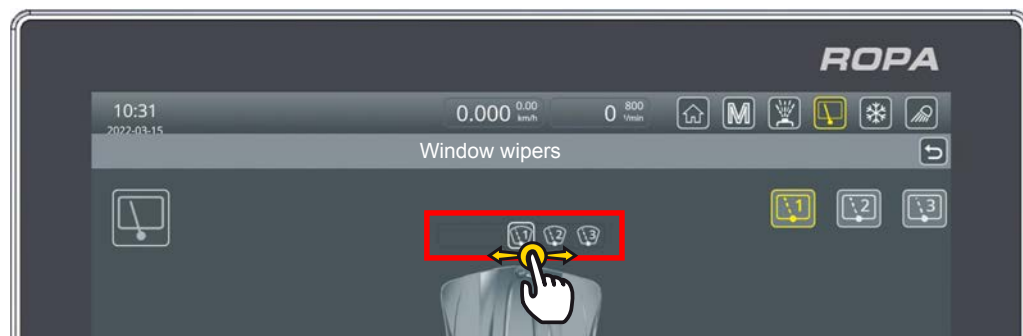


- Press lever to the right: Turn indicator right (R)
- Press lever to the left: Turn indicator left (L)
- Lever down/centre/up: high beam/dimmed headlight/headlight flasher (F)
- Pressure switch on the end: Horn (H)
- Sliding sleeve before the horn: front window washer system (W)
- Turning the sliding sleeve to the first stop location downward: interval operation of the front window wiper (S). The duration of the wiping interval may be set on the R-Touch in the "Window wiper" menu.
- Turning the sliding sleeve to the second stop location upward: uninterrupted operation of the front window wiper (S).

#### ADVICE



See a detailed explanation of the "Window wipers" menu here: [See Page 129](#)

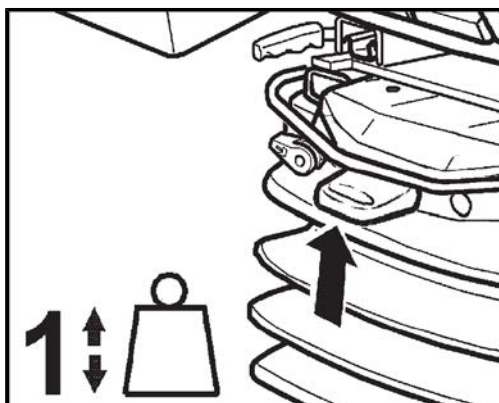


## 5.7 Driver's seat

### Safety instructions:

- To prevent damage to the driver's back, the seat must be adjusted for the driver's weight before use and each time the drivers change.
- To prevent injury, no objects should be placed within the moving area of the driver's seat.
- To eliminate any risk of accident, the settings must be checked to ensure they are correctly engaged before driving the vehicle.
- Adjustments must not be made while operating or driving.
- When the backrest upholstery has been removed, the backrest frame must be supported, e.g. held in place, before the backrest adjuster is operated. If you fail to do so, there is a danger that the backrest frame may jerk forward and cause injury.
- Any modification to the standard condition of the driver's seat (e.g. with other than original retrofitting and spare parts made by Grammer) may invalidate the certified and approved condition of the driver's seat. Functions may be impaired, threatening your safety. For this reason, any structural change to the driver's seat must be approved by Grammer.
- Fasteners must be checked regularly for tightness. If the seat wobbles there may be loose bolts or other faults. If the seat does not function correctly (e.g. the seat suspension), contact a specialist workshop immediately to arrange for repairs to be carried out.
- The driver's seat may only be installed, maintained and repaired by specialist staff.

If you fail to do so, your health may be affected and the risk of accident increases.

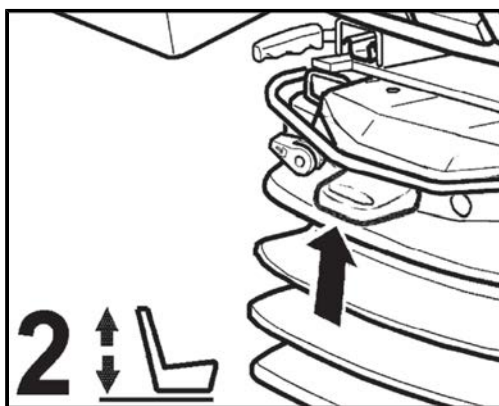


### Weight adjustment

The seat should be adjusted for the driver's weight by briefly pulling the actuator lever of the automatic weight and height adjuster (arrow) with the vehicle at a standstill and the driver sitting on the seat.

The driver must sit absolutely still during adjustment.

To prevent damage to health, the setting for the driver's weight must be checked and adjusted as necessary before the vehicle is driven.

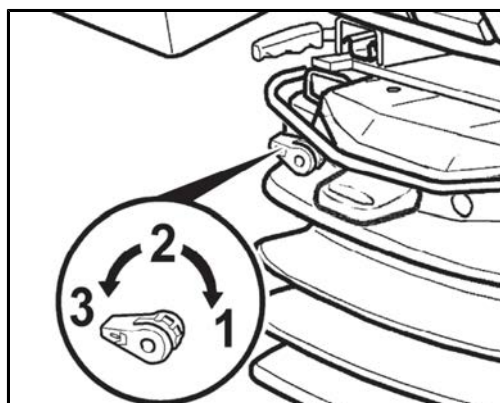


### Height adjustment

The seat height can be set pneumatically and is infinitely adjustable.

The seat height can be altered by pulling or pressing the actuator lever (arrow). If the adjustment reaches the top or bottom end stop, the height is adjusted automatically in order to guarantee a minimum spring travel.

In order to avoid damage, do not operate compressor for more than 1 minute.



### Shock absorption

The damping of the seat can be adjusted to match the characteristics of the road or field surface.

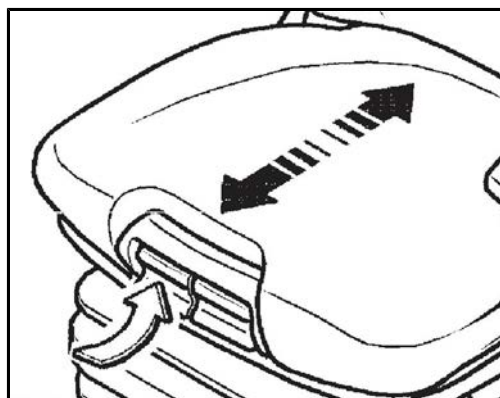
The comfort of the suspension can be adjusted individually. Rotate the lever to the desired setting and release.

Position 1 = soft

Position 2 = medium

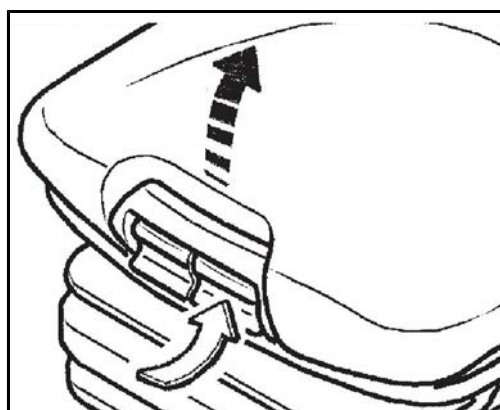
Position 3 = hard

The manufacturer recommends position 2 as the basic setting for drivers of average weight.



### Seat depth adjustment

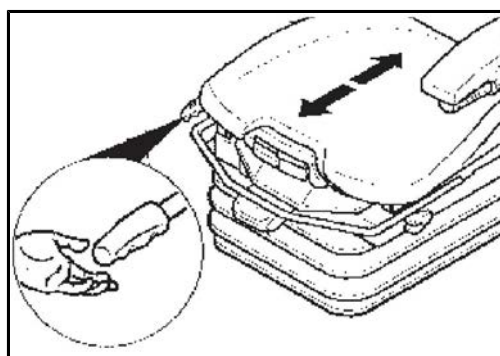
The depth of the seat pan can be adjusted individually. To adjust the depth of the seat cushion, lift the right handle (see arrow). You can reach the desired seating position by moving the seat cushion forwards or backwards.



### Seat pan angle adjustment

The angle of the seat pan can be individually adjusted.

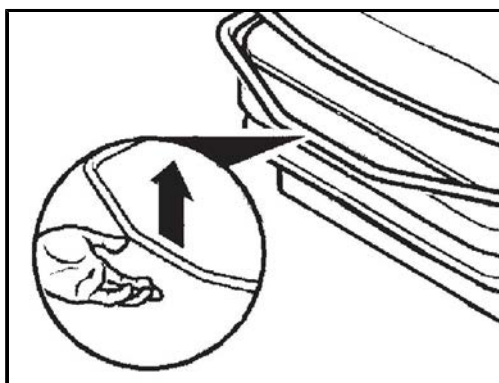
To adjust the angle of the seat pan, lift the left handle (see arrow). By exerting pressure on or off the seat pan it can be moved to the desired angle position.



### Longitudinal adjustment without operating console

Lateral adjustment of the seat is released by pressing the locking lever upward.

The locking lever must latch into the desired position. It should not be possible to move the driver's seat into another position when it is locked.



#### Longitudinal adjustment with operating console

Moving the locking lever upward releases lateral adjustment.

The locking lever must latch into the desired position. It should not be possible to move the driver's seat into another position when it is locked.

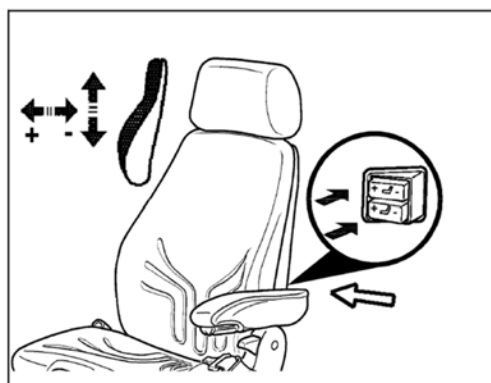


#### Headrest

The headrest can be individually adjusted for height by pulling it upward over the various increments up the end stop.

By pushing forward or backward the angle of the headrest can be adjusted individually.

To remove the headrest, pull it over the end stop.



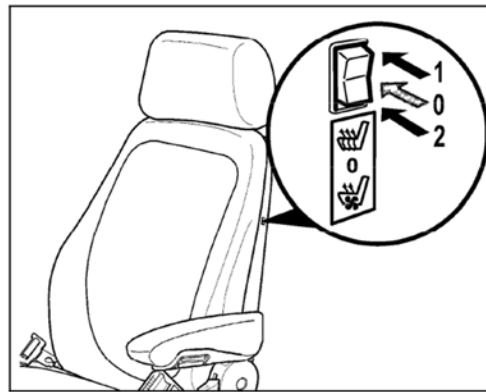
#### Lumbar support

Pressing the top and bottom switch adjusts the lumbar support in the top and bottom area of the seatback cushion.

This increases both the seating comfort and the performance of the driver.

The lumbar support is adjusted outwards by pressing + and inwards by pressing - on the switch.

If the seatback cushion no longer moves when + is pressed on the switch, the maximum position has been reached and the switch must be released.



### Seat heating and cooling

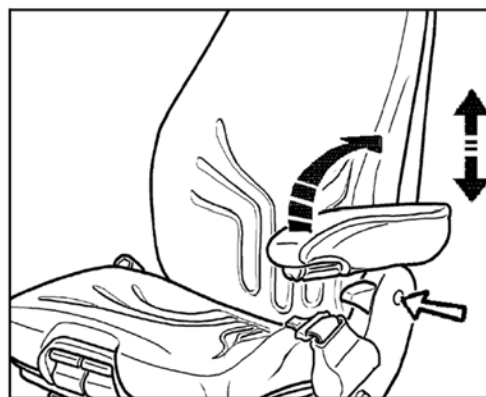
The active seat air conditioning ensures that the seat surface is always dry. Body moisture in the contact area of the seat is removed. This keeps the seat comfortably cool and dry.

Seat heating and cooling can be turned on and off by pressing the switch.

0 = seat heating and cooling OFF

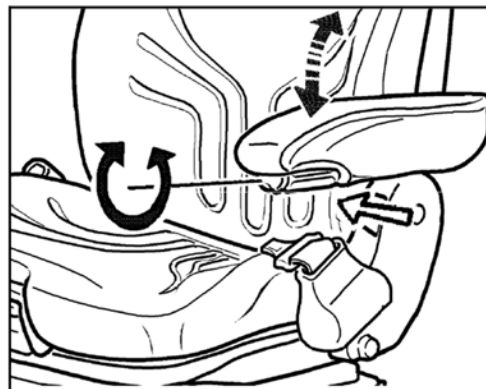
1 = seat heating ON (seat cooling OFF)

2 = seat air cooling ON (seat heating OFF)



### Armrest

The armrests can be folded backward if required.



### Armrest inclination

The inclination of the armrest can be modified by turning the adjustment hand wheel (arrow).

### Backrest adjustment

#### CAUTION



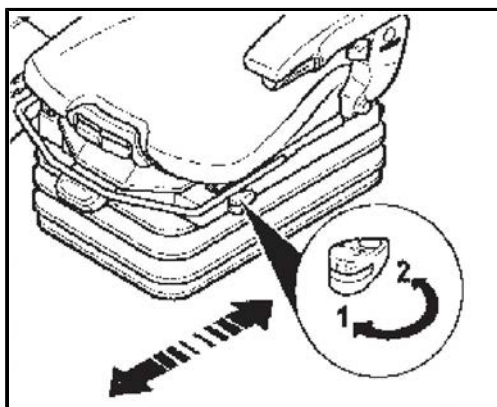
Take care with the backrest frame – it may jerk forward and cause injury!

– Hold the backrest hand tight before adjusting.



The backrest is adjusted using the locking lever (arrow).

The locking lever must latch into the desired position. It should not be possible to move the backrest into another position when it is locked.



### **Horizontal suspension**

Under certain driving conditions, it is useful to activate the horizontal suspension. This means that shock impacting in the driving direction can be better absorbed by the driver seat.

Position 1 = horizontal suspension on

Position 2 = horizontal suspension off

### **Cleaning**

Dirt can impair the function of the seat.

Make sure you keep your seat clean.

It is not necessary to remove the upholstery from the seat frame for cleaning.

Avoid soaking of the upholstery when cleaning the upholstered surface.

Check impact of standard upholstery or plastic cleaners first on a small hidden area.



### 5.7.1 Rotating driver's seat

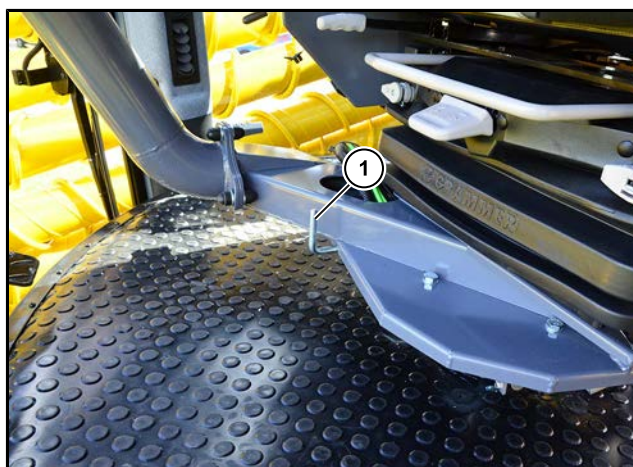
The rotatable driver's seat has a pneumatic seat brake. This seat brake is operated using the switch (17) on the left joystick. You can fix the seat in the position most favourable for you. An additional mechanical lock (1) always fixes the seat in the position prescribed by law when driving on roads.

#### DANGER



#### Hazard of severe accidents!

- When driving on roads, the driver's seat must be secured against inadvertent rotation by using the mechanical seat lock on the bottom of the driver's seat.
- The seat may not be adjusted while driving.



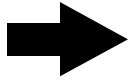
(1) Mechanical seat lock for driving on roads

The seat is locked by pressing the inside button (17) on the left joystick. The seat brake is released by pressing again this button.



## 5.7.2 Driver's seat occupancy identification system

### ADVICE



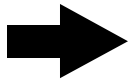
For the machine to be fully functional, the driver's seat must be occupied. Once the driver gets up from the seat, the system automatically stops all dangerous movements a few seconds later. However, brief raising from the driver's seat doesn't influence the machine functions.

## 5.7.3 Folding left joystick console



(1) Left joystick console folded up

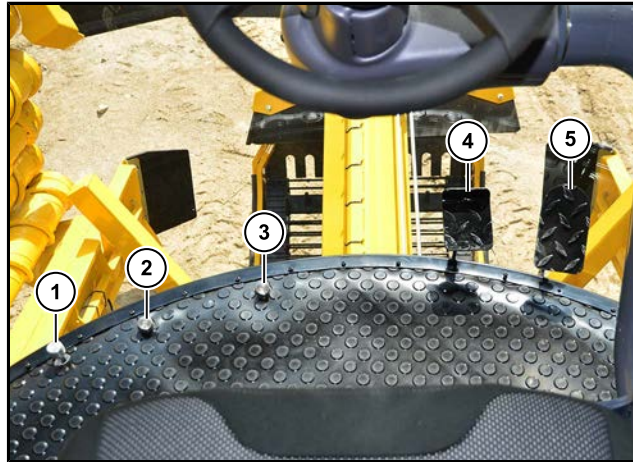
### ADVICE



For the machine to be fully functional, the left joystick console must be folded down. If the joystick console is folded up, the machine drive cannot be activated.



## 5.8      Operating components on the floor of the driver's cabin



- (1) Opener for cleaning flap
- (2) Foot-switch look forward
- (3) Foot switch driving direction
- (4) Brake pedal
- (5) Drive pedal

## 5.9 Operating console R-Concept



For a detailed description see Chapter 6 "Operation" ([See Page 103](#)). The console is divided into different operating fields:

- (1) R-Touch auxiliary terminal
- (2) R-Touch main terminal
- (3) Keypad I
- (4) Keypad II
- (5) Operating panel R-Direct
- (6) Operating panel R-Select
- (7) Foldable armrest with storage compartment
- (8) Switches on operating console
- (9) Right joystick with multi-functional handle
- (10) Lever height adjustment operating console
- (11) Main steering switch



Outlets at the front side of the operating console

- (12) USB double socket 5V / 3.6A (USB-A and USB-C)
- (13) Outlet 24V/8A maximum
- (14) Outlet 12V/5A maximum

#### ATTENTION



The voltage transformer could be damaged if this 12 V outlet (14) is overloaded.

### 5.9.1 R-Touch main terminal



Various settings can be adjusted by touching (tapping) the screen of the R-Touch main terminal (1). Since it is a capacitive touch screen (PCAP), the screen also reacts to touches with stylus or gloves. Almost all functions which can be performed by turning/pressing R-Select and R-Direct, can be made as well by touching tempered glass surface of the R-Touch. In Chapter 6 therefore, the operation of all functions with the both operating sections R-Select and R-Direct is described.

A USB-port is located on the left side of the terminal (2).

#### ADVICE



A key to restart the terminal (3) is located at the rear right side of the terminal. Use this key only in emergency cases, e.g. if there is no response from the terminal.

#### ADVICE



Use only the USB stick supplied by ROPA or a similar stick formatted in FAT 32.

## 5.9.2 R-Touch auxiliary terminal

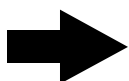
The auxiliary terminal is installed above the main terminal.



The R-Touch auxiliary terminal (1) is primarily used to display the images from the built-in video cameras and to select their view formats. The operation of all functions of the auxiliary terminal is described in Chapter 6 ([See Page 150](#)).

A USB-port is located on the left side of the terminal (2).

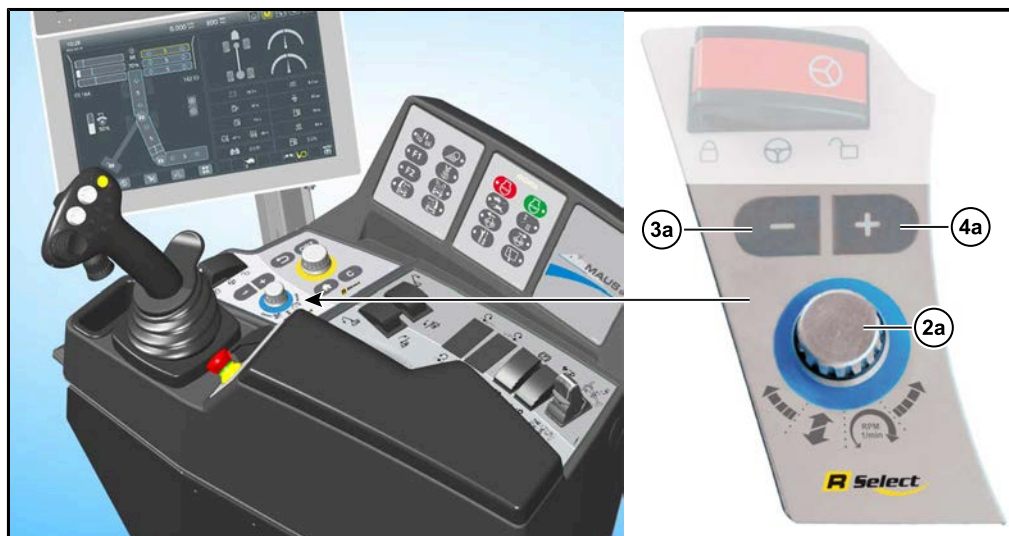
### ADVICE



A key to restart the terminal (3) is located at the rear right side of the terminal.

Use this key only in emergency cases, e.g. if there is no response from the terminal.

### 5.9.3 R-Select



The R-Select (2) (BLUE operating panel colour) allows the driver to perform about 15 different functions without knowing the menu structure. Generally, there are two possibilities to operate the selection area of R-Select (2b). You can select the desired functions either by rotating the R-Select wheel (2a) or by touching the corresponding keys on the touch screen. The selected function is displayed in yellow.



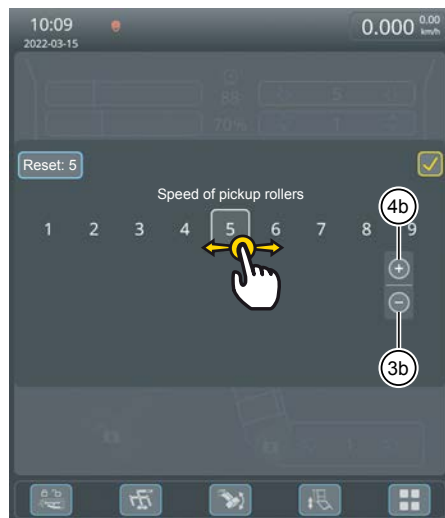
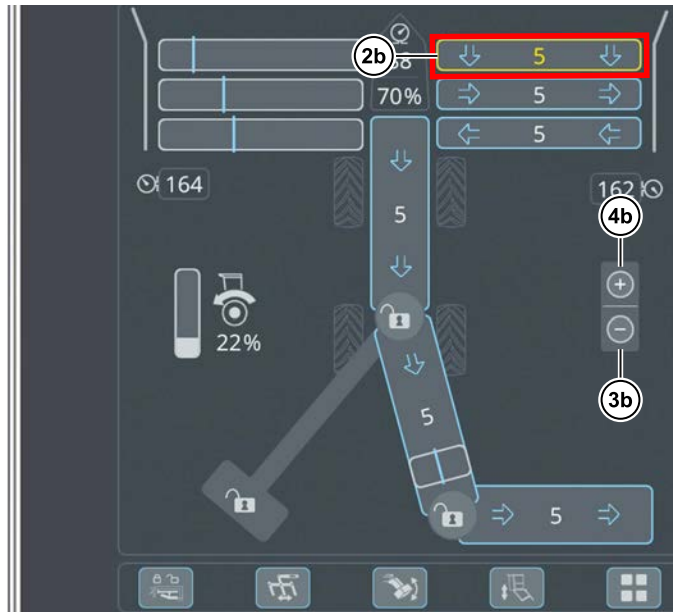
#### (3a) – Key:

Thus, the selected function is slowed respectively rotation speed, pressure or drive speed are reduced.



#### (4a) + Key:

Thus, the selected function is accelerated respectively rotation speed, pressure or drive speed are increased.



For example, "Speed stage of pickup rollers" is selected:

The speed stage of the pickup rollers can be set with the + (4a) and - (3a) keys on the R-Select or with the + (4b) and - (3b) buttons on the touch screen. Alternatively, the stage can be set by swiping left and right on the touch screen.

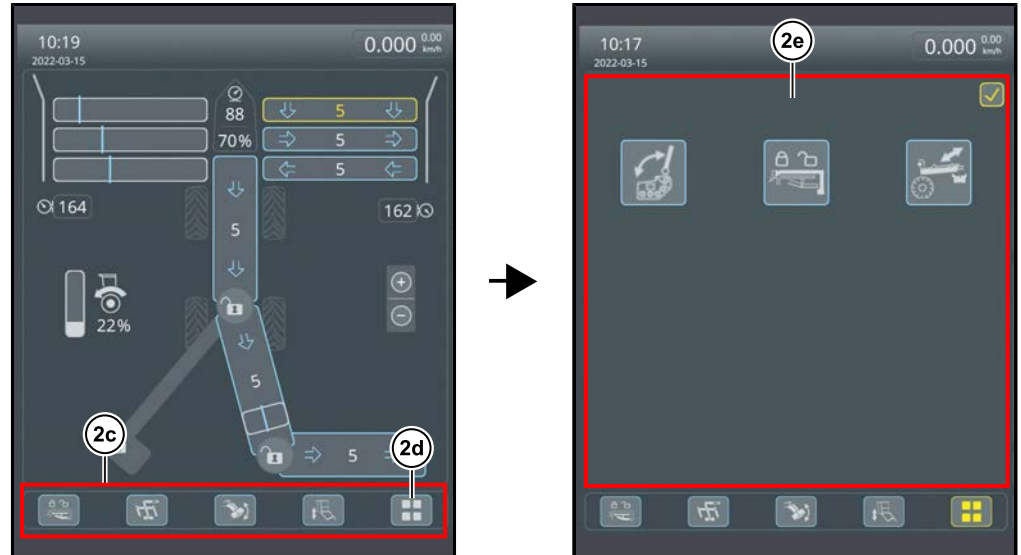




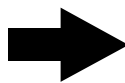
### R-Select menu (2d):

The R-Select Quick Access Toolbar (2c) is located at the bottom left of the terminal. Here, you can set further functions with the R-Select.

By pressing the key (2d) you open the R-Select menu (2e), in which further functions can be selected.



### ADVICE



You can also open the R-Select menu (2e) by holding one of the icons of the Quick Access Toolbar (2c). Here you can select another icon to add it to the Quick Access Toolbar. Thus, the Quick Access Toolbar can be set individually.

The following functions are included in R-Select menu:



Raise/lower driver's cabin



Raise/lower counterweight



Rotate recleaner



Fold plates in/out



Counterweight arm lock



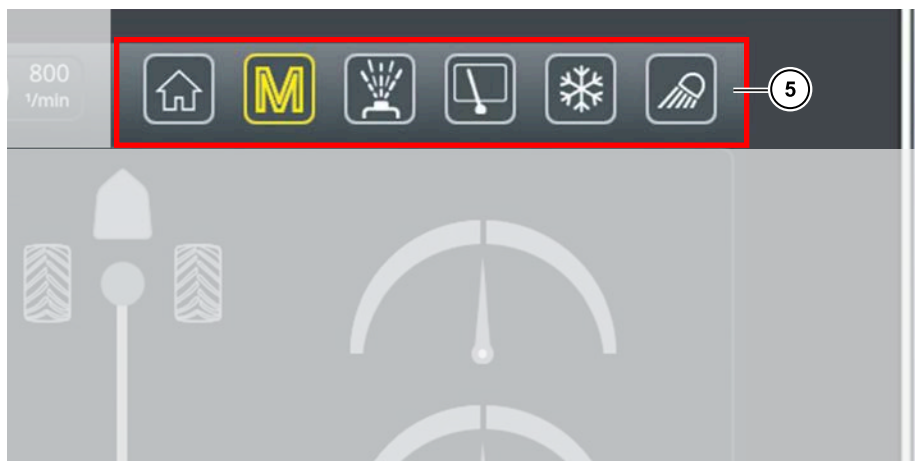
Swivel arm lock



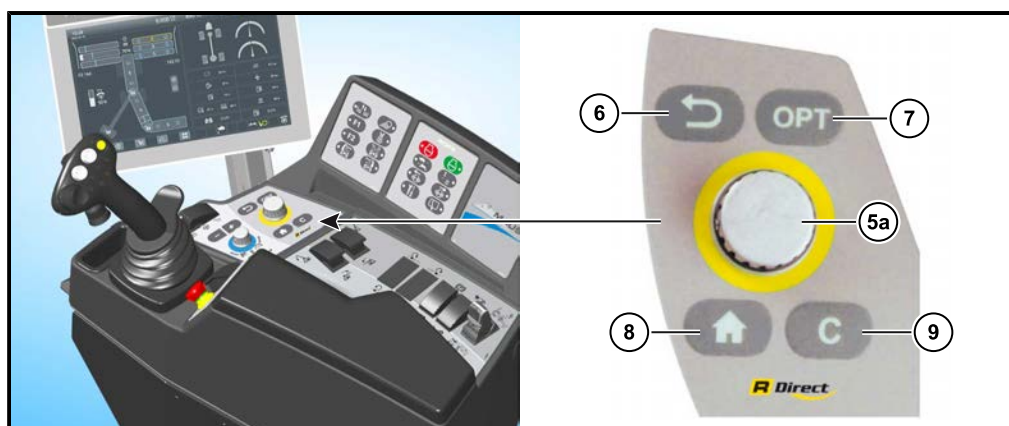
Adjust beet brake



## 5.9.4 R-Direct



The R-Direct function area (5) (YELLOW operating panel colour) allows the driver to perform different settings, e.g. access to the main menu with submenus. The R-Touch main terminal accepts commands when you touch one of the R-Direct selecting fields (5) as well as when you turn or press wheel on the R-Direct (5a).



### (6) RETURN-key:

With the RETURN-key you can leave each R-Direct menu gradually.



### (7) OPT-key:

Use this key to open the quick access window. ([See Page 114](#))



### (8) HOME-key:

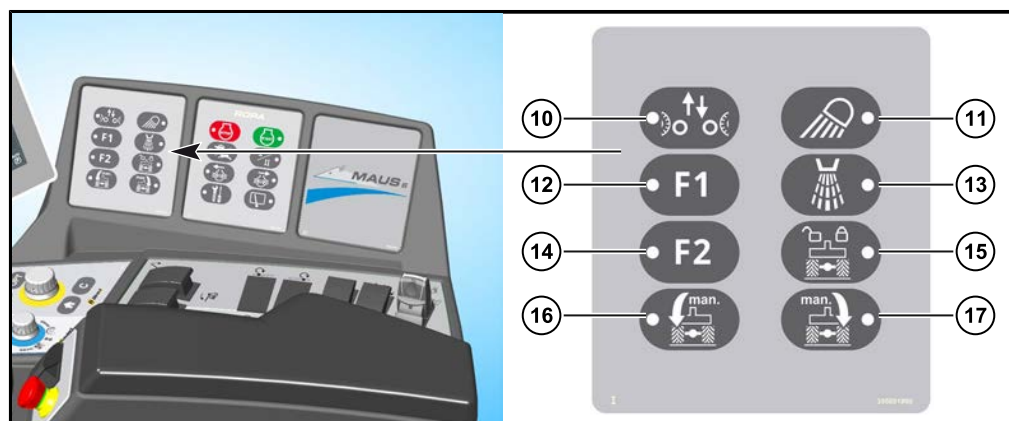
Click here to go back to the start screen.



### (9) C-key:

With the C-key you can delete any entered information (Delete). When a warning indicator activates the warning buzzer, you can suppress the sounding of the buzzer for a short period pressing the C-key (9).

### 5.9.5 Keypad I



**(10) Raise/lower additional axes:** [See Page 201.](#)

The additional axes are lowered when the LED lights.



**(11) Light - working lights:** [See Page 139.](#)



**(12) Functional key 1:**

You can save different functions for the key (12) and call them up by pressing this key. The assignment of the function keys can be changed in the menu "Basic settings", submenu "Function keys". (Not active currently)



**(13) Water spray system (option):** [See Page 284.](#)



**(14) Functional key 2:**

You can save different functions for the key (14) and call them up by pressing this key. The assignment of the function keys can be changed in the menu "Basic settings", submenu "Function keys". (Not active currently)



**(15) Oscillating axle support ON/OFF:**

The oscillating axle support is on when the LED lights. ([See Page 212](#)).



**(16) Swing axle left:**

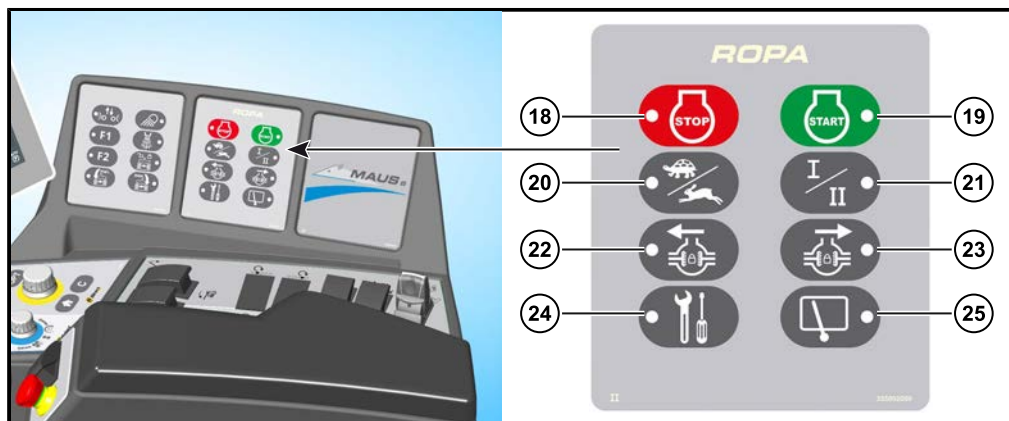
The load on the left rear axle is increased so long as this key is pressed.



**(17) Swing axle right:**

The load on the right rear axle is increased so long as this key is pressed.

## 5.9.6 Keypad II



**(18) STOP diesel engine:**

This key shuts the diesel engine down.



**(19) START diesel engine:**

This key starts the diesel engine (must be held for at least 3 sec.).



**(20) Switching operating mode "Turtle/Rabbit":**

[See Page 186](#)



**(21) Switching between I/II gear of the operating mode:**

Operating mode gear I - all-wheel drive is automatically switched on.

Operating mode gear II - all-wheel drive is automatically switched off.

[See Page 186](#)



**(22) Differential lock front axle ON/OFF:**

The differential lock is on when the LED lights. ([See Page 187](#))



**(23) Differential lock ON/OFF:**

The differential lock is on when the LED lights. ([See Page 187](#))



**(24) Service key**

This key is used by service personnel, e.g. for diagnostic purposes.



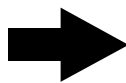
**(25) Window wipers (all except for the windscreen):** [See Page 129](#)

### 5.9.7 Switches on operating console



- (26) **Steer the rear axle right/left (only in "Turtle" operating mode)**
- (27) **Emergency stop switch**

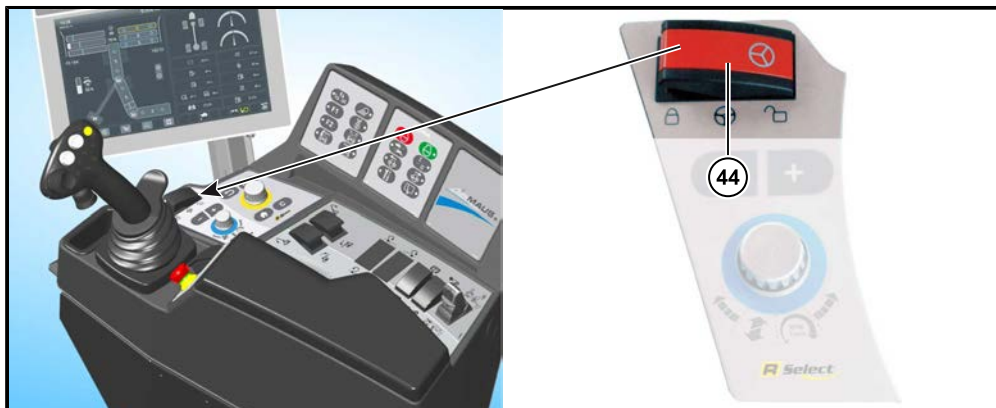
#### ADVICE



The emergency stop switch never switches off the diesel engine and the traction drive! It switches off the machine drive as well as the yellow button (6) on the joystick! In order to unlock, turn the Emergency-Stop switch slightly clockwise.

- (28) **Clearing shield left**  
press forward = unfold  
press backward = fold
- (29) **Clearing shield right**  
press forward = unfold  
press backward = fold
- (30) **Not used**
- (31) **Not used**
- (32) **Parking brake**
- (33) **Quick motion switch truck conveyor/infeed conveyor**  
press to the right = fast motion truck conveyor  
press to the left = fast motion infeed conveyor
- (34) **Analogue rocker**  
Automatic unfolding into operating position. ([See Page 212](#))  
Automatic folding for road drive. ([See Page 218](#))

## 5.9.8 Main steering switch



(44) Main steering switch

### DANGER



When the main steering switch is unlocked the driving speed of the machine is limited.

- When driving on public roads and paths, the main steering switch must generally be locked.
- It may ONLY be unlocked for driving through narrow curves and at low speed (below 12 km/h).

swung right = unlocked

Steering of rear axle is possible.

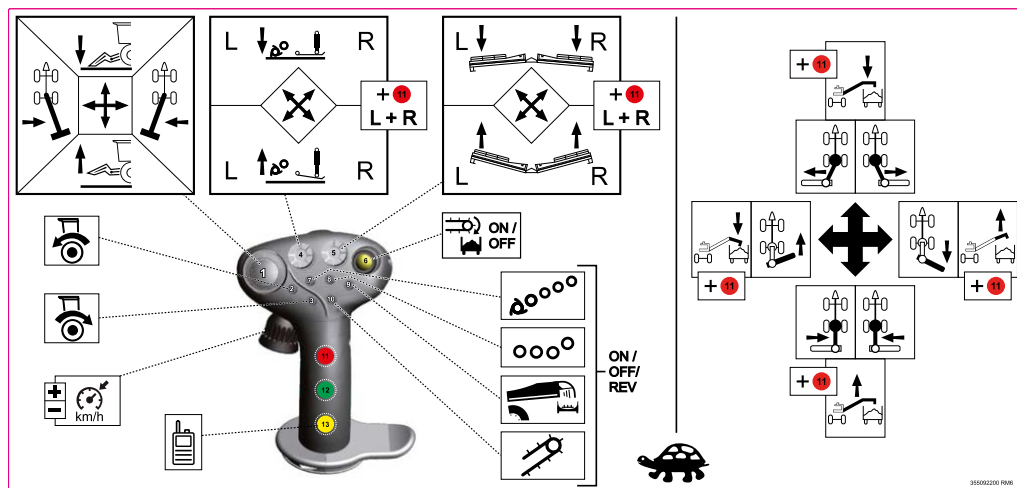
swung left = locked

Steering of rear axle is locked.

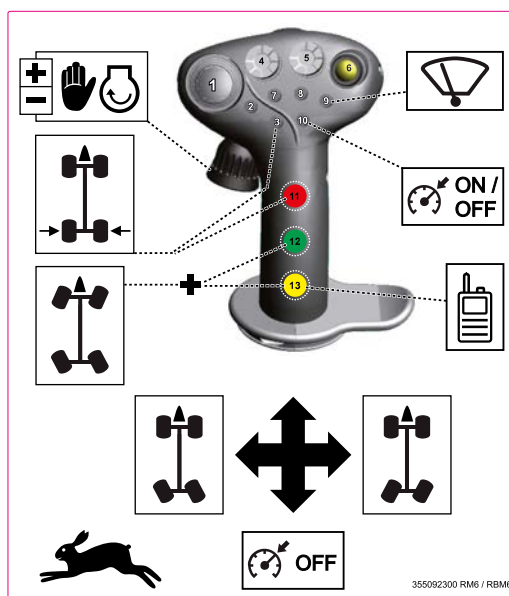
### 5.9.9 Right joystick with multi-functional handle

The joystick enables easy control of a multitude of functions of the machine with a single hand without distracting the attention of the operator. For better orientation, there are transparent stickers located on the side window of the driver's cabin containing the following schematic overviews of all functions of the joystick with multifunctional handle. For a detailed description, see: [See Page 157](#).

#### Joystick functions in the operating mode "Turtle"

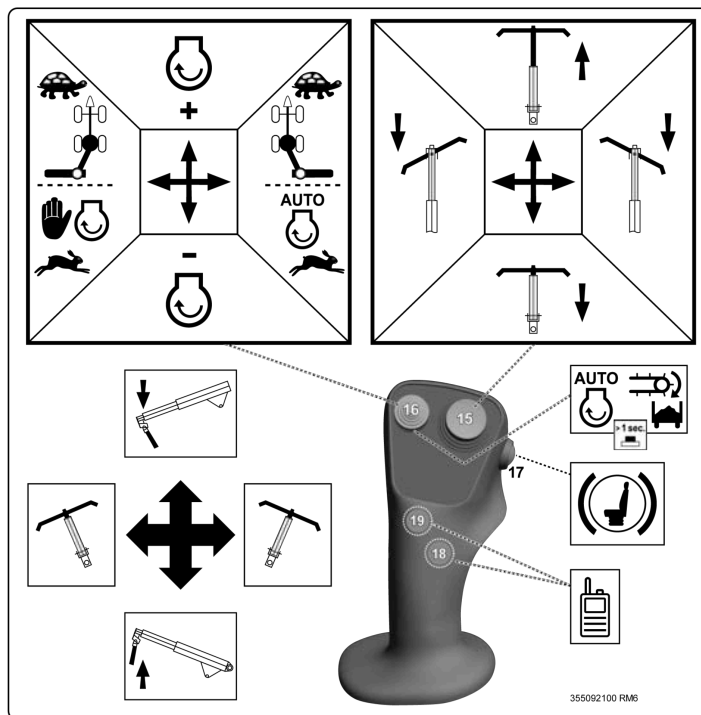


#### Joystick functions in the operating mode "Rabbit"



### 5.9.10 Left joystick

As soon as the left joystick console is folded up, the machine drive and the traction drive stop automatically. You can find a detailed description of the left joystick operation here: [See Page 163](#)



### 5.9.11 Ignition lock

The ignition lock has three switching positions:

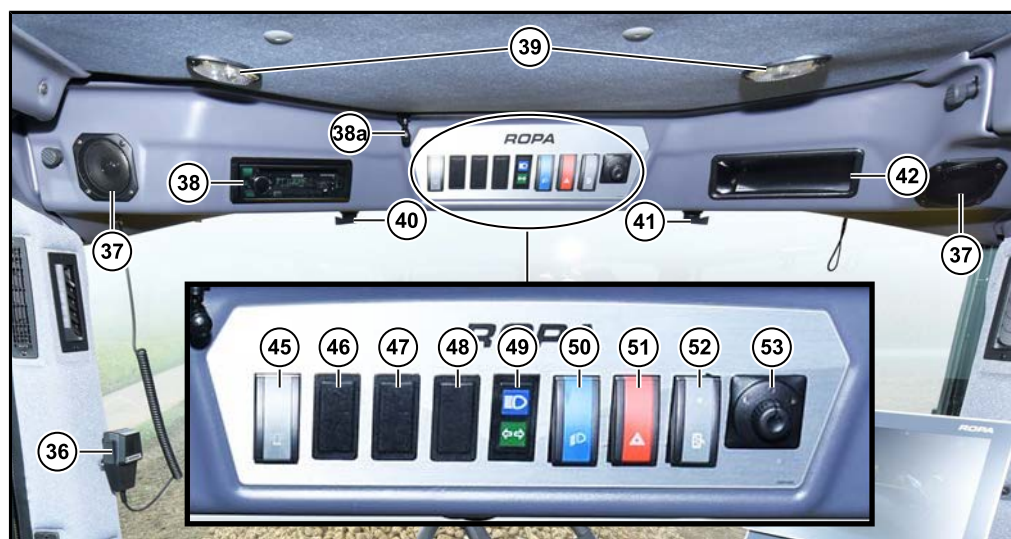
- Position 0: Shut down diesel engine/ignition off – the key may be removed
- Position I: Ignition on, the diesel engine is ready for start
- Position II: Start diesel engine (not connected)



For details, see [See Page 171](#)



## 5.10 Switches of the roof console



- (36) Microphone for outside speaker system
- (37) Loud-speaker radio
- (38) Radio with Bluetooth (see separate operating manual)
- (38a) Hands-free communication microphone
- (39) Internal lamps on driver's cabin ceiling LED
- (40) Rotating switch to fold in/out the left rearview mirror
- (41) Rotating switch to fold in/out the right rearview mirror
- (42) Roof console storage compartment ([See Page 167](#))
- (45) Switch for rotating beacons
- (46) Not used
- (47) Not used
- (48) Not used
- (49) High beam control (above) / turn signal control (below)
- (50) Switch parking/driving lights
- (51) Switch flashing warning system
- (52) Switch mirror heating

### ADVICE



The mirror heating switches off to conserve battery life in few minutes with the stopped diesel engine.

- (53) Four-way switch for electrical adjustment of right and left outer mirrors.

### WARNING



**Hazard of objects falling down from the storage compartment in the roof console.**

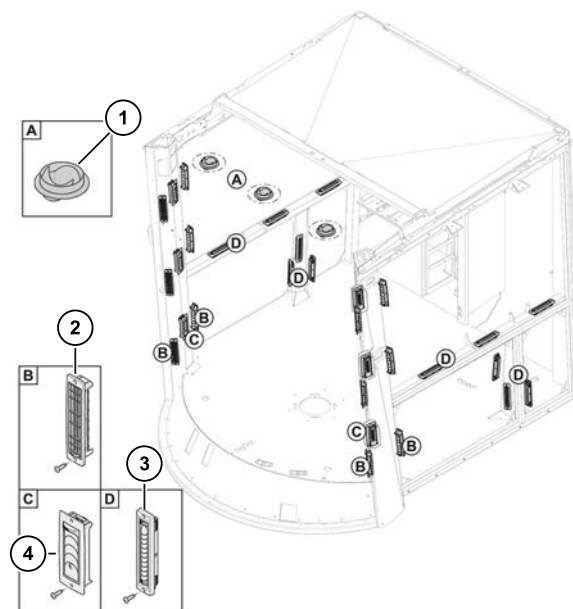
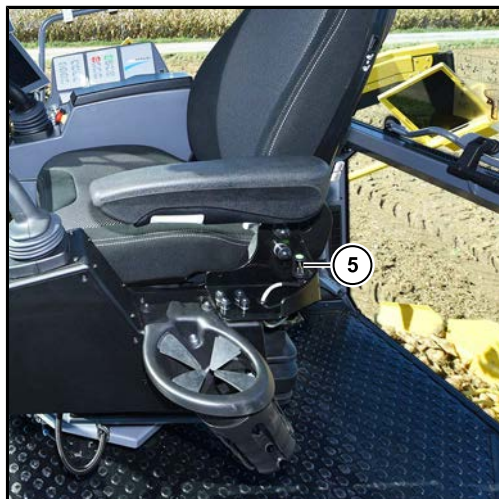
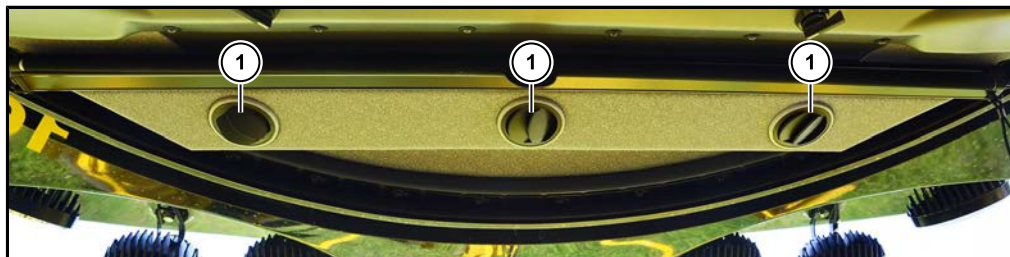
During jerky movements of the machine or driving around curves, these objects may fall out of the storage compartment and severely injure the driver.

Do not put any heavy or sharp objects in this storage compartment.  
Whenever possible, place such items in the storage compartment on the cabin rear wall.



- (73) USB double socket 5V / 3.6A (USB-A and USB-C)
- (74) Switch for LED internal lamps on driver's cabin ceiling
- (75) Not used
- (76) Battery main switch ([See Page 334](#))

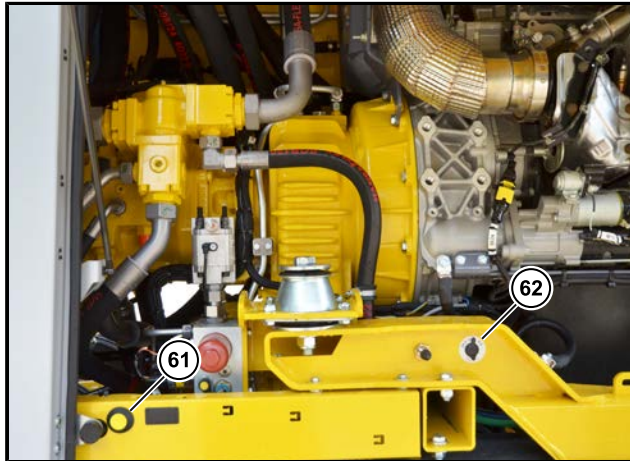
## 5.11 Climate control



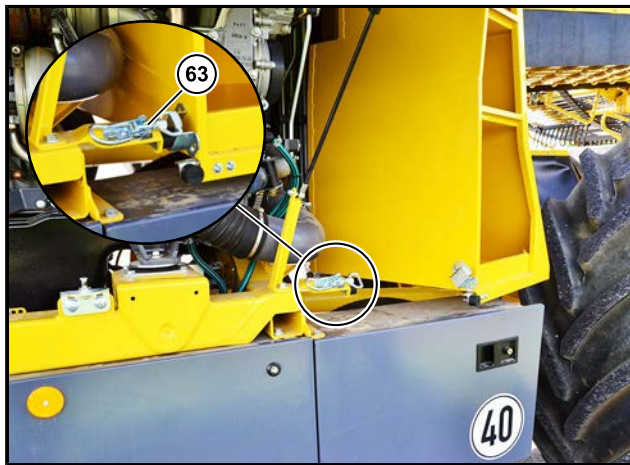
- (1) Air vents (round nozzle) in the roof console
- (2) Air vents (roller nozzle vector nozzle)
- (3) Air vents (roller nozzle)
- (4) Air vents (roller nozzle small Louver-S II)
- (5) Inside temperature sensor
- (6) Handle (to open the upper side windows)

## 5.12 Engine housing

There is a key (61) in the engine compartment, which serves to switch on or off engine compartment light. When the engine compartment cover is closed, the engine compartment lights switch off automatically after 15 minutes. In order to switch on the engine compartment lighting with either the ignition or the battery main switch switched off, hold the key (61) for 5 sec and then release it.

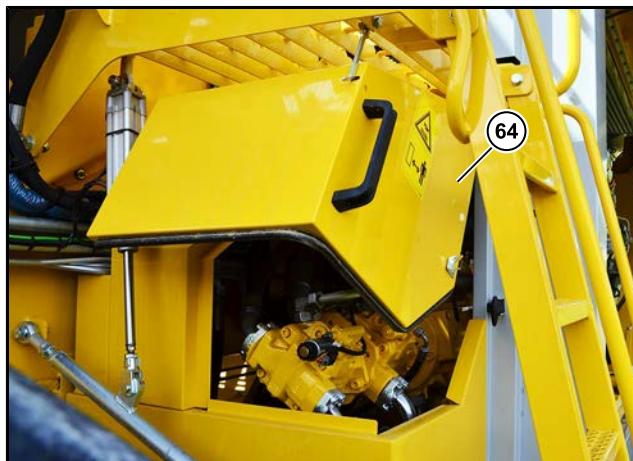


- (61) Engine compartment lighting ON/OFF
- (62) Engine compartment outlet 24V/8A maximum

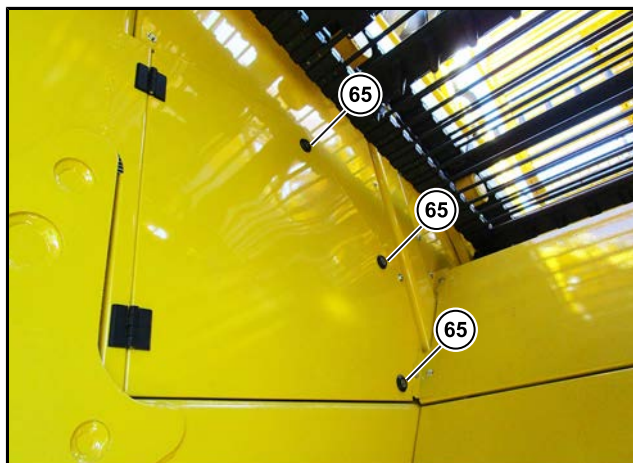


- (63) Unlocking lever for storage compartment in engine compartment





(64) Pump cover behind climbing ladder



(65) Unlock engine housing maintenance hatch in the infeed conveyor duct

### 5.13 Outlet on fuel tank

One more outlet is installed at the rear under the fuel filler nozzle.



(66) Outlet on fuel tank 24V / 8A maximum

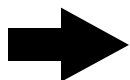
## 5.14 Ladder light

The key (67) for switching on the ladder light is in the cutout under the engine compartment cover. In order to switch on the ladder lighting with either the ignition or the battery main switch switched off, hold the key (67) for 5 sec and then release it. For more details on this and the Leaving Home function, see [See Page 142](#).



(67) Key for ladder lighting on the machine

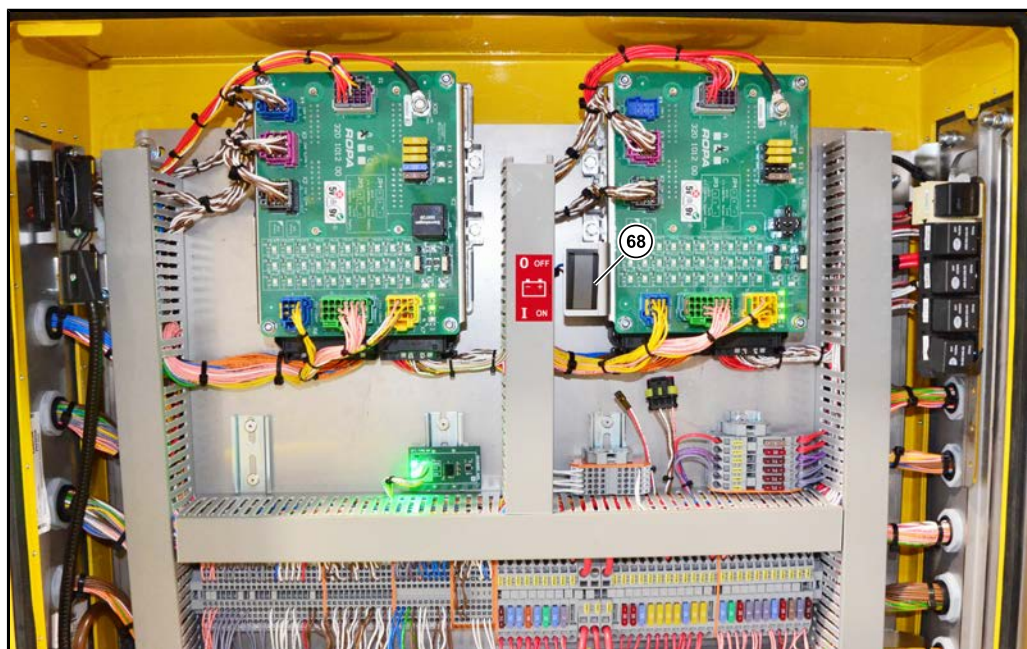
### ADVICE



Even though the battery main switch in the roof console is off, by pressing this key, you can switch on the shining downward headlights on the mirror brackets (also activates the battery disconnect relay). This function helps to use the ladder safely even at night.



## 5.15 Battery emergency shutdown



(68) Battery emergency switch-off (*See Page 334*)

### ATTENTION



#### **Risk of machine damage.**

If this switch is turned off while the ignition is on, it can lead to data loss.

The power supply will be switched off immediately.

It may also seriously damage the exhaust gas after-treatment system.

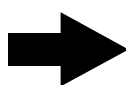


# 6      **Operation**



This chapter provides all information for operation of the machine. For most work in an agricultural area, the mode of working and the work results are under the influence of many individual and different factors. The scope of this operating manual would be exceeded if we have considered all conceivable situations (ground condition, sugar beet varieties, weather, local land conditions, etc.). This operating manual cannot be instructions for loading of sugar beets or replace driving instructions for driving on the road. Preconditions for operation of this machine and for optimum harvest results are, besides driver training offered by the manufacturer or service partner, solid basic agricultural knowledge and some experience with growing sugar beets and the associated work processes. This chapter provides information about processes of operation and coherences during operation of the machine. You will find an exact description of adjusting work for the individual functional components in the respective chapters. The required maintenance work is described in chapter 7, "Maintenance and Services".

#### ADVICE

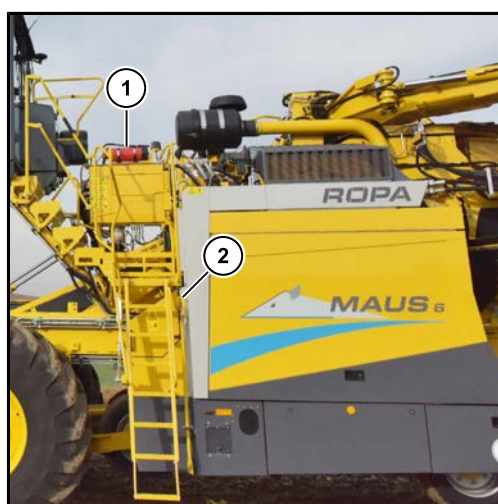


Obtain comprehensive information about the safety measures for operation of this machine before each operation of the machine. Should any people be present, who are not informed about the applicable hazard zones and safety distances, then inform these people about safety distances and hazard zones. Indispensably inform these people that you will immediately shut down the machine as soon as anyone unauthorized comes close to the hazard zones.

## 6.1 First startup

For safety reasons, check all oil levels, the level of coolant fluid, the current fuel and AdBlue® level in the tank. Otherwise, all work and actions that must be performed for daily operation are also required for the first startup.

All bolted connections must be checked for tightness after the first 10 operating hours and retightened in case of need. In addition, the complete hydraulic system must be checked for leaks. Possibly existing leaks must be repaired immediately. Furthermore, all hose clips on coolant hoses, charge air hoses and air intake hoses must be checked for tight fit and possibly retightened.



Stow the provided accessories, such as fire extinguisher (1), wheel chocks, cleaning scraper (2), tool box in the compartments or holders provided for them.

---

## **6.2      Safety regulations for operation of the machine**

- Before starting work, familiarize yourself with the machine and the operating components. In case of need, obtain instructions from a person already having sufficient experience in handling the machine.
- Before each startup, check the machine for driving and operating safety.
- Instruct all people staying in the vicinity of the machine about the hazard zones and the applicable safety regulations for handling of the machine. Strictly prohibit anyone to enter the hazard zones while the machine is running. The appendix to this operating manual contains a drawing showing the hazard zones of the machine. In case of need, copy this sheet and possibly hand it out to all people present during operation of the machine. Obtain confirmation of receipt of this sheet from each person by their signature.
- Generally, it is not permitted to carry any persons on the access platform, neither when driving on the road nor when loading. An accompanying person, if required, may only sit on the emergency seat once the diesel engine is started or while the machine is moving. As the name suggests, it is an emergency seat, not a passenger seat! If this regulation is deviated from for training purposes, then this is done at your own risk and under the responsibility of each of the participants.
- The effectiveness of operating or adjusting components must not be impaired or bypassed in any way. Safety installations may neither be circumvented nor bridged or otherwise rendered ineffective.
- When working with and on the machine, always wear tightly fitting and suitable protective clothing respectively approved personal protective equipment. Depending on the activities, the following personal protective equipment is required: warning vest, protective helmet, safety boots, hand protection, ear protection, face protection.
- Never step on the rollers or conveyors while the diesel engine is running.
- Staying under raised machine parts is prohibited, even if the machine is shut down. These parts may suddenly come down and severely injure people.
- Staying in the swivelling perimeter of machine parts is prohibited.
- Only specially authorised personnel may enter the hazard areas for maintenance or inspection work after exact agreement with the operator. Thoroughly inform these persons of the potential risk and dangers before they enter the hazard zones. All activities between the operator and said personnel shall be thoroughly agreed prior to the start of such activities. All maintenance, adjusting and monitoring work on this machine shall, to the technically possible extent, always be performed with the machine standing totally still and the diesel engine shut down. In this case, the operator of the machine is responsible for ensuring that unauthorised persons do not operate the machine either inadvertently or contrary to prior agreements.



**DANGER**



**Hazard to life due to rotating rollers!**

There is a risk of the severest or even deadly injuries for people staying in the hazard zone. Especially near the pickup, objects or people may be drawn into rollers by body parts or pieces of clothing. In this case, body parts may be ripped off and fragmented. Objects may be drawn in by the rollers and destroyed or cause severe damage to the pickup of the machine.

- The operator is obliged to immediately shut down the machine as soon as people or animals enter the hazard zone or reach into the hazard zone with objects.
- It is expressly prohibited to use one's hands or tools to pick up sugar beets not caught by the pickup and put them into the pickup while the machine is running.
- The engine must be shut off before maintenance and repair work and the ignition key must be removed.
- In all cases, please read the operating manual and comply with the safety instructions.
- In the past, these activities have lead to severest accidents.

- When refuelling, the diesel engine must be shut down. Smoking, fire and open flames are strictly prohibited when handling fuel. Explosion hazard! Do not use cell phones or radios while refuelling.
- Always give a short signal with the horn before starting the diesel engine. This will alert anyone in the vicinity of the machine to leave the hazard zone. Make sure yourself that there are no more persons in the hazard area when starting the machine.
- Always maintain sufficient fire protection by keeping the machine free of dirt, grease residues and other flammable objects. Immediately remove spilt fuel or oils using suitable binding agents.
- Keep combustible materials out of the area around the park heating and the exhaust pipe of the park heating (e.g. leaves, etc.).
- Do not run the machine in enclosed spaces. There is a poisoning hazard due to poisonous engine exhaust gases. If the diesel engine is to run in an enclosed room for maintenance or adjustment, the exhaust gases must be routed outside by using suitable means (evacuating device, exhaust hoses, exhaust pipe extensions, etc.).
- When driving on public roads and paths, please comply with the applicable laws and regulations for your own benefit.
- Safe operation of the machine requires the full concentration and attention of the driver. Do not wear headphones for listening to the radio or for monitoring radios, etc.
- While driving, do not use radios, mobile phones (smartphones) etc. Should it be necessary, for operational reasons, to use such devices while driving, then always use a suitable hands-free device for this purpose. For radios with external input for the P.T.T. switch, you can use the P.T.T switch function integrated in this machine on the left or right joystick. ([See Page 157](#))
- Before starting up the machine, adjust all mirrors so that you can monitor and see the complete driving and working area.
- Before driving off, always check if there is anyone present in the immediate vicinity of the machine. Inform those people about your plans and instruct them to keep a safe distance.
- The individual vehicle handling of the machine always depends on the road condition respectively the ground. Always adjust your driving to the current environmental and ground conditions.
- Never leave the driver's seat when the machine is running.
- When working on slopes and hillsides, always make sure that the machine is sufficiently stable.

## 6.2.1 Working in the vicinity of power lines

### DANGER



#### Hazard to life due to electrical current!

Due to the dimensions of the machine, the landscape and the construction of power lines, the prescribed safety distance may be violated when working in the vicinity of or under power lines. This causes the greatest hazard to life for the driver and bystanders.

- When working in the vicinity of power lines, indispensably comply with the applicable minimum distances. These minimum distances between the outside edge of the machine and the power line may amount to up to 8.5m. The size of this minimum distance always depends on the voltage of the power line. The greater the voltage, the greater the prescribed minimum distance. Obtain information from the power company responsible about the technical situation in due time before starting loading. In case of need, agree on temporary shutdown of the power line for the time during which you are loading.
- Strictly abide with the agreements made between the power company and you about possible shutdown of power. Only begin your work after you have ensured yourself that shutdown has actually happened, for instance by calling the power company and enquiring about this.
- Especially when performing work at night or in vision-impairing weather, inform yourself exactly about the routing of power lines.
- Make sure that you do not violate the prescribed minimum distances while loading.
- When installing antennas or other auxiliary devices, always make sure that the total height of the machine in no case exceeds a dimension of 4m.

Well memorize the following behavioural rules when you are working in the vicinity of power lines. Exact compliance with these rules may save your life.

## 6.2.2 Behaviour during or after contact to the power lines

- Try to break the contact with the electric power line immediately by reversing, swinging away or lowering.
- Stay seated in the driver's seat – no matter what happens around you!
- Do not walk around in the driver's cabin.
- In case of electrical shock or after contact to a power line, in no case leave the driver's cabin. There is extreme hazard to life outside of the driver's cabin.
- Wait until help arrives.
- In no case use a cell phone or a radio connected to an external antenna.
- Warn any people approaching the machine of the danger with hand signals and loud shouting.
- Only leave the driver's cabin after you have been instructed to do so by rescue personnel.

#### If you have to leave the driver's cabin despite voltage flashover for reasons such as imminent danger to life due to fire:

- Jump off the machine. Jump to a safe standing position with feet together.
- Do not touch the machine from outside.
- Move away from the machine making very small steps.

## 6.3 R-Concept

Both R-Touch colour terminals are the information and command centre of the machine. From here, you can monitor the entire machine, see operating modes, performance data, images from the video cameras and adjust parts of the machine.

Before you start, make sure that you have become familiar with both R-Touch colour terminals and the various warning and status displays so that you can use the machine safely and effectively.

### 6.3.1 R-Touch main terminal



The machine is operated with 3 essential elements:

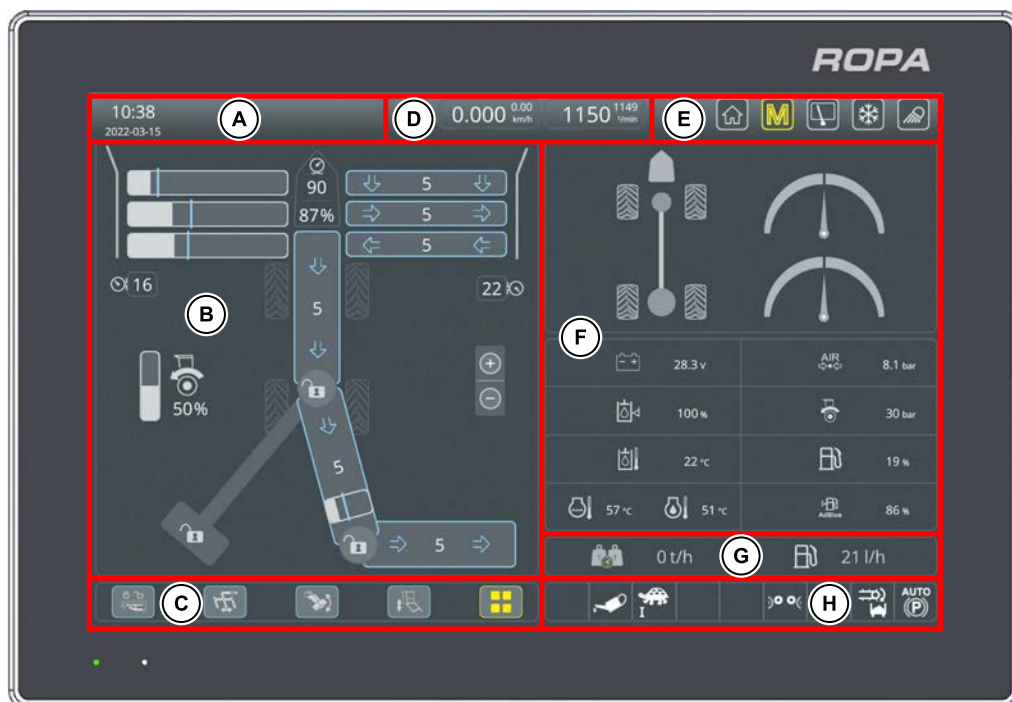
- The R-Touch main terminal, a user-friendly touch screen (1).
- The R-Direct, a push/rotating wheel (yellow) for operating in the menus (2).
- The R-Select, a push/rotating wheel (blue) for operating the machine settings on the left half of the screen (3).

In all menus you move by turning and pressing the rotary wheel, left and right, vertically and horizontally through the menu. It is indicated by a yellow cursor. In menus R-Direct or R-Select this cursor shows your current position in the function selection, in addition, the selected field is highlighted.

Lightly pressing the middle of the rotary wheel (enter function) confirms the current position of the cursor. In this manual we do not dwell on the touch operating, as it is similar to the rotating/pushing. This does not include functions that can only be performed by touching.

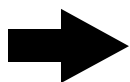
The R-Touch colour terminal is not switched off as long as the status LED (4) remains green while the ignition is switched off.

### 6.3.1.1 Display areas on the R-Touch main terminal

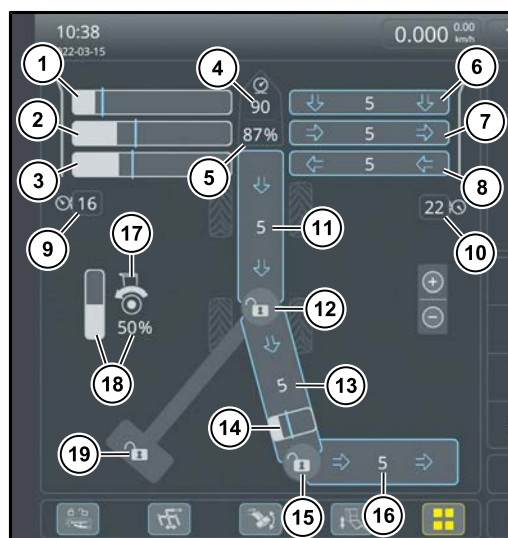


**[A]** Display area for warning indicators and hints ([See Page 145](#))

#### ADVICE



When a warning indicator activates the warning buzzer, you can suppress the sounding of the buzzer for a short period clicking on the display area **[A]** or pressing the key **C**.



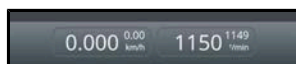
### [B] Display area beet path

- (1) Load and warning threshold for pickup roller drive
- (2) Load and warning threshold for conveyor roller drive
- (3) Load and warning threshold for drive of 4-part pinch rollers
- (4) Relief pressure pickup in the centre
- (5) Pickup height
- (6) Set speed and status of drive for pickup rollers
- (7) Set speed and status of drive for conveyor rollers
- (8) Set speed and status of drive for 4 pinch rollers
- (9) Relief pressure left pickup side part
- (10) Relief pressure right pickup side part
- (11) Set infeed conveyor speed
- (12) Condition of swivel arm lock
- (13) Set recleaning speed
- (14) Load and warning threshold for recleaning drive
- (15) Condition of truck conveyor lock
- (16) Set truck conveyor speed
- (17) Status of traction drive (only during loading)
- (18) Set speed/rotational speed on the rotary wheel of the right joystick
- (19) Counterweight arm lock status

### [C] Quick access toolbar for R-Select (See Page 85)



### [D] Display field driving and rotational speed diesel engine



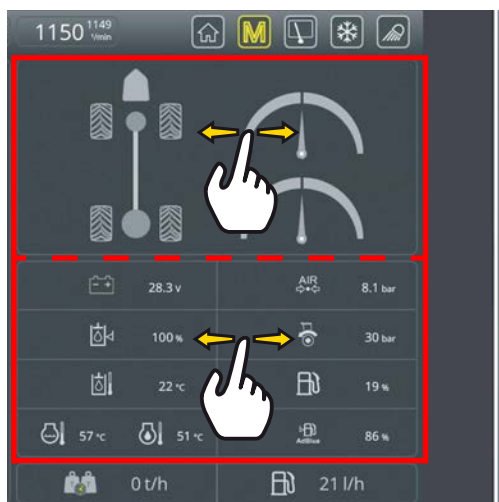
(See Page 168)

(See Page 193)

### [E] Display and operating panel for R-Direct functional area (See Page 115)



## [F] Individual display areas

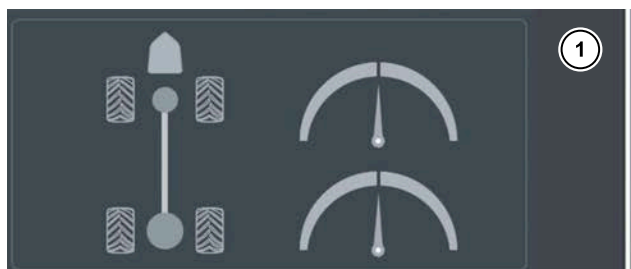


### Adjust display areas at the top and bottom

Swipe sideways on the display field to change it. Already selected in the other display area field is not available for switching.

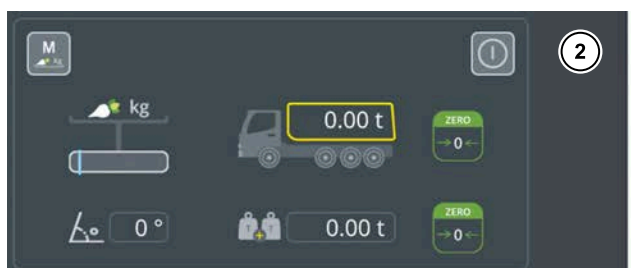
#### (1) Display field: Steering

[See Page 205](#)



#### (2) Display field: Scales

[See Page 297](#)



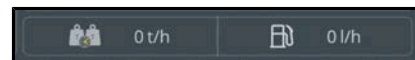


### (3) Display field: Operating parameters



- (a) Voltage vehicle power supply
- (b) Hydraulic oil level
- (c) Hydraulic oil temperature
- (d) Coolant temperature
- (e) Engine oil temperature (above 60°C is hidden)
- (f) Pneumatic system reservoir pressure
- (g) Pressure traction drive
  - Arrow counterclockwise: higher pressure forward
  - Arrow clockwise: higher pressure backward
- (h) Tank level fuel
- (i) AdBlue® tank content only on models with AdBlue-tank

### [G] Display for capacity, waiting period and actual fuel consumption



Display for capacity ([See Page 299](#)) and actual fuel consumption ([See Page 168](#))



Indicator for waiting period ([See Page 249](#))

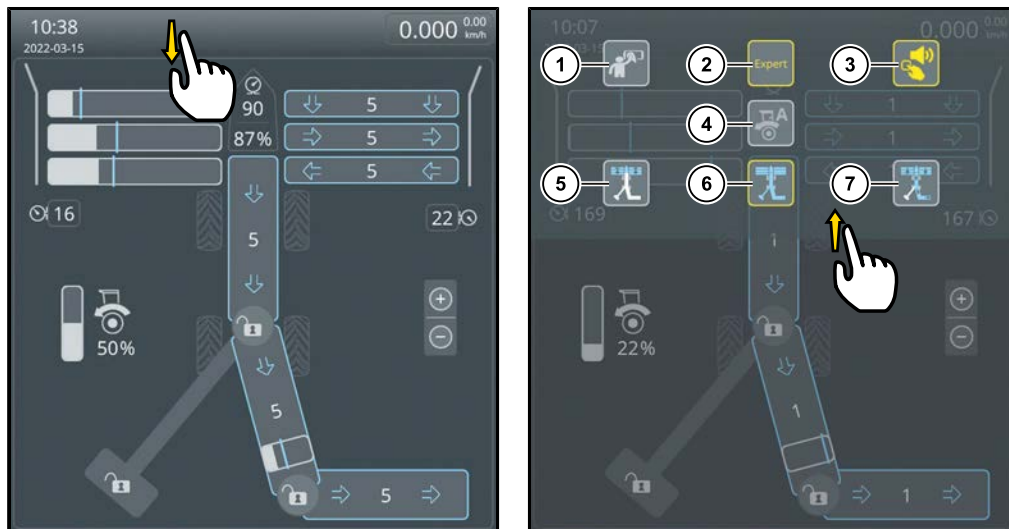
### [H] Display fields for status indications

([See Page 149](#))



### 6.3.1.2 Fold out quick access window

Touch the display area on the left top screen with the finger and swipe from top to bottom. Identical function also by pressing the OPT key.  
The quick access window opens.



To close the quick access window touch it and swipe from bottom to top.

The following functions can be selected in the quick access window:

- (1) Cleaning mode ([See Page 115](#))
- (2) Expert mode ON/OFF ([See Page 460](#))
- (3) Key tones ON/OFF
- (4) Feed automatic activation ON/OFF ([See Page 196](#))
- (5) START loading mode ([See Page 276](#))
- (6) "LOAD" loading mode
- (7) END loading mode ([See Page 280](#))

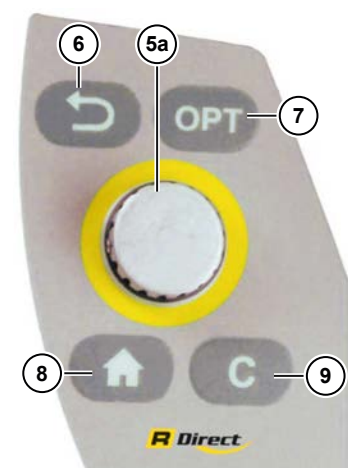
### 6.3.1.3 R-Touch cleaning mode



Cleaning mode ([See Page 114](#)) starts a screen saver so you can clean the screen with a microfibre cloth without adjusting machine settings.

To exit the cleaning mode, press the Return key in the upper right corner until the displayed time is up.

### 6.3.2 Functional area R-Direct



R-Direct operating panel

At the R-Direct functional area (5) (YELLOW colour of operating panel) the driver has access to the main menu, water spray system control, window wiper control, climate control and lighting control. ([See Page 88](#))

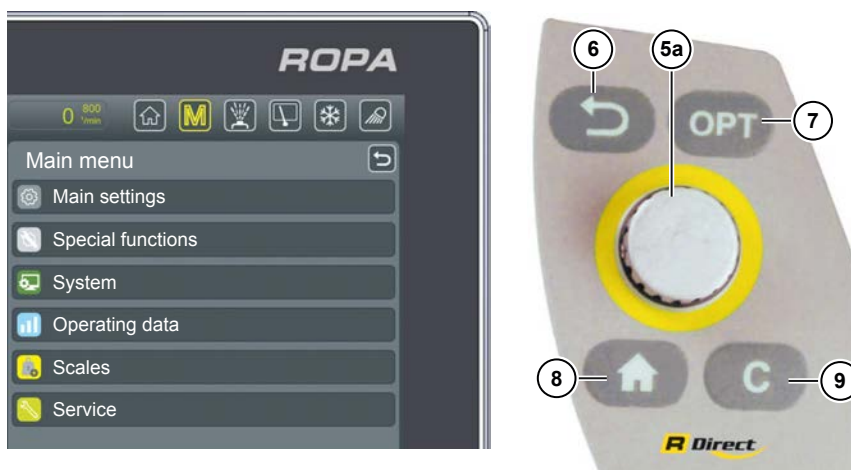
### 6.3.2.1 HOME key

The HOME key (8) is always available on the R-Touch colour terminals as well as on the R-Direct operating panel. Press the HOME key once to return to the main screen.

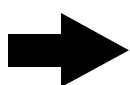


### 6.3.2.2 Main menu

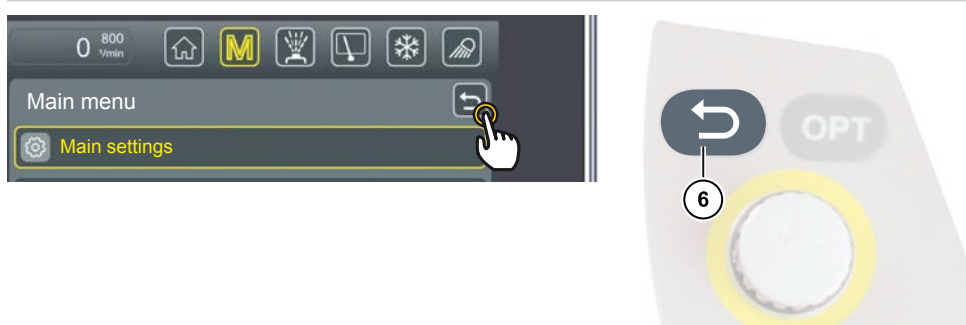
All submenus of the main menu can be selected with help of the R-Touch colour terminals or R-Direct rotary wheel (5a).



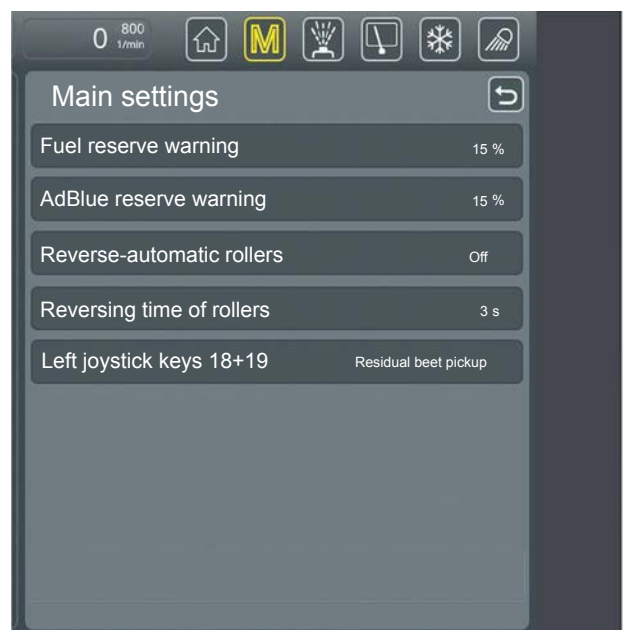
#### ADVICE



The RETURN key (6) is always available in the menu area as well as on the R-Direct operating panel. Pressing the key RETURN you go step by step back to the main screen.



### 6.3.2.2.1 Main settings menu



Fuel reserve warning % ([See Page 170](#))

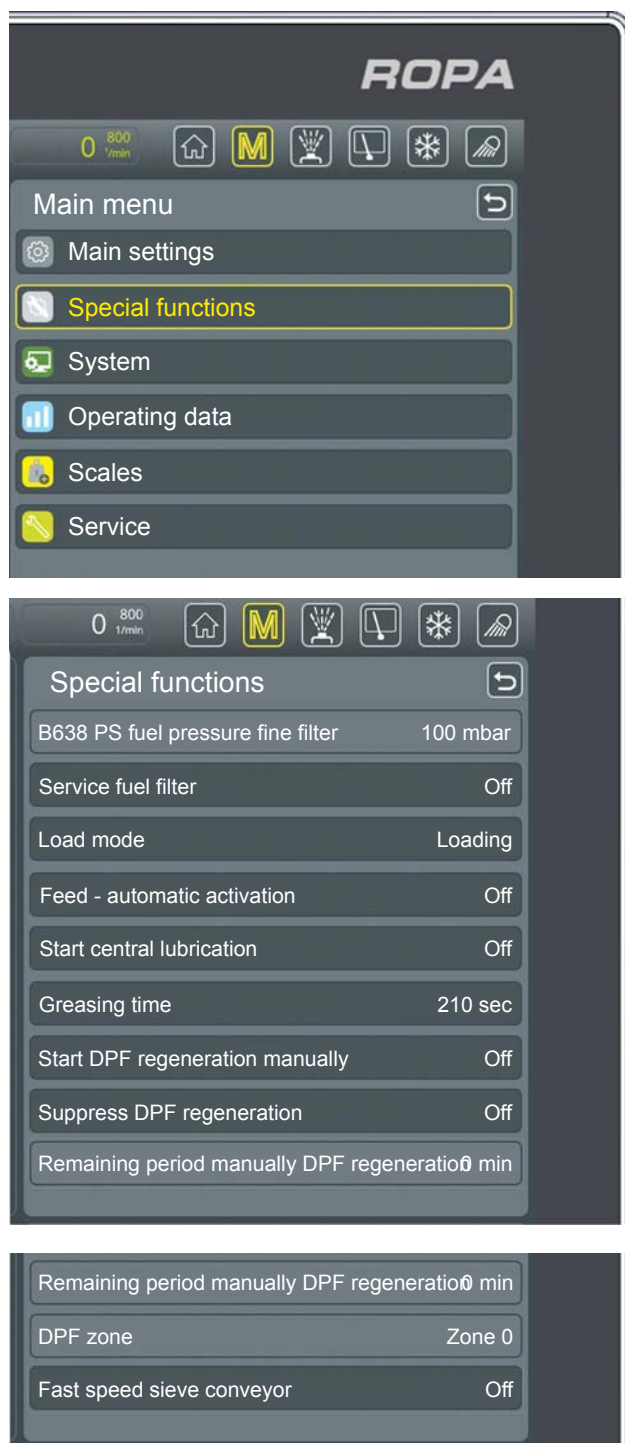
AdBlue® reserve warning % ([See Page 170](#))

Reverse-automatic rollers ([See Page 274](#))

Reversing time rollers (sec) ([See Page 274](#))

Left joystick keys 18+19 ([See Page 163](#))

### 6.3.2.2.2 Special functions



Service fuel filter ([See Page 356](#))

Loading mode ([See Page 276](#), [See Page 280](#))

Feed automatic activation ([See Page 196](#))

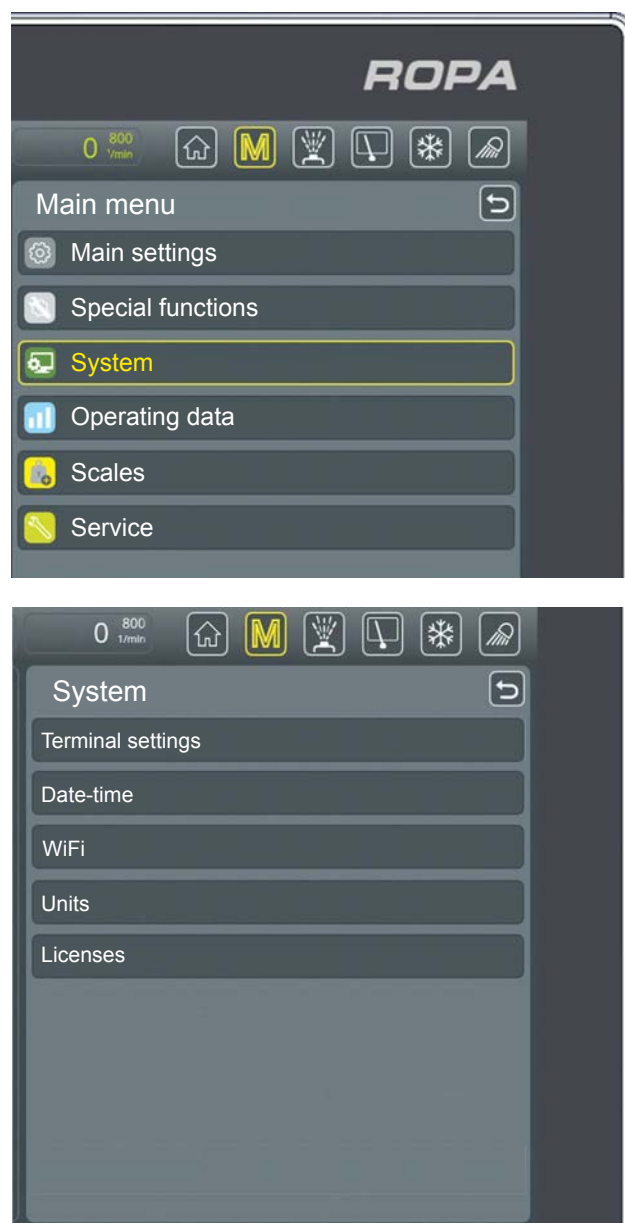
Central lubrication ([See Page 321](#))

Greasing time (sec) ([See Page 321](#))

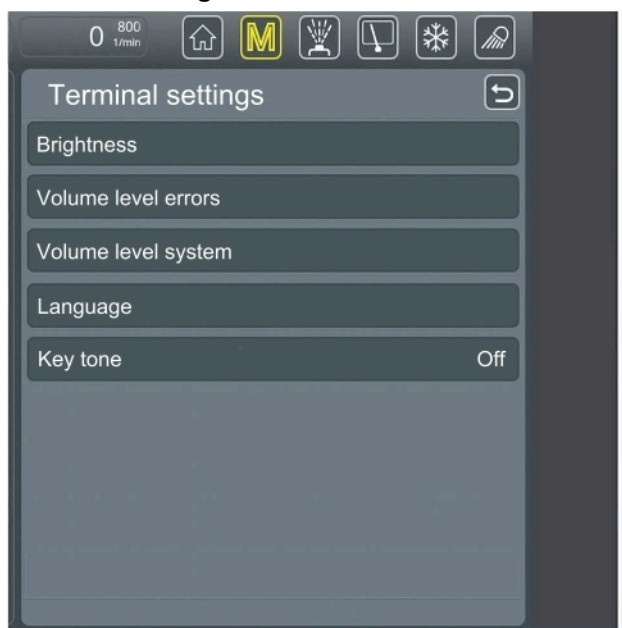
Sieve conveyor fast motion ([See Page 262](#))



### 6.3.2.2.3 System menu



### Terminal settings submenu



In the line "Brightness" you can set the brightness of the screen.

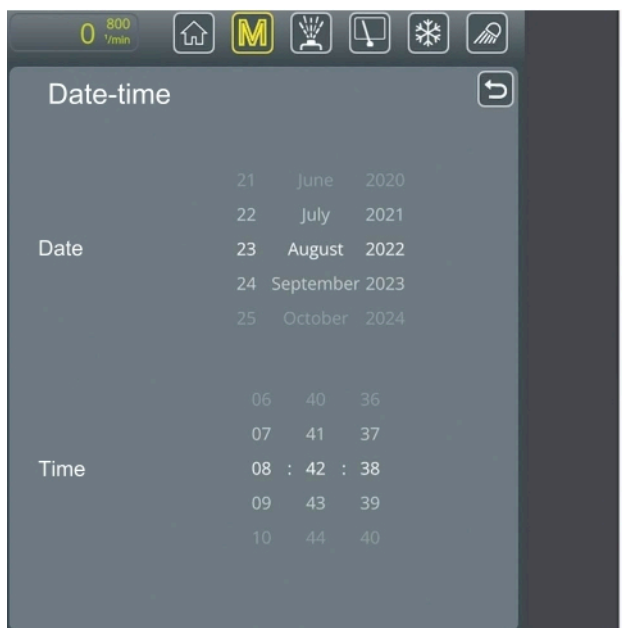
In the line "Volume level errors" you can set the volume level of the warning and advisory tones.

In the "System volume level" line you can set the volume level of the system (e.g. volume of the key tones).

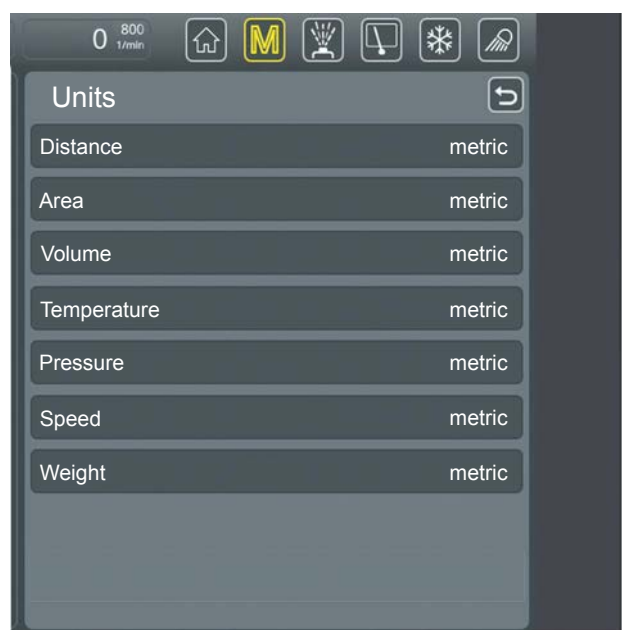
In the "Language" line you can set the language of the R-Touch colour terminals.

In the "Key tone" line you can switch on or off sound of the display keys.

### Date/time submenu



### Units submenu



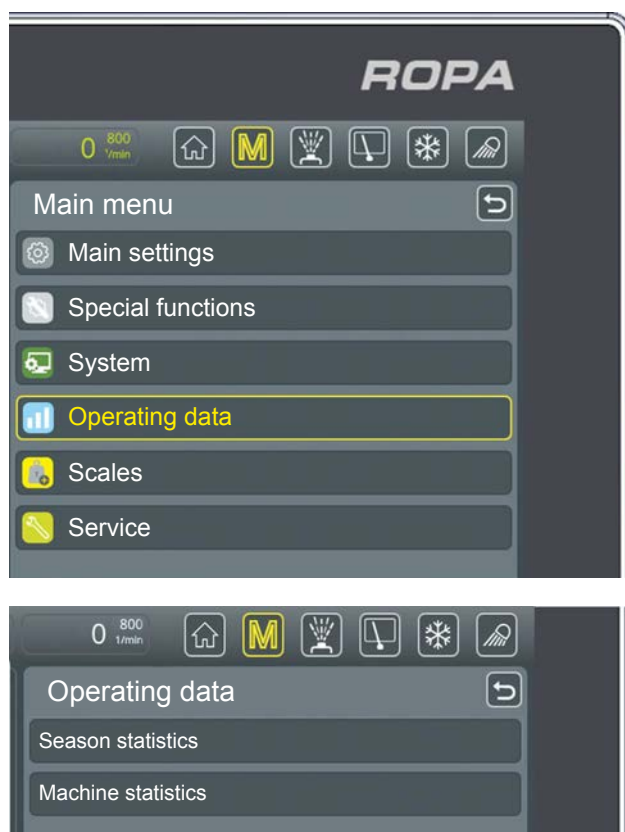
In the "Units" menu you can select various bases of calculation for the physical parameters speed, distance, volume and pressure. Please be careful; if you set, for example, the driving speed at mph instead of km/h, the values on the driving speed display will be completely incomprehensible. Please do not adjust the values any more after having set them once before start of the season. The default values correspond to the European standard.

#### ADVICE

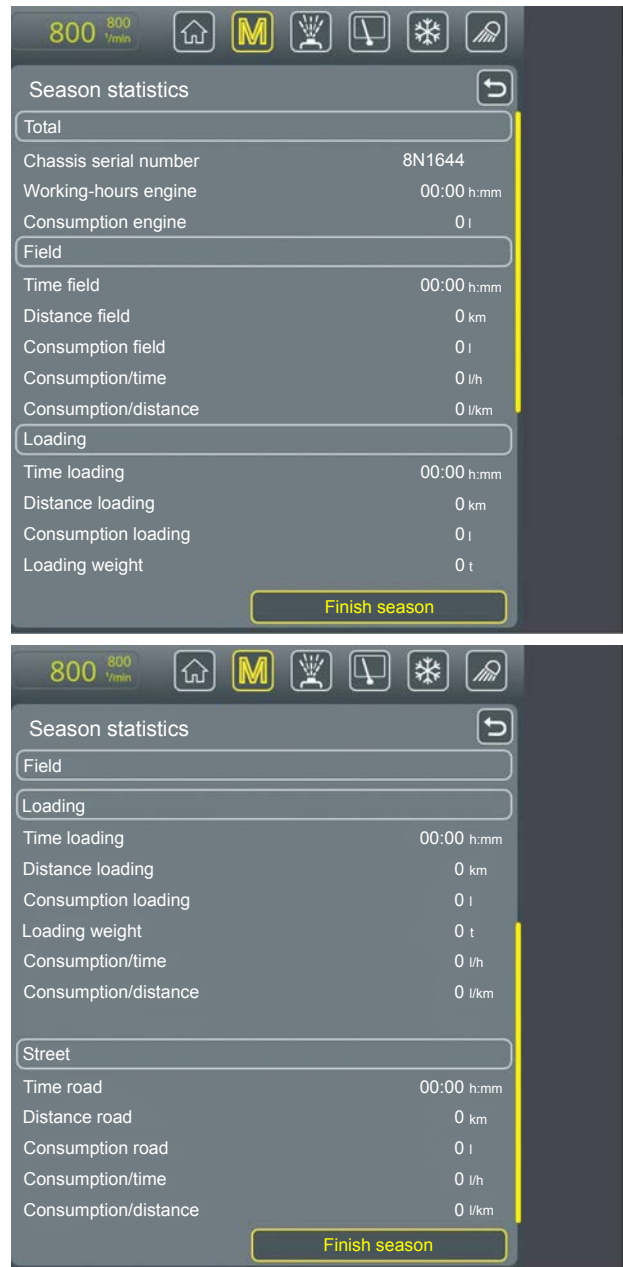


This menu is locked in order to prevent from accidental change of the units. Any modifications in the menu "Units" can be made only after entering a code.

#### 6.3.2.2.4 Menu Operating data



### Submenu Season statistics



**Season statistics**

**Total**

Chassis serial number	8N1644
Working-hours engine	00:00 h:mm
Consumption engine	0 l

**Field**

Time field	00:00 h:mm
Distance field	0 km
Consumption field	0 l
Consumption/time	0 l/h
Consumption/distance	0 l/km

**Loading**

Time loading	00:00 h:mm
Distance loading	0 km
Consumption loading	0 l
Loading weight	0 t

**Finish season**

**Season statistics**

**Field**

**Loading**

Time loading	00:00 h:mm
Distance loading	0 km
Consumption loading	0 l
Loading weight	0 t
Consumption/time	0 l/h
Consumption/distance	0 l/km

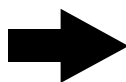
**Street**

Time road	00:00 h:mm
Distance road	0 km
Consumption road	0 l
Consumption/time	0 l/h
Consumption/distance	0 l/km

**Finish season**

The Season statistics can only be deleted, if you press the combination of keys 1 and 4 on the keyboard after pressing the Finish season key on the R-Touch. This avoids inadvertent deleting.







#### ADVICE




Once the season statistics are deleted, all saved orders for the respective season are lost permanently. These are the loading weight data.

### Submenu Machine statistics

800 800  
l/min

Machine statistics


Total

Chassis serial number8N1644  
Working-hours engine00:00 h:mm  
Consumption engine0.00 l

Field

Time field00:00 h:mm  
Distance field0.00 km  
Consumption field0.00 l  
Consumption/time0 l/h  
Consumption/distance0 l/km

Loading

Time loading00:00 h:mm  
Distance loading0.00 km  
Consumption loading0.00 l  
Loading weight0.00 t  
Consumption/time0 l/h

800 800  
l/min








Machine statistics


Total

Consumption/distance0 l/km

Loading

Time loading00:00 h:mm  
Distance loading0.00 km  
Consumption loading0.00 l  
Loading weight0.00 t  
Consumption/time0 l/h  
Consumption/distance0 l/km

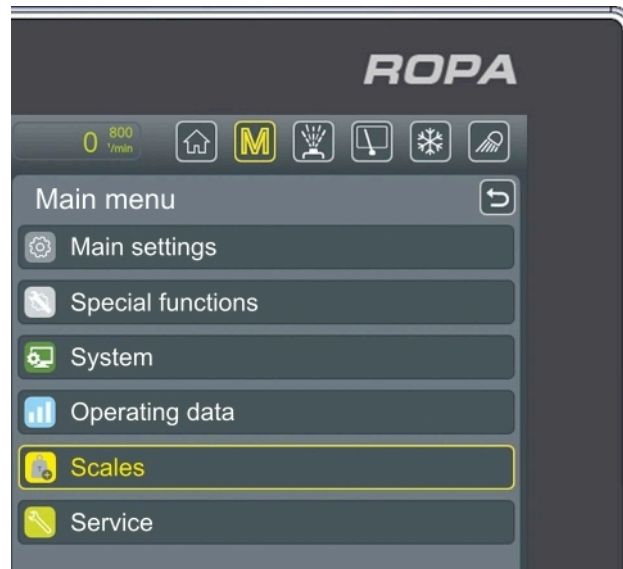
Street

Time road00:00 h:mm  
Distance road0.000 km  
Consumption road0.00 l  
Consumption/time0 l/h  
Consumption/distance0 l/km

In "Machine statistics" it is neither possible to enter data nor to delete or modify them.

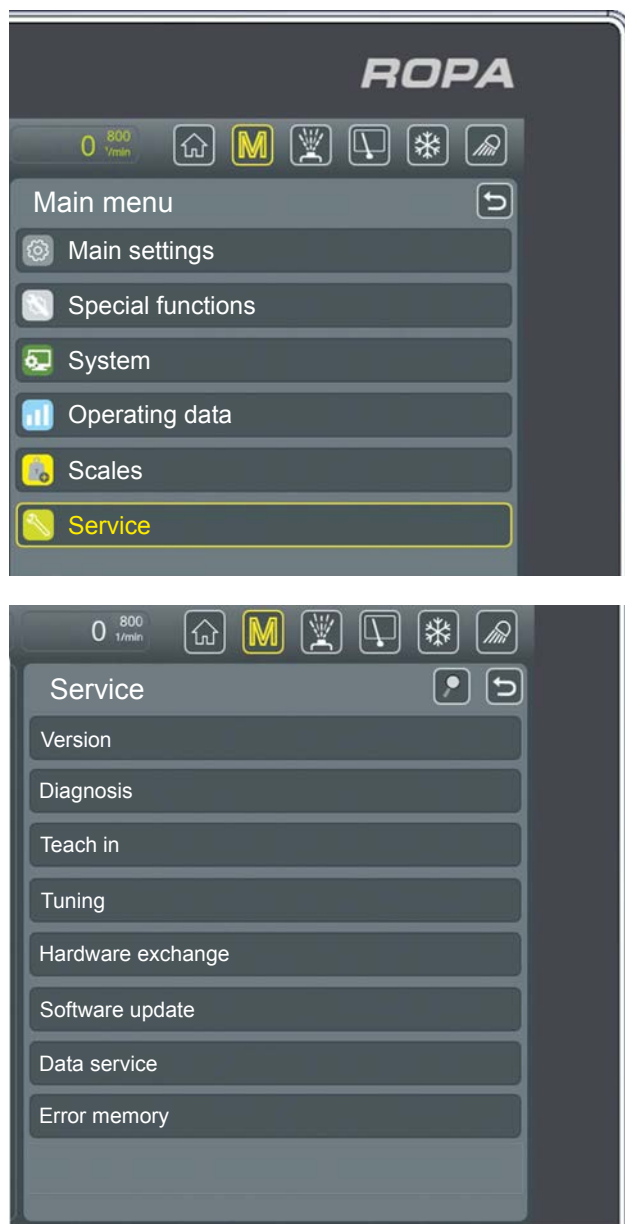


### 6.3.2.2.5 Scale menu



See detailed information from [Page 296](#).

### 6.3.2.2.6 Menu Service



For the operator, only the submenus "Version" and "Diagnostics" (see Chapter "Malfunction and Remedies", [See Page 460](#)) are of importance in the service menu. The Tuning and Teach-In submenus are only accessible if you enter a code.

#### **DANGER**



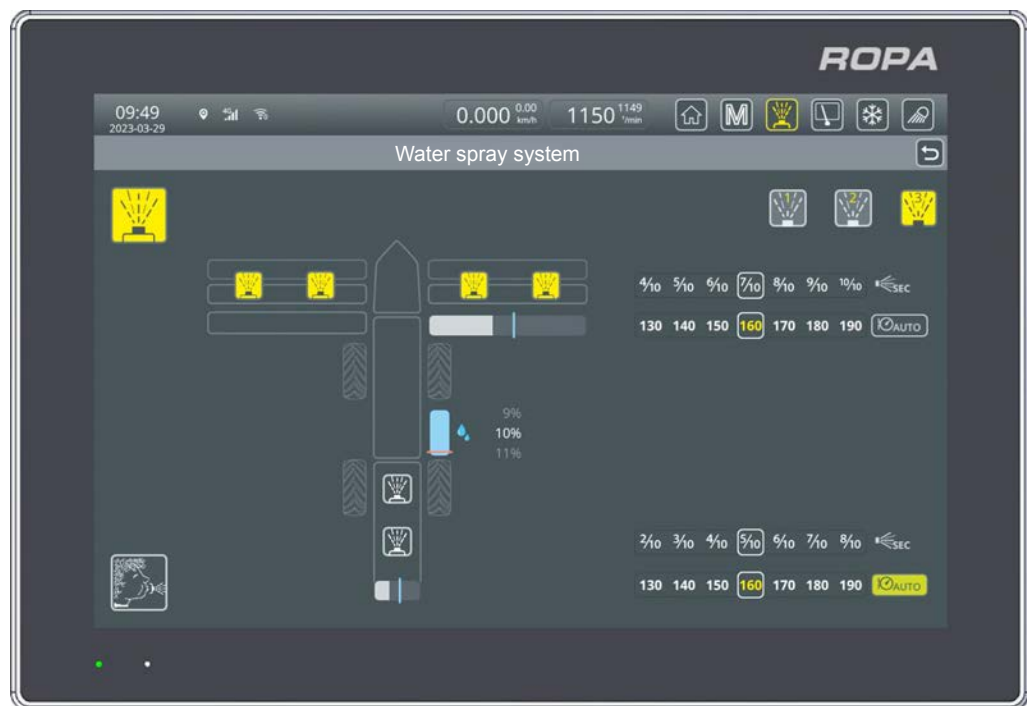
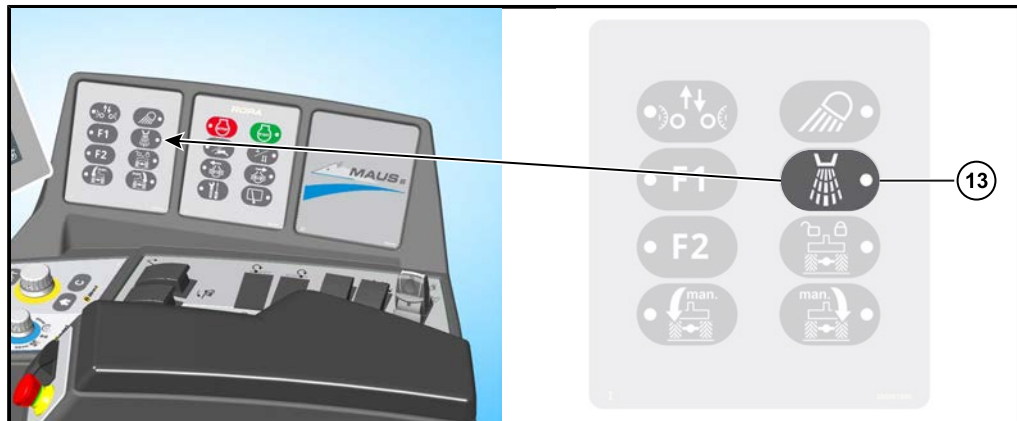
Access to these menus is locked by a specific code for safety reasons. If wrong settings are made in these menus or the applicable safety regulations are not or not sufficiently observed, then it may lead to extreme accidents with fatal injuries. In many cases, severe damage may be caused to the machine, with the consequence of expensive repairs or long periods of standstill. Access to these menus is therefore authorised only with direct contact to the manufacturer by telephone or to people expressly authorised for this purpose by the manufacturer.

### Data service submenu



The "Data service" submenu is required to import, export and delete databases.

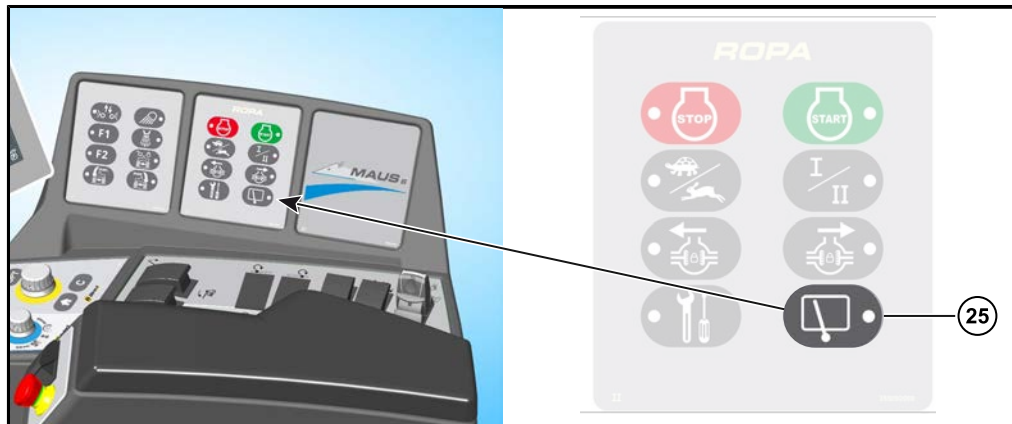
### 6.3.2.3 Water spray system menu



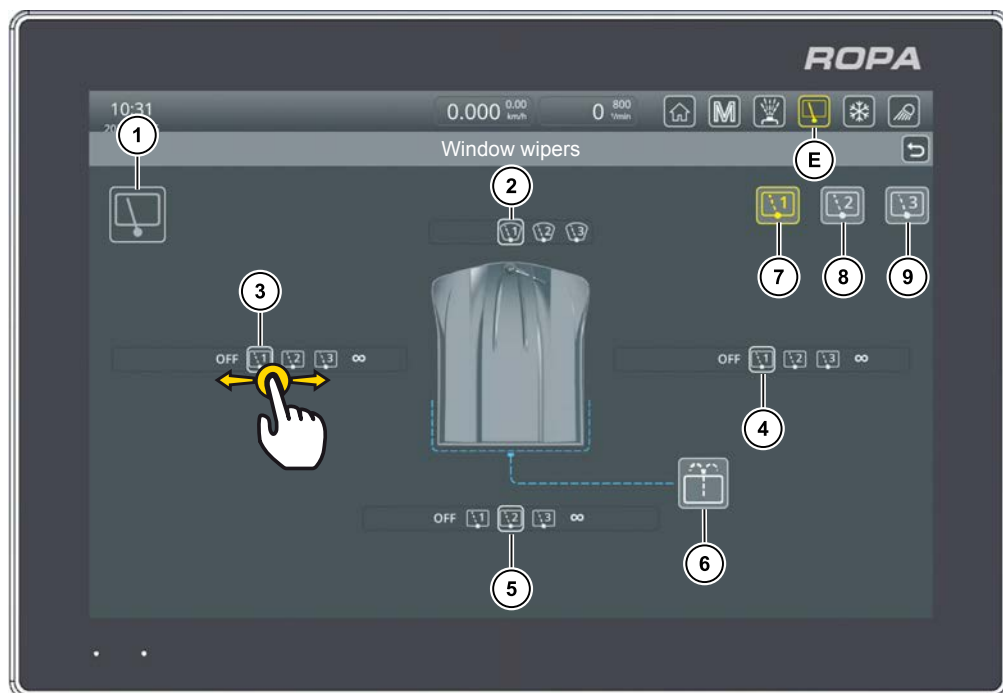
For detailed information [See Page 284](#).

### 6.3.2.4 Window wiper menu

The window wipers on the machine are controlled via the R-Touch. The Window wiper menu appears when the key (25) on keypad II is pressed for two seconds. Briefly press this key to switch the wipers on or off with the last selected setting.



Similarly, the menu can be accessed by touching the symbol (E) on the R-Direct functional area.



- (1) Switch selected window wiper on/off
- (2) Adjustment of front window wiper interval
- (3) Adjustment of left window side wiper
- (4) Adjustment of right window side wiper
- (5) Adjustment of rear window wiper interval (incl. cabin door wiper)
- (6) Side and rear window washer system
- (7) Window wiper program 1
- (8) Window wiper program 2
- (9) Window wiper program 3

The window wipers can be adjusted by swiping the respective line to the left and right on the terminal.

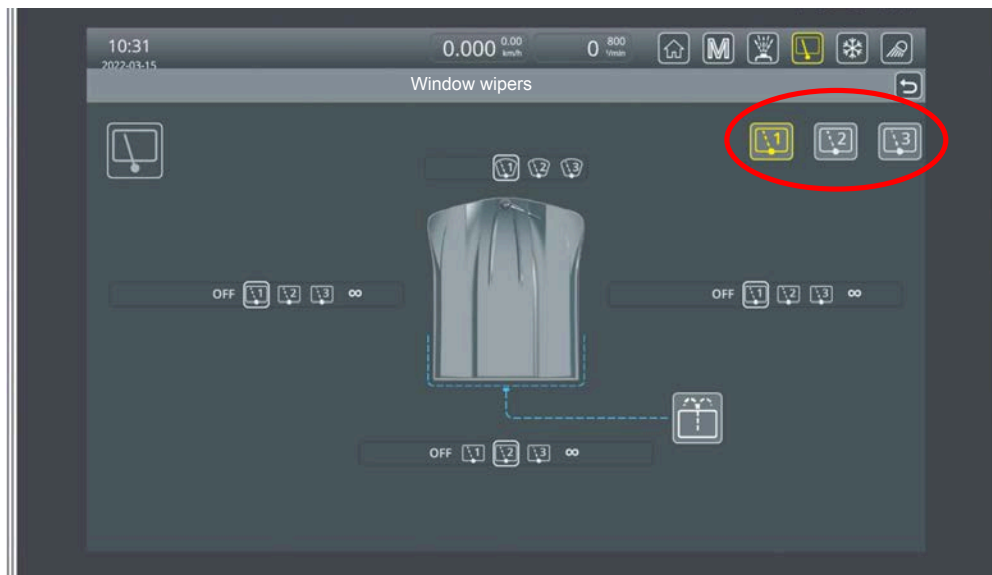
Only the interval period can be switched on for the windscreen wiper (2) in this menu. The window wiper and the window washer system for the front window are operated from the steering column switch ([See Page 73](#)).

The left (3) and right (4) side window wipers as well as the rear window wiper (5) can be switched to one of three interval periods or to continuous operation. They can be switched off if not needed. By touching the screen button (1), you can switch the selected settings on or off.

Touching the screen button (6) activates the window washer system for the side and rear windows.

### 6.3.2.4.1 Configuration of window wiper program

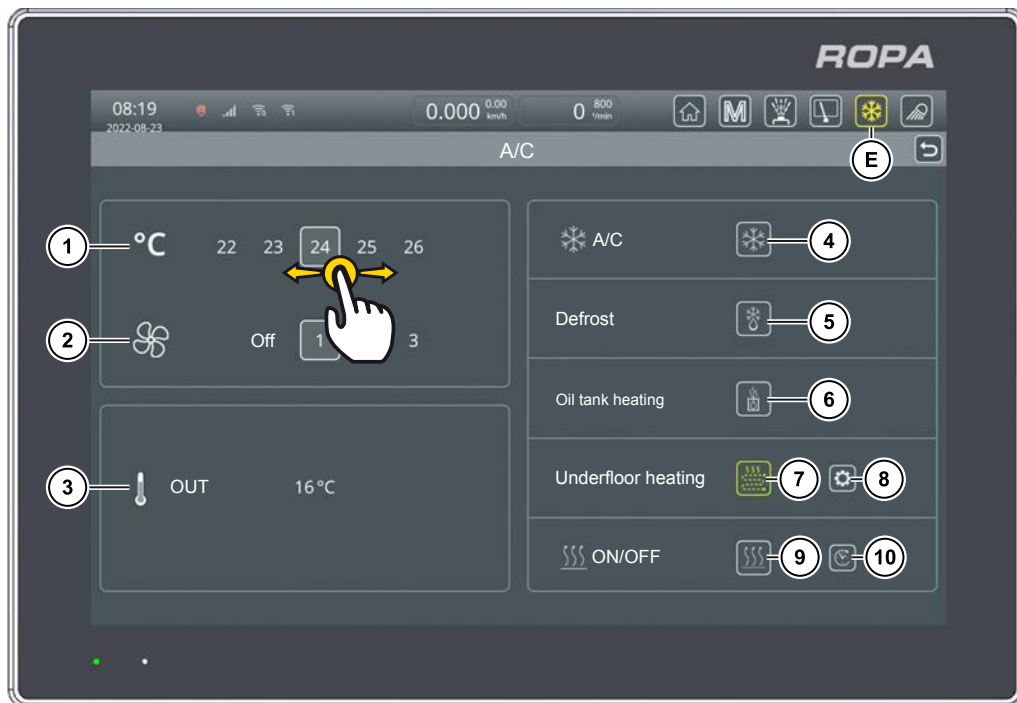
Window wiper programs 1-3 can be individually assigned as desired. To do this, switch on all window wipers with settings, which you want to add to a program. By touching and holding one of the wiper program touch fields, you can save the current selection to this program.





### 6.3.2.5 Climate control

The air conditioning system always ensures optimum climate conditions in the driver's cabin. The setting range is between 16 and 30°C. Similarly, the menu can be accessed by touching the symbol (E) on the R-Direct functional area.



In the climate control menu, the set temperature (1) and the fan speed (2) can be set by swiping left and right on the colour terminal.

If the fan stage is set to "Auto", the fan speed is automatically reduced when the set temperature is reached.

In addition, this menu displays the current outdoor temperature (3).

The air conditioning can be switched on and off with the screen button (4).

The defroster function for clearing the windows can be switched on and off with the screen button (5). Fan and heating system run at maximum power; simultaneously, the air is dried at maximum power.

The oil tank heating can be switched on and off with the screen button (6). ([See Page 134](#))

The underfloor heating can be switched on and off with the screen button (7). The screen button (8) opens a menu for setting the stage of the underfloor heating. ([See Page 135](#))

The park heating can be switched on and off with the screen button (9). The screen button (10) opens a menu for preselecting the parking heating. ([See Page 137](#))



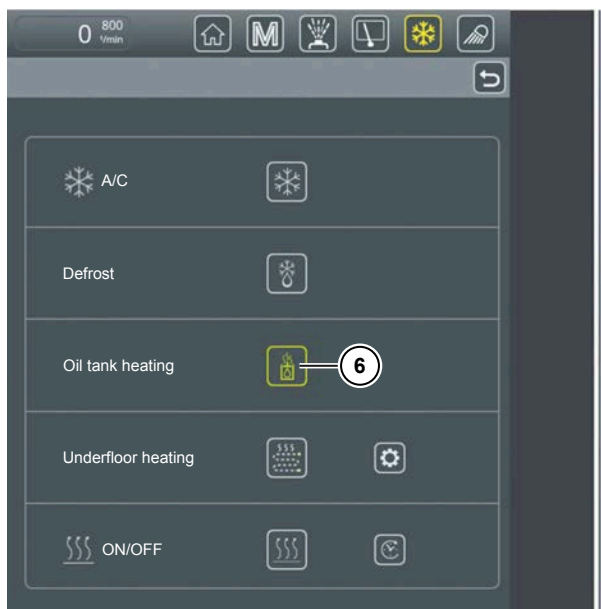
**(11)** Inside temperature sensor

Make sure that the temperature sensor **(11)** remains free of obstructions and is not covered by clothing or other objects, otherwise the climate control cannot function properly.

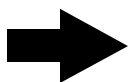
### 6.3.2.5.1 Oil tank heating

The oil in the hydraulic oil tank can be preheated by the oil tank heater. A heating coil connected to the diesel engine cooling system is installed in the hydraulic oil tank. The hydraulic oil tank heater must be switched on at every cold start.

The oil tank heating can be switched on and off with the screen button (6).



#### ADVICE

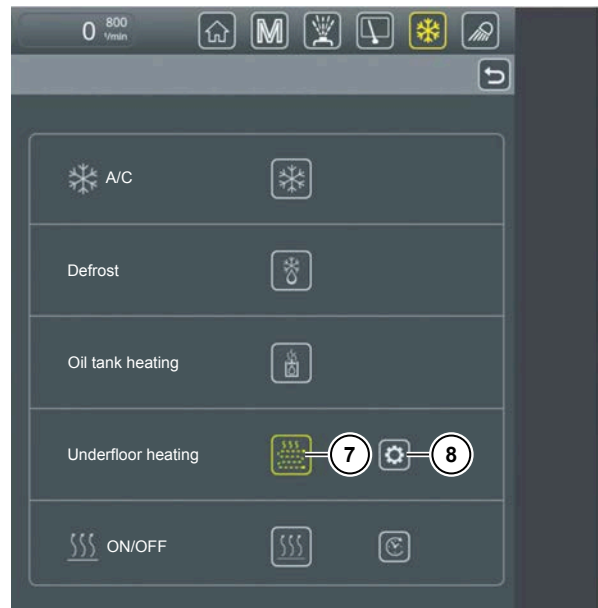


Use the oil tank heater. Warmed hydraulic oil reduces wear of the hydraulic system.

At a hydraulic oil temperature of 40 °C and higher, the oil tank heater is automatically deactivated even if switched on by the driver. The water valve of the oil tank heater is automatically controlled in such a way that it does not allow the hydraulic oil to heat up further if the parking heater is switched on.

### 6.3.2.5.2 Underfloor heating

The underfloor heating can be switched on and off with the screen button (7).



By pressing the screen button (8), you open a menu for setting the stage of the underfloor heating.



You can adjust the stage by swiping to the left or right on the terminal.

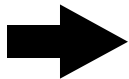
lower stage = less underfloor heating

higher stage = more underfloor heating



*Non-heated area of the underfloor heating*

#### **ADVICE**

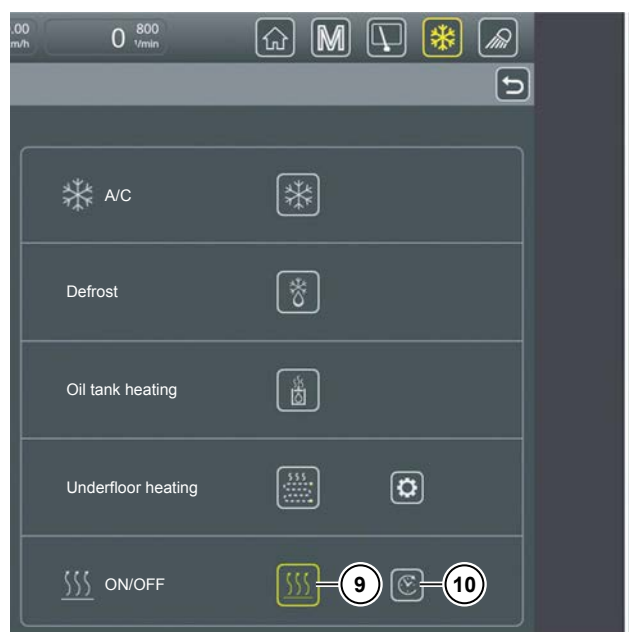


If you want to place something on the floor that should not be heated from below even though the underfloor heating is switched on, there is also a spot for it.

The non-heated area is located in front of the storage compartments in the rear wall of the cabin. From the right rear corner of the cabin, this area runs approx. 380 mm forward and approx. 750 mm to the left.

### 6.3.2.5.3 Park heating

The park heating can be switched immediately on and off with the screen button (9).



The screen button (10) opens a menu for preselecting the parking heater activation time and setting the run time.

If the screen button (10) is active and the screen button (9) is inactive, it means that the parking heater is currently deactivated, but the parking heater automatic function has been activated.

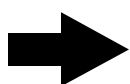


- (12) Day of week
- (13) Switch-on time - hours
- (14) Switch-on time - minutes
- (15) Runtime after activation

By swiping up and down on the terminal, you can set the time and day of the week when the parking heater should be switched on. The parking heater can be set for maximum a week in advance.

The park heating automatic function is activated by pressing the screen button (11). The park heating then switches on automatically at the set time and is active for the set runtime from 30 to 120 minutes. In the climate control menu, the button (10) indicates whether it is active.

#### ADVICE

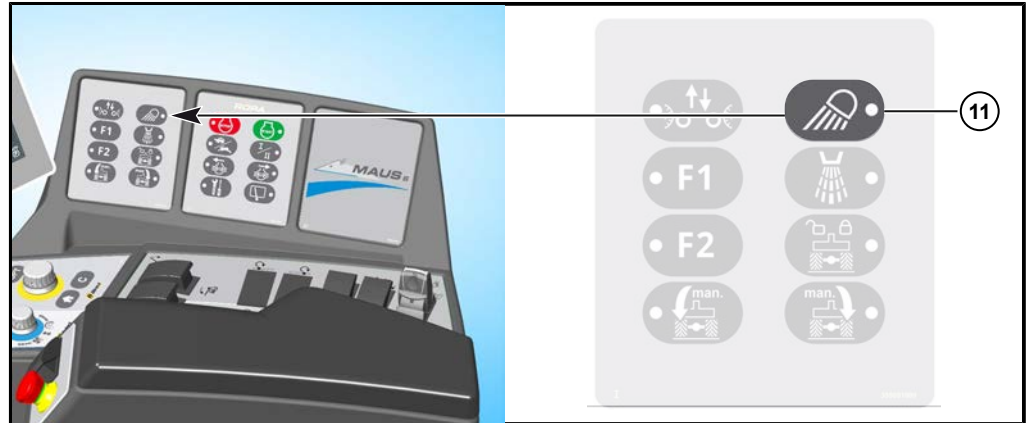


The main battery switch must not be shut off while park heating is on, unless there is immediate danger. In this case the heater will be switched off without a cooling down period (risk of overheating!).

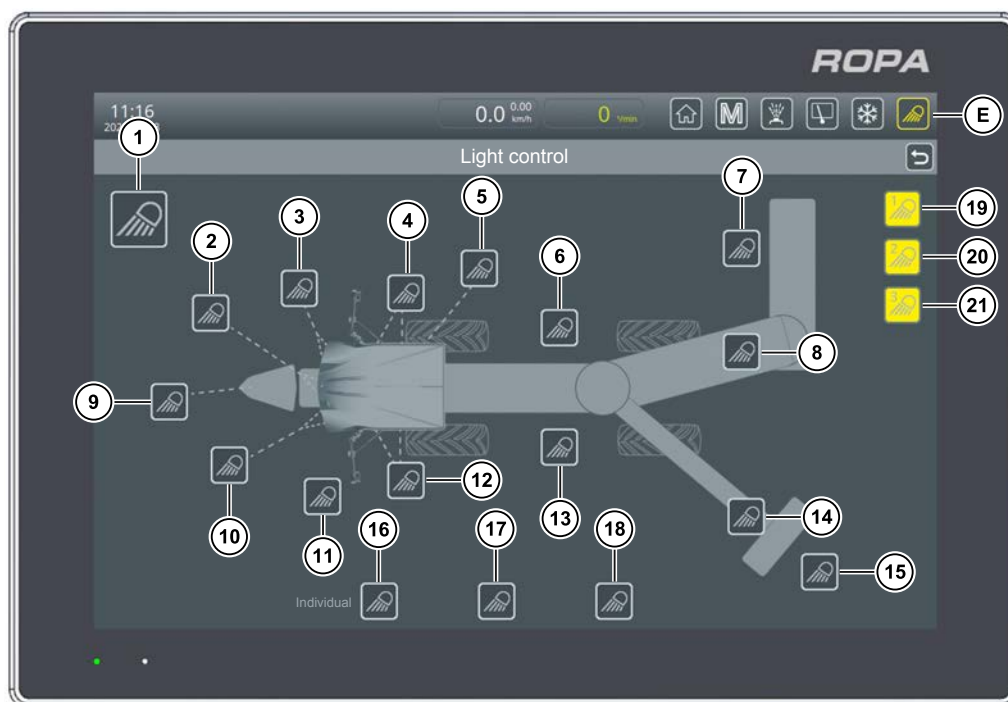


### 6.3.2.6 Light control

The lighting in the machine is controlled via the R-Touch. The light control menu appears after pressing the key (11) on the keypad I for two seconds. Briefly pressing this key switches the light on or off with the last selected setting.



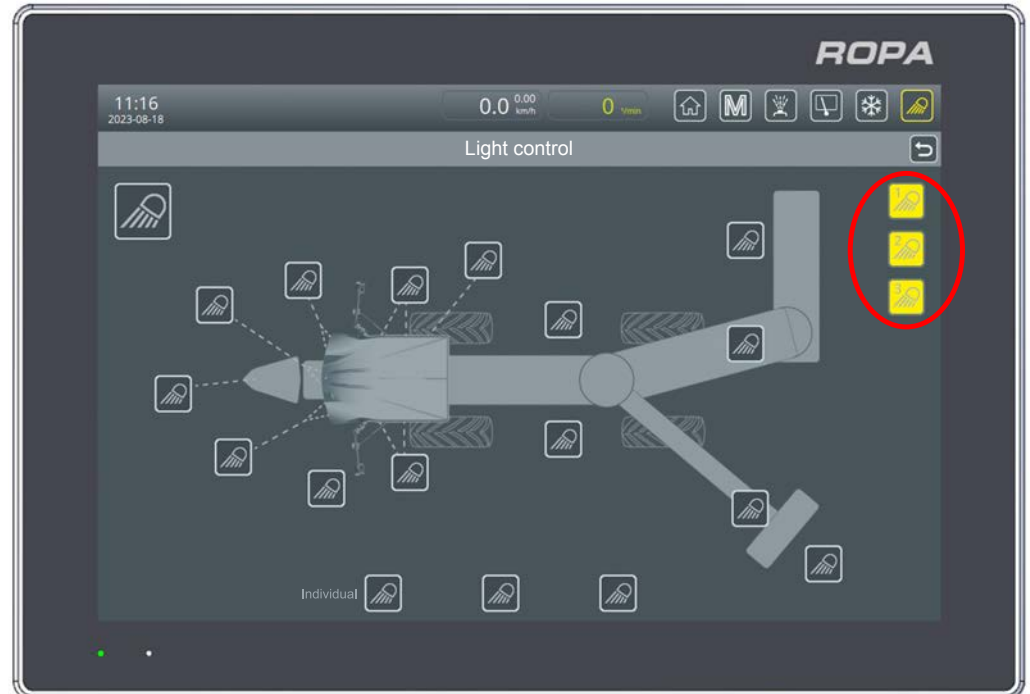
Similarly, the menu can be accessed by touching the symbol (E) on the R-Direct functional area.



- (1) Switch light on/off
- (2) Headlight driver's cabin roof front centre
- (3) Headlight driver's cabin roof front right
- (4) Headlight driver's cabin roof right outside
- (5) Headlight driver's cabin roof rear right
- (6) Headlight vehicle frame right
- (7) Truck conveyor headlight(s)
- (8) Infeed conveyor and re-cleaner headlight(s)
- (9) Central mark headlight(s)
- (10) Headlight driver's cabin roof front left
- (11) Headlights rearview mirrors left and right
- (12) Headlight driver's cabin roof left outside
- (13) Headlight vehicle frame left
- (14) Tank headlight(s)
- (15) Tank back run headlight(s)
- (16) Individual headlight 3 ([See Page 143](#))
- (17) Individual headlight 1 ([See Page 143](#))
- (18) Individual headlight 2 ([See Page 143](#))
- (19) Light program 1
- (20) Light program 2
- (21) Light program 3

### 6.3.2.6.1 Configuration of light programs

The light programs 1-3 can be individually assigned according to your wish. To do this, switch on the lights you want to add to a program. By touching and holding the light program touch fields you save the currently active lights in that light program.



The lights and lighting programs can be selected either by touching the screen or by turning and pressing the R-Direct rotary wheel.

### 6.3.2.6.2 Ladder light



The "Coming Home" and "Leaving Home" functions are integrated into the machine. The "Ladder light" key (67) is located in the cutout under the engine compartment cover.

These functions are also active when the battery main switch is turned off.

#### **Leaving Home**

A "Leaving Home" function is provided so that you can safely ascend the ladder in the dark. It is switched on by pressing the "Ladder light" key. The ladder lights are then switched on for approx. 6 minutes.

#### **Coming Home**

The "Coming Home" function is automatically activated if the headlights in the driver's cabin roof were still on when the ignition was switched off (ignition lock turned from position I to position 0). The ladder lights switch off after max. 6 minutes. This function is also active with deactivated battery main switch.

### 6.3.2.6.3 Individual headlights

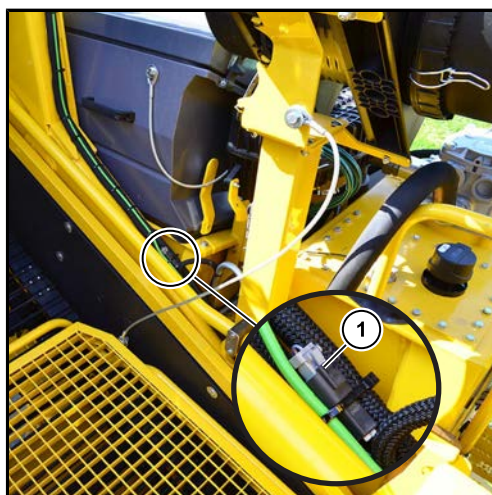
There are three plugs on the machine. The additional working lights (ROPA item no. 320100900) can be connected to these plugs.

The plug E081 (1) for individual headlight 1 is located at the infeed conveyor frame behind the hydraulic oil tank. The plug E082 (2) for individual headlight 2 is located behind the cover sheet at the very front compressed air reservoir. The plug E083 (3) for individual headlight 3 is located behind the right front tyre under the cover sheet of the control unit for operating hydraulics I.

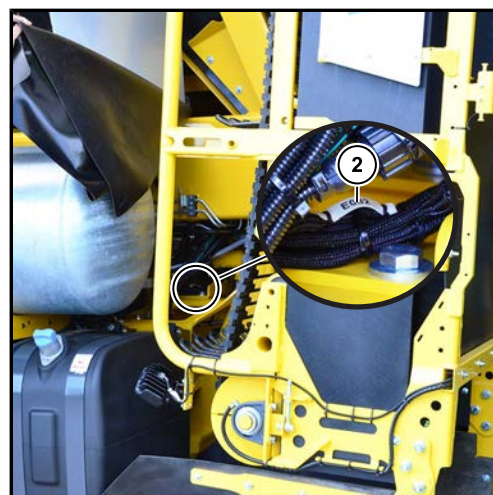
You will need an extension cable to connect a working light. The extension cables are available in the following lengths: 600 mm (ROPA item no. 330044900), 3200 mm (ROPA item no. 330022500) and 5,000 mm (ROPA item no. 330027100).

You can connect up to two work lights to one plug using a Y-connector (4) (ROPA item no. 322050800). (max. 70 W)

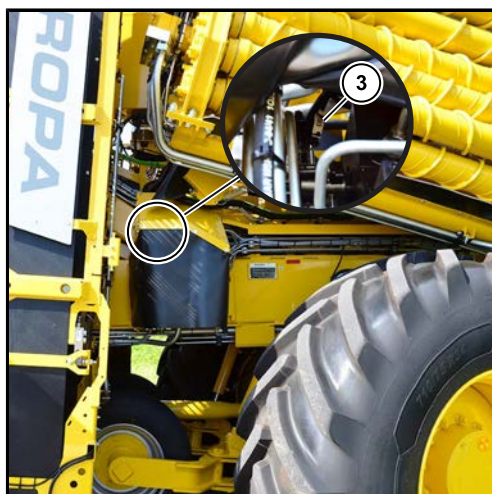
The correct function of the individual headlights is only guaranteed with the ROPA work lights (ROPA item no. 320100900).



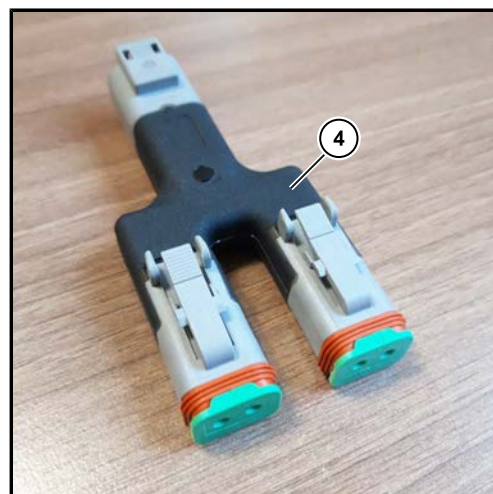
*Plug for individual headlight 1 (E081)*



*Plug for individual headlight 2 (E082)*



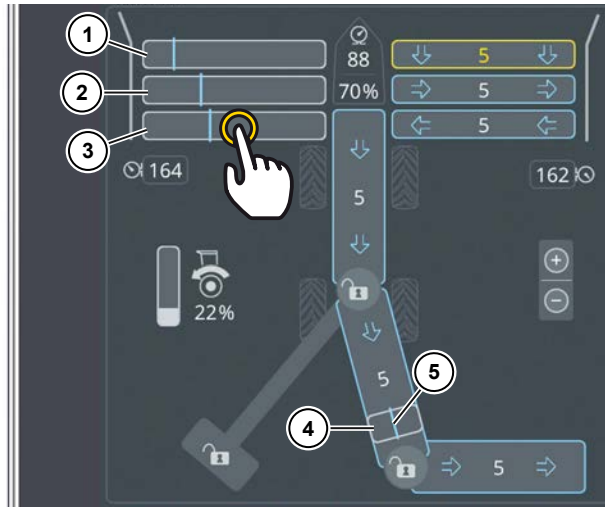
*Plug for individual headlight 3 (E083)*



*Y-connector*

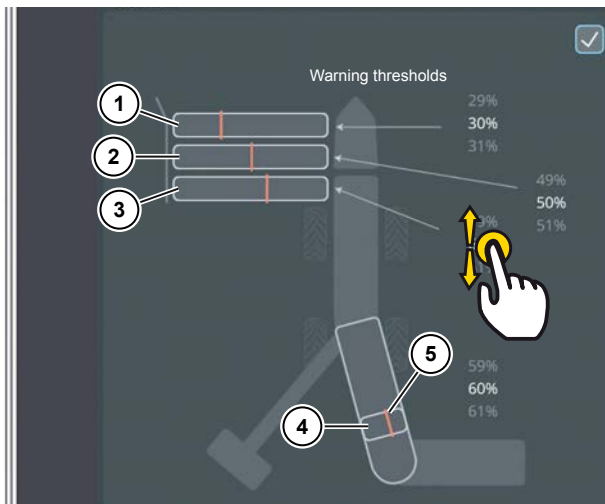
### 6.3.3 Readjusting warning thresholds

The warning thresholds for the drives of pickup rollers, conveyor rollers, 4-part pinch rollers and recleaning can be adjusted on the R-Touch.



- (1) Load on drive of pickup rollers
- (2) Load on drive of conveyor rollers
- (3) Load on drive of 4-part pinch rollers
- (4) Load on drive of recleaner
- (5) set warning threshold for the respective drive (blue line)








Press one of the load indicators (**1-4**) to open the menu in which you can adjust the warning thresholds for these drive. Tap the % indicator on the screen and swipe up or down to adjust the respective warning threshold. Press the check mark in the top right corner to exit the menu or the function area.

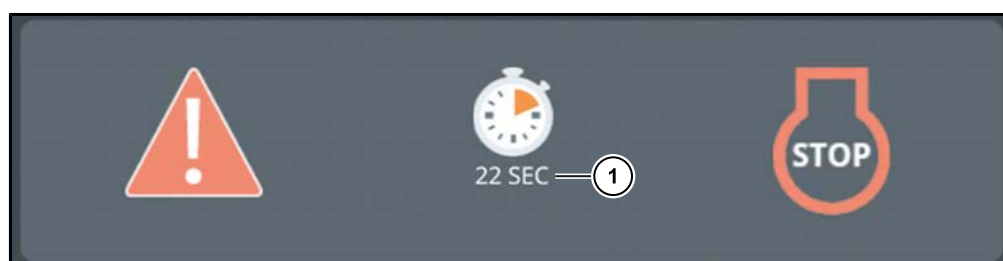




### 6.3.4 Warning and status indications on the R-Touch

#### Orange warning indicators that lead to diesel engine stop
















	Engine oil pressure too low		Hydraulic fluid too hot
	Serious engine problems, shut down diesel engine immediately		Lubrication pump distributor gears failed
	Coolant level too low		Hydraulic oil level too low
	Coolant temperature too high		



(1) Period until automatic shutdown of the diesel engine








In the event of some serious malfunctions, the diesel engine shuts down after a certain period of time. An error message appears on the R-Touch. An entry is made in the error memory at the same time. The diesel engine can be restarted at the driver's own responsibility, e.g. to move off a railway crossing.

#### Orange warning indicators

	Security code active		Engine oil level too low
	Coolant temperature too high		Pump distributor gear clutch pressure too low
	Stop! Insufficient supply pressure		Battery voltage too low or too high (under 24V or over 32V)
	Automated engine STOP active		Release pressure parking brake too low
	<b>WARNING!</b> Injury hazard		<b>STOP!</b> Impending collision
	Engine oil temperature too high		Emergency stop switch pressed
	Warning emergency steering defect		Control diesel engine error memory
	Insufficient supply pressure		



### Orange warning indicators of electronic problems




















	Speed signal out of range		Error data backup
	Analogue signal out of range		Incorrect machine configuration
	Line break or short circuit found		Communication problem with control device A003
	Internal memory fault in EEPROM		

### Yellow warning indicators
























	Pickup rollers overloaded		Conveyor rollers overloaded
	4-part pinch rollers overloaded		Infeed conveyor overloaded
	Recleaner overloaded		Truck conveyor overloaded
	Pickup rollers blocked		Conveyor rollers blocked
	4-part pinch rollers blocked		Infeed conveyor blocked
	Recleaner blocked		Truck conveyor blocked
	Fault level switch in intermediate tank		Battery is not charged
	Fuel prefilter is dirty		Fuel fine filter is dirty
	Air filter dirty		Air chamber reservoir pressure is too low
	Differential lock front axle is not released		Rear axle differential lock not released
	Error drive pedal sensors		Oscillating axle support enabled
	Engine oil level far too low		Engine oil level too high
	Increased filling level of the diesel particulate filter		Engine oil level too low
	Error in engine control Check Engine warning light (AWL warning), check diesel engine		High exhaust gas temperature
	LIM control light, diesel engine torque limiter is active		DEF control light (Diesel Exhaust Fluid), AdBlue® Warning

**Yellow hints on operation**

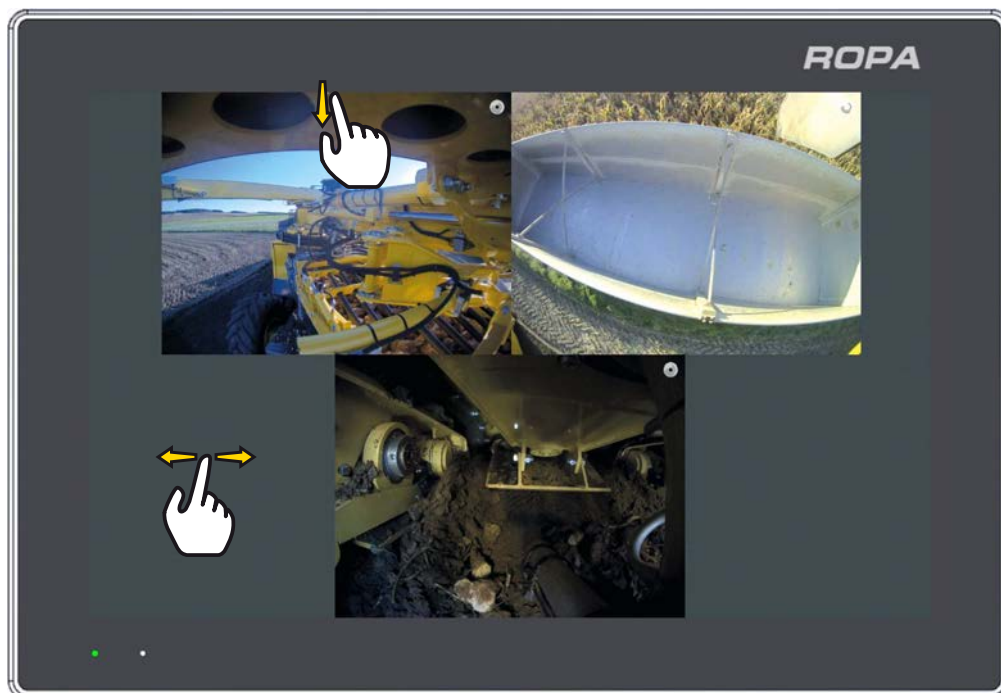
	Please swing out pickup		Please close engine housing door
	Please swing up fold plates		Please close rear platform wall
	Please release "look forward" foot-switch		Please swing down left joystick console
	Please press "look forward" foot switch		Please swivel recleaner into operating position
	Please press "look forward" footswitch or lift pile pickup		Please swing out truck conveyor further
	When switching on the machine drive, please turn the driver's seat forward and check if there are no people in the hazard zone of the pickup		Please move truck conv. to transport position
	Please turn the driver's seat further right		Please lower truck conveyor
	Please turn the driver's seat to the left		Please raise truck conveyor
	Please occupy driver's seat		Please leave driver's seat
	Please set pile pickup to central position		Please swivel counterweight arm further left
	Please raise pickup further		Please turn in front axle less
	Please lower pickup further		Please turn in rear axle less
	Release the start key		Please activate traction drive forward
	Please lock main steering switch		Please unlock main steering switch
	Please release parking brake		Please release gas pedal for switching on the diff. lock
	Please set rear axle straight		Please release brake pedal
	Please press drive pedal		Please release drive pedal
	In Turtle operating mode please shift to 1st gear		Please change operating mode
	While in operating mode "Rabbit", please shift to 2nd gear		Please change operating mode

	Please drive slower		Please fill up fuel tank
	Please drive faster		Please fill up AdBlue®
	Differential lock engaged		Please release drive pedal to change the operating mode
	Operating temperature not reached		Please switch analogue-rocker to neutral position
	Please unlock counterweight arm		Please lock counterweight arm
	Please unlock swivel arm		Please lock swivel arm
	Please raise counterweight		Please lower counterweight
	Please lift driver's cabin		Please lower driver's cabin
	Please raise additional axle		Please activate additional axle
	Please close safety rail at ladder		

**Status indications**

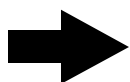
	Oscillating axle support enabled		Central lubrication operating
	Operating mode "Tuttle" is active (loading) Gear 1 is active		Operating mode "Tuttle" is active (loading) Gear 2 is active
	Operating mode "Rabbit" is active (road drive) Gear 1 is active		Operating mode "Rabbit" is active (road drive) Gear 2 is active
	Front axle differential lock active		Rear axle differential lock active
	Loading direction left active		Loading direction right active
	Traction drive loading forward activated		Traction drive loading backward activated
	Additional axles raised		Additional axles lowered
	Driver's seat position indicator		Height indicator pile pickup in %
	Machine drive switched on		Manual engine speed adjustment active
	Automotive driving active		Automatic parking brake active
	Parking brake engaged		"END" loading mode active
	"START" loading mode active		

### 6.3.5 R-Touch auxiliary terminal



*Quick access bar is hidden*

#### ADVICE



Unlike the main terminal, the auxiliary terminal cannot be operated with R-Direct or R-Select. The auxiliary terminal can only be operated by touching.

The auxiliary terminal is primarily used to display the images from the built-in video cameras of the machine. Images of up to four different cameras can be displayed simultaneously.

#### Show the quick access bar

Touch the top edge of the auxiliary terminal display and swipe from top to bottom. Thus you open the quick access bar.

To hide the quick access bar, touch it and swipe from bottom to top. Alternatively, the quick access bar fades automatically after 3 seconds.

### 6.3.5.1 Display areas on the R-Touch auxiliary terminal



Quick access bar is shown

- (1) Standby mode
- (2) Activate cleaning mode ([See Page 115](#))
- (3) Configure individual camera 1-3 display
- (4) HOME key on auxiliary terminal
- (5) Main menu ([See Page 116](#))
- (6) Still image monitor

#### Standby mode

Use this touch field (1) to put the display of the left color terminal in standby mode. It switches off the screen. This function can be useful, e.g. when driving on roads to avoid being dazzled. Touch the display at any place to turn it on again.

If the machine is in the road mode and the main steering switch is opened, the screen is activated immediately if it was previously in a standby mode.

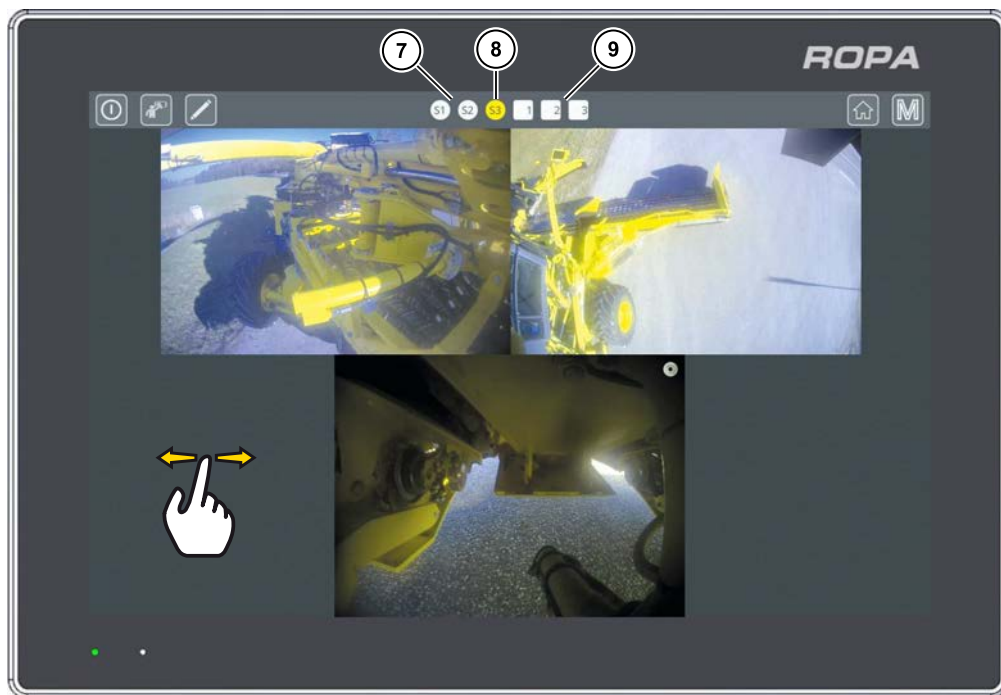
#### Still image monitor

Each camera's display has a still image monitor (6). If there is no continuous rotating movement in the icon, the camera image transfer is interrupted.

## 6.3.5.2 Operation of video system

### 6.3.5.2.1 Switching between the different camera views

To change the camera view, swipe the display panel to the right or left. The available camera views are displayed in succession.



*Quick access bar is shown*

- (7) Standard camera display S1 - S3
- (8) Active camera display
- (9) Individual camera 1-3 display (optional)

The Standard camera view S1 - S3 (7) and Individual camera view 1 - 3 (9) touch fields can be used to directly access one of up to six camera views in the quick access bar. The active camera view (8) is marked yellow.

If you touch the active camera window, it will be displayed in full size. Touch the screen again if you want to return to the previous view.

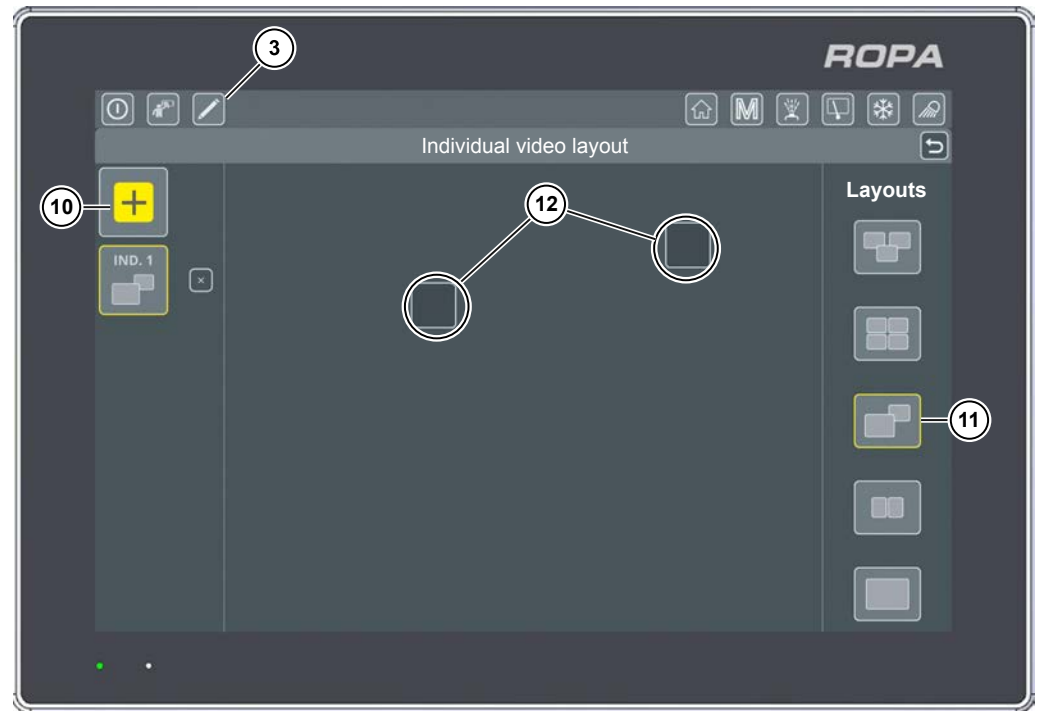
The three default camera views are preset and cannot be changed by the driver.



### 6.3.5.2.2 Configuration of individual camera views

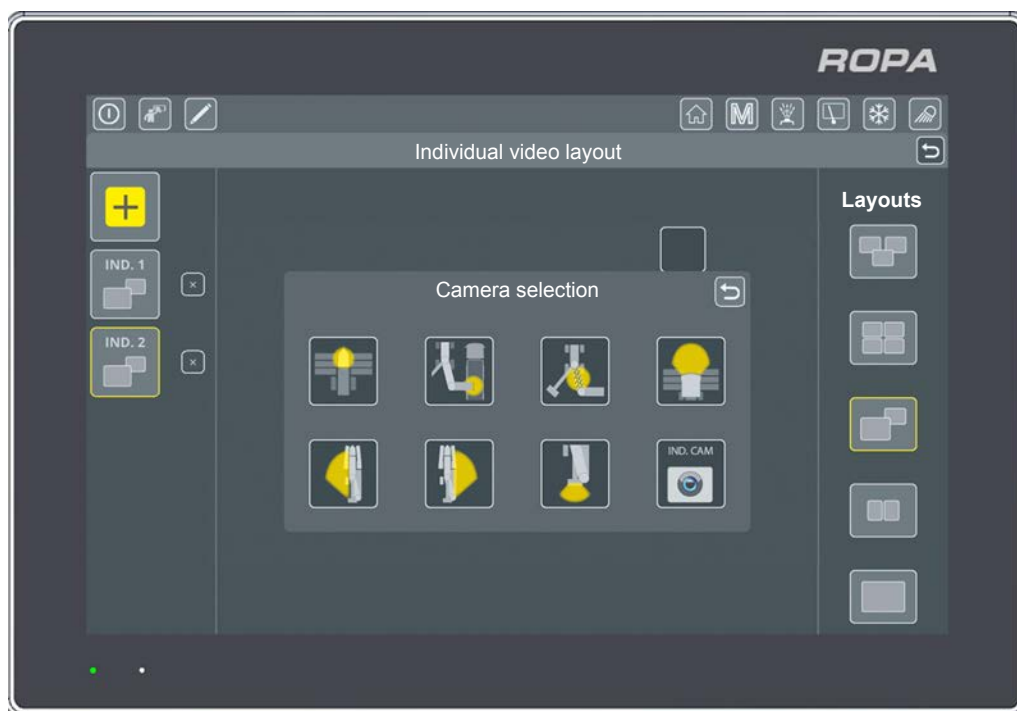
To configure the individual camera views, press the Configure individual camera view screen button (3).

Users can configure up to three different individual camera views. To do this, press the screen button for adding individual camera view (10).











- (10) Add individual camera view
- (11) Layout for an individual camera view
- (12) Select camera view to be displayed in this window

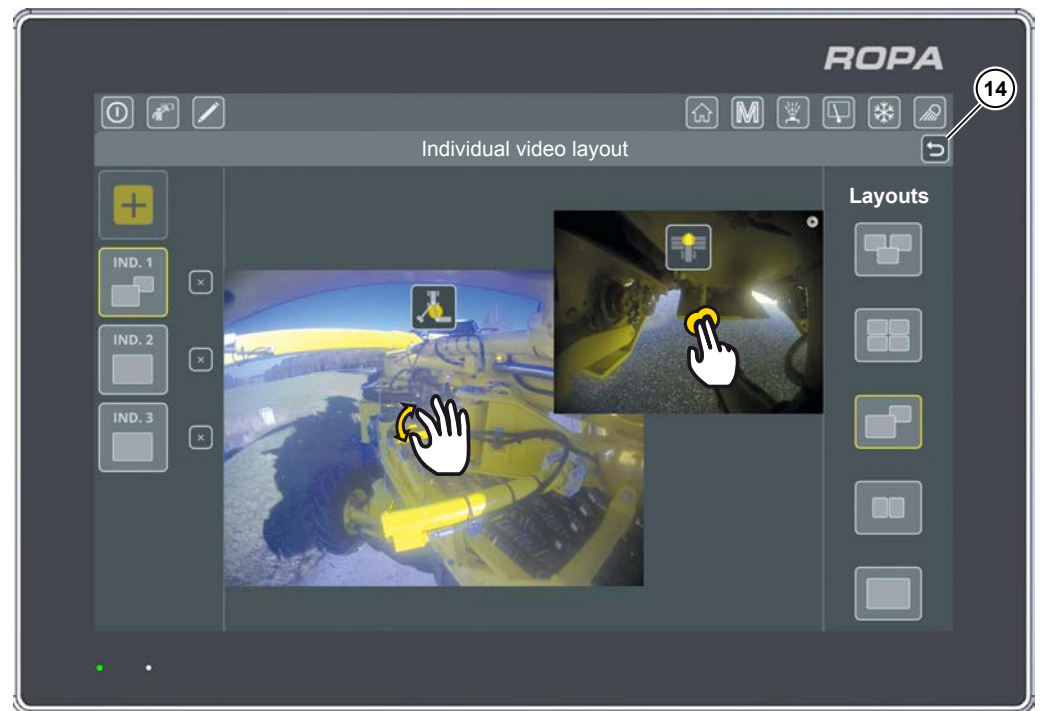
The individual camera view to be changed is highlighted in yellow. On the right side of the screen, you can select one of five different layouts (11).



Depending on the equipment options, by touching the Select camera view to be displayed in this window (12) field, you can choose between the following cameras.

	Central mark camera		Cabin roof camera (option)
	Recleaner camera (option)		Truck conveyor camera (option)
	Rear area control camera left (option)		Rear area control camera right (option)
	Back run camera		Individual camera (option)

## Define image section



While configuring, you can zoom in the individual camera views to have relevant areas displayed larger.

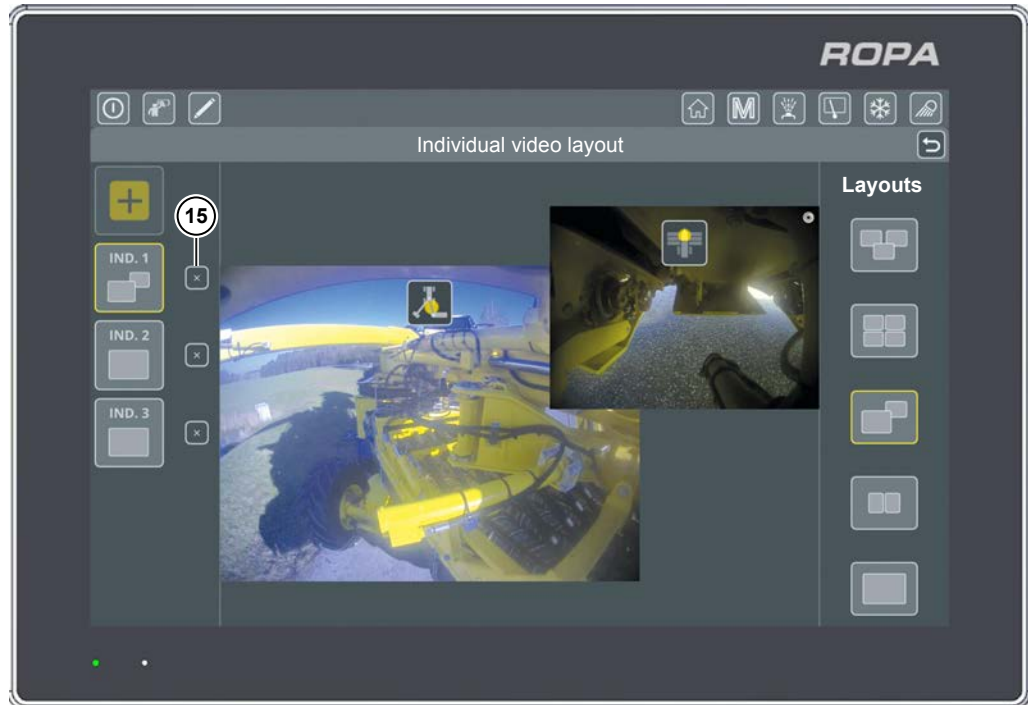


In order to move the zoomed views, use two fingers to move the image.

To save and exit the editing process, touch the Return key (14).

### 6.3.5.2.3 Deleting an individual camera view

Individual camera views that have already been created are displayed on the left. In order to delete an individual camera view, press the Delete button next to the respective view (15).

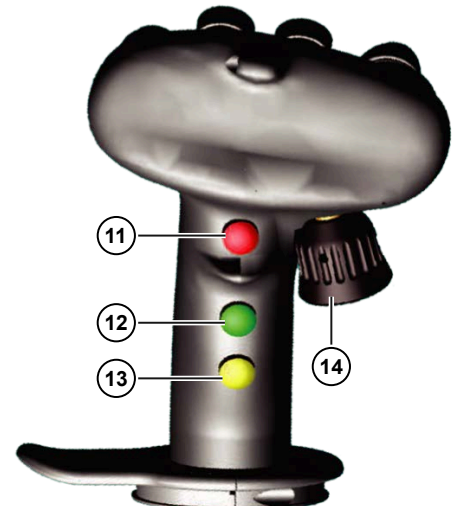


## 6.4 Right joystick

The right joystick is the most important operating component of the machine. Here the control of the machine essential functions is ergonomically combined in one operating component.



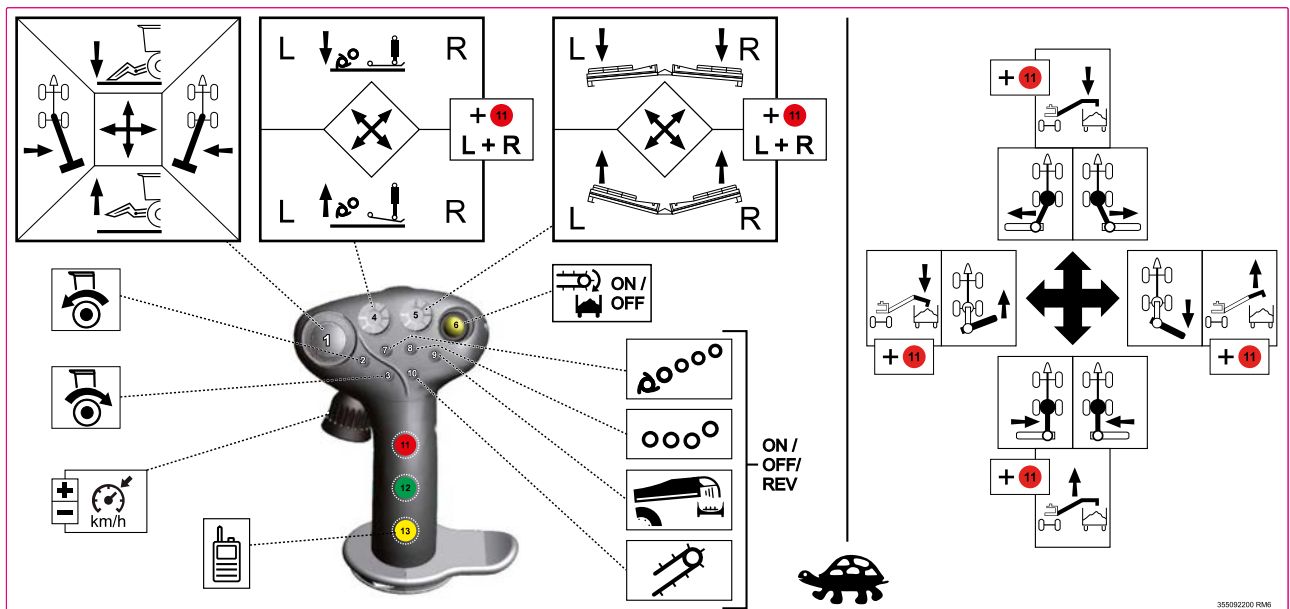
Joystick front side



Joystick rear side

### 6.4.1 Right joystick - operating mode "Turtle"

Joystick functions in the operating mode "Turtle"



### Joystick movements - multi-key (11) NOT pressed

Only the two rotary drives turn! The rotating direction of the swivel arm always depends on the selected loading direction!

**Joystick FORWARD** Turn swivel arm

**Joystick BACKWARD** Turn swivel arm

**Joystick LEFT** Turn truck conveyor to the left

**Joystick RIGHT** Turn truck conveyor to the right

### Joystick movements - multi-key (11) PRESSED and HELD

This lifts and lowers the truck conveyor or articulated part!

**Joystick FORWARD** Lower truck conveyor

**Joystick BACKWARD** Raise truck conveyor

**Joystick LEFT** Fold in truck conveyor articulated part

**Joystick RIGHT** Fold out truck conveyor articulated part



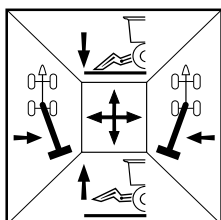
#### Mini joystick (1)

**FORWARD** Lowering pickup

**BACKWARD** Raising pickup

**LEFT** Swivel counterweight arm to the right

**RIGHT** Swivel counterweight arm to the left



Before swivelling the counterweight arm, it must be unlocked via the R-Select and by pressing the key +. Always swivel the counterweight arm in the direction opposite to the truck conveyor!

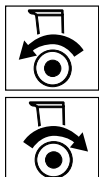


#### Key (2) Traction drive forward

Pressing this key only switches the traction drive forward in "Turtle" operating mode. Pressing this key again stops the traction drive.

#### Key (3) Traction drive backward

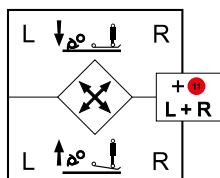
Press this key to switch the traction drive in reverse for as long as you hold the key down, only in the "Turtle" operating mode. If the machine is driving forward during loading, then you stop forward movement by pressing this key.





#### X-Y button (4) Support feet

<b>FRONT LEFT</b>	Raise supporting foot left
<b>FRONT RIGHT</b>	Raise supporting foot right
	<b>Pickup rollers work deeper in the ground</b>
<b>REAR LEFT</b>	Lower supporting foot left
<b>REAR RIGHT</b>	Lower supporting foot right
	<b>Pickup rollers work more shallow in the ground</b>



#### ADVICE

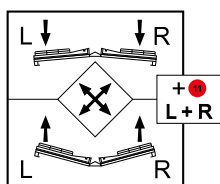


If the multi-key (11) is pressed at the same time as the X-Y key (4), both support feet are always adjusted simultaneously, regardless of which side the X-Y key is moved to.



#### X-Y key (5) fold pickup

<b>FRONT LEFT</b>	Fold out pickup side section left
<b>FRONT RIGHT</b>	Fold out pickup side section right
<b>REAR LEFT</b>	Fold in pickup side section left
<b>REAR RIGHT</b>	Fold in pickup side section right



With this, you also change the relief pressure of the pickup side sections.

#### ADVICE



If the multi-key (11) is pressed at the same time as the X-Y key (5), both pickup side parts are always folded simultaneously, regardless of which side the X-Y key is moved to.



#### Key (6) machine drive

<b>PRESS KEY SHORTLY</b>	Machine drive On/Off
<b>PRESS AND HOLD KEY</b>	Reload



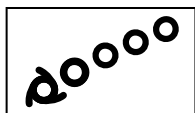




**Key (7) drive pickup rollers and conveyor rollers**

**PRESS KEY SHORTLY**  
**PRESS AND HOLD KEY**

Pickup rollers and conveyor rollers On/Off  
Reverse pickup rollers and conveyor rollers



**Key (8) drive 4 pinch rollers**

**PRESS KEY SHORTLY**  
**PRESS AND HOLD KEY**

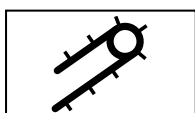
4 pinch rollers On/Off  
Reverse 4 pinch rollers



**Key (9) drive recleaning**

**PRESS KEY SHORTLY**  
**PRESS AND HOLD KEY**

Recleaning On/Off  
Reverse recleaning (no reversing for sieve conveyor model)



**Key (10) drive infeed conveyor**

**PRESS KEY SHORTLY**

Infeed conveyor on/off



**Key (13) radio**

**PRESS AND HOLD KEY**

Radio activation

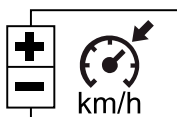
(See Page 167).



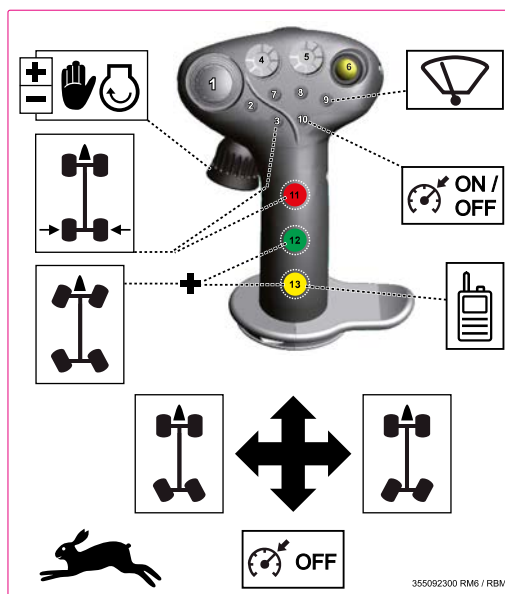
**Rotary wheel (14) forward driving speed when loading**

**TURN ROTARY WHEEL**

Change forward speed



### Joystick functions in the operating mode "Rabbit"



<b>Joystick LEFT</b>	Steer rear axle to left
<b>Joystick RIGHT</b>	Steer rear axle to right



**PRESS KEY SHORTLY**  
**PRESS AND HOLD KEY**

Window wiper(s) On  
Windscreen washer system On



**PRESS KEY SHORTLY**

Cruise control on/off

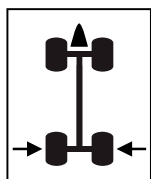




**Key (3) or multifunctional key (11) rear axle central position**

**PRESS KEY (3) OR (11) SHORTLY**

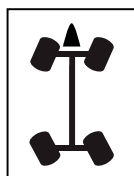
Put rear axle in central position



**Key (12) and (13) all-wheel steering**

**PRESS KEY (12) AND (13) BRIEFLY AT THE SAME TIME**

All-wheel steering On



**Key (13) Radio**

**PRESS AND HOLD KEY**

Radio activation

(See Page 167).

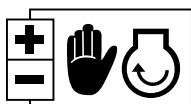


**Rotary wheel (14) Engine speed adjustment with manual engine rotational speed control**

**TURN ROTARY WHEEL**

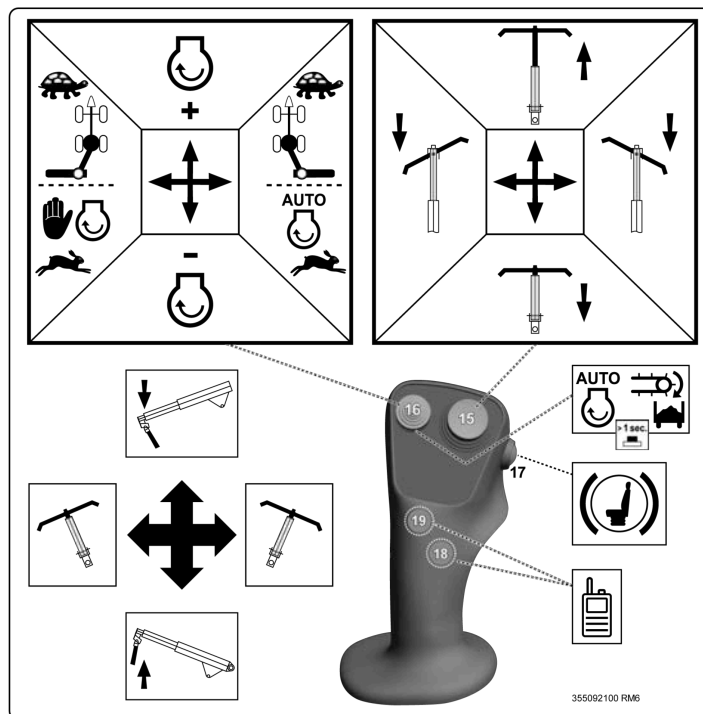
Change engine rpm

The driving speed (= feed speed) for loading operation is set via the rotary wheel (14).



## 6.5 Left joystick

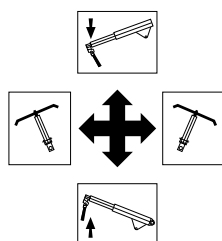
As soon as the left joystick console is folded up, the machine drive and the traction drive stop automatically.



### ADVICE

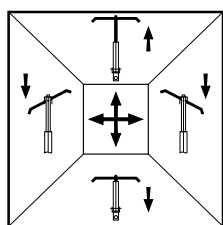
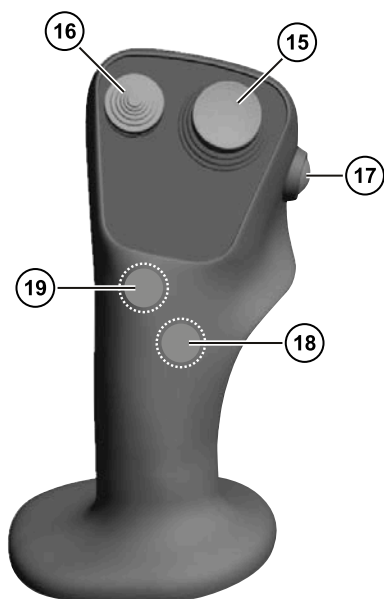


All functions can only be executed using the joystick if the seat console is swung all the way down and the machine is operated in Turtle I or Turtle II mode or the machine is operated in Rabbit I or Rabbit II mode with unlocked main steering switch.



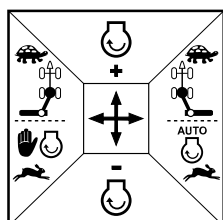
### Joystick movements

<b>FORWARD</b>	Lower pile pickup
<b>BACKWARD</b>	Raise pile pickup
<b>LEFT</b>	Swivel pile pickup (completely) to the left
<b>RIGHT</b>	Swivel pile pickup (completely) to the right



#### Mini joystick (15)

- |                 |  |
|-----------------|--|
| <b>FORWARD</b>  | Telescopically extend pile pickup        |
| <b>BACKWARD</b> | Telescopically retract pile pickup       |
| <b>LEFT</b>     | Rotate residual beet pickup to the left  |
| <b>RIGHT</b>    | Rotate residual beet pickup to the right |



#### X-Y key (16)

**Only in the operating mode "Turtle"**

- |                 |                              |
|-----------------|------------------------------|
| <b>FORWARD</b>  | Increase diesel engine speed |
| <b>BACKWARD</b> | Reduce diesel engine speed   |

- |              |   |
|--------------|---|
| <b>LEFT</b>  | Loading direction to the left (the truck is positioned on the left side of the machine)   |
| <b>RIGHT</b> | Loading direction to the right (the truck is positioned on the right side of the machine) |

Preselect right/left loading direction. In order to switch over, push the X-Y key (16) in the required direction and hold it briefly in the end position.

#### ADVICE



If the X-Y switch (16) is pressed to the left/right and held briefly, the direction of rotation of the swivel arm is reversed.  
With automatic folding function, the preselected loading direction determines the destination of the truck conveyor ([See Page 214](#)) when folding out.

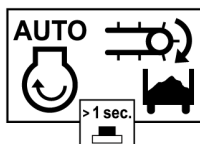
### X-Y key (16)

#### Only in the operating mode "Rabbit"

**LEFT** Manual diesel engine speed control

**RIGHT** Automotive diesel engine speed control

In order to switch over, push the X-Y key (16) in the required direction and hold it briefly in the end position.



### X-Y key (16) automotive loading

#### PRESS AND HOLD THE X-Y KEY

Automatic engine speed adjustment during loading On

#### ADVICE



If the X-Y key (16) is pressed again or pushed forward or backward, the automatic engine speed adjustment during loading is switched off again. ([See Page 172](#))



### Key (17) rotating seat brake

#### PRESS KEY SHORTLY

Set/release rotating seat brake



### Key (18) or (19), rotate residual beet pickup or radio

There are three different operating variants for the keys (18) and (19). You can switch between these three variants in the "Main settings" menu, "Joystick left keys 18+19" line ([See Page 166](#)).

Variant 1 "Residual beet pickup": The residual beet pickup can be rotated by pressing key (18) or (19), one at a time.

#### PRESS KEY (18)

Rotate residual beet pickup to the right

#### PRESS KEY (19)

Rotate residual beet pickup to the left

Variant 2 "Radio": Press and hold key (18) or (19) to activate the radio ([See Page 167](#)).

#### PRESS AND HOLD KEY (18) OR (19)

Radio activation

Variant 3 "Both": In this variant, press keys (18) and (19) simultaneously to activate the radio ([See Page 167](#)).

In addition, in the "Both" variant, you can rotate the residual beet pickup by pressing the key (18) or (19), one at a time.

#### PRESS KEY (18)

Rotate residual beet pickup to the right

#### PRESS KEY (19)

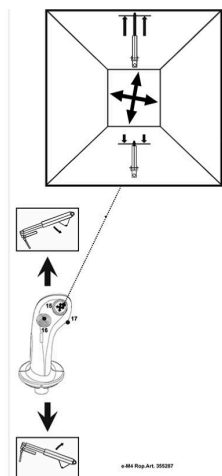
Rotate residual beet pickup to the left

#### PRESS AND HOLD KEY (18) AND (19)

Radio activation

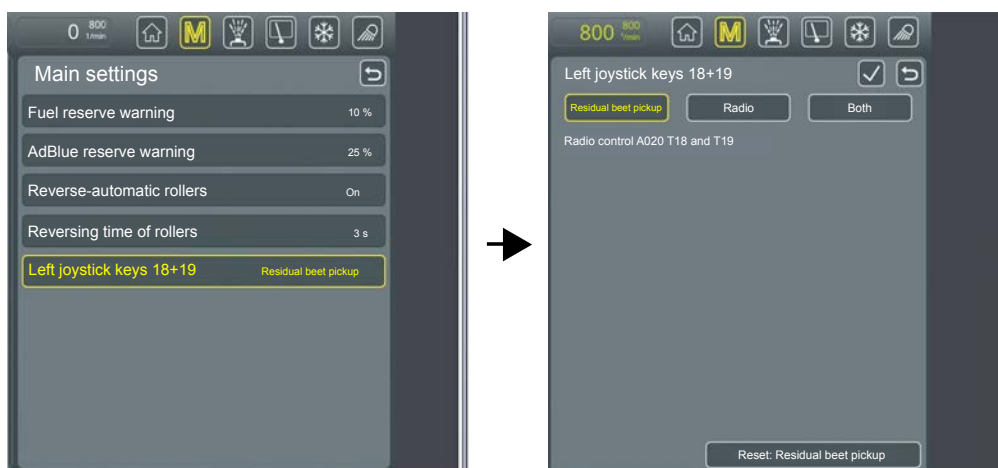
### 6.5.1 Switching joystick left Keys 18+19

"Rotate residual beet pickup" is the standard function of both keys (18) and (19) on the left joystick.



Both buttons can be reassigned in the main menu, Basic settings submenu, Joystick left keys 18+19 line. You can set it to "Residual beet pickup", "Radio" (See [Page 167](#)) or "Both".

In order to change back to the standard assignment, press the "Reset: residual beet pickup" key.





## 6.6 Radio control

If you want to install a radio, you can remove the storage compartment from the roof console. A radio can be installed in the opening on the roof console. The power cable for it is already provided in the roof console.

You can activate an external microphone connected to the radio by three different methods ([See Page 160](#), [See Page 165](#), [See Page 166](#)). This way you have the PTT function on both joysticks. This allows speaking via external microphone without releasing the joystick.

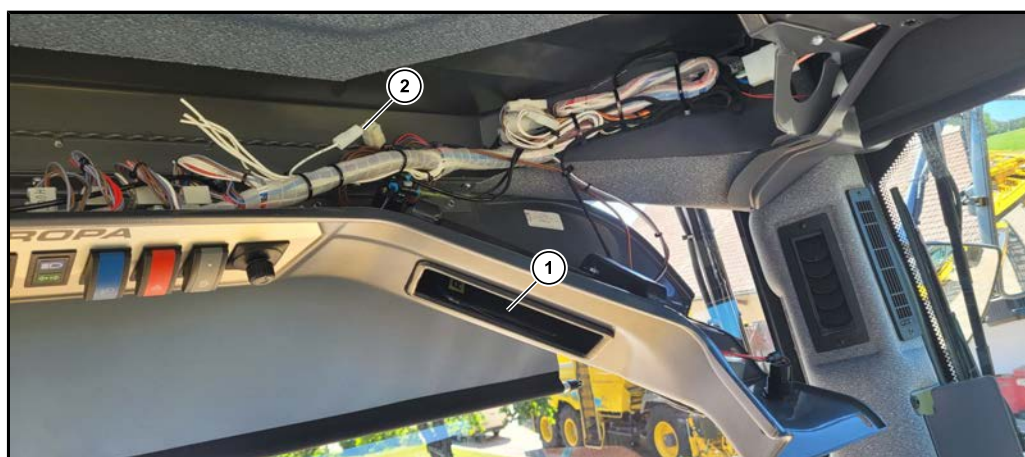
### ADVICE



A control line already laid by ROPA up to the roof console must be connected to a compatible radio.

When activated via the PTT buttons, the control line (cable number: 851 --> CB:1) is at 24V.

For more detailed information, contact your ROPA service partner.

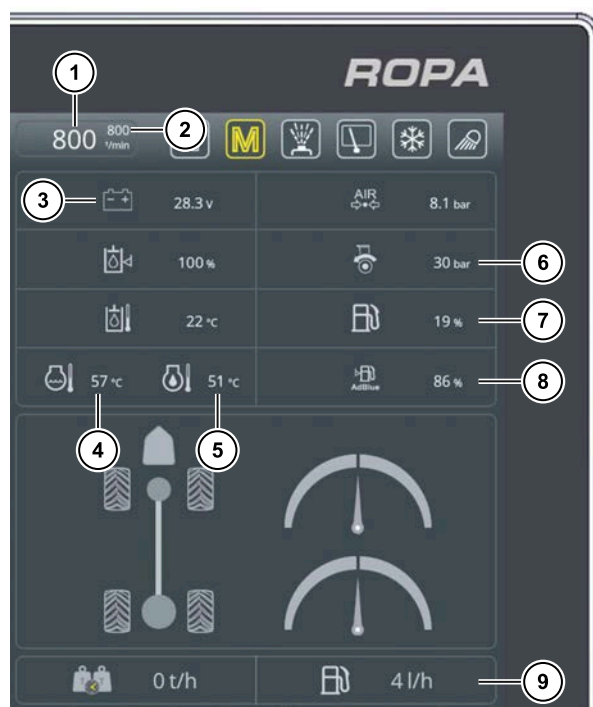


- (1) Roof console storage compartment
- (2) Control line plug (cable no. 851 --> CB:1)

## 6.7 Diesel engine

A summary of the maintenance work required on the diesel engine can be found in the operating manual and original maintenance documentation from MTU/Mercedes-Benz.

Information regarding procedure to be followed in the event of malfunctions can be found in the "Malfunctions and Remedies" chapter and in the MTU/Mercedes-Benz operating instructions.



- (1) Actual rotational speed
- (2) Set rotational speed
- (3) Voltage vehicle power supply
- (4) Coolant temperature (all right up to max. 105 °C)
- (5) Engine oil temperature (above 60°C is hidden)
- (6) Pressure traction drive
  - Arrow counterclockwise: higher pressure forward
  - Arrow clockwise: higher pressure backward
- (7) Tank level fuel
- (8) AdBlue tank level®
- (9) Current fuel consumption in l/h

### ATTENTION



#### Hazard of severe engine damages

- Whenever one of the warning icons below appears on the R-Touch, shut the diesel engine down immediately and determine the cause of the warning.
- Only restart the diesel engine once the cause has been eliminated.

**In case of engine problems, the R-Touch displays the following warning messages:**



Engine oil pressure too low. IMMEDIATELY SHUT DOWN and refill engine oil.



Engine oil level too low. IMMEDIATELY refill engine oil. ([See Page 340](#))



Coolant temperature too high. Shut down the diesel engine, determine and eliminate the cause (e.g. clean the radiator).



Coolant level too low. Shut down the diesel engine and immediately refill coolant.



Severe problems in the diesel engine! Shut down the diesel engine IMMEDIATELY and call customer service. STOP Engine!



Error in engine control  
CHECK Engine!  
Exhaust-related errors.



Air filter dirty! Immediately perform maintenance on the air filter!



Fuel prefilter insert at the electric pump is dirty! Exchange the filter, as loss of engine power is to be expected soon.



Engine fuel fine filter on diesel engine is blocked! Exchange the filter, as loss of engine power is to be expected soon.



DEF control light (Diesel Exhaust Fluid). AdBlue® Warning.



DPF warning indicator; Increased filling level of the diesel particulate filter.



DPF regeneration status indicator, warning indicator High exhaust gas temperature.



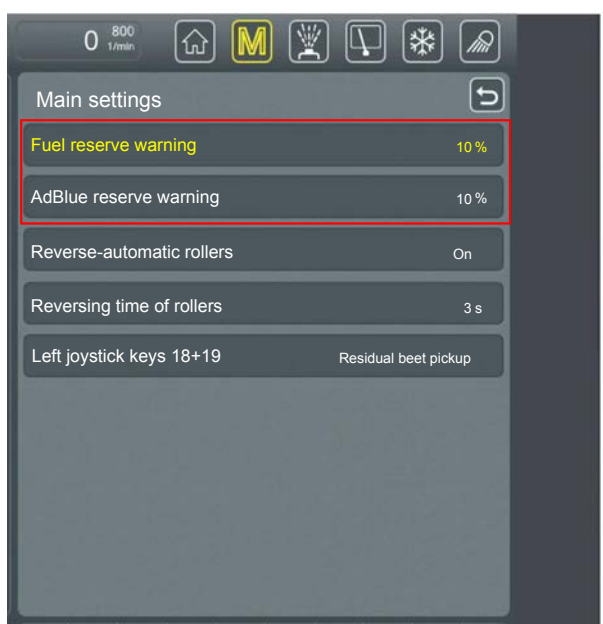
LIM control light, diesel engine torque limiting is active.



Spare fuel quantity reached! When this warning icon is displayed on the R-Touch, the spare fuel quantity set by you has been reached.



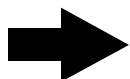
AdBlue® reserve quantity reached. When this warning icon is displayed on the R-Touch, the spare fuel quantity of AdBlue® set by you has been reached.



The warning threshold for the fuel reserve can be set in the "Main settings" menu, "Fuel reserve warning" line. You state this value in percent of the total tank capacity.

The warning threshold for AdBlue® reserve can be set in the "AdBlue-reserve warning" line. (applicable for c-diesel engine and d-diesel engine)

#### ADVICE



Depending on the design, fuel tank contents exceeding 1,000 litres are not indicated on the display.

#### Fuel quality

[See Page 349](#)

#### ATTENTION



#### Risk of serious engine damage!

Use only sulphur-free diesel fuel that conforms to the specified standards!

Non-permitted fuel types cause irreversible damage to the diesel engine and the exhaust gas treatment system and significantly reduce the expected service life.

Do not add petrol to vehicles with diesel engines. Even small amounts of petrol can damage the fuel system and diesel engine.

### Water content

The maximum permissible water content in diesel fuel is 200 mg/kg.

## 6.7.1 Start/shut down diesel engine

If the drive pedal is not in resting position during starting, then for safety reasons, traction drive is blocked. The block remains until the drive pedal is completely released and pressed again.

### ATTENTION

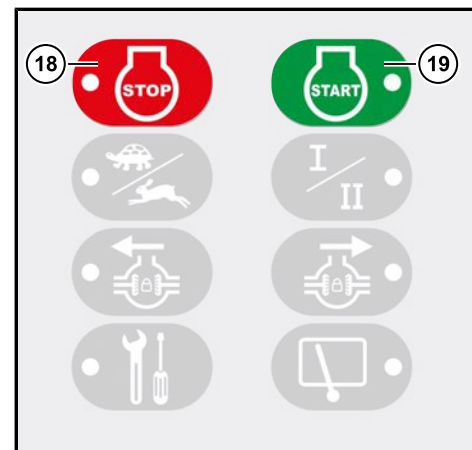




#### Risk of machine damage.

Use of chemical starting aids (e.g. Startpilot etc.) is expressly prohibited, as it may lead to injuries and to machine damage.

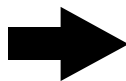
The ignition lock has three switching positions:

- Position 0: Shut down diesel engine/ignition off – the key may be removed
- Position I: Ignition on, the diesel engine is ready for start
- Position II: Start diesel engine (not connected)



Use the START key  to start the diesel engine and the STOP key  or ignition lock to shut it down.

### ADVICE



After each start of the engine, the fan of the cooling system is automatically reversed for a short time. This frees the cooling system of loose dirt (leaves, etc.).

### CAUTION



It is necessary for the safe operation of the control units that the ignition is switched off at least once every 24 hours (position 0). Wait until the green LED on the colour terminal goes off before switching the machine on again. Only then the machine is considered to be switched off completely.


### ADVICE



To start the diesel engine press and hold the START key (19) for at least 3 sec.. If the START key is pressed too briefly, a note appears on the terminal.

If the diesel engine does not start immediately, then the electronic system switches off the starter after a certain period of time. In this case, wait at least 2 minutes until new start attempt so that the starter can cool down sufficiently.

Help for engine start. (See Page 486)

If the diesel engine cannot be started due to a starting block, the R-Touch displays the following warning icon: 

This warning icon and one of the following alternately flash on the R-Touch:

	Please swing up rear platform wall		Please close engine housing door
---	------------------------------------	---	----------------------------------

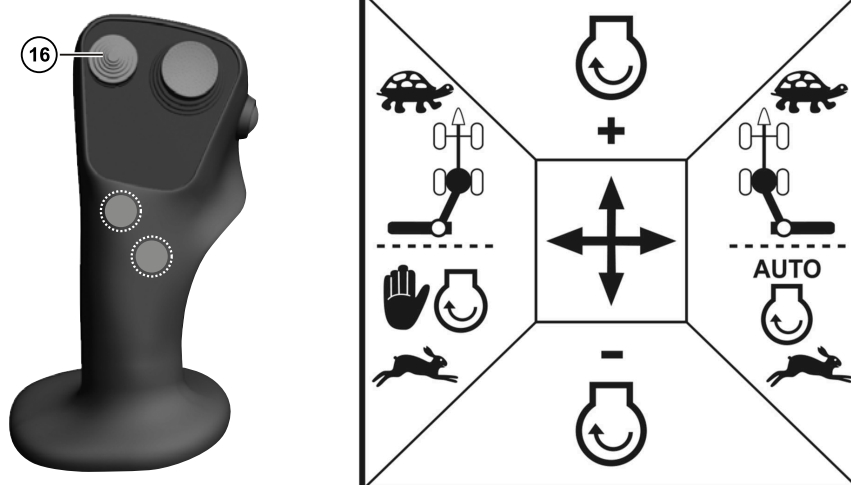
Let the diesel engine idle for a short time before shutting it down. If the diesel engine is shut down at high speed, then the turbo charger runs on after the oil pressure has already fallen.

This leads to lack of lubricant and therefore to unnecessary wear on bearings of the fast-running turbine of the turbocharger.



To shut down the diesel engine

- Press STOP key (18).
- Only in case of emergency, shut down the diesel engine by moving the ignition lock to position 0.

## 6.7.2 Engine speed adjustment



### 6.7.2.1 Engine speed adjustment in Rabbit operating mode

By pushing the X-Y key (16) on the left joystick to the right/left, you can switch between driving with manual engine speed adjustment  (to the left) and automotive driving  (to the right). In order to switch over, push the X-Y key (16) in the required direction and hold it briefly in this position.



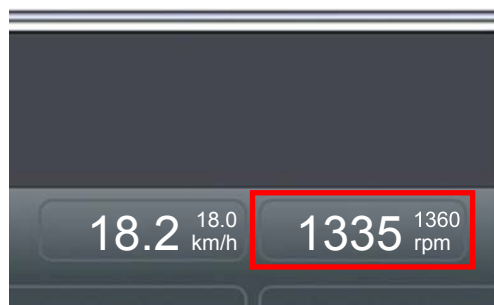
#### Automatic engine speed adjustment (automotive driving)

During automotive driving adjustment of the engine speed is exclusively performed using the driving pedal.



### Manual adjustment of the engine speed

Manual engine speed adjustment in the Rabbit operating mode can only be performed using the rotary wheel (14) on the right joystick. The highest engine speed is at about 1,500 rpm. This variant is the most suitable for driving on uneven terrain.



#### 6.7.2.2

### Engine speed adjustment in Turtle operating mode

#### Manual adjustment of the engine speed

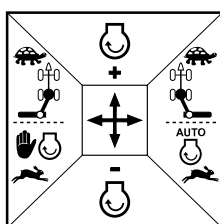


Engine rotational speed adjustment is manually performed by moving the X-Y key (16) forward/backward on the left joystick.

Press the X-Y key (16) briefly forward: The engine rotational speed increases with each press by 25 rpm.

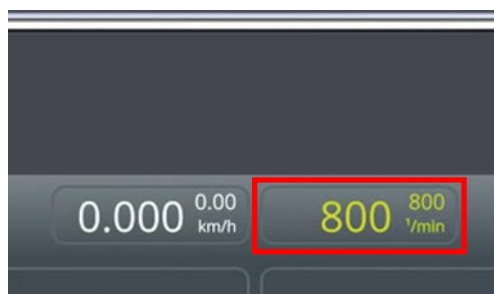
Pull the X-Y key (16) briefly backward: The engine rotational speed decreases by 25 rpm with each press.

Press the X-Y key (16) forward/backward and hold it: The engine rotational speed will continue to change for as long as you keep the key pressed.



#### Automatic engine speed adjustment (automotive loading)

To activate the automotive engine speed adjustment, press the X-Y switch (16) and hold it briefly. You can tell if the engine speed is active by the text displayed in green.





### **Machine drive On/Off**

When adjusting the engine speed manually, once the machine drive has been switched on, the diesel engine speed is automatically adjusted to the value that was set before the machine drive was switched off for the last time.

The diesel engine speed limits the possible speed of the machine drives.

Example: If the speed of the truck conveyor is set to stage 10, but the diesel engine only runs at 1,200 rpm during loading, the speed of stage 10 will not be reached. Fuel-saving loading is possible despite the speed stage of the truck conveyor being set too high, as the maximum flow volume of the pump limits the speed of the truck conveyor.

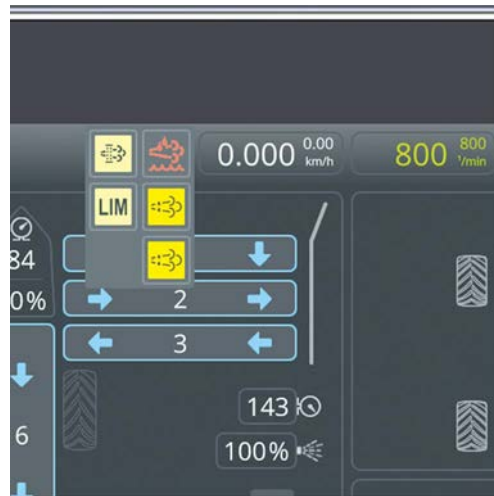
During automotive loading, the machine drive set at the fastest speed determines the speed of the diesel engine.

Example: If the speed of the truck conveyor is set to stage 10, the diesel engine runs at high speed during loading, as it has to reach the speed of stage 10. Fuel-saving loading is not possible if the stage (speed) is set too high.

Automotive loading works great when ALL six machine drives are set to actually required stage (speed).

After switching off of the machine drive, the engine speed is automatically reduced to idling speed (exception "After-loading" [See Page 277](#)).

### 6.7.3 Power reduction SCR system (applicable for c-diesel engine and d-diesel engine)



There are 3 types of targeted power reductions regarding the SCR system:

- **Empty AdBlue-tank**
- **Violation of the permissible European or EPA limits/poor AdBlue® quality**
- **SCR system error (short circuit, faulty component, etc.)**

Each of these events causes the warning lights on the R-Touch to flash or light, and also a targeted power reduction is implemented.



DEF control light (Diesel Exhaust Fluid), AdBlue® warning.



LIM control light, diesel engine torque limiter is active.



CHECK engine warning light (AWL warning), check diesel engine.

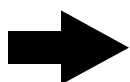


STOP engine warning light, shut down diesel engine (performance reduced).

### 6.7.3.1 Power reduction AdBlue® filling level (applicable for c-diesel engine and d-diesel engine)

AdBlue® level	System impact	Capacity
approx. 10 % – 7.5 %	DEF warning light is on	Normal
approx. 7.5 % – 5 %	DEF warning light flashes LIM warning light is on ○ Torque reduction to 75% of the nominal torque	Slight reduction
approx. 5 % – 2.5 %	DEF warning light flashes LIM warning light flashes ○ Torque reduction to 50% of the nominal torque ○ Rotational speed limited to 60% of nominal rotational speed	Strong reduction
approx. 2.5 % – 0 %	DEF warning light flashes LIM warning light flashes Stop engine warning light is on ○ Reduction to 20% of the nominal torque ○ Reduction to the idling speed	Full reduction begins
AdBlue® 0 %	DEF warning light flashes LIM warning light flashes Stop engine warning light flashes ○ Diesel engine in idling speed	Full reduction

#### ADVICE



This type of power reduction is "self-healing", i.e. after refuelling, the power raises itself again.



DEF control light (Diesel Exhaust Fluid), AdBlue® warning.



LIM control light, diesel engine torque limiter is active.



STOP engine warning light, shut down diesel engine (performance reduced).

### 6.7.3.2 Power reduction AdBlue® quality/system error (applicable for c-diesel engine and d-diesel engine)

Error	System impact	Capacity
By detection of poor quality/system error	DEF control light is on after 60 min for 60 min.	Normal
60 min. after detection	DEF warning light flashes LIM warning light is on ○ Torque reduction to 75% of the nominal torque	Slight reduction
180 min. after detection	DEF warning light flashes LIM warning light flashes ○ Torque reduction to 50% of the nominal torque ○ Rotational speed limited to 60% of nominal rotational speed	Strong reduction
230 min. after detection	DEF warning light flashes LIM warning light flashes Stop engine warning light is on ○ Reduction to 20% of the nominal torque ○ Reduction to the idling speed	Full reduction begins
240 min. after detection	DEF warning light flashes LIM warning light flashes Stop engine warning light flashes ○ Diesel engine in idling speed	Full reduction



For all malfunctions in the SCR system, the system effects should be equated to those of poor AdBlue® quality. Additionally, in the event of system error the warning light "CHECK engine" is on permanently.



DEF control light (Diesel Exhaust Fluid), AdBlue® warning.



LIM control light, diesel engine torque limiter is active.

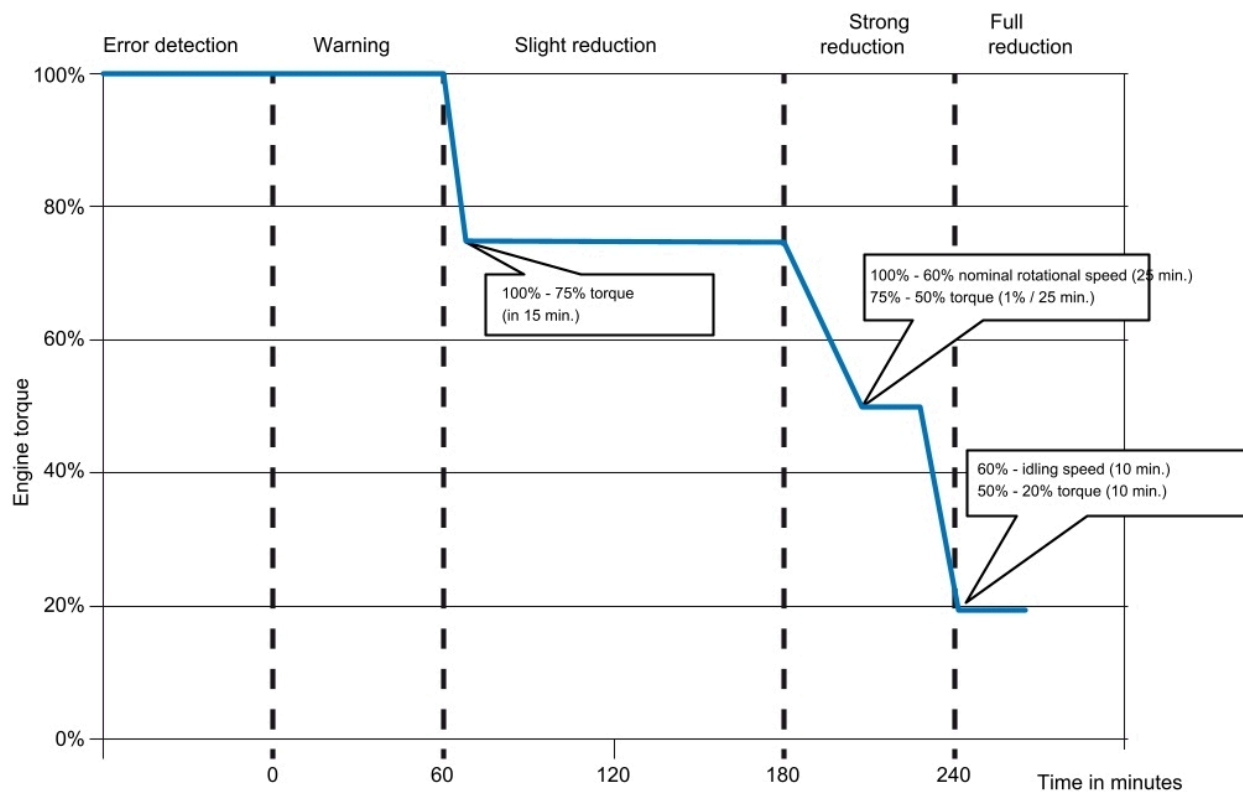


CHECK engine warning light (AWL warning), check diesel engine.



STOP engine warning light, shut down diesel engine (performance reduced).

### 6.7.3.3 Power reduction process



#### 6.7.4 Diesel particulate filter (abbreviated as "DPF", applicable for d-diesel engine)

##### **DANGER**

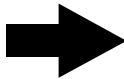


**Hazard of fire due to combustible materials in the engine compartment or on the exhaust gas system**

Flammable materials may ignite.

- For this reason, check regularly whether there are any flammable foreign materials in the engine compartment or on the exhaust gas system.
- Park the vehicle in such a way that no flammable materials come into contact with any hot parts of the vehicle.
- Do not park on dry meadows or harvested grain fields.

##### **ADVICE**



**Damage due to hot exhaust gases**

Very hot exhaust gases escape from the exhaust tailpipe during automatic and manual regeneration.

Keep a minimum distance of one metre from other objects, e.g. parked vehicles.

The presence of any person in the area where the exhaust gases are emitted is prohibited.

If the machine is operated mainly in low-load mode, the regeneration time may be significantly longer. Such art of operation increases fuel consumption and can impair the functionality of the exhaust gas system.

If regeneration of the diesel particulate filter is not possible over a longer period of time, it could lead to the following:

- reduction of the engine torque
- reduction of the engine speed
- exchange of the diesel particulate filter

### Zone 0

Particle filter passive regeneration.

#### No action required.

DPF is always protected by passive regeneration when the diesel engine is running.



### Zone 1

The active automatic regeneration of the DPF is on. Warning indicator lights up to inform the driver.

#### No action required.

An automatic regeneration may start while driving, loading or in a standby mode. The automatic regeneration only starts when all operating conditions are met, such as sufficiently high engine oil and exhaust gas temperatures. If one of the operating conditions is no longer fulfilled during regeneration, the indicator light goes out. Please note, that temperatures similar to those of full load can occur at the exhaust gas outlet even at low power requirements of the diesel engine or when the engine is at a standstill.

#### ADVICE



Under normal operating conditions, it occurs approx. every 35 hours of operation.

If possible, please do not interrupt regeneration (do not switch off the diesel engine if that is possible). However, the interruption is not harmful.



### Zone 2

Particle filter filling level high, initiate manual regeneration immediately. Warning indicators are on.

#### Action required within the next 1-2 hours.

Carry out high idle regeneration at a standstill in the "Special functions" menu, "Start DPF regeneration manually" line ([See Page 182](#)). Press "On", the idle speed increases at the start of regeneration, which lasts between 30 and 60 minutes.

#### ADVICE



**This advice applies to Zone 2, Zone 3 and Zone 4.**

The vehicle operating profile is not sufficient for automatic regeneration (too low load requirement, too frequent interruptions).

If the indicator requests you to perform a manual regeneration at low outside temperatures, start the regeneration before you switch off the diesel engine.

The manual regeneration only starts if the following conditions are met:

- Engine oil and exhaust gas temperature is sufficiently high.
- AdBlue® (DEF) is not frozen.
- System without malfunctions.





### Zone 3

Particle filter filling level very high, initiate manual regeneration immediately. Warning indicators are on.

#### **Action required within the next 30 minutes.**

Carry out high idle regeneration at a standstill in the "Special functions" menu, "Start DPF regeneration manually" line ([See Page 182](#)). Press "On", the idle speed increases at the start of regeneration, which lasts between 30 and 60 minutes.



### Zone 4

Particle filter filling level critically high, warning indicators are on, particle filter warning indicator is flashing.

#### **Immediate action required.**

Carry out high idle regeneration at a standstill in the "Special functions" menu, "Start DPF regeneration manually" line ([See Page 182](#)). Press "On", the idle speed increases at the start of regeneration, which lasts between 30 and 60 minutes.



### Zone 5

Particle filter overfilled, contact the workshop. Warning indicators are on, particle filter warning indicator is flashing.

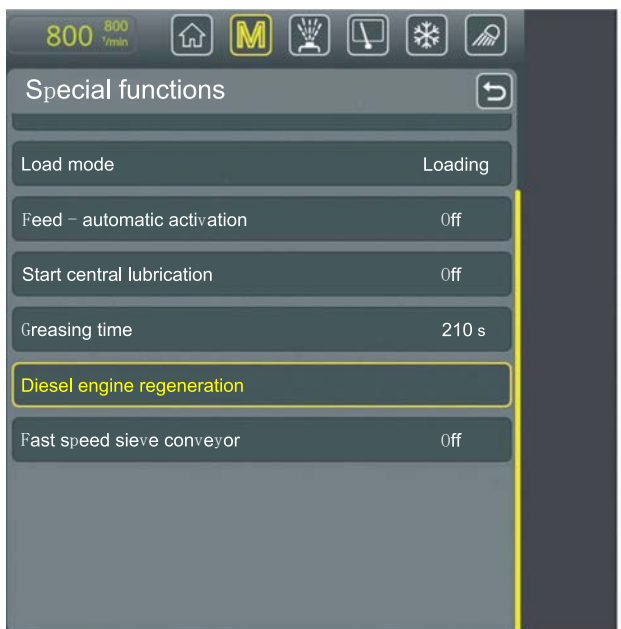
#### **Immediate action required.**

Reduced performance. Drive to the nearest workshop hardly possible  
.Mercedes service required. Mercedes XENTRY diagnosis system required. Have the diesel particulate filter cleaned or replaced.  
High idle regeneration no longer possible.

#### 6.7.4.1 Diesel particulate filter (DPF) regeneration applicable for d-diesel engine)

To start DPF regeneration (High Idle Regeneration) open the main menu, "Special Functions", "Diesel Engine Regeneration" submenu.

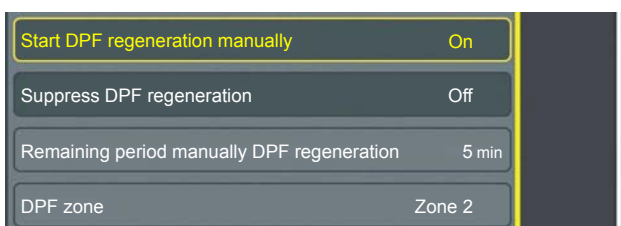
In the line "Start DPF regeneration manually", choose the "On" option.



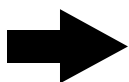
If you need to avoid the higher exhaust gas temperature that occurs during regeneration, e.g. when entering a hazardous area, you can suppress regeneration. The automatic and manual regeneration cannot be started and a running regeneration is aborted. Activate the suppression only for the period of danger. As soon as you activate the regeneration suppression, the regeneration remains blocked even after the engine restart. As a result, a large number of particles may quickly accumulate in the diesel particulate filter.

The line "Remaining period manual DPF regeneration" shows in minutes the remaining time, which the machine still needs to regenerate the diesel particulate filter.

The line "DPF zone" shows the current DPF zone in which the machine is now.



#### ADVICE



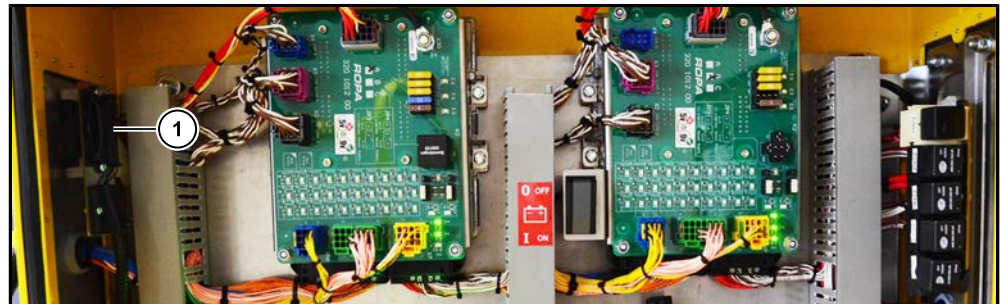
The manual DPF regeneration can be carried out in DPF zone 2 and DPF zone 3.

To suppress the automatic DPF regeneration, select the option "On" in the "Suppress DPF generation" line.

### 6.7.5 Amendments or supplements to the Mercedes-Benz engine operating manual

The items listed below must generally be considered for the diesel engines from Mercedes-Benz, which are installed in the ROPA machines:

- The installed diesel engine is OM 936 LA 260 kW and 1,400 Nm. It means that only some parts of the Mercedes-Benz operating manual applies, namely those referring to these engine models, and generally applying to all engine models.
- All diesel engines have no flame starter system, but are equipped with a constant throttle brake. Control is performed using the CPC4 control device via CAN bus. This control device is located in the central electrical system.
- The exhaust after-treatment system of the machine is controlled by ACM (only on c-diesel engine and d-diesel engine). It is located approximately in the middle of the machine's frame on the left above the rear side of the gearbox.
- The warning lamps mentioned in the MTU/Mercedes-Benz operating manual are replaced on ROPA machines by the warning indications on the R-Touch. But the meaning of these indications is identical to the lamps described in the MTU/Mercedes-Benz operating manual. Once the STOP indicator is displayed on the R-Touch, the diesel engine must be IMMEDIATELY shut down because of a severe engine fault, which may lead to the diesel engine breakdown in case of further operation.
- The diagnosis socket (X-340 (1)) for the engine electronics is located in the front/top of the central electrical system.



- The STOP button on the diesel engine is disabled.
- The Mercedes-Benz operating manual mentions an emergency switch for the full engine performance (override switch, emergency switch for bypassing the operating restriction). This switch is not installed in the ROPA machines.
- Please keep confirmations of maintenance work from MTU/Mercedes Benz customer service with the enclosed original documentation from MTU/Mercedes Benz.

The MTU/Mercedes-Benz operating manual is absolutely binding and an original copy is supplied with the machine.

## 6.8 Operating modes "Turtle" and "Rabbit"

The icon ("Turtle"/"Rabbit") of the currently active operating mode is displayed on the R-Touch.

The machine can be operated in the following modes:



"Turtle I"

= Loading operation



"Turtle II"

= While it is possible to switch into this operating mode, in practice, however, it does not make any sense because this would switch off the all-wheel drive.



"Rabbit I"

= Slow driving on roads with all-wheel drive



"Rabbit II"

= Rapid driving on roads without all-wheel drive

### ATTENTION



#### Hazard of severe damage to traction drive!

In the "Rabbit" operating mode, particularly when driving downhill,  
in the **variant 1 with one traction drive motor**, never exceed 35 km/h  
in the **variant 2 with two traction drive motors**, never exceed 43 km/h.

- Adjust your way of driving
- Drive on steep slopes downhill at reduced speed
- Slow down in emergency cases the vehicle using the operating brake

### 6.8.1 Diesel engine and traction drive overspeed warning



#### ATTENTION



**Hazard of severe damage to traction drive!**  
**Hazard of severe damage to diesel engine**

If this warning appears on the terminal, immediately reduce the speed of the machine by activating the operating brake.

## 6.8.2 Operating mode change



- To switch the operating mode completely release the drive pedal and stop the vehicle.
- Select the desired operating mode using keys **(20)** and **(21)** on keypad II.

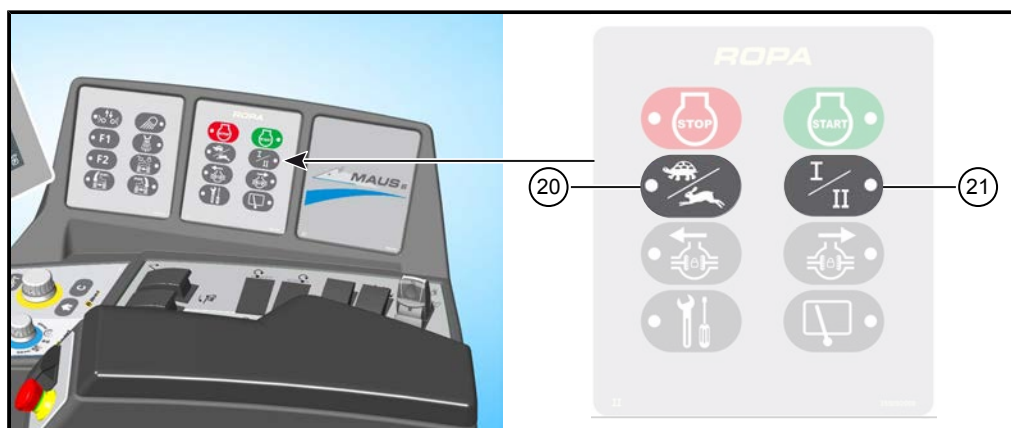
In "Turtle" operating mode the ladder swings out and the warning signs on the pile pickup swing up.

Driving speeds:

Operating mode "Turtle I"	0-0.7 km/h
Operating mode "Rabbit I"	0-10 km/h
Operating mode "Rabbit II"	0-40 km/h (or 32 km/h, 30 km/h, 25 km/h)

Switching process:


- To switch the operating mode completely release the drive pedal and stop the vehicle.
- Select the desired combination of operating mode and gear using the keys **(20)** and **(21)** on keypad II:  
Use key **(20)** to select operating mode "Turtle"/"Rabbit"  
And key **(21)** to select gear I/II.
- When switching to another operating mode, a sound may be heard ("clack"). Once the operating mode is switched on correctly, the corresponding symbol appears on the R-Touch.
- If after switching on the operating mode, the symbol flashes on the R-Touch, the gear is not engaged. Should this happen, press again the key **(20)** or **(21)** to switch to the requested operating mode.



### ATTENTION



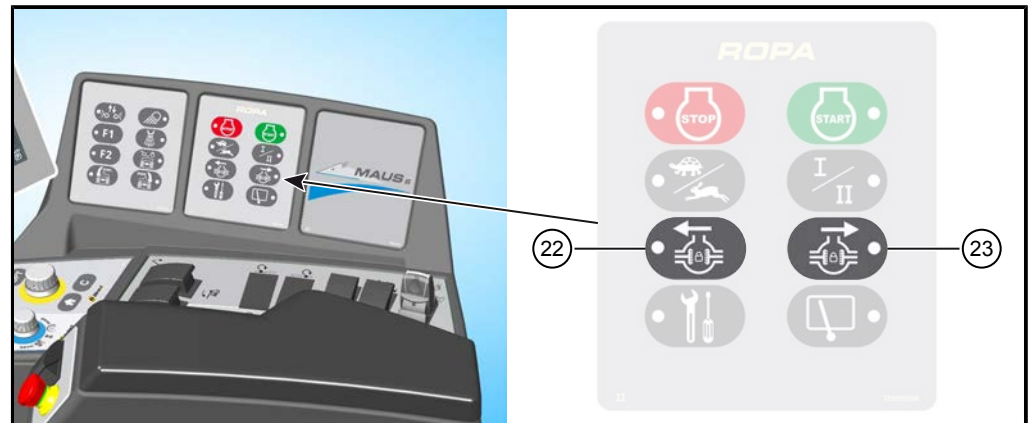
#### Hazard of heavy damage to the gearbox.

The keys for switching between the operating modes may **ONLY** be used when the machine is at standstill (0.0 km/h). If you do not follow this advice, the gearbox may be destroyed. Additionally, sufficient pressure must be present in the compressed air system. This is the case if the icon  disappears from the R-Touch.

### 6.8.3 Differential lock



The differential locks for the front and rear axles can be activated independently of each other. The front axle is switched on/off with the key (22) and the rear axle with the key (23) on the keypad II.



#### ATTENTION

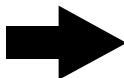


#### Hazard of severe damage to the axles.

If you do not observe this note, then the claw clutches of the differential locks may be destroyed.

- The differential lock may **ONLY** be switched when the machine is at a complete standstill (0.0 km/h).
- Never steer the wheels sharply with the differential lock switched on! Always set the wheels before switching on into running straight ahead position! The power transmitting components (differential drive, cardan shaft, planetary drive, etc.) are highly stressed.

#### ADVICE



If machine traction is insufficient under demanding conditions, then first switch on just the differential lock of the front axle.

The rear axle lock should only be used if further work would otherwise be impossible. To avoid damage to the axle, the wheels must in any case be steered in approximately straight position.





If the steering angle of the front or rear axle is excessively turned in a particular direction, then the differential lock cannot be engaged.



Only switch on the differential locks if they are actually needed. Use of the differential locks is not required when operating on normal terrain or with correctly set pickup depth, pickup relief and counterweight position.





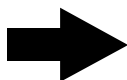

**Switch on differential lock of front axle:**

- To switch on the differential lock, release the drive pedal completely and stop the vehicle.
- Press the key **(22)** on keypad II.
- The icon  appears on the R-Touch if the engagement position of the axle is not achieved. The LED flashes.
- The icon  appears on the R-Touch if the differential lock is engaged. The LED glows.


**Switch on differential lock of rear axle:**

It is not possible to lock the rear axle alone. The lock of the rear axle can only activated if the differential lock of the front axle has been switched on. If, on the other hand, the differential lock for the front axle is switched off, then automatically the differential lock for the rear axle is switched off as well.



- To switch on the differential lock, release the drive pedal completely and stop the vehicle.
- Press the key **(23)** on keypad II.
- The icon  appears on the R-Touch if the engagement position of the axle is not achieved. The LED flashes.
- The icon  appears on the R-Touch if the differential lock is engaged. The LED glows.


**ADVICE**


The rear axle is only able to perform limited steering tasks with the differential lock engaged. If larger steering movements of the rear axle are required, then first switch off the differential lock of the rear axle.


**Front axle differential lock not released**

**Rear axle differential lock not released**
**Switch off differential lock:**

- You can switch both differential locks off with the key **(22)** on the keypad II. The LED is off.
- You can switch off the differential lock of the rear axle with the key **(23)** on the keypad II. The LED is off.
- If one of the following icons appears on the R-Touch after switching off the differential lock:  -  then an axle is locked and therefore the differential lock is not completely released yet. This lock may be released by deliberately steering this axle back and forth.

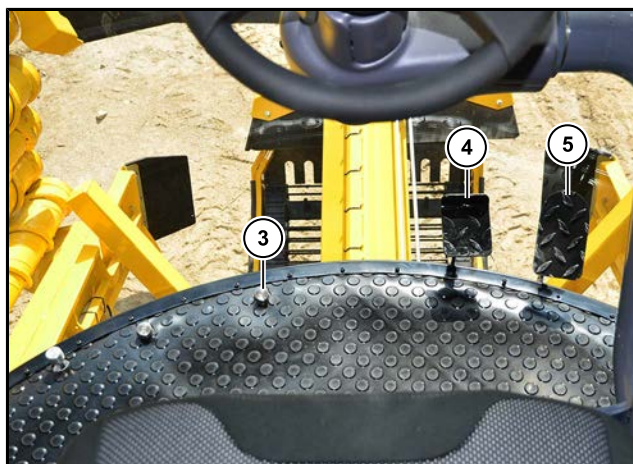
The differential lock will be switched automatically off with switching to the operating mode "Rabbit II".

## 6.9 Driving

The electronic control relieves the driver and protects the environment thanks to the automotive driving.

Automotive driving means that the driving speed is preselected by the pressure on the gas pedal. The electronics control the hydrostatic drive and the diesel engine so that the preselected speed is always driven at the lowest possible engine rotational speed, independent on the fact whether you are driving uphill or downhill.

You control the driving speed of the machine using the gas pedal. The more you press the pedal, the faster the machine drives. When you completely release the gas pedal, the machine strongly brakes due to the hydrostatic drive.



- (3) Foot switch driving direction
- (4) Brake pedal
- (5) Drive pedal

Hydrostatic drives are deemed very safe. The following measure additionally increases this safety, if there should be any operating faults of the drive. If, when releasing the driving pedal, the machine should neither reduce driving speed nor stand still, then a safety circuit is activated by engaging the parking brake (32).



This safety circuit bypasses the standard control behaviour of the hydraulic system and opens a safety valve that quickly shuts off the traction drive. If, in the extremely improbable case of failure of all safety devices, the machine still does not stop, then shut down the diesel engine with the STOP key (18) or ignition key as quickly as possible. ([See Page 94](#)) ([See Page 171](#))


#### DANGER




**Danger of severe rear-end collisions with injuries hazardous to life or even deadly when engaging the parking brake or shutting off the diesel engine, while the machine is driving.**

- Therefore, only use this EMERGENCY STOP function in an extreme emergency and try to warn following traffic by pressing the foot brake pedal several times and switching on the hazard warning lights.









If the vehicle moves very slowly after switching to the operating mode "Rabbit", the respective icon appears on the R-Touch: e.g. "Please move truck conveyor to transport position" . Before starting the machine, make sure that it is entirely in the transport position.



If the supply pressure in hydrostatic drive is too low, the orange warning icon appears:  Please stop and call customer service!

If it is not possible to move the vehicle, then the cause for this is shown on the R-Touch:


	Please release parking brake.	
	Please release the brake pedal.	
	Compressed air brake reservoir pressure is too low!	
	Error of the drive pedal sensors!	Call customer service
	Release pressure parking brake too low!	
	Supply pressure in hydrostatic drive very low!	

## 6.9.1 Driving, "Rabbit" operating mode

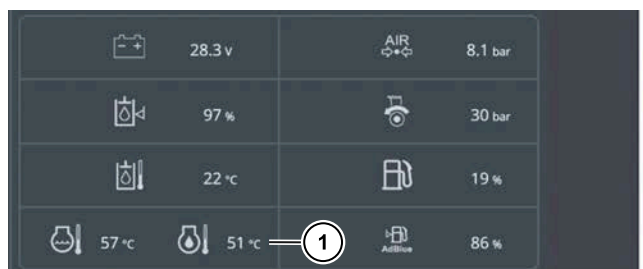
For driving on the road select either automotive driving or driving with manual speed adjustment (rotary wheel on the right joystick [See Page 172](#)).

### 6.9.1.1 Speed limiting - diesel engine too cold



At engine oil temperatur below 60 °C the constant throttle brake ([See Page 203](#)) cannot be activated and the driving speed is limited to approx. 20 km/h. Once the pre-set from the drive pedal driving speed exceeds 20 km/h, a note appears on the R-Touch .

The current engine oil temperature (1) below 60°C appears in the display field operating parameters. As soon as you achieve engine oil temperature of 60°C, you can drive (depending on variant) up to 40 km/h.



### 6.9.1.2 Selection of the driving direction (forward/backward) in operating mode "Rabbit"

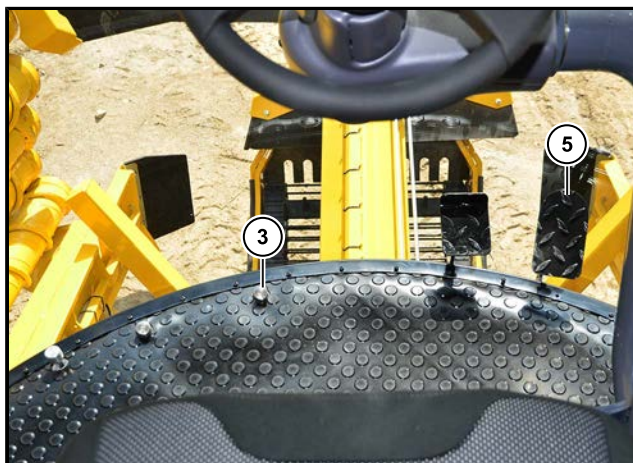
Foot switch driving direction (3):

NOT PRESSED

Driving direction "forwards"

PRESSED

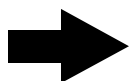
Driving direction "backwards"



(3) Foot switch driving direction

(5) Drive pedal

#### ADVICE



Only for "Rabbit II" operating mode: the driving pedal (5) must be released completely for switching to drive in the reverse direction. Wait until the machine comes to a complete standstill (0.0 km/h). Only then the foot switch "Driving direction" may be pushed and held in this position. Once the gas pedal is pushed, the machine drives backward.

In the "Rabbit I" operating mode the driving direction may be changed at low speed. When reversing, a warning signal always sounds to alert others that the vehicle drives backward. Simultaneously, both backup lamps are automatically switched on.

#### ATTENTION

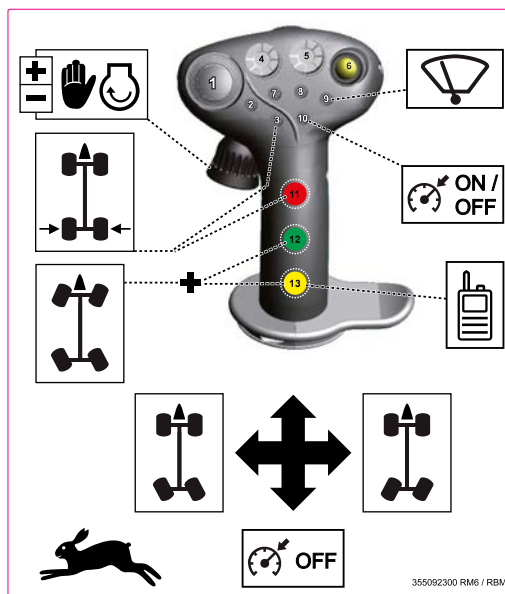


**Hazard of damage to the machine.**

When driving in reverse, always make sure that the counterweight is raised high enough that neither the counterweight nor the under-run protective device contact the ground/road surface. This danger exists when the terrain slopes steeply behind the machine.

### 6.9.1.3 Cruise control

In order to relieve the driver, the vehicle is equipped with a cruise control. Therefore, **only** in the operating mode "Rabbit II", the driving speed may be preselected either by pressing the gas pedal or by switching on cruise control.



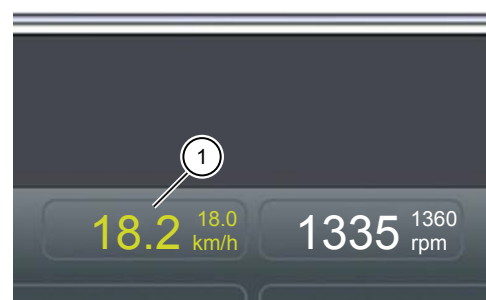
#### 6.9.1.3.1 Switching on cruise control

Cruise control may only be switched on if the following conditions are met:

- operating mode "Rabbit II" switched on (displayed on the R-Touch)
- left joystick console folded down,
- driving speed higher than 10 km/h.

This is how you switch on cruise control:

- Set the driving speed using the drive pedal.
- Press the key **(10)** on the right joystick. The driving speed indicator on the R-Touch **(1)** is green. Cruise control is switched on.



The cruise control assumes the speed set by the drive pedal at the moment the key (10) is pressed.

This speed is not necessarily the actual speed.

Example:

The currently driven speed is 11 km/h. The driver quickly presses the drive pedal to the end-stop. The drive pedal sets the machine to maximum speed. The machine begins to accelerate. In this moment, cruise control is switched on. Cruise control assumes the speed set by the drive pedal (= maximum speed). If you would like to increase the speed shortly during the drive, then you can override cruise control at any time by pressing on the drive pedal. If you drive faster than set by cruise control, then cruise control is switched on, but the effect of cruise control during driving can only be detected when you reduce pressure on the drive pedal. When you release the drive pedal, then the machine will continue to drive at the speed assumed by cruise control.

#### **6.9.1.3.2 Switching off cruise control**

Before switching off cruise control, you should always press down the drive pedal so far until you are assuming the speed driven by cruise control. Thus, you prevent sudden braking effect of the machine after switching off the cruise control.


To switch off the cruise control, pull briefly the right joystick fully back or press the key (10) on the right joystick. Further options for switching off cruise control are:

- Actuate the brake pedal
- Press the foot switch driving direction
- Press the emergency stop switch
- By engage the parking brake
- Lift the left joystick console

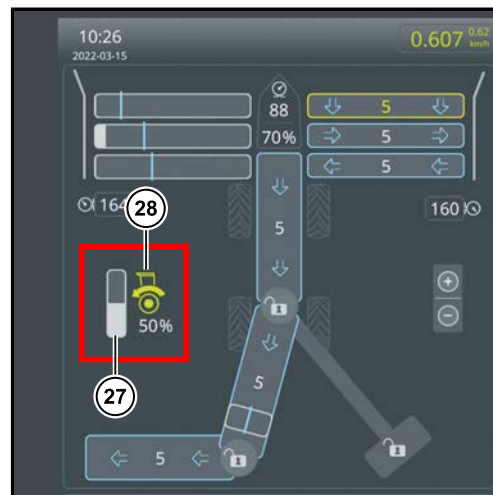


## 6.9.2 Driving, "Turtle" operating mode



In the "Turtle" operating mode, the traction drive is operated almost exclusively using the keys (2) and (3) and the rotary wheel (14) on the right joystick. If driving forward is activated using the key (2), then the terminal displays the icon . This key is used to switch on the traction drive forwards. Pressing this key again stops the traction drive. Switching off machine drive (yellow machine drive key (6)) also switches off the traction drive.

The driving speed (= feed speed) for loading operation can be controlled via the rotary wheel (14) on the right joystick.

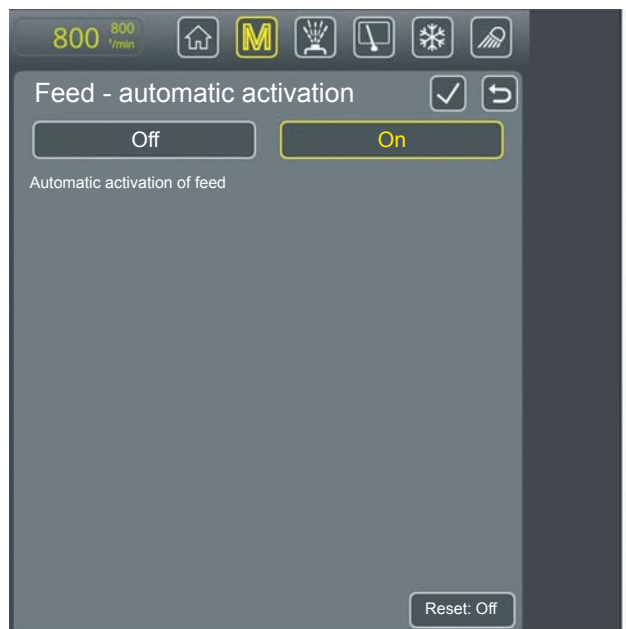


- (27) Set driving speed
- (28) Status of traction drive (only during loading)


The speed set may be overridden up to maximum speed using the driving pedal. This function enables quicker driving to the beet pile.

### 6.9.2.1 Automatic feed switch-on

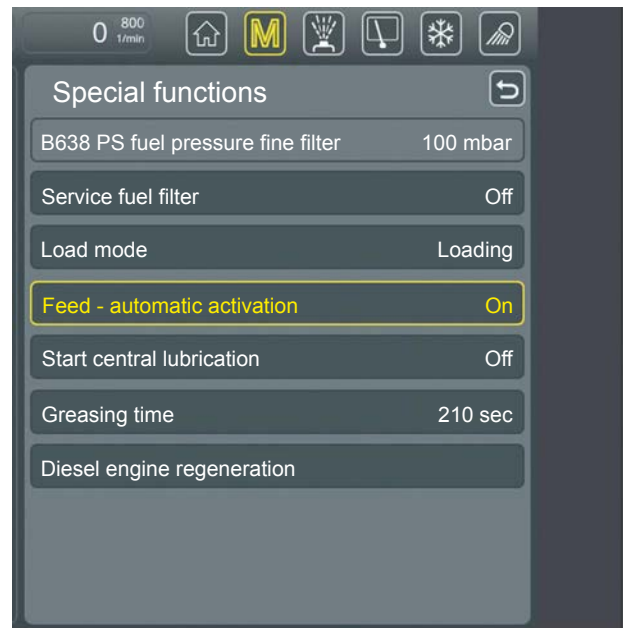
Each time the ignition is switched on and the operating mode is changed (Rabbit ↔ Turtle), the following window appears on the R-Touch after the machine drive is switched on (yellow button (6)):



Now select "On" to activate the automatic feed. Confirm the entry.


This confirmation activates the automatic function of the traction drive. Now press the key (2) to switch on the feed. After switching off the machine drive, the display field for traction drive status (28) flashes . This means that: after the next switch-on of the machine drive, forward driving motion starts automatically (as soon as the pickup rollers start to rotate). Pressing the key (2) is therefore no longer required. This function remains activated until the operating mode is switched again or until the ignition is switched off. For safety reasons, pressing the key (3) also switches off the automatic feed switch-on.

However, if you wish to reactivate the currently deactivated automatic feed switch-on, please open the "Special functions" menu and select the "Feed automatic activation" line.



### 6.9.2.2 Driving backward in the operating mode "Turtle"



If reverse driving is activated via the key (3), then the icon  appears on the terminal.

This key switches on the reverse drive direction of the traction drive for as long as the key (3) is pressed. If the machine is driving forward during loading, then you can stop this movement by pressing this key. When driving in reverse, the rotary wheel cannot be used to control the speed. The machine always drives backwards at the maximum possible speed.

In addition, the traction drive may be stopped as follows:

- By pressing the emergency stop switch
- By pressing the foot switch for driving direction
- By engage the parking brake

## 6.10 Road traffic

### 6.10.1 General

#### DANGER



The under-run protective device at the rear of the fuel tank must always be folded down to the lowest position when driving on public roads to protect other road users. Never hang up!

#### ATTENTION



The machine is NEITHER intended NOR designed to be used as a vehicle for continuous driving on the road at maximum speed. The manual transmission and the axles must cool down again after a maximum of 80 km (49 miles) of road travel at a time. To do this, park the machine for at least 1 hour. Non-observance of this warning may result in damage to the gearbox and axles.

The machine is regarded to be a self-propelled processing machine within the territory of the European Union. This type of vehicle is subject to very specific regulations and conditions which may differ between countries. Some differences are also possible within a country with regard to the specific requirements set by the responsible road traffic authority.

In any case, the operator must make sure that the machine is furnished with the regionally required equipment and protection aids, e.g. warning triangle, warning lights, etc. and that these devices are always kept in a functional condition.

#### ADVICE



ROPA expressly wants to point out that the driver and owner of the machine are always alone responsible for compliance with the respective regulations and conditions of the competent road traffic authorities.

**The following generally applies before driving on public roads in the territory of the Federal Republic of Germany:**

- The recleaner must be folded to transport position and then the truck conveyor must be laid down in transport position.
- The counterweight arm must be folded in to the central vehicle axis and locked.
- The counterweight must be folded down as far as it goes.
- The swivel arm must be locked.
- The driver's cabin must be lowered to the end-stop.
- The pickup must be raised as far as it goes.
- The fold plates must be swung down, the support feet must be raised as far as they go and both clearing shields must be swung in as far as they go.
- Both pickup side sections must be swung in completely.
- The pile pickup must be swung into central position, set to horizontal position and pulled in to the central mark.
- The residual beet pickup must be turned crosswise with respect to the driving direction.
- The oscillating axle support must be switched off.
- Switch to operating mode "Rabbit II".
- The driver's seat must be locked in driving direction.
- The wheels of the rear axle must be aligned in straight position.
- Rear axle steering must be locked (lock main steering switch).
- **All** working floodlights must be switched off.
- The auxiliary steps on the fuel tank must be swung up and locked.
- The operational and road safety of the vehicle, in particular those involving steering and lighting, must be checked and, if necessary, measures taken to reestablish this safety.
- The additional axles must be lowered in order to drive on public roads and paths. Always ensure that nobody stays in the area of the additional axles BEFORE lowering the additional axles!

**Further requirements for operating the machine:**

Regardless of the time of day, the yellow rotating beacons must be switched on when driving on public roads and streets.

Before driving on public roads and paths, the machine must be cleaned to the extent that:

- the gross weight is not exceeded;
- all warning signs are visible;
- all direction indicators and lighting fixtures are clean and functional.

As a self-propelled working machine with the highest driving speed of max. 40 km/h, 32 km/h, 30 km/h or 25 km/h, this machine is a subject to registration and license plate duty. Furthermore, the vehicle must be insured against damage from vehicle owners' liability according to the locally applicable regulations.

The following conditions must always be fulfilled:

- A guide giving the directions required for safe driving of the vehicle to the driver must always be used, if otherwise safe driving of the vehicle (for instance at intersections and road junctions, when backing up, or in case of unfavourable weather conditions) cannot be ensured.
- Rear wheel steering may only be switched on for a short time for passing narrow turns at low vehicle speed.
- Only experienced and reliable persons who are familiar with the area may be employed as drivers and accompanying personnel (instructors).
- The vehicle may only be driven on public roads and paths by operator, who have the valid mandatory driver's license. Besides the valid driver's licence, the driver also has to carry originals of the general type approval of the machine and the existing and valid exceptional permit.


- Safety vests, first aid kit and warning triangle have to be carried with at hand.
- No people may ride on the platform in front of the driver's cabin.
- The vehicle owner or his representative shall instruct each driver in detail about his/her special obligation to drive the vehicle in a safe manner before the start of each working period. The instructions given must be acknowledged by the drivers with their signature. The vehicle owner must keep these acknowledgements for at least one year. You will find a form for this instruction in Chapter 9 ([See Page 532](#)). ROPA recommends copying this form before completing it.
- As already mentioned, the regionally competent road traffic authorities may establish additional conditions or conditions different from listed above. It is the sole responsibility of the vehicle owner and the driver to gain knowledge of these regulations and to comply with them.
- If parts or functions of the vehicle whose condition or sequence has been prescribed are subsequently modified, then the "General type approval" lapses and a new "General type approval" must be applied for in accordance with the respective country-specific administrative procedure.

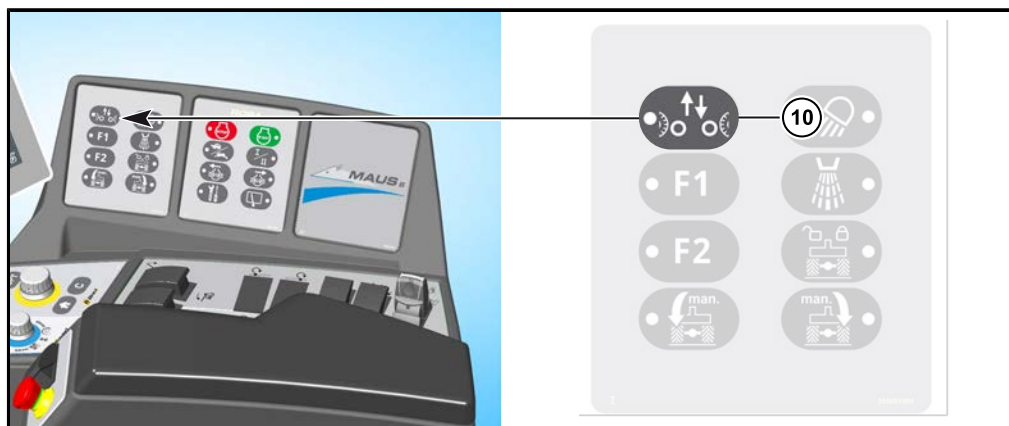
## 6.10.2 Additional axles





The additional axles must be activated when driving on the road. The highest speed can be reached only when the additional axles are activated.



The additional axles are activated with the key (10) on keypad I. The LED lights up when the additional axles are lowered. The symbol  appears on the R-Touch main terminal.



The axles may not be used for driving off roads, and therefore must be lifted up for driving off roads. If you switch from operating mode "Rabbit" to operating mode "Turtle" while the additional axles are lowered, the R-Touch displays the following warning icon . The additional axles can be raised by pressing the key (10). The LED goes out once the additional axles are raised. The symbol  appears on the R-Touch main terminal.





## 6.11 Braking system

The braking system of the machine is a pneumatically actuated dry drum brake. For safety reasons, the braking system consists of two independent brake circuits:

- The operating brake activated by the brake pedal on the driver's cabin floor.
- The parking brake, which is activated by the toggle switch.

The parking brake only holds the front axle. The operating brake on the rear axle is pneumatically controlled but hydraulically actuated.

### DANGER




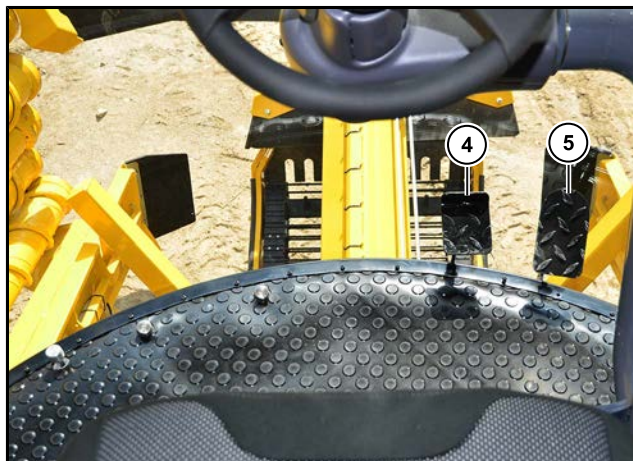
#### Hazard to life in case of faulty brakes.

- Before each drive, check functioning of the brakes!
- The braking systems must regularly be thoroughly checked!
- Setting and repair work on the brakes may only be performed by trained specialist personnel.

### 6.11.1 Operating brake



The operating brake is activated by the left pedal on the driver's cabin floor. It only operates if there is sufficient pressure in the pneumatic system. If the operating brake is not sufficiently functional (e.g. too low reservoir pressure), then the following warning icon is displayed on the R-Touch .



- (4) Brake pedal
- (5) Drive pedal

### DANGER



**When a warning icon is displayed on the R-Touch pointing at problems with the braking system, then there is the severest hazard to life for the driver and bystanders as well as other road users.**

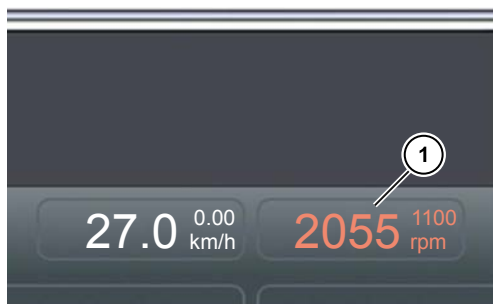
- Operation of the machine must then be immediately terminated.
- The machine must be parked in such a manner that nobody is endangered or damaged.
- Additionally, the machine must be secured against rolling using wheel chocks and by engaging the parking brake.
- It may only be moved again, after the cause for the brake fault has been repaired by specialist personnel and the machine has been released for operation by corresponding specialist personnel.

## 6.11.2

### Engine brake

The diesel engine is fitted with a wear-free constant throttle brake. This engine brake can develop high braking force in connection with the hydrostatic traction drive without any interference of the mechanical brake. This brake is activated automatically when releasing the drive pedal and it increases the braking effect of the hydrostatic drive. The operating brake is required only in exceptional cases.


The engine rotation speed indicator on the R-Touch (1) is red. The engine brake is active.



### 6.11.3 Parking brake




The parking brake is operated via the toggle switch (32) in the console ([See Page 91](#)). The parking brake affects front wheels. Even when the ignition is switched off and the pneumatic system is pressureless, the parking brake is automatically engaged and active. For safety reasons, the parking brake can only be released when sufficient pressure is present in the pneumatic system.

When the parking brake is engaged, the icon  appears on the R-Touch.

As long as the parking brake is engaged, pressure on the drive pedal is without effect. In an emergency, the spring-loaded actuator of the brakes may be manually mechanically released. For instructions see Chapter 8 "Malfunction and Remedies". ([See Page 494](#))



If the parking brake is not released sufficiently (e.g. too low release pressure), then the following warning icon is displayed on the R-Touch .

### 6.11.4 Automatic parking brake (only in the operating mode "Rabbit")



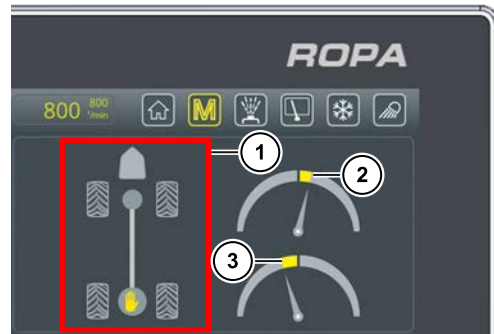
When the machine has been at a standstill for several seconds (drive pedal released), the parking brake is engaged automatically. If the automatic parking brake is active, the following symbol appears on the R-Touch main terminal:

 = Automatic parking brake active.

For safety reasons, it prevents the machine from rolling away unintentionally on inclined terrain. When the drive pedal is pressed again, the automatic parking brake is released.

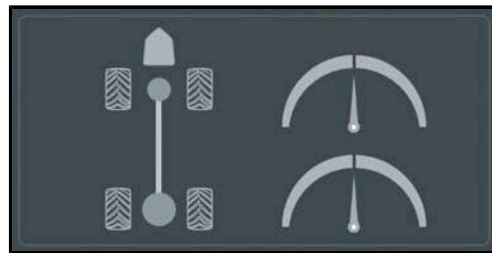
## 6.12 Steering

Display field: Steering



- (1) Display of active steering mode (in this case: manual rear axle steering)
- (2) Position display for front axle steering
- (3) Position indication rear axle steering

Overview of steering modes in "Rabbit" operating mode



Rear axle in straight position



All-wheel steering

### ADVICE



In the "Rabbit" operating mode the steering field display is automatically shown in the top display area.

### 6.12.1 Steering in the operating mode "Rabbit"

In the operating mode "Rabbit", the rear wheels may be steered by moving the joystick back and forth, if the main steering switch (44) is unlocked. When driving on public roads and paths, the main steering switch must generally be locked. It may ONLY be unlocked for driving through narrow curves and at low speed (below 12 km/h). When the main steering switch is unlocked the driving speed of the machine is limited.

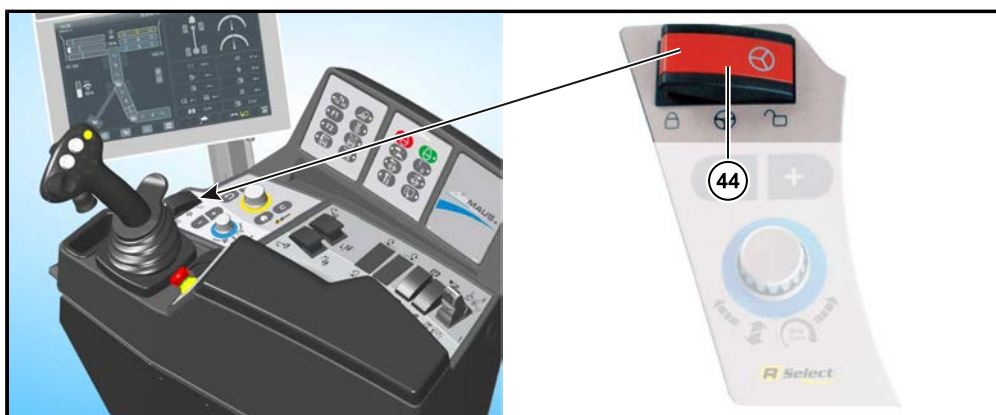
#### **DANGER**



#### **Hazard of deadly injuries when driving with unlocked main steering switch.**


In case of some technical faults, uncontrolled swinging movements of the vehicle at higher speeds may occur. This might seriously endanger or cause deadly injuries to other participants in traffic.

- Therefore, the main steering switch may be unlocked on public roads and paths only under the conditions stated above and only for as long as indispensably required.



### 6.12.1.1 Manual rear axle steering



In the operating mode „Rabbit“, the rear axle may be steered independently from the front axle by moving the right joystick left/right. Additionally, the main steering switch unlocked. The symbol  appears on the R-Touch main terminal.

When driving in the operating mode "Rabbit" at a speed of more than 12 km/h, the main steering switch must generally be locked.



### 6.12.1.2 All-wheel steering

All-wheel steering can be used to steer both front and rear axles simultaneously with the steering wheel with no further driver input. The rear axle steers in the opposite direction to the front axle. This steering mode simplifies manoeuvring for less skilled drivers.

The following prerequisites must be met before actuating all-wheel steering:

- "Rabbit" operating mode active
- Reduce speed
- Main steering switch (44) unlocked (permitted maximum speed 12 km/h)
- Drive at least 0.5 km/h
- Press simultaneously on the right joystick the keys (12) and (13).



Steering indicator appears on the R-Touch:





If the all-wheel steer was not activated, then the cause of it is shown on the R-Touch:



- Unlock main steering switch (44)

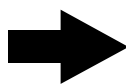


- Drive faster, the minimum speed (0.5 km/h) shouldn't be reached.



- Driving speed too high. Please continue reducing the speed.

#### ADVICE



Once the main steering switch is opened in the operating mode "Rabbit", the speed is reduced automatically for the safety reasons. If the keys (12) and (13) on the joystick are pressed and held in such a way at too high speed and with opened main steering switch, at first the speed is reduced automatically to the maximum activation speed, then the function "All-wheel steer" becomes active. The keys can be released again.

In case you need to continue driving at a higher or maximum speed, please proceed as follows:

- Set rear axle to central position (see following section)
- Lock the main steering switch

#### 6.12.1.3

#### Put rear axle in central position




- Select operating mode "Rabbit"
- Drive slowly (below 12 km/h).
- Unlock main steering switch (44)
- Drive at least 0.5 km/h and press briefly the multi-key (11) on the joystick. Don't hold it.

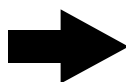
It sets the rear wheels straight.

Then, the main steering switch must IMMEDIATELY be locked again.



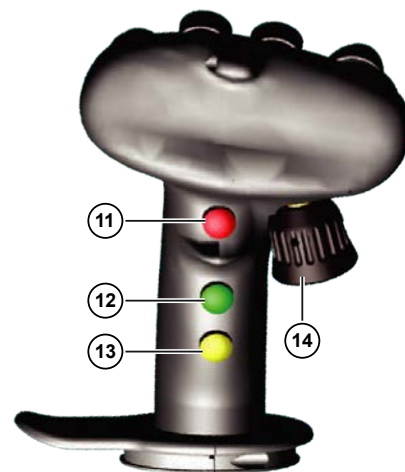
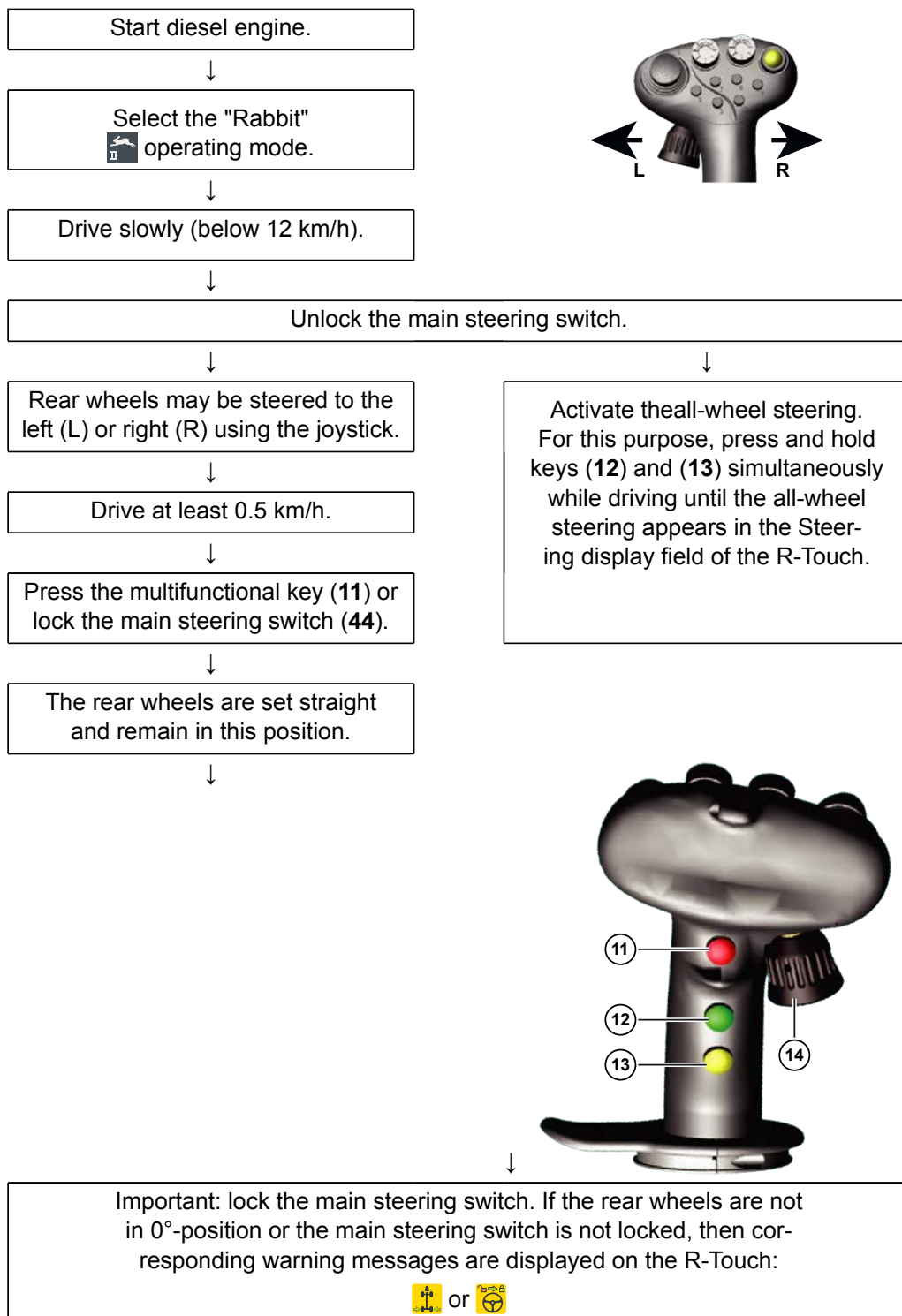
If the rear axle is not locked in central position, then during driving in the operating mode "Rabbit II", the following warning icon  is displayed on the R-Touch.

#### ADVICE



Once the main steering switch is locked, the rear wheels are immediately and automatically straightened.

#### 6.12.1.4 Quick description: steering in the "Rabbit" operating mode



### 6.12.2 Steering in the operating mode "Turtle"

During loading operation, the rear axle is steered using the toggle switch (26) on the operating console. Precondition: The main steering switch (44) is unlocked. There are the following limitations for this type of steering:

- The steering angle is very limited when the differential lock is activated.
- Both axes should be steered as little as possible to avoid excess wear of the car-dan joints.

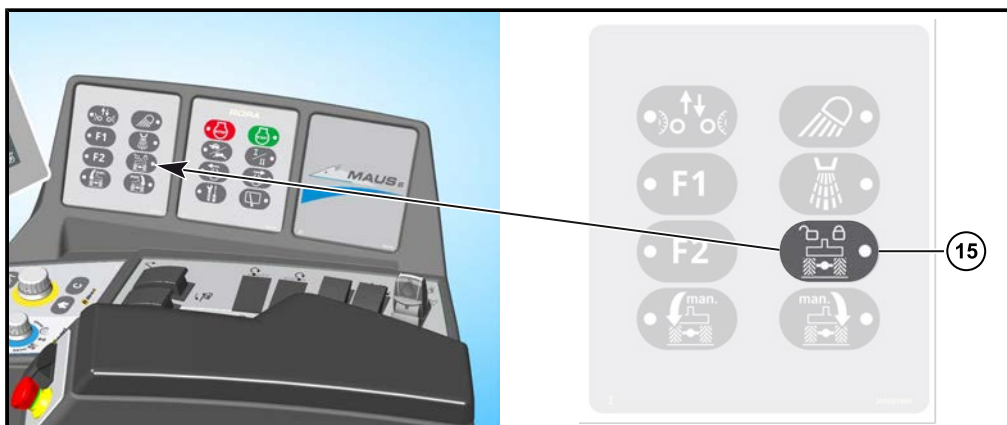


## 6.13 Folding the machine out/in

With the help of automatic folding the machine can be set into loading or transport position.



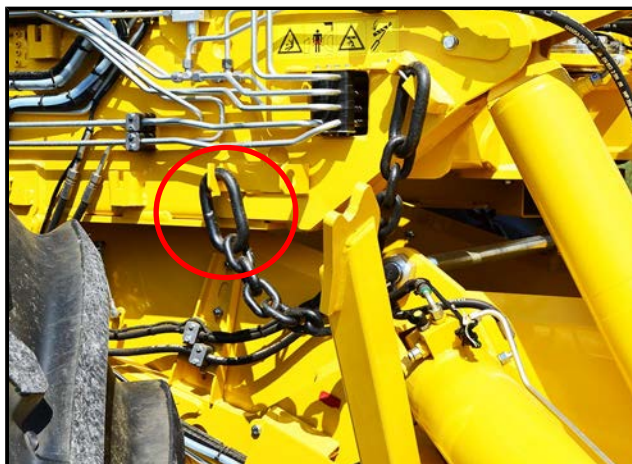
- Switch on the oscillating axle support for the rear axle before folding out the machine. Press the key (15) on the keypad I. LED lights.



### 6.13.1 Folding out machine with the help of automatic folding in front



- Switch to the "Turtle I" operating mode. ([See Page 186](#))
- Before folding out, remove securing chains for the pickup and insert them into the hooks on the vehicle frame provided for this purpose.



#### ATTENTION



#### Risk of machine damage.

Do not intentionally lower the pickup into the securing chains.



- Switch on the oscillating axle support for the rear axle before folding out the machine. ([See Page 212](#) [See Page 248](#))

## WARNING



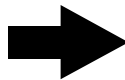
### Hazard of extremely severe injuries.

- Make sure, that nobody stands in the hazard zones when the machine is started.
- Make sure that there are no persons on the boarding platform.
- The driver is responsible for ensuring that there is nobody in the area between the safety rail at the boarding steps and the cabin door when lifting or lowering the cabin.

### The following processes are executed automatically. During these processes, several movements are performed simultaneously:

- 1 The speed of the diesel engine increases.
- 2 The telescoping part of the pile pickup extends outward.
- 3 The pile pickup is raised.
- 4 Both pickup side sections fold out.
- 5 The cabin is raised up to the end-stop.
- 6 Both fold plates are swung up.
- 7 The clearing shields fold out.
- 8 The support feet are extended completely.
- 9 The pickup side section lowers until it is just above ground level.
- 10 As soon as these processes are completed, the diesel engine switches to idling speed.

## ADVICE

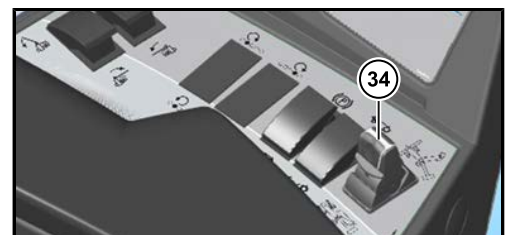
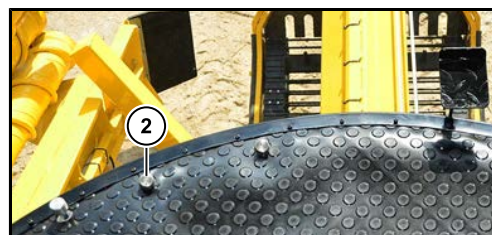



The fold plates and clearing shields are folded out using a timer. If the oil is very cold, the automatic folding system might not be able to move the fold plates and clearing shields all the way to the end-stop. In this case, please select with the R-Select the function "Fold plates" and perform the final part manually.



### To start the automatic folding:

- Move the rotating seat forward to the central position until the rotating seat status indicator on the R-Touch becomes green.
- Then press and hold the "Look forward" foot-switch (2).



- Press the analogue rocker switch (34) to the right and let it latch into position. Keep pressing the foot-switch (2). If the foot-switch (2) is released, then, for safety reasons, all movements are stopped.
- Now, please put the analogue rocker switch (34) in the central position again. If you have forgotten this, the following is displayed on the R-Touch: 

### 6.13.2 Folding out machine with the help of automatic folding at rear



Condition for this is that the machine front is already folded out and the driver's cabin is raised to the end-stop ([See Page 212](#)).

.Pre-select the loading direction using the X-Y key (16). The selected loading direction determines the destination of the truck conveyor. To do so, press the X-Y key (16) to the left or to the right and hold it for approx. two seconds in this position. The selected loading direction (2) is displayed on the R-Touch.



#### For loading direction to the right:

Turn the rotating seat until it almost reaches the end-stop and the rotating seat status indicator on the R-Touch (1) becomes green.



#### In the case of loading direction to the left:

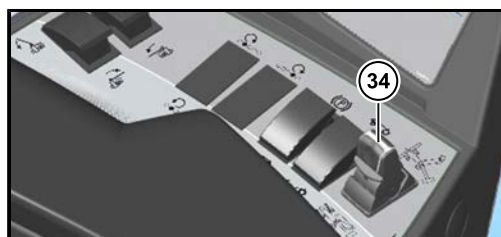
Choose the line of sight direction that is most favourable for you. Make sure that you always turn the rotating seat until it almost reaches the end-stop.



- Switch on the oscillating axle support for the rear axle before folding out the machine. ([See Page 212](#))

#### To start the automatic folding:

- Move analogue rocker switch (34) to the right (do not click into position because, for safety reasons, latching-in stops all movements) and, shortly before latching-in, hold the switch in that position until all the processes are finished.



### WARNING



#### **Hazard of extremely severe injuries.**

- Make sure, that nobody stands in the hazard zones when the machine is started.

**The following processes are executed automatically. During these processes, several movements are performed simultaneously:**

- 1 The speed of the diesel engine increases.
- 2 The counterweight is raised up to the end-stop.
- 3 The lock of the counterweight arm opens up to the end-stop.
- 4 The counterweight arm swivels a little to the left thereby enabling complete opening of the lock.
- 5 The truck conveyor is raised only slightly above the lateral transport support.
- 6 The truck conveyor turns to the right and out of the machine perimeter.
- 7 The recleaner swivels into working position.
- 8 The swivel arm is unlocked.
- 9 The truck conveyor is raised, simultaneously the truck conveyor articulation is swung up.
- 10 With the pre-selected "Loading direction left", the completely lowered truck conveyor crosses over with the counterweight (lift up to the end-stop) at the rear of the machine.
- 11 As soon as these processes are completed, the diesel engine switches to idling speed.

If automatic folding is not entirely completed, you can intervene at any time and complete the folding process manually. ([See Page 225](#))

### ATTENTION



Always pay attention that there is sufficient free space behind the machine allowing implementation of this movements. In addition, there must be sufficient ground clearance.



### 6.13.3 Folding in machine automatically in front

The condition is that the machine rear is completely folded in and the truck conveyor rests on the transport support.

#### WARNING



#### Hazard of extremely severe injuries.

- Make sure, that nobody stands in the hazard zones when the machine is started.
- Make sure that there are no persons on the boarding platform.
- The driver is responsible for ensuring that there is nobody in the area between the safety rail at the boarding steps and the cabin door when lifting or lowering the cabin.

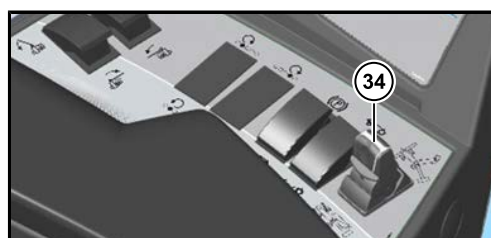
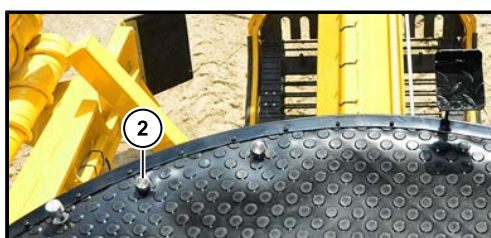
**The following processes are executed automatically. During these processes, several movements are performed simultaneously:**


- 1 The speed of the diesel engine increases.
- 2 The pile pickup raises and rotates to the central position.
- 3 The residual beet pickup rotates to the central position. The telescoping mechanism retracts about half-way.
- 4 The pickup is raised up to the end-stop.
- 5 The cabin lowers down completely to the end-stop.
- 6 The fold plates are swung down to the end-stop; simultaneously the clearing shields and support feet move into the transport position.
- 7 The pickup side sections fold in completely to the end-stop.
- 8 The telescoping part of the pile pickup retracts completely and the pile pickup lowers to the central mark hatch.
- 9 As soon as these processes are completed, the diesel engine switches to idling speed.



#### To start the automatic folding:

- Move the rotating seat forward to the central position until the rotating seat status indicator on the R-Touch becomes green.
- Then press and hold the "Look forward" foot-switch (2).

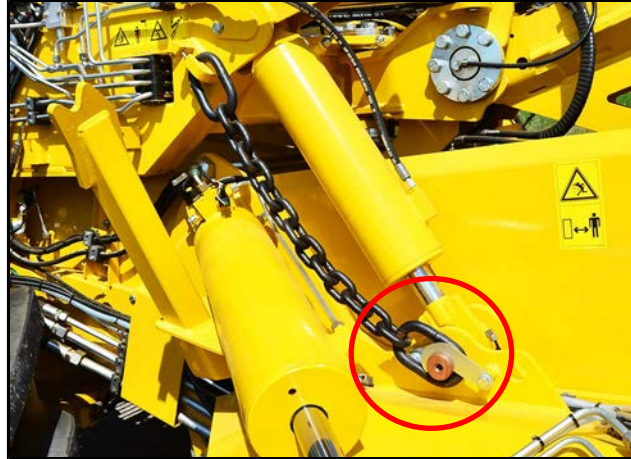


- Press the analogue rocker switch (34) to the left and let it latch into position. Keep pressing the foot-switch (2). If the foot-switch (2) is released, then, for safety reasons, all movements are stopped.
- Now, please put the analogue rocker switch (34) in the central position again. If you have forgotten this, the following is displayed on the R-Touch: 



- Switch off oscillating axle support.
- Check visually if the machine is really in the transport position. If not, put the machine into the transport position manually.
- Clean the machine so, that all lighting and warning devices are visible, the allowed total weight is not exceeded and pollution of public roads is avoided.

- **Insert the safety chains and secure the pickup.** There is one safety chain for the right side and one safety chain for the left side of the front chassis. When driving on public roads, these chains must be fastened to the pickup central part. Fasten the chains on the central part of the pickup, when you have swung in the pickup and are leaving the machine. In case of a malfunction of the hydraulic system, the pickup cannot drop unexpectedly. Otherwise, this could result in serious damage to the driver's cabin! Such damage is excluded from any guarantee, warranty or accommodation.

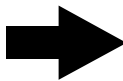


Switch into the operating mode "Rabbit". The warning signs are automatically swung down and the ladder is swung into the vehicle contour.



The additional axles are to be activated as soon as the vehicle is located on a paved road.

#### ADVICE



Such processes as lifting of the support feet and folding of the clearing shield are time-controlled. If the hydraulic oil is very cold, the automatic folding system might not be able to move the support foot or clearing shield as far as it can go. In this case, please move it manually. Otherwise, the external width or the overall height could be exceeded.

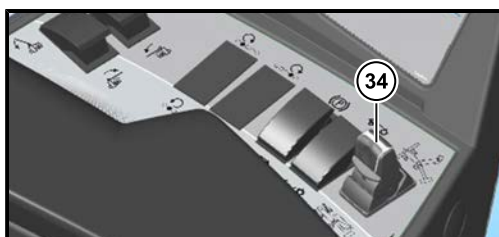
#### 6.13.4 Folding in machine automatically at rear



- Remove large accumulations of soiling and deposits of earth. Pay particular attention that the area around the lower pivot point of the roller recleaner is free of earth deposits.
- If at all possible, use automatic fold-in (saves time).
- Check whether the folding/swivelling area of the truck conveyor and counterweight arm are free of obstacles, transport vehicles or people.
- Turn the rotating seat to the right or left just before the stop until the rotating seat indicator on the R-Touch turns green.

##### To start the automatic folding:

- Press the analogue rocker switch (34) to the left (do not click into position because, for safety reasons, latching-in stops all movements) and, shortly before latching-in, hold the switch in that position until all the processes are finished.



#### WARNING



##### Hazard of extremely severe injuries.

- Make sure, that nobody stands in the hazard zones when the machine is started.

##### The following processes are executed automatically. During these processes, several movements are performed simultaneously:

- 1 The speed of the diesel engine increases.
- 2 If loading in the left direction, then the truck conveyor and counterweight arm must first cross over each other.
- 3 Counterweight arm is positioned somewhat left of the centre.
- 4 Swivel arm is turned into the transport position (swivel arm position indicator in 0-range) and locked.
- 5 Recleaner swivels up to the end-stop in the transport position.
- 6 The truck conveyor articulation lowers down to the end-stop.
- 7 Counterweight arm lock moves to the end-stop.
- 8 Counterweight arm swivels to the centre up to the end-stop roller on the swivel arm.
- 9 Counterweight arm is completely locked (clamped on the swivel arm).
- 10 The truck conveyor turns and lowers until it rests on the transport support.
- 11 The counterweight lowers down completely to the end-stop.
- 12 As soon as these processes are completed, the diesel engine switches to idling speed.

#### ATTENTION



Always make sure that there is enough free space to perform such movements behind and around the machine. In addition, there must be sufficient ground clearance.

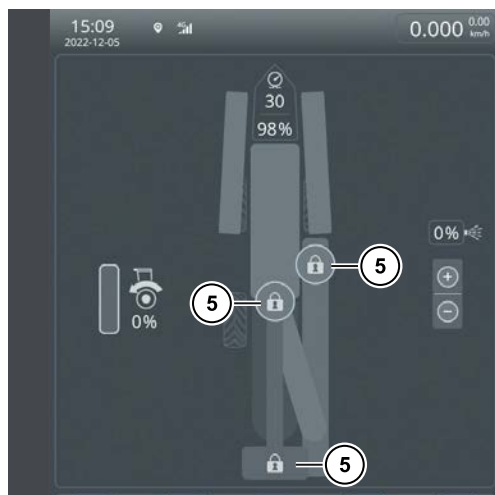
**WARNING**



**Hazard of unwanted swivelling movements!**

The machine may not be moved on roads or moved to another place if the counterweight and swivel arm are not locked.

- The counterweight and swivel arms must always be locked when driving on public roads.
- The truck conveyor must be positioned on the transport support (see display **(5)** on the R-Touch)!

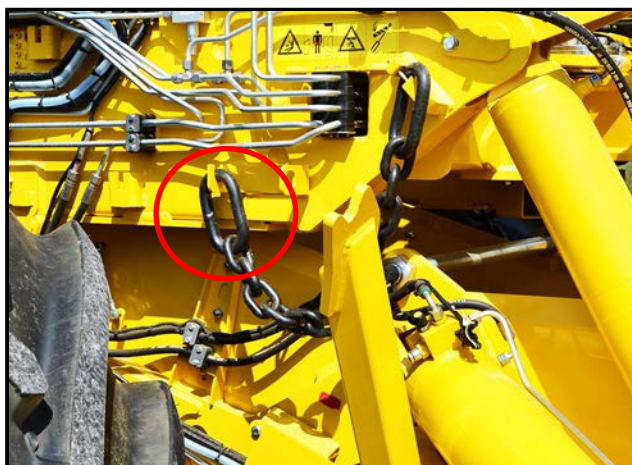


### 6.13.5 Folding out machine manually in front

If the automatic folding does not operate, the machine can be "manually" folded step by step to loading or transport position.



- Switch to the "Turtle I" operating mode. ([See Page 186](#))
- Before folding out, remove securing chains for the pickup and insert them into the hooks on the vehicle frame provided for this purpose.



#### **ATTENTION**



**Risk of machine damage.**

Do not intentionally lower the pickup into the securing chains.



- Switch on the oscillating axle support for the rear axle before folding out the machine. ([See Page 212](#))

**WARNING**



**Hazard of extremely severe injuries.**

- Make sure, that nobody stands in the hazard zones when the machine is started.

**For folding out perform the following actions consecutively:**

- Extend the telescopic mechanism of the pile pickup slightly and raise the pile pickup as high as possible. (*See Page 281*)



- Fold the both pickup side sections out.

To do it, push the X-Y key (5)

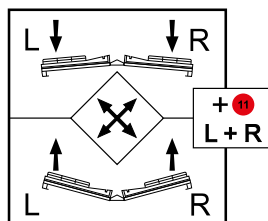
**FORWARD LEFT**

Fold out pickup side section left

**FORWARD RIGHT**

Fold out pickup side section right

To fold it out faster, press the multi-key (11) and keep it pressed. If you then slide the X-Y key (5) forward left or forward right, then both pickup side sections are simultaneously folded out.



**WARNING**

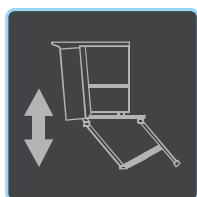


**Hazard of extremely severe injuries.**

- Make sure that there are no persons on the boarding platform.
- The driver is responsible for ensuring that there is nobody in the area between the safety rail at the boarding steps and the cabin door when lifting or lowering the cabin.



- Raise driver's cabin up to the end-stop.



Raise/lower driver's cabin

Choose this function with R-Select.

+ key = raise driver's cabin

- key = lower driver's cabin



The driver's cabin may only be lowered or raised when the pickup side sections are folded out.

- Swing the folding plates out.



Fold plates in/out

Choose this function with R-Select.

+ key = swing the folding plates out (fold up)

- key = swing the folding plates in (fold down)

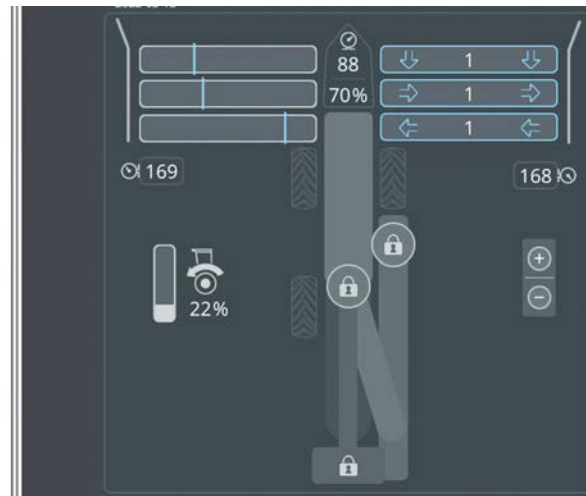


When swinging up the fold plates, the support feet are simultaneously extended all the way and both clearing shields are folded out.



Swinging up the fold plates is only possible when the R-Touch displays that both pickup side sections are folded out.

It is displayed on the R-Touch as follows:



– Move pickup to operating depth

To do it, push the X-Y key (4)

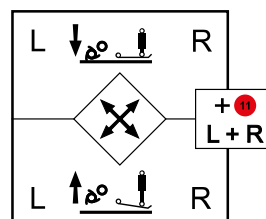
#### **FORWARD LEFT**

Retract the left support foot to the estimated operating height of the pickup

#### **FORWARD RIGHT**

Retract the right support foot to the estimated operating height of the pickup

To retract it faster, press the multi-key (11) and keep it pressed. If you now slide the X-Y key (4) forward left or right, then both support feet are retracted simultaneously.



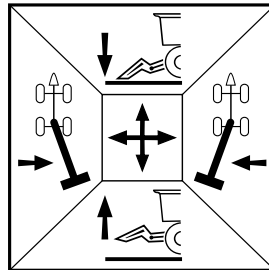
**ATTENTION**



**Danger of damage to the pickup.**

In any case, avoid pressing the pickup to the ground when lowering it so much that the front axle becomes unloaded. This may damage the pickup.

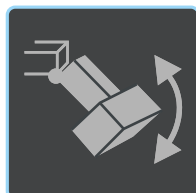
Push the mini joystick (1) forward and lower the complete pickup to the ground. This makes it almost impossible to tip the machine over during fold-out of the truck conveyor.



### 6.13.6 Folding out machine manually at rear

Condition for this is that the machine front is already folded out and the driver's cabin is raised to the end-stop. ([See Page 212](#))

- Raise counterweight (fuel tank).



Raise/lower counterweight

Choose this function with R-Select.

+ key = raise counterweight

- key = lower counterweight

In general, always first raise the counterweight to the end-stop. You thereby minimize the risks of collision between the truck conveyor and the counterweight arm if the monitoring sensors malfunction.



- Unlock counterweight arm.



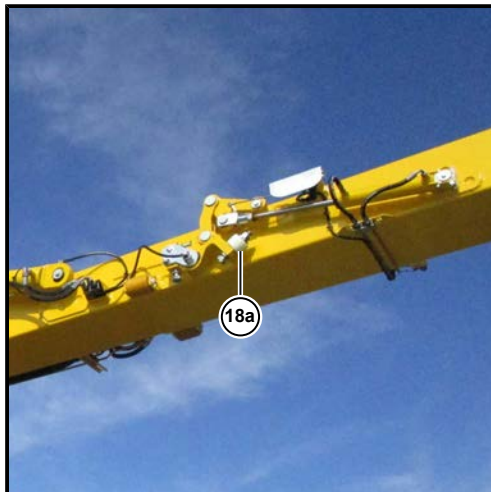
Counterweight arm lock

Choose this function with R-Select.

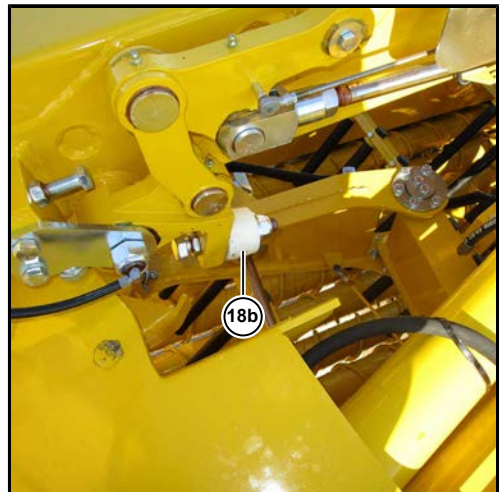
+ key = unlock counterweight arm

- key = lock counterweight arm





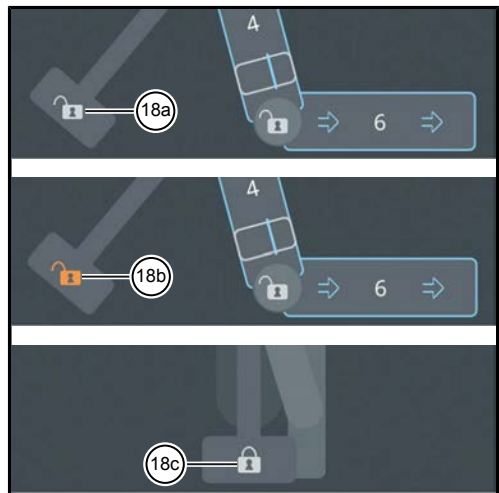
**(18a)** Counterweight arm lock opened



**(18b)** Counterweight arm lock at the end-stop



**(18c)** Counterweight arm lock closed

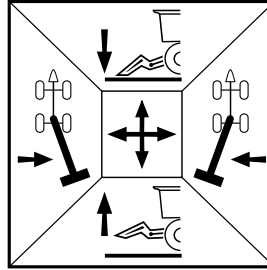


**ATTENTION**



When the swivel arm is swung under the counterweight arm, the lock **(18a)** of the counterweight arm must be fully open, otherwise the machine might be damaged.

- Use the mini joystick (1) to swivel the counterweight arm somewhat out of the central position.



### **DANGER**



A person, swept into the machinery during swivelling of the counterweight arm and trapped there, might sustain fatal injuries!

- Staying under the counterweight arm when it is swung out is strictly prohibited.
- The machine operator must make sure that no people are located within the swivelling range of the counterweight arm.

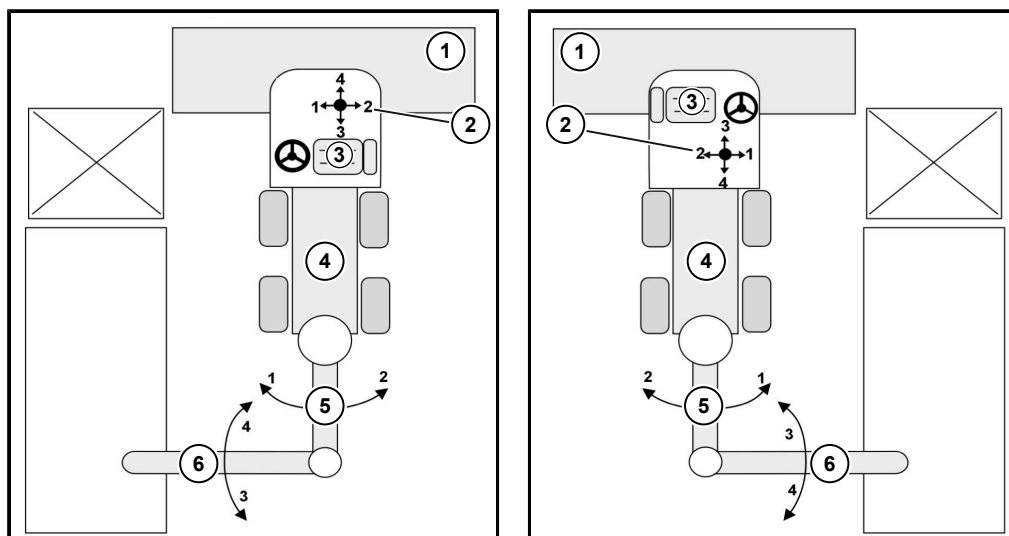
Danger of fatal injuries if the machine tips over.

- NEVER swivel the counterweight arm to the same side on which the truck conveyor is located.

- Specify loading direction.

Use the X-Y key (16) to select the loading direction. ([See Page 164](#))





loading direction left



loading direction right

- (1) Pickup
- (2) Joystick
- (3) Driver's seat
- (4) Infeed conveyor
- (5) Swivel arm
- (6) Truck conveyor

### **DANGER**



A person, swept into the machinery during swivelling of the truck conveyor and trapped there, might sustain fatal injuries!

- Staying under the truck conveyor when it is swung out is strictly prohibited.
- The machine operator must make sure that no people are located within the swivelling range of the truck conveyor.

Hazard due to electrical current.

- In any case, pay attention to power lines located within the swivelling range of the truck conveyor. Always keep a sufficient safety distance to these lines. This distance is always determined by the type of power line and this information must be acquired from the competent power company.

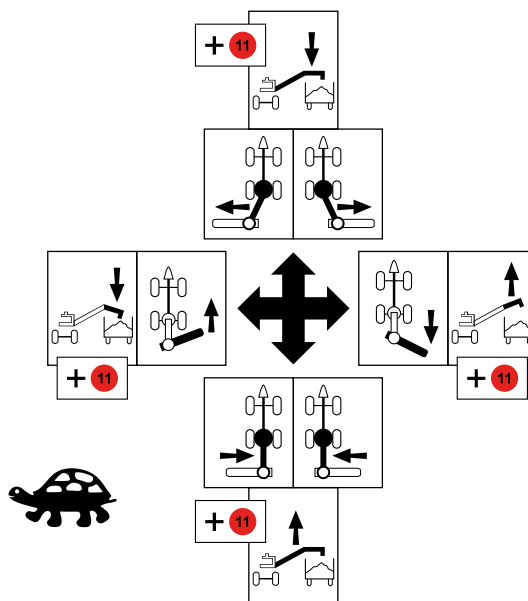




- Fold out truck conveyor.

For this purpose:

- Press and hold the multi-key (11) on the right joystick, simultaneously, lightly pull backward the right joystick to slightly (about 5cm) lift the truck conveyor above the transport support.
- Release the multi-key (11). Then, carefully push the right joystick a little to the right, and by this, rotate the truck conveyor out of the vehicle perimeter.
- Press and hold the multi-key (11) on the right joystick, simultaneously, press the right joystick to the right and thereby swing up the truck conveyor articulation so far, until sufficient distance to the ground is reached.





- Swivel the recleaner into operating position.



Swivel recleaning

Choose this function with R-Select.

+ key = swivel recleaner into operating position

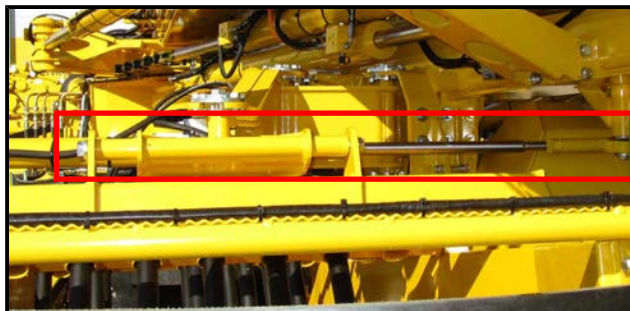
- key = swivel recleaner into transport position



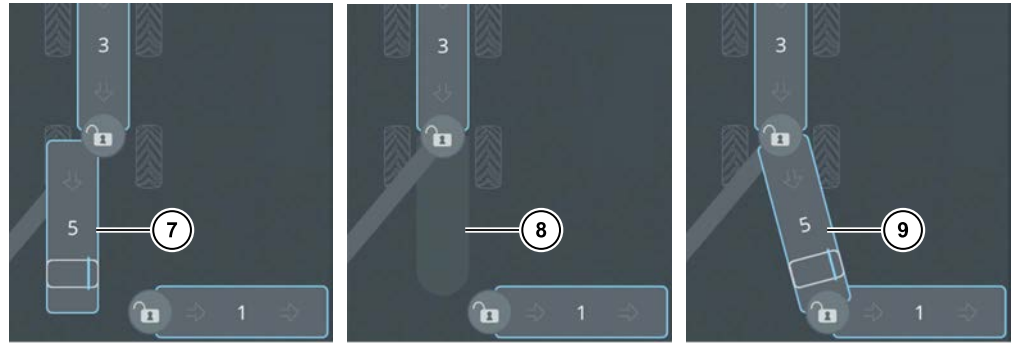
*Recleaner in transport position*



*Recleaner in working position*



*Cylinder swivel recleaner into transport position*



- (7) Recleaner in transport position
- (8) Recleaner neither in transport nor in working position
- (9) Recleaner in working position



The truck conveyor must be rotated out far enough from the machine contour. Imminent collisions (10) are displayed on the R-Touch.



- Unlock the swivel arm lock.

For this purpose:

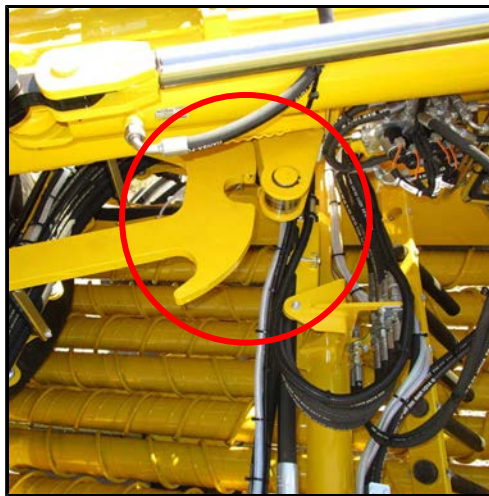


Swivel arm lock

Choose this function with R-Select.

+ key = unlock swivel arm

- key = lock swivel arm



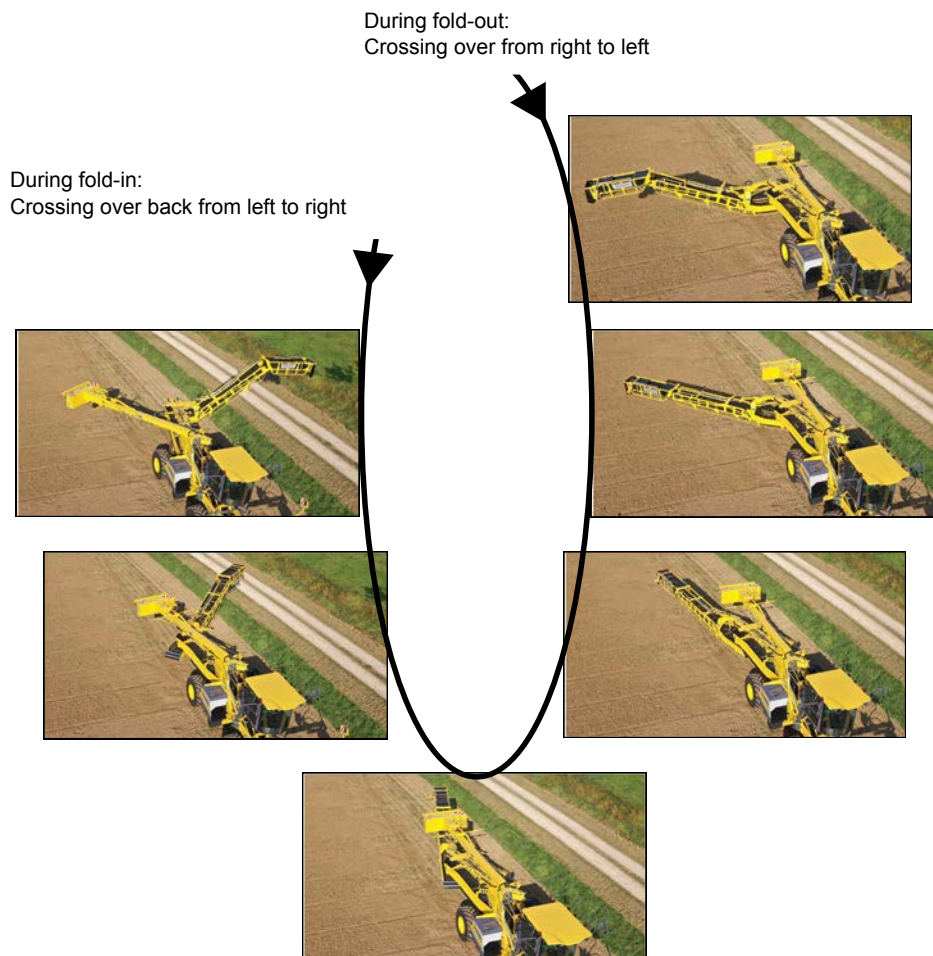
*Swivel arm unlocked*

- If the transport vehicle is located to the right of the machine, then swivel the truck conveyor over the vehicle and begin loading.

- Position the truck conveyor into the "left loading" direction.

When moving into this loading direction, the truck conveyor crosses over with the counterweight arm.

- To do so, generally lift the counterweight all the way.
- Raise the truck conveyor articulation up to the end-stop.
- Lower the truck conveyor down to the end-stop.
- Rotate the swivel arm straight back.
- Rotate the counterweight arm straight back.
- Rotate the truck conveyor under the completely raised counterweight to the left side of the machine.



### 6.13.7 Folding in the machine manually at rear

For reasons of stability when changing from working position to transporting position, do not forget to first swing in the truck conveyor and only then swing in the pickup. When swinging in the truck conveyor, work very diligently and concentrated, since otherwise, you could severely damage the machine. ROPA therefore urgently recommends that a second, reliable person be called in as flagman during the first experimental attempts.

This person may in no case be standing in the rotating and swivelling range of the truck conveyor or the counterweight.

#### **DANGER**



A person, swept into the machinery during swivelling of the truck conveyor and trapped there, might sustain fatal injuries!

- Staying under the truck conveyor when it is swung out is strictly prohibited.
- The machine operator must make sure that no people are located within the swivelling range of the truck conveyor.

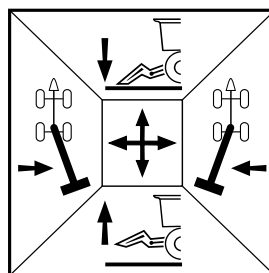
Hazard due to electrical current.

- In any case, pay attention to power lines located within the swivelling range of the truck conveyor. Always keep a sufficient safety distance to these lines. This distance is always determined by the type of power line and this information must be acquired from the competent power company.

- Remove large accumulations of soiling and deposits of earth. Pay particular attention that the area around the lower pivot point of the roller recleaner is free of earth deposits.
- Check whether the folding/swivelling area of the truck conveyor and counterweight arm are free of obstacles, transport vehicles or people. The driver's cabin should always be completely raised to enable the best overview of the hazard zones.
- If the truck conveyor is positioned to the left loading direction, then the truck conveyor and counterweight arm must first cross over before fold-in. ([See Page 233](#))



- Use the mini joystick (1) to swivel the counterweight arm somewhat out of the central position.





- Activate swivel arm lock.

For this purpose:



Swivel arm lock

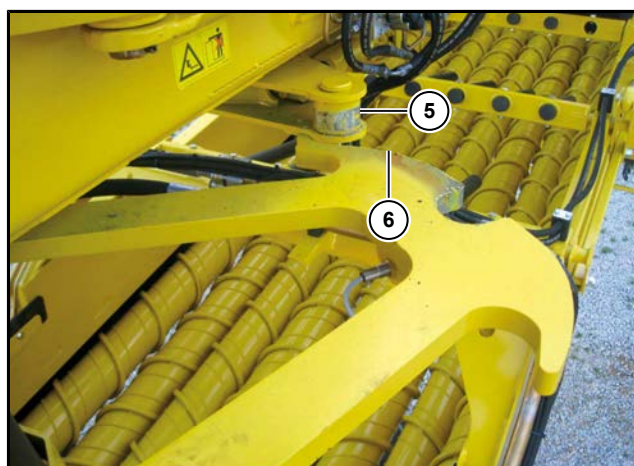
Choose this function with R-Select.

+ key = unlock swivel arm

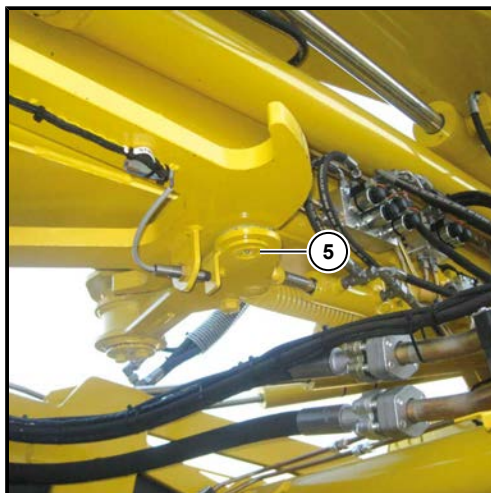
- key = lock swivel arm



The locking lever first begins to close when its roller (5) starts rolling along the cam track (6).



- Turn swivel arm into transport position. The activated swivel arm lock automatically latches in position and is displayed like this (8).



*Swivel arm locked*



- Swivel recleaning to transport position.



Swivel recleaning

Choose this function with R-Select.

+ key = swivel recleaner into operating position

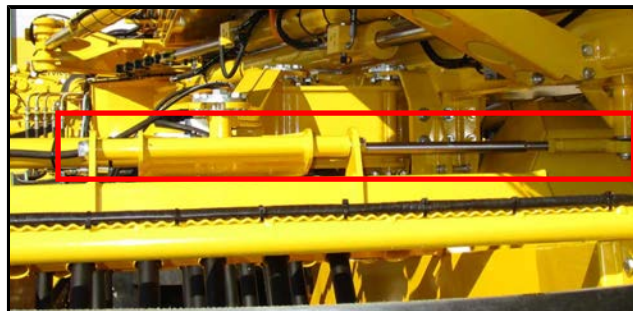
- key = swivel recleaner to transport position



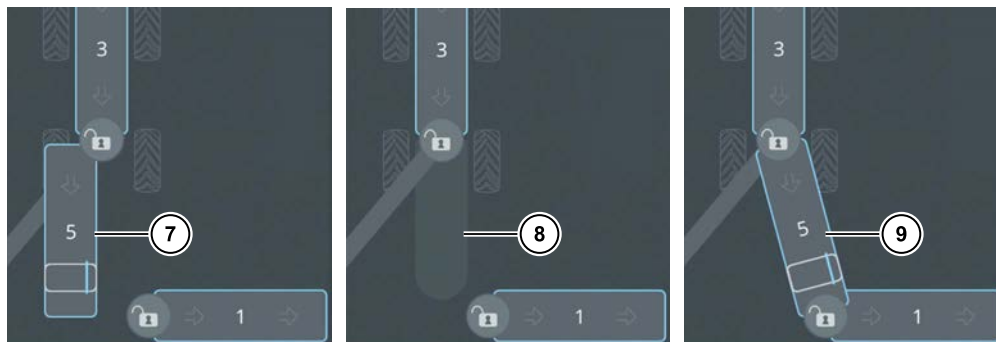
*Recleaner in transport position*



*Recleaner in working position*

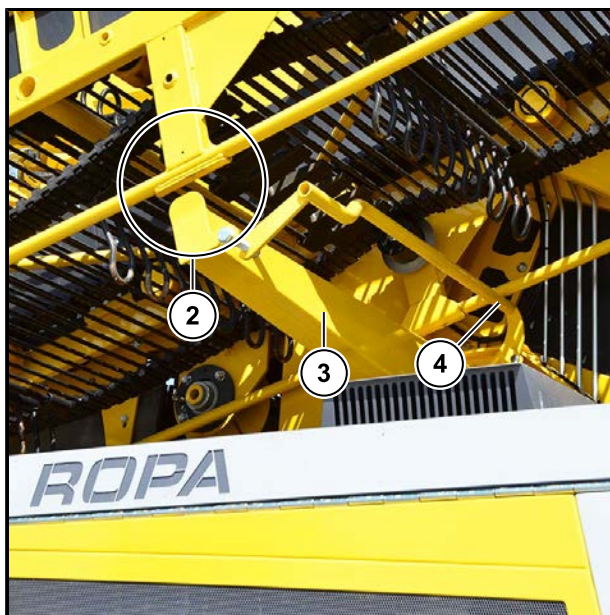


*Cylinder swivel recleaner into transport position*

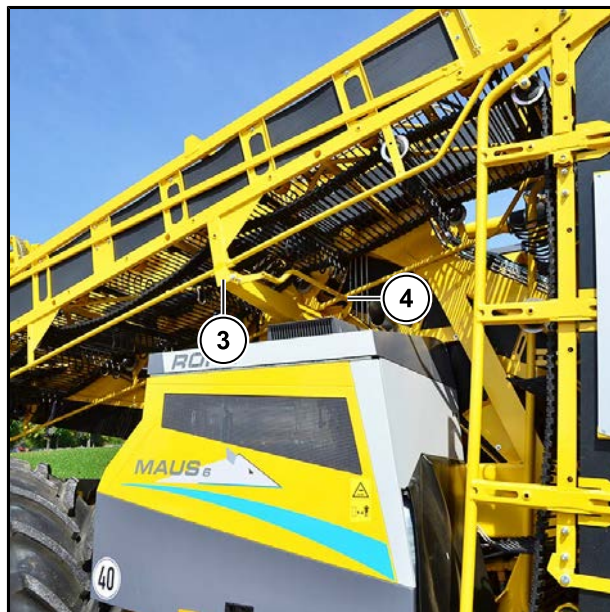


- (7) Recleaner in transport position
- (8) Recleaner neither in transport nor in working position
- (9) Recleaner in working position

- Lower the truck conveyor articulation down to the end-stop.
- Turn the inner side of truck conveyor until it is just above the outer end of the transport support (3).



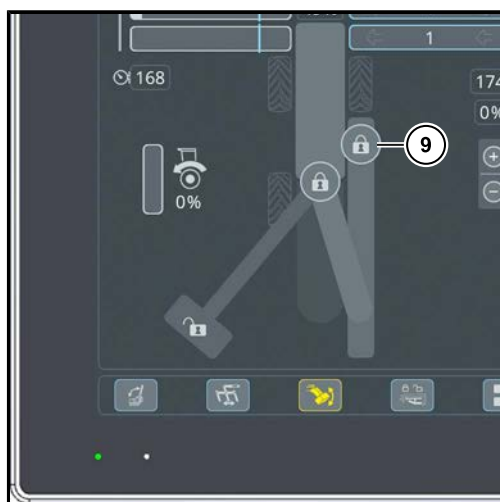
Manually, lower the truck conveyor 5-10 cm (2) over the transport support (3) and turn up to the end-stop on the main frame.



*Truck conveyor correctly rested on the transport support.*



Completely lower the truck conveyor to the transport support (3) until the safety guard rail (4) is pressed. The safety guard rail indicates this by displaying the (9) icon on the R-Touch.



- Move the counterweight arm lock to the end-stop. To do so, select the "Counterweight arm lock" function on the R-Select, press and hold the - key until the lock status display on the R-Touch displays the end-stop position (18b). When the driver's cabin is raised, one can also view the mechanism from the driver's seat.

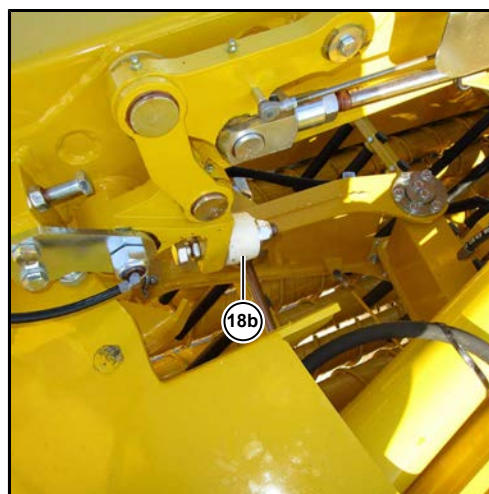


Counterweight arm lock

Choose this function with R-Select.

+ key = unlock counterweight arm

- key = lock counterweight arm



Counterweight arm lock at the end-stop

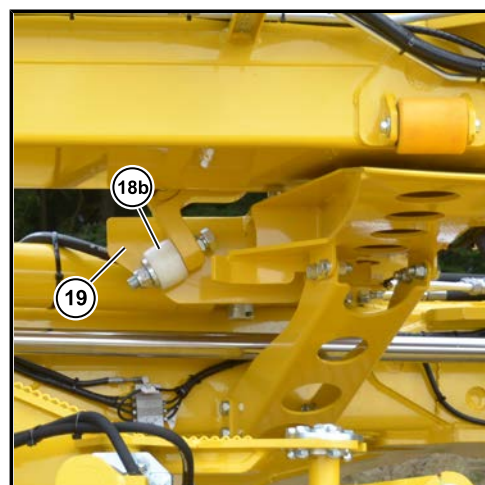
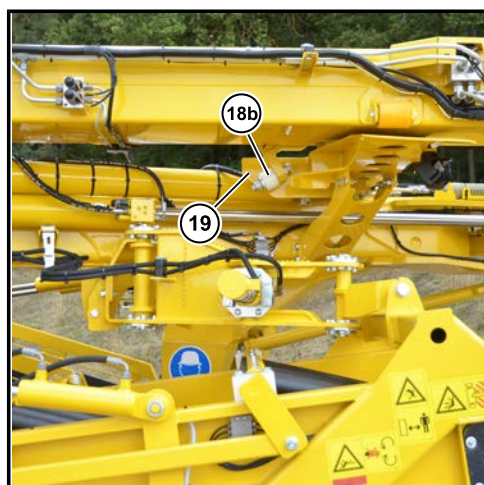
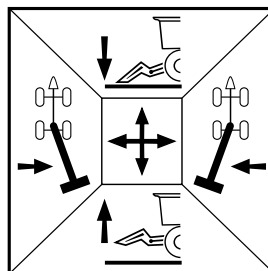
### ADVICE



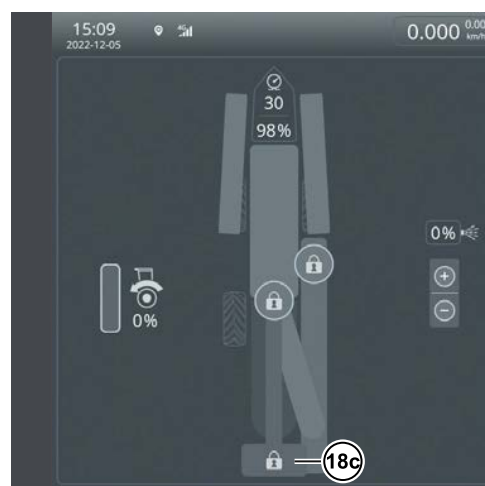
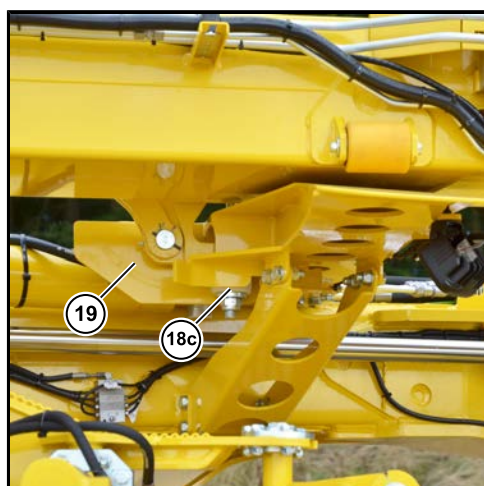
Moving the lock into the end-stop is only possible if the counterweight arm is located left of the swivel arm.



- Swivel the counterweight arm into the central position until the roller of the locking lever rest lies on the lateral end-stop (19).

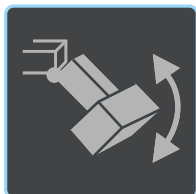


- Close the counterweight arm lock up to the end-stop. To do so, select the function "Counterweight arm lock" on the R-Select, press and hold the key - until the lock status display on the R-Touch displays the correct lock (18c).



*Counterweight arm lock closed*

- Lower the counterweight completely to the end-stop. To do so, select the function "Lower counterweight" on the R-Select and press the key - for so long until the counterweight is completely swung down.



Raise/lower counterweight

Choose this function with R-Select.

+ key = raise counterweight

- key = lower counterweight



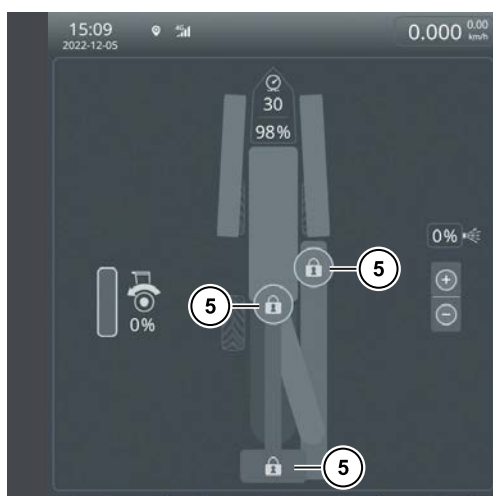
## WARNING



### Hazard of unwanted swivelling movements!

The machine may not be moved on roads or moved to another place if the counterweight and swivel arm are not locked.

- The counterweight and swivel arms must always be locked when driving on public roads.
- The truck conveyor must be positioned on the transport support (see display (5) on the R-Touch)!



### 6.13.8 Folding in the machine manually in front

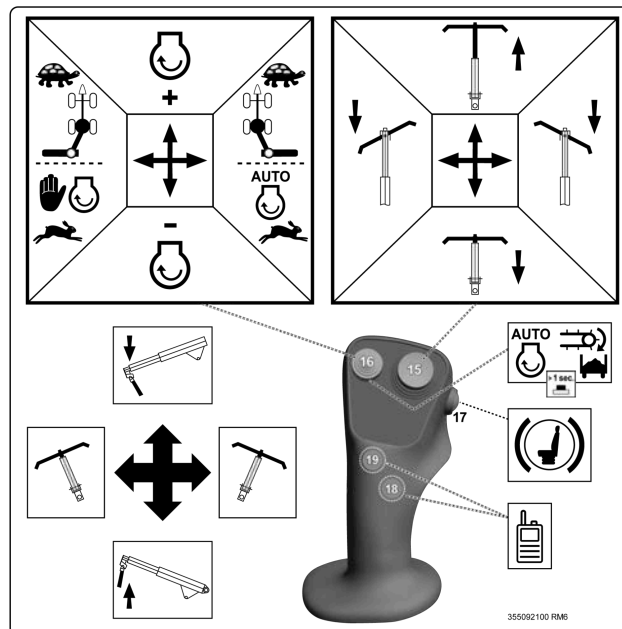
The condition is that the machine rear is completely folded in and the truck conveyor rests on the transport support.

#### WARNING



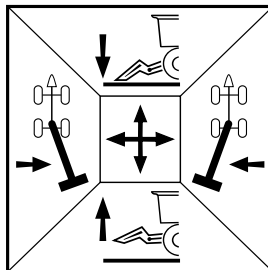
#### Hazard of extremely severe injuries.

- Make sure, that nobody stands in the hazard zones when the machine is started.
  - Make sure that there are no persons on the boarding platform.
  - The driver is responsible for ensuring that there is nobody in the area between the safety rail at the boarding steps and the cabin door when lifting or lowering the cabin.
- 
- Swing the pile pickup to the center and raise it as far as possible. ([See Page 163](#))
  - Telescopically extend pile pickup about half-way.
  - Turn the residual beet pickup to the central position.



- Raise the central part of the pickup as high as possible. For this purpose, pull the mini joystick (1) on the right joystick backwards.





The pickup height indicator has to show minimum 98 %.



- Swing down the fold plates to the end-stop. Select the function "Fold plates in/out" on the R-Select, press the key - and hold it until the fold plates, clearing shields and support feet move completely into the transport position.



Fold plates in/out

Choose this function with R-Select.

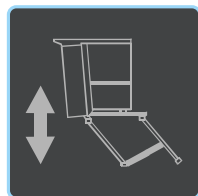
+ key = swing the folding plates out

- key = swing the folding plates up





- Lower the driver's cabin to the end-stop. Select the function "Lower/raise driver's cabin" on the R-Select, press the key - and hold it for so long, until the driver's cabin is completely lowered.



Raise/lower driver's cabin

Choose this function with R-Select.

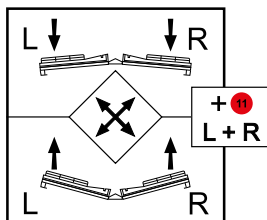
+ key = raise driver's cabin

- key = lower driver's cabin



The driver's cabin may only be lowered or raised when the pickup side sections are folded out.

- Fold in the pickup side sections completely to the end-stop. For this purpose, pull the X-Y key (5) on the right joystick diagonally backwards. To fold in faster, press the multi-key (11) and hold it in this position. If you then slide the X-Y key (5) diagonally to backward left or backward right, then both pickup side sections are simultaneously folded in. After fold-in, keep the X-Y key (5) pressed until you can hear the hydraulic system working against the maximum pressure. In this way, the pickup side sections are pressed against the end-stop.



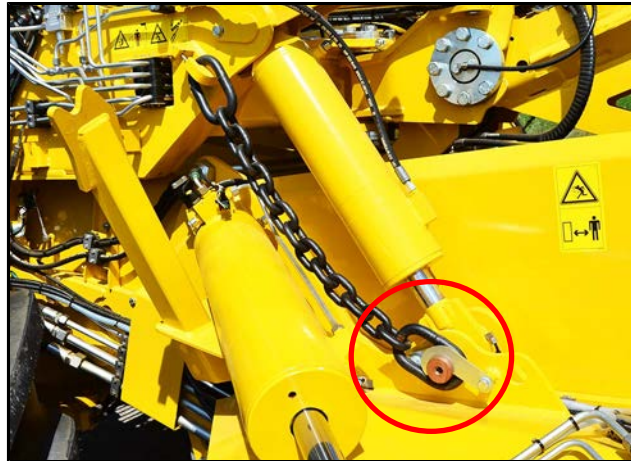
Indicator for pickup side sections folded in.

#### ADVICE



The pickup side sections may only be folded in or out if the central section of the pickup is raised to the end-stop and the driver's cabin is completely lowered! If the central section of the pickup is not at the upper end-stop, then the side sections can only be folded two-thirds of the way in. If a machine is located on a side slope and the pickup cannot be folded in due to heavy soiling, first park the machine with the front oriented either uphill or downhill and then fold in the pickup.

- Switch off oscillating axle support.
- **Insert the safety chains and secure the pickup.** There is one safety chain for the right side and one safety chain for the left side of the front chassis. When driving on public roads, these chains must be fastened to the pickup central part. Fasten the chains on the central part of the pickup, when you have swung in the pickup and are leaving the machine. In case of a malfunction of the hydraulic system, the pickup cannot drop unexpectedly. Otherwise, this could result in serious damage to the driver's cabin! Such damage is excluded from any guarantee, warranty or accommodation.



- Switch into the operating mode "Rabbit". The warning signs are automatically swung down and the ladder is swung into the vehicle contour.



- The additional axles are to be activated as soon as the vehicle is located on a paved road.

## 6.14 Loading operation

### 6.14.1 General information regarding loading

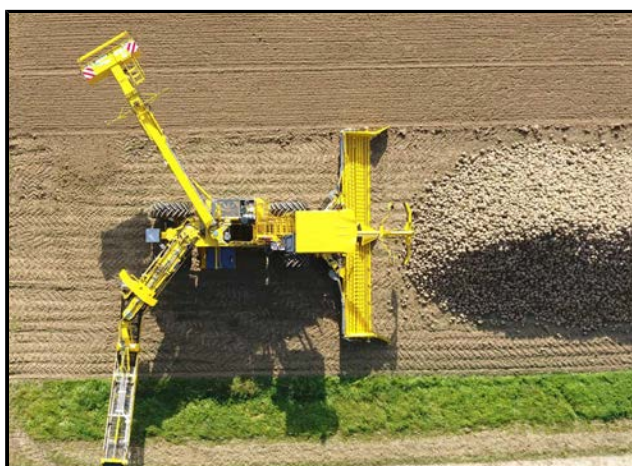
#### **DANGER**



There is a risk of serious or even fatal injuries for persons staying in the hazard zone. Especially in the pickup area, persons or objects may be drawn into running shafts by body parts or clothing. In this case, body parts may be ripped off and fragmented. Objects may be drawn in by the rollers and destroyed or cause severe damage to the pickup of the machine.

- The operator is obliged to immediately shut down the machine as soon as people or animals enter the hazard zone or try to reach into the hazard zone with some objects.
- It is expressly prohibited to move sugar beets not picked up by the machine into the machine manually or using tools, as long as the machine is running.
- Before maintenance and repair work, the machine must be shut down and the diesel engine switched off.
- Secure the diesel engine against accidental start-up, keep the ignition key out of reach of any third party!
- In all cases, please read the operating manual and comply with the safety instructions.
- In the past, these activities have lead to severest accidents. Staying under lifted machine parts or within the swivelling perimeter of machine parts is hazardous and therefore prohibited.

Before starting work, learn about the local soil and terrain conditions. Immediately before loading, check whether the pile meets the requirements of the pile layout chart in the appendix ([See Page 535](#)). Especially, make sure that the pile is not wider than 10.2 m in any place. If this should be the case, make sure that the pile is as evenly as possible brought to a maximum width of 10 m.



*Ideal pile width*

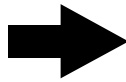
Before starting work, inform the persons present about the most important safety regulations, particularly about the hazard zones and the required safety distances. Have the participants confirm by signing the form attached in appendix that they have received these instructions ([See Page 533](#)) (make a copy before completing the form!).

Make sure to draw the attention of all persons present to the fact that you are obliged to stop the machine immediately and to stop work immediately as soon as any person enters the hazard zones or does not leave them when asked to do so.

**Tip:** You can save time during fold-in and fold-out of the machine if you select "Loading direction to the right". Neither "Loading direction to the right" nor "Loading direction to the left" has any effect on the quality of work, beet flow or stability of the machine. ROPA machines enable you to load either to the right or to the left with the same work speed and quality.

Position the machine in hilly terrain in a way that you can load "uphill". If possible, avoid loading at an excessively steep angle.

#### ADVICE

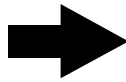


When loading, always swing the counterweight arm as far to the side opposite the truck conveyor as it is necessary to ensure approximately equal load on the wheels on the right and left sides of the machine. When loading, always switch the oscillating axle support ON. If you use the oscillating axle support, do not apply considerably more load to the rear wheel on the truck side than to the other rear wheel. Normally it is quite sufficient to switch on the oscillating axle support before folding out the pickup and balance everything else only with the correct positioning of the counterweight arm.

### 6.14.2 Safety circuits for loading operation

The machine is fitted with multiple safety circuits. It is not permitted to bypass these or otherwise render them inoperable. These circuits are the result of accident analyses and are intended to contribute to increase safety for people in especially critical phases of the loading process. Simultaneously, the driver is always reminded of his personal responsibility.

#### ADVICE



Anyone who tries to manipulate these circuits in any manner, thereby knowingly violating safety requirements, shall be held completely responsible for his actions and is guilty of gross negligence. He is fully responsible for all consequences and shall also be held liable!

### 6.14.3 Switching on the machine drive

#### DANGER



**There is an acute hazard to life for all people standing in the hazard zone during the loading process!**

- Therefore, before switching on the machine drive perform a diligent visual inspection to make sure that there are no persons in the danger zone of the machine.
- The people must be strictly instructed to leave the hazard zone.
- No people may be located in the hazard zone during loading.
- If some people approach the hazard zone, the machine must be immediately immobilized and the loading operation must be interrupted.
- The loading process may only be begun or continued when all people are at a sufficient distance to the machine.
- If these people do not leave in spite of being requested to do so, then the loading process may not be begun or continued.





The driver's seat must be occupied, [See Page 80](#).

Rotate the driver's seat to the forward direction. First sound the horn briefly to notify all people in the vicinity that the machine drive is being started and they must keep clear of the machine.

Press the yellow key (6) only **briefly** to switch on the machine drive.



#### **Safety circuit when switching on the machine drive**

The driver's seat is equipped with a position sensor. That's why, the machine drive can only be switched on with the yellow button (6) if the driver's seat is centred and turned forward and if you had an overview of the pickup. The rotating seat status indicator (1) on the R-Touch should turn green. In addition, the pile pickup must be raised high enough so that no error message related to the pile pickup is displayed.



(2) Indicator for expiration of cooling-off period



(3) Indicator for expiration of cooling-off period (22 seconds remaining)

If the transport vehicles need to be exchanged rapidly, the machine drive can be switched on again without turning the driver's seat into the green zone. This is possible as long as the waiting period, counted down on the R-Touch starting from the switch-off time of the machine drive, has not expired.

The waiting period (3) covers the display of the current flow volume of the scale (only with optional scale).

Recommendation for fuel-saving loading:

Use the X-Y key (16) to select an engine rotational speed between 1,200 and 1,300 rpm.





#### 6.14.4 Pickup depth setting

- Depth guide of the pickup is assumed by the two support feet (10) adjustable in height (except for external side of the two lateral parts of pickup) and the central part (central mark).
- Drive into the beet pile.
- While doing so, set the pickup depth.  
The pickup should be set to such a height that the fingers of the pickup roller enter the ground for their whole length. This pickup depth is the optimum for preserving, power-saving work.

##### ADVICE



Never press the tube of the pickup roller into the ground, but allow its lower side to reach the surface. If the pickup is positioned too low and thus shoves the soil in front, the drive is exposed to extreme forces and this roller could sag. In this case, the operating costs of the machine rise sharply! Even surface under the pile is very important for the best operation of the loader. It is not possible to work with low losses if ground under the pile is not even and level. Avoid deep ruts under the beet pile.



The mini joystick (1) on the right joystick is used to set the height of the pickup central section and, along with it, the height at the inner edges of the pickup side sections. The X-Y key (4) is used to set the height of the support feet and, along with it, the height at the right and left outer edges of the pickup side sections.

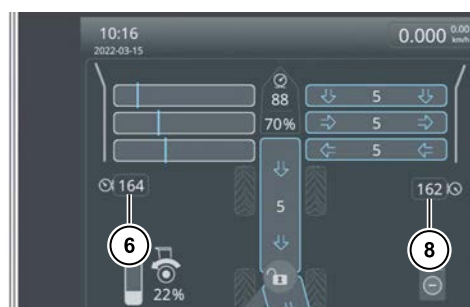
#### 6.14.4.1 Relieving the pickup

The pickup must be relieved so that it does not sink into the ground too deeply during loading on softer pile terrain.

##### 6.14.4.1.1 Relieving the pickup side sections

The support feet are only required to partially carry the weight of the pickup side sections. A part of the load is to be transferred to the chassis.

The components used for this purpose are the hydraulic cylinders (12) that fold the pickup side sections in and out (X-Y key (5) on the right joystick). The side sections must be relieved by raising them to the point that the support feet touch the ground when just a small amount of weight is applied. If the pickup is correctly relieved, then you will see only shallow dragging tracks behind the two support feet (10) when operating under normal ground conditions.



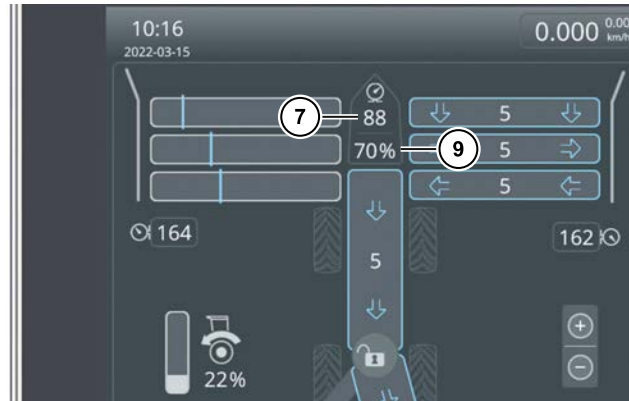
- (6) Relief pressure left (bar)
- (8) Relief pressure right (bar)

To relieve the pickup side sections, always just press the X-Y key (5) briefly.

### 6.14.4.1.2 Relieving the pickup central section

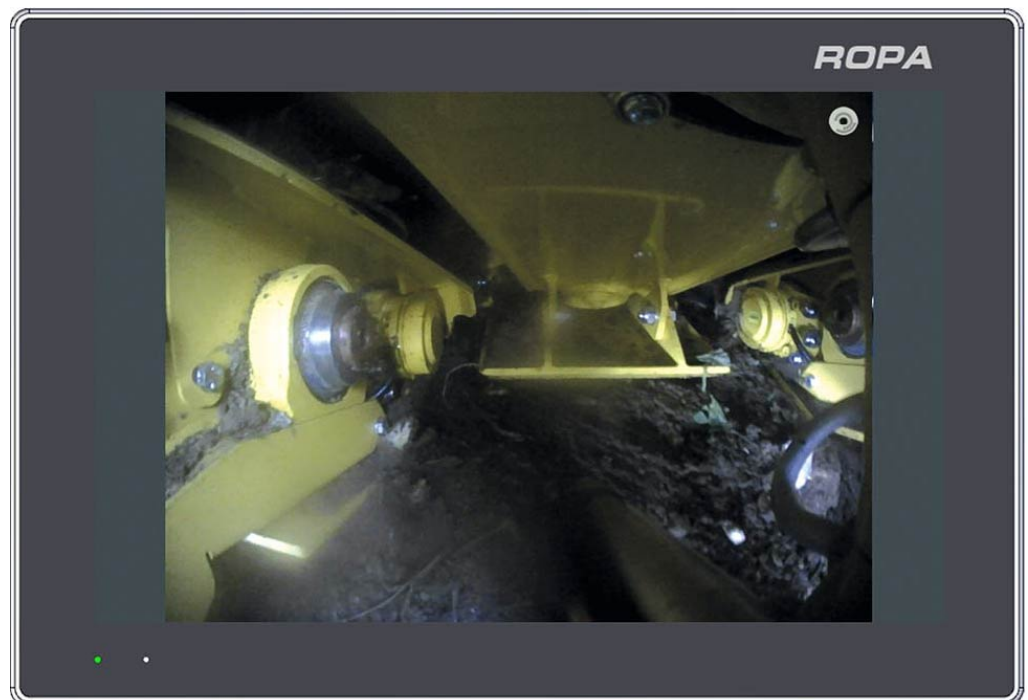


The relief pressure of the central part is set using the mini joystick (1) so that the front axle is loaded. This improves traction of the front tyres and the drive train is loaded more evenly.



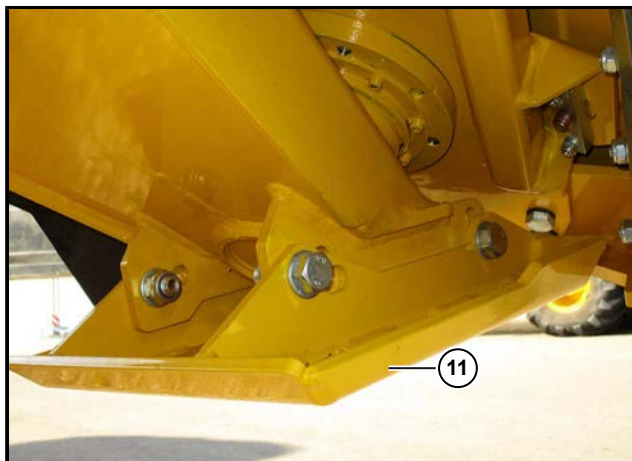
- (7) Relief pressure in the centre (bar)
- (9) Pickup height in %

There is no guideline value for the relief pressure of the central section. The only decisive factor is the display of the central mark camera on the video monitor. Here, you should be able to see that all the beet is picked up and that there is no loss of beet behind the skid.



*Example with optimum adjustment on the image made by central mark camera. No beet fragments, bearing assembly of the pickup roller visible over the ground.*





**(11)** Skids under the central mark (adjustable)

Working too deep in the ground increases the power requirements of the pickup drive and substantially increases roller wear! The depth setting must constantly be adjusted to the ground profile and the load on the pickup by the beet weight.

#### **6.14.5 Clearing shields**

The clearing shields (1) limit the pickup width and guide the beets from sides onto the pickup.



- (1)** Clearing shield
- (2)** Rubber skirt

When using the machine for the first time, set the rubber skirts (2) so that these just barely contact the ground.

#### **ATTENTION**



During loading, especially watch out for frozen ground and built-up bulging soil in the course of the clearing shield. Do not drive through obstacles with the clearing shields! It might damage the folding mechanism.



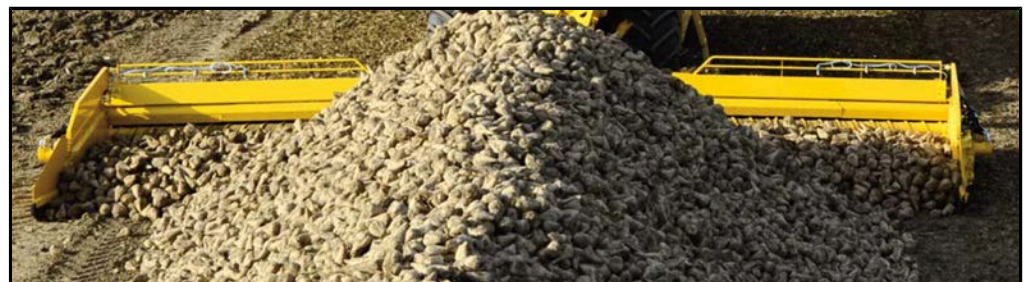
**(28) Clearing shield left**

press forward = unfold,  
press backward = fold.

**(29) Clearing shield right**

press forward = unfold,  
press backward = fold.

If you do not need the maximum pickup width, then please always set the clearing shields straight forward. By doing so, you improve the beet flow to the outer ends of the pickup.



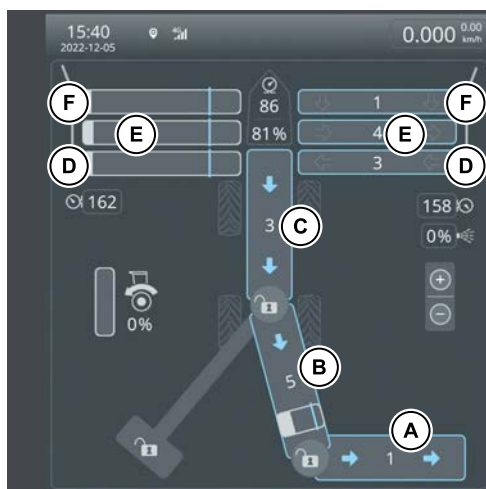
*Optimal setting of the clearing shields (image of the previous model Maus 5)*



*Incorrect setting of the clearing shields. Soil is shoved in the clearing shield area. Moreover, incorrect approach to the pile. It should be approached as centrally as possible. (Image of the previous model Maus 5)*

## 6.14.6 Beet path

This section of the R-Touch depicts in symbols the flow of beets through the machine. This clearly presents all important operational parameters to you.



The following general meaning is allocated to the individual colours and icons:

grey arrows	= component is switched off
blue arrows	= component is moving in the working direction
orange arrows	= component is reversed; it is moving against the working direction
orange area	= blockage pressure

Set the speed of the complete beet flow as optimally as possible. Match the speeds of the pickup rollers to the 4-part pinch rollers. Set the rotational speeds of the pickup rollers and 4-part pinch rollers to such a high speed that the beets picked up are moved to the infeed conveyor without blockages.

When selecting the rotational speed, consider the degree of soiling of the beets. In case of very soiled beets and wet ground, you should select a higher speed. This means that the rollers should be running faster than under "good" conditions.



The feed speed of the traction drive also influences the degree of cleaning:

- Low feed speed = thin beet cover on the rollers = all beets pass through a double cleaning path = greater cleaning effect.
- High feed speed = a thick beet cover on the rollers = only some of the beets pass through the double cleaning path = lower cleaning effect and a gentler treatment of the beets.



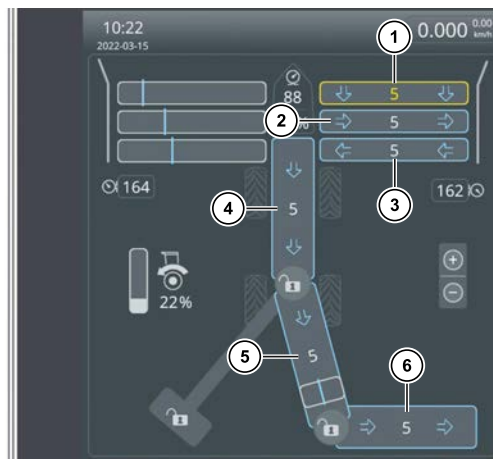
*Optimal distribution of beets across the entire width of the pickup.*

We strongly recommend that the frost breakers are never removed from the pickup side sections. These serve as valuable aids for monitoring the correct feeding quantity. As long as the beets do not jam at the frost breakers, a jam on the beet path is hardly possible. You regulate the supply of beets via the feed speed of the traction drive.



*A uniform beet flow at a reasonable throughput without any beet jams and with a high degree of cleaning*





The greater your experience with the machine, the better your precision at estimating the optimum speeds.

- (1) Speed of pickup rollers
- (2) Speed of conveyor rollers
- (3) Speed of 4-part pinch rollers
- (4) Infeed conveyor speed
- (5) Recleaner speed
- (6) Truck conveyor speed

### 6.14.7 Truck conveyor (drive A)

(See Page 256)

The truck conveyor moves the beets from the recleaner to the transport vehicle. The beets should be treated as gently as possible during this process.



This drive is switched on or off jointly with the machine drive using the yellow button (6) on the right joystick.




Truck conveyor speed

Choose this function with R-Select.


+ key = truck conveyor faster

- key = truck conveyor slower



If this drive is stopped, all forward drives will also stop. This drive can not be reversed. If this drive is overloaded, then the following icon  is displayed on the R-Touch.



If the truck conveyor is blocked, then the following icon  is displayed on the R-Touch.

### 6.14.7.1 Truck conveyor fast motion

Sometimes, a larger quantity of soil sticks to the conveyor, e.g. when loading under unfavourable conditions. To be able to fling this soil off the conveyor, the truck conveyor is equipped with a quick motion switch.



You can switch on quick motion using the toggle switch (33). For this purpose, move this switch to the right and hold it for so long, until soiling is removed. The truck conveyor then runs at double speed.

Only switch on quick motion when the conveyor is empty and there are no more beets on the truck conveyor. The infeed conveyor is automatically stopped for as long as the truck conveyor belt is switched to quick motion.

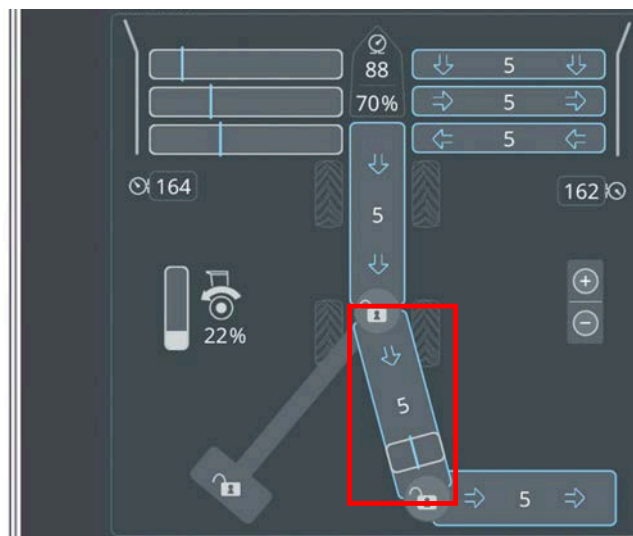
### 6.14.8 Recleaner (drive B)

(See Page 256)



Depending on equipment, your machine has a sieve conveyor cleaner, an 8-set pinch roller cleaner or a stone remover. They perform recleaning of the beets. The recleaner is located between the infeed conveyor and the truck conveyor. The recleaner drive is only operating when the machine drive has already been switched on. Briefly press the key (9) on the right joystick once to switch on the recleaner.

If this key is pressed briefly again, then the drive for the recleaner is switched off. If this key is pressed and held pressed, then the rotating direction of the recleaner is reversed. Reversing of the recleaner is only possible for the versions with a pinch roller cleaner and stone remover.



### Recleaner speed

The rotational speed of the recleaner may be set to one of 10 stages. Choose this function with R-Select.

+ key = more aggressive recleaning

- key = gentler recleaning

Only with 8-set pinch roller recleaner:

If the key + is released after the stage 10 is reached and then pressed for at least three seconds, the "Max" stage is reached. The highest hydraulic drive speed is achieved in the "Max" stage.

### ADVICE




To treat the beets as carefully as possible, the speed of the recleaner should not be selected higher than necessary. The "Max" stage should only be used in case of extremely sticky soil.

If this drive is stopped, all forward drives will also stop.


### 6.14.8.1 Sieve conveyor cleaner (option)

The cleaning effect of the sieve conveyor is mainly achieved by the fact that the conveyor is moving faster forward than the beet flow. The beets start to roll and are cleaned in this manner.



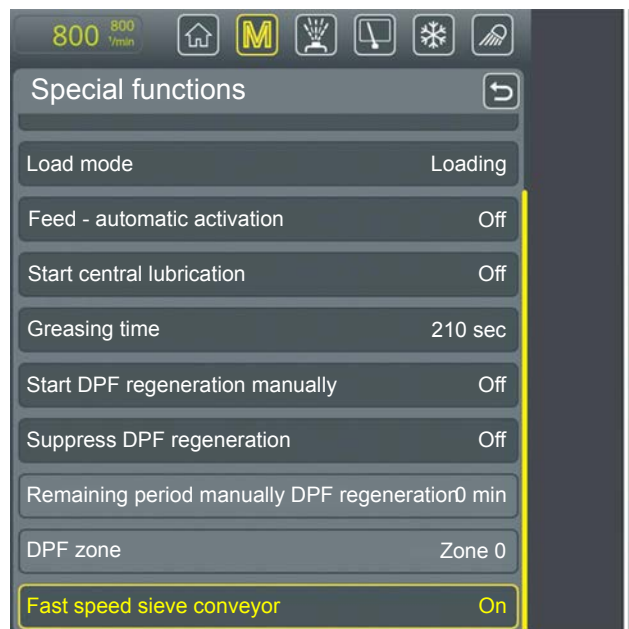
If the warning limit of the sieve conveyor cleaner is exceeded, then the following icon  is displayed on the R-Touch.



If the sieve conveyor is blocked, then the following icon  is displayed on the R-Touch.

### 6.14.8.1.1 Fast speed sieve conveyor cleaning

Sometimes, a larger quantity of soil sticks to the conveyor, e.g. when loading under unfavourable conditions. The sieve conveyor cleaning is fitted with a fast speed switch to allow this soil to be thrown off the conveyor.




Open the "Sieve conveyor fast speed" line in the "Special functions" menu and set the selection to "ON". The speed of the sieve conveyor is doubled. Set the value back to "OFF" as soon as the soil has been cleared.

Switch on the fast speed only when the conveyor is empty and there are no beets on the conveyor chain.




### 6.14.8.2 8-set pinch roller cleaning (option)



If the warning limit is exceeded at the pinch roller cleaner, then the following icon  is displayed on the R-Touch.



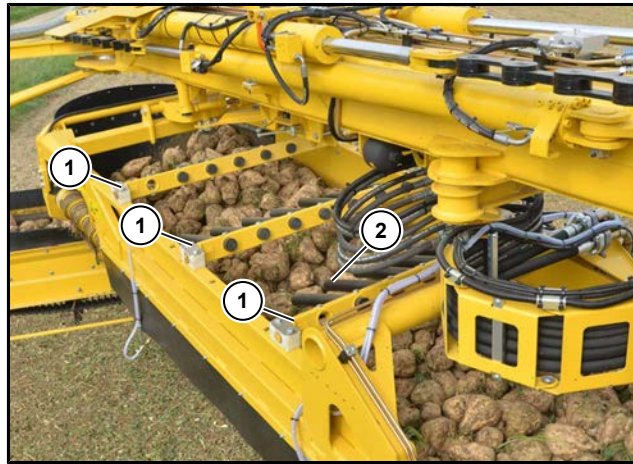
If the pinch roller cleaner is blocked, then the following icon  is displayed on the R-Touch.

Mostly, blockage-forming foreign objects can be removed by reversing the pinch roller cleaner.





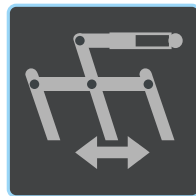
### 6.14.8.2.1 Beet brake (only for 8-set pinch roller cleaner)



- (1) Beet brake
- (2) Braking bars

For the roller cleaner, the cleaning effect is mainly achieved by the fact that the rollers pull dirt and trimmings off in a downward direction.

In addition, a swivelling beet brake (1) is mounted. Braking bars (2), which are mounted to the frame of the roller cleaner, pile up the beets. Due to this action, the beets additionally rub against each other and the cleaning effect is increased. To adjust the intensity of the recleaning, the braking bars (2) can be inserted into the beet flow.



Beet brake

Choose this function with R-Select.

+ key = The beet flow is slowed down more (intensive cleaning).

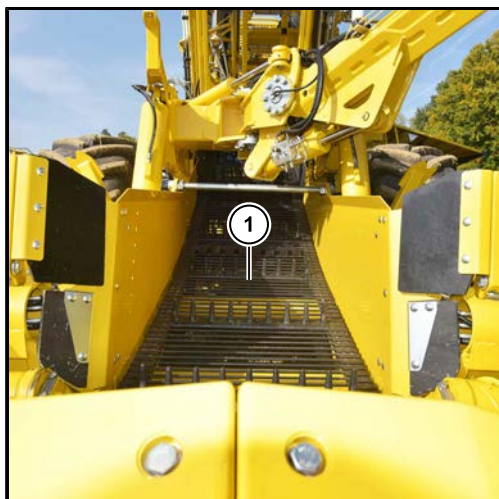
- key = The beet flow is slowed down less (gentle cleaning).



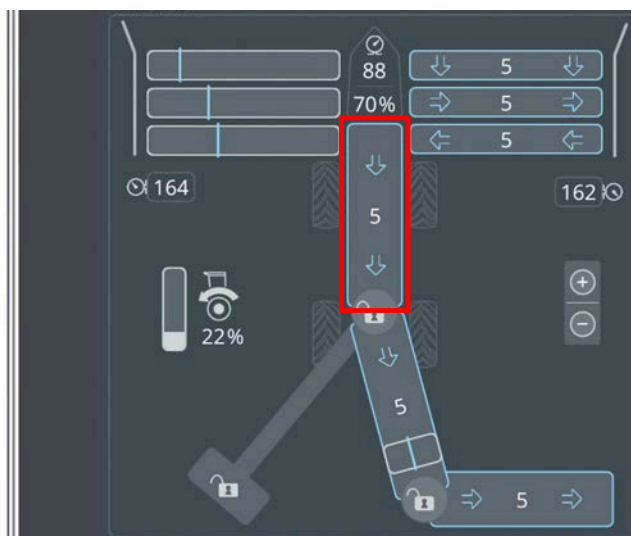
### 6.14.9 Infeed conveyor (drive C)

(See Page 256)

The infeed conveyor (1) moves the beets from the pickup to the recleaner. This drive is switched on or off using the button (10) on the right joystick.



The infeed conveyor only runs when the recleaner is already running. If this drive is stopped, all forward drives will also stop. This drive can not be reversed.



#### Infeed conveyor speed

The speed of the infeed conveyor can be adjusted in ten steps. Choose this function with R-Select.

+ key = infeed conveyor faster

- key = infeed conveyor slower

### 6.14.9.1 Infeed conveyor fast motion

Sometimes, a larger quantity of dirt sticks mainly in the section of the infeed and the deflection rollers of the infeed conveyor. This usually happens when loading under very unfavourable conditions. To be able to fling this soil off the conveyor, the infeed conveyor is equipped with a quick motion switch.



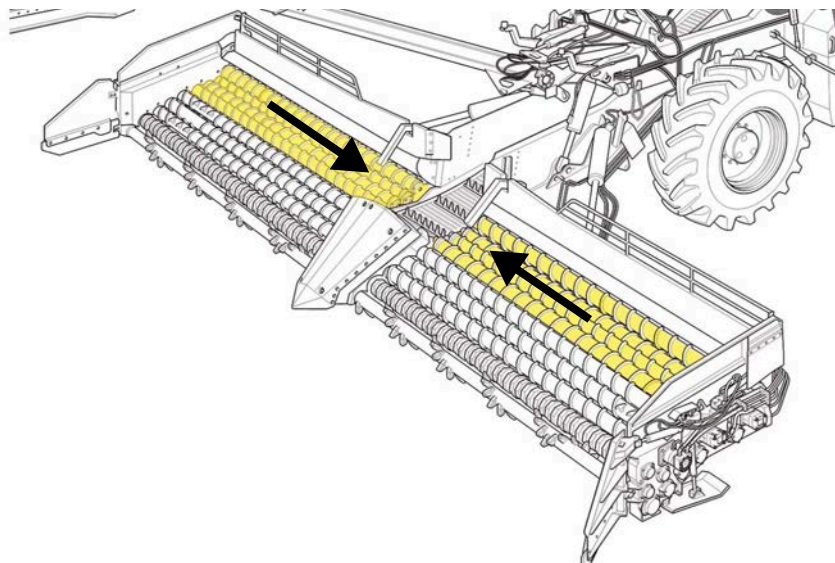
You can switch on quick motion using the toggle switch (33). For this purpose, move this switch to the left and hold it for so long, until soiling is removed. The infeed conveyor then runs at double speed.

Only switch on quick motion when the infeed conveyor is empty and there are no beets are on the infeed conveyor.

Briefly switch on quick motion if a "roll" made of soil and other contamination develops in the section behind the deflecting roller. Quick motion removes this roll of dirt as long as it does not exceed a specific size. Otherwise, the dirt must be removed manually. If the recleaner is blocked, then the infeed conveyor automatically shuts off. As soon as a blockage of the recleaner has been removed, the infeed conveyor can be started again by briefly pressing on the button (10) on the right joystick.

### 6.14.10 4-part pinch rollers in the pickup (drive D)

(See Page 256)



The 4-part pinch rollers in the pickup move the beets to the center of the pickup onto the infeed conveyor. They only move in the feed direction when the machine drive is switched on and the infeed conveyor is running.

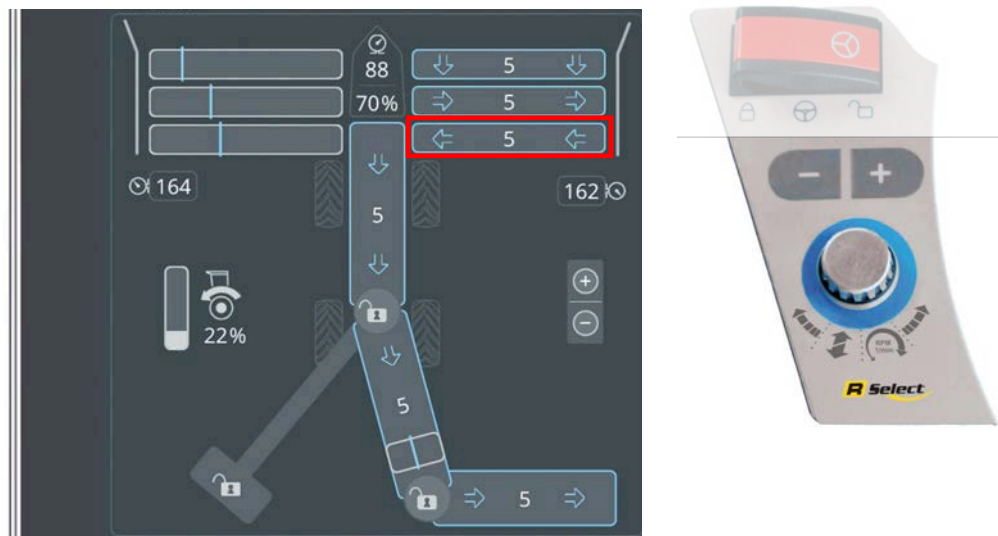
These pinch rollers may also be reversed when the infeed conveyor stops.



To switch on the 4-part pinch rollers, briefly press the key (8) once on the right joystick.

If this key is briefly pressed again, the 4-part pinch rollers stop.

If this key is pressed and held pressed, then the rotating direction of the 4-part pinch rollers is reversed.



### Speed of 4-part pinch rollers

The rotary speed of the 4-part pinch rollers can be adjusted in ten steps. Choose this function with R-Select.


+ key = increase rotational speed (more aggressive cleaning and transport)

- key = reduce speed (gentler cleaning and transport)


To treat the beets as carefully as possible, the speed of 4-part pinch rollers should not be selected higher than necessary.

If the key + is released after the stage 10 is reached and then pressed for at least three seconds, the "Max" stage is reached. The highest hydraulic drive speed is achieved in the "Max" stage. The "Max" stage should only be used in case of extremely sticky soil. In this stage, the rotational speed of the 4-part pinch rollers is only dependent on the rotational speed of the diesel engine.



If the warning limit of the 4-part pinch rollers is exceeded, then the following warning icon  is displayed on the R-Touch.



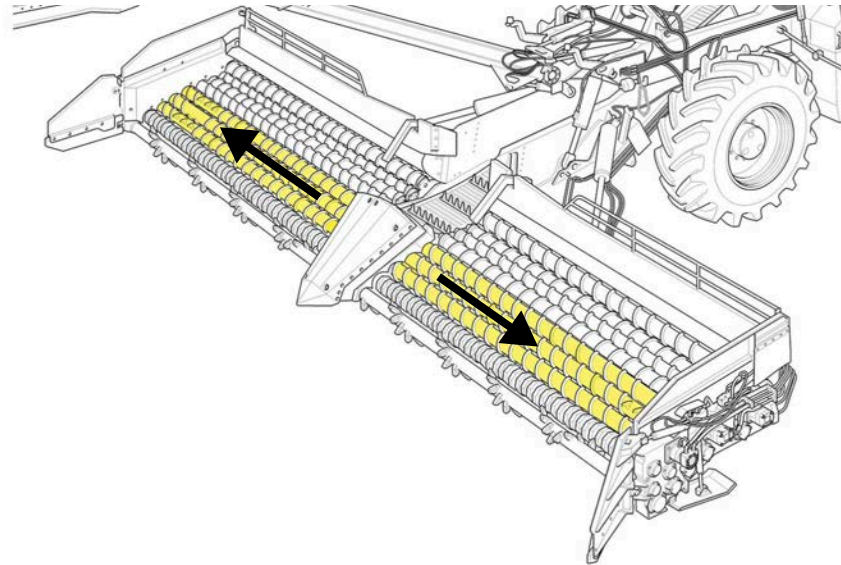
If the 4-part pinch rollers are blocked, then the following warning icon  is displayed on the R-Touch.

In case the 4-part pinch rollers are blocked, then both the conveyor rollers drive and the pickup rollers drive are switched off.



## 6.14.11 Conveyor rollers (drive E)

(See Page 256)

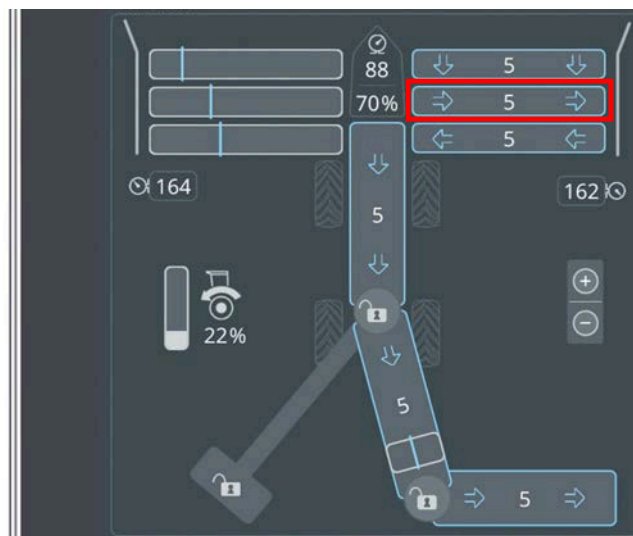


The conveyor rollers preclean the beets and guide them to the outside. A greater cleaning effect is achieved due to the longer cleaning path.

The conveyor rollers always move in operating direction if the 4-part pinch rollers also move in operating direction.

To switch on the conveyor rollers (can be switched on only together with the pickup rollers), press the key (7) on the right joystick once briefly.

If this key is briefly pressed again, the conveyor rollers/pickup rollers stop. If this key is pressed and held pressed, then the rotating direction of the conveyor rollers/pickup rollers is reversed.



### Speed of conveyor rollers

Choose this function with R-Select.

+ key = increase speed (rollers rotate faster)


- key = decrease speed (rollers rotate slower)

To treat the beets as carefully as possible, the speed of the conveyor rollers should not be selected higher than necessary.


At a higher speed of the conveyor rollers, many beets are transported all the way to the outside. Thus, the cleaning path is extended. It is recommended if the beets are highly soiled.

The speed of the eccentric drive of the central mark is synchronous to the speed of the conveyor rollers (due to series connection of the hydraulic motors).



If the warning limit of the conveyor rollers is exceeded, the following warning icon  is displayed on the R-Touch.



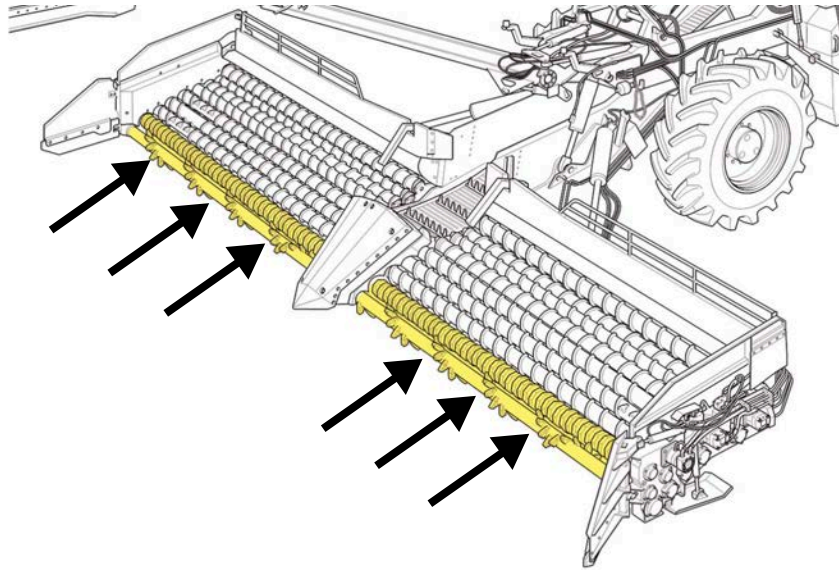
If the conveyor rollers are blocked, then the following warning icon  is displayed on the R-Touch.

If the conveyor rollers are blocked, the pickup roller drive is switched off.



## 6.14.12 Pickup rollers (drive F)

(See Page 256)

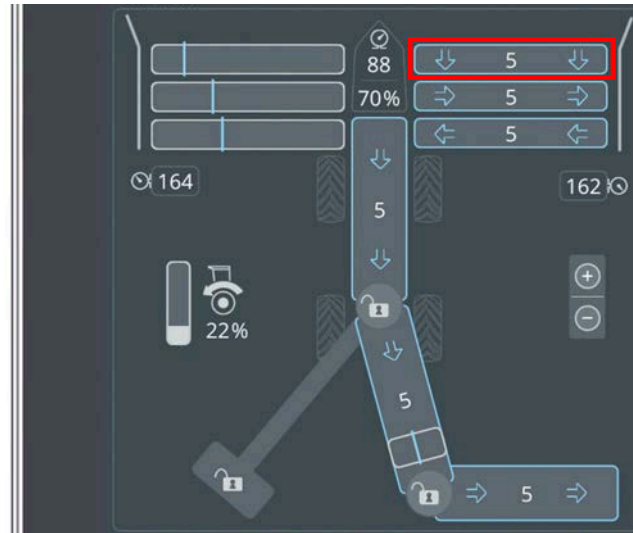


The pickup rollers have different tasks. They pick up the beets from the ground and transfer them to the cleaner rollers. These forward the beets to the conveyor rollers and simultaneously clean the pig tails of the pickup rollers.

The pickup rollers always move in working direction if the 4-part pinch rollers also move in the working direction.

To switch on the pickup rollers (can be switched on jointly with the conveyor rollers), press briefly the key (7) on the right joystick once.

If this key is briefly pressed again, the conveyor rollers/pickup rollers stop. If this key is pressed and held pressed, then the rotating direction of the conveyor rollers/pickup rollers is reversed.



### Speed of pickup rollers


Choose this function with R-Select.

+ key = increase speed (rollers rotate faster)


- key = decrease speed (rollers rotate slower)

To treat the beets as carefully as possible, the speed of the pickup rollers should not be selected higher than necessary.



If the warning limit of the pickup rollers is exceeded, then the following warning icon  is displayed on the R-Touch.



If the pickup rollers are blocked, then the following warning icon  is displayed on the R-Touch.

The traction drive stops automatically as soon as the pickup rollers are stopped or reversed.

### 6.14.13 Automatic reversing function for all roller drives

You can set the automatic reversing function in the menu "Basic settings" to "ON" or "OFF" for all roller drives.

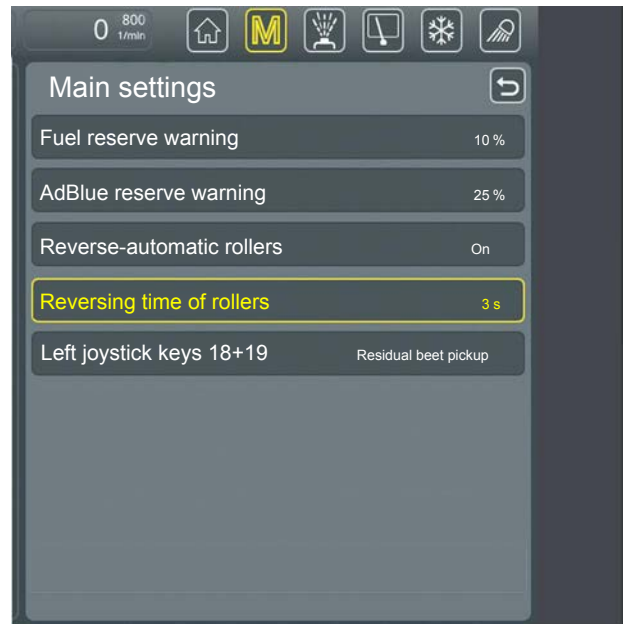


The automatic reversing function detects blocks on all roller drives of the beet flow. When the system detects a block, then the automatic reversing function immediately stops all drives located in front of the blocked drive. Simultaneously, the traction drive, if has been activated, is stopped.

The automatic reversing function now several times reverses the rotating direction of the blocked drive (at maximum 5 times), until the block is overcome. Then, all drives, including the traction drive, if has been activated, are automatically switched on again.

Shouldn't you succeed in releasing the blockage by reversing after five attempts, then all drives are switched off.

In the "Reversing time rollers" line you can set in seconds for how long the rollers should rotate backward during automatic reversing.



You can manually start additional reversing attempts by using the keys (7), (8) or (9) on the right joystick. If you still do not success in it, then the cause for the blockage must be removed manually.

For this purpose, switch off the machine and secure it against inadvertent starting.

### **DANGER**

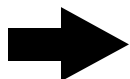
#### **Risk of serious injury when removing blockages in the drives.**

- Always switch off the machine drive before removing blockages.
- Shut down the diesel engine.
- Secure the diesel engine against accidental start-up, keep the ignition key out of reach of any third party!

## 6.14.14 Driving into the beet pile – Loading mode START

If a truck is not ready for loading under the truck conveyor, before switching on the machine drive set the selection in the "LOAD MODE" line from "LOAD" (default setting) to "START".

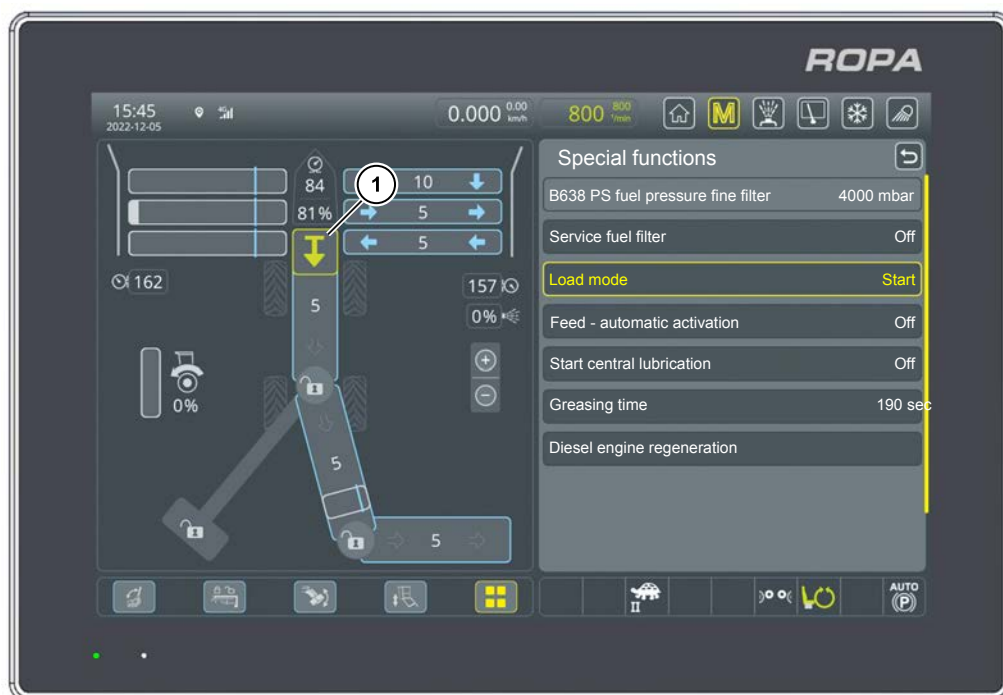
### ADVICE



Similarly, you can turn on the "START" loading mode via the quick access window (See Page 114).



This allows the machine to drive into the beet pile with the pickup running without disturbing the remaining beet path. As soon as the machine drive is switched off (yellow key (6) on the right joystick), the load mode is automatically reset to "LOAD".



(1) Status symbol loading mode "START"

### 6.14.15 Loading a transport vehicle

When loading trucks the following directions must be observed at all times to ensure that the beets are handled as gently as possible during the loading process.

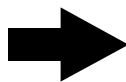
- Never change the direction of the beet flow between the infeed conveyor, pre-cleaning and truck conveyor by 90° or more!



*gentle beet flow*

- Adjust the complete beet cleaning process to be as gentle as possible (lowest possible speed).
- Work at the lowest possible diesel engine speed (1,200 - 1,300 rpm) to save fuel and protect the environment.
- Do not allow the beets to fall into the load compartment of the truck any higher than necessary. Always lower the truck conveyor as far as possible and when starting loading, plunge the articulation between the side walls of the truck as low as possible.

#### ADVICE



**Important!!** The rotary motions of the swivel arm and truck conveyor are actuated by chain drives. During operation, watch the rotation movements to ensure that they are always correct and that the chains are correctly tensioned. The chains are automatically tensioned by the hydraulic system.

The machine must be stopped immediately if the chains are not correctly tensioned.

#### DANGER



**Risk of fatal injury due to uncontrolled swivel motions of swivel arm and truck conveyor if the chain on the rotary drive skips.**

- Stop the machine immediately and have the machine checked by a mechanic.

### 6.14.16 After-loading function



If you still want to load a small amount of sugar beet onto the truck after the machine has been switched off, you can easily do this using the after-loading function. After-loading is always performed at a permanently programmed low engine speed on which the driver has no influence.

Press the yellow key for machine drive ON/OFF (6) on the right joystick and **hold it until** the desired amount of sugar beet has been loaded. The drive stops as soon as the key is released.



## 6.14.17 Special features during loading

### 6.14.17.1 Frozen beet pile

A lightly frozen beet pile can be broken up or loosened with the pile pickup. A very frozen beet pile must never be broken up with the pile pickup. Always use suitable heavy equipment (e.g. excavator, backhoe etc.).

The telescopic tube of the pile pickup must be pushed into the pile under its own power only. If the vehicle moves forward at the same time this will destroy the telescopic tube.

#### ATTENTION

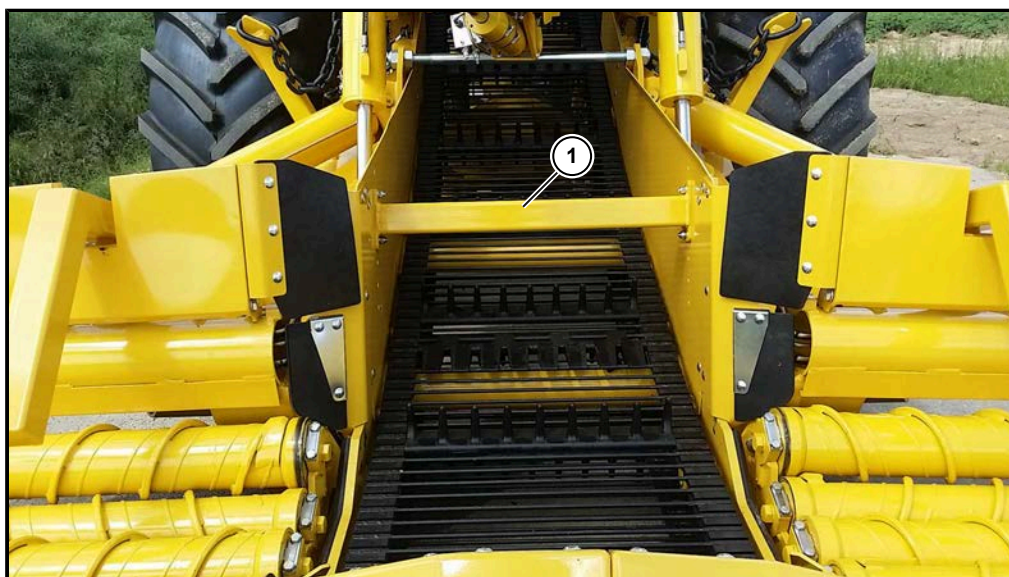


A frozen beet pile must not be loosened by lifting the entire pickup. This may seriously damage the pickup.

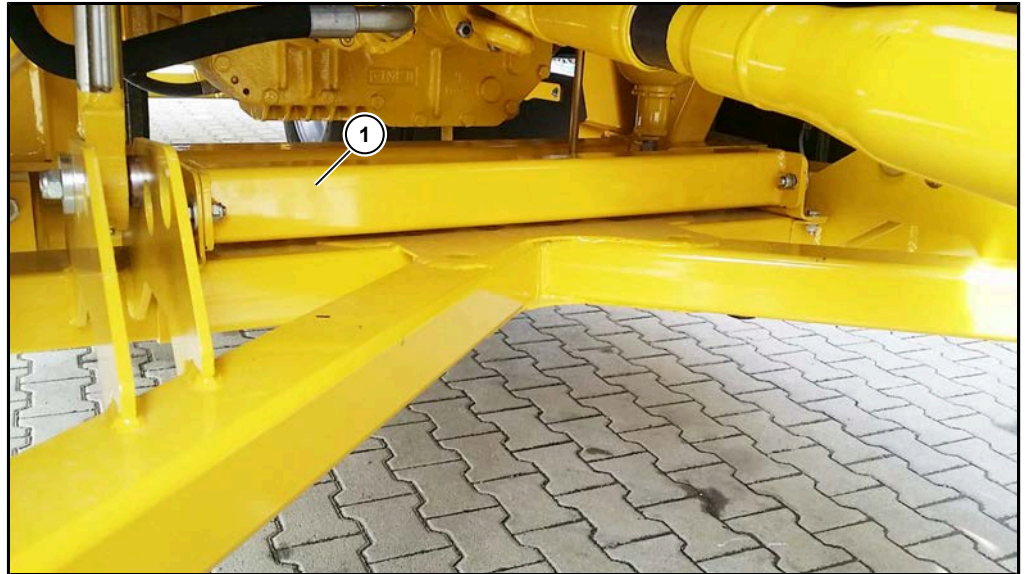
When loading frozen beet piles always use the frost breaker (1) at the entrance to the infeed conveyor.

On delivery of the machine the frost breaker (1) is attached to the frame of the rear auxiliary axle. Attach it to the entrance of the infeed conveyor as required and fasten it with the bolts used to fasten into the frame of the auxiliary axle.

The frost breakers help break up frozen lumps of beets and assist the smooth flow of beets through the machine.





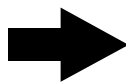


(1) Frost breaker on the additional axle rear

#### 6.14.17.2 Extremely narrow beet pile

Even if the beet pile is very narrow and it appears that only half of the pickup width would be sufficient, the pickup must always be completely extended and used for loading.

##### ADVICE



Always approach the beet pile approximately in the centre of the beet mass. Thus, both pickup side parts bear approximately the same load. In this way, the pickup frame is protected from excessive wear.

Also in case of a very narrow beet pile, with which half the pickup width would be sufficient for loading, the beets must be picked up with both pickup side sections.

## 6.14.18 END load mode

For fuel-saving operation, it is recommended to reduce the speed in the entire beet path at the end of the pile, because at that stage the pile pickup will only be delivering small quantities of beets onto the pickup. The weighing result is also more accurate if the truck conveyor reaches a specific minimum fill level. Go to the "Special functions" menu, then to the "LOAD MODE" line and switch from the "LOAD" (default setting) to the "END".

### ADVICE



Similarly, you can turn on the "END" loading mode via the quick access window (See [Page 114](#)).

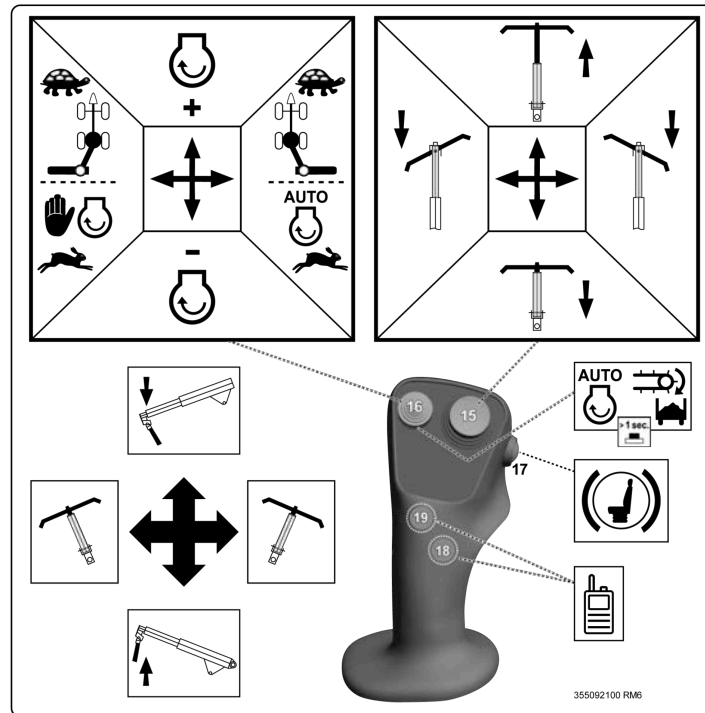
This selection sets the speed of all drives to the values previously set last time the "END" mode was used.

To return to the default setting, go to the "Special functions" menu, then the "LOAD MODE" row and switch from "END" to "LOAD".



(1) Status symbol "END" loading mode

## 6.14.19 Pick up remaining beets with pile pickup



The pile pickup can be used to move the tip of a beet pile to the outsides of the pickup. The remaining beet pickup (plastic part) is attached to the pile pickup. It is used to pull the last beets from a pile onto the pickup. The pile pickup is controlled with the left joystick.

### Safety switch for picking up remaining beets

#### **DANGER**



There is a risk of serious or even fatal injuries for persons staying in the hazard zone. Especially in the pickup area, persons or objects may be drawn into running shafts by body parts or clothing. In this case, body parts may be ripped off and fragmented. Objects may be drawn in by the rollers and destroyed or cause severe damage to the pickup of the machine.

- The operator is obliged to immediately shut down the machine as soon as people or animals enter the hazard zone or try to reach into the hazard zone with some objects.
- It is expressly prohibited to move sugar beets not picked up by the machine into the machine manually or using tools, as long as the machine is running.
- Before maintenance and repair work, the machine must be shut down and the diesel engine switched off.
- Secure the diesel engine against accidental start-up, keep the ignition key out of reach of any third party!
- In all cases, please read the operating manual and comply with the safety instructions.
- In the past, these activities have lead to severest accidents. Staying under lifted machine parts or within the swivelling perimeter of machine parts is hazardous and therefore prohibited.

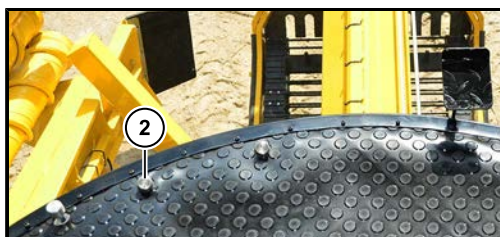
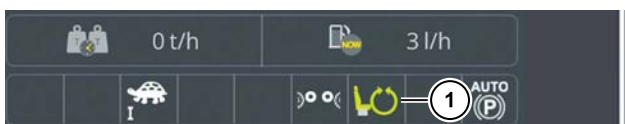
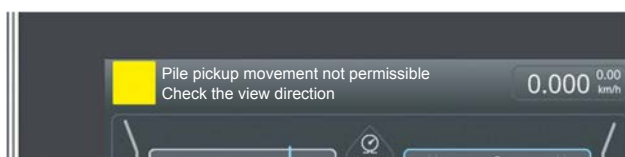
### Pile pickup raised

As long as the pile pickup is raised sufficiently high, the R-Touch shows no warning indicators. The safety circuit does not have any effect during loading process. The pile pickup can be used without restriction as long as it does not fall below a specific minimum height (e.g. on a frozen beet pile).



### Pile pickup lowered

If the warning message "Pile pickup movement not permissible. Check the view direction" appears because the pile pickup is lowered, without any further actions the telescopic arm can only be moved to the left/right and up/down. As soon as the telescopic arm is extended or retracted the driver's seat must be rotated forward. The rotating seat status indicator (1) on the R-Touch should turn green. The "Look forward" foot switch (2) on the floor of the cabin must be pressed.



The "Look forward" foot switch (2) must always be pressed and held if remaining beets are being picked up. All rollers in the pickup will stop as soon as this foot switch is released (dead-man circuit). The rollers can only be reactivated at the right joystick if the rotating seat is rotated forward and the "Look forward" foot switch (2) is pressed. The pile pickup can only be lifted as soon as the seat is rotated away from the central area. All other functions of the pile pickup will be blocked.




If the rollers in the pickup are rotating and the pile pickup is lowered below the above-mentioned height limit, the driver will still have time to rotate the driver's seat forward until the green zero range is displayed on the R-Touch and to press the "Look forward" foot switch (2). It takes a few seconds for the safety circuit to actuate. A visual display on the R-Touch and an acoustic warning signal informs the driver of this period.




If the "Look forward" foot switch is continuously pressed (e.g. electrically bridged or continuously mechanically pressed), the machine drive cannot be activated.

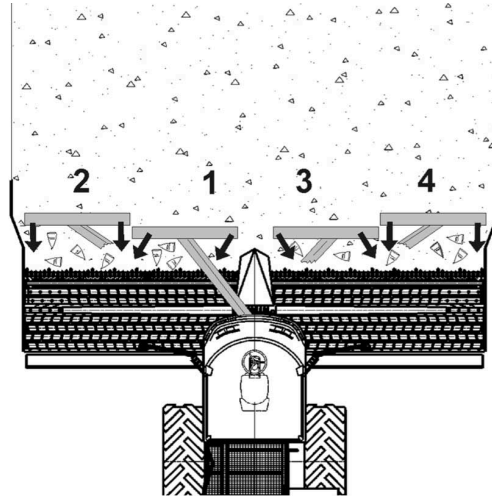


If the R-Touch shows this icon , the pile pickup must be rotated to the centre and lifted before lifting the pickup.



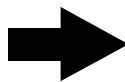
The pickup must be lowered before swivelling the pile pickup far to the right or left. If the pickup is not lowered sufficiently, the R-Touch shows the following icon .

Before picking up remaining beets, we recommend lowering the pickup a few centimetres at very low speed and picking the remaining beets as follows:



- Always pull the beets to the conveyor rollers at the central mark. To do this move the remaining beet pickup parallel to the conveyor rollers and wait until the beets are transported to the infeed conveyor.
- Then pull the outside beets over the conveyor rollers. With some practice it should be possible to pickup the remaining beets in six actions.

#### ADVICE



Tip! Always work around the central mark when picking up remaining beets and always from the centre of the pickup to the outside.

Beets lying on the edge can be picked up more easily if the clearing shields are folded in.



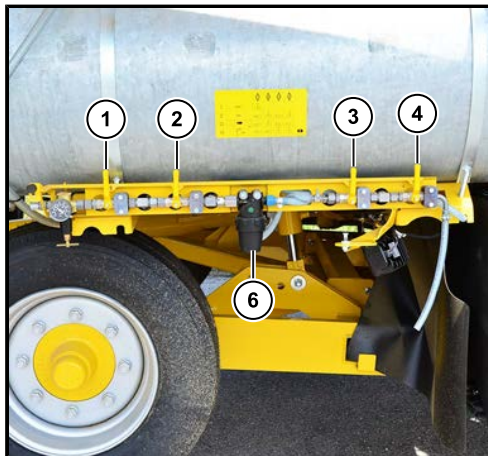


## 6.15 Water spray system (option)

### 6.15.1 Structural design of the water spray system

The water spray system is designed for wetting the pinch rollers in particularly sticky soil conditions. It is also ideal for gentle loading of beets that have become extremely soft and dry due to exposure to sun and wind. The beet flow moves more easily over wetted pinch rollers. This reduces losses during loading. The water required for wetting is filled into the water tank (5), initially not pressurised, from above. The pressure required for spraying is generated by the machine air compressor.

The water spray system is easily switched on and off from the driver's seat.



- (1) Ball valve 1
- (2) Ball valve 2
- (3) Ball valve 3
- (4) Ball valve 4
- (5) Water tank
- (6) Water filter
- (7) Pressure reducer (max. 5 bar)

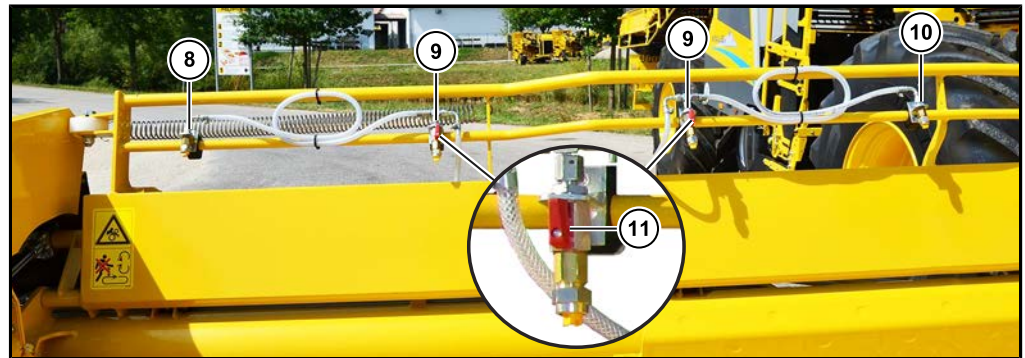
**ATTENTION**



**Risk of machine damage.**

If the pressure reducer is set above 5 bar, the compressed air escapes through the safety pressure valve (6 bar). The air compressor runs continuously due to such incorrect operation and may overheat or even malfunction.

### 6.15.1.1 Pickup water spray nozzles

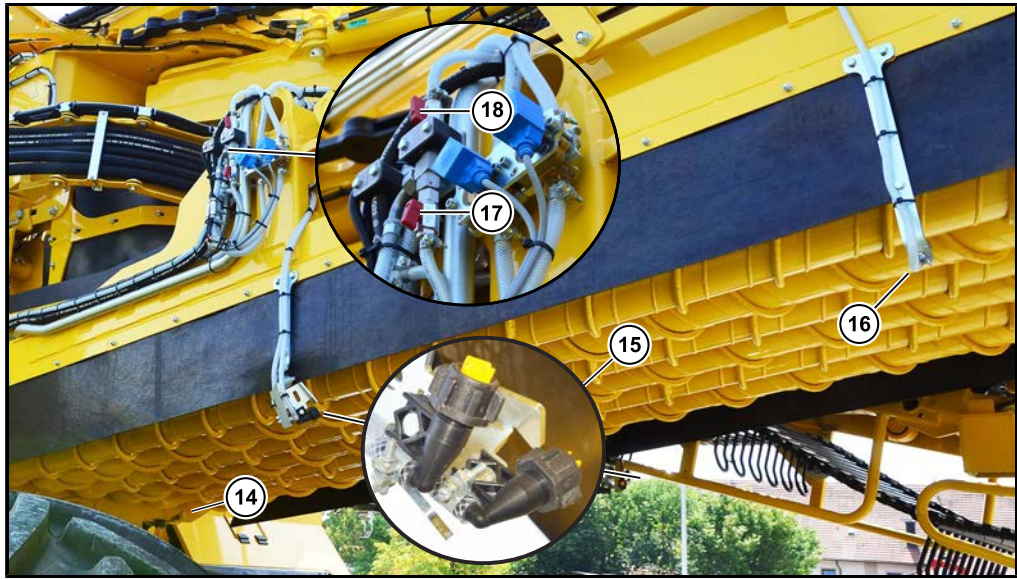


*Pickup water spray nozzles on DUO water spray system (option)*

- (8) Outer spray nozzles on the pickup
- (9) Central spray nozzles on the pickup
- (10) Inner spray nozzles on the pickup
- (11) Shut-off valves for central spray nozzles



### 6.15.1.2 Recleaner water spray nozzles



*Recleaner water spray nozzles on DUO water spray system (option)*

- (14) Front spray nozzles on the recleaner
- (15) Central spray nozzles on the recleaner
- (16) Rear spray nozzles on the recleaner
- (17) Stop valve for the rear half of the centre spray nozzles
- (18) Stop valve for the rear spray nozzles

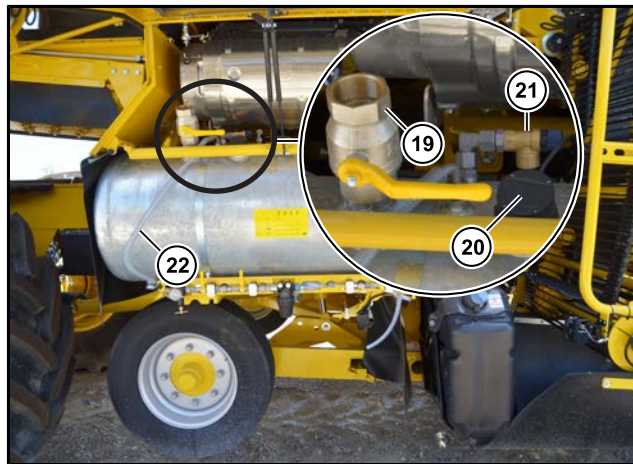
## 6.15.2 Filling water tank

### CAUTION



#### Risk of injury due to dirt particles and spraying water.

- Before starting to fill the water tank, open slowly and carefully the ball valve at the filler neck (19) to release any pressure accumulated in the water tank.
  - Do not bend over the filler opening until the pressure has been released.
- 
- Close the ball valve (1) (OFF position) before filling.
  - Before starting to fill the water tank, slowly open the ball valve at the filler neck (19) to release any pressure.
  - Use only clean water without impurities for filling the tank.
  - The transparent hose (22) shows the water level in the tank during filling.
  - Close the ball valve at the filler neck (19) once the tank is full.



- (19) Filler neck with ball valve  
 (20) Fill level indicator sensor  
 (21) Safety pressure valve  
 (22) Transparent hose for level indicator

### WARNING



#### Hazard of severe injuries.

The response pressure of the safety pressure valve (21) is factory-set to 6 bar.

- The setting of this safety component must not be changed under any circumstances, because any changes may result in serious injury or major property damage.
- In case of replacement, install only an original ROPA spare part.

### 6.15.2.1 Filling water tank with optional GEKA coupling

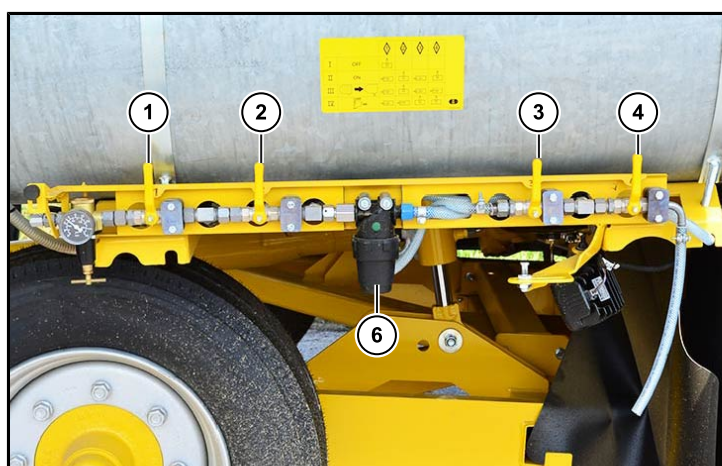


With the GEKA coupling option (23), you can refill the water tank during loading. Always make sure that you are outside the hazard zone of the machine ([See Page 27](#)). You can fill the water tank under pressure or without pressure. In order to fill without pressure, open the ball valve at the filler neck (19) and constantly check the filling level at the level control (22).

### 6.15.3 Operation of water spray system

#### 6.15.3.1 Setting of the four ball valves in the four operating modes

		1	2	3	4	
I	OFF					
II	ON					
III						
IV						



Set the four ball valves to the required operating mode.

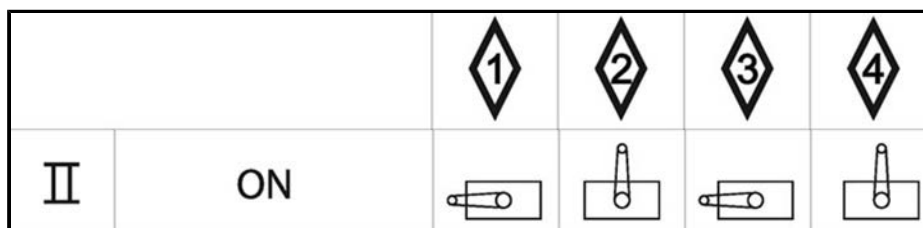
#### Operating mode I OFF

To deactivate the water spray system, set the ball valve (1) to the position of operating mode I.

		1	2	3	4
I	OFF				

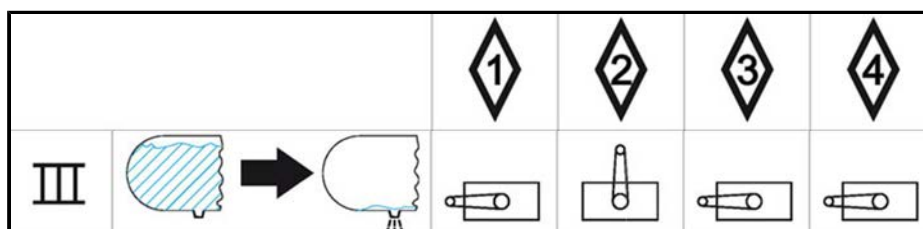
### Operating mode II ON

To activate the water spray system, set four ball valves to the position of operating mode II.



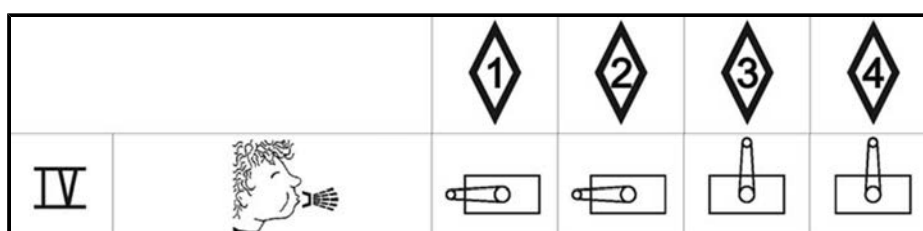
### Operating mode III Draining water and emptying the tank

If there is a possibility of freezing or before extended downtime we recommend draining the water from the system completely to prevent damage to the water spray system. The diesel engine of the machine should be running to drain the tank faster (for compressed air supply).



### Operating mode IV Blowing out spray nozzles and pressure lines

Pressure lines and spray nozzles must be blown out if there is danger of freezing. Set four ball valves to the position of operating mode IV and switch on the water spray system using the screen button (24) ([See Page 291](#)). Leave the system switched on until only air without water vapour comes out of all spray nozzles. Finally, open the water filter (6) and drain the filter holder. Screw the filter holder with the filter screen back onto the filter head.



#### ADVICE

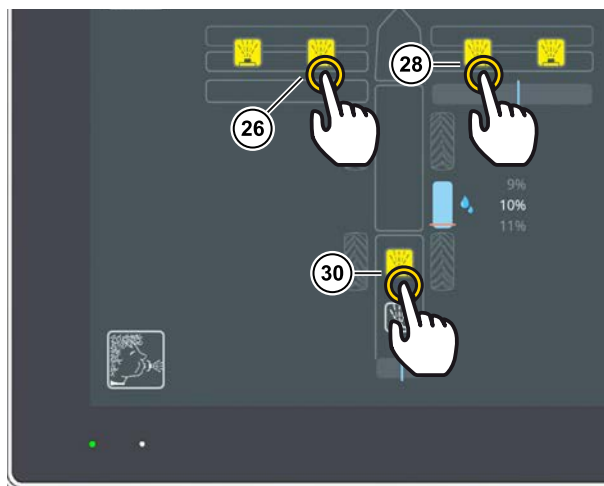


If the water spray system function is not required, set the ball valve (1) to the position of operating mode I. Thus, you disconnect the water tank from the compressed air reservoir. This allows you to achieve the necessary reservoir pressure of the pneumatic system in the shortest possible time after the diesel engine has been started.



### 6.15.3.2 Duo water spray system (option)

With the optional Duo water spray system one additional water valve is installed in each side pickup section and in the recleaner. This water valve switches additional spray nozzles. These water valves are switched on and off individually via the switch panels (26), (28) and (30). The timer control and pressure control also actuate the additional water valves.

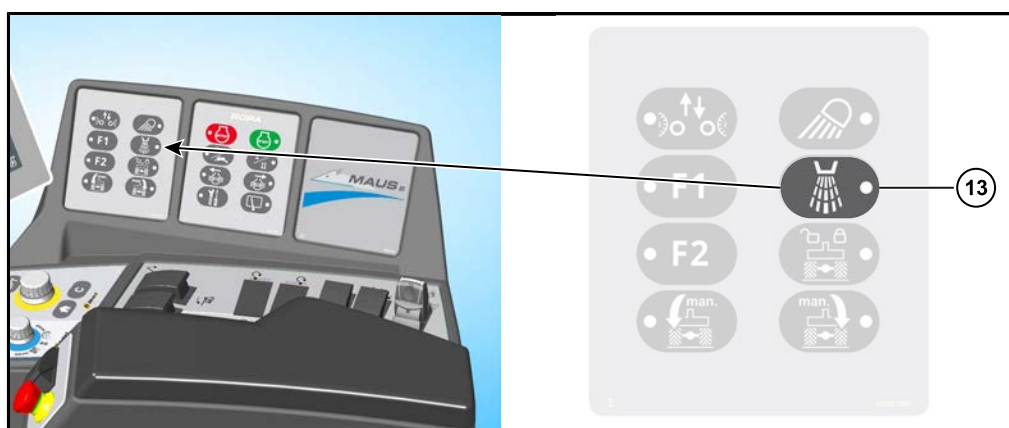


- (26) Spray nozzles on pickup left (optional Duo water spray system)
- (28) Spray nozzles on pickup right (optional Duo water spray system)
- (30) Spray nozzles on recleaner (optional Duo water spray system)

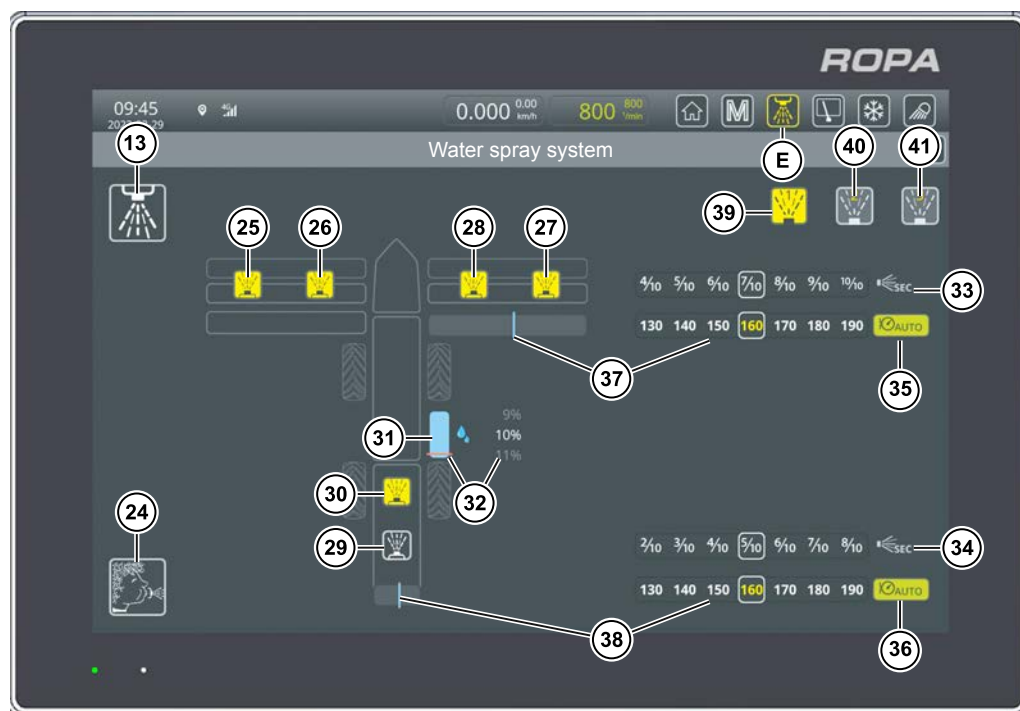
### 6.15.3.3 Operation of the water spray system

**Set the four ball valves to the required operating mode.**

The water spray system of the machine is controlled from the R-Touch. The Water spray system menu appears when the key (13) on keypad I is pressed and held down for three seconds. Briefly pressing the key switches the water spray system with the last selected setting on or off.



Similarly, the menu can be accessed by touching the symbol **(E)** on the R-Direct functional area.



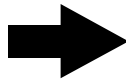
*Overview of water spray system menu (with optional DUO water spray system)*

- (E)** Opens the water spray system menu
- (13)** Activate/deactivate water spray system
- (24)** Switch on/off blowing out of spray nozzles and pressure lines ([See Page 289](#))
- (25)** Activate/deactivate spray nozzles pickup left
- (26)** Activate/deactivate spray nozzles pickup left (Duo water spray system option)
- (27)** Activate/deactivate spray nozzles pickup right
- (28)** Activate/deactivate spray nozzles pickup right (Duo water spray system option)
- (29)** Activate/deactivate recleaner spray nozzles
- (30)** Activate/deactivate recleaner spray nozzles (Duo water spray system option)
- (31)** Water tank fill level indicator in 20%-steps
- (32)** Adjustable warning threshold for water tank filling level
- (33)** Adjusting timer control (4-part pinch rollers) [See Page 293](#)
- (34)** Adjusting timer control (recleaning) [See Page 293](#)
- (35)** Activate/deactivate water spray system automatic pressure control (4-part pinch rollers)
- (36)** Activate/deactivate water spray system automatic pressure control (recleaning)
- (37)** Adjusting pressure control (4-part pinch rollers) [See Page 294](#)
- (38)** Adjusting pressure control (recleaning) [See Page 294](#)
- (39)** Water spray program 1
- (40)** Water spray program 2
- (41)** Water spray program 3

The adjustable warning threshold **(32)** for the message "Refill water tank" is set in %. We recommend the 0 % setting if the function of water spray system is not required. This setting deactivates the warning.



### ADVICE



The level sensor evaluates the filling level only in 5 stages (20 %), therefore small steps in the adjustment of the warning threshold are sometimes not effective.

#### 6.15.3.4 Water-saving operation (timer control)

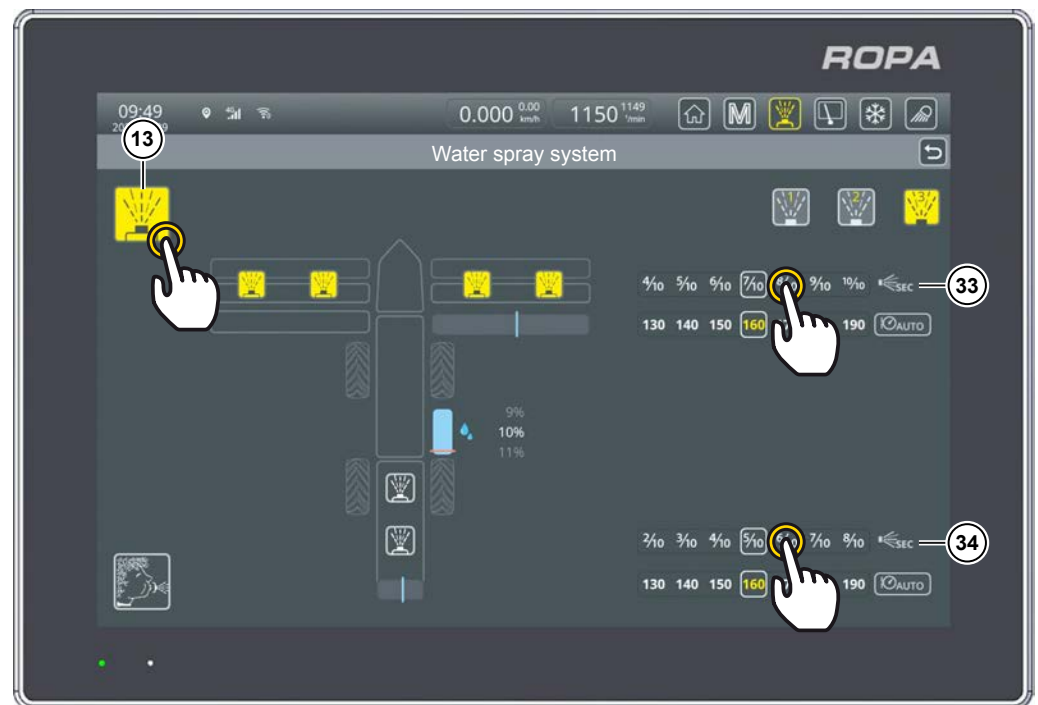
The system only sprays if the machine drive is switched on.

Touch the switch panel (13) to activate timer control.

For the best possible control of wetting and to save water at the same time, the spray times for the 4-part pinch rollers (33) and recleaning (34) can be set separately. Tap the indicator bar and move it to the left or to the right.

- completely to the right (10/10), continuous operation
- to the left, reduces the operating time of the spray interval One interval is 10 seconds.

A setting of 5/10 means that the system sprays for 5 seconds and then stops for 5 seconds.



### 6.15.3.5 Water-saving operation (pressure control)

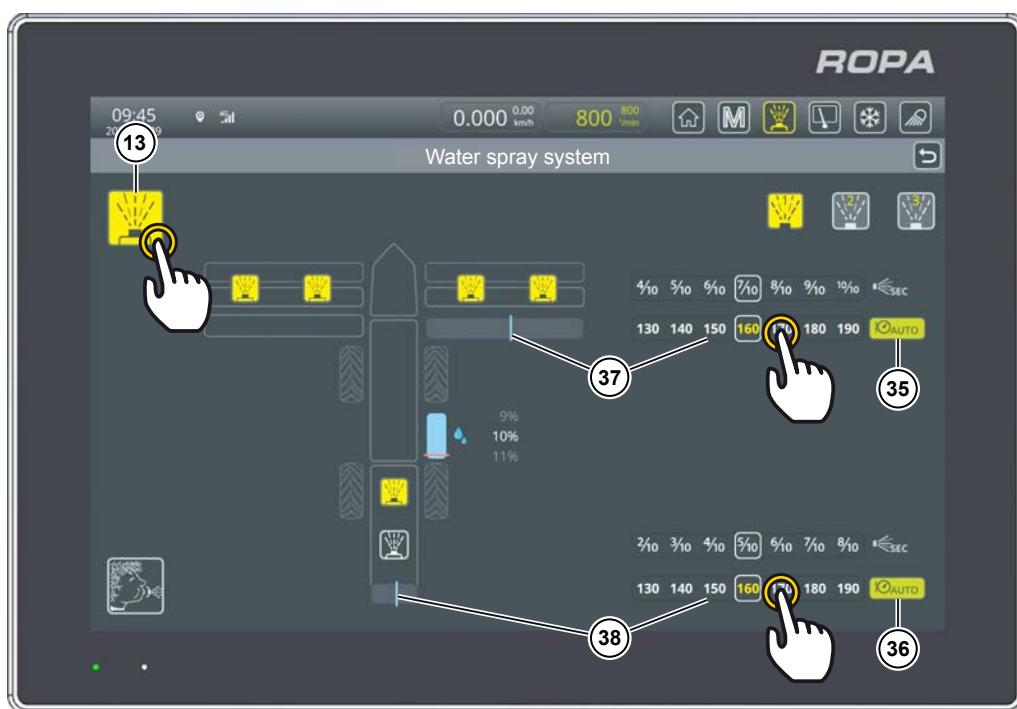
Touch the switch panel (35) to activate the pressure control of 4-part pinch rollers and the switch panel (36) to activate the pressure control of the recleaner. Touch the switch panel (13) to switch on the water spray system.

If the pressure thresholds that are set in this menu via the indicator bars (37) and (38) are exceeded, the water spray system will start spraying.

If the pressure falls below the threshold, spraying will automatically stop.

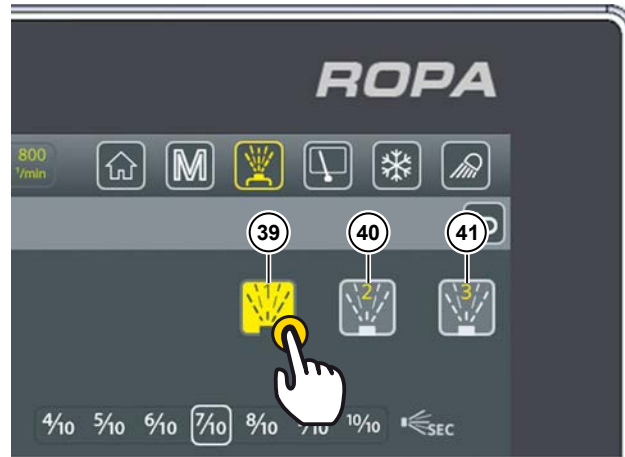
Touch the pressure threshold for the 4-part pinch rollers (37) and move it to the left for earlier start the water spray system (lower pressure), or to the right to delay the start of the water spray system (higher pressure).

Touch the pressure threshold for the recleaner (38) and move it to the left for earlier start of the water spray system (lower pressure), or to the right to delay the start of the water spray system (higher pressure).



### 6.15.3.6 Configuring water spray programs

Water spray programs 1-3 can be individually assigned as desired. To do this, activate the desired spray nozzles and set the time and pressure control. By touching and holding one of the water spray program touch fields (39-41), you can save the current selection to this program.



- (39) Water spray program 1
- (40) Water spray program 2
- (41) Water spray program 3

### 6.15.3.7 Cleaning of the water filter screen

Every time you fill up, check whether the filter screen (6a) in the filter bowl (6) is dirty and clean the screen if necessary.

To open the water filter, close the ball valves (1), (2) and (3). Then open ball valve (4) to release the pressure.

If the filter screen is damaged, a new one can be ordered under ROPA item no. 208003200.



### **6.15.3.8      Cleaning filter screen in the water nozzles**

Each nozzle holder of the water spray system also contains a filter sieve. When the nozzle is removed, you can take out the filter and clean it.



*Filter (ROPA item no. 420057600) in nozzle holder*

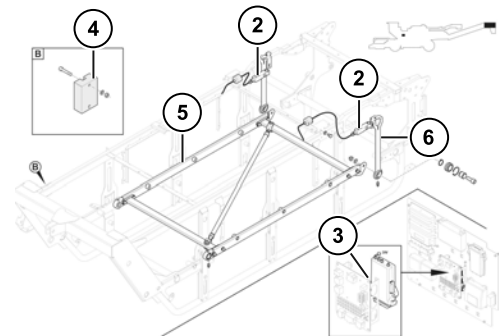
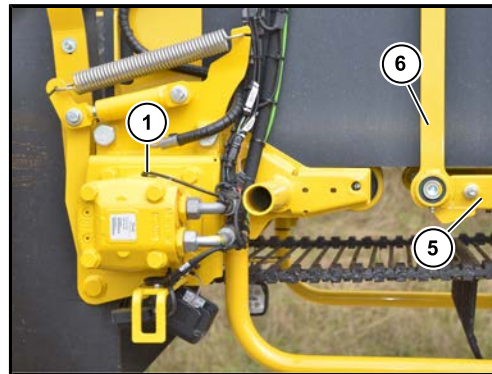
## 6.16 Scales (option)

### 6.16.1 Design and function

This is a conveyor scale. The amount of beet is recorded on a weighing frame inside the truck conveyor articulation part before overloading. It weighs the load with the dirt content (referred to in general as sugar beet) transported to the truck by the conveyor via two highly sensitive electronic weighing cells. The accuracy of every single weighing process is primarily influenced by the correct operation of the scales and is not subject to the influence of the manufacturer.

In addition to correct operation, the following factors also have a significant influence on the accuracy of the weighing process:

- Ground characteristics
- Degree of contamination of the sugar beets
- Degree of contamination of the support rollers in the weighing frame and the support rollers, located immediately in front of and behind the weighing frame
- The inclination angle of the truck loader articulated section

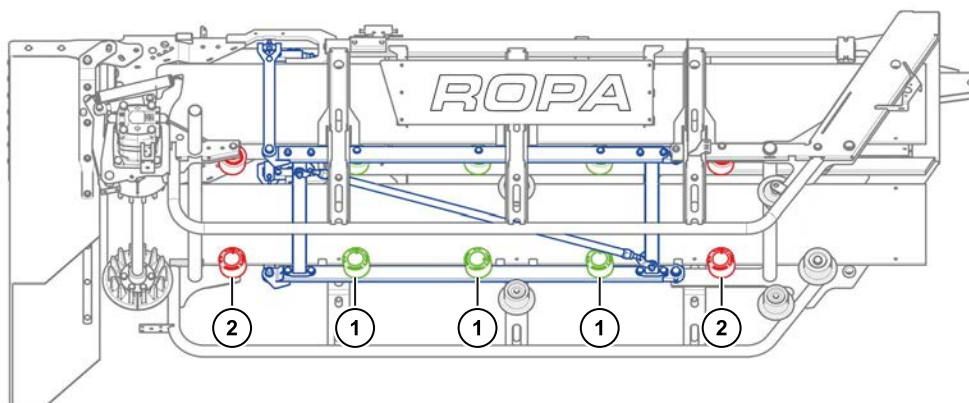


- (1) Rotation speed sensor in the drive motor
- (2) Weighing cell with CAN bus data transfer
- (3) Scale computer in the central electrics
- (4) Inclination sensor
- (5) Weighing frame
- (6) Connecting lever weighing cell

## 6.16.2 Operation of scales

The following items are vitally important to ensure an optimal weighing result:

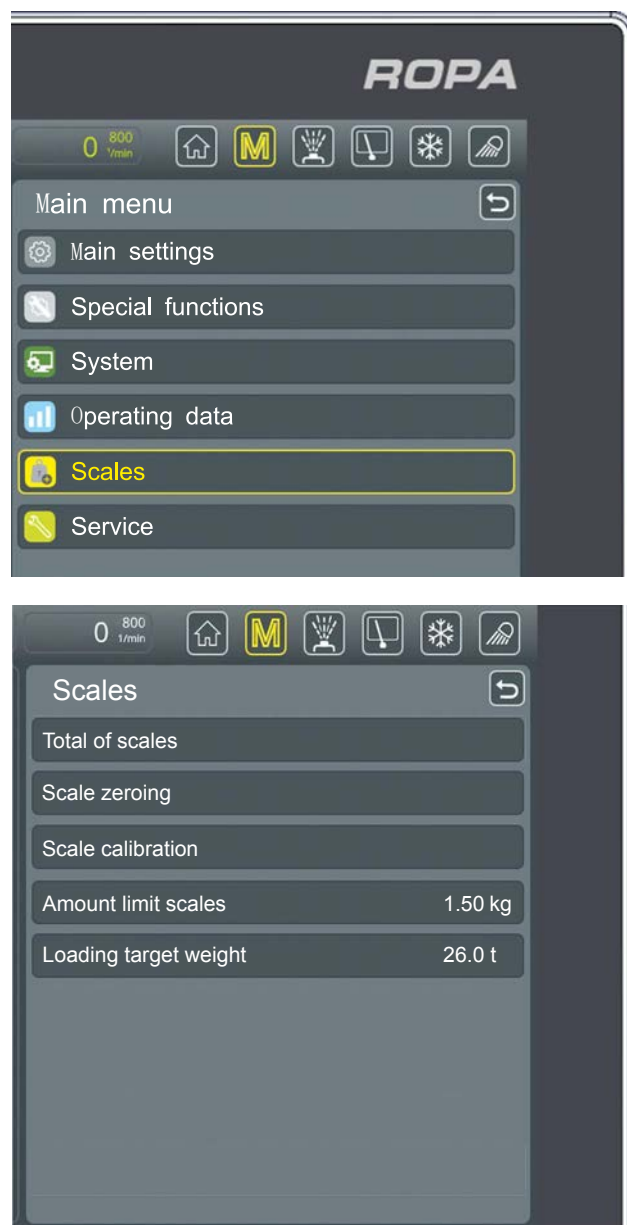
- The belt tension should be as low as possible.
- Clean the support rollers on the weighing frame (1) and also the support rollers (2) in front of and behind the weighing frame on a regular basis. ([See Page 420](#)).



- During weighing move the truck conveyor slowly and as smoothly as possible.
- Keep the inclination angle of the truck conveyor as constant as possible during weighing.
- Do not lift the truck conveyor at too much of an angle if at all possible. The display of the inclination angle on the terminal should be highlighted in grey if possible. If the colour changes to orange, it might lead to higher differences in weighing results.
- Soil on the conveyor will seriously affect the weighing result. For this reason run a zeroing ([See Page 304](#)) at regular intervals. If the beets are very dirty or the soil is very sticky we recommend zeroing at every 3rd to 5th truck. Zeroing is required because otherwise the dirt particles adhering to the conveyor will be regularly weighed with the load.  
A new zeroing is required whenever the proportion of soil on the conveyor changes. The same applies EVERY time the machine is moved. In our experience the major cause of incorrect weighing results is because zeroing is not carried out frequently enough.
- If weighing results are incorrect in spite of regular zeroing, first clean the scale. ([See Page 420](#)).
- If it does not help, the scale must be recalibrated. ([See Page 307](#)).

### 6.16.2.1 Scale display field and menu

Access via the R-Direct main menu or directly by touching the switch panel (14) on the scale display field.



#### *Scale menu*

Total of scales ([See Page 311](#))

Scale zeroing ([See Page 304](#))

Scale calibration ([See Page 307](#))

Amount limit scales ([See Page 302](#))

Loading target weight ([See Page 312](#))



### Display field Scales



- (5) Start/end weighing
- (6) Reset the currently loaded weight
- (7) Reset the weight of the day counter
- (8) Current fuel consumption
- (9) Weight of the day counter
- (10) Current capacity
- (11) Display of loading angle (inclination of truck conveyor articulation)
- (12) Display of set summation limit
- (13) Status indicator bar showing load on weighing cells
- (14) Shortcut to Scale Menu
- (15) Currently loaded weight

#### 6.16.2.2 Commissioning after delivery of machine

The scales must always be calibrated before using for the first time. The calibration is performed in two stages, which must be performed in the sequence described every time. ([See Page 307](#))

#### ADVICE



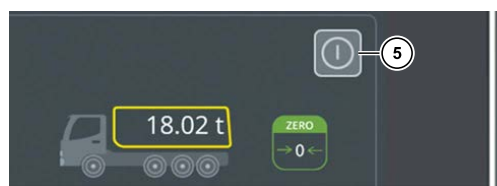
If a component of the scales (except for the speed sensor, in some cases also the inclination sensor) is replaced, it must be recommissioned. Only authorised service personnel may carry out this procedure, as it is not explained in this manual.

### 6.16.2.3 Start/end weighing



Touch the field (5) to start the weighing process.

*Weighing started: Scale touch field highlighted in green*



To end or stop the weighing process touch the field (5) as well.

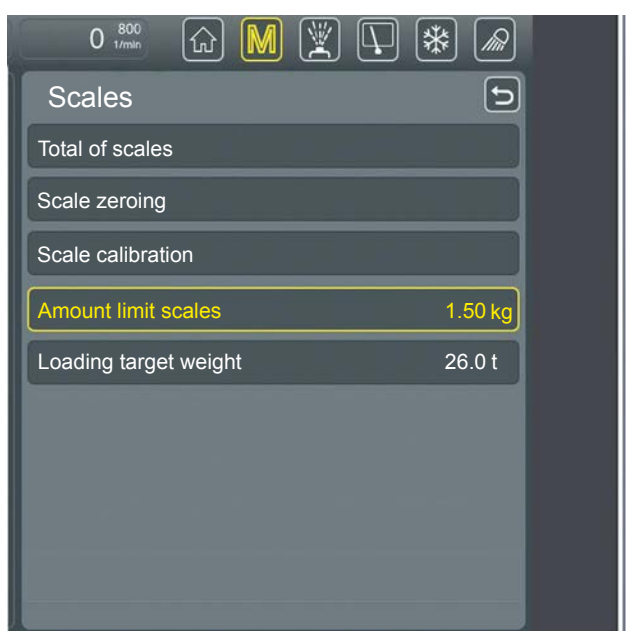
*Weighing finished or interrupted: Scale touch field highlighted in grey*

#### 6.16.2.4 Amount limit scales

The indicator status bar (13) displays the load on the weighing cells. The amount limit (12) (= blue mark) is the minimum load on the weighing section above which the volume on the conveyor is detected and the weight is added up. The volume on the conveyor is displayed in the bargraph (13), coloured green.



*Amount limit scales too high, scales add weight*



This amount limit can be changed in the "Amount limit scales" menu.

#### ADVICE



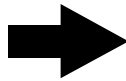
The default factory setting gives a good weighing result under normal conditions. However, it is important to adjust the amount limit to the current conditions in order to achieve a good weighing result.



*Amount limit scales too low, weighing stopped*

If the grey bar graph is on the left of the amount limit, the scales do not add any weight to the weighed quantity.

#### ADVICE



##### **Example of an amount limit set too low:**

There are no beets on sieve chain of the truck conveyor, yet the weight of the current loading increases slowly.

Cause: The amount of dirt adhering to the conveyor since the last zeroing causes a load that is already above the amount limit. This dirt is now weighed. Also, too high conveyor tension can be the reason for adding up and displaying some loading weight.

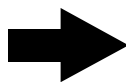
##### **Example of an amount limit set too high:**

Beet is permanently falling from the truck conveyor onto the transport vehicle. 2 beets or more every second. Nevertheless, the weight of the current loading does not increase.

Cause: The beet quantity is not high enough to bring the load above the amount limit.

Especially when *driving into a beet pile* (when many beets come over the previously empty truck conveyor) and at the *end of the pile* during residual beet pickup (less beets, at the end only a few beets come in one minute), a correctly set truck conveyor is crucial for a good weighing result.

#### ADVICE



For the highest possible weighing accuracy, the conveyor section of the machine should not be allowed to run empty when a truck is changed. Thus, any deviation caused by falling below the amount limit is avoided. The truck conveyor starts smoothly even when loaded due to the proportional control of the pump.

### 6.16.2.5

#### **Reset the currently loaded weight**

There are two ways to reset the weight of the current loading (14) after changing trucks.



- Touch the switch panel (6).
- Keys on the right joystick. Press and hold keys (11), (12) and (13) simultaneously for a short time and then release them. This function is not yet implemented in the machine software ( as of August 7, 2023).

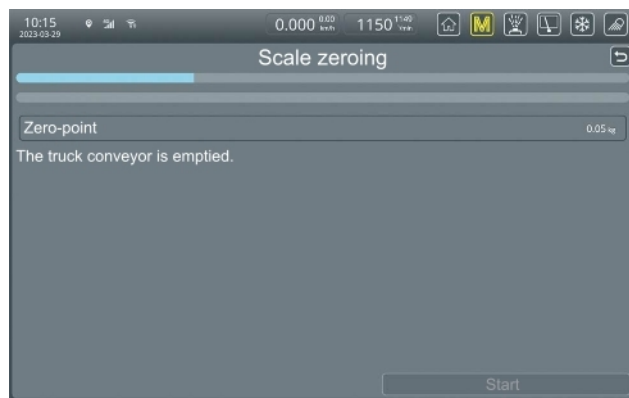


(1) Indicator of the previous zero point of the scale

Press the "Start" screen button.

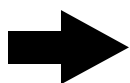


The following message appears: "Switching on machine drive"..

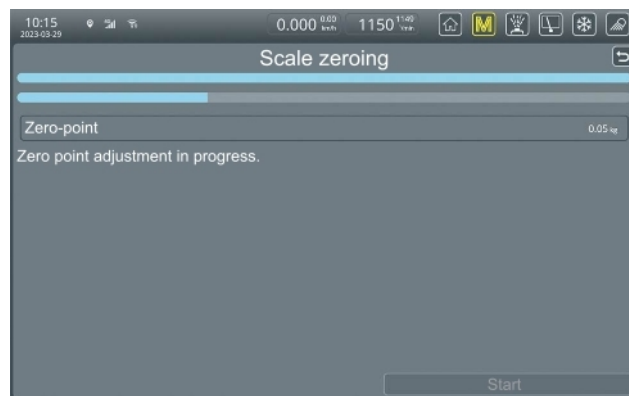


The following message appears: "The truck conveyor is emptied".  
The indicator graph above must now progress to the right end.

#### ADVICE



Do not switch off the machine drive during this period!  
Switch it off only in case of emergency!



The following message appears: "Zero point adjustment in progress". The indicator graph below must now progress to the right end.

#### ADVICE



Do not switch off the machine drive during this period!  
Switch it off only in case of emergency!



(2) Display of the new zero point

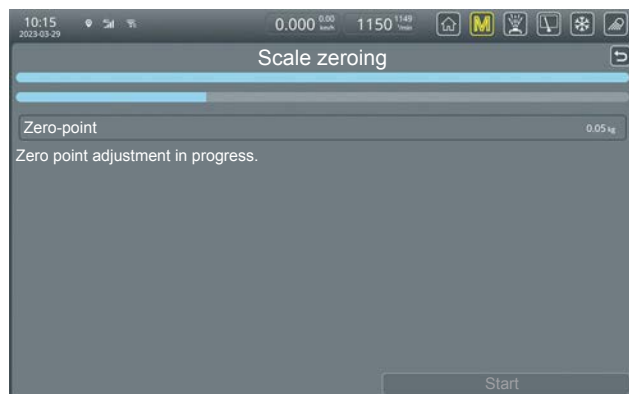
Exit the menu by pressing the "Return" key.

Please wait until the R-Touch displays the following message: "Zero point adjustment is completed." This indicates that the zeroing process is complete.

#### ADVICE



You can repeat the zero point adjustment as often as you like, but the result may not differ significantly. If the difference is too great each time you try again, the cause of the difference must be eliminated. First of all, try to clean the scales ([See Page 420](#)).

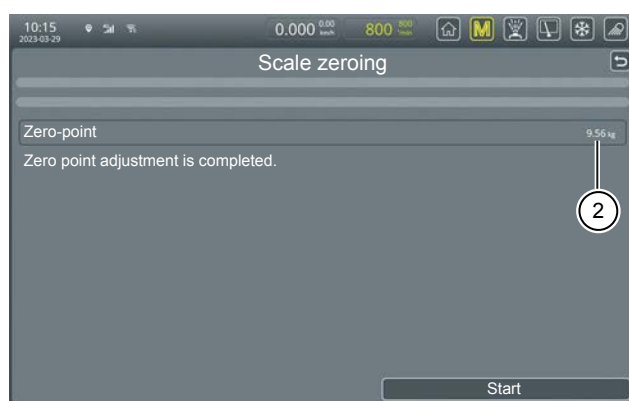


The following message appears: "Zero point adjustment in progress". The indicator graph below must now progress to the right end.

#### ADVICE



Do not switch off the machine drive during this period!  
Switch it off only in case of emergency!



Please wait until the R-Touch displays the following message: "Zero point adjustment is completed." This indicates that the zeroing process is complete.

(2) Display of the new zero point

Exit the menu by pressing the "Return" key.

#### ADVICE

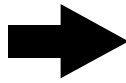


You can repeat the zero point adjustment as often as you like, but the result may not differ significantly. If the difference is too great each time you try again, the cause of the difference must be eliminated. First of all, try to clean the scales ([See Page 420](#)).



### 6.16.2.7 Scale calibration

#### ADVICE



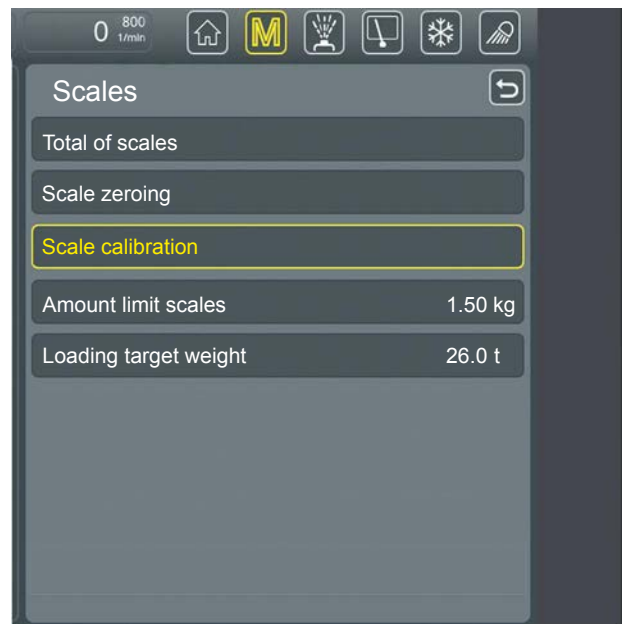
Calibration is not a daily process. The calibration value should always be adjusted after consulting a responsible person!

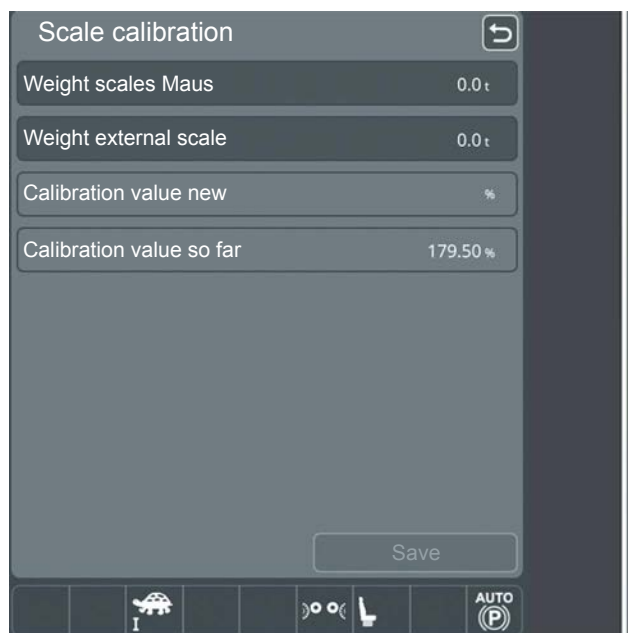
Clean the rollers on the weighing frame as well as preceding and following rollers. The truck conveyor belt and its carriers should be kept either clean or only very slightly dirty. Perform zeroing ([See Page 304](#)). Reset the day counter and the weight of the current loading. Weigh the first loading and note the indicated weight.

Have the actual weight of this load weighed on a calibrated scale by the consignee. This is the only way to include the loss of weight due to the fuel used during transport to the consignee.

**As soon as this exact value is available, proceed as follows:**

Reset the day counter and the weight of the current loading. Select the "Scale calibration" menu item in the Scales menu.



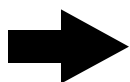


Scale calibration

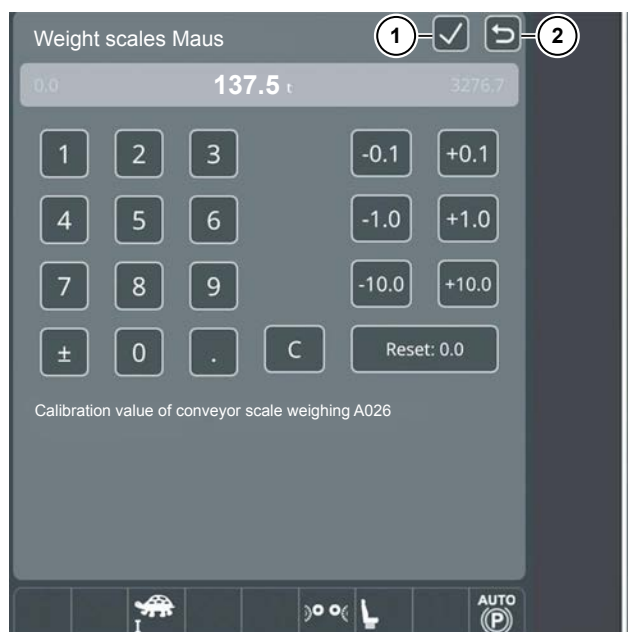
Weight scales Maus	0.0 t
Weight external scale	0.0 t
Calibration value new	%
Calibration value so far	179.50 %

Save

**ADVICE**



There should be no beginning or end of pile within this loading.



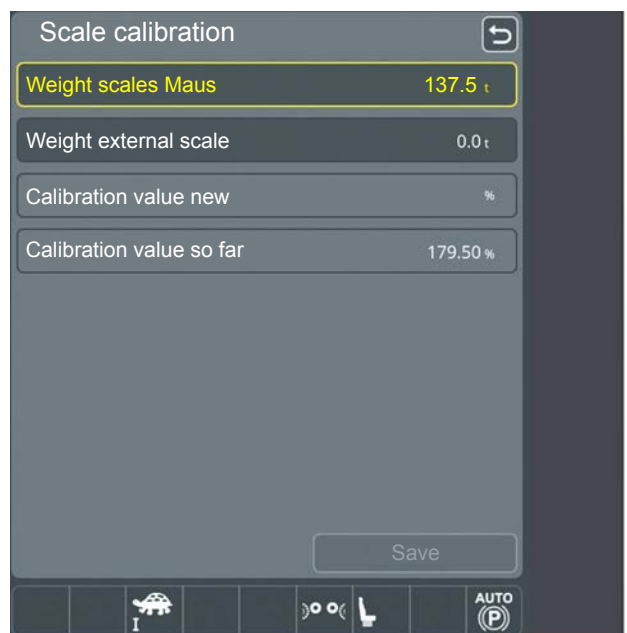
Weight scales Maus

0.0 137.5 t 3276.7

1	2	3	-0.1	+0.1
4	5	6	-1.0	+1.0
7	8	9	-10.0	+10.0
±	0	.	C	Reset: 0.0

Calibration value of conveyor scale weighing A026

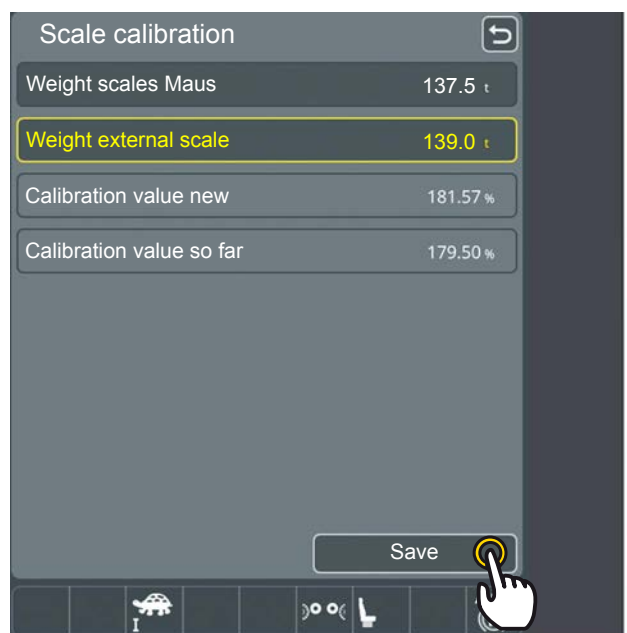
Fill in the weight, that you have recorded, here: "Weight scales Maus". Confirm the entry with (1). If you are uncertain, cancel with (2).



Scale calibration	
Weight scales Maus	137.5 t
Weight external scale	0.0 t
Calibration value new	%
Calibration value so far	179.50 %
Save	

Enter in the "Weight external scale" the actual weight that was determined for this loading with the external calibrated scales of the consignee and confirm the input.

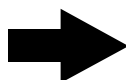
The system now calculates the new calibration value and displays the previous and the new calibration value.



Scale calibration	
Weight scales Maus	137.5 t
Weight external scale	139.0 t
Calibration value new	181.57 %
Calibration value so far	179.50 %
Save	

Touch the "Save" key and close the menu with the "Return" key.

#### ADVICE



The more loadings you have recorded for calibration, the better it is for a "meaningful" calibration value.

We recommend recording the weight of at least five truck loads, better even ten or more.

There should be no beginning or end of pile as well as no zeroing performed within those loadings.

Once the correct calibration value has been determined, the calibration value can also be refined using the deviation of the amount per week (only if the scales are operated in a consistent manner and the loading conditions are reasonably similar).

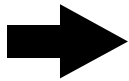
#### **6.16.2.8 Continuing operation of scales**

Follow the directions in [Page 298](#).

Perform zeroing at regular intervals.

Check the accuracy of the scales regularly. Compare the weight of a load displayed by the scales with the weight recorded externally on the calibrated scale of the consignee. Calibrate the scales immediately should any large deviations occur.

##### **ADVICE**



The weighing accuracy depends on the attention of the user. Regular zeroing, careful calibration and as little soil accumulation on the conveyor will ensure continuing weighing accuracy.

#### **6.16.2.9 Scale wizard interface (option)**

Optionally, the machine can be equipped with an interface for data transfer from the scales.

Südzucker AG's TMS device processes the data from the scales and lists the weight of each loading of the Maus. After the truck has been weighed on the factory scales, it shows you on the TMS device the weight of the loading determined there and the deviation from the weighing result of the Maus.

Thus, you always have an automated overview of the actual accuracy of the scales and can react accordingly.

### 6.16.2.10 Reset scale counter

Select "Reset the weight of the day counter" (19) on the scale display field.

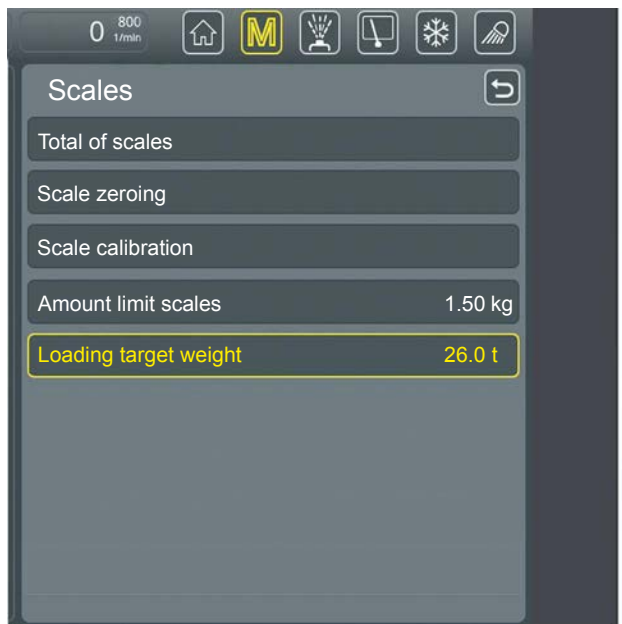


Confirm the "Reset day counter?" query touching the "Yes" button (2). Or select "No" to exit the menu without clearing the counter.

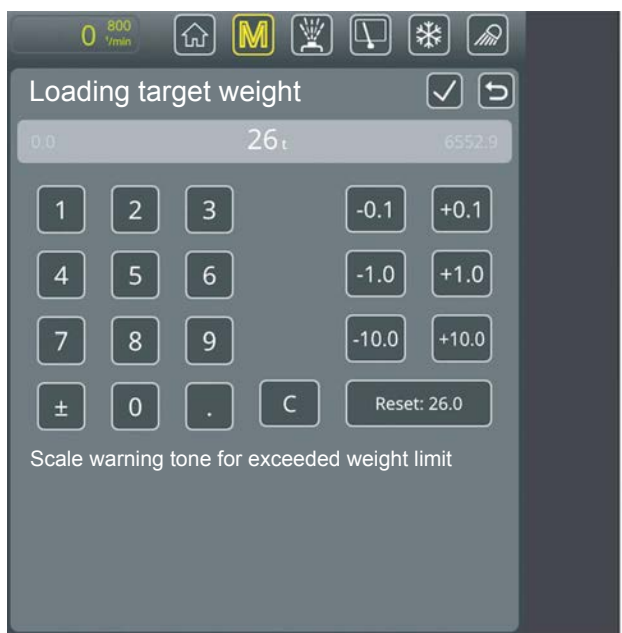
The "Amount season" can only be deleted by deleting the "Statistics season" ([See Page 122](#)).

### 6.16.2.11 Loading target weight

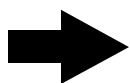
In the menu "Scale", submenu "Loading target weight", you can set a target weight whereby a signal tone sounds as soon as this weight has been reached during loading.



Select the line "Target weight" to enter the desired value.



#### ADVICE

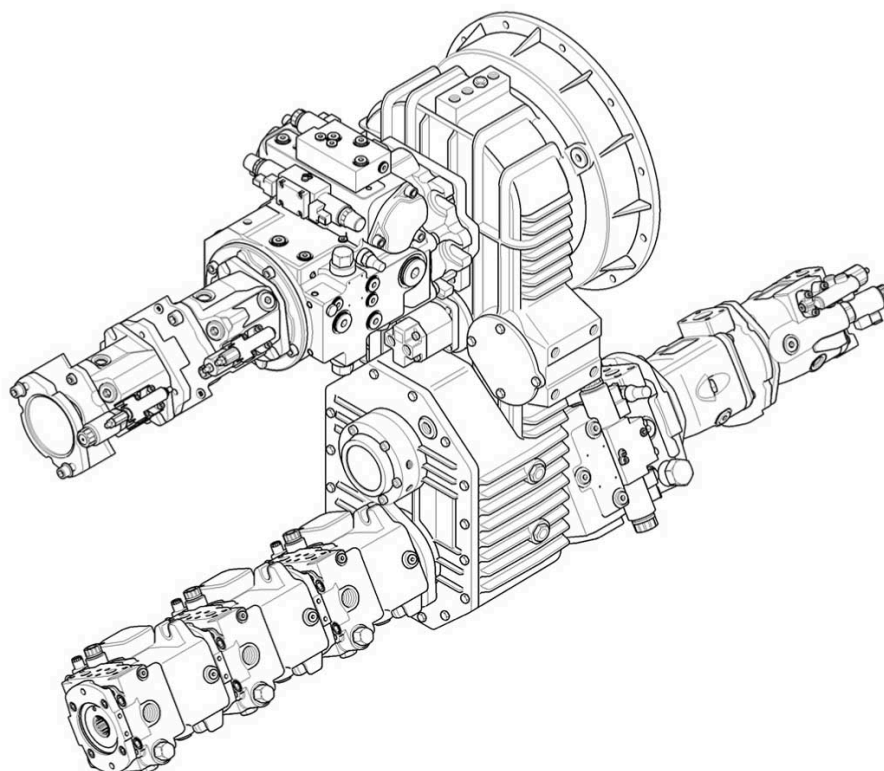



This function facilitates the correct loading of the transport vehicles. There is no need in constant monitoring of the scales. A signal tone instructs the user to check the scale shortly before the desired loading limit is reached in order to avoid an unintentional overloading.

## 6.17 Pump distributor gears



The pump distributor gears is directly flanged to the diesel engine and transfers engine power to the individual hydraulic pumps. The hydraulic pumps required for loading are connected by a multiple disc clutch. Briefly press the yellow key (6) on the right joystick to switch this clutch and thus the machine drive on and off.



The pump distributor gears are fitted with pressure circulation lubrication. If lubrication is not sufficient, then a warning signal sounds. The R-Touch shows the warning icon .

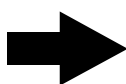
### ATTENTION



#### **Hazard of severe damage to the machine.**

- Immediately shut down the diesel engine if the warning signal sounds while the diesel engine is running.

### ADVICE



The highest allowed engine rotating speed for the drive of hydraulic pumps may not be exceeded, not even for a short time.

Maximum rotating speed:


Machine drive switched on: 1,975 rpm

Machine drive switched off: 2,700 rpm

(in overrun mode with active constant throttle brake)





If the machine drive is switched on the oil pressure in the multiple plate clutch is too low, the following warning icon  is displayed on the R-Touch (pump distributor gears clutch pressure). In this case the machine drive must be switched off immediately and the cause of the low oil pressure found and corrected. If the drive continues to run even though the oil pressure is too low, the multiple plate clutch will be completely destroyed.

## 6.18 Hydraulic system




### WARNING



#### The hydraulic system is under high pressure.

Hot hydraulic fluid may emit from leaks and cause severe injuries! The prestress of the pressure reservoirs is present even when the remaining hydraulic system is already pressureless. When dirt, even only in the smallest quantities, enters the hydraulic system, this may lead to serious damage to the complete hydraulic system.

- Work on pressure reservoirs of the machine may only be performed by trained personnel.
- When working on the pressure reservoirs, the machine must first be rendered completely pressureless.
- The pressure reservoirs themselves may in no case be damaged or opened, because substantial injuries to people can occur due to the constant prestress.
- During all work on the hydraulic system, ensure extreme cleanliness.

	28.3 v		8.1 bar
<b>(1)</b> 	97 %		30 bar
<b>(2)</b> 	22 °C		19 %
	57 °C		51 °C
			86 %

- (1)** Hydraulic oil level  
**(2)** Hydraulic oil temperature


Check the hoses of the hydraulic system for aging and damage on a regular basis! Immediately exchange damaged or aged hoses. Use only original ROPA hoses or hoses fully conforming to the technical specifications of the original hoses! Observe the regionally applying safety regulations on the service life of hydraulic hoses.



The hydraulic system is operational after the diesel engine has been started. To spare the hydraulic system, the engine rotational speed during the first minutes (about 5 min.) after a cold start should in no case exceed the value of 1,300 rpm. Even higher rotational speeds for short times should be avoided. Use the park heating to preheat the hydraulic oil.


At outside temperatures below +10 °C proceed as follows when starting work and switching on the machine: shut off the drives for recleaning and pickup before switching on the machine drive. To do this press the keys **(9)**, **(8)** and **(7)** on the right joystick in succession. These drives will be displayed with grey arrows on the R-Touch. Switch on the machine drive by briefly pressing the key **(6)** on the right joystick. The hydraulic system is operating and the rollers are stationary. Wait two to three minutes before switching on the drives one after the other.



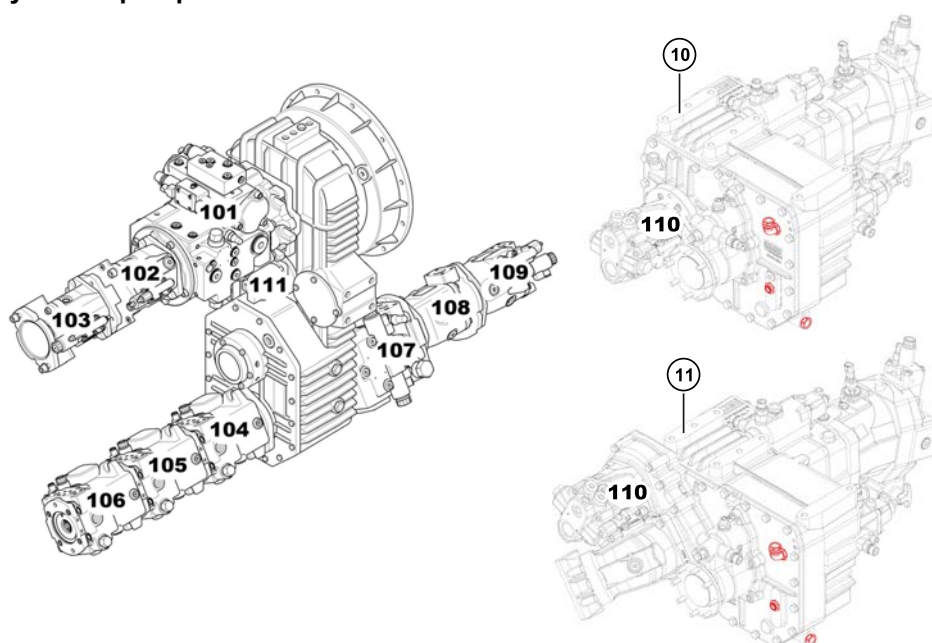
If the temperature of the hydraulic fluid is 70° C or higher, or when the icon  is displayed on the R-Touch, immediately clean the hydraulic oil cooler.

The fan drive of the hydraulic oil cooler automatically reverses when the engine is started. So that soiling is removed to a great extent independently.



The level should be kept in a range between 80% and 100%. Avoid overfilling above 100 %. If the hydraulic fuel level is too low, then the R-Touch displays the warning icon:  hydraulic fluid level too low. Shut the diesel engine IMMEDIATELY down! If the driver ignores this warning, the diesel engine switches off automatically within a short time. Refill hydraulic fluid and determine the cause for the lack of fluid. In case of a burst hydraulic hose, in the most unfavourable case, the complete hydraulic fluid tank becomes empty within 30 seconds.

### Hydraulic pumps:



- (10) Transmission with one traction drive motor  
(11) Transmission with two traction drive motors

Pos.	Function
101	Traction drive
102	Pump operating hydraulics/front axle steering
103	Pump for water/charge air/oil cooler fan drive
104	Pump for 4 pinch rollers
105	Pickup roller pump
106	Pump for conveyor rollers
107	Recleaner drive
108	Infeed conveyor drive
109	Truck conveyor drive
110	Emergency steering pump
111	Pump greasing + coupling PDG

The machine has 9 hydraulic circuits, which are supplied by nine axial piston pumps. Pump number 111 is solely for the transmission clutch and transmission lubrication. It is not connected to the hydraulic system. Pumps 101/102/103/111 operate continuously as soon as the diesel engine is started. Pumps 104/105/106/107/108/109 only operate if the diesel engine is running, the machine drive is switched and the power train is engaged via the multiple plate clutch.

## 6.19 Pneumatic system

The pneumatic system supplies the brake system and the pneumatic system with compressed air.

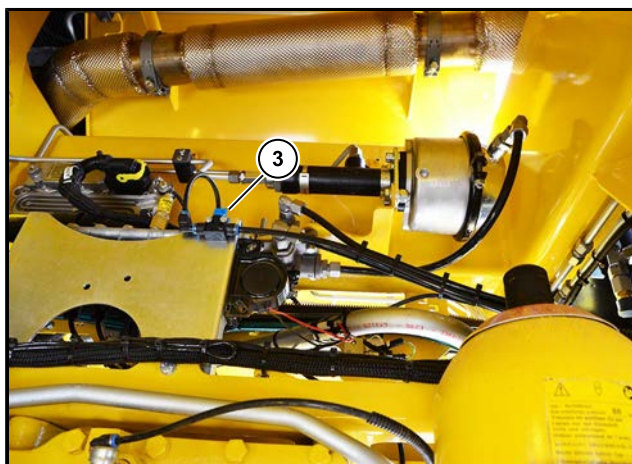
The following processes of the machine are performed by the pneumatic system:

- Switch off all-wheel drive.
- Switch on differential locks.
- Fold the rear view mirror.
- Swing climbing ladder.
- Switch manual transmission, Turtle/Rabbit/I/II operating modes.
- Actuate the rotating seat brake.
- Raise/lower the warning signs.

In addition to the pneumatic system, the air compressor also supplies to:

- The compressed air service connectors on the machine.
- The blow-out gun in the driver's cabin.
- The water spray system (if option is available).


In any case, ensure that the stop cock (3) of the pneumatic system is always open because otherwise a large part of the pneumatic system is out of operation. The stop cock is situated above the manual transmission.



The stop cock is open in the position shown (3). To close, turn it by 90°.

The exact reservoir pressure of the pneumatic system (4) is displayed on the R-Touch.



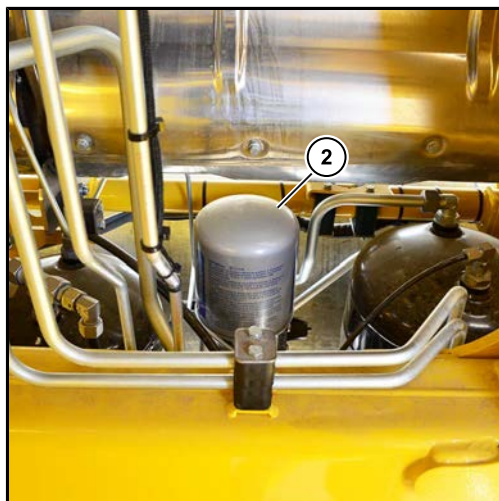
All pneumatically controlled switching processes can only be reliably performed if there is sufficient pressure in the pneumatic system. If the pressure in the pneumatic system is insufficient, the R-Touch displays the following warning icon .

The machine may not be moved as long as this symbol is displayed on the R-Touch.

### 6.19.1 Air compressor

The entire pneumatic system of the machine is supplied with compressed air by a compressor. It is flanged directly to the diesel engine. The air compressor draws air via the air filter of the diesel engine. Once the preset maximum pressure is reached the pressure regulator blows off automatically. The air compressor is maintenance-free.

### 6.19.2 Air dryer

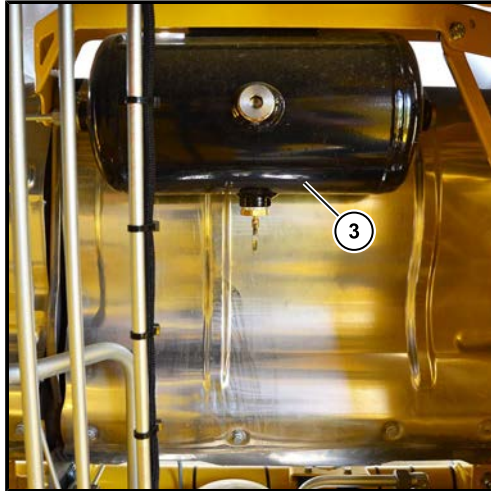


(2) Air dryer

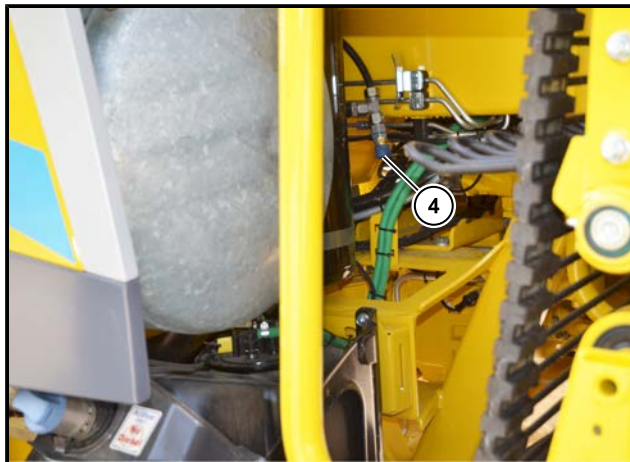
The air dryer (2) is installed under the right side cover. It separates the condensing water before the air reaches the compressed air reservoir. The air dryer contains a heating element that prevents freezing at low temperatures. The air dryer heating element switches on automatically as required.

### 6.19.3 Compressed air reservoir

The machine has five compressed air reservoirs, which are installed under the right side cover. The four large compressed air reservoirs supply the brake system and the pneumatic system with compressed air. The small compressed air reservoir (3) is for regeneration of the air dryer. A compressed air service connector (4) is installed under the tarpaulin on the very front compressed air reservoir.



(3) Compressed air reservoir

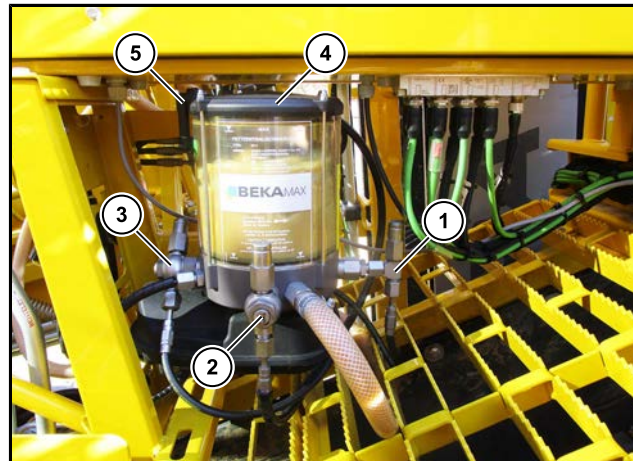


(4) Compressed air coupling on the front compressed air reservoir




## 6.20 Central lubricating system

The machine is fitted with a central lubricating system and has two lubricating circuits in the models with sieve conveyor cleaner and stone remover or three in the model with 8-setpinch roller cleaner.



- (1) Lubricating circuit 1 support
- (2) Lubricating circuit 2 chassis
- (3) Lubricating circuit 3 8-set pinch rollers cleaner
- (4) 2-kg reservoir
- (5) Vent pipe

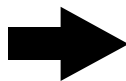


All connected lubricating points are automatically supplied with grease. The lubricating pump supplies the grease to the main distributors, the main distributors distribute the grease to sub-distributors, and these supply it to the individual lubricating points. As long as the lubricating pump is running, a stirring paddle is rotating in the grease reservoir and the R-Touch displays the icon .

### Filling the central lubrication system

The 2-kg supply reservoir (4) is filled up via the refill pump (6) on the grease bucket (7). Never completely fill up the 2-kg supply reservoir of the lubrication pump. Only fill the supply reservoir of the lubrication pump for 90 %. In this way, you avoid blocking of the ventilation pipe (5) on the 2-kg supply reservoir.

#### ADVICE



In any case, make sure that there is always sufficient grease supply in the grease reservoir. In no case may the grease supply be used up so that air enters the pipe system!

#### ADVICE



Fill the 2 kg supply reservoir when the engine is warm from operation as the grease bucket stands on a heated platform. In such a way refilling is possible with a minimum effort.

### 6.20.1 Central lubricating system mode AUTO

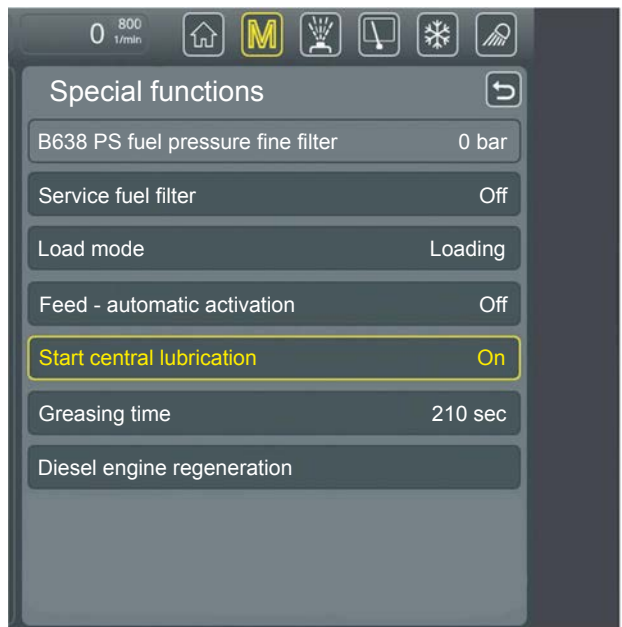
Every time the machine drive is switched on the lubrication pump is switched on for the period that the operator has selected in the "Main settings" menu. The factory setting for this period is 210 seconds. The driver can extend the period to a maximum 300 seconds.

We recommend setting the lubrication period to 180 seconds (pump operating time) for loading up to 20 tons per delivery unit. We recommend a pump running time of about 210 seconds when loading trucks of approx. 28 tonnes, and correspondingly longer pump running times for larger trucks.



## 6.20.2 Intermediate lubrication in central lubricating system

The lubrication system can be manually activated at any time. Switch the option in the R-Touch menu "Special functions", line "Start central lubrication" line from "AUTO" to "ON".

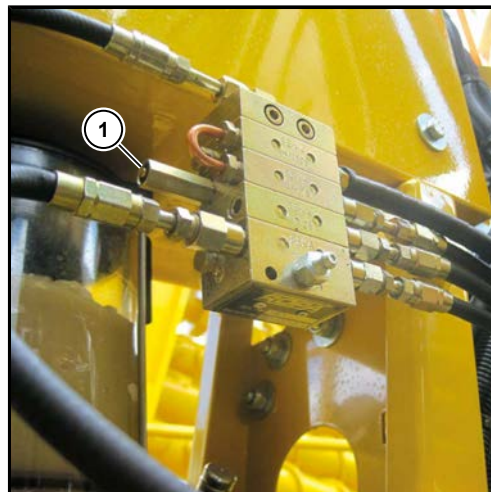


The central lubrication system then non-stop for 20 minutes. After this period of time, it switches back to the AUTO mode. ([See Page 322](#))

Regularly check the lubricating pipe system. Check the lubricating system daily for faults. One option is to check the two or three main distributors. An indicator pin is installed there for checking the function. This indicator pin moves slowly when the grease flows through the main distributor. This shows whether the pump element of this lubricating circuit is operating. This check can be carried out safely with the intermediate lubrication.

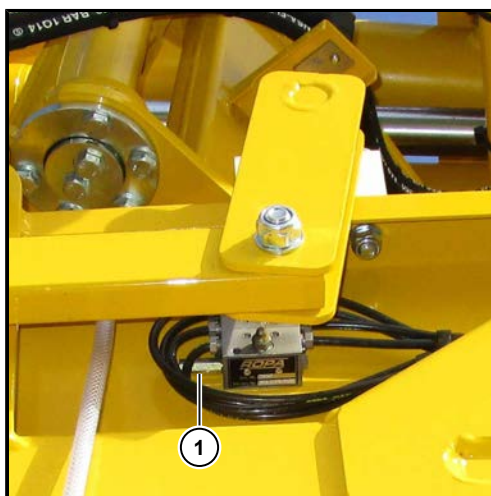


*Pickup main distributor (right side of the pickup central section)*



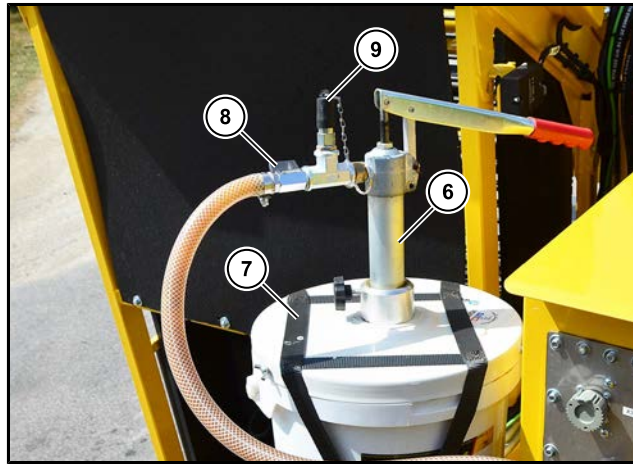
*Chassis main distributor (right next to lubrication pump)*

(1) Indicator pin



*Main distributor for 8-set pinch rollers cleaner (on the left of the recleaner frame)*

### 6.20.3 Filling up grease gun



- (6) Central lubrication refill pump
- (7) 18-kg grease bucket
- (8) Stopcock
- (9) Nipple for filling up the hand lever grease gun

A stopcock (8) and a plug-in connector (9) for filling the hand lever grease gun is located in the supply hose to the lubricating pump. It enables direct filling of the hand lever grease gun in the on-board tool kit from the grease bucket. For this purpose, press the hand lever grease gun into the connecting nipple (9) and close the stopcock. When you press the pump lever of the grease bucket, then the hand lever grease gun is filled up with lubricating grease.

## 6.21 Video system

### WARNING



The video system is solely for assistance and may show obstacles in a distorted perspective, incorrectly or do not show at all. It is not a substitute for your attention. The video system cannot display all objects that are very close and/or above the rear view camera. It does not warn you about collision, people or objects. You are responsible for the safety and must pay attention to your immediate surroundings. This applies not only to the rear, but also to the area in front of and on the sides of the machine. Otherwise you might not see people or objects, and continue driving, causing injuries to people or damage to property and the machine.

The video system could either fail or work incorrectly, when

- it rains heavily, snows or is foggy.
- the camera is exposed to very strong white light. White streaks may appear on the screen.
- the camera lens is dirty or covered.

The cameras are maintenance-free. When the image quality deteriorates, you should clean the lens cover using a soft, clean and lightly moistened cloth. When cleaning, make sure that you do not scratch the lens cover.

The images from the cameras can be displayed on the auxiliary terminal. You can select the desired camera swiping sideways on the terminal ([See Page 150](#)). Images of up to 4 different cameras can be displayed simultaneously.

The vehicle is equipped with the following cameras:

- Back run camera ([See Page 327](#))
- Central mark camera ([See Page 328](#))

#### Optional

- Recleaner camera ([See Page 330](#))
- Truck conveyor camera ([See Page 331](#))

#### Optional with R-Connect monitor

- Cabin roof camera ([See Page 329](#))

#### Optional with R-View

- Rear area control camera left ([See Page 332](#))
- Rear area control camera right ([See Page 332](#))

#### Automatic camera control

The video system switches to different views depending on the operating mode, the position of the main steering switch, the driving direction and the driving speed. For further information on operation and configuration, see ([See Page 150](#)). Depending on the situation, the images of the most relevant cameras will be displayed automatically. (e.g. the back run camera and R-View are displayed when reversing).

### 6.21.1 Back run camera

The machine is equipped with a rear view camera as standard. This camera is installed at the top of the rear part of the vehicle and is used to provide a better view when reversing. The rear view camera is a visual parking aid, it is automatically activated as soon as you move backwards.



*Back run camera*



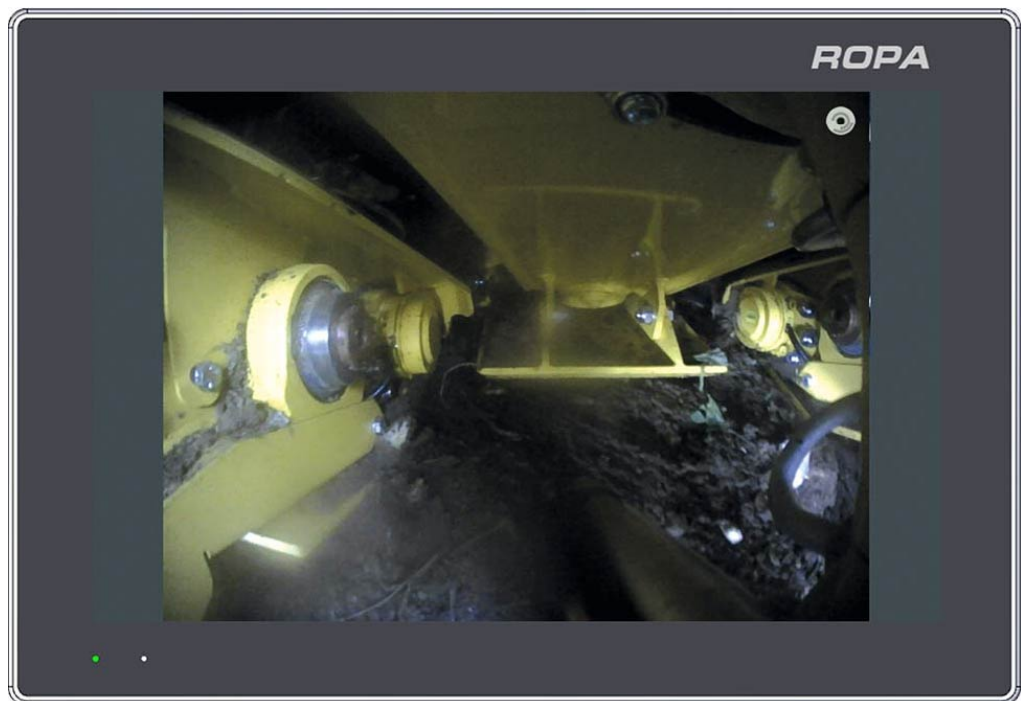


### 6.21.2 Central mark camera

The central mark camera is installed at the front under the central mark and is used to determine the correct working depth. Always switch on the lights for the central mark camera while loading in the "Light control" menu ([See Page 139](#)).



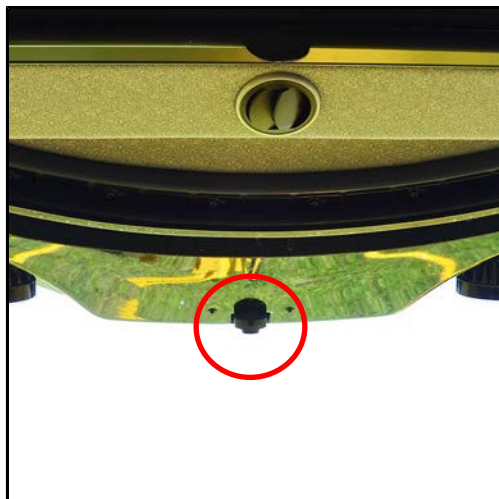
Central mark camera



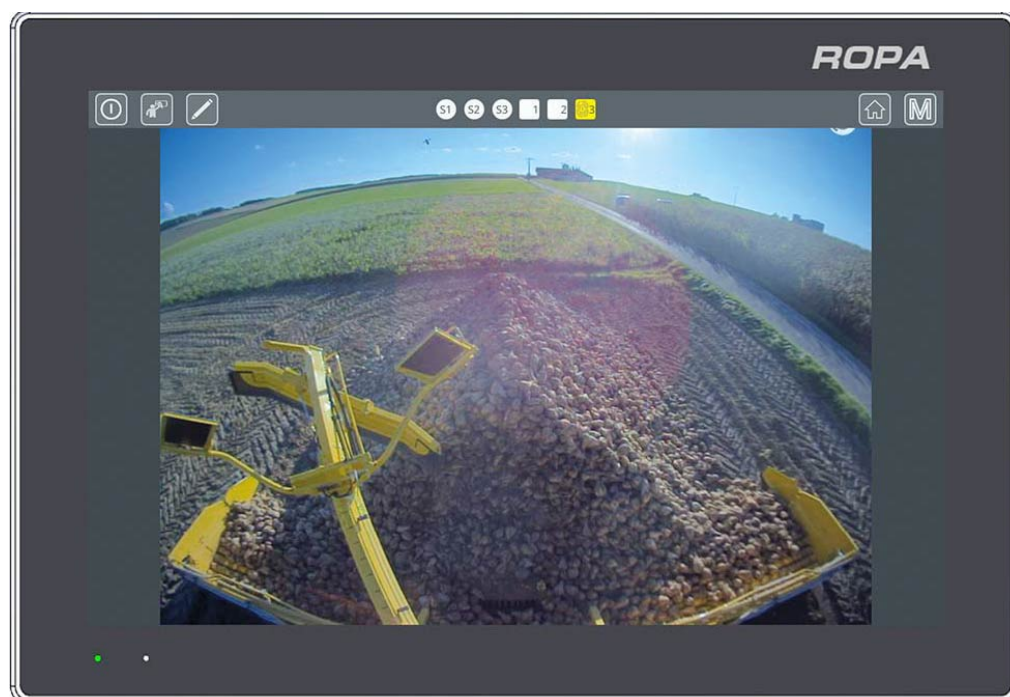
*Example with optimum adjustment on the image made by central mark camera. No beet fragments, pickup roller bearing is visible over the ground.*

### 6.21.3 Cabin roof camera (option with R-Connect monitor)

Optionally, the machine can be equipped with a front camera. This camera is located at the top of the cabin front and is used to monitor the pickup during loading.



Cabin roof camera



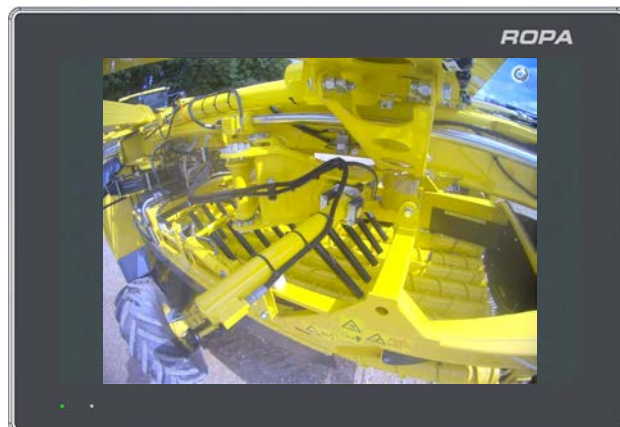
*In the future, this option can be used to document the conditions at the beet pile by transmitting images in the R-Connect system.*

#### 6.21.4 Recleaner camera (option)

Optionally, the machine can be equipped with a camera that monitors the recleaner.

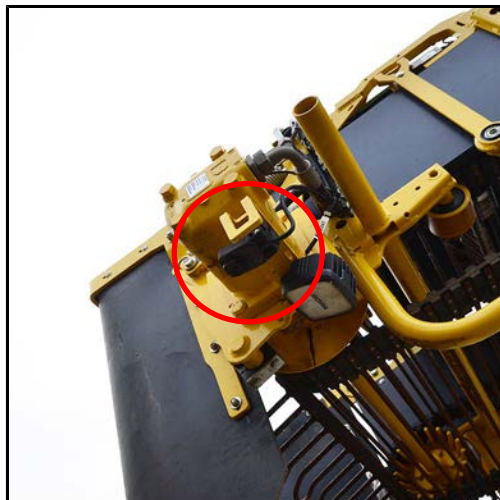


*Recleaner camera*



### 6.21.5 Truck conveyor camera (option)

An optional video camera can be installed on the truck conveyor of the machine to monitor the loading process. This camera provides a view between the sides of a high transport vehicle.



*Truck conveyor camera*



### 6.21.6 R-View cameras (option)

Your machine can be fitted with the optional "R-View" video system. The images of the rear area control camera left and the rear area control camera right are displayed together with the back run camera. The image shows the environment around the rear part of the machine.



#### ATTENTION



The R-View cameras might not display some obstacles, e.g. branches of trees, on the top rear corners of the machine. You can see obstacles on the monitor up to a height of about 3 metres above the ground.

#### ATTENTION



When driving along the edge of the forest, hedges, etc., pay attention to these side cameras. On both cameras, the outer piece (with the holders centred by springs) can deflect a little to the rear and front. Then, they automatically swivel back into the starting position.


The cameras have normal holders, which can not bend tree-branches! Large tree-branches could damage camera holders and the machine. Such damage is not covered by the warranty!







## 6.22 Electrical system

### 6.22.1 Voltage monitoring



The battery voltage is monitored by the system. If the voltage is too high or too low, then the warning icon  is displayed on the R-Touch. The battery voltage may not exceed 32 V and may not fall below 24 V. As experience has shown, the machine cannot be started with a battery voltage of less than 24 Volts.

 28.3 v	 8.1 bar
 97 %	 30 bar
 22 °C	 19 %
 57 °C	 51 °C
	 86 %



When the generator fails, the following icon  appears on the R-Touch.

## 6.22.2 Battery disconnect relay

### 6.22.2.1 Battery main switch function

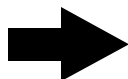
When you disconnect the power supply from the main battery switch (76) the power supply does not switch off until 6 minutes later (provided the ignition lock is in 0-position). If you forget to switch off the main battery switch (76) the battery disconnect relay will switch off automatically 120 hours after switching off the ignition. In this case you have to switch the main battery switch (76) OFF/ON once before the next time you turn on the ignition.



swung upward = OFF

swung downward = ON (shown in the image)

#### ADVICE



The function of the battery main switch can be overridden by the following systems:

- Control device diesel engine exhaust after-treatment
- Telematics
- Park heating
- Ladder light
- Engine compartment lighting



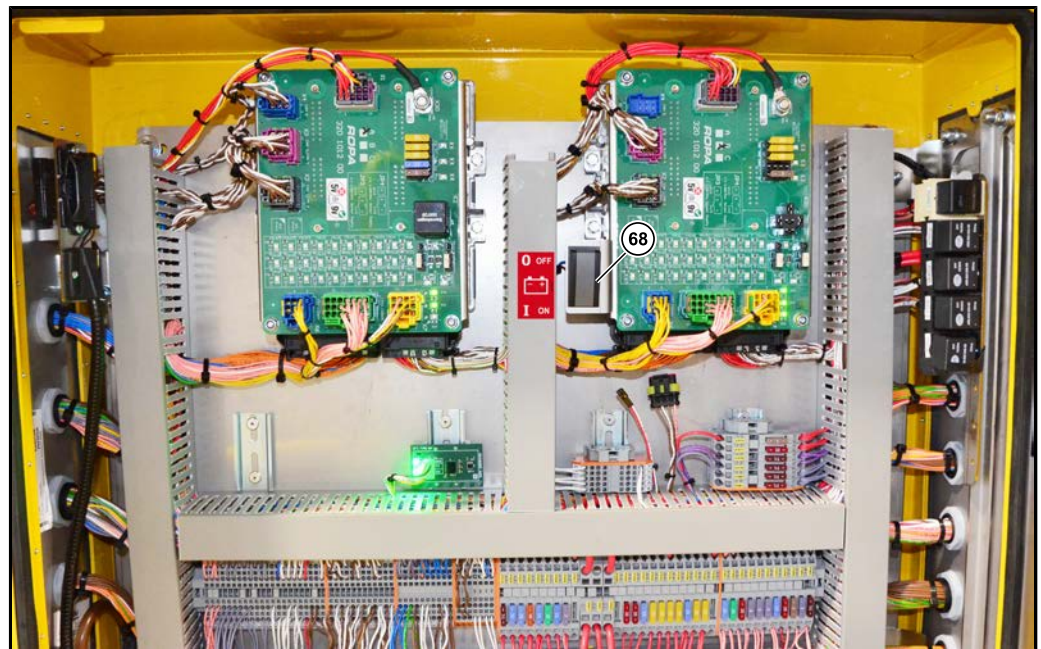
### 6.22.2.2 Battery emergency stop switch

The switch (68) for battery emergency stop is located in the central electrics cabinet. This switch may be actuated IN CASE OF EMERGENCY ONLY.

In case of emergency (e.g. fire in the vehicle), activate the battery emergency stop switch. This disconnects the battery from the vehicle power supply **immediately and without delay** by the battery disconnection relay.

If you want to disconnect the battery from the vehicle power supply, the ignition **must be** switched off and the diesel engine **must** have been shut down for at least one hour. This is the only way to ensure that the control system of the diesel engine has switched off all internal systems and those of the exhaust gas aftertreatment.

If you want to shut down the machine for a longer period of time, ([See Page 435](#)).



(68) Battery emergency stop switch

#### ATTENTION



#### Risk of machine damage.

If this switch is turned off while the ignition is on, it can lead to data loss.

The power supply will be switched off immediately.

It may also seriously damage the exhaust gas after-treatment system.

## 6.23 Shutting down the machine during the harvest season

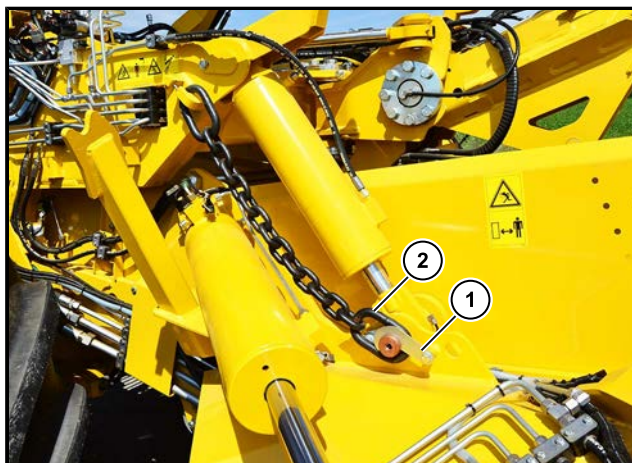
Park the machine so that nobody is impeded or endangered. Also make sure of a sufficient safety distance to freely suspended power lines.

- Raise the pickup all the way up.
- Shut down diesel engine.
- Engage parking brake.
- Switch off all loads for electrical power.
- Pull off the ignition key.
- Disconnect the power supply at the battery main switch in the driver's cabin.
- Leave the machine and lock the driver's cabin.
- Fasten the safety chains (2) to the bolt end of the central pickup section and secure them with the safety hooks (1).
- Secure the machine against rolling away using wedges.
- Completely drain water from the water spray system in case of freezing risk.

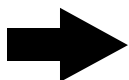
### ATTENTION



Due to lowering pressure in the hydraulic system, the pickup may come down during longer standstill periods and severely damage the driver's cabin. Therefore, when parking the machine, always fasten the safety chains (2) to the bolts on the left and right of the pickup central section.



### ADVICE



Please, in case of need, consider additional protection for children.

# **7      Maintenance and Service**



**WARNING**

During all maintenance work, there is the hazard of heavy or severe injury and the hazard of damage to the machine.

- Do not climb over the rear platform wall.
  - Shut down the machine before carrying any maintenance and repair work ([See Page 336](#)).
  - Secure the diesel engine against accidental start-up, keep the ignition key out of reach of any third party!
  - Only perform maintenance work for which you have been trained and for which you have the required knowledge and tools.
  - During all maintenance work, strictly comply with all regional regulations on safety, health protection and protection of the environment. Never forget: when you do not comply with the applicable regulations on safety, health protection or protection of the environment, you needlessly endanger yourself, other people and the environment. You may also lose your insurance cover.
  - Always use approved and safe ladders and climbing aids.
  - Do not step on the open panels of the storage compartment tools and the battery compartment.
-

## 7.1 Diesel engine

To open the cover of the engine compartment, first press the unlocking button in the handle. Reach into the opening on the engine compartment cover and press the latch (1) upwards. Now the cover can be opened.

### ATTENTION



#### Hazard of engine damages!

- Check the engine oil level on the R-Touch main terminal daily with the machine standing on an even surface and the diesel engine cold and not running.
- The optimal oil level is achieved between 50% and 100% indication. The oil level measurement becomes active after the diesel engine has been shut down for at least 5 minutes.
- If necessary, add approved engine oil. Make sure that you do not fill in too much oil.
- Check the oil level on the dipstick. ([See Page 346](#))

The extracts from the Mercedes Benz maintenance manual can be found below. To preserve any guarantee and warranty claims to Mercedes-Benz in full, the operator of the diesel engine must ensure that the maintenance work prescribed by Mercedes-Benz is carried out on time and in full by personnel expressly authorised by Mercedes-Benz for such kind of work. These people are obliged to confirm correct and timely implementation of maintenance work in the original maintenance vouchers.



### 7.1.1 Dry air filter



The diesel engine is equipped with one dry air filter, consisting of one main filter element and one safety cartridge.


#### ATTENTION



#### Hazard of engine damages!

- During filter change make sure of utmost cleanliness.
- In addition, the diesel engine may never be operated without the filter elements.

#### The filter cartridge (main element) must be replaced:

- once a year (highly recommended) or,
- if the icon  appears on the terminal,
- if the cartridge is damaged.

The safety cartridge can be accessed after dismantling the main element (1). It protects the diesel engine from dirt during maintenance being performed on the main element or when the main element is damaged. The safety cartridge cannot be cleaned, but it must be replaced in case of need, at the latest every two years.



The dry air filter is located above the hydraulic oil tank and is accessible from the boarding platform. During installation and removal, make sure of utmost cleanliness and correct fit of the cartridge. Damaged air filter cartridges must be immediately exchanged for new and undamaged filter cartridges.

#### CAUTION



#### Falling hazard!

- When working on the boarding platform always ensure that the safety rail on the ladder is closed.



The filter cartridges may only be removed when the diesel engine is shut down. The safest, quickest and cleanest way of maintaining the filter cartridges is exchanging them for new cartridges.

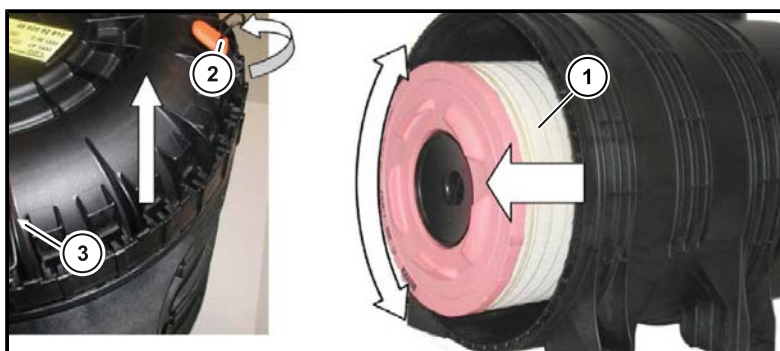
The main element may, as described below, be cleaned. Since minor damage is often very difficult or impossible to detect, always use new filter cartridges to protect the diesel engine. We do not assume any warranty for cleaned elements and the consequences caused by them.

#### ENVIRONMENT



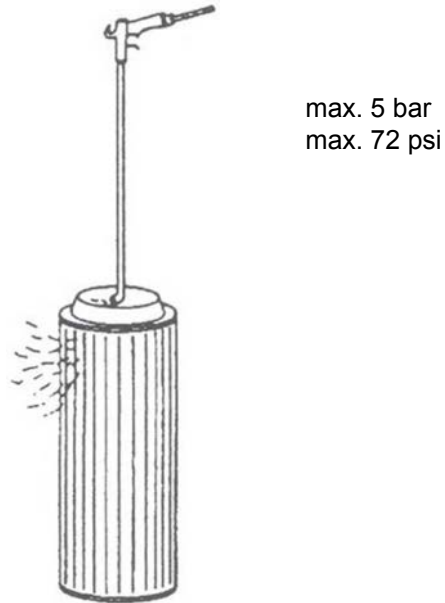
When replacing the filter cartridge, the old cartridge must be disposed of in accordance with the local environmental regulations.

- Open filter housing.
- Carefully remove the main cartridge (1) from the inner pipe by rotating it gently and make sure that it cannot be damaged.

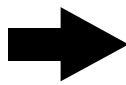


- Thoroughly clean the inside of the housing with the moist cloth, especially the sealing surface for the filter cartridge. Be very careful so that no dirt get into the pure air side of the filter.
- Never wash or brush out the main element. When blowing out, take the great care that no dust reaches the internal side of the main element.
- Blow out using a compressed air gun. A pipe angled at 90° at the lower end must be fitted onto this gun (see illustration).

- This pipe is not commercially available, but may be self-made without any problem. It should be long enough to reach the bottom of the cartridge.
- Set the pressure reducer to max. 5 bar and blow out the filter cartridge with dry compressed air until no more dust comes out. During blowing out, constantly move the compressed air gun up and down and constantly rotate the filter.



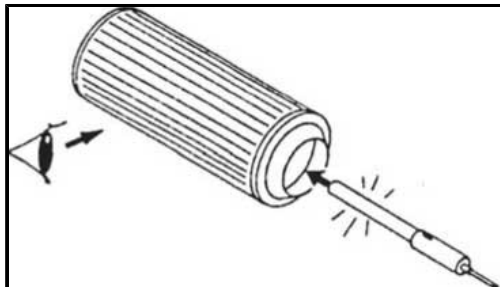
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**ADVICE**

The tip of the pipe should not come into contact with the filter paper! Before refitting the cleaned main element must be carefully examined for damage to the paper bellows and seals.

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- Then, check the cartridge for damage to the paper bellows and the rubber seals. In case of damage (cracks, buckling, impressions, etc.), use a new cartridge. Rips or holes in the paper bellows can easily be found when shining through with a hand lamp (see illustration). To make even small damage visible do not perform this examination in direct sunlight or bright daylight, but if possible in a darkened room.



Carefully inspect each crease individually using a suitable flashlight. Damaged filter cartridges may never be reused in any case. Use only original filter cartridges (ROPA main element item no. 301022500; ROPA safety cartridge item no. 301022600). In no case install filter elements with metal outside sheathing.

- Slide the main element with the open side first into the housing. Place the cover on it, observe the position of dust emission valve (see illustration). The dust emission valve must face downward (deviation  $\pm 15^\circ$  of the „UP/TOP“ mark is admissible); if necessary, take off the lower part of housing and reinstall it after rotating.



- Attach wire spring closures in the groove (4) of the flange at the housing and tighten along the perimeter in succession.

### Safety cartridge exchange:

The safety cartridge must be exchanged at every fifth maintenance for the main element or at the latest after two years for a new safety cartridge. The safety cartridge may not be cleaned or reused after uninstalling.

- Uninstall the main element as described above.
- Screw the safety cartridge (5) counterclockwise and pull it out.
- Slide in a new safety cartridge and screw it hand tight clockwise (5 Nm).



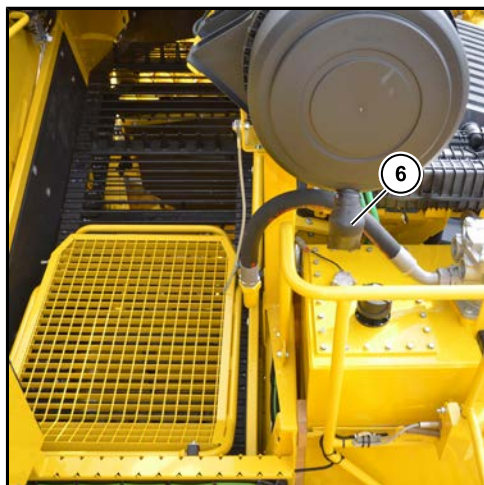
### Storage of filter cartridges:

Filter elements must be stored upright in their original packaging protected from dust and moisture so they cannot be damaged.

We recommend keeping at least one replacement filter element on hand.

### Dust emission valve

Dust emission valves are to a great extent maintenance-free. Possible dust deposits are easily removed by multiple compressions. The valve must be installed so that it is always free and does not touch anything. A damaged dust emission valve must be immediately exchanged.



(6) Dust emission valve

## 7.1.2 Changing engine oil in the diesel engine

The engine oil filter must be exchanged for each oil change. Only change oil in a diesel engine warm from operation. Before performing the oil change, park the machine on even ground and secure it against rolling away.

The first oil change on **a-diesel engine** and **c-diesel engine** is required after 500 operating hours. Further oil changes are required after, in each case, 500 operating hours or at least annually.

The first oil change on **d-diesel engine** is required after 1,000 operating hours. Further oil changes are required after, in each case, 1,000 operating hours or at least every 2 years.

### ADVICE



**Changed maintenance intervals in case of reduced fuel quality.**

[See Page 503](#)

### CAUTION



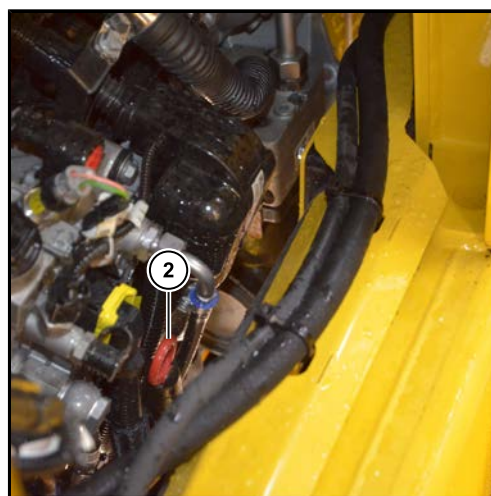
#### Hot oil!

The oil in diesel engine may become very hot. Hazard of burning.

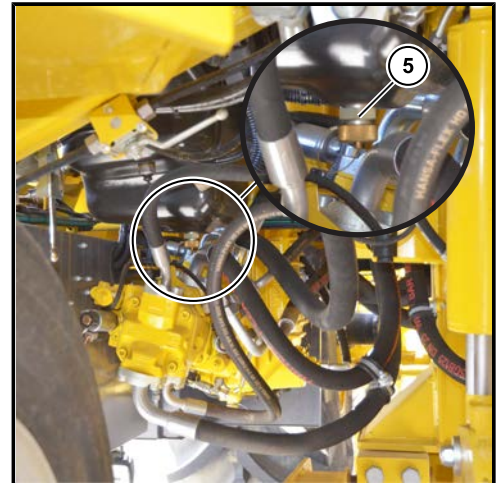
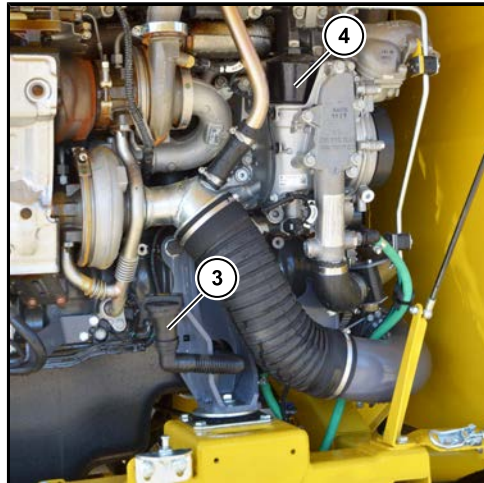
- When changing engine oil, do not touch any hot components of the diesel engine.
- When changing oil, always wear gloves and suitable personal protective equipment ([See Page 37](#)).



(1) Maintenance hatch on the infeed conveyor duct



(2) Oil dipstick



- (3) Engine oil filling cap  
(4) Engine oil filter cover

- (5) Engine oil drain valve

**Proceed as follows for an oil and filter exchange:**

- Before oil change, clean some wide area around the cap of the engine oil filter (4) and the oil filler cap (3).
- Change the oil only with diesel engine warm from operation.
- Park the machine on level ground.
- Put an oil-resistant collecting vessel of sufficient size underneath.
- Open the closing cap of the drain valve (5).
- Screw on the provided oil drain hose. The valve opens and the old oil drains.
- Unscrew the cap of the engine oil filter (4) using a ratchet and socket wrench insert.
- When the oil has drained from the oil filter bowl, pull out the oil filter cover including the oil filter cartridge.
- Unclip the oil filter cartridge laterally pressing at the lower edge and dispose of it in an environmentally compatible manner.
- Replace the gasket of the screw-on cover. Moisten the new gasket using engine oil before inserting it.
- Insert the new oil filter cartridge in the oil filter cover and clip it into the cover pressing laterally.
- Place the oil filter cover including oil filter cartridge onto the oil filter bowl and screw on tightly (tightening torque 55 Nm).
- Unscrew the oil drain hose again and screw on the screw cap on the oil drain valve (5) again.



### **Filling in engine oil**

Fill in fresh engine oil through the oil filling cap (3).

#### **d-diesel engine, with particle filter**

**Prescribed oil types:**

**Engine oil, low SAPS**

MB standard 228.52

**Filling volume:**

approx. 27 litres

#### **a-diesel engine and c-diesel engine, without particle filter**

**Prescribed oil types:**

**Engine oil, semi-synthetic**

MB standard 228.5 or 228.51

**Filling volume:**

approx. 27 litres

Then start the diesel engine from the driver's seat and let it idle for about one minute.  
Shut down the diesel engine.

Check the oil level with the dipstick approx. 5 minutes after the diesel engine has been shut down. When the oil has been collected in the oil sump, the oil level should be in the middle between the min. and the max. marking on the oil dipstick. Do not fill in too much engine oil.

Check the diesel engine and oil filter for leaks (visual inspection).

#### **ADVICE**



We recommend to keep the engine oil level at a midpoint between the min. and max. markings of the dipstick in order to achieve low engine oil consumption.



### 7.1.3 Refuelling with diesel fuel

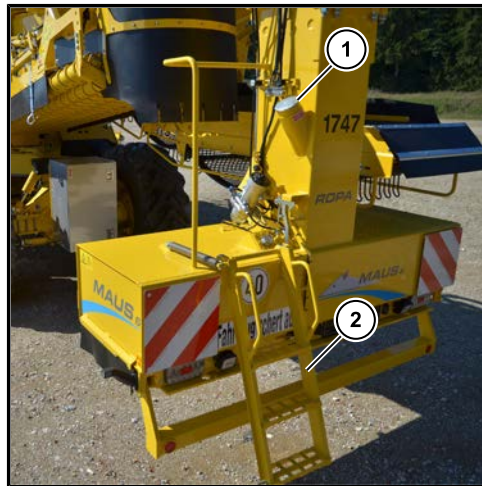
#### WARNING



**Improper refuelling and improper actions around fuel may cause explosions, fire, serious burns and other injuries.**

- Make sure that the filler cap (1) is correctly closed to prevent ingress of dirt into the diesel fuel tank. The fuel cannot vaporise and fuels spills are prevented.
- When refuelling, the diesel engine must be shut down. Smoking, fire and open flames are strictly prohibited when handling fuel. Explosion hazard! Do not use mobile phones while refuelling.
- Refuel outside only.
- Observe the applicable safety instructions of the refuelling station or tanker truck.

The fuel filler neck of the diesel tank is located on the left side of the fuel tank and can be easily reached from the auxiliary stairs ([See Page 66](#)). The tank is vented through the fuel cap (1).



- (1) Tank spout fuel cap
- (2) foldable auxiliary steps (unfolded)

### Diesel fuel

Engine	Required quality of diesel fuel
a-diesel engine	<ul style="list-style-type: none"><li>• If possible: <b>DIN EN 590</b> (max. 0.001% sulphur by weight) (10 ppm)</li><li>• if not available: (max. 0.005% sulphur by weight) (50 ppm)</li></ul>
c-diesel engine	<b>ASTM D975 1-D and 2-D</b> (max. 0.0015% by weight sulphur) (15 ppm)
d-diesel engine (EU)	<b>DIN EN 590</b> (max. 0.001% sulphur by weight) (10 ppm)
d-diesel engine (outside EU)	<b>ASTM D975 1-D and 2-D</b> (max. 0.0015% by weight sulphur) (15 ppm)

### ADVICE



Synthetic fuels (XTL, E-Fuels) according to EN 15940, are officially approved for all engine types.

### Not approved fuels in general

- Fuel with a sulphur content exceeding 0.005% sulphur (50 ppm)
- Marine diesel fuel
- Aviation turbine fuel
- Heating oils
- Fatty acid methyl ester fuels according to DIN EN 14214 (often referred to by the abbreviation FAME or also B100 (bio-diesel fuel)).

### ATTENTION



### Hazard of severe engine damages

Use only sulphur-free diesel fuel that conforms to the listed standards! Non-permitted fuel types cause irreversible damage to the diesel engine and the exhaust gas treatment system and significantly reduce the expected service life. Do not add petrol to vehicles with diesel engines. Even small amounts of petrol can damage the fuel system and diesel engine.

### Water content

The maximum permissible water content in diesel fuel is 200 mg/kg.

### Storage duration

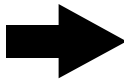
Diesel fuel can decompose. If the maximum storage period of 90 days is exceeded, check the fuel quality.

### Diesel fuel at low temperatures

The flow capacity of the diesel fuel may be insufficient at low outside temperatures. In order to avoid any operational problems, there are types of diesel fuel with better flow properties which can be used during the winter months. Winter types of diesel fuel can be used safely in the Federal Republic of Germany and other Central European countries at outside temperatures of up to -22 °C. Under normal conditions, in most countries, winter diesel fuel can be used without problems at the usual outside temperatures.

## 7.1.4 Fuel system

### ADVICE



Hazard of damage to the environment from leaking fuel. When working on the filter, first set up the catching pan and properly dispose of fuel caught.

### WARNING

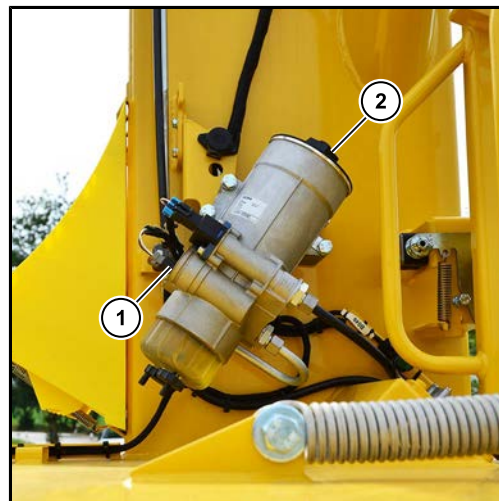


#### **Burning hazard when handling diesel fuel.**

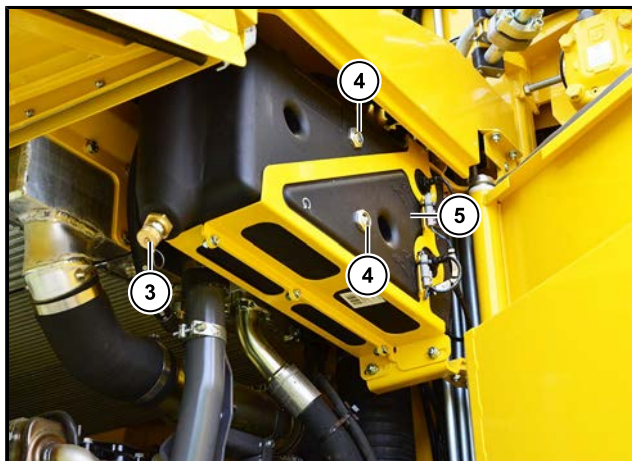
Smoking, fire and open flames are prohibited when handling diesel fuel, because fuels are easily combustible and fuel fumes cause an explosion hazard. Always make sure of sufficient supply of fresh air when handling fuels.

Hazard of skin injuries and poisoning. Diesel fuel may cause damage to the skin in case of direct contact. When handling diesel fuel, always wear suitable protective gloves, avoid inhaling fuel fumes, because it may lead to poisoning effects.

The diesel fuel is pumped by the electric pump (1) through the fuel filter (2) with an integrated water separator and a preheater to the intermediate tank (5) above the diesel engine. The fuel pump pumps the diesel fuel from the intermediate tank (5) through the two filters on the diesel engine (fuel prefilter and fuel fine filter) to the high-pressure pump.




- (1) Electric pump for diesel fuel
- (2) Fuel prefilter at the electric pump




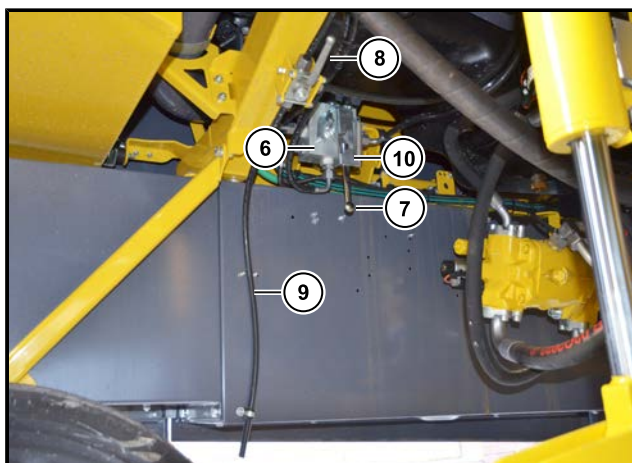
- (3) Drain valve intermediate tank
- (4) Inspection glasses as fill level indicator for the intermediate tank
- (5) Intermediate tank



The filter cartridges must be exchanged according to the maintenance plan. The fuel filters at the diesel engine must be immediately exchanged, independent of operating hours, if the icon  appears on the R-Touch.




However, if the following icon  appears on the R-Touch, the fuel prefilter insert at the electric pump must be exchanged.

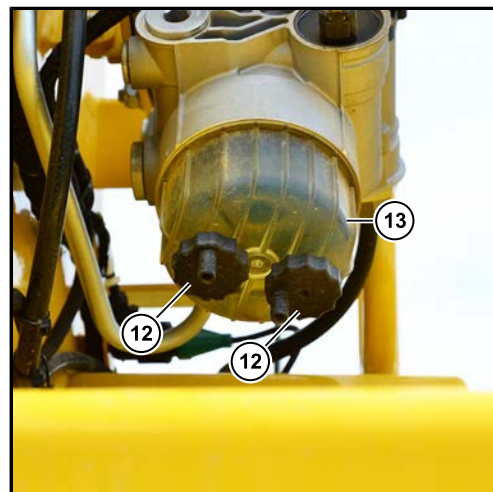
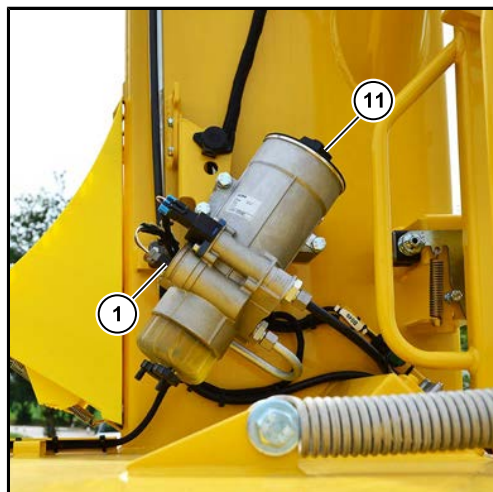


- (6) Fuel system control unit
- (7) Fuel system service lever
- (8) Fuel system 3-way tap
- (9) Fuel fine filter drain hose
- (10) Safety flap for fuel system service lever

### 7.1.4.1 Replacing/draining water of the fuel prefilter insert at the electric pump



The filter insert must be changed once a year or if it takes too long to fill the intermediate tank or if it does not fill (the R-Touch shows the following icon ). (See Page 169)



- (1) Electric pump for diesel fuel
- (11) Fuel prefilter cover

- (12) Drain screws
- (13) Water collecting vessel

#### Replace the filter insert as follows:

- Shut down the diesel engine.
- Make sure that the level of the fuel tank is below the level of this filter (if the fuel gauge is below 100 %, it is certainly the case).
- Block the connection to the buffer tank. To do it, move the service lever (7) on the fuel supply control unit (6) by 45° backward to the SERVICE position (See Page 356).
- Turn the both drain screws (12) out and drain the collected water and fuel from the filter.
- Remove the lid (11) (wrench size 46) from the filter housing.
- Uninstall the old filter insert and exchange it for a new one with the ROPA item no. 303016700.
- Dispose of the old filter insert in compliance with the local disposal regulations.
- Turn the both drain screws (12) again in the water collection vessel.
- Moisten the new sealing for the lid (11) lightly with oil.
- Install the lid (11) (tightening torque 40Nm) with the new sealing. Make sure that the sealing is not damaged in the process.
- Open the fuel connection to the intermediate tank. Move the service lever (7) on the fuel supply control unit (6) by 45° forward (operating position).
- Bleed the fuel system. (See Page 356)
- Check the fuel system for leakage.

#### Draining water from the water collecting vessel


Draining of water collected is required when the water collecting vessel is full, freezing threatens or the filter element is replaced.

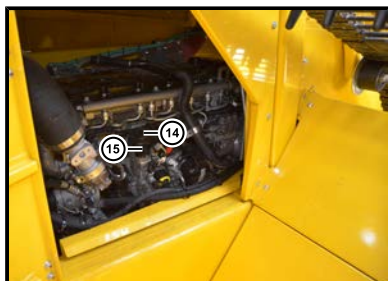
- Unscrew drain screws (12) at the bottom of the water collecting vessel (13).
- Let the water drain.
- Retighten the drain screws.



### 7.1.4.2 Exchange fuel fine filter and prefilter on the diesel engine



The fuel fine filter insert (14) (ROPA item no. 303025500) and the fuel prefilter insert (15) (ROPA item no. 303025400) on the diesel engine must be replaced when the engine oil is changed for the first time and at least once a year since then. When the warning icon  appears on the R-Touch, both filter inserts must be replaced.



- (14) Fuel fine filter  
(15) Fuel prefilter

#### ATTENTION



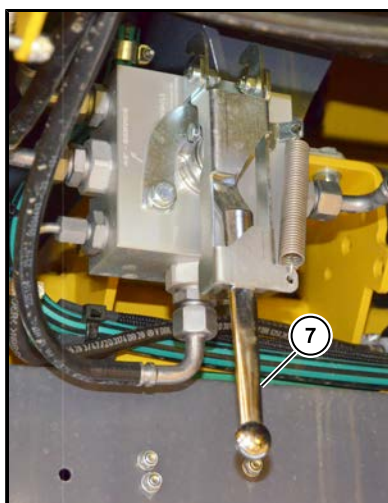
#### Danger of machine damage

Foreign objects, which ingress the fuel circuit, may cause blockages!

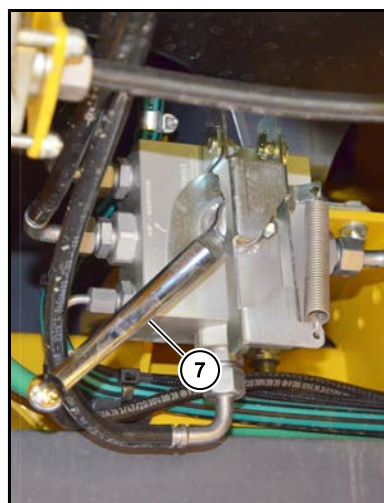
- In any case, make sure that no foreign objects ingress the filter housing.
- Do not wipe the inside of the filter housing.
- Avoid any ingress of water into the filter housing.

#### To exchange the fuel fine filter, proceed as follows:

- Park the vehicle and shut down the diesel engine.
- Shut off the fuel connection to the intermediate tank. Move the service lever (7) on the fuel supply control unit (6) by 45° backward to the SERVICE position. Thus, fuel from the intermediate tank can no longer flow into the diesel engine.
- Place a sufficiently large and fuel-resistant container to catch the fuel under the filter bowl and the drain hose (9).
- Move the lever of the 3-way valve (8) to the horizontal position (this allows the contents of the filter bowl to flow into the collecting container).



Lever in operating position (safety flap closed)



Lever in SERVICE position

- Unscrew the cap of the fuel fine filter (14).
- Slightly pull the screw-on lid with the filter insert from the filter housing and let the fuel drain.
- Take off the screw-on lid including filter insert.
- Unclip the filter insert by lateral pressure at the lower edge of the filter insert.
- Replace the gasket of the screw-on cover.
- Cover evenly and completely the both sealings of the filter insert with the supplied grease, as well as gasket and screw-on lid.
- Clip the new filter insert into the screw-on lid.
- Screw on and tighten the screw-on lid including filter insert: tightening torque 25 Nm.
- Move the lever of the 3-way valve (8) to the vertical position (this closes the filter bowl drain).
- Open the fuel connection to the intermediate tank. Move the service lever (7) on the fuel supply control unit (6) by 45° forward into operating position and make sure that the lock is closed correctly.
- Bleed the fuel system. ([See Page 356](#))
- Check the fuel system for leakage.

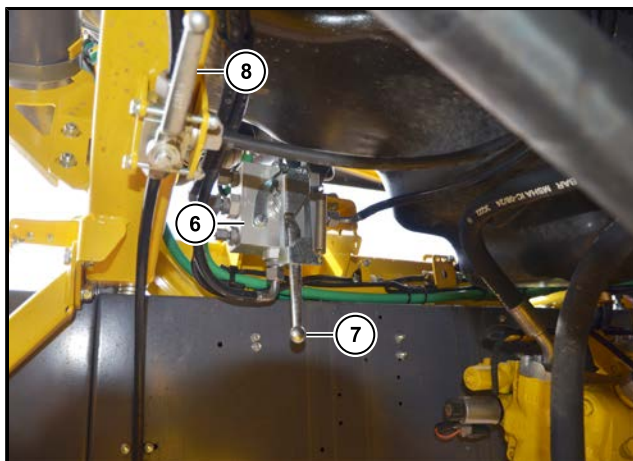
**To exchange the fuel prefilter, proceed as follows:**

- Park the vehicle and shut down the diesel engine.
- Shut off the fuel connection to the intermediate tank. Move the service lever (7) on the fuel supply control unit (6) by 45° backward to the SERVICE position. Thus, fuel from the intermediate tank can no longer flow into the diesel engine.
- Unscrew the screw-on lid (15) of the fuel prefilter.
- Take off the screw-on lid and the filter insert.
- Put in a new filter insert. Replace the gasket at the screw-on lid (15) and slightly grease it.
- Screw on and tighten the screw-on lid (15) (tightening torque 25 Nm).
- Bleed the fuel system. ([See Page 356](#))
- Check the fuel system for leakage.

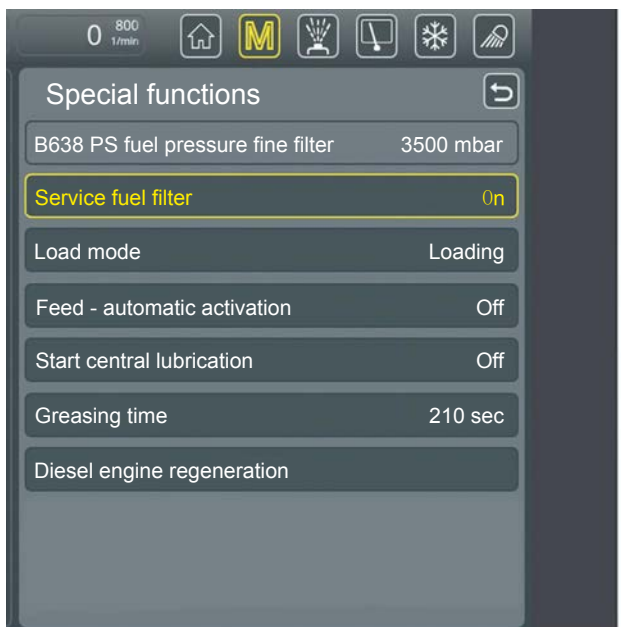


### 7.1.4.3 Bleeding the fuel system

- Park the vehicle and shut down the diesel engine.
- Shut off the fuel connection to the intermediate tank. Move the service lever (7) on the fuel supply control unit (6) by 45° backward to the SERVICE position. Thus, fuel from the intermediate tank can no longer flow into the diesel engine.



- Open "Special functions" menu on the R-Touch.
- Choose in the line "Service fuel filter" option "ON". The R-Touch displays the current fuel pressure in millibars (mbar). The fuel pressure reaches approx. 3,500 mbar after a certain period of time. If this value remains constant, the fuel system is vented.
- Start the diesel engine. After it has been started successfully, switch the diesel engine off again and set the option to "OFF" in the "Service fuel filter" line.
- Open the fuel connection to the intermediate tank. Move the service lever (7) on the fuel supply control unit (6) by 45° forward (operating position).



#### 7.1.4.4 Microorganisms in the fuel system

Occasionally, at first inexplicable blocks in the fuel system are found. These blocks are often caused by microorganisms.

These microorganisms (bacteria, fungi or yeast) can grow rapidly under favourable for them conditions. Water, which as condensing water is found in every storage or vehicle (fuel) tank, and vital elements in chemically bound form, like sulphur, phosphor, nitrogen, oxygen and trace elements are necessary for growth. Fuel additives may also contribute to microorganisms' growth.

Depending on the temperature, growth is more or less strong, which leads to the formation of fibrous mushroom meshes (mycelium) and sludge. The consequences are blocks of the fuel prefilter by rust and fibres (mycelium) and frequent filter exchange. It leads to a reduced performance of the diesel engine and, in extreme cases, to breakdown of the vehicle.

##### Remedial measures

If infestation by microorganisms is detected in storage or vehicle tanks, we recommend the following disinfectant against it:

Product:	GrotaMar 82	ROPA item no. 435006000 (1.0 l)
Manufacturer:	Schülke & Mayr	
	D-22840 Norderstedt	
Phone:	040/52100-0	
Fax:	040/52100-244	
Internet:	www.schuelke.com	
E-mail:	sai@schuelke.com	

In case of need, please contact the manufacturer (for instance to enquire about sources abroad). Consumption - 0.5-1.0 l per 1000 l of diesel fuel.

#### 7.1.5 Cooling system diesel engine



All coolers must be regularly checked for cleanliness and cleaned.

If the admissible maximum temperature is repeatedly exceeded during very high environmental temperature ([See Page 168](#)) the complete cooling system must be checked for cleanliness and, in case of need, be immediately cleaned.

Always make sure that the air intake grids are free of dirt or adherent leaves, etc.

When cleaning the air intake grids or the coolers, always switch off the diesel engine and secure it against inadvertent starting (pull off the ignition key). In case of problems with one cooler, always also clean all other coolers/radiators.

##### WARNING



##### Poisoning hazard and hazard of damage to the skin!

Corrosion protection and antifreeze agents contain hazardous materials. There is an acute poisoning hazard when swallowing. In case of contact to the skin, irritation or cauterization/burns may occur.

- Never fill corrosion protection/antifreeze agents into drinking vessels or beverage bottles.
- Always store these agents so that children do not have access to the agents.
- In any case, comply with the instructions on safety of the manufacturer of these agents.

#### ADVICE



#### Corrosion protection/antifreeze agents are hazardous for the environment.

When handling these materials, always make sure that the corrosion protection/antifreeze agents do not enter the environment, but are disposed of in a manner compatible to the environment.

Always make sure of sufficient antifreeze and only use corrosion protection/antifreeze agents expressly permitted according to Mercedes-Benz factory standards 325.5 or 326.5. ([See Page 516](#))

### 7.1.5.1 Cleaning of the cooling system

The cooling system is located over the diesel engine.

After folding down the rear wall of the platform the cooling system is easily accessible from the boarding platform.

#### CAUTION



#### Falling hazard!

- When working on the boarding platform always ensure that the safety rail on the ladder is closed.

When cleaning the air intake grids or the coolers, always switch off the diesel engine and secure it against inadvertent starting (pull off the ignition key and take it with you).

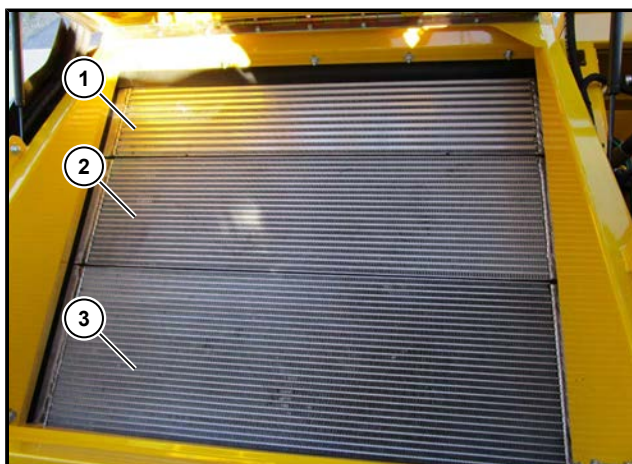
#### WARNING



#### Burning hazard!

Each cooler is heated up during operation.

- Wear protective gloves!
- Let the machine cool down sufficiently before starting any work on the cooling systems!



- (1) Charge air cooler
- (2) Hydraulic oil cooler
- (3) Radiator



When R-Touch displays the warning icon "Cooling water temperature" , the cooling system must be cleaned immediately.

The coolant in the coolant circuit of the diesel engine may not exceed the permissible temperature of 105 °C.

### DANGER

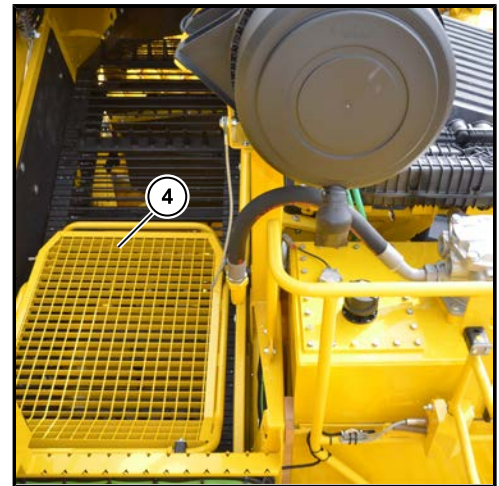


#### **Hazard of extremely severe injuries due to starting infeed conveyor**

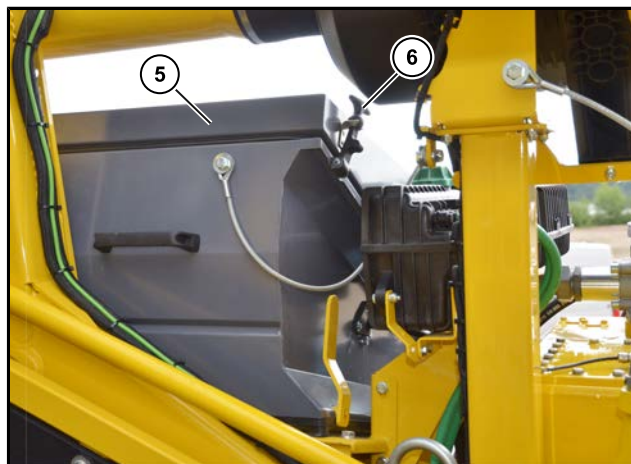
- Before maintenance and repair work, the machine must be shut down and the diesel engine switched off.
- Secure the diesel engine against accidental start-up, keep the ignition key out of reach of any third party!

Proceed on the cleaning of the cooling system as follows:

- Fold down the rear platform wall (4).



- Release the rubber closures (6) on the intake grid.
- Swing up the intake grid (5).
- Clean the intake grid from the collected dirt with the brush and, if necessary, with the water stream from the water hose.



- (5) Intake grid
- (6) Front rubber fastener

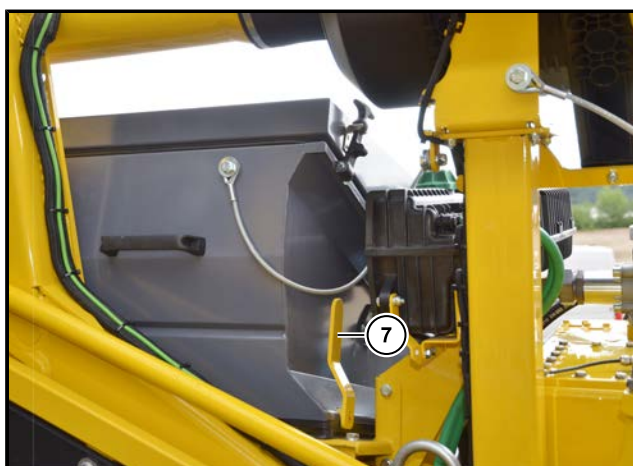
**CAUTION**



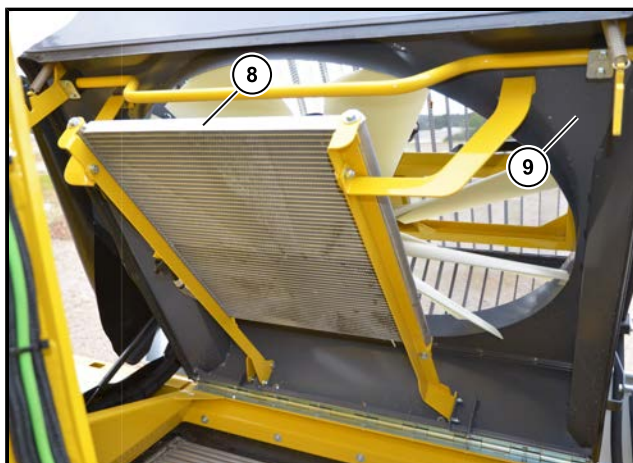
**Danger to eyes and skin injury due to foreign bodies blowing out.**

The powerful air flow of the fan may cause injuries to eyes and skin by particles of dirt blown by the air stream.

- No people are allowed to be on the boarding platform during automatic reversing.
- Fold up the rear platform wall, close the cabin door, start the diesel engine and wait for the automatic reversing program of the fan.
- Switch off the diesel engine and secure the machine against inadvertent starting (pull off the ignition key and take it with you).
- Pull the locking lever for the ventilator cowl (7) and fold it up.



(7) Ventilator cowl locking lever

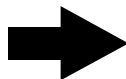


(8) Condenser air conditioning system

(9) Ventilator cowl folded up

- Check the cooling system for dirt.
- Remove the coarse dirt by hand, by cleaning the cooling system with the water hose or using compressed air. Use a pressure cleaner only with a flat spray at reduced pressure and from at least 30 cm away.

---

**ADVICE**


A plug-in connector for connecting the compressed air hose is located to the right of the compressed air reservoir.

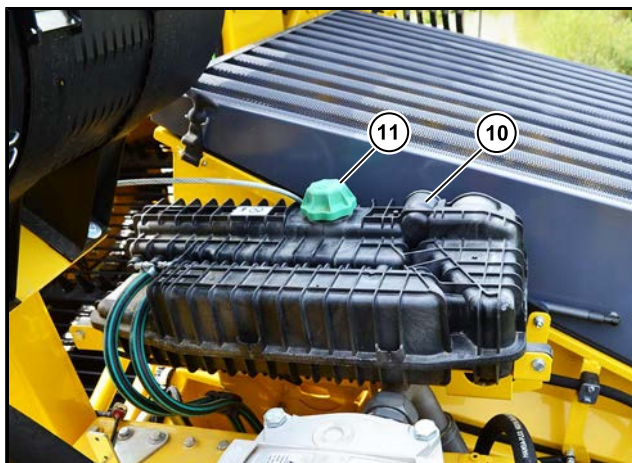
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### 7.1.5.2 Coolant check



If the liquid level in the expansion tank (10) seems too low, the following warning icon is displayed on R-Touch: . The cooling-water expansion tank is located in front of the intake grid. It is easily accessible from the boarding platform.



*Compensation tank for coolant*

- (10) Expansion tank for coolant
- (11) Coolant filler cap

#### WARNING



#### Burning hazard!

As long as the diesel engine is warm, the cooling system is under pressure. There is a burning (scalding) hazard from emitting steam or spraying hot coolant!

- Wear protective gloves and protective goggles.
- Open the filler cap (11) of the expansion tank only when the engine has cooled off. Open the filler cap always very carefully.

Only check the coolant level at a coolant temperature of below 50°C.

Before correcting the coolant level, check corrosion protection/antifreeze.

To check the coolant level, slowly and carefully open the filler cap (11) of the expansion tank. Slowly relieve possible excess pressure.

Check corrosion protection/antifreeze using a testing device.

The correct component of 50 vol.-% corrosion protection/antifreeze agents in the coolant is warranted if it is frost-proof up to -37°C. If the desired antifreeze effect is not achieved, correct the mixture ratio.

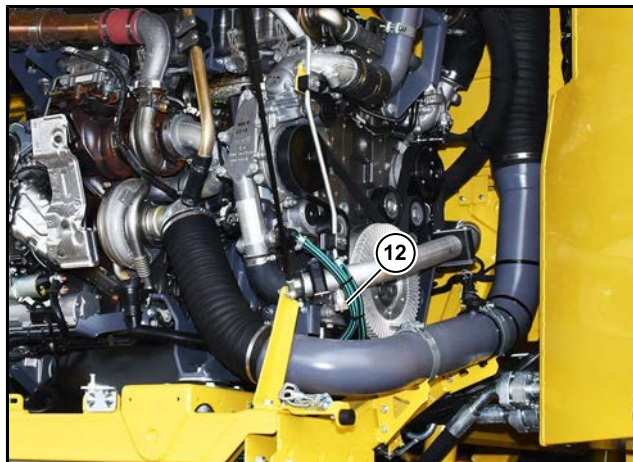
If the concentration is too low, there is a hazard of damage to the engine due to corrosion/cavitation in the cooling system!

Avoid concentrations of more than 55 vol.-% corrosion protection/antifreeze agents, otherwise the maximum frost protection of up to -45°C can not be achieved. The cooling system is correctly filled if the coolant reaches to the lower edge of the filler neck. Only use prepared coolant with 50 vol.-% corrosion protection/antifreeze agents that has been expressly approved by Mercedes-Benz for refilling. (See [Page 516](#) und [Page 364](#))



### 7.1.5.3 Change of coolant

Use only corrosion protection/antifreeze agents approved by Mercedes-Benz. The coolant must be exchanged every three years. In any case, comply with the regionally applicable regulations on environmentally compatible disposal of coolant.



**(12)** Drain valve for coolant at cooling water pipe

Before renewing the coolant, check the cooling and heating system for leaks and condition.

The drain valve **(12)** is installed on the coolant pipe (see picture).

- Slowly open the filler cap **(11)** at the expansion tank **(10)** of engine cooling system, relieve excess pressure, then take off the cap.
- Screw on drain hose on the drain valve.
- Drain coolant and catch coolant in a suitable vessel.
- Close the drain valve again.
- Fill in coolant in the prescribed combination up to the lower edge of the filling neck on the expansion tank **(10)** and close the cover lid **(11)**.
- Set the desired temperature for the air conditioning system to the maximum temperature, so that the control valve for the heating system is opened.
- Switch on the hydraulic oil tank and the underfloor heating.
- Switch on the park heating.
- Start diesel engine and let it run for about 1 minute at differing rotational speeds.
- Check the coolant level and, in case of need, fill up coolant.
- Have replacement of coolant confirmed in service documentation.

**Specified coolant types:**

**corrosion/antifreeze -40°**

MB standard 325.5 and 326.5

**Filling volume:**

approx. 25-30 litres

#### 7.1.5.4 Remarks of ROPA on the coolant (general information)

Normally, coolant consists of water and corrosion protection/antifreeze agent. The corrosion protection/antifreeze agents (ethylene glycol with corrosion inhibitors) have the following tasks in the cooling system:

- Sufficient corrosion and cavitation protection for all components of the cooling system.
- Lowering of the freezing point (frost protection).
- Raising of the boiling point.

For reasons of corrosion protection, about 50 vol.-% corrosion protection/antifreeze agents must be added to the cooling liquid, if the expected environmental temperatures do not require even higher concentration. This concentration (50 vol.-%) offers antifreeze protection up to about -37°C. A higher concentration is only sensible for even lower environmental temperatures. Even in case of extremely low environmental temperatures, do not use more than 55 vol.-% of corrosion protection/antifreeze agents, since the maximum frost protection is achieved then, and greater share in the mixture reduces frost protection and worsens heat dissipation (55 vol.-% corresponds to frost protection up to about -45°C). If these coolant regulations are not complied with, then corrosion and damage to the cooling system are inevitable. Adding of corrosion protection/antifreeze agents raises the boiling point. Increased pressure further increases the boiling temperature. Both physics coherences are used in modern cooling systems – the maximum coolant temperature is increased without increasing the hazard of boiling. Corresponding to the higher temperature level, the cooling performance increases.

#### 7.1.6 Valve clearance adjustment

Checking or adjusting the valve clearance is required every second diesel engine maintenance. This work may only be performed by people expressly authorized for this work by Mercedes-Benz.

Valve clearance for cold diesel engine:

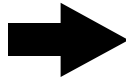
- Inlet valves 0.30 mm +/- 0.05 mm
- Outlet valves 0.60 mm +/- 0.05 mm
- Engine brake The adjustment results in a valve clearance of approx. 0.15 mm. The valve clearance of the engine brake valve cannot be checked but it must be adjusted.

### 7.1.7

## SCR exhaust after-treatment with AdBlue® (applicable for c-diesel engine and d-diesel engine)

The machine is equipped with an SCR exhaust after-treatment system. In any case, comply with the notes on handling AdBlue® ([See Page 529](#)).

### ADVICE

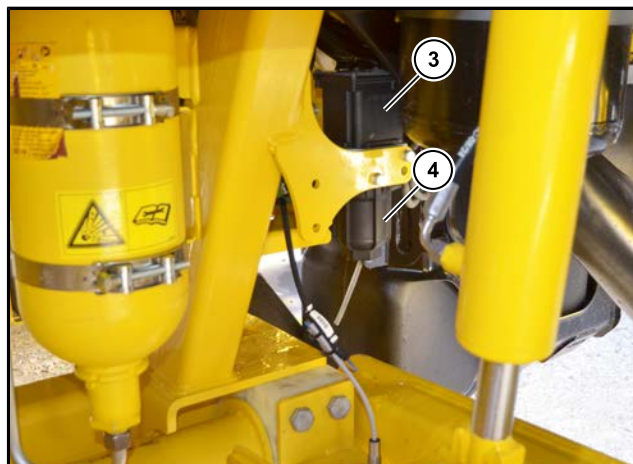


The term AdBlue® refers to products related to exhaust gas aftertreatment in diesel engines by means of selective catalytic reduction (SCR).

Worldwide, the abbreviation DEF (Diesel Exhaust Fluid) or AUS 32 (Aqueous Urea Solution) is often used instead of AdBlue®.



- (1) AdBlue® tank filler cap
- (2) AdBlue® tank



- (3) AdBlue® pump module
- (4) Filter housing AdBlue® pump module

### ATTENTION



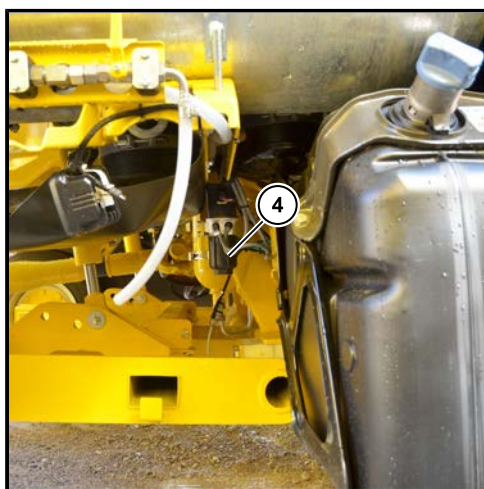
#### Danger of machine damage!

Even filling in small amounts of other liquids leads to great damage to the SCR exhaust after-treatment system. No accommodation will be granted for such kind of damage.

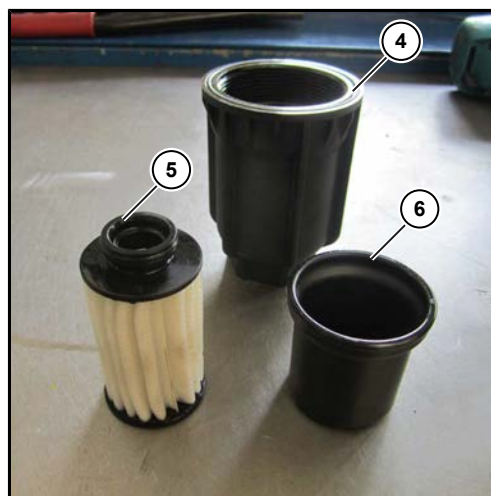
- Utmost cleanliness must be ensured when filling up AdBlue®.
- The AdBlue® tank may be filled with AdBlue® only, do not fill in water or other liquids. If the quality is not sufficient, the diesel engine reduces its output, the machine is no longer ready for operation.

#### 7.1.7.1

### Exchange of AdBlue® filter insert



(4) Filter housing AdBlue® pump module



(5) Exchanging AdBlue® filter insert  
(6) Frost protection membrane

### WARNING



#### Danger from AdBlue®!

Burning and scalding hazard when working on the hot exhaust system and the AdBlue® system. Hazard of burns after skin or eye contact with AdBlue® liquid. Hazard of poisoning by inhalation of AdBlue® vapours or swallowing AdBlue® liquid.

- Only start work on the AdBlue® system when the system has cooled down and the pressure in the system has been reduced.
- Fill AdBlue® in suitable vessels only and use suitable lines only.

Exchange of AdBlue® filter insert:

- Exchange the AdBlue® filter insert every second engine oil change.
- Place a suitable receptacle under the AdBlue® pump and screw out the filter housing (4). Remove the frost protection membrane (6) and the filter insert (5) from the AdBlue® pump module.
- The filter insert should be disposed of according to the local regulations.
- Use a new AdBlue® filter insert (ROPA item no. 303019500).

#### ATTENTION



Use only the supplied lubricant spray from Mercedes-Benz for greasing. Make sure this lubricant is used extremely sparingly, otherwise it may cause damage to the AdBlue® system.

- Put the new filter insert (5) in the AdBlue® pump module.
- Put the frost protection membrane (6) over the filter insert.
- Spray thinly the sealing bead on the frost protection membrane and the thread of the AdBlue® pump module using the provided lubricant.
- Screw the filter housing (4) again on and tighten it with a torque of 80 Nm.
- The AdBlue® system bleeds itself automatically, manual bleeding is therefore not necessary.

### 7.1.8 Exchange diesel particulate filter (applicable for d-diesel engine)

Based on information from the engine manufacturer, the diesel particulate filter needs to be replaced after about 4,500 operating hours ([See Page 503](#)).

Please contact your Ropa service partner or MTU/Mercedes-Benz authorised service partner. Mercedes XENTRY diagnosis system is required for such work.

### 7.1.9 Other maintenance work on diesel engine

During each maintenance service on the diesel engine, the following additional work must be carefully performed in compliance with the Mercedes-Benz maintenance regulations (see maintenance booklet for the engine):

- Leak and condition examination of all pipes and hoses of the diesel engine.
- Check the suction line between air filters and diesel engine, cooling and heating system for condition and leaks.
- Checking all lines and hoses for undamaged condition as well as chafe-free and proper routing and fastening.
- Check all hose clamping collars, flanged connections and air intake manifold for tight seat.



## 7.2 Pump distributor gears (PDG)

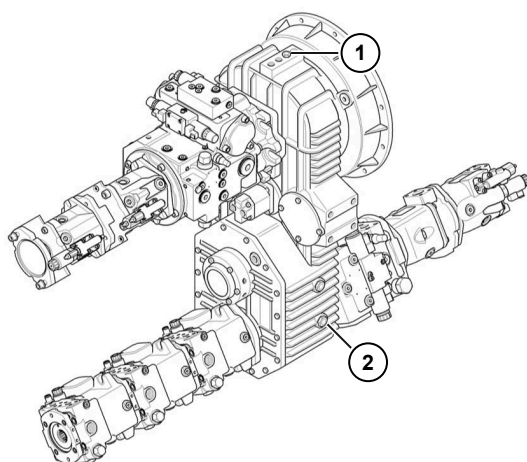
The pump distributor gear unit is directly flanged to the diesel engine and transfers engine power to the individual hydraulic pumps.

The oil level of the pump distributor gears must indispensably be checked daily. Check the oil level, before you start the diesel engine! Once the diesel engine is started, the oil level can no longer be checked.

In order to read the oil level, the machine must be on a level and horizontal surface and the diesel engine must have been shut down for at least 5 minutes. When the oil level rises or falls without evident reason, indispensably call in a customer service mechanic.

The oil level can be read at the inspection glass (2). It must be within the inspection glass range (in no case above the top edge of the inspection glass!). The inspection glass is located on the left side of the pump distributor gears.

The gear oil is cooled by its individual oil cooler ([See Page 371](#)).




*Pump distributor gears*

- (1) Oil filling screw
- (2) Inspection glass

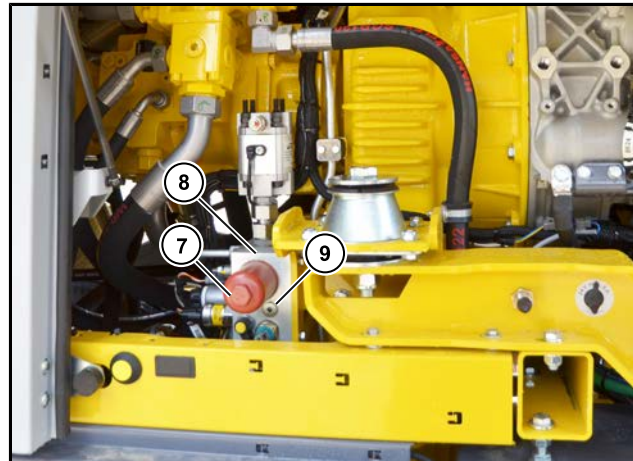




### Lubrication pump distributor gears failed!

- Start diesel engine and watch the R-Touch. The warning icon  should disappear from the R-Touch within 10 seconds.
- If the warning icon does not disappear in 10 sec., shut down the diesel engine immediately and bleed the transmission.
- Let the diesel engine run for a minute, then shut it off.
- Wait at least 10 minutes, then check the oil level again – as described above, in case of need, correct oil level.

### Bleeding the transmission



- (7) Pressure filter bowl
- (8) PDG control unit
- (9) MP port plug

- Place an oil catch basin under the control block (8).
- Remove the plug at the MP port (9).
- Close the engine compartment cover and fold up the pump cover behind the ladder.
- Observe the MP port (9) on the control unit (8) through the opening.
- Have another reliable and trained person start the diesel engine and let it run (maximum 15 seconds) until the gear oil comes out of the opening in the control unit (8) without bubbles.
- Screw in the plug as soon as the oil is bubble-free and tighten it with a torque of 16 Nm. If oil does not come out within 15 seconds, screw in the plug again and contact customer service.
- Wait at least 10 minutes and check the oil level again as described above.
- Fill in some oil after in necessary.

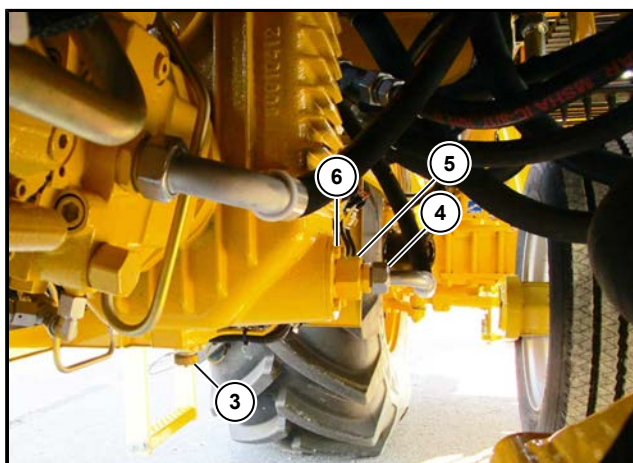


### 7.2.1 Oil change/filter exchange on pump distributor gears

The first oil change is required after 50 operating hours, further oil changes must be performed annually. The intake filter of the pump distributor gears and the pressure filter cartridge must be replaced at every oil change.

**Proceed as follows for an oil and filter exchange:**

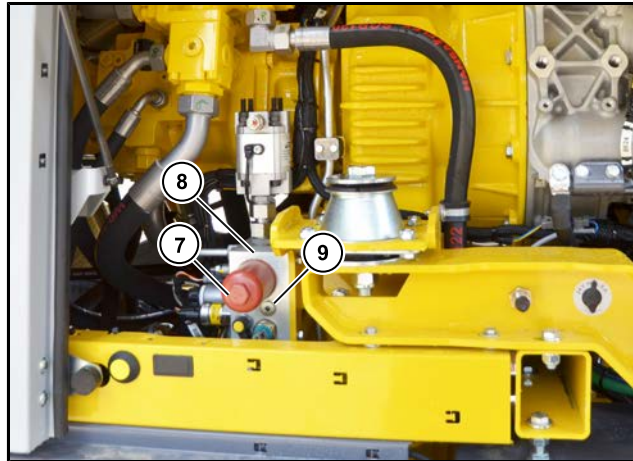
- Clean before oil change wide area around the intake and pressure filters.
- Change oil only with gears warm after operation.
- Put an oil-resistant collecting vessel of sufficient size underneath.
- Unscrew the closing cap at the oil drain valve (3).
- Screw on the provided oil drain hose. The valve opens and the old oil drains.



- (3) Oil drain valve
- (4) Suction hose
- (5) Hexagonal bolt connection on filter flange
- (6) Filter flange

- Remove the screw cap (4) of the intake hose from the filter connection. For this purpose, you'll need an SW 36 fork wrench.
- Loosen the hexagonal bolt connection (5) on the filter flange. The bolt connection must only be loosened. In no case totally screw off this bolt connection. For this purpose, you need an SW 46 fork wrench.
- Screw out the 4 bolts (SW13) on the filter flange (6) and pull out the filter insert.
- Exchange the filter element for a new one (ROPA item no. 181060100). For installation always use a new paper gasket (ROPA item no. 181051700) and a new O-ring (ROPA item no. 412059500). Before assembly, coat them with some oil.
- Retighten the flange (6) and hose line (5/4).

- Screw the pressure filter bowl (7) with the SW24 spanner out of the gear steering unit (8) and exchange the filter insert for a new one (ROPA item no. 270044200).
- Also exchange the O-ring at the pressure filter bowl (7) for a new O-ring.
- At first, screw the pressure filter bowl (7) completely into the steering unit (8), in order to unscrew it then by **one sixth** revolution.
- Unscrew the oil drain hose again and screw on the screw cap on the oil drain valve (3) again.
- Open the oil filler screw (1) and fill in fresh oil into the filler neck for so long, until the oil level is in the upper range of the inspection glass (2).



- (7) Pressure filter bowl
- (8) PDG control unit
- (9) MP port plug

**Prescribed oil types:**

**Gear oil ATF**

ATF oil as per Dexron II D

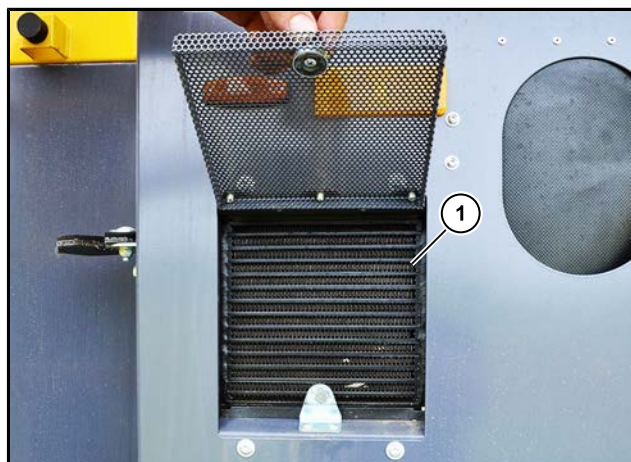
**Filling volume:**

approx. 10.0 litres

### 7.2.2

### Oil cooler pump distributor gears

- Check the oil cooler of the pump distributor gears every day for soiling.
- If required clean it with pressure air or spray stream from water hose.
- Never use a high-pressure cleaner.



- (1) Oil cooler pump distributor gears

## 7.3 Hydraulic system

### WARNING



#### Hazard from pressure accumulator!

The pressure reservoirs of the hydraulic system are constantly under high internal pressure, even if the remaining hydraulic system is already rendered pressureless.

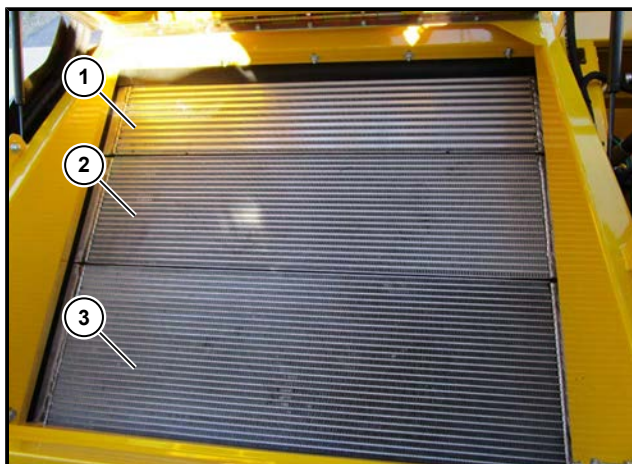
- Work on the pressure reservoirs may only be performed by especially trained personnel, familiar with handling of pressure reservoirs.
- Render the system pressureless before all work on the hydraulic system or on the pressure reservoirs.
- Work on the hydraulic system may only be performed by people having been instructed about the special risks and hazards when working on hydraulic systems.

Regularly check the hoses of the hydraulic system for aging and damage!

Immediately exchange damaged or aged hoses. Only use hoses for replacements conforming to the specifications of the original hose!

For cost reasons, we recommend ordering replacement hoses directly from ROPA, because original ROPA hydraulic hoses are generally significantly more economical than competitive products.

### 7.3.1 Clean hydraulic fluid cooler



- (1) Charge air cooler
- (2) Hydraulic oil cooler
- (3) Radiator



After each start of the engine, the fan of the cooling system is automatically reversed for a short time. So that soiling is removed to a great extent independently. Consider that a soiled cooler achieves a clearly reduced cooling performance. This will substantially reduce the load capacity of the machine. If the hydraulic oil is too hot, shut down the diesel engine and try to determine the cause. Usually, the hydraulic oil cooler (2) is soiled.

**WARNING**



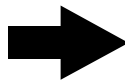
**Burning hazard!**

All coolers heat up during operation. Hazard of severe burnings!

- Wear protective gloves!
- Let the machine cool down sufficiently before starting any work on the cooling systems!

- Check the cooling system for dirt.
- Remove the coarse dirt by hand, by cleaning the cooling system with the water hose or using compressed air. Use a pressure cleaner only with a flat spray at reduced pressure and from at least 30 cm away.

**ADVICE**

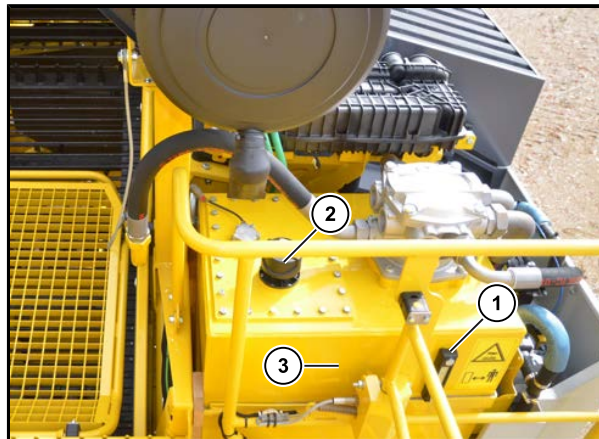


A plug-in connector for connecting the compressed air hose is located to the right of the compressed air reservoir.

### 7.3.2 Hydraulic oil tank

The tank for the hydraulic oil is located on the cabin platform behind the railing. In addition to the display on R-Touch, oil level and oil temperature can be read at the inspection glass (1) on the front of the hydraulic oil tank (3). The hydraulic fluid level should always remain in the range between the centre of the inspection glass and the upper edge of the inspection glass. Make sure that the oil level in the hydraulic oil tank is correct at all times. During all work on the hydraulic system, make sure of the utmost cleanliness!

Please observe that different types of hydraulic fluid may not be mixed.



- (1) Inspection glass oil level + oil temperature
- (2) Oil filling cap hydraulic oil
- (3) Front side hydraulic oil tank



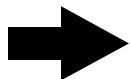
Adding hydraulic fluid:

- For refilling hydraulic fluid, unscrew the black filling cap (bleeding head) (2) from the lid of the oil tank.
- When you open the filling lid for the hydraulic fluid, then it is possible that you hear a 'hissing' sound. This sound is normal.

The filling lid (ROPA item no. 270070000) (2) is both a filler and vent filter. It maintains the required air balance as the fluid level varies (e.g. due to the fluid temperature).

Replace it as soon as it becomes dirty, but no later than every 2 years.

**ADVICE**



When using a vacuum pump, do not set a vacuum on more than 0.2 bar.

### 7.3.2.1 Hydraulic fluid change

The hydraulic fluid must be changed annually – best shortly before start of the season. For this purpose, provide a barrel of sufficient size. Use the fluid drain hose provided to change the hydraulic fluid. Screw the oil drain hose onto the drain valve (1) in the bottom of the hydraulic fluid tank. The valve opens and the old oil drains.

**ADVICE**



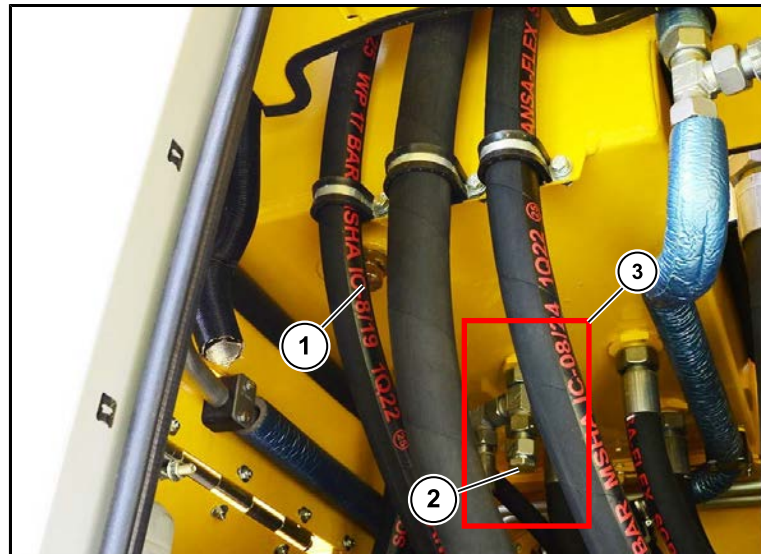
The entire machine contains more than twice as much hydraulic fluid as can be drained during a hydraulic fluid change. For this reason it is essential to adhere strictly to the prescribed intervals for changing the hydraulic fluid.



### Chip catcher of leak oil line open circulation

A chip catcher is installed under the hydraulic oil tank, in the return flow (3) of the leak oil of the open circulation pumps. Here, a small quantity of leak oil flows back into the tank through the protective sieve located in the hydraulic oil tank. While the diesel engine is switched off, any metal parts, e.g. chips would sink from the protective sieve into the sealing plug.

After draining the hydraulic oil, open the sealing plug (2) at the bottom of the chip catcher. Collect this small quantity of hydraulic oil remaining here in a suitable clean container and check it for metal parts. Should you notice any metal parts, please contact your Ropa service partner.



- (1) Hydraulic oil tank drain valve
- (2) Chip catcher plug
- (3) Leak oil return flow

### Filling the hydraulic oil tank

We recommend filling the hydraulic oil through the factory-installed filling valve (4) with a suitable oil pump. Using this method the fresh oil passes through the suction return filter before entering hydraulic oil tank. This increases the purity of the oil in the hydraulic system.

A suitable filling hose with the correct connector for the filling valve (4) is available with ROPA item no. 632040900. Never use the same hose which you use to drain waste oil.

#### Prescribed oil types:

**Hydraulic oil HVLP 46** (containing zinc)  
 ISO-VG 46 as per DIN 51524 part 3

#### Filling volume:

approx. 190 litres



- (4) Filling valve for hydraulic oil on machines with one traction motor (up to 32 km/h), on the traction drive motor



- (4) Filling valve for hydraulic oil on machines with two traction motors (up to 40 km/h), on the rear traction drive motor



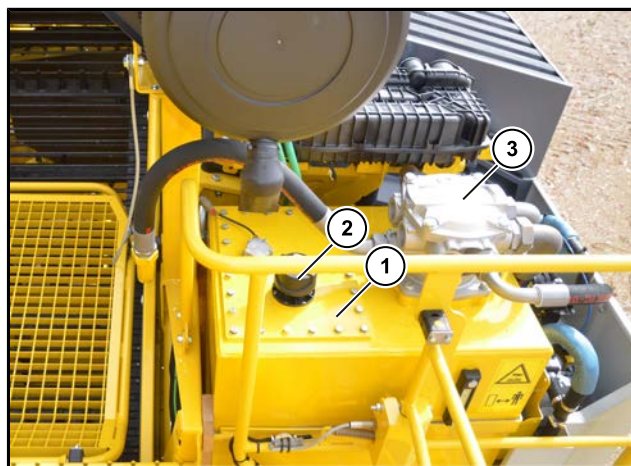
### 7.3.2.2 Cleaning intake sieves

#### Cleaning intake sieves

The intake sieves inside of the hydraulic fluid tank must be checked for soiling every two years before filling up the fresh hydraulic fluid by optical inspection. If the sieves are soiled, they must be cleaned.



- For this purpose, take off the metal lid (1) of the hydraulic fluid container. (SW13)
- If soiled: Remove the intake sieves
- Flush the intake sieves from inside to the outside using sufficient cleaning agent. The protective sieve above the chip catcher must be flushed from the outside to the inside.
- Reinstall the intake sieves.
- Place the gasket and the metal lid onto them.
- Before installing them, coat the bolts for fastening the metal lid with sealing compound (ROPA item no. 017002600) and tighten the bolts.
- Before filling with fresh hydraulic fluid, replace both filter elements of the hydraulic system.
- Fill up the hydraulic system only with prescribed sorts of oil.

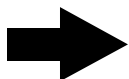


- (1) Metal lid
- (2) Oil filling cap with integrated bleeding and ventilation filter

### 7.3.2.3 Exchange suction return filter element

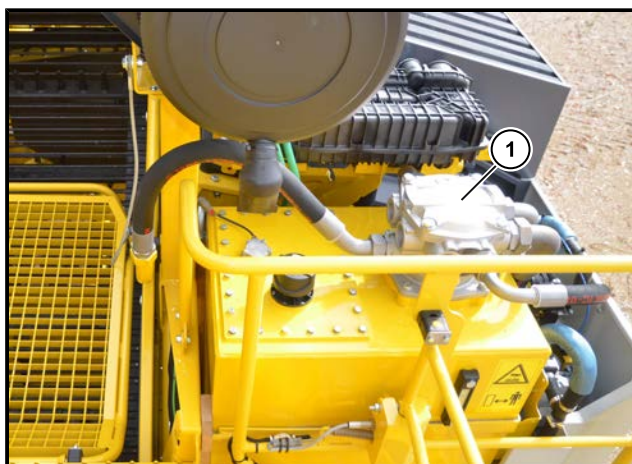
The suction return filter is situated at the hydraulic oil tank (1). (Filter element ROPA item no. 270088600).

#### ADVICE



The filter element is a disposable product. It may not be cleaned. The filter element can be destroyed by cleaning. The hydraulic system might sustain heavy damage.

First exchange of the filter element is required after the first 50 operating hours, thereafter, annually.



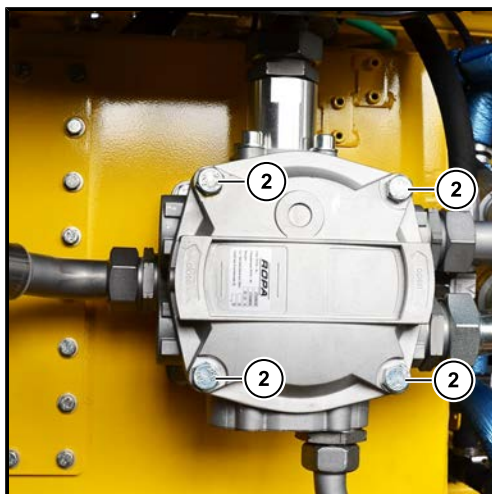
(1) Suction return filter

#### ADVICE



When exchanging the filter elements – as well as during all works on the hydraulic system – make sure of the utmost cleanliness. Make sure that the O-ring seals in the filter housing are not damaged or contaminated.

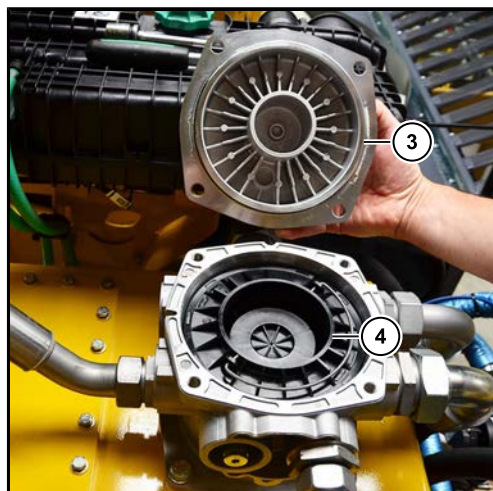
**In order to exchange a filter element in the suction return filter proceed as follows:**



(2) Fixing screw M12 (SW19)

Before opening the filter housing, make sure that the hydraulic system is absolutely pressureless and the oil filling cap is open.

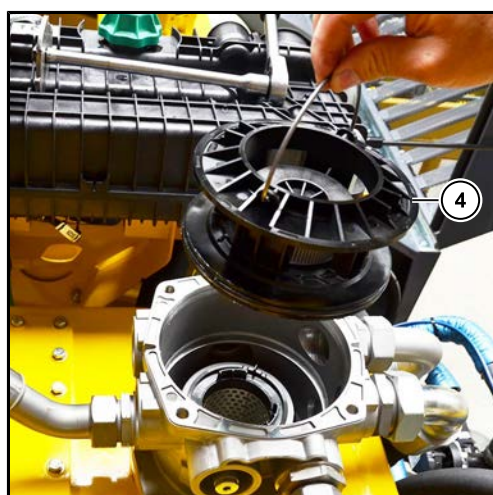
Remove the four screws that fasten the lid (2).



Take off the lid (3) of the suction return filter.

Then lift the metal bracket of the separating plate (4).

- (3) Lid of suction return filter
- (4) Separating plate with metal bracket



With a slight twisting motion, take out the separating plate (4) holding it on the metal bracket.

**The separating plate has a protective strainer.**

Check the inner side of the strainer on metal chips or other foreign bodies. This protective strainer filters the hydraulic oil, e.g. 'sucked' from the hydraulic oil tank when the filter element is dirty or at low temperatures.

- (4) Separating plate with metal bracket



(5) Specialized tool

Using the special tool (ROPA item no. 018139800) (5), loosen the old filter element by aligning it centrally and turning it anti-clockwise in the direction of the "OPEN" marking (6). Finally, pull the old filter element out upwards.



Clean housing, cover and separating plate.

Check the O-rings and the separating plate. Replace any damaged parts.

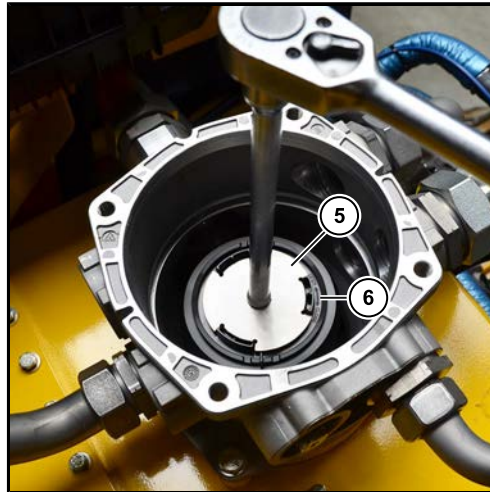
(5) Specialized tool  
(6) Rotation direction mark



Before installation, moisten sealing surfaces of the new filter element, its thread (7) and O-rings with fresh hydraulic fluid.

(7) Thread of filter element

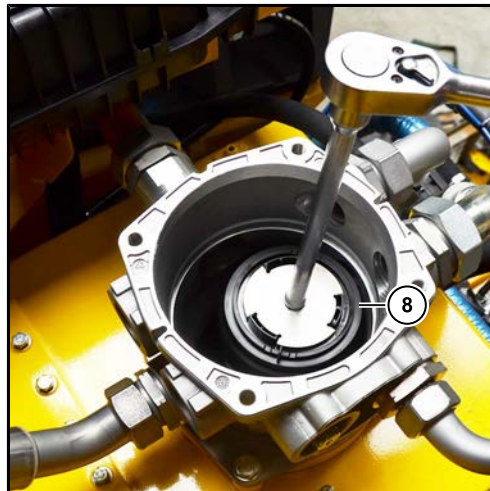




- (5) Specialized tool
- (6) Rotation direction mark

Using the special tool (ROPA item no. 018139800) (5), turn the new filter element clockwise in the direction of the "CLOSE" marking (6) until a slight resistance is felt.

After you feel some resistance, turn a little further clockwise until a greater resistance is felt.

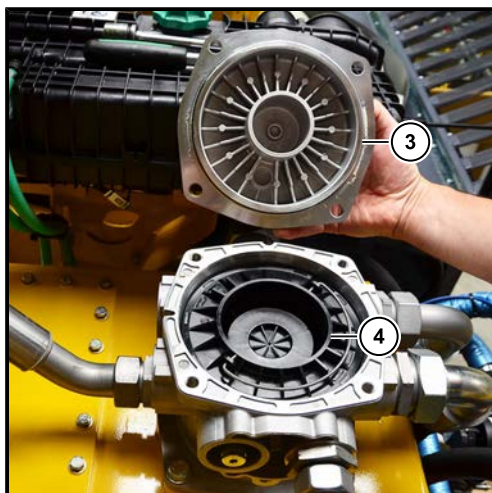


- (8) Ball joint in the filter element can be swivelled, element tilted to the side

Now the ball joint integrated in the filter element can be swivelled and the filter element can be tilted sideways in the housing (8). In this way, tolerances in the housing are compensated.

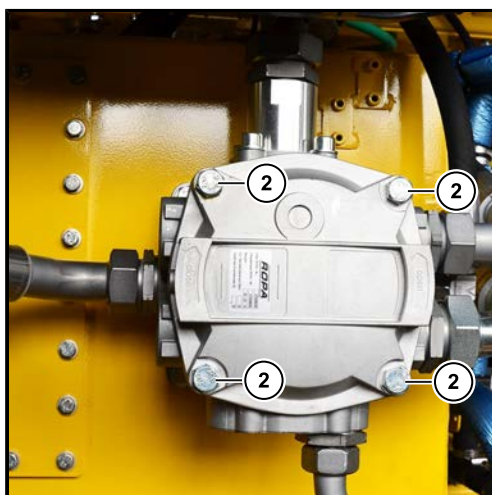
Tightening torque of the filter element:  
8 Nm.

Then position the filter element centrally to the housing.



Attach the separating plate with the protective sieve and metal bracket (4) to the filter element from above. Then swing down the metal bracket.

- (3) Lid of suction return filter
- (4) Separating plate with metal bracket



Put the cover (3) back on and retighten the fixing screws (2).

The tightening torque for the fixing screws is 40 Nm.

- (2) Fixing screw M12 (SW19)

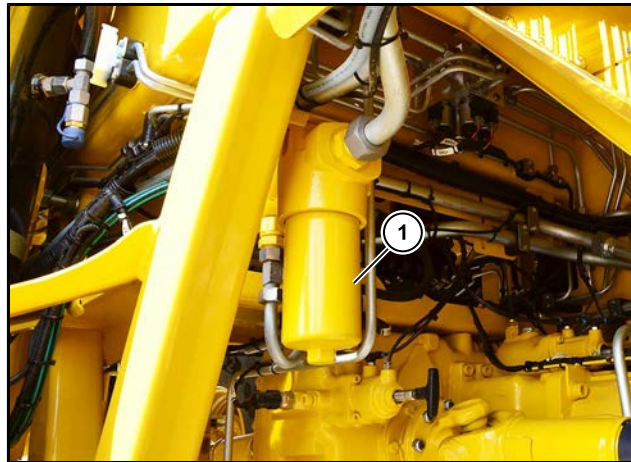
Designation	ROPA item no.	unit count
Suction return filter element	270088600	1
O-ring	412060800	2
Specialized tool	018139800	1

#### ADVICE



Filter element must be disposed of in compliance with regional environmental protection regulations!

### 7.3.3 Replacing pressure filter element



(1) Pressure filter operating hydraulics

#### ADVICE



The filter element is a disposable product. It may not be cleaned. The filter element can be destroyed by cleaning. The hydraulic system might sustain heavy damage.

#### Pressure filter operating hydraulics

The pressure filter for the operating hydraulics is located on the gearbox on the right next to the drive of the front cardan shaft. First exchange of the filter element is required after the first 50 operating hours, thereafter, annually. Besides a fluid-resistant and sufficiently large catchment barrel, you will need a ring wrench or fork wrench SW 32.

#### Filter exchange

- Shut down diesel engine.
- Unscrew the filter bowl. Catch the liquid in a suitable container and clean it respectively dispose of it in an environmentally compatible manner.
- Pull the filter element from the element holding pin. Once the filter element is removed, check if there is a metal end cap at the top. If this is not the case, pull off the end cap separately from the element holding pin. Inspect the element surface for dirt residue and larger particles. These might indicate damages of the components.
- Clean the bowl.
- Inspect the filter for mechanical damage; check sealing surfaces and threads in particular.
- Replace O-ring on the filter bowl. Dirt or incomplete pressure relief during disassembly may lead to seizing of the bowl screw thread.



### Element installation

- Moisten the thread and sealing surfaces of the filter bowl and head as well as the O-ring of the bowl and element with clean hydraulic fluid.
- Install a new element (ROPA item no. 270043000).
- Carefully install the filter element on the element holding pin.
- Screw in the filter bowl to the stop.
- Unscrew the filter bowl by one sixth revolution.
- Start diesel engine and, for instance, raise the pile pickup to the stop (move against pressure), check the filter for leaks.

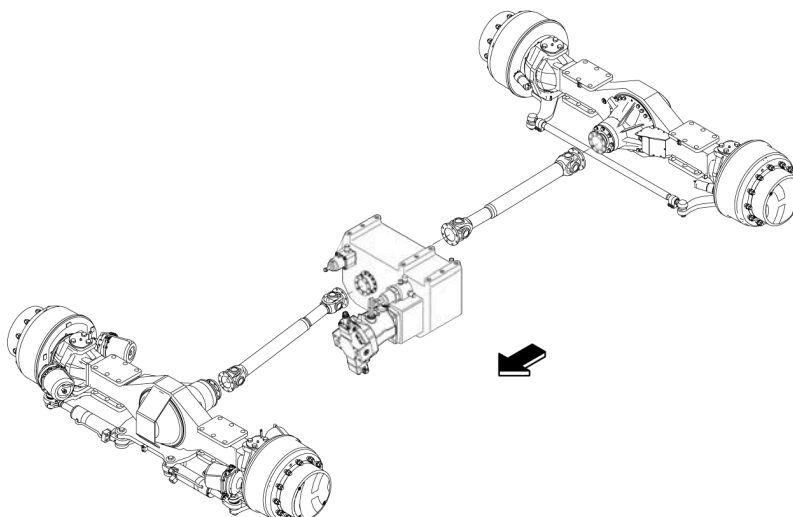
### ADVICE



Filter element must be disposed of in compliance with regional environmental protection regulations!

## 7.4

### Mechanical drive for steering axles



### 7.4.1 Cardan shafts from gearbox to the steering axles

All drive shafts on the machine must be lubricated after every 200 operating hours.

#### **DANGER**



#### **Hazard to life due to rotating machine parts!**

When the engine is running, body parts or pieces of clothing may be caught by rotating drive shafts and pulled into the machine.

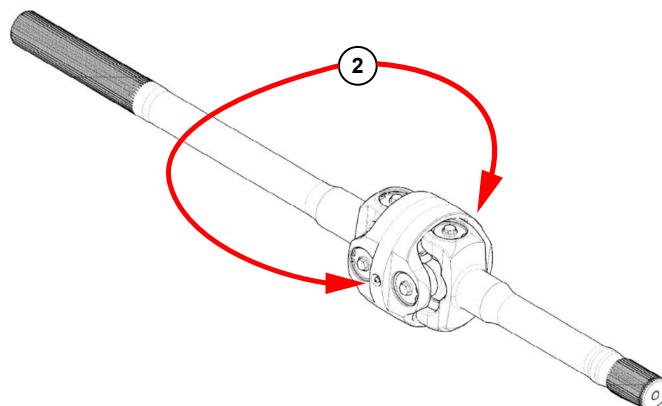
- Stop the machine and shut down diesel engine.
- Secure the diesel engine against accidental start-up, keep the ignition key out of reach of any third party!



*Illustration shows a grease nipple*

### 7.4.2 Maintenance knuckle joints of the axles

The knuckle joints of the double joint shafts in the stub axles of the two steering axles must be lubricated every 200 operating hours. Each knuckle joint contains two lubricating nipples. Both lubricating nipples (2) must be lubricated.



## 7.5 Manual transmission (4-gear)

The manual transmission is used to switch the "Turtle" and "Rabbit" operating modes and also gear I and II and all-wheel drive.

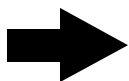
The oil level must be checked every 50 operating hours. It is checked at the inspection glasses (2). The inspection glasses (2) are at the back of the transmission on the left beside the cardan shaft and the reduction gear.

To read the oil level, the machine must be standing on even and level ground with the diesel engine shut down for at least 5 minutes.

Read the oil level in the inspection glass; it must be within the inspection glass area (never above the top edge of the inspection glass!).

The first oil change is required after 50 operating hours, further oil changes must be performed annually.

### ADVICE



The complete transmission consists of two units linked by a narrow duct with a common oil supply. The machine must be completely level to change the oil. After refilling with fresh wait at least one hour before checking the level. The transmission has sufficient oil only if both inspection glasses show the same oil level in the centre of the inspection glasses after the waiting period.

### CAUTION



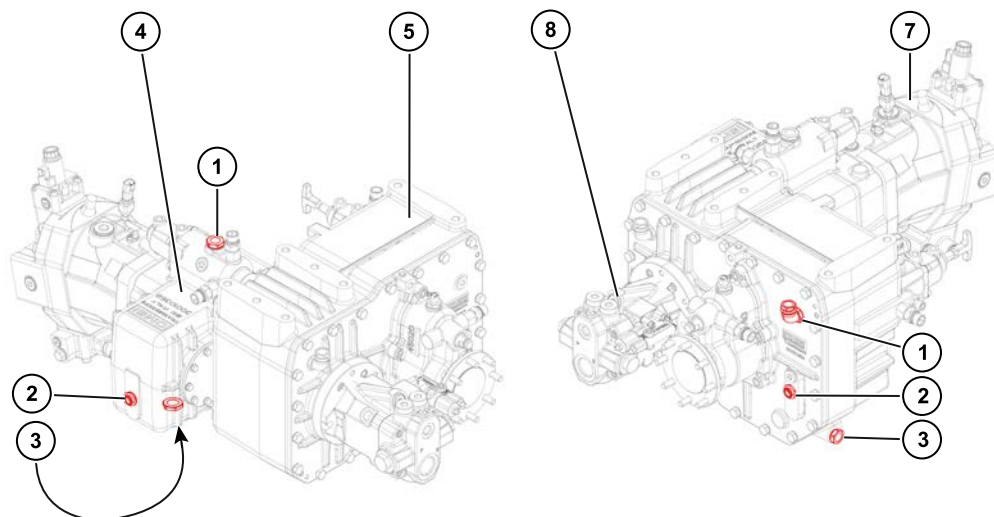
#### Hot oil!

The oil in the manual transmission may become very hot. Hazard of burning.

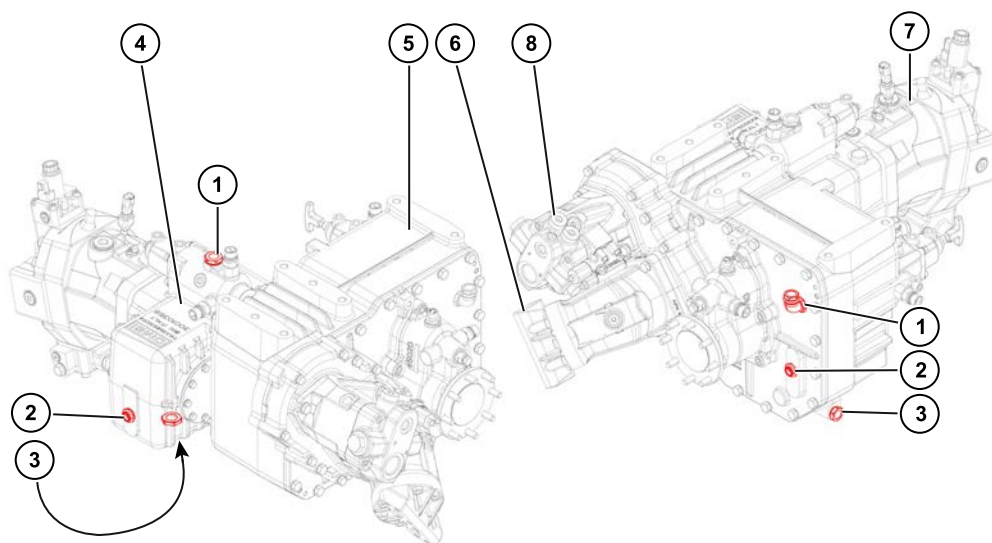
- When changing oil, always wear gloves and suitable personal protective equipment ([See Page 37](#)).

The machine has **2 models** available for the **traction drive**:

Model 1;	1 traction drive engine	Maximum speed 32 km/h
Model 2:	2 traction drive engines	Maximum speed 40 km/h



*1 traction drive engine*



*2 traction drive engines*

- (1) Oil filling screw
- (2) Inspection glass
- (3) Oil drain screw
- (4) Turtle/rabbit reduction gear
- (5) Gear1/gear 2 manual transmission
- (6) Traction drive motor rear
- (7) Traction drive engine
- (8) Emergency steering pump

**Follow the procedure below to change the oil:**

- Change oil only with gears warm after operation.
- Park the machine on level ground.
- Put an oil-resistant collecting vessel of sufficient size underneath.
- Unscrew the two oil drain plugs **(3)** (they are at the bottom corner of the transmission case and the bottom of the reduction gear); the old oil drains out.
- Clean metallic residue from the magnetic oil drain plugs **(3)**. Then replace the plugs and tighten them.
- Open the oil filler screw **(1)** and fill in fresh oil into the filler neck for so long, until the oil level is in the upper range of the inspection glass **(2)**.

**Prescribed oil variants:**

**Fully synthetic gear oil**

API GL5, SAE 75W-90

**Filling volume:**

Traction drive with 1 traction drive engine  
approx. 12 litres

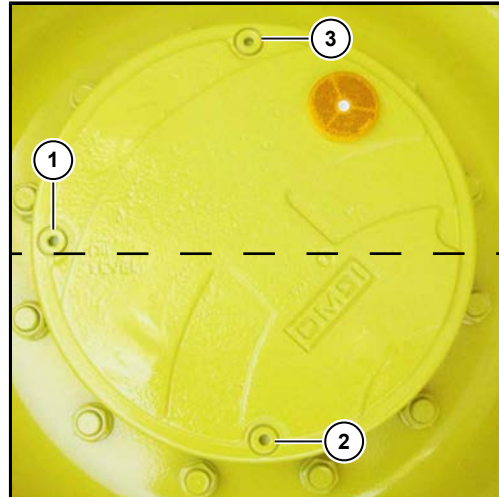
Traction drive with 2 traction drive engines  
approx. 12.4 litres

## 7.6 Axles

### 7.6.1 Planetary gears (applies to both axles)

The first oil change is required after 50 operating hours, further oil changes must be performed annually.

Park the machine so that the respective wheel is sitting as shown in the illustration.



- (1) Oil filling opening and oil level control screw
- (2) Oil drain screw
- (3) Bleeding screw

#### DANGER



#### Injury hazard!

Hazard to life due to moving machine parts.

- Before oil change, each time stop the machine and switch off the engine.
- Secure the diesel engine against accidental start-up, keep the ignition key out of reach of any third party!
- All maintenance and repair work may only be performed by trained personnel.

#### WARNING



#### Hazard of hot oil emitting under pressure!

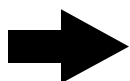
The oil of the planetary gears may become very hot and, due to heating up, may be under some pressure.

- Always wear gloves and suitable personal protective equipment ([See Page 37](#)) when changing oil on the planetary gears.
- Always first unscrew the bleeding screw very slowly and with the required caution. So that the pressure, which may have built up in the planetary gears, can be relieved without danger.

**Follow the procedure below to change the oil:**

- Change oil only with gears warm after operation.
- Park the machine on level ground.
- The oil level control screw ("Oil Level") (1) is horizontal (see illustration).
- Put an oil-resistant collecting vessel of sufficient size underneath.
- Open the oil drain screw (2) and the oil level control screw and let the old oil drain.
- Reinsert the oil drain screw.
- Open the bleeding screw (3). Close the ROPA planetary gear oil filler at the oil filler opening (1).
- Fill up the planetary gears using the ROPA planetary gear oil filler so far until the oil level reaches the lower edge of the oil filling opening.
- Screw the oil level control screw in again.
- Screw in the bleeding screw again.
- Wait for about 15 minutes and check the oil level again. Add oil if necessary. Tightening torque for the three screws: 50 Nm.

**ADVICE**



Use the ROPA planetary oil filler (ROPA item no. 018001700, included with the machine) for filling the oil. Using this special tool, you can precisely and easily fill up the corresponding oil volume.

**Prescribed oil variants:**

**Gear oil**

API GL5, SAE 90

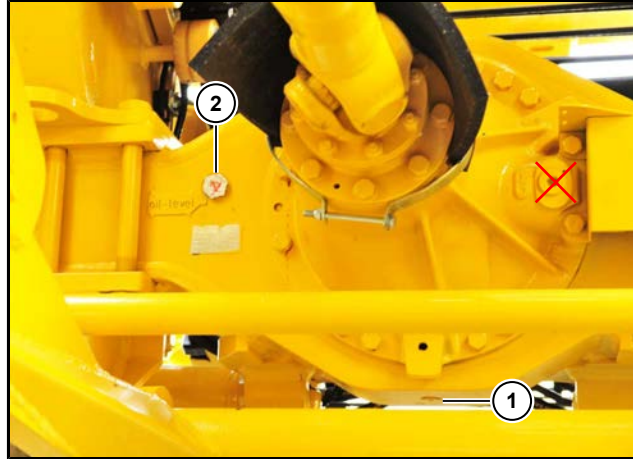
**Filling volume:**

per planetary gear approx. 3.5 litres



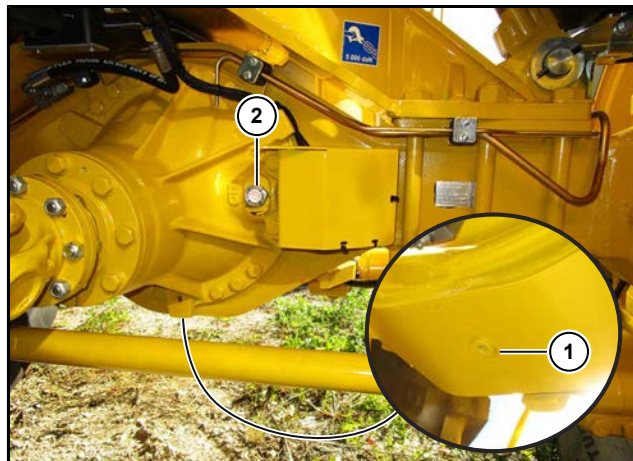
## 7.6.2 Differential gears on front and rear axle

The first oil change is required after 50 operating hours, further oil changes must be performed annually.



Front axle

- (1) Oil drain screw
- (2) Oil filling opening and oil level control screw



Rear axle

### DANGER



#### **Injury hazard!**

Hazard to life due to moving machine parts.

- Before oil change, each time stop the machine and switch off the engine.
- Secure the diesel engine against accidental start-up, keep the ignition key out of reach of any third party!
- All maintenance and repair work may only be performed by trained personnel.

**Follow the procedure below to change the oil:**

- Change the oil only with gears warm after operation.
- Park the machine on level ground.
- Put an oil-resistant collecting vessel of sufficient size underneath.
- Unscrew the oil drain bolt of the differential gear. It is located at the bottom, at the lowest part of the axle body.
- Open the oil level control screw and wait until the oil has drained completely.
- Reinsert the oil drain screw.
- Fill in oil through the oil filling opening for so long until the oil level reaches the lower edge of the oil filling opening.
- Screw the oil level control screw in again.

**Prescribed oil variants:**

**Gear oil**

API GL5, SAE 90

**Filling volume:**

approx. 22 litres Front axle

approx. 20 litres Rear axle

## 7.7 Pneumatic system

Maintenance work on the pneumatic system is only required for the air dryer and compressed air reservoirs. The compressor is maintenance-free.

The air dryer and the five compressed air reservoirs are installed under the right side cover. The dryer cartridge (1 ROPA item no. 261003500) of the air dryer must be replaced once a year.

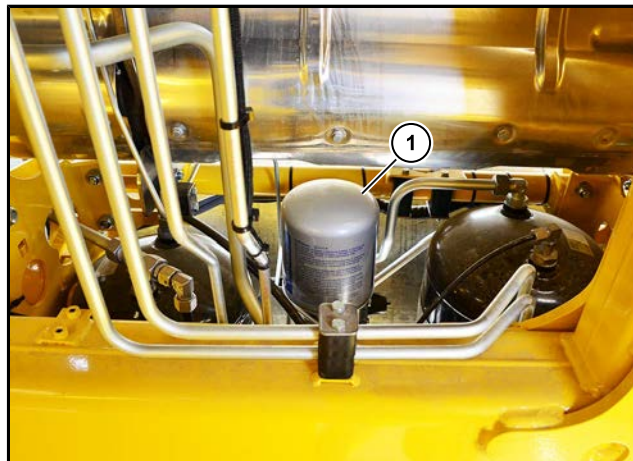
The condensation water must be drained from the compressed air reservoirs every 100 operating hours. If the machine is to be taken out of operation for a longer period (more than a week) the condensation water must also be drained from the compressed air tank. For this, press the drain valve slightly sideward or backward.

### CAUTION

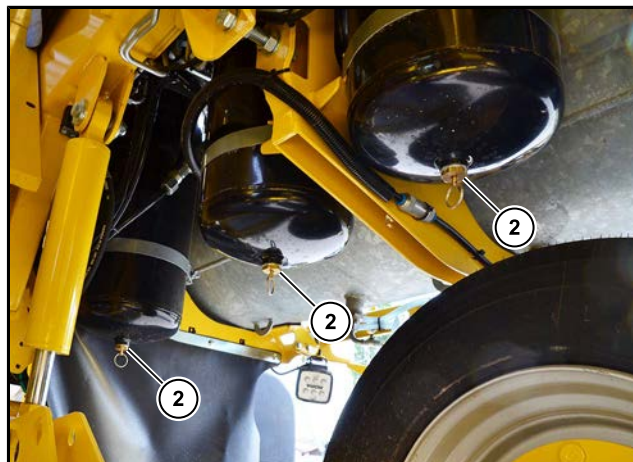


#### Falling and injury hazard!

- Before draining water, stop the machine and switch off the engine.
- The machine must be secured against inadvertent starting of the engine.
- All maintenance and repair work may only be performed by trained personnel.
- Use a stable ladder for all maintenance work on the air dryer.
- When handling acid batteries, always wear gloves, protective goggles and approved personal protective equipment ([See Page 37](#)).



(1) Air dryer cartridge



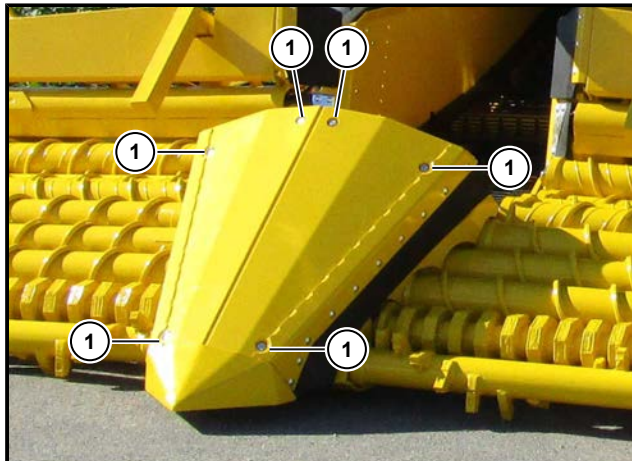
(2) Drain valve

## 7.8 Pickup

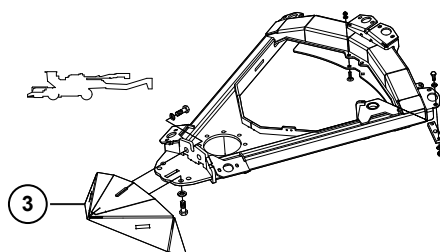
### 7.8.1 Central mark

Check the bottom of the central mark for dirt every day when the side pickup sections are folded in (visual inspection). Heavy dirt should be removed immediately.

The central mark cover (2) can be partially removed after unscrewing three screws (1).



The mark (3), i.e. the front part of the central mark, is a wear part. It should be prepared or replaced before the material is completely worn away. We recommend to have this wear part in stock for machines that are subject to high workloads.

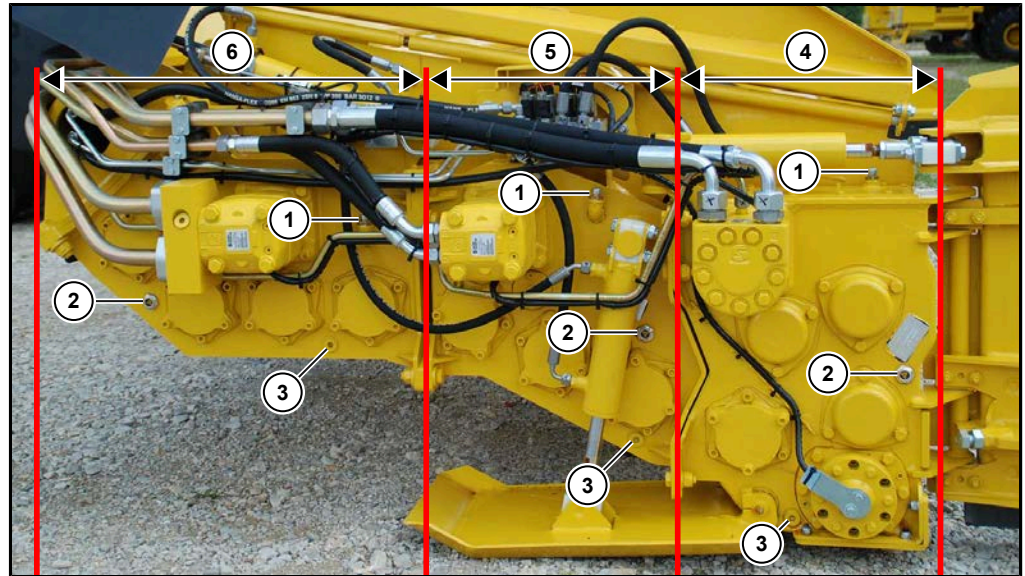




## 7.8.2 Pickup gears

The machine is fitted with three gearboxes on the outside right and left of the pickup. Park the machine on level ground. The oil level of the six gearboxes must be checked daily with the pickup folded out and lowered. The oil level can be read in the inspection glass (2). It must be within the inspection glass range (in no case above the top edge of the inspection glass!).

The first oil change is required after 50 operating hours, further oil changes must be performed annually.



- (1) Oil filling screw
- (2) Inspection glass
- (3) Oil drain screw
- (4) Pickup roller gearbox
- (5) Conveyor roller gearbox
- (6) 4-set pinch roller gearbox

Proceed as follows for changing the oil:

- Change the oil only with gears warm after operation.
- Park the machine on level ground.
- Put an oil-resistant collecting vessel of sufficient size underneath.
- Turn off the closing cap of the oil drain screw.
- Open the oil level filling screw and wait until the oil has drained completely.
- Reinsert the oil drain screw.
- Add fresh oil in the filler opening (also the bleeding screw) until the oil level is in the upper section of the inspection glasses with the pickup lowered.

### Prescribed oil variants:

### Gear oil

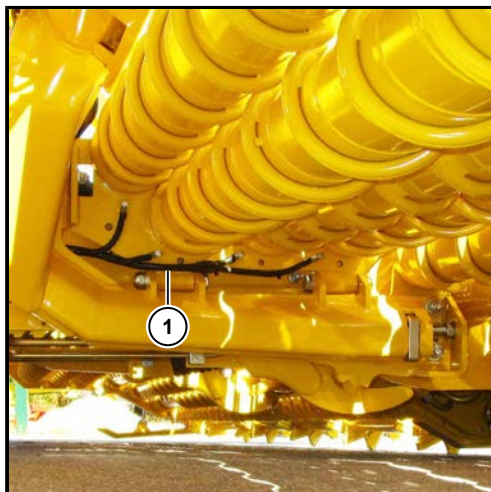
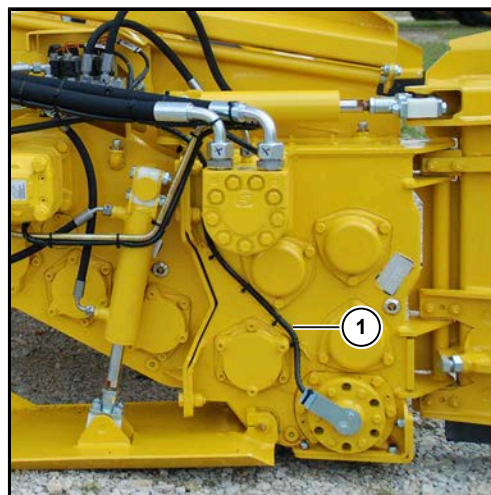
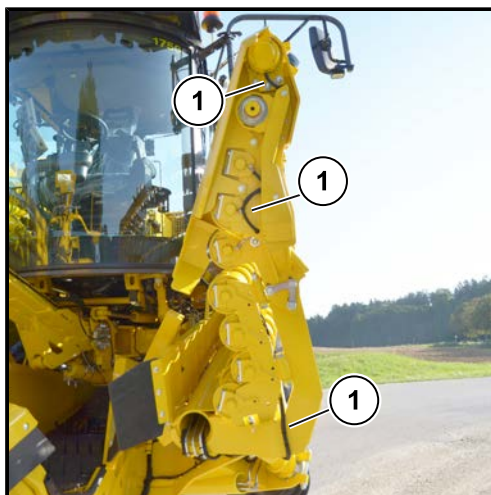
API GL5, SAE 90

### Filling volume:

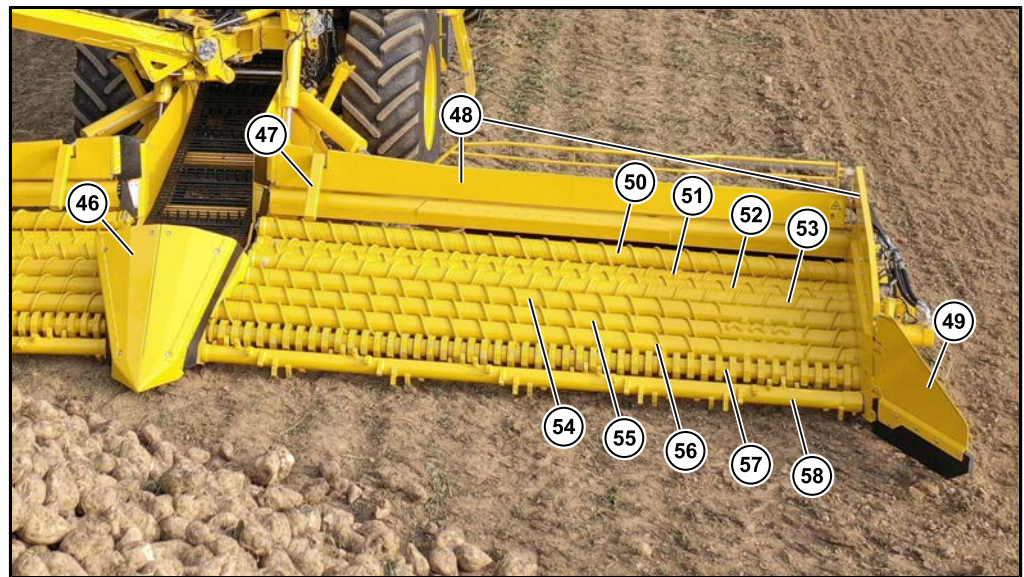
per pickup roller gearbox:	approx. 9.0 litres
per conveyor roller gearbox:	approx. 3.5 litres
per 4-set pinch roller gearbox:	approx. 1.4 litres

### 7.8.3 Pickup central lubrication

Check all lines (1) of the central lubrication system that lead to the rollers every day (visual inspection of lines).



## 7.8.4 Removing and installing rollers



- |      |                 |      |                   |
|------|-----------------|------|-------------------|
| (46) | Central mark    | (53) | Pinch roller 1    |
| (47) | Frost breaker   | (54) | Conveyor roller 3 |
| (48) | Fold plates     | (55) | Conveyor roller 2 |
| (49) | Clearing shield | (56) | Conveyor roller 1 |
| (50) | Pinch roller 4  | (57) | Cleaning roller   |
| (51) | Pinch roller 3  | (58) | Pickup roller     |
| (52) | Pinch roller 2  |      |                   |

### DANGER



#### Crushing hazard!

When removing and installing rollers, there is a risk that the pickup side parts may suddenly fold in and severely injure anyone standing in this area.

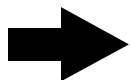
- Shut down the machine before carrying any maintenance and repair work.
- Before starting work, the pickup side section must be securely supported or safely attached to a crane with sufficient load capacity and additionally secured.
- Shut down diesel engine.
- Secure the diesel engine against accidental start-up, keep the ignition key out of reach of any third party!
- Observe the applicable accident prevention regulations for work under raised loads.



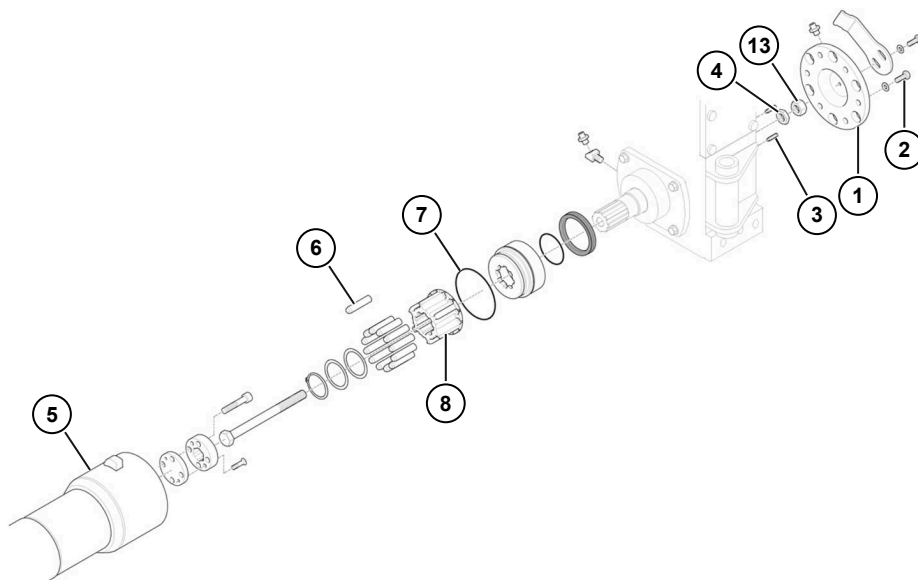
### 7.8.4.1 Removing and installing pickup and cleaning roller

The pickup roller and cleaning roller can only be removed together, because the fingers of the pickup roller move between the discs of the cleaning roller.

#### ADVICE

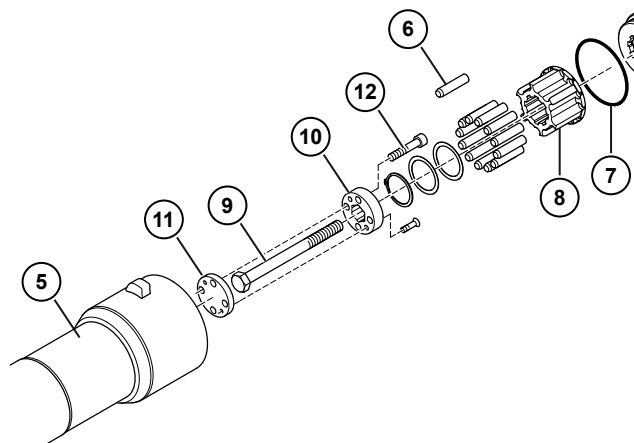


The gear oil of the pickup roller gears does NOT have to be drained to remove the rollers.



Before removing the pickup roller the cover (1) of the bearing flange (outside of gearbox) must be removed:

- Unscrew the lubrication line.
- Unscrew six hexagon bolts (2) (SW 13) on the cover and remove the cover.
- Unscrew the two grub screws (3) out far enough so the flat nut (4) is blocked.
- Loosen the lock nut (13) (SW30), screw in the two grub screws again and remove the two nuts.
- Pull the pickup roller (5) from the gearbox. The pickup roller is only held by 12 plastic carriers (6). These 12 plastic carriers (ROPA item no. 100284900) (6) must be replaced every time the pickup roller is removed. The O-ring (ROPA item no. 412021700) (7) must also be replaced.



- Grease the new plastic carriers (6) thoroughly before pushing them into the gear bush (8).
- The carrier plate (10) and the screw retention (11) must be pre-assembled on the new hexagonal bolt (M 20x360)(9).
- The preassembled bolt is screwed into the finger roller with 4 hexagon socket head screws (M12x40) (12). The screws must be locked with medium-strength screw-locking compound, e.g. Loctite 243, and tightened to 85 Nm.
- Insert the finger roller with the preassembled screw into the pickup. Make sure that the plastic carriers (6) are engaged with the teeth and the O-ring (7) is not damaged.
- Pull the finger roller with the flat nut (4) (which must be secured with Loctite 243) against the gearbox to the stop. Loosen the flat nut (4) again, screw it in until it is flush and then loosen it approx. 1/3 revolution until it is parallel to the threaded holes of the two grub screws (3).
- Unscrew both grub screws until the position of the flat nut (4) is fixed. Now lock the flat nut (4) with the lock nut (13) and secure it with Loctite 243.
- Screw thboth grub screws (3) into the shaft to the stop. The hexagonal screw (9) should have a perceptible longitudinal play of just one millimetre.
- Fill the hole above the lock nut completely with grease before replacing the cover (1) and then fasten the cover with the six hexagonal screws (2).

#### ADVICE



The hexagonal screws (M 20x360) (ROPA item no. 415005000) (9) must be replaced once a year. The M20 nuts (ROPA item no. 414037000 (4) and 414032000 (13) ) must also be replaced once a year.

The cleaner roller does not a lock on the gearbox. The cleaner roller is attached to the gearbox. It can be pulled off after loosening the counter bearing in the centre of the pickup (pedestal bearing with adjusting ring).

### 7.8.4.2 Replacing the fingers of the pickup rollers

The pickup rollers are fitted with wear plates on the pickup fingers (ROPA item no. 208003800). Hard-metal plates are soldered to the wear plates.

The wear plates are fastened with screws, which allows every single wear plate to be replaced individually quickly and without difficulty once it has become worn.



*Pickup finger with wear plate*

#### **DANGER**



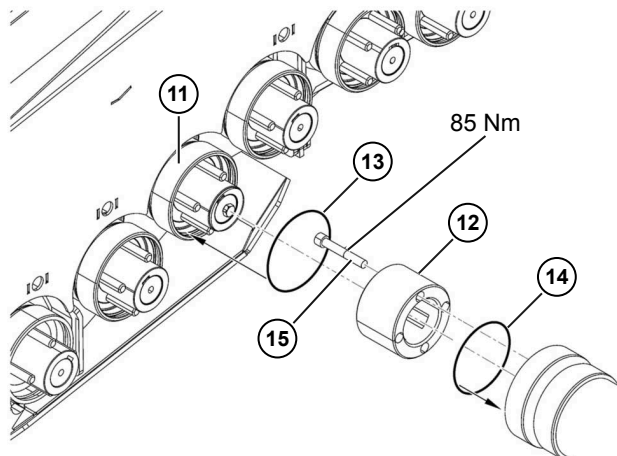
**Danger of serious injury when working on the fingers of the pickup rollers.**

- Before maintenance and repair work, the machine must be shut down and the diesel engine switched off.
- Secure the diesel engine against accidental start-up, keep the ignition key out of reach of any third party!

### 7.8.4.3 Removing and installing feed rollers and pinch rollers

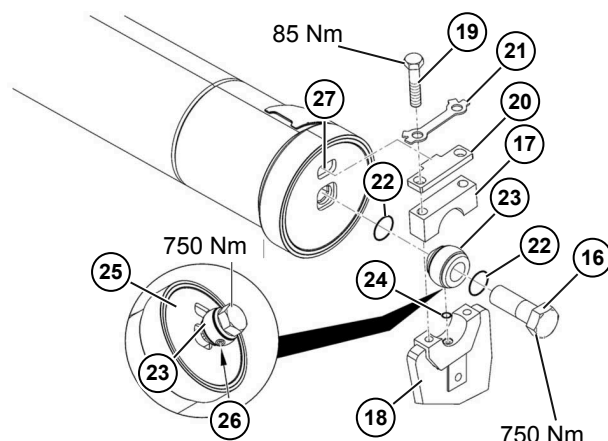
Please note the following basic information:

**Drive side:**



- The rollers are driven by the coupling lugs (11) on the gearboxes. They are the only means of holding the rollers to the gearboxes.
- All polyamide couplings (12) must be greased before they are pushed onto the coupling lugs.
- Before assembly, one new O-ring (ROPA item no. 412033800) (13) must be inserted into the coupling lug and one O-ring (O-Ring ROPA item no. 412063500) (14) into the end of the roller.
- The four M12 x 80 Allen screws (ROPA item no. 415005100) (15), with which the polyamide couplings (12) are screwed into the rollers, must be coated with special thread-locking compound and must be used only once.

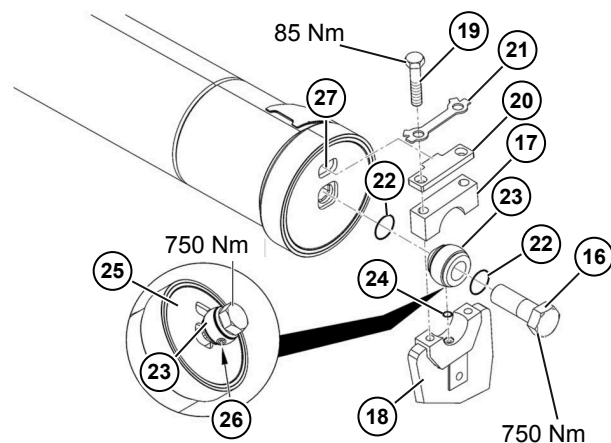
**Counter bearing side:**



- All M24 fine-thread screws (**16**) are right-hand thread (!). The tightening torque is 750 Nm. They must not be coated with liquid thread-lock (Loctite).
- Mark them in pairs before unscrewing the top (**17**) and bottom half-shell (**18**). These parts are precisely manufactured and cannot be exchanged with other parts or combined with other parts.
- Remove the two M12 hexagonal screws (**19**) and remove the top half-shell (**17**) with the locking plate (**20**) and the screw lock washer (**21**).

**Removing and inserting roller:**

- To lift a roller out, it must be lifted until it is above the bottom half-shell (**18**). This is best done with an in-house manufactured hook that grips the roller. A roller weighs approx. 150 kg. The lifted roller will tilt slightly on the coupling lug. The roller can be detached from the coupling lug by tapping the roller coil lightly in an axial direction.
- When reassembling always replace both O-rings (ROPA item no. 412030900) (**22**) on the fastener (**23**) with the new O-rings. The same applies to the O-ring (ROPA item no. 412032000) (**24**) in the grease duct in the bottom half-shell.
- The hexagonal screws (**19**) must be tightened to a torque of 85 Nm. The screws are locked by bending up the corners of the screw locking plate (ROPA item no. 100273600) (**21**).
- When inserting the fastening bracket (**23**) in the anti-rotation washer (**25**) make sure that the lubrication hole (**26**) in the fastening ball must always opposite to the slot (**27**) in the lock washer (**25**).



#### ADVICE



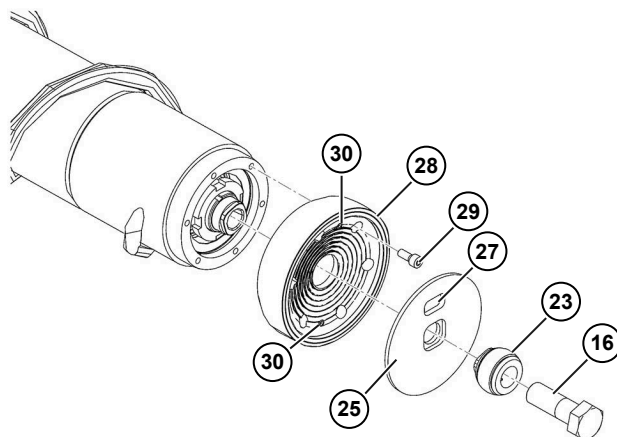
Before screwing in the M24 fine-thread screws (16) the thread must be thinly coated with copper paste (ROPA item no. 017015900 tube containing 100 gr.).

- When installing the rollers, make sure that the turns of the rollers are not aligned. The turns of the rollers must be offset centrally to one another.
- The pinch rollers should be mounted on the holder on the opposite side as required to keep the wear even. Replace the pinch rollers crosswise when reinstalling them. To prevent one-sided wear of the slot (27) in the anti-rotation washer (25), the anti-rotation plates (20) should be mounted on rollers rotating in the opposite direction after every season.

#### 7.8.4.4 Replacing wear flange

On a new machine the distance between two wear flanges (28) is approx. 0.5 mm. As soon as this distance is too high, more grass, weeds, beet leaves etc. will remain stuck at the transition to the following conveyor.

ROPA recommends replacing the wear flanges as soon as the distance is 2-3 mm. The replacement process is simple. The replacement does not affect the settings of the taper roller bearings because they are behind the wear flange.

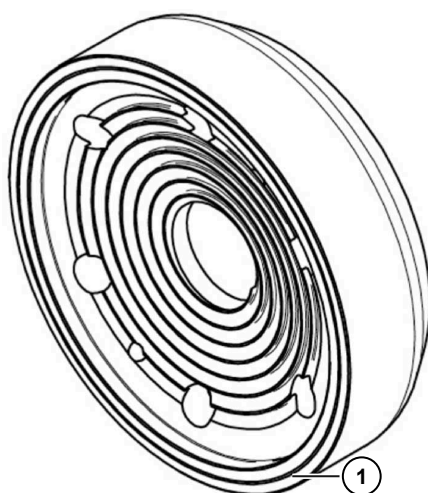


The basic procedure corresponds to the removal of pinch rollers, with the only difference being that the M24 fine-thread screw (16) is loosened first (do not unscrew completely).

To replace the wear flange (28) it is only necessary to remove the fastening screws (29) of the wear flange. If the two grub screws (30) are screwed into the thread, the wear flange is pressed out.

Wear flanges are required in two types:

- ROPA item no. 100225600 wear flange for clockwise rotating rollers (without marking)
- ROPA item no. 100225700 wear flange for anticlockwise rotating rollers (marking: 1 groove (1) on face)



The direction of rotation is always recognised by looking at the face of the wear flange.



### 7.8.4.5 Installing and adjusting the bearings of the pinch rollers or conveyor rollers

A special tool is essential for installing or adjusting the bearings (adjustable taper roller bearings) at the ends of the pinch rollers and conveyor rollers. This tool can be ordered under the ROPA item no. 018002400. However, this work is very rarely required and can only be performed by experienced technicians.

### 7.8.4.6 Replacing radial shaft seals (Simmer rings) on the gearbox

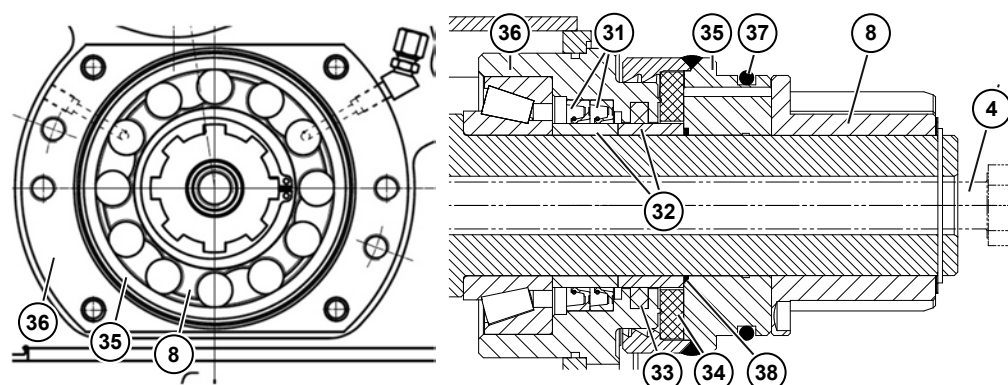
Because the pickup roller bearings are exposed to a large amount of dirt due to their design, soil may penetrate the gearbox flange over time in spite of thorough sealing. For this reason the two radial shaft seals (ROPA item no. 246002800) (**31**), the two inner rings (ROPA item no. 240015200) (**32**) and the two felt rings (ROPA item no. 246002600 (**33**) and ROPA item no. 246014500) (**34**) on the gearbox side bearing of the pickup roller must be replaced after approx. 300,000 t loading for safety reasons.

Remove the gear sleeve (**8**), the dirt deflector flange (**35**) and the bearing flange (**36**) for this purpose.

Removing the gear sleeve (**8**) requires the ROPA special tool item no. 018068000.

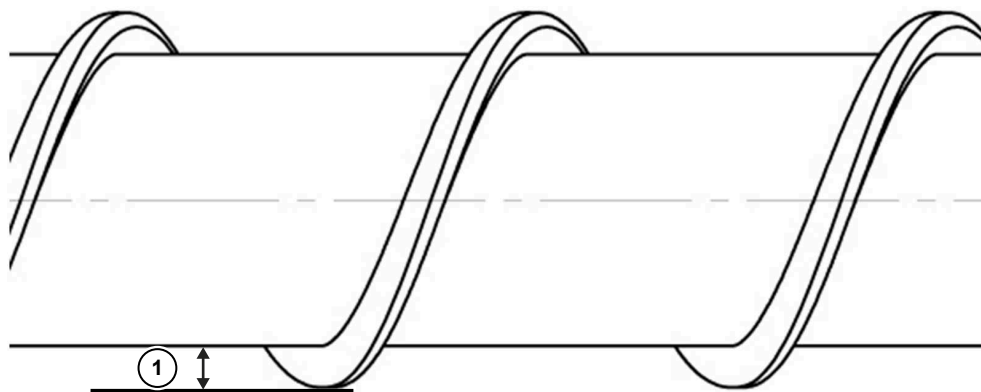
Remove dirt deposits on the inner saw-tooth thread in the dirt deflector flange (**35**).

During reassembly always replace the O-rings (**37**) (ROPA item no. 412081000) and (**38**) (ROPA item no. 412081000) at the same time.

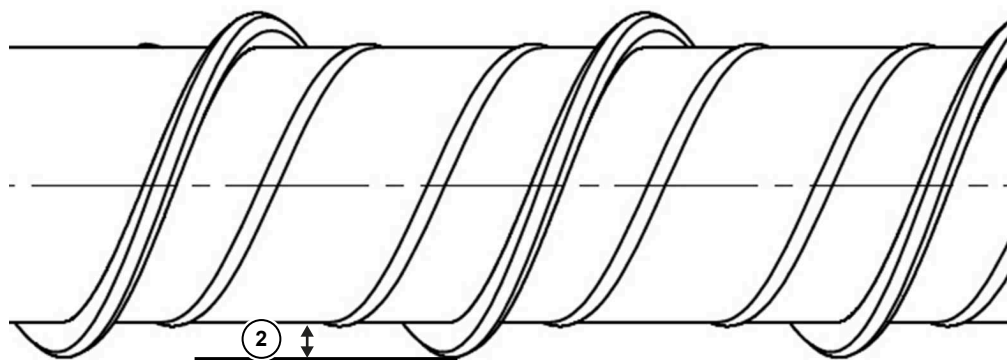


### 7.8.4.7 Build-up welding

The welding material must be only applied to the conveyor side of the roller spirals on the conveyor and pinch rollers. Never manually apply a build-up welding bead directly on the roller tube. The heat will affect the complete roller and it will become unusable.



Note that the built-up spirals (1) on the conveyor rollers must never be higher than max. 20 mm.



Note that the built-up spirals (2) on the pinch roller must never be higher than max. 18 mm.

Build-up welding must always be done by machine to ensure that the surface of the weld is smooth and to prevent damage to the beets. This work can be done professionally and cost-effectively at many ROPA service centres.

We recommend ROPA SCREWTEC special filling wire with a diameter of 1.6 mm for build-up welding. It is applied at the factory and can be ordered in 15 kg rolls at ROPA item no. 017013600.

#### ADVICE

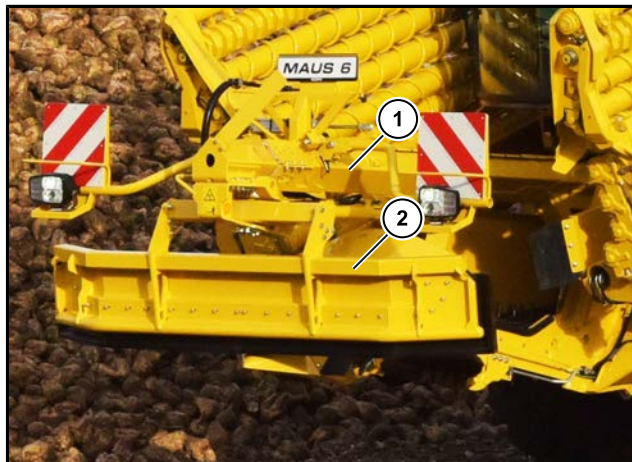


Also check the wear of the roller tube before any further actions.

The build-up welding often lasts so long that the roller tube is also worn out if the hard welded-on finish is worn. Replacement of the worn roller with a new one is then the most cost-effective solution in this case.

## 7.9 Pile pickup with residual beet pickup

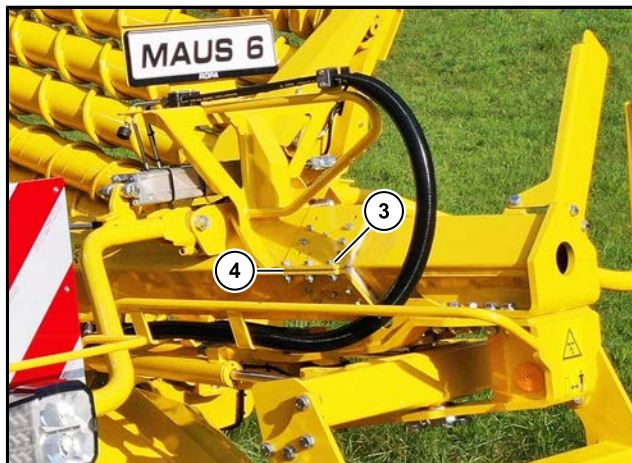
Clean major soiling from the hydraulically actuated parts and coat the telescopic tube with grease as required.



- (1) Pile pickup
- (2) Residual beet pickup

The play between the outer and inner pipe of the telescopic tube can be adjusted as follows:

- Remove the six hexagonal screws (3).
- The play is adjusted with spacers (4).
- Replace the six hexagonal screws.



## 7.10 Infeed conveyor

The deflector rollers (1) of the infeed conveyor (front at the conveyor infeed) are fitted with wipers (2). They scrape off adhering soil. The screws in the wipers must be checked once a week and replaced as soon as the screw heads are heavily worn. If the screw heads are worn too much, the wiper may come loose and fold into the infeed conveyor. This will destroy the infeed conveyor. Damage of this type is not covered by any guarantee, warranty or goodwill.

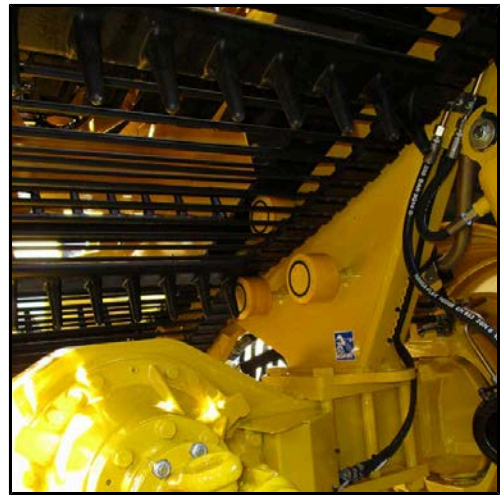
The wipers must be adjusted or replaced as required, depending on the wear. The area of the infeed conveyor deflector must be checked daily to once a week, depending on the soil conditions, and cleaned if heavily soiled. The sieve conveyor must be tensioned as required.

**It must never be tightened too much.**

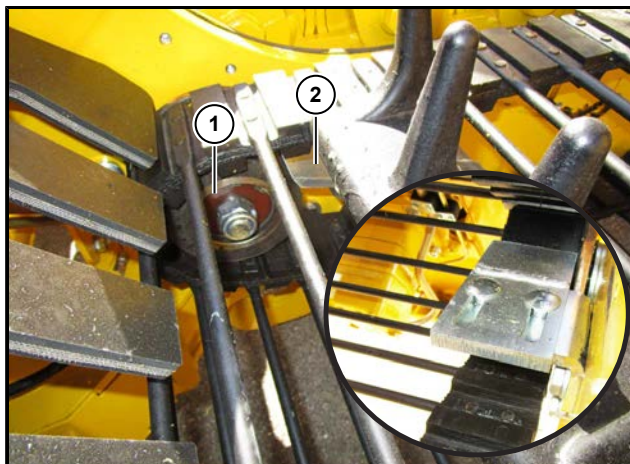
Check every day that all support rollers in the infeed conveyor duct are in good condition. If rollers in the area of the front axles are defective, heavily worn or missing altogether, the belt will slip over the axle. This may cause significant damage to the axle housing.



*Infeed conveyor duct*



*Check this area regularly and clean as required*



- (1) Deflector roller
- (2) Wiper



### 7.10.1 Tensioning infeed conveyor

#### WARNING



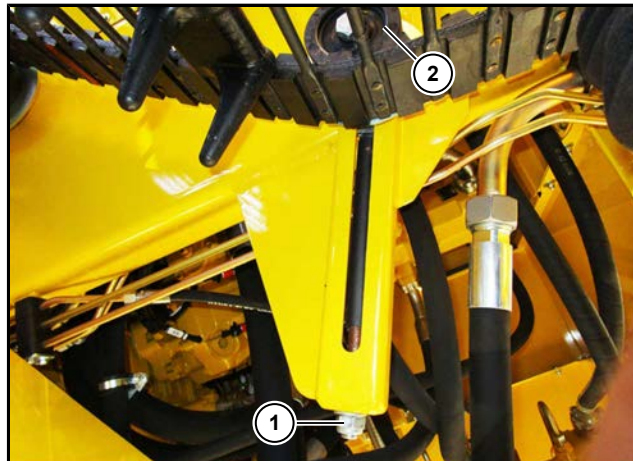
#### Hazard of severe injuries.

The retension of the infeed conveyor belt may only be performed with the drive switched off and the diesel engine shut down.

- Before maintenance and repair work, the machine must be shut down and the diesel engine switched off.
- Secure the diesel engine against accidental start-up, keep the ignition key out of reach of any third party!

Check the tension of the infeed conveyor only with the pickup folded out and lowered to working height.

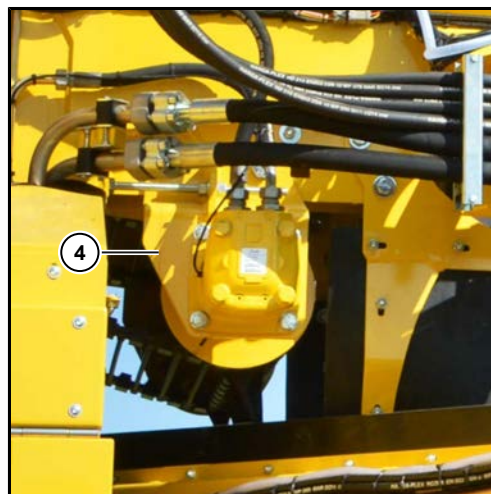
If it is necessary to tension the infeed conveyor, loosen the fastening screws from the tension roller (2) (right and left behind the front wheel on the bottom of the frame tube) and with the aid of the tension screw (1) pull the tension roller down (2). Make sure that the tension rollers (2) are pushed out equally on both sides.



- (1) Tensioning bolt
- (2) Tension roller

### Synchronism

If the infeed conveyor is severely one-sided on the side flange of the drive wheels, it can be synchronised by moving the oil engine bracket (4) or drive shaft (3).

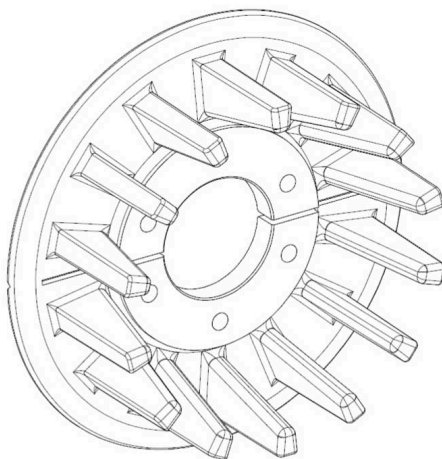


## 7.10.2 Replacing infeed conveyor drive wheels

### ATTENTION



Replace drive wheels when required, do not wait until the unloading conveyor belt jumps off!



Check the drive wheels for wear at least once a week. Extremely worn drive wheels lead to premature wear of the infeed conveyor belt.

Service life: depending on soil conditions every 60,000 - 140,000 t of loading.

## 7.11 Recleaning

Depending on equipment, your machine has a sieve conveyor cleaner, an 8-set pinch roller cleaner or a stone remover.

### 7.11.1 Sieve conveyor cleaner

The cleaning belt must not be too tight. The belt return should sag slightly.



#### WARNING

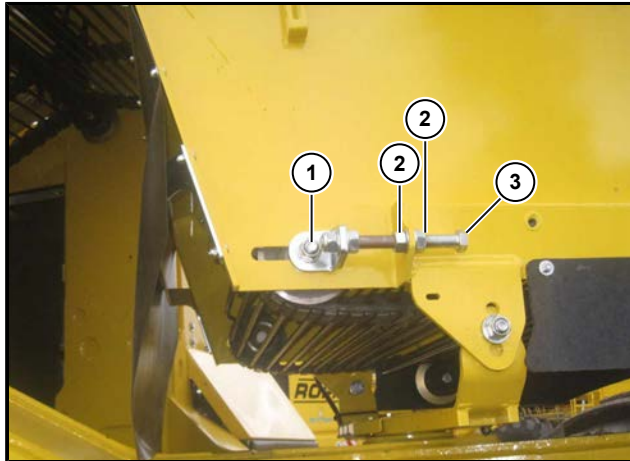


#### **Hazard of extremely severe injuries due to the cleaning belt starting!**

The cleaning belt must not be tensioned unless the machine drive and the diesel engine are switched off.

- Before maintenance and repair work, the machine must be shut down and the diesel engine switched off.
- Secure the diesel engine against accidental start-up, keep the ignition key out of reach of any third party!





- (1) Fixing screw
- (2) Lock nut
- (3) Tensioning bolt

- Loosen the fixing screws (1) for the deflector rollers on the right and left.
- To tension the belt loosen the lock nuts (2) on the two tensioning bolts (3) on the right and left.
- Turn the lock nuts as far as necessary and tighten them.
- Make sure that the tensioning bolts are adjusted equally on both sides to tension the belt evenly.

### 7.11.2 8-set pinch roller cleaning

If the rollers in the pinch roller cleaner are seriously out of balance, never continue working with the rollers for an extended period, because the suspension or recleaner frame may be damaged.

The pinch rollers are removed and installed in the same way as the pinch rollers in the pickup.



#### **DANGER**



#### **Hazard of extremely severe injuries due to starting pinch rollers!**

- Before maintenance and repair work, the machine must be shut down and the diesel engine switched off.
- Secure the diesel engine against accidental start-up, keep the ignition key out of reach of any third party!

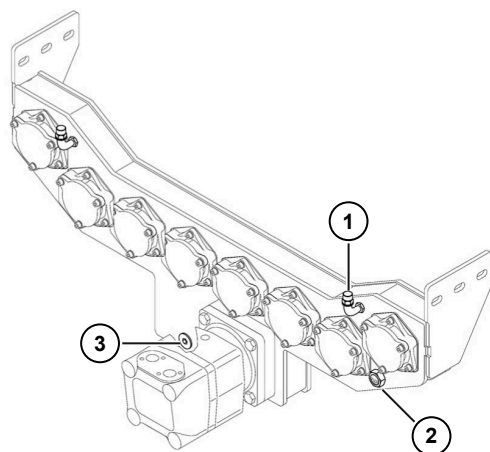
#### **Falling hazard!**

- Always use approved and safe ladders and climbing aids or an approved work platform for all work on the pinch roller cleaner.

The 8.set pinch roller cleaner is driven by a hydraulic motor.

The oil level of the gearbox must be checked once a week. The oil level is checked at the inspection glass. If the oil level is above the middle of the glass, it is not necessary to add oil.

The first oil change is due after 50 operating hours, then the oil must be changed once a year.



- (1) Oil filling screw
- (2) Inspection glass
- (3) Oil drain screw

Proceed as follows for changing the oil:

- Change the oil only with gears warm after operation.
- Put an oil-resistant collecting vessel of sufficient size underneath.
- Turn off the closing cap of the oil drain screw.
- Open the oil level filling screw and wait until the oil has drained completely.
- Reinsert the oil drain screw.
- Add oil into the oil filling opening until the oil level is in the upper section of the inspection glass.
- Screw on the oil filler cap.

**Prescribed oil variants:**

**Gear oil**

API GL5, SAE 90

**Filling volume:**

approx. 6.0 litres

## 7.12 Truck conveyor

### 7.12.1 Tensioning the truck conveyor

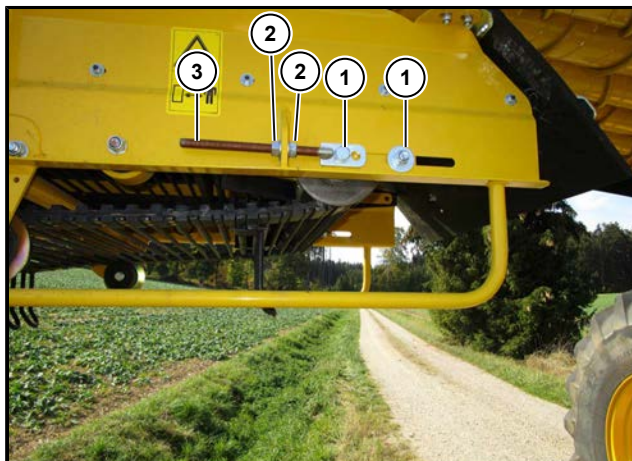
The truck conveyor must be tensioned as required. The belt tension is correctly set if the bottom return side of the belt sags approx. 2 - 3 cm between the rollers with the truck conveyor fully lowered and the conveyor articulation fully extended (truck conveyor almost straight).



*Truck conveyor correctly tensioned*

Proceed as follows to tension the truck conveyor:

- Shut down the diesel engine and secure it against inadvertent starting.
- Loosen the fixing screws (1) for the deflector rollers on the right and left.
- Turn the nuts (2) on the tension rods (3) left/right until the left/right deflection rollers are pushed back sufficiently far.
- Lock the nuts (2) on the tension rod (3) left/right.
- Tighten the fixing screws (1) for the deflector rollers on the right and left.
- Always make sure that you tension both sides of the belt evenly to prevent the belt from wearing more on one side and being damaged.

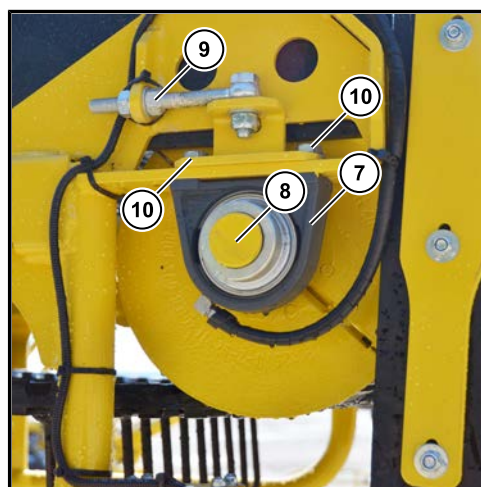
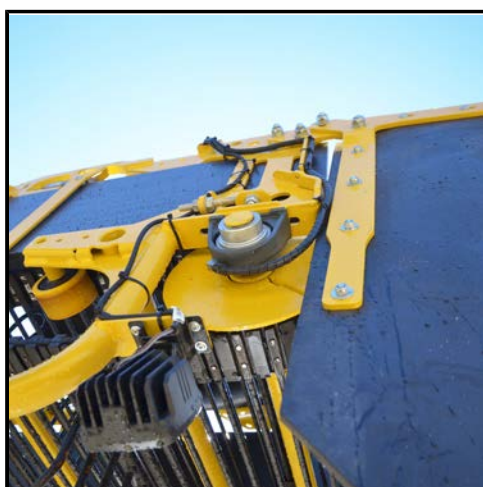


If the truck conveyor is crooked, it can be made even by adjusting the clamping nuts (4) on the diagonal strut (5) in the conveyor infeed.



### **Synchronism**

If the truck conveyor belt is severely one-sided on the side flange of the drive wheels, it can be synchronised by moving the counter bearing (7) of the drive shaft (8).



- (7) Counter bearing truck conveyor drive shaft
- (8) Truck conveyor drive shaft
- (9) Clamping nut
- (10) Fixing screws



The side walls of the truck conveyor are wear-resistant plastic plates (6). They are designed to be turned four times quickly and easily.



## 7.12.2 Scales (option)

### ATTENTION

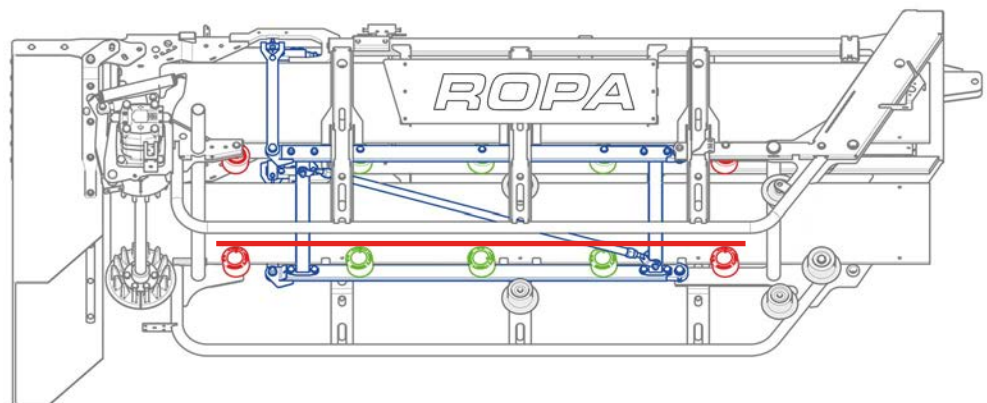


In general, during any maintenance and repair work, avoid blows and bumps to the weighing frame as they also affect the weighing cells. Such stresses can result in bending of the weighing cell and lead to significant deviations in the weighing result. Such damage is not visible to the naked eye.

### 7.12.2.1 Settings on the scale's mechanics

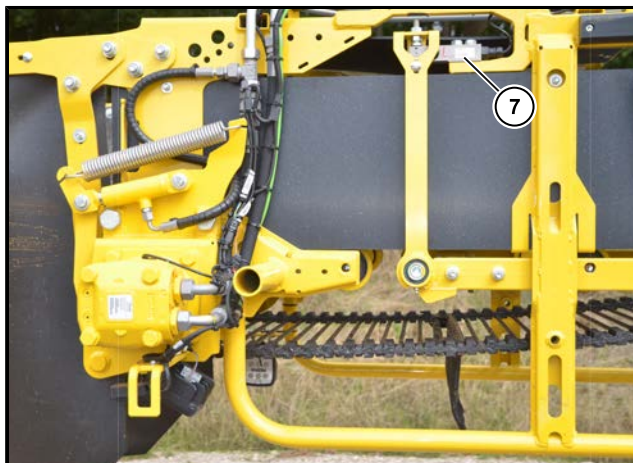
#### Exchange support rollers (truck conveyor)

If you change a support roller on the weighing frame or a support roller before or after the weighing frame, make absolutely sure when installing these rollers that every five support rollers are installed at the exactly same height (see drawing - red line).



green = support rollers in the scale frame  
red = fixed support rollers before and after weighing frame  
red line = same height of the support rollers  
blue = weighing frame with connecting lever to the weighing cell

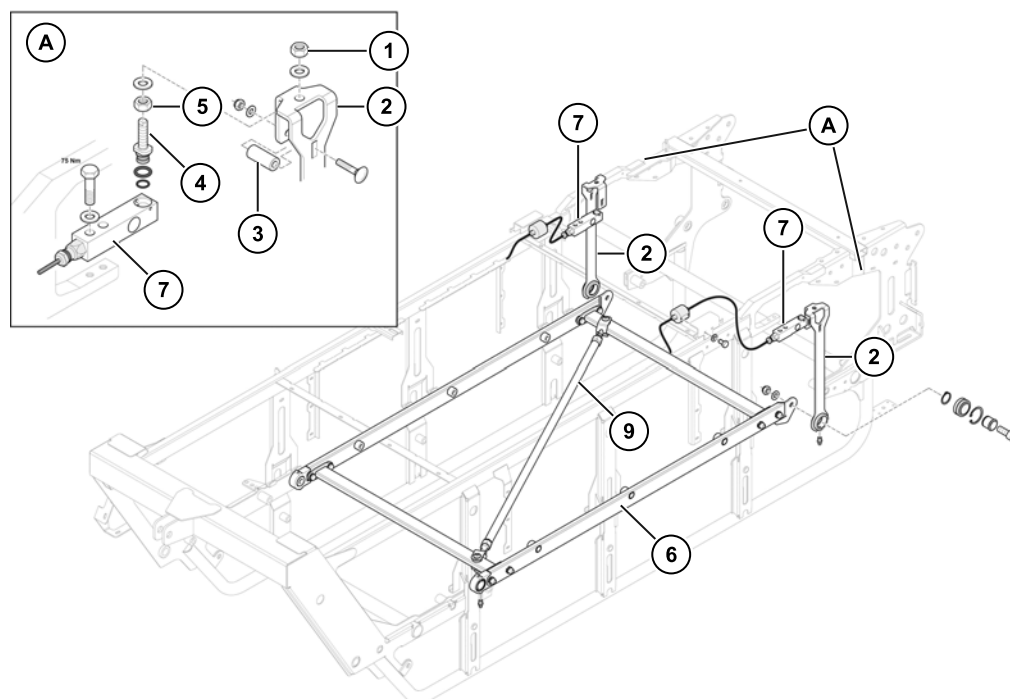




(7) Weighing cell

### Setting the weighing frame height

Place a level or similar straight edge over five rollers or use a tight cord for alignment. Align the rollers to the same height.



The weighing frame (6) is fixed to the connecting levers (2). However, the height of the connecting lever to the weighing cell (7) can be adjusted with the mounting bolt (4). First loosen the spacer tube (3). Then adjust the mounting bolt with the hexagon nuts (1+5) until the support rollers on the weighing frame are aligned with the fixed support rollers. Perform this adjustment on both sides. At the end, tighten the spacer tube again. Make sure to leave a gap of approx. 1 to 2 mm between the bottom of the weighing cell (7) and the spacer tube (3).

#### ADVICE



It is recommended to move the truck conveyor into the operating position at the end of work. Both weighing cells must indicate approximately the same weight if the belt is empty. You will find the actual weight of each weighing cell under A091 and A092 in the Diagnosis menu ([See Page 480](#)).

**Check the gap between the weighing frame and the truck conveyor articulation frame**

The distance (8) must be the same on both sides. If necessary, change the dimension by adjusting the diagonal brace in the weighing frame (9).



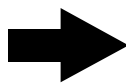
**7.12.2.2 Remove dirt accumulated on the scales**

Remove the dirt that builds up between the weighing frame and the side walls on a regular basis. Make sure that the weighing frame is not subjected to any external forces; it may only be exposed to loads caused by the mass of the sieve conveyor and the load on top of it.

The inclined position of the support rollers on the truck conveyor articulated section creates a self-cleaning effect, but it is not always sufficient. Therefore, regularly check whether the support rollers on the weighing frame as well as the support rollers in front of and behind the weighing frame are dirty. It might be necessary to clean it several times a day depending on the soil characteristics.

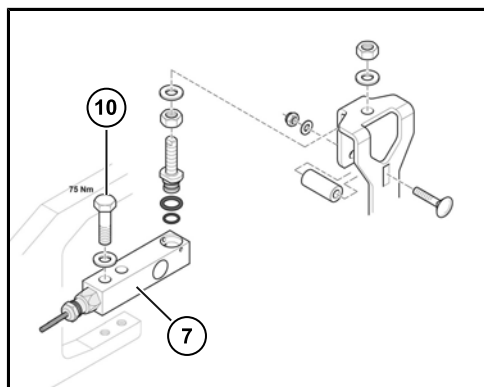
### 7.12.2.3 Exchange weighing cell

#### ADVICE



Never mount the fixing screws (10) of the weighing cells (7) using an impact driver. It may destroy the weighing cells. This is applicable for all major forces applied by screwdrivers.

If it is necessary to replace a weighing cell, the work must be performed by authorised service technicians.



- (7) Weighing cell
- (10) Weighing cell fastening nuts (76 Nm)

### 7.12.3 Rotary drives for swivel arm and truck conveyor

The swivel arm and truck conveyor are driven hydraulically by two chain drives. The chains are automatically tensioned by hydraulic cylinders.

#### **DANGER**



#### **Hazard of extremely severe injuries by chain drives!**

- Before maintenance and repair work, the machine must be shut down and the diesel engine switched off.
- Secure the diesel engine against accidental start-up, keep the ignition key out of reach of any third party!

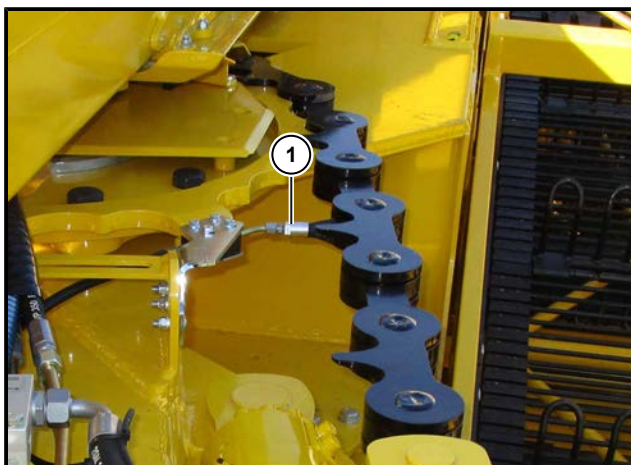
#### **Falling hazard!**

- Always use approved and safe ladders and climbing aids or an approved work platform for all work on the drives for the swivel arm and truck conveyor.
- Never climb on the machine.

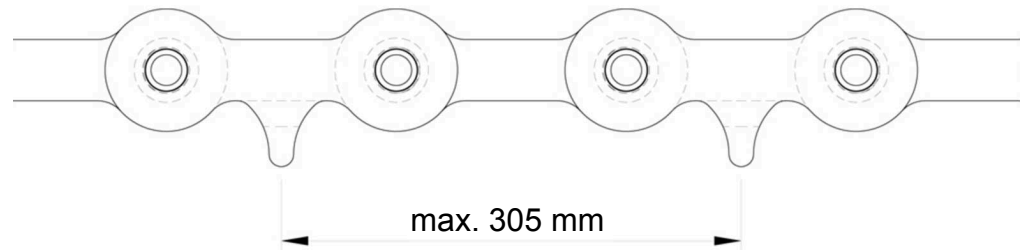


*Rotating truck conveyor chain drive*

If necessary, adjust the grease brushes (1) and make sure that the contact areas of the chain links on the sprocket are always coated with grease.



Check the chain wear one a year as described below and replace the chain immediately it reaches the wear limit (305 mm).


**DANGER**


**Hazard of fatal injuries by uncontrolled rotary movements of swivel arm and truck conveyor if the chain jumps off the sprocket.**

- Stop the machine immediately and have the machine checked by a mechanic.

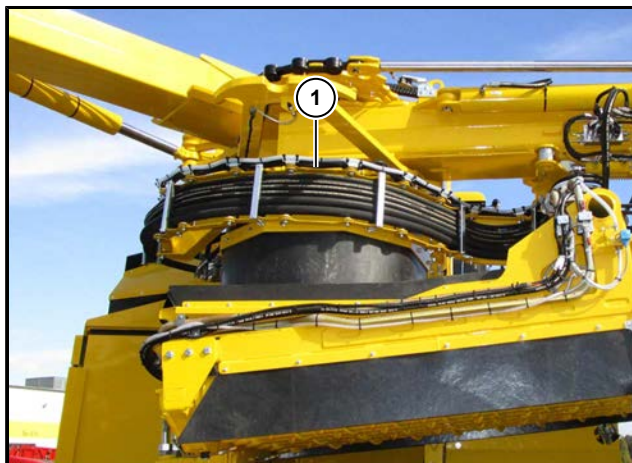


*Rotating swivel unit chain drive*



### **7.12.3.1 Chassis energy ducting chain to recleaner swivel arm**

The pivot points of the energy ducting chain are maintenance-free. If they start to squeak, coat the pivot points lightly with oil.

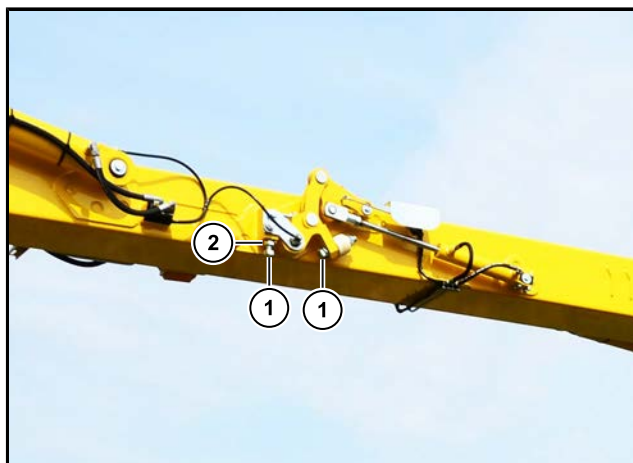


**(1)** Energy ducting chain

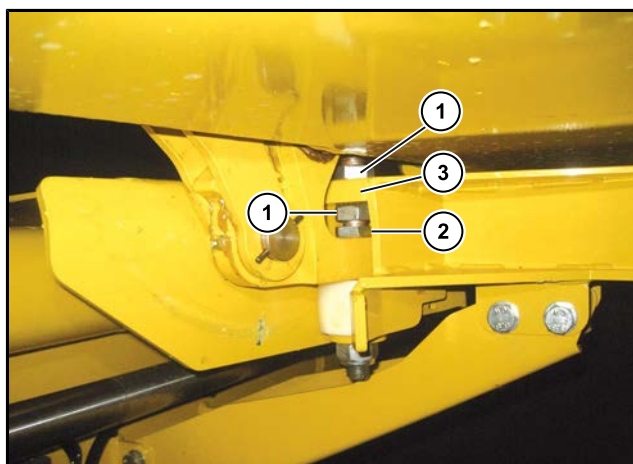
## 7.13 Counterweight arm

### Adjusting counterweight arm lock stop screws

As soon as the clamp is no longer rigid, the stop screws (1) must be adjusted. To do this, loosen the lock nuts (2) on the stop screws and adjust the screws until there is no more play at the clamping position (3) on the swivel arm.



*Counterweight arm lock*



## 7.14 Braking system

The front axle has a drum brake actuated by compressed air. The rear axle has a hydraulically-actuated drum brake. Two independent brake circuits guarantee maximum safety, even if one brake circuit fails.

After washing the machine run the brakes dry. If the machine is moved with frozen brakes (ice formation due to water penetration), the brake system may be seriously damaged.

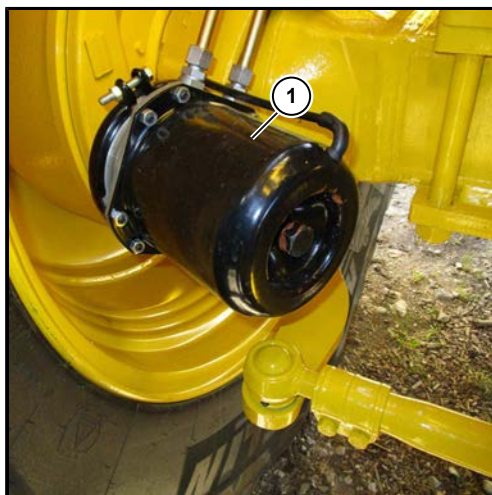
Check brake function before every trip.

### DANGER

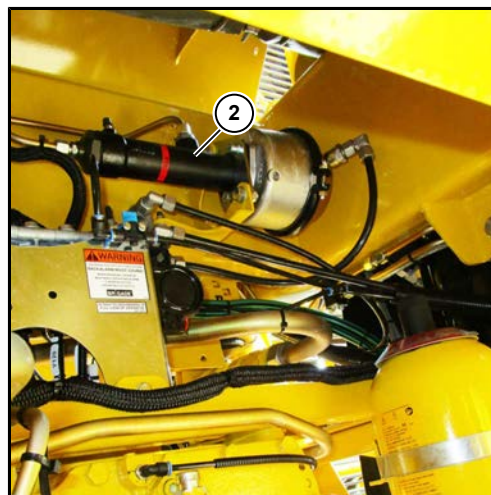


**If mistakes are made during maintenance, repairs or adjustment work, the driver and other persons in traffic will be at risk of death.**

- Adjustments and repair work on the brakes may only be performed by trained specialist personnel who are familiar with the maintenance and repair of compressed-air brakes.



(1) Pneumatic front-axle brake



(2) Combination pneumatic/hydraulic cylinder



(3) Rear axle with hydraulically-actuated drum brake

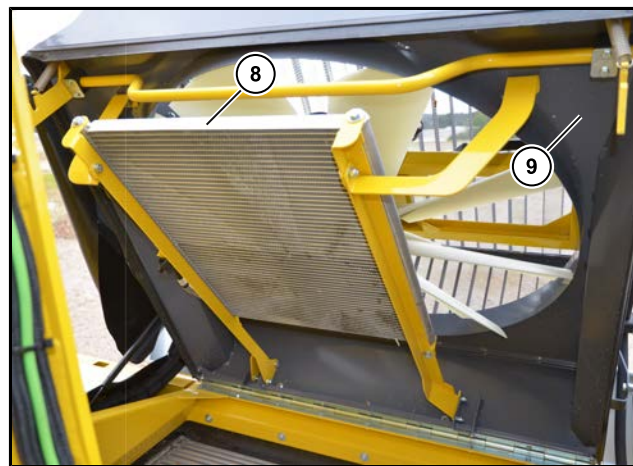
## 7.15 Air conditioning and ventilation system

If the air conditioning system doesn't cool sufficiently, it may be down to the following causes:

- Air conditioning system condenser is clogged.  
**Remedy:** clean the air conditioning system condenser.
- Coolant circuit is filled insufficiently.  
**Remedy:** Only possible for specialist personnel with the required special tools.
- Recirculating air filter in the driver's cabin is clogged.  
**Remedy:** Clean recirculating air filter.

If the heating and ventilation systems are not operating at full power, it is usually caused by clogged filters. Therefore, always clean both filters.

### 7.15.1 Condenser air conditioning system



- (8) Condenser air conditioning system  
(9) Ventilator cowl

- Check daily the condenser (8) of the air conditioning system on soiling.
- If required clean it with pressure air or spray stream from water hose.
- Never use a high-pressure cleaner.
- For cleaning, lift up the condenser (8) together with the ventilator cowl (9).

#### CAUTION

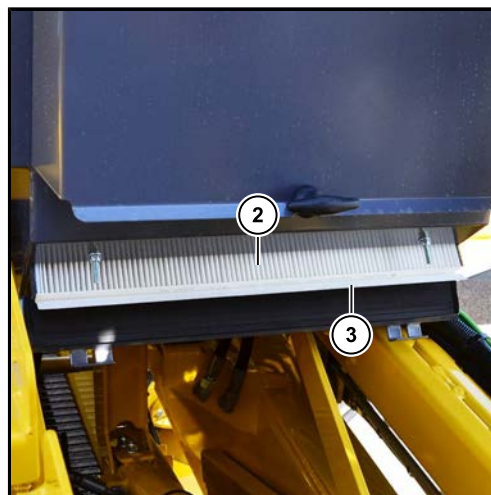
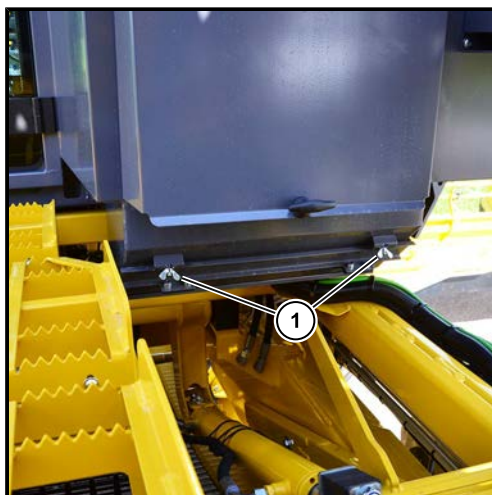


#### Hazard of damage to health and hazard of damage to the environment.

Maintenance work on the air conditioning system, which requires opening of the coolant circuit (e.g. refilling of coolant, exchange of the collector dryer, etc.), may only be performed by an authorised specialist workshop.

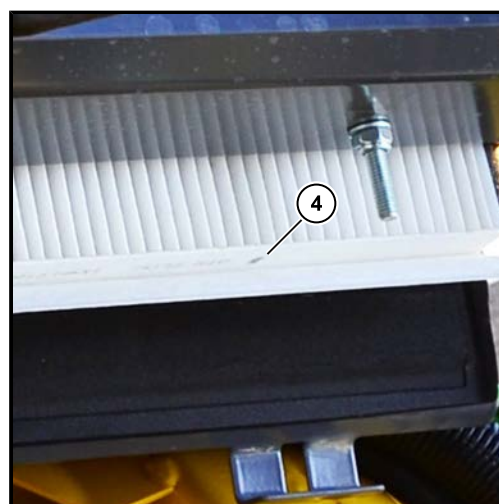
## 7.15.2 Driver's cabin recirculating filter

The recirculating filter (2) for the driver's cabin is located on the right outer side of the rear wall of the driver's cabin.



This filter must be cleaned in case of need. For this purpose:

- Lower the driver's cabin completely and loosen both wing nuts (1) of the cover, open the cover downwards.
- Pull the recirculating filter (2) downward by the flap (3).
- Blow out recirculating filter using compressed air.
- Reinsert the cleaned recirculating filter. Pay attention to the flow direction. The printed arrow (4) on the filter must point to the rear of the machine.
- Close the cover and fasten it with the two wing nuts (1).



This filter element (ROPA item no. 352042200) should be renewed once a year in any case.



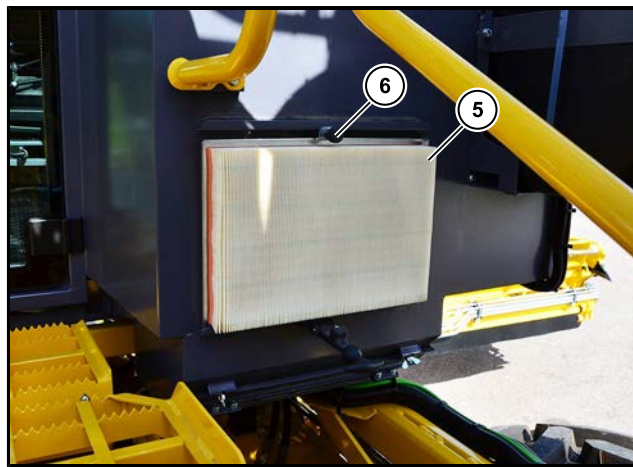
### 7.15.3 Fresh air intake filter in driver's cabin

The fresh air intake filter (5) for the driver's cabin is located right, outside on the rear cabin wall.

This filter must be cleaned in case of need. For this purpose:

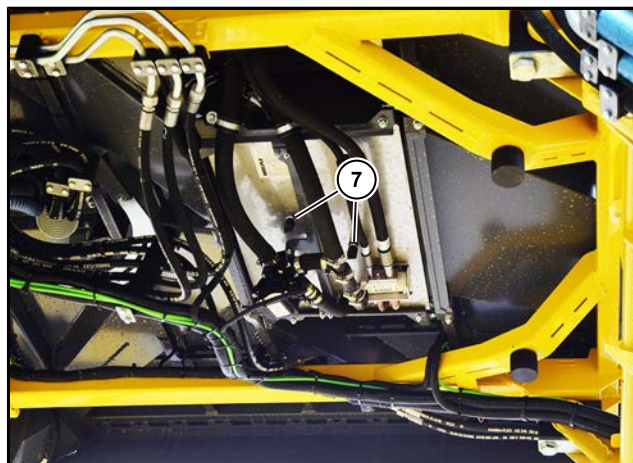
- Open the rubber fastener of the cover hood and remove the cover hood.
- Screw out the knurled-head screw (6) and remove the filter from the holding frame.
- Clean filter element using compressed air.
- Reinsert the cleaned filter element in the holding frame and fasten it using the knurled-head screw.
- Install the cover hood.

This filter element (ROPA item no. 352033200) should be renewed once a year in any case.



*With removed cover hood*

### 7.15.4 Condensate drain in the air conditioner



**(7)** Condensate drain

Check the condensate drain on the air conditioner on the bottom of the cabin regularly. If there isn't any water coming out here, the condensate drain should be cleaned.



## 7.15.5 Folding down air conditioner

### DANGER



Hazard of extremely severe injuries.

ALWAYS insert the cylinder support for the driver's cabin when working under the driver's cabin.

The air conditioner is installed under the cabin floor between the air intake duct and the air exhaust duct. The lid can be opened when the air conditioning unit is folded down. This way you get access to both heat exchangers, the sensors and the fan of this unit.

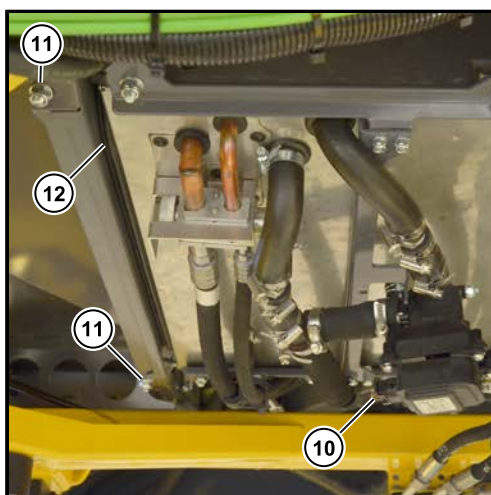
### ATTENTION



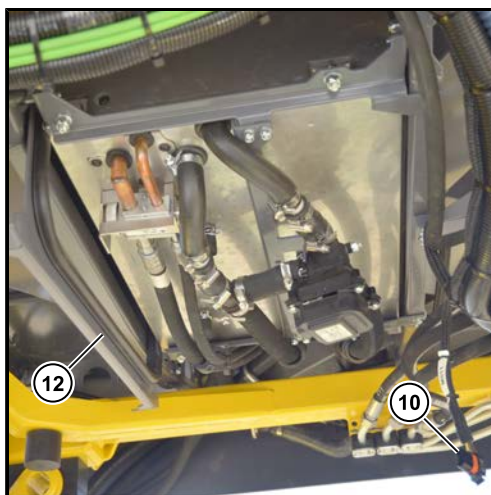
The air conditioner has an elastic seal at the front that must be released before you can fold the unit down. Otherwise, this seal will be damaged.

At the rear, a robust seal is mounted onto a seal carrier, which can be removed separately to create the necessary free space to release the front seal. The air conditioner must be moved approx. 8-10 mm backwards before folding it down.

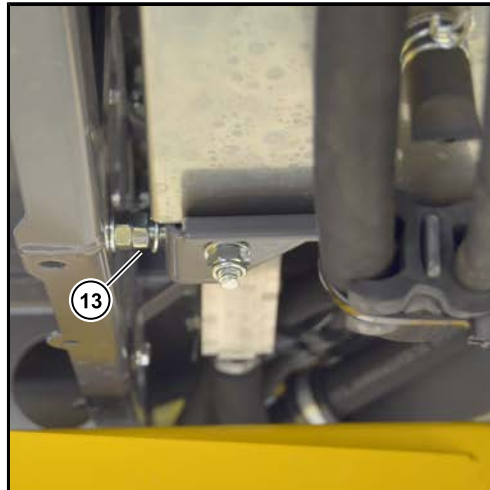
**To fold down the air conditioner, proceed as follows:**



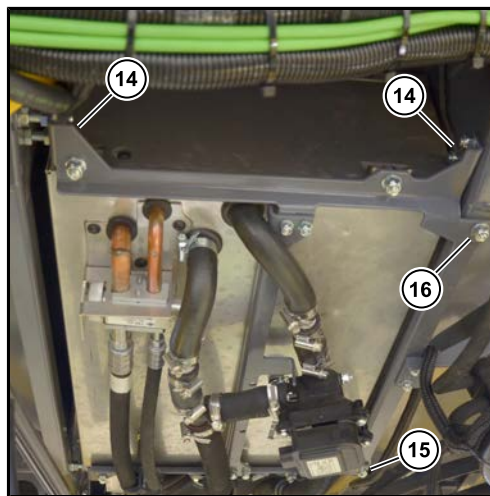
- Disconnect the M011 plug (10) from the water valve.
- Remove both screws (11).



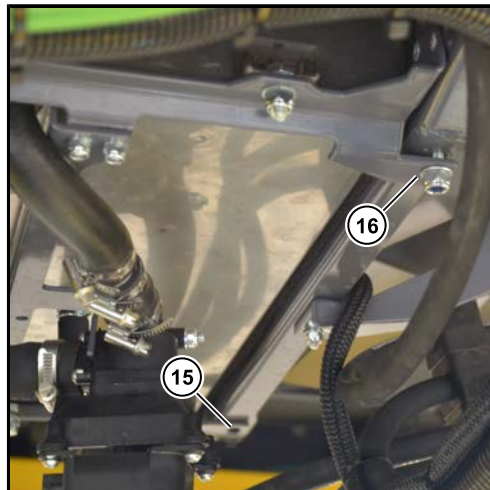
- Pull the seal carrier (12) completely out in the downward direction.



- Turn back the lock nut (**13**) on the screw at the rear pivot point of the air conditioner by approx. 10 mm. Turn back the nut on the screw at the front pivot point (not shown in the picture) of the air conditioner by approx. 10 mm as well. Thus, you create free space so you can pull the air-conditioning unit backward later.



- Remove the horizontal screws (**14**) on the right side of the air conditioner.



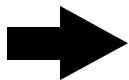
- Remove the screw (**15**) and then the screw (**16**). During this process, hold the air conditioner upwards and do not let it accidentally fold downwards.



- Pull the air conditioner at least 10 mm backwards. The air conditioner can be folded down now.
- Unscrew the cover of the air conditioner to access its internal components.

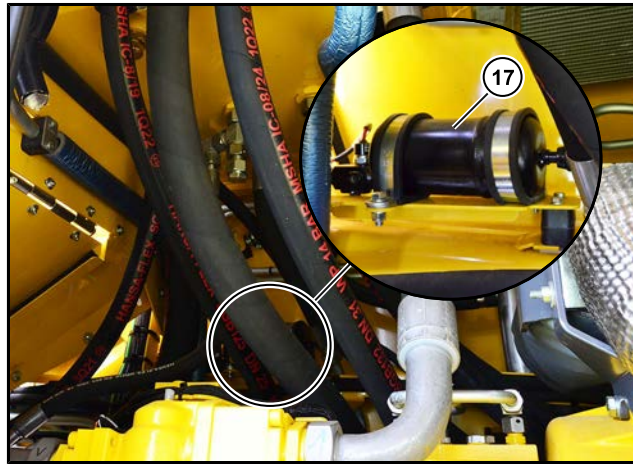
Put the air conditioner back in the reverse order.

#### **ADVICE**



Make sure that all seals of the air conditioner are not damaged and fitted correctly. Otherwise, the heating and cooling capacity of the climate control system is reduced.

### 7.15.6 Coolant circuit



(17) Collector dryer underneath the hydraulic oil tank

#### ATTENTION



#### Note for the specialist workshop!

If replacing or refilling the coolant, this should be mixed with the following oil: Fuchs Reniso PAG46 (ROPA item no. 435004600). The air conditioning system may never be operated with other oil additives. Totally, there is 250 ml of oil in the coolant circuit.  
**Coolant type: R134a, coolant filling volume approx. 1,750 g.**

#### Maintenance once a year:

- Have the air conditioning system checked by a qualified workshop and repaired, if needed.



**Maintenance every two years:**

- Have the coolant and collector dryer (17) (ROPA item no. 352041500) replaced by an authorised specialist workshop.

A fluorescing agent is added to the coolant by ROPA. This enables quick and cost-effective detection of possible leaks in the air conditioning system.



**(18)** Maintenance connection beside collector dryer



**(19)** Maintenance connection on air conditioning compressor

## 7.16 Battery maintenance

Check the acid level in the vehicle batteries once a week during the season.



### WARNING



#### Risk of burns.

Battery acid may cause dangerous burns on the skin and within the respiratory system.

- When handling acid batteries, always wear approved personal protective equipment (safety goggles, acid-proof gloves, apron) ([See Page 37](#)).
- Avoid skin contact with battery acid.
- Avoid inhaling acid vapours.
- When handling batteries, make sure that there is sufficient ventilation in the workplace.
- In case of skin contact with battery acid, immediately flush the skin sections concerned with lots of water. Then immediately consult a doctor.

Where necessary, refill with distilled water until the acid level is 10 mm above the upper level of the plates.

Use the ROPA battery cell filler with automatic level stop (ROPA item no. 015036400) to complete this task quickly and safely.

## 7.17 Shutdown for a longer period of time

In case the machine has to be shut down for more than four weeks, then the following work must be performed:

- Fill the AdBlue® tank to the top to prevent the AdBlue® from crystallising.
- Fill the fuel tank to the top to prevent its walls from corroding.
- Thoroughly wash the machine. Avoid directly spraying the bearings and supporting rollers.
- Drain condensate from the compressed air reservoirs.
- Lubricate all lubricating points of the machine.
- Let the central lubricating system run for at least 2 cycles with drive switched on.
- Spray the complete machine with corrosion-inhibiting oil. Make sure that no oil or grease touches the tyres.
- Grease all piston shafts and the collars of the hydraulic cylinders.
- Park the machine in a dry and weather-protected place, if possible, in a hall.
- Completely drain water from the water spray system in case of freezing risk.
- Switch off the main battery switch.



### WARNING



#### **Risk of burns.**

Battery acid may cause dangerous burns on the skin and within the respiratory system.

- When handling acid batteries, always wear approved personal protective equipment (safety goggles, acid-proof gloves, apron) ([See Page 37](#)).
  - Avoid skin contact with battery acid.
  - Avoid inhaling acid vapours.
  - When handling batteries, make sure that there is sufficient ventilation in the workplace.
  - In case of skin contact with battery acid, immediately flush the skin sections concerned with lots of water. Then immediately consult a doctor.
- 
- Uninstall the batteries. The batteries should be stored cool and dry, but protected against frost. Before storing, check the acid level and, in case of need, fill up using distilled water. Completely charge the batteries before storing them. Check the battery voltage once each month during storage and, in case of need, recharge the batteries. Grease the battery terminals using a specific terminal grease.

### DANGER



#### **Warning against explosion hazard!**

If acid batteries are improperly charged using unsuitable charging devices or too high charging voltage, then this may lead to generation of oxyhydrogen gas. Oxyhydrogen gas is very easily combustible and may explode.

- Always make sure of the correct charging voltage.
- Make sure that the batteries are only charged in well ventilated locations.
- Smoking, fire or open flame are strictly prohibited.

#### **Batteries useful life**

To preserve the starting ability of the batteries in case of a shutdown period of more than 2 weeks, the following notes must be observed:

- Check the liquid level. If it is too low, then exclusively fill up with distilled water to the maximum acid level mark.
- The self-discharge rate amounts to about 0.2% of the nominal capacity/day at 20°C.
- To avoid deep discharge, the acid density must be checked at regular intervals. If the acid density is below 1.21 kg/l, then the batteries must be recharged. The recommended charging current is 1/10th of the capacity.
- Deep discharged batteries form lead sulphate. Regeneration by recharging is no longer possible.
- In case of batteries forming sulphate, detectable by the silver-coloured plate coating and turbid battery acid, there are neither guarantee nor warranty claims. They are also excluded from any accommodation scheme, because this damage is caused by gross negligence during maintenance.

### ADVICE



**After a shutdown of up to 6 months, the machine must be put into operation for at least 30 minutes.**

- Leave diesel engine running for at least 30 minutes!
- Allow the machine drive to run for a few minutes.
- It is also recommended to drive the machine at least 1 km on the road.

### 7.17.1 Mercedes-Benz regulations for Diesel engine shutdown

During temporary shutdown of the machines, operated with the diesel fuel B07 (diesel fuel with up to 7% of biodiesel content), the fuel amount control valve may become stuck.

#### Actions in the event of shutdown for a period of up to 6 months

In order to avoid sediments accumulation due to 7% biodiesel content in diesel fuel, as well as consequential damages or problems during restart, which may result from it, the following points must be noted during the machine shutdown additionally to the actions pointed out in the Mercedes-Benz operating manual:

- Let the diesel engine run monthly for approx. 10 minutes at max. 900 rpm, with the air conditioning and heating switched on.
- Always by all means check engine oil level and coolant level before start. Additionally, drain the water separator on the diesel engine and fuel prefilter.
- Always by all means monitor the oil pressure as well as coolant and oil temperature when starting or while the diesel engine is running.

#### ADVICE



The monthly diesel engine start is not required if the engine has been operated and shut down with FAME-free fuel (B0-diesel fuel). If the engine system has been operated previously with the standard diesel fuel according to DIN EN 590 with 7 % of bio-diesel content, it is sufficient to pump out all the remaining fuel from the tank and fill it with B0 fuel. Before shutdown the engine system must be operated for at least 30 min. with this fuel, to flush all the fuel-carrying components.

The B0 requirement is currently met by, for example, the fuels Aral Ultimate Diesel and BP Ultimate Diesel.

In the case of a shutdown for longer than 6 months, further actions are required. Please contact an **mtu** partner or **mtu** authorised Mercedes-Benz service centre for details.

## **7.18      Dismantling and disposal**

If the machine is not disposed of properly at the end of its service life, it can lead to accidents and damages to environment.

Hazard may come from:

- Hydraulic oil/ engine oil
  - Lubricants/process materials
  - Cooling fluid/coolant
  - Fuel
  - Batteries
  - Media/pressure accumulator under pressure
  - Residual energy
  - Moving parts
- 
- Now the machine can be disassembled and disposed of by an appropriate disposal company in accordance with applicable laws, directives and standards.
  - Observe national safety regulations for disassembly of machines.
  - Wear personal protective equipment.
  - Render the system pressureless before all work on the hydraulic system or on the pressure reservoirs.

## **8      Malfunction and Remedies**



Your attention is optically drawn to malfunctions and hazardous situations by warning indications on the R-Touch and acoustically by warning sounds. Some functions may be blocked in case of hazardous situations.

Malfunctions, causes and remedies are described on the R-Touch, chapter 6.

## 8.1 Safety circuits

The machine provides the greatest possible safety to the operator and materials. Safety switches in the driver's cabin block individual functions of the machine when the operator leaves the cabin. If a function cannot be executed from within the driver's cabin or if switches are blocked, then first check whether the left joystick console is swung down, the driver's seat is occupied, the back wall of the platform is folded up, the engine compartment cover and the ladder safety rail are closed.

If the malfunction cannot be remedied, then refer to the respective sections of this operating manual for the components concerned respectively non-functional components. You will find hints on safety circuits and possible reasons for a malfunction there.

### WARNING



#### Hazard of extreme injuries or damage to the machine.

- Never defeat safety installations, safety locks or safety circuits. This may have the consequence of extreme injuries.
- Never perform functional tests, if you are not fully informed about the scope and consequences of such a test.
- Make sure, that when searching for the cause of the malfunction respectively when remedying malfunctions, in case of need, a second, reliable person is present, who is familiar with the machine to such an extent, that he is able to shut down the machine immediately, when a hazard threatens.
- In case of the slightest doubt, call in specialist personnel trained accordingly or enquire with service personnel from ROPA.
- Do not perform any repairs on the machine if you do not have the required specialist knowledge and experience.

Should you be able to contact your dealer or the manufacturer, further fault diagnostics is possible via the special diagnostic menus of the R-Touch. For safety reasons, individual menus are blocked for the operator. In case of improper handling, hazards to life may occur, or the machine may be heavily damaged, which would cause costly repairs.

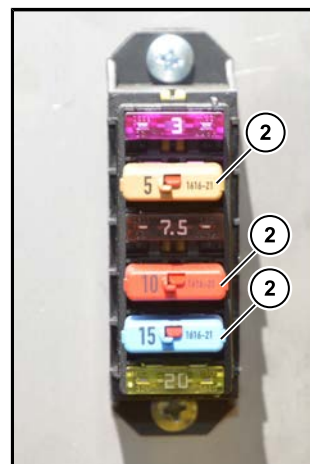
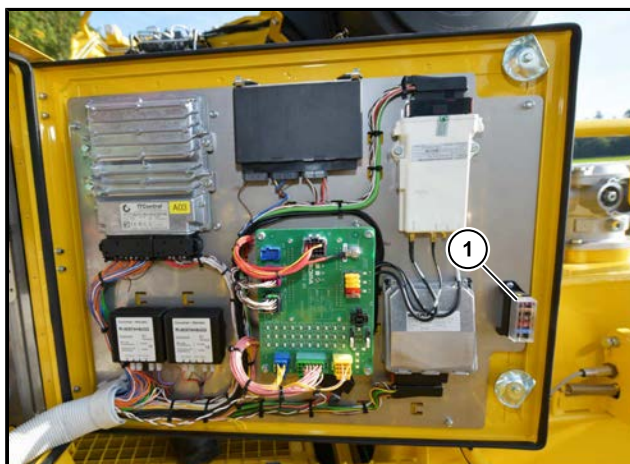


## 8.2 Fuses

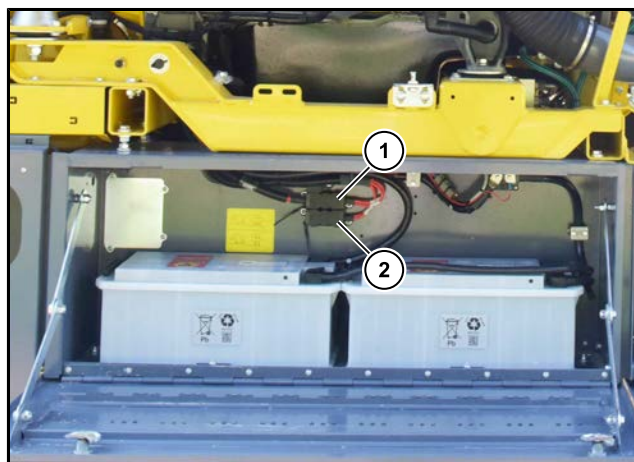
### 8.2.1 Fuses

The electrical fuses are located in the seat console and in the switch cabinet of the central electrics, installed on the outside right of the cabin platform. The machine is partially equipped with commercially available flat plug fuses (fuses) and self-resetting electronic fuses.

The fuses are labelled on the PCBs and Wago pins. You will find the fuse diagram in the seat console next to the driver's seat. In addition, there are reserve fuses in the reserve fuse holder (1) in the central electrical system. Here you will also find flat circuit breakers (2) which help you to find faults in the event of a short circuit.



### 8.2.2 Fuses in the battery case



The main fuses are situated in the battery case (Mega fuse).

F001 (1) to the central electrics, Pin X1.

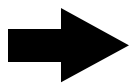
F002 (2) to the central electrics, PinX2.

Whether these fuses are intact can be determined using the measuring device (continuity tester).

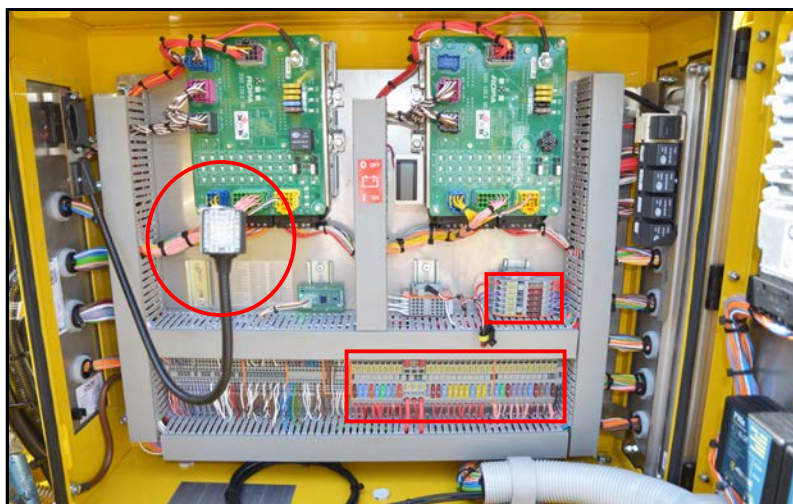
No.	Ampere	Occupation	Pos. in the machine
<b>Main power supply, screwed Littelfuse® MEGA® fuses</b>			
F001	125	Supply central electrics X1, computer A001, diesel engine	in the battery case, top fuse (1)
F002	125	Supply central electrics X2, computer A002, computer A003	in the battery case, bottom fuse (2)

### 8.2.3 Fuses in the central electrics

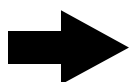
#### ADVICE



The machines with chassis numbers 8J1506, 8L1597, 8L1598 and 8L1599 were manufactured before the start of series production. There are minor differences in the electrical system of these machines. In the mentioned above machines the circuit diagrams may differ slightly from those of the series machines.



#### ADVICE

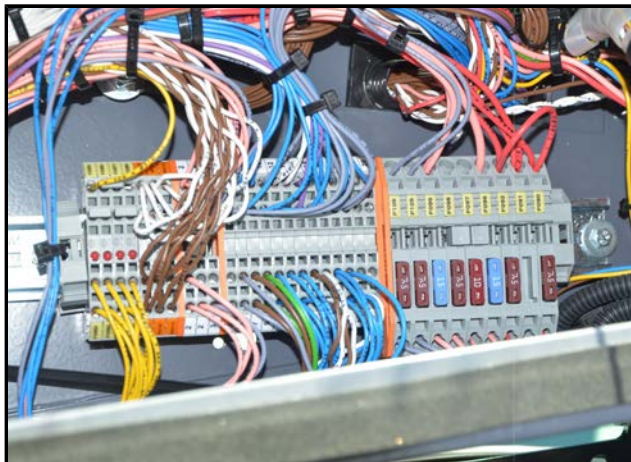


The inside light in the central electrics functions even with the ignition switched off. Do not forget to switch it off before closing the cover of the central electrics.

No.	Ampere	Occupation	
F019	7.5	Pin 30 outlet seat console 24 V	Pin 30 from X1
F020	15	Supply line pin 30 console	
F021	15	A403 CPC4 Mercedes/OBD-outlet	
F022	40	A435 MCM Mercedes	
F023	15	Reading light/inner light central electrics/engine compartment outlet 24 V/outlet on fuel tank 24 V	
F024	30	Heater fan for park heating operation	
F025	15	Park heating	
F026	3	Air conditioning control unit for park heating operation/W-bus converter	
F027	40	A095 ACM Mercedes	

No.	Ampere	Occupation	
F028		reserve	Pin 30 from X2
F029	10	Hazard warning system	
F030	10	24V power supply voltage transformer 1	
F031	15	Pin 30 for radio (DIN chute roof console)	
F032	20	Window wiper right front	
F033	20	Window wiper right rear	
F034	20	Rear window wiper	
F035	20	Window wiper door	
F036	15	Driving light power supply	
F037	20	Window wiper left rear	
F038	20	Window wiper left front/coding	
F039		reserve	Pin 15
F051	15	Front window wiper	
F052	30	Heater fan	
F053	10	Hazard warning system	
F054	3	Ethernet switch 1	
F055	3	Generator, battery relay	
F056	3	A019 air conditioning control unit	
F057	15	Heating fuel prefilter/air dryer heater	
F058	10	24V power supply voltage transformer 2	
F059	5	Ethernet switch 2/rear area control camera	
F060	3	Computer scales	
F064	7.5	ACM/MCM/weighing cells, inclination sensor/swivel arm path measuring system, rotate truck conveyor	Pin 30 in front of main switch
F070	5	Battery relay/battery emergency shutdown	
F071	10	Computer telematics/diagnosis park heater/power supply before main switch	12 V
F075	7.5	Roof console/seat console	
F076	7.5	Outlet 12 V cooling box	12 V
F080	7.5	Parking light right	
F081	7.5	Parking light left, instrument lighting	from driving light F036

## 8.2.4 Fuses in the driver's cabin seat console

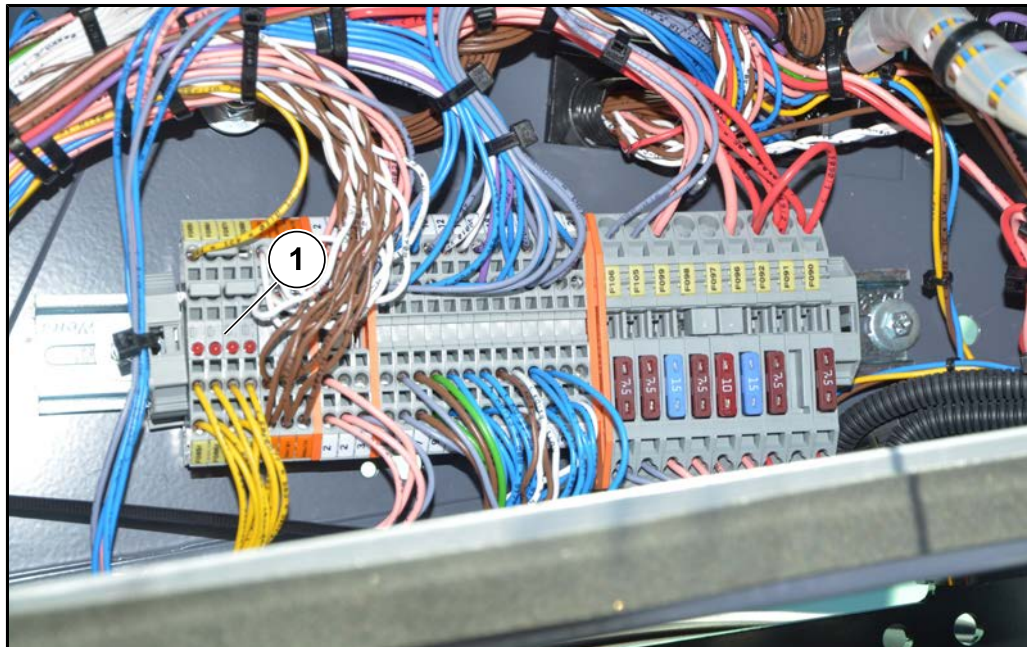


No.	Ampere	Occupation	
F090	7.5	A007 colour terminal	Pin 30 from F001
F091		reserve	
F092	7.5	A070 colour terminal	
F096	15	Air seat compressor/seat heating	Pin 15 after K001
F097	10	Steering column switch	
F098	7.5	G018 USB double socket	
F099	15	Entire electronics, ESRs, terminal, joystick, operational section, engine elec- tronics	Pin 15 directly from S050 ignition lock
F105	7.5	High beam	from driving light F036
F106	7.5	Low beam	
Self-resetting electronic fuses with LED			
Fr085	100mA	S129 emergency stop circuit 1	9 V
	100mA	S129 emergency stop circuit 2	9 V
Fr086	100mA	S062 main switch steering	9 V
	100mA	S062 main switch steering	9 V
Fr087	100mA	S063 parking brake	9 V
	100mA	S063 parking brake	9 V
Fr088	100mA	Diverse switches on console	9 V



### 8.2.5 Electronic LED fuses in Wago pins

In addition to the fuses, there are self-resetting electronic fuses in the seat console. If the light emitting diode (LED) (1) of a fuse glows in red, the fuse is overloaded and the power supply to the connected component is interrupted.

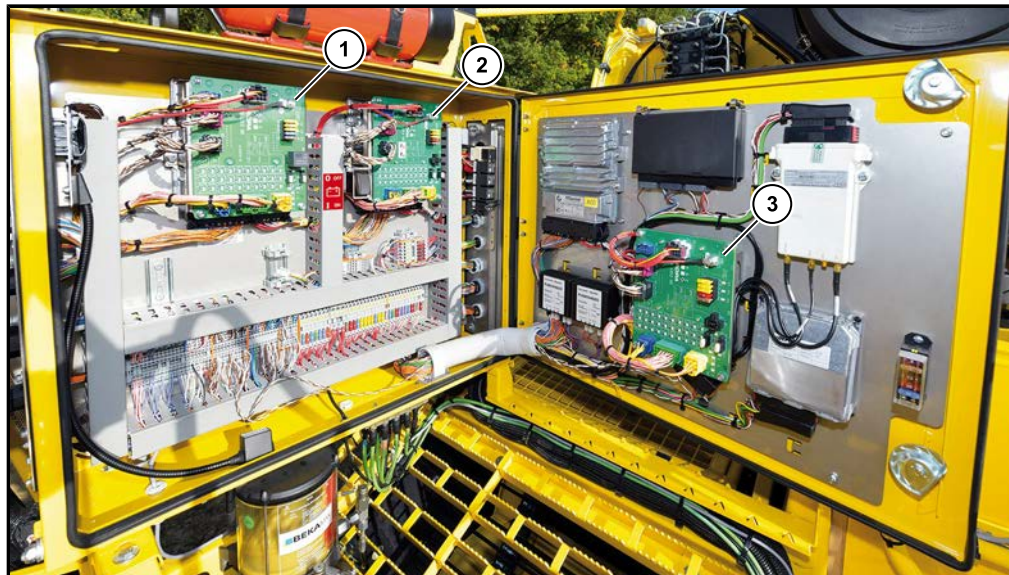


*LED fuses in the seat console*



### 8.2.6 Fuses on PCBs in the central electrics

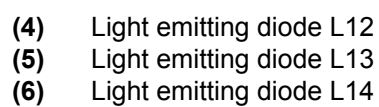
Three identical PCBs are installed in the central electrics. They can be distinguished by their designation A, B and C.



- (1) PCB A
- (2) PCB B
- (3) PCB C

These PCBs are energised by the main fuses in the battery case. Each PCB secures one of three main machine computers.

Fuses F006, F007, F008 and F010 supply power to the respective computer. The LEDs next to the mentioned fuses must not glow. Glowing LED indicates a fault in the corresponding flat plug fuse.

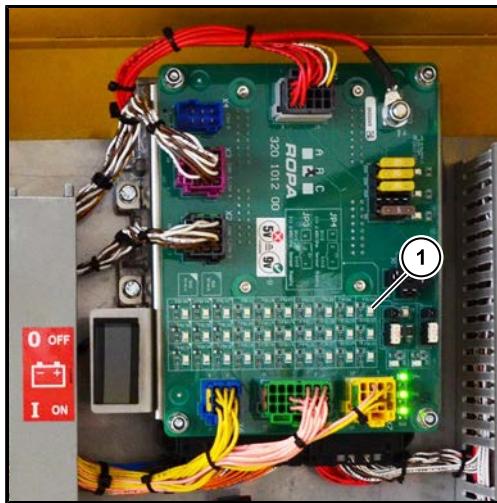


LED L12 glows green when the ignition is switched on, which means that there is a working power supply to the 24-volt reset fuses in this PCB.

LED L13 glows green when the ignition is switched on, which means that there is a working power supply to the 9-volt reset fuses of circuit 1 in this PCB.

LED L14 glows green when the ignition is switched on, which means that there is a working power supply to the 9-volt reset fuses of circuit 2 in this PCB.

The fuses Fr101 to Fr139 are self-resetting fuses. If the light-emitting diode (LED) in a fuse glows, the fuse is overloaded and the power supply to the connected component is interrupted. Each self-resetting fuse secures the power supply to a sensor. The LED on these 39 fuses may not glow. A red LED means that voltage is no longer supplied to the connected component.



(1) Self-resetting electronic fuses with LED

**8.2.6.1 PCB A**

No.	Ampere	Occupation	
F006.A	20	A001 power supply outputs	Pin 30 PCB
F007.A	20	A001 power supply outputs	
F008.A	20	A001 power supply outputs	
F009.A	15	K002.A relay fan oil cooler PDG	
F010.A	5	A001 power supply CPU	
Self-resetting electronic fuses with LED			
Fr101.A	125mA	B107 pressure sensor air chamber reservoir pressure	24 V
Fr102.A	125mA	B217 pressure LS operating hydraulics (safety)	24 V
Fr103.A	125mA	B079 sensor rotary seat	24 V
Fr104.A	125mA	B180 height bar truck conveyor transport support	24 V
Fr105.A	125mA	B086 sensor counterweight arm right/left	24 V
Fr106.A	125mA	B035 truck conv. articulation sensor	24 V
Fr107.A	125mA	B034 truck conv. height sensor	24 V
Fr108.A	125mA	B087 sensor counterweight up/down	24 V
Fr109.A	125mA	B218 sensor beet brake position	24 V
Fr110.A	125mA	B027 pressure sensor additional axles	24 V
Fr111.A	125mA	B095 sensor rotate residual beet pickup	24 V
Fr112.A	125mA	B073 cab height	24 V
Fr113.A	125mA	B088 counterweight arm lock	24 V
Fr114.A	125mA	B089 rotate recleaner rear	24 V
Fr115.A	125mA	not used	24 V
Fr116.A	125mA	not used	24 V
Fr117.A	125mA	not used	24 V
Fr118.A	125mA	not used	24 V
Fr119.A	125mA	not used	24 V
Fr120.A	125mA	not used	24 V
Fr121.A	125mA	not used	24 V
Fr122.A	125mA	not used	24 V
Fr123.A	125mA	not used	24 V
Fr131.A	125mA	B051 sensor PDG greasing	9 V
Fr132.A	125mA	S045 foot switch drive direction	9 V
Fr133.A	125mA	S121 foot-switch look forward	9 V



No.	Ampere	Occupation	
Fr134.A	125mA	B305 driving speed 2	9 V
Fr135.A	125mA	B096 water tank level sensor	9 V
Fr136.A	125mA	not used	9 V
Fr137.A	125mA	not used	9 V
Fr138.A	125mA	not used	9 V
Fr139.A	125mA	not used	9 V

**8.2.6.2 PCB B**

No.	Ampere	Occupation	
F006.B	20	A002 power supply outputs	Pin 30 PCB
F007.B	20	A002 power supply outputs	
F008.B	20	A002 power supply outputs	
F009.B		Relay not used	
F010.B	5	A002 power supply CPU	
Self-resetting electronic fuses with LED			
Fr101.B	125mA	B001 sensor wheel angle front axle	24 V
Fr102.B	125mA	B002 sensor wheel angle rear axle	24 V
Fr103.B	125mA	B020 pressure sensor pickup rollers	24 V
Fr104.B	125mA	B083 pressure sensor pickup conveyor rollers	24 V
Fr105.B	125mA	B021 pressure sensor 4 pinch rollers	24 V
Fr106.B	125mA	B081/B082 oil tank level/temperature	24 V
Fr107.B	125mA	B080 pr. sensor emergency steering pump	24 V
Fr108.B	125mA	B046 tank sensor	24 V
Fr109.B	125mA	B638 Mercedes fine filter fuel pressure	24 V
Fr110.B	125mA	D014 camera central mark	24 V
Fr111.B	125mA	D015 truck conveyor camera	24 V
Fr112.B	125mA	not used	24 V
Fr113.B	125mA	D016 recleaner camera	24 V
Fr114.B	125mA	D012 cabin roof camera	24 V
Fr115.B	125mA	not used	24 V
Fr116.B	125mA	not used	24 V
Fr117.B	125mA	not used	24 V
Fr118.B	125mA	not used	24 V
Fr119.B	125mA	not used	24 V
Fr120.B	125mA	not used	24 V
Fr121.B	125mA	not used	24 V
Fr122.B	125mA	not used	24 V
Fr123.B	125mA	not used	24 V
Fr131.B	125mA	B062 rpm pickup rollers right	9 V
Fr132.B	125mA	B063 rpm pickup rollers left	9 V
Fr133.B	125mA	B074 conveyor rollers right	9 V



No.	Ampere	Occupation	
Fr134.B	125mA	B075 conveyor rollers left	9 V
Fr135.B	125mA	not used	9 V
Fr136.B	125mA	B064 speed 4 pinch rollers right	9 V
Fr137.B	125mA	B065 speed 4 pinch rollers left	9 V
Fr138.B	125mA	S091 engine housing door	9 V
Fr139.B	125mA	S092 folding grid platform	9 V

**8.2.6.3 PCB C**

No.	Ampere	Occupation	
F006.C	20	A003 power supply outputs	Pin 30 PCB
F007.C	20	A003 power supply outputs	
F008.C	20	A003 power supply outputs	
F009.C	10	K002.C relay electric pump fuel prefilter	
F010.C	5	A003 power supply CPU	
Self-resetting electronic fuses with LED			
Fr101.C	125mA	B026 PS traction drive forward	24 V
Fr102.C	125mA	B084 PS traction drive backward	24 V
Fr103.C	125mA	not used	24 V
Fr104.C	125mA	B009 sensor driving pedal 1	24 V
Fr105.C	125mA	B032 drive pedal sensor (safety)	24 V
Fr106.C	125mA	B061 pressure sensor brake-pressure service brake	24 V
Fr107.C	125mA	B085 pressure sensor PDG coupling	24 V
Fr108.C	125mA	B022 pressure sensor recleaner	24 V
Fr109.C	125mA	B010 pickup depth sensor	24 V
Fr110.C	125mA	B076 fold pickup right	24 V
Fr111.C	125mA	B077 fold pickup left	24 V
Fr112.C	125mA	B067 pressure sensor pickup relief centre	24 V
Fr113.C	125mA	B068 pressure sensor pickup relief right	24 V
Fr114.C	125mA	B069 pressure sensor pickup left	24 V
Fr115.C	125mA	B070 pile pickup height sensor	24 V
Fr116.C	125mA	B008 pile pickup side sensor	24 V
Fr117.C	125mA	B094 sensor telescopic pile pickup	24 V
Fr118.C	125mA	not used	24 V
Fr119.C	125mA	not used	24 V
Fr120.C	125mA	not used	24 V
Fr121.C	125mA	not used	24 V
Fr122.C	125mA	not used	24 V
Fr123.C	125mA	not used	24 V
Fr131.C	125mA	B072 speed infeed conveyor	9 V
Fr132.C	125mA	B066 cleaning speed	9 V
Fr133.C	125mA	B071 speed truck conveyor	9 V

No.	Ampere	Occupation	
Fr134.C	125mA	B097 speed pinch roller 1 stone remover	9 V
Fr135.C	125mA	B098 speed pinch roller 2 stone remover	9 V
Fr136.C	125mA	B212 pressure sensor parking brake	9 V
Fr137.C	125mA	S128 swivel arm lock	9 V
Fr138.C	125mA	S125 ladder safety lock	9 V
Fr139.C	125mA	B047 rpm driving speed	9 V

### 8.3 List of relays

No.	Designation	Position in the machine	Comments	Item No.
K001	Relay main load pin 15	in the central electrics	Load relay ignition current pin 15, power 70 A	320009900
K002.A	Relay fan motor oil cooler PDG	on PCB A in the central electrics	switches the fan	320015400
K002.C	Relay electric pump fuel prefilter	on PCB C in the central electrics	switches the fuel pump	320015400
K003	Relay direction indicator	in the roof console	flasher unit	320087100
K004	Relay fan module/park heating	in the central electrics		320015400
K006	Relay window wiper	in the central electrics	switches the front wiper motor	320057300
K017	Relay air conditioning control unit/park heating	in the central electrics	to switch from air conditioning control unit pin 15 to pin 30	320015400
K043	Battery disconnect relay	in battery case	electrically operated battery main switch	320076200

## 8.4 Color codes for electric wiring

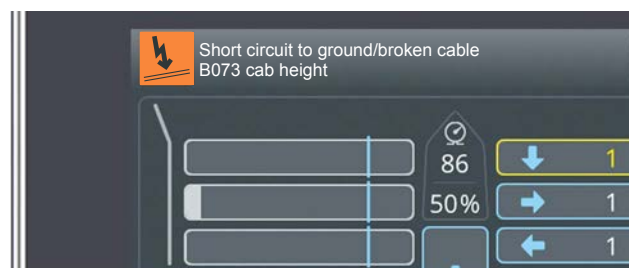
### Colour codes for electric wiring

<b>brown</b>	ground
<b>brown/white</b>	wired ground
<b>red</b>	pin 30 (continuous current)
<b>pink</b>	pin 15 (ignition current)
<b>yellow</b>	9 volt
<b>violet</b>	12 volt
<b>blue</b>	digital signal lines (ON/OFF)
<b>green</b>	analogue signal lines (changing sensor values)
<b>grey</b>	all lamps "E" light bulbs and "H" warning devices (buzzer)
<b>white</b>	electrical motors and internal wiring, miscellaneous
<b>orange</b>	control lines for all valves and solenoids (all „Y“)

Feature:

- twisted cables
- white (twisted) = CAN-high
- brown (twisted) = CAN-low
- twisted together = CAN bus data line

## 8.5 Troubleshooting via the R-Touch



Some malfunctions are indicated on the R-Touch by warning icons. In case of electrical or electronic problems, the components concerned are displayed including the designation of the component.

Example:



= Communication problem with control device A003



= Analogue signal out of range.



= Line break or short circuit found.

DIN	Part	Position in the machine	Comments	Item No.
A001	Computer A001	in the central electrics, behind PCB A	Computer A, TTC580	320088700
A002	Computer A002	in the central electrics, behind PCB B	computer B, TTC580	320088700
A003	Computer A003	in the central electrics, on the lid	computer C, TTC580	320088700
A007	Main terminal	in the seat console right, bottom terminal	12.1" Touch	320089500
A008	Steering unit park heating	on the park heating	Webasto Thermo Pro 90 D 24V park heating	320033400
A009	Radio	in the roof console left		320095600
A010	Joystick CAN right	in the seat console	with rotary wheel as incremental encoder	320103200
A019	Air conditioning control device	in the central electrics, on the lid	for temperature control in the driver's cabin	352044320
A020	Joystick CAN left	in the console left at the driver's seat		320106000
A026	Computer scales	in the central electrics on the lid, behind PCB C	for weight recording, 2 weighing cells	320108400
A030	Position sensor swivel arm	shorter cylinder, at the swivel arm right	MTS measuring system, CAN-Open	276062100
A031	Position sensor truck conveyor	longer cylinder, right at the swivel arm	MTS measuring system, CAN-Open	276061600
A040	Operating section R-Direct/Select	right next to the joystick	2 incremental encoder, 6 buttons	720017800
A041	Operating panel 1, 8 keys	front panel	8 buttons, film not included	320083100
A042	Operating panel 2, 8 keys	central panel	8 buttons, film not included	320083100
A045	Telematics computer TCG4	in the central electrics, on the lid	it functions only with registration	320102810
A046	Ethernet switch 1	underneath central electrical box	for video image transfer	320103100
A047	Ethernet switch 2	rear on counterweight arm	for transfer of video image, option only with R-View	320103100
A067	AdBlue-dispenser unit Mercedes	<b>c-diesel engine:</b> in the mixing tube before 175-litre AGN <b>d-diesel engine:</b> in 300-litre AGN rear	is cooled via AdBlue®	303021800

DIN	Part	Position in the machine	Comments	Item No.
A070	Auxiliary terminal	in the seat console right, top terminal	12.1" Touch, video monitor	320089500
A080	Mercedes AdBlue® pump module	at AdBlue-tank	with AdBlue® filter	303021700
A091	Weighing cell CAN 1 left	on the truck conveyor, left	for scales	320105700
A092	Weighing cell CAN 2 right	on the truck conveyor, right	for scales	320105700
A093	Inclination sensor scale CAN	at truck conveyor articulation part	for scales	320108300
A094	W-bus converter	in the central electrics	for park heating control	330054100
A095	ACM Mercedes	over the transmission	computer for Mercedes exhaust after-treatment	
A113	NO <sub>x</sub> sensor after catalyst	<b>c-diesel engine:</b> in 175-litre AGN, inner side of infeed conveyor <b>d-diesel engine:</b> in exhaust tailpipe after 300-litre AGN	for exhaust after-treatment	303026300
A114	NO <sub>x</sub> sensor before catalyst	<b>c-diesel engine:</b> in front of AdBlue-dispenser <b>d-diesel engine:</b> on intake socket before 300-litre AGN	for exhaust after-treatment	303026200
A200	Window wiper right front	right side window, front		320089600
A201	Window wiper right rear	right side window, rear		320089600
A202	Rear window wiper	right rear window		320089600
A203	Door window wiper	in the cabin doors		320089600
A204	Window wiper left rear	left side window, rear		320089600
A205	Window wiper left front	left side window, front		320089600
A403	CPC4 Mercedes	in the central electrics	computer for communication ROPA with Mercedes	
A435	MCM2 Mercedes	at the engine unit, inner side	computer for injection, Mercedes	





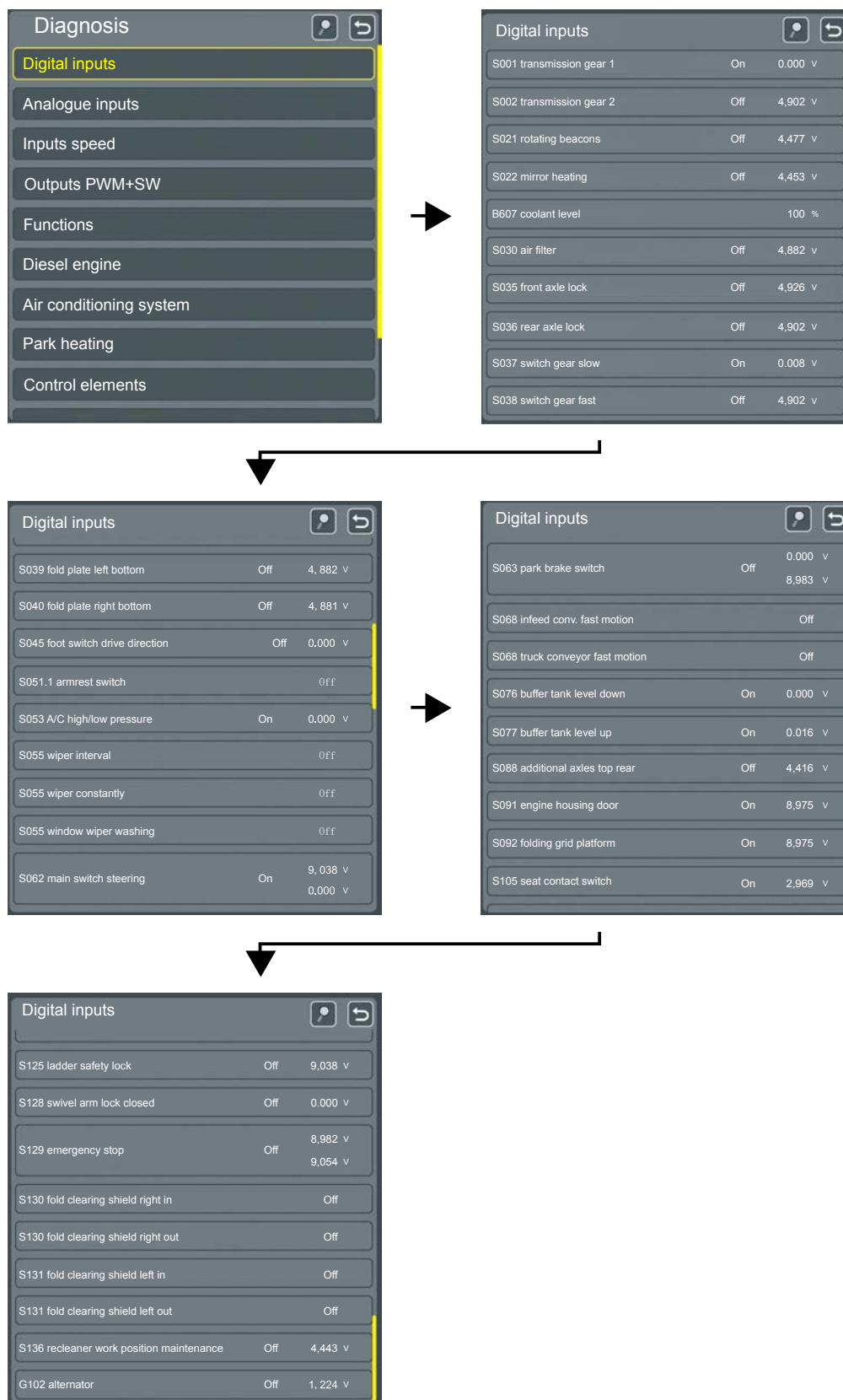
Expert mode is activated here (See Page 114)

### 8.5.1 Overview of diagnostic menus

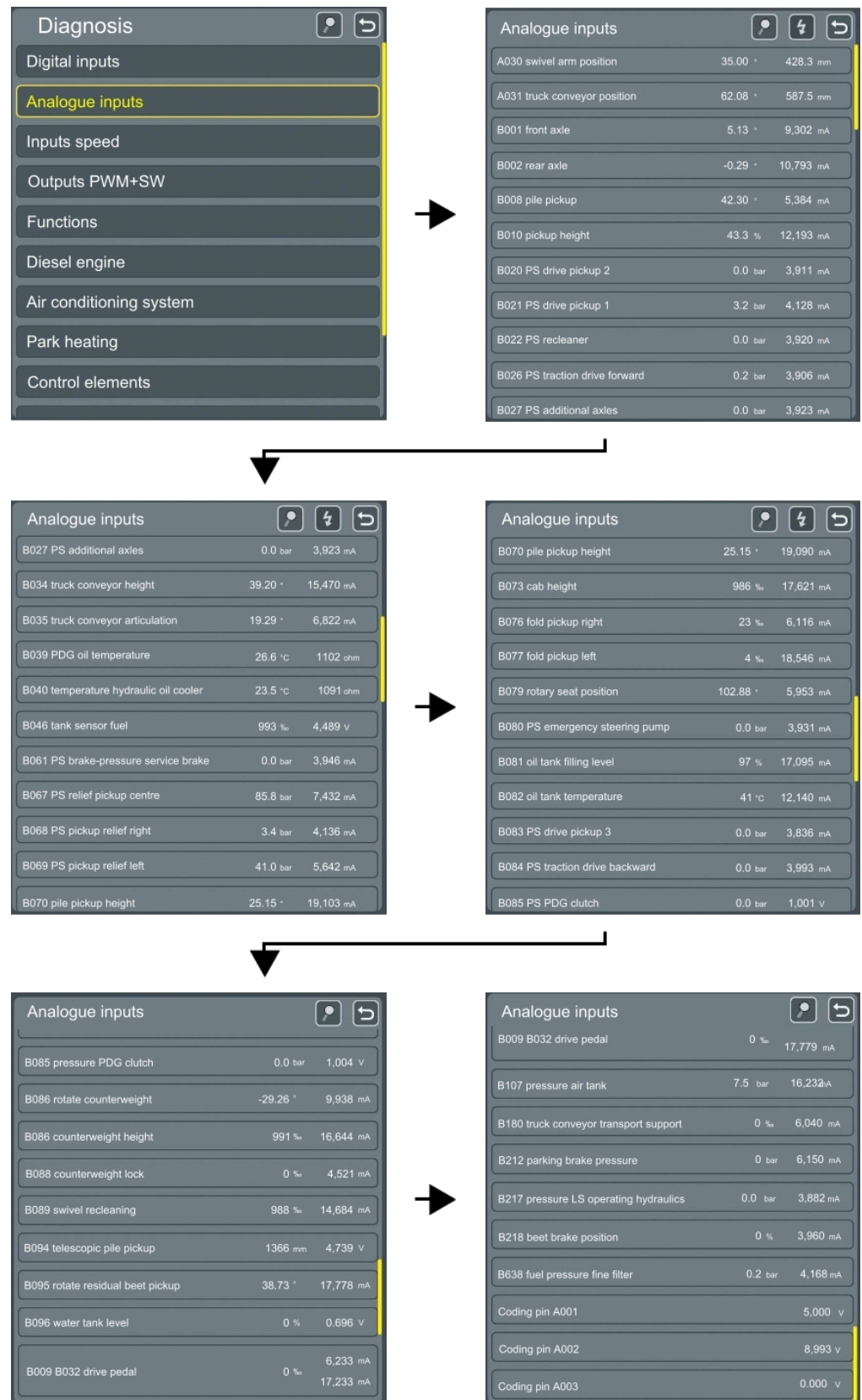
Please find below illustrations of the available diagnostics menus on the R-Touch. They facilitate malfunctions diagnostics for service personnel, if you call up the corresponding menu items after being requested by service personnel and notify the values or icons displayed to service personnel.



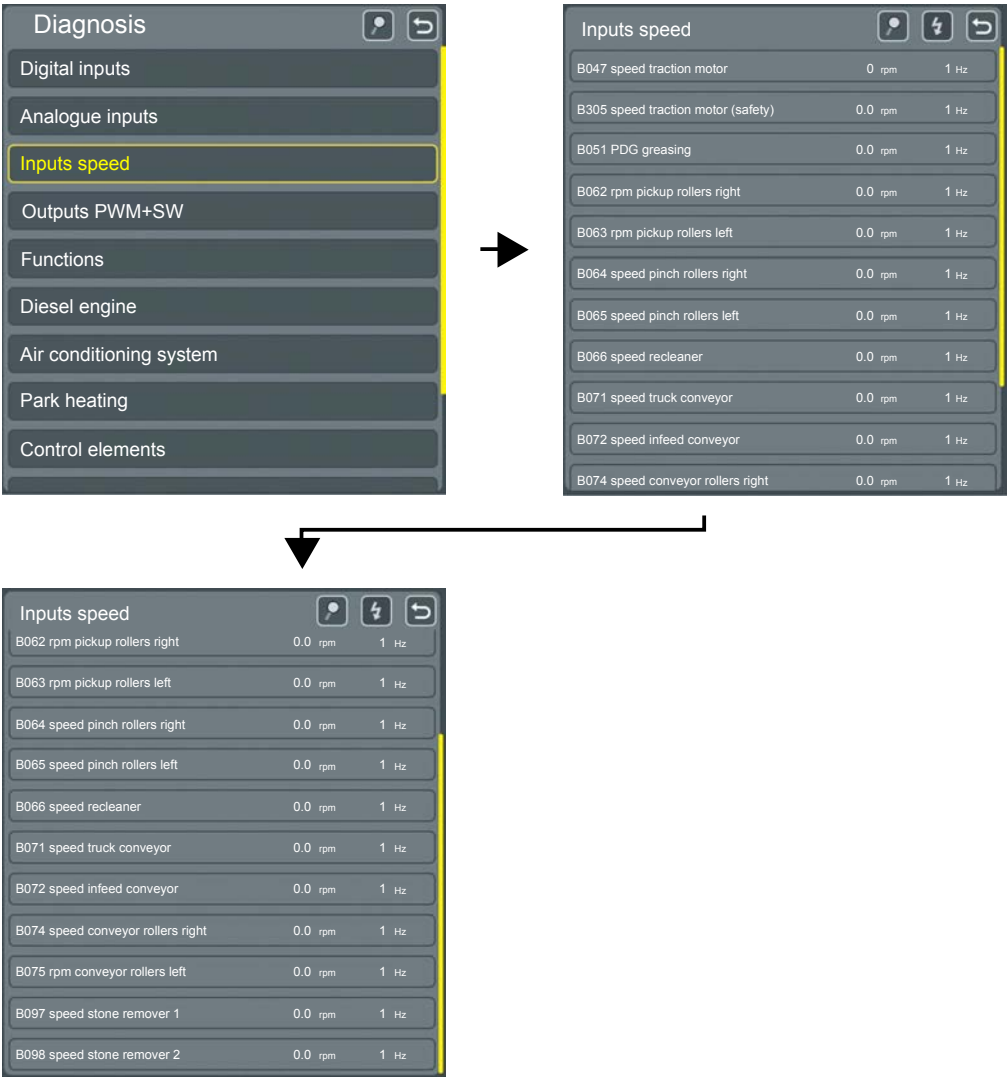
### 8.5.1.1 Digital inputs



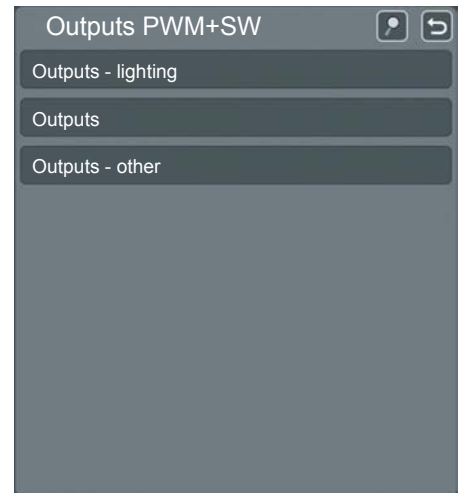
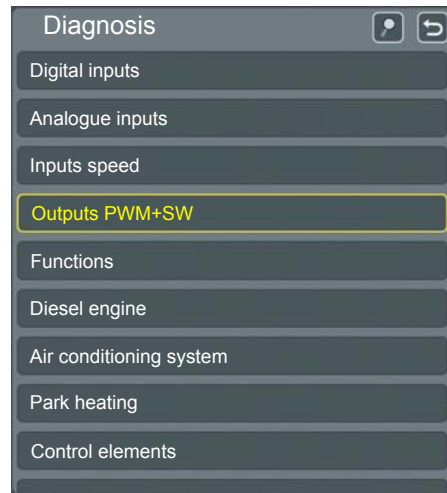
### 8.5.1.2 Analogue inputs



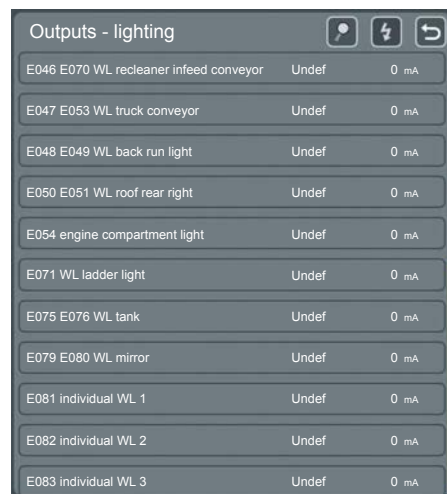
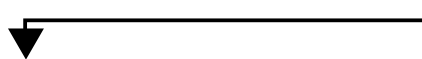
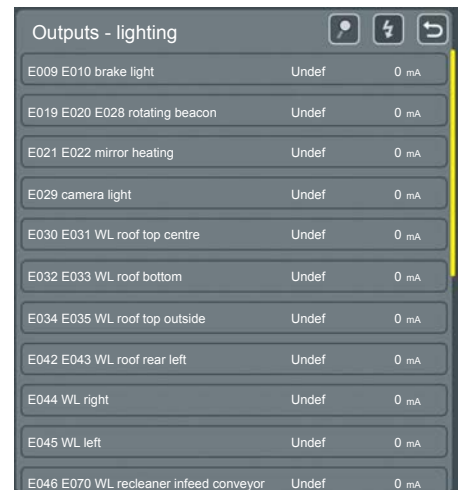
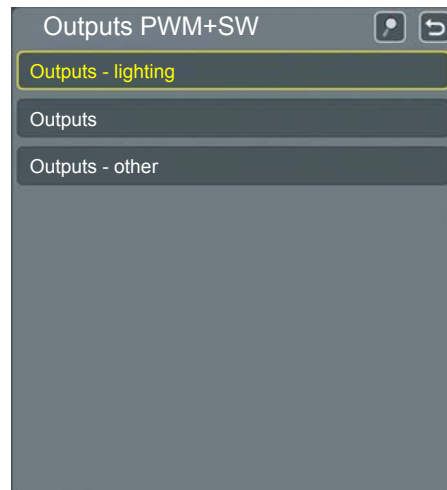
8.5.1.3      Inputs speed



### 8.5.1.4 Outputs PWM + SW

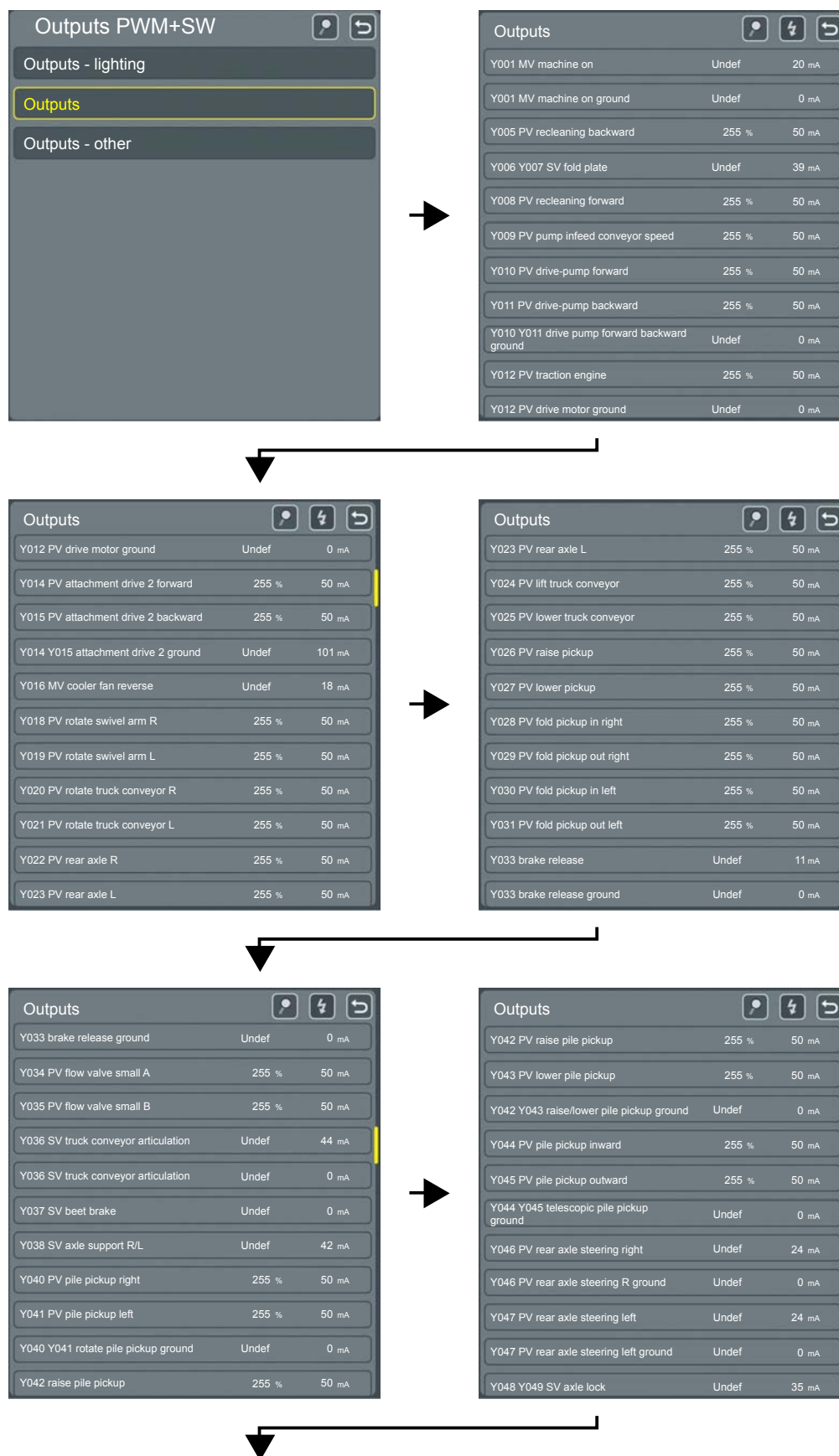


#### Outputs - lighting





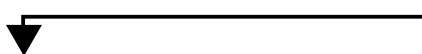
## Outputs



Outputs		
Y048 Y049 SV axle lock	Undef	35 mA
Y048 Y049 axle lock ground	Undef	0 mA
Y052 SV supporting foot R	Undef	41 mA
Y053 SV supporting foot L	Undef	39 mA
Y054 SV rotate residual beet pickup	Undef	46 mA
Y062 PV attachment drive 1 forward	255 %	50 mA
Y063 PV attachment drive 1 backward	255 %	50 mA
Y062 Y063 attachment drive 1 ground	Undef	0 mA
Y068 SV additional axes on	Undef	0 mA
Y069 SV additional axes	Undef	0 mA
Y072 MV rotary seat brake	Undef	374 mA



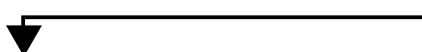
Outputs		
Y072 MV rotary seat brake	Undef	374 mA
Y073 SV lower truck conveyor	Undef	24 mA
Y073 SV lower truck conveyor ground	Undef	0 mA
Y083 SV drive pump neutral position	Undef	26 mA
Y099 PV cooler fan pump	255 %	50 mA
Y119 MV differential lock front	Undef	9 mA
Y120 MV differential lock rear	Undef	13 mA
Y121 MV transmission gear 1	Undef	11 mA
Y122 MV transmission gear 2	Undef	11 mA
Y123 MV switch gear slow	Undef	368 mA
Y124 MV switch gear fast	Undef	11 mA



Outputs		
Y124 MV switch gear fast	Undef	11 mA
Y125 SV cabin up/down	Undef	42 mA
Y126 SV clearing shield right	Undef	1 mA
Y127 SV clearing shield left	Undef	0 mA
Y128 PV attachment drive 3 forward	255 %	50 mA
Y129 PV attachment drive 3 backward	255 %	50 mA
Y128 Y129 attachment drive 3 ground	Undef	0 mA
Y130 SV rotate swivel arm	Undef	42 mA
Y130 SV rotate swivel arm ground	Undef	0 mA
Y131 SV rotate truck conveyor	Undef	46 mA
Y131 SV rotate truck conveyor ground	Undef	0 mA



Outputs		
Y131 SV rotate truck conveyor ground	Undef	0 mA
Y132 SV rotate recleaner	Undef	41 mA
Y133 SV lock LS-discharge	Undef	31 mA
Y134 PV swivel counterweight right	255 %	50 mA
Y135 PV swivel counterweight left	255 %	50 mA
Y134 Y135 swivel counterweight ground	Undef	101 mA
Y136 PV pump truck conveyor speed	255 %	50 mA
Y137 SV counterweight arm lock	Undef	46 mA
Y138 SV floating position pickup centre	Undef	22 mA
Y139 SV raise counterweight	Undef	44 mA
Y139 SV raise counterweight ground	Undef	0 mA



Outputs		
Y139 SV raise counterweight ground	Undef	0 mA
Y140 SV lock swivel arm	Undef	42 mA
Y141 SV swivel arm lock closed	Undef	24 mA
Y142 SV unfold pickup right	Undef	20 mA
Y143 SV unfold pickup left	Undef	20 mA
Y144 PV flow valve large A	255 %	50 mA
Y145 PV flow valve large B	255 %	50 mA
Y147 MV water spray system pickup left outside	Undef	0 mA
Y148 MV water spray system pickup right outside	Undef	1 mA
Y149 MV water spray system pickup left inside	Undef	0 mA
Y150 MV water spray system pickup right inside	Undef	1 mA



Outputs		
Y147 MV water spray system pickup left outside	Undef	1 mA
Y148 MV water spray system pickup right outside	Undef	0 mA
Y149 MV water spray system pickup left inside	Undef	0 mA
Y150 MV water spray system pickup right inside	Undef	3 mA
Y151 MV water spray system cleaning front	Undef	0 mA
Y152 MV water spray system cleaning rear	Undef	0 mA
Y158 stone remover changeover valve 1	Undef	42 mA
Y159 stone remover changeover valve 2	Undef	40 mA
Y174 SV truck/infeed conveyor fast motion	Undef	22 mA
Y175 SV lock truck conveyor	Undef	22 mA
Y176 SV lock infeed conveyor	Undef	22 mA

Outputs - other

Outputs PWM+SW

Outputs - lighting

Outputs

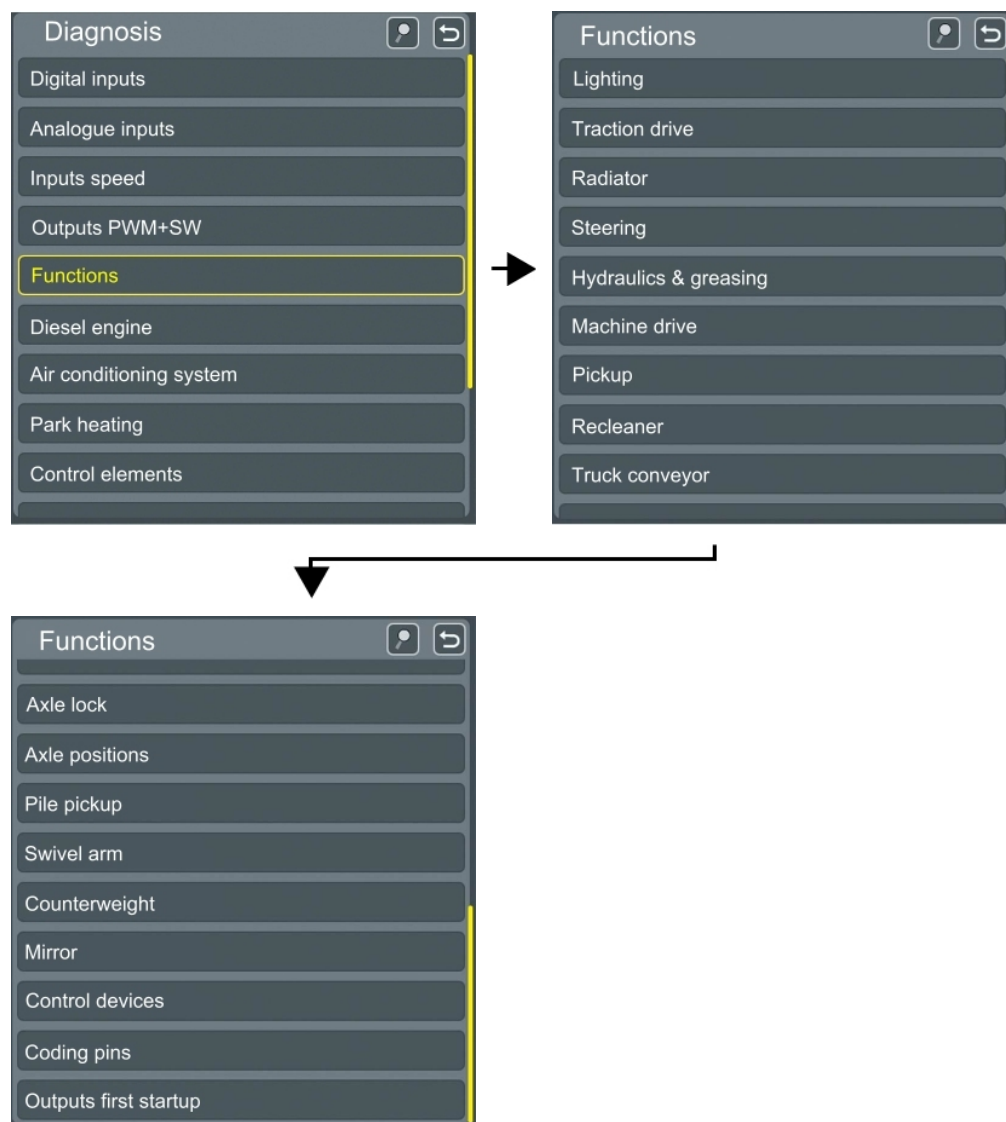
Outputs - other

→

Outputs - other

H013 back up alarm	Undef	0 mA
M005 central lubricating pump	Undef	0 mA
M006 window washer pump 1	Undef	1 mA
M010 window washer pump 2	Undef	1 mA
M014 oil cooler fan PDG	Undef	0 mA
M015 fuel pump prefilter	Undef	1 mA
M017 window washer pump 3	Undef	1 mA
M022 M023 M024 hot-water valve feed	Undef	0 mA
M022 hot-water valve floor	255 %	3,461 V
M023 hot-water valve oil tank	255 %	3,469 V
M024 hot-water valve diesel engine	255 %	3,469 V

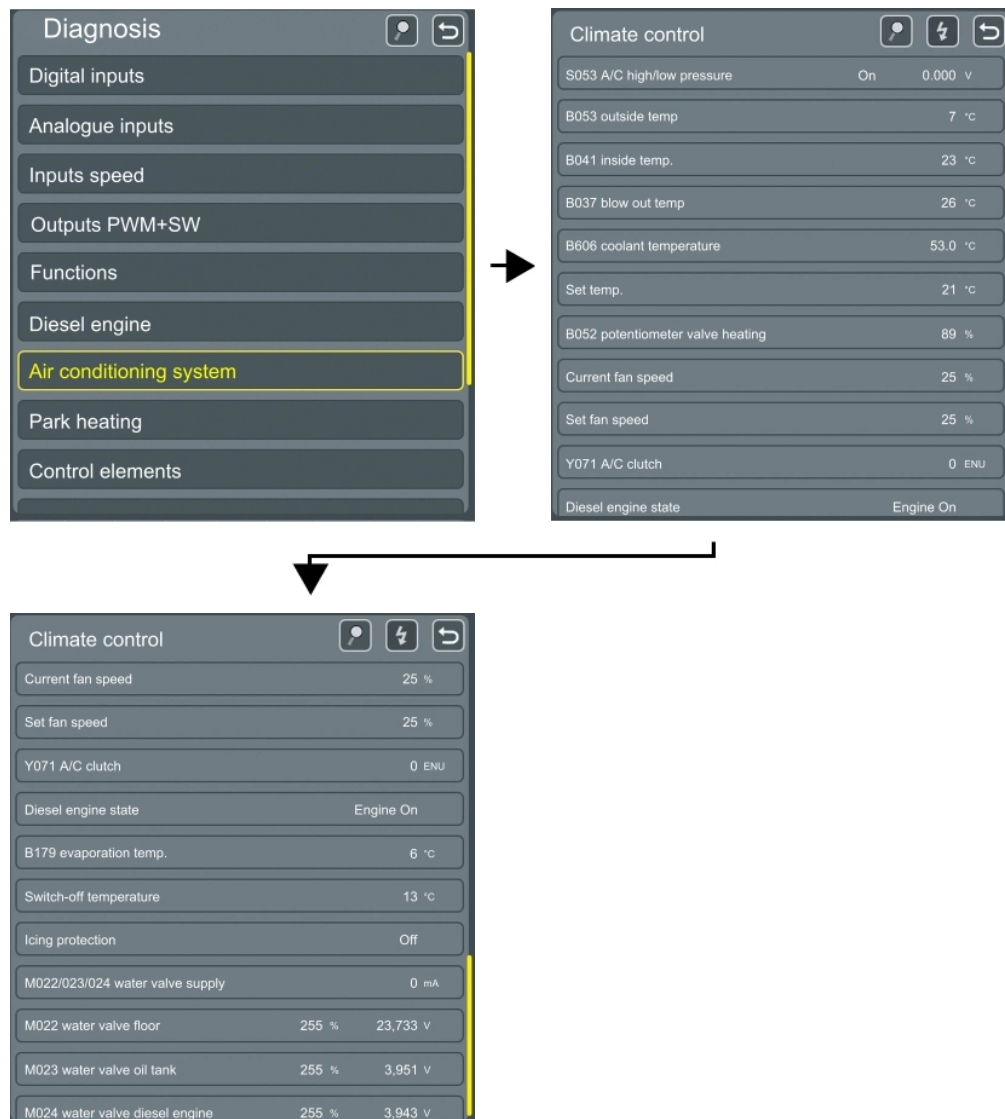
### 8.5.1.5 Functions



8.5.1.6 Diesel engine

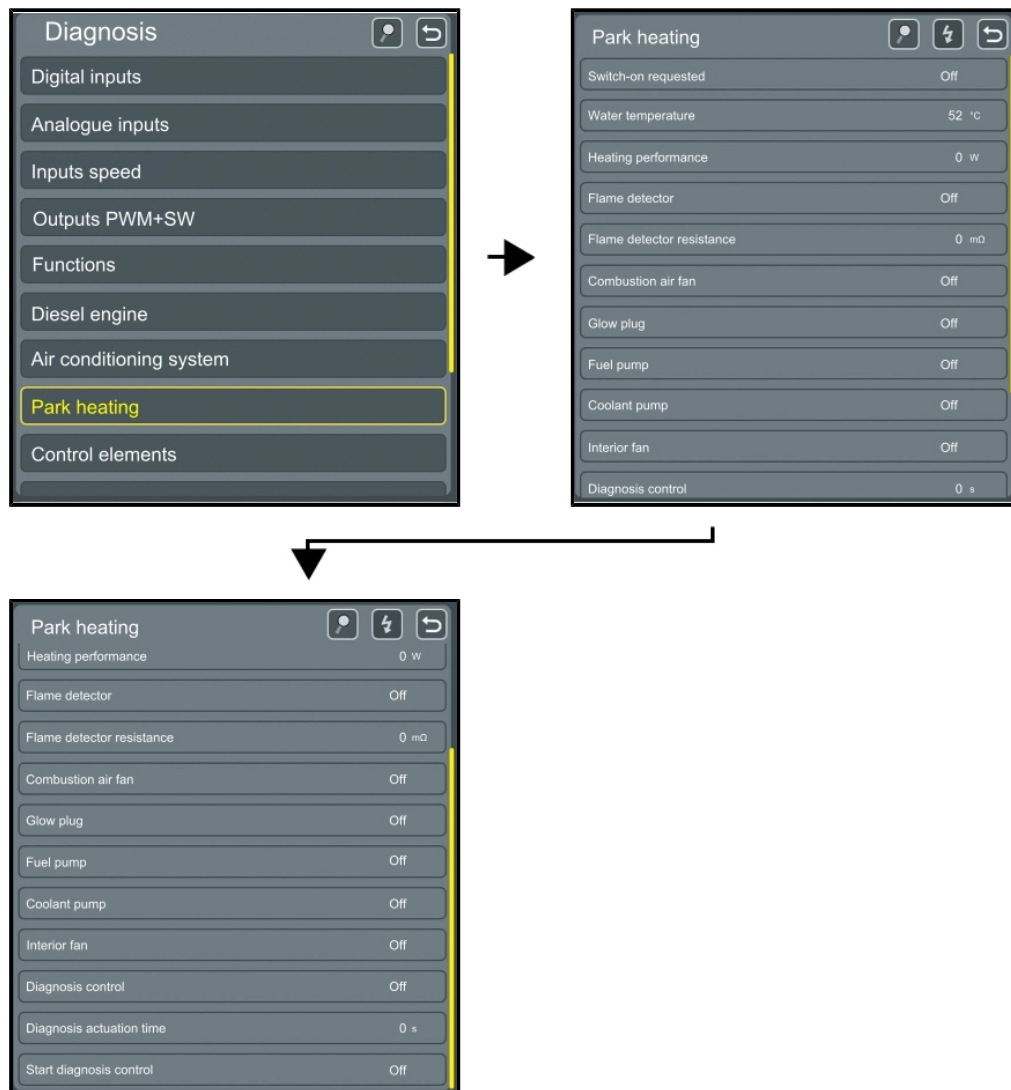


### 8.5.1.7 Air conditioning system

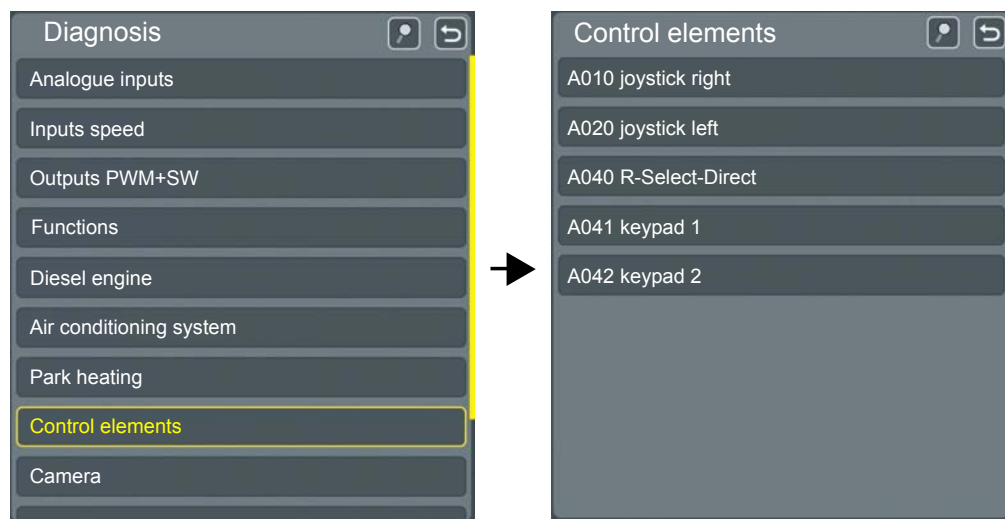




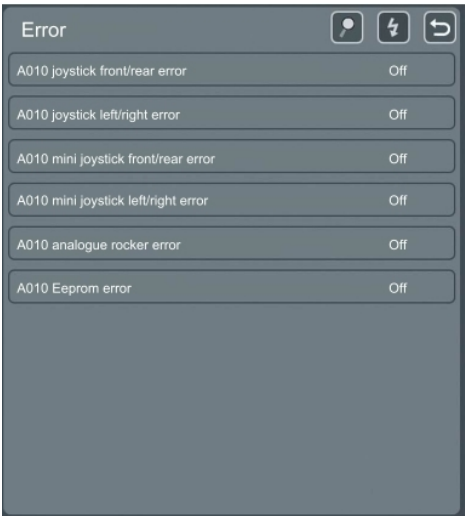
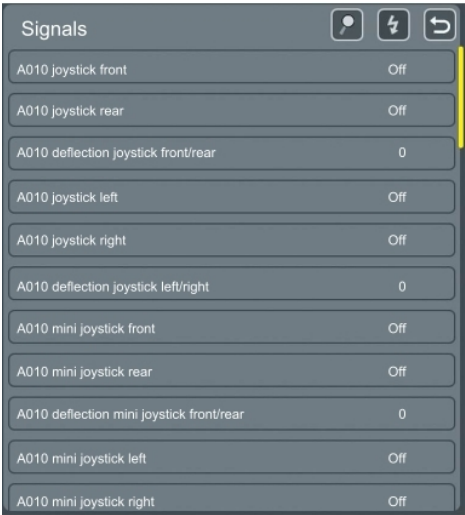
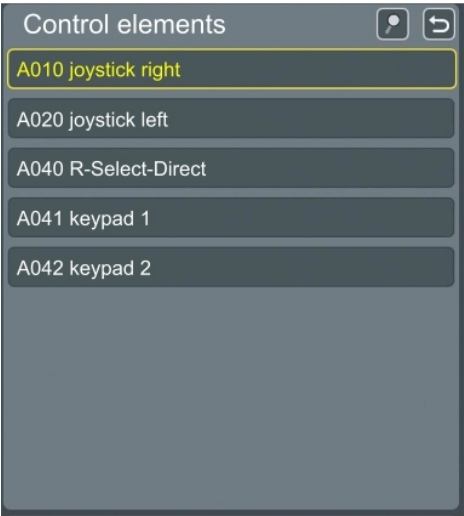
### 8.5.1.8 Park heating

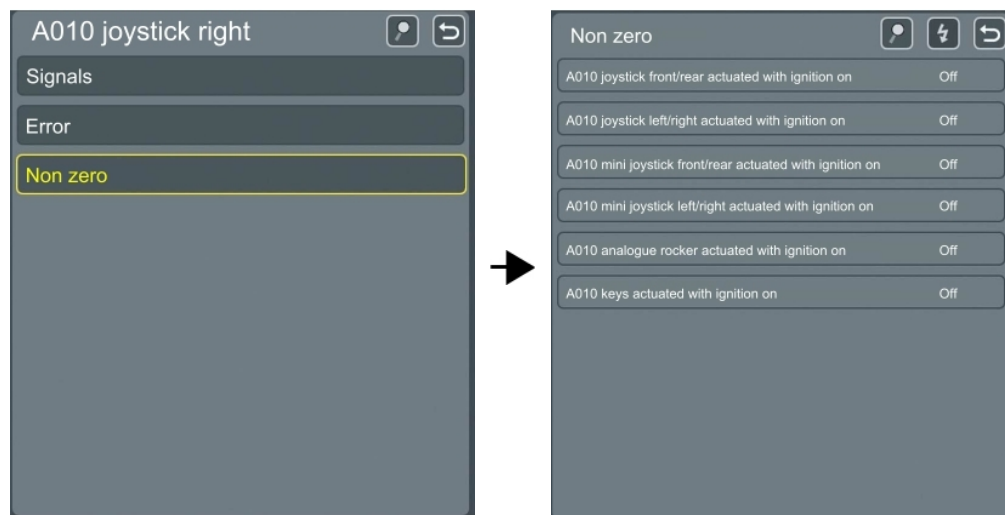


### 8.5.1.9 Control elements

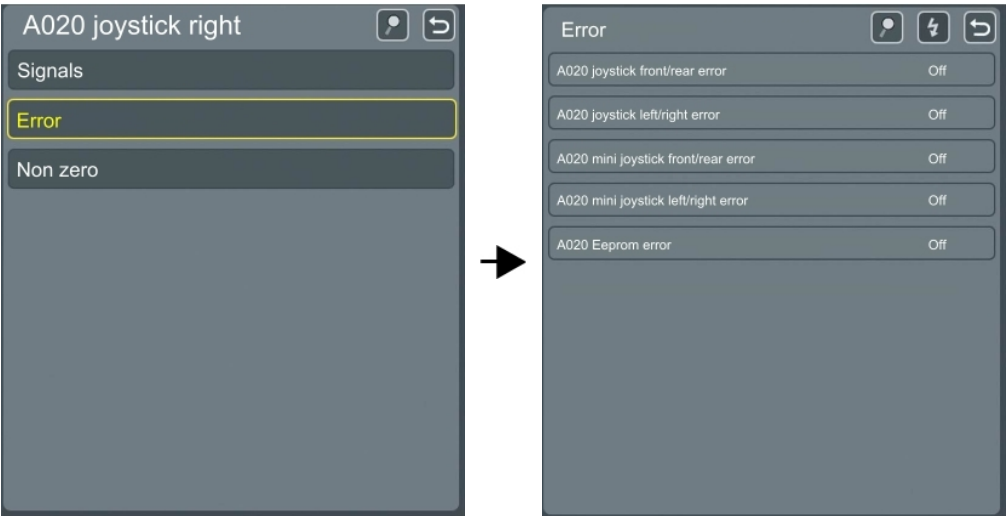
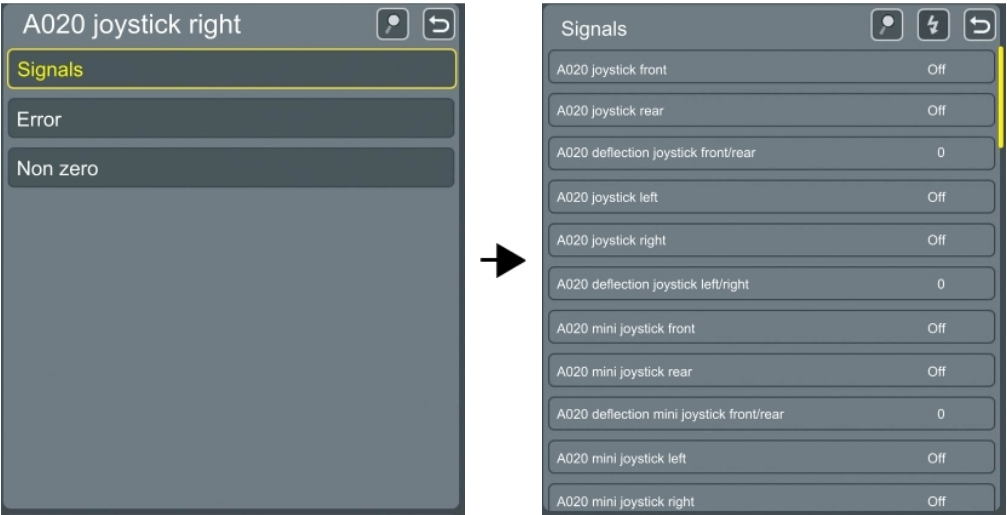
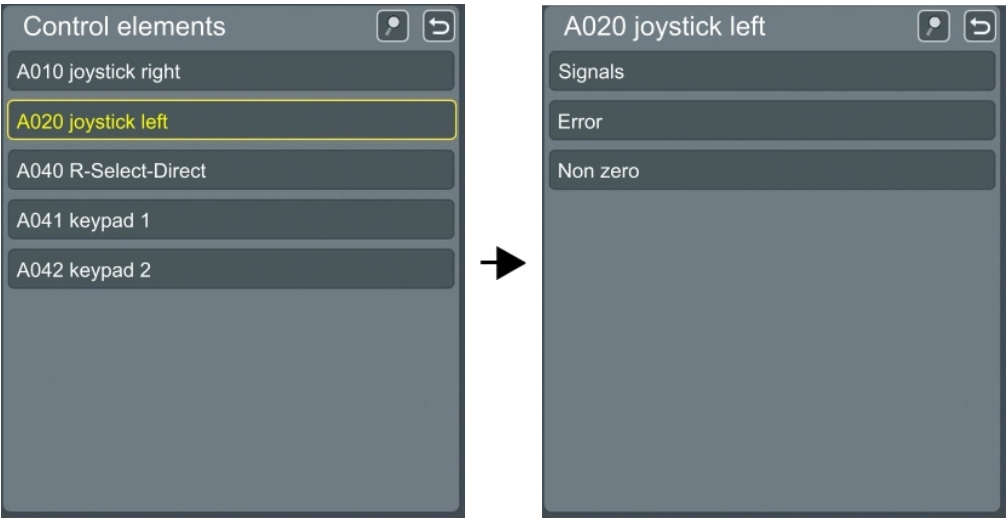


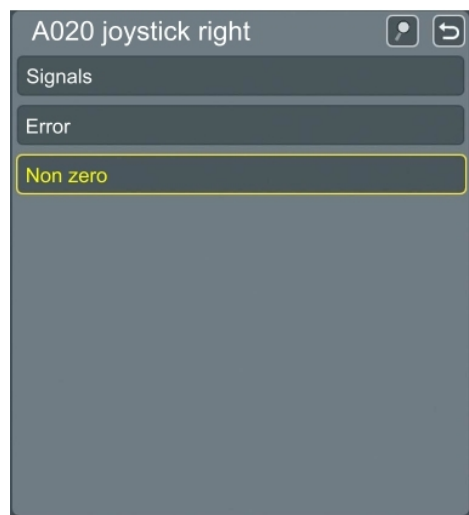
A010 joystick right



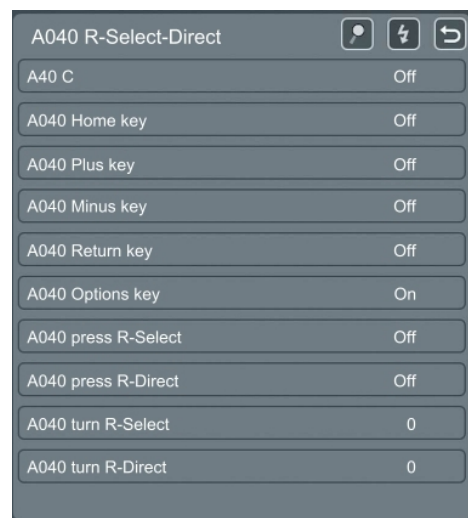
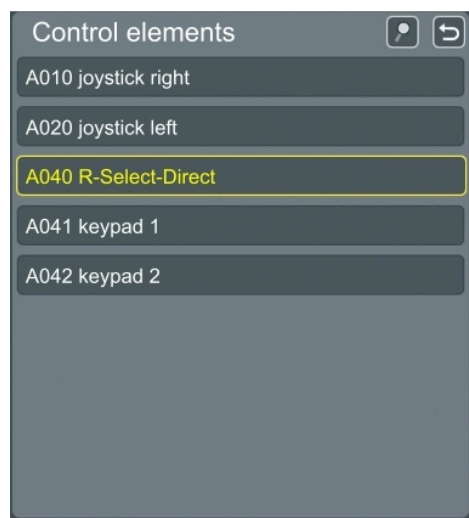


A020 joystick left

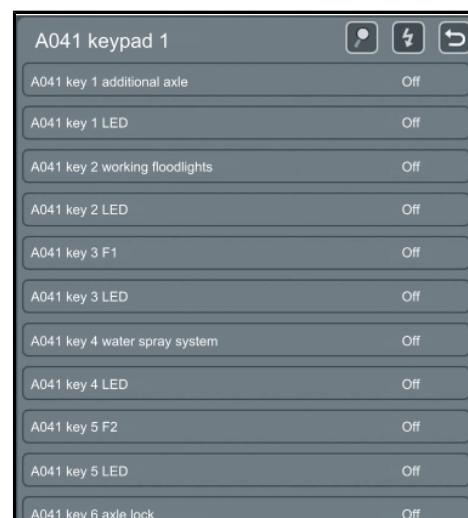
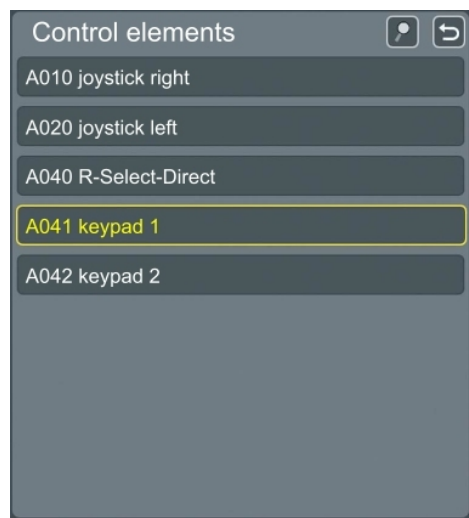




#### A040 R-Select-Direct

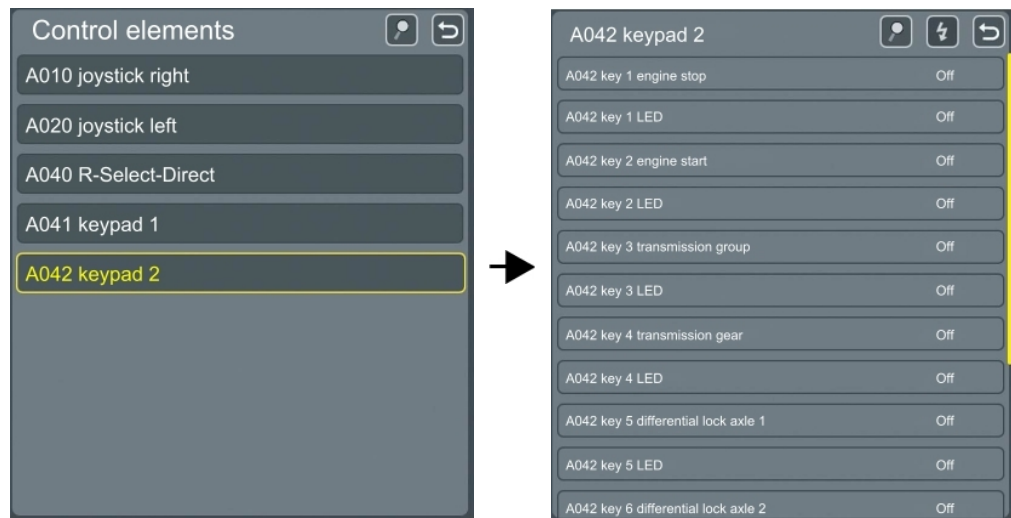


#### A041 keypad 1

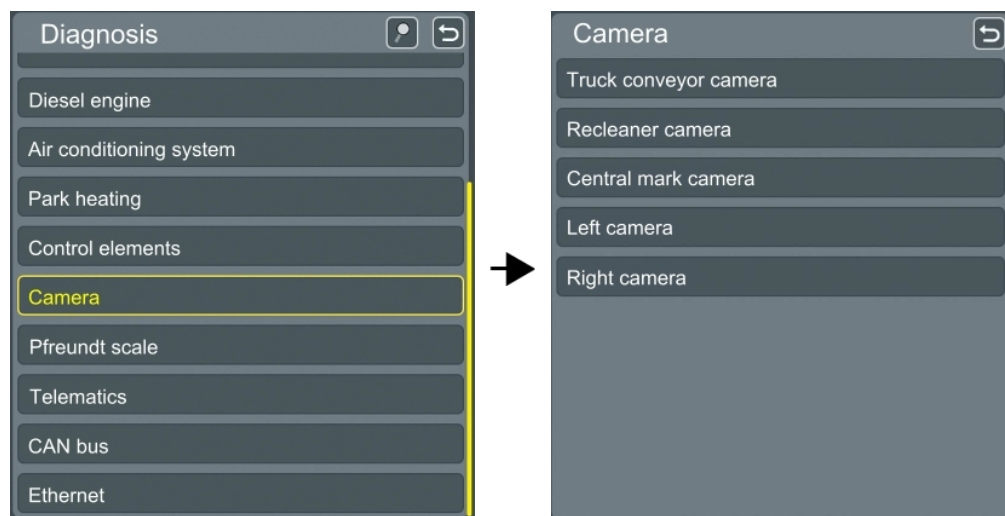




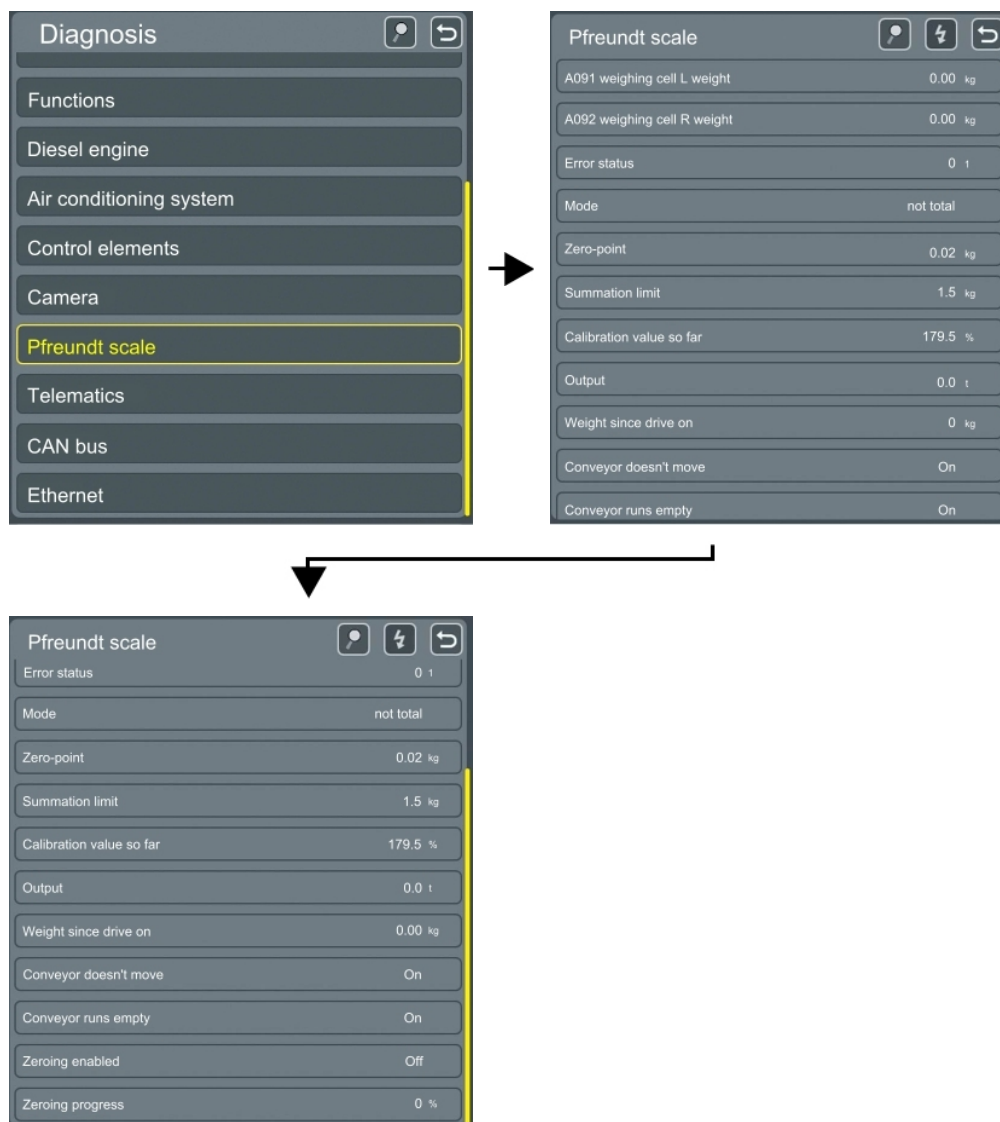
### A042 keypad 2



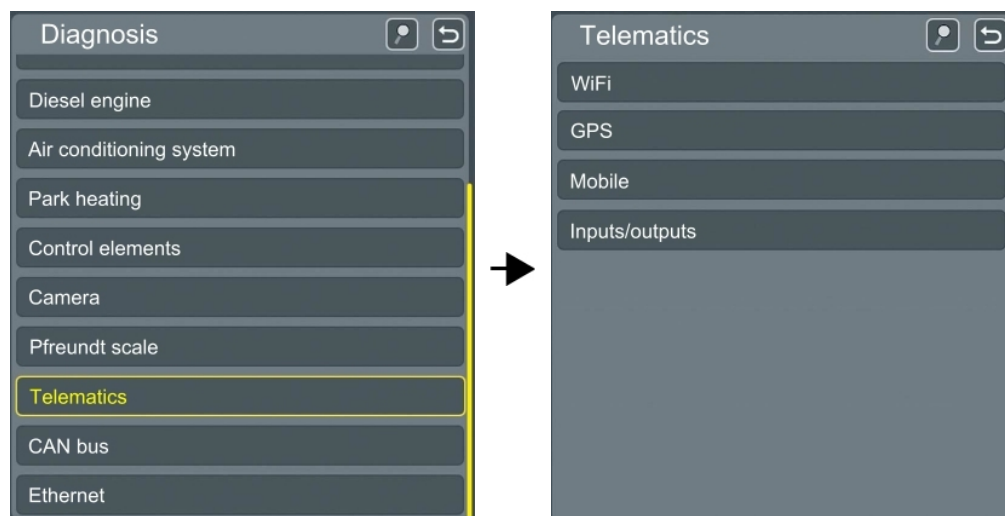
### 8.5.1.10 Camera



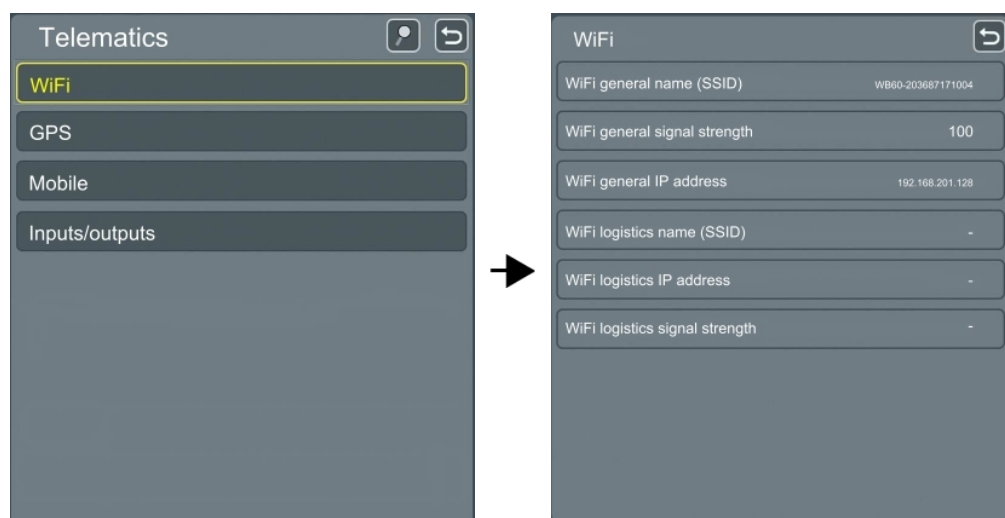
### 8.5.1.11 Pfreundt scale



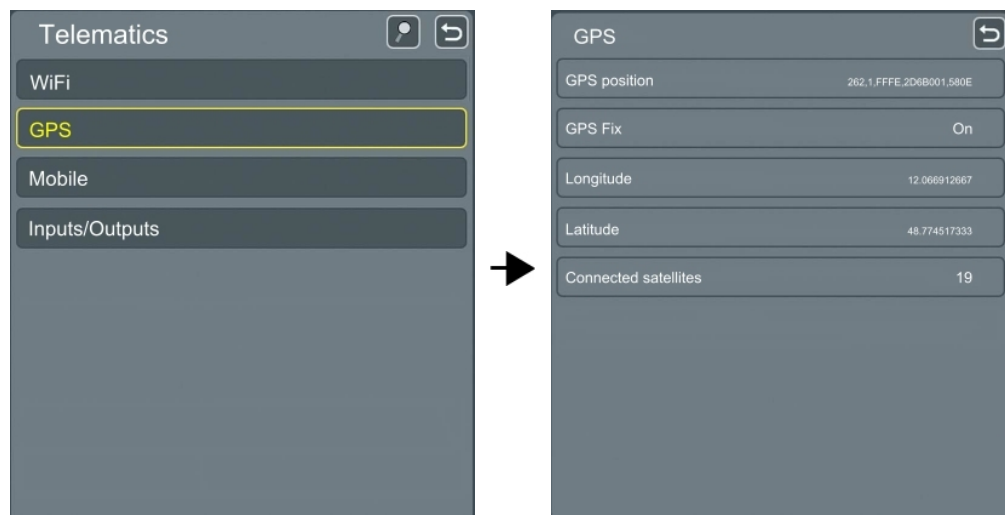
### 8.5.1.12 Telematics



#### WiFi



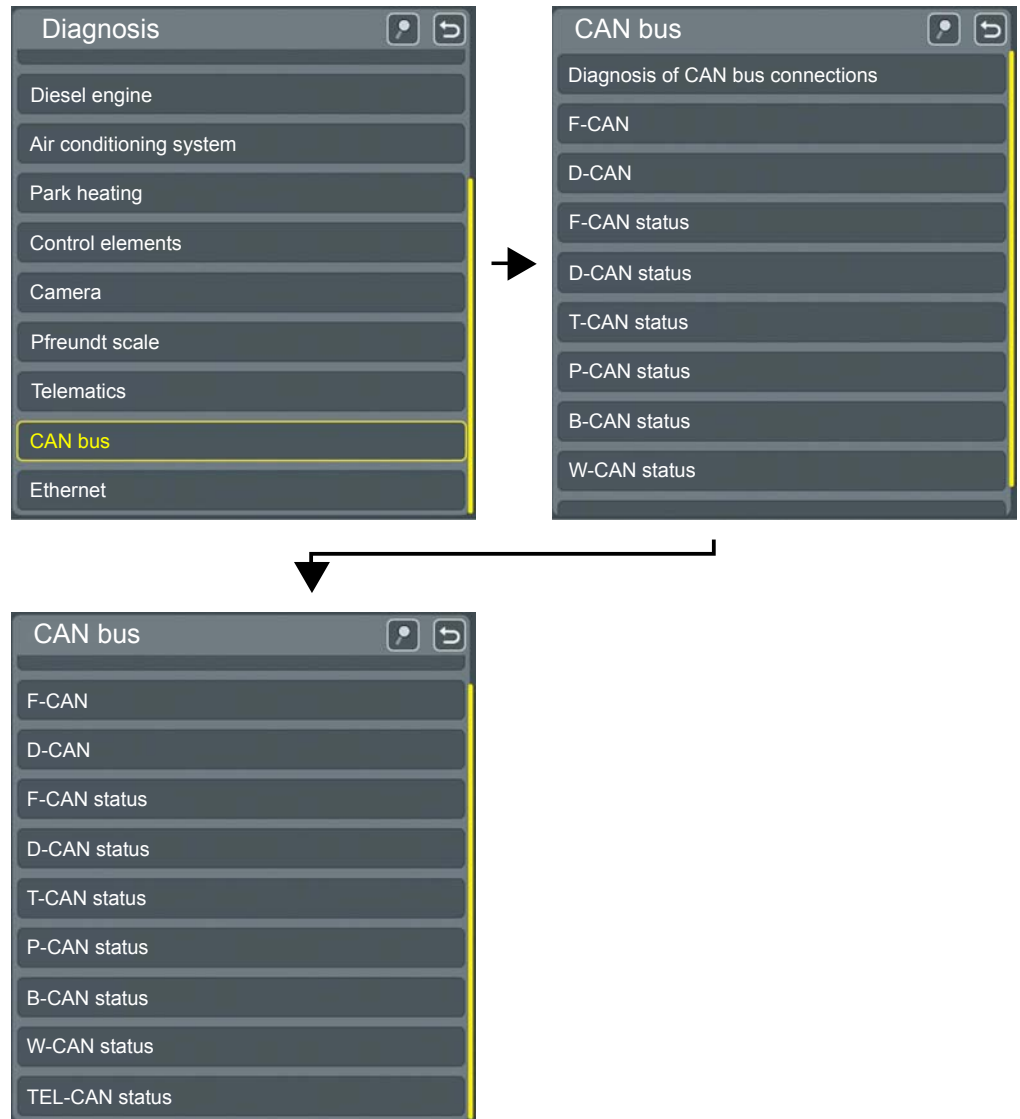
#### GPS



Mobile



### 8.5.1.13 CAN bus



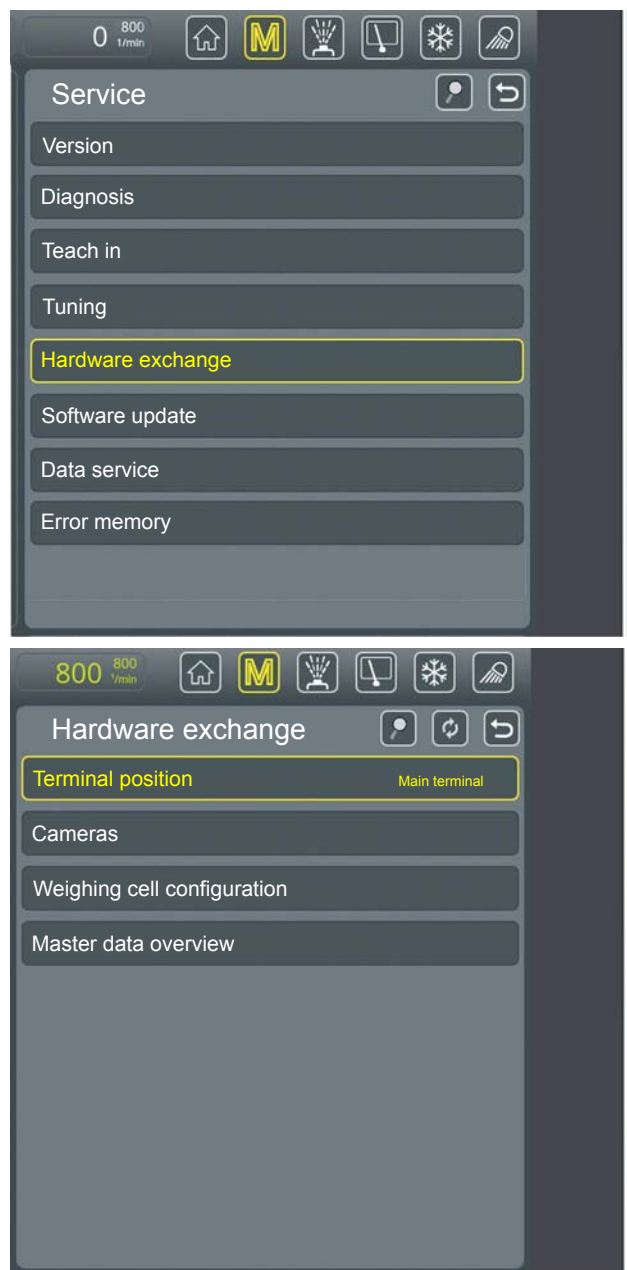
### 8.5.1.14 Ethernet





## 8.5.2 Terminal exchange

If required, the main and the auxiliary terminals can be exchanged, e.g. if one terminal does not function properly. Please do not change anything here without consulting your Ropa service partner. Since the data base in the main terminal is not identical to the data base in the auxiliary terminal.



## 8.6 Jump starting and charging the battery

### ATTENTION



- Should it become necessary to jump start the machine, then no charging or starting aid device connected to the mains or a generator may be used, because use of these devices can lead to irreparable damage of the machine electronics.
- Only other motor vehicles with a 24V power system or vehicle batteries with a battery voltage of 24V and sufficient capacity may be used for jump starting.

### ADVICE



#### **Risk of machine damage.**

We expressly point out that quick chargers and mains-connected jump start devices for starting the machine are prohibited.

Damage from excessive voltage caused by non-approved charging devices or jump start devices are covered neither by the guarantee nor by the warranty. No accommodation will be granted for such kind of damage.



*Battery case*

### WARNING



#### **Injury hazard.**

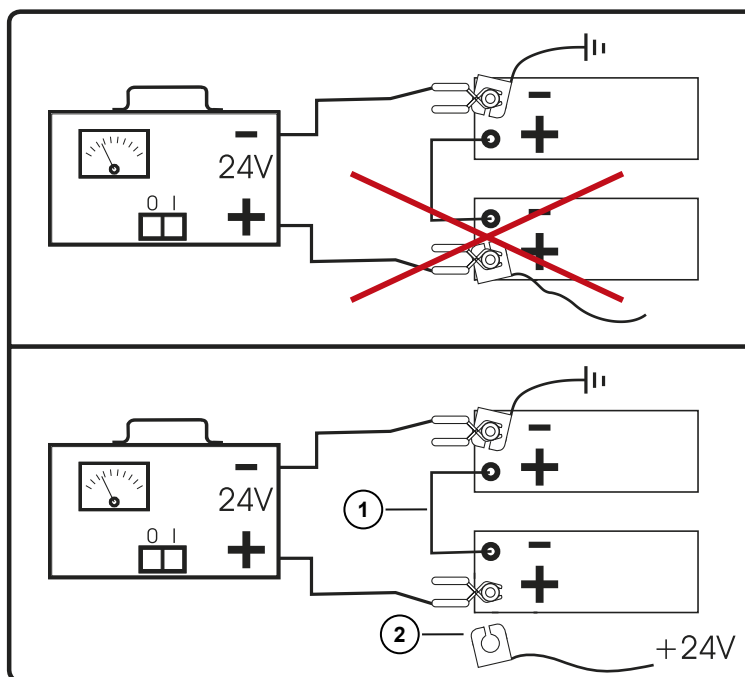
- Please absolutely comply with the safety information from the battery manufacturer when handling acid batteries.

### Charging the batteries

- Generally, for charging the batteries, the plus terminal (2) must be disconnected and the main battery switch ([See Page 334](#)) must be switched off.
- Do not remove the plus pole of the battery bridge (1).
- Only normal battery charging devices may be used for charging the battery.

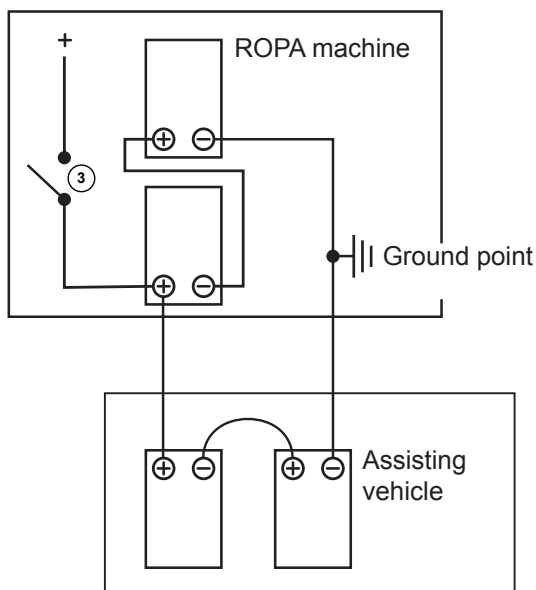
### Quick charge devices are expressly prohibited!

The charging current may at max. amount to one tenth of the nominal capacity of the battery.



#### Jump starting

Because, in the past, damage has been caused several times due to improper charging of batteries or jump starting, we would like to expressly point out that machine may only be jump started using the following method.



#### (3) Battery disconnect relay

- Exclusively use standardized jump starting cables with actually sufficient cross section of the electrical conductors.
- Only use batteries with the same rated voltage (24V).
- Make sure of sufficient battery capacity of the assisting vehicle.
- Shut down the combustion engines and switch off the ignition of both vehicles.
- Switch off the battery main switch [See Page 334](#) on the **ROPA machine**. Check that the battery disconnect relay has really opened (green LED on the R-Touch is off if ignition is switched ON).
- Make sure that the two vehicles do not touch at any point.
- First connect the negative terminal of the battery of the assisting vehicle to the negative terminal of the battery of the **ROPA machine**. Alternatively, a blank metallic and electrically conductive spot (e.g. grounding strip or engine block) of the assisting vehicle may be connected to a similar place (grounding strip, engine block or salvaging lug on the main frame at the rear) of the **ROPA machine**.
- Connect the positive terminal of the battery of the assisting vehicle to the positive terminal of **ROPA machine**.
- Switch on the battery main switch on the **ROPA machine**.
- Start the combustion engine of the assisting vehicle and rev it up to a medium speed.
- Start the diesel engine of the **ROPA machine** and make sure, that the start attempt does not last longer than 15 seconds.
- Before removing the jump start cable, in any case shut down the combustion engine of the assisting vehicle. Otherwise, the electronic system of the assisting vehicle may be damaged.
- Remove the jump start cable from both vehicles in reverse order (first remove the positive cable, then the negative cable).

## 8.7 Welding on the machine

When welding on the machine, always turn off the main battery switch. The ground cable of the welding transformer must be connected as close as possible to the welding position.

---

**ATTENTION****Danger of machine damage.**

Welding on the machine may only be performed by people sufficiently qualified for the respective work under the regional regulations. Welding on structural parts or parts with a safety function may only be performed after enquiry with ROPA, to the extent as it is admissible under the respective applicable regulations. All welding works may only be performed as per applicable standards and the recognized rules of engineering. Always observe the increased fire hazard when welding near combustible parts or liquids (fuel, oils, greases, tyres, etc.). We expressly point out that ROPA will not assume any warranty for damage to the machine caused by improper welding.

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## 8.8 Towing

### WARNING

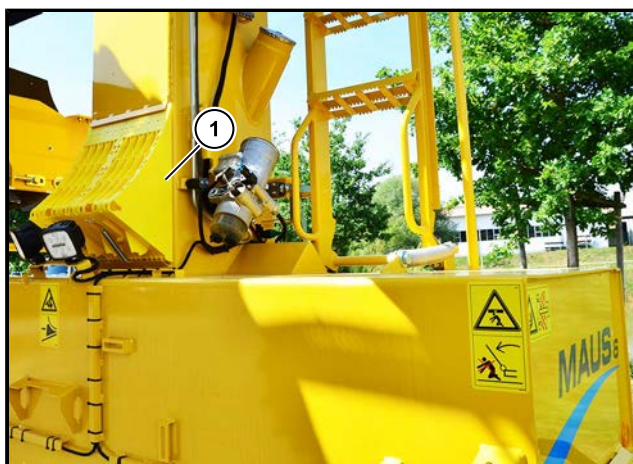


When the engine is shut down, the vehicle is very difficult to steer! The emergency steering pump is only effective at speeds above approx. 4 km/h.

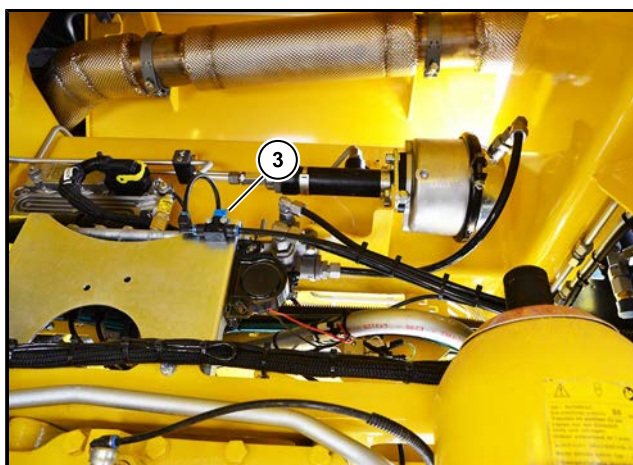
- Caution, if the brake is not functional! Only use vehicles with sufficient braking power to tow the machine.
- For towing, use exclusively inflexible towing bars of sufficient dimensions. No other vehicles may be towed or loads drawn using the machine itself.

If it is necessary to tow the machine, then always observe the regional regulations on the towing vehicle and on securing of the vehicle combination on public roads and paths.

- Shut down the diesel engine.
- Engage the parking brake and additionally secure the machine to prevent it from rolling with the two wedges (1).

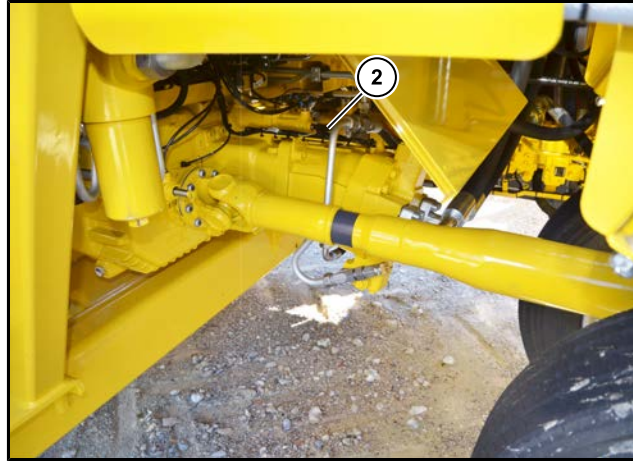


- Notify the nearest authorised customer service of ROPA. You need suitable salvaging aids and tools.
- Switch to "Turtle" or gear 2 operating mode.
- Turn off compressed air supply to the pneumatic system. For this purpose, turn the red plastic stopcock (3) above the transmission at right angles to the line.



**Model with 1 traction drive engine**

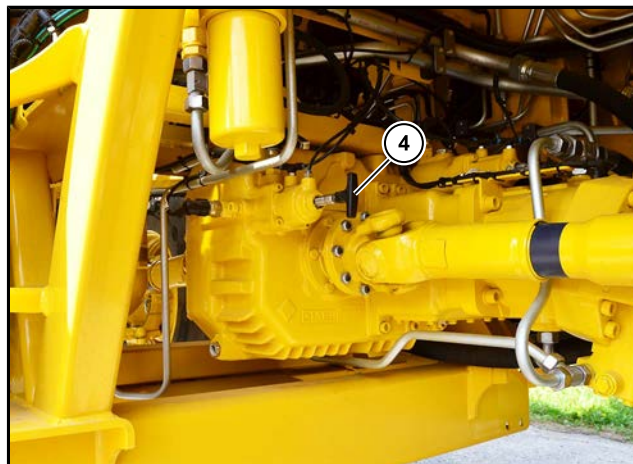
- Set the reduction gear to neutral.
- Pull the shift rod (2) (on the front of the reduction gear) out 26 to 30 mm. Neither of the two gears may be engaged.
- The emergency steering pump is still being driven and is still operational.



*Shift rod (2) on the front of the reduction gear*

**Model with 2 traction drive engines:**

- Set the transmission to neutral.
- Pull the shift rod (4) (on the front of the transmission) out about 12 mm. Neither of the two gears may be engaged.
- The emergency steering pump is no longer being driven and is not operational.



*Shift rod (4) on the front of the transmission*

**From this point with both models:**

- Connect an appropriate salvaging aid e.g. a rigid towing bar ([See Page 492](#)).
- Release the parking brake manually, ([See Page 494](#)).

**ADVICE**


It is impossible to start the diesel engine of the machine by towing or rolling.

If necessary, compressed air from the assisting vehicle can be fed in via the compressed air coupling. The maximum allowable feed pressure is 8.5 bar.



## 8.9 Connecting salvaging aids



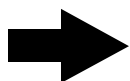
There is a salvaging lug (1) in the rear at the centre of the engine compartment for connecting salvaging aids (tow bar, etc.).

### ADVICE



Connecting of salvaging aids at the front side of the machine is extremely problematic and must be carried out by qualified versed personnel only in an extreme emergency. In case of need, contact ROPA customer service.

### ADVICE



Always make sure of sufficient rigidity of the salvaging aids. Consider that the load caused on the salvaging aids during salvaging of a vehicle may amount to several times the normal vehicle weight. For salvaging of the machine, call in very experienced specialists and always use equipment with sufficient bearing capacity and load capacity and suitable vehicles.

## 8.10 Jacking up for wheel change

### DANGER

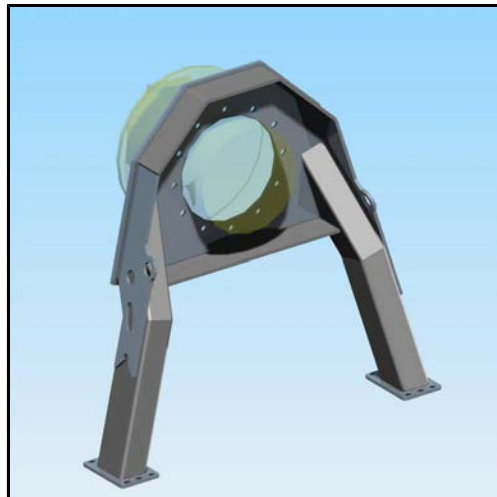


#### Hazard of fatal injuries!

- For safety reasons, the machine must be always jacked up only on one axle and on one side.
- To jack up park the machine on even and sufficiently stable ground.
- Fold out the pickup. Truck conveyor and counterweight arm remain in transport position.
- Secure the machine against rolling by engaging the parking brake and using the wheel chocks.
- A (hydraulic) jack of at least 15 t load capacity is required for lifting.
- Position the jack as shown in the following pictures.



- Once the machine is lifted, it has to be additionally secured with massive load bearing timbers or similar materials against crashes. For the wheel change we recommend fixing the ROPA safety stand (ROPA item no. 018041000) to the wheel hub.



## 8.11 Releasing the parking brake manually

Working on the spring-loaded actuators is dangerous and may only be performed by people trained for this work and familiar with working on pre-stressed spring piles.

Sufficiently high pressure must be available in the pneumatic system to release the parking brake. In an emergency, the parking brake may even be manually released if there is insufficient pressure for the braking system. The spring-loaded actuator must be deactivated manually.

This must be done only if the diesel engine and traction drive are functional and at least partial braking power can be generated with the traction drive.

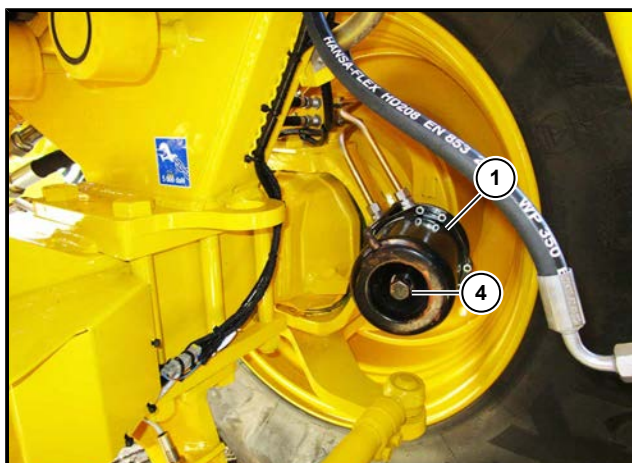
### **DANGER**



**Hazard to life due to the machine inadvertently rolling away.**

- Before loosening the spring-loaded actuator secure the machine against rolling away using all wedges.
- Any work on the vehicle brakes may only be performed by qualified personnel who, due to their professional training, are familiar with the maintenance and repair of compressed air brakes.

**Deactivating the spring-loaded actuator:**



### **DANGER**



- Never park the vehicle unsecured with the spring-loaded actuator (1) released.
- Secure the vehicle against rolling away using sufficiently large wedges.
- Put in the driver's field of vision a distinctive sign with the inscription: "Danger! Vehicle has no braking performance! The spring-loaded actuators are released".
- Secure the diesel engine against accidental start-up, keep the ignition key out of reach of any third party!

**WARNING**



**Hazard of severe injuries from parts flung away with great force.**

The parts inside the spring-loaded actuator are pre-stressed with great spring force and may be flung away in case of improper opening, causing severe injuries to people.

- Never open the spring-loaded actuator using force or improperly.
- 
- Stop the machine and shut down the diesel engine.
  - Secure the diesel engine against accidental start-up, keep the ignition key out of reach of any third party!
  - Secure the vehicle against rolling away using the two wedges.
  - Use a SW 24 ring spanner to turn the emergency release bolt (4) (hexagonal bolt centrally positioned on the cylinder) anticlockwise (maximum torque 35 Nm, path approx. 70 mm) until a hard stop can be felt.
  - The spring-loaded actuators are released, the vehicle is totally without brakes.
  - The vehicle may be towed to the next workshop or a secure parking place under compliance with the corresponding safety regulations.

## 8.12 Hydraulic valves

All hydraulic valves are electrically controlled. Problems with solenoid valves may be detected using specific test cables, which are supplied with each machine. These test cables may only be connected to the solenoid valves by trained and instructed specialist personnel.

Should an electrically controlled valve malfunction, then in any case, without exception, call in a specialist. Never try to shake the solenoid valve concerned to remedy possible contact problems or a possible line break. If the valve is suddenly opened during such tries, then the person concerned may suffer deadly injuries.

**WARNING**



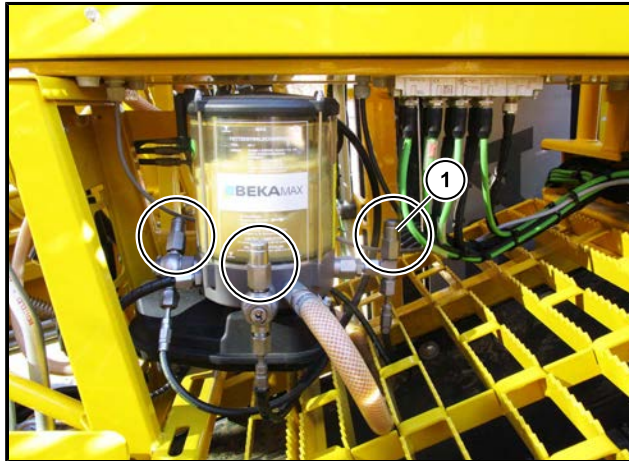
Searching and remedying malfunctions on all components of the hydraulic system is exclusively the task of trained specialists. We expressly warn of tries to repair or self-performed tests on hydraulic valves under electro-magnetic control. If during such tests or tries to repair, parts of the hydraulic system are suddenly put under pressure, then this may trigger unwanted machine movement. This may pinch or even crush people or body parts.

## 8.13 Central lubricating system – bleeding and removal of blocks

During all work on the central lubrication system, make sure of utmost cleanliness. In no case should dirt enter the lubrication system.

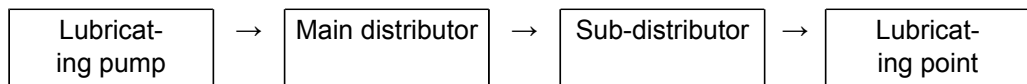
Should the grease reservoir inadvertently have been run empty, then the grease pump must be bled. For this purpose, remove the main pipe from main distribution and switch on the pump for so long until air-free grease emits from the main pipe. Screw a lubricating nipple into the input of the main distributor and using the grease gun, pump grease into the main distributor for so long until grease emits at the bearings. Then, reconnect all pipes.

If the pipe system is blocked, then the grease will be pressed out at the safety valve (1) (directly at the pipe output of the pump). To remove this block, proceed as follows:



#### (1) Safety valve

- Search for the blocked spot in the pipe system. Go along the stiffer grease pipe from the lubricating pump through the main distributor (the blocked pipe is stiffer because it is under pressure) further to the corresponding sub-distributor and from there to the blocked lubricating point. Please refer to chapter 9 for a detailed plan ([See Page 519](#)).
- Disconnect the pipe from the distributor and screw a lubricating nipple into the corresponding (sub) distributor.
- Try to loosen the block strongly pressing grease into the distributor using the hand lever grease gun.
- Proceed systematically: from the grease pump to the main distributor, from there to the sub-distributor, etc..



- Once you determine that the line is permeable again, connect the line with the consumer. Check the free passage by performing an intermediate lubrication. ([See Page 323](#))
- Shouldn't the method prescribed here lead you to any success, please contact your ROPA service station.

Some distributors are provided with a lubricating nipple. This lubricating nipple is used to simplify troubleshooting.

All lubrication points of the sub-distributor can be supplied with grease via this lubricating nipple, because there is a check valve in the outlet of the main distributor.

There is no check valve between the lubrication pump and the main distributor.

The main distributors can be recognised by the integrated lifting pin indicator ([See Page 323](#)). Should you feel only slight resistance when greasing the lubricating nipple at the main distributor, then the grease can flow freely into the grease reservoir of the central lubrication pump. In this case the wing in central lubrication pump must be turned by approx. 120° via manual intermediate lubrication.

## 8.14 Emergency operation ventilator drives emergency operation



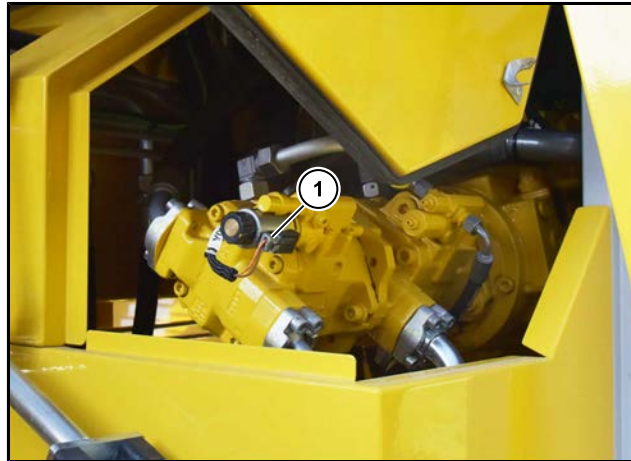
Emergency operation ventilator drives

To check whether **the fan wheel of the cooling system** is really running at maximum speed, the plug (1) labelled "Y099" can be disconnected from the hydraulic pump for test purposes. Then, the ventilator should be running at maximum speed.



If the cooling performance is not improved by this measure, then the machine may only be operated at reduced load.





**ATTENTION**



**Hazard of damages to fan drive!**

Perform the test by disconnecting the plug "Y099" only with the fan running forward. The reversing of the uncontrolled fan at maximum revolutions speed would cause damage to the fan runner or the fan drive.

## 8.15 Adjusting brake

**DANGER**



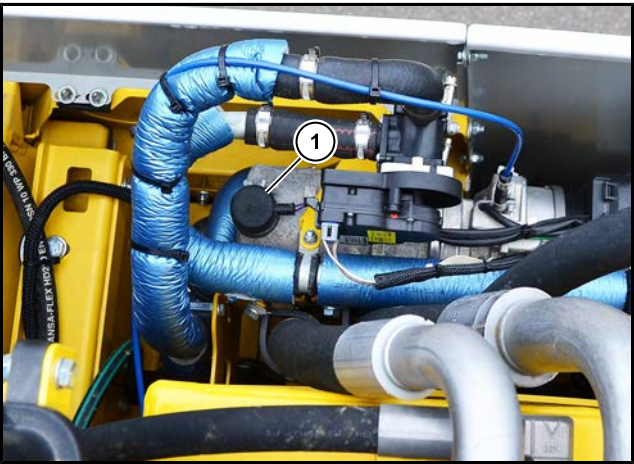
Adjustments and repair work on the brakes may only be performed by trained specialist personnel who are familiar with the maintenance and repair of compressed-air brakes.

The expansion wedge brake is fitted with an automatic self-adjusting mechanism. The brake therefore do not require adjustment.

8.16      **Park heating**

Should any fault occur, check whether the fuses and plug connectors are intact and tightly seated.  
If it does not help, please contact a Webasto service centre ([www.webasto.com](http://www.webasto.com)) and specify the model of your park heater (Thermo Pro 90D 24V).

Heating switches off automatically = fault shutdown	
Cause	Remedy
No ignition after start and repeat start. Flame is extinguished during operation.	Switch heater off and on again. If it still does not heat, contact a Webasto service centre.
Power failure longer than 20 seconds.	Check fuses, plug connectors and battery charge.
Heater overheats due to low coolant or loss of coolant.	Check coolant level, bleed coolant circuit
Shutdown due to temperature limiter (overheating).	Allow device to cool, then press temperature limiter button (1) to switch on again.





## **9      Lists/Tables/Plans/ Diagrams/Maintenance Verification**



## 9.1 Lubricating and operating supplies

Component	Lubricant type	Filling vol- ume	Intervals
Diesel engine OM 936			
Engine oil	<b>Engine oil, low SAPS</b> MB standard 228.52 (only for d-diesel engine, with particle filter)	approx. 27 litres	every 1,000 oper. hrs. ( <a href="#">See Page 346</a> )
	<b>Engine oil, semi-synthetic</b> multigrade oil as per MB standard 228.5 MB standard 228.51 is also permitted (only for a-diesel engine and c- diesel engine, without particle filter)		every 500 oper. hrs. ( <a href="#">See Page 346</a> )
Cooling system	Corrosion/antifreeze agent -40° as per <b>MB standard 325.5 and 326.5</b> ( <a href="#">See Page 516</a> )	approx. 25-30 litres	every 3 years
Fuel tank	<b>Diesel fuel</b>  Quality depending on diesel engine variant and exhaust gas standard ( <a href="#">See Page 349</a> )	approx. 1190 litres	when needed
Intermediate tank		(approx. 27 l)	
AdBlue® tank	<b>AdBlue® DIN 70070 or ISO 22241</b>	approx. 95 litres	when needed
Axles			
Differential gears → front axle → rear axle	<b>Gear oil</b> API GL 5, SAE 90	approx. 22 litres	annually
		approx. 20 litres	
Planetary gears 2 axles, 2 pcs. each		each approx. 3.5 litres	
Pickup/cleaning			
Pickup rollers gears 2 pcs.		each approx. 9.0 litres	annually
Gears for conveyor rollers, 2 pcs.		each approx. 3.5 litres	
Gears for 4 pinch rollers 2 pcs.		each approx. 1.4 litres	
Gears for 8-set pinch rollers (only with option)		approx. 6.0 litres	

Component	Lubricant type	Filling volume	Intervals
<b>Miscellaneous</b>			
4-gear manual transmission Model with 1 traction drive engine Model with 2 traction drive engines	<b>Fully synthetic gear oil</b> API GL5, SAE 75W-90	approx. 12 litres approx. 12.4 litres	annually
Pump distributor gears	<b>Gear oil ATF</b> ATF oil as per Dexron II D	approx. 10.0 litres	
Hydraulic system	<b>Hydraulic fluid HVL 46</b> (containing zinc) ISO-VG 46 as per DIN51524 part 3	approx. 190 litres	
Lubricating points	<b>Grease</b> as per DIN 51825, NLGI Class 2, Type: KP2K-20, at low outside temperatures KP2K-30		according to lubricating plan
Air conditioning system	Coolant and oil ( <a href="#">See Page 433</a> )		when needed
Windscreen washer system	<b>Window frost protection</b>	approx. 20 litres	when needed

The oil level control bolts and inspection glasses are decisive for the filling volumes!

Please observe the standards and approvals in our Lubricant specification table ([See Page 508](#)).

## 9.2 Maintenance table

Maintenance work	before har- vest start	daily	after the first 50 oper. hrs.	Maintenance interval			when needed	annu- ally
				every 50 oper. hrs.	after the first 500 oper. hrs.	every 500 oper. hrs.		
Diesel engine OM936 (applicable for <b>d-diesel engine</b> )								
	see also Mercedes-Benz operating manual							
Change engine oil and oil filter	every 1,000 operating hours, at least every 2 years Good only if fuel quality is strictly observed ( <a href="#">See Page 349</a> ) Otherwise, reduce the oil change interval by half.							
Start DPF regeneration manually	immediately, as soon as DPF zone 2 is reached							
Replace diesel particle filter	approx. every 4500 oper. hrs.							
Diesel engine OM936 (applicable for <b>a-diesel engine</b> and <b>c-diesel engine</b> )								
	see also Mercedes-Benz operating manual							
Change engine oil and oil filter	every 500 operating hours, but at least once a year Good only if fuel quality is strictly observed ( <a href="#">See Page 349</a> ) Otherwise, reduce the oil change interval by half.							
Diesel engine OM936 (applicable for <b>all models</b> )								
	see also Mercedes-Benz operating manual							
Check oil level		x						
Check valve clearance, if needed, adjust	During every 2nd engine oil change							
Change coolant	every 3 years							
Check coolant level, if needed, fill up	X		X		X	X	X	
Clean radiator fins							X	
Replace fuel prefilter insert Drain water from the water collecting vessel							X	X
Replace fuel fine filter and prefilter of the engine unit Drain water from the water collecting vessel	at every engine oil change, but at least once in 2 years							
Replace air filter main element							X	X
Replace air filter safety cartridge	Every 2 years or after 5 main element maintenance works							
Leak and condition test of all pipes and hoses			X		X	X		
Check V-ribbed belt for condition	X				X	X		
Exchange V-ribbed belt	See Mercedes-Benz engine maintenance instructions							
Exchange of AdBlue® filter cartridge	During every 2nd engine oil change							
Remove dust/dirt deposits from the exhaust gas system		X						
<b>Pump distributor gears</b>								
Check oil level	X	X						
Change oil	X		X					X
Exchange intake and pressure filter	X		X					X

Maintenance work	before har- vest start	daily	after the first 50 oper. hrs.	Maintenance interval			when needed	annu- ally
				every 50 oper. hrs.	after the first 500 oper. hrs.	every 500 oper. hrs.		
4-gear manual transmission								
Check oil level	X			X				
Change oil	X		X					X
Axles								
Check oil level	X			X				
Change oil	X		X					X
Hydraulic system								
Clean hydraulic fluid cooler	X	X					X	
Check oil level		X						
Change hydraulic fluid	X							X
Clean intake sieves inside the fluid tank	every 2 years							
Hydraulic fluid filter (2 pieces) replace filter elements	X		X				X	X
Exchange filling cap hydraulic fluid tank (ventilation and bleeding filter)	every 2 years							
Check hydraulic lines for damage and chafe marks	X		X			X		X
Pneumatics								
Replace air dryer cartridge	X							X
Drain compressed air reservoir				X				
Battery								
Check acid level, possibly fill up liquid	X			X			X	
Check voltage, possibly recharge	X						X	

Maintenance work	before har- vest start	daily	after the first 50 oper. hrs.	Maintenance interval			when needed	annu- ally
				every 50 oper. hrs.	after the first 500 oper. hrs.	every 500 oper. hrs.		
Driver's cabin								
Clean recirculating air filter							X	
Replace recirculating filter								X
Clean fresh air intake filter				X			X	
Renew fresh air intake filter								X
Pickup								
Check oil level in pickup rollers gearbox	X	X						
Changing oil pickup roller gearbox	X		X					X
Replace radial shaft seal in the bearing on the gearbox side	every 300,000 t of load						X	
Replace hexagon screws (M20 x 360) in the pickup roller	X							X
Check gear oil level in conveyor rollers	X	X						
Change oil in conveyor roller gearbox	X		X					X
Check oil level in the gears for 4-part pinch rollers	X	X						
Change oil in the gears for 4-part pinch rollers	X		X					X
Infeed conveyor								
Check and if necessary adjust deflection roller scraper		X					X	
Replace drive wheels	Depending on soil conditions every 60,000 - 140,000 t of loading						X	
Check tension and adjust if necessary				X			X	
Recleaner version sieve conveyor								
Check tension of sieve conveyor and adjust if necessary				X			X	
Replace drive wheels	Depending on soil conditions every 100,000 - 200,000 t of loading							



Maintenance work	before har- vest start	daily	after the first 50 oper. hrs.	Maintenance interval			when needed	annu- ally
				every 50 oper. hrs.	after the first 500 oper. hrs.	every 500 oper. hrs.		
Recleaner version with 8-set pinch rollers								
Check oil level in the gears for 8-part pinch rollers	X	X						
Change oil in the gears for 8-part pinch rollers	X		X					X
Recleaner version stone remover								
Check tension of sieve conveyor and adjust if necessary				X			X	
Replace drive wheels	Depending on soil conditions every 100,000 - 200,000 t of loading							
Check pretension of the pinch rollers	X						X	X
Truck conveyor								
Check tension of sieve conveyor and adjust if necessary	X			X			X	
Replace drive wheels	Depending on soil conditions every 80,000 - 180,000 t of loading							X
Remove dirt accumulated on the scales		X					X	
All belts, conveyor tunnels and the remaining machine								
Remove soiling and sticking dirt		X					X	
Check all rollers (do they rotate freely?)		X						
Refill grease container		X						
Grease lubricating points	according to lubricating plan							
Retighten wheel bolts 450 Nm	after the first 10 and the first 50 oper. hrs.							
Check tyre pressure	X			X				
Air conditioning system								
Check condenser for soiling, possibly clean				X			X	
Check hoses and lines for chafe marks (visually), possibly have them exchanged	X		X					X
Check coolant, possibly have refilled	X							X
Have the air conditioning system checked by a qualified workshop and, in case of need, repaired	X							X
Have the collector dryer and coolant replaced	every 2 years							

### 9.3 Lubricating plan (lubrication with grease gun)

Lubricating point	Number of nipples	Every oper. hrs.
Telescopic pile pickup (coat with grease)	4	when required
Fold in pickup hydraulic cylinder joint head	2	100
Bolt on fold pickup cylinder	2	100
Raising pickup hydraulic cylinder joint head	2	100
Support foot pivot left and right	2	100
Residual beet pickup pivot	2	100
Pile pickup hydraulic cylinder joint head right/left	4	100
Pile pickup hydraulic cylinder joint head up/down	2	100
Front additional axle self-steering	2	100
Cylinder axle support	4	100
Additional axles rear-front cylinder load	8	200
Locking lever swivel arm roller	1	200
Locking lever swivel arm pivot	1	200
Universal joints in front and rear axles	8	200
Cardan shafts from gearbox to axles	4	200
Nipple block beside tank support	8	200
Turn intermediate lever for residual beet pickup sensor	1	annually
Counterweight arm locking lever	4	annually
Under-run protective device pivot	2	annually
Rear recleaner attachment	6	200
Rotate recleaner cylinder joint head	1	200
Pivot point of scale interm. frame in truck conv. articulated part	2	200
Bearing on truck conveyor weighing frame	2	200
Bearing on weighing cell connecting lever	2	200

#### ADVICE



All lubricating points must also be lubricated after each washing of the machine. After washing of the machine, the central lubrication system must also be lubricated using at least 2 intermediate lubrication cycles. To do this, run all drives at low speed.

**Grease ROPA item no. 435006200** ([See Page 515](#))

as per DIN 51825, NLGI-class 2, type: KP2K-20,

at low outdoor temperatures KP2K-30.

No lubricating greases containing solid lubricants may be employed. Biologically degradable greases are also admissible.

## 9.4 Lubricant specification table

Sort	ROPA marking	Standard/specification	ROPA item no. Container size
<b>Hydraulic oil HVLP 46</b> (containing zinc)	<b>ROPA hydroFluid HVLP 46</b>	ISO-VG 46 as per DIN 51524 part 3 <a href="#">See Page 509</a>	<b>435001210</b> = 20 l <b>435001230</b> = 208 l <b>435001240</b> = 1000 l
<b>Engine oil, low SAPS</b> (only d-diesel engine)	<b>ROPA engineOil E9 5W-30</b>	Mercedes Standard MB 228.52 <a href="#">See Page 510</a>	<b>435015910</b> = 20 l <b>435015920</b> = 60 l <b>435015930</b> = 208 l <b>435015940</b> = 1000 l
<b>Engine oil, semi-synthetic</b> (only for a-diesel engine and c-diesel engine)	<b>ROPA engineOil E7+ 10W-40</b>	Mercedes Standard MB 228.5 <a href="#">See Page 511</a>	<b>435012010</b> = 20 l <b>435012020</b> = 60 l <b>435012030</b> = 208 l <b>435012040</b> = 1000 l
<b>Gear oil</b>	<b>ROPA gearOil GL5 90</b>	API GL 5, SAE 90 <a href="#">See Page 512</a>	<b>435002010</b> = 20 l <b>435002020</b> = 60 l <b>435002030</b> = 208 l <b>435002040</b> = 1000 l
<b>Fully synthetic gear oil</b>	<b>ROPA gearOil GL5 75W-90 synth</b>	API GL5, SAE 75W-90 <a href="#">See Page 513</a>	<b>435011610</b> = 20 l <b>435011620</b> = 60 l <b>435011630</b> = 208 l
<b>Gear oil ATF</b>	<b>ROPA gearFluid ATF</b>	ATF oil as per Dexron II D <a href="#">See Page 514</a>	<b>435011810</b> = 20 l <b>435011820</b> = 60 l <b>435011830</b> = 208 l
<b>Grease</b>	<b>ROPA multi tem- perature grease 2</b>	DIN 51825, NLGI-class 2, type: KP2K-20, at low out- door temperatures KP2K-30 <a href="#">See Page 515</a>	<b>435015300</b> = 400 g <b>435006200</b> = 18 kg <b>435002300</b> = 25 kg <b>435006100</b> = 180 kg

## 9.4.1 Product Data Sheet ROPA hydroFluid HVLP 46

### Properties

**ROPA hydroFluid HVLP 46** is a mineral oil-based hydraulic fluid with particularly favourable viscosity temperature characteristics (high VI hydraulic oil). Paraffin-based primary raffinate is used exclusively as the base oil. Even under extreme temperature variations and when starting up hydraulics at temperatures below zero ROPA hydroFluid HVLP 46 provides a very high degree of uniformity. The optimal properties for protection from wear, corrosion and oxidation guarantee the best possible functional safety of the hydraulic system. Due to the good filterability of ROPA hydroFluid HVLP 46, it can be used in many hydraulic systems. No filter plugging.

### Information on use

**ROPA hydroFluid HVLP 46** is particularly suitable for hydraulic systems that are exposed to extremely varying temperatures. These include the entire range of mobile hydraulics in agricultural and construction machines as well as all stationary systems that work outdoors.

The multi-purpose character of ROPA hydroFluid HVLP 46 allows significant reduction of product range. In this way, the risk that the wrong product might be used is largely avoided. It also simplifies storage and ordering process.

ROPA hydroFluid HVLP 46 can be used wherever HVLP or HLP hydraulic oils are prescribed.

### Description / specifications

**ROPA hydroFluid HVLP 46** is very shear stable and exceeds the requirements for hydraulic oils HVLP 46 as per DIN 51524 Part 3 and for hydraulic oils HV 46 as per ISO 11158.

### Usage recommendations

Hydraulic oil HVLP 46 as per DIN 51524 part 3

Hydraulic oil HV 46 as per ISO 11158

**Ropa item no. & container sizes** [See Page 508](#)

Characteristics		Test method	ROPA hydroFluid HVLP 46
Marking		DIN 51 502	HVLP 46
		DIN ISO 6743/4	HV 46
Density at 15°C	g/cm³	DIN 51 757	0.874
Kin. viscosity at 40°C	mm²/s	DIN EN ISO 3104	45.9
Kin. viscosity at 100°C	mm²/s	DIN EN ISO 3104	8.12
Viscosity index (VI)		DIN ISO 2909	150
Flash point COC	°C	DIN ISO 2592	228
Pour point	°C	DIN ISO 3016	-39
FZG-Test A/8,3/90	SKS	DIN ISO 14 635	12
All characteristic data are subject to production-related variations. We reserve the right to make modifications to the technical data. For more information, see our Material Safety Data Sheet.			

## 9.4.2 Product Data Sheet ROPA engineOil E9 5W-30

### Properties

**ROPA engineOil E9 5W-30** is a premium low SAPS easy-running engine oil for commercial vehicles with and without diesel particulate filter (DPF), EGR and SCR catalysts for NOx reduction. ROPA engineOil E9 5W-30 is characterized by a low ash additive technology (low SAPS = low contents of sulphate ash, phosphorus and sulphur). The all-season viscosity range SAE 5W-30 preferred by many engine manufacturers is achieved due to the use of selected base oils of the modern synthesis technology. ROPA engineOil E9 5W-30 allows very long oil change intervals, providing simultaneously an improved engine protection. The modern "Low SAPS" additive reduces internal friction in the diesel engine, resulting in lower fuel consumption and optimised wear protection. The economic efficiency is characterised by reduced oil consumption, lower pollutant emissions and less operating costs. The improved soot carrying capacity contributes significantly to the prevention of abrasive wear in the diesel engine and best engine cleanliness.

### Information on use

**ROPA engineOil E9 5W-30** was developed specifically for the efficient care of modern, exhaust-optimised diesel engines, even under extreme loads. ROPA engineOil E9 5W-30 is a high-performance commercial vehicle engine oil that can be used all year round and allows long oil change intervals. The engine oil sustains the effectiveness of the exhaust gas treatment systems for a very long period of time. Power losses due to clogged diesel particulate filters are minimised thanks to lowered particulate emissions, resulting in higher efficiency.

### Description / specifications

SAE class 5W-30

API CK-4 / SN

ACEA E9 / E7 / E6

Jaso DH-2

### Approvals

MB-approval 228.52

Volvo VDS-4.5 (STD 417-0003)

### Usage recommendations

MAN M 3677

MB-Blatt 228.51

Deutz DQC IV-18LA

MTU MTL 5044 type 3.1

MAN M 3477

Scania Low Ash

Deutz TTCD

Caterpillar ECF-3

Renault VI RLD-3

Mack EOS-4.5

Cummins CES 20086

Detroit Diesel DDC 93K222

### Ropa item no. & container sizes

[See Page 508](#)

Characteristics		Test method	ROPA engineOil E9 5W-30
SAE class		SAE J 300	5W-30
Density at 15°C	g/cm³	DIN 51 757	0.857
Dyn. viscosity at -30°C (CCS)	mPa s	ASTM D 5293	5,970
Kin. viscosity at 40°C	mm²/s	DIN EN ISO 3104	72.5
Kin. viscosity at 100°C	mm²/s	DIN EN ISO 3104	11.9
Viscosity index (VI)		DIN ISO 2909	160
Flash point COC	°C	DIN ISO 2592	231
Pour point	°C	DIN ISO 3016	-45
Base number	mgKOH/g	ASTM D 2896	10.2
All characteristic data are subject to production-related variations. We reserve the right to make modifications to the technical data. For more information, see our Material Safety Data Sheet.			

### 9.4.3 Product Data Sheet ROPA engineOil E7+ 10W-40

#### Properties

**ROPA engineOil E7+ 10W-40** is a UHPD low-viscosity engine oil for commercial vehicles. The SAE 10W-40 year-round range of viscosity preferred by the engine manufacturers can be achieved thanks to the use of special base oils and innovative additives. At very low outside temperatures, the SAE 10W cold viscosity ensures reliable cold starts (low cold start wear) and the fastest possible supply to all lubrication points. Extreme loads are safely mastered due to the high temperature viscosity SAE 40. Friction losses and wear are significantly reduced. Efficiency is significantly improved due to low oil and fuel consumption and longer oil change intervals, even under severe conditions.

#### Information on use

**ROPA engineOil E7+ 10W-40** was developed for the efficient care of commercial vehicle and stationary diesel engines, even under extreme loads. It exceeds all the requirements for a modern high-performance engine oil for vehicles of various types in agriculture, construction and commercial vehicle fleets.

ROPA engineOil E7+ 10W-40 is a high-performance diesel engine oil that can be used year-round and is recommended for use in Euro III - Euro VI diesel engines. Due to its low ash content this product can be used in a wide variety of exhaust aftertreatment systems.

#### Description / specifications

SAE class 10W-40  
ACEA E4/E7  
API CI-4

#### Approvals

MB-approval 228.5  
Volvo VDS-3 (STD 417-0002)

#### Usage recommendations

MAN M 3277 MTU MTL 5044 type 3

#### Ropa item no. & container sizes

[See Page 508](#)

Characteristics		Test method	ROPA engineOil E7+ 10W-40
SAE class		SAE J 300	10W-40
Density at 15°C	g/cm³	DIN 51 757	0.869
Dyn. viscosity at -25°C (CCS)	mPa s	ASTM D 5293	5.770
Kin. viscosity at 40°C	mm²/s	DIN EN ISO 3104	96.8
Kin. viscosity at 100°C	mm²/s	DIN EN ISO 3104	14.5
Viscosity index (VI)		DIN ISO 2909	156
Flash point COC	°C	DIN ISO 2592	236
Pour point	°C	DIN ISO 3016	-42
Base number	mgKOH/g	DIN ISO 3771	12.7
All characteristic data are subject to production-related variations. We reserve the right to make modifications to the technical data. For more information, see our Material Safety Data Sheet.			

## 9.4.4 Product Data Sheet ROPA gearOil GL5 90

### Properties

**ROPA gearOil GL5 90** Gear oil is manufactured from special base oils with specific additives. The viscosity is selected to guarantee good flow properties at low temperatures and also good lubrication at high temperatures.

### Information on use

**ROPA gearOil GL5 90** gear oil is specially designed for heavy-duty hypoid drive axles and for bevel and spur gearboxes, steering boxes and manual transmissions in vehicles and machines with API GL-5 requirements.

### Description / specifications

SAE class 85W-90

API GL-5

### Usage recommendations

MAN M 342 type M1

MAN M 342 type M2

ZF TE-ML 05A, 12E, 16B, 16C, 17B, 19B, 21A

ZF001911

ZF001912

### Ropa item no. & container sizes

[See Page 508](#)

Characteristics		Test method	ROPA gearOil GL5 -90
SAE class		SAE J 306	85W-90
Density at 15°C	g/cm³	DIN 51 757	0.898
Dyn. viscosity at -12°C	mPa s	DIN 51 398	21,000
Kin. viscosity at 40°C	mm²/s	DIN EN ISO 3104	198
Kin. viscosity at 100°C	mm²/s	DIN EN ISO 3104	17.6
Viscosity index (VI)		DIN ISO 2909	96
Flash point COC	°C	DIN ISO 2592	230
Pour point	°C	DIN ISO 3016	-21
FZG-Test A/8,3/90	SKS	DIN ISO 14 635	>12
All characteristic data are subject to production-related variations. We reserve the right to make modifications to the technical data. For more information, see our Material Safety Data Sheet.			



## 9.4.5 Product Data Sheet ROPA gearOil GL5 75W-90 synth

### Properties

**ROPA gearOil GL5 75W-90 synth** is a fully synthetic low-friction multifunction gear oil for very heavy-duty axle and manual transmissions. The SAE 75W-90 viscosity guarantees outstanding flow properties at low temperatures and also maximum lubrication security at high temperatures. The special low-friction properties of ROPA gearOil GL5 75W-90 synth also ensure reduced fuel consumption.

### Information on use

**ROPA gearOil GL5 75W-90 synth** is suitable for universal application in manual transmissions, auxiliary drives and axle drives in commercial vehicles, agricultural machines, construction machines and passenger cars.

The API GL-4 and API GL-5 requirements are easily met.

ROPA gearOil GL5 75W-90 synth can also be used without problems in gear units that require gear oils complying with MAN 341 Type E3 and MAN 342 Type M3.

### Description / specifications

SAE class 75W-90

API GL-4 / GL-5

### Usage recommendations

MB sheet 235.8

former ZF TE-ML 05B

### Ropa item no. & container sizes

[See Page 508](#)

Characteristics		Test method	ROPA gearOil GL5 75W-90 synth
SAE class		SAE J 306	75W-90
Density at 15°C	g/cm <sup>3</sup>	DIN 51 757	0.869
Dyn. viscosity at -40°C	mPa s	DIN 51 398	77,000
Kin. viscosity at 40°C	mm <sup>2</sup> /s	DIN EN ISO 3104	107
Kin. viscosity at 100°C	mm <sup>2</sup> /s	DIN EN ISO 3104	15.7
Viscosity index (VI)		DIN ISO 2909	157
Flash point COC	°C	DIN ISO 2592	200
Pour point	°C	DIN ISO 3016	<-51
All characteristic data are subject to production-related variations. We reserve the right to make modifications to the technical data. For more information, see our Material Safety Data Sheet.			

## 9.4.6 Product Data Sheet ROPA gearFluid ATF

### Properties

**ROPA gearFluid ATF** is a gear oil for automatic transmissions, gearboxes with multi-disc clutches and is used as hydraulic oil in a wide range of applications. Gear changes are made smoother with special additives on the friction surfaces in the gearbox.

ROPA gearFluid ATF conforms to the General Motors ATF Dexron II D specification and is specified by major motor vehicle manufacturers who use automatic transmission that require Dexron II D. ROPA gearFluid ATF can also be used in automatic transmissions that conform to the Mercedes-Benz MB 236.1 specification.

### Information on use

Different ATF oils are prescribed for automatic transmissions as well as torque converter and power shift transmissions installed in vehicles due to different requirements on the friction value. Therefore, always follow the manufacturer's instructions.

### Description / specifications

General Motors Dexron II D

Ford Mercon

### Usage recommendations

MAN 339 type V1	MB sheet 236.1	ZF000438
MAN 339 type Z1	Caterpillar TO-2	ZF TE-ML 04D, 14A
MAN 339 type L 2		

**Ropa item no. & container sizes** [See Page 508](#)

Characteristics		Test method	ROPA gearFluid ATF
Paint			dyed red
Density at 15°C	g/cm <sup>3</sup>	DIN 51 757	0.871
Dyn. viscosity at -40°C (CCS)	mPa s	DIN 51 398	48,000
Kin. viscosity at 40°C	mm <sup>2</sup> /s	DIN EN ISO 3104	36.1
Kin. viscosity at 100°C	mm <sup>2</sup> /s	DIN EN ISO 3104	7.20
Viscosity index (VI)		DIN ISO 2909	168
Flash point COC	°C	DIN ISO 2592	210
Pour point	°C	DIN ISO 3016	-48
All characteristic data are subject to production-related variations. We reserve the right to make modifications to the technical data. For more information, see our Material Safety Data Sheet.			

## 9.4.7 Product Data Sheet ROPA multi temperature grease 2

### Properties

**ROPA multi temperature grease 2** is an EP grease based on resistant to ageing mineral oils.

It especially meets the requirements of BEKA-MAX central lubrication systems and is suitable for the lubrication of roller and sliding bearings, even under high loads. ROPA multi temperature grease 2 can also be used without problems for lubrication points that require grease as per MAN standards (works standard MAN 283 Li-P2) and Mercedes-Benz (delivery specification: DBL 6804.00 - Fuel regulation sheet 267).

### Information on use

Wheel bearing lubrication of trucks, construction machines, industrial trucks and agricultural machines. Lubrication of the slewing ring bearings. Bearing lubrication of machine tools, presses, pumps, electric motors. For central lubrication systems of agricultural and construction machines.

### Special advantages:

easy to pump in central lubrication systems	resistant to ageing
water-resistant	mechanically very stable
corrosion-proof	high pressure absorption capacity
strongly adherent	

### Description / specifications

as per DIN 51 502, KP 2 K-30

### Approvals

**Beka-MAX central lubrication systems**

### Usage recommendations

MAN (works standard MAN 283 Li-P2)

Mercedes-Benz (Fuel regulation sheet 267)

### Ropa item no. & container sizes

[See Page 508](#)

Characteristics	as per DIN 51502	KP 2 K-30
Thickener		Lithium soap
Operational temperature range		from -30 to +120 °C
Permissible for short term		+130 °C
Dropping point	DIN ISO 2176	approx. 175 °C
Worked penetration after 60 DH (double cycles)	DIN ISO 2337	from 265 to 295 1/10 mm
Penetration in waste after 100,000 DH		< 30 1/10 mm
Base oil type		Mineral oil
Base oil, viscosity at 40°C	DIN 51562-01	110 mm²/s
Water resistance	DIN 51807-01	1 – 90
Emcor test	DIN 51802	Corrosion degree 0
Corrosion effect on copper	DIN 51811	Corrosion degree 1 - 100
Mechanical dynamic test FAG-FE9	DIN 51821-02 -A/1500/6000-120	F <sub>50</sub> >100h
VKA-welding power	DIN 51350-04	2400 N
All characteristic data are subject to production-related variations. We reserve the right to make modifications to the technical data. For more information, see our Material Safety Data Sheet.		

## 9.5 Diesel engine coolant

### Corrosion protection/antifreeze coolant

Sort	Designation	Standard/specification	ROPA item no. Container size
Diesel engine coolant	Corrosion protection/antifreeze coolant	MB-approval 325.5	435007210 = 20 l

The coolant is a concentrate in accordance with MB approval 325.5 (Mercedes-Benz Specifications for Operating Fluids). This concentrate is red. It must be diluted with water before use in the diesel engine cooling system. Mix water and concentrate outside the coolant circuit and only then pour the ready mixture into the cooling system.

Frost resistance up to	Mixing ratio	
	Concentrate	Water
-37 °C	50 %	50 %

This mixing ratio is important for:

- freezing point
- boiling point
- heat dissipation
- share of corrosion protection

Do not use more than 55 vol.% concentrate even at extremely low atmospheric temperature. With 55 vol.% concentrate, you have the maximum frost protection of an aqueous ethylene glycol solution, approx. for -45 °C; a higher concentrate share reduces the frost protection and heat dissipation of the coolant, which can lead to permanent damage. If there is less than 45 vol.% or more than 55 vol.% of corrosion/antifreeze agent in the coolant, the mixing ratio must be corrected immediately.

**Alternatively, you can use a pre-mixed corrosion/antifreeze agent according to MB approval 326.5.**

#### ATTENTION



#### Hazard of engine damages

In accordance with MB approval 325.5, the coolant must not be mixed with other coolants (except with a pre-mixed corrosion/antifreeze agent in accordance with MB approval 326.5).

**Water quality**

Use clean water as soft as possible to prepare the coolant. Mostly, drinking water fulfils the desired requirements. Information on the quality of drinking water can be obtained from the local waterworks or the responsible water supply company on request.

If no information about the water quality or no suitable water is available, use distilled or deionised water. Do not use seawater, brackish water, brines and industrial waste water. Salts can enhance corrosion or form unwanted sediments.

The chemical values of the water used for mixing of coolants must be within the limits given in the table below:

Water quality		min	max
alkaline-earth ions	mmol/l		2.7
hardness	°dH		15
chloride	mg/l		80
chloride + sulphate	mg/l		160
pH-value	-	6.5	8.0

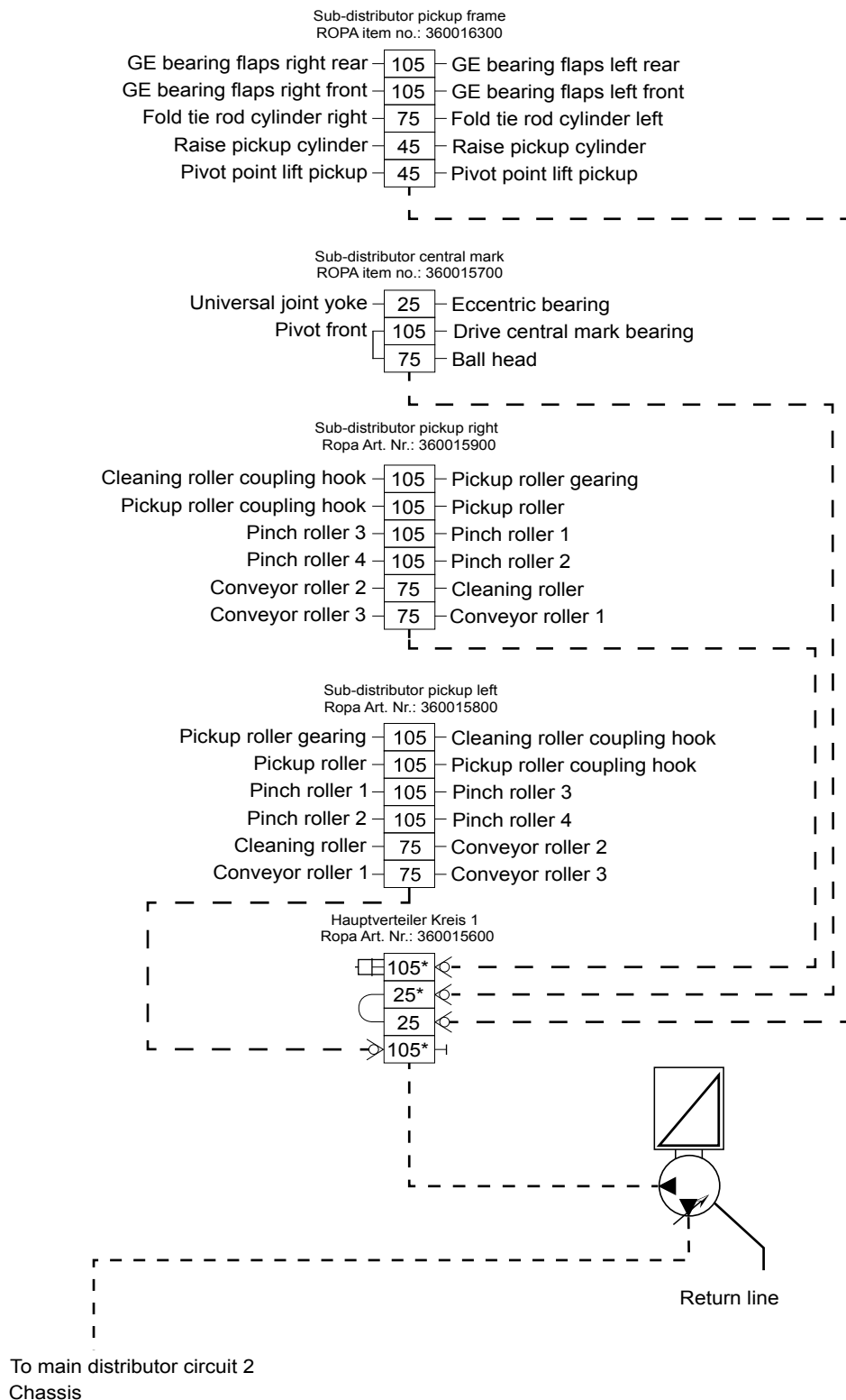
## 9.6 Filter cartridges, V-belts

### Maus 6 / BunkerMaus 6 with Mercedes Benz OM936

Diesel engine Mercedes Benz OM936	ROPA item no.
Oil filter insert, 1 pc.	303025600
Fuel fine filter insert engine, 1 pc.	303025500
Fuel prefilter insert engine, 1 pc.	303025400
Fuel prefilter insert electric pump, 1 pc.	303016700
Park heating fuel filter	301010600
Diesel particulate filter (only d-diesel engine), 1 pc.	3030320T0
<b>Diesel engine air filter</b>	
Air filter main cartridge, 1 pc.	301022500
Air filter safety cartridge, 1 pc.	301022600
<b>AdBlue® system</b>	
AdBlue® filter insert, 1 pc.	303019500
<b>V-belts</b>	
Flat belt: 1 pc. V-belt	226006600
<b>Hydraulic system</b>	
Suction return filter in the oil tank	270088600
High pressure filter element Including O-ring	270043000
Filling lid with integrated ventilation/bleeding filter	270070000
<b>Pump distributor gears</b>	
Intake filter	181060100
O-ring 32.99* 2.62 NBR70	412059500
Paper gasket for intake filter	181051700
Pressure filter element Including O-ring 46*3, ROPA item no. 412045600	270044200
<b>Pneumatics</b>	
Air dryer cartridge	261003500
<b>Driver's cabin ventilation</b>	
Fresh air intake filter	352033200
Driver's cabin recirculating filter	352042200
<b>Only with optional water spray system</b>	
Filter insert 100 mesh/inch	208003200

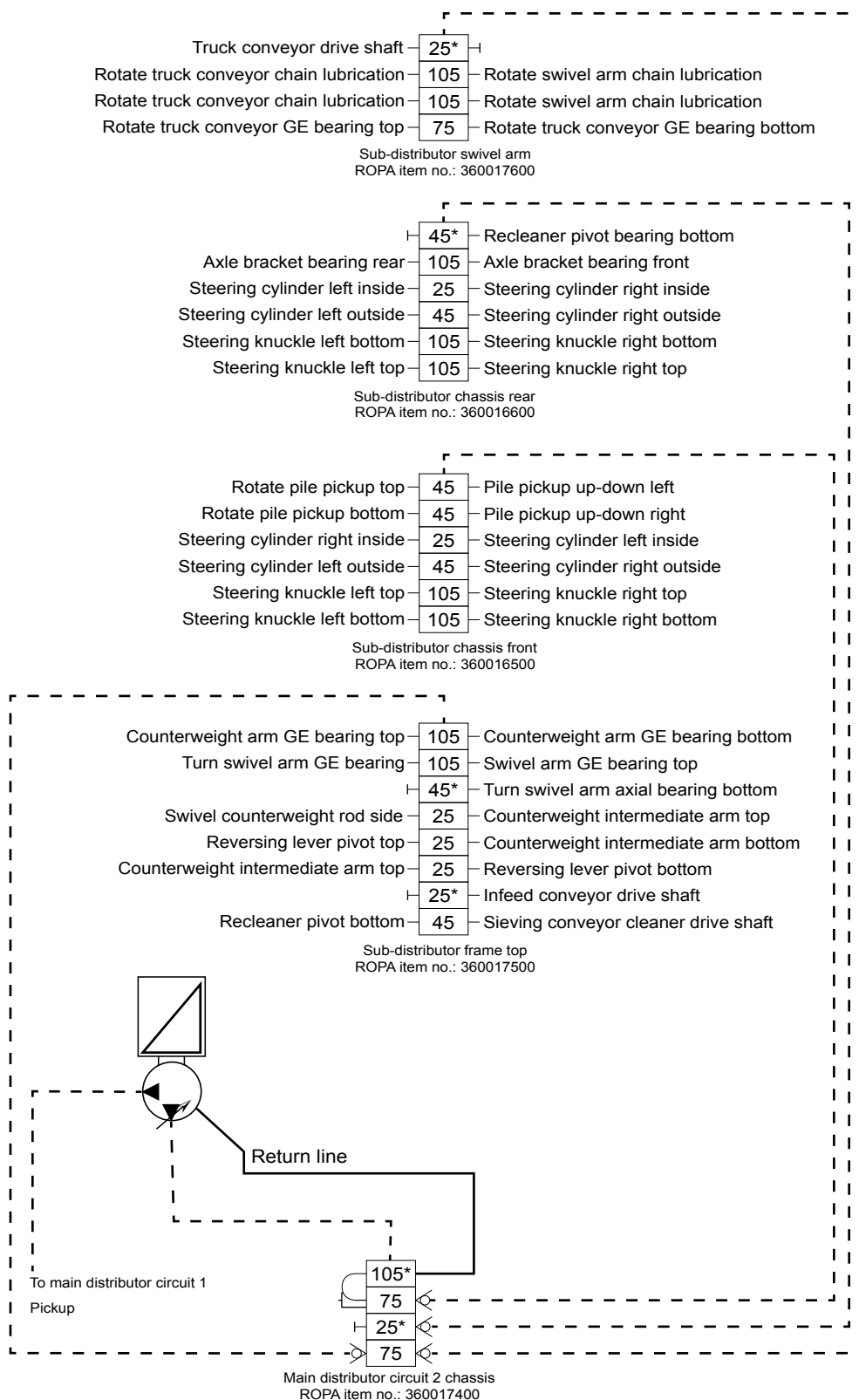
## 9.7 Lubricating plans

### 9.7.1 Central lubrication circle 1 pickup

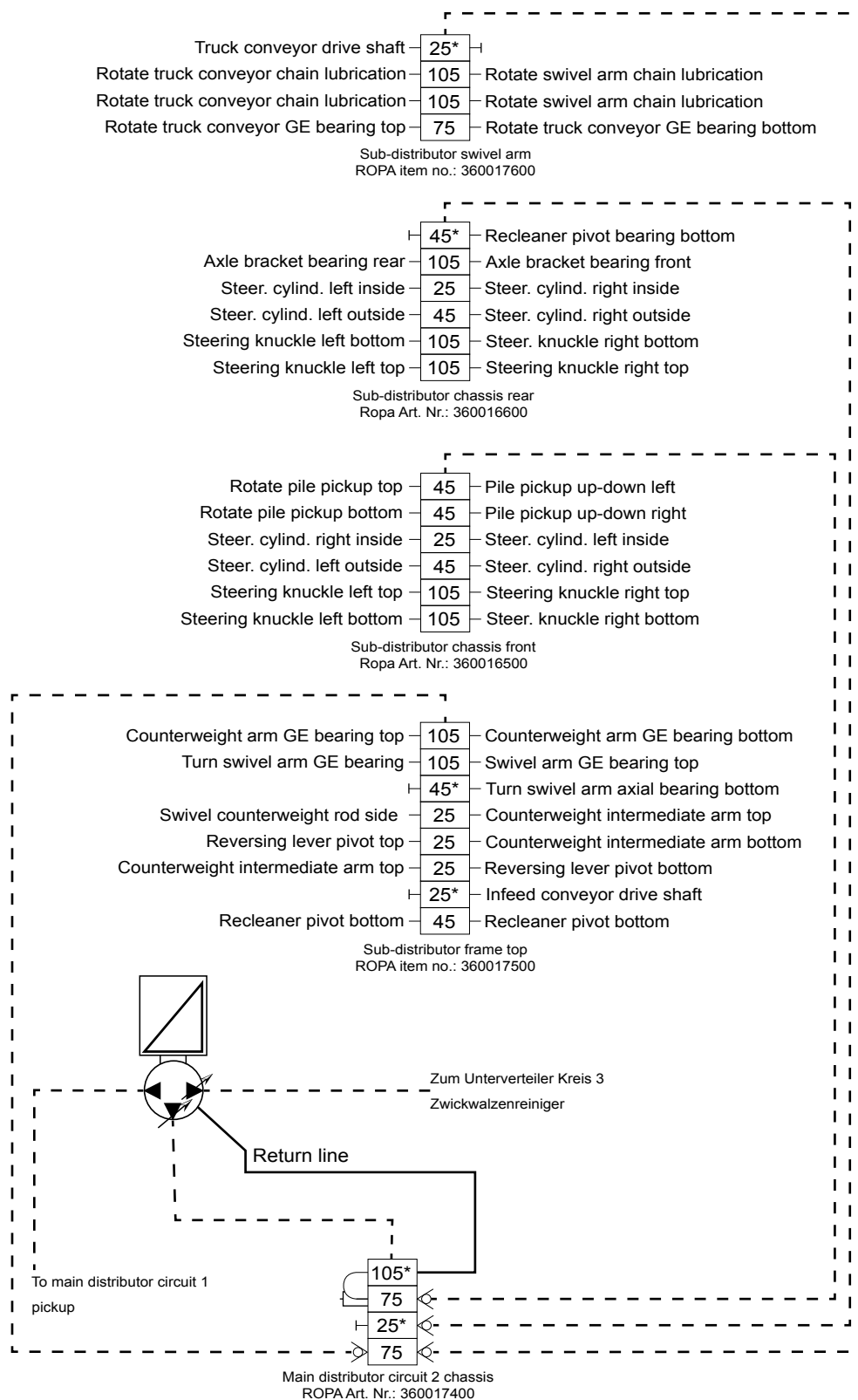




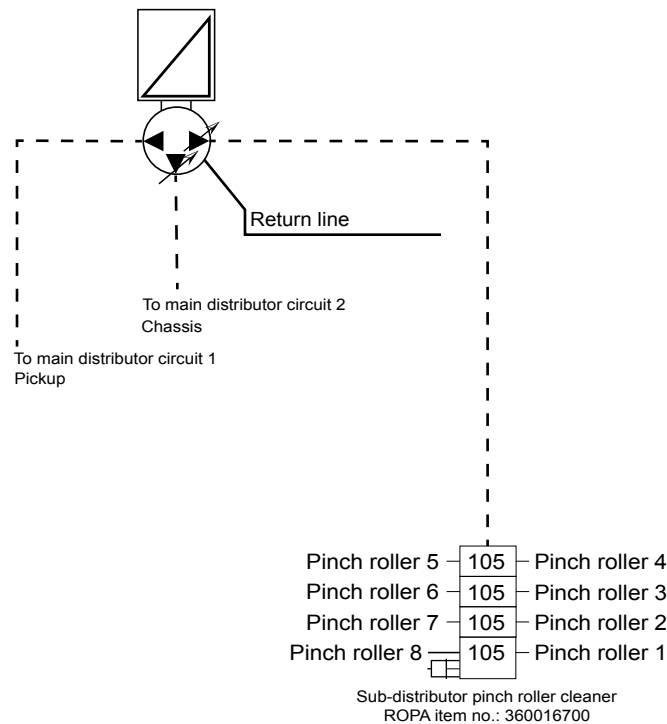
## 9.7.2 Central lubrication circuit 2 chassis with sieve conv. cleaner



### 9.7.3 Central lubrication circuit 2 chassis with 8-set pinch roller cleaner

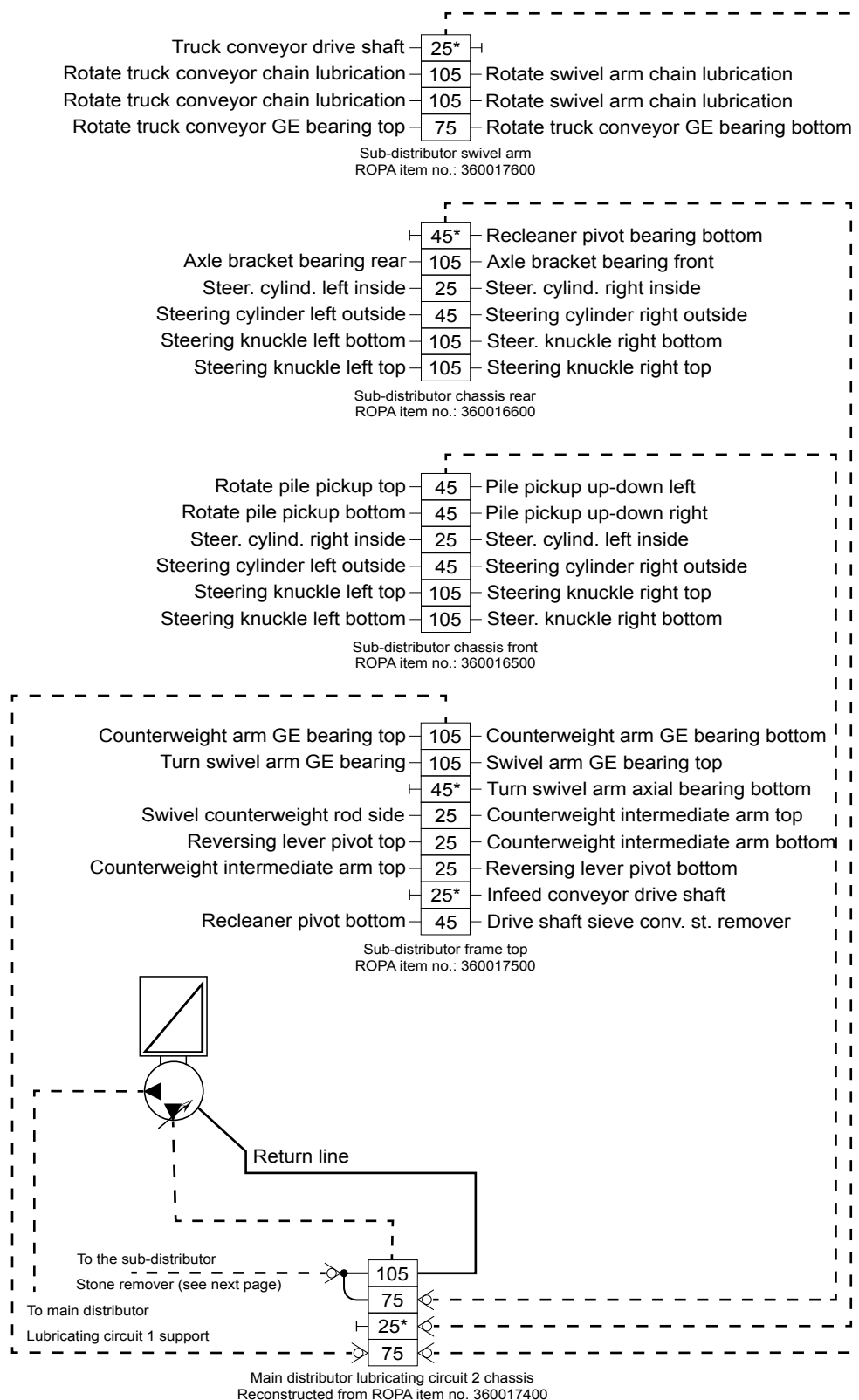


9.7.4 Central lubrication circuit 3 8-set pinch roller cleaner

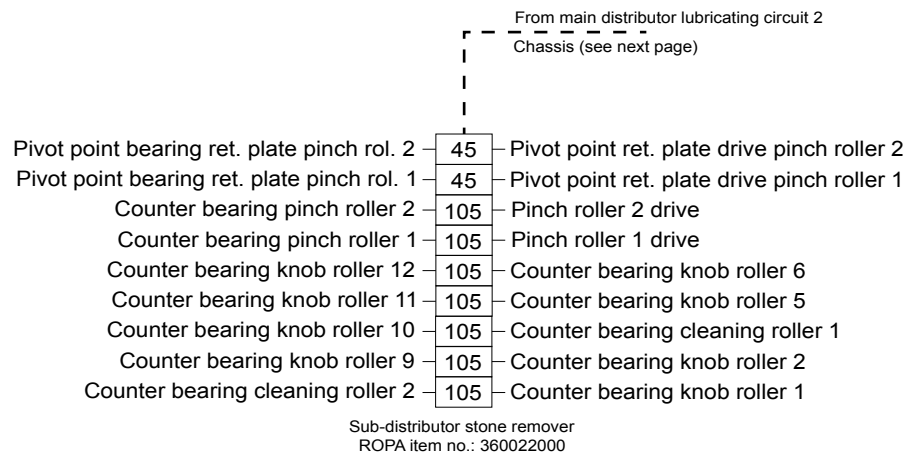


## 9.7.5 Central lubrication circuit 2 chassis with stone remover

View, part 1



View, part 2



## 9.8 Maintenance verification

### 9.8.1 Maintenance verification oil change + filter exchange

	Date:	Date:	Date:	Date:	Date:
	Oper.hrs.	Oper.hrs.	Oper.hrs.	Oper.hrs.	Oper.hrs.
	ok	ok	ok	ok	ok
<b>Diesel engine</b>					
Engine oil					
Engine oil filter					
Valves adjusted					
Engine fuel prefilter					
Engine fuel fine filter					
Fuel prefilter at the electric pump					
Air filter main cartridge					
Air filter safety cartridge					
Antifreeze checked					
Coolant changed					
AdBlue® filter cartridge					
Diesel particulate filter (only d-diesel engine)					
<b>Axles/Gear units</b>					
<b>Front axle</b>					
Differential gears					
Planetary gears, 2 pcs.					
<b>Rear axle</b>					
Differential gears					
Planetary gears, 2 pcs.					

	Date:	Date:	Date:	Date:	Date:
	Oper.hrs.	Oper.hrs.	Oper.hrs.	Oper.hrs.	Oper.hrs.
	ok	ok	ok	ok	ok
<b>Gears</b>					
Pickup rollers right					
Pickup rollers left					
Conveyor rollers right					
Conveyor rollers left					
4 pinch rollers right					
4 pinch rollers left					
8 pinch rollers (optional)					
<b>Pump distributor gears</b>					
Gear oil					
PDG oil filter (2 filter elements)					
<b>4-gear manual transmission</b>					
<b>Hydraulic oil</b>					
Hydraulic oil					
Hydraulic oil filter (2 filter elements)					
Intake sieves inside the oil tank cleaned					



**9.8.2 Maintenance confirmation****1st customer service ROPA machine**

Maintenance performed after: \_\_\_\_\_ hours

Required: 50 oper. hrs.

Maintenance performed on: \_\_\_\_\_  
DateMaintenance performed by: \_\_\_\_\_  
Signature/stamp

The maintenance may only be performed by ROPA-Service staff.

**The 1st diesel engine customer service**

Maintenance performed after: \_\_\_\_\_ hours

Required: 500 oper. hrs. for a-diesel engine

Required: 500 oper. hrs. for c-diesel engine

Required: 1,000 oper. hrs. for d-diesel engine

Maintenance performed on: \_\_\_\_\_  
DateMaintenance performed by: \_\_\_\_\_  
Signature/stamp

The maintenance may be confirmed by authorised MTU or Mercedes-Benz Service only.

## 9.9 Torque table for bolts and nuts (Nm)

Metric thread DIN 13				
Dimension	6.9	8.8	10.9	12.9
M4	2.4	3.0	4.4	5.1
M5	5.0	5.9	8.7	10
M6	8.5	10	15	18
M8	21	25	36	43
M10	41	49	72	84
M12	72	85	125	145
M14	115	135	200	235
M16	180	210	310	365
M18	245	300	430	500
M20	345	425	610	710
M22	465	580	820	960
M24	600	730	1050	1220
M27	890	1100	1550	1800
M30	1200	1450	2100	2450

Metric fine thread DIN 13				
Dimension	6.9	8.8	10.9	12.9
M8x1	23	27	39	46
M10x1	43	52	76	90
M12x1.5	76	89	130	155
M14x1.5	125	145	215	255
M16x1.5	190	225	330	390
M18x1.5	275	340	485	570
M20x1.5	385	475	680	790
M22x1.5	520	630	900	1050

### Tightening torque wheel nuts

Front and rear wheels	450 Nm
Additional axles	400 Nm

## 9.10 AdBlue® information sheet

### Identification

AdBlue is the trade name for the diesel engine NOx reduction agent AUS 32 defined by the standard DIN 70070 / ISO 22241.

### AdBlue® tasks

AdBlue reduces toxic nitrogen oxides to water vapour and elementary nitrogen in the exhaust of diesel-powered vehicles with SCR catalytic converter technology.

### Chemical characteristics and composition of AdBlue®

AdBlue consists of technically pure urea, without addition of foreign substances, dissolved in demineralized water. It contains 32.5% of urea. AdBlue is not an additive but is contained in a separate tank in vehicles SCR catalytic converter technology.

Chemical formula:	$\text{H}_2\text{N-CO-NH}_2$
Mol mas (urea):	60.06 g/mol
CAS (Chemical-Abstracts-Service)-No.:	57-13-6

### Handling contaminated by AdBlue® operating materials, fuels and lubricants

It should be ensured that AdBlue® is strictly separated from other operating materials, fuels and lubricants, e.g coolant, engine oil, fuel, hydraulic and brake fluids, and not the same containers and collecting tanks are used. For example, even minimal quantity of AdBlue® is enough in the coolant circuit to damage thermostats and temperature sensors. Operating materials, which contain traces of AdBlue®, must not be used.

### Handling AdBlue® contaminated by foreign substances

Some components of the exhaust gas treatment system react very sensitively to the smallest traces of contamination in AdBlue. Therefore, when handling AdBlue, it is always necessary to use only clean containers and collecting tanks dedicated to this purpose. AdBlue that contain traces of impurities may not be used further.

### Usage period and storage life

AdBlue decomposes during storage to ammonium hydroxide and carbon dioxide and then no longer conforms to the requirements of DIN 70070 / ISO 22241. If the recommended storage temperature of maximum 25°C is maintained, then AdBlue meets the requirements of this norm for at least 6 months after its date of manufacture. If the recommended storage temperature is exceeded, then this period is shortened. AdBlue freezes and solidifies at temperatures below -11°C. If warmed, frozen AdBlue will again liquefy and can be used again without degradation of quality.

### Disposal and degradability

AdBlue only poses a low level of danger to water bodies and soil. It can be further used by microbes and is therefore easily decomposed. For this reason, AdBlue is classified in Germany in the lowest risk category of WGK 1 water hazards (German Water Hazard Classification).

### Regulations

The product does not need to be labelled in accordance with EC directives or respective national laws.

National regulations:	
Statutory Ordinance on Hazardous Incidents:	not subject to

### Marking

Pumps for dispensing AdBlue are labelled with standard designation DIN 70070 / ISO 22241, or with the AdBlue trade name.

### Physical and chemical properties of AdBlue®

Form:	liquid
Colour:	colourless, clear, light yellow
Smell:	slight smell of ammonia
pH:	10 (aqueous solution, 10%)
Beginning of crystallisation:	-11 °C
Boiling point/range:	103 °C
Flash point:	-
Auto-ignition temperature:	not self-igniting
Density:	approx. 1.09 g/cm³ at 20 °C
Viscosity, dynamic:	approx. 1.4 mPa s at 25°C

### Protection of electrical and electronic components when handling AdBlue®

AdBlue leads to corrosion of electrical and electronic components. For this reason, all electrical and electronic components in the vicinity must be covered to avoid contact with AdBlue during performance of any tasks in which AdBlue could leak out.

### Storage and packaging

In order to avoid crystal precipitation, it is recommended to store AdBlue under normal conditions (optimally at up to 25°C). In order to avoid negative effects upon the quality due to contamination, AdBlue should only be handled via storage and filling systems designed for such purposes. Suitable container materials include alloyed steel, aluminium, various plastics as well as plastic coated metal containers. Non-suitable for this purpose are unalloyed steels, copper, copper containing alloys and zinc-plated steels.

Disposal of smaller quantities:

Due to its easy decomposition, small quantities of spilled AdBlue can be rinsed away without a problem using copious water.

Disposal of larger quantities:

Disposal of larger quantities of AdBlue must be carried out in compliance with applicable recovery and disposal regulations.

The applicable waste treatment classification is location-dependent and is to be carried out in accordance with the European Waste Catalogue (EWC) and/or the German Directive on the List of Waste Materials (AAV).

Contaminated packaging:

Packaging on which remnants of AdBlue adhere is to be treated as the substance itself. It is best to empty packaging, clean appropriately and then introduce into the appropriate recycling waste channel.

## 9.11 Confirmation about instructions given to the driver

Mrs/Mr

date of  
birth

.....  
Last name and first name

Was instructed  
on

☐

about safe handling of the machine

☐

about maintenance of the machine

by

.....  
Last name and first name

Has demonstrated the  
required knowledge

☐

for safe handling of the machine

☐

for maintenance of the machine

by presenting the following documents:

.....  
Certificate/testimonial

of (date)

.....  
Certificate/testimonial

of (date)

She/he was given instructions by (last

ON (date)

name and first name) .....

about the specific obligation of safe driving of the machine and the associated requirements. Subjects of these instructions were: The chapter driving on roads of the operating manual of the machine, the applicable safety regulations and the specific requirements of the road traffic authority, in whose jurisdiction the machine is to be moved.

I hereby confirm that I have given the above mentioned instructions to their full extent:

.....  
Signature

I hereby confirm that I have received the above mentioned instructions for their full extent and have understood them:

.....  
Signature of the operator

**I have received, read and understood the operating instructions:**

.....  
Place and date

.....  
Signature of the vehicle owner

.....  
Signature of the operator

## 9.12 Safety instructions

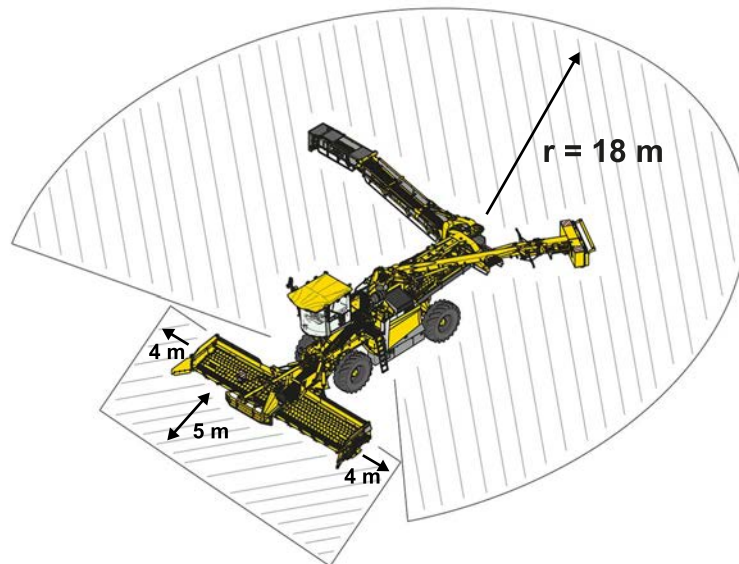
The shaded areas shown in the following diagram mark the hazard zones of the **Maus**. As soon as anyone approaches the hazard zones, the driver must shut down the **Maus** immediately and stop the loading process without delay. If the driver does not comply with this instruction, the driver is responsible for all consequences resulting from his actions.

### WARNING



There is an acute danger to life for any person staying within a hazard zone during the loading process!

- In any case, follow the instructions of the machine operator.
- Never enter the hazard zones!
- If you have accidentally entered a hazard zone, leave it immediately and quickly, but without excessive haste.
- Keep minors and seniors away from the operating machine.





### Statement

I

(last name and first name)

have received this safety information. I have been informed that the driver is under strict instructions to stop the loading process as soon as any person or persons approach the danger zone.

I am aware of the locations of the danger zones on the **Maus**. If I am accompanied by children or minors, I will inform such persons of the dangers, prohibit them from entering the Hazard zones and I will supervise them appropriately.

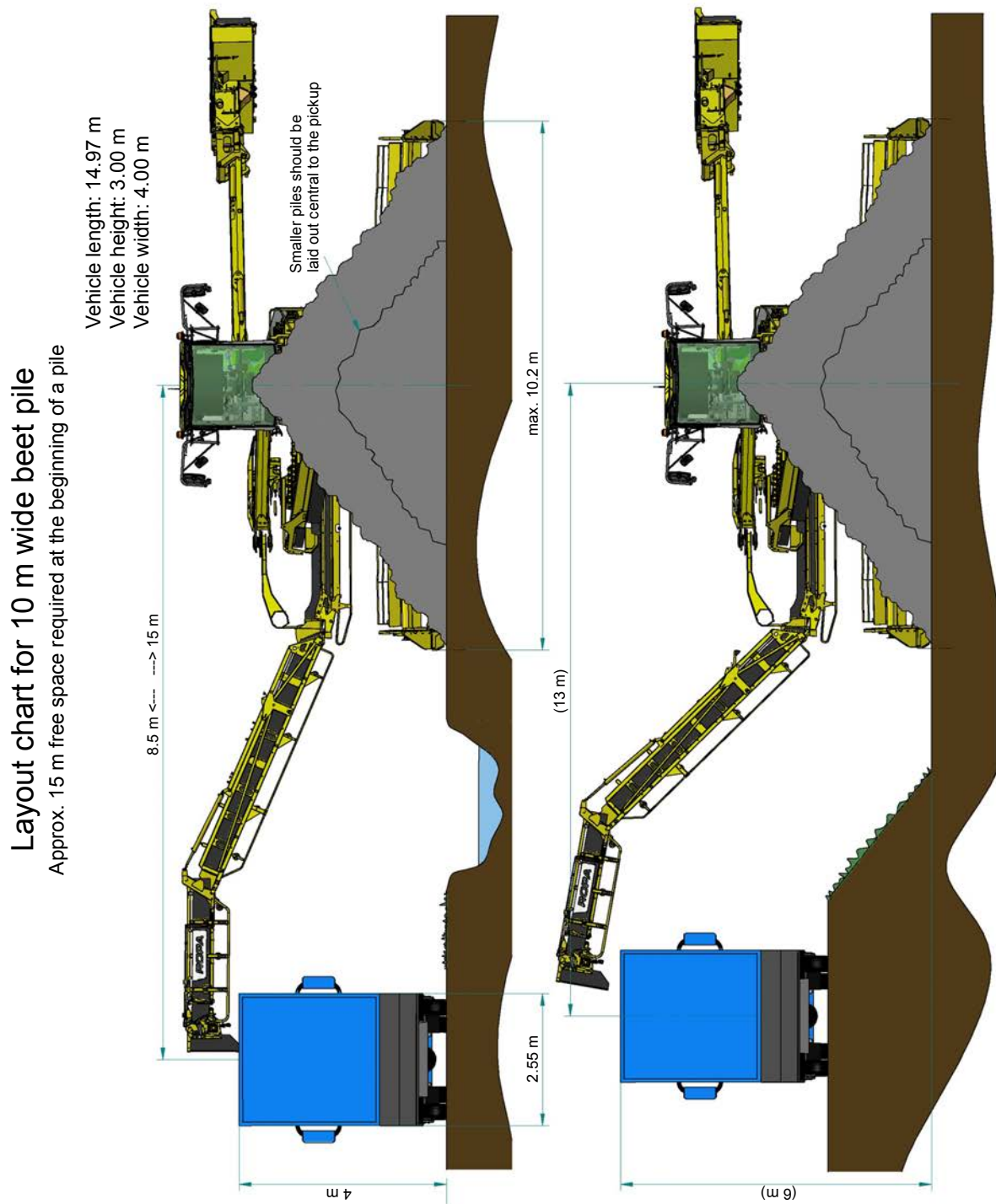
Date/signature of the informed person

I have conducted this safety session and I have given the above person a copy of this safety information.

Date/signature

Please copy this form before completing it!

## 9.13 Layout chart for a beet pile



## **9.14 Notes for beet harvesting**

**Please copy and give to driver**

### **9.14.1 Practical tips**

During lifting, ensure the correct soil content of the beets. A little amount of soil (soil content around 10-15%) protects the beets during loading. If the soil content is too high, the beets cannot be loaded so quickly.

If sugar beets are loaded immediately after lifting they should be cleaned as much as possible by the beet harvester. If freshly lifted beets are cleaned at loading this will more often cause damage to the beet body than with beets deposited for a while.

In case of very light soil, which can easily be strained, you should include a low soil content in the beet pile during harvesting. This soil content has a certain damping effect during loading, which largely protects the beets from damage, but can be removed without any problem by ROPA cleaner-loaders.

A large amount of soil will generally still stick to the beets, particularly with sticky soil, in spite of thorough cleaning. These sugar beets should be deposited in piles for at least 3-5 days before loading and 'kept dry' during this period. In case of moist weather, cover these piles if possible, so that soil residues will start to dry off. Dried soil has a certain damping effect during loading, but can also be excellently cleaned off with the machine.

In case of very difficult ground conditions, an optimal cleaning effect may only be achieved if the beets are deposited in piles for at least 5-7 days and are 'kept dry' during this period. The same holds true if the soil content is sticking very much to the beet body after lifting. For these beets, you will only achieve a high throughput during loading and beet-sparing loading if the soil content has started to dry on the beet body. Lay out a beet pile on ground that is as dry and free of tracks as possible. The ground should be as free as possible of foreign bodies like stones, wooden parts, etc.

If the estimated soil content of a pile is 25% or greater the pile height should not exceed two meters, if possible. For this pile height, you will achieve high throughput with simultaneous optimum distribution of soil cleaned off during loading. Long and low piles can usually be loaded faster than short and high ones.

Take note of our plans for depositing piles. Keep the required clearance to the transport path.

Make sure that the maximum pickup width does not exceed 10.20 metres.

Loading is usually performed to the right (less time required for folding in and out). Please consider this when making the pile. Due to the technologically mature engineering of the machine loading to the left is also possible with the same throughput and the same quality.

Even surface under the pile is very important for the best operation of the loader. It is not possible to work with low losses if ground under the pile is not even and level. Avoid deep ruts under the beet pile.

## 9.15 ROPA Handover confirmation

ROPA Fahrzeug- und Maschinenbau GmbH, Sittelsdorf 24, D-84097 Herrngiersdorf

Support point address:

---

---

---

---

---

---

---

---

Chassis number:

Type: 

---

Sub device no.: 

---

Type: 

---

Sub device no.: 

---

Type: 

---

Sub device no.: 

---

Type: 

---

Sub device no.: 

---

Type: 

---

Sub device no.: 

---

Client's address:

---

---

---

---

---

---

---

---

Owner:

Email:

Telephone:

Mobile phone:

Handover date:

---

No deficiencies were found during the test run. The safe operation and maintenance were explained to me. I was informed about the chapter safety in the operating manual. The following items were handed to me together with the machine:

**Document number:**

(operating manual item no.)

**Designation:**

(operating manual title)

**Software:**

(version)

---



Date/Signature of client or his representative

**Support point or representative for machine delivery:**

The machine has been handed over to the client in perfect condition. The handover has been executed correctly.



Date / Signature of support point or representative for machine delivery

**Voluntary data processing consent:**

I agree that the above personal data as well as further information about me, which becomes known in connection with business relations, for purposes of customer service, customer survey and related to me as a customer (by phone, e-mail or via an Internet entry page), as well as for any other advertising, consulting and information purposes (written, by phone or e-mail) about products and services can be received by the ROPA support point and/or ROPA, or passed on to ROPA, as well as stored, processed and used. The non-granting of the consent does not effect on the delivery of the purchased item or services. You can, if desired, partially strike out this consent. Your consent can be revoked at any time in writing to the ROPA support point or the company ROPA.



---

Date/Signature of client or his representative

## 9.16 ROPA First Use Record

ROPA Fahrzeug- und Maschinenbau GmbH, Sittelsdorf 24, D-84097 Herrngiersdorf

ROPA partner:

Customer / site of operation:

---

---

---

---

---

---

---

---

Chassis No.:

Operating hours:

Machine type:

Lifting/loading hours:

Software version:

Harvested area:

First use date:

Record:

---

---

---

---

Any customer complaints:

---

---

---

---

---

The safe operation and maintenance were explained to the customer.

The customer was informed about the chapter safety in the operating manual.

Date

Signature of mechanic

Signature of customer





# 10 Index



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